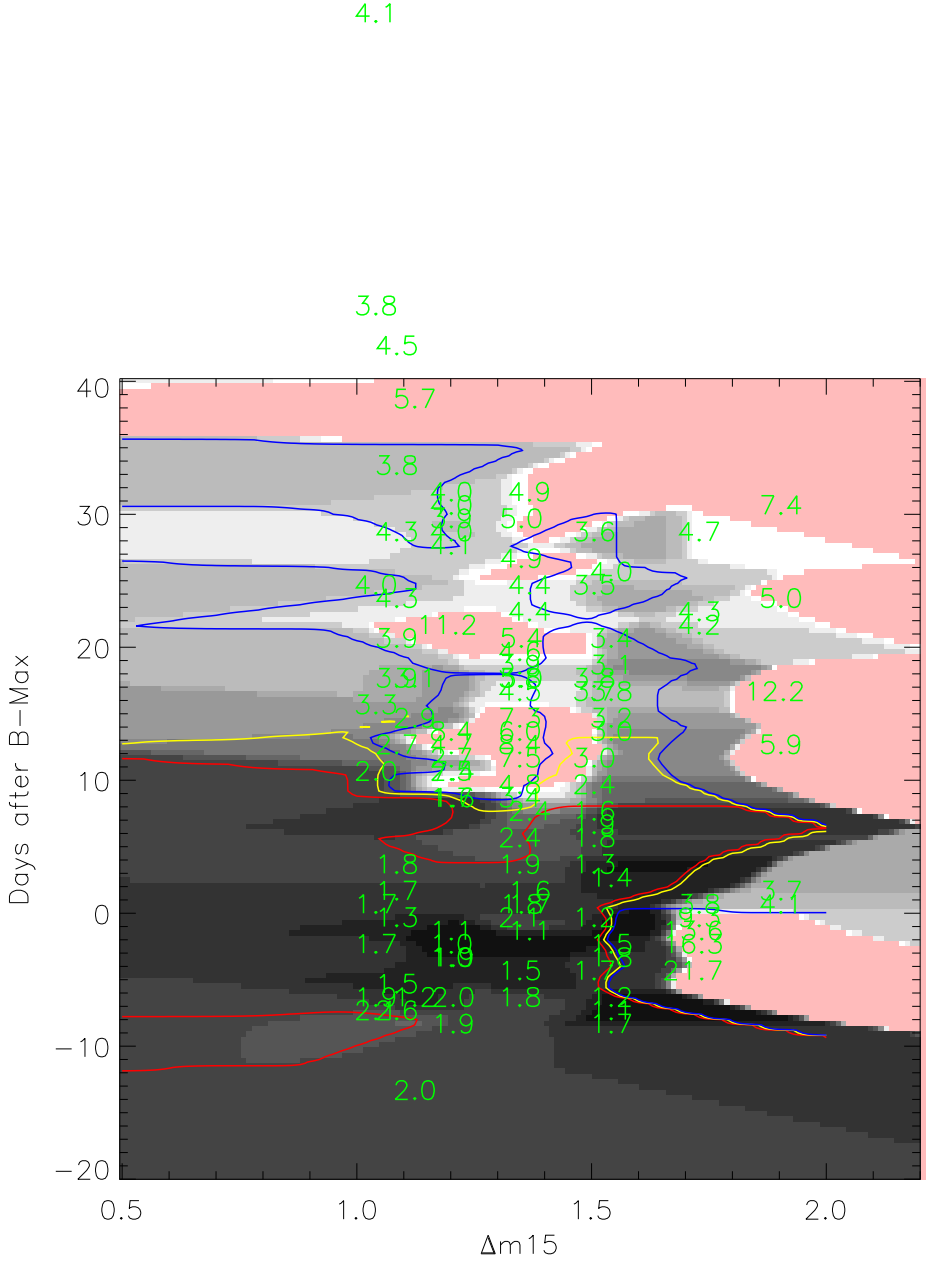
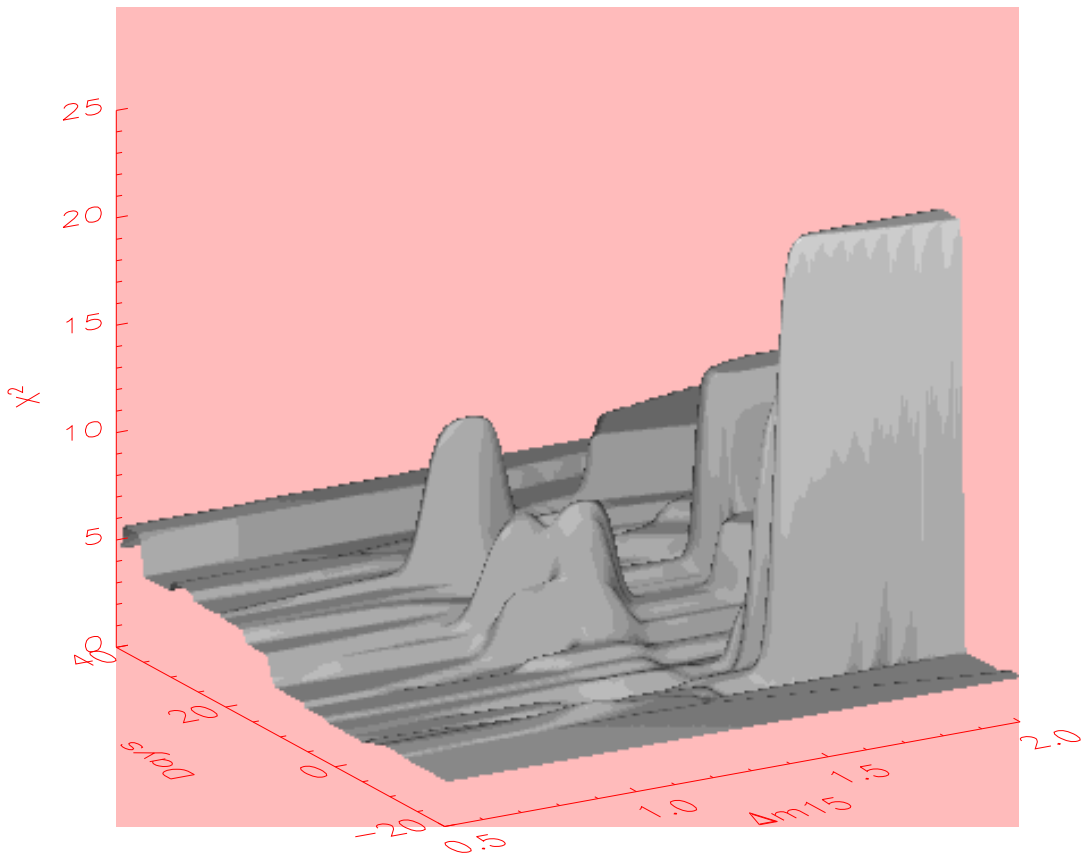
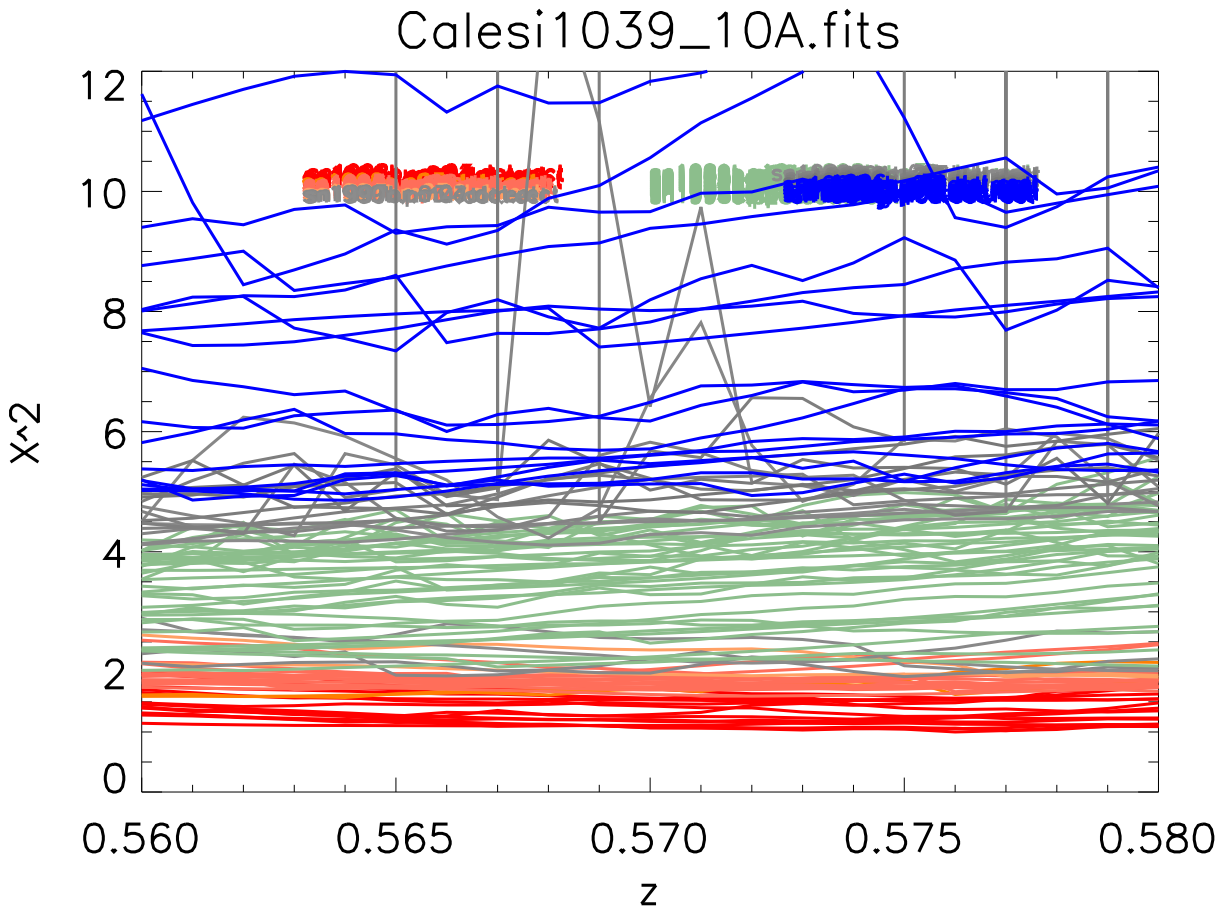
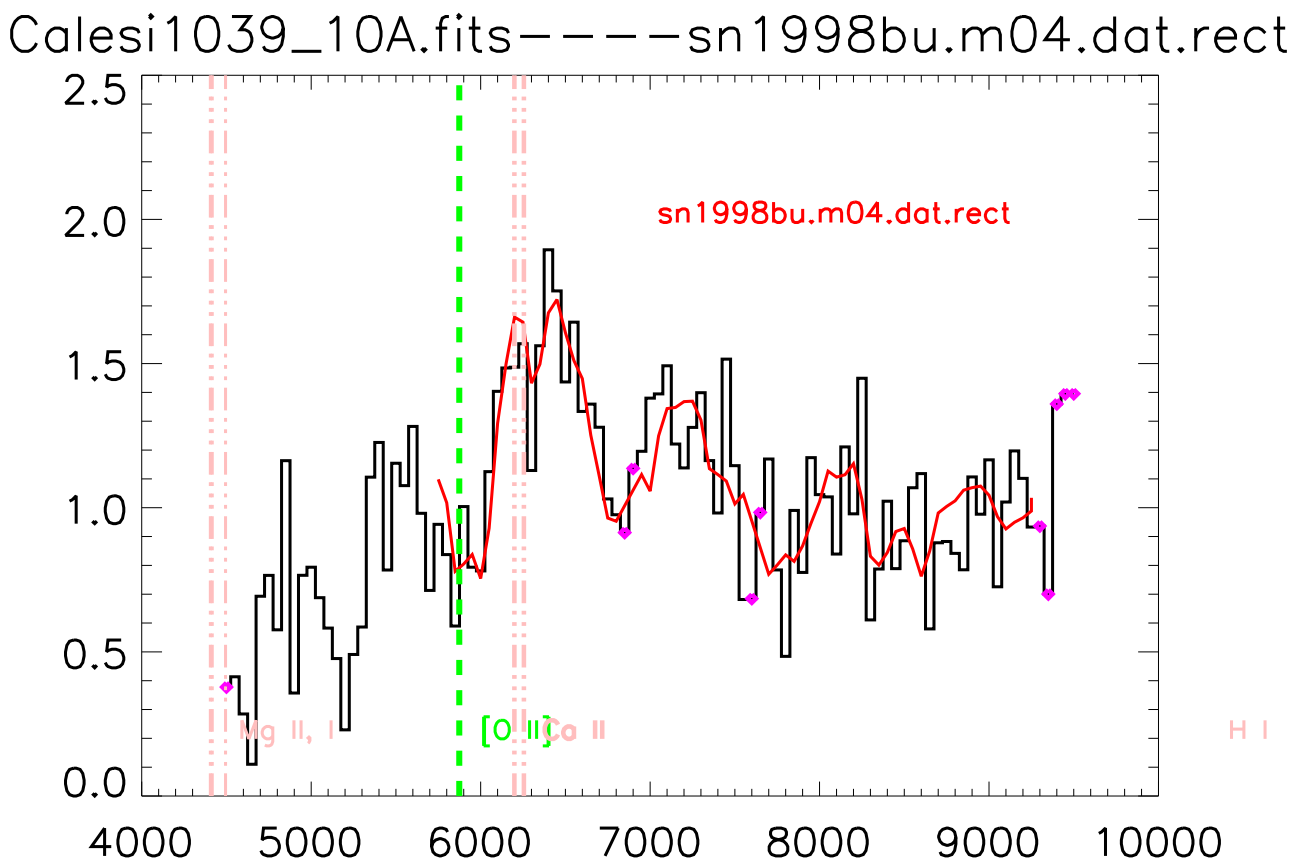
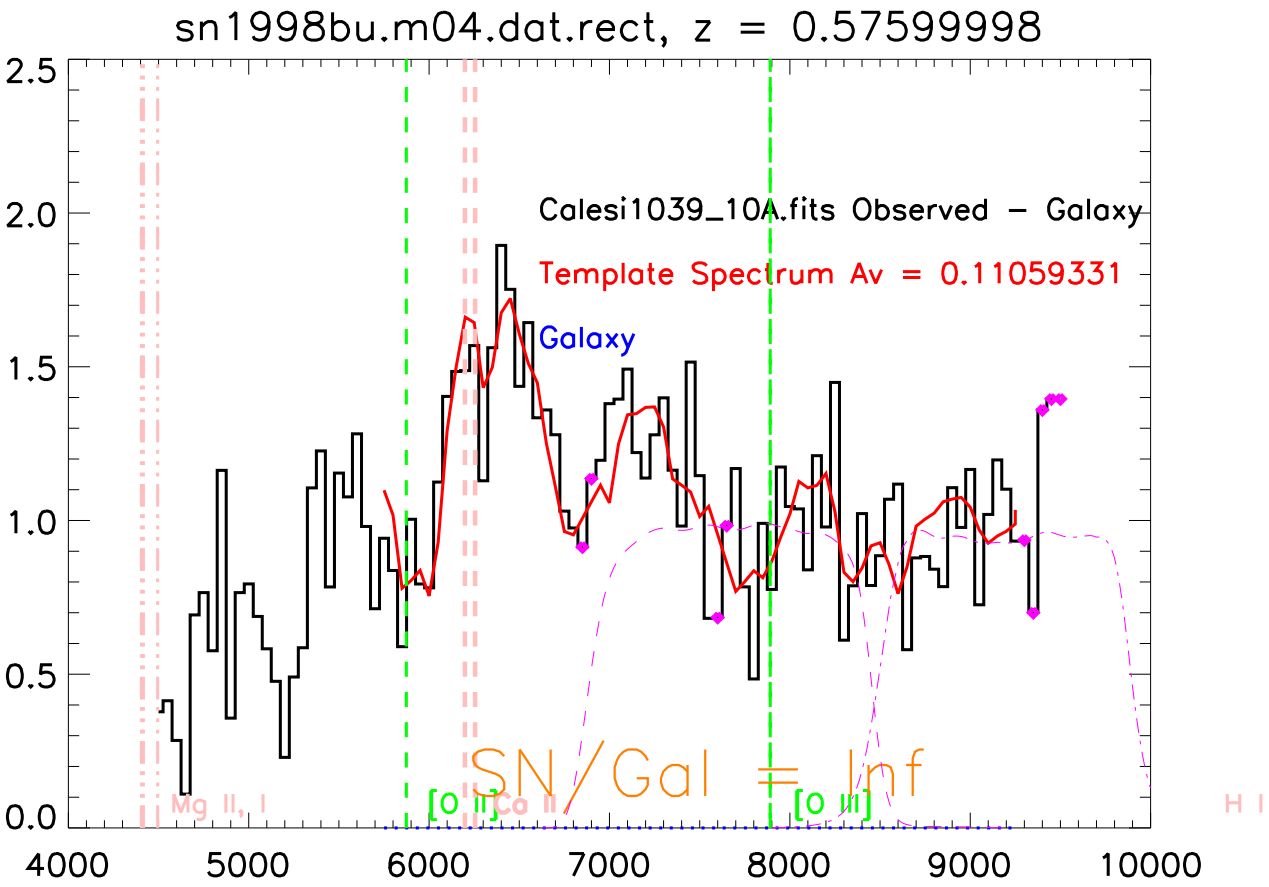

Days after B−Max
Δm15
40
30
20
10
0
−10
−20
0.5
1.0
1.5
2.0

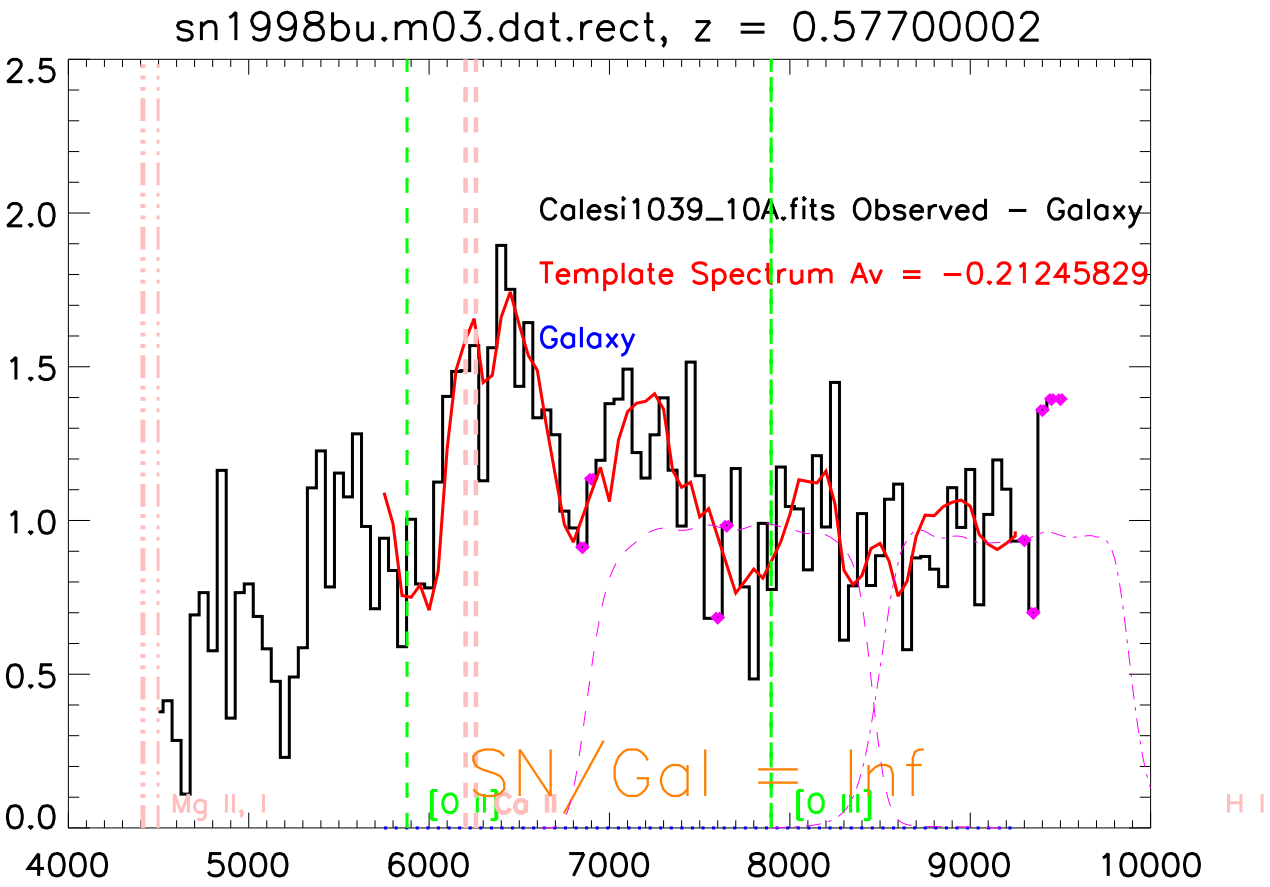


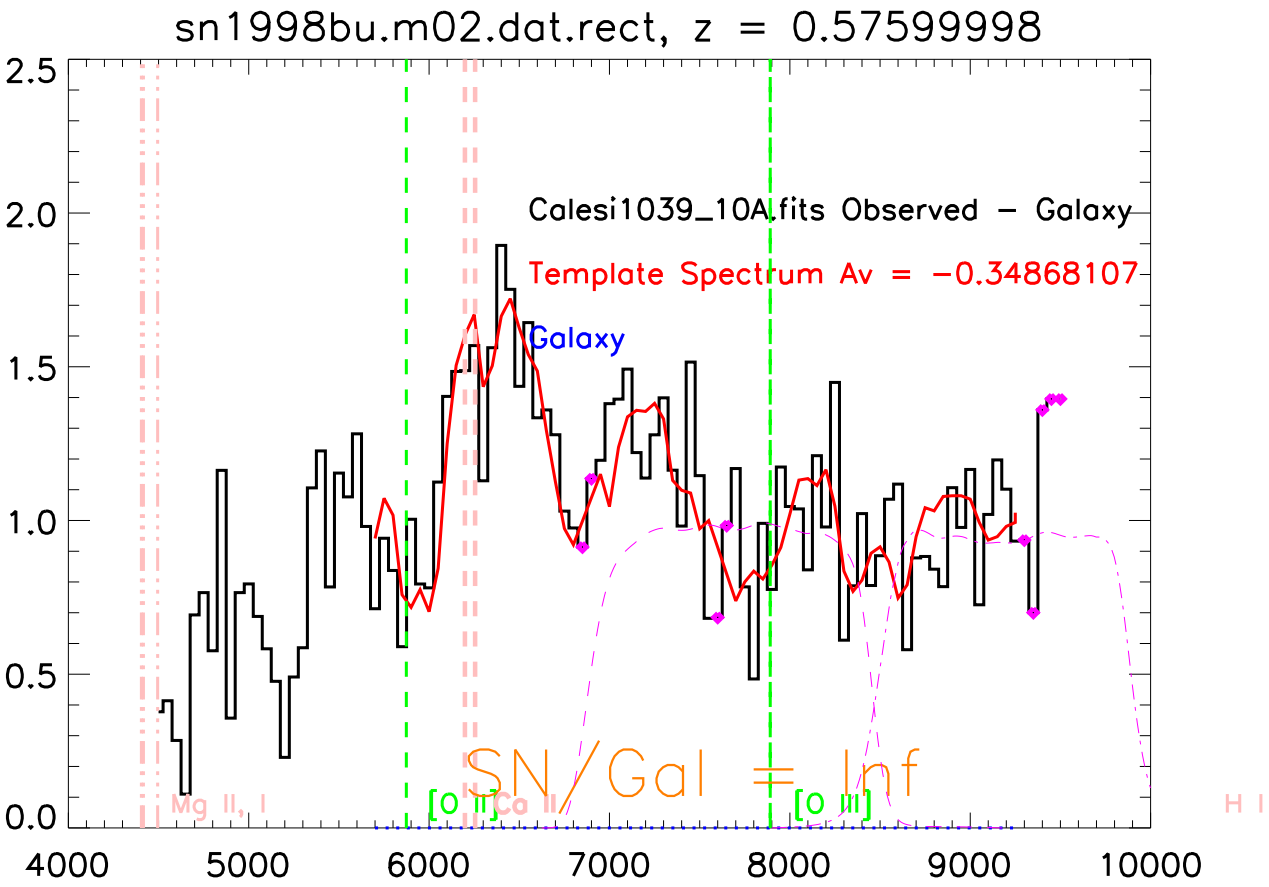
25
20
15
10
5
0
χ^2
40
20
0
−20
Days
0.5
1.0
1.5
2.0
Δm15


Calesi1039_10A.fits
X^2
z
0
2
4
6
8
10
12
0.560
0.565
0.570
0.575
0.580


Calesi1039_10A.fits----sn1998bu.m04.dat.rect
sn1998bu.m04.dat.rect
Mg II, I
[O II]
Ca II
H I
2.5
2.0
1.5
1.0
0.5
0.0
4000
5000
6000
7000
8000
9000
10000


sn1998bu.m04.dat.rect, z = 0.57599998
Calesi1039_10A.fits Observed − Galaxy
Template Spectrum Av = 0.11059331
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
2.5
2.0
1.5
1.0
0.5
0.0
4000
5000
6000
7000
8000
9000
10000


sn1998bu.m03.dat.rect, z = 0.57700002
Calesi1039_10A.fits Observed − Galaxy
Template Spectrum Av = −0.21245829
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
2.5
2.0
1.5
1.0
0.5
0.0
4000
5000
6000
7000
8000
9000
10000


sn1998bu.m02.dat.rect, z = 0.57599998
Calesi1039_10A.fits Observed − Galaxy
Template Spectrum Av = −0.34868107
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
2.5
2.0
1.5
1.0
0.5
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8000
9000
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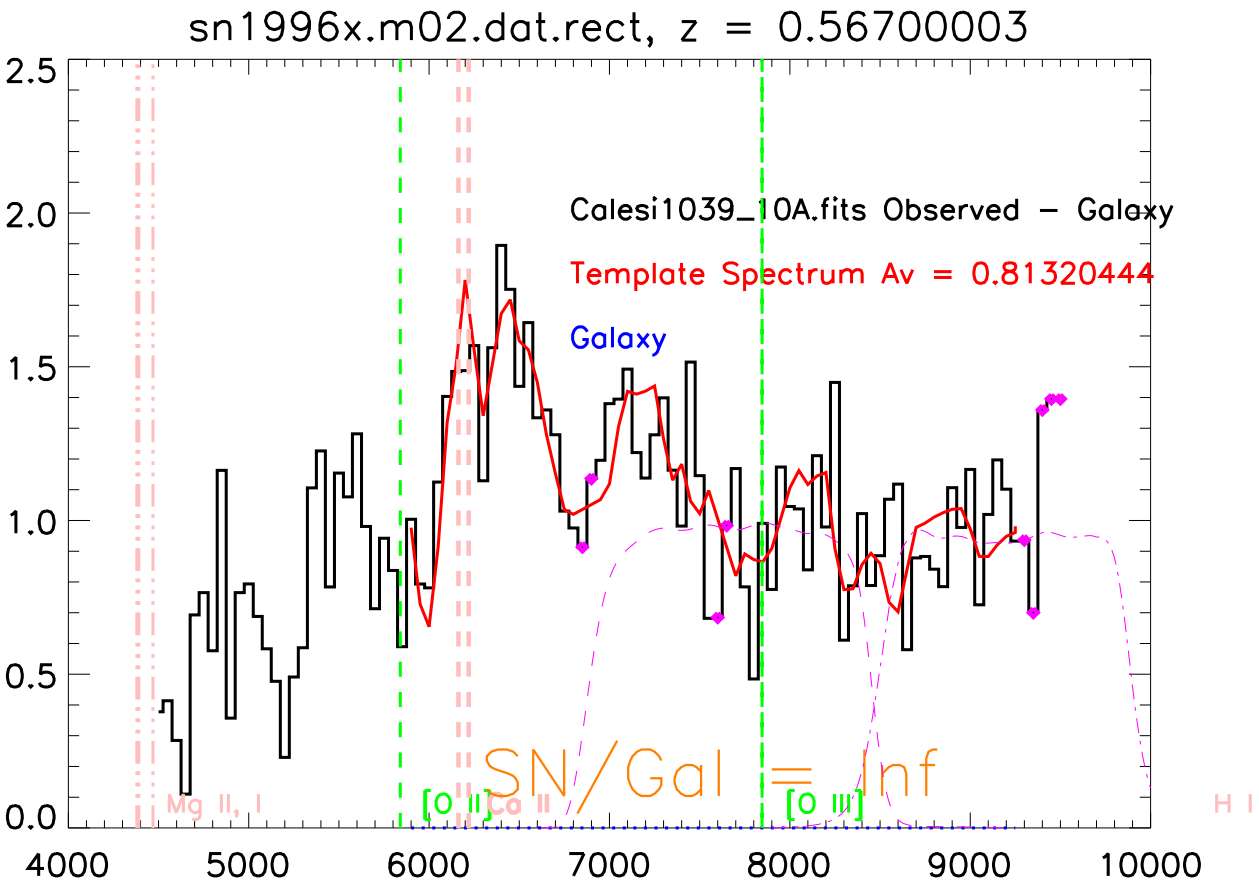
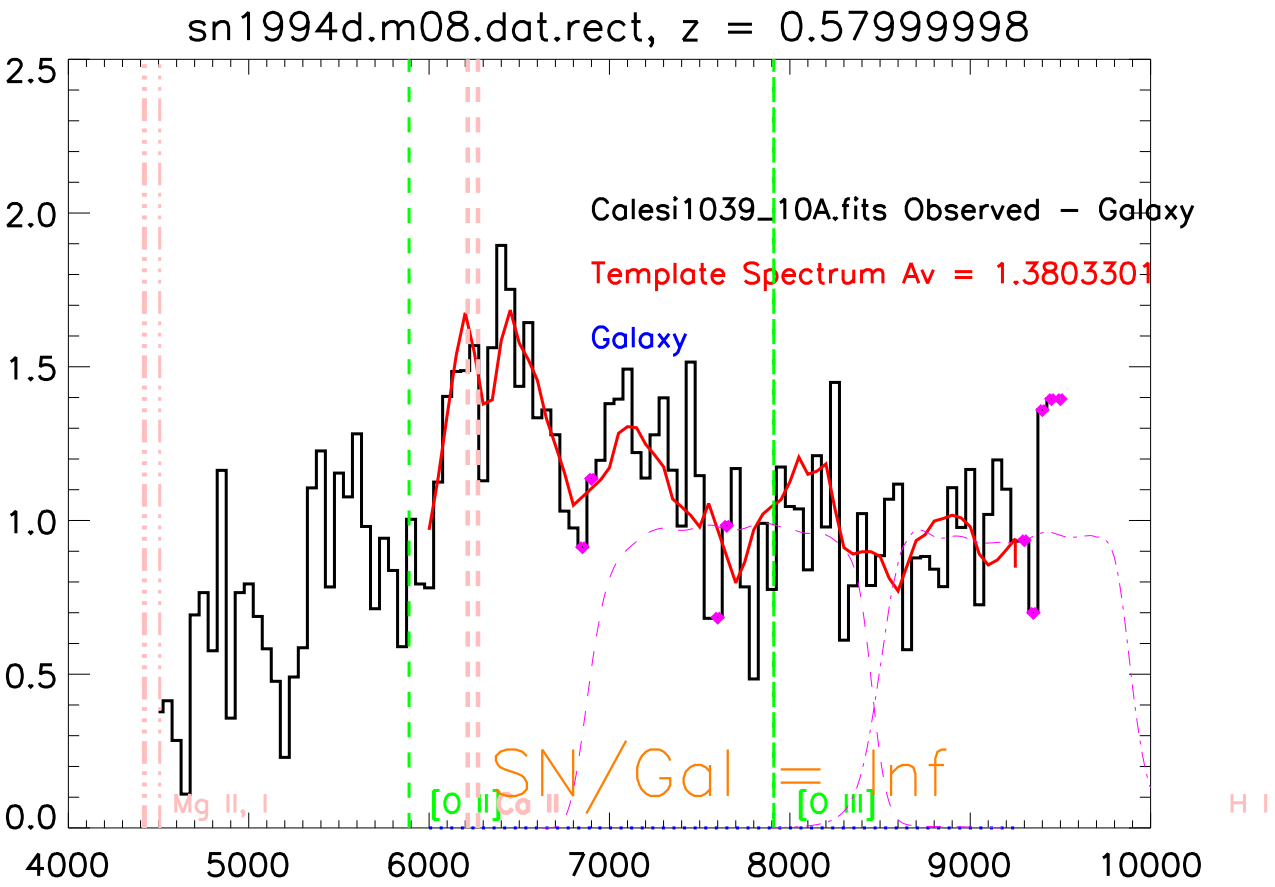
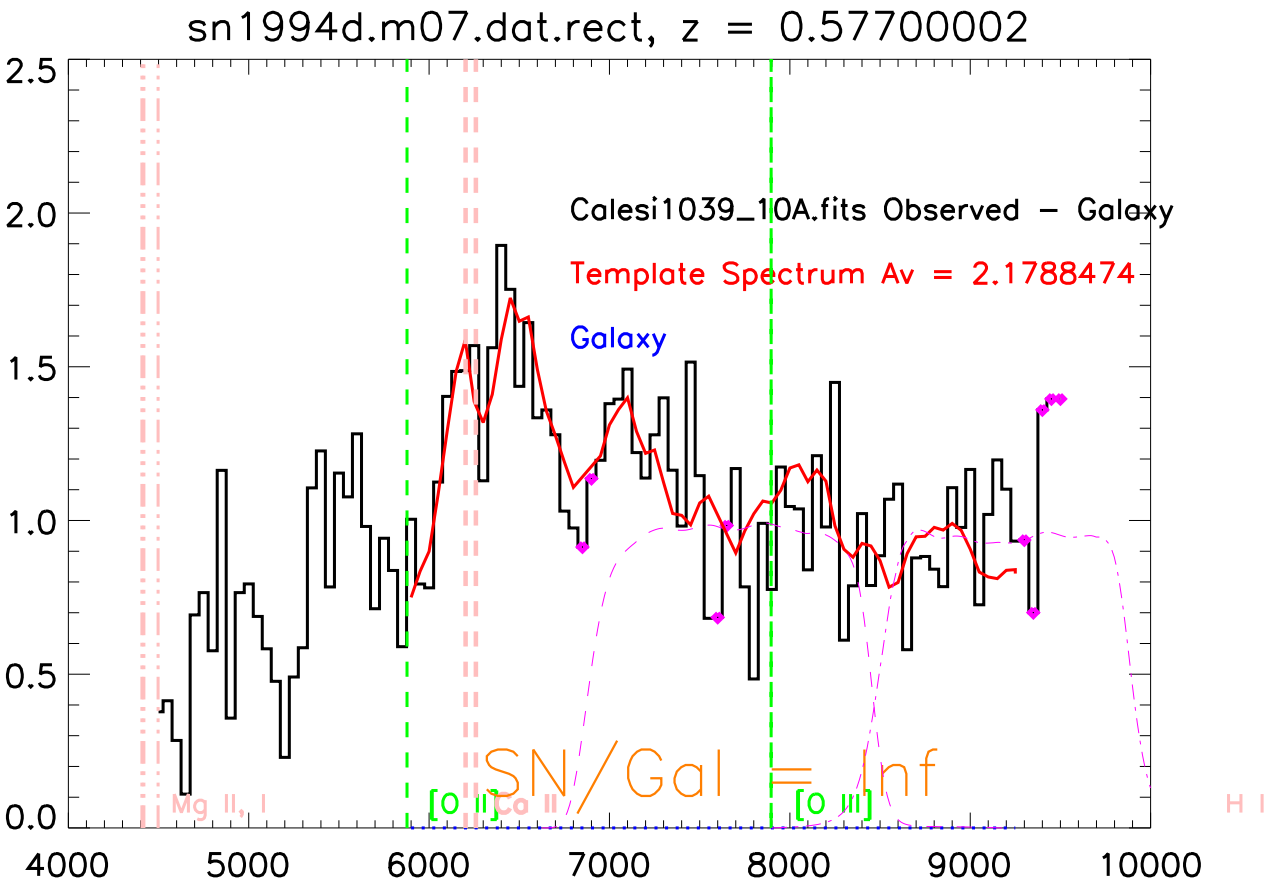
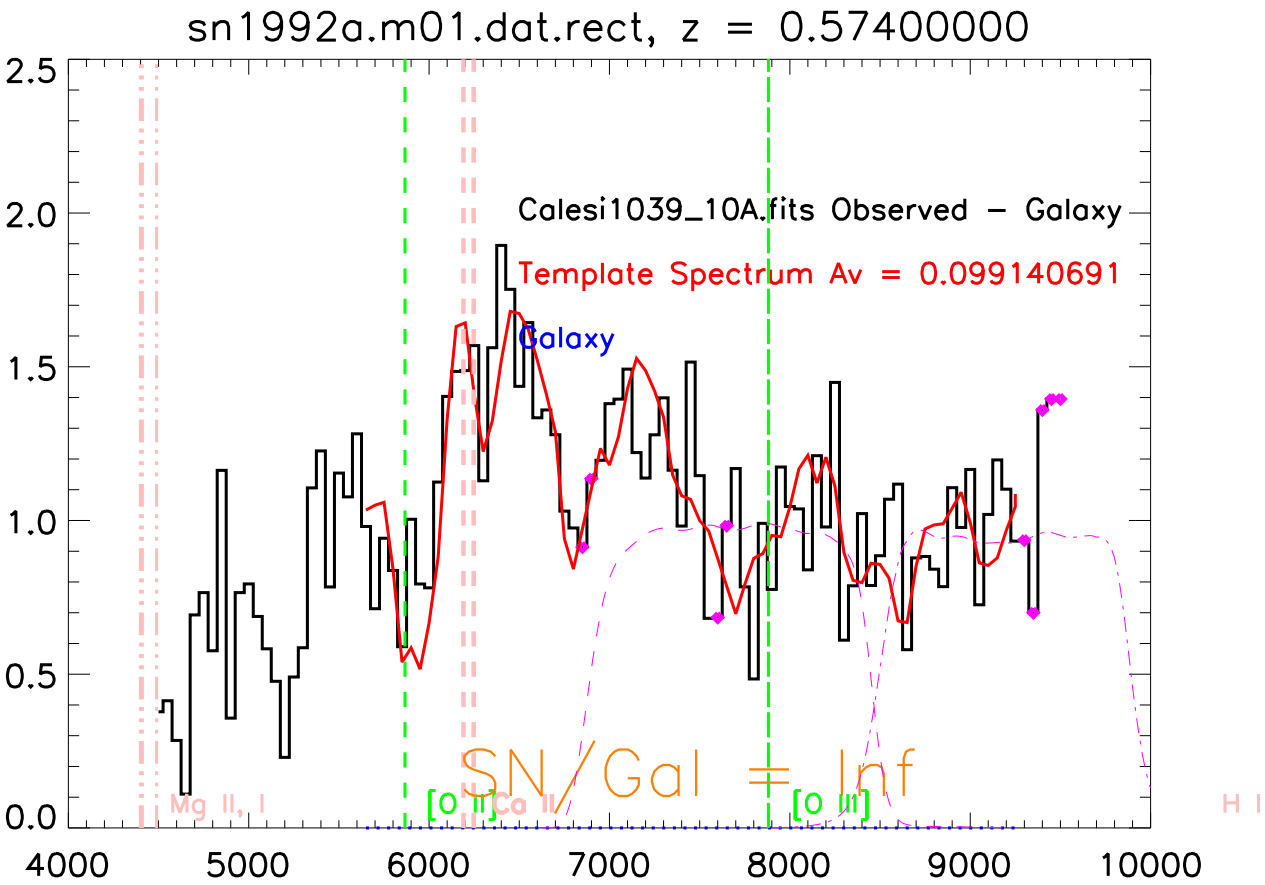
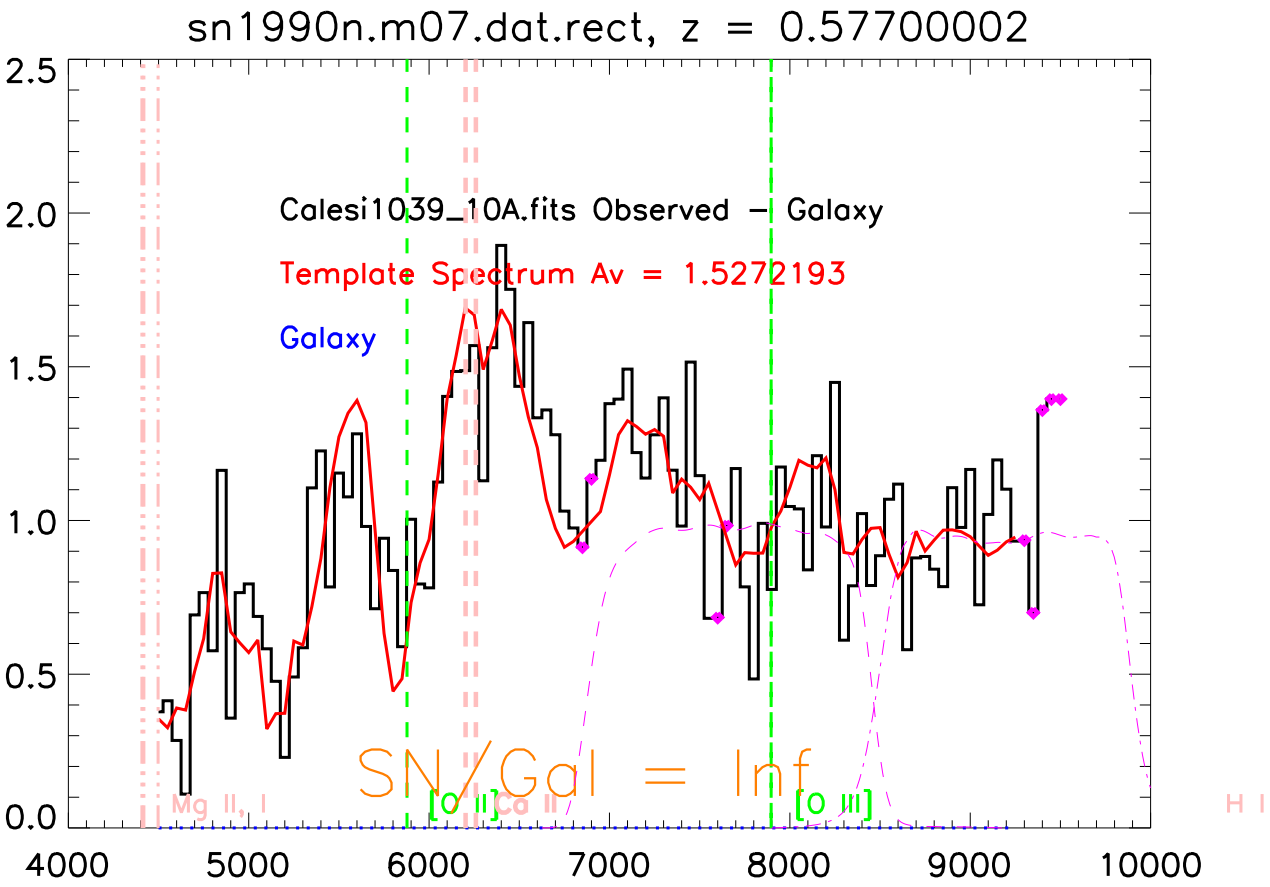
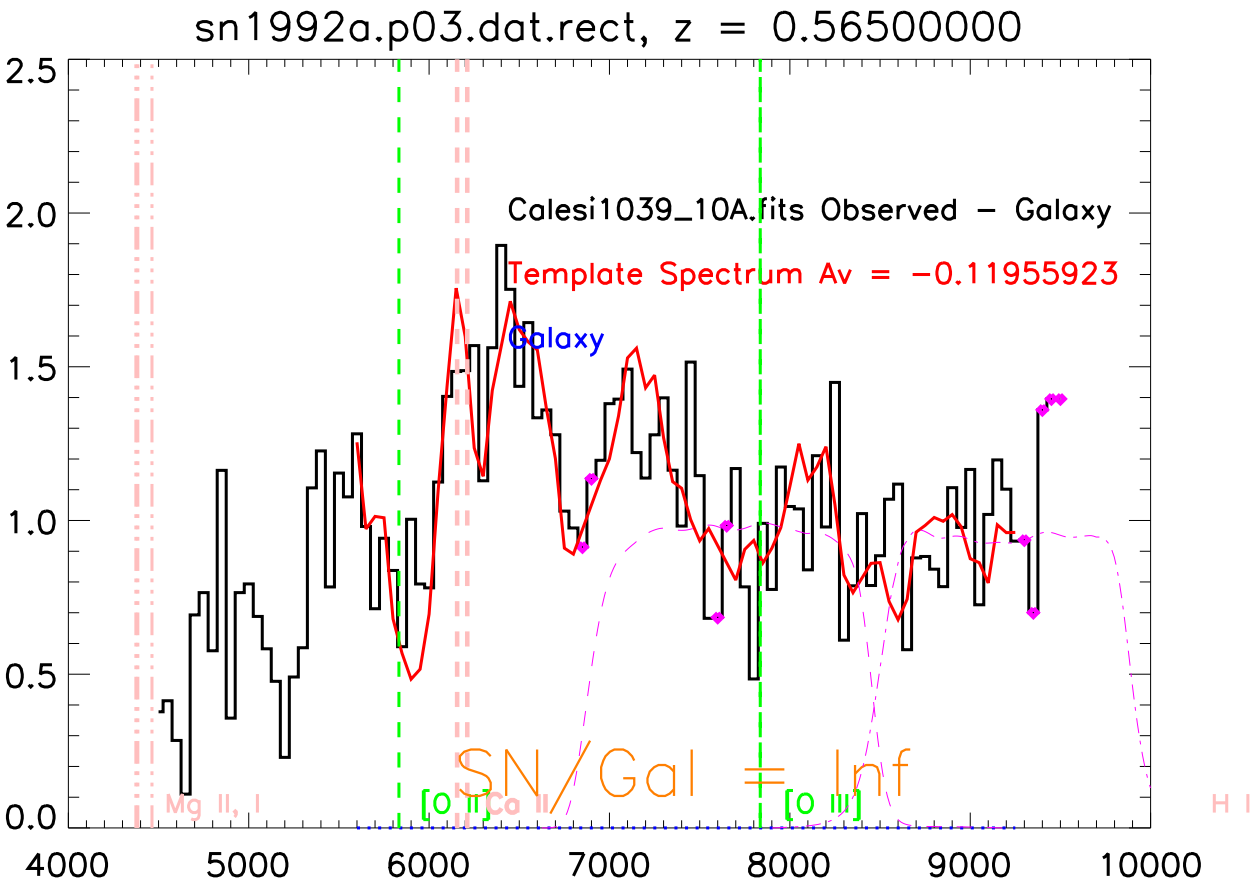

sn1996x.m02.dat.rect, z = 0.56700003
Calesi1039_10A.fits Observed − Galaxy
Template Spectrum Av = 0.81320444
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
2.5
2.0
1.5
1.0
0.5
0.0
4000
5000
6000
7000
8000
9000
10000

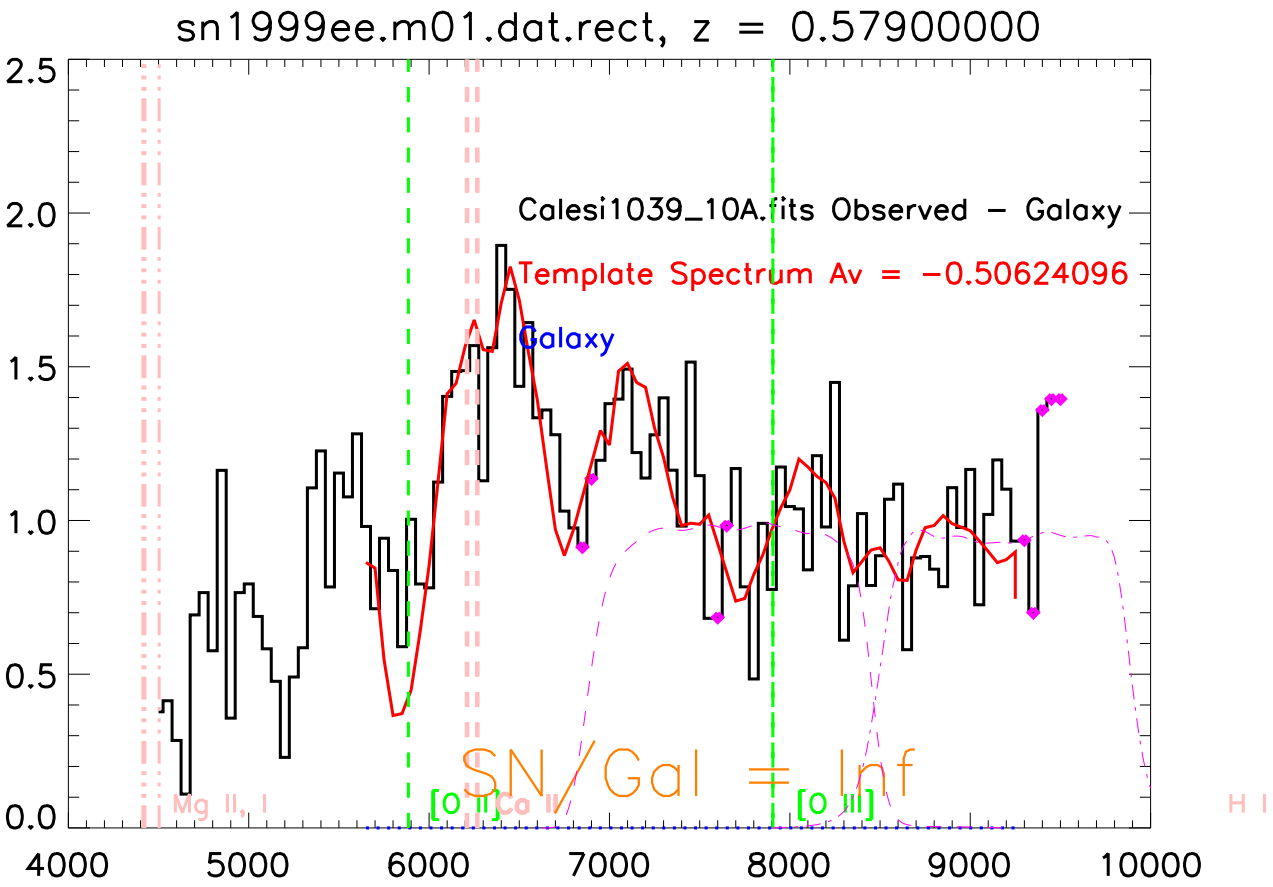

sn1994d.m08.dat.rect, z = 0.57999998
Calesi1039_10A.fits Observed − Galaxy
Template Spectrum Av = 1.3803301
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
2.5
2.0
1.5
1.0
0.5
0.0
4000
5000
6000
7000
8000
9000
10000

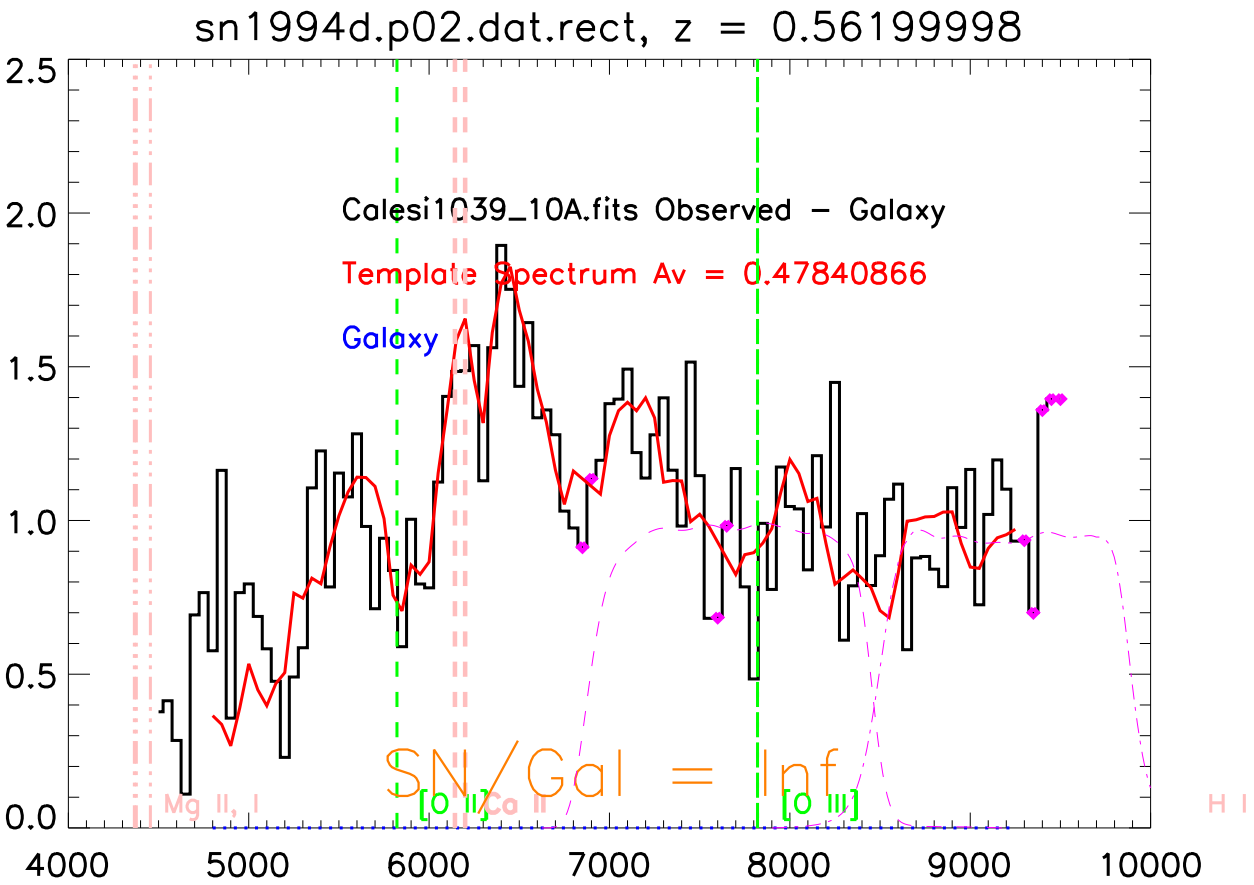

sn1994d.m07.dat.rect, z = 0.57700002
Calesi1039_10A.fits Observed − Galaxy
Template Spectrum Av = 2.1788474
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
2.5
2.0
1.5
1.0
0.5
0.0
4000
5000
6000
7000
8000
9000
10000

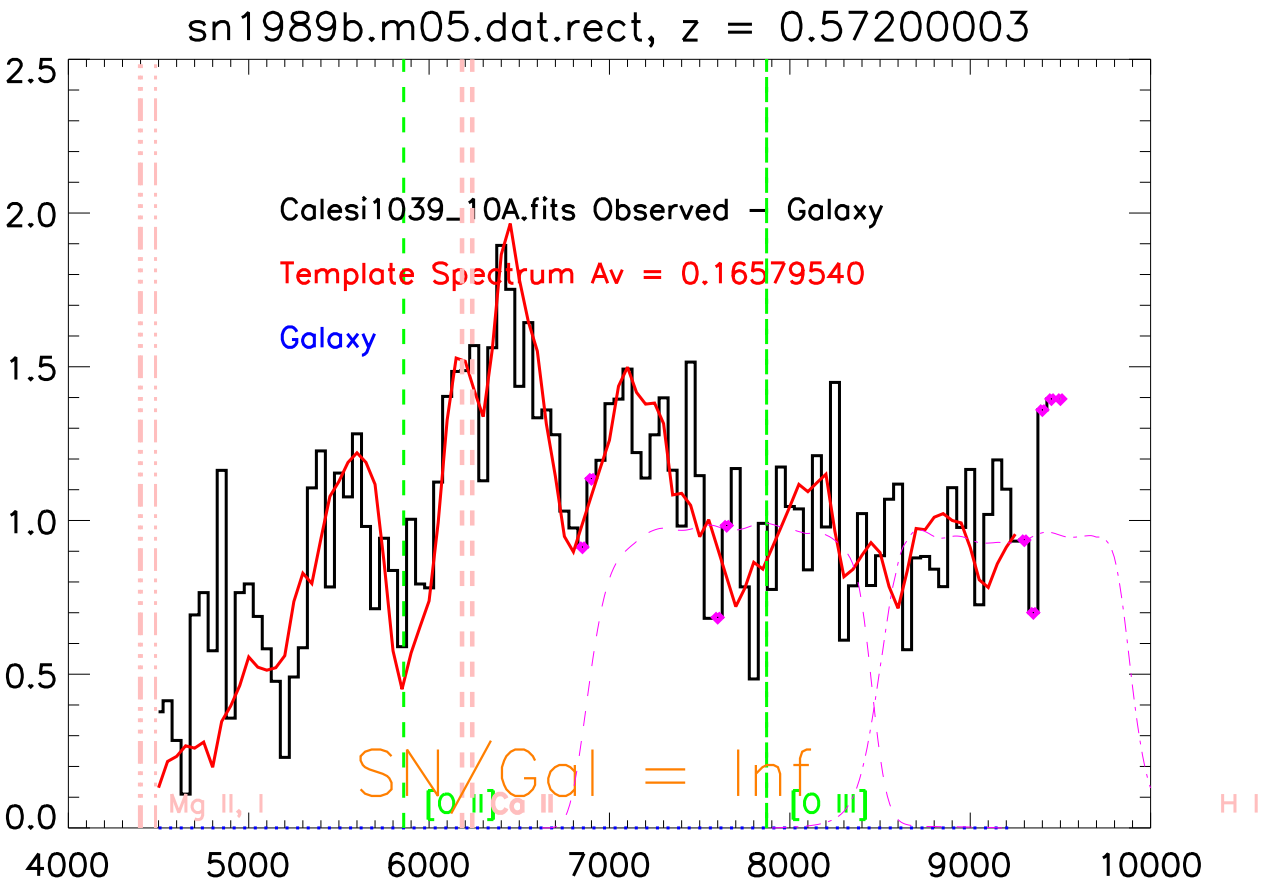

sn1992a.m01.dat.rect, z = 0.57400000
Calesi1039_10A.fits Observed − Galaxy
Template Spectrum Av = 0.099140691
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
2.5
2.0
1.5
1.0
0.5
0.0
4000
5000
6000
7000
8000
9000
10000

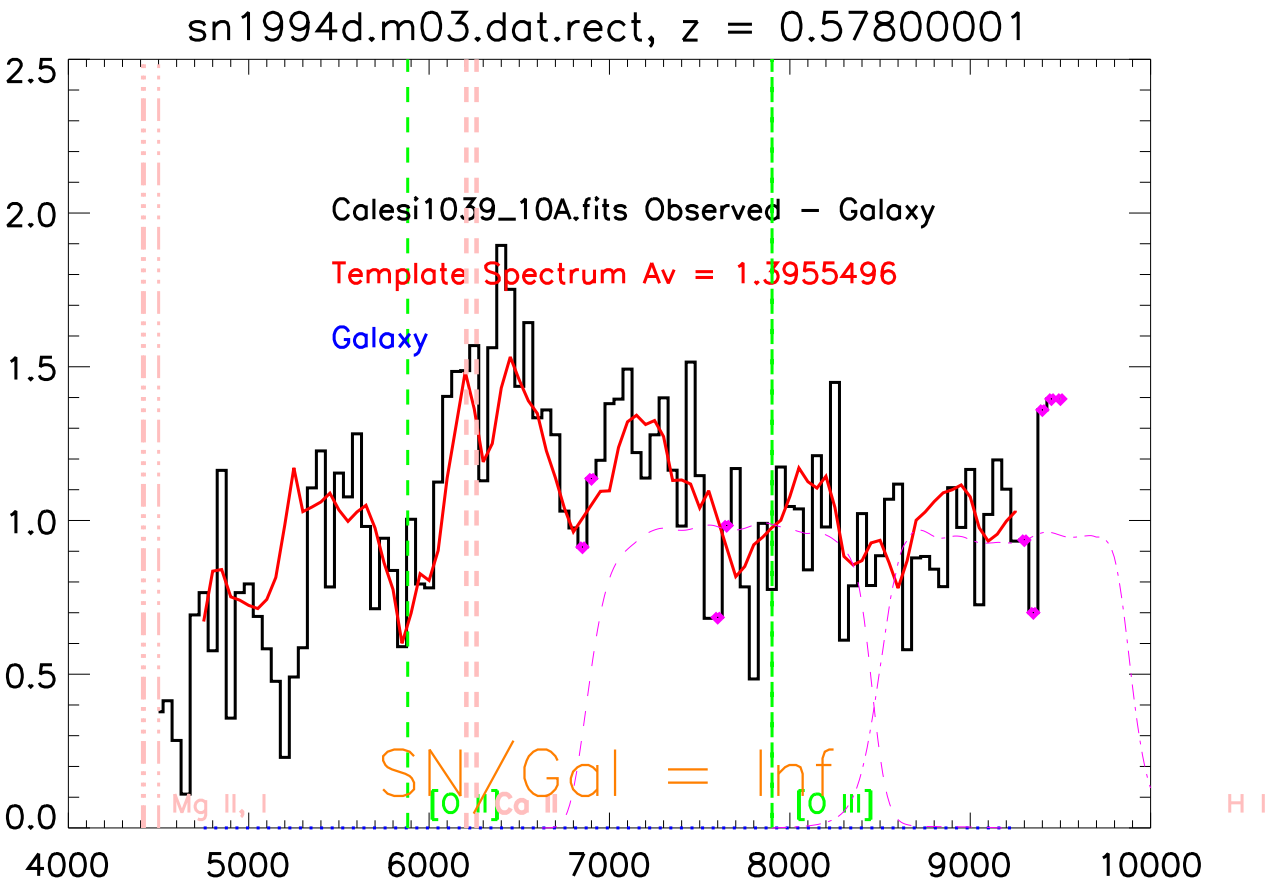

sn1990n.m07.dat.rect, z = 0.57700002
Calesi1039_10A.fits Observed – Galaxy
Template Spectrum Av = 1.5272193
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
2.5
2.0
1.5
1.0
0.5
0.0
4000
5000
6000
7000
8000
9000
10000


sn1992a.p03.dat.rect, z = 0.56500000
Calesi1039_10A.fits Observed − Galaxy
Template Spectrum Av = −0.11955923
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
2.5
2.0
1.5
1.0
0.5
0.0
4000
5000
6000
7000
8000
9000
10000


sn1999ee.m01.dat.rect, z = 0.57900000
Calesi1039_10A.fits Observed − Galaxy
Template Spectrum Av = −0.50624096
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
2.5
2.0
1.5
1.0
0.5
0.0
4000
5000
6000
7000
8000
9000
10000


sn1994d.p02.dat.rect, z = 0.56199998
Calesi1039_10A.fits Observed − Galaxy
Template Spectrum Av = 0.47840866
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
2.5
2.0
1.5
1.0
0.5
0.0
4000
5000
6000
7000
8000
9000
10000


sn1989b.m05.dat.rect, z = 0.57200003
Calesi1039_10A.fits Observed – Galaxy
Template Spectrum Av = 0.16579540
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
2.5
2.0
1.5
1.0
0.5
0.0
4000
5000
6000
7000
8000
9000
10000


sn1994d.m03.dat.rect, z = 0.57800001
Calesi1039_10A.fits Observed − Galaxy
Template Spectrum Av = 1.3955496
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
2.5
2.0
1.5
1.0
0.5
0.0
4000
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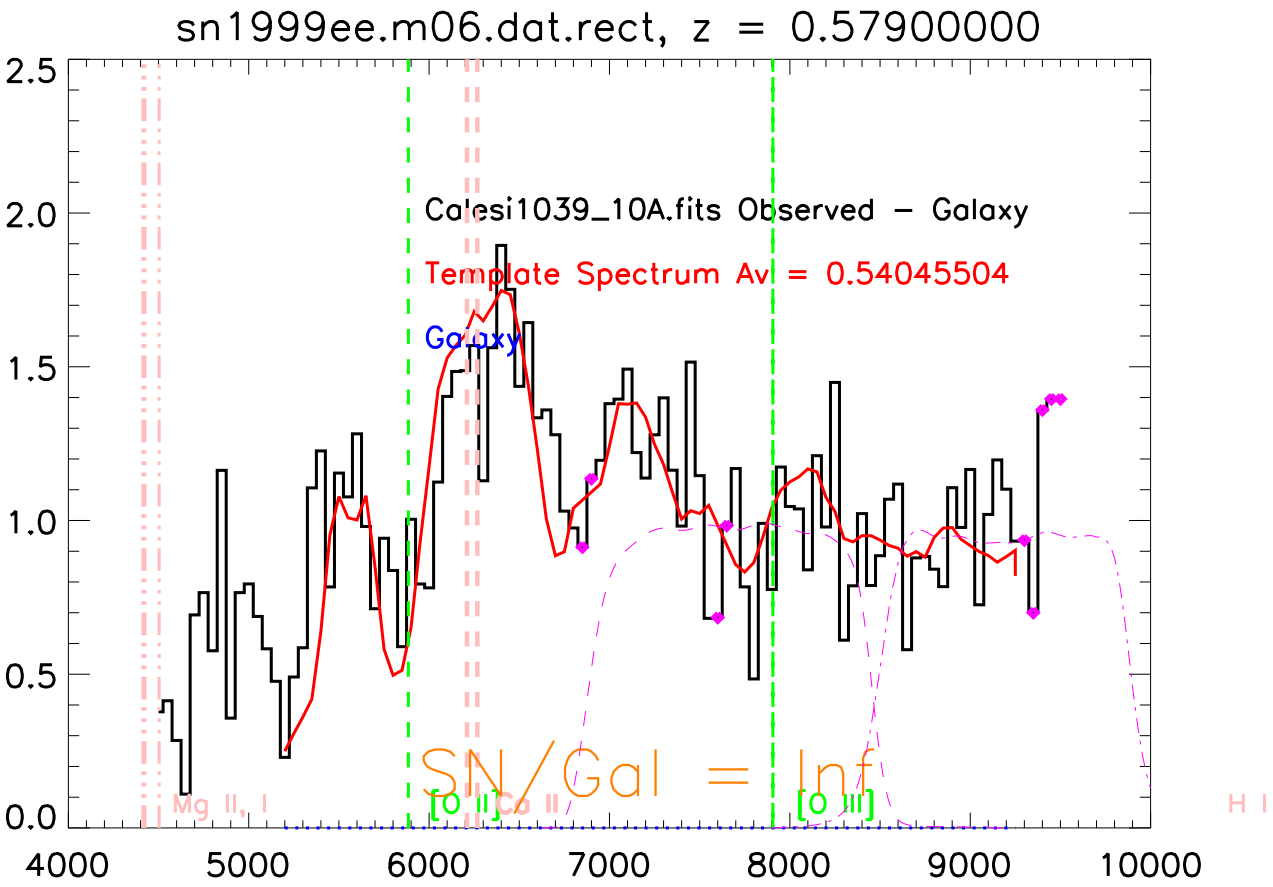
6000
7000
8000
9000
10000


sn1999ee.m06.dat.rect, z = 0.57900000
Calesi1039_10A.fits Observed − Galaxy
Template Spectrum Av = 0.54045504
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
2.5
2.0
1.5
1.0
0.5
0.0
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6000
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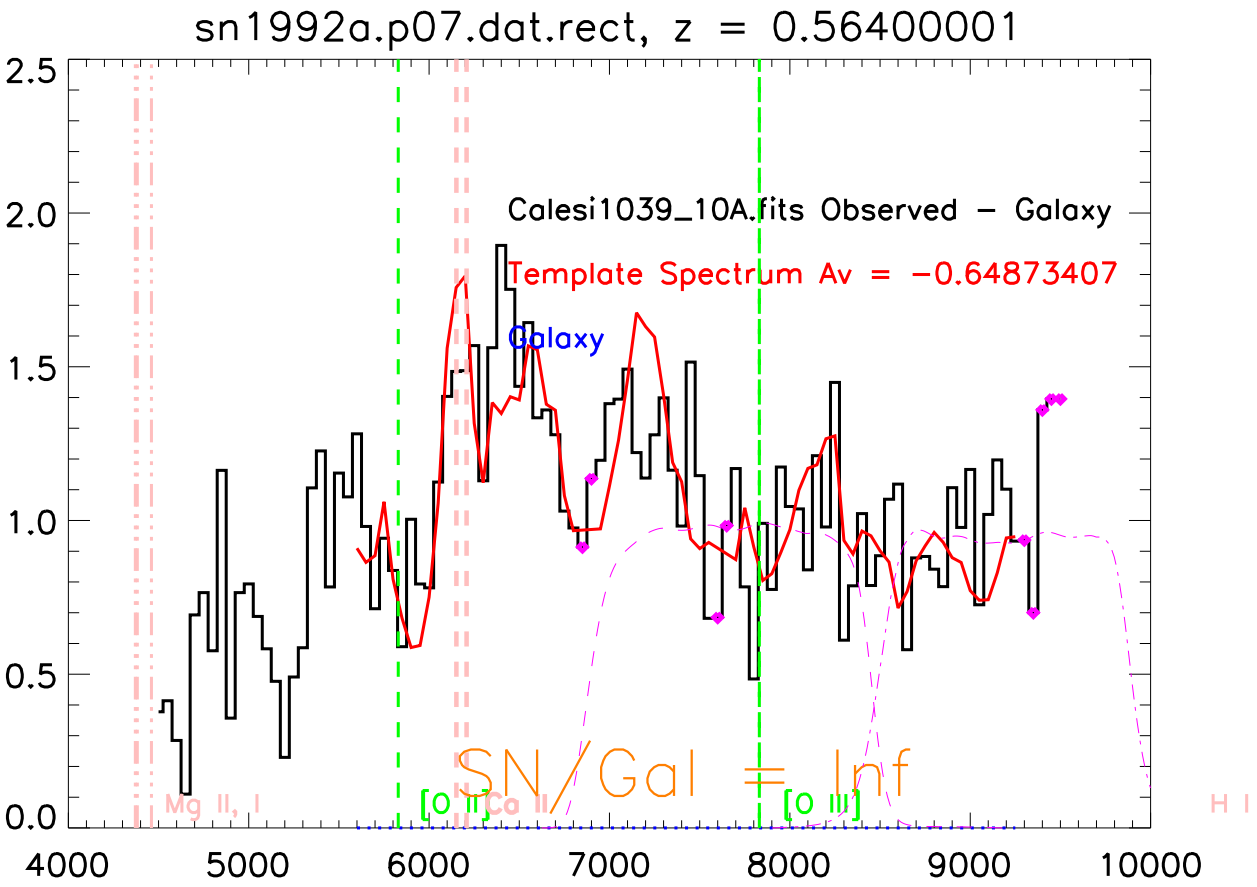
8000
9000
10000


sn1992a.p07.dat.rect, z = 0.56400001
Calesi1039_10A.fits Observed − Galaxy
Template Spectrum Av = −0.64873407
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
2.5
2.0
1.5
1.0
0.5
0.0
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5000
6000
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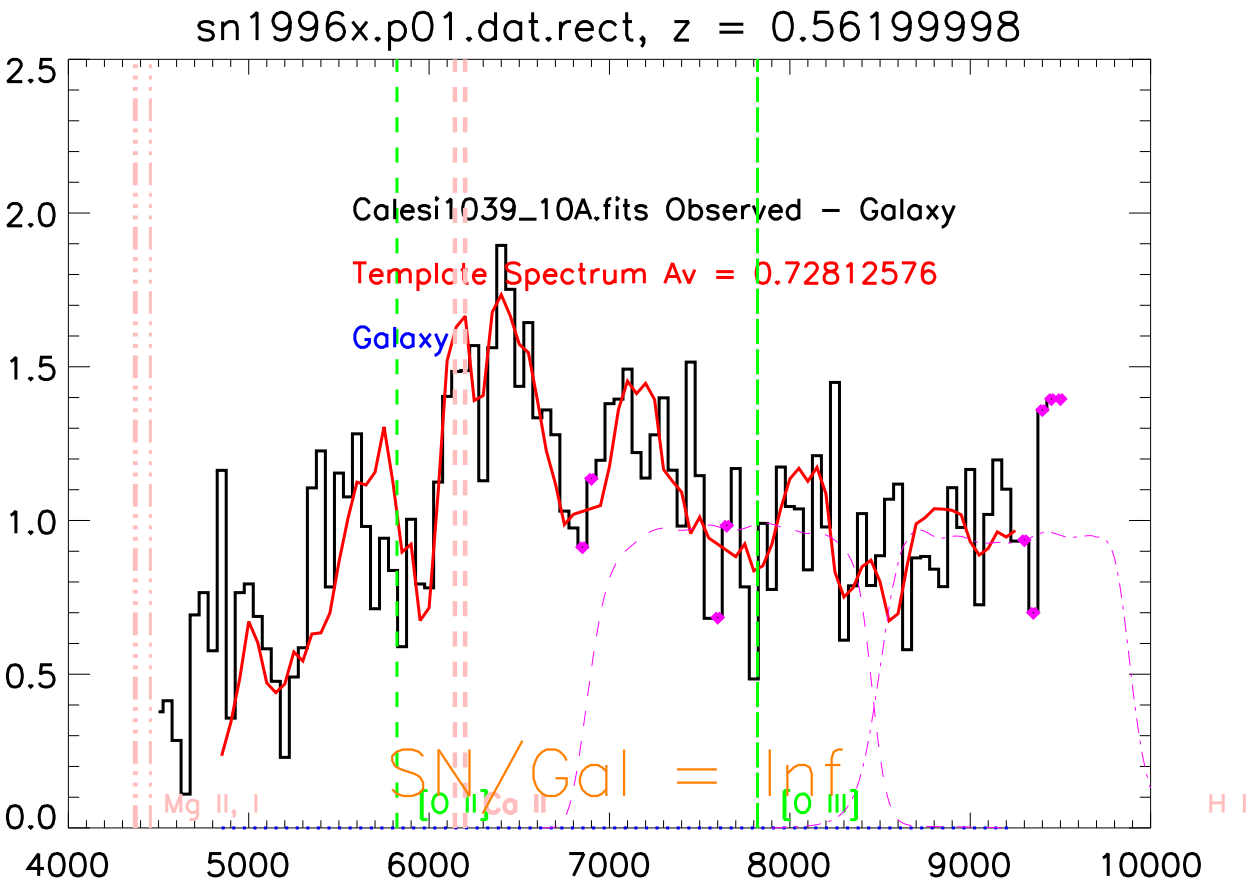
8000
9000
10000


sn1996x.p01.dat.rect, z = 0.56199998
Calesi1039_10A.fits Observed − Galaxy
Template Spectrum Av = 0.72812576
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
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2.0
1.5
1.0
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5000
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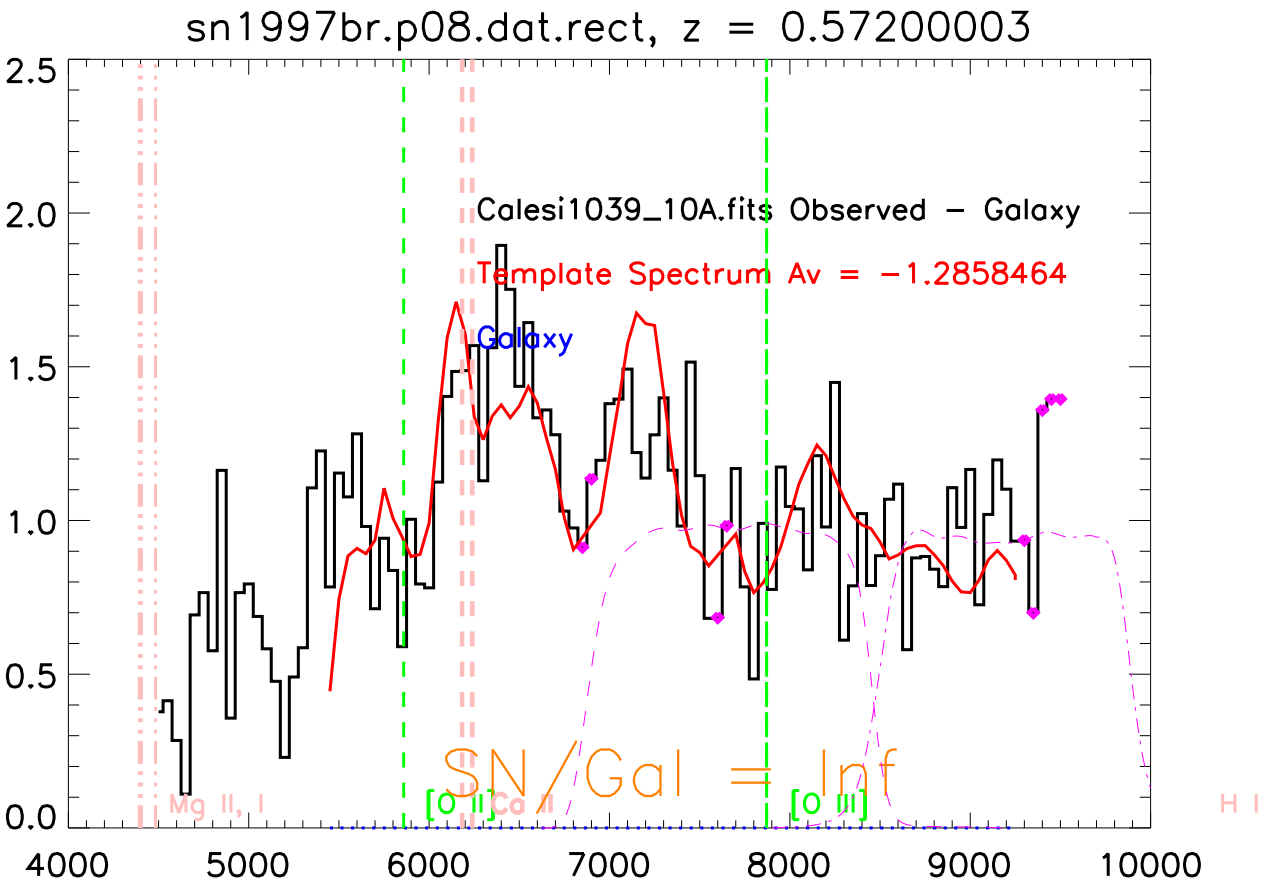
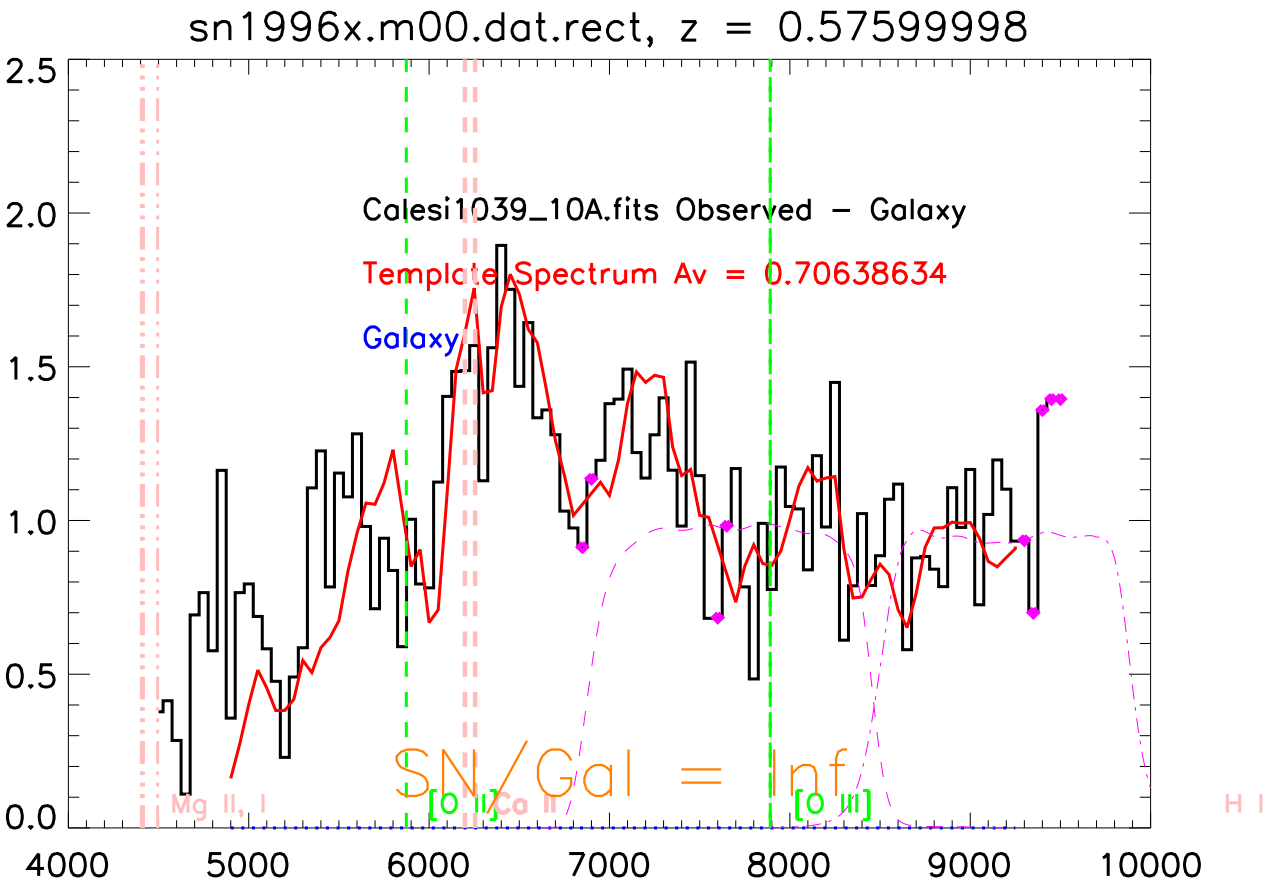
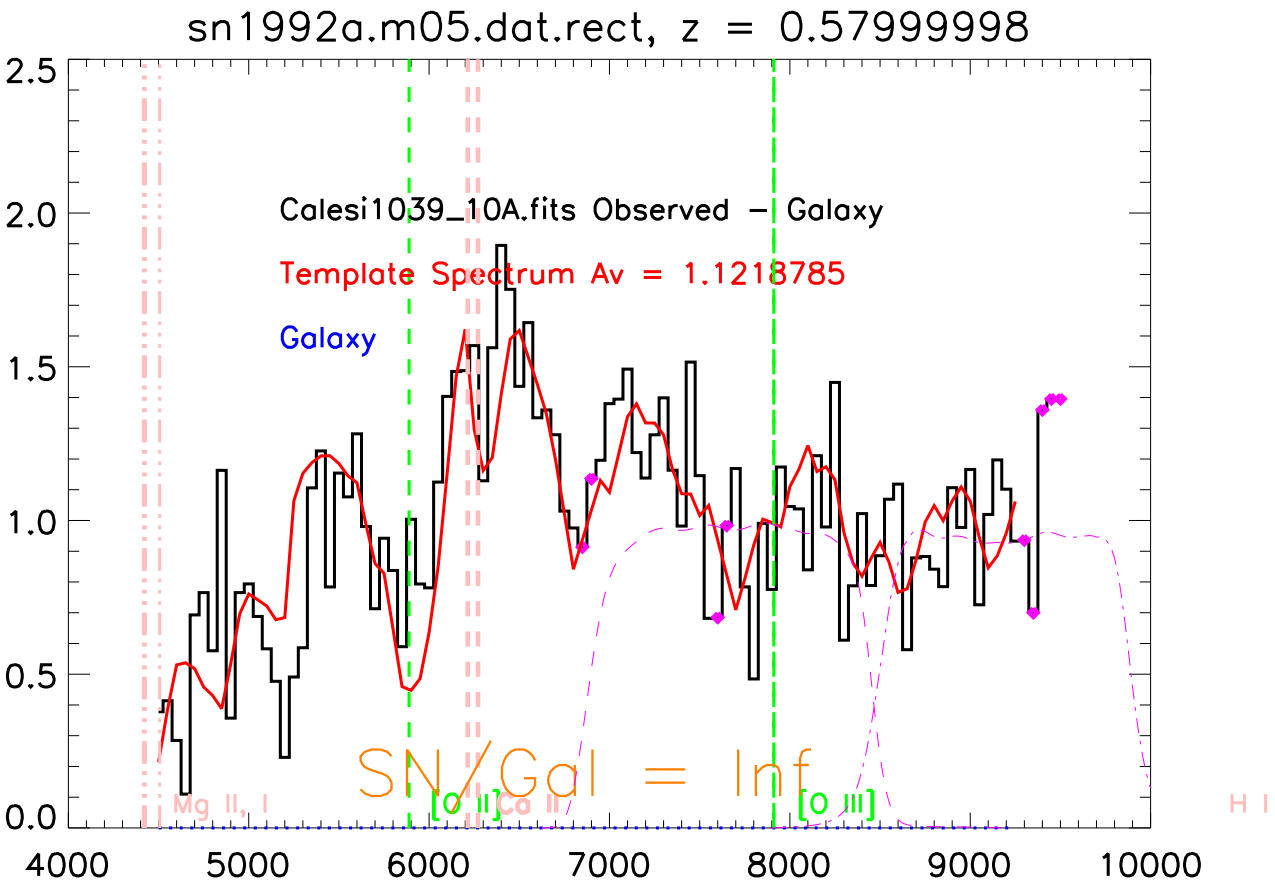
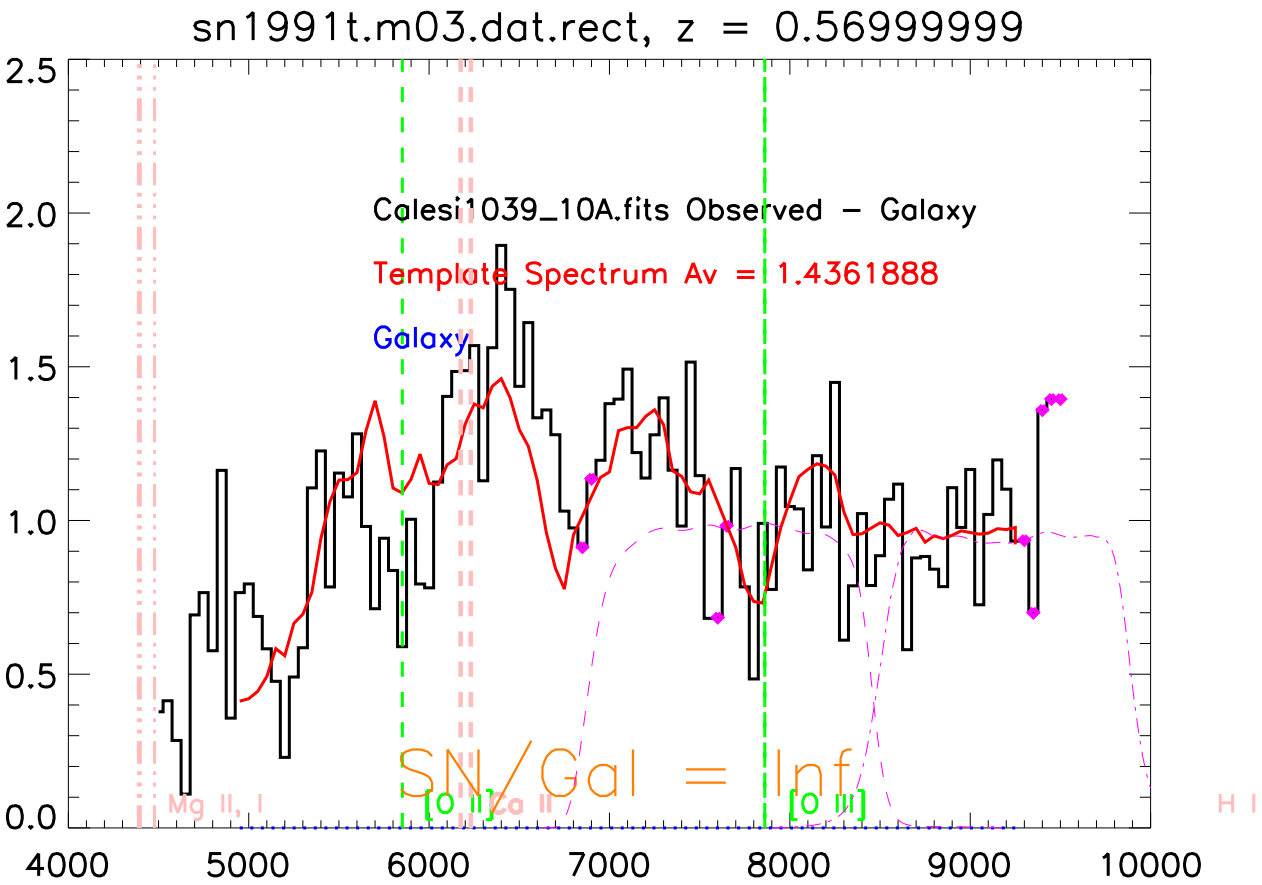
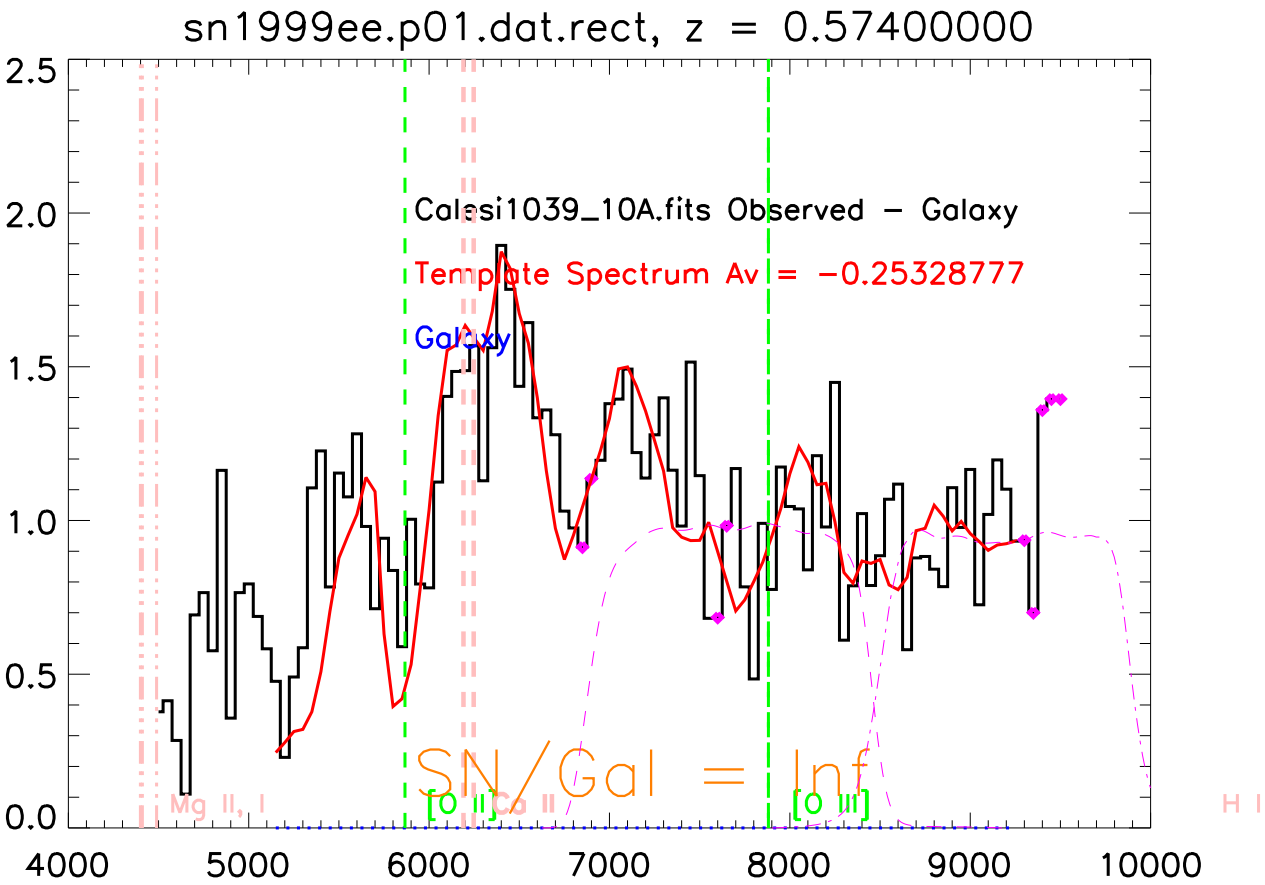
8000
9000
10000

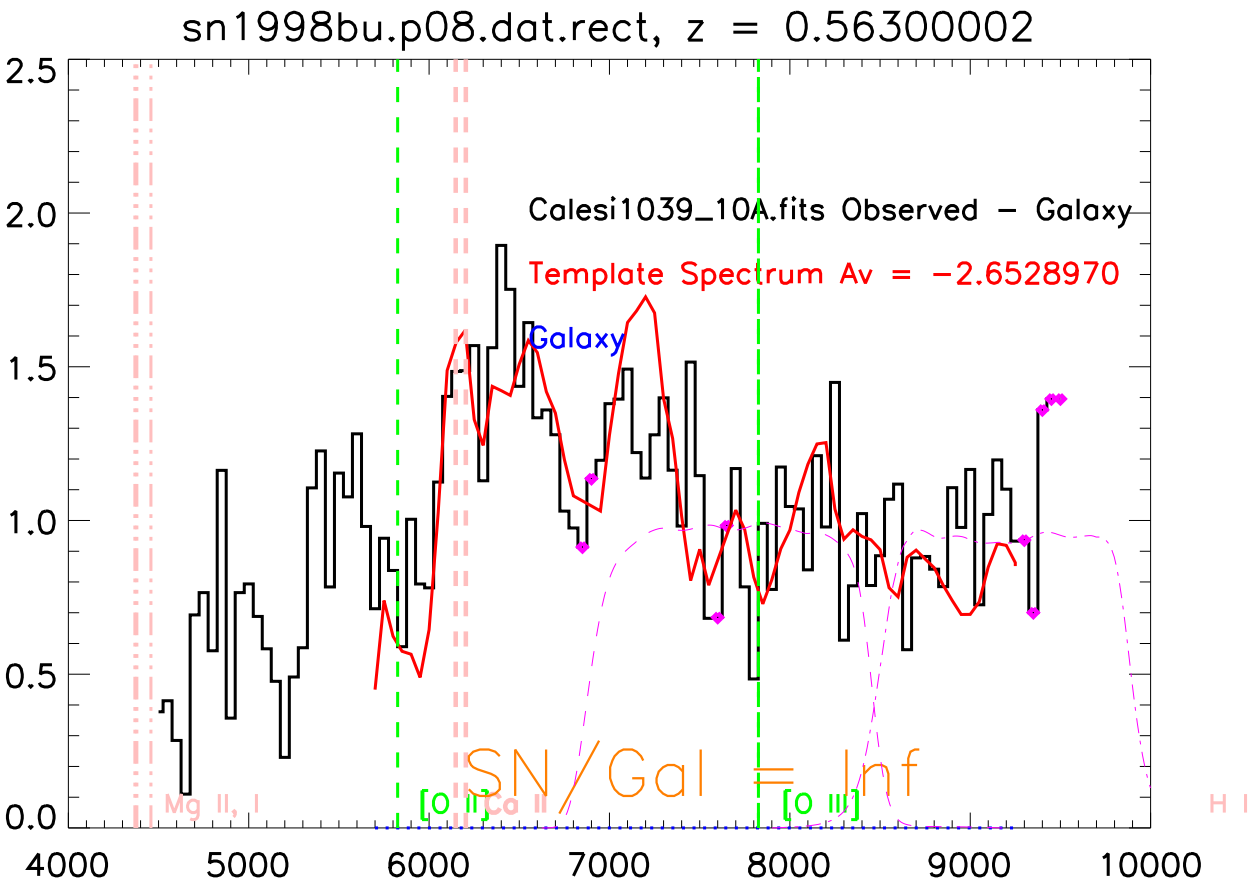

sn1997br.p08.dat.rect, z = 0.57200003
Calesi1039_10A.fits Observed − Galaxy
Template Spectrum Av = −1.2858464
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
2.5
2.0
1.5
1.0
0.5
0.0
4000
5000
6000
7000
8000
9000
10000

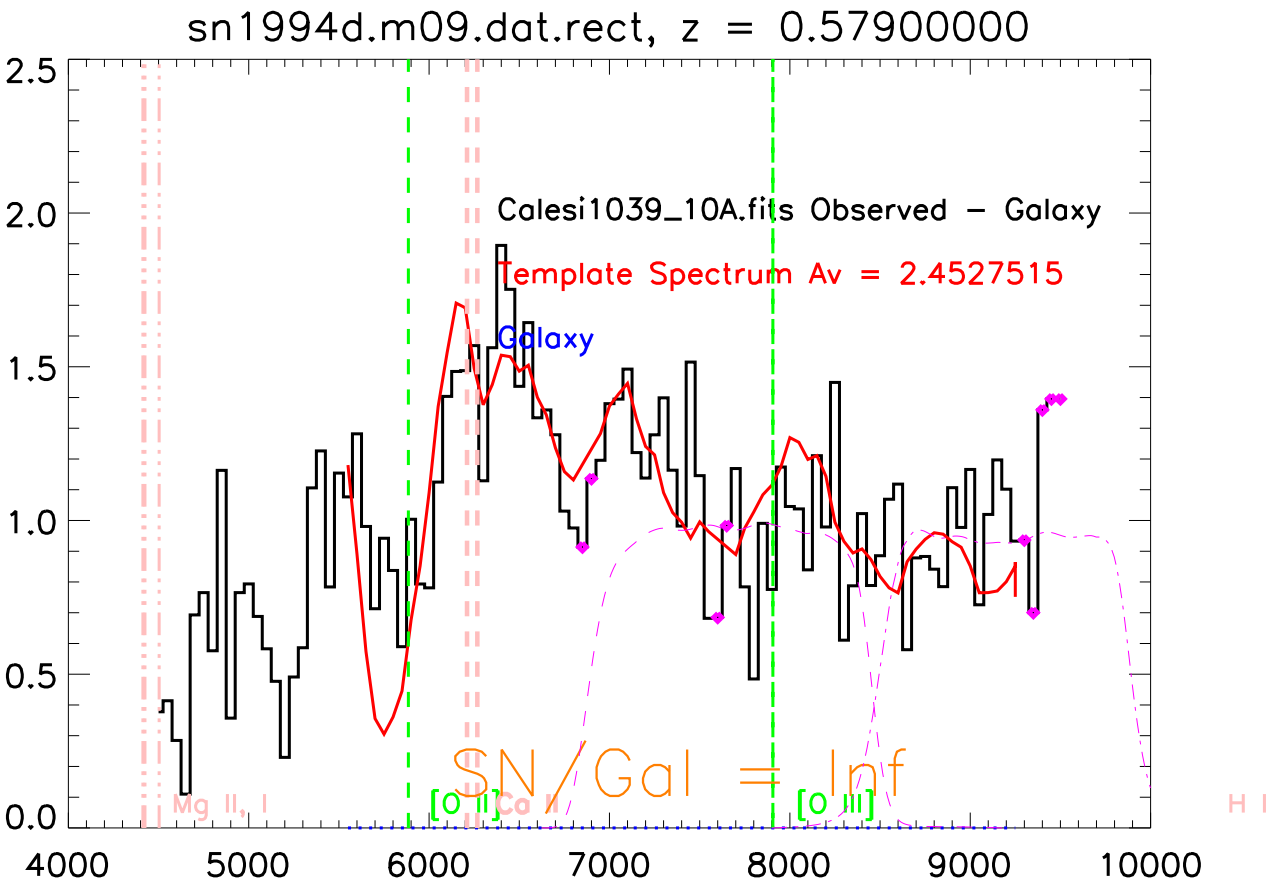

sn1996x.m00.dat.rect, z = 0.57599998
Calesi1039_10A.fits Observed − Galaxy
Template Spectrum Av = 0.70638634
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
2.5
2.0
1.5
1.0
0.5
0.0
4000
5000
6000
7000
8000
9000
10000

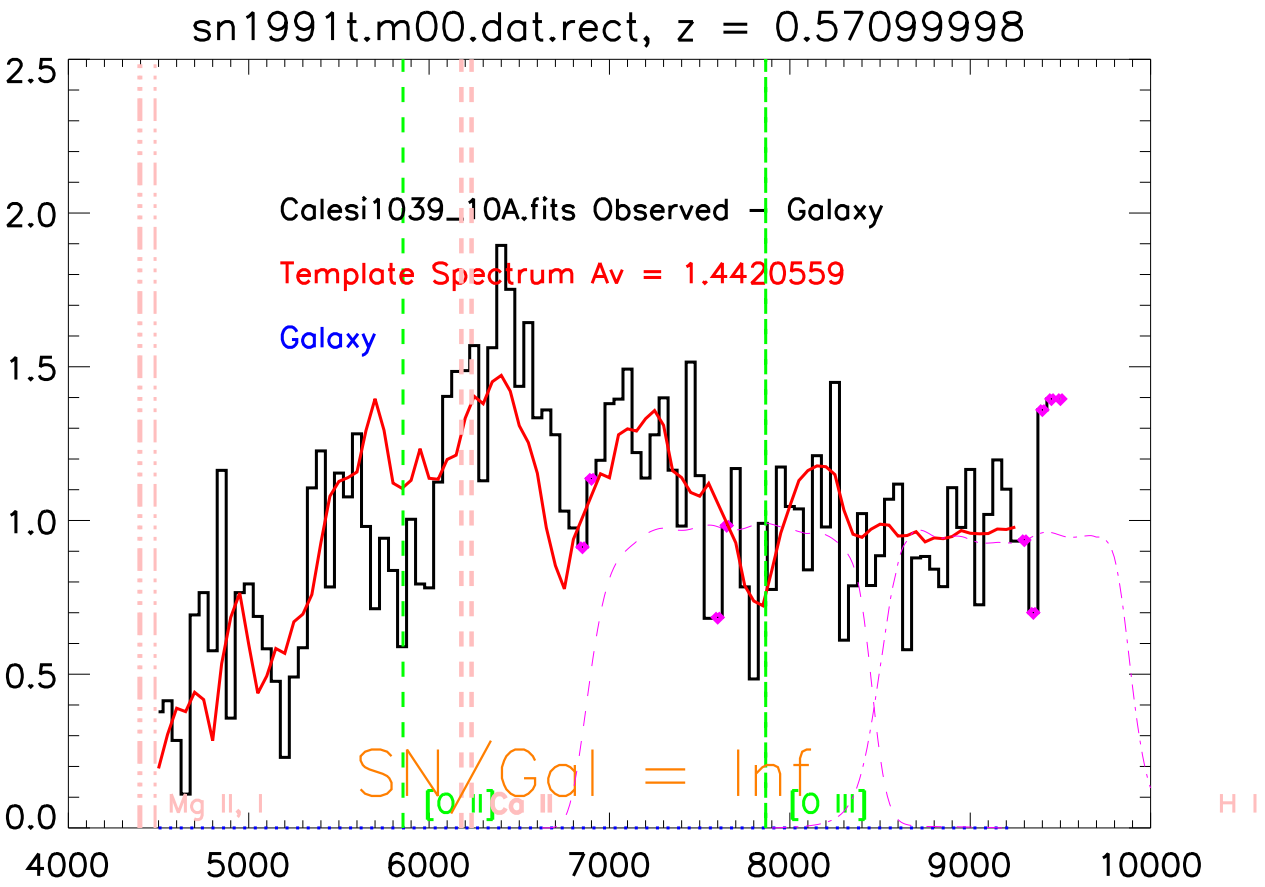

sn1992a.m05.dat.rect, z = 0.57999998
Calesi1039_10A.fits Observed − Galaxy
Template Spectrum Av = 1.1218785
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
2.5
2.0
1.5
1.0
0.5
0.0
4000
5000
6000
7000
8000
9000
10000

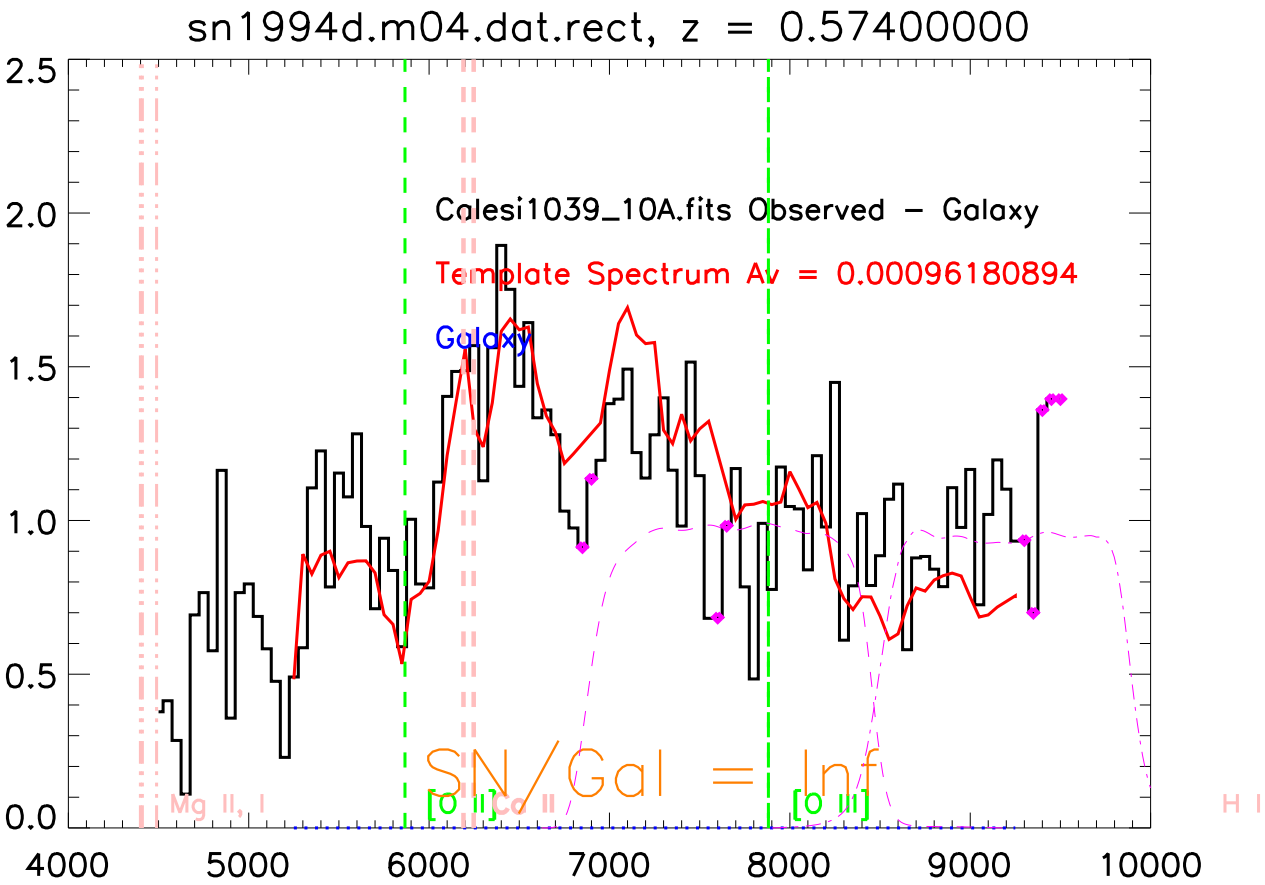

sn1991t.m03.dat.rect, z = 0.56999999
Calesi1039_10A.fits Observed − Galaxy
Template Spectrum Av = 1.4361888
Galaxy
SN/Gal = Inf
Mg II, I
[O II]Ca II
[O III]
H I
2.5
2.0
1.5
1.0
0.5
0.0
4000
5000
6000
7000
8000
9000
10000

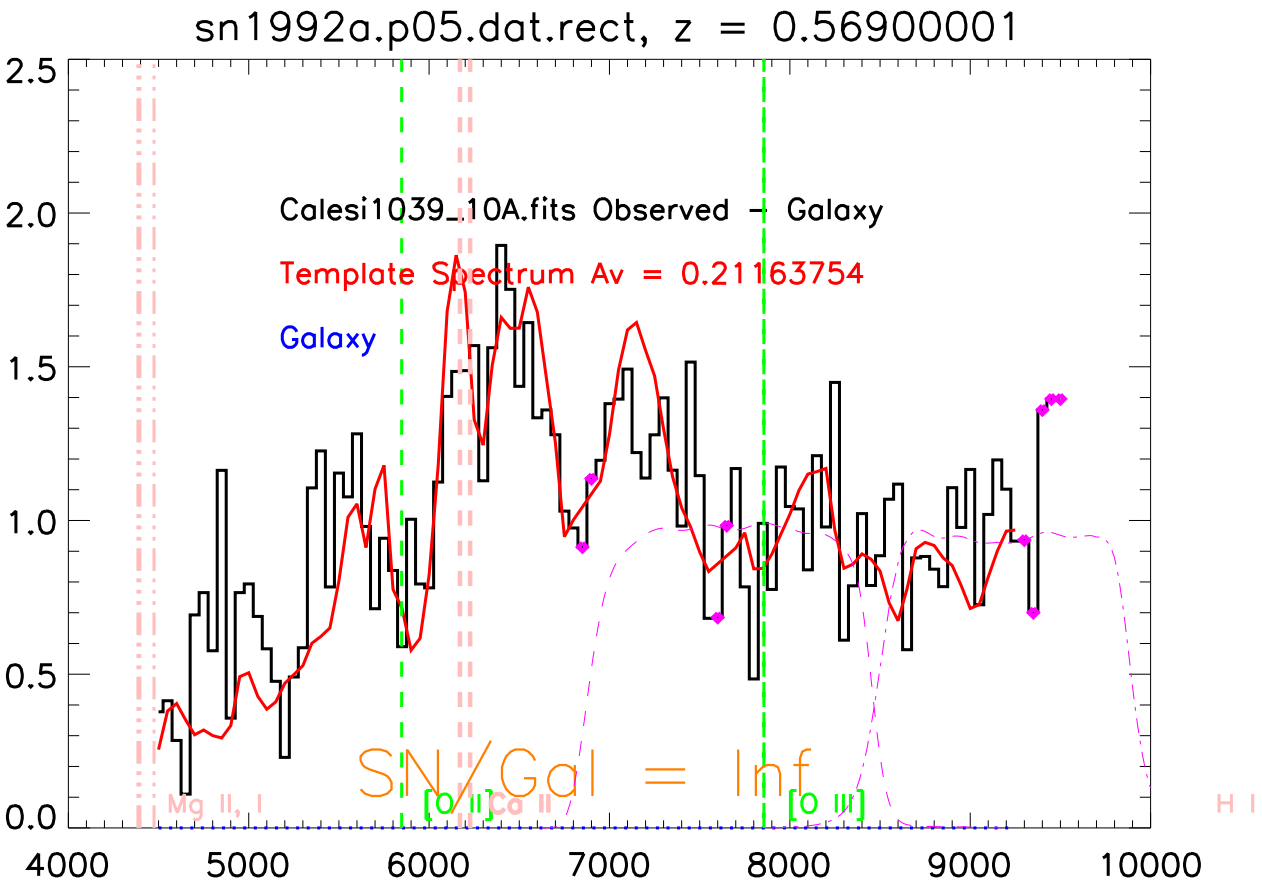

sn1999ee.p01.dat.rect, z = 0.57400000
Calasi1039_10A.fits Observed − Galaxy
Template Spectrum Av = −0.25328777
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
2.5
2.0
1.5
1.0
0.5
0.0
4000
5000
6000
7000
8000
9000
10000

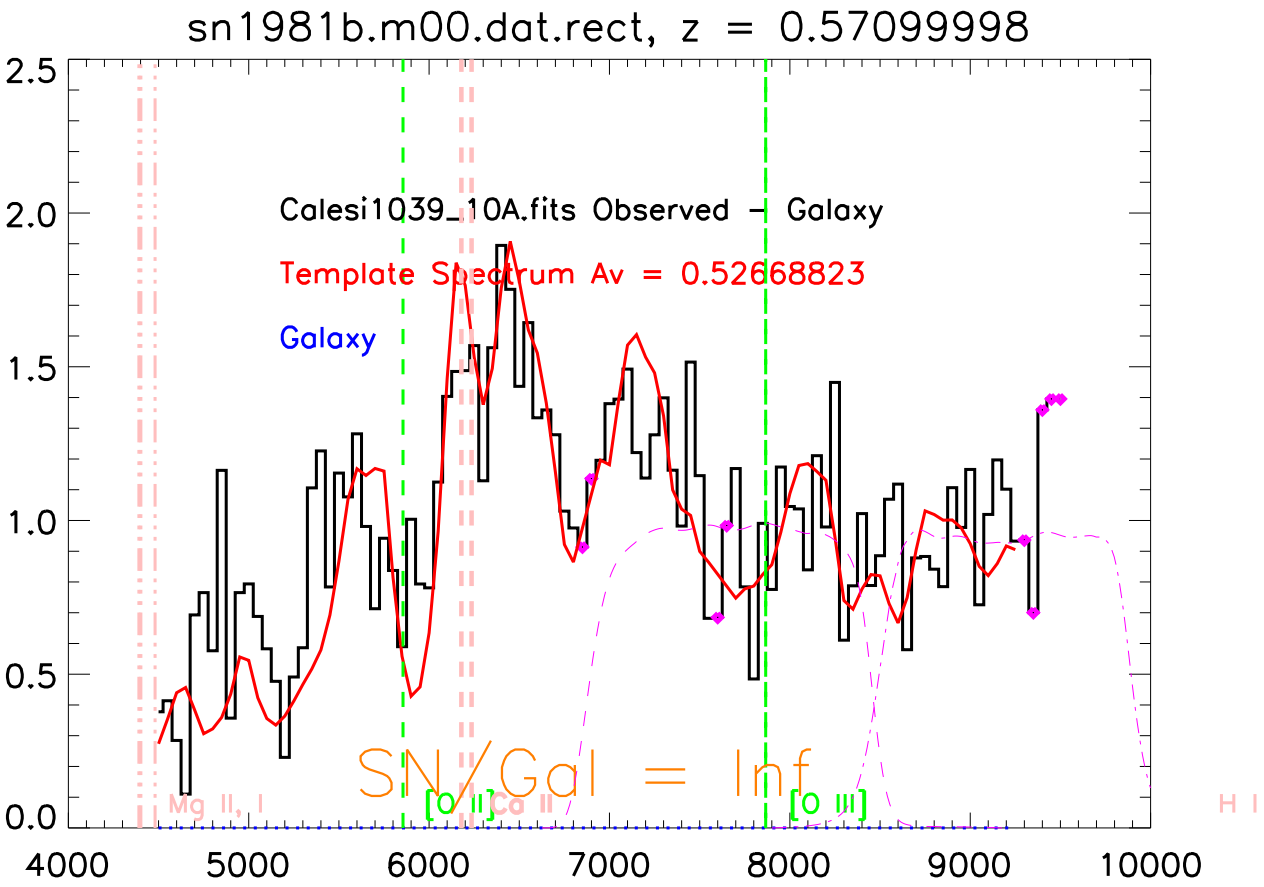

sn1998bu.p08.dat.rect, z = 0.56300002
Calesi1039_10A.fits Observed − Galaxy
Template Spectrum Av = −2.6528970
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
2.5
2.0
1.5
1.0
0.5
0.0
4000
5000
6000
7000
8000
9000
10000

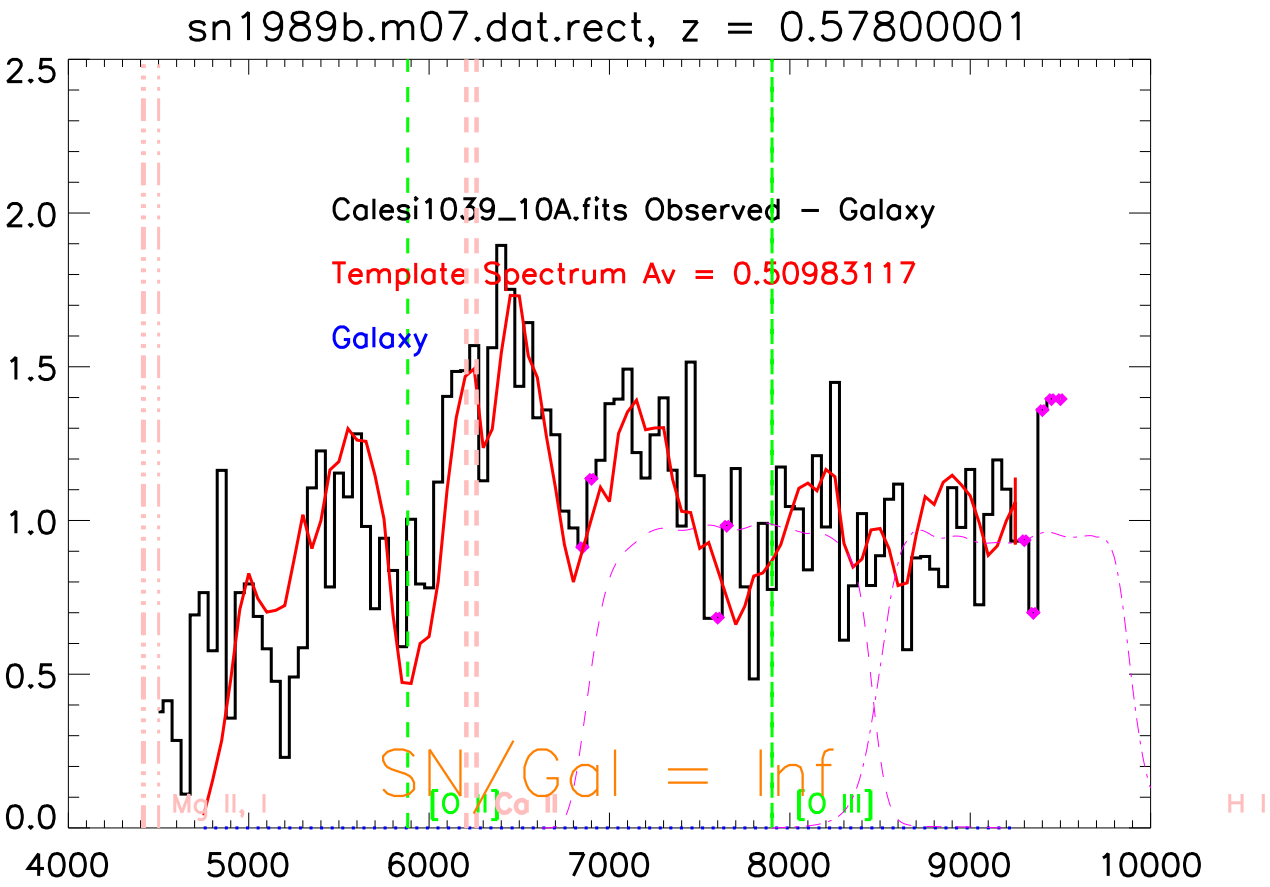

sn1994d.m09.dat.rect, z = 0.57900000
Calesi1039_10A.fits Observed − Galaxy
Template Spectrum Av = 2.4527515
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
2.5
2.0
1.5
1.0
0.5
0.0
4000
5000
6000
7000
8000
9000
10000


sn1991t.m00.dat.rect, z = 0.57099998
Calesi1039_10A.fits Observed – Galaxy
Template Spectrum Av = 1.4420559
Galaxy
SN/Gal = Inf
Mg II, I
[O II]Ca II
[O III]
H I
2.5
2.0
1.5
1.0
0.5
0.0
4000
5000
6000
7000
8000
9000
10000


sn1994d.m04.dat.rect, z = 0.57400000
Calesi1039_10A.fits Observed − Galaxy
Template Spectrum Av = 0.00096180894
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
2.5
2.0
1.5
1.0
0.5
0.0
4000
5000
6000
7000
8000
9000
10000


sn1992a.p05.dat.rect, z = 0.56900001
Calesi1039_10A.fits Observed + Galaxy
Template Spectrum Av = 0.21163754
Galaxy
S/N Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
2.5
2.0
1.5
1.0
0.5
0.0
4000
5000
6000
7000
8000
9000
10000


sn1981b.m00.dat.rect, z = 0.57099998
Calesi1039_10A.fits Observed – Galaxy
Template Spectrum Av = 0.52668823
Galaxy
SN/Gal = Inf
Mg II, I
[O II]Ca II
[O III]
H I
2.5
2.0
1.5
1.0
0.5
0.0
4000
5000
6000
7000
8000
9000
10000


sn1989b.m07.dat.rect, z = 0.57800001
Calesi1039_10A.fits Observed − Galaxy
Template Spectrum Av = 0.50983117
Galaxy
SN/Gal = Inf
[O II]
Ca II
[O III]
Mg II, I
H I
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2.0
1.5
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9000
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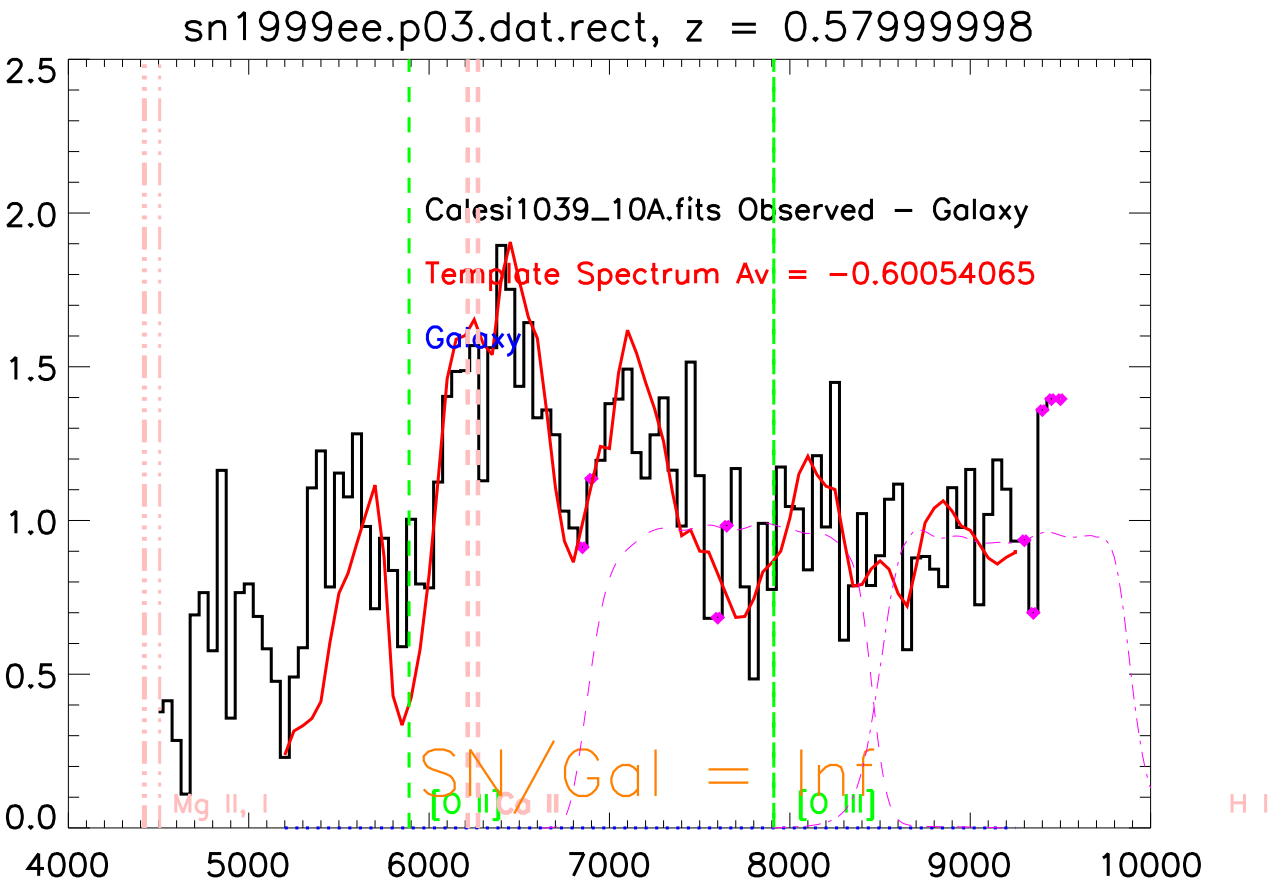
sn1999ee.p03.dat.rect, z = 0.57999998
Calesi1039_10A.fits Observed − Galaxy
Template Spectrum Av = −0.60054065
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
2.5
2.0
1.5
1.0
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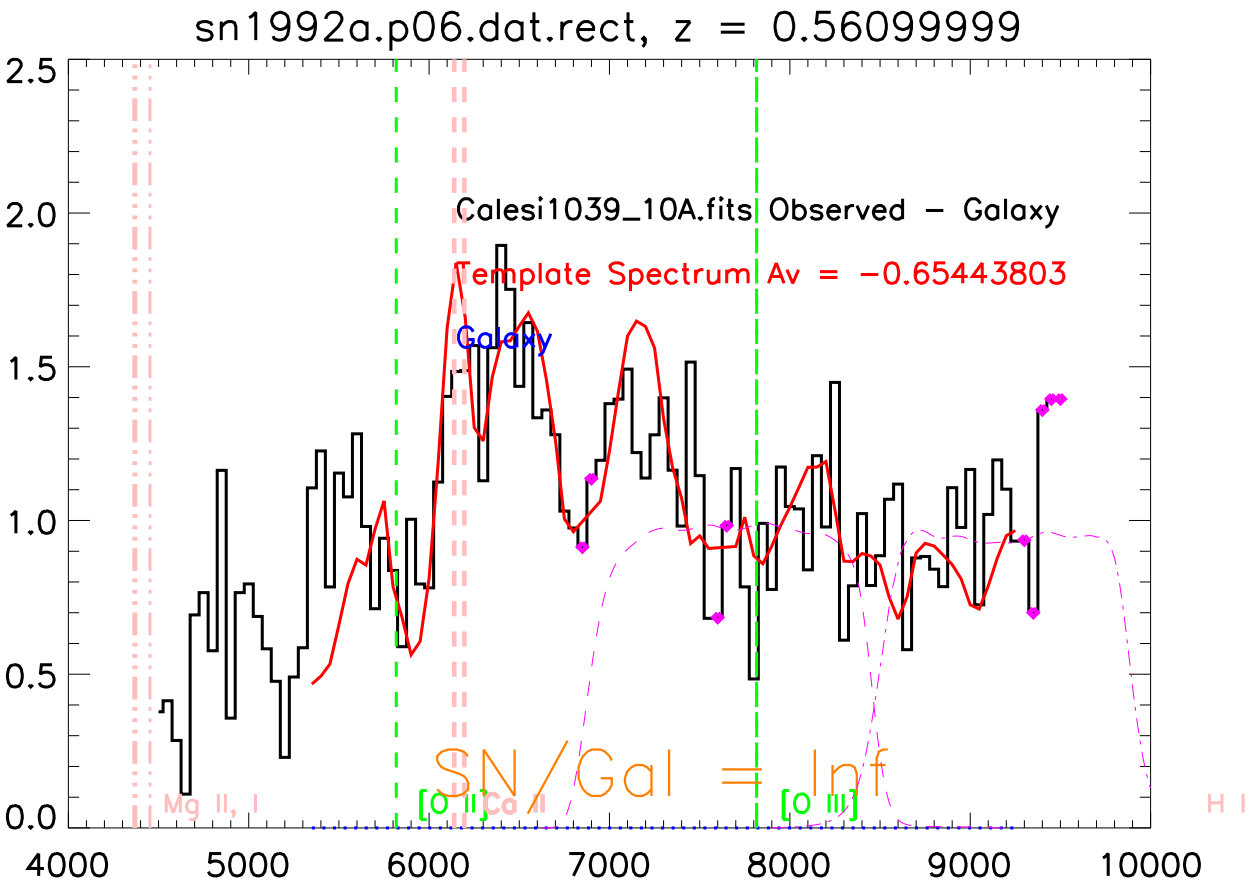
sn1992a.p06.dat.rect, z = 0.56099999
Calesi1039_10A.fits Observed − Galaxy
Template Spectrum Av = −0.65443803
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
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2.0
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1.0
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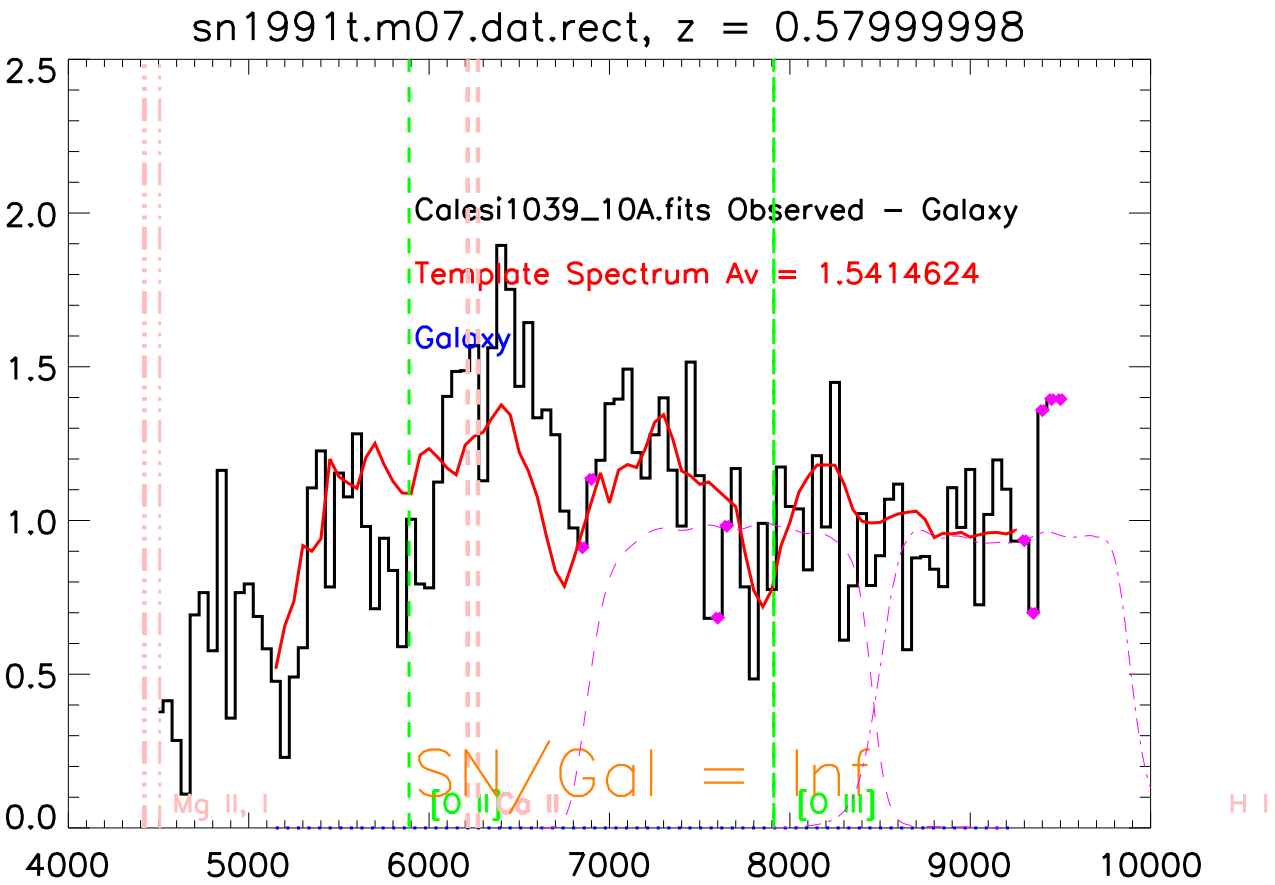
sn1991t.m07.dat.rect, z = 0.57999998
Calesi1039_10A.fits Observed − Galaxy
Template Spectrum Av = 1.5414624
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
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2.0
1.5
1.0
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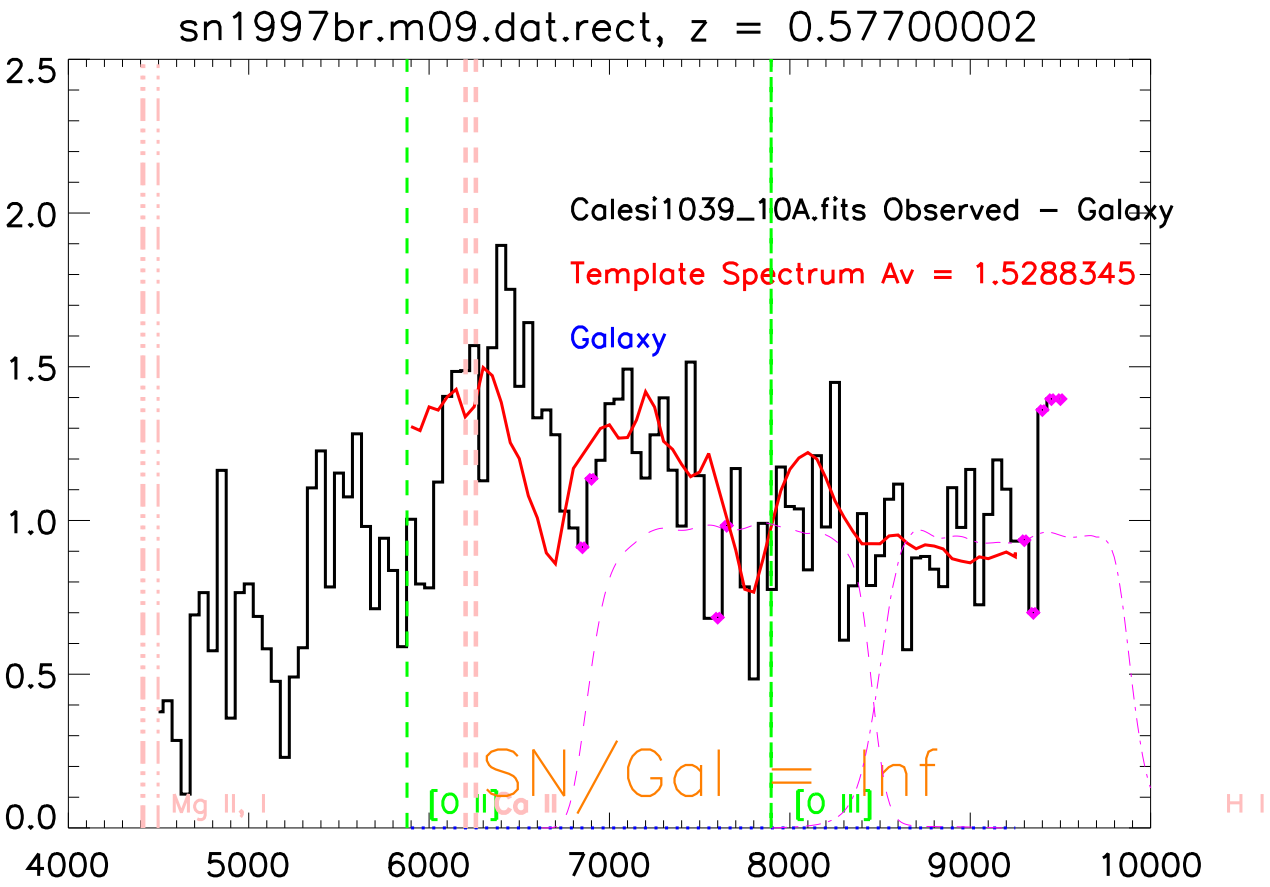
sn1997br.m09.dat.rect, z = 0.57700002
Calesi1039_10A.fits Observed − Galaxy
Template Spectrum Av = 1.5288345
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
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2.0
1.5
1.0
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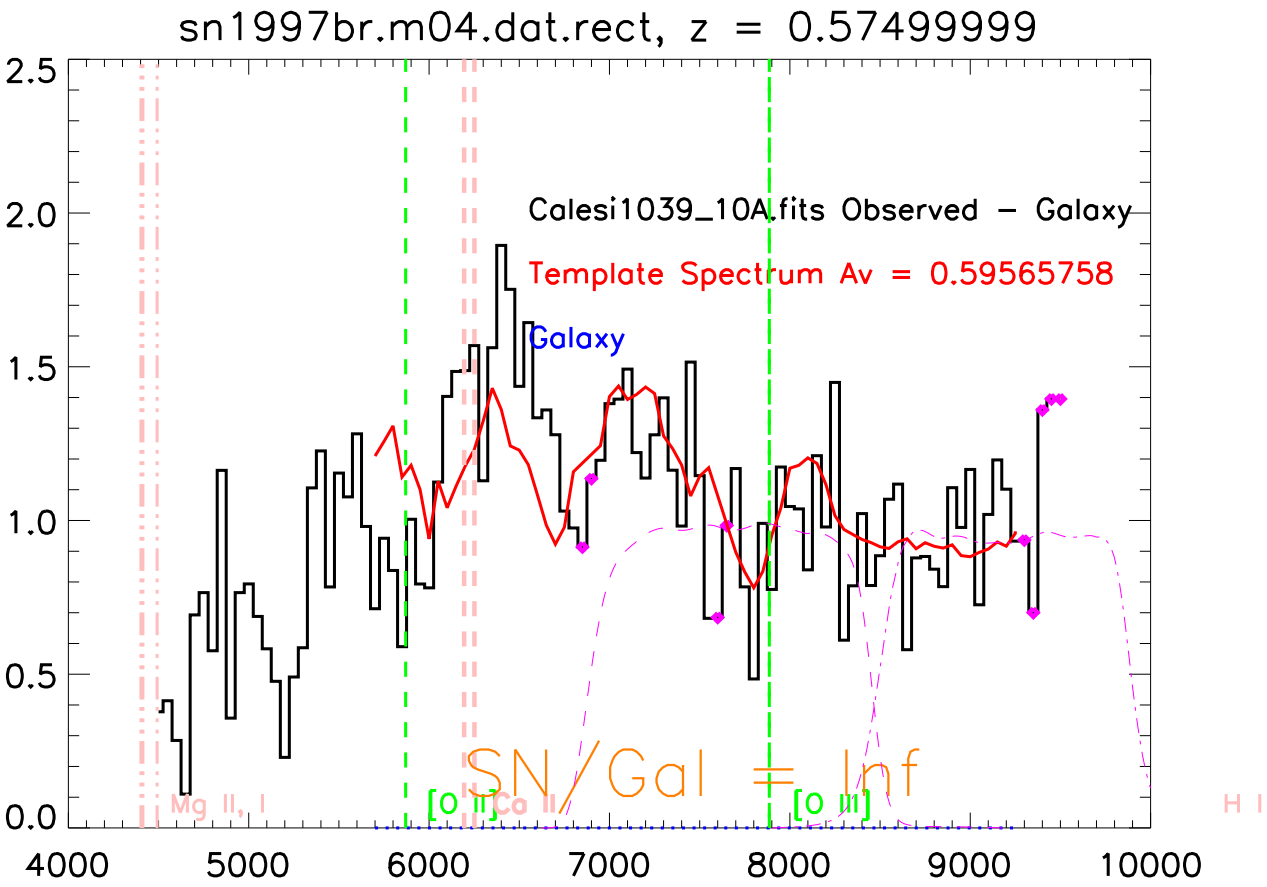
sn1997br.m04.dat.rect, z = 0.57499999
Calesi1039_10A.fits Observed − Galaxy
Template Spectrum Av = 0.59565758
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
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2.0
1.5
1.0
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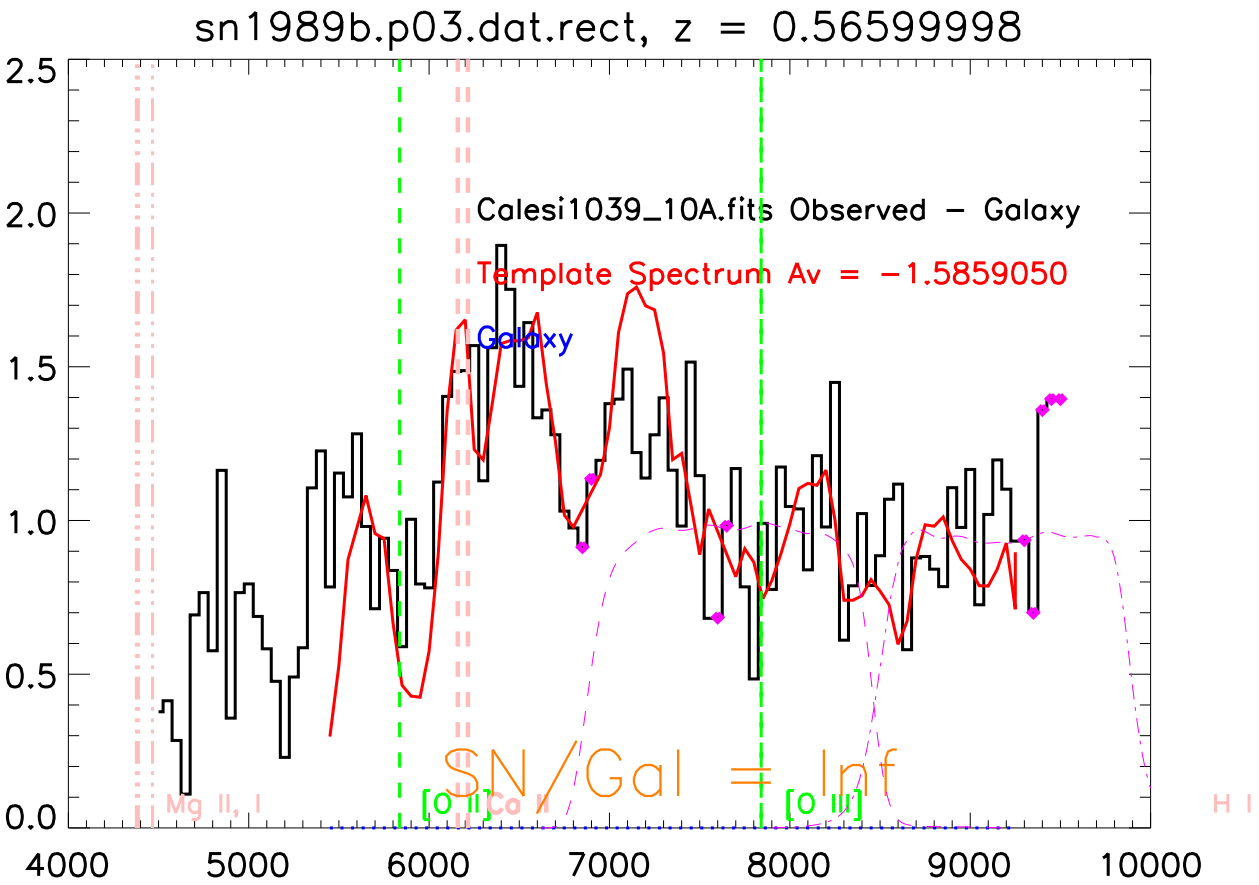
sn1989b.p03.dat.rect, z = 0.56599998
Calesi1039_10A.fits Observed − Galaxy
Template Spectrum Av = −1.5859050
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca I
[O III]
H I
2.5
2.0
1.5
1.0
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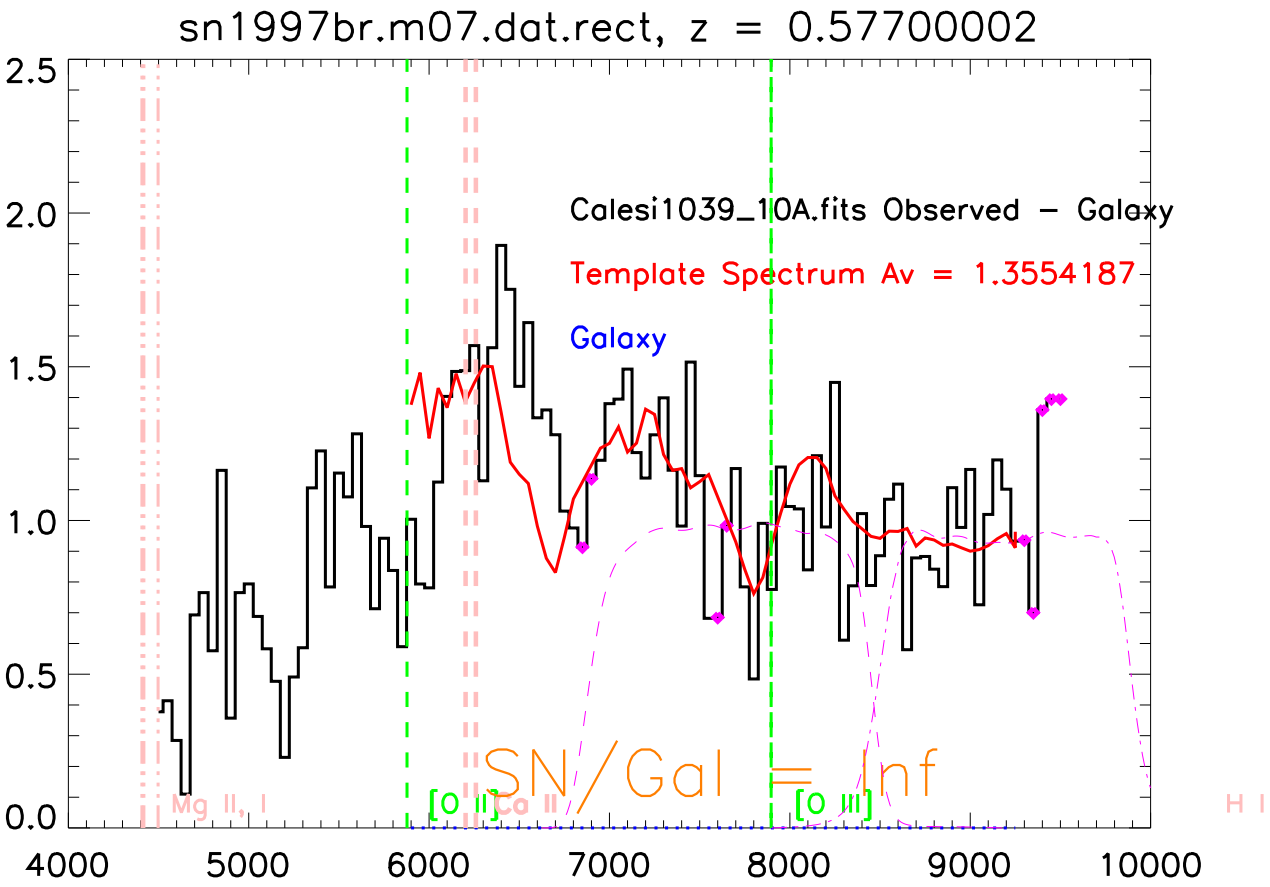
sn1997br.m07.dat.rect, z = 0.57700002
Calesi1039_10A.fits Observed − Galaxy
Template Spectrum Av = 1.3554187
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
2.5
2.0
1.5
1.0
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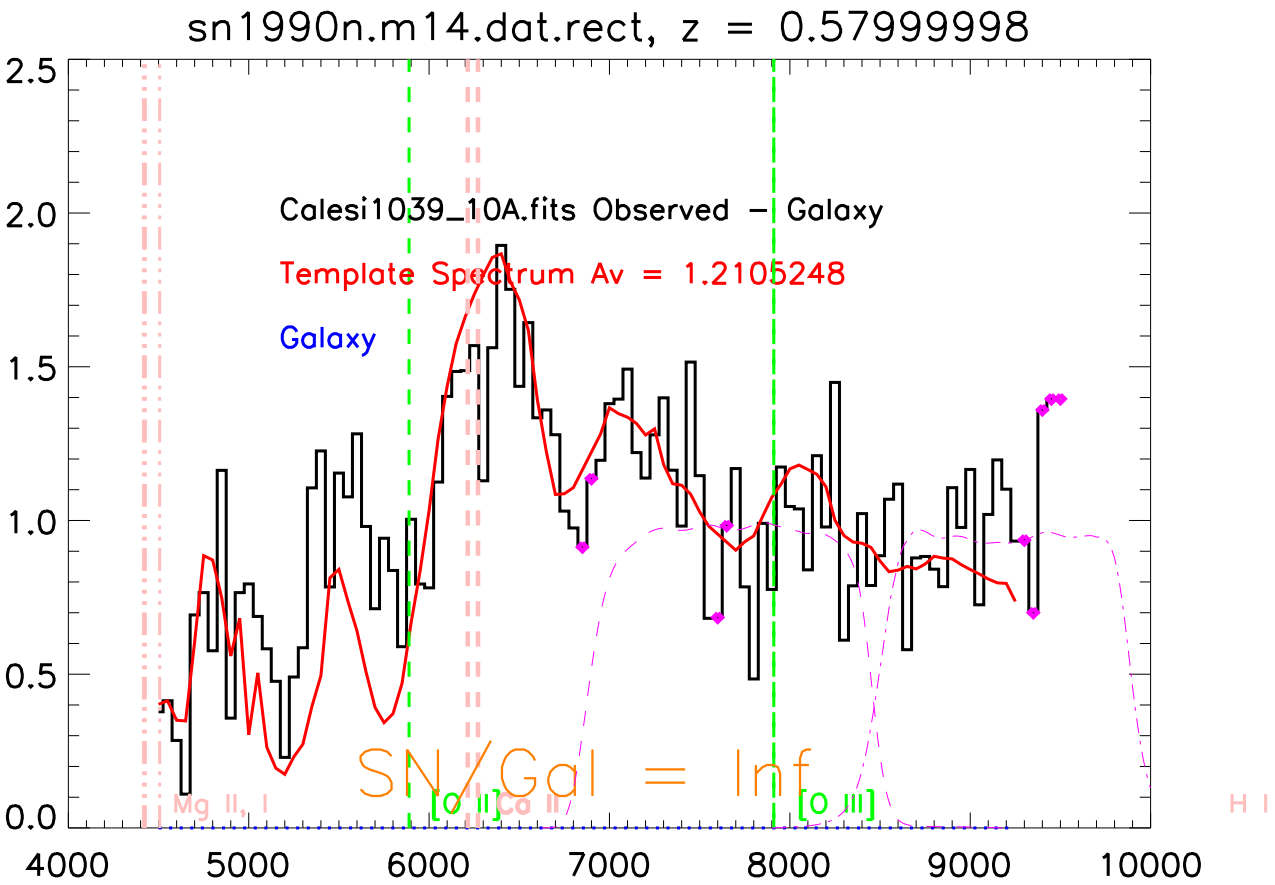
sn1990n.m14.dat.rect, z = 0.57999998
Calesi1039_10A.fits Observed – Galaxy
Template Spectrum Av = 1.2105248
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
2.5
2.0
1.5
1.0
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8000
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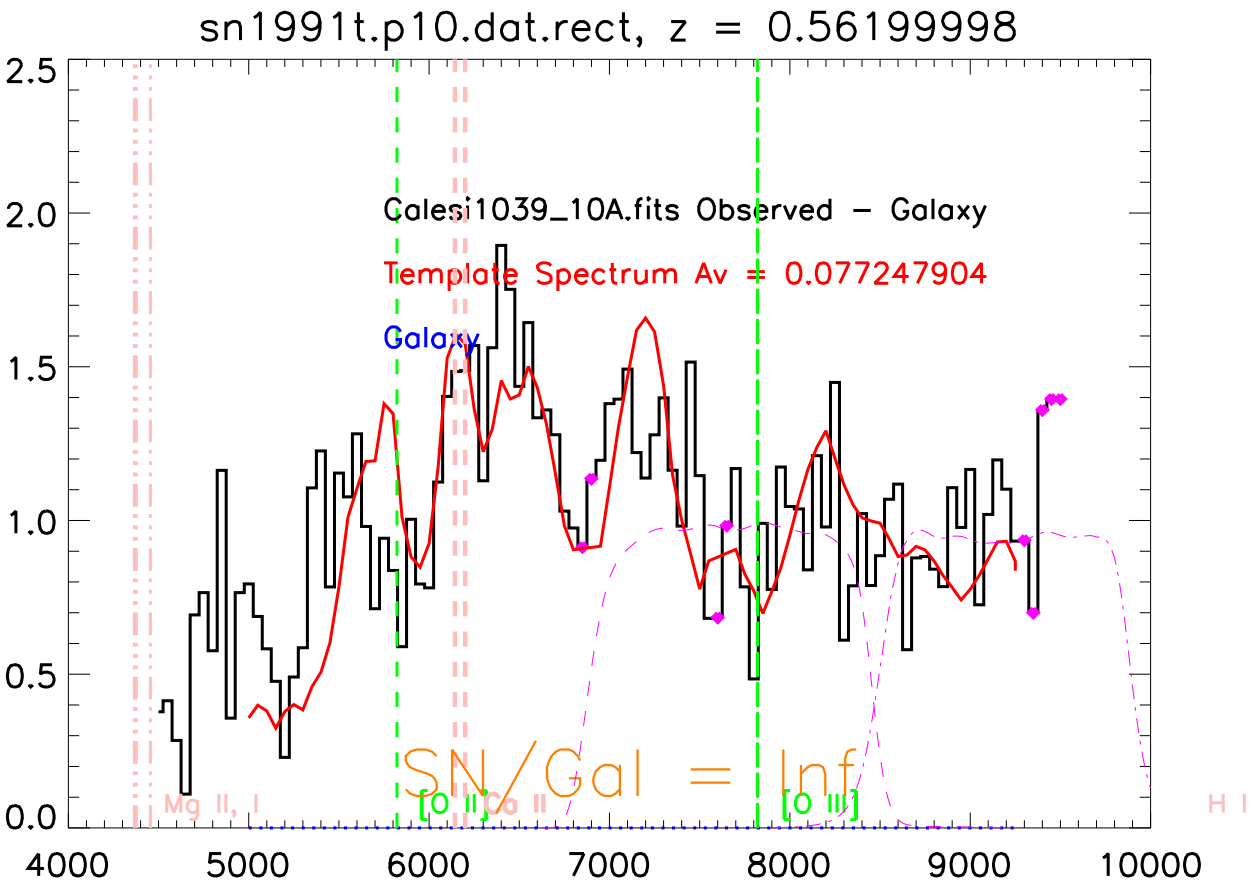
sn1991t.p10.dat.rect, z = 0.56199998
Calesi1039_10A.fits Observed − Galaxy
Template Spectrum Av = 0.077247904
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
2.5
2.0
1.5
1.0
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8000
9000
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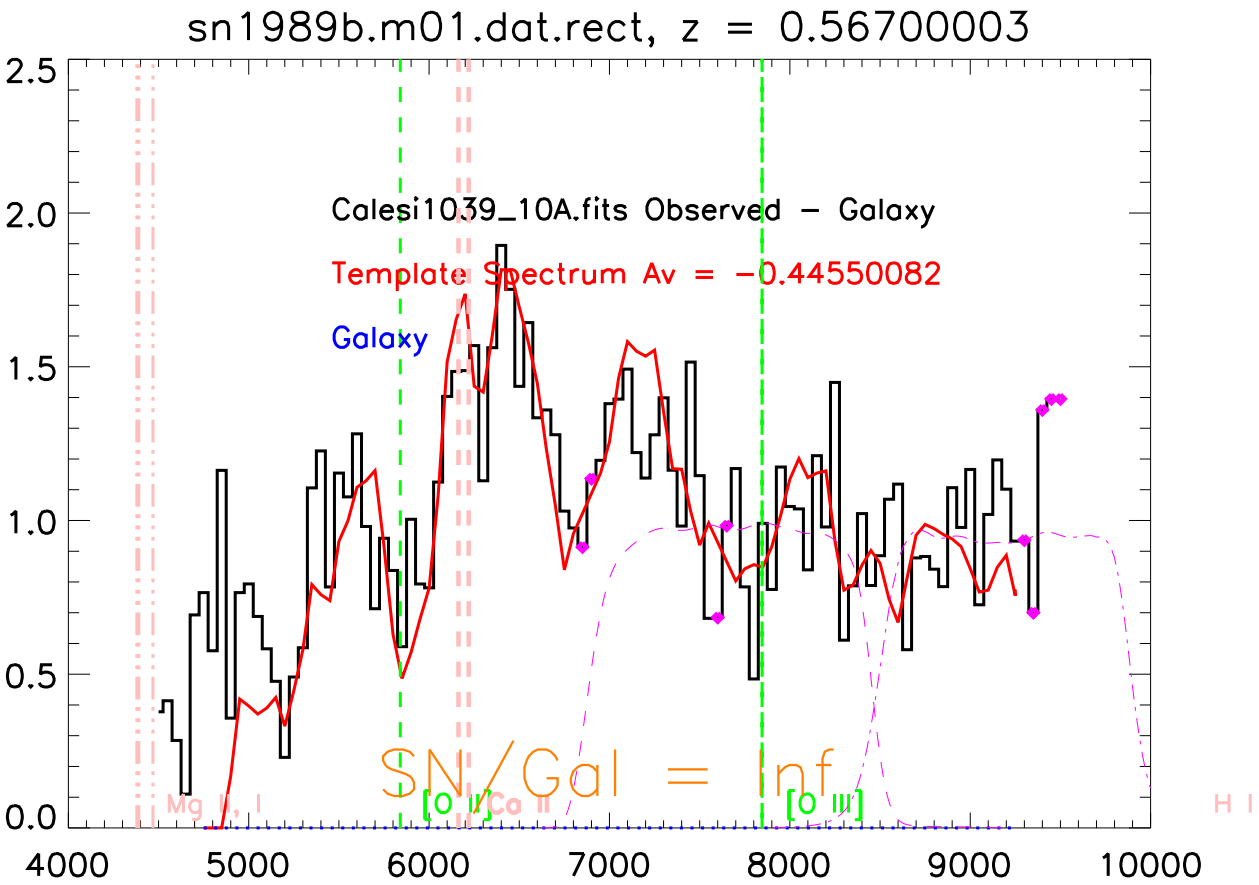
sn1989b.m01.dat.rect, z = 0.56700003
Calesi1039_10A.fits Observed − Galaxy
Template Spectrum Av = −0.44550082
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
2.5
2.0
1.5
1.0
0.5
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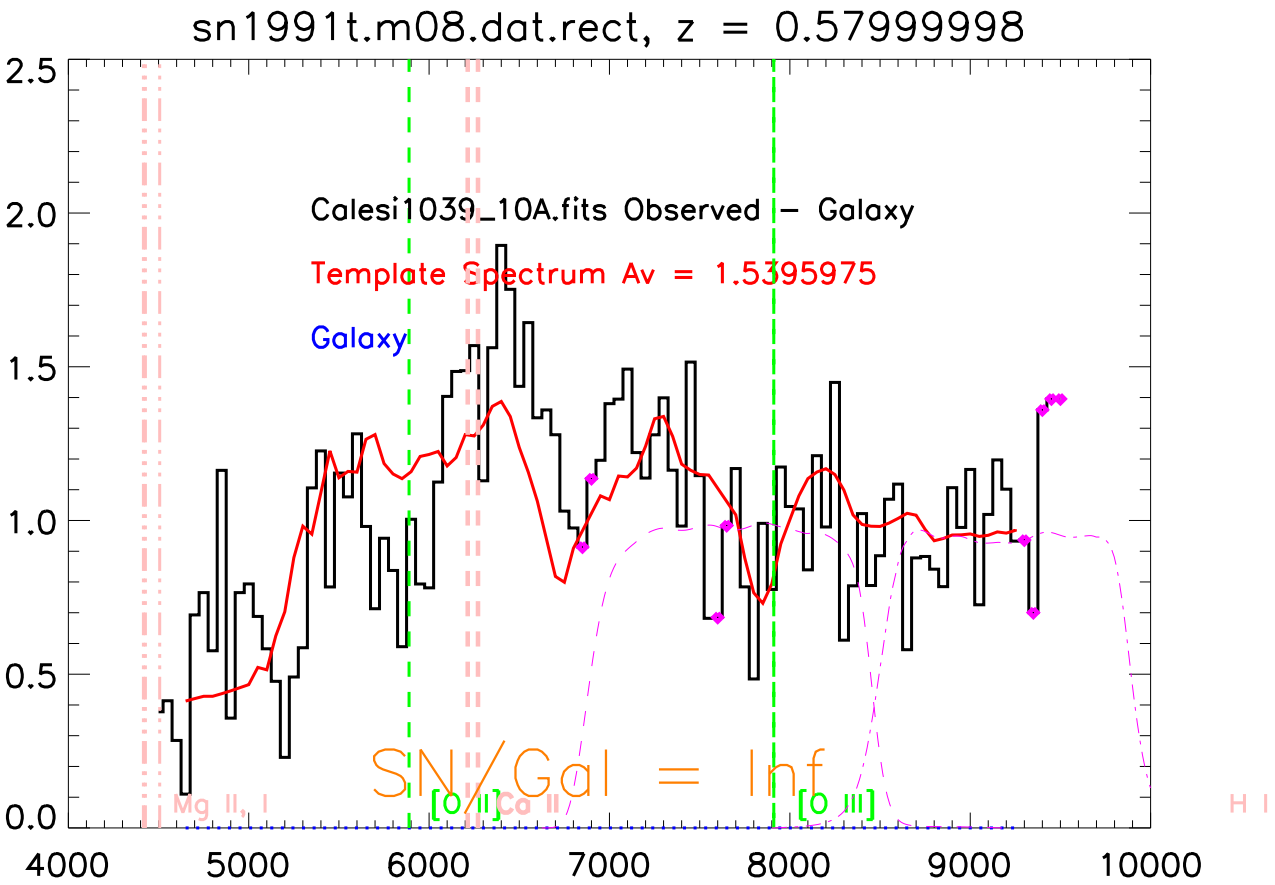
sn1991t.m08.dat.rect, z = 0.57999998
Calesi1039_10A.fits Observed – Galaxy
Template Spectrum Av = 1.5395975
Galaxy
S/N/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
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2.0
1.5
1.0
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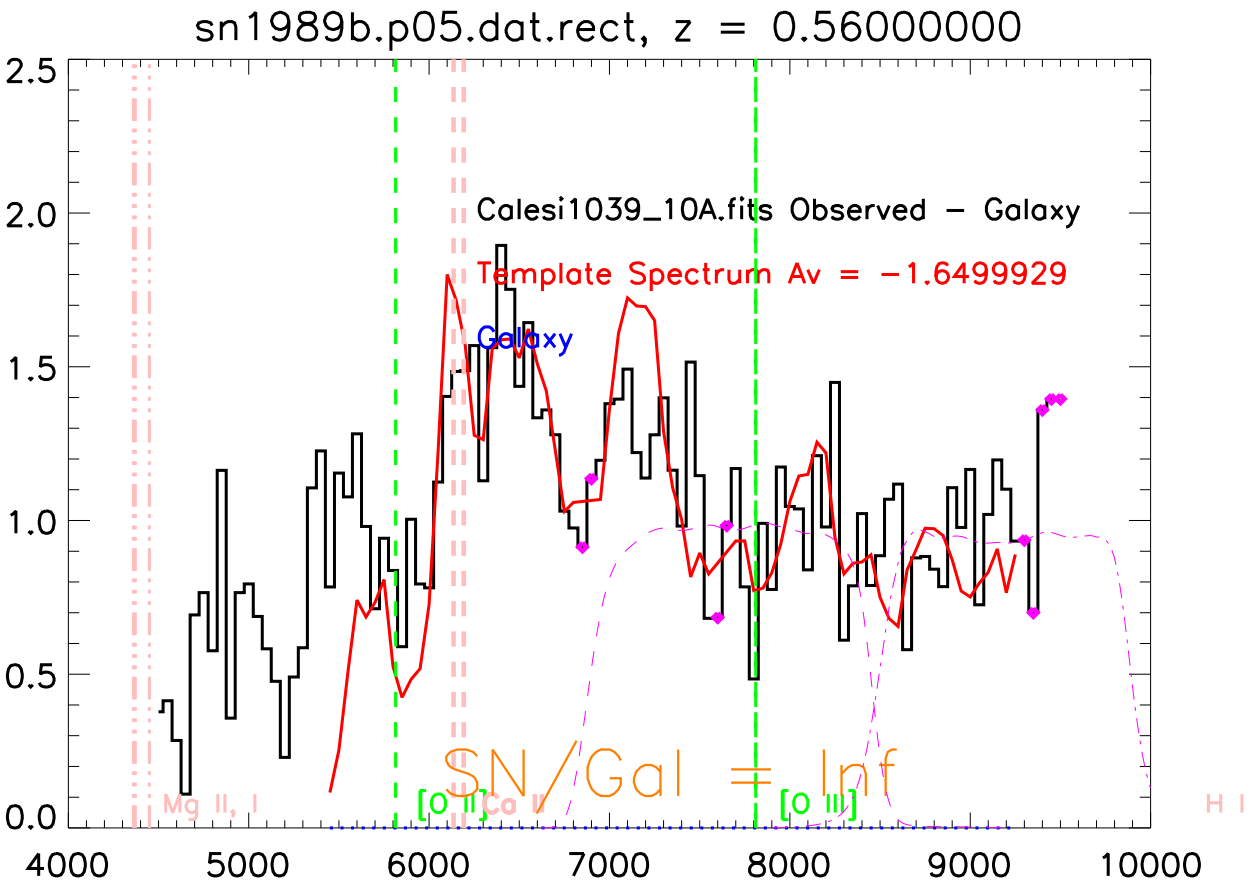
sn1989b.p05.dat.rect, z = 0.56000000
Calesi1039_10A.fits Observed − Galaxy
Template Spectrum Av = −1.6499929
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
2.5
2.0
1.5
1.0
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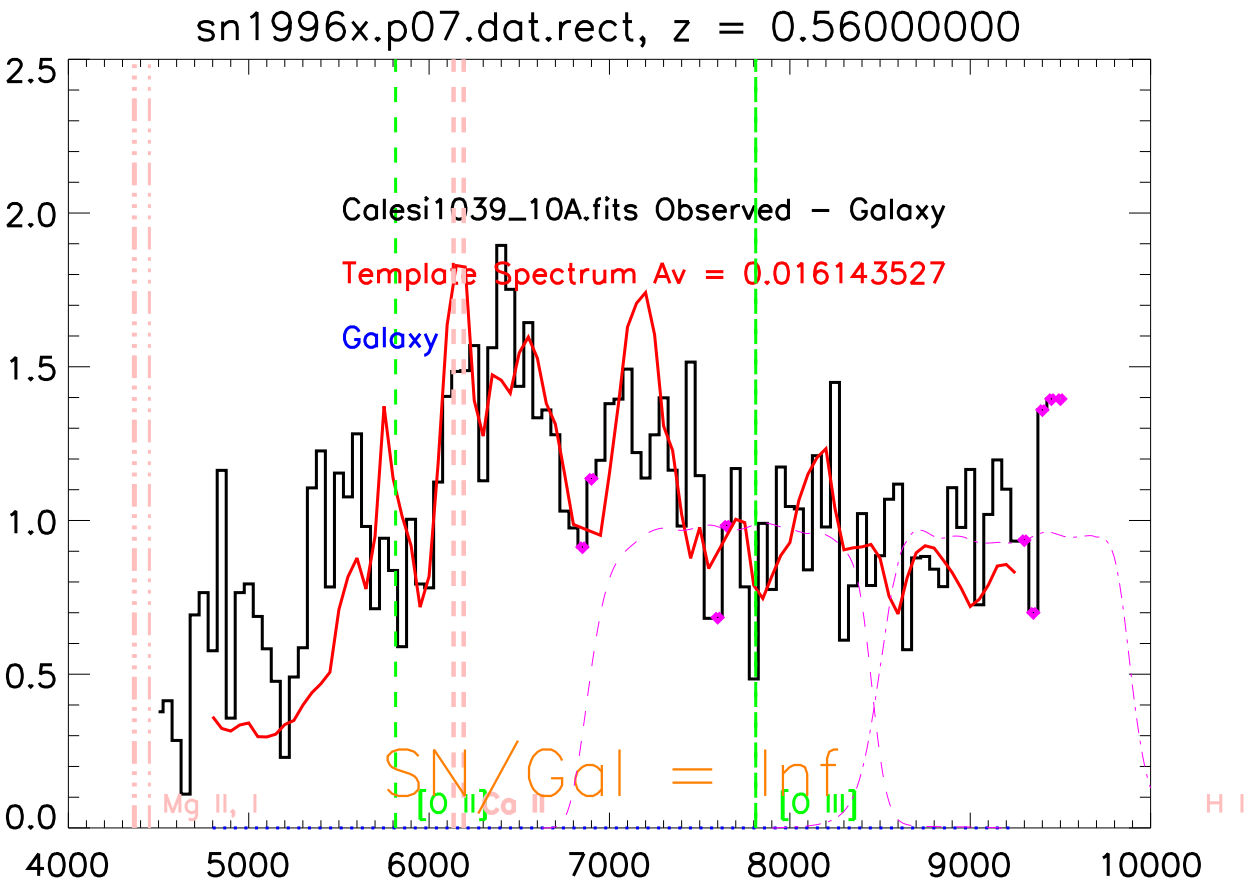
sn1996x.p07.dat.rect, z = 0.56000000
Calesi1039_10A.fits Observed − Galaxy
Template Spectrum Av = 0.016143527
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
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2.0
1.5
1.0
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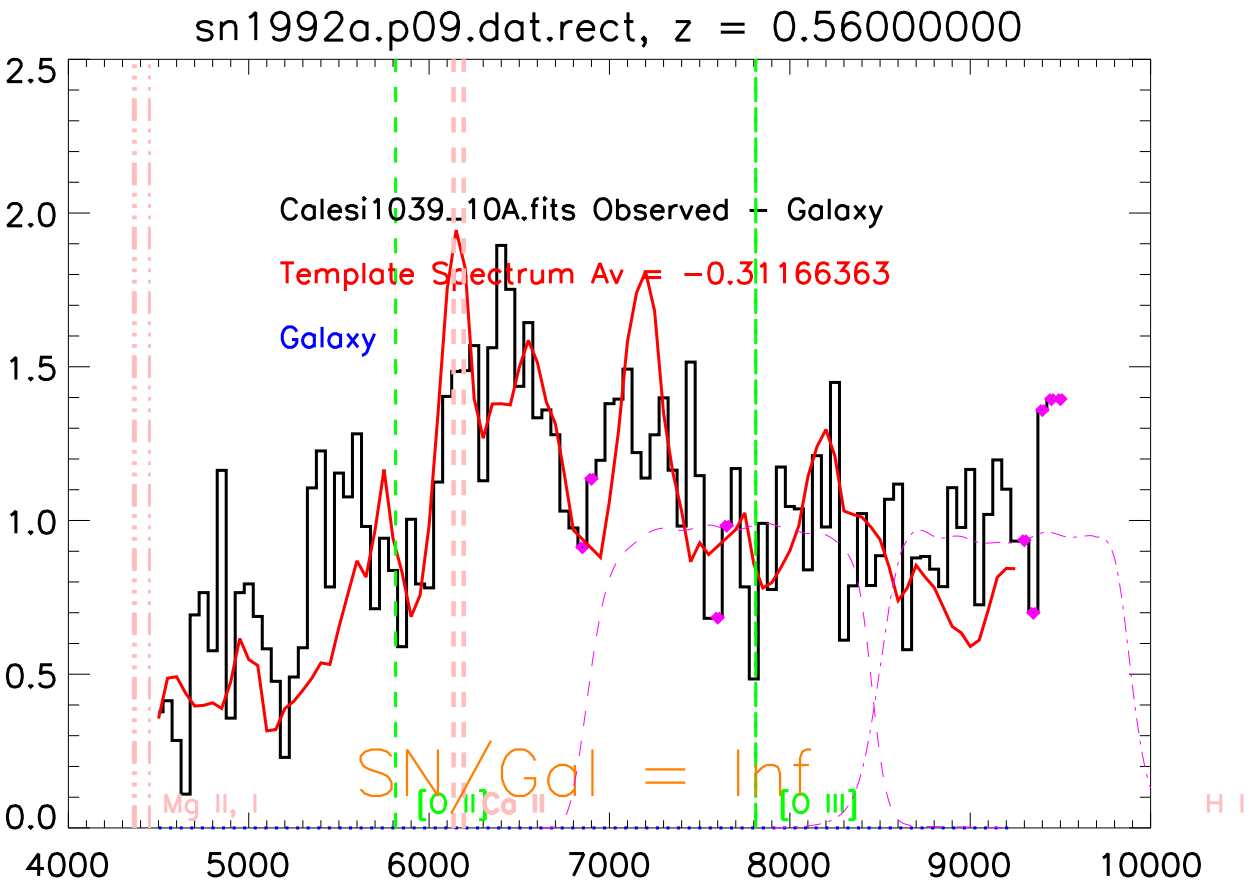
sn1992a.p09.dat.rect, z = 0.56000000
Calesi1039_10A.fits Observed + Galaxy
Template Spectrum Av = -0.31166363
Galaxy
S/N/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
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2.0
1.5
1.0
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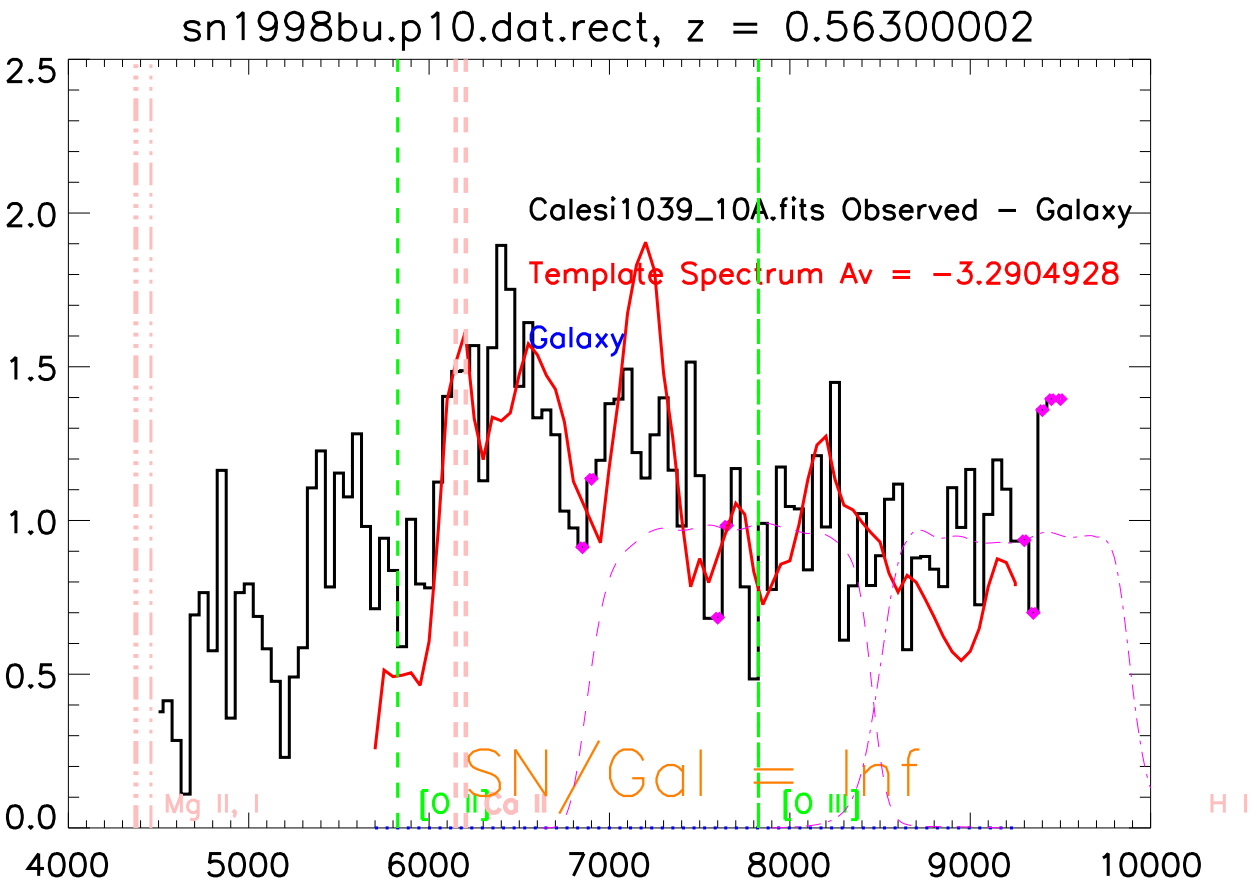
sn1998bu.p10.dat.rect, z = 0.56300002
Calesi1039_10A.fits Observed − Galaxy
Template Spectrum Av = −3.2904928
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
2.5
2.0
1.5
1.0
0.5
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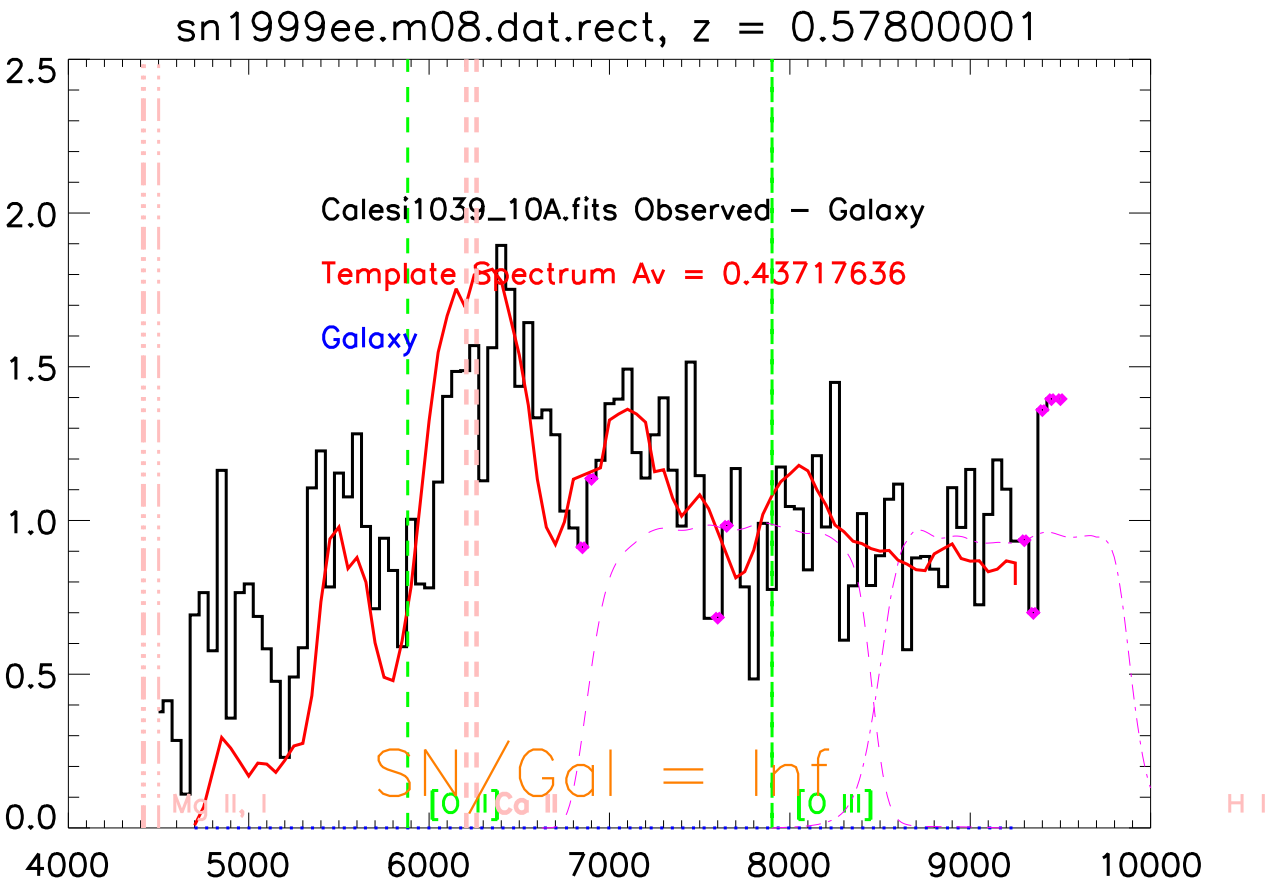
6000
7000
8000
9000
10000


sn1999ee.m08.dat.rect, z = 0.57800001
Calesi1039_10A.fits Observed − Galaxy
Template Spectrum Av = 0.43717636
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
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2.0
1.5
1.0
0.5
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6000
7000
8000
9000
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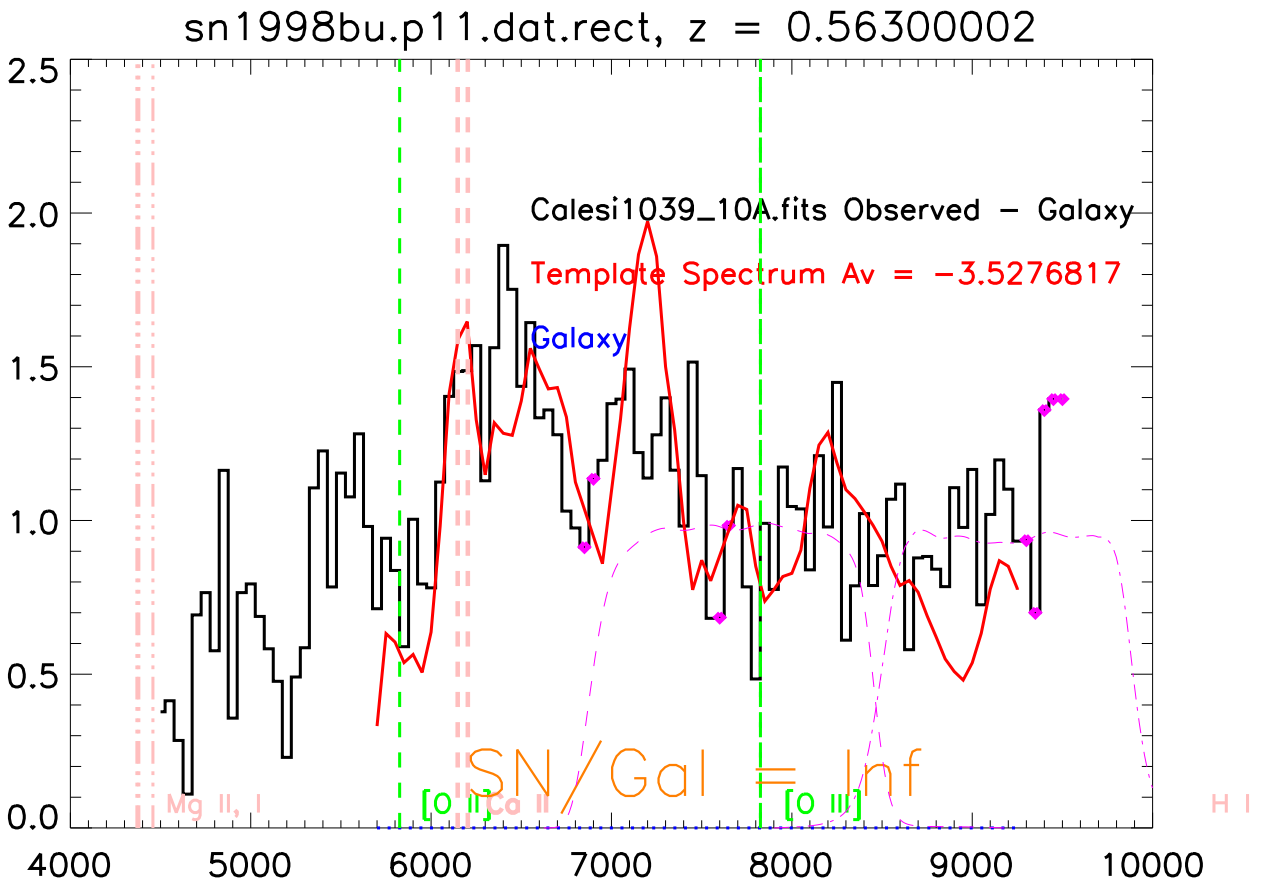
sn1998bu.p11.dat.rect, z = 0.56300002
Calesi1039_10A.fits Observed − Galaxy
Template Spectrum Av = −3.5276817
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
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2.0
1.5
1.0
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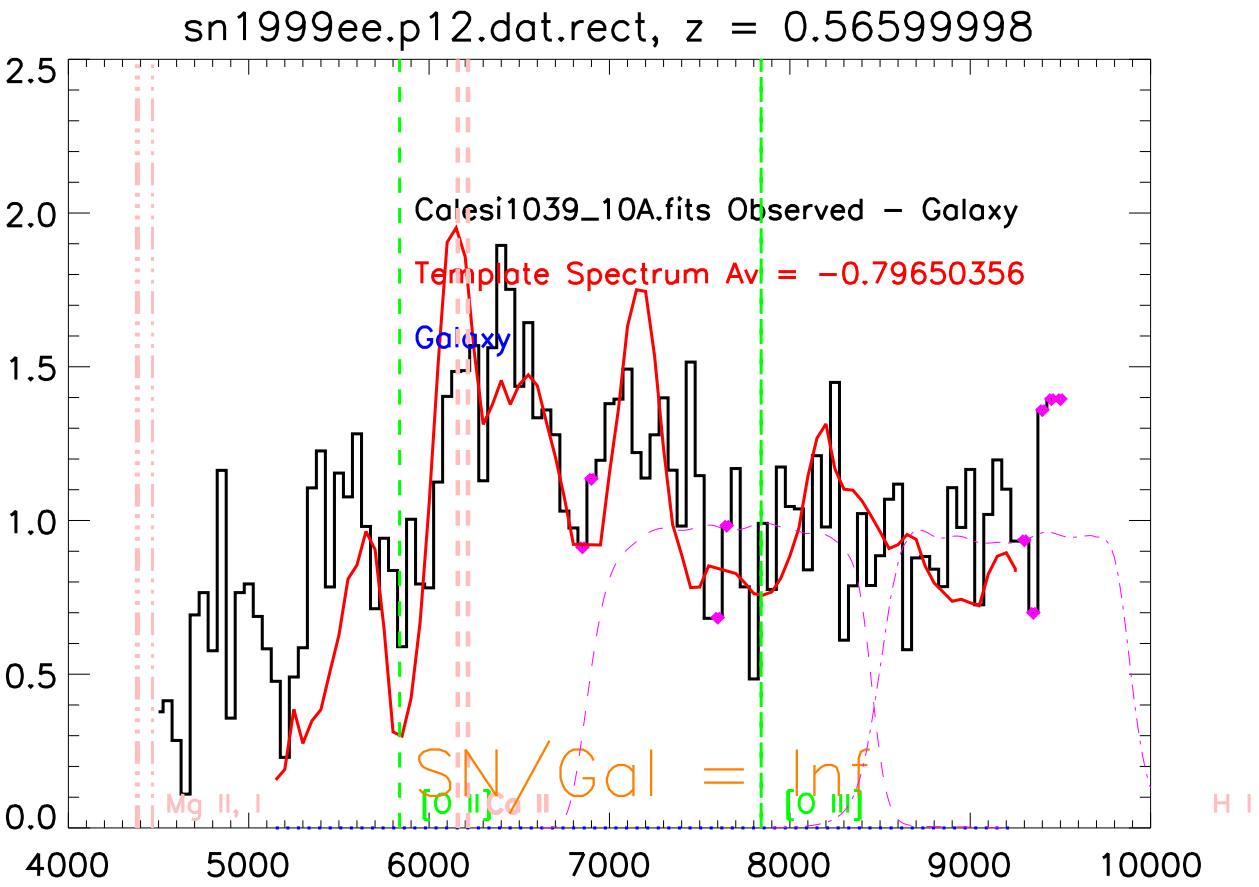
sn1999ee.p12.dat.rect, z = 0.56599998
Calesi1039_10A.fits Observed − Galaxy
Template Spectrum Av = −0.79650356
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
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2.0
1.5
1.0
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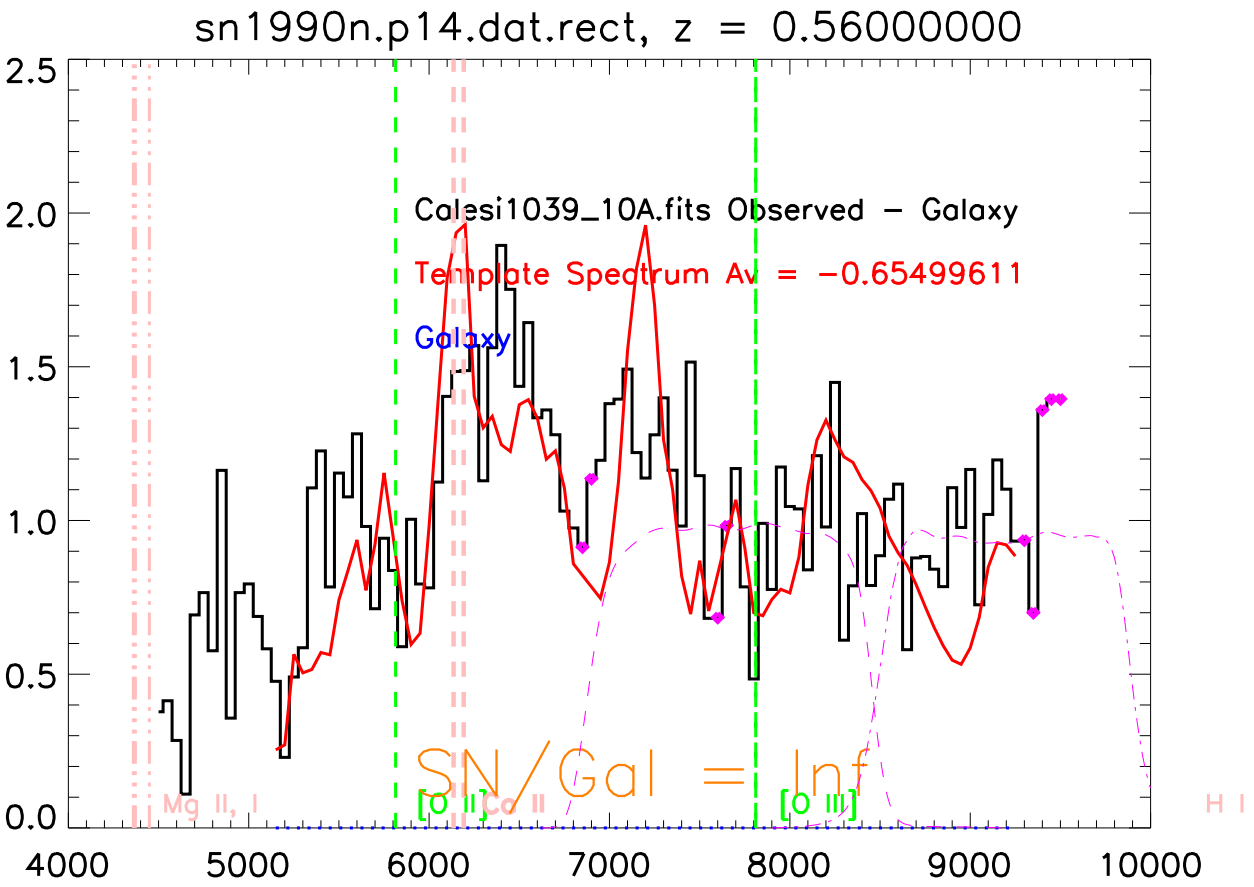
sn1990n.p14.dat.rect, z = 0.56000000
Calesi1039_10A.fits Observed − Galaxy
Template Spectrum Av = −0.65499611
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
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2.0
1.5
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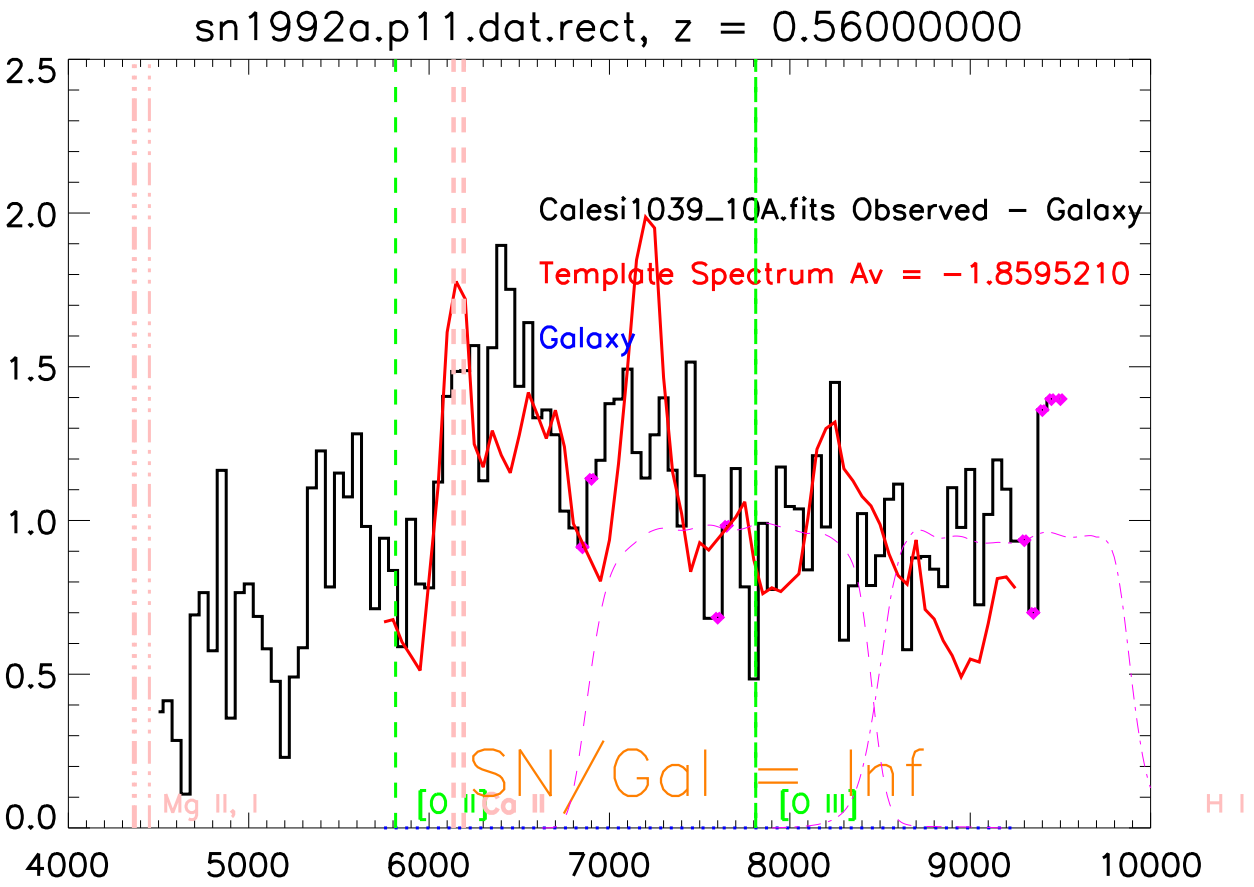
sn1992a.p11.dat.rect, z = 0.56000000
Calesi1039_10A.fits Observed − Galaxy
Template Spectrum Av = −1.8595210
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
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2.0
1.5
1.0
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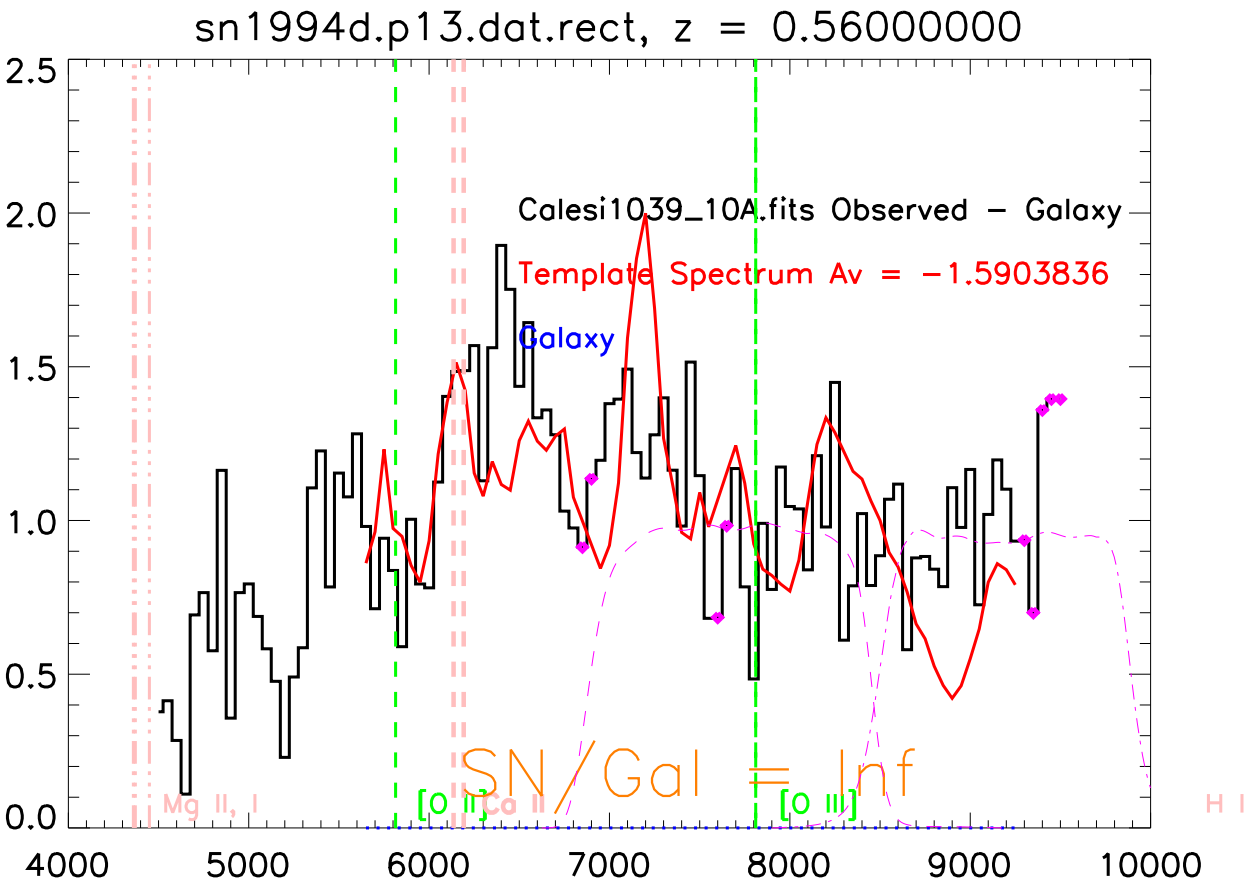
sn1994d.p13.dat.rect, z = 0.56000000
Calesi1039_10A.fits Observed − Galaxy
Template Spectrum Av = −1.5903836
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
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2.0
1.5
1.0
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9000
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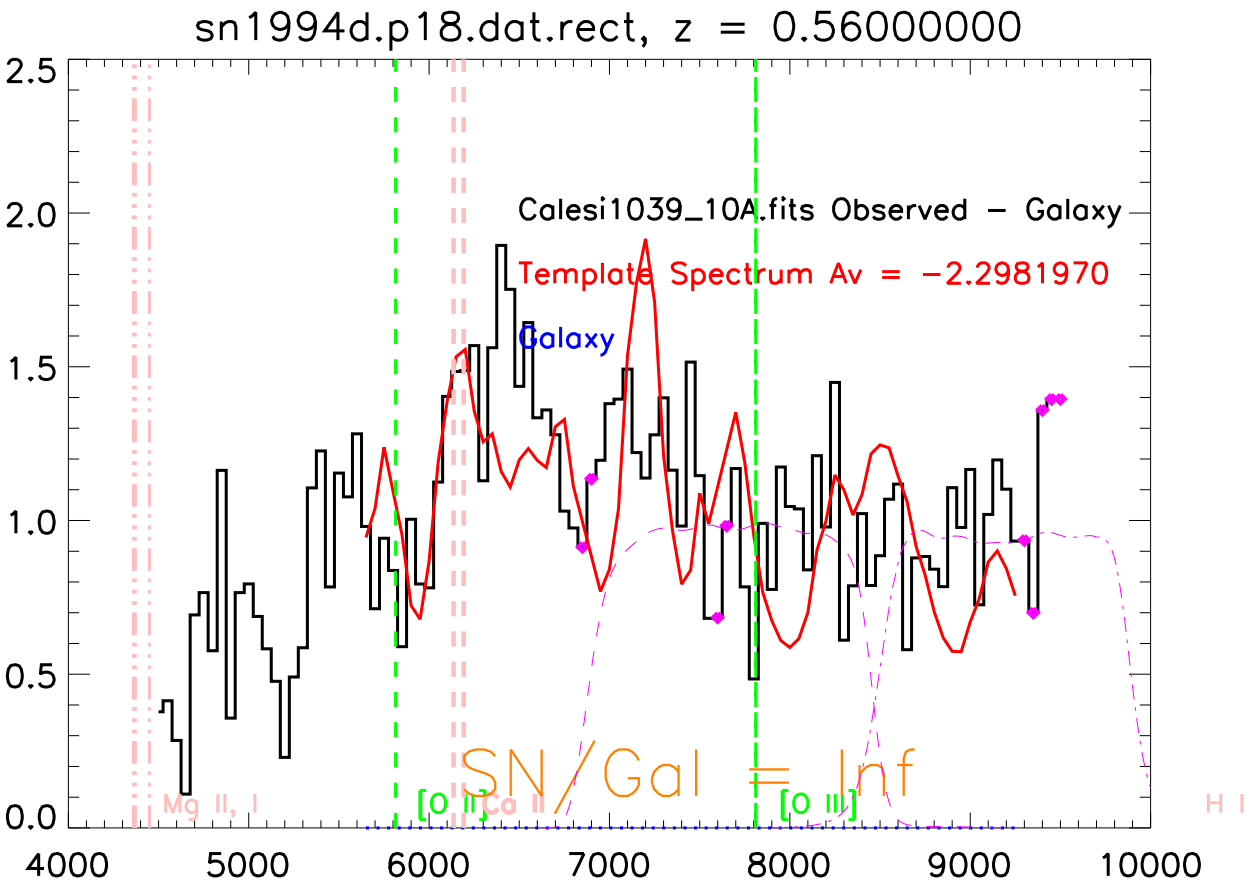
sn1994d.p18.dat.rect, z = 0.56000000
Calesi1039_10A.fits Observed − Galaxy
Template Spectrum Av = −2.2981970
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
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2.0
1.5
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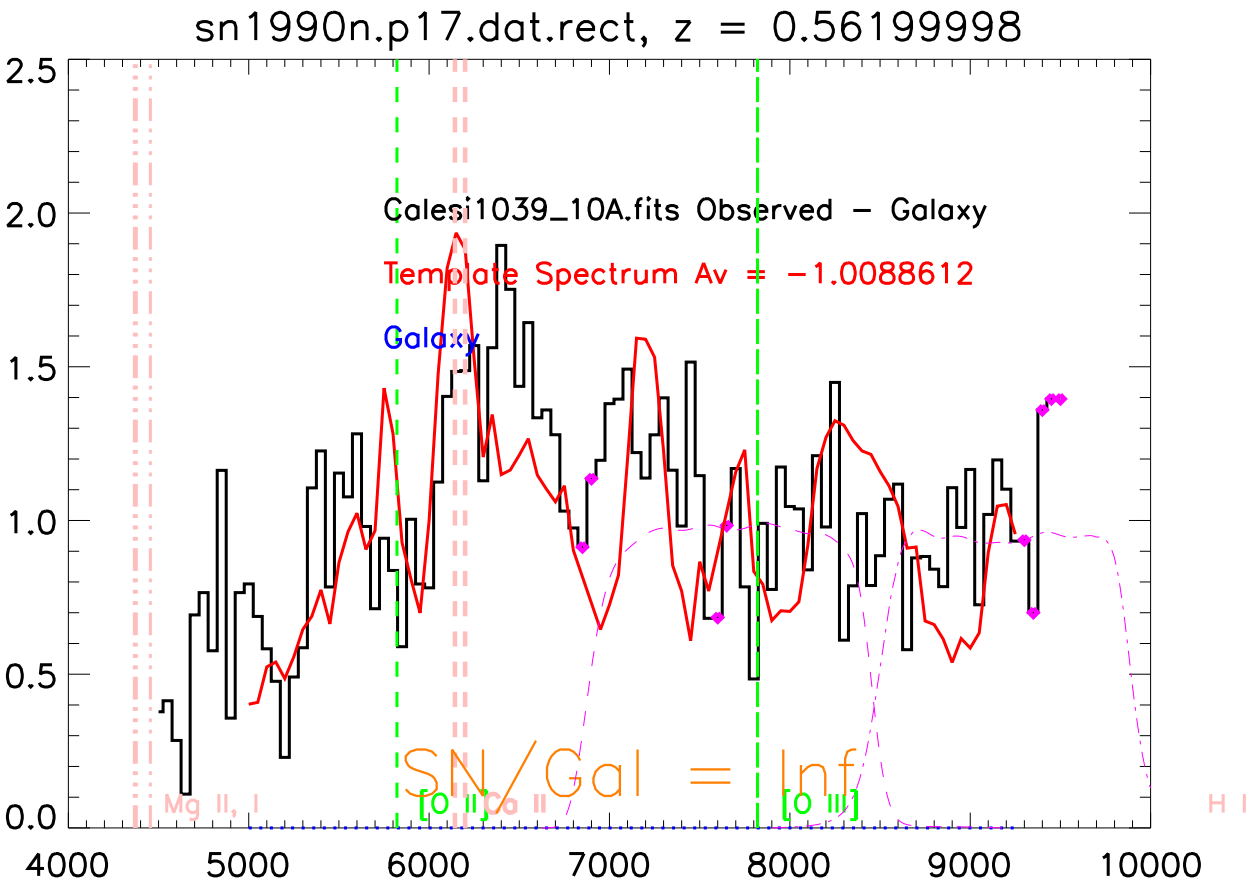
9000
10000


sn1990n.p17.dat.rect, z = 0.56199998
Calesi1039_10A.fits Observed − Galaxy
Template Spectrum Av = −1.0088612
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
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2.0
1.5
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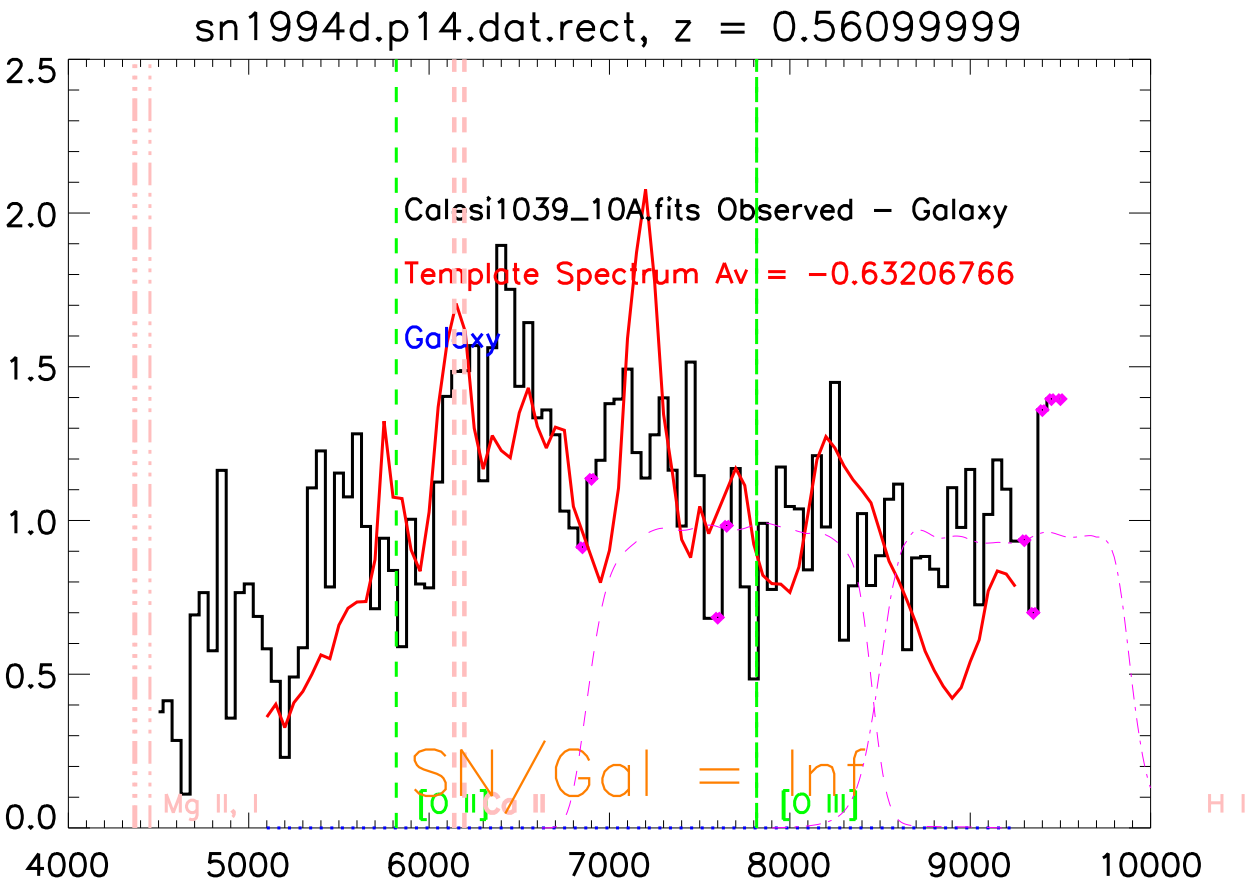
sn1994d.p14.dat.rect, z = 0.56099999
Calasi1039_10A.fits Observed − Galaxy
Template Spectrum Av = −0.63206766
Galaxy
SN/Gal = Inf
[O II]
Ca II
[O III]
Mg II, I
H I
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2.0
1.5
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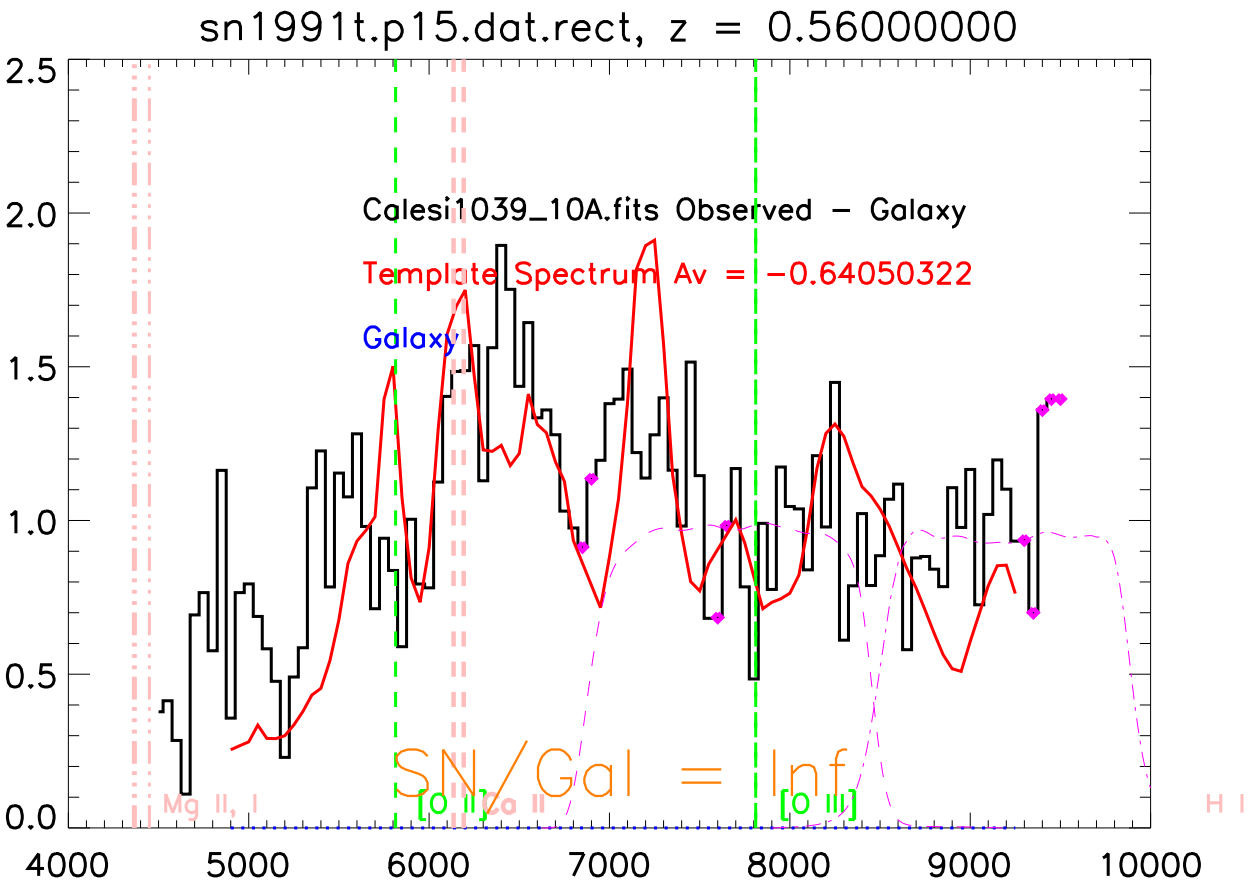
sn1991t.p15.dat.rect, z = 0.56000000
Calesi1039_10A.fits Observed − Galaxy
Template Spectrum Av = −0.64050322
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
2.5
2.0
1.5
1.0
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8000
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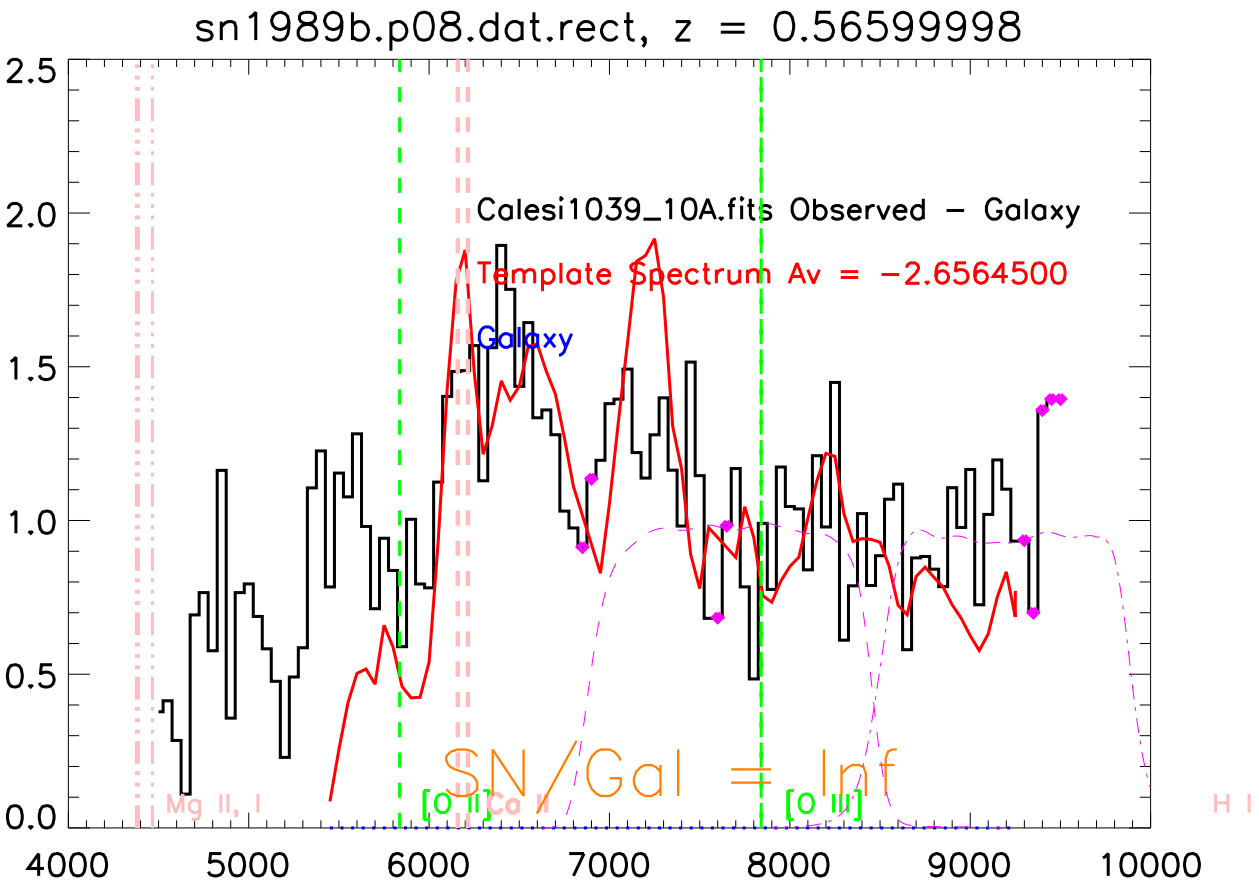
sn1989b.p08.dat.rect, z = 0.56599998
Calesi1039_10A.fits Observed − Galaxy
Template Spectrum Av = −2.6564500
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca I
[O III]
H I
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2.0
1.5
1.0
0.5
0.0
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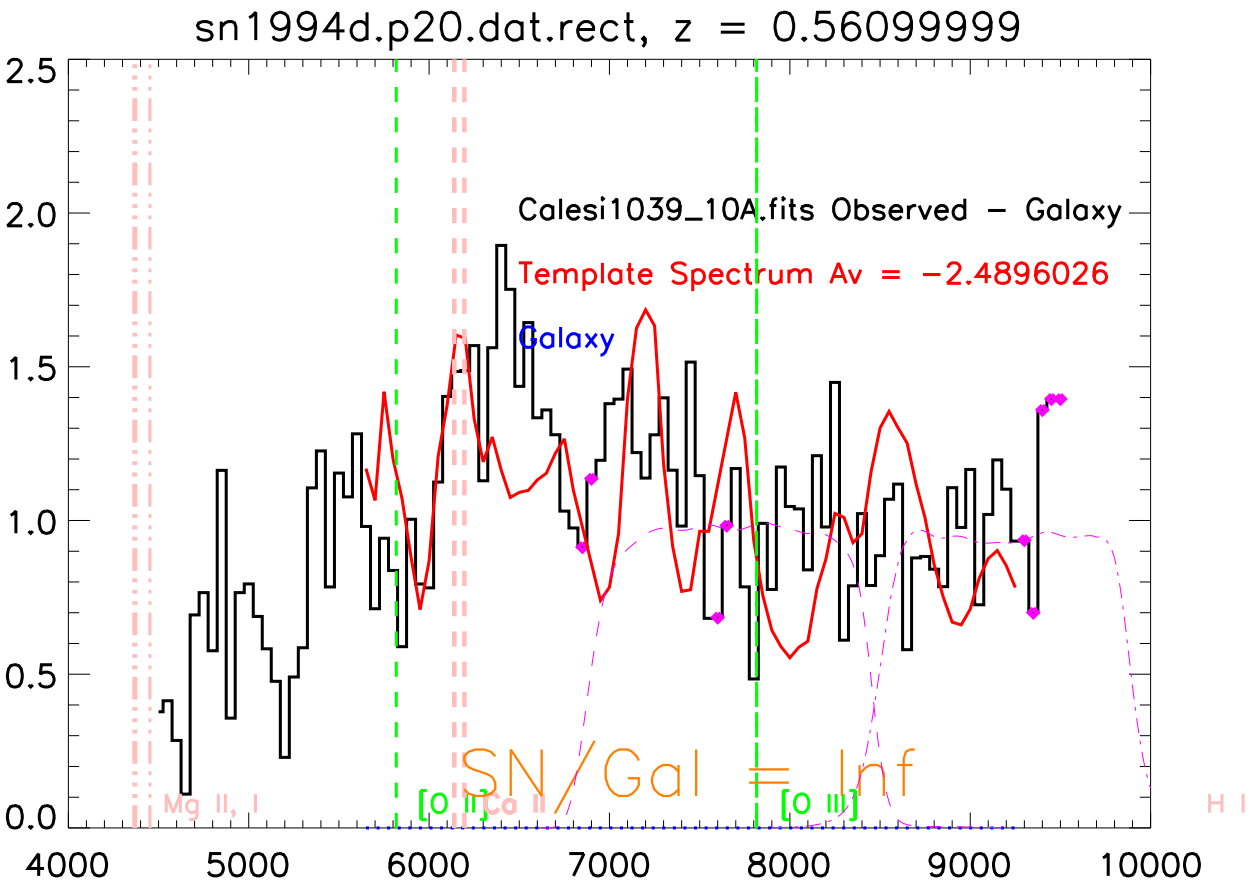
6000
7000
8000
9000
10000


sn1994d.p20.dat.rect, z = 0.56099999
Calesi1039_10A.fits Observed − Galaxy
Template Spectrum Av = −2.4896026
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
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1.5
1.0
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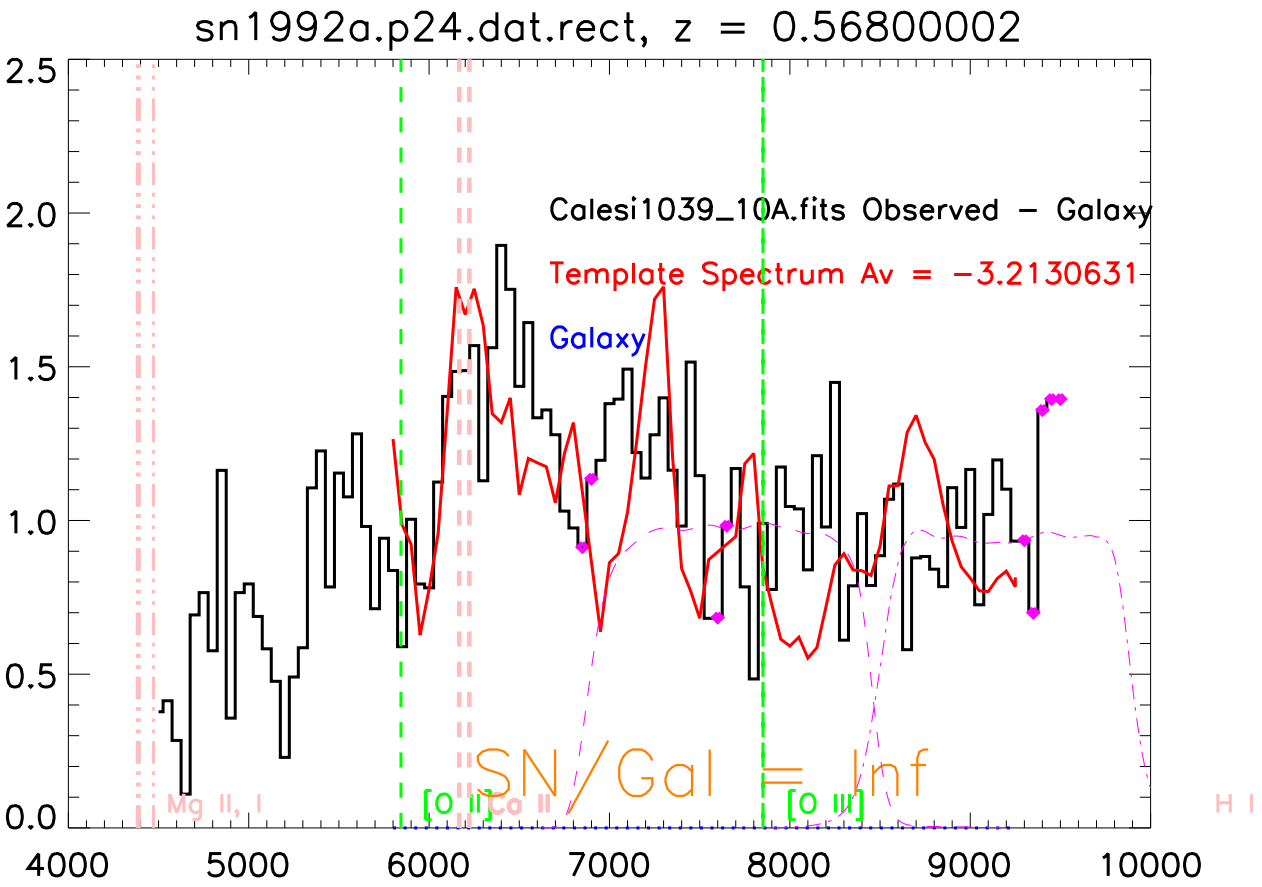
sn1992a.p24.dat.rect, z = 0.56800002
Calesi1039_10A.fits Observed − Galaxy
Template Spectrum Av = −3.2130631
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
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2.0
1.5
1.0
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9000
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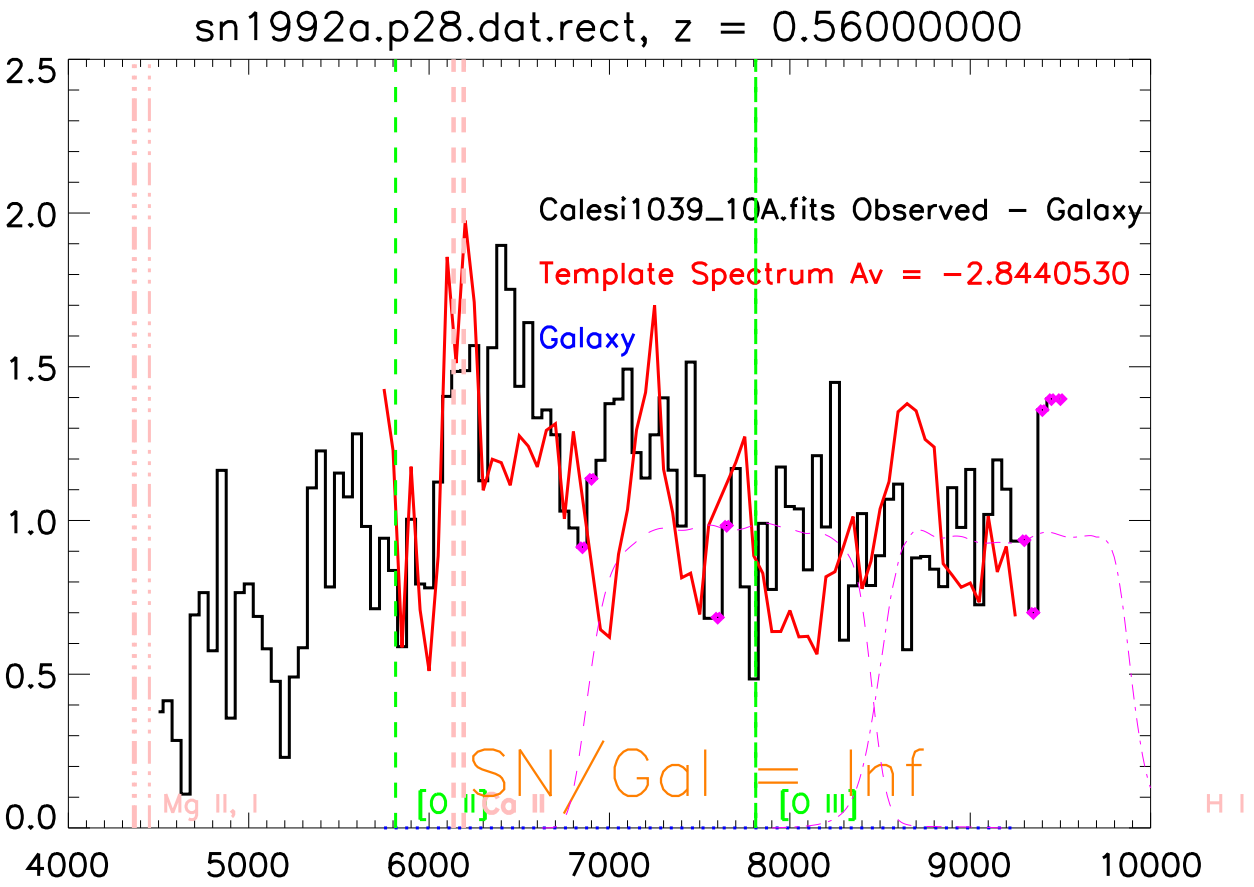
sn1992a.p28.dat.rect, z = 0.56000000
Calesi1039_10A.fits Observed − Galaxy
Template Spectrum Av = −2.8440530
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
2.5
2.0
1.5
1.0
0.5
0.0
4000
5000
6000
7000
8000
9000
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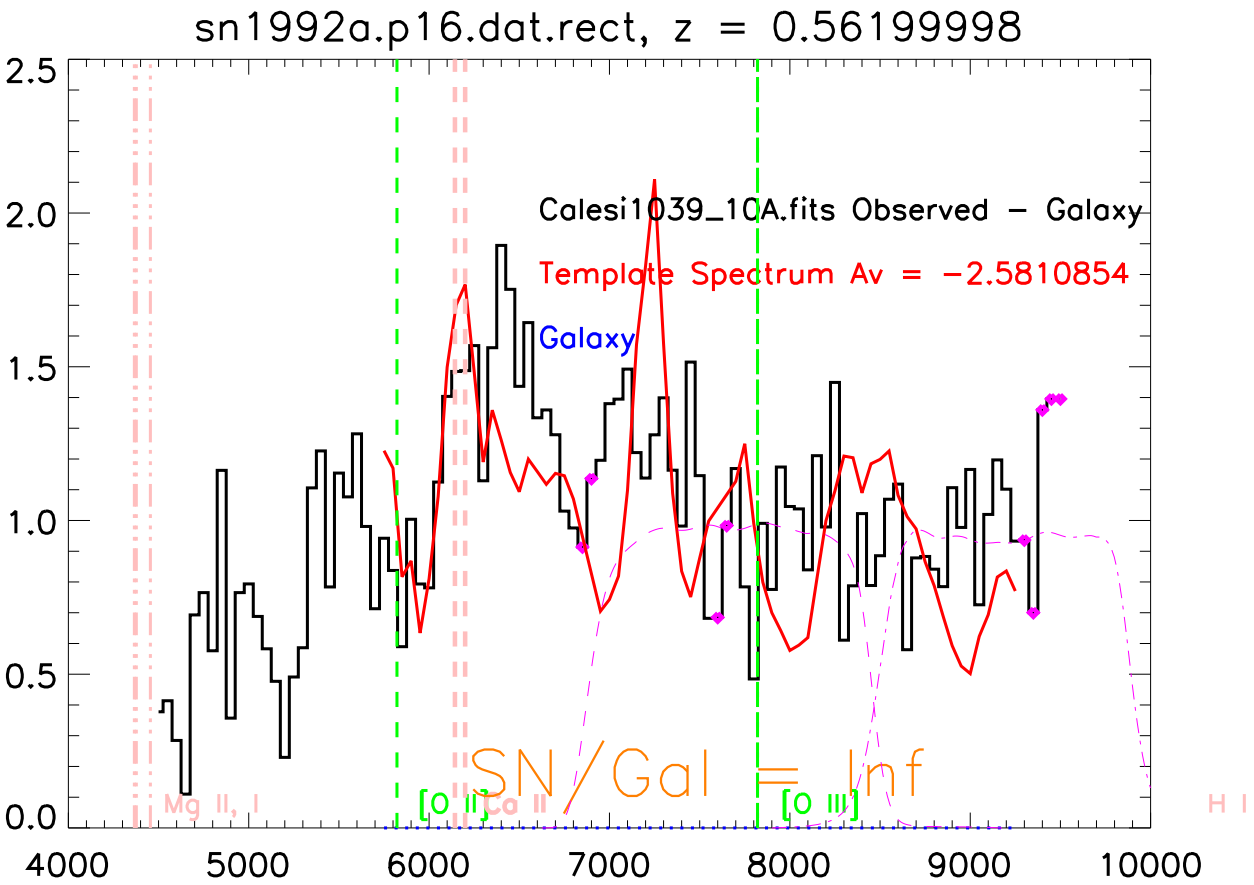
sn1992a.p16.dat.rect, z = 0.56199998
Calesi1039_10A.fits Observed − Galaxy
Template Spectrum Av = −2.5810854
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
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2.0
1.5
1.0
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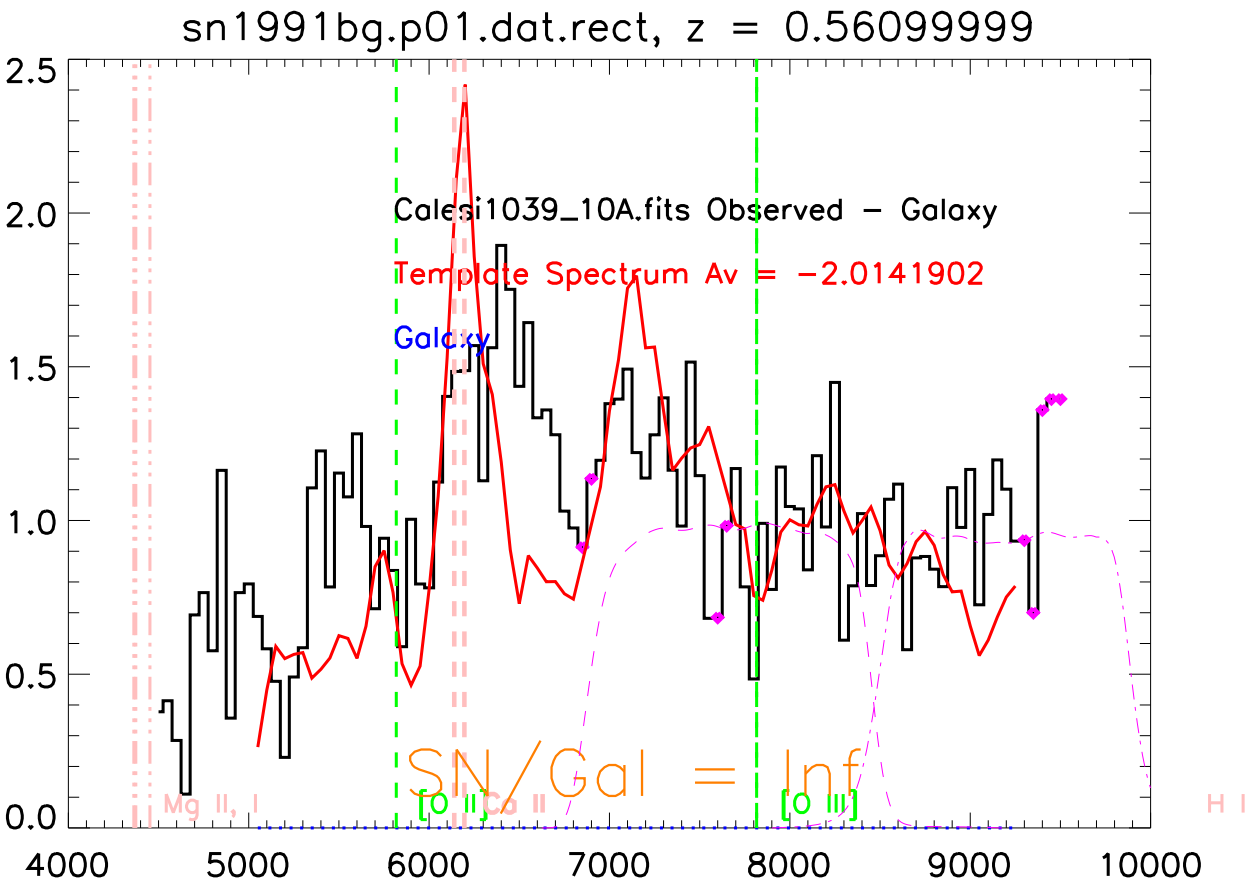
sn1991bg.p01.dat.rect, z = 0.56099999
Calesi1039_10A.fits Observed − Galaxy
Template Spectrum Av = −2.0141902
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
2.5
2.0
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1.0
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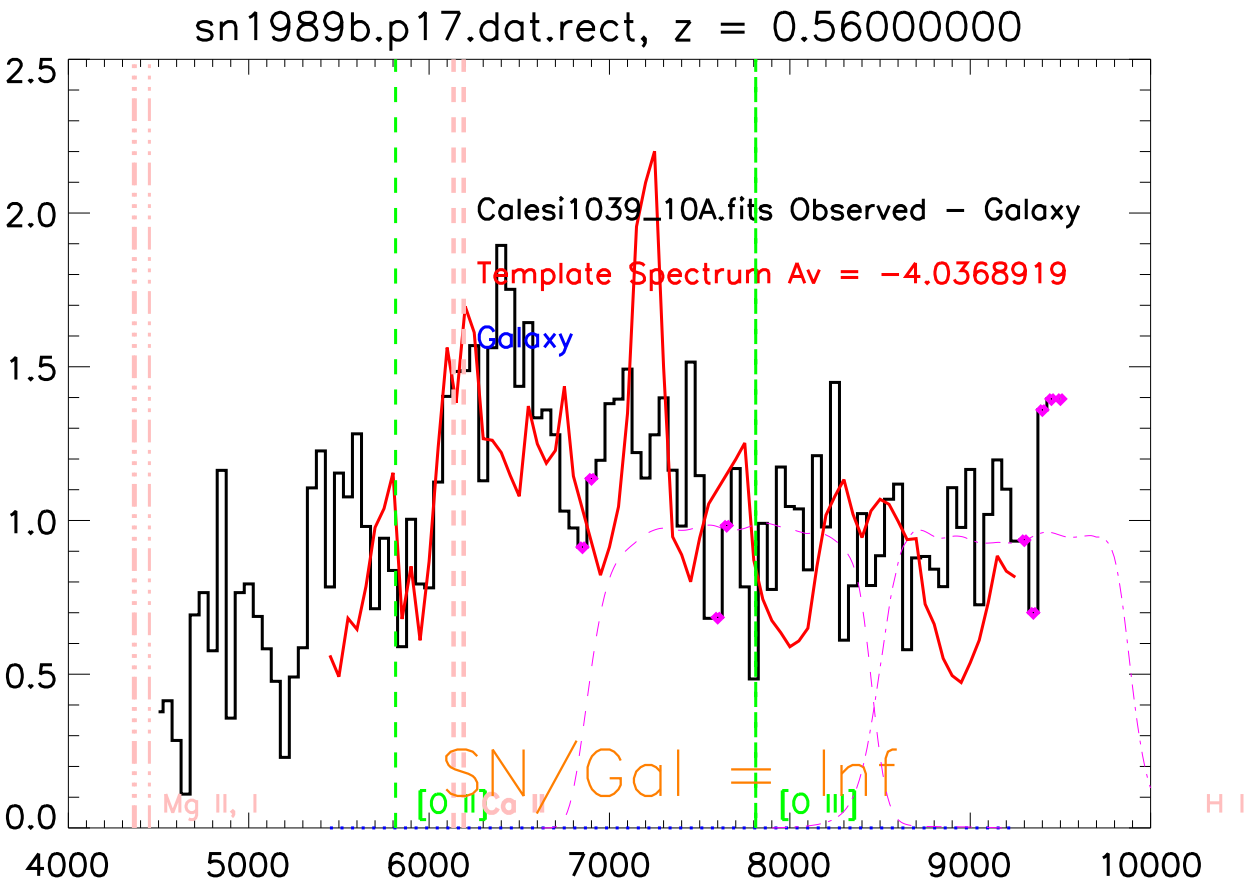
sn1989b.p17.dat.rect, z = 0.56000000
Calesi1039_10A.fits Observed − Galaxy
Template Spectrum Av = −4.0368919
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
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2.0
1.5
1.0
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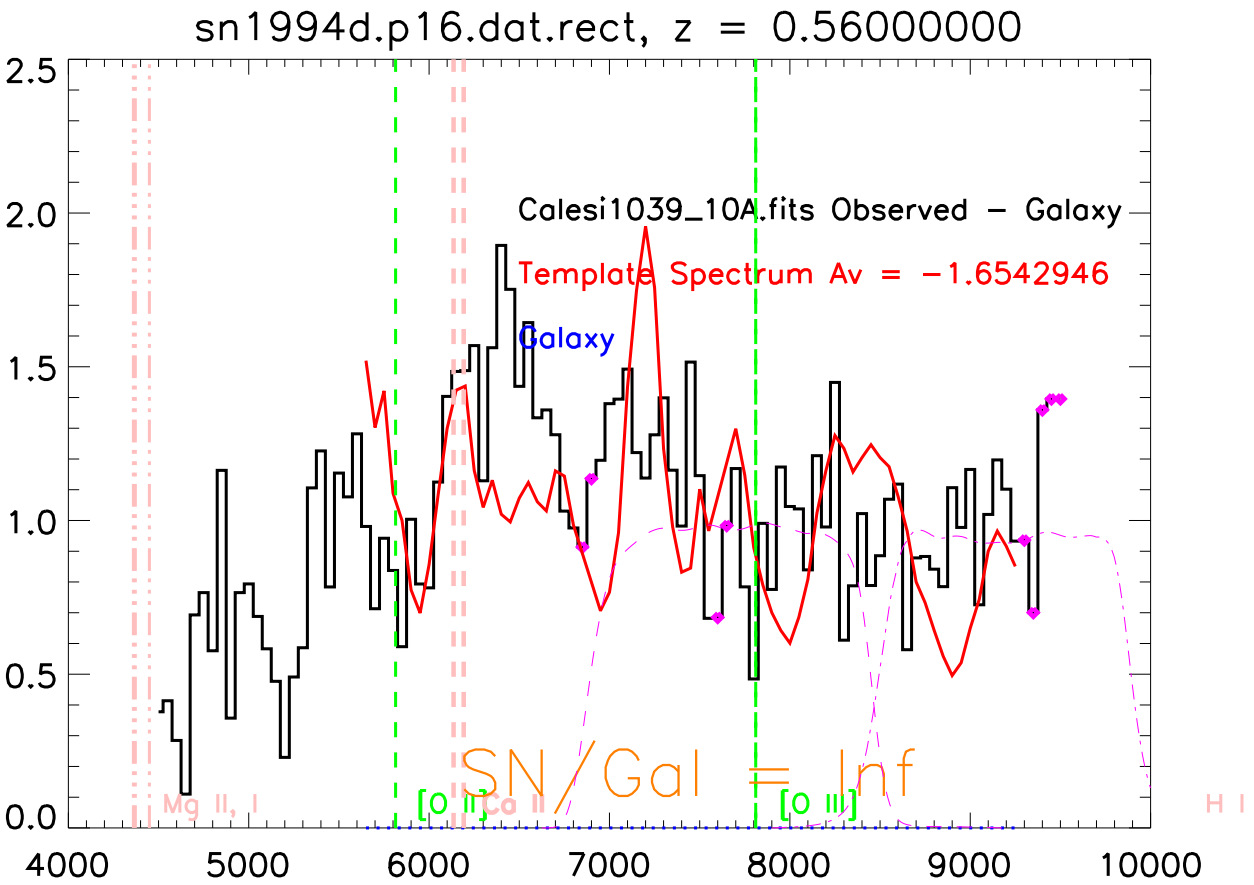
sn1994d.p16.dat.rect, z = 0.56000000
Calesi1039_10A.fits Observed − Galaxy
Template Spectrum Av = −1.6542946
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
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2.0
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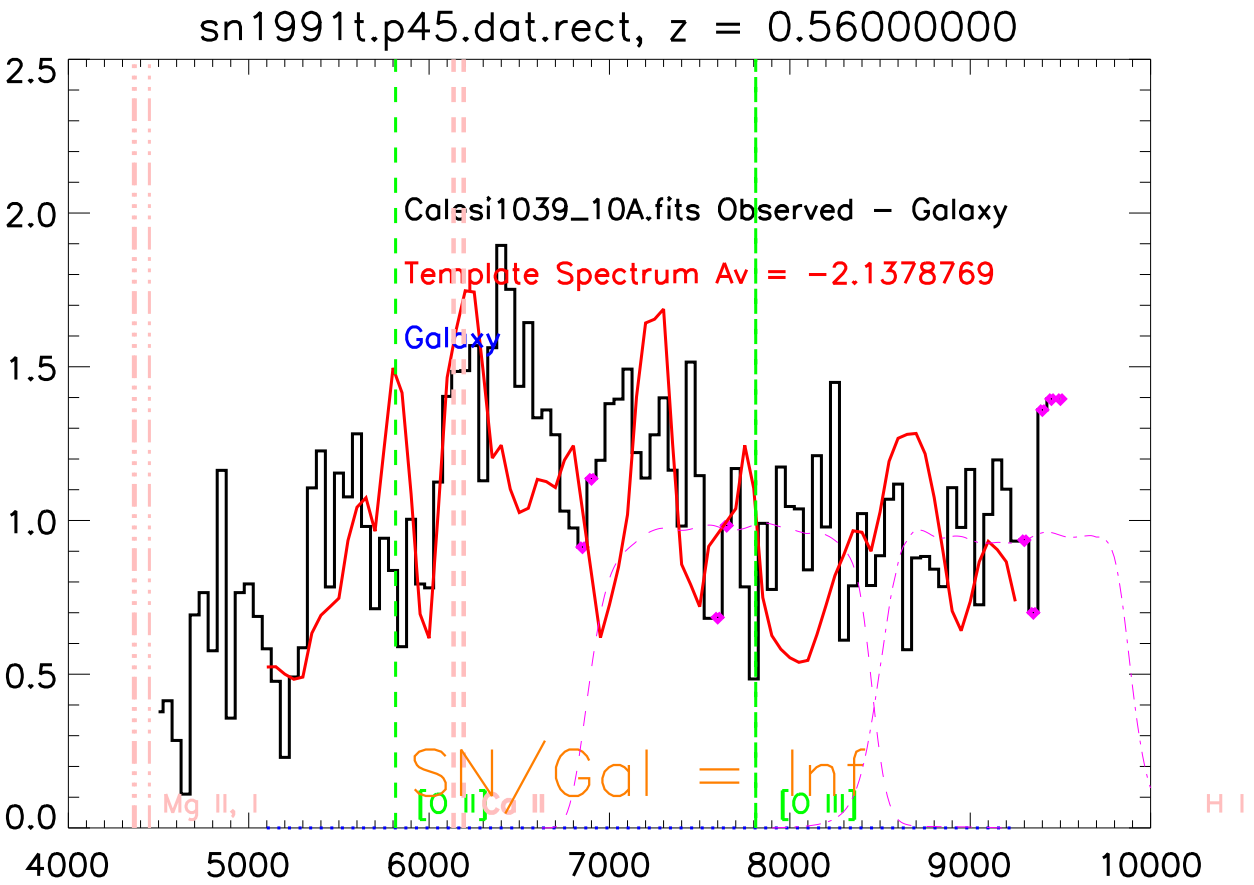
sn1991t.p45.dat.rect, z = 0.56000000
Calasi1039_10A.fits Observed − Galaxy
Template Spectrum Av = −2.1378769
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
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2.0
1.5
1.0
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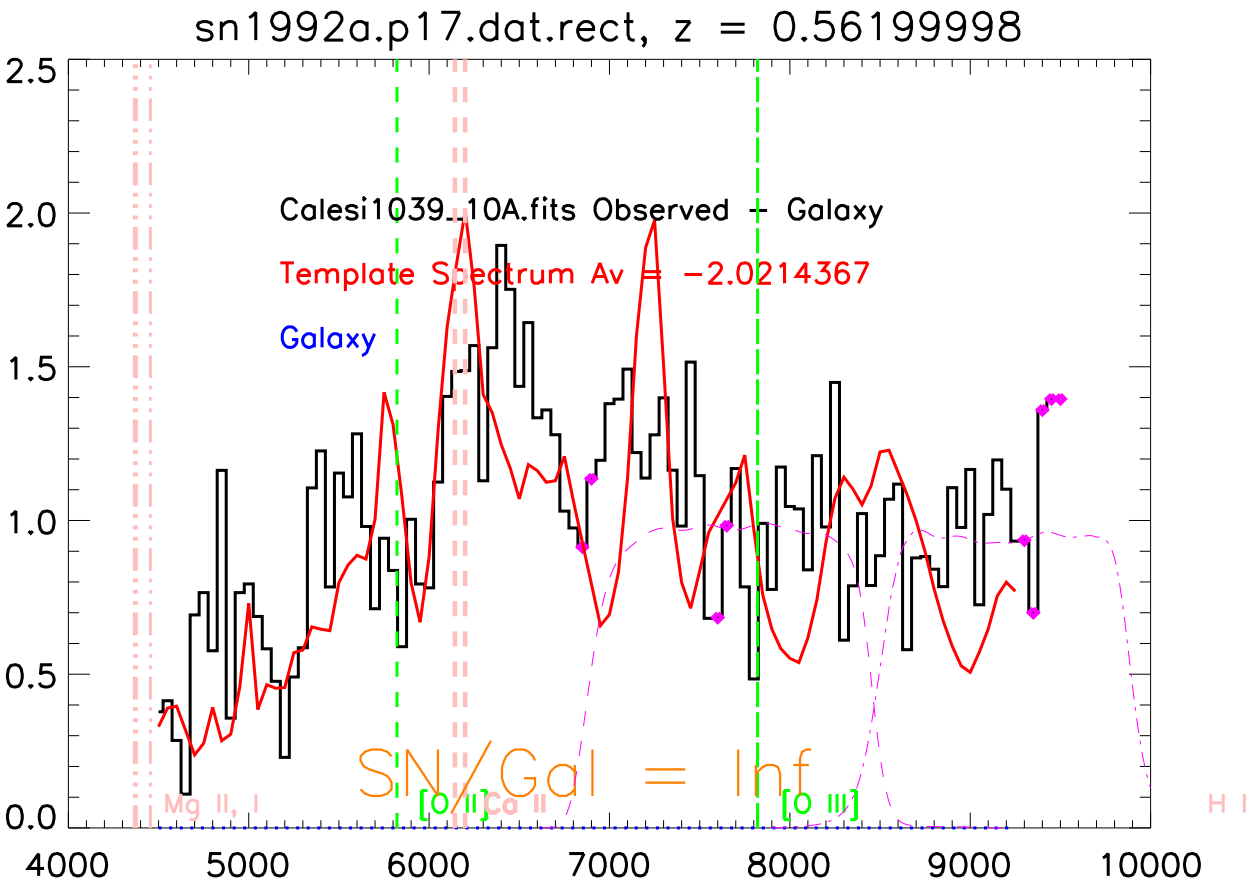
sn1992a.p17.dat.rect, z = 0.56199998
Calesi1039_10A.fits Observed + Galaxy
Template Spectrum Av = -2.0214367
Galaxy
S/N Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
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2.0
1.5
1.0
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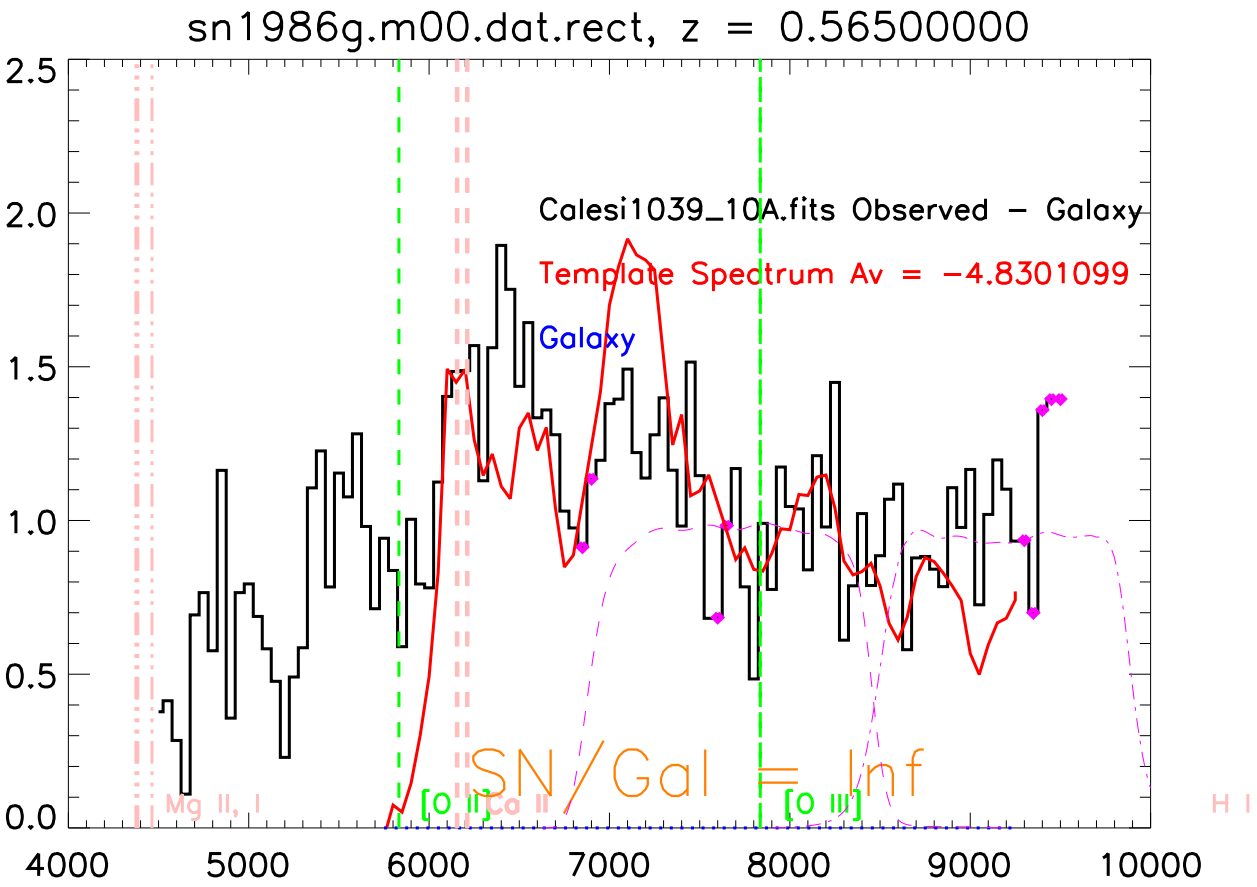
sn1986g.m00.dat.rect, z = 0.56500000
Calesi1039_10A.fits Observed − Galaxy
Template Spectrum Av = −4.8301099
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Co II
[O III]
H I
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2.0
1.5
1.0
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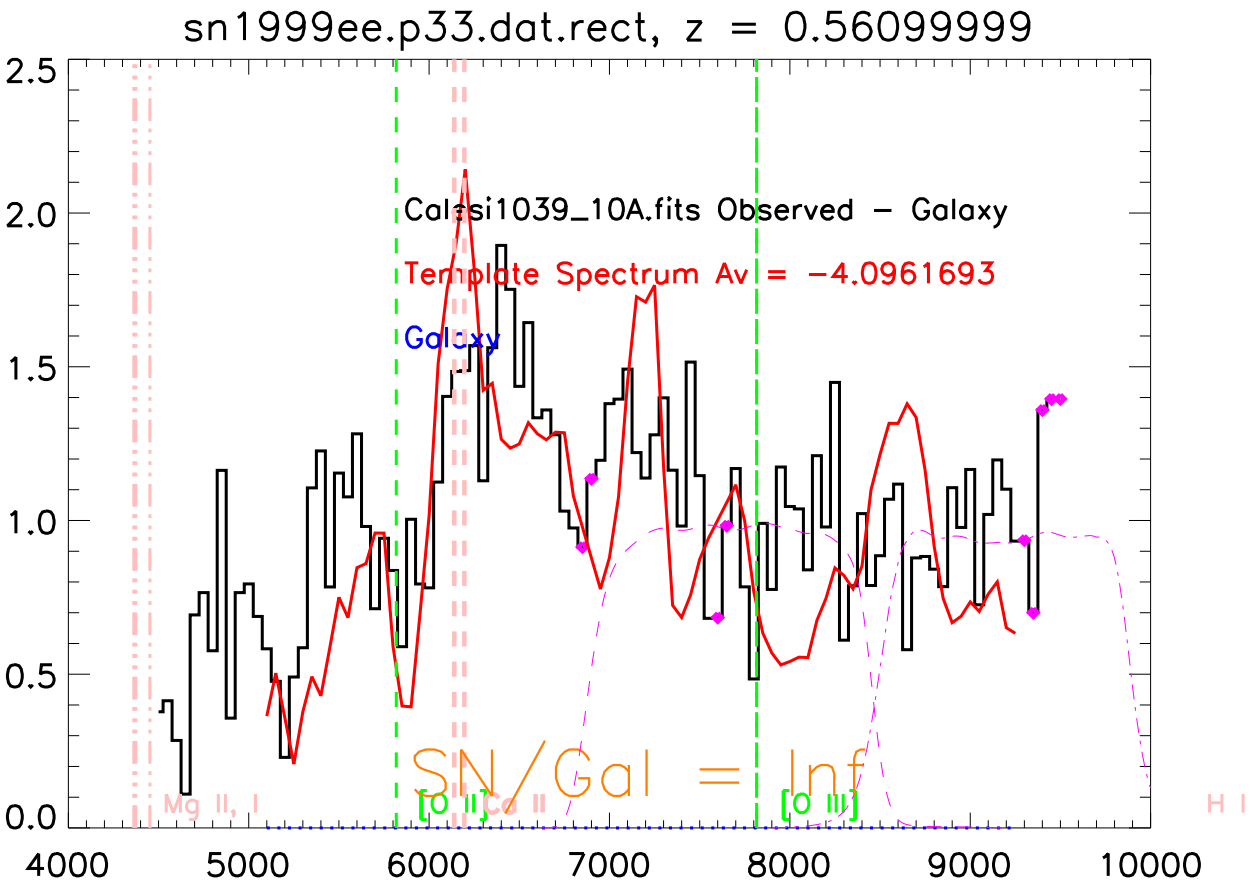
sn1999ee.p33.dat.rect, z = 0.56099999
Calasi1039_10A.fits Observed − Galaxy
Template Spectrum Av = −4.0961693
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
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2.0
1.5
1.0
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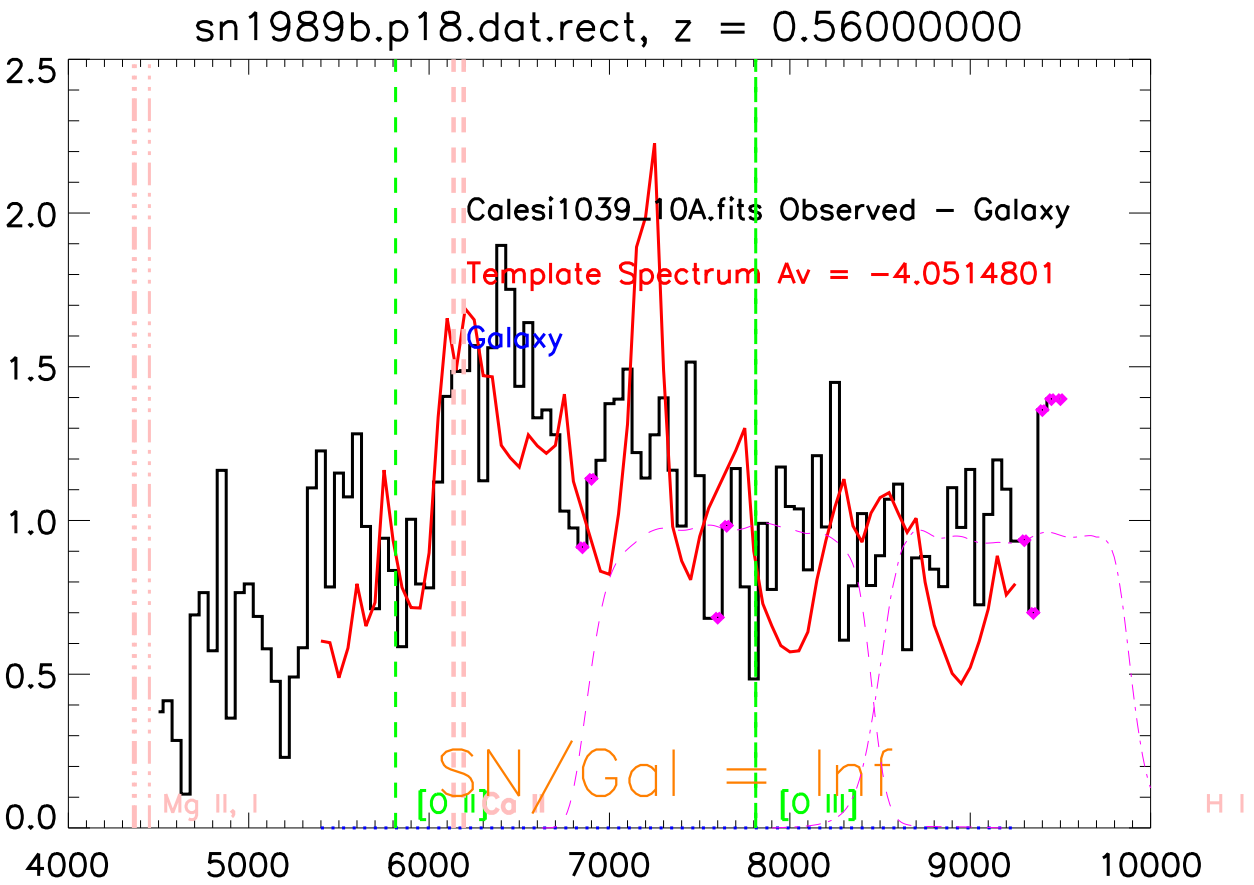
sn1989b.p18.dat.rect, z = 0.56000000
Calesi1039_10A.fits Observed − Galaxy
Template Spectrum Av = −4.0514801
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
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2.0
1.5
1.0
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8000
9000
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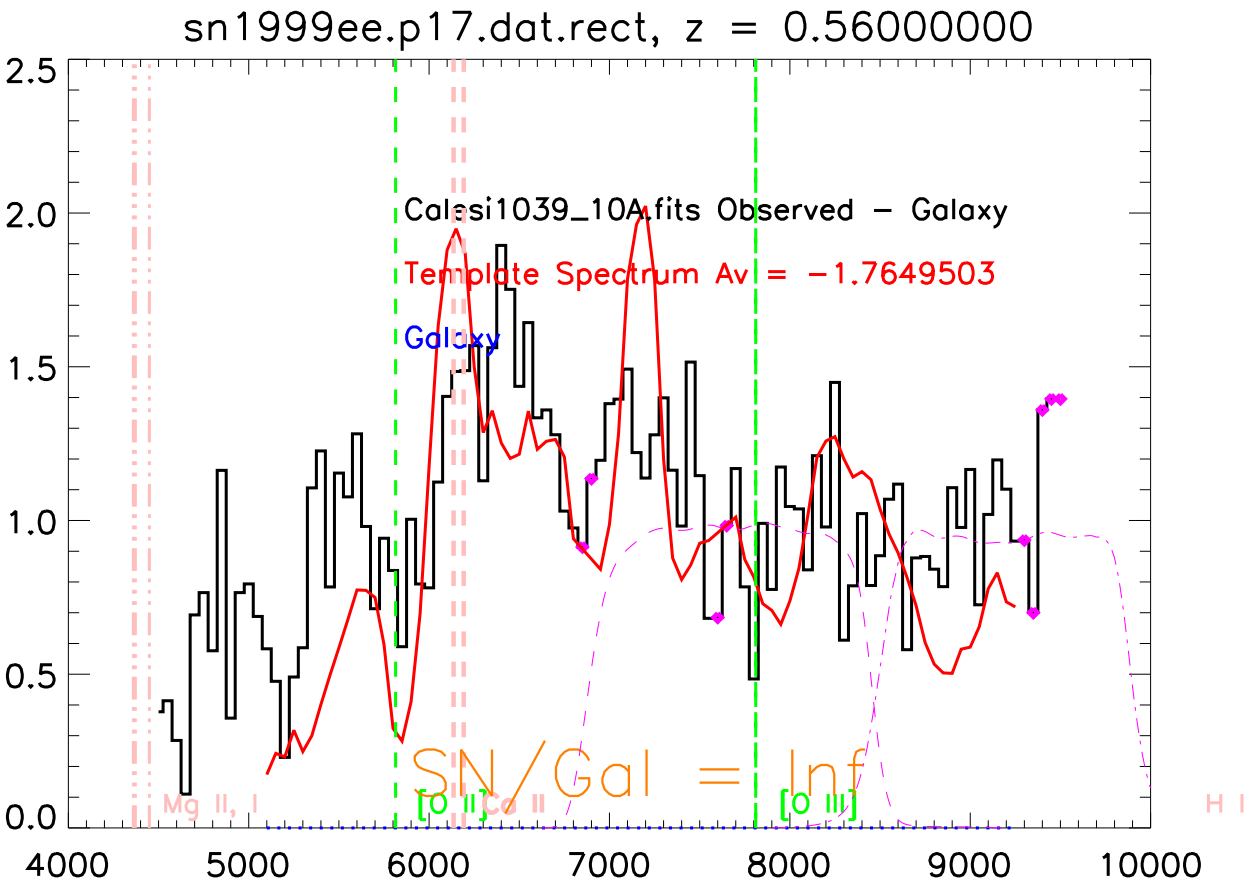
sn1999ee.p17.dat.rect, z = 0.56000000
Calasi1039_10A.fits Observed − Galaxy
Template Spectrum Av = −1.7649503
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
2.5
2.0
1.5
1.0
0.5
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8000
9000
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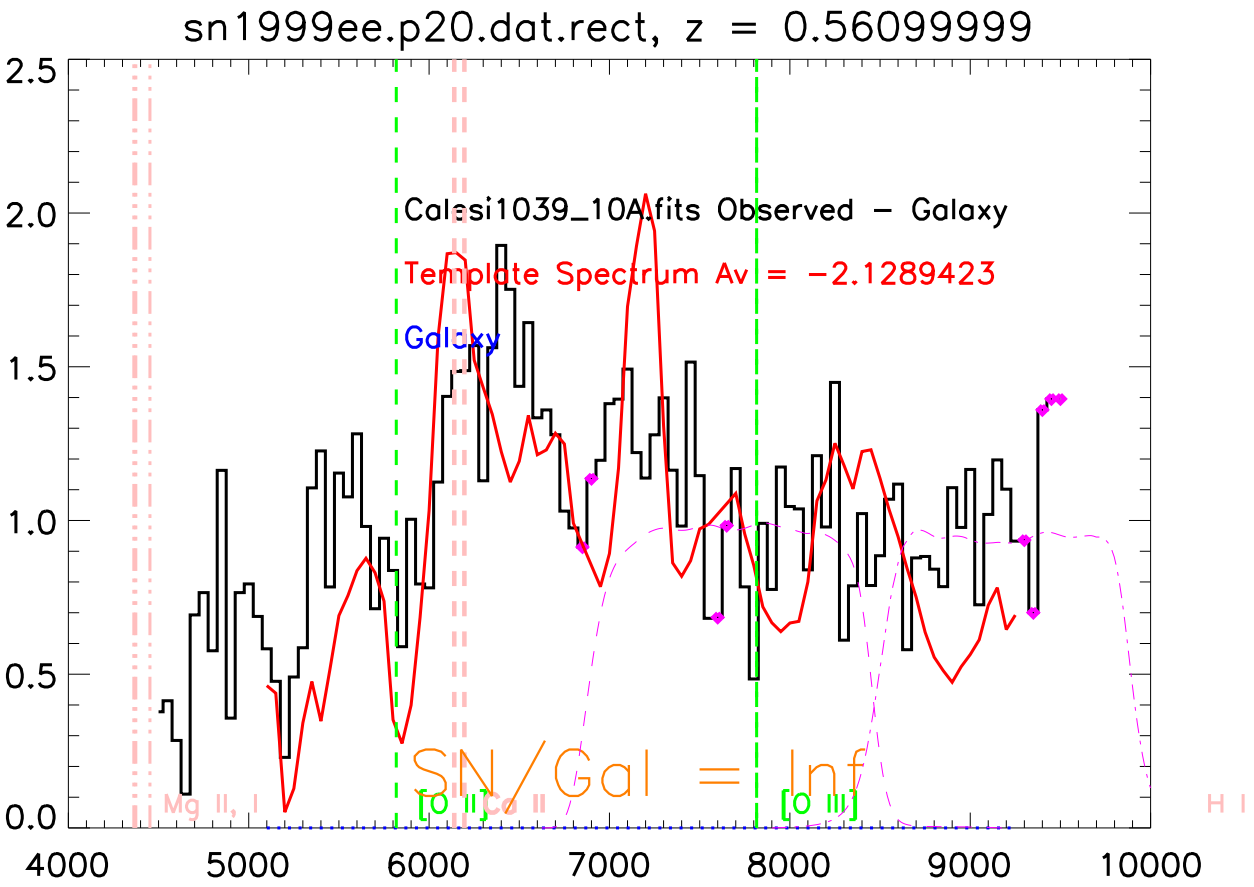
sn1999ee.p20.dat.rect, z = 0.56099999
Calasi1039_10A.fits Observed − Galaxy
Template Spectrum Av = −2.1289423
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
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2.0
1.5
1.0
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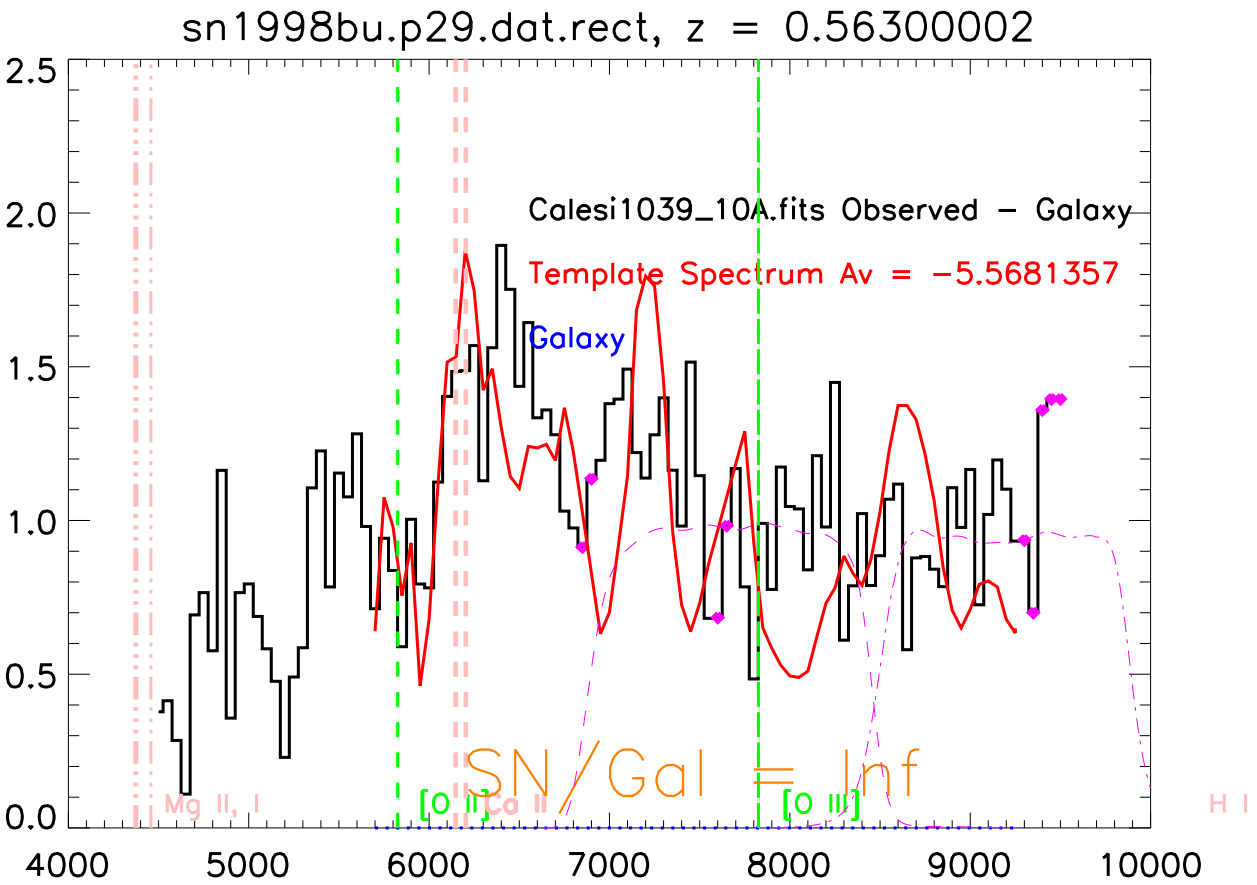
sn1998bu.p29.dat.rect, z = 0.56300002
Calesi1039_10A.fits Observed − Galaxy
Template Spectrum Av = −5.5681357
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
2.5
2.0
1.5
1.0
0.5
0.0
4000
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8000
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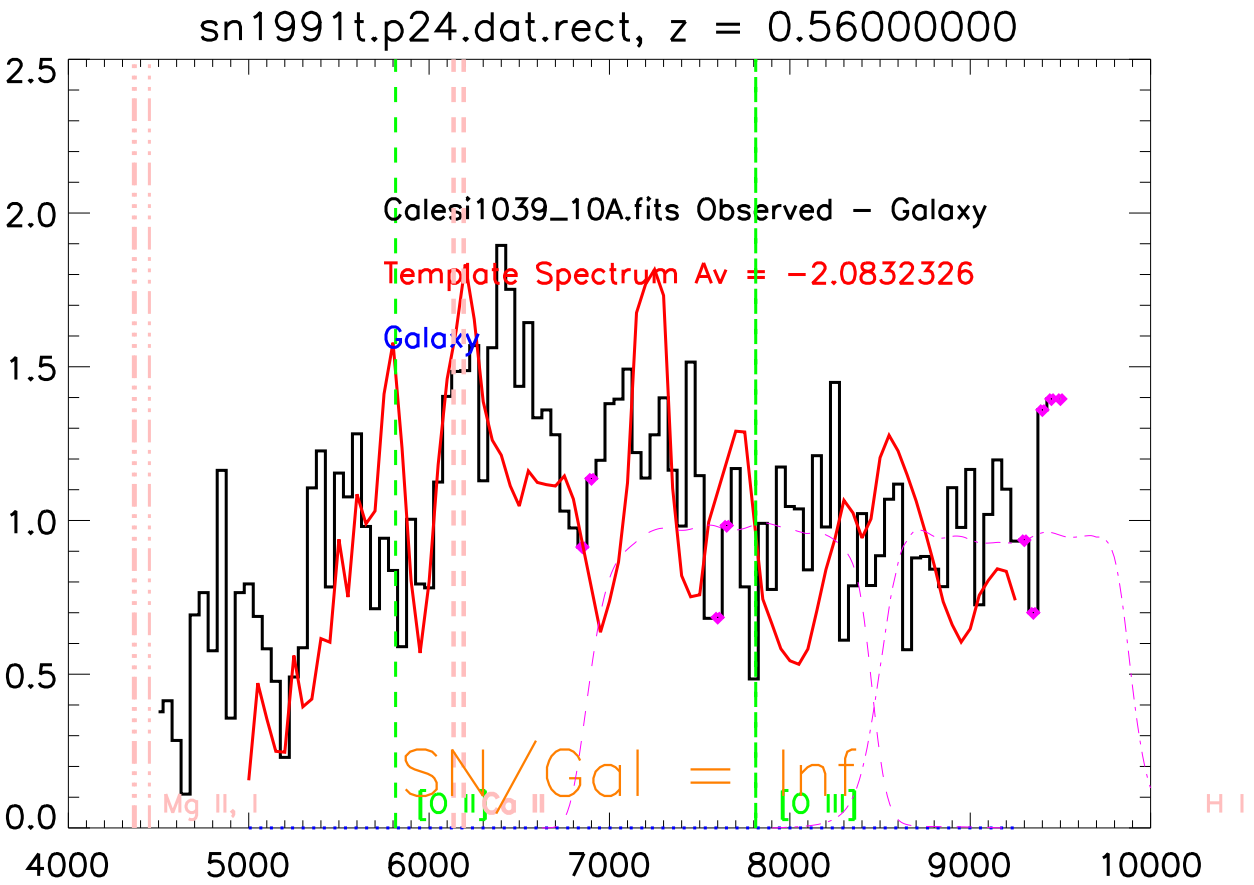
sn1991t.p24.dat.rect, z = 0.56000000
Calesi1039_10A.fits Observed − Galaxy
Template Spectrum Av = −2.0832326
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
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2.0
1.5
1.0
0.5
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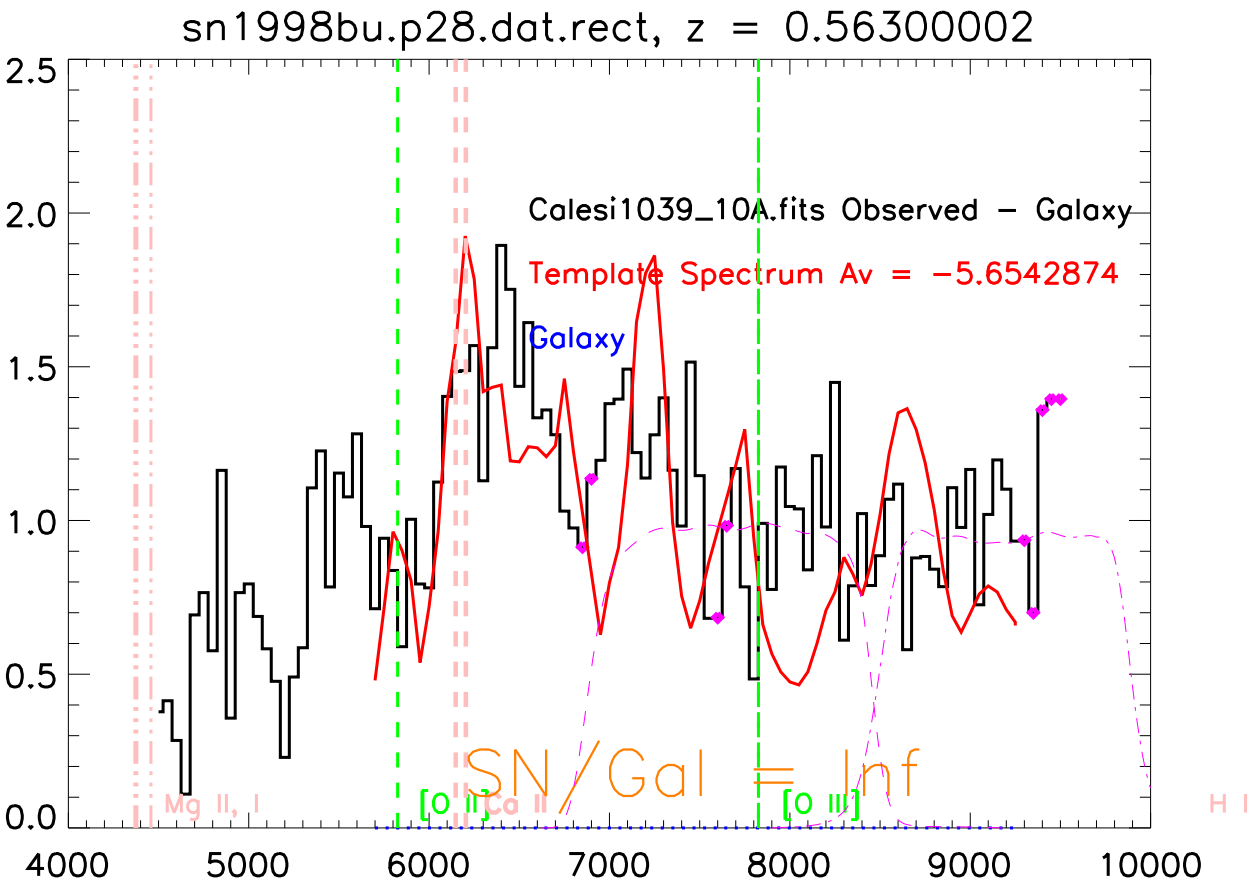
sn1998bu.p28.dat.rect, z = 0.56300002
Calesi1039_10A.fits Observed − Galaxy
Template Spectrum Av = −5.6542874
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
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2.0
1.5
1.0
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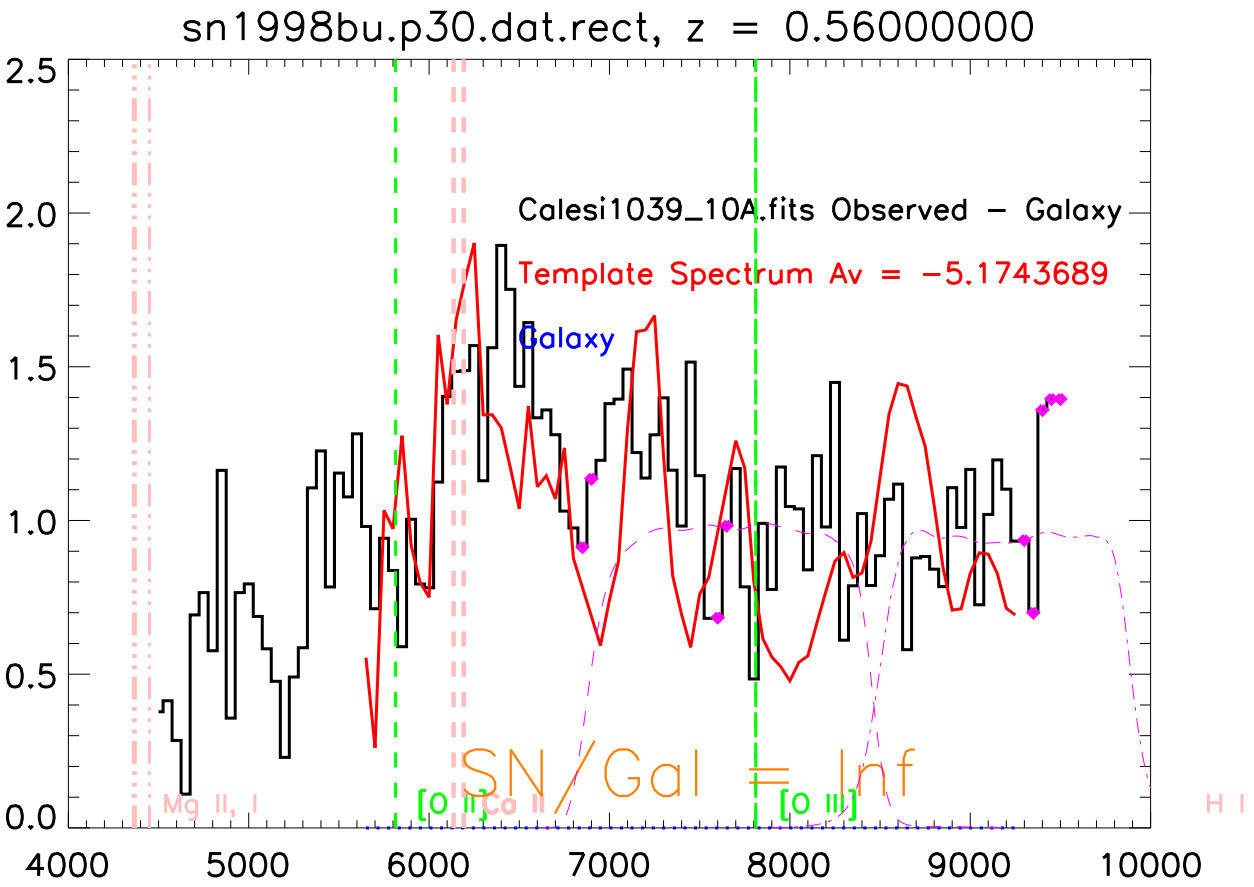
sn1998bu.p30.dat.rect, z = 0.56000000
Calesi1039_10A.fits Observed − Galaxy
Template Spectrum Av = −5.1743689
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
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2.0
1.5
1.0
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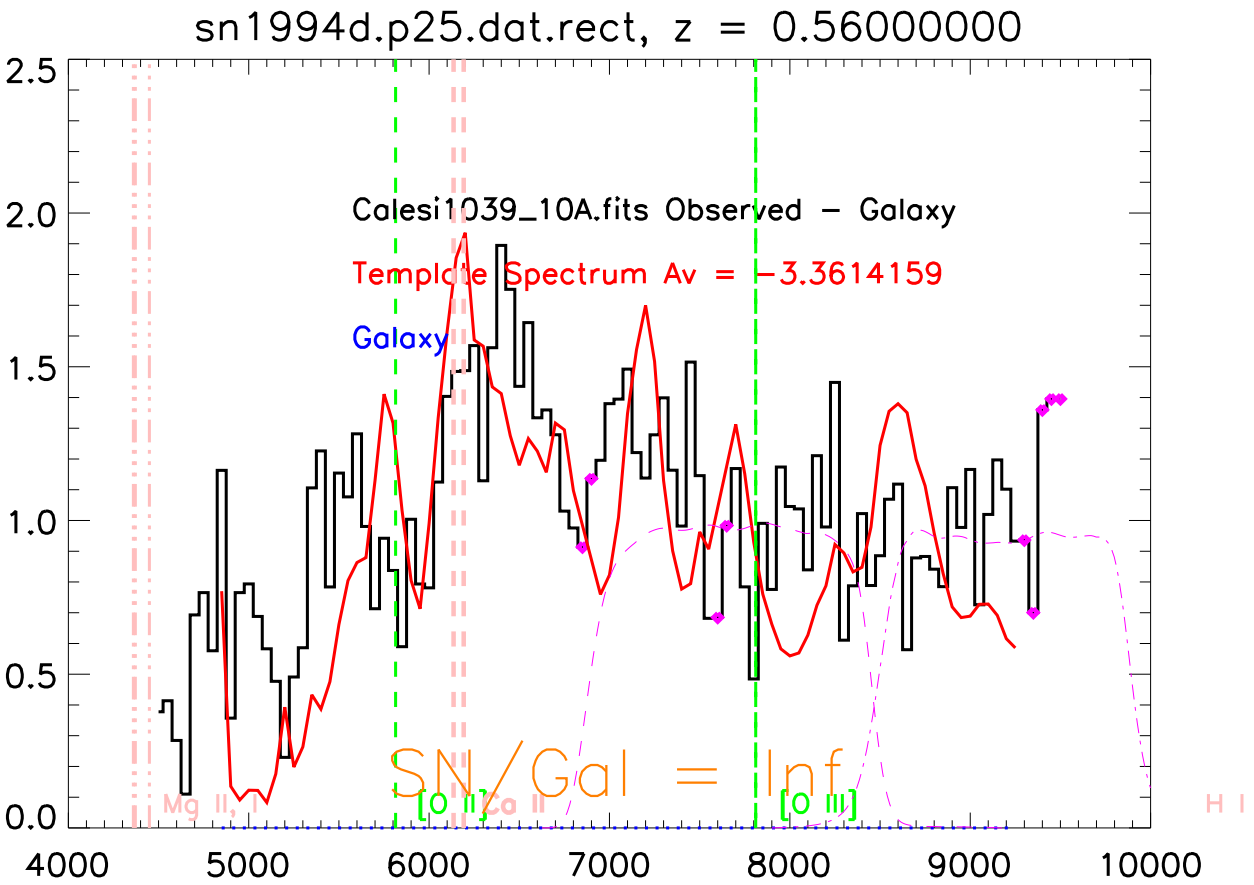
sn1994d.p25.dat.rect, z = 0.56000000
Calesi1039_10A.fits Observed − Galaxy
Template Spectrum Av = −3.3614159
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
2.5
2.0
1.5
1.0
0.5
0.0
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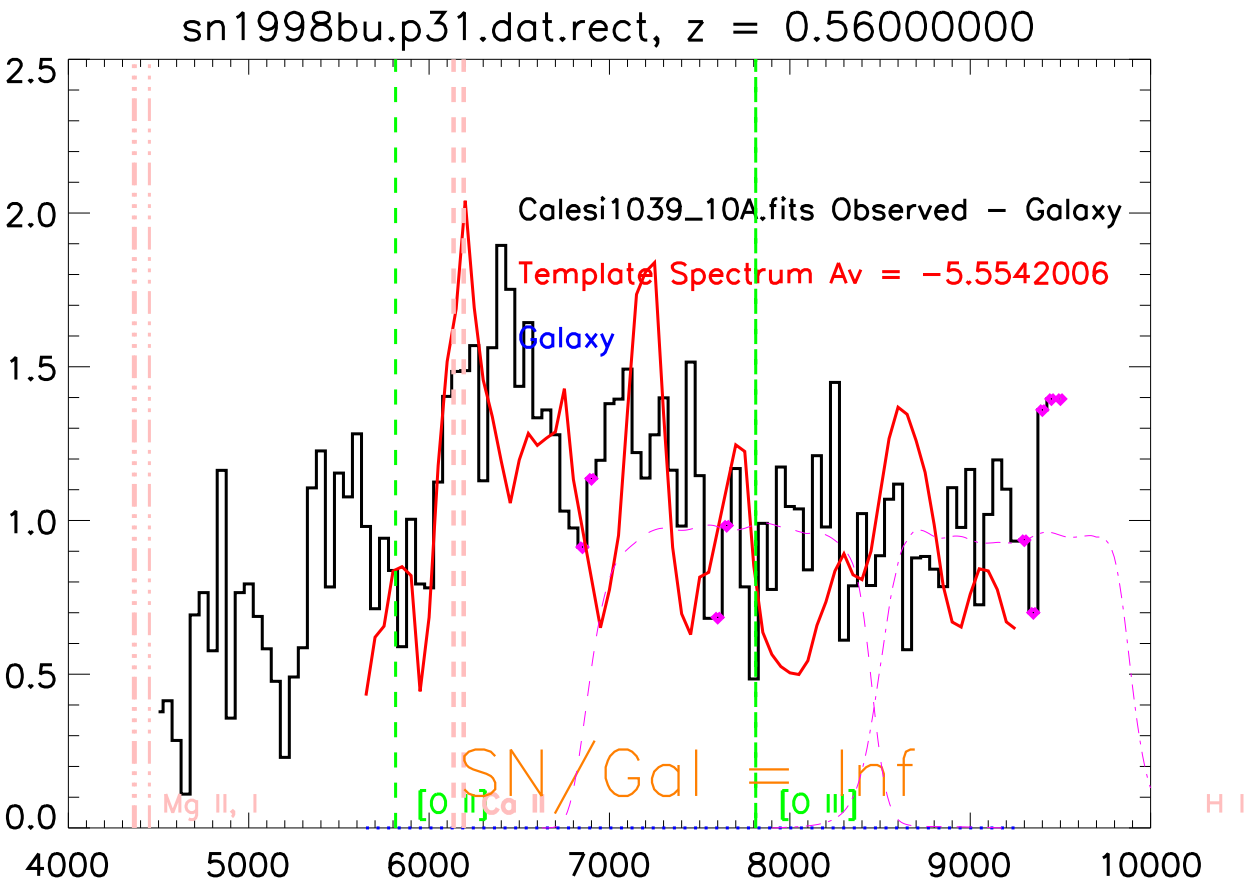
5000
6000
7000
8000
9000
10000


sn1998bu.p31.dat.rect, z = 0.56000000
Calesi1039_10A.fits Observed − Galaxy
Template Spectrum Av = −5.5542006
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
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2.0
1.5
1.0
0.5
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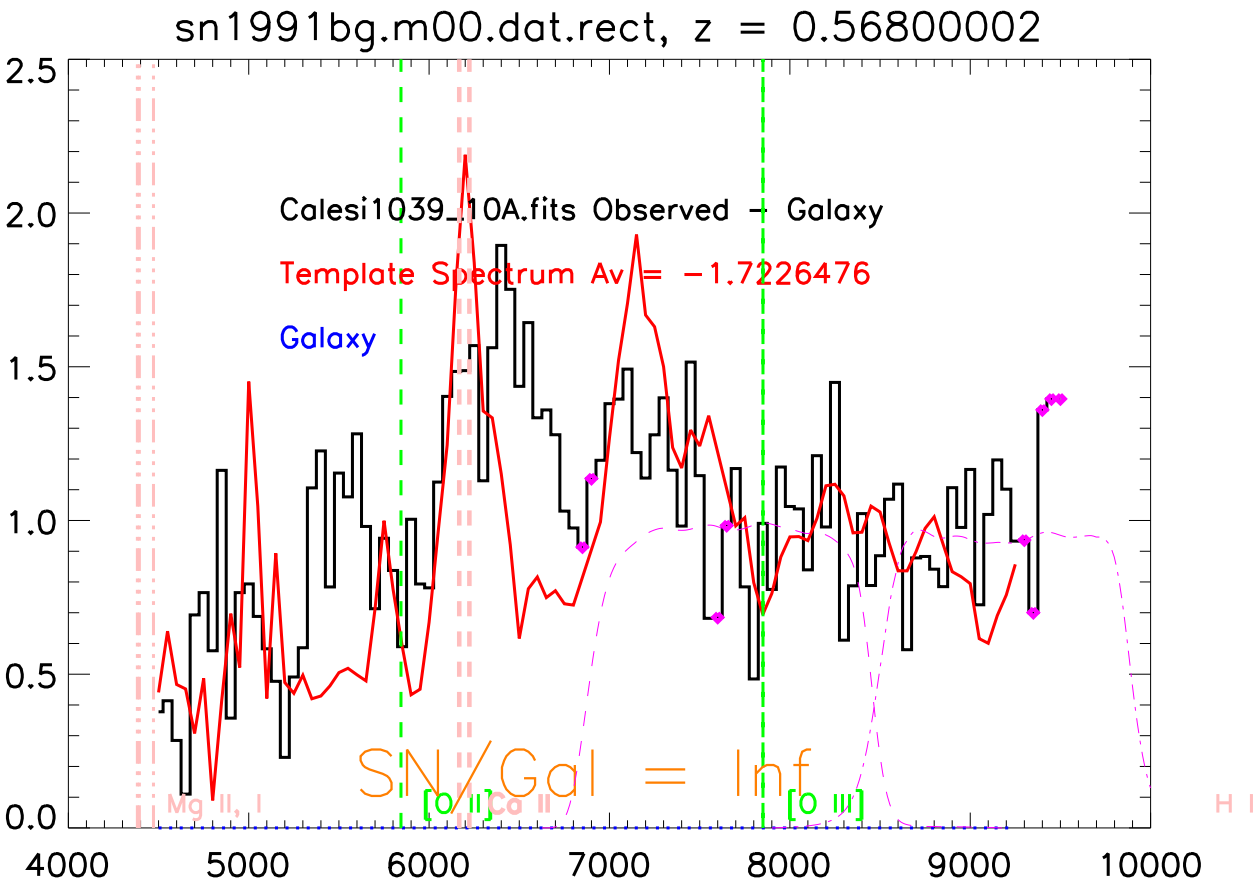
6000
7000
8000
9000
10000


sn1991bg.m00.dat.rect, z = 0.56800002
Calesi1039_10A.fits Observed + Galaxy
Template Spectrum Av = -1.7226476
Galaxy
S/N Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
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2.0
1.5
1.0
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8000
9000
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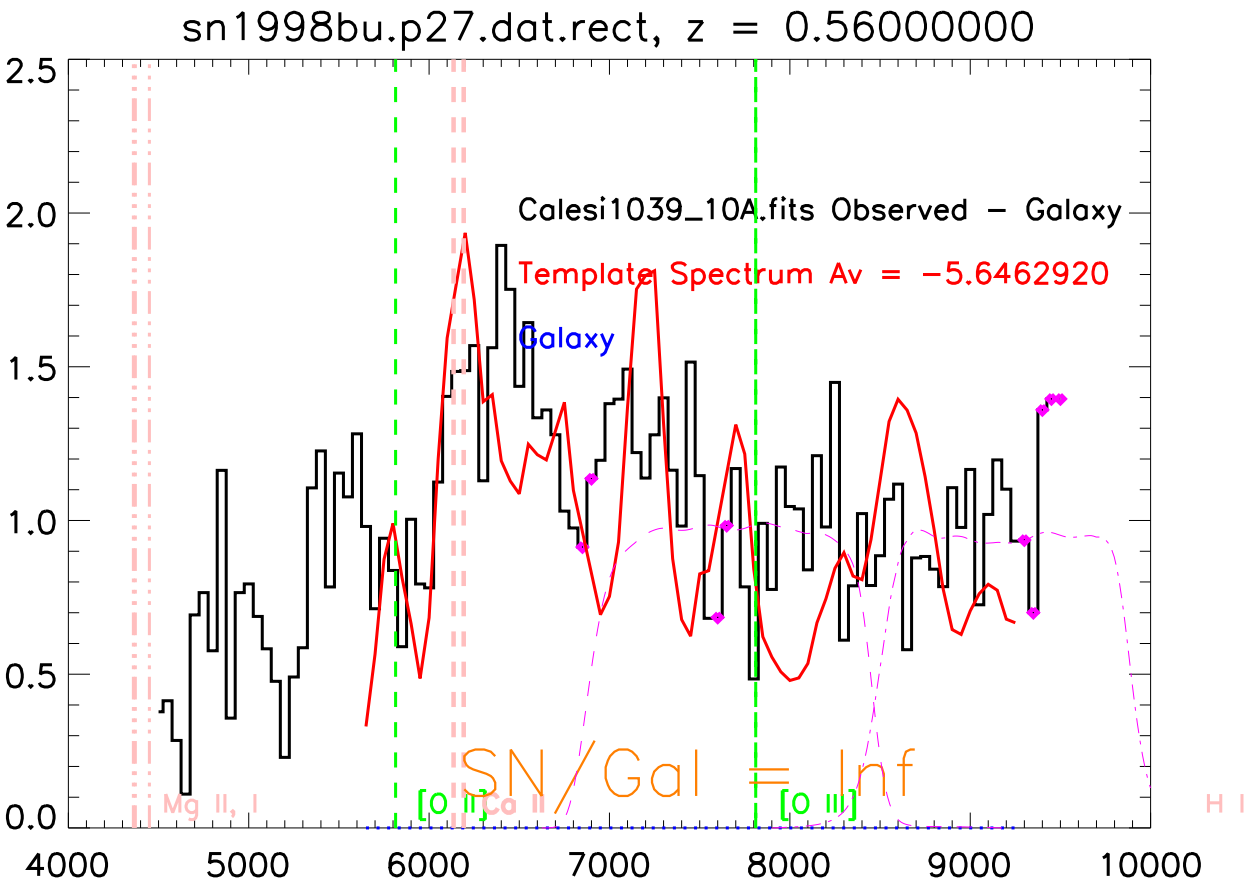
sn1998bu.p27.dat.rect, z = 0.56000000
Calesi1039_10A.fits Observed − Galaxy
Template Spectrum Av = −5.6462920
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
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2.0
1.5
1.0
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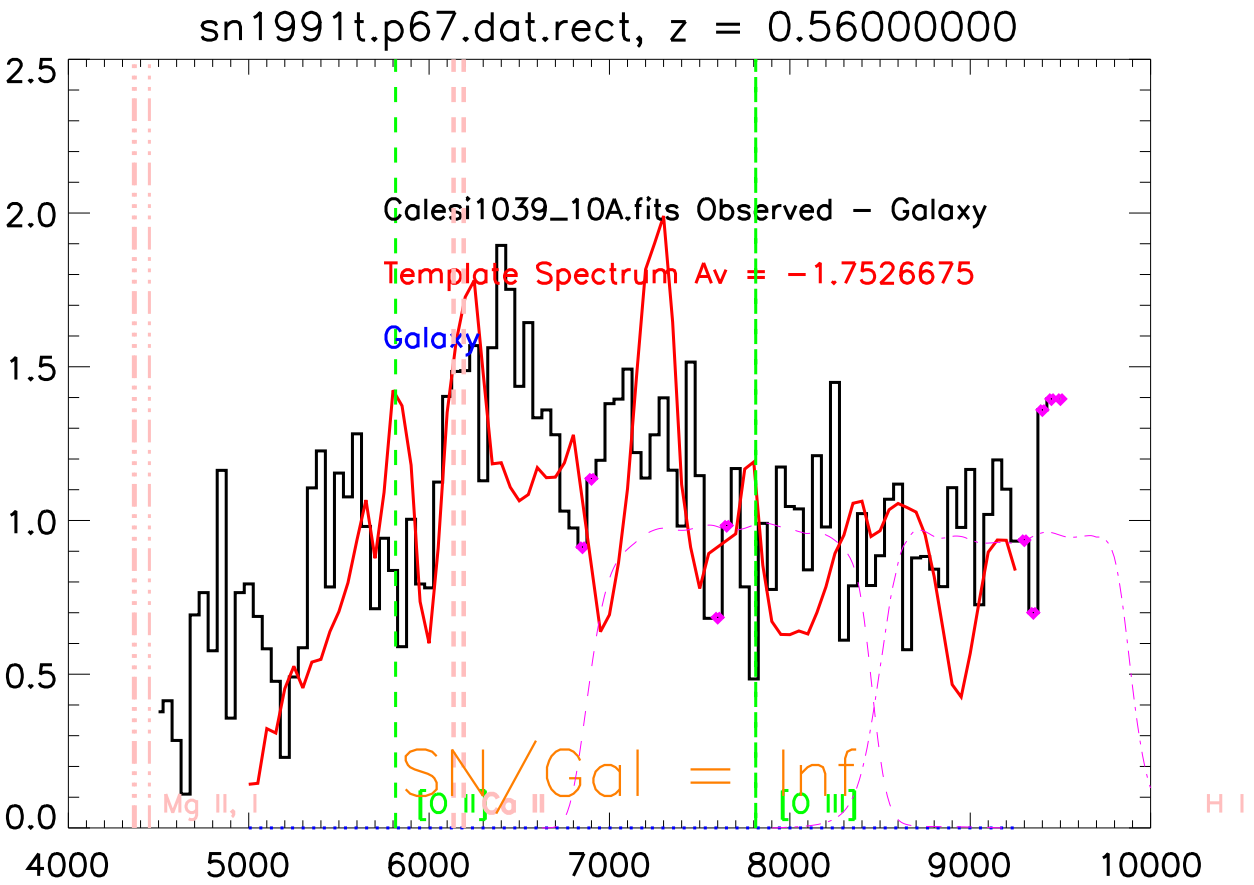
sn1991t.p67.dat.rect, z = 0.56000000
Calesi1039_10A.fits Observed − Galaxy
Template Spectrum Av = −1.7526675
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
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2.0
1.5
1.0
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8000
9000
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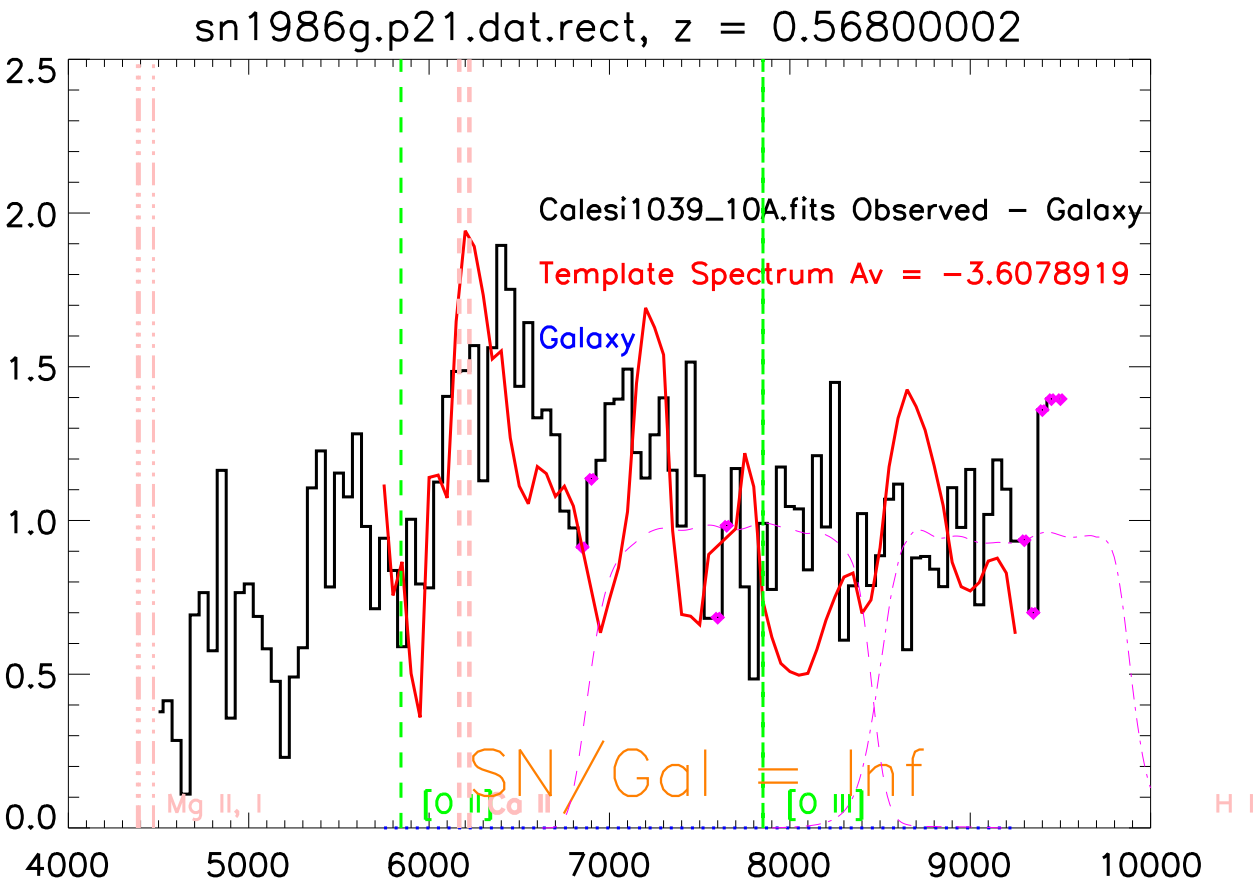
sn1986g.p21.dat.rect, z = 0.56800002
Calesi1039_10A.fits Observed − Galaxy
Template Spectrum Av = −3.6078919
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
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2.0
1.5
1.0
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8000
9000
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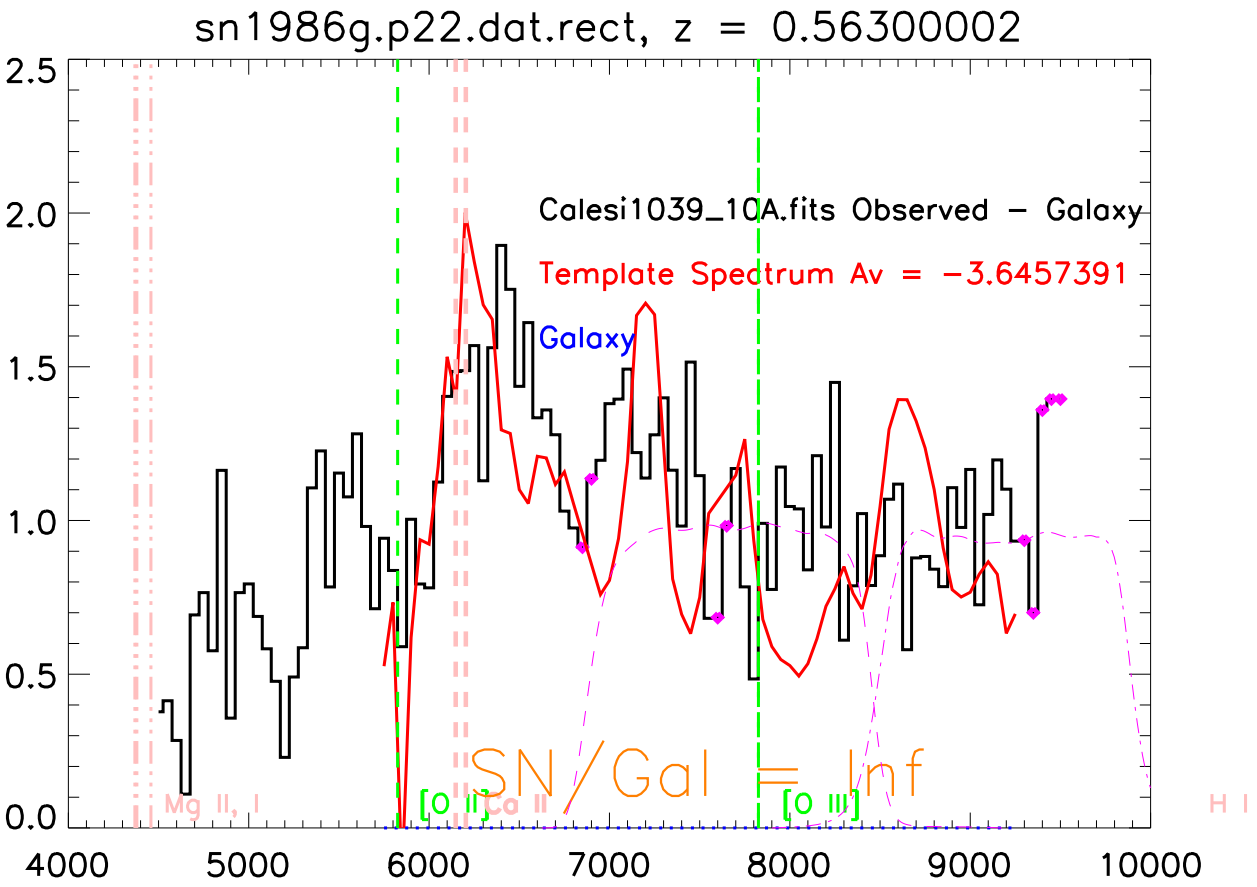
sn1986g.p22.dat.rect, z = 0.56300002
Calesi1039_10A.fits Observed − Galaxy
Template Spectrum Av = −3.6457391
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
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2.0
1.5
1.0
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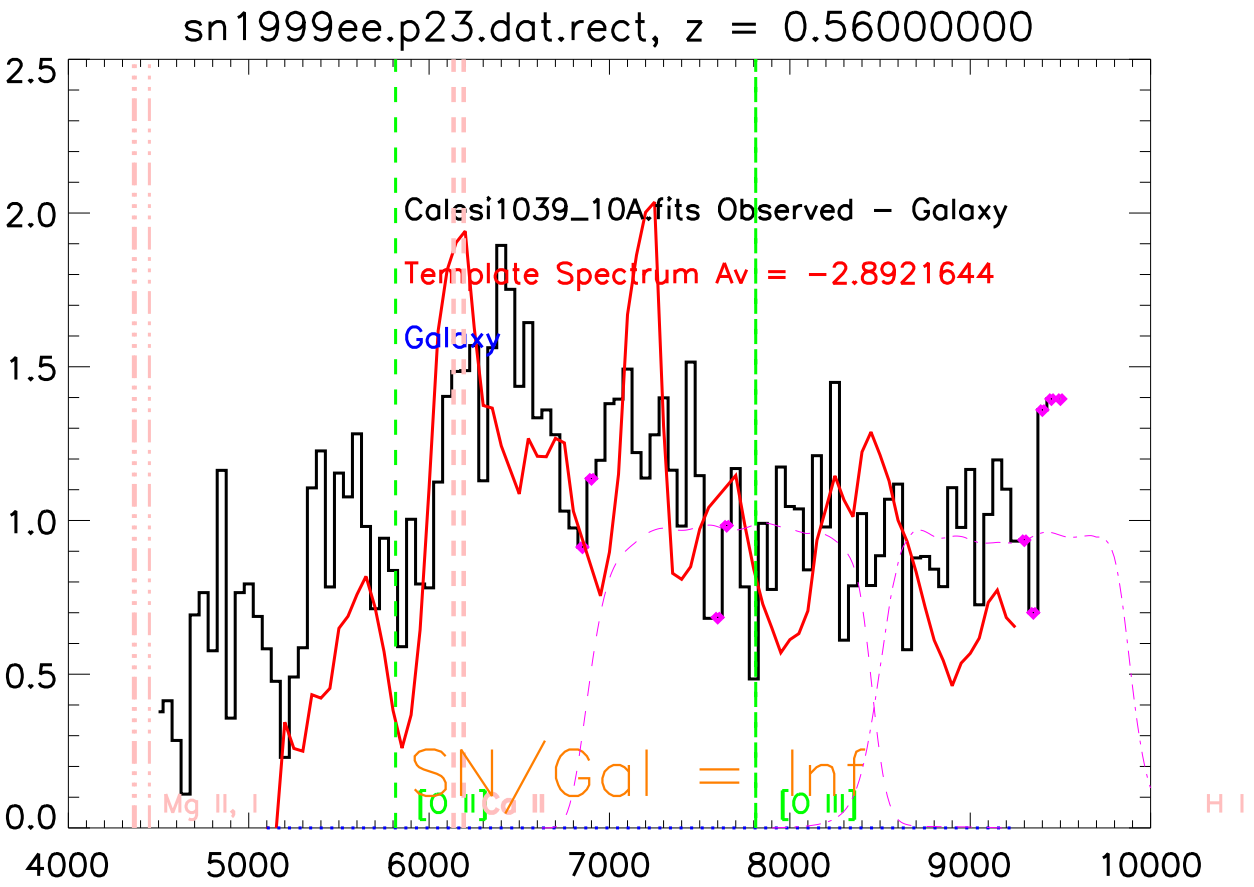
8000
9000
10000


sn1999ee.p23.dat.rect, z = 0.56000000
Calasi1039_10A.fits Observed − Galaxy
Template Spectrum Av = −2.8921644
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
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2.0
1.5
1.0
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8000
9000
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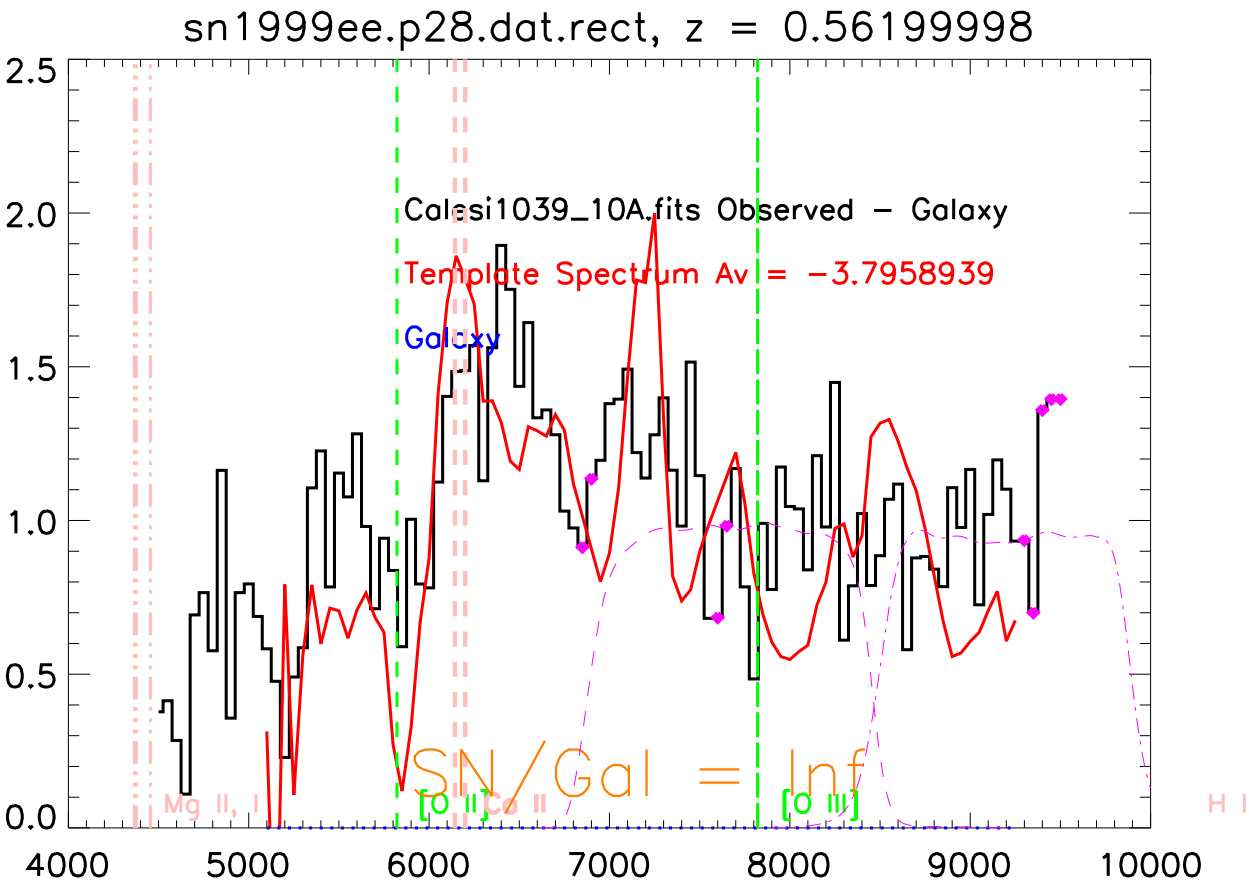
sn1999ee.p28.dat.rect, z = 0.56199998
Calesi1039_10A.fits Observed − Galaxy
Template Spectrum Av = −3.7958939
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
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2.0
1.5
1.0
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6000
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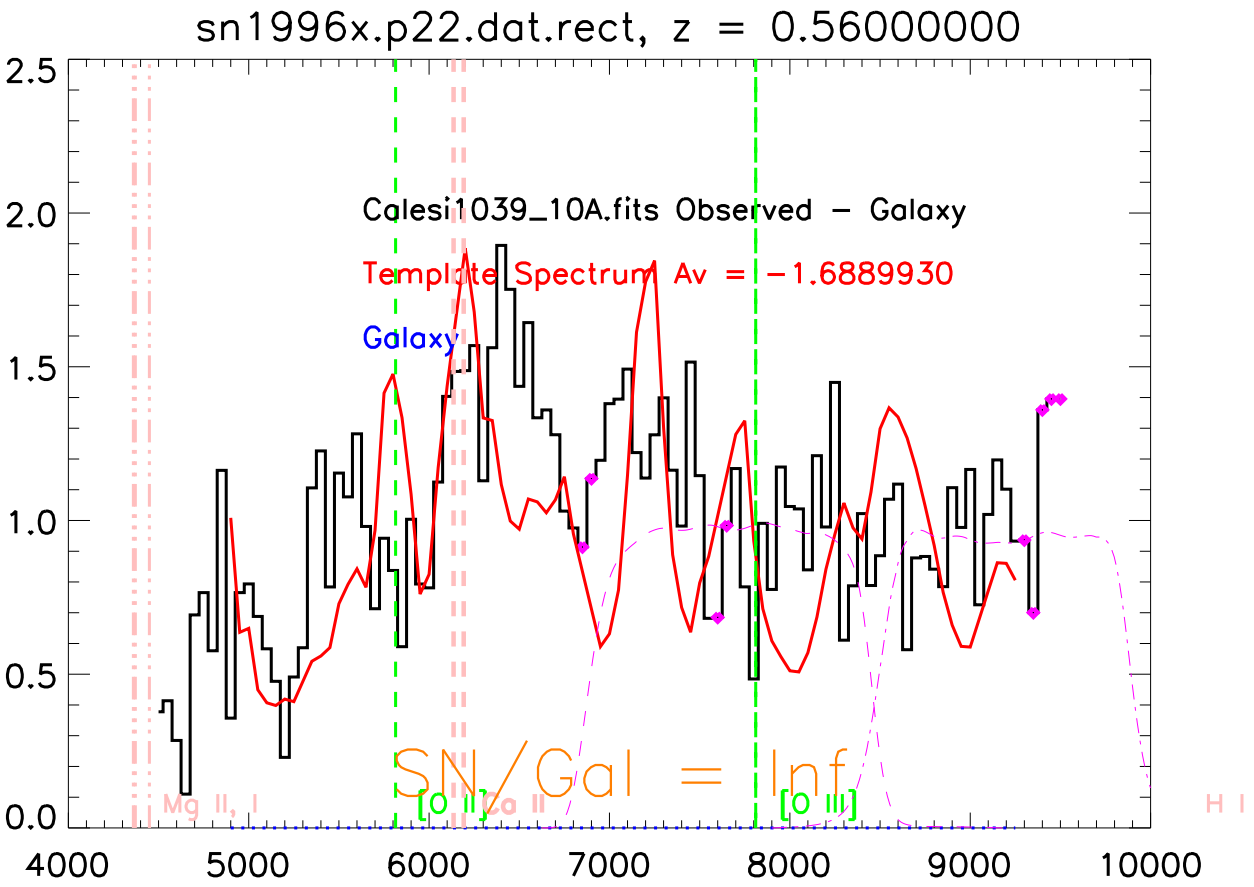
8000
9000
10000


sn1996x.p22.dat.rect, z = 0.56000000
Calesi1039_10A.fits Observed − Galaxy
Template Spectrum Av = −1.6889930
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
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2.0
1.5
1.0
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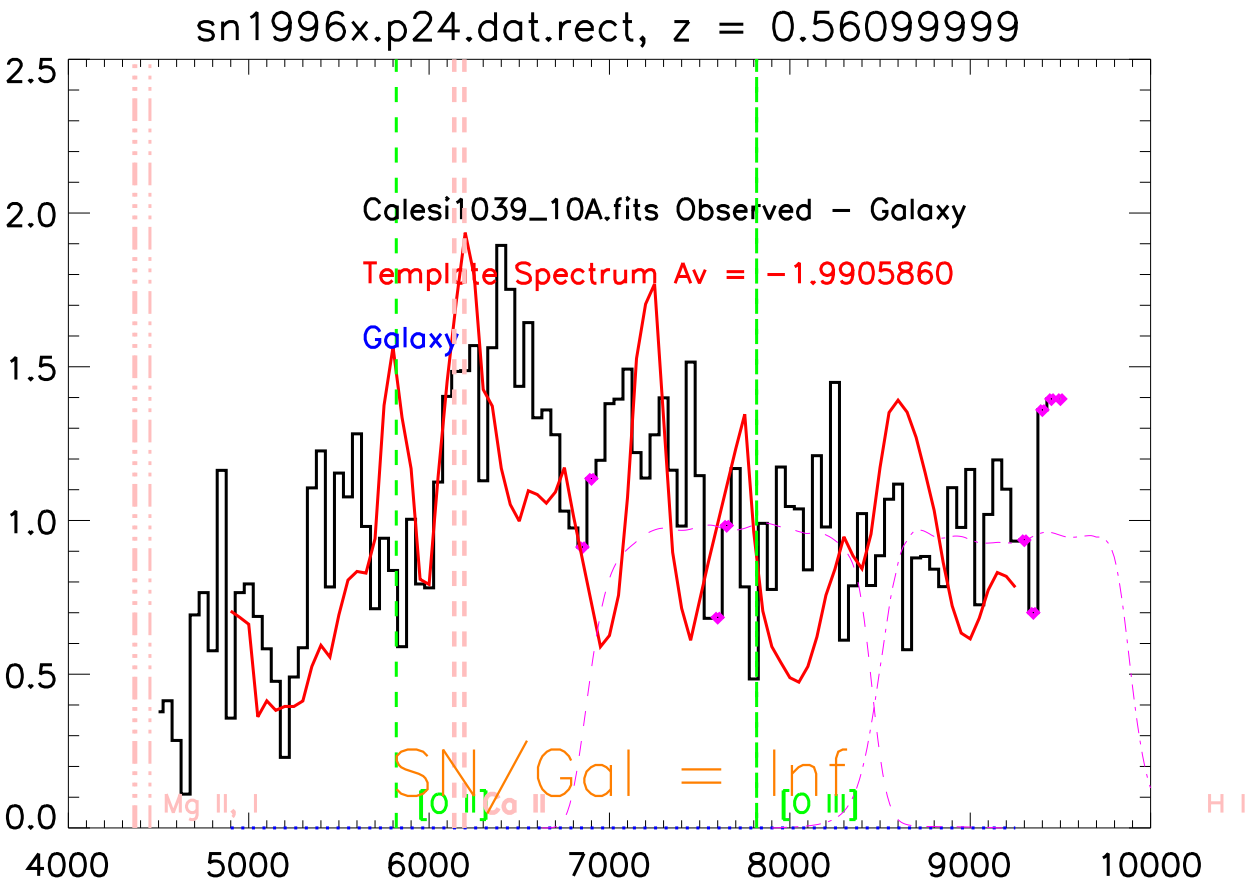
8000
9000
10000


sn1996x.p24.dat.rect, z = 0.56099999
Calesi1039_10A.fits Observed − Galaxy
Template Spectrum Av = −1.9905860
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
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2.0
1.5
1.0
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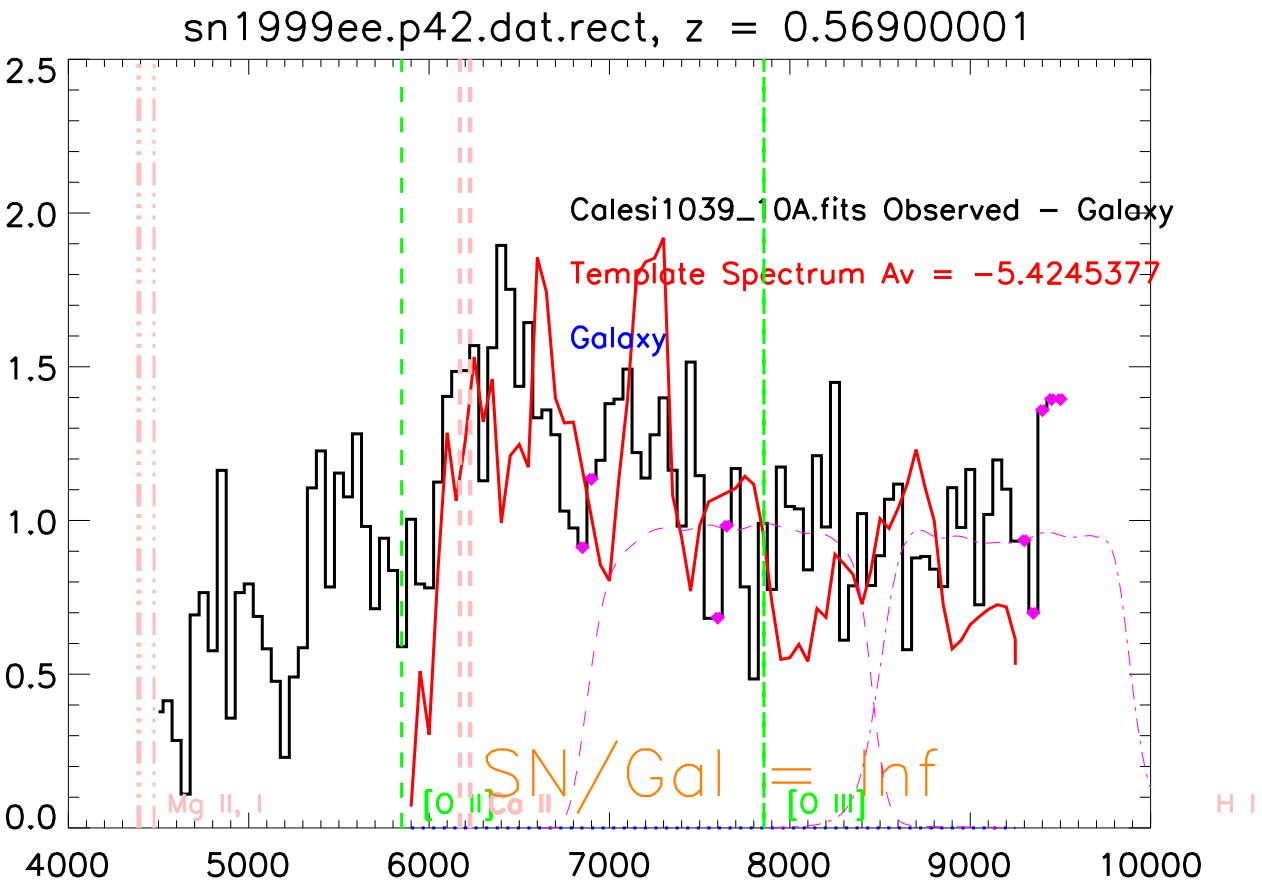
8000
9000
10000


sn1999ee.p42.dat.rect, z = 0.56900001
Calesi1039_10A.fits Observed − Galaxy
Template Spectrum Av = −5.4245377
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
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2.0
1.5
1.0
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4000
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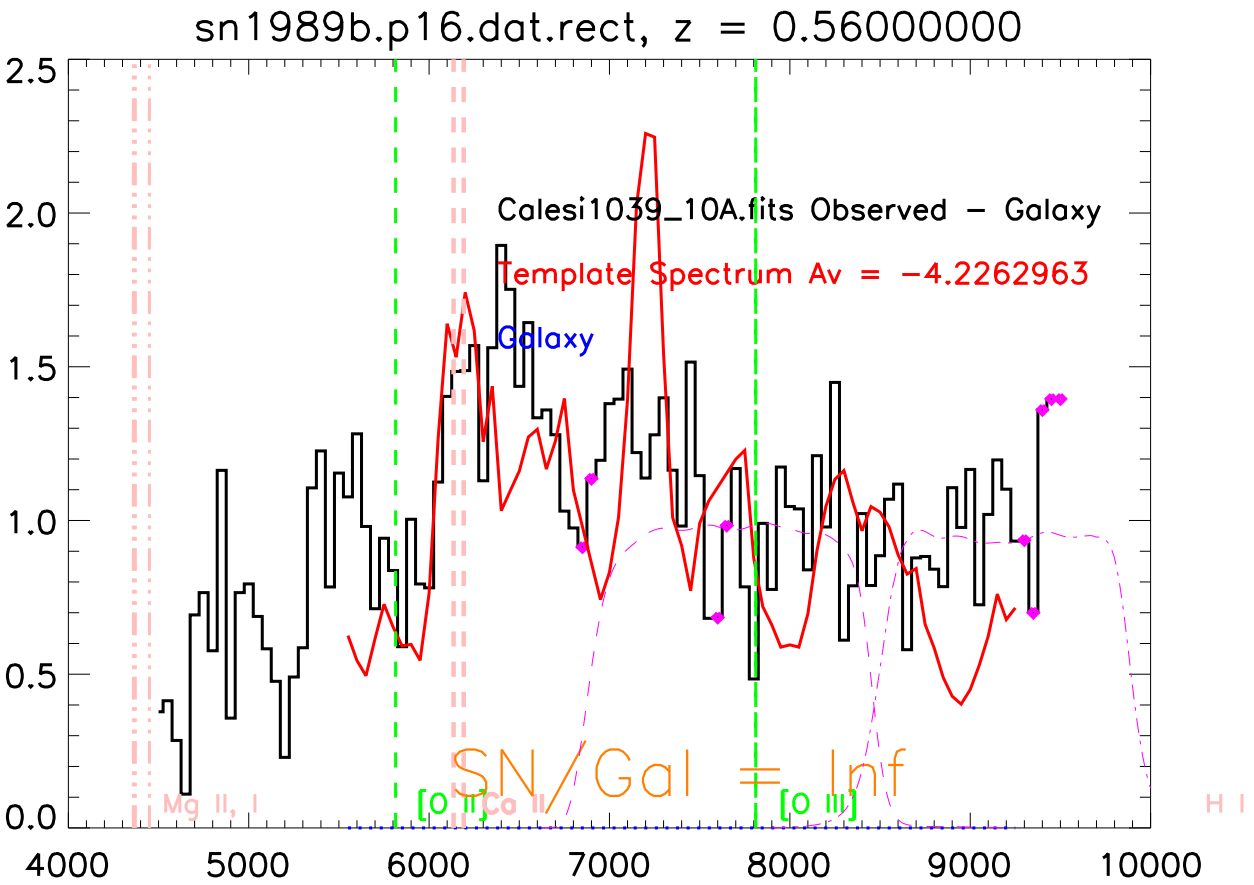
6000
7000
8000
9000
10000


sn1989b.p16.dat.rect, z = 0.56000000
Calesi1039_10A.fits Observed − Galaxy
Template Spectrum Av = −4.2262963
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
2.5
2.0
1.5
1.0
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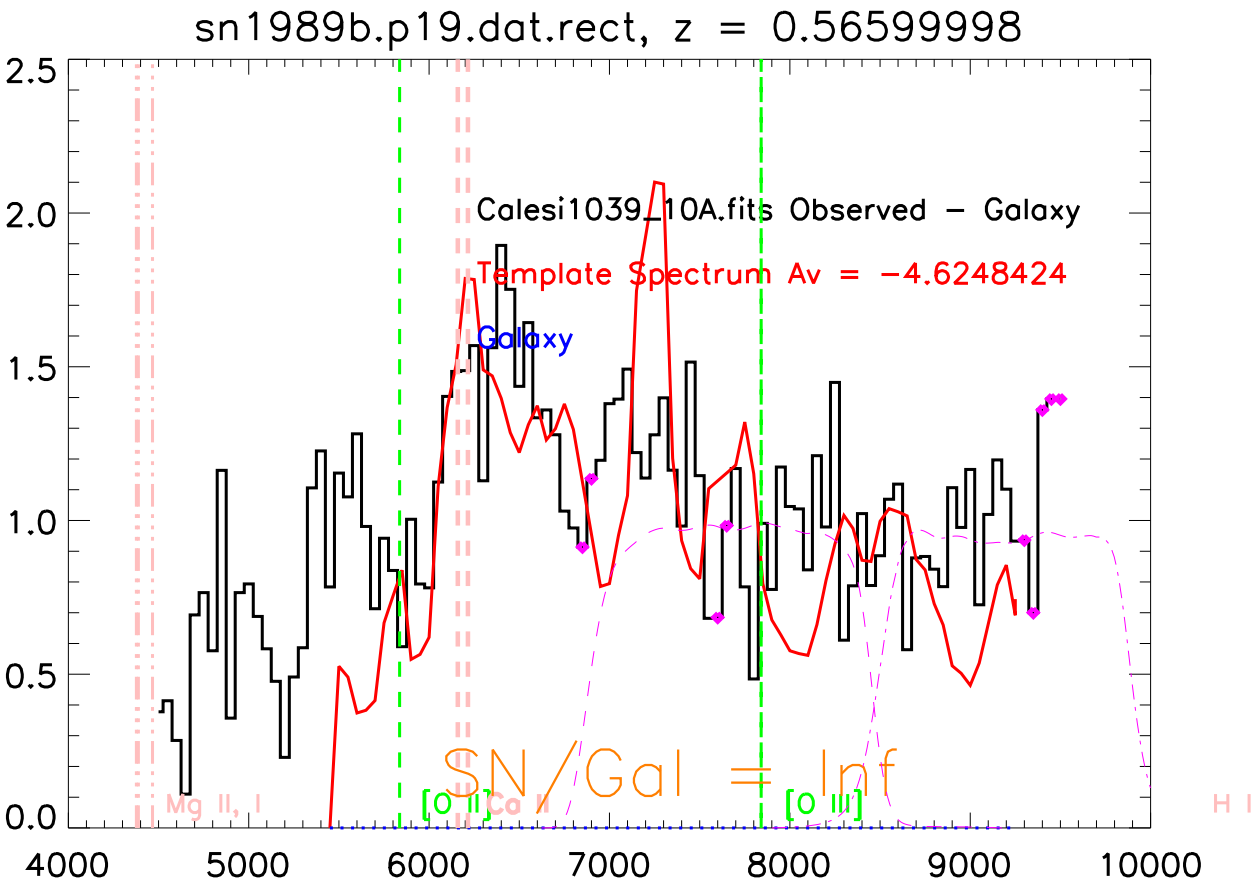
4000
5000
6000
7000
8000
9000
10000


sn1989b.p19.dat.rect, z = 0.56599998
Calesi1039_10A.fits Observed − Galaxy
Template Spectrum Av = −4.6248424
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca I
[O III]
H I
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2.0
1.5
1.0
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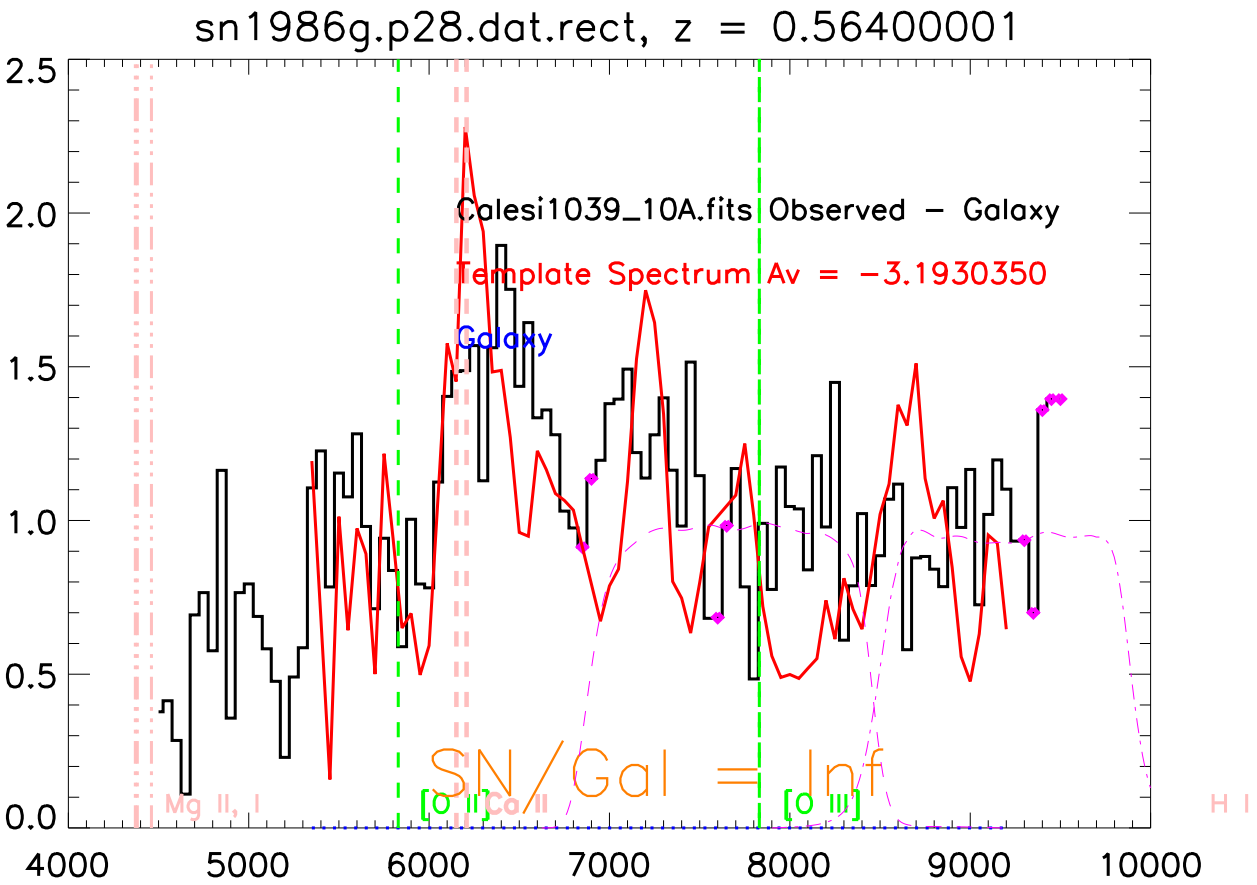
8000
9000
10000


sn1986g.p28.dat.rect, z = 0.56400001
Calesi1039_10A.fits Observed − Galaxy
Template Spectrum Av = −3.1930350
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
2.5
2.0
1.5
1.0
0.5
0.0
4000
5000
6000
7000
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9000
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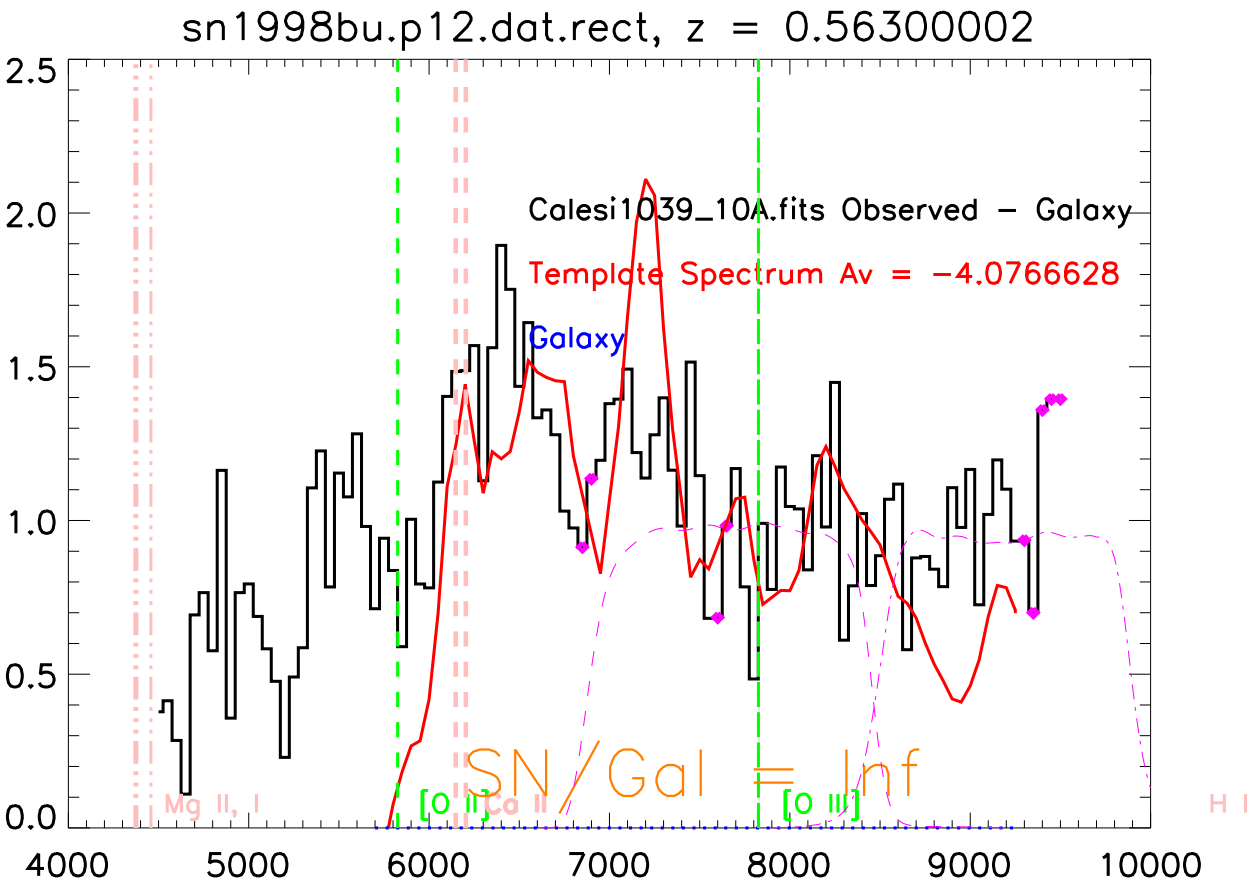
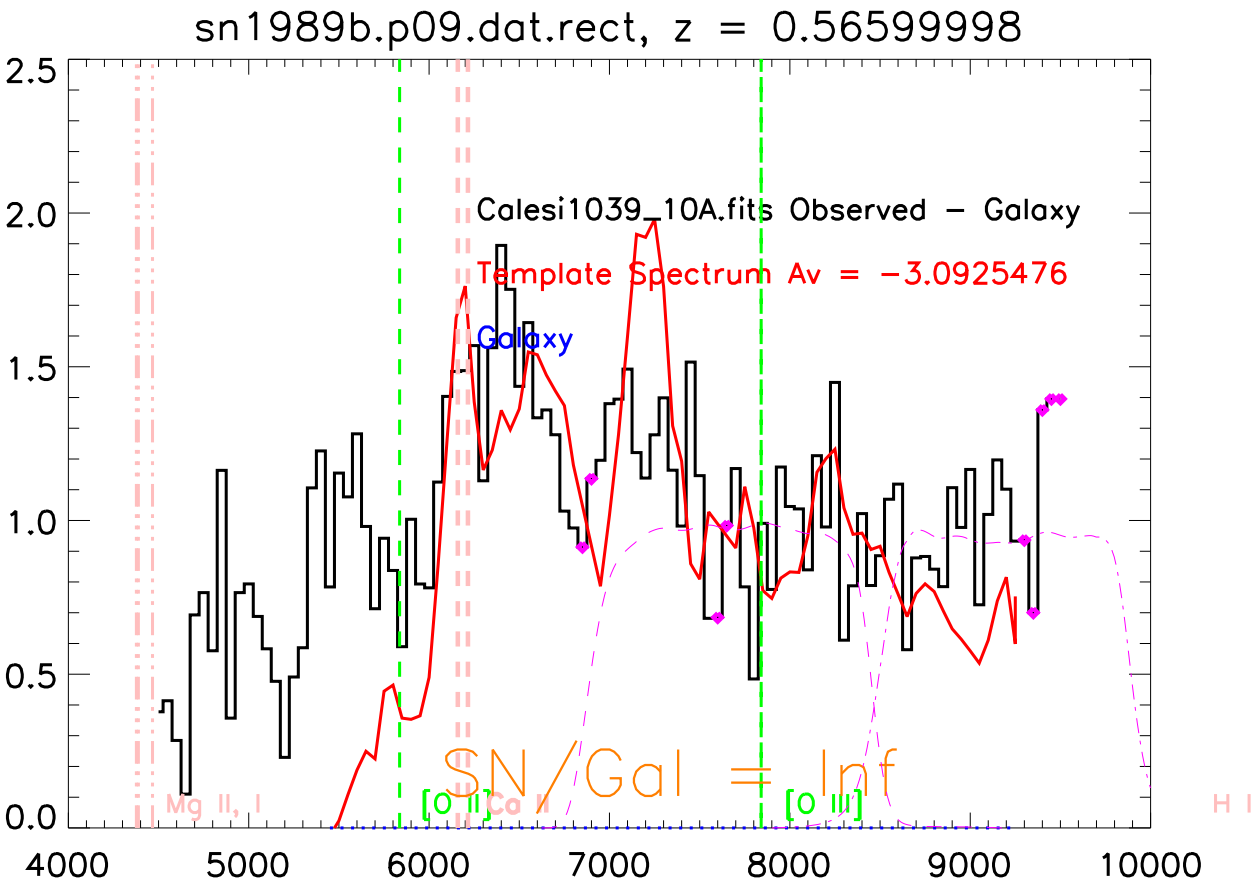

sn1998bu.p12.dat.rect, z = 0.56300002
Calesi1039_10A.fits Observed − Galaxy
Template Spectrum Av = −4.0766628
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
2.5
2.0
1.5
1.0
0.5
0.0
4000
5000
6000
7000
8000
9000
10000


sn1989b.p09.dat.rect, z = 0.56599998
Calesi1039_10A.fits Observed − Galaxy
Template Spectrum Av = −3.0925476
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca I
[O III]
H I
2.5
2.0
1.5
1.0
0.5
0.0
4000
5000
6000
7000
8000
9000
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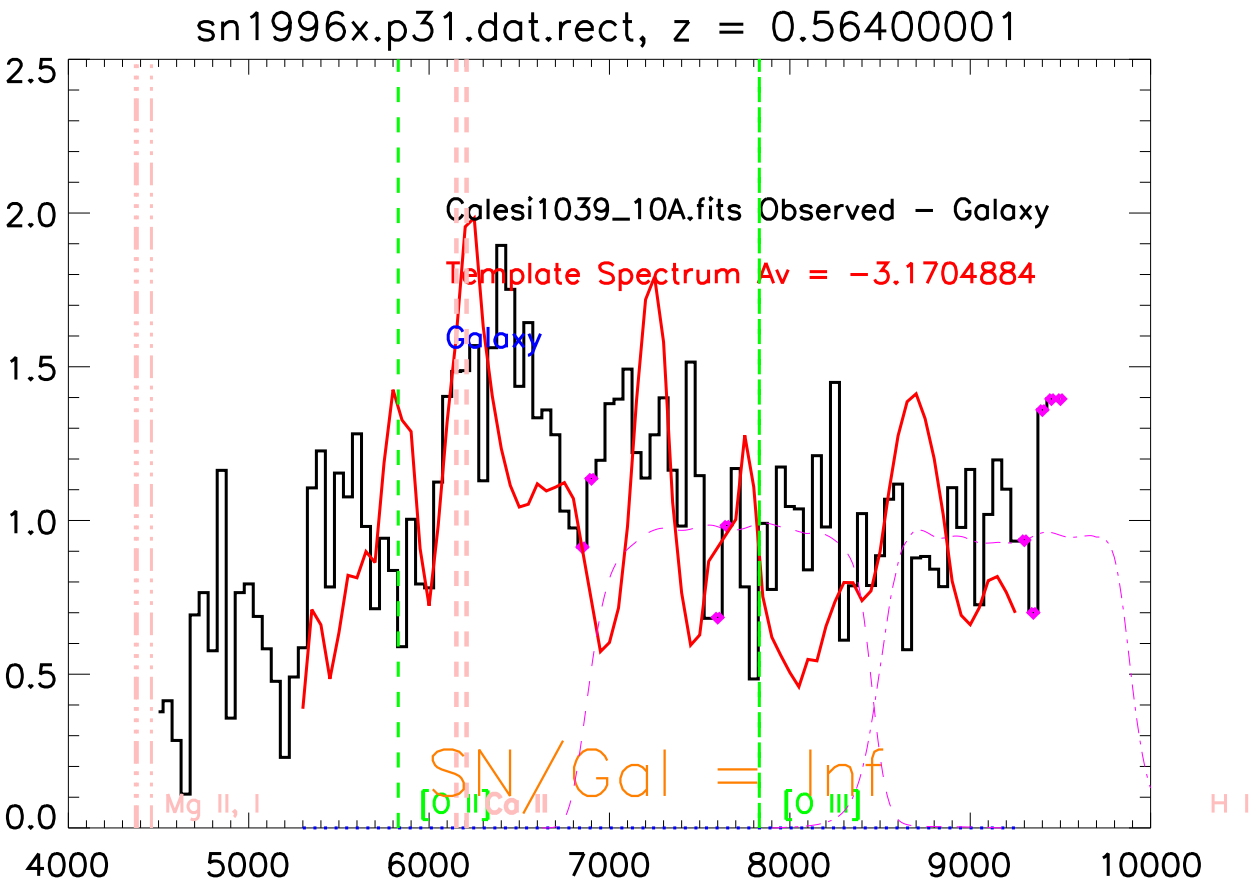
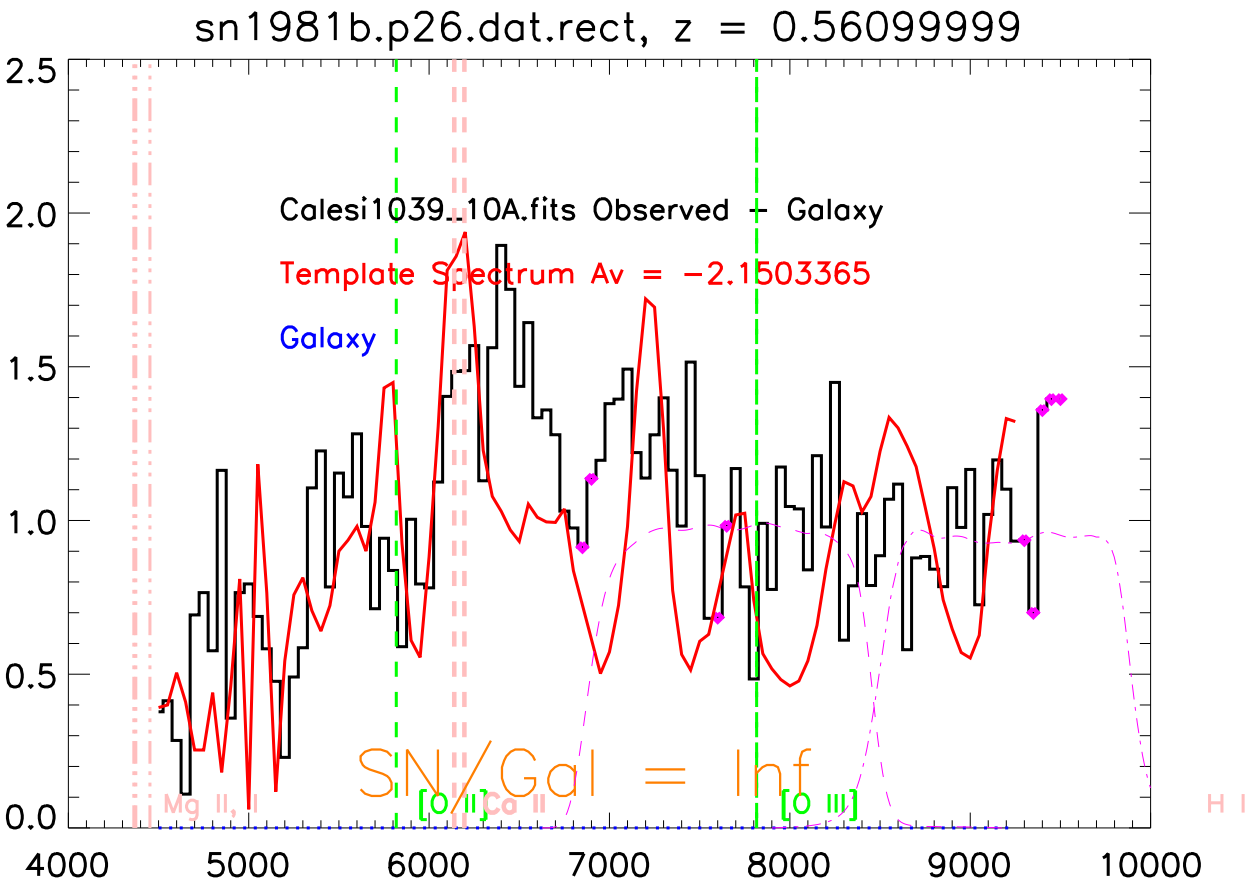
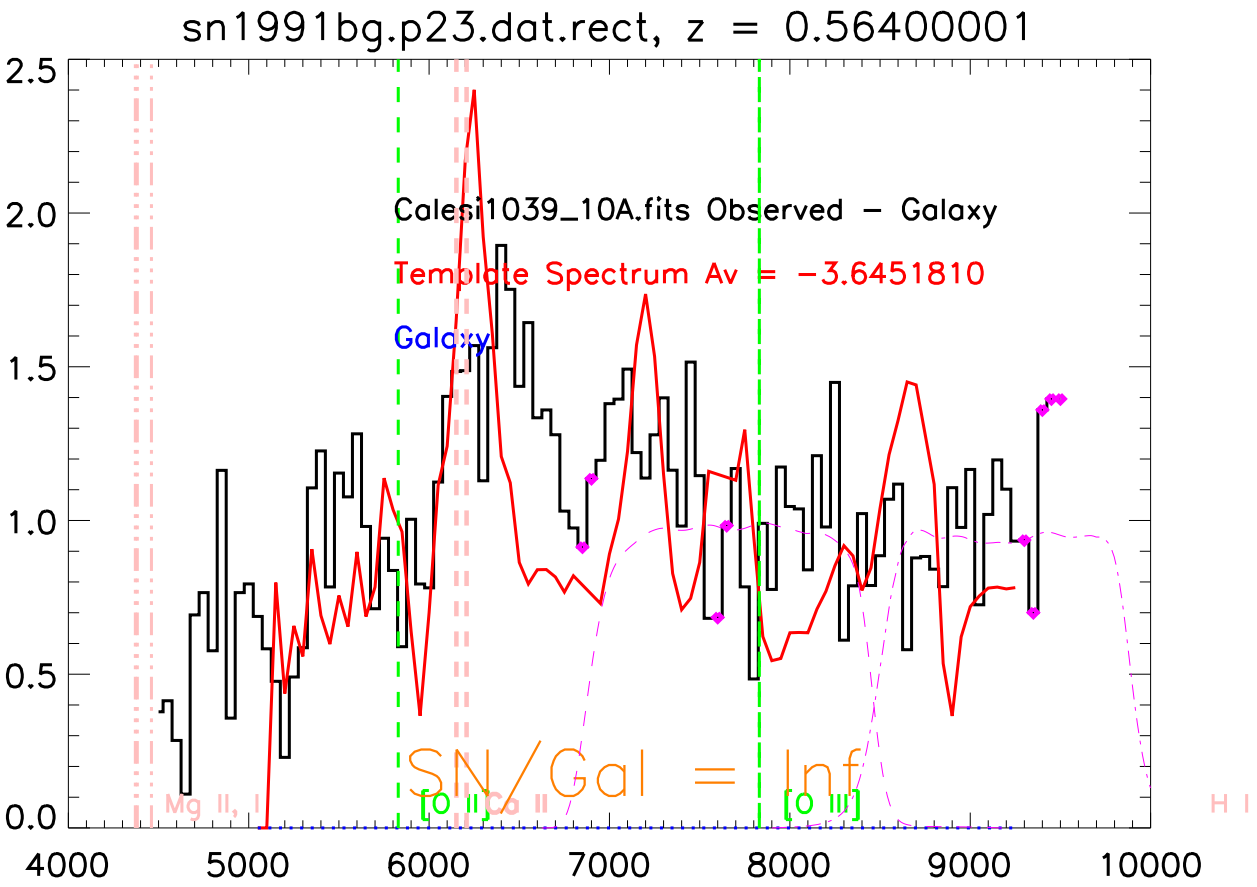
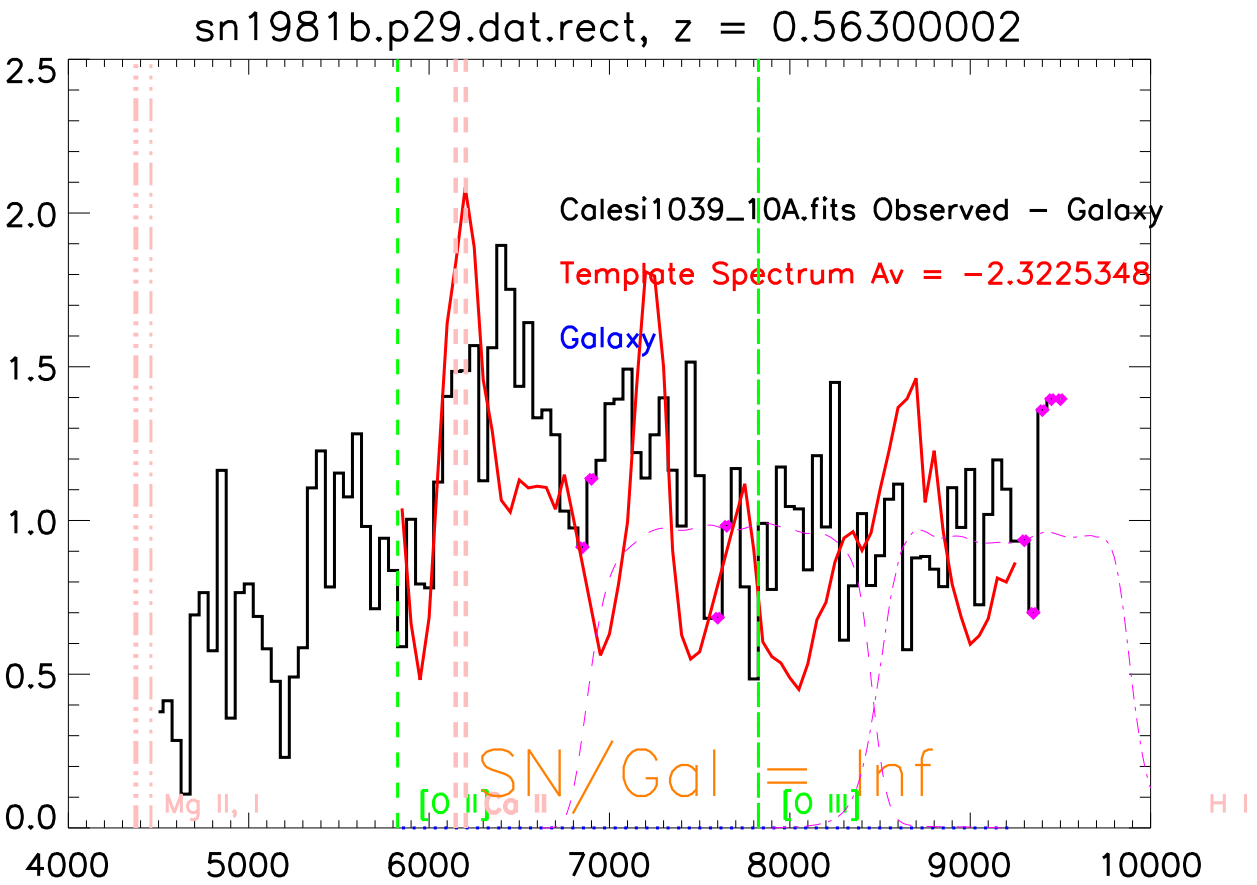
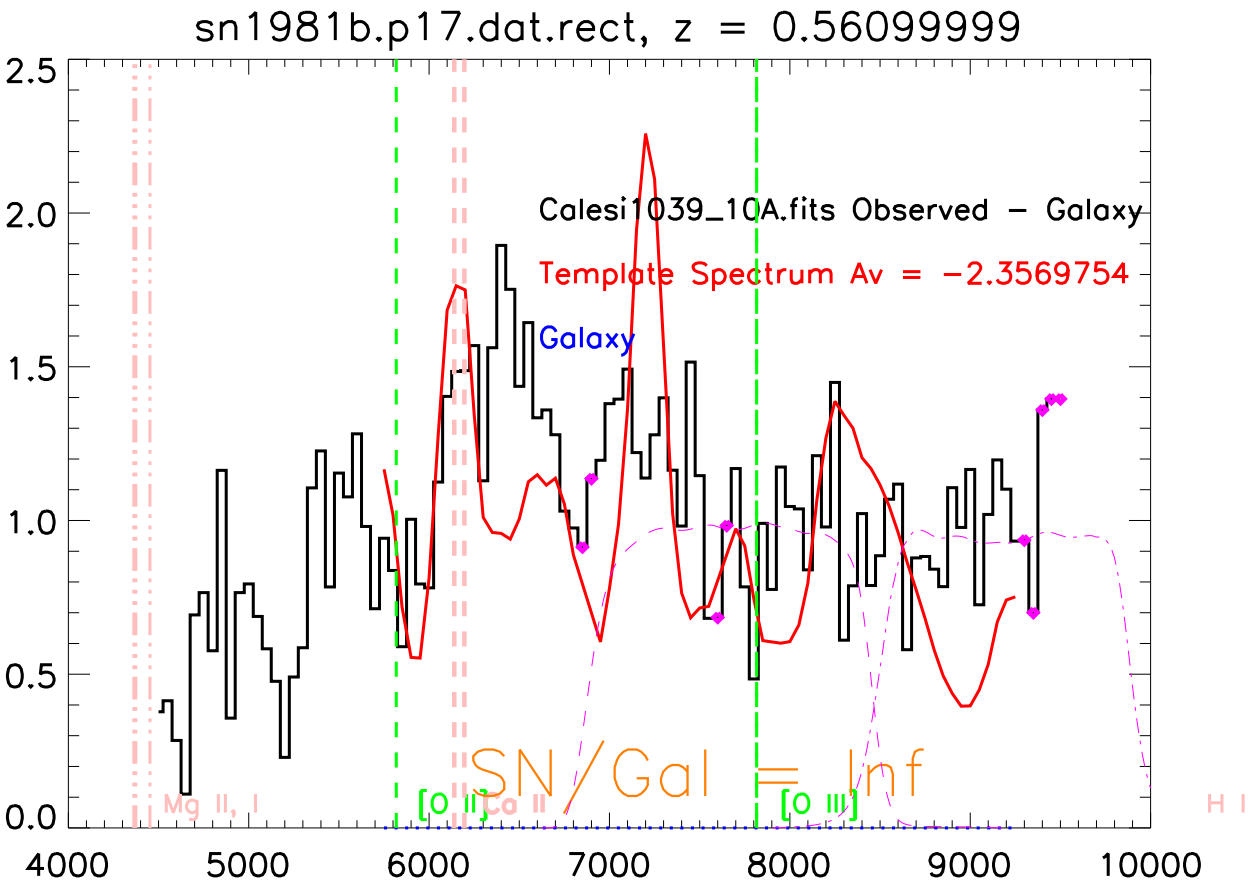
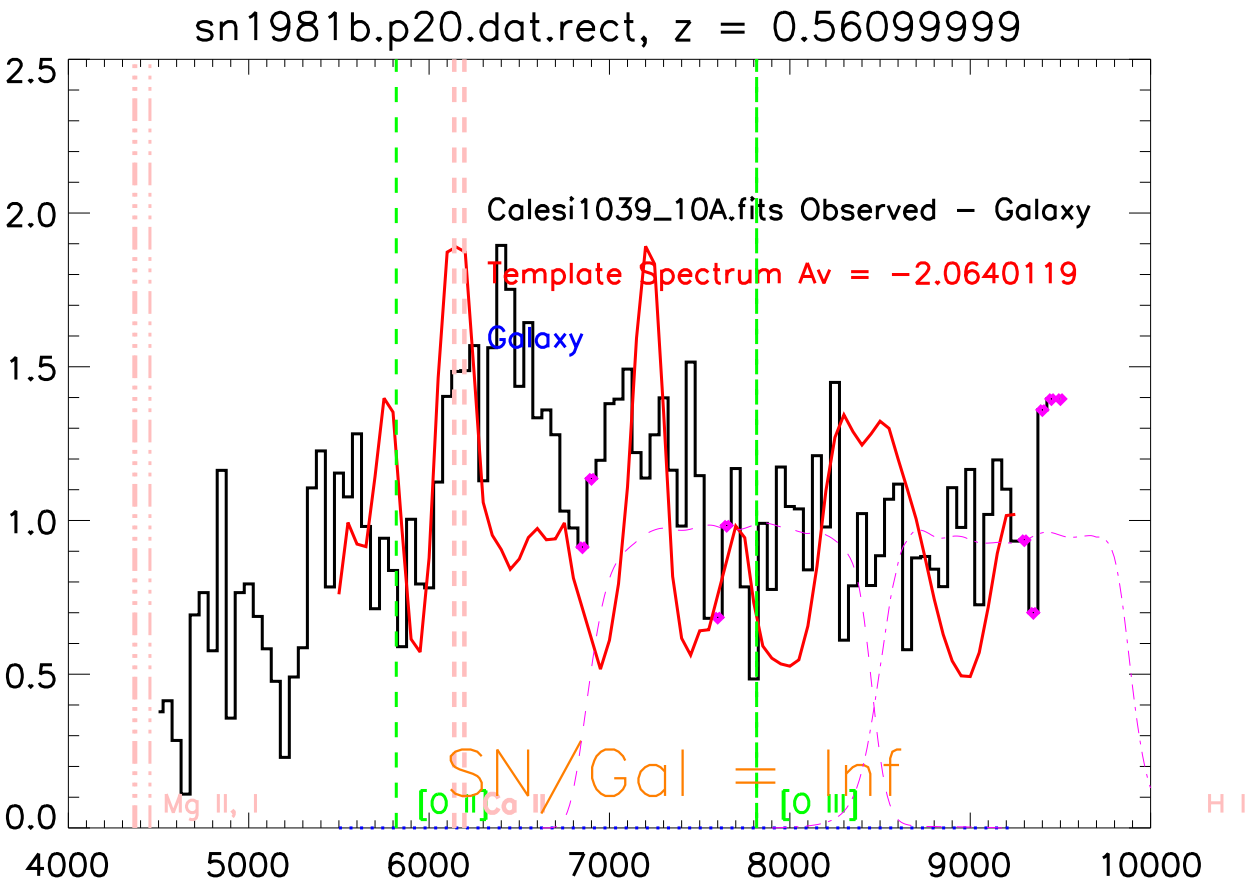

sn1996x.p31.dat.rect, z = 0.56400001
Calesi1039_10A.fits Observed − Galaxy
Template Spectrum Av = −3.1704884
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
2.5
2.0
1.5
1.0
0.5
0.0
4000
5000
6000
7000
8000
9000
10000

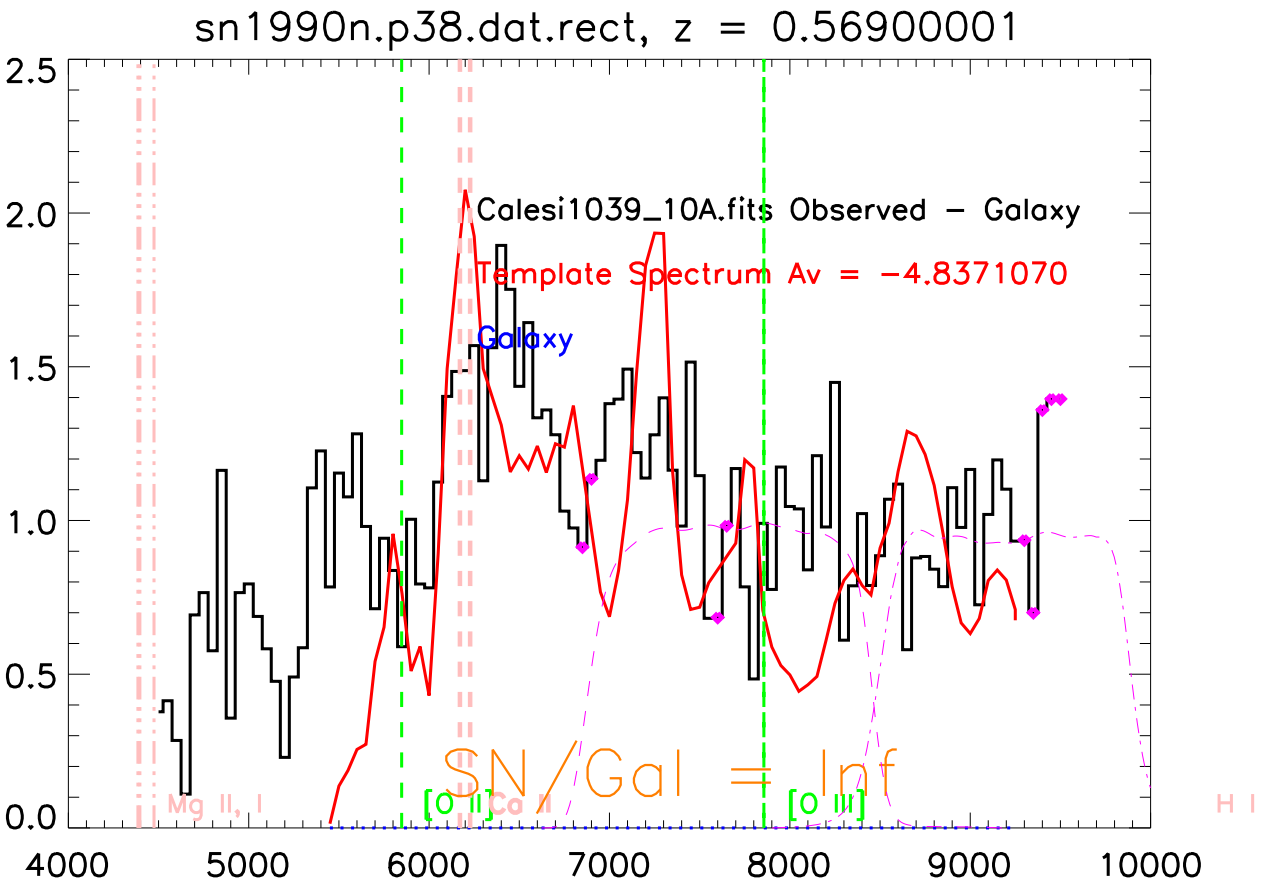

sn1981b.p26.dat.rect, z = 0.56099999
Calesi1039_10A.fits Observed + Galaxy
Template Spectrum Av = -2.1503365
Galaxy
S/N/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
2.5
2.0
1.5
1.0
0.5
0.0
4000
5000
6000
7000
8000
9000
10000

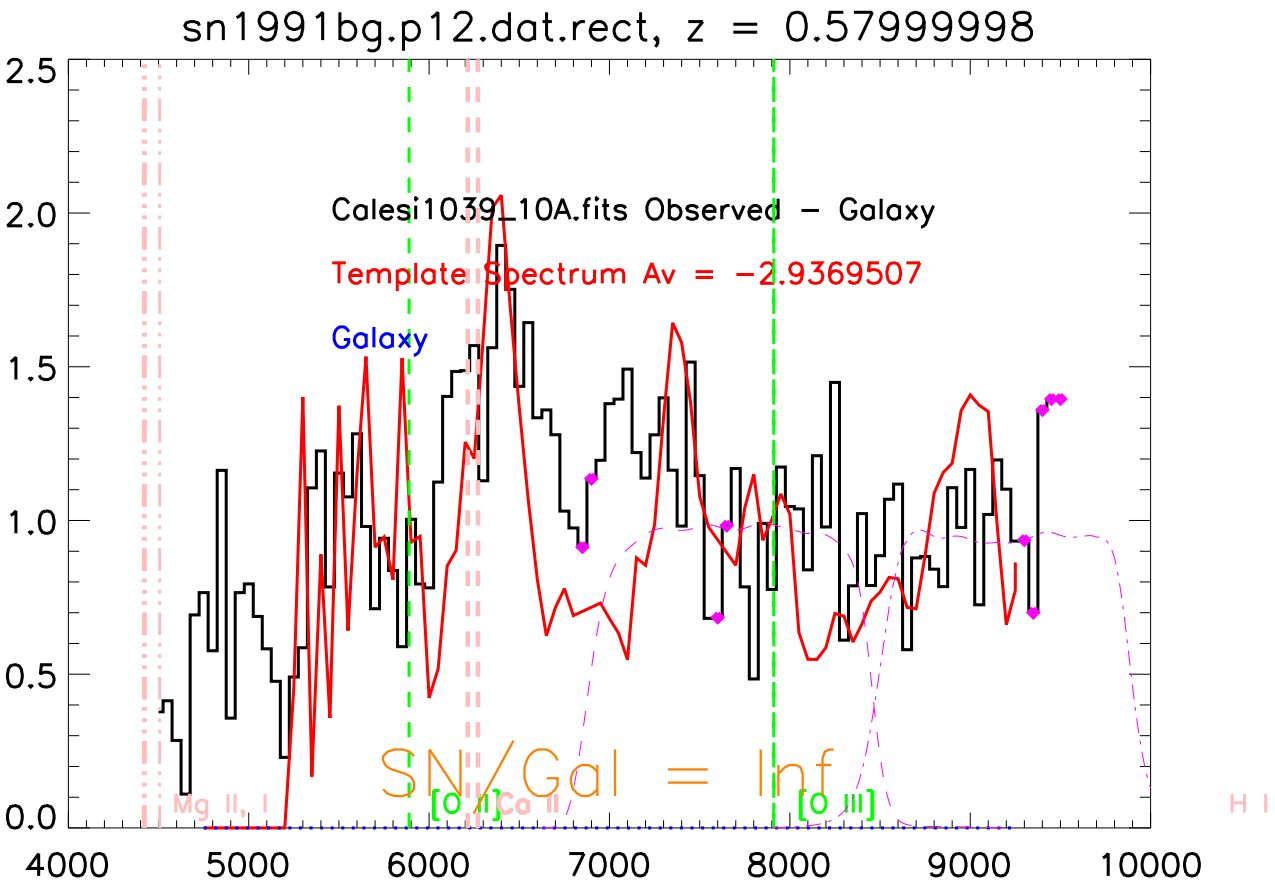

sn1991bg.p23.dat.rect, z = 0.56400001
Calesi1039_10A.fits Observed − Galaxy
Template Spectrum Av = −3.6451810
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
2.5
2.0
1.5
1.0
0.5
0.0
4000
5000
6000
7000
8000
9000
10000

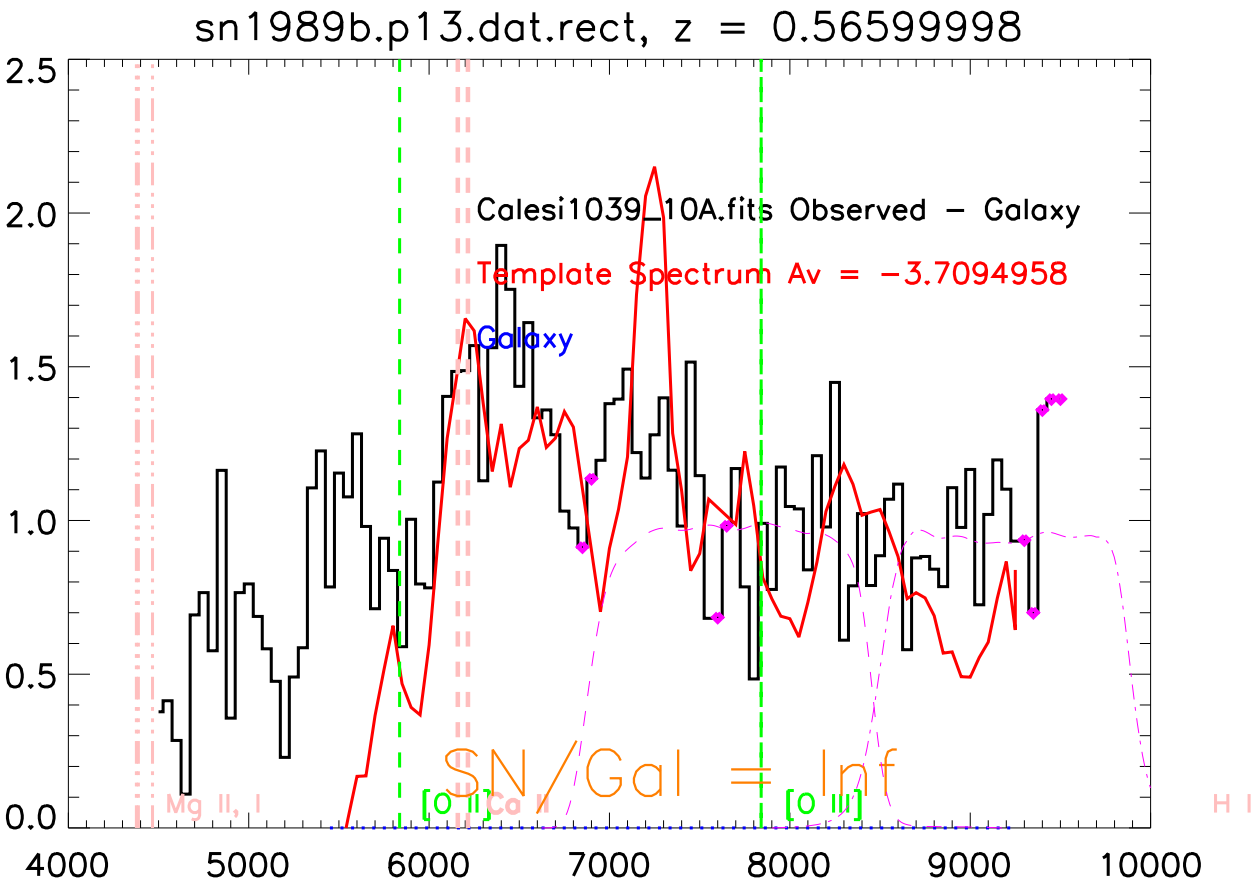

sn1981b.p29.dat.rect, z = 0.56300002
Calesi1039_10A.fits Observed − Galaxy
Template Spectrum Av = −2.3225348
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
2.5
2.0
1.5
1.0
0.5
0.0
4000
5000
6000
7000
8000
9000
10000


sn1981b.p17.dat.rect, z = 0.56099999
Calesi1039_10A.fits Observed − Galaxy
Template Spectrum Av = −2.3569754
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
2.5
2.0
1.5
1.0
0.5
0.0
4000
5000
6000
7000
8000
9000
10000


sn1981b.p20.dat.rect, z = 0.56099999
Calesi1039_10A.fits Observed − Galaxy
Template Spectrum Av = −2.0640119
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
2.5
2.0
1.5
1.0
0.5
0.0
4000
5000
6000
7000
8000
9000
10000


sn1990n.p38.dat.rect, z = 0.56900001
Calesi1039_10A.fits Observed − Galaxy
Template Spectrum Av = −4.8371070
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
2.5
2.0
1.5
1.0
0.5
0.0
4000
5000
6000
7000
8000
9000
10000


sn1991bg.p12.dat.rect, z = 0.57999998
Calesi1039_10A.fits Observed − Galaxy
Template Spectrum Av = −2.9369507
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
2.5
2.0
1.5
1.0
0.5
0.0
4000
5000
6000
7000
8000
9000
10000


sn1989b.p13.dat.rect, z = 0.56599998
Calesi1039_10A.fits Observed − Galaxy
Template Spectrum Av = −3.7094958
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca I
[O III]
H I
2.5
2.0
1.5
1.0
0.5
0.0
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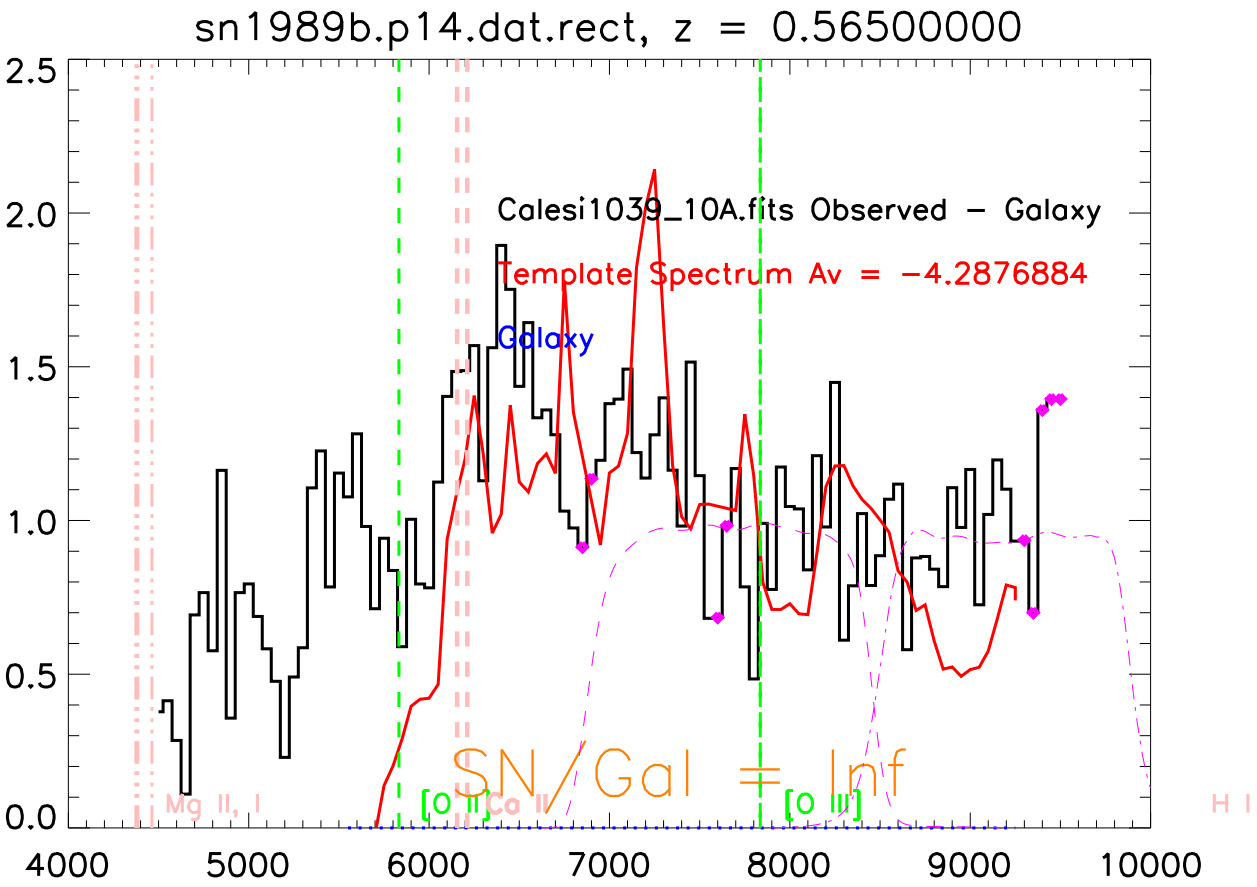
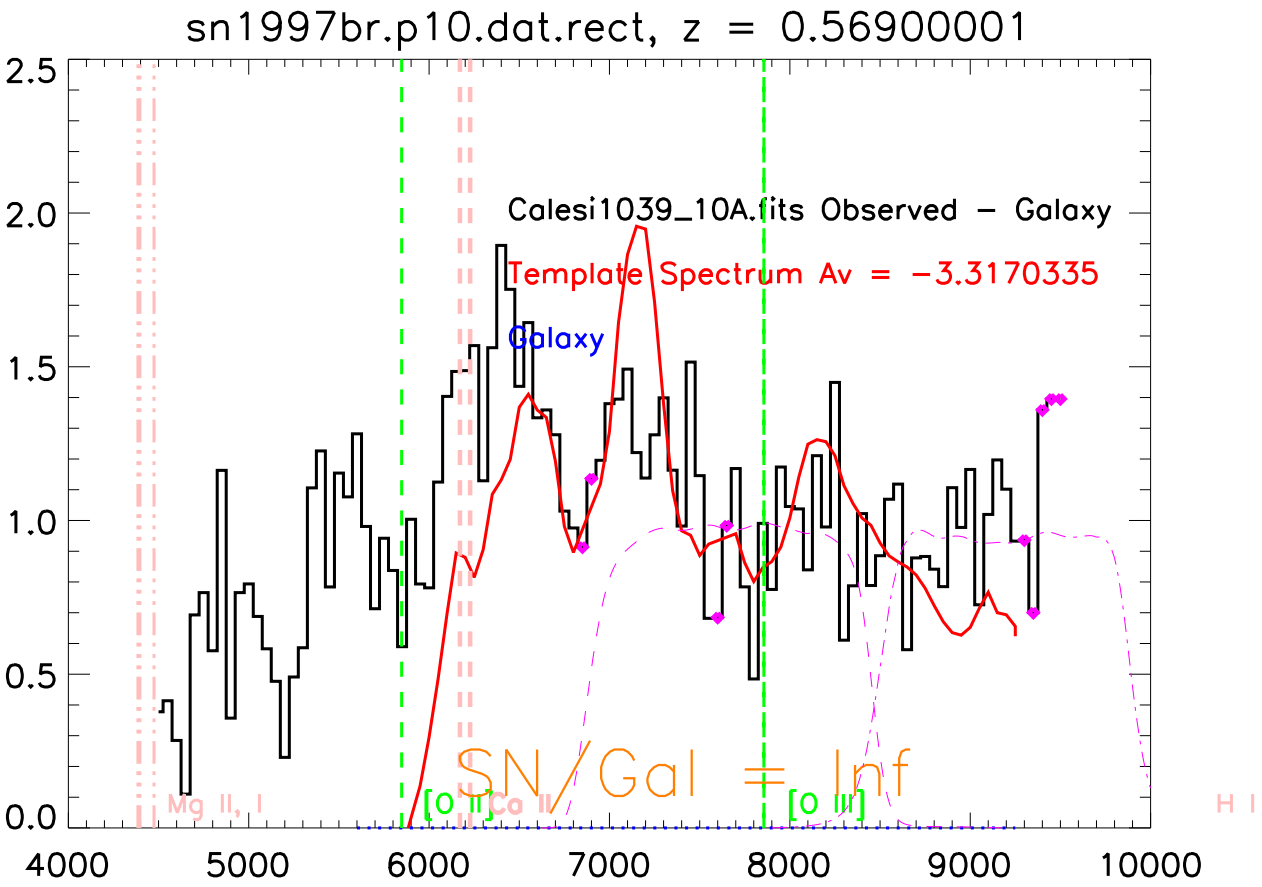
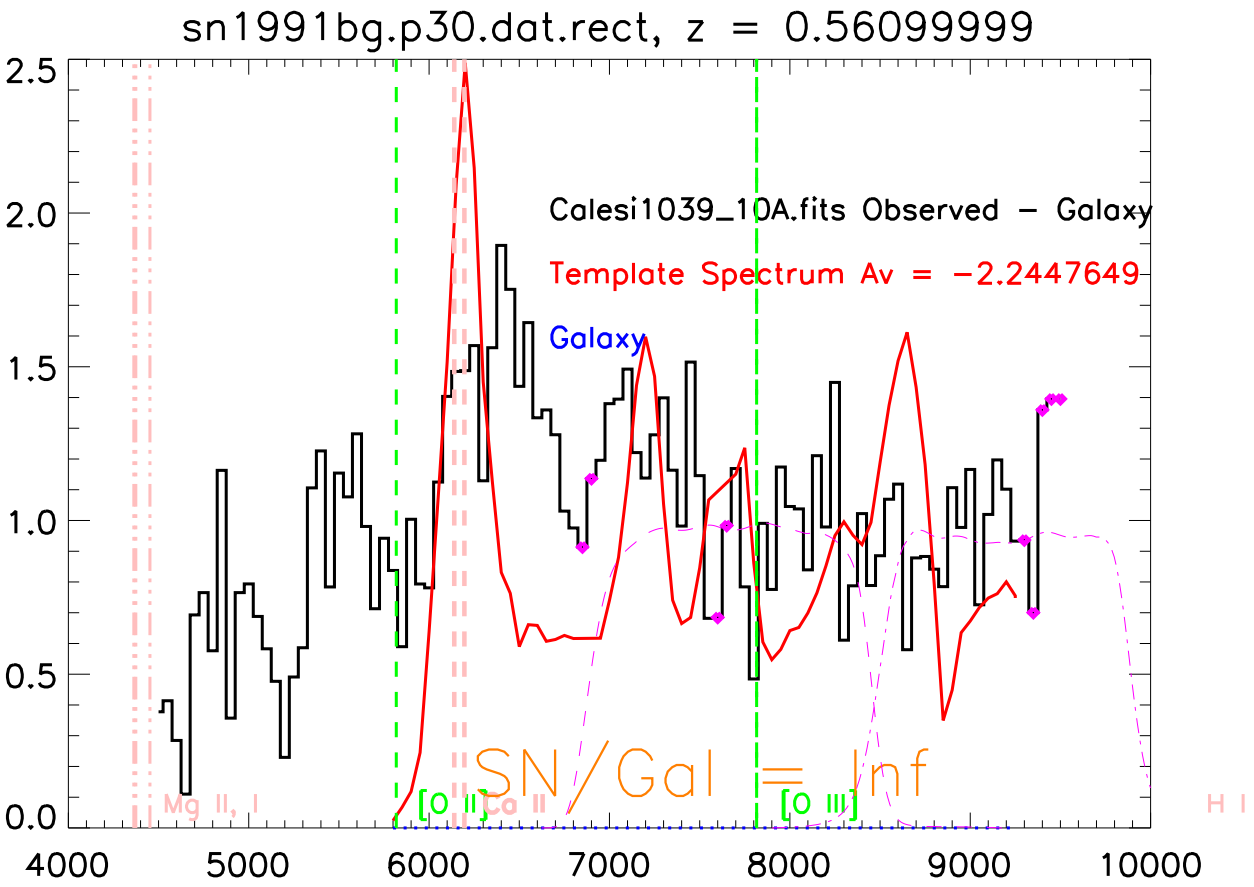
5000
6000
7000
8000
9000
10000


sn1989b.p14.dat.rect, z = 0.56500000
Calesi1039_10A.fits Observed − Galaxy
Template Spectrum Av = −4.2876884
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
2.5
2.0
1.5
1.0
0.5
0.0
4000
5000
6000
7000
8000
9000
10000


sn1997br.p10.dat.rect, z = 0.56900001
Calesi1039_10A.fits Observed − Galaxy
Template Spectrum Av = −3.3170335
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
2.5
2.0
1.5
1.0
0.5
0.0
4000
5000
6000
7000
8000
9000
10000


sn1991bg.p30.dat.rect, z = 0.56099999
Calesi1039_10A.fits Observed − Galaxy
Template Spectrum Av = −2.2447649
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
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2.0
1.5
1.0
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0.0
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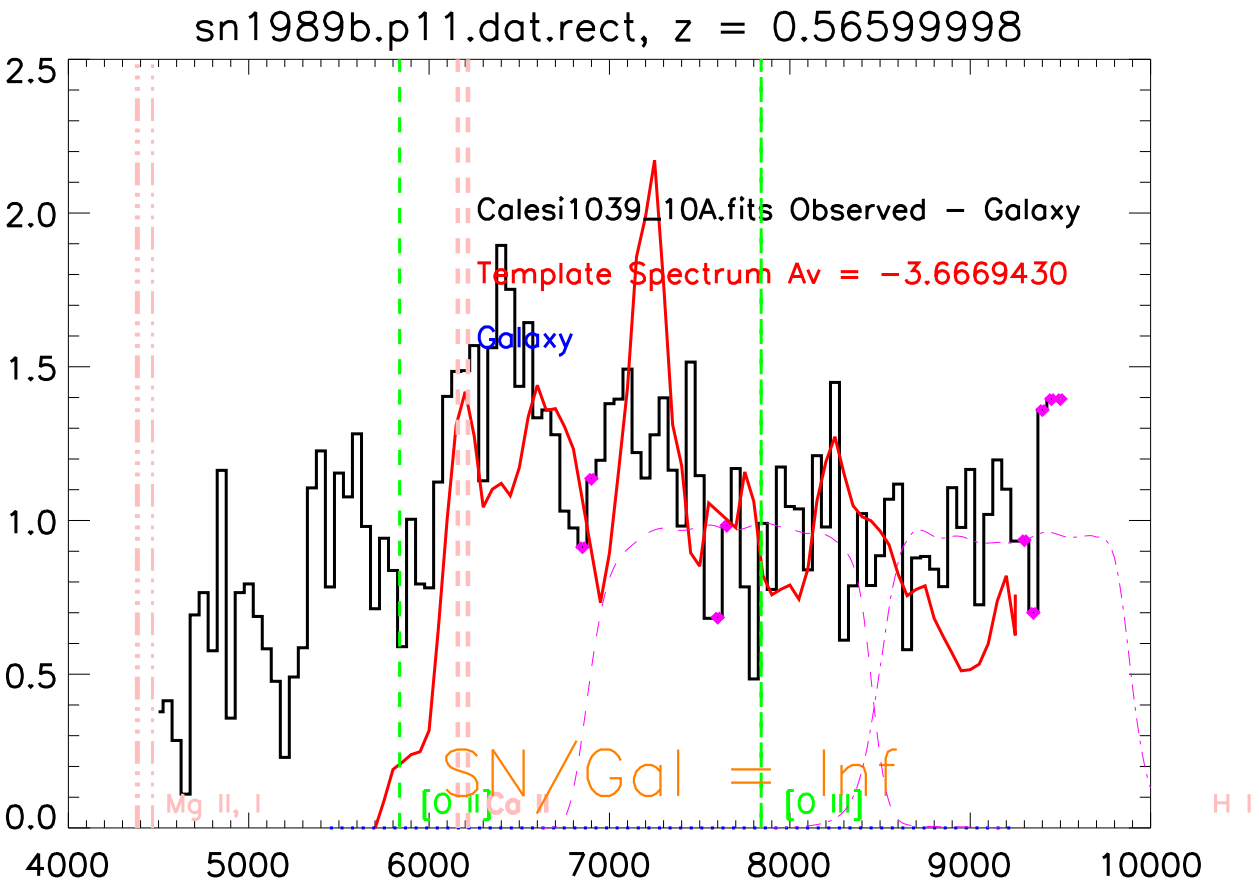
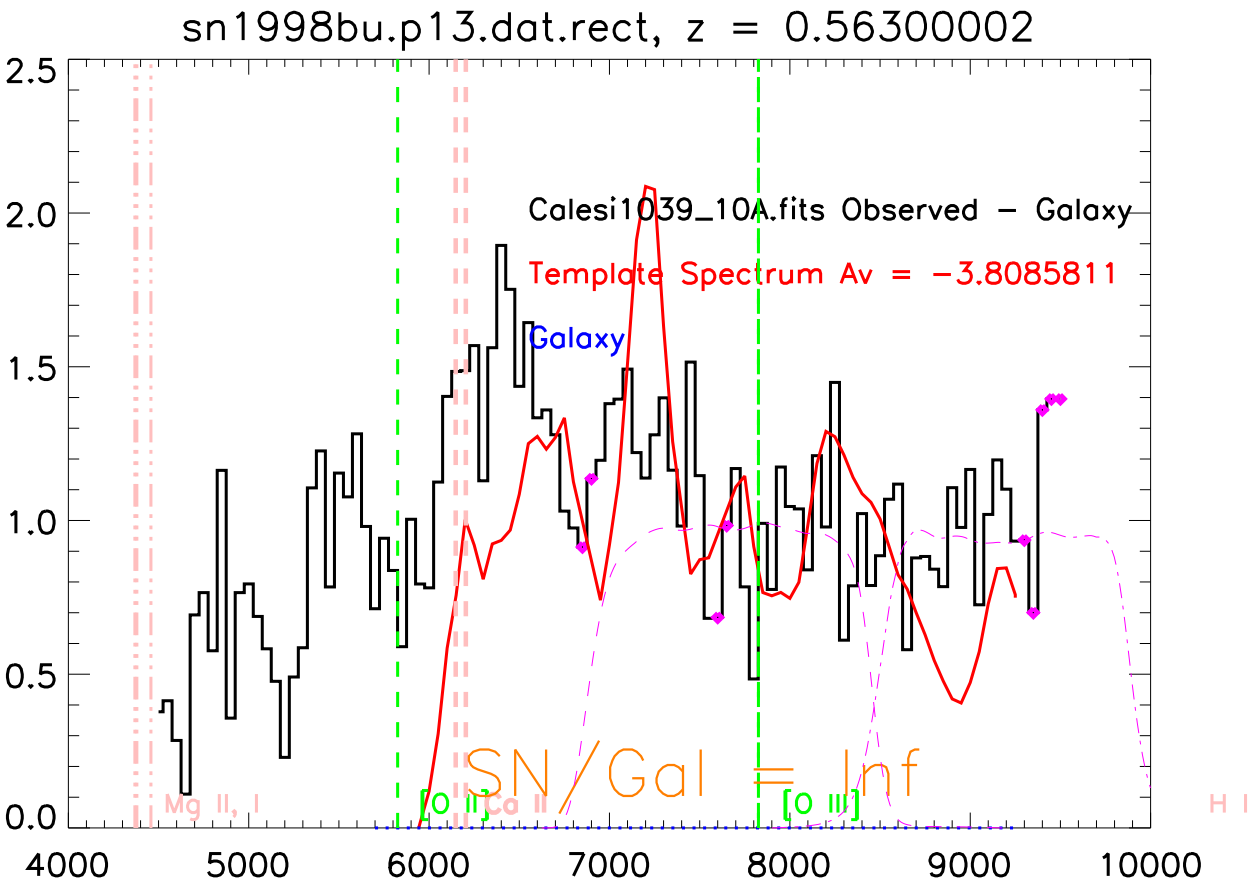
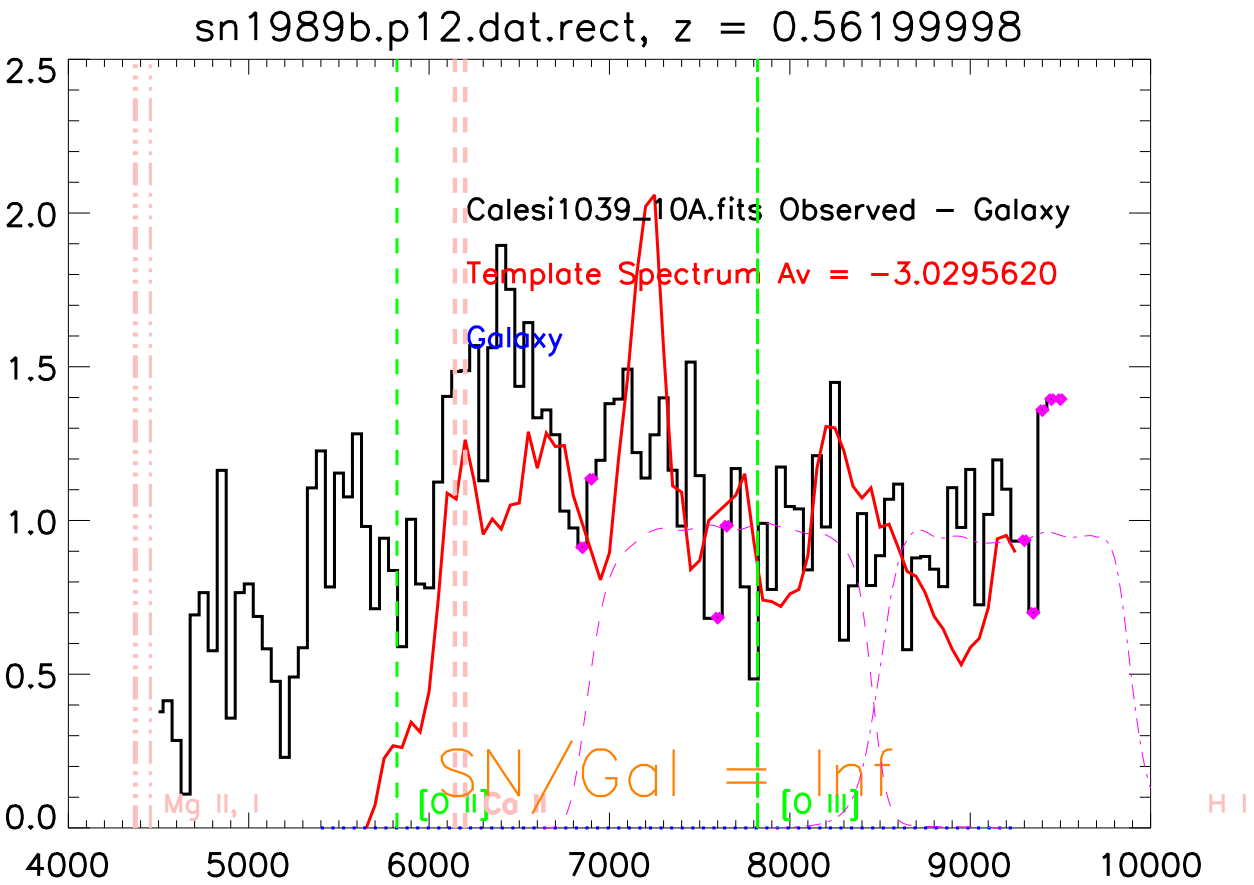
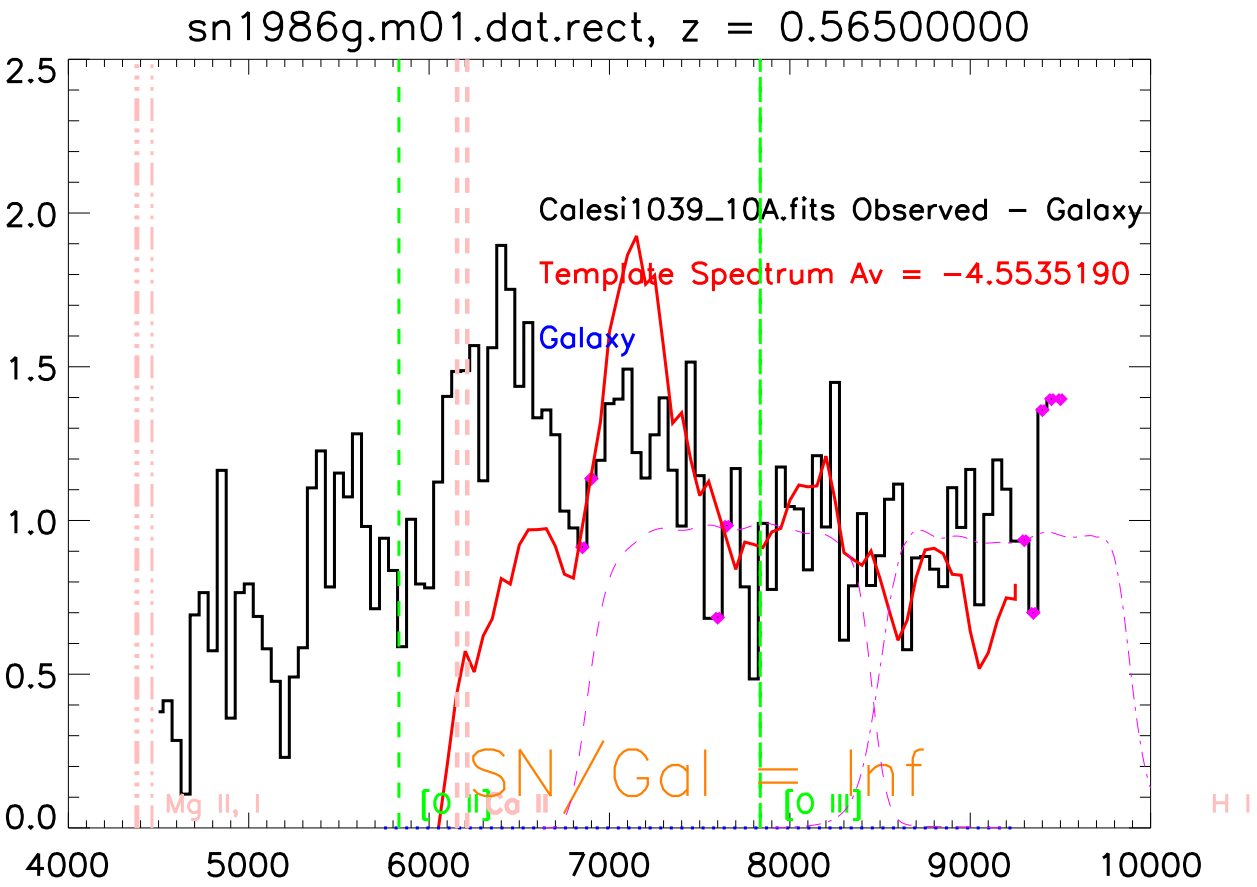
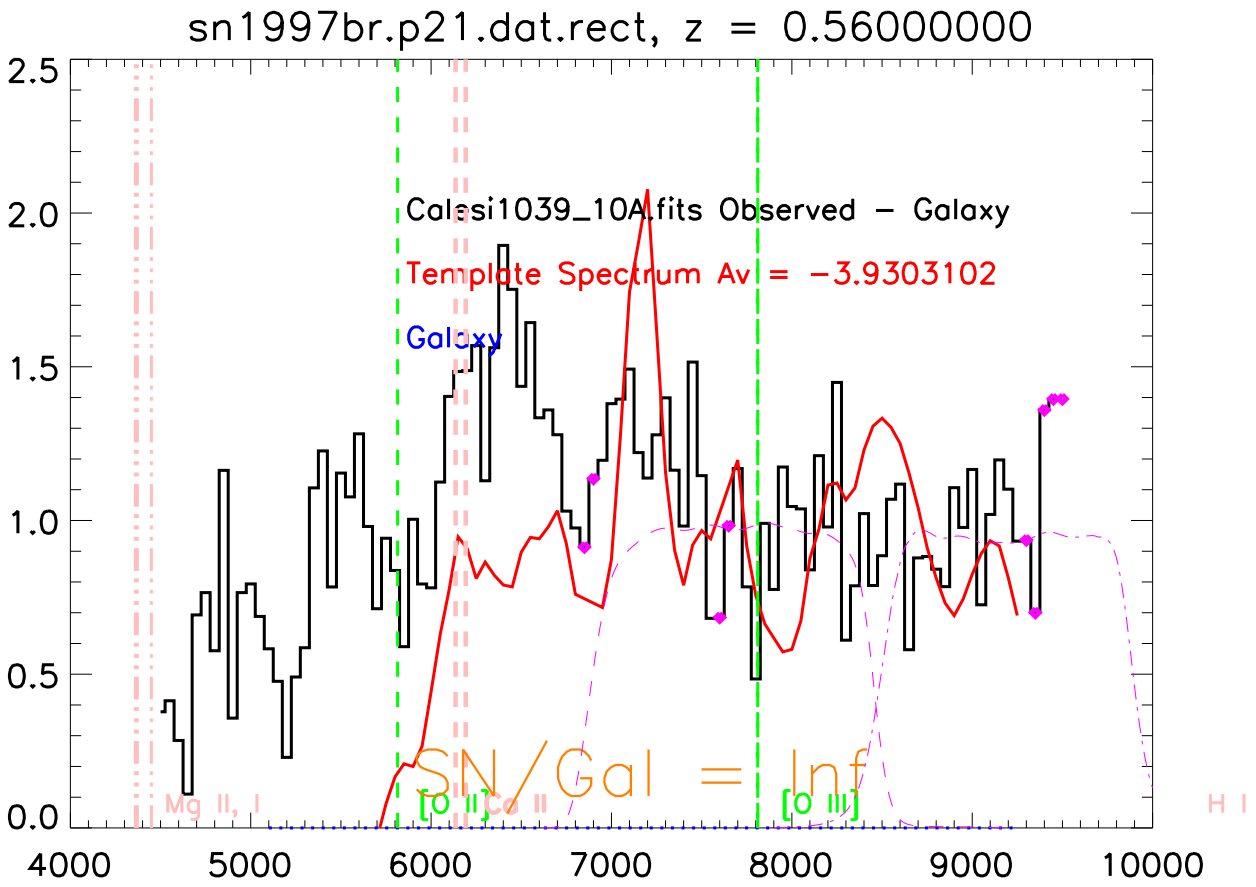
5000
6000
7000
8000
9000
10000

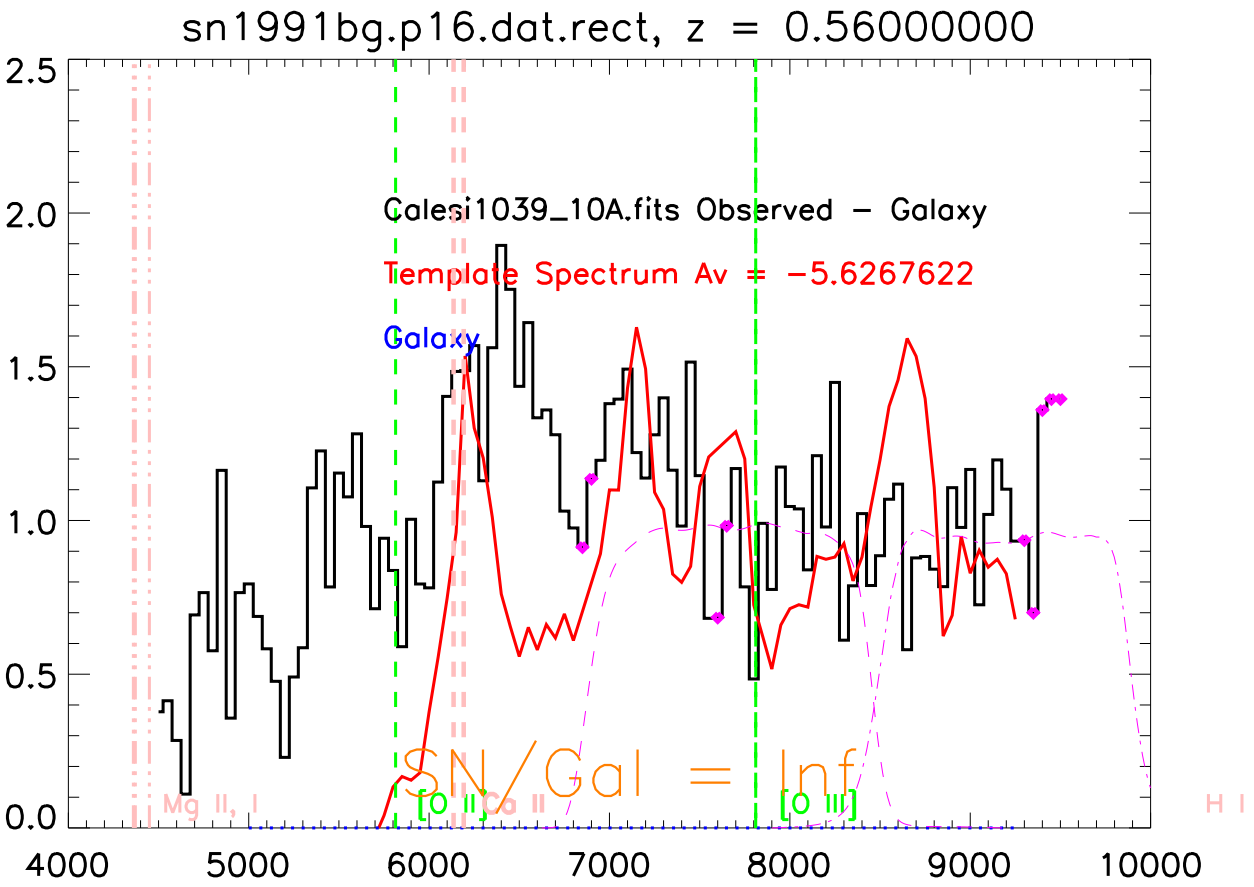

sn1989b.p11.dat.rect, z = 0.56599998
Calesi1039_10A.fits Observed − Galaxy
Template Spectrum Av = −3.6669430
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca I
[O III]
H I
2.5
2.0
1.5
1.0
0.5
0.0
4000
5000
6000
7000
8000
9000
10000

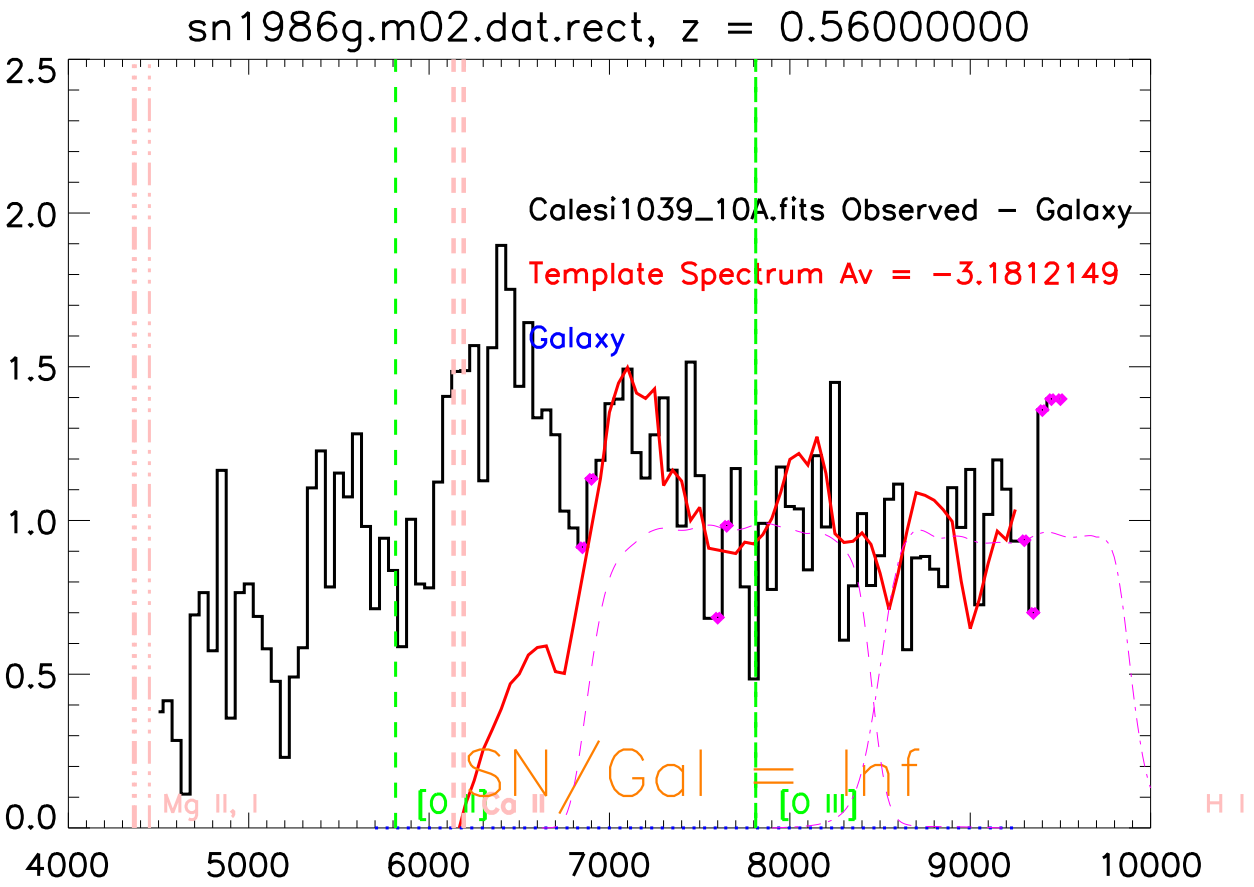

sn1998bu.p13.dat.rect, z = 0.56300002
Calesi1039_10A.fits Observed − Galaxy
Template Spectrum Av = −3.8085811
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
2.5
2.0
1.5
1.0
0.5
0.0
4000
5000
6000
7000
8000
9000
10000

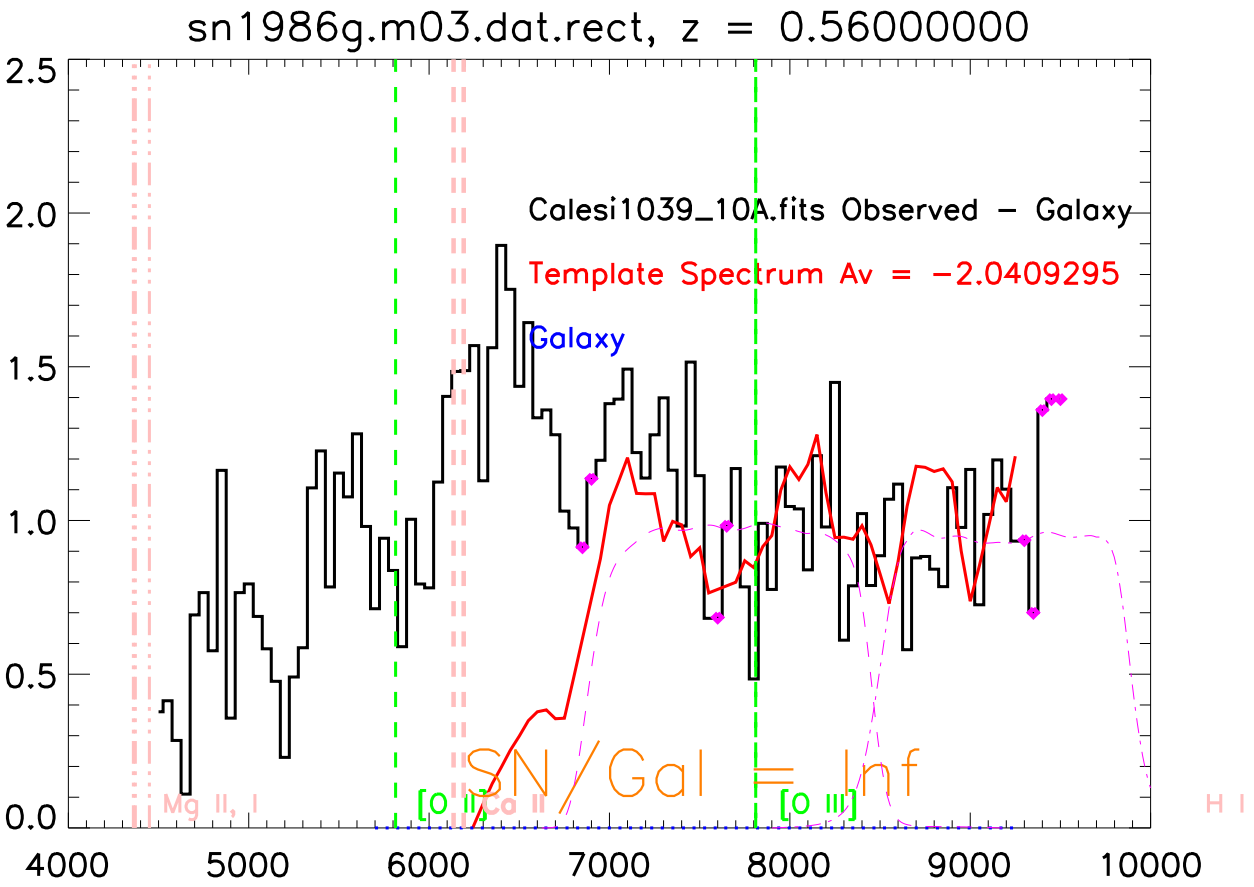

sn1989b.p12.dat.rect, z = 0.56199998
Calesi1039_10A.fits Observed − Galaxy
Template Spectrum Av = −3.0295620
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
2.5
2.0
1.5
1.0
0.5
0.0
4000
5000
6000
7000
8000
9000
10000

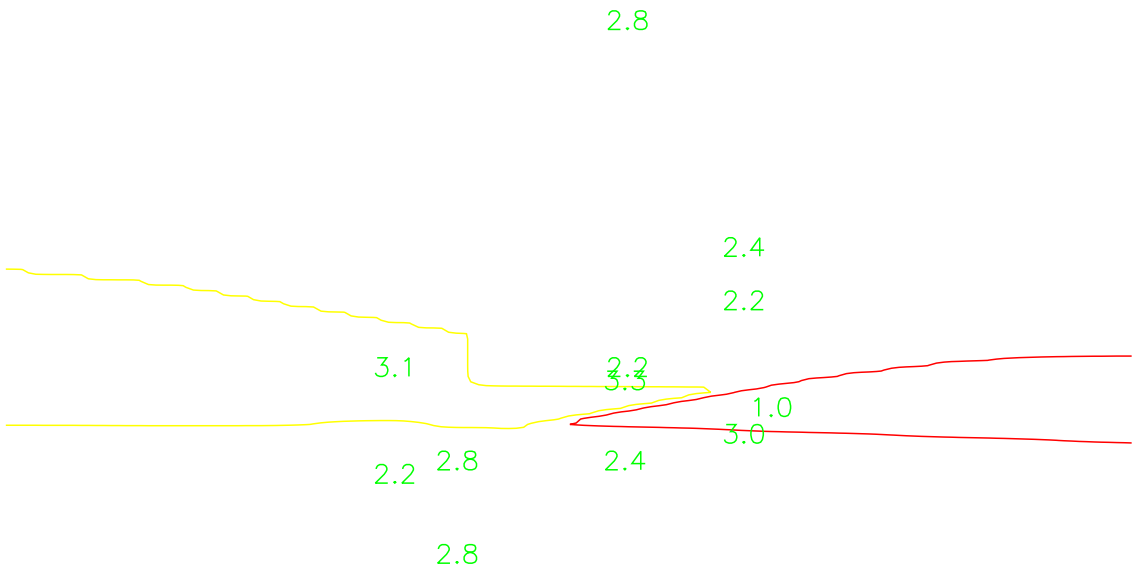

sn1986g.m01.dat.rect, z = 0.56500000
Calesi1039_10A.fits Observed − Galaxy
Template Spectrum Av = −4.5535190
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
2.5
2.0
1.5
1.0
0.5
0.0
4000
5000
6000
7000
8000
9000
10000

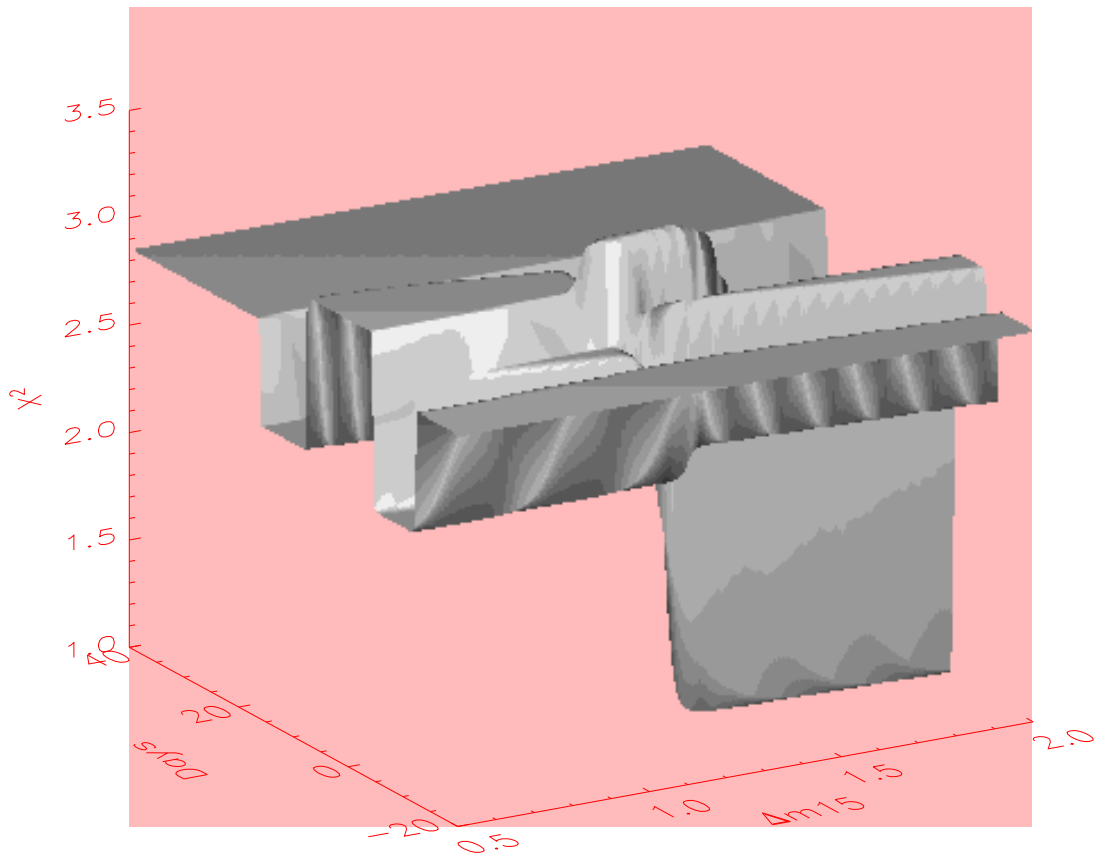

sn1997br.p21.dat.rect, z = 0.56000000
Calasi1039_10A.fits Observed − Galaxy
Template Spectrum Av = −3.9303102
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
2.5
2.0
1.5
1.0
0.5
0.0
4000
5000
6000
7000
8000
9000
10000


sn1991bg.p16.dat.rect, z = 0.56000000
Calesi1039_10A.fits Observed − Galaxy
Template Spectrum Av = −5.6267622
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
2.5
2.0
1.5
1.0
0.5
0.0
4000
5000
6000
7000
8000
9000
10000

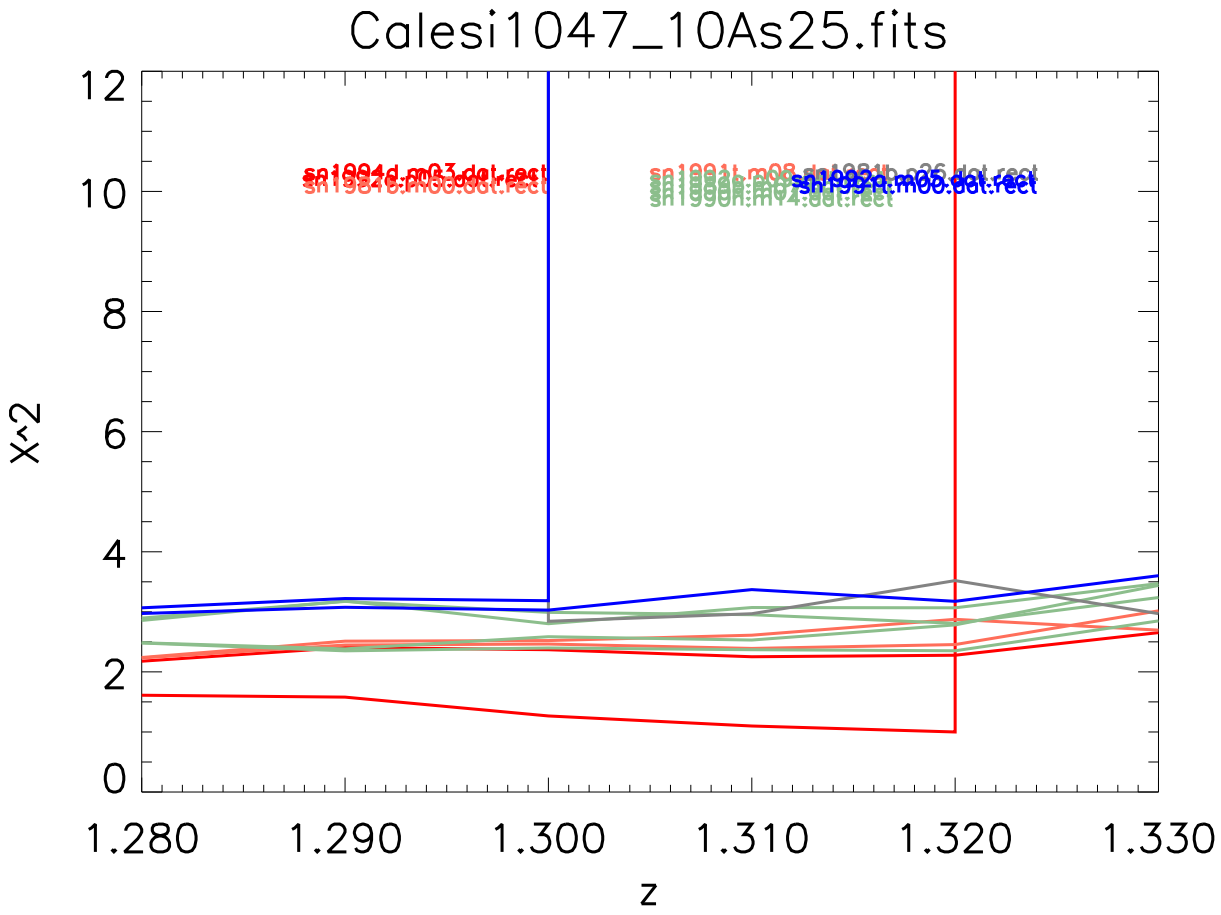

sn1986g.m02.dat.rect, z = 0.56000000
Calesi1039_10A.fits Observed − Galaxy
Template Spectrum Av = −3.1812149
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
2.5
2.0
1.5
1.0
0.5
0.0
4000
5000
6000
7000
8000
9000
10000

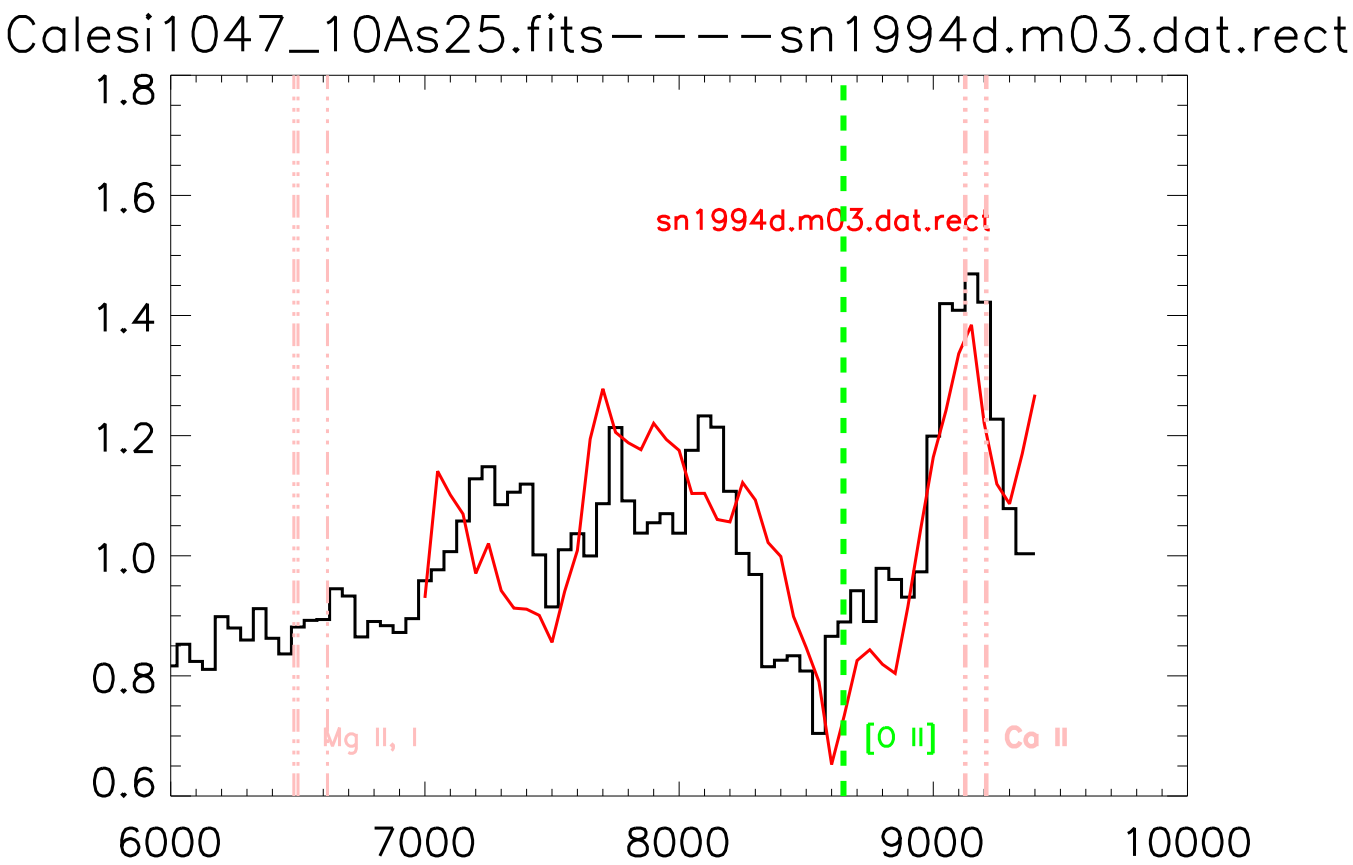

sn1986g.m03.dat.rect, z = 0.56000000
Calesi1039_10A.fits Observed − Galaxy
Template Spectrum Av = −2.0409295
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
2.5
2.0
1.5
1.0
0.5
0.0
4000
5000
6000
7000
8000
9000
10000

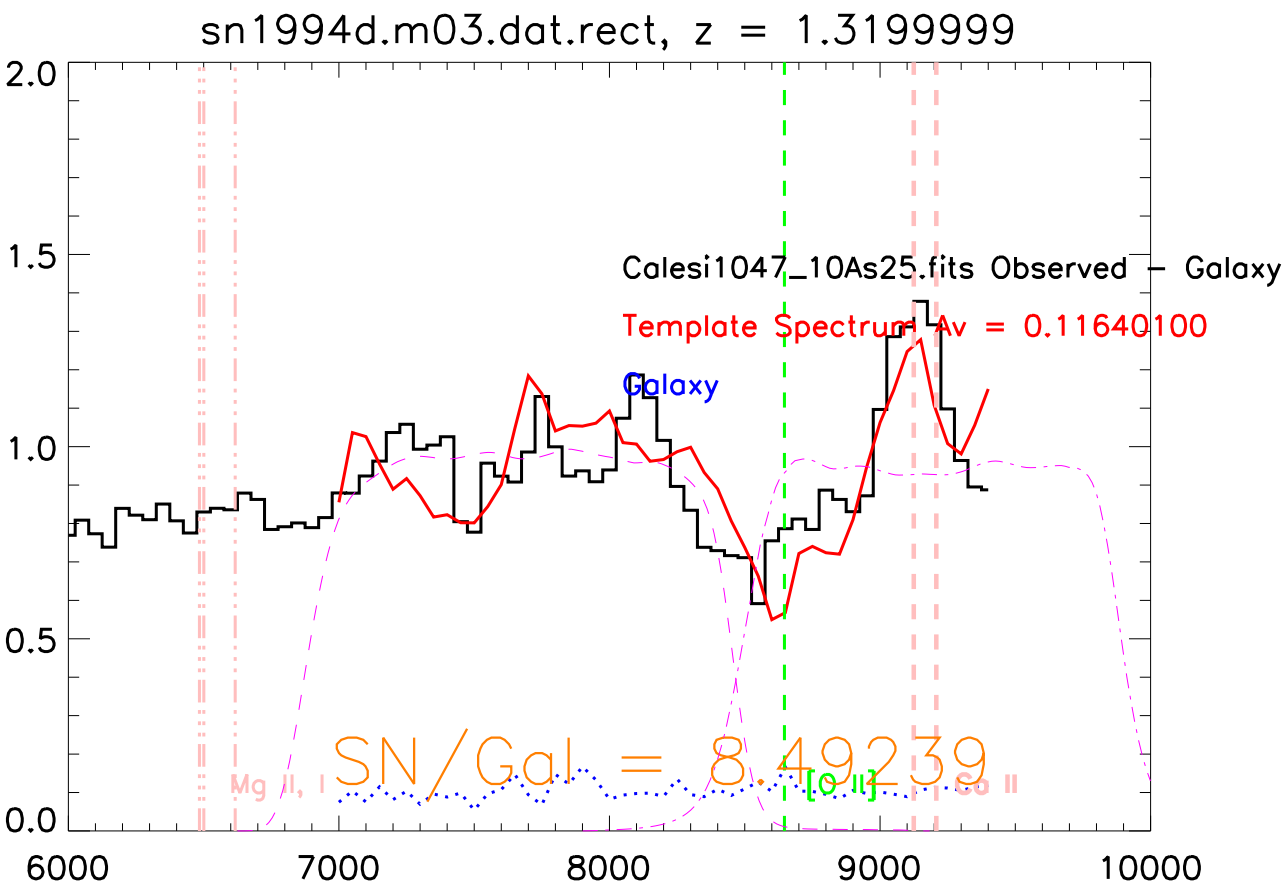

2.8
2.4
2.2
3.1
2.2
3.3
1.0
3.0
2.2
2.8
2.4
2.8

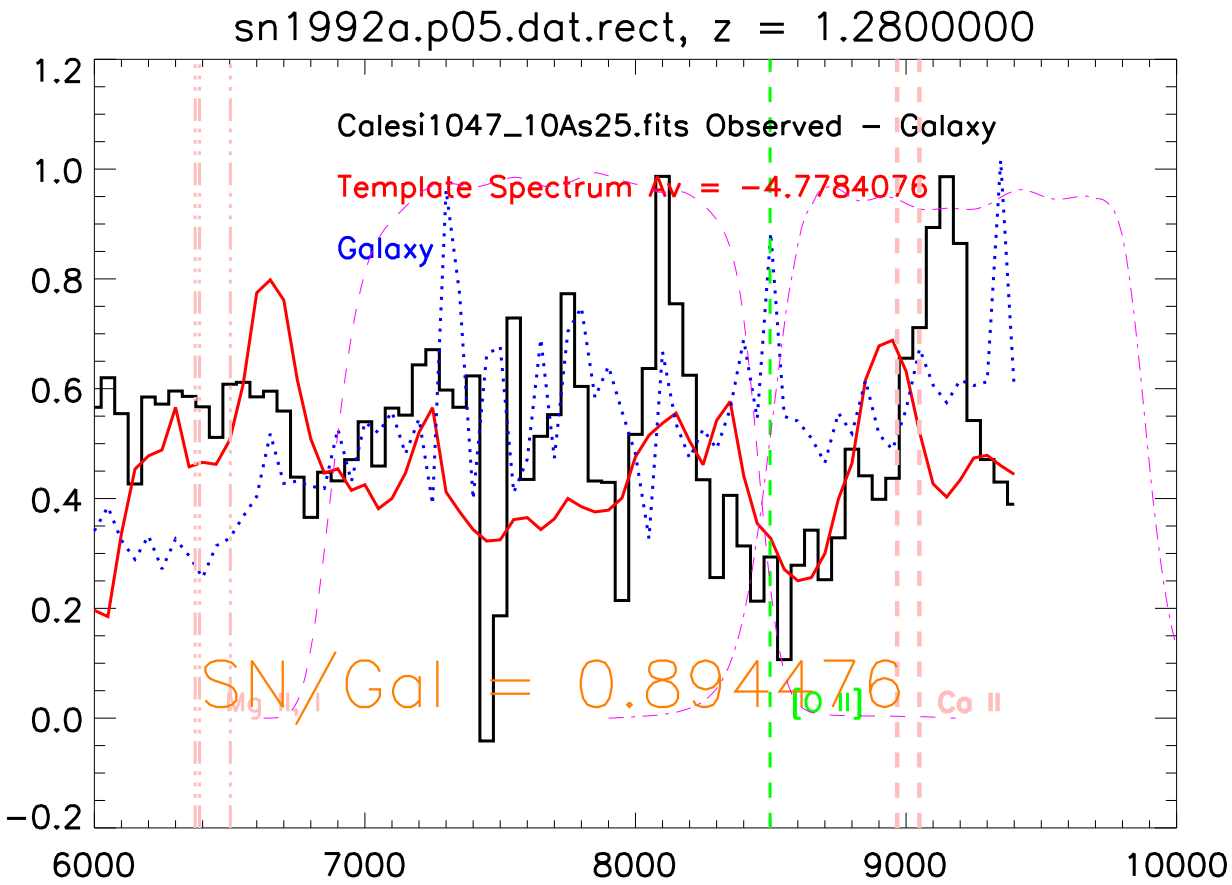


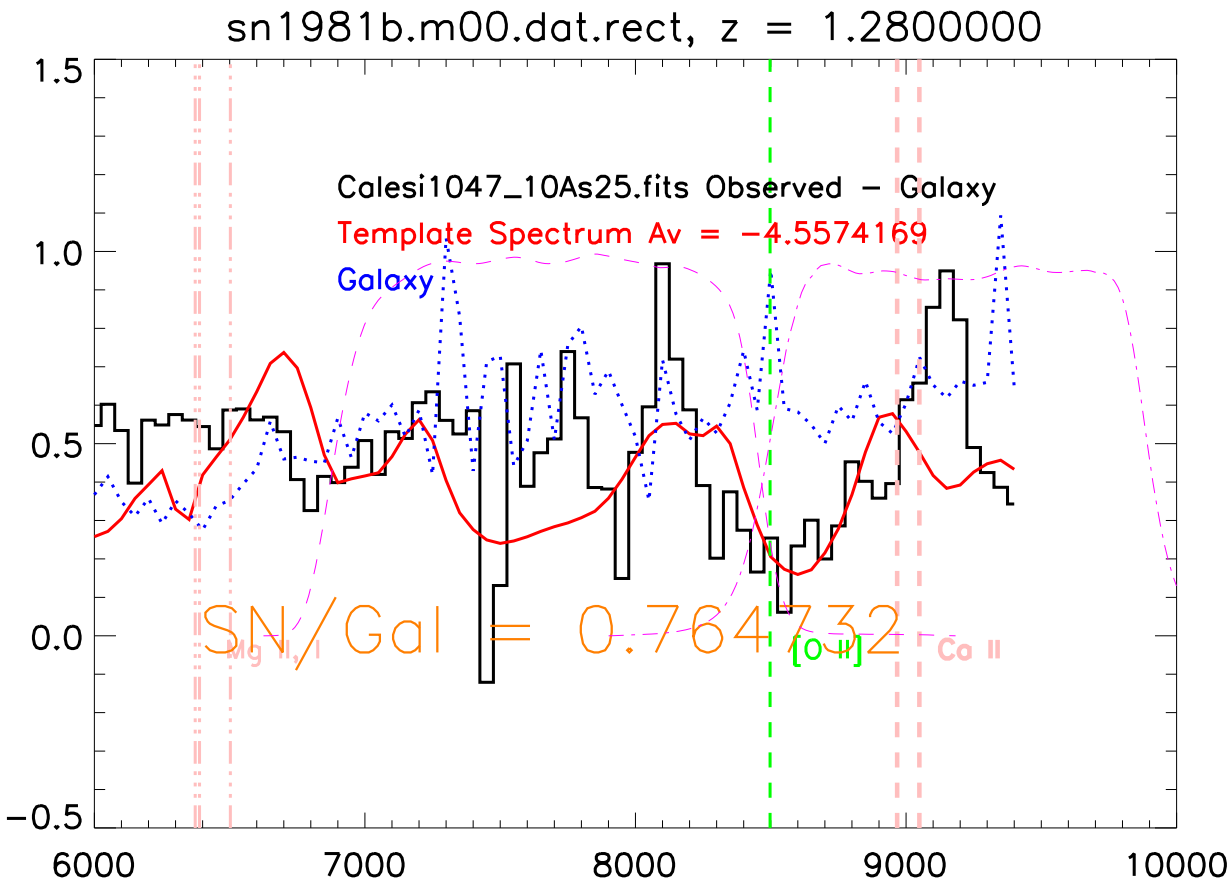
3.5
3.0
2.5
2.0
1.5
1.0
χ^2
40
20
0
−20
Days
0.5
1.0
1.5
2.0
Δm15

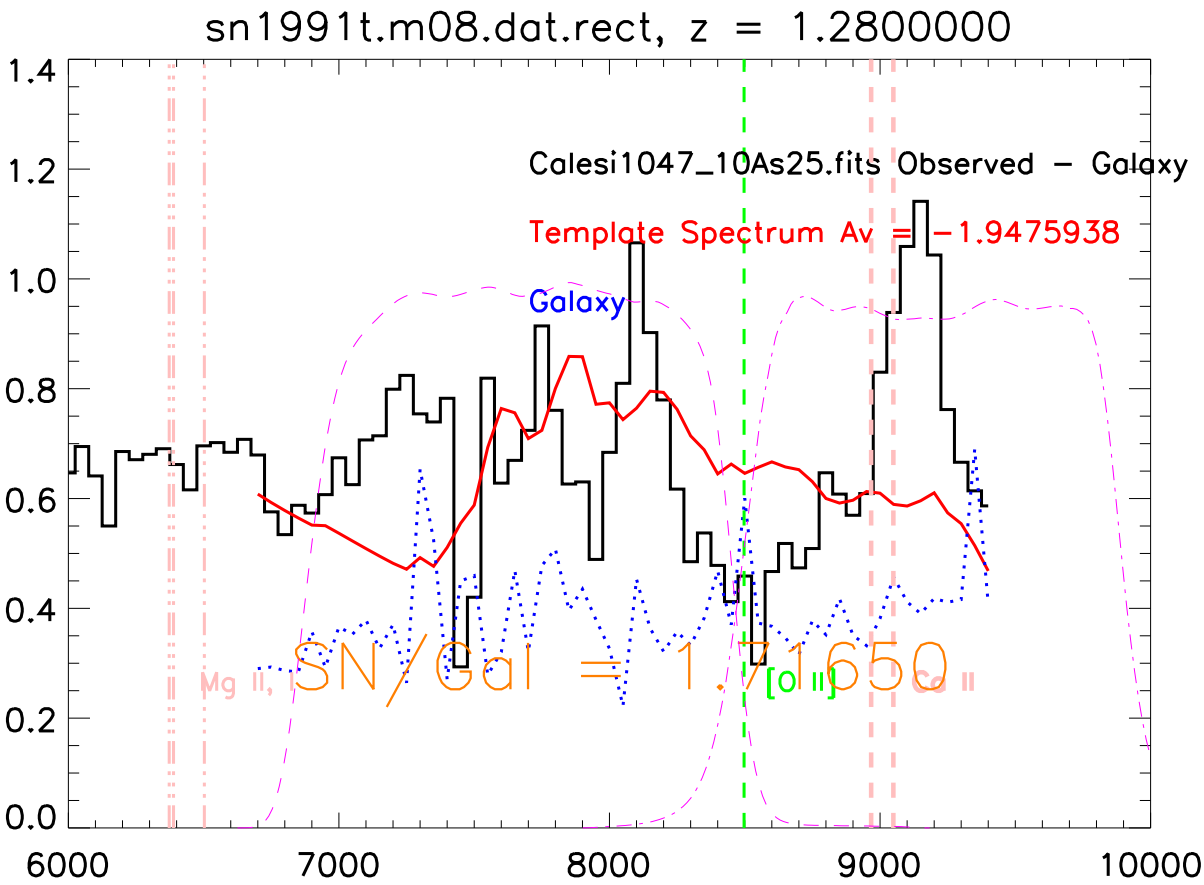

Calesi1047_10As25.fits
X^2
z
0
2
4
6
8
10
12
1.280
1.290
1.300
1.310
1.320
1.330
sn1994d.m03.dat.rect
sn1991t.m08.dat.rect
sn1990n.m00.dat.rect

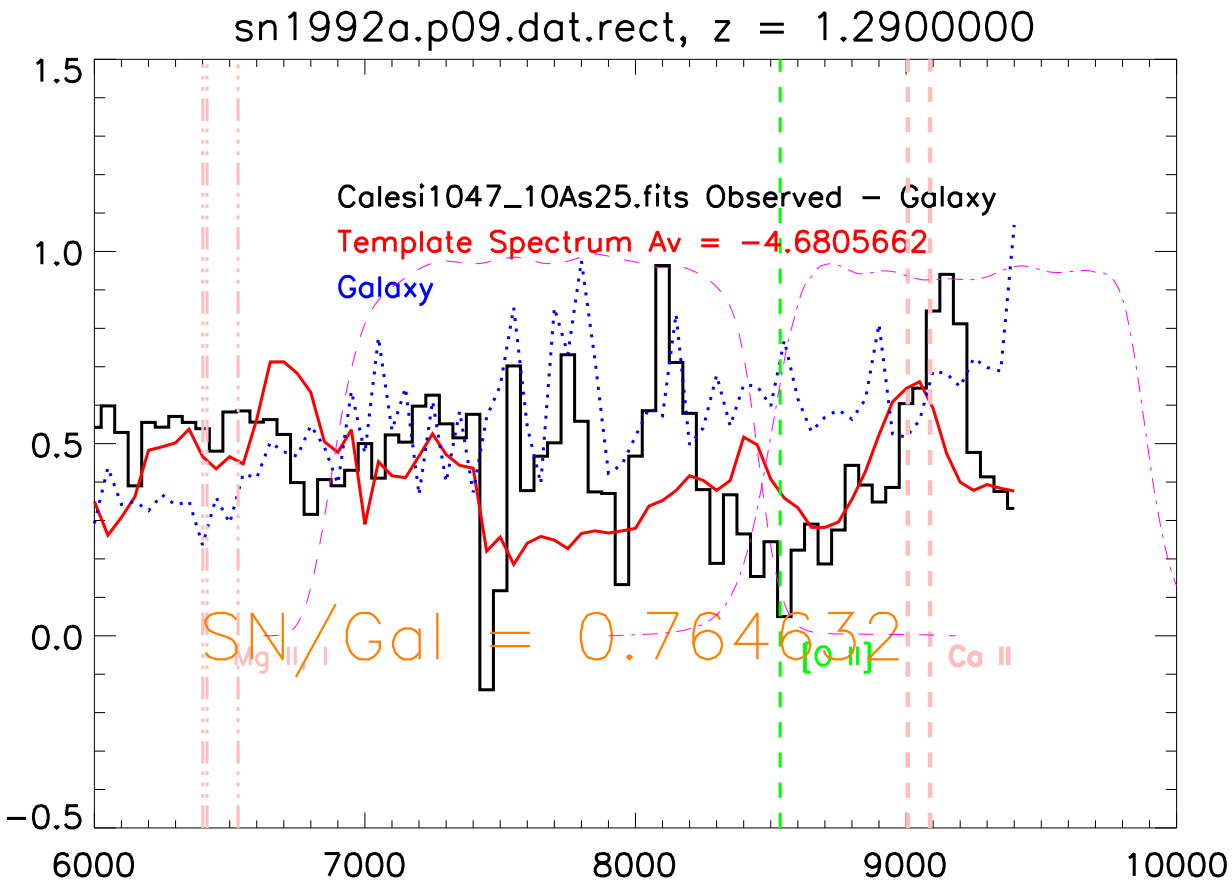

Calesi1047_10As25.fits----sn1994d.m03.dat.rect
sn1994d.m03.dat.rect
Mg II, I
[O II]
Ca II
1.8
1.6
1.4
1.2
1.0
0.8
0.6
6000
7000
8000
9000
10000

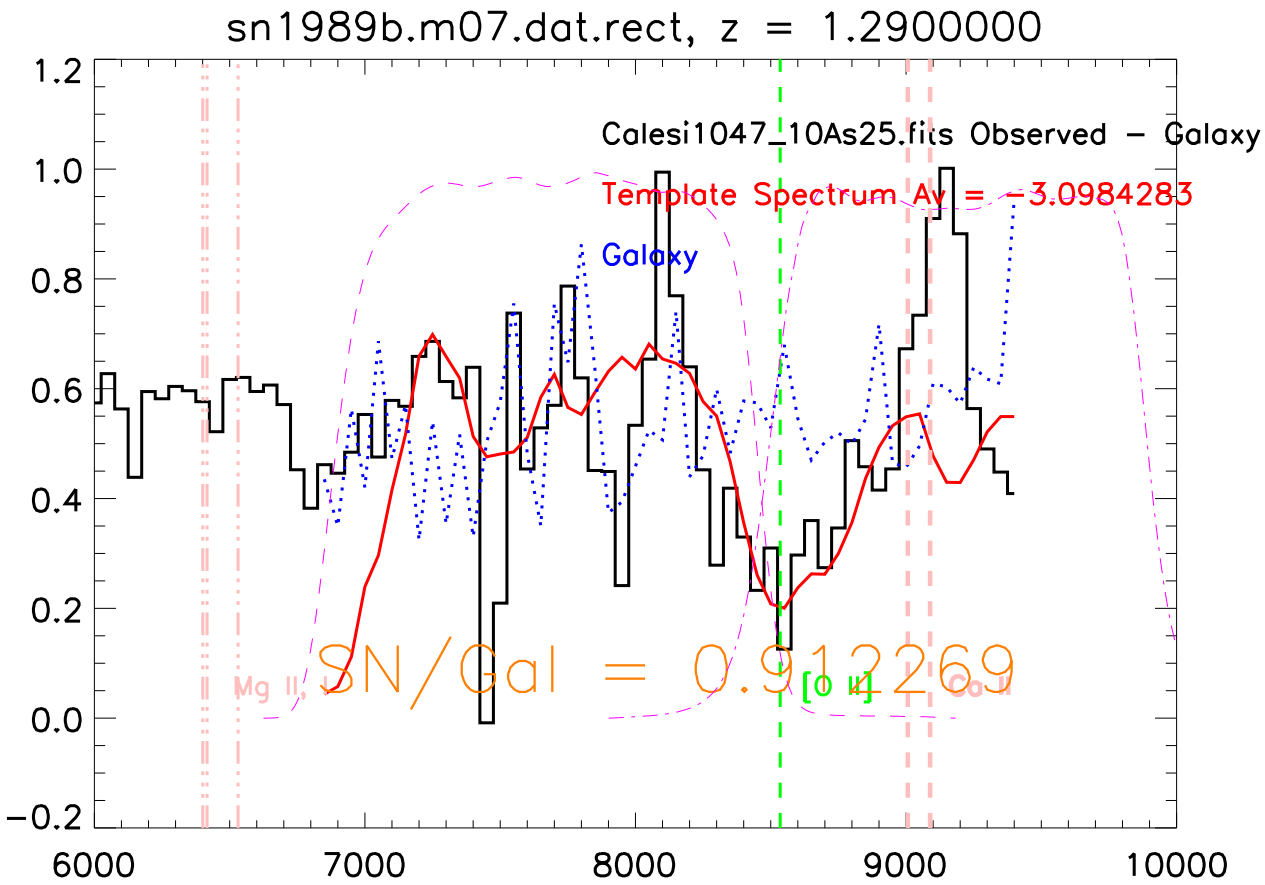

sn1994d.m03.dat.rect, z = 1.3199999
Calesi1047_10As25.fits Observed – Galaxy
Template Spectrum Av = 0.11640100
Galaxy
SN/Gal = 8.49239
Mg II, I
[O II]
Ca II
2.0
1.5
1.0
0.5
0.0
6000
7000
8000
9000
10000

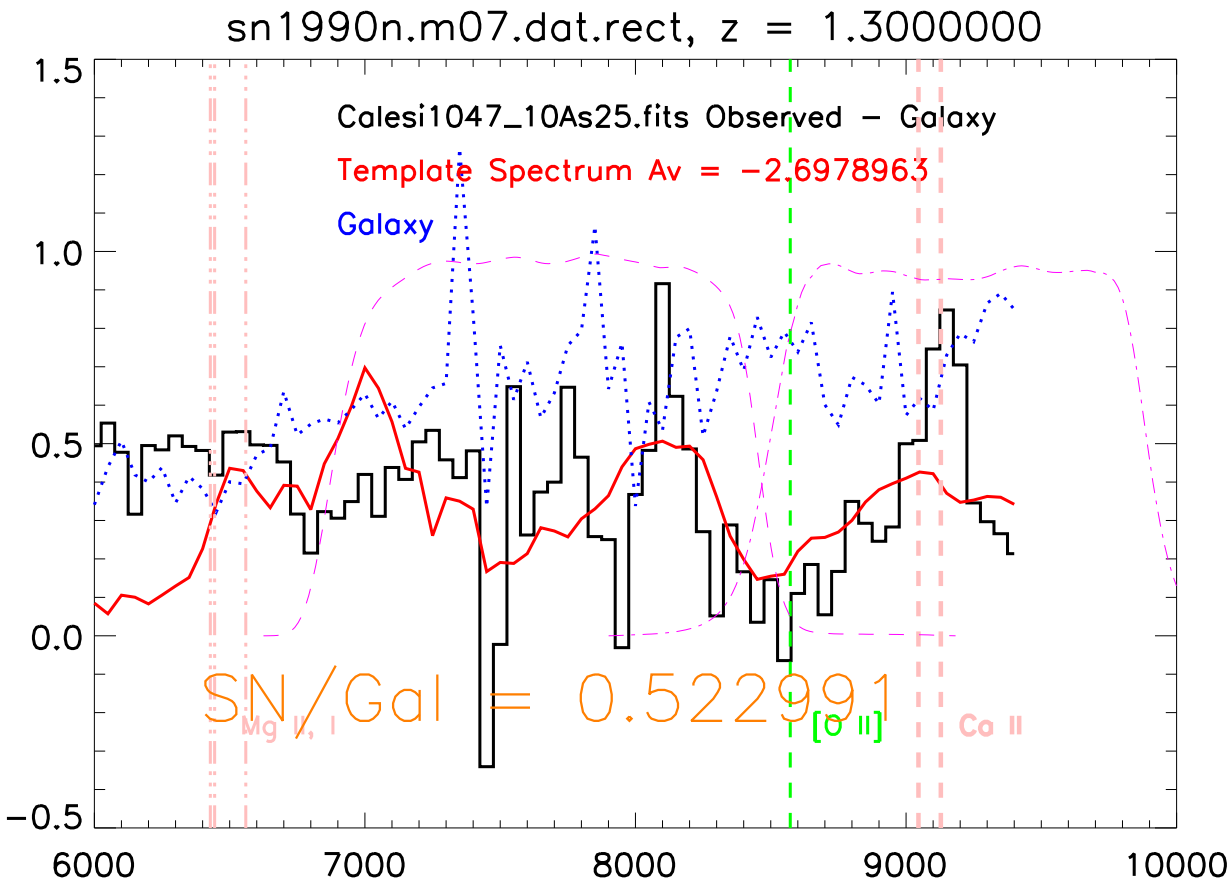

sn1992a.p05.dat.rect, z = 1.2800000
Calesi1047_10As25.fits Observed − Galaxy
Template Spectrum Av = −4.7784076
Galaxy
SN/Gal = 0.8944476
Mg II
[O II]
Ca II
1.2
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
6000
7000
8000
9000
10000

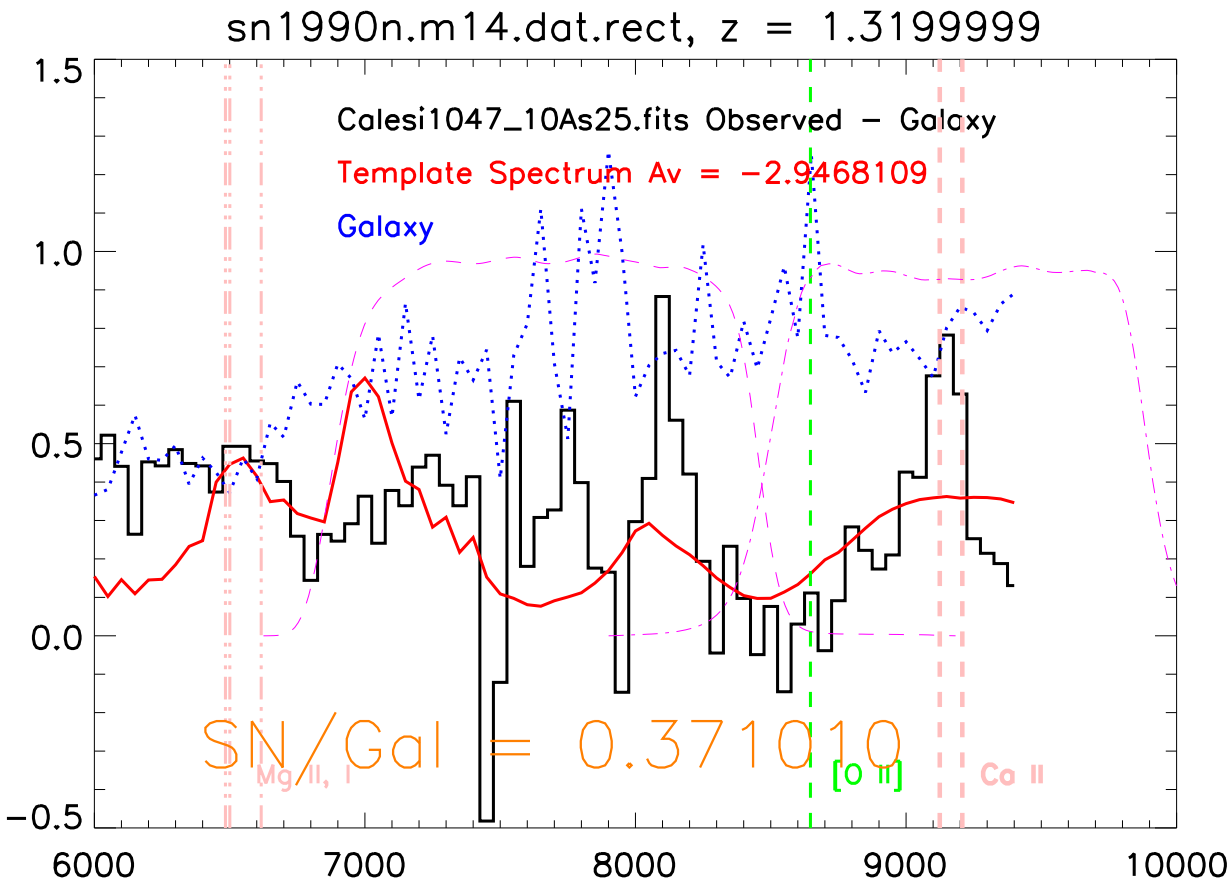

sn1981b.m00.dat.rect, z = 1.2800000
Calesi1047_10As25.fits Observed − Galaxy
Template Spectrum Av = −4.5574169
Galaxy
SN/Gal = 0.764732
Mg II
[O II]
Ca II
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

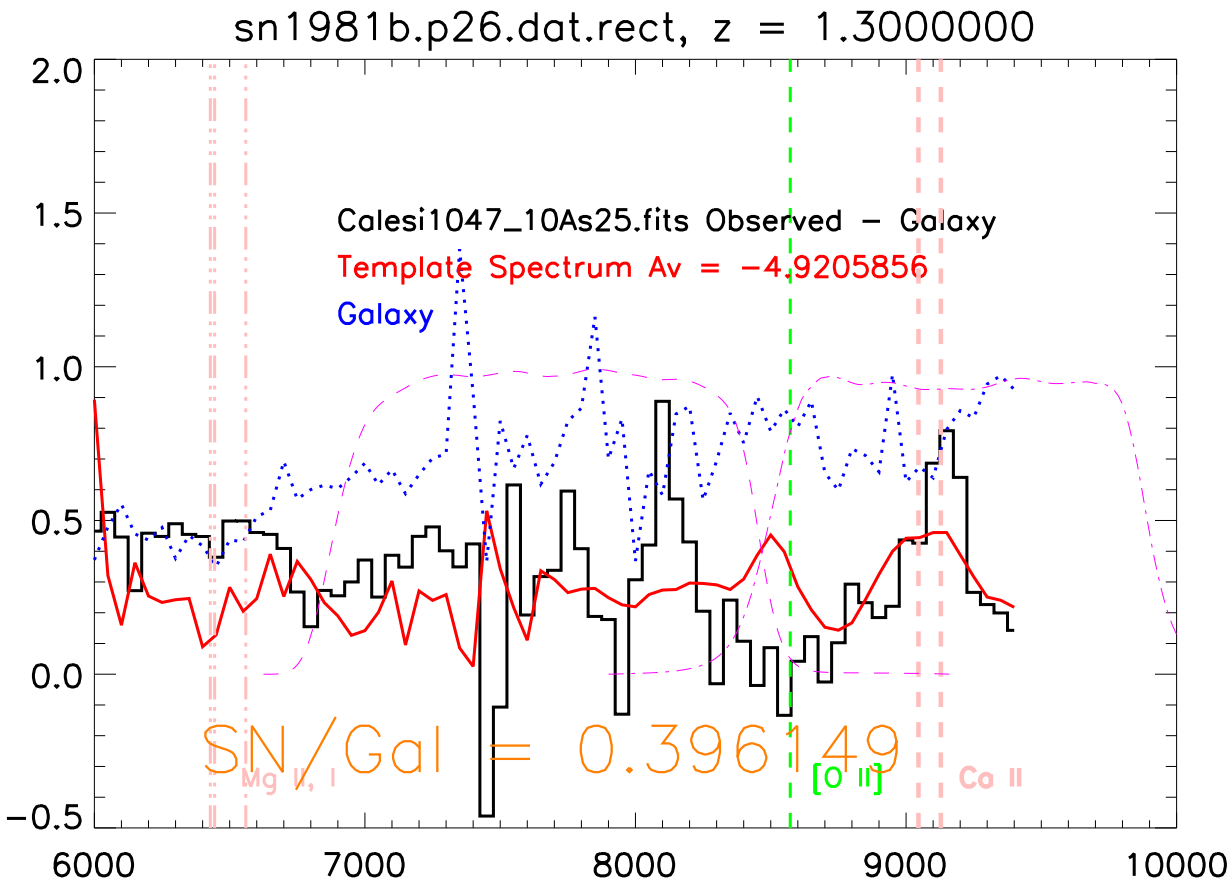

sn1991t.m08.dat.rect, z = 1.2800000
Calesi1047_10As25.fits Observed − Galaxy
Template Spectrum Av = −1.9475938
Galaxy
SN/Gal = 1.71650
Mg II
[O II]
Ca II
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
6000
7000
8000
9000
10000

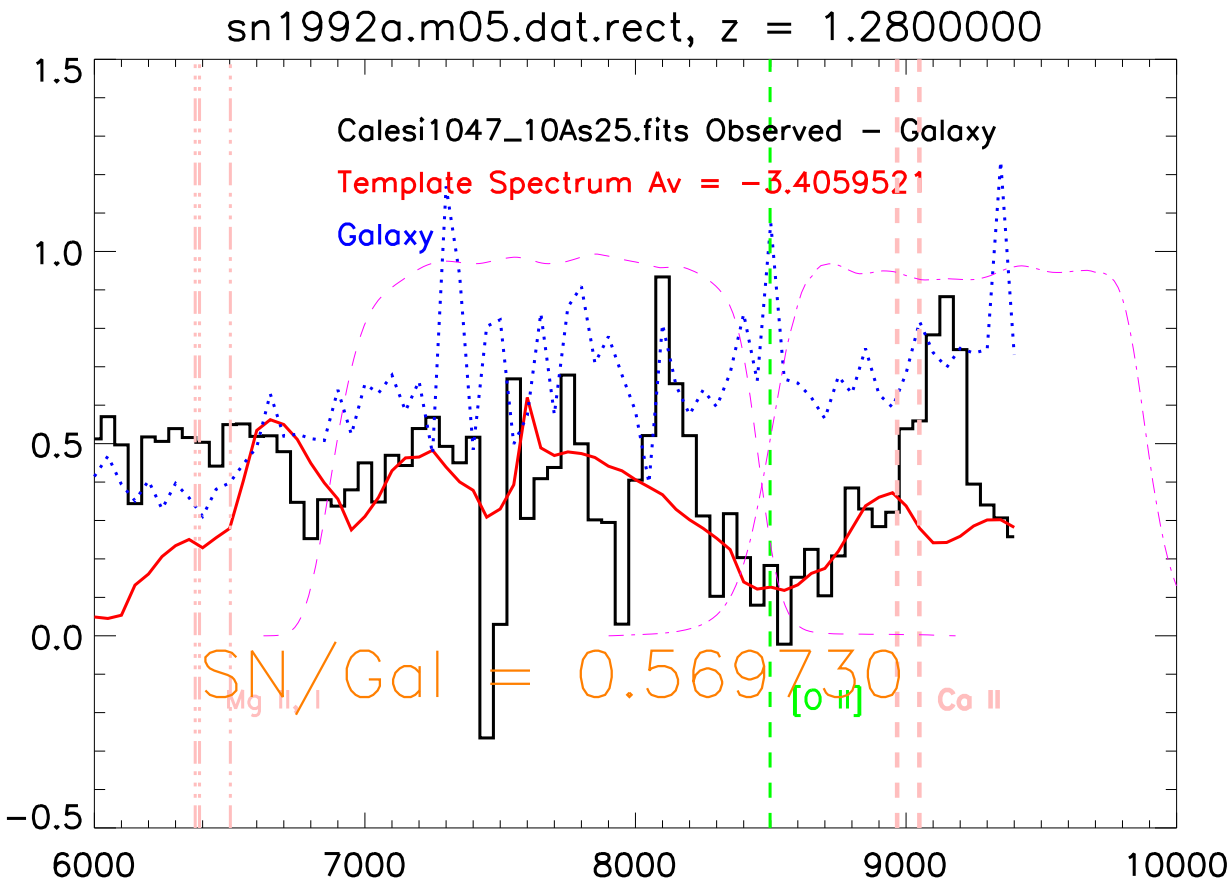

sn1992a.p09.dat.rect, z = 1.2900000
Calesi1047_10As25.fits Observed − Galaxy
Template Spectrum Av = −4.6805662
Galaxy
SN/Gal = 0.764632
Mg II
[O II]
Ca II
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

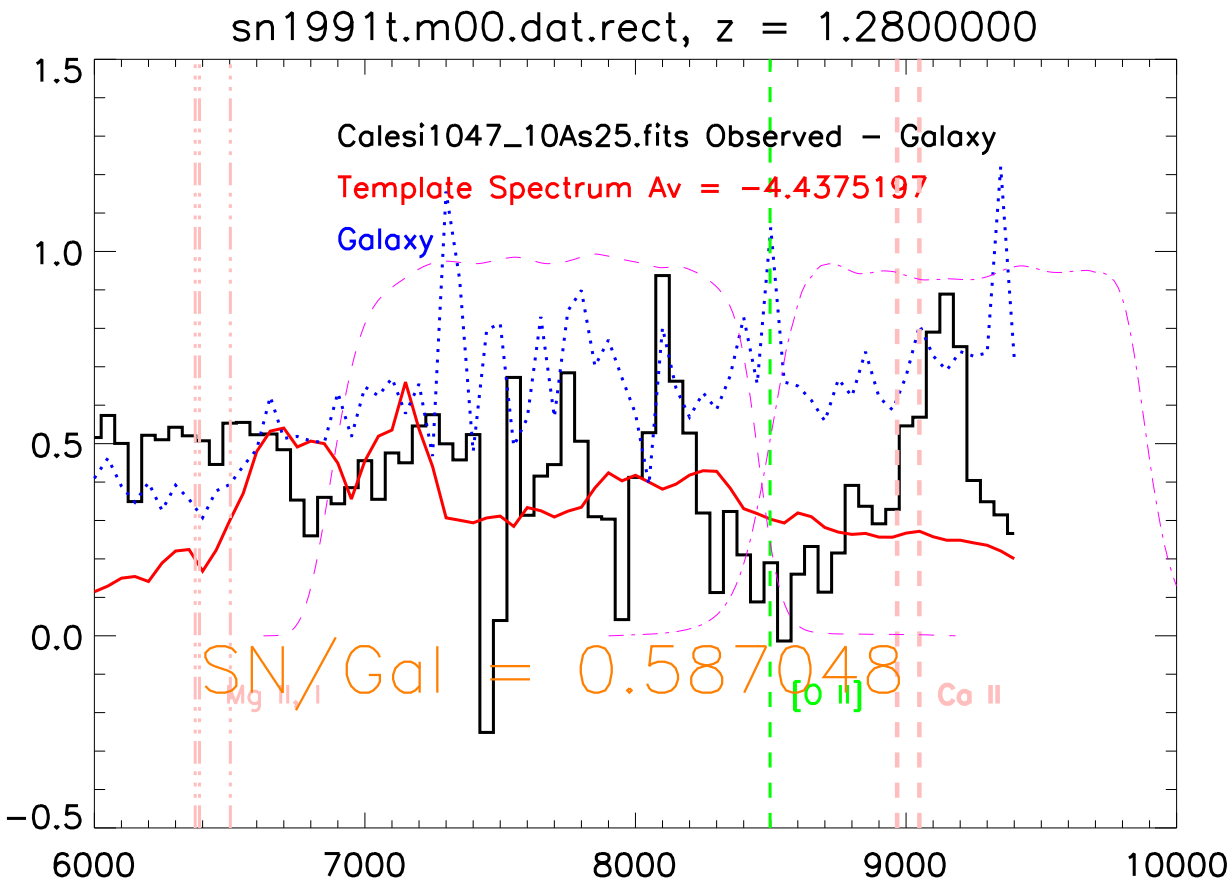

sn1989b.m07.dat.rect, z = 1.2900000
Calesi1047_10As25.fits Observed − Galaxy
Template Spectrum Av = −3.0984283
Galaxy
SN/Gal = 0.9112269
Mg II
[O II]
Ca II
1.2
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
6000
7000
8000
9000
10000

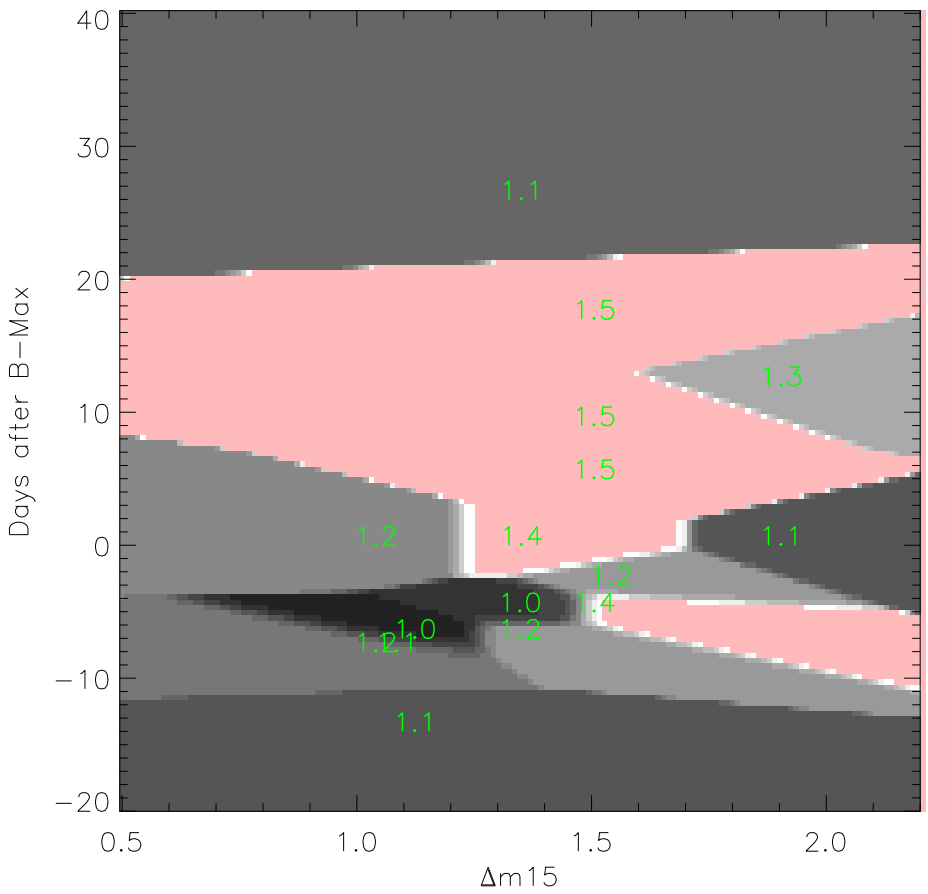

sn1990n.m07.dat.rect, z = 1.3000000
Calesi1047_10As25.fits Observed − Galaxy
Template Spectrum Av = −2.6978963
Galaxy
SN/Gal = 0.522991
Mg II, I
[O II]
Ca II
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

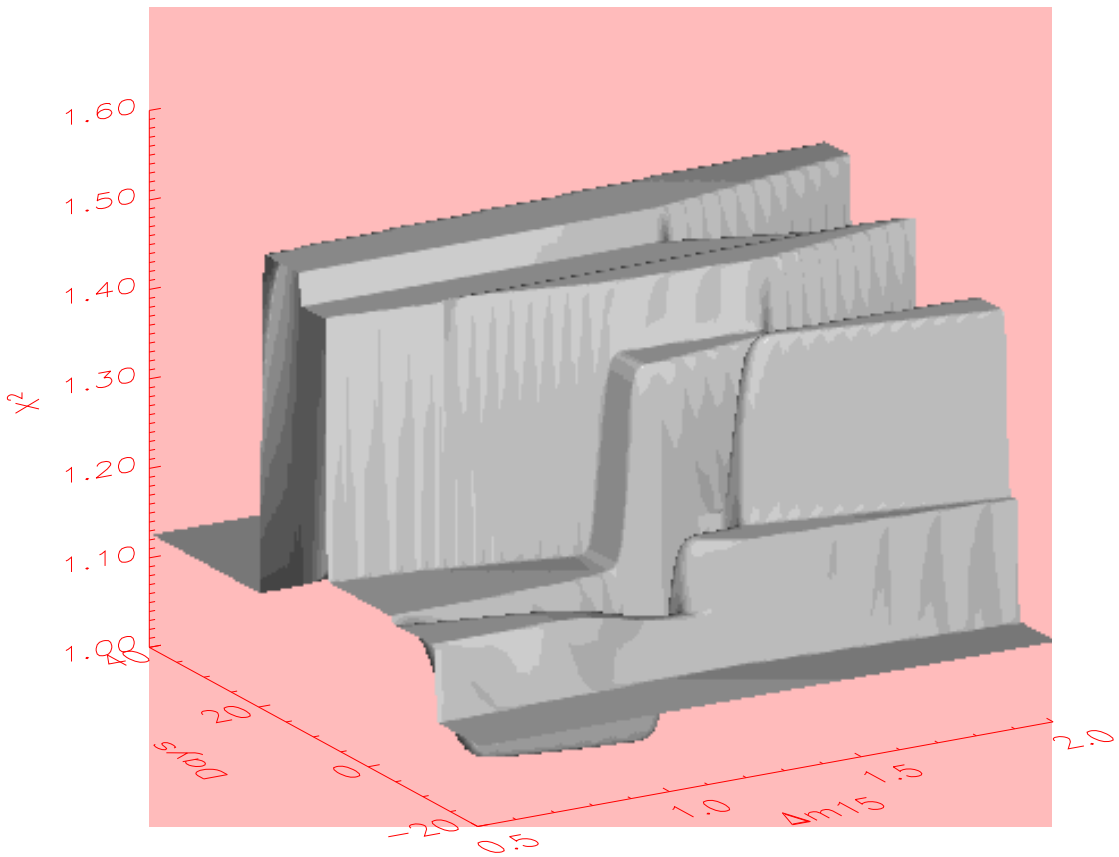

sn1990n.m14.dat.rect, z = 1.3199999
Calesi1047_10As25.fits Observed − Galaxy
Template Spectrum Av = −2.9468109
Galaxy
SN/Gal = 0.371010
Mg II, I
[O II]
Ca II
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000


sn1981b.p26.dat.rect, z = 1.3000000
Calesi1047_10As25.fits Observed − Galaxy
Template Spectrum Av = −4.9205856
Galaxy
S/N/Gal = 0.396149
Mg II, I
[O II]
Ca II
2.0
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

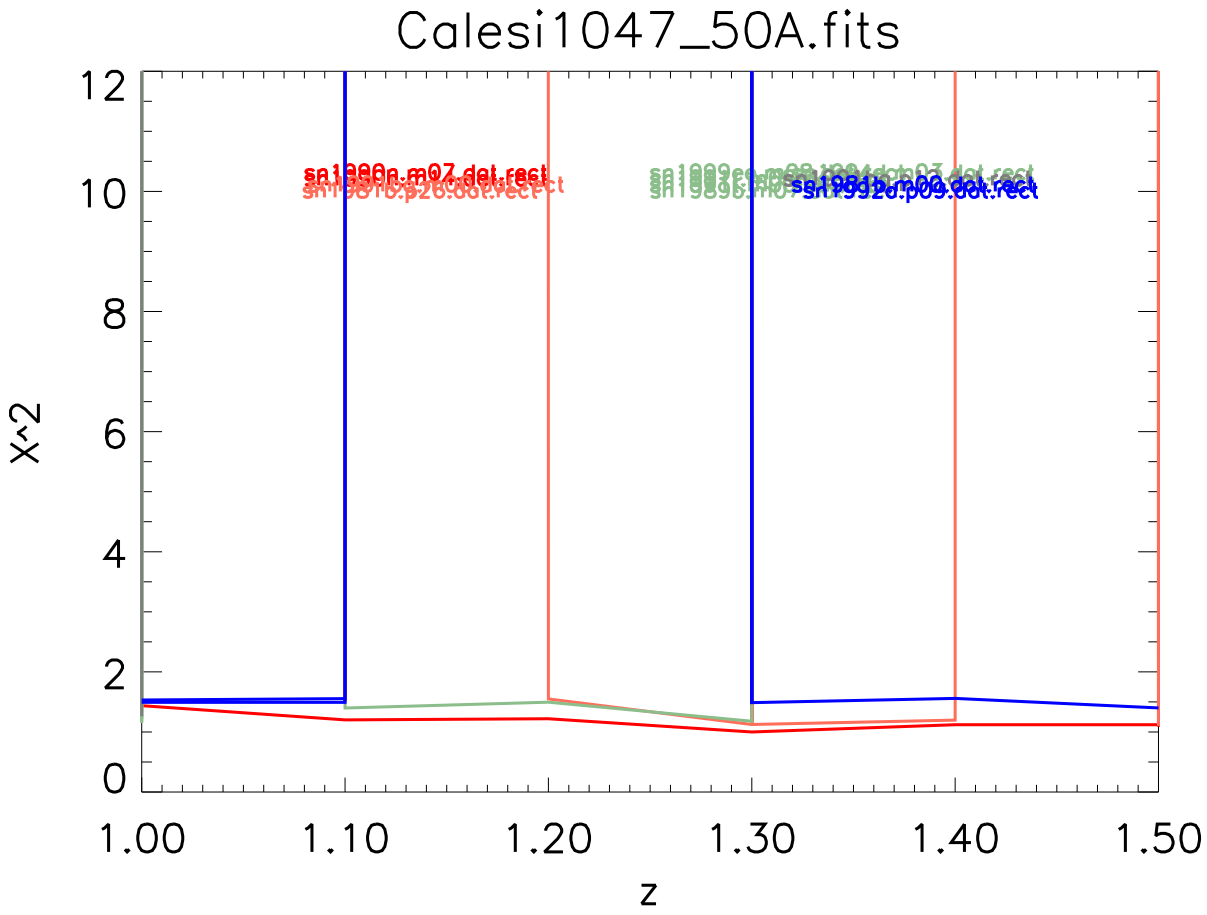

sn1992a.m05.dat.rect, z = 1.2800000
Calesi1047_10As25.fits Observed − Galaxy
Template Spectrum Av = −3.4059521
Galaxy
SN/Gal = 0.569730
Mg II, I
[O II]
Ca II
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

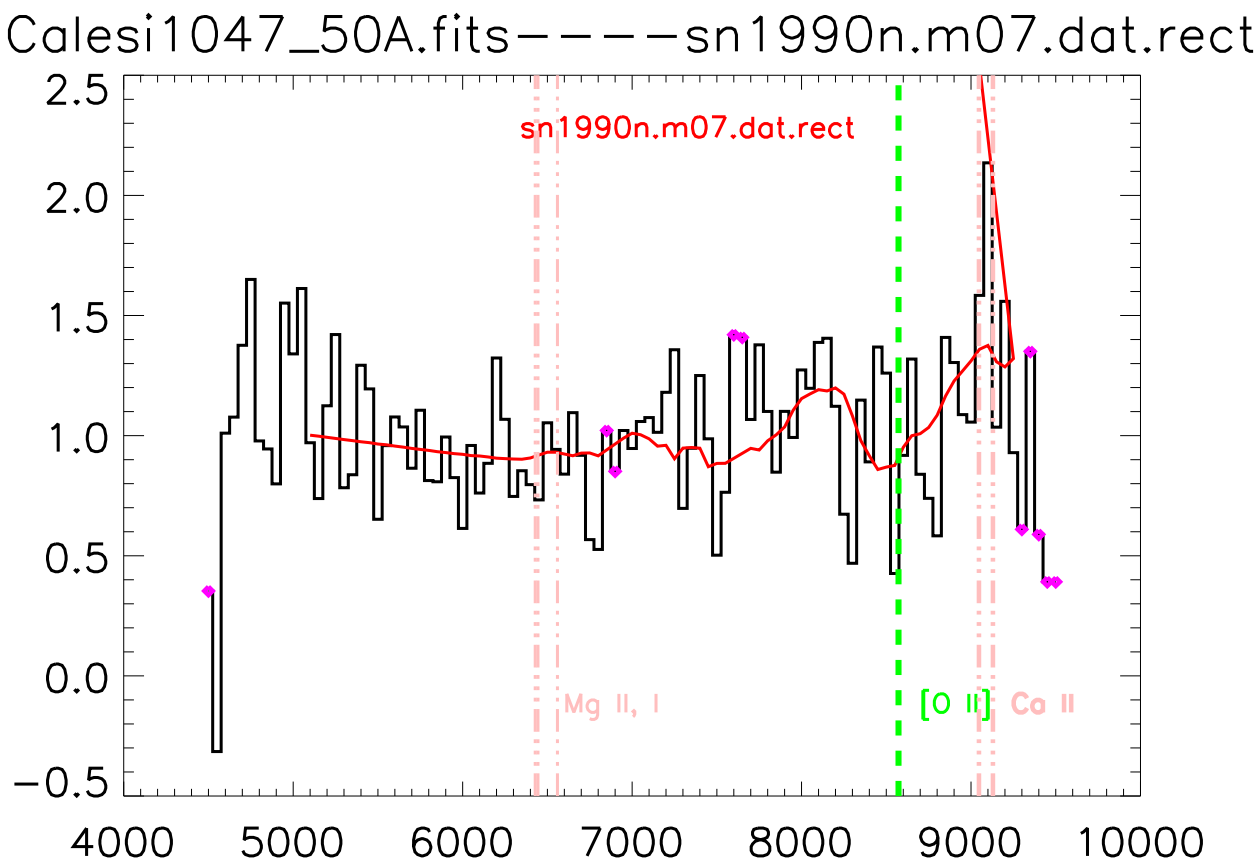

sn1991t.m00.dat.rect, z = 1.2800000
Calesi1047_10As25.fits Observed − Galaxy
Template Spectrum Av = −4.4375197
Galaxy
SN/Gal = 0.587048
Mg II
[O II]
Ca II
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

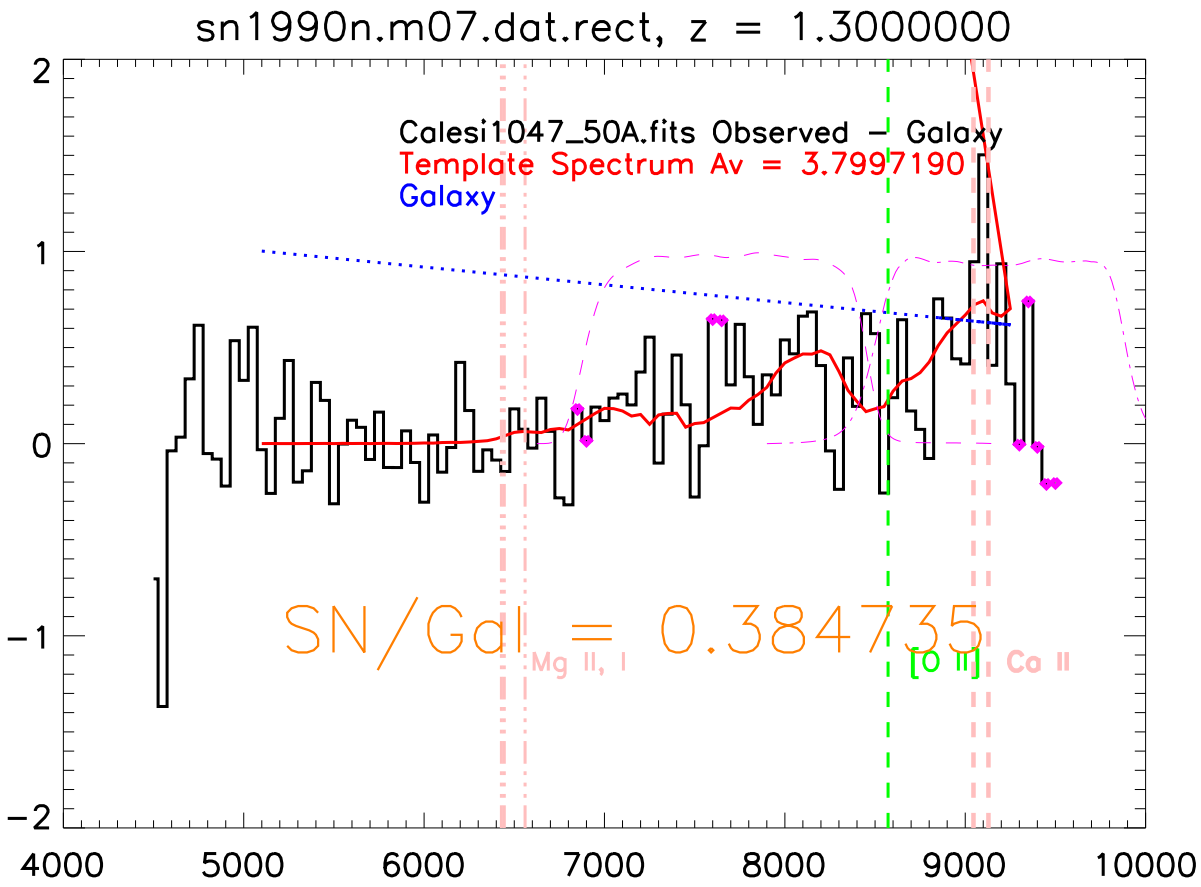

40
30
20
10
0
−10
−20
0.5
1.0
1.5
2.0
Days after B−Max
Δm15
1.1
1.5
1.3
1.5
1.5
1.2
1.4
1.1
1.2
1.0
1.4
1.2
1.0
1.2
1.1
1.1

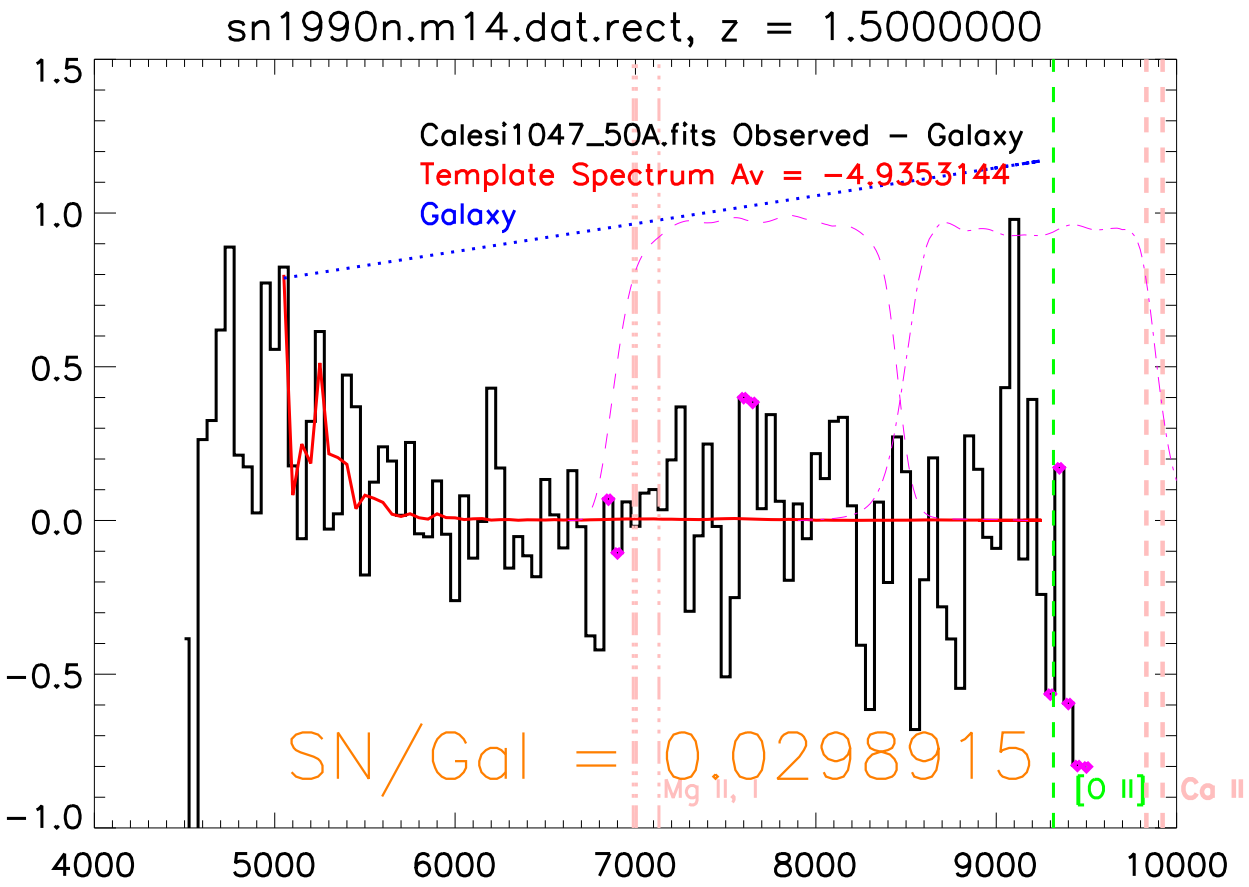


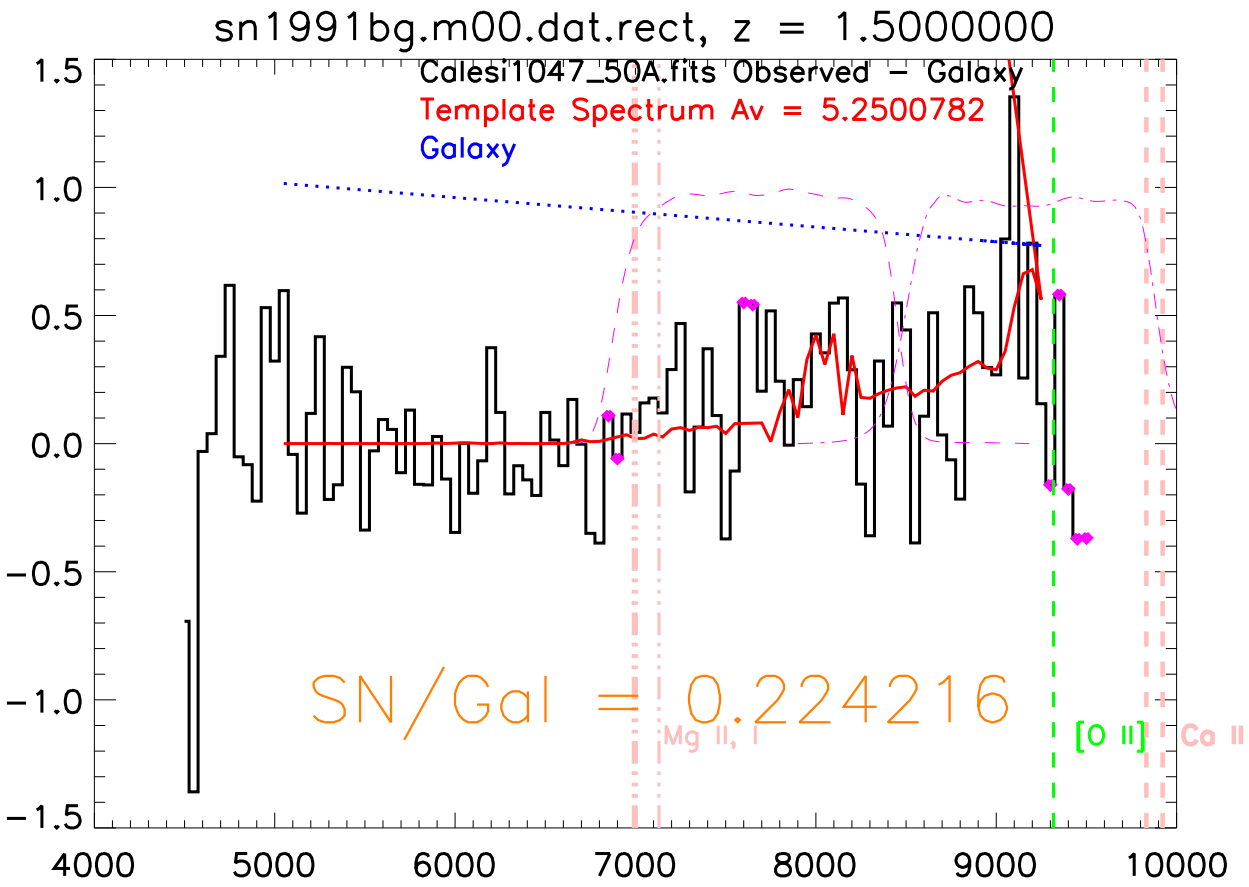
1.60
1.50
1.40
1.30
1.20
1.10
1.00
χ^2
40
20
0
−20
Days
0.5
1.0
1.5
2.0
Δm15

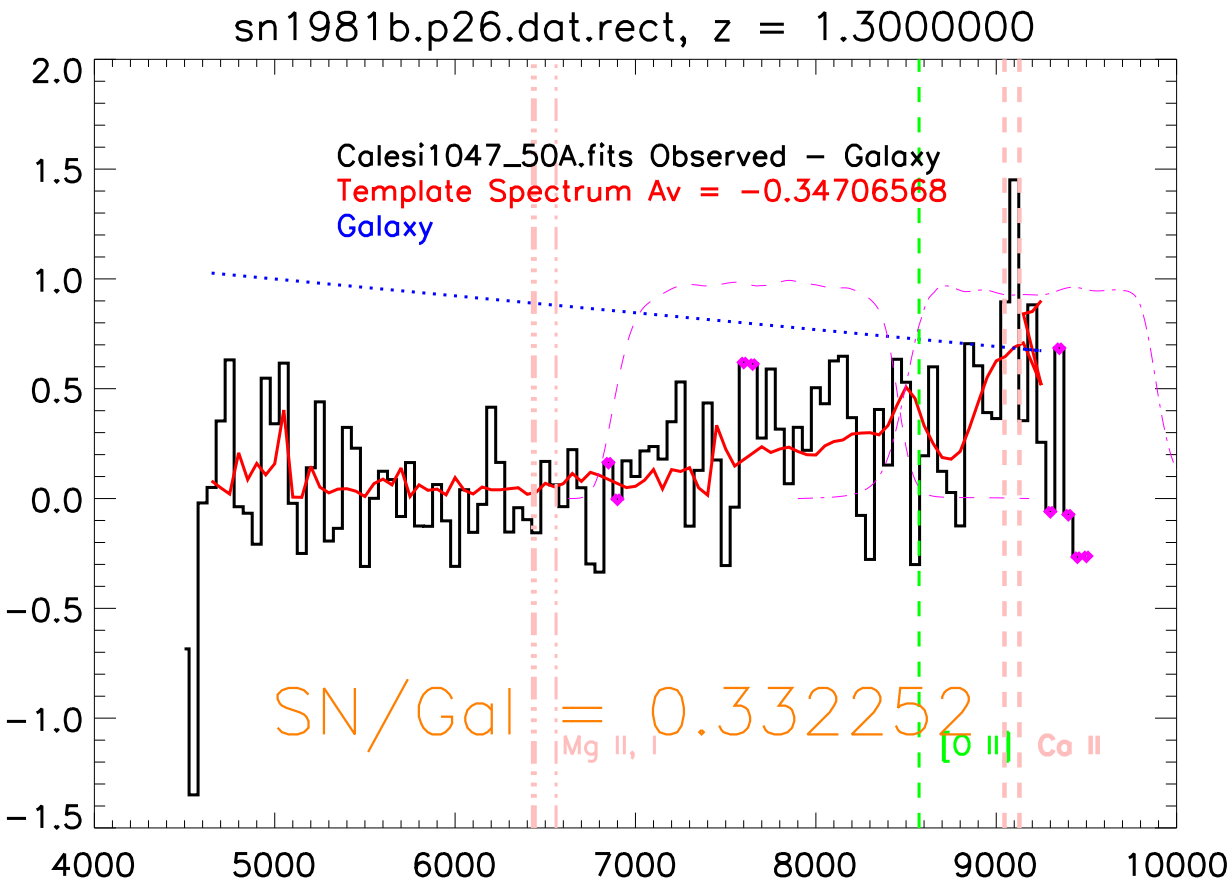

Calesi1047_50A.fits
12
10
8
6
4
2
0
X^2
1.00
1.10
1.20
1.30
1.40
1.50
z

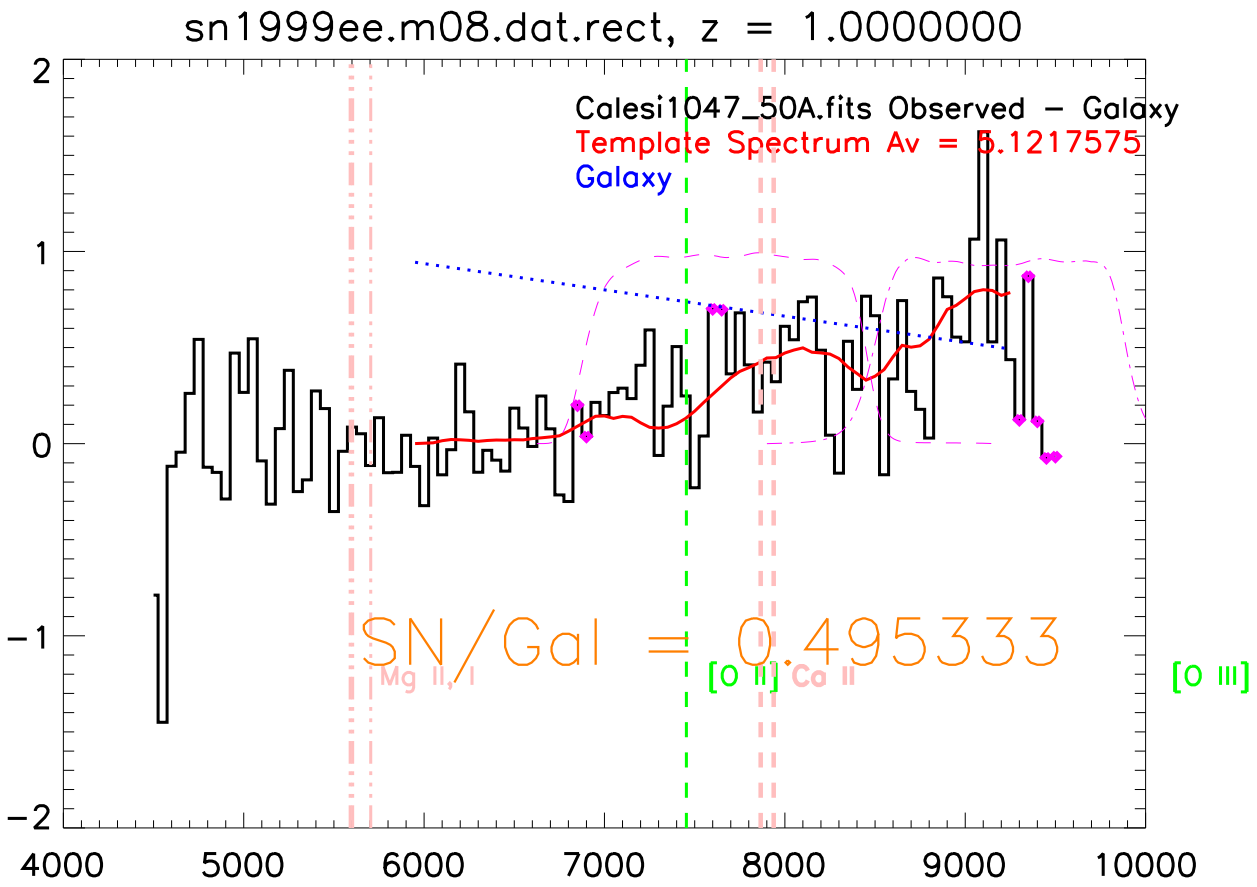

Calesi1047_50A.fits----sn1990n.m07.dat.rect
sn1990n.m07.dat.rect
Mg II, I
[O II]
Ca II
2.5
2.0
1.5
1.0
0.5
0.0
−0.5
4000
5000
6000
7000
8000
9000
10000

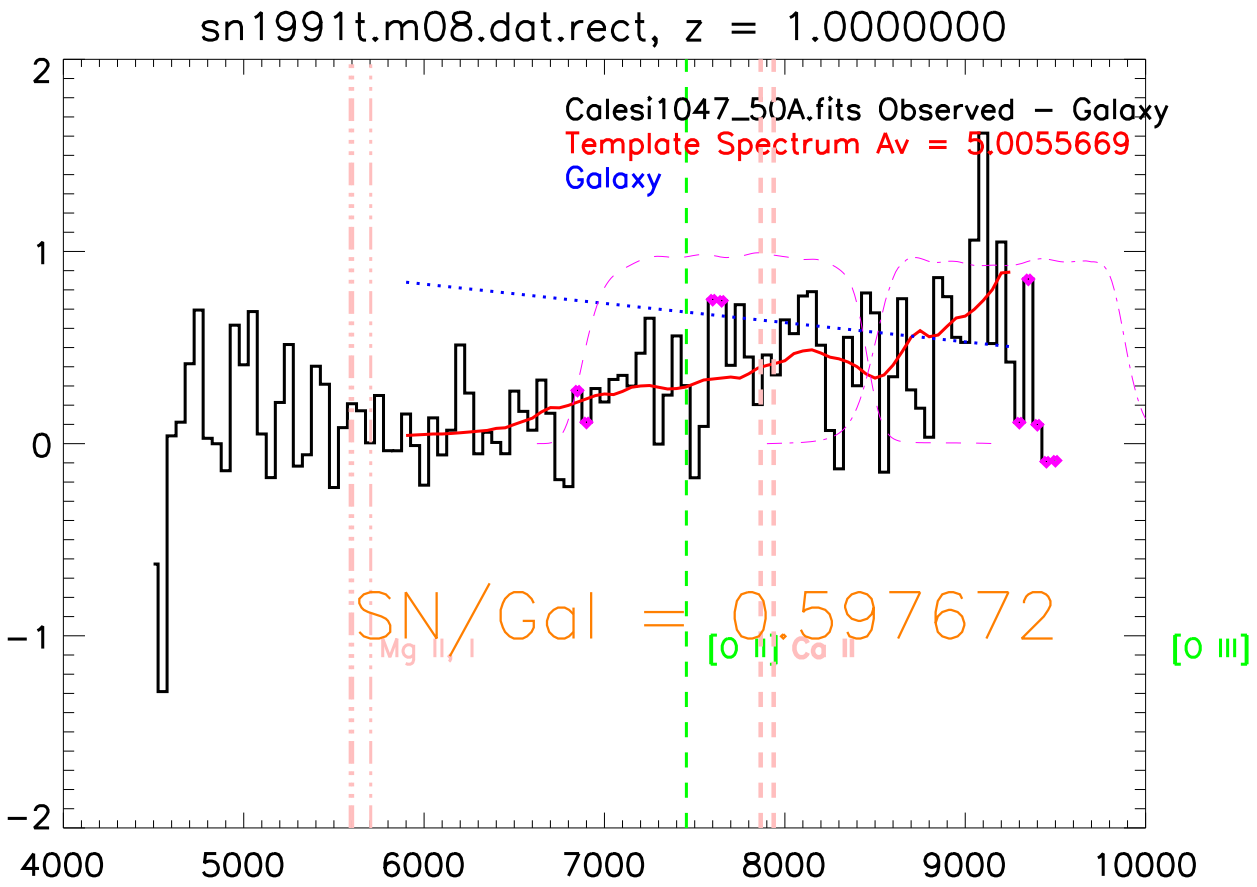

sn1990n.m07.dat.rect, z = 1.3000000
Calesi1047_50A.fits Observed − Galaxy
Template Spectrum Av = 3.7997190
Galaxy
SN/Gal = 0.384735
Mg II, I
[O II]
Ca II
2
1
0
−1
−2
4000
5000
6000
7000
8000
9000
10000

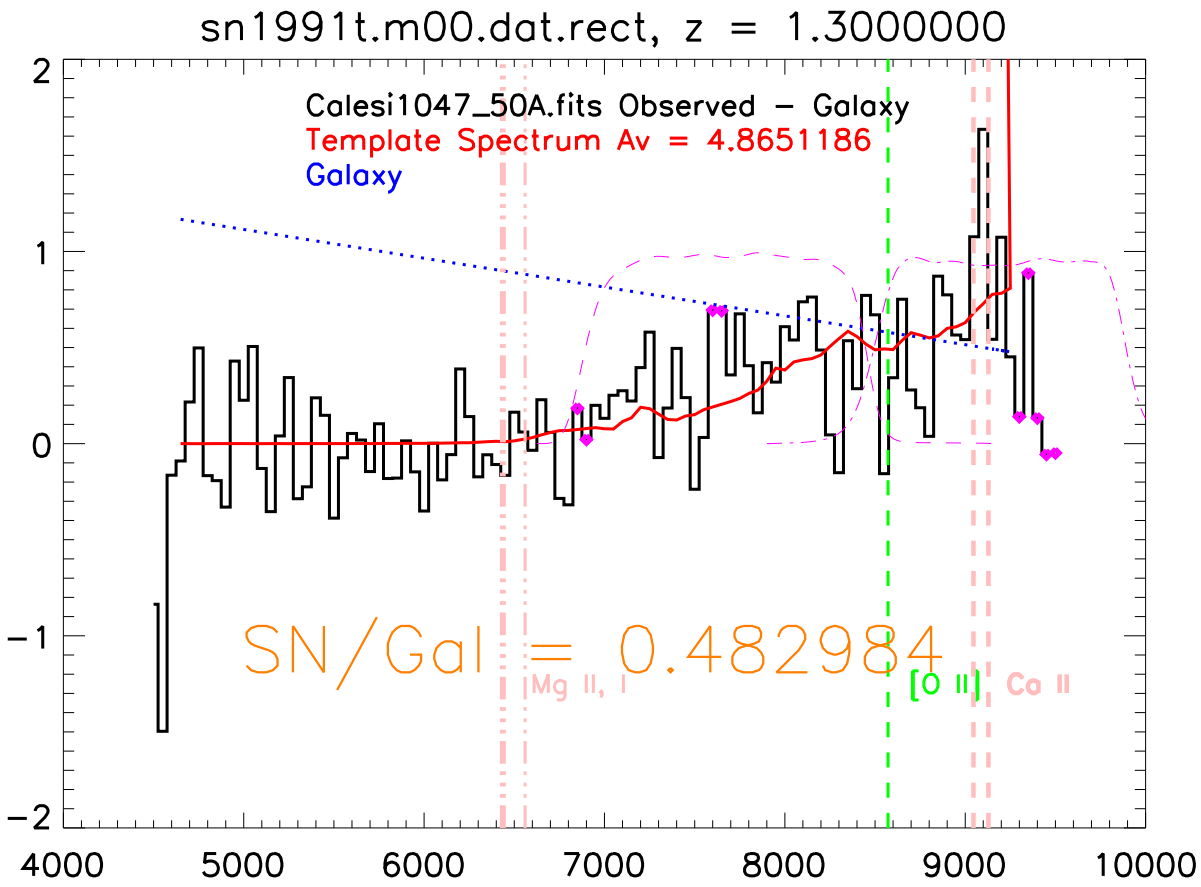

sn1990n.m14.dat.rect, z = 1.5000000
Calesi1047_50A.fits Observed − Galaxy
Template Spectrum Av = −4.9353144
Galaxy
SN/Gal = 0.0298915
Mg II, 1
[O II]
Ca II
1.5
1.0
0.5
0.0
−0.5
−1.0
4000
5000
6000
7000
8000
9000
10000

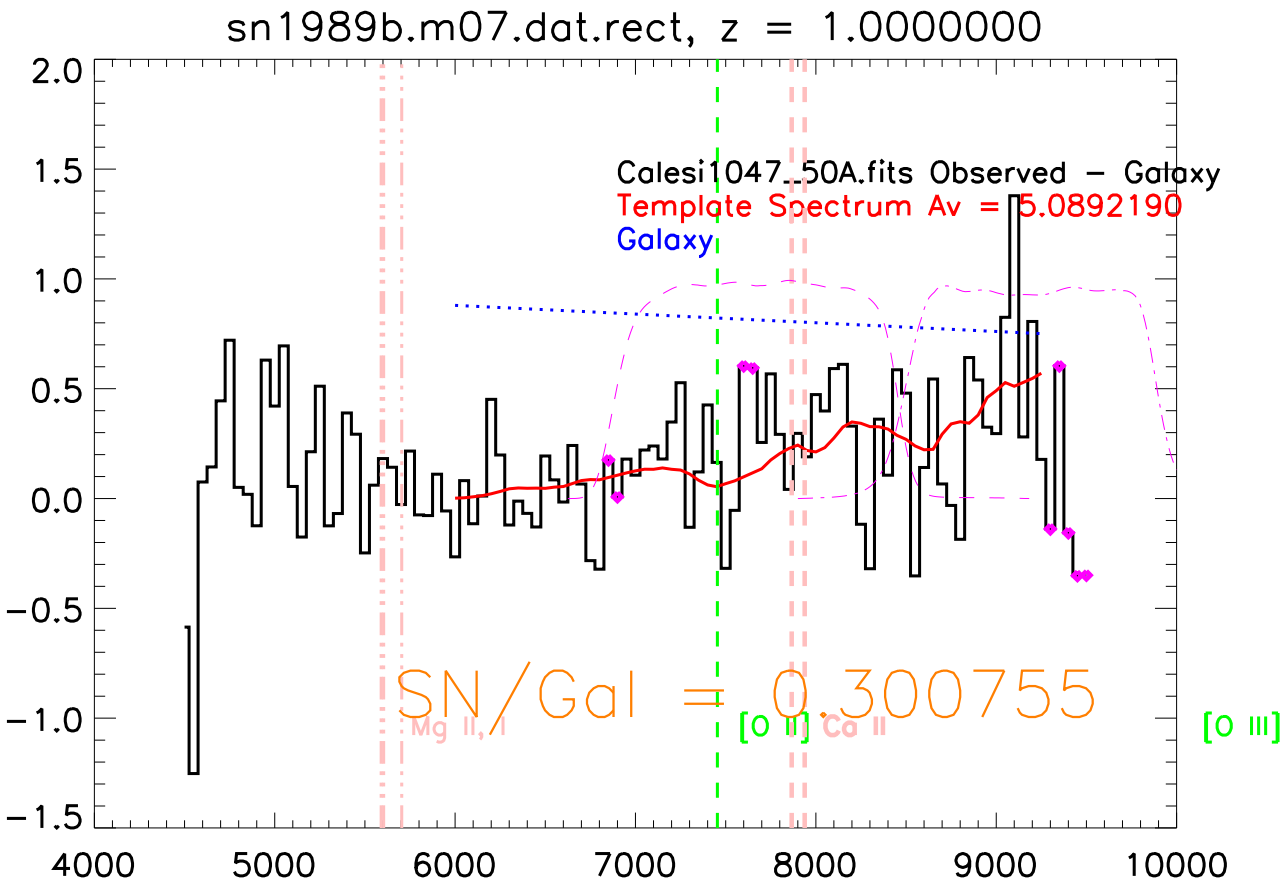

sn1991bg.m00.dat.rect, z = 1.5000000
Calesi1047_50A.fits Observed − Galaxy
Template Spectrum Av = 5.2500782
Galaxy
SN/Gal = 0.224216
Mg II, I
[O II]
Ca II
1.5
1.0
0.5
0.0
−0.5
−1.0
−1.5
4000
5000
6000
7000
8000
9000
10000

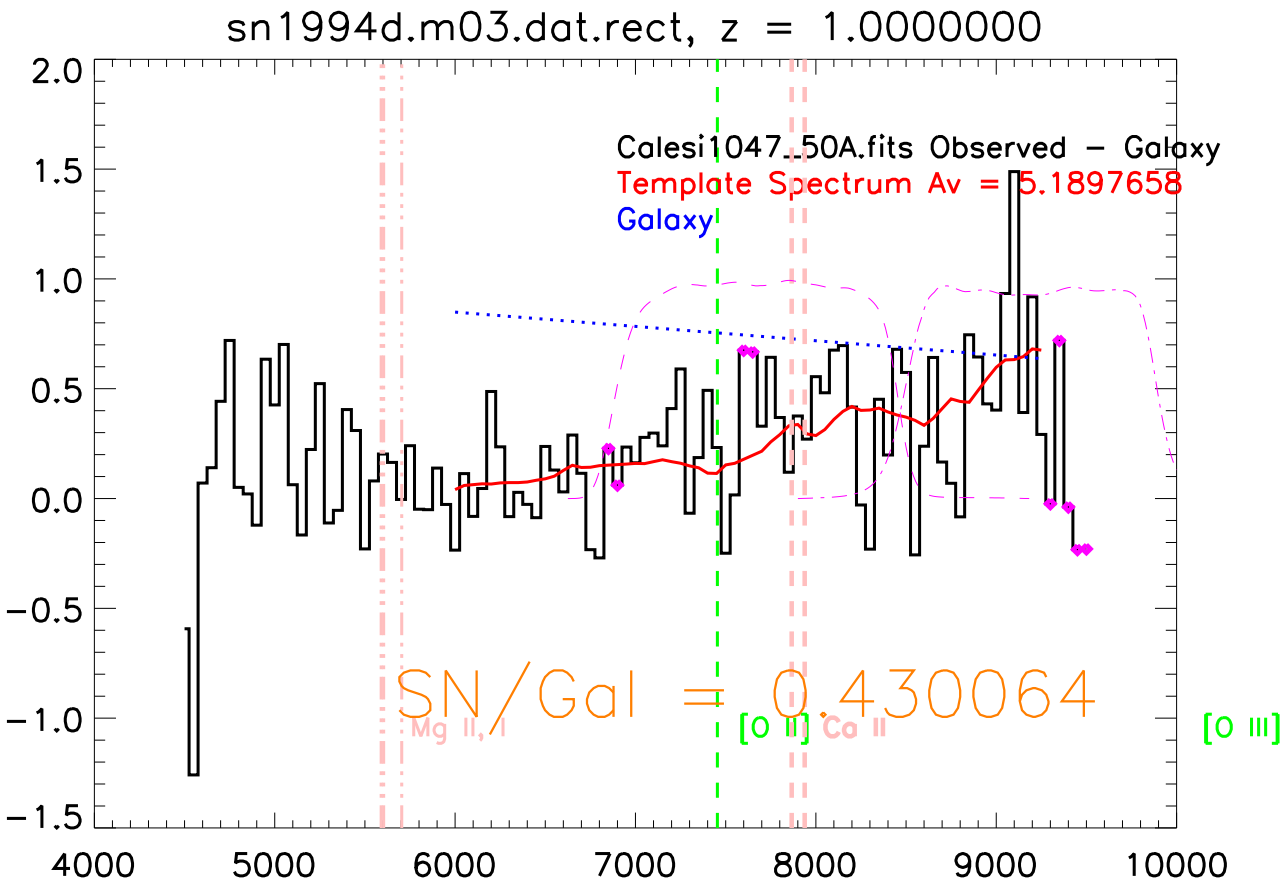

sn1981b.p26.dat.rect, z = 1.3000000
Calesi1047_50A.fits Observed − Galaxy
Template Spectrum Av = −0.34706568
Galaxy
SN/Gal = 0.332252
Mg II, I
[O II]
Ca II
2.0
1.5
1.0
0.5
0.0
−0.5
−1.0
−1.5
4000
5000
6000
7000
8000
9000
10000

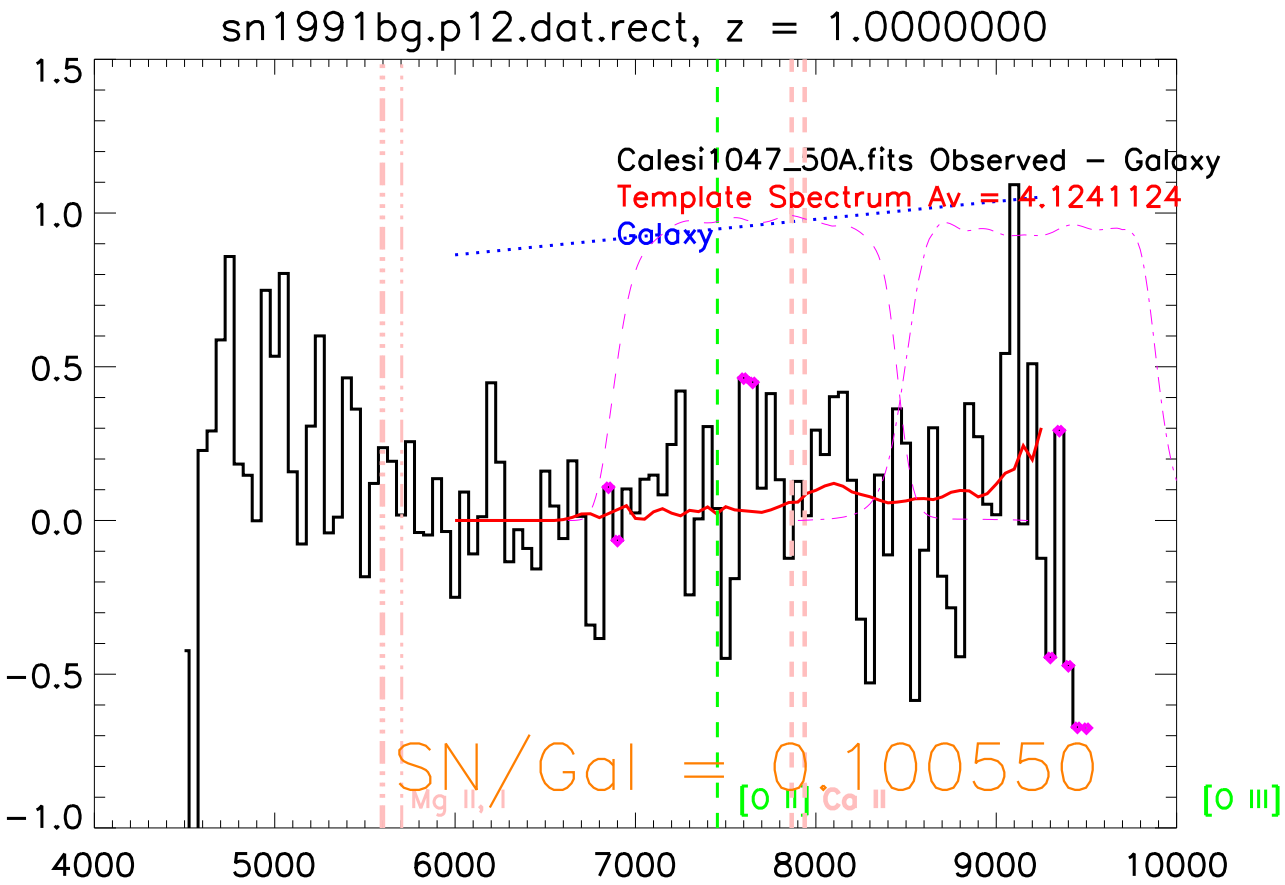

sn1999ee.m08.dat.rect, z = 1.0000000
Calesi1047_50A.fits Observed − Galaxy
Template Spectrum Av = 5.1217575
Galaxy
SN/Gal = 0.495333
Mg II, I
[O II]
Ca II
[O III]
2
1
0
−1
−2
4000
5000
6000
7000
8000
9000
10000

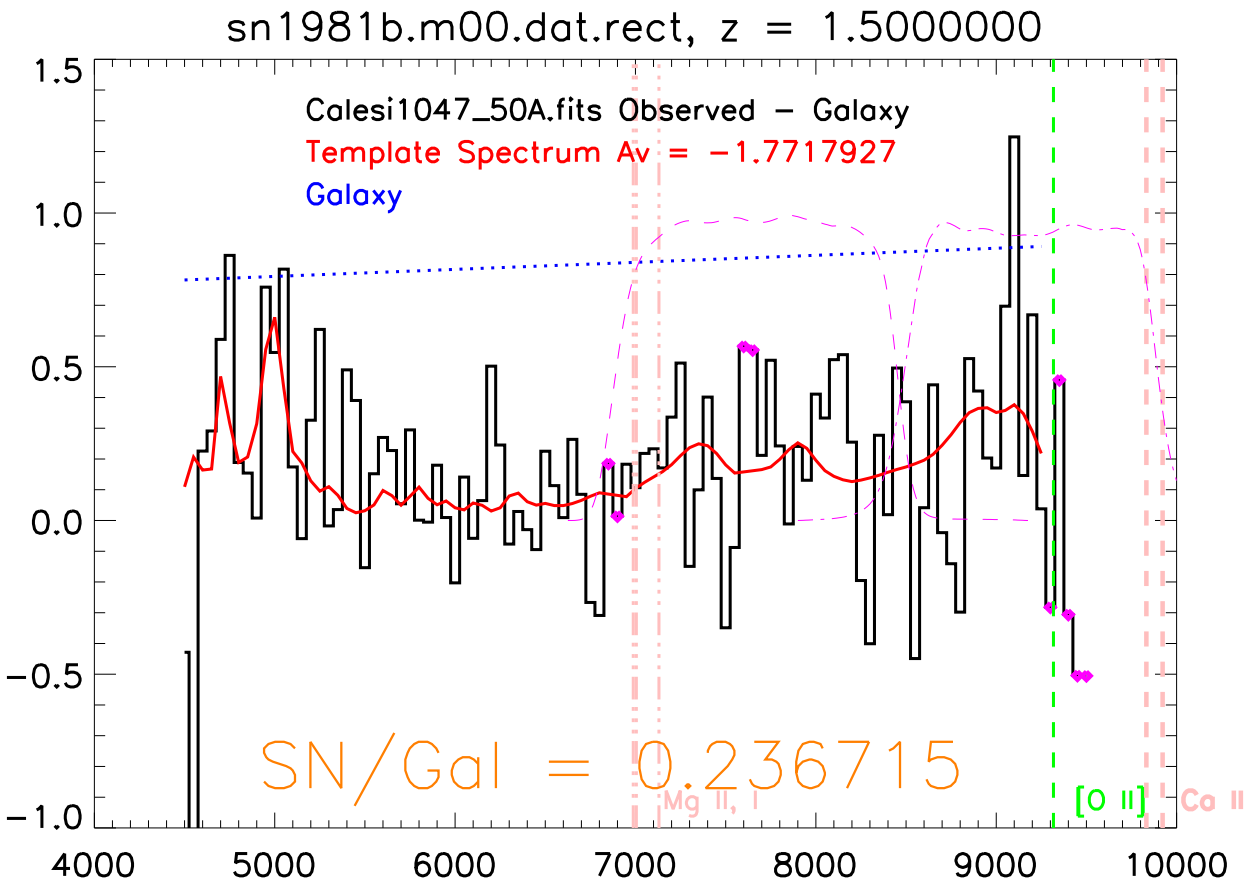

sn1991t.m08.dat.rect, z = 1.0000000
Calesi1047_50A.fits Observed − Galaxy
Template Spectrum Av = 5.0055669
Galaxy
SN/Gal = 0.597672
Mg II, I
[O II]
Ca II
[O III]
2
1
0
−1
−2
4000
5000
6000
7000
8000
9000
10000

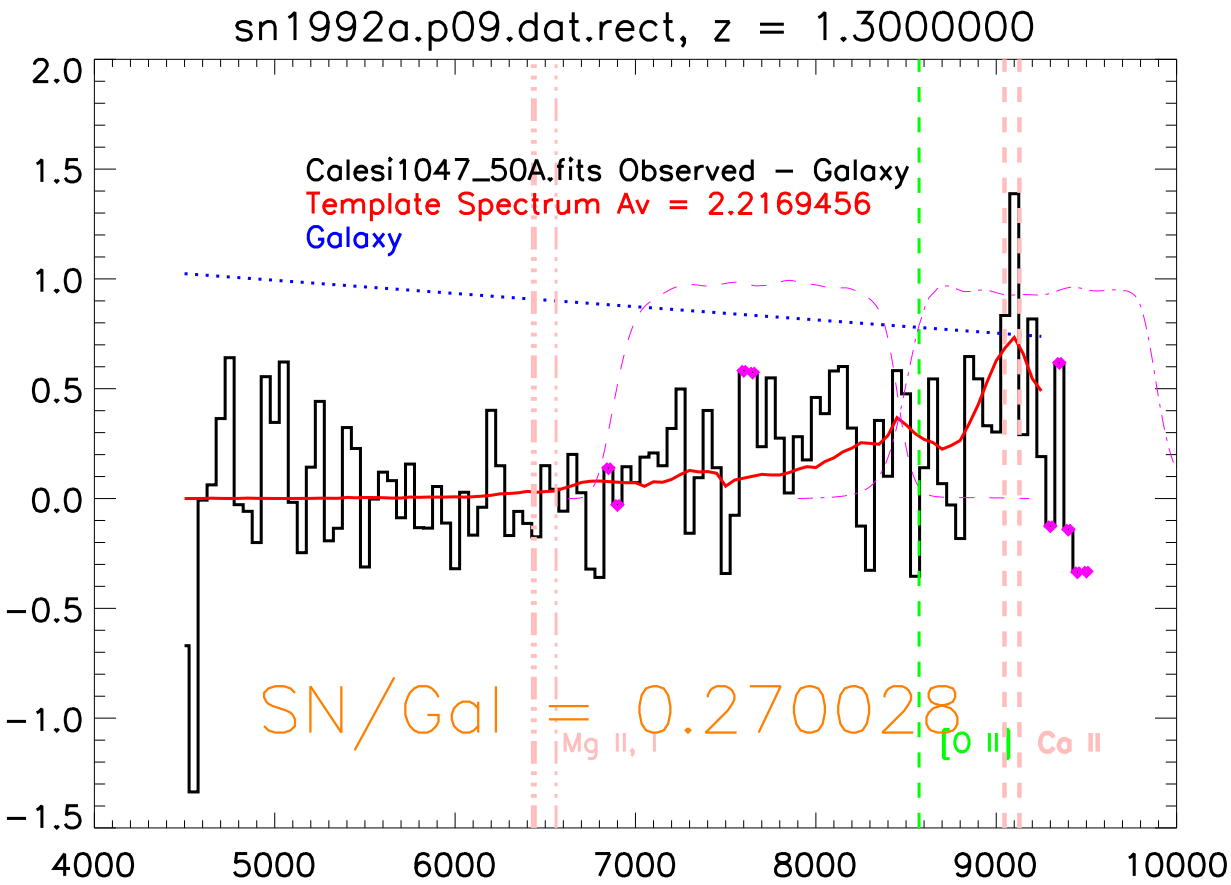

sn1991t.m00.dat.rect, z = 1.3000000
Calesi1047_50A.fits Observed − Galaxy
Template Spectrum Av = 4.8651186
Galaxy
SN/Gal = 0.482984
Mg II, I
[O II]
Ca II
2
1
0
−1
−2
4000
5000
6000
7000
8000
9000
10000

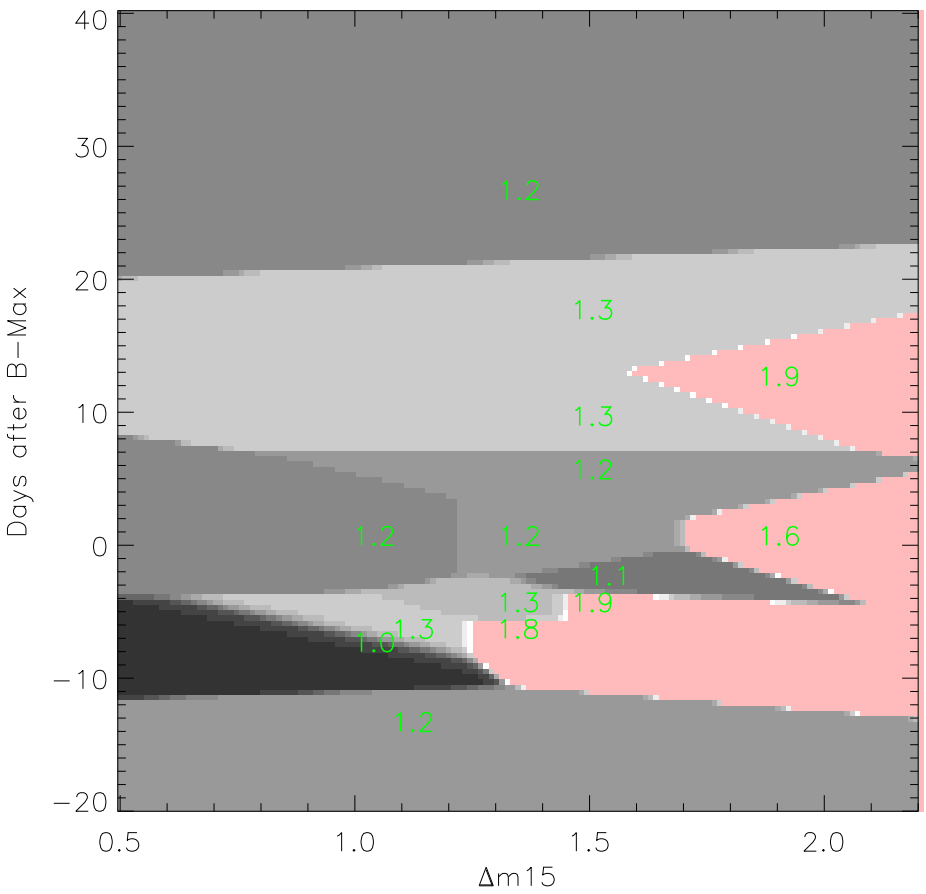

sn1989b.m07.dat.rect, z = 1.0000000
Calesi1047_50A.fits Observed − Galaxy
Template Spectrum Av = 5.0892190
Galaxy
SN/Gal = 0.300755
Mg II, I
[O II]
Ca II
[O III]
2.0
1.5
1.0
0.5
0.0
−0.5
−1.0
−1.5
4000
5000
6000
7000
8000
9000
10000

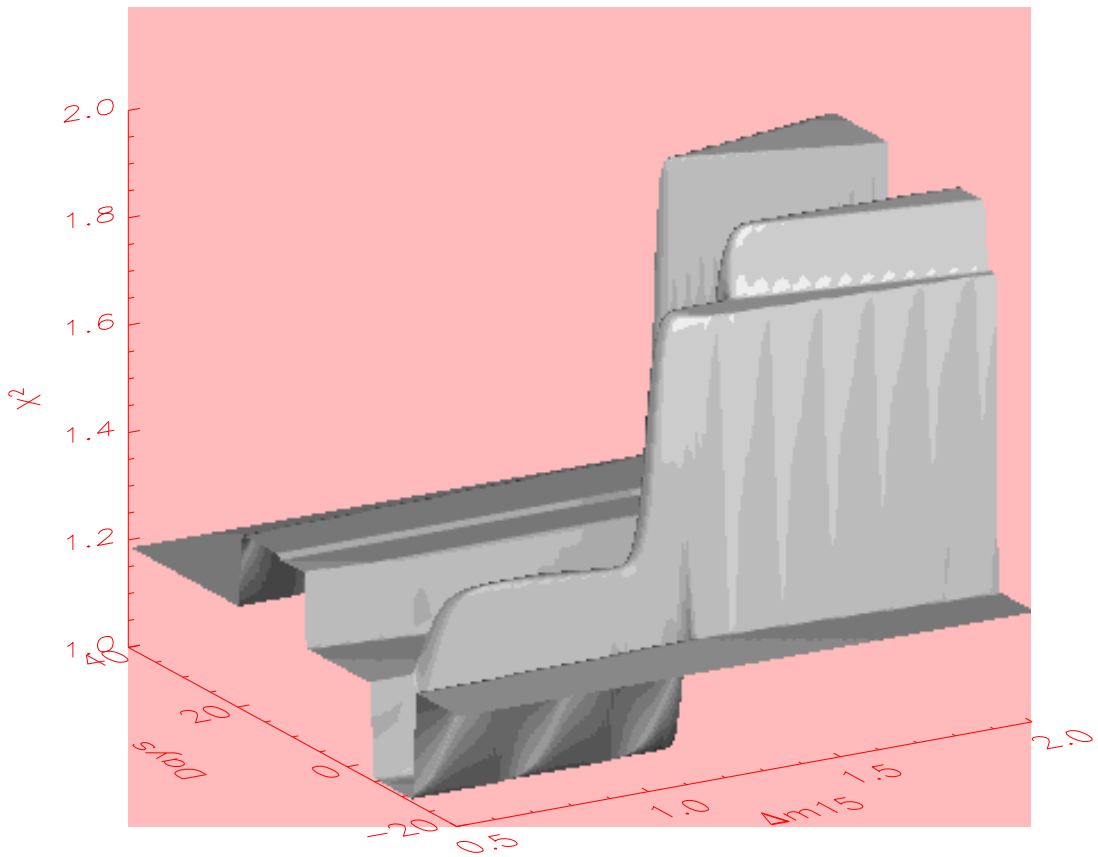

sn1994d.m03.dat.rect, z = 1.0000000
Calesi1047..50A.fits Observed − Galaxy
Template Spectrum Av = 5.1897658
Galaxy
SN/Gal = 0.430064
Mg II, I
[O II]
Ca II
[O III]
2.0
1.5
1.0
0.5
0.0
−0.5
−1.0
−1.5
4000
5000
6000
7000
8000
9000
10000


sn1991bg.p12.dat.rect, z = 1.0000000
Calesi1047_50A.fits Observed − Galaxy
Template Spectrum Av. = 4.1241124
Galaxy
SN/Gal = 0.100550
Mg II, I
[O II]
Ca II
[O III]
1.5
1.0
0.5
0.0
−0.5
−1.0
4000
5000
6000
7000
8000
9000
10000

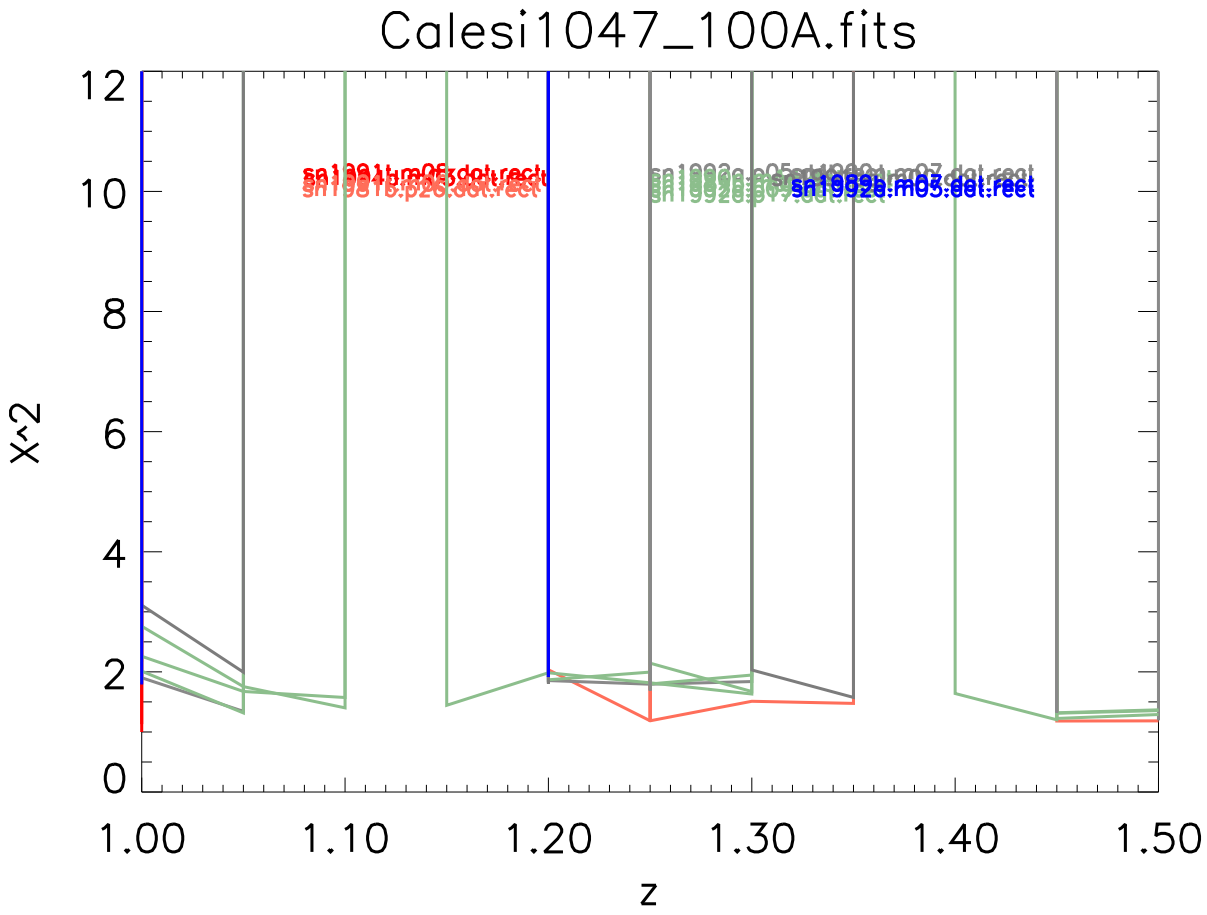

sn1981b.m00.dat.rect, z = 1.5000000
Calesi1047_50A.fits Observed − Galaxy
Template Spectrum Av = −1.7717927
Galaxy
SN/Gal = 0.236715
Mg II, I
[O II]
Ca II
1.5
1.0
0.5
0.0
−0.5
−1.0
4000
5000
6000
7000
8000
9000
10000

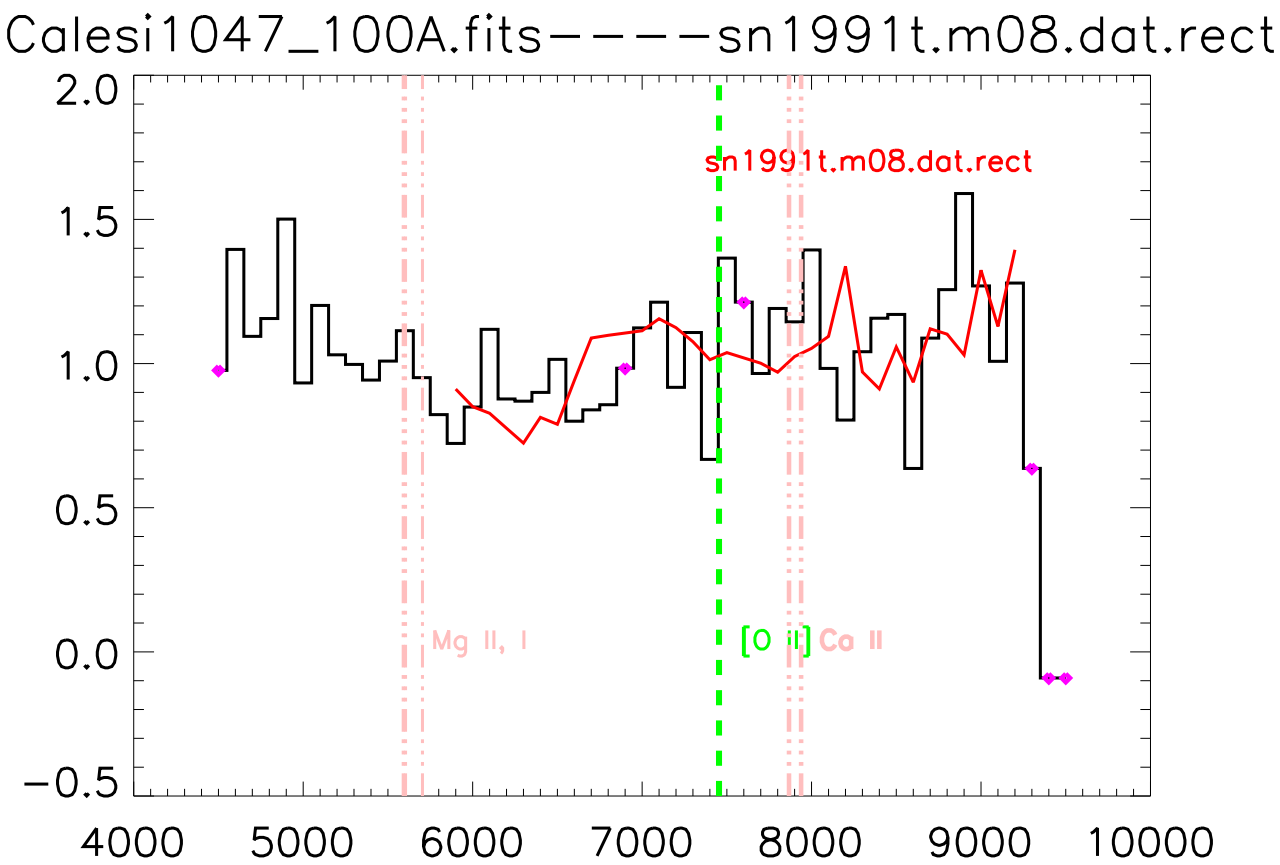

sn1992a.p09.dat.rect, z = 1.3000000
Calesi1047_50A.fits Observed − Galaxy
Template Spectrum Av = 2.2169456
Galaxy
SN/Gal = 0.270028
Mg II, I
[O II]
Ca II
2.0
1.5
1.0
0.5
0.0
−0.5
−1.0
−1.5
4000
5000
6000
7000
8000
9000
10000

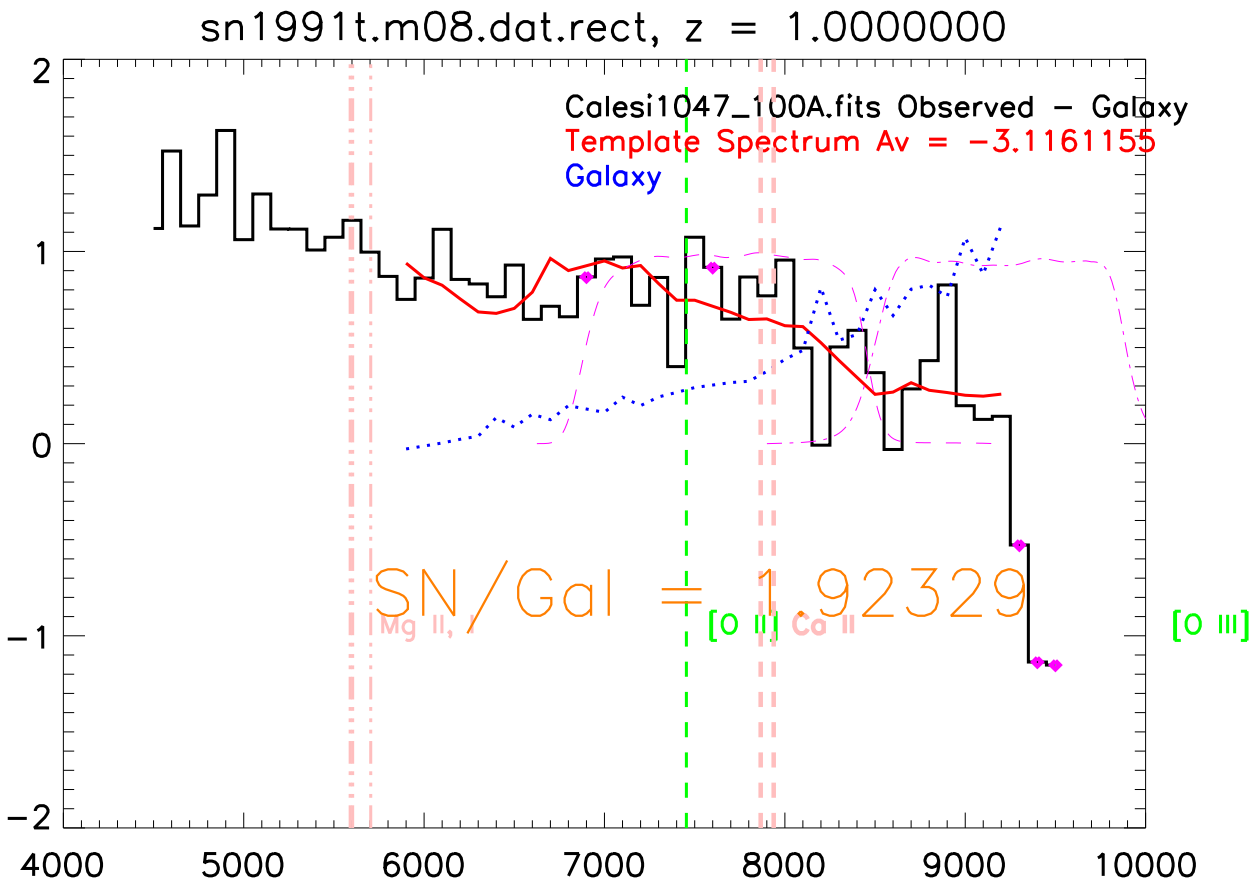

40
30
20
10
0
−10
−20
0.5
1.0
1.5
2.0
Days after B−Max
Δm15
1.2
1.3
1.9
1.3
1.2
1.2
1.2
1.6
1.1
1.3
1.9
1.8
1.0
1.3
1.2

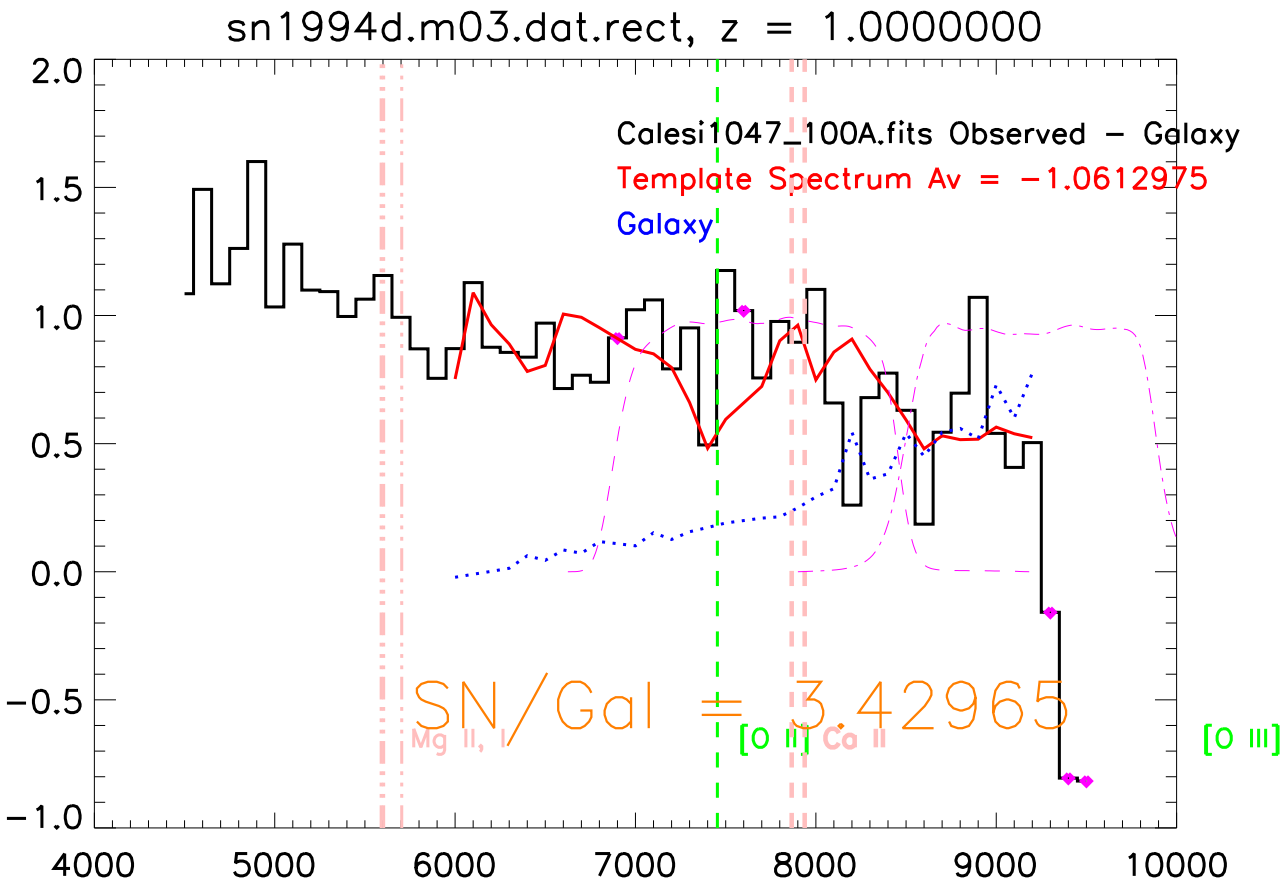


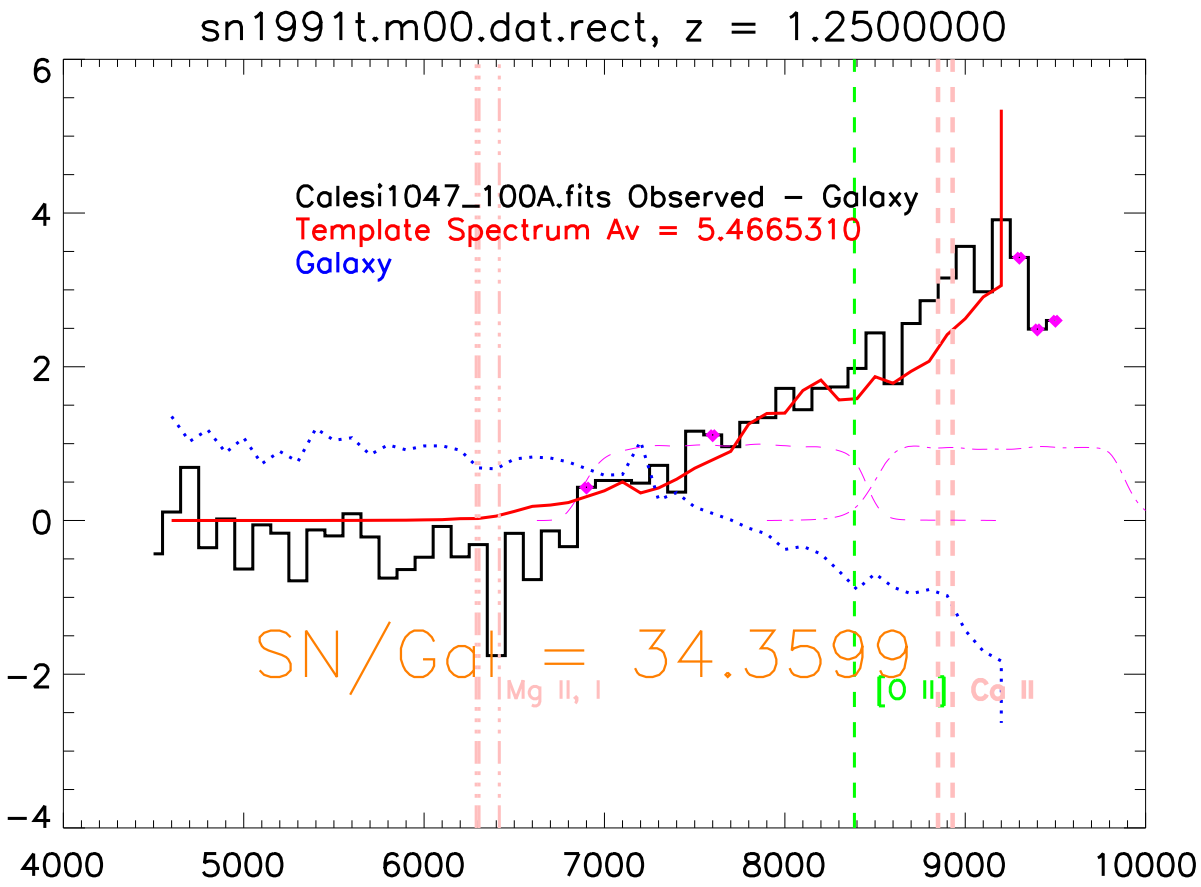
2.0
1.8
1.6
1.4
1.2
1.0
χ^2
40
20
0
−20
Days
0.5
1.0
1.5
2.0
Δm15

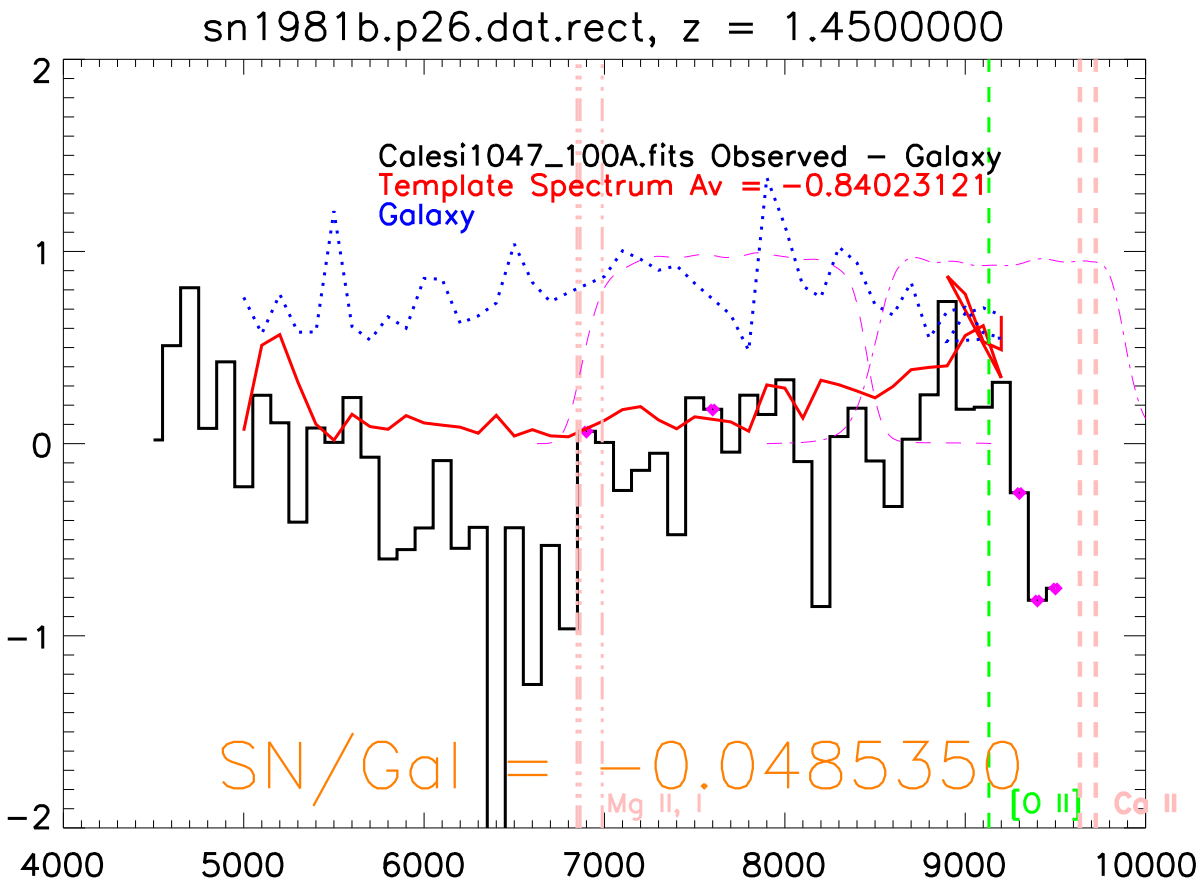

Calesi1047_100A.fits
12
10
8
6
4
2
0
X^2
1.00
1.10
1.20
1.30
1.40
1.50
z
sn1992a.m05.dat.rest

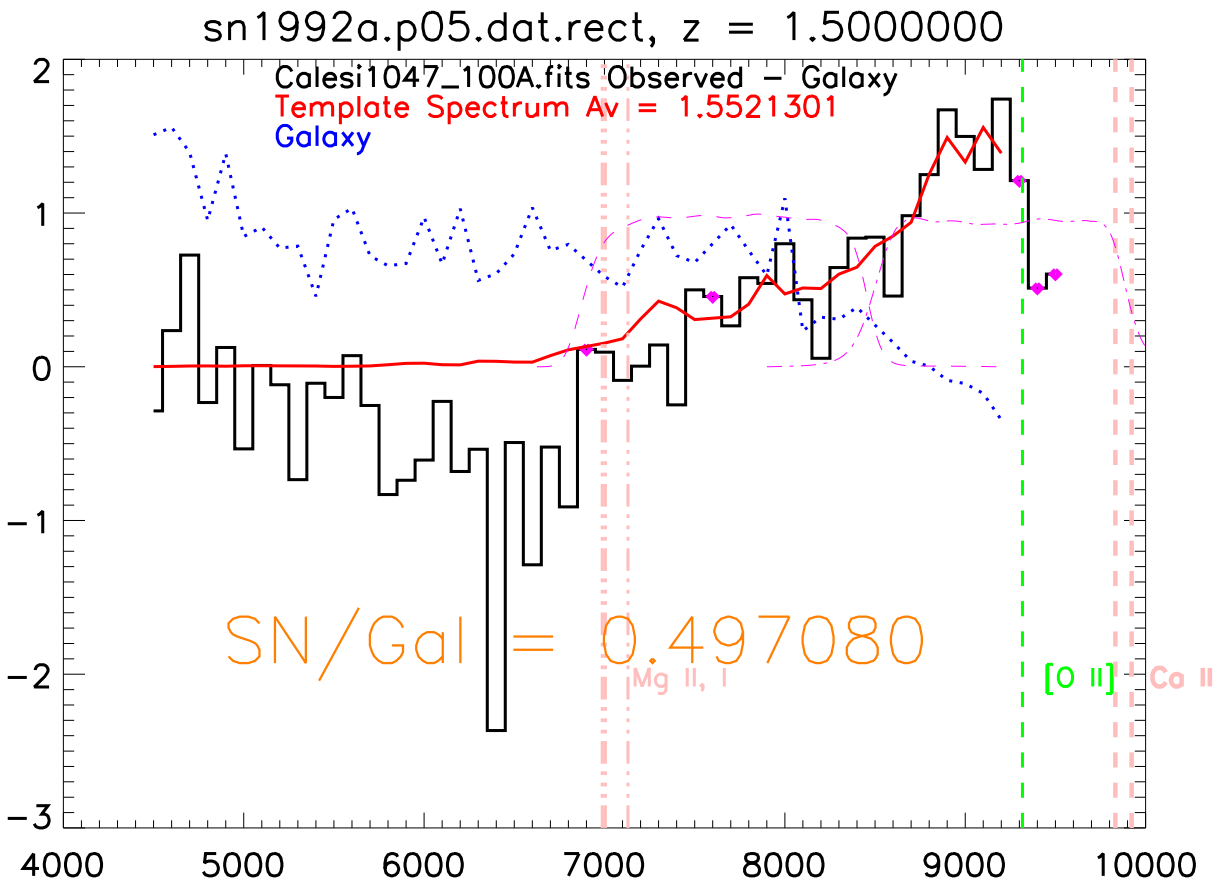

Calesi1047_100A.fits----sn1991t.m08.dat.rect
sn1991t.m08.dat.rect
Mg II, I
[O II] Ca II
2.0
1.5
1.0
0.5
0.0
−0.5
4000
5000
6000
7000
8000
9000
10000

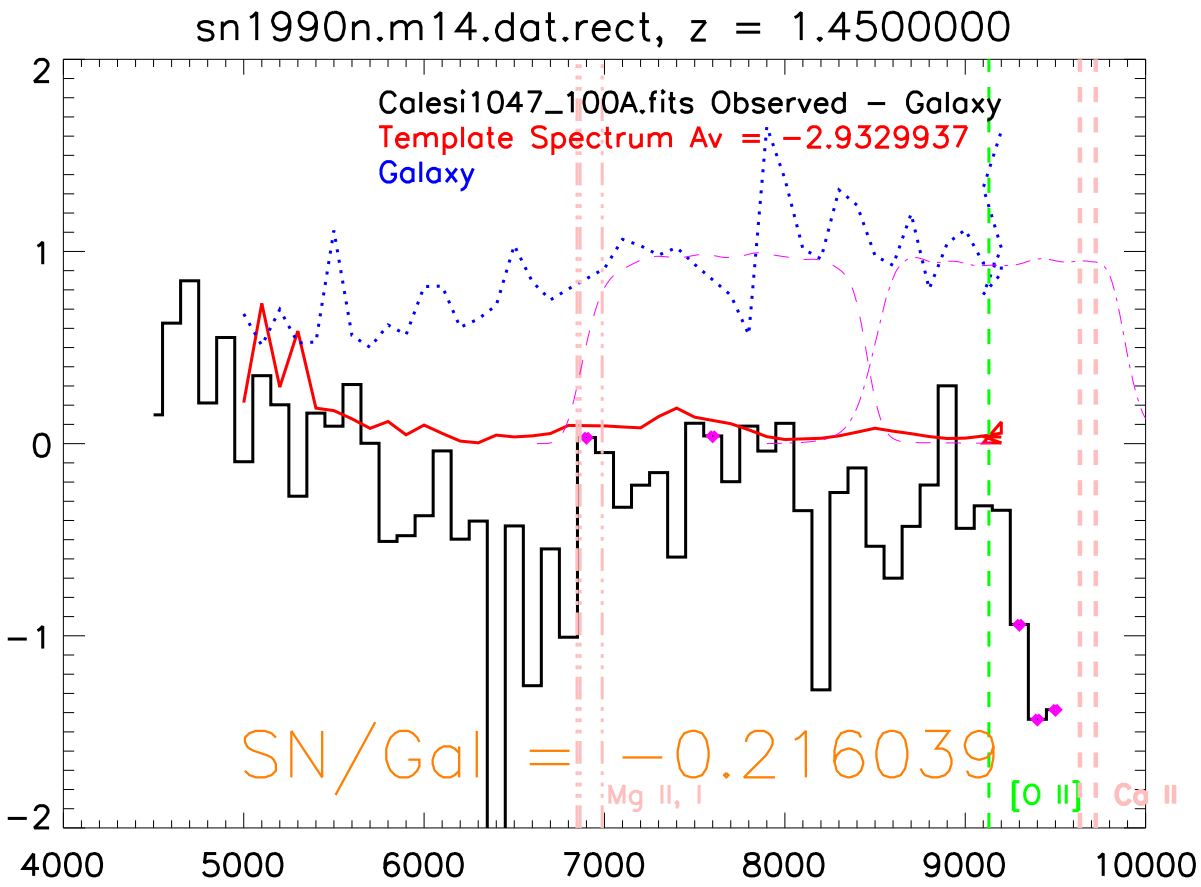

sn1991t.m08.dat.rect, z = 1.0000000
Calesi1047_100A.fits Observed − Galaxy
Template Spectrum Av = −3.1161155
Galaxy
SN/Gal = 1.92329
[O II]
Ca II
[O III]
2
1
0
−1
−2
4000
5000
6000
7000
8000
9000
10000

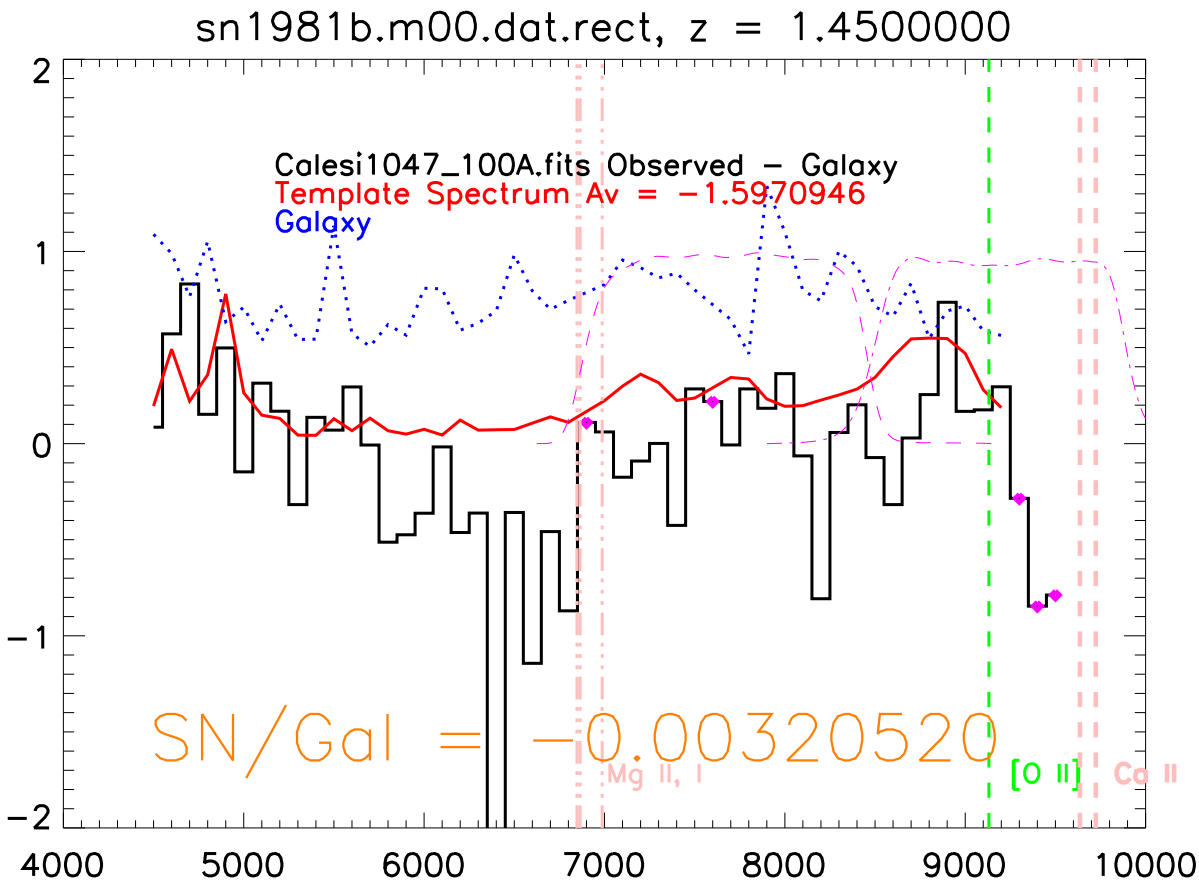

sn1994d.m03.dat.rect, z = 1.0000000
Calesi1047_100A.fits Observed − Galaxy
Template Spectrum Av = −1.0612975
Galaxy
SN/Gal = 3.42965
Mg II, I
[O II]
Ca II
[O III]
2.0
1.5
1.0
0.5
0.0
−0.5
−1.0
4000
5000
6000
7000
8000
9000
10000

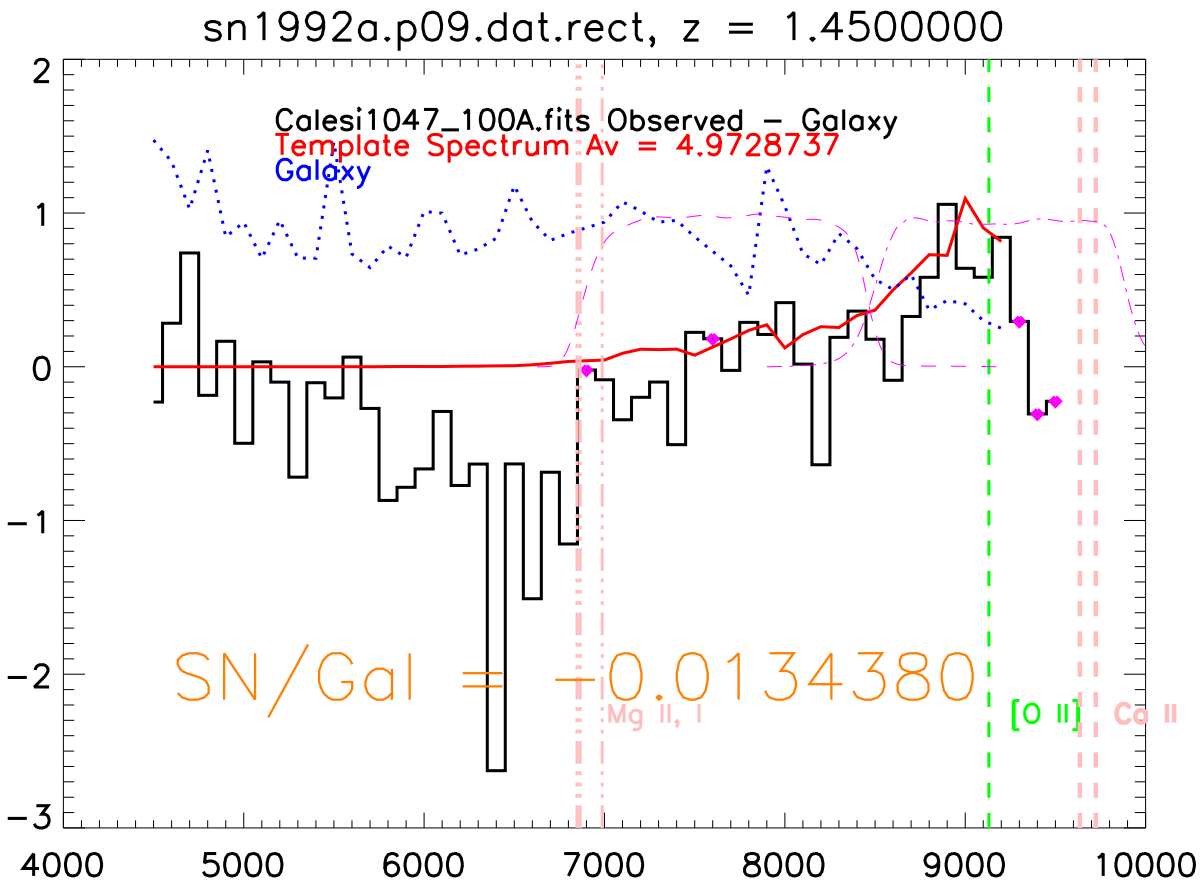

sn1991t.m00.dat.rect, z = 1.2500000
Calesi1047_100A.fits Observed − Galaxy
Template Spectrum Av = 5.4665310
Galaxy
SN/Gal = 34.3599
Mg II, I
[O II]
Ca II
6
4
2
0
−2
−4
4000
5000
6000
7000
8000
9000
10000

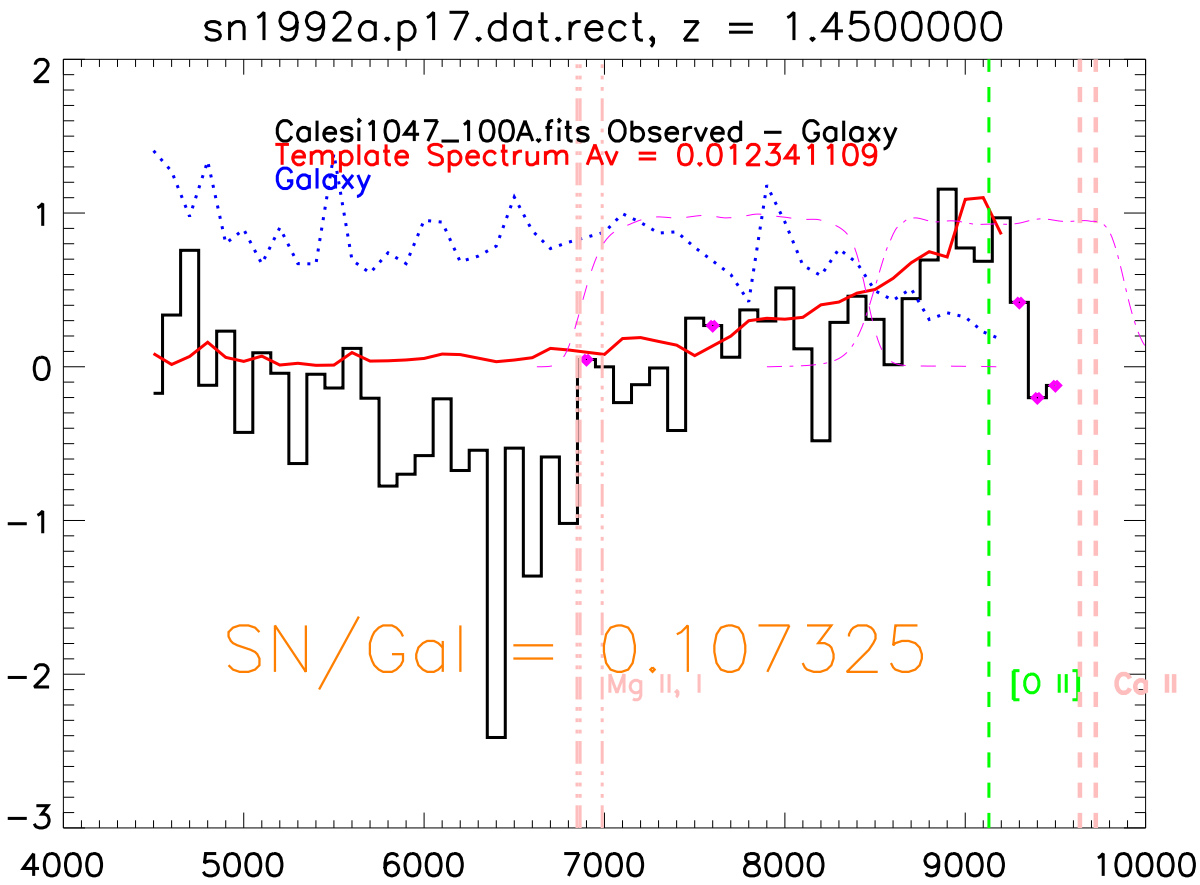

sn1981b.p26.dat.rect, z = 1.4500000
Calesi1047_100A.fits Observed − Galaxy
Template Spectrum Av = −0.84023121
Galaxy
SN/Gal = −0.0485350
Mg II, I
[O II]
Ca II
2
1
0
−1
−2
4000
5000
6000
7000
8000
9000
10000

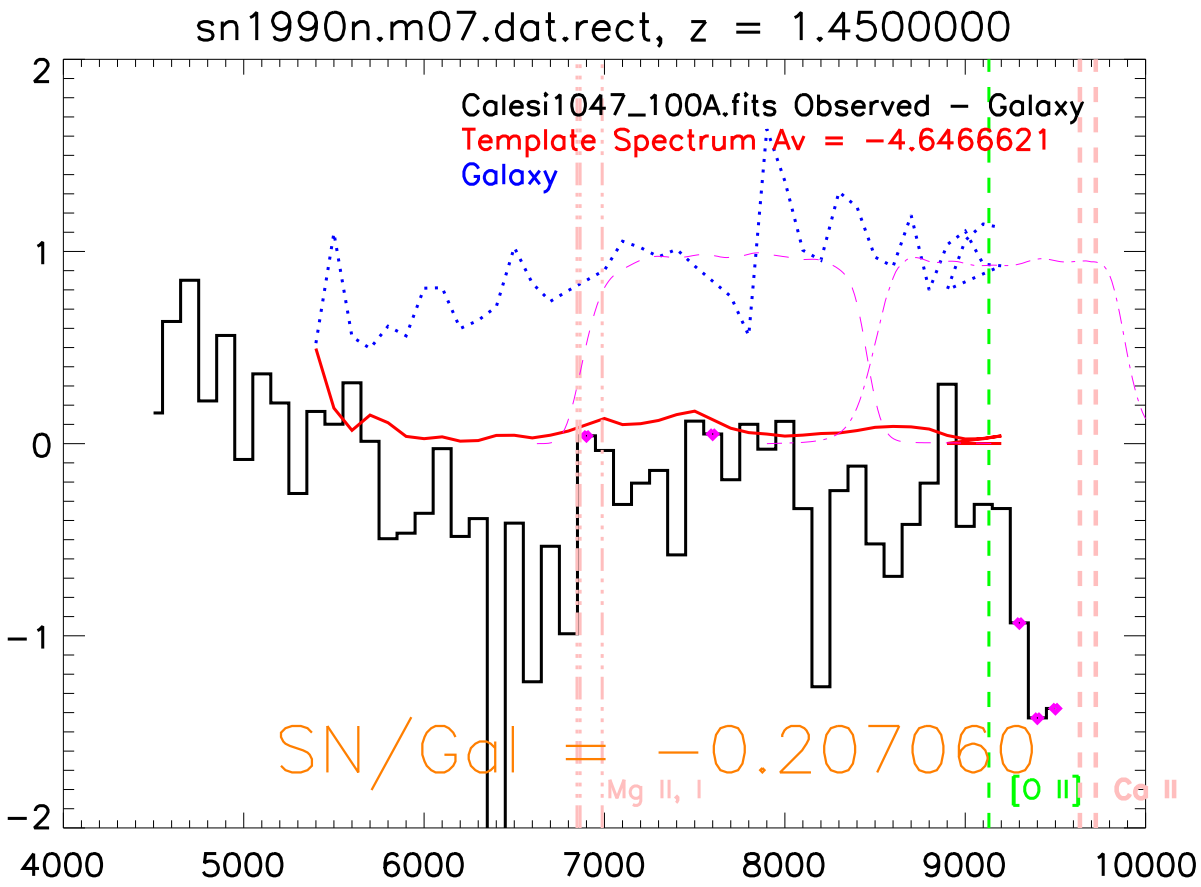

sn1992a.p05.dat.rect, z = 1.5000000
Calesi1047_100A.fits Observed − Galaxy
Template Spectrum Av = 1.5521301
Galaxy
SN/Gal = 0.497080
Mg II, I
[O II]
Ca II
2
1
0
−1
−2
−3
4000
5000
6000
7000
8000
9000
10000

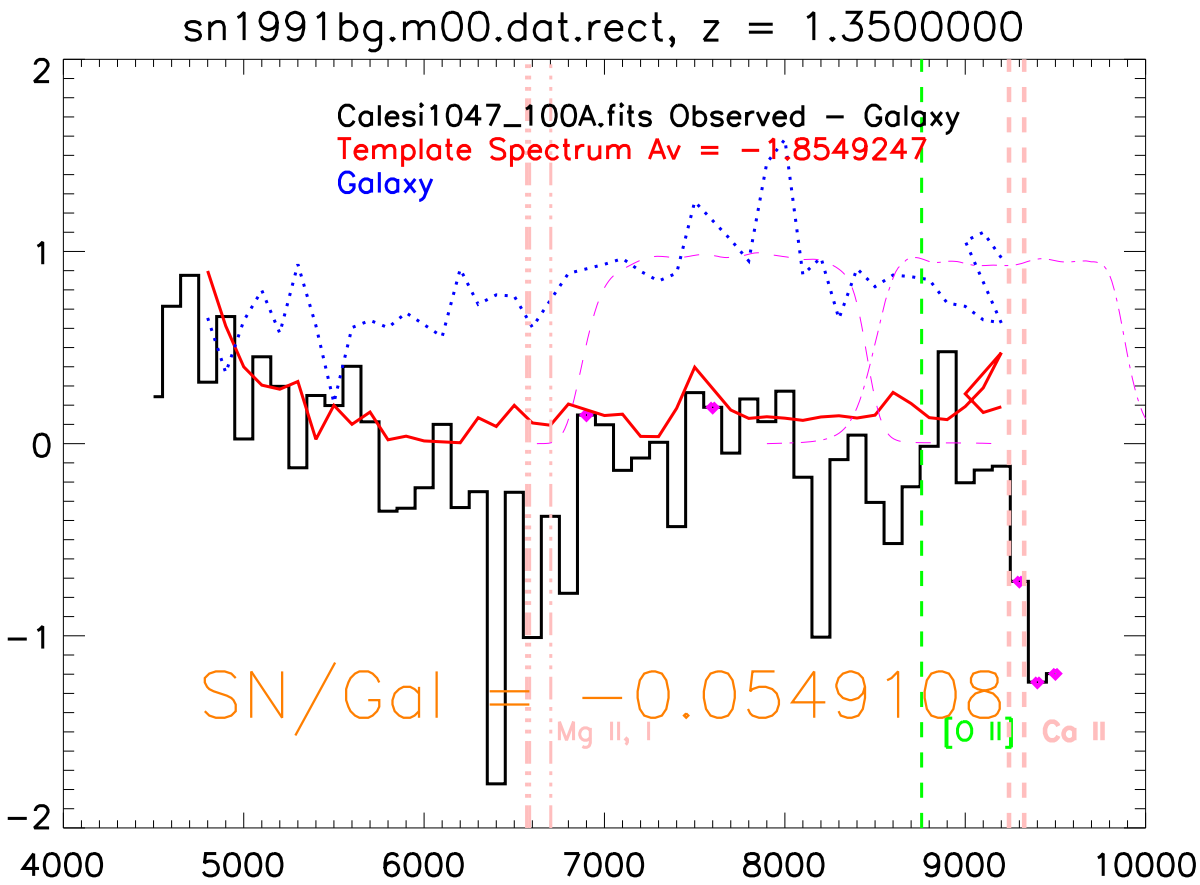

sn1990n.m14.dat.rect, z = 1.4500000
Calesi1047_100A.fits Observed − Galaxy
Template Spectrum Av = −2.9329937
Galaxy
SN/Gal = −0.216039
Mg II, I
[O II]
Ca II
2
1
0
−1
−2
4000
5000
6000
7000
8000
9000
10000

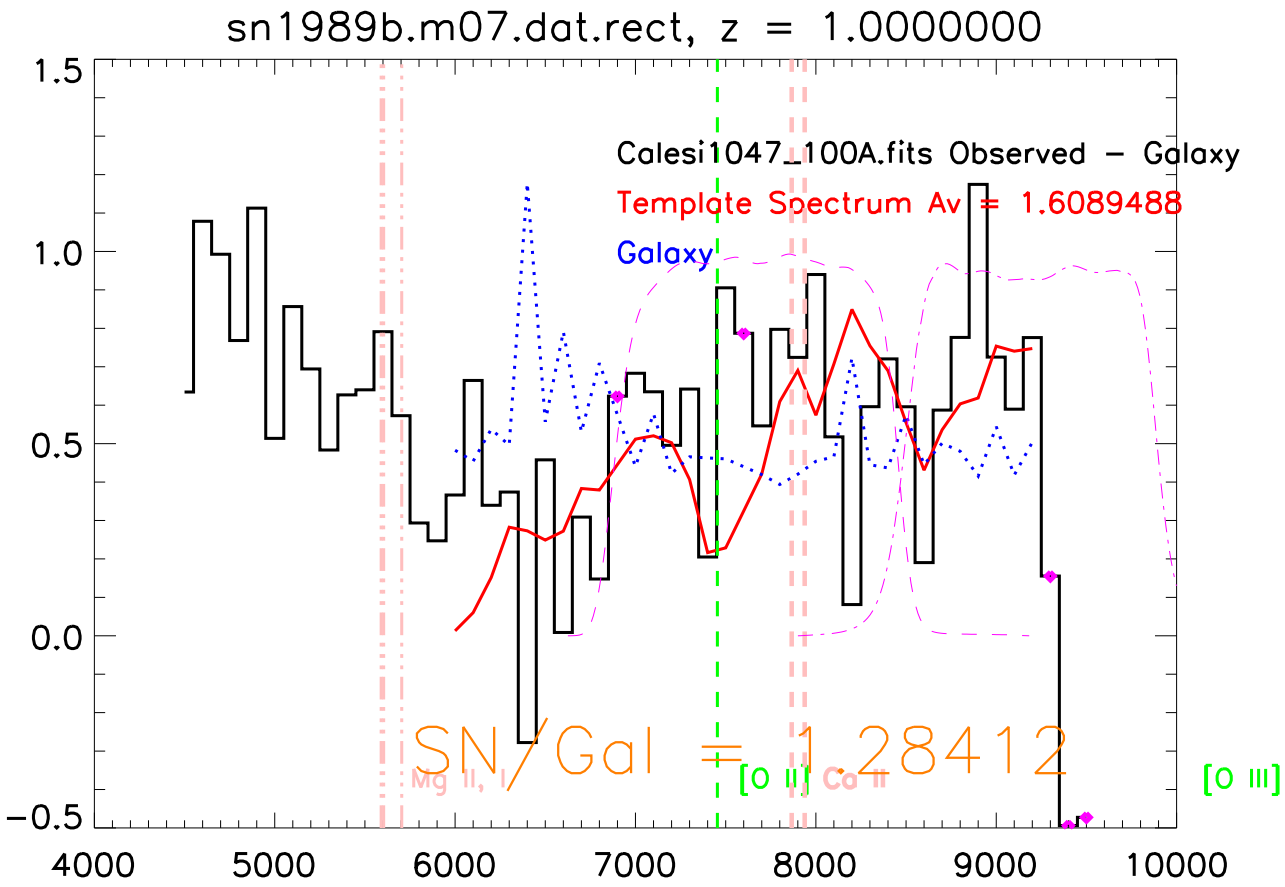

sn1981b.m00.dat.rect, z = 1.4500000
Calesi1047_100A.fits Observed − Galaxy
Template Spectrum Av = −1.5970946
Galaxy
SN/Gal = −0.00320520
Mg II, I
[O II]
Ca II
2
1
0
−1
−2
4000
5000
6000
7000
8000
9000
10000

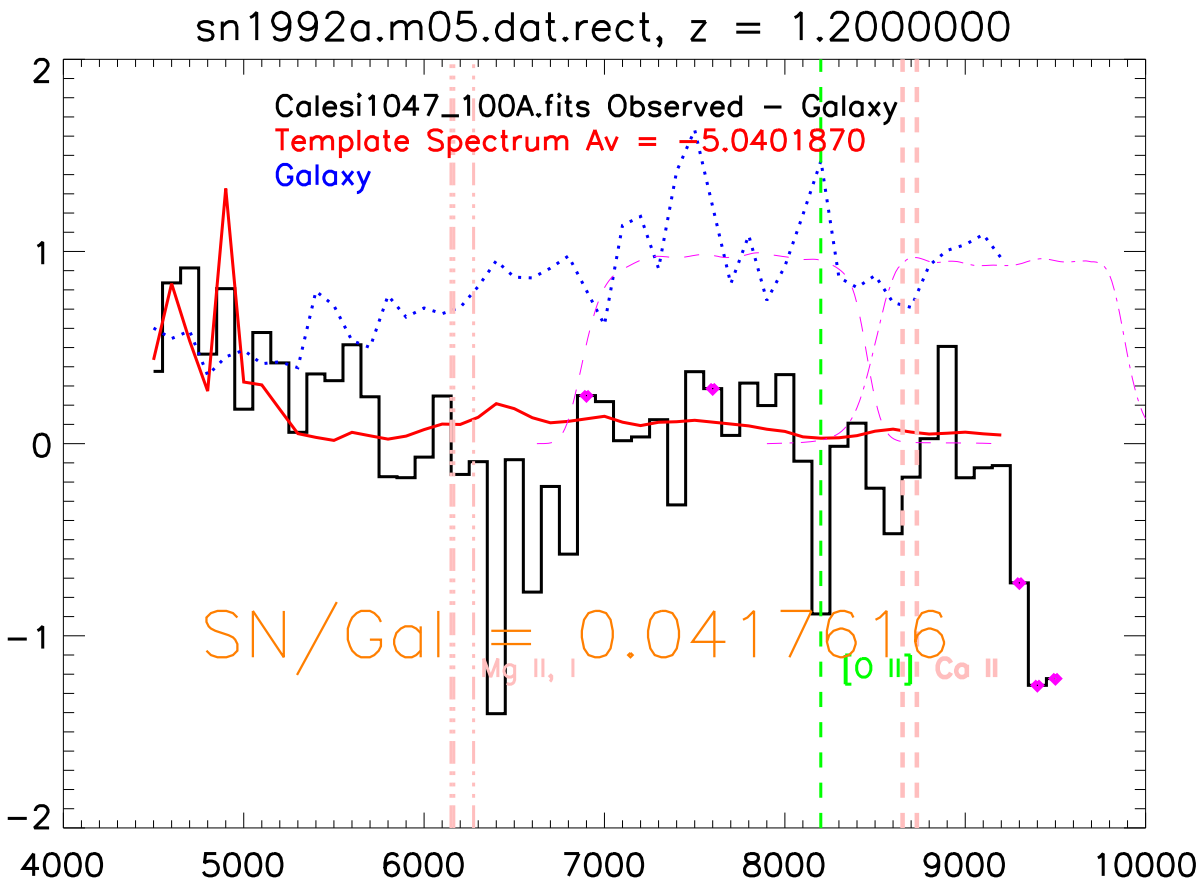

sn1992a.p09.dat.rect, z = 1.4500000
Calesi1047_100A.fits Observed − Galaxy
Template Spectrum Av = 4.9728737
Galaxy
SN/Gal = +0.0134380
Mg II, I
[O II]
Ca II
2
1
0
−1
−2
−3
4000
5000
6000
7000
8000
9000
10000


sn1992a.p17.dat.rect, z = 1.4500000
Calesi1047_100A.fits Observed − Galaxy
Template Spectrum Av = 0.012341109
Galaxy
SN/Gal = 0.107325
Mg II, I
[O II]
Ca II
2
1
0
−1
−2
−3
4000
5000
6000
7000
8000
9000
10000

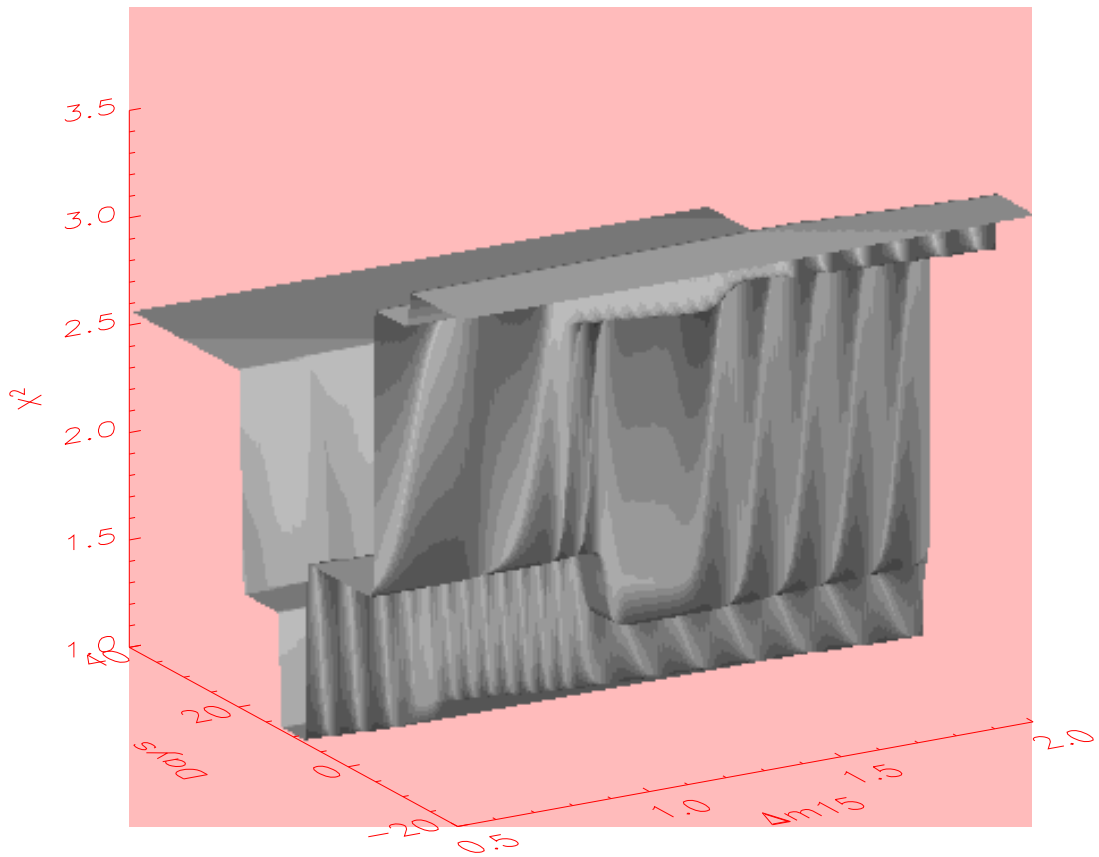

sn1990n.m07.dat.rect, z = 1.4500000
Calesi1047_100A.fits Observed − Galaxy
Template Spectrum Av = −4.6466621
Galaxy
SN/Gal = −0.207060
Mg II, I
[O II]
Ca II
2
1
0
−1
−2
4000
5000
6000
7000
8000
9000
10000


sn1991bg.m00.dat.rect, z = 1.3500000
Calesi1047_100A.fits Observed − Galaxy
Template Spectrum Av = −1.8549247
Galaxy
SN/Gal = −0.0549108
Mg II, I
[O II]
Ca II
2
1
0
−1
−2
4000
5000
6000
7000
8000
9000
10000

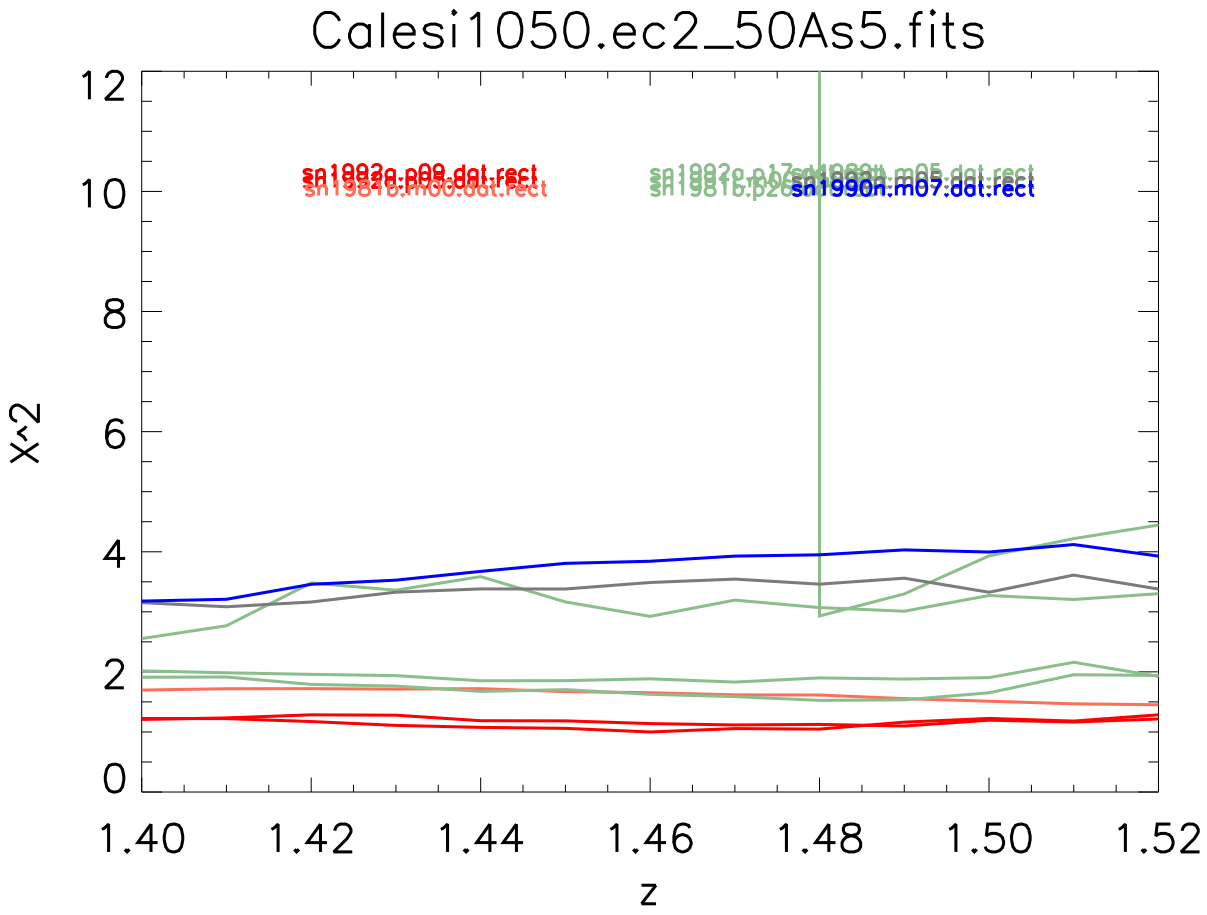

sn1989b.m07.dat.rect, z = 1.0000000
Calesi1047_100A.fits Observed − Galaxy
Template Spectrum Av = 1.6089488
Galaxy
SN/Gal = 1.28412
[O II]
Ca II
[O III]
1.5
1.0
0.5
0.0
−0.5
4000
5000
6000
7000
8000
9000
10000

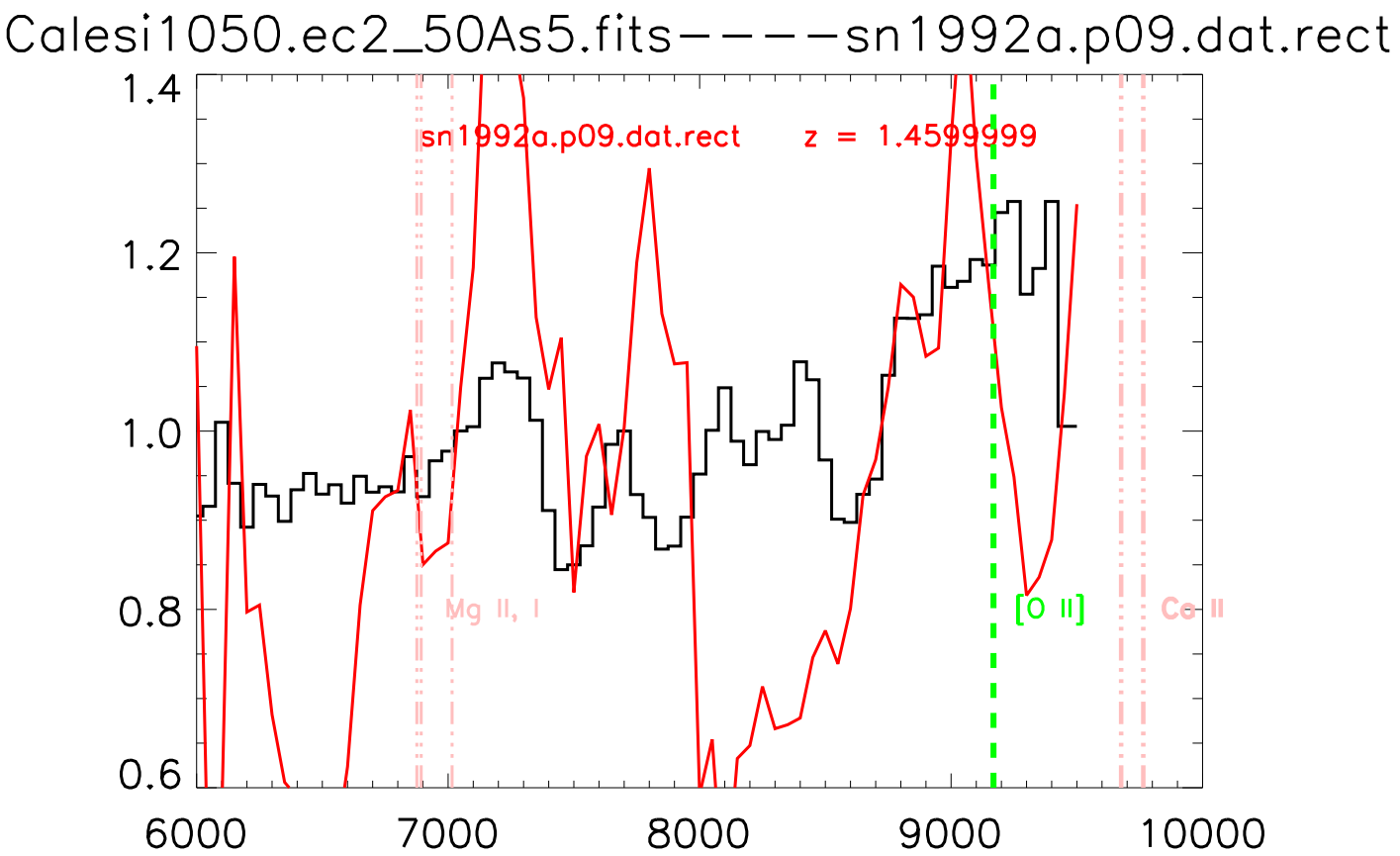

sn1992a.m05.dat.rect, z = 1.2000000
Calesi1047_100A.fits Observed − Galaxy
Template Spectrum Av = −5.0401870
Galaxy
SN/Gal = 0.0417616
Mg II, I
[O II]
Ca II
2
1
0
−1
−2
4000
5000
6000
7000
8000
9000
10000

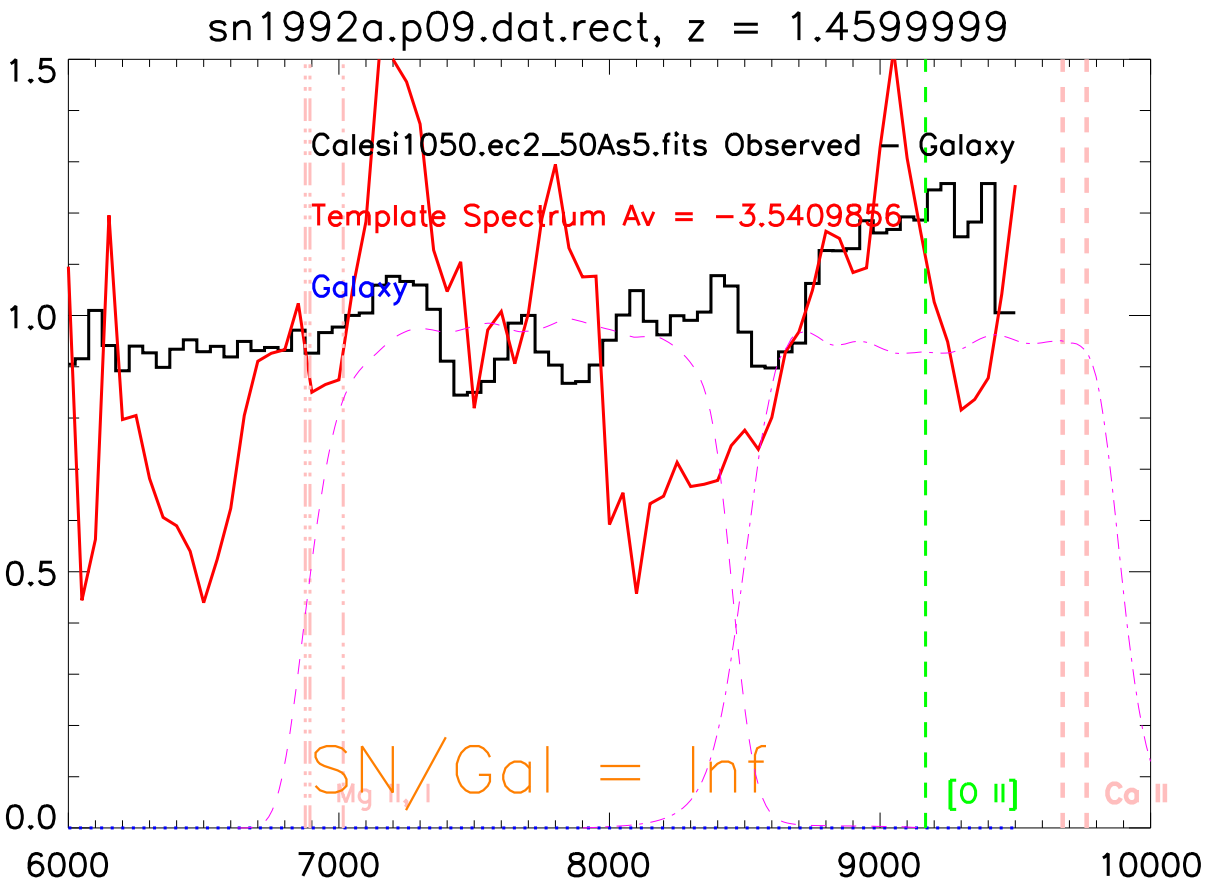
2.6
1.5
1.0
1.1
1.8
1.5
2.9
3.1
3.2
3.3

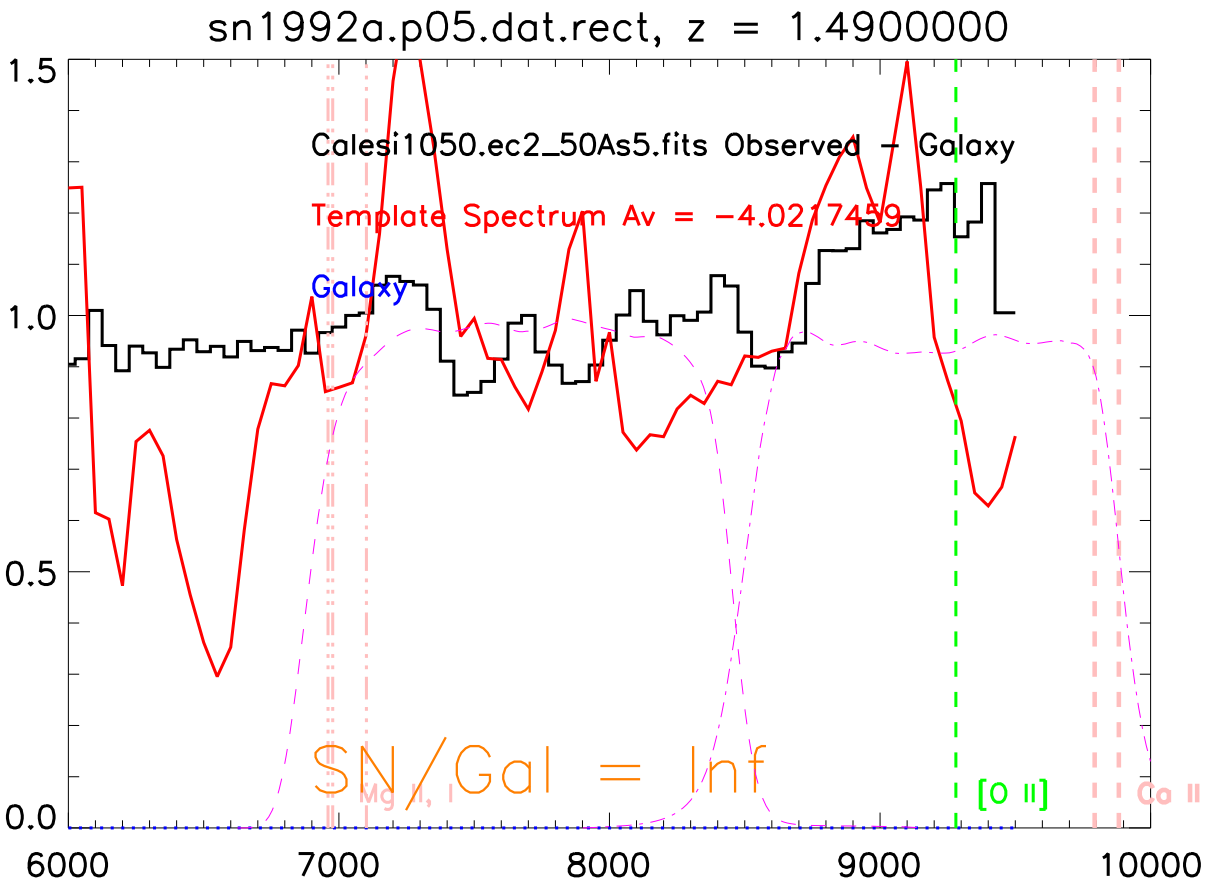


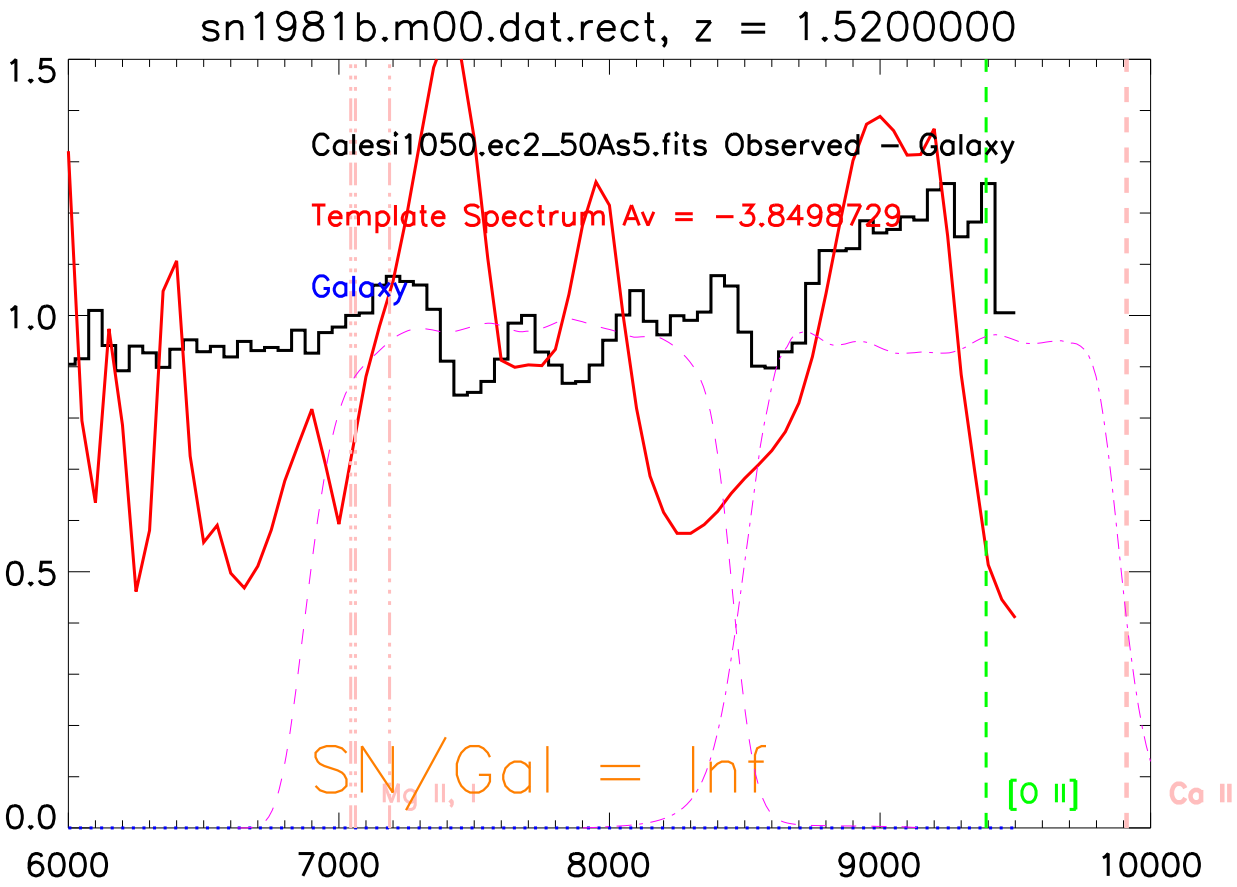
3.5
3.0
2.5
2.0
1.5
1.0
χ^2
40
20
0
−20
Days
0.5
1.0
1.5
2.0
Δm15

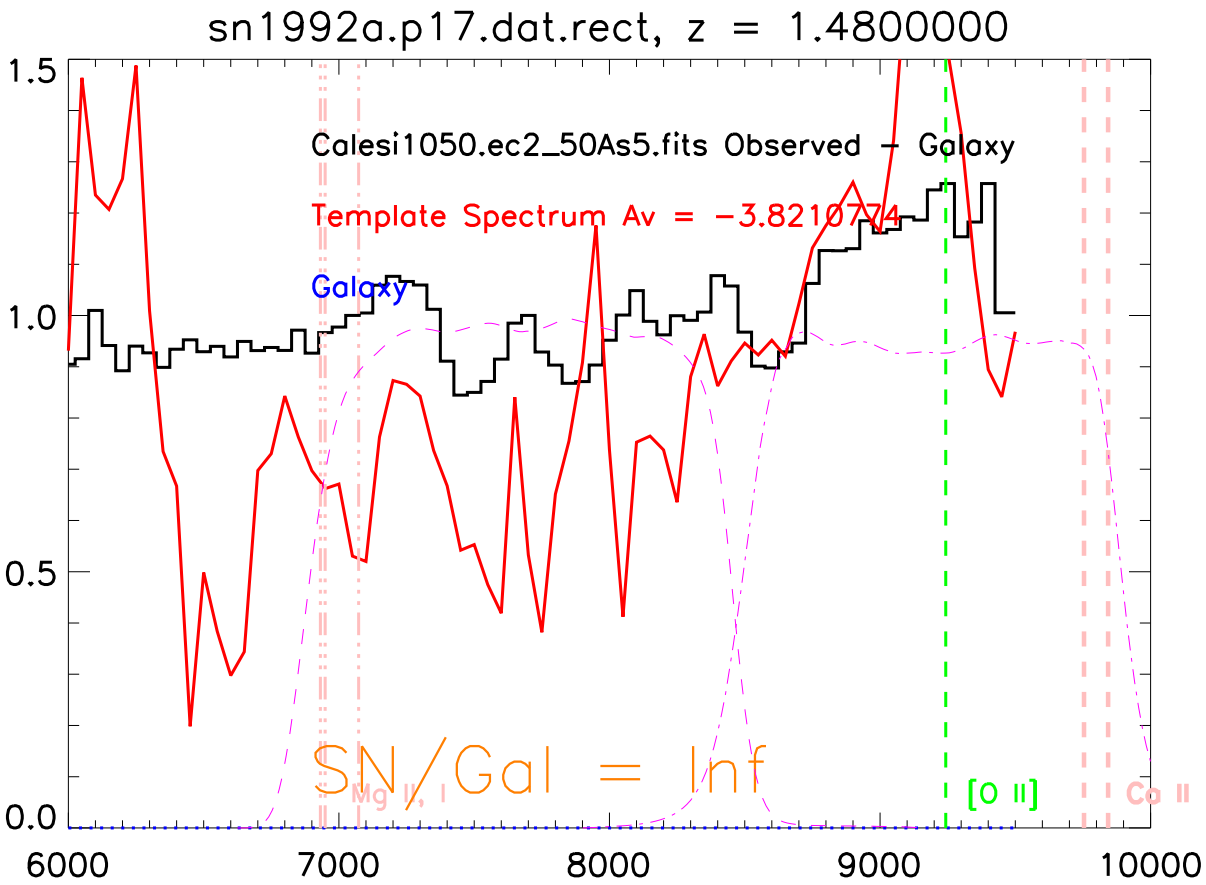

Calesi1050.ec2_50As5.fits
12
10
8
6
4
2
0
X^2
1.40
1.42
1.44
1.46
1.48
1.50
1.52
z
sn1990n:m07.dat:rect

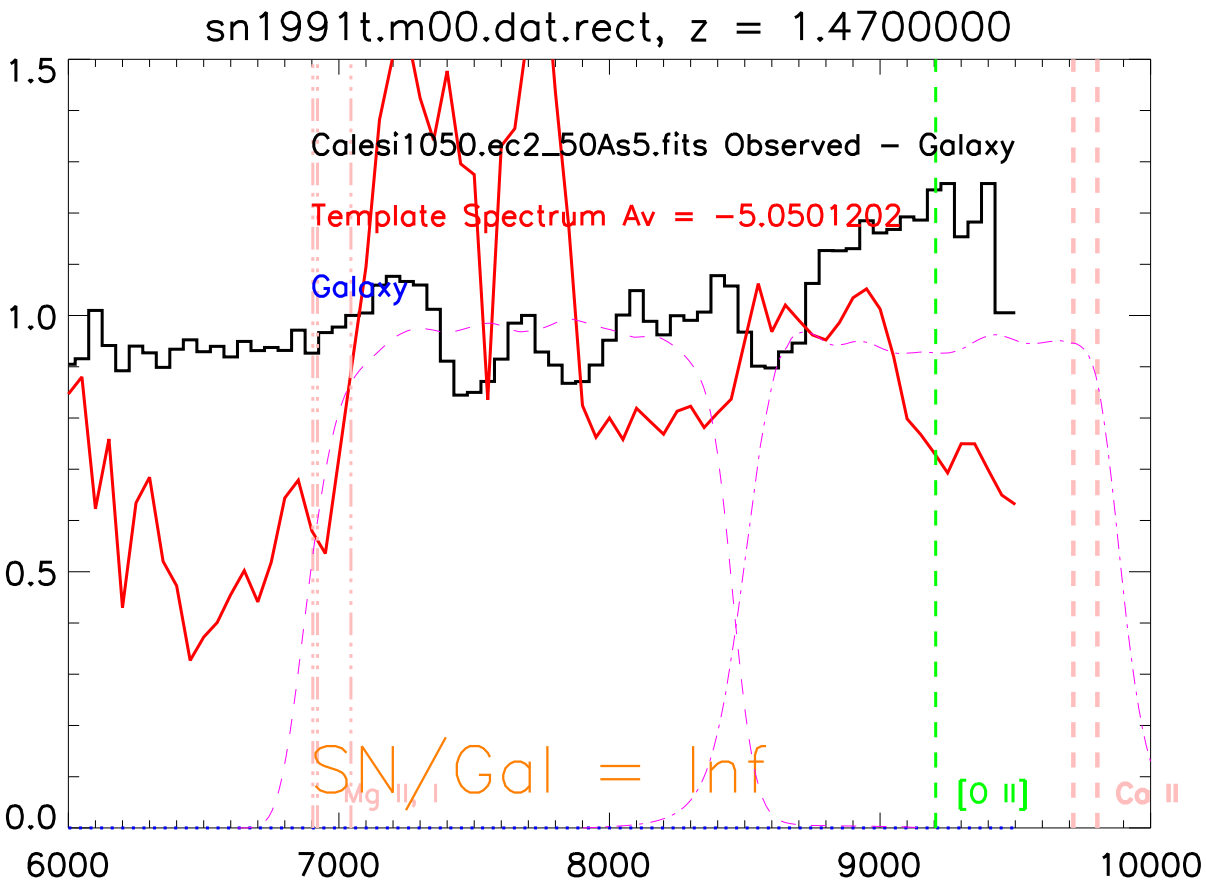

Calesi1050.ec2_50As5.fits----sn1992a.p09.dat.rect
sn1992a.p09.dat.rect z = 1.4599999
Mg II, I
[O II]
Ce II
1.4
1.2
1.0
0.8
0.6
6000
7000
8000
9000
10000

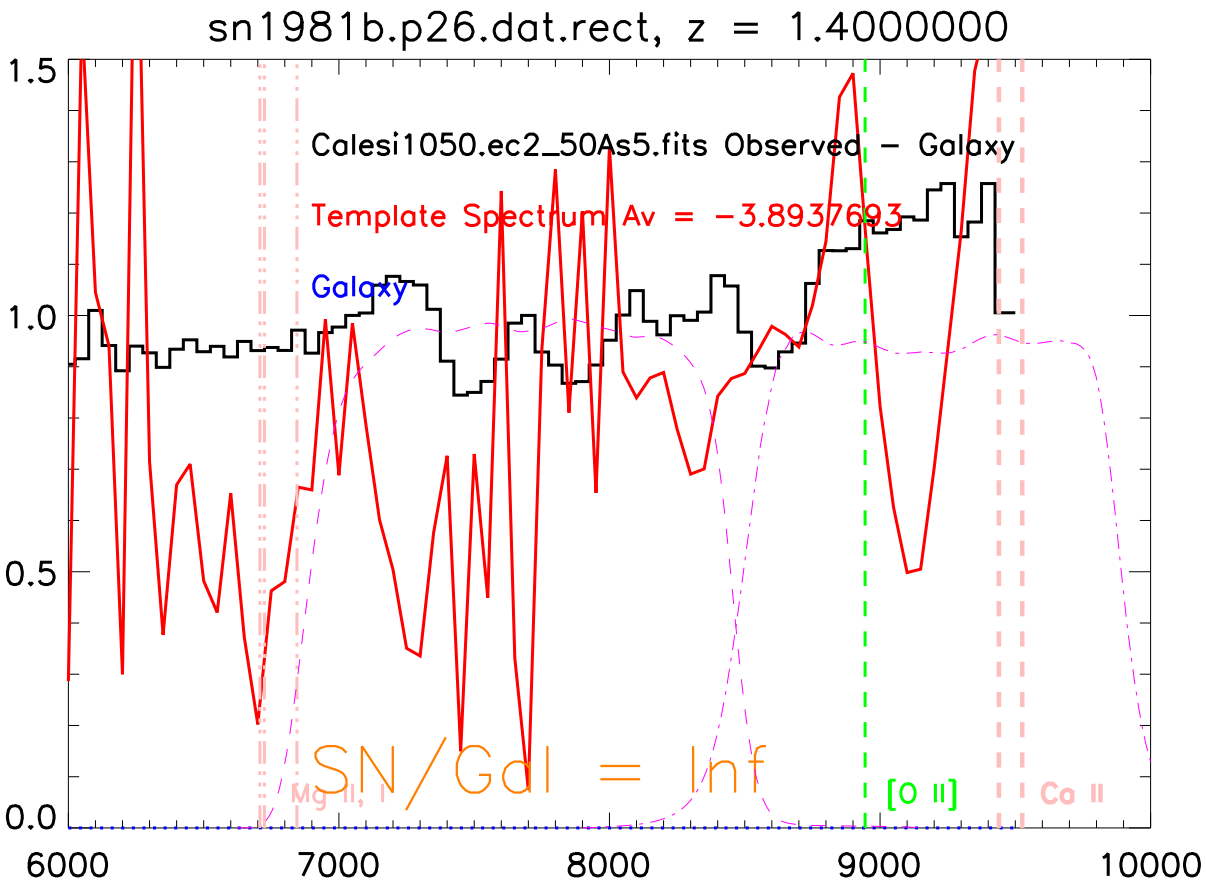

sn1992a.p09.dat.rect, z = 1.4599999
Calesi1050.ec2_50As5.fits Observed — Galaxy
Template Spectrum Av = −3.5409856
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
1.5
1.0
0.5
0.0
6000
7000
8000
9000
10000

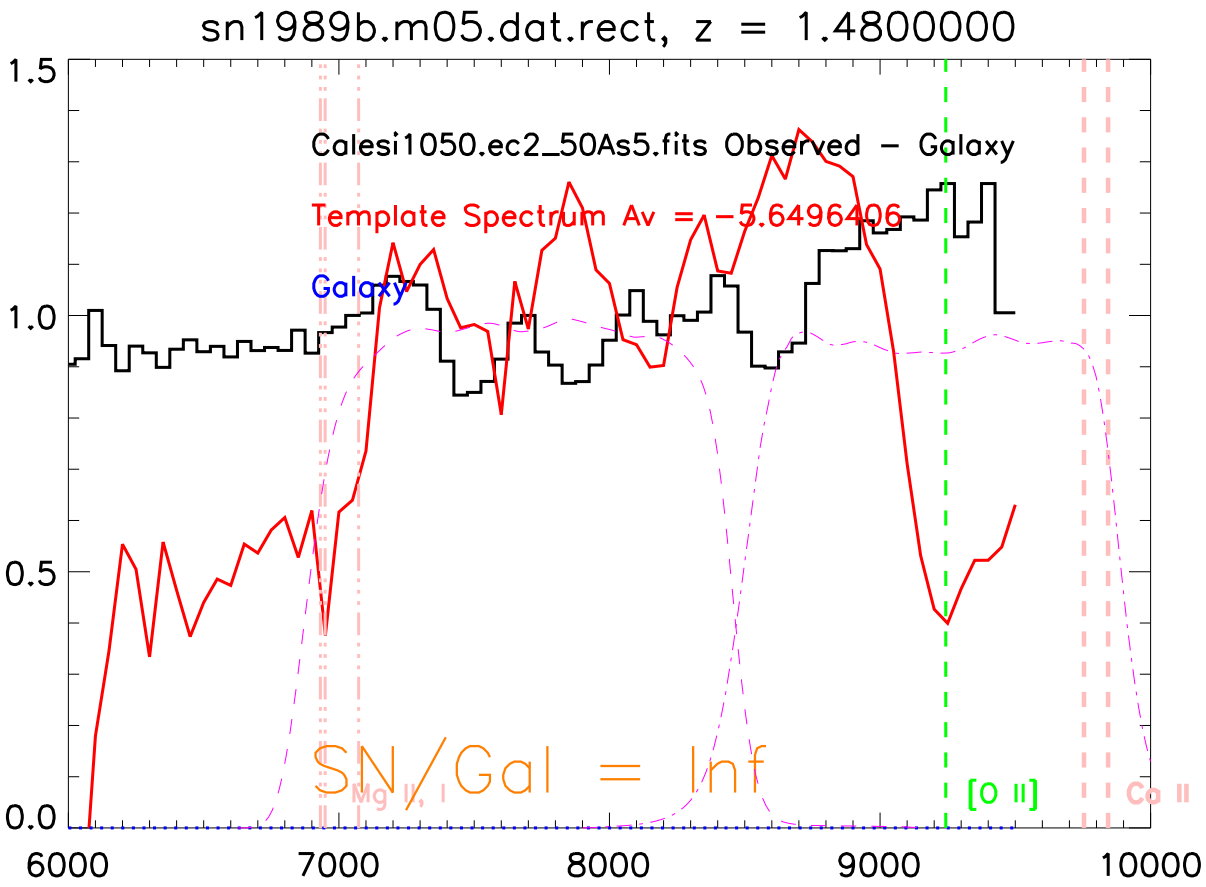

sn1992a.p05.dat.rect, z = 1.4900000
Calesi1050.ec2_50As5.fits Observed – Galaxy
Template Spectrum Av = -4.0217459
Galaxy
SN/Gal = Inf
Mg I, I
[O II]
Ca II
1.5
1.0
0.5
0.0
6000
7000
8000
9000
10000

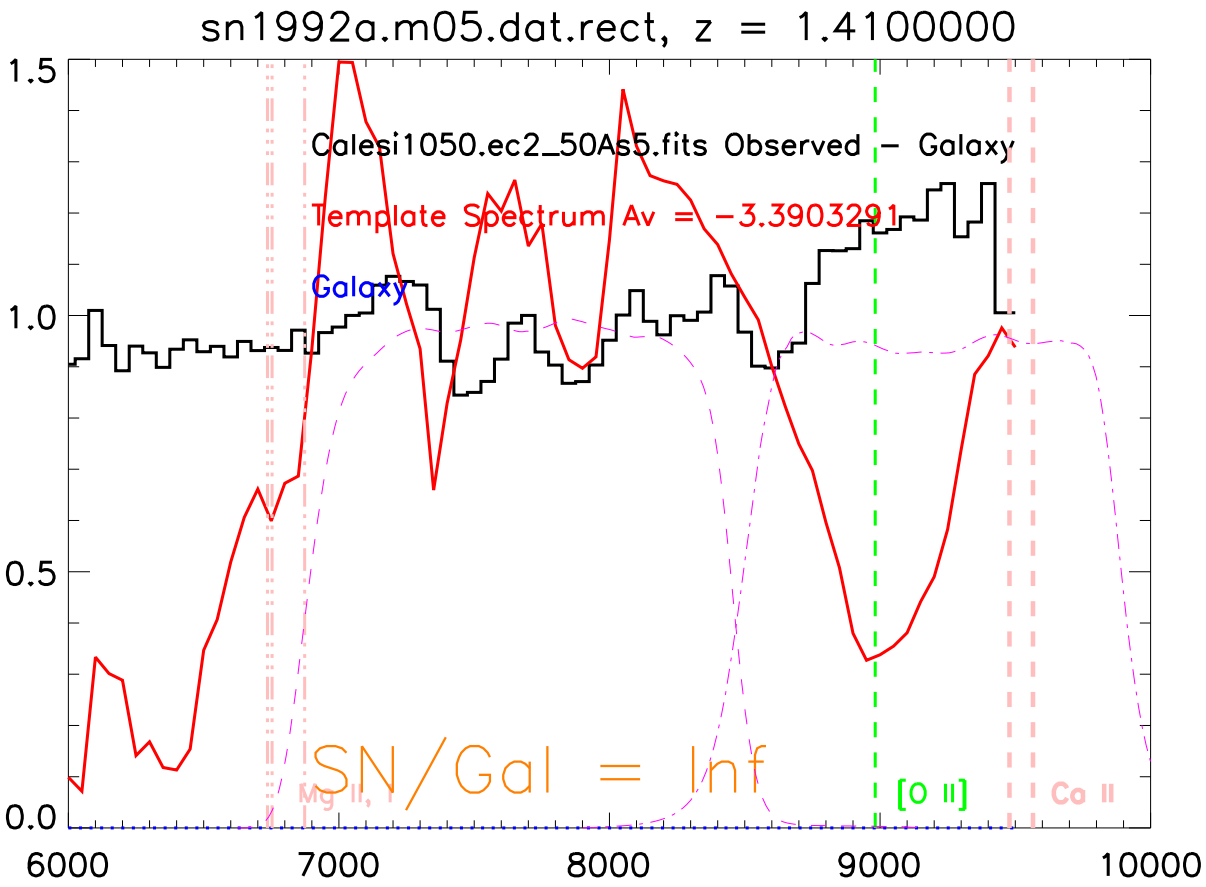

sn1981b.m00.dat.rect, z = 1.5200000
Calesi1050.ec2_50As5.fits Observed – Galaxy
Template Spectrum Av = -3.8498729
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
1.5
1.0
0.5
0.0
6000
7000
8000
9000
10000

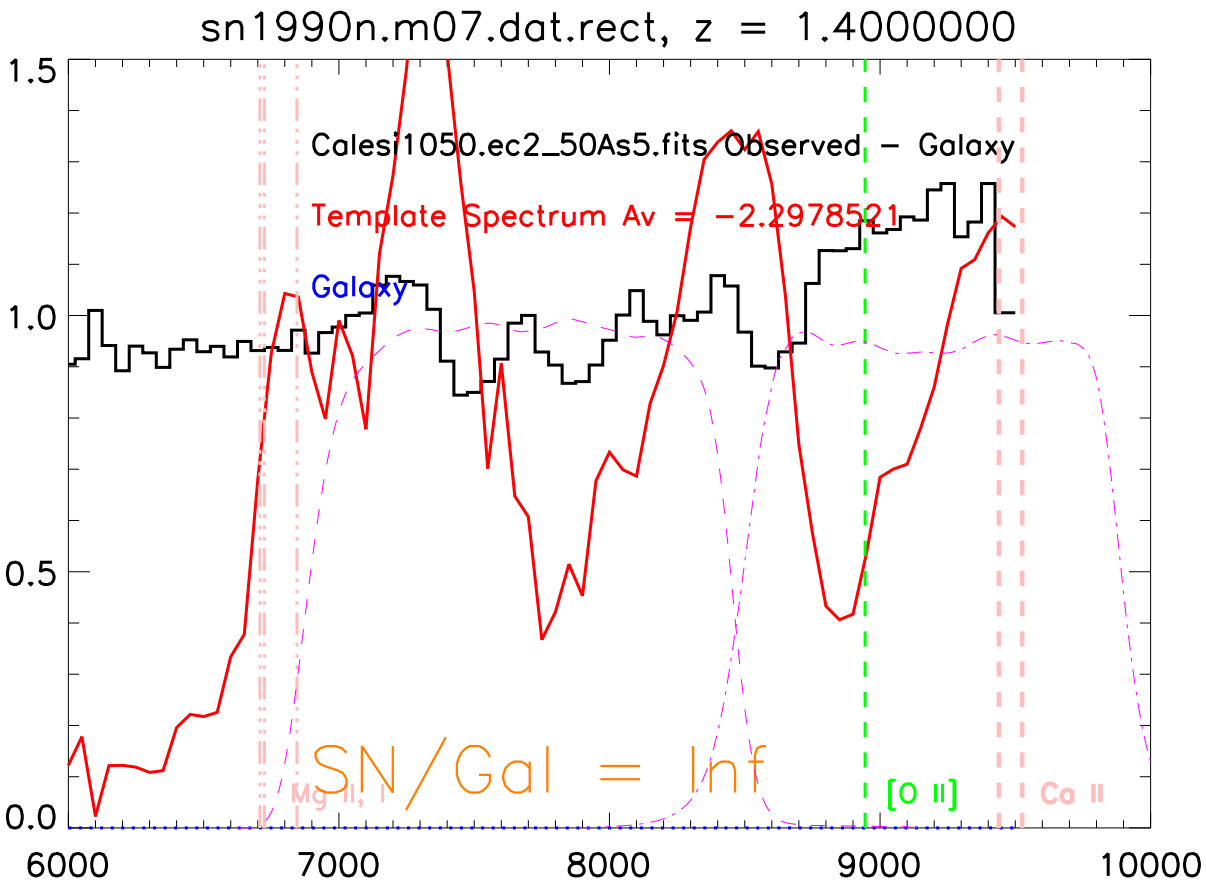

sn1992a.p17.dat.rect, z = 1.4800000
Calesi1050.ec2_50As5.fits Observed – Galaxy
Template Spectrum Av = -3.8210774
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
1.5
1.0
0.5
0.0
6000
7000
8000
9000
10000


sn1991t.m00.dat.rect, z = 1.4700000
Calesi1050.ec2_50As5.fits Observed − Galaxy
Template Spectrum Av = −5.0501202
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
1.5
1.0
0.5
0.0
6000
7000
8000
9000
10000

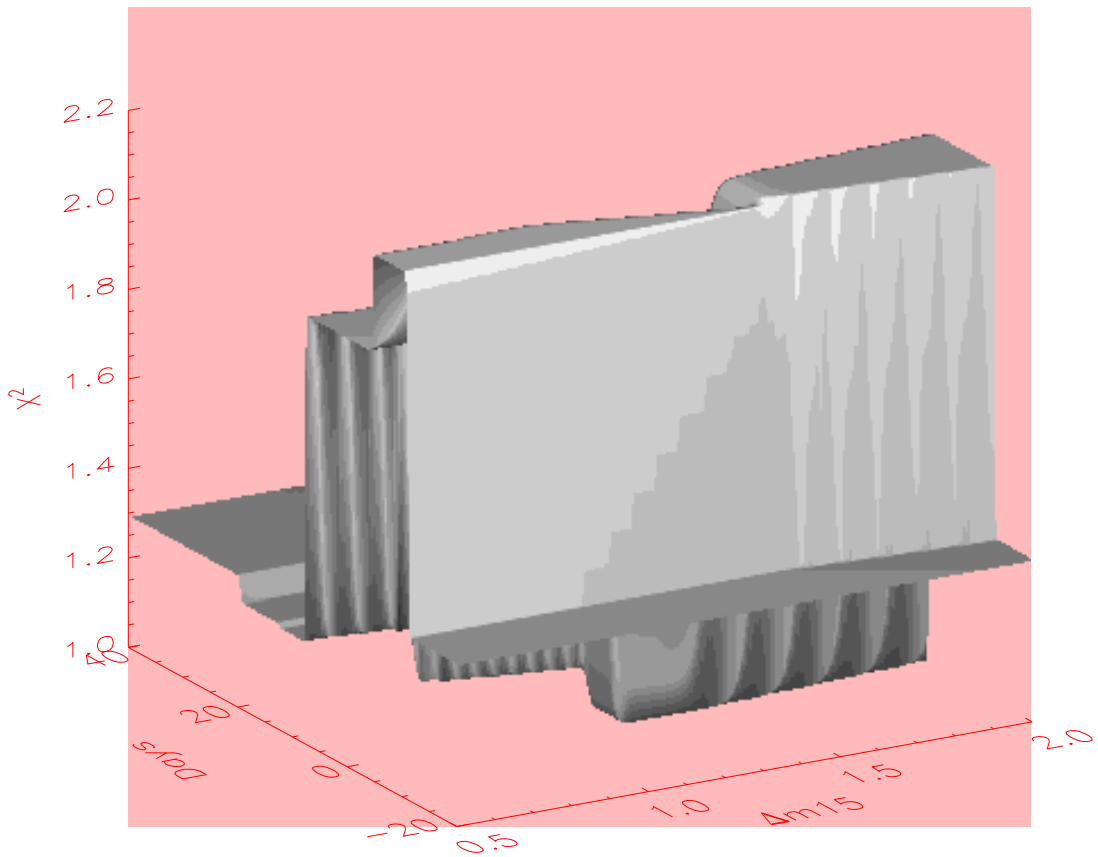

sn1981b.p26.dat.rect, z = 1.4000000
Calesi1050.ec2_50As5.fits Observed – Galaxy
Template Spectrum Av = -3.8937693
Galaxy
SN/Gdl = Inf
Mg II, I
[O II]
Ca II
1.5
1.0
0.5
0.0
6000
7000
8000
9000
10000

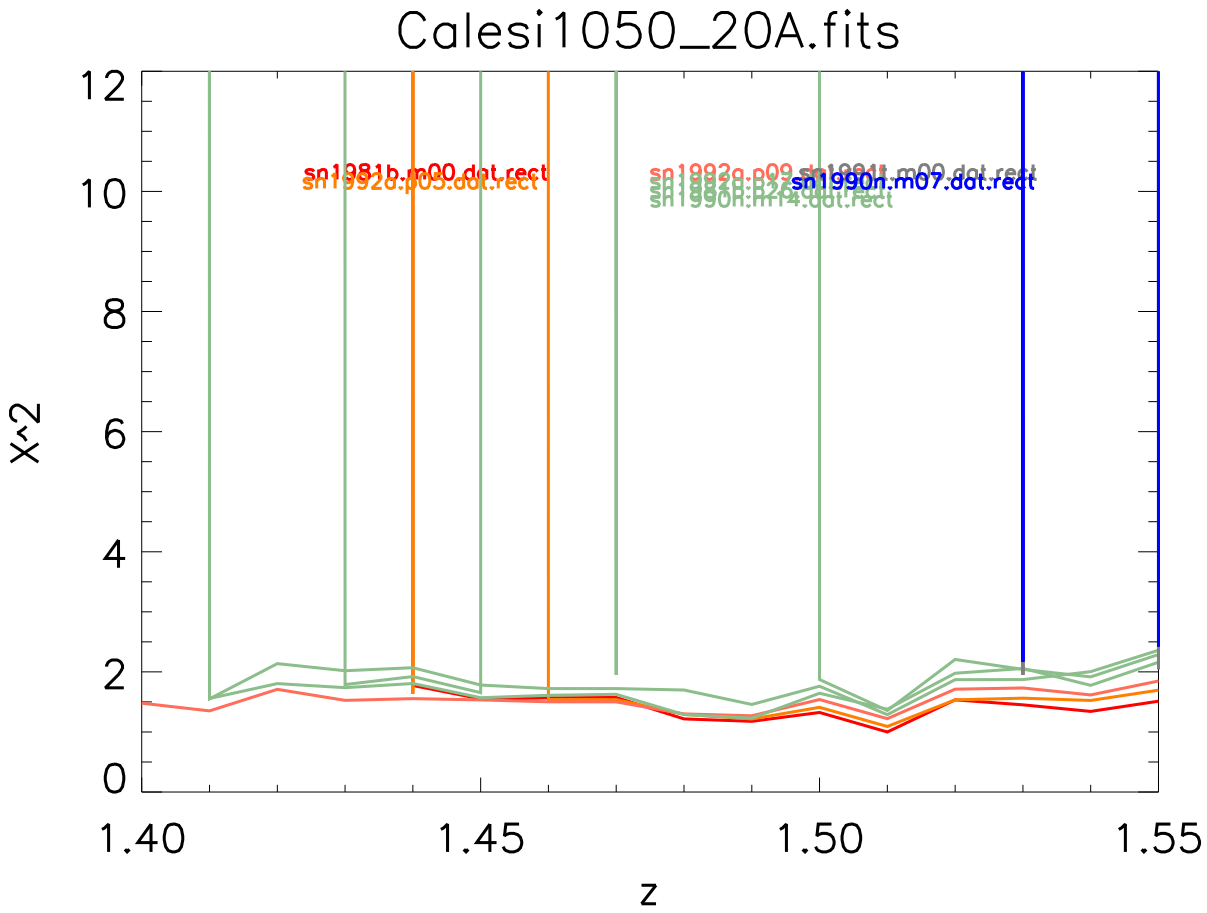

sn1989b.m05.dat.rect, z = 1.4800000
Calesi1050.ec2_50As5.fits Observed − Galaxy
Template Spectrum Av = −5.6496406
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
1.5
1.0
0.5
0.0
6000
7000
8000
9000
10000

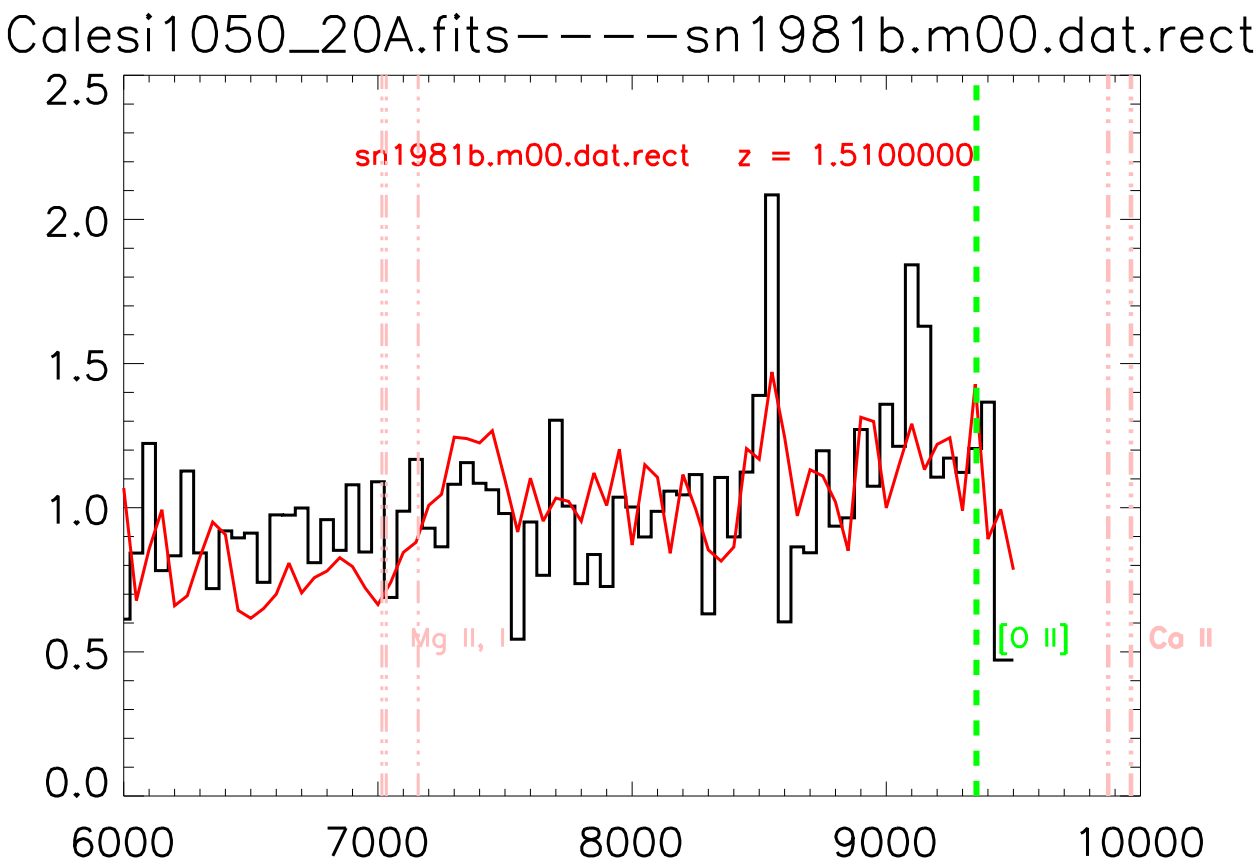

sn1992a.m05.dat.rect, z = 1.4100000
Calesi1050.ec2_50As5.fits Observed – Galaxy
Template Spectrum Av = −3.3903291
Galaxy
SN/Gal = Inf
[O II]
Ca II
1.5
1.0
0.5
0.0
6000
7000
8000
9000
10000

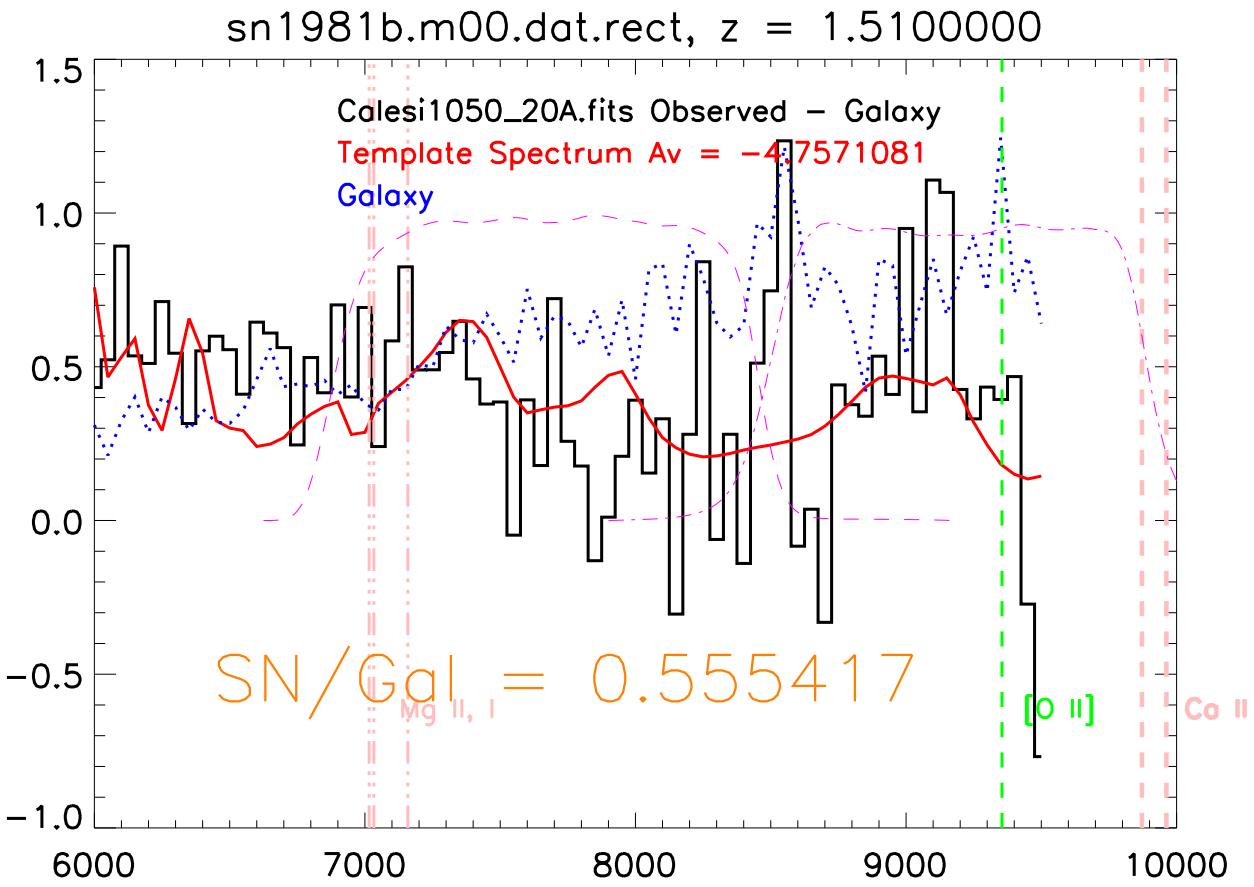

sn1990n.m07.dat.rect, z = 1.4000000
Calesi1050.ec2_50As5.fits Observed – Galaxy
Template Spectrum Av = -2.2978521
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
1.5
1.0
0.5
0.0
6000
7000
8000
9000
10000

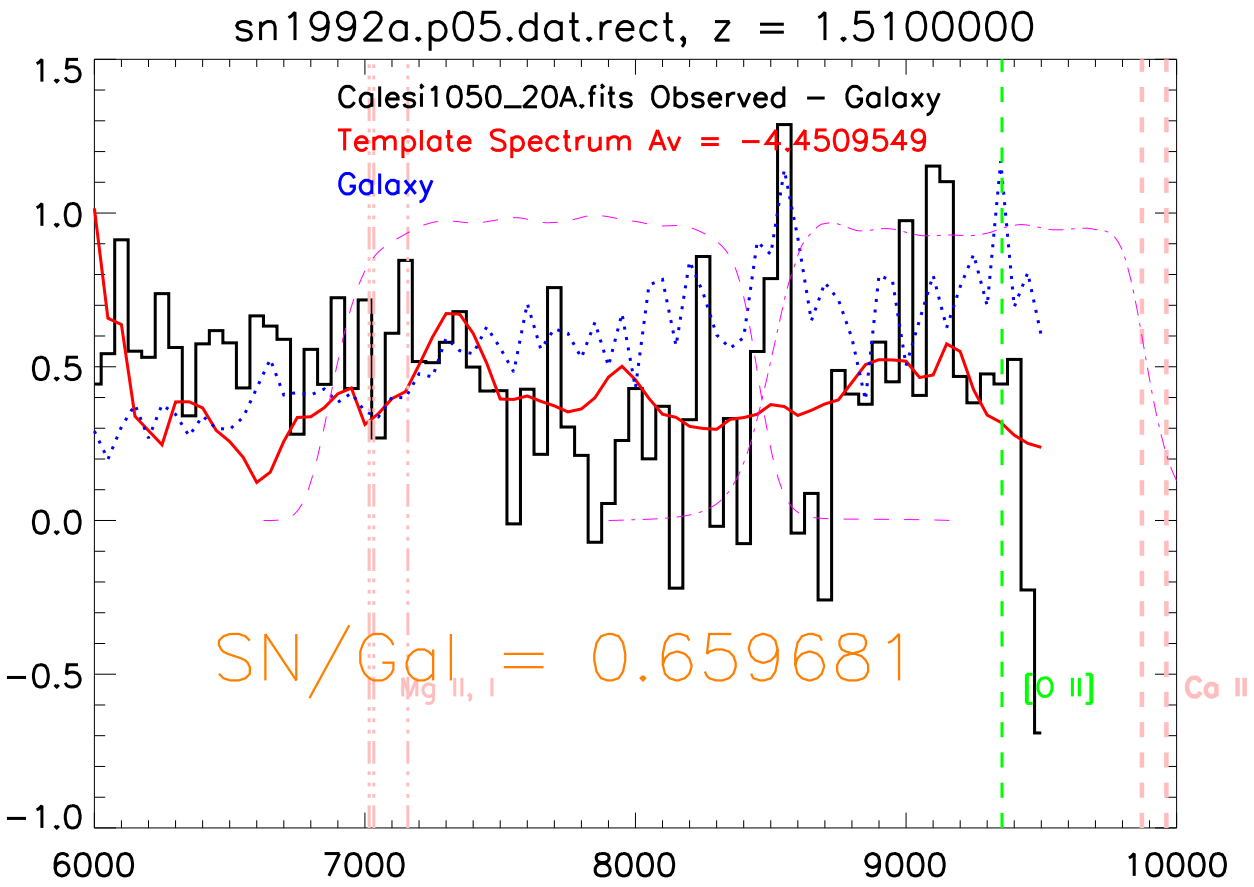
1.3
1.2
1.2
1.1
2.0
1.0
1.7
2.2
2.2
1.4

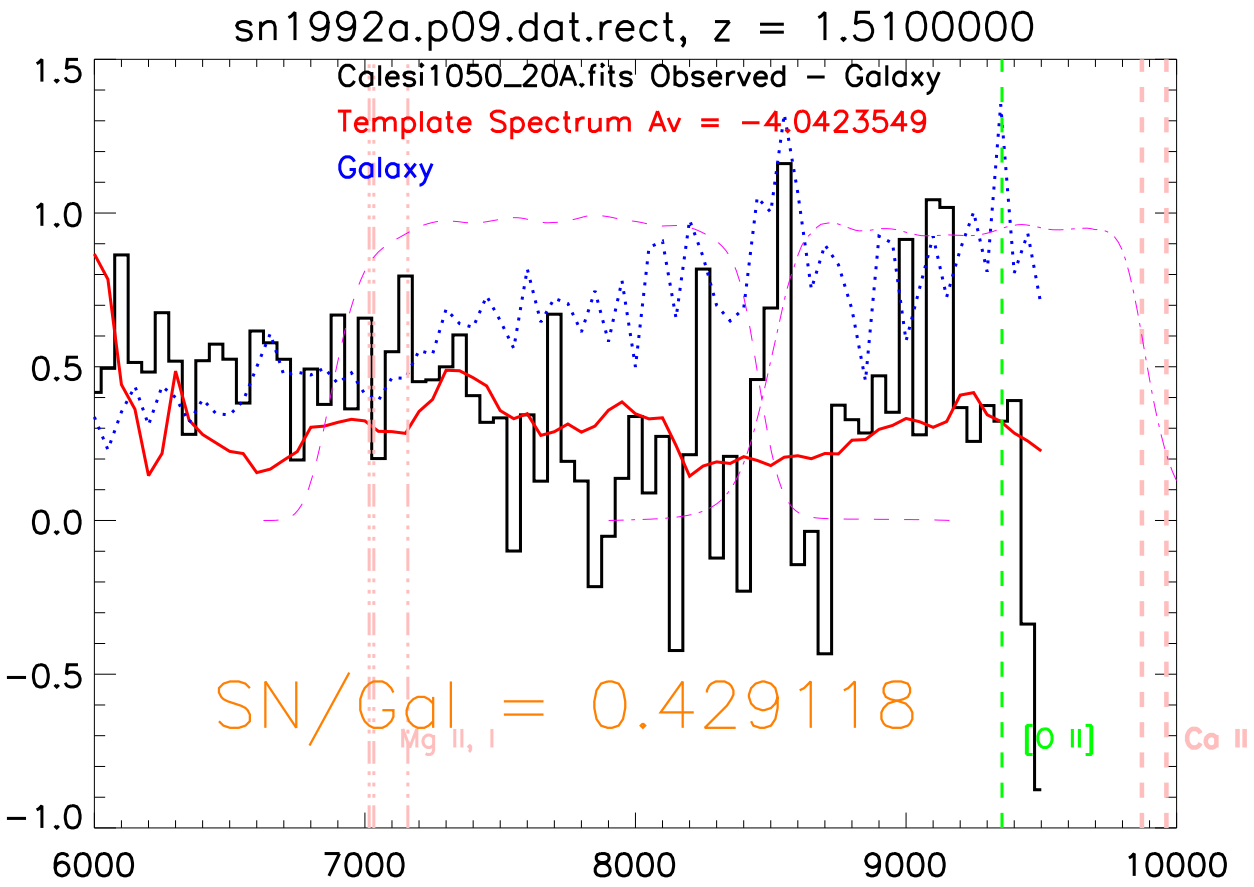

2.2
2.0
1.8
1.6
1.4
1.2
1.0
χ²
40
20
0
−20
Δm15
0.5
1.0
1.5
2.0

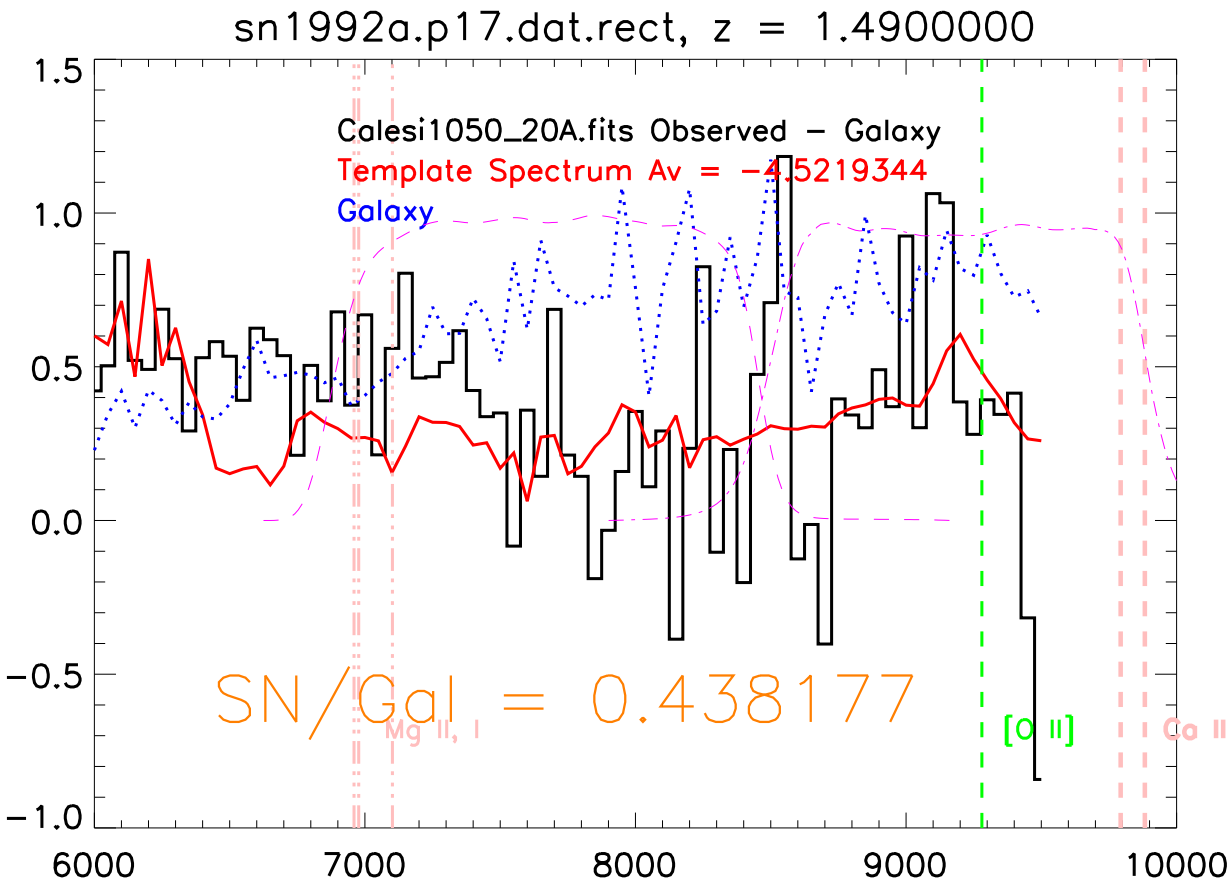

Calesi1050_20A.fits
12
10
8
6
4
2
0
X^2
1.40
1.45
1.50
1.55
z
sn1990n.m07.dat.rect

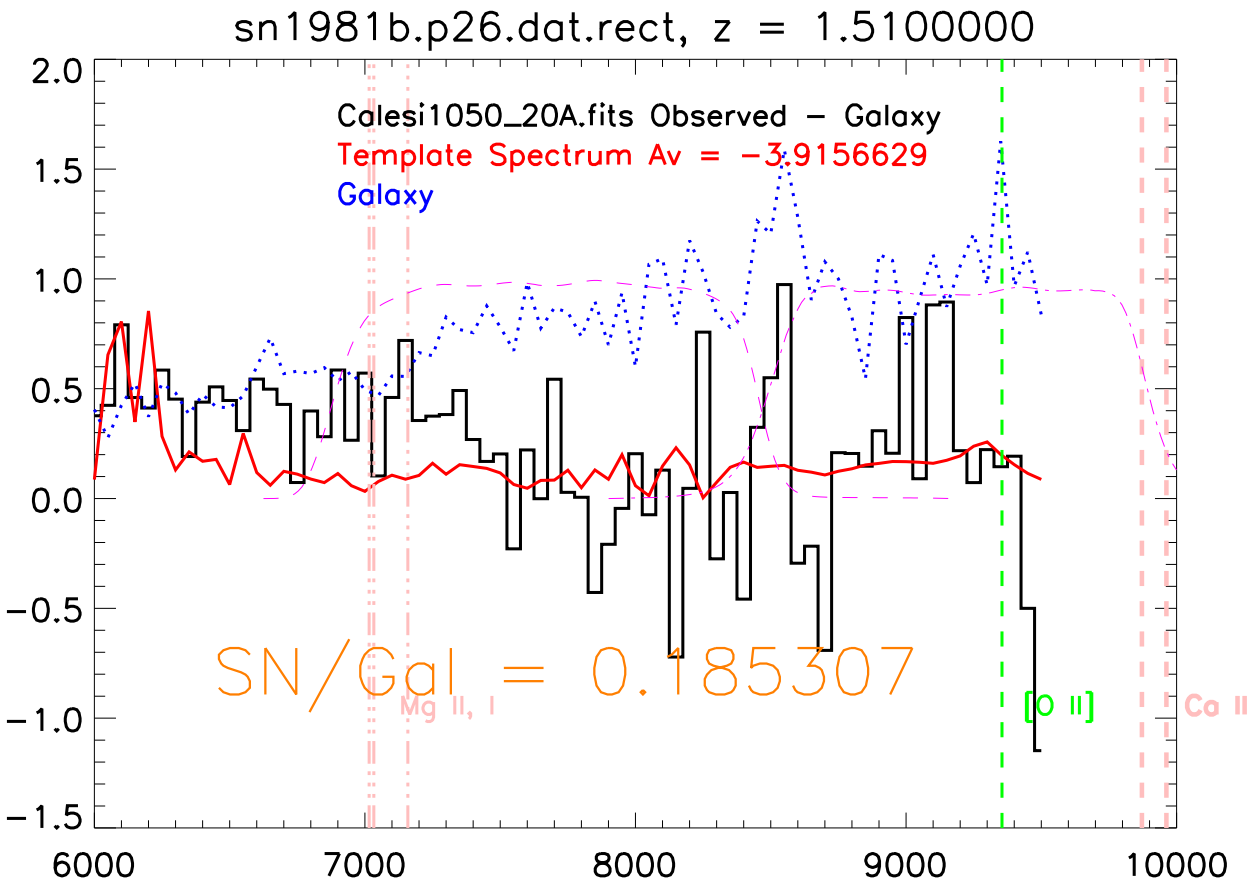

Calesi1050_20A.fits----sn1981b.m00.dat.rect
sn1981b.m00.dat.rect z = 1.5100000
Mg II, I
[O II]
Ca II
2.5
2.0
1.5
1.0
0.5
0.0
6000
7000
8000
9000
10000

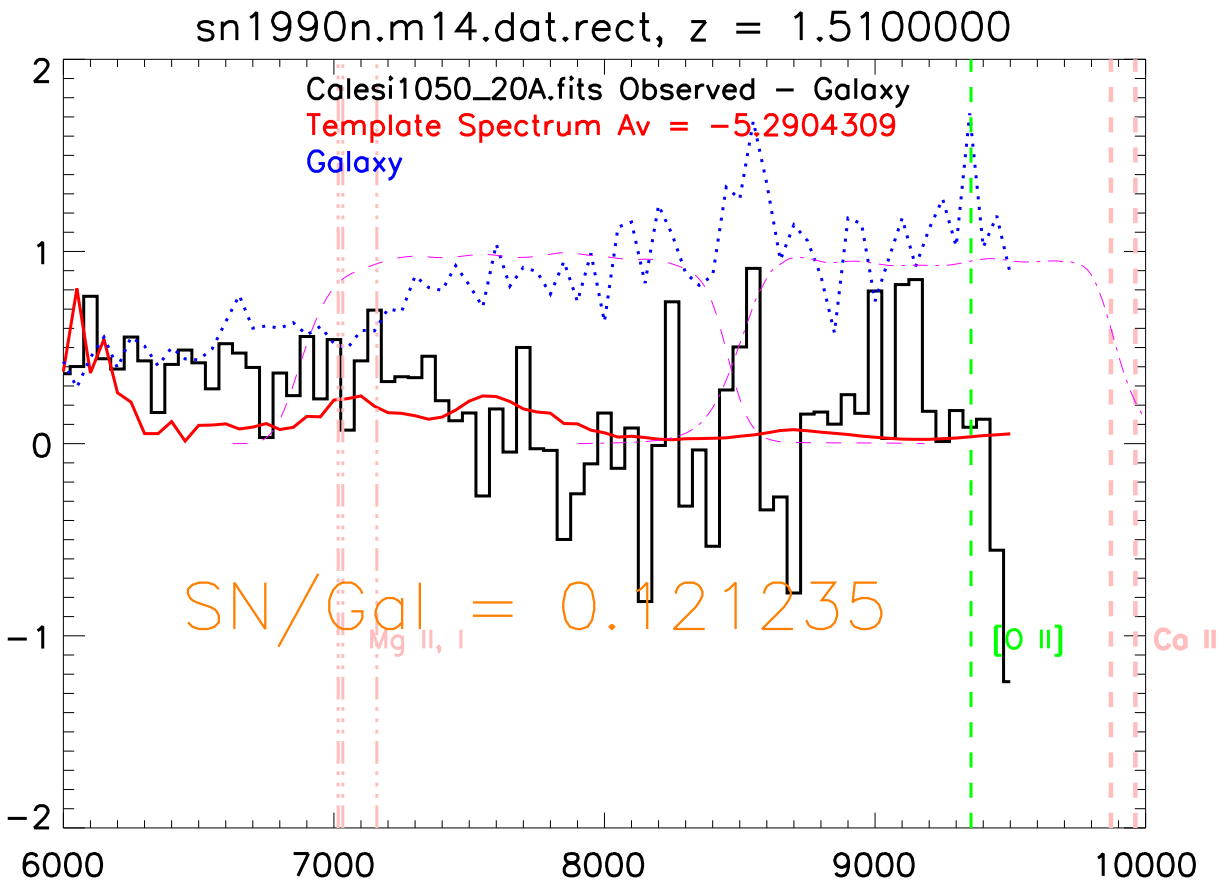

sn1981b.m00.dat.rect, z = 1.5100000
Calesi1050_20A.fits Observed − Galaxy
Template Spectrum Av = −4.7571081
Galaxy
SN/Gal = 0.555417
Mg II, I
[O II]
Co II
1.5
1.0
0.5
0.0
−0.5
−1.0
6000
7000
8000
9000
10000

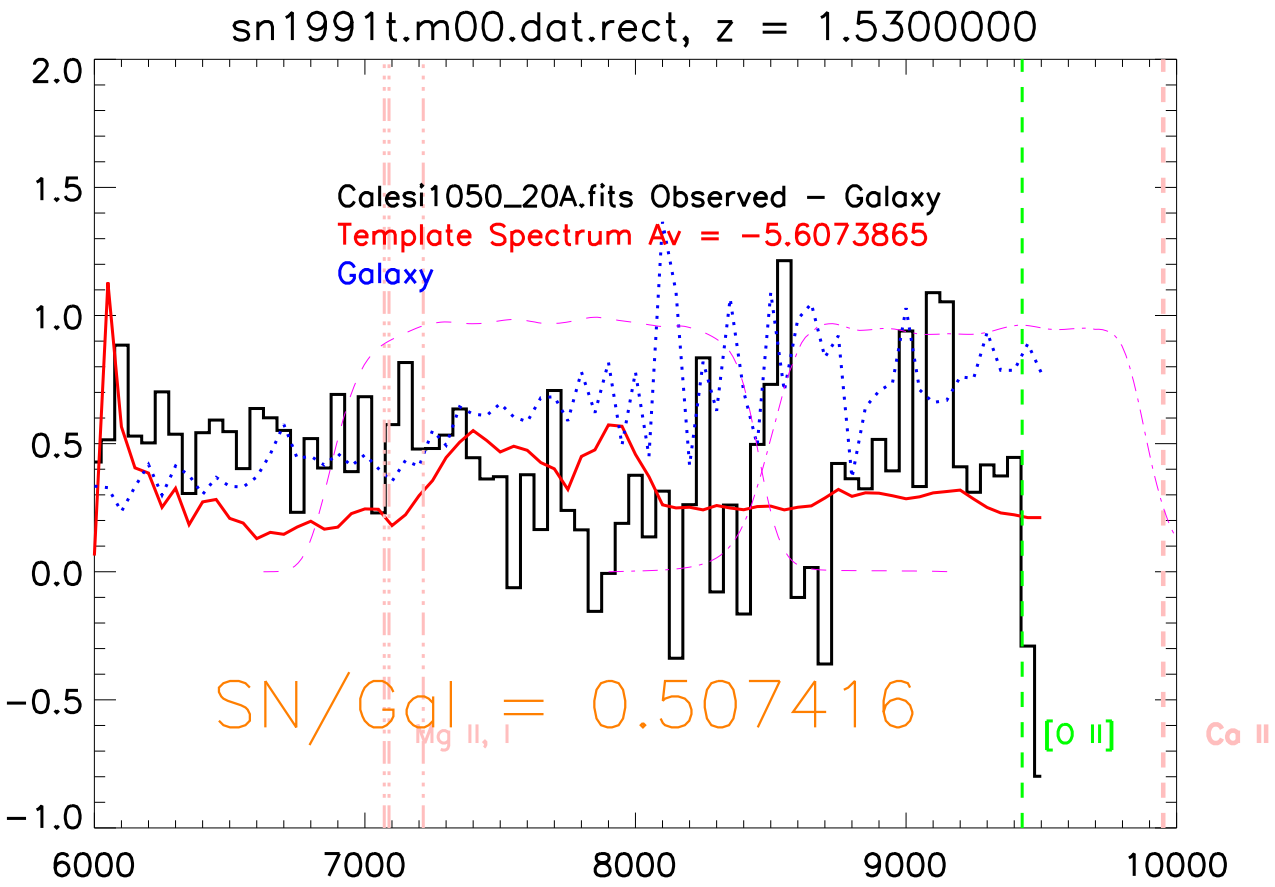

sn1992a.p05.dat.rect, z = 1.5100000
Calesi1050_20A.fits Observed − Galaxy
Template Spectrum Av = −4.4509549
Galaxy
SN/Gal = 0.659681
Mg II, I
[O II]
Ca II
1.5
1.0
0.5
0.0
−0.5
−1.0
6000
7000
8000
9000
10000

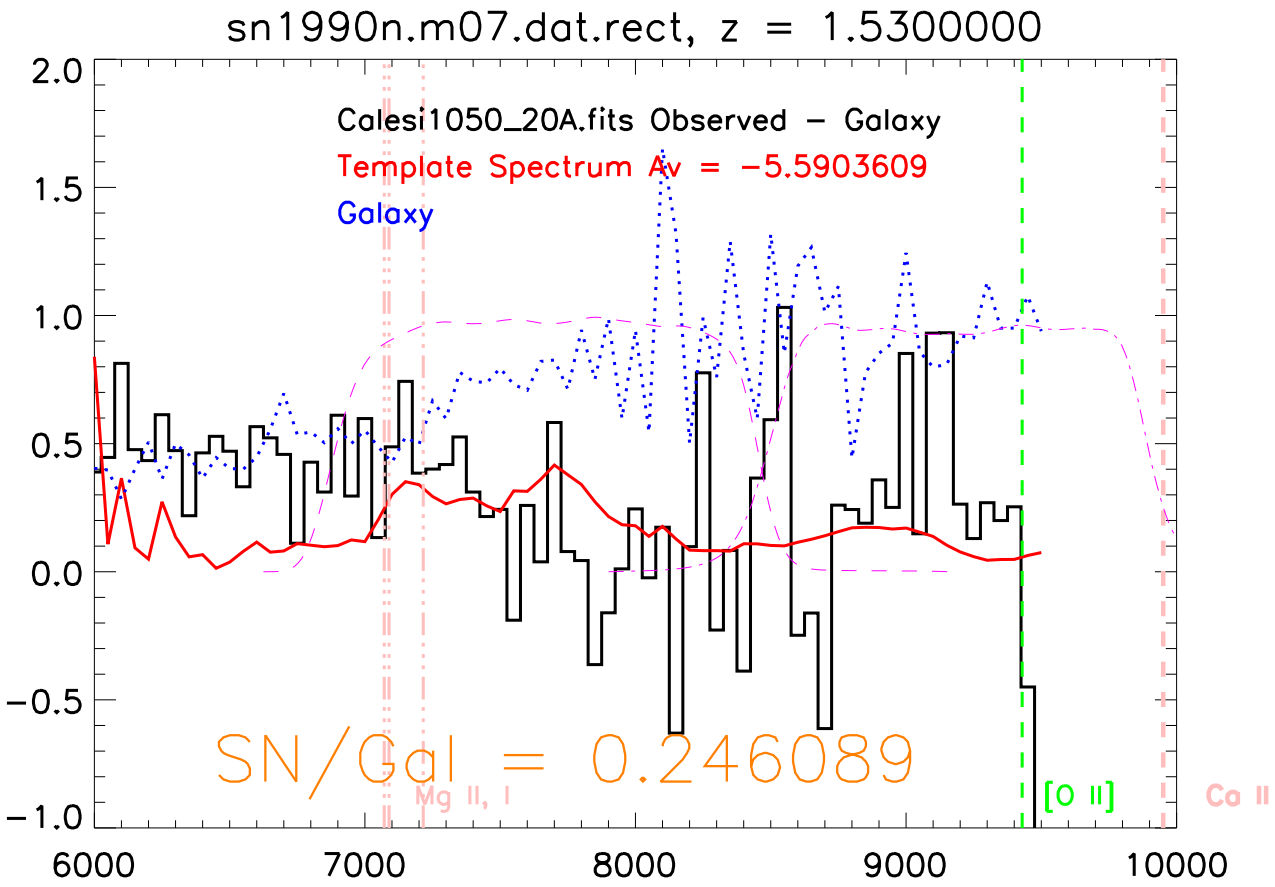

sn1992a.p09.dat.rect, z = 1.5100000
Calesi1050_20A.fits Observed − Galaxy
Template Spectrum Av = −4.0423549
Galaxy
SN/Gal = 0.429118
Mg II, I
[O II]
Ca II
1.5
1.0
0.5
0.0
−0.5
−1.0
6000
7000
8000
9000
10000

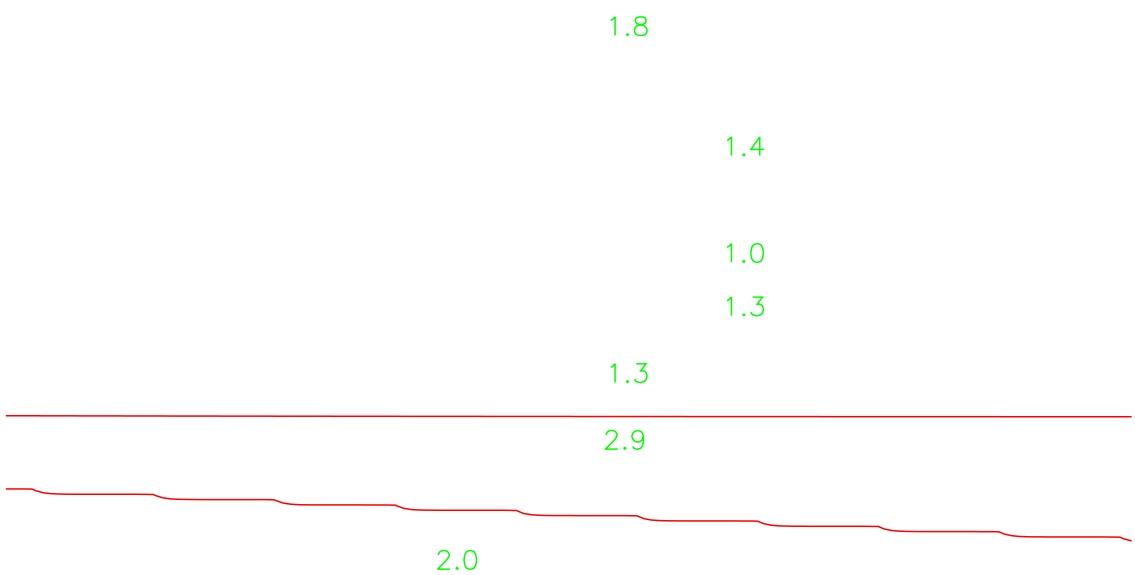

sn1992a.p17.dat.rect, z = 1.4900000
Calesi1050_20A.fits Observed − Galaxy
Template Spectrum Av = −4.5219344
Galaxy
SN/Gal = 0.438177
Mg II, I
[O II]
Ca II
1.5
1.0
0.5
0.0
−0.5
−1.0
6000
7000
8000
9000
10000

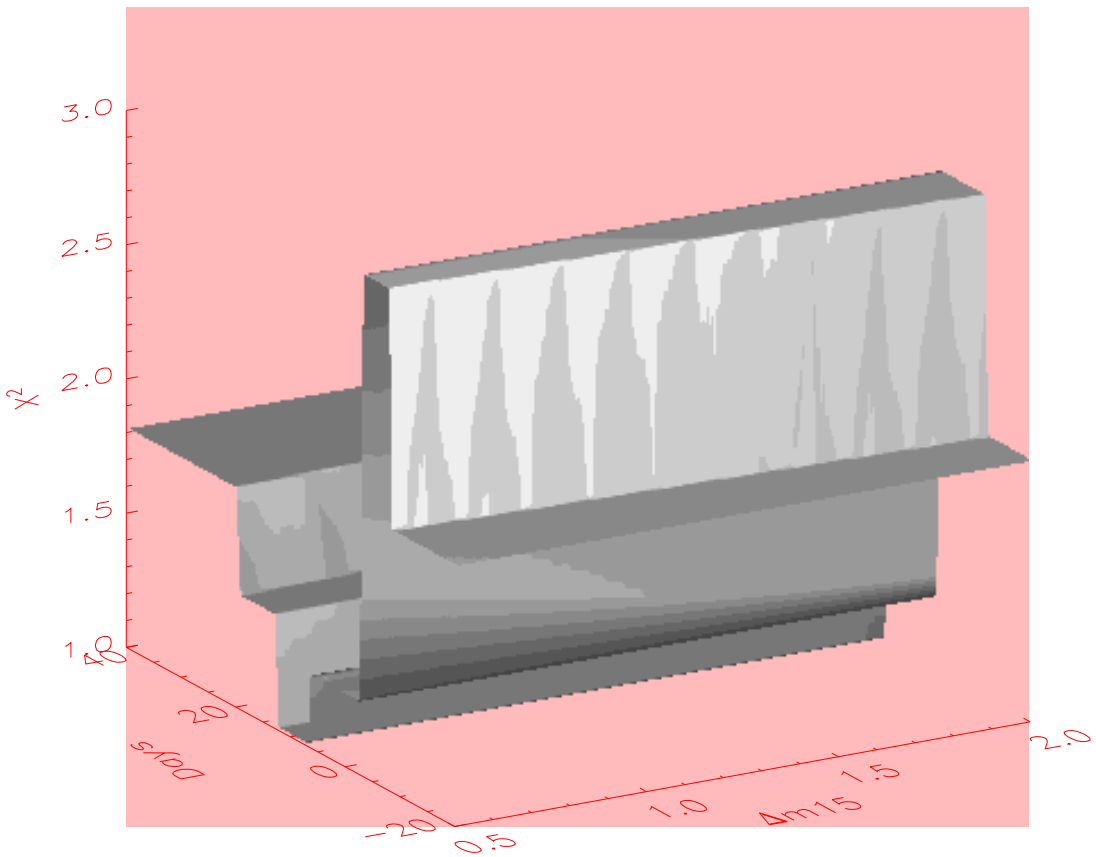

sn1981b.p26.dat.rect, z = 1.5100000
Calesi1050_20A.fits Observed − Galaxy
Template Spectrum Av = −3.9156629
Galaxy
SN/Gal = 0.185307
Mg II, I
[O II]
Ca II
2.0
1.5
1.0
0.5
0.0
−0.5
−1.0
−1.5
6000
7000
8000
9000
10000

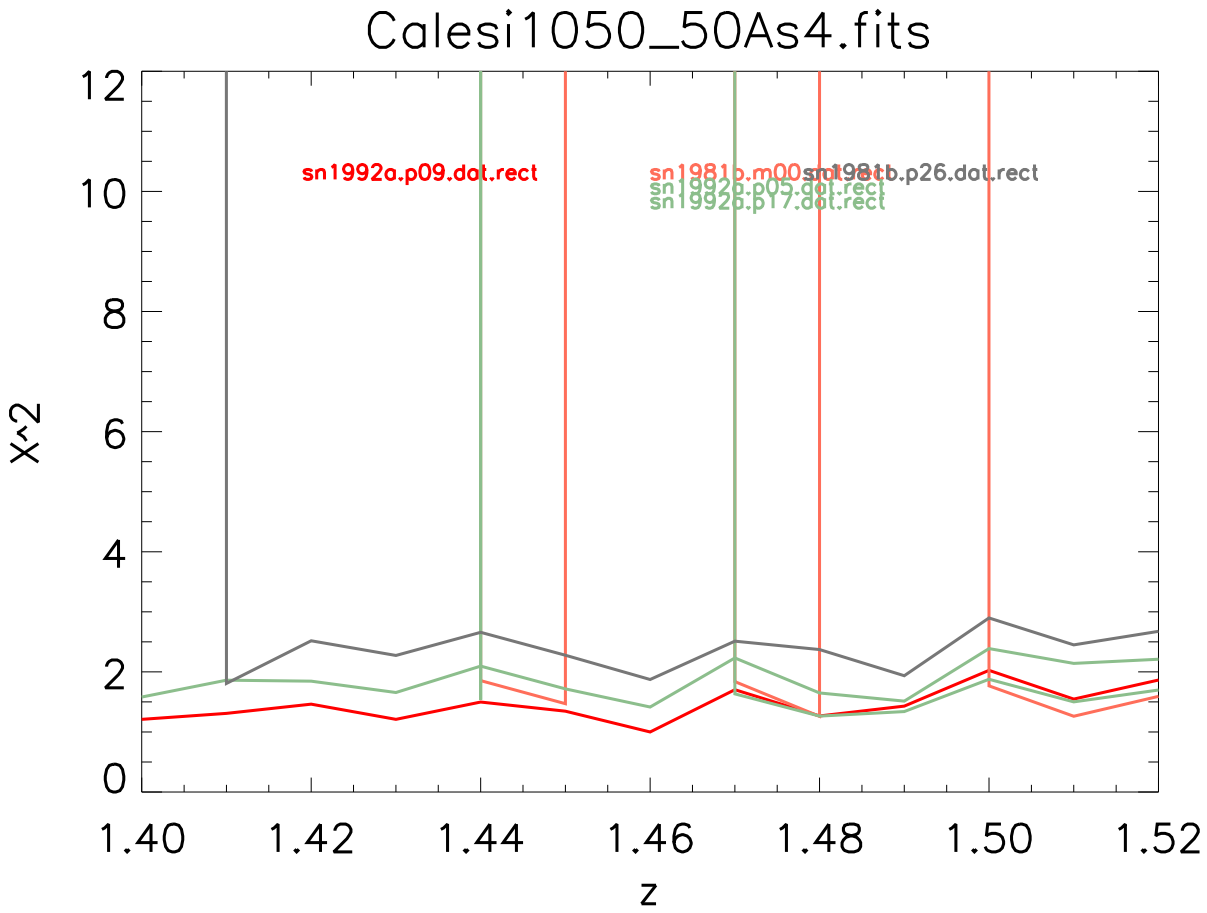

sn1990n.m14.dat.rect, z = 1.5100000
Calesi1050_20A.fits Observed − Galaxy
Template Spectrum Av = −5.2904309
Galaxy
SN/Gal = 0.121235
Mg II, I
[O II]
Ca II
2
1
0
−1
−2
6000
7000
8000
9000
10000

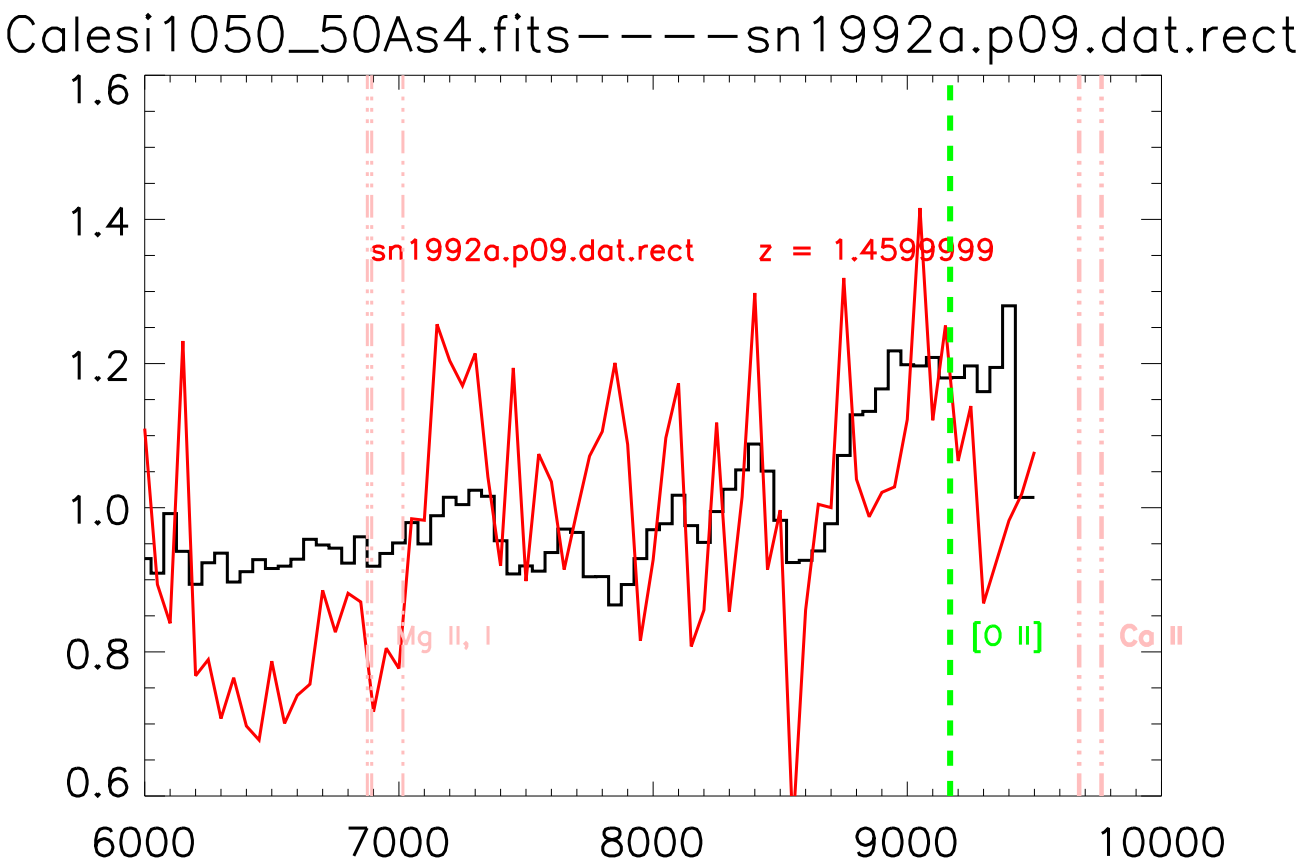

sn1991t.m00.dat.rect, z = 1.5300000
Calesi1050_20A.fits Observed − Galaxy
Template Spectrum Av = −5.6073865
Galaxy
SN/Gal = 0.507416
Mg II, I
[O II]
Ca II
2.0
1.5
1.0
0.5
0.0
−0.5
−1.0
6000
7000
8000
9000
10000

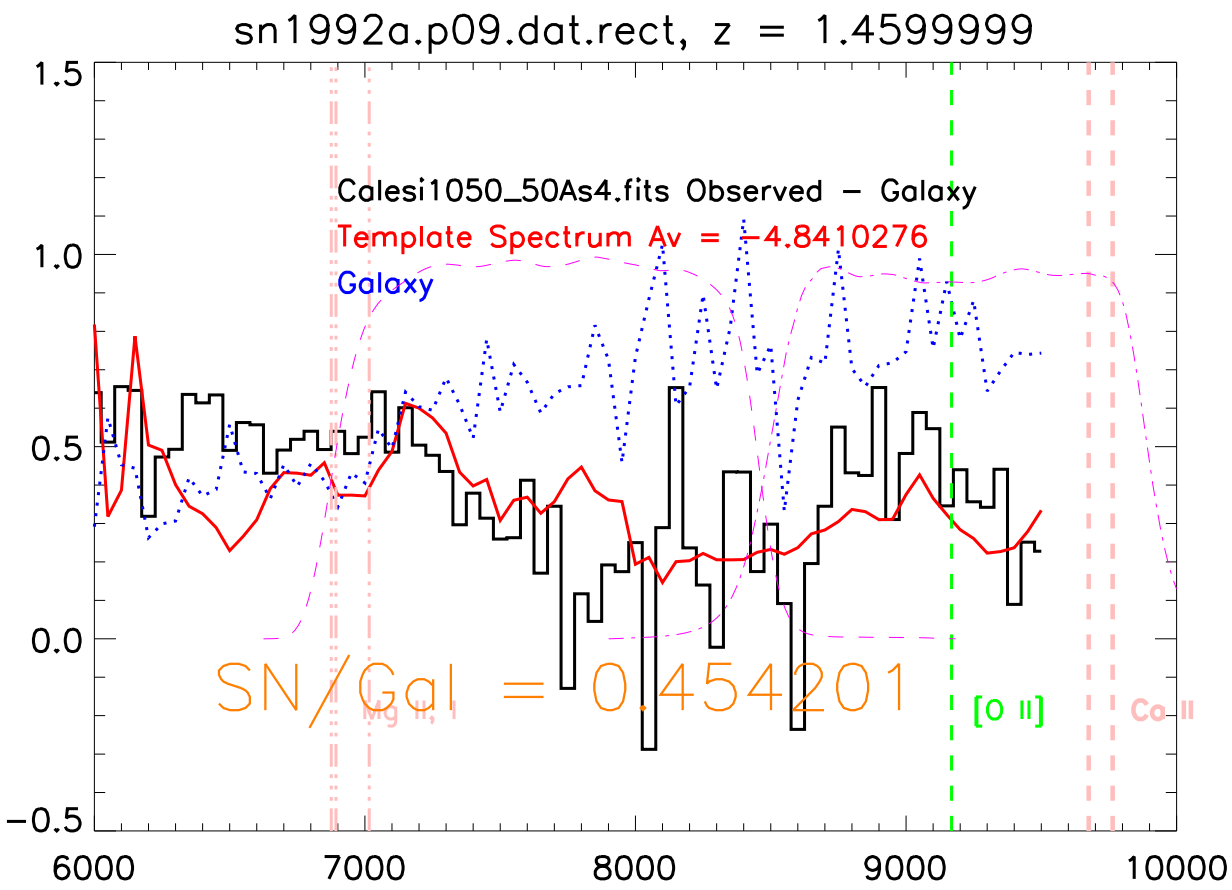

sn1990n.m07.dat.rect, z = 1.5300000
Calesi1050_20A.fits Observed − Galaxy
Template Spectrum Av = −5.5903609
Galaxy
SN/Gal = 0.246089
Mg II, I
[O II]
Ca II
2.0
1.5
1.0
0.5
0.0
−0.5
−1.0
6000
7000
8000
9000
10000

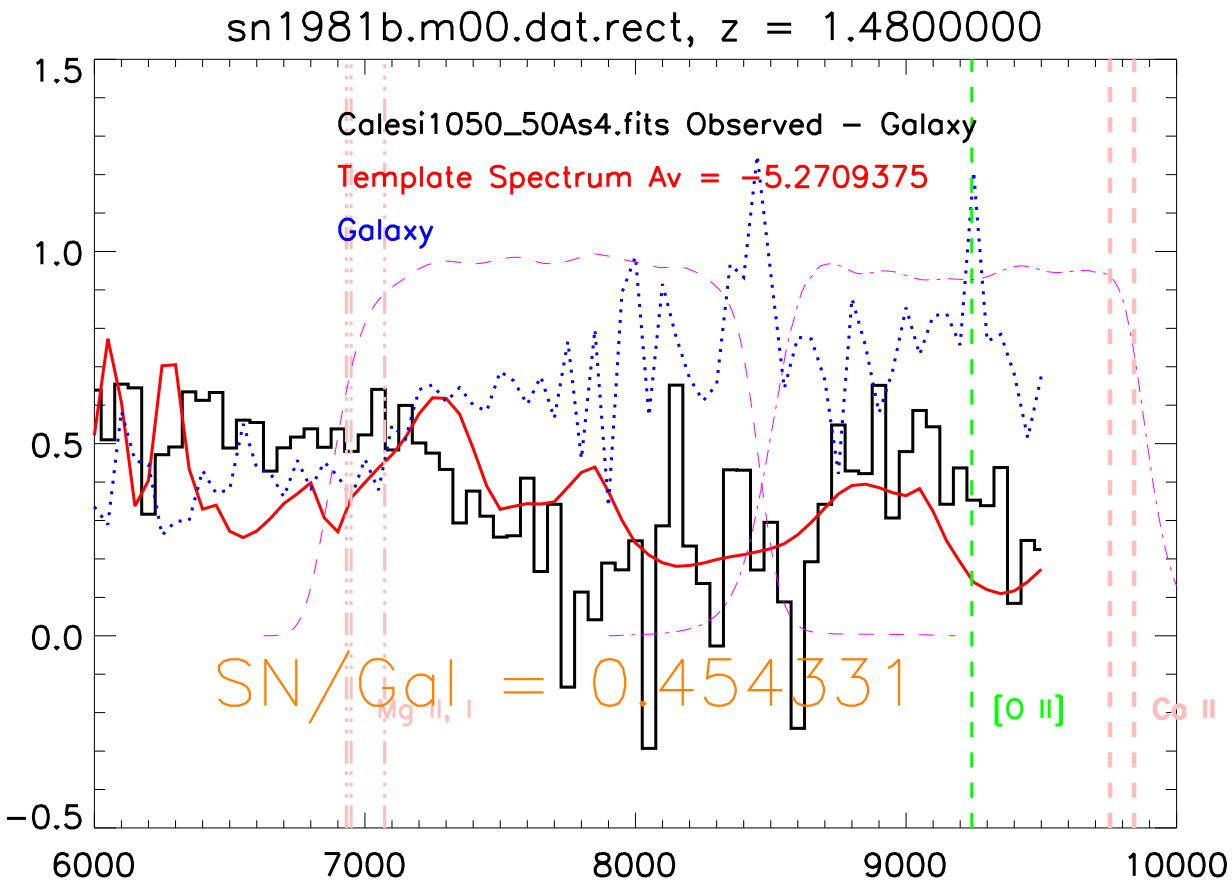

1.8
1.4
1.0
1.3
1.3
2.9
2.0

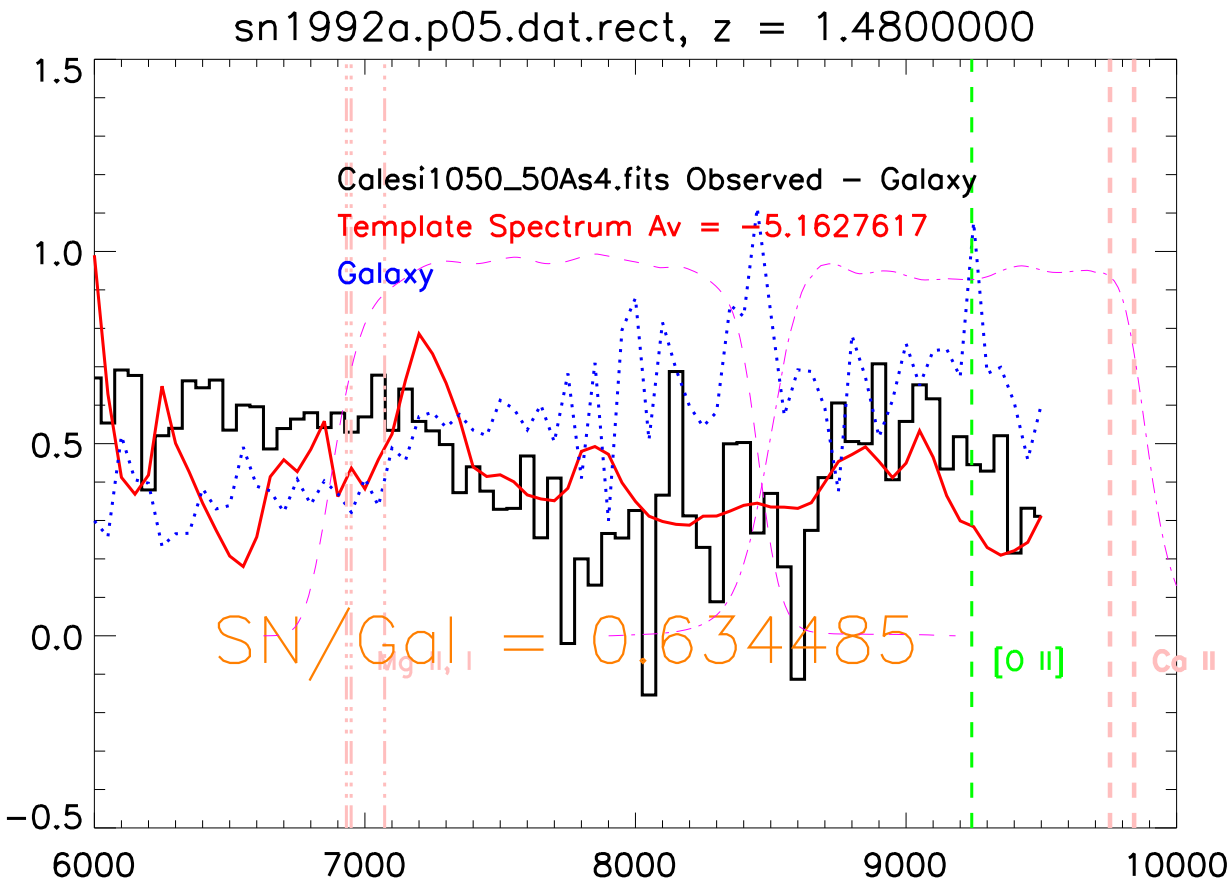

3.0
2.5
2.0
1.5
1.0
χ^2
40
20
0
−20
dφ/s
0.5
1.0
1.5
2.0
Δm15

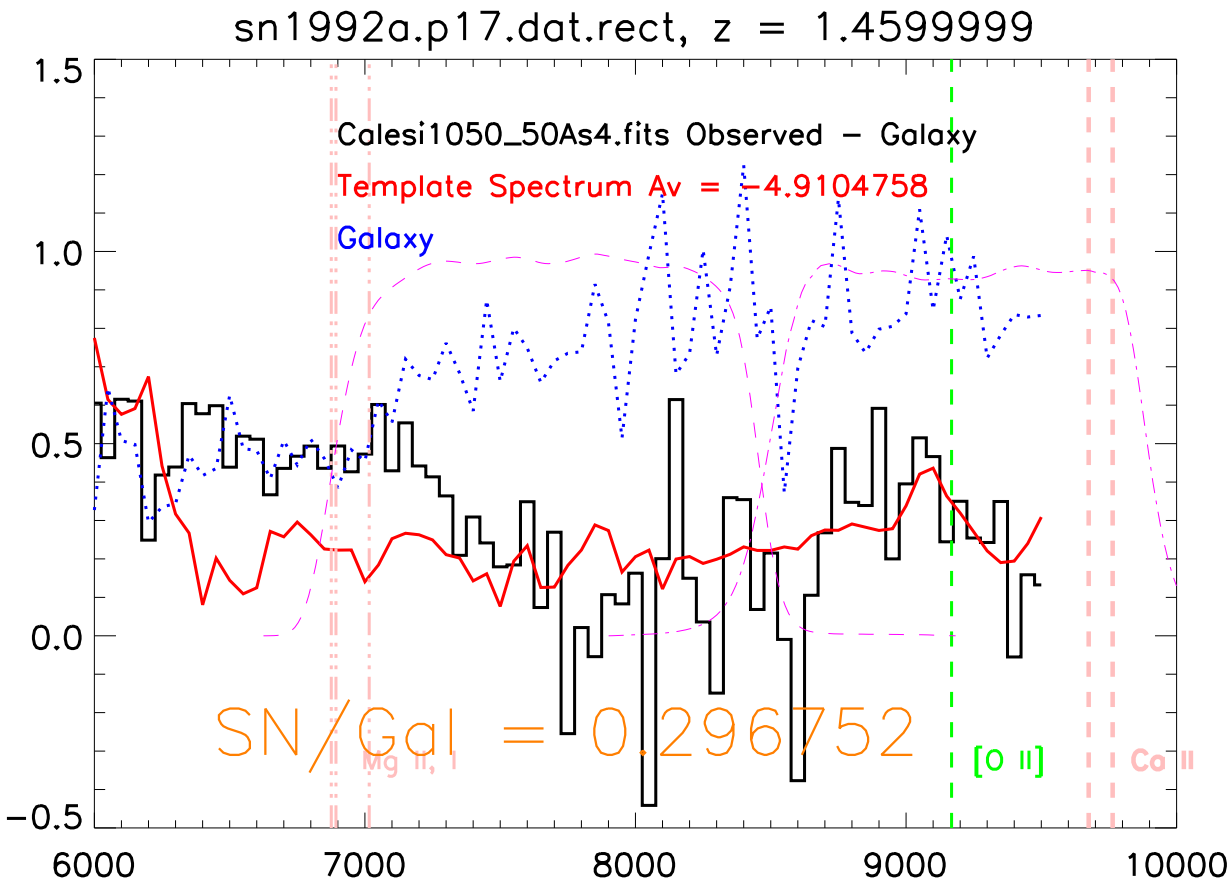

Calesi1050_50As4.fits
sn1992a.p09.dot.rect
sn1992b.p05.dot.rect
sn1992b.p17.dot.rect
sn1998b.p26.dot.rect
X^2
z
0
2
4
6
8
10
12
1.40
1.42
1.44
1.46
1.48
1.50
1.52

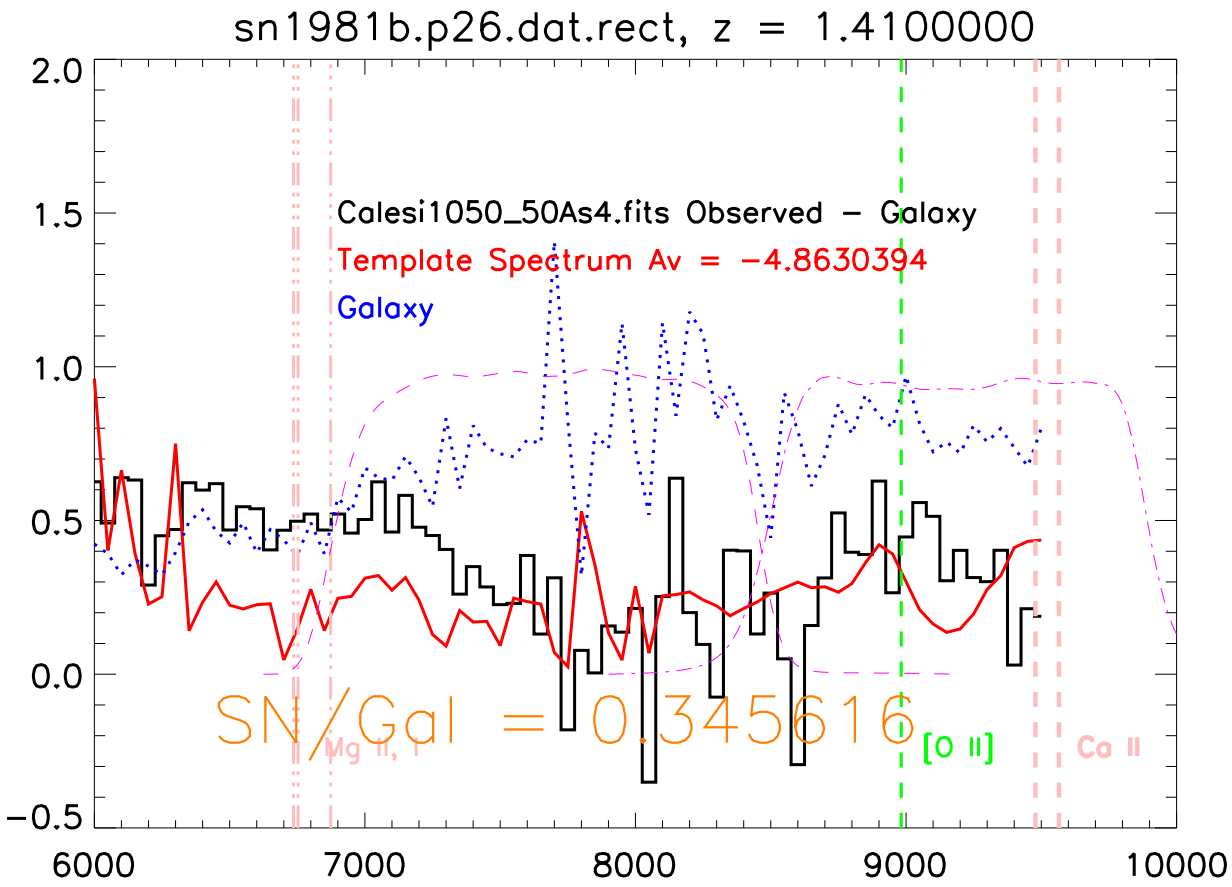

Calesi1050_50As4.fits----sn1992a.p09.dat.rect
sn1992a.p09.dat.rect z = 1.4599999
Mg II, I
[O II]
Ca II
1.6
1.4
1.2
1.0
0.8
0.6
6000
7000
8000
9000
10000

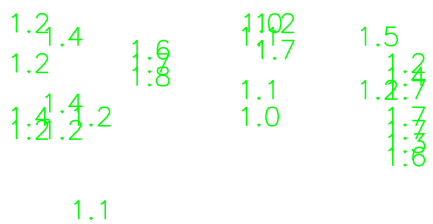

sn1992a.p09.dat.rect, z = 1.4599999
Calesi1050_50As4.fits Observed − Galaxy
Template Spectrum Av = −4.8410276
Galaxy
SN/Gal = 0.454201
Mg II, I
[O II]
Ca II
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

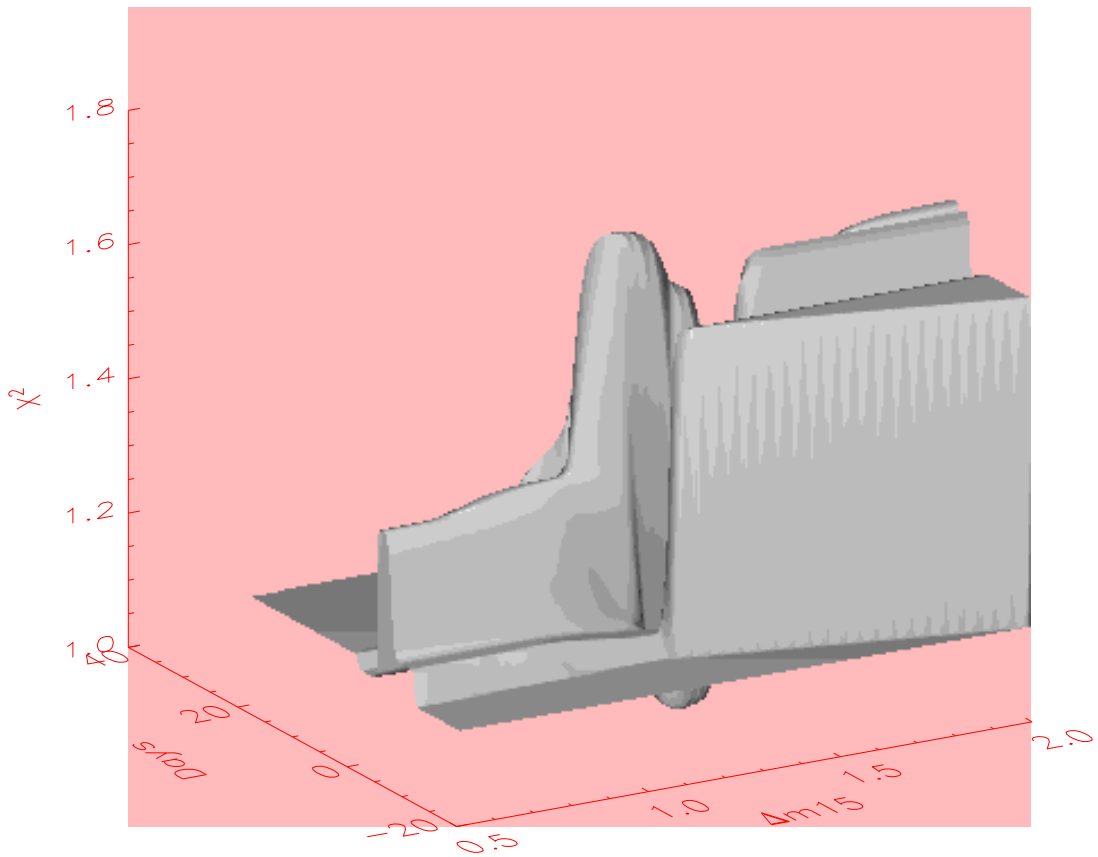

sn1981b.m00.dat.rect, z = 1.4800000
Calesi1050_50As4.fits Observed − Galaxy
Template Spectrum Av = −5.2709375
Galaxy
SN/Gal = 0.454331
Mg II, I
[O II]
Ca II
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000


sn1992a.p05.dat.rect, z = 1.4800000
Calesi1050_50As4.fits Observed − Galaxy
Template Spectrum Av = −5.1627617
Galaxy
SN/Gal = 0.634485
Mg II, I
[O II]
Ca II
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

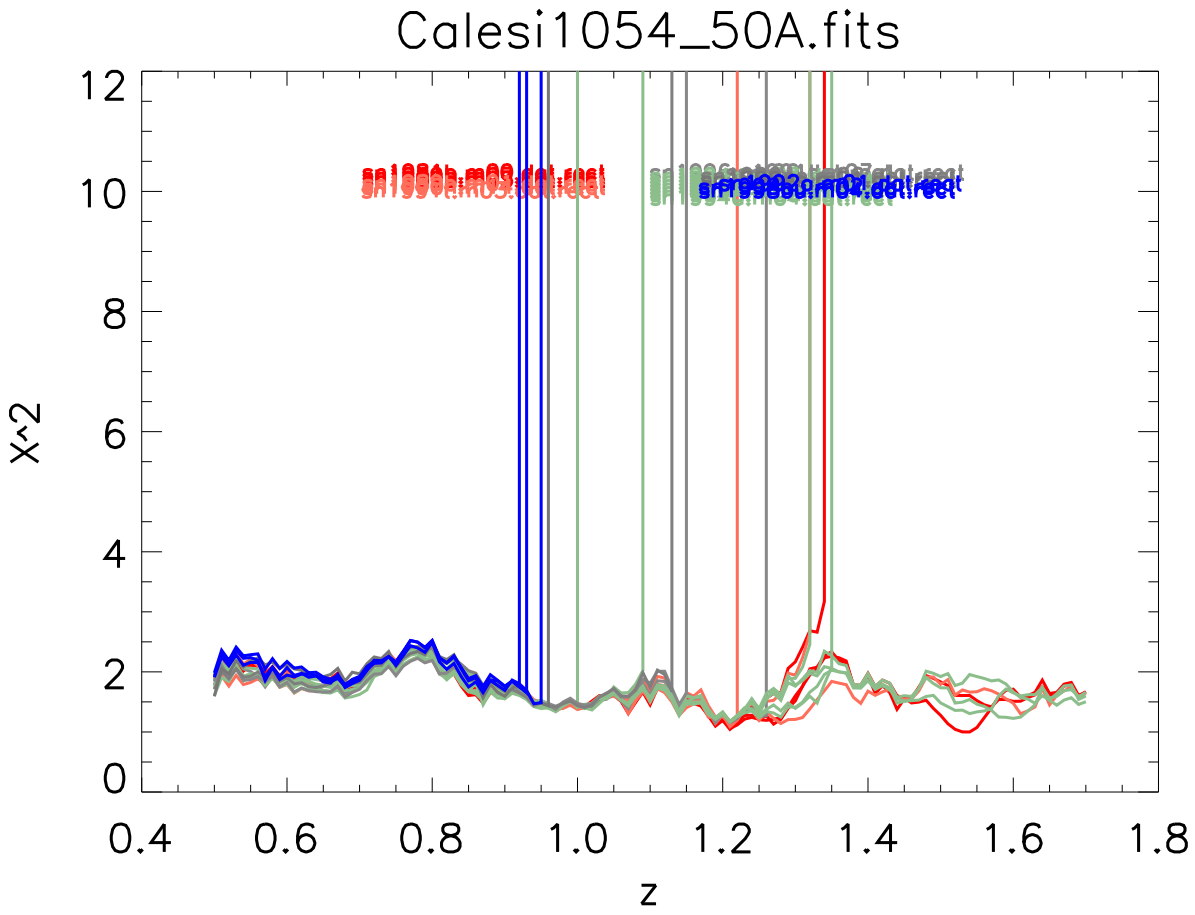

sn1992a.p17.dat.rect, z = 1.4599999
Calesi1050_50As4.fits Observed − Galaxy
Template Spectrum Av = 4.9104758
Galaxy
SN/Gal = 0.296752
Mg II, I
[O II]
Ca II
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

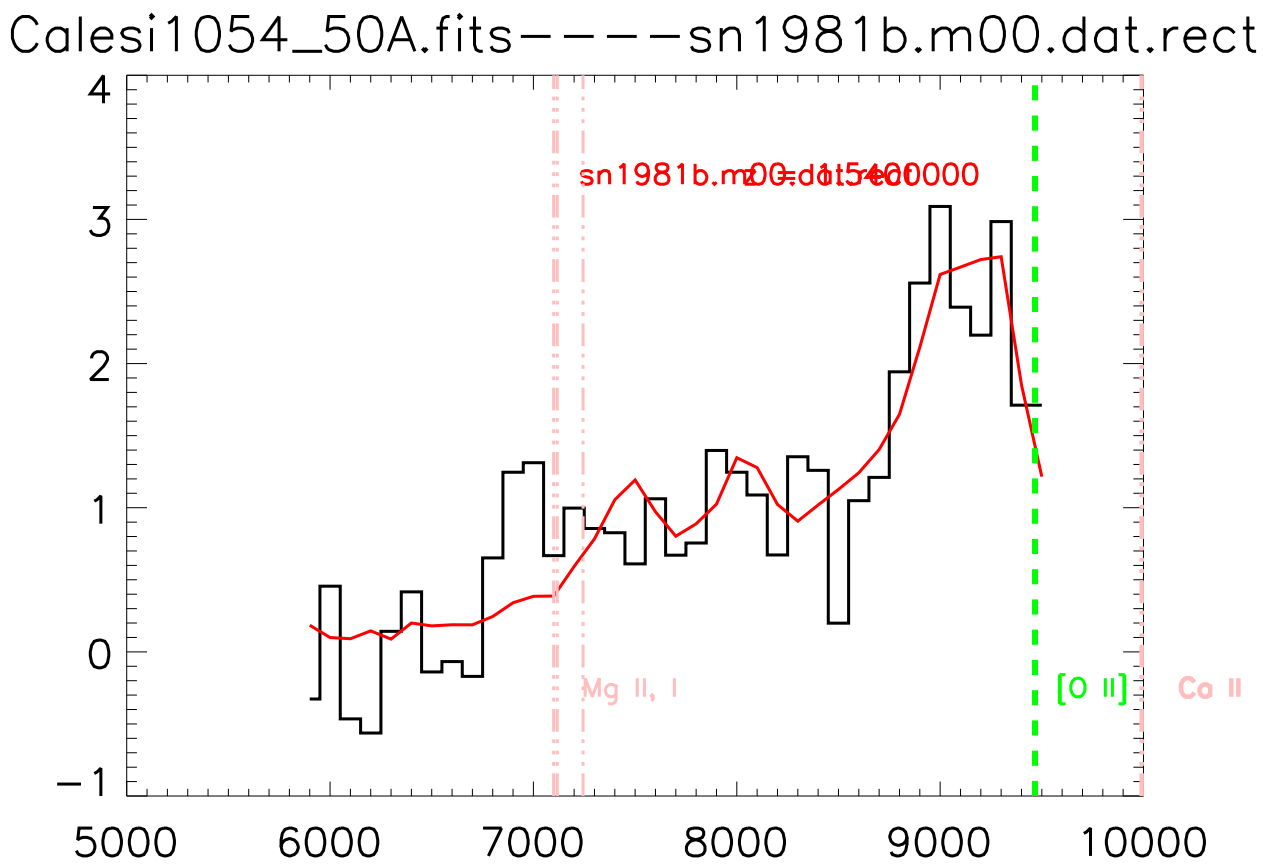

sn1981b.p26.dat.rect, z = 1.4100000
Calesi1050_50As4.fits Observed − Galaxy
Template Spectrum Av = −4.8630394
Galaxy
SN/Gal = 0.3456616
Mg II, 1
[O II]
Ca II
2.0
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

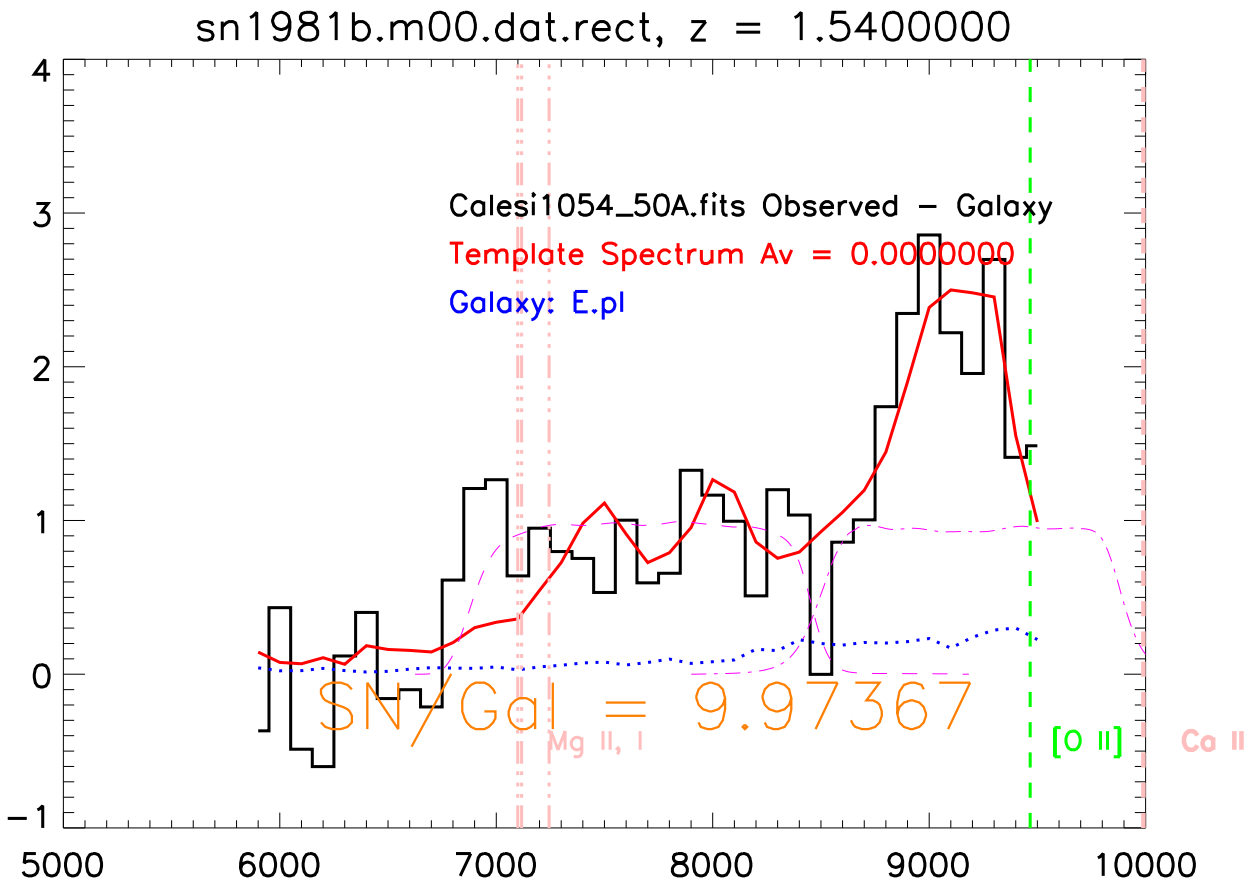

1.2
1.4
1.2
1.4
1.2
1.2
1.1
1.6
1.7
1.8
1.1
1.0
1.5
1.2.7
1.6

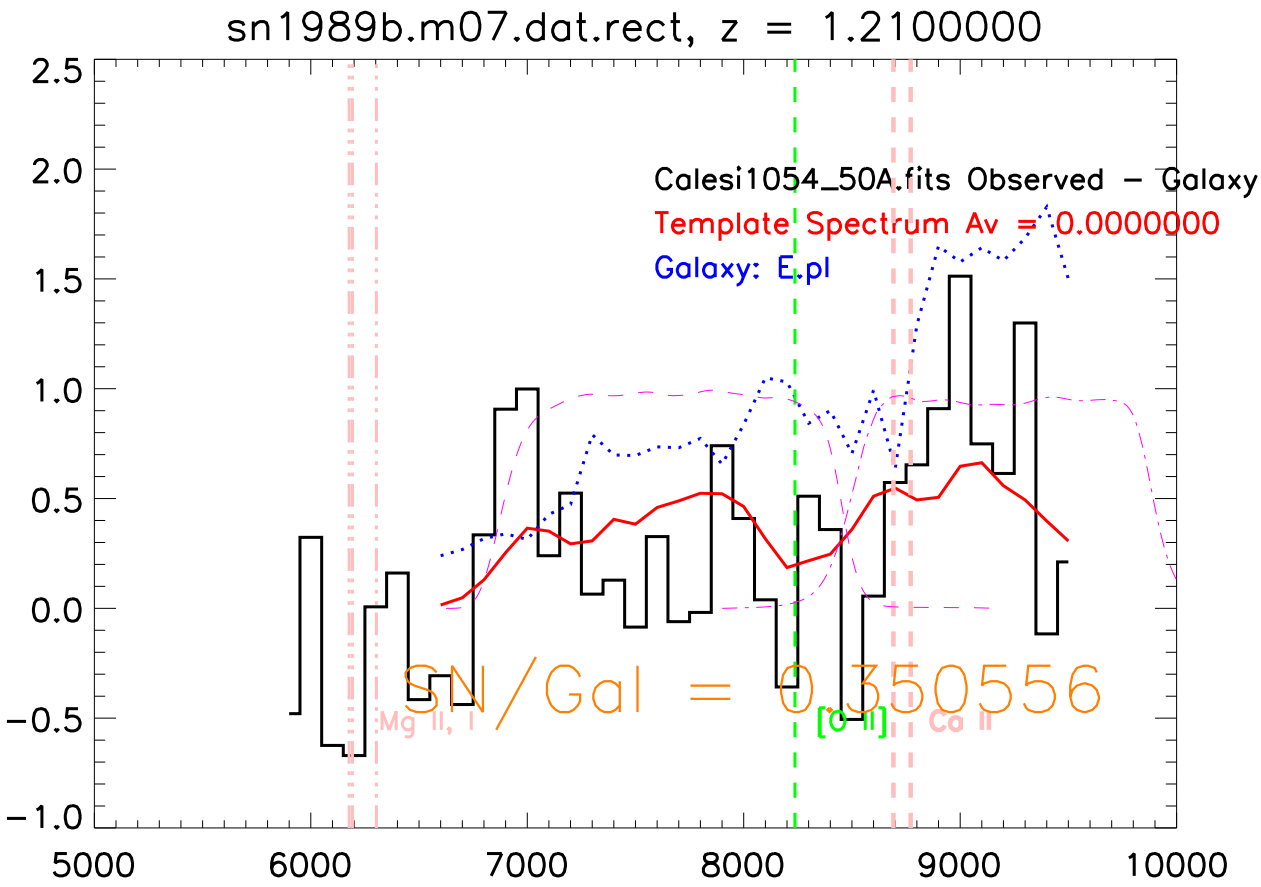


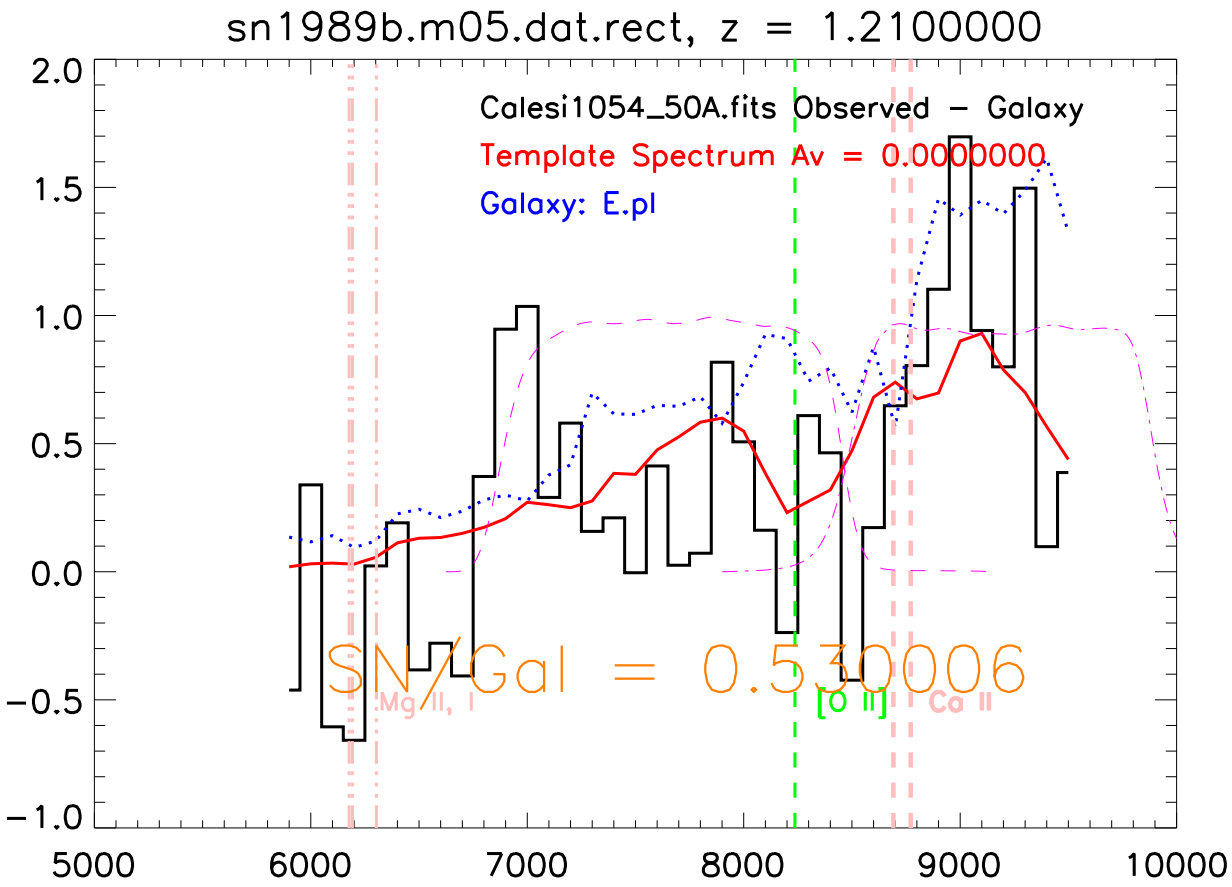
1.8
1.6
1.4
1.2
1.0
χ^2
40
20
0
−20
Days
0.5
1.0
1.5
2.0
Δm15

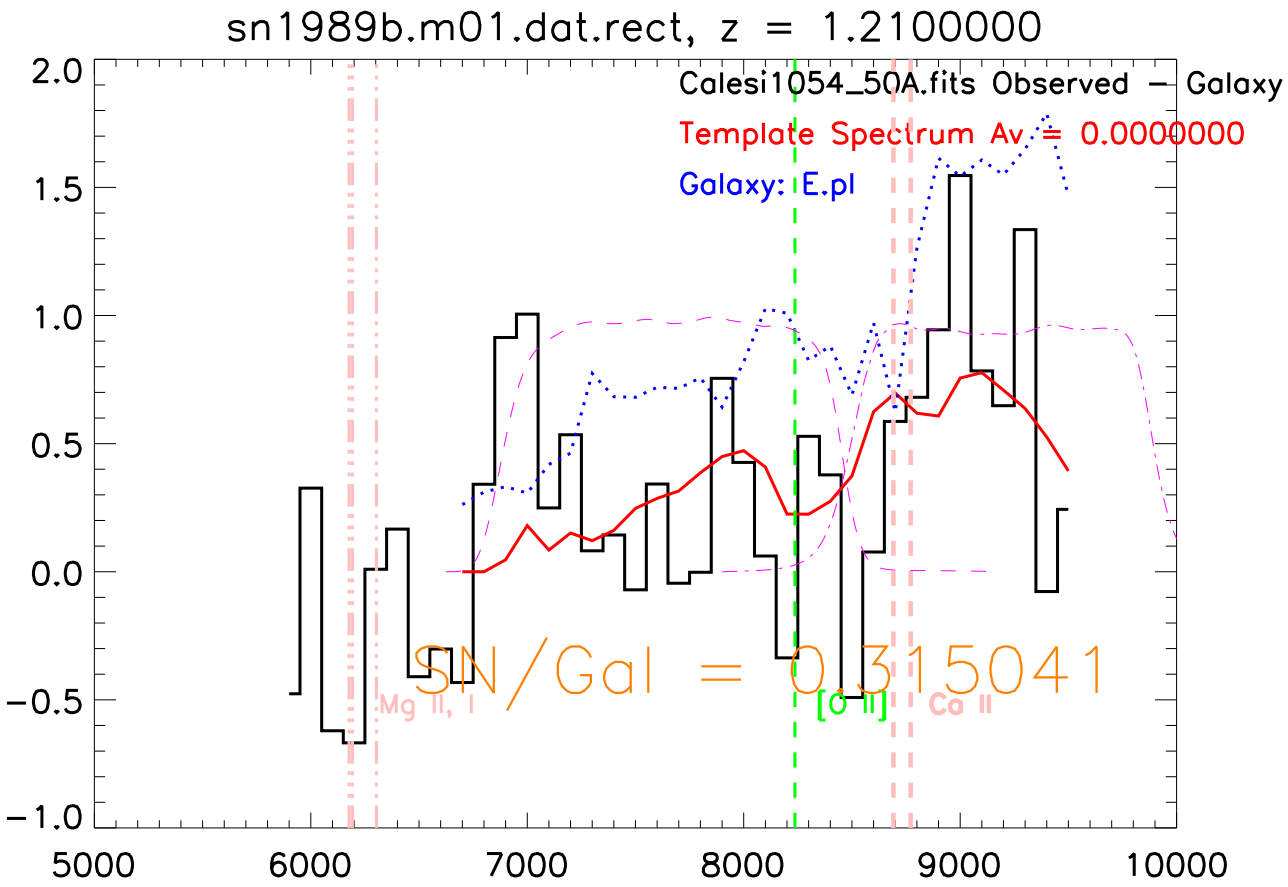

Calesi1054_50A.fits
X^2
z
0
2
4
6
8
10
12
0.4
0.6
0.8
1.0
1.2
1.4
1.6
1.8

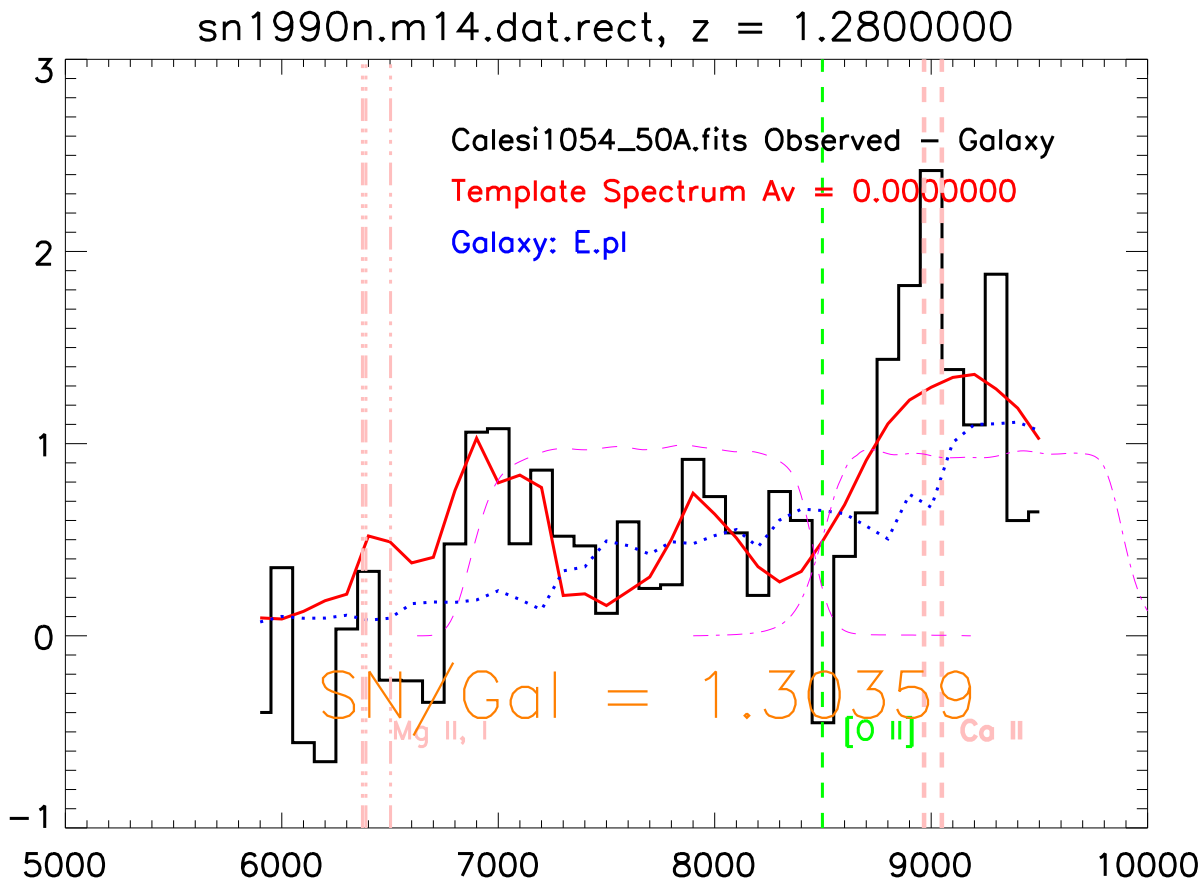

Calesi1054_50A.fits----sn1981b.m00.dat.rect
sn1981b.m00.dat.rect
Mg II, I
[O II]
Ca II
4
3
2
1
0
−1
5000
6000
7000
8000
9000
10000

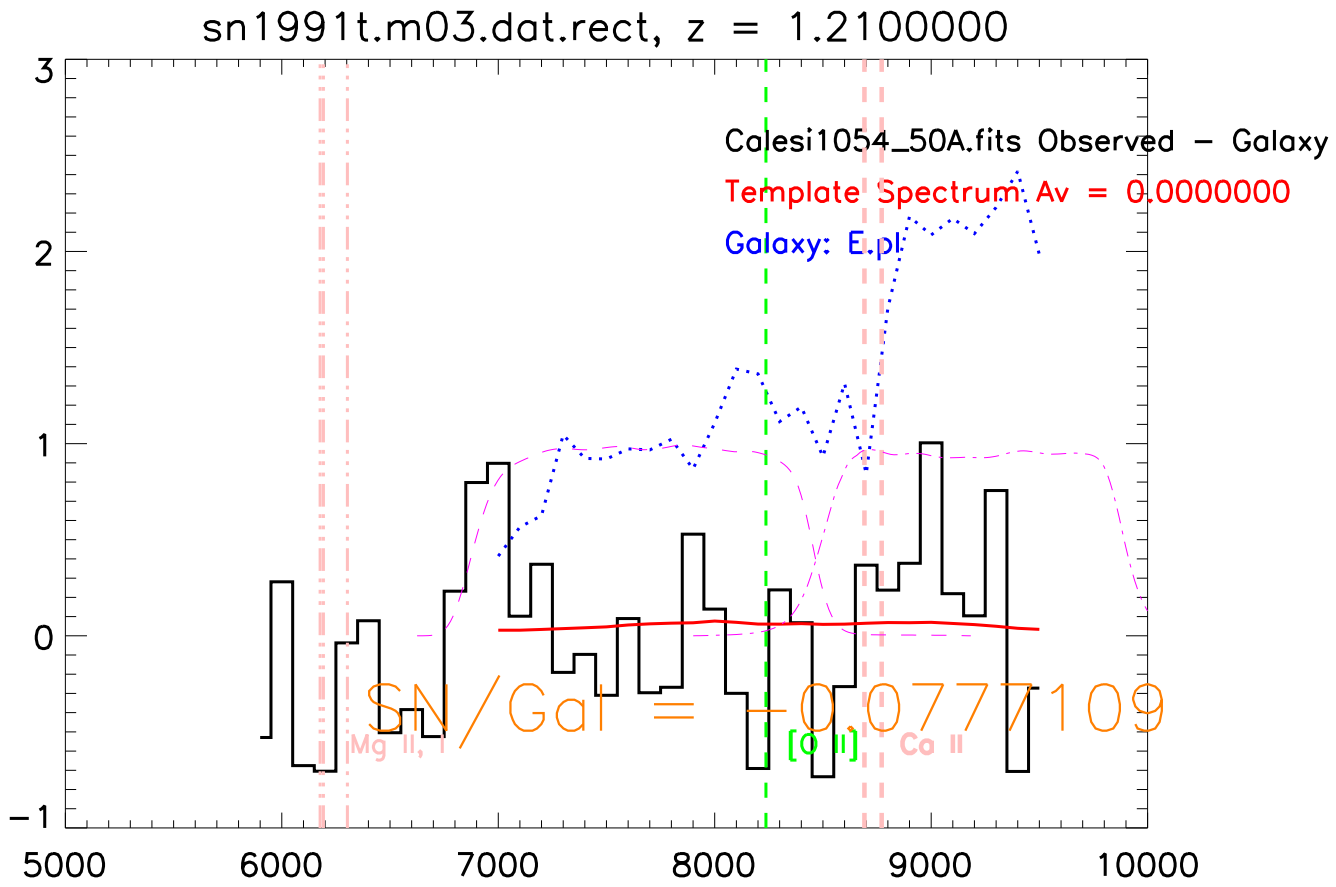

sn1981b.m00.dat.rect, z = 1.5400000
Calesi1054_50A.fits Observed − Galaxy
Template Spectrum Av = 0.0000000
Galaxy: E.pl
SN/Gal = 9.97367
Mg II, I
[O II]
Ca II
4
3
2
1
0
−1
5000
6000
7000
8000
9000
10000

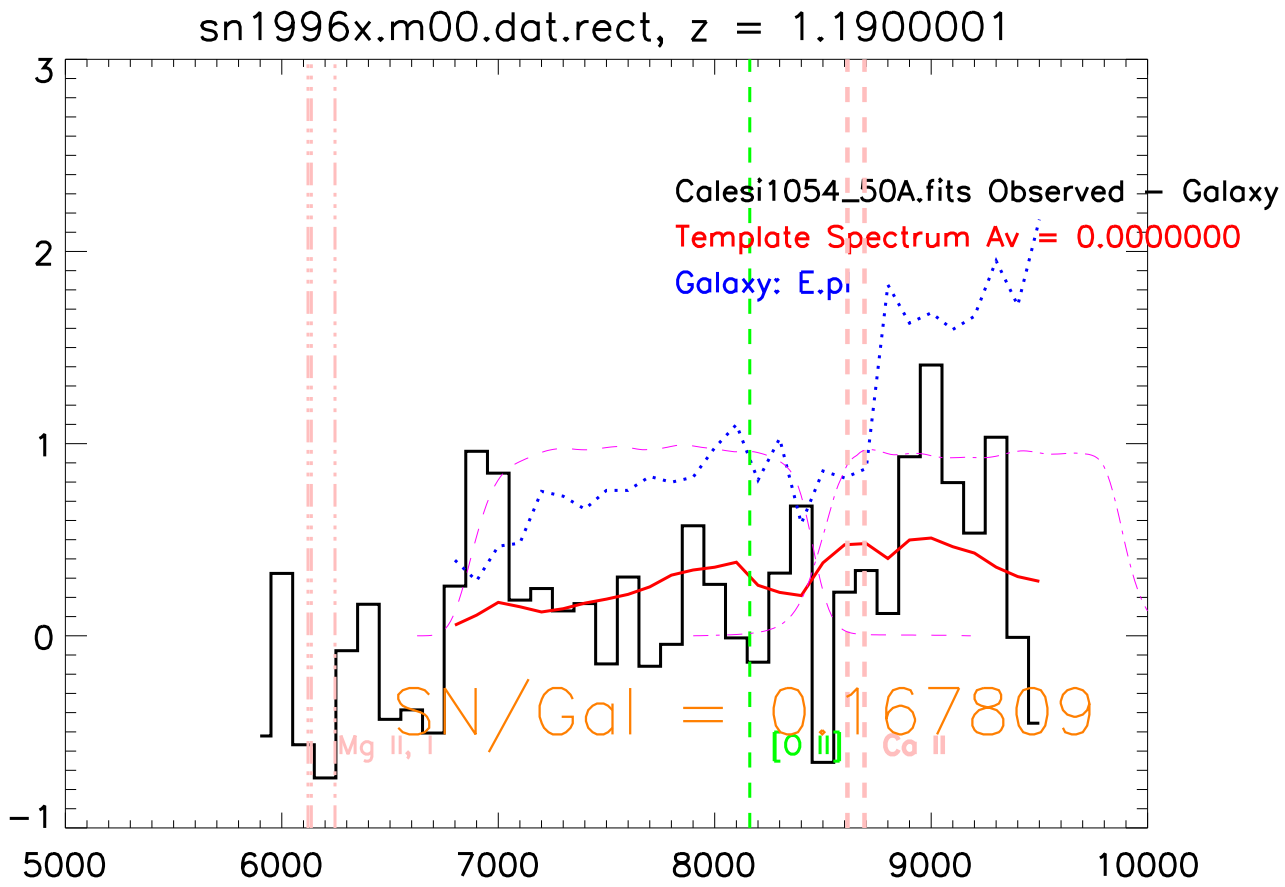

sn1989b.m07.dat.rect, z = 1.2100000
Calesi1054_50A.fits Observed − Galaxy
Template Spectrum Av = 0.0000000
Galaxy: E.pl
SN/Gal = 0.350556
Mg II, I
[O II]
Ca II
2.5
2.0
1.5
1.0
0.5
0.0
−0.5
−1.0
5000
6000
7000
8000
9000
10000

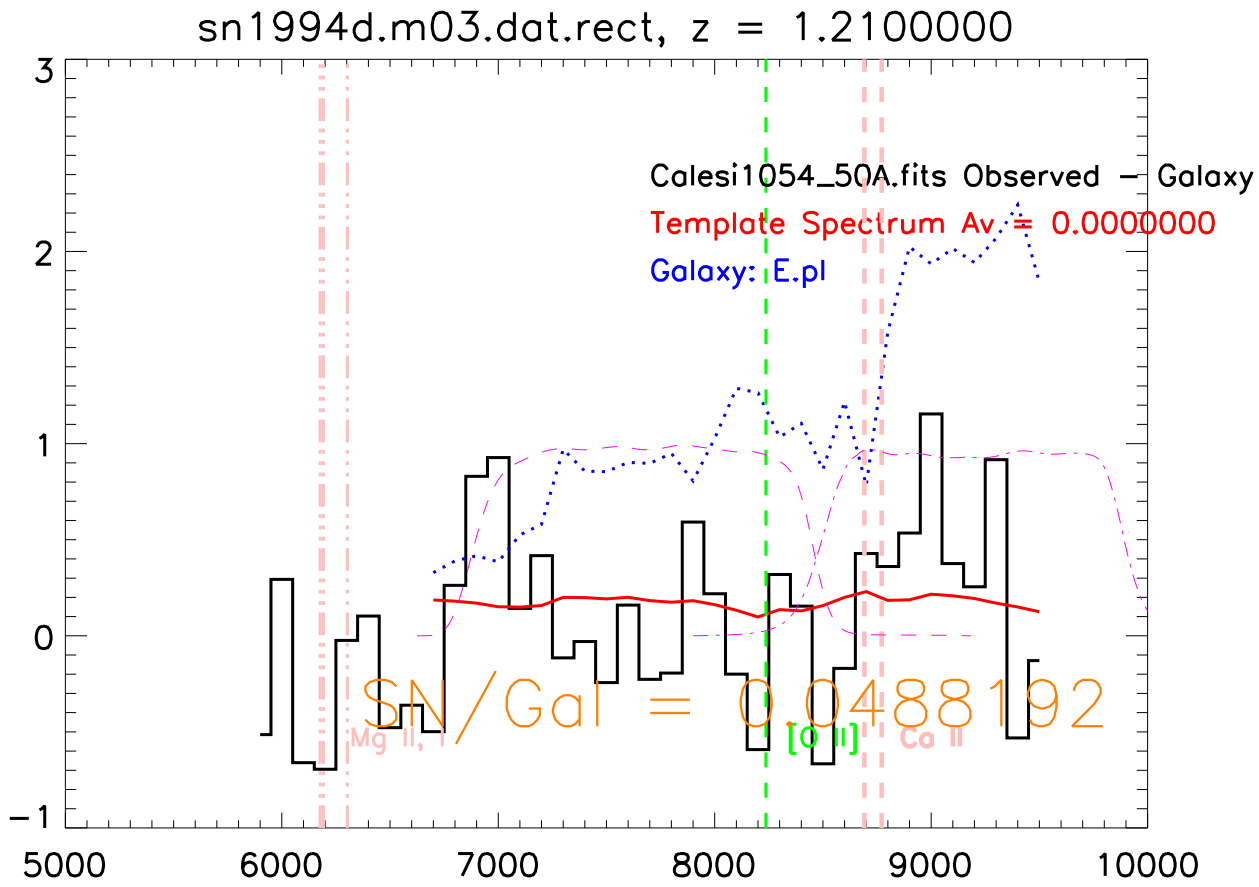

sn1989b.m05.dat.rect, z = 1.2100000
Calesi1054_50A.fits Observed − Galaxy
Template Spectrum Av = 0.0000000
Galaxy: E.pl
S/N Gal = 0.530006
Mg II, I
[O II]
Ca II
2.0
1.5
1.0
0.5
0.0
−0.5
−1.0
5000
6000
7000
8000
9000
10000

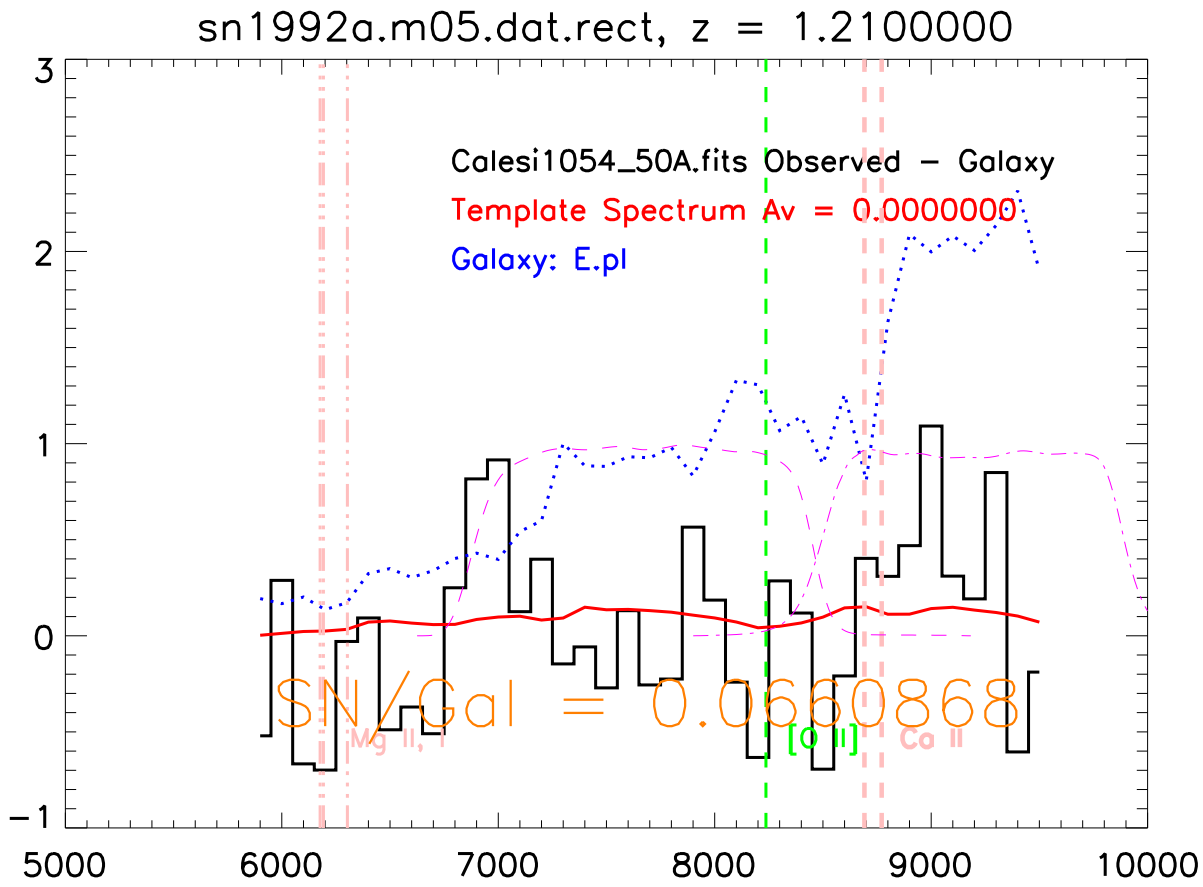

sn1989b.m01.dat.rect, z = 1.2100000
Calesi1054_50A.fits Observed
Galaxy
Template Spectrum Av = 0.0000000
Galaxy: E.pl
SN/Gal = 0.3115041
Mg II, I
[O II]
Ca II
2.0
1.5
1.0
0.5
0.0
−0.5
−1.0
5000
6000
7000
8000
9000
10000

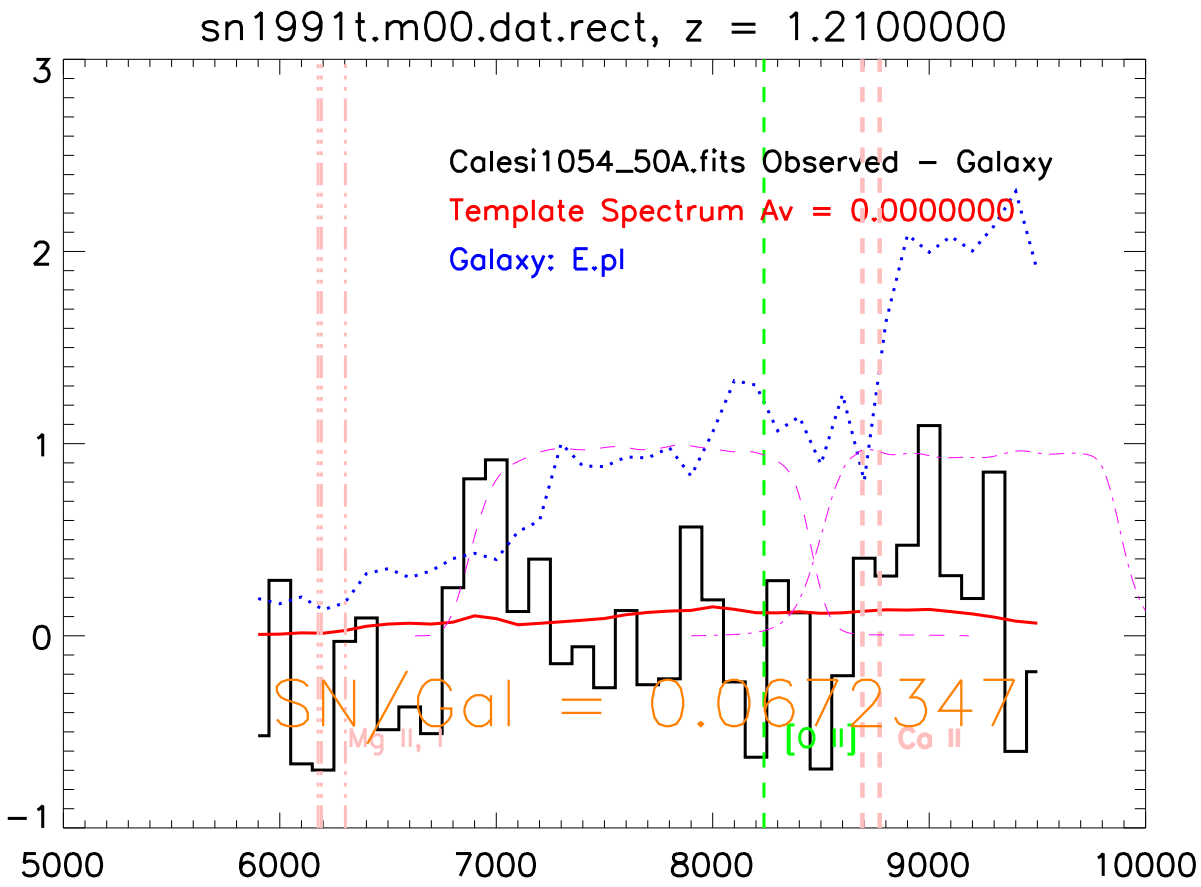

sn1990n.m14.dat.rect, z = 1.2800000
Calesi1054_50A.fits Observed – Galaxy
Template Spectrum Av = 0.0000000
Galaxy: E.pl
SN/Gal = 1.30359
Mg II, I
[O II]
Ca II
3
2
1
0
−1
5000
6000
7000
8000
9000
10000

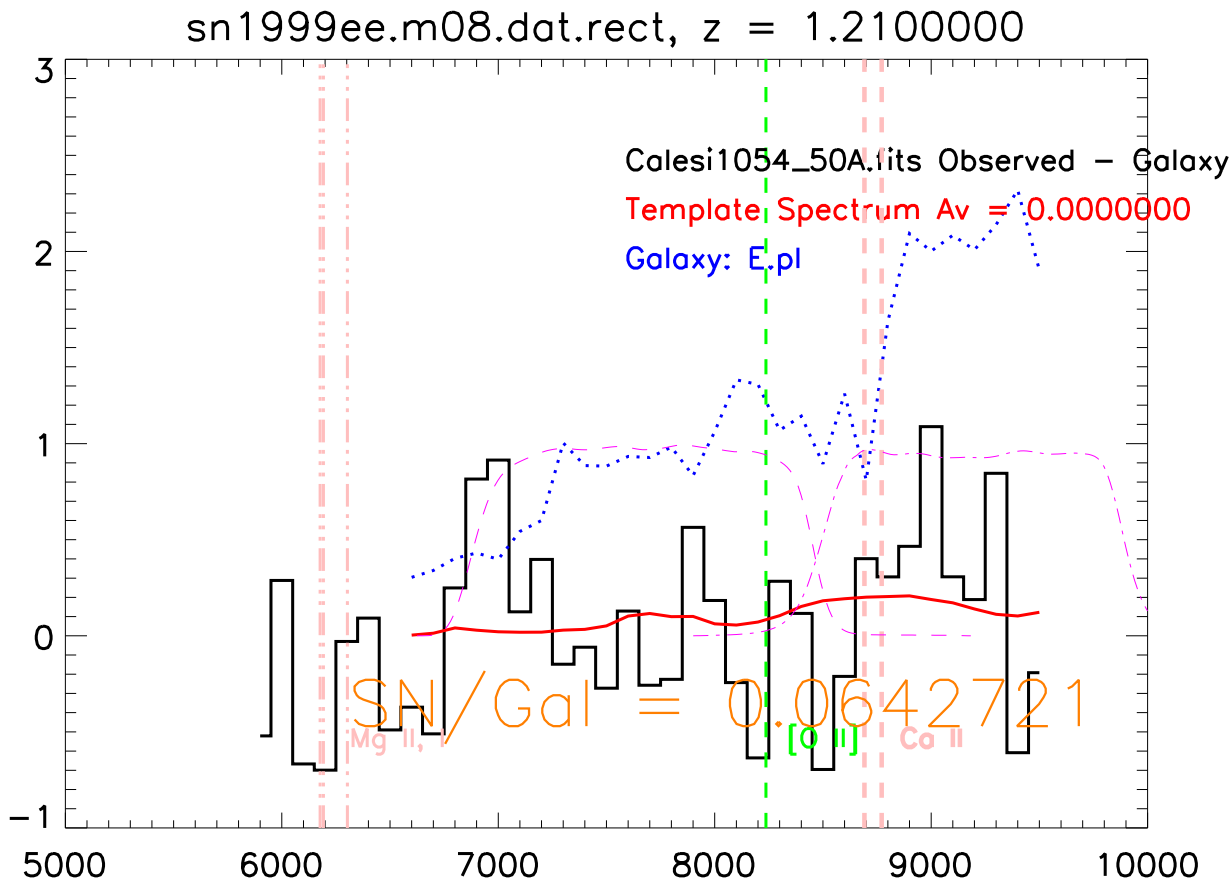

sn1991t.m03.dat.rect, z = 1.2100000
Calesi1054_50A.fits Observed − Galaxy
Template Spectrum Av = 0.0000000
Galaxy: E.pl
SN/Gal = −0.0777109
Mg II, 1
[O II]
Ca II
3
2
1
0
−1
5000
6000
7000
8000
9000
10000

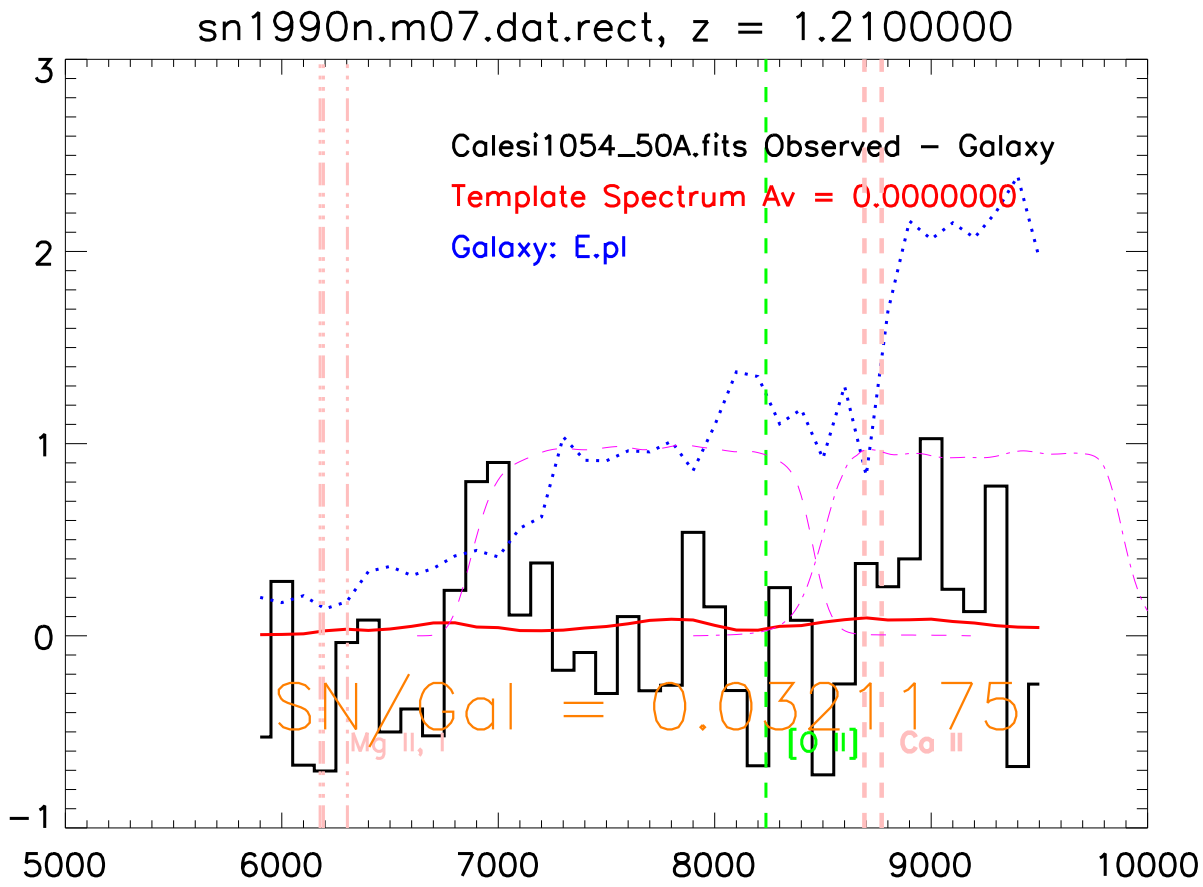

sn1996x.m00.dat.rect, z = 1.1900001
Calesi1054_50A.fits Observed – Galaxy
Template Spectrum Av = 0.0000000
Galaxy: E.pl
SN/Gal = 0.167809
Mg II, I
[O II]
Ca II
3
2
1
0
−1
5000
6000
7000
8000
9000
10000

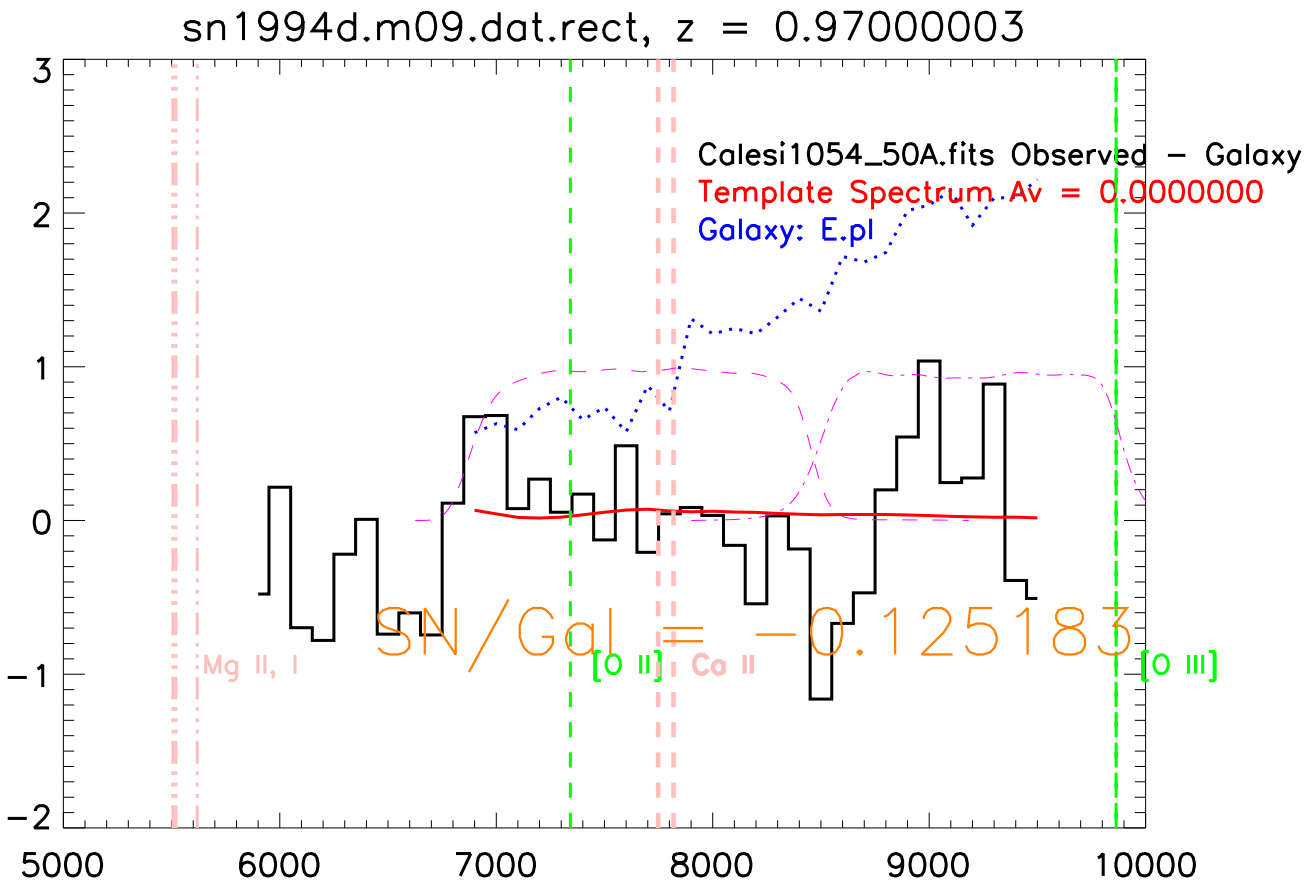

sn1994d.m03.dat.rect, z = 1.2100000
Calesi1054_50A.fits Observed — Galaxy
Template Spectrum Av = 0.0000000
Galaxy: E.pl
SN/Gal = 0.0488192
Mg II, Fe
[O II]
Ca II
3
2
1
0
−1
5000
6000
7000
8000
9000
10000

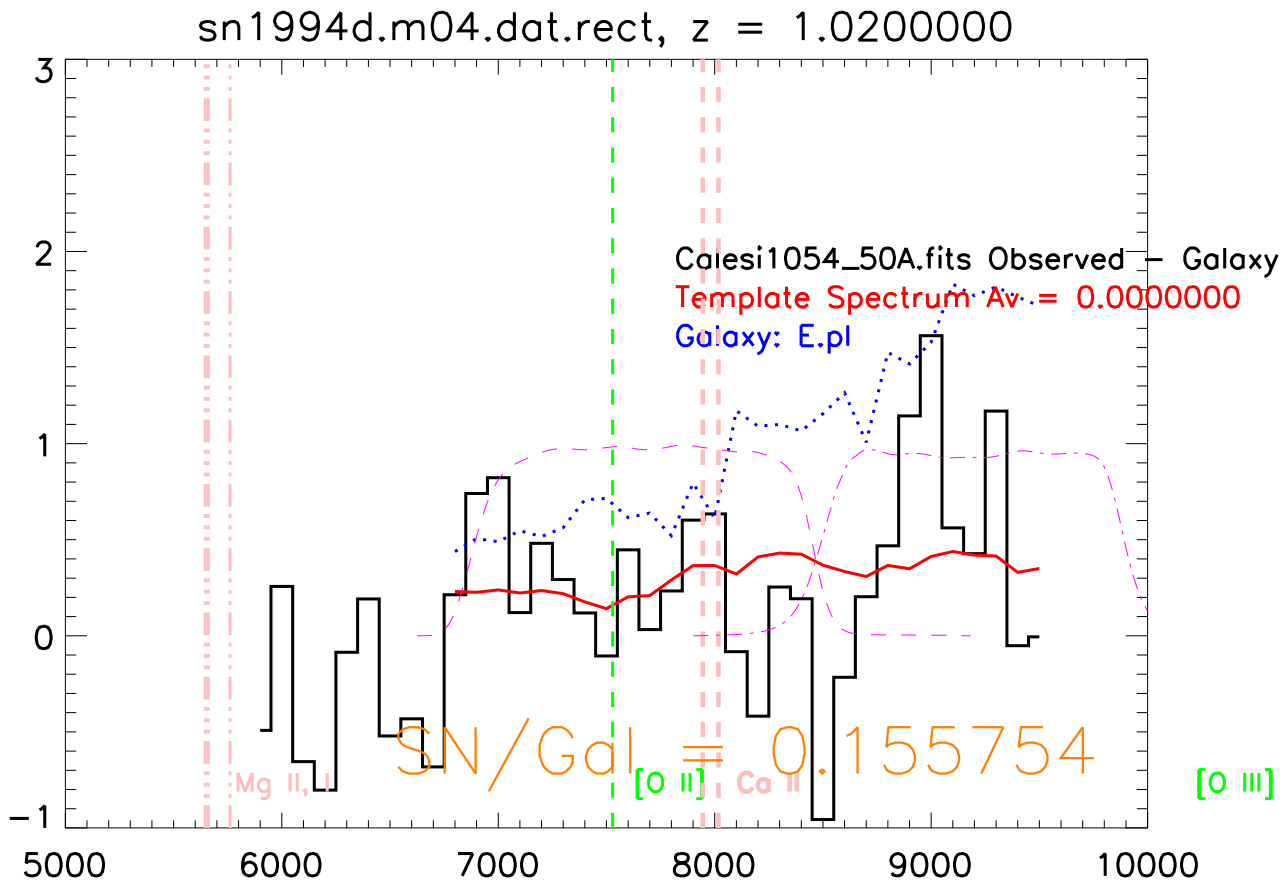

sn1992a.m05.dat.rect, z = 1.2100000
Calesi1054_50A.fits Observed − Galaxy
Template Spectrum Av = 0.0000000
Galaxy: E.pl
SN/Gal = 0.0660868
Mg II, I
[O II]
Ca II
3
2
1
0
−1
5000
6000
7000
8000
9000
10000

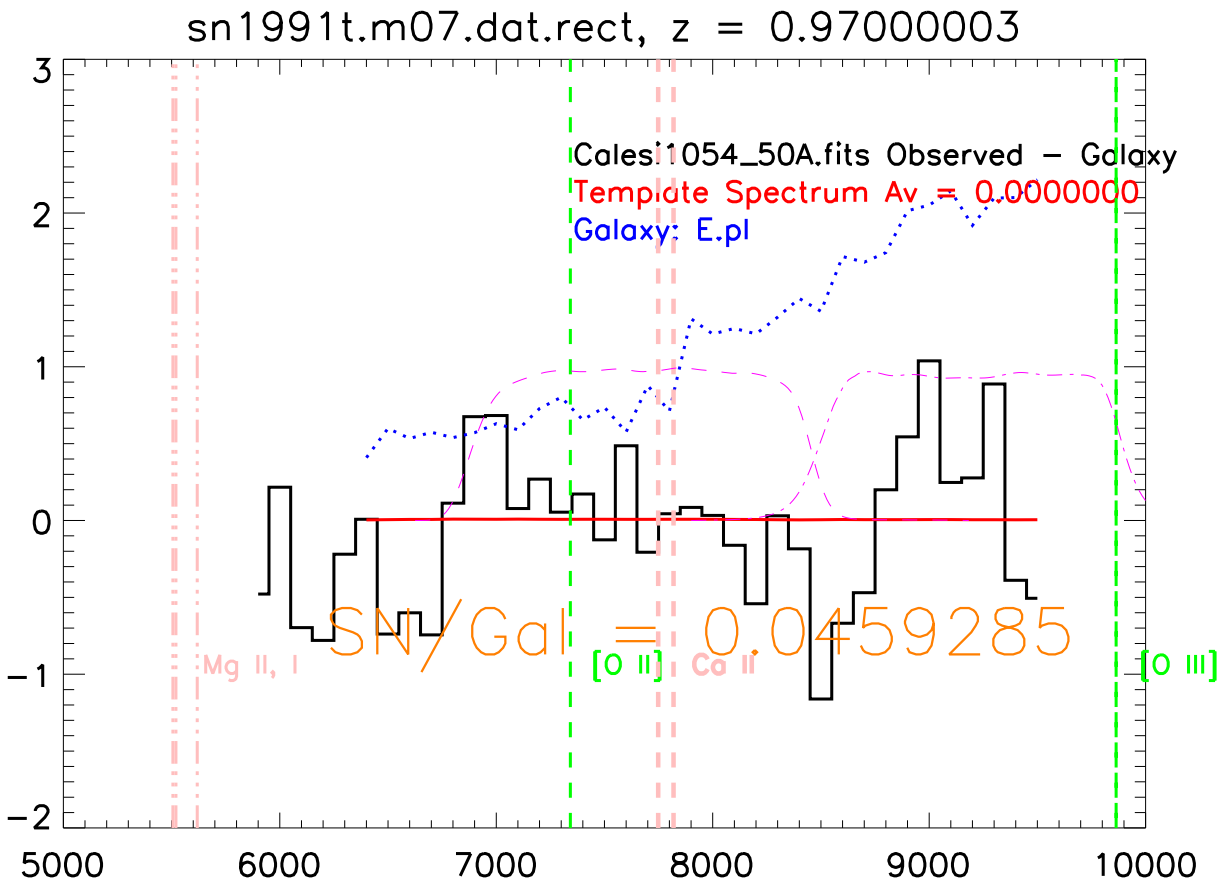

sn1991t.m00.dat.rect, z = 1.2100000
Calesi1054_50A.fits Observed − Galaxy
Template Spectrum Av = 0.0000000
Galaxy: E.pl
SN/Gal = 0.067272347
Mg II, I
[O II]
Ca II
3
2
1
0
−1
5000
6000
7000
8000
9000
10000

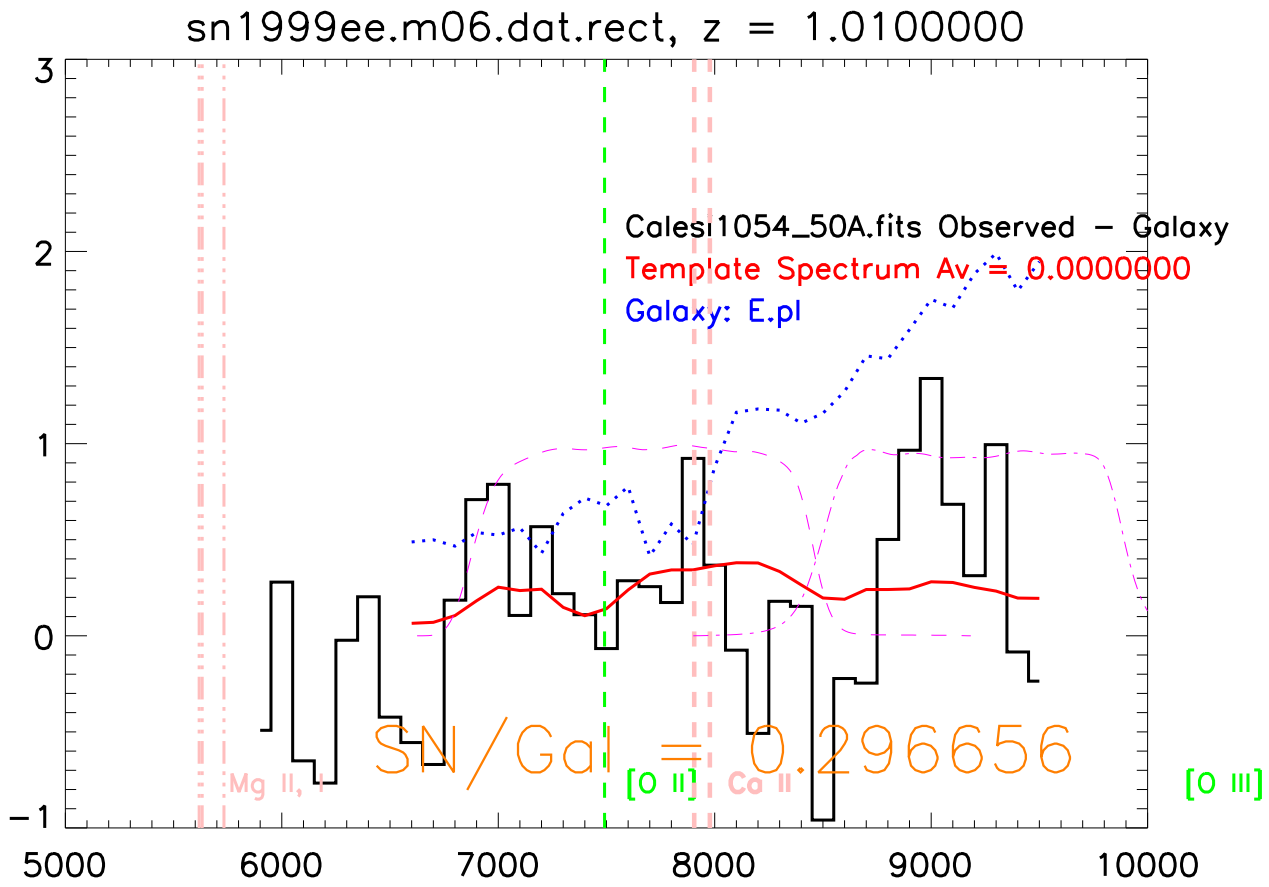

sn1999ee.m08.dat.rect, z = 1.2100000
Calesi1054_50A.fits Observed − Galaxy
Template Spectrum Av = 0.0000000
Galaxy: E.pl
SN/Gal = 0.0642721
[O II]
Ca II
3
2
1
0
−1
5000
6000
7000
8000
9000
10000

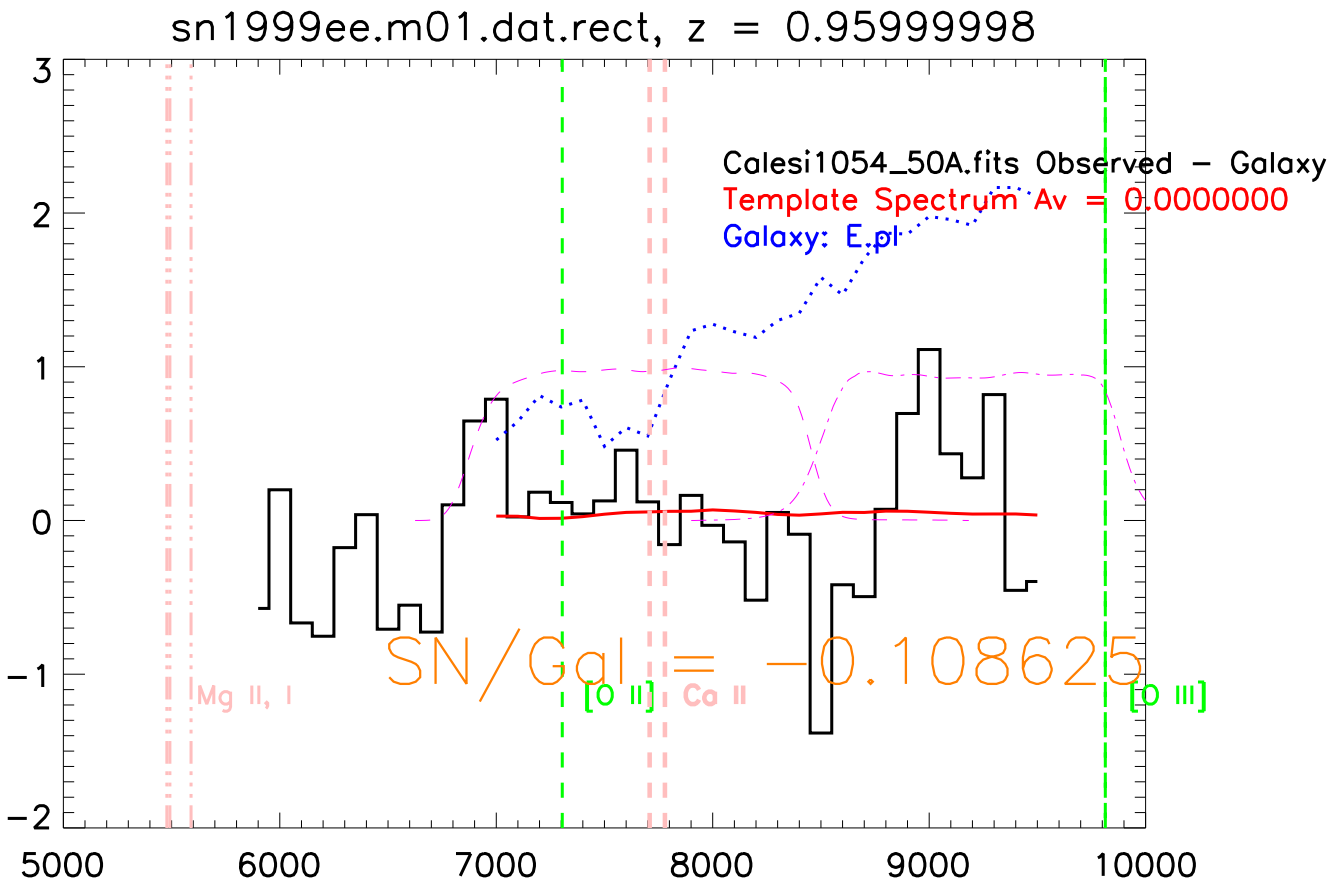

sn1990n.m07.dat.rect, z = 1.2100000
Calesi1054_50A.fits Observed − Galaxy
Template Spectrum Av = 0.0000000
Galaxy: E.pl
SN/Gal = 0.032 1175
Mg II, I
[O II]
Ca II
3
2
1
0
−1
5000
6000
7000
8000
9000
10000

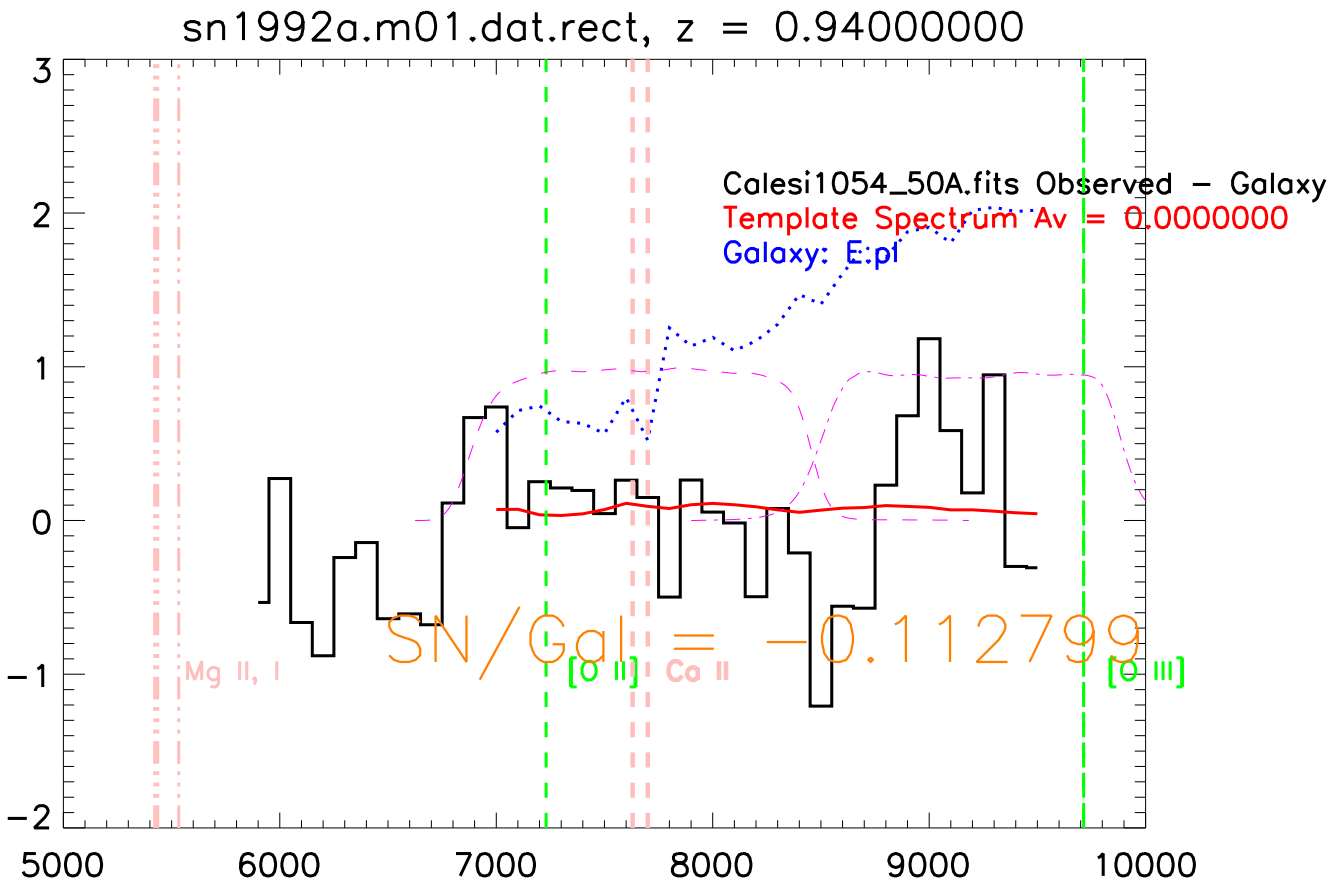

sn1994d.m09.dat.rect, z = 0.97000003
Calesi1054_50A.fits Observed − Galaxy
Template Spectrum Av = 0.0000000
Galaxy: E.pl
SN/Gal = −0.125183
Mg II, I
[O II]
Ca II
[O III]
3
2
1
0
−1
−2
5000
6000
7000
8000
9000
10000

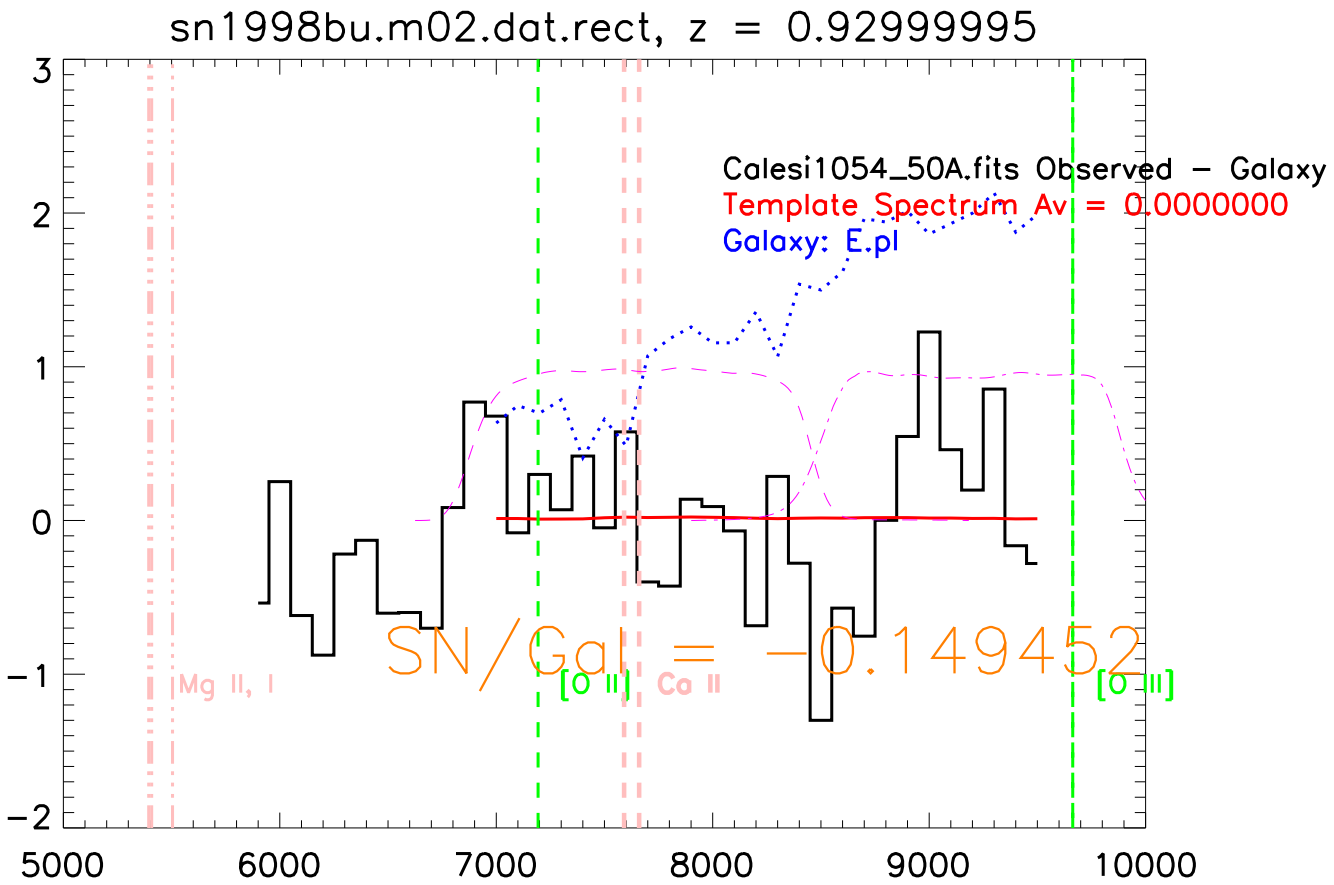

sn1994d.m04.dat.rect, z = 1.0200000
Calesi1054_50A.fits Observed – Galaxy
Template Spectrum Av = 0.0000000
Galaxy: E.pl
SN/Gal = 0.155754
Mg II,
[O II]
Ca II
[O III]
3
2
1
0
−1
5000
6000
7000
8000
9000
10000

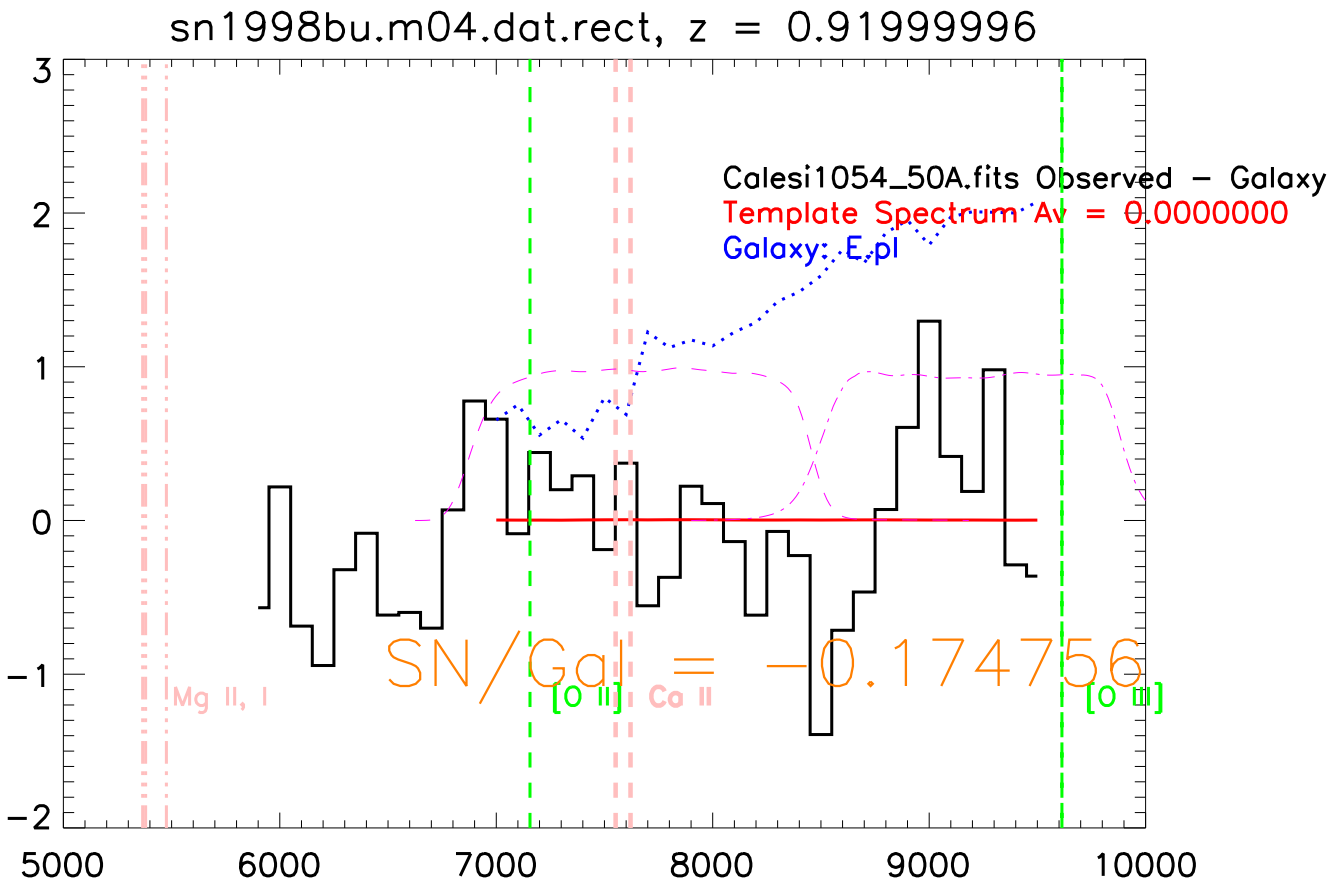

sn1991t.m07.dat.rect, z = 0.97000003
Cales1054_50A.fits Observed − Galaxy
Template Spectrum Av = 0.0000000
Galaxy: E.pl
SN/Gal = 0.0459285
Mg II, I
[O II]
Ca II
[O III]
3
2
1
0
−1
−2
5000
6000
7000
8000
9000
10000

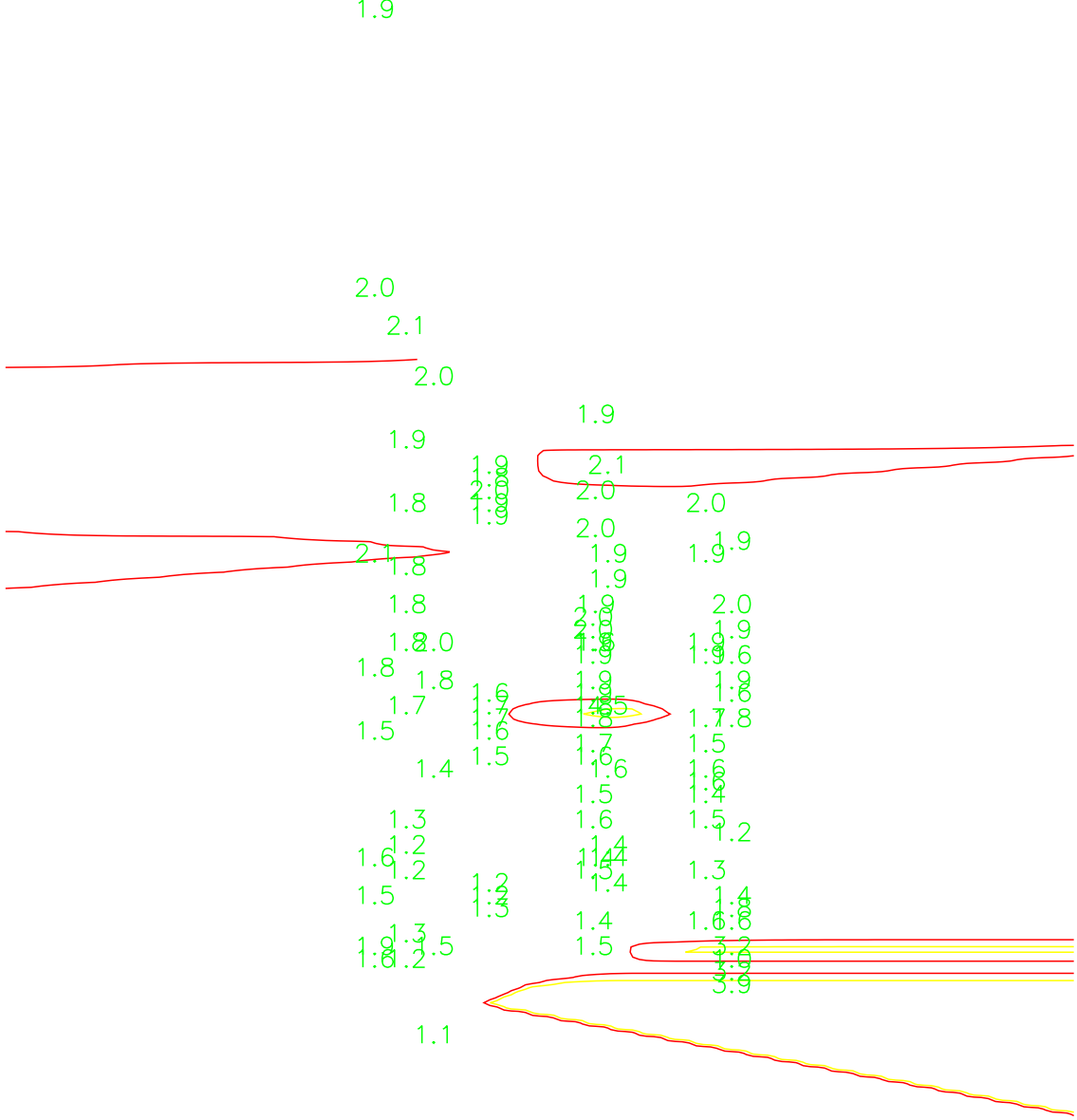

sn1999ee.m06.dat.rect, z = 1.0100000
Calesi1054_50A.fits Observed − Galaxy
Template Spectrum Av = 0.0000000
Galaxy: E.pl
SN/Gal = 0.296656
Mg II,
[O II]
Ca II
[O III]
3
2
1
0
−1
5000
6000
7000
8000
9000
10000

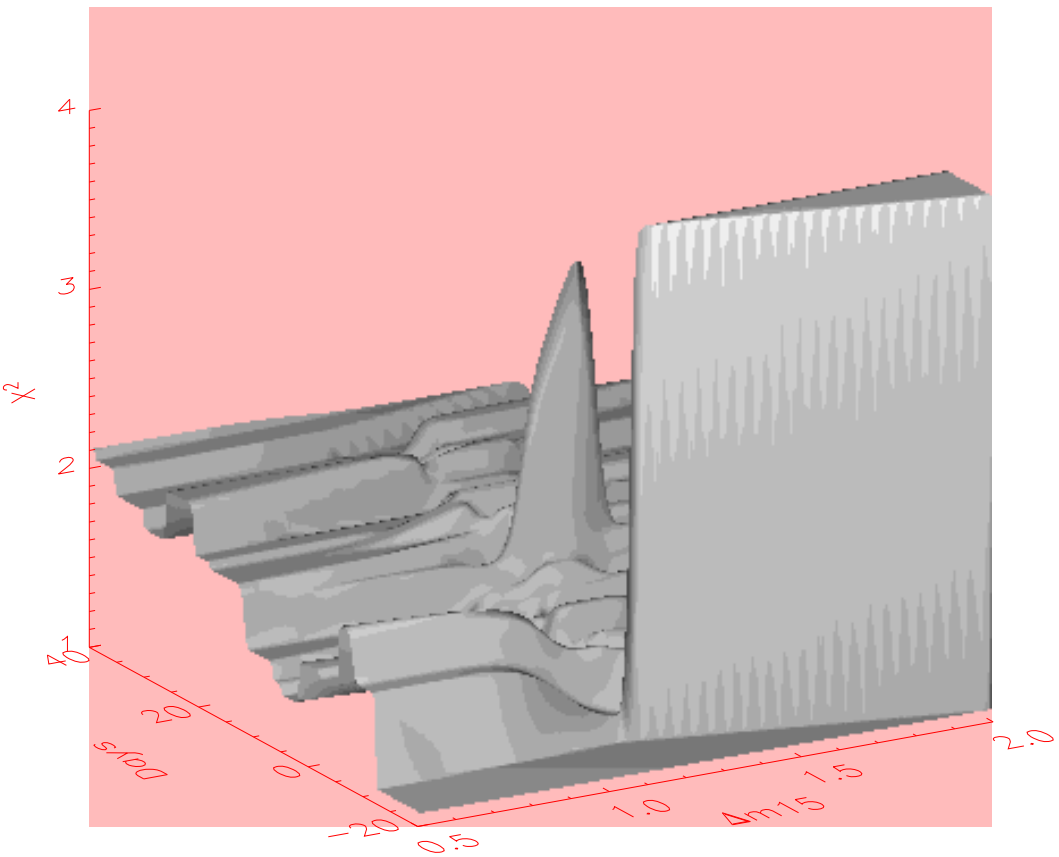

sn1999ee.m01.dat.rect, z = 0.95999998
Calesi1054_50A.fits Observed − Galaxy
Template Spectrum Av = 0.0000000
Galaxy: E.pl
SN/Gal = −0.108625
Mg II, I
[O II]
Ca II
[O III]
3
2
1
0
−1
−2
5000
6000
7000
8000
9000
10000


sn1992a.m01.dat.rect, z = 0.94000000
Calesi1054_50A.fits Observed − Galaxy
Template Spectrum Av = 0.0000000
Galaxy: E.pl
SN/Gal = −0.112799
Mg II, I
[O II]
Ca II
[O III]
3
2
1
0
−1
−2
5000
6000
7000
8000
9000
10000

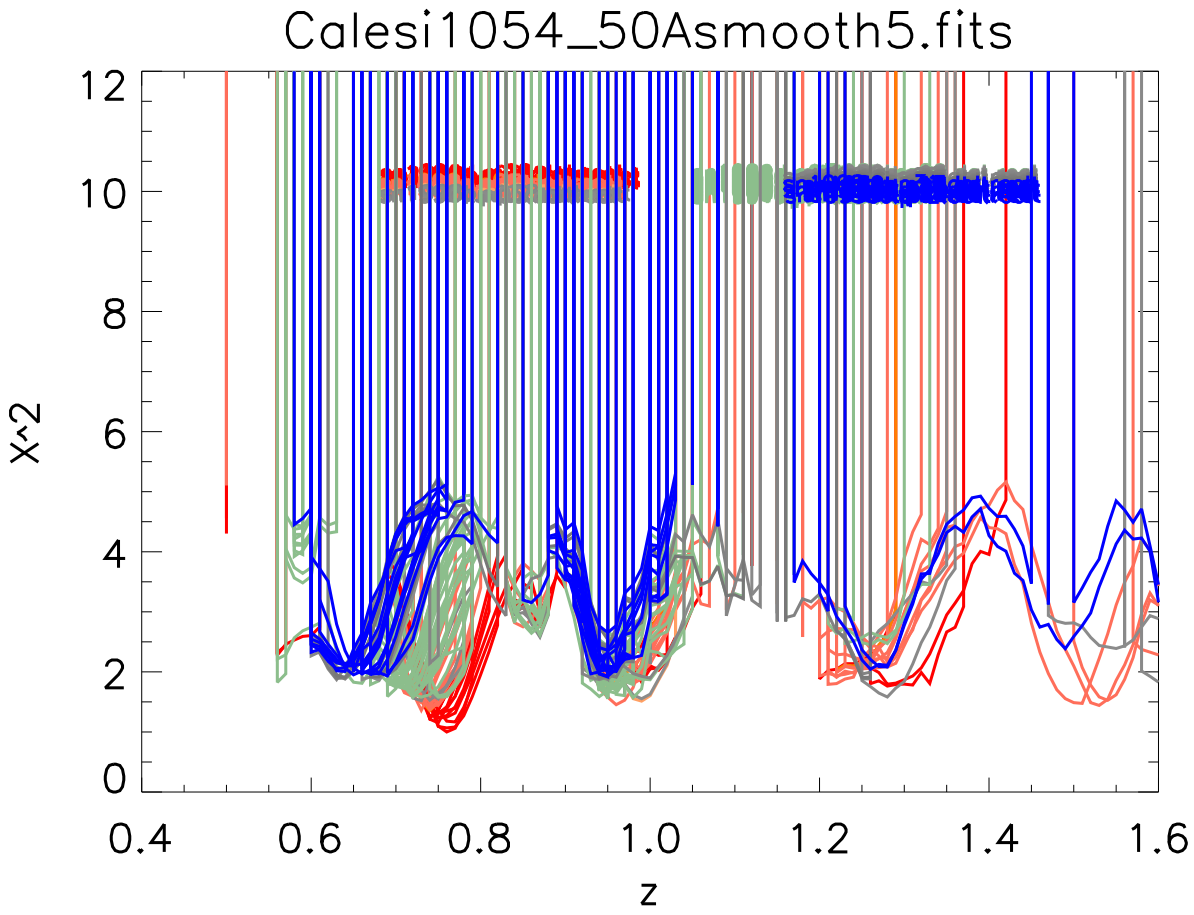

sn1998bu.m02.dat.rect, z = 0.92999995
Calesi1054_50A.fits Observed − Galaxy
Template Spectrum Av = 0.10000000
Galaxy: E.pl
SN/Gal = −0.149452
Mg II, I
[O II]
Ca II
[O III]
3
2
1
0
−1
−2
5000
6000
7000
8000
9000
10000

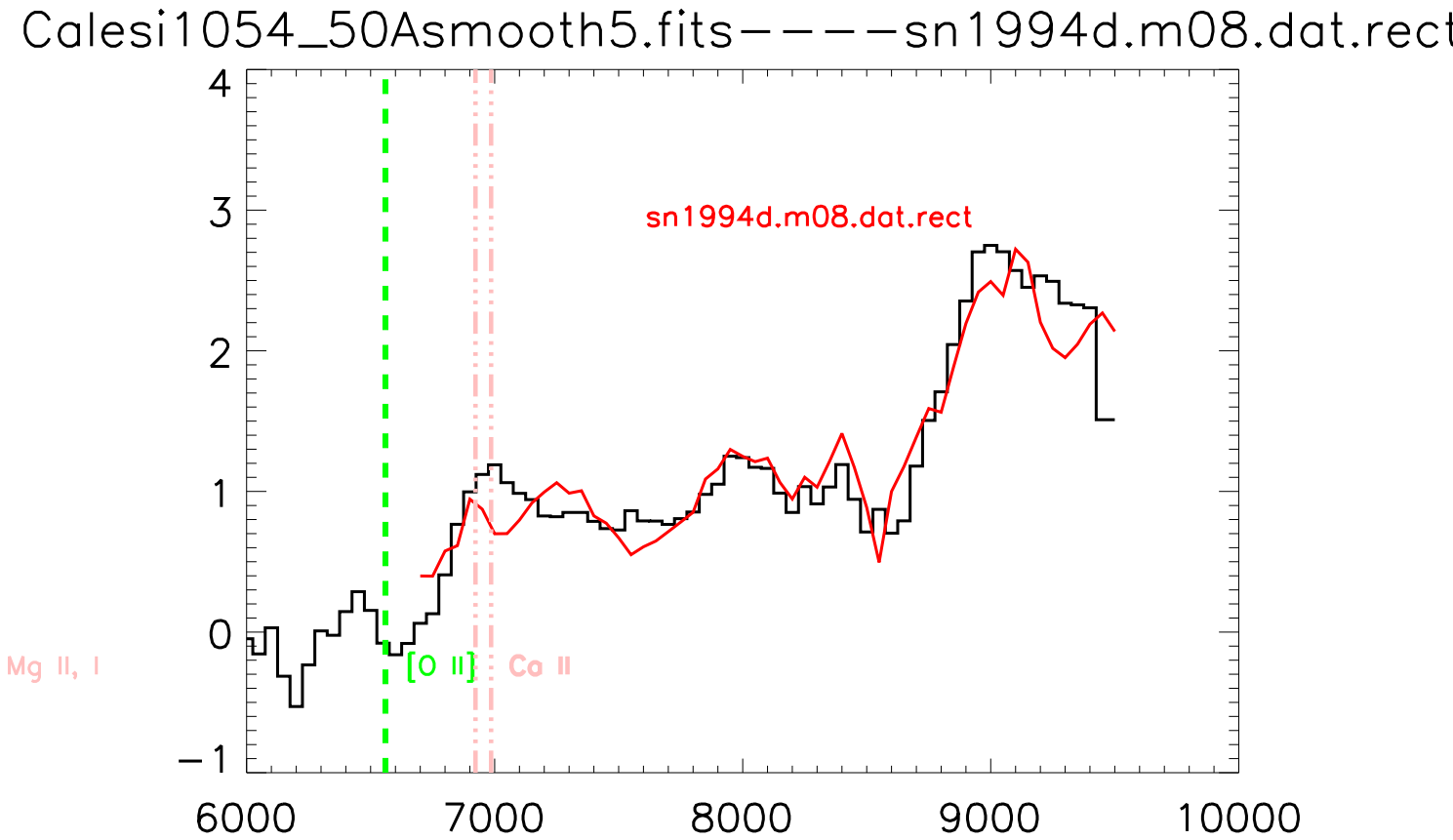

sn1998bu.m04.dat.rect, z = 0.91999996
Calesi1054_50A.fits Observed − Galaxy
Template Spectrum Av = 0.0000000
Galaxy: E.pl
SN/Gal = −0.174756
Mg II, I
[O II]
Ca II
[O III]
3
2
1
0
−1
−2
5000
6000
7000
8000
9000
10000

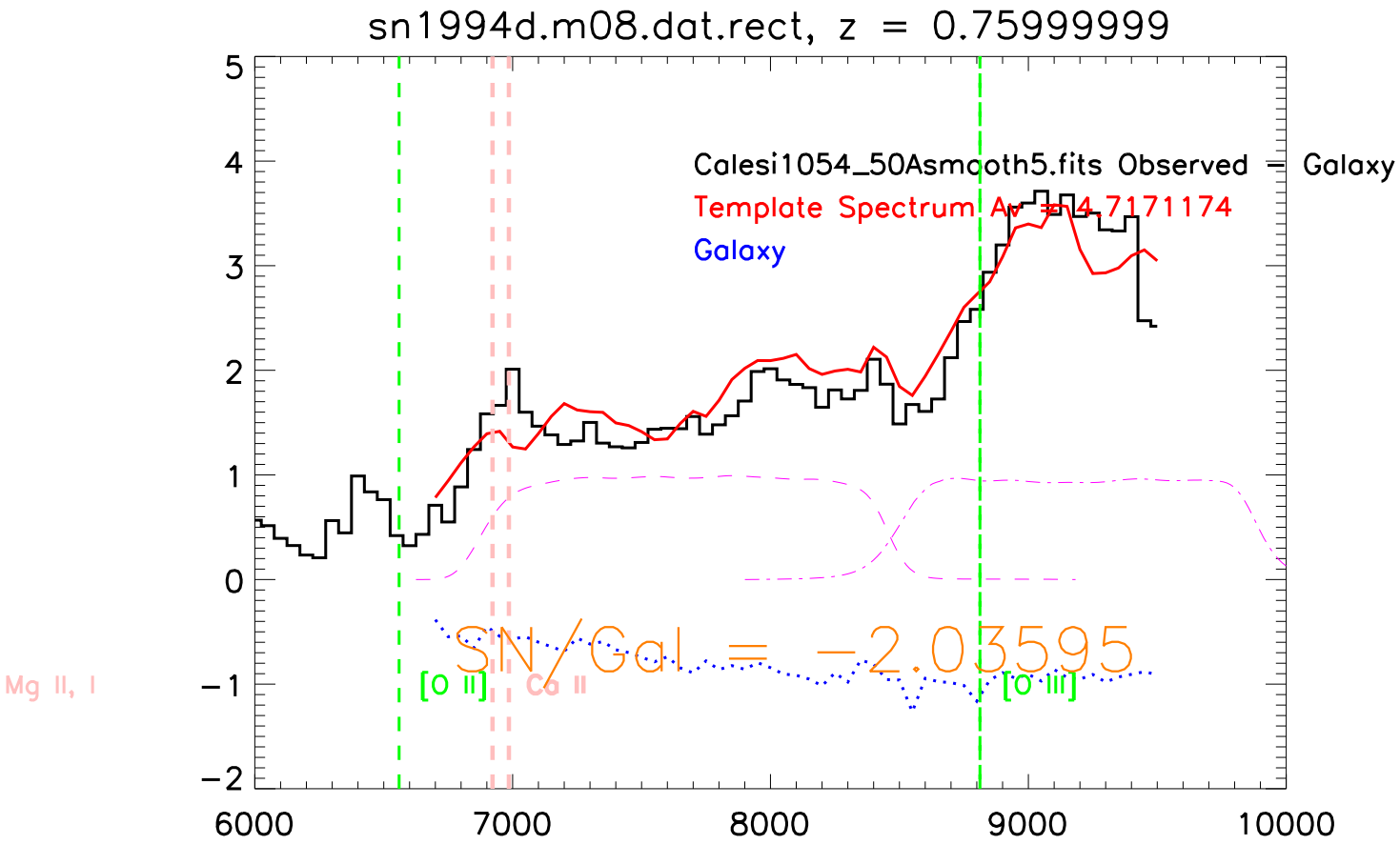


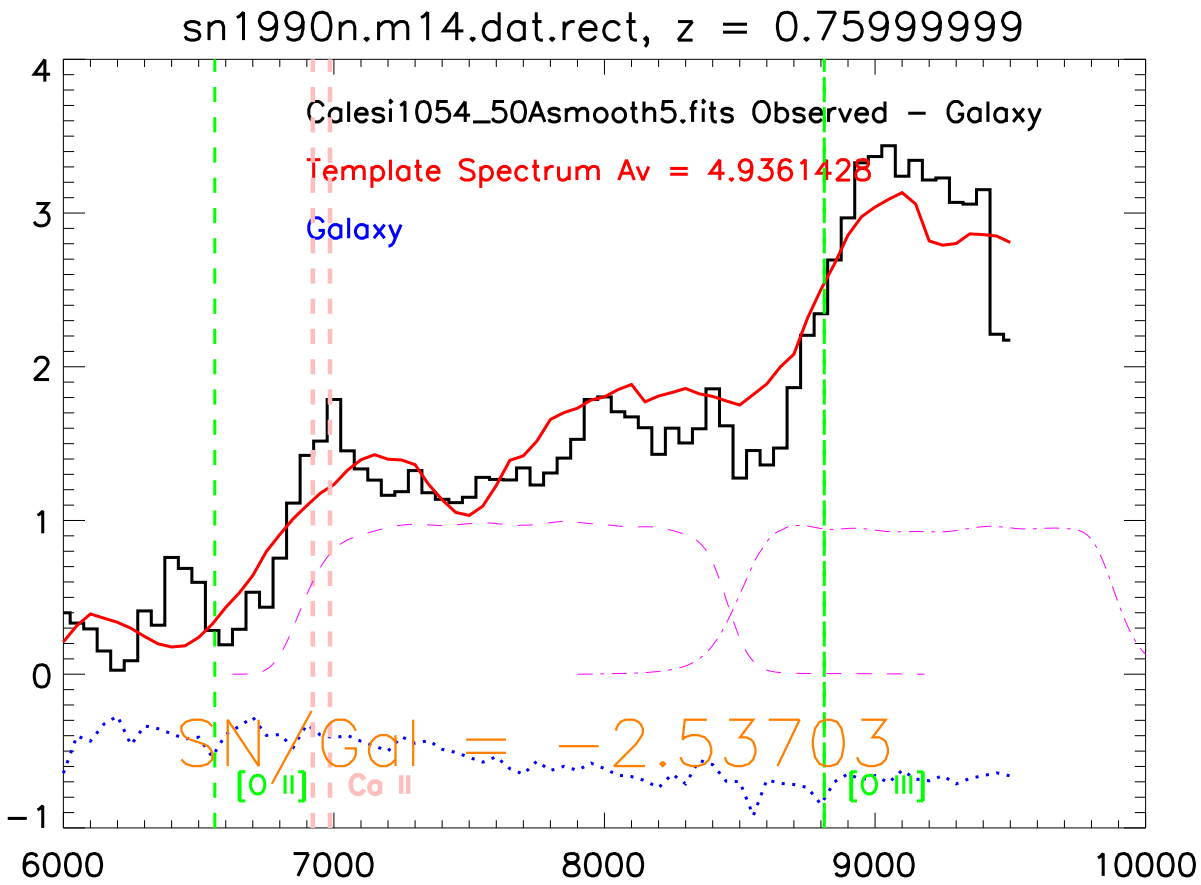


4
3
2
1
χ^2
40
20
0
−20
Days
0.5
1.0
1.5
2.0
Δm15

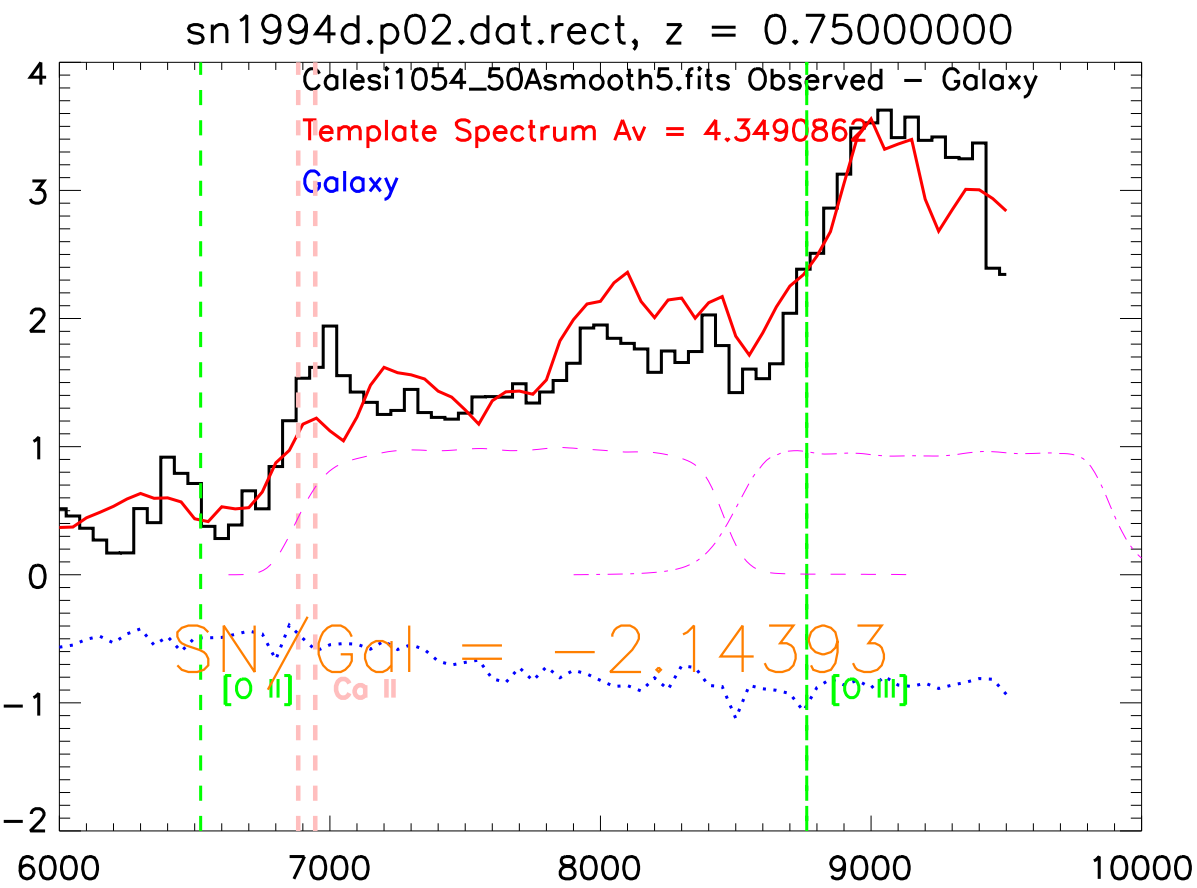

Calesi1054_50Asmooth5.fits
X^2
z
0
2
4
6
8
10
12
0.4
0.6
0.8
1.0
1.2
1.4
1.6


Calesi1054_50Asmooth5.fits----sn1994d.m08.dat.rect
sn1994d.m08.dat.rect
Mg II, I
[O II]
Ca II
4
3
2
1
0
−1
6000
7000
8000
9000
10000

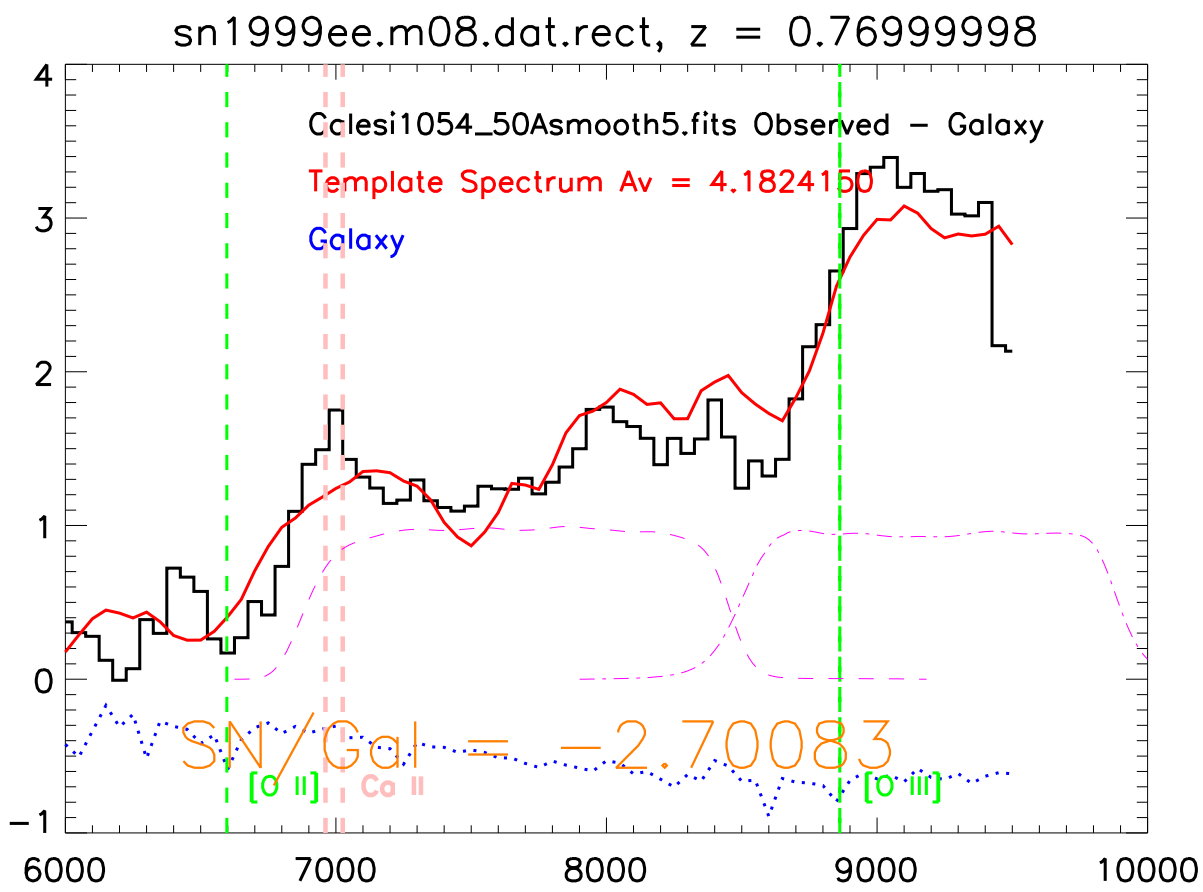

sn1994d.m08.dat.rect, z = 0.75999999
Calesi1054_50Asmooth5.fits Observed = Galaxy
Template Spectrum Av = 4.7171174
Galaxy
SN/Gal = −2.03595
[O II]
Ca II
[O III]
Mg II, I
5
4
3
2
1
0
−1
−2
6000
7000
8000
9000
10000


sn1990n.m14.dat.rect, z = 0.75999999
Calesi1054_50Asmooth5.fits Observed − Galaxy
Template Spectrum Av = 4.9361428
Galaxy
SN/Gal = −2.53703
[O II]
Ca II
[O III]
4
3
2
1
0
−1
6000
7000
8000
9000
10000

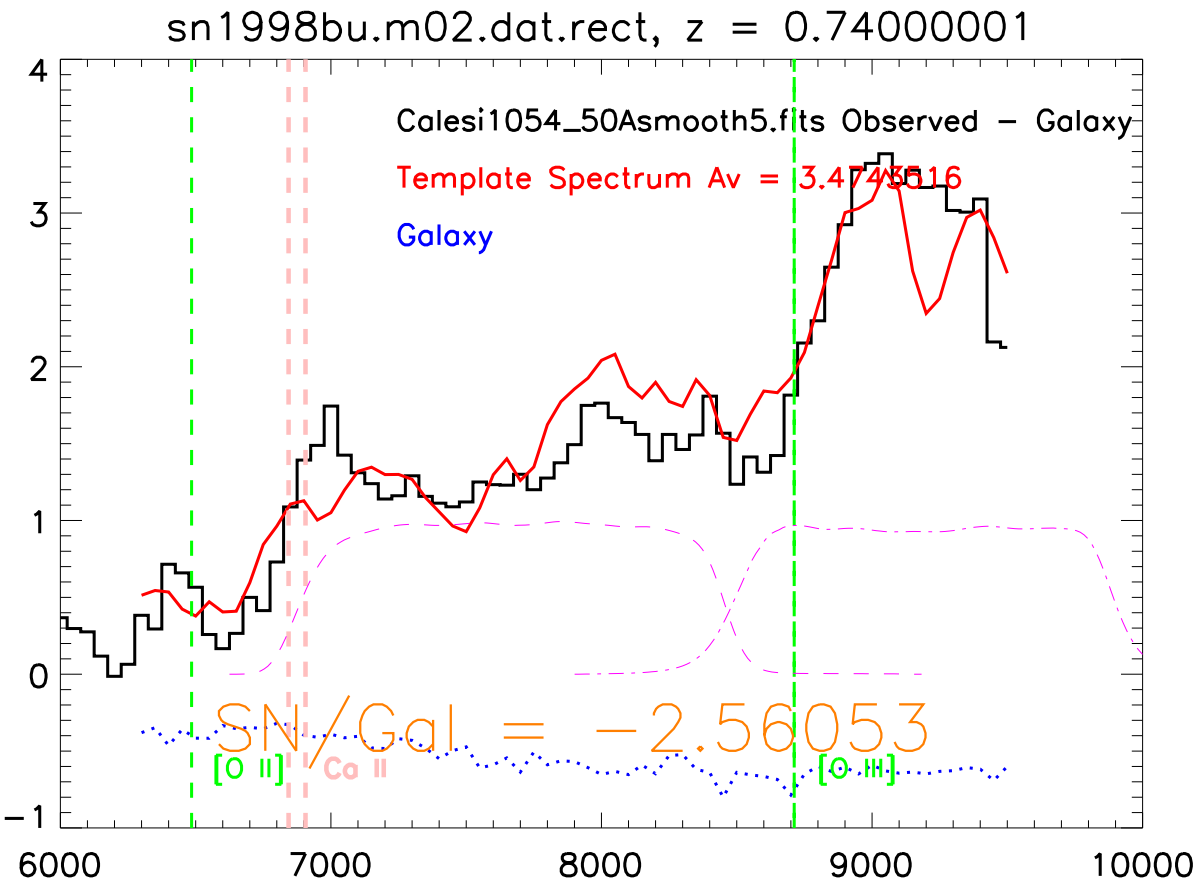
Mg II, I


sn1994d.p02.dat.rect, z = 0.75000000
Calesi1054_50Asmooth5.fits Observed − Galaxy
Template Spectrum Av = 4.3490862
Galaxy
SN/Gal = −2.14393
[O II]
Ca II
[O III]
4
3
2
1
0
−1
−2
6000
7000
8000
9000
10000

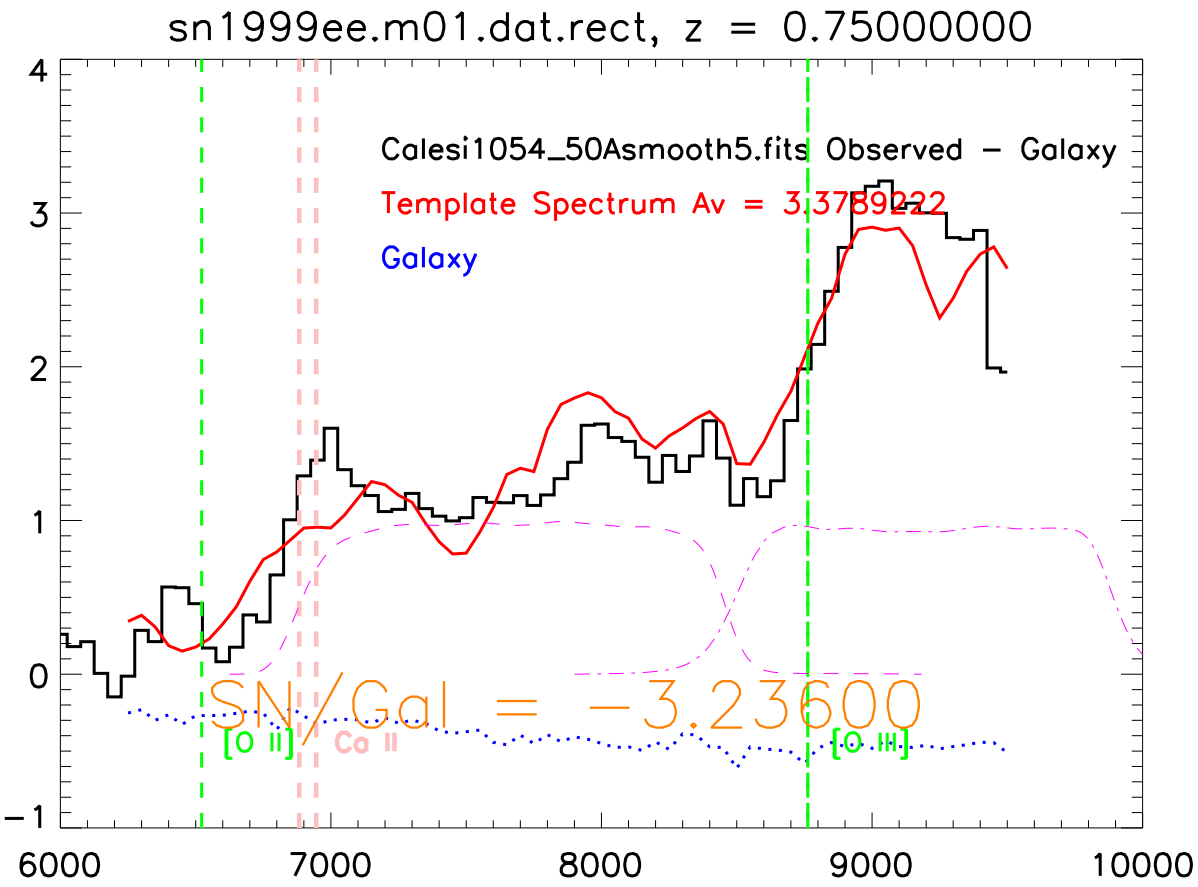
Mg II, I

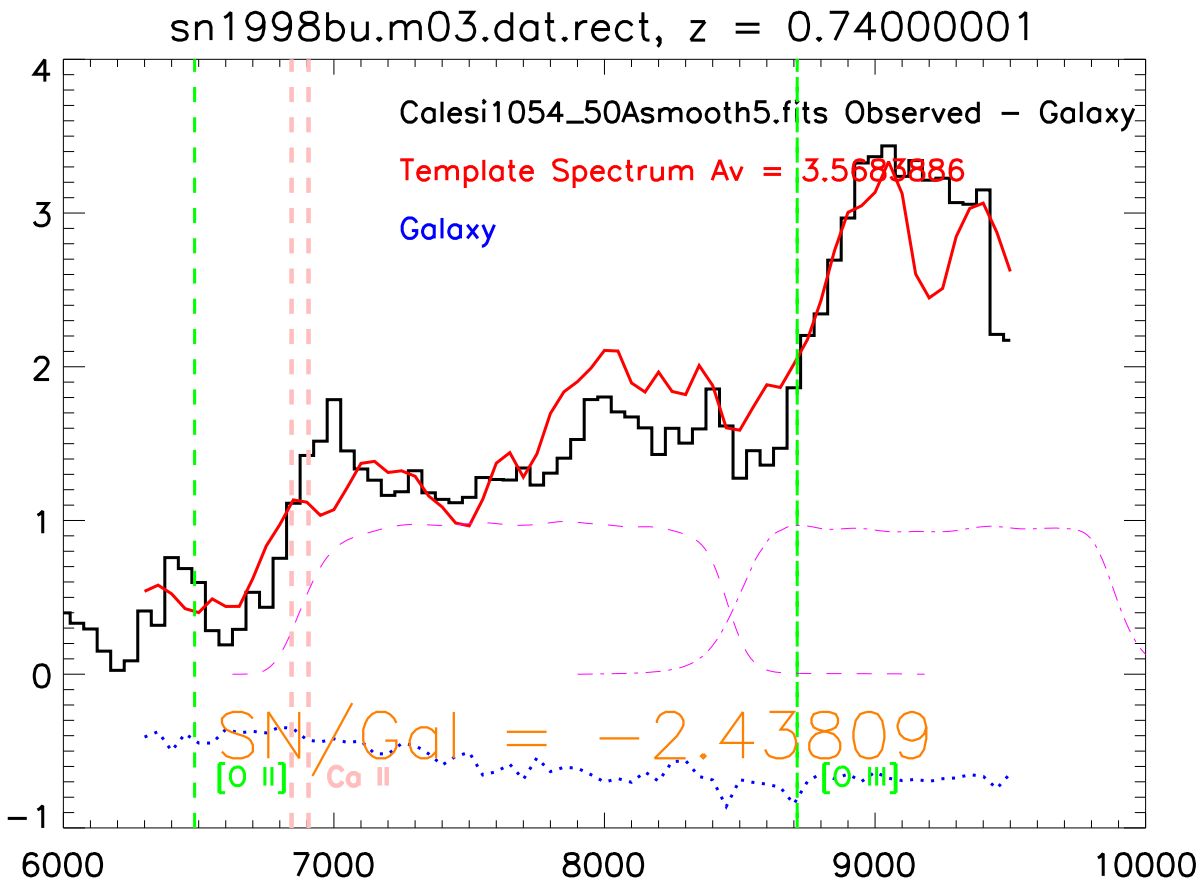

sn1999ee.m08.dat.rect, z = 0.76999998
Ccalesi1054_50Asmooth5.fits Observed − Galaxy
Template Spectrum Av = 4.1824150
Galaxy
S/N/Gal = −2.70083
[O II]
Ca II
[O III]
4
3
2
1
0
−1
6000
7000
8000
9000
10000

Mg II, I

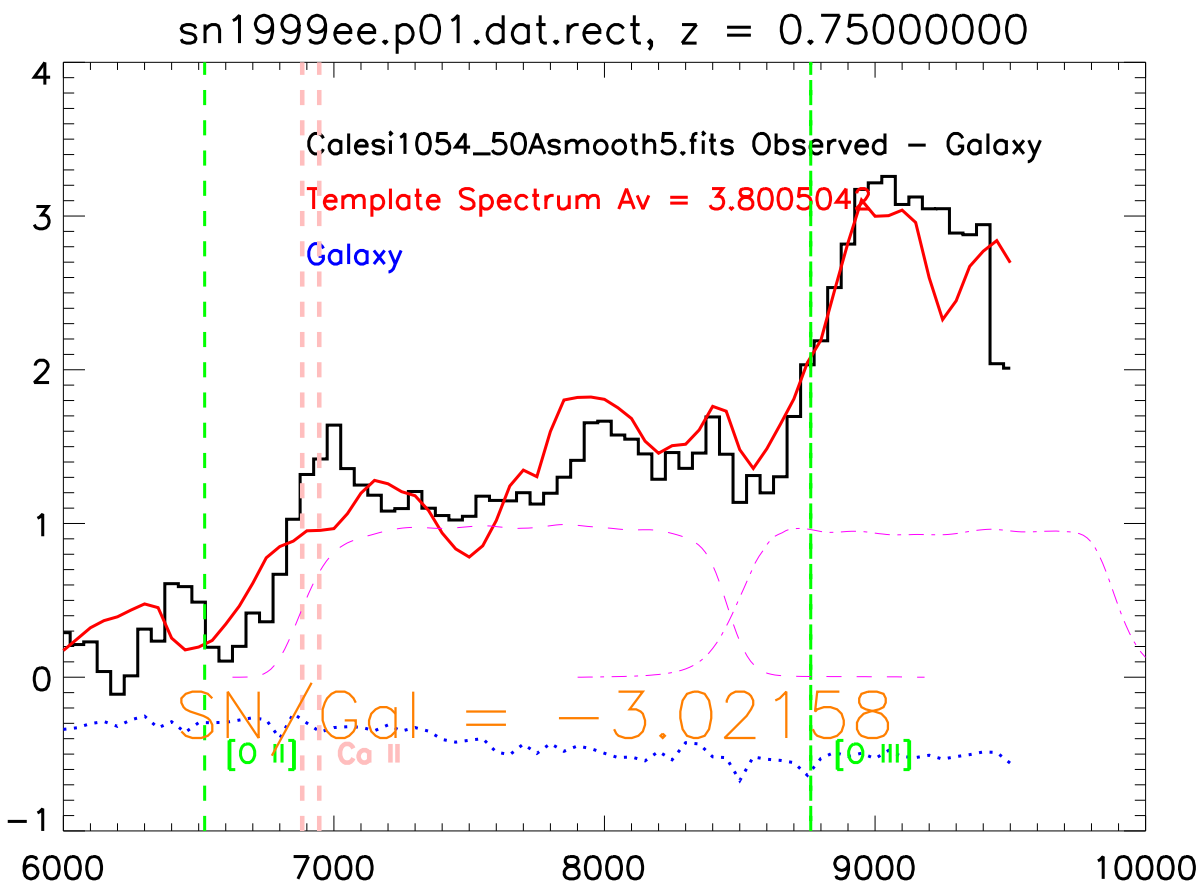

sn1998bu.m02.dat.rect, z = 0.74000001
Calesi1054_50Asmooth5.fits Observed − Galaxy
Template Spectrum Av = 3.47435516
Galaxy
SN/Gal = −2.56053
[O II]
Ca II
[O III]
4
3
2
1
0
−1
6000
7000
8000
9000
10000

Mg II, I

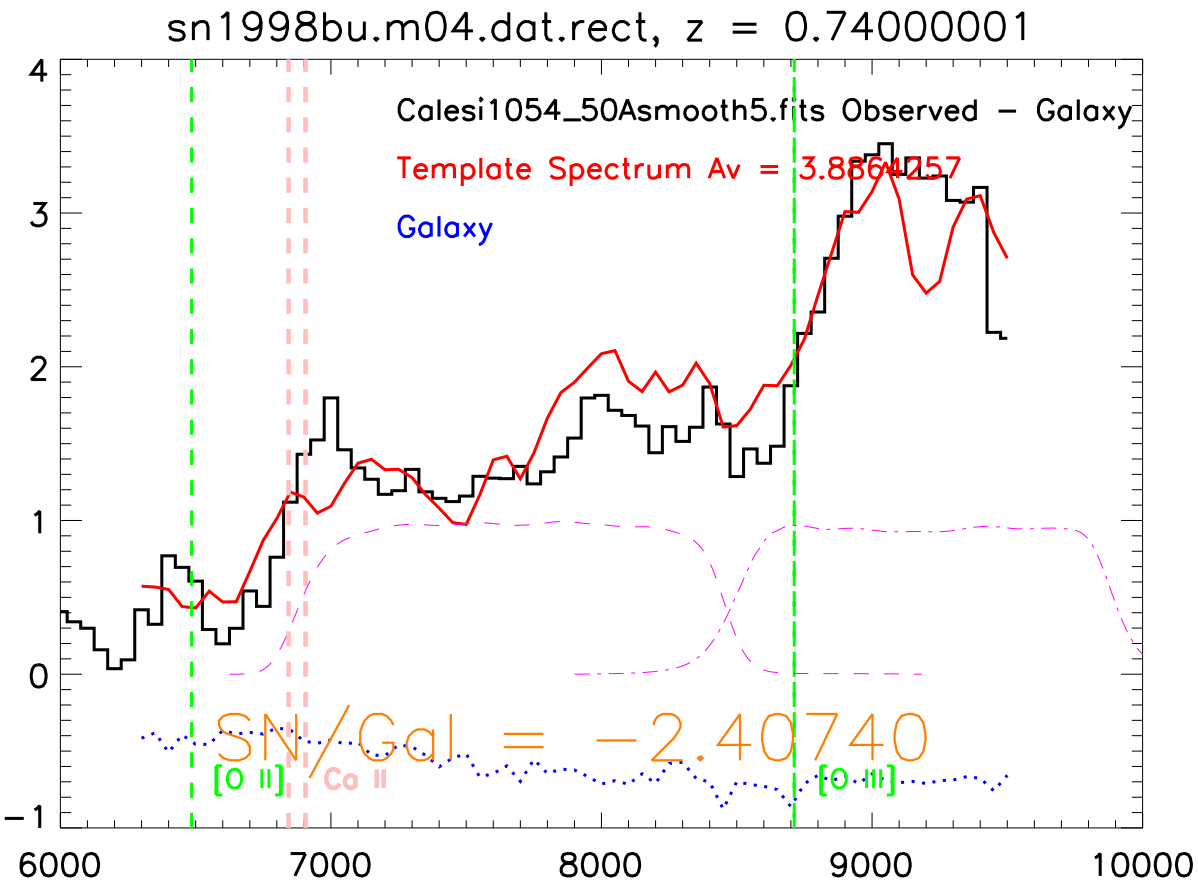

sn1999ee.m01.dat.rect, z = 0.75000000
Calesi1054_50Asmooth5.fits Observed − Galaxy
Template Spectrum Av = 3.3789222
Galaxy
SN/Gal = −3.23600
[O II]
Ca II
[O III]
Mg II, I
4
3
2
1
0
−1
6000
7000
8000
9000
10000


sn1998bu.m03.dat.rect, z = 0.74000001
Calesi1054_50Asmooth5.fits Observed − Galaxy
Template Spectrum Av = 3.56838886
Galaxy
SN/Gal = −2.43809
[O II]
Ca II
[O III]
4
3
2
1
0
−1
6000
7000
8000
9000
10000

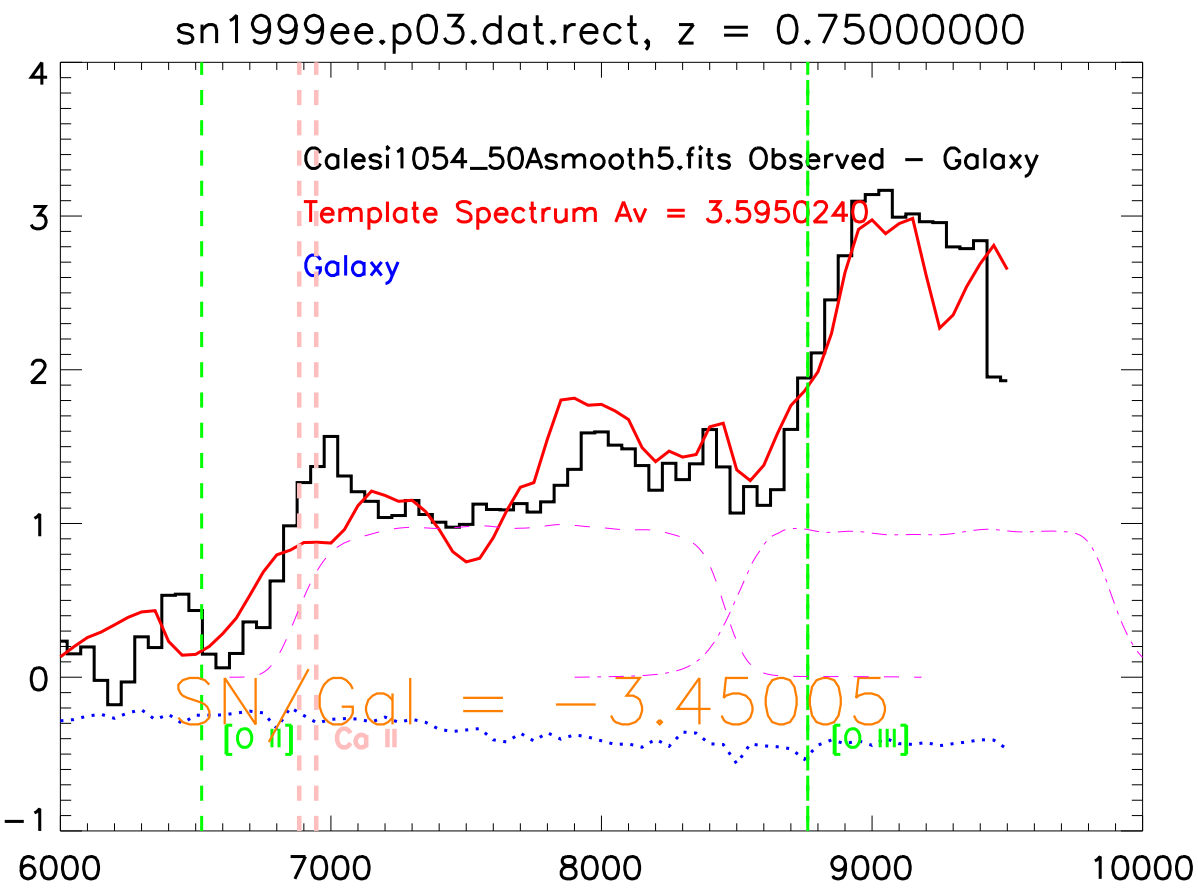
Mg II, I


sn1999ee.p01.dat.rect, z = 0.75000000
Calesi1054_50Asmooth5.fits Observed − Galaxy
Template Spectrum Av = 3.8005042
Galaxy
SN/Gal = −3.02158
[O II]
Ca II
[O III]
4
3
2
1
0
−1
6000
7000
8000
9000
10000

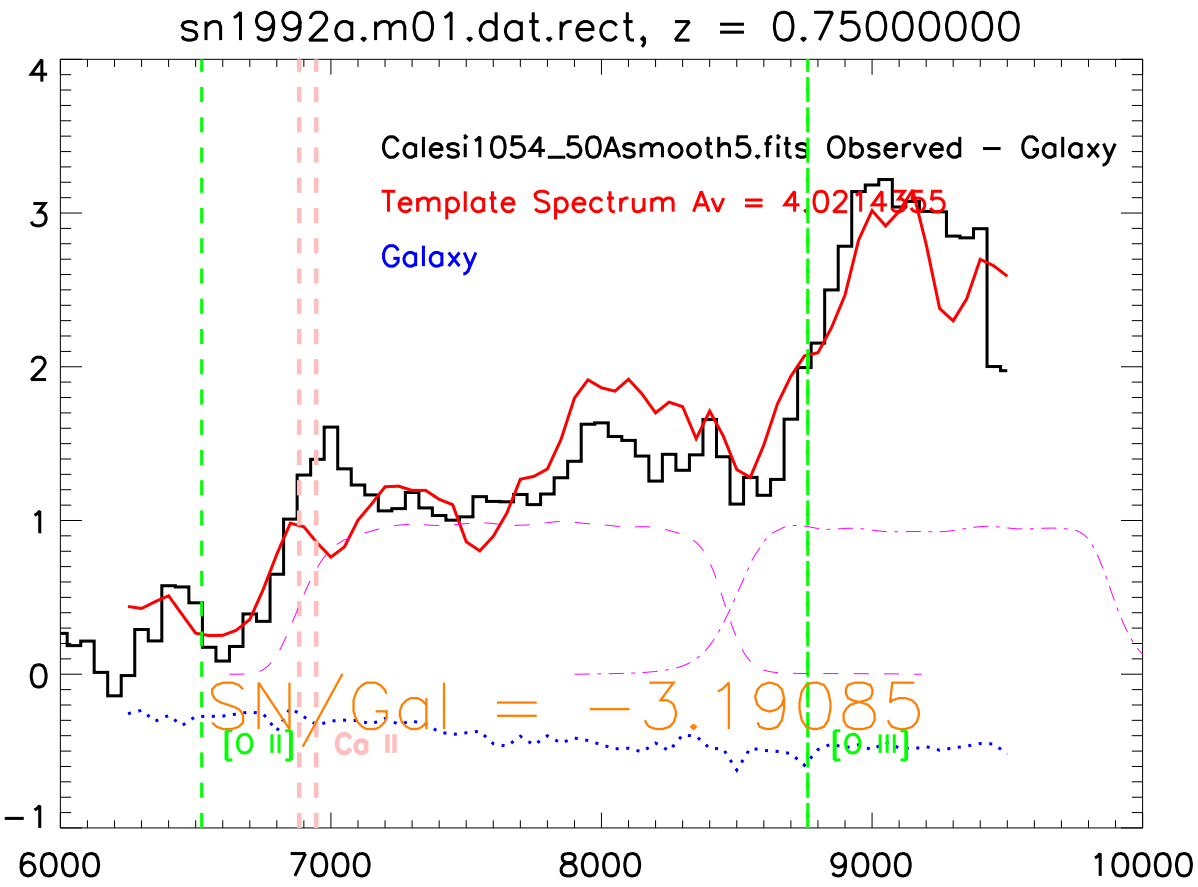
Mg II, I


sn1998bu.m04.dat.rect, z = 0.74000001
Calesi1054_50Asmooth5.fits Observed − Galaxy
Template Spectrum Av = 3.88644757
Galaxy
SN/Gal = −2.40740
[O II]
Ca II
[O III]
4
3
2
1
0
−1
6000
7000
8000
9000
10000

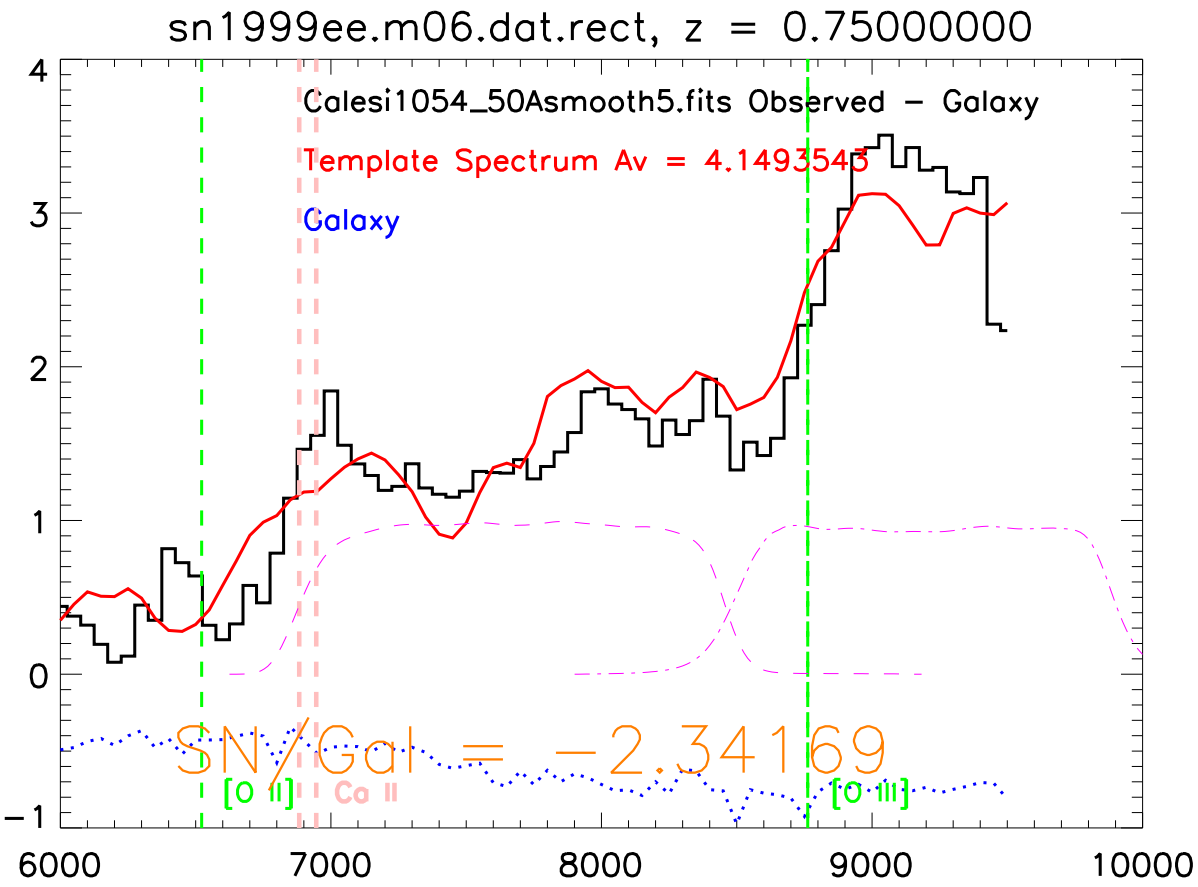
Mg II, I


sn1999ee.p03.dat.rect, z = 0.75000000
Calesi1054_50Asmooth5.fits Observed − Galaxy
Template Spectrum Av = 3.5950240
Galaxy
SN/Gal = −3.45005
[O II]
Ca II
[O III]
4
3
2
1
0
−1
6000
7000
8000
9000
10000

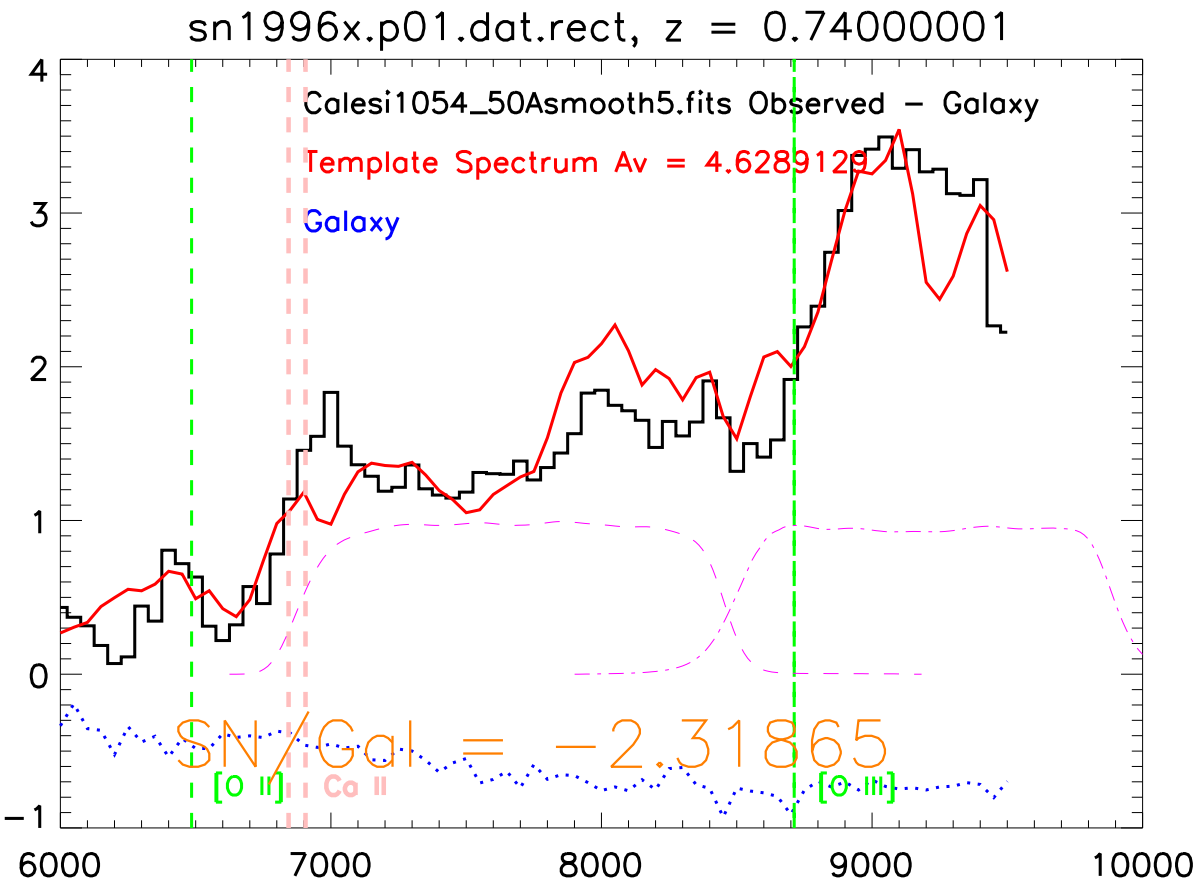
Mg II, I


sn1992a.m01.dat.rect, z = 0.75000000
Calesi1054_50Asmooth5.fits Observed − Galaxy
Template Spectrum Av = 4.02143555
Galaxy
SN/Gal = −3.19085
[O II]
Ca II
[O III]
4
3
2
1
0
−1
6000
7000
8000
9000
10000

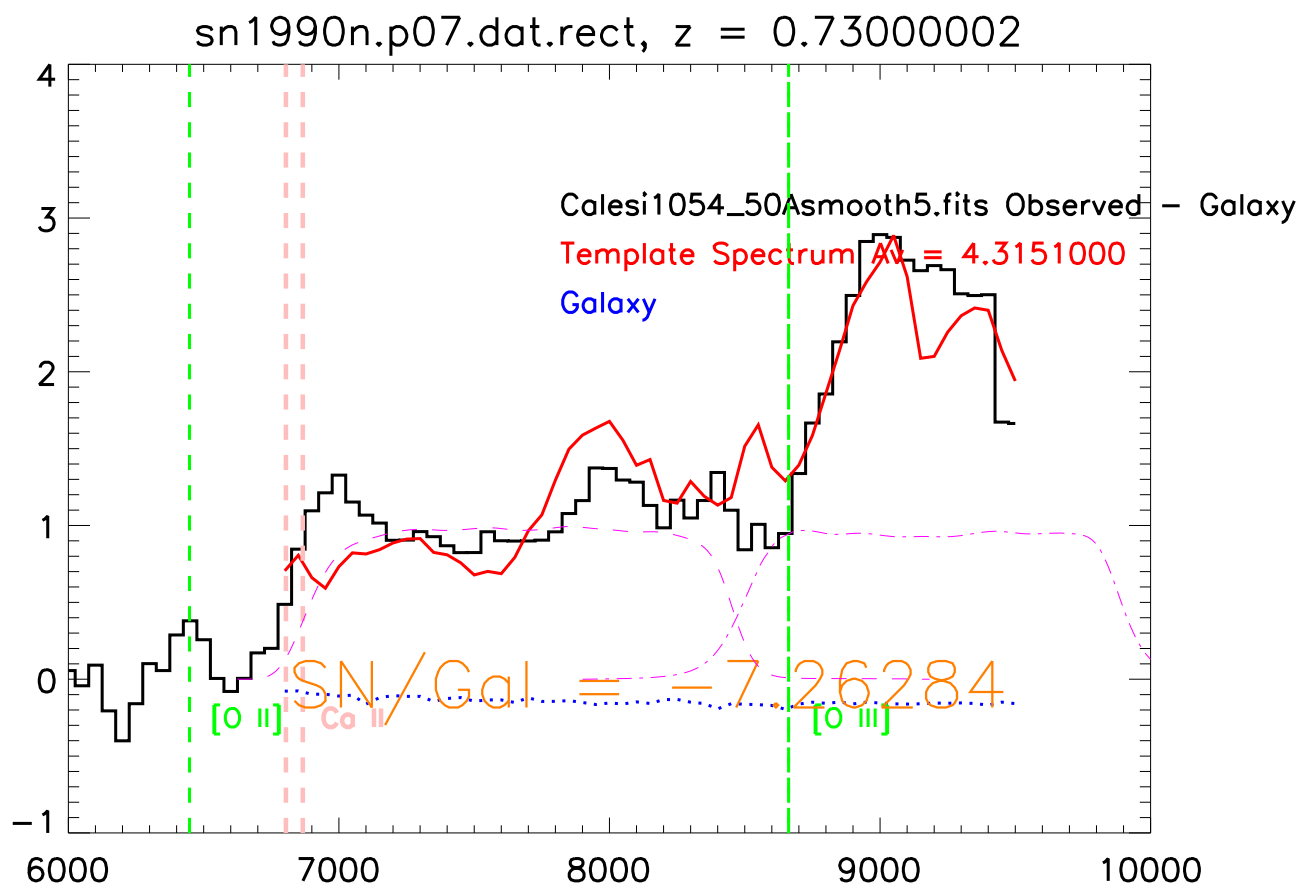
Mg II, I


sn1999ee.m06.dat.rect, z = 0.75000000
Calesi1054_50Asmooth5.fits Observed − Galaxy
Template Spectrum Av = 4.1493545
Galaxy
SN/Gal = −2.34169
[O II]
Ca II
[O III]
4
3
2
1
0
−1
6000
7000
8000
9000
10000

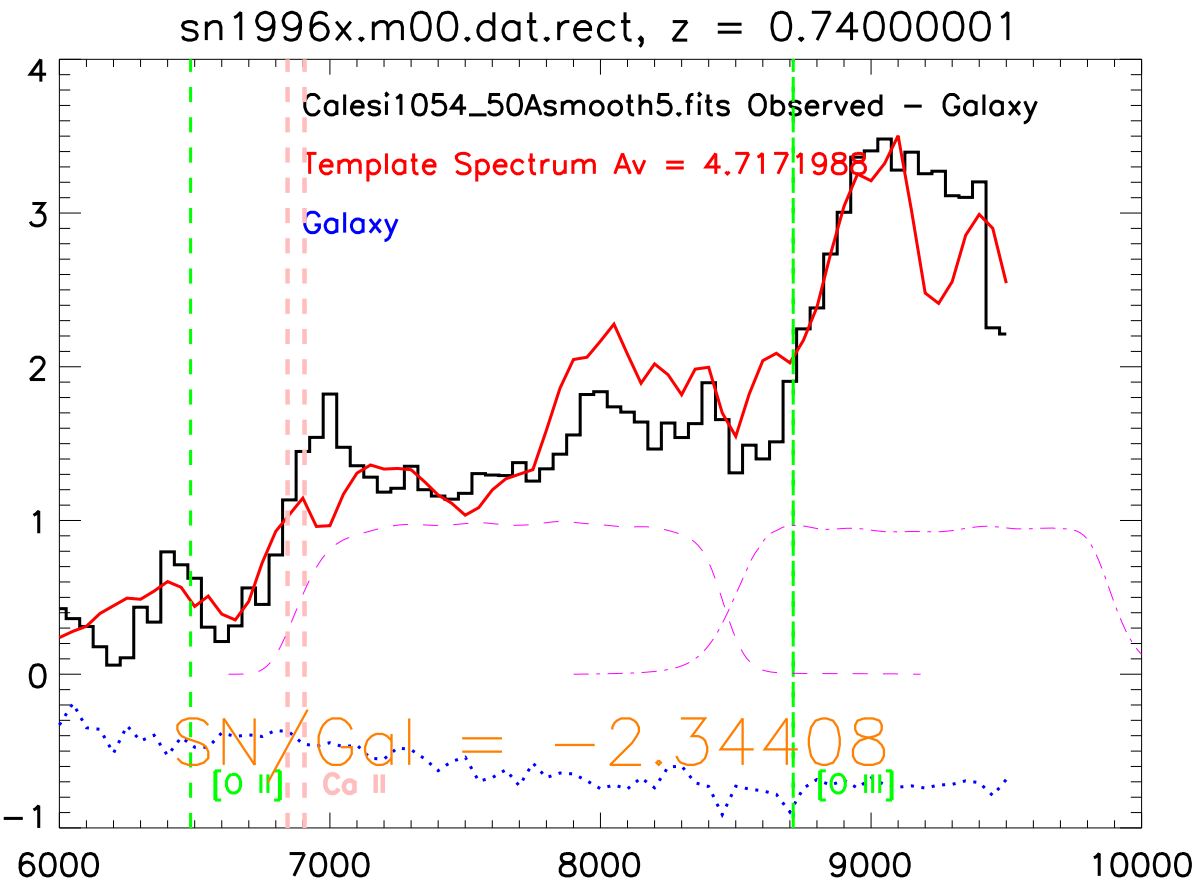
Mg II, I


sn1996x.p01.dat.rect, z = 0.74000001
Calesi1054_50Asmooth5.fits Observed − Galaxy
Template Spectrum Av = 4.6289129
Galaxy
SN/Gal = −2.31865
[O II]
Ca II
[O III]
4
3
2
1
0
−1
6000
7000
8000
9000
10000

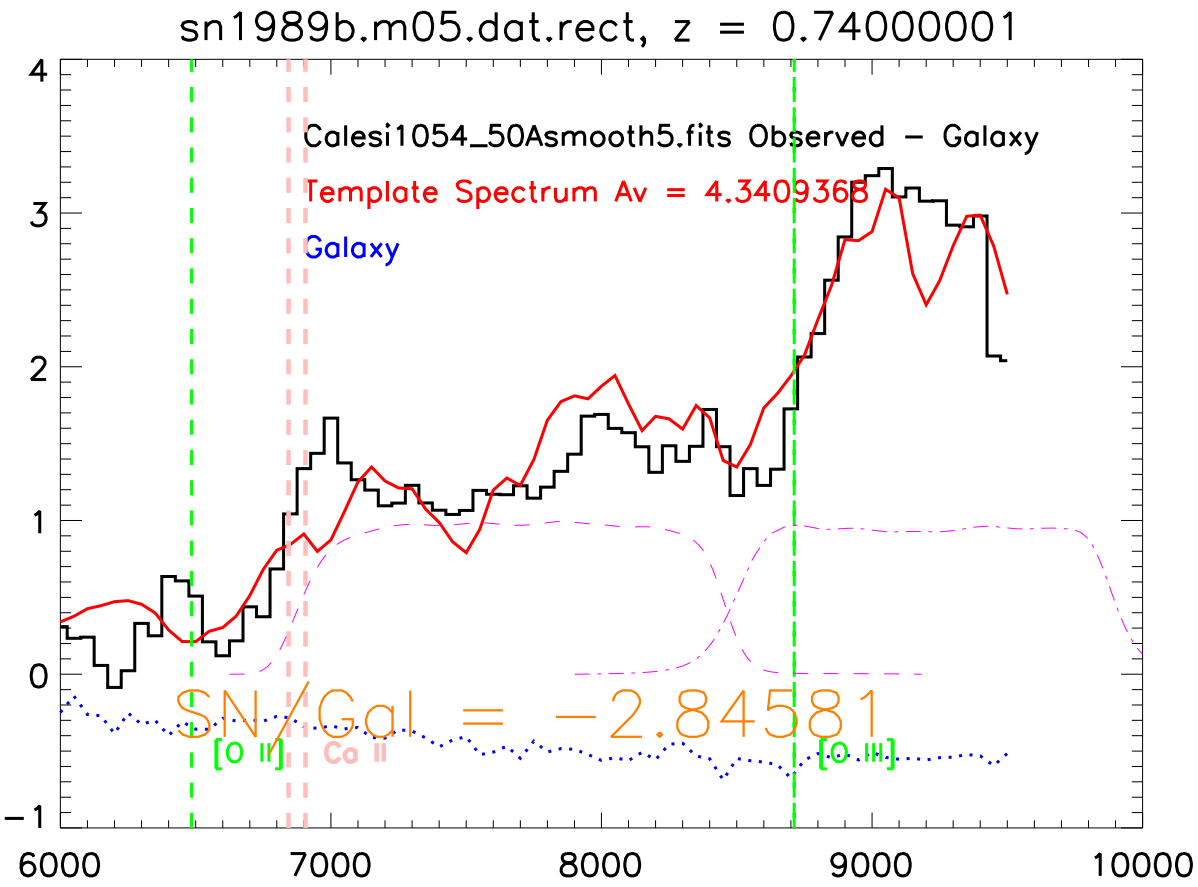
Mg II, I

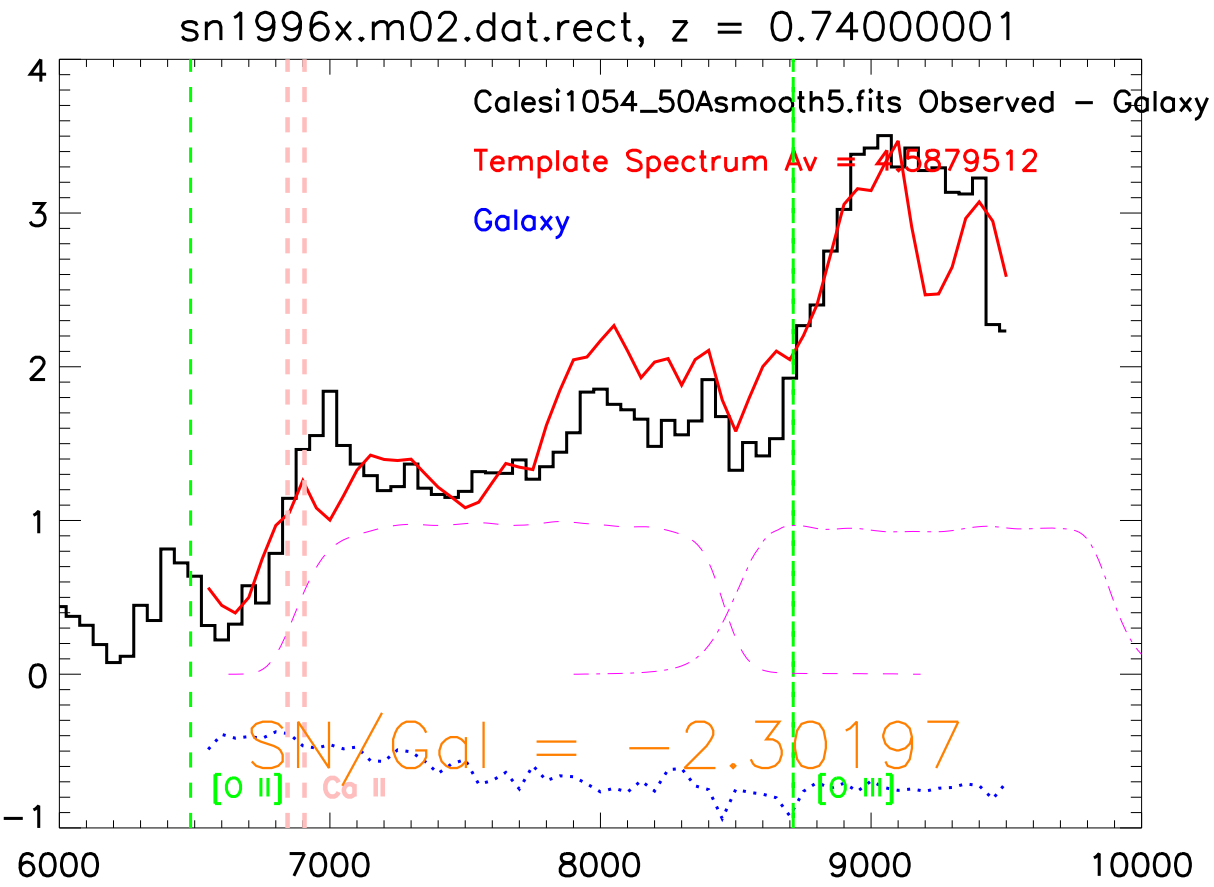

sn1990n.p07.dat.rect, z = 0.73000002
Calesi1054_50Asmooth5.fits Observed − Galaxy
Template Spectrum AV = 4.3151000
Galaxy
SN/Gal = −7.26284
[O II]
Ca II
[O III]
4
3
2
1
0
−1
6000
7000
8000
9000
10000

Mg II, I

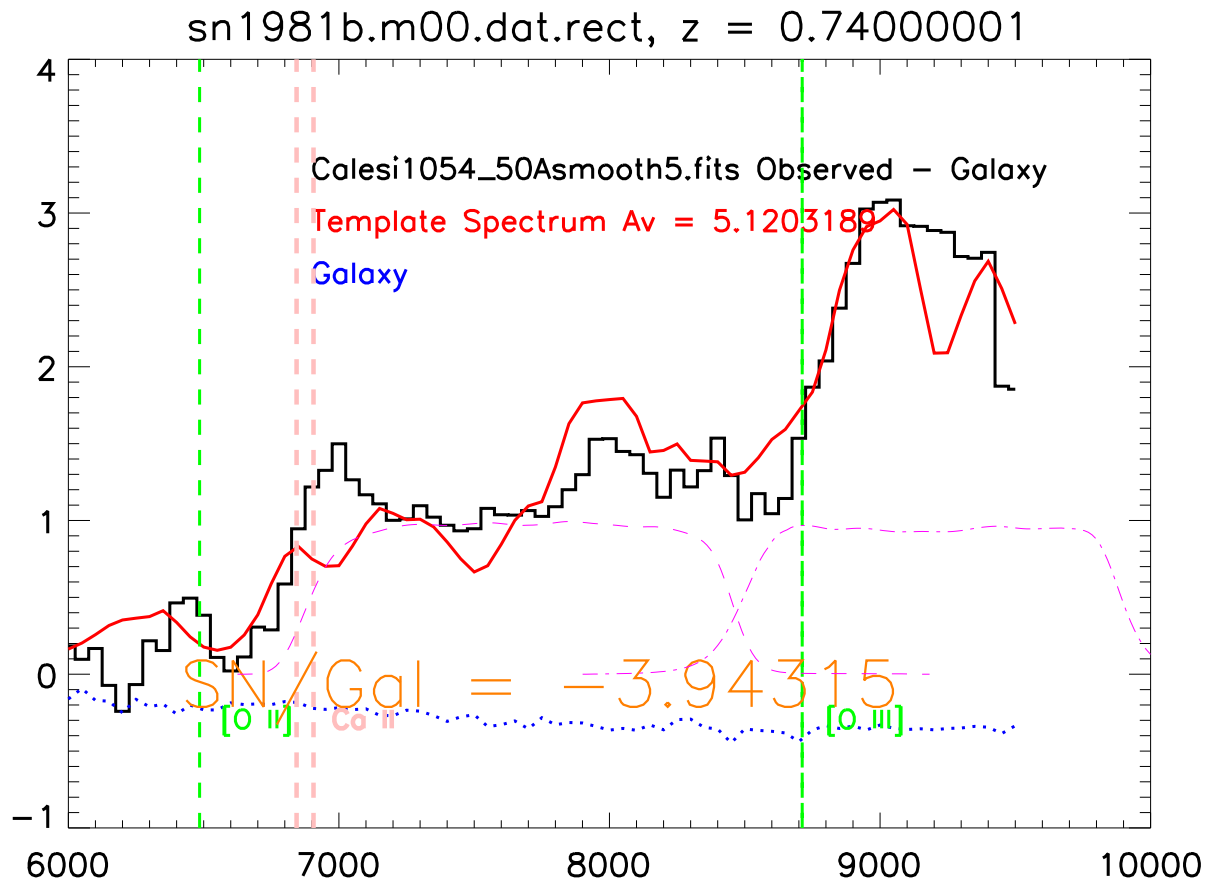

sn1996x.m00.dat.rect, z = 0.74000001
Calesi1054_50Asmooth5.fits Observed − Galaxy
Template Spectrum Av = 4.7171988
Galaxy
SN/Gal = −2.34408
[O II]
Ca II
[O III]
4
3
2
1
0
−1
6000
7000
8000
9000
10000

Mg II, I

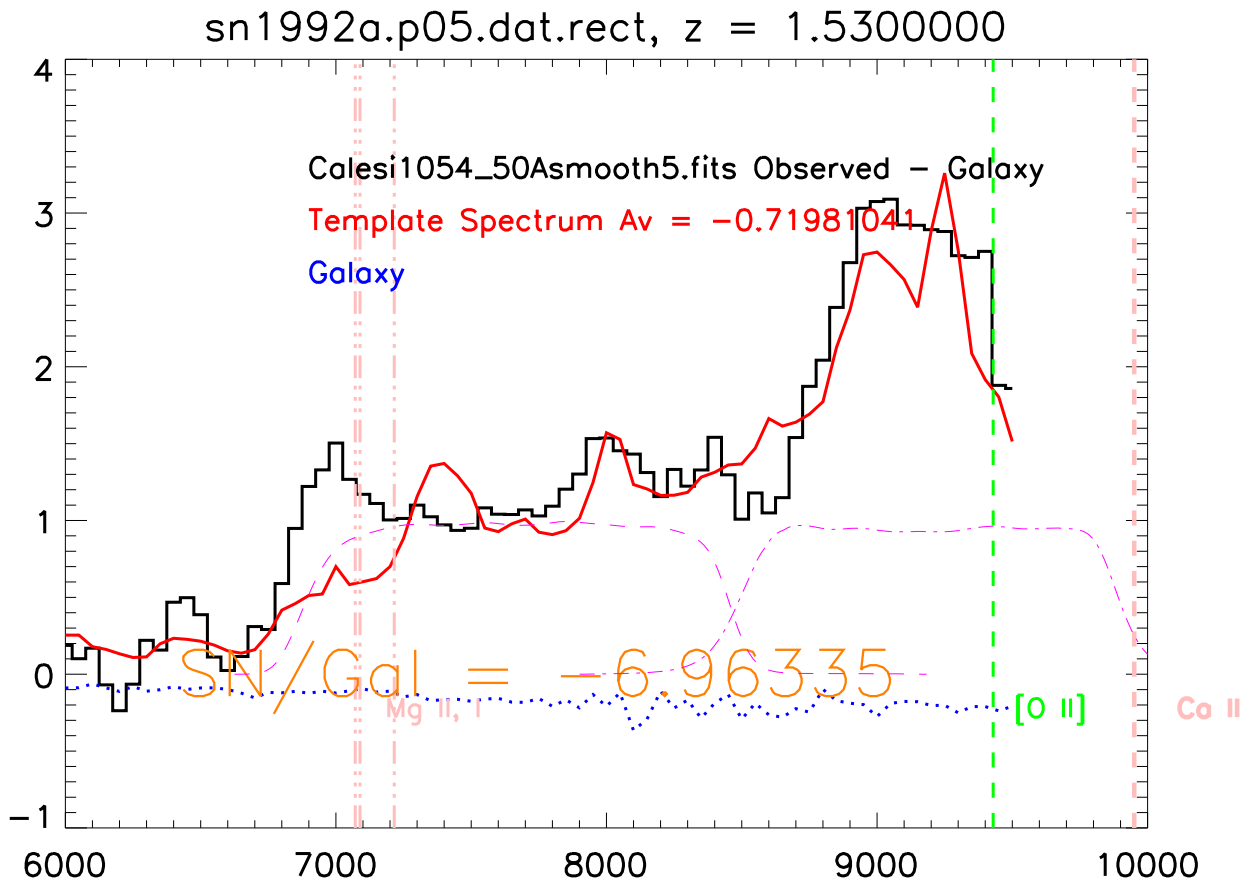

sn1989b.m05.dat.rect, z = 0.74000001
Calesi1054_50Asmooth5.fits Observed − Galaxy
Template Spectrum Av = 4.3409368
Galaxy
SN/Gal = −2.84581
[O II]
Ca II
[O III]
Mg II, I
4
3
2
1
0
−1
6000
7000
8000
9000
10000

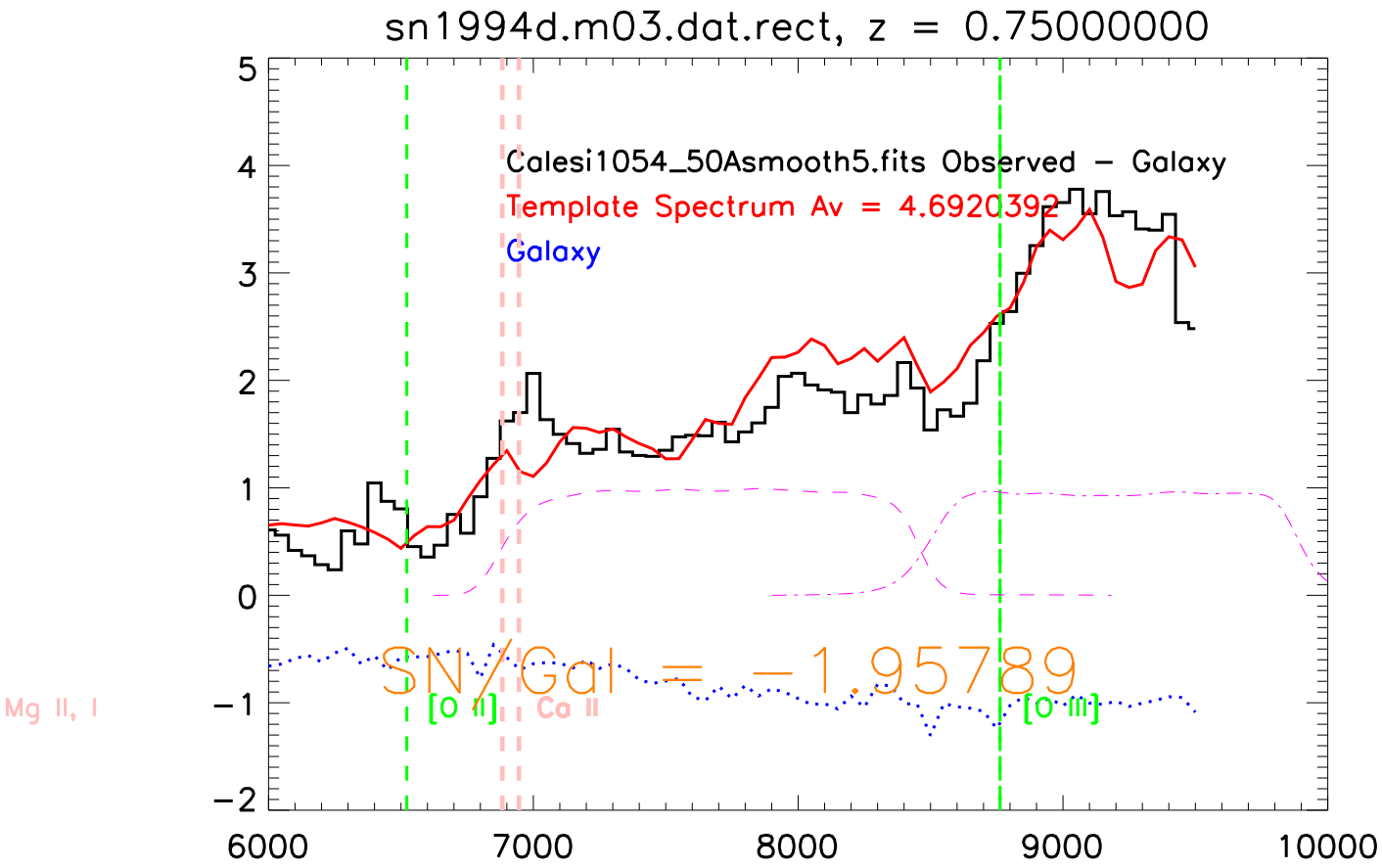

sn1996x.m02.dat.rect, z = 0.74000001
Calesi1054_50Asmooth5.fits Observed − Galaxy
Template Spectrum Av = 4.5879512
Galaxy
SN/Gal = −2.30197
[O II]
Ca II
[O III]
4
3
2
1
0
−1
6000
7000
8000
9000
10000

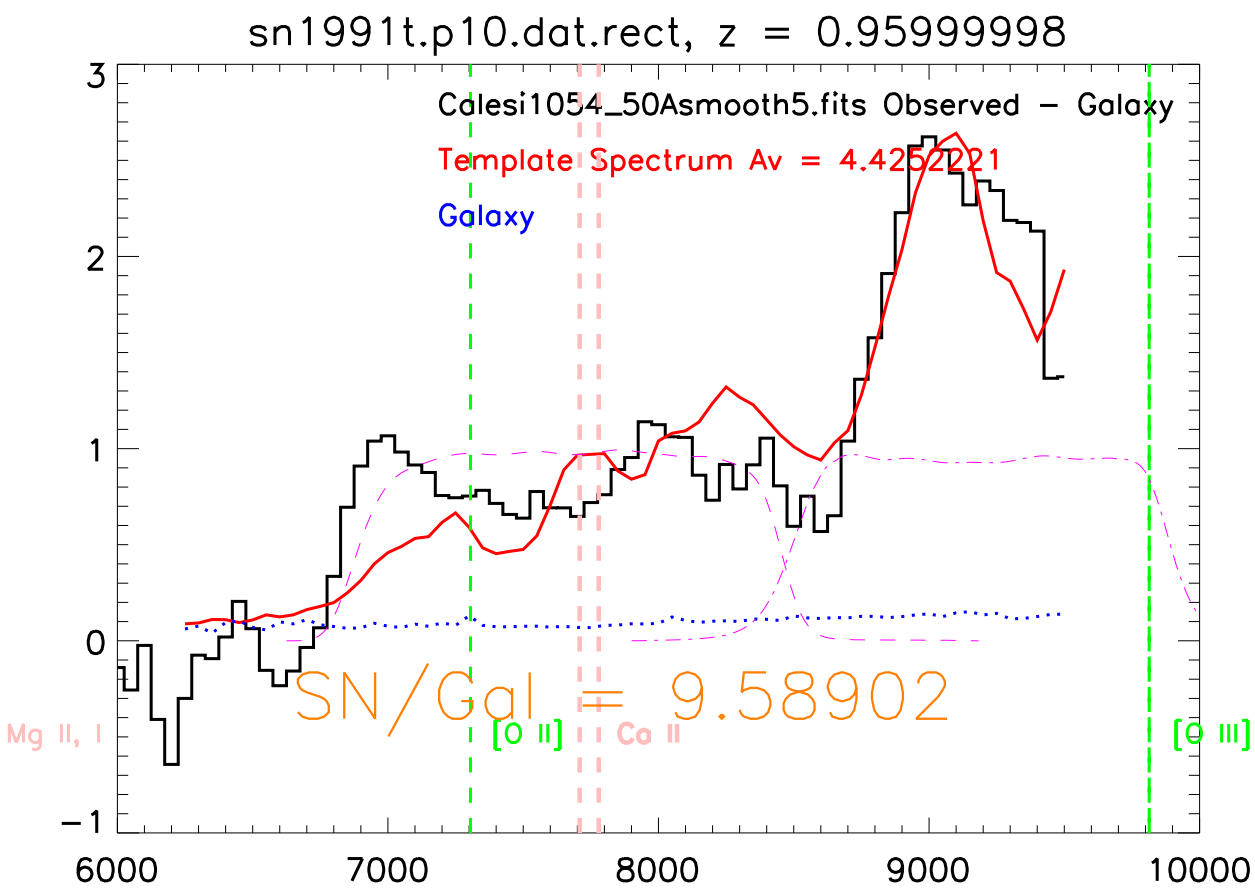
Mg II, I

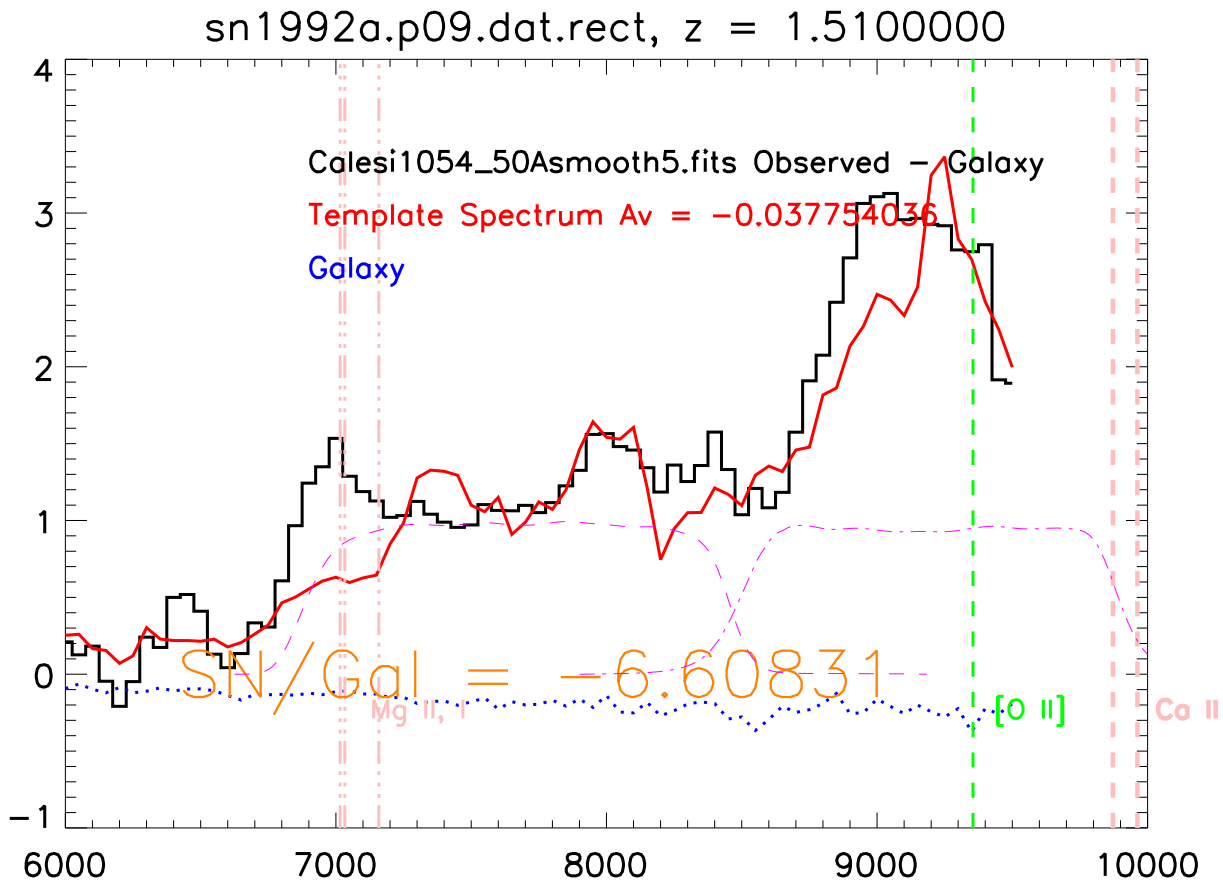

sn1981b.m00.dat.rect, z = 0.74000001
Calesi1054_50Asmooth5.fits Observed − Galaxy
Template Spectrum Av = 5.1203189
Galaxy
SN/Gal = −3.94315
[O II]
Ca II
[O III]
4
3
2
1
0
−1
6000
7000
8000
9000
10000

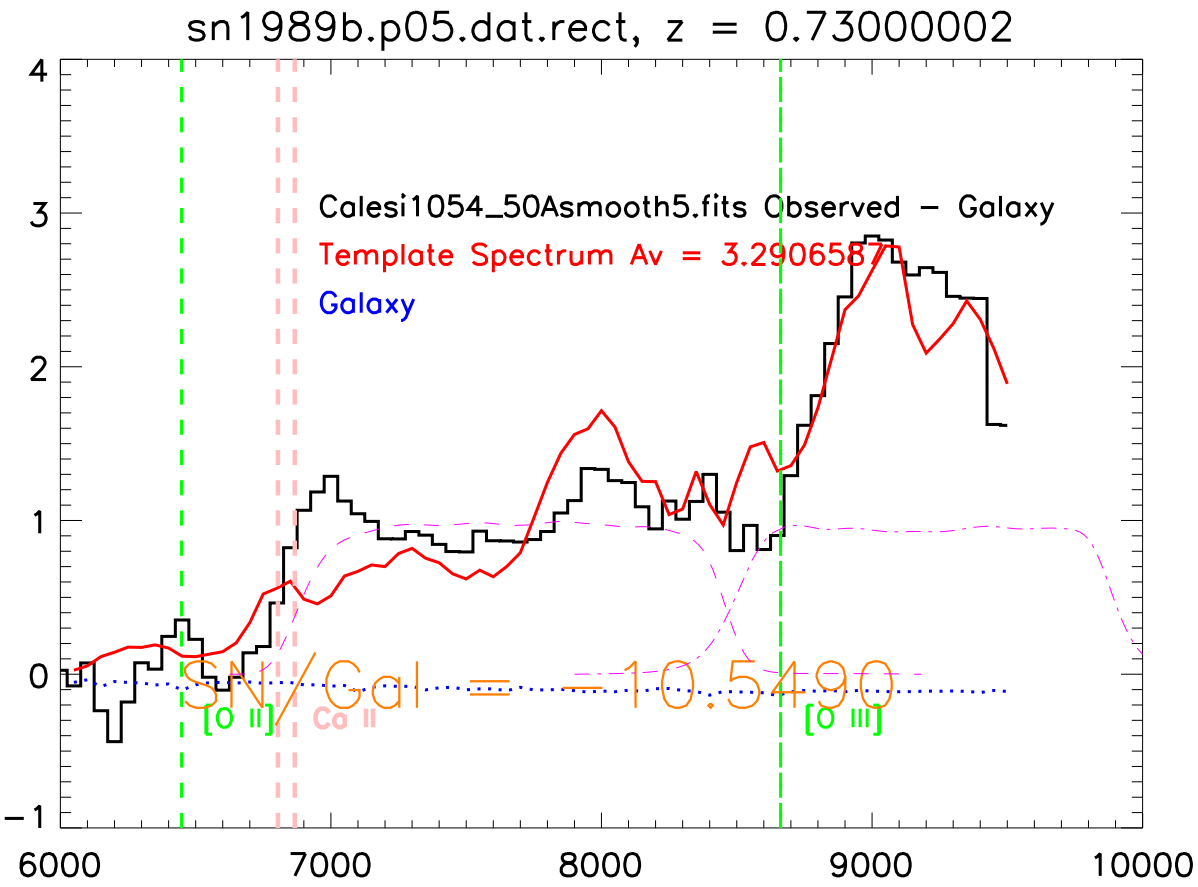
Mg II, I


sn1992a.p05.dat.rect, z = 1.5300000
Calesi1054_50Asmooth5.fits Observed − Galaxy
Template Spectrum Av = −0.71981041
Galaxy
S/N/Gal = −6.96335
Mg II, I
[O II]
Ca II
4
3
2
1
0
−1
6000
7000
8000
9000
10000

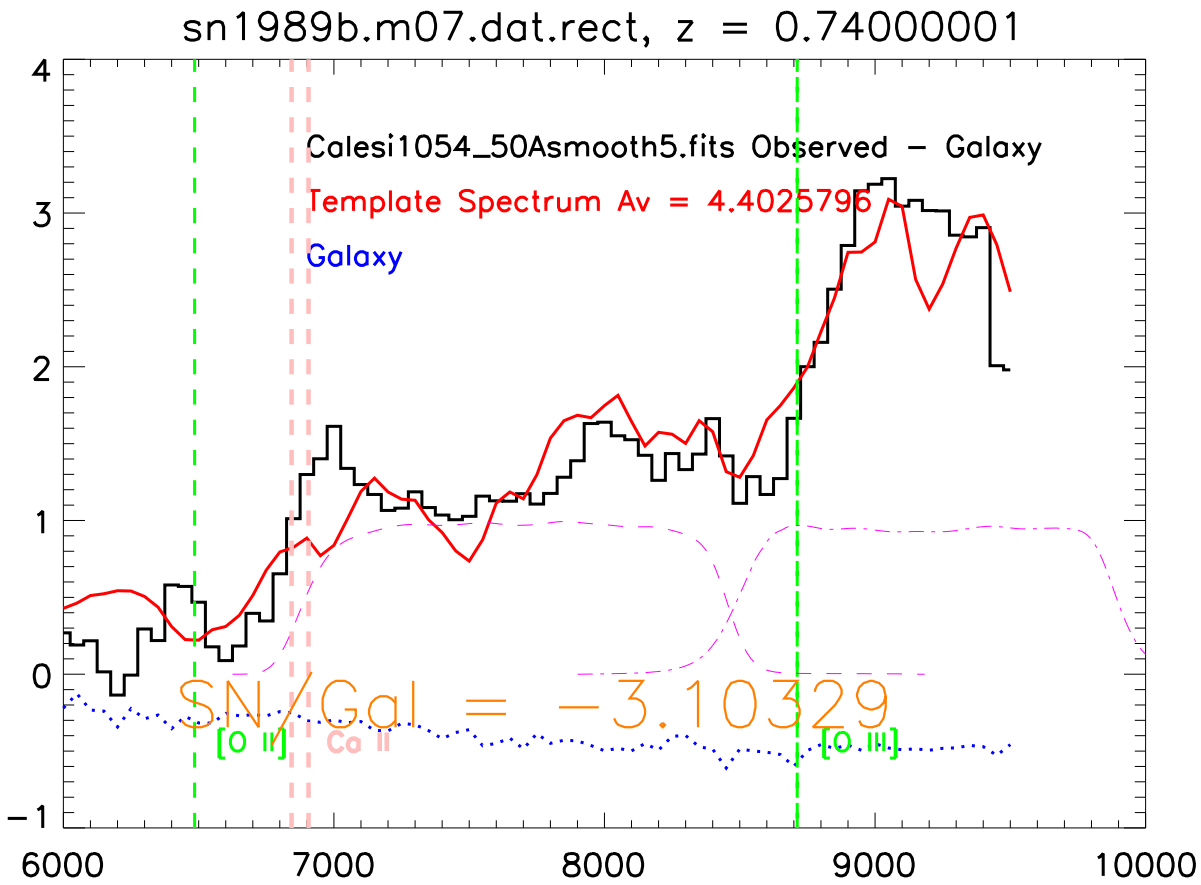

sn1994d.m03.dat.rect, z = 0.75000000
Calesi1054_50Asmooth5.fits Observed − Galaxy
Template Spectrum Av = 4.6920392
Galaxy
SN/Gal = −1.95789
[O II]
Ca II
[O III]
Mg II, I
5
4
3
2
1
0
−1
−2
6000
7000
8000
9000
10000

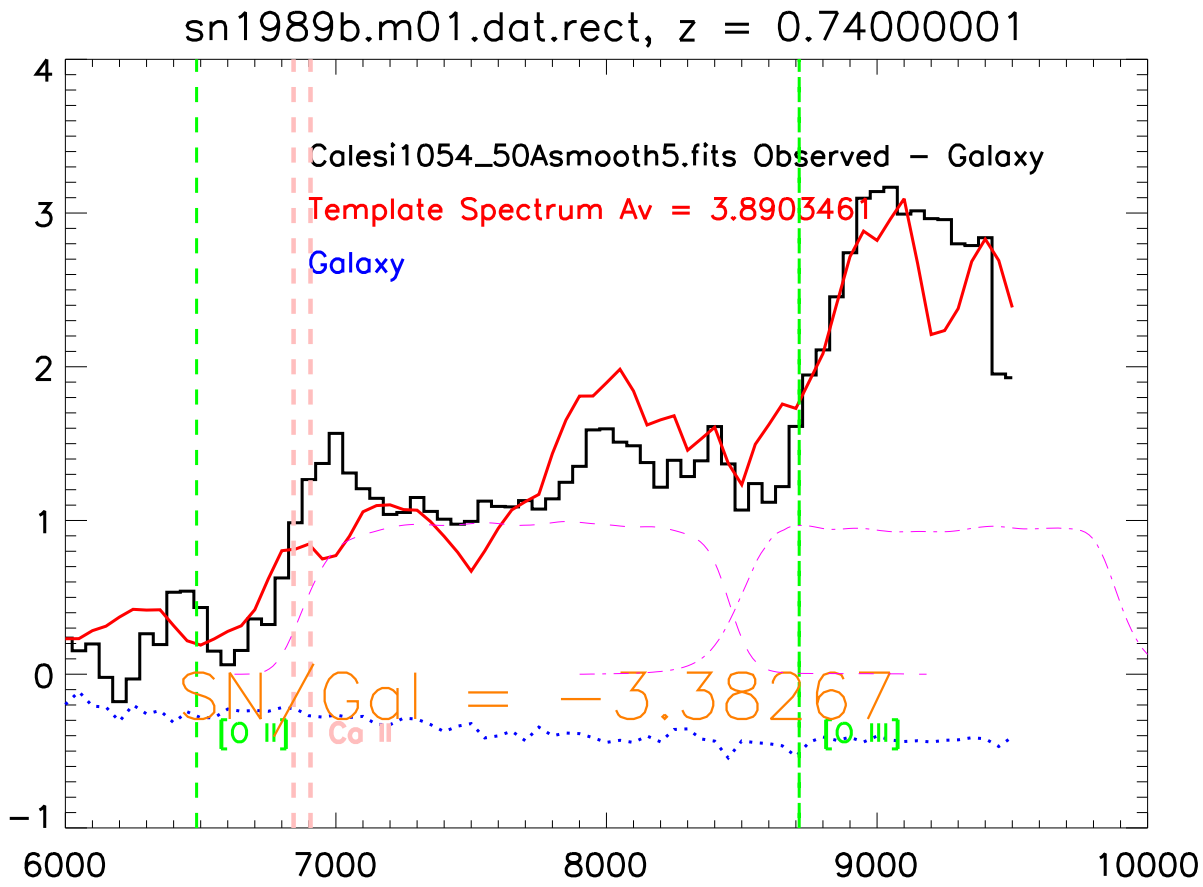

sn1991t.p10.dat.rect, z = 0.95999998
Calesi1054_50Asmooth5.fits Observed − Galaxy
Template Spectrum Av = 4.42522221
Galaxy
SN/Gal = 9.58902
Mg II, I
[O II]
Ca II
[O III]
3
2
1
0
−1
6000
7000
8000
9000
10000


sn1992a.p09.dat.rect, z = 1.5100000
Calesi1054_50Asmooth5.fits Observed − Galaxy
Template Spectrum Av = −0.037754036
Galaxy
SN/Gal = −6.60831
Mg II, I
[O II]
Co II
4
3
2
1
0
−1
6000
7000
8000
9000
10000

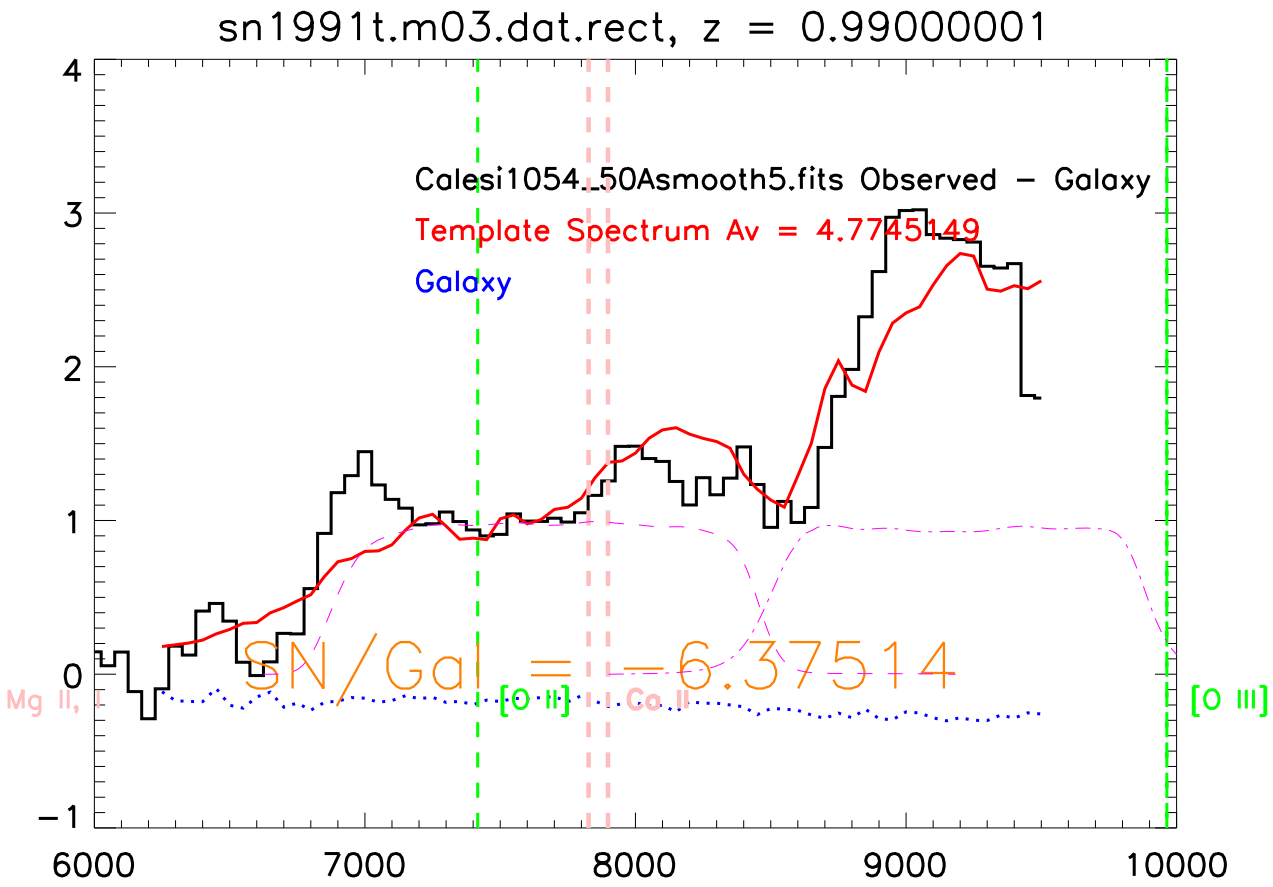

sn1989b.p05.dat.rect, z = 0.73000002
Calesi1054_50Asmooth5.fits Observed − Galaxy
Template Spectrum Av = 3.2906587
Galaxy
SN/Gal = −10.5490
[O II]
Ca II
[O III]
4
3
2
1
0
−1
6000
7000
8000
9000
10000

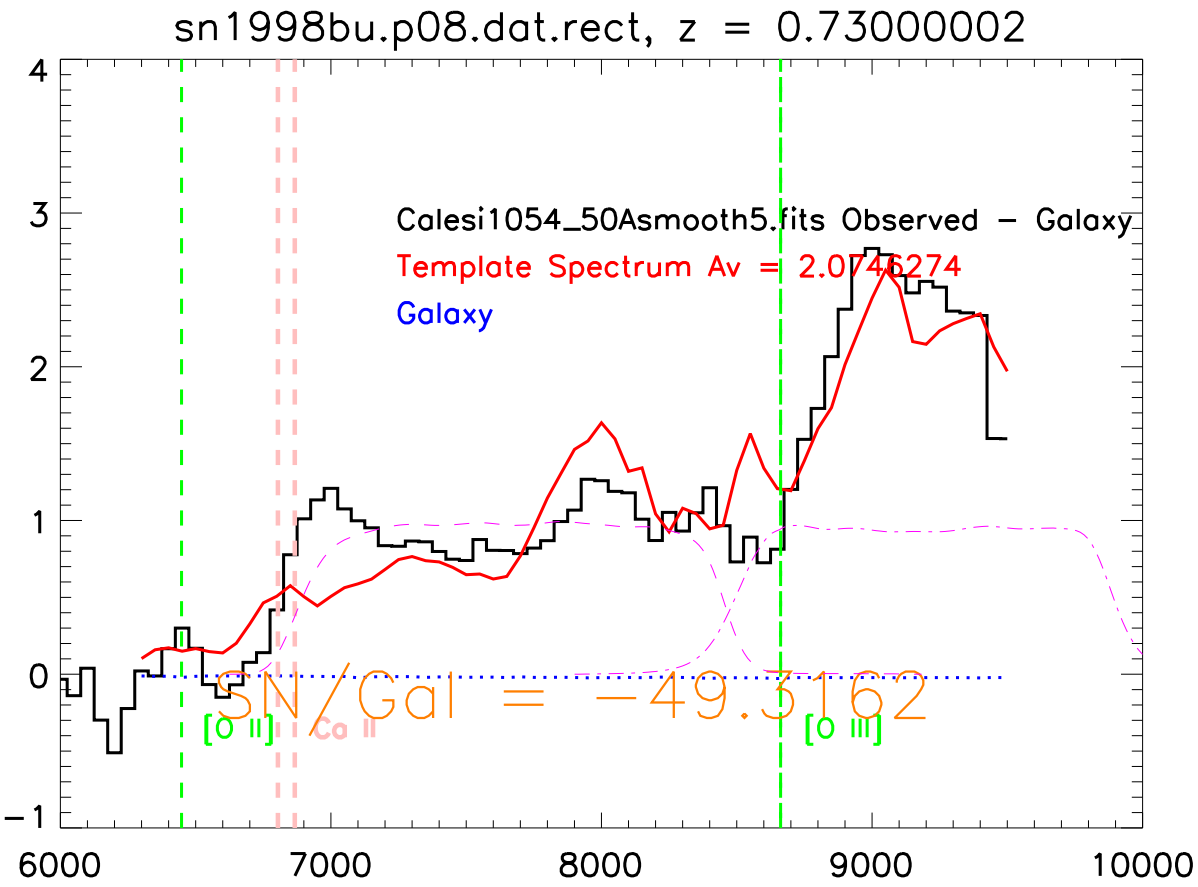
Mg II, I


sn1989b.m07.dat.rect, z = 0.74000001
Calesi1054_50Asmooth5.fits Observed − Galaxy
Template Spectrum Av = 4.4025796
Galaxy
SN/Gal = −3.10329
[O II]
Ca II
[O III]
Mg II, I
4
3
2
1
0
−1
6000
7000
8000
9000
10000

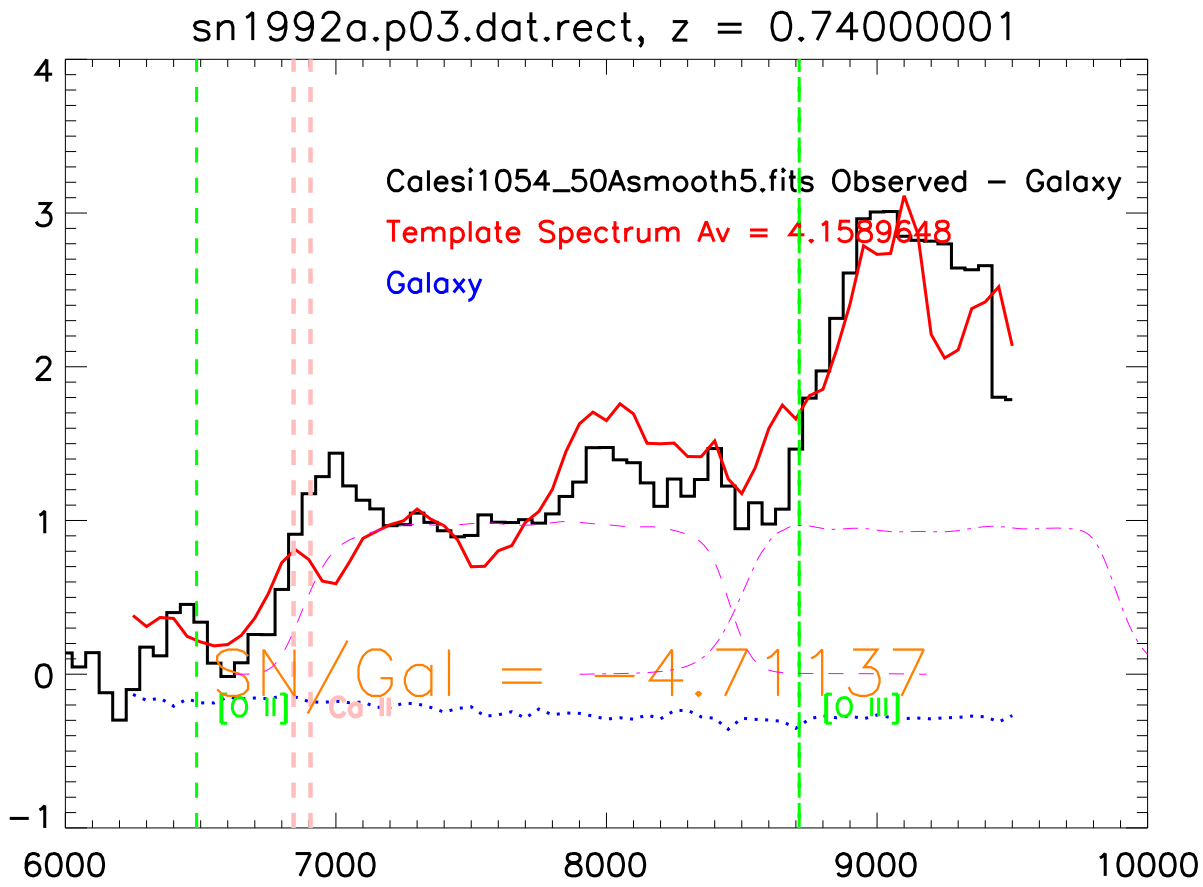

sn1989b.m01.dat.rect, z = 0.74000001
Calesi1054_50Asmooth5.fits Observed − Galaxy
Template Spectrum Av = 3.8903461
Galaxy
SN/Gal = −3.38267
[O II]
Ca II
[O III]
4
3
2
1
0
−1
6000
7000
8000
9000
10000

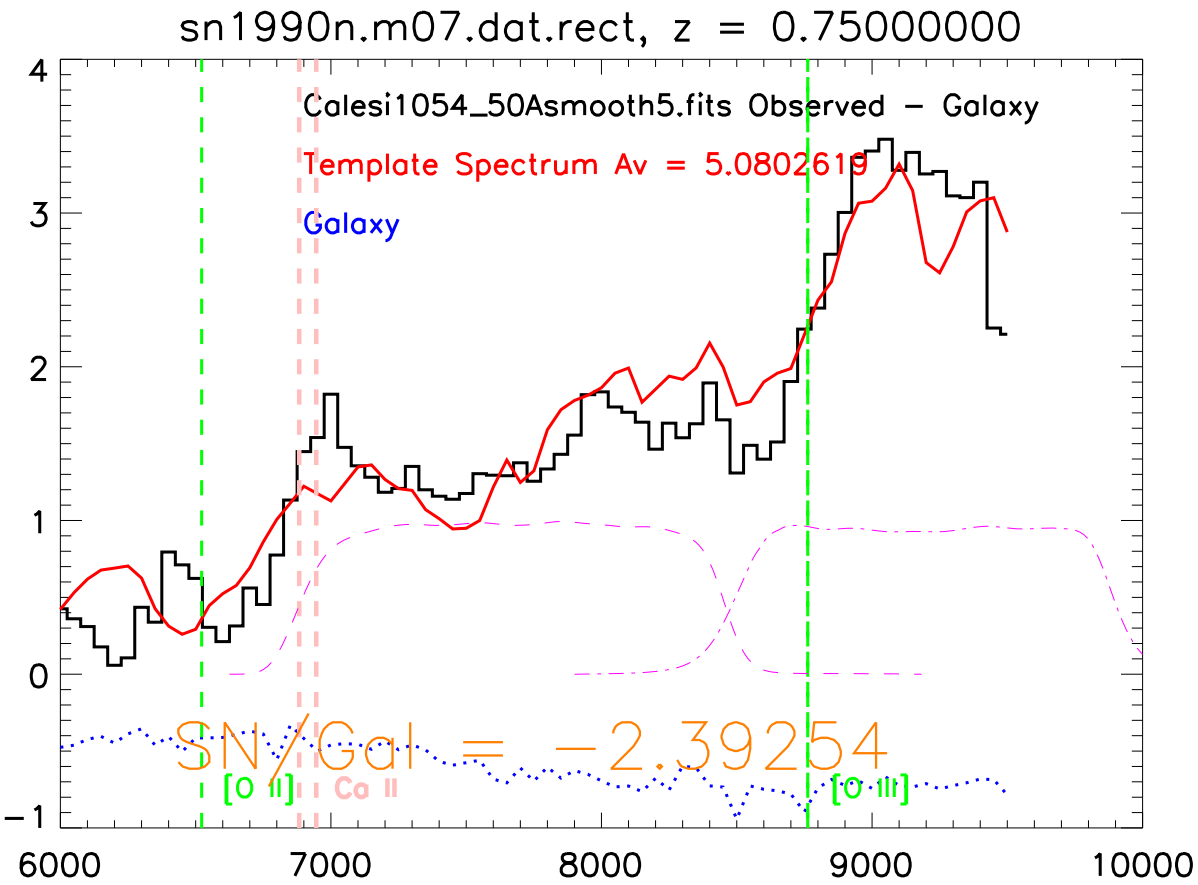
Mg II, I


sn1991t.m03.dat.rect, z = 0.99000001
Calesi1054_50Asmooth5.fits Observed − Galaxy
Template Spectrum Av = 4.7745149
Galaxy
SN/Gal = −6.37514
[O II]
Ca II
[O III]
4
3
2
1
0
−1
6000
7000
8000
9000
10000

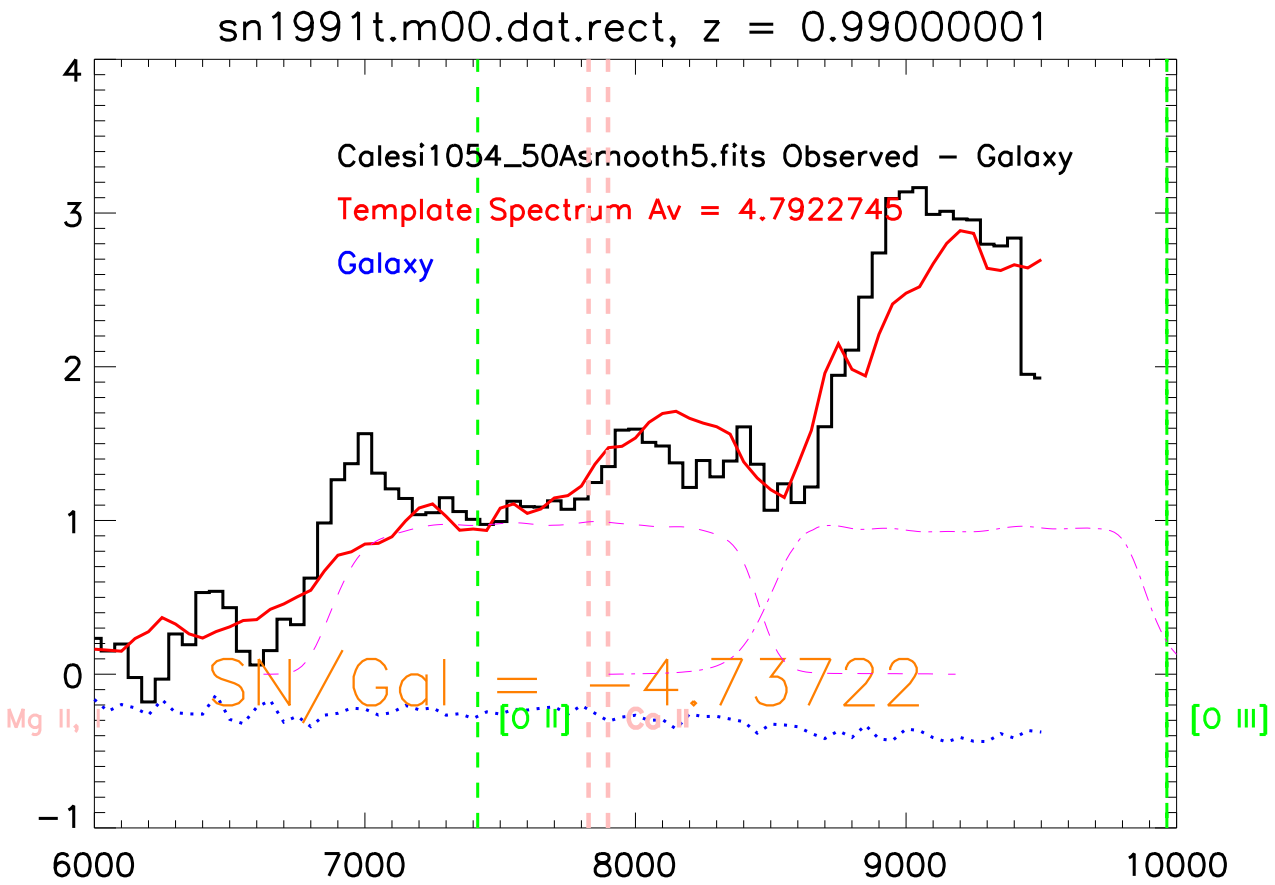

sn1998bu.p08.dat.rect, z = 0.73000002
Calesi1054_50Asmooth5.fits Observed − Galaxy
Template Spectrum Av = 2.07746274
Galaxy
SN/Gal = −49.3162
[O II]
Ca II
[O III]
4
3
2
1
0
−1
6000
7000
8000
9000
10000

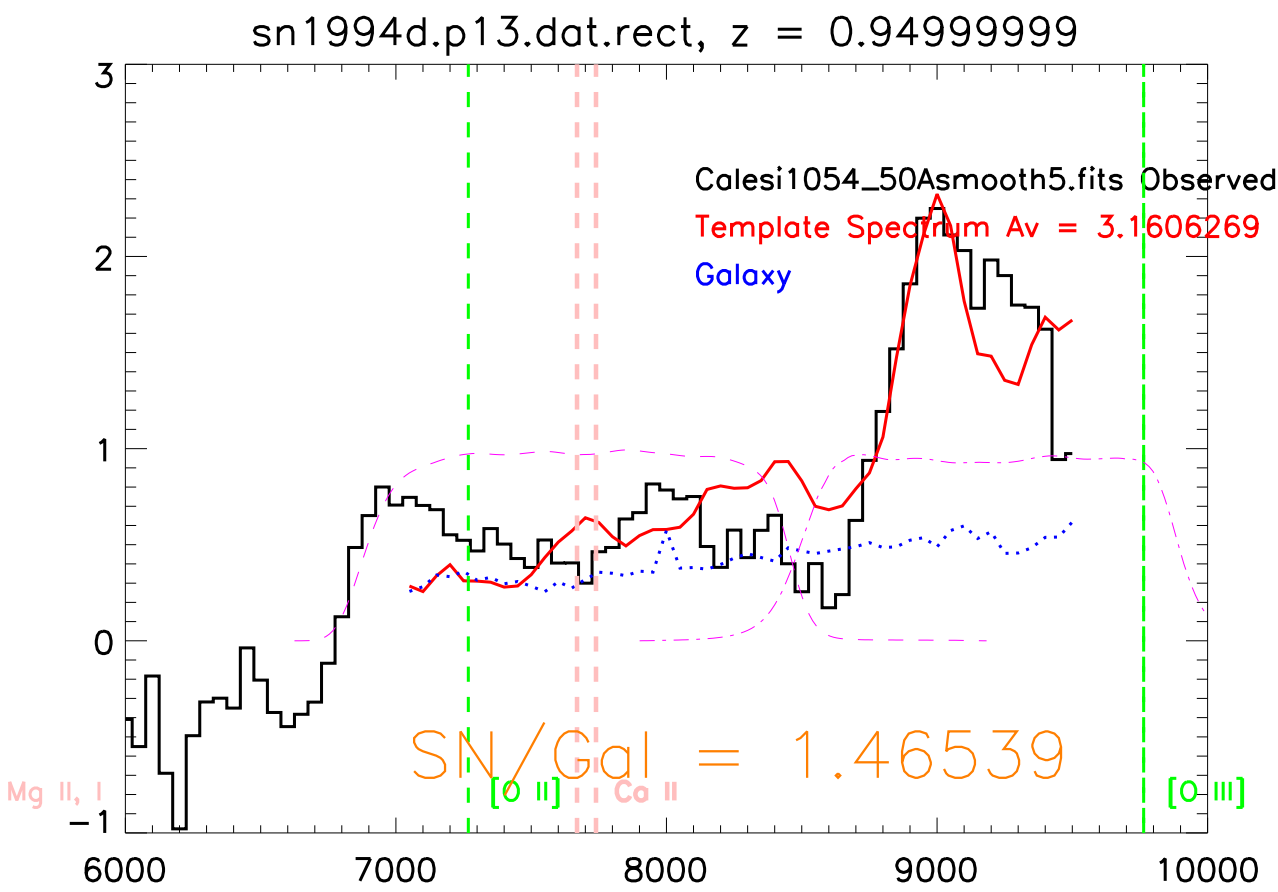
Mg II, I

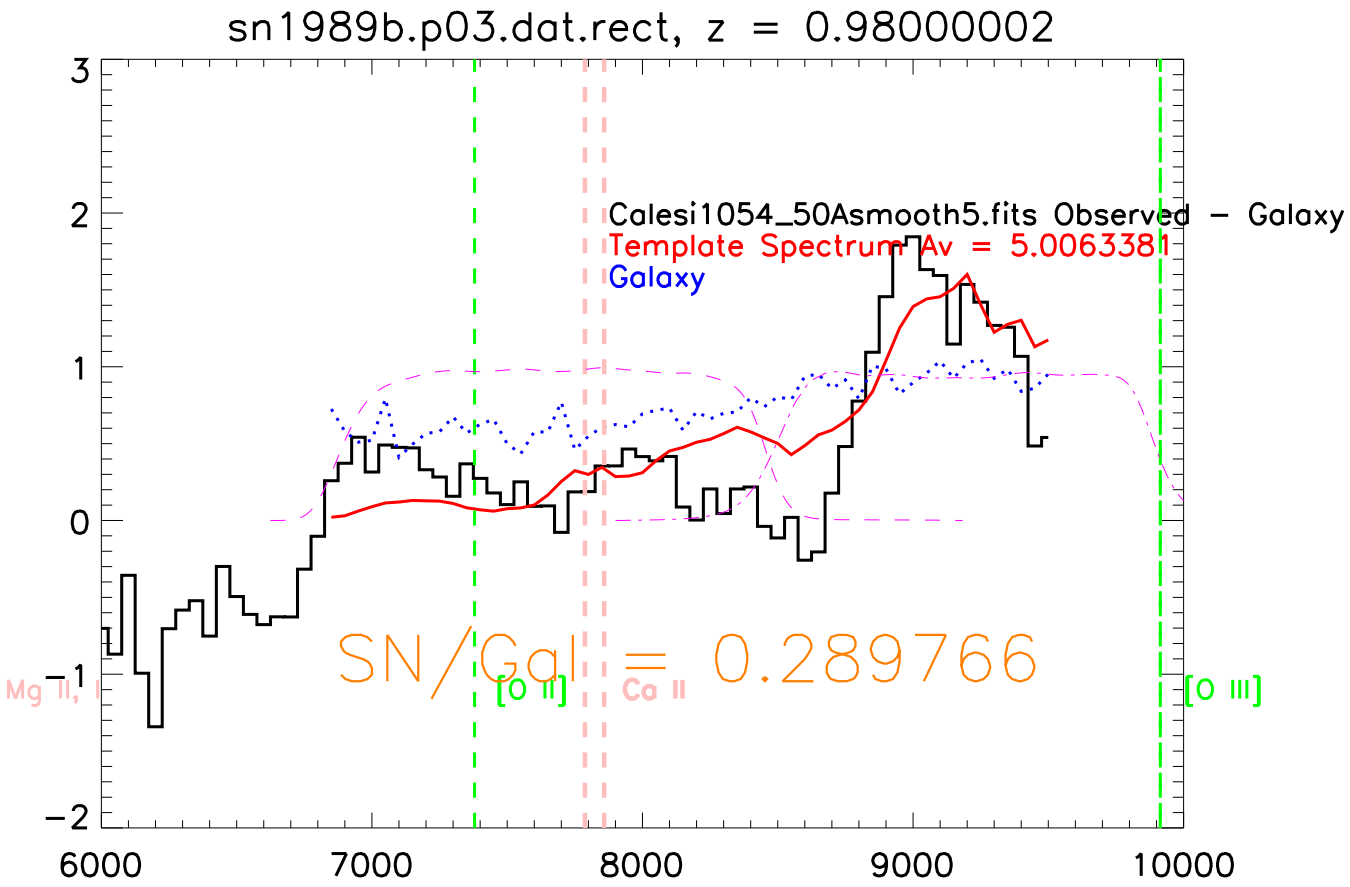

sn1992a.p03.dat.rect, z = 0.74000001
Calesi1054_50Asmooth5.fits Observed − Galaxy
Template Spectrum Av = 4.1589648
Galaxy
SN/Gal = −4.71137
[O II]
Ca II
[O III]
Mg II, I
4
3
2
1
0
−1
6000
7000
8000
9000
10000

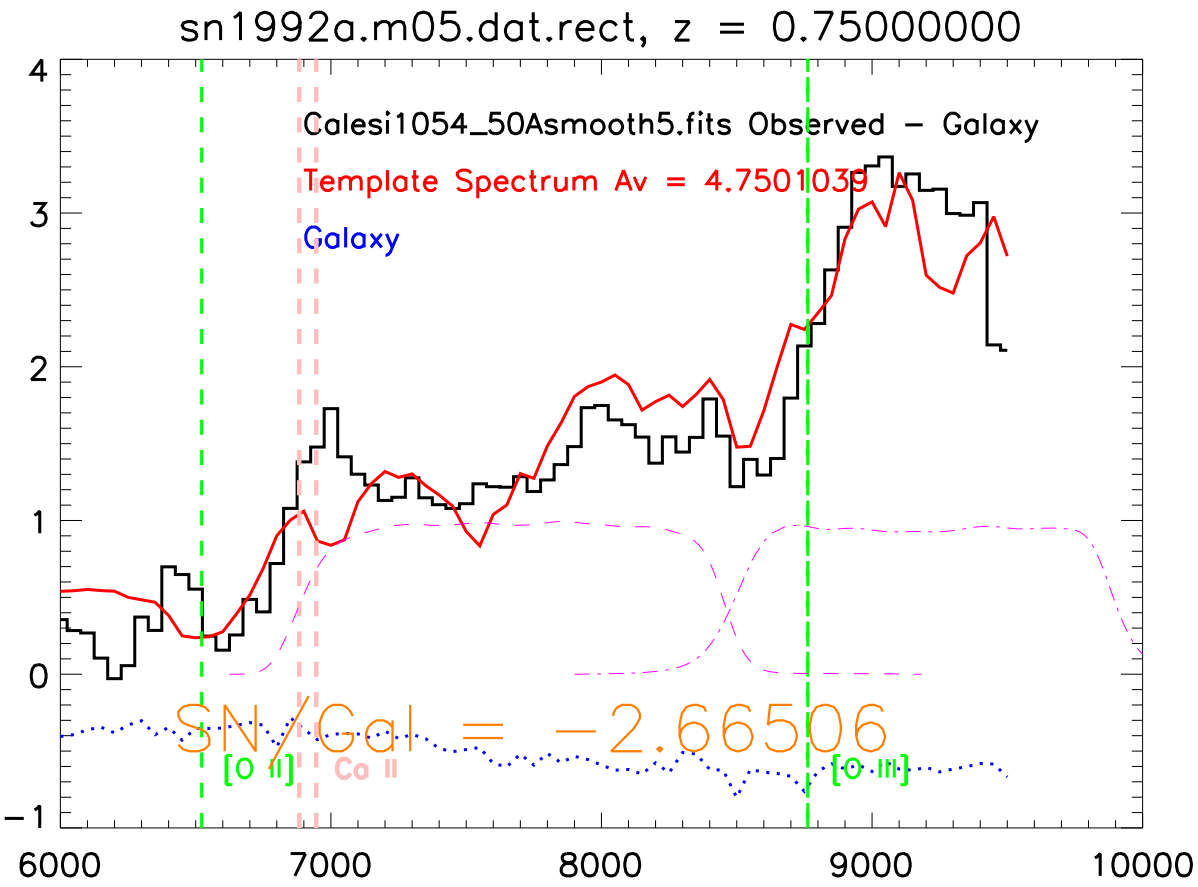

sn1990n.m07.dat.rect, z = 0.75000000
Calesi1054_50Asmooth5.fits Observed − Galaxy
Template Spectrum Av = 5.0802619
Galaxy
SN/Gal = −2.39254
[O II]
Ca II
[O III]
4
3
2
1
0
−1
6000
7000
8000
9000
10000

Mg II, I

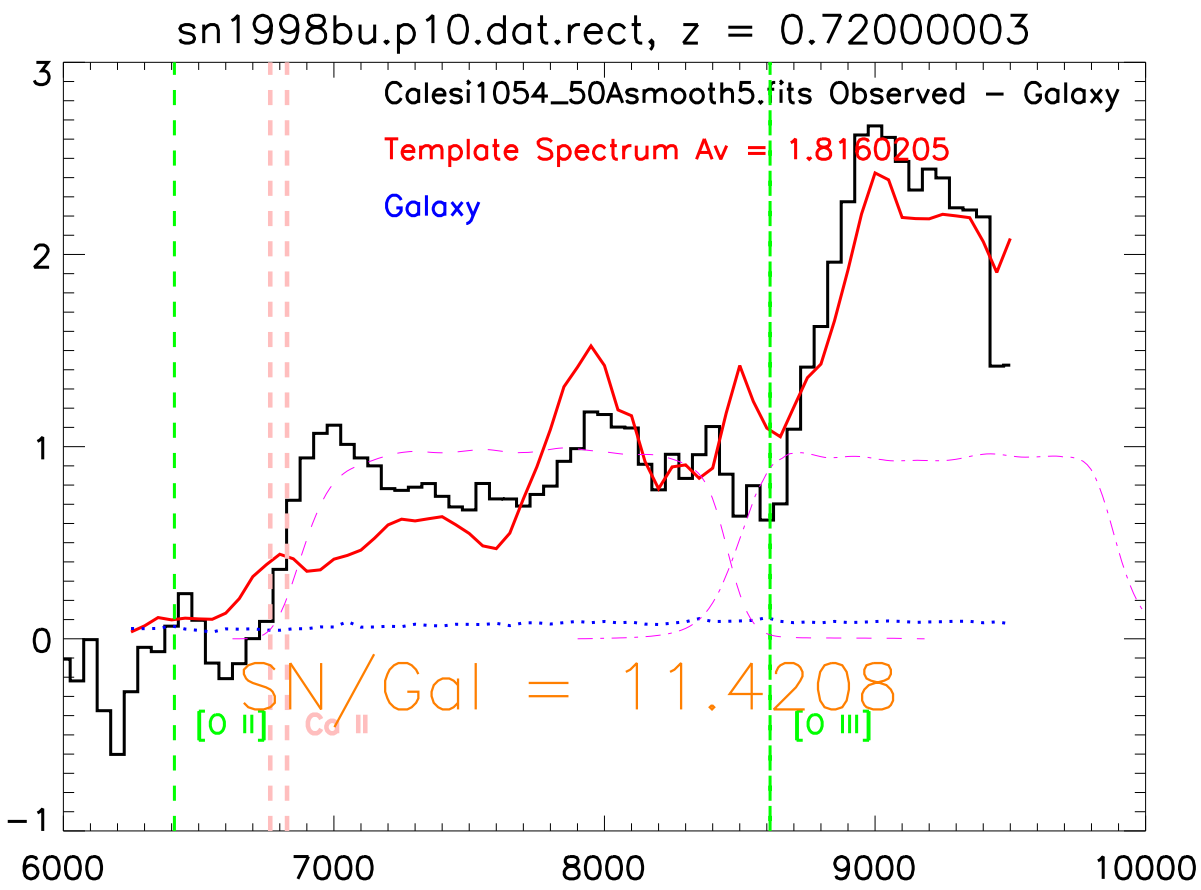

sn1991t.m00.dat.rect, z = 0.99000001
Calesi1054_50Asmooth5.fits Observed − Galaxy
Template Spectrum Av = 4.7922745
Galaxy
SN/Gal = −4.73722
Mg II,
[O II]
Ca II
[O III]
4
3
2
1
0
−1
6000
7000
8000
9000
10000


sn1994d.p13.dat.rect, z = 0.94999999
Calesi1054_50Asmooth5.fits Observed – Galax
Template Spectrum Av = 3.1606269
Galaxy
SN/Gal = 1.46539
Mg II, I
[O II]
Ca II
[O III]
3
2
1
0
−1
6000
7000
8000
9000
10000

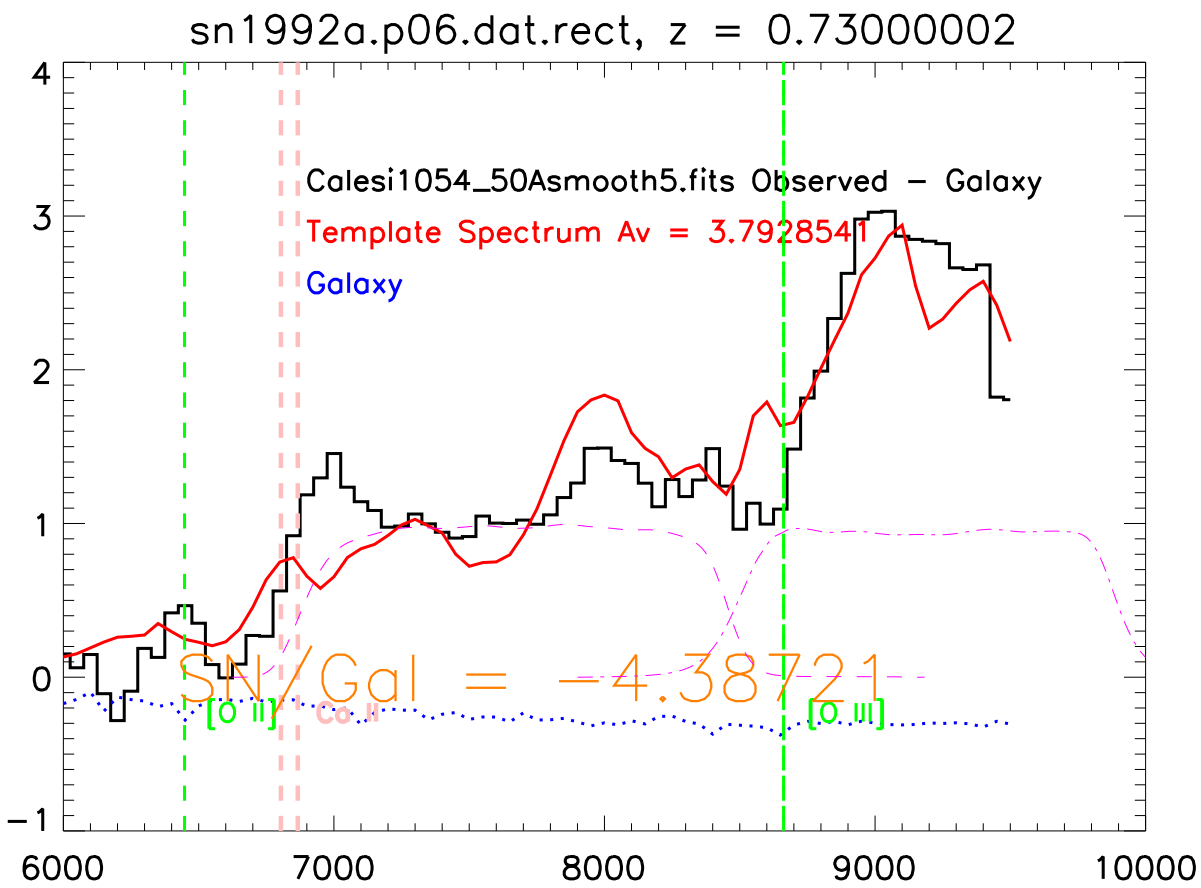

sn1989b.p03.dat.rect, z = 0.98000002
Calesi1054_50Asmooth5.fits Observed − Galaxy
Template Spectrum Av = 5.0063381
Galaxy
SN/Gal = 0.289766
[O II]
Ca II
[O III]
3
2
1
0
−1
−2
6000
7000
8000
9000
10000


sn1992a.m05.dat.rect, z = 0.75000000
Calesi1054_50Asmooth5.fits Observed − Galaxy
Template Spectrum Av = 4.7501039
Galaxy
SN/Gal = −2.66506
[O II]
Ca II
[O III]
4
3
2
1
0
−1
6000
7000
8000
9000
10000

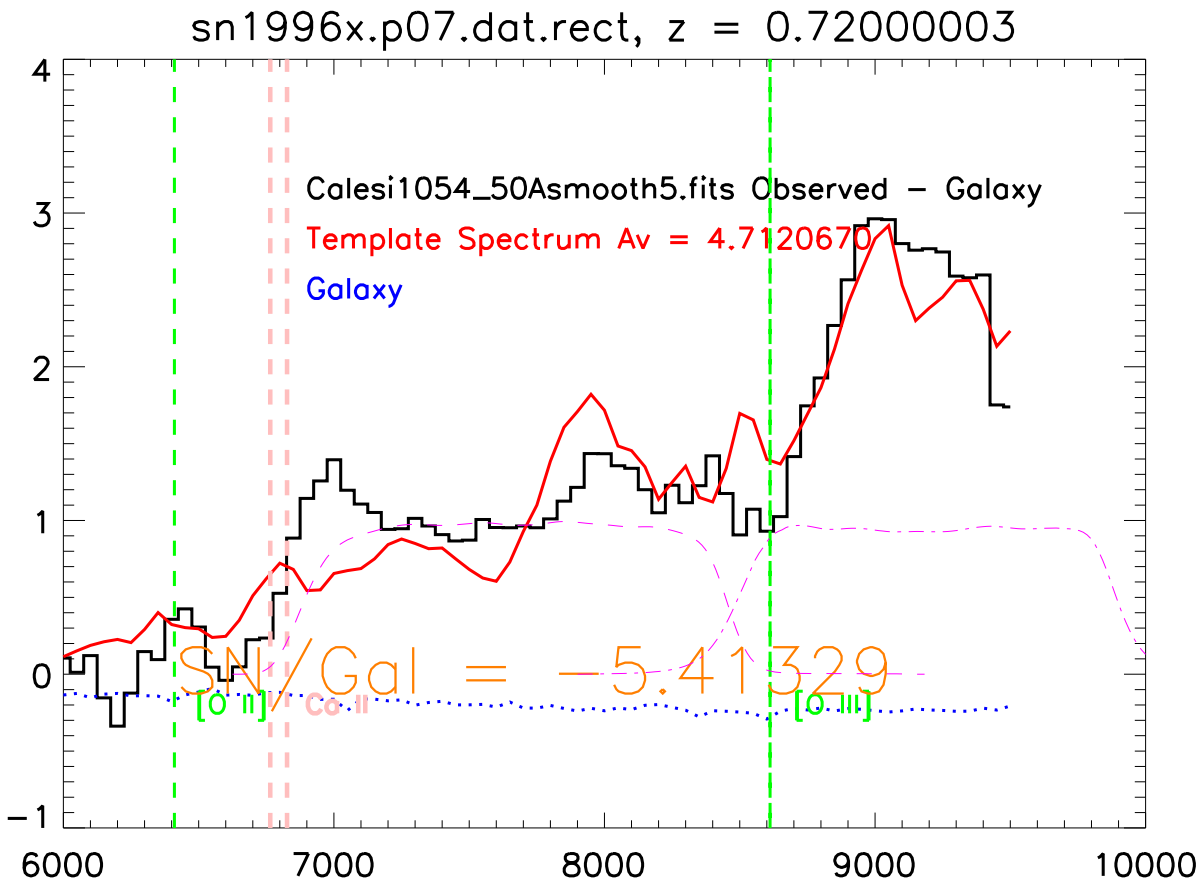
Mg II, I


sn1998bu.p10.dat.rect, z = 0.72000003
Calesi1054_50Asmooth5.fits Observed − Galaxy
Template Spectrum Av = 1.81600205
Galaxy
SN/Gal = 11.4208
[O II]
Ca II
[O III]
3
2
1
0
−1
6000
7000
8000
9000
10000

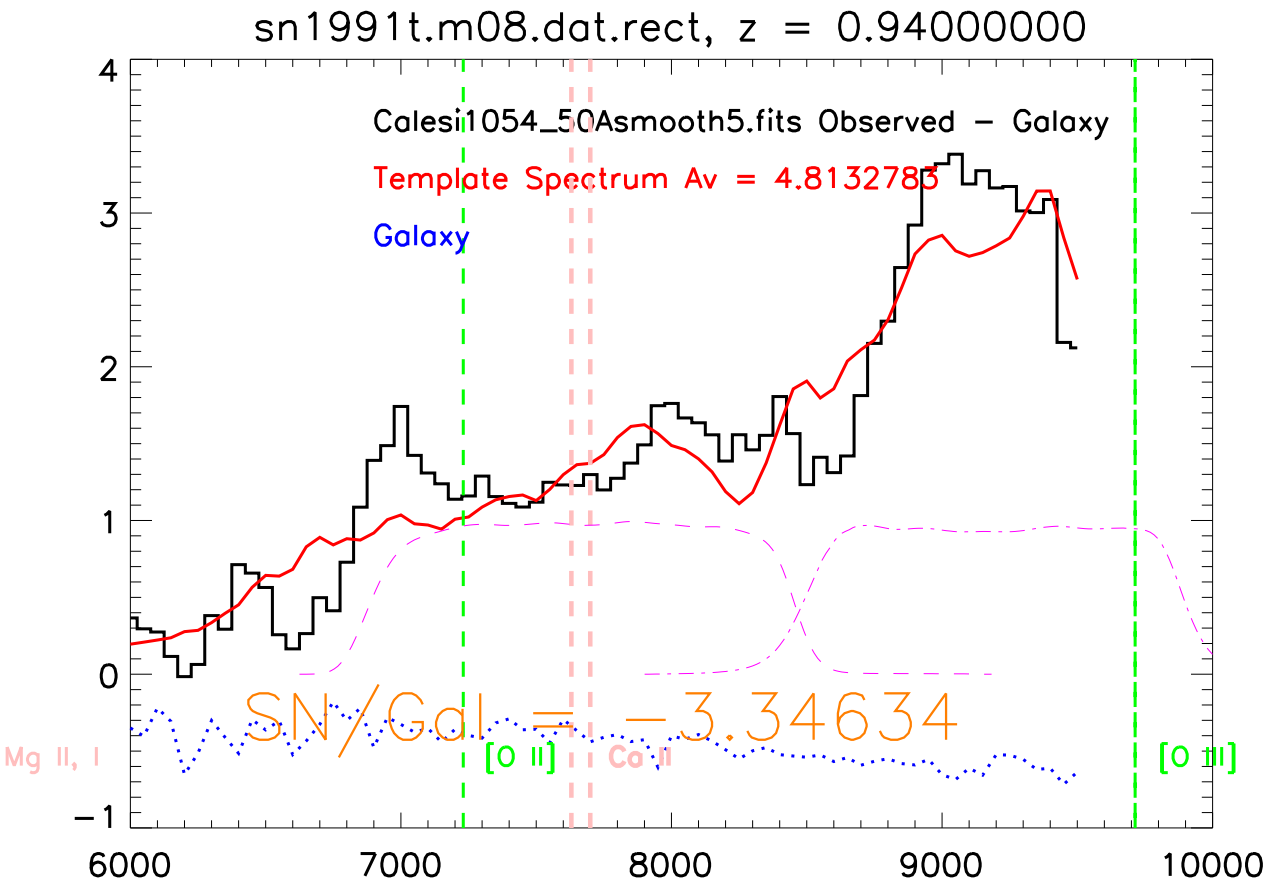
Mg II, I

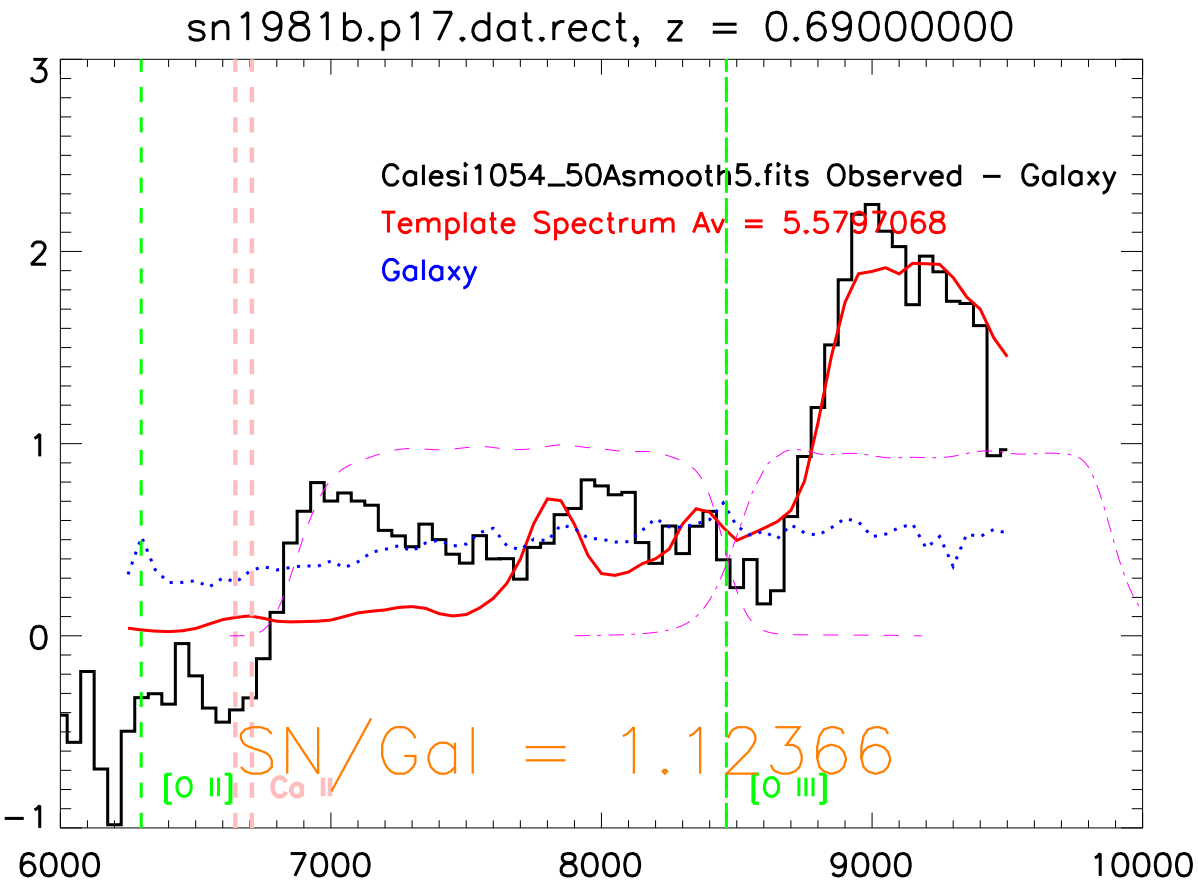

sn1992a.p06.dat.rect, z = 0.73000002
Calesi1054_50Asmooth5.fits Observed − Galaxy
Template Spectrum Av = 3.7928541
Galaxy
SN/Gal = −4.38721
[O II]
Ca II
[O III]
4
3
2
1
0
−1
6000
7000
8000
9000
10000

Mg II, I

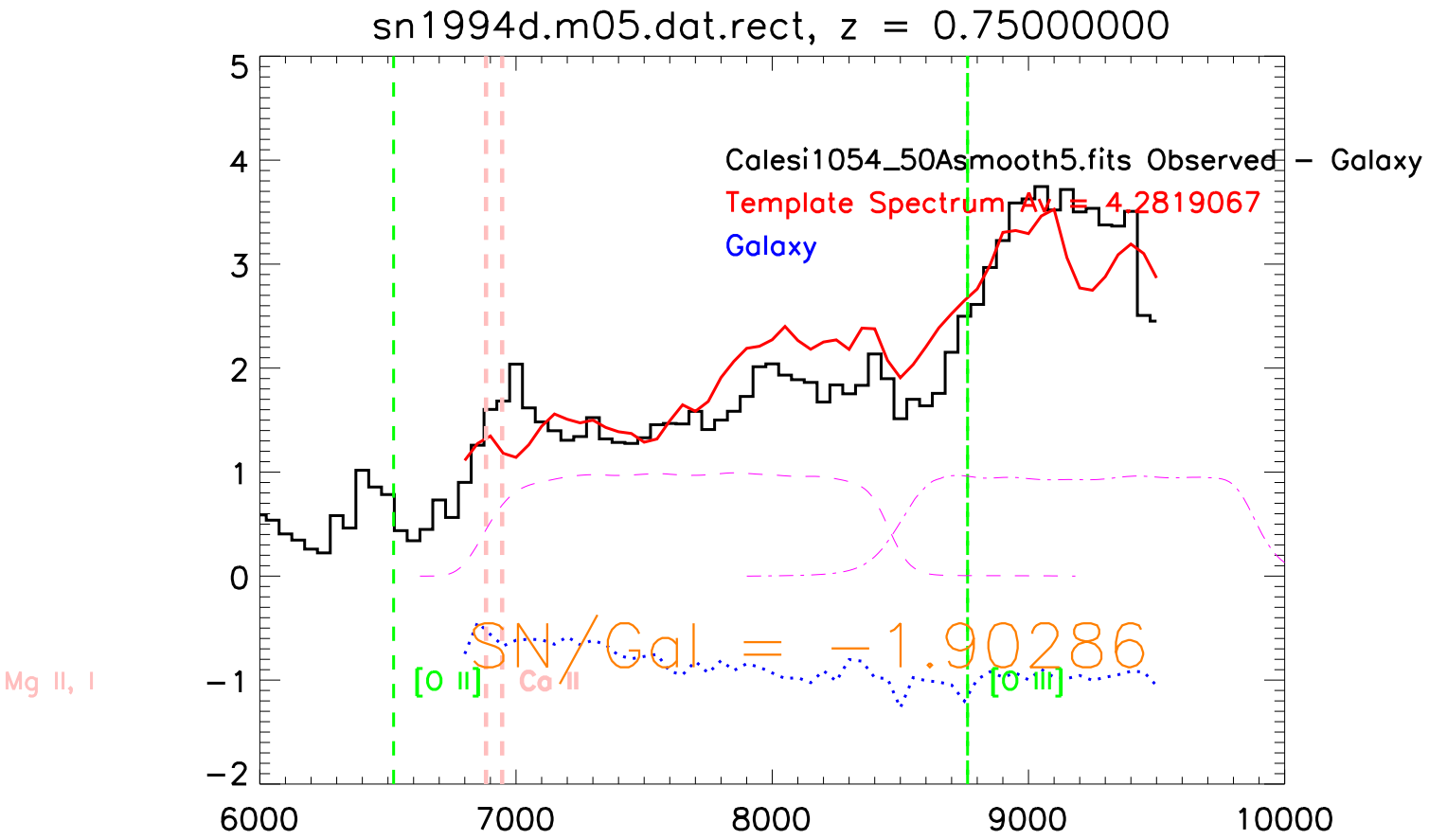

sn1996x.p07.dat.rect, z = 0.72000003
Calesi1054_50Asmooth5.fits Observed − Galaxy
Template Spectrum Av = 4.7120670
Galaxy
SN/Gal = −5.41329
[O II]
Ca II
[O III]
4
3
2
1
0
−1
6000
7000
8000
9000
10000

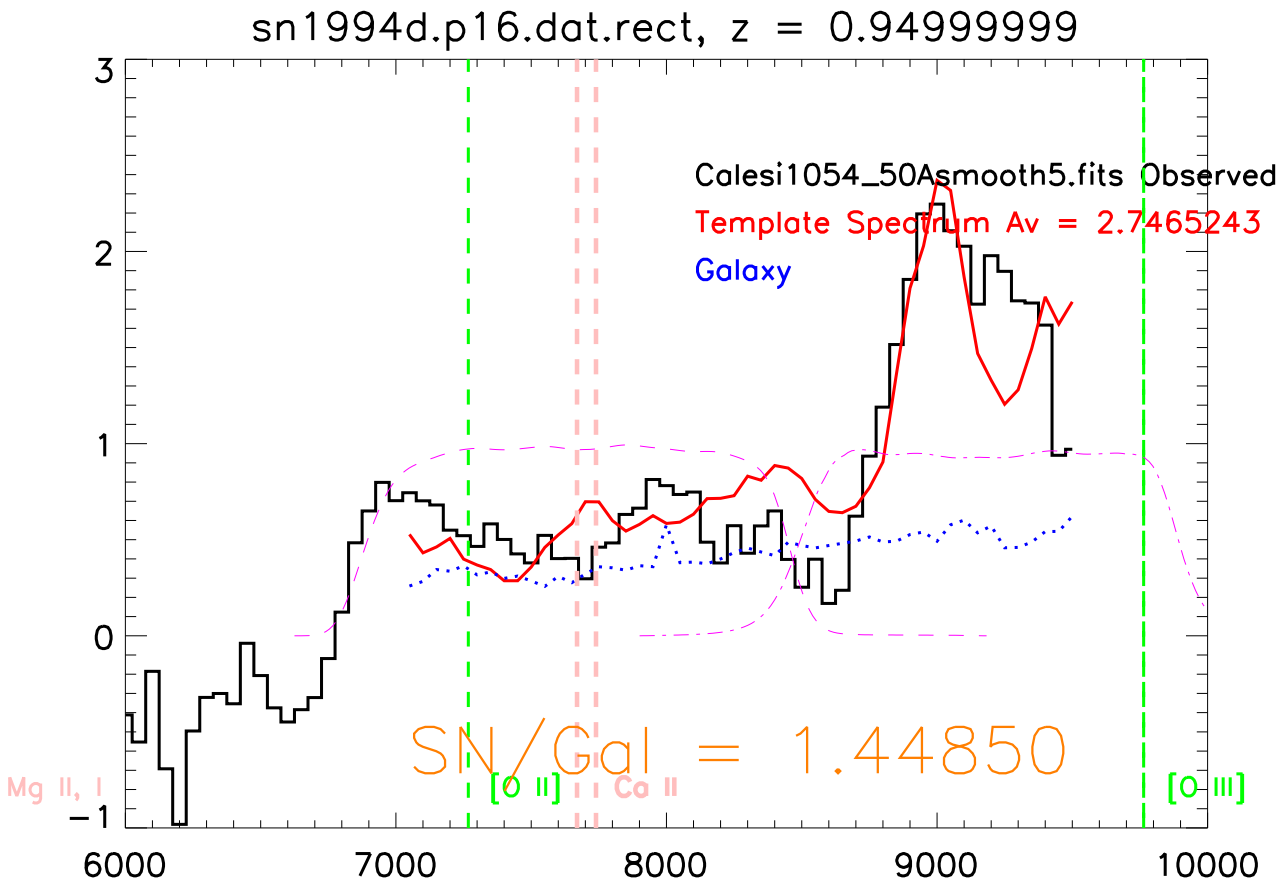
Mg II, I

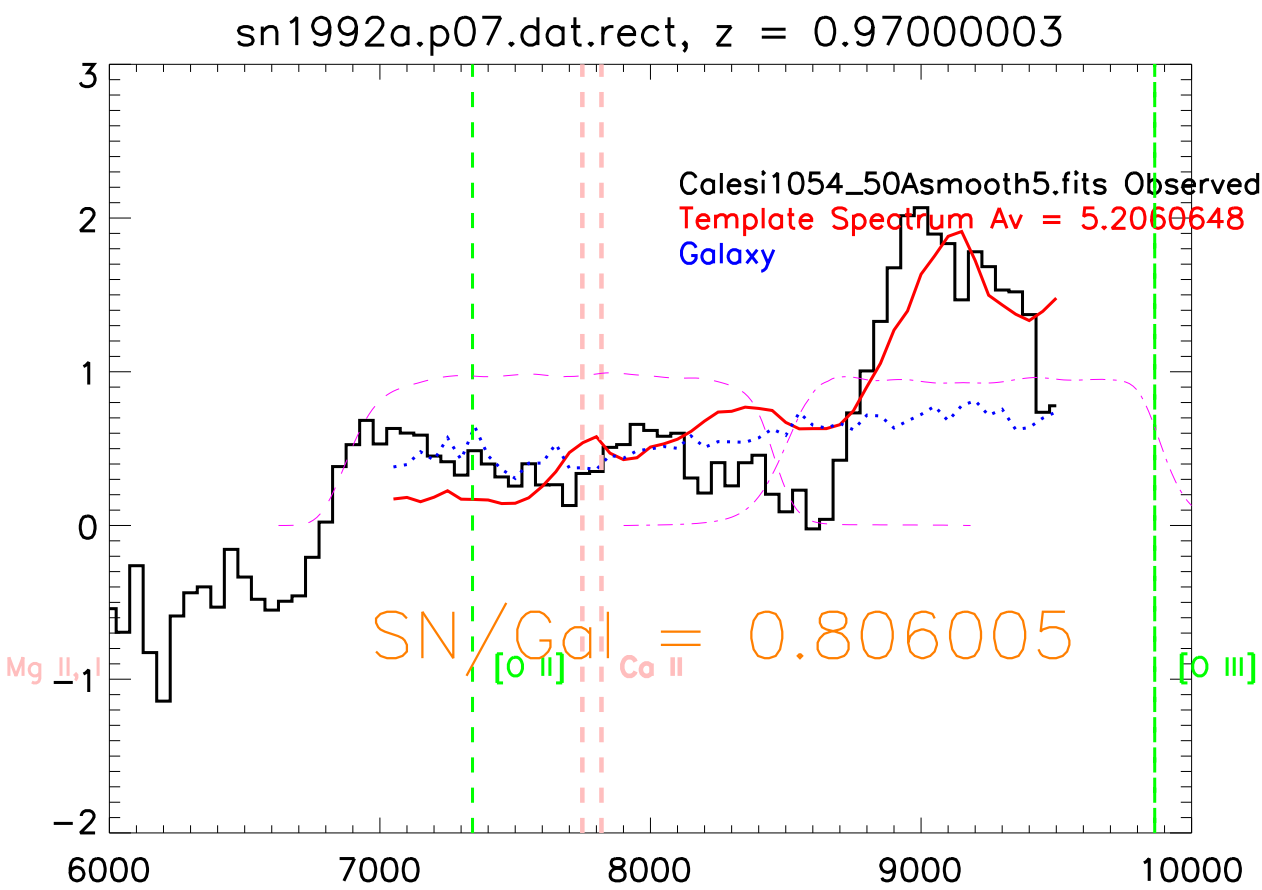

sn1991t.m08.dat.rect, z = 0.94000000
Calesi1054_50Asmooth5.fits Observed − Galaxy
Template Spectrum Av = 4.8132783
Galaxy
SN/Gal = −3.34634
Mg II, I
[O II]
Ca II
[O III]
4
3
2
1
0
−1
6000
7000
8000
9000
10000

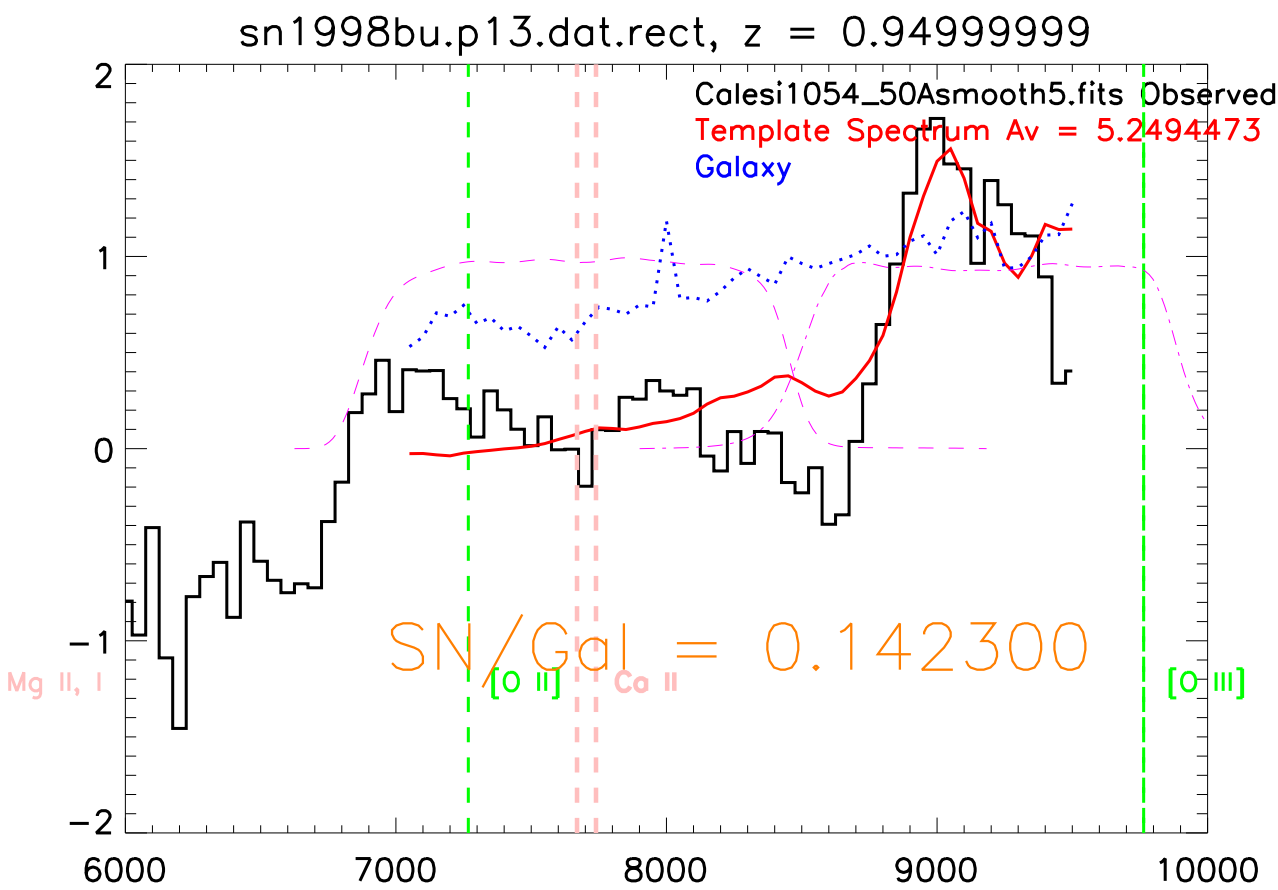

sn1981b.p17.dat.rect, z = 0.69000000
Calesi1054_50Asmooth5.fits Observed − Galaxy
Template Spectrum Av = 5.5797068
Galaxy
SN/Gal = 1.12366
[O II]
Ca II
[O III]
3
2
1
0
−1
6000
7000
8000
9000
10000

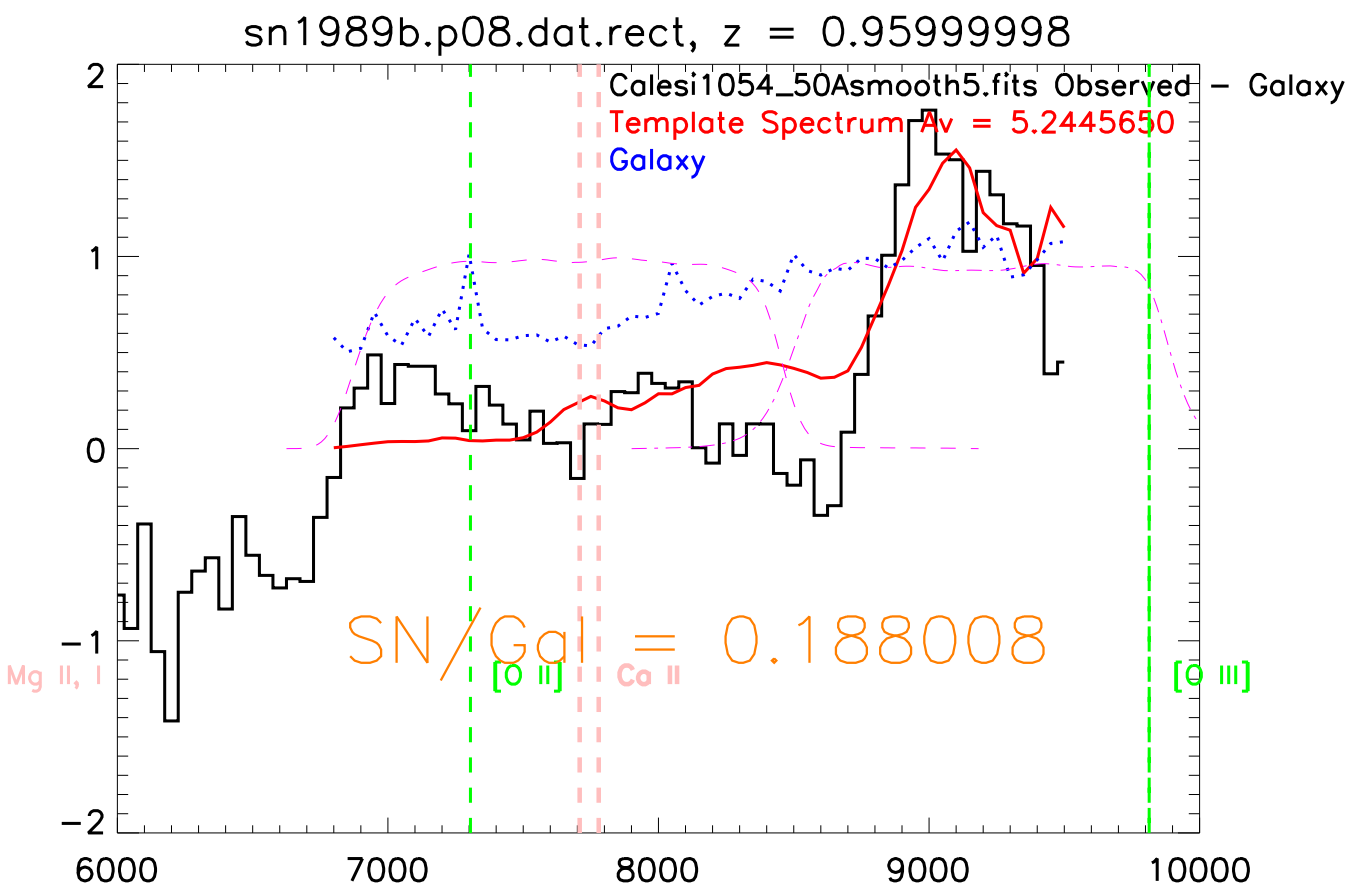
Mg II, I

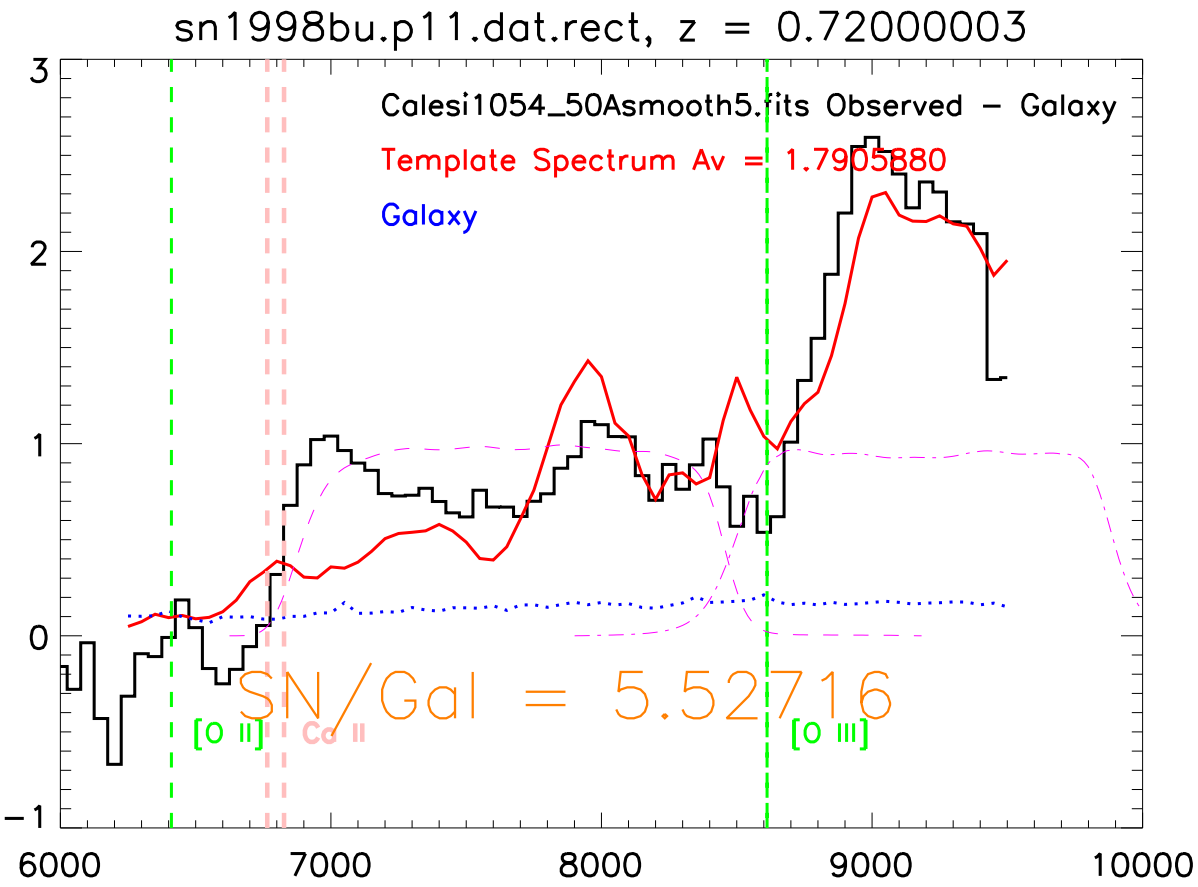

sn1994d.m05.dat.rect, z = 0.75000000
Calesi1054_50Asmooth5.fits Observed − Galaxy
Template Spectrum, AV = 4.2819067
Galaxy
SN/Gal = −1.90286
Mg II, I
[O II]
Ca II
[O III]
5
4
3
2
1
0
−1
−2
6000
7000
8000
9000
10000


sn1994d.p16.dat.rect, z = 0.94999999
Calesi1054_50Asmooth5.fits Observed – Galax
Template Spectrum Av = 2.7465243
Galaxy
SN/Gal = 1.44850
Mg II, I
[O II]
Ca II
[O III]
3
2
1
0
−1
6000
7000
8000
9000
10000

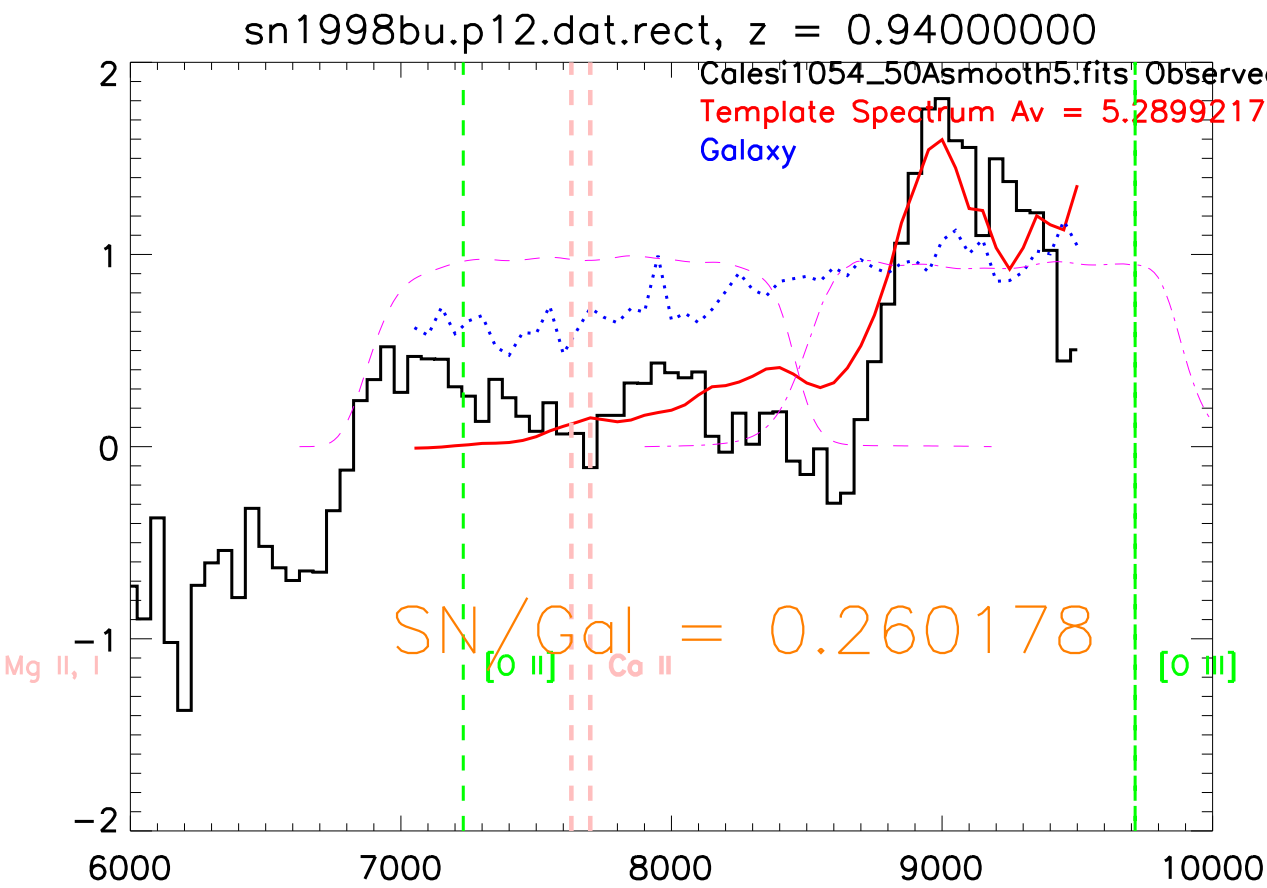

sn1992a.p07.dat.rect, z = 0.97000003
Calesi1054_50Asmooth5.fits Observed – Galax
Template Spectrum Av = 5.2060648
Galaxy
SN/Gal = 0.806005
Mg II
[O II]
Ca II
[O III]
3
2
1
0
−1
−2
6000
7000
8000
9000
10000

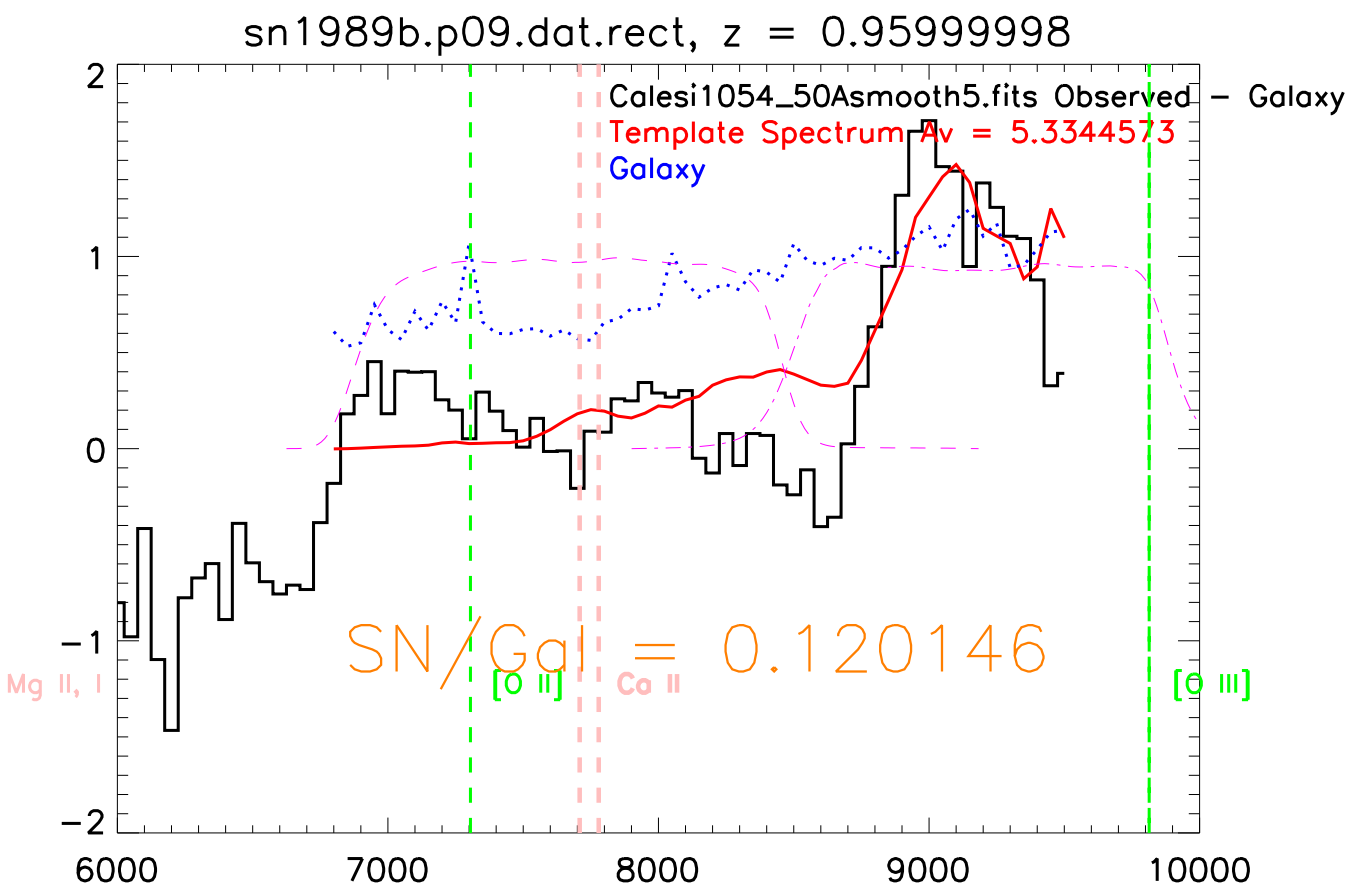

sn1998bu.p13.dat.rect, z = 0.94999999
Calesi1054_50Asmooth5.fits Observed – Galax
Template Spectrum Av = 5.2494473
Galaxy
SN/Gal = 0.142300
Mg II, I
[O II]
Ca II
[O III]
2
1
0
−1
−2
6000
7000
8000
9000
10000

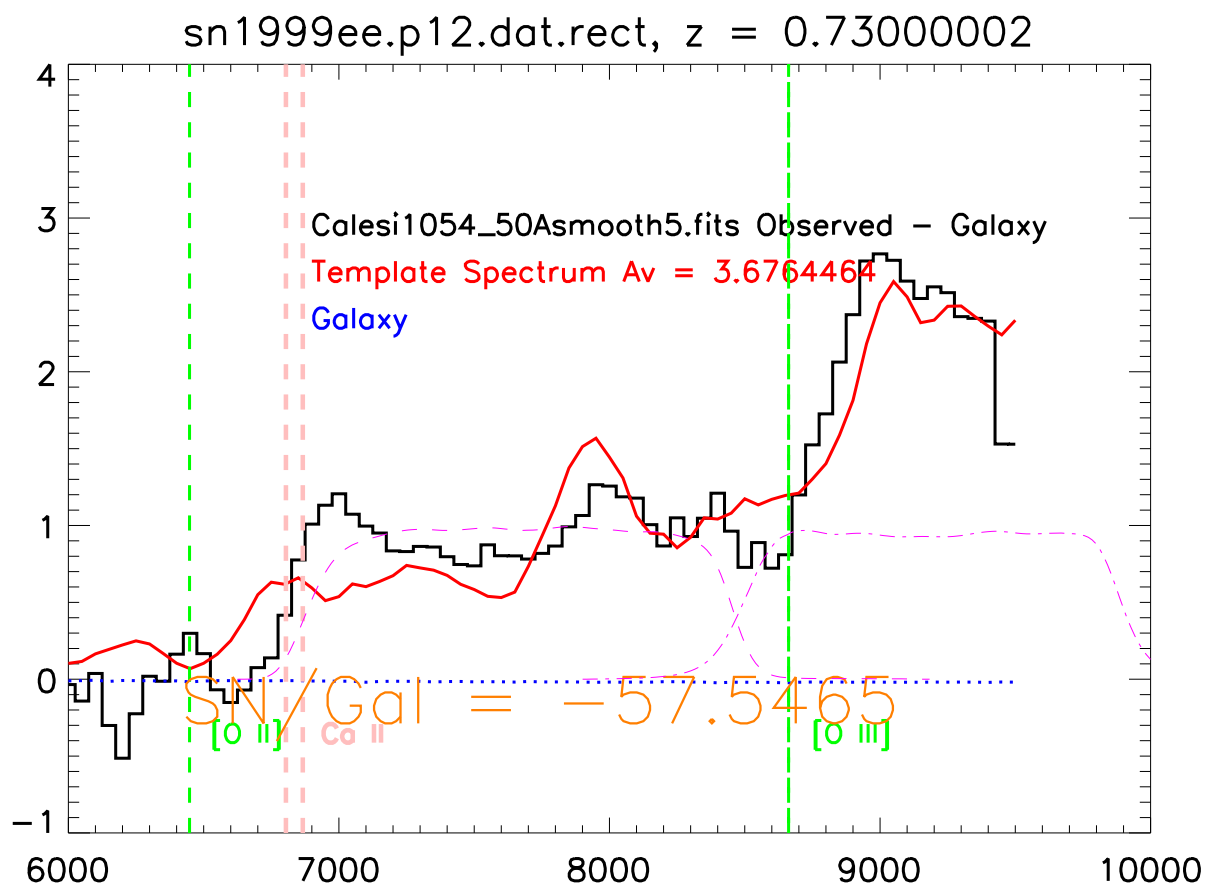

sn1989b.p08.dat.rect, z = 0.95999998
Calesi1054_50Asmooth5.fits Observed – Galaxy
Template Spectrum Av = 5.2445650
Galaxy
SN/Gal = 0.188008
Mg II, I
[O II]
Ca II
[O III]
2
1
0
−1
−2
6000
7000
8000
9000
10000


sn1998bu.p11.dat.rect, z = 0.72000003
Calesi1054_50Asmooth5.fits Observed − Galaxy
Template Spectrum Av = 1.7905880
Galaxy
SN/Gal = 5.52716
[O II]
Ca II
[O III]
3
2
1
0
−1
6000
7000
8000
9000
10000

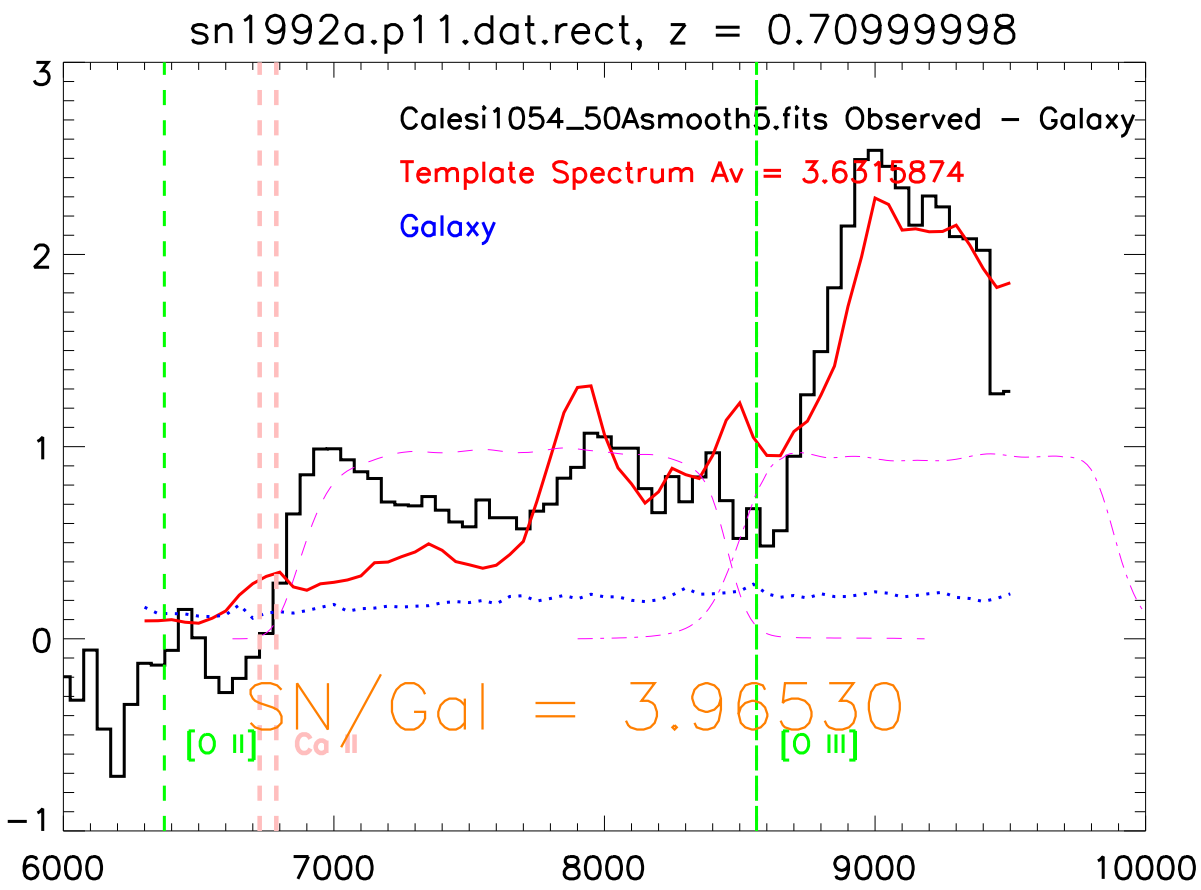
Mg II, I


sn1998bu.p12.dat.rect, z = 0.94000000
Calesi1054_50Asmooth5.fits Observed − Galax
Template Spectrum Av = 5.2899217
Galaxy
SN/Gal = 0.260178
Mg II, I
[O II]
Ca II
[O III]
2
1
0
−1
−2
6000
7000
8000
9000
10000

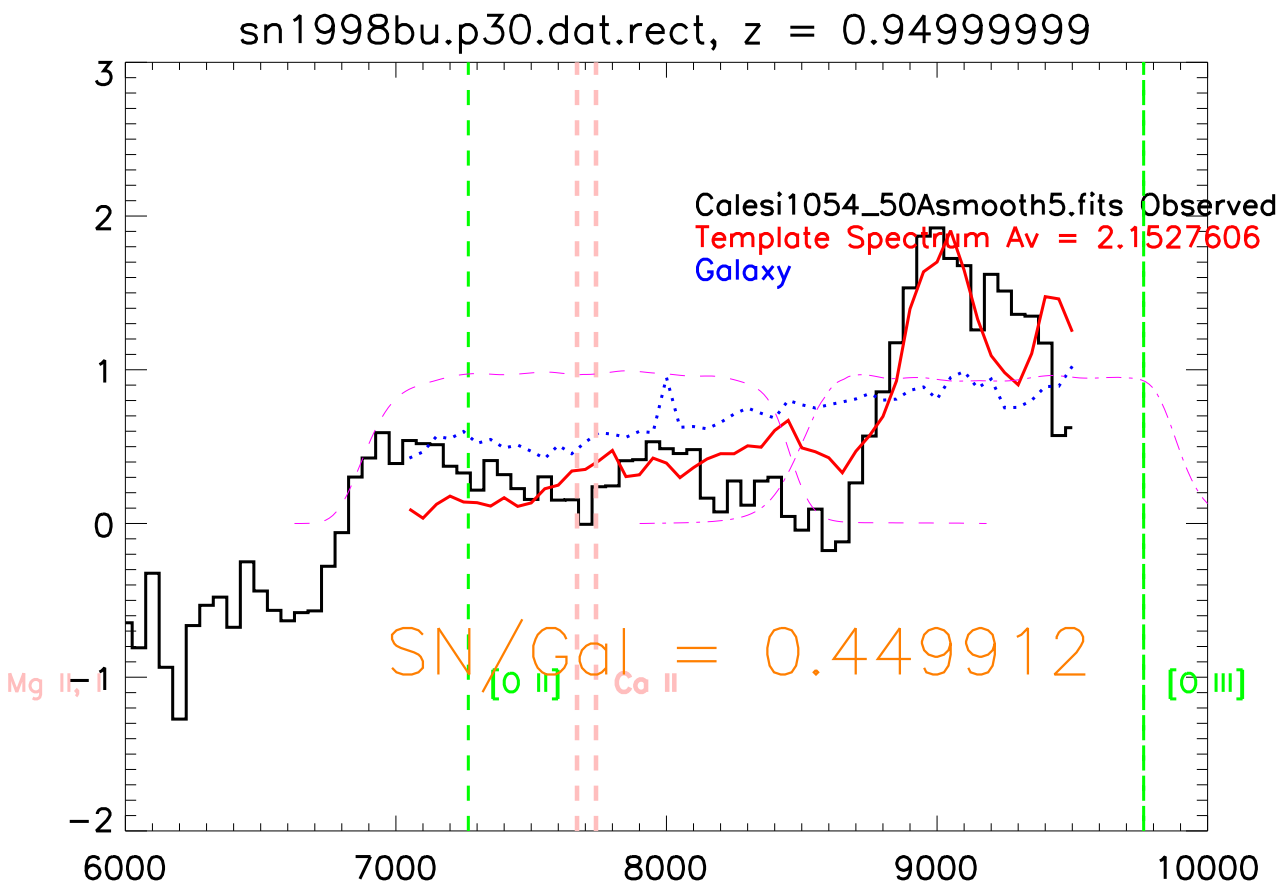

sn1989b.p09.dat.rect, z = 0.95999998
Calesi1054_50Asmooth5.fits Observed − Galaxy
Template Spectrum Av = 5.3344573
Galaxy
SN/Gal = 0.120146
Mg II, I
[O II]
Ca II
[O III]
2
1
0
−1
−2
6000
7000
8000
9000
10000

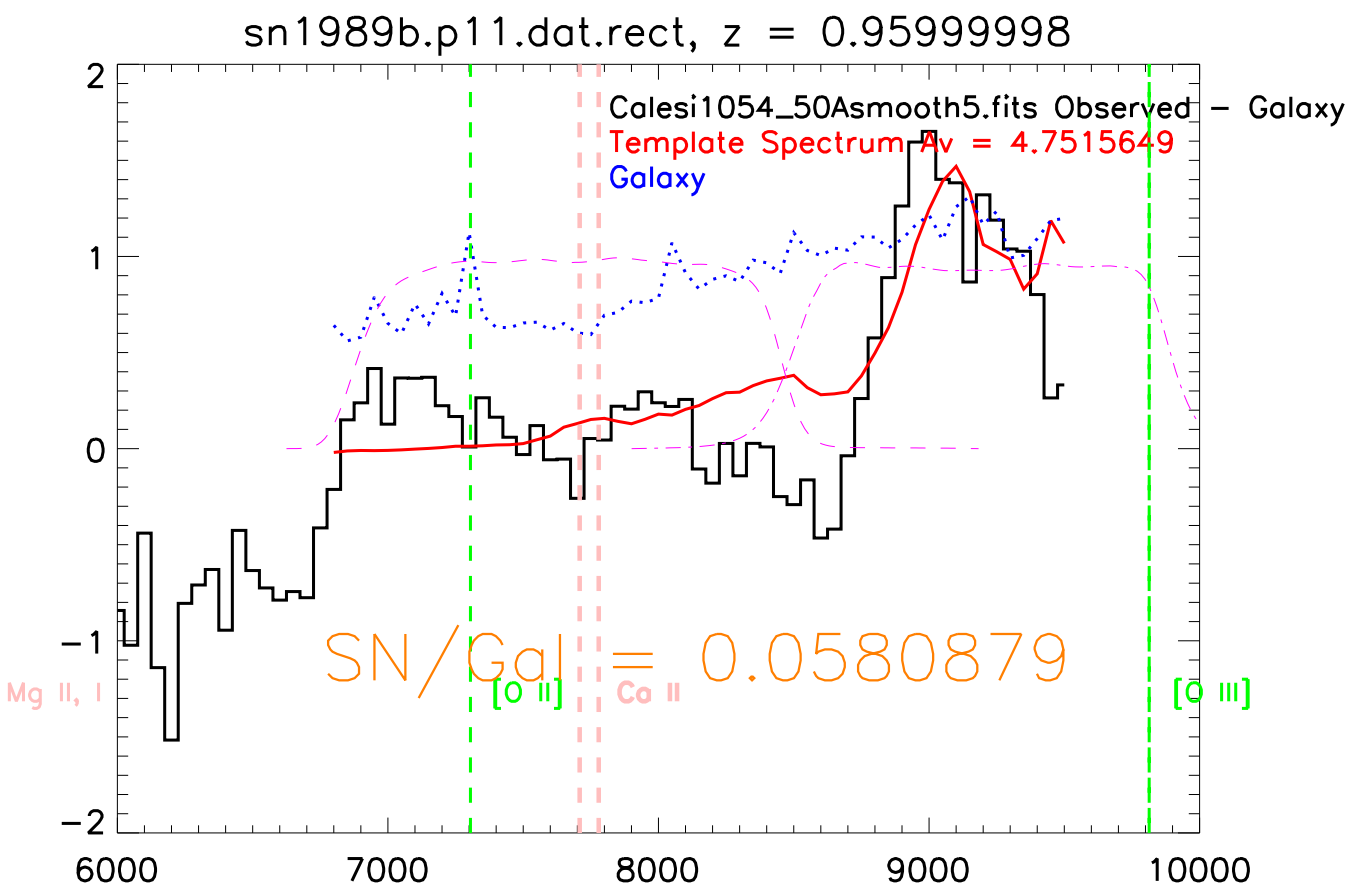

sn1999ee.p12.dat.rect, z = 0.73000002
Calesi1054_50Asmooth5.fits Observed − Galaxy
Template Spectrum Av = 3.6764464
Galaxy
SN/Gal = −57.5465
[O II]
Ca II
[O III]
4
3
2
1
0
−1
6000
7000
8000
9000
10000

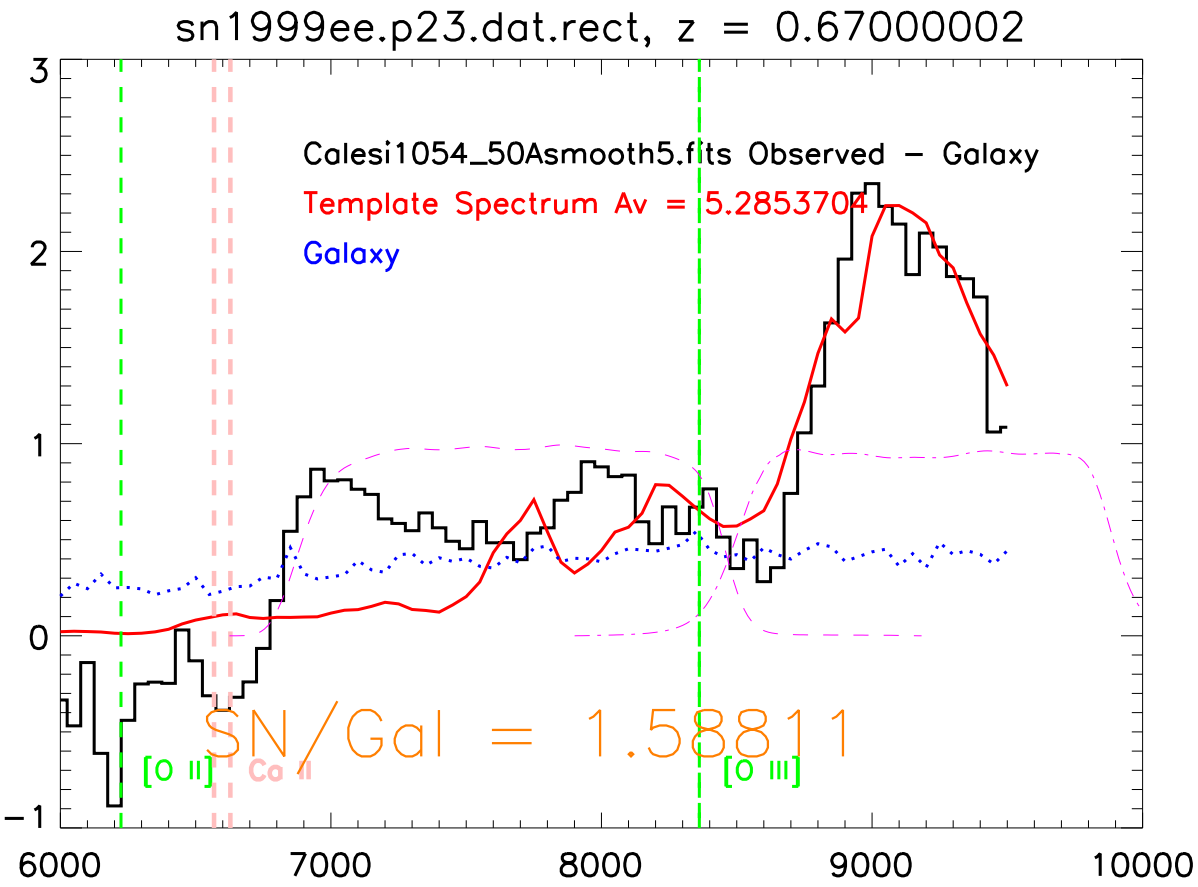
Mg II, I


sn1992a.p11.dat.rect, z = 0.70999998
Calesi1054_50Asmooth5.fits Observed − Galaxy
Template Spectrum Av = 3.6315874
Galaxy
SN/Gal = 3.96530
[O II]
Ca II
[O III]
3
2
1
0
−1
6000
7000
8000
9000
10000

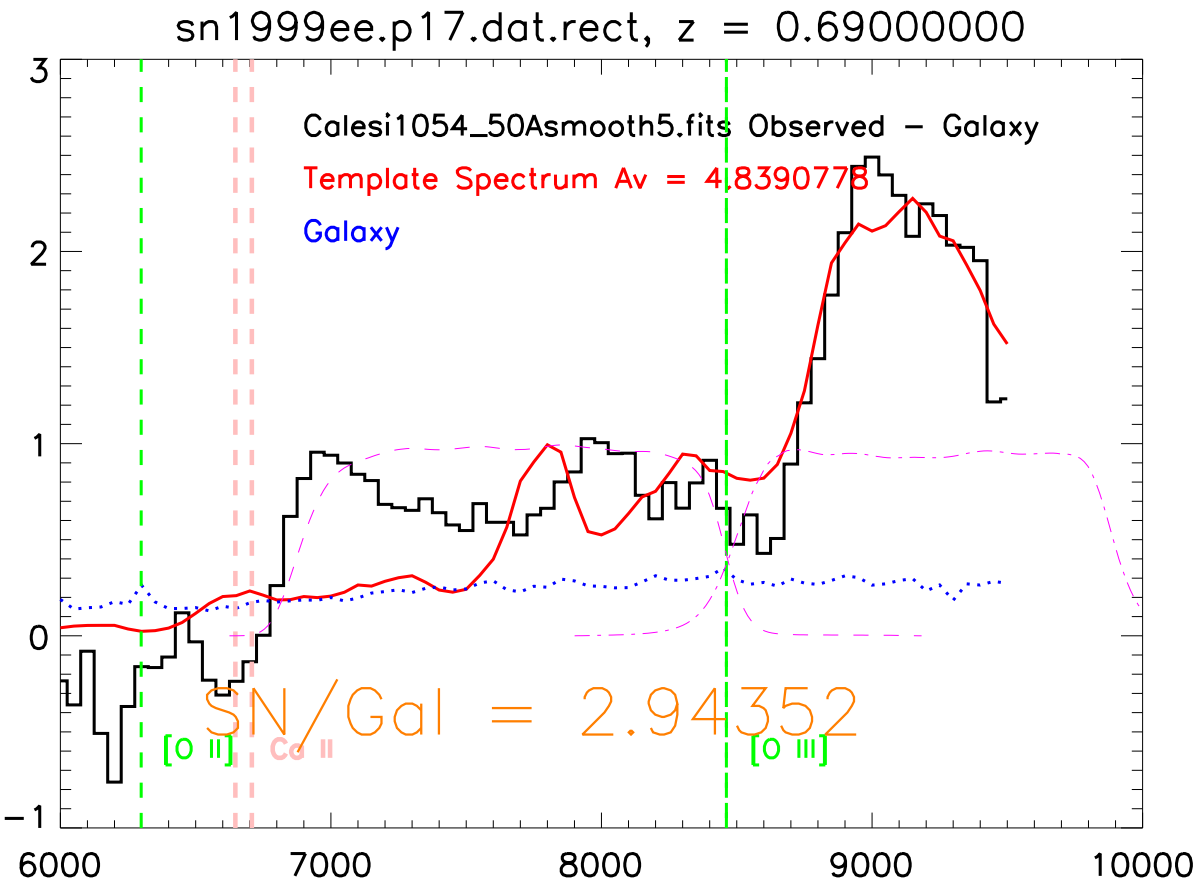
Mg II, I


sn1998bu.p30.dat.rect, z = 0.94999999
Calesi1054_50Asmooth5.fits Observed – Galax
Template Spectrum Av = 2.1527606
Galaxy
SN/Gal = 0.449912
Mg II
[O II]
Co II
[O III]
3
2
1
0
−1
−2
6000
7000
8000
9000
10000


sn1989b.p11.dat.rect, z = 0.95999998
Calesi1054_50Asmooth5.fits Observed − Galaxy
Template Spectrum Av = 4.7515649
Galaxy
SN/Gal = 0.0580879
Mg II, I
[O II]
Ca II
[O III]
2
1
0
−1
−2
6000
7000
8000
9000
10000


sn1999ee.p23.dat.rect, z = 0.67000002
Calesi1054_50Asmooth5.fits Observed − Galaxy
Template Spectrum Av = 5.2853704
Galaxy
SN/Gal = 1.58811
[O II]
Ca II
[O III]
3
2
1
0
−1
6000
7000
8000
9000
10000

Mg II, I


sn1999ee.p17.dat.rect, z = 0.69000000
Calesi1054_50Asmooth5.fits Observed − Galaxy
Template Spectrum Av = 4.8390778
Galaxy
SN/Gal = 2.94352
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Ca II
[O III]
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2
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0
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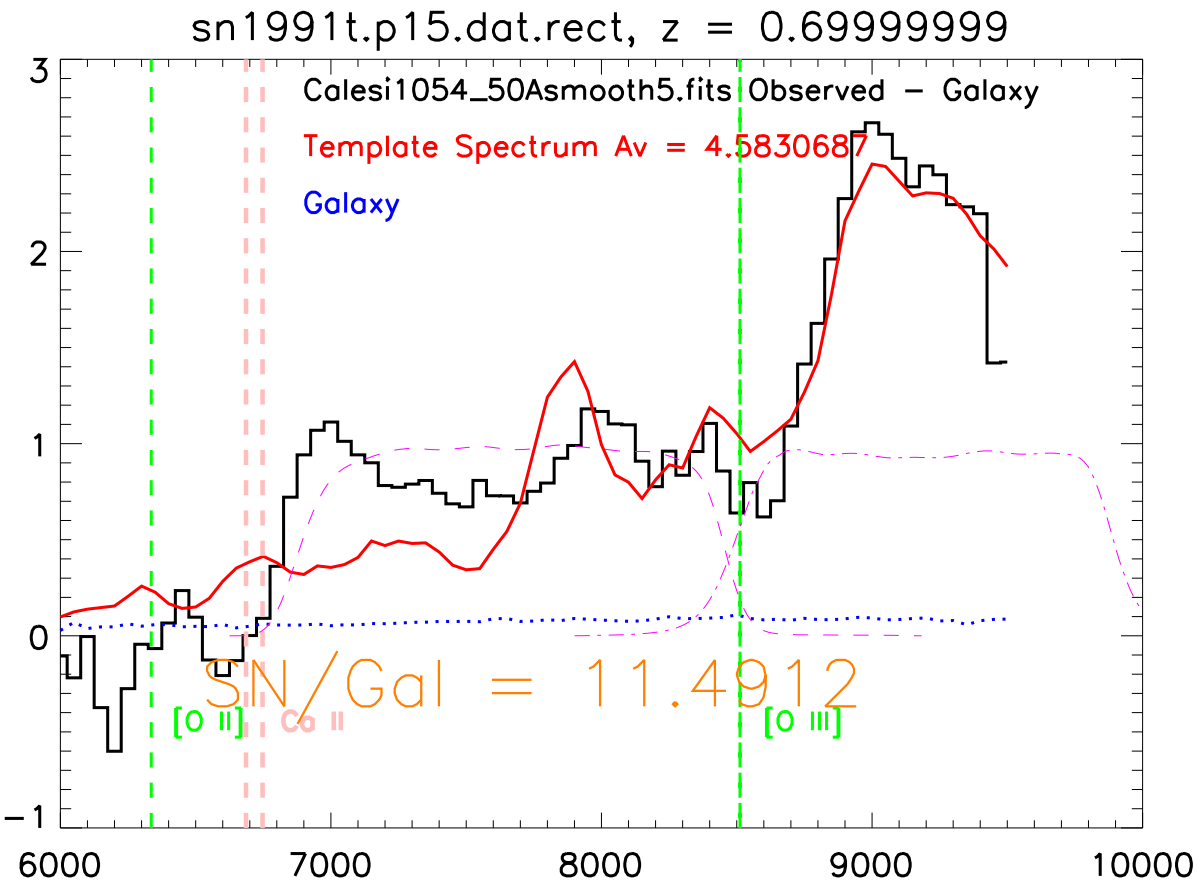
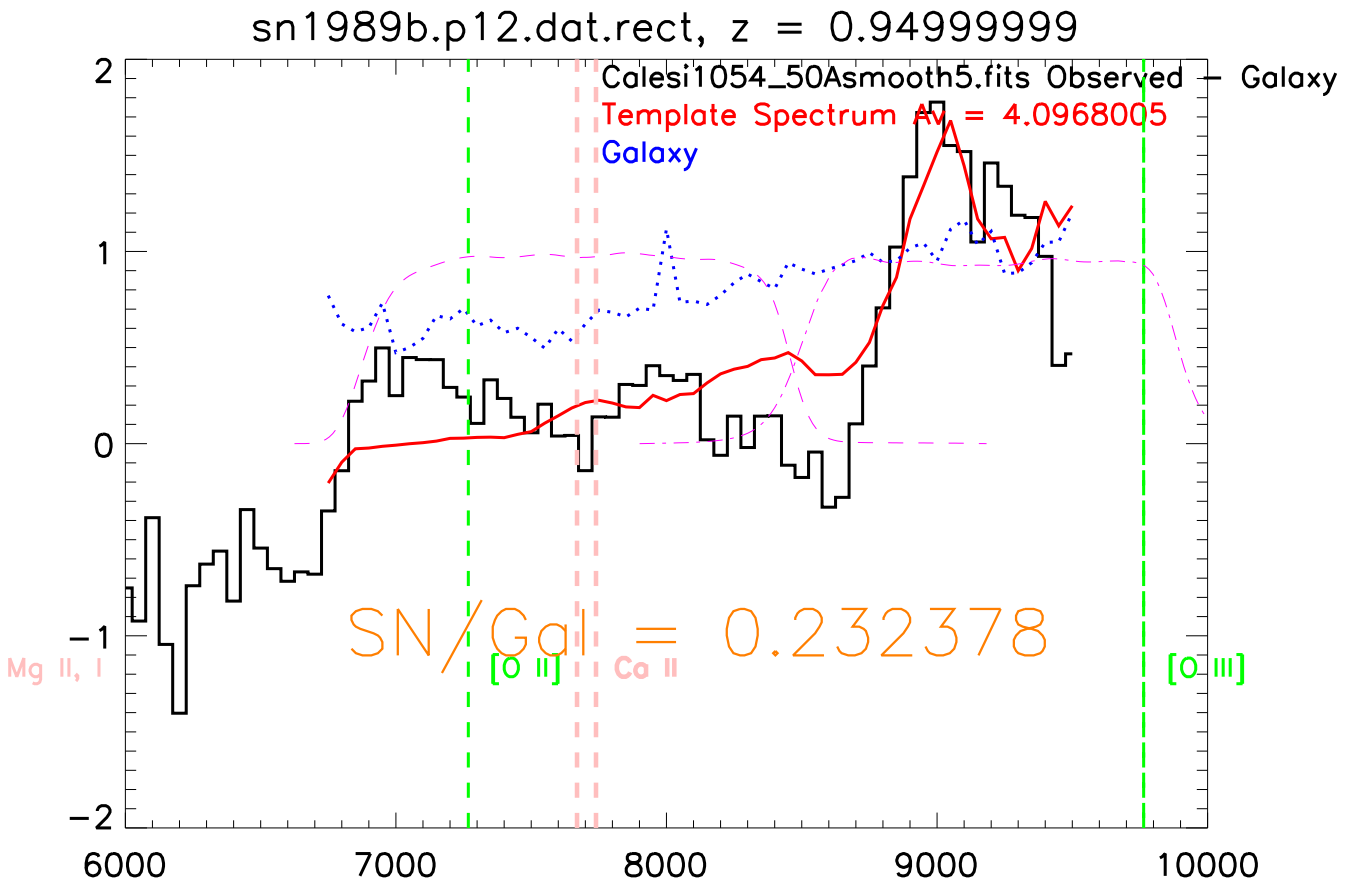
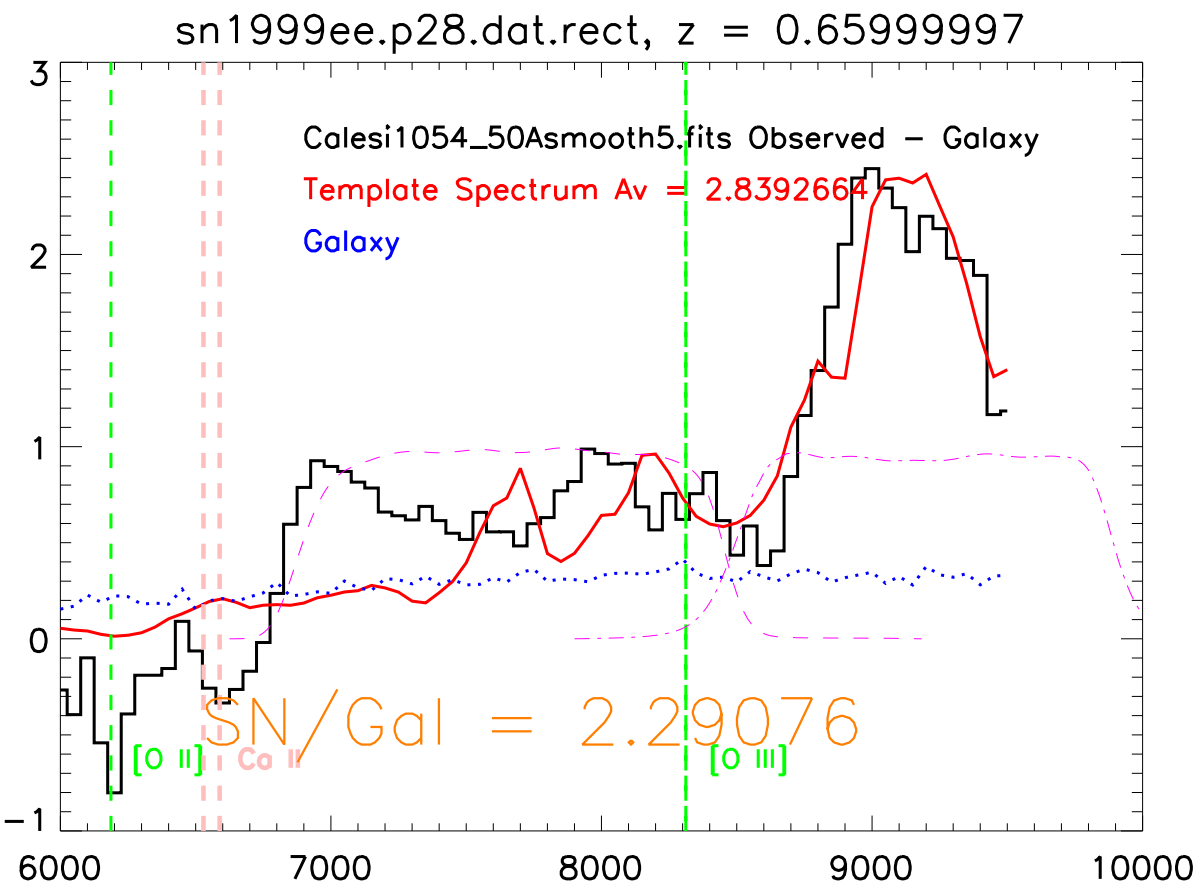
6000
7000
8000
9000
10000

Mg II, I

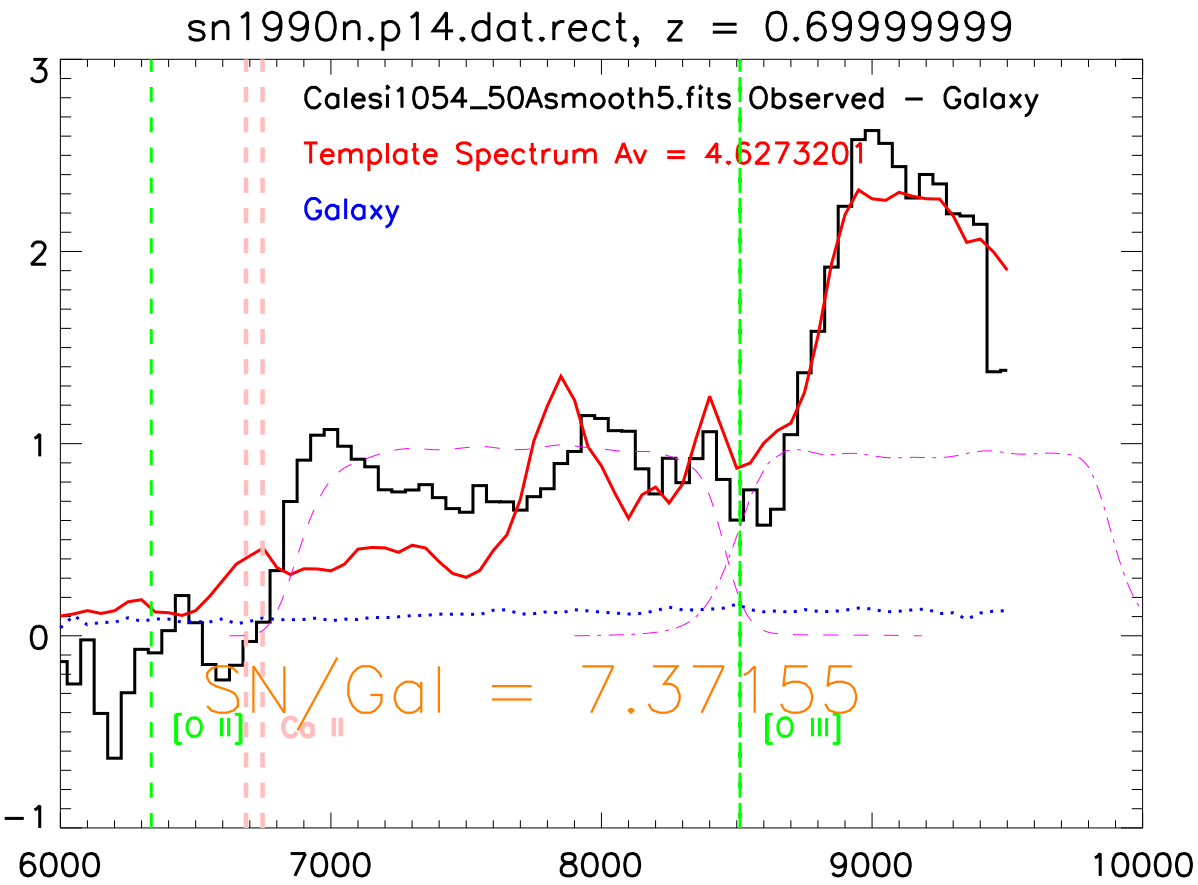

sn1991t.p15.dat.rect, z = 0.69999999
Calesi1054_50Asmooth5.fits Observed − Galaxy
Template Spectrum Av = 4.5830687
Galaxy
SN/Gal = 11.4912
[O II]
Ca II
[O III]
3
2
1
0
−1
6000
7000
8000
9000
10000

Mg II, I

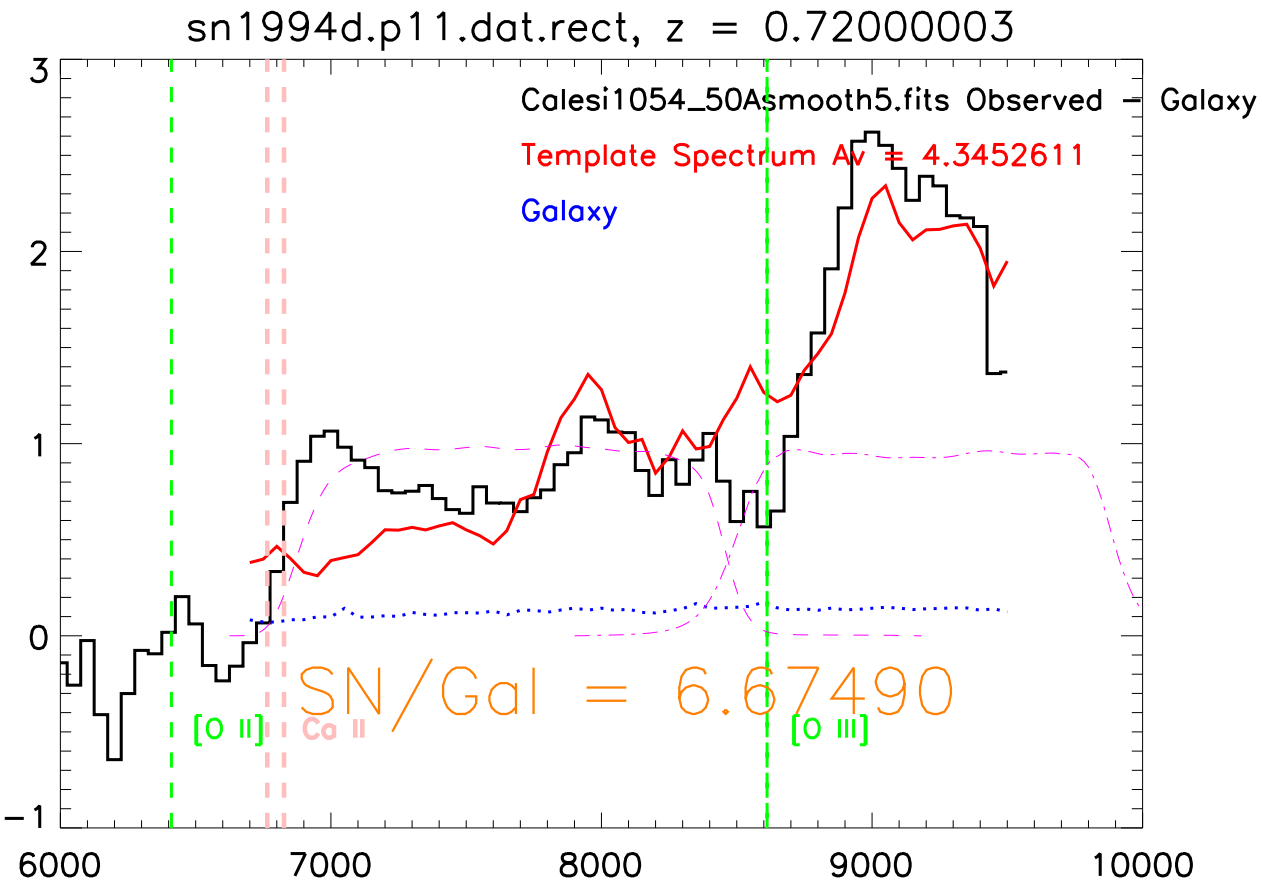

sn1989b.p12.dat.rect, z = 0.94999999
Calesi1054_50Asmooth5.fits Observed
Galaxy
Template Spectrum AV = 4.0968005
Galaxy
SN/Gal = 0.232378
Mg II, I
[O II]
Ca II
[O III]
2
1
0
−1
−2
6000
7000
8000
9000
10000


sn1999ee.p28.dat.rect, z = 0.65999997
Calesi1054_50Asmooth5.fits Observed − Galaxy
Template Spectrum Av = 2.8392664
Galaxy
SN/Gal = 2.29076
[O II]
Ca II
[O III]
3
2
1
0
−1
6000
7000
8000
9000
10000

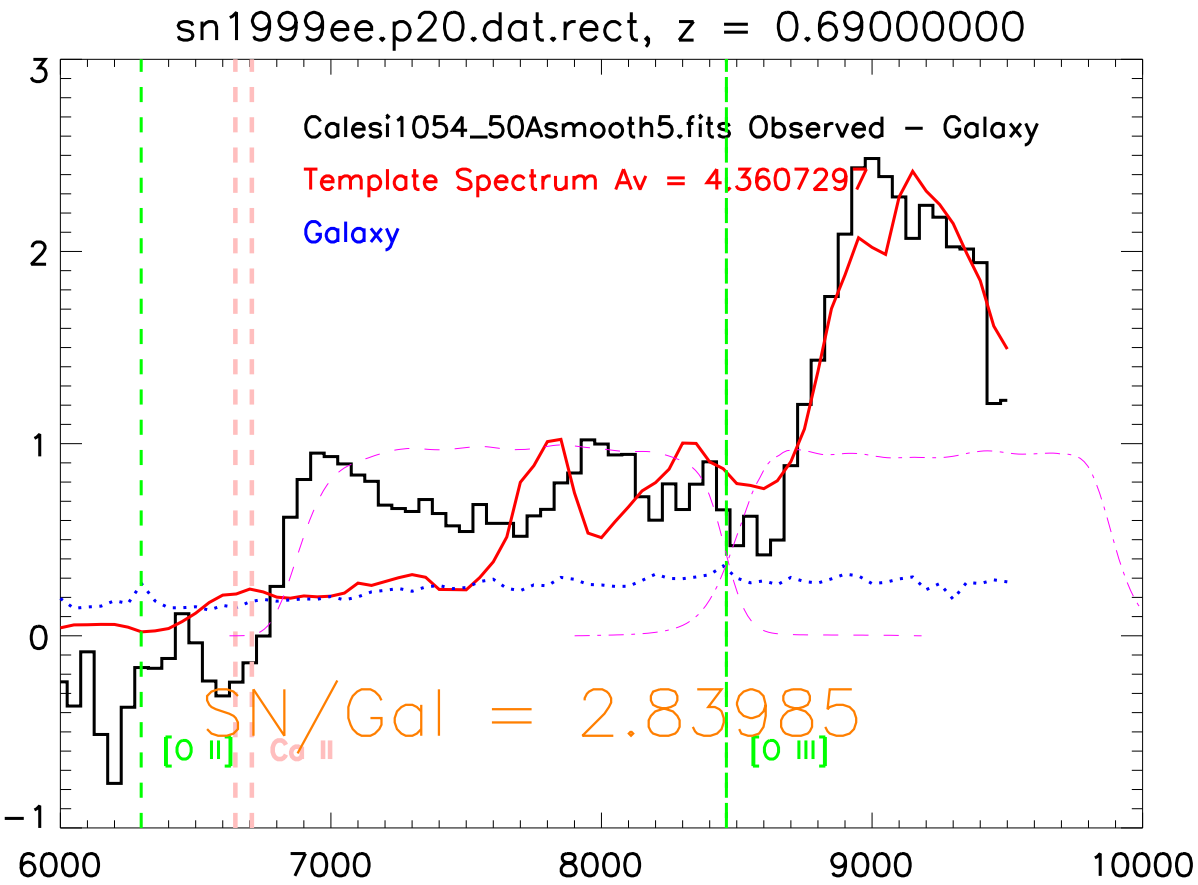
Mg II, I


sn1990n.p14.dat.rect, z = 0.69999999
Calesi1054_50Asmooth5.fits Observed − Galaxy
Template Spectrum Av = 4.6273201
Galaxy
SN/Gal = 7.37155
[O II]
Ca II
[O III]
3
2
1
0
−1
6000
7000
8000
9000
10000

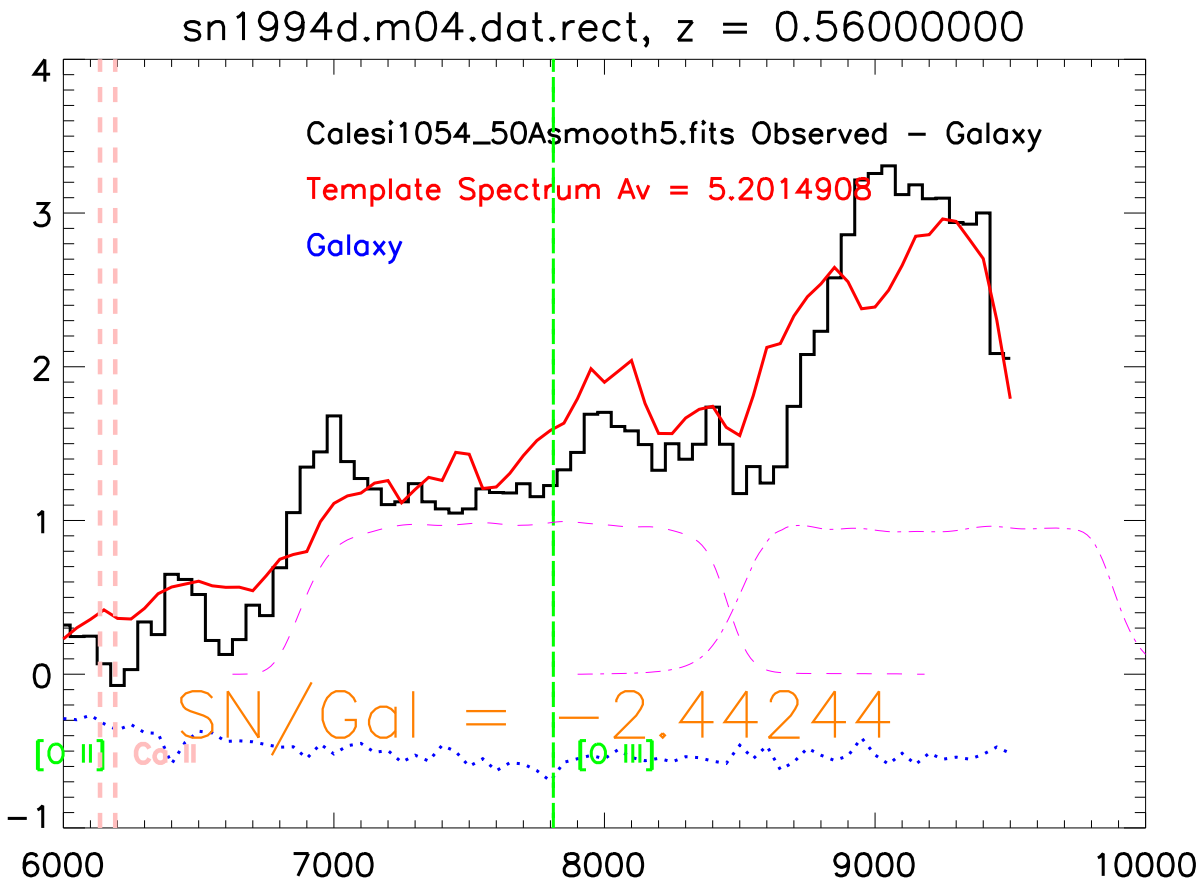
Mg II, I

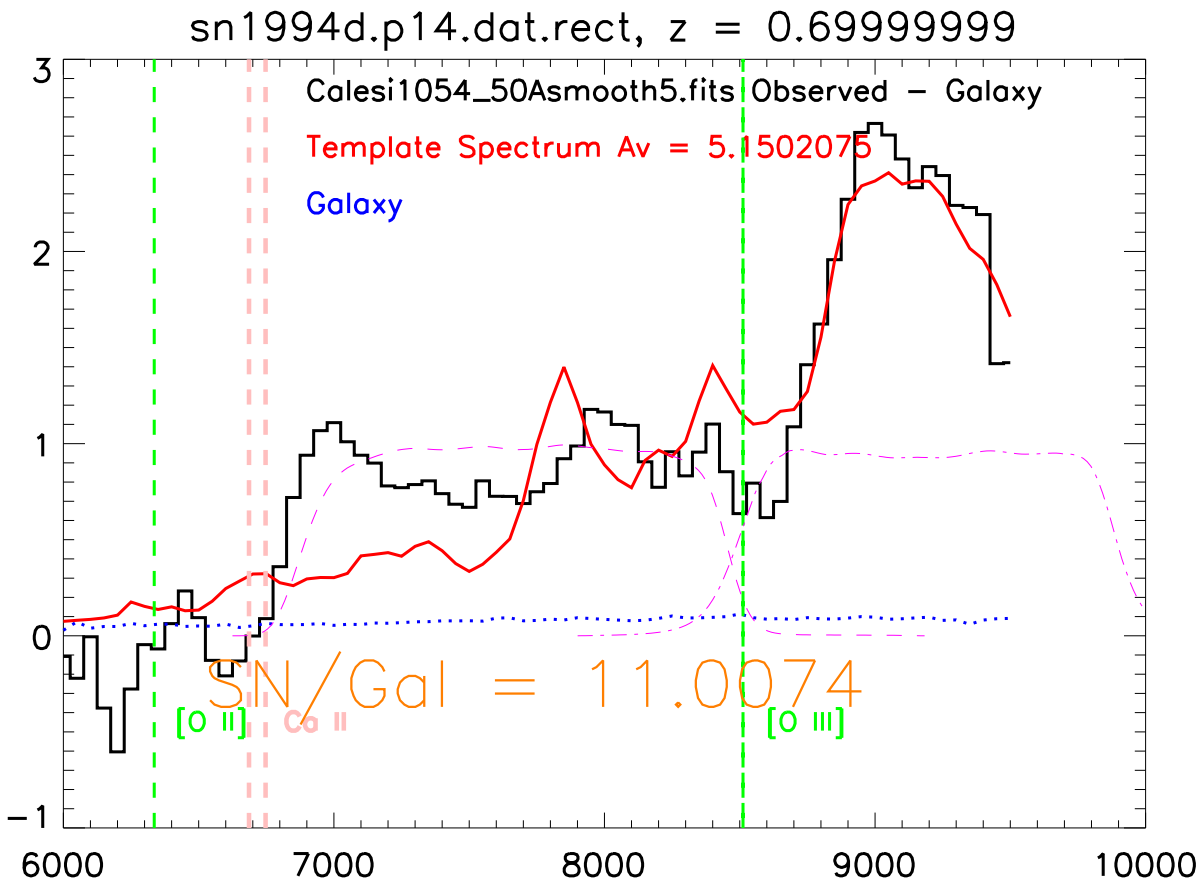

sn1994d.p11.dat.rect, z = 0.72000003
Calesi1054_50Asmooth5.fits Observed
Galaxy
Template Spectrum Av = 4.3452611
Galaxy
SN/Gal = 6.67490
[O II]
Ca II
[O III]
3
2
1
0
−1
6000
7000
8000
9000
10000

Mg II, I

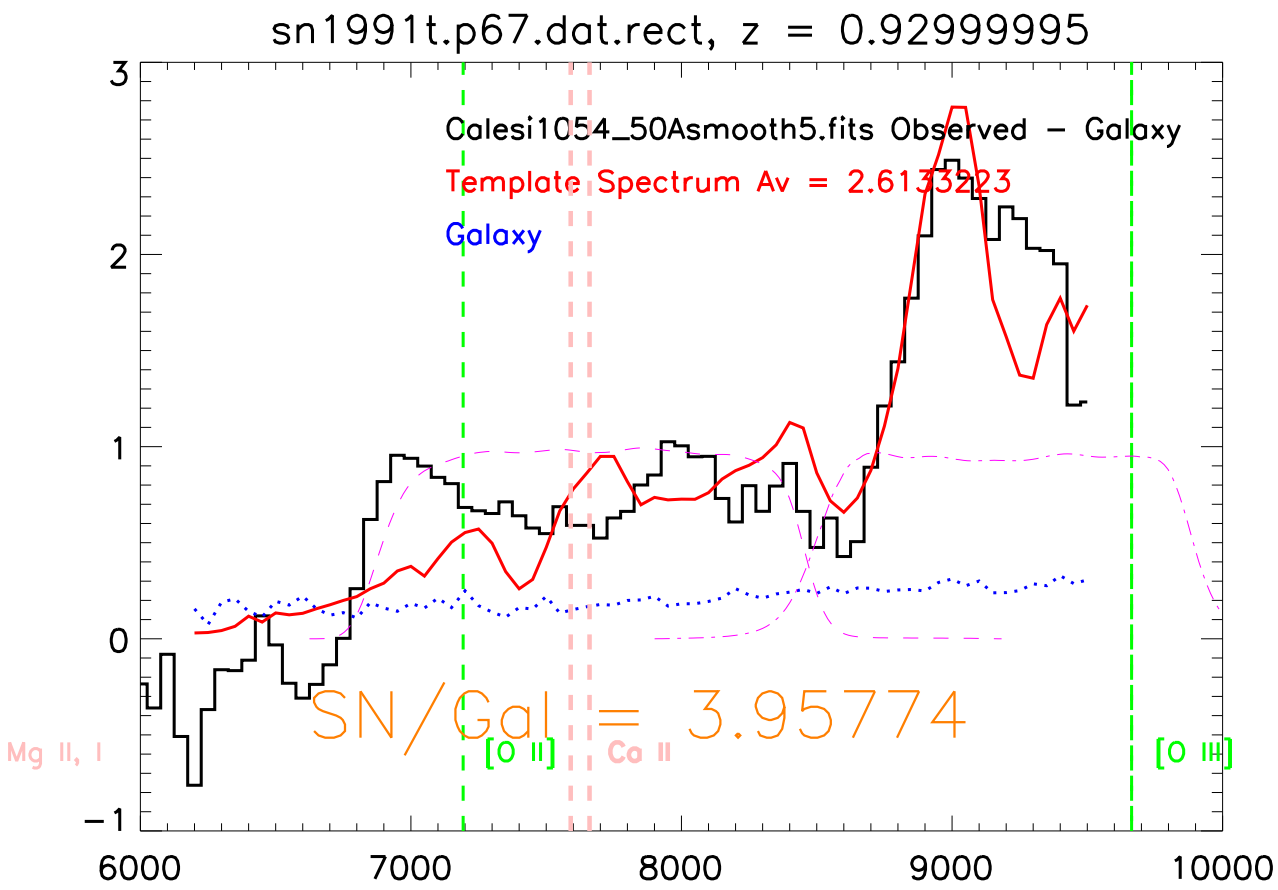

sn1999ee.p20.dat.rect, z = 0.69000000
Calesi1054_50Asmooth5.fits Observed − Galaxy
Template Spectrum Av = 4.3607297
Galaxy
SN/Gal = 2.83985
[O II]
Ca II
[O III]
3
2
1
0
−1
6000
7000
8000
9000
10000

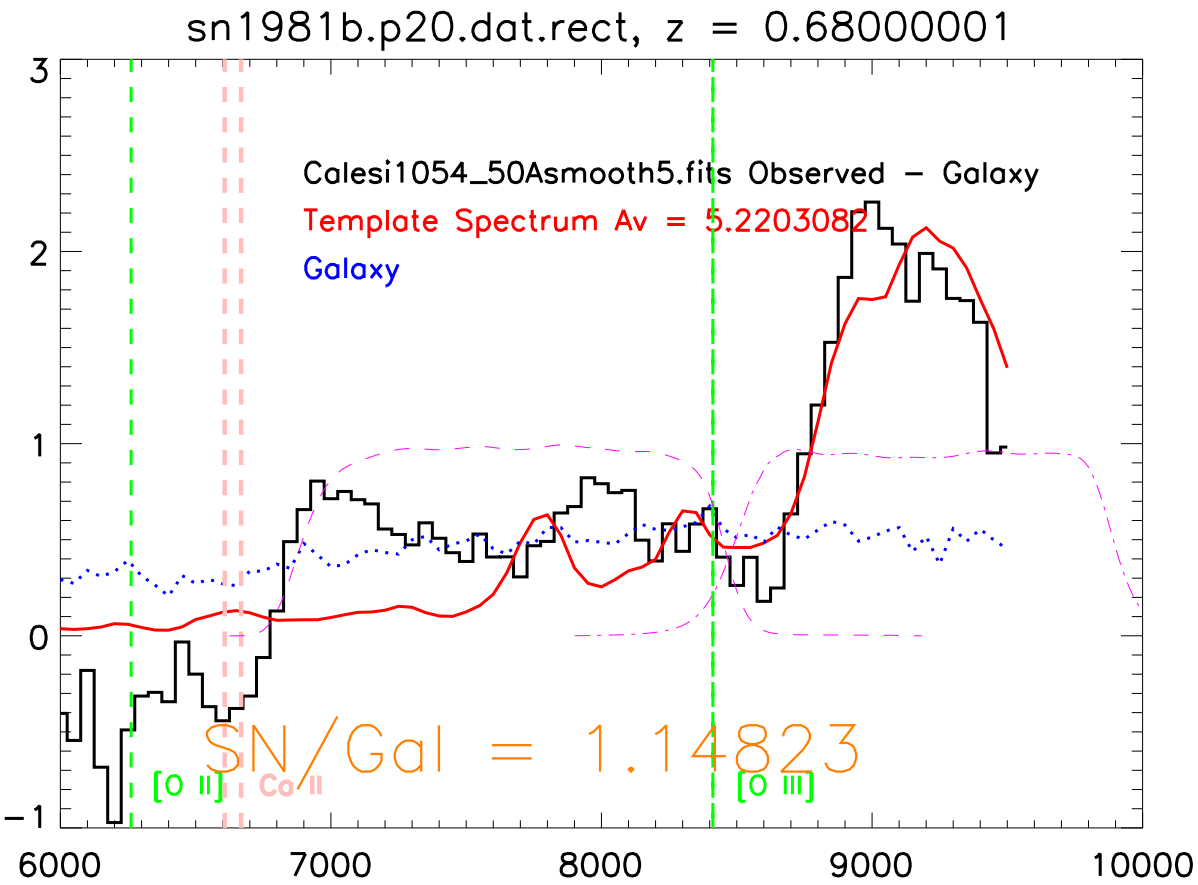
Mg II, I


sn1994d.m04.dat.rect, z = 0.56000000
Calesi1054_50Asmooth5.fits Observed − Galaxy
Template Spectrum Av = 5.2014908
Galaxy
SN/Gal = −2.44244
[O II]
Ca II
[O III]
4
3
2
1
0
−1
6000
7000
8000
9000
10000

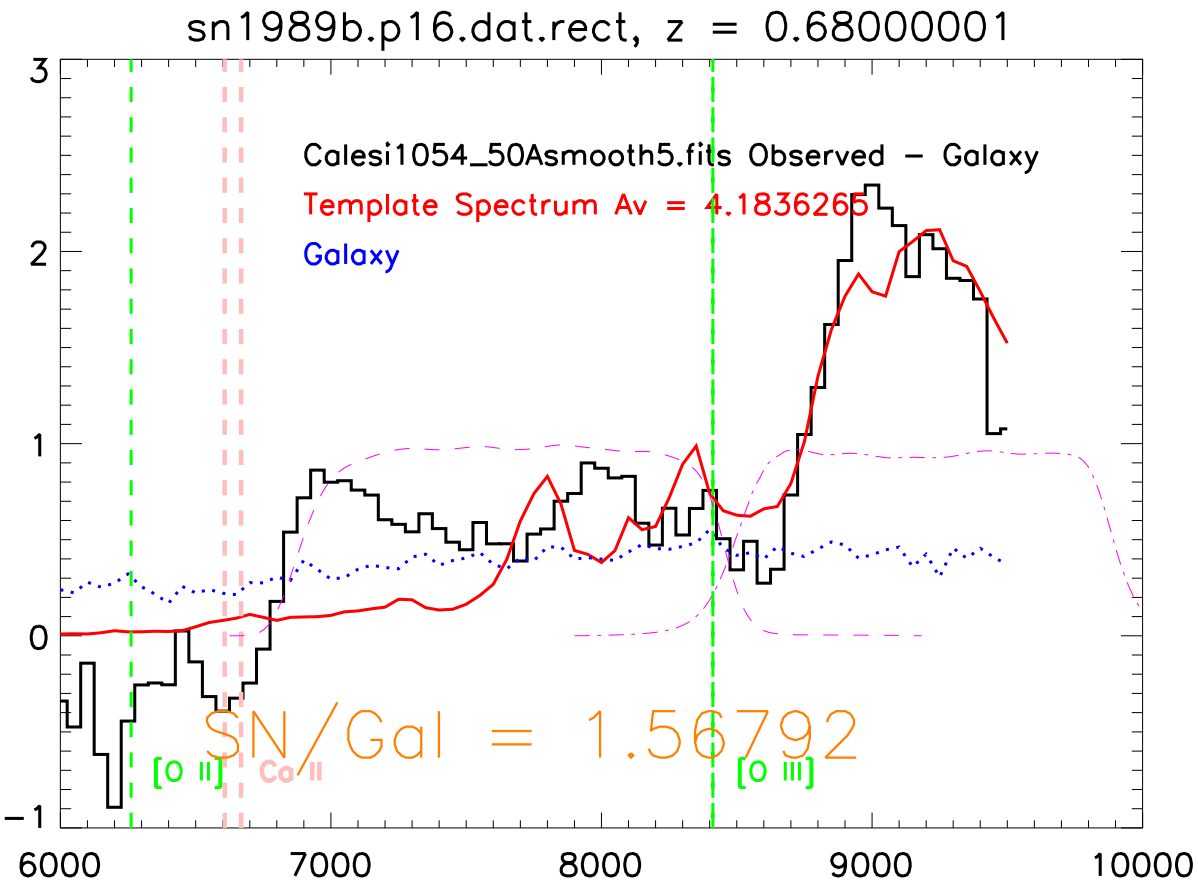

sn1994d.p14.dat.rect, z = 0.69999999
Calesi1054_50Asmooth5.fits Observed − Galaxy
Template Spectrum Av = 5.1502075
Galaxy
SN/Gal = 11.0074
[O II]
Ca II
[O III]
3
2
1
0
−1
6000
7000
8000
9000
10000

Mg II, I

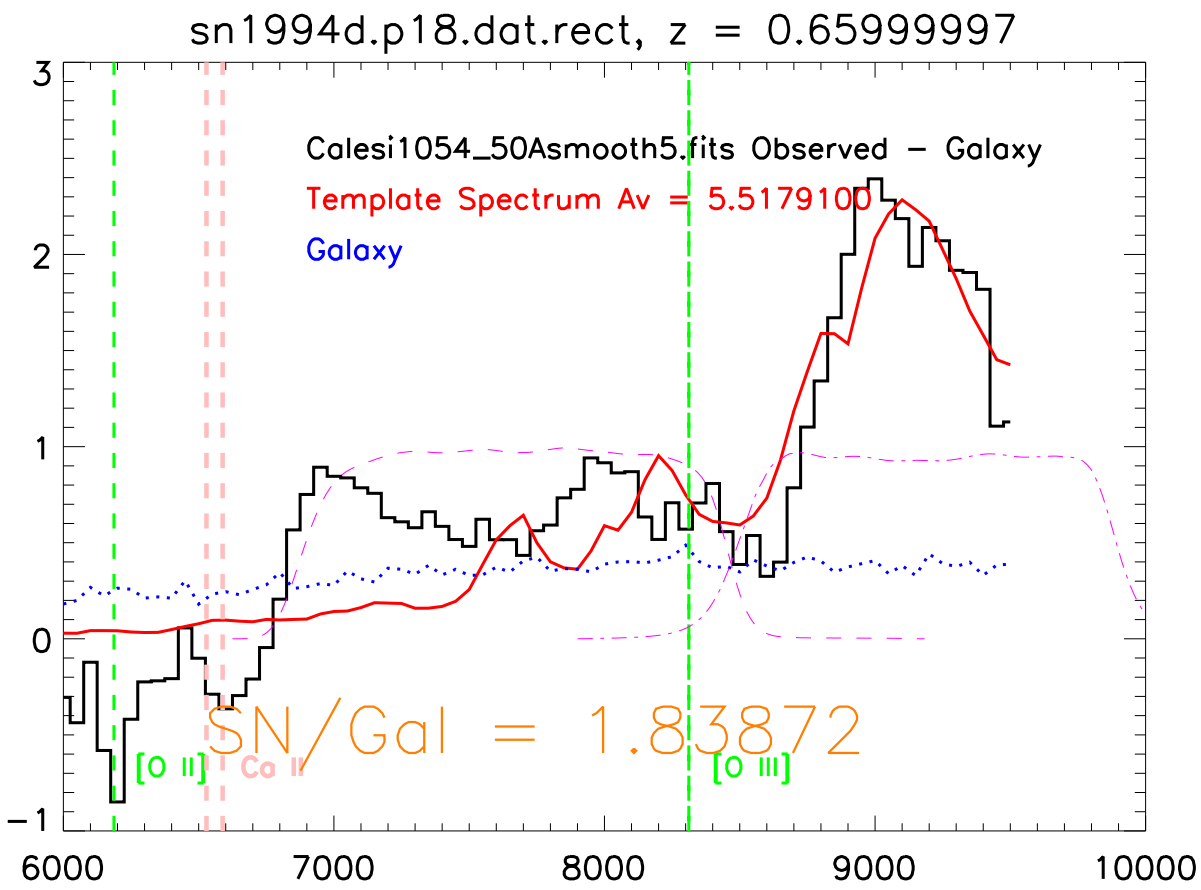

sn1991t.p67.dat.rect, z = 0.92999995
Calesi1054_50Asmooth5.fits Observed − Galaxy
Template Spectrum Av = 2.6133223
Galaxy
SN/Gal = 3.95774
Mg II, I
[O II]
Ca II
[O III]
3
2
1
0
−1
6000
7000
8000
9000
10000


sn1981b.p20.dat.rect, z = 0.68000001
Calesi1054_50Asmooth5.fits Observed − Galaxy
Template Spectrum Av = 5.2203082
Galaxy
SN/Gal = 1.14823
[O II]
Ca II
[O III]
3
2
1
0
−1
6000
7000
8000
9000
10000

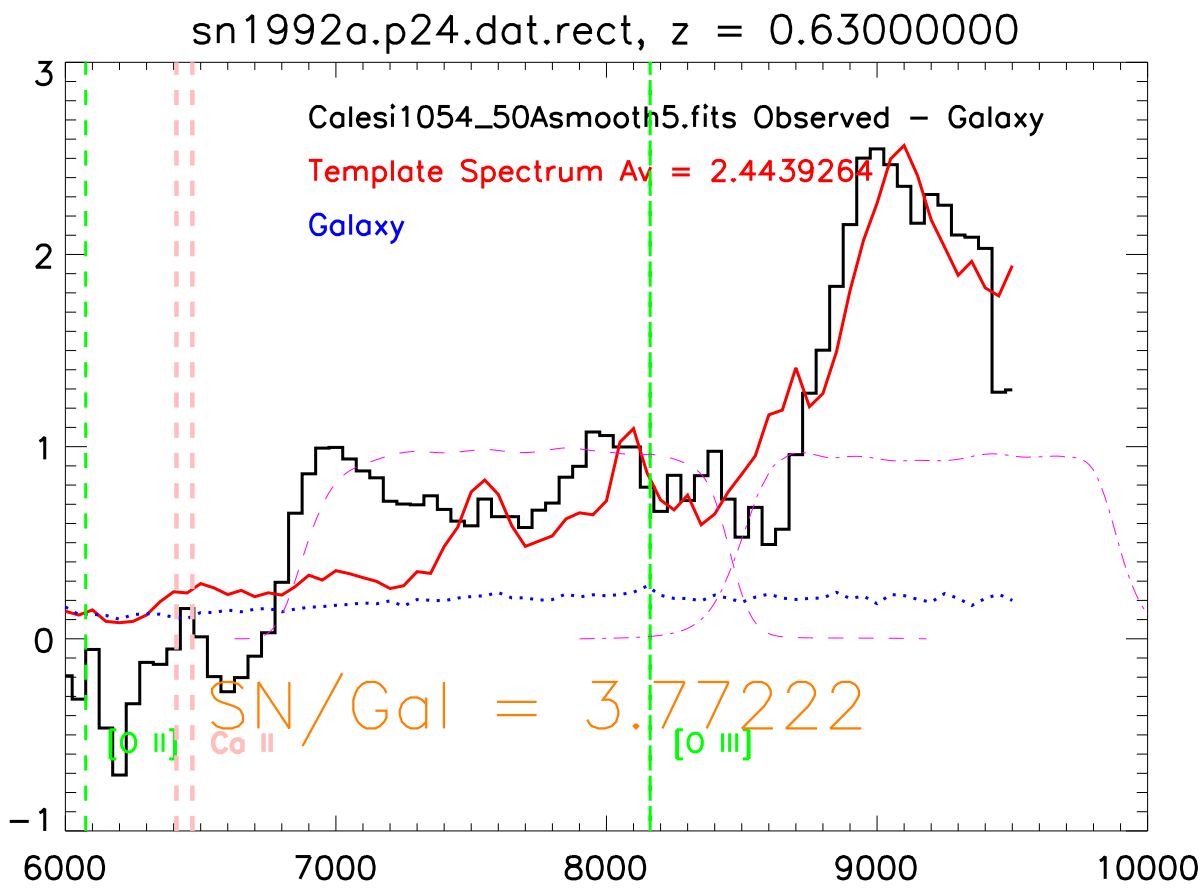
Mg II, I

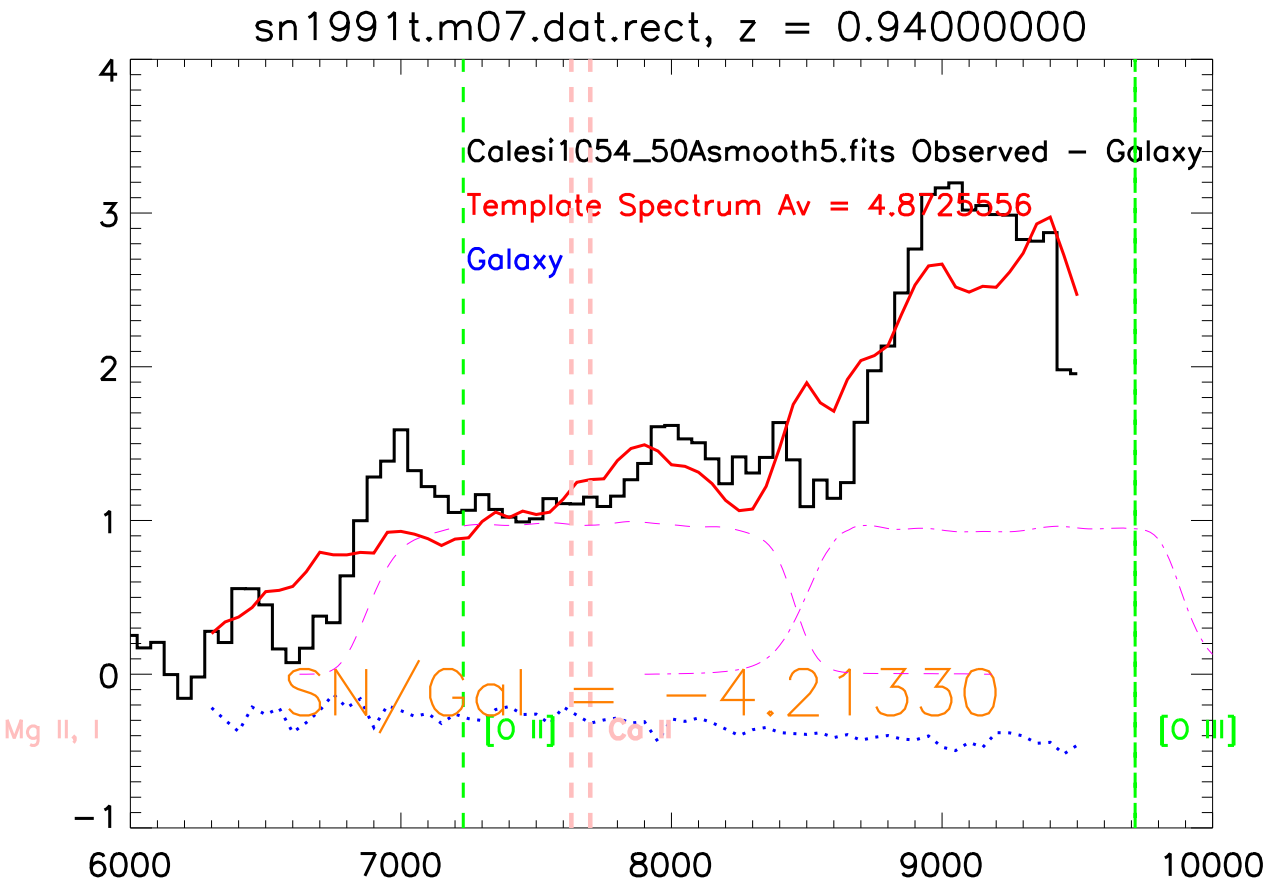

sn1989b.p16.dat.rect, z = 0.68000001
Calesi1054_50Asmooth5.fits Observed − Galaxy
Template Spectrum Av = 4.1836265
Galaxy
SN/Gal = 1.56792
[O II]
Ca II
[O III]
3
2
1
0
−1
6000
7000
8000
9000
10000

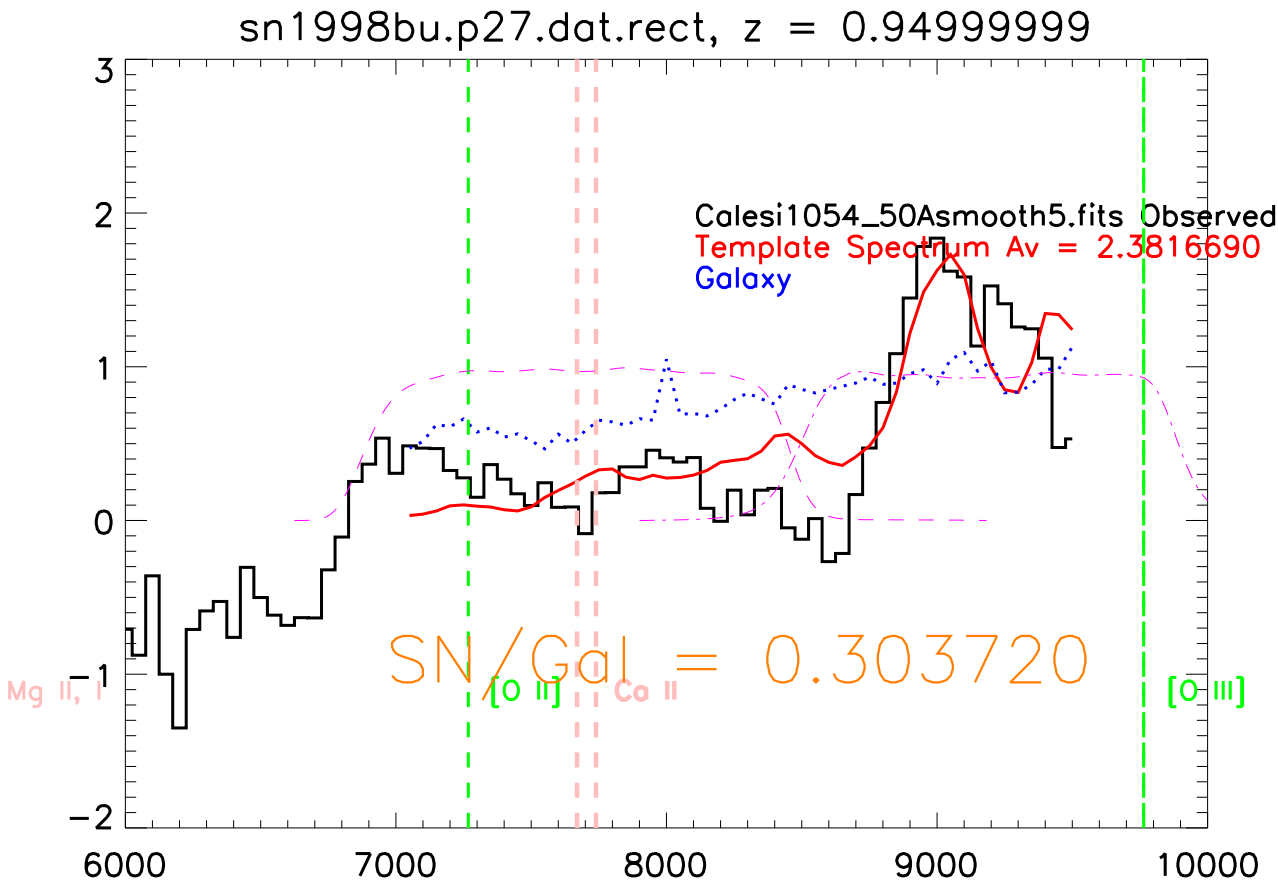
Mg II, I

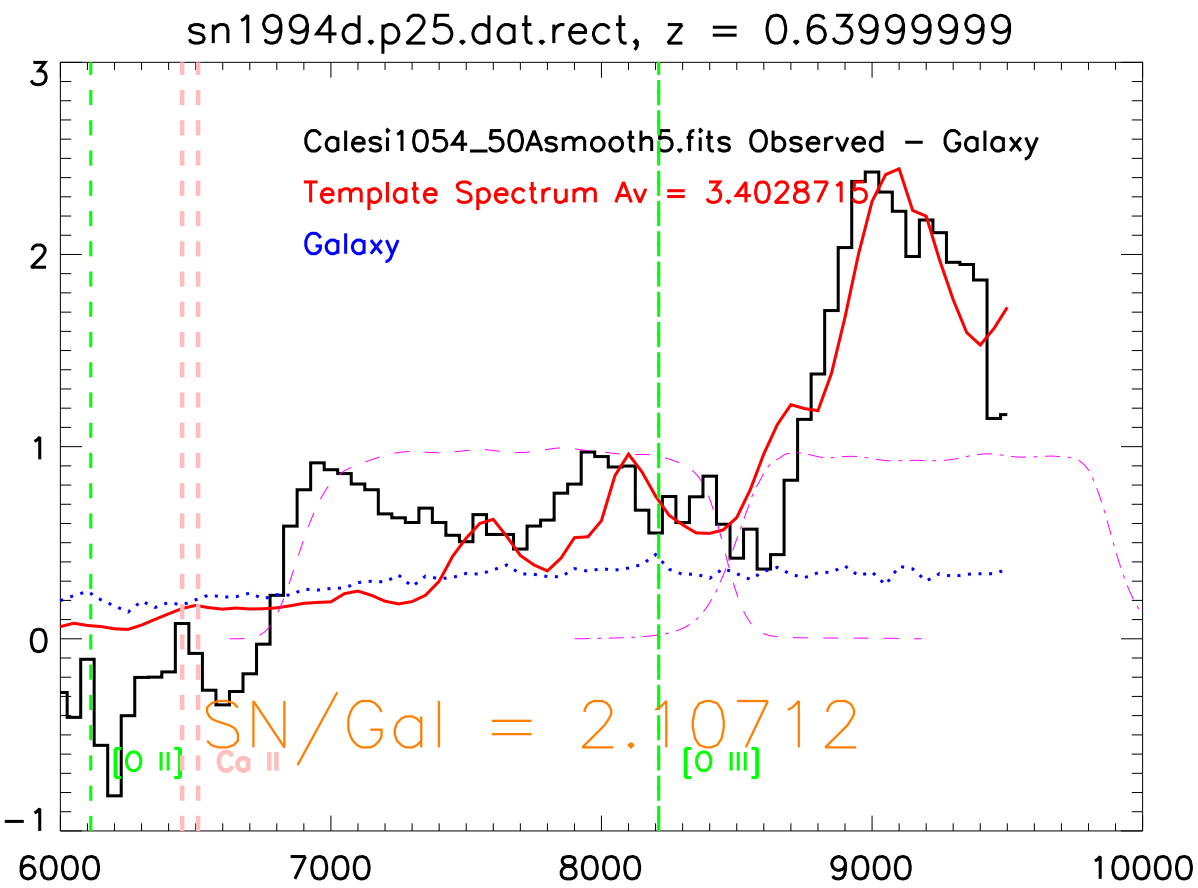

sn1994d.p18.dat.rect, z = 0.65999997
Calesi1054_50Asmooth5.fits Observed − Galaxy
Template Spectrum Av = 5.5179100
Galaxy
SN/Gal = 1.83872
[O II]
Ca II
[O III]
3
2
1
0
−1
6000
7000
8000
9000
10000

Mg II, I

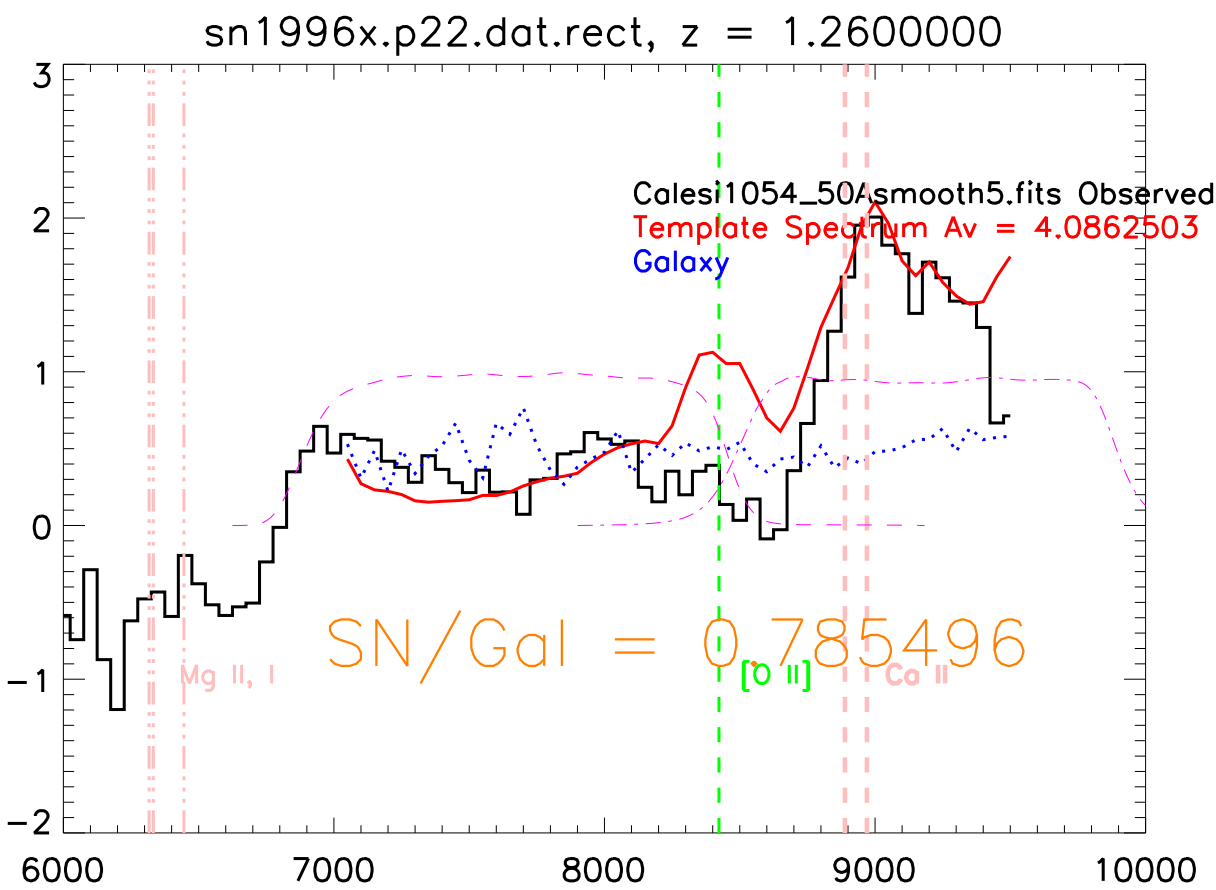

sn1992a.p24.dat.rect, z = 0.63000000
Calesi1054_50Asmooth5.fits Observed − Galaxy
Template Spectrum Av = 2.4439264
Galaxy
SN/Gal = 3.77222
[O II]
Ca II
[O III]
3
2
1
0
−1
6000
7000
8000
9000
10000

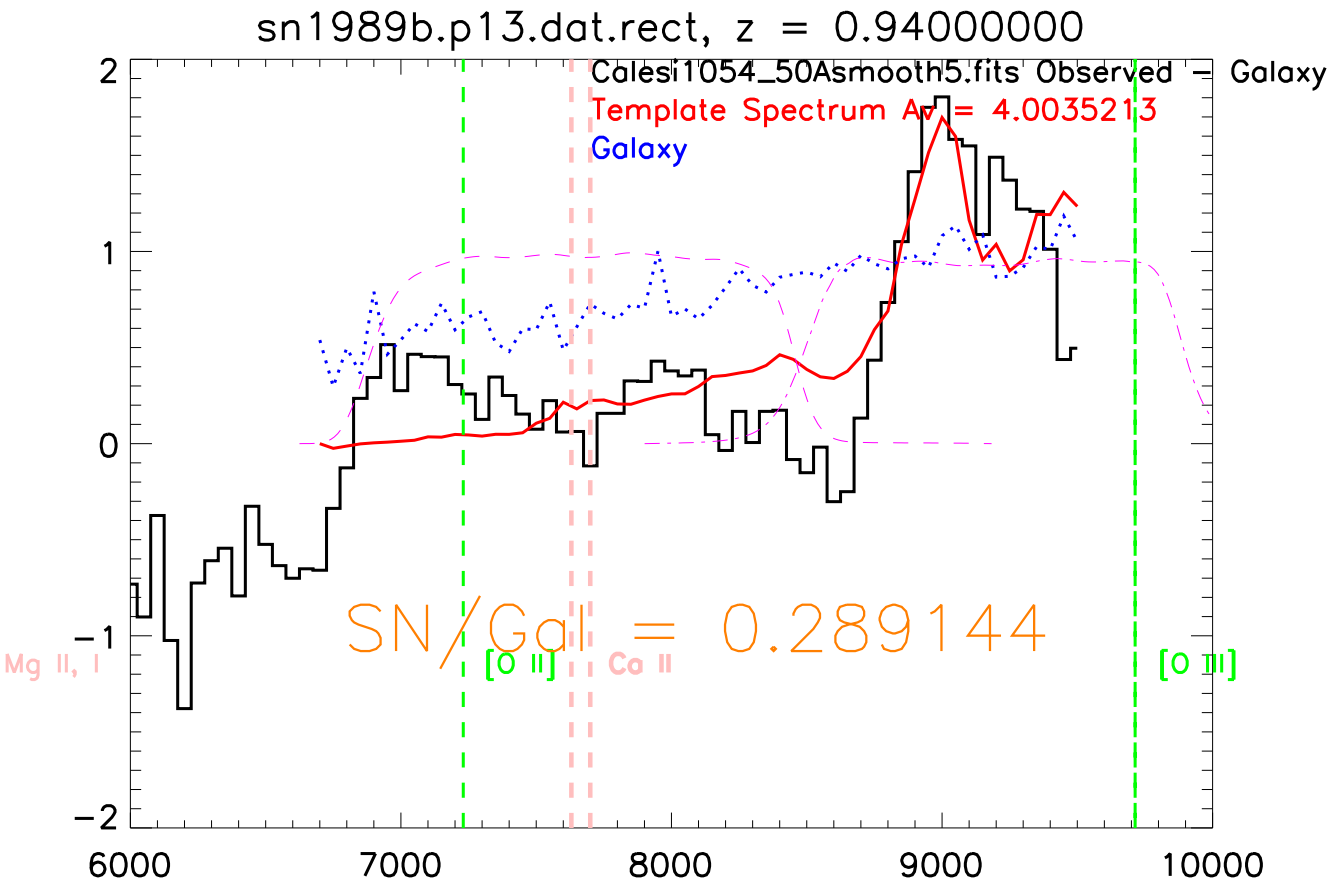

sn1991t.m07.dat.rect, z = 0.94000000
Calesi1C54_50Asmooth5.fits Observed − Galaxy
Template Spectrum Av = 4.8725556
Galaxy
SN/Gal = −4.21330
Mg II, I
[O II]
Ca II
[O III]
4
3
2
1
0
−1
6000
7000
8000
9000
10000

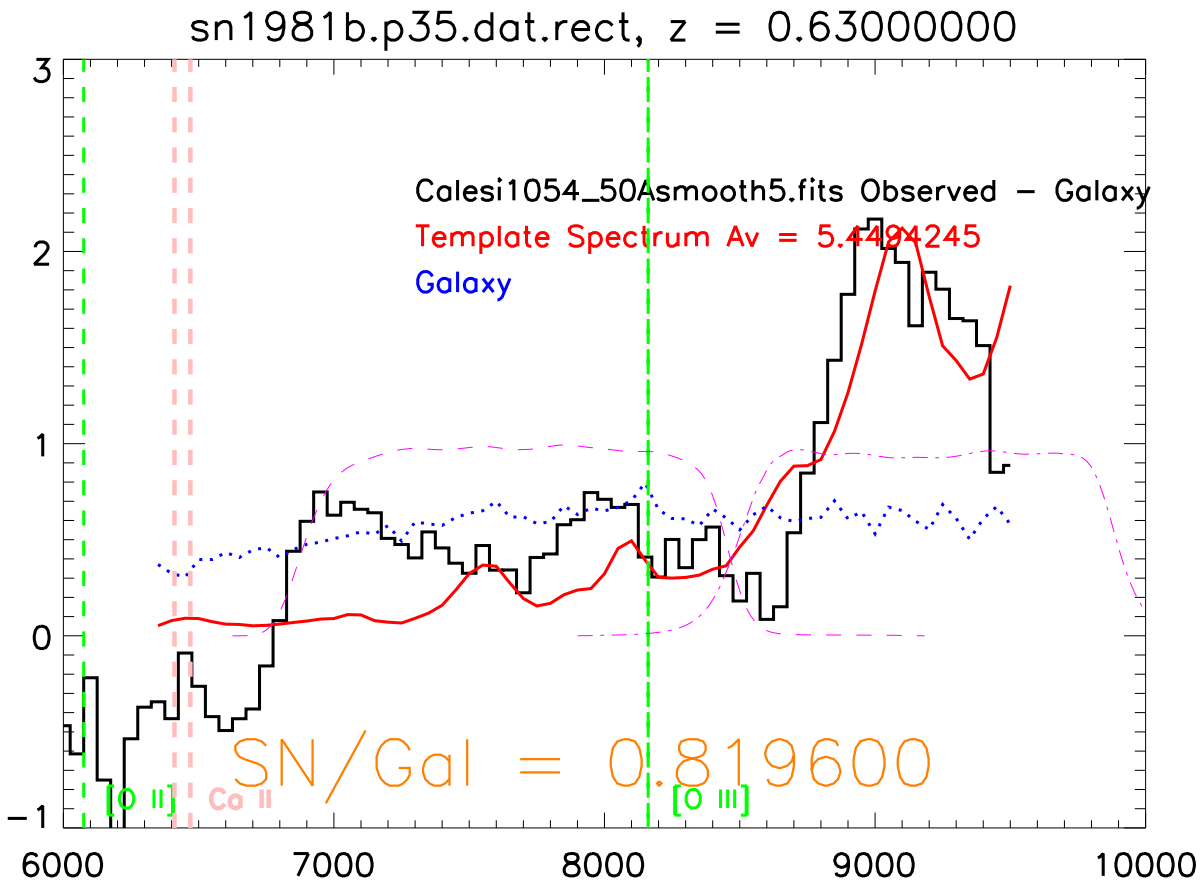

sn1998bu.p27.dat.rect, z = 0.94999999
Calesi1054_50Asmooth5.fits Observed − Galax
Template Spectrum Av = 2.3816690
Galaxy
SN/Gal = 0.303720
Mg II, I
[O II]
Co II
[O III]
3
2
1
0
−1
−2
6000
7000
8000
9000
10000

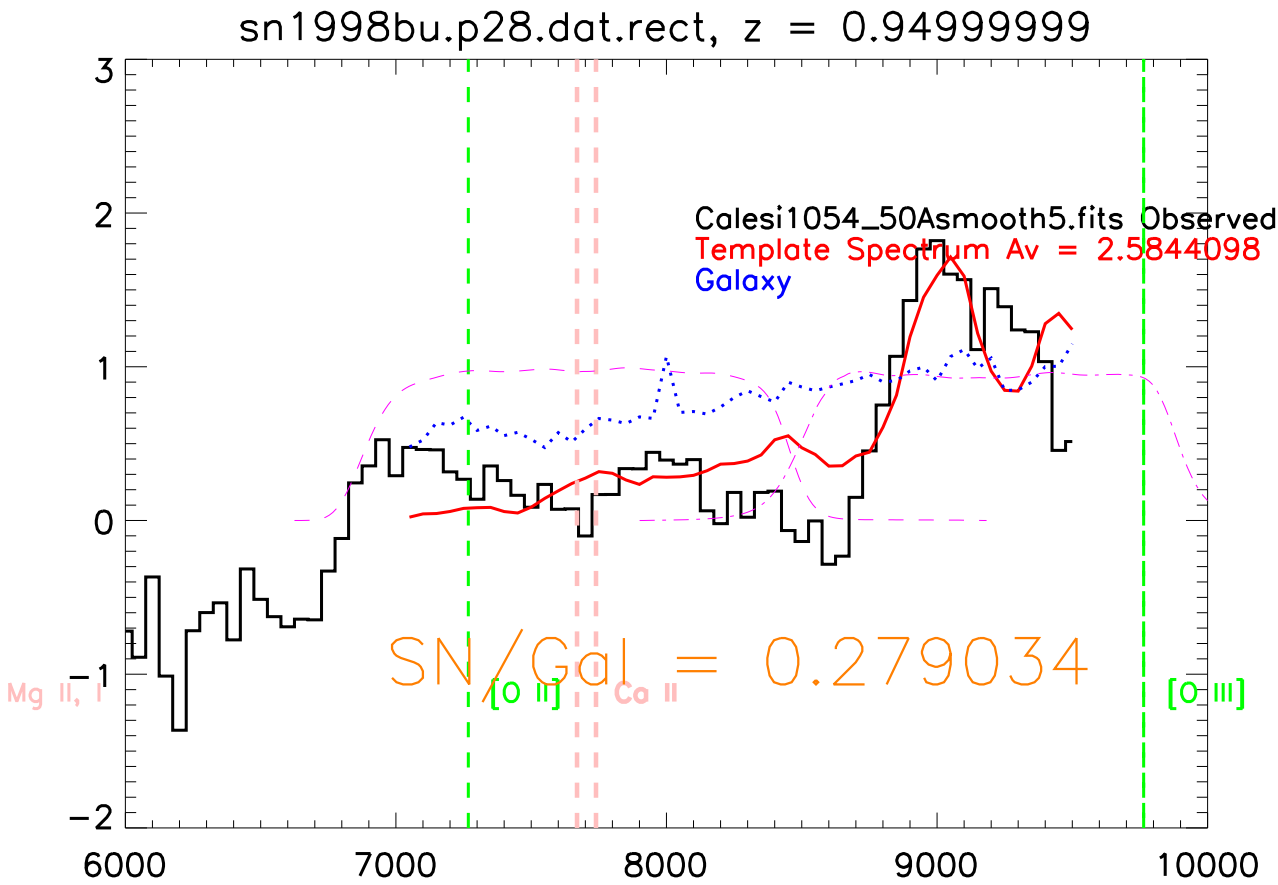

sn1994d.p25.dat.rect, z = 0.63999999
Calesi1054_50Asmooth5.fits Observed − Galaxy
Template Spectrum Av = 3.4028715
Galaxy
SN/Gal = 2.10712
[O II]
Ca II
[O III]
3
2
1
0
−1
6000
7000
8000
9000
10000

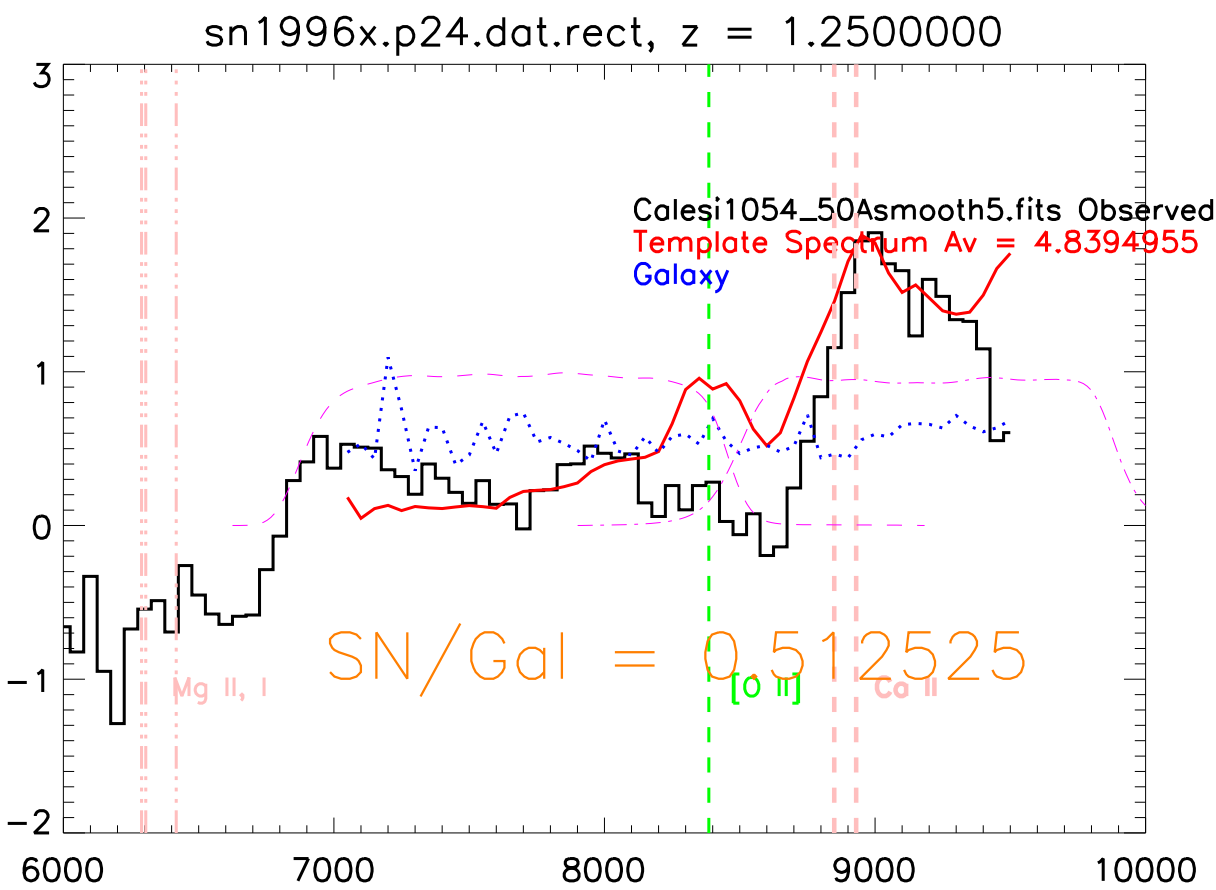
Mg II, I

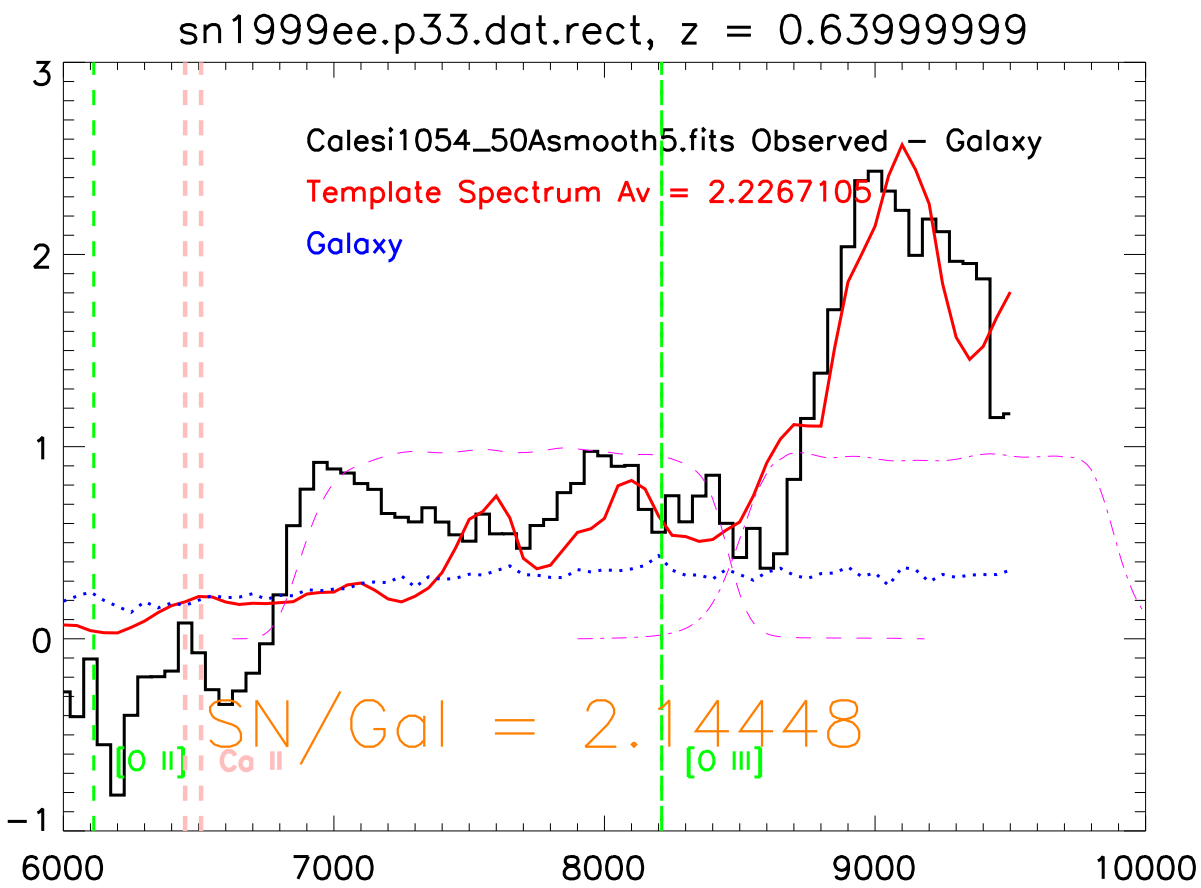

sn1996x.p22.dat.rect, z = 1.2600000
Calesi1054_50Asmooth5.fits Observed – Galax
Template Spectrum Av = 4.0862503
Galaxy
SN/Gal = 0.785496
Mg II, I
[O II]
Ca II
3
2
1
0
−1
−2
6000
7000
8000
9000
10000


sn1989b.p13.dat.rect, z = 0.94000000
Calesi1054_50Asmooth5.fits Observed
Galaxy
Template Spectrum Av = 4.0035213
Galaxy
SN/Gal = 0.289144
Mg II, I
[O II]
Ca II
[O III]
2
1
0
−1
−2
6000
7000
8000
9000
10000

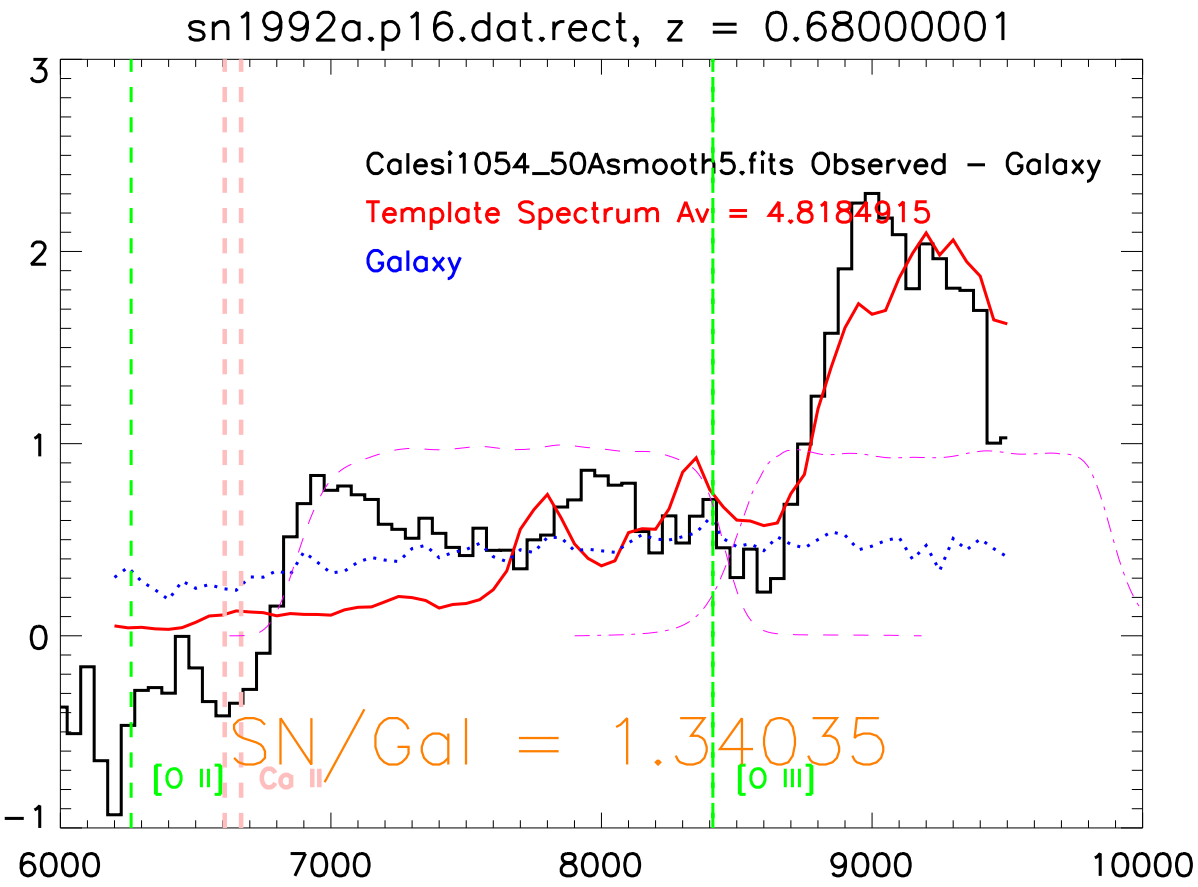

sn1981b.p35.dat.rect, z = 0.63000000
Calesi1054_50Asmooth5.fits Observed – Galaxy
Template Spectrum Av = 5.4494245
Galaxy
SN/Gal = 0.819600
[O II]
Ca II
[O III]
3
2
1
0
−1
6000
7000
8000
9000
10000


sn1998bu.p28.dat.rect, z = 0.94999999
Calesi1054_50Asmooth5.fits Observed − Galax
Template Spectrum Av = 2.5844098
Galaxy
SN/Gal = 0.279034
Mg II, I
[O II]
Ca II
[O III]
3
2
1
0
−1
−2
6000
7000
8000
9000
10000

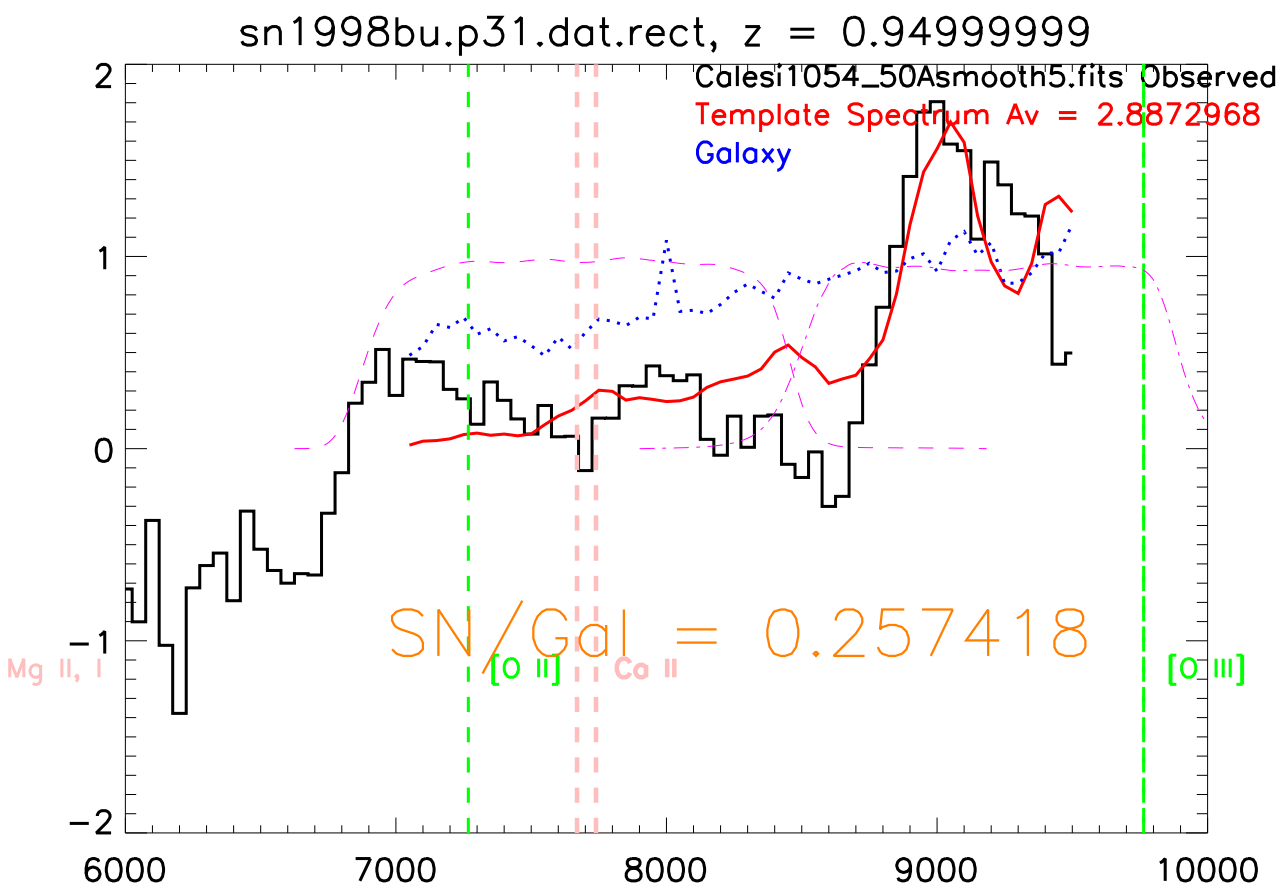

sn1996x.p24.dat.rect, z = 1.2500000
Calesi1054_50Asmooth5.fits Observed – Galax
Template Spectrum Av = 4.8394955
Galaxy
SN/Gal = 0.512525
Mg II, I
[O II]
Ca II
3
2
1
0
−1
−2
6000
7000
8000
9000
10000

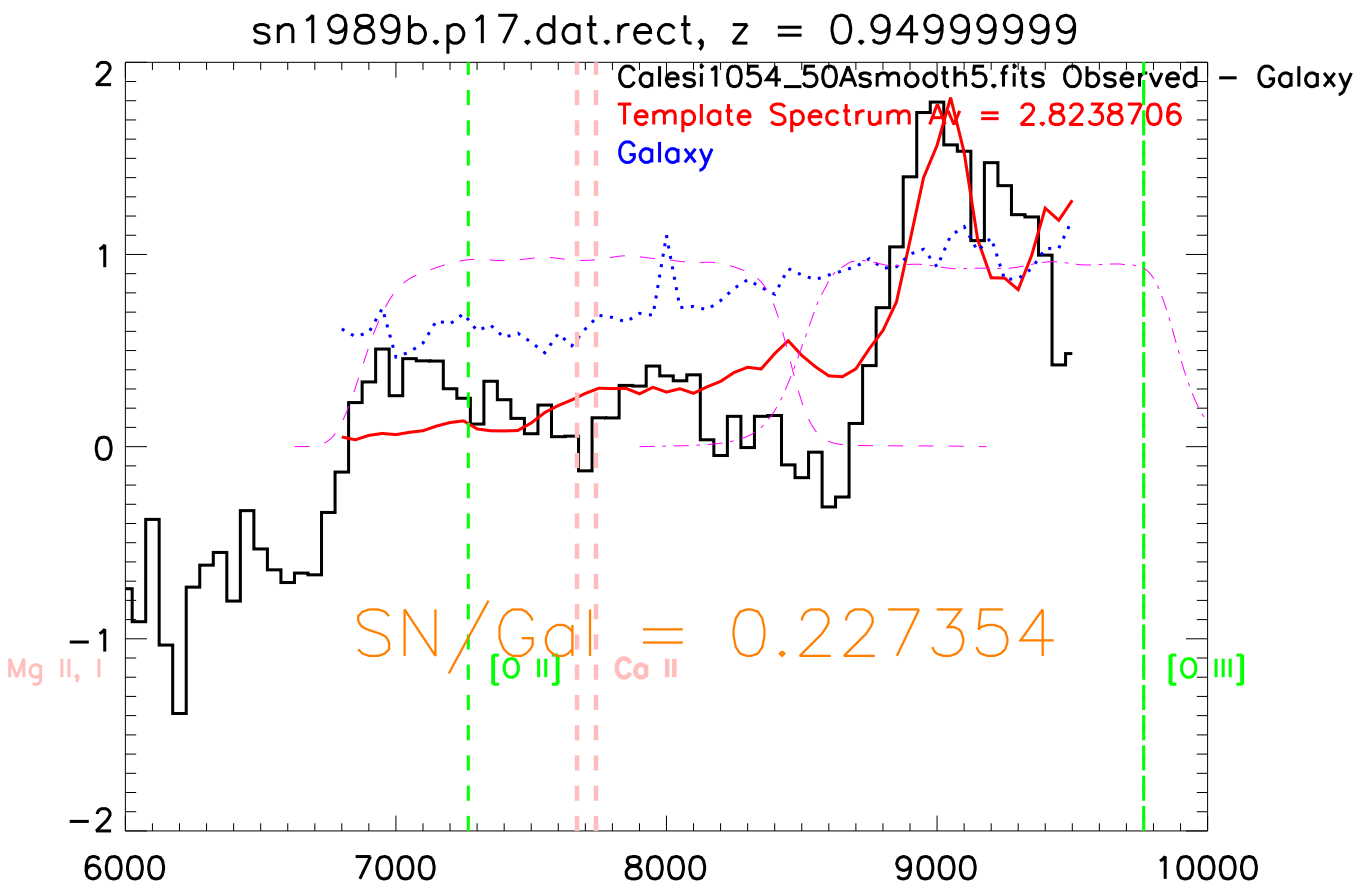

sn1999ee.p33.dat.rect, z = 0.63999999
Calesi1054_50Asmooth5.fits Observed − Galaxy
Template Spectrum Av = 2.2267105
Galaxy
SN/Gal = 2.14448
[O II]
Ca II
[O III]
3
2
1
0
−1
6000
7000
8000
9000
10000

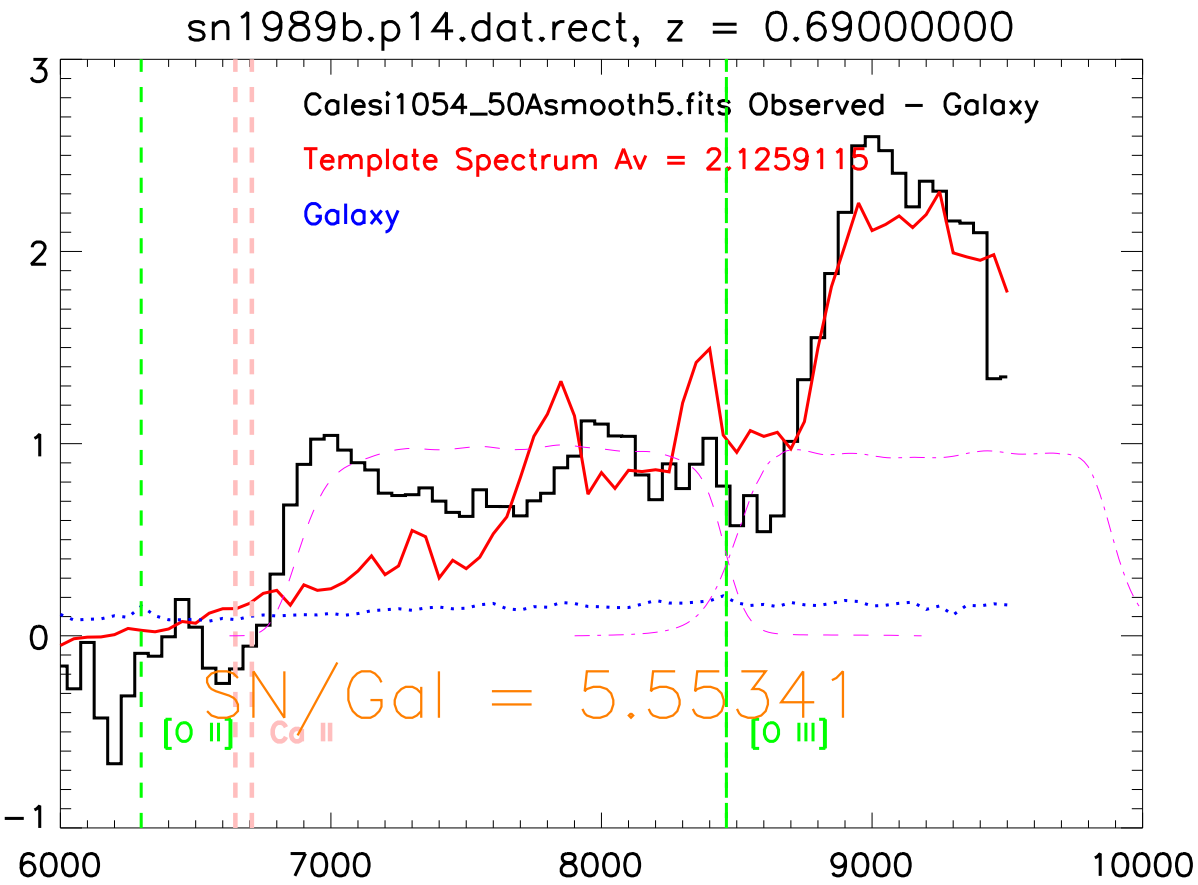
Mg II, I


sn1992a.p16.dat.rect, z = 0.68000001
Calesi1054_50Asmooth5.fits Observed − Galaxy
Template Spectrum Av = 4.81849115
Galaxy
SN/Gal = 1.34035
[O II]
Ca II
[O III]
3
2
1
0
−1
6000
7000
8000
9000
10000

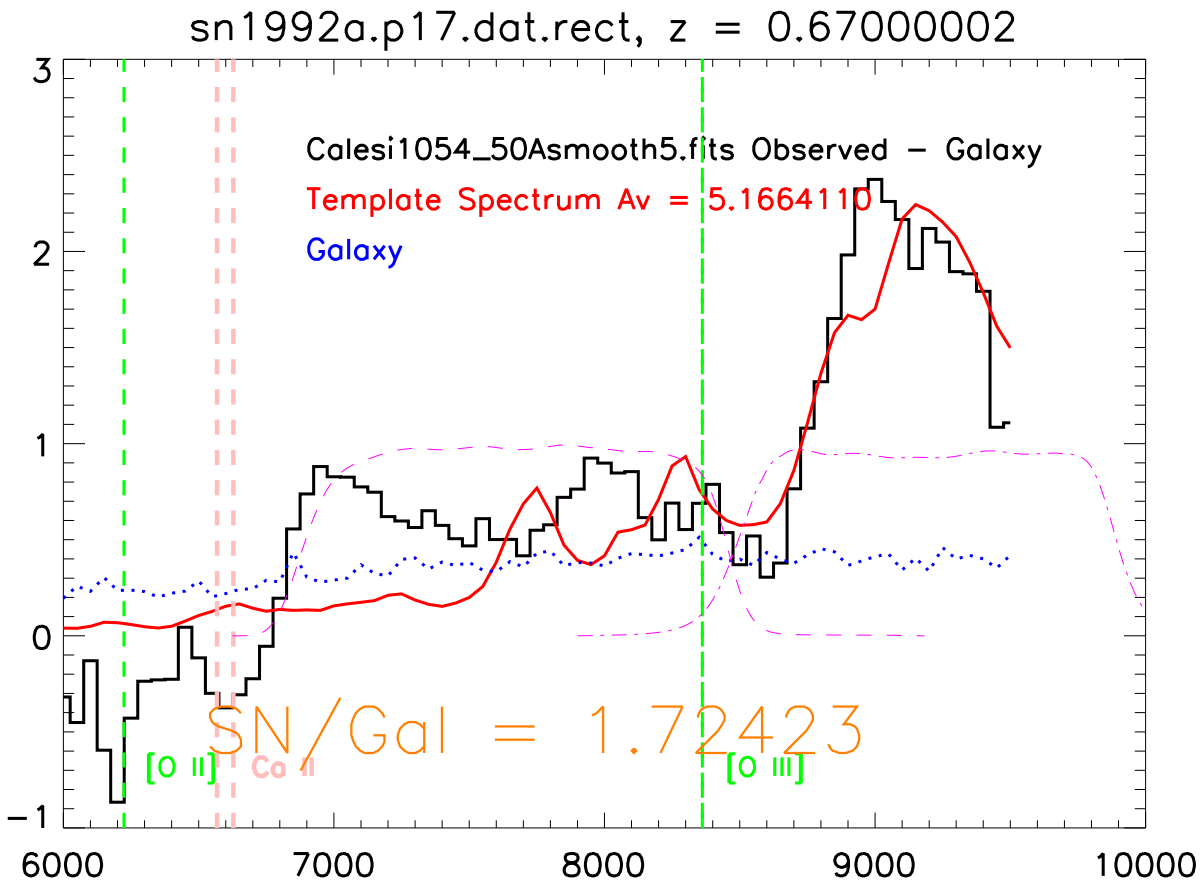
Mg II, I


sn1998bu.p31.dat.rect, z = 0.94999999
Calesi1054_50Asmooth5.fits Observed − Galax
Template Spectrum Av = 2.8872968
Galaxy
SN/Gal = 0.257418
Mg II, I
[O II]
Ca II
[O III]
2
1
0
−1
−2
6000
7000
8000
9000
10000

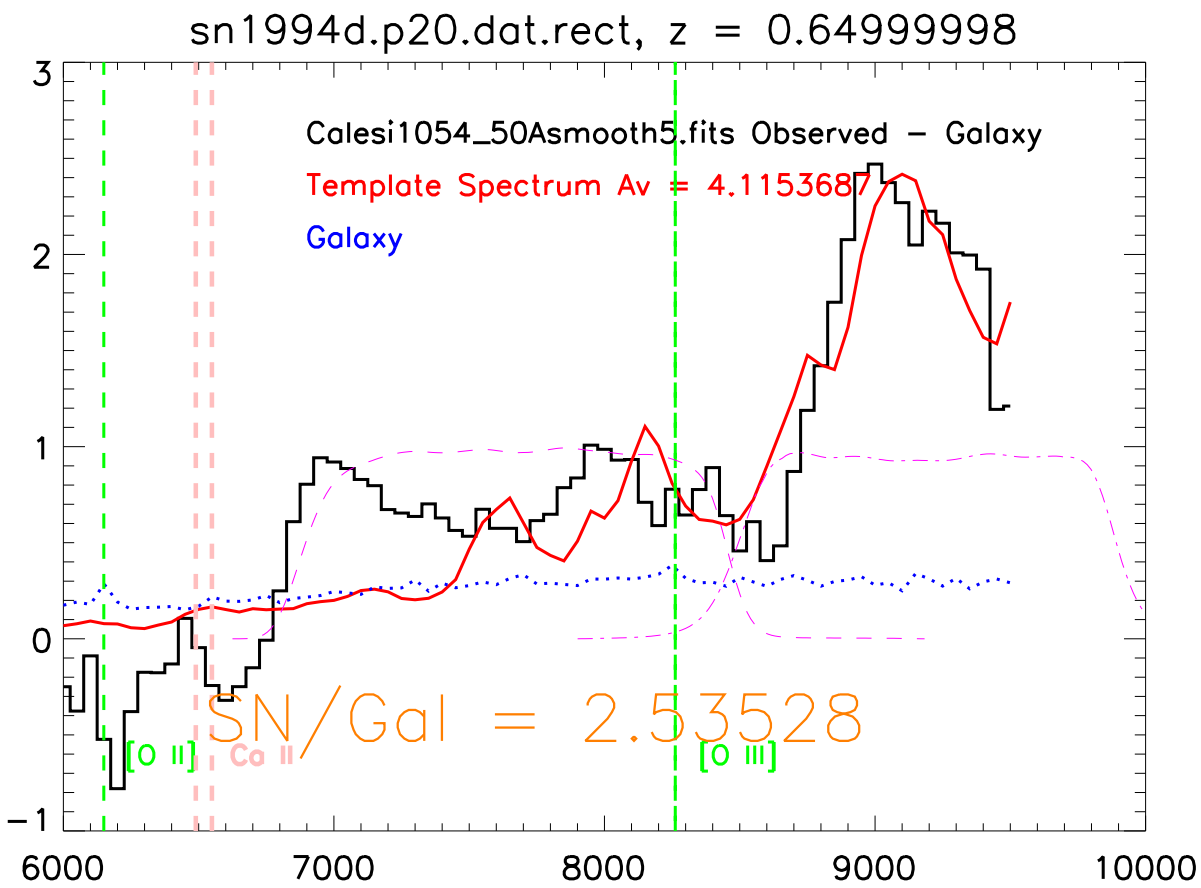

sn1989b.p17.dat.rect, z = 0.94999999
Calesi1054_50Asmooth5.fits Observed − Galaxy
Template Spectrum AV = 2.8238706
Galaxy
SN/Gal = 0.227354
Mg II, I
[O II]
Ca II
[O III]
2
1
0
−1
−2
6000
7000
8000
9000
10000


sn1989b.p14.dat.rect, z = 0.69000000
Calesi1054_50Asmooth5.fits Observed − Galaxy
Template Spectrum Av = 2.1259115
Galaxy
SN/Gal = 5.55341
[O II]
Ca II
[O III]
3
2
1
0
−1
6000
7000
8000
9000
10000

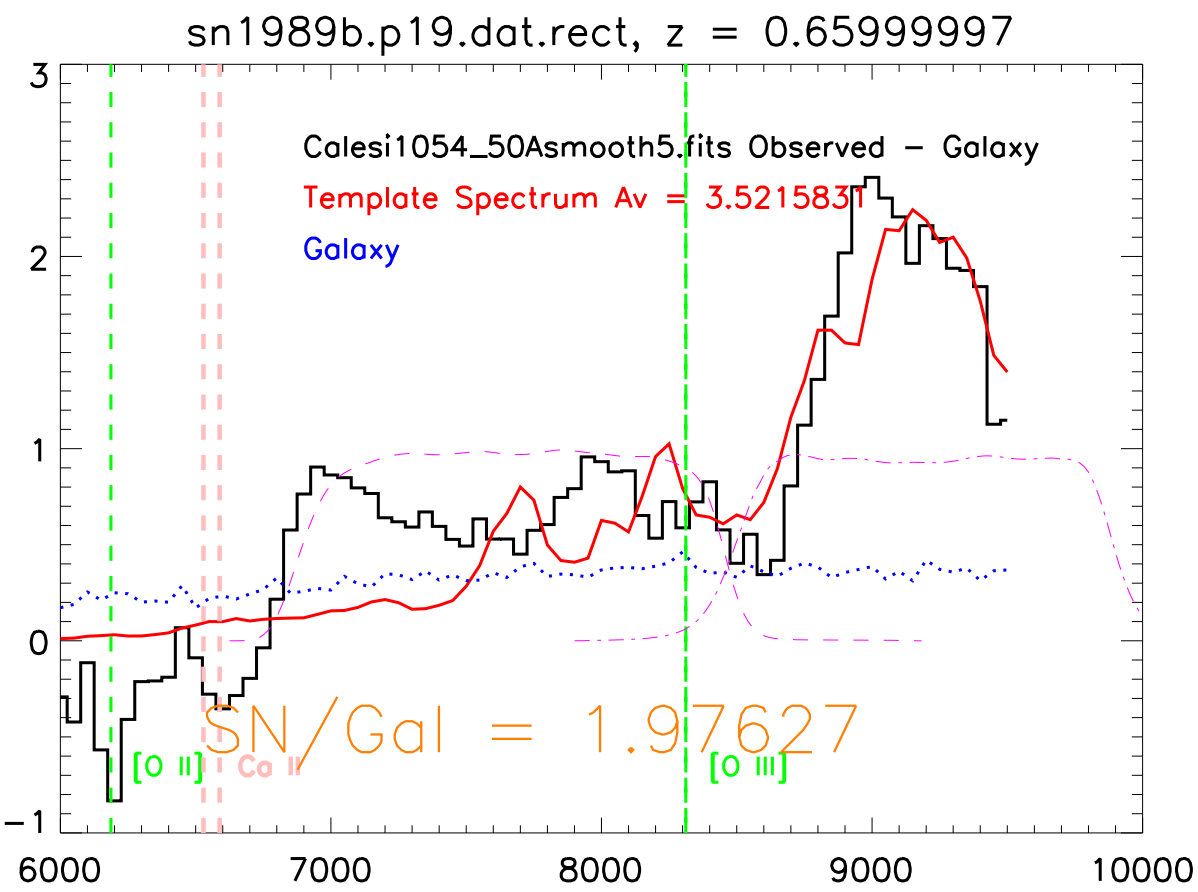
Mg II, I


sn1992a.p17.dat.rect, z = 0.67000002
Calesi1054_50Asmooth5.fits Observed − Galaxy
Template Spectrum Av = 5.1664110
Galaxy
SN/Gal = 1.72423
[O II]
Ca II
[O III]
3
2
1
0
−1
6000
7000
8000
9000
10000

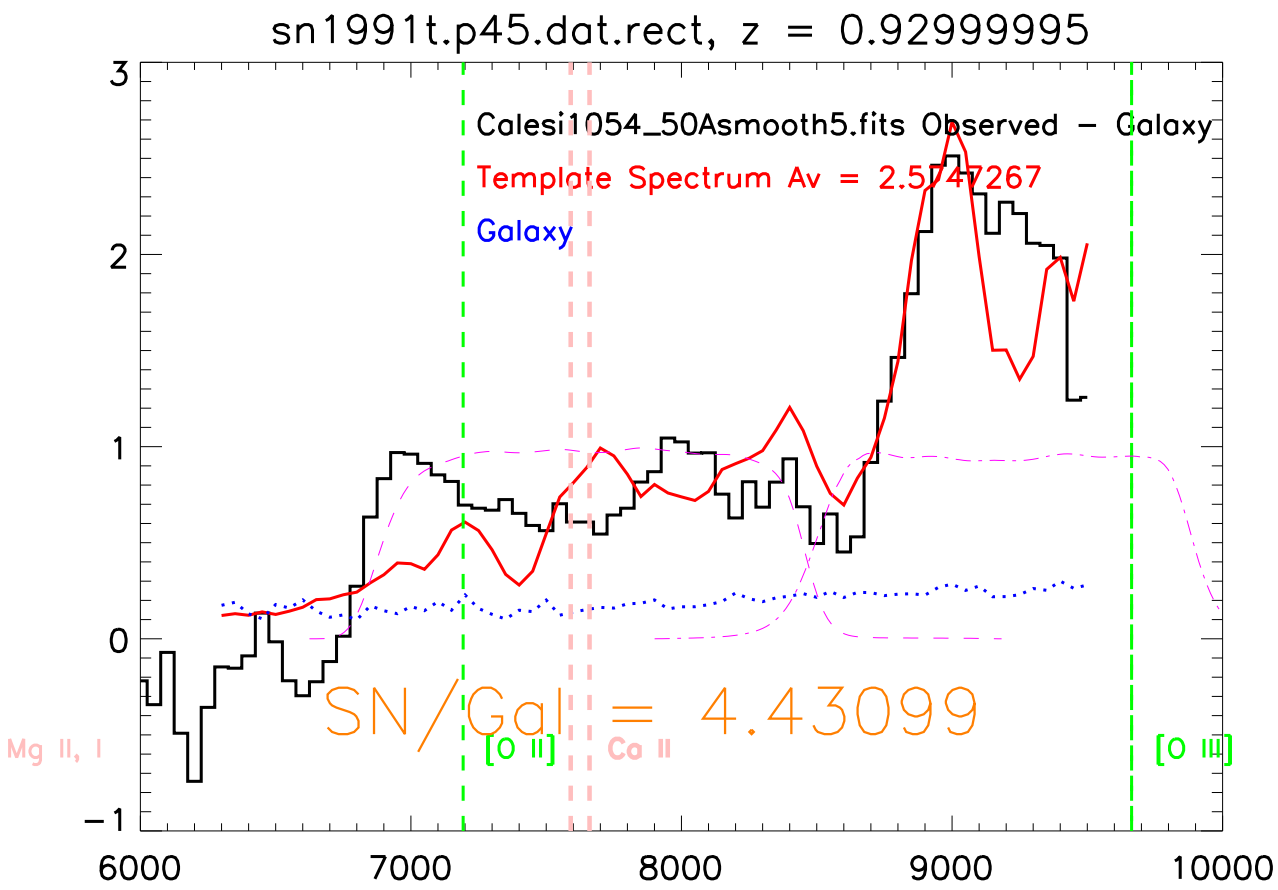
Mg II, I

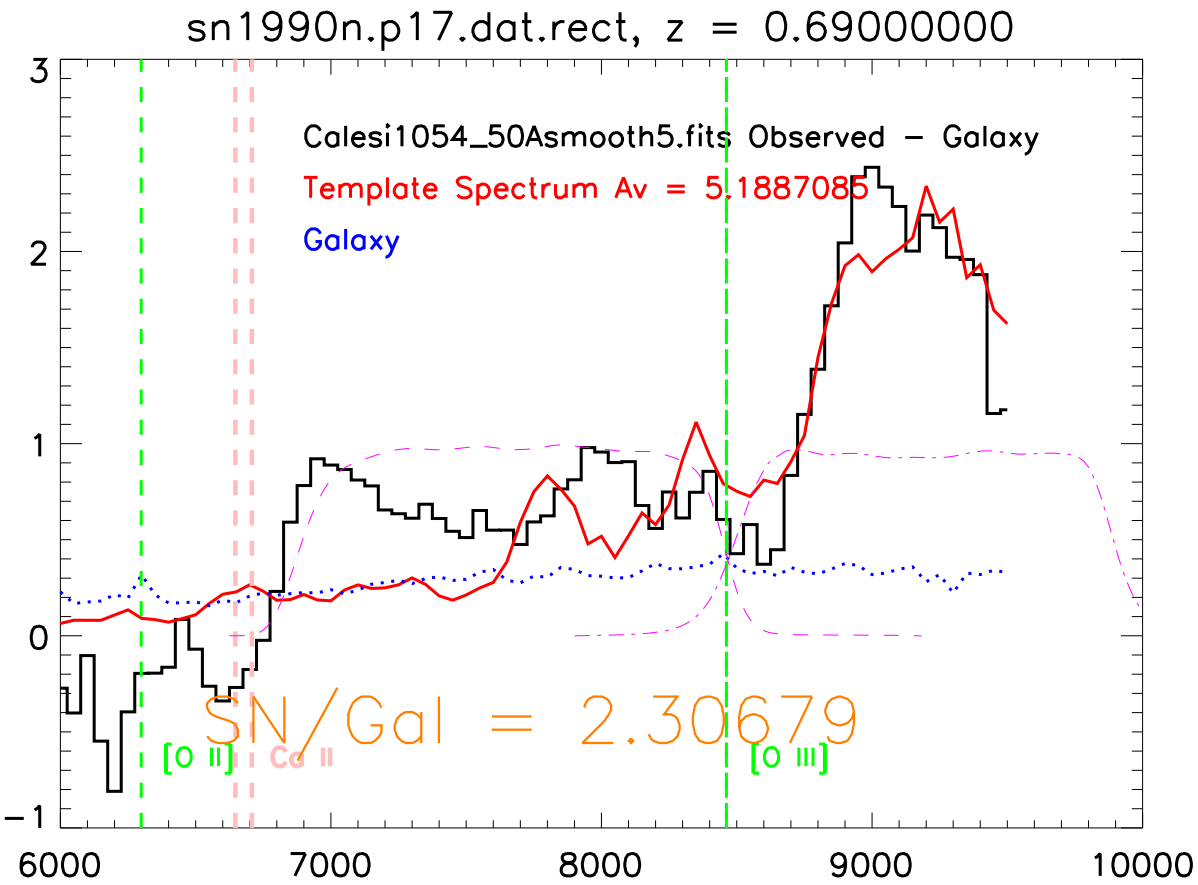

sn1994d.p20.dat.rect, z = 0.64999998
Calesi1054_50Asmooth5.fits Observed − Galaxy
Template Spectrum Av = 4.1153687
Galaxy
SN/Gal = 2.53528
[O II]
Ca II
[O III]
3
2
1
0
−1
6000
7000
8000
9000
10000

Mg II, I


sn1989b.p19.dat.rect, z = 0.65999997
Calesi1054_50Asmooth5.fits Observed – Galaxy
Template Spectrum Av = 3.5215831
Galaxy
SN/Gal = 1.97627
[O II]
Ca II
[O III]
3
2
1
0
−1
6000
7000
8000
9000
10000

Mg II, I


sn1991t.p45.dat.rect, z = 0.92999995
Calesi1054_50Asmooth5.fits Observed − Galaxy
Template Spectrum Av = 2.5747267
Galaxy
SN/Gal = 4.43099
Mg II, I
[O II]
Ca II
[O III]
3
2
1
0
−1
6000
7000
8000
9000
10000


sn1990n.p17.dat.rect, z = 0.69000000
Calesi1054_50Asmooth5.fits Observed − Galaxy
Template Spectrum Av = 5.1887085
Galaxy
SN/Gal = 2.30679
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Ca II
[O III]
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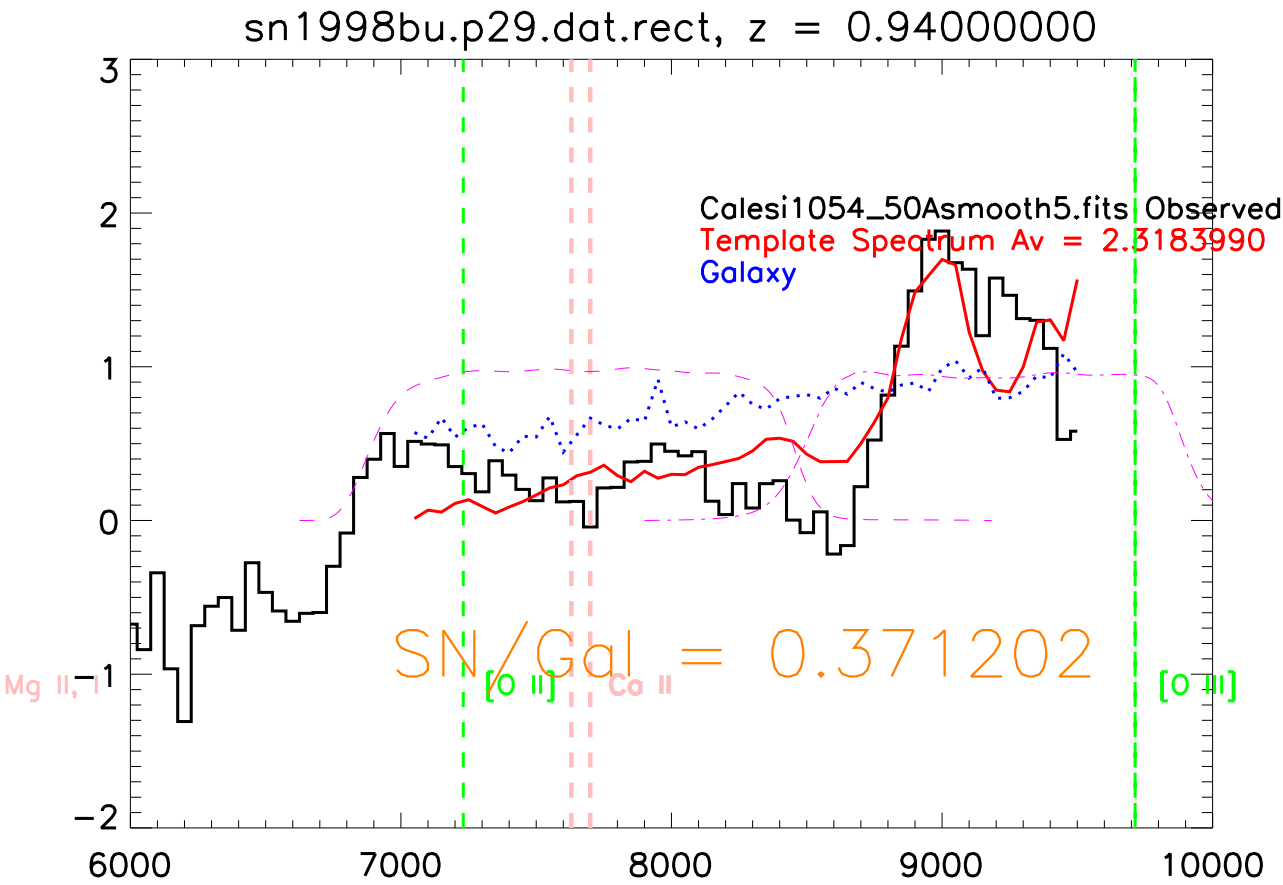
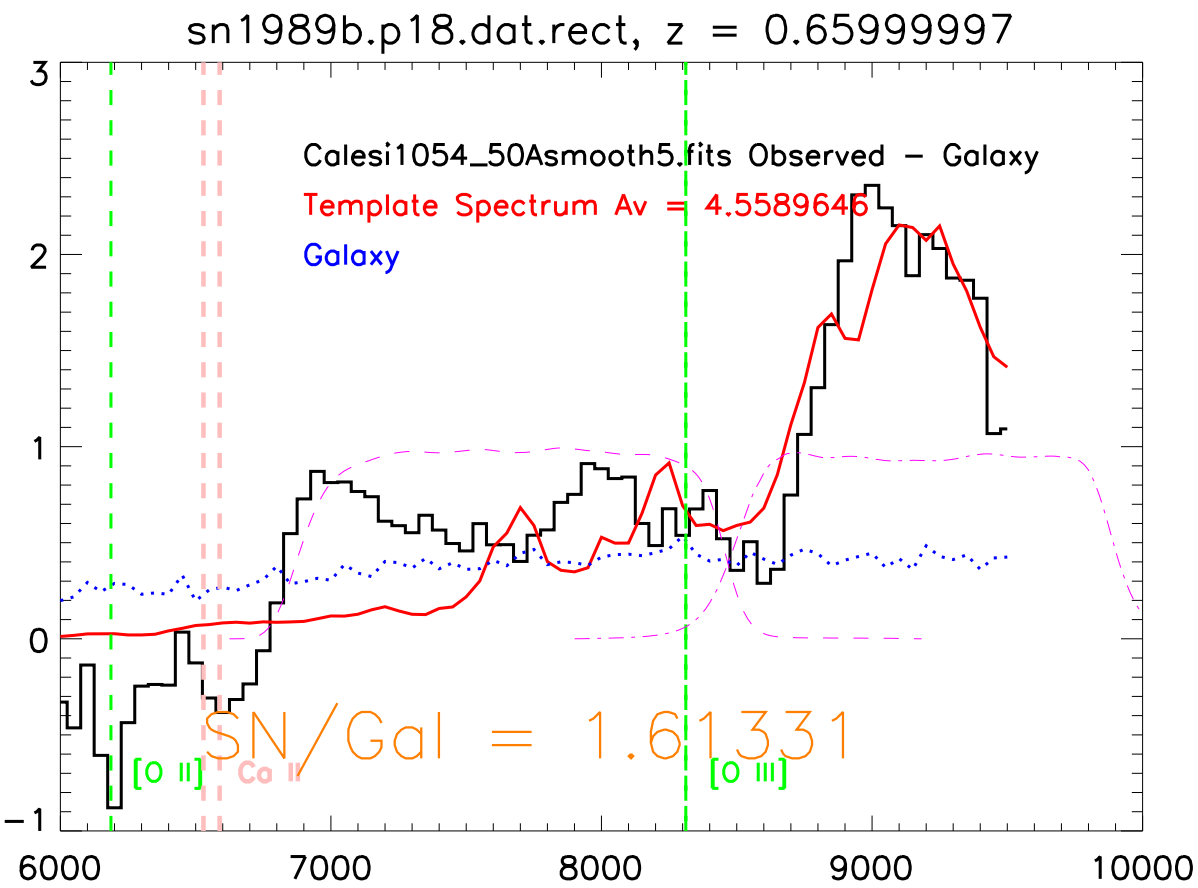
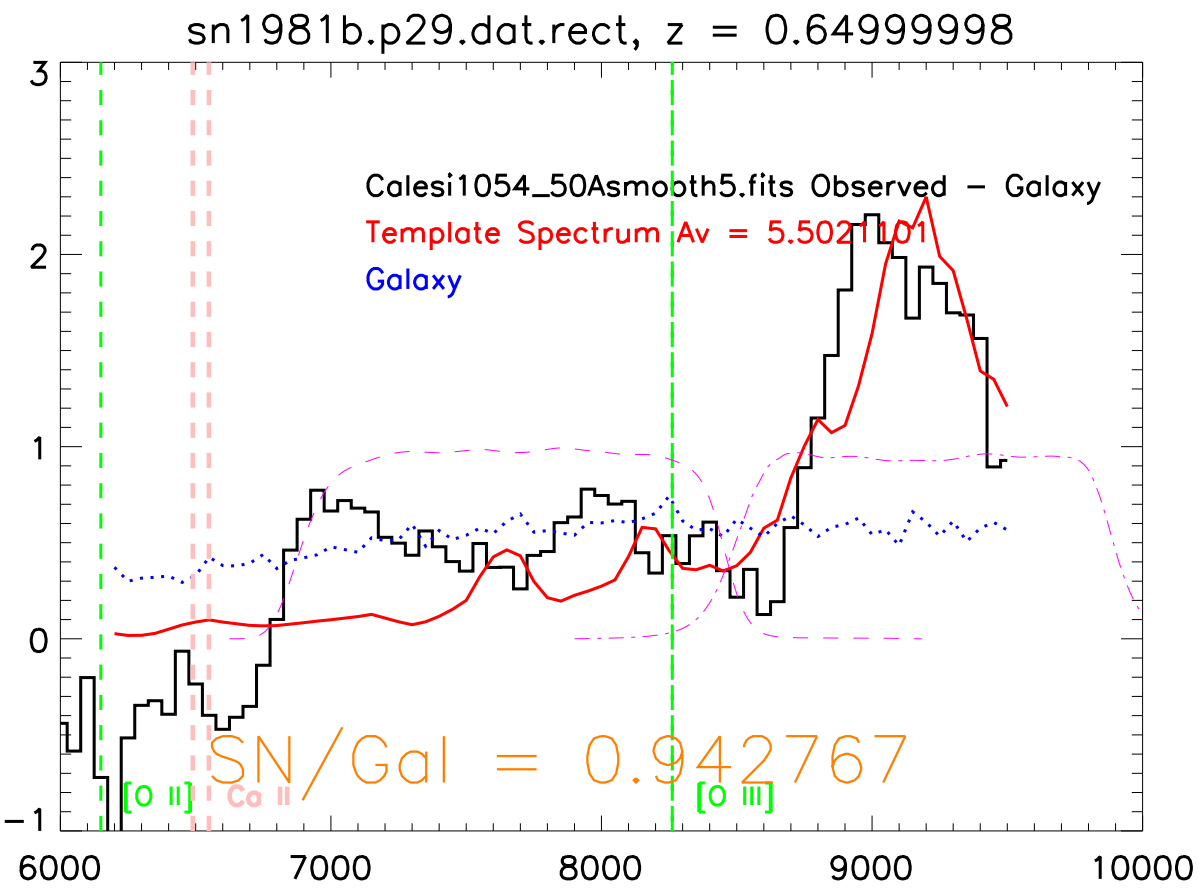
2
1
0
−1
6000
7000
8000
9000
10000

Mg II, I

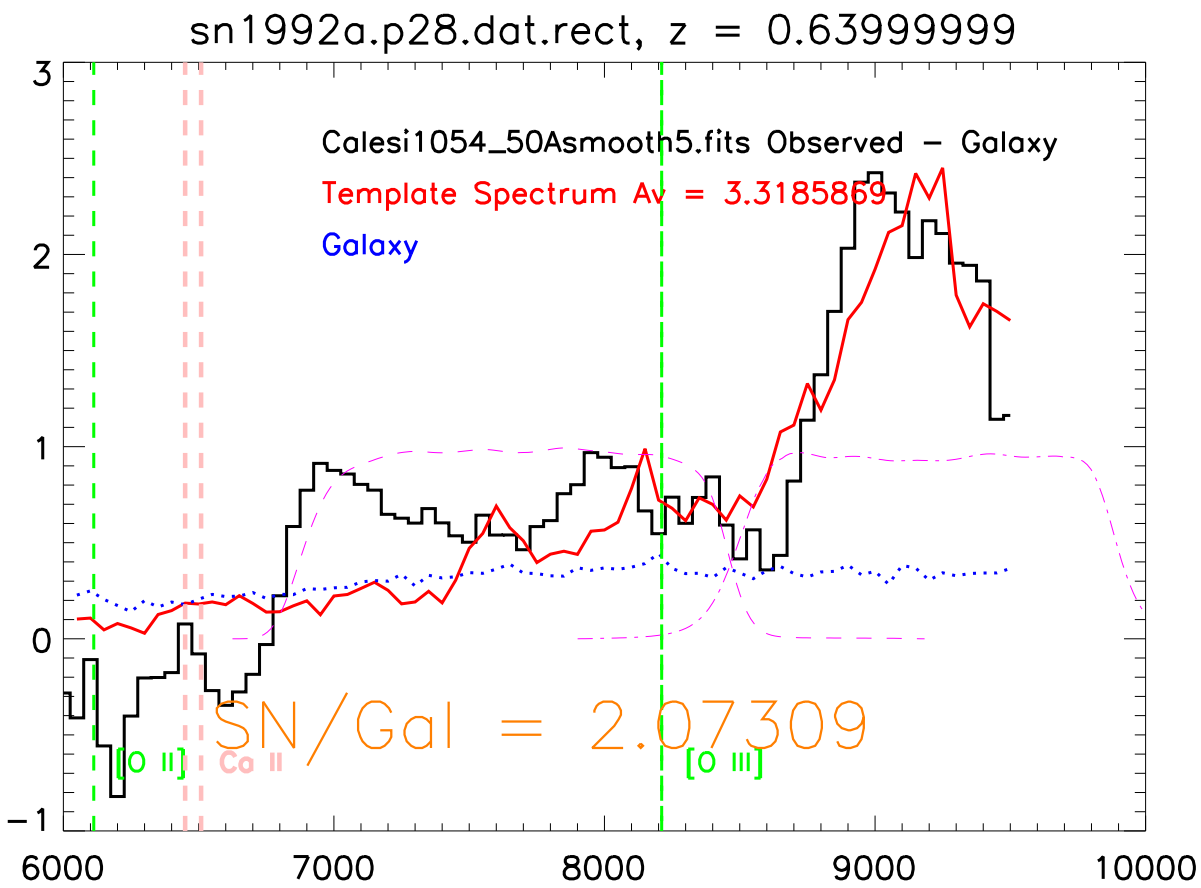

sn1998bu.p29.dat.rect, z = 0.94000000
Calesi1054_50Asmooth5.fits Observed − Galax
Template Spectrum Av = 2.3183990
Galaxy
SN/Gal = 0.371202
Mg II,
[O II]
Ca II
[O III]
3
2
1
0
−1
−2
6000
7000
8000
9000
10000


sn1989b.p18.dat.rect, z = 0.65999997
Calesi1054_50Asmooth5.fits Observed − Galaxy
Template Spectrum Av = 4.5589646
Galaxy
SN/Gal = 1.61331
[O II]
Ca II
[O III]
3
2
1
0
−1
6000
7000
8000
9000
10000

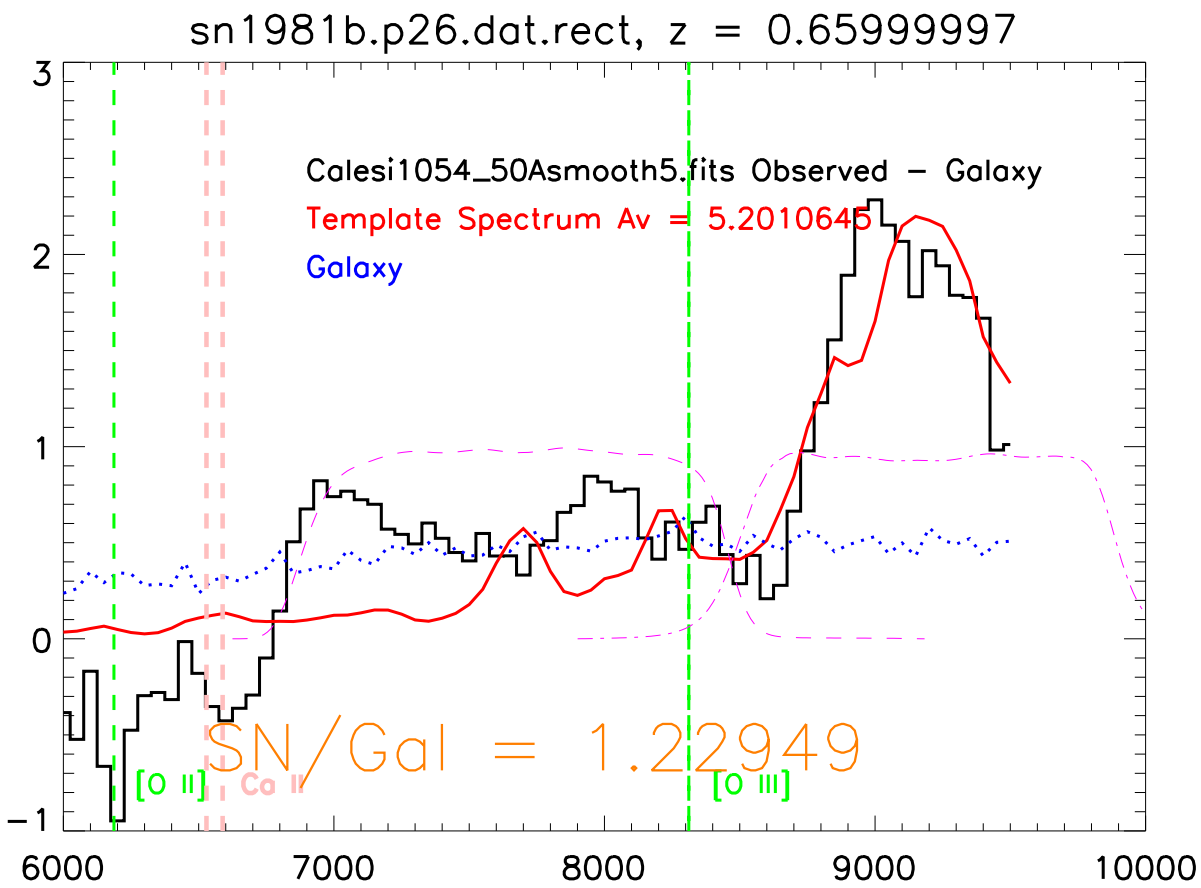
Mg II, I


sn1981b.p29.dat.rect, z = 0.64999998
Calesi1054_50Asmooth5.fits Observed − Galaxy
Template Spectrum Av = 5.5021101
Galaxy
SN/Gal = 0.942767
[O II]
Co II
[O III]
3
2
1
0
−1
6000
7000
8000
9000
10000

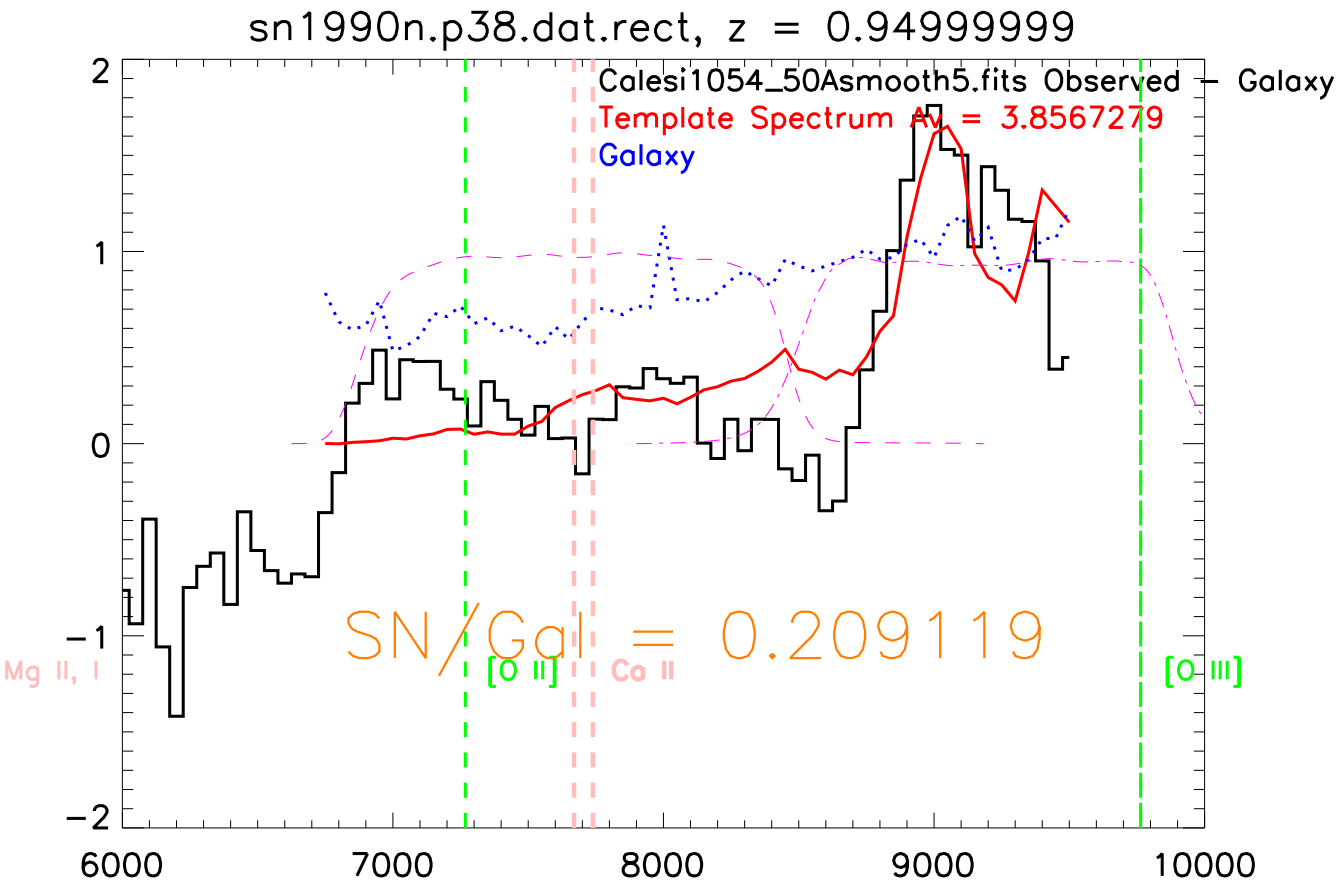
Mg II, I

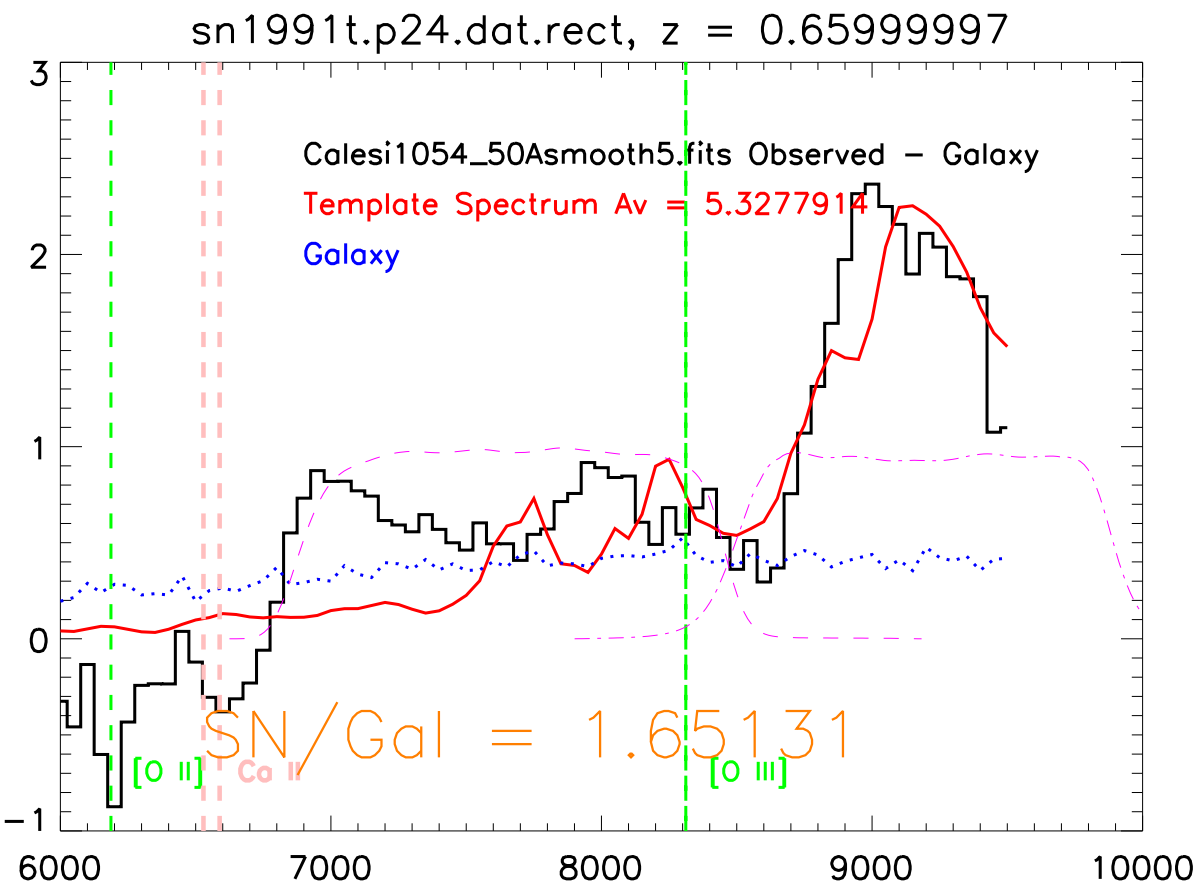

sn1992a.p28.dat.rect, z = 0.63999999
Calesi1054_50Asmooth5.fits Observed − Galaxy
Template Spectrum Av = 3.3185869
Galaxy
SN/Gal = 2.07309
[O II]
Ca II
[O III]
3
2
1
0
−1
6000
7000
8000
9000
10000

Mg II, I

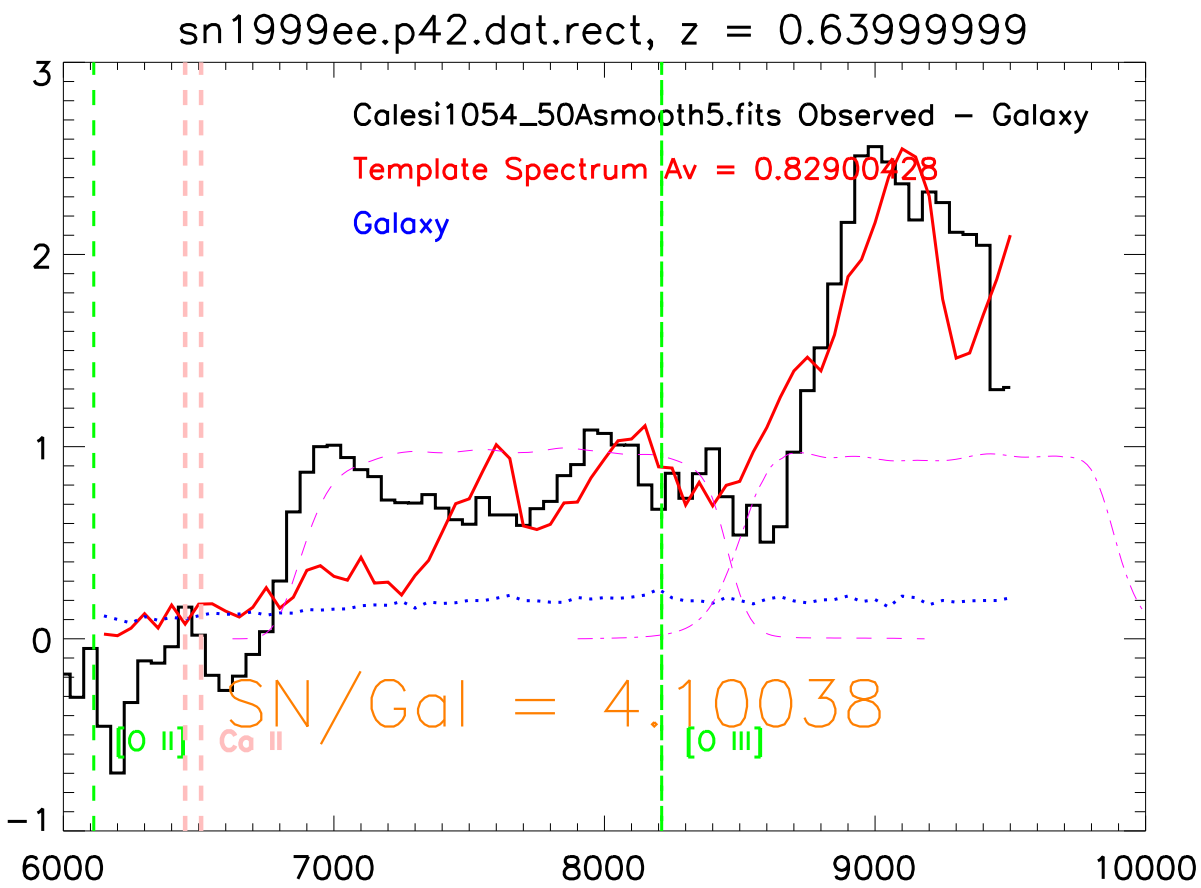

sn1981b.p26.dat.rect, z = 0.65999997
Calesi1054_50Asmooth5.fits Observed − Galaxy
Template Spectrum Av = 5.2010645
Galaxy
SN/Gal = 1.22949
[O II]
Ca II
[O III]
3
2
1
0
−1
6000
7000
8000
9000
10000

Mg II, I


sn1990n.p38.dat.rect, z = 0.94999999
Calesi1054_50Asmooth5.fits Observed
Galaxy
Template Spectrum AV = 3.8567279
Galaxy
SN/Gal = 0.209119
Mg II, I
[O II]
Ca II
[O III]
2
1
0
−1
−2
6000
7000
8000
9000
10000


sn1991t.p24.dat.rect, z = 0.65999997
Calesi1054_50Asmooth5.fits Observed − Galaxy
Template Spectrum Av = 5.3277914
Galaxy
SN/Gal = 1.65131
[O II]
Ca II
[O III]
3
2
1
0
−1
6000
7000
8000
9000
10000

Mg II, I


sn1999ee.p42.dat.rect, z = 0.63999999
Calesi1054_50Asmooth5.fits Observed − Galaxy
Template Spectrum Av = 0.82900428
Galaxy
SN/Gal = 4.10038
[O II]
Ca II
[O III]
3
2
1
0
−1
6000
7000
8000
9000
10000

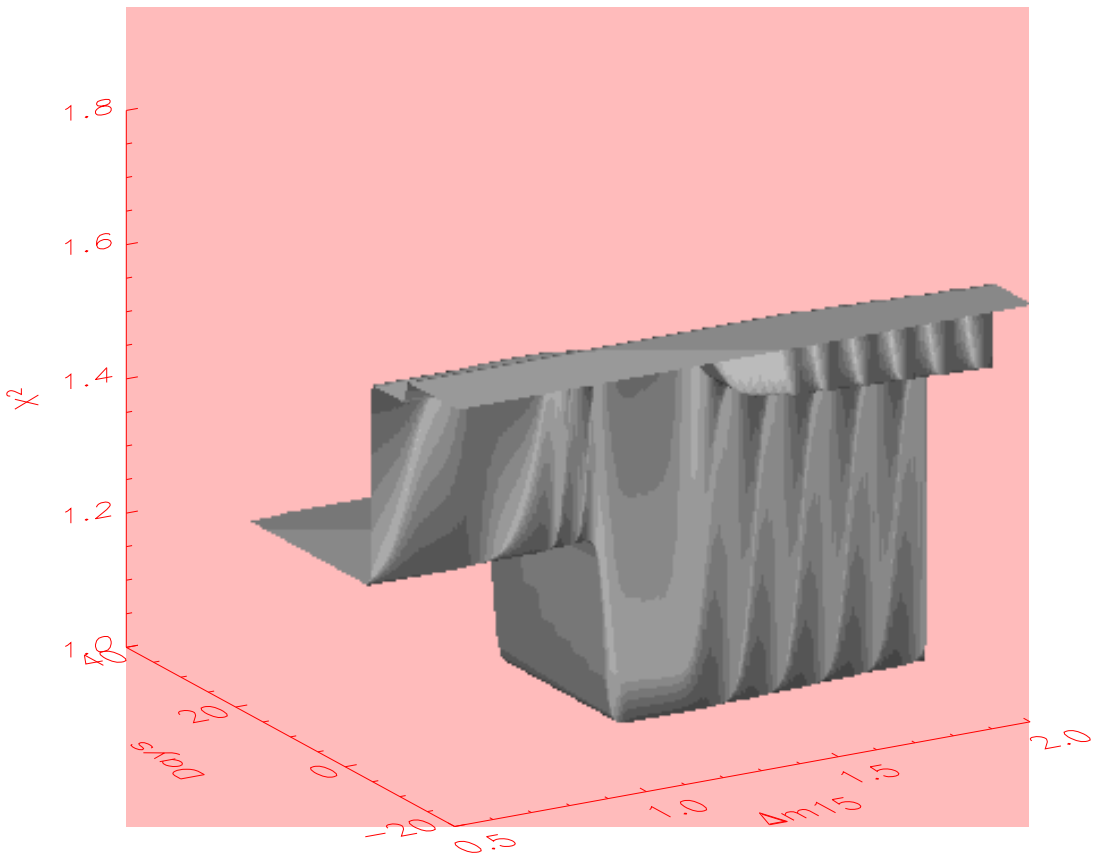
Mg II, I

1.3 1.0

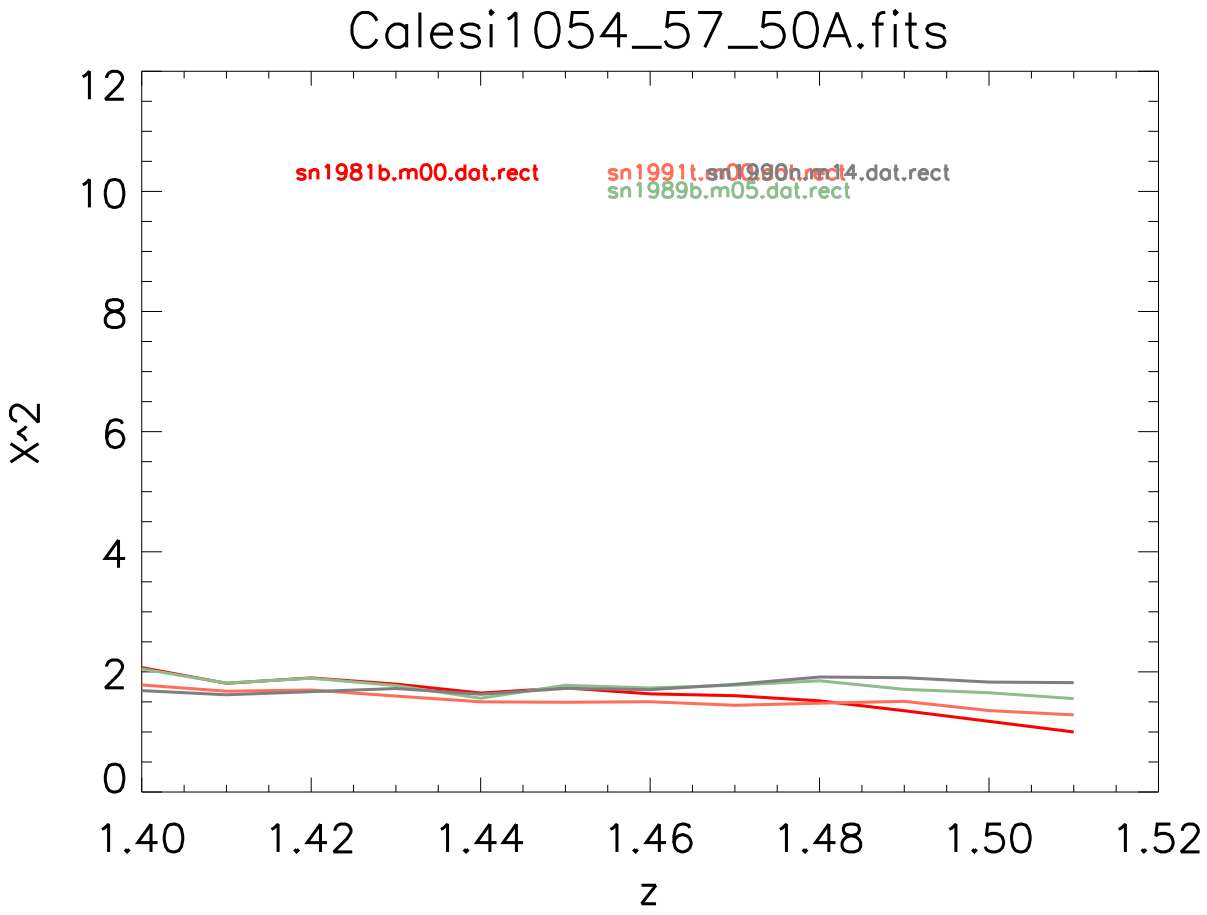
1.6 1.5

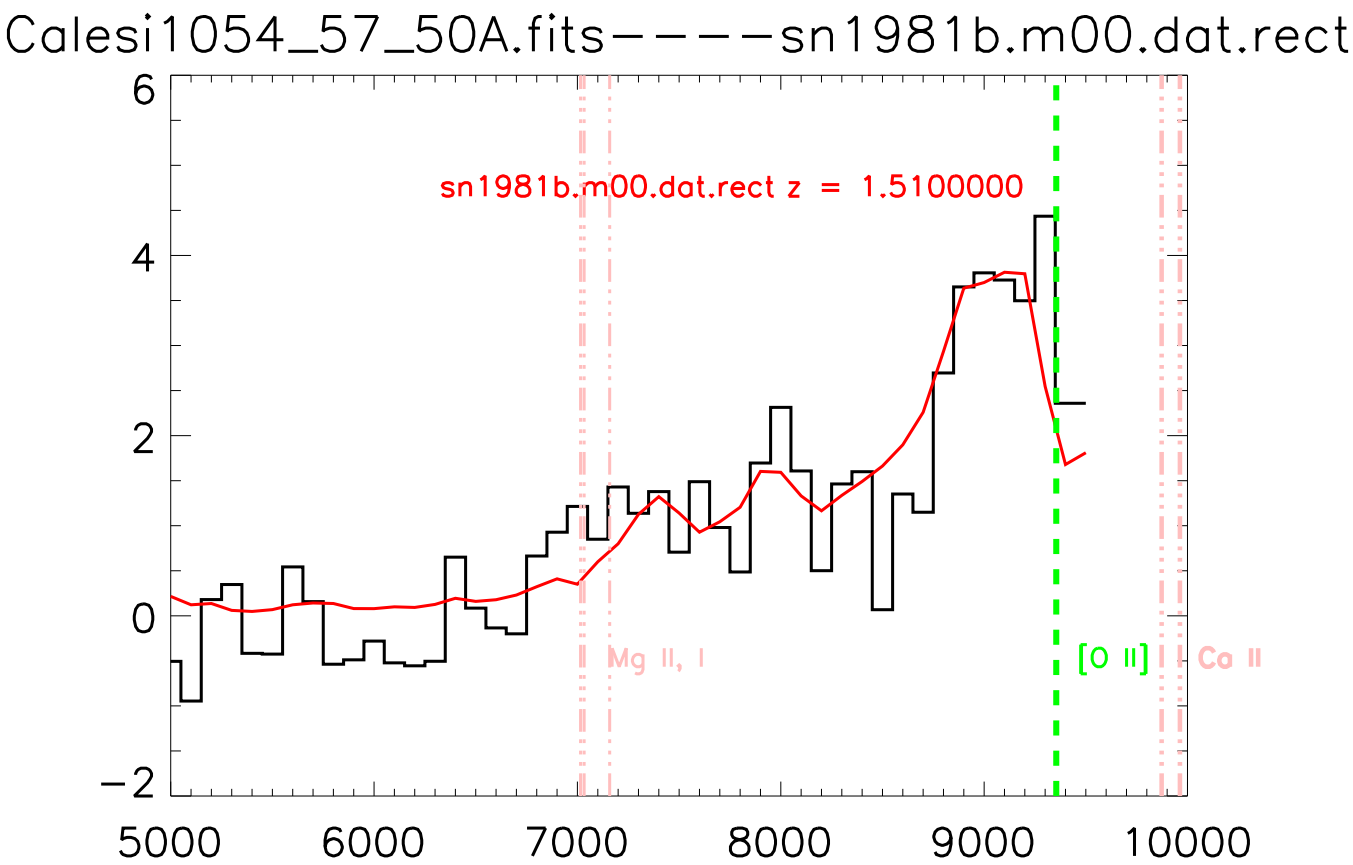
1.6

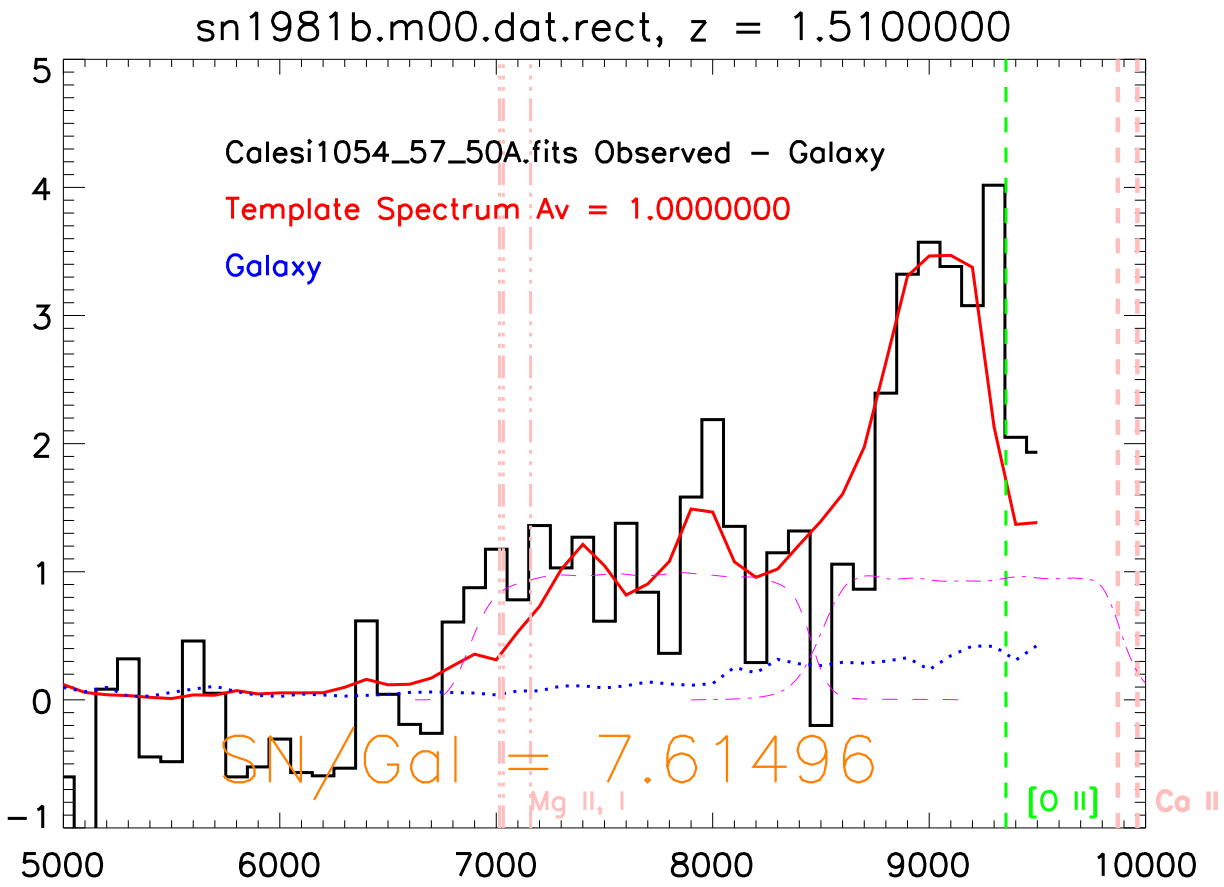
1.6

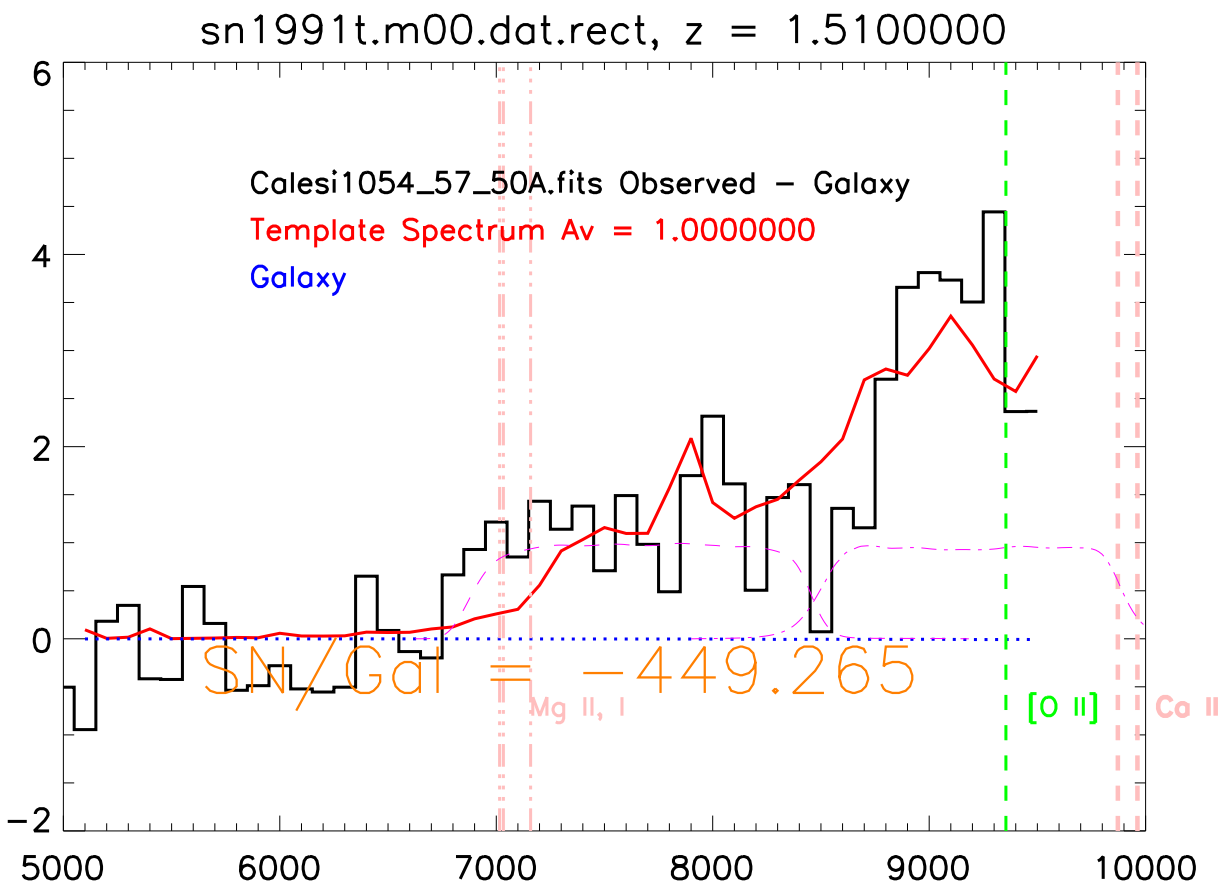


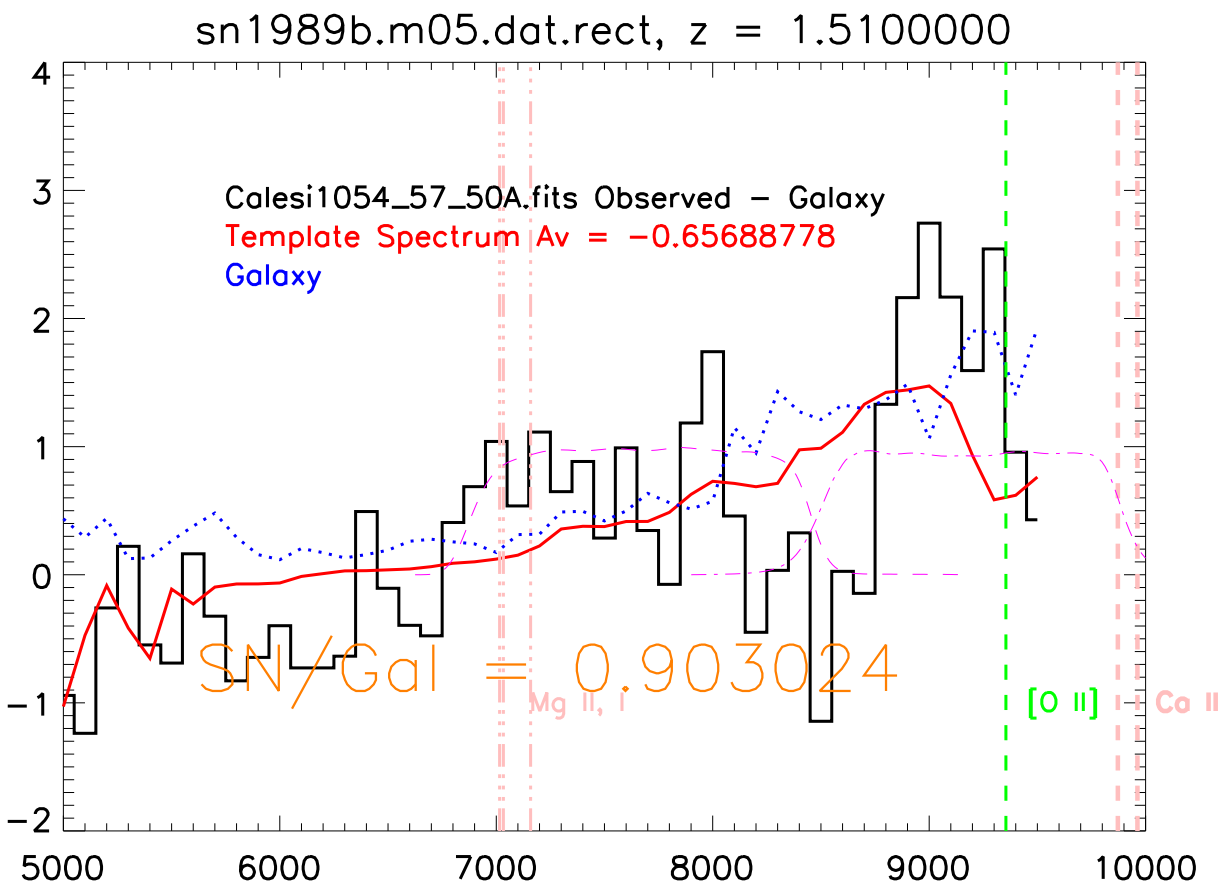
1.8
1.6
1.4
1.2
1.0
χ^2
40
20
0
−20
Days
0.5
1.0
1.5
2.0
Δm15

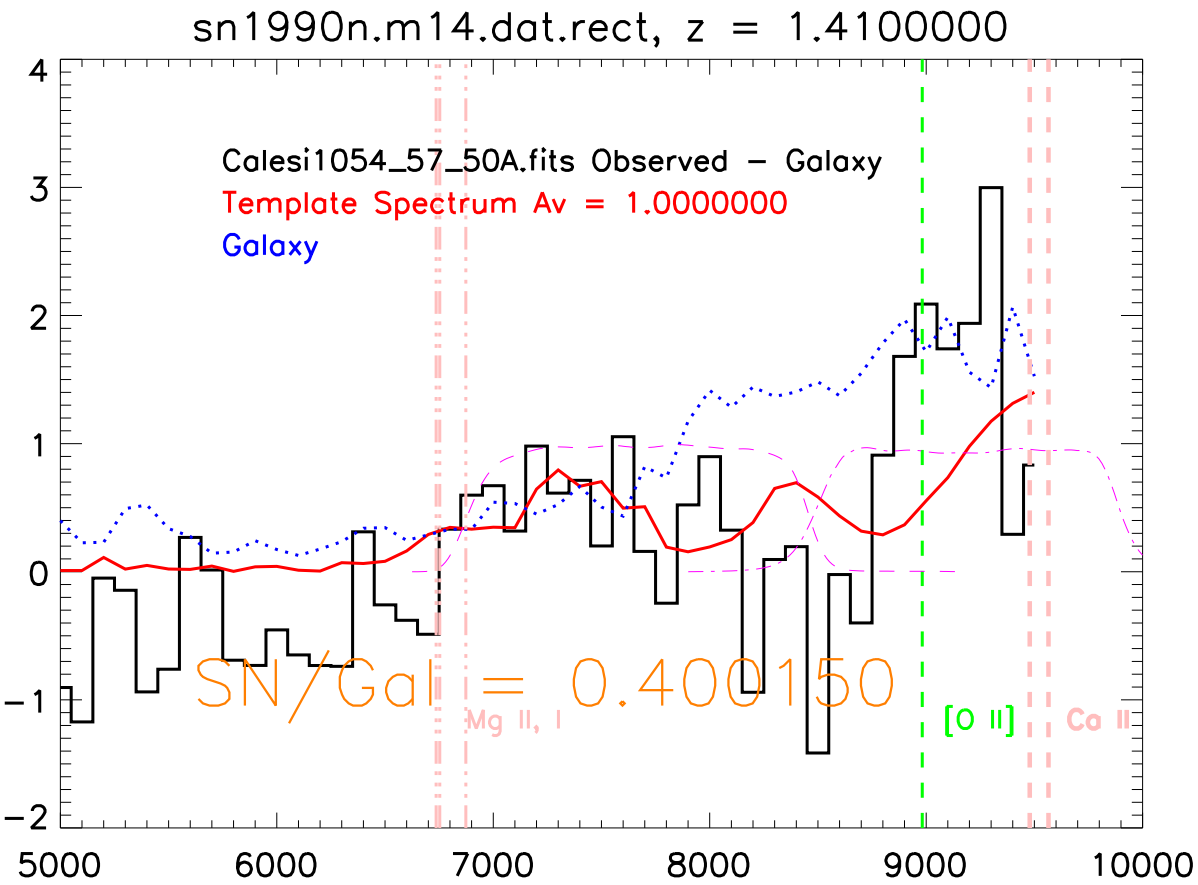

Calesi1054_57_50A.fits
sn1981b.m00.dat.rect
sn1989b.m05.dat.rect
X^2
z
0
2
4
6
8
10
12
1.40
1.42
1.44
1.46
1.48
1.50
1.52


Calesi1054_57_50A.fits----sn1981b.m00.dat.rect
sn1981b.m00.dat.rect z = 1.5100000
Mg II, I
[O II]
Ca II
6
4
2
0
−2
5000
6000
7000
8000
9000
10000

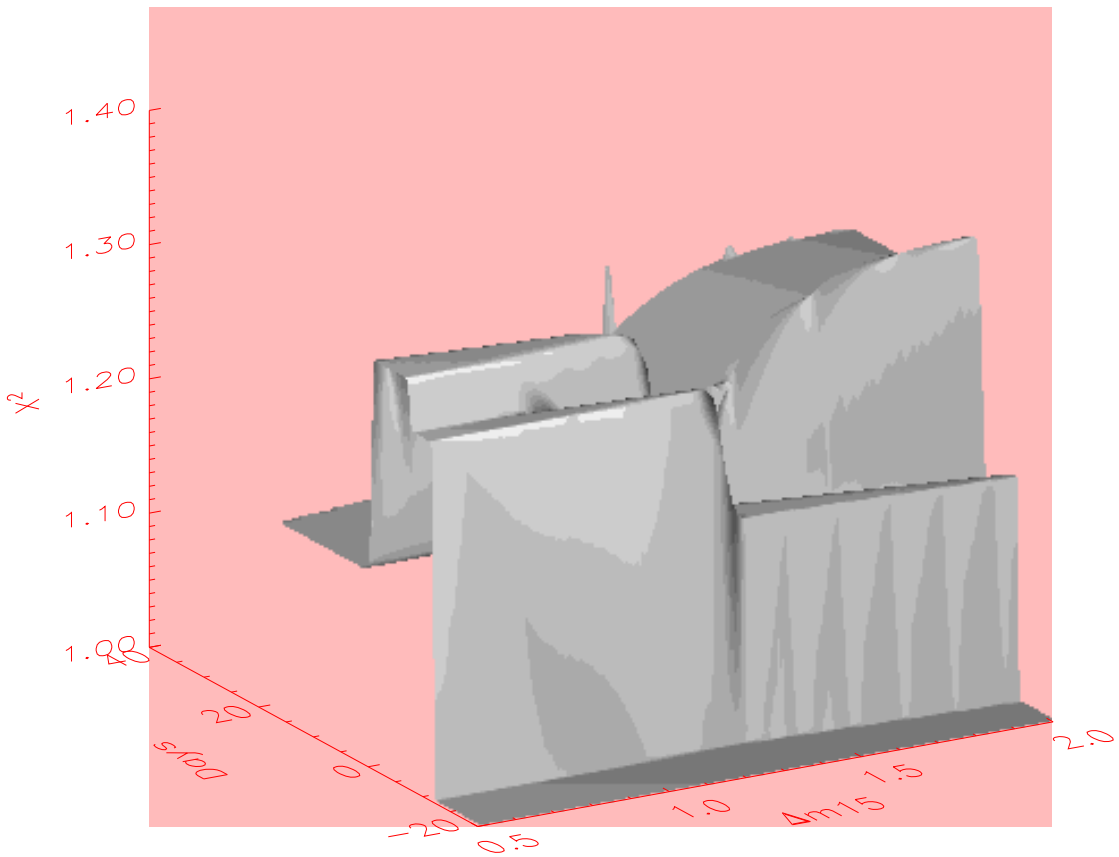

sn1981b.m00.dat.rect, z = 1.5100000
Calesi1054_57_50A.fits Observed − Galaxy
Template Spectrum Av = 1.0000000
Galaxy
S/N Gal = 7.61496
Mg II, I
[O II]
Ca II
5
4
3
2
1
0
−1
5000
6000
7000
8000
9000
10000


sn1991t.m00.dat.rect, z = 1.5100000
Calesi1054_57_50A.fits Observed − Galaxy
Template Spectrum Av = 1.0000000
Galaxy
SN/Gal = −449.265
Mg II, I
[O II]
Ca II
6
4
2
0
−2
5000
6000
7000
8000
9000
10000

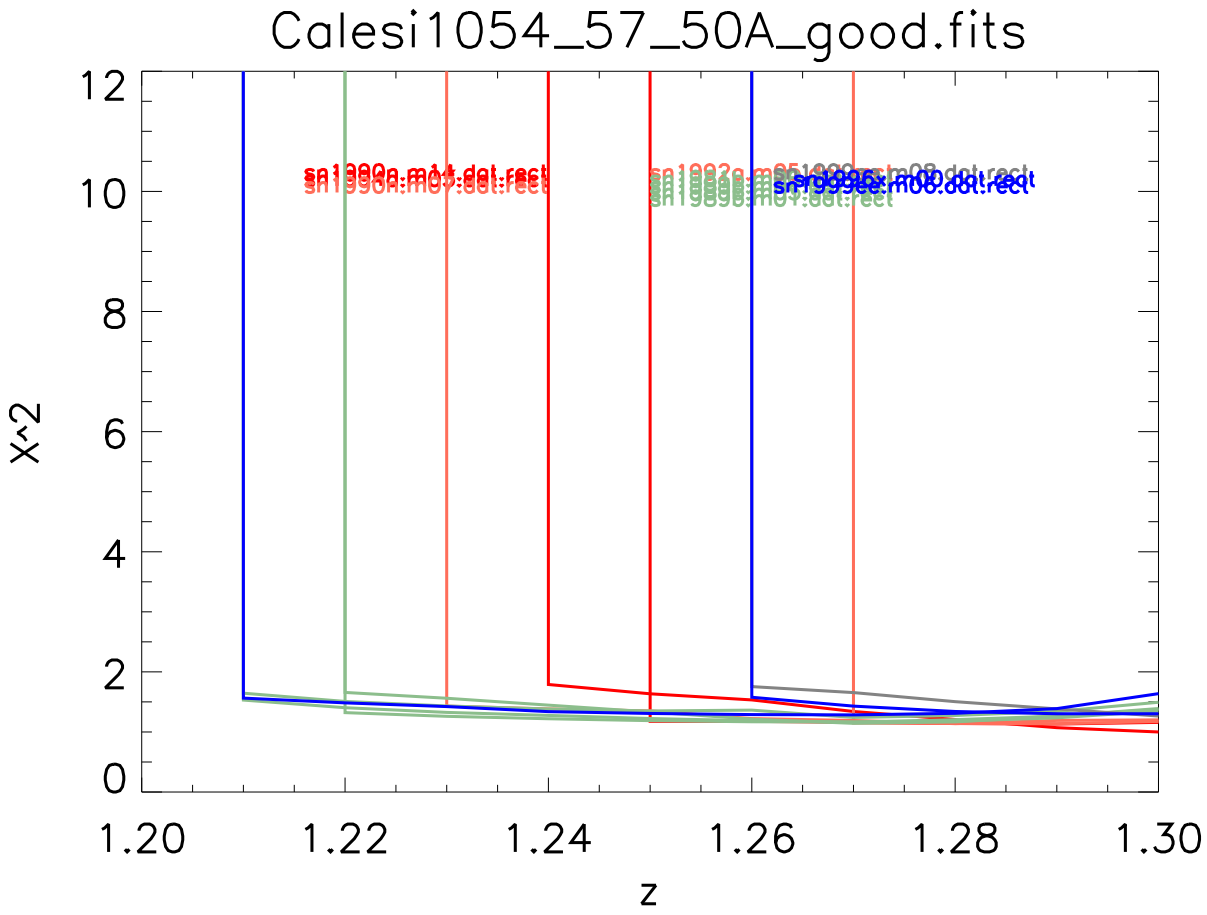

sn1989b.m05.dat.rect, z = 1.5100000
Calesi1054_57_50A.fits Observed − Galaxy
Template Spectrum Av = −0.65688778
Galaxy
SN/Gal = 0.903024
Mg II, I
[O II]
Ca II
4
3
2
1
0
−1
−2
5000
6000
7000
8000
9000
10000

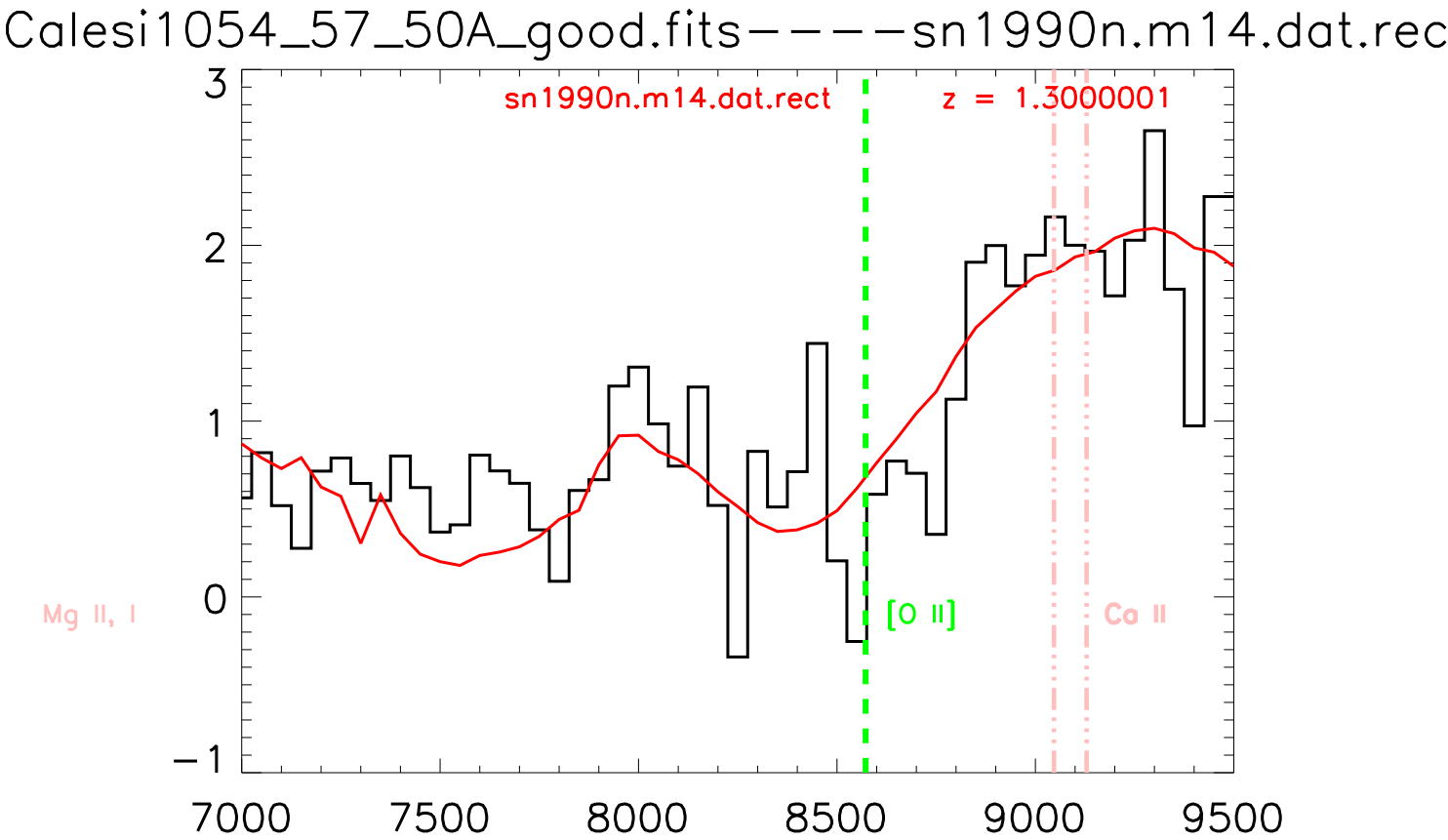

sn1990n.m14.dat.rect, z = 1.4100000
Calesi1054_57_50A.fits Observed − Galaxy
Template Spectrum Av = 1.0000000
Galaxy
SN/Gal = 0.400150
Mg II, I
[O II]
Ca II
4
3
2
1
0
−1
−2
5000
6000
7000
8000
9000
10000

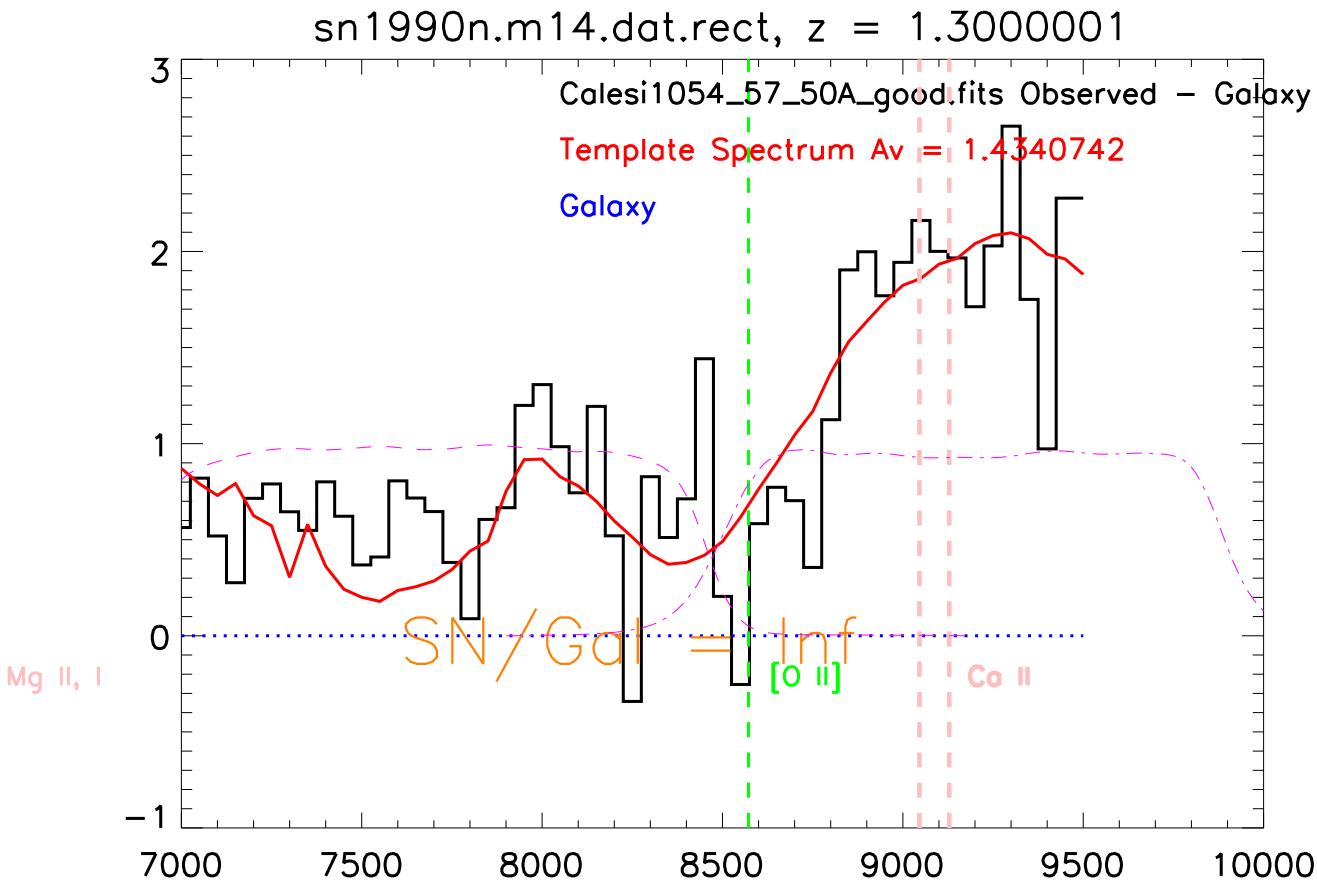
1.3
1.2
1.1
1.3
1.2
1.1
1.2
1.3
1.3
1.1
1.0

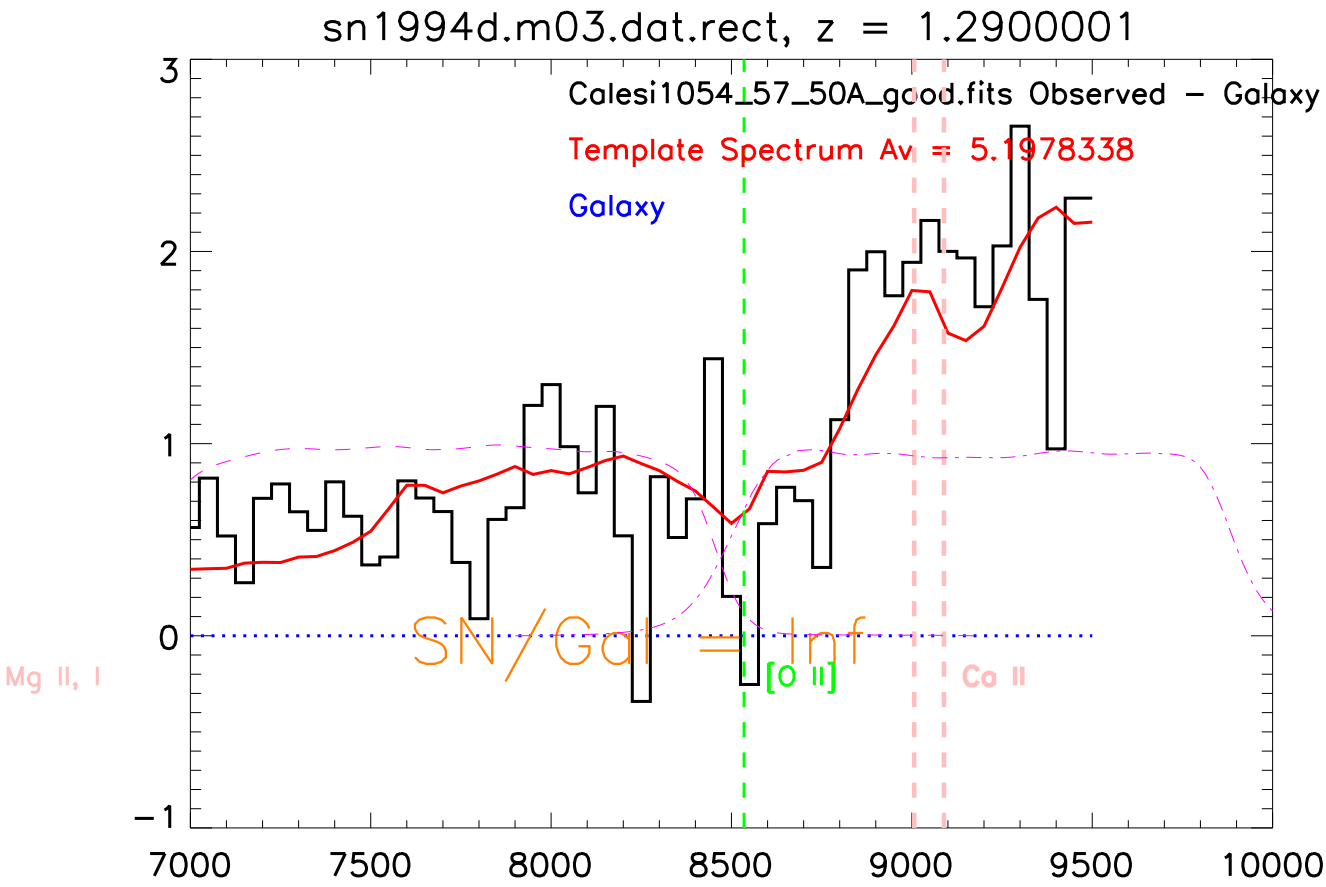


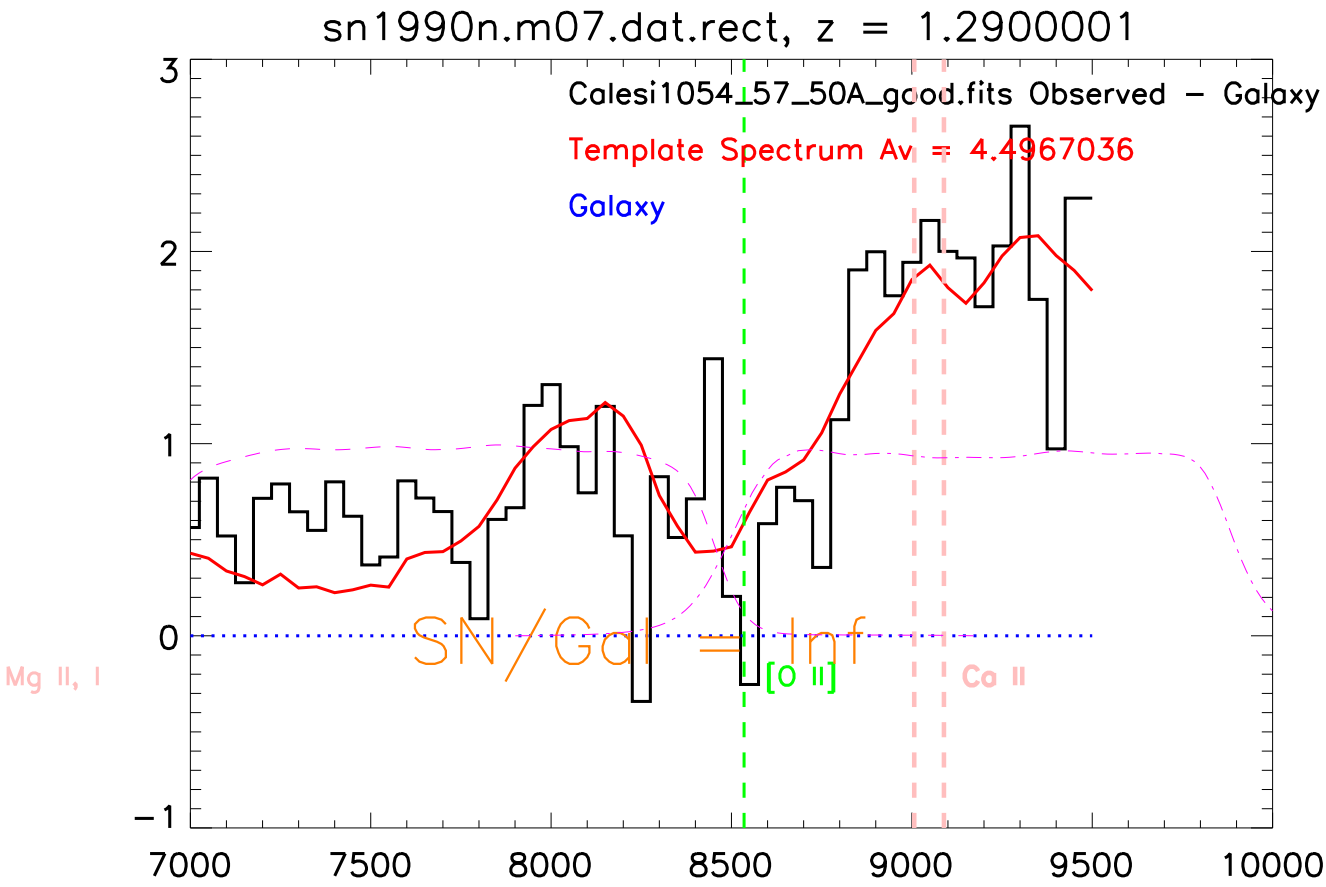
1.40
1.30
1.20
1.10
1.00
χ^2
40
20
0
−20
Days
0.5
1.0
1.5
2.0
Δm15

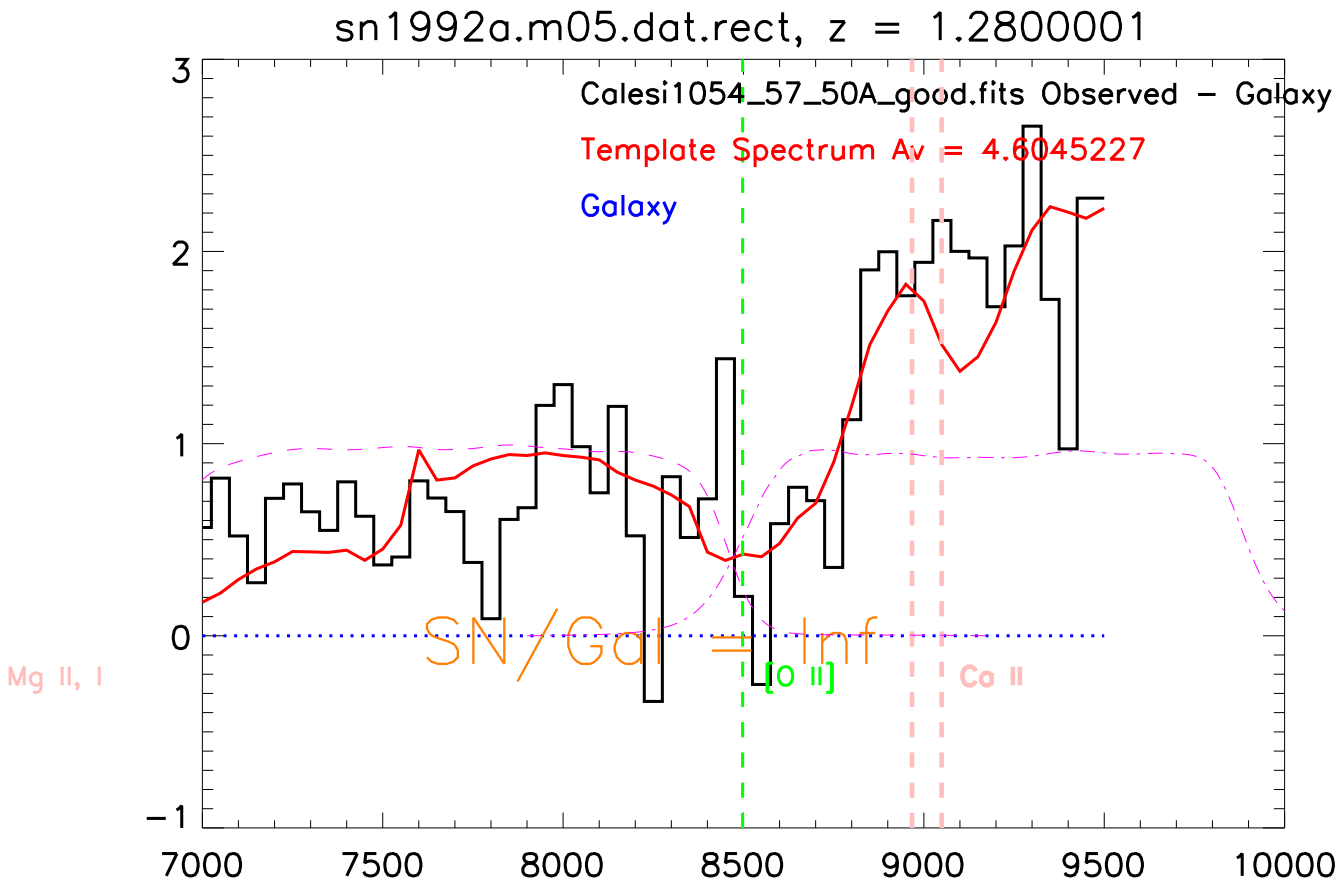

Calesi1054_57_50A_good.fits
X^2
z
0
2
4
6
8
10
12
1.20
1.22
1.24
1.26
1.28
1.30

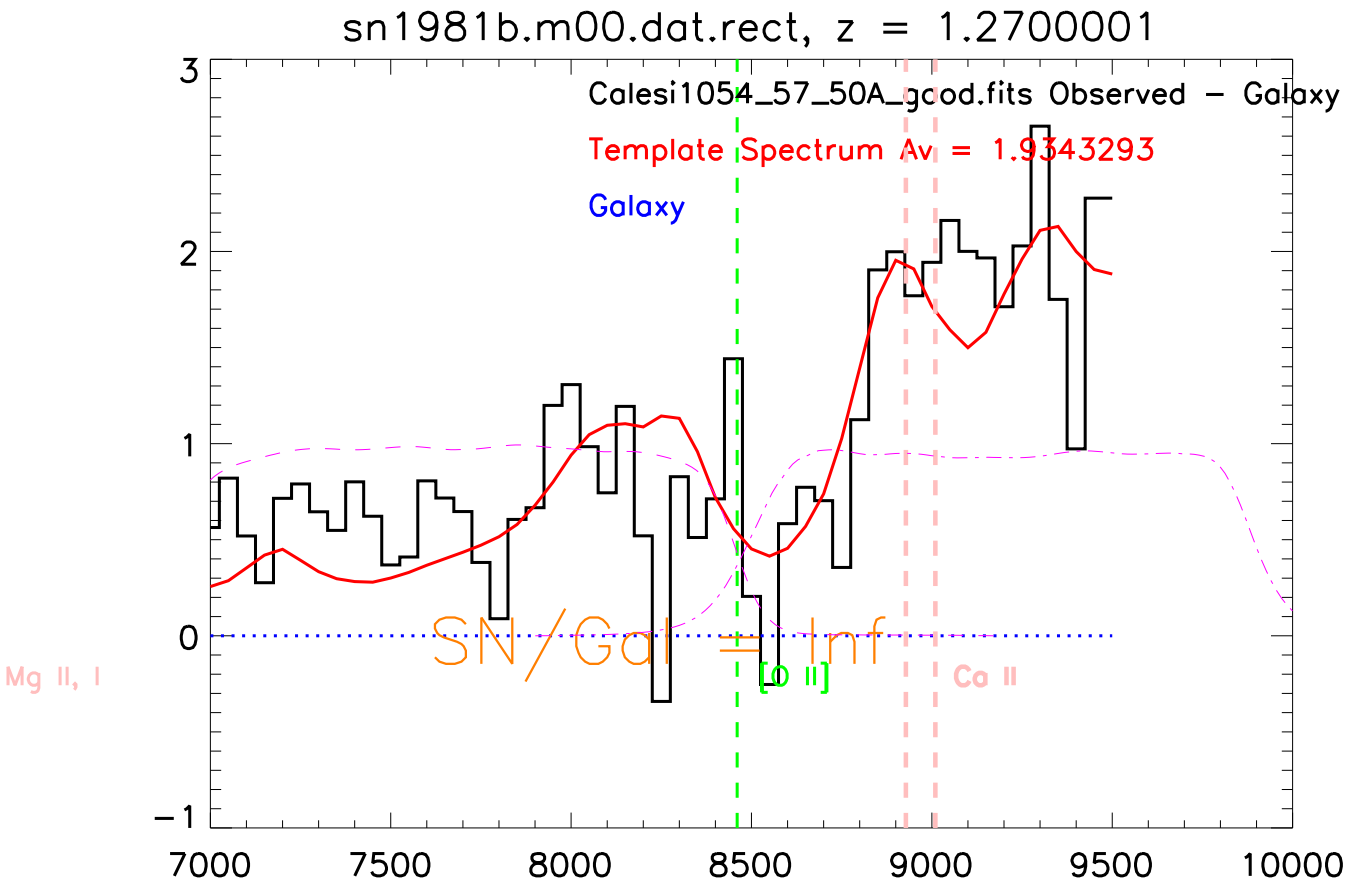

Calesi1054_57_50A_good.fits----sn1990n.m14.dat.rec
sn1990n.m14.dat.rect
z = 1.3000001
[O II]
Ca II
Mg II, I
3
2
1
0
−1
7000
7500
8000
8500
9000
9500

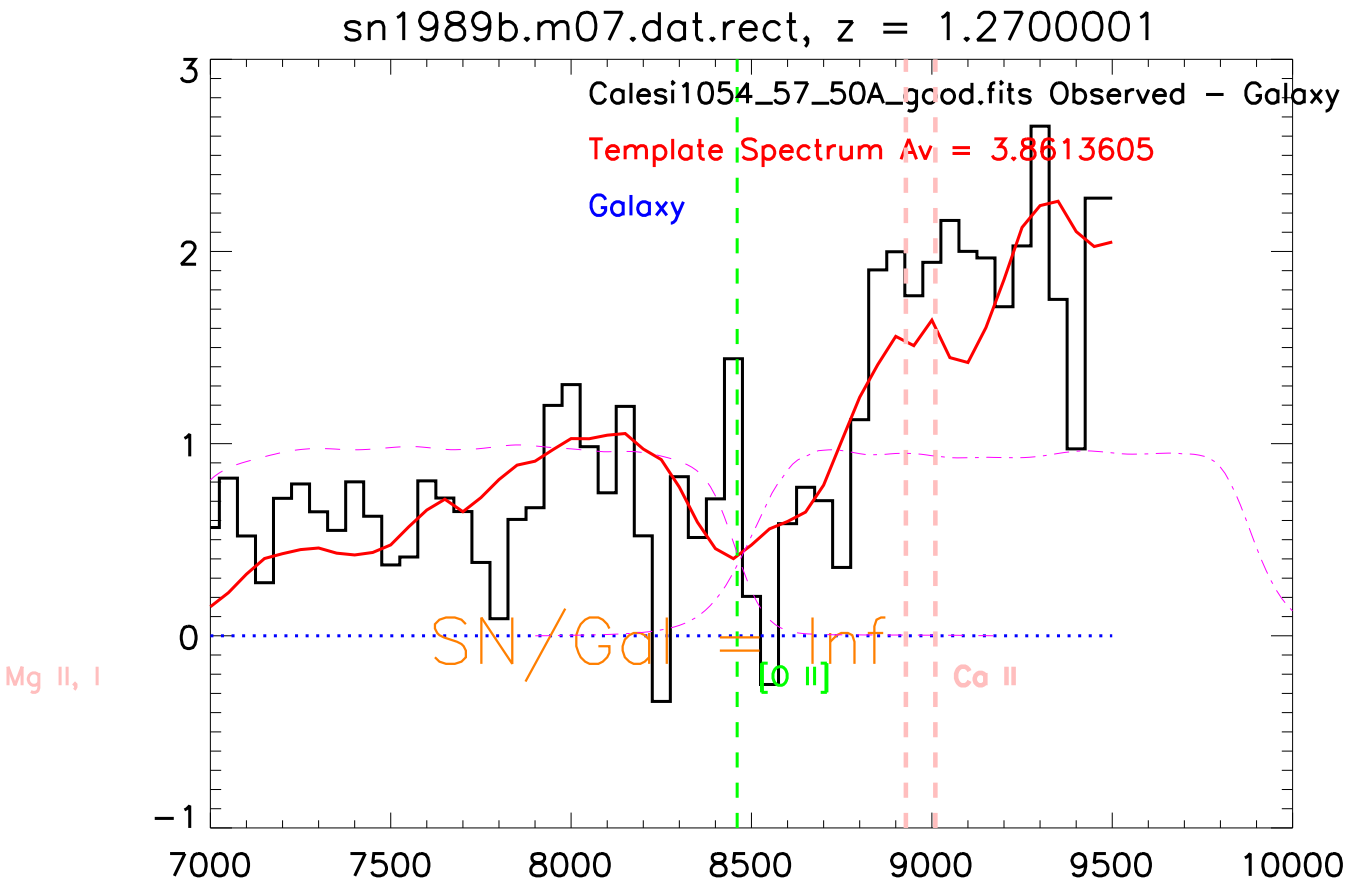

sn1990n.m14.dat.rect, z = 1.3000001
Calesi1054_57_50A_good.fits Observed − Galaxy
Template Spectrum Av = 1.4340742
Galaxy
SN/Gal = Inf
[O II]
Ca II
Mg II, I
3
2
1
0
−1
7000
7500
8000
8500
9000
9500
10000

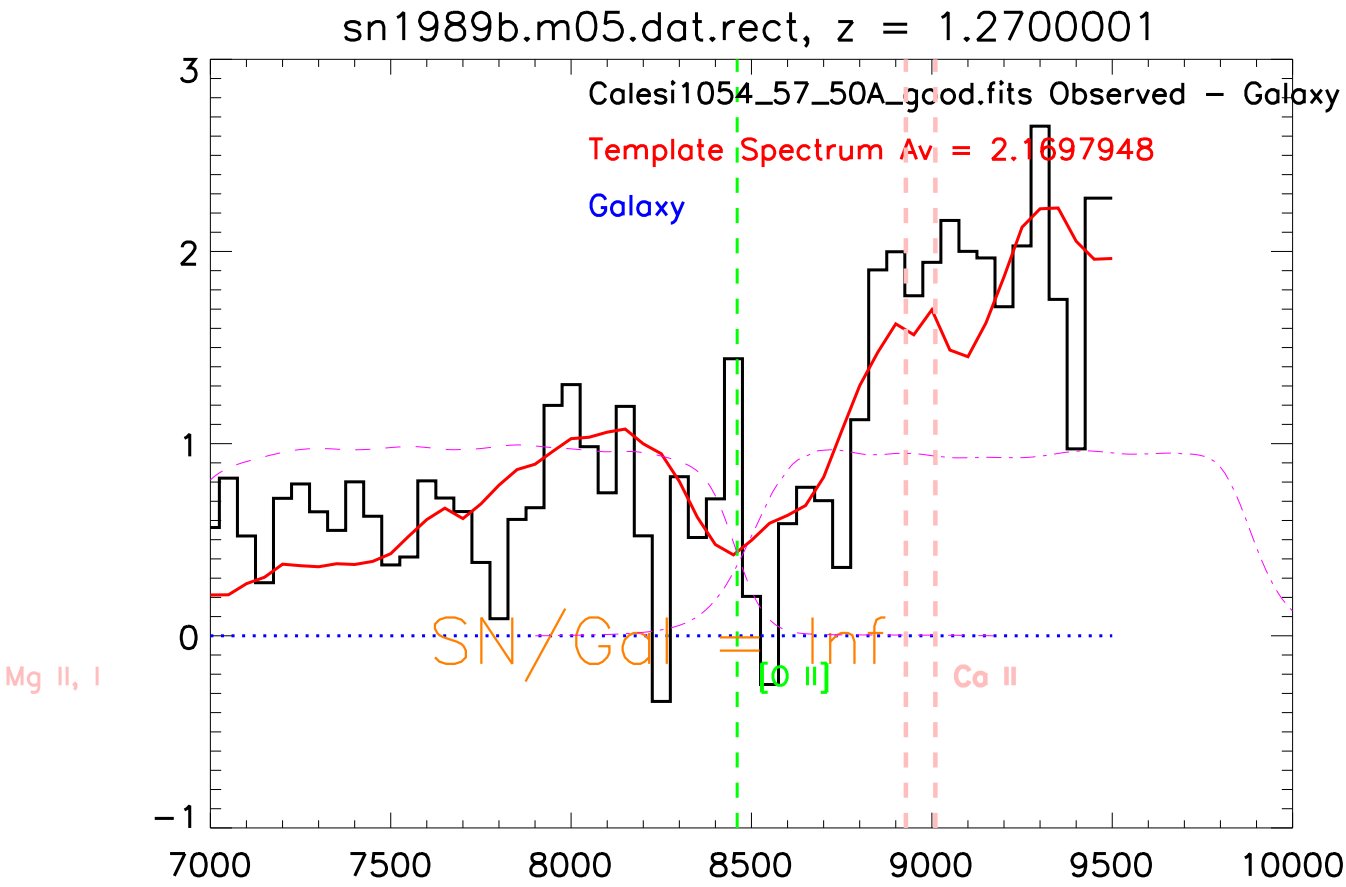

sn1994d.m03.dat.rect, z = 1.2900001
Calesi1054_57_50A_good.fits Observed − Galaxy
Template Spectrum Av = 5.1978338
Galaxy
SN/Gal = Inf
[O II]
Ca II
Mg II, I
3
2
1
0
−1
7000
7500
8000
8500
9000
9500
10000

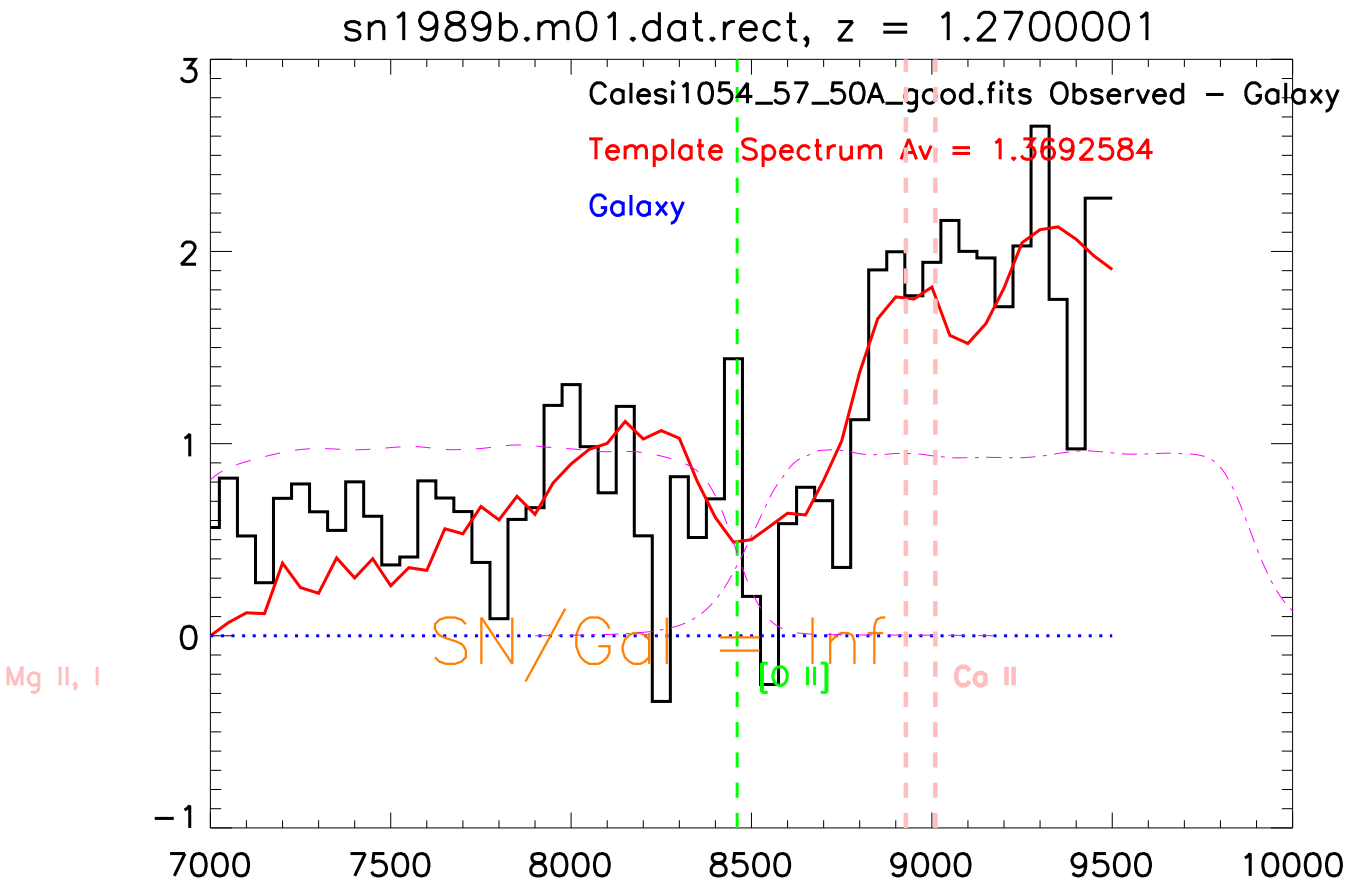

sn1990n.m07.dat.rect, z = 1.2900001
Calesi1054_57_50A_good.fits Observed − Galaxy
Template Spectrum Av = 4.4967036
Galaxy
SN/Gal = Inf
[O II]
Ca II
Mg II, I
3
2
1
0
−1
7000
7500
8000
8500
9000
9500
10000

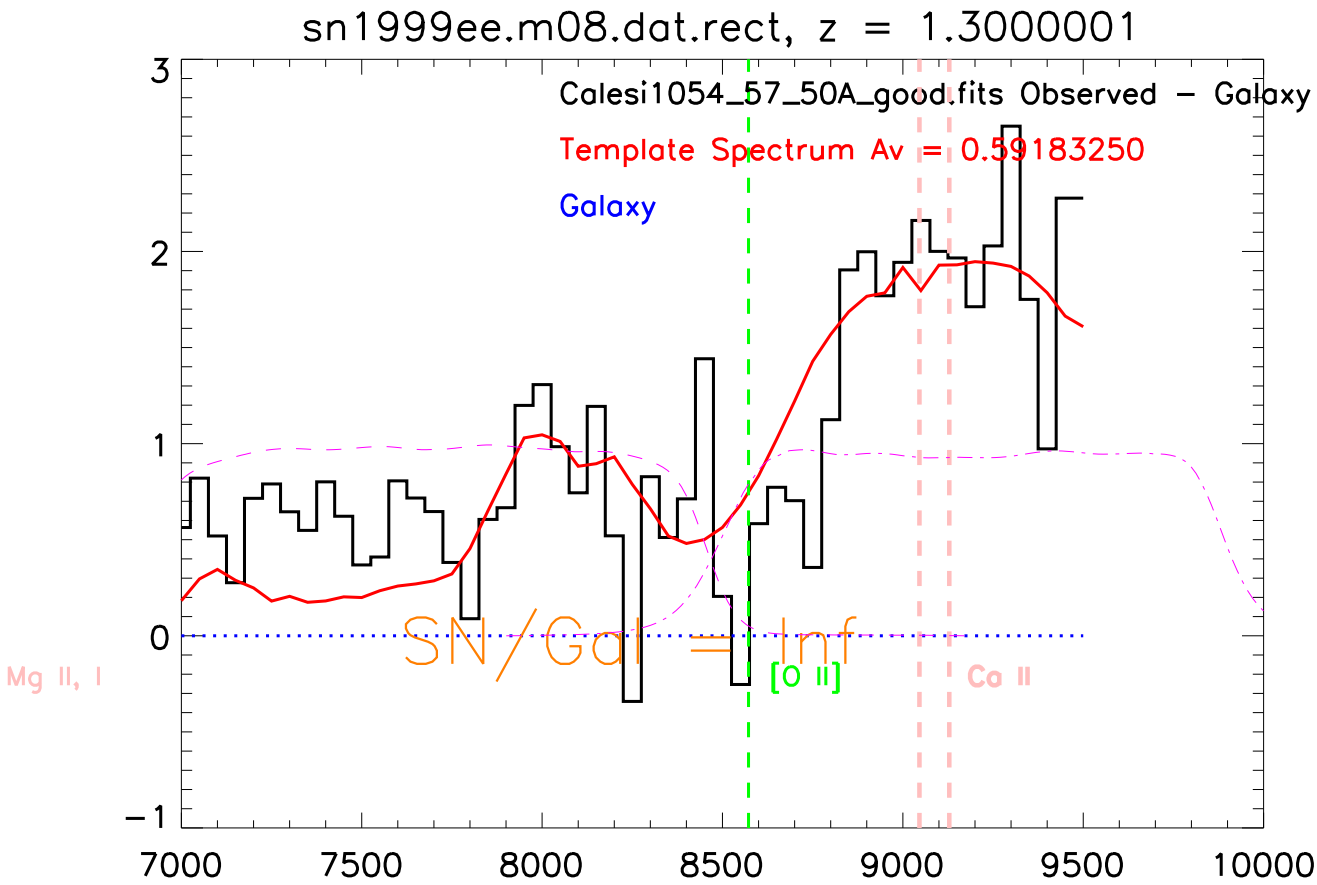

sn1992a.m05.dat.rect, z = 1.2800001
Calesi1054_57_50A_good.fits Observed − Galaxy
Template Spectrum Av = 4.6045227
Galaxy
SN/Gal = Inf
[O II]
Ca II
Mg II, I
3
2
1
0
−1
7000
7500
8000
8500
9000
9500
10000

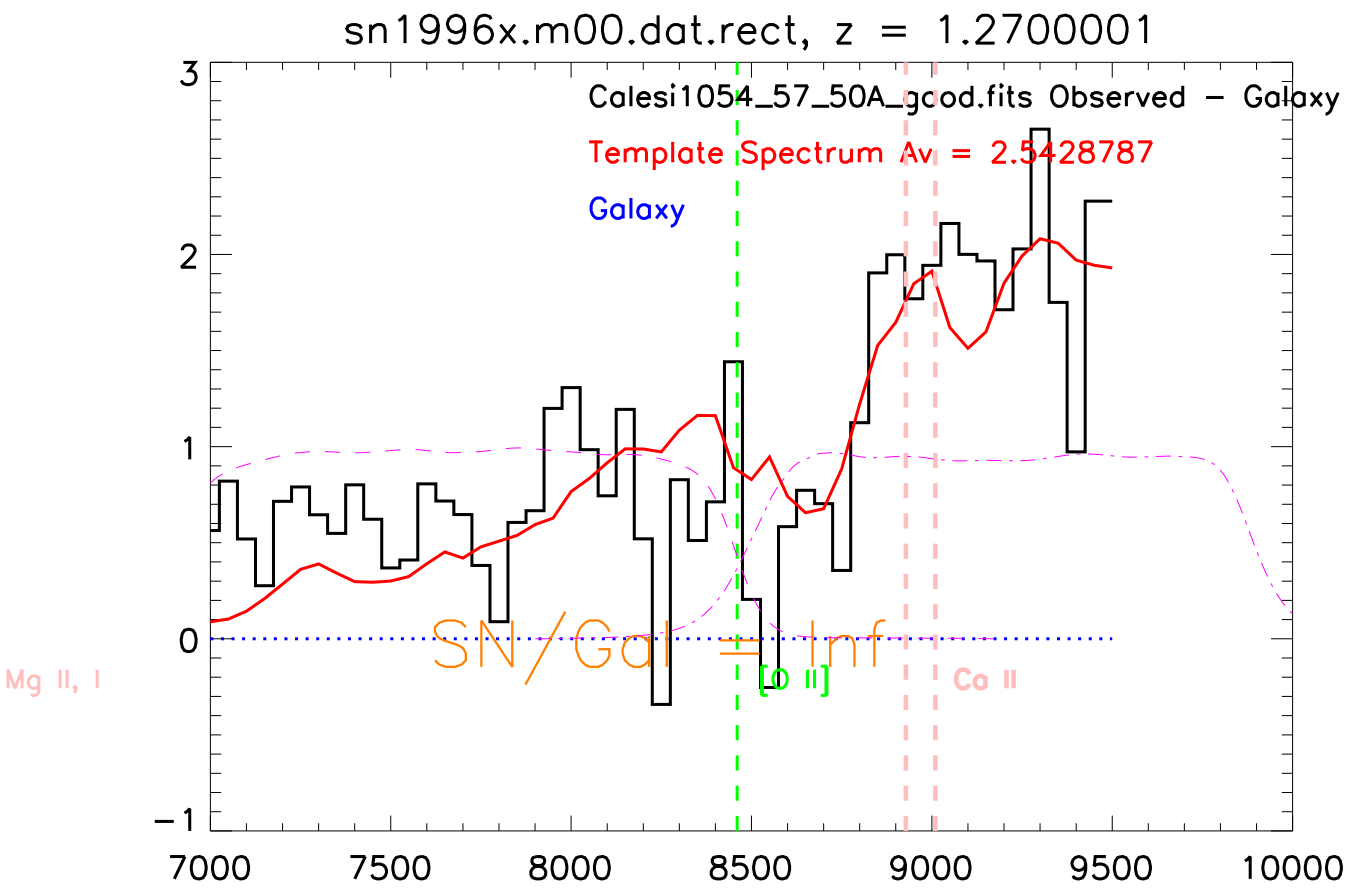

sn1981b.m00.dat.rect, z = 1.2700001
Calesi1054_57_50A_good.fits Observed − Galaxy
Template Spectrum Av = 1.9343293
Galaxy
SN/Gal = Inf
[O II]
Ca II
Mg II, I
3
2
1
0
−1
7000
7500
8000
8500
9000
9500
10000

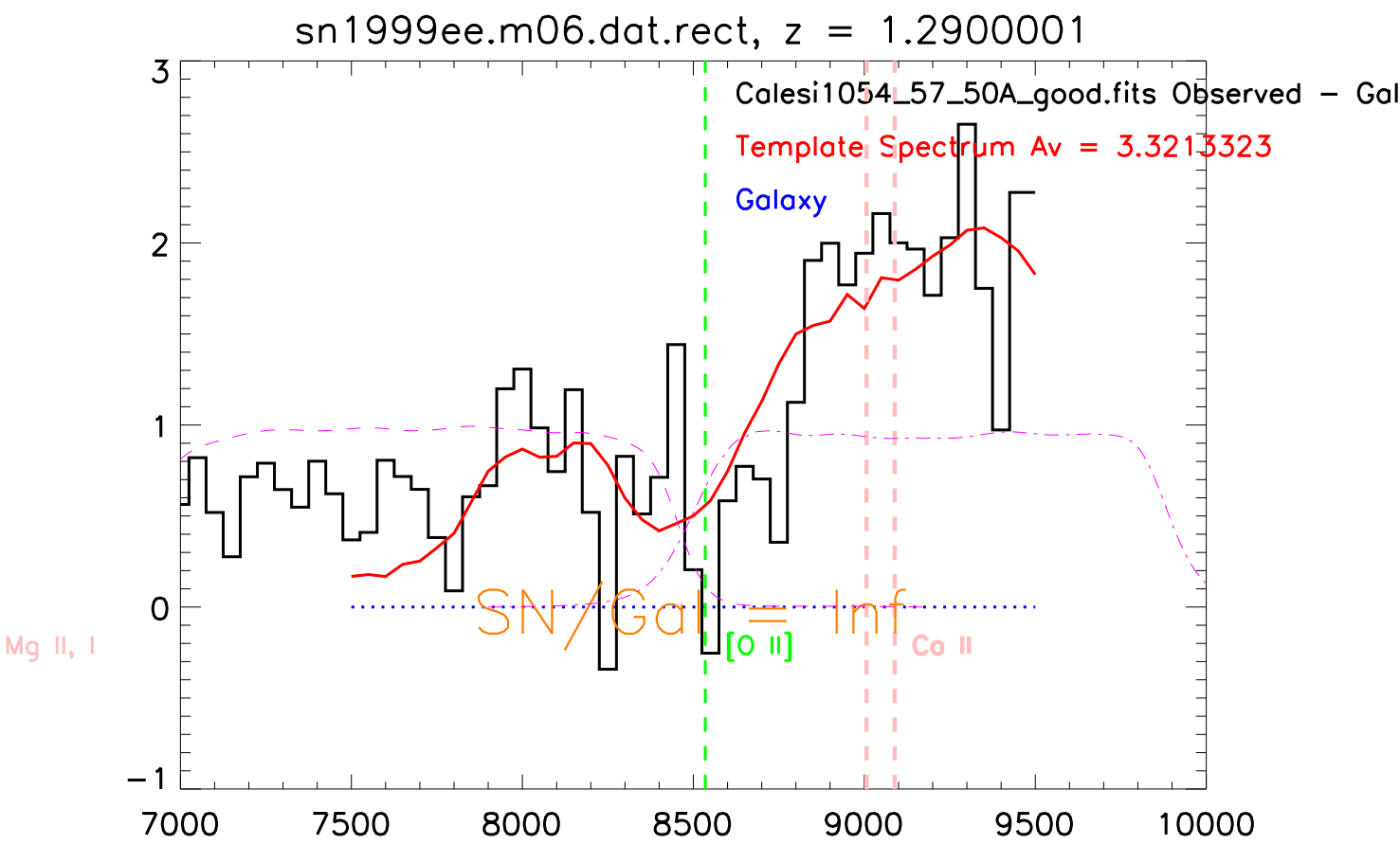

sn1989b.m07.dat.rect, z = 1.2700001
Calesi1054_57_50A_good.fits Observed − Galaxy
Template Spectrum Av = 3.8613605
Galaxy
SN/Gal = Inf
[O II]
Ca II
Mg II, I
3
2
1
0
−1
7000
7500
8000
8500
9000
9500
10000

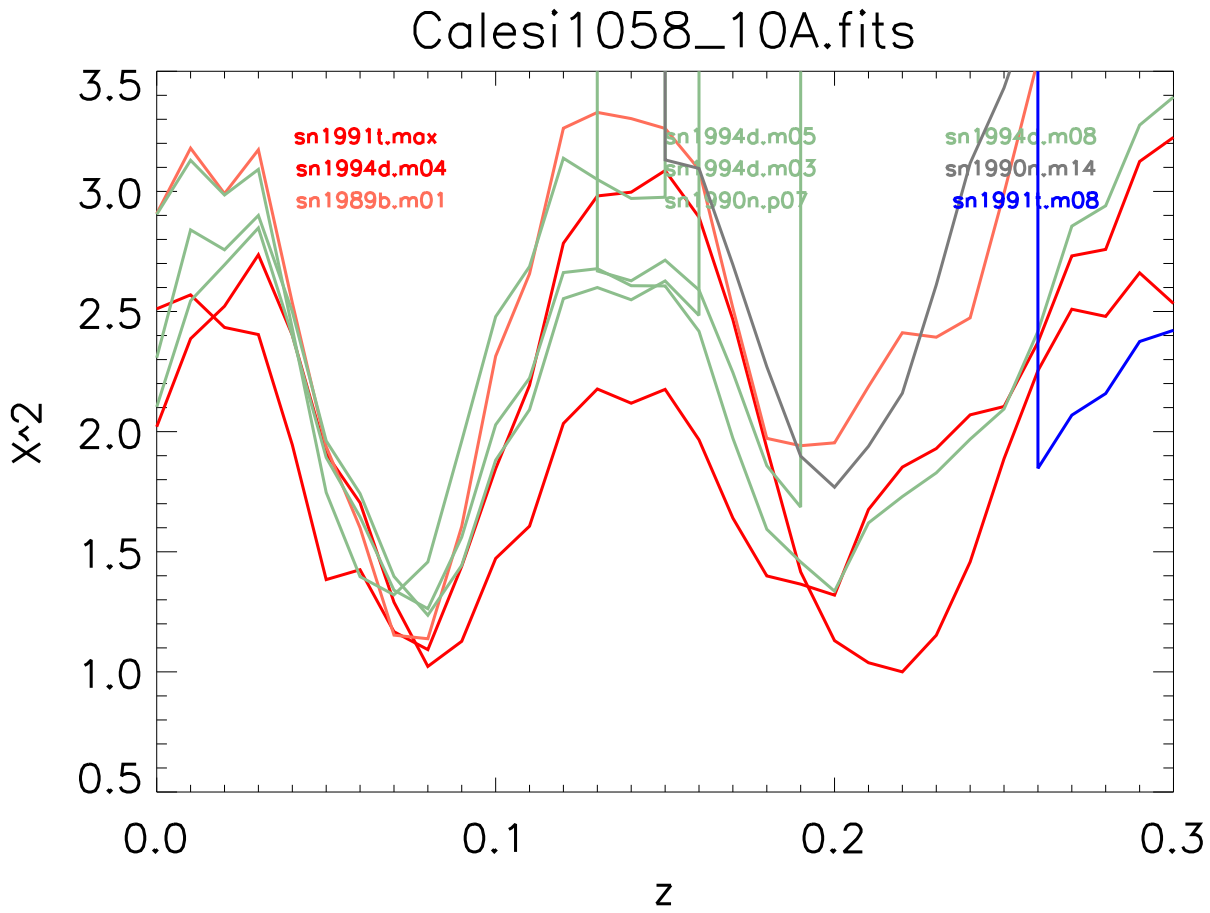

sn1989b.m05.dat.rect, z = 1.2700001
Calesi1054_57_50A_good.fits Observed − Galaxy
Template Spectrum Av = 2.1697948
Galaxy
SN/Gal = Inf
[O II]
Ca II
Mg II, I
3
2
1
0
−1
7000
7500
8000
8500
9000
9500
10000

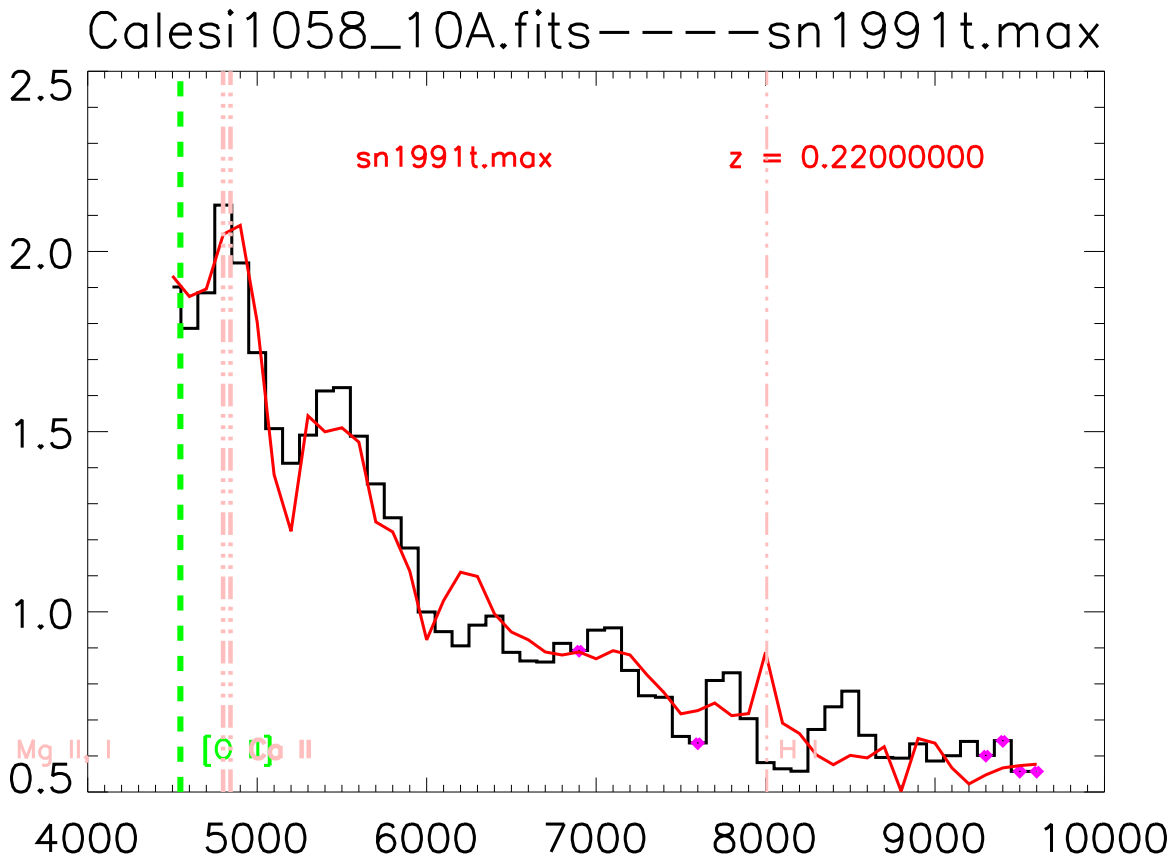

sn1989b.m01.dat.rect, z = 1.2700001
Calesi1054_57_50A_good.fits Observed − Galaxy
Template Spectrum Av = 1.3692584
Galaxy
SN/Gal = Inf
[O II]
Ca II
Mg II, I
3
2
1
0
−1
7000
7500
8000
8500
9000
9500
10000

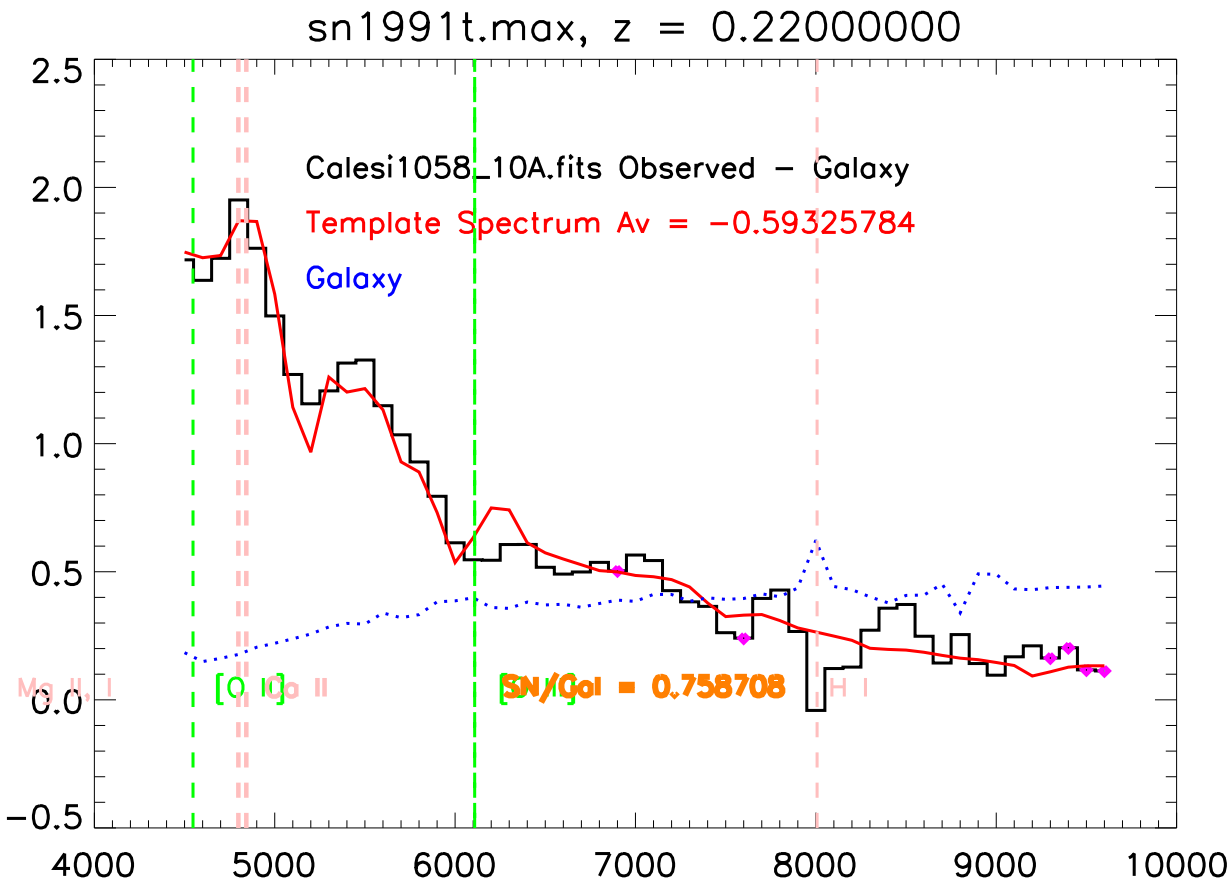

sn1999ee.m08.dat.rect, z = 1.3000001
Calesi1054_57_50A_good.fits Observed − Galaxy
Template Spectrum Av = 0.59183250
Galaxy
SN/Gal = Inf
[O II]
Ca II
Mg II, I
3
2
1
0
−1
7000
7500
8000
8500
9000
9500
10000

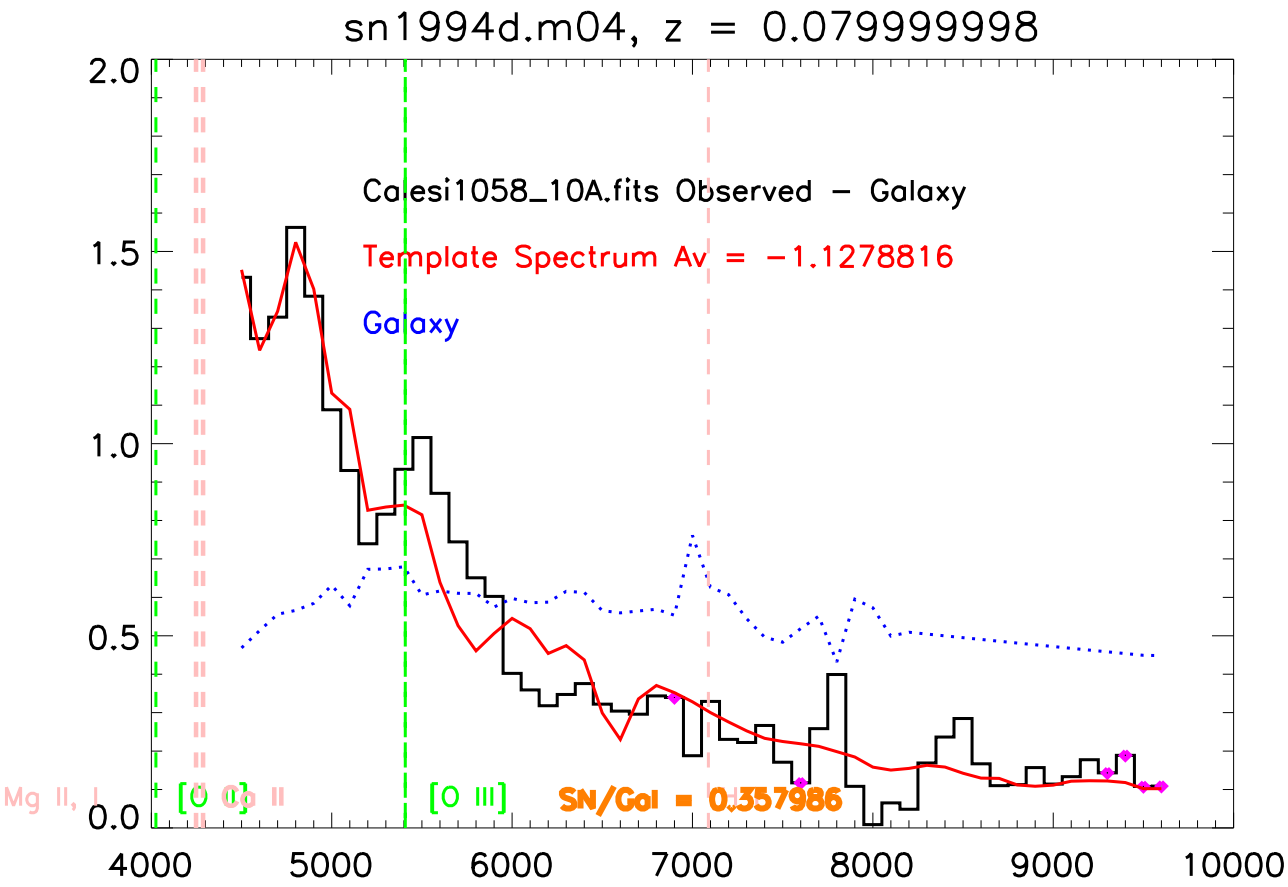

sn1996x.m00.dat.rect, z = 1.2700001
Calesi1054_57_50A_good.fits Observed − Galaxy
Template Spectrum Av = 2.5428787
Galaxy
SN/Gal = Inf
[O II]
Ca II
Mg II, I
3
2
1
0
−1
7000
7500
8000
8500
9000
9500
10000

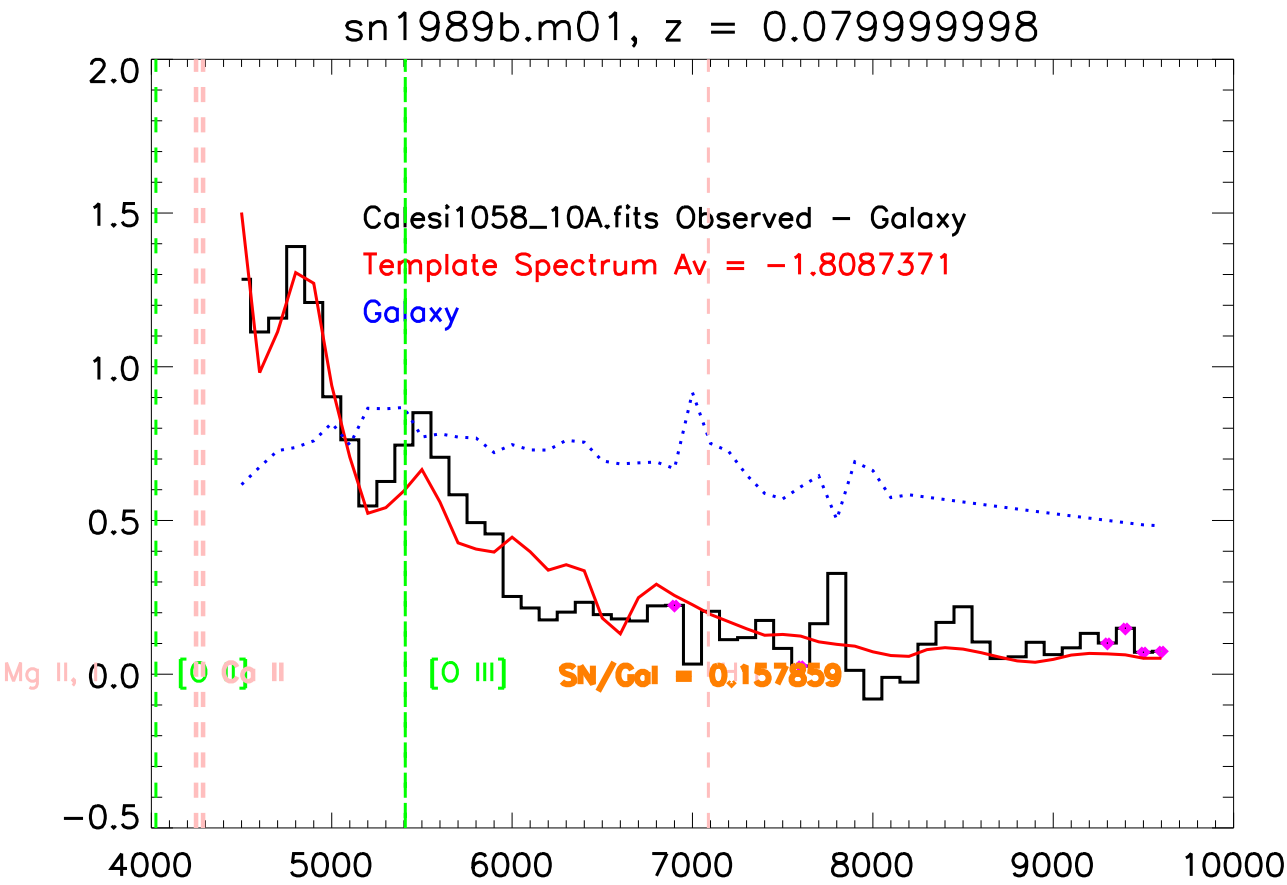

sn1999ee.m06.dat.rect, z = 1.2900001
Calesi1054_57_50A_good.fits Observed – Gal
Template Spectrum Av = 3.3213323
Galaxy
SN/Gal = Inf
[O II]
Ca II
Mg II, I
3
2
1
0
−1
7000
7500
8000
8500
9000
9500
10000

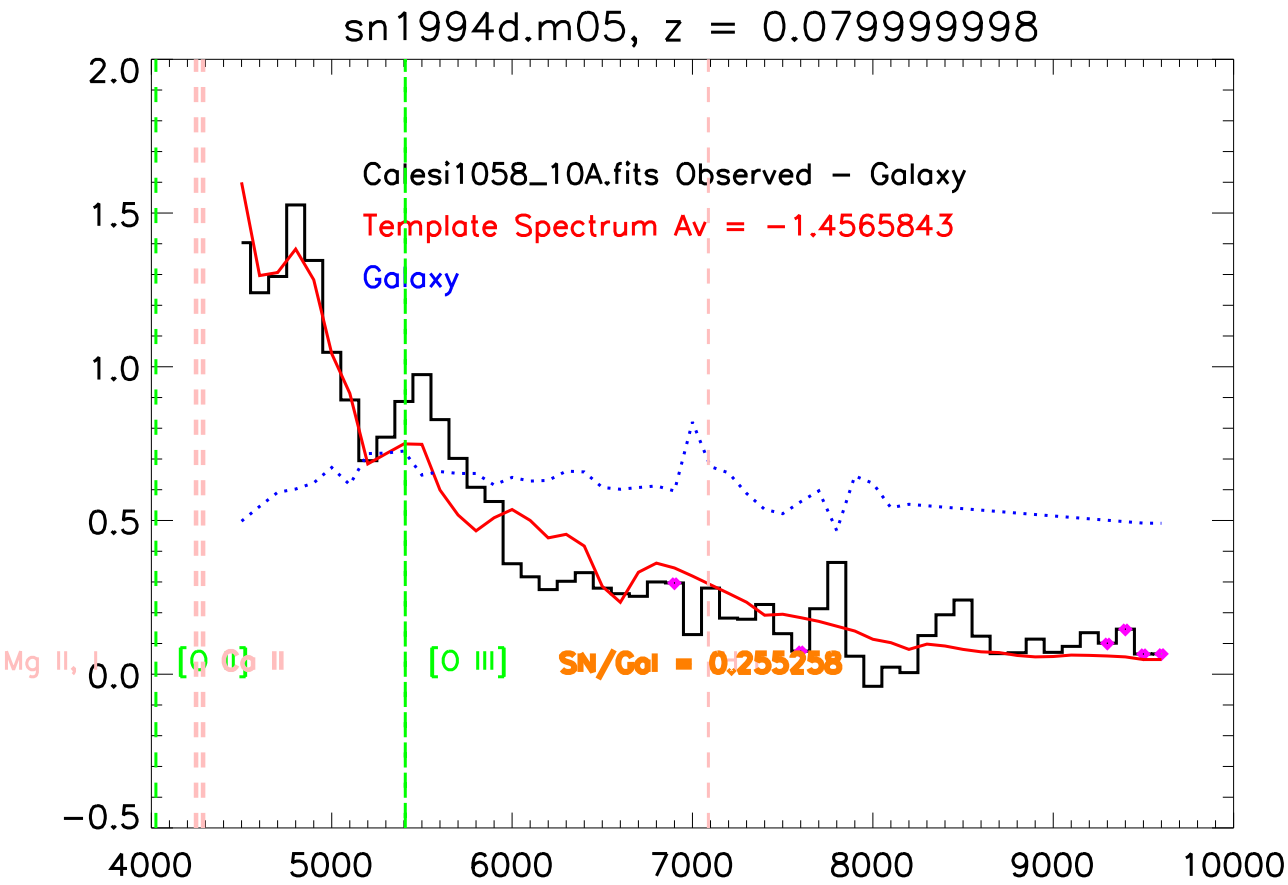

Calesi1058_10A.fits
sn1991t.max
sn1994d.m04
sn1989b.m01
sn1994d.m05
sn1994d.m03
sn1990n.p07
sn1994d.m08
sn1990n.m14
sn1991t.m08
X^2
z
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
0.1
0.2
0.3

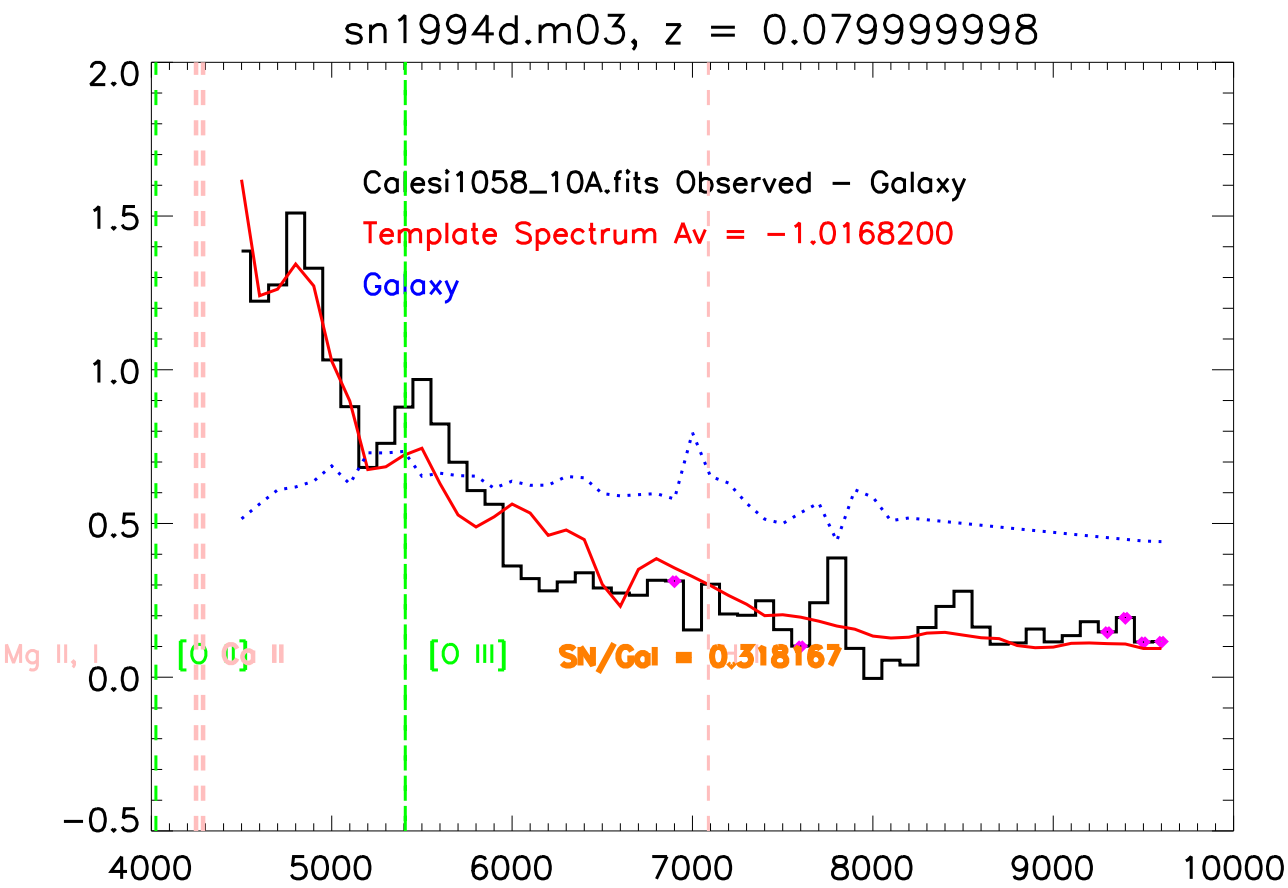

Calesi1058_10A.fits----sn1991t.max
sn1991t.max
z = 0.22000000
Mg II
[O II]
Ca II
Hδ
2.5
2.0
1.5
1.0
0.5
4000
5000
6000
7000
8000
9000
10000

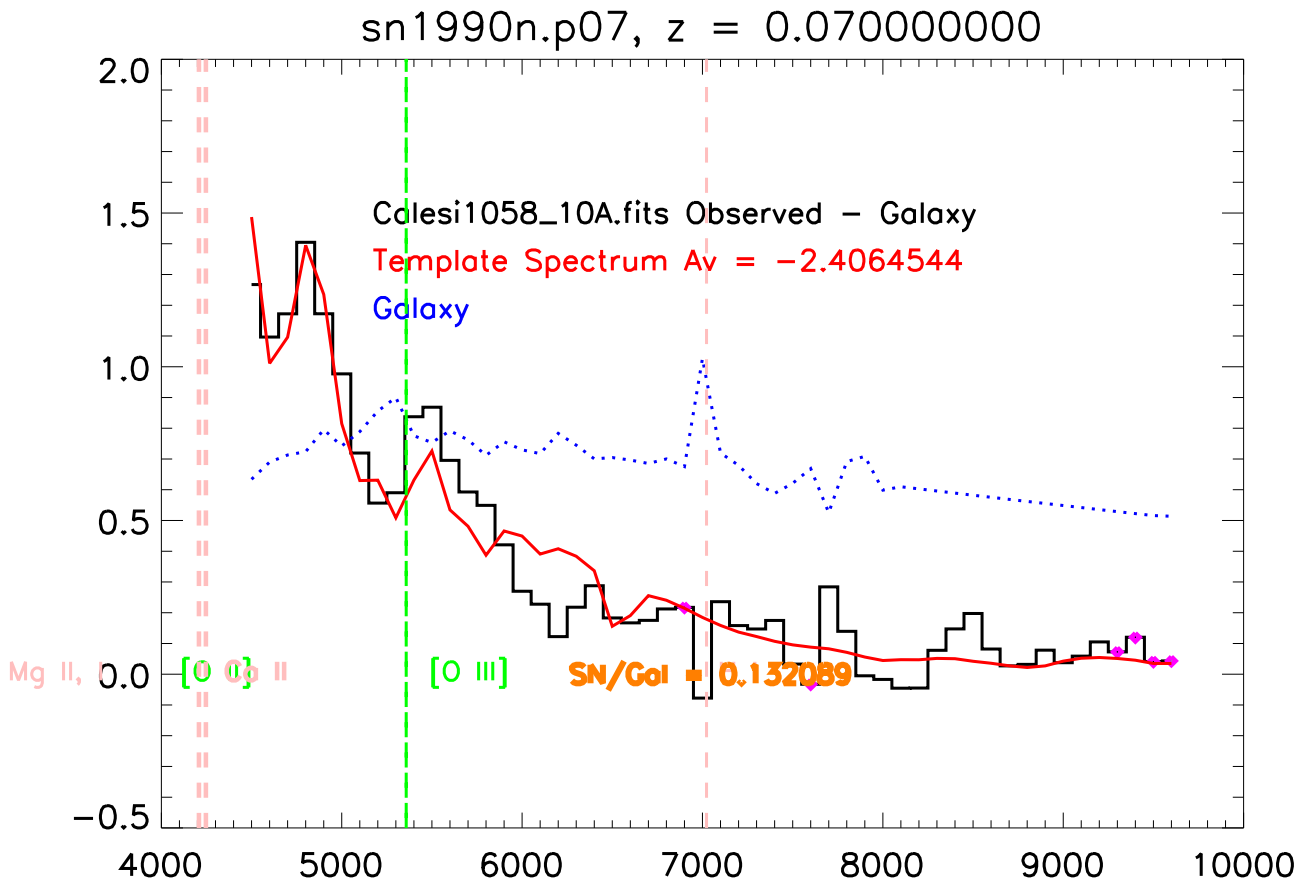

sn1991t.max, z = 0.22000000
Calesi1058_10A.fits Observed − Galaxy
Template Spectrum Av = −0.59325784
Galaxy
SN/Gal = 0.758708
2.5
2.0
1.5
1.0
0.5
0.0
−0.5
4000
5000
6000
7000
8000
9000
10000

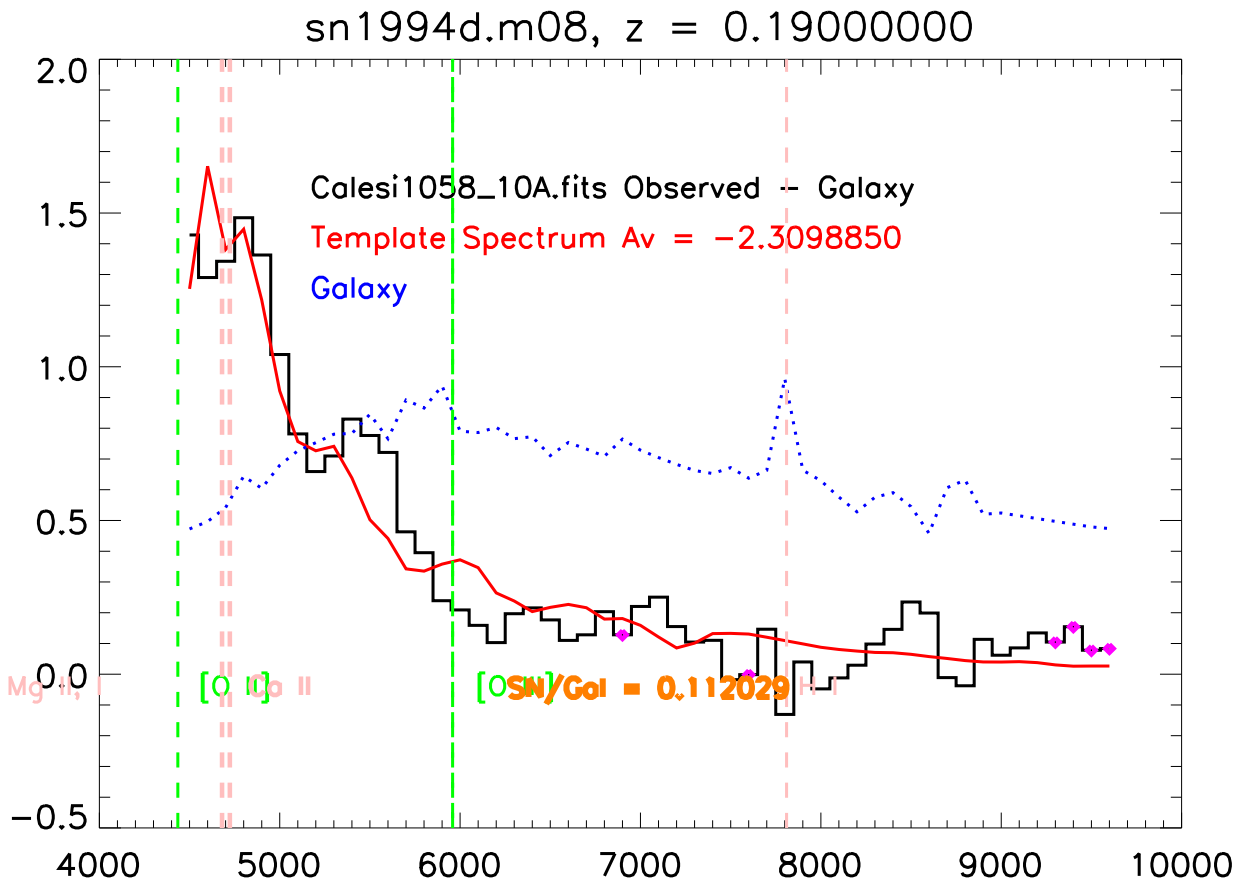

sn1994d.m04, z = 0.079999998
Calesi1058_10A.fits Observed − Galaxy
Template Spectrum Av = −1.1278816
Galaxy
[O II]
[O III]
SN/Gal = 0.357986
2.0
1.5
1.0
0.5
0.0
4000
5000
6000
7000
8000
9000
10000

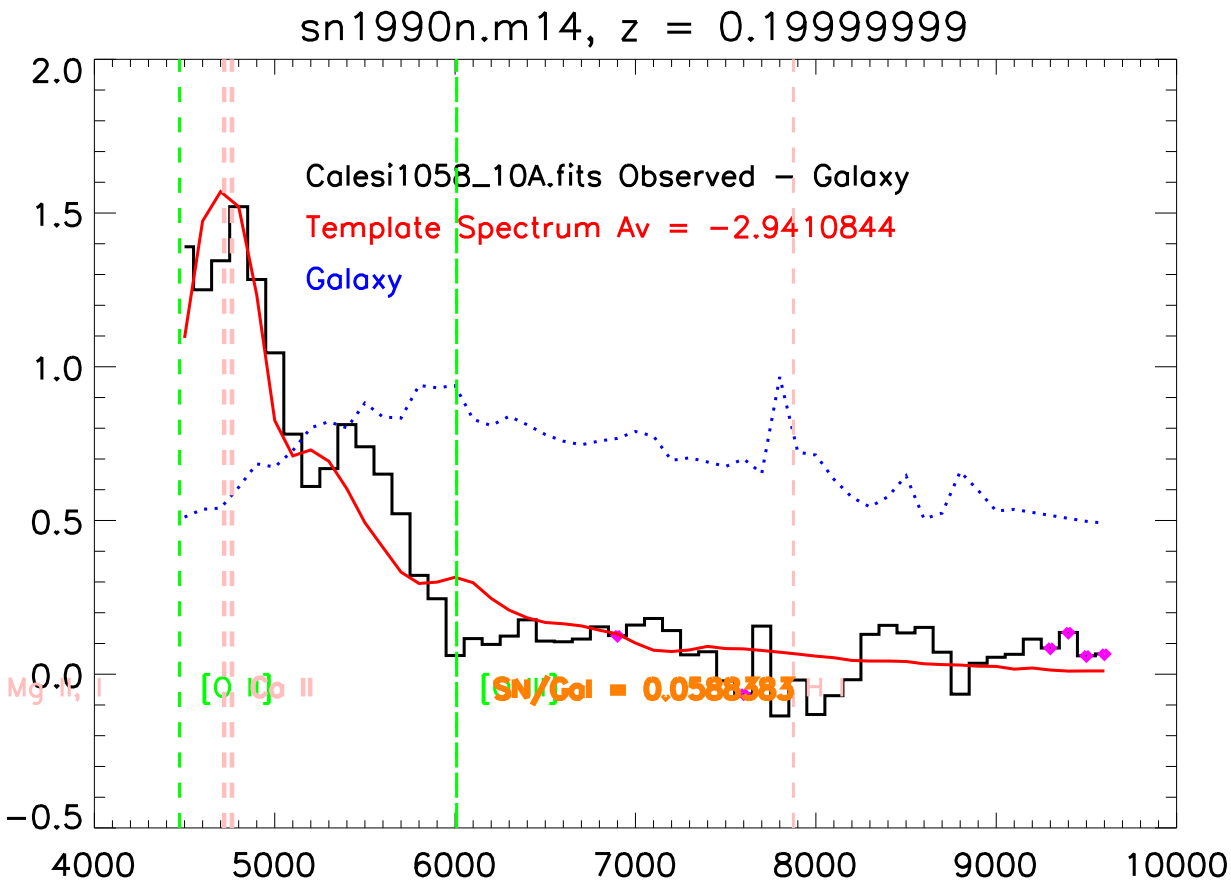

sn1989b.m01, z = 0.079999998
Calesi1058_10A.fits Observed − Galaxy
Template Spectrum Av = −1.8087371
Galaxy
[O II]
[O III]
SN/Gal = 0.157859
2.0
1.5
1.0
0.5
0.0
−0.5
4000
5000
6000
7000
8000
9000
10000

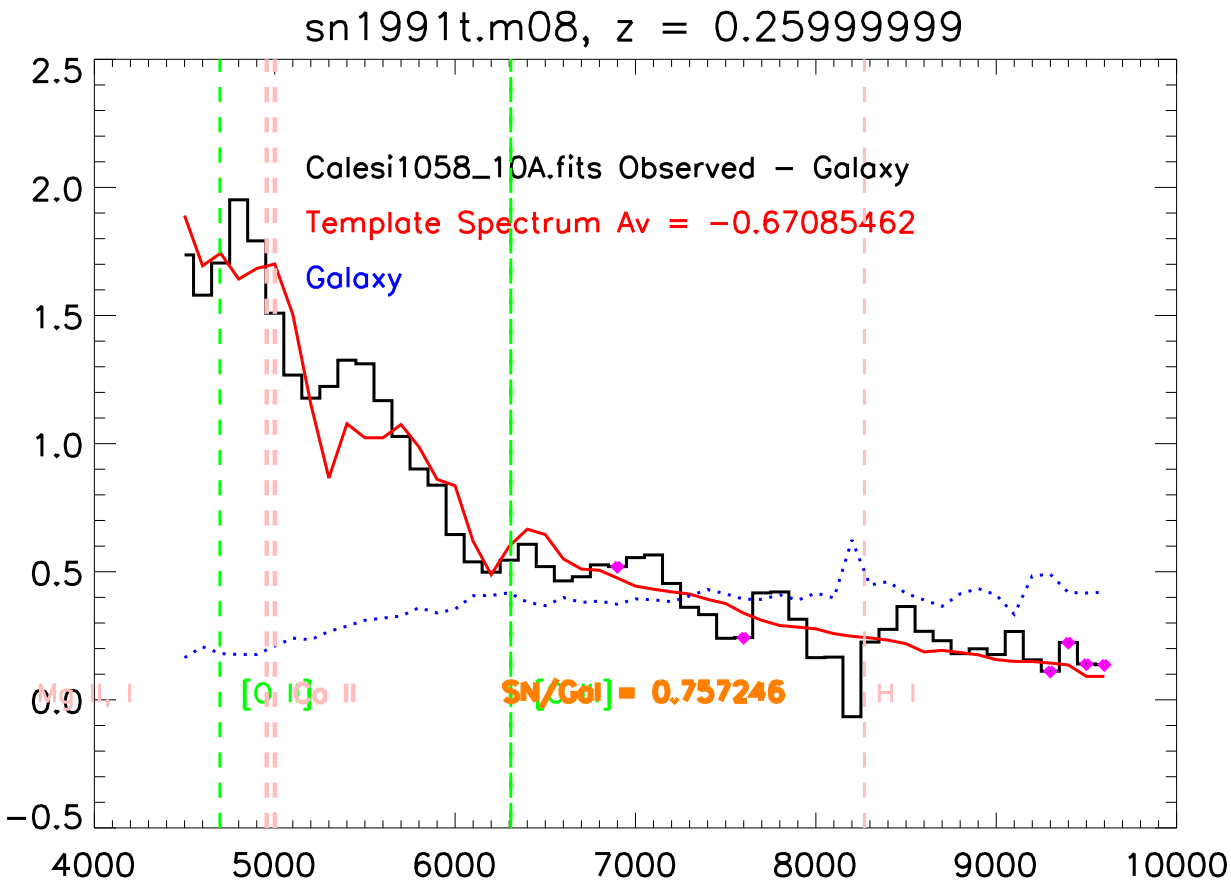

sn1994d.m05, z = 0.079999998
Calesi1058_10A.fits Observed − Galaxy
Template Spectrum Av = −1.4565843
Galaxy
[O II]
[O III]
SN/Gal = 0.255258
2.0
1.5
1.0
0.5
0.0
−0.5
4000
5000
6000
7000
8000
9000
10000

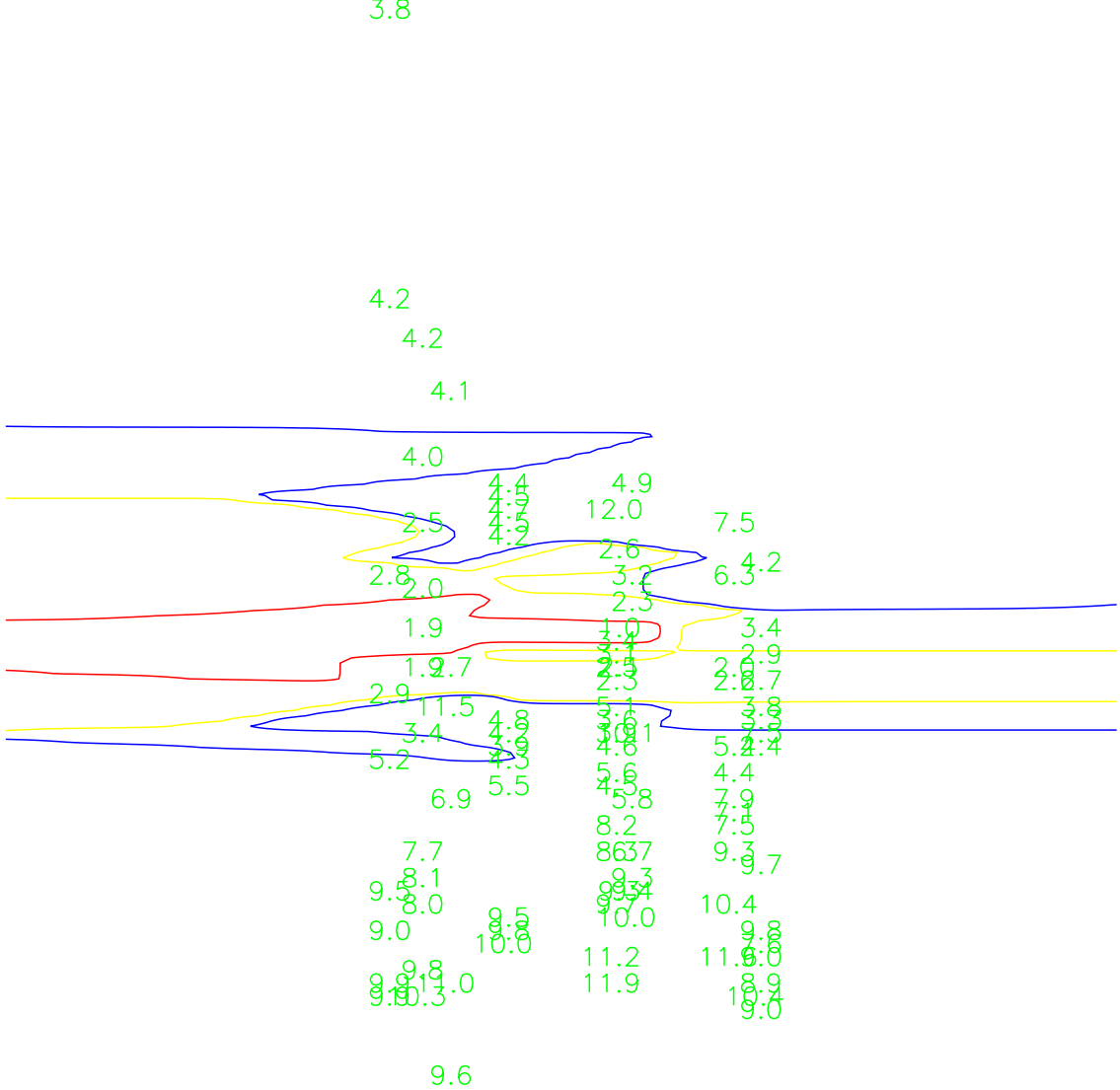

sn1994d.m03, z = 0.079999998
Calesi1058_10A.fits Observed − Galaxy
Template Spectrum Av = −1.0168200
Galaxy
[O II]
[O III]
SN/Gal = 0.318167
2.0
1.5
1.0
0.5
0.0
−0.5
4000
5000
6000
7000
8000
9000
10000

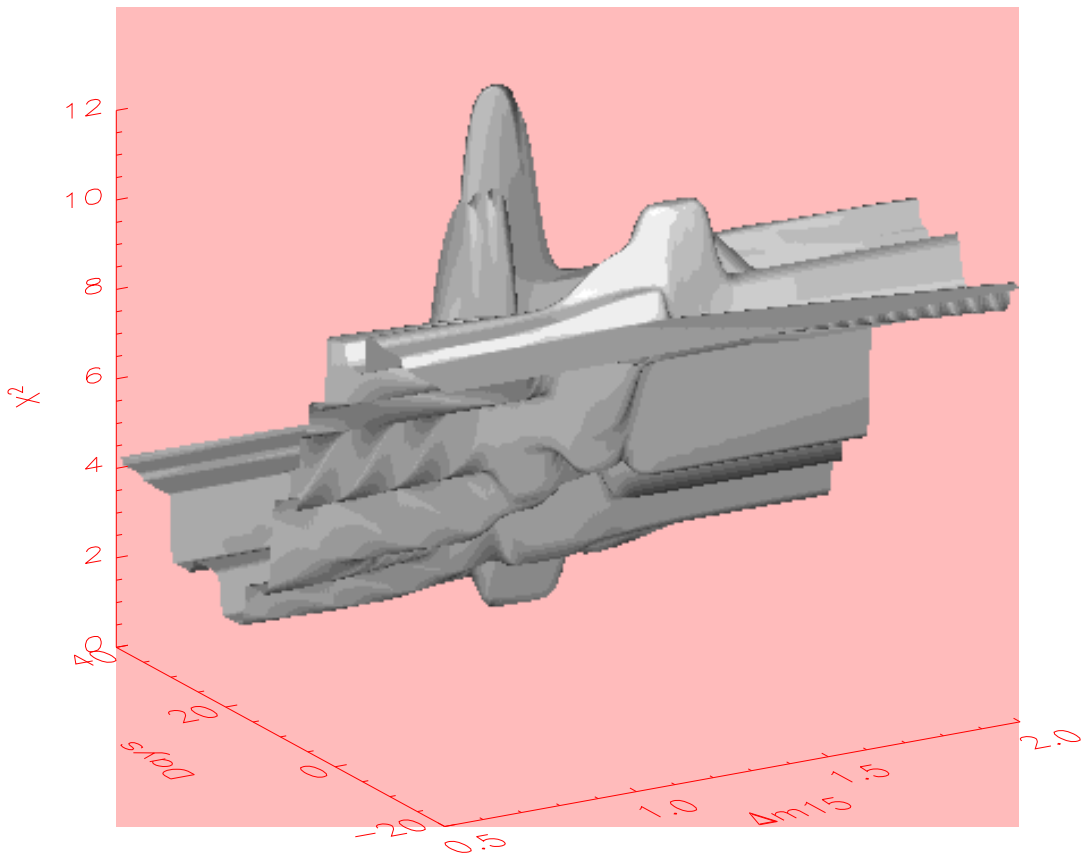

sn1990n.p07, z = 0.070000000
Calesi1058_10A.fits Observed − Galaxy
Template Spectrum Av = −2.4064544
Galaxy
[O II]
[O III]
SN/Gal = 0.132089
2.0
1.5
1.0
0.5
0.0
−0.5
4000
5000
6000
7000
8000
9000
10000


sn1994d.m08, z = 0.19000000
Calesi1058_10A.fits Observed -- Galaxy
Template Spectrum Av = −2.3098850
Galaxy
[O II]
[O III]
SN/Gal = 0.112029
2.0
1.5
1.0
0.5
0.0
−0.5
4000
5000
6000
7000
8000
9000
10000

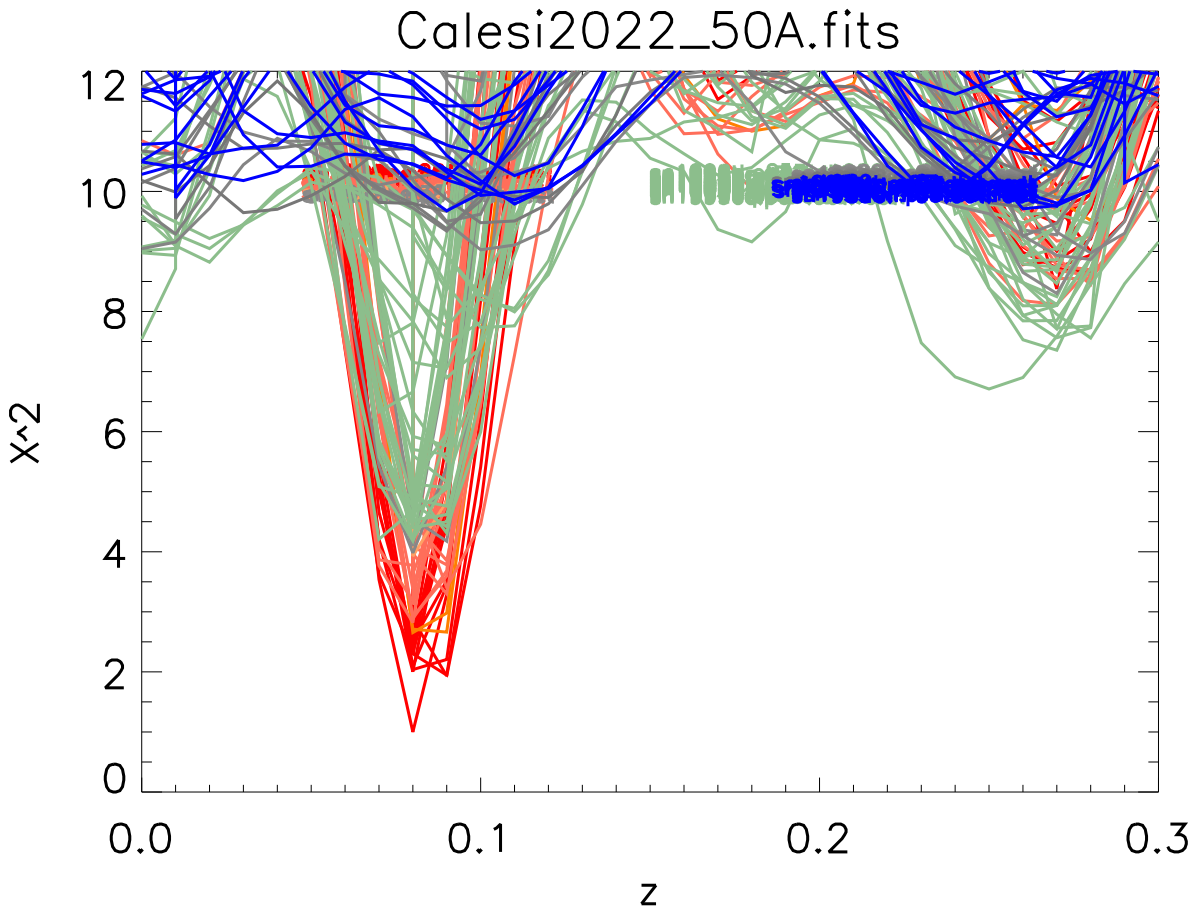

sn1990n.m14, z = 0.19999999
Calesi1058_10A.fits Observed – Galaxy
Template Spectrum Av = −2.9410844
Galaxy
SN/Gal = 0.0588383
2.0
1.5
1.0
0.5
0.0
−0.5
4000
5000
6000
7000
8000
9000
10000

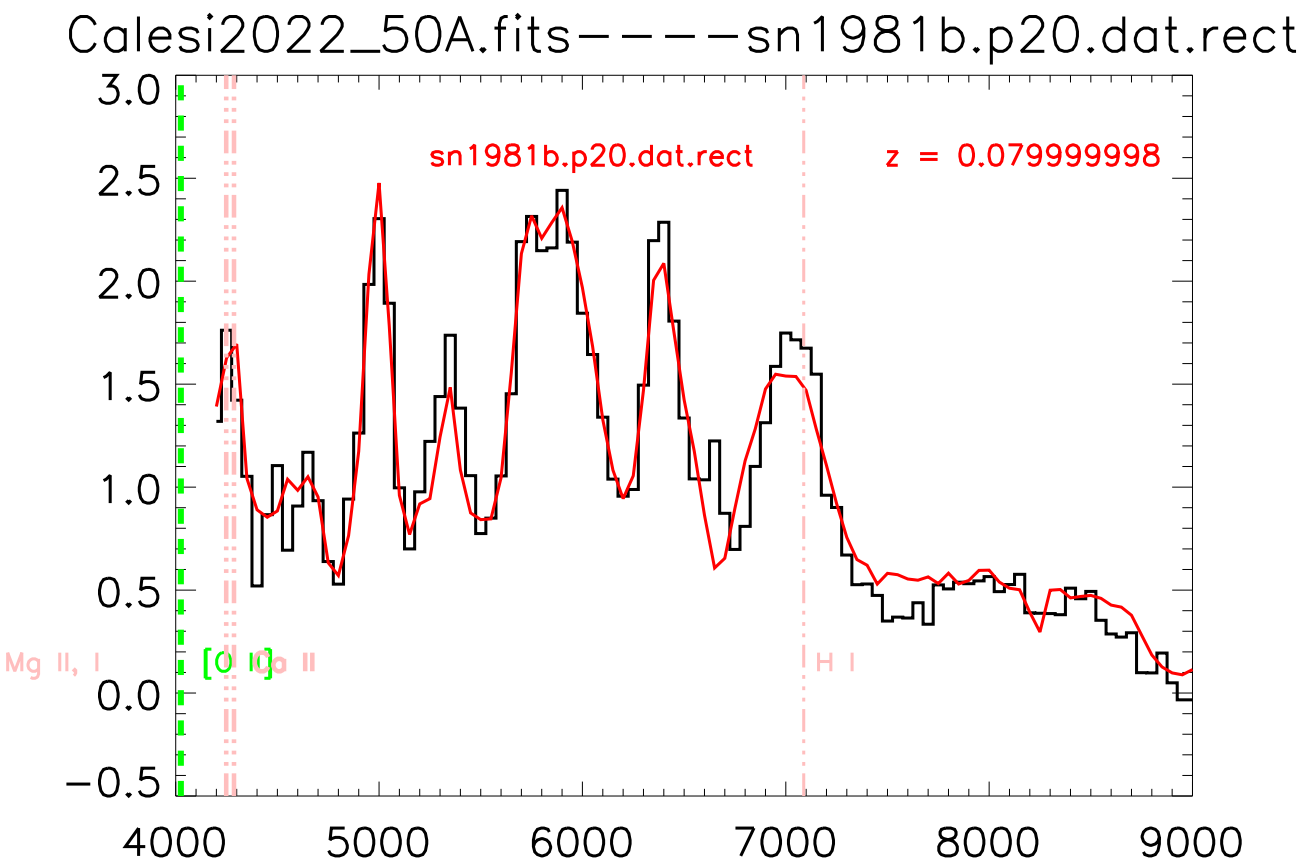

sn1991t.m08, z = 0.25999999
Calesi1058_10A.fits Observed − Galaxy
Template Spectrum Av = −0.67085462
Galaxy
SN/Gal = 0.757246
2.5
2.0
1.5
1.0
0.5
0.0
−0.5
4000
5000
6000
7000
8000
9000
10000

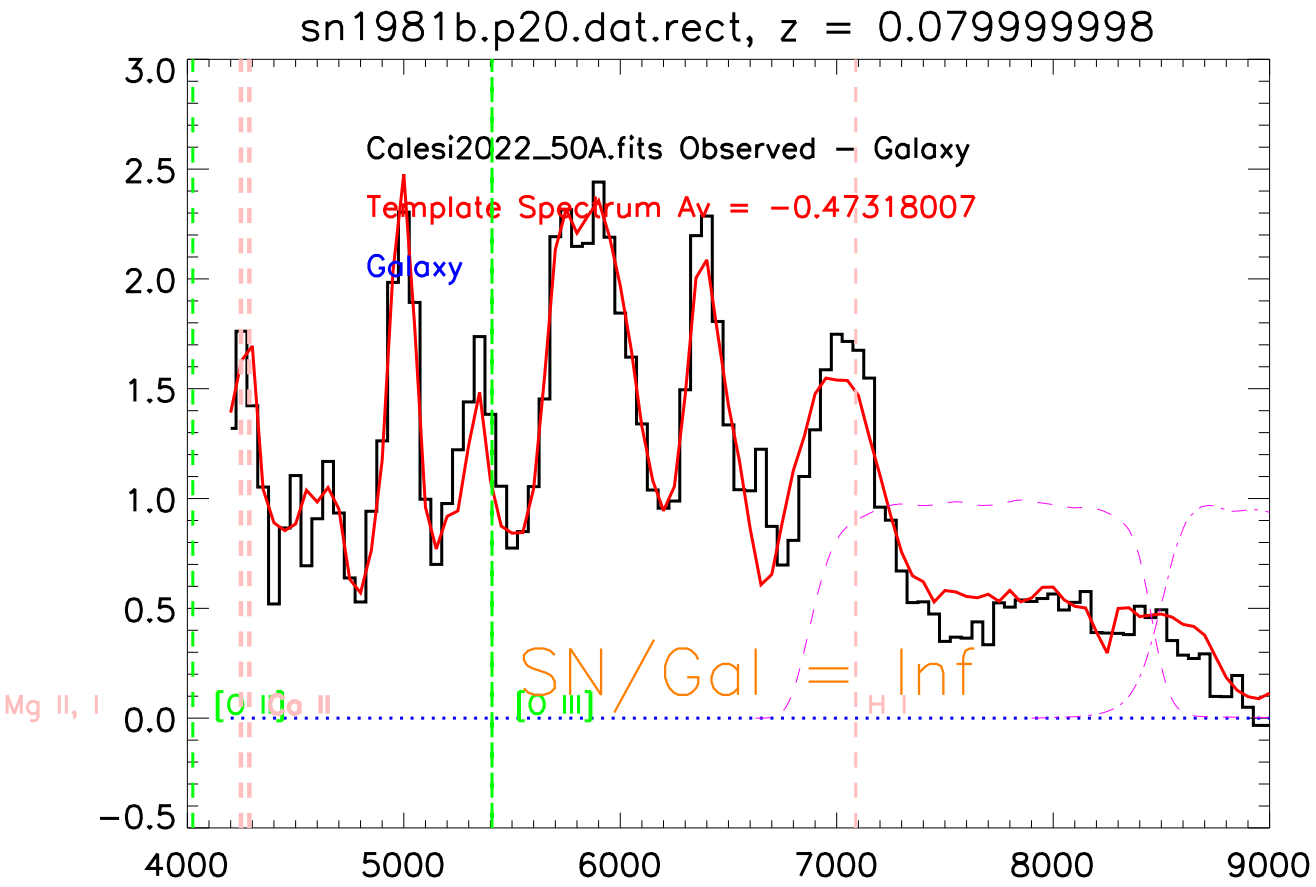


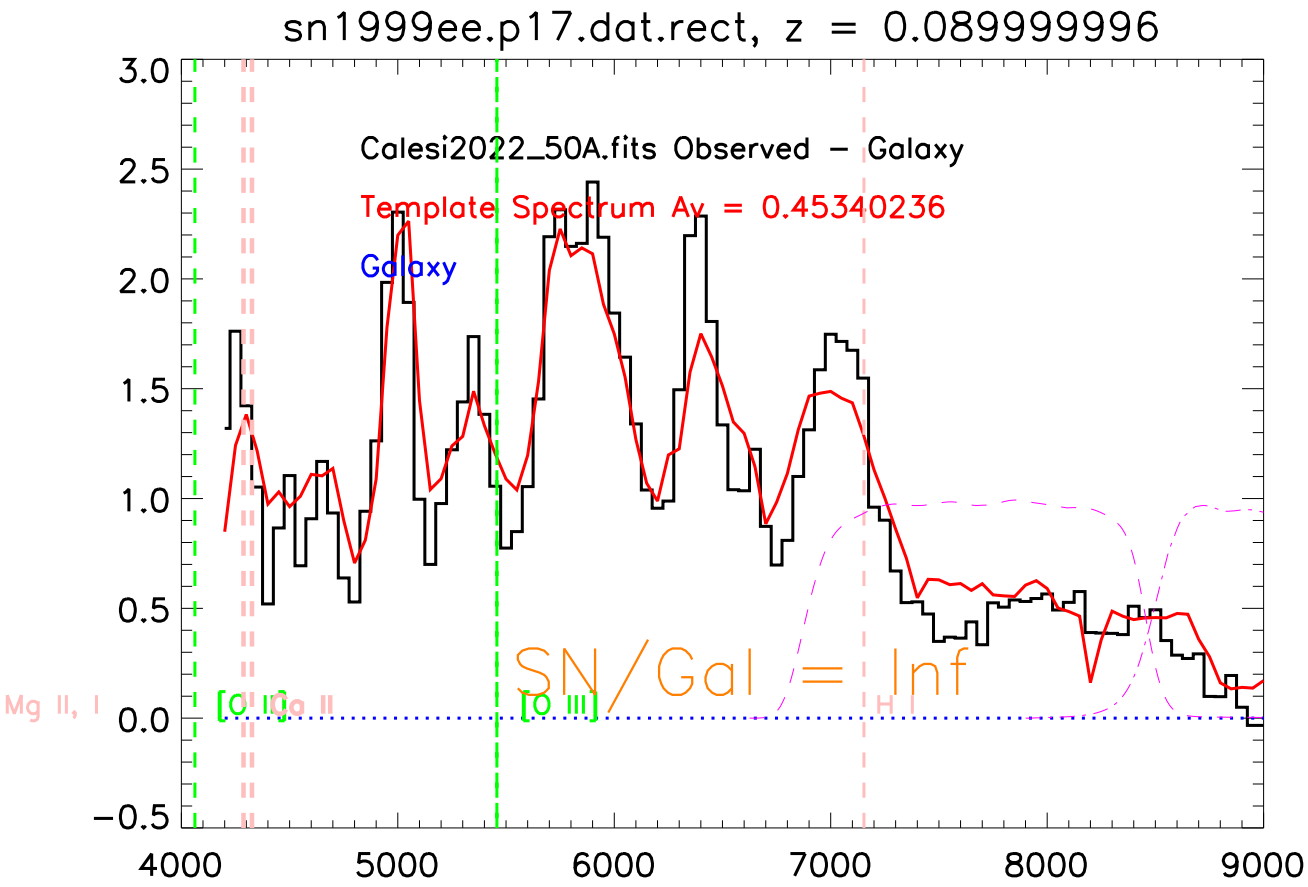


12
10
8
6
4
2
0
χ^2
40
20
0
−20
Days
0.5
1.0
1.5
2.0
Δm15


Calesi2022_50A.fits
12
10
8
6
4
2
0
X^2
0.0
0.1
0.2
0.3
z


Calesi2022_50A.fits----sn1981b.p20.dat.rect
sn1981b.p20.dat.rect
z = 0.079999998
Mg II, I
[O II]
Ca II
H I
3.0
2.5
2.0
1.5
1.0
0.5
0.0
−0.5
4000
5000
6000
7000
8000
9000


sn1981b.p20.dat.rect, z = 0.079999998
Calesi2022_50A.fits Observed − Galaxy
Template Spectrum Av = −0.47318007
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
3.0
2.5
2.0
1.5
1.0
0.5
0.0
−0.5
4000
5000
6000
7000
8000
9000


sn1999ee.p17.dat.rect, z = 0.089999996
Calesi2022_50A.fits Observed − Galaxy
Template Spectrum Av = 0.45340236
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
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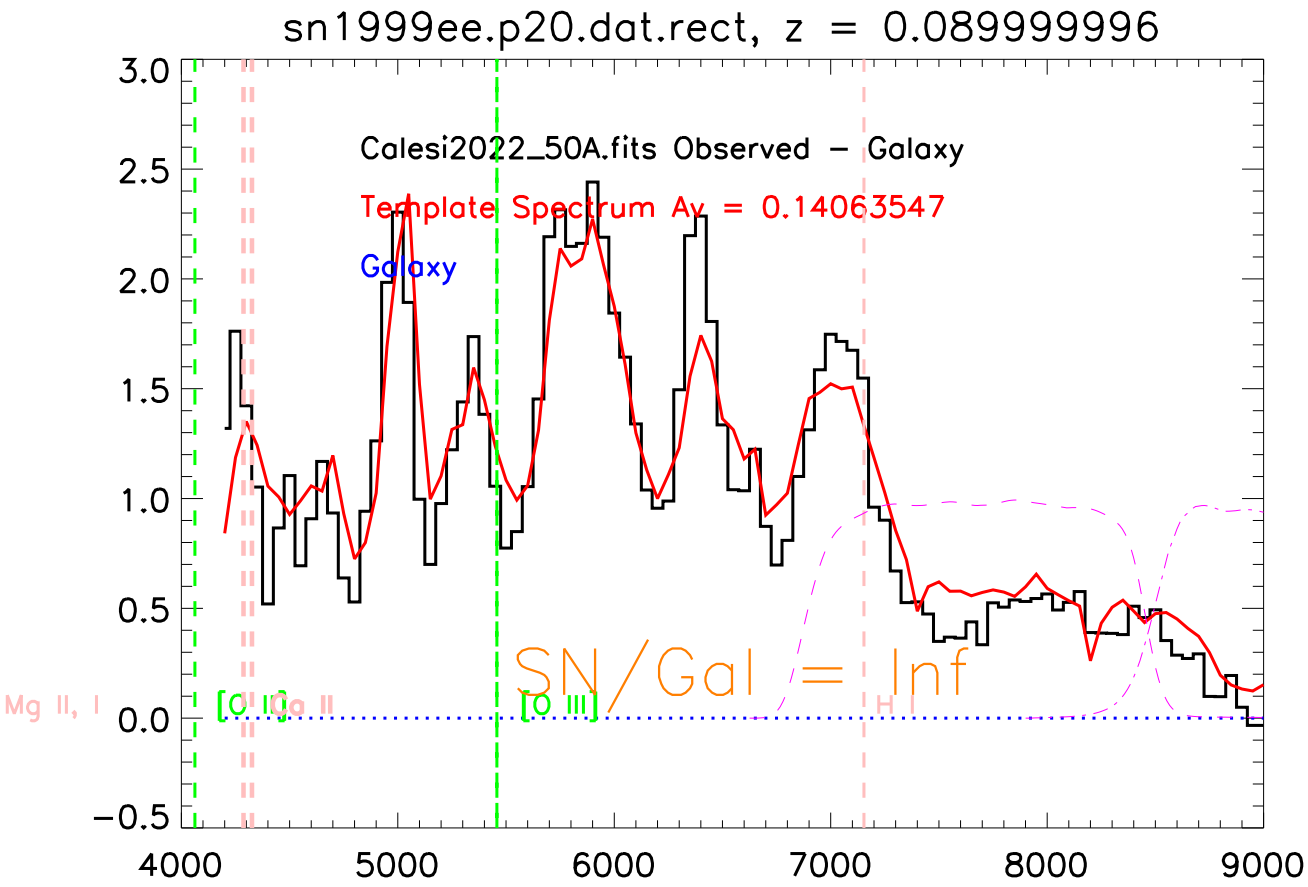
sn1999ee.p20.dat.rect, z = 0.089999996
Calesi2022_50A.fits Observed − Galaxy
Template Spectrum Av = 0.14063547
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
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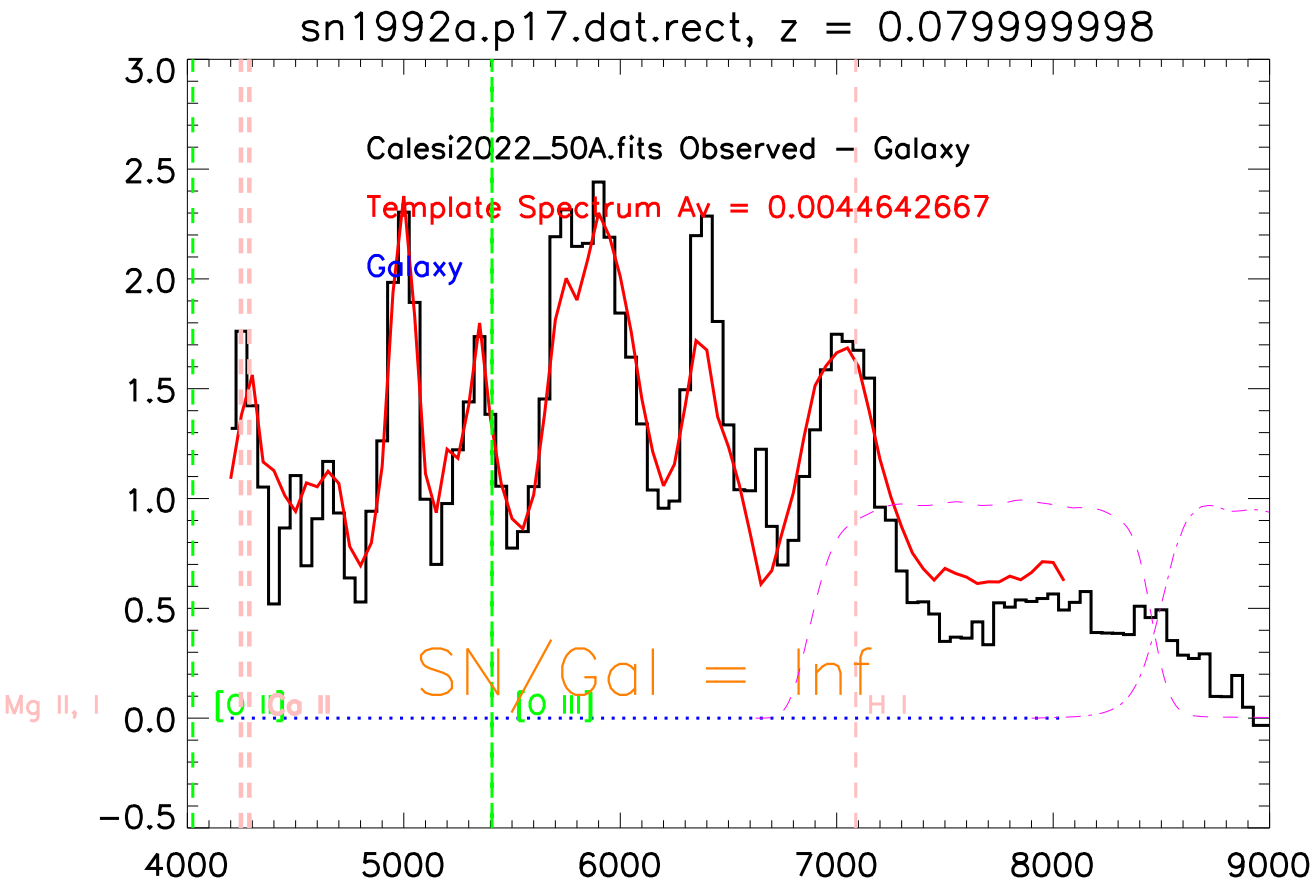
sn1992a.p17.dat.rect, z = 0.079999998
Calesi2022_50A.fits Observed − Galaxy
Template Spectrum Av = 0.0044642667
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
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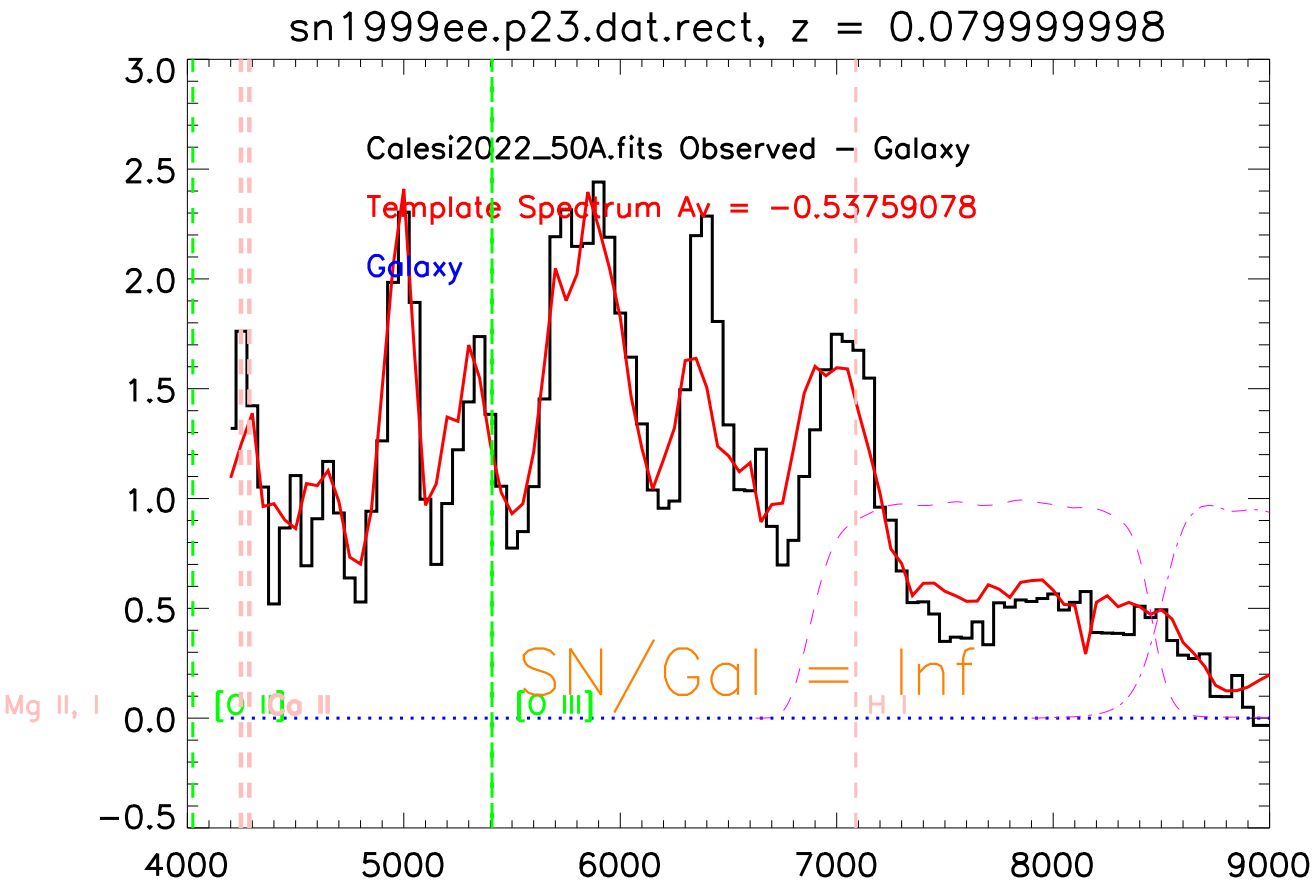
sn1999ee.p23.dat.rect, z = 0.079999998
Calesi2022_50A.fits Observed − Galaxy
Template Spectrum Av = −0.53759078
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
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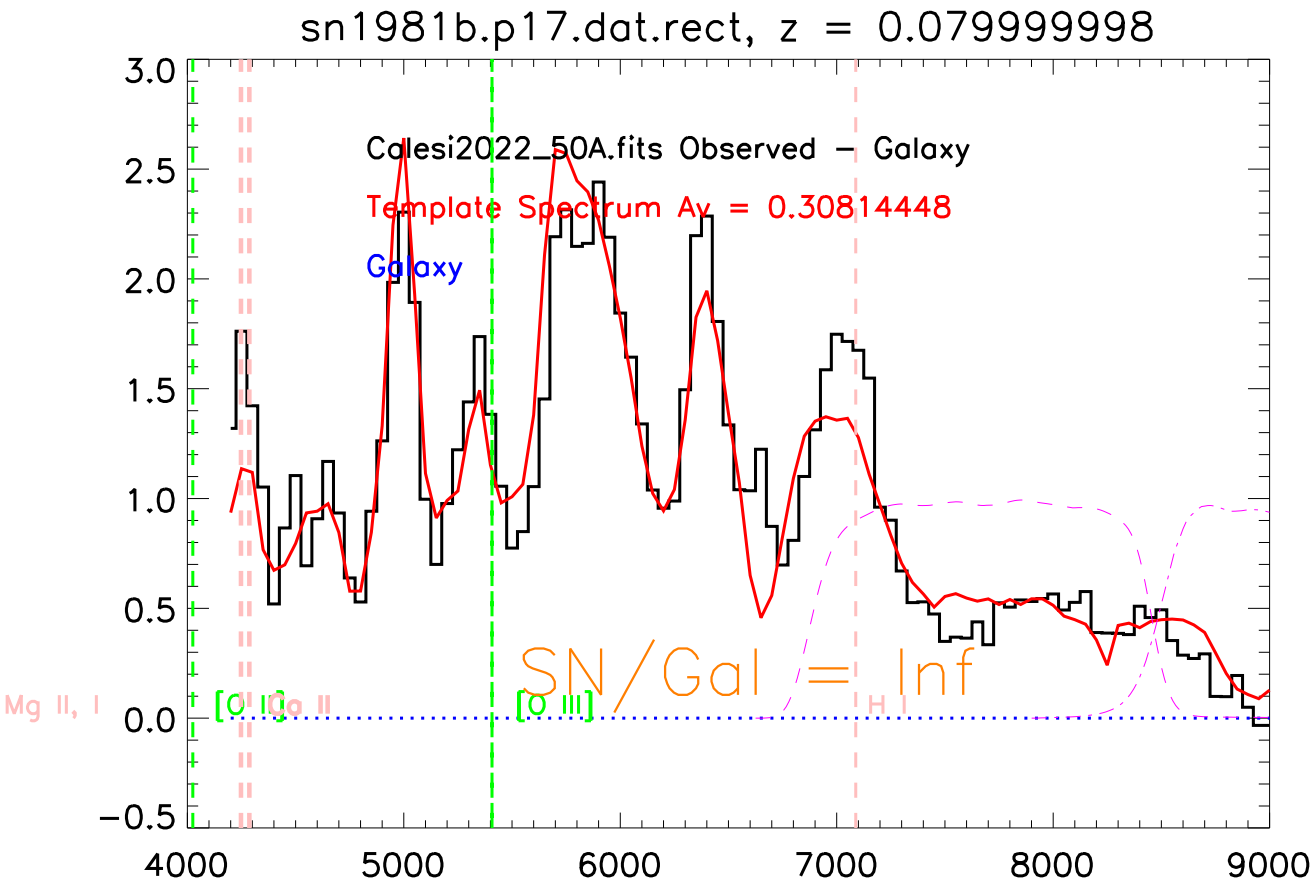
sn1981b.p17.dat.rect, z = 0.079999998
Calesi2022_50A.fits Observed − Galaxy
Template Spectrum Av = 0.30814448
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
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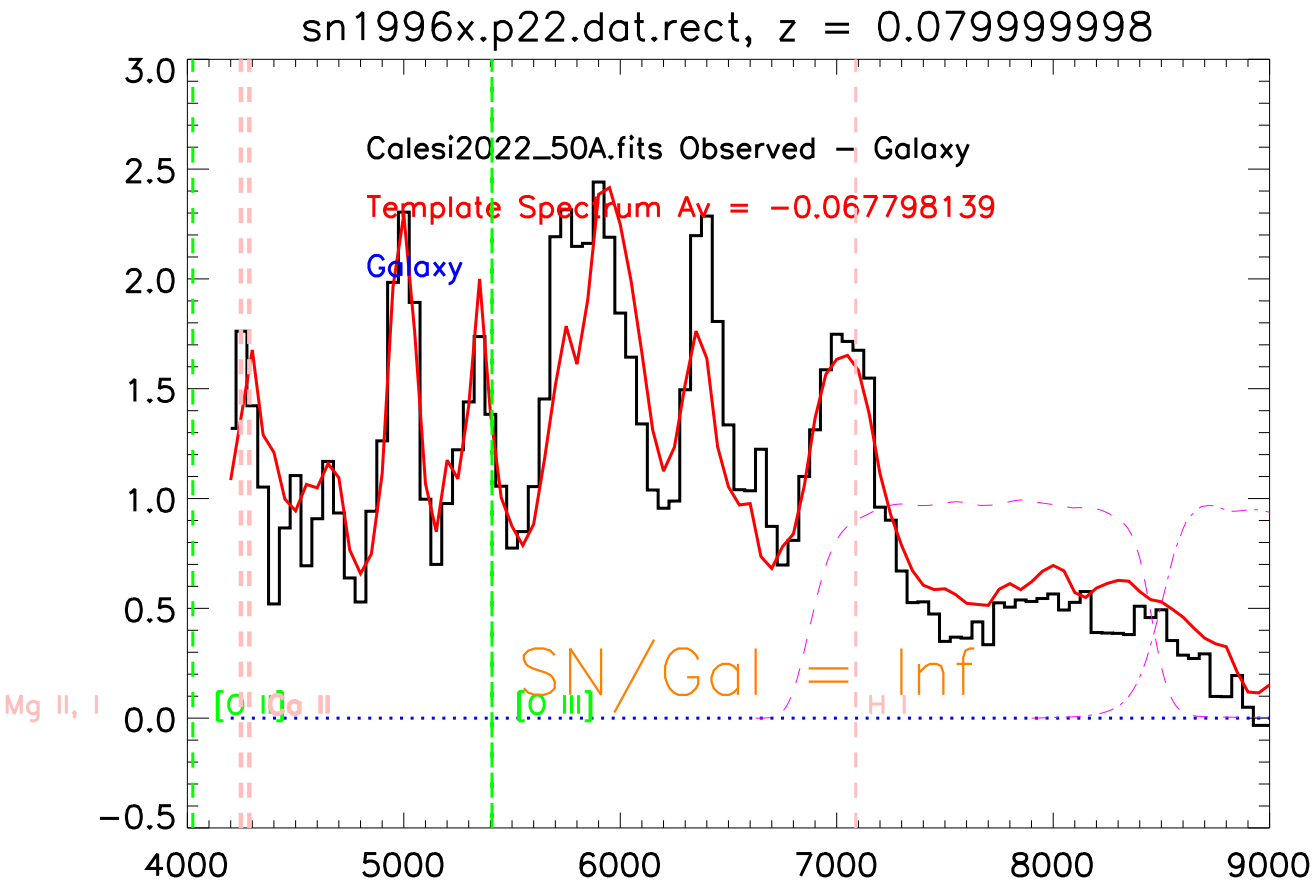
sn1996x.p22.dat.rect, z = 0.079999998
Calesi2022_50A.fits Observed − Galaxy
Template Spectrum Av = −0.067798139
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
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1.0
0.5
0.0
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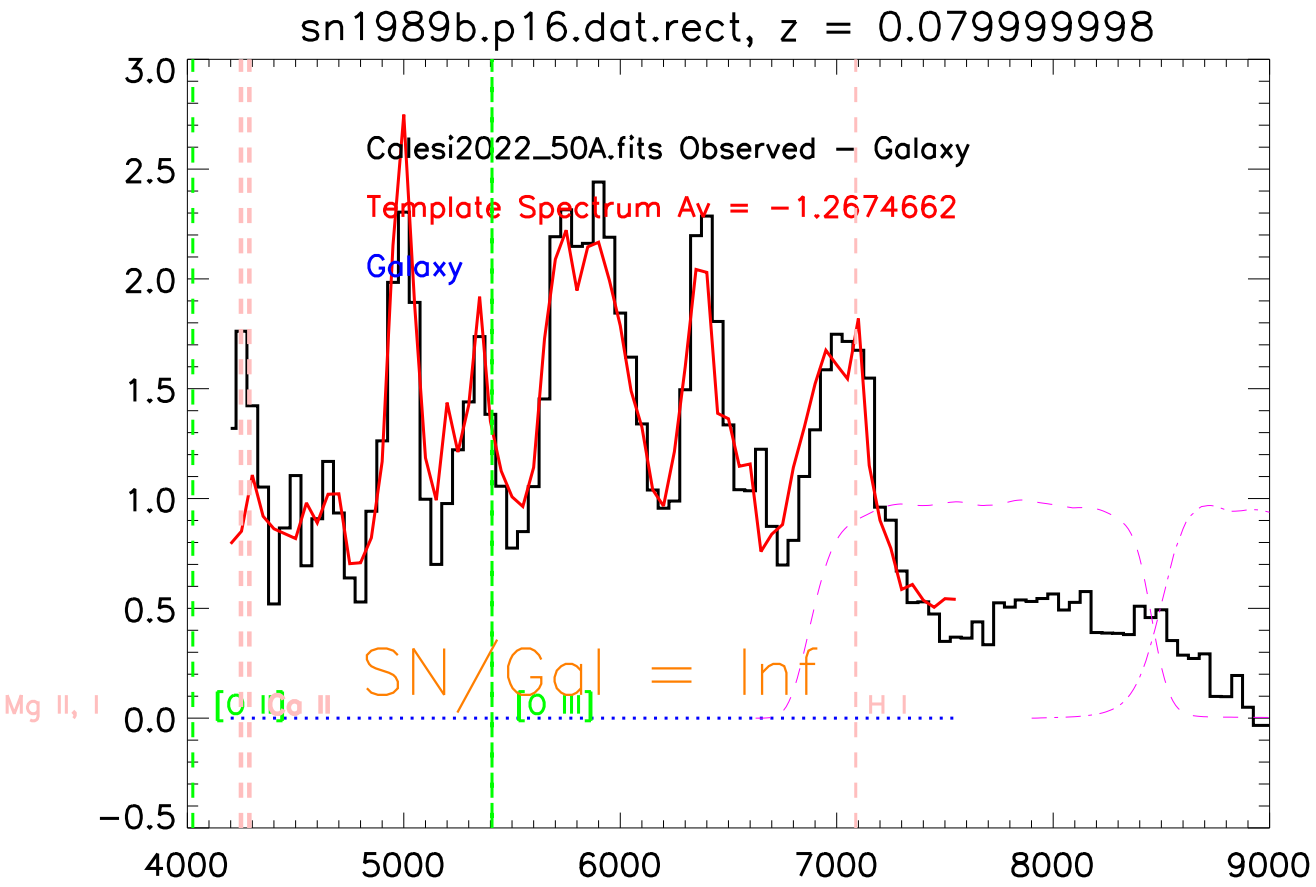
sn1989b.p16.dat.rect, z = 0.079999998
Calesi2022_50A.fits Observed − Galaxy
Template Spectrum Av = −1.2674662
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
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1.0
0.5
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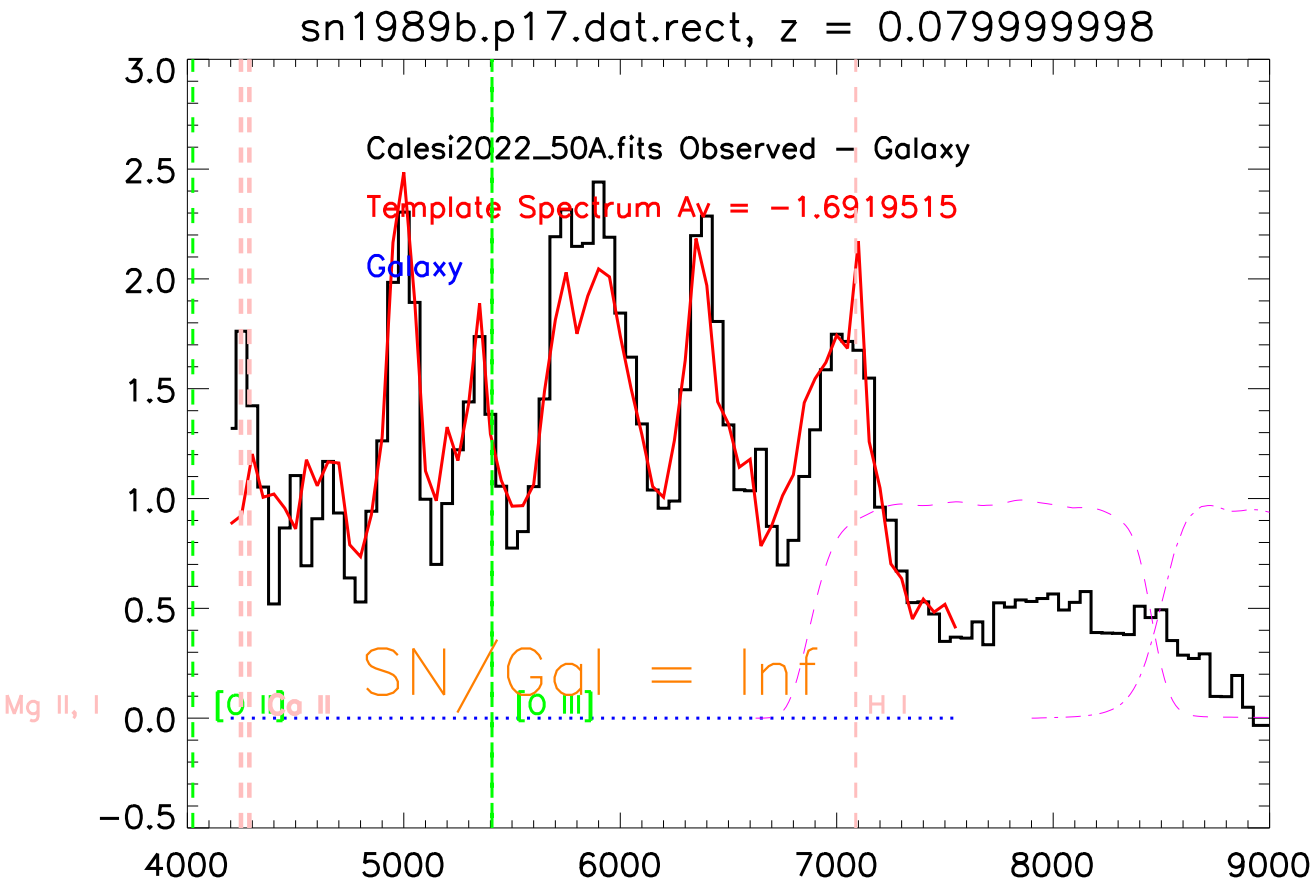
sn1989b.p17.dat.rect, z = 0.079999998
Calesi2022_50A.fits Observed − Galaxy
Template Spectrum Av = −1.6919515
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
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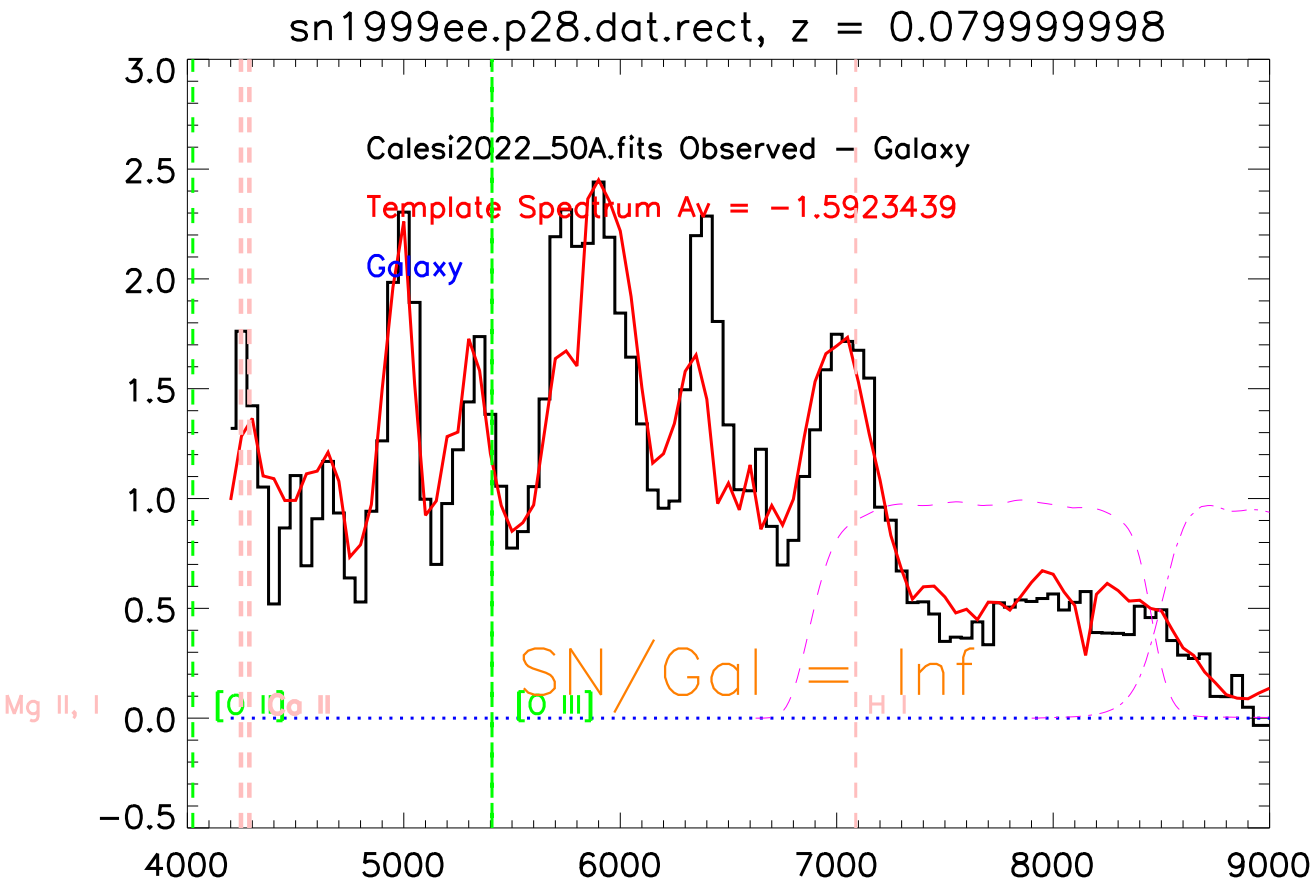
sn1999ee.p28.dat.rect, z = 0.079999998
Calesi2022_50A.fits Observed − Galaxy
Template Spectrum Av = −1.5923439
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
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1.5
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0.5
0.0
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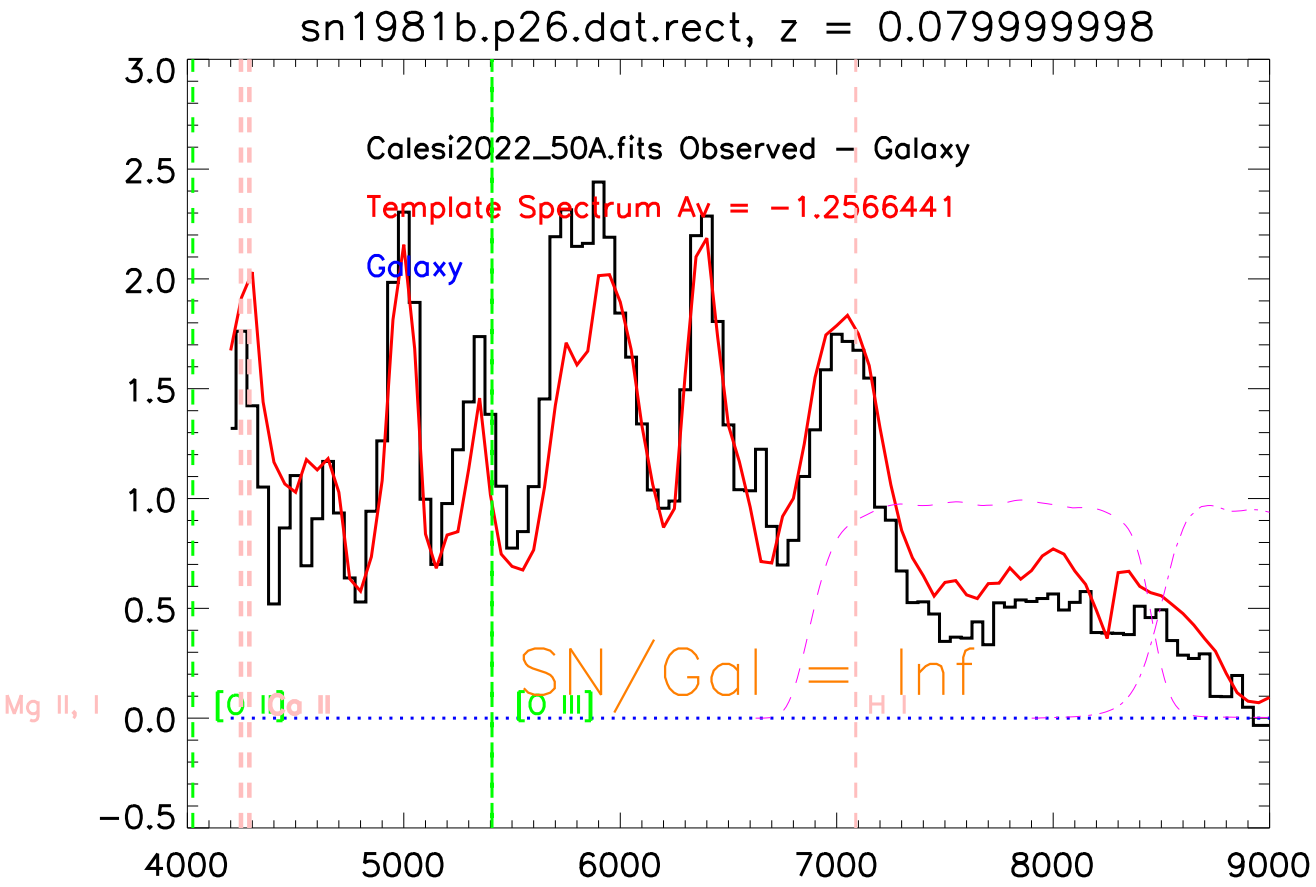
sn1981b.p26.dat.rect, z = 0.079999998
Calesi2022_50A.fits Observed − Galaxy
Template Spectrum Av = −1.2566441
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
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1.5
1.0
0.5
0.0
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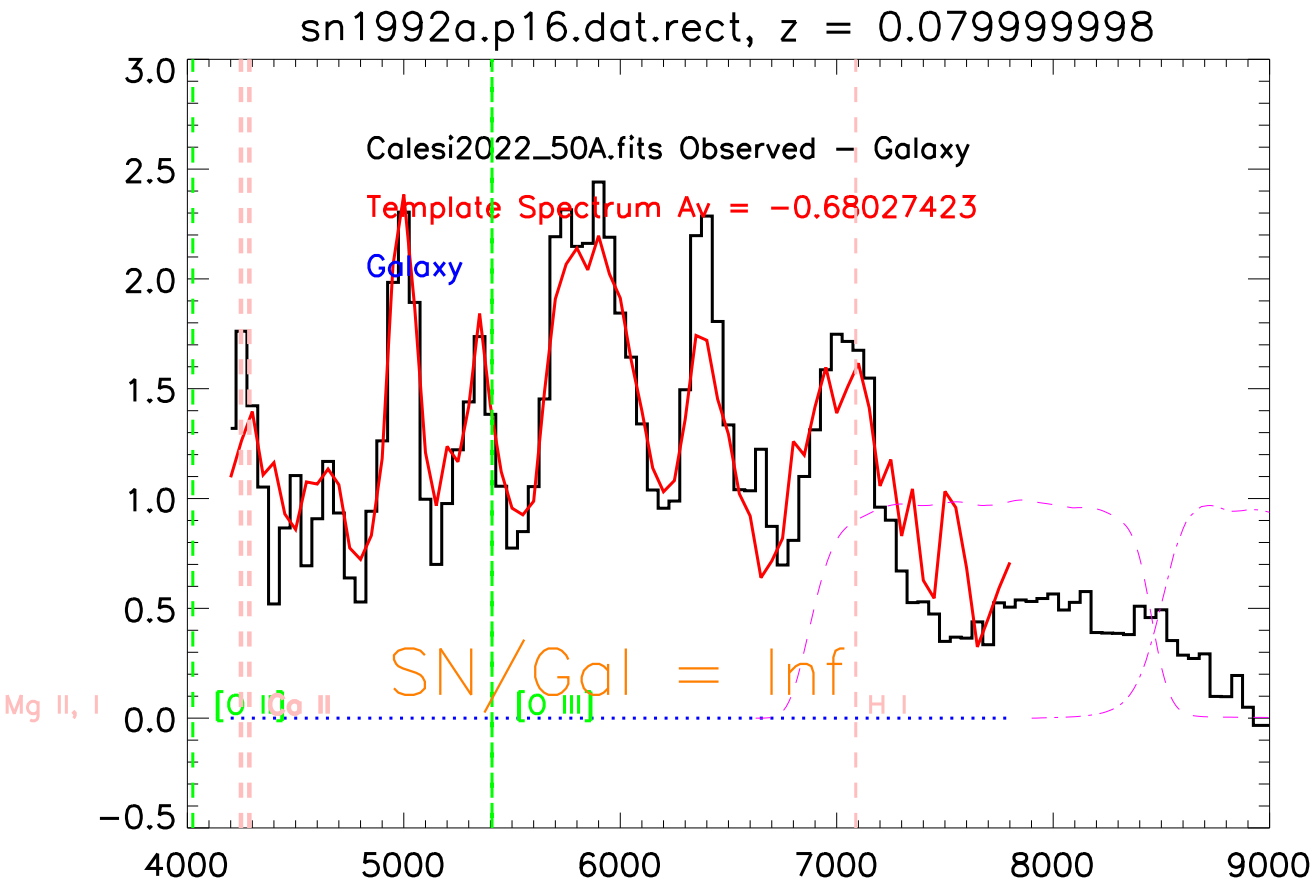
sn1992a.p16.dat.rect, z = 0.079999998
Calesi2022_50A.fits Observed − Galaxy
Template Spectrum Av = −0.68027423
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
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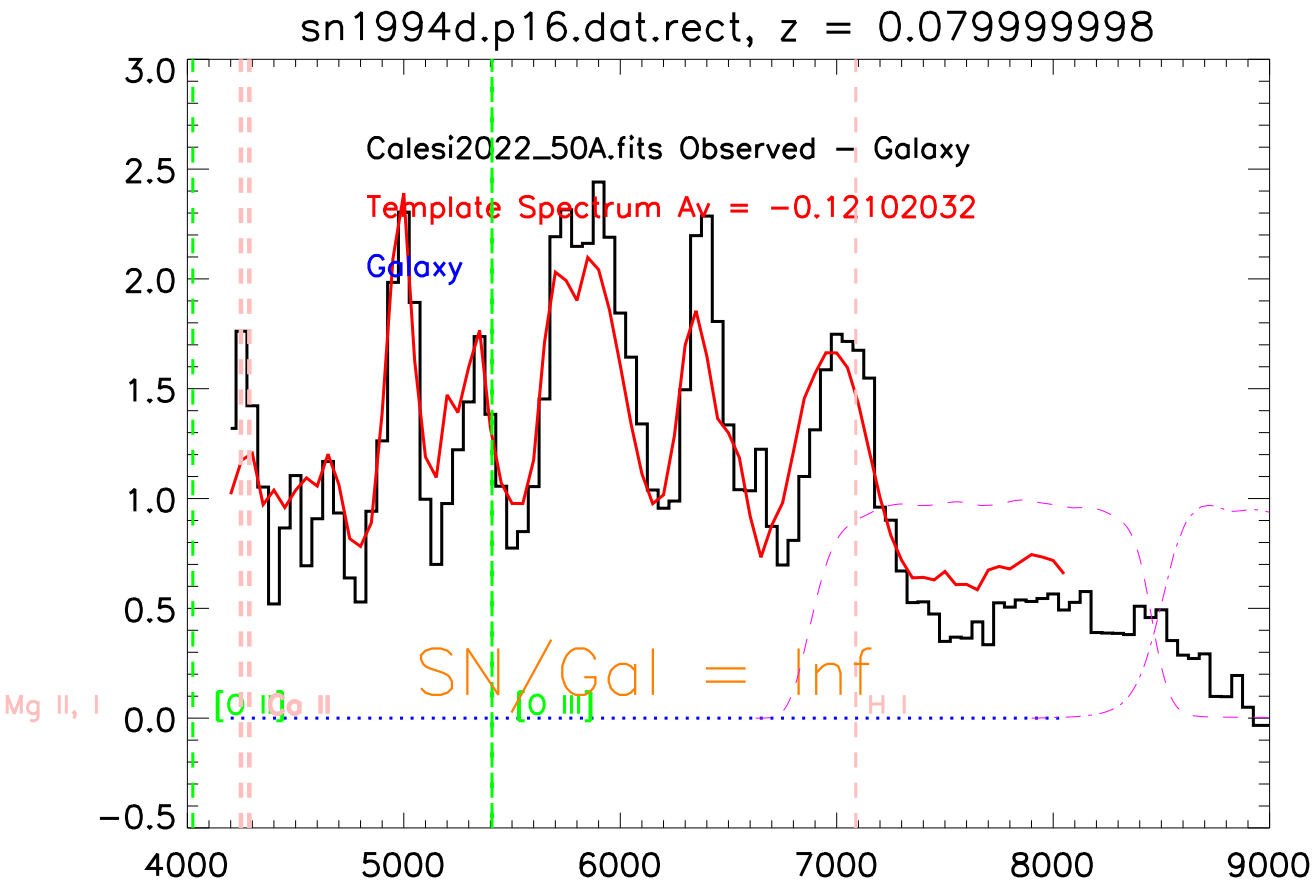
sn1994d.p16.dat.rect, z = 0.079999998
Calesi2022_50A.fits Observed − Galaxy
Template Spectrum Av = −0.12102032
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
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0.0
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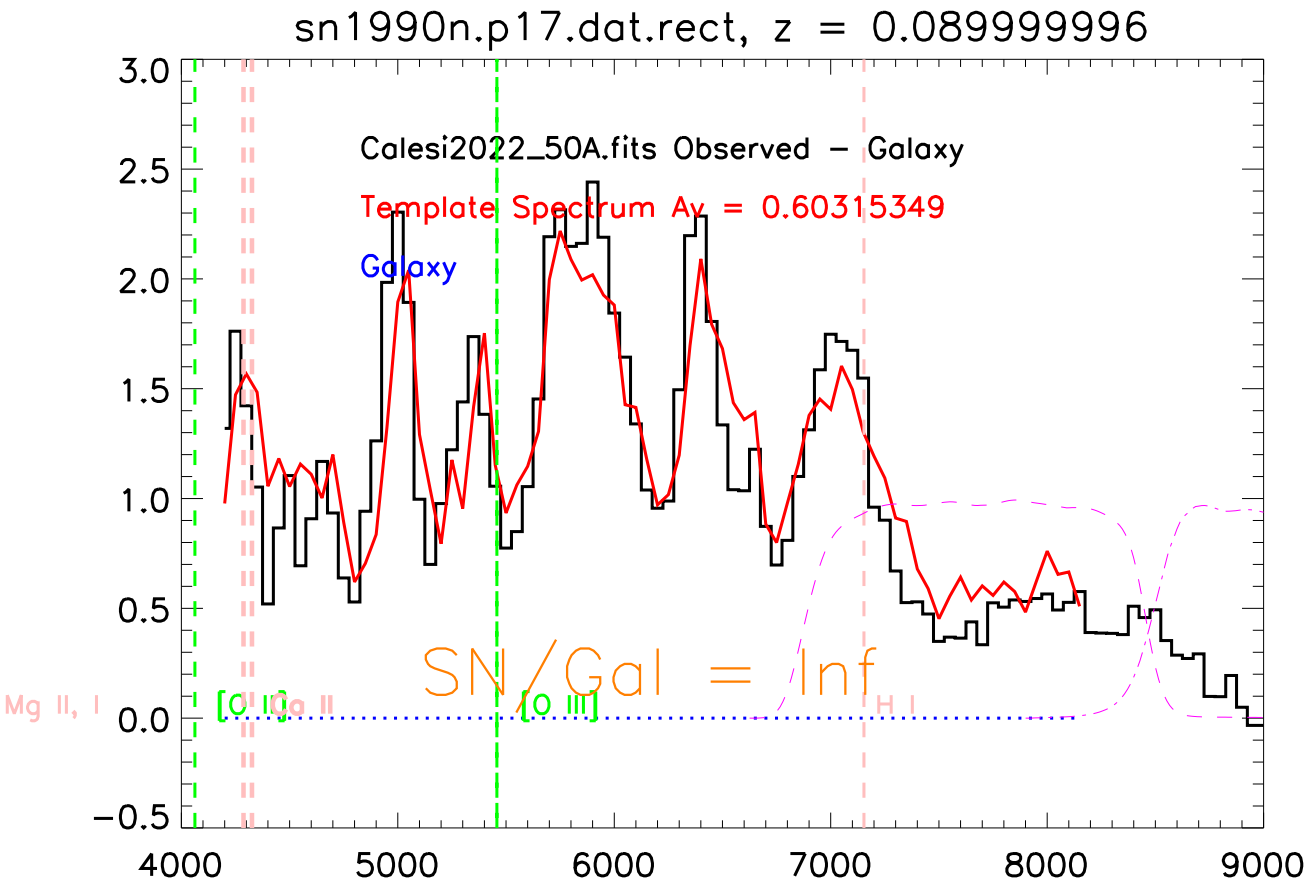
sn1990n.p17.dat.rect, z = 0.089999996
Calesi2022_50A.fits Observed − Galaxy
Template Spectrum Av = 0.60315349
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
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1.5
1.0
0.5
0.0
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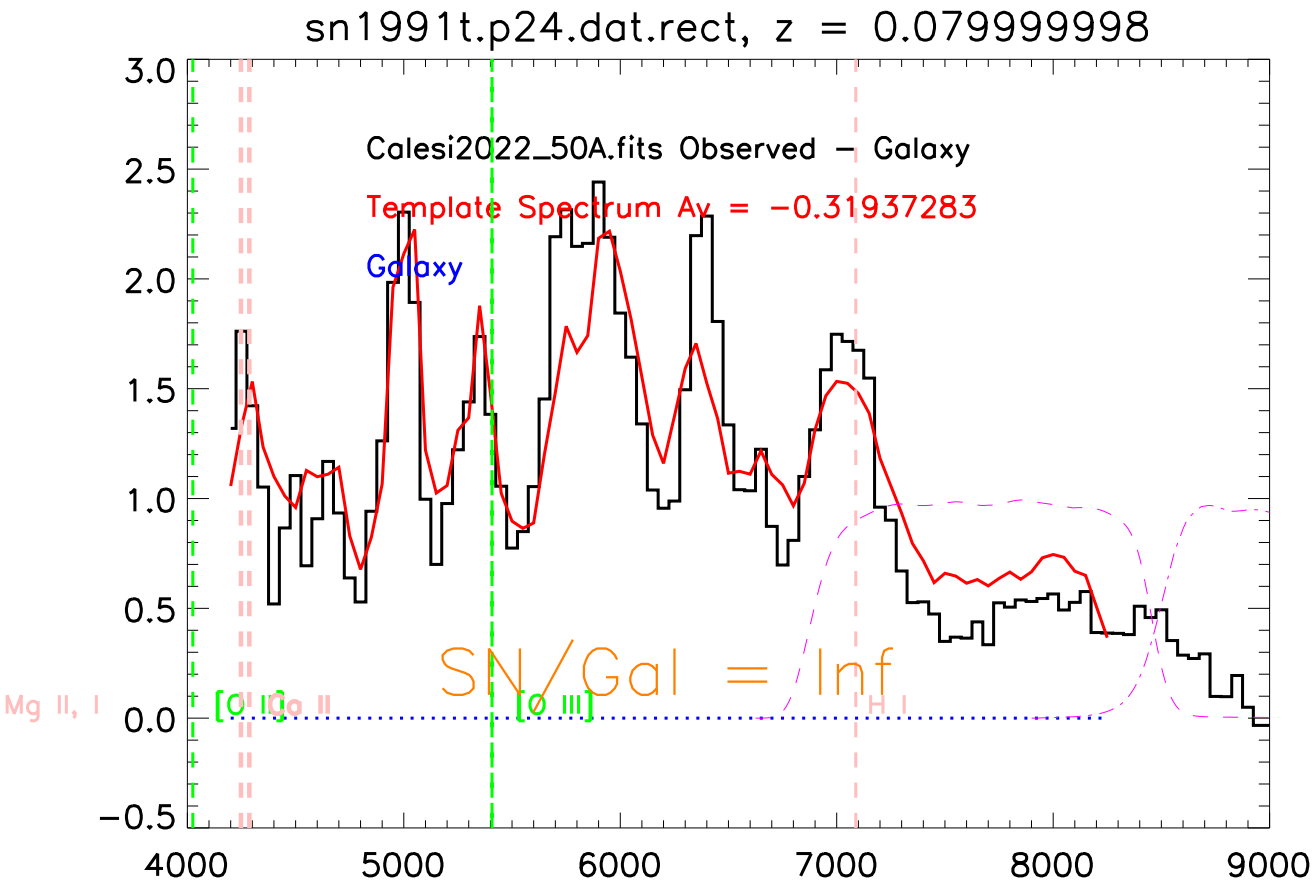
sn1991t.p24.dat.rect, z = 0.079999998
Calesi2022_50A.fits Observed − Galaxy
Template Spectrum Av = −0.31937283
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
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1.5
1.0
0.5
0.0
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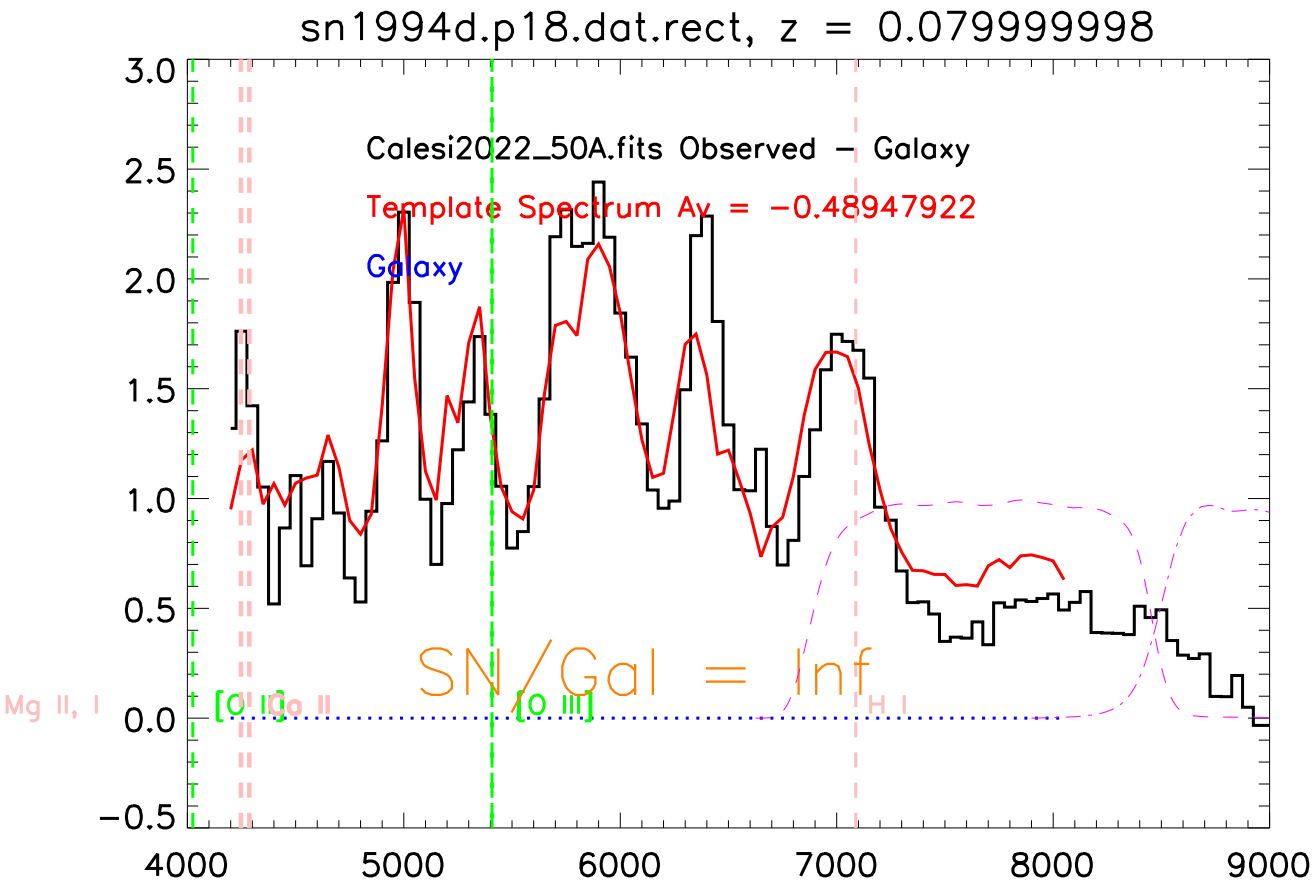
sn1994d.p18.dat.rect, z = 0.079999998
Calesi2022_50A.fits Observed − Galaxy
Template Spectrum Av = −0.48947922
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
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1.5
1.0
0.5
0.0
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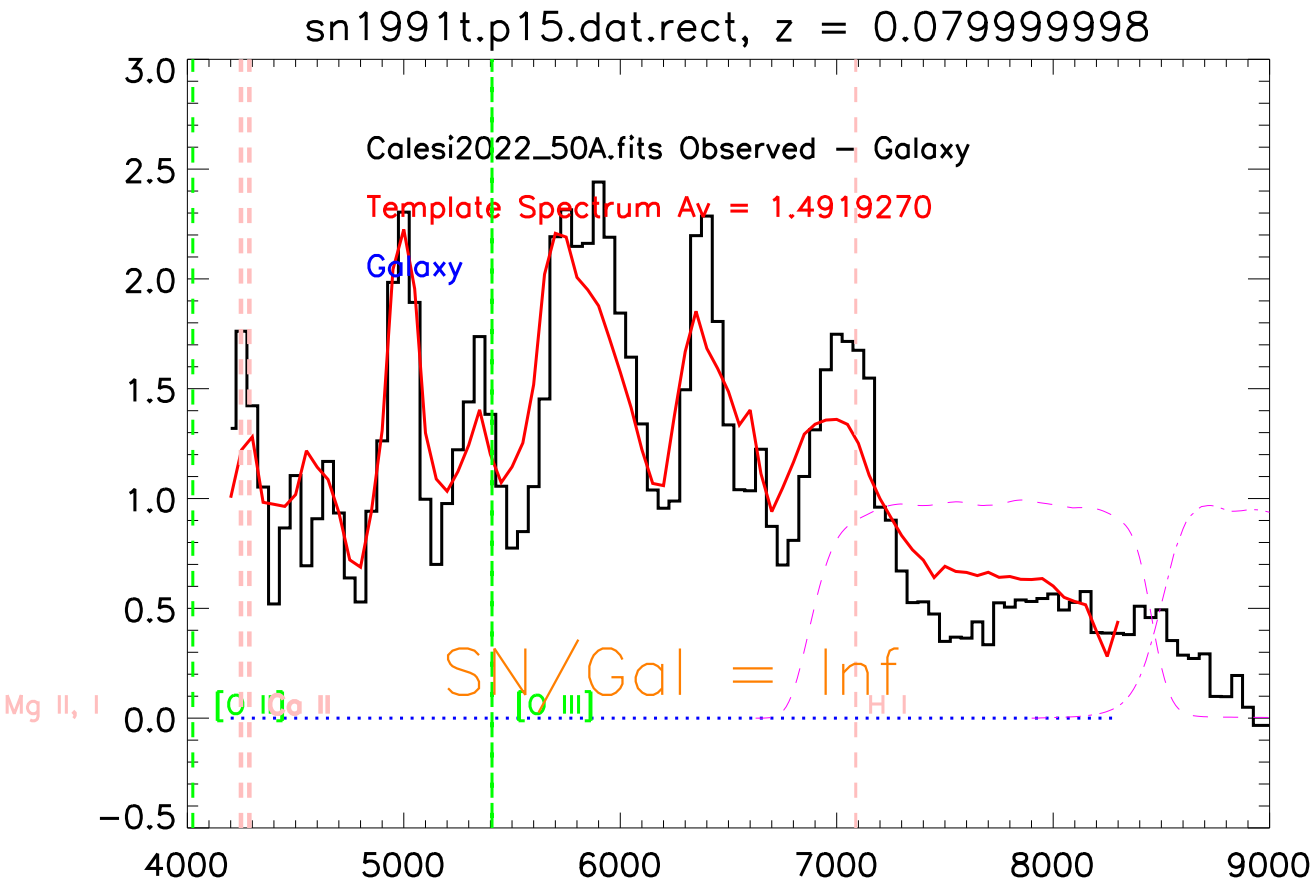
sn1991t.p15.dat.rect, z = 0.079999998
Calesi2022_50A.fits Observed − Galaxy
Template Spectrum Av = 1.4919270
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
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1.5
1.0
0.5
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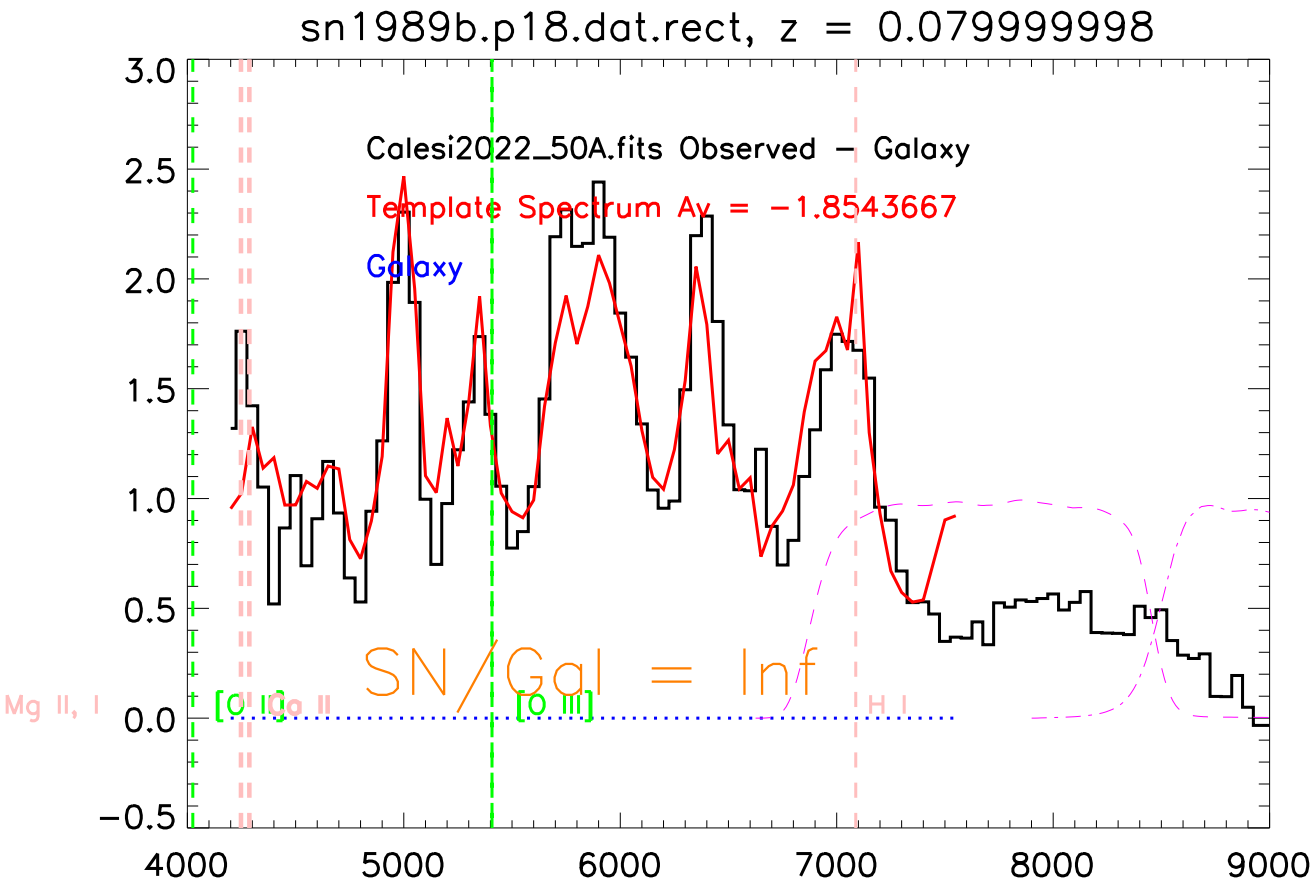
sn1989b.p18.dat.rect, z = 0.079999998
Calesi2022_50A.fits Observed − Galaxy
Template Spectrum Av = −1.8543667
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
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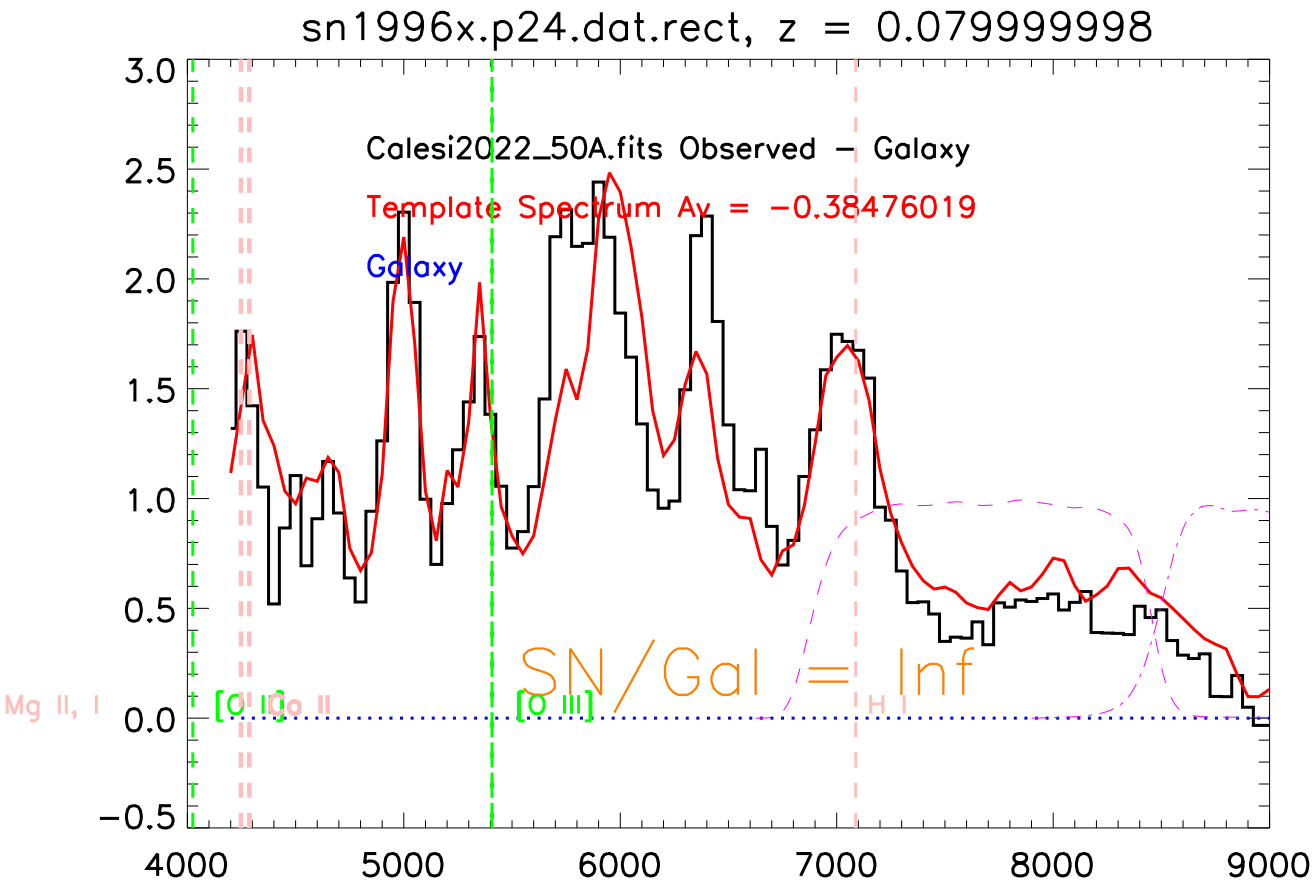
sn1996x.p24.dat.rect, z = 0.079999998
Calesi2022_50A.fits Observed − Galaxy
Template Spectrum Av = −0.38476019
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
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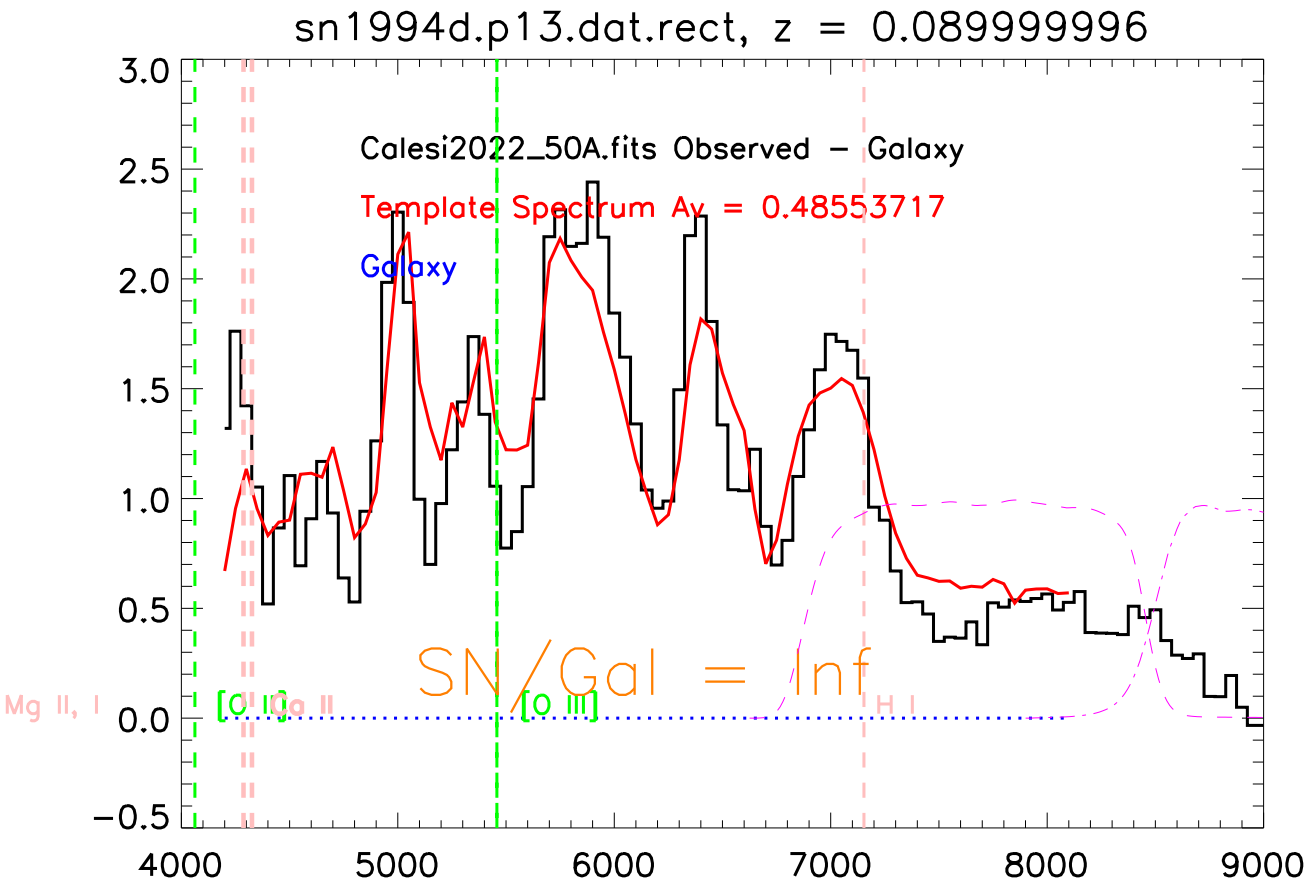
sn1994d.p13.dat.rect, z = 0.089999996
Calesi2022_50A.fits Observed − Galaxy
Template Spectrum Av = 0.48553717
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
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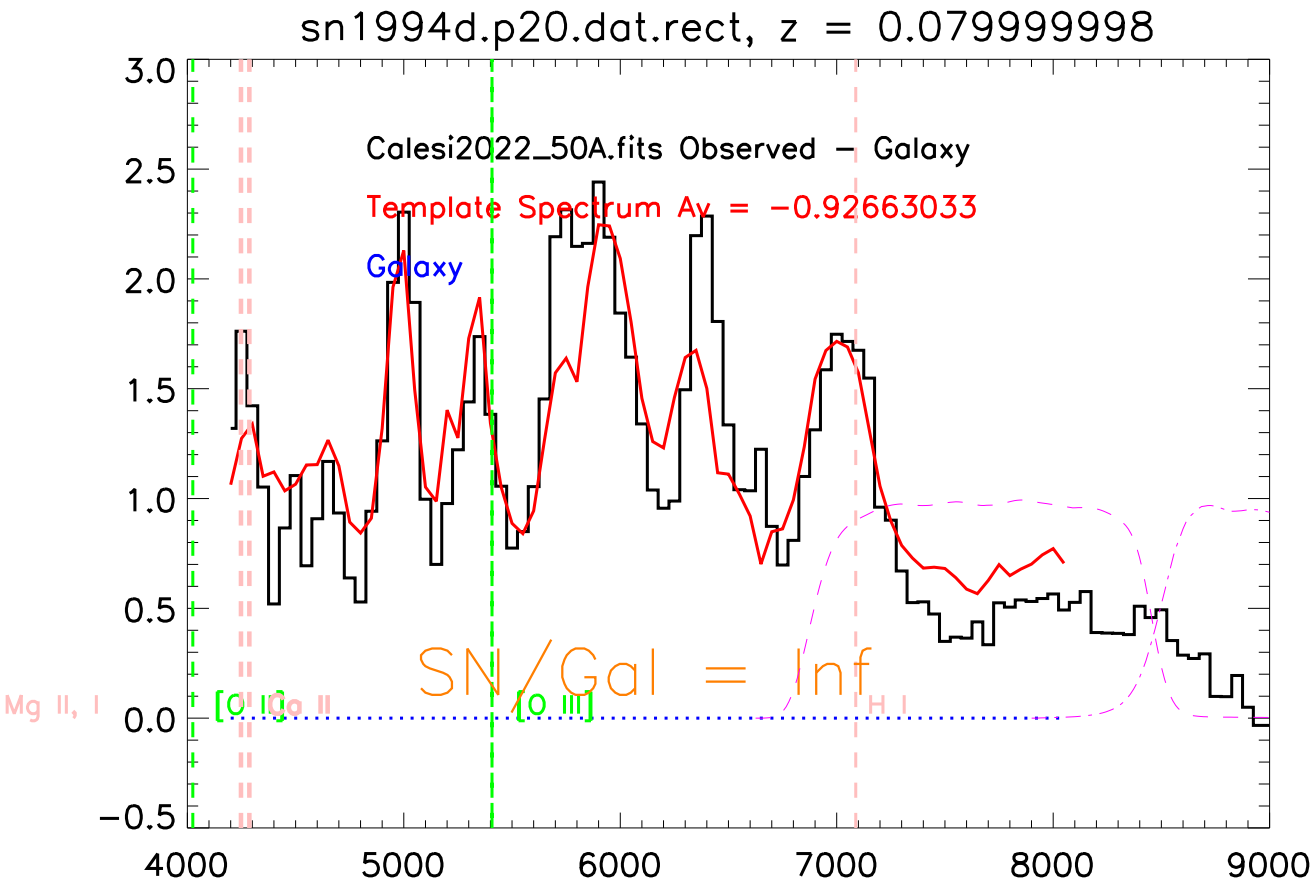
sn1994d.p20.dat.rect, z = 0.079999998
Calesi2022_50A.fits Observed − Galaxy
Template Spectrum Av = −0.92663033
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
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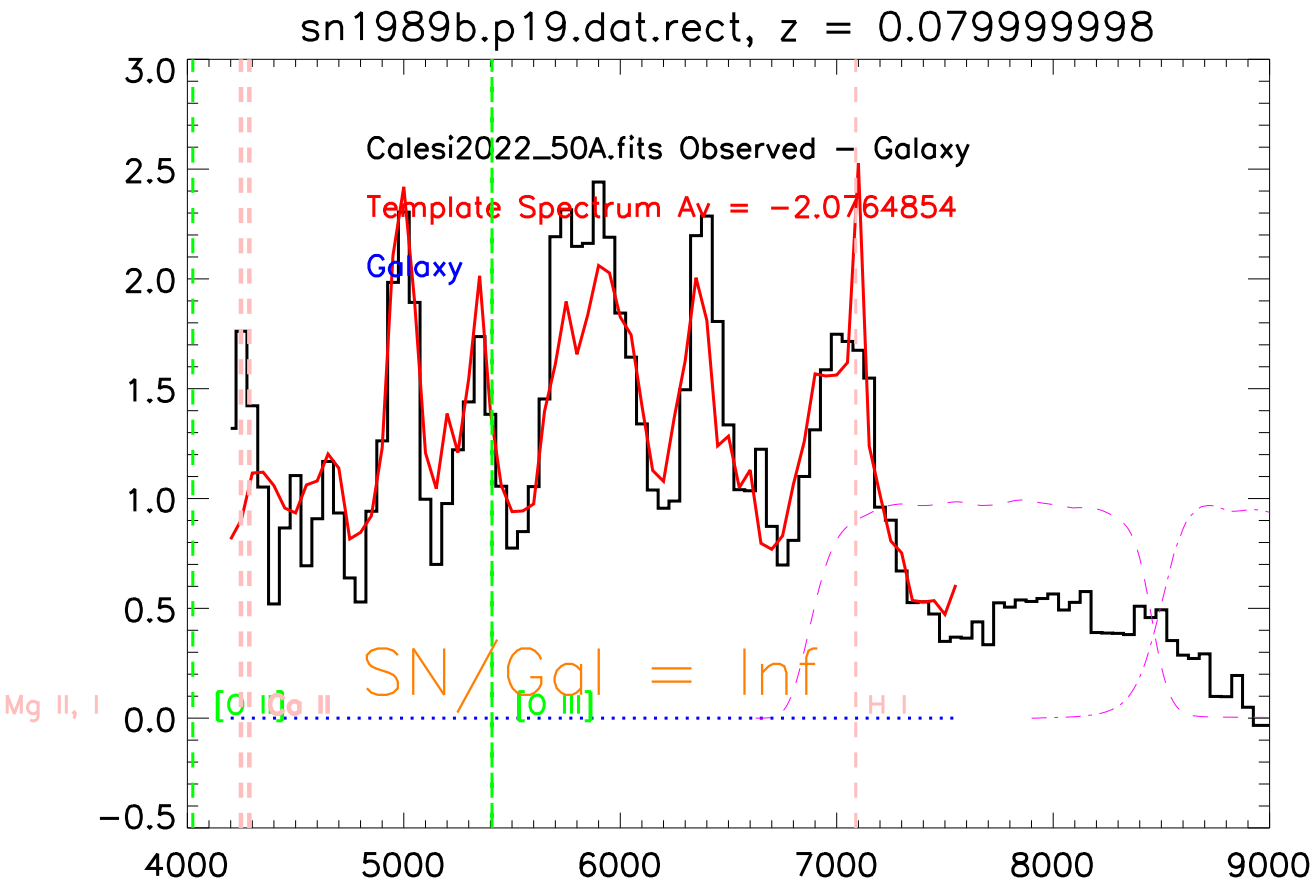
sn1989b.p19.dat.rect, z = 0.079999998
Calesi2022_50A.fits Observed – Galaxy
Template Spectrum Av = −2.0764854
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
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1.5
1.0
0.5
0.0
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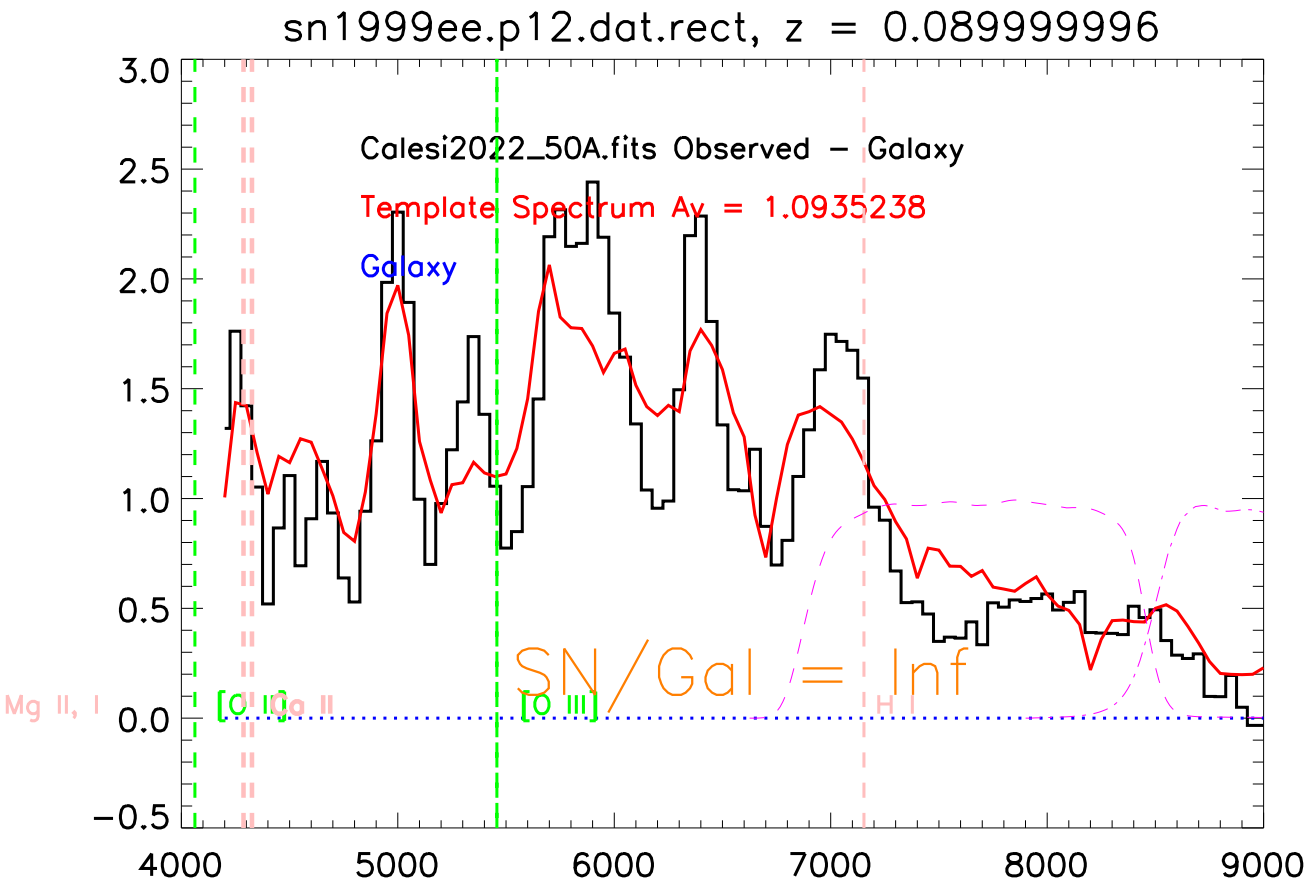
sn1999ee.p12.dat.rect, z = 0.089999996
Calesi2022_50A.fits Observed − Galaxy
Template Spectrum Av = 1.0935238
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
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1.0
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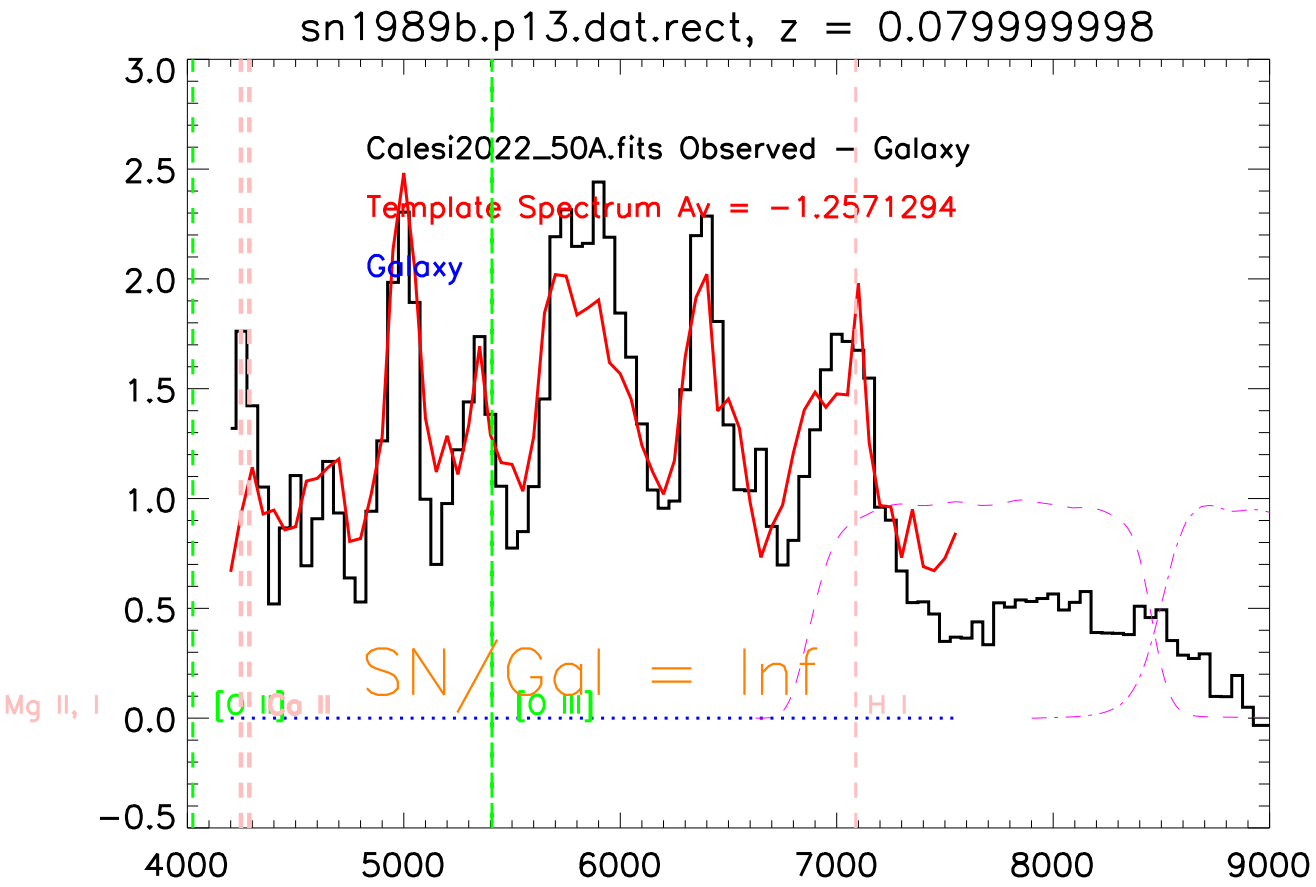
sn1989b.p13.dat.rect, z = 0.079999998
Calesi2022_50A.fits Observed − Galaxy
Template Spectrum Av = −1.2571294
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
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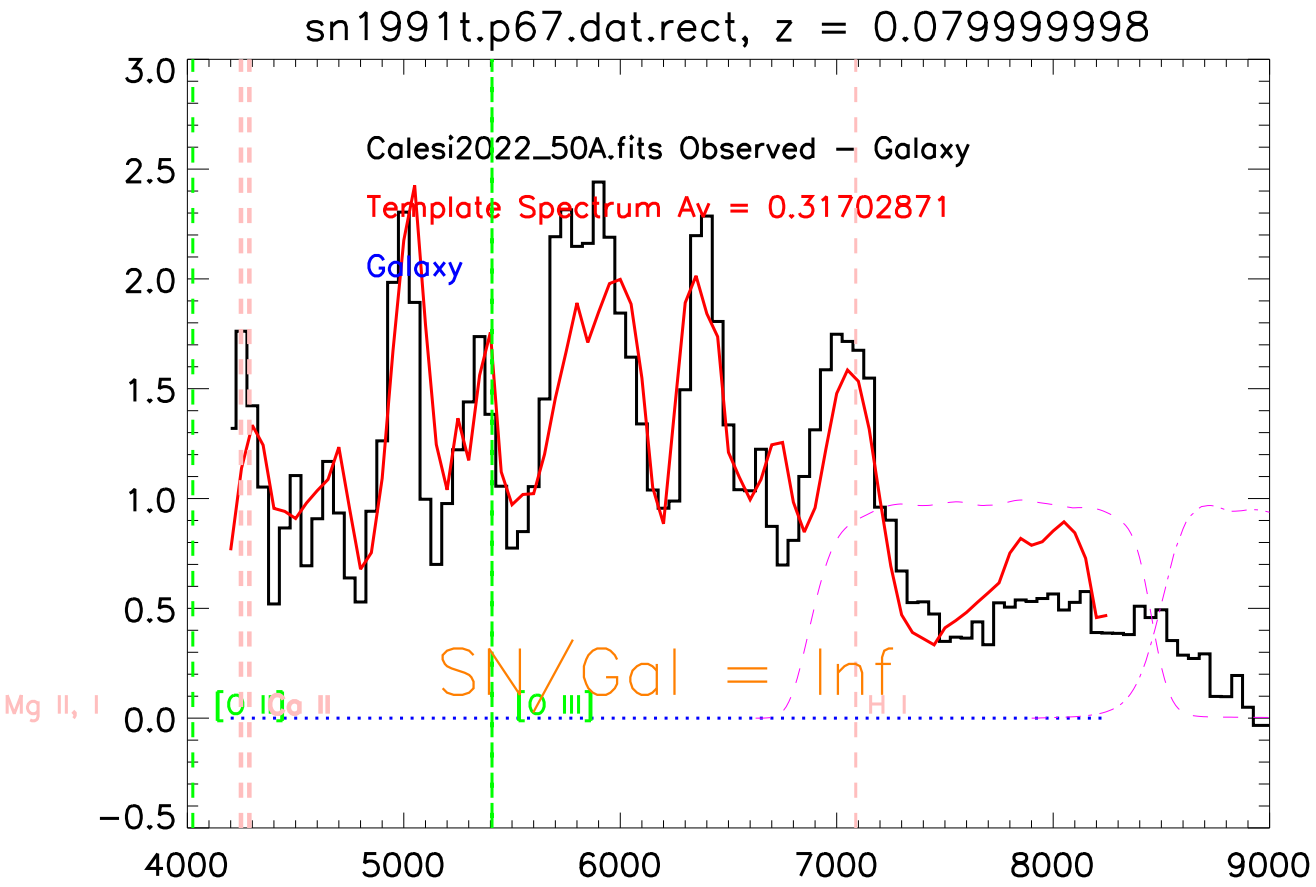
sn1991t.p67.dat.rect, z = 0.079999998
Calesi2022_50A.fits Observed − Galaxy
Template Spectrum Av = 0.31702871
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
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1.5
1.0
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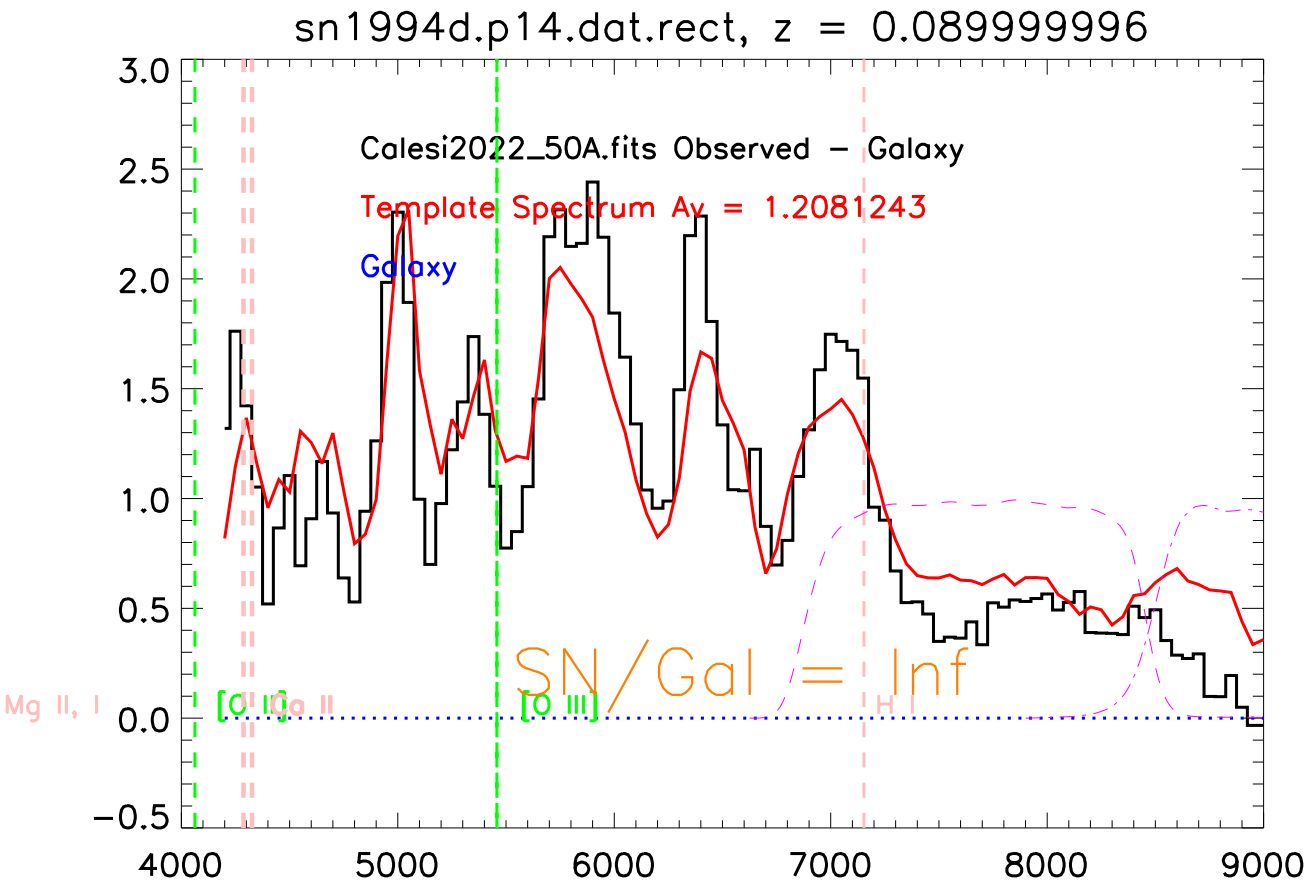
sn1994d.p14.dat.rect, z = 0.089999996
Calesi2022_50A.fits Observed − Galaxy
Template Spectrum Av = 1.2081243
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
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1.5
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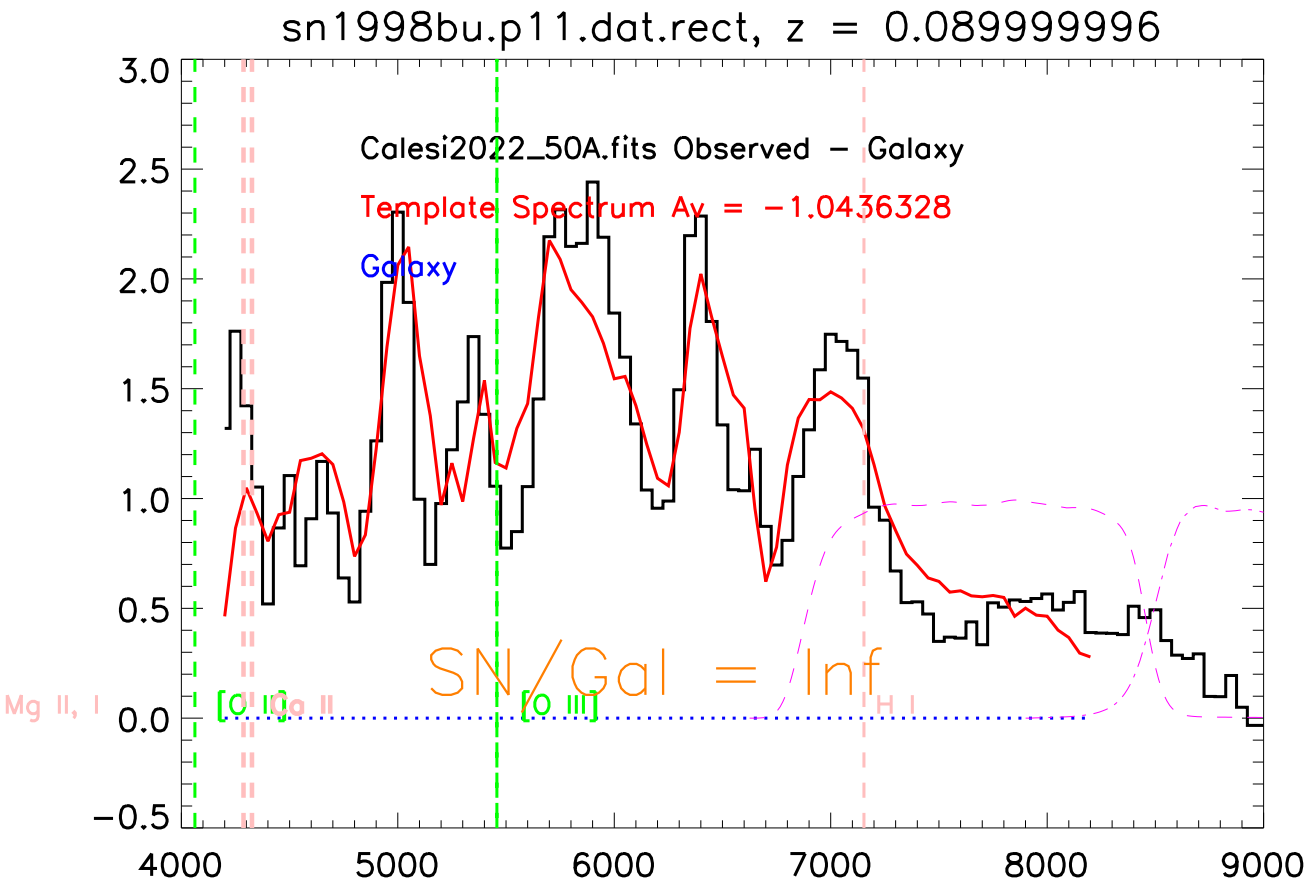
sn1998bu.p11.dat.rect, z = 0.089999996
Calesi2022_50A.fits Observed − Galaxy
Template Spectrum Av = −1.0436328
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
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1.5
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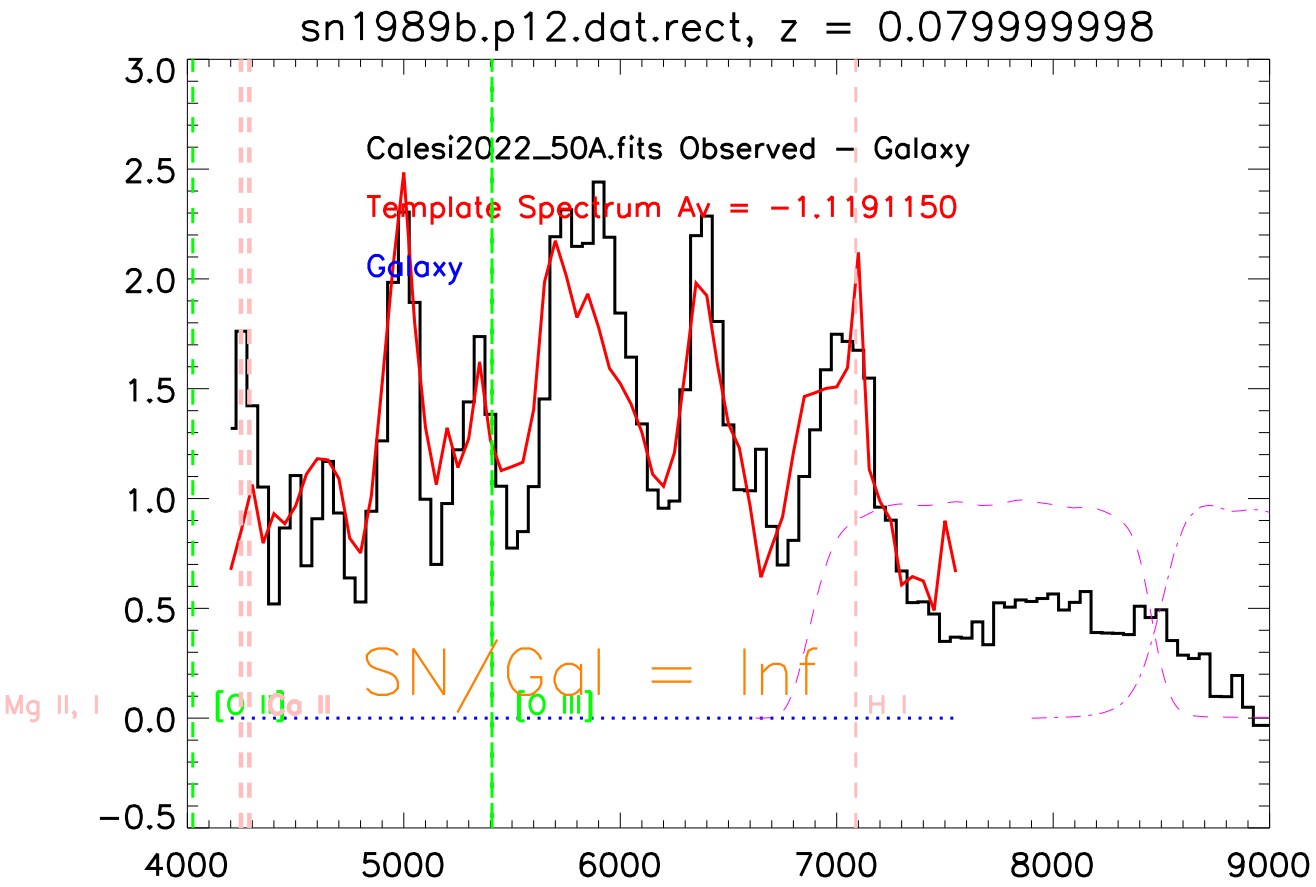
sn1989b.p12.dat.rect, z = 0.079999998
Calesi2022_50A.fits Observed − Galaxy
Template Spectrum Av = −1.1191150
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
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1.5
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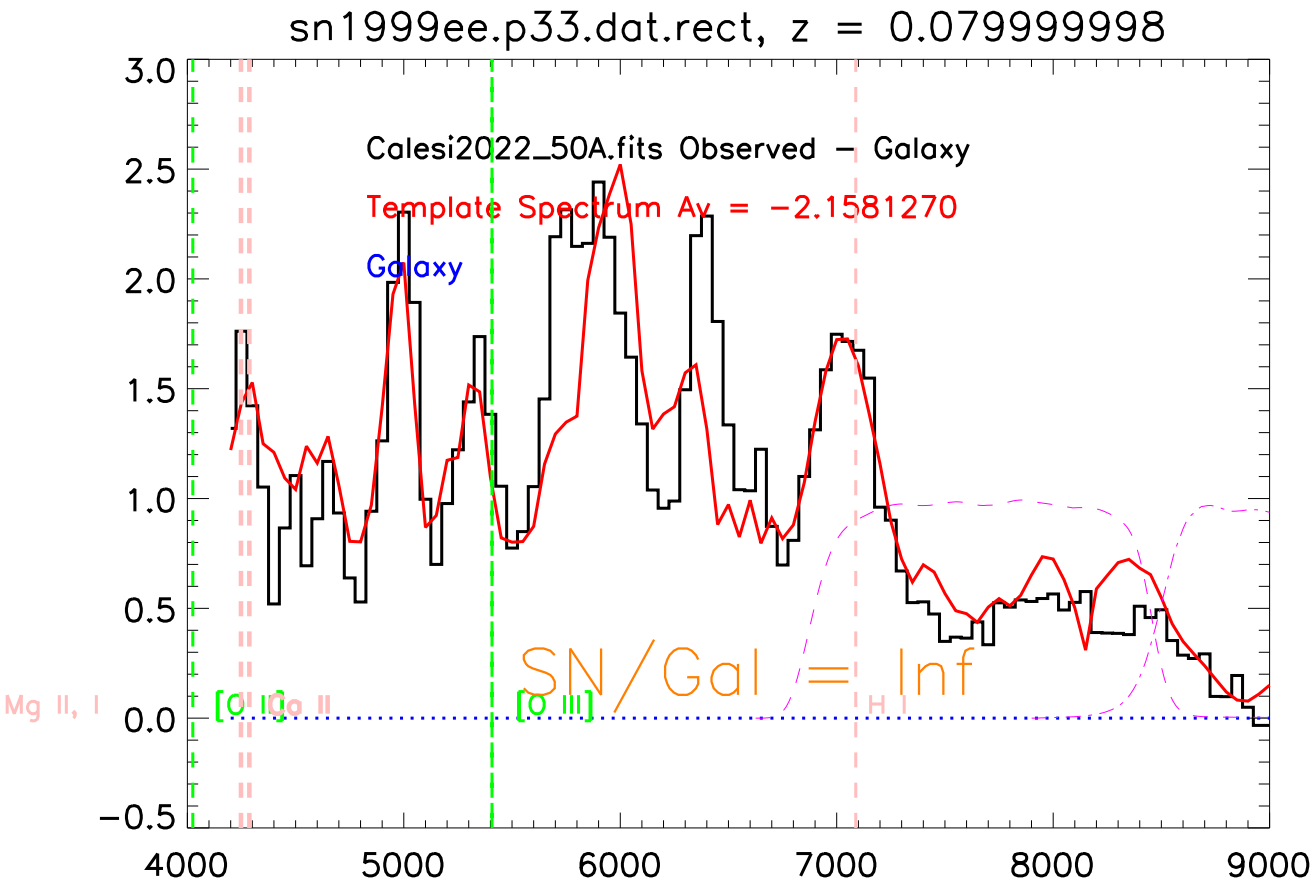
sn1999ee.p33.dat.rect, z = 0.079999998
Calesi2022_50A.fits Observed − Galaxy
Template Spectrum Av = −2.1581270
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
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1.5
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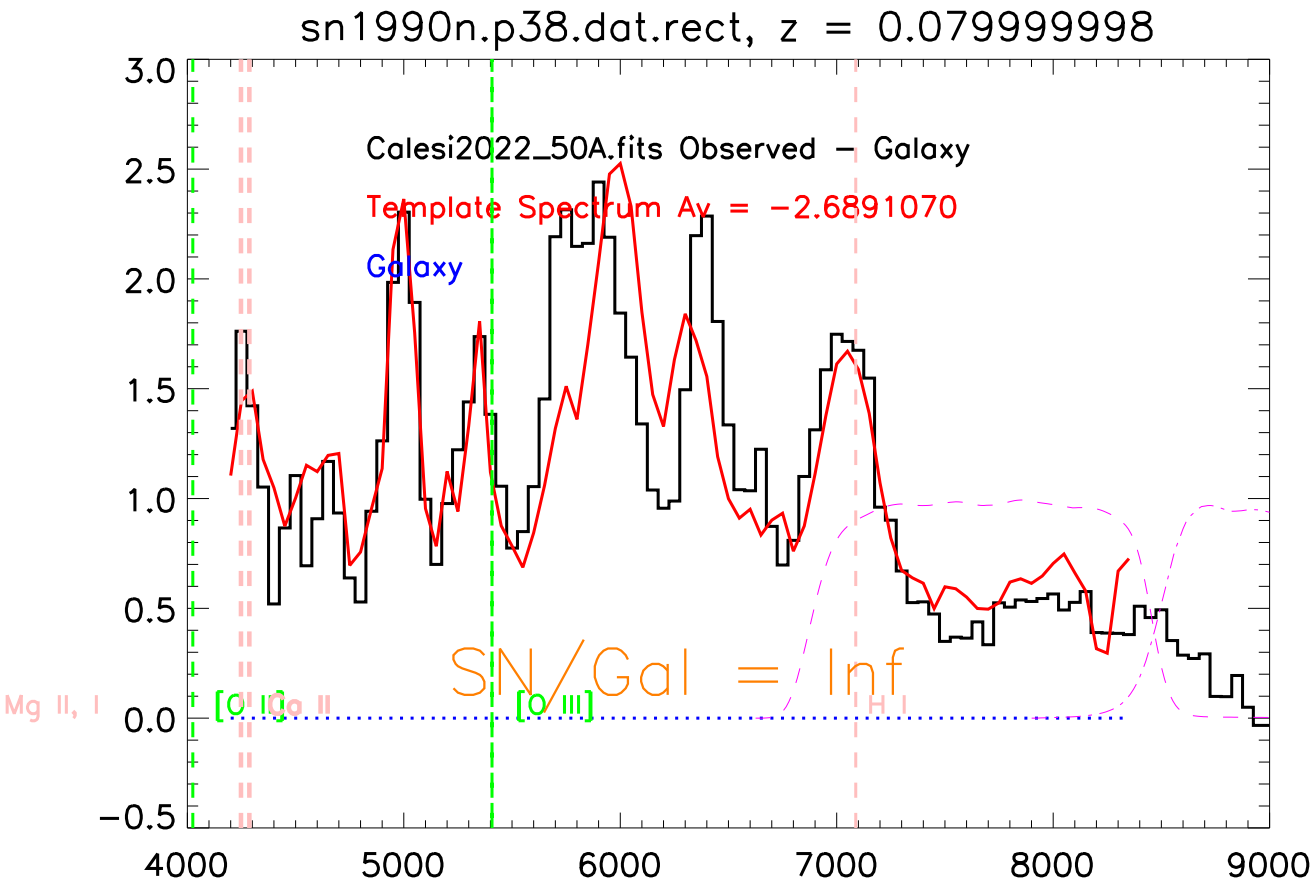
sn1990n.p38.dat.rect, z = 0.079999998
Calesi2022_50A.fits Observed − Galaxy
Template Spectrum Av = −2.6891070
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
3.0
2.5
2.0
1.5
1.0
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0.0
−0.5
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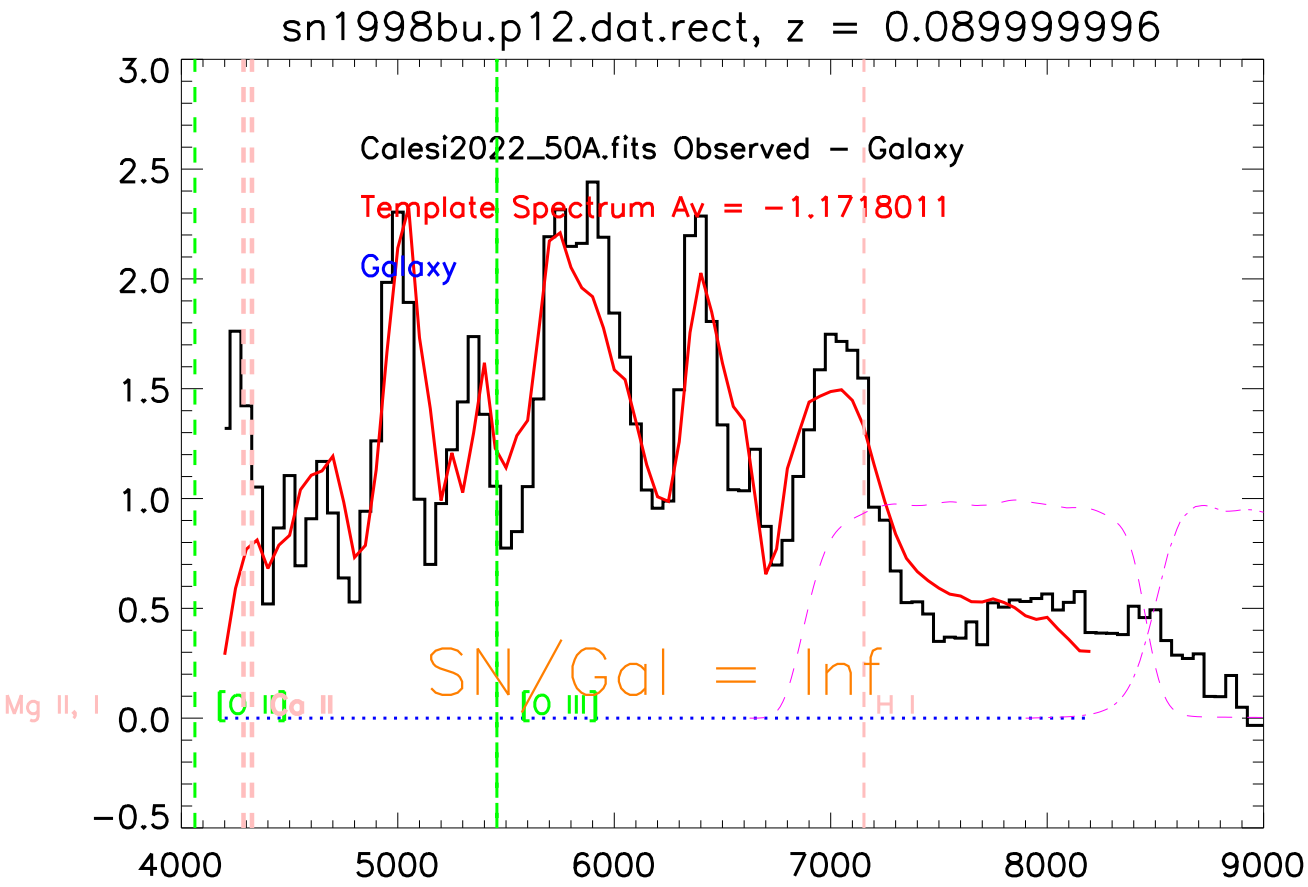
sn1998bu.p12.dat.rect, z = 0.089999996
Calesi2022_50A.fits Observed − Galaxy
Template Spectrum Av = −1.1718011
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
3.0
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1.5
1.0
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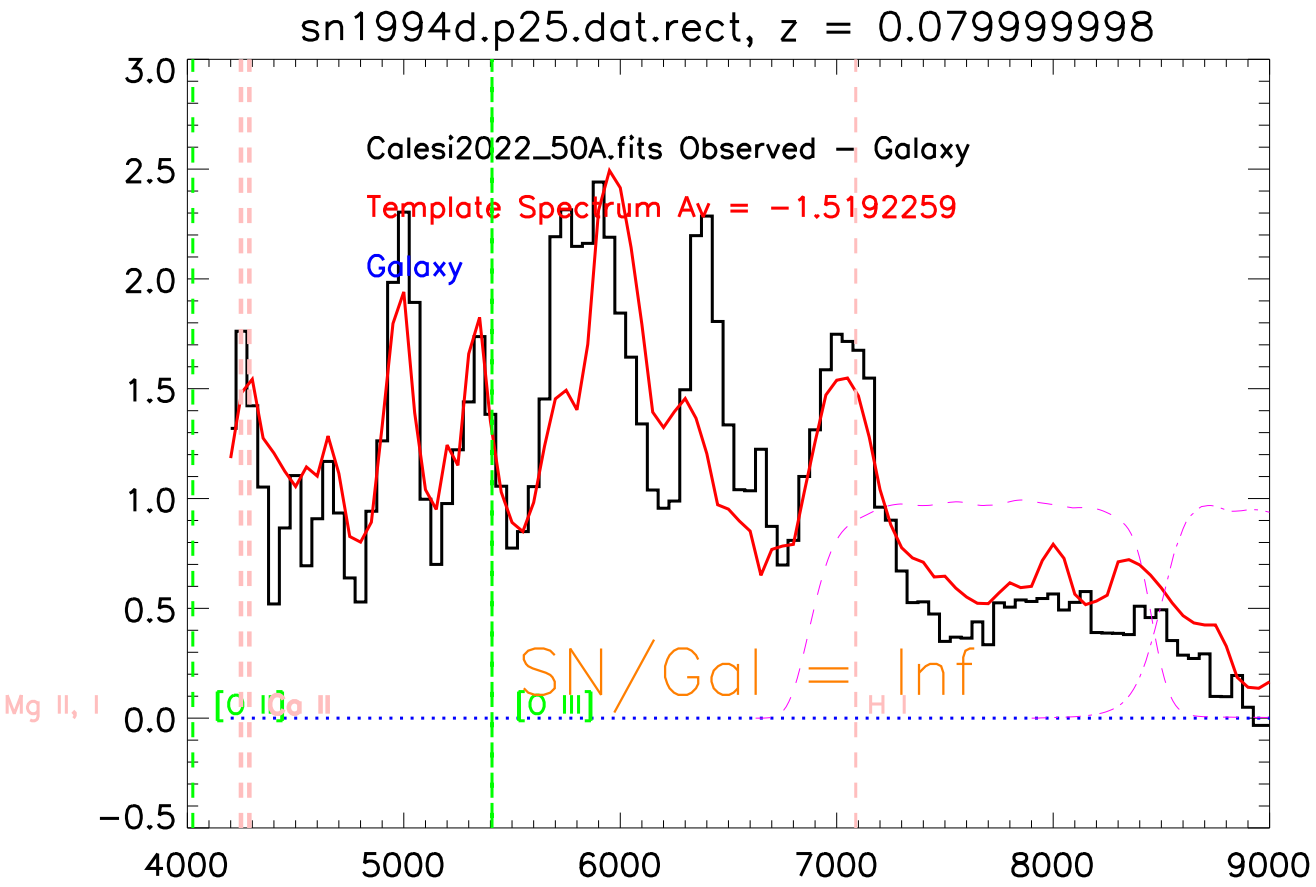
sn1994d.p25.dat.rect, z = 0.079999998
Calesi2022_50A.fits Observed − Galaxy
Template Spectrum Av = −1.5192259
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
3.0
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1.5
1.0
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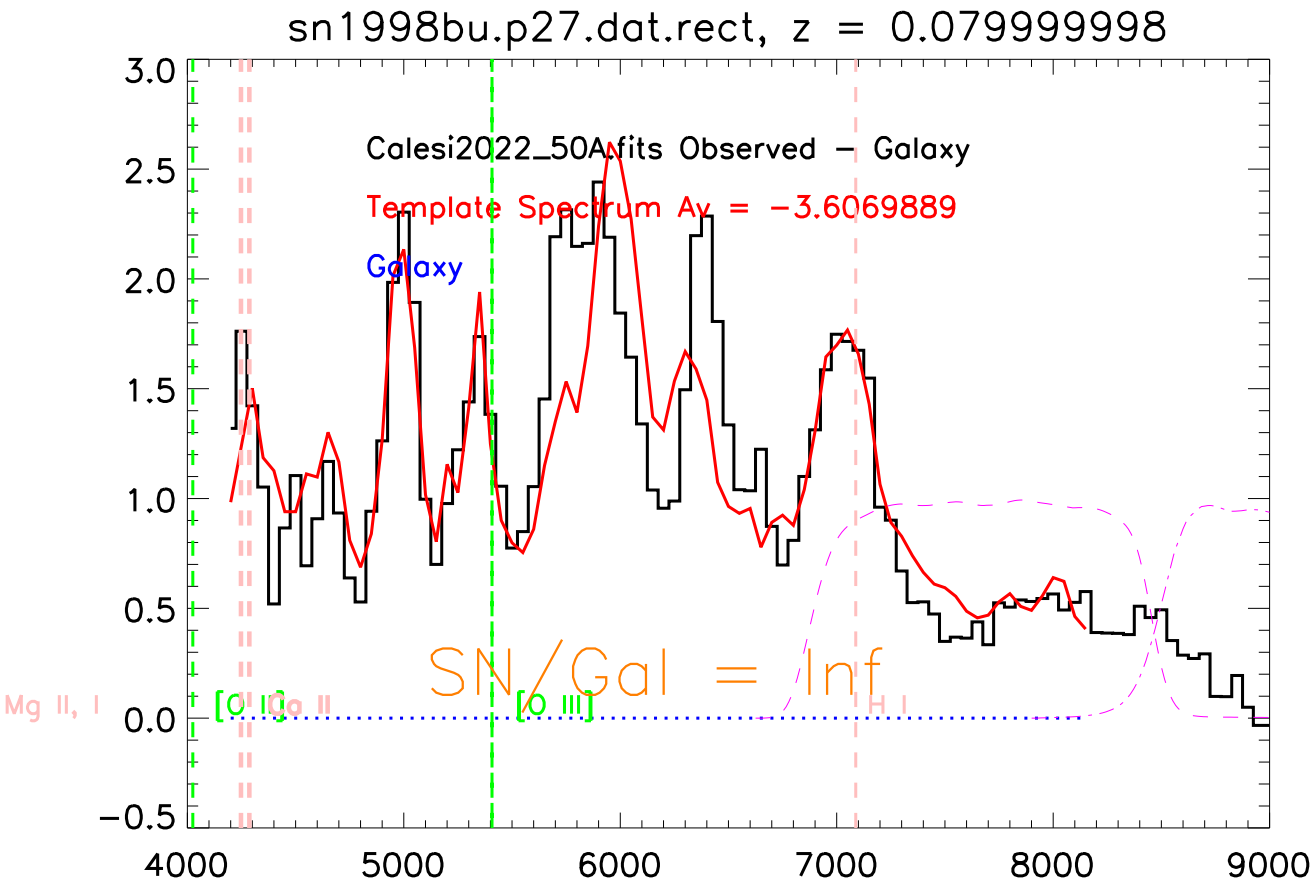
sn1998bu.p27.dat.rect, z = 0.079999998
Calesi2022_50A.fits Observed − Galaxy
Template Spectrum Av = −3.6069889
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
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1.5
1.0
0.5
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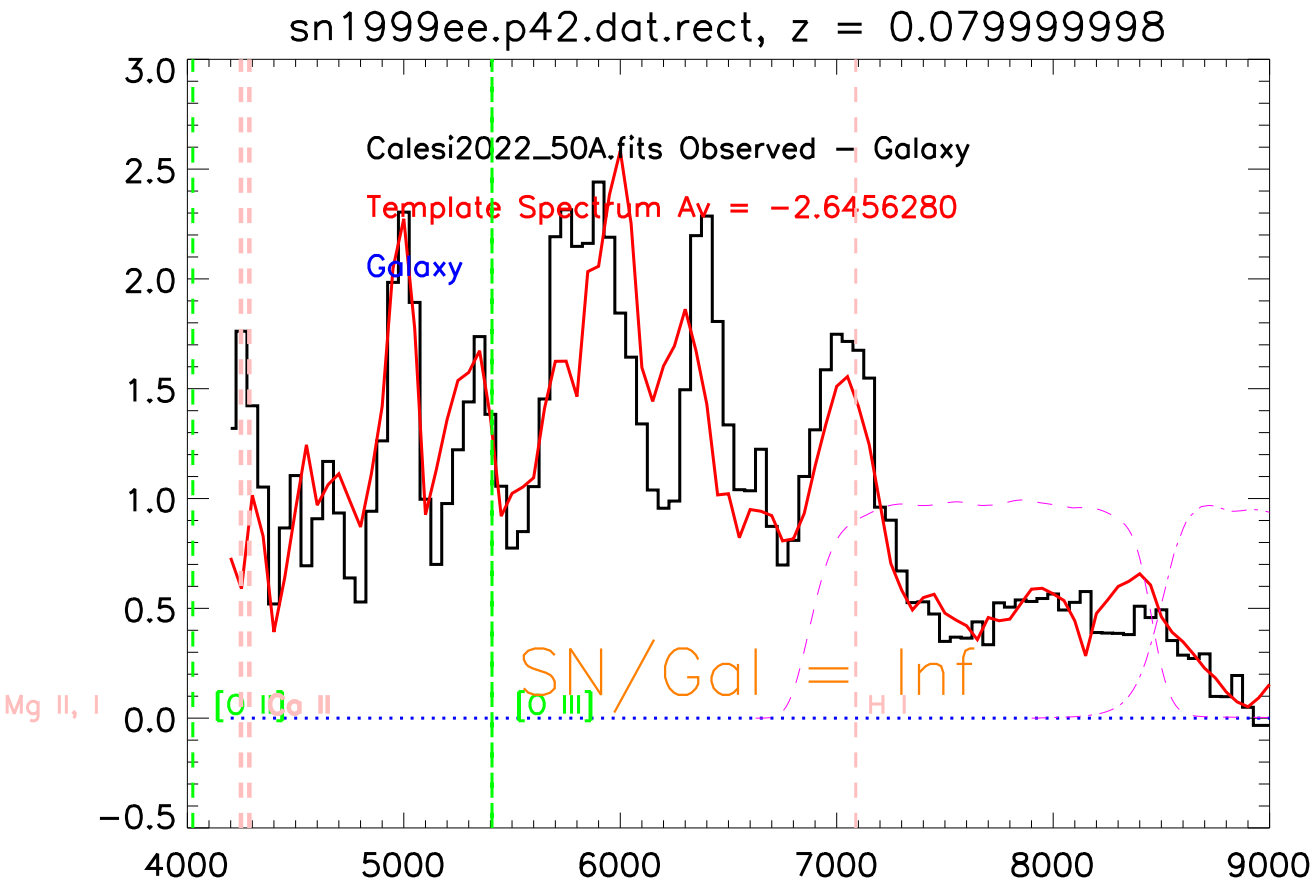
sn1999ee.p42.dat.rect, z = 0.079999998
Calesi2022_50A.fits Observed − Galaxy
Template Spectrum Av = −2.6456280
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
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1.5
1.0
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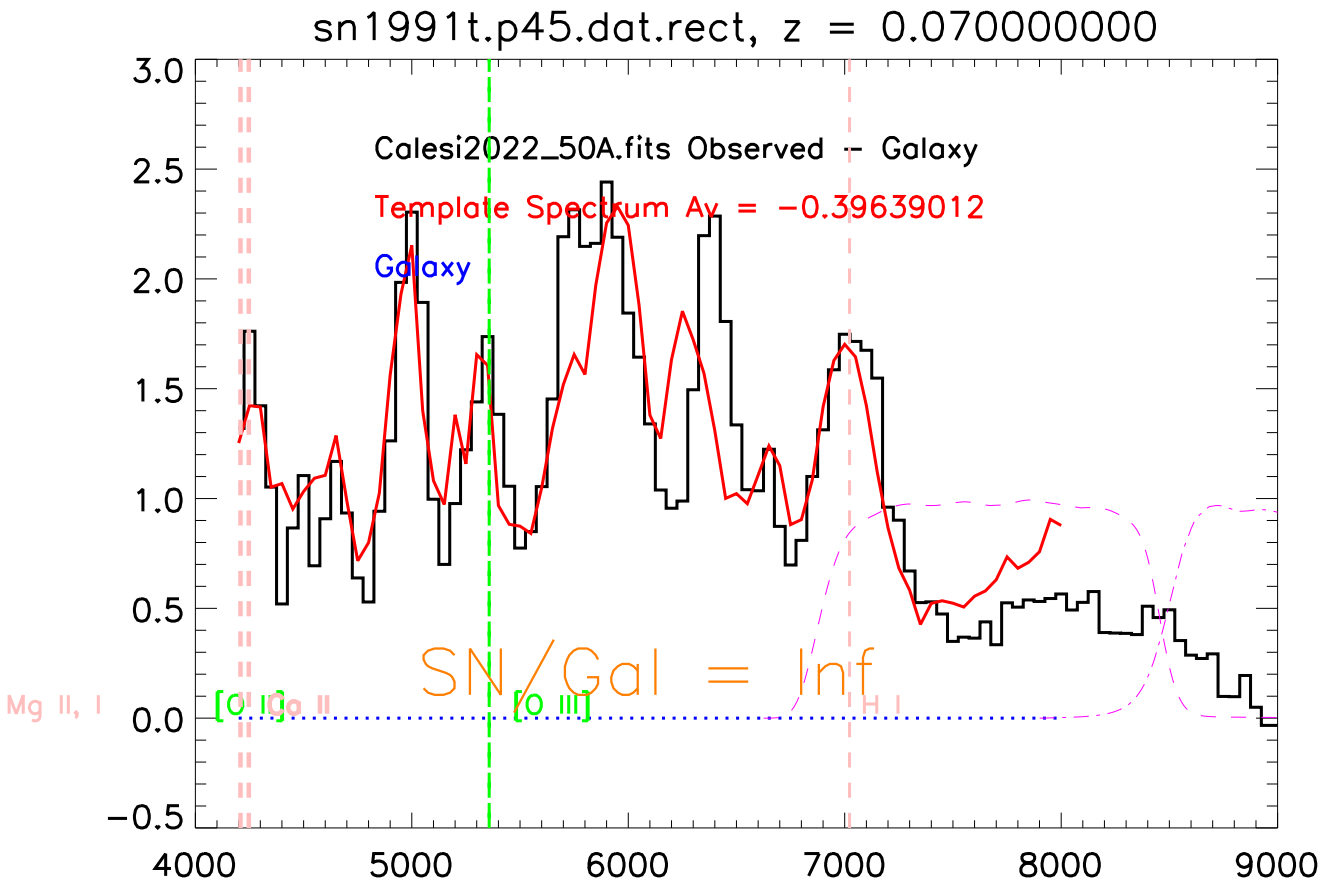
sn1991t.p45.dat.rect, z = 0.070000000
Calesi2022_50A.fits Observed -- Galaxy
Template Spectrum Av = -0.39639012
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
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1.5
1.0
0.5
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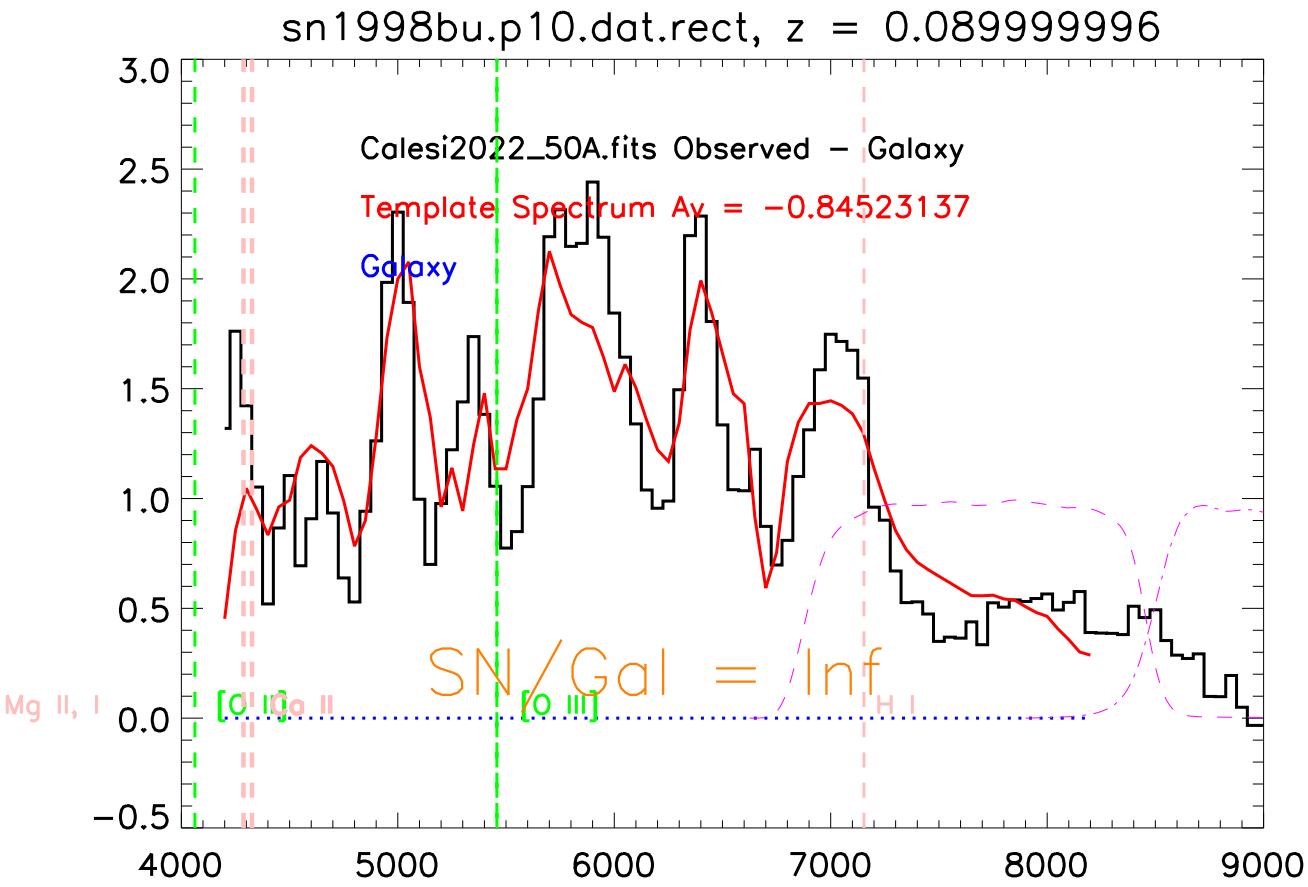
sn1998bu.p10.dat.rect, z = 0.089999996
Calesi2022_50A.fits Observed − Galaxy
Template Spectrum Av = −0.84523137
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
3.0
2.5
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1.5
1.0
0.5
0.0
−0.5
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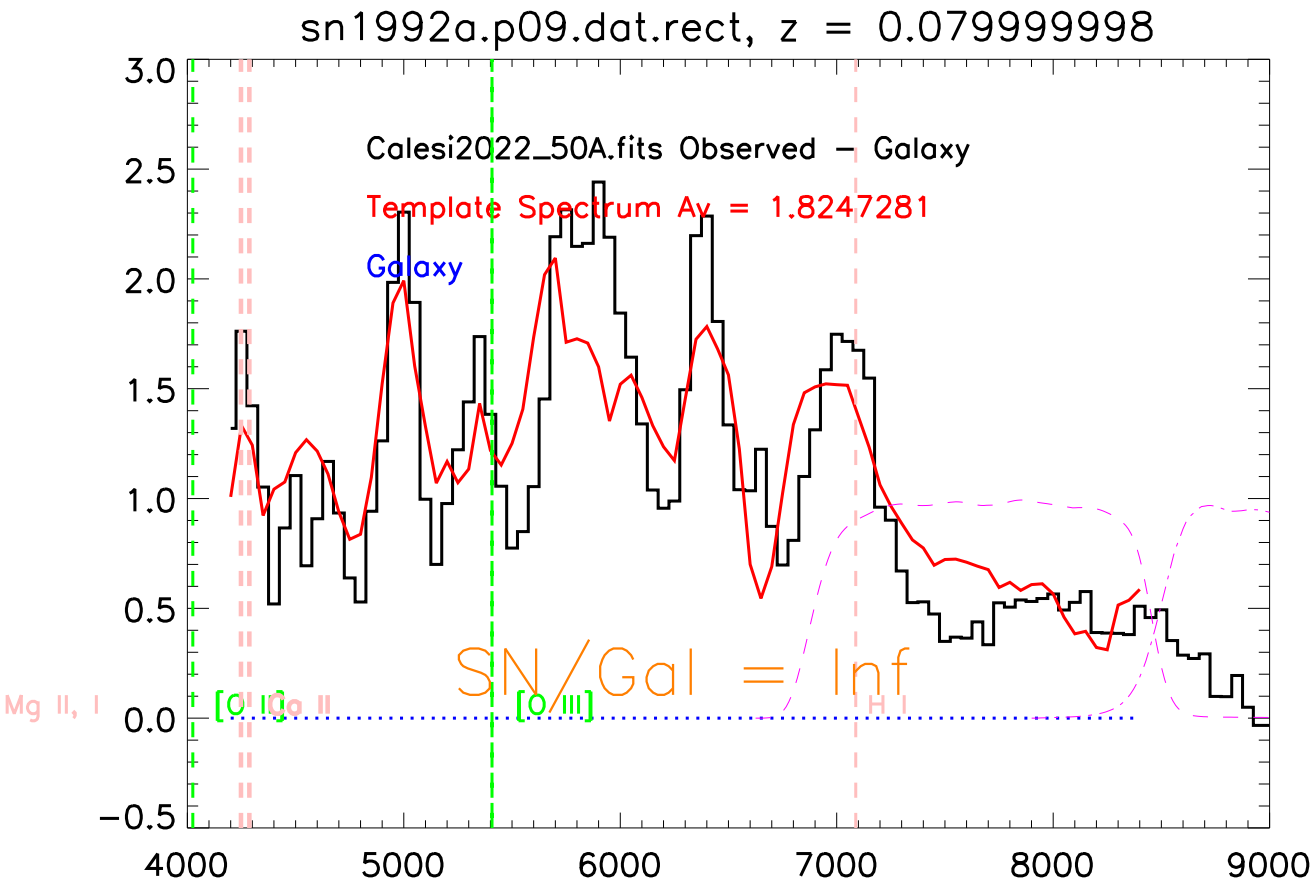
sn1992a.p09.dat.rect, z = 0.079999998
Calesi2022_50A.fits Observed − Galaxy
Template Spectrum Av = 1.8247281
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
3.0
2.5
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1.5
1.0
0.5
0.0
−0.5
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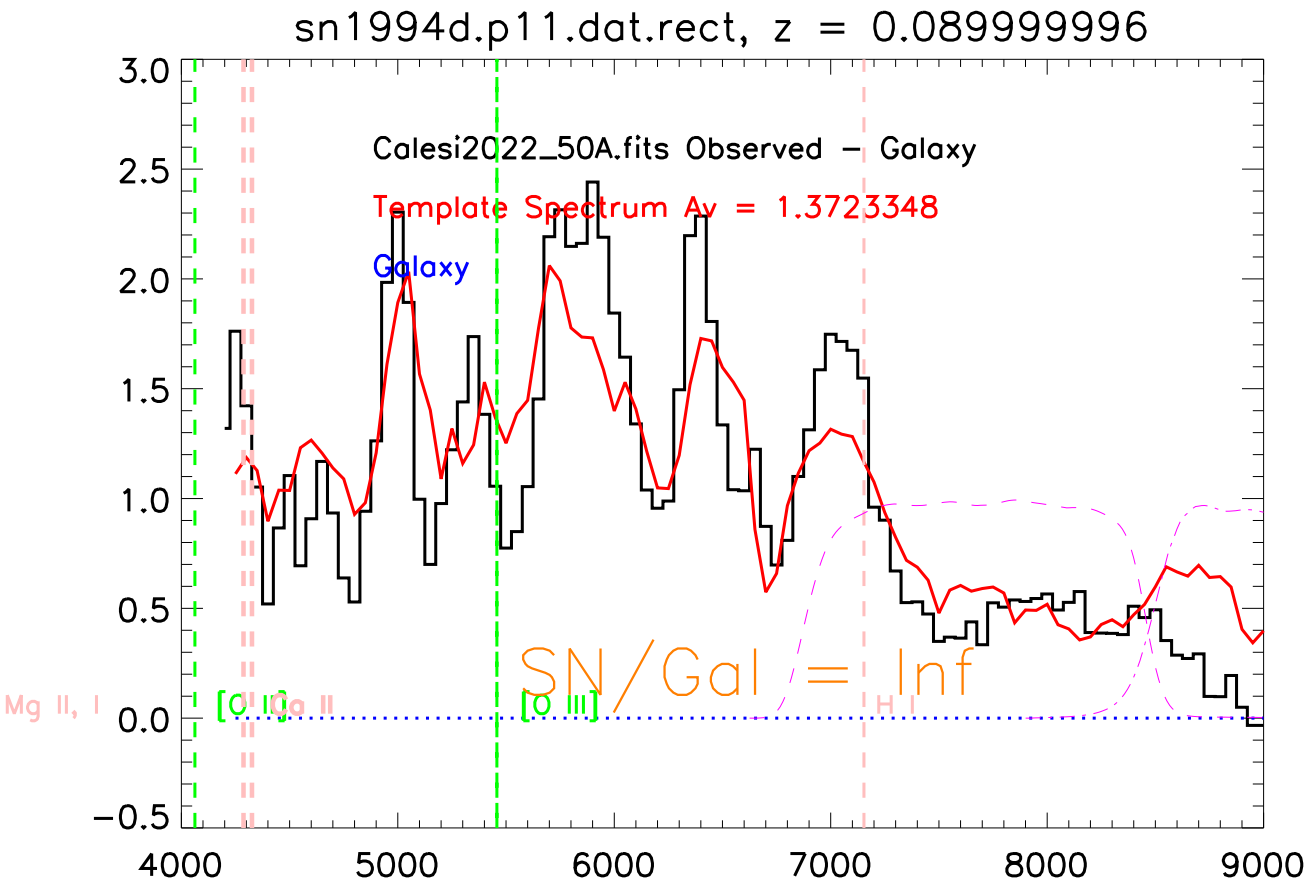
sn1994d.p11.dat.rect, z = 0.089999996
Calesi2022_50A.fits Observed − Galaxy
Template Spectrum Av = 1.3723348
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
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1.5
1.0
0.5
0.0
−0.5
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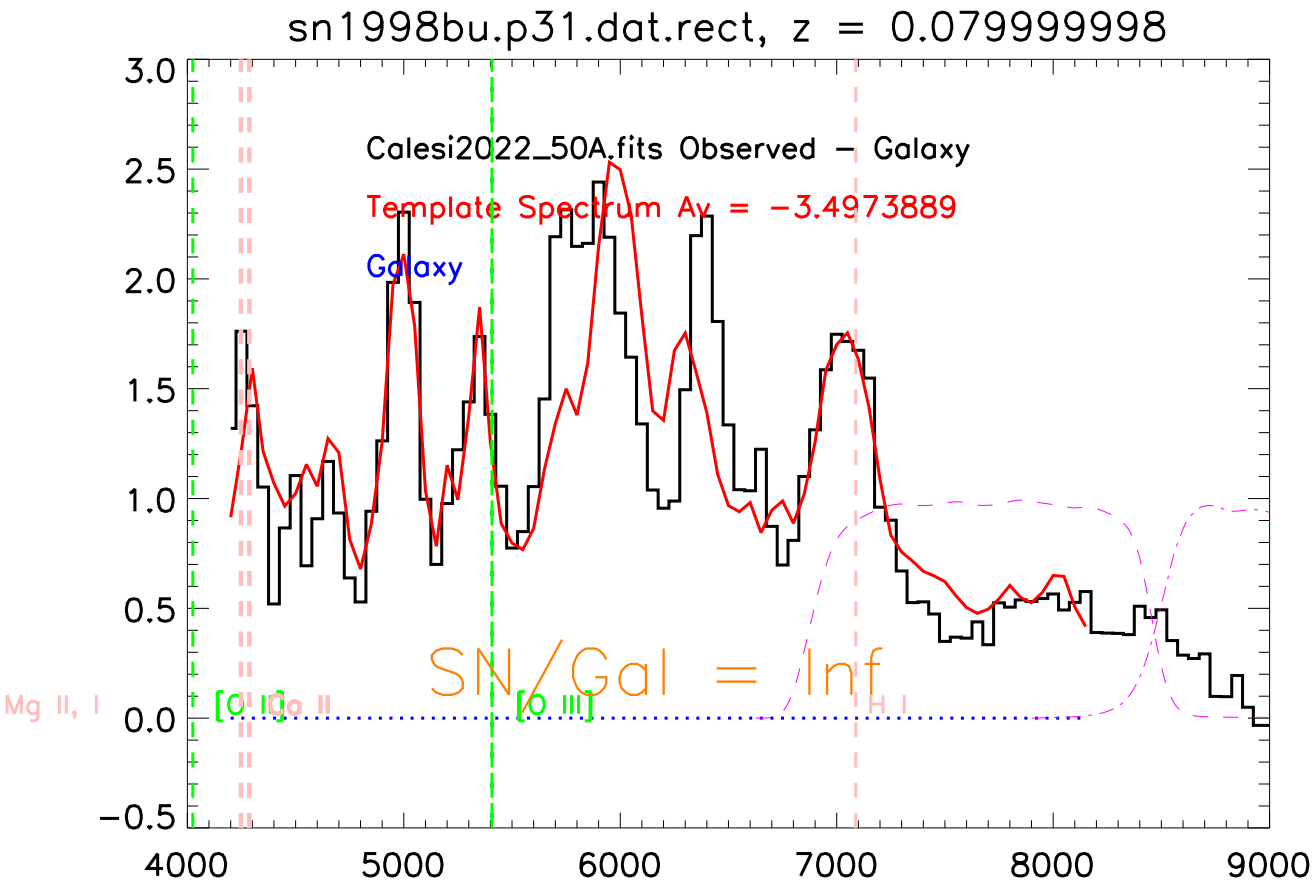
9000


sn1998bu.p31.dat.rect, z = 0.079999998
Calesi2022_50A.fits Observed − Galaxy
Template Spectrum Av = −3.4973889
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
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1.5
1.0
0.5
0.0
−0.5
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7000
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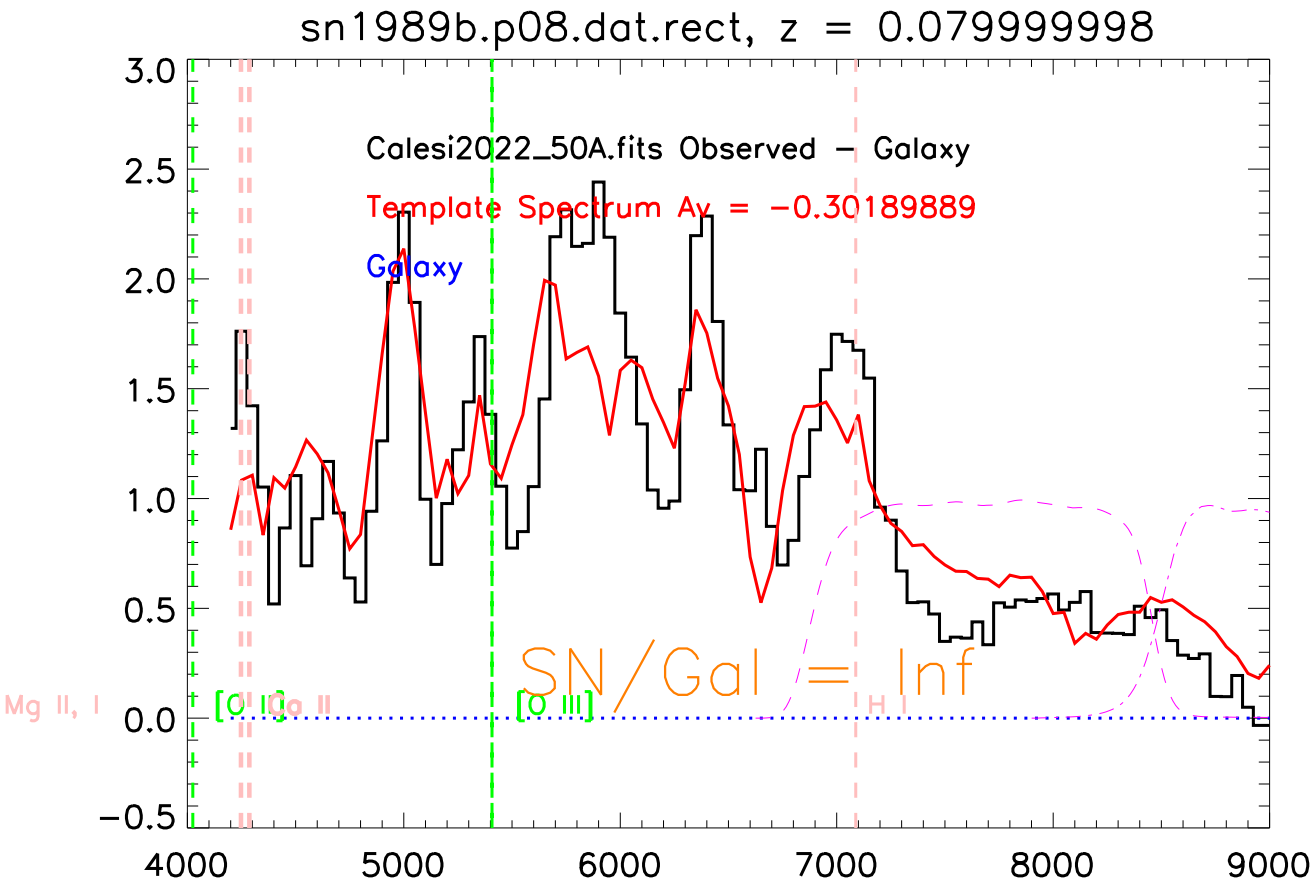
9000


sn1989b.p08.dat.rect, z = 0.079999998
Calesi2022_50A.fits Observed − Galaxy
Template Spectrum Av = −0.30189889
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
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1.5
1.0
0.5
0.0
−0.5
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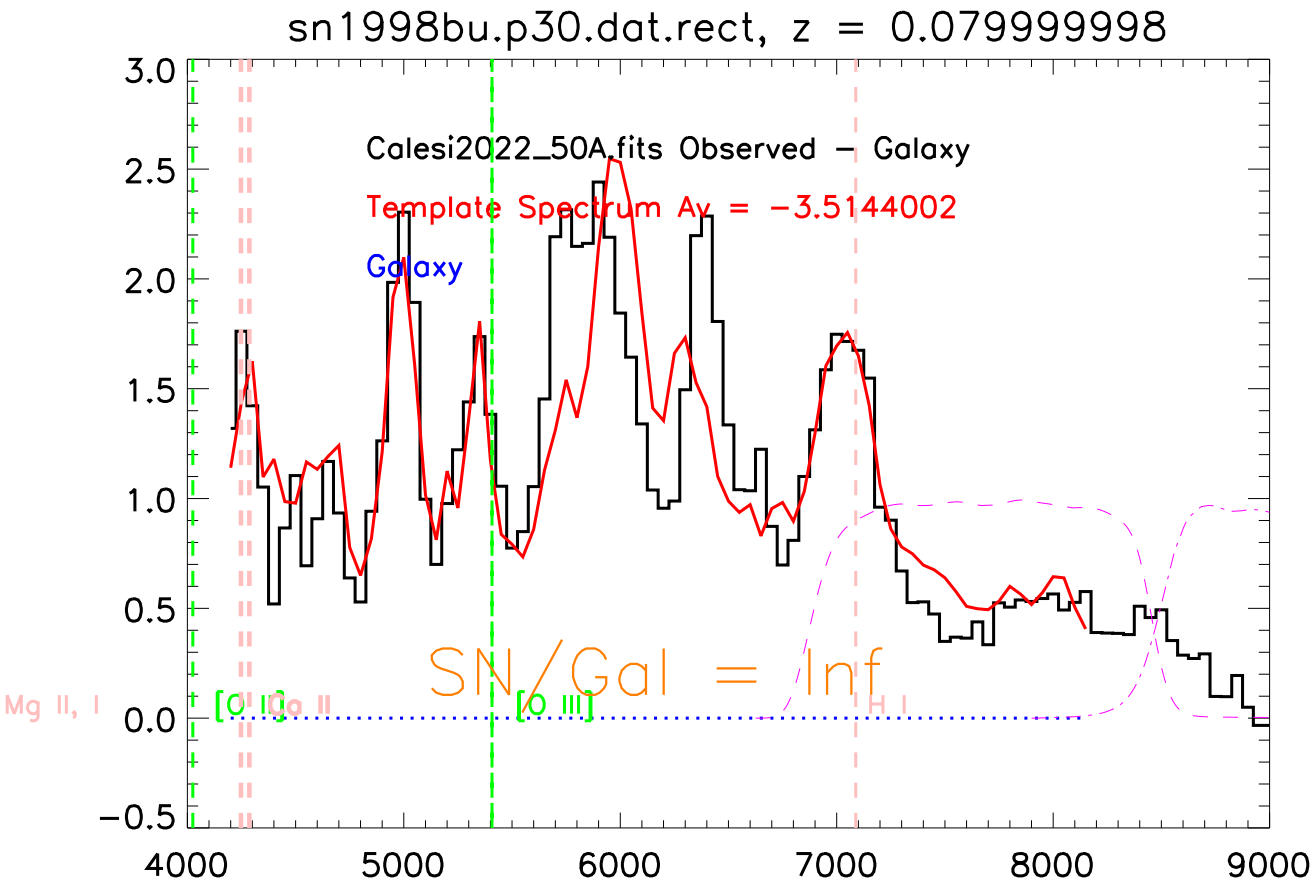
7000
8000
9000


sn1998bu.p30.dat.rect, z = 0.079999998
Calesi2022_50A.fits Observed − Galaxy
Template Spectrum Av = −3.5144002
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
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2.0
1.5
1.0
0.5
0.0
−0.5
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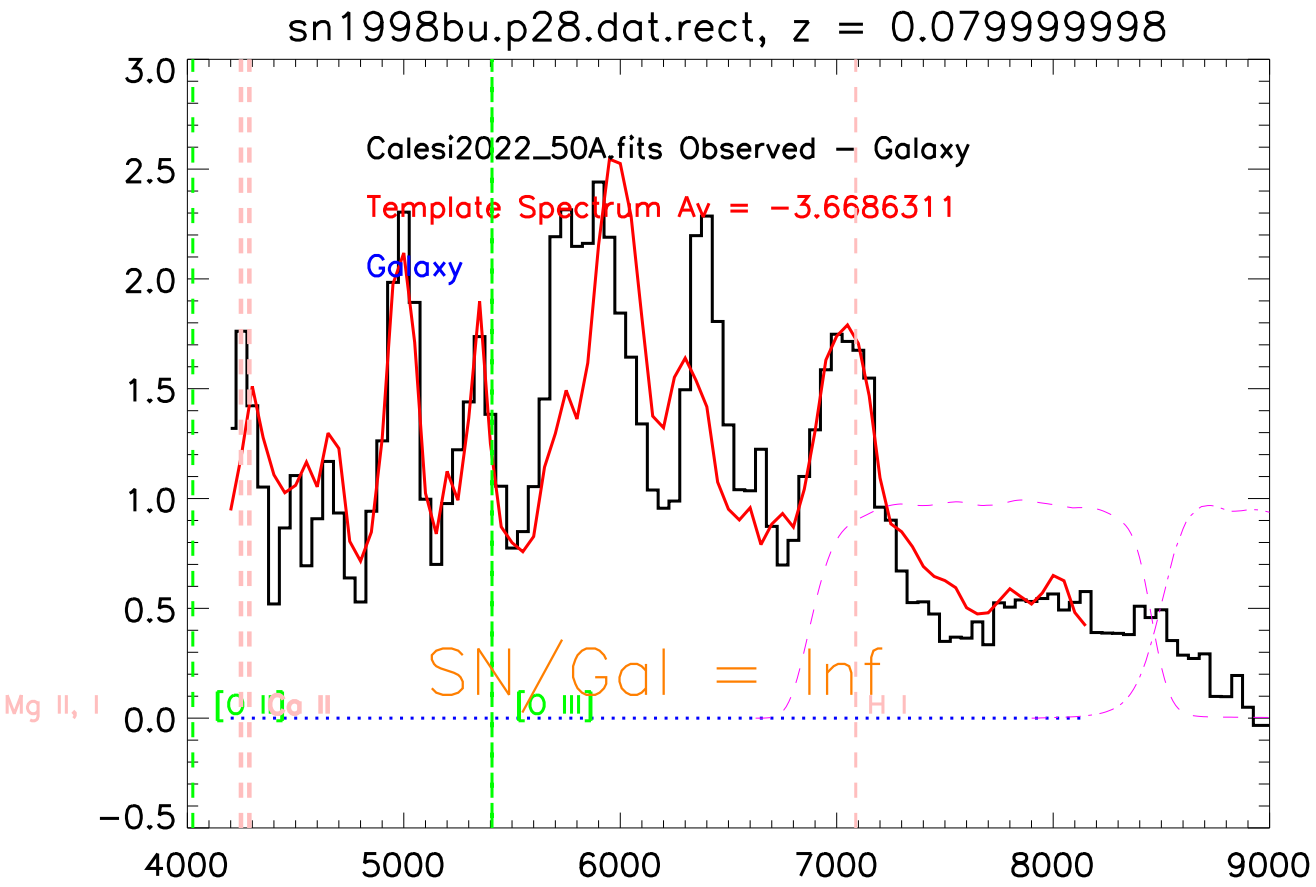
sn1998bu.p28.dat.rect, z = 0.079999998
Calesi2022_50A.fits Observed − Galaxy
Template Spectrum Av = −3.6686311
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
3.0
2.5
2.0
1.5
1.0
0.5
0.0
−0.5
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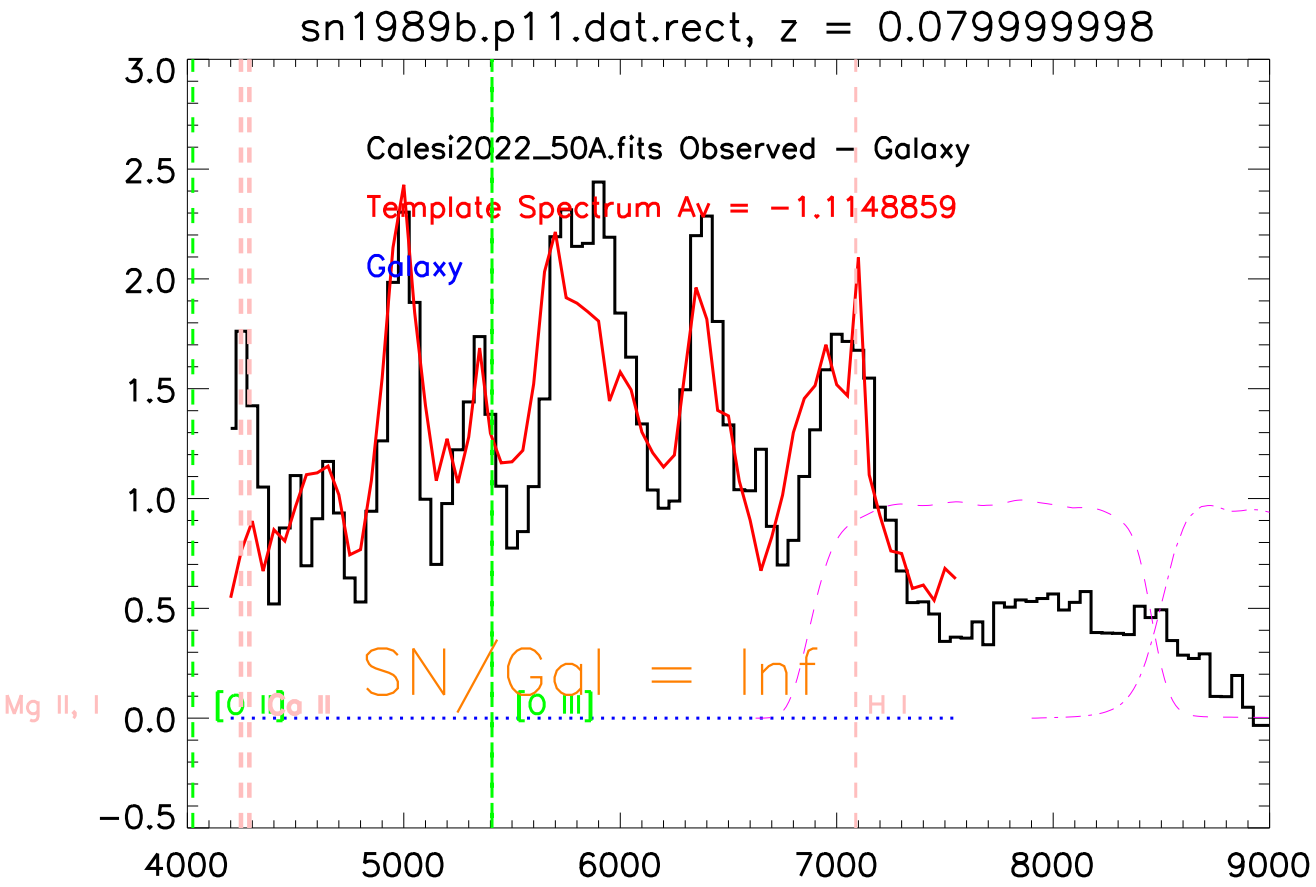
sn1989b.p11.dat.rect, z = 0.079999998
Calesi2022_50A.fits Observed − Galaxy
Template Spectrum Av = −1.1148859
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
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2.0
1.5
1.0
0.5
0.0
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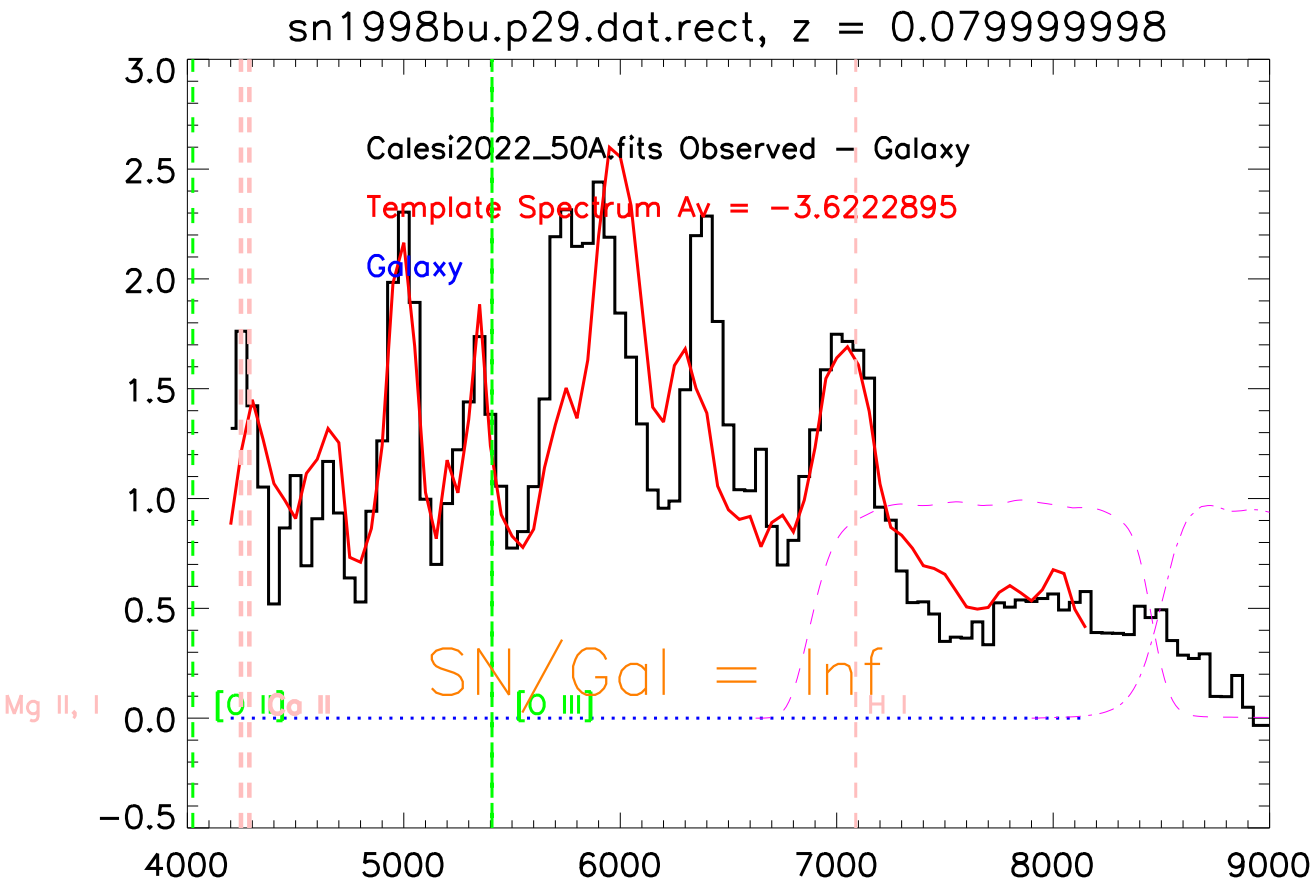
sn1998bu.p29.dat.rect, z = 0.079999998
Calesi2022_50A.fits Observed − Galaxy
Template Spectrum Av = −3.6222895
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
3.0
2.5
2.0
1.5
1.0
0.5
0.0
−0.5
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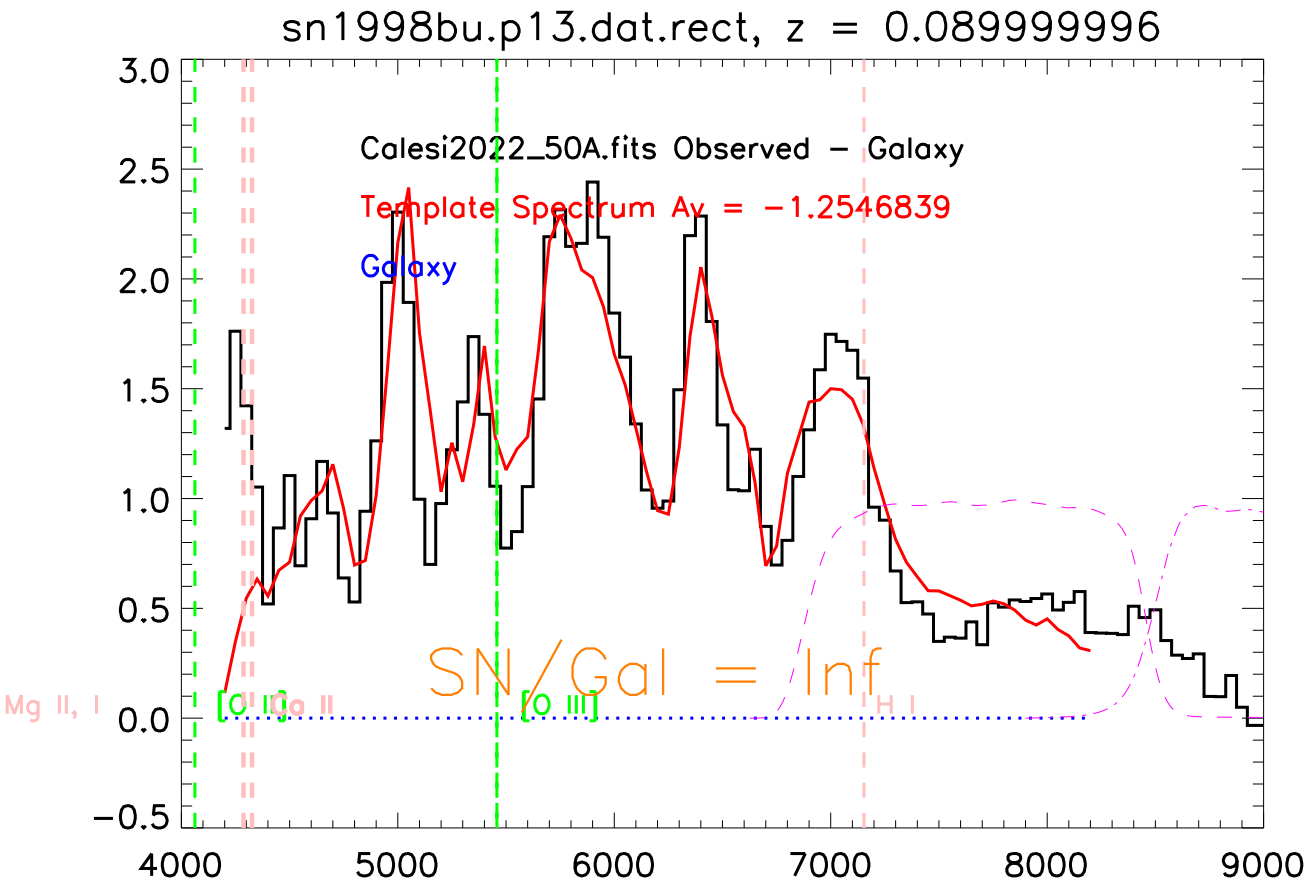
7000
8000
9000


sn1998bu.p13.dat.rect, z = 0.089999996
Calesi2022_50A.fits Observed − Galaxy
Template Spectrum Av = −1.2546839
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
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2.0
1.5
1.0
0.5
0.0
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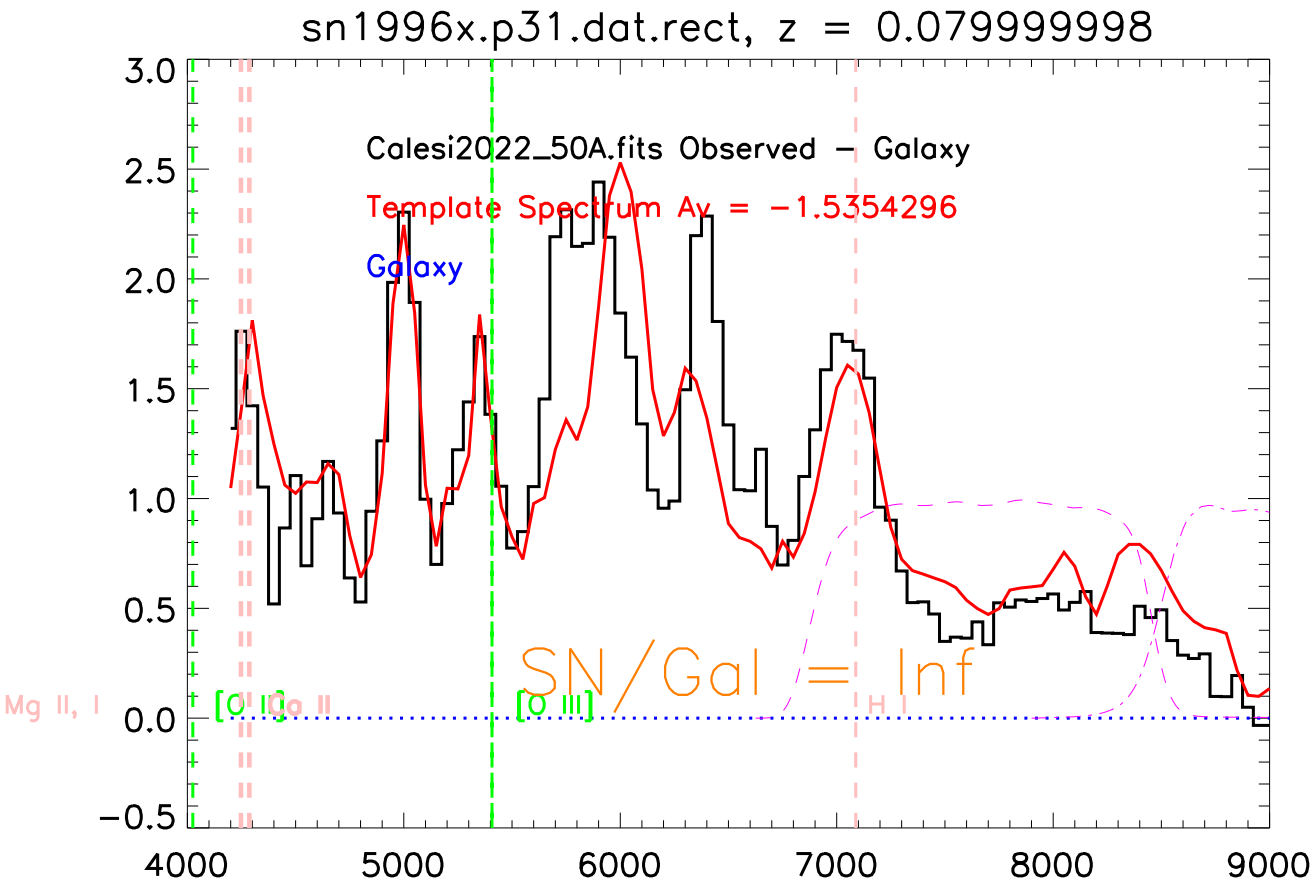
7000
8000
9000


sn1996x.p31.dat.rect, z = 0.079999998
Calesi2022_50A.fits Observed − Galaxy
Template Spectrum Av = −1.5354296
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
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1.5
1.0
0.5
0.0
−0.5
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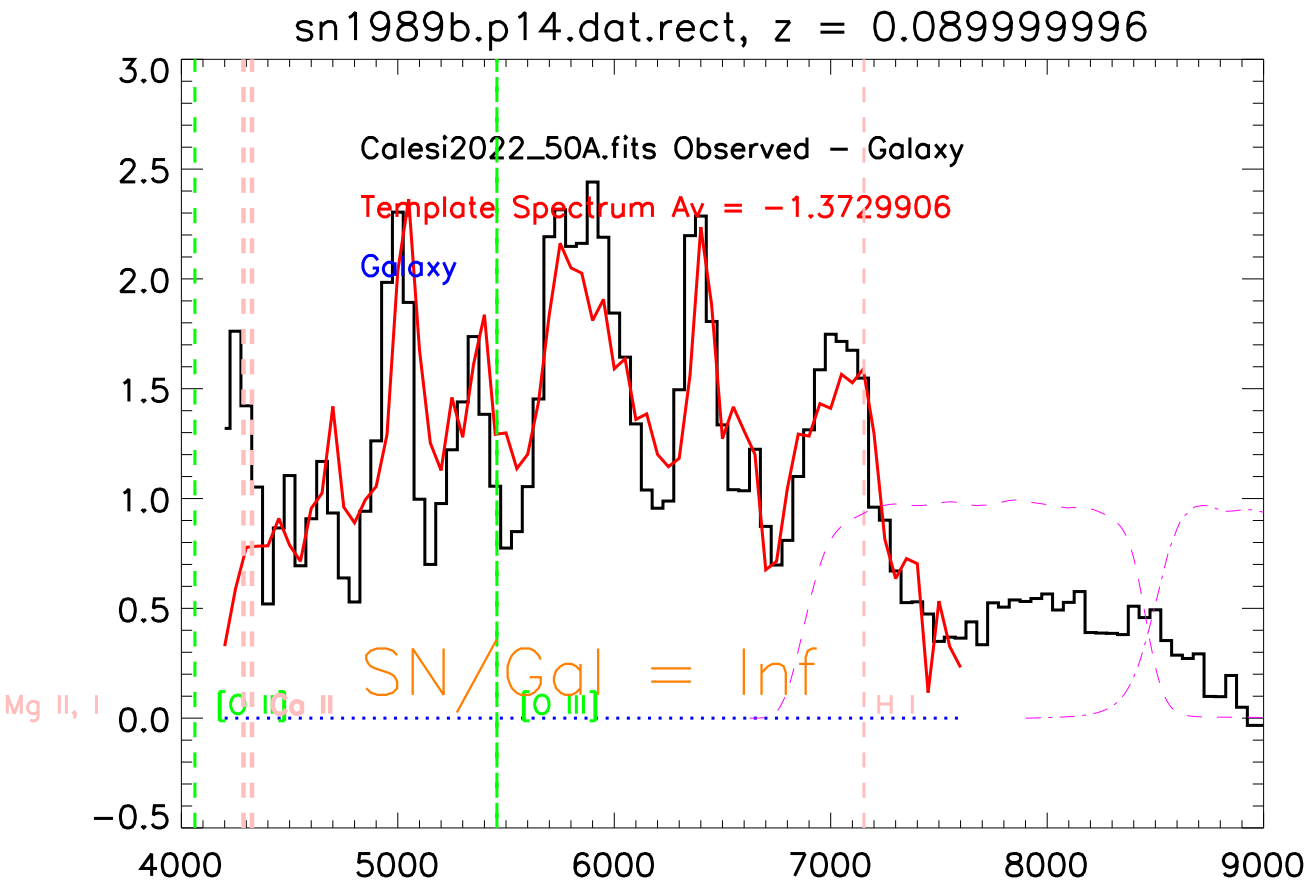
sn1989b.p14.dat.rect, z = 0.089999996
Calesi2022_50A.fits Observed − Galaxy
Template Spectrum Av = −1.3729906
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
3.0
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2.0
1.5
1.0
0.5
0.0
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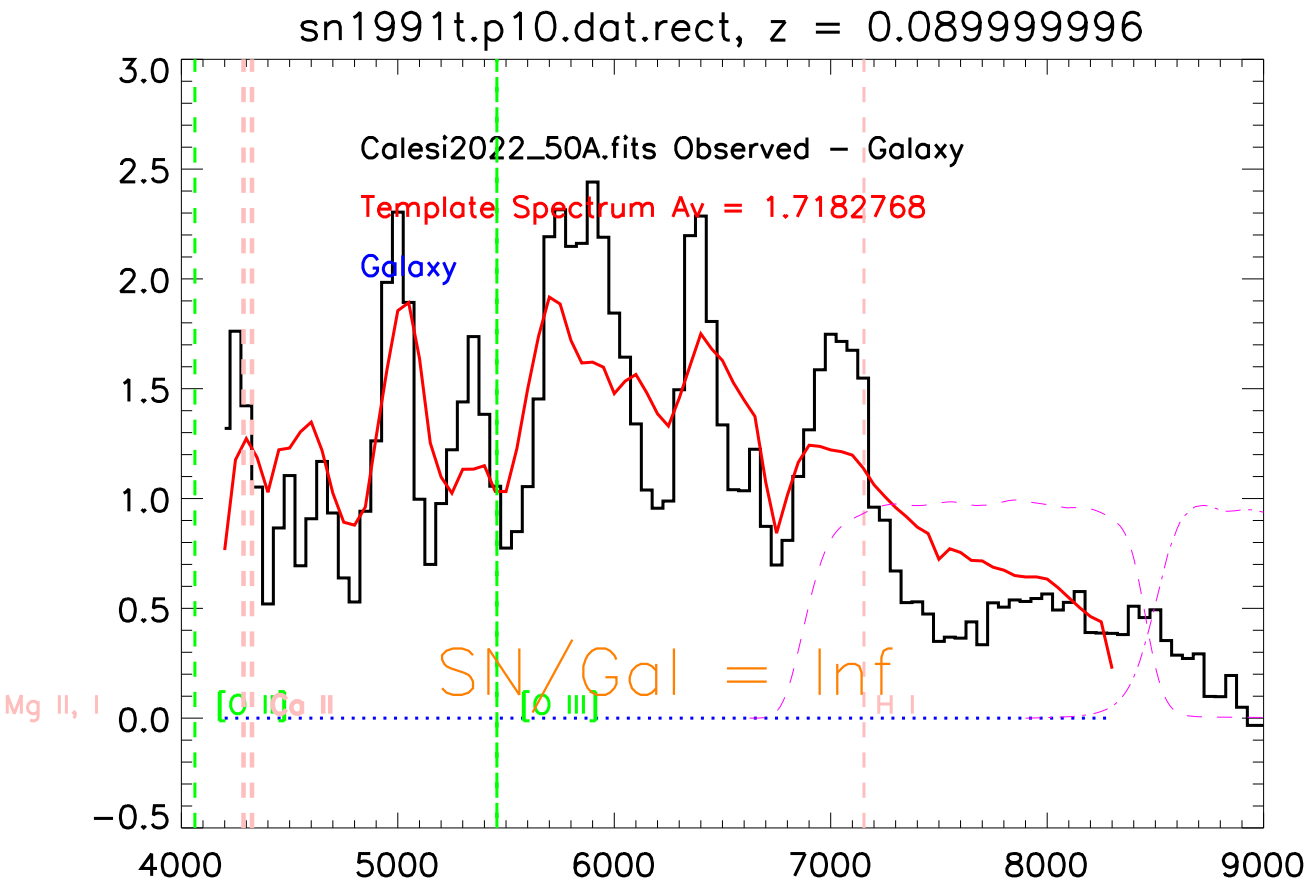
sn1991t.p10.dat.rect, z = 0.089999996
Calesi2022_50A.fits Observed − Galaxy
Template Spectrum Av = 1.7182768
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
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1.5
1.0
0.5
0.0
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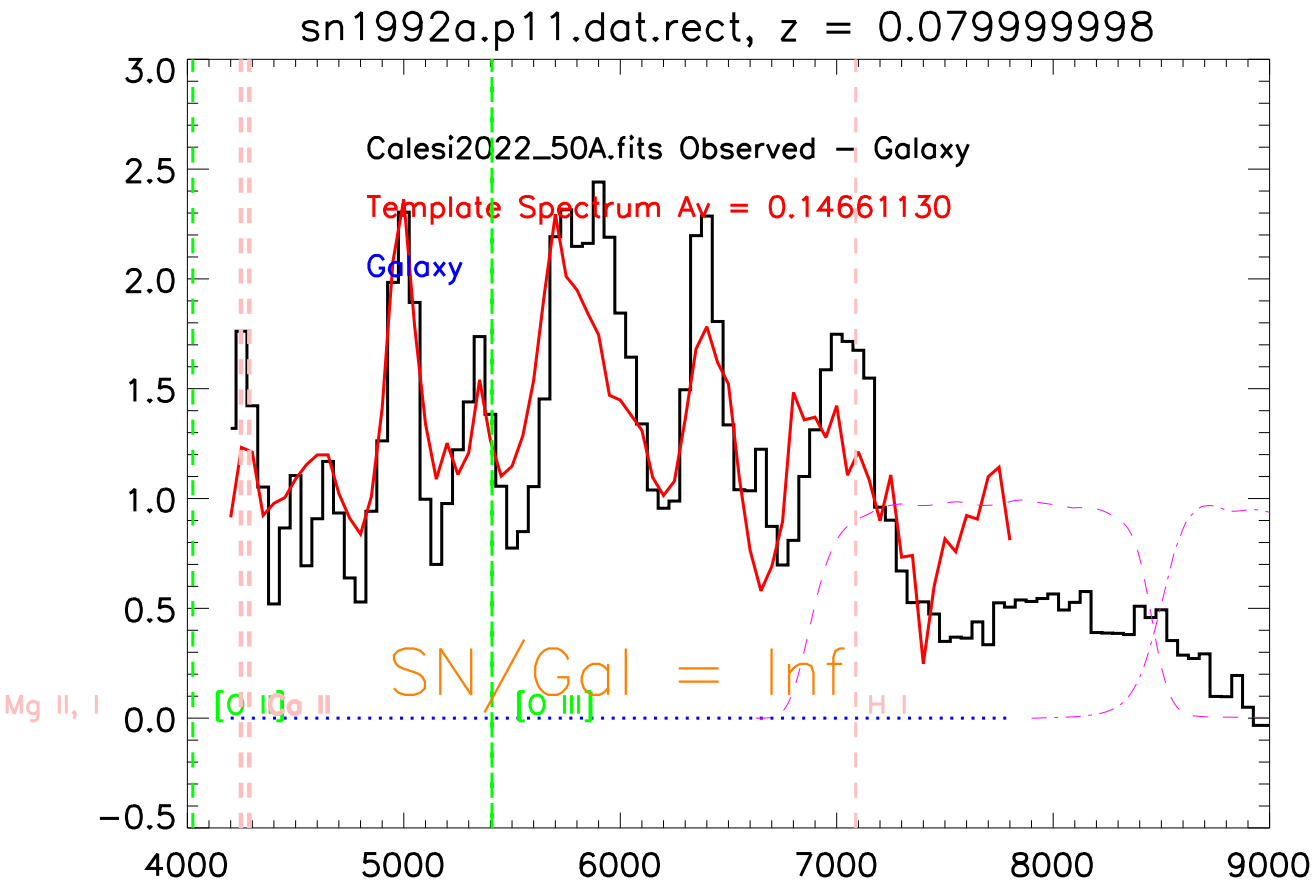
sn1992a.p11.dat.rect, z = 0.079999998
Calesi2022_50A.fits Observed − Galaxy
Template Spectrum Av = 0.14661130
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
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1.5
1.0
0.5
0.0
−0.5
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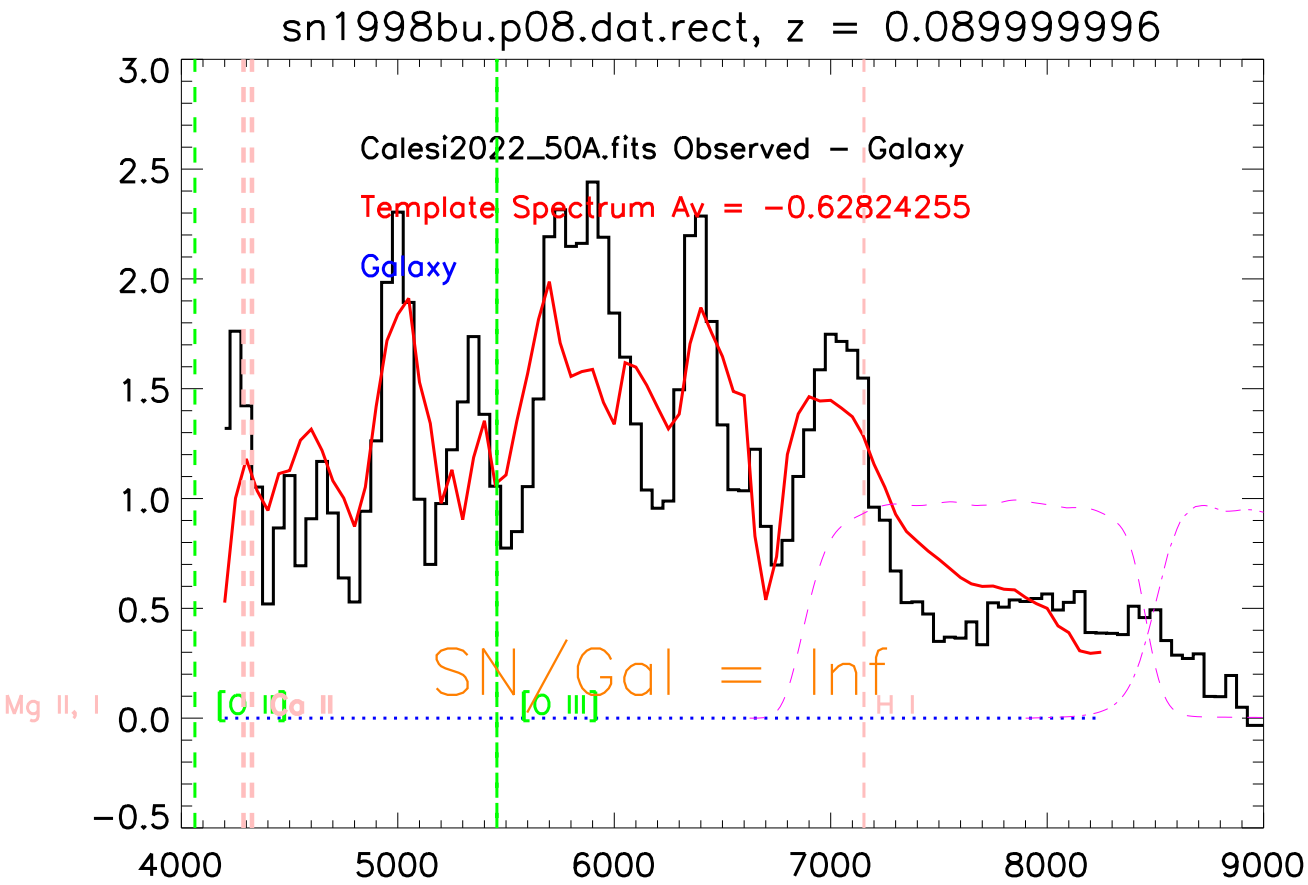
sn1998bu.p08.dat.rect, z = 0.089999996
Calesi2022_50A.fits Observed − Galaxy
Template Spectrum Av = −0.62824255
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
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1.5
1.0
0.5
0.0
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8000
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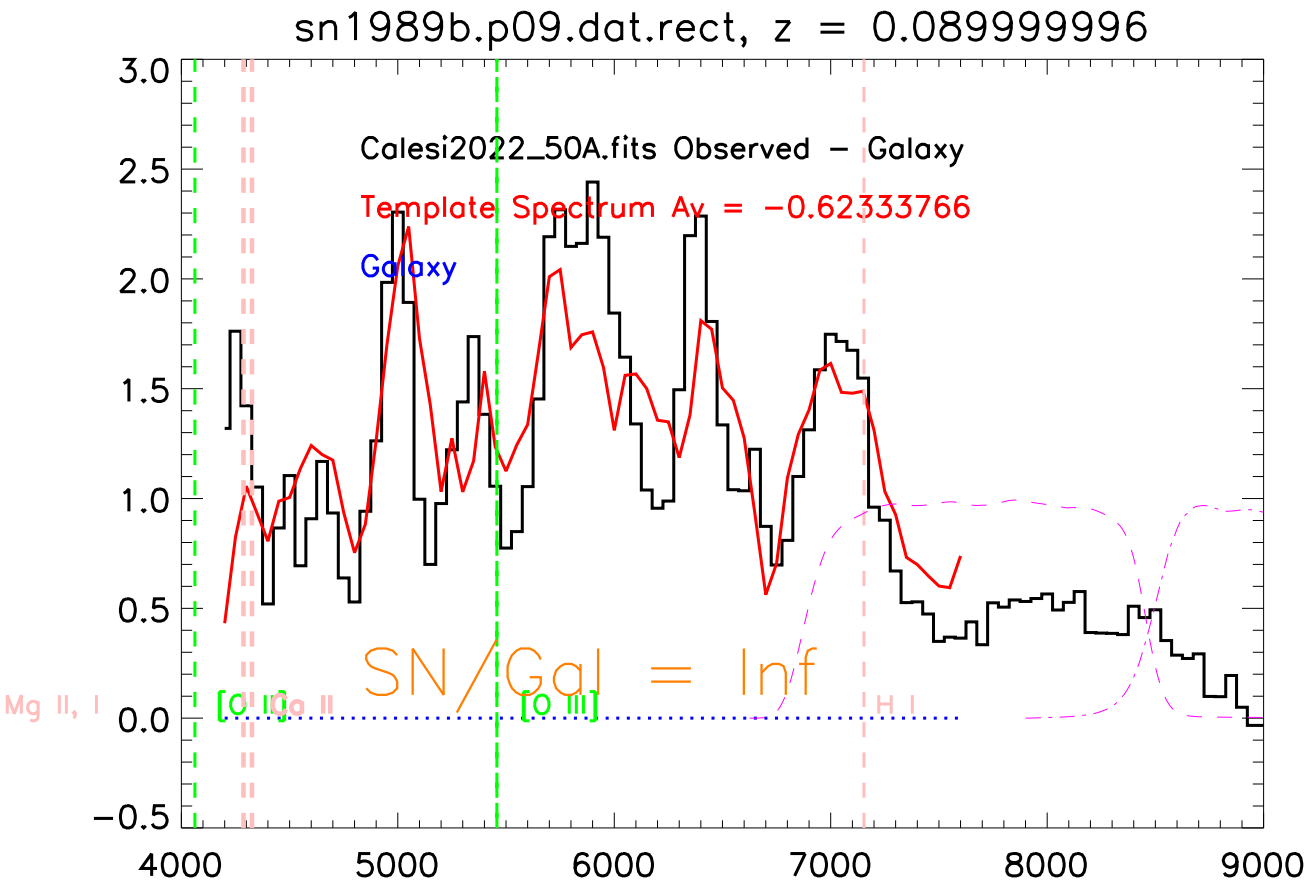
sn1989b.p09.dat.rect, z = 0.089999996
Calesi2022_50A.fits Observed − Galaxy
Template Spectrum Av = −0.62333766
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
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1.5
1.0
0.5
0.0
−0.5
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7000
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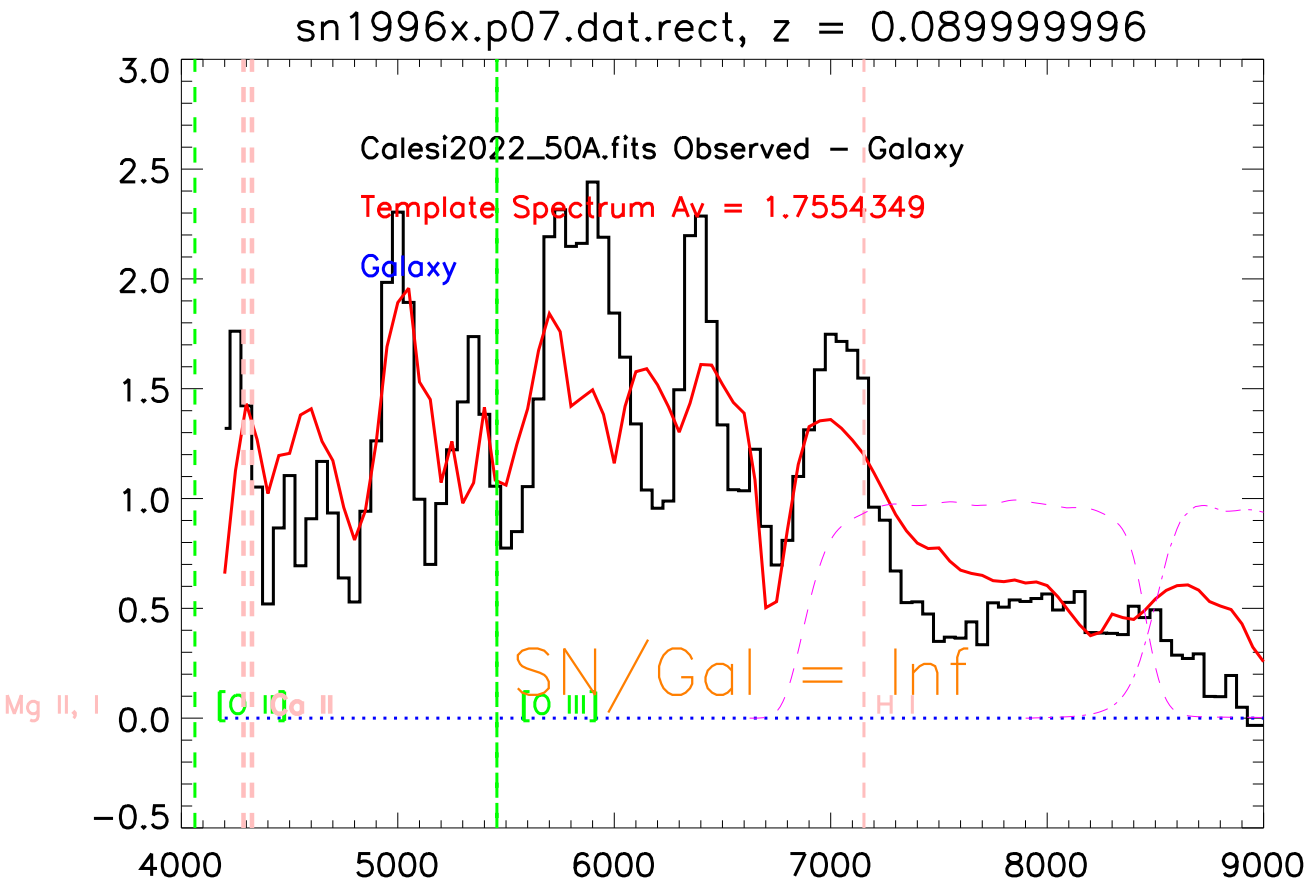
sn1996x.p07.dat.rect, z = 0.089999996
Calesi2022_50A.fits Observed − Galaxy
Template Spectrum Av = 1.7554349
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
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1.5
1.0
0.5
0.0
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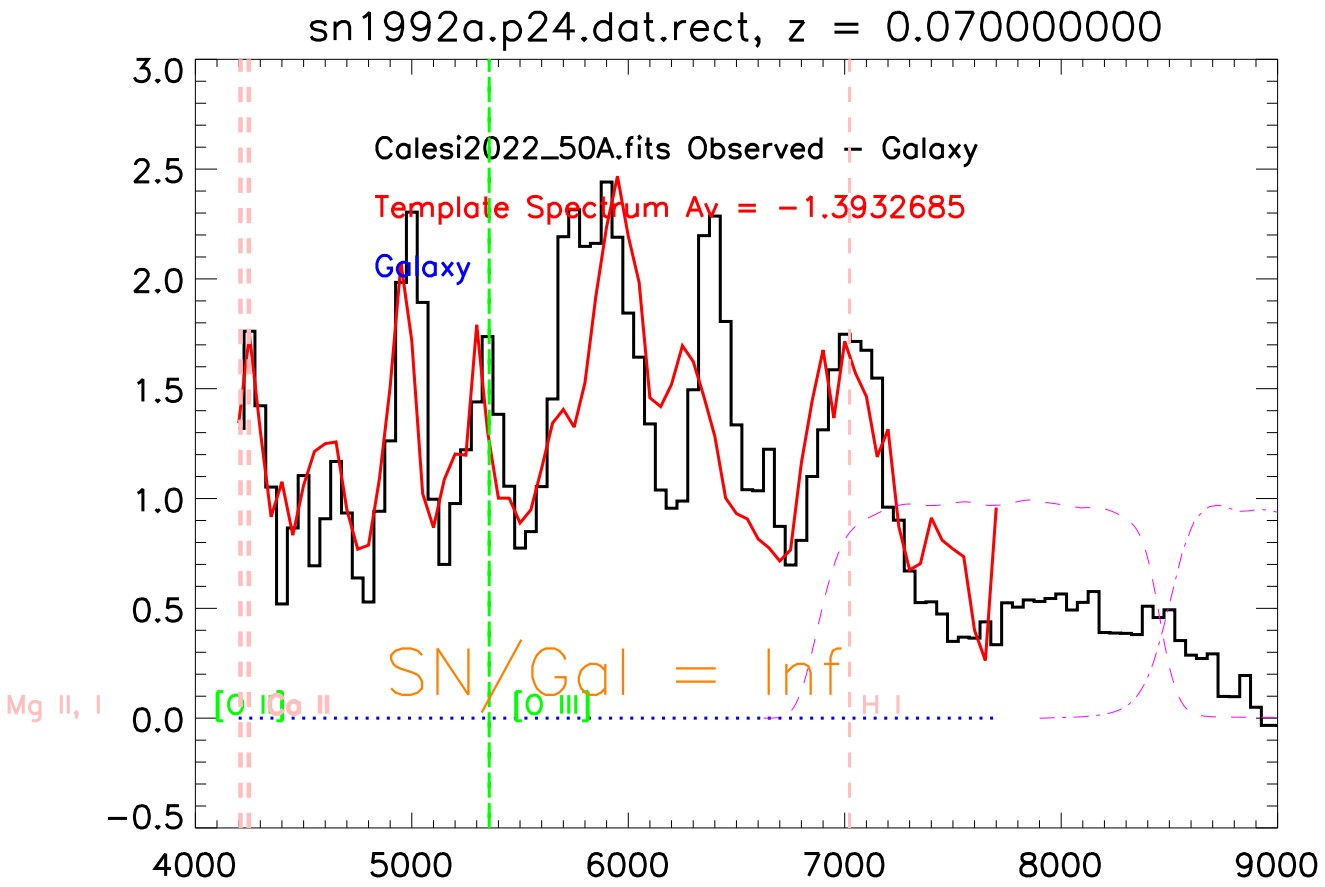
sn1992a.p24.dat.rect, z = 0.070000000
Calesi2022_50A.fits Observed -- Galaxy
Template Spectrum Av = -1.3932685
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
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1.5
1.0
0.5
0.0
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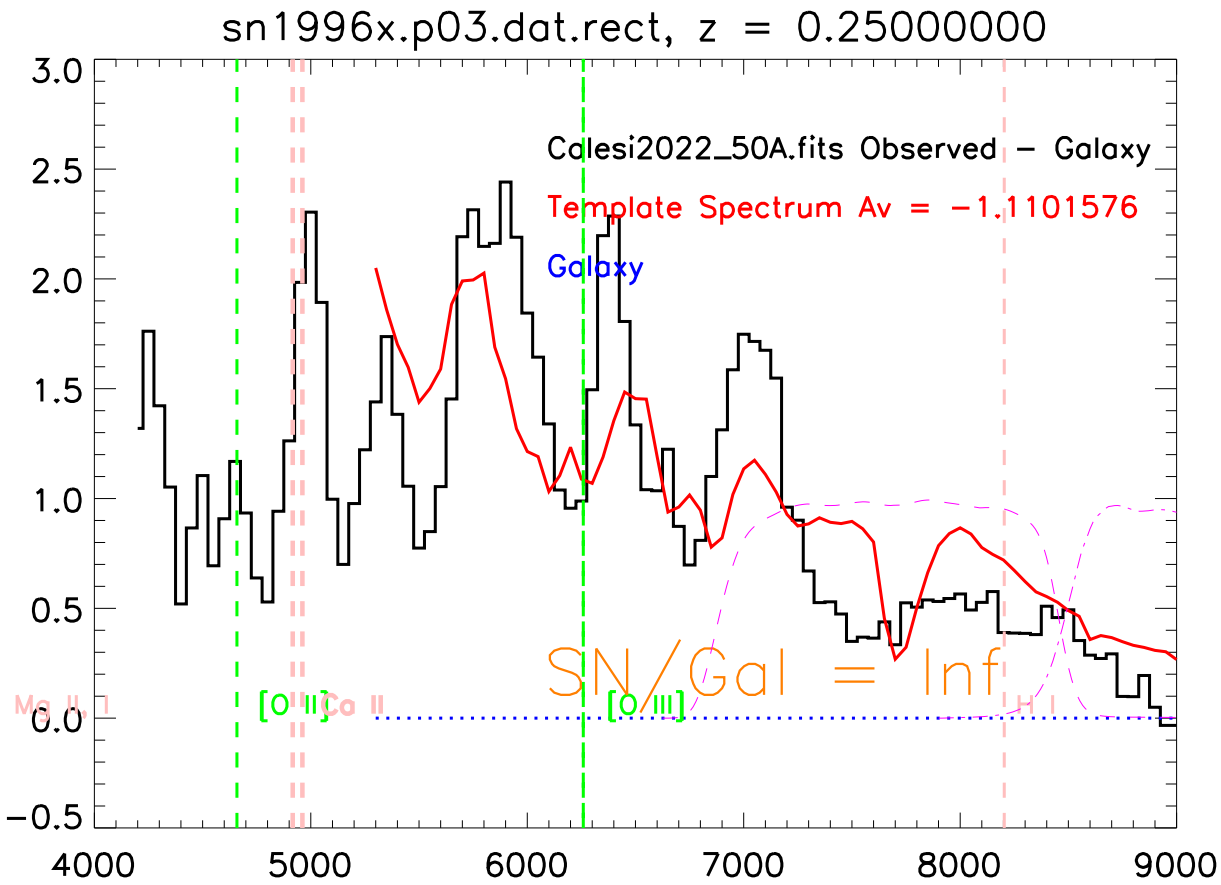
sn1996x.p03.dat.rect, z = 0.25000000
Calesi2022_50A.fits Observed − Galaxy
Template Spectrum Av = −1.1101576
Galaxy
SN/Gal = Inf
Mg II
[O II]
Ca II
[O III]
H I
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2.5
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1.5
1.0
0.5
0.0
−0.5
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7000
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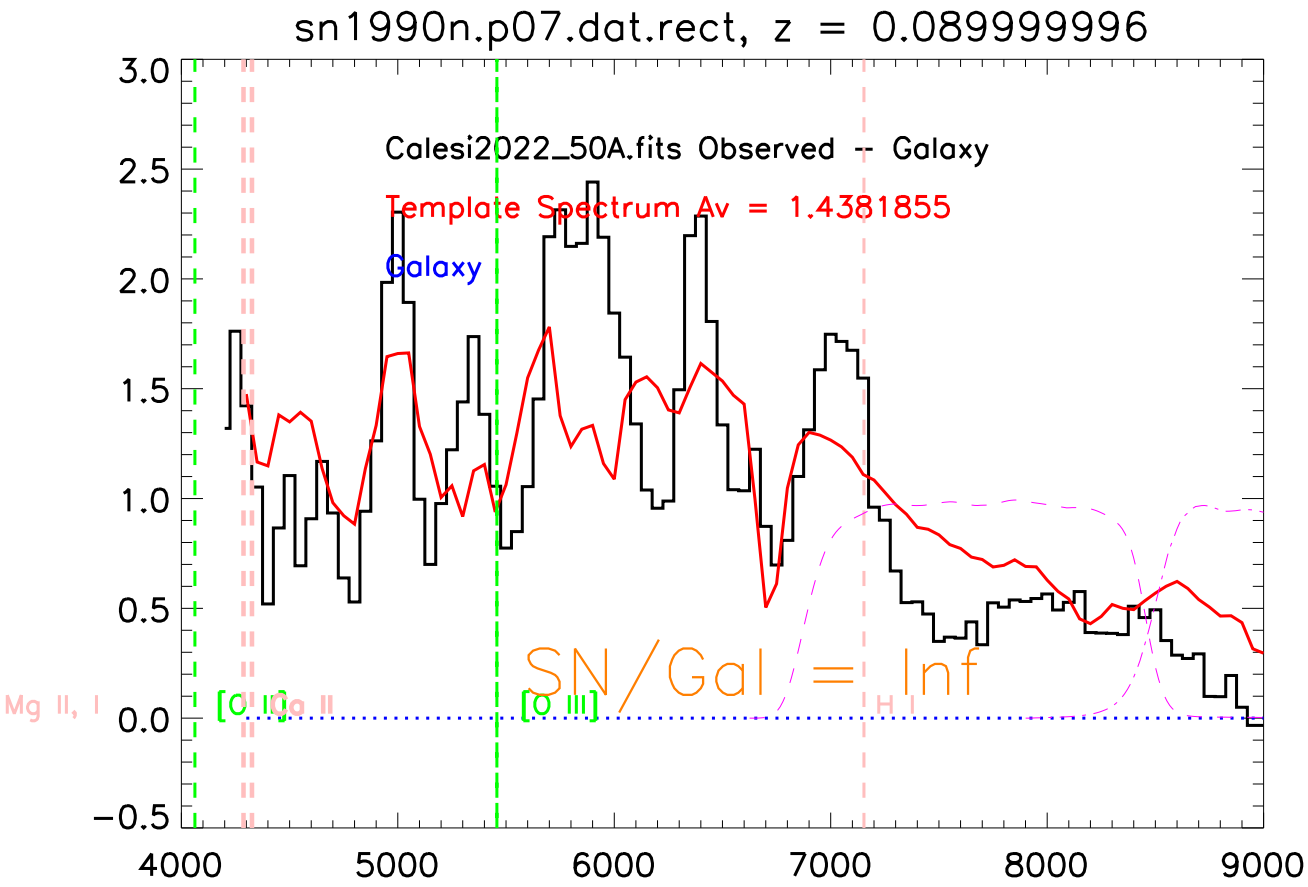
sn1990n.p07.dat.rect, z = 0.089999996
Calesi2022_50A.fits Observed -- Galaxy
Template Spectrum Av = 1.4381855
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
3.0
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1.5
1.0
0.5
0.0
−0.5
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7000
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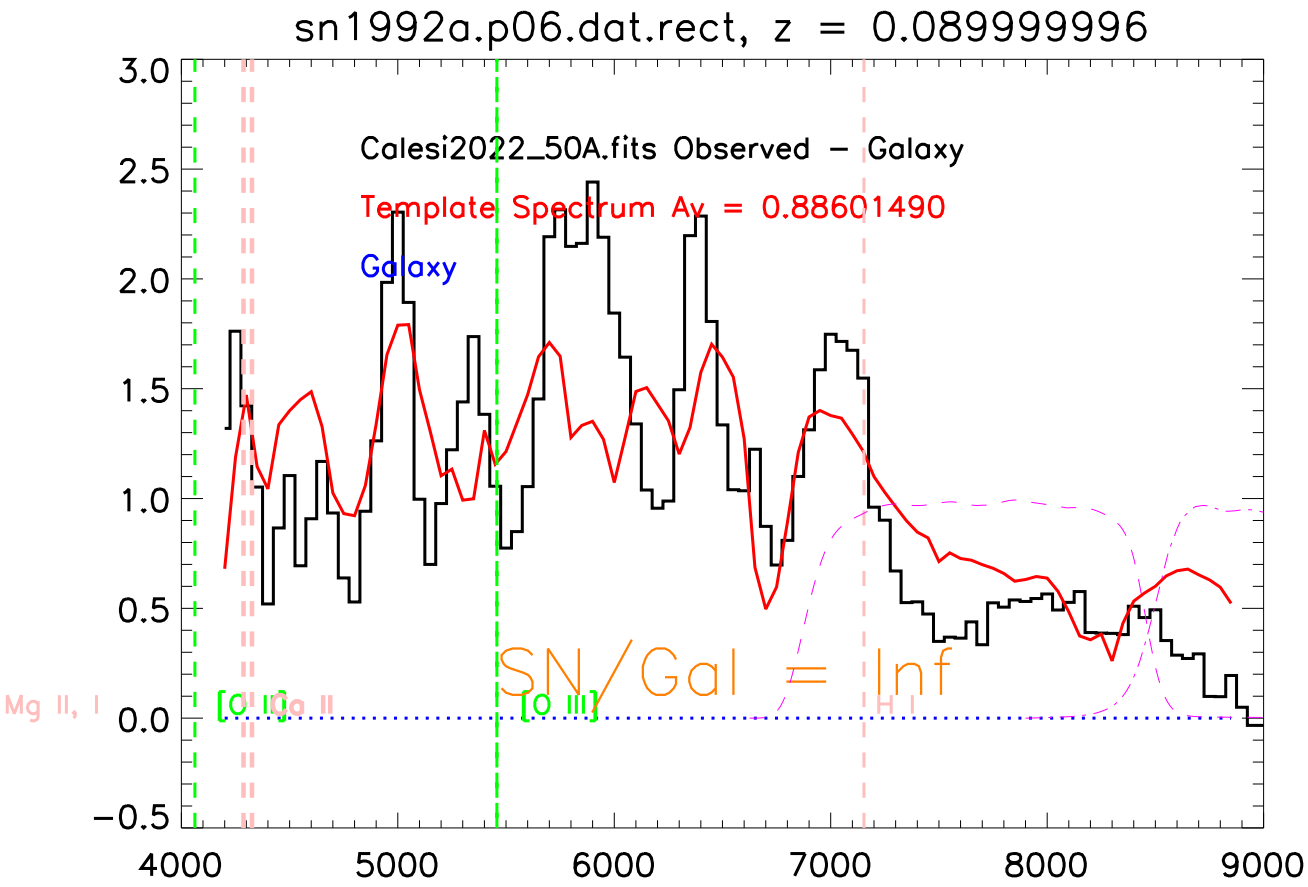
sn1992a.p06.dat.rect, z = 0.089999996
Calesi2022_50A.fits Observed − Galaxy
Template Spectrum Av = 0.88601490
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
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1.5
1.0
0.5
0.0
−0.5
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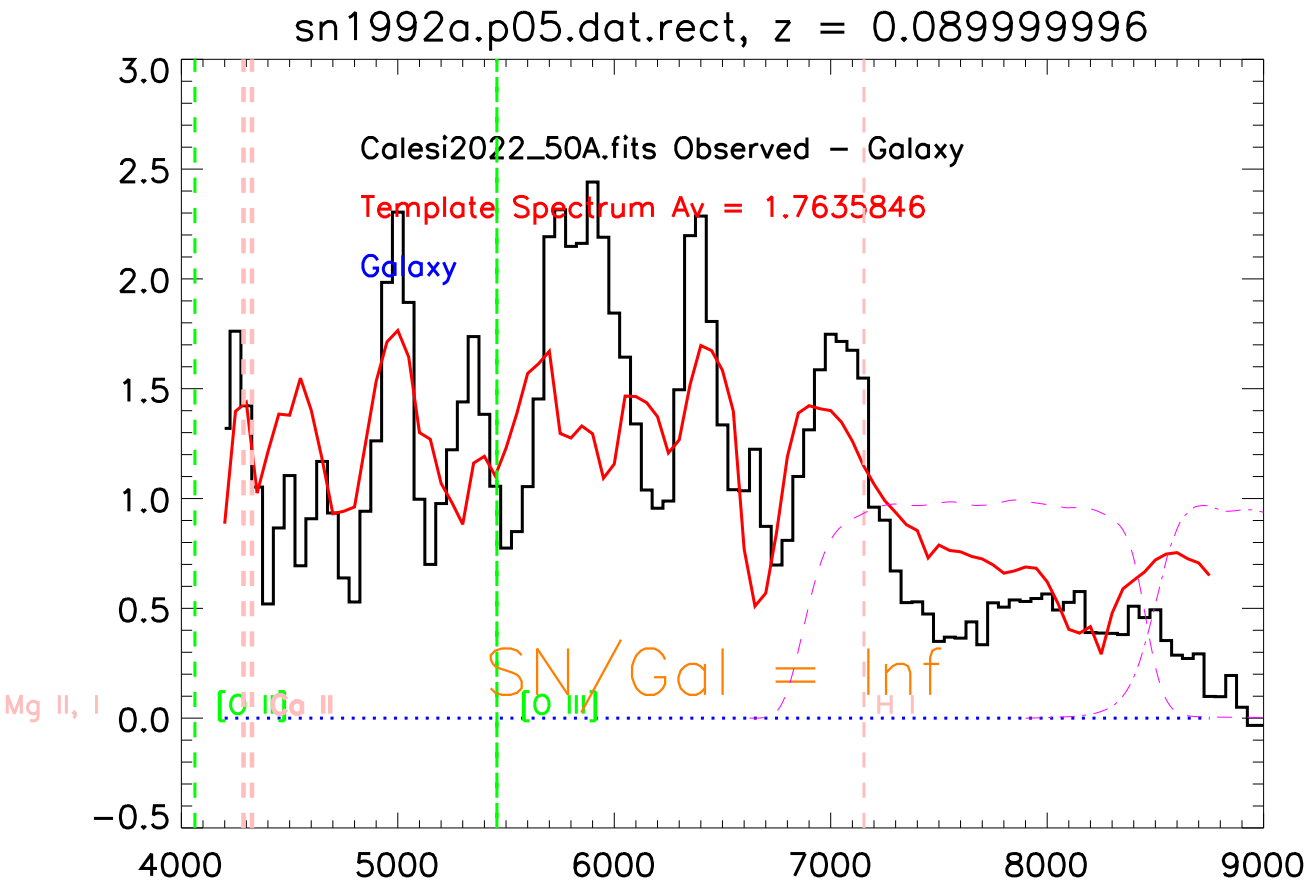
7000
8000
9000


sn1992a.p05.dat.rect, z = 0.089999996
Calesi2022_50A.fits Observed − Galaxy
Template Spectrum Av = 1.7635846
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
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2.0
1.5
1.0
0.5
0.0
−0.5
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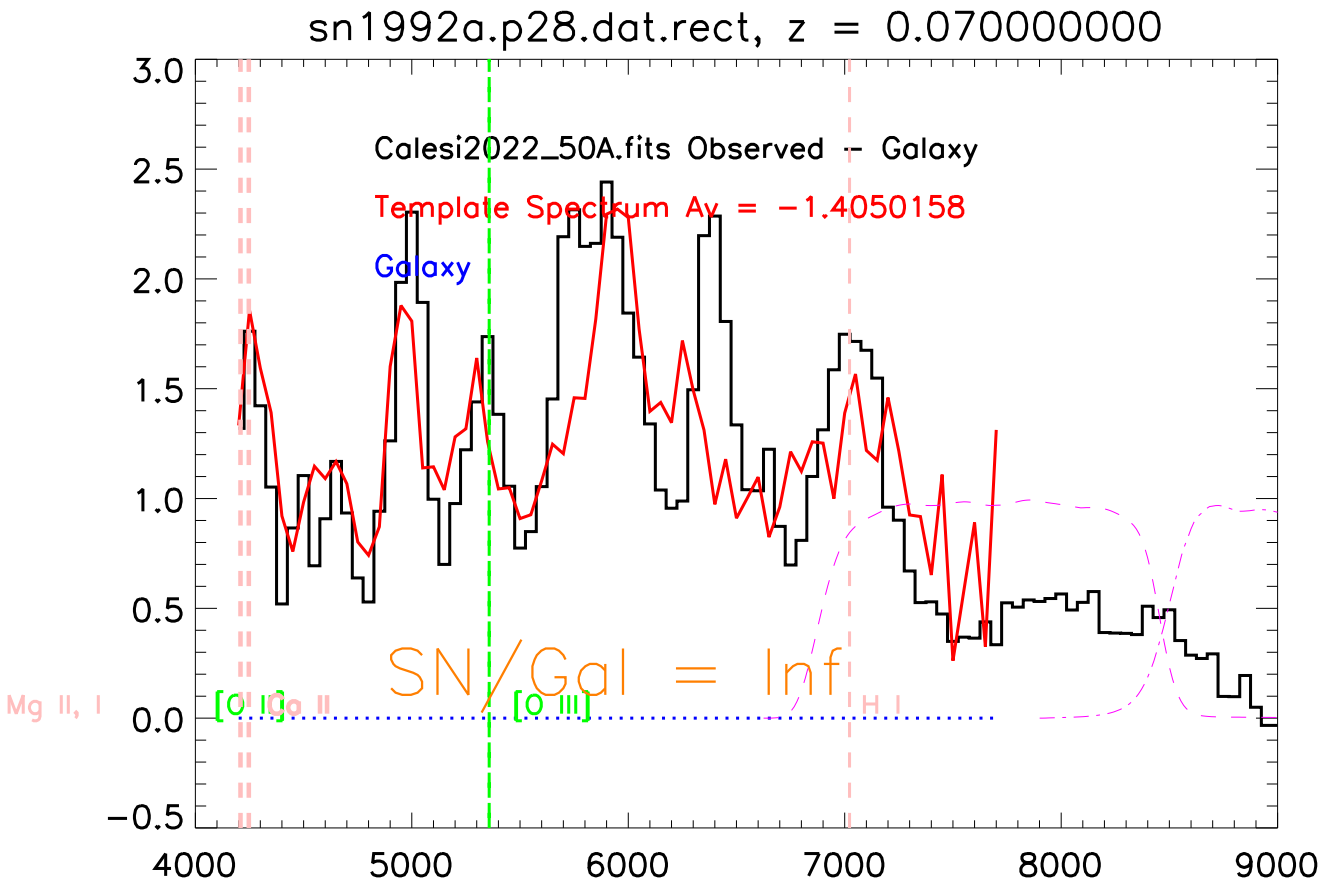
sn1992a.p28.dat.rect, z = 0.070000000
Calesi2022_50A.fits Observed -- Galaxy
Template Spectrum Av = -1.4050158
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
3.0
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2.0
1.5
1.0
0.5
0.0
−0.5
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7000
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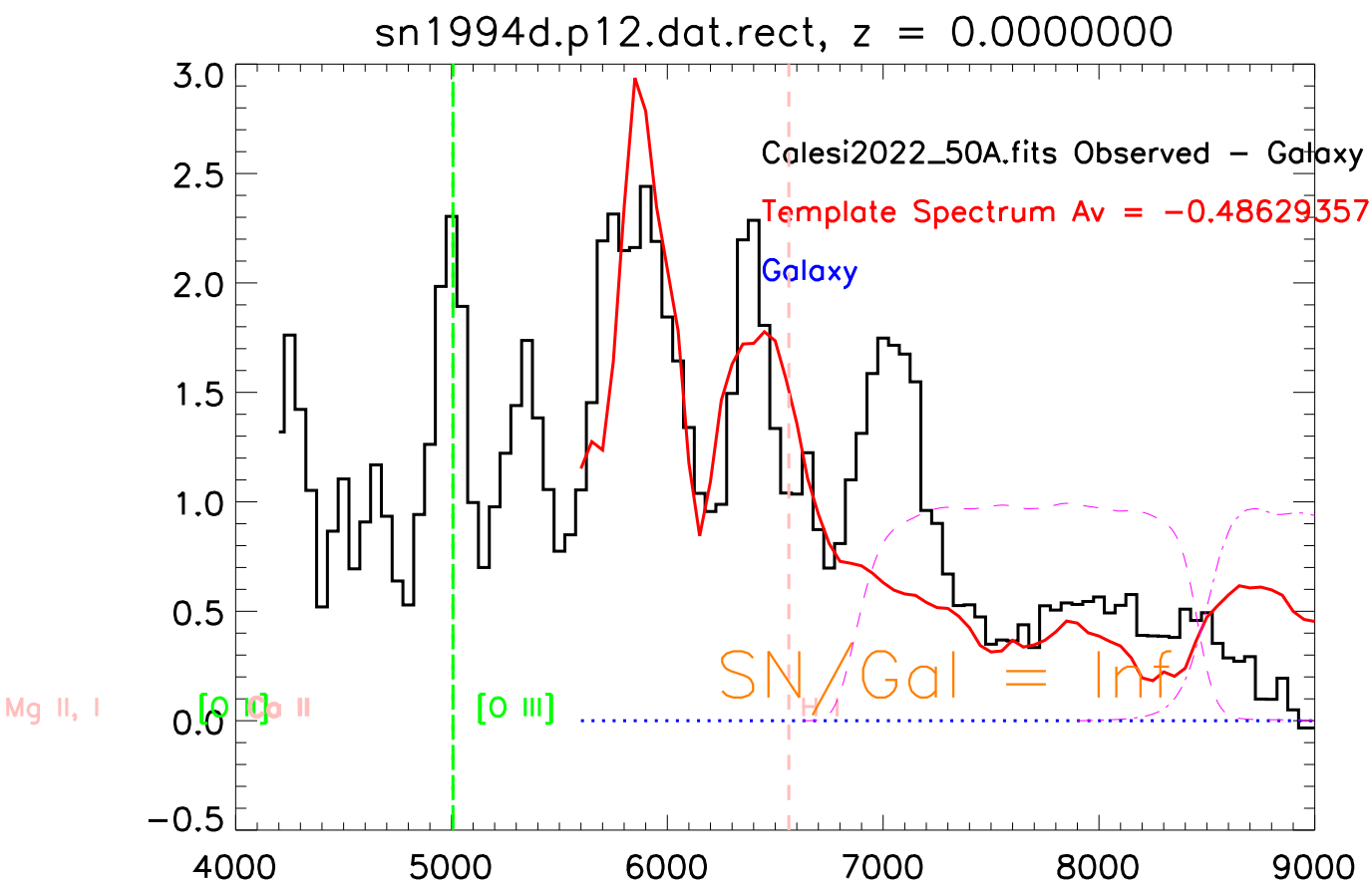
9000


sn1994d.p12.dat.rect, z = 0.0000000
Calesi2022_50A.fits Observed − Galaxy
Template Spectrum Av = −0.48629357
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
[O III]
3.0
2.5
2.0
1.5
1.0
0.5
0.0
−0.5
4000
5000
6000
7000
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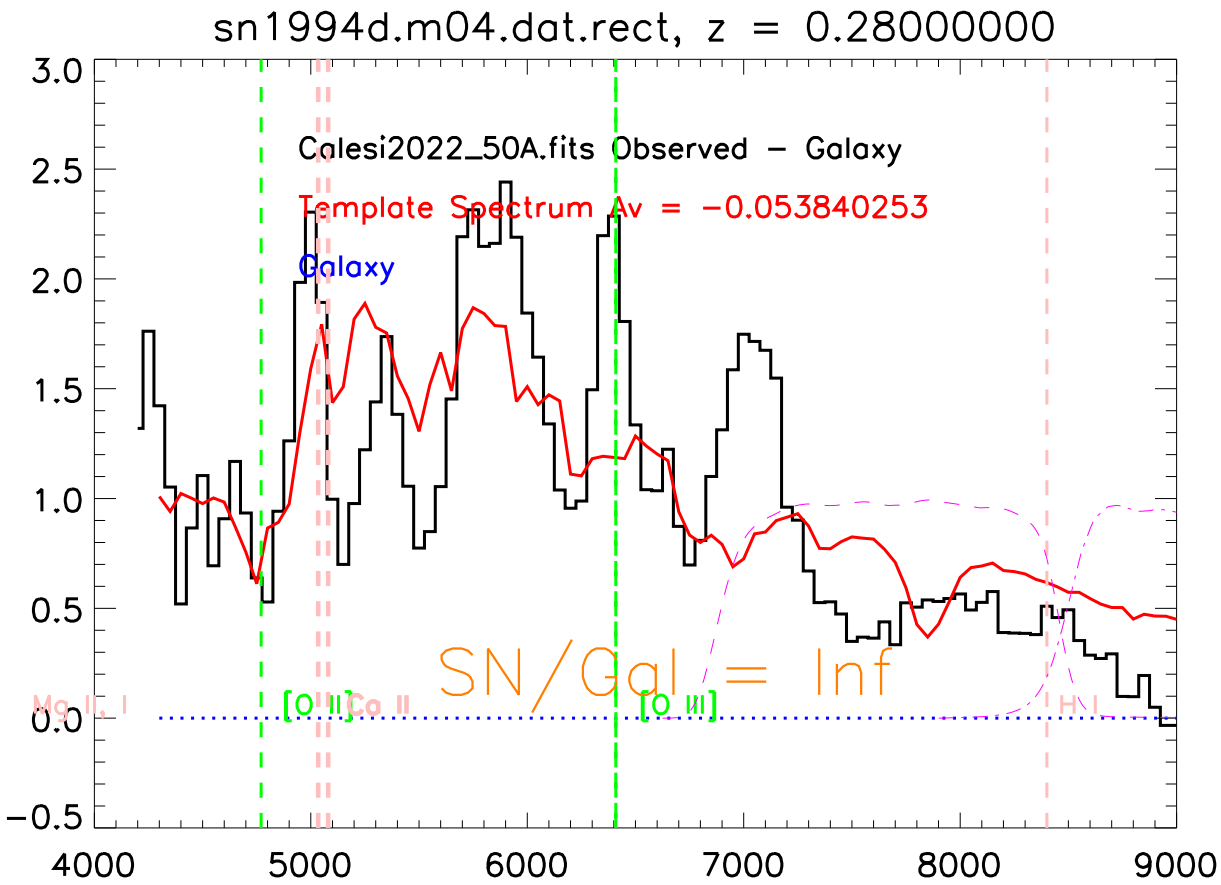
9000


sn1994d.m04.dat.rect, z = 0.28000000
Calesi2022_50A.fits Observed − Galaxy
Template Spectrum Av = −0.053840253
Galaxy
SN/Gal = Inf
[O II]
Ca II
[O III]
Mg II, I
H I
3.0
2.5
2.0
1.5
1.0
0.5
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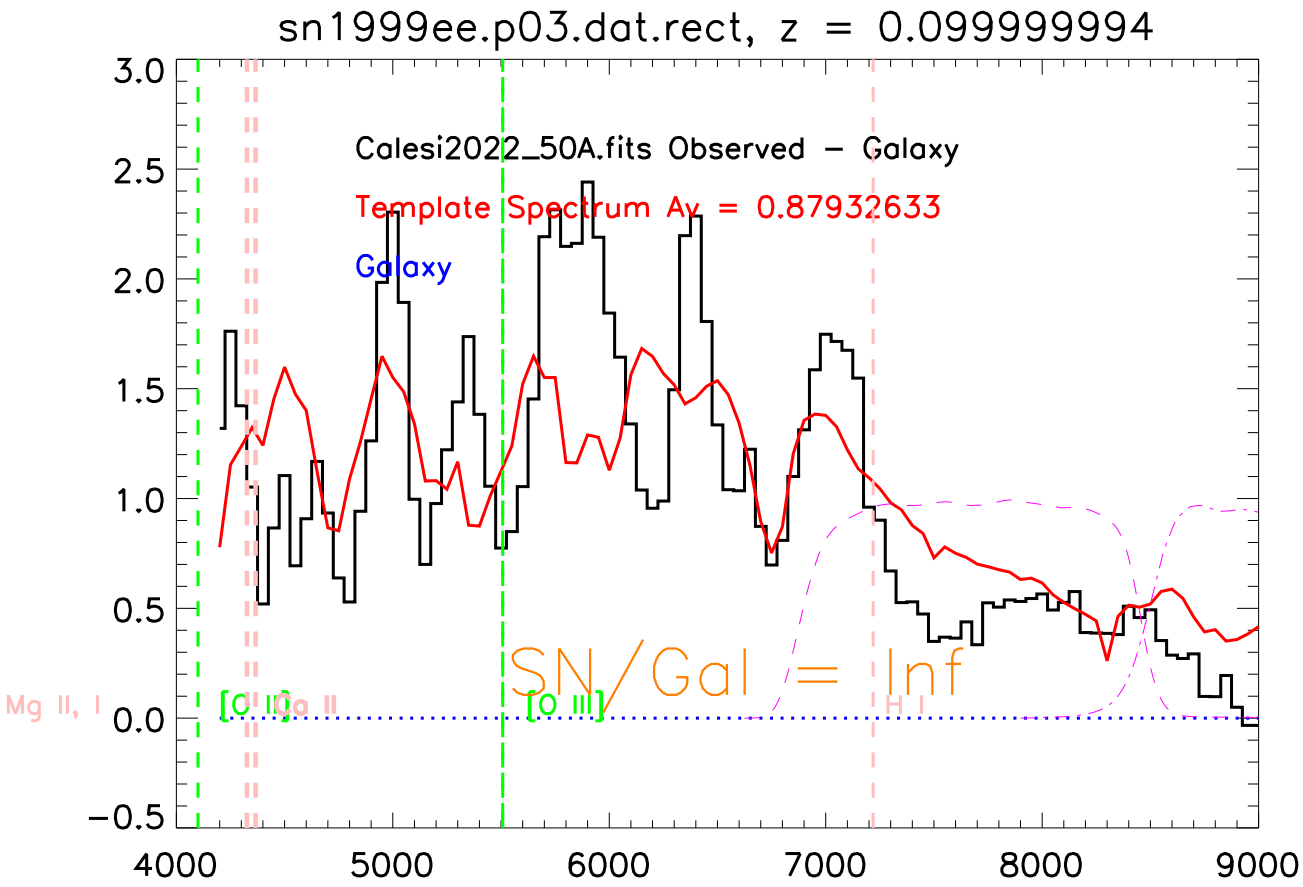
sn1999ee.p03.dat.rect, z = 0.099999994
Calesi2022_50A.fits Observed − Galaxy
Template Spectrum Av = 0.87932633
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
3.0
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1.5
1.0
0.5
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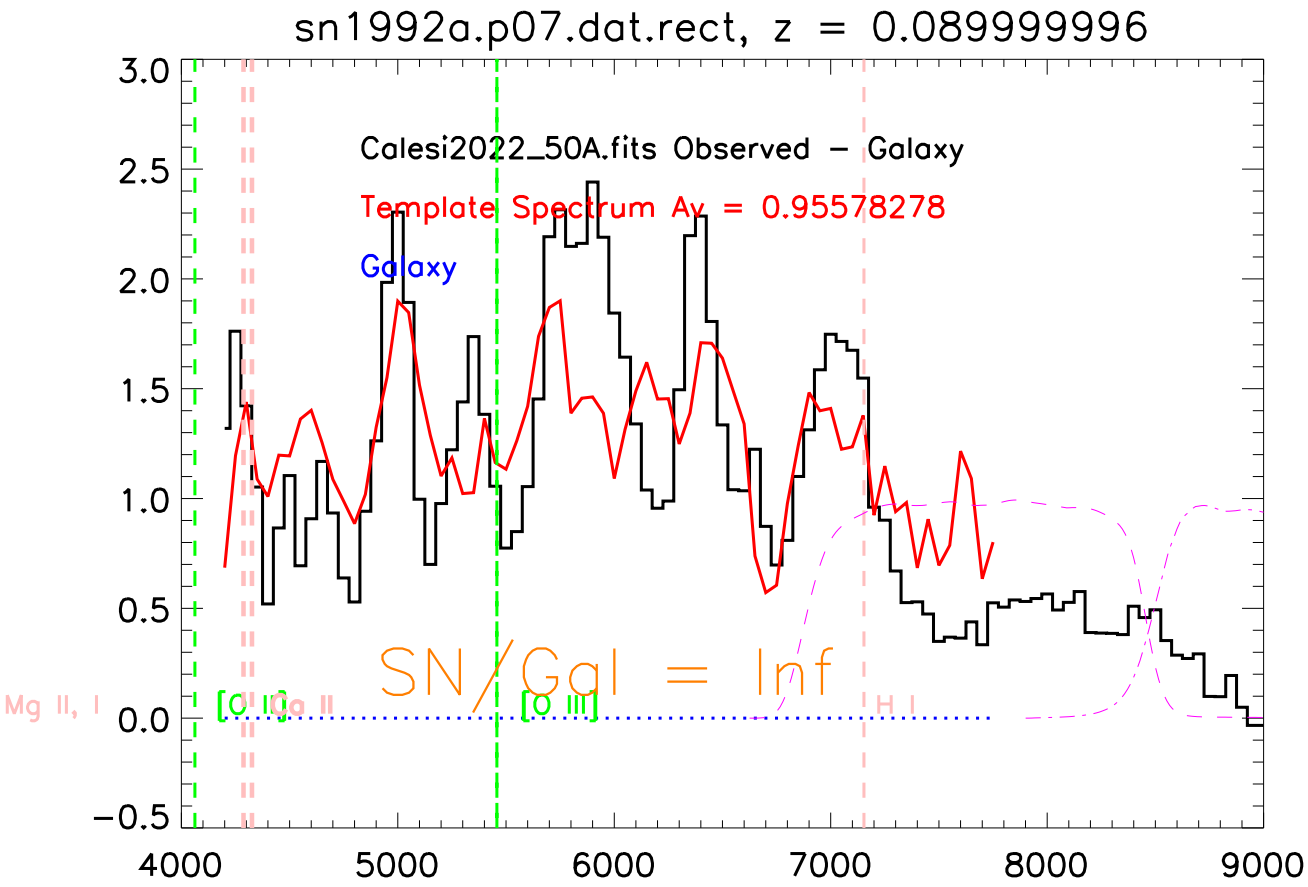
9000


sn1992a.p07.dat.rect, z = 0.089999996
Calesi2022_50A.fits Observed − Galaxy
Template Spectrum Av = 0.95578278
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
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1.5
1.0
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8000
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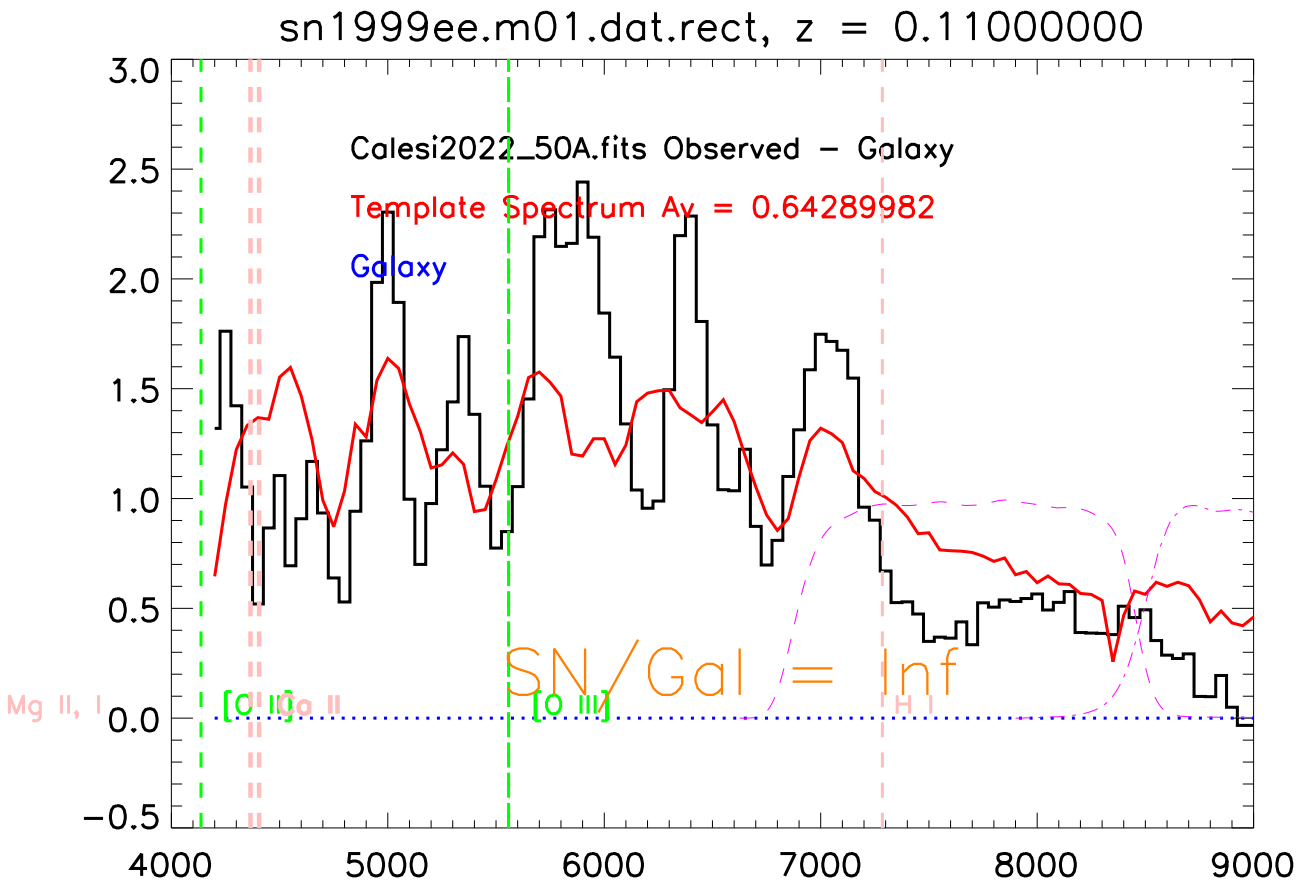
sn1999ee.m01.dat.rect, z = 0.11000000
Calesi2022_50A.fits Observed − Galaxy
Template Spectrum Av = 0.64289982
Galaxy
SN/Gal = Inf
[O II]
[O III]
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1.5
1.0
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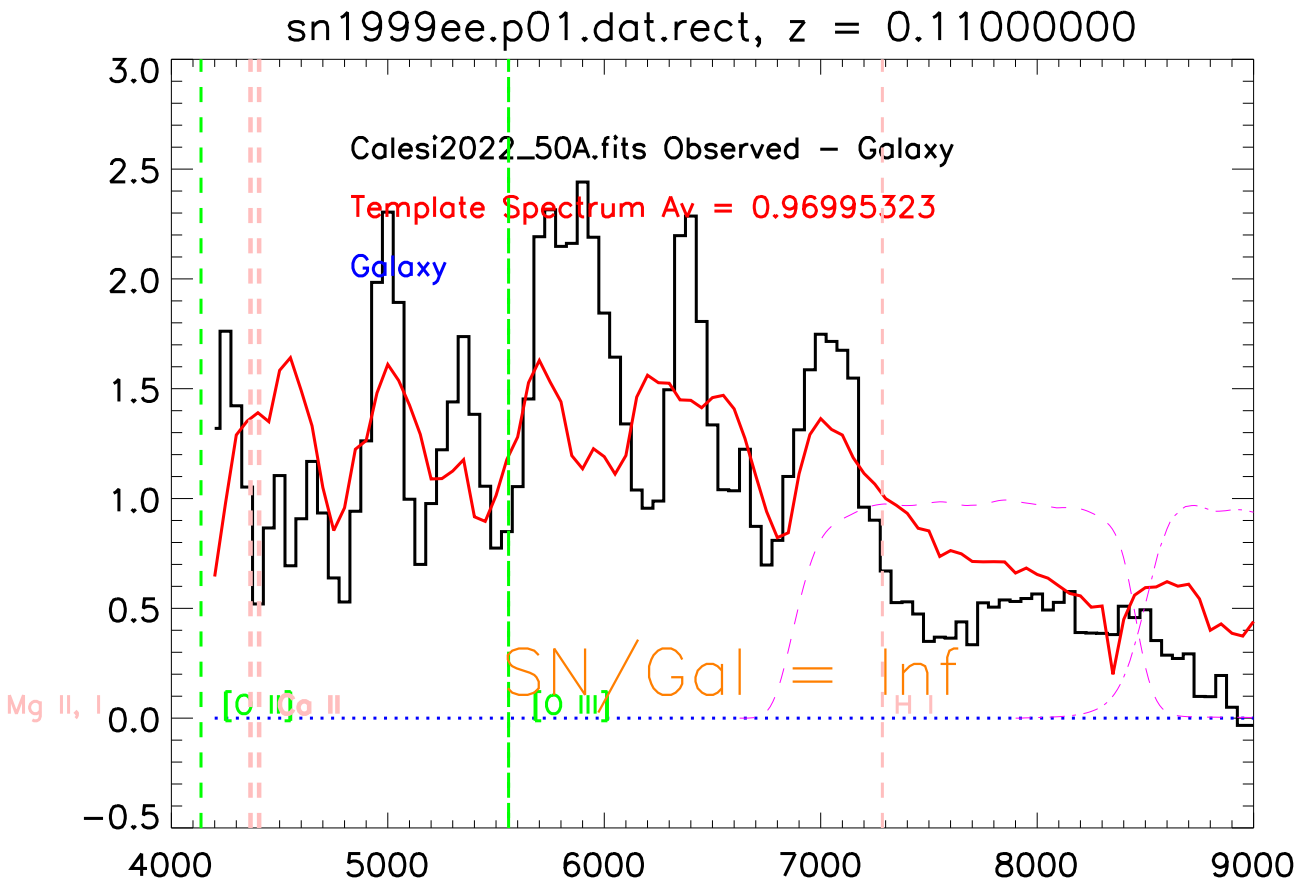
sn1999ee.p01.dat.rect, z = 0.11000000
Calesi2022_50A.fits Observed − Galaxy
Template Spectrum Av = 0.96995323
Galaxy
SN/Gal = Inf
[O II]
[O III]
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1.5
1.0
0.5
0.0
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8000
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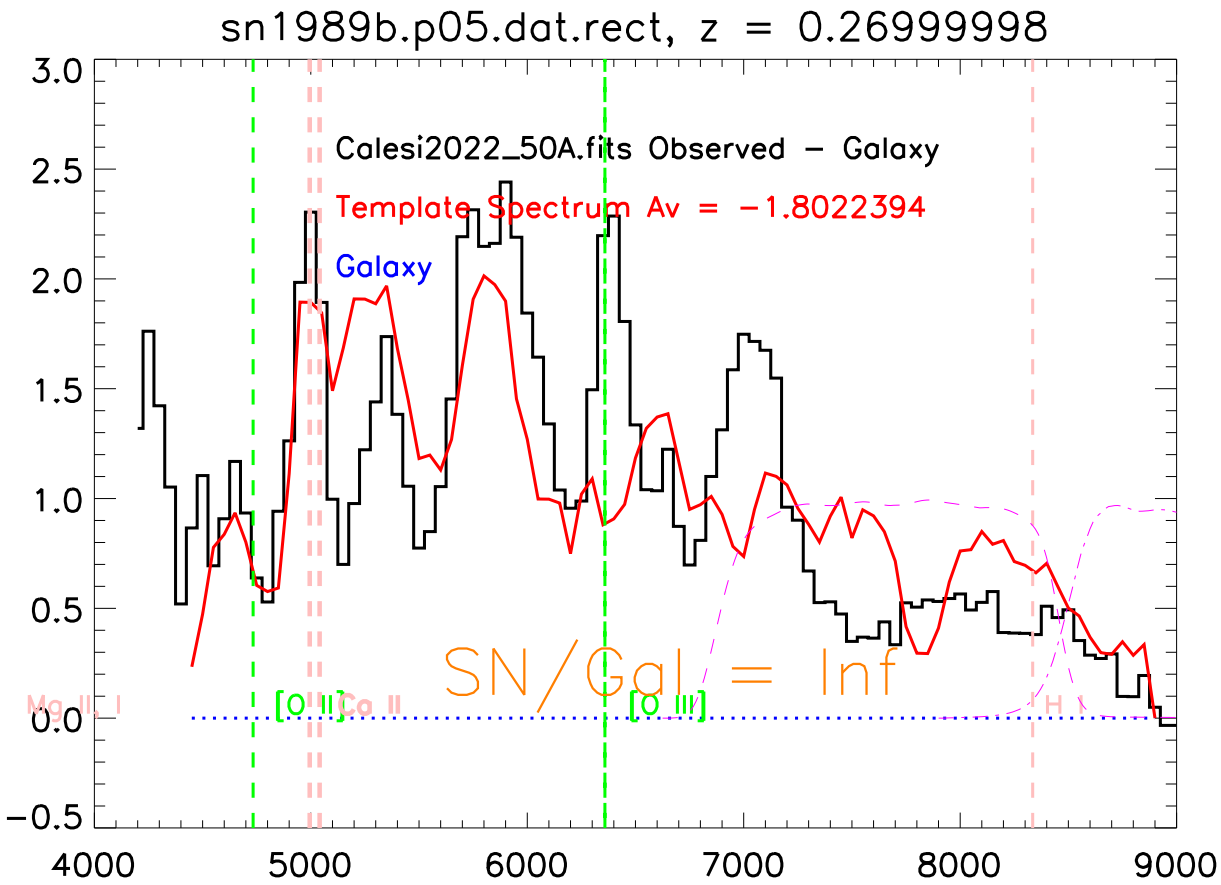
sn1989b.p05.dat.rect, z = 0.26999998
Calesi2022_50A.fits Observed − Galaxy
Template Spectrum Av = −1.8022394
Galaxy
SN/Gal = Inf
Mg II
[O II]
Ca II
[O III]
H
3.0
2.5
2.0
1.5
1.0
0.5
0.0
−0.5
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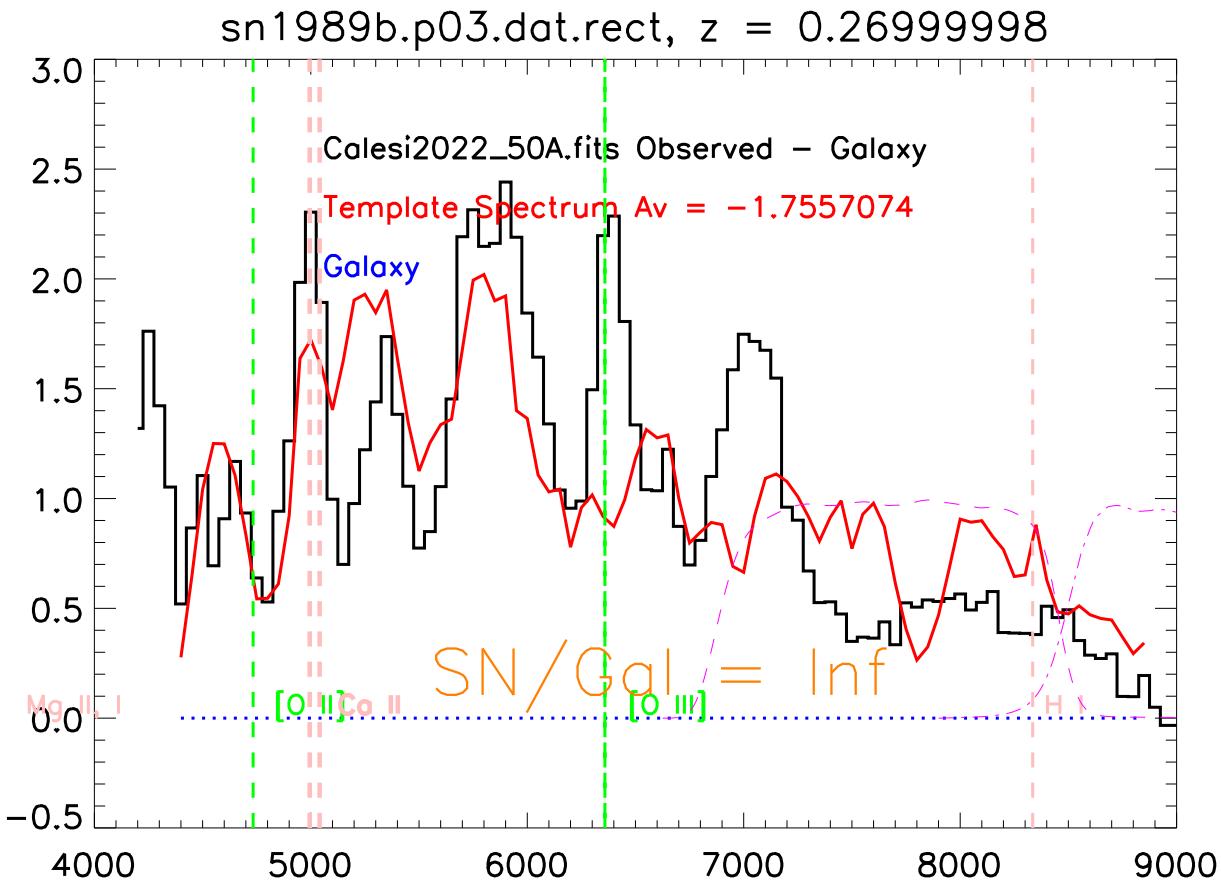
7000
8000
9000


sn1989b.p03.dat.rect, z = 0.26999998
Calesi2022_50A.fits Observed − Galaxy
Template Spectrum, Av = −1.7557074
Galaxy
SN/Gal = Inf
Mg II
[O II]
Ca II
[O III]
H
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2.0
1.5
1.0
0.5
0.0
−0.5
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7000
8000
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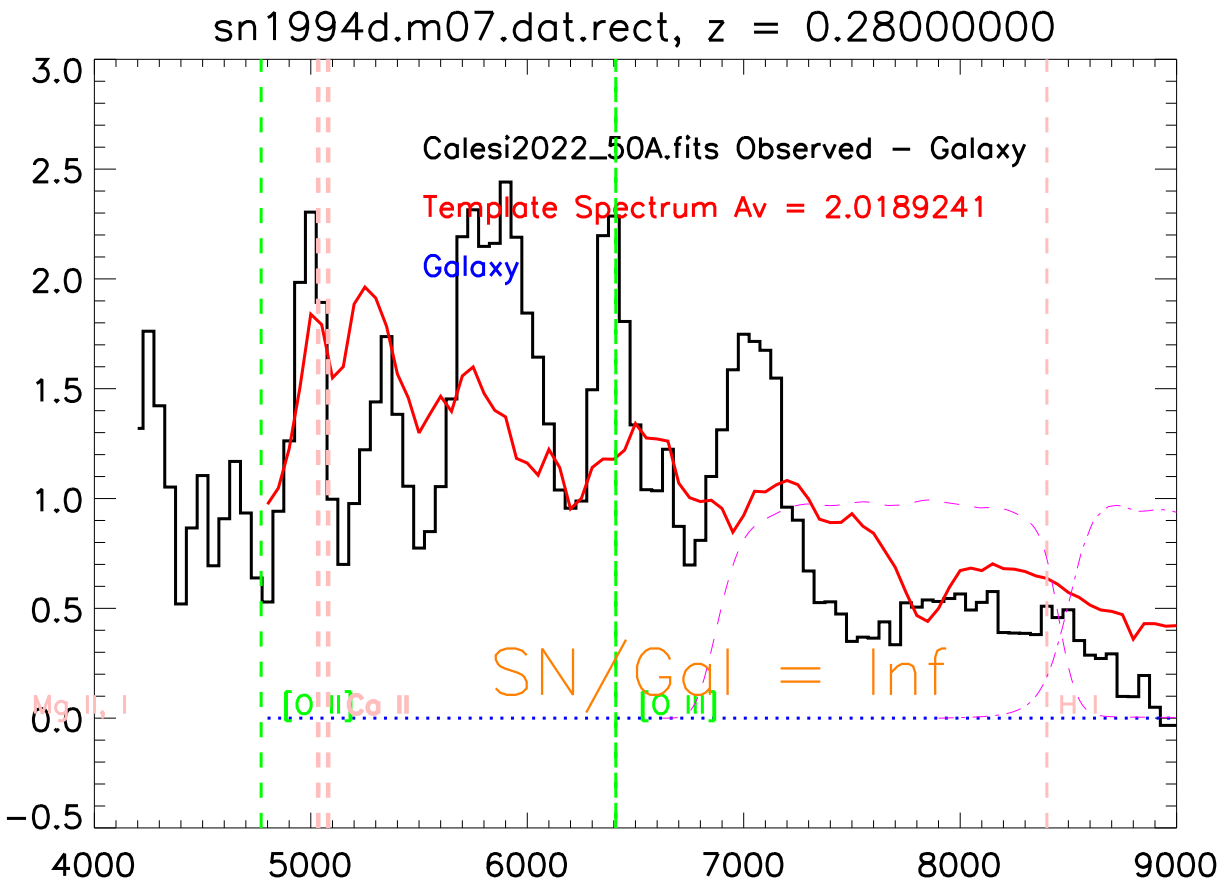
sn1994d.m07.dat.rect, z = 0.28000000
Calesi2022_50A.fits Observed − Galaxy
Template Spectrum Av = 2.0189241
Galaxy
SN/Gal = Inf
[O II]
Ca II
[O III]
H I
Mg II, I
3.0
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2.0
1.5
1.0
0.5
0.0
−0.5
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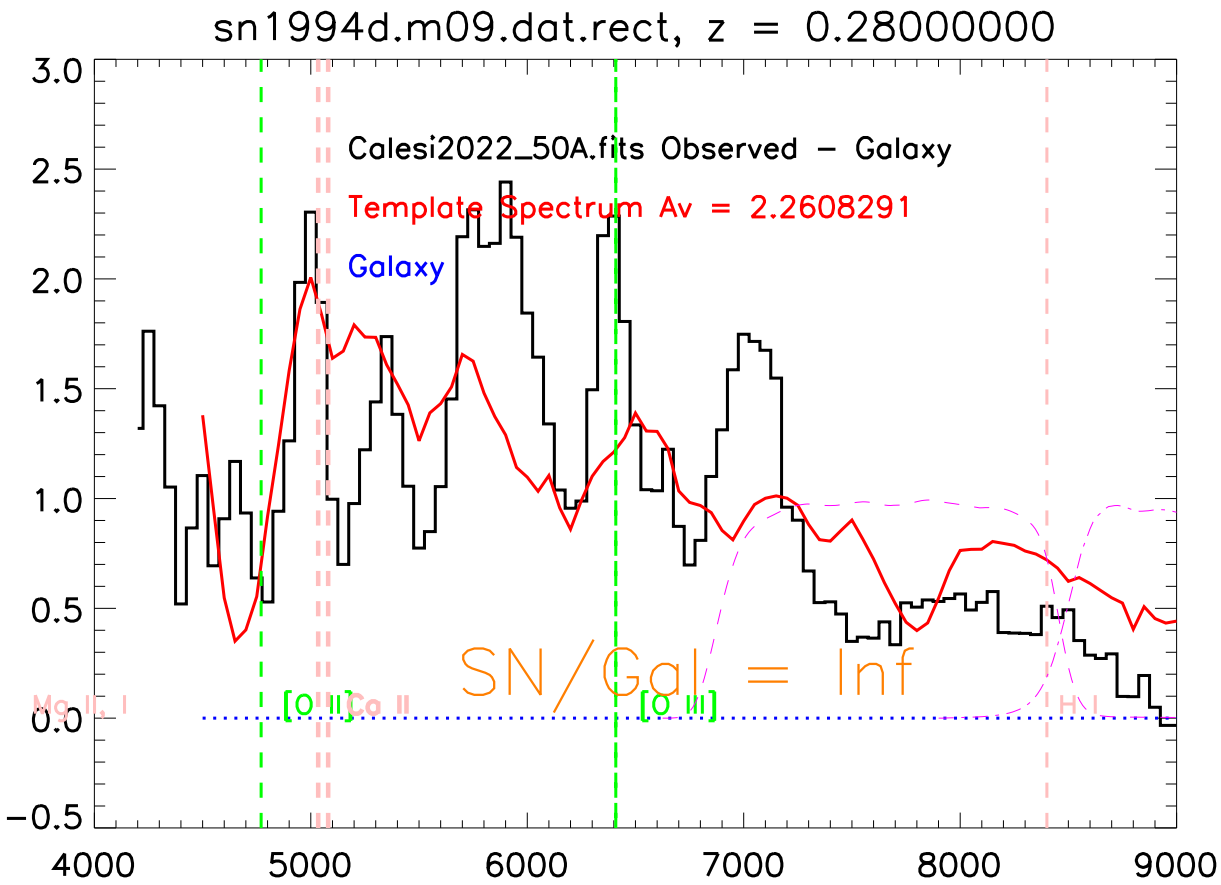
7000
8000
9000


sn1994d.m09.dat.rect, z = 0.28000000
Calesi2022_50A.fits Observed − Galaxy
Template Spectrum Av = 2.2608291
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
3.0
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2.0
1.5
1.0
0.5
0.0
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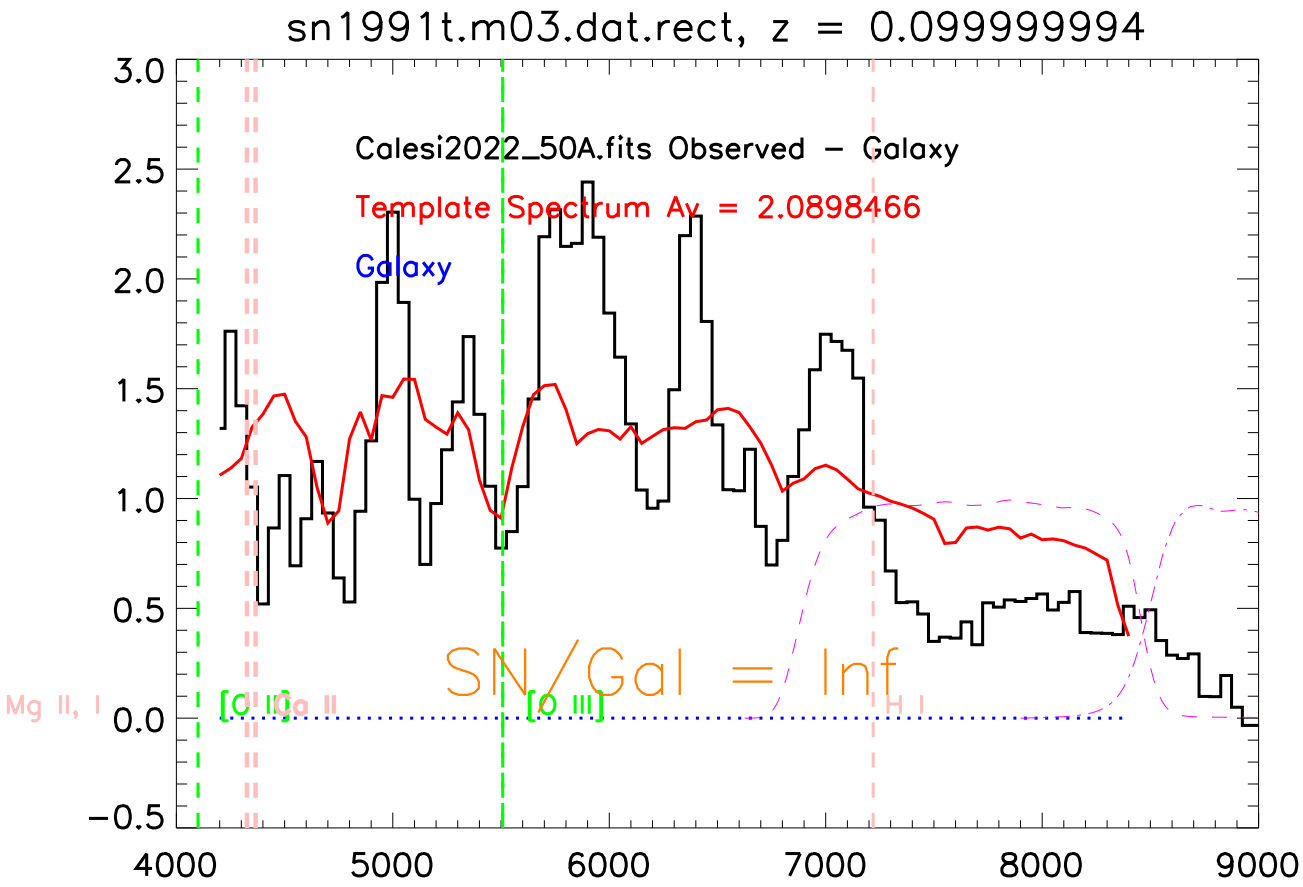
7000
8000
9000


sn1991t.m03.dat.rect, z = 0.099999994
Calesi2022_50A.fits Observed − Galaxy
Template Spectrum Av = 2.0898466
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
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1.5
1.0
0.5
0.0
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7000
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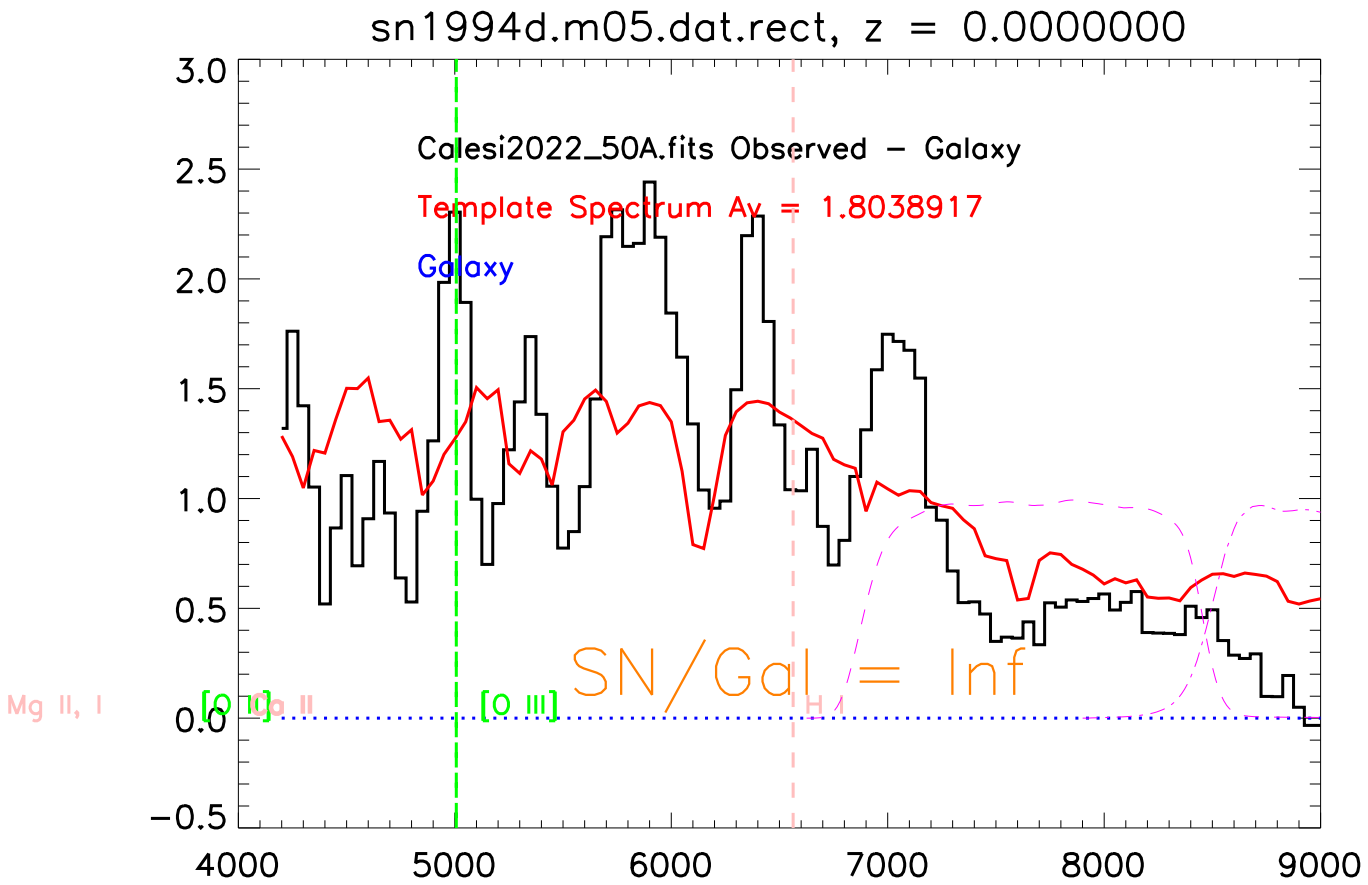
sn1994d.m05.dat.rect, z = 0.0000000
Calesi2022_50A.fits Observed − Galaxy
Template Spectrum Av = 1.8038917
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
[O III]
H
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2.5
2.0
1.5
1.0
0.5
0.0
−0.5
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7000
8000
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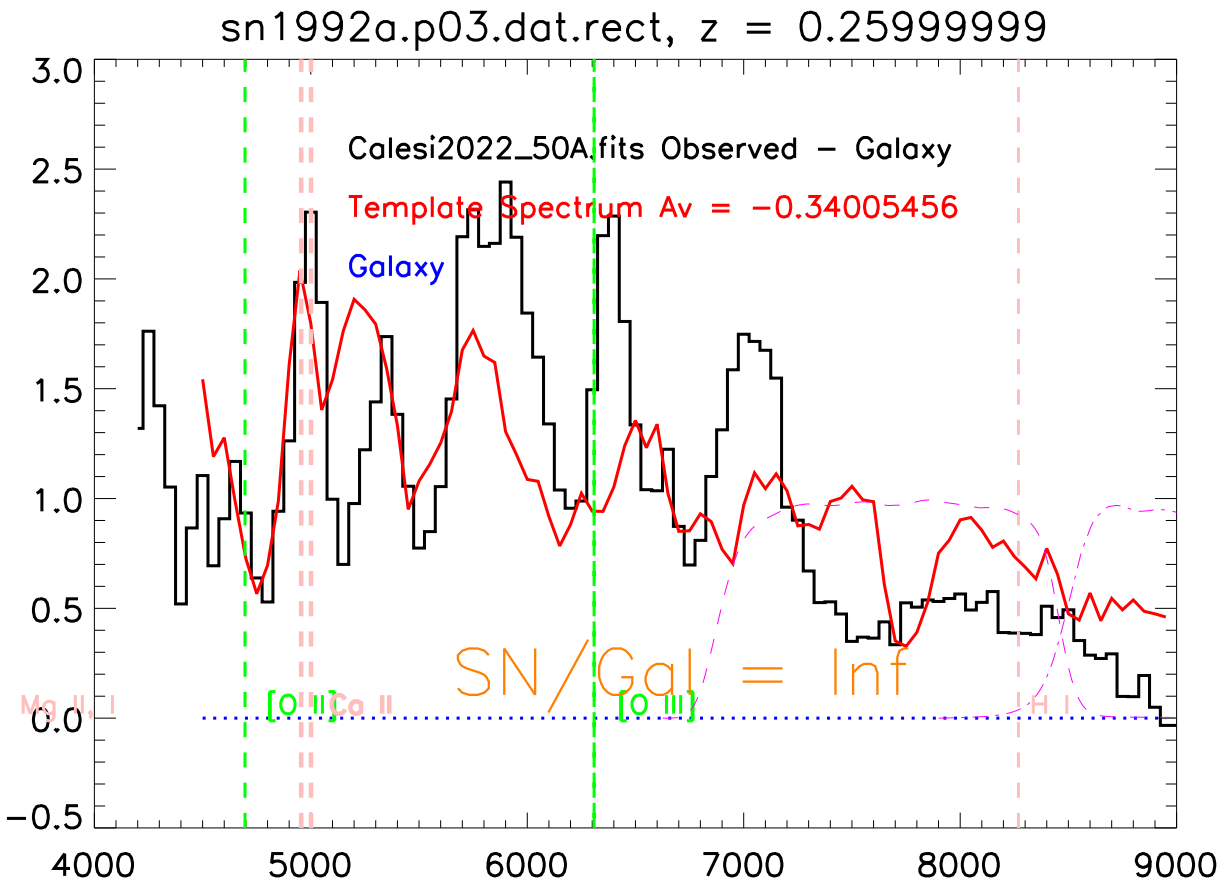
sn1992a.p03.dat.rect, z = 0.25999999
Calesi2022_50A.fits Observed − Galaxy
Template Spectrum Av = −0.34005456
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
3.0
2.5
2.0
1.5
1.0
0.5
0.0
−0.5
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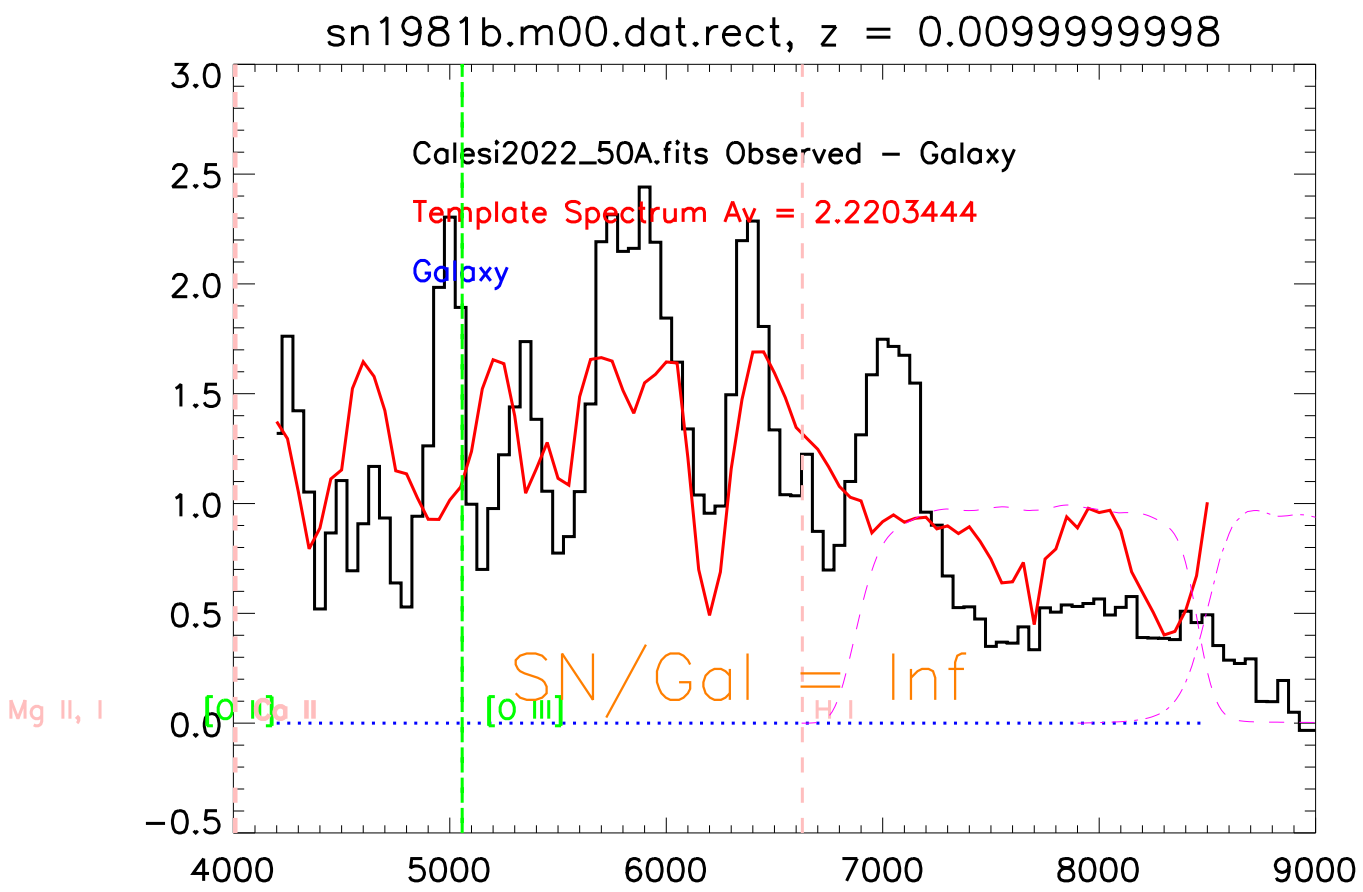
7000
8000
9000


sn1981b.m00.dat.rect, z = 0.0099999998
Calesi2022_50A.fits Observed − Galaxy
Template Spectrum Av = 2.2203444
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
3.0
2.5
2.0
1.5
1.0
0.5
0.0
−0.5
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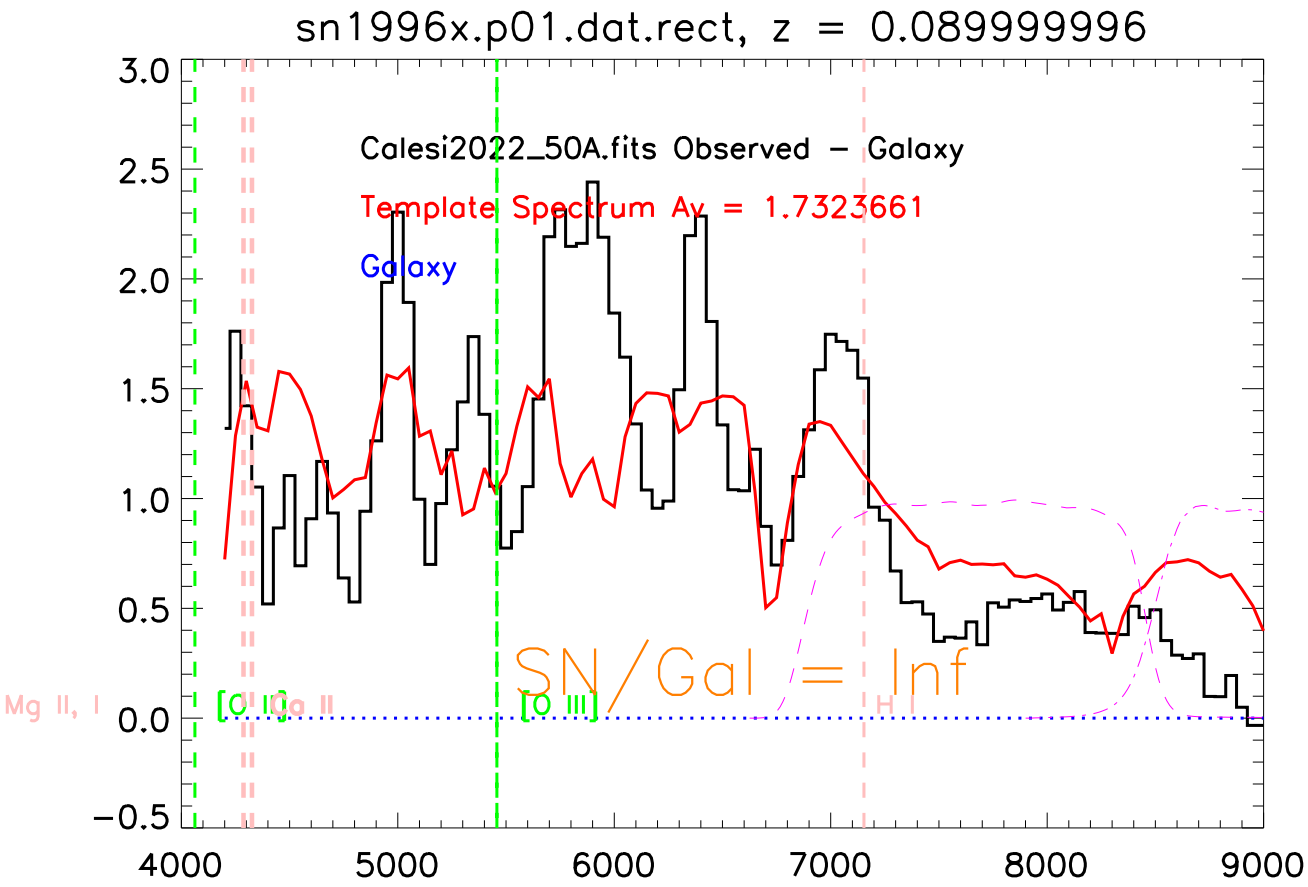
7000
8000
9000


sn1996x.p01.dat.rect, z = 0.089999996
Calesi2022_50A.fits Observed − Galaxy
Template Spectrum Av = 1.7323661
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
3.0
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2.0
1.5
1.0
0.5
0.0
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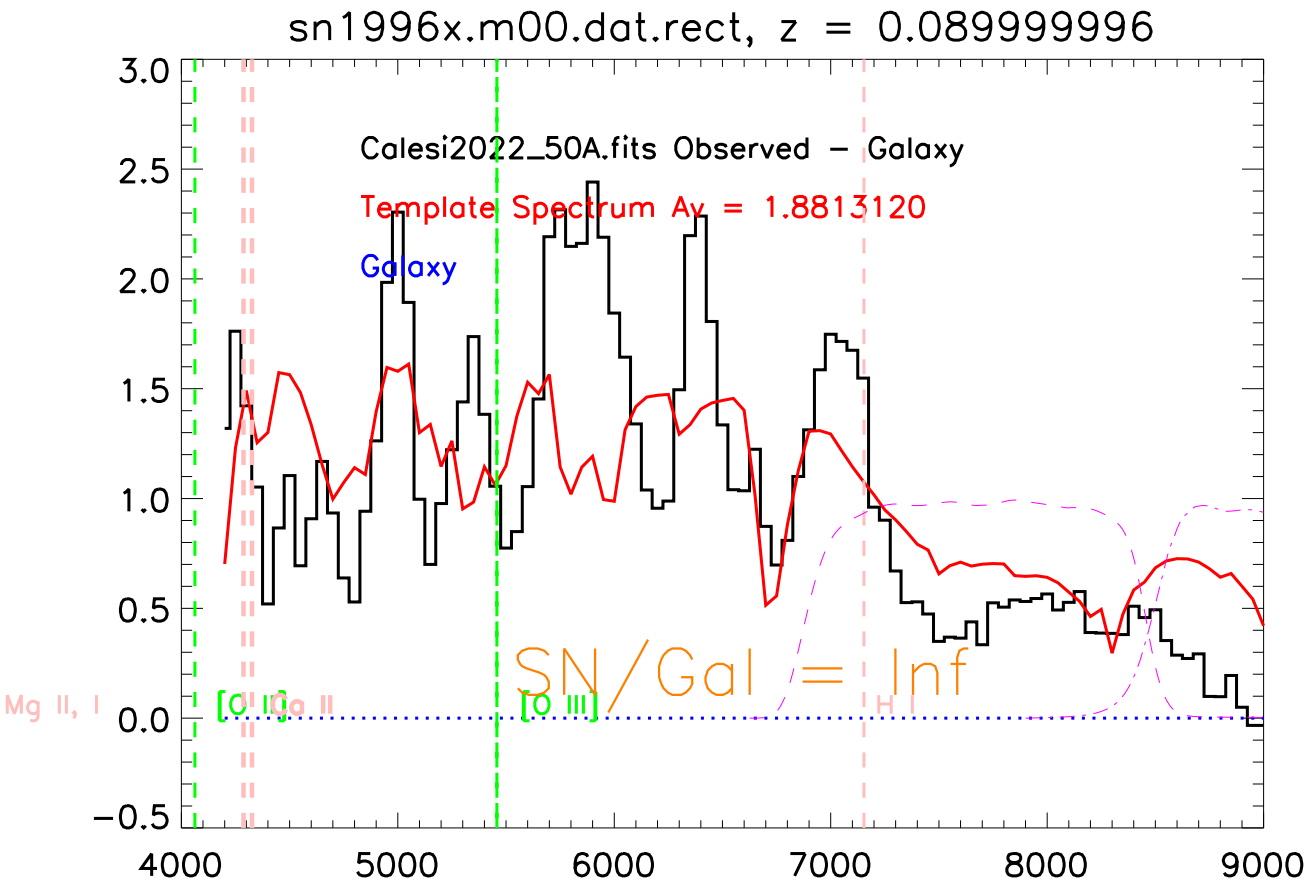
7000
8000
9000


sn1996x.m00.dat.rect, z = 0.089999996
Calesi2022_50A.fits Observed − Galaxy
Template Spectrum Av = 1.8813120
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
3.0
2.5
2.0
1.5
1.0
0.5
0.0
−0.5
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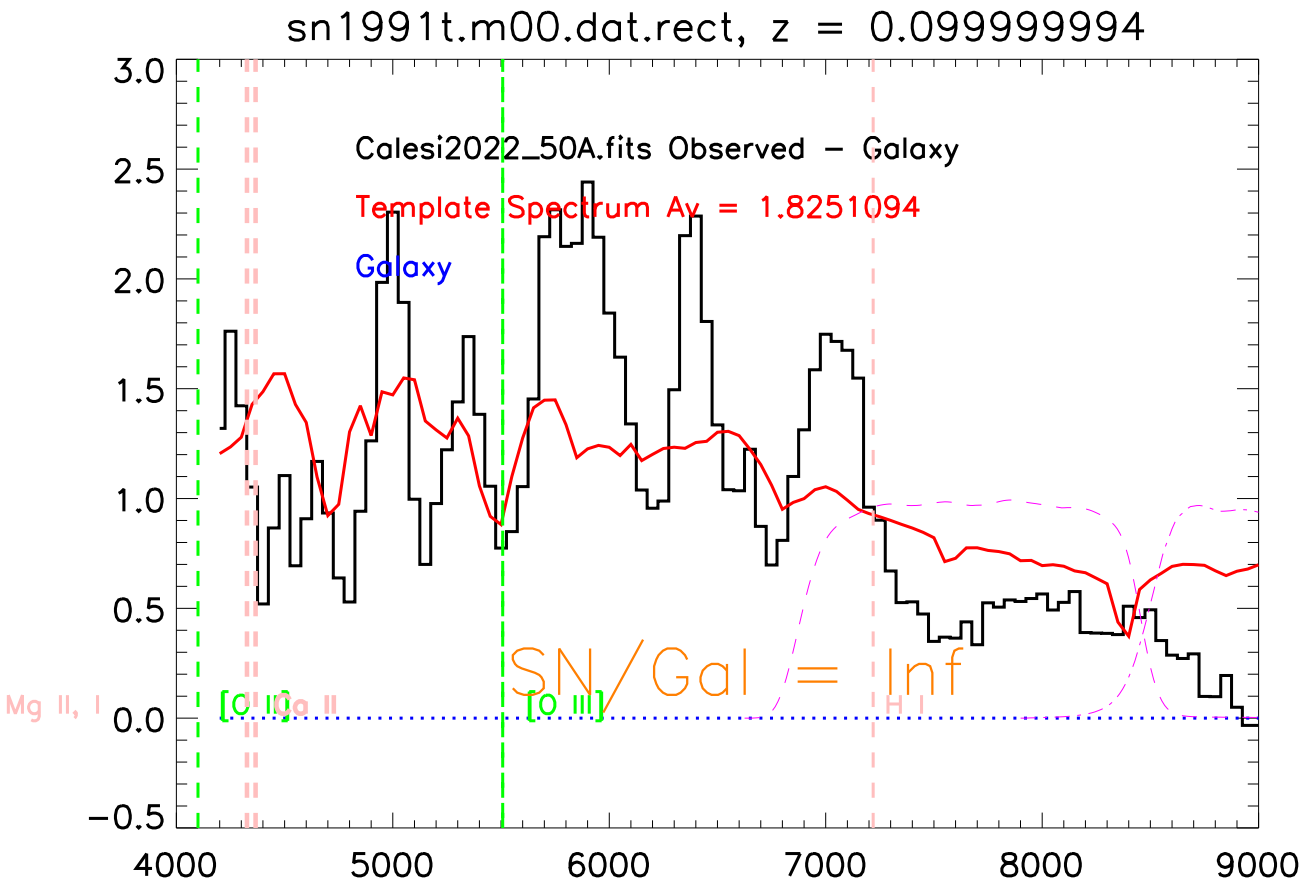
7000
8000
9000


sn1991t.m00.dat.rect, z = 0.099999994
Calesi2022_50A.fits Observed − Galaxy
Template Spectrum Av = 1.8251094
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
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2.0
1.5
1.0
0.5
0.0
−0.5
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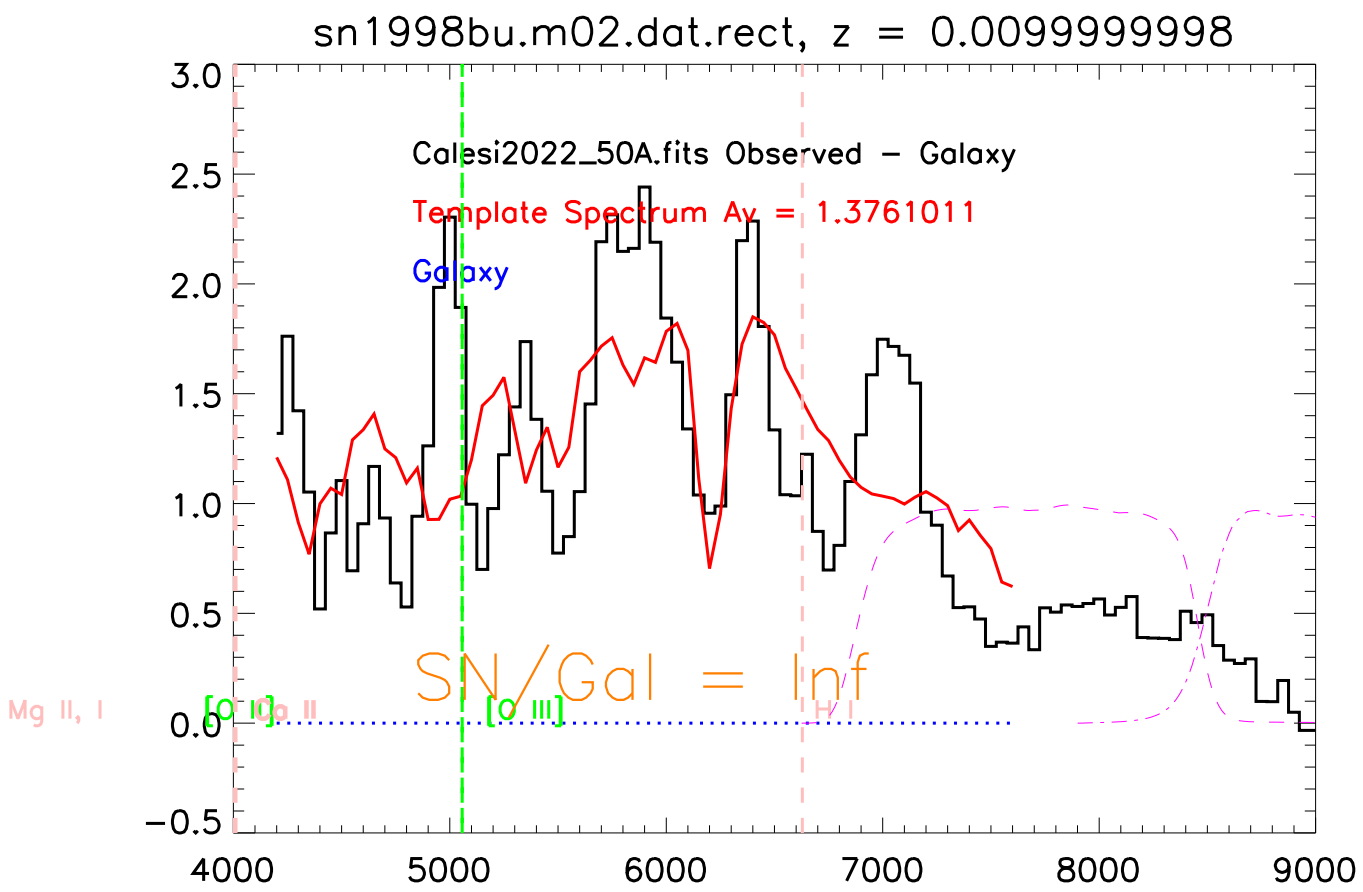
7000
8000
9000


sn1998bu.m02.dat.rect, z = 0.0099999998
Calesi2022_50A.fits Observed − Galaxy
Template Spectrum Av = 1.3761011
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
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2.0
1.5
1.0
0.5
0.0
−0.5
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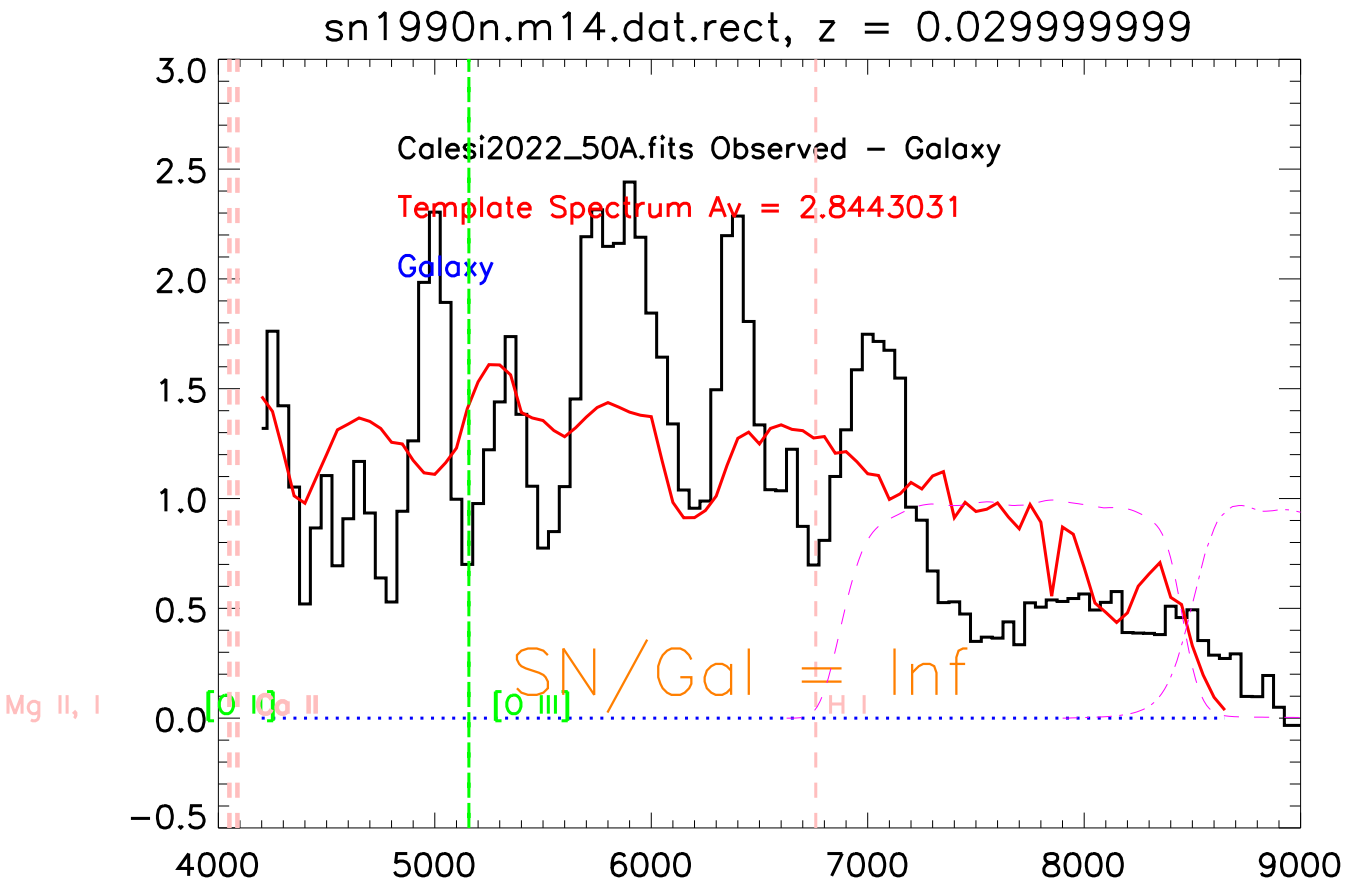
7000
8000
9000


sn1990n.m14.dat.rect, z = 0.029999999
Calesi2022_50A.fits Observed − Galaxy
Template Spectrum Av = 2.8443031
Galaxy
SN/Gal = Inf
Mg II, I
[O I]
Ca II
[O III]
H I
3.0
2.5
2.0
1.5
1.0
0.5
0.0
−0.5
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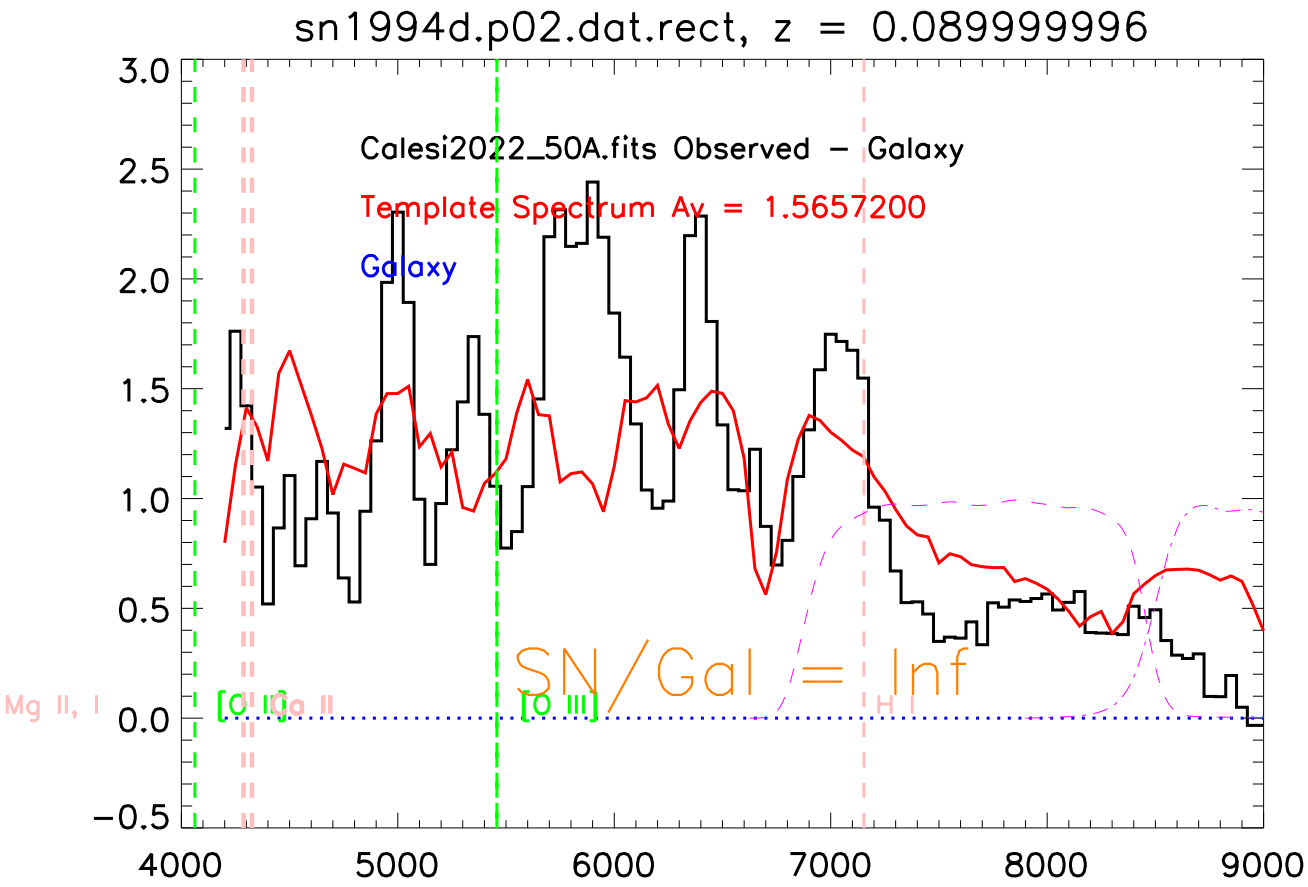
7000
8000
9000


sn1994d.p02.dat.rect, z = 0.089999996
Calesi2022_50A.fits Observed − Galaxy
Template Spectrum Av = 1.5657200
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
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2.5
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1.5
1.0
0.5
0.0
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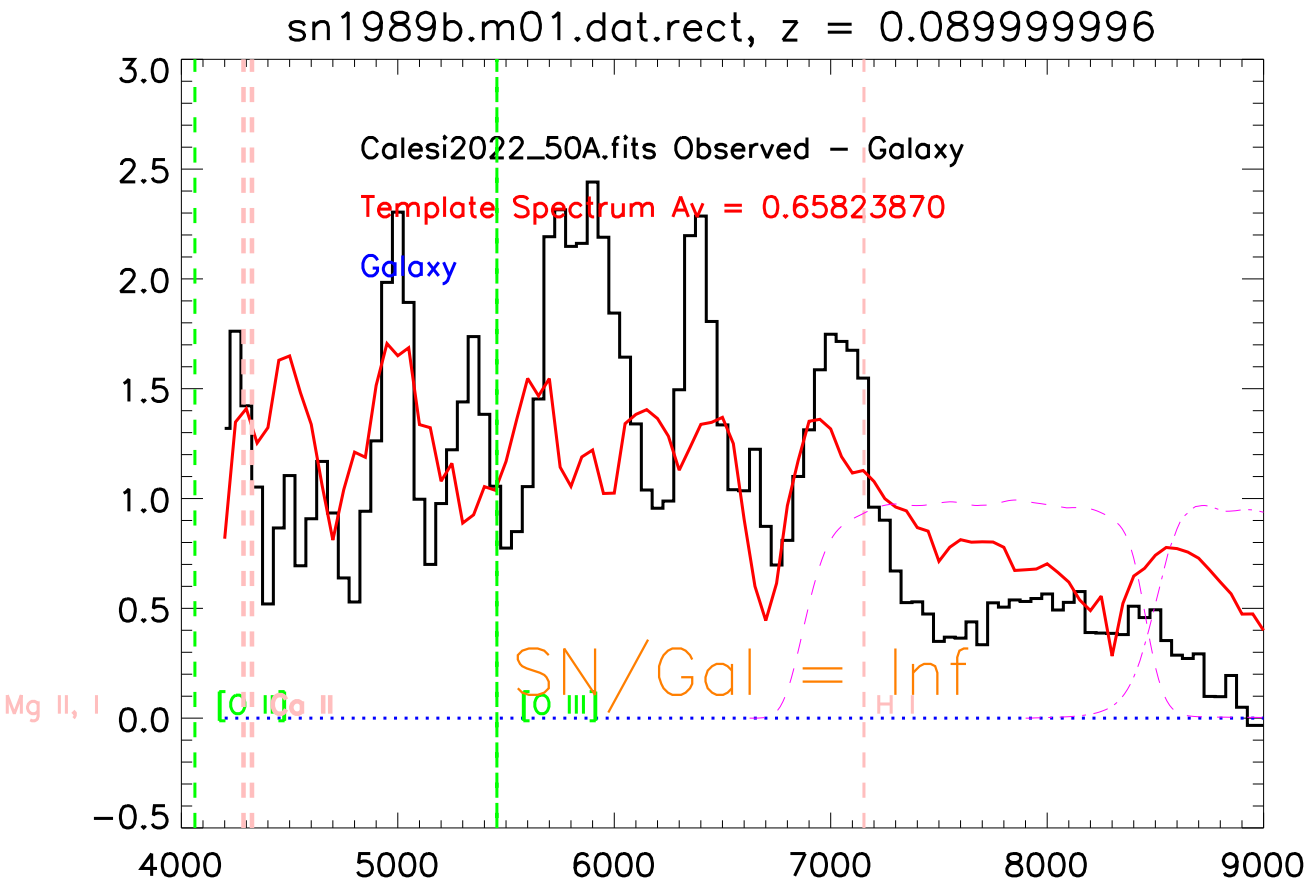
8000
9000


sn1989b.m01.dat.rect, z = 0.089999996
Calesi2022_50A.fits Observed − Galaxy
Template Spectrum Av = 0.65823870
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
3.0
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1.5
1.0
0.5
0.0
−0.5
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7000
8000
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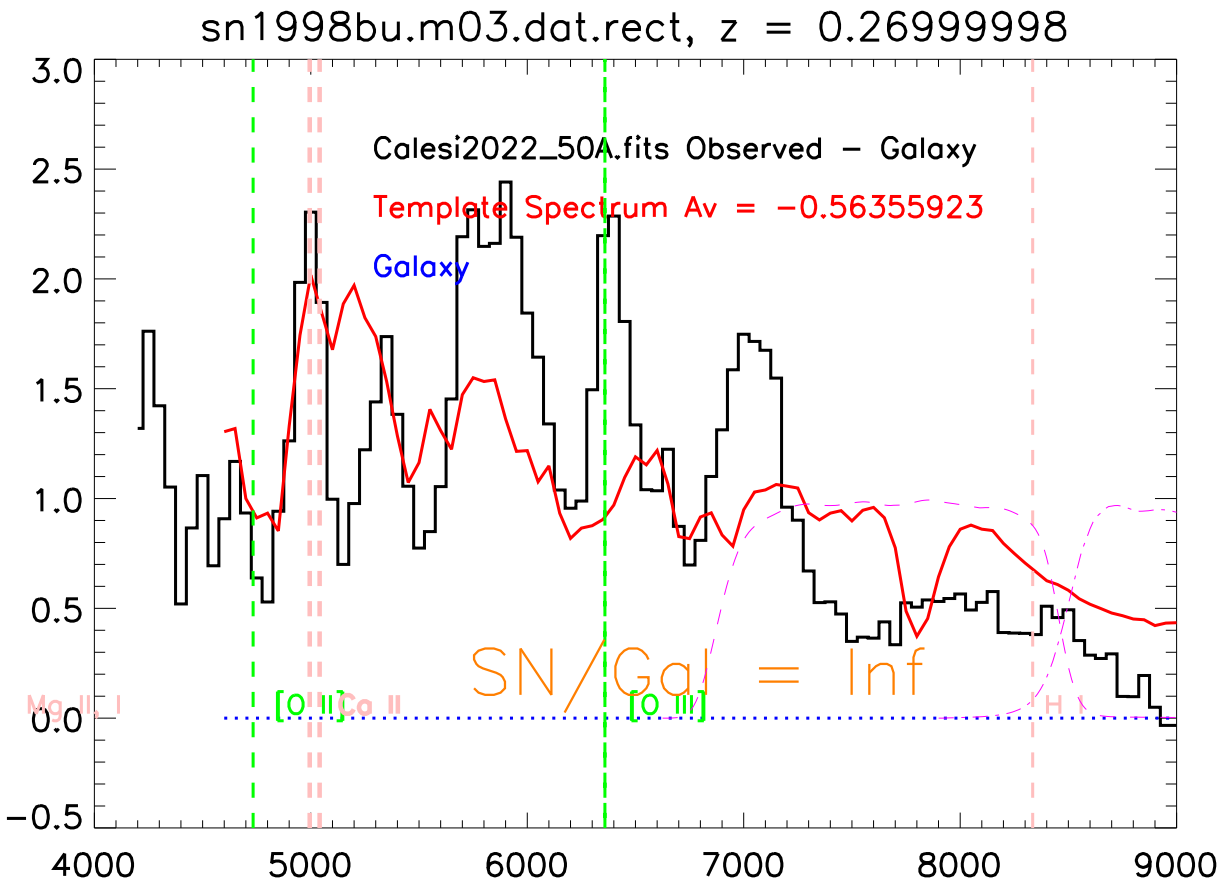
sn1998bu.m03.dat.rect, z = 0.26999998
Calesi2022_50A.fits Observed − Galaxy
Template Spectrum Av = −0.56355923
Galaxy
SN/Gal = Inf
Mg II
[O II]
Ca II
[O III]
H
3.0
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2.0
1.5
1.0
0.5
0.0
−0.5
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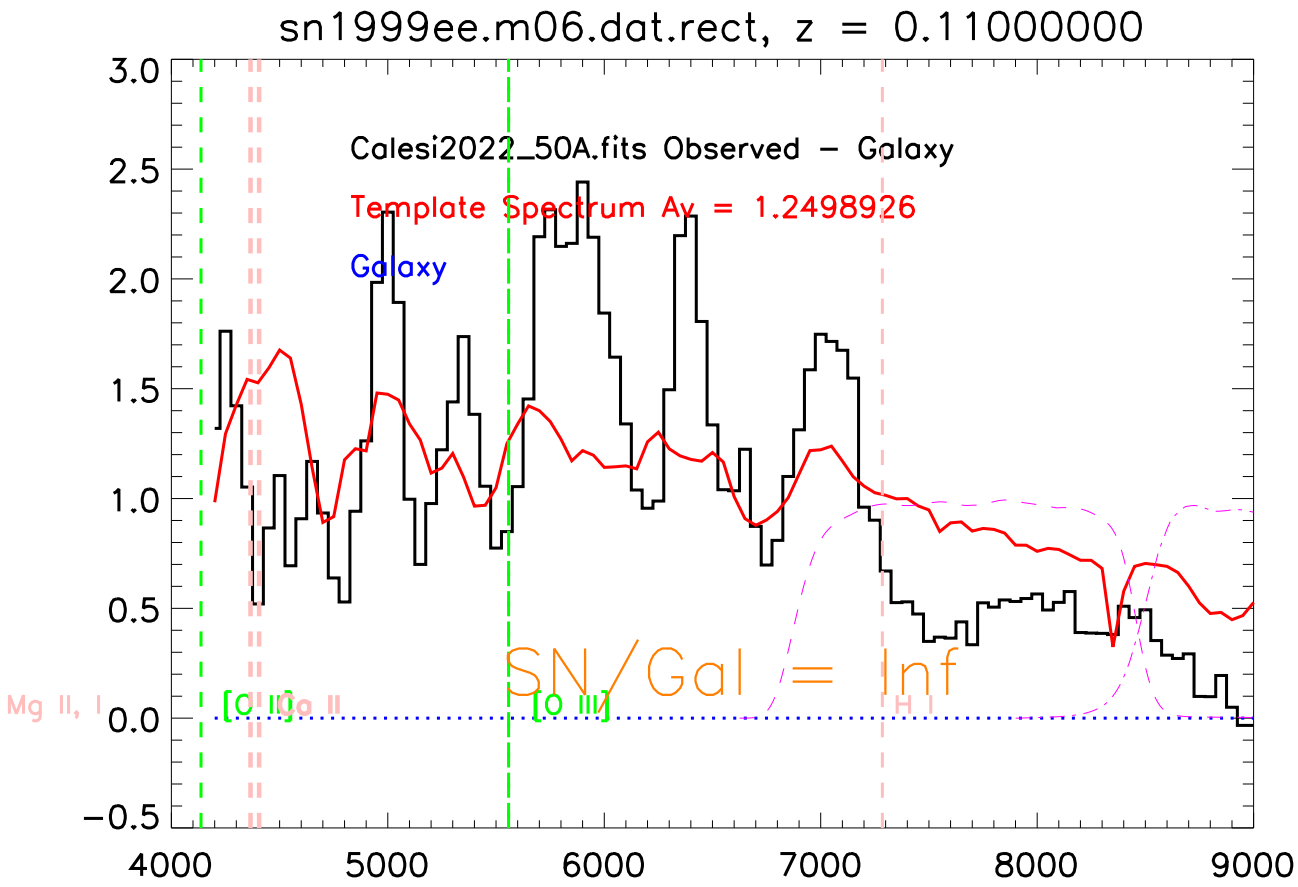
7000
8000
9000


sn1999ee.m06.dat.rect, z = 0.11000000
Calesi2022_50A.fits Observed − Galaxy
Template Spectrum Av = 1.2498926
Galaxy
SN/Gal = Inf
[O II]
[O III]
H I
3.0
2.5
2.0
1.5
1.0
0.5
0.0
−0.5
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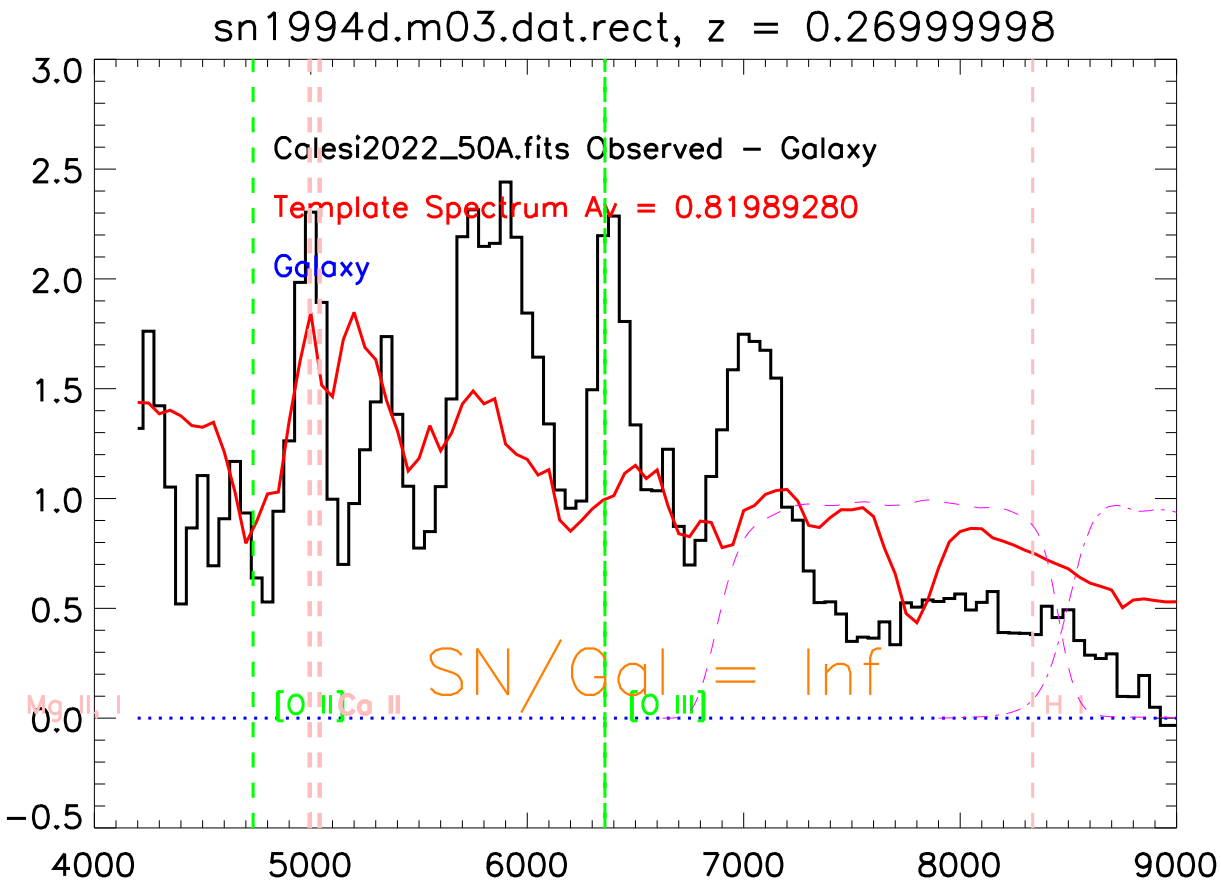
7000
8000
9000


sn1994d.m03.dat.rect, z = 0.26999998
Calesi2022_50A.fits Observed − Galaxy
Template Spectrum Av = 0.81989280
Galaxy
SN/Gal = Inf
Mg II
[O II]
Ca II
[O III]
H
3.0
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1.5
1.0
0.5
0.0
−0.5
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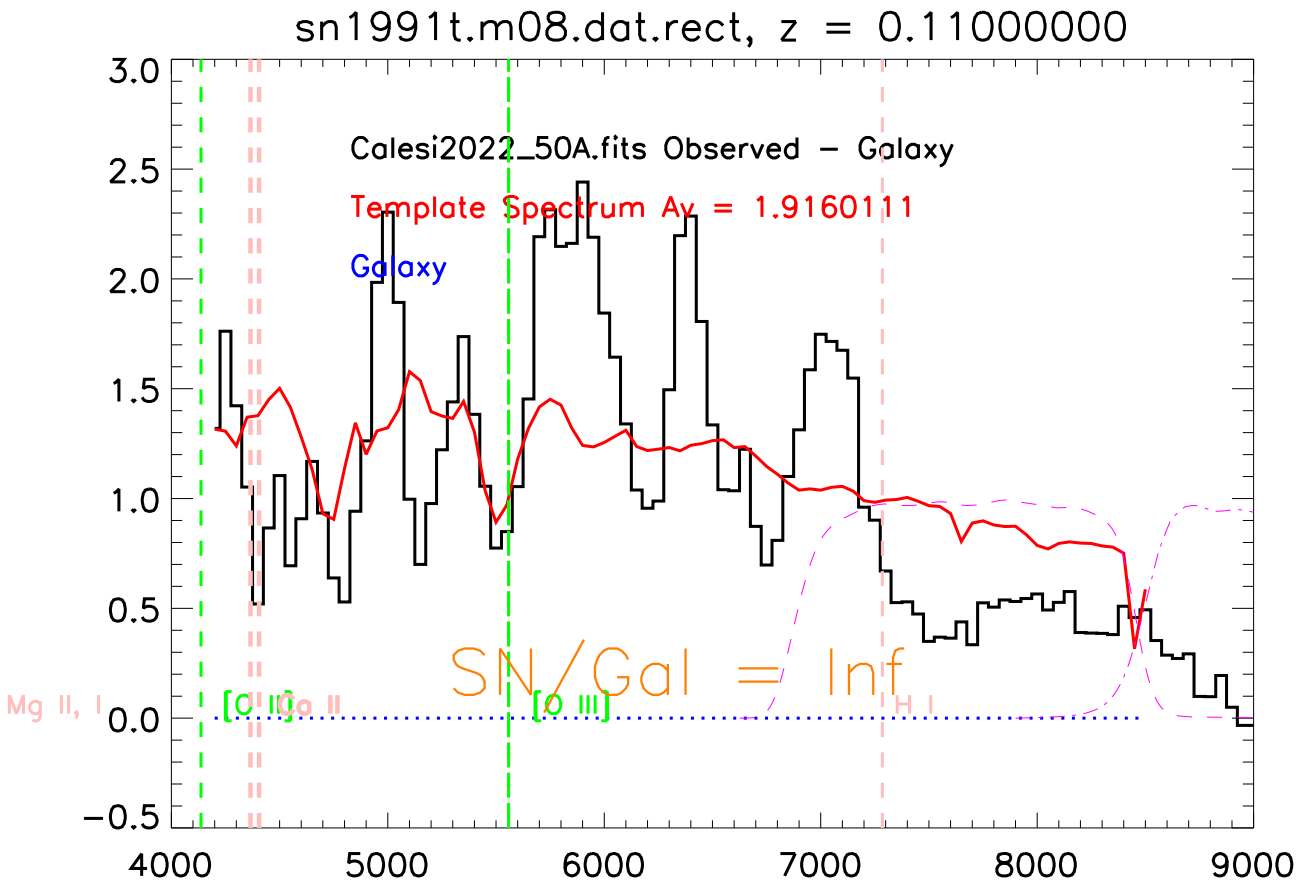
7000
8000
9000


sn1991t.m08.dat.rect, z = 0.11000000
Calesi2022_50A.fits Observed − Galaxy
Template Spectrum Av = 1.9160111
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
3.0
2.5
2.0
1.5
1.0
0.5
0.0
−0.5
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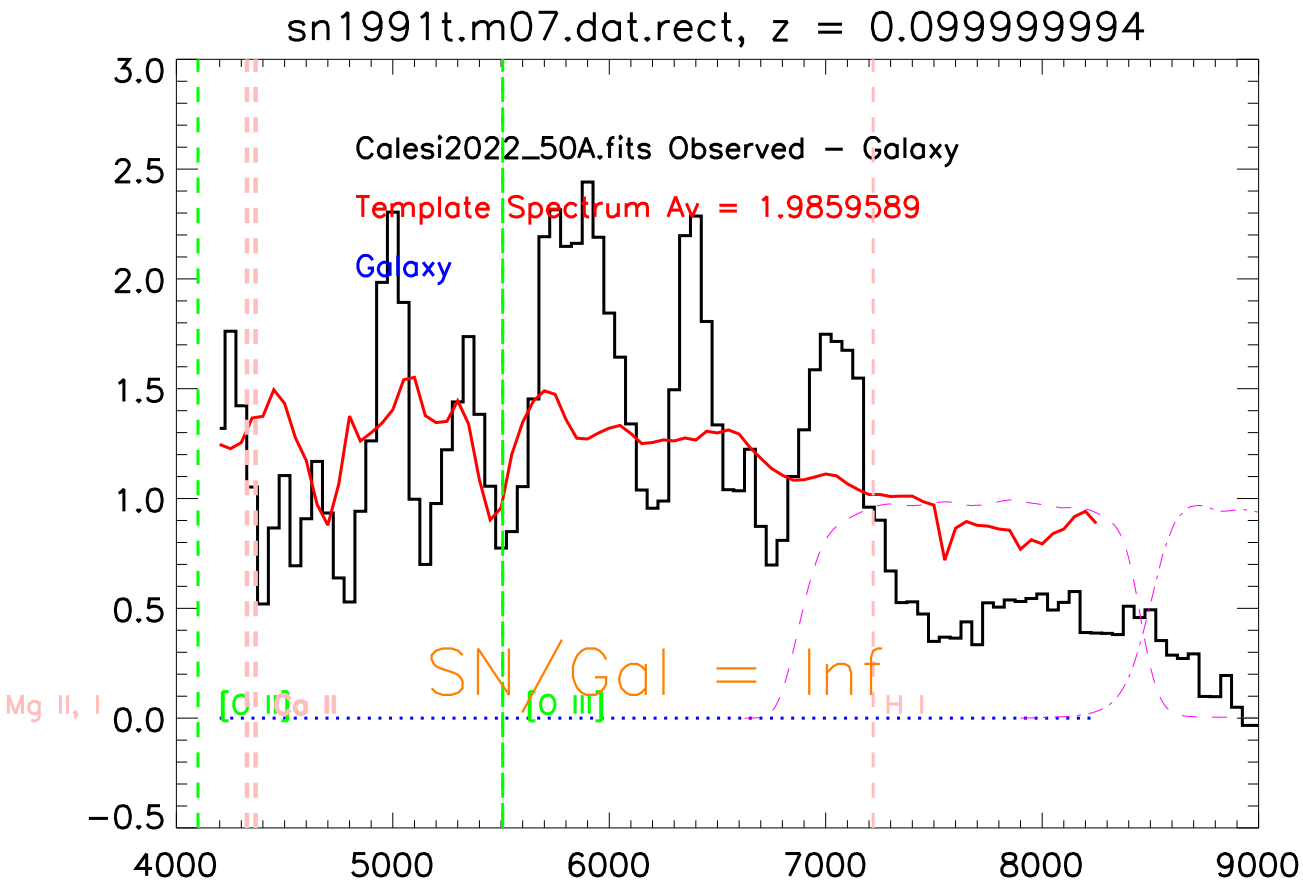
7000
8000
9000


sn1991t.m07.dat.rect, z = 0.099999994
Calesi2022_50A.fits Observed − Galaxy
Template Spectrum Av = 1.9859589
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
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2.0
1.5
1.0
0.5
0.0
−0.5
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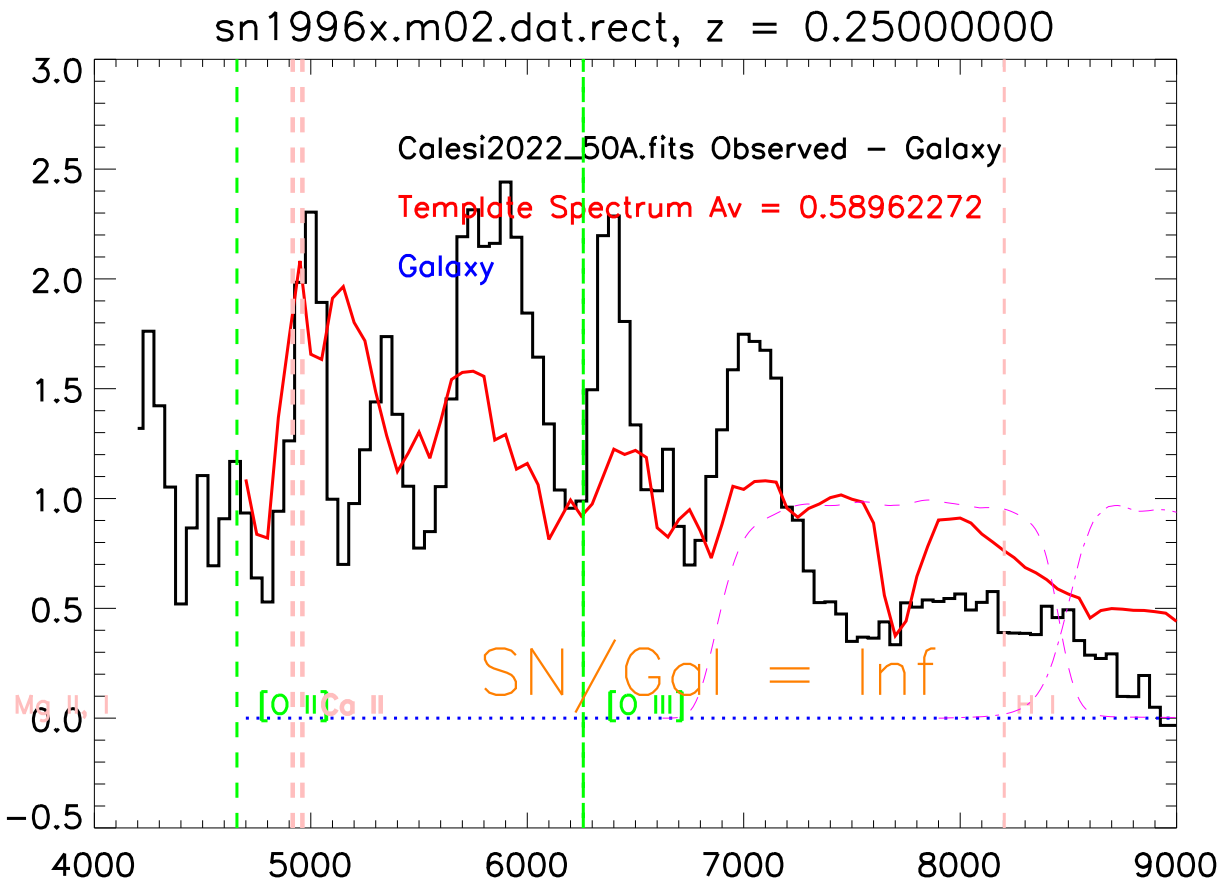
7000
8000
9000


sn1996x.m02.dat.rect, z = 0.25000000
Calesi2022_50A.fits Observed − Galaxy
Template Spectrum Av = 0.58962272
Galaxy
SN/Gal = Inf
[O II]
Ca II
[O III]
H I
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2.5
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1.5
1.0
0.5
0.0
−0.5
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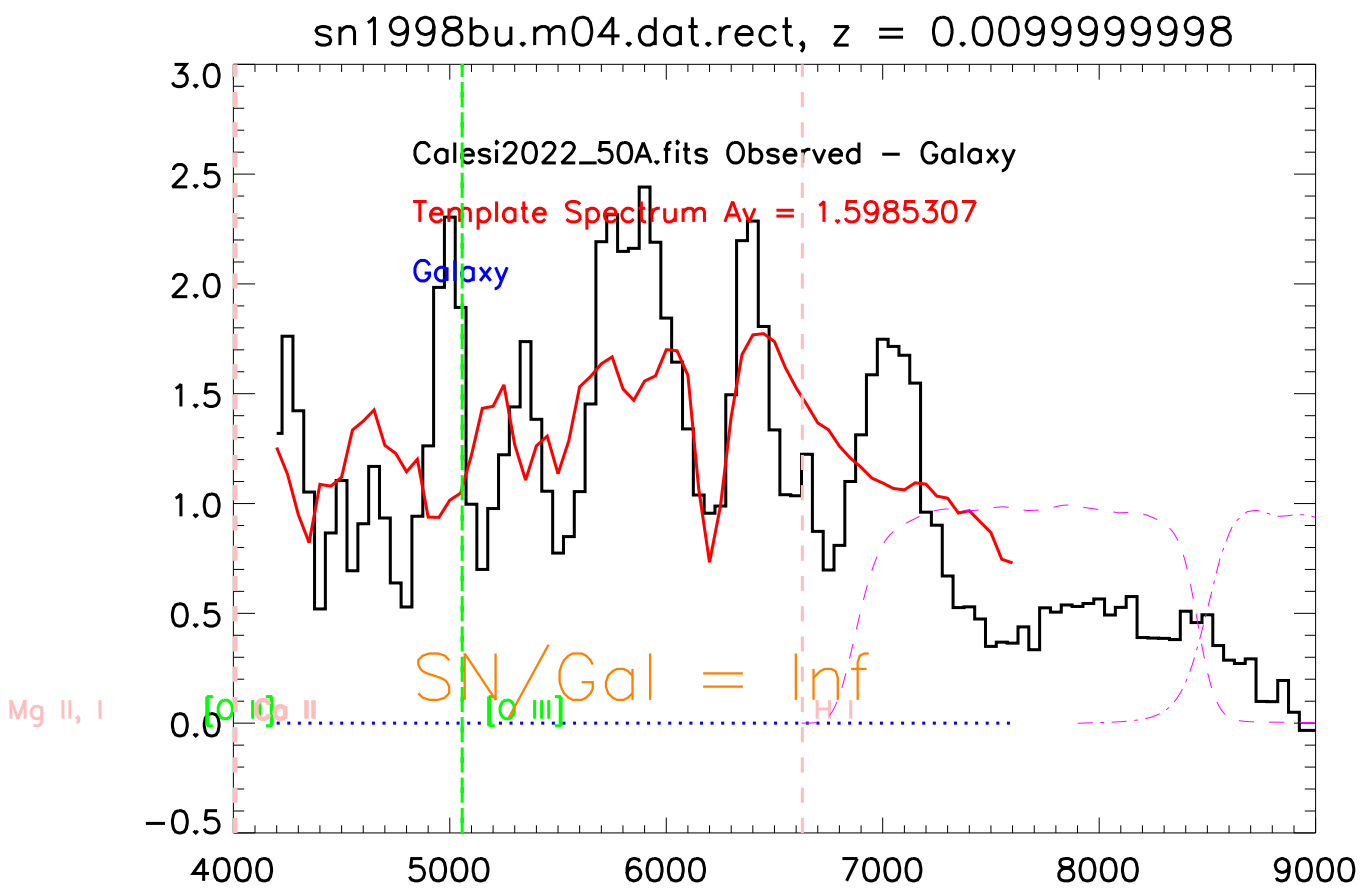
6000
7000
8000
9000


sn1998bu.m04.dat.rect, z = 0.0099999998
Calesi2022_50A.fits Observed − Galaxy
Template Spectrum Av = 1.5985307
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
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1.5
1.0
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0.0
−0.5
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8000
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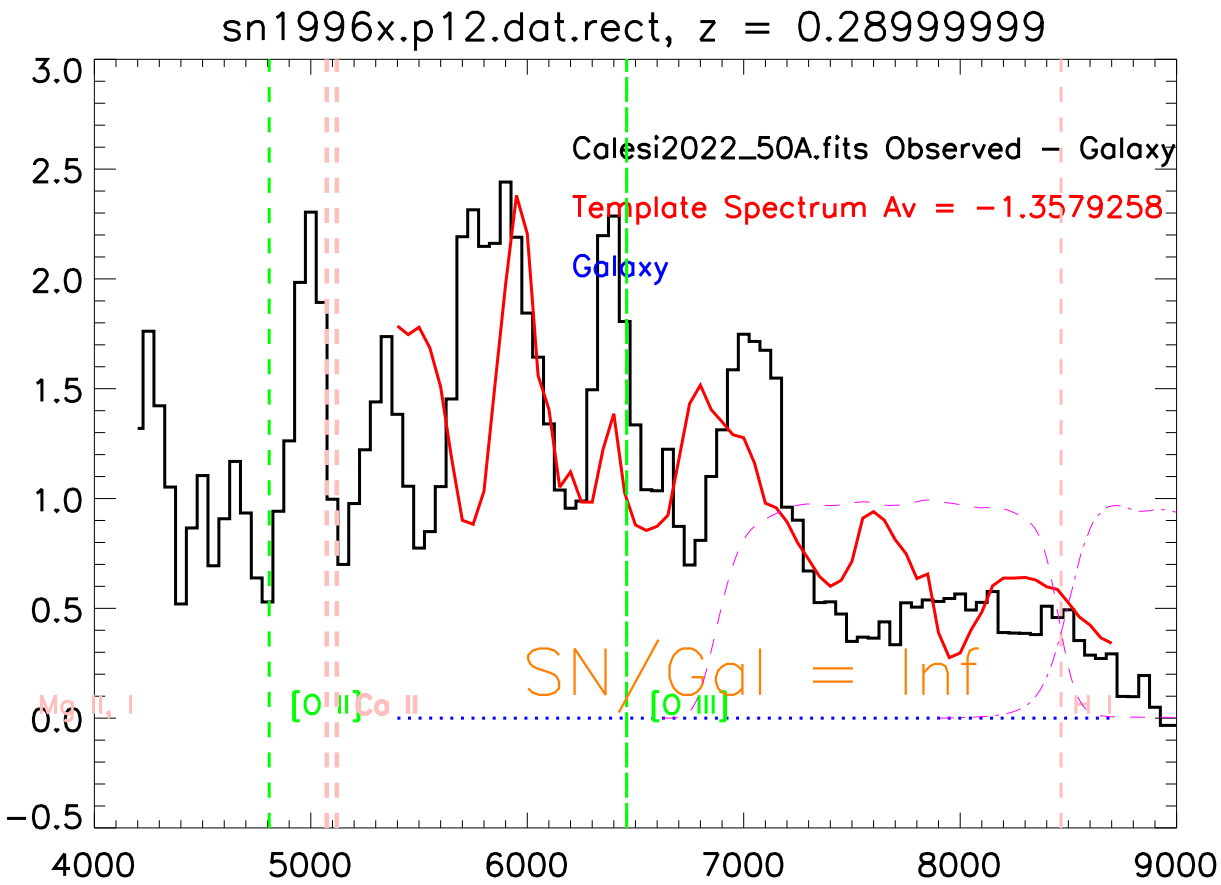
sn1996x.p12.dat.rect, z = 0.28999999
Calesi2022_50A.fits Observed − Galaxy
Template Spectrum Av = −1.3579258
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
N I
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1.5
1.0
0.5
0.0
−0.5
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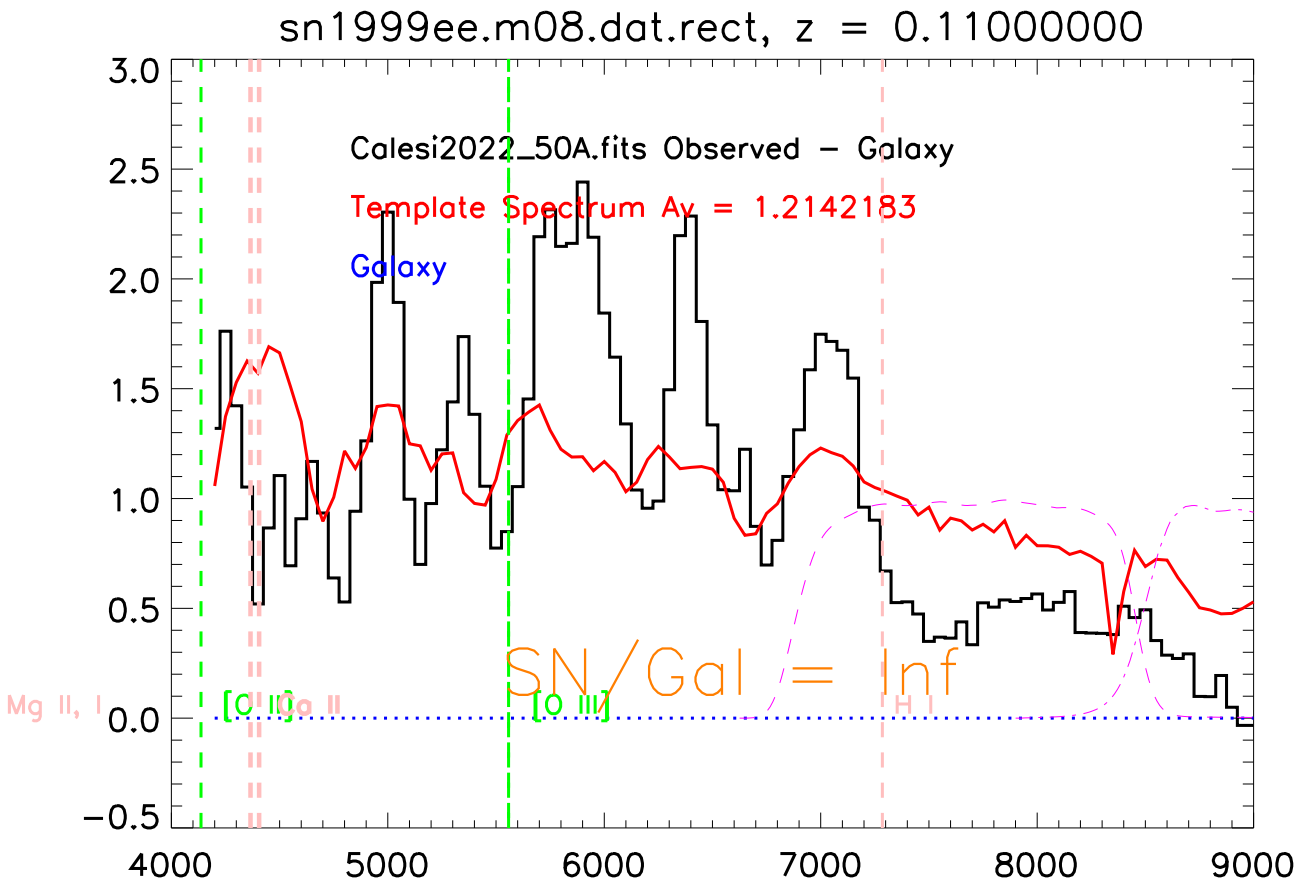
7000
8000
9000


sn1999ee.m08.dat.rect, z = 0.11000000
Calesi2022_50A.fits Observed − Galaxy
Template Spectrum Av = 1.2142183
Galaxy
SN/Gal = Inf
[O II]
[O III]
H I
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1.5
1.0
0.5
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−0.5
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7000
8000
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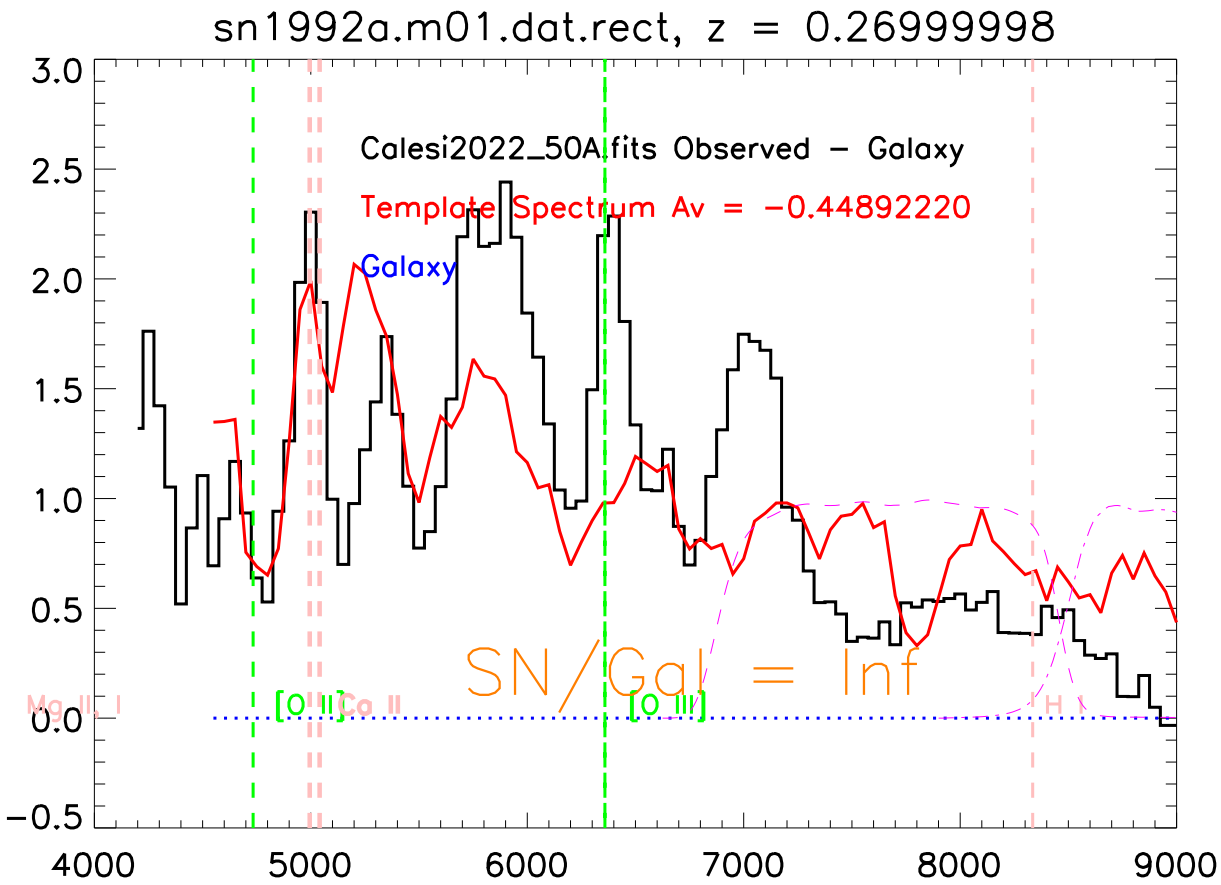
sn1992a.m01.dat.rect, z = 0.26999998
Calesi2022_50A.fits Observed − Galaxy
Template Spectrum Av = −0.44892220
Galaxy
SN/Gal = Inf
Mg II
[O II]
Ca II
[O III]
H
3.0
2.5
2.0
1.5
1.0
0.5
0.0
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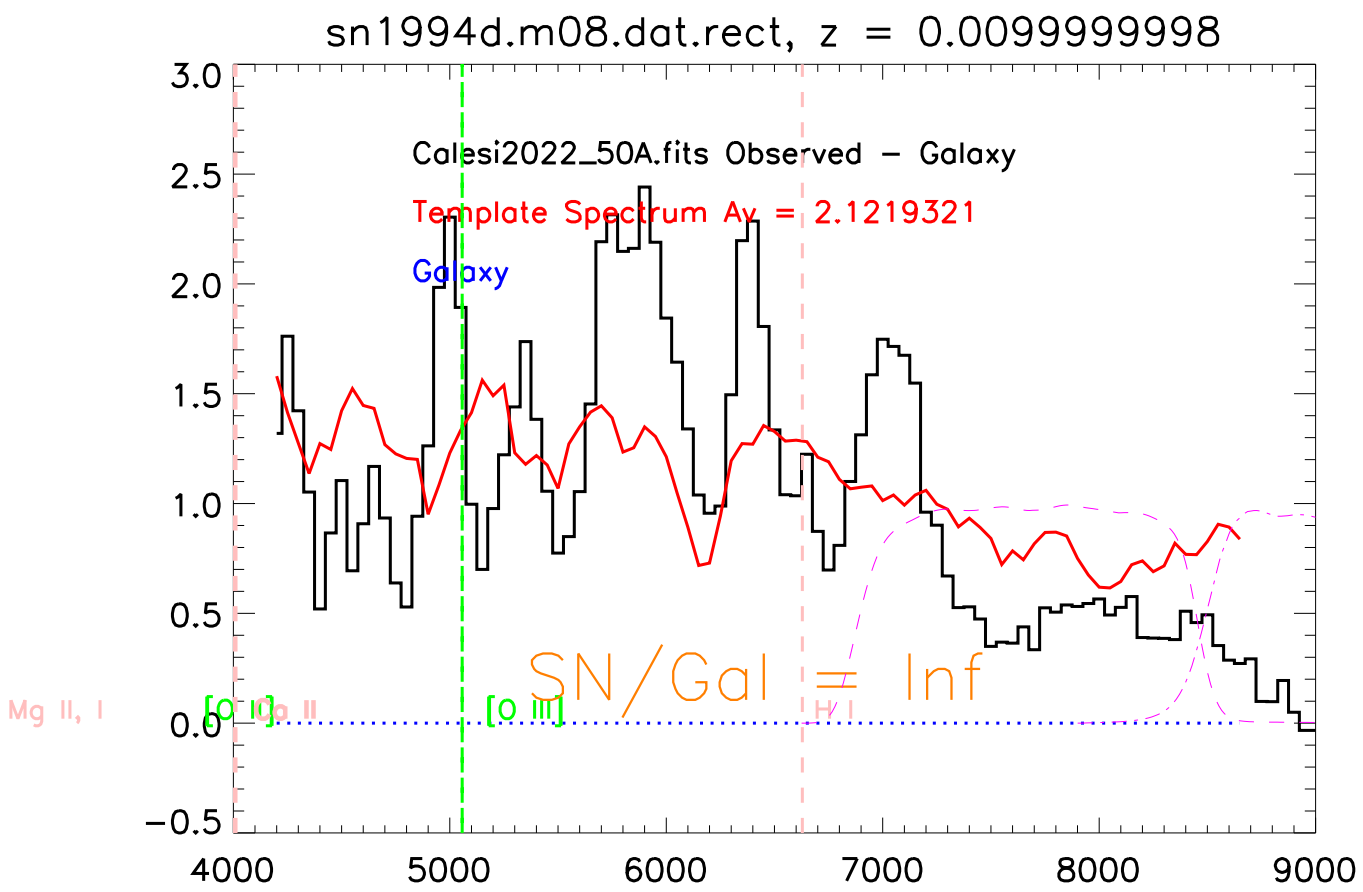
sn1994d.m08.dat.rect, z = 0.0099999998
Calesi2022_50A.fits Observed − Galaxy
Template Spectrum Av = 2.1219321
Galaxy
SN/Gal = Inf
[O II]
[O III]
Mg II, I
H I
3.0
2.5
2.0
1.5
1.0
0.5
0.0
−0.5
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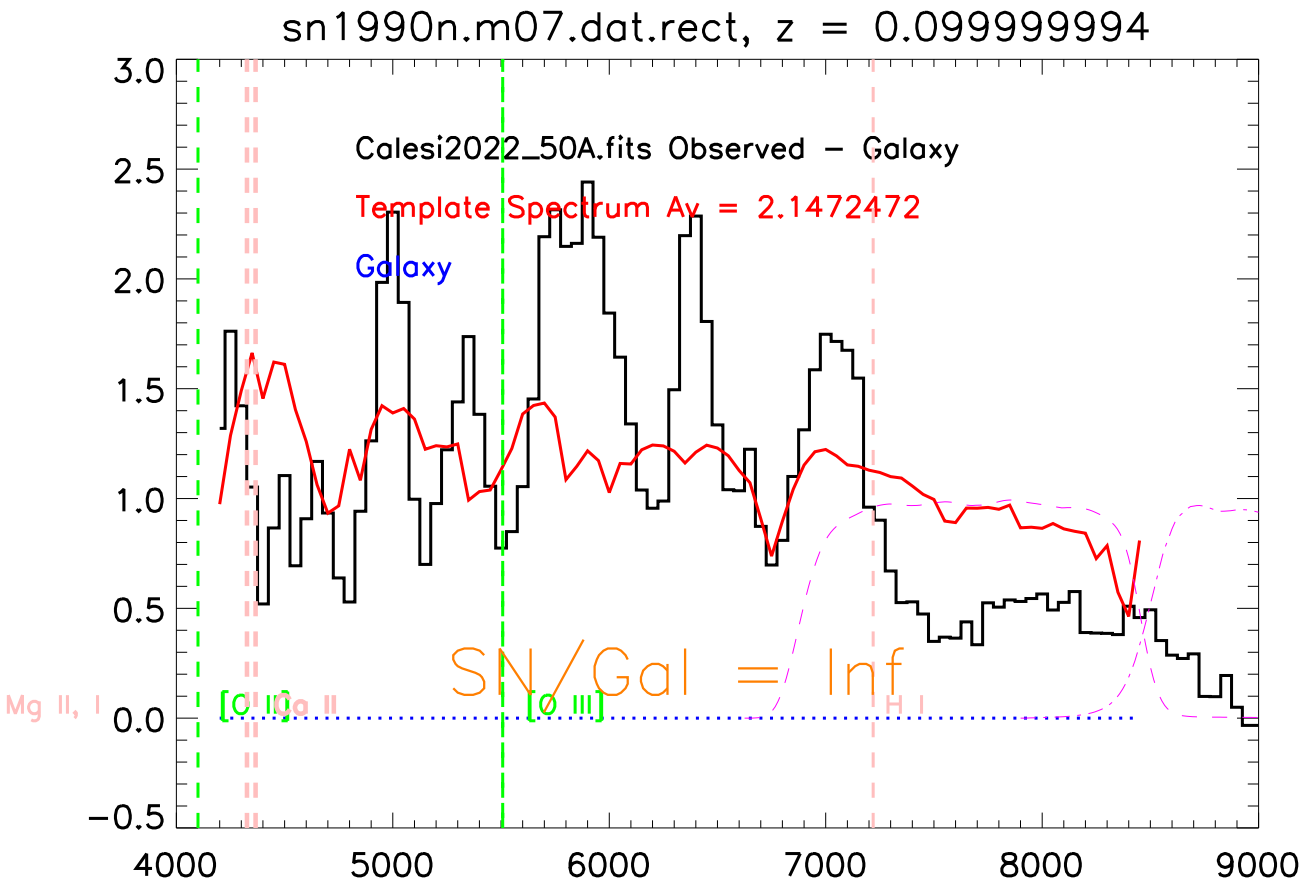
7000
8000
9000


sn1990n.m07.dat.rect, z = 0.099999994
Calesi2022_50A.fits Observed − Galaxy
Template Spectrum Av = 2.1472472
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
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1.5
1.0
0.5
0.0
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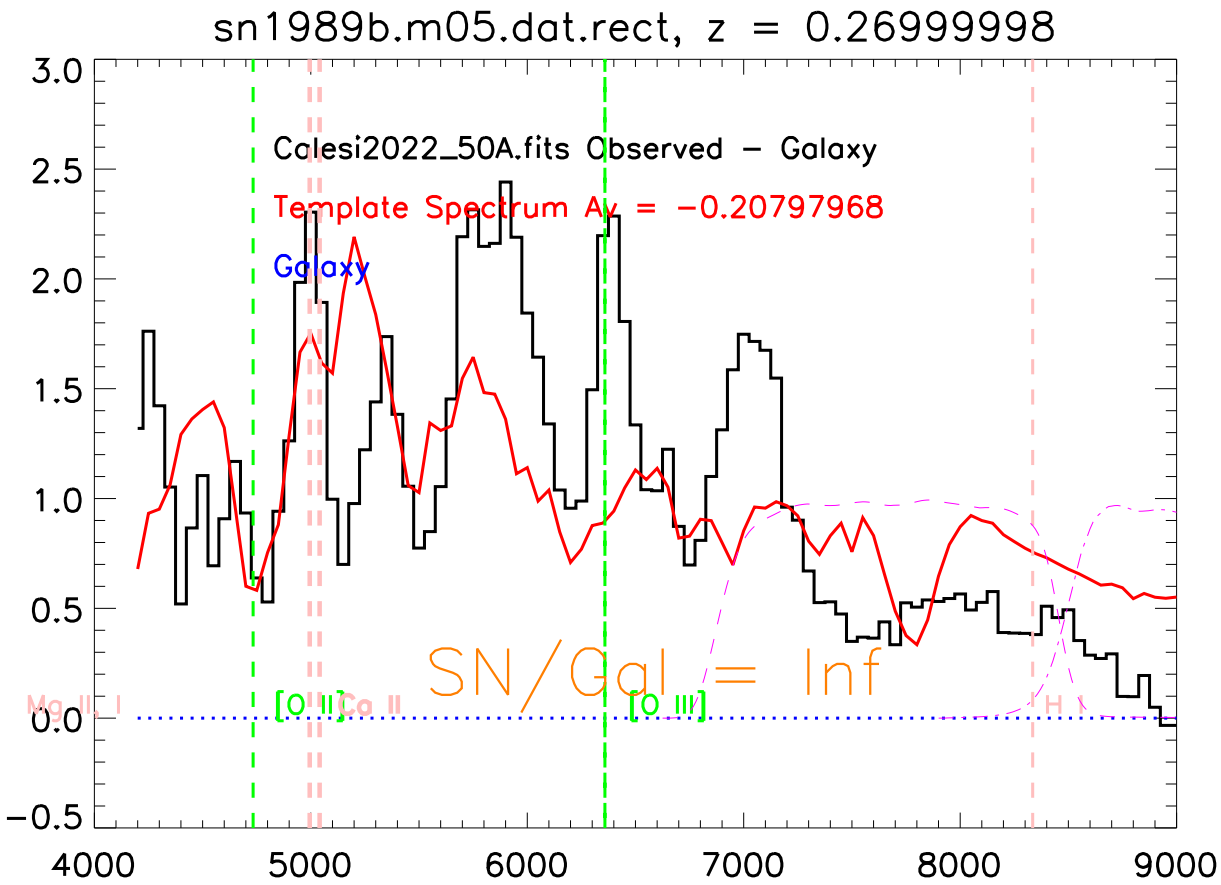
8000
9000


sn1989b.m05.dat.rect, z = 0.26999998
Calesi2022_50A.fits Observed − Galaxy
Template Spectrum Av = −0.20797968
Galaxy
SN/Gal = Inf
Mg II
[O II]
Ca II
[O III]
H
3.0
2.5
2.0
1.5
1.0
0.5
0.0
−0.5
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7000
8000
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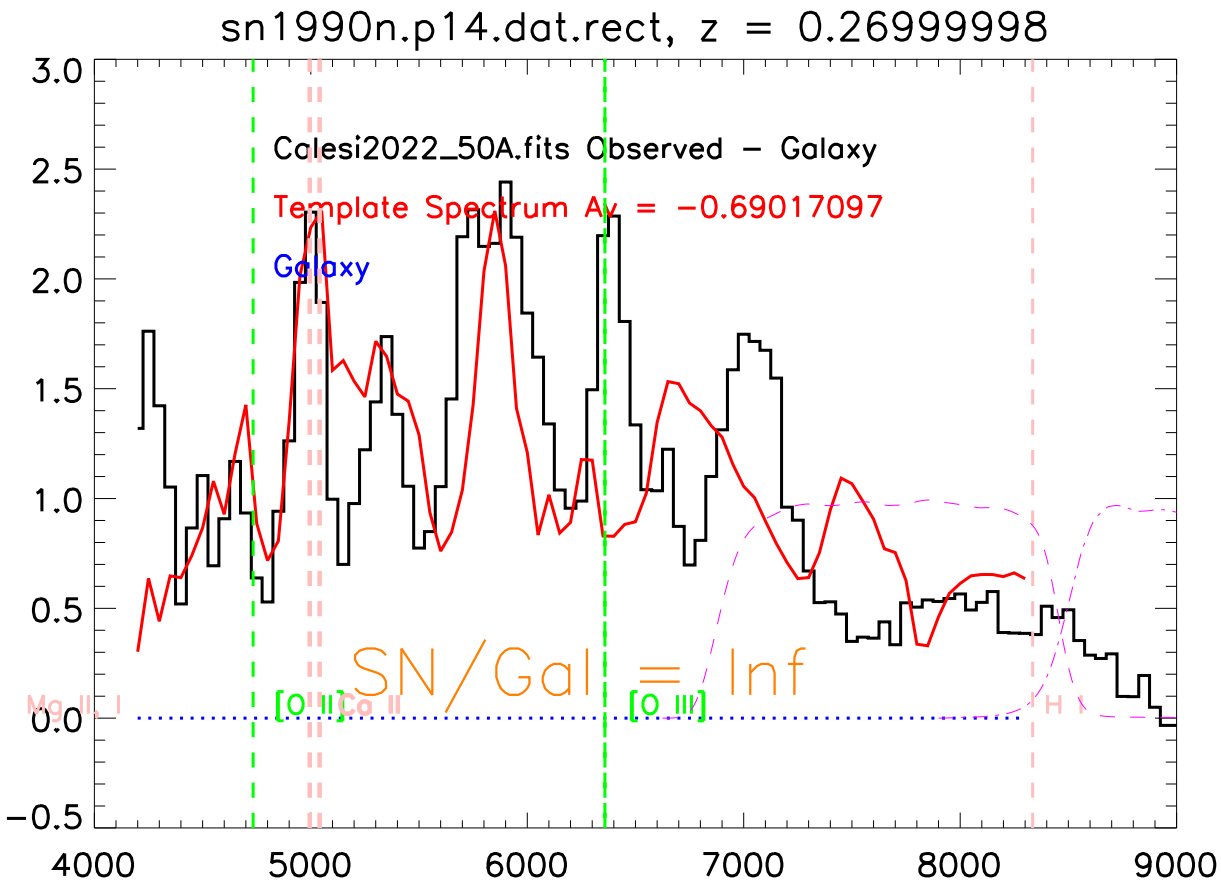
sn1990n.p14.dat.rect, z = 0.26999998
Calesi2022_50A.fits Observed − Galaxy
Template Spectrum Av = −0.69017097
Galaxy
SN/Gal = Inf
[O II]
Ca II
[O III]
H I
3.0
2.5
2.0
1.5
1.0
0.5
0.0
−0.5
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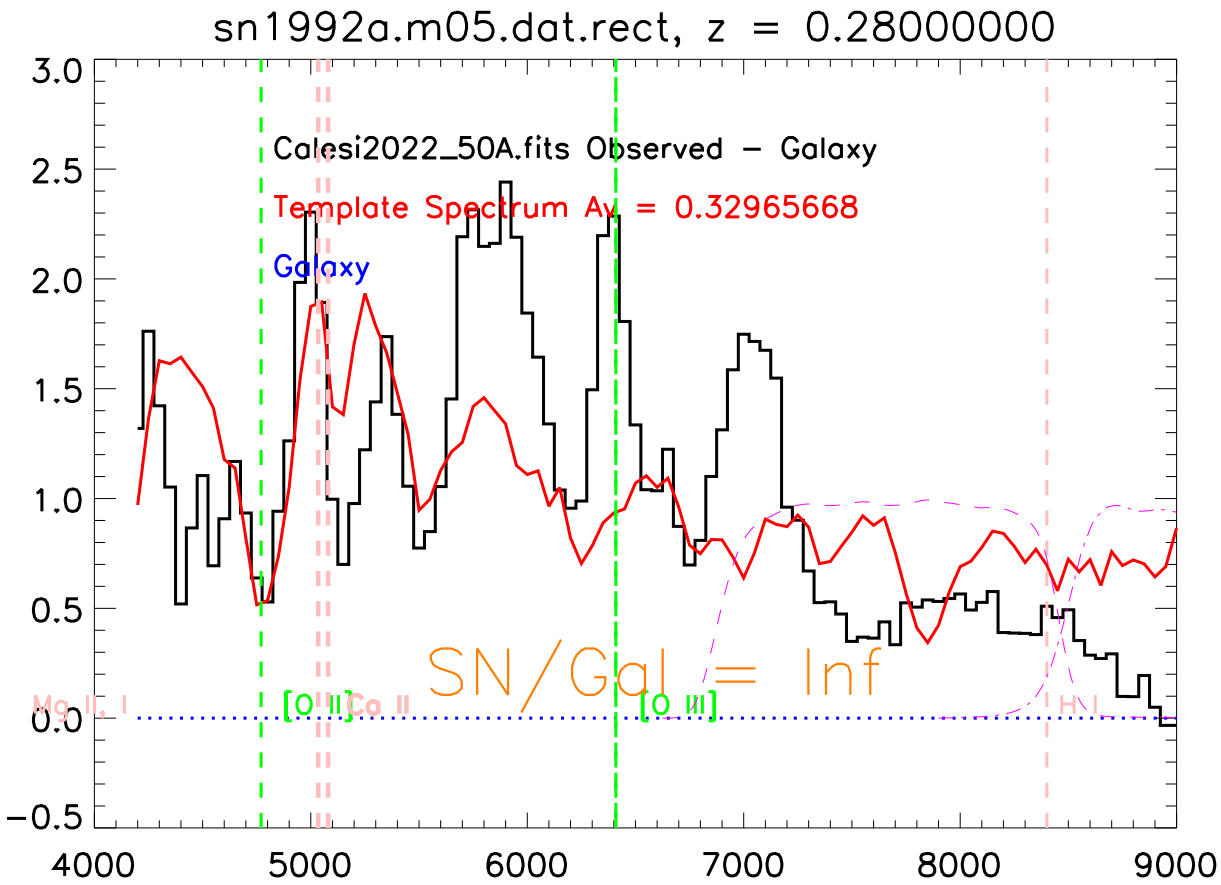
7000
8000
9000


sn1992a.m05.dat.rect, z = 0.28000000
Calesi2022_50A.fits Observed − Galaxy
Template Spectrum Av = 0.32965668
Galaxy
SN/Gal = Inf
[O II]
Ca II
[O III]
H I
3.0
2.5
2.0
1.5
1.0
0.5
0.0
−0.5
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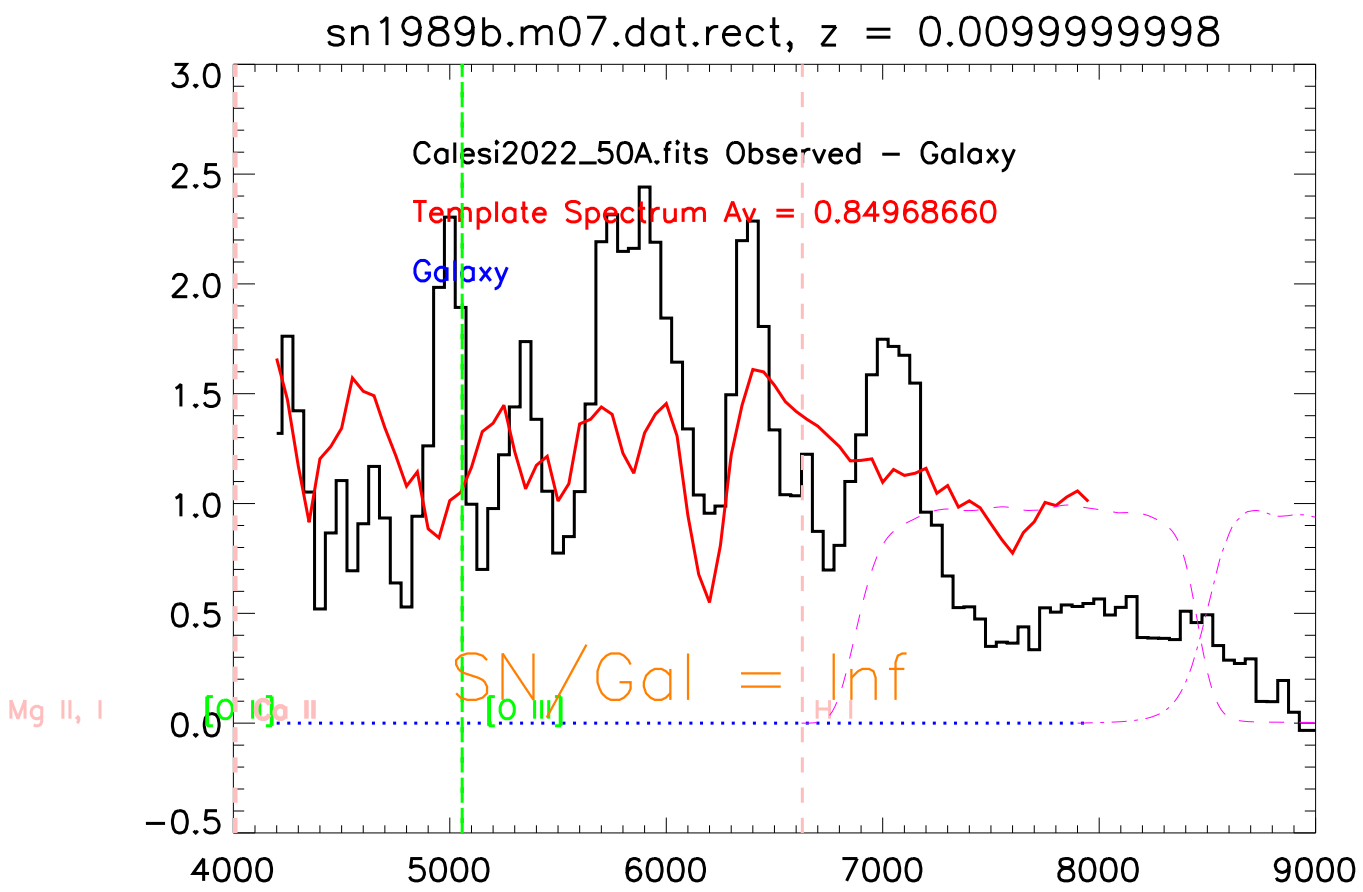
7000
8000
9000


sn1989b.m07.dat.rect, z = 0.0099999998
Calesi2022_50A.fits Observed − Galaxy
Template Spectrum Av = 0.84968660
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
3.0
2.5
2.0
1.5
1.0
0.5
0.0
−0.5
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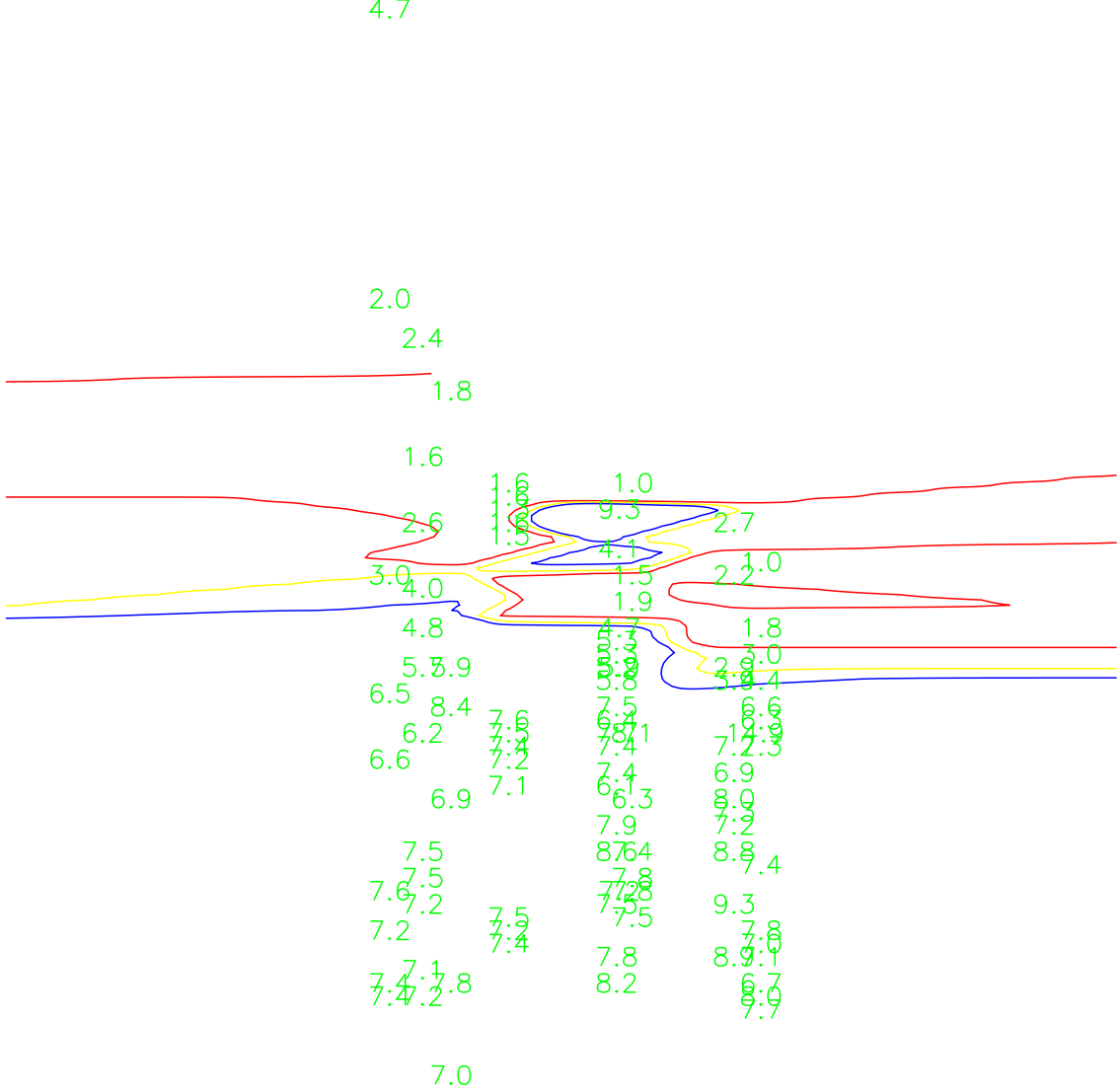
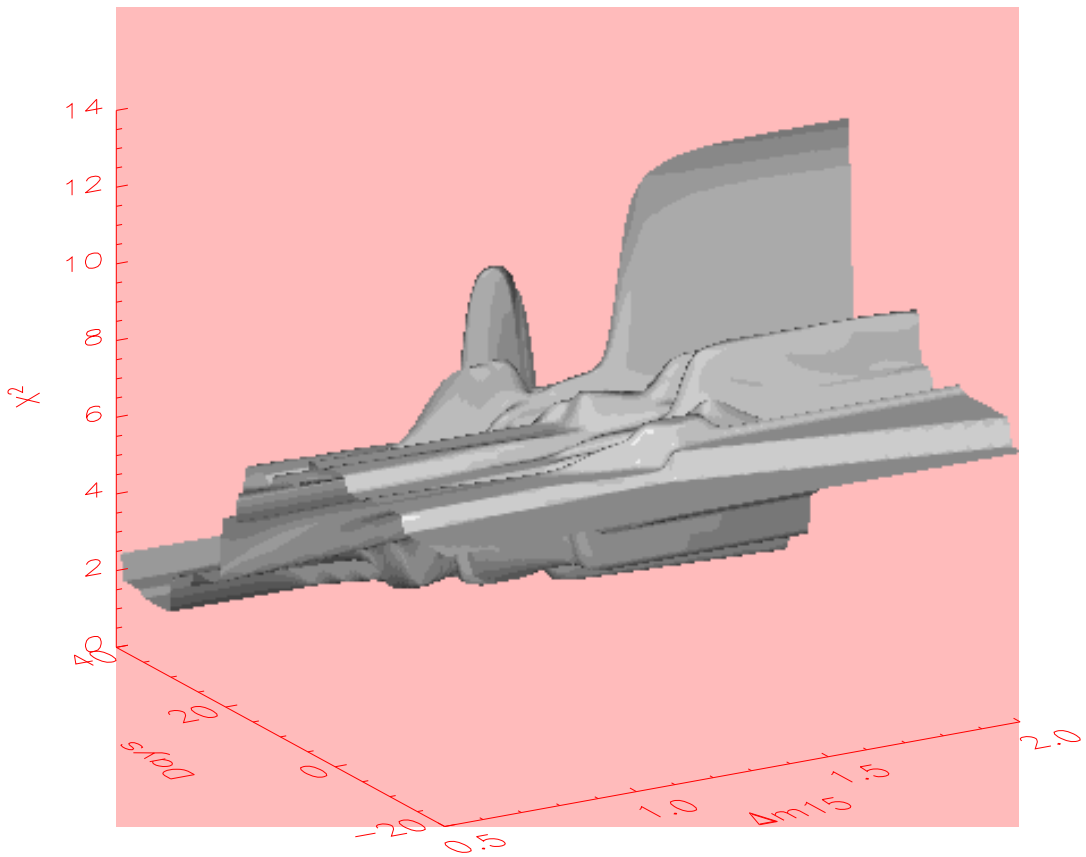
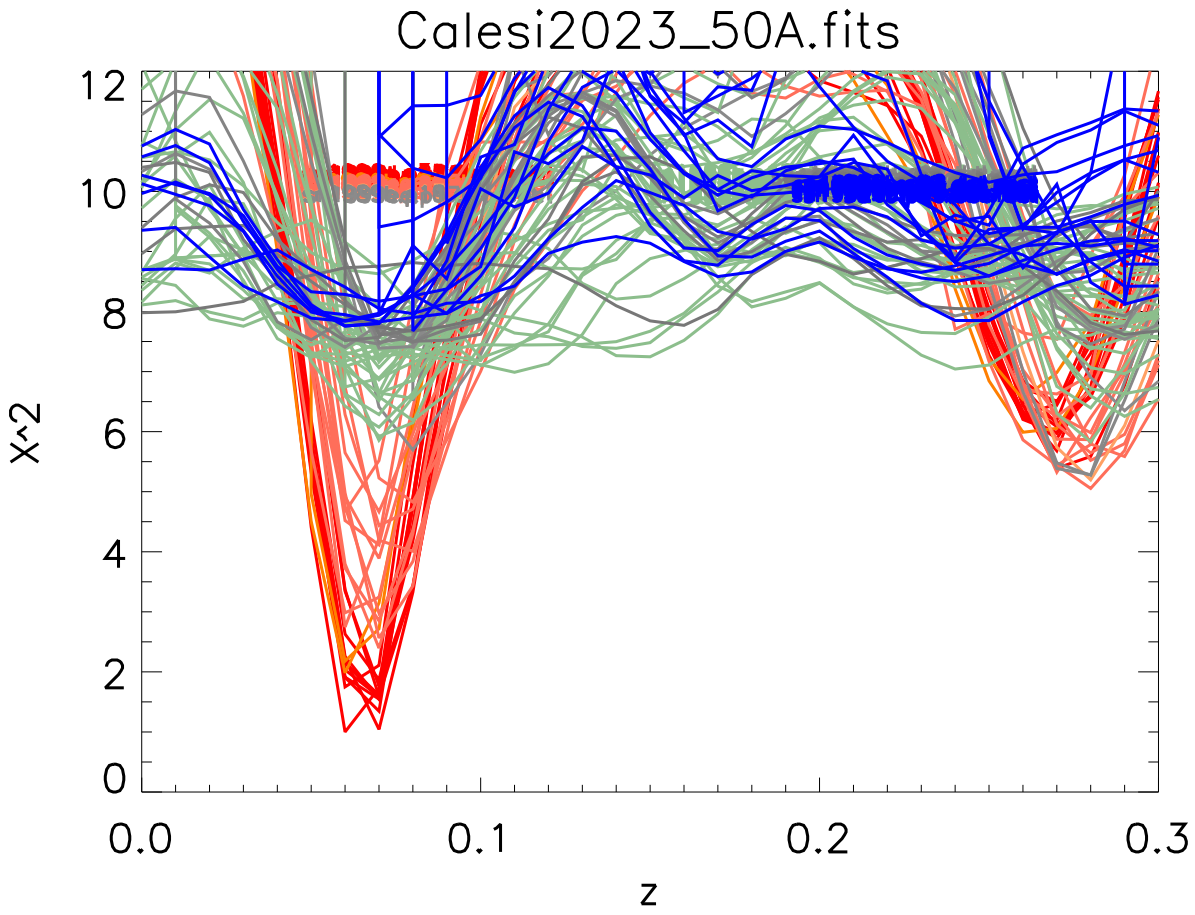
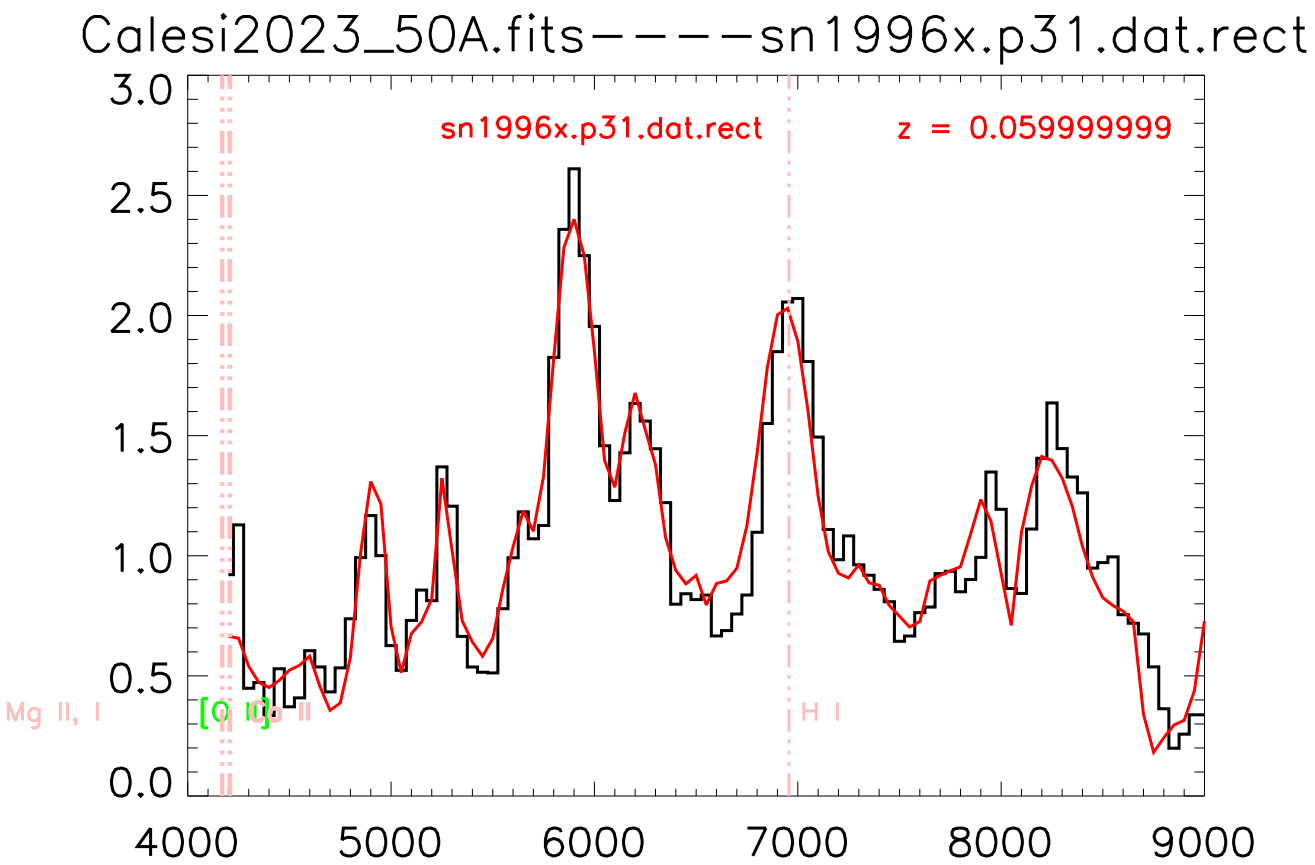
6000
7000
8000
9000





14
12
10
8
6
4
2
0
χ^2
40
20
0
−20
Days
0.5
1.0
1.5
2.0
Δm15


Calesi2023_50A.fits
X^2
z
0
2
4
6
8
10
12
0.0
0.1
0.2
0.3


Calesi2023_50A.fits----sn1996x.p31.dat.rect
sn1996x.p31.dat.rect
z = 0.059999999
Mg II, I
[O II]
H I
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2.5
2.0
1.5
1.0
0.5
0.0
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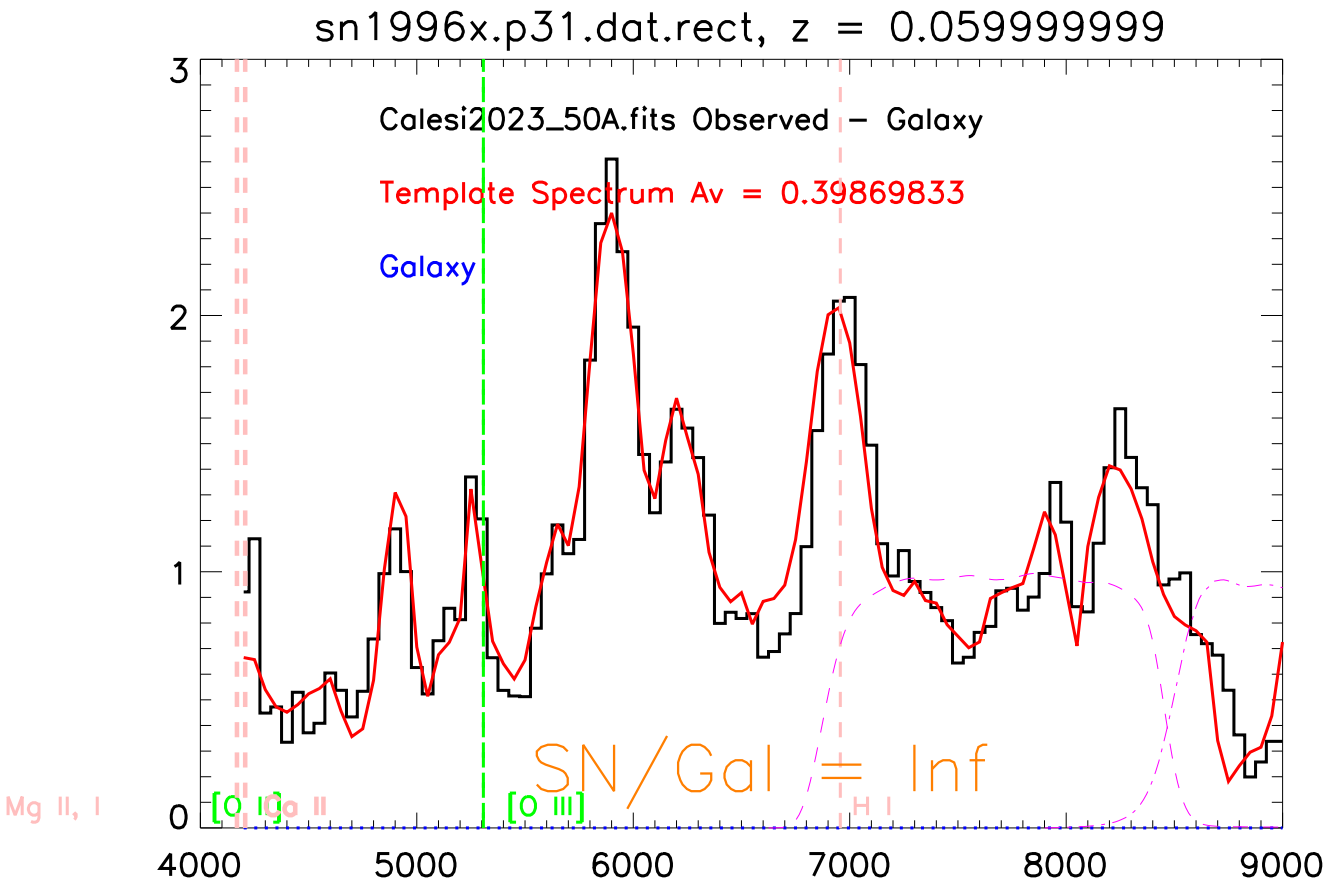
5000
6000
7000
8000
9000


sn1996x.p31.dat.rect, z = 0.059999999
Calesi2023_50A.fits Observed – Galaxy
Template Spectrum Av = 0.39869833
Galaxy
SN/Gal = Inf
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[O II]
Ca II
[O III]
H I
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2
3
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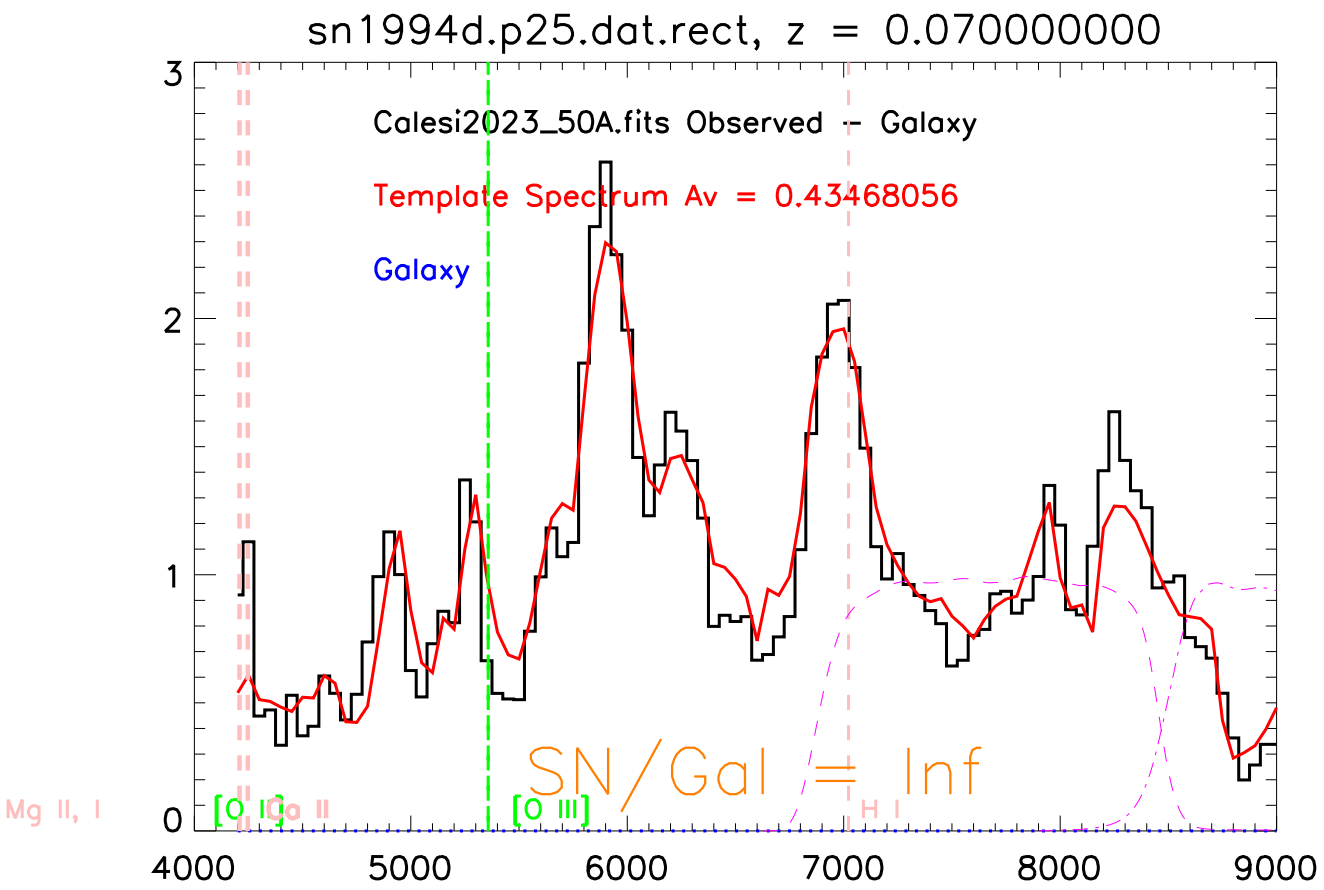
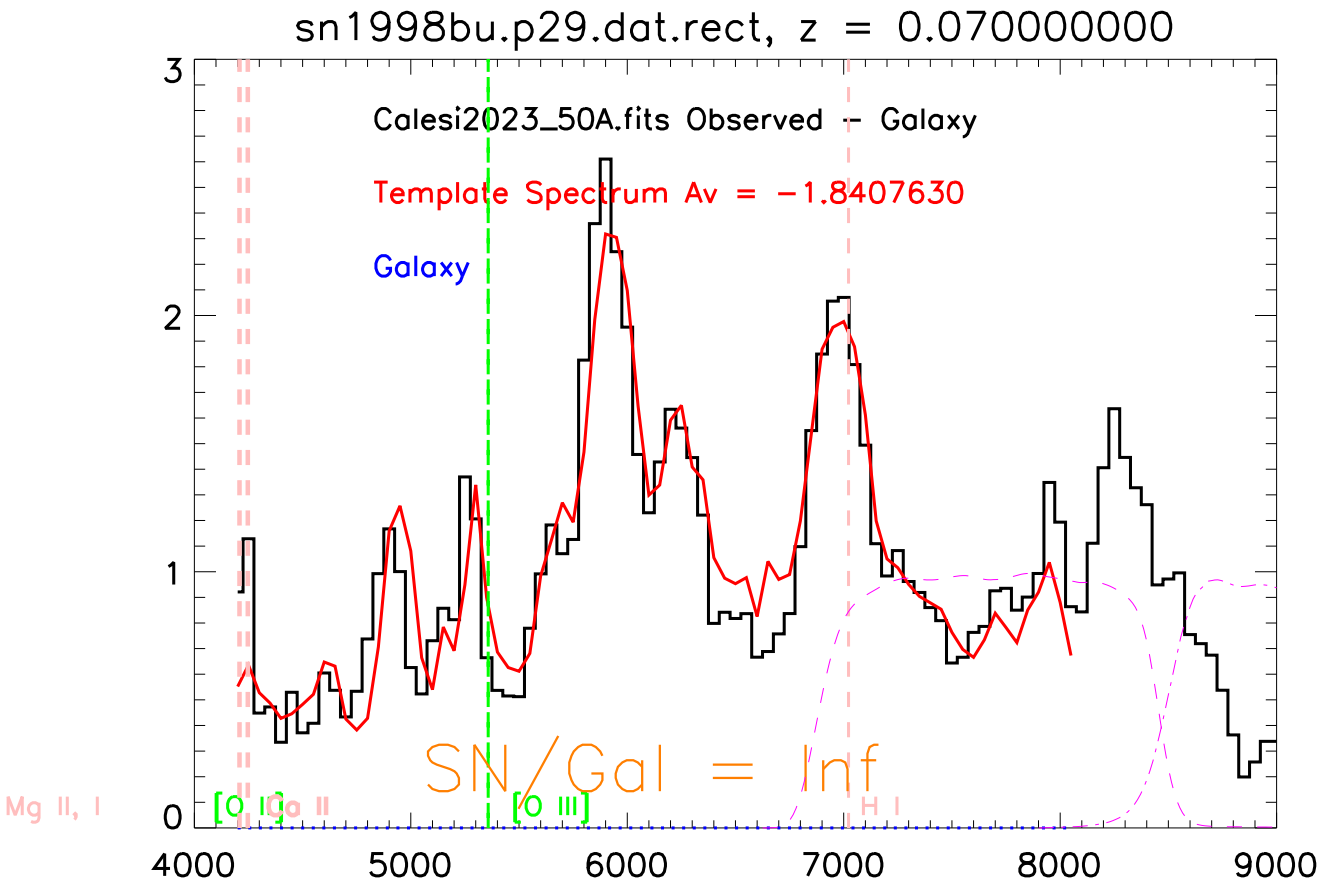
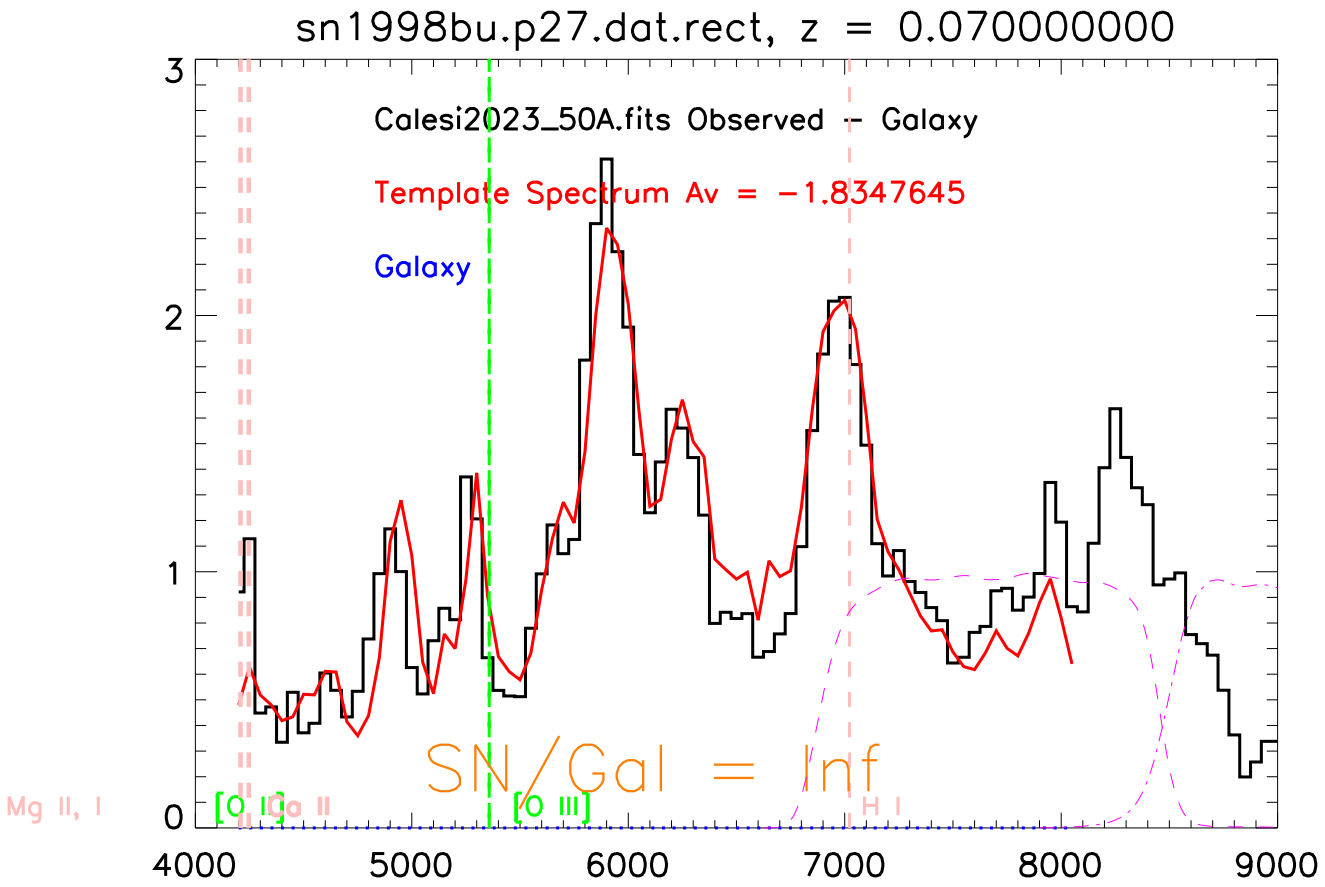
5000
6000
7000
8000
9000


sn1994d.p25.dat.rect, z = 0.070000000
Calesi2023_50A.fits Observed - Galaxy
Template Spectrum Av = 0.43468056
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
0
1
2
3
4000
5000
6000
7000
8000
9000


sn1998bu.p29.dat.rect, z = 0.070000000
Calesi2023_50A.fits Observed - Galaxy
Template Spectrum Av = -1.8407630
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
0
1
2
3
4000
5000
6000
7000
8000
9000


sn1998bu.p27.dat.rect, z = 0.070000000
Calesi2023_50A.fits Observed - Galaxy
Template Spectrum Av = -1.8347645
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
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2
3
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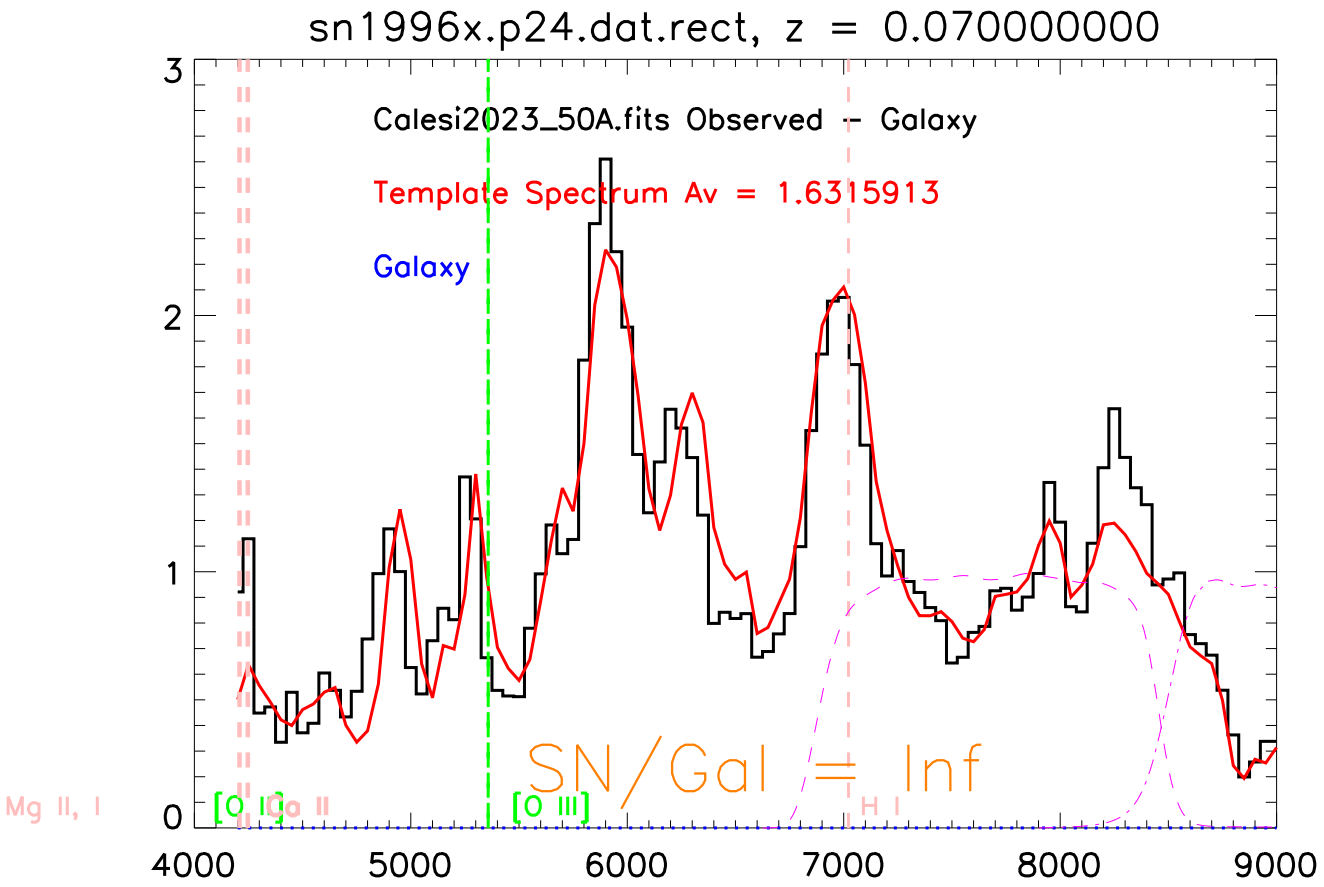
5000
6000
7000
8000
9000


sn1996x.p24.dat.rect, z = 0.070000000
Calesi2023_50A.fits Observed - Galaxy
Template Spectrum Av = 1.6315913
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
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2
3
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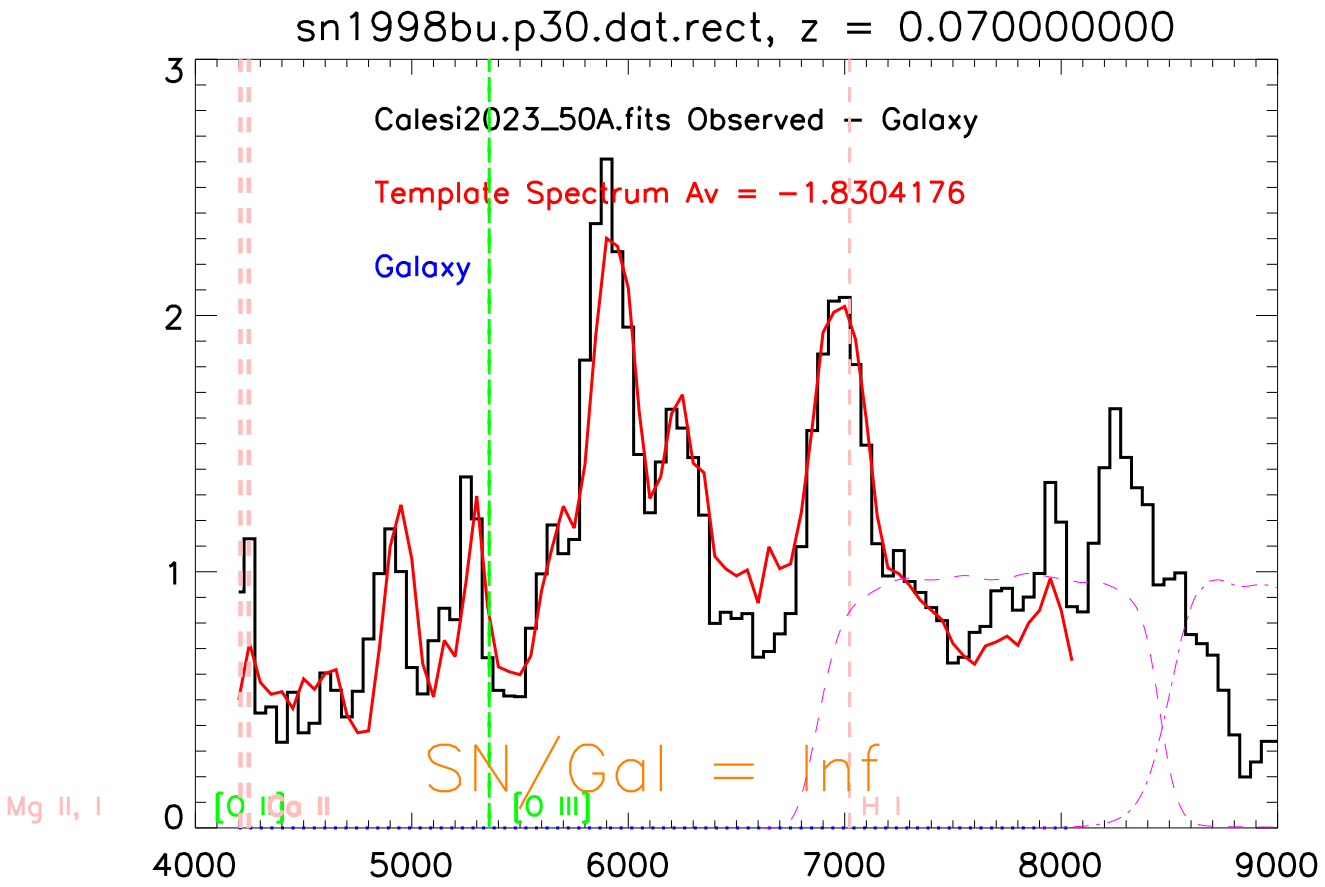
5000
6000
7000
8000
9000


sn1998bu.p30.dat.rect, z = 0.070000000
Calesi2023_50A.fits Observed - Galaxy
Template Spectrum Av = -1.8304176
Galaxy
SN/Gal = Inf
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[O II]
Ca II
[O III]
H I
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2
3
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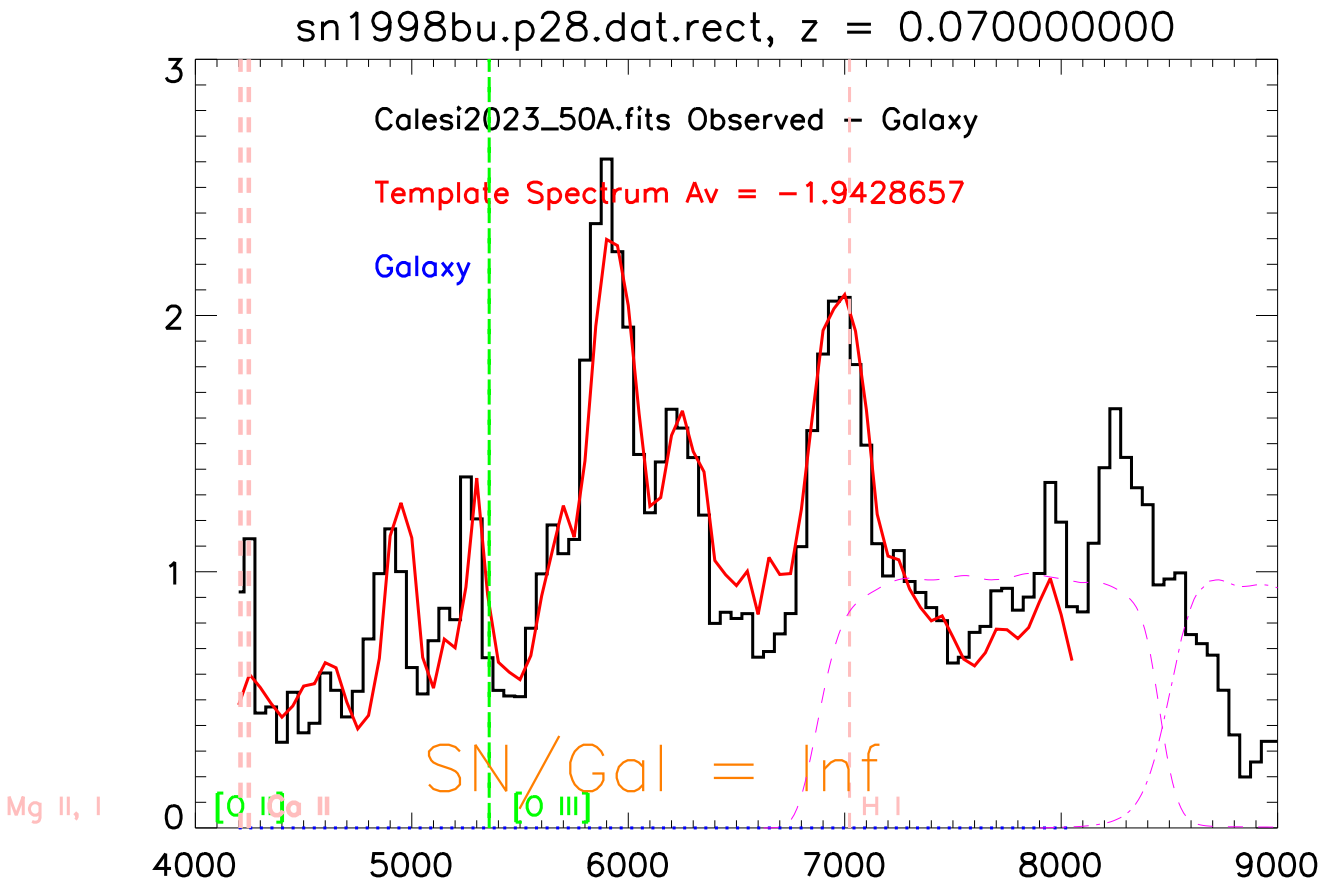
5000
6000
7000
8000
9000


sn1998bu.p28.dat.rect, z = 0.070000000
Calesi2023_50A.fits Observed - Galaxy
Template Spectrum Av = -1.9428657
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
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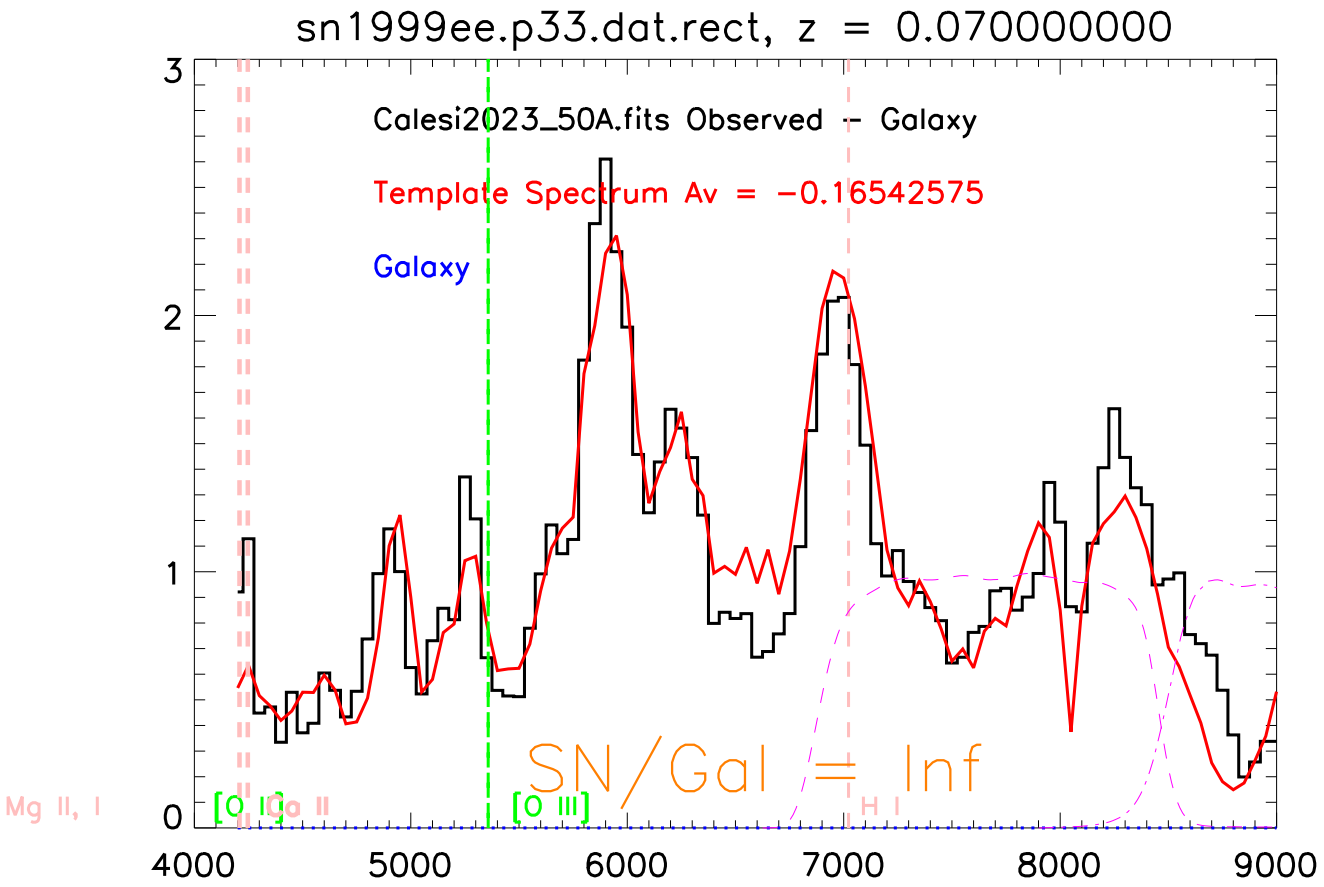
2
3
4000
5000
6000
7000
8000
9000


sn1999ee.p33.dat.rect, z = 0.070000000
Calesi2023_50A.fits Observed - Galaxy
Template Spectrum Av = -0.16542575
Galaxy
SN/Gal = Inf
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[O II]
Ca II
[O III]
H I
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2
3
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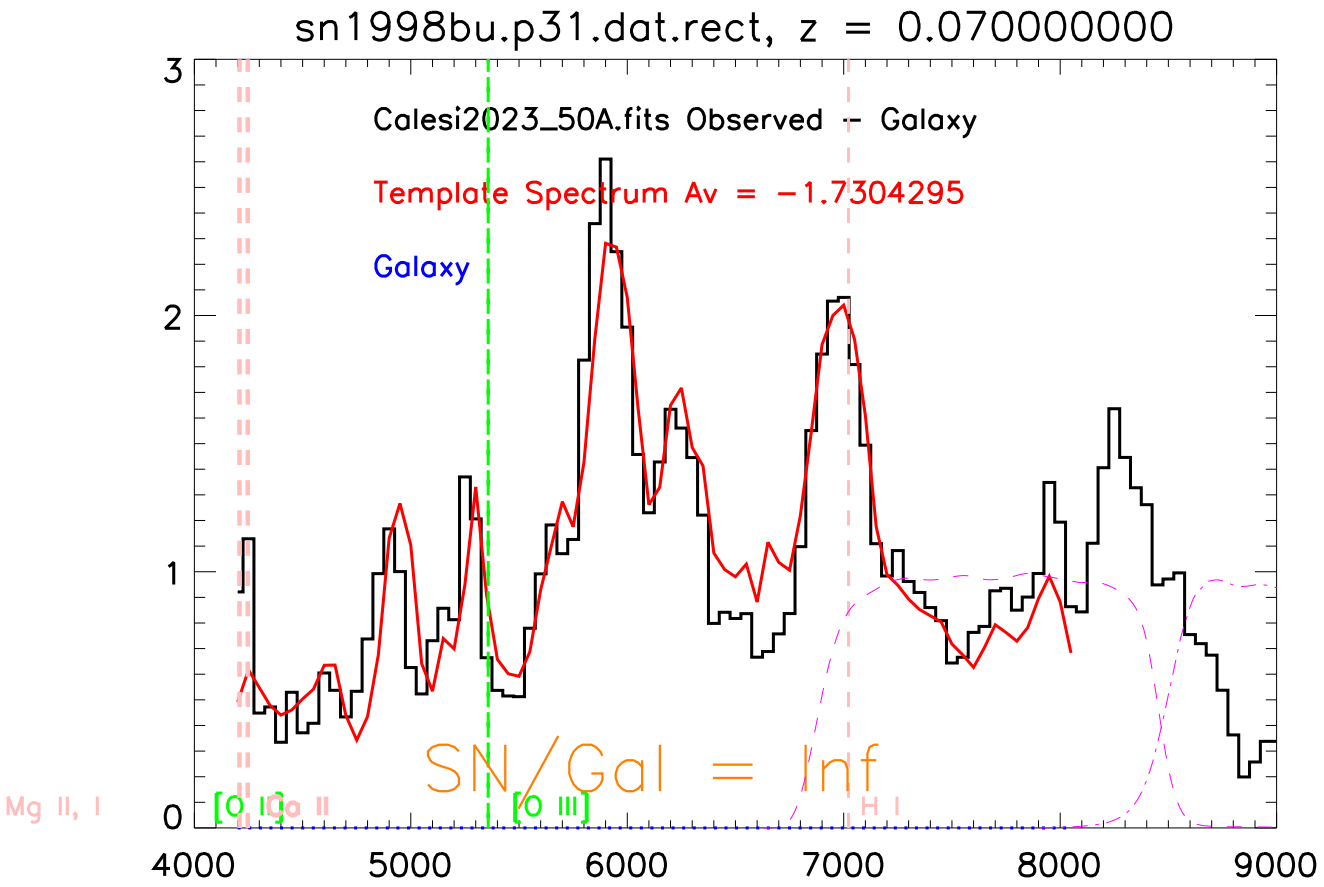
5000
6000
7000
8000
9000


sn1998bu.p31.dat.rect, z = 0.070000000
Calesi2023_50A.fits Observed - Galaxy
Template Spectrum Av = -1.7304295
Galaxy
SN/Gal = Inf
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[O II]
Ca II
[O III]
H I
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2
3
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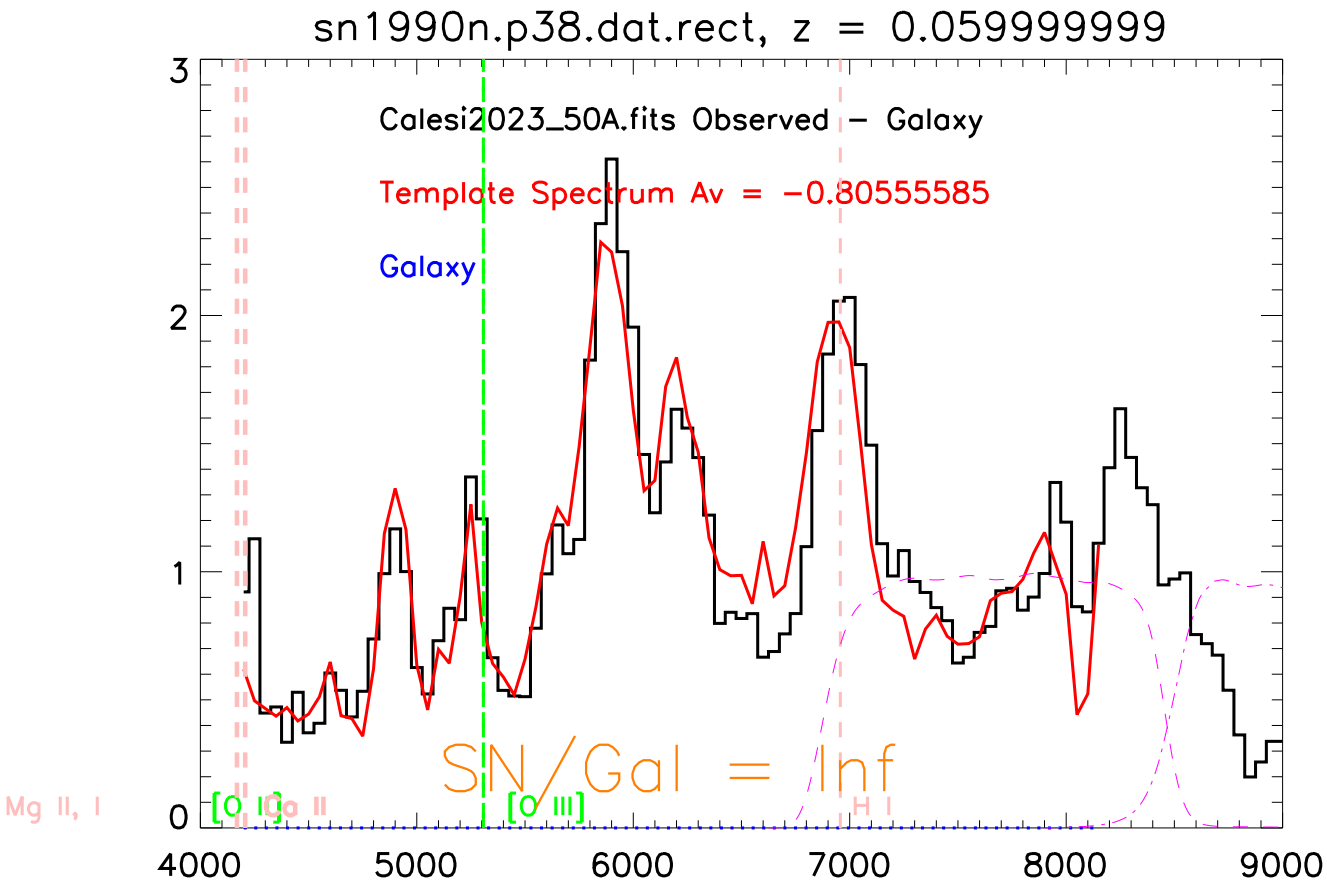
7000
8000
9000


sn1990n.p38.dat.rect, z = 0.059999999
Calesi2023_50A.fits Observed – Galaxy
Template Spectrum Av = −0.80555585
Galaxy
SN/Gal = Inf
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Ca II
[O III]
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2
3
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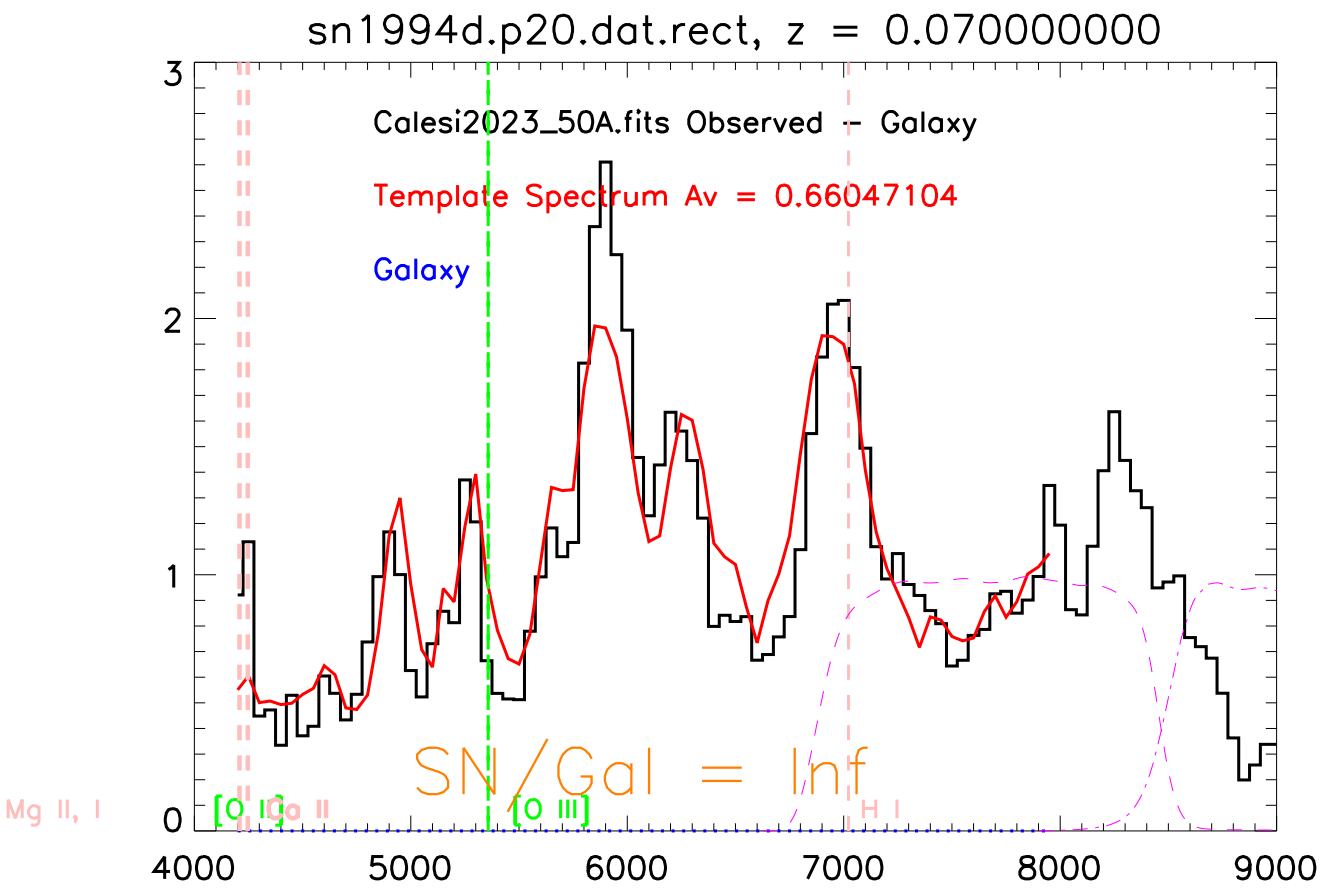
7000
8000
9000


sn1994d.p20.dat.rect, z = 0.070000000
Calesi2023_50A.fits Observed - Galaxy
Template Spectrum Av = 0.66047104
Galaxy
SN/Gal = Inf
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Ca II
[O III]
H I
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2
3
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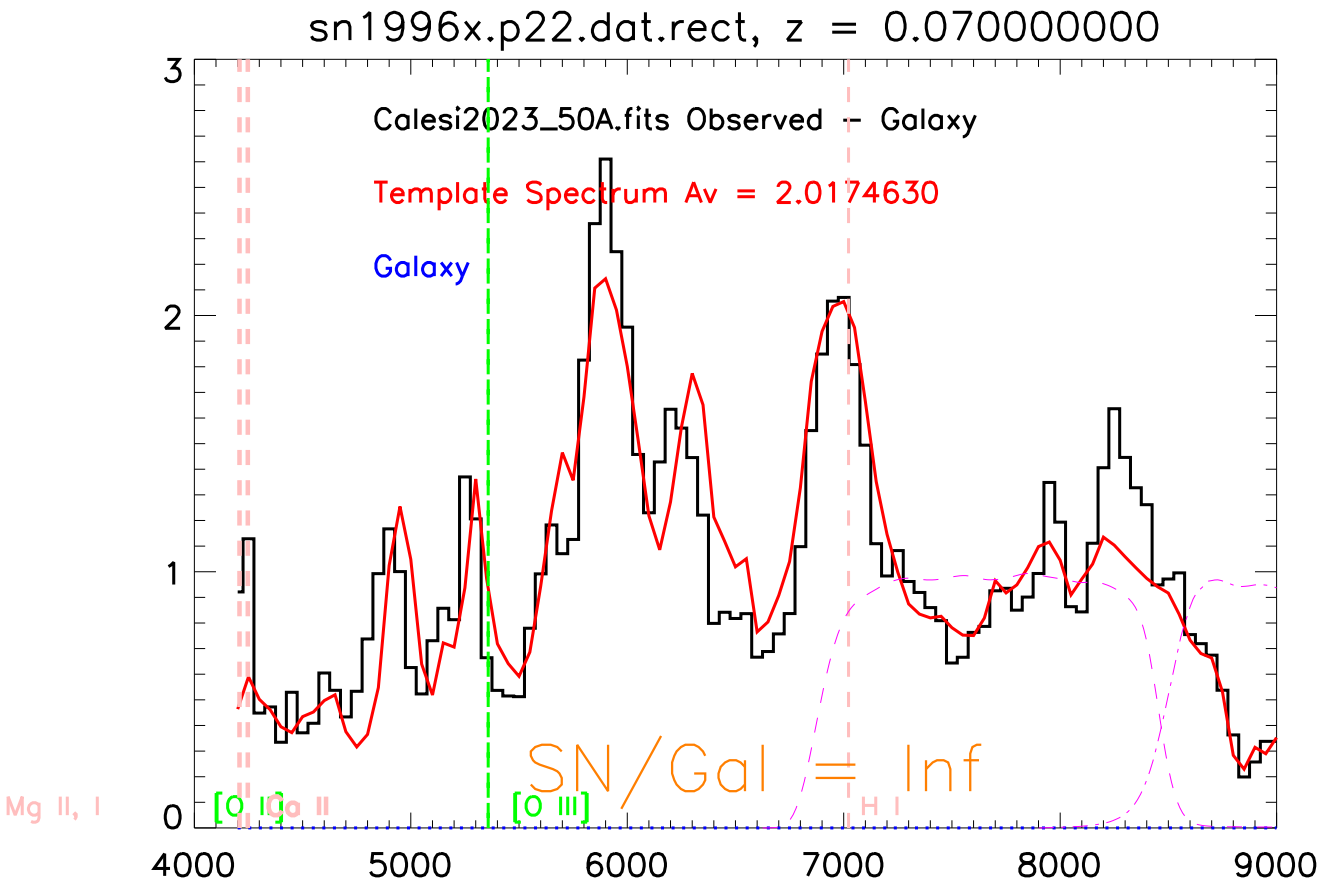
5000
6000
7000
8000
9000


sn1996x.p22.dat.rect, z = 0.070000000
Calesi2023_50A.fits Observed - Galaxy
Template Spectrum Av = 2.0174630
Galaxy
SN/Gal = Inf
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Ca II
[O III]
H I
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2
3
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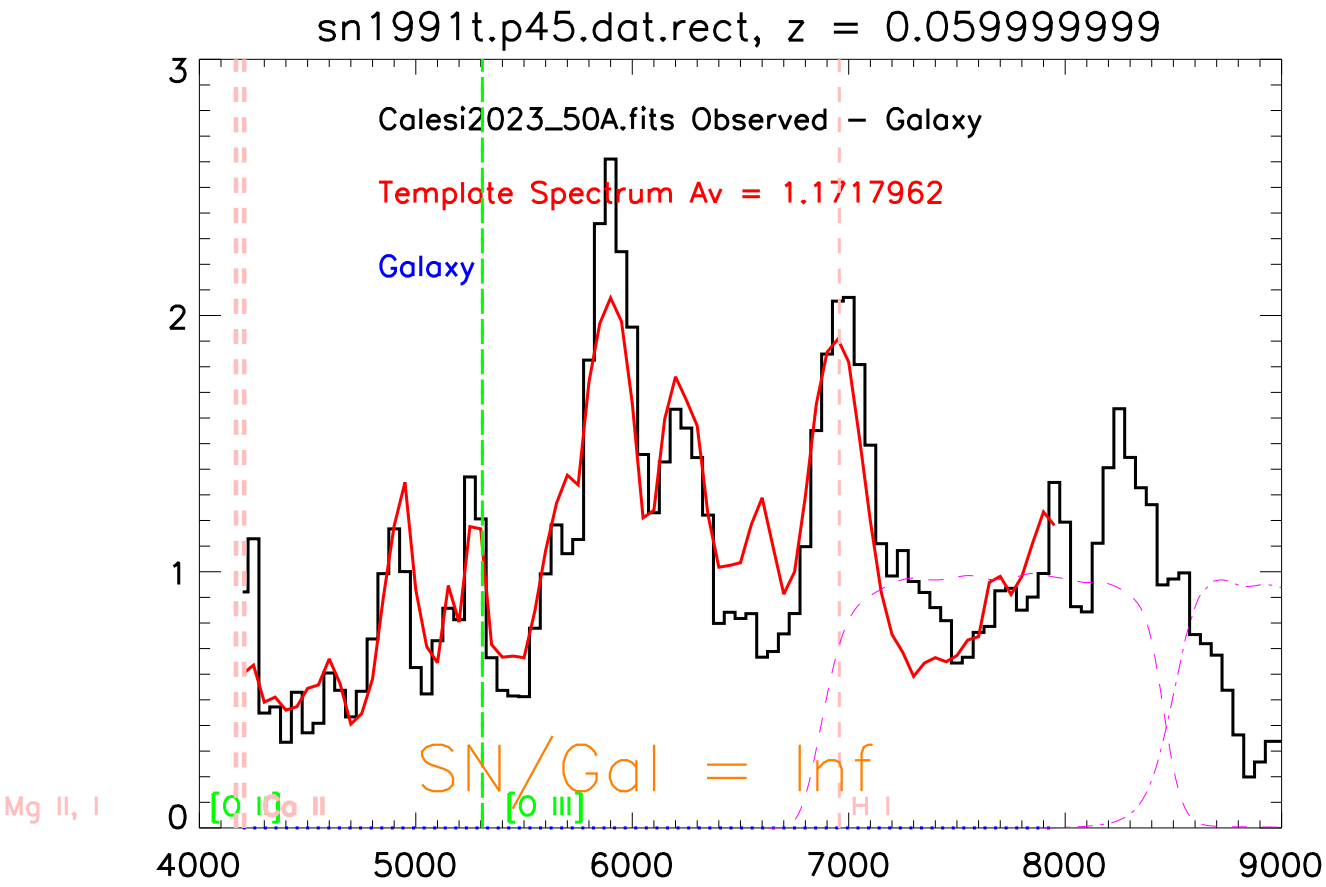
6000
7000
8000
9000


sn1991t.p45.dat.rect, z = 0.059999999
Calesi2023_50A.fits Observed – Galaxy
Template Spectrum Av = 1.1717962
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
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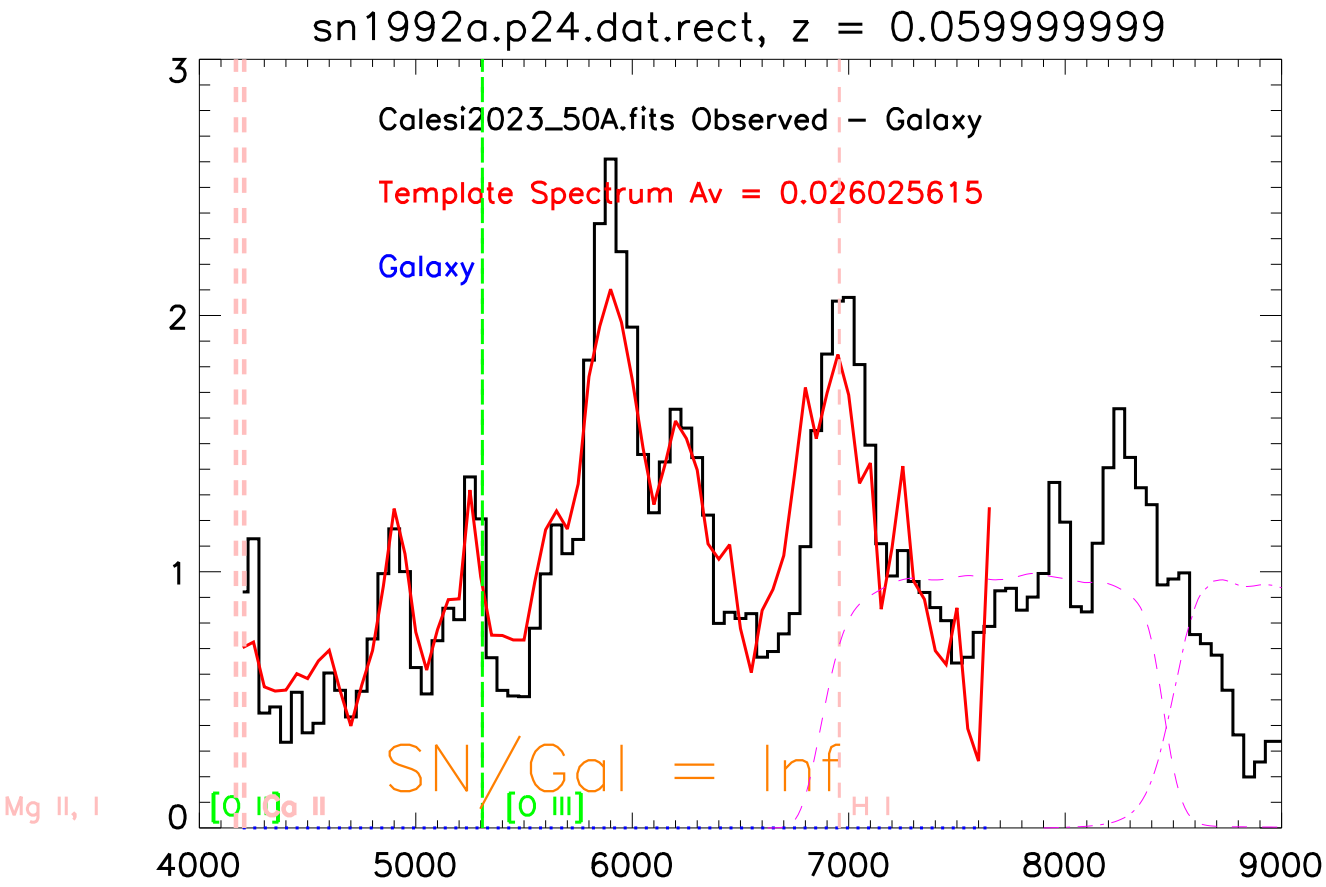
7000
8000
9000


sn1992a.p24.dat.rect, z = 0.059999999
Calesi2023_50A.fits Observed – Galaxy
Template Spectrum Av = 0.026025615
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
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2
3
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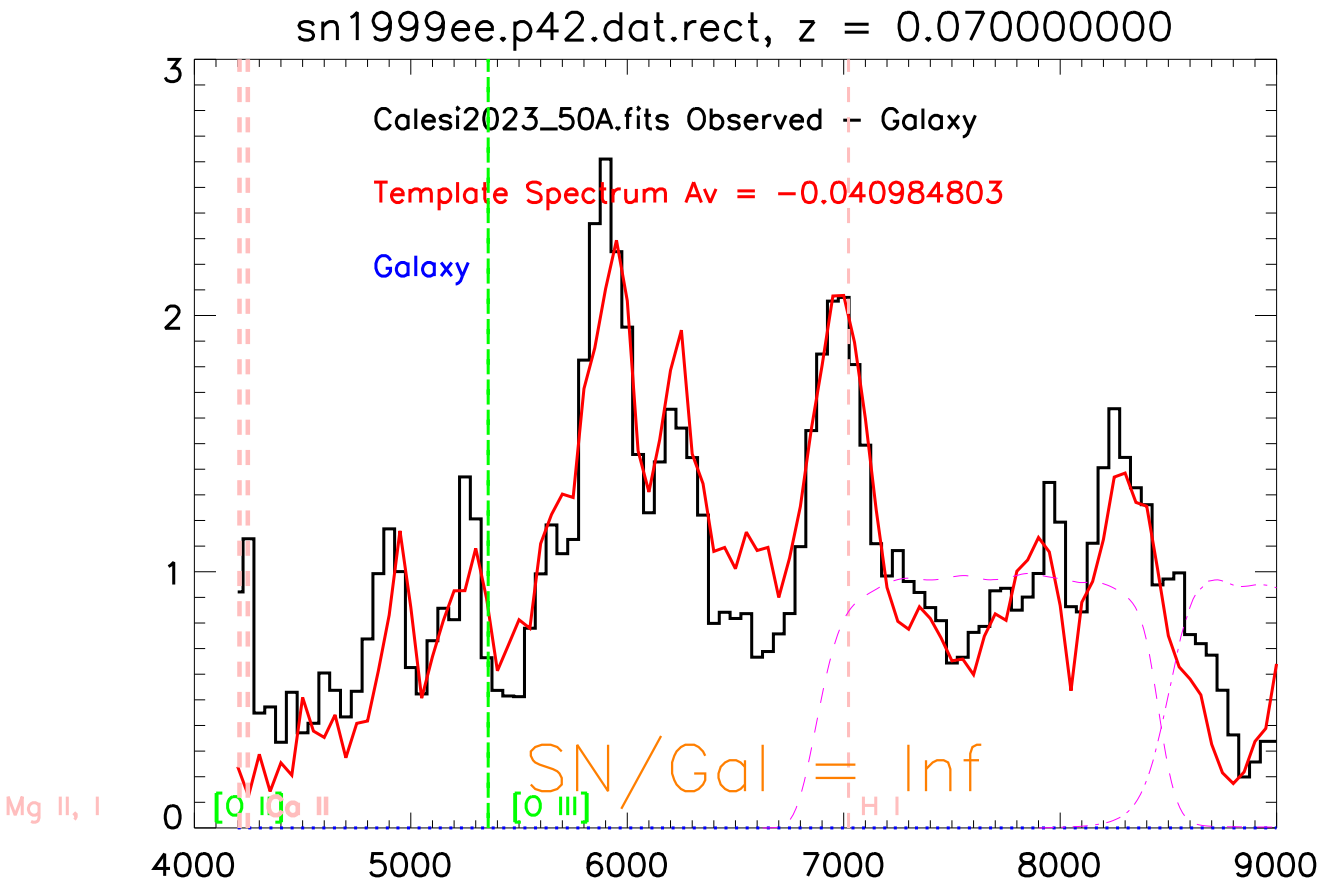
7000
8000
9000


sn1999ee.p42.dat.rect, z = 0.070000000
Calesi2023_50A.fits Observed - Galaxy
Template Spectrum Av = -0.040984803
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
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2
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7000
8000
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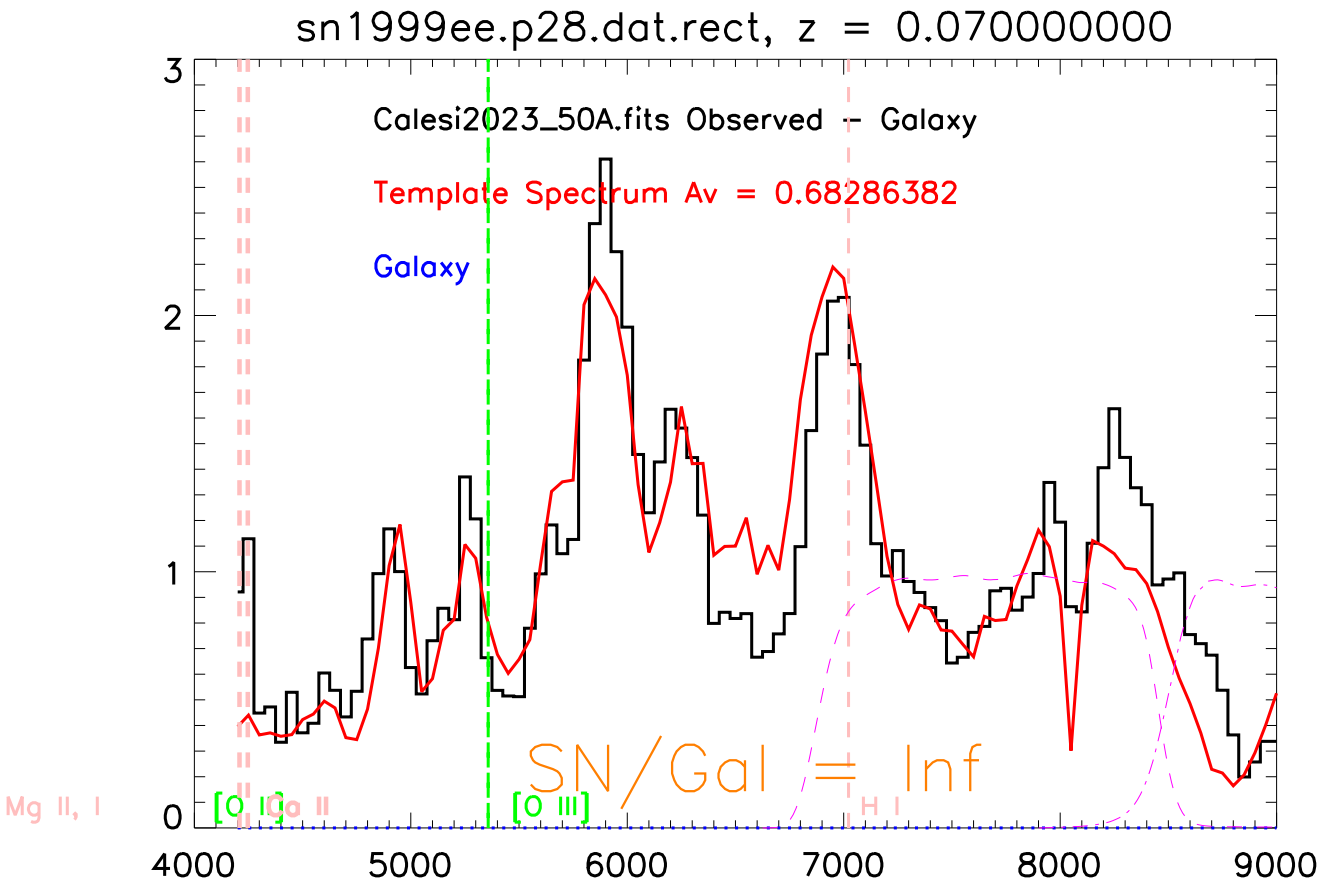
sn1999ee.p28.dat.rect, z = 0.070000000
Calesi2023_50A.fits Observed - Galaxy
Template Spectrum Av = 0.68286382
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
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3
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7000
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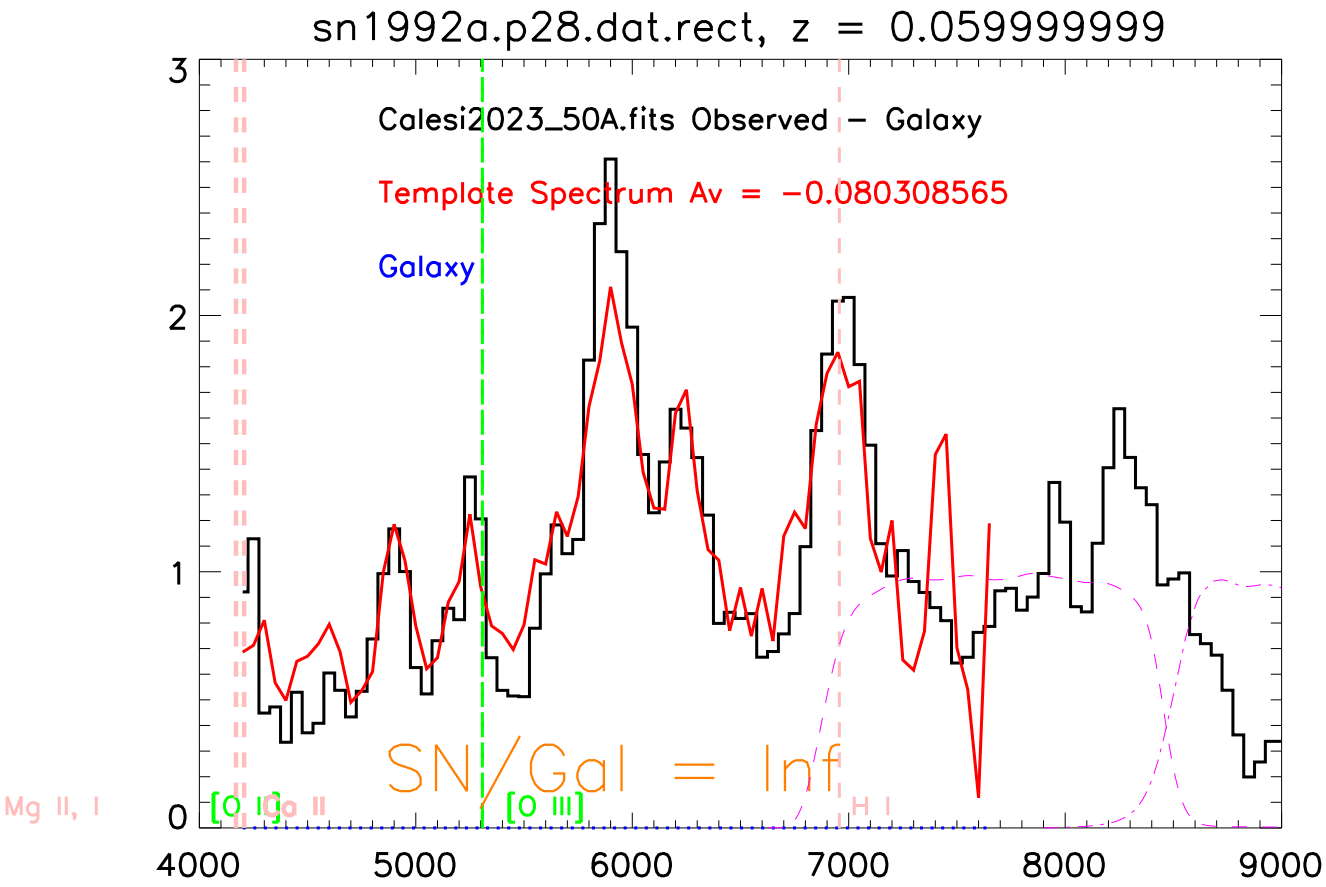
9000


sn1992a.p28.dat.rect, z = 0.059999999
Calesi2023_50A.fits Observed – Galaxy
Template Spectrum Av = −0.080308565
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
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2
3
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7000
8000
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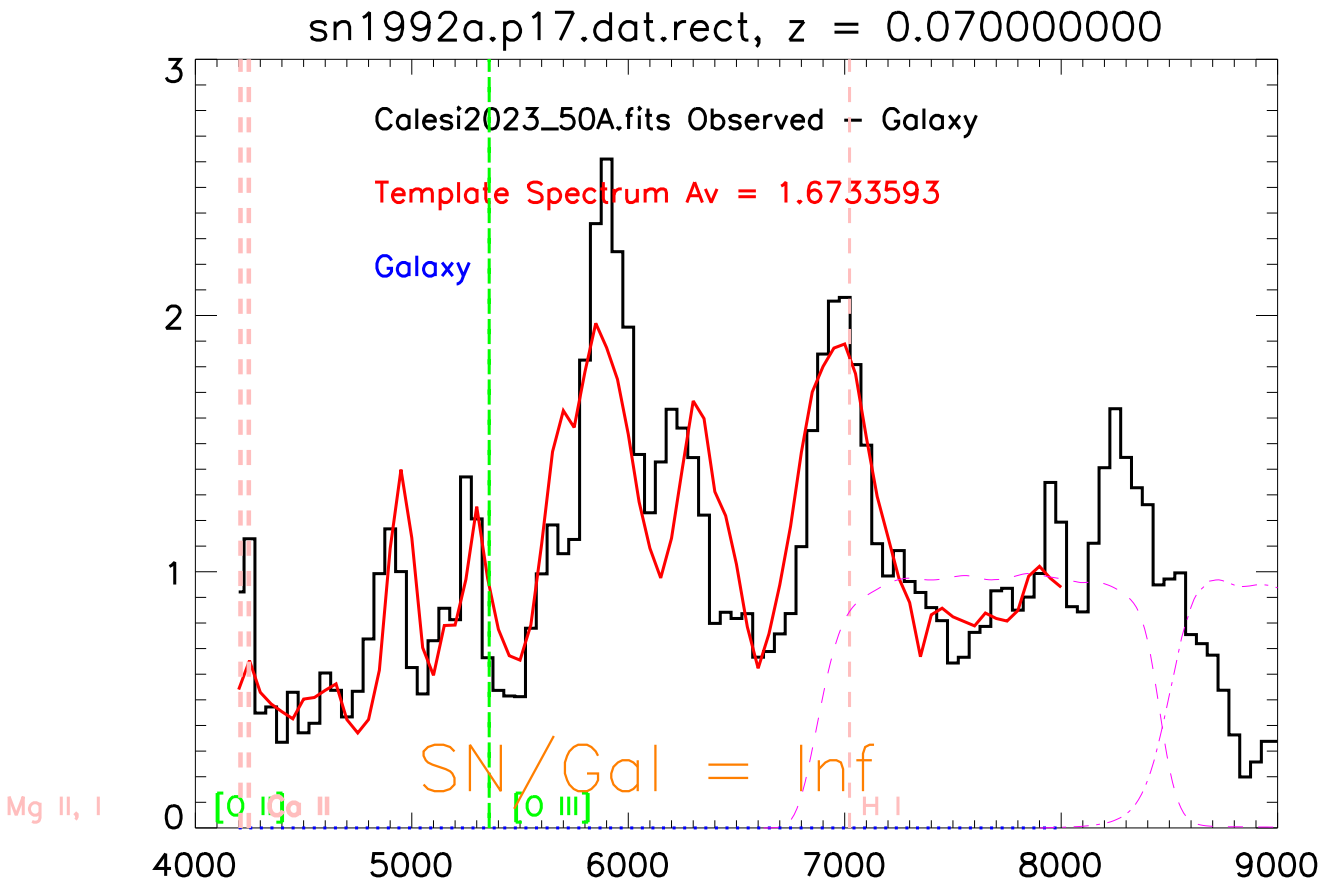
sn1992a.p17.dat.rect, z = 0.070000000
Calesi2023_50A.fits Observed - Galaxy
Template Spectrum Av = 1.6733593
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
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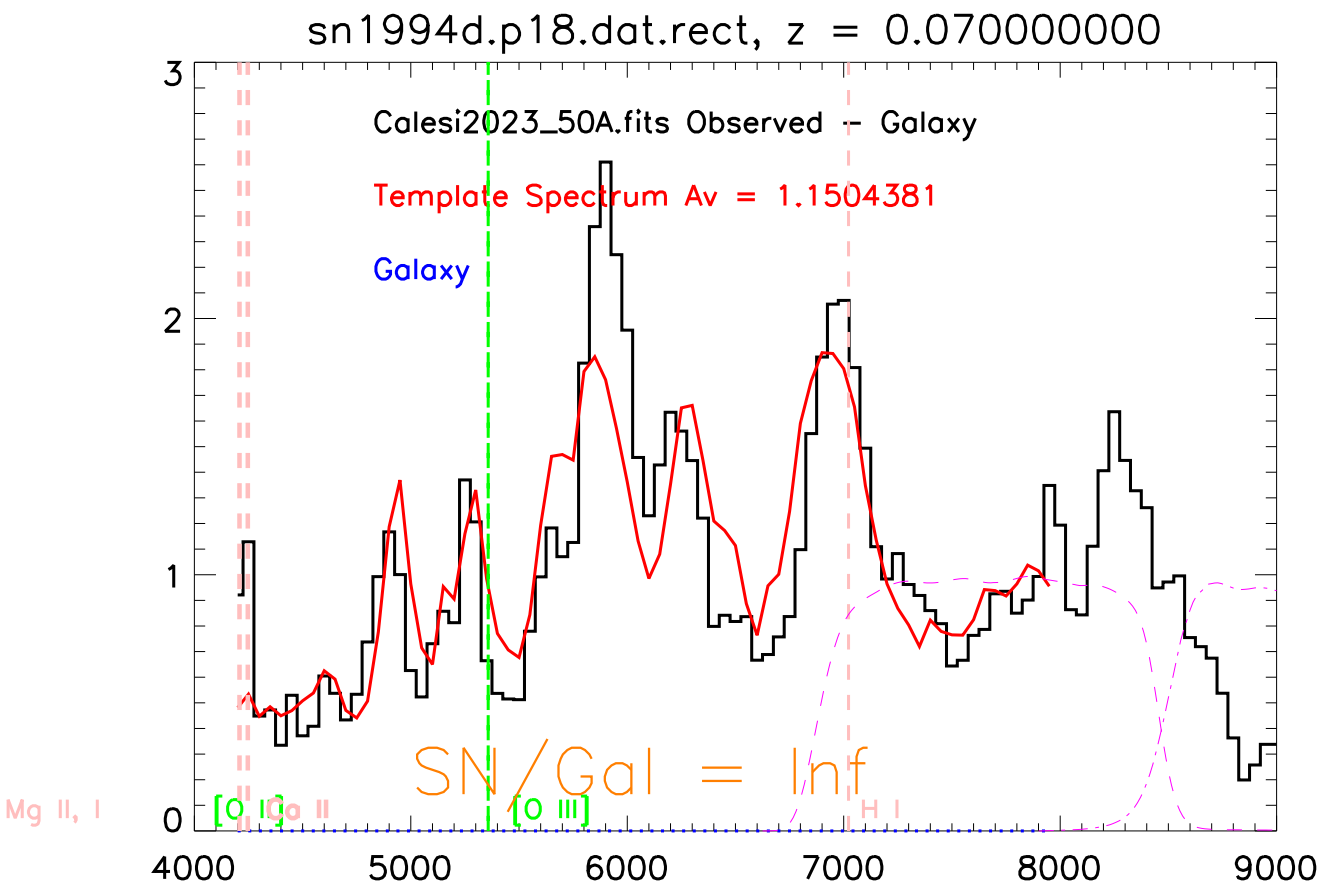
2
3
4000
5000
6000
7000
8000
9000


sn1994d.p18.dat.rect, z = 0.070000000
Calesi2023_50A.fits Observed - Galaxy
Template Spectrum Av = 1.1504381
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
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0
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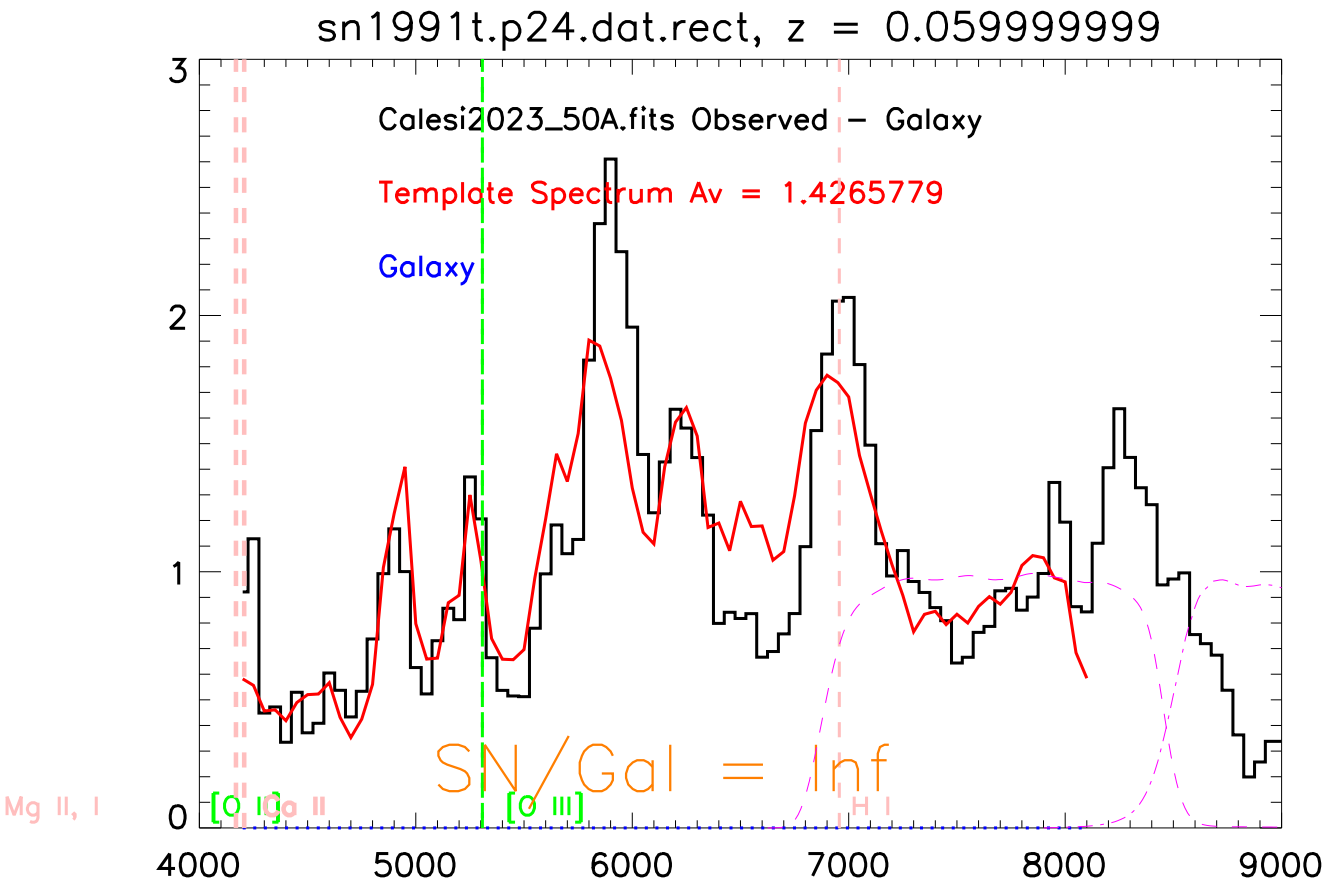
6000
7000
8000
9000


sn1991t.p24.dat.rect, z = 0.059999999
Calesi2023_50A.fits Observed – Galaxy
Template Spectrum Av = 1.4265779
Galaxy
SN/Gal = Inf
Mg II, I
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Ca II
[O III]
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2
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7000
8000
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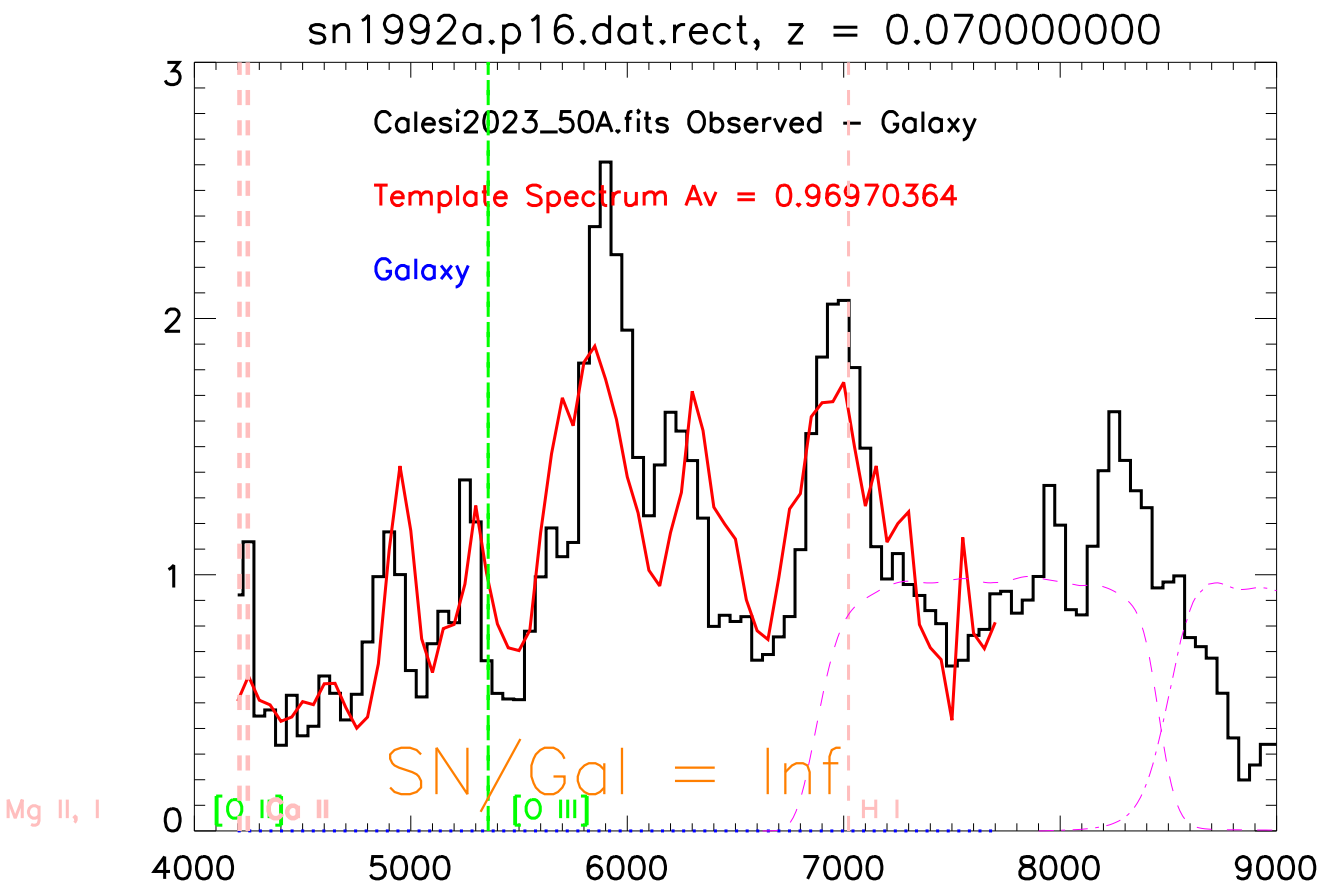
sn1992a.p16.dat.rect, z = 0.070000000
Calesi2023_50A.fits Observed - Galaxy
Template Spectrum Av = 0.96970364
Galaxy
SN/Gal = Inf
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Ca II
[O III]
H I
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3
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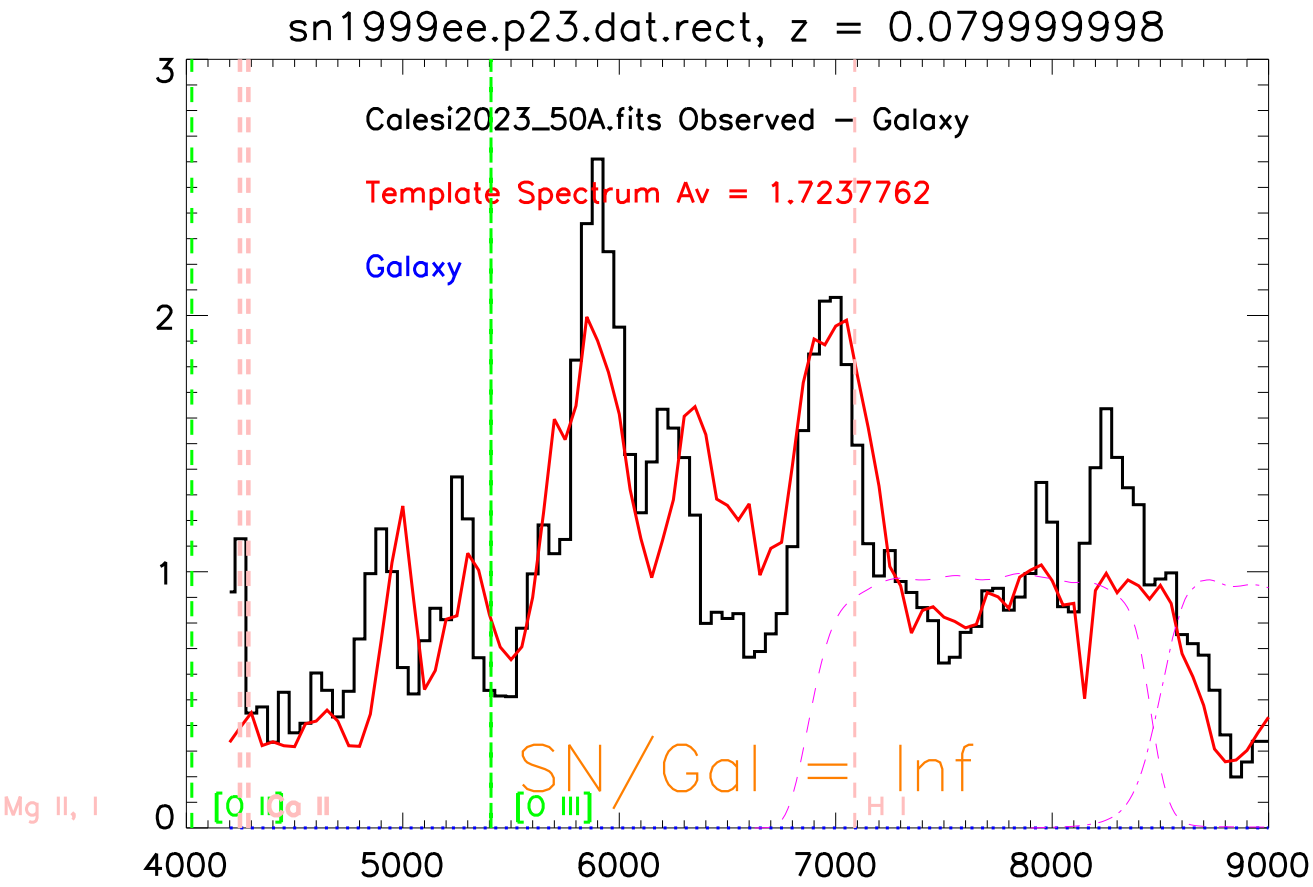
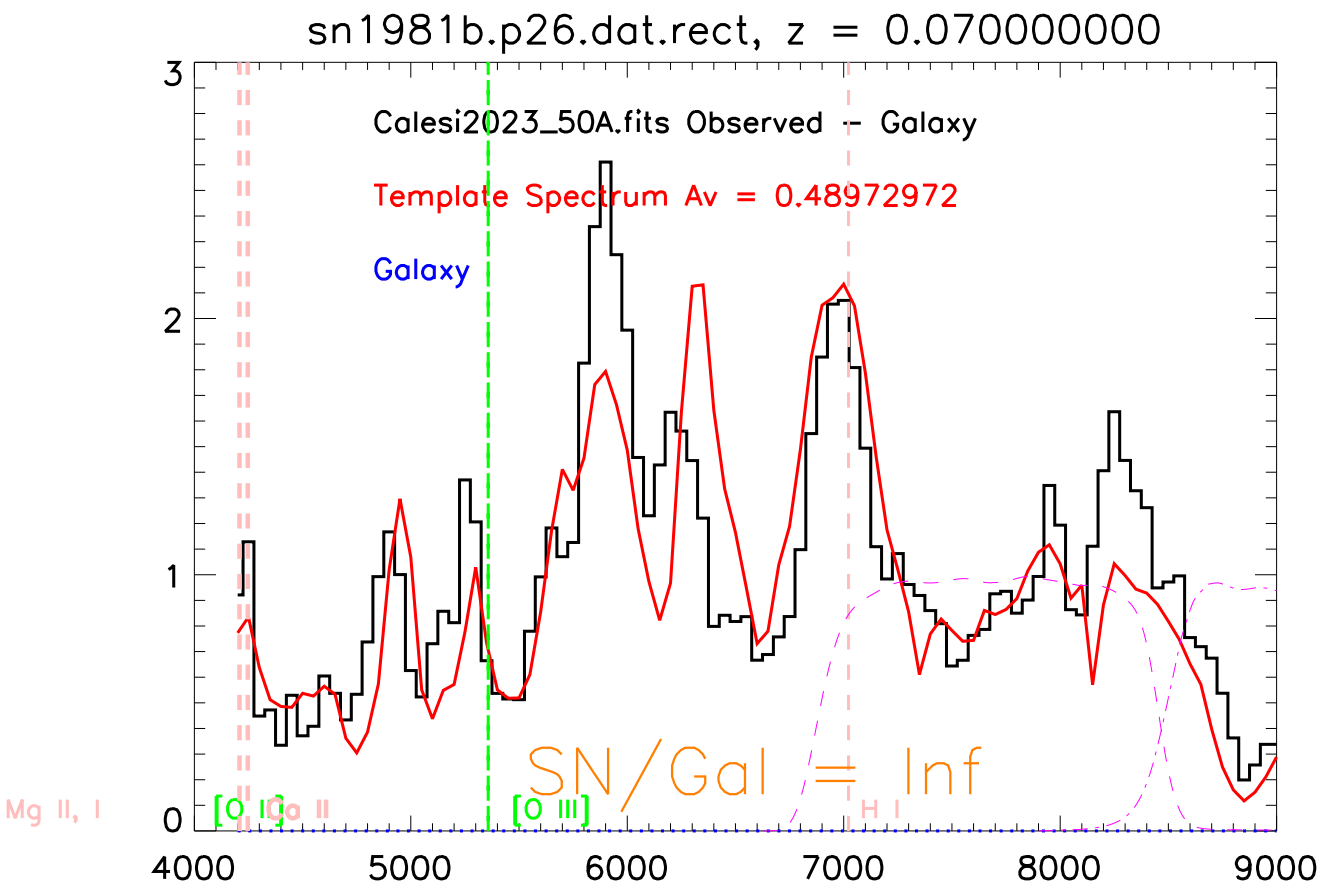
6000
7000
8000
9000


sn1999ee.p23.dat.rect, z = 0.079999998
Calesi2023_50A.fits Observed – Galaxy
Template Spectrum Av = 1.7237762
Galaxy
SN/Gal = Inf
Mg II, I
[O I]
Ca II
[O III]
H I
0
1
2
3
4000
5000
6000
7000
8000
9000


sn1981b.p26.dat.rect, z = 0.070000000
Calesi2023_50A.fits Observed - Galaxy
Template Spectrum Av = 0.48972972
Galaxy
SN/Gal = Inf
Mg II, I
[O II]a II
[O III]
H I
0
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2
3
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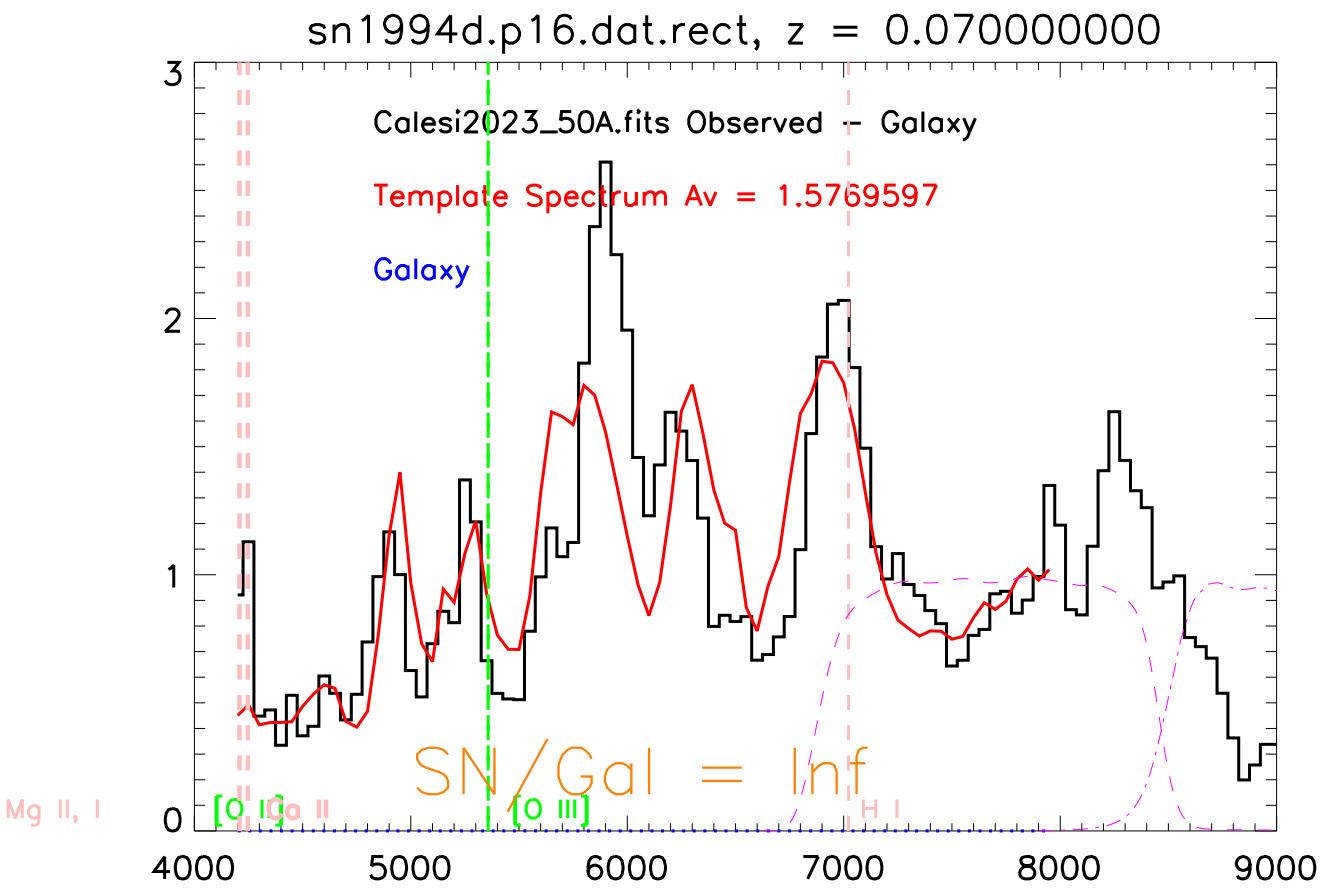
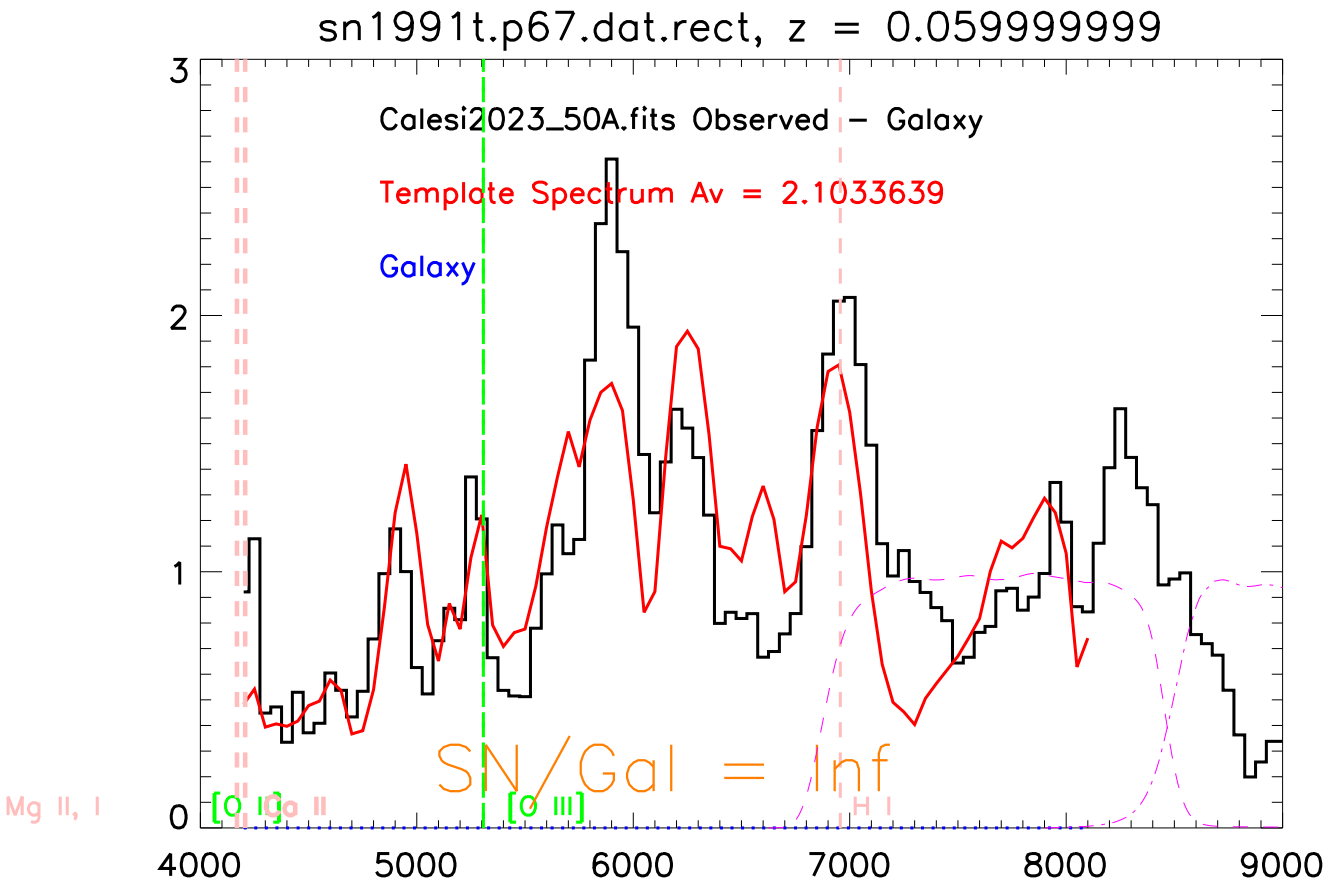
8000
9000


sn1994d.p16.dat.rect, z = 0.070000000
Calesi2023_50A.fits Observed - Galaxy
Template Spectrum Av = 1.5769597
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
0
1
2
3
4000
5000
6000
7000
8000
9000


sn1991t.p67.dat.rect, z = 0.059999999
Calesi2023_50A.fits Observed – Galaxy
Template Spectrum Av = 2.1033639
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
0
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2
3
4000
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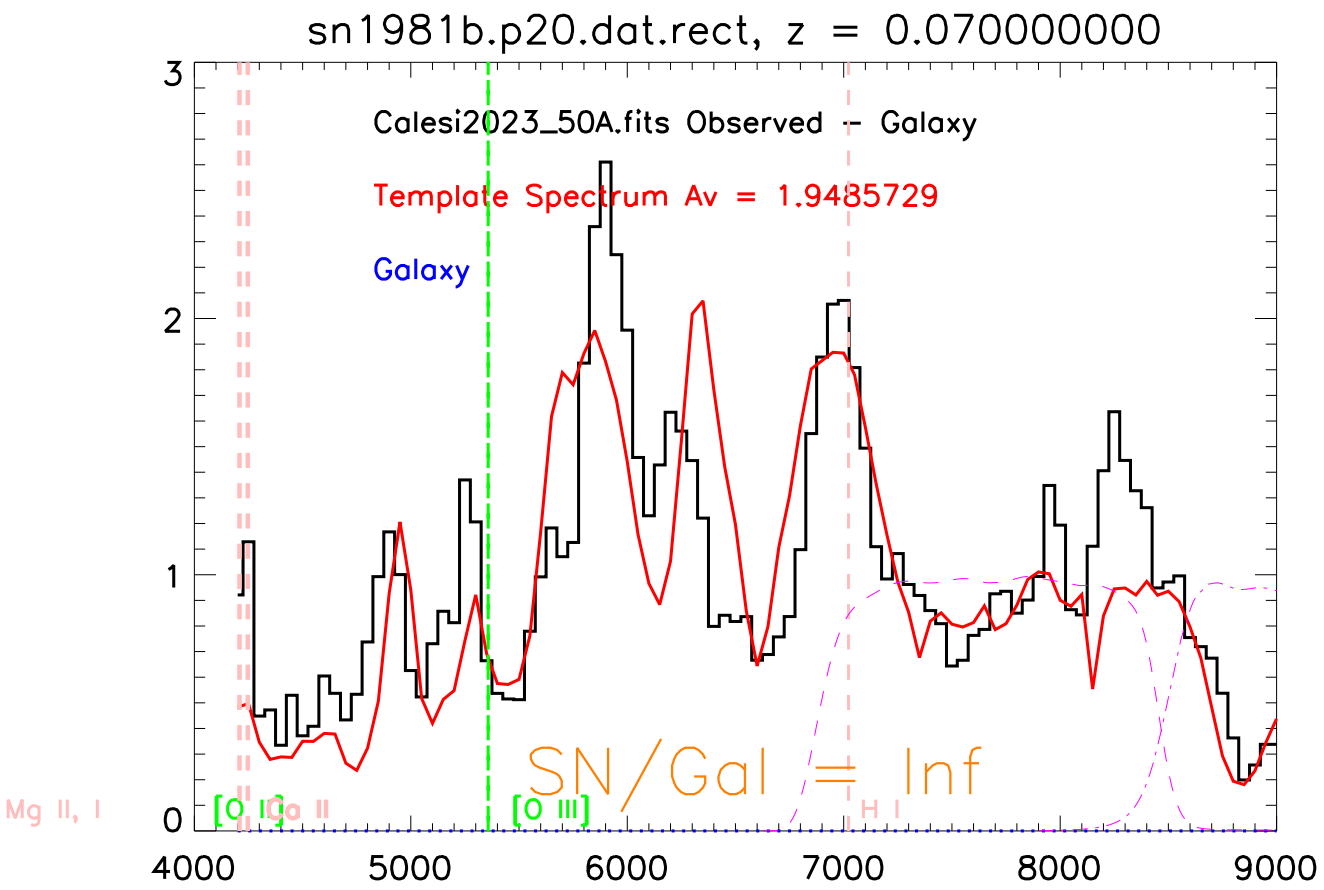
7000
8000
9000


sn1981b.p20.dat.rect, z = 0.070000000
Calesi2023_50A.fits Observed - Galaxy
Template Spectrum Av = 1.9485729
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
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2
3
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8000
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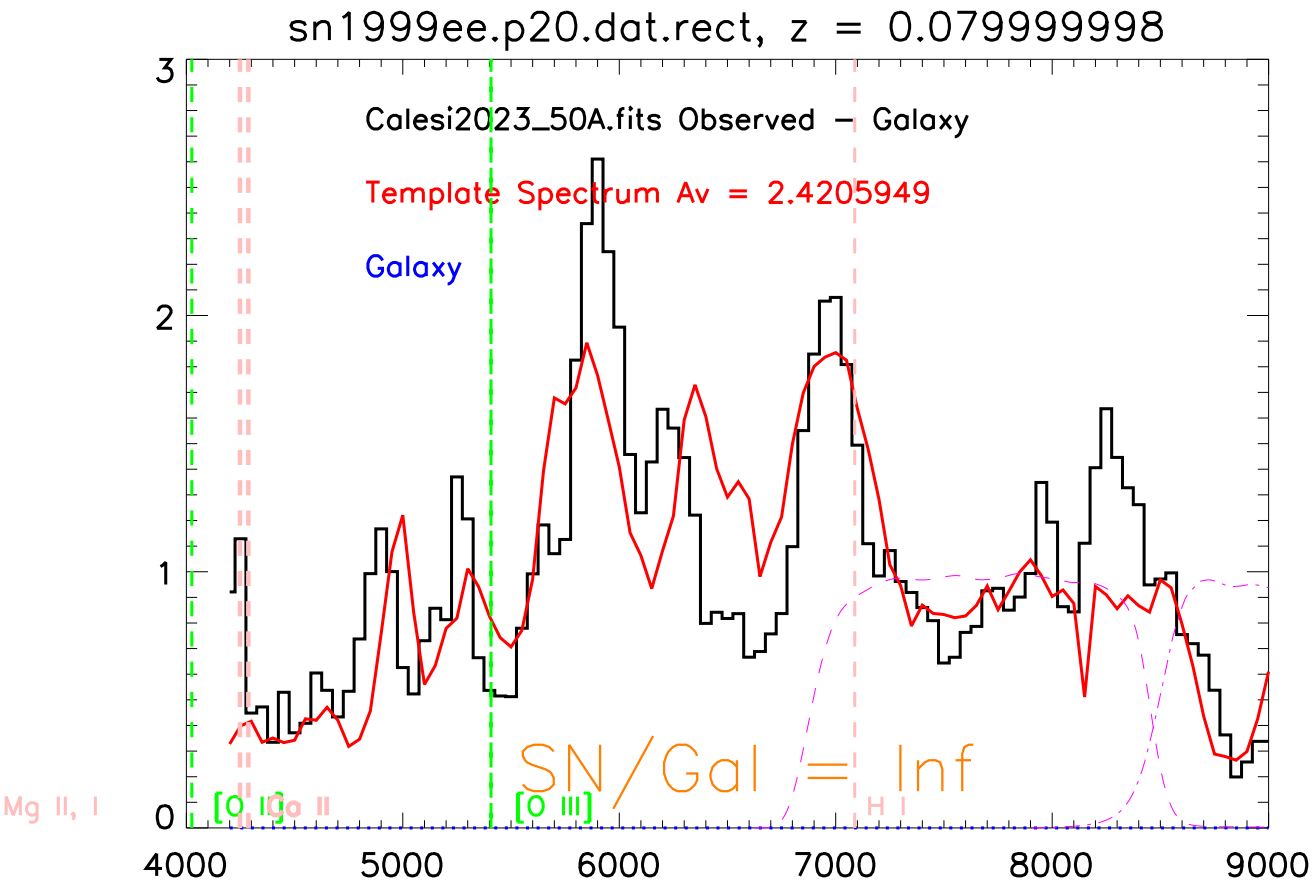
sn1999ee.p20.dat.rect, z = 0.079999998
Calesi2023_50A.fits Observed − Galaxy
Template Spectrum Av = 2.4205949
Galaxy
SN/Gal = Inf
Mg II, I
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Ca II
[O III]
H I
0
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2
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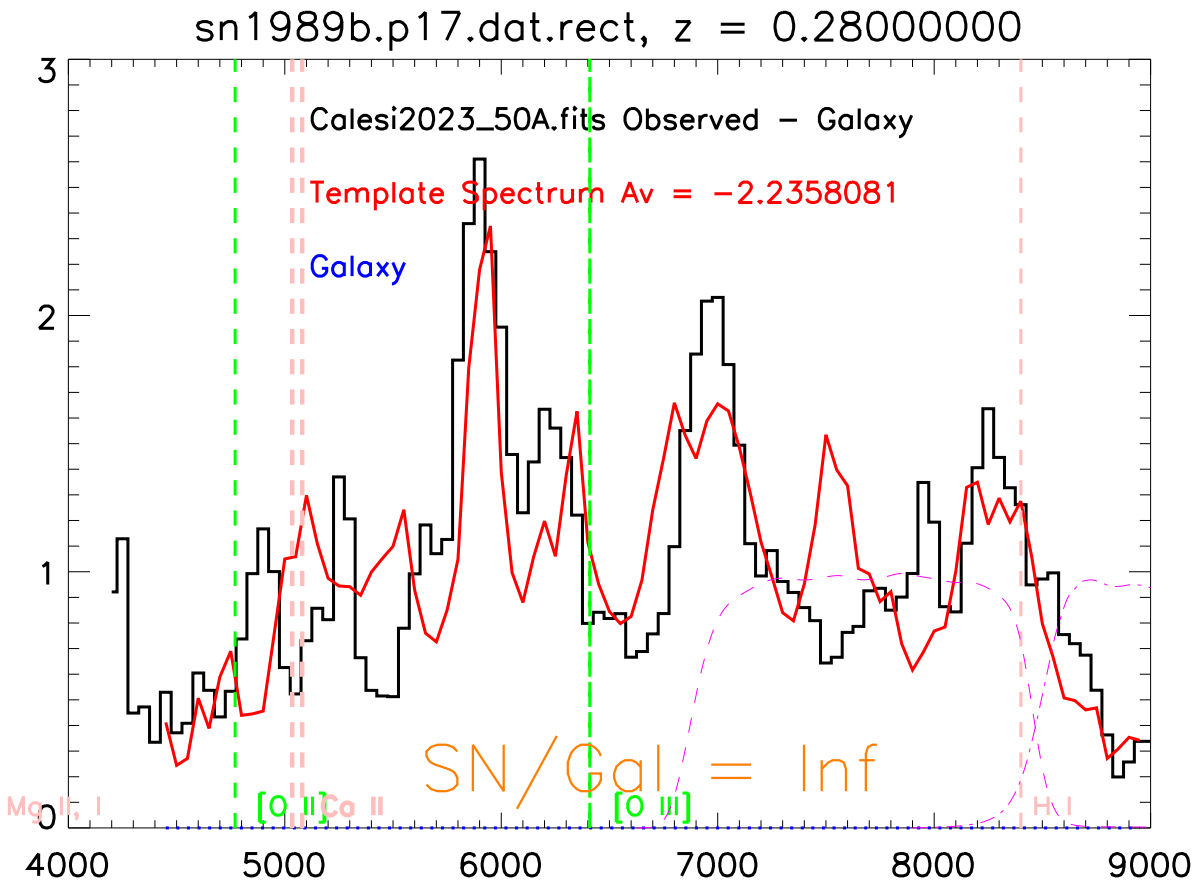
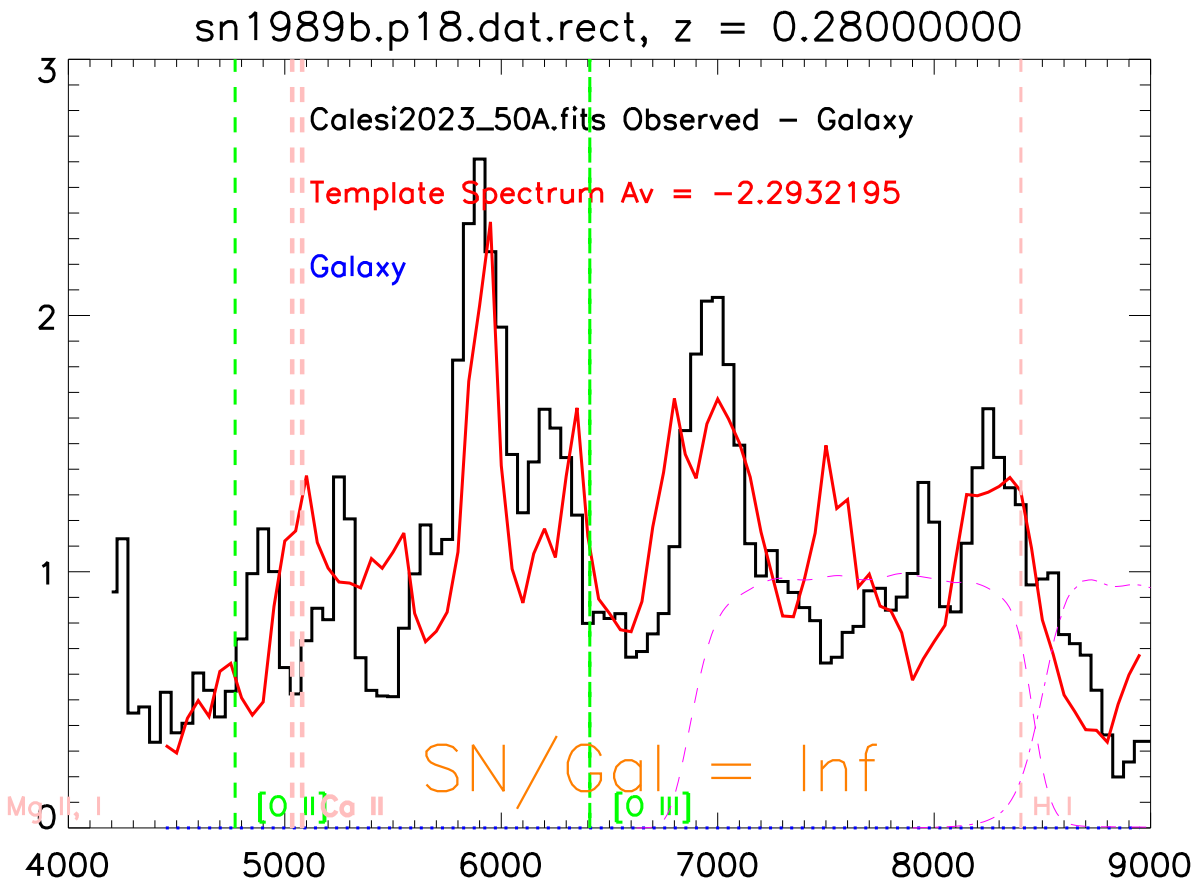

sn1989b.p17.dat.rect, z = 0.28000000
Calesi2023_50A.fits Observed − Galaxy
Template Spectrum Av = −2.2358081
Galaxy
SN/Gal = Inf
[O II]
Ca II
[O III]
H I
3
2
1
0
4000
5000
6000
7000
8000
9000


sn1989b.p18.dat.rect, z = 0.28000000
Calesi2023_50A.fits Observed − Galaxy
Template Spectrum Av = −2.2932195
Galaxy
SN/Gal = Inf
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Ca II
[O III]
H I
3
2
1
0
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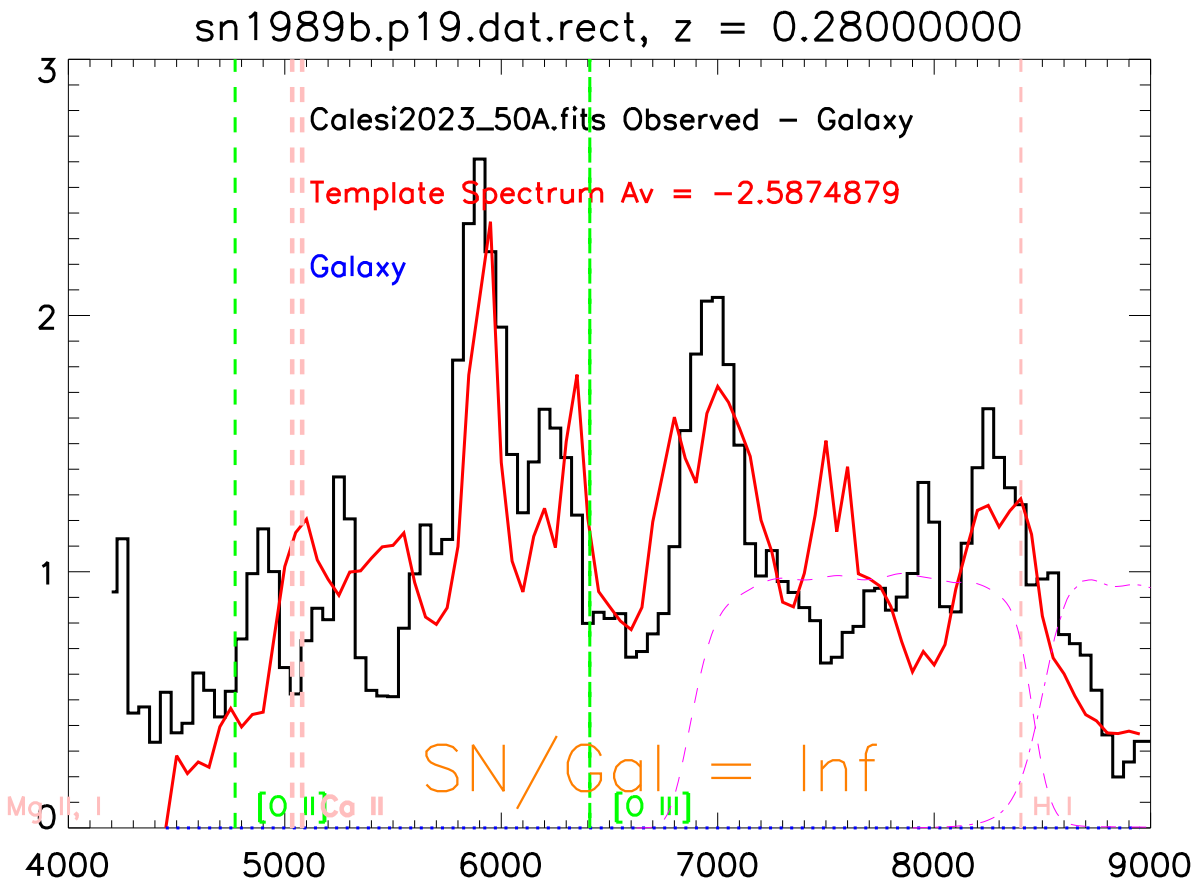
5000
6000
7000
8000
9000


sn1989b.p19.dat.rect, z = 0.28000000
Calesi2023_50A.fits Observed − Galaxy
Template Spectrum Av = −2.5874879
Galaxy
SN/Gal = Inf
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Ca II
[O III]
H I
3
2
1
0
4000
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7000
8000
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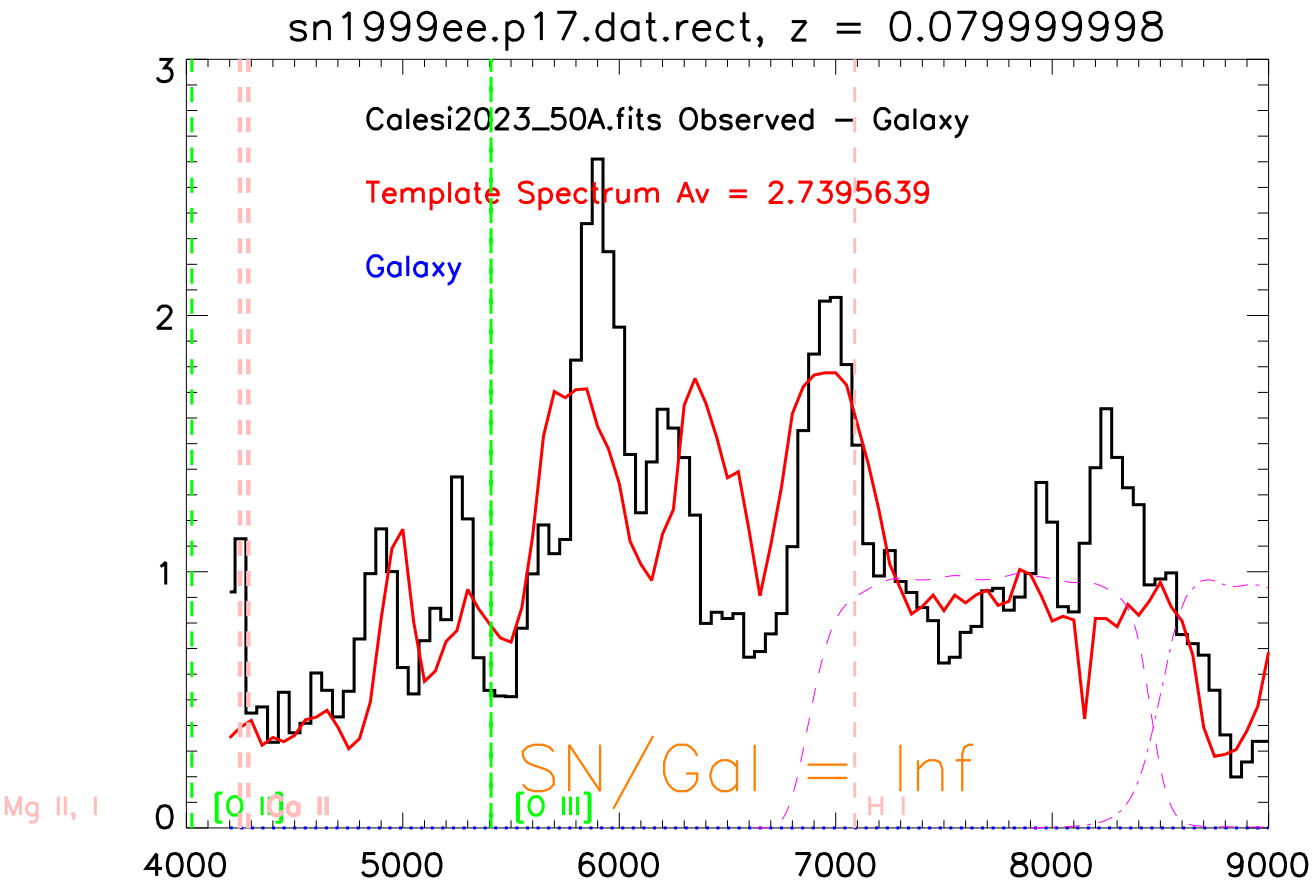
sn1999ee.p17.dat.rect, z = 0.079999998
Calesi2023_50A.fits Observed – Galaxy
Template Spectrum Av = 2.7395639
Galaxy
SN/Gal = Inf
Mg II, I
[O I]
Ca II
[O III]
H I
0
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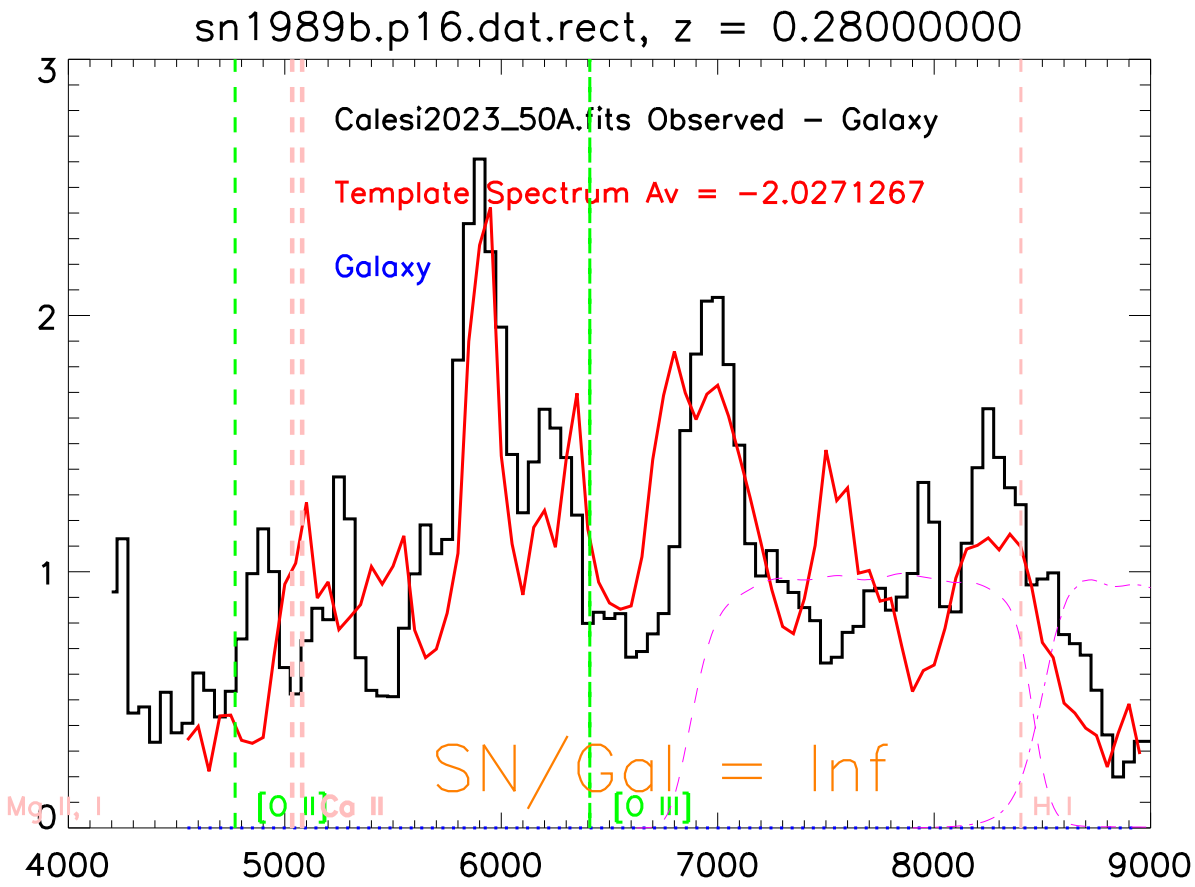
4000
5000
6000
7000
8000
9000


sn1989b.p16.dat.rect, z = 0.28000000
Calesi2023_50A.fits Observed − Galaxy
Template Spectrum Av = −2.0271267
Galaxy
SN/Gal = Inf
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Ca II
[O III]
H I
3
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1
0
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6000
7000
8000
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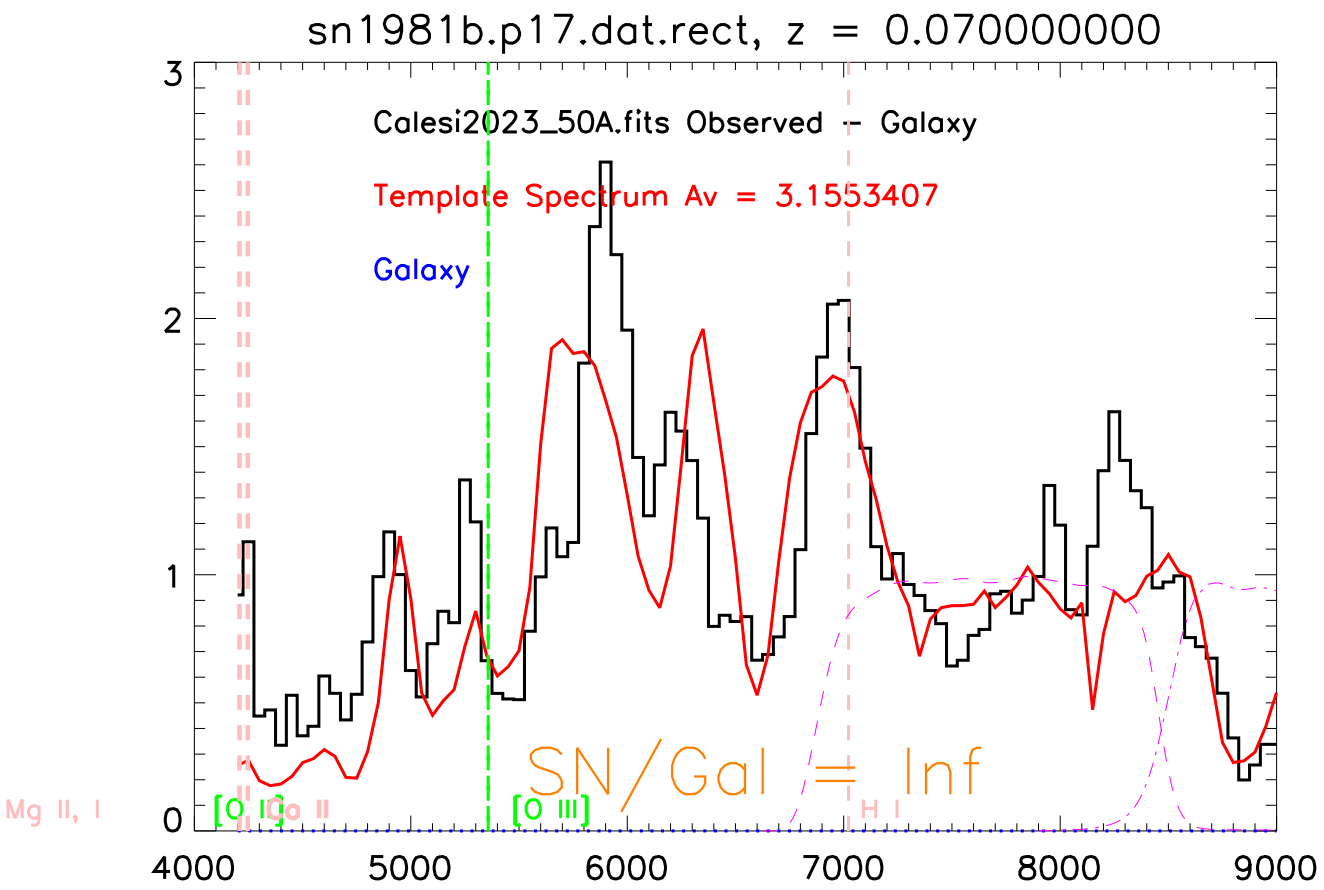
sn1981b.p17.dat.rect, z = 0.070000000
Calesi2023_50A.fits Observed - Galaxy
Template Spectrum Av = 3.1553407
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
0
1
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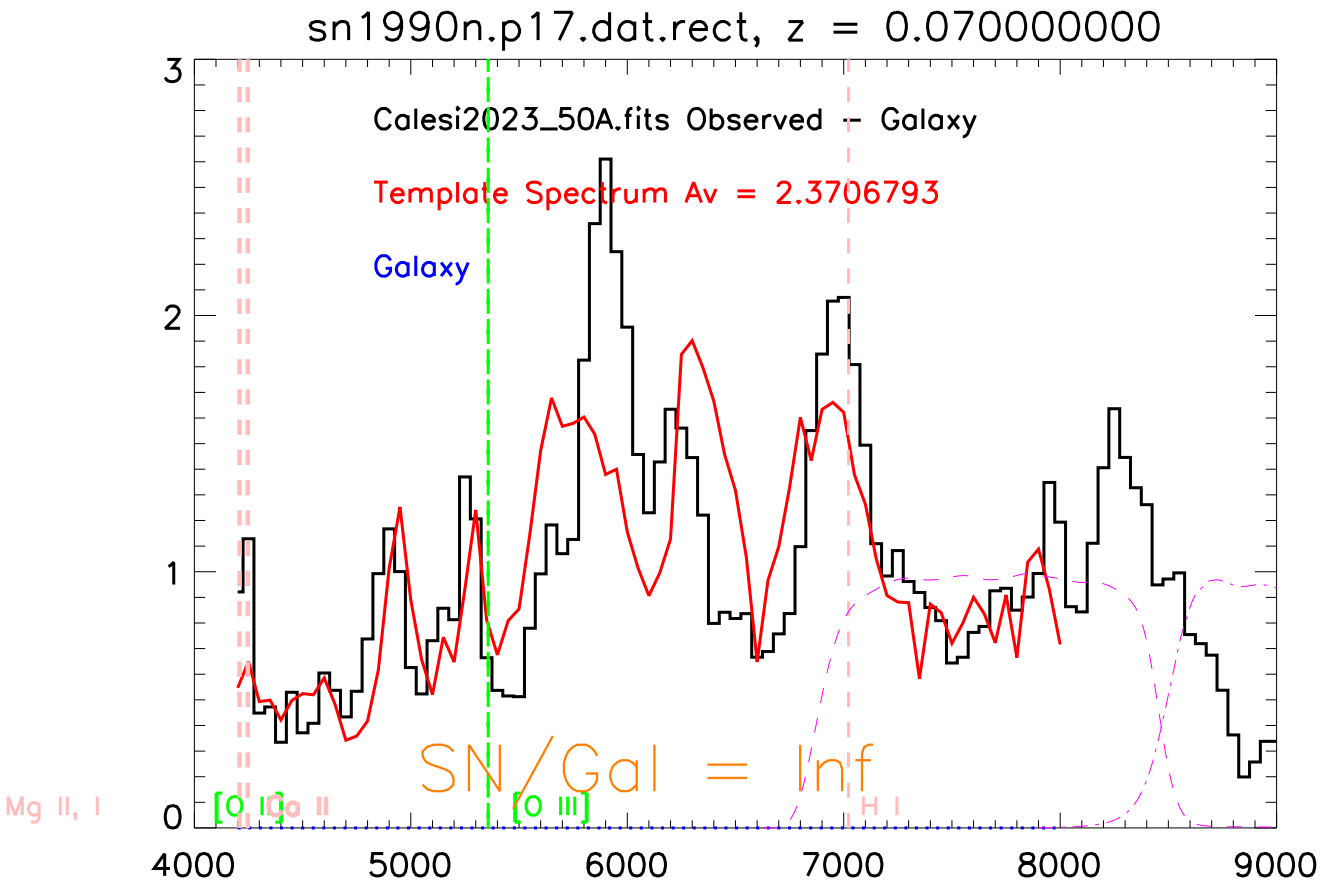
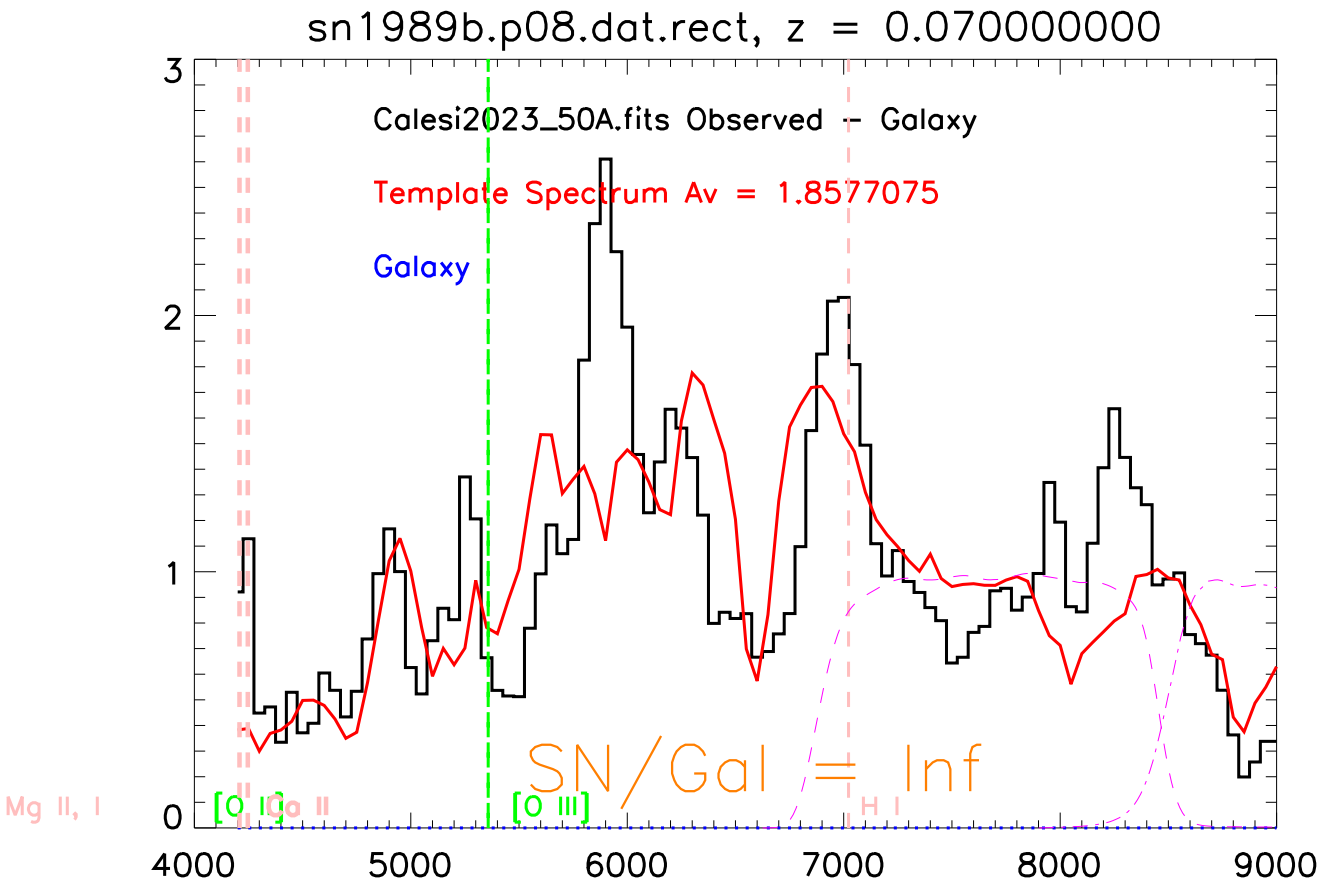
3
4000
5000
6000
7000
8000
9000


sn1990n.p17.dat.rect, z = 0.070000000
Calesi2023_50A.fits Observed - Galaxy
Template Spectrum Av = 2.3706793
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
3
2
1
0
4000
5000
6000
7000
8000
9000


sn1989b.p08.dat.rect, z = 0.070000000
Calesi2023_50A.fits Observed - Galaxy
Template Spectrum Av = 1.8577075
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
0
1
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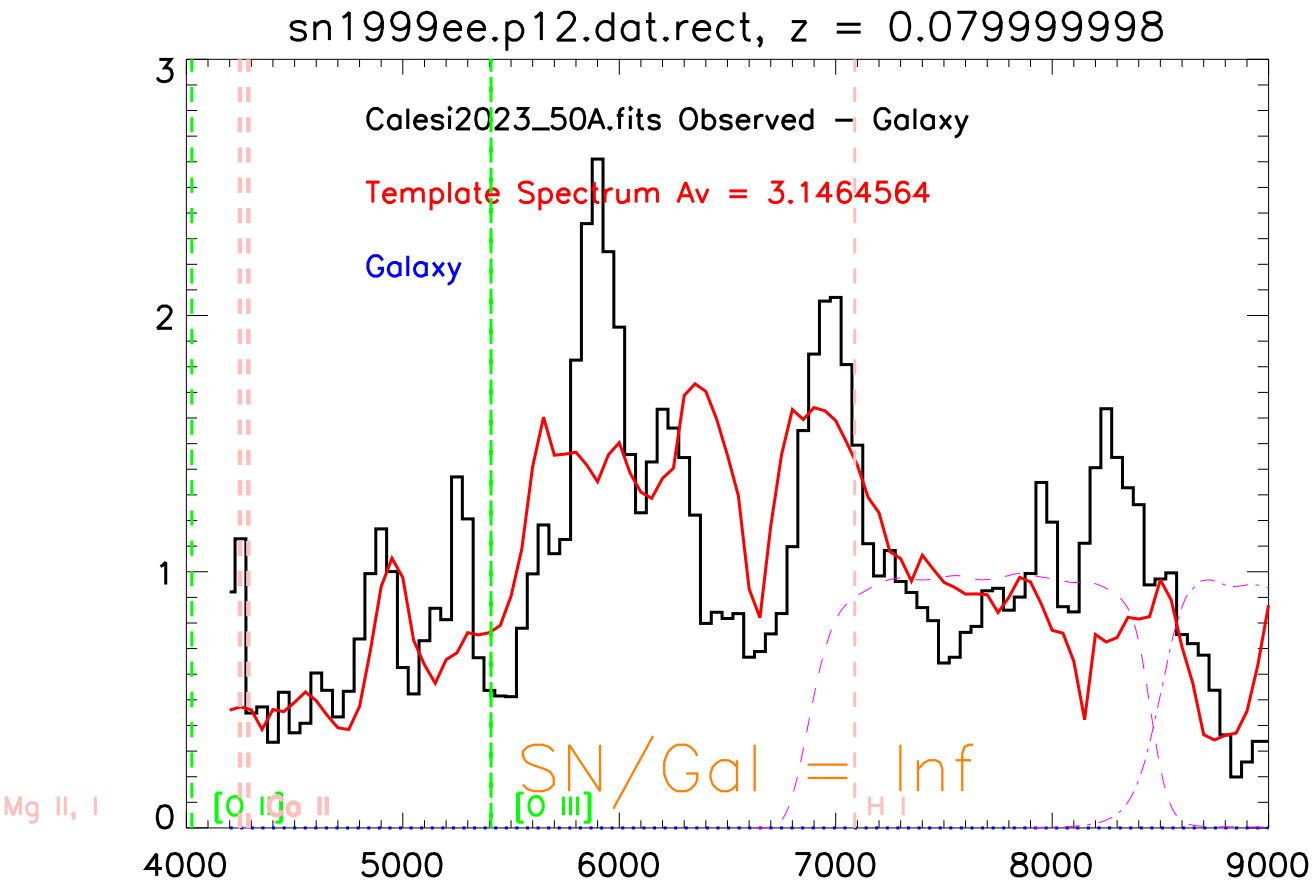
4000
5000
6000
7000
8000
9000


sn1999ee.p12.dat.rect, z = 0.079999998
Calesi2023_50A.fits Observed – Galaxy
Template Spectrum Av = 3.1464564
Galaxy
SN/Gal = Inf
Mg II, I
[O I]
Ca II
[O III]
H I
0
1
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3
4000
5000
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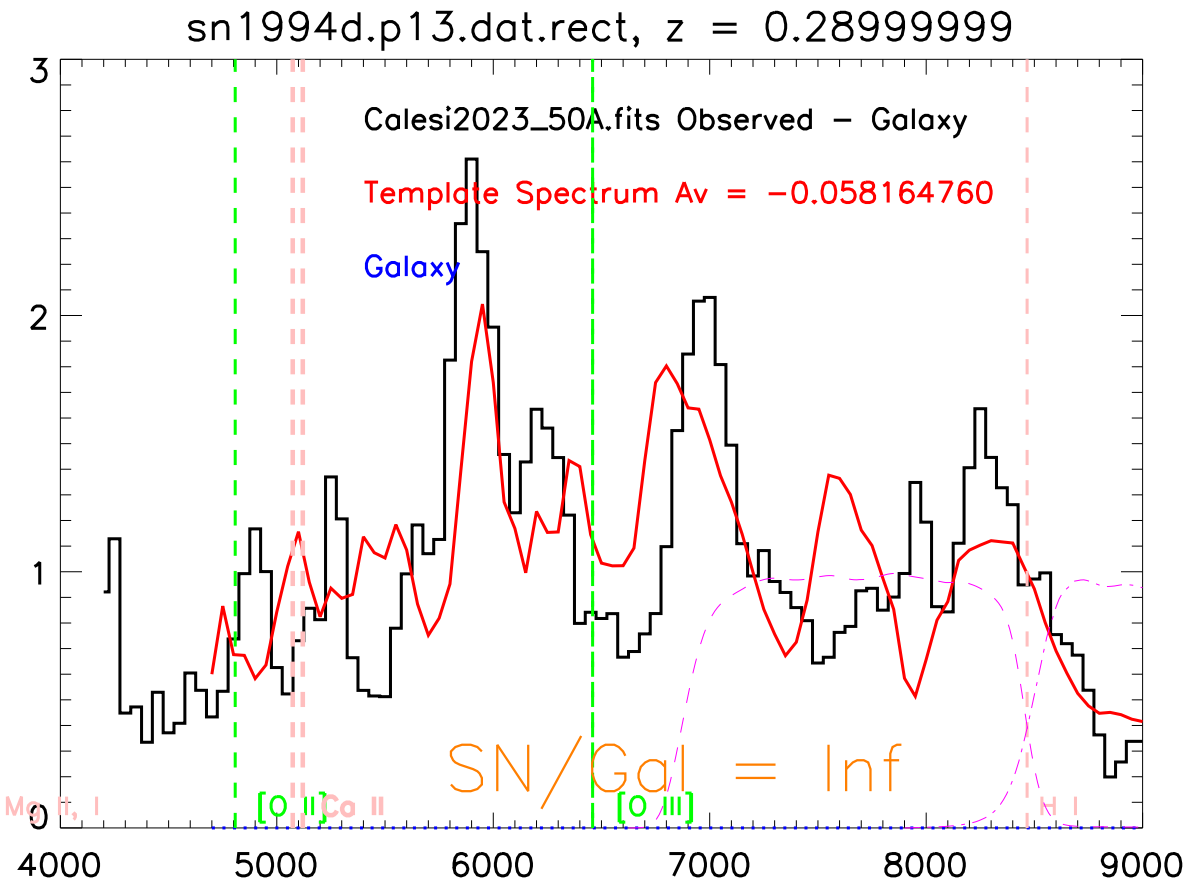
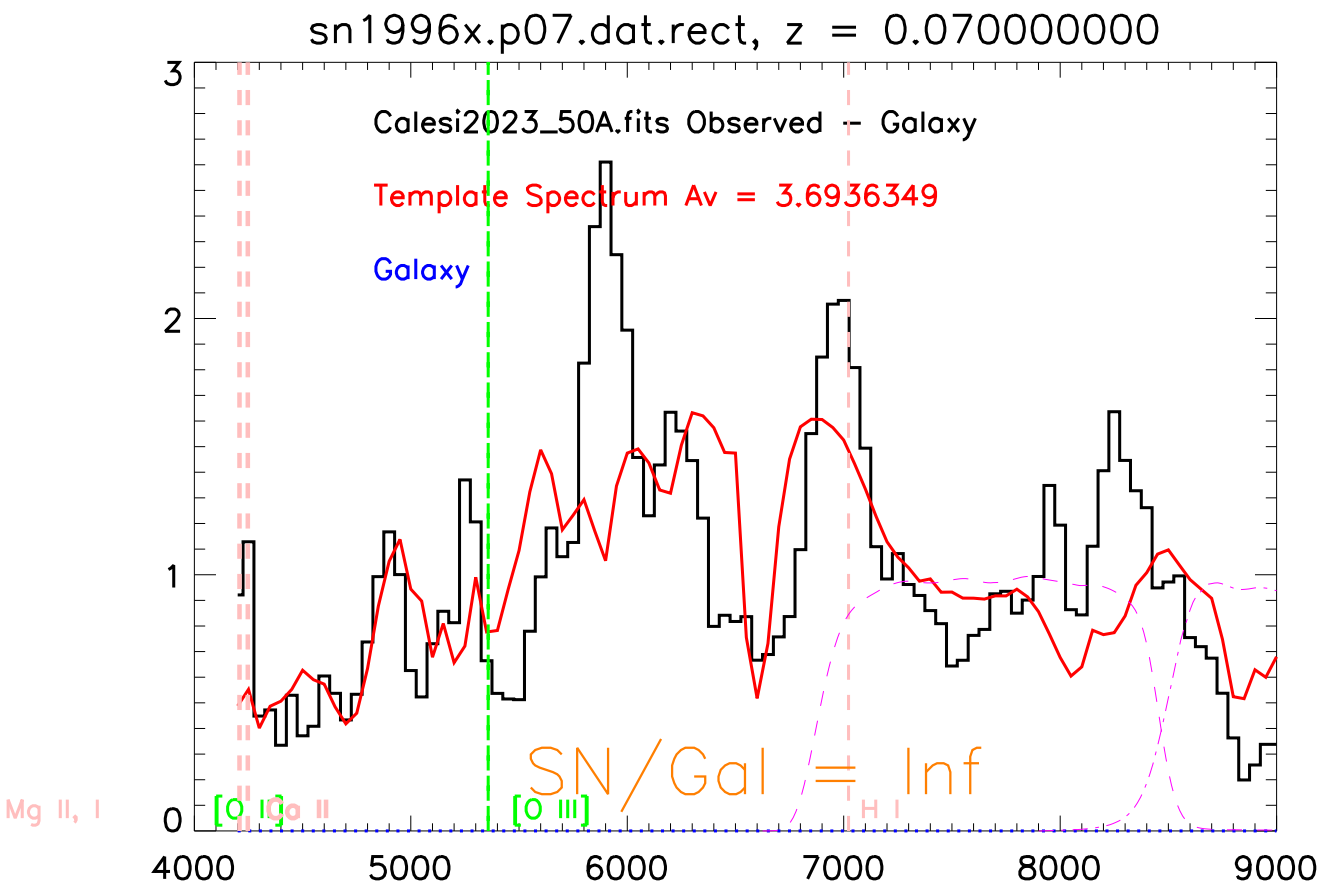
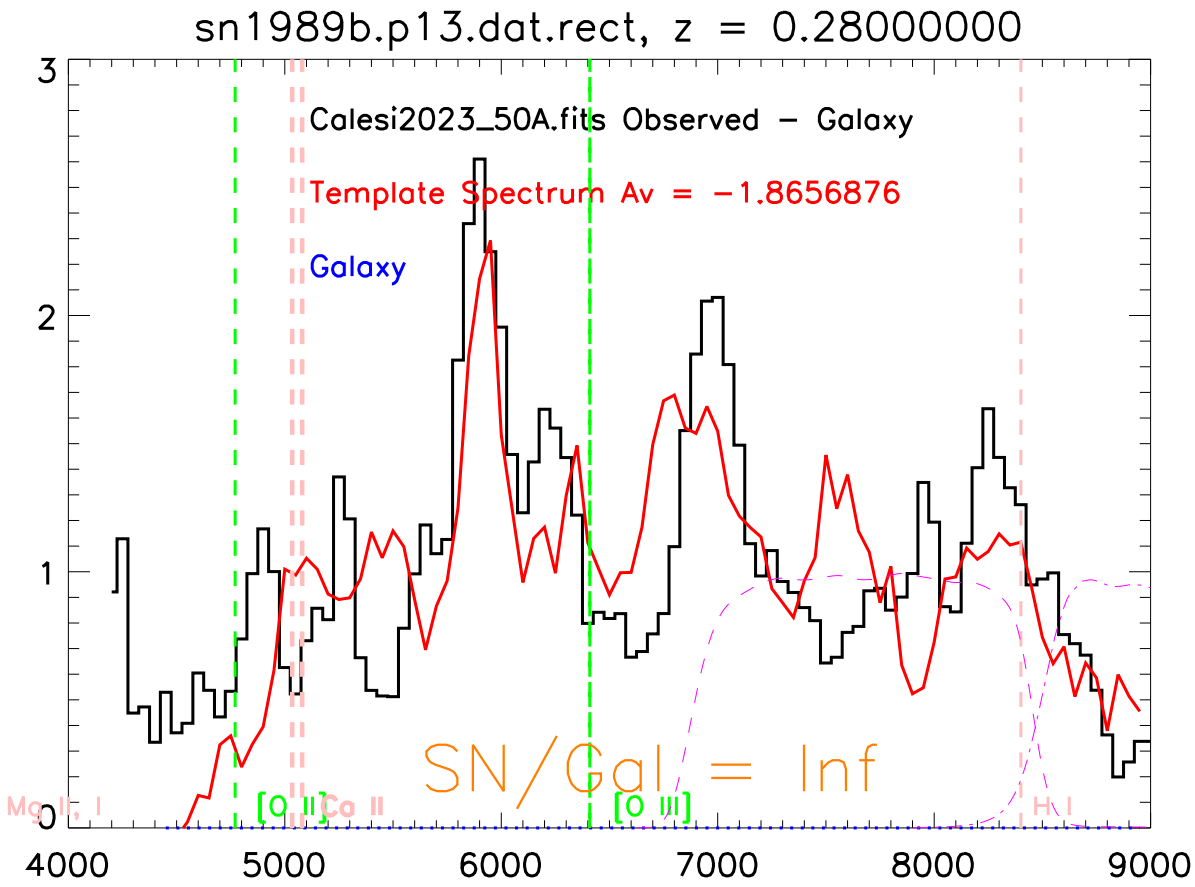
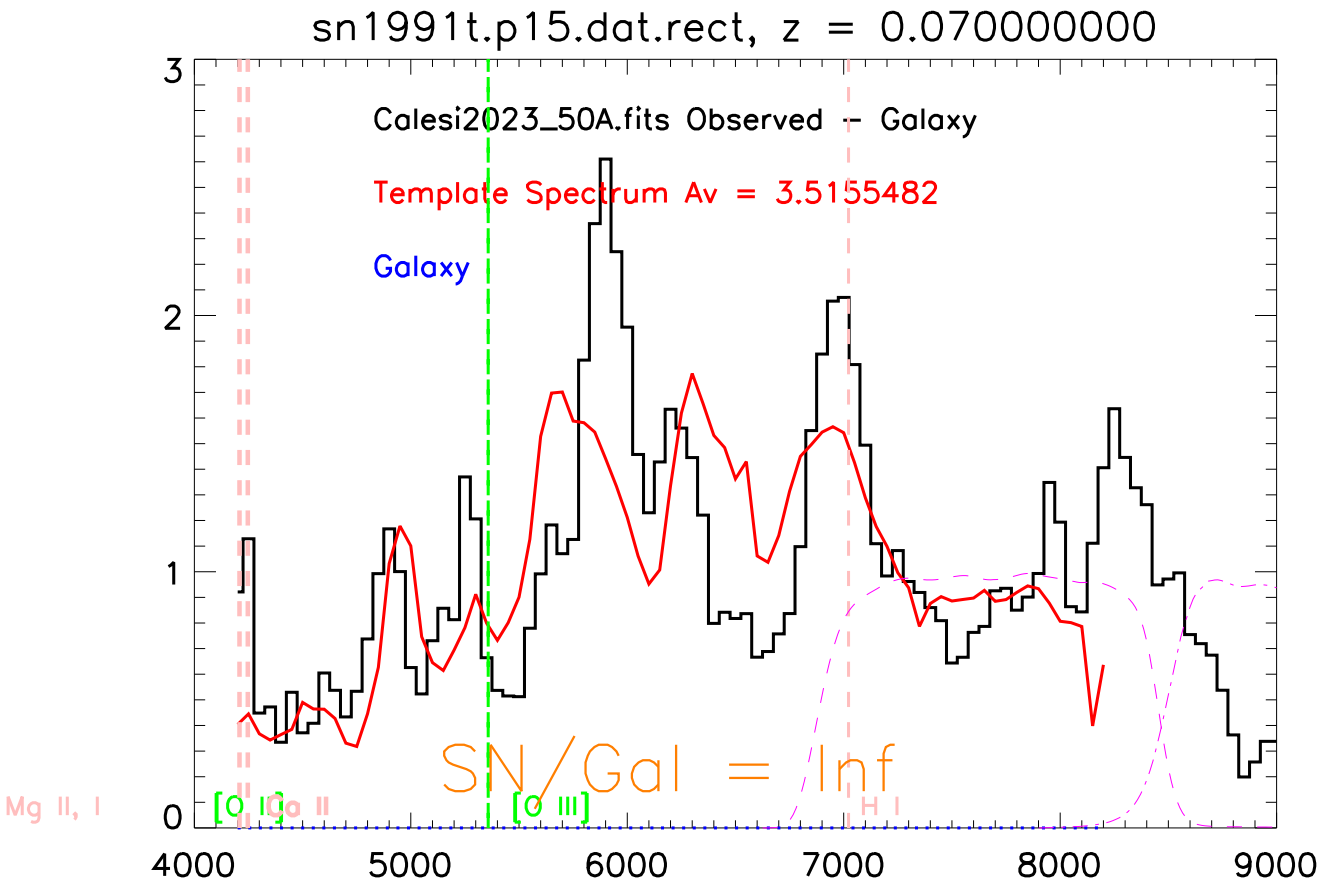
7000
8000
9000


sn1994d.p13.dat.rect, z = 0.28999999
Calesi2023_50A.fits Observed − Galaxy
Template Spectrum Av = −0.058164760
Galaxy
SN/Gal = Inf
[O II]
Ca II
[O III]
H I
3
2
1
0
4000
5000
6000
7000
8000
9000


sn1996x.p07.dat.rect, z = 0.070000000
Calesi2023_50A.fits Observed - Galaxy
Template Spectrum Av = 3.6936349
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
0
1
2
3
4000
5000
6000
7000
8000
9000


sn1989b.p13.dat.rect, z = 0.28000000
Calesi2023_50A.fits Observed − Galaxy
Template Spectrum Av = −1.8656876
Galaxy
SN/Gal = Inf
[O II]
Ca II
[O III]
H I
3
2
1
0
4000
5000
6000
7000
8000
9000


sn1991t.p15.dat.rect, z = 0.070000000
Calesi2023_50A.fits Observed - Galaxy
Template Spectrum Av = 3.5155482
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
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2
3
4000
5000
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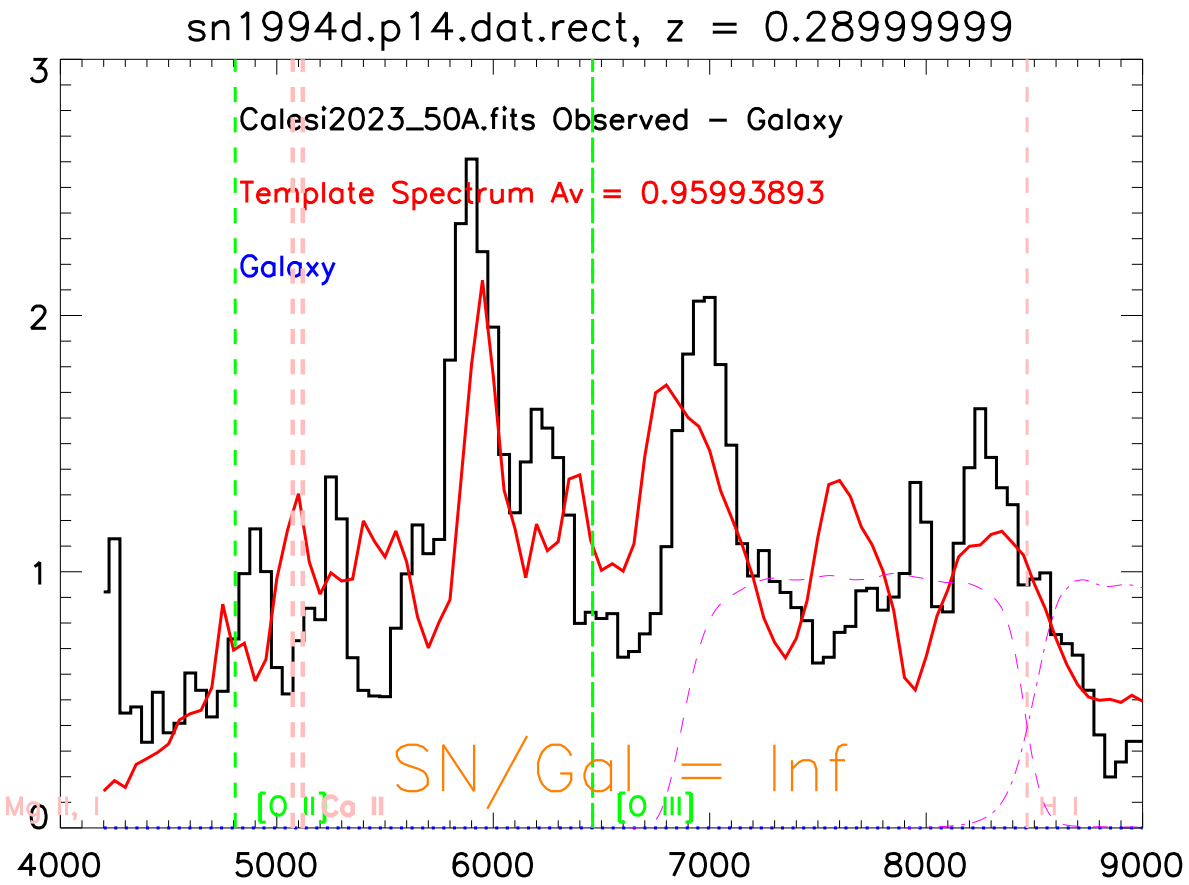
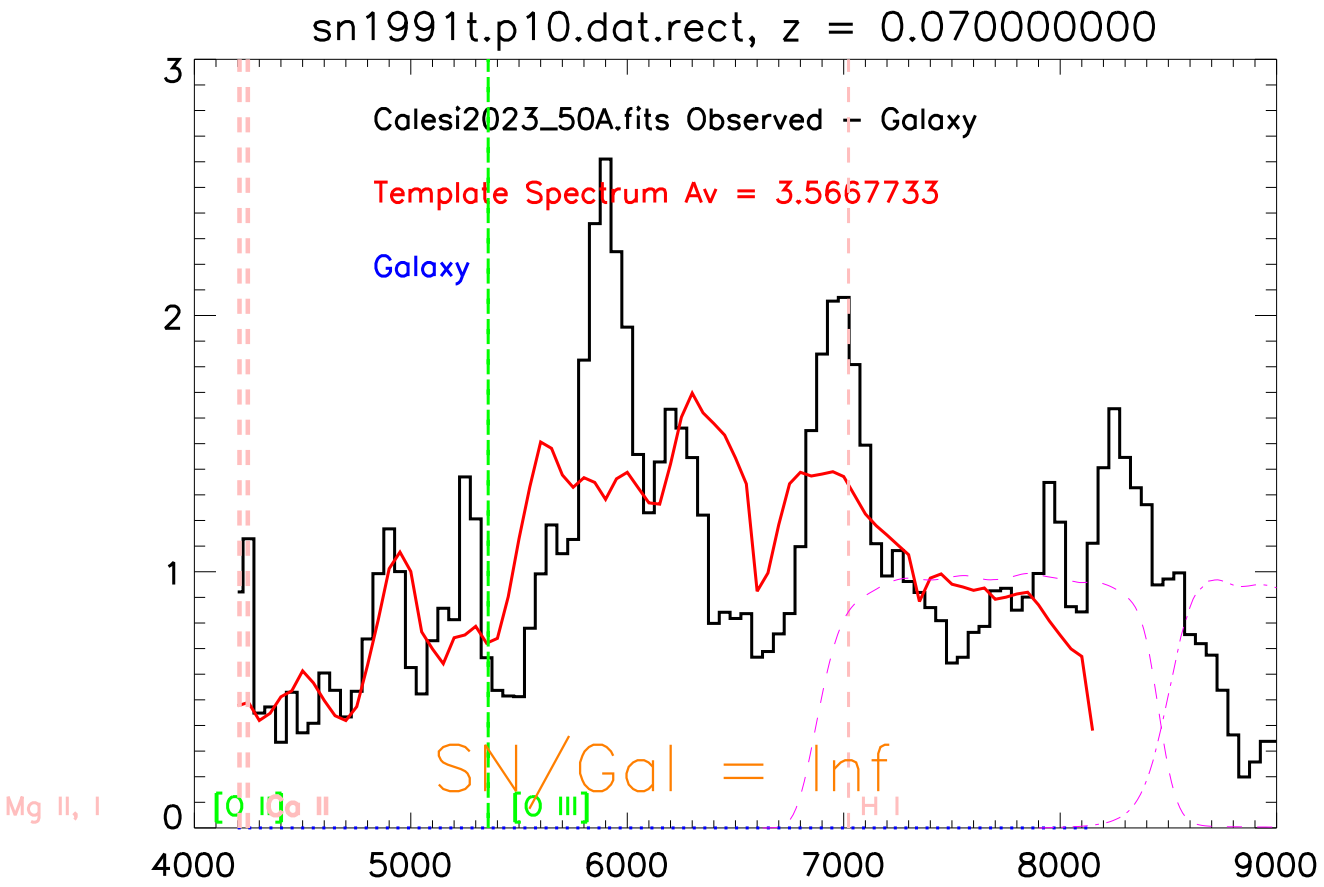
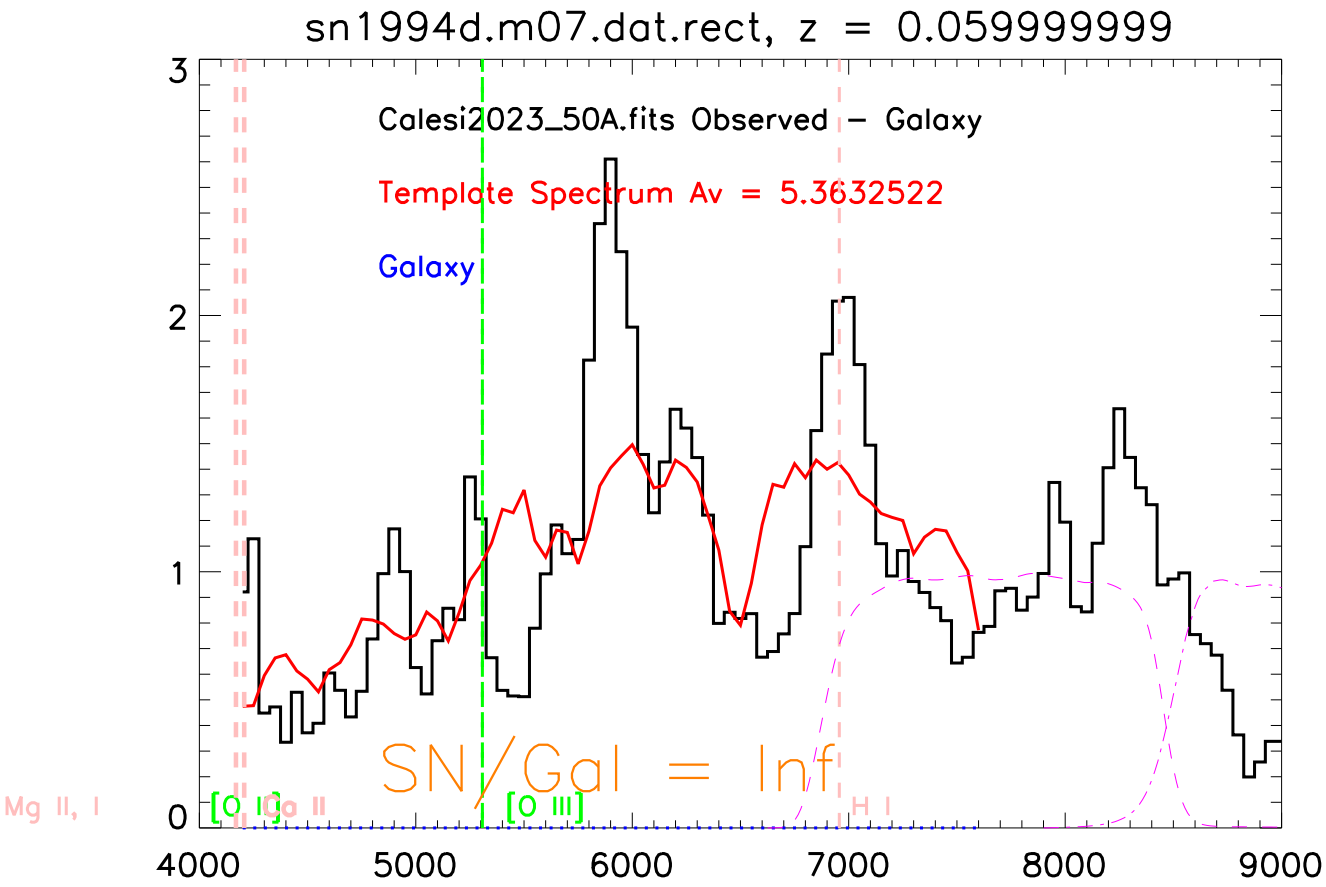
7000
8000
9000


sn1994d.p14.dat.rect, z = 0.28999999
Calesi2023_50A.fits Observed − Galaxy
Template Spectrum Av = 0.95993893
Galaxy
SN/Gal = Inf
[O II]
Ca II
[O III]
H I
3
2
1
0
4000
5000
6000
7000
8000
9000


sn1991t.p10.dat.rect, z = 0.070000000
Calesi2023_50A.fits Observed - Galaxy
Template Spectrum Av = 3.5667733
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
0
1
2
3
4000
5000
6000
7000
8000
9000


sn1994d.m07.dat.rect, z = 0.059999999
Calesi2023_50A.fits Observed – Galaxy
Template Spectrum Av = 5.3632522
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
0
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2
3
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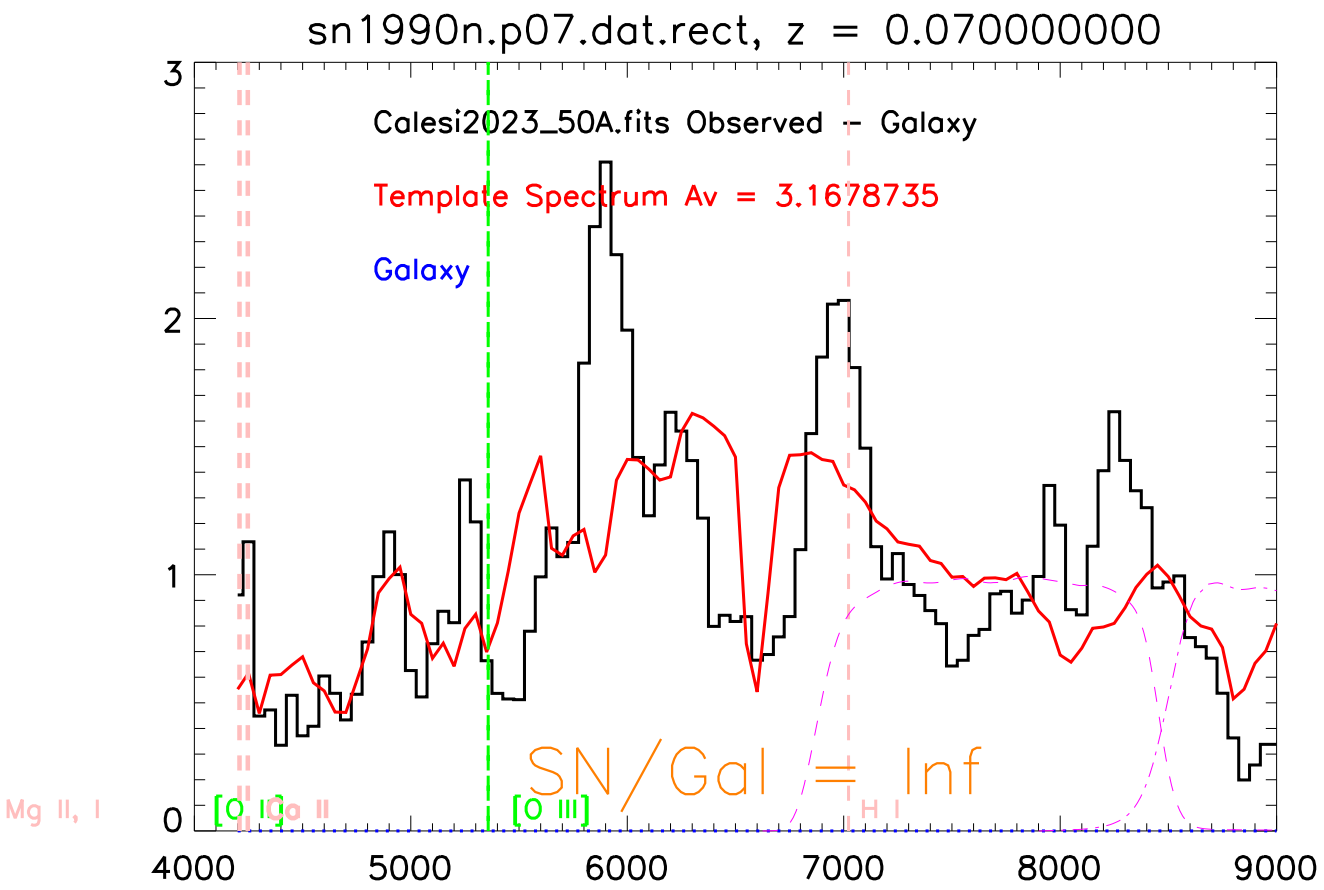
sn1990n.p07.dat.rect, z = 0.070000000
Calesi2023_50A.fits Observed - Galaxy
Template Spectrum Av = 3.1678735
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
0
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3
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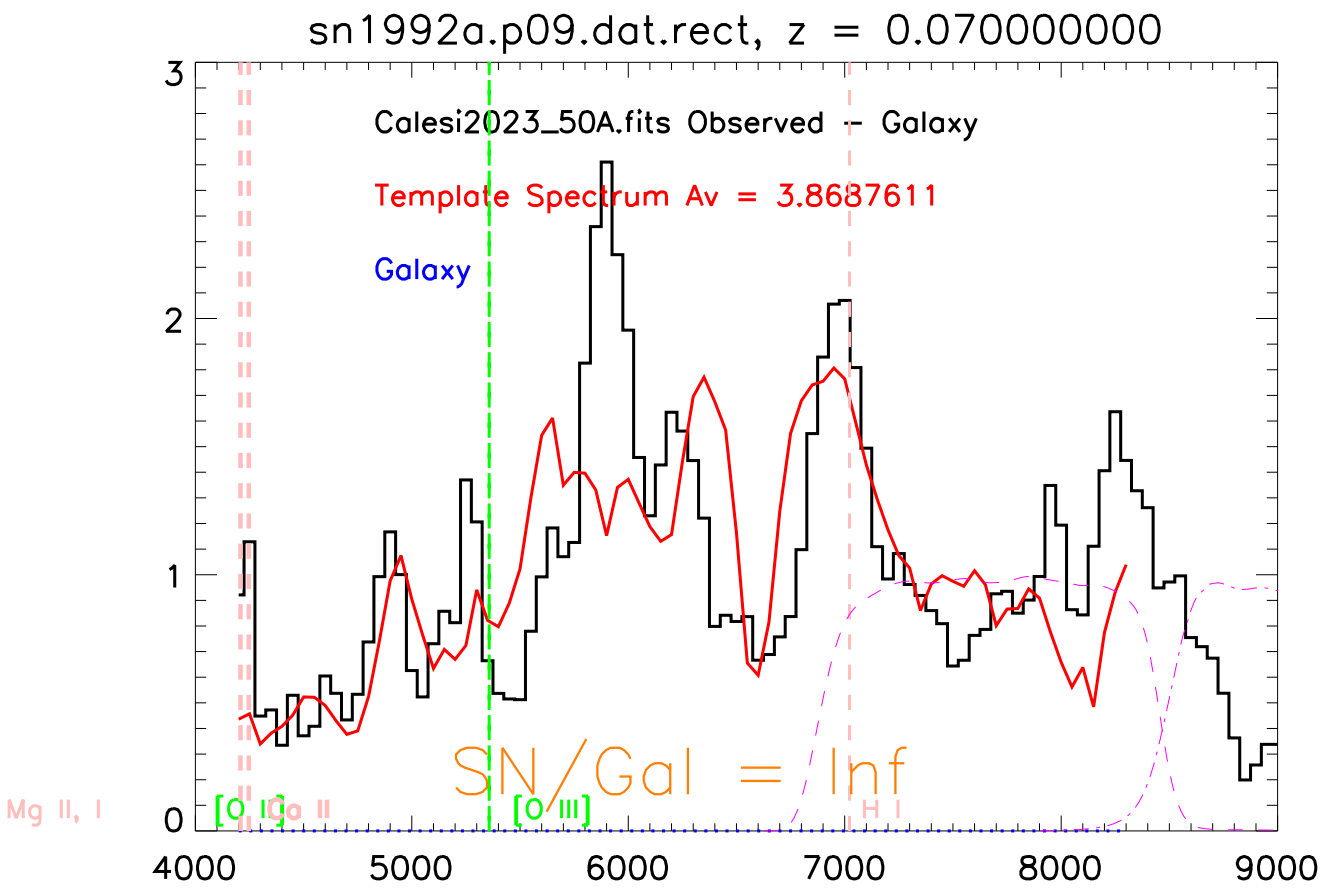
7000
8000
9000


sn1992a.p09.dat.rect, z = 0.070000000
Calesi2023_50A.fits Observed - Galaxy
Template Spectrum Av = 3.8687611
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
0
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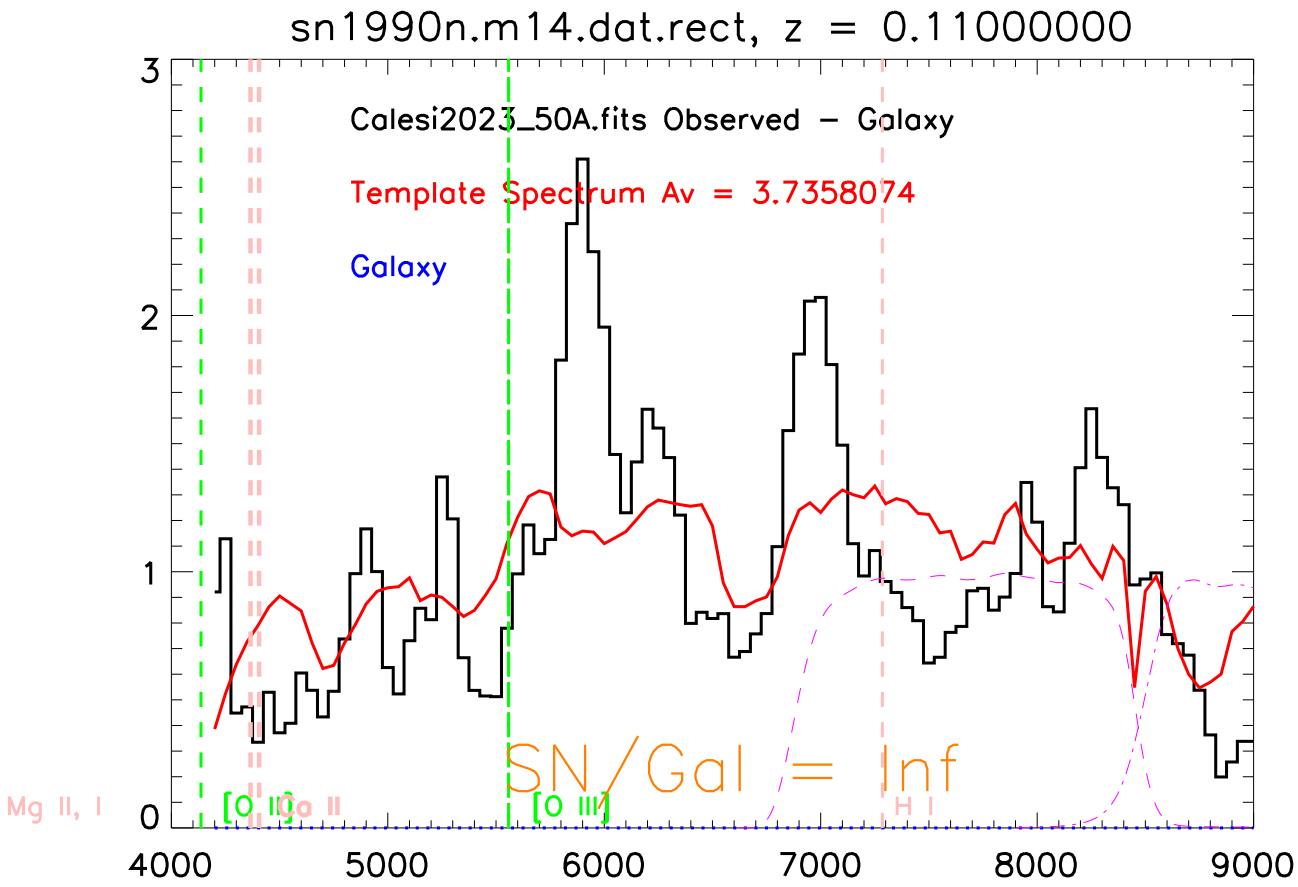
3
4000
5000
6000
7000
8000
9000


sn1990n.m14.dat.rect, z = 0.11000000
Calesi2023_50A.fits Observed − Galaxy
Template Spectrum Av = 3.7358074
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
0
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4000
5000
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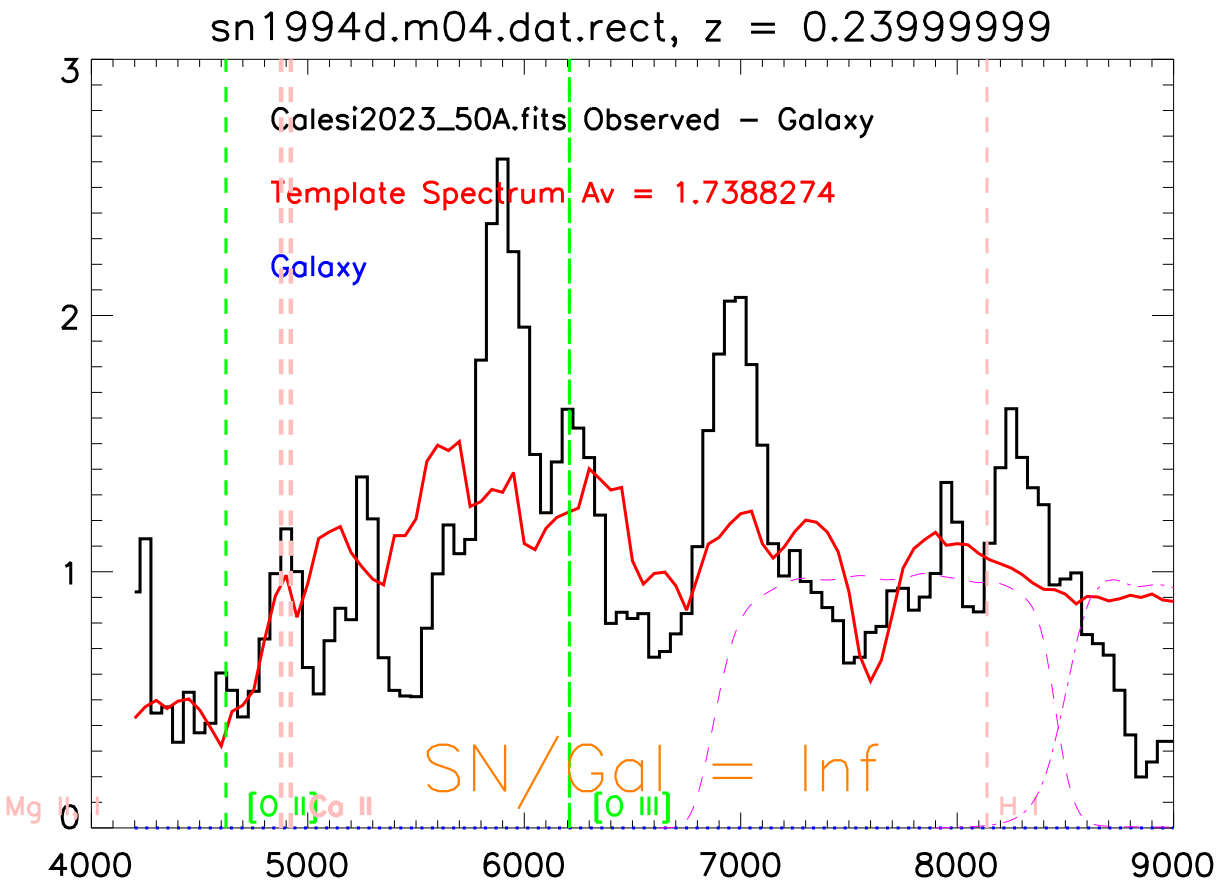
7000
8000
9000


sn1994d.m04.dat.rect, z = 0.23999999
Calesi2023_50A.fits Observed − Galaxy
Template Spectrum Av = 1.7388274
Galaxy
SN/Gal = Inf
[O II]
Ca II
[O III]
H I
Mg II
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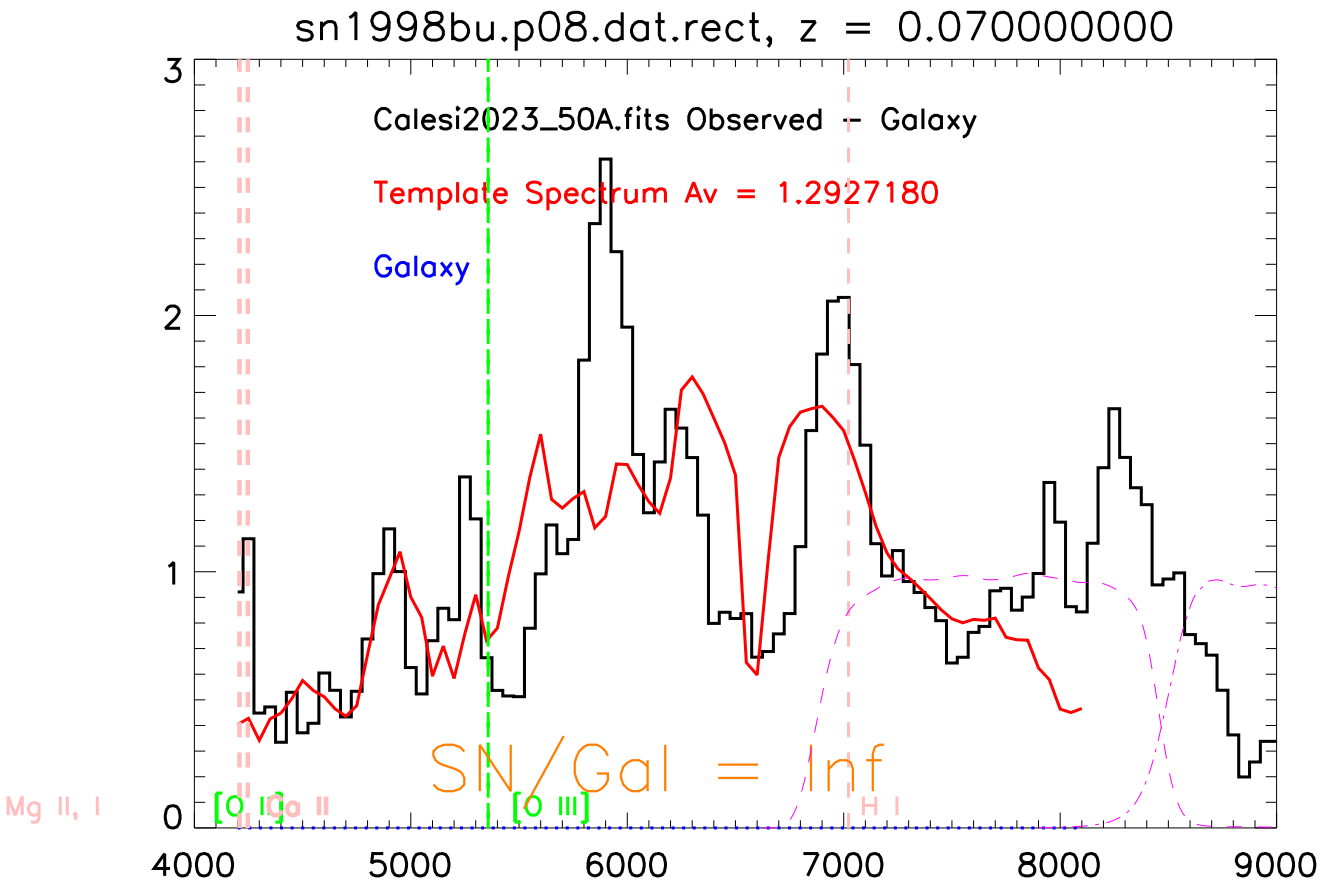
0
4000
5000
6000
7000
8000
9000


sn1998bu.p08.dat.rect, z = 0.070000000
Calesi2023_50A.fits Observed - Galaxy
Template Spectrum Av = 1.2927180
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
0
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4000
5000
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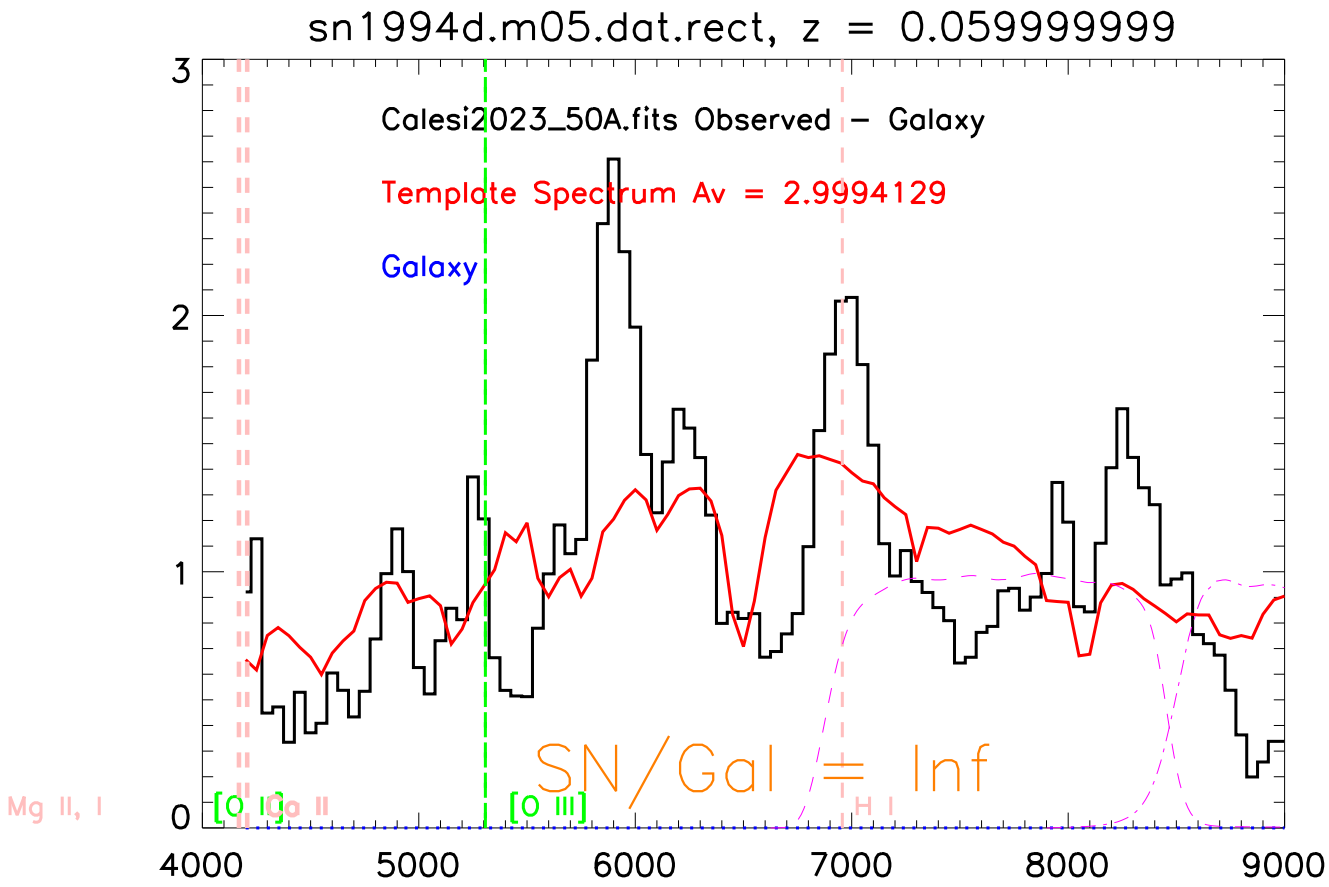
9000


sn1994d.m05.dat.rect, z = 0.059999999
Calesi2023_50A.fits Observed – Galaxy
Template Spectrum Av = 2.9994129
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
0
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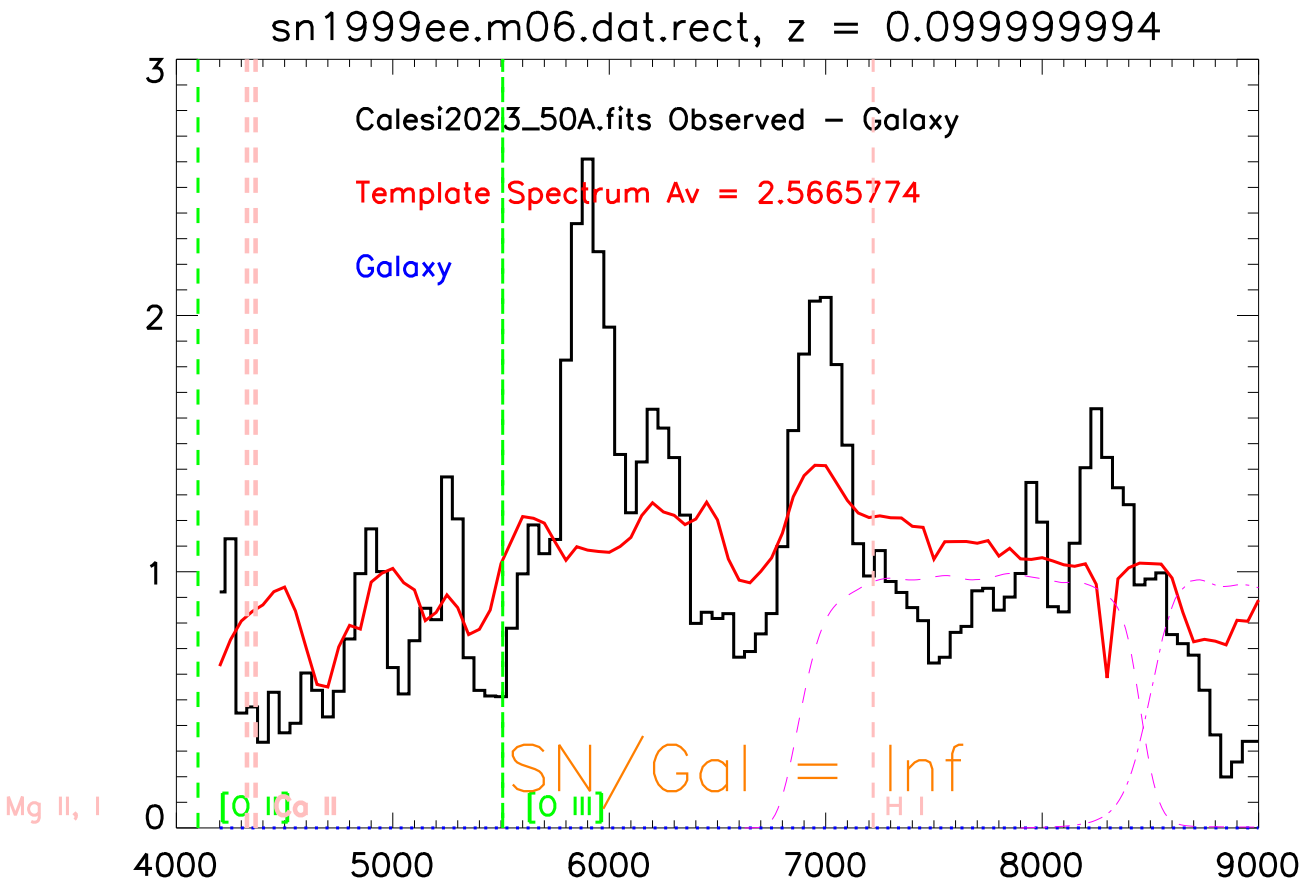
8000
9000


sn1999ee.m06.dat.rect, z = 0.099999994
Calesi2023_50A.fits Observed − Galaxy
Template Spectrum Av = 2.5665774
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
0
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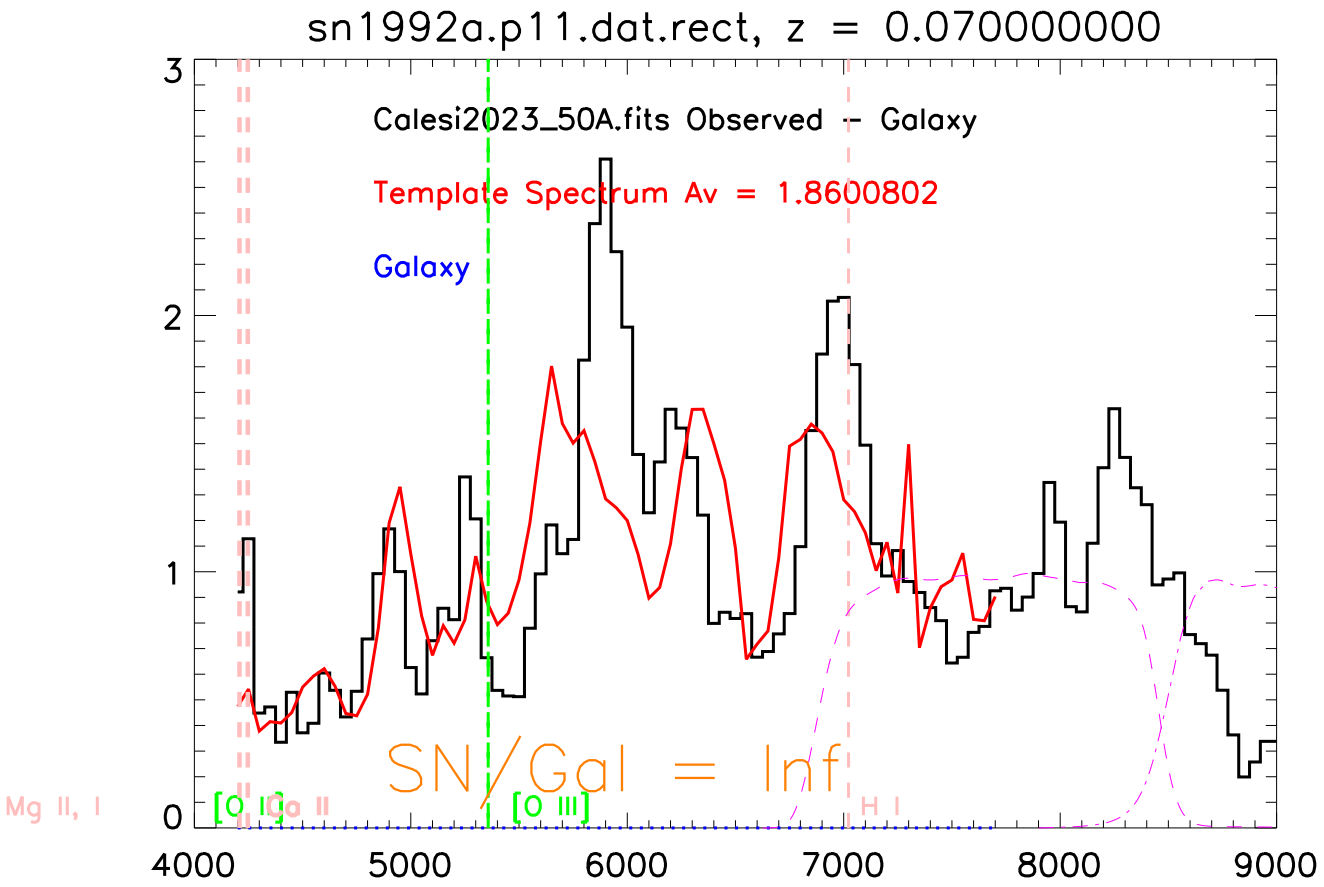
7000
8000
9000


sn1992a.p11.dat.rect, z = 0.070000000
Calesi2023_50A.fits Observed - Galaxy
Template Spectrum Av = 1.8600802
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
0
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4000
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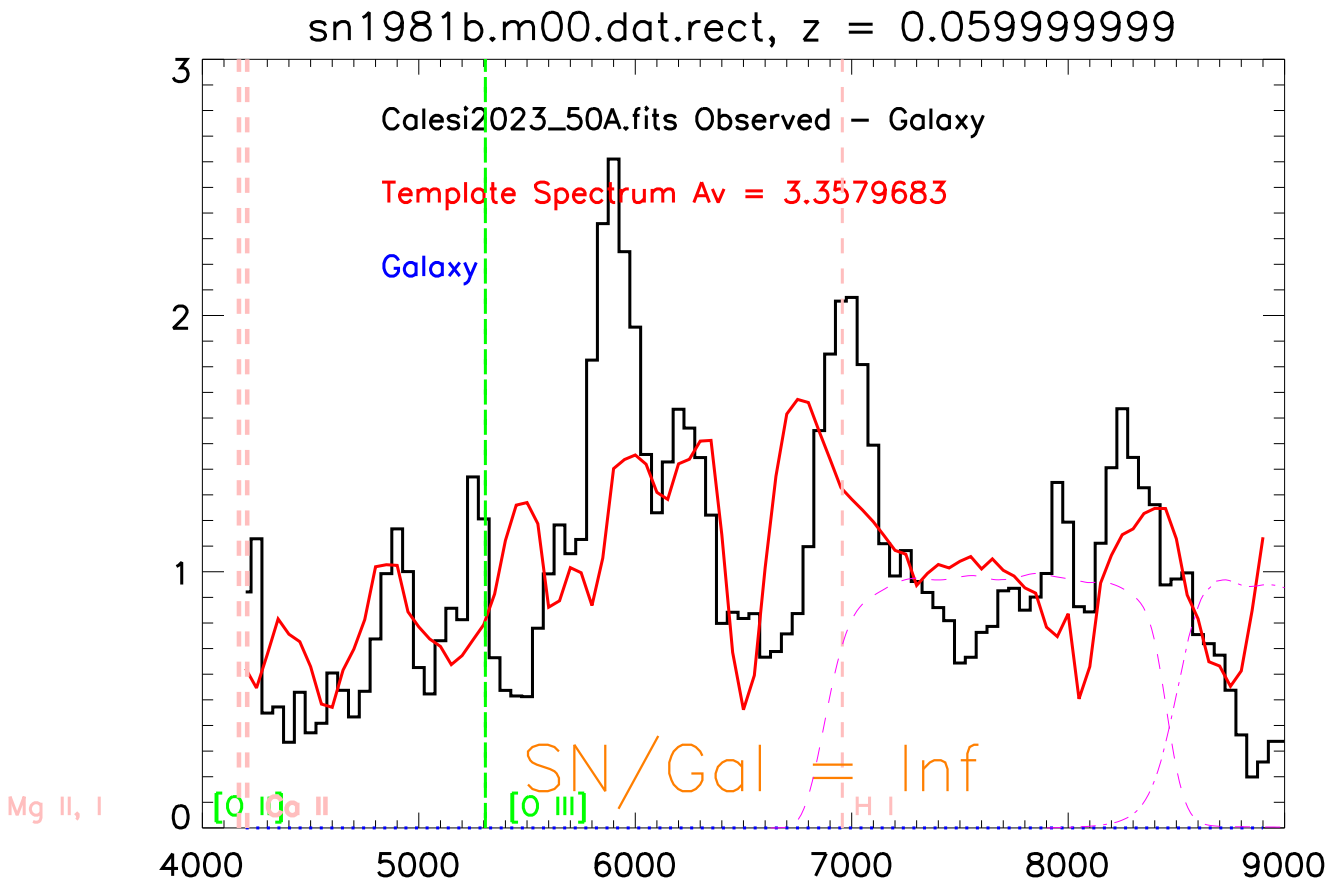
6000
7000
8000
9000


sn1981b.m00.dat.rect, z = 0.059999999
Calesi2023_50A.fits Observed – Galaxy
Template Spectrum Av = 3.3579683
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
0
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4000
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7000
8000
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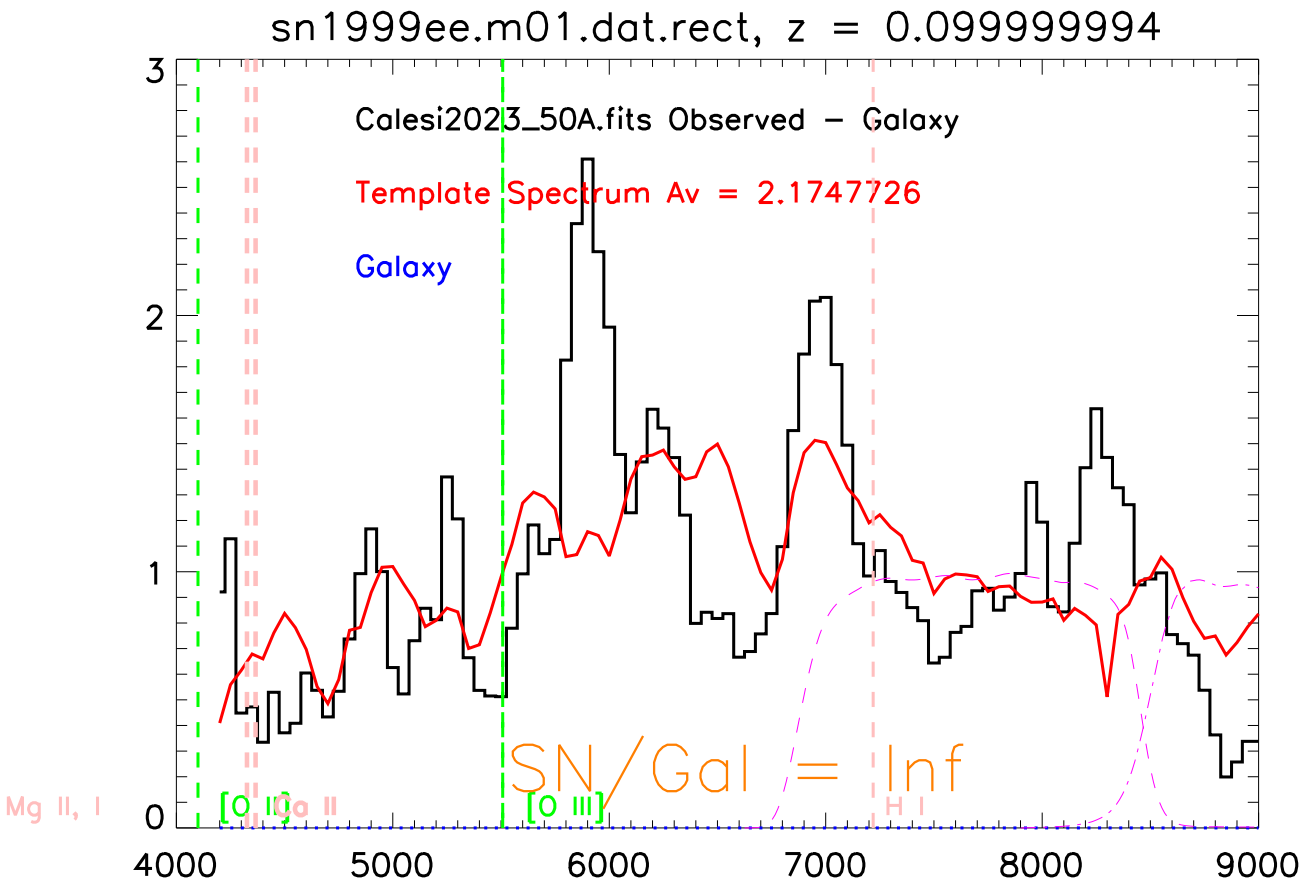
sn1999ee.m01.dat.rect, z = 0.099999994
Calesi2023_50A.fits Observed − Galaxy
Template Spectrum Av = 2.1747726
Galaxy
SN/Gal = Inf
Mg II, I
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Ca II
[O III]
H I
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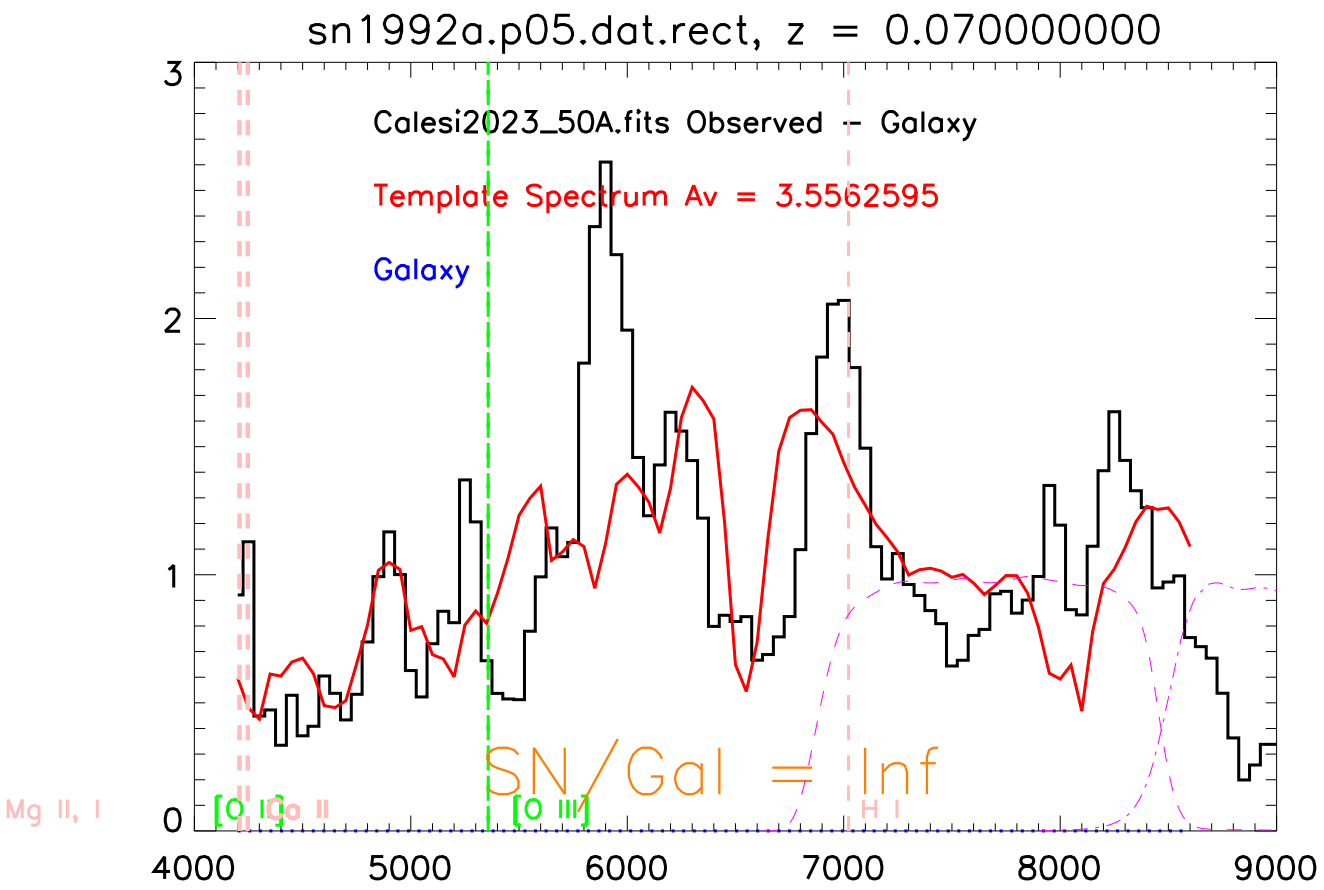
7000
8000
9000


sn1992a.p05.dat.rect, z = 0.070000000
Calesi2023_50A.fits Observed - Galaxy
Template Spectrum Av = 3.5562595
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
0
1
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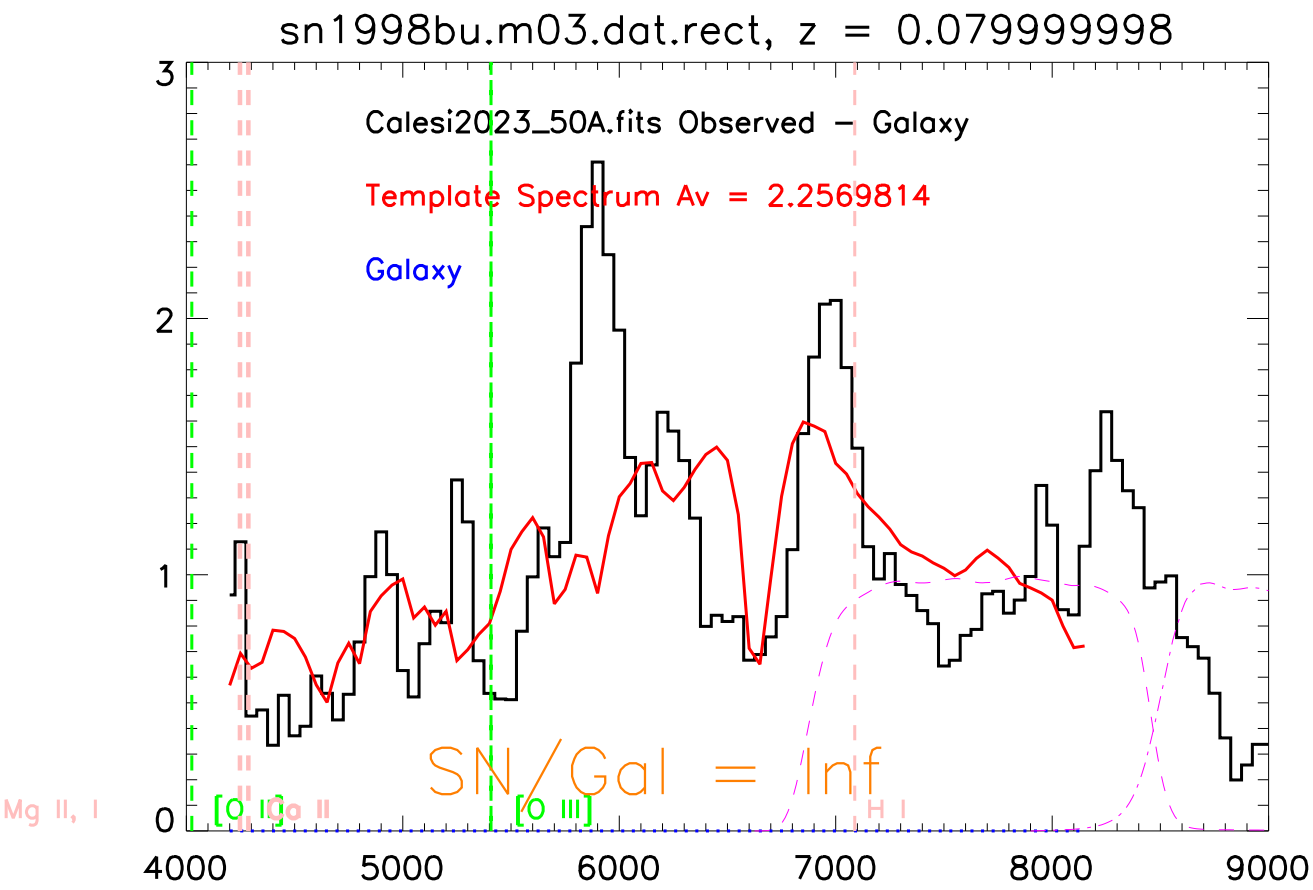
4000
5000
6000
7000
8000
9000


sn1998bu.m03.dat.rect, z = 0.079999998
Calesi2023_50A.fits Observed – Galaxy
Template Spectrum Av = 2.2569814
Galaxy
SN/Gal = Inf
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Ca II
[O III]
H I
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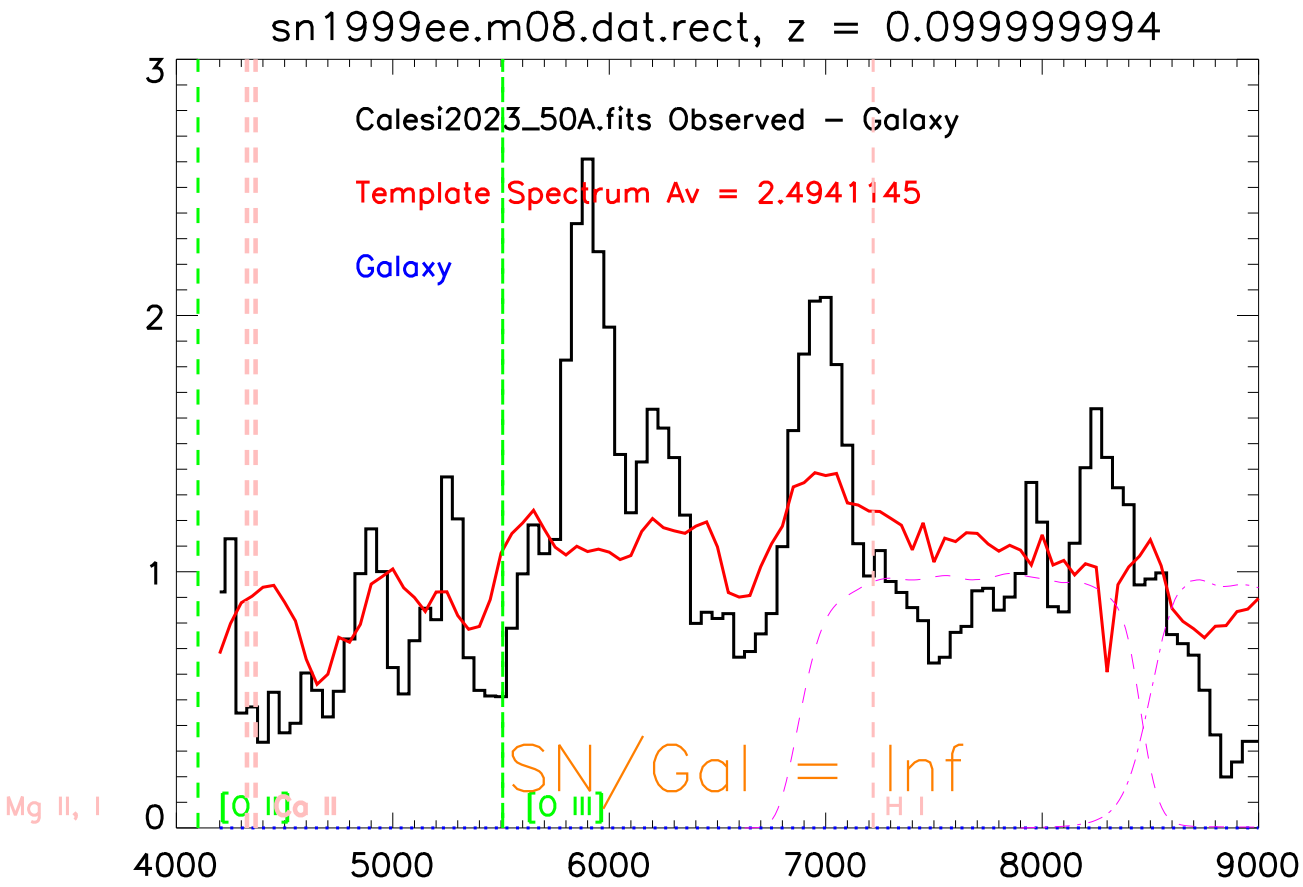
sn1999ee.m08.dat.rect, z = 0.099999994
Calesi2023_50A.fits Observed − Galaxy
Template Spectrum Av = 2.4941145
Galaxy
SN/Gal = Inf
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Ca II
[O III]
H I
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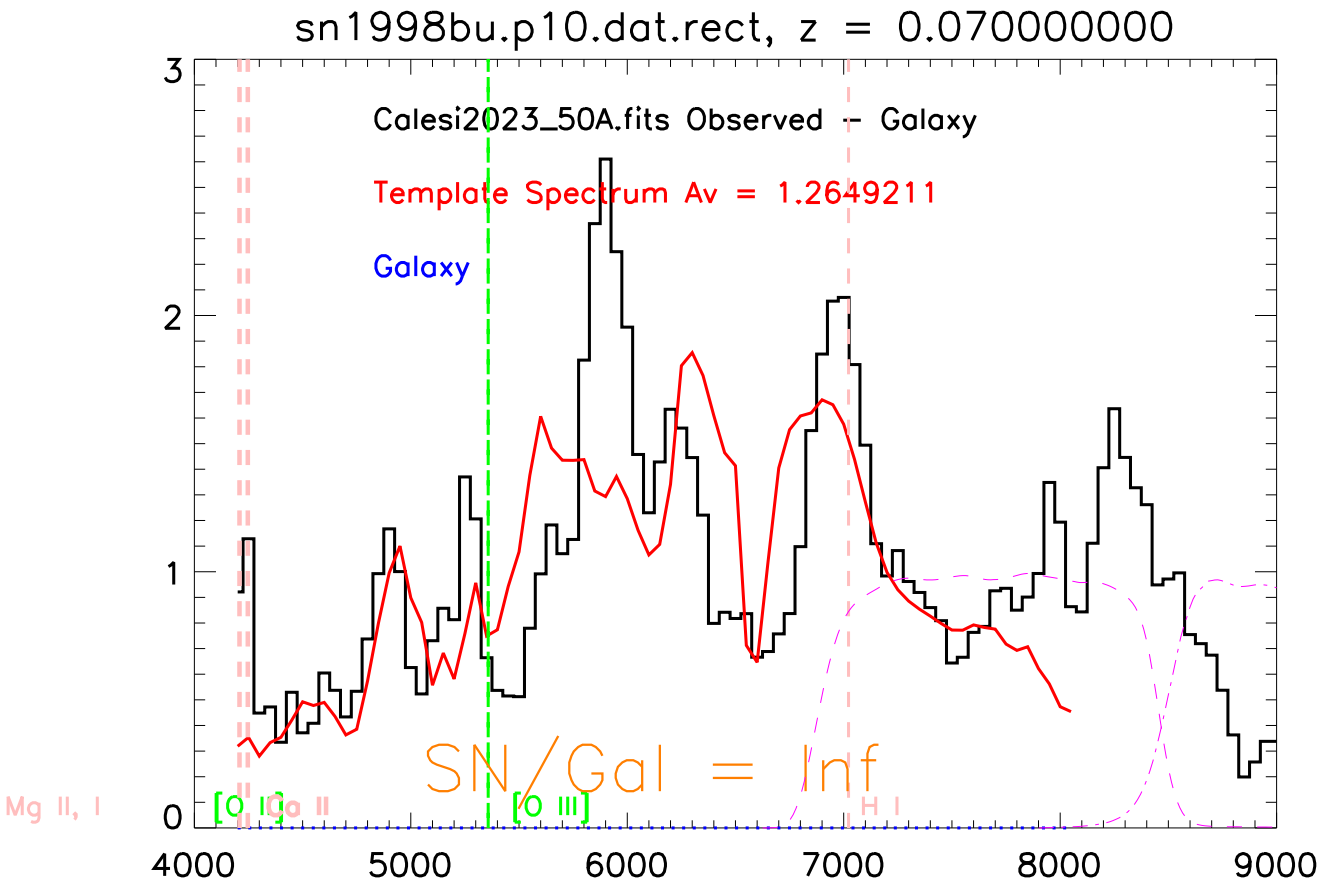
sn1998bu.p10.dat.rect, z = 0.070000000
Calesi2023_50A.fits Observed - Galaxy
Template Spectrum Av = 1.2649211
Galaxy
SN/Gal = Inf
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Ca II
[O III]
H I
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0
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7000
8000
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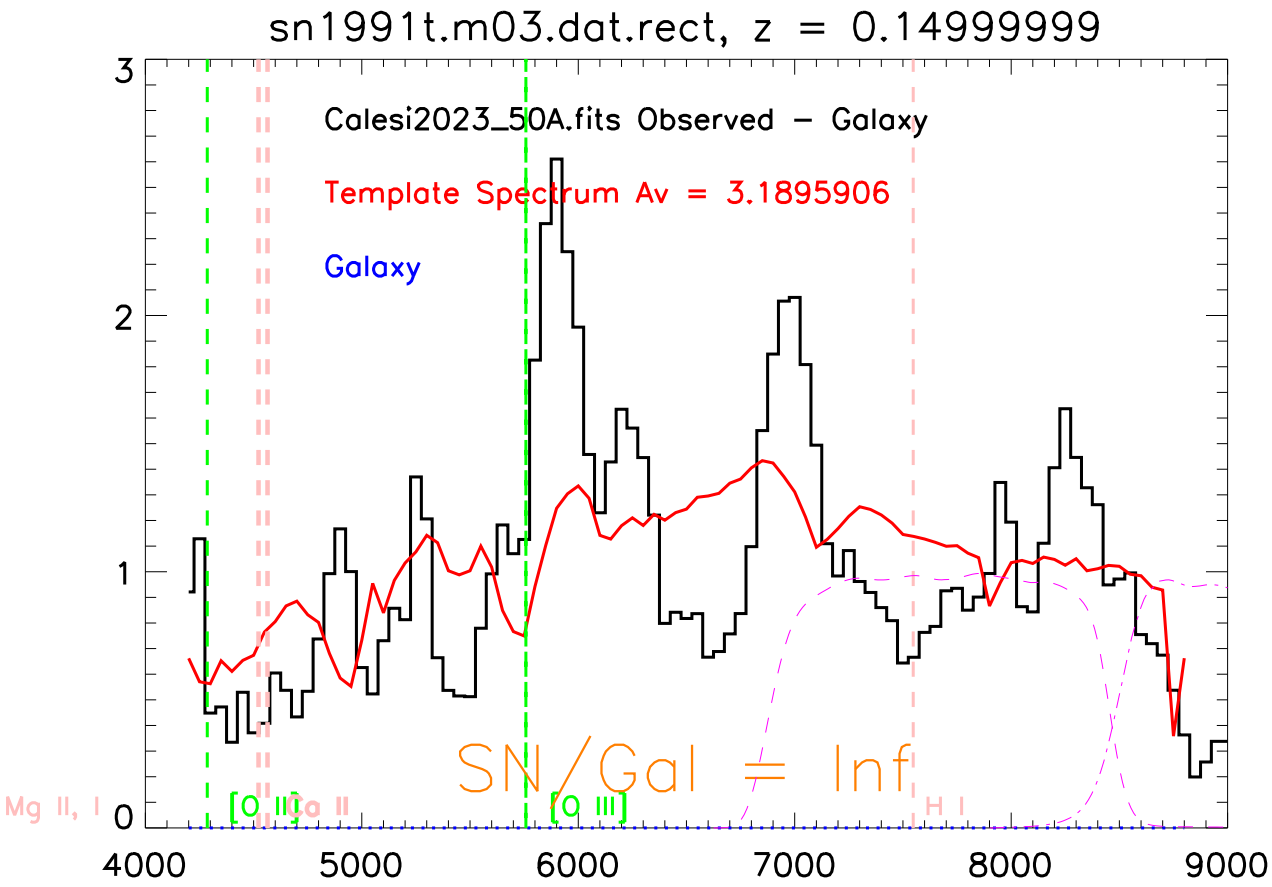
sn1991t.m03.dat.rect, z = 0.14999999
Calesi2023_50A.fits Observed − Galaxy
Template Spectrum Av = 3.1895906
Galaxy
SN/Gal = Inf
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Ca II
[O III]
H I
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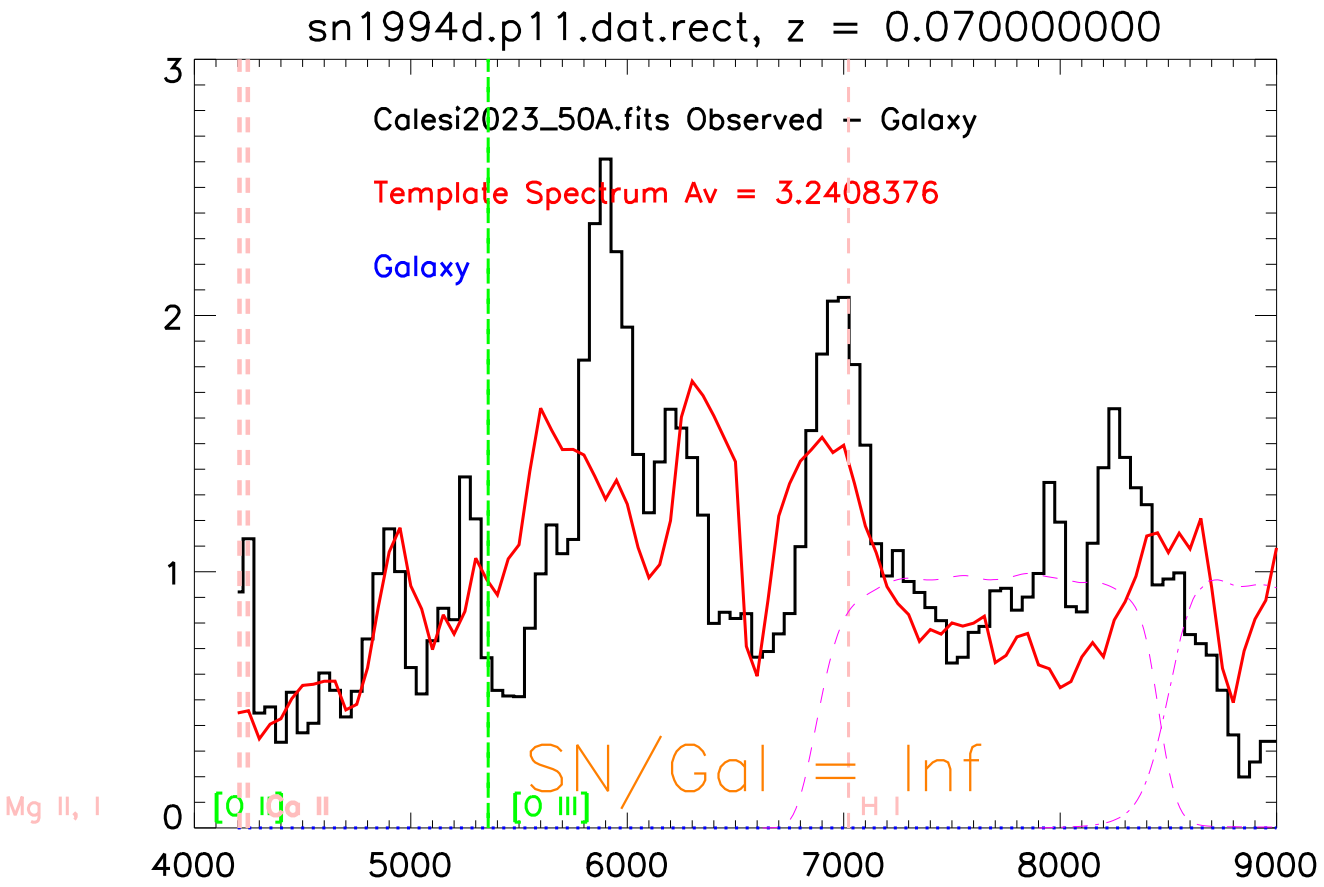
sn1994d.p11.dat.rect, z = 0.070000000
Calesi2023_50A.fits Observed - Galaxy
Template Spectrum Av = 3.2408376
Galaxy
SN/Gal = Inf
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Ca II
[O III]
H I
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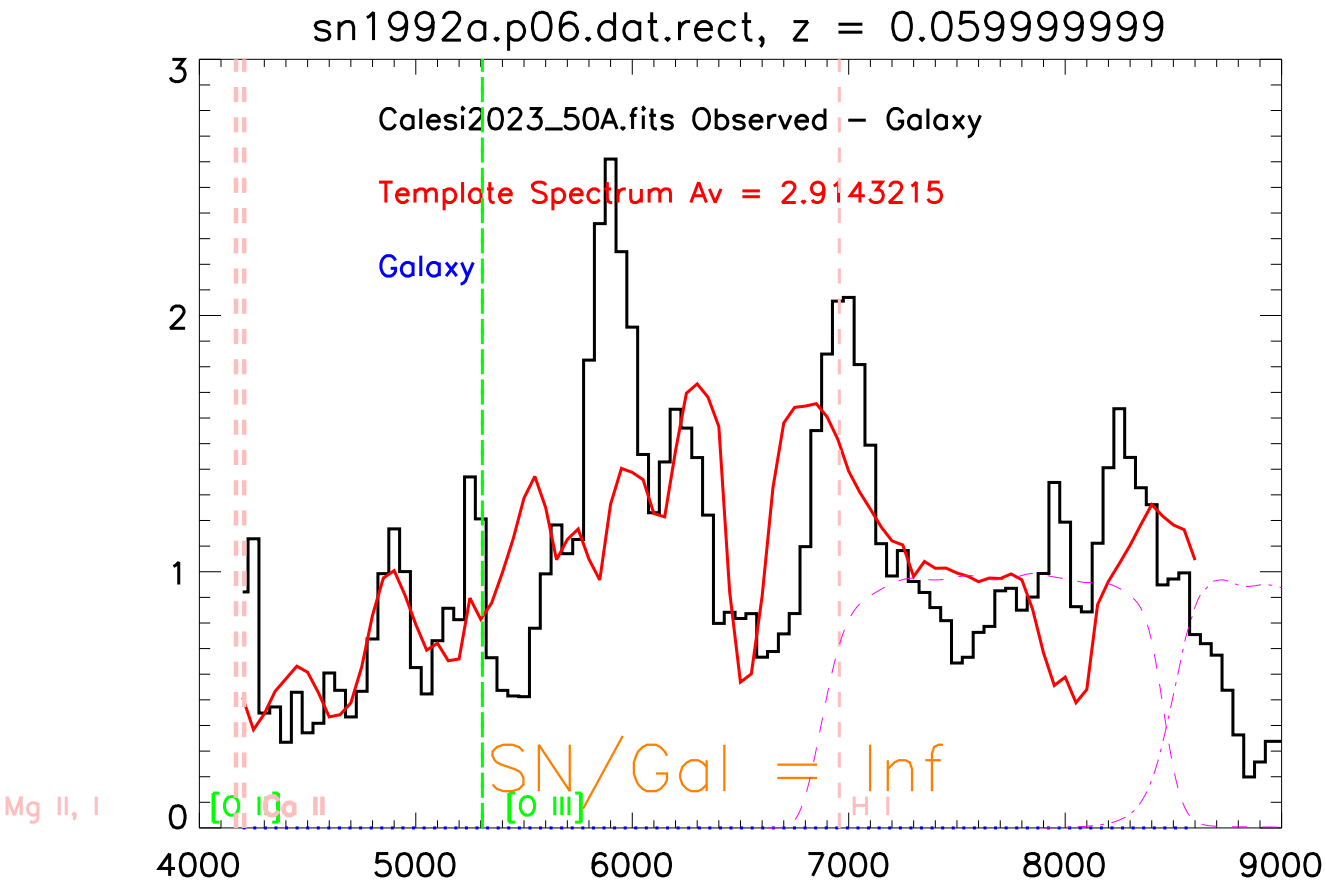
sn1992a.p06.dat.rect, z = 0.059999999
Calesi2023_50A.fits Observed – Galaxy
Template Spectrum Av = 2.9143215
Galaxy
SN/Gal = Inf
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[O II]
Ca II
[O III]
H I
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2
3
4000
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7000
8000
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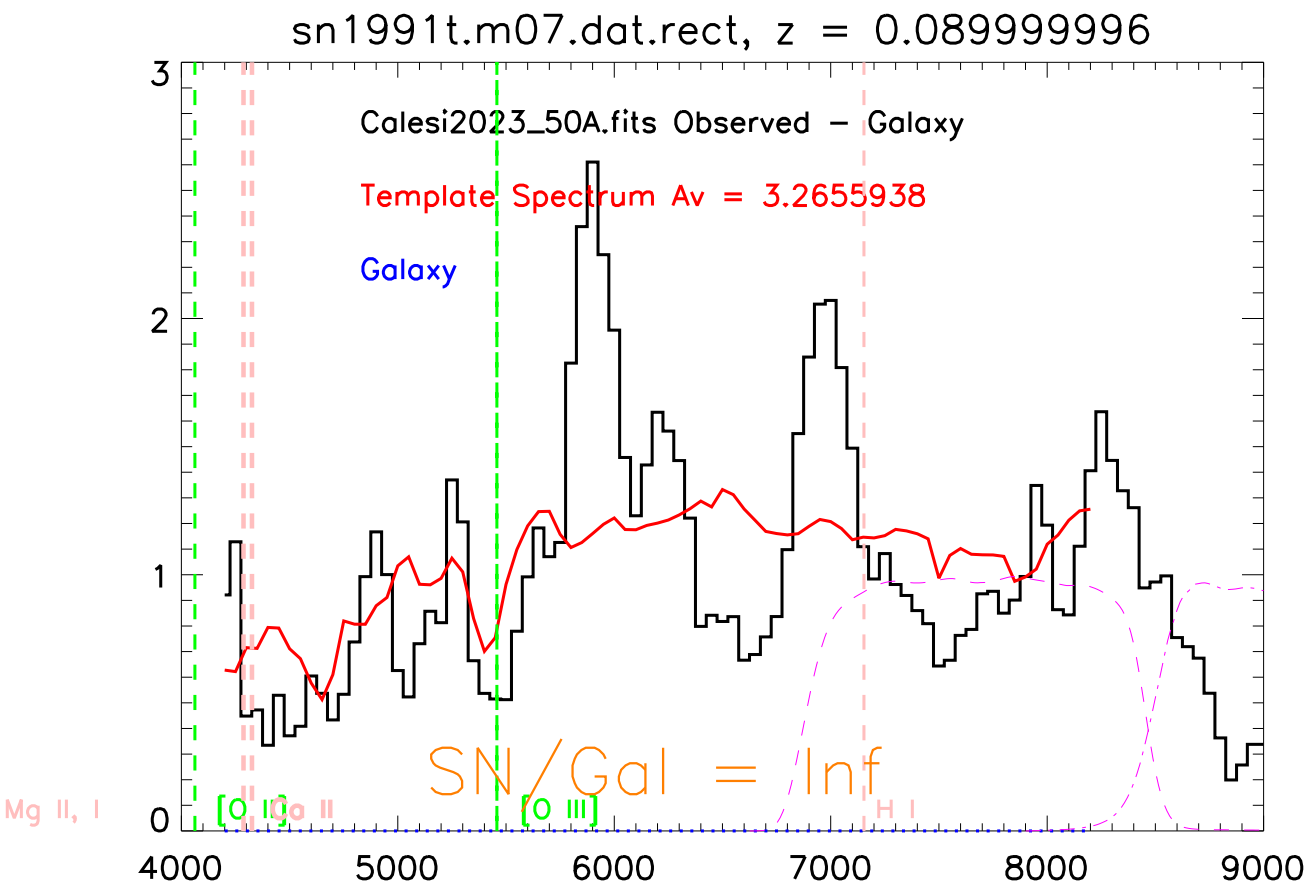
sn1991t.m07.dat.rect, z = 0.089999996
Calesi2023_50A.fits Observed − Galaxy
Template Spectrum Av = 3.2655938
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
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2
3
4000
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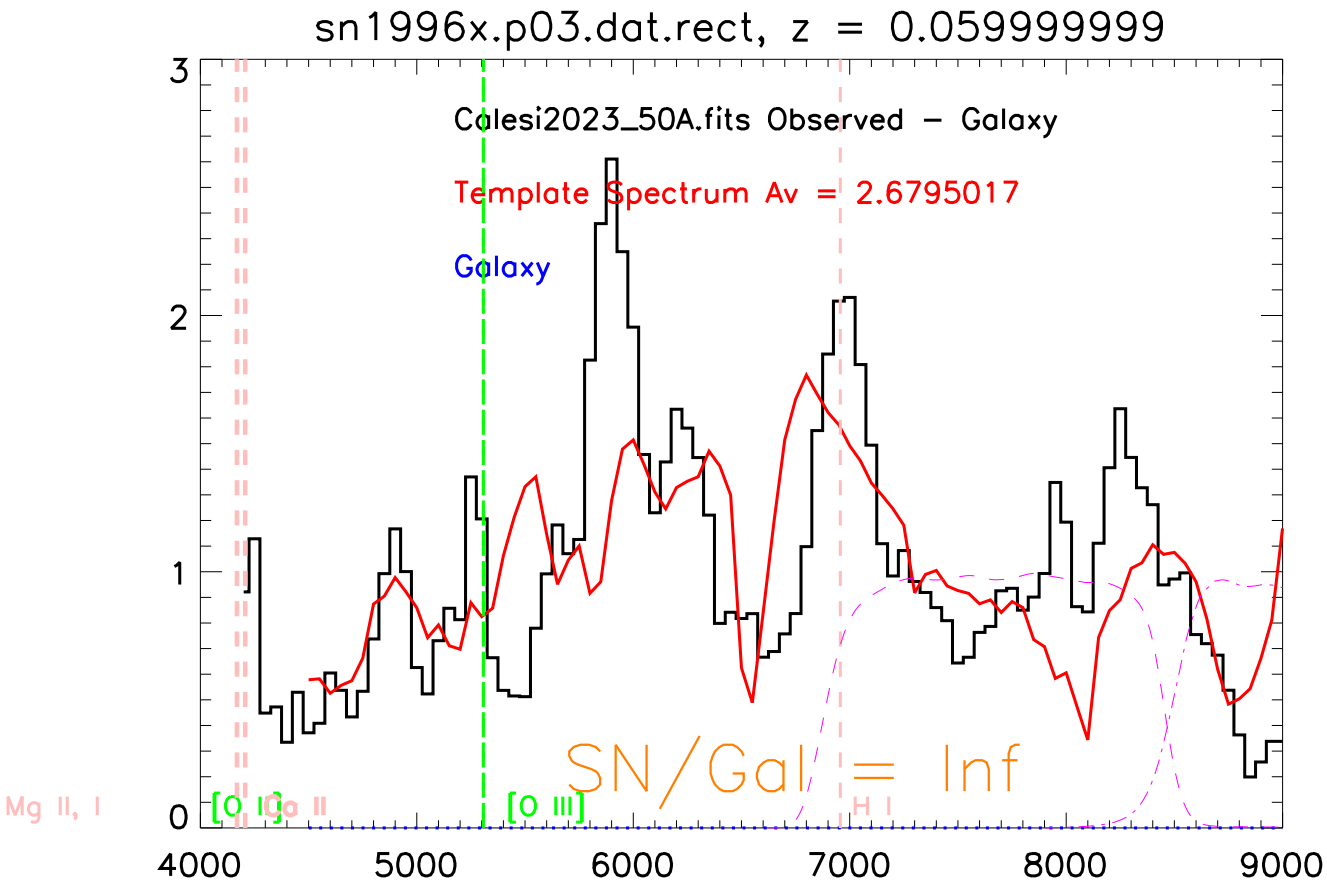
8000
9000


sn1996x.p03.dat.rect, z = 0.059999999
Calesi2023_50A.fits Observed − Galaxy
Template Spectrum Av = 2.6795017
Galaxy
SN/Gal = Inf
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Ca II
[O III]
H I
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2
3
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8000
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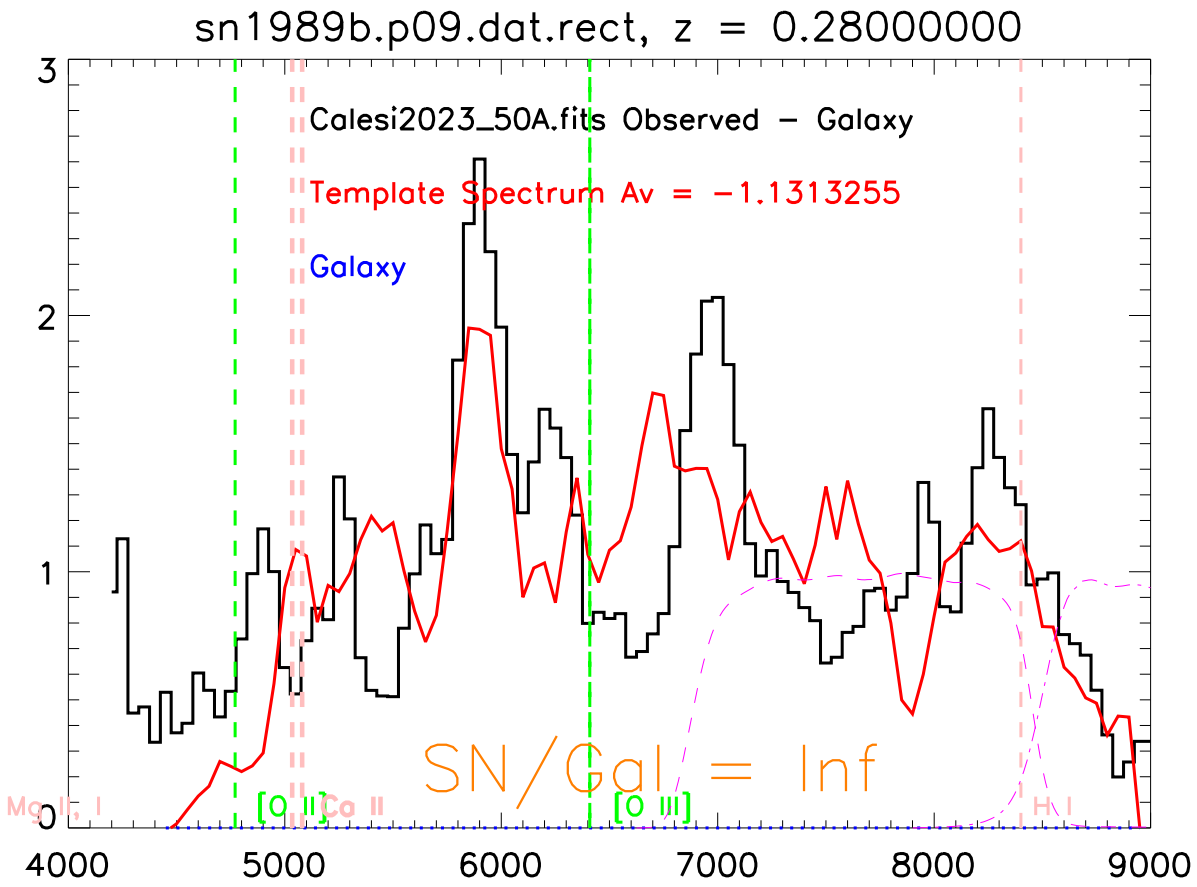
sn1989b.p09.dat.rect, z = 0.28000000
Calesi2023_50A.fits Observed − Galaxy
Template Spectrum Av = −1.1313255
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SN/Gal = Inf
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Ca II
[O III]
H I
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7000
8000
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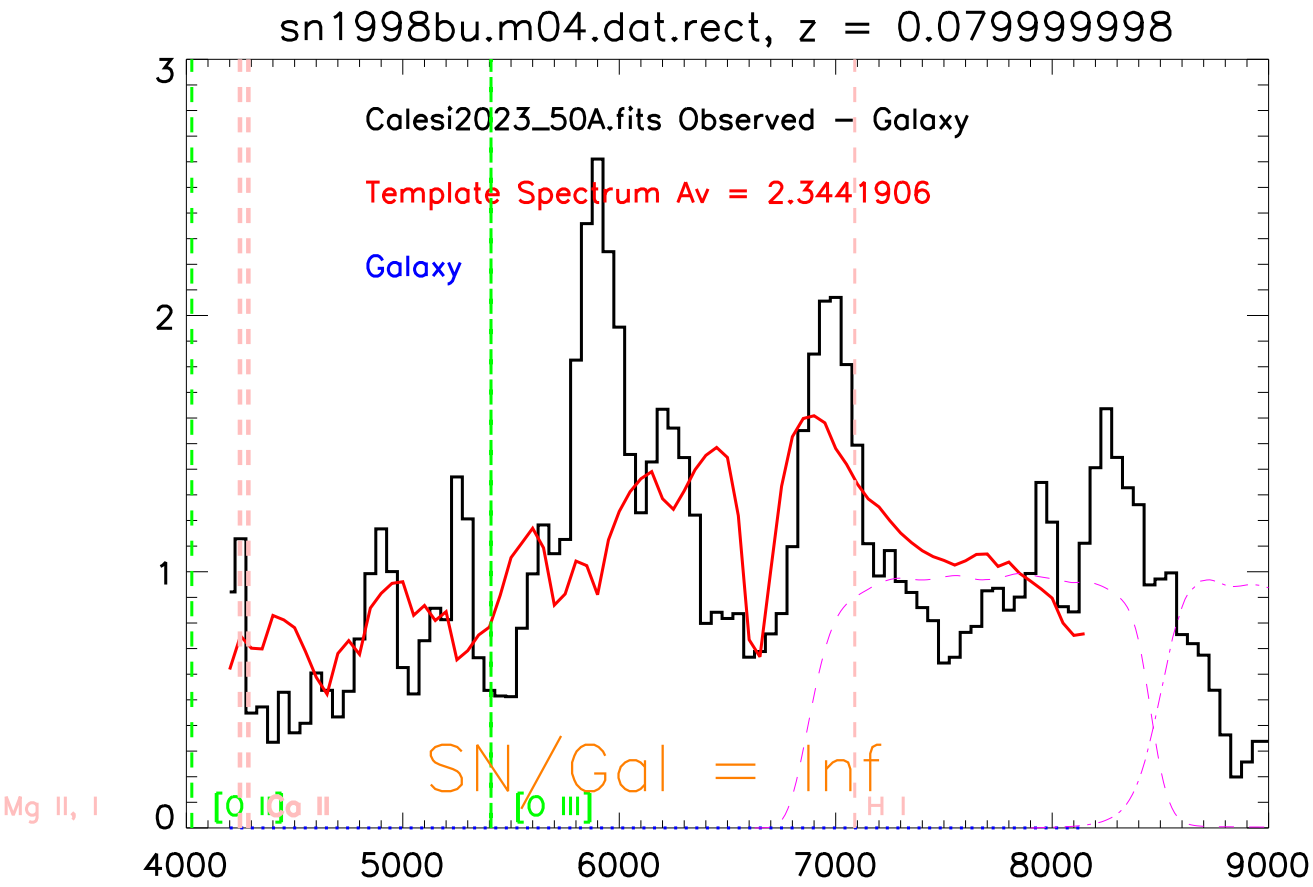
sn1998bu.m04.dat.rect, z = 0.079999998
Calesi2023_50A.fits Observed − Galaxy
Template Spectrum Av = 2.3441906
Galaxy
SN/Gal = Inf
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Ca II
[O III]
H I
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2
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7000
8000
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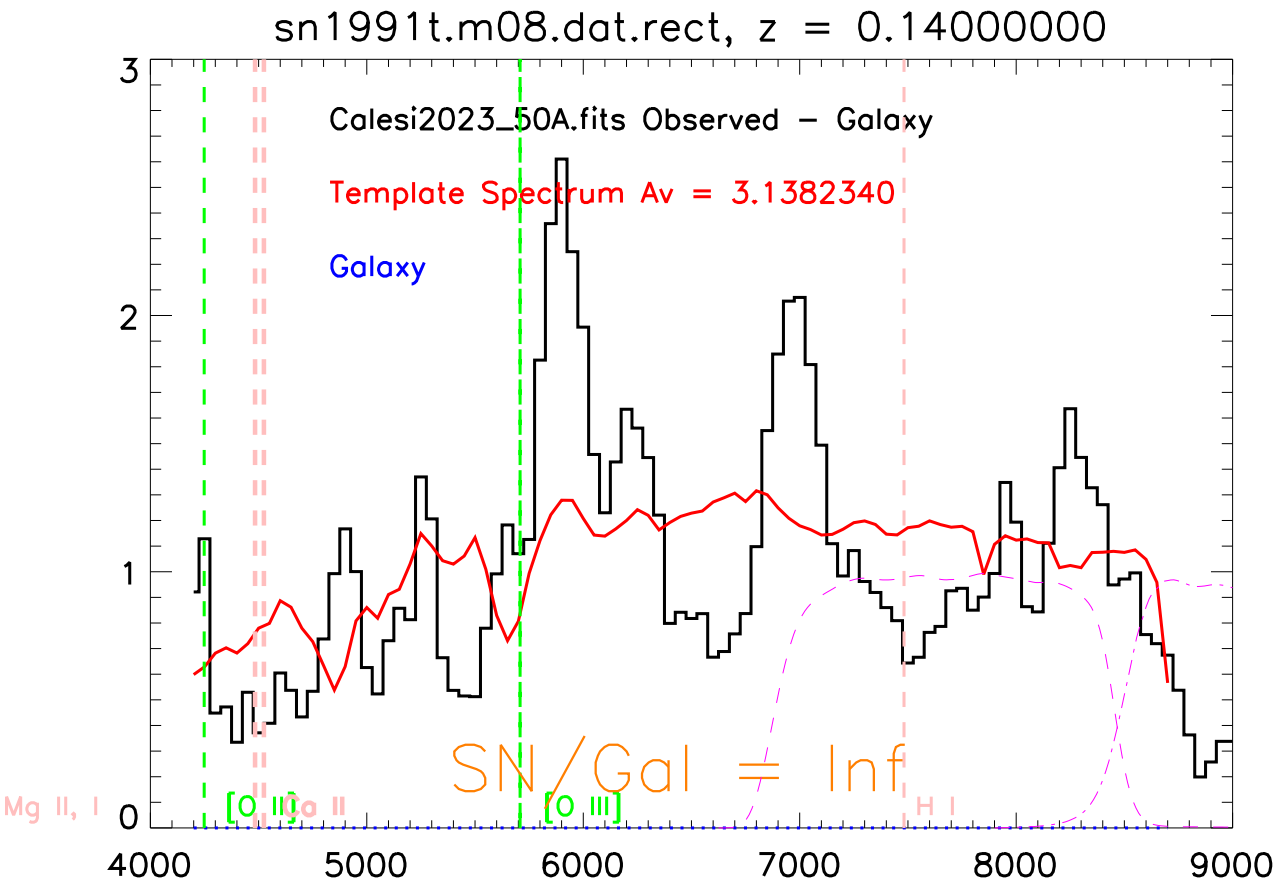
sn1991t.m08.dat.rect, z = 0.14000000
Calesi2023_50A.fits Observed − Galaxy
Template Spectrum Av = 3.1382340
Galaxy
SN/Gal = Inf
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Ca II
[O III]
H I
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8000
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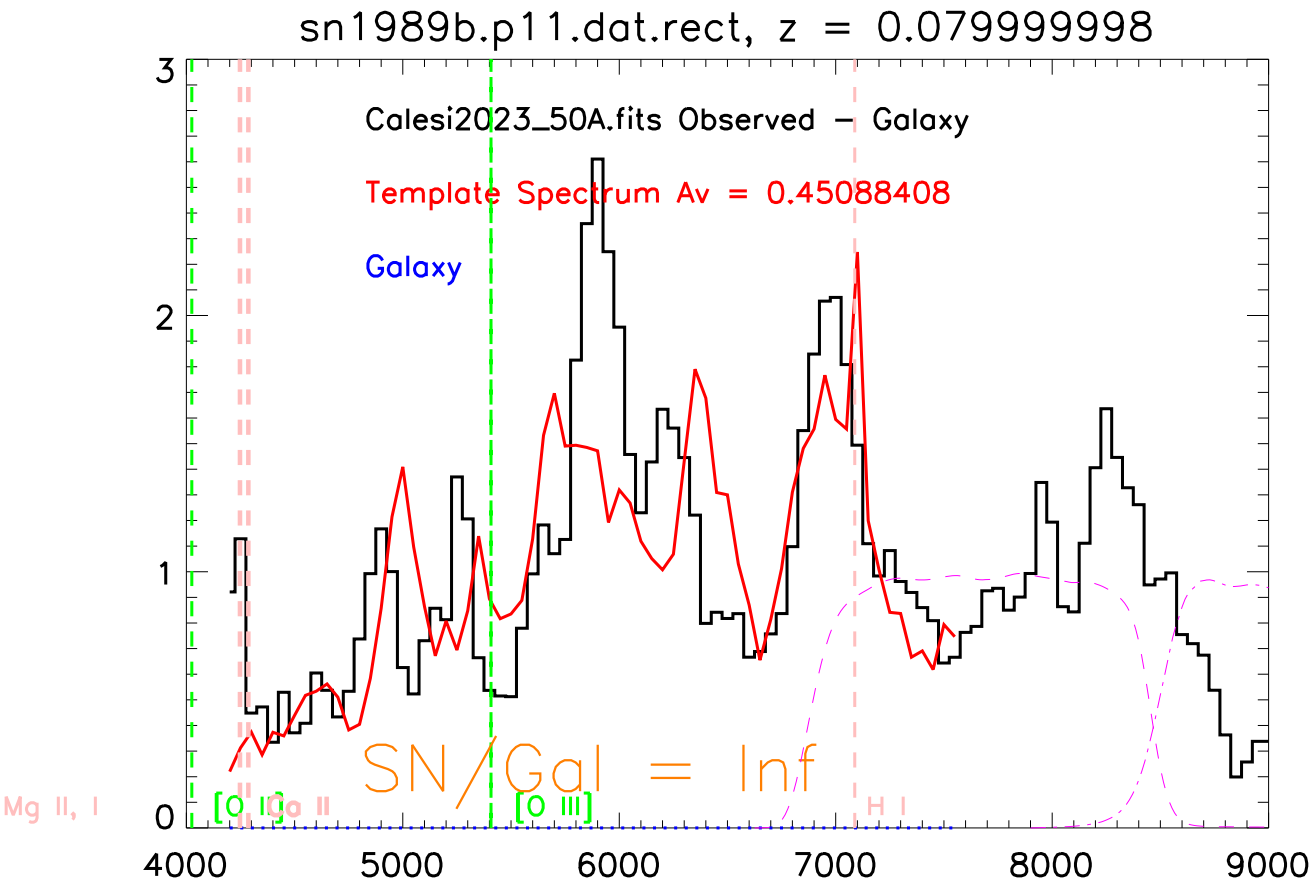
sn1989b.p11.dat.rect, z = 0.079999998
Calesi2023_50A.fits Observed – Galaxy
Template Spectrum Av = 0.45088408
Galaxy
SN/Gal = Inf
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Ca II
[O III]
H I
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3
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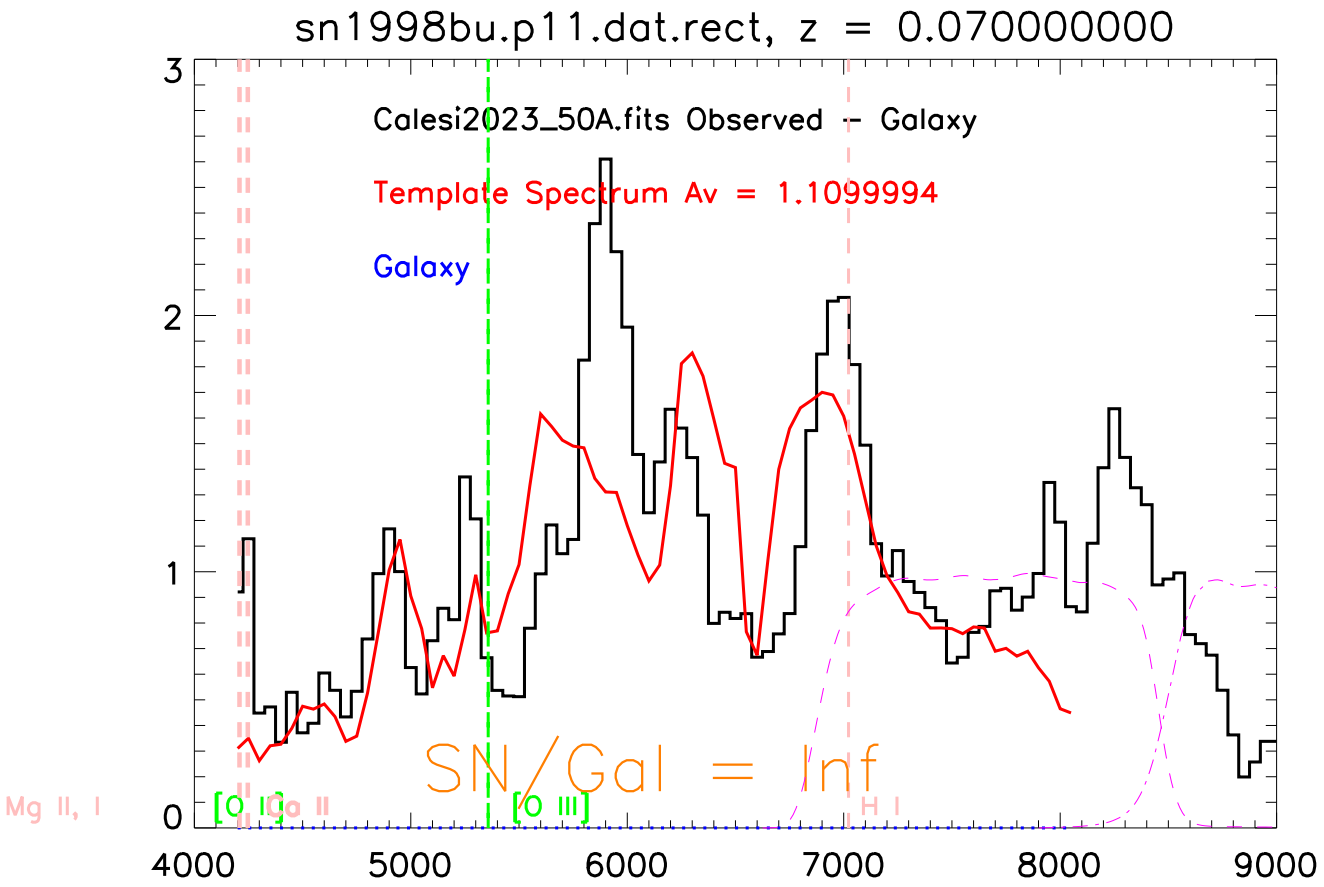
8000
9000


sn1998bu.p11.dat.rect, z = 0.070000000
Calesi2023_50A.fits Observed - Galaxy
Template Spectrum Av = 1.1099994
Galaxy
SN/Gal = Inf
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Ca II
[O III]
H I
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0
4000
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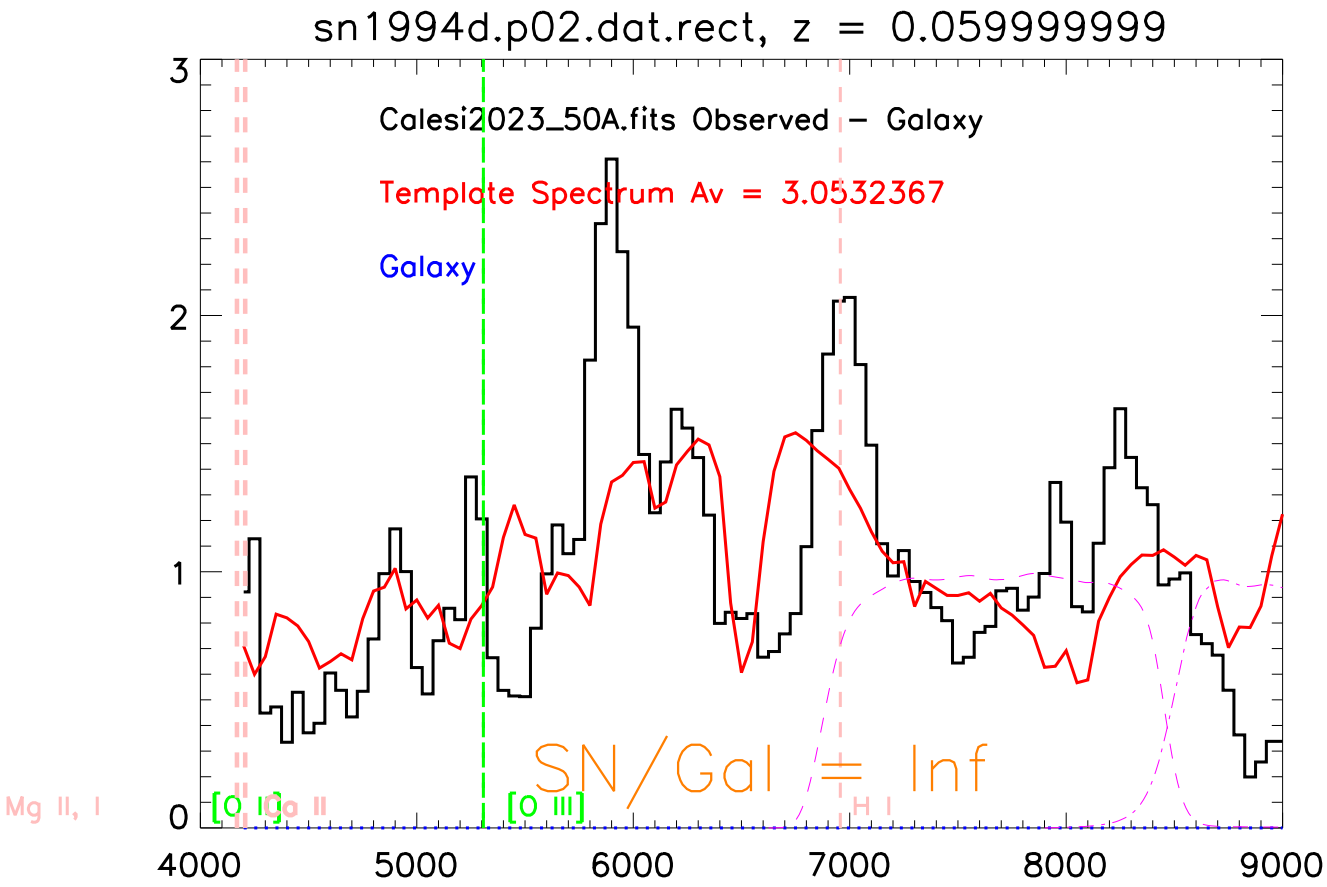
7000
8000
9000


sn1994d.p02.dat.rect, z = 0.059999999
Calesi2023_50A.fits Observed – Galaxy
Template Spectrum Av = 3.0532367
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
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7000
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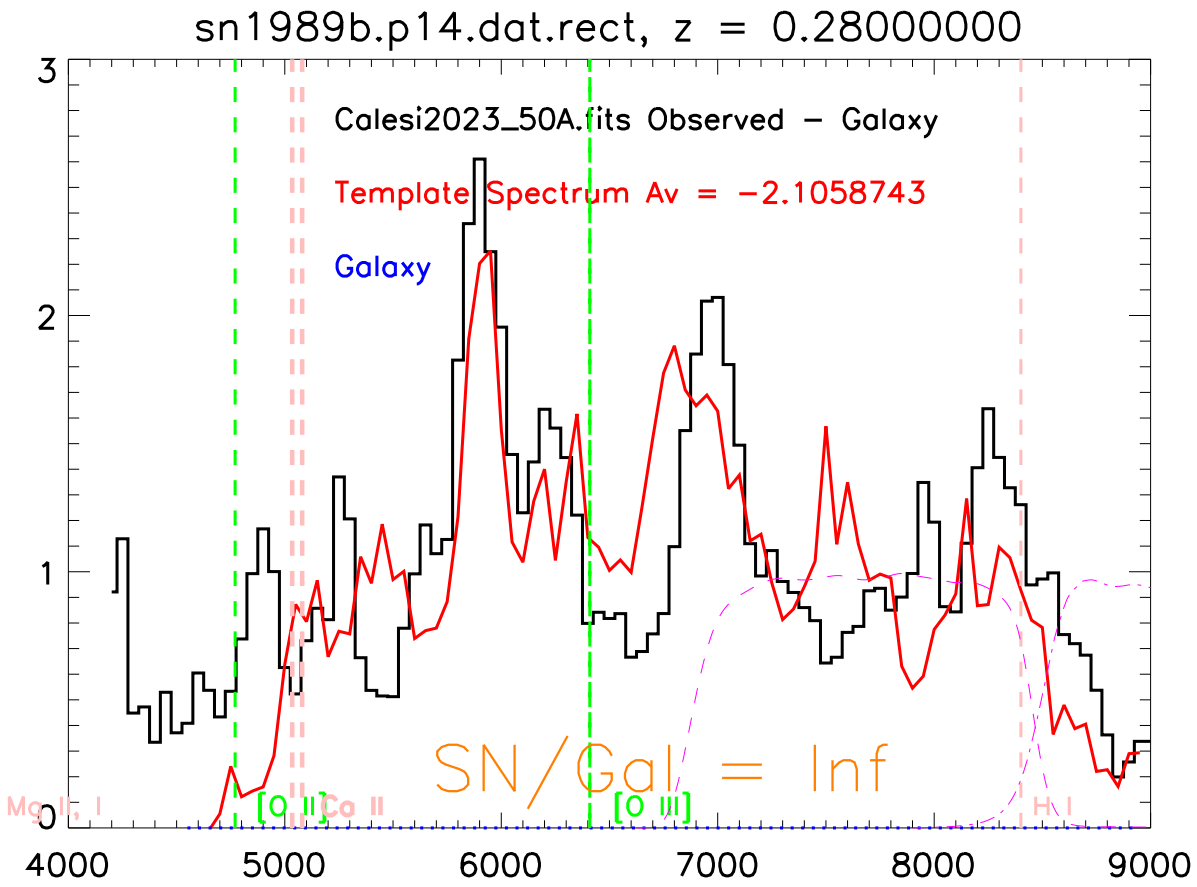
9000


sn1989b.p14.dat.rect, z = 0.28000000
Calesi2023_50A.fits Observed − Galaxy
Template Spectrum Av = −2.1058743
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SN/Gal = Inf
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Ca II
[O III]
H I
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7000
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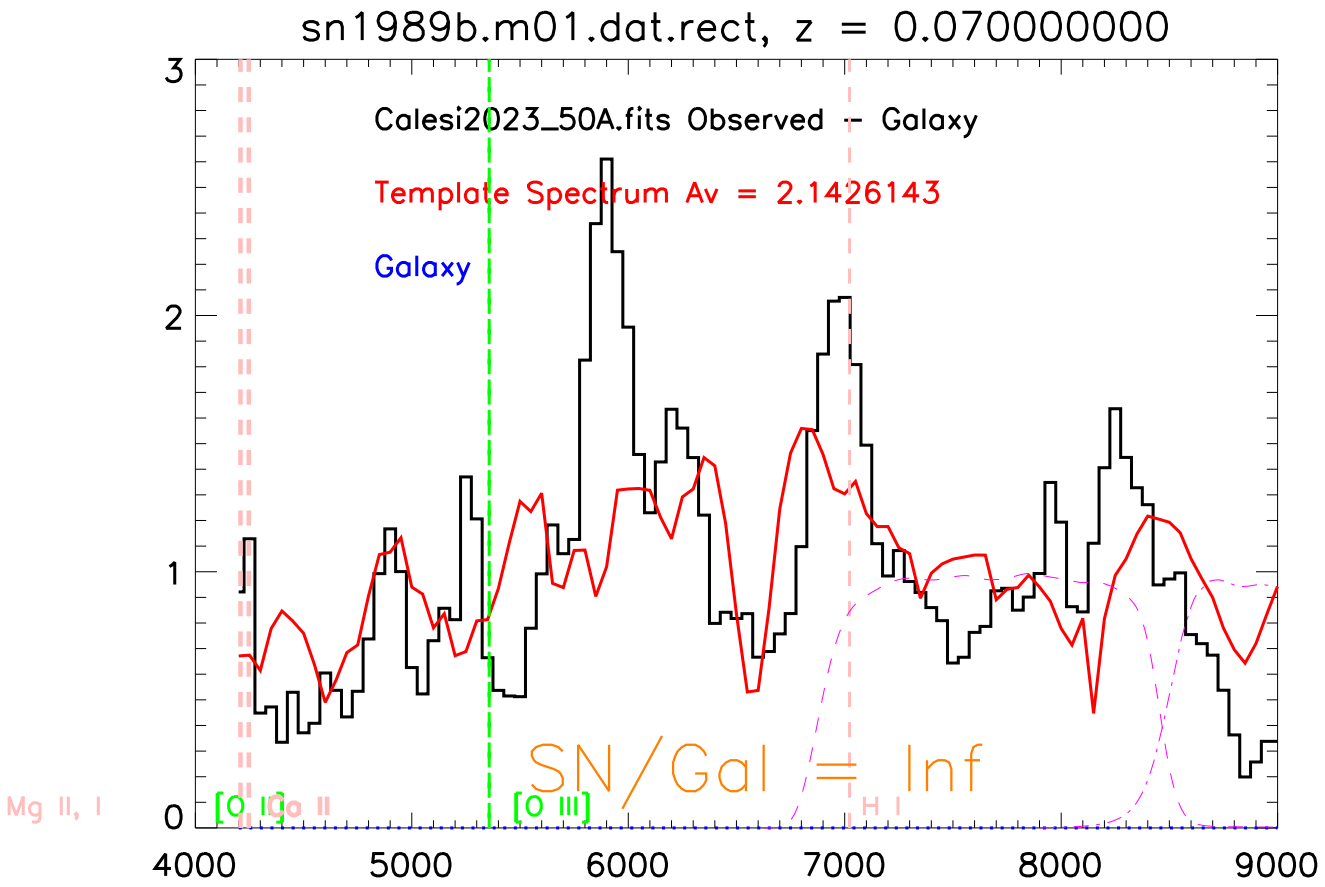
sn1989b.m01.dat.rect, z = 0.070000000
Calesi2023_50A.fits Observed - Galaxy
Template Spectrum Av = 2.1426143
Galaxy
SN/Gal = Inf
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Ca II
[O III]
H I
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1
0
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6000
7000
8000
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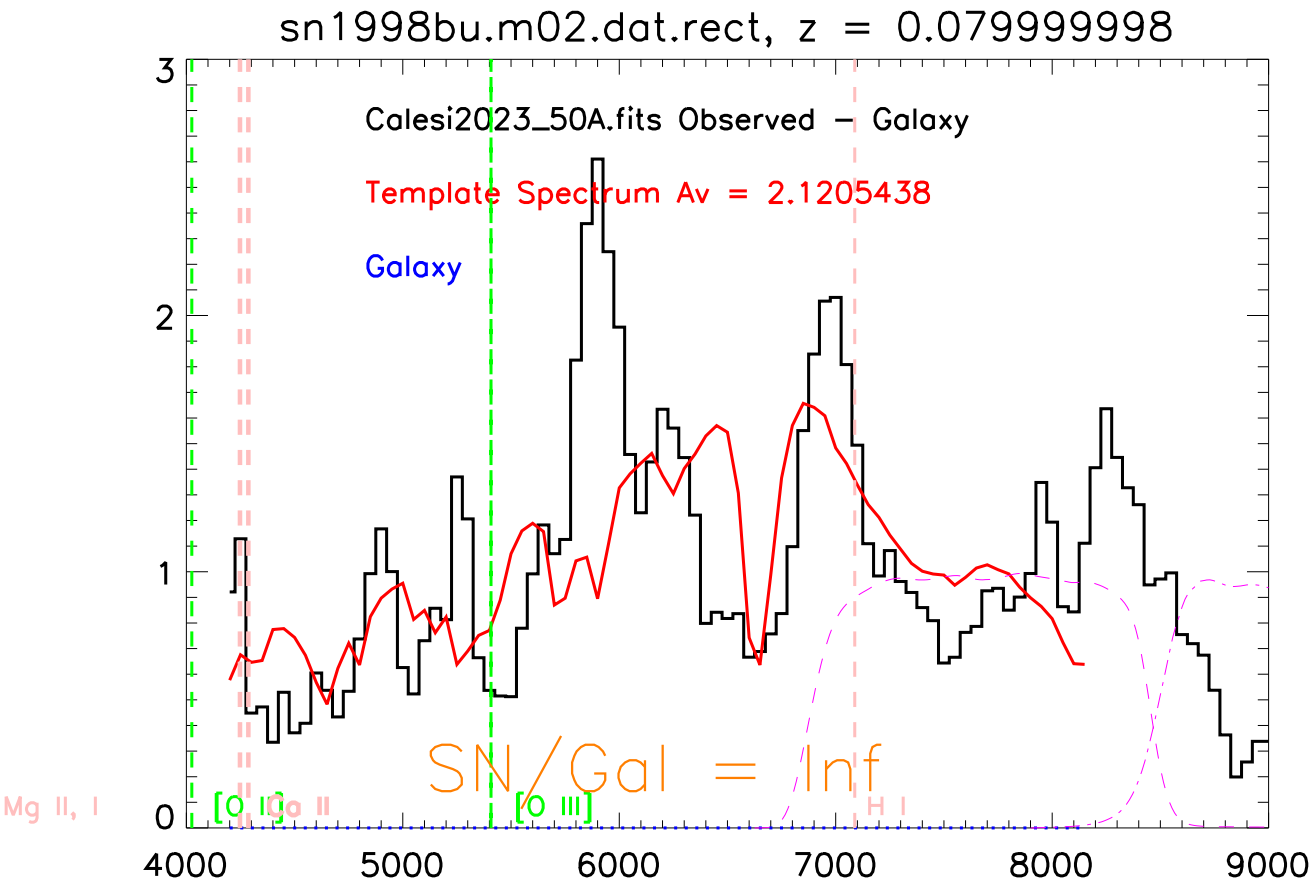
sn1998bu.m02.dat.rect, z = 0.079999998
Calesi2023_50A.fits Observed – Galaxy
Template Spectrum Av = 2.1205438
Galaxy
SN/Gal = Inf
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Ca II
[O III]
H I
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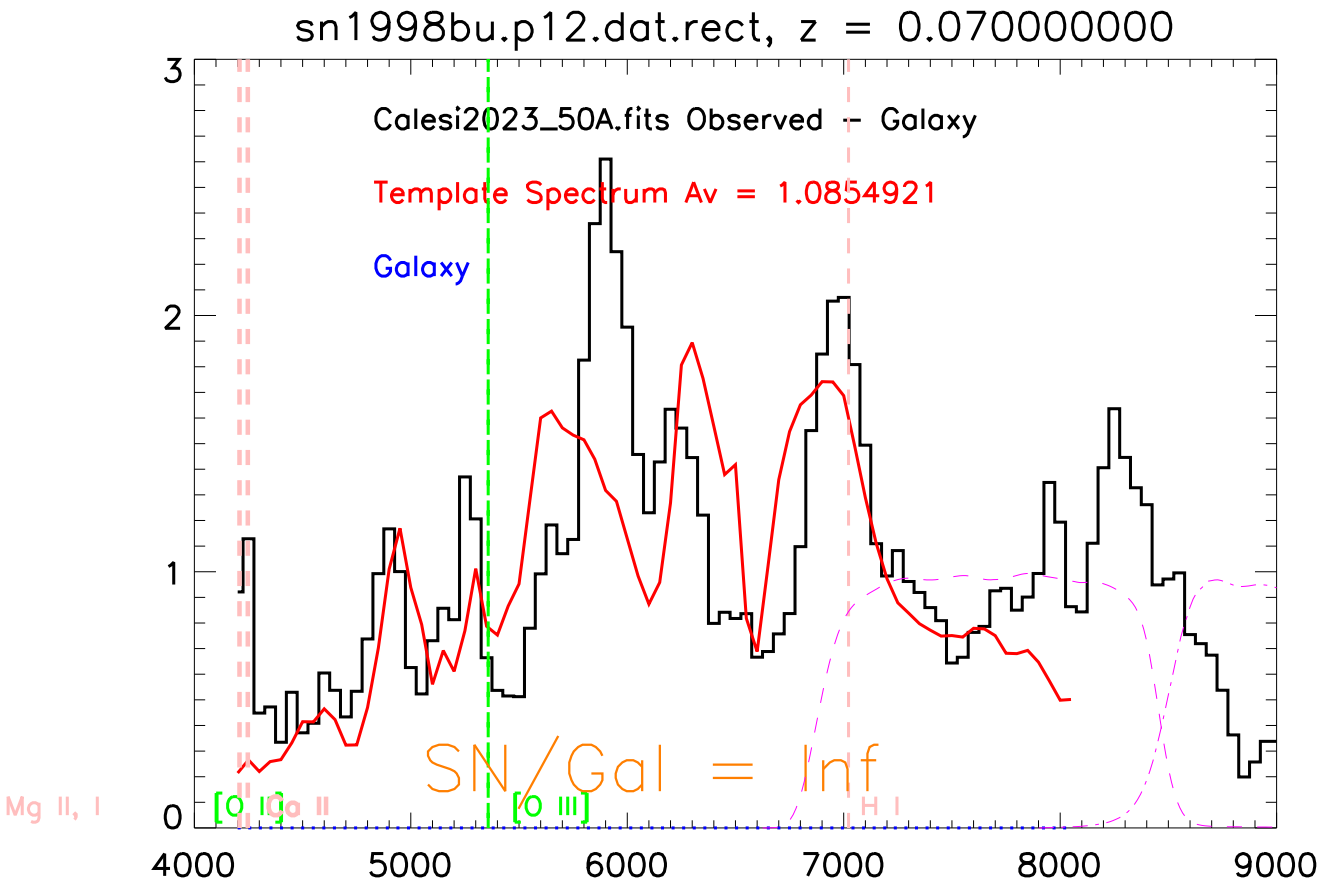
8000
9000


sn1998bu.p12.dat.rect, z = 0.070000000
Calesi2023_50A.fits Observed - Galaxy
Template Spectrum Av = 1.0854921
Galaxy
SN/Gal = Inf
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Ca II
[O III]
H I
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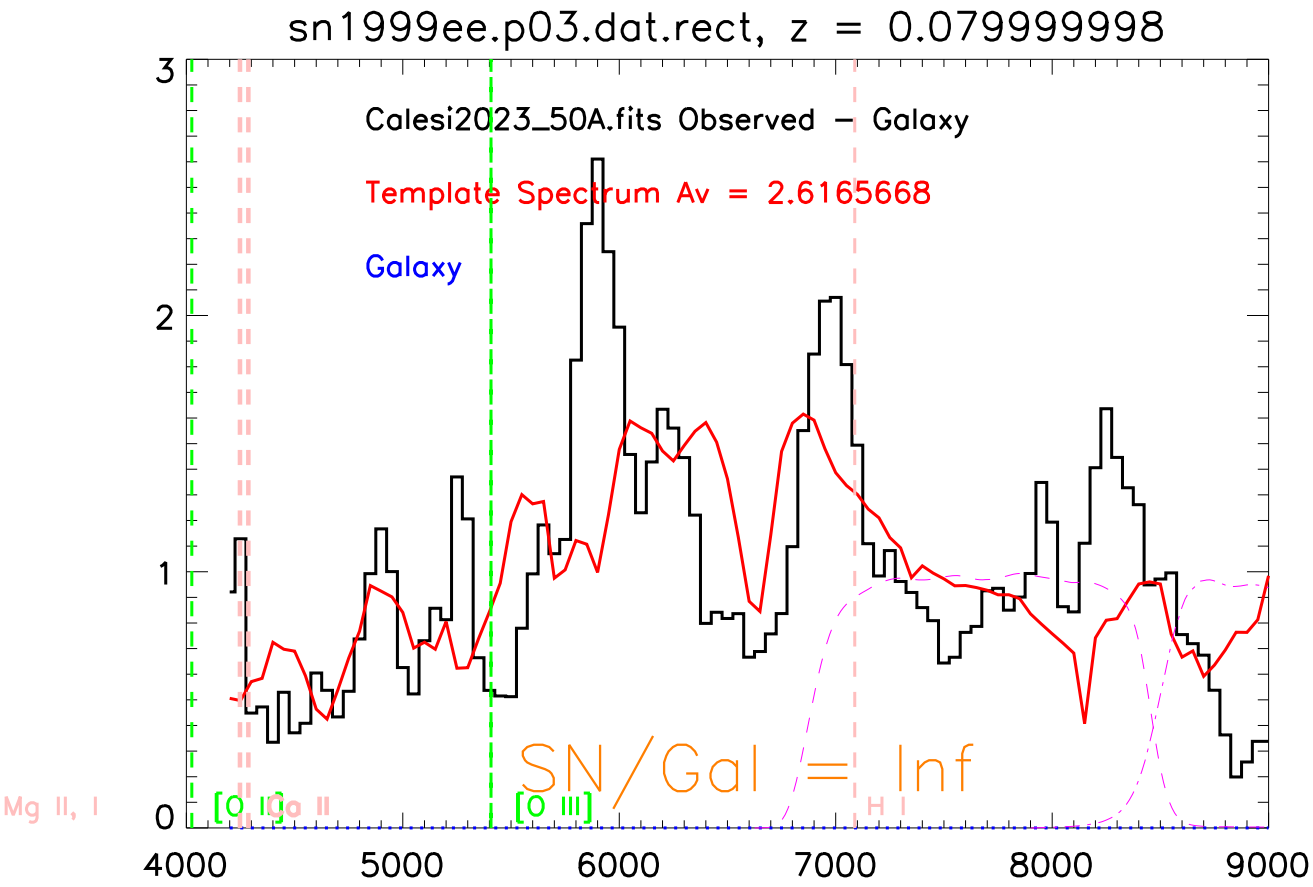
7000
8000
9000


sn1999ee.p03.dat.rect, z = 0.079999998
Calesi2023_50A.fits Observed – Galaxy
Template Spectrum Av = 2.6165668
Galaxy
SN/Gal = Inf
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Ca II
[O III]
H I
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3
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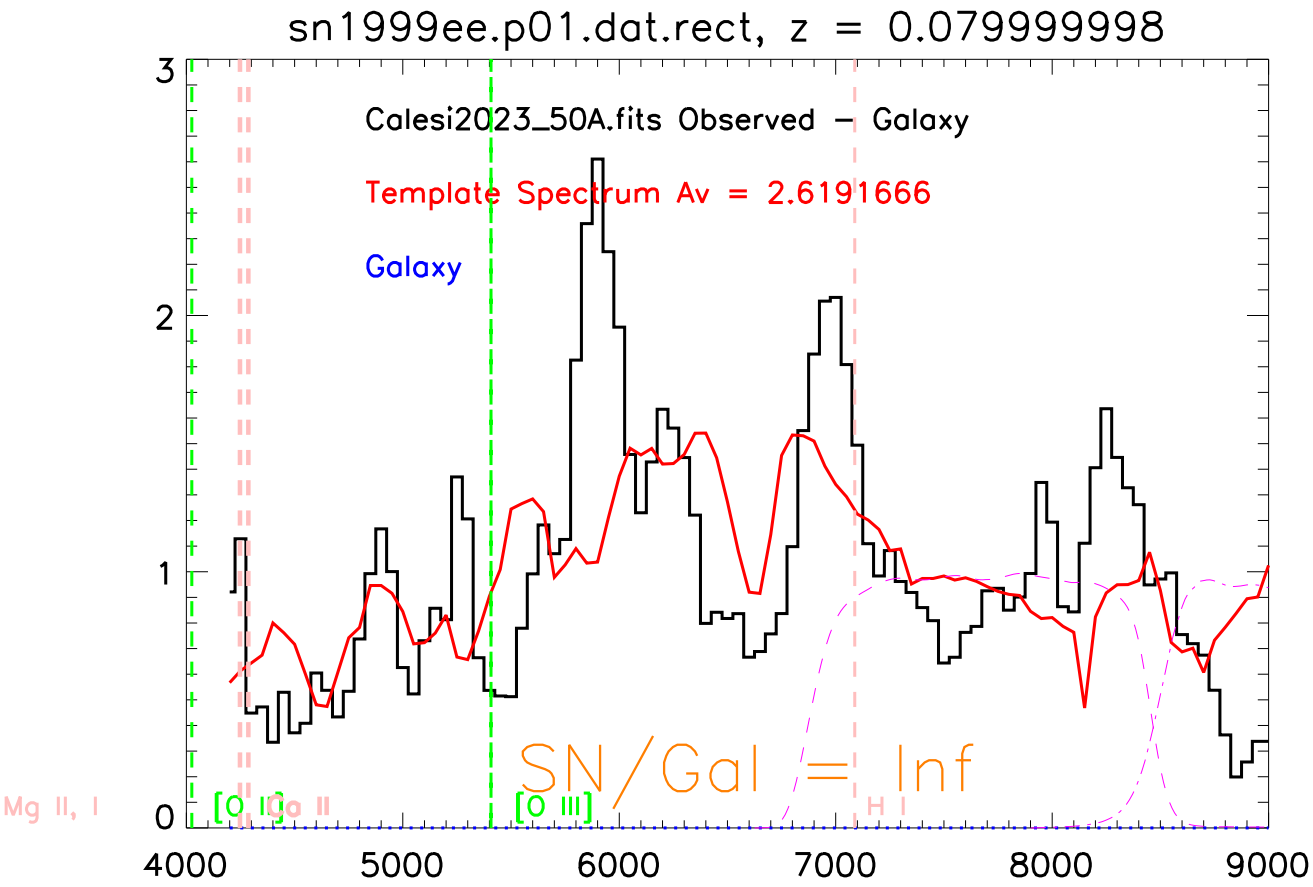
7000
8000
9000


sn1999ee.p01.dat.rect, z = 0.079999998
Calesi2023_50A.fits Observed – Galaxy
Template Spectrum Av = 2.6191666
Galaxy
SN/Gal = Inf
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Ca II
[O III]
H I
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2
3
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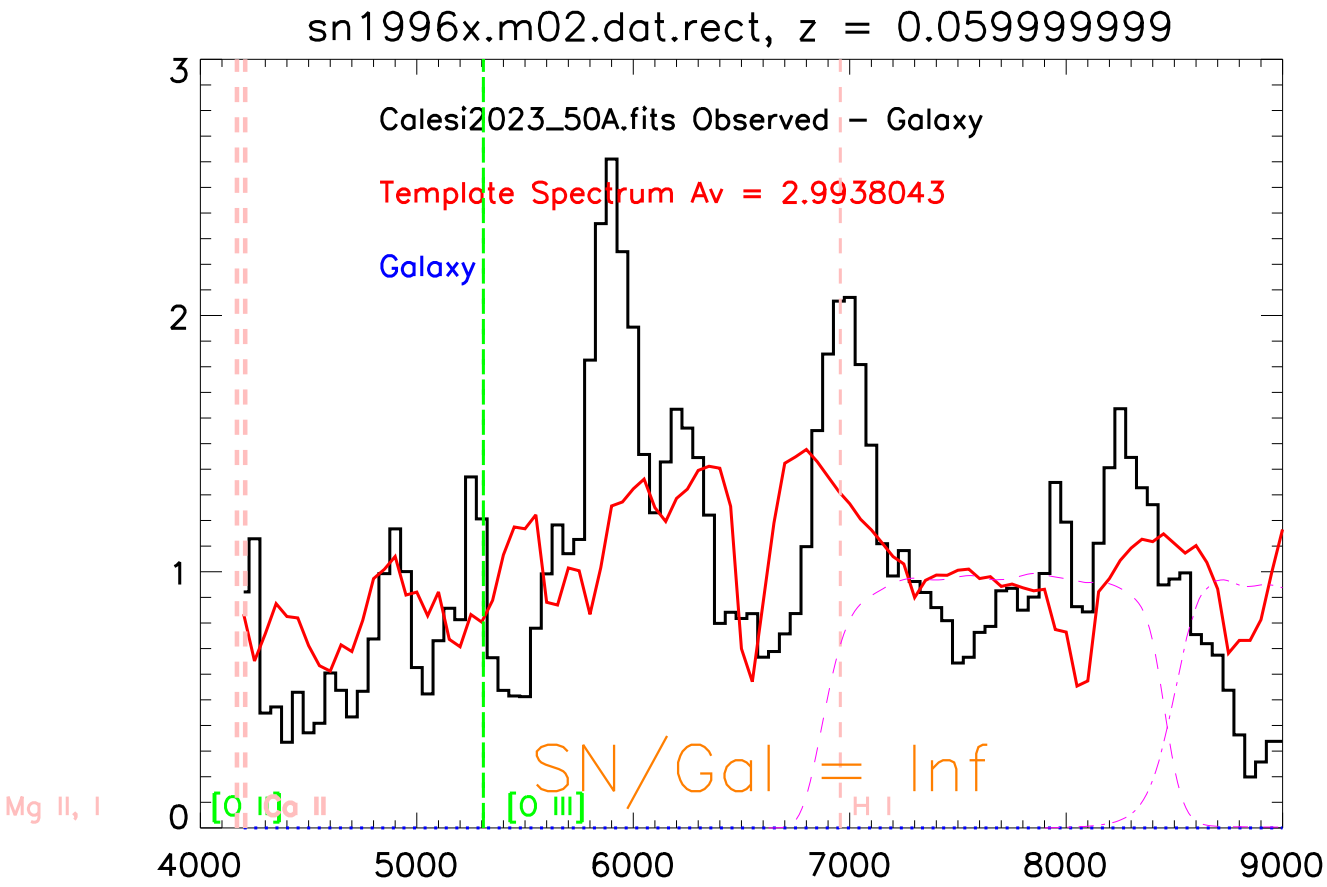
8000
9000


sn1996x.m02.dat.rect, z = 0.059999999
Calesi2023_50A.fits Observed – Galaxy
Template Spectrum Av = 2.9938043
Galaxy
SN/Gal = Inf
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Ca II
[O III]
H I
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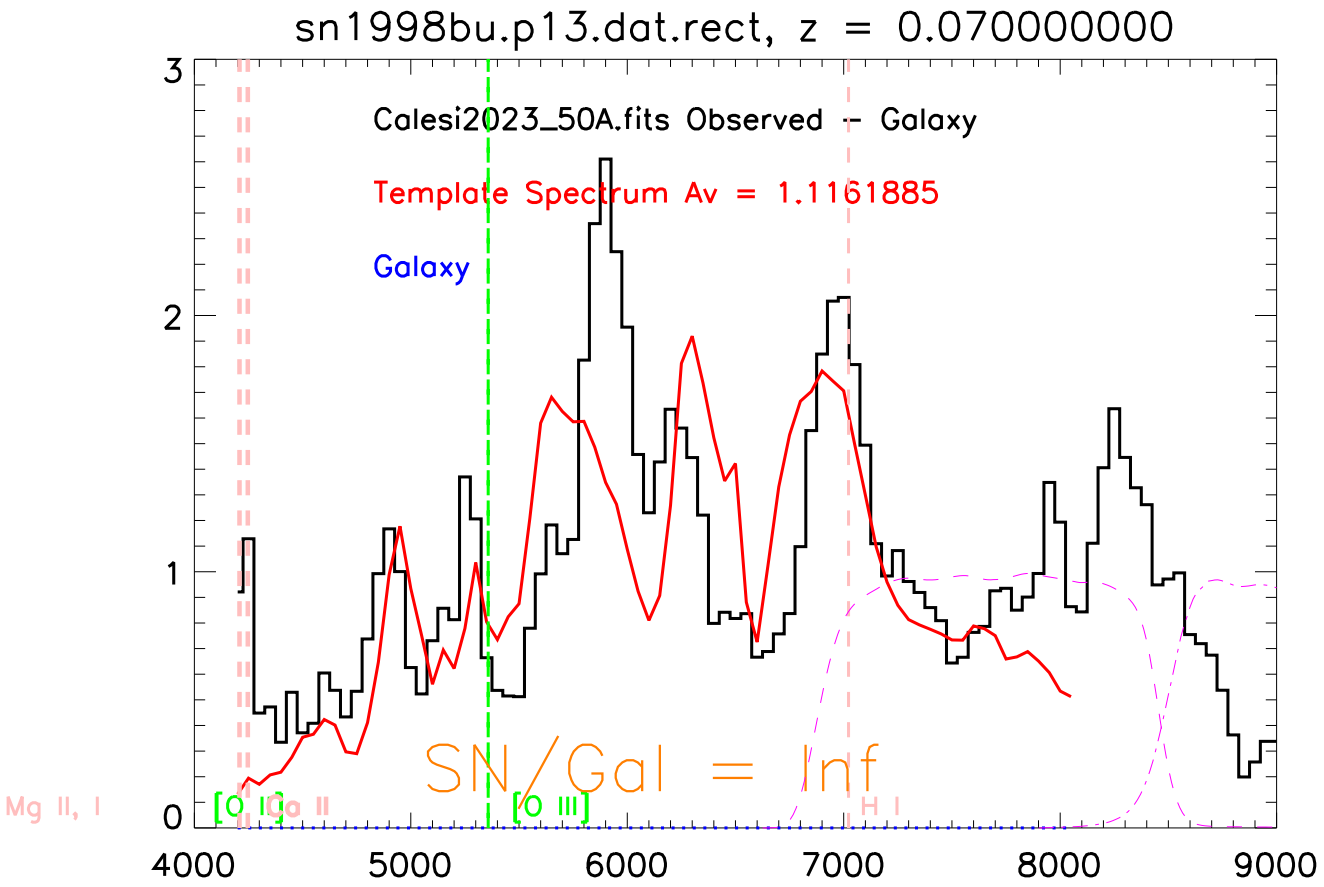
sn1998bu.p13.dat.rect, z = 0.070000000
Calesi2023_50A.fits Observed - Galaxy
Template Spectrum Av = 1.1161885
Galaxy
SN/Gal = Inf
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Ca II
[O III]
H I
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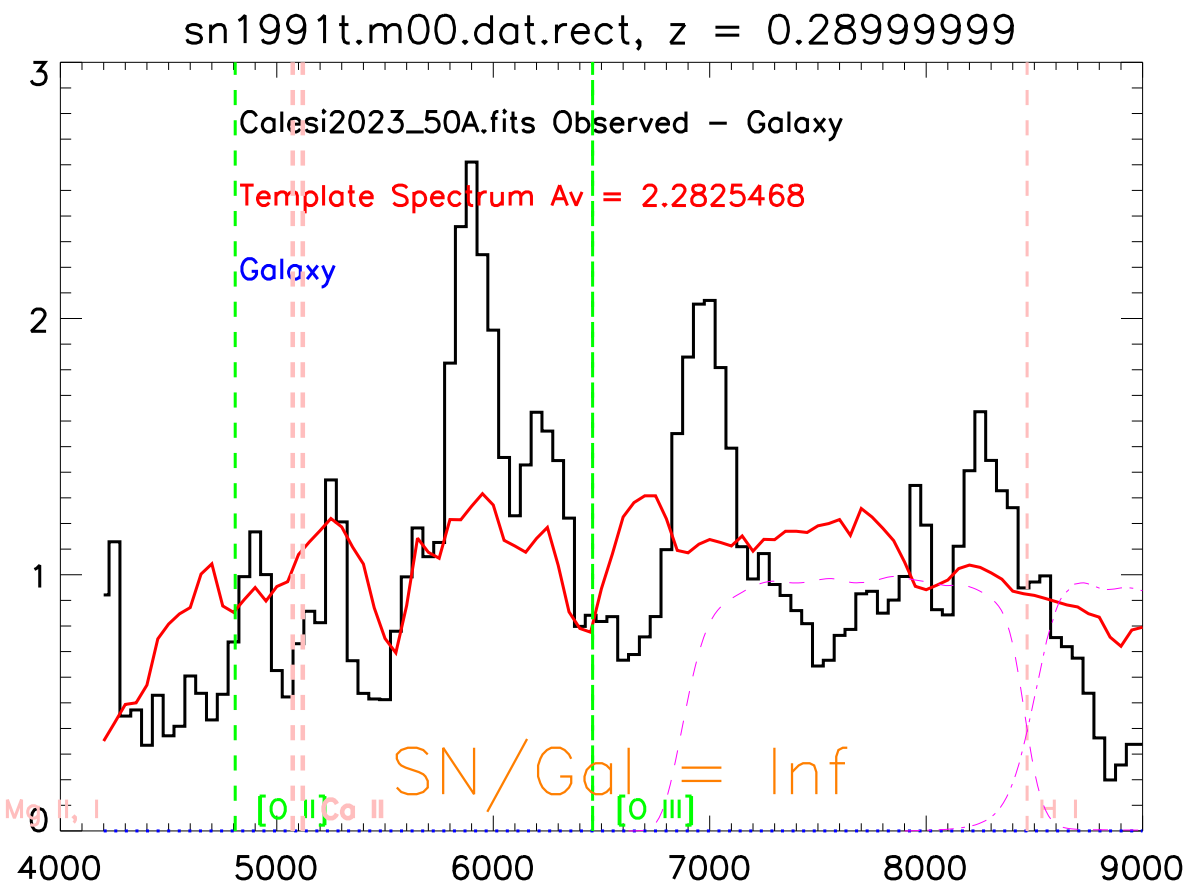
7000
8000
9000


sn1991t.m00.dat.rect, z = 0.28999999
Calesi2023_50A.fits Observed − Galaxy
Template Spectrum Av = 2.2825468
Galaxy
SN/Gal = Inf
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Ca II
[O III]
H I
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7000
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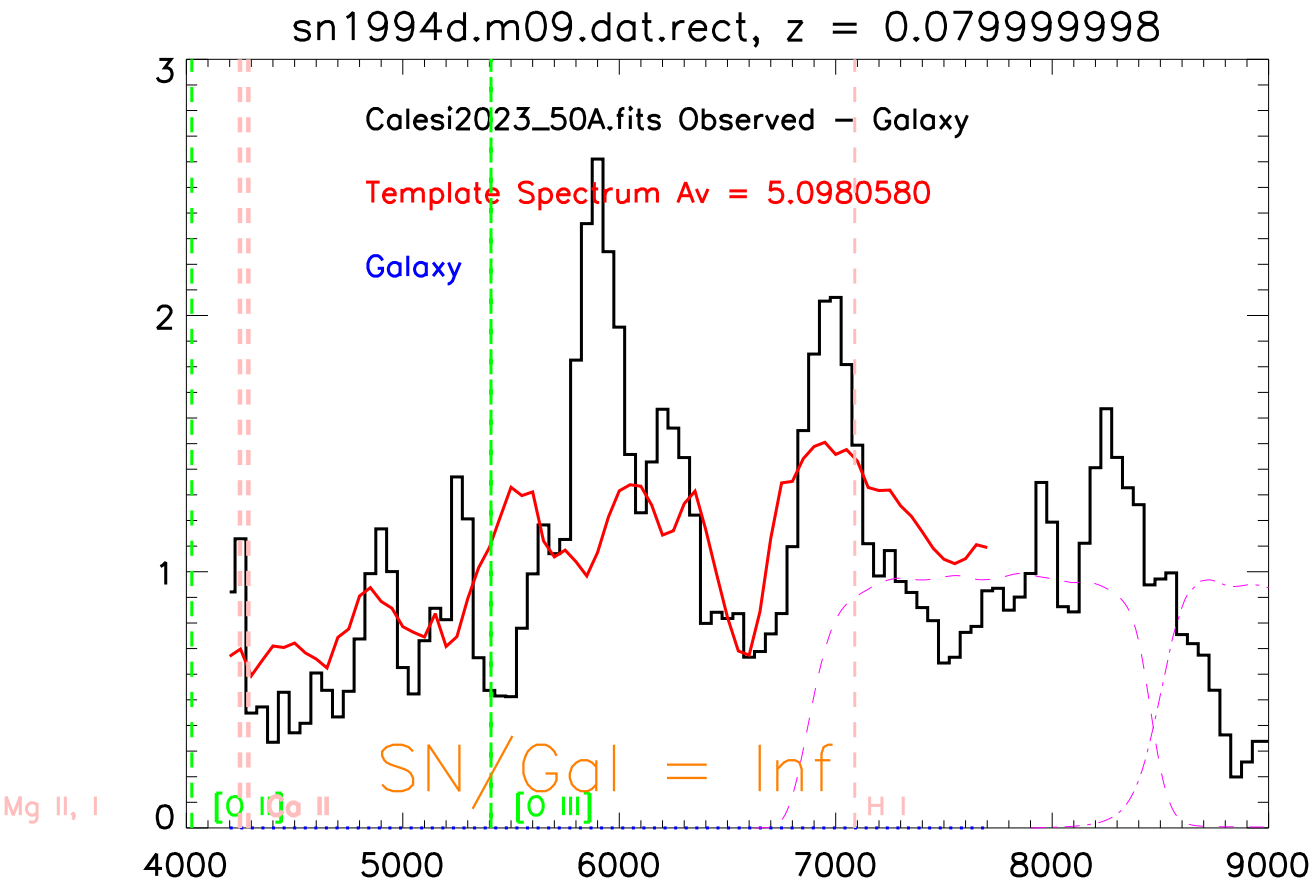
9000


sn1994d.m09.dat.rect, z = 0.079999998
Calesi2023_50A.fits Observed − Galaxy
Template Spectrum Av = 5.0980580
Galaxy
SN/Gal = Inf
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Ca II
[O III]
H I
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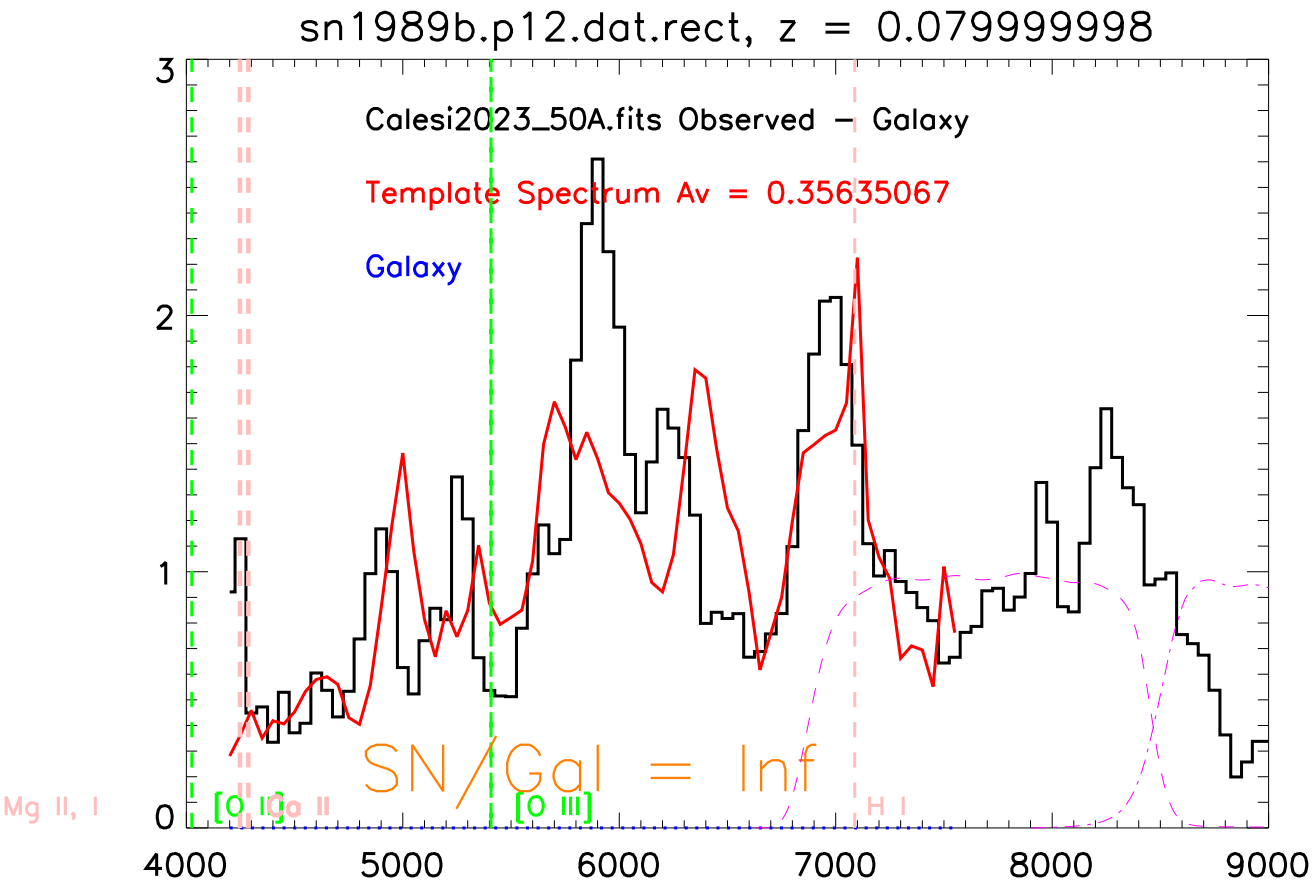
sn1989b.p12.dat.rect, z = 0.079999998
Calesi2023_50A.fits Observed – Galaxy
Template Spectrum Av = 0.35635067
Galaxy
SN/Gal = Inf
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Ca II
[O III]
H I
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2
3
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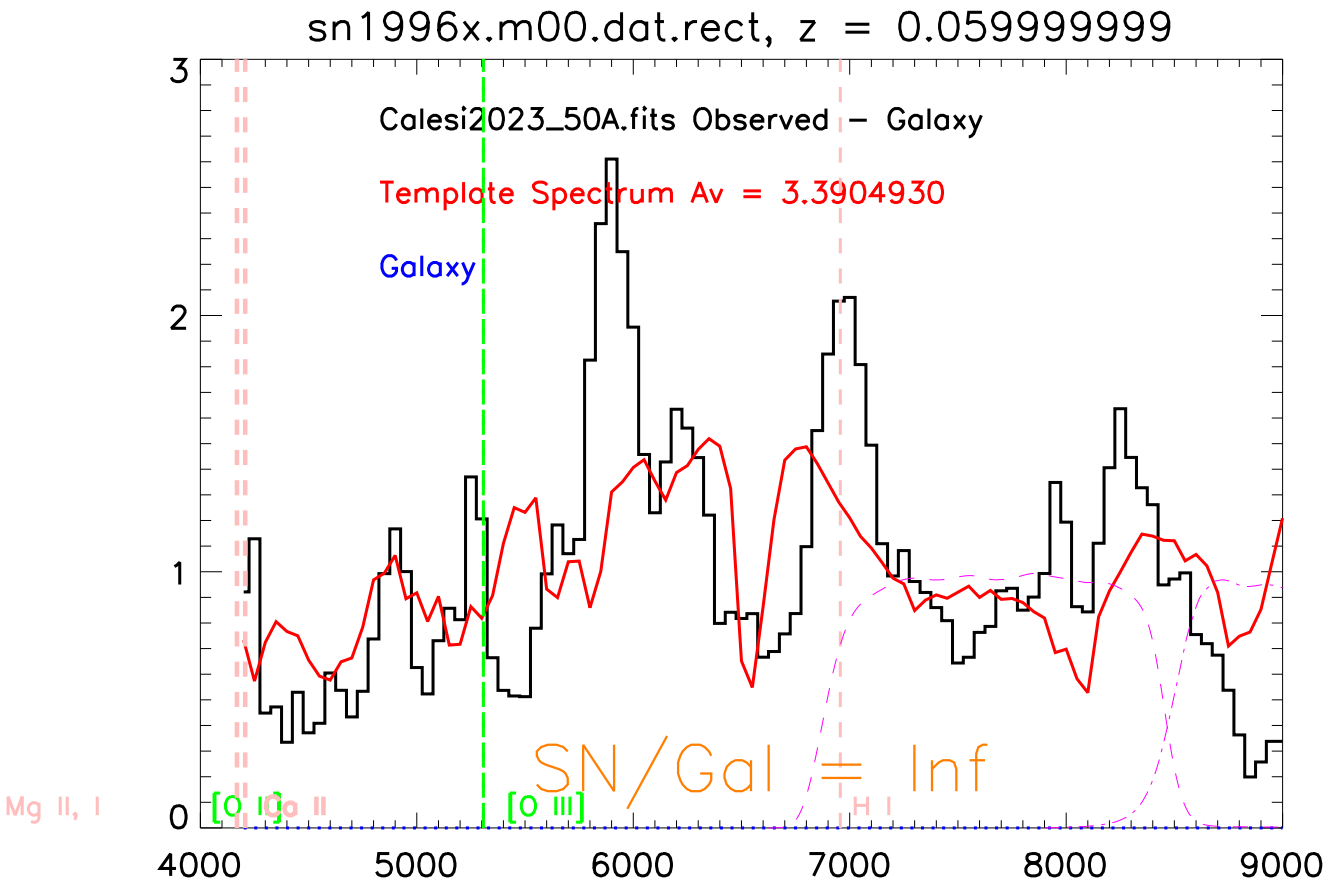
7000
8000
9000


sn1996x.m00.dat.rect, z = 0.059999999
Calesi2023_50A.fits Observed – Galaxy
Template Spectrum Av = 3.3904930
Galaxy
SN/Gal = Inf
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Ca II
[O III]
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7000
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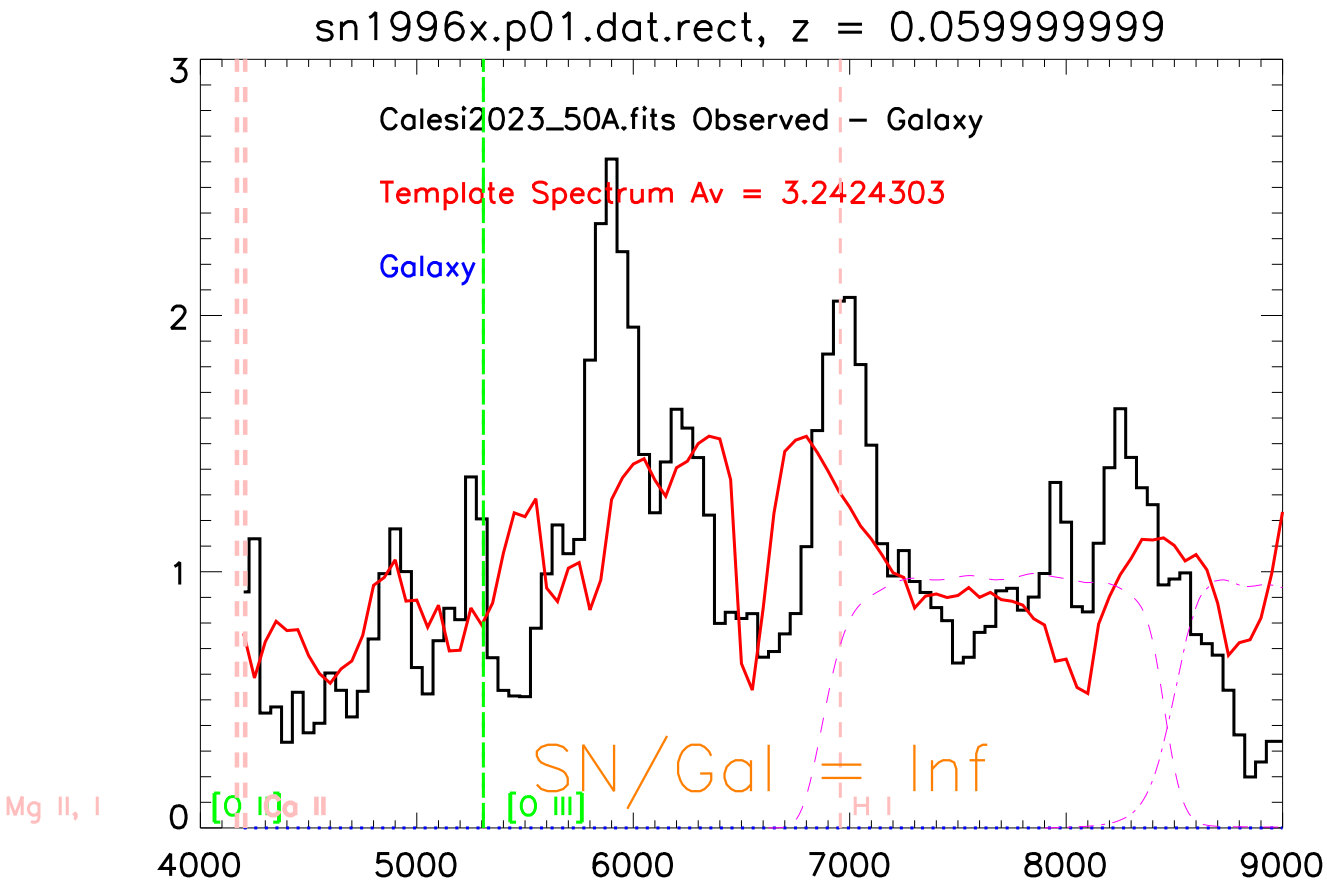
sn1996x.p01.dat.rect, z = 0.059999999
Calesi2023_50A.fits Observed − Galaxy
Template Spectrum Av = 3.2424303
Galaxy
SN/Gal = Inf
Mg II, I
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Ca II
[O III]
H I
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3
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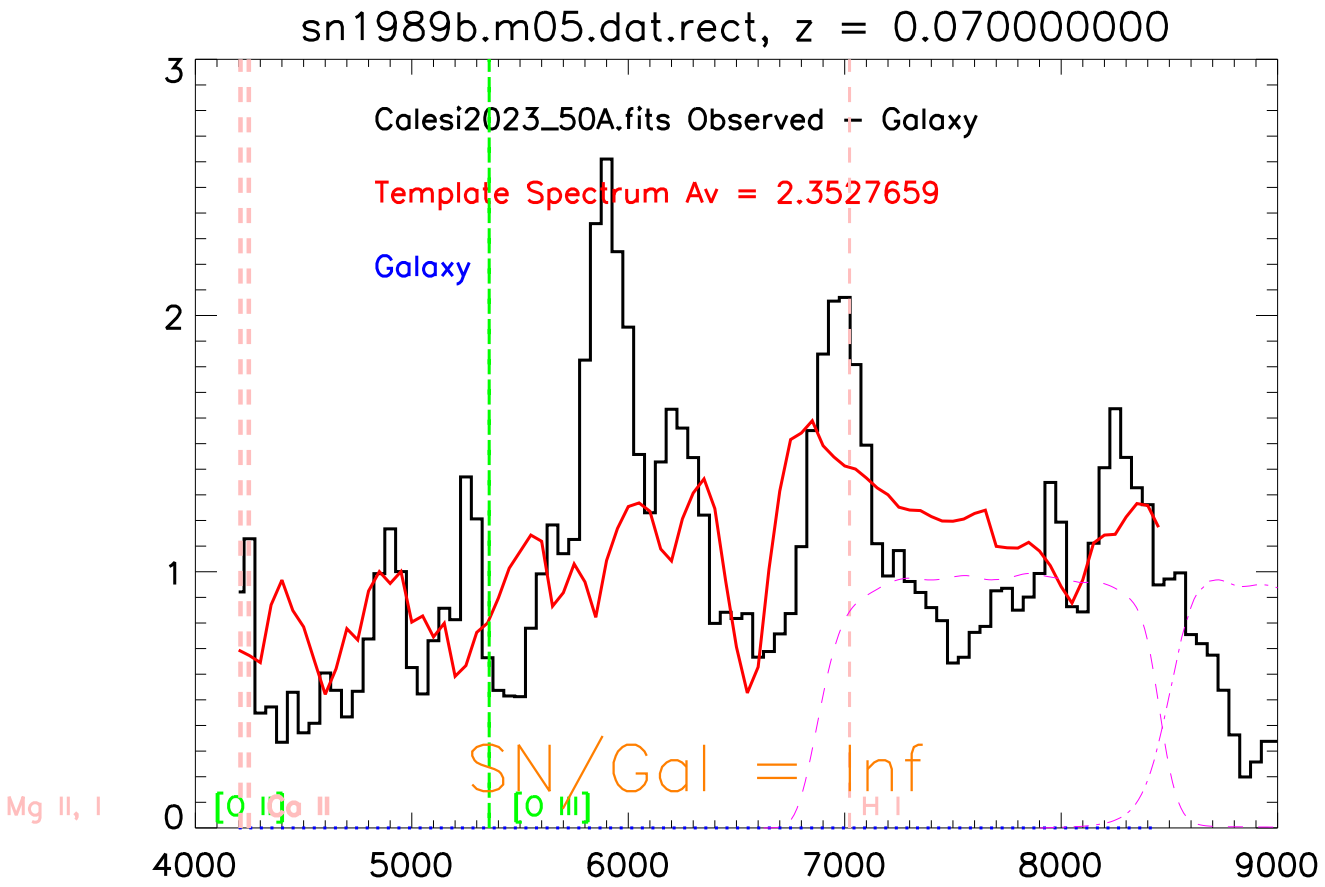
8000
9000


sn1989b.m05.dat.rect, z = 0.070000000
Calesi2023_50A.fits Observed - Galaxy
Template Spectrum Av = 2.3527659
Galaxy
SN/Gal = Inf
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Ca II
[O III]
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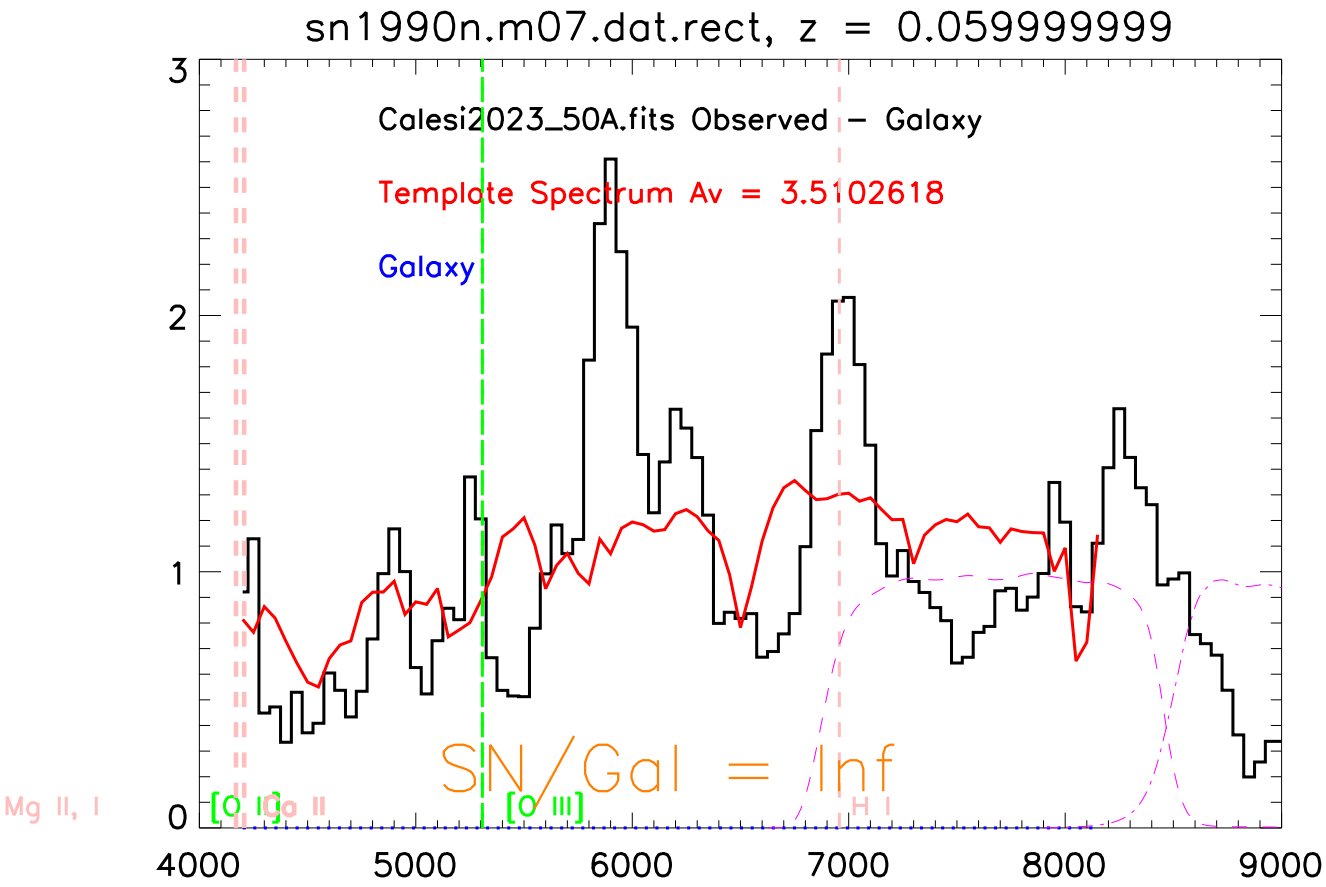
sn1990n.m07.dat.rect, z = 0.059999999
Calesi2023_50A.fits Observed – Galaxy
Template Spectrum Av = 3.5102618
Galaxy
SN/Gal = Inf
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[O III]
H I
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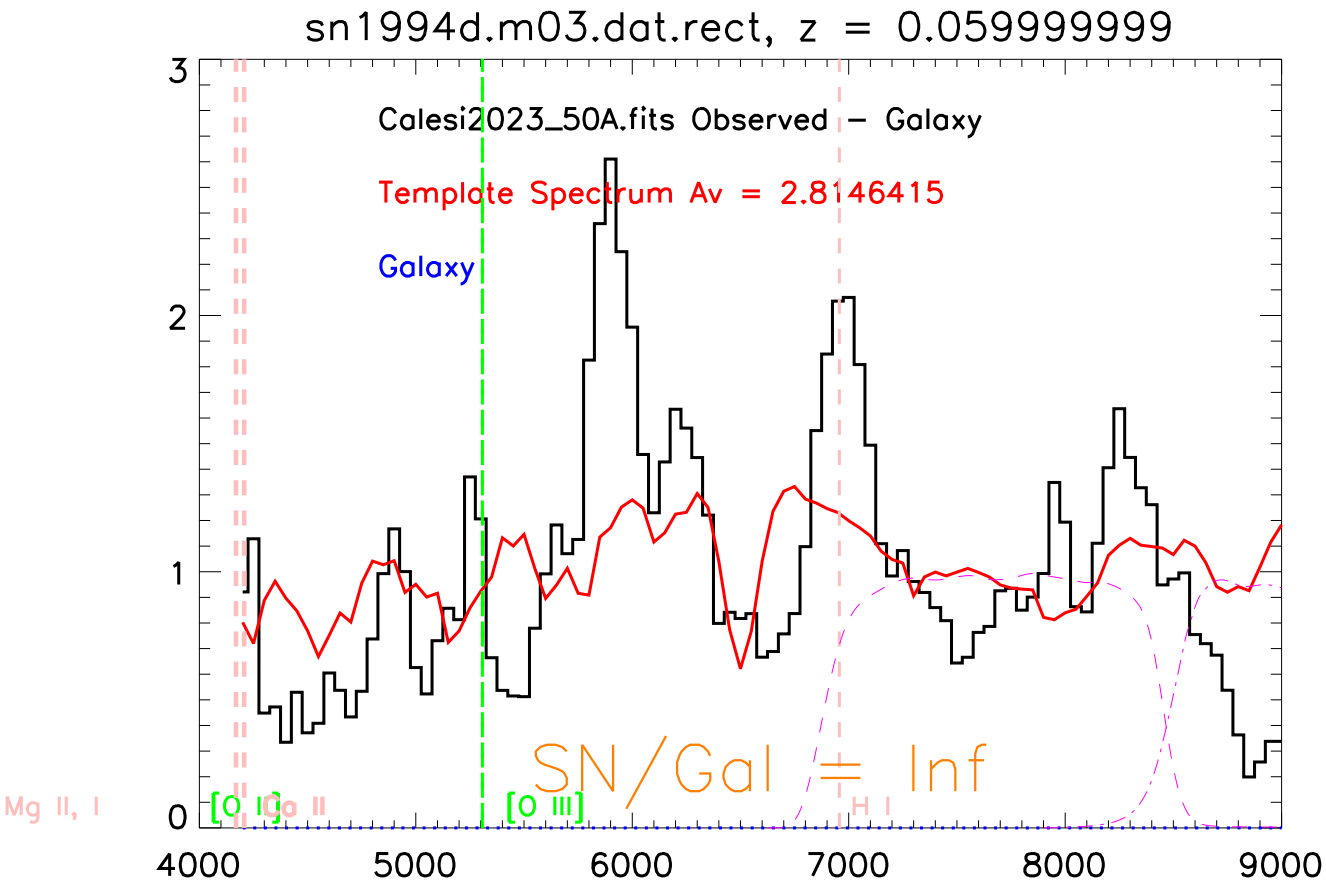
7000
8000
9000


sn1994d.m03.dat.rect, z = 0.059999999
Calesi2023_50A.fits Observed – Galaxy
Template Spectrum Av = 2.8146415
Galaxy
SN/Gal = Inf
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Ca II
[O III]
H I
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3
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8000
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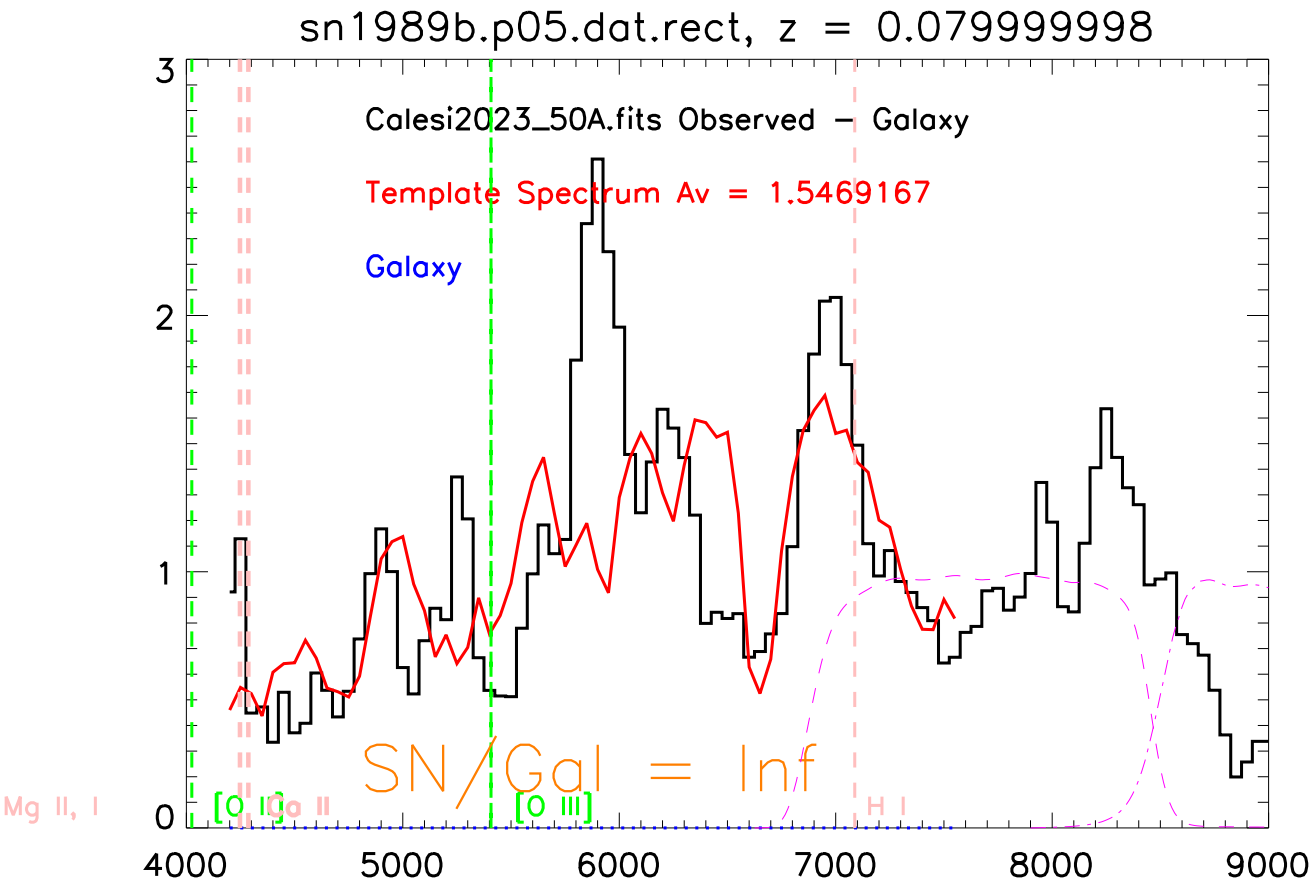
sn1989b.p05.dat.rect, z = 0.079999998
Calesi2023_50A.fits Observed – Galaxy
Template Spectrum Av = 1.5469167
Galaxy
SN/Gal = Inf
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Ca II
[O III]
H I
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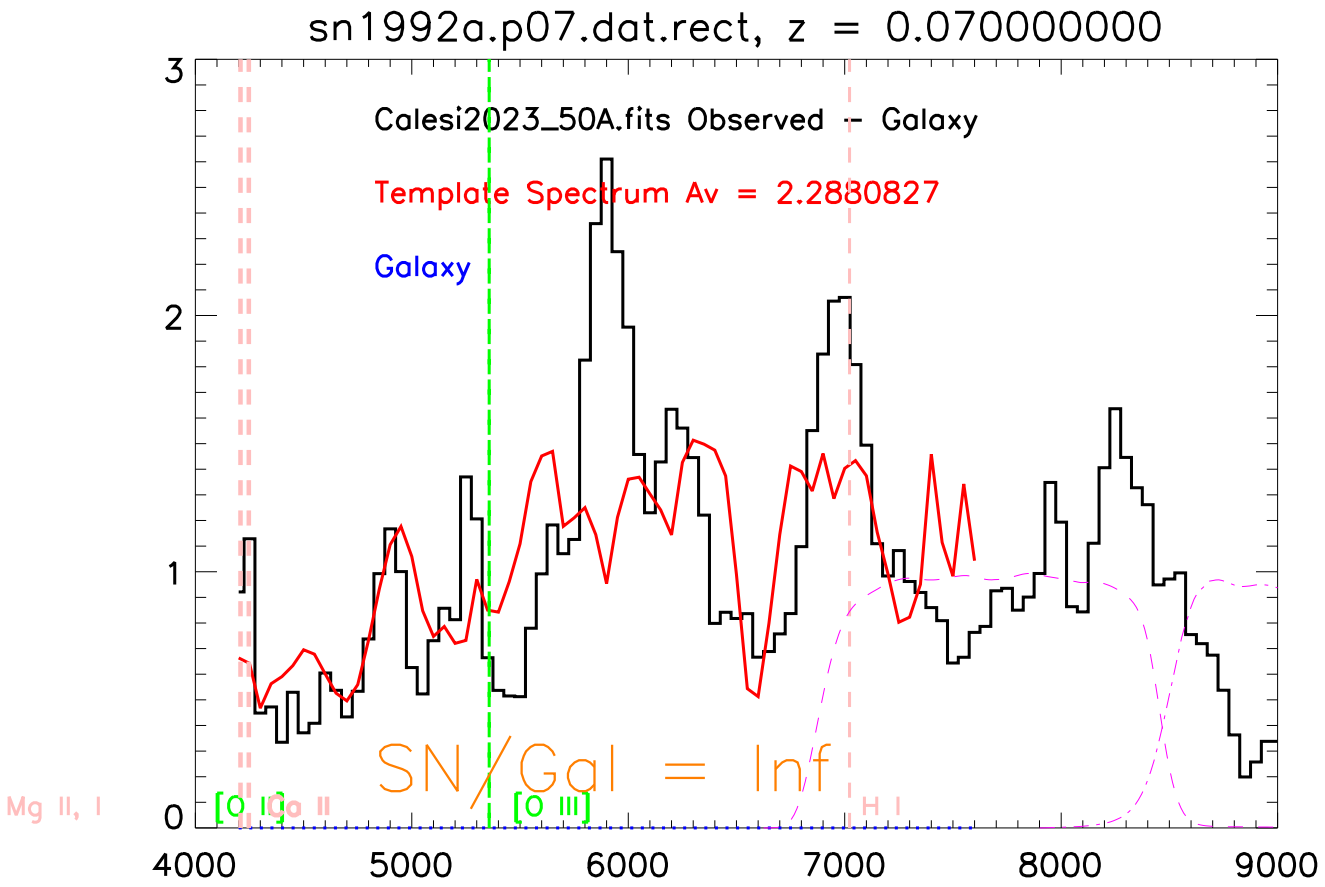
8000
9000


sn1992a.p07.dat.rect, z = 0.070000000
Calesi2023_50A.fits Observed - Galaxy
Template Spectrum Av = 2.2880827
Galaxy
SN/Gal = Inf
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Ca II
[O III]
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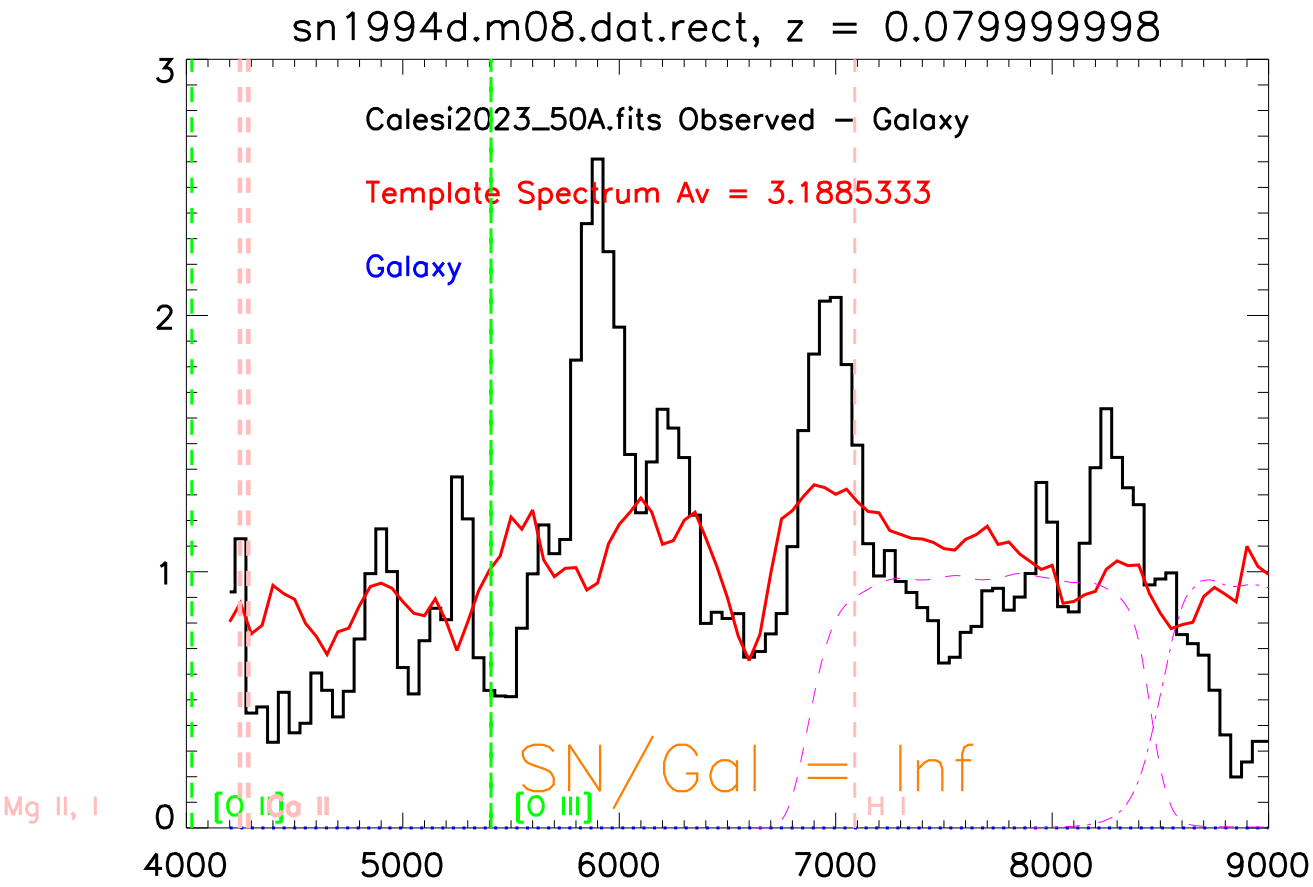
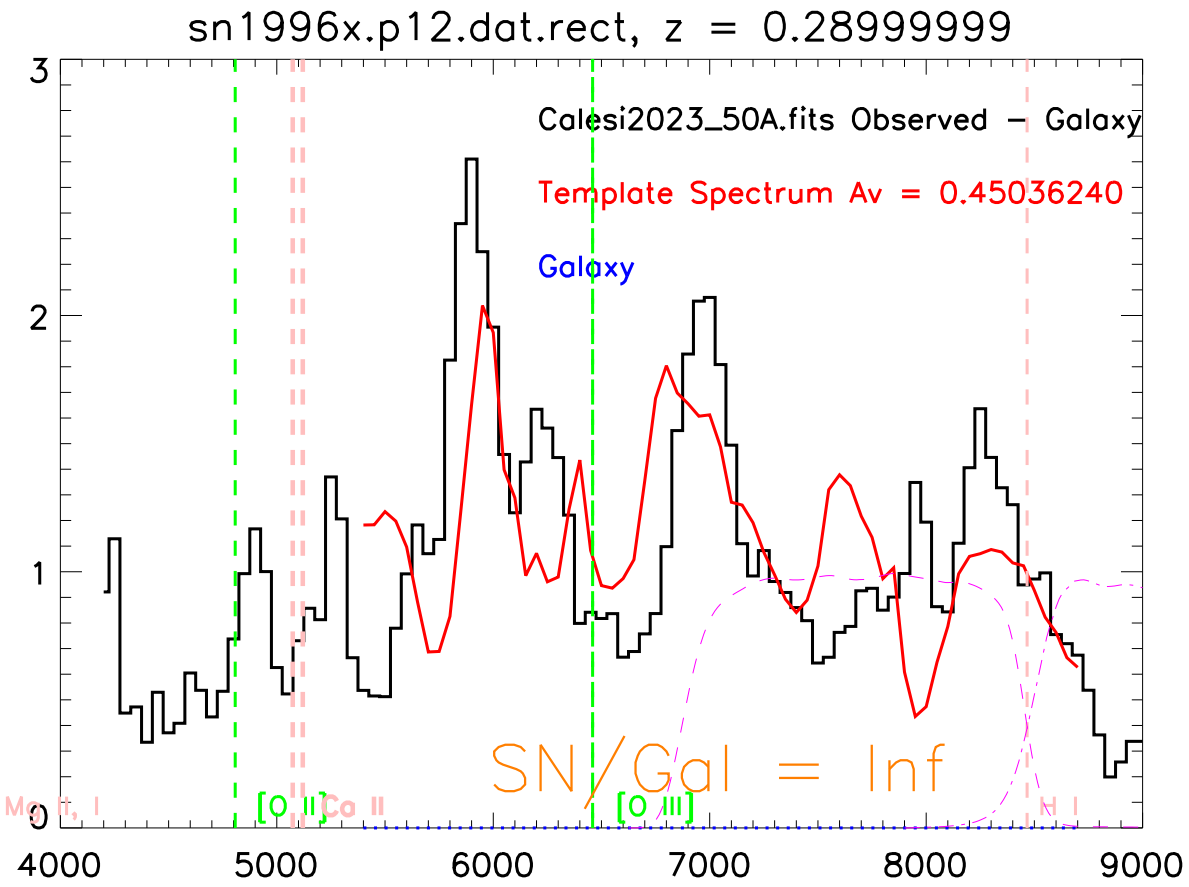
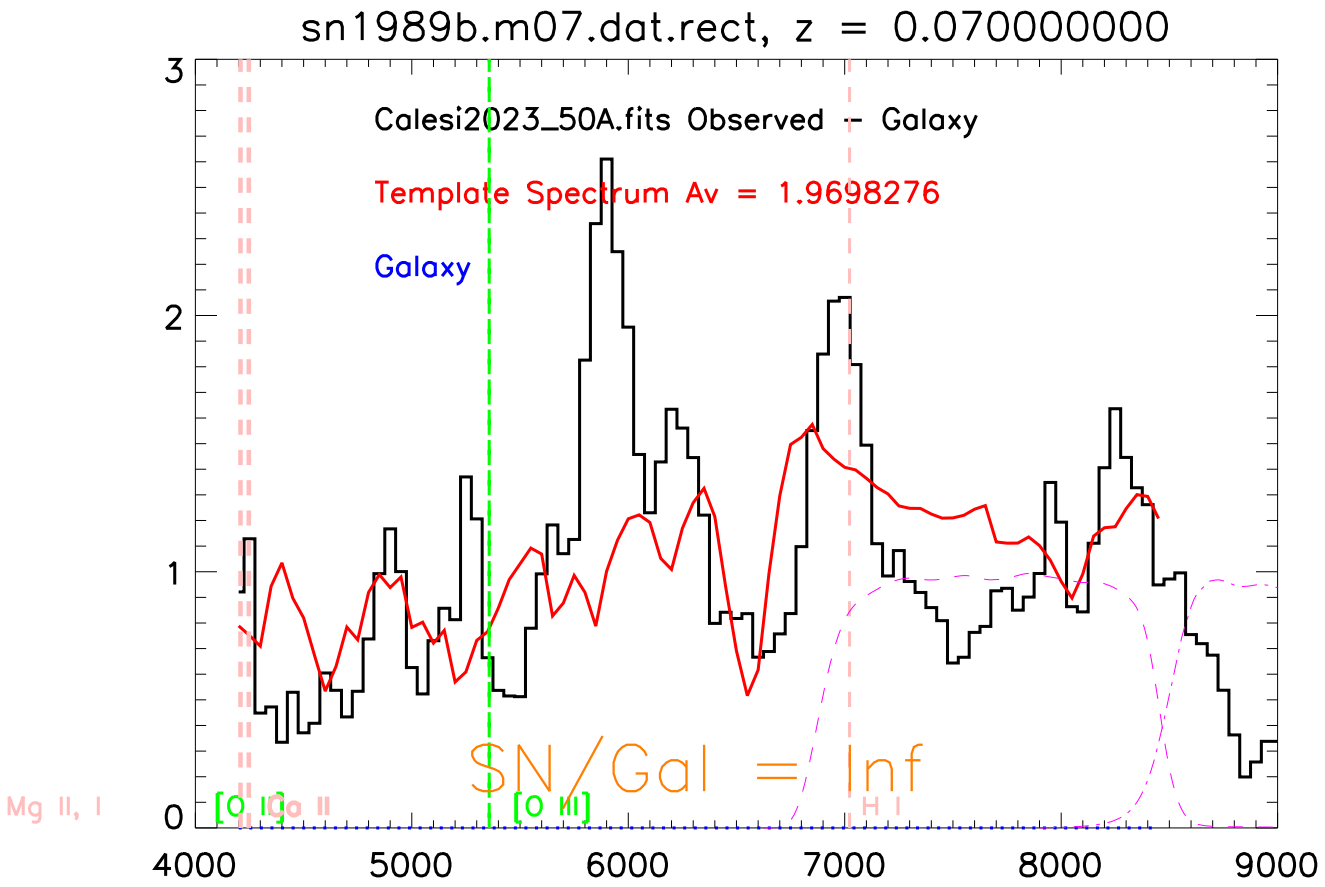
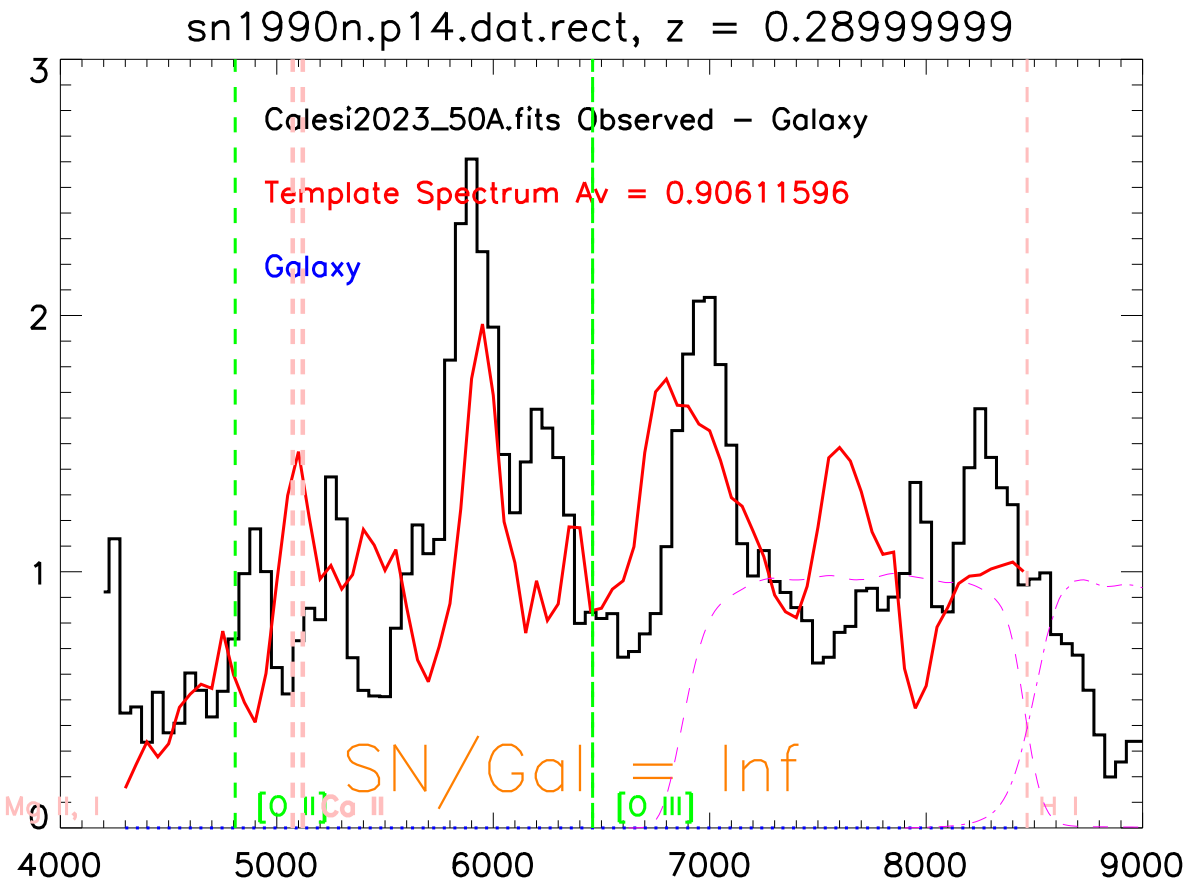
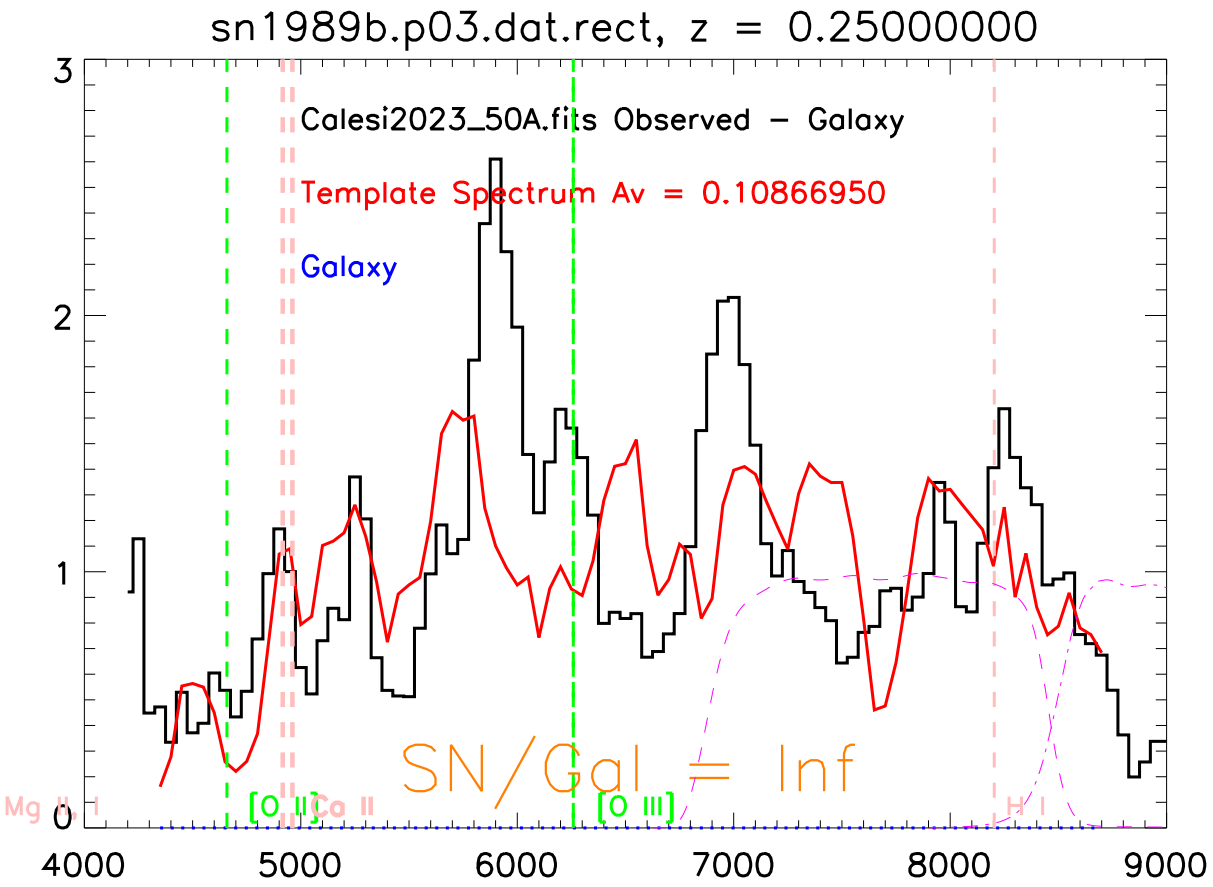
9000

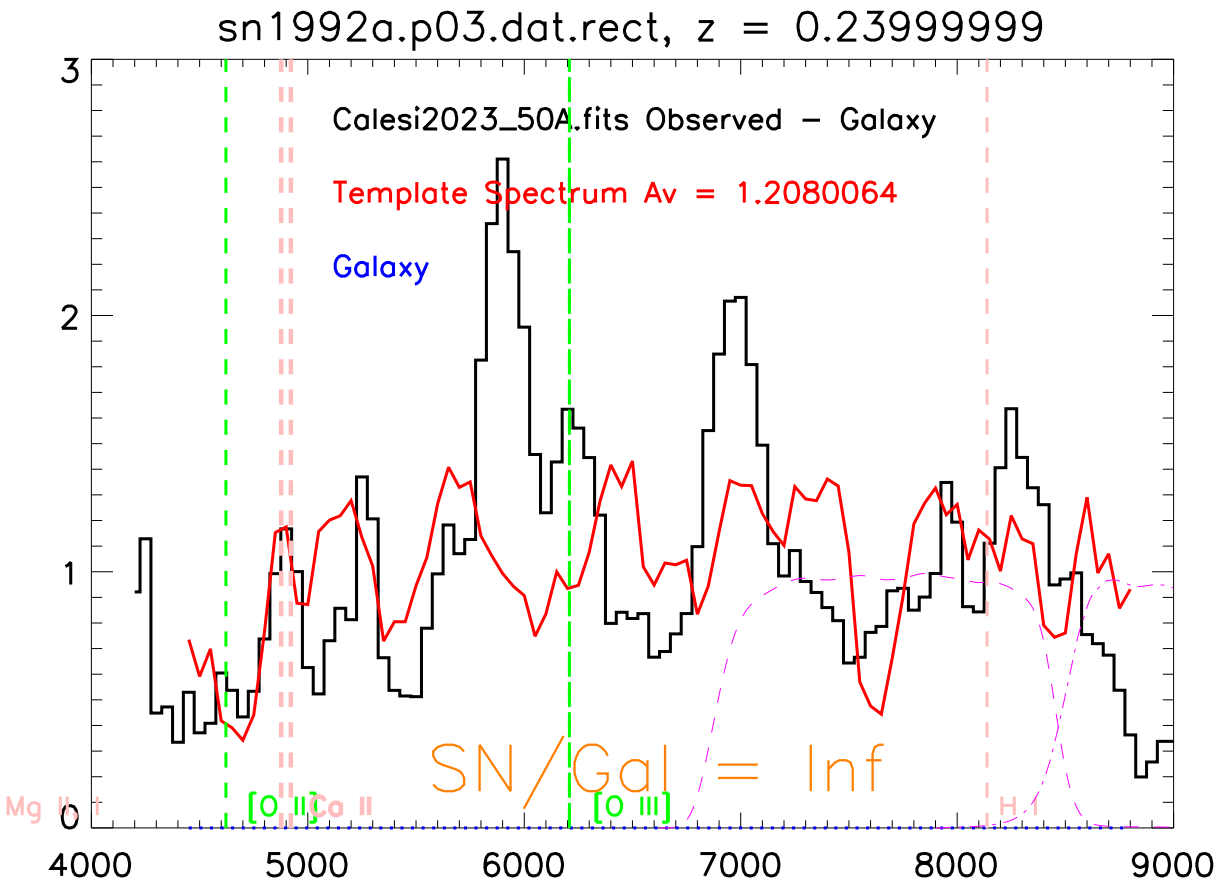

sn1994d.m08.dat.rect, z = 0.079999998
Calesi2023_50A.fits Observed – Galaxy
Template Spectrum Av = 3.1885333
Galaxy
SN/Gal = Inf
Mg II, I
[O I]
Ca II
[O III]
H I
3
2
1
0
4000
5000
6000
7000
8000
9000

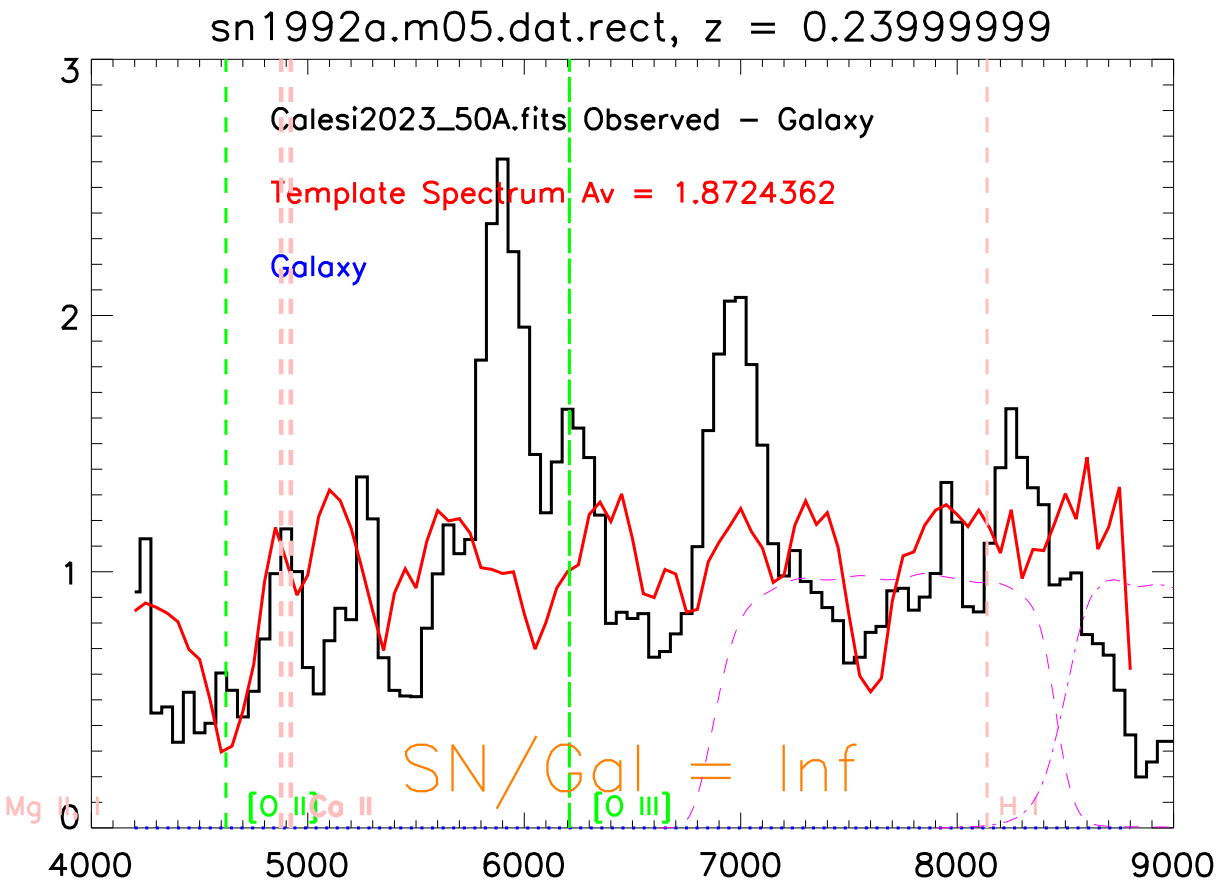

sn1996x.p12.dat.rect, z = 0.28999999
Calesi2023_50A.fits Observed – Galaxy
Template Spectrum Av = 0.45036240
Galaxy
SN/Gal = Inf
[O II]
Ca II
[O III]
H I
3
2
1
0
4000
5000
6000
7000
8000
9000

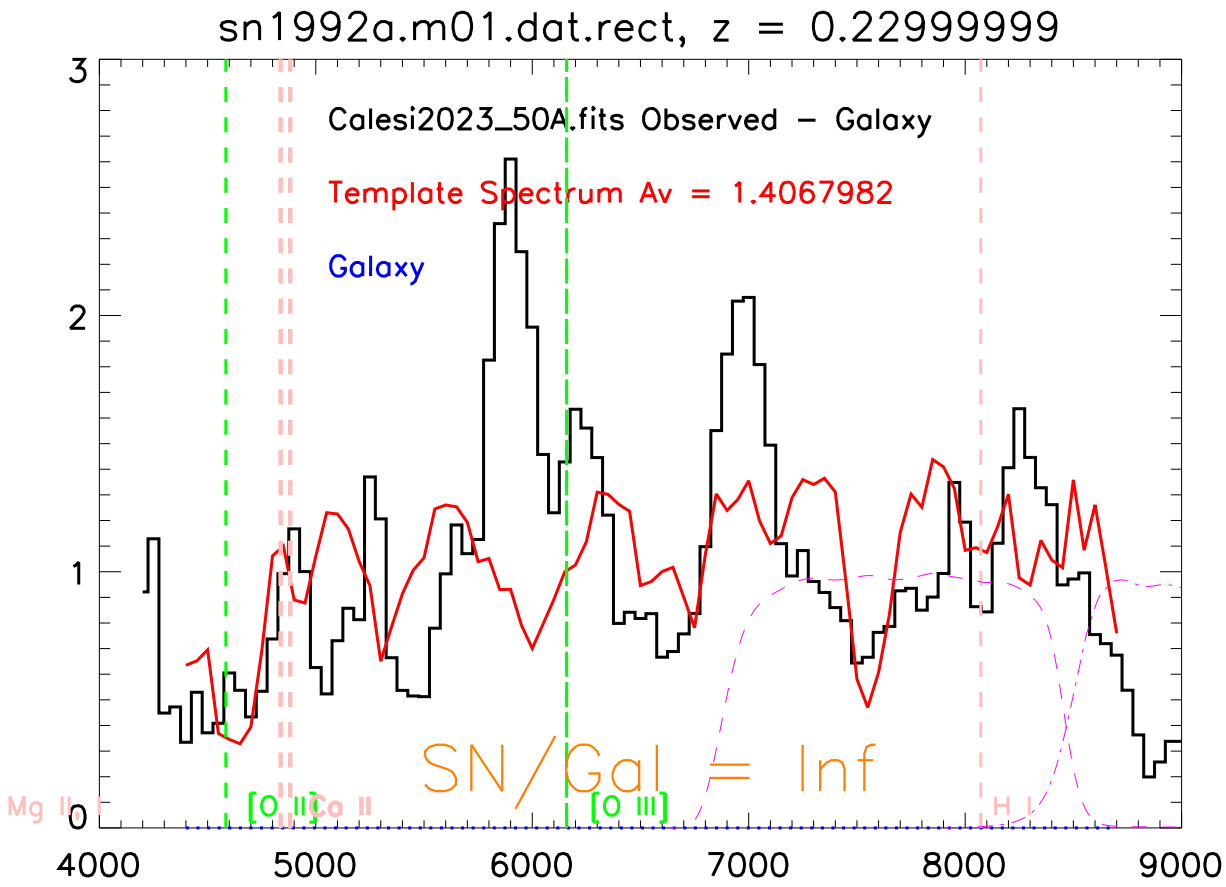

sn1989b.m07.dat.rect, z = 0.070000000
Calesi2023_50A.fits Observed - Galaxy
Template Spectrum Av = 1.9698276
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
0
1
2
3
4000
5000
6000
7000
8000
9000

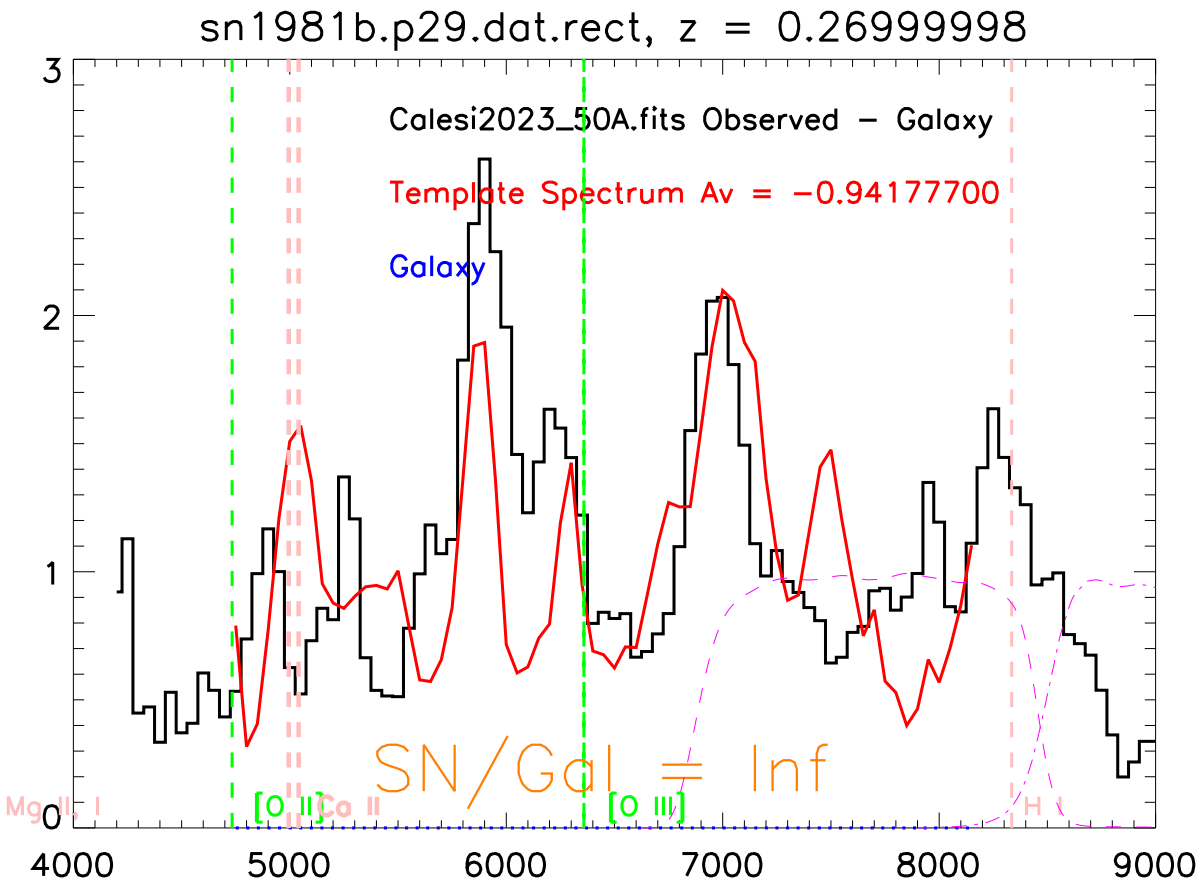

sn1990n.p14.dat.rect, z = 0.28999999
Calesi2023_50A.fits Observed − Galaxy
Template Spectrum Av = 0.90611596
Galaxy
SN/Gal = Inf
[O II]
Ca II
[O III]
H I
3
2
1
0
4000
5000
6000
7000
8000
9000

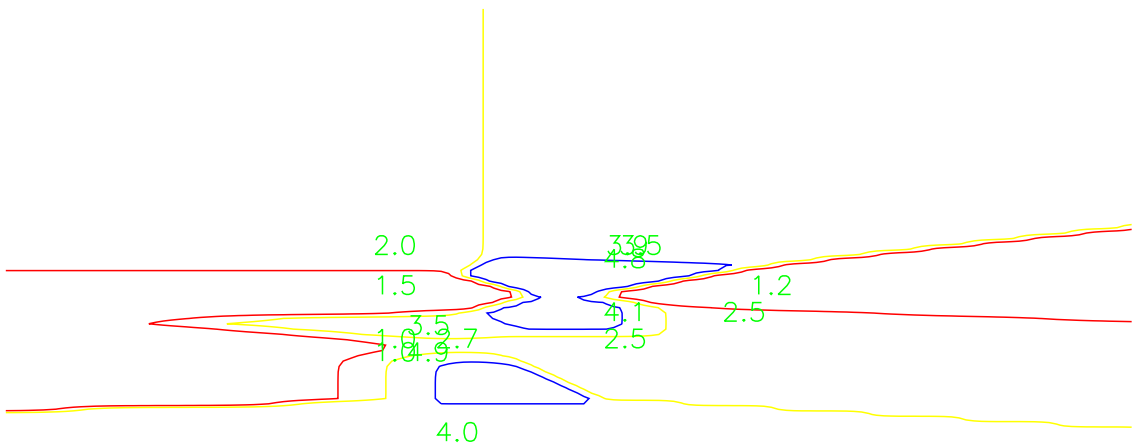

sn1989b.p03.dat.rect, z = 0.25000000
Calesi2023_50A.fits Observed − Galaxy
Template Spectrum Av = 0.10866950
Galaxy
SN/Gal = Inf
Mg II
[O II]
Ca II
[O III]
H I
0
1
2
3
4000
5000
6000
7000
8000
9000

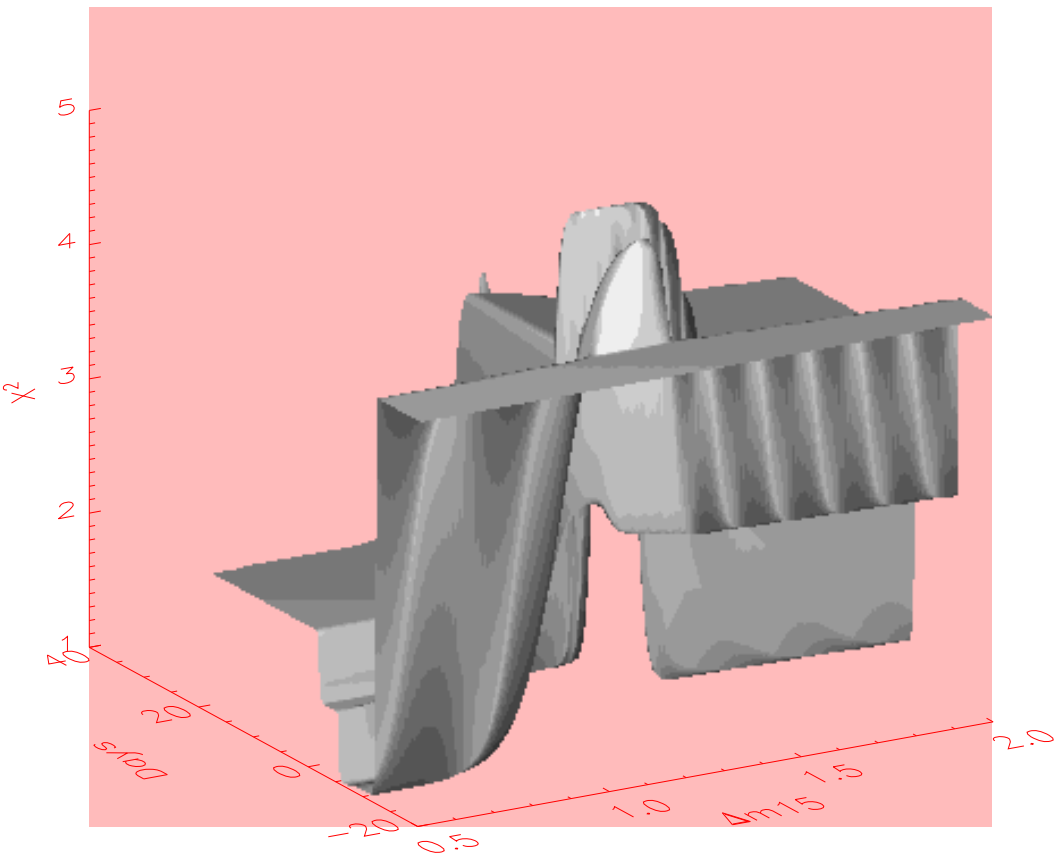

sn1992a.p03.dat.rect, z = 0.23999999
Calesi2023_50A.fits Observed − Galaxy
Template Spectrum Av = 1.2080064
Galaxy
SN/Gal = Inf
Mg II
[O II]
Ca II
[O III]
H-1
3
2
1
0
4000
5000
6000
7000
8000
9000


sn1992a.m05.dat.rect, z = 0.23999999
Calesi2023_50A.fits Observed − Galaxy
Template Spectrum Av = 1.8724362
Galaxy
SN/Gal = Inf
Mg II
[O II]
Ca II
[O III]
H 1
3
2
1
0
4000
5000
6000
7000
8000
9000

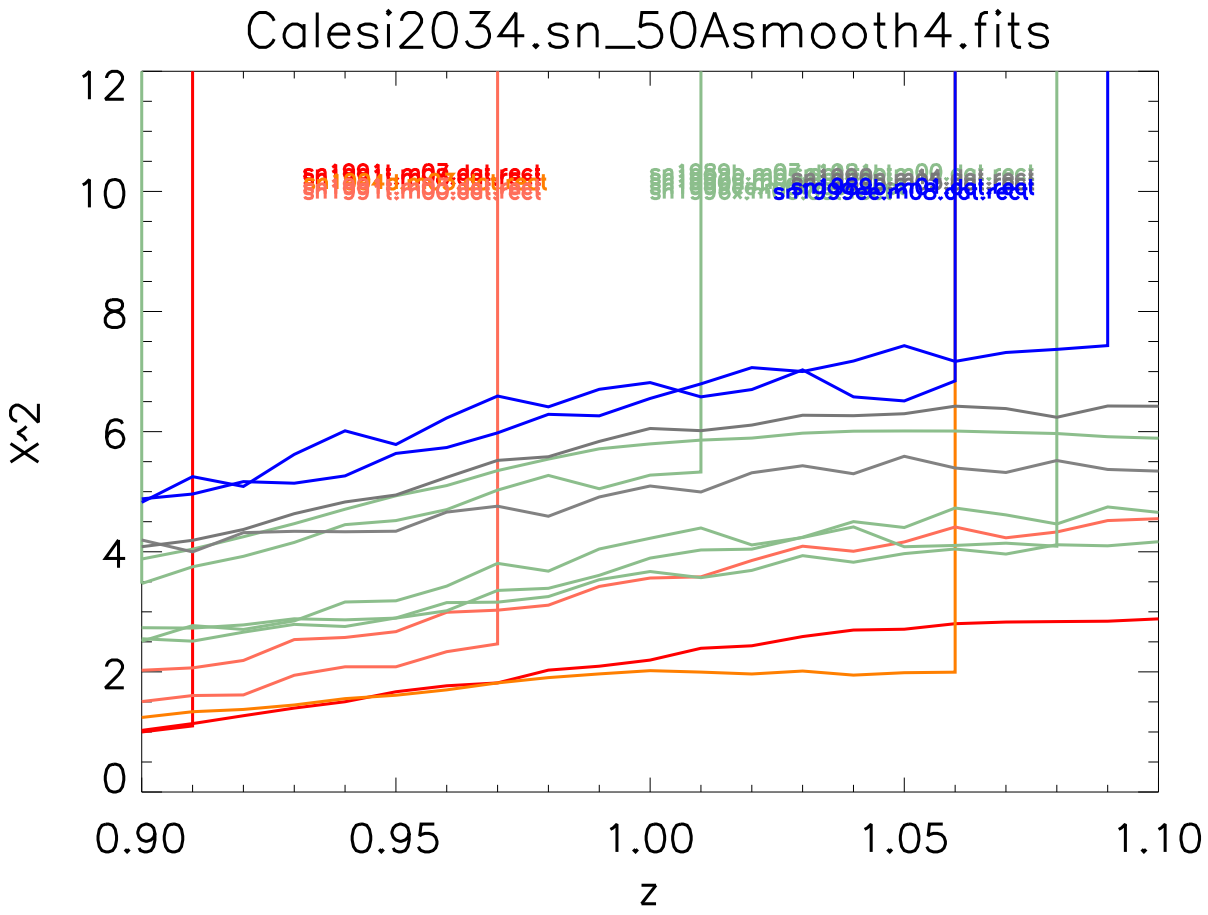

sn1992a.m01.dat.rect, z = 0.22999999
Calesi2023_50A.fits Observed − Galaxy
Template Spectrum Av = 1.4067982
Galaxy
SN/Gal = Inf
Mg II
[O II]
Ca II
[O III]
H I
0
1
2
3
4000
5000
6000
7000
8000
9000

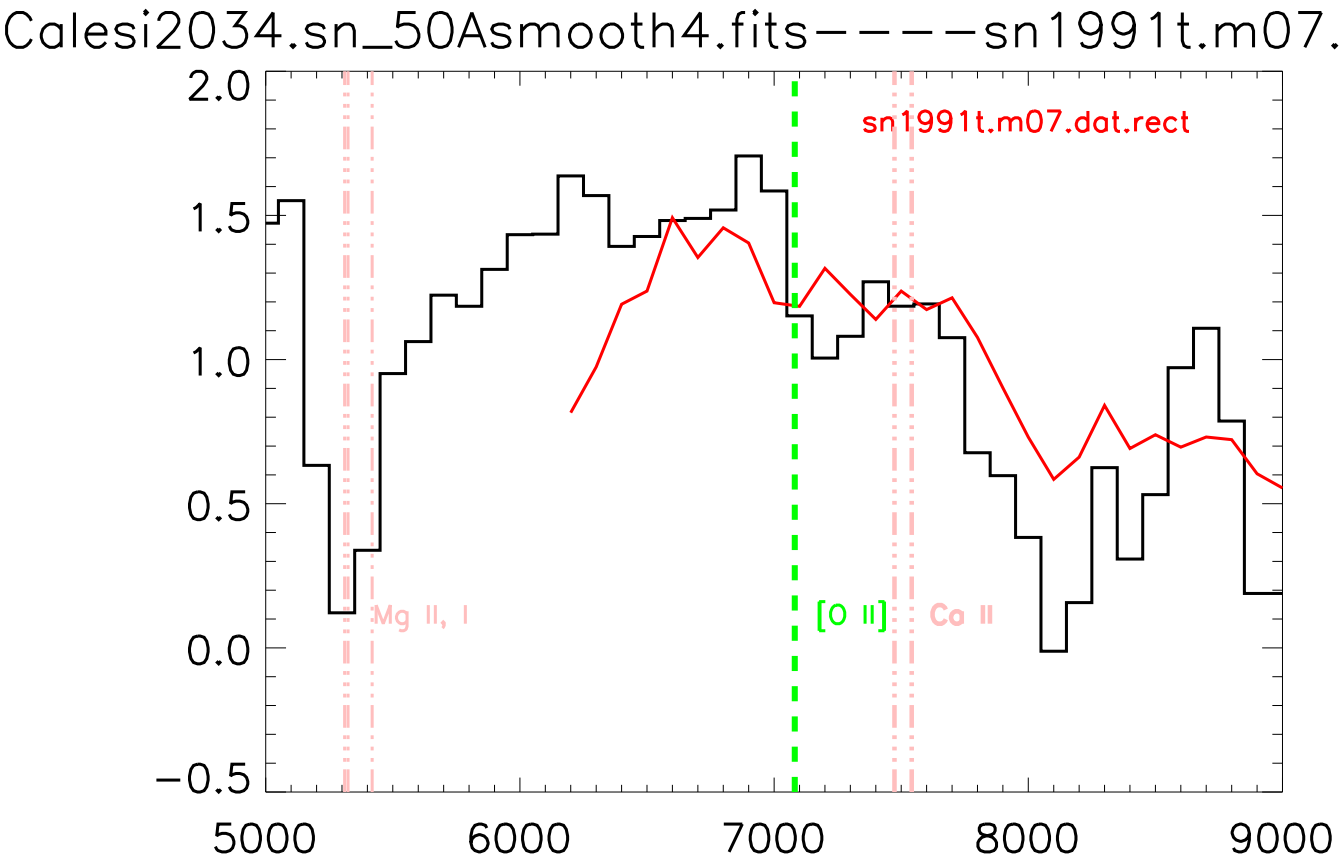

sn1981b.p29.dat.rect, z = 0.26999998
Calesi2023_50A.fits Observed − Galaxy
Template Spectrum Av = −0.94177700
Galaxy
SN/Gal = Inf
[O II]
Ca II
[O III]
3
2
1
0
4000
5000
6000
7000
8000
9000

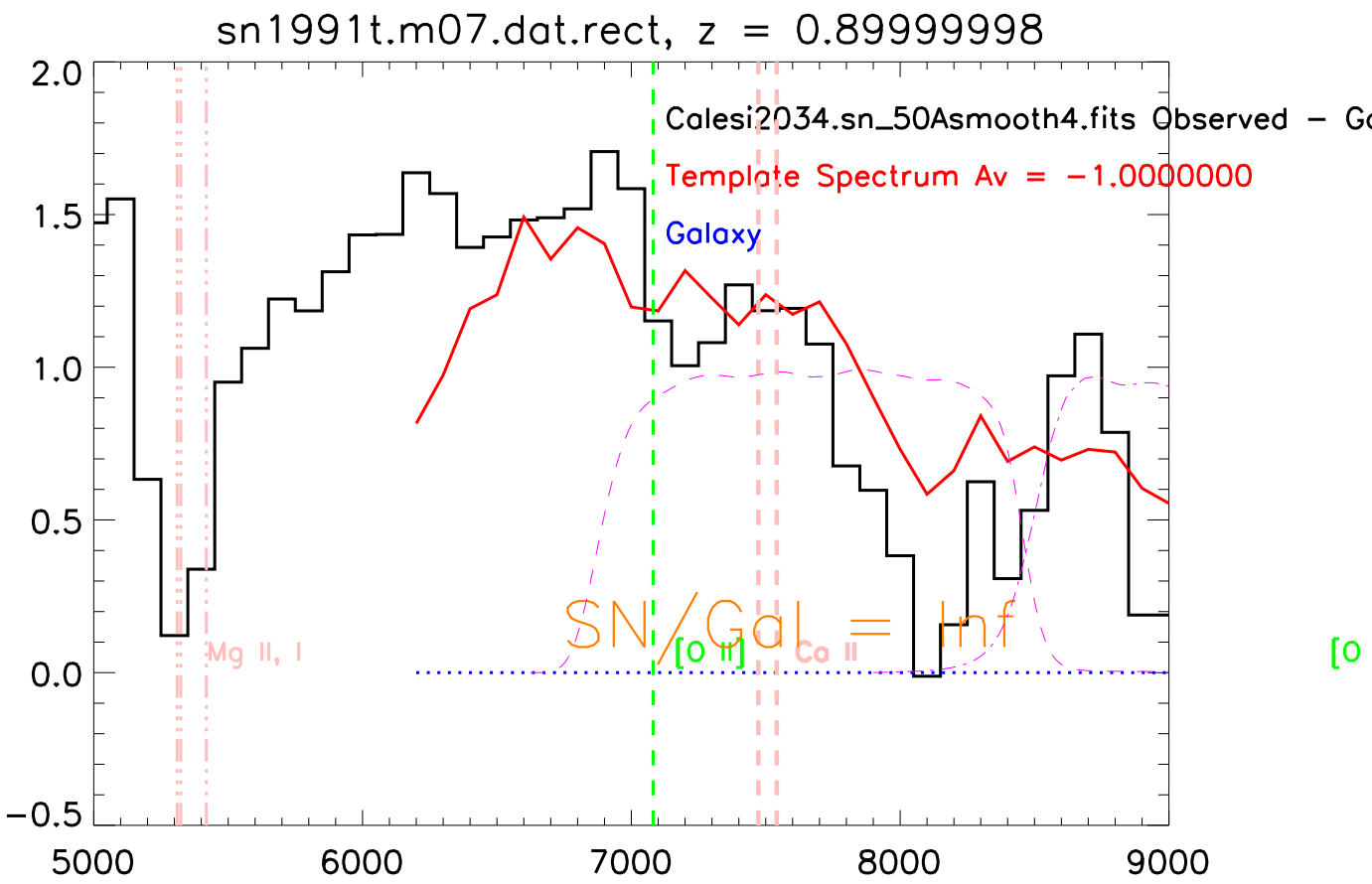

2.0
1.5
1.2
2.5
4.1
2.5
4.0

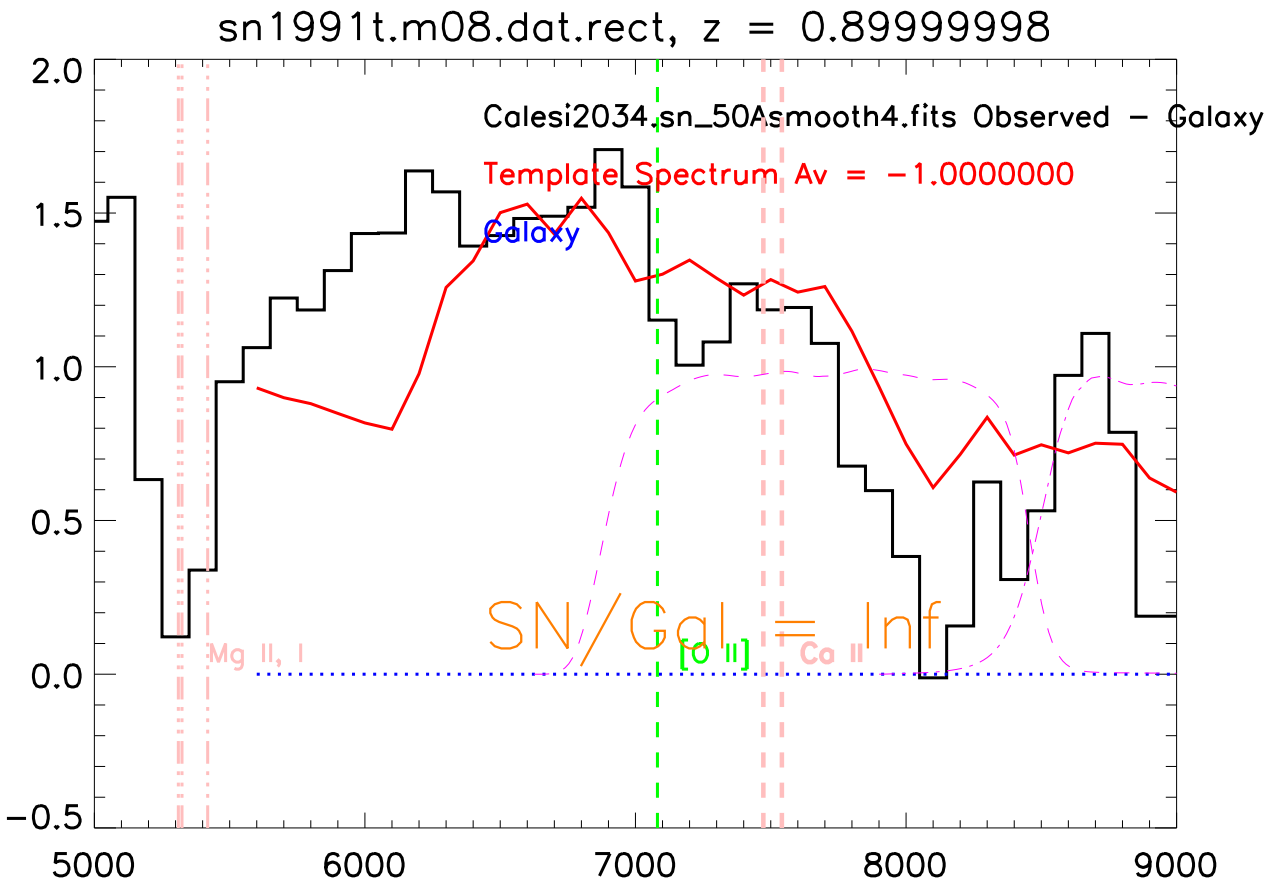


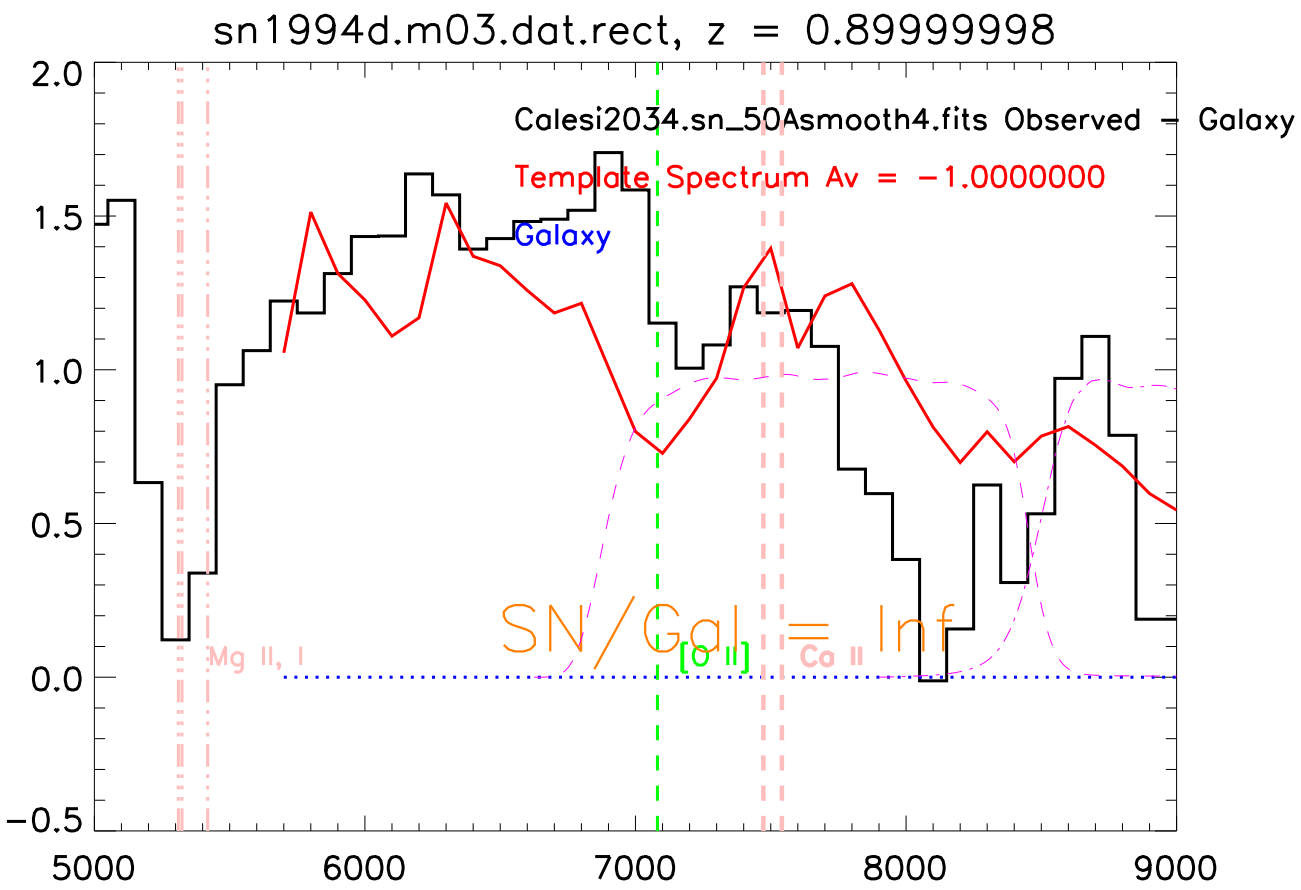
5
4
3
2
1
χ^2
40
20
0
−20
Days
0.5
1.0
1.5
2.0
Δm15

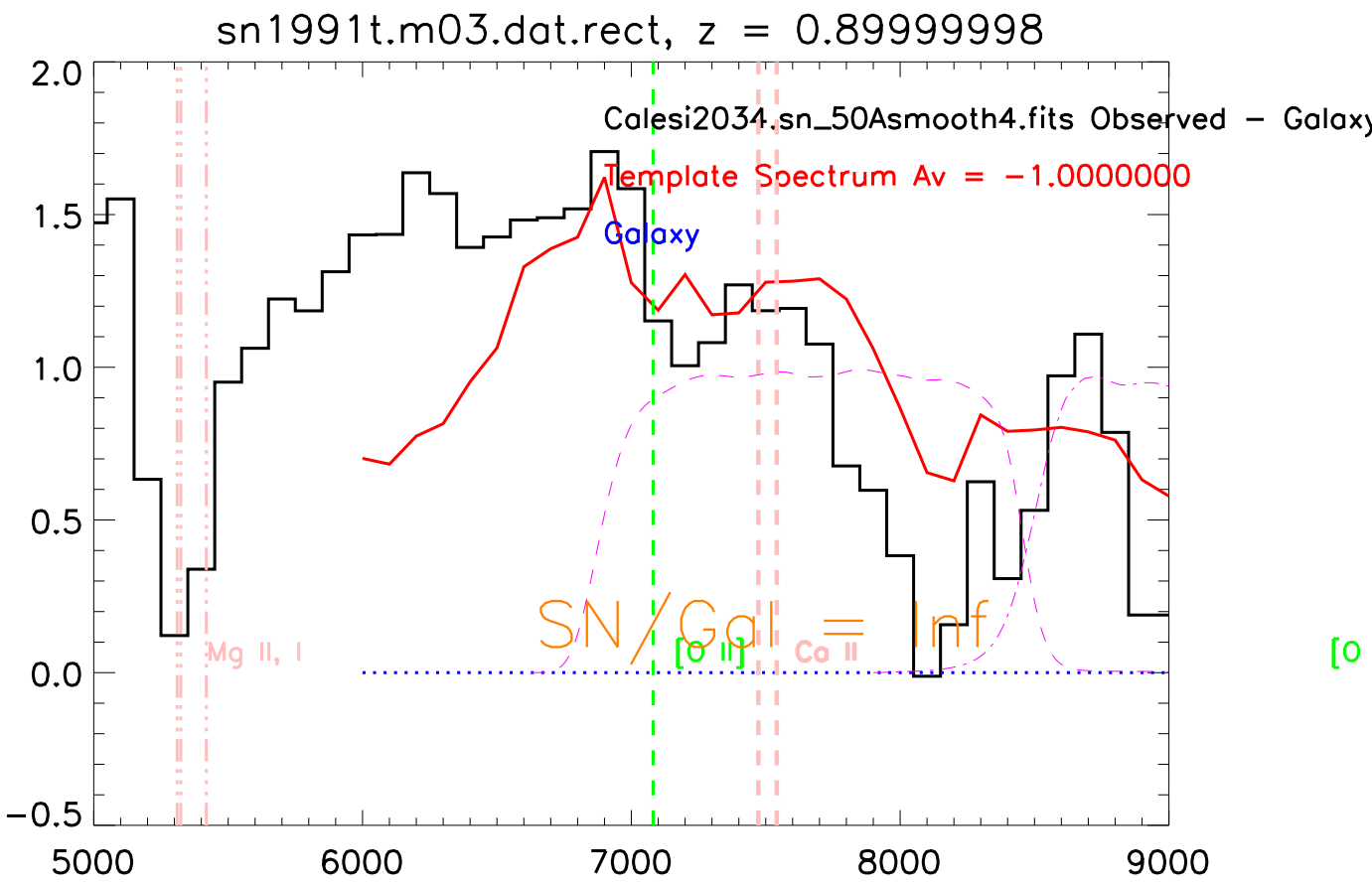

Calesi2034.sn_50Asmooth4.fits
X^2
z
0
2
4
6
8
10
12
0.90
0.95
1.00
1.05
1.10

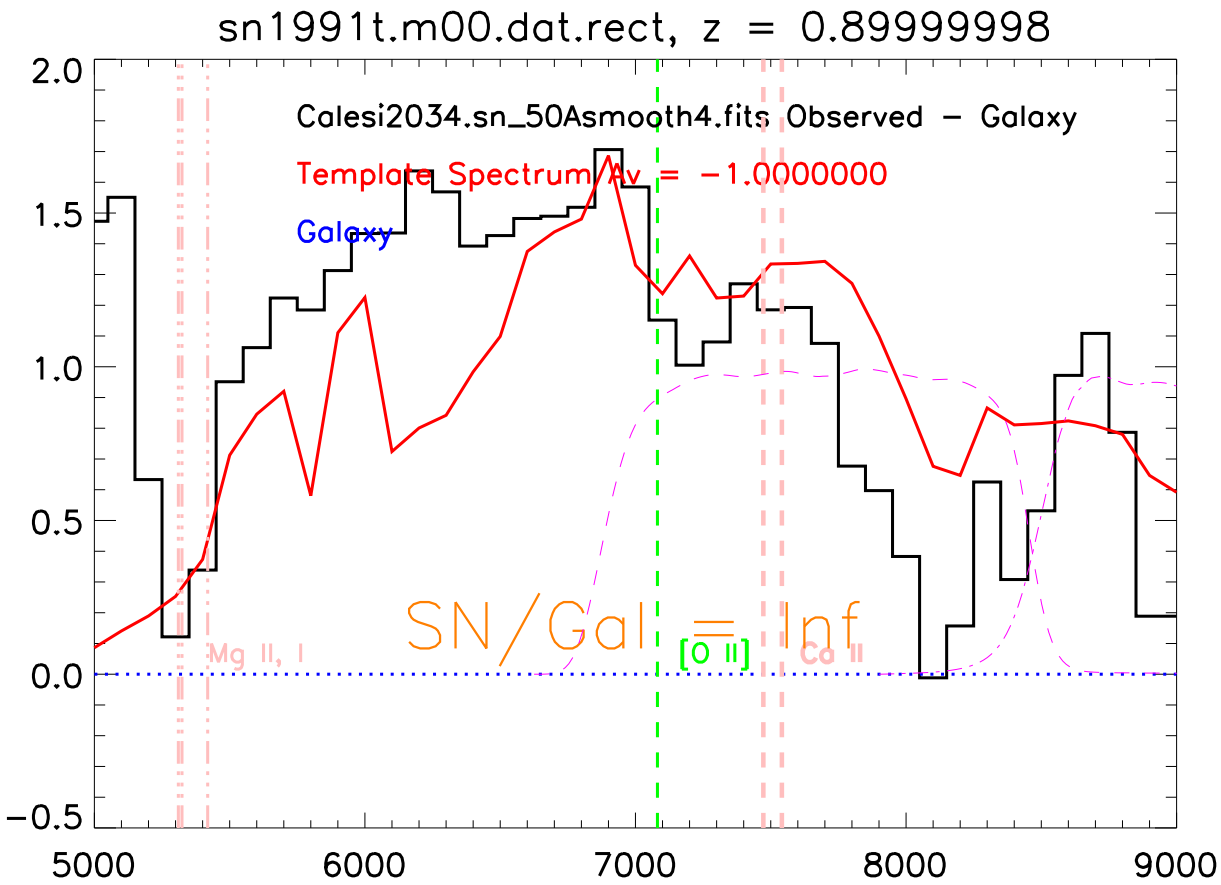

Calesi2034.sn_50Asmooth4.fits----sn1991t.m07.dat.rec
sn1991t.m07.dat.rect
Mg II, I
[O II]
Ca II
2.0
1.5
1.0
0.5
0.0
−0.5
5000
6000
7000
8000
9000

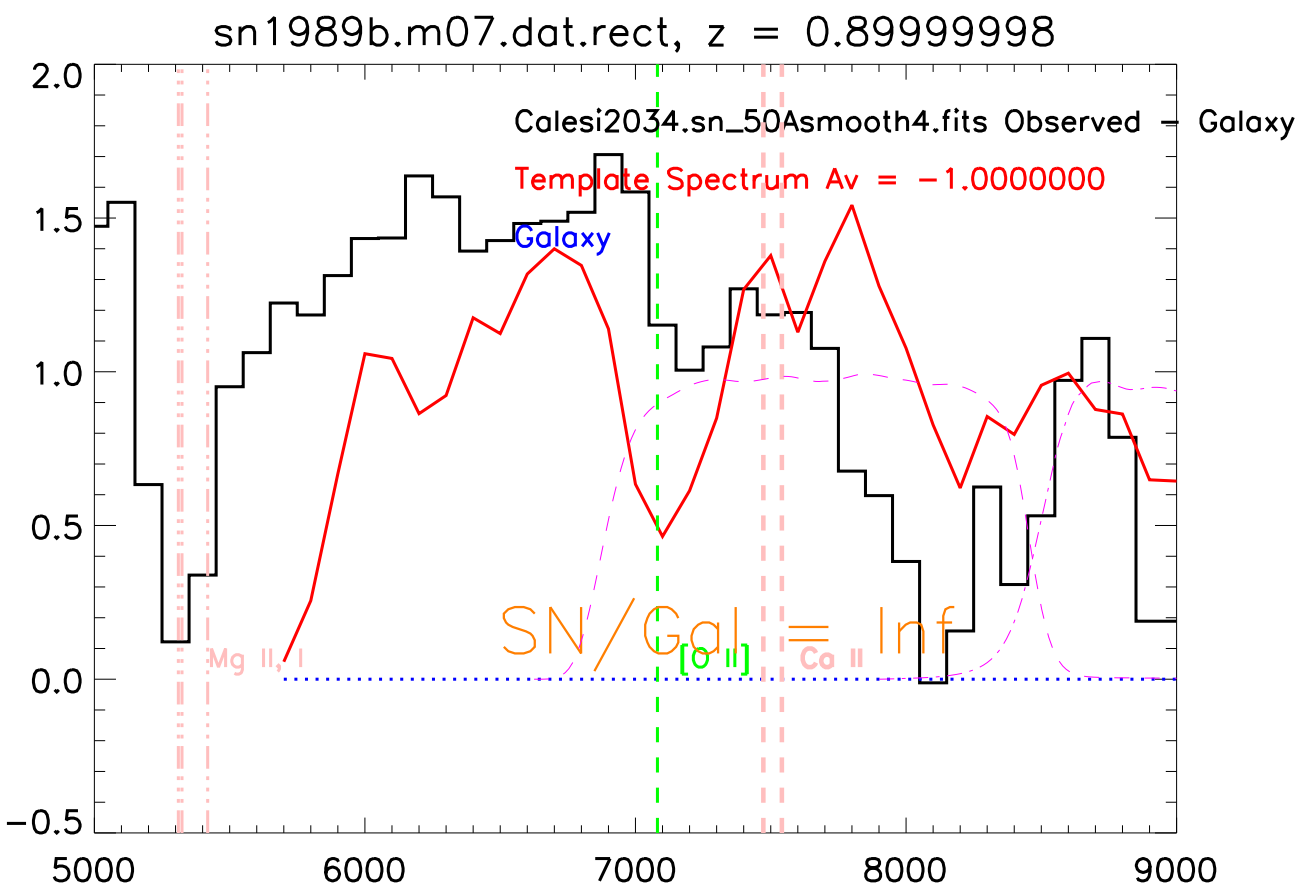

sn1991t.m07.dat.rect, z = 0.89999998
Calesi2034.sn_50Asmooth4.fits Observed – Ga
Template Spectrum Av = −1.0000000
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O
2.0
1.5
1.0
0.5
0.0
−0.5
5000
6000
7000
8000
9000

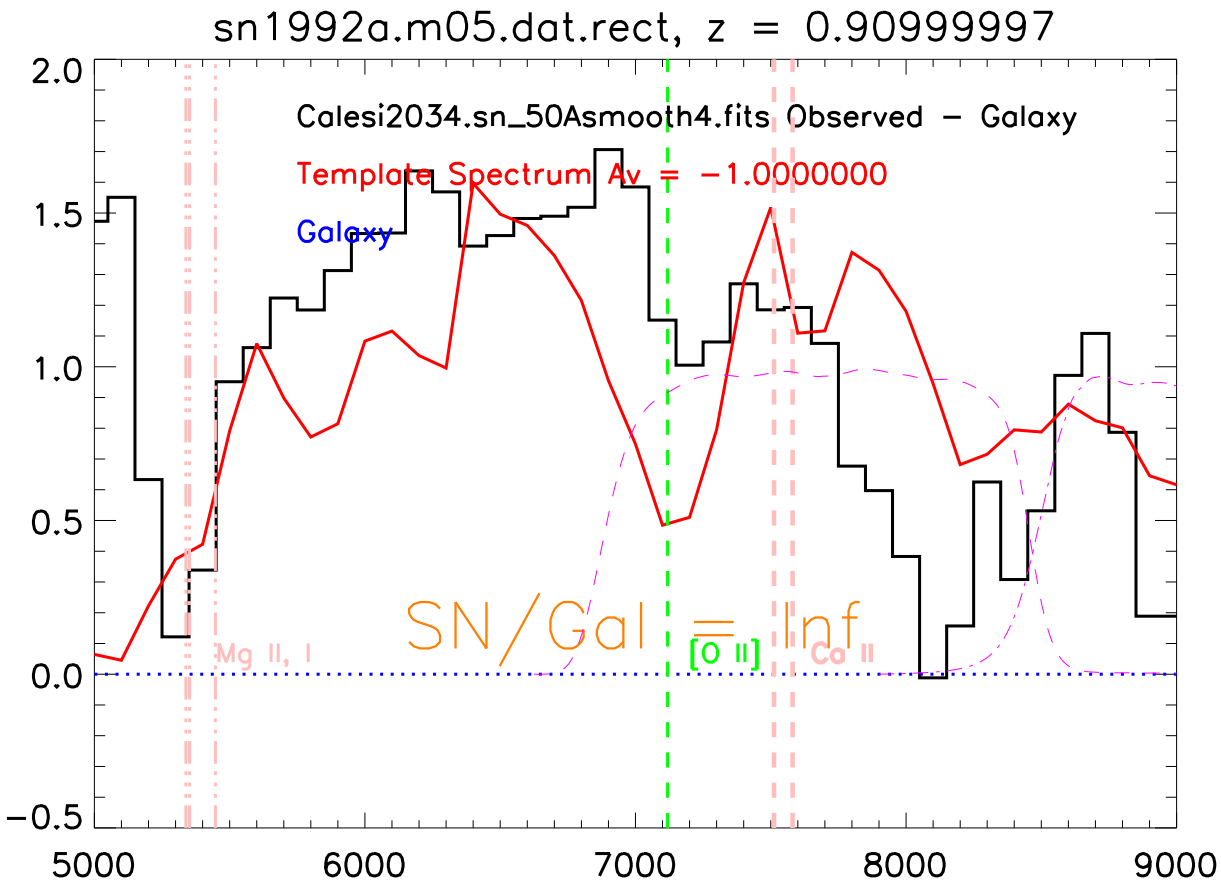

sn1991t.m08.dat.rect, z = 0.89999998
Calesi2034.sn_50Asmooth4.fits Observed − Galaxy
Template Spectrum Av = −1.0000000
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O
2.0
1.5
1.0
0.5
0.0
−0.5
5000
6000
7000
8000
9000

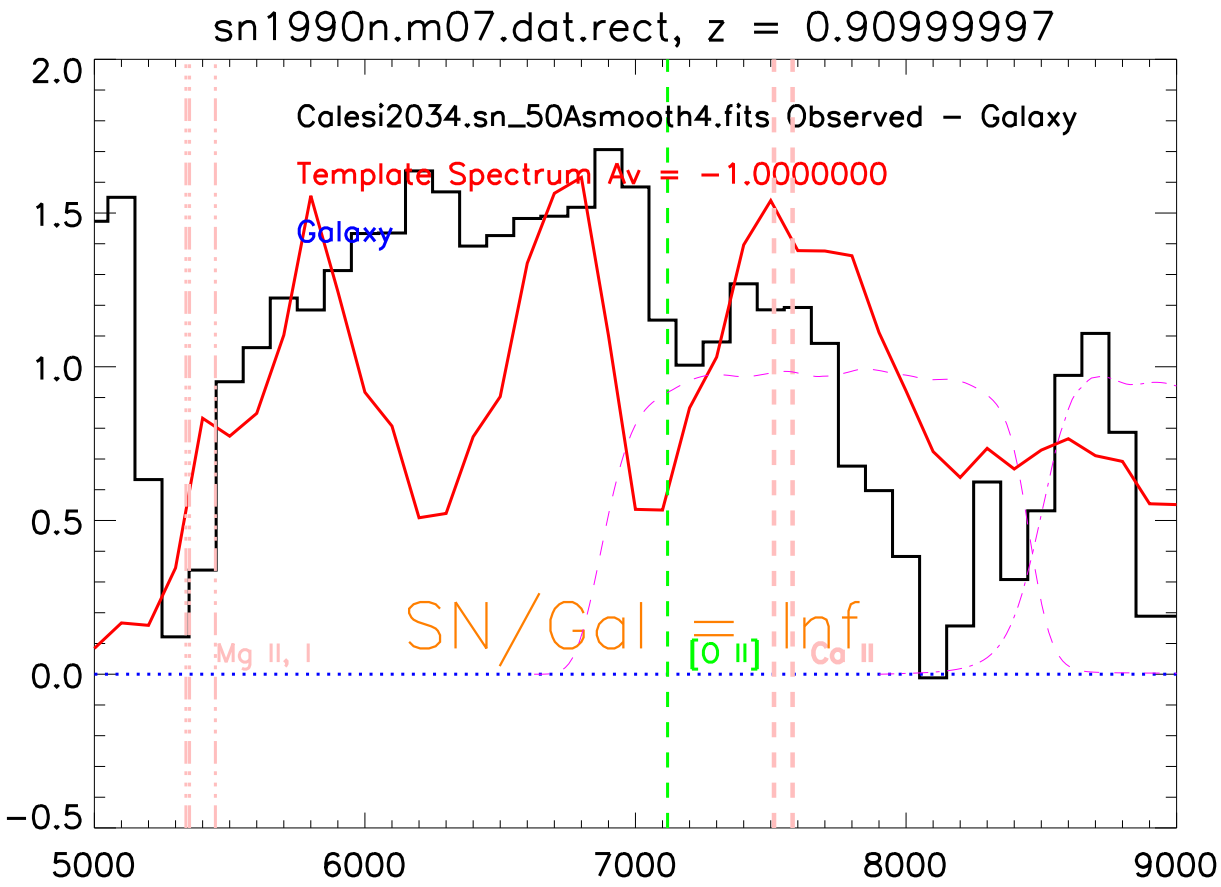

sn1994d.m03.dat.rect, z = 0.89999998
Calesi2034.sn_50Asmooth4.fits Observed - Galaxy
Template Spectrum Av = -1.0000000
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O
2.0
1.5
1.0
0.5
0.0
-0.5
5000
6000
7000
8000
9000

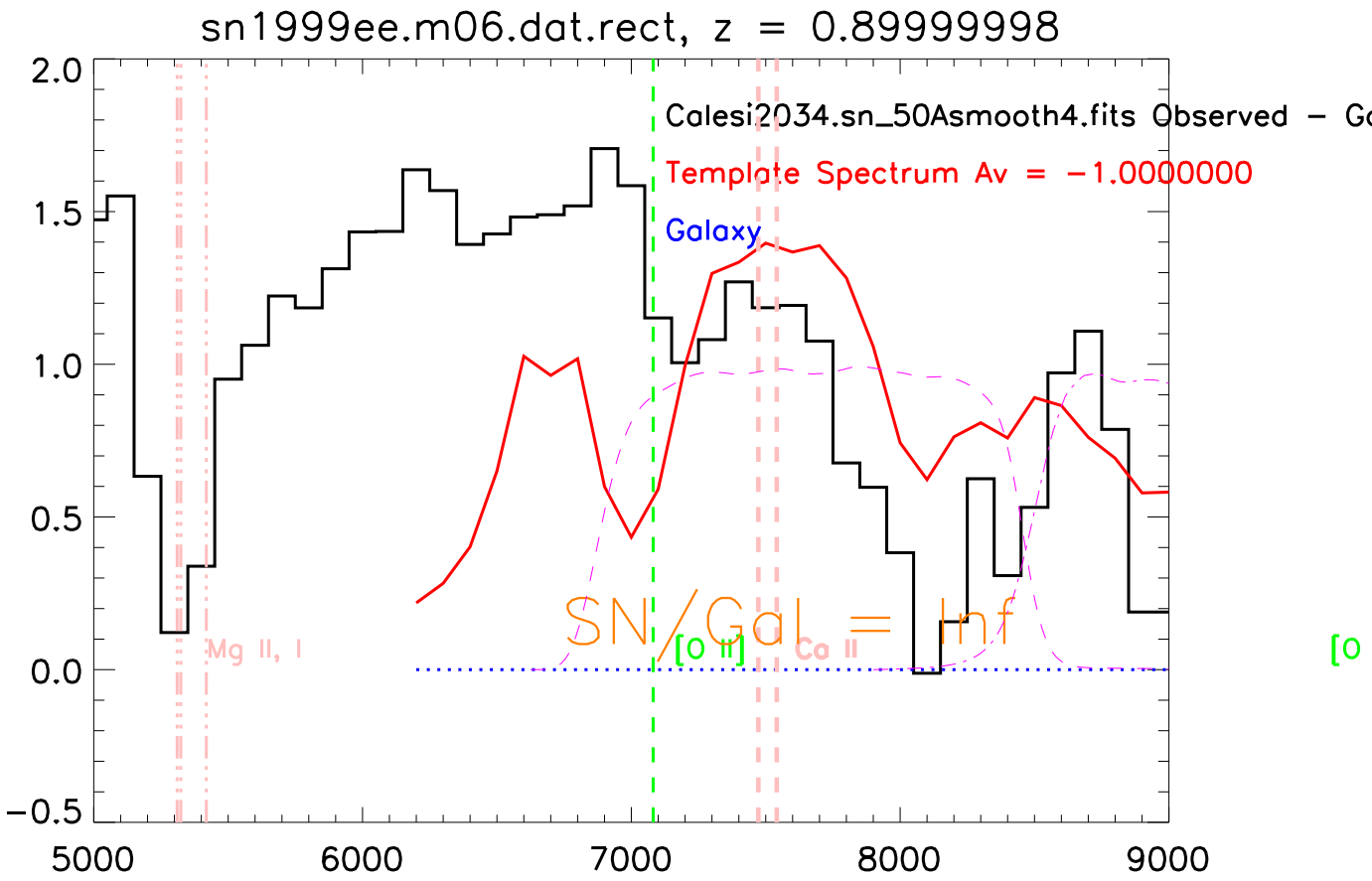

sn1991t.m03.dat.rect, z = 0.89999998
Calesi2034.sn_50Asmooth4.fits Observed − Galaxy
Template Spectrum Av = −1.0000000
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O
2.0
1.5
1.0
0.5
0.0
−0.5
5000
6000
7000
8000
9000

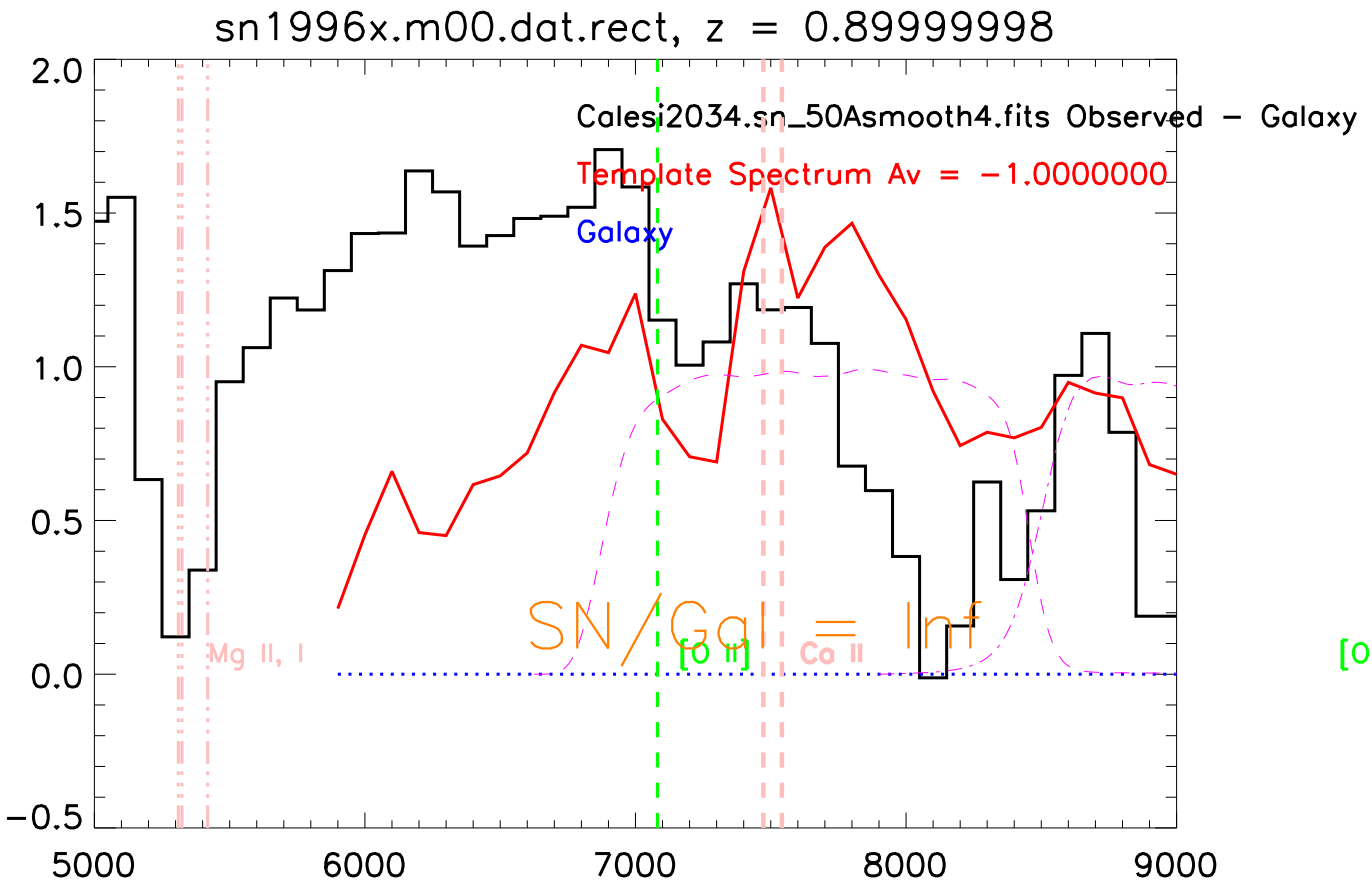

sn1991t.m00.dat.rect, z = 0.89999998
Calesi2034.sn_50Asmooth4.fits Observed − Galaxy
Template Spectrum/Av = −1.0000000
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O
2.0
1.5
1.0
0.5
0.0
−0.5
5000
6000
7000
8000
9000

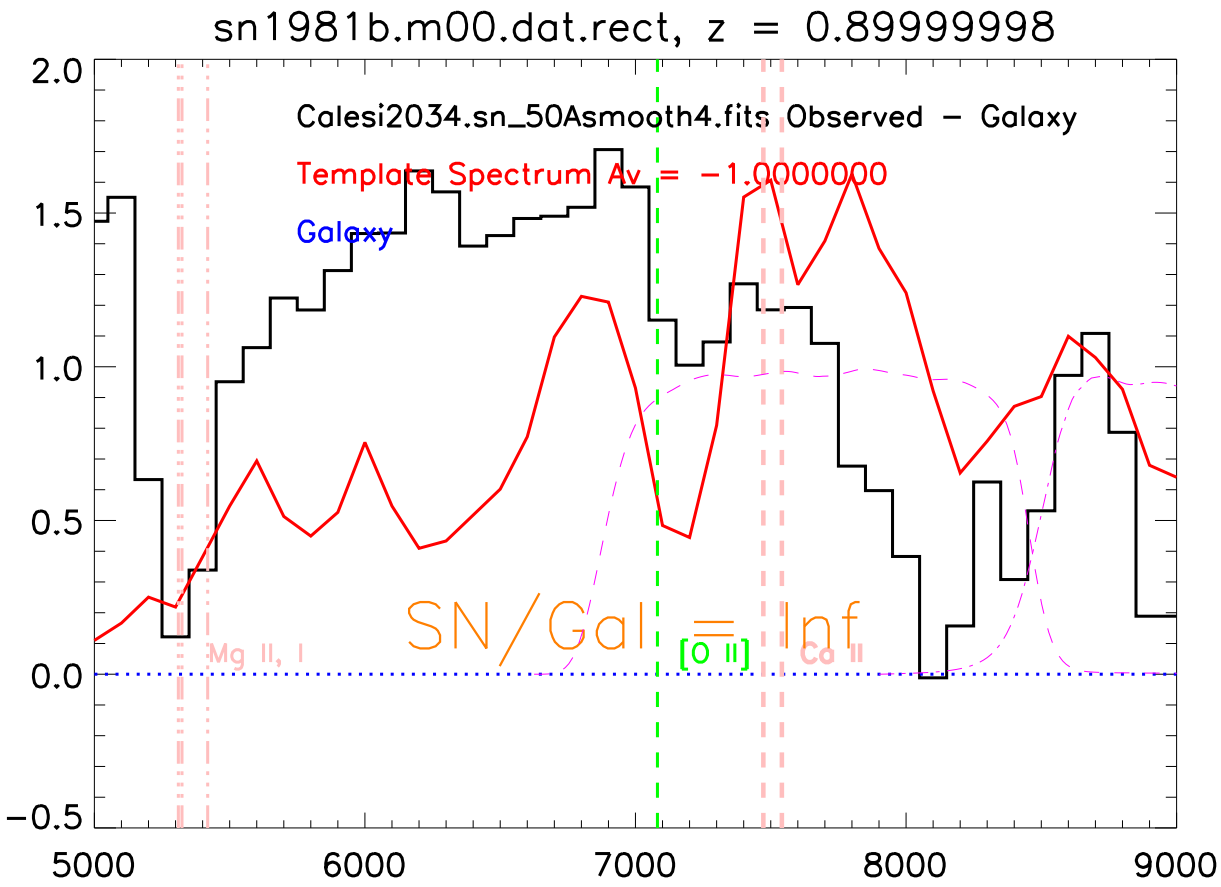

sn1989b.m07.dat.rect, z = 0.89999998
Calesi2034.sn_50Asmooth4.fits Observed - Galaxy
Template Spectrum Av = -1.0000000
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O
2.0
1.5
1.0
0.5
0.0
-0.5
5000
6000
7000
8000
9000

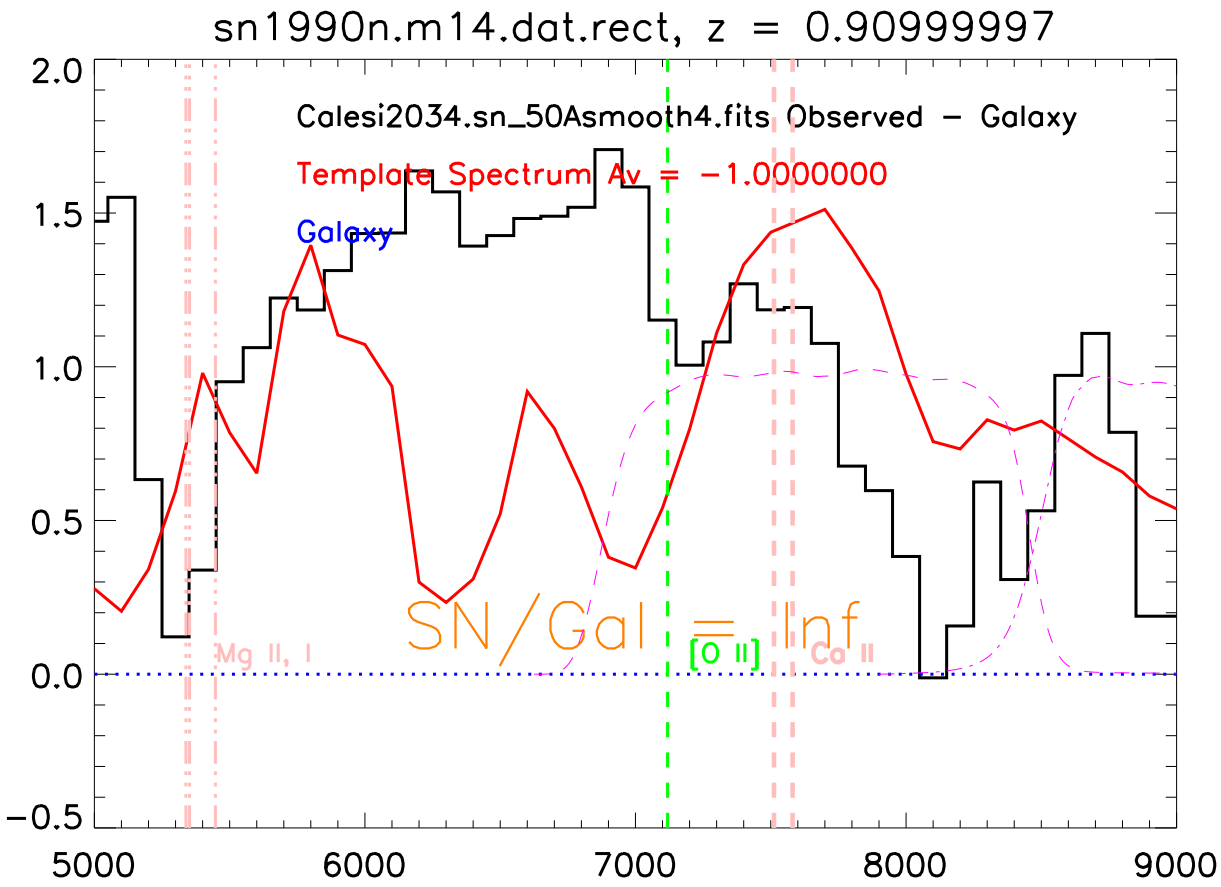

sn1992a.m05.dat.rect, z = 0.90999997
Calesi2034.sn_50Asmooth4.fits Observed − Galaxy
Template Spectrum Av = −1.0000000
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
2.0
1.5
1.0
0.5
0.0
−0.5
5000
6000
7000
8000
9000

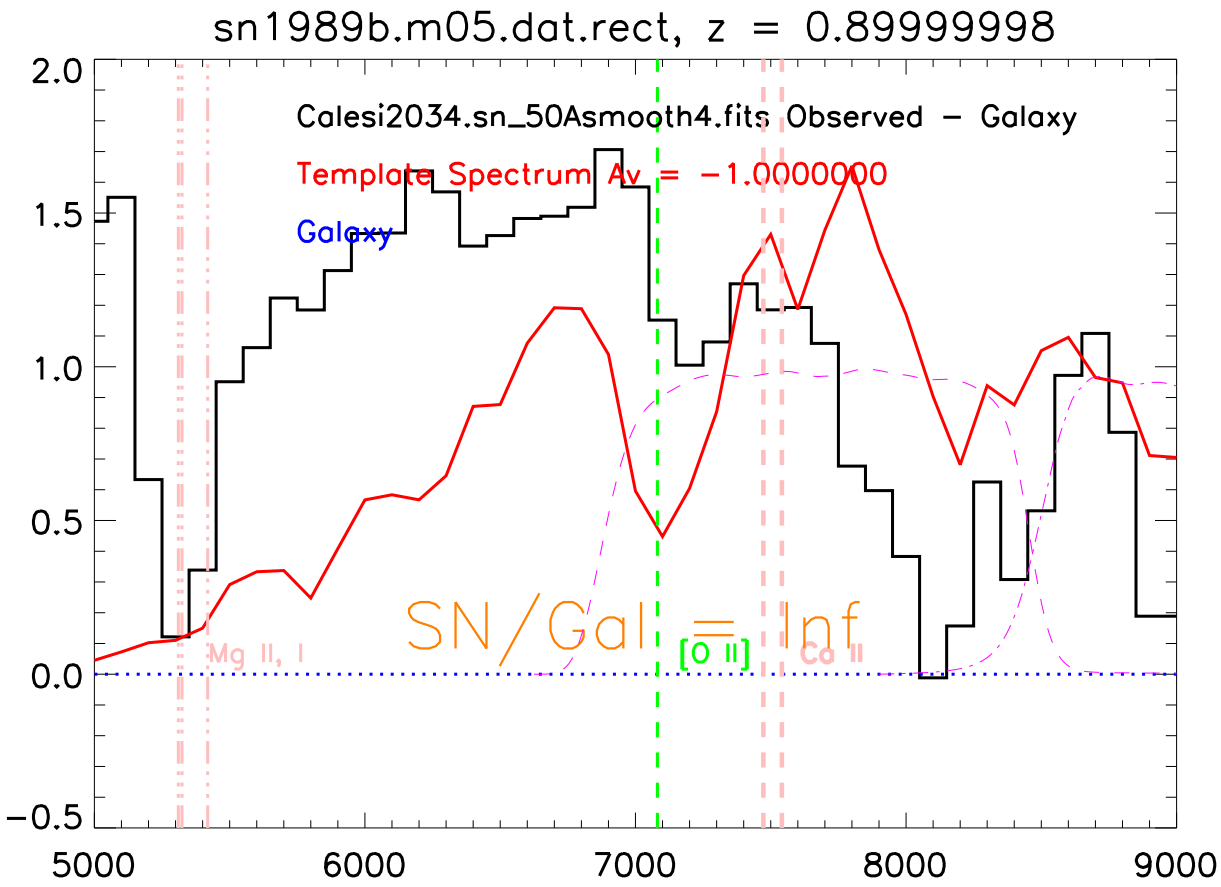

sn1990n.m07.dat.rect, z = 0.90999997
Calesi2034.sn_50Asmooth4.fits Observed − Galaxy
Template Spectrum Av = −1.0000000
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
2.0
1.5
1.0
0.5
0.0
−0.5
5000
6000
7000
8000
9000

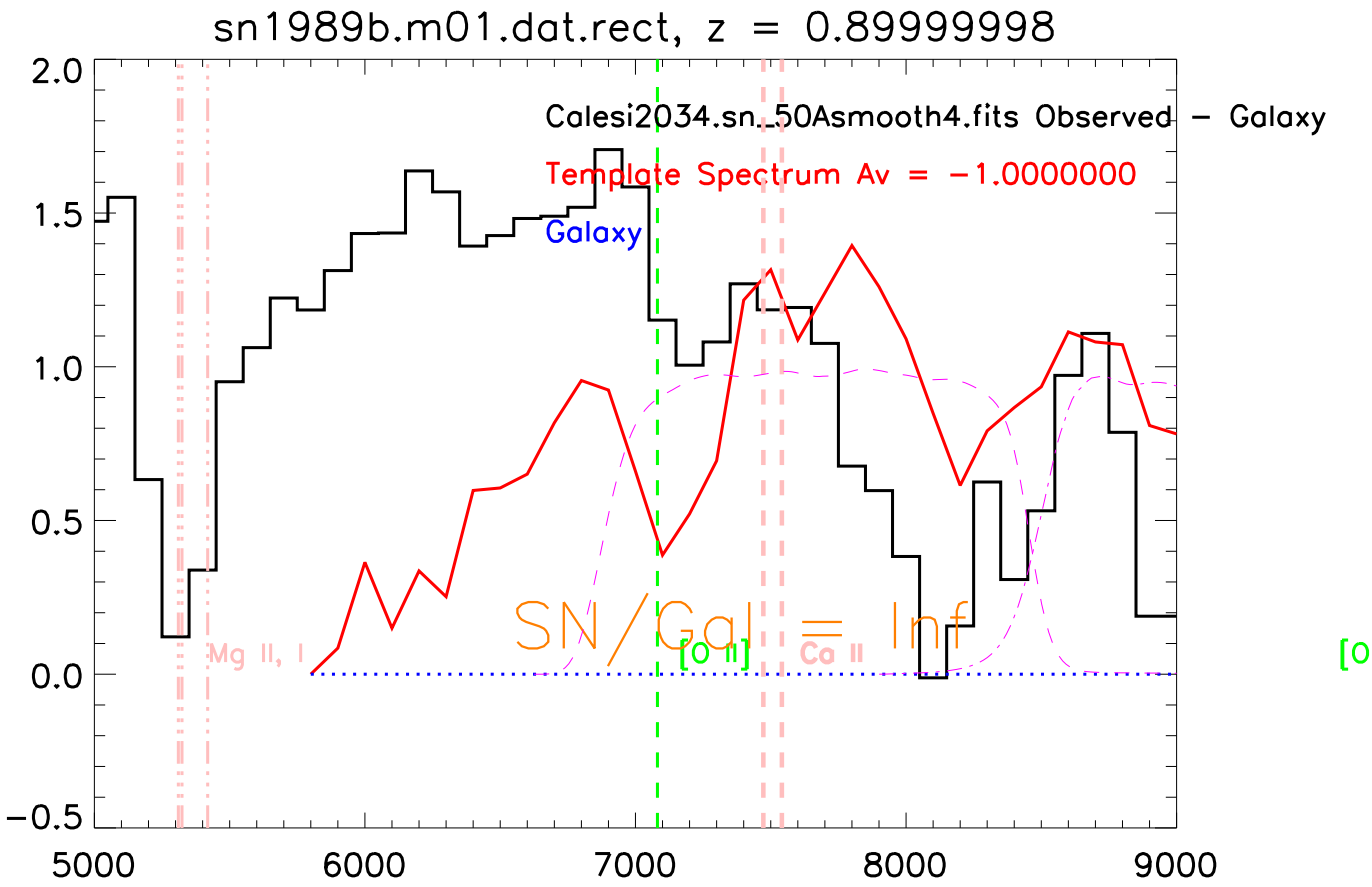

sn1999ee.m06.dat.rect, z = 0.89999998
Calesi2034.sn_50Asmooth4.fits Observed – Ga
Template Spectrum Av = −1.0000000
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O
2.0
1.5
1.0
0.5
0.0
−0.5
5000
6000
7000
8000
9000

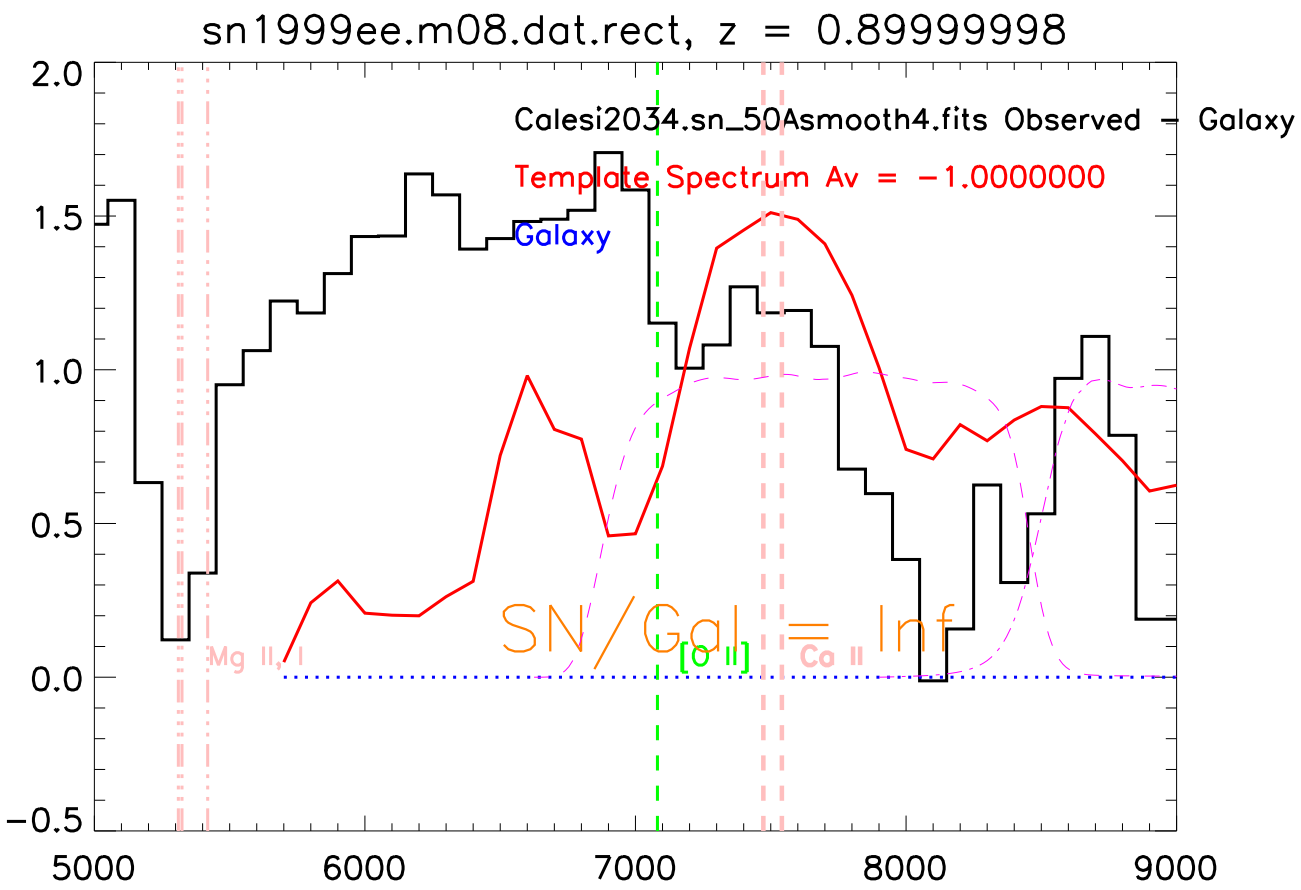

sn1996x.m00.dat.rect, z = 0.89999998
Calesi2034.sn_50Asmooth4.fits Observed − Galaxy
Template Spectrum Av = −1.0000000
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O
2.0
1.5
1.0
0.5
0.0
−0.5
5000
6000
7000
8000
9000

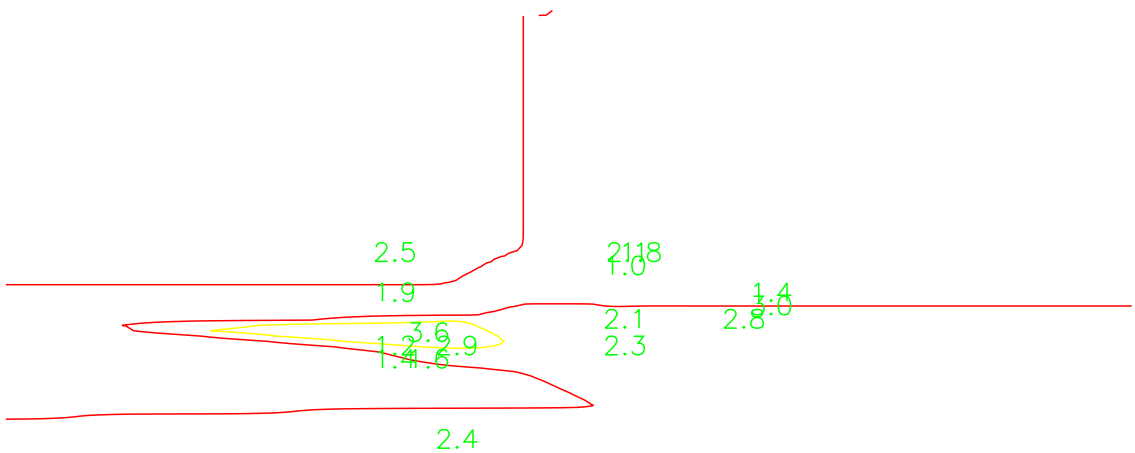

sn1981b.m00.dat.rect, z = 0.89999998
Calesi2034.sn_50Asmooth4.fits Observed − Galaxy
Template Spectrum Av = −1.0000000
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O
2.0
1.5
1.0
0.5
0.0
−0.5
5000
6000
7000
8000
9000

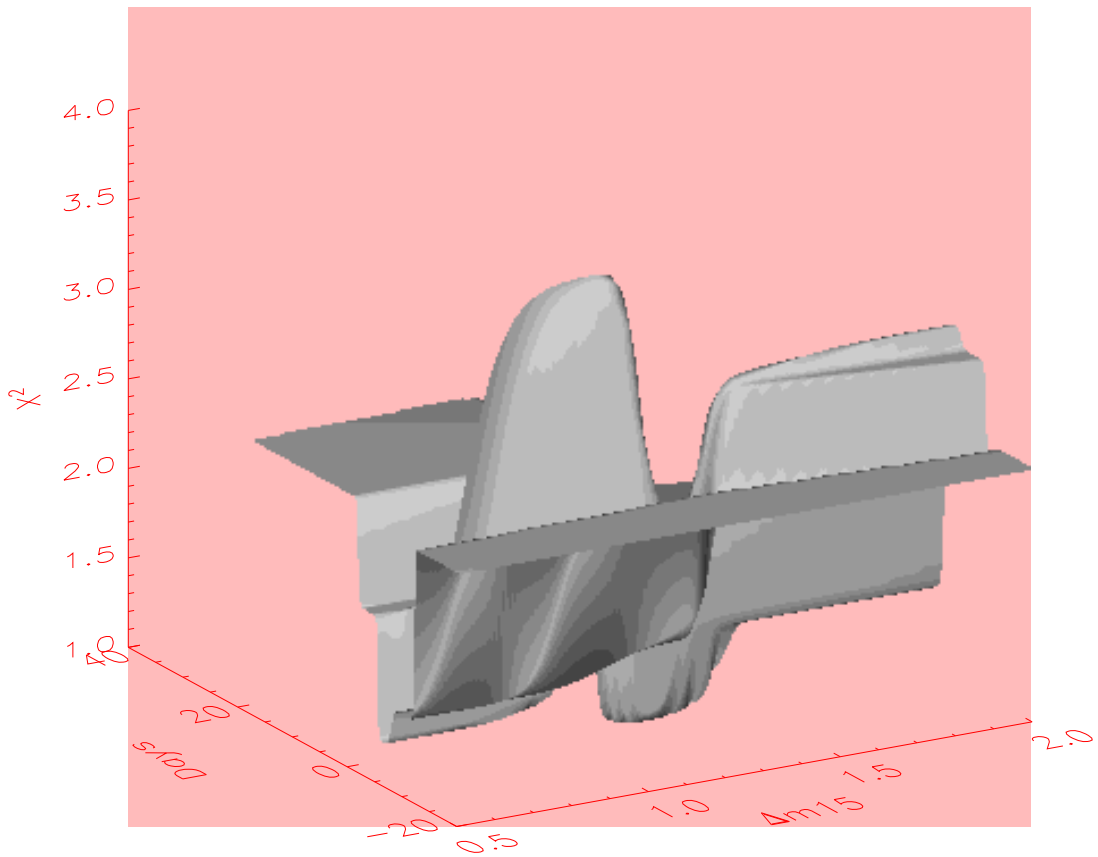

sn1990n.m14.dat.rect, z = 0.90999997
Calesi2034.sn_50Asmooth4.fits Observed − Galaxy
Template Spectrum Av = −1.0000000
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O
2.0
1.5
1.0
0.5
0.0
−0.5
5000
6000
7000
8000
9000


sn1989b.m05.dat.rect, z = 0.89999998
Calesi2034.sn_50Asmooth4.fits Observed − Galaxy
Template Spectrum Av = −1.0000000
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O
2.0
1.5
1.0
0.5
0.0
−0.5
5000
6000
7000
8000
9000

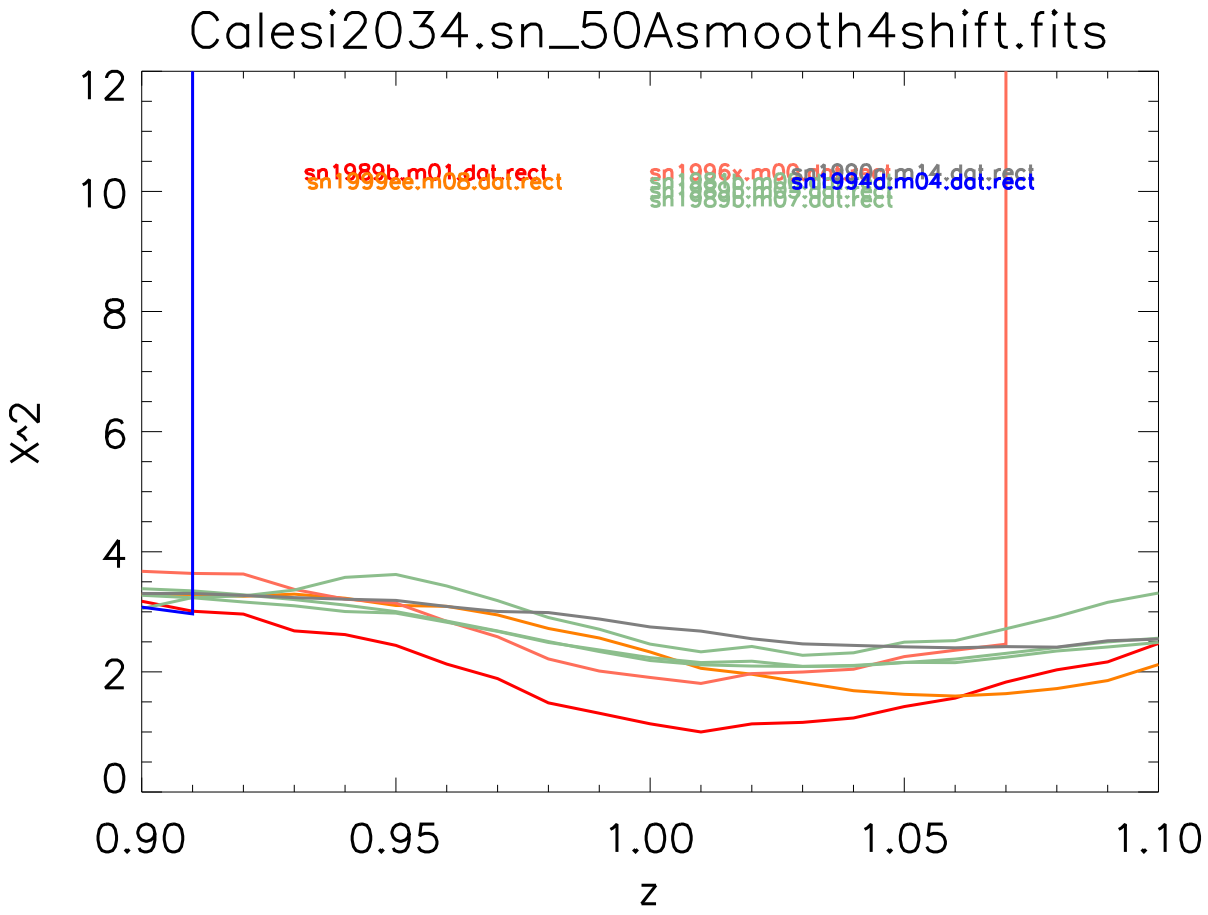

sn1989b.m01.dat.rect, z = 0.89999998
Calesi2034.sn..50Asmooth4.fits Observed − Galaxy
Template Spectrum Av = −1.0000000
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O
2.0
1.5
1.0
0.5
0.0
−0.5
5000
6000
7000
8000
9000

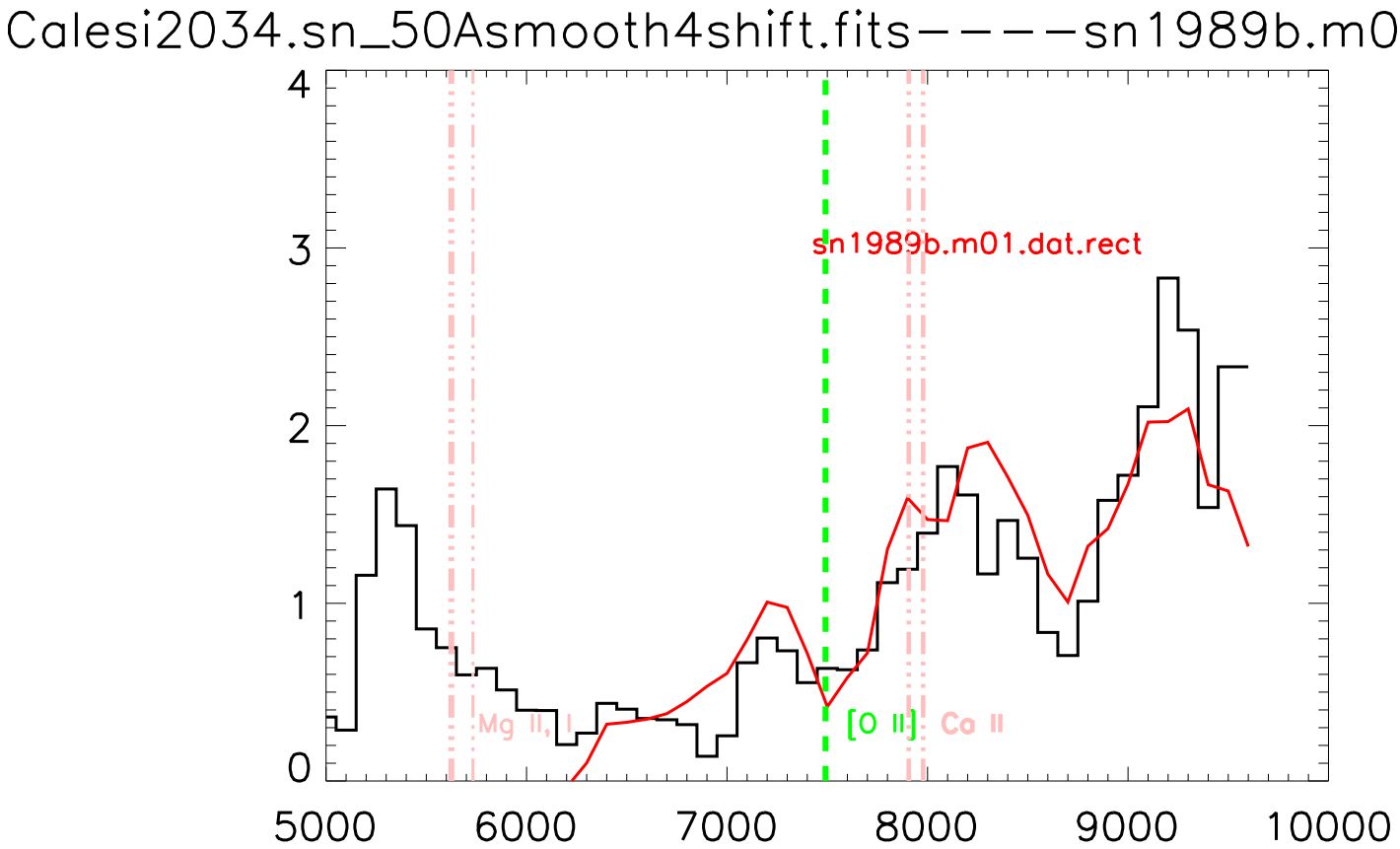

sn1999ee.m08.dat.rect, z = 0.89999998
Calesi2034.sn_50Asmooth4.fits Observed – Galaxy
Template Spectrum Av = −1.0000000
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O
2.0
1.5
1.0
0.5
0.0
−0.5
5000
6000
7000
8000
9000

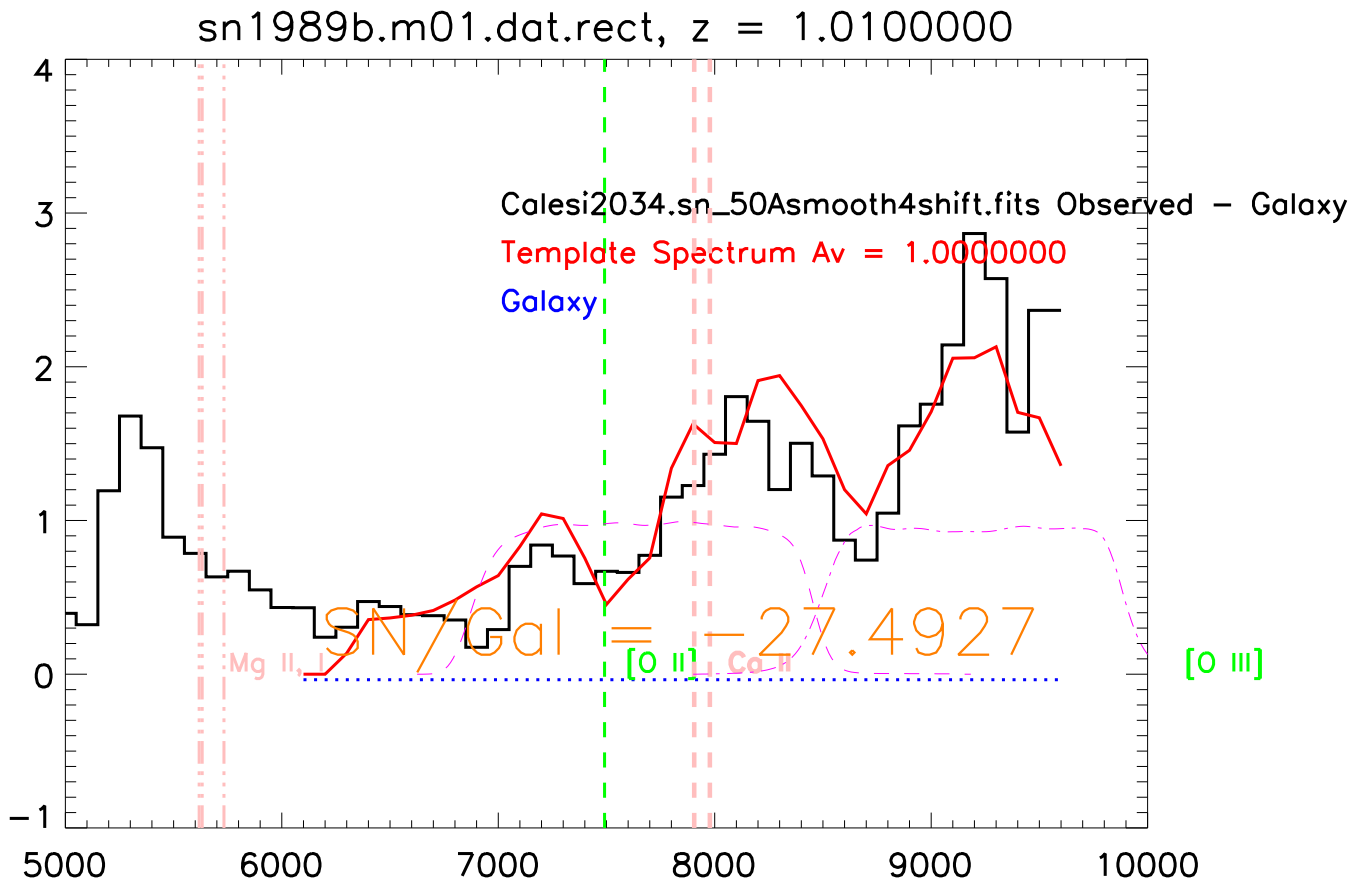

2.5
1.9
2118
1.0
1.4
3.0
2.8
2.1
2.3
3.6
2.9
1.2
1.4
1.6
2.4

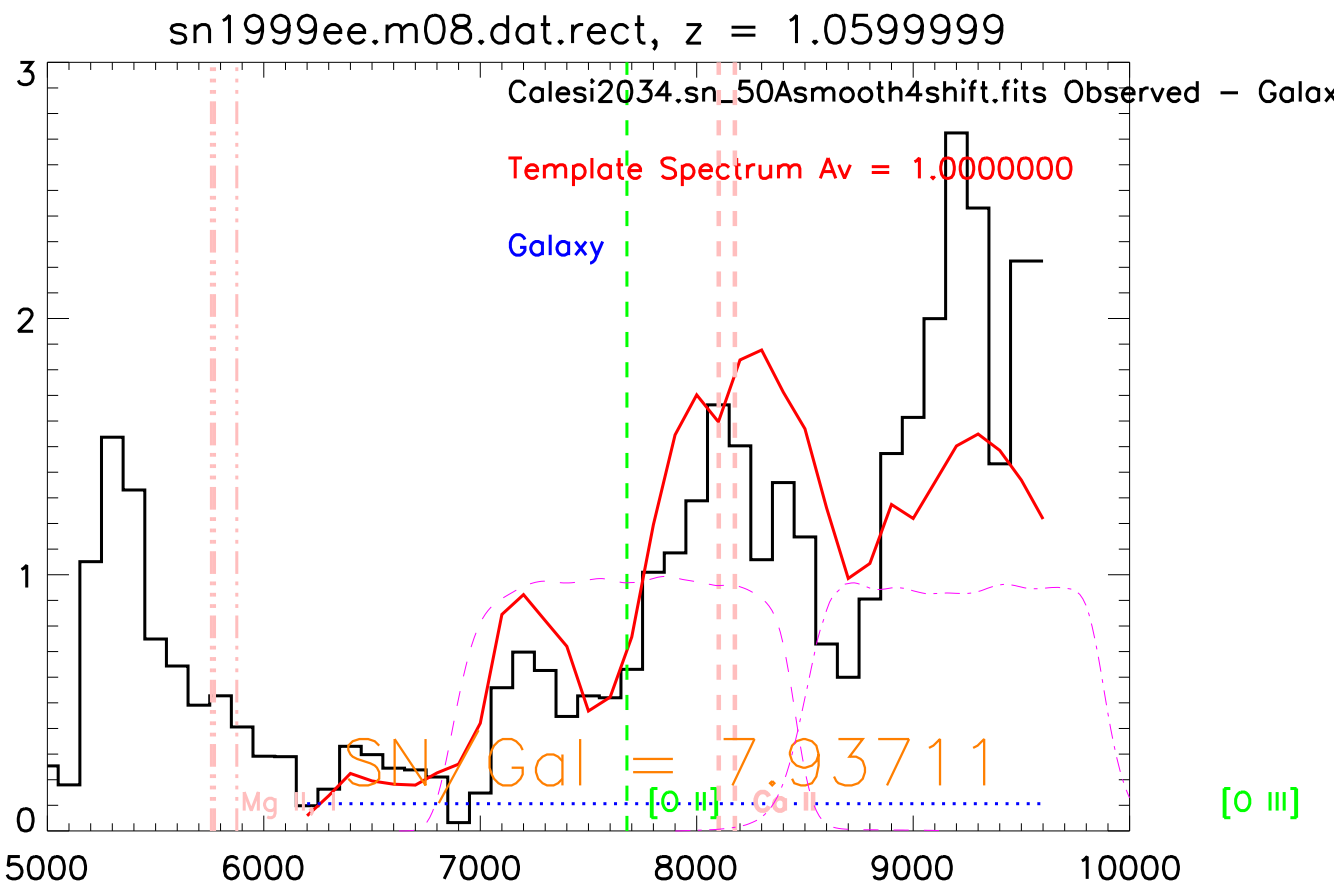


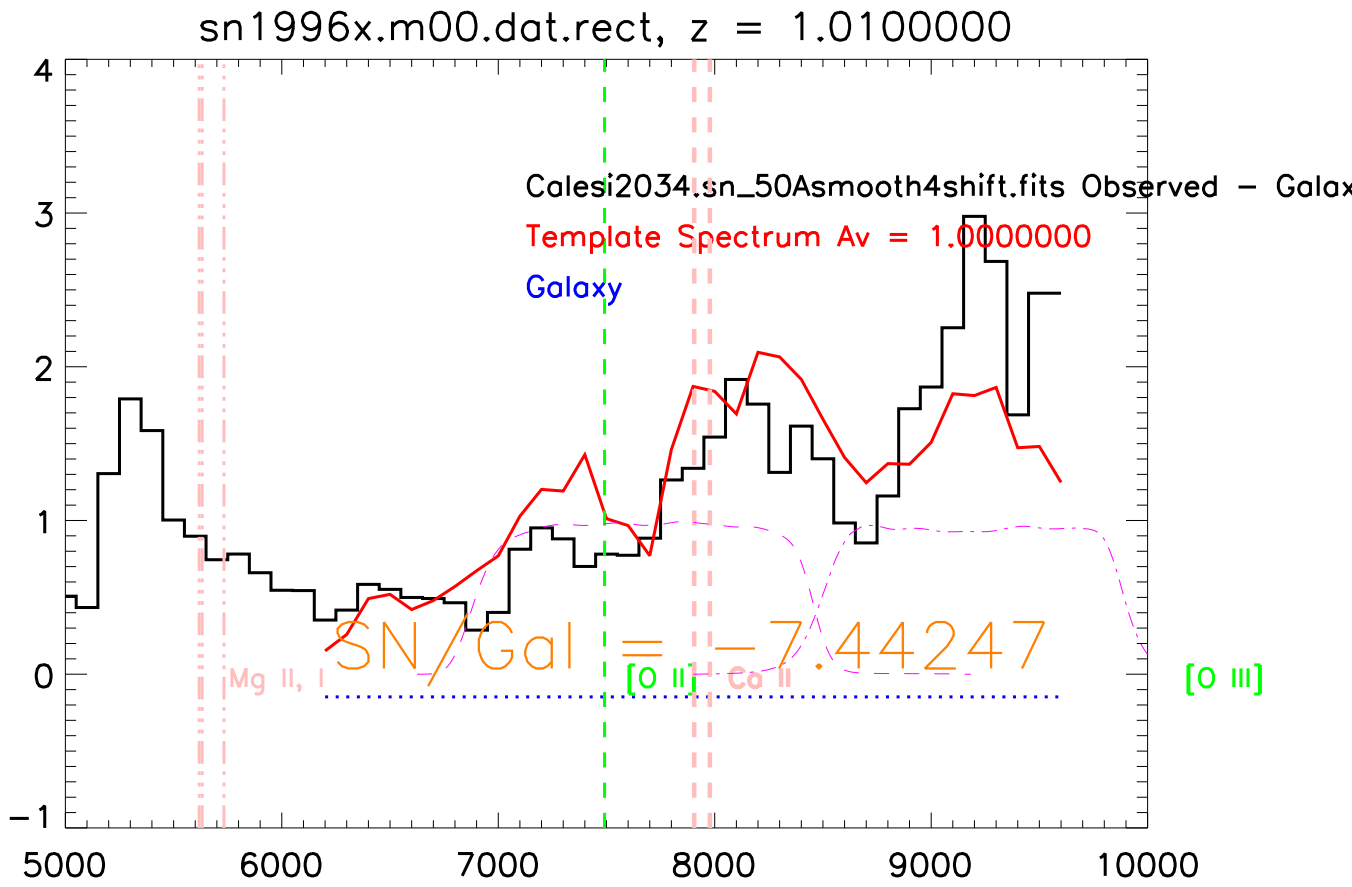
4.0
3.5
3.0
2.5
2.0
1.5
1.0
χ^2
40
20
0
−20
Days
0.5
1.0
1.5
2.0
Δm15

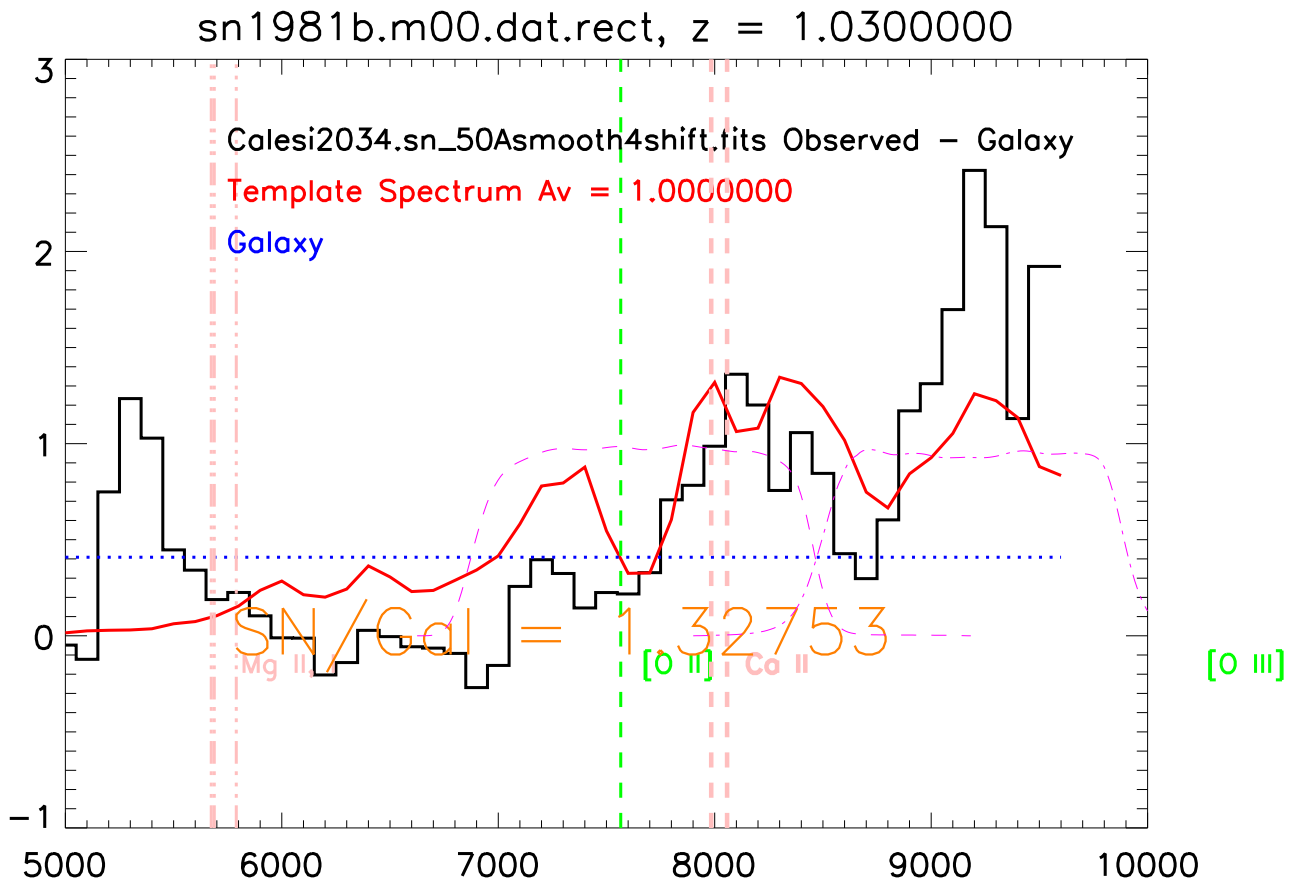

Calesi2034.sn_50Asmooth4shift.fits
sn1989b.m01.dat.rect
sn1994d.m04.dat.rect
X^2
z
0
2
4
6
8
10
12
0.90
0.95
1.00
1.05
1.10

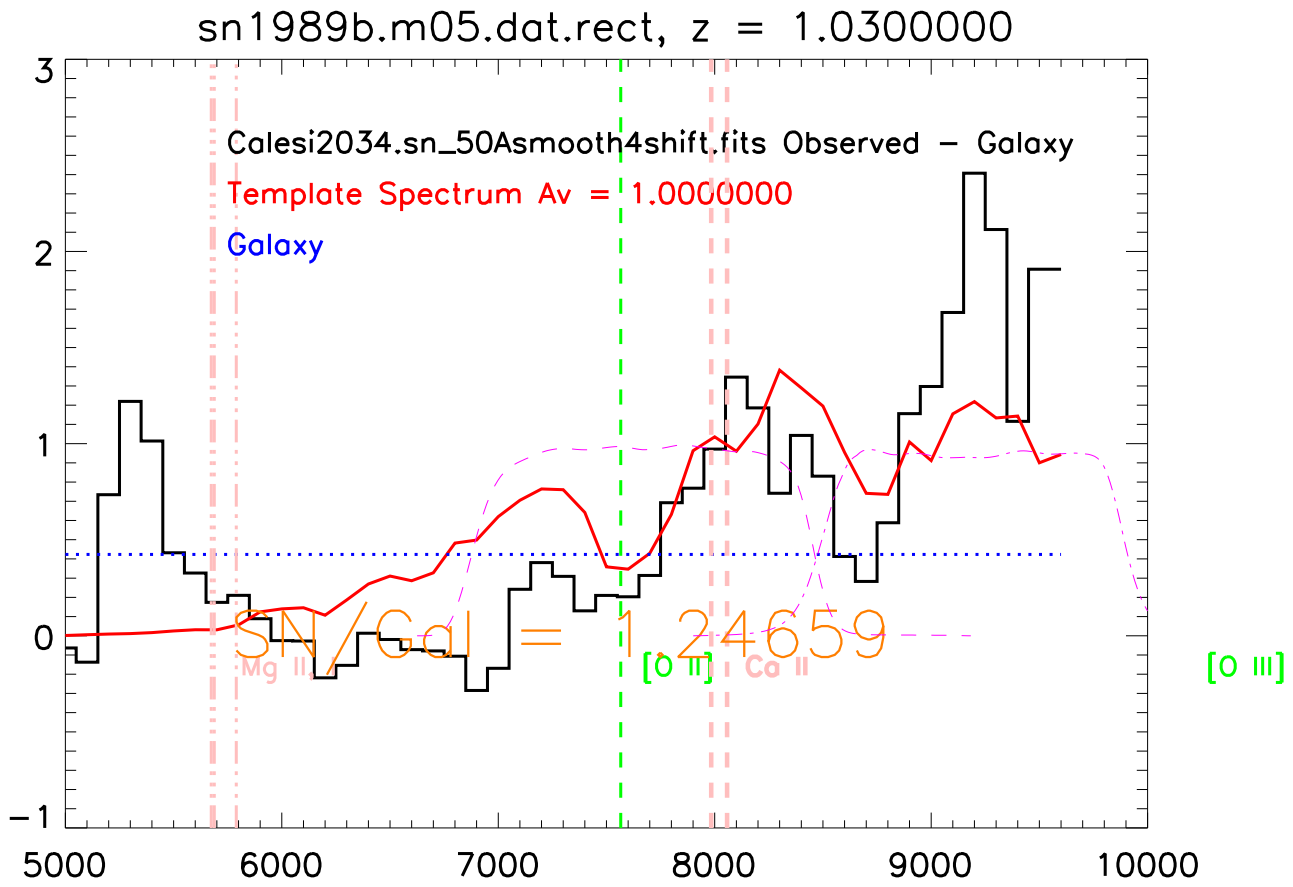

Calesi2034.sn_50Asmooth4shift.fits----sn1989b.m01.dat.
sn1989b.m01.dat.rect
Mg II, I
[O II]
Ca II
0
1
2
3
4
5000
6000
7000
8000
9000
10000

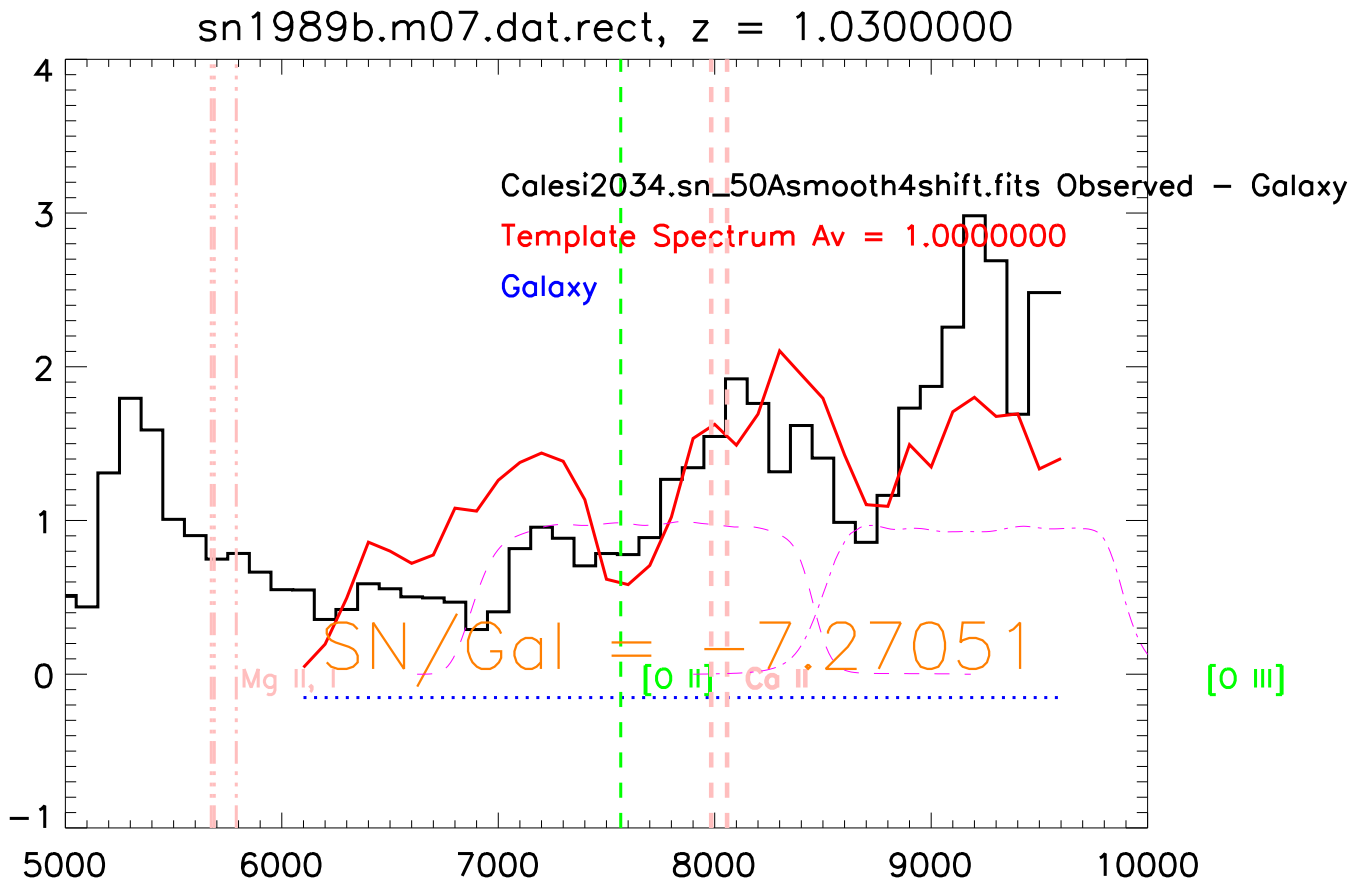

sn1989b.m01.dat.rect, z = 1.0100000
Calesi2034.sn_50Asmooth4shift.fits Observed − Galaxy
Template Spectrum Av = 1.0000000
Galaxy
SN/Gal = −27.4927
Mg II
[O II]
Ca II
[O III]
4
3
2
1
0
−1
5000
6000
7000
8000
9000
10000

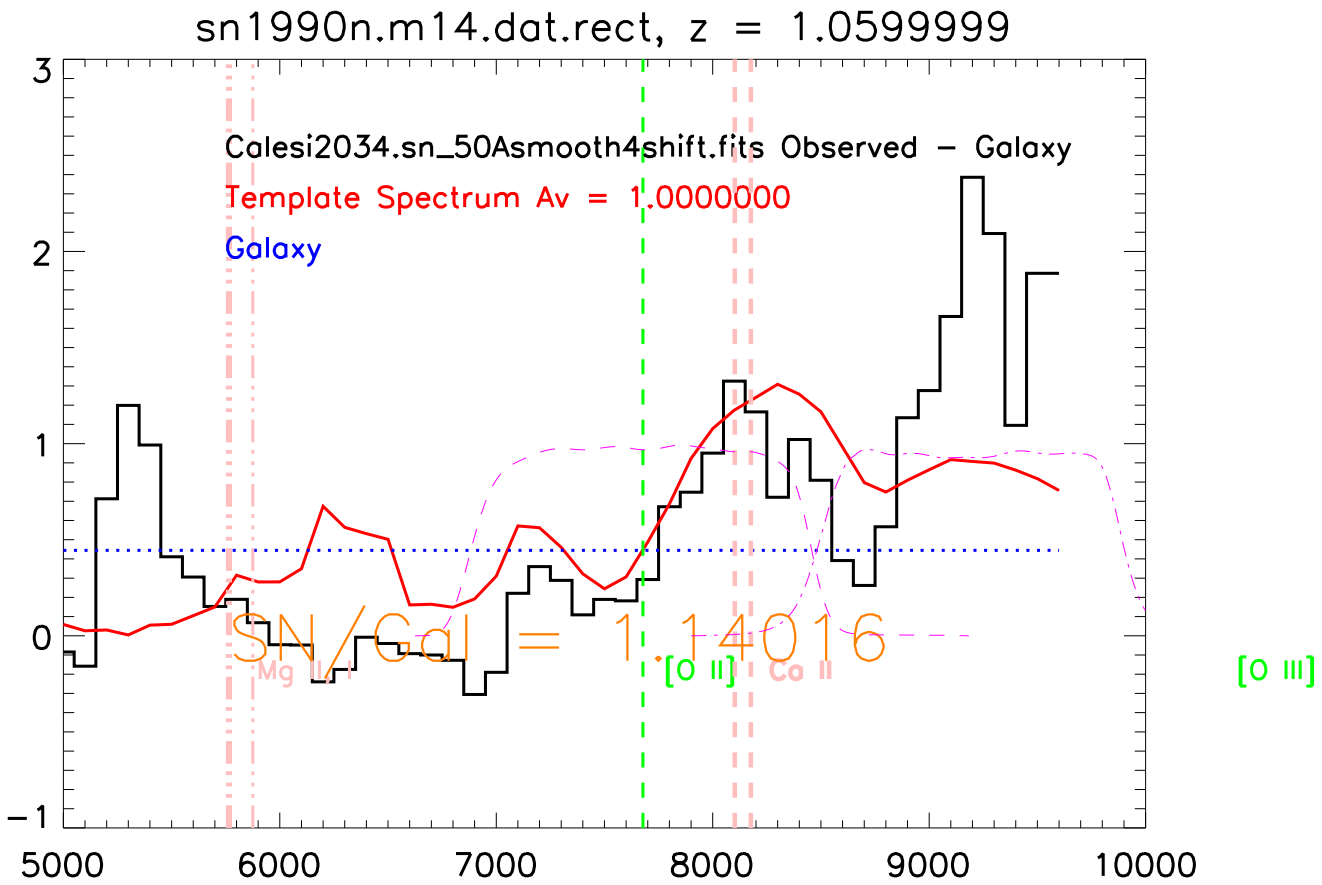

sn1999ee.m08.dat.rect, z = 1.0599999
Calesi2034.sn_50Asmooth4shift.fits Observed – Galax
Template Spectrum Av = 1.0000000
Galaxy
SN / Gal = 7.93711
Mg II
[O II]
Ca
[O III]
0
1
2
3
5000
6000
7000
8000
9000
10000

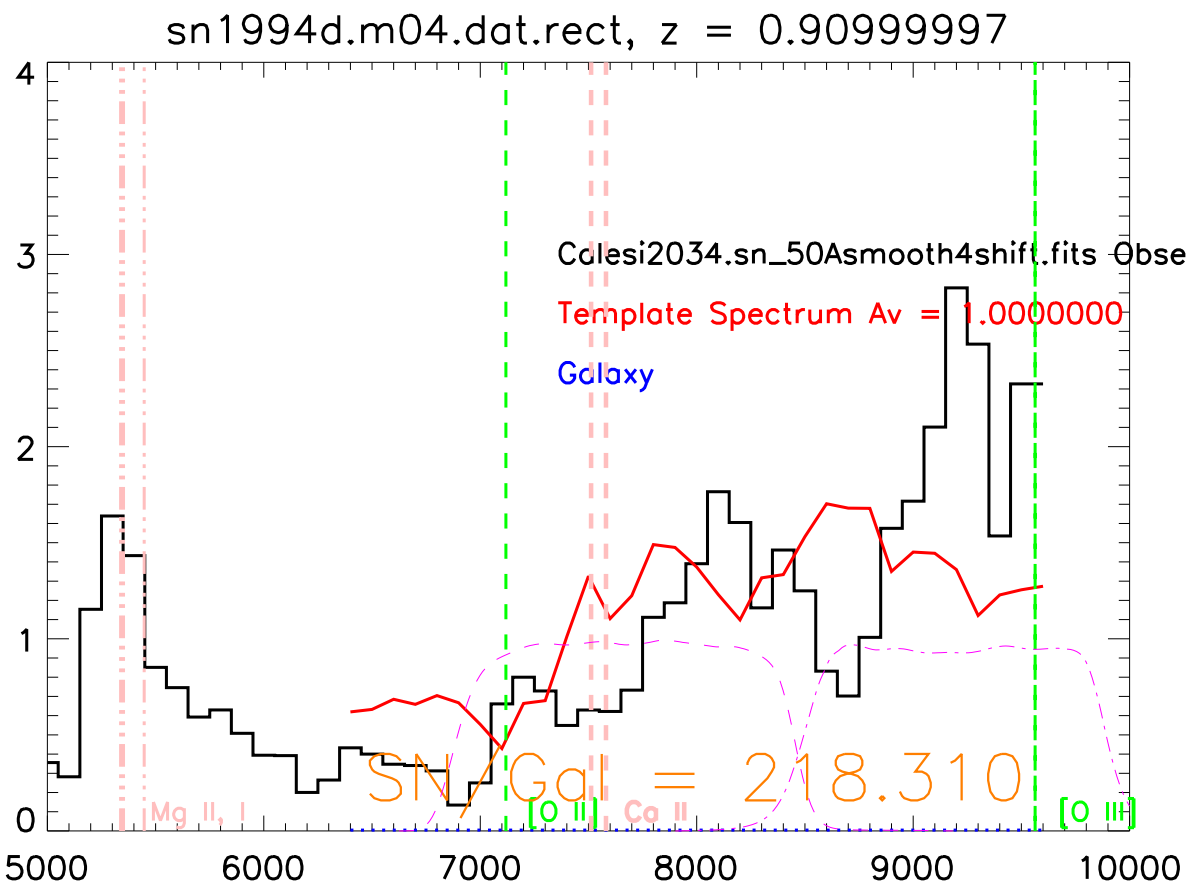

sn1996x.m00.dat.rect, z = 1.0100000
Calesi2034.sn_50Asmooth4shift.fits Observed – Galax
Template Spectrum Av = 1.0000000
Galaxy
SN/Gal = −7.44247
Mg II, I
[O II]
Ca II
[O III]
4
3
2
1
0
−1
5000
6000
7000
8000
9000
10000

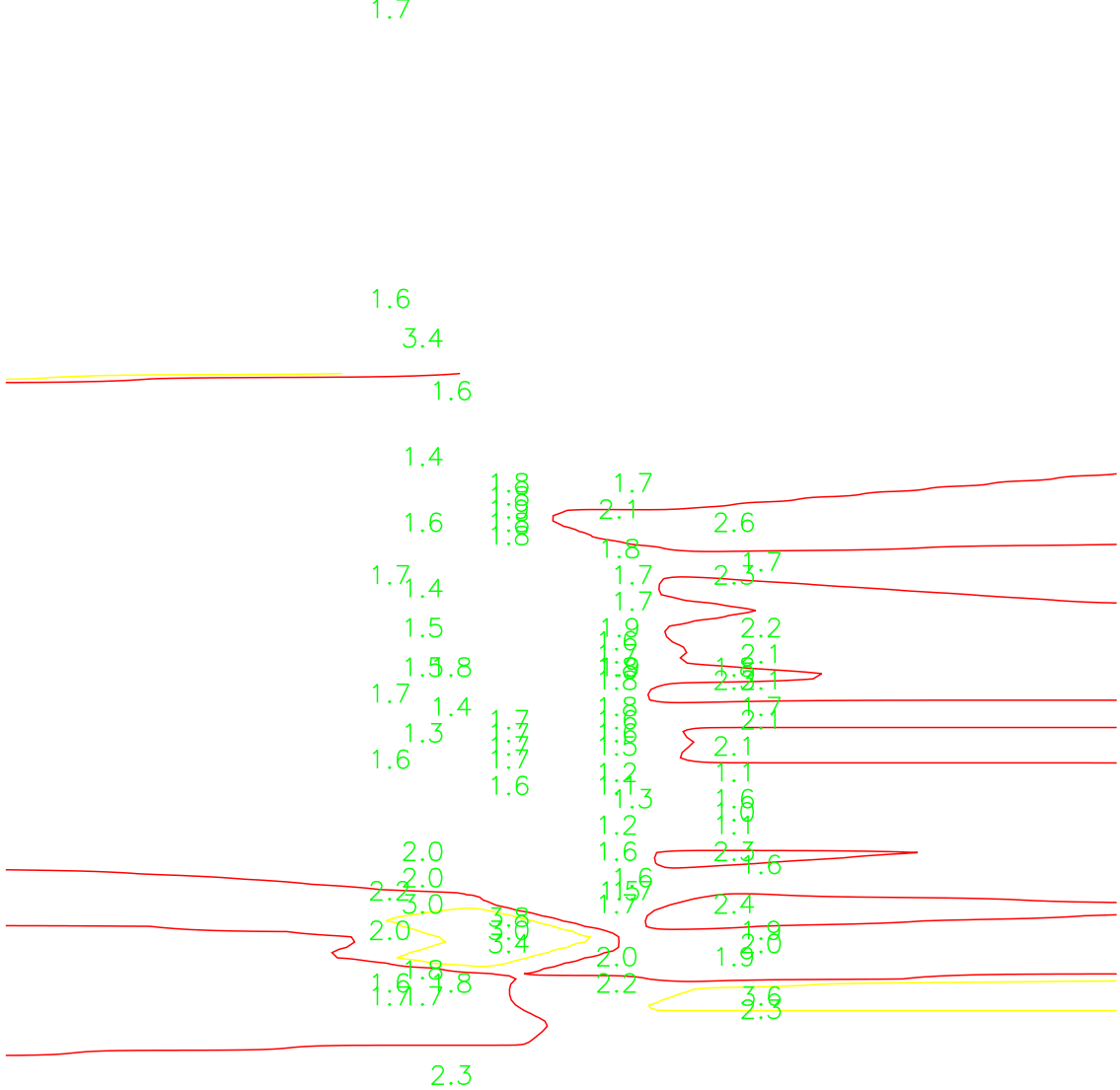

sn1981b.m00.dat.rect, z = 1.0300000
Calesi2034.sn_50Asmooth4shift.fits Observed − Galaxy
Template Spectrum Av = 1.0000000
Galaxy
SN/Gal = 1.32753
Mg II
[O II]
Ca II
[O III]
3
2
1
0
−1
5000
6000
7000
8000
9000
10000

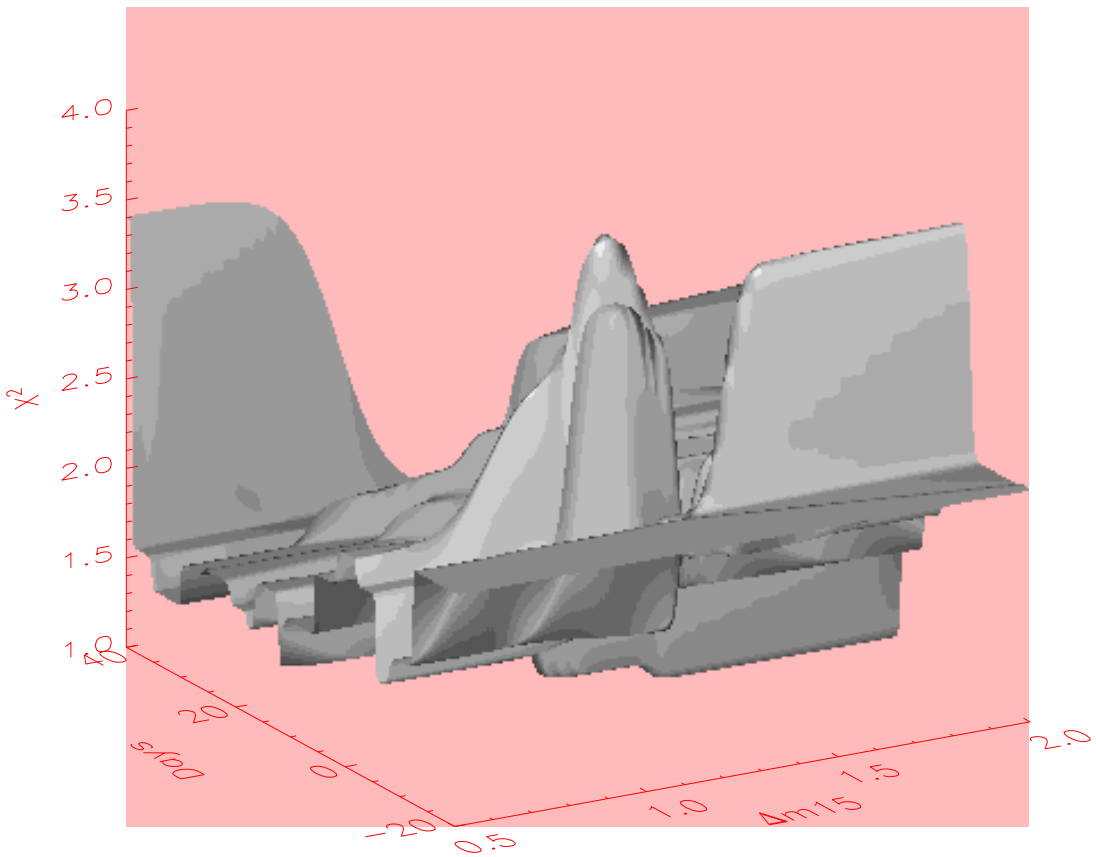

sn1989b.m05.dat.rect, z = 1.0300000
Calesi2034.sn_50Asmooth4shift.fits Observed – Galaxy
Template Spectrum Av = 1.0000000
Galaxy
SN/Gal = 1.24659
Mg II
[O II]
Ca II
[O III]
3
2
1
0
−1
5000
6000
7000
8000
9000
10000


sn1989b.m07.dat.rect, z = 1.0300000
Calesi2034.sn_50Asmooth4shift.fits Observed – Galaxy
Template Spectrum Av = 1.0000000
Galaxy
SN/Gal = 7.27051
Mg II, f
[O II]
Ca II
[O III]
4
3
2
1
0
−1
5000
6000
7000
8000
9000
10000

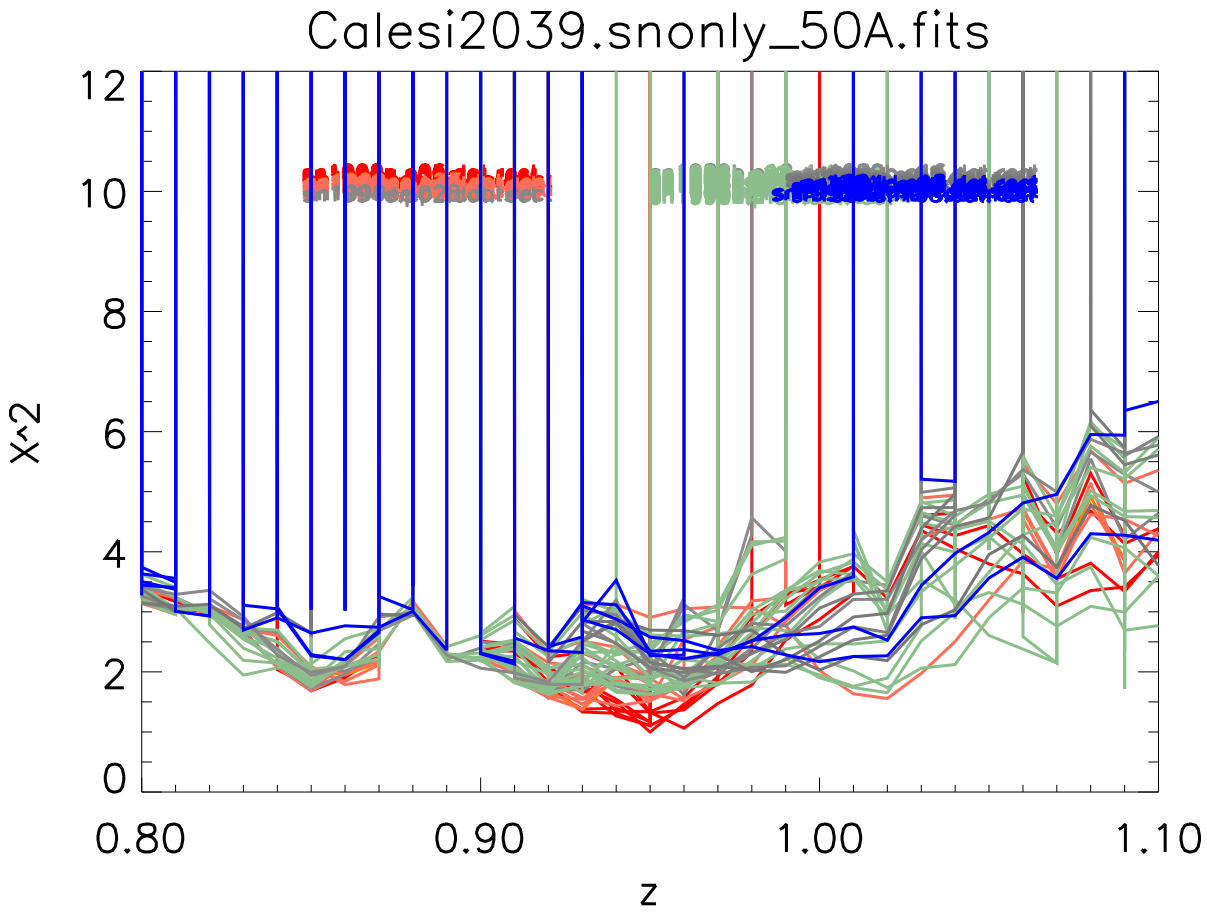

sn1990n.m14.dat.rect, z = 1.0599999
Calesi2034.sn_50Asmooth4shift.fits Observed − Galaxy
Template Spectrum Av = 1.0000000
Galaxy
SN/Gal = 1.14016
Mg II
[O II]
Ca II
[O III]
3
2
1
0
−1
5000
6000
7000
8000
9000
10000

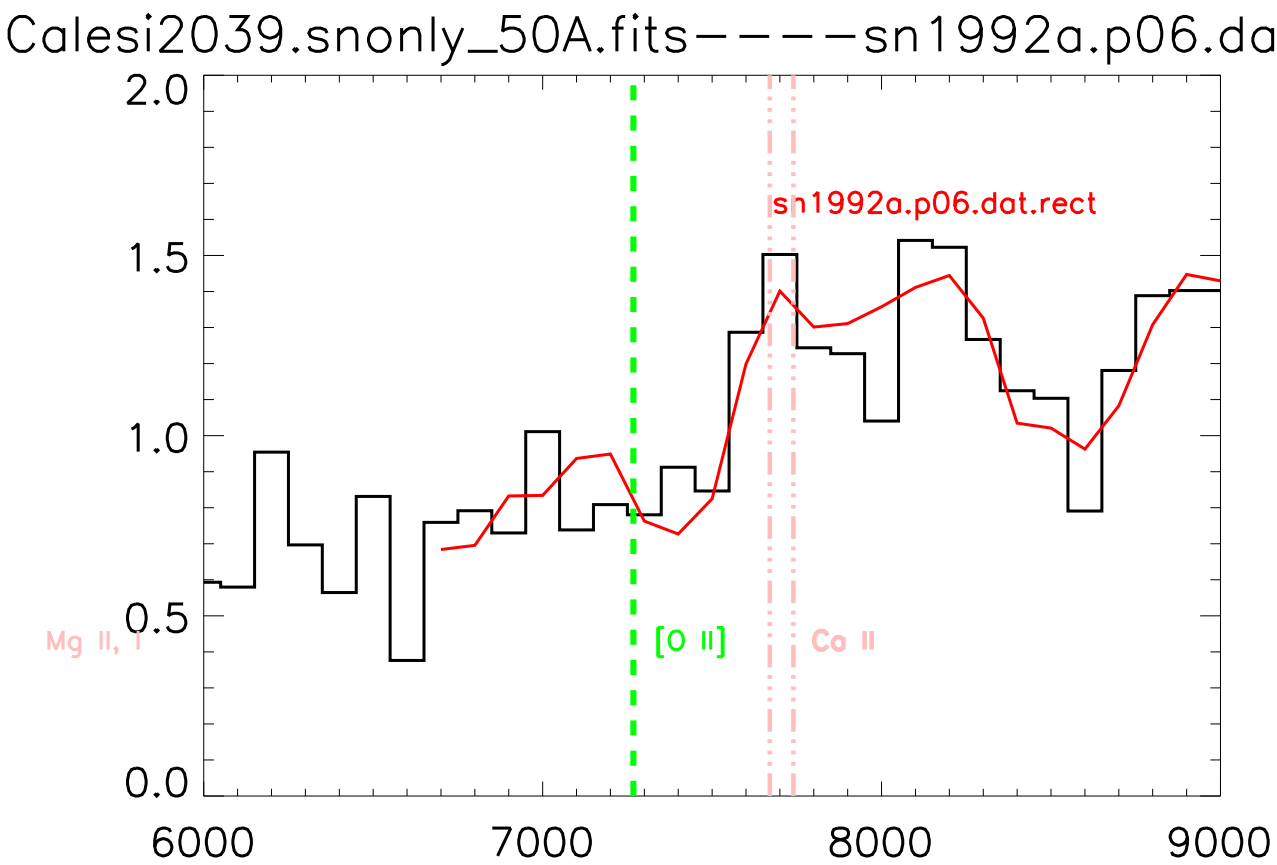

sn1994d.m04.dat.rect, z = 0.90999997
Colesi2034.sn_50Asmooth4shift.fits Observed – Ga
Template Spectrum Av = 1.0000000
Galaxy
SN / Gal = 218.310
Mg II, I
[O II]
Ca II
[O III]
0
1
2
3
4
5000
6000
7000
8000
9000
10000

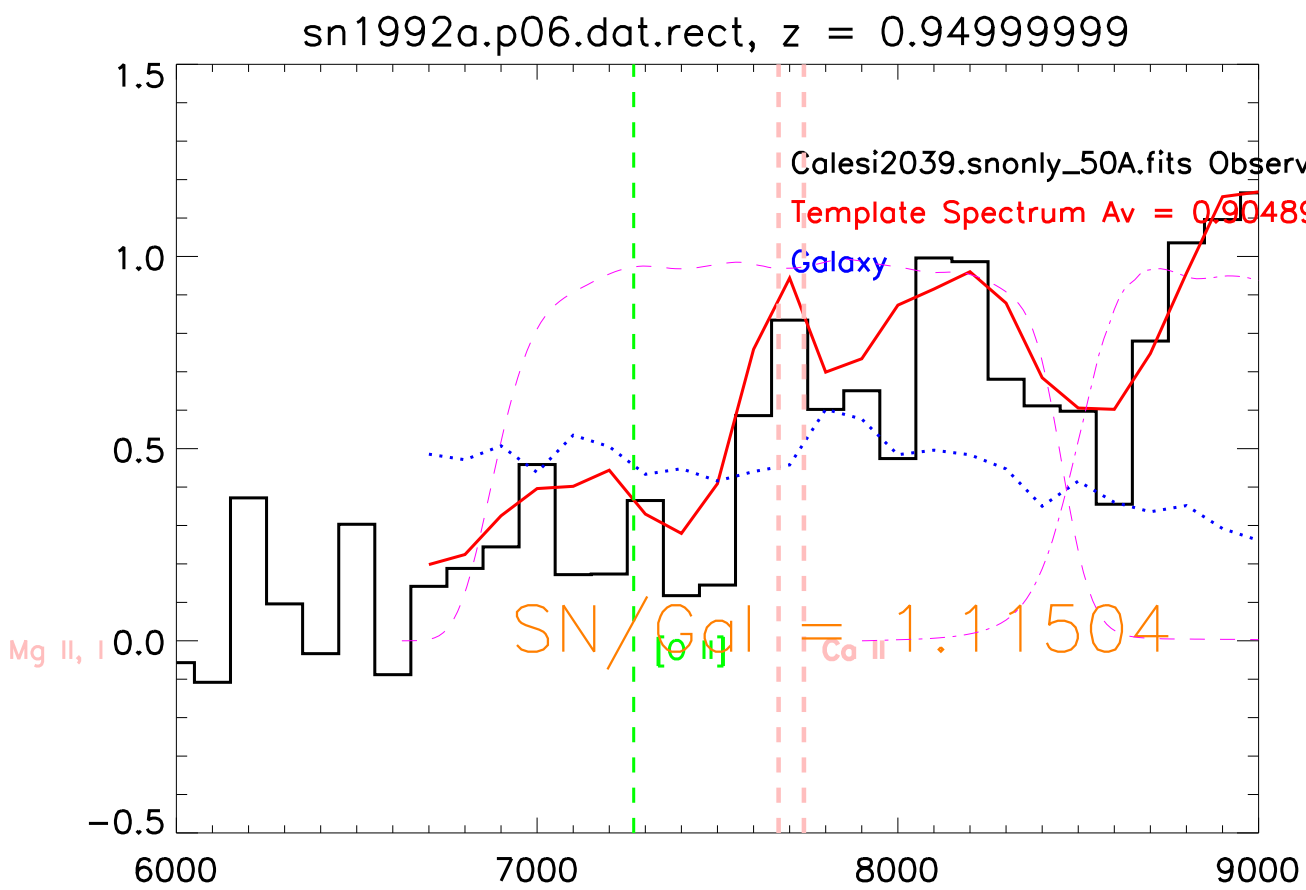


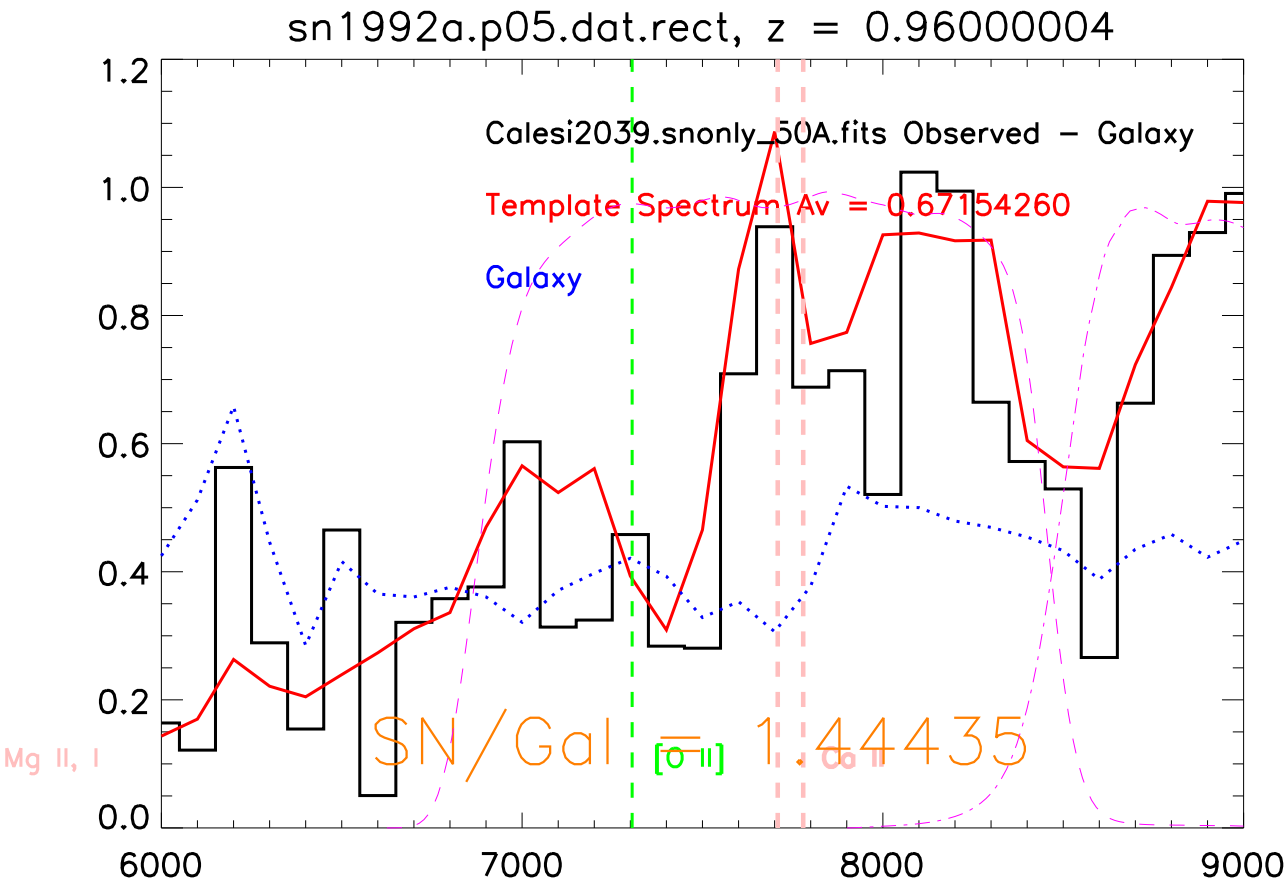


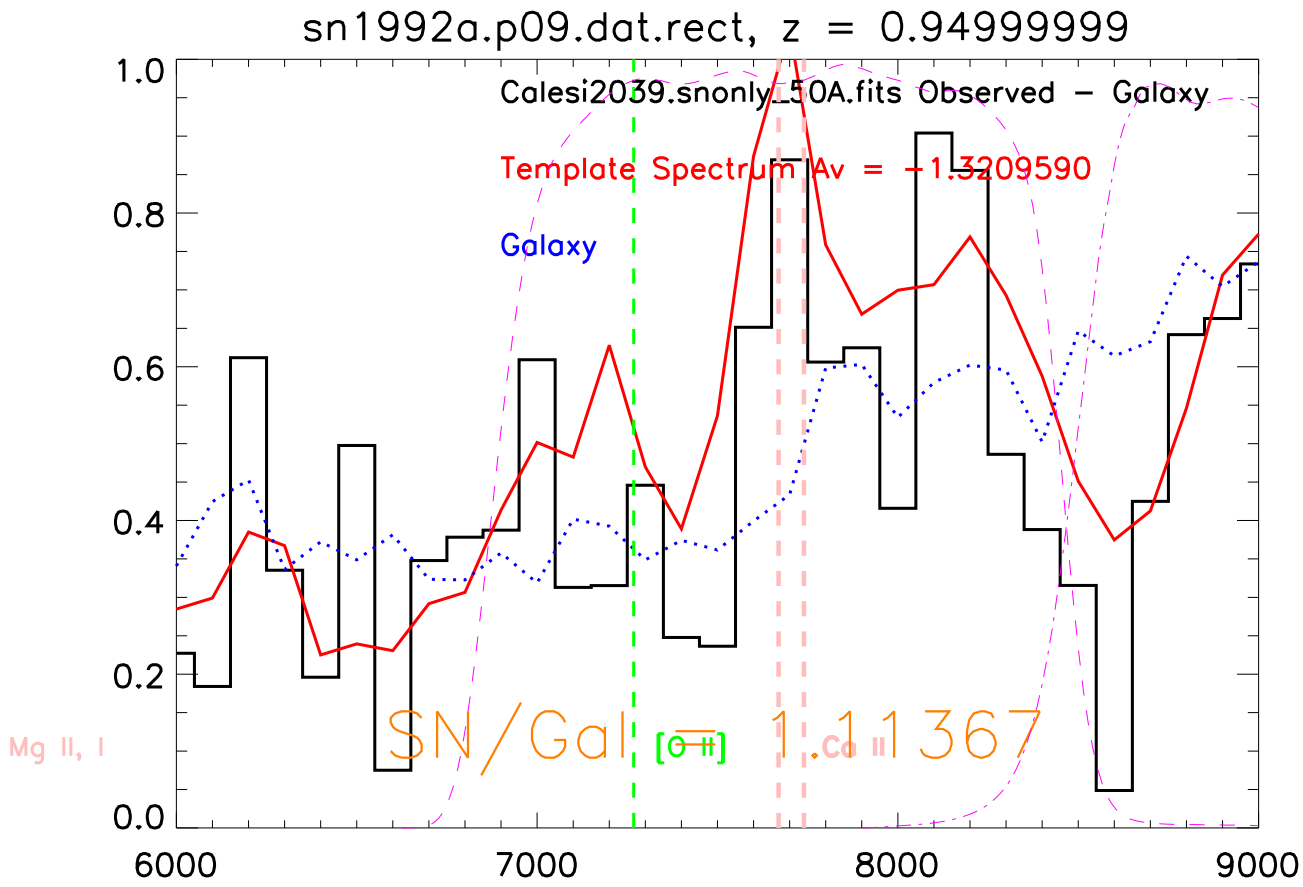
4.0
3.5
3.0
2.5
2.0
1.5
1.0
χ^2
40
20
0
−20
Days
0.5
1.0
1.5
2.0
Δm15

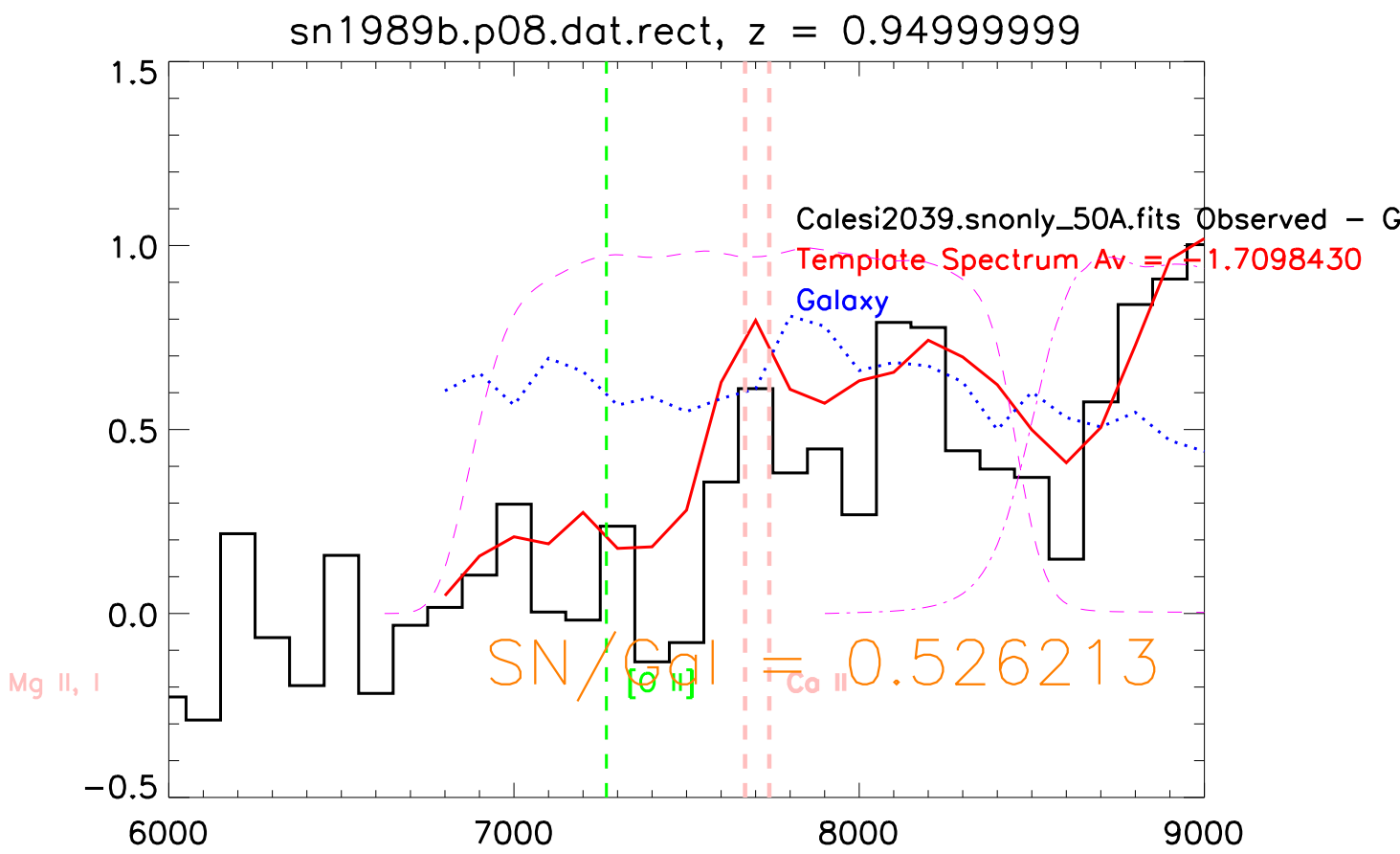

Calesi2039.snonly_50A.fits
X^2
z
0
2
4
6
8
10
12
0.80
0.90
1.00
1.10

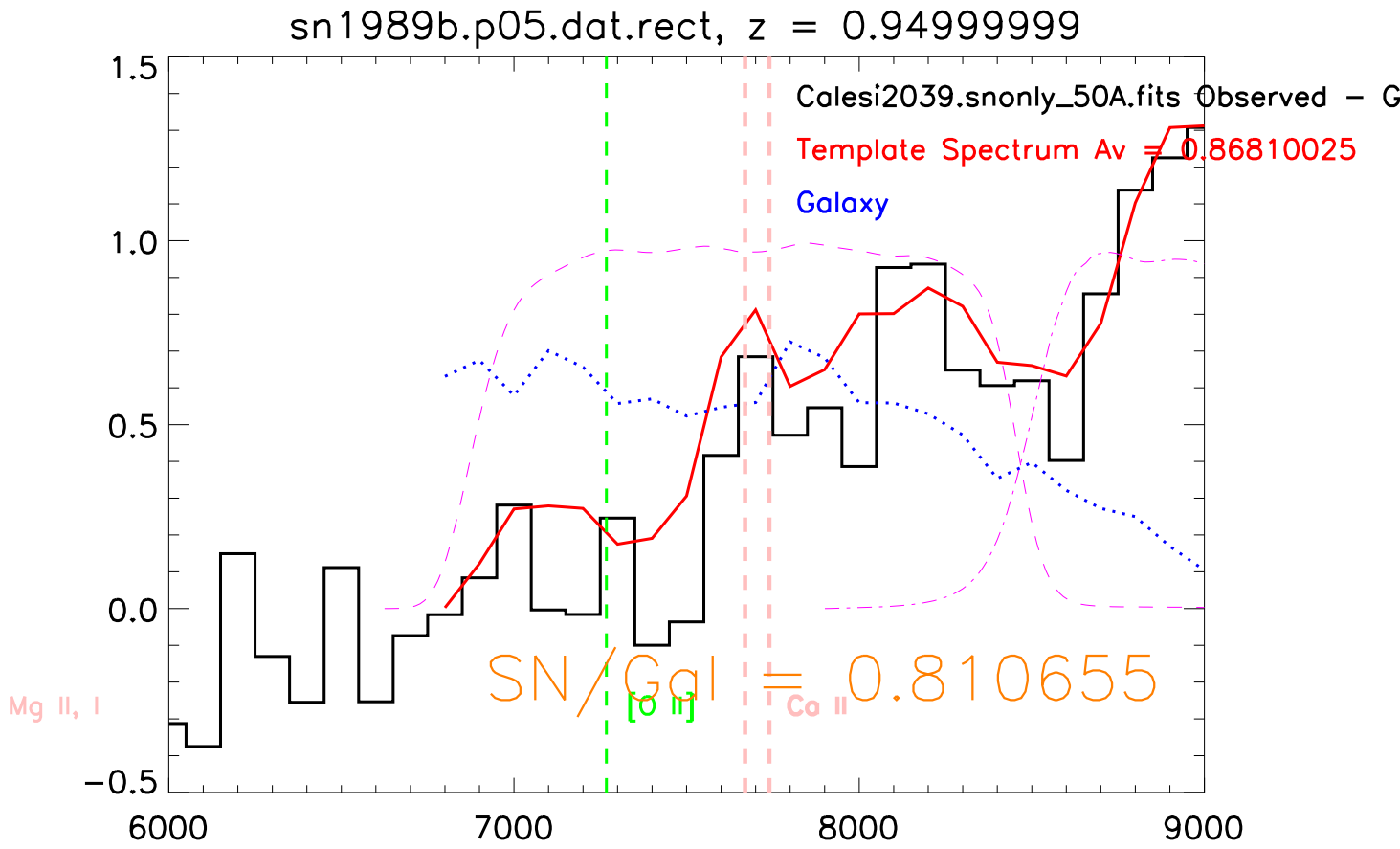

Calesi2039.snonly_50A.fits----sn1992a.p06.dat.rect
sn1992a.p06.dat.rect
Mg II, I
[O II]
Ca II
2.0
1.5
1.0
0.5
0.0
6000
7000
8000
9000

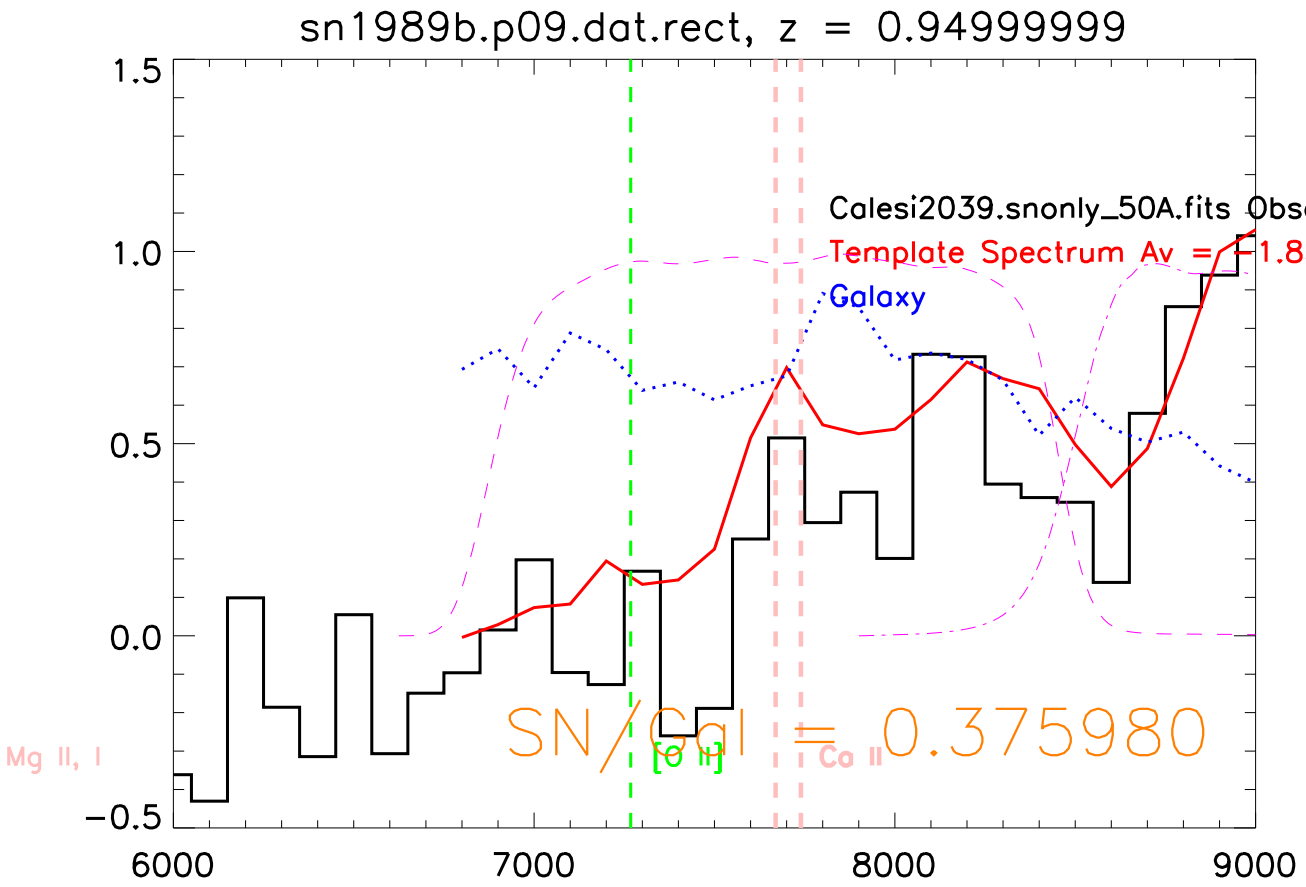

sn1992a.p06.dat.rect, z = 0.94999999
Calesi2039.snonly_50A.fits Observed – Gala
Template Spectrum Av = 0.90489060
Galaxy
SN/Gal = 1.11504
[O II]
Mg II, I
Ca II
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000

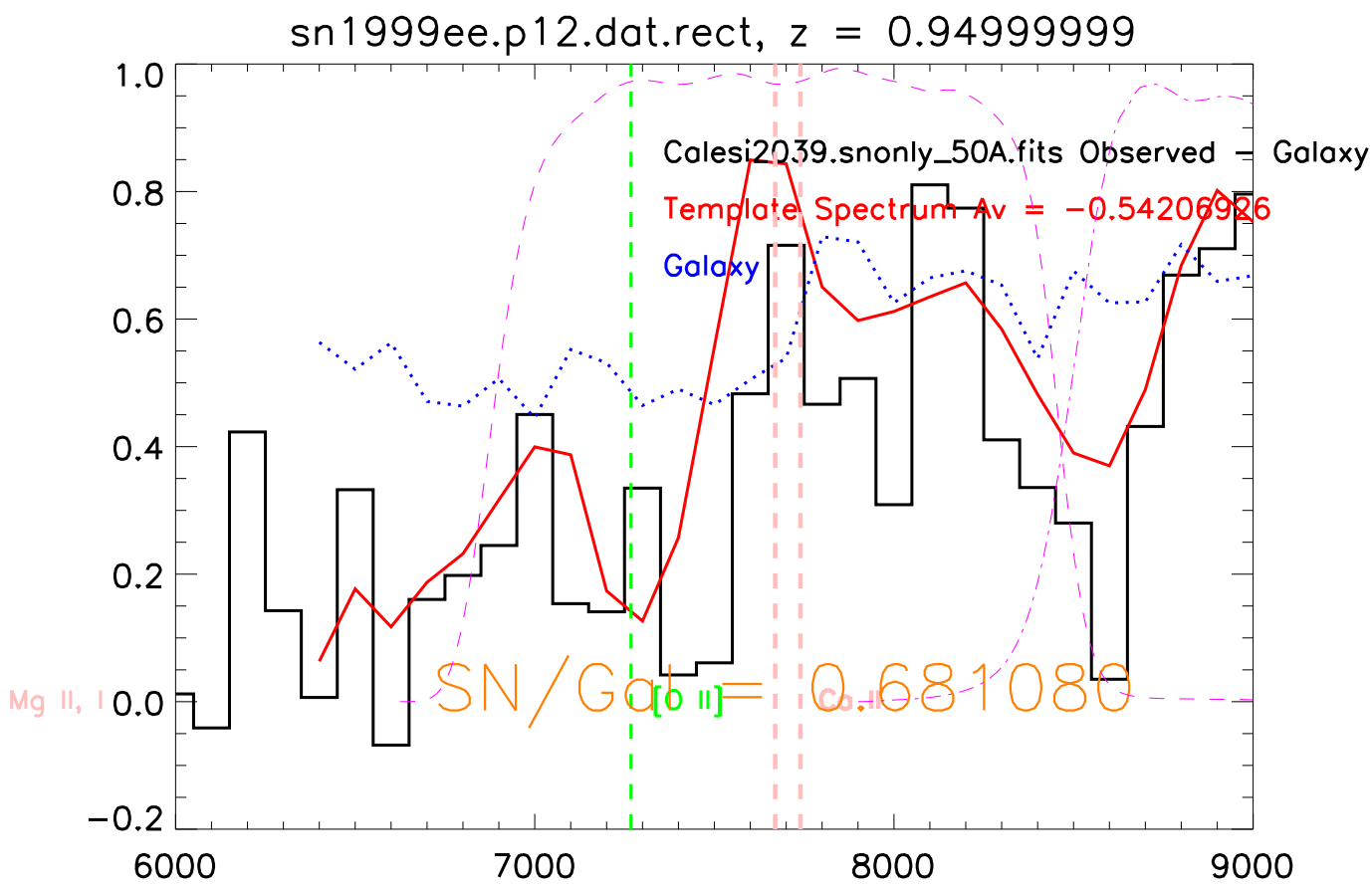

sn1992a.p05.dat.rect, z = 0.96000004
Calesi2039.snonly_50A.fits Observed − Galaxy
Template Spectrum Av = 0.67154260
Galaxy
SN/Gal = 1.44435
[O II]
Mg II, I
Ca II
1.2
1.0
0.8
0.6
0.4
0.2
0.0
6000
7000
8000
9000

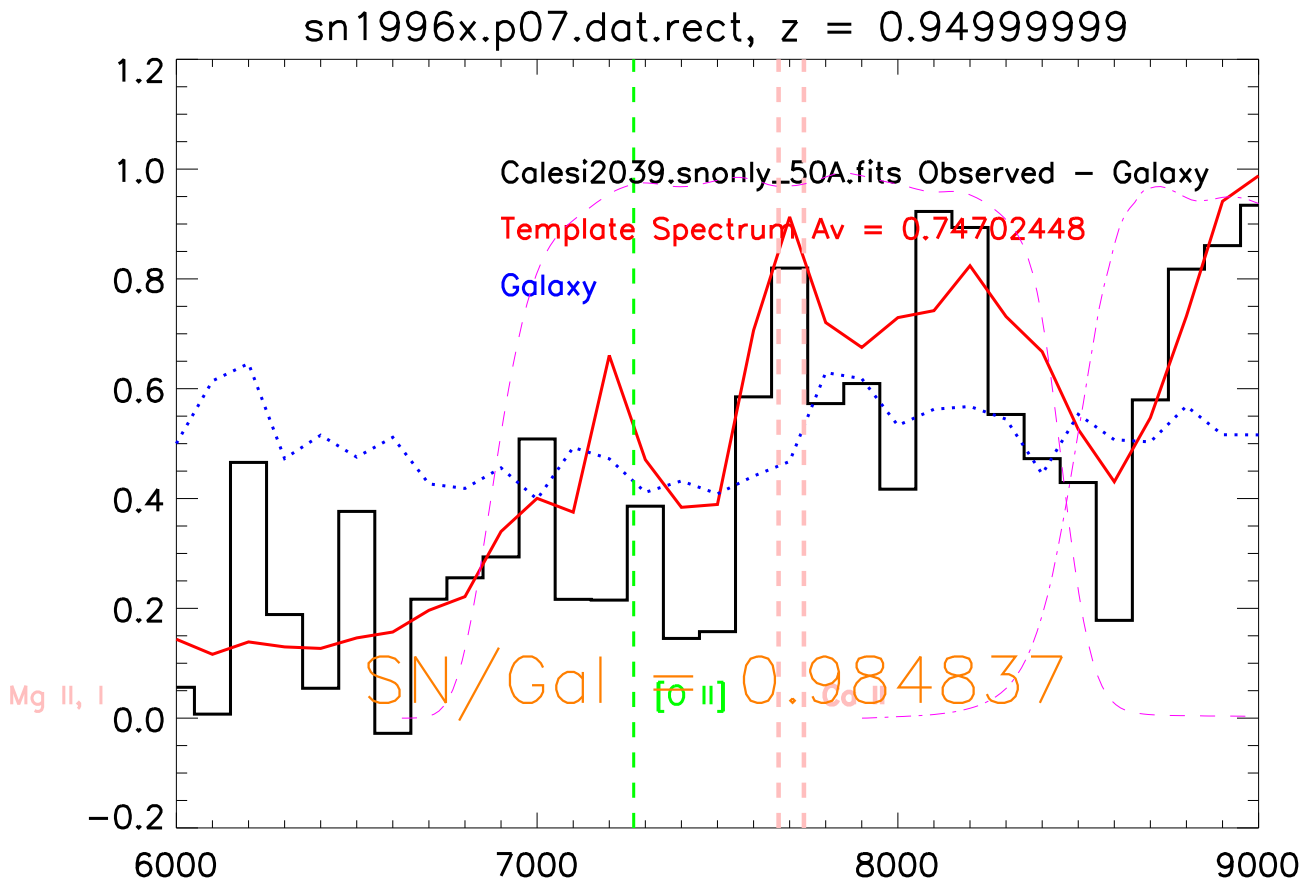

sn1992a.p09.dat.rect, z = 0.94999999
Calesi2039.snonly_50A.fits Observed − Galaxy
Template Spectrum Av = −1.3209590
Galaxy
SN/Gal = 1.11367
[O II]
Mg II, I
Ca II
1.0
0.8
0.6
0.4
0.2
0.0
6000
7000
8000
9000

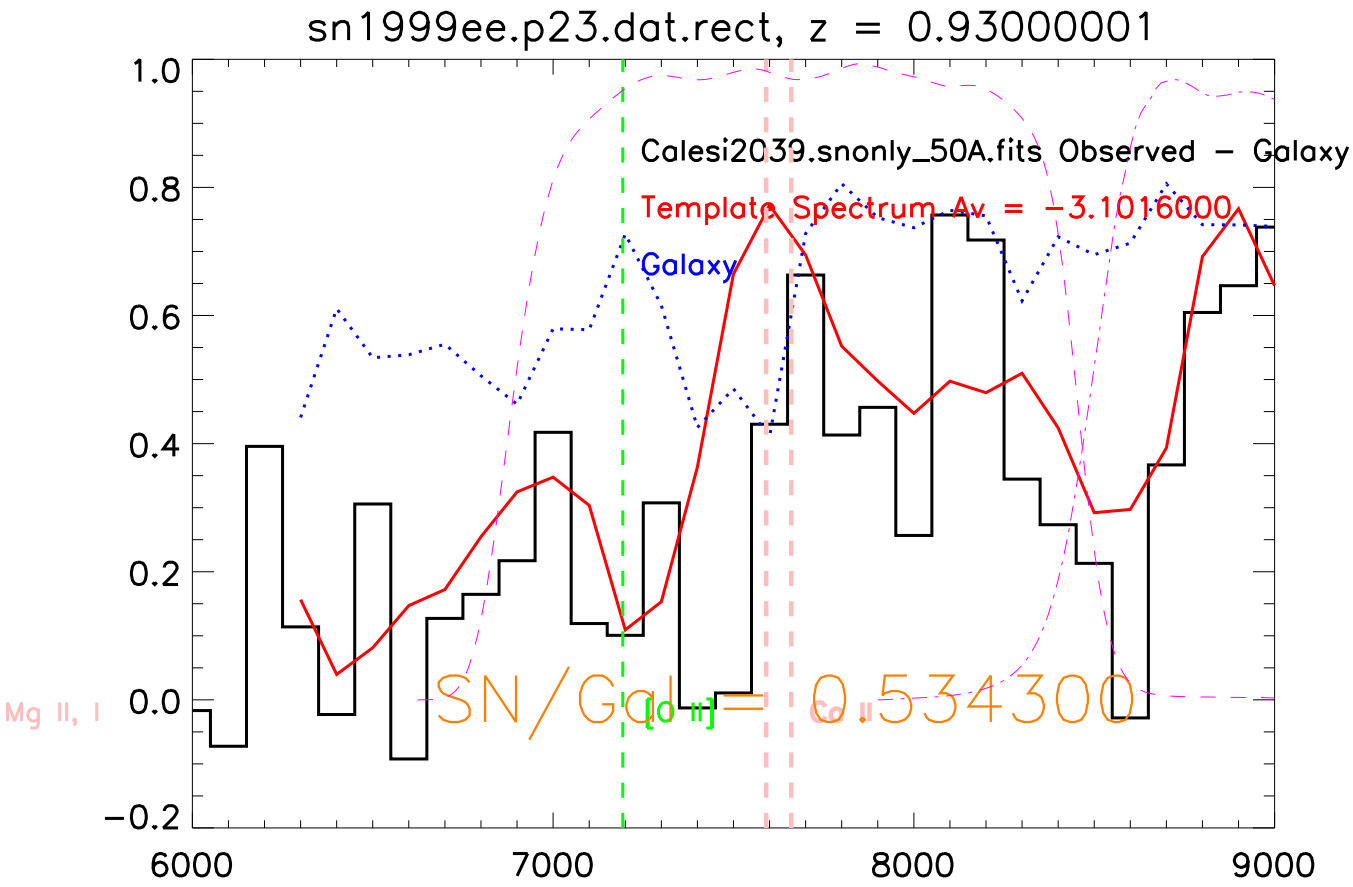

sn1989b.p08.dat.rect, z = 0.94999999
Calesi2039.snonly_50A.fits Observed – G
Template Spectrum Av = 1.7098430
Galaxy
SN/Gal = 0.526213
Mg II, I
[O II]
Ca II
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000

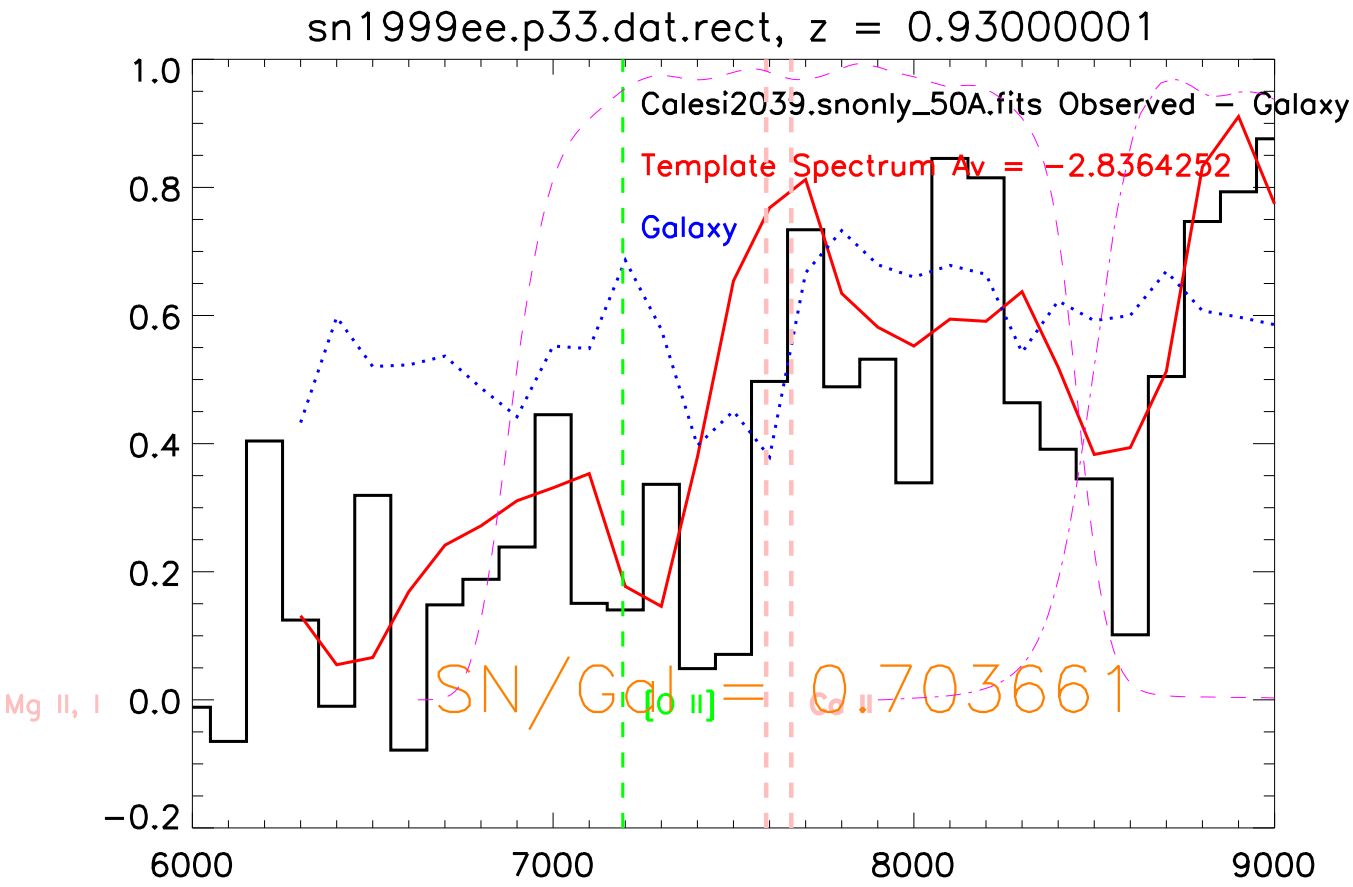

sn1989b.p05.dat.rect, z = 0.94999999
Calesi2039.snonly_50A.fits Observed – G
Template Spectrum Av = 0.86810025
Galaxy
SN/Gal = 0.810655
Mg II, I
[O II]
Ca II
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000

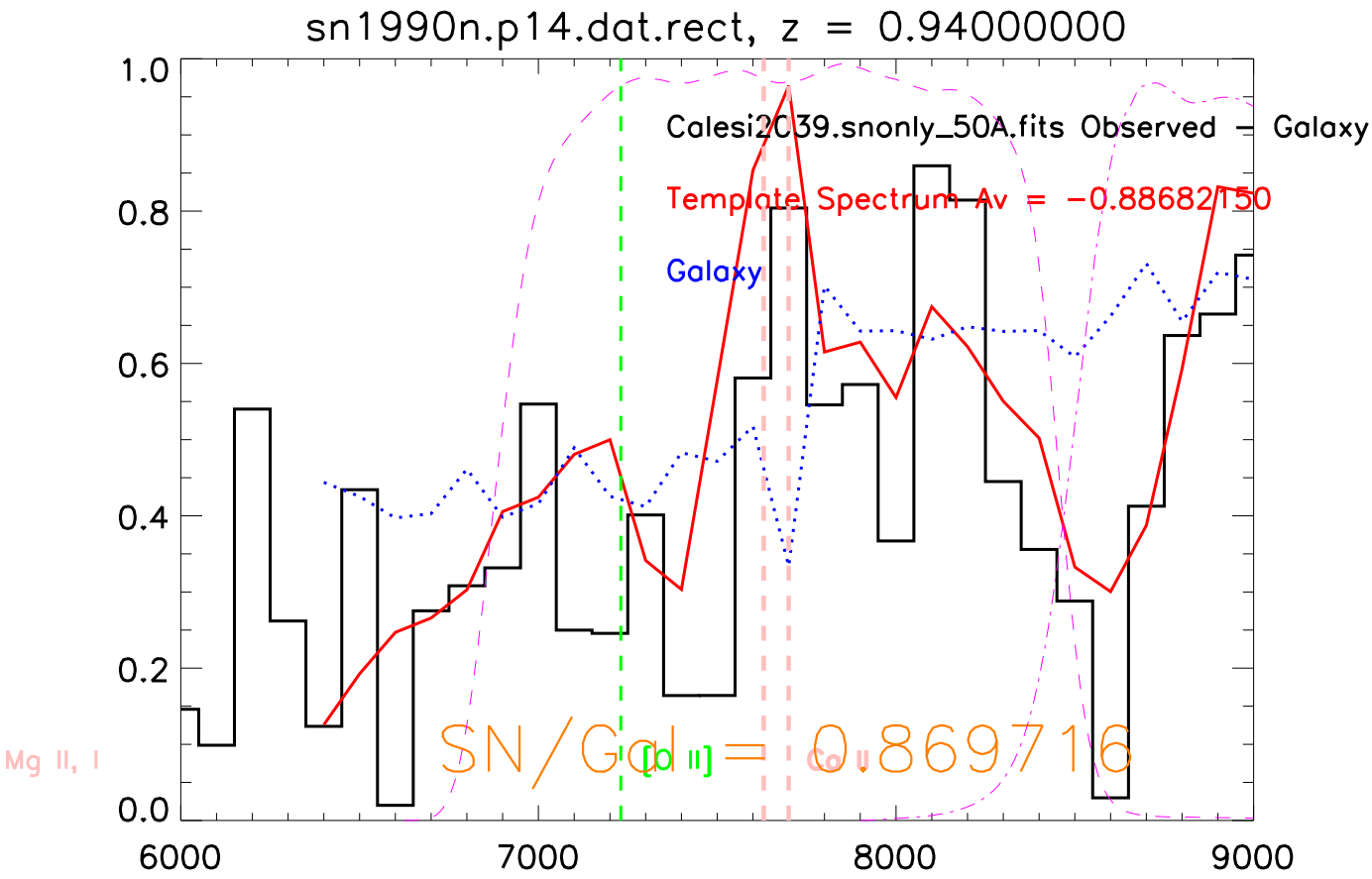

sn1989b.p09.dat.rect, z = 0.94999999
Calesi2039.snonly_50A.fits Observed – G
Template Spectrum Av = 1.8327817
Galaxy
SN/Gal = 0.375980
[O II]
Ca II
Mg II, I
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000

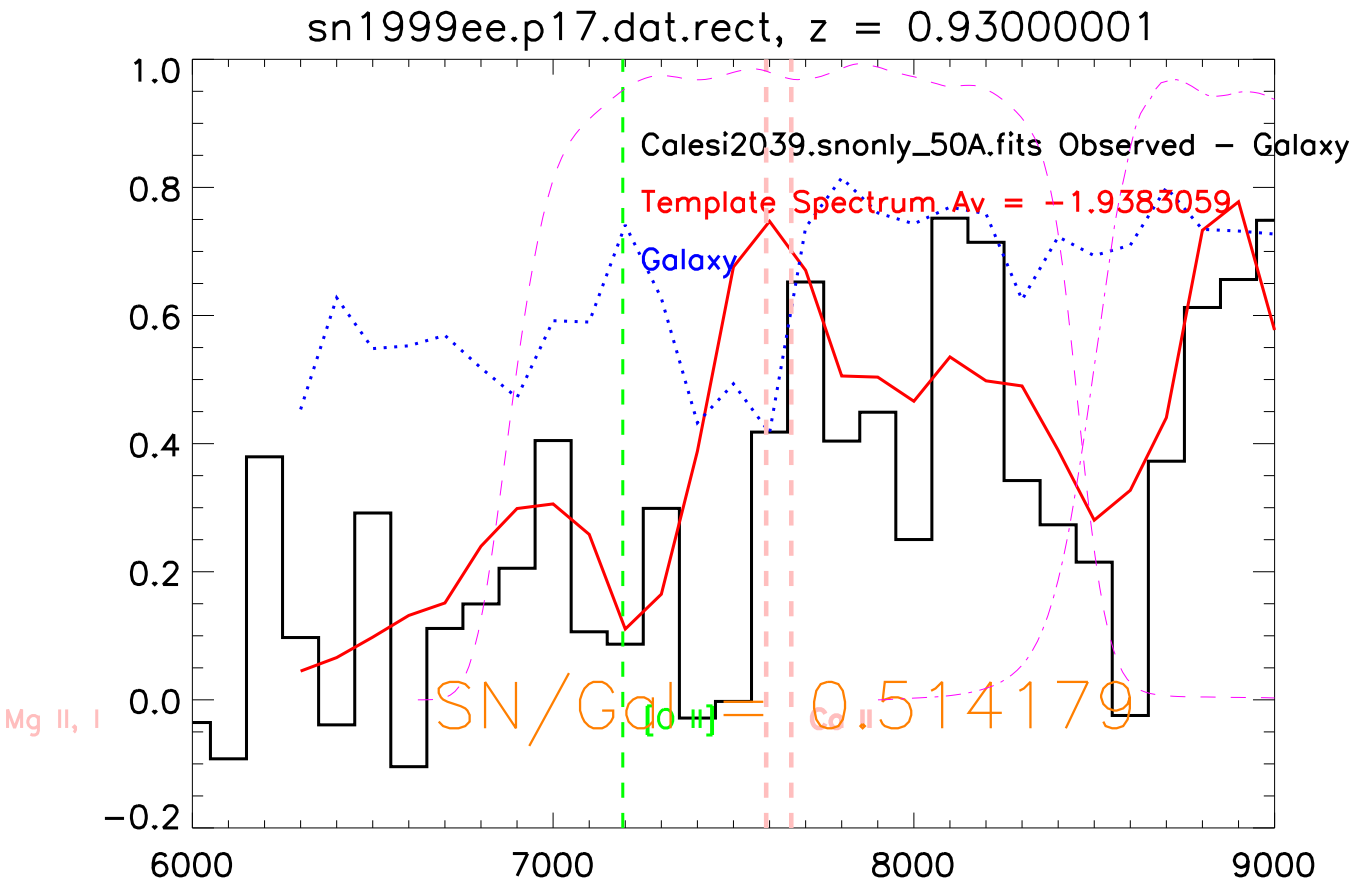

sn1999ee.p12.dat.rect, z = 0.94999999
Calesi2039.snonly_50A.fits Observed – Galaxy
Template Spectrum Av = −0.54206926
Galaxy
SN/Gal = 0.681080
[O II]
Mg II, I
Ca II
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
6000
7000
8000
9000

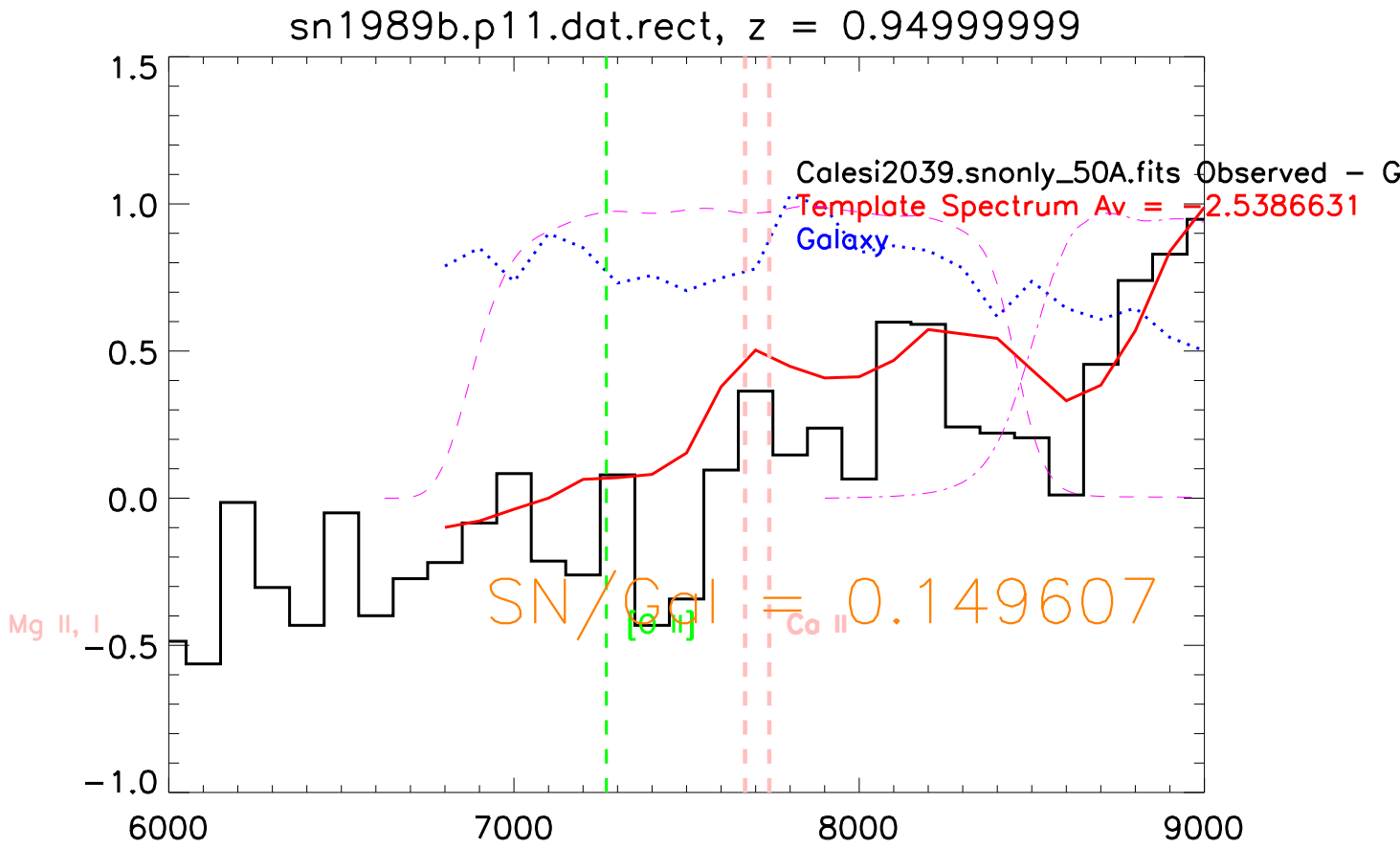

sn1996x.p07.dat.rect, z = 0.94999999
Calesi2039.snonly_50A.fits Observed − Galaxy
Template Spectrum Av = 0.74702448
Galaxy
SN/Gal = 0.984837
[O II]
Mg II, I
Ca II
1.2
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
6000
7000
8000
9000

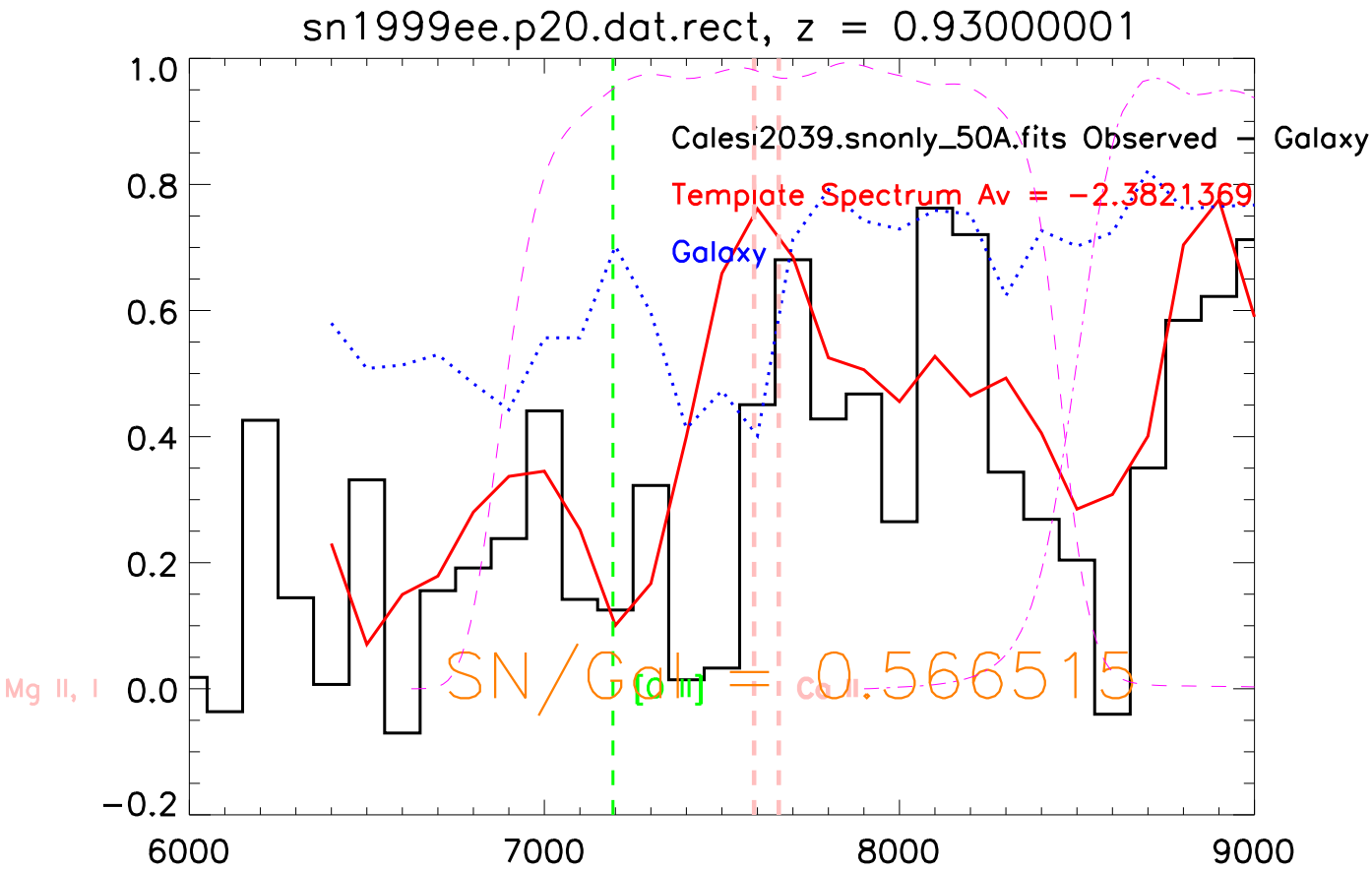

sn1999ee.p23.dat.rect, z = 0.93000001
Calesi2039.snonly_50A.fits Observed – Galaxy
Template Spectrum Av = −3.101600
Galaxy
SN/Gal = 0.534300
Mg II, I
[O II]
Ca II
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
6000
7000
8000
9000

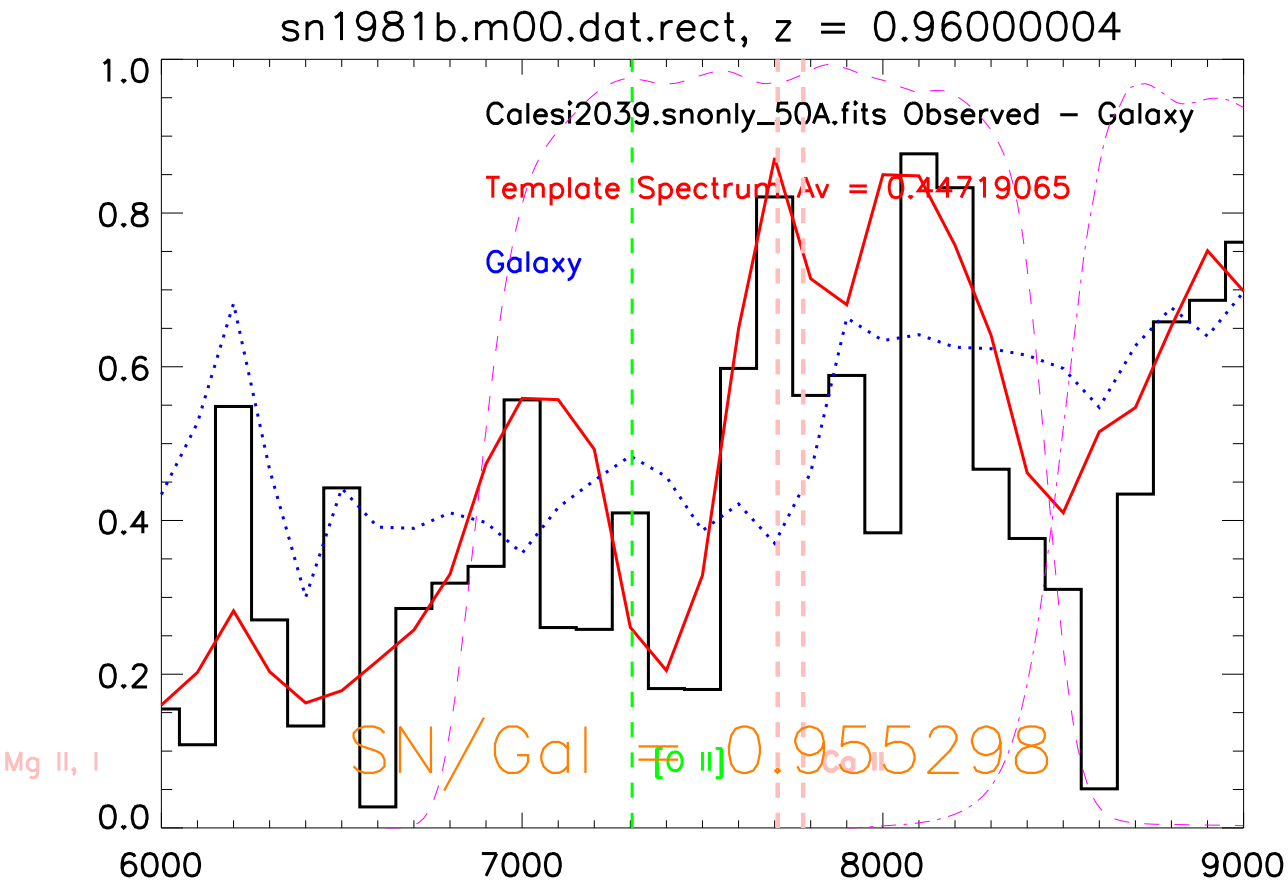

sn1999ee.p33.dat.rect, z = 0.93000001
Calesi2039.snonly_50A.fits Observed – Galaxy
Template Spectrum Av = –2.8364252
Galaxy
SN/Gal = 0.703661
Mg II, I
[O II]
Ca II
1.0
0.8
0.6
0.4
0.2
0.0
–0.2
6000
7000
8000
9000

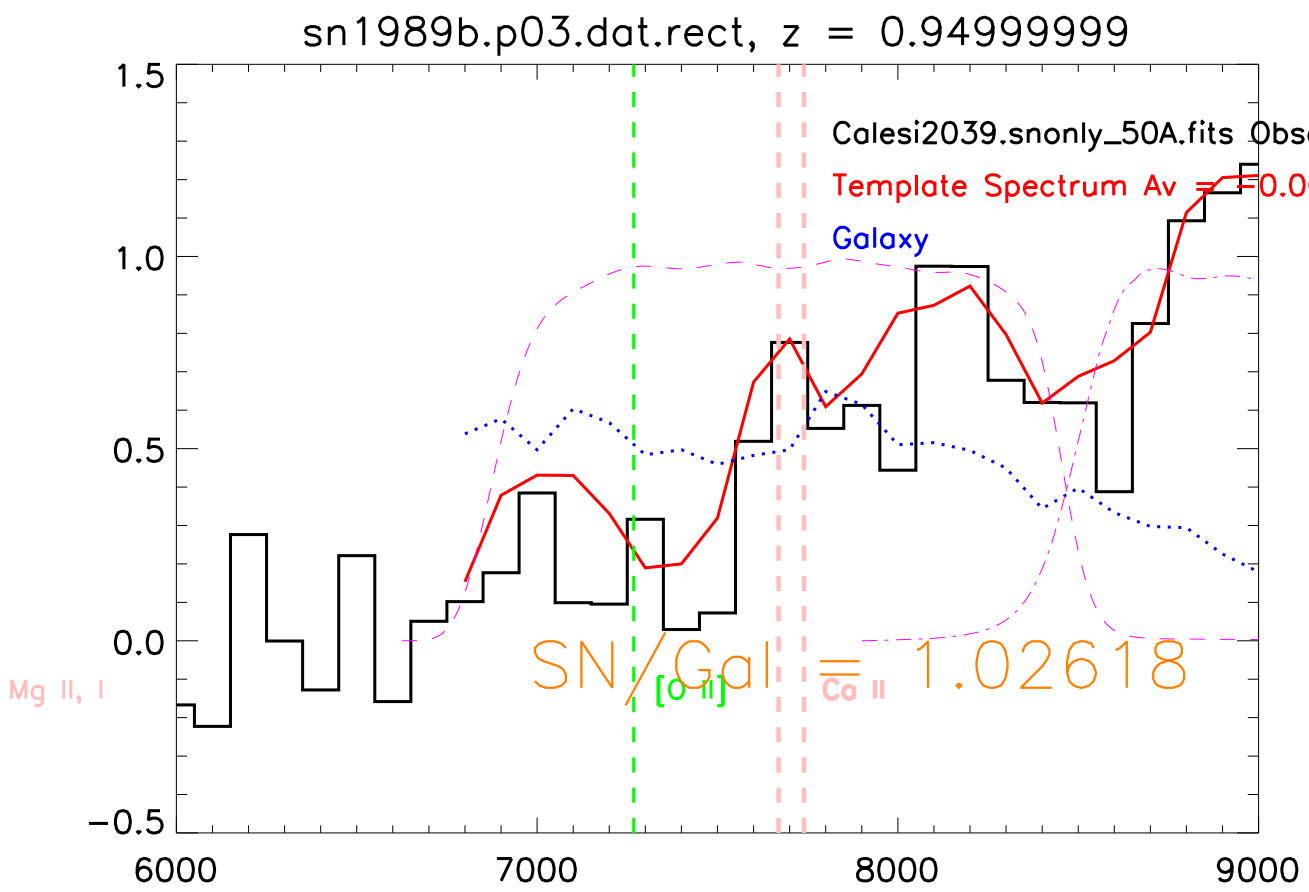

sn1990n.p14.dat.rect, z = 0.94000000
Calesi2C39.snonly_50A.fits Observed – Galaxy
Template Spectrum Av = -0.88682150
Galaxy
SN/Gal = 0.869716
[O II]
Mg II, I
1.0
0.8
0.6
0.4
0.2
0.0
6000
7000
8000
9000

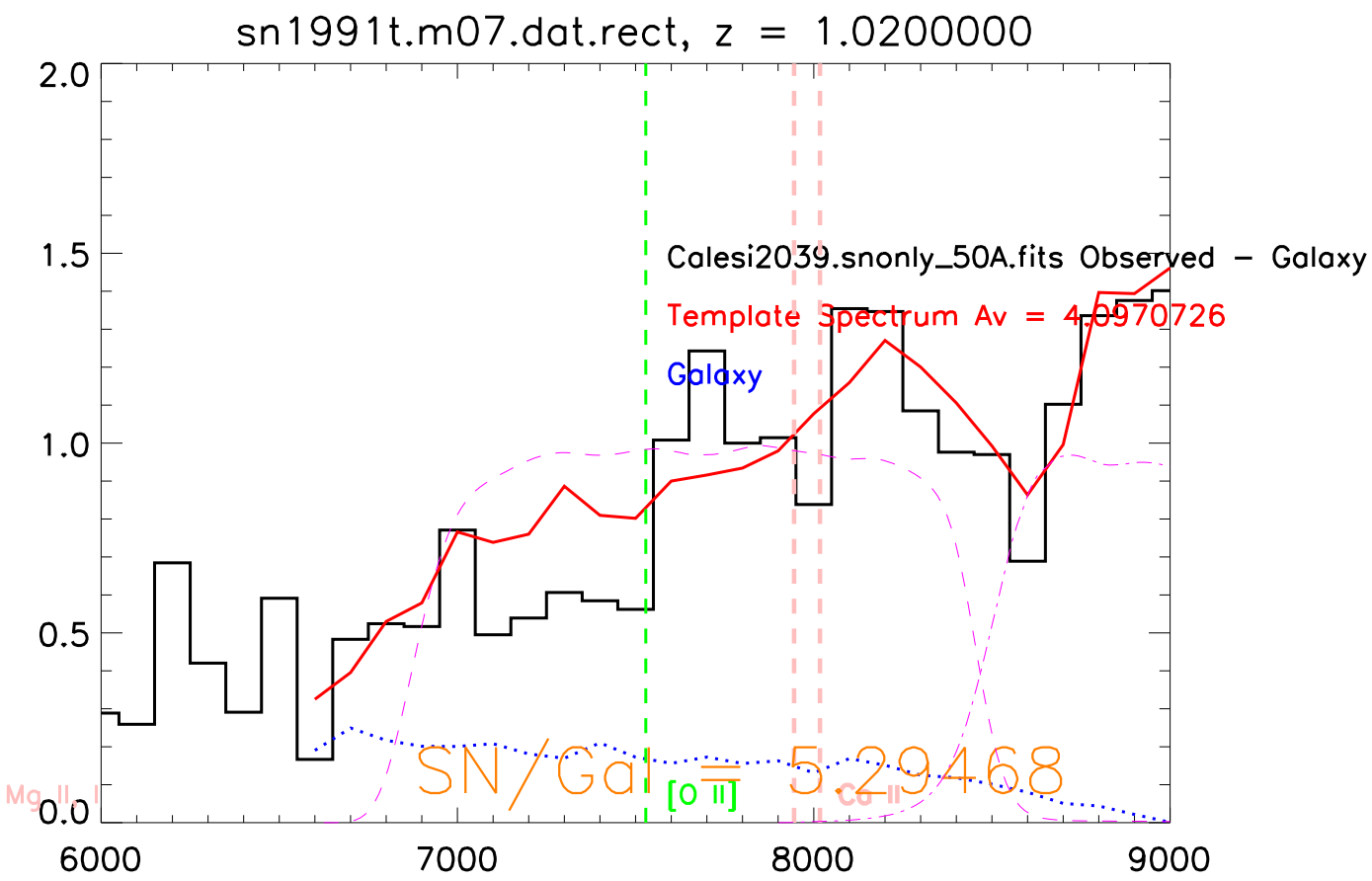

sn1999ee.p17.dat.rect, z = 0.93000001
Calesi2039.snonly_50A.fits Observed − Galaxy
Template Spectrum Av = −1.9383059
Galaxy
SN/Gal = 0.514179
Mg II, I
[O II]
Ca II
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
6000
7000
8000
9000

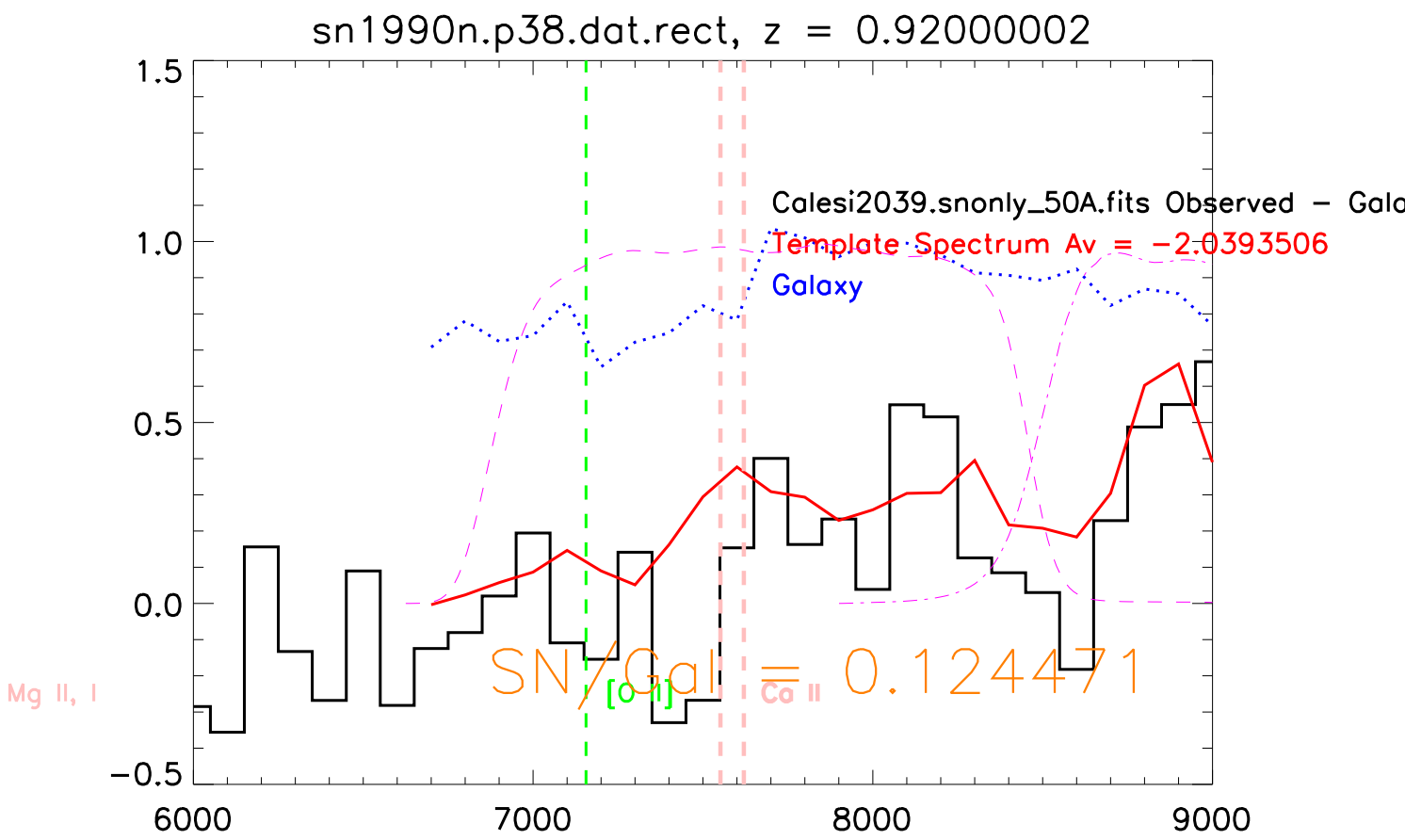

sn1989b.p11.dat.rect, z = 0.94999999
Calesi2039.snonly_50A.fits Observed – G
Template Spectrum Av = 2.5386631
Galaxy
SN/Gal = 0.149607
Mg II, I
[O II]
Ca II
1.5
1.0
0.5
0.0
−0.5
−1.0
6000
7000
8000
9000

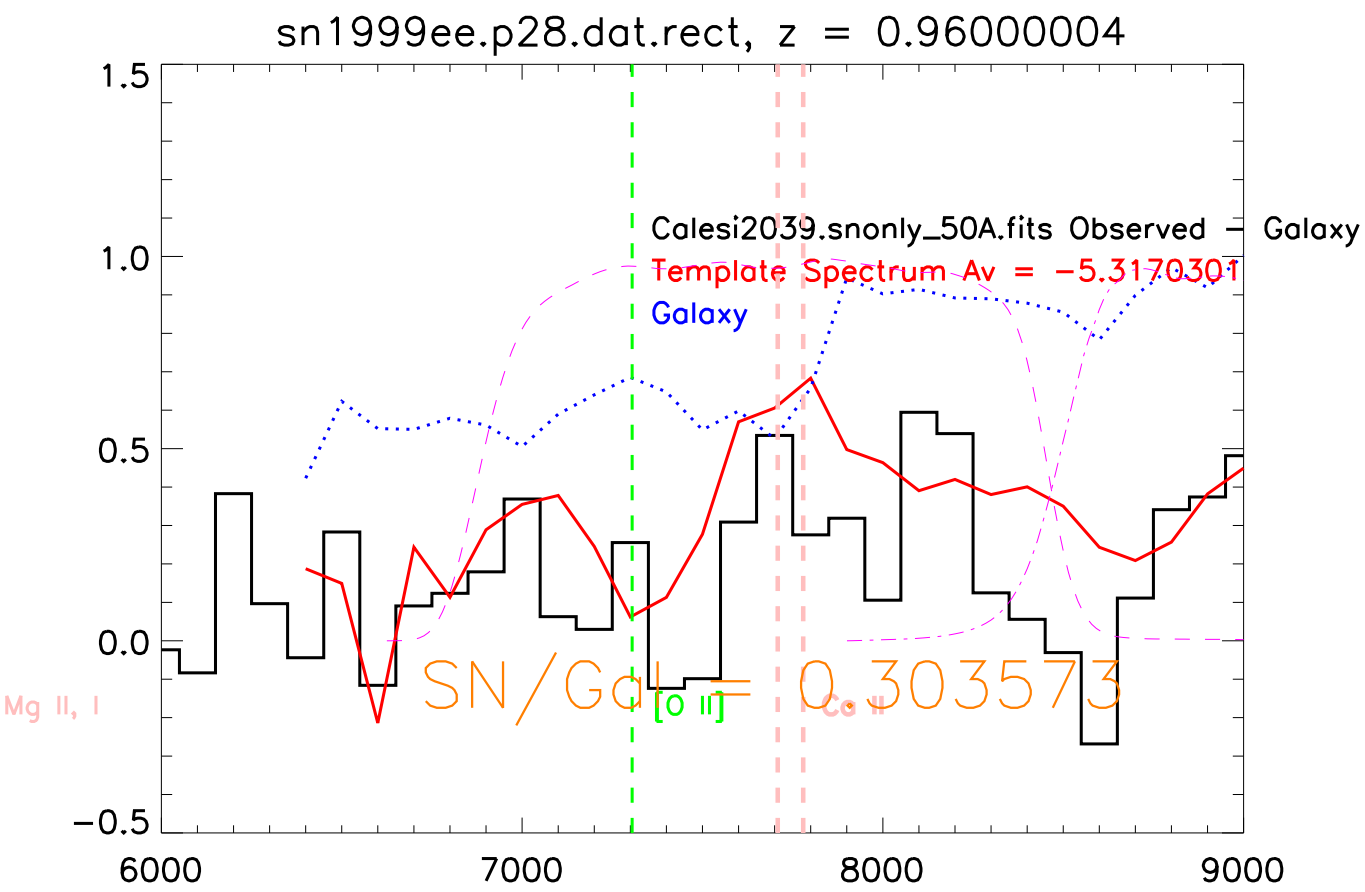

sn1999ee.p20.dat.rect, z = 0.93000001
Calesi2039.snonly_50A.fits Observed – Galaxy
Template Spectrum Av = −2.3821369
Galaxy
SN/Gal = 0.566515
[O II]
Mg II, I
Ca II
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
6000
7000
8000
9000

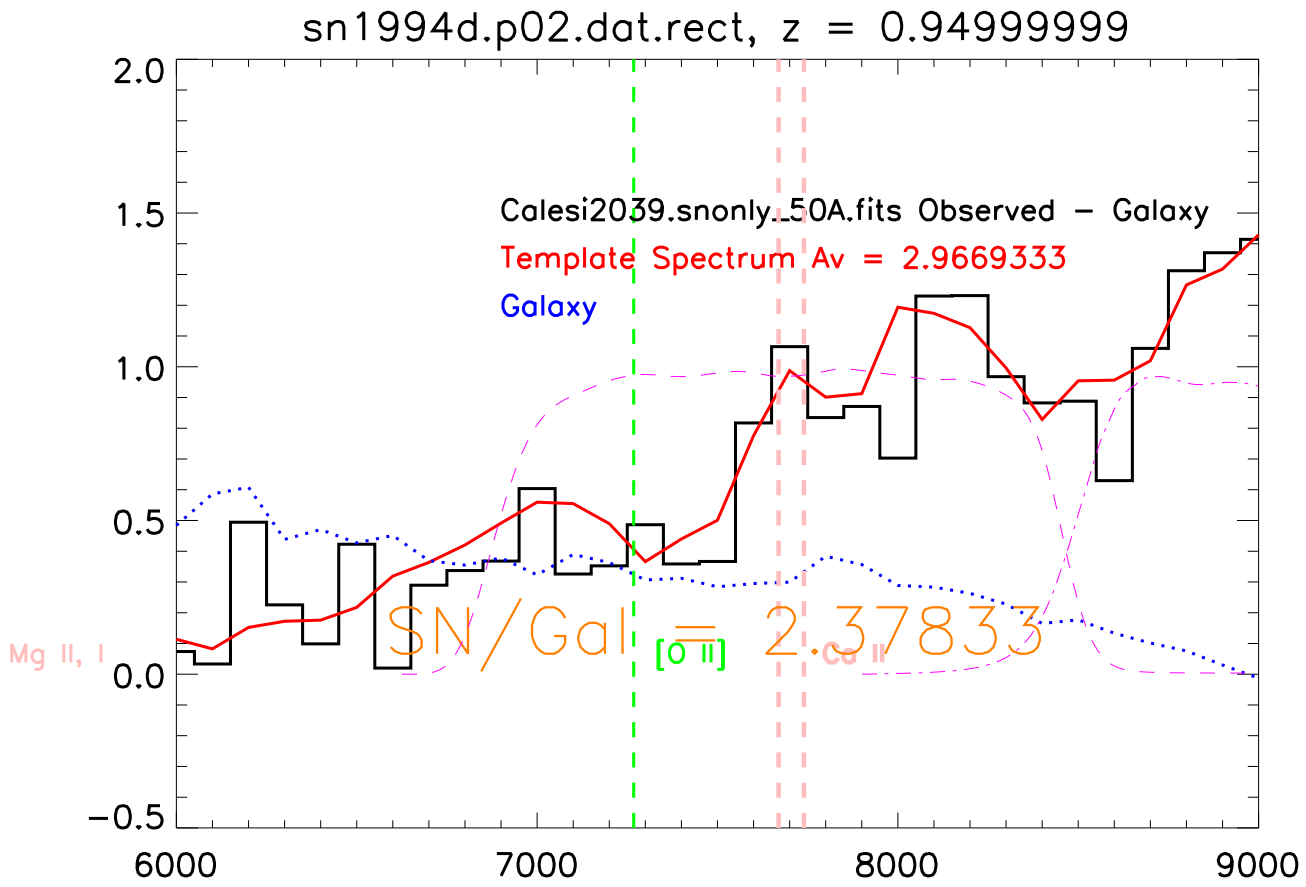

sn1981b.m00.dat.rect, z = 0.96000004
Calesi2039.snonly_50A.fits Observed – Galaxy
Template Spectrum, Av = 0.44719065
Galaxy
SN/Gal = 0.955298
[O II]
Mg II, I
Ca II
1.0
0.8
0.6
0.4
0.2
0.0
6000
7000
8000
9000

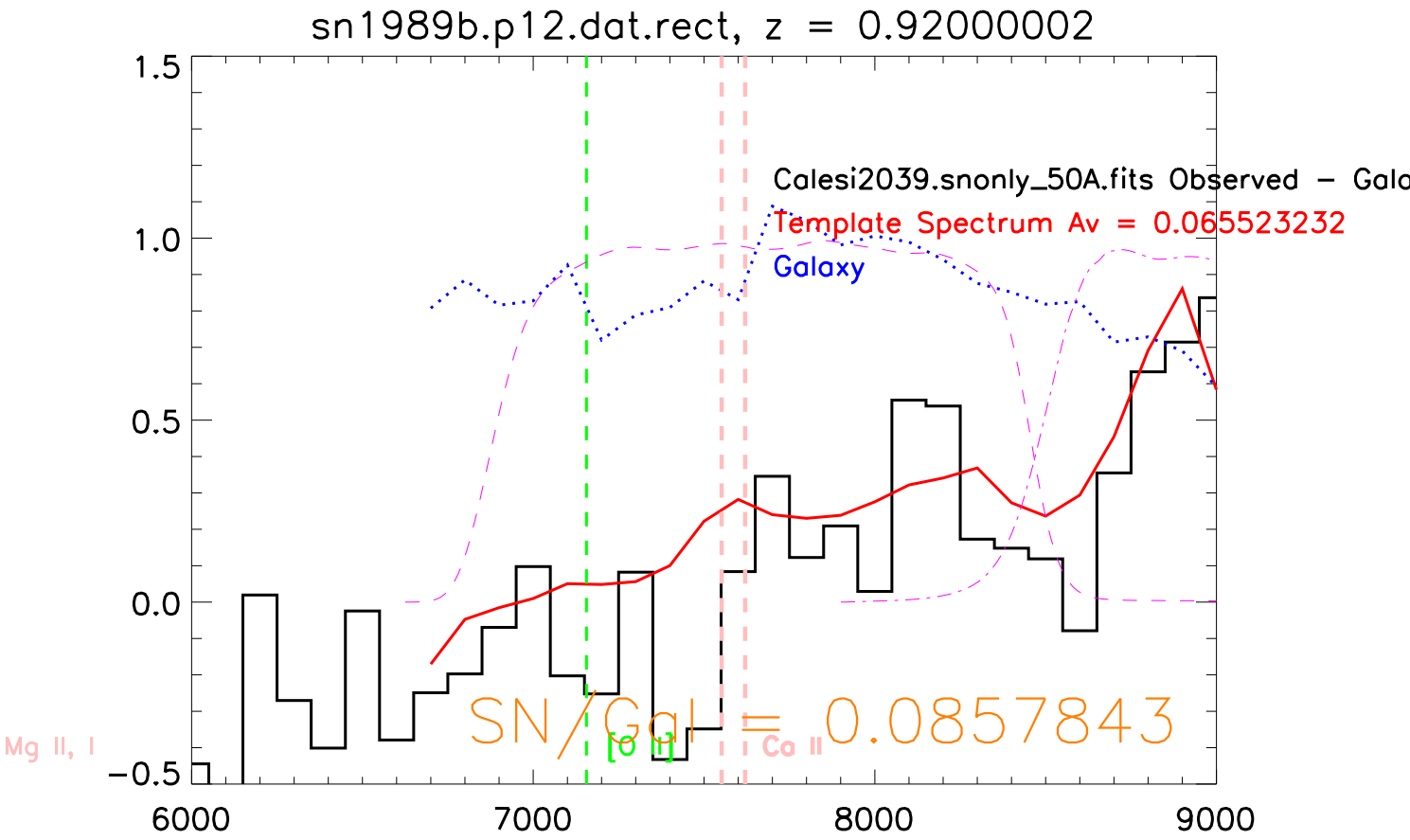

sn1989b.p03.dat.rect, z = 0.94999999
Calesi2039.snonly_50A.fits Observed – G
Template Spectrum Av = 0.009552203
Galaxy
SN/Gal = 1.02618
[O II]
Ca II
Mg II, I
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000

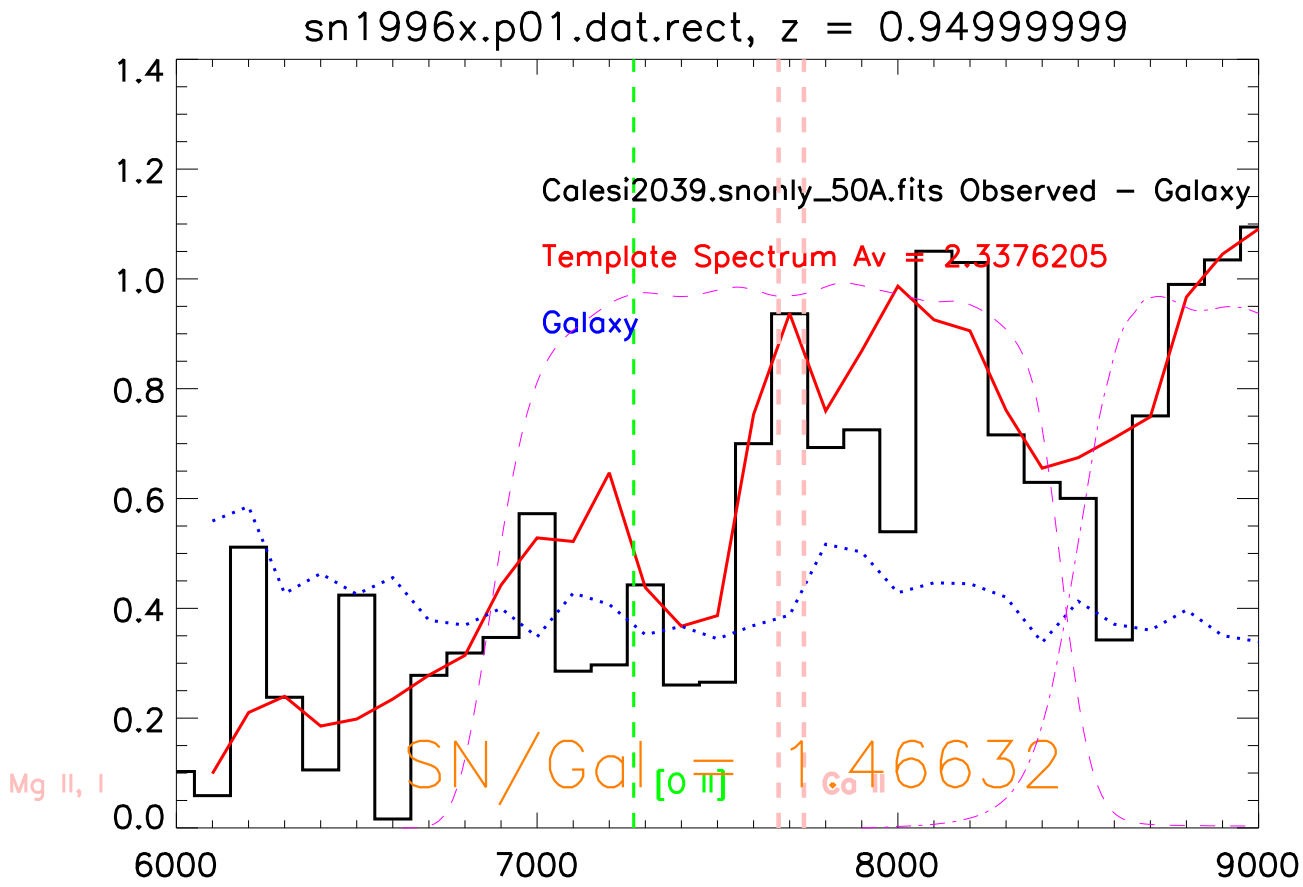

sn1991t.m07.dat.rect, z = 1.0200000
2.0
1.5
1.0
0.5
0.0
6000
7000
8000
9000
Calesi2039.snonly_50A.fits Observed − Galaxy
Template Spectrum Av = 4.0970726
Galaxy
SN/Gal = 5.29468
[O II]
Ca II
Mg II

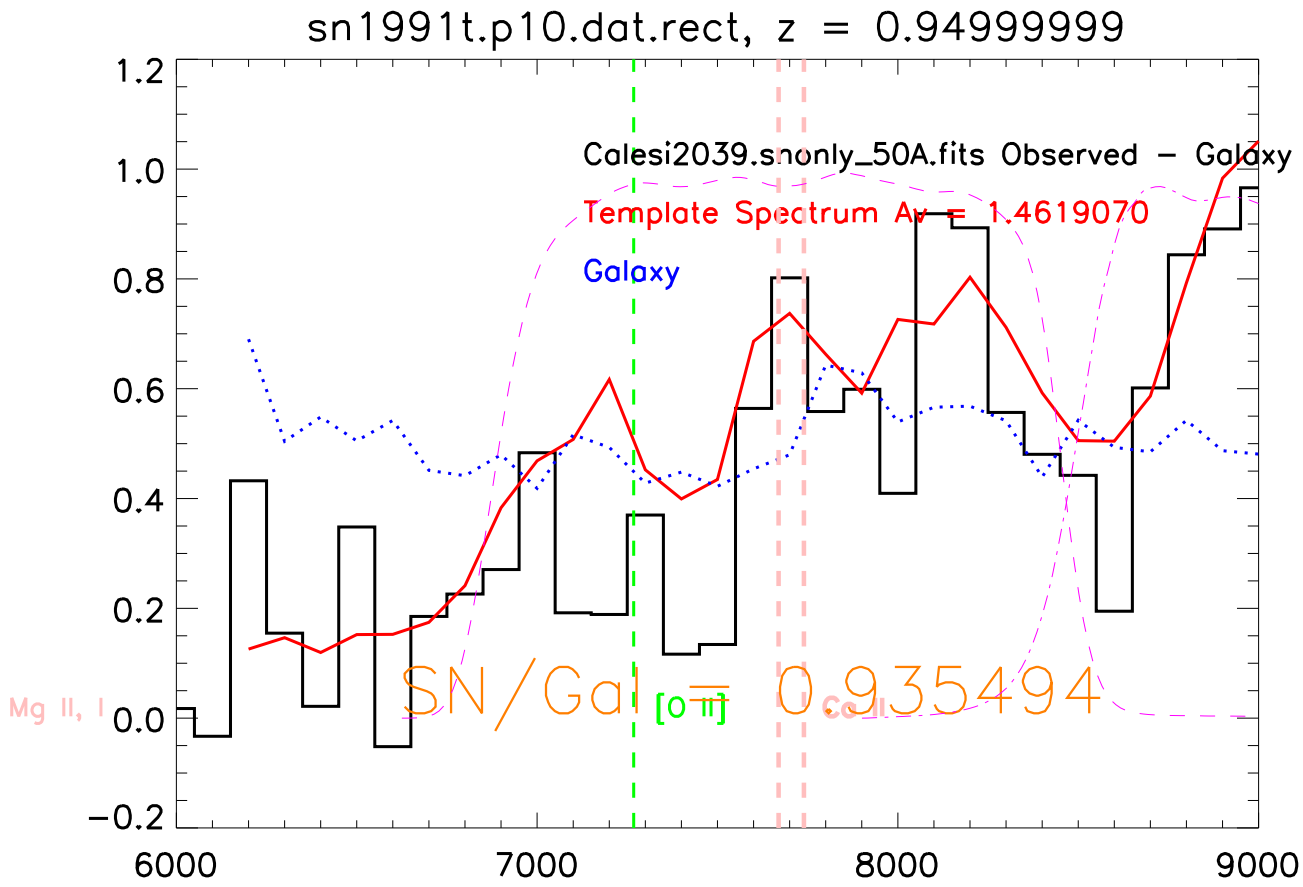

sn1990n.p38.dat.rect, z = 0.92000002
Calesi2039.snonly_50A.fits Observed – Gala
Template Spectrum Av = −2.0393506
Galaxy
SN/Gal = 0.124471
[O II]
Ca II
Mg II, I
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000

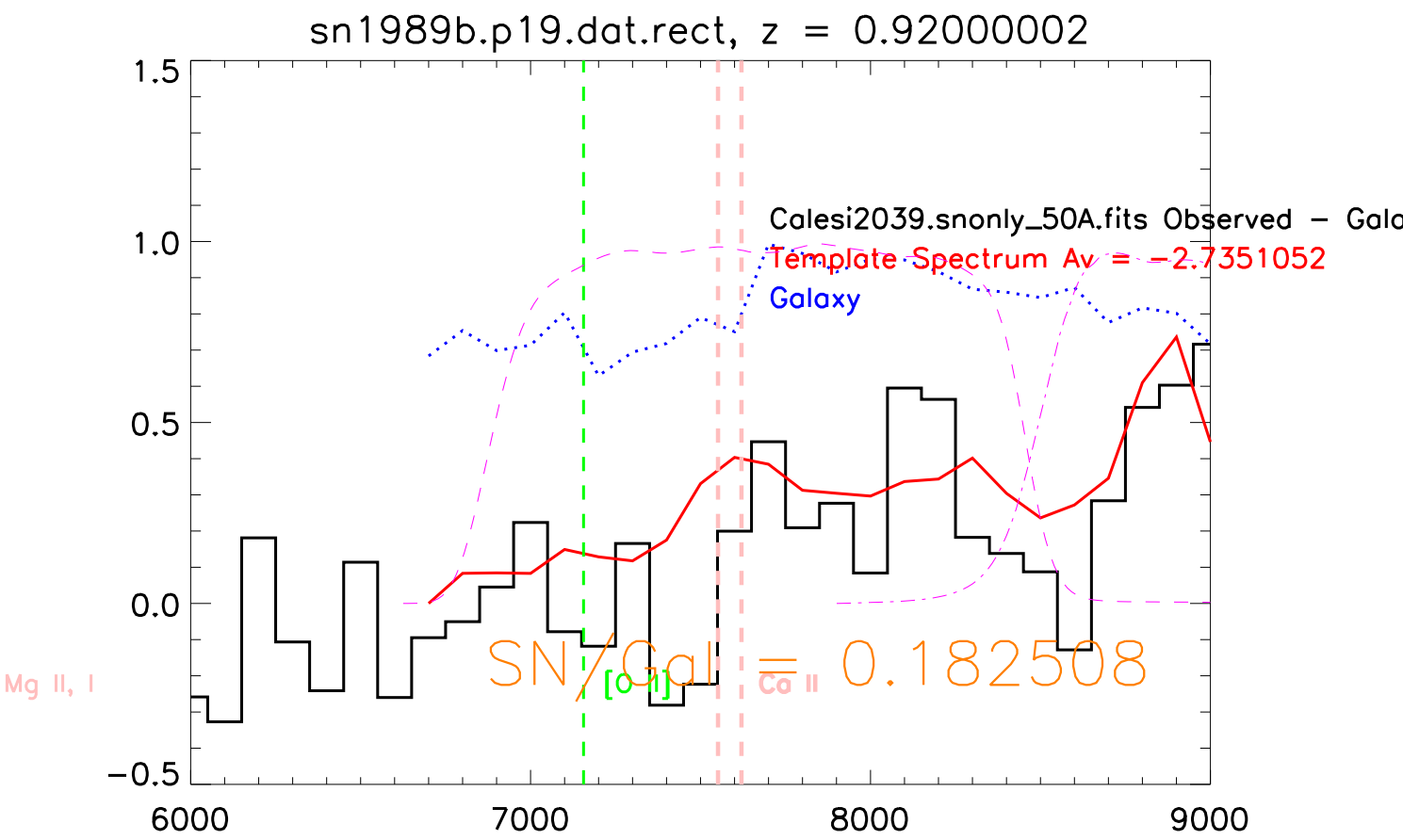

sn1999ee.p28.dat.rect, z = 0.96000004
Calesi2039.snonly_50A.fits Observed – Galaxy
Template Spectrum Av = -5.3170301
Galaxy
SN/Gal = 0.303573
Mg II, I
[O II]
Ca II
1.5
1.0
0.5
0.0
-0.5
6000
7000
8000
9000

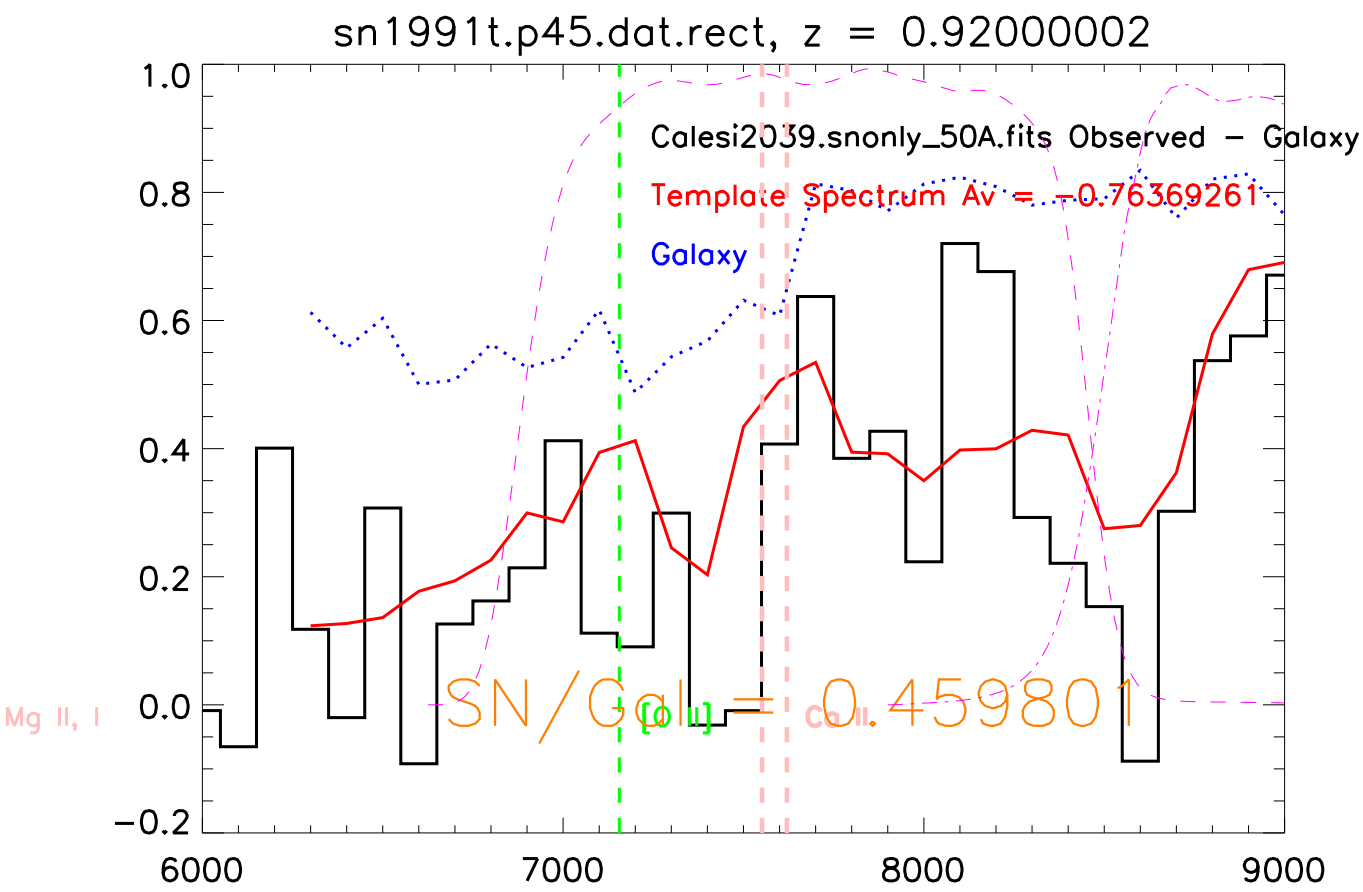

sn1994d.p02.dat.rect, z = 0.94999999
Calesi2039.snonly_50A.fits Observed − Galaxy
Template Spectrum Av = 2.9669333
Galaxy
SN/Gal = 2.37833
[O II]
Mg II, I
Ca II
2.0
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000

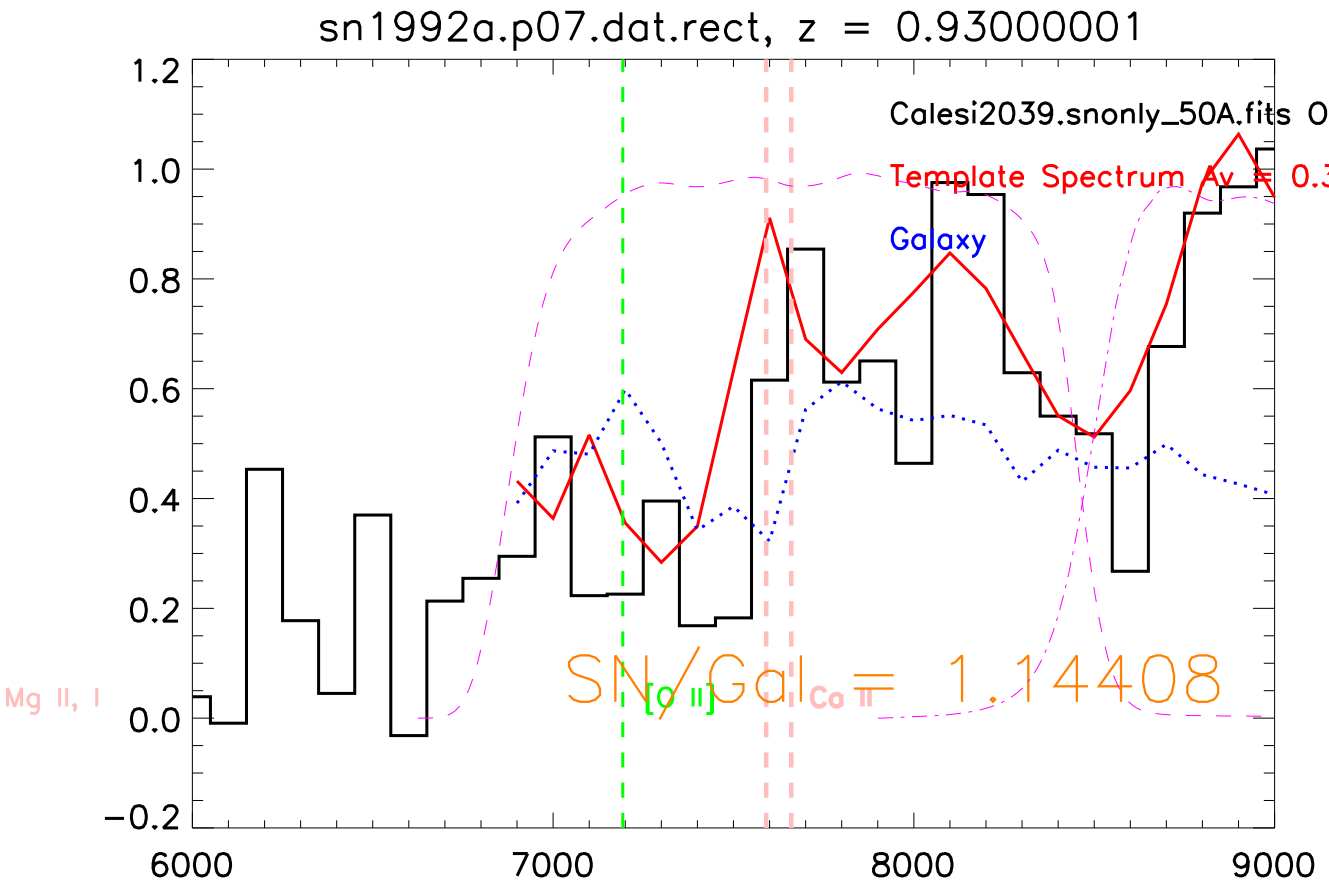

sn1989b.p12.dat.rect, z = 0.92000002
Calesi2039.snonly_50A.fits Observed – Gala
Template Spectrum Av = 0.065523232
Galaxy
SN/Gal = 0.0857843
Mg II, I
[O II]
Ca II
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000

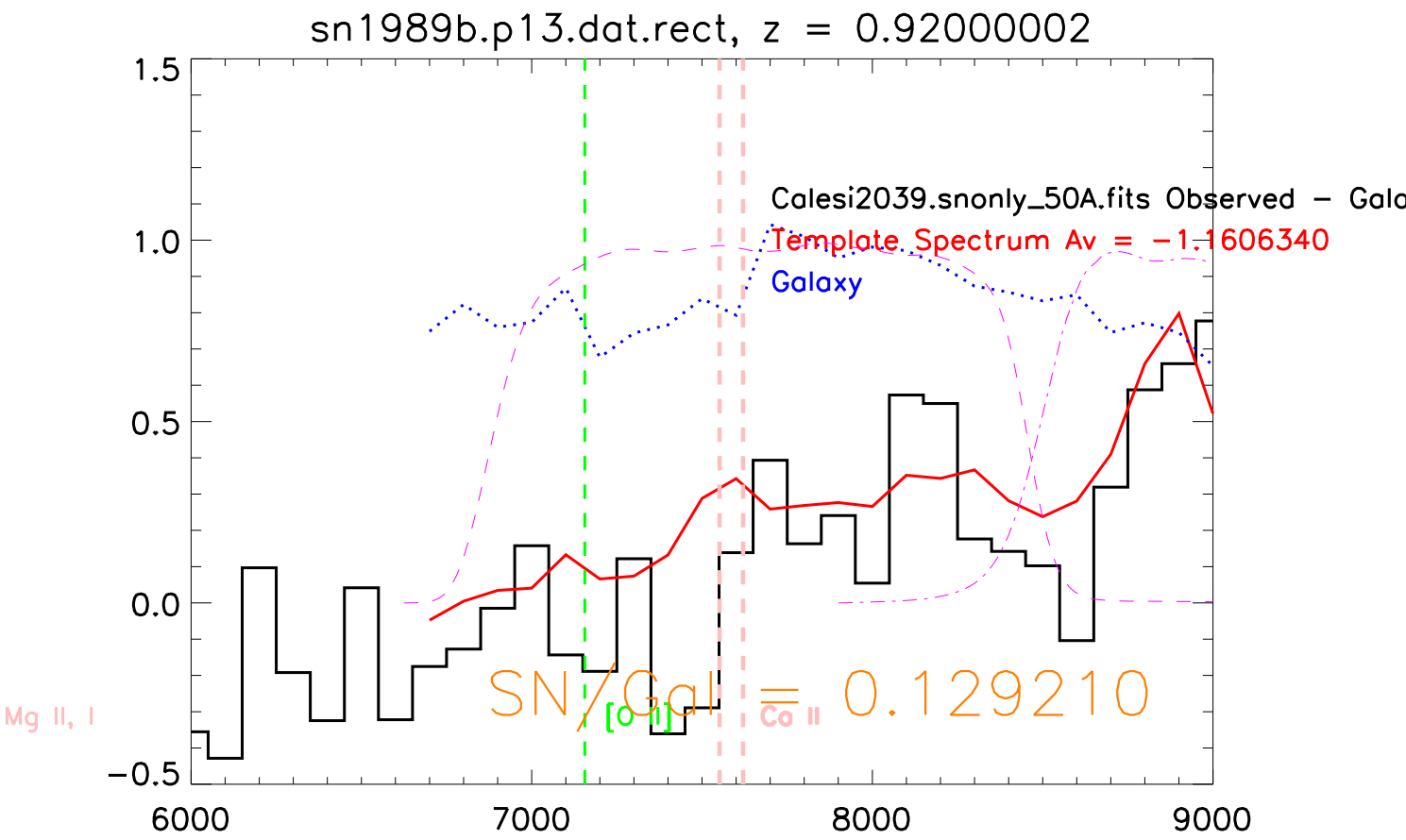

sn1996x.p01.dat.rect, z = 0.94999999
Calesi2039.snonly_50A.fits Observed − Galaxy
Template Spectrum Av = 2.3376205
Galaxy
SN/Gal = 1.46632
[O II]
Ca II
Mg II, I
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
6000
7000
8000
9000

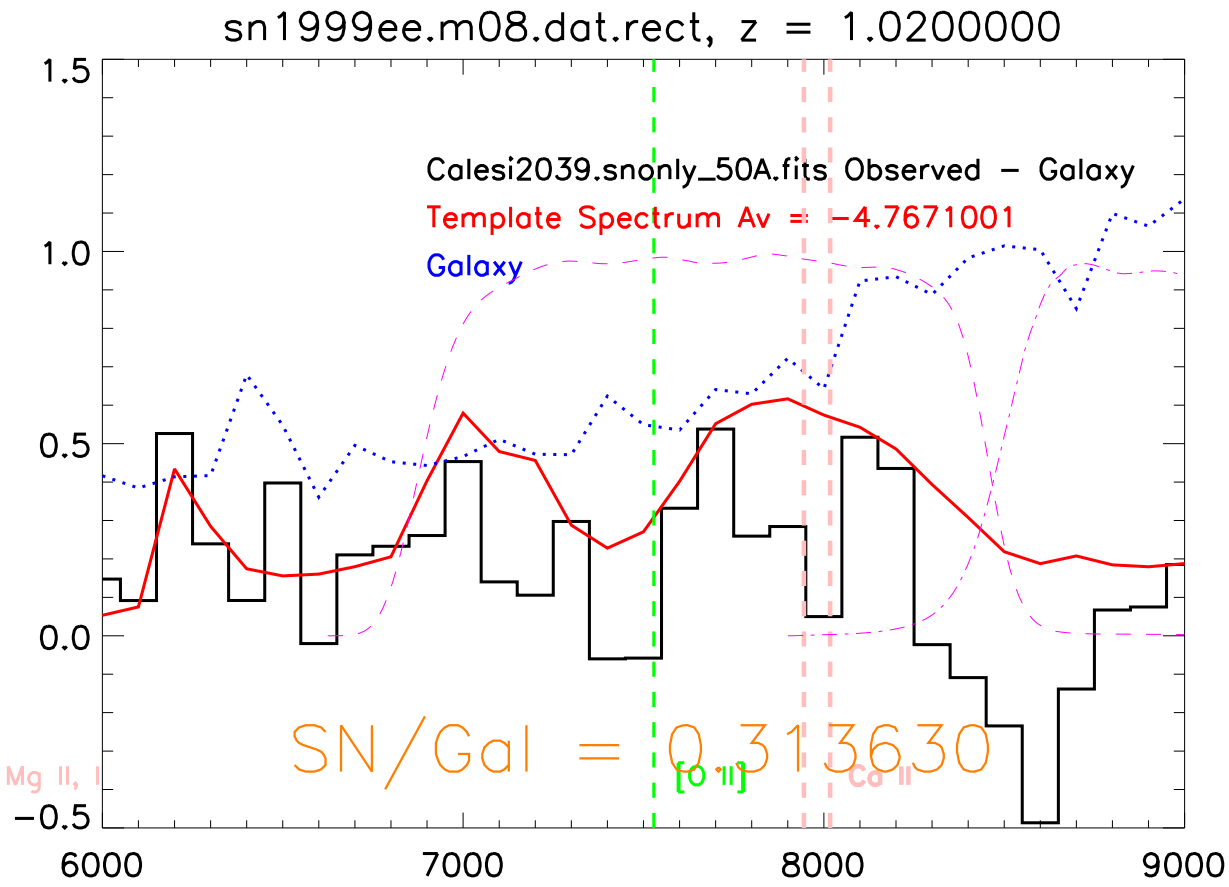

sn1991t.p10.dat.rect, z = 0.94999999
Calesi2039.snonly_50A.fits Observed – Galaxy
Template Spectrum Av = 1.4619070
Galaxy
SN/Gal = 0.935494
[O II]
Mg II, I
Ca II
1.2
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
6000
7000
8000
9000

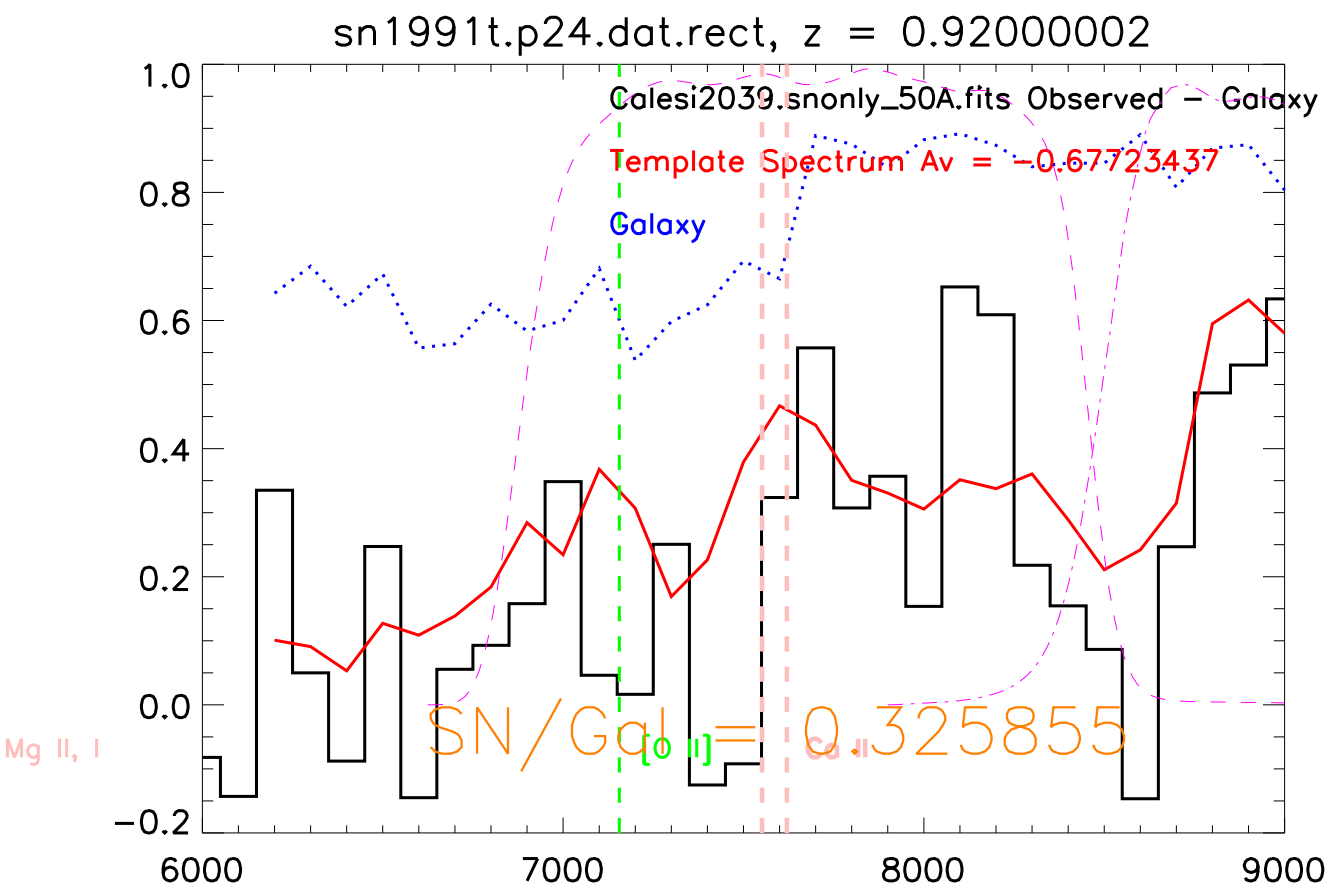

sn1989b.p19.dat.rect, z = 0.92000002
Calesi2039.snonly_50A.fits Observed – Gala
Template Spectrum Av = −2.7351052
Galaxy
SN/Gal = 0.182508
Mg II, I
[O II]
Ca II
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000

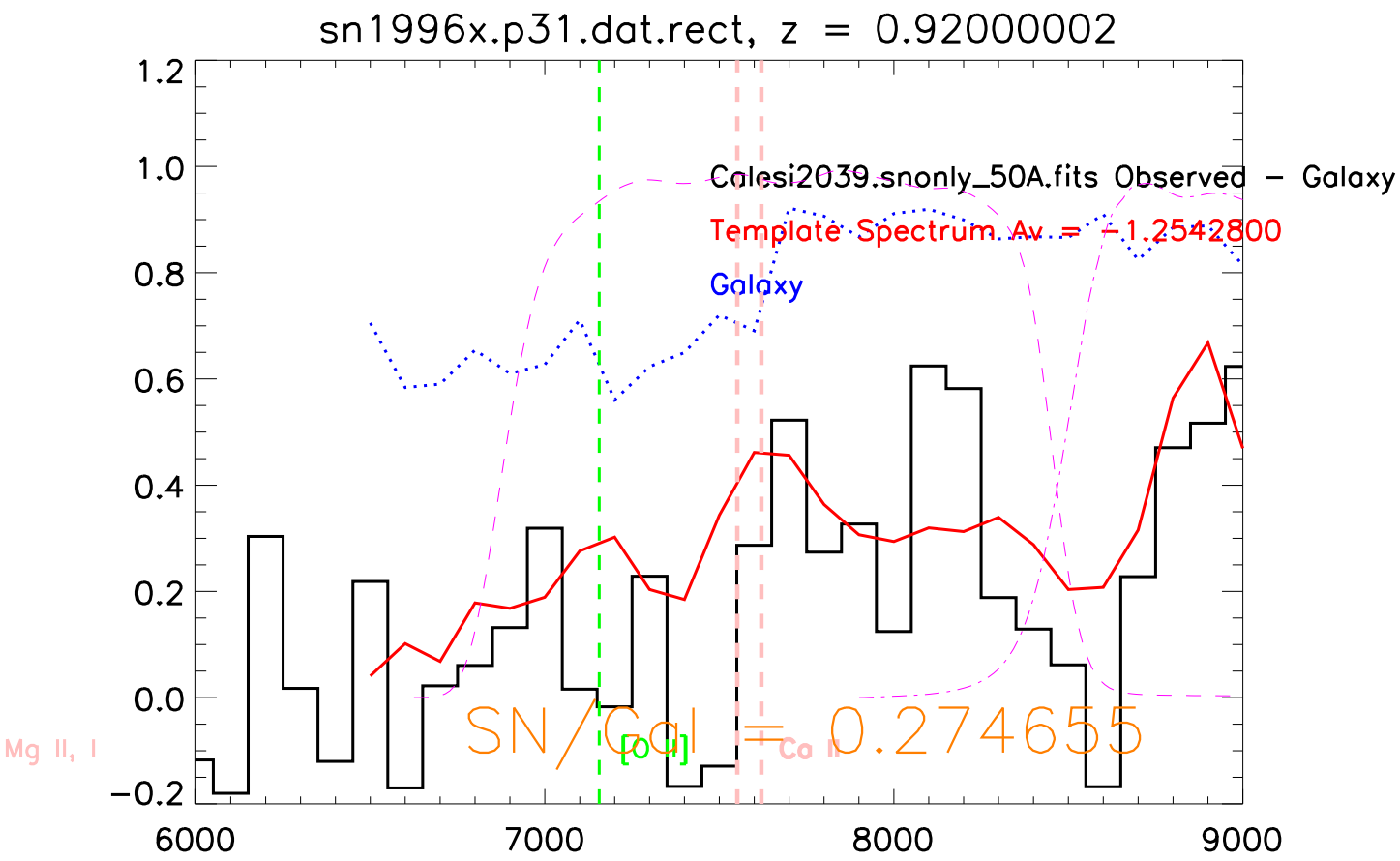

sn1991t.p45.dat.rect, z = 0.92000002
Calesi2039.snonly_50A.fits Observed − Galaxy
Template Spectrum Av = −0.76369261
Galaxy
SN/Gal = 0.459801
Mg II, I
[O II]
Ca II
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
6000
7000
8000
9000

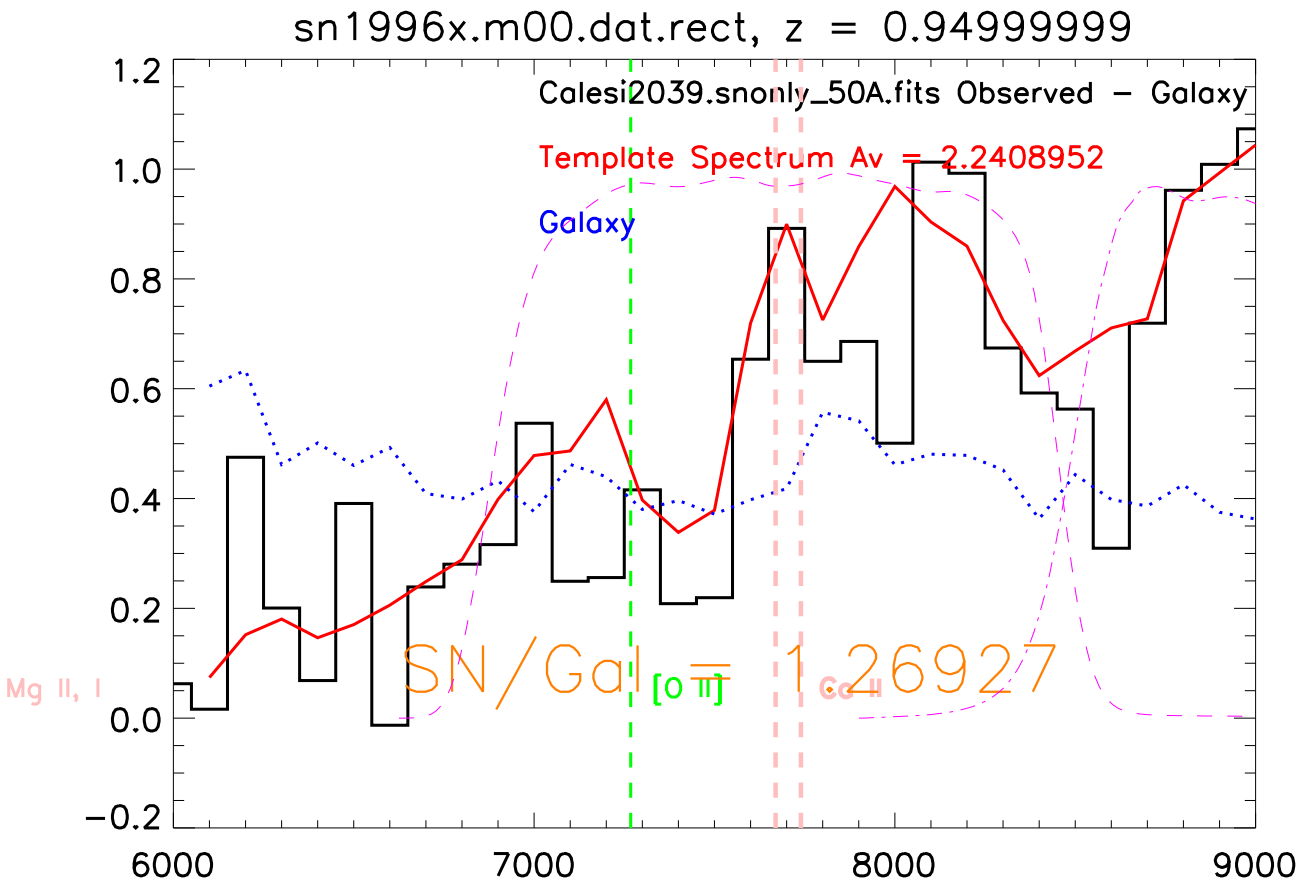

sn1992a.p07.dat.rect, z = 0.93000001
Calesi2039.snonly_50A.fits Observed -
Template Spectrum Av = 0.35936809
Galaxy
SN/Gal = 1.14408
[O II]
Ca II
Mg II, I
1.2
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
6000
7000
8000
9000

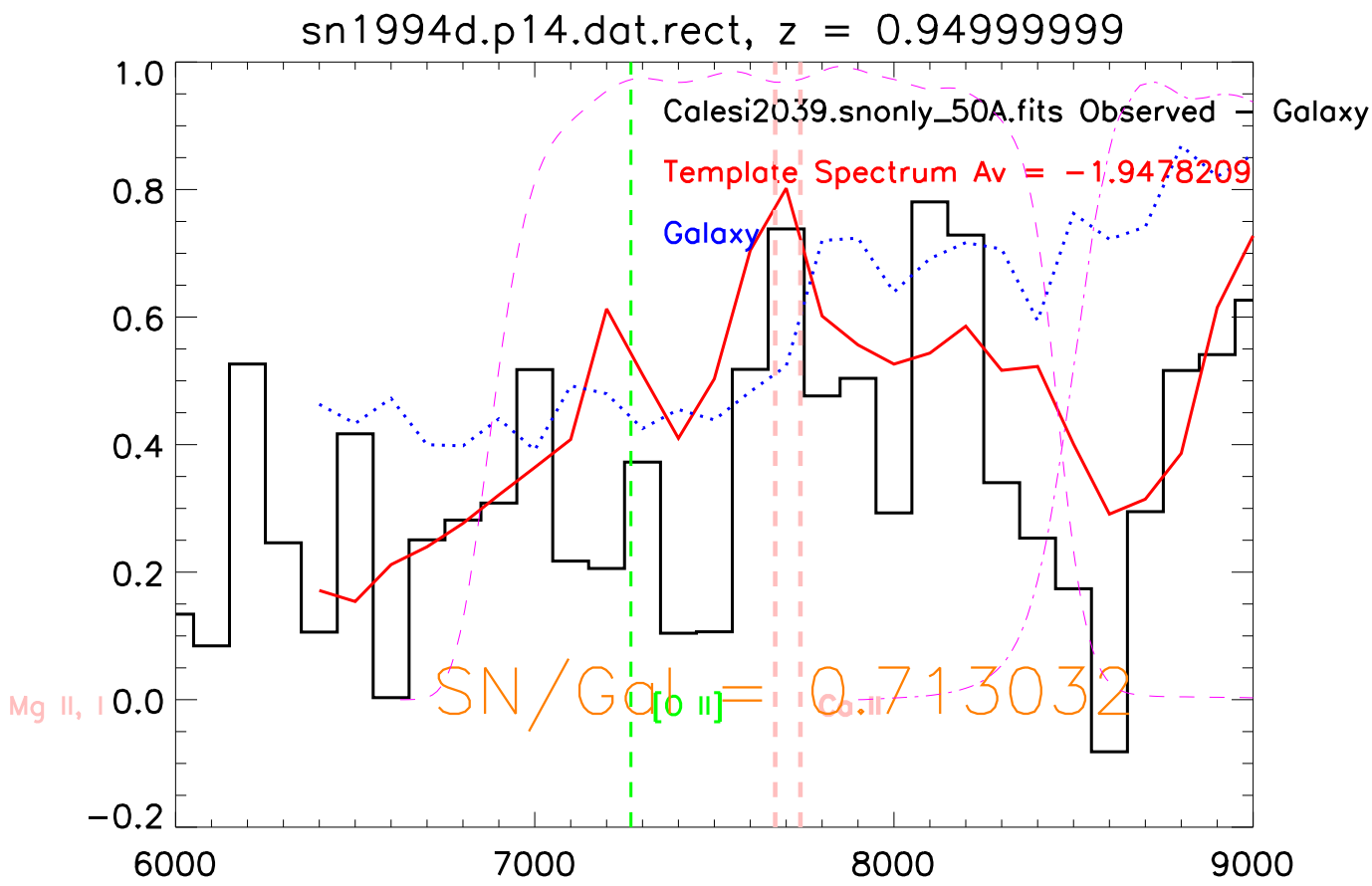

sn1989b.p13.dat.rect, z = 0.92000002
Calesi2039.snonly_50A.fits Observed – Galo
Template Spectrum Av = −1.1606340
Galaxy
SN/Gal = 0.129210
[O II]
Ca II
Mg II, I
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000

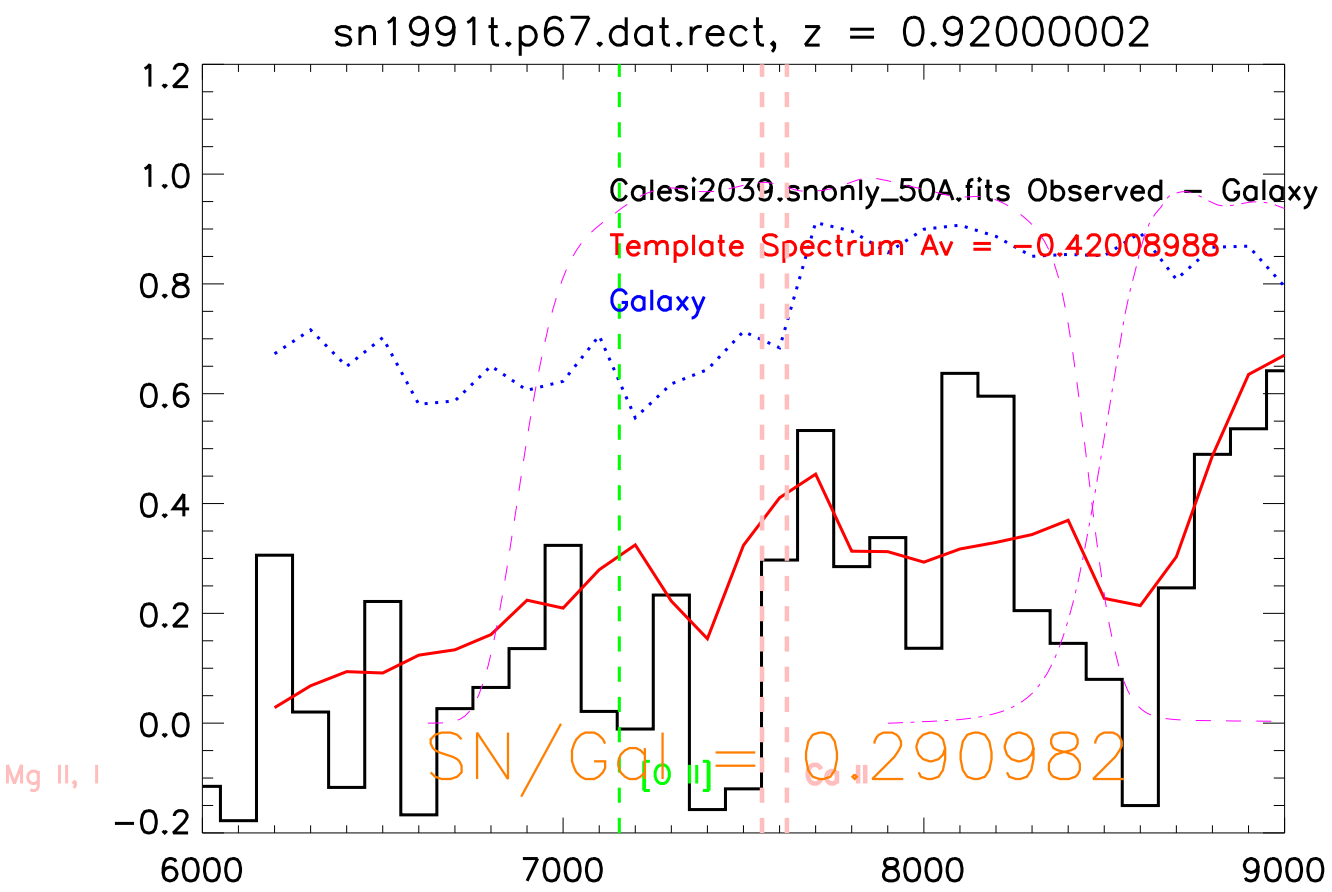

sn1999ee.m08.dat.rect, z = 1.0200000
Calesi2039.snonly_50A.fits Observed − Galaxy
Template Spectrum Av = −4.7671001
Galaxy
SN/Gal = 0.313630
[O II]
Ca II
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000

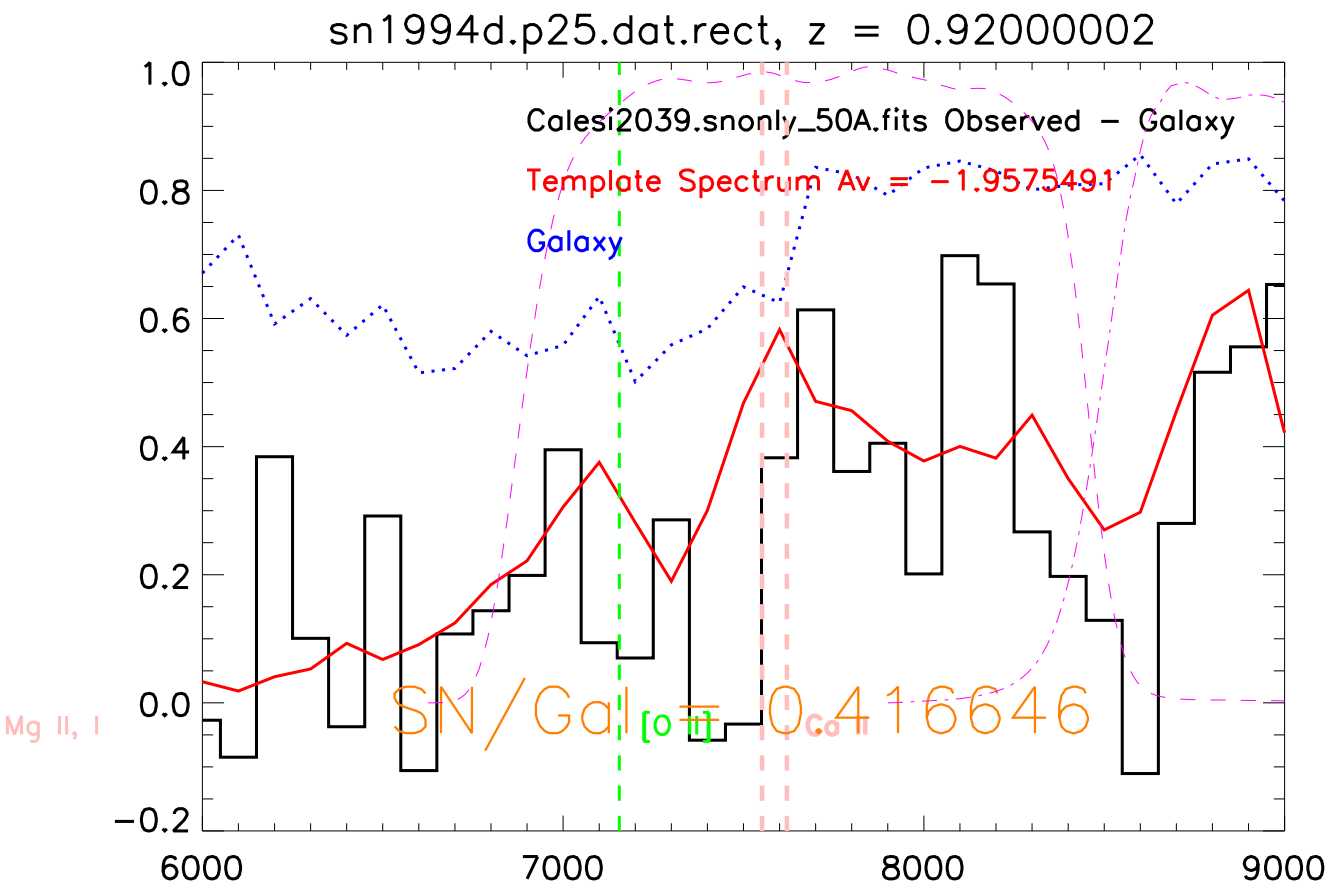

sn1991t.p24.dat.rect, z = 0.92000002
Calesi2039.snonly_50A.fits Observed − Galaxy
Template Spectrum Av = −0.6772437
Galaxy
SN/Gal = 0.325855
Mg II, I
[O II]
Ca II
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
6000
7000
8000
9000

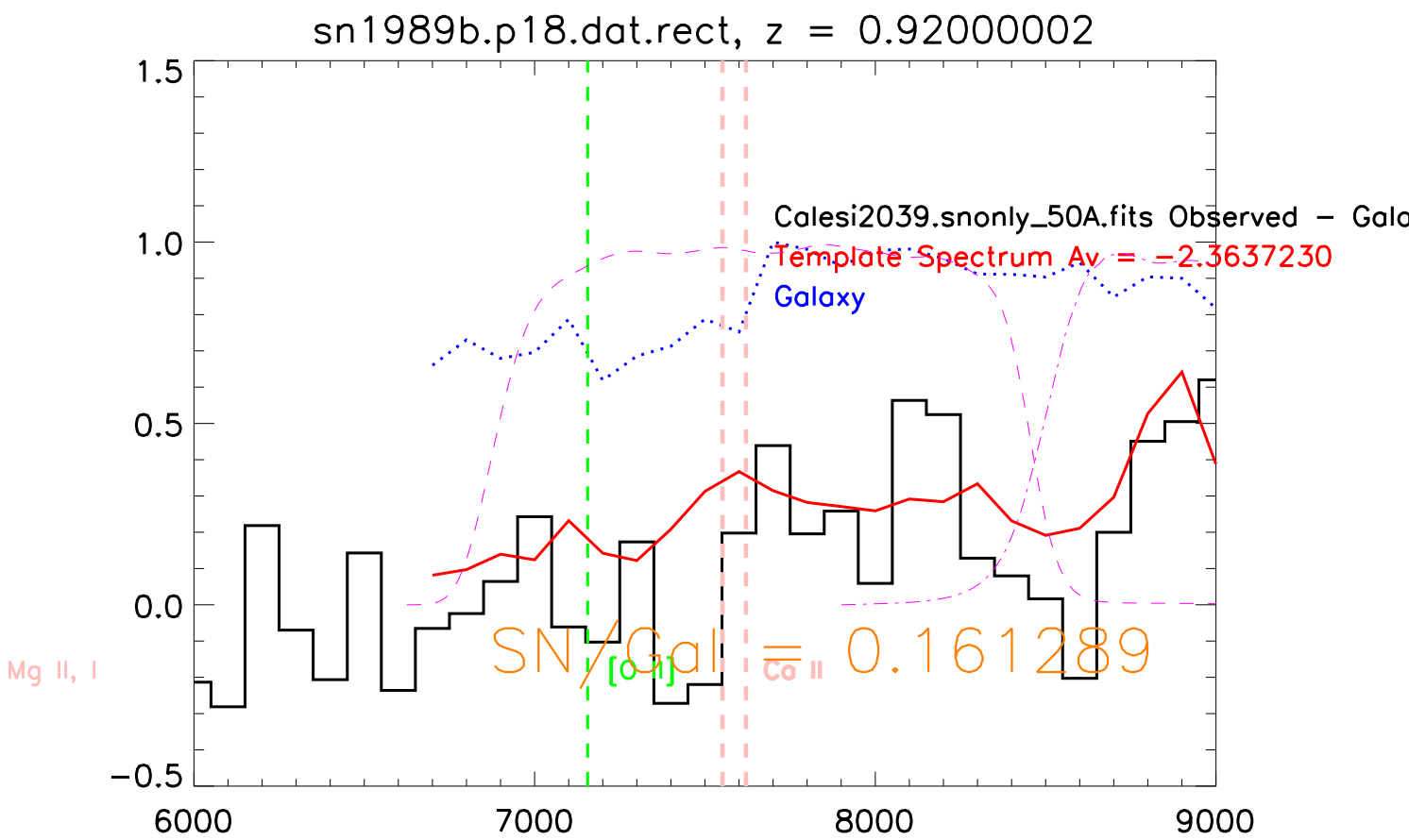

sn1996x.p31.dat.rect, z = 0.92000002
Calesi2039.snonly_50A.fits Observed − Galaxy
Template Spectrum Av = −1.2542800
Galaxy
SN/Gal = 0.274655
Mg II, I
[O II]
Ca II
1.2
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
6000
7000
8000
9000

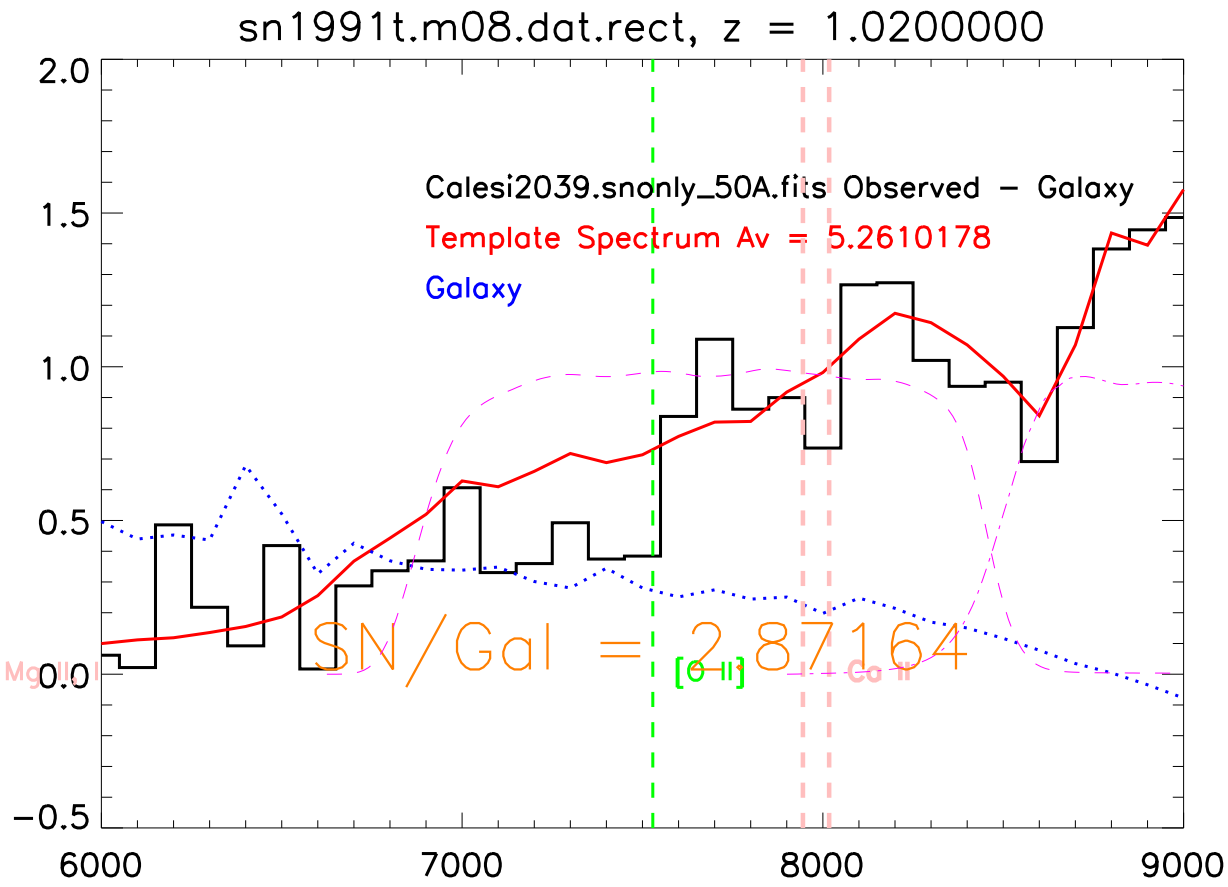

sn1996x.m00.dat.rect, z = 0.94999999
Calesi2039.snonly_50A.fits Observed − Galaxy
Template Spectrum Av = 2.2408952
Galaxy
SN/Gal = 1.26927
[O II]
Mg II, I
Ca II
1.2
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
6000
7000
8000
9000

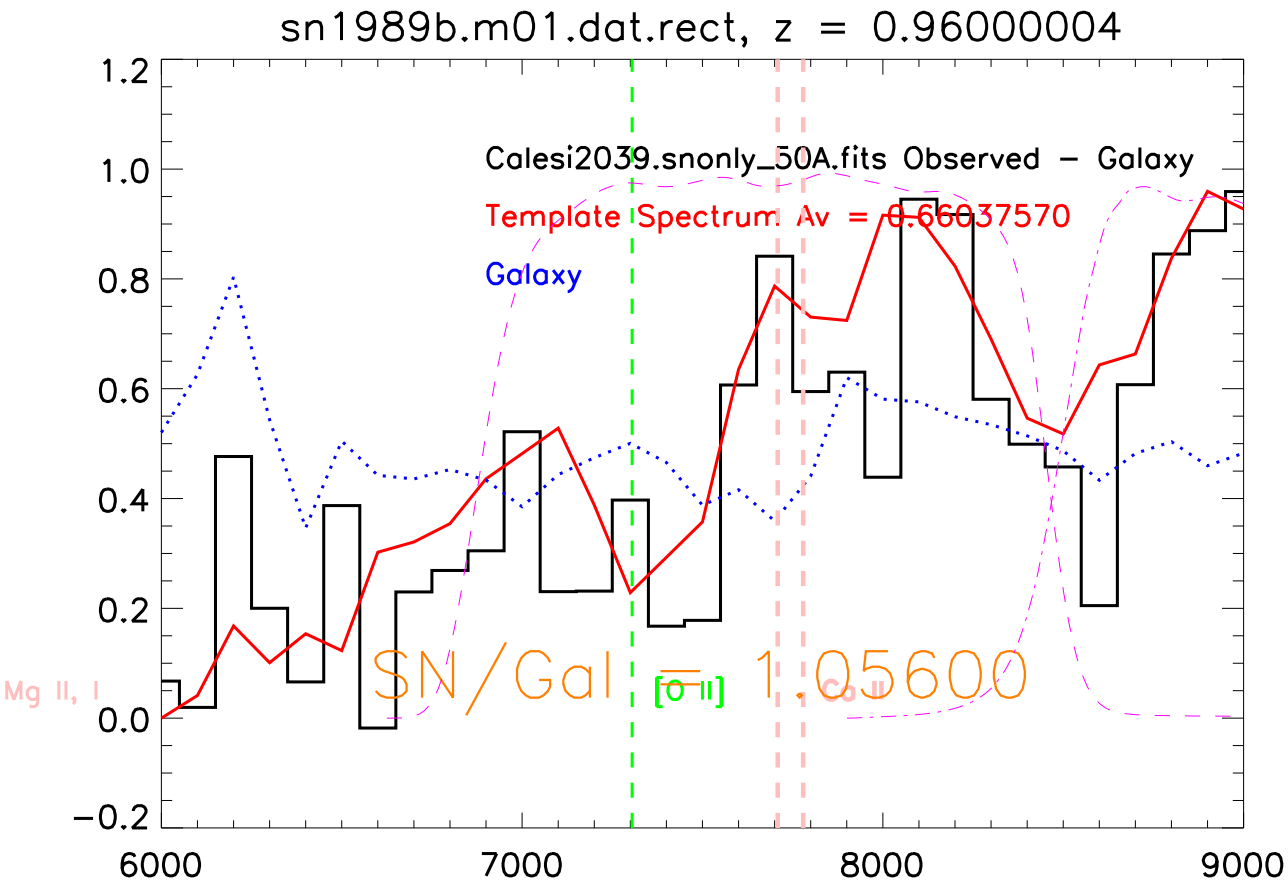

sn1994d.p14.dat.rect, z = 0.94999999
Calesi2039.snonly_50A.fits Observed
Galaxy
Template Spectrum Av = -1.9478209
Galaxy
SN/Gal = 0.713032
[O II]
Ca II
Mg II, I
1.0
0.8
0.6
0.4
0.2
0.0
-0.2
6000
7000
8000
9000

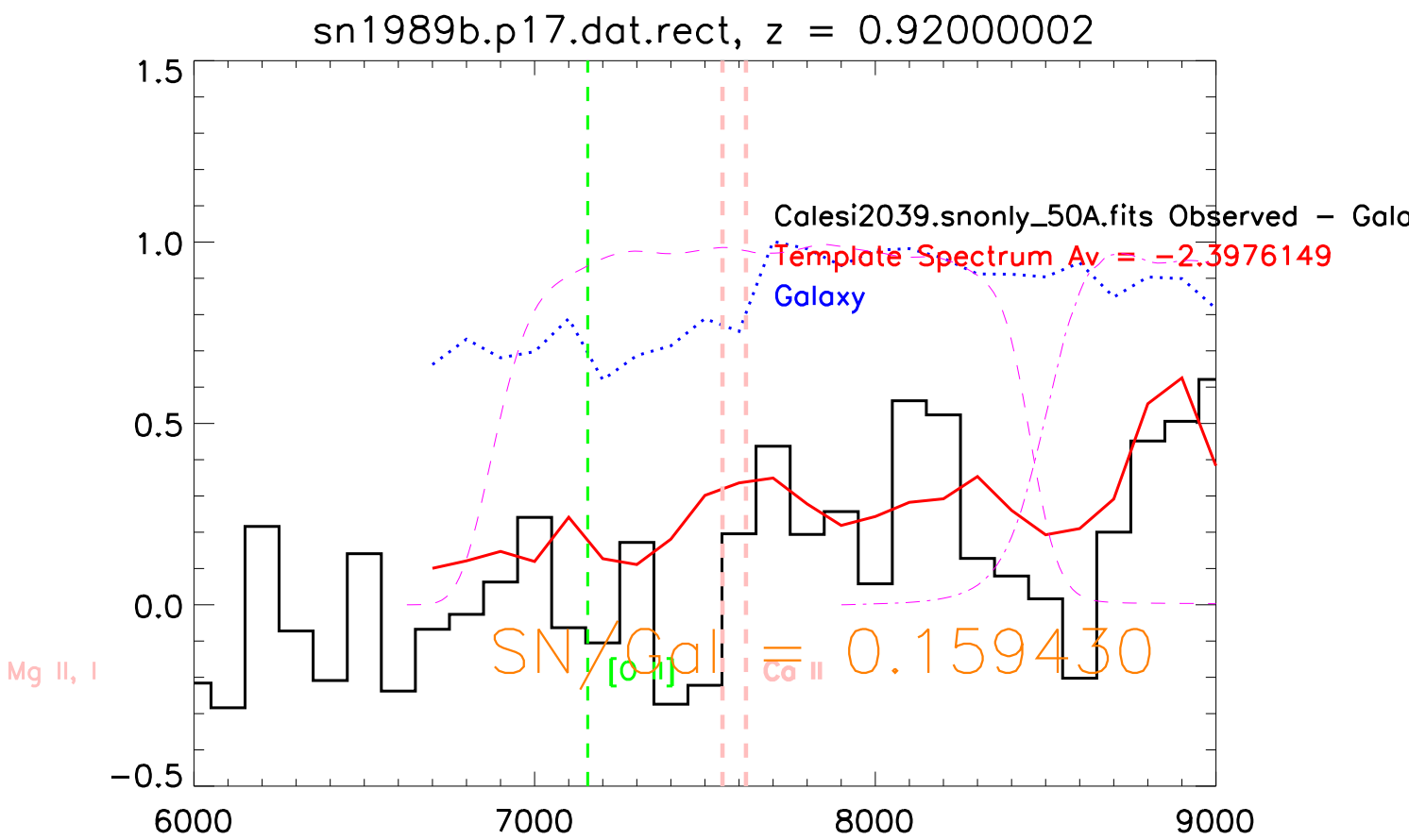

sn1991t.p67.dat.rect, z = 0.92000002
Calesi2039.snonly_50A.fits Observed – Galaxy
Template Spectrum Av = –0.42008988
Galaxy
SN/Gal = 0.290982
[O II]
Mg II, I
Ca II
1.2
1.0
0.8
0.6
0.4
0.2
0.0
–0.2
6000
7000
8000
9000

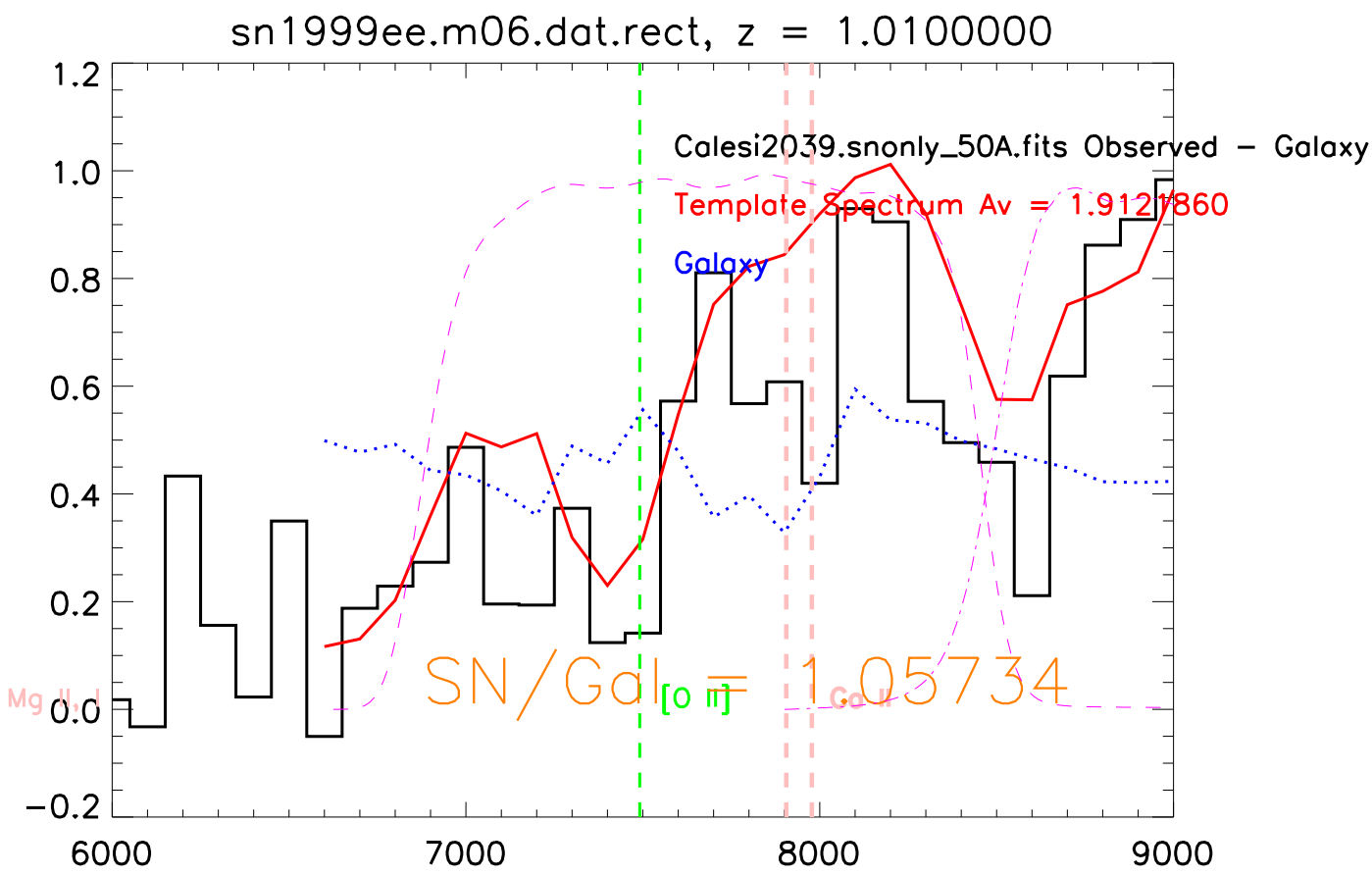

sn1994d.p25.dat.rect, z = 0.92000002
Calesi2039.snonly_50A.fits Observed − Galaxy
Template Spectrum Av. = −1.957549.1
Galaxy
SN/Gal = 0.416646
[O II]
Mg II, I
Ca II
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
6000
7000
8000
9000

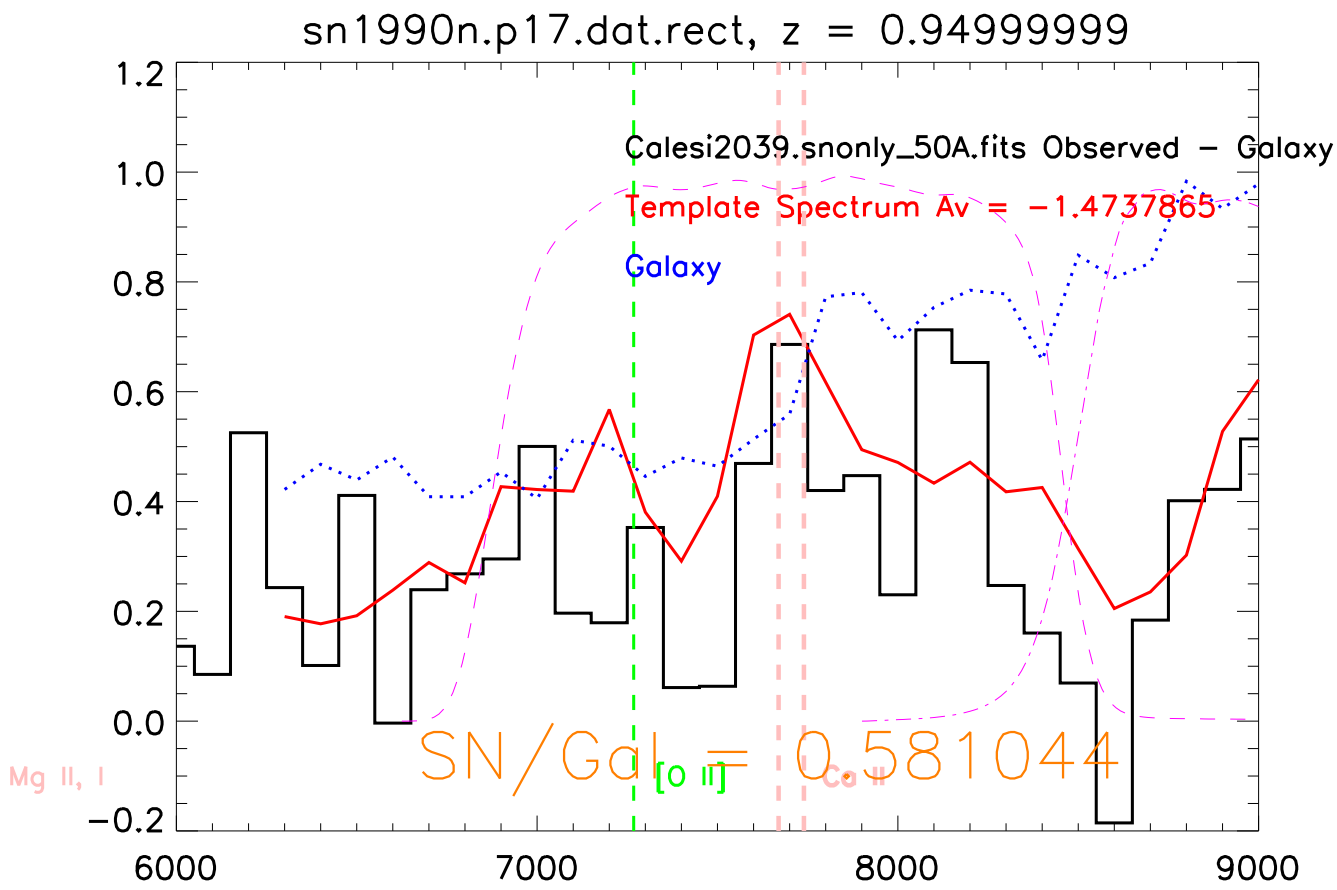

sn1989b.p18.dat.rect, z = 0.92000002
Calesi2039.snonly_50A.fits Observed – Gala
Template Spectrum Av = −2.3637230
Galaxy
SN/Gal = 0.161289
[O II]
Ca II
Mg II, I
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000

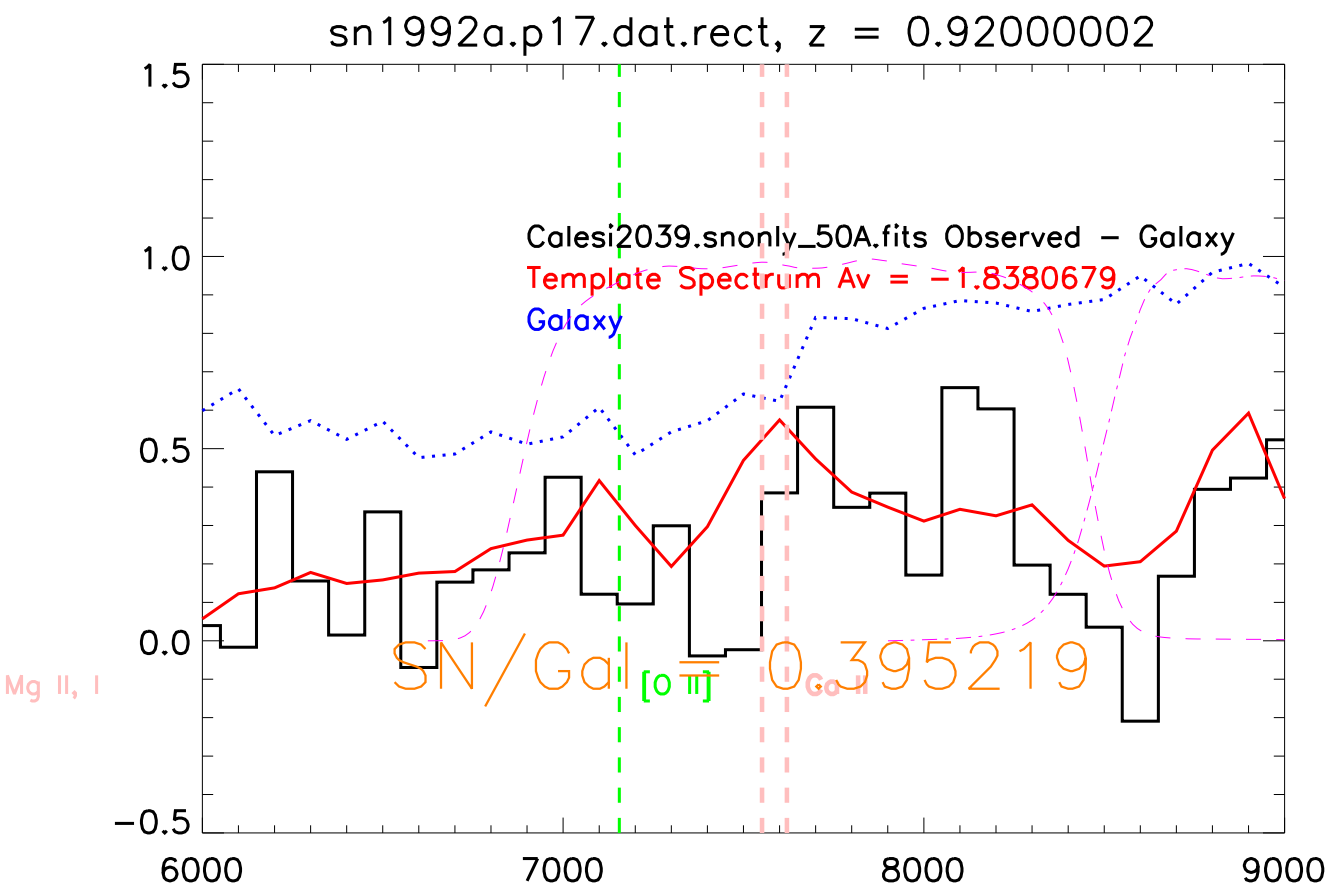

sn1991t.m08.dat.rect, z = 1.0200000
Calesi2039.snonly_50A.fits Observed − Galaxy
Template Spectrum Av = 5.2610178
Galaxy
SN/Gal = 2.87164
[O II]
2.0
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000

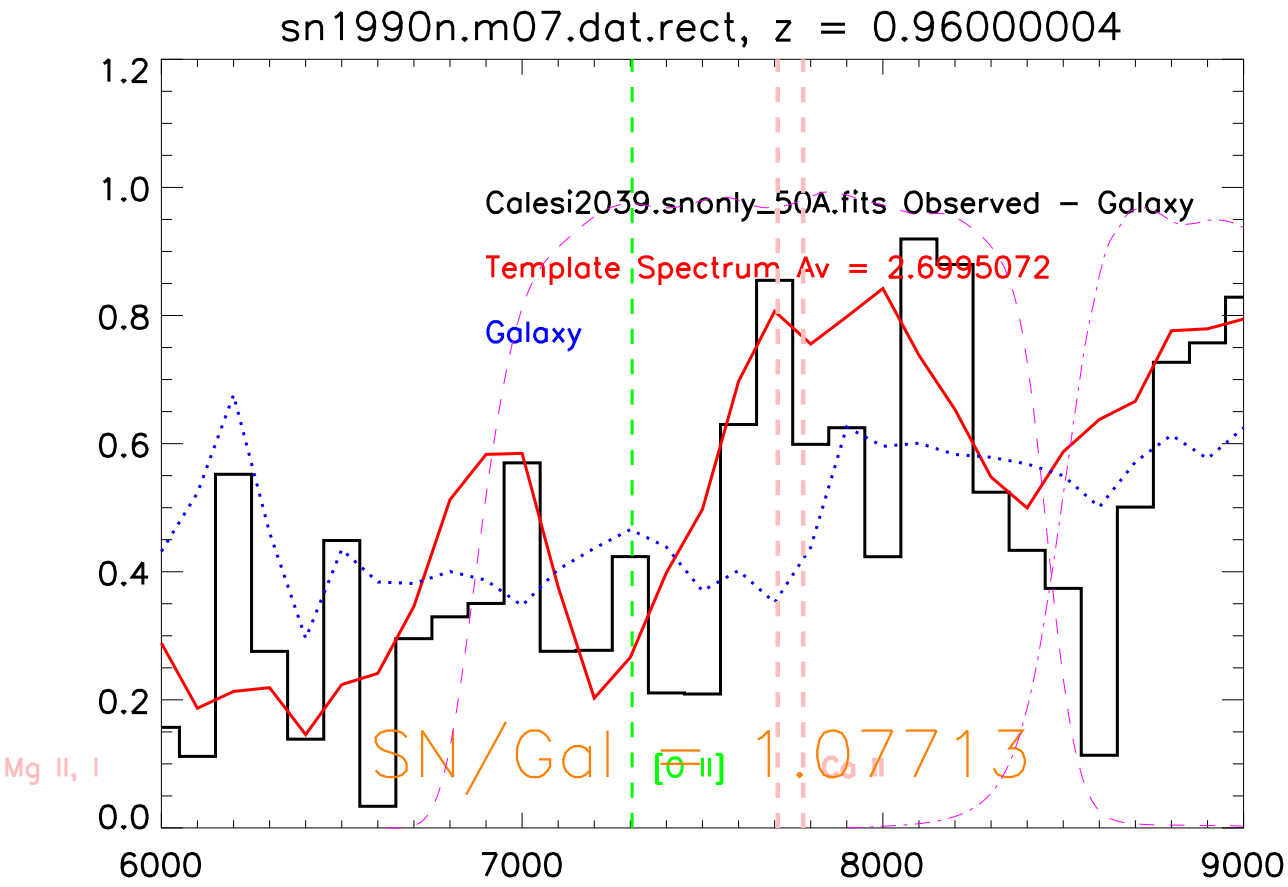

sn1989b.m01.dat.rect, z = 0.96000004
Calesi2039.snonly_50A.fits Observed − Galaxy
Template Spectrum Av = 0.66037570
Galaxy
SN/Gal = 1.05600
[O II]
Mg II, I
Ca II
1.2
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
6000
7000
8000
9000

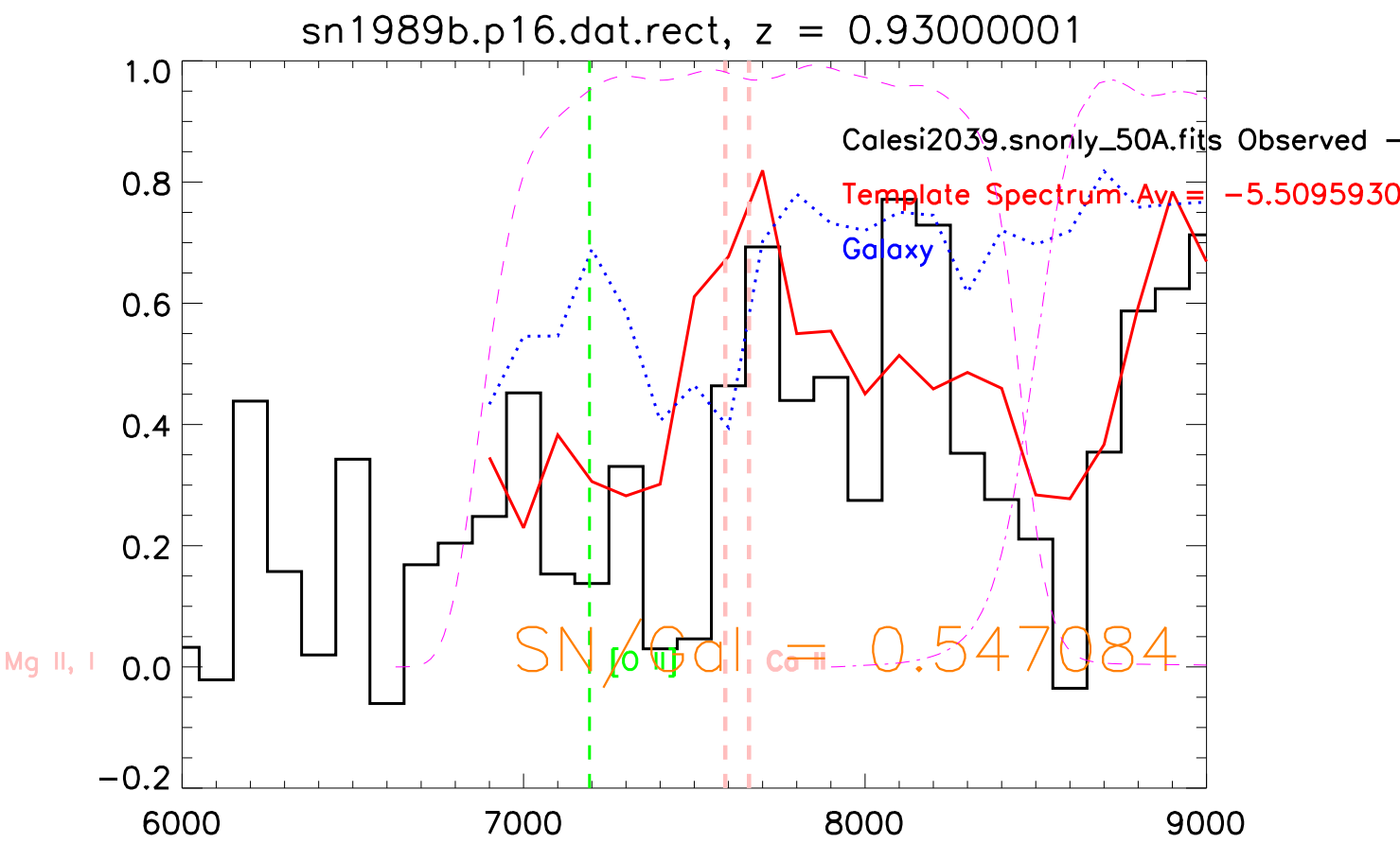

sn1989b.p17.dat.rect, z = 0.92000002
Calesi2039.snonly_50A.fits Observed – Gala
Template Spectrum Av = −2.3976149
Galaxy
SN/Gal = 0.159430
[O II]
Ca II
Mg II, I
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000

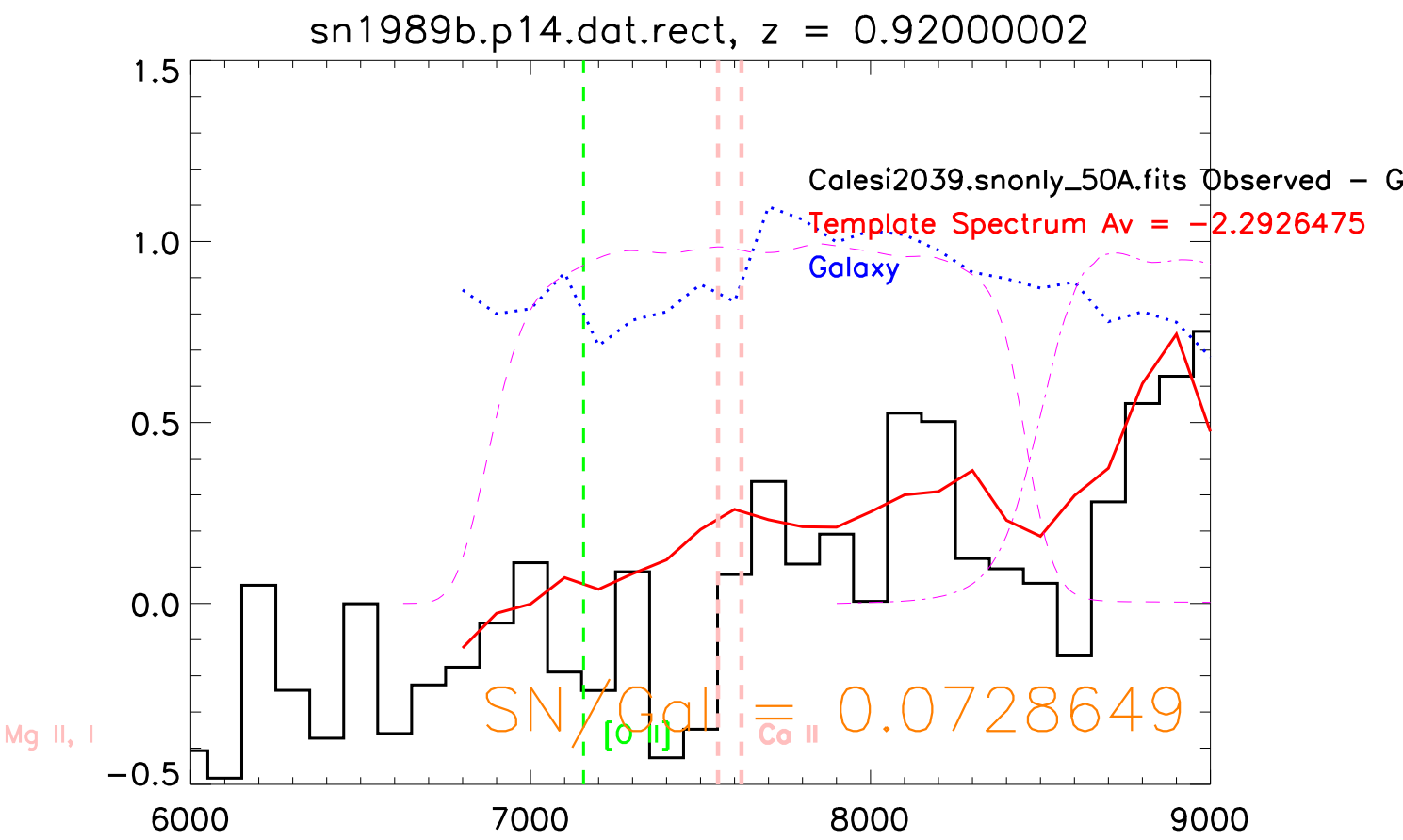

sn1999ee.m06.dat.rect, z = 1.0100000
Calesi2039.snonly_50A.fits Observed – Galaxy
Template Spectrum Av = 1.9121860
Galaxy
SN/Gal = 1.05734
[O II]
Mg II
Ca II
1.2
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
6000
7000
8000
9000

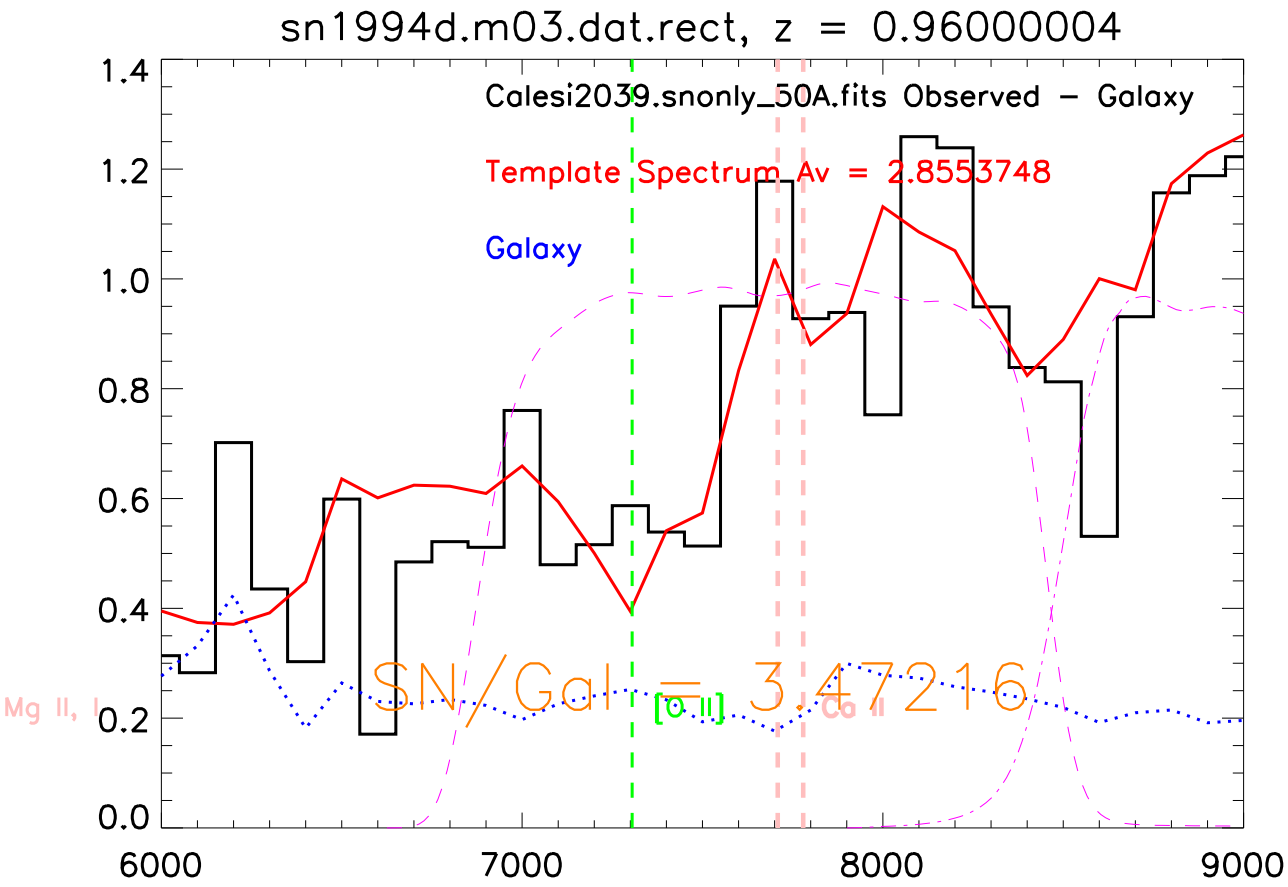

sn1990n.p17.dat.rect, z = 0.94999999
Calesi2039.snonly_50A.fits Observed − Galaxy
Template Spectrum Av = −1.4737865
Galaxy
SN/Gal = 0.581044
[O II]
Ca II
Mg II, I
1.2
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
6000
7000
8000
9000

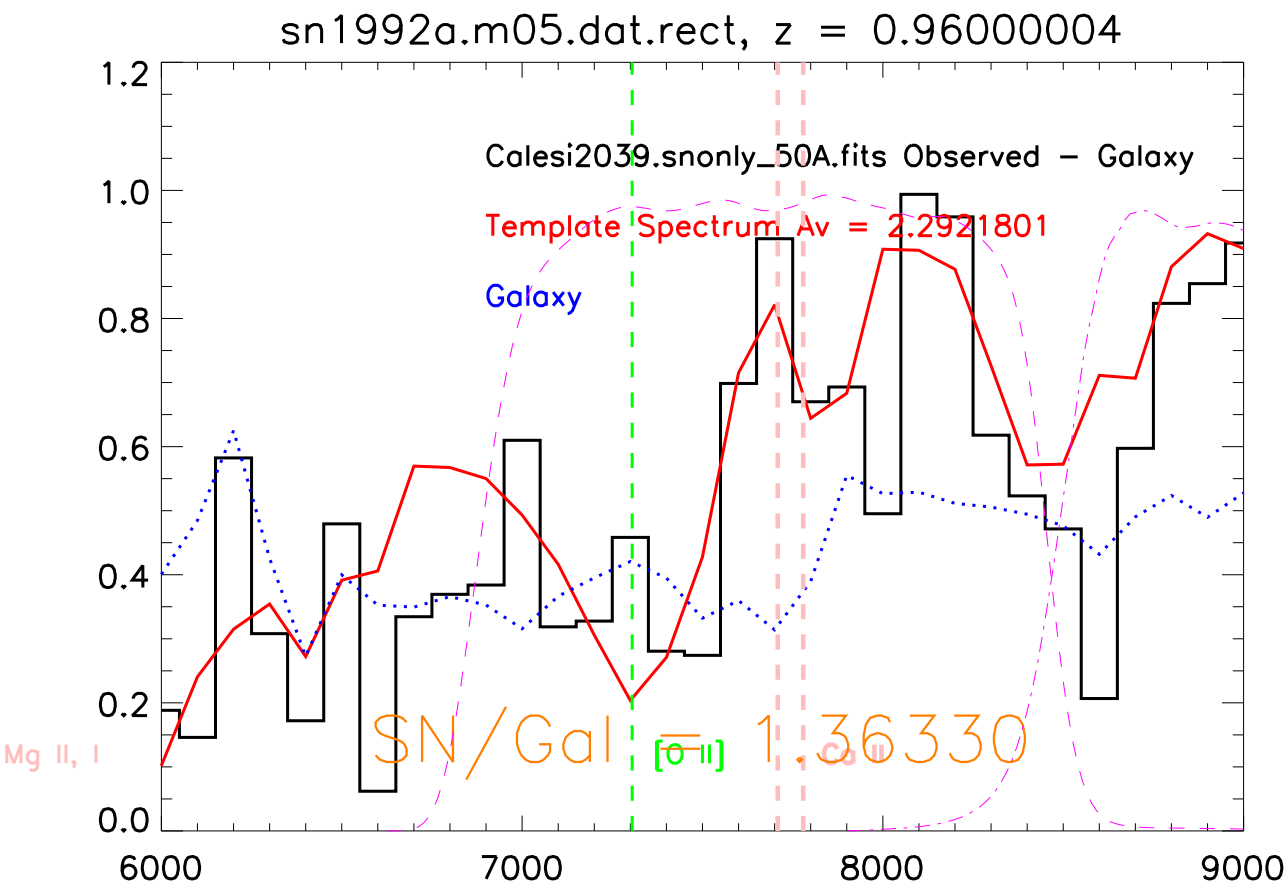

sn1992a.p17.dat.rect, z = 0.92000002
Calesi2039.snonly_50A.fits Observed − Galaxy
Template Spectrum Av = −1.8380679
Galaxy
SN/Gal = 0.395219
[O II]
Ca II
Mg II, I
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000

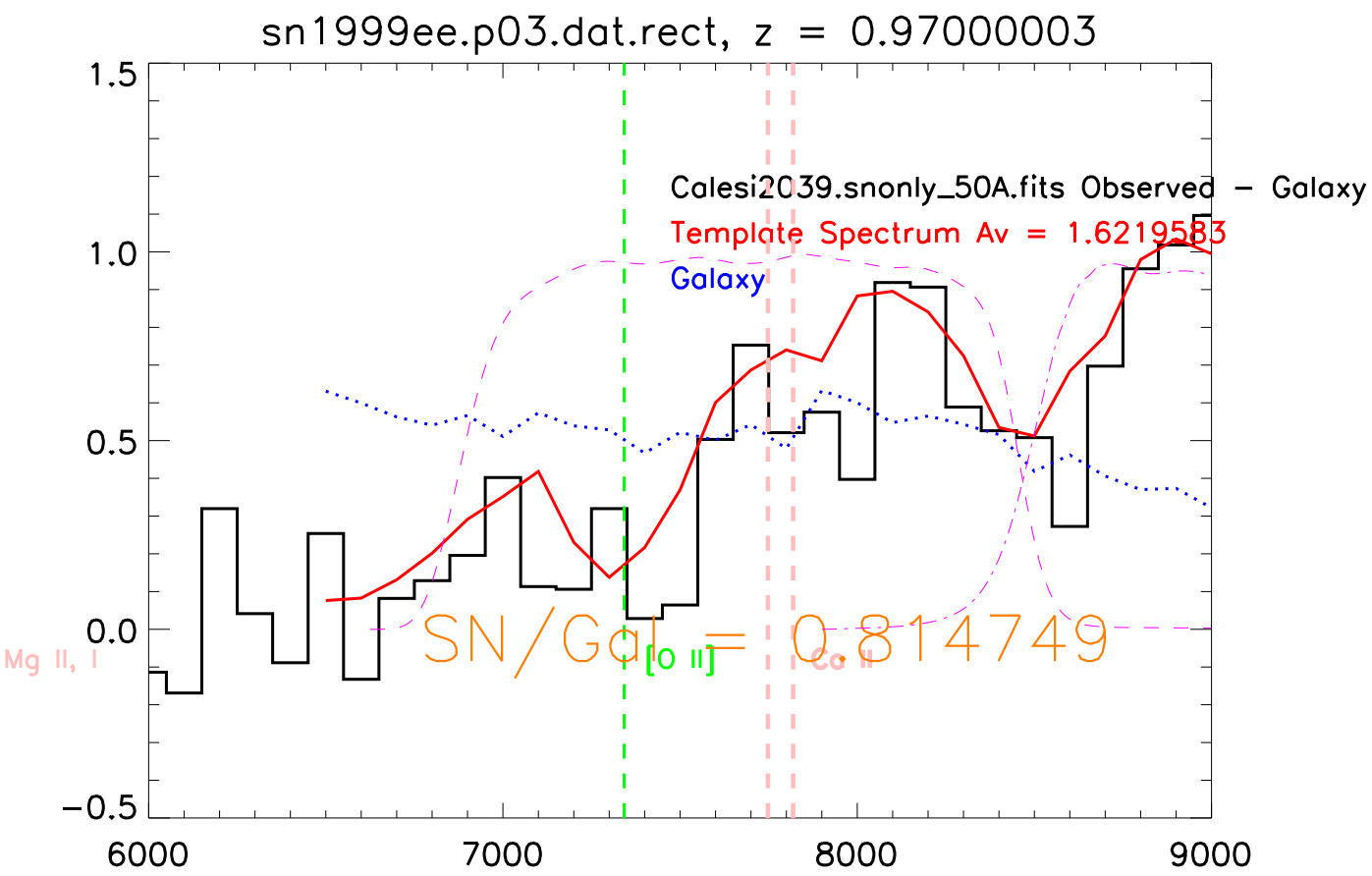

sn1990n.m07.dat.rect, z = 0.96000004
Calesi2039.snonly_50A.fits Observed − Galaxy
Template Spectrum Av = 2.6995072
Galaxy
SN/Gal = 1.07713
[O II]
Mg II, I
Ca II
1.2
1.0
0.8
0.6
0.4
0.2
0.0
6000
7000
8000
9000

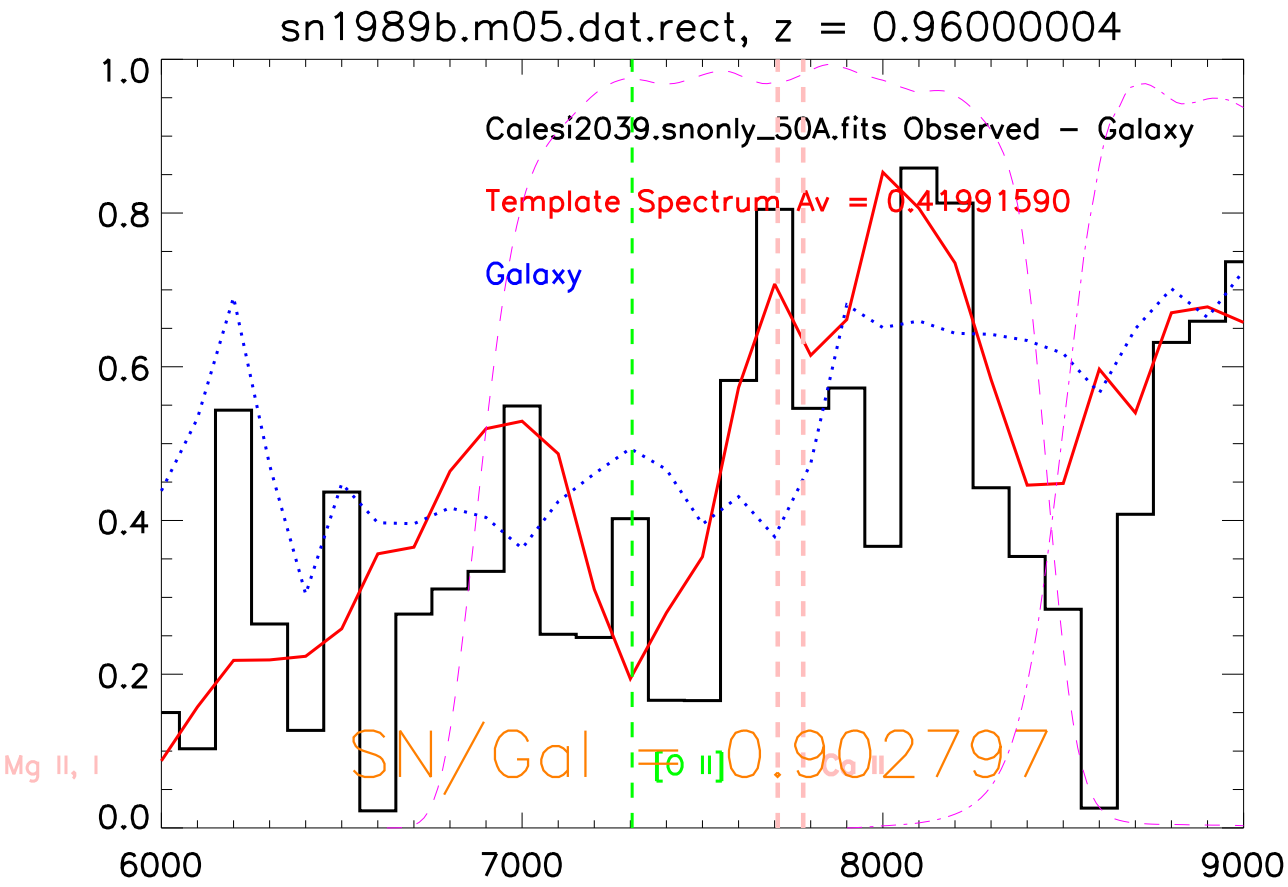

sn1989b.p16.dat.rect, z = 0.93000001
Calesi2039.snonly_50A.fits Observed -
Template Spectrum Av = -5.5095930
Galaxy
SN/Gal = 0.547084
Mg II, I
[O II]
Ca II
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
6000
7000
8000
9000

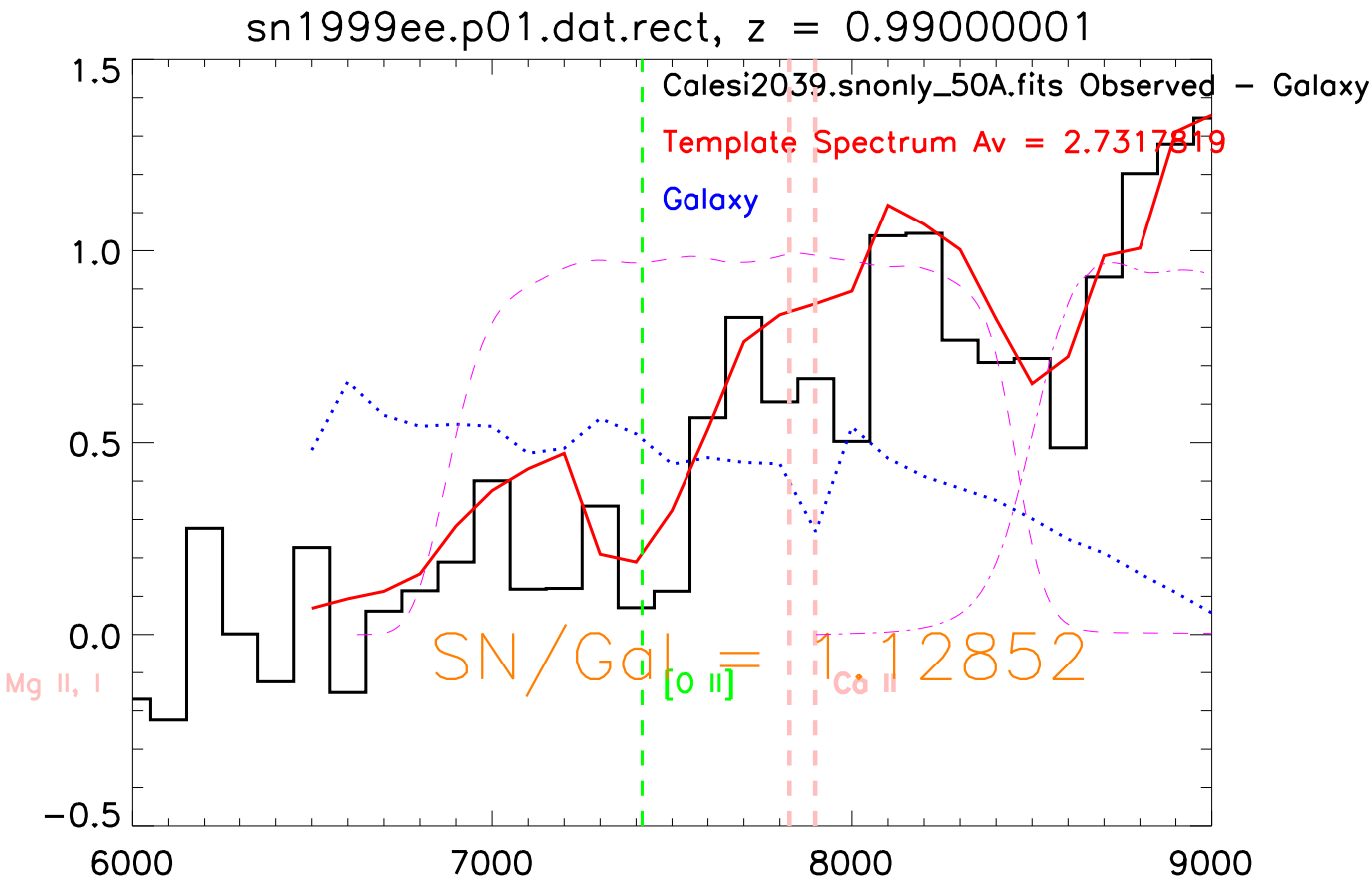

sn1989b.p14.dat.rect, z = 0.92000002
Calesi2039.snonly_50A.fits Observed – G
Template Spectrum Av = −2.2926475
Galaxy
SN/Gal = 0.0728649
Mg II, I
[O II]
Ca II
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000

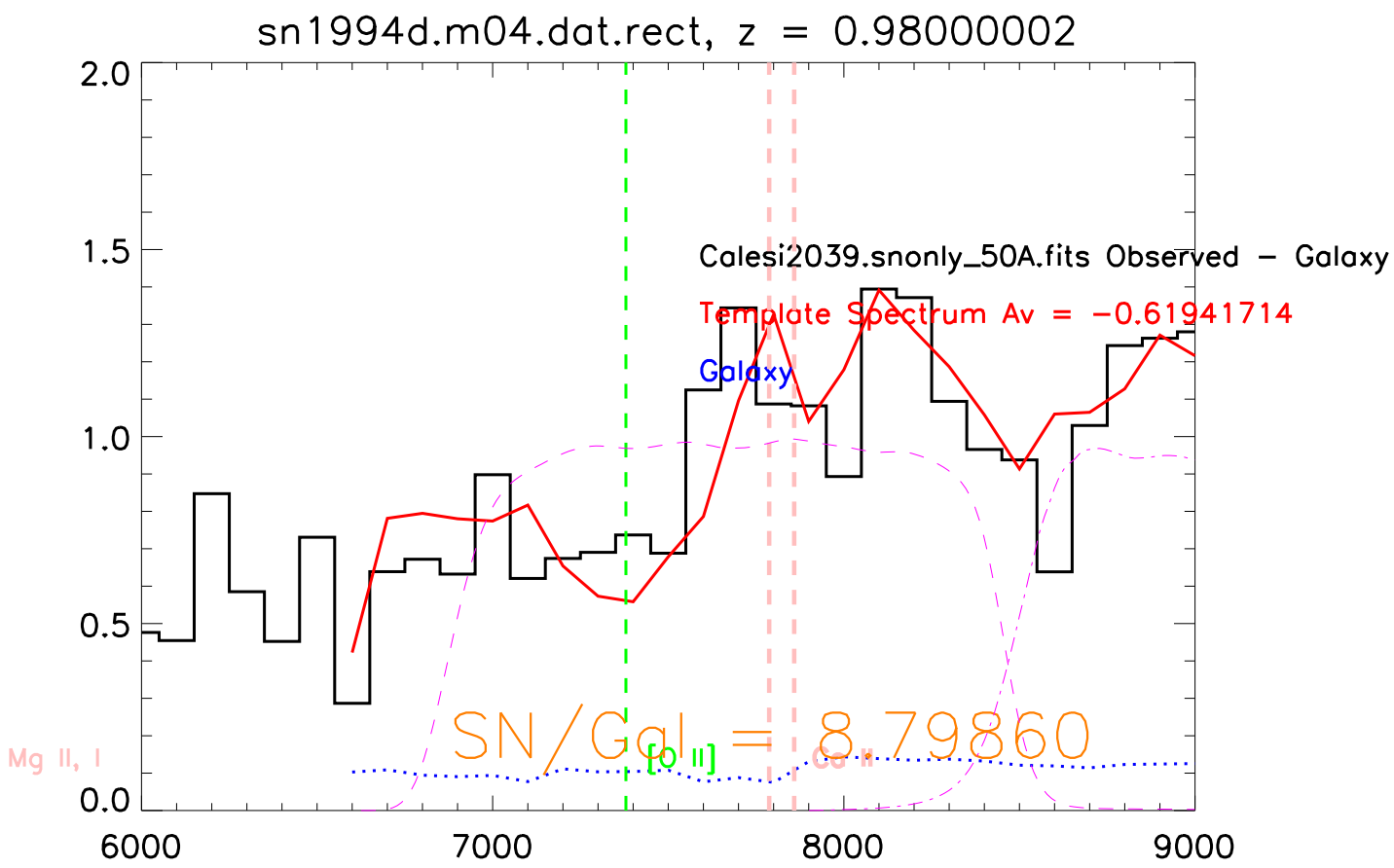

sn1994d.m03.dat.rect, z = 0.96000004
Calesi2039.snonly_50A.fits Observed − Galaxy
Template Spectrum Av = 2.8553748
Galaxy
SN/Gal = 3.47216
[O II]
Ca II
Mg II, I
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
6000
7000
8000
9000

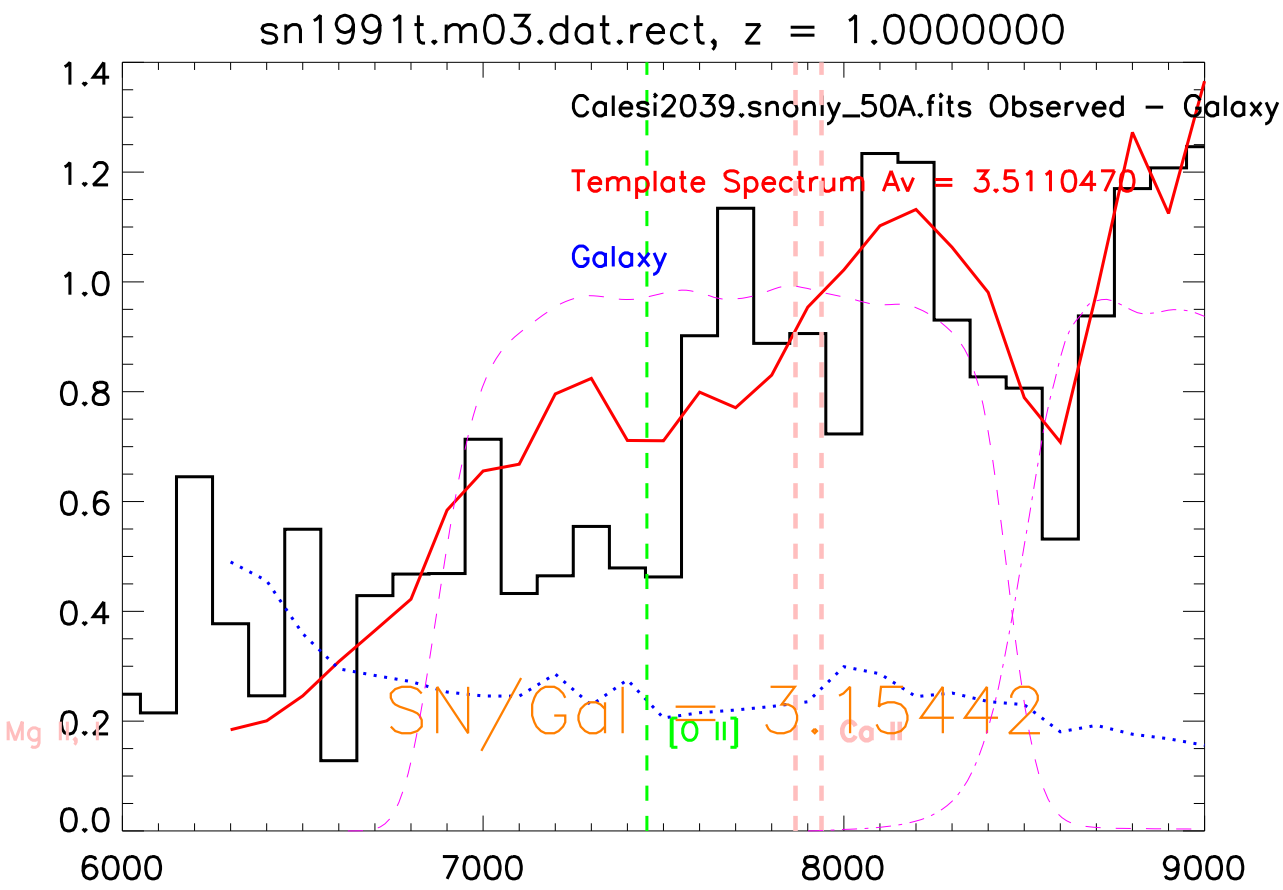

sn1992a.m05.dat.rect, z = 0.96000004
Calesi2039.snonly_50A.fits Observed − Galaxy
Template Spectrum Av = 2.2921801
Galaxy
SN/Gal = 1.36330
[O II]
Mg II, I
Ca II
1.2
1.0
0.8
0.6
0.4
0.2
0.0
6000
7000
8000
9000

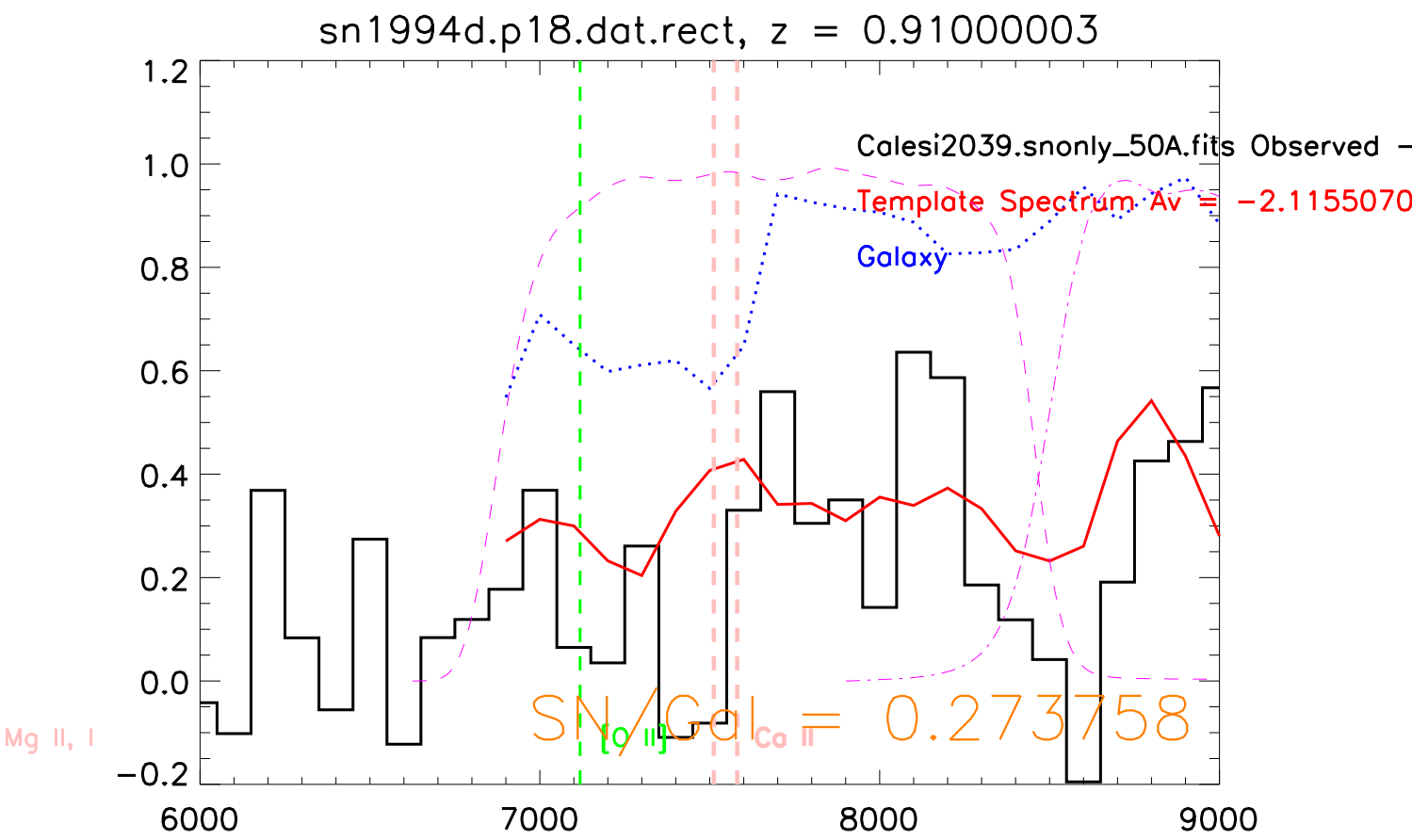

sn1999ee.p03.dat.rect, z = 0.97000003
Calesi2039.snonly_50A.fits Observed − Galaxy
Template Spectrum Av = 1.6219583
Galaxy
SN/Gal = 0.814749
[O II]
Mg II, I
Ca II
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000

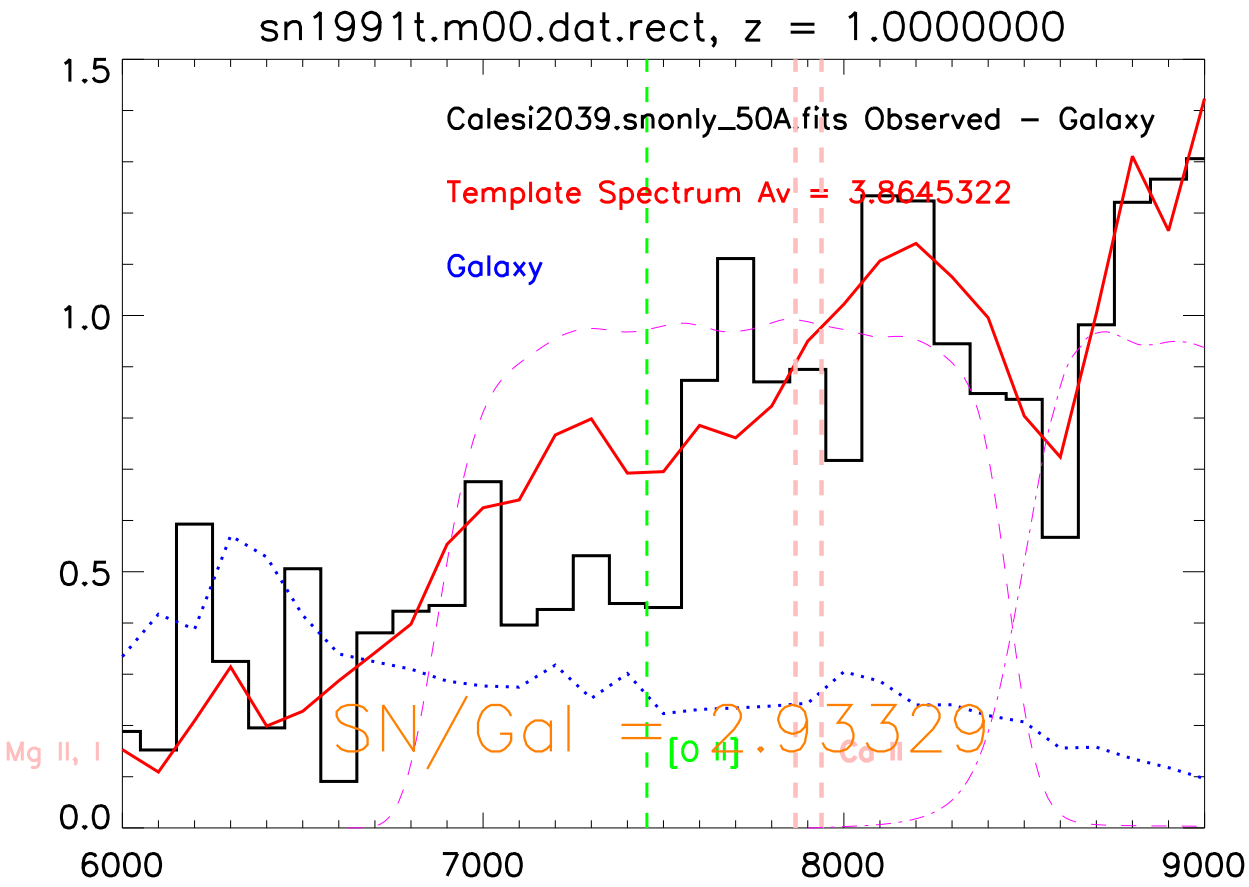

sn1989b.m05.dat.rect, z = 0.96000004
Calesi2039.snonly_50A.fits Observed – Galaxy
Template Spectrum Av = 0.41991590
Galaxy
SN/Gal = 0.902797
Mg II, I
[O II]
Ca II
1.0
0.8
0.6
0.4
0.2
0.0
6000
7000
8000
9000

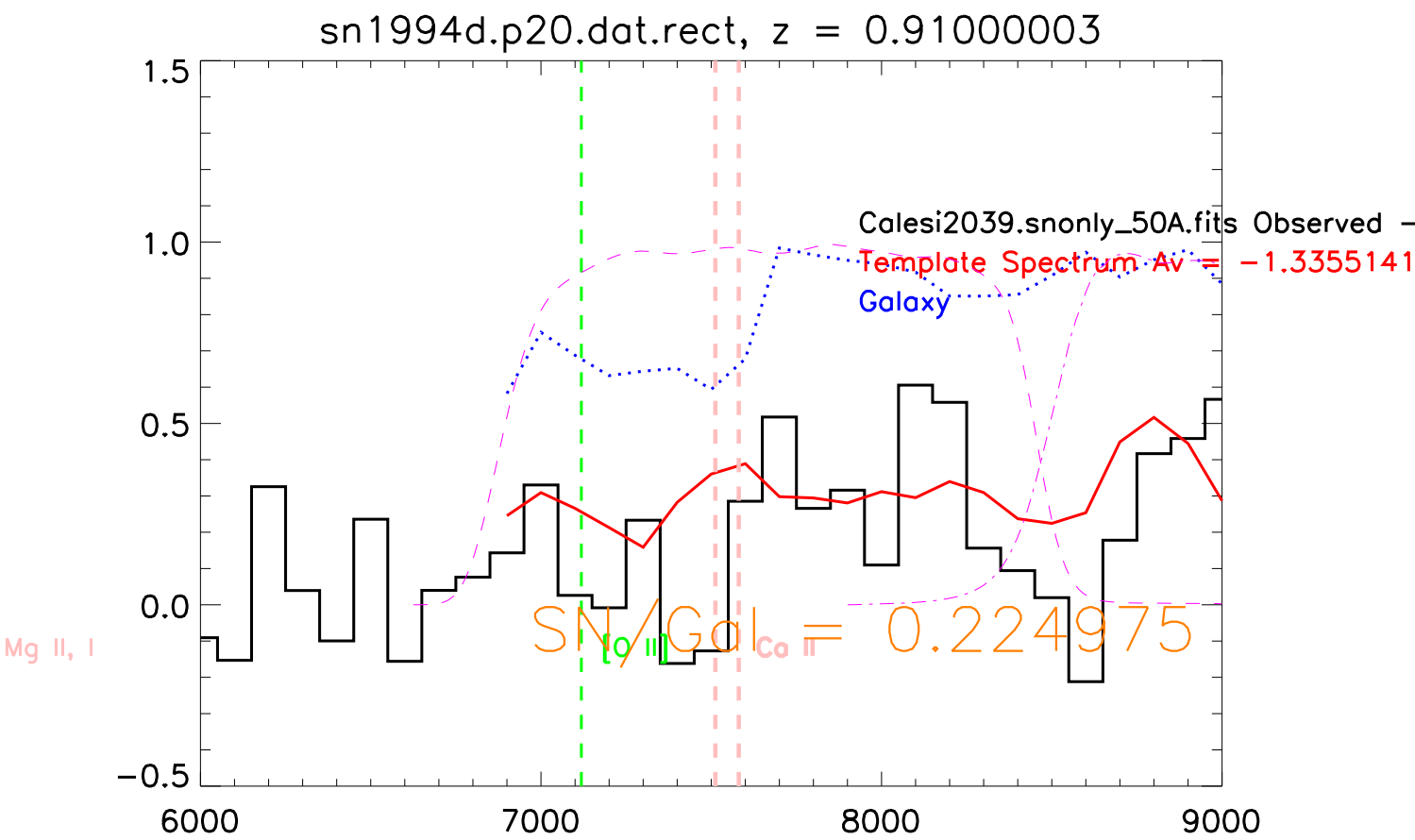

sn1999ee.p01.dat.rect, z = 0.99000001
Calesi2039.snonly_50A.fits Observed − Galaxy
Template Spectrum Av = 2.7317819
Galaxy
SN/Gal = 1.12852
Mg II, I
[O II]
Ca II
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000

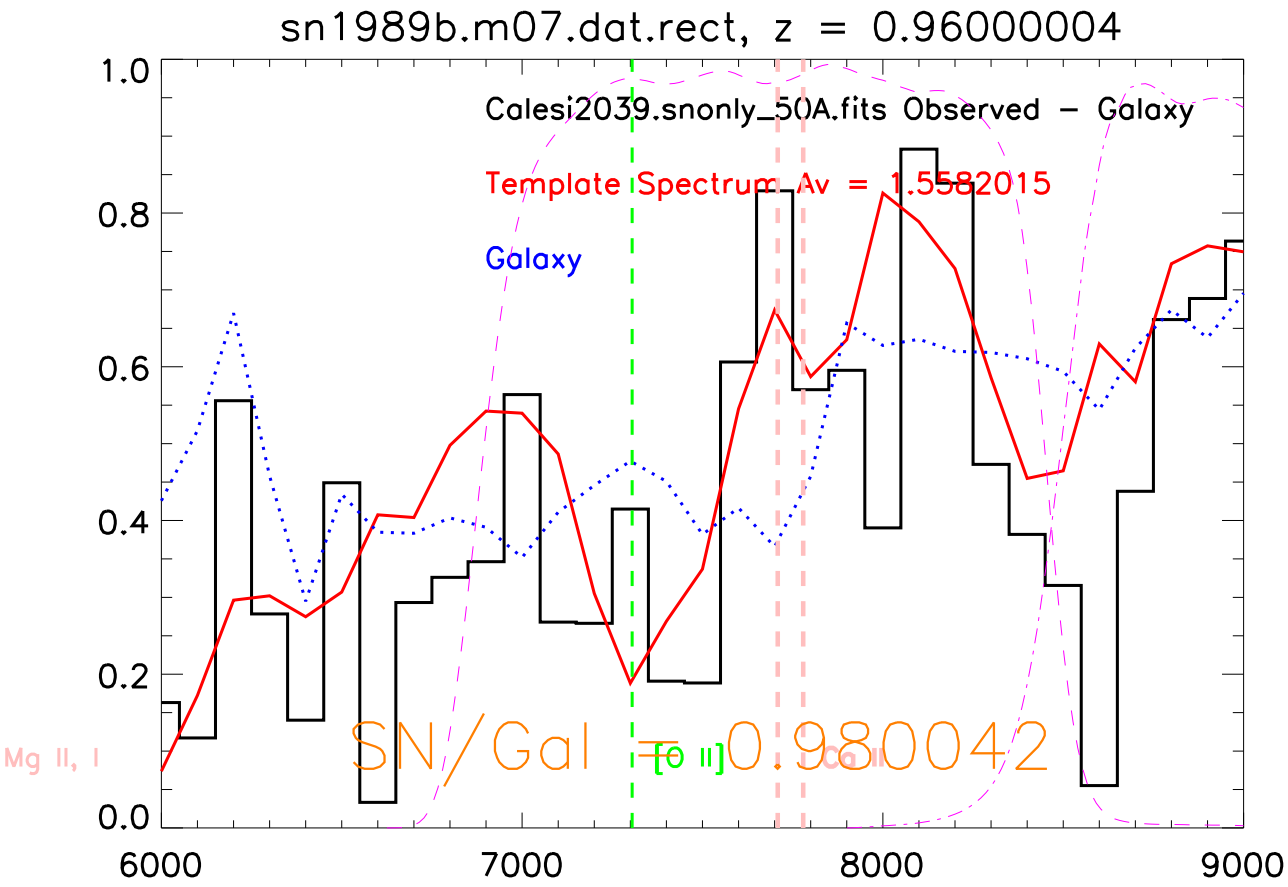

sn1994d.m04.dat.rect, z = 0.98000002
2.0
1.5
1.0
0.5
0.0
6000
7000
8000
9000
Calesi2039.snonly_50A.fits Observed − Galaxy
Template Spectrum Av = −0.61941714
Galaxy
SN/Gal = 8.79860
Mg II, I
[O II]
Ca H

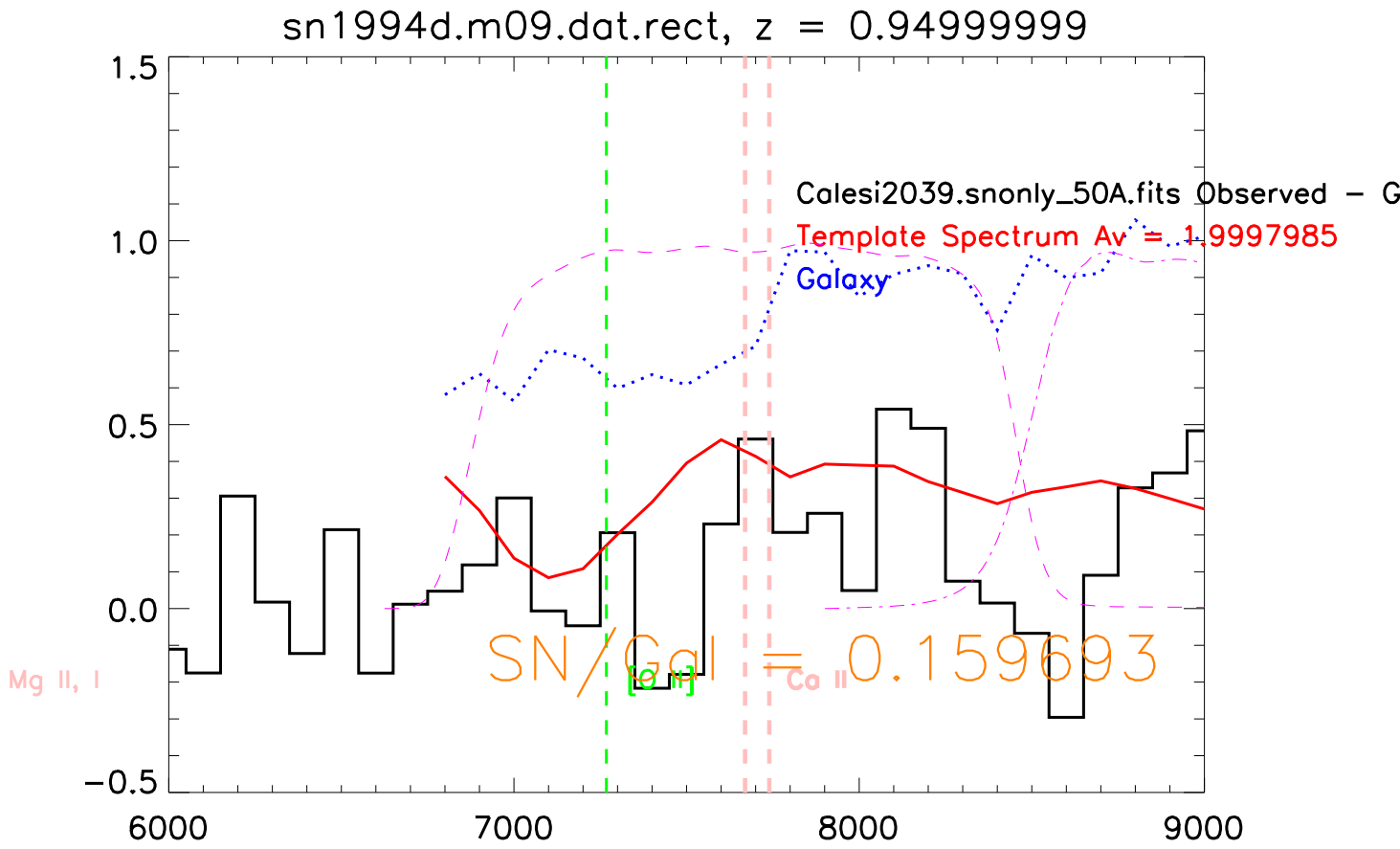

sn1991t.m03.dat.rect, z = 1.0000000
Calesi2039.snonly_50A.fits Observed – Galaxy
Template Spectrum Av = 3.5110470
Galaxy
SN/Gal = 3.15442
[O II]
Ca II
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
6000
7000
8000
9000

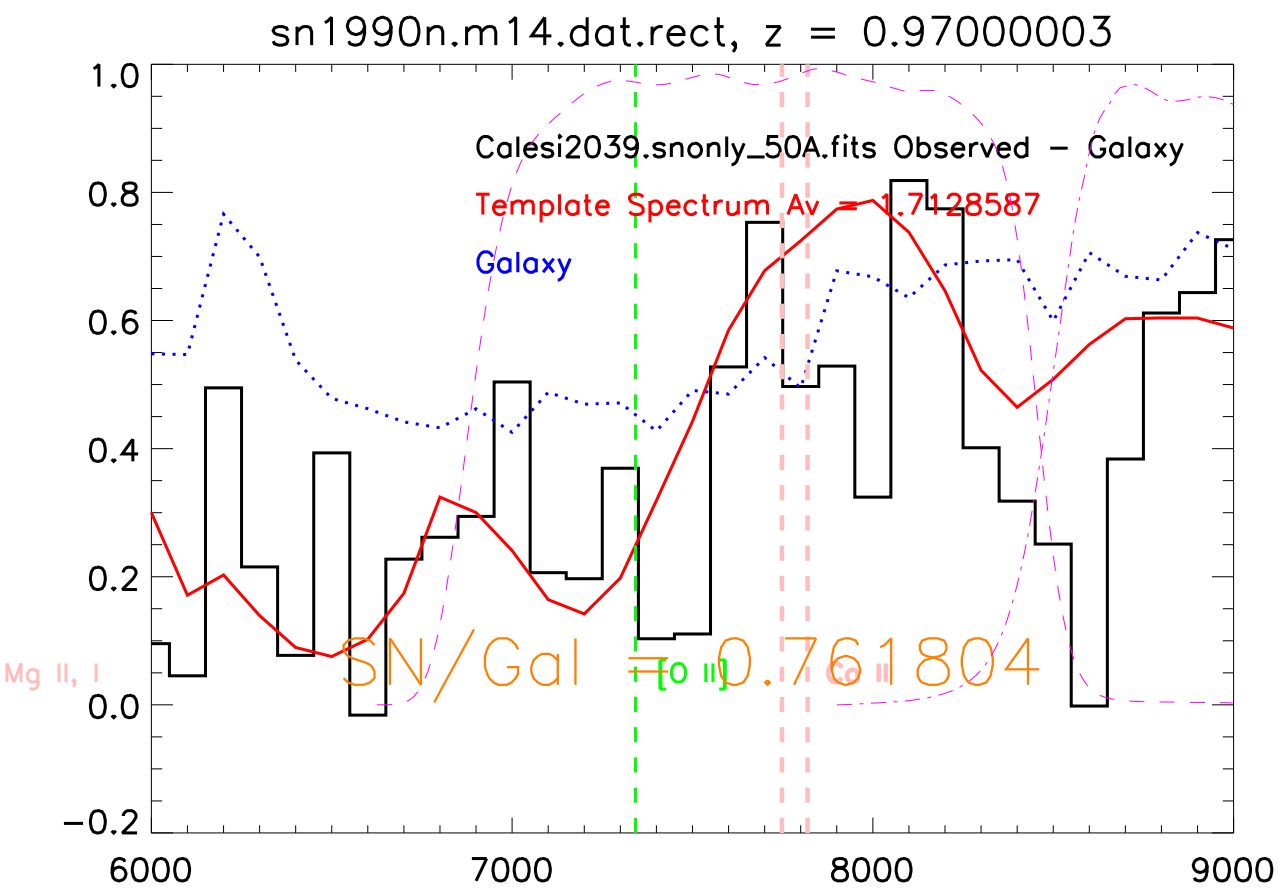

sn1994d.p18.dat.rect, z = 0.91000003
Calesi2039.snonly_50A.fits Observed -
Template Spectrum Av = -2.1155070
Galaxy
SN/Gal = 0.273758
Mg II, I
[O II]
Ca II
1.2
1.0
0.8
0.6
0.4
0.2
0.0
-0.2
6000
7000
8000
9000

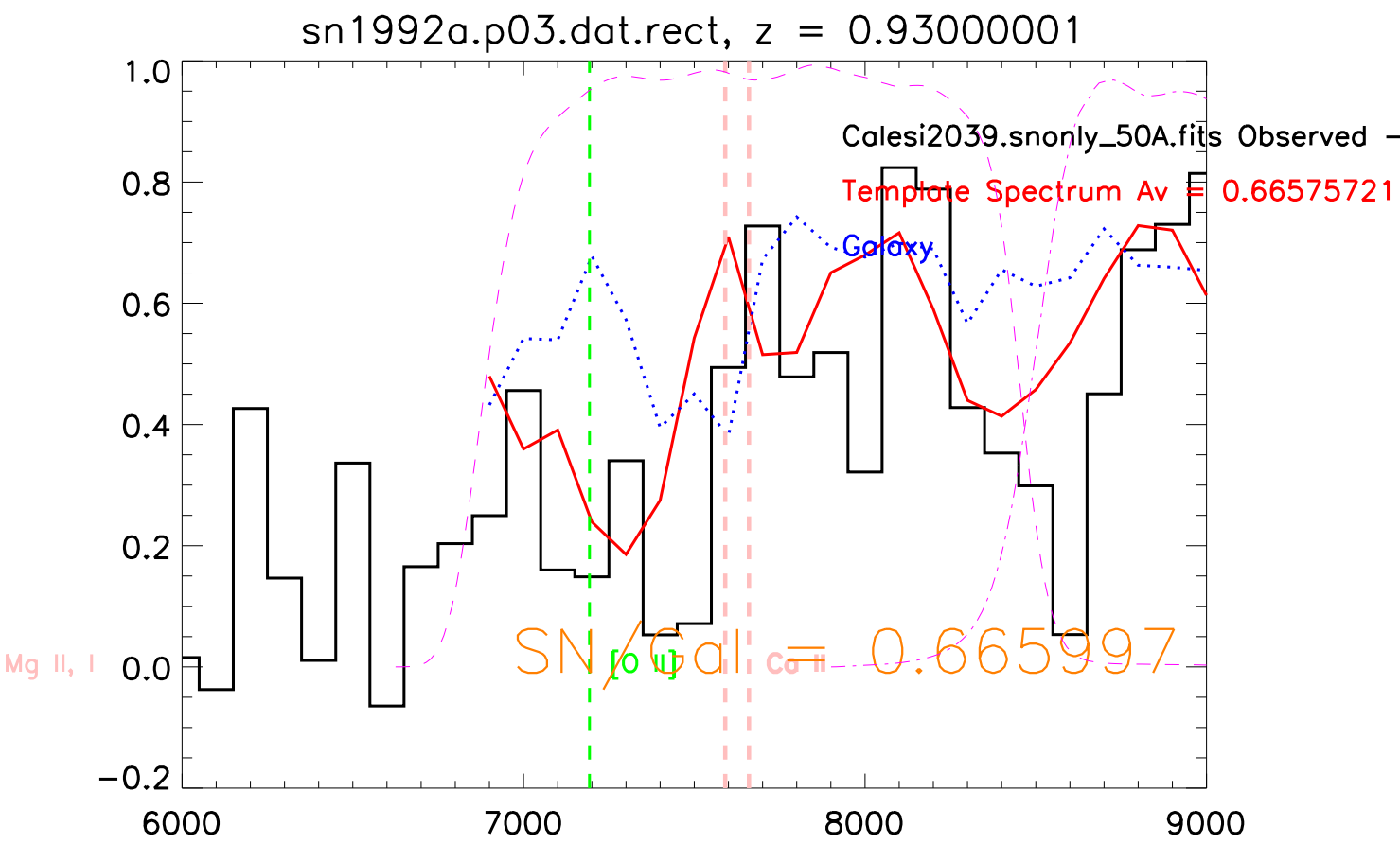

sn1991t.m00.dat.rect, z = 1.0000000
Calesi2039.snonly_50A.fits Observed − Galaxy
Template Spectrum Av = 3.8645322
Galaxy
SN/Gal = 2.93329
[O II]
Ca II
Mg II, I
1.5
1.0
0.5
0.0
6000
7000
8000
9000

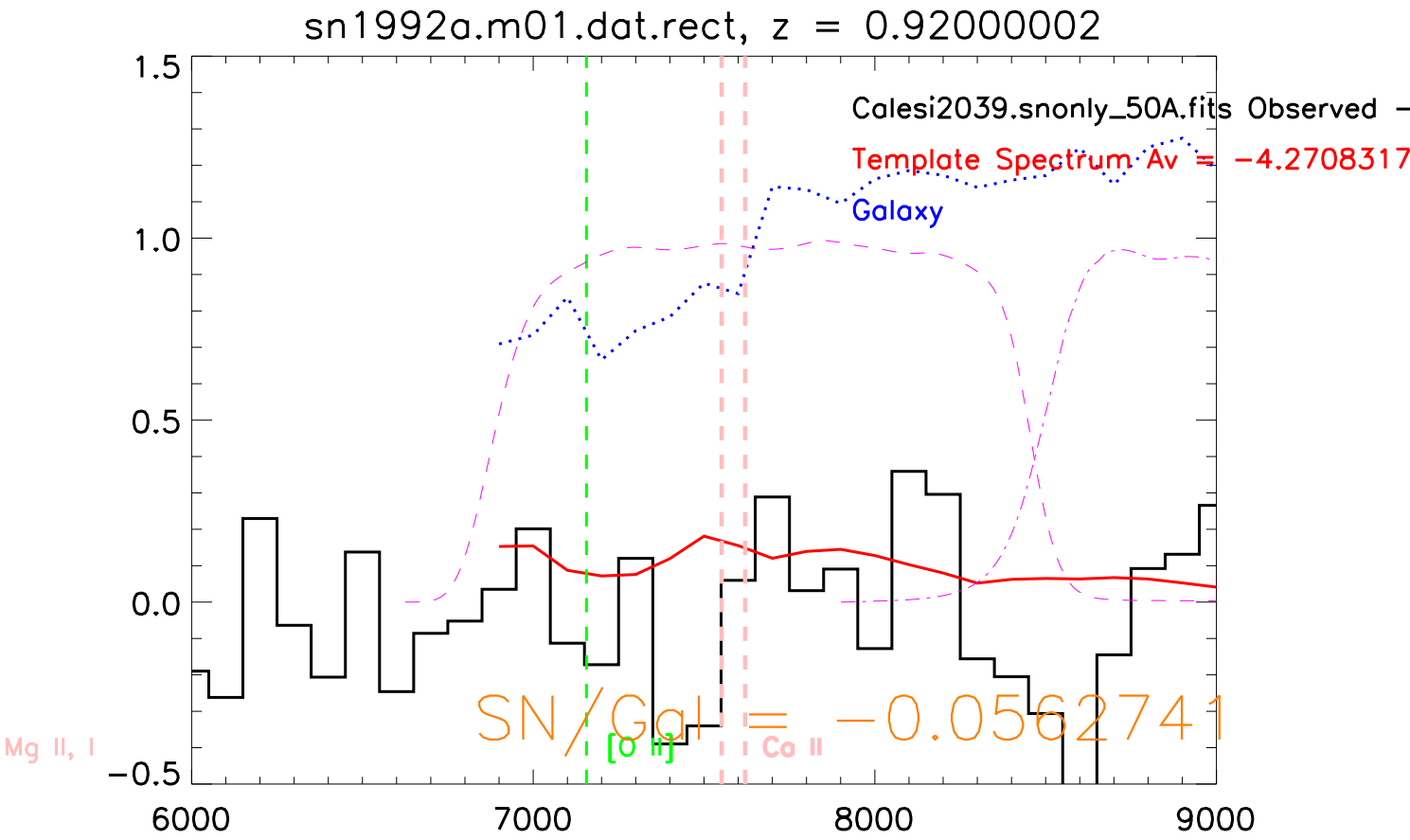

sn1994d.p20.dat.rect, z = 0.91000003
Calesi2039.snonly_50A.fits Observed -
Template Spectrum Av = -1.3355141
Galaxy
SN/Gal = 0.224975
Mg II, I
[O II]
Ca II
1.5
1.0
0.5
0.0
-0.5
6000
7000
8000
9000

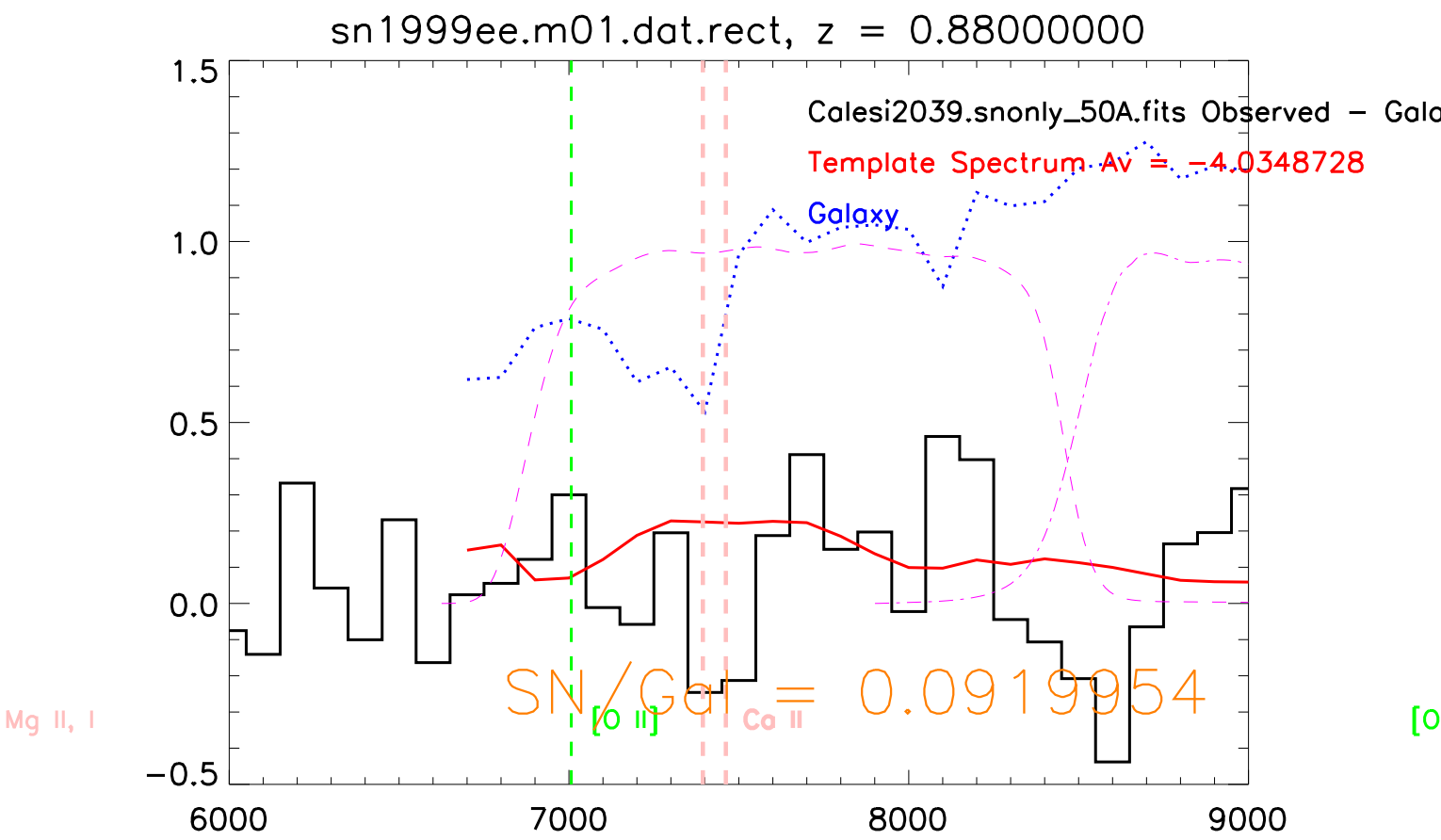

sn1989b.m07.dat.rect, z = 0.96000004
Calesi2039.snonly_50A.fits Observed – Galaxy
Template Spectrum, Av = 1.5582015
Galaxy
SN/Gal = 0.980042
[O II]
Mg II, I
Ca II
1.0
0.8
0.6
0.4
0.2
0.0
6000
7000
8000
9000

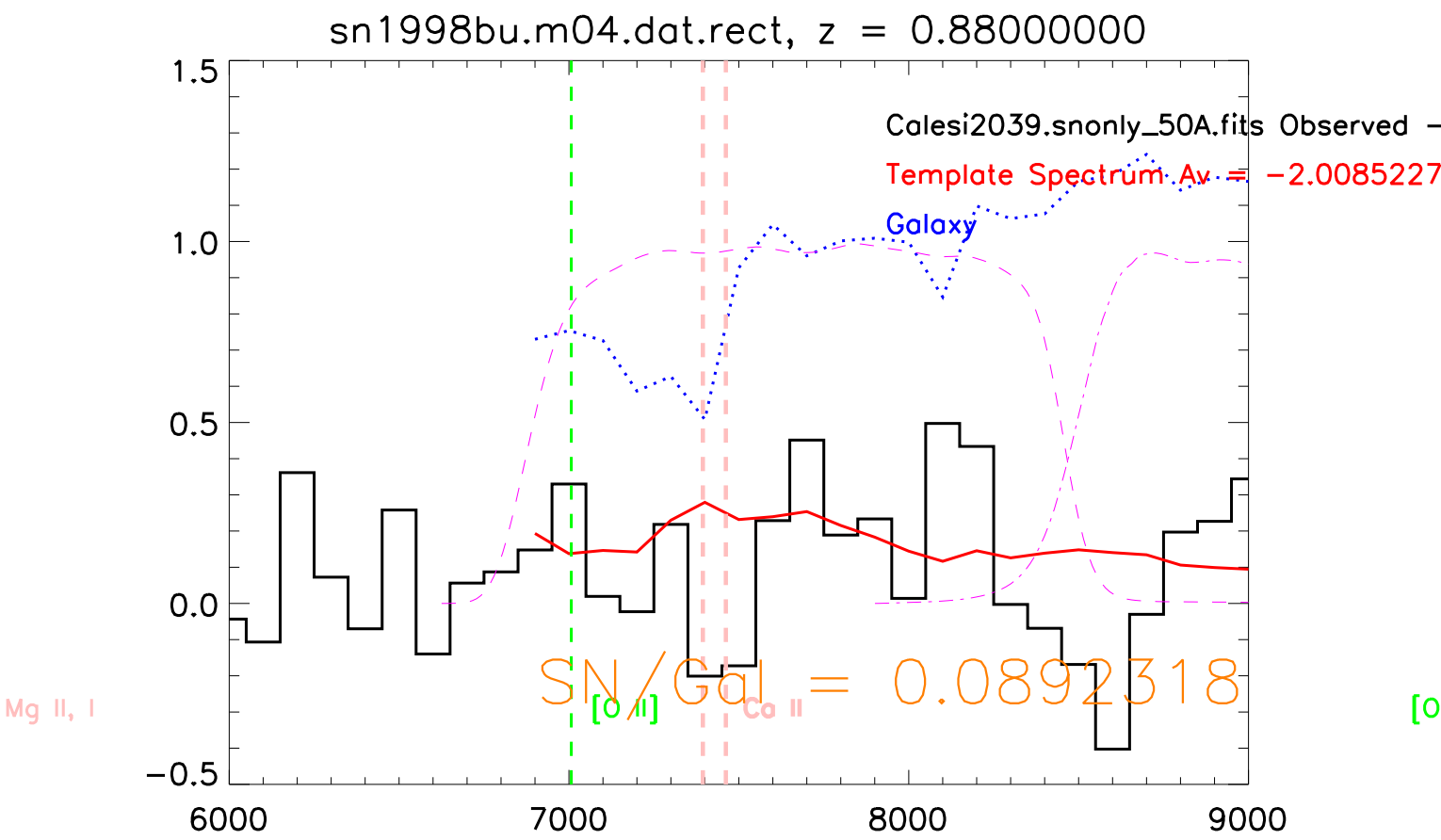

sn1994d.m09.dat.rect, z = 0.94999999
Calesi2039.snonly_50A.fits Observed – G
Template Spectrum Av = 1.9997985
Galaxy
SN/Gal = 0.159693
Mg II, I
[O II]
Ca II
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000

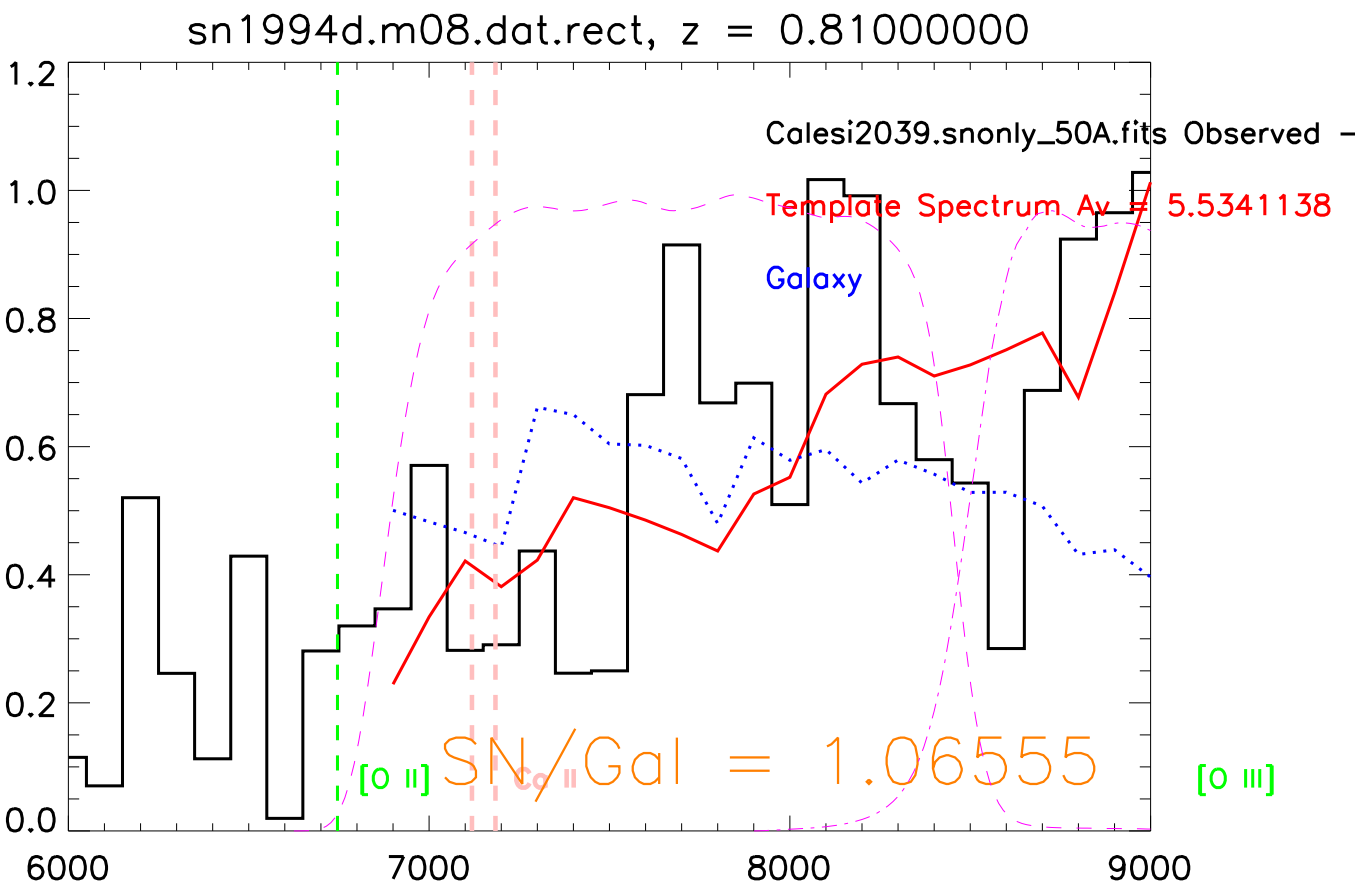

sn1990n.m14.dat.rect, z = 0.97000003
Calesi2039.snonly_50A.fits Observed − Galaxy
Template Spectrum Av = 1.7128587
Galaxy
SN/Gal = 0.761804
Mg II, I
[O II]
Ca II
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
6000
7000
8000
9000

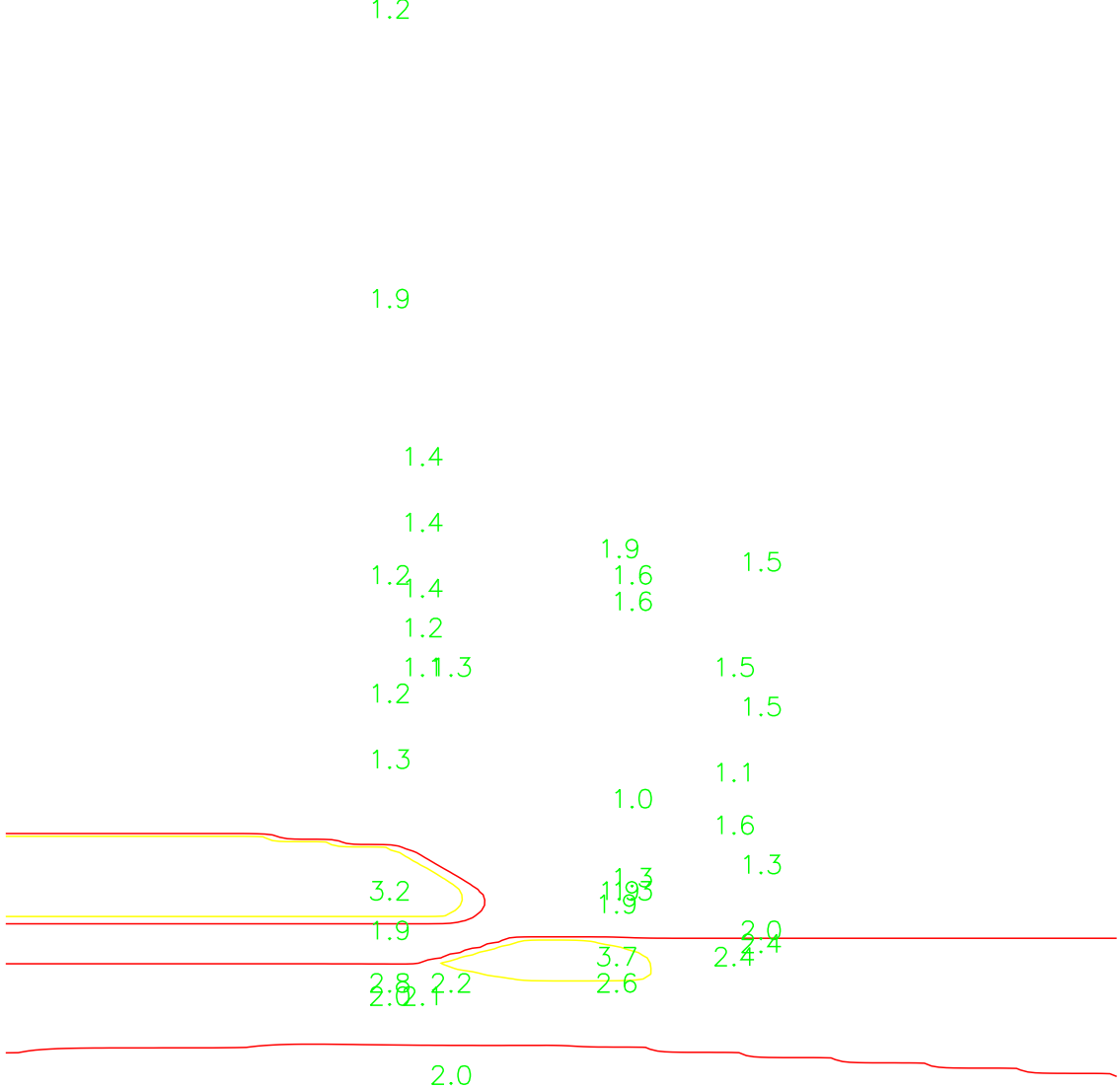

sn1992a.p03.dat.rect, z = 0.93000001
Calesi2039.snonly_50A.fits Observed -
Template Spectrum Av = 0.66575721
Galaxy
SN/Gal = 0.665997
Mg II, I
[O II]
Ca II
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
6000
7000
8000
9000

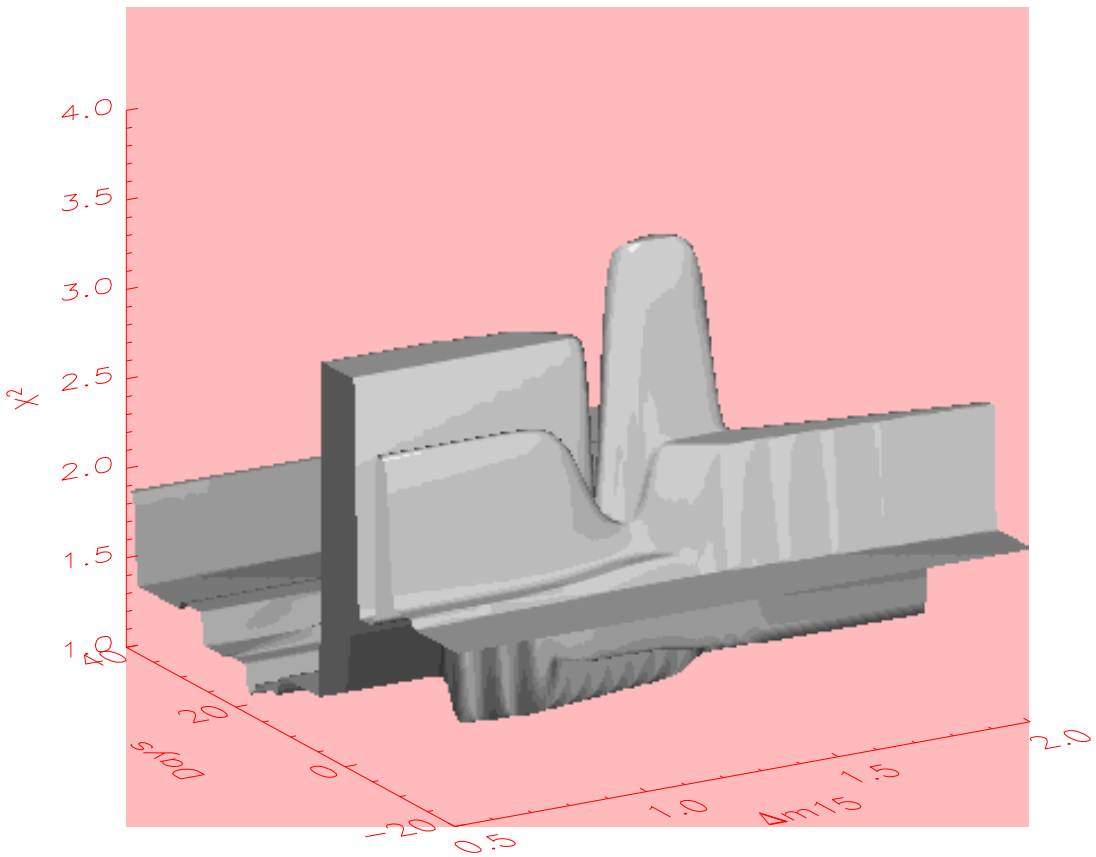

sn1992a.m01.dat.rect, z = 0.92000002
Calesi2039.snonly_50A.fits Observed -
Template Spectrum Av = -4.2708317
Galaxy
SN/Gal = -0.0562741
Mg II, I
[O II]
Ca II
1.5
1.0
0.5
0.0
-0.5
6000
7000
8000
9000


sn1999ee.m01.dat.rect, z = 0.88000000
Calesi2039.snonly_50A.fits Observed – Gala
Template Spectrum Av = –4.0348728
Galaxy
SN/Gal = 0.09199954
Mg II, I
[O II]
Ca II
[O
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000

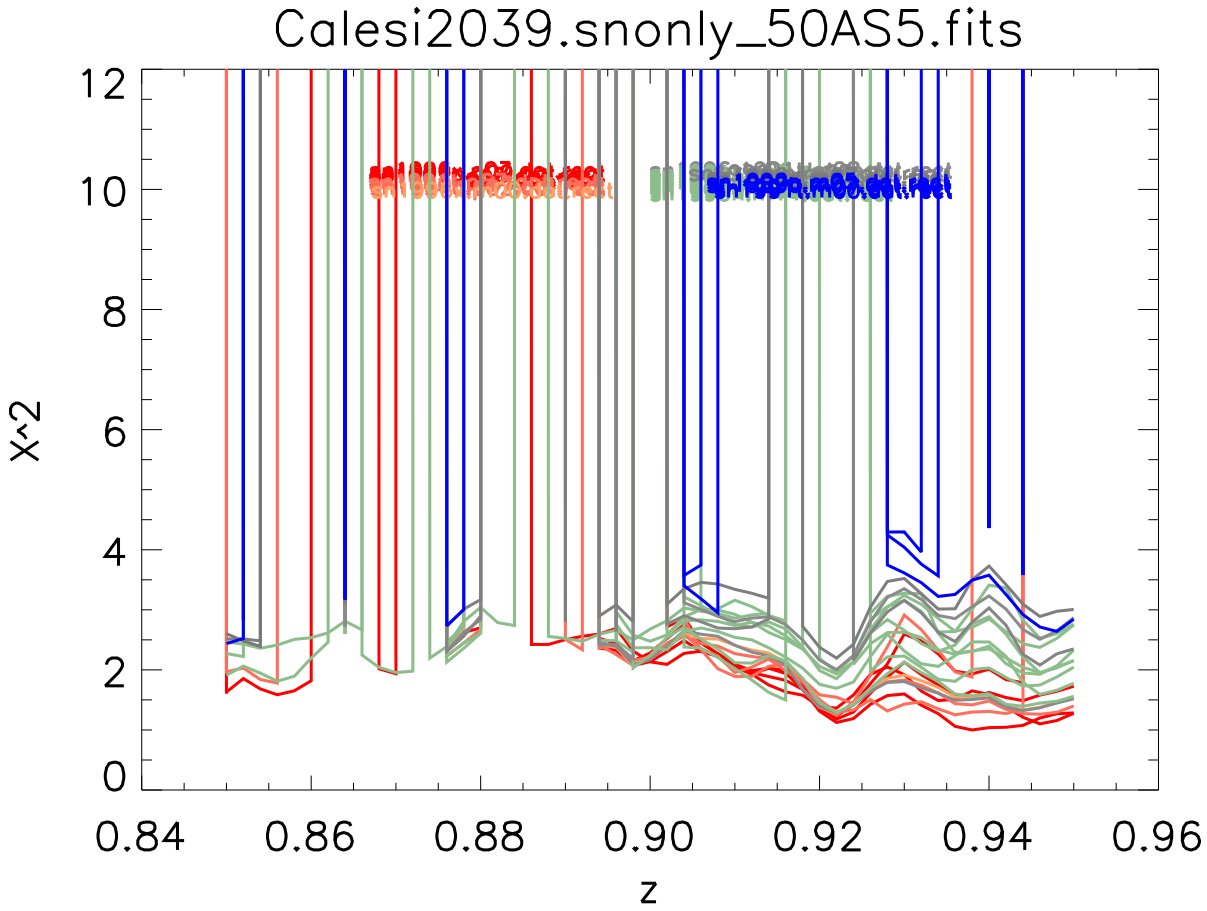

sn1998bu.m04.dat.rect, z = 0.88000000
Calesi2039.snonly_50A.fits Observed -
Template Spectrum Av = -2.0085227
Galaxy
SN/Gal = 0.0892318
Mg II, I
[O II]
Ca II
[O
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000

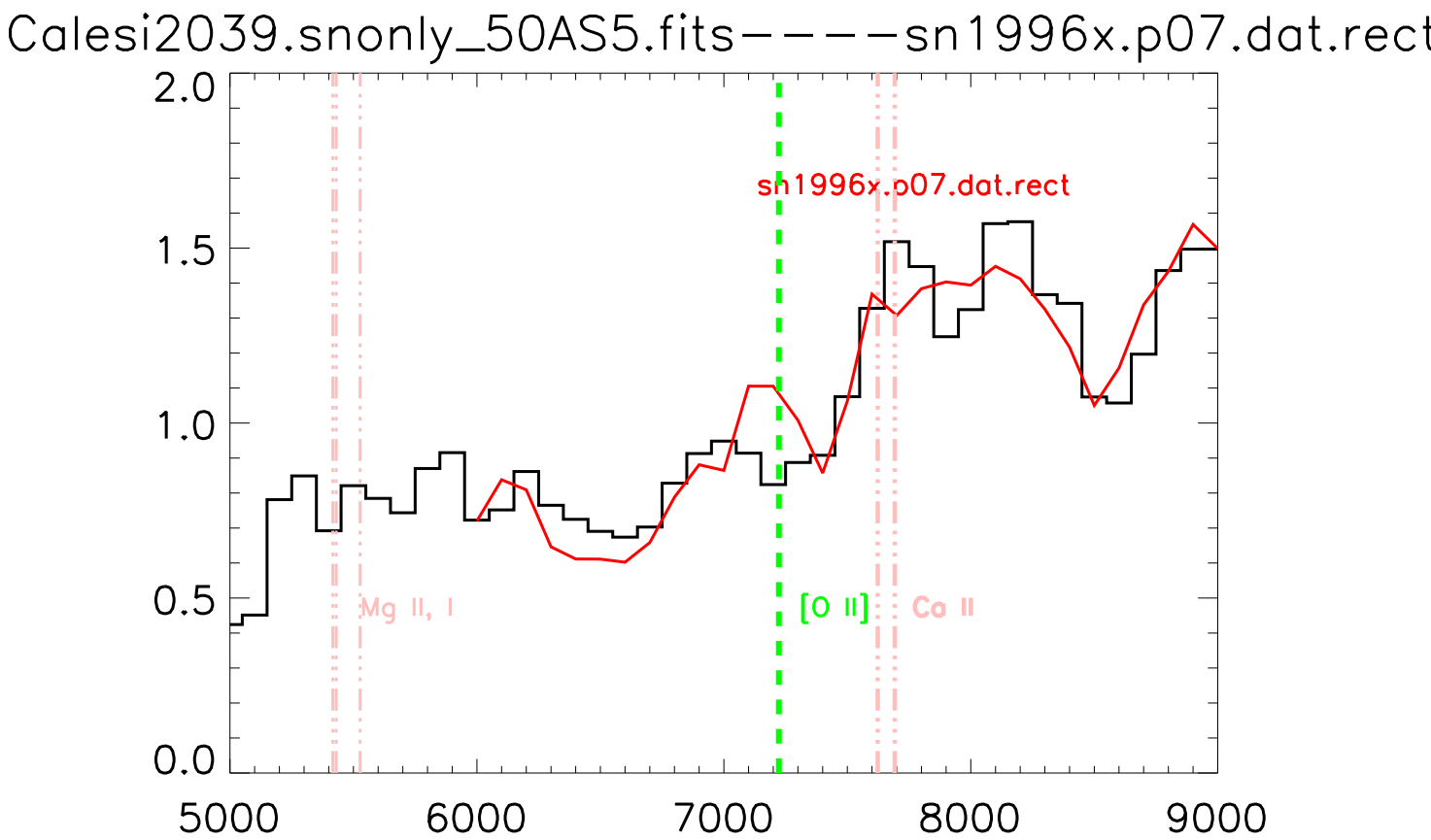

sn1994d.m08.dat.rect, z = 0.81000000
Calesi2039.snonly_50A.fits Observed –
Template Spectrum Av = 5.5341138
Galaxy
SN/Gal = 1.06555
[O II]
Ca II
[O III]
1.2
1.0
0.8
0.6
0.4
0.2
0.0
6000
7000
8000
9000

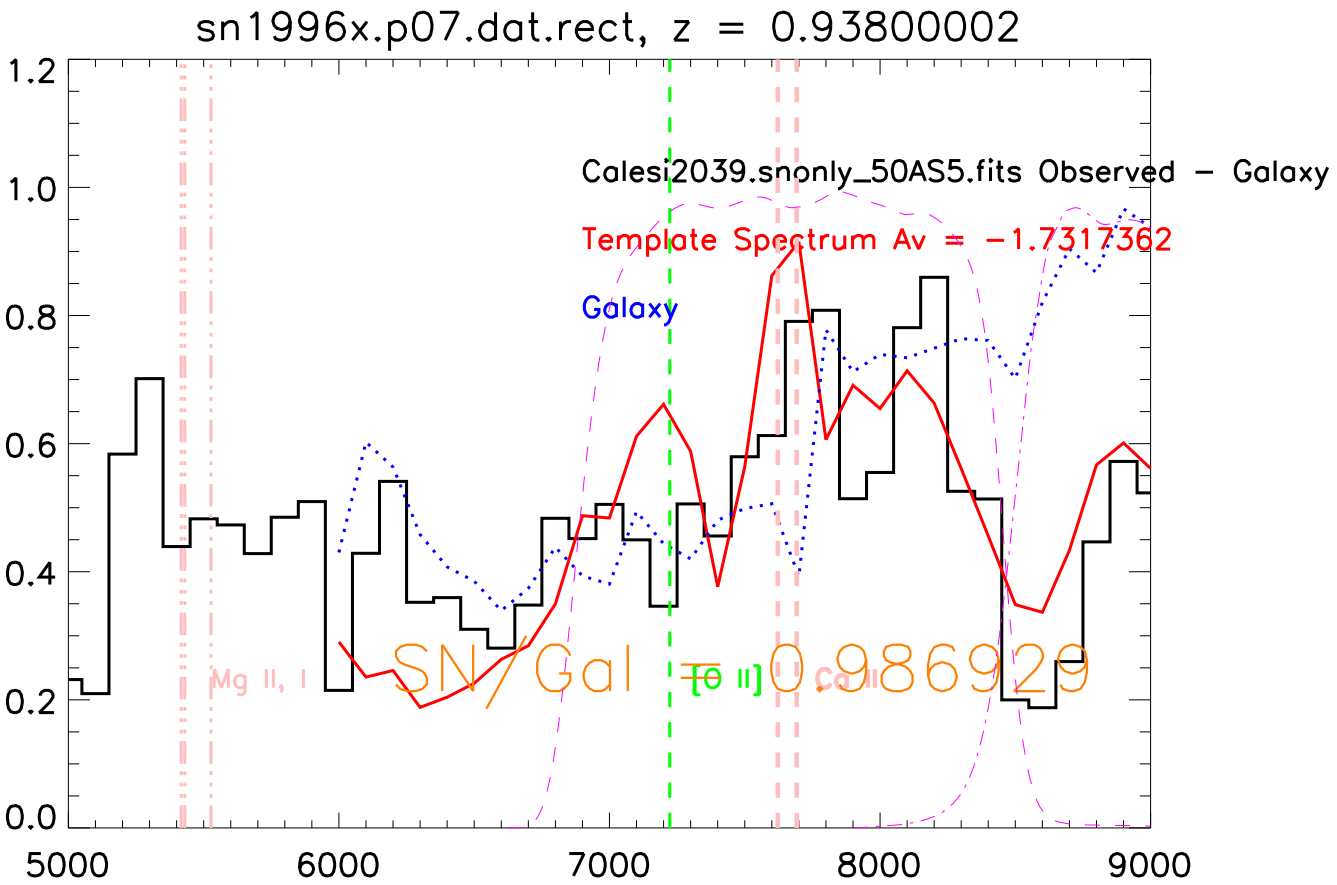

1.2
1.9
1.4
1.4
1.9
1.5
1.2
1.6
1.4
1.6
1.2
1.1
1.3
1.5
1.2
1.5
1.3
1.1
1.0
1.6
1.3
3.2
1.9
1.9
1.9
2.0
2.4
3.7
2.4
2.8
2.2
2.6
2.0
2.1
2.0

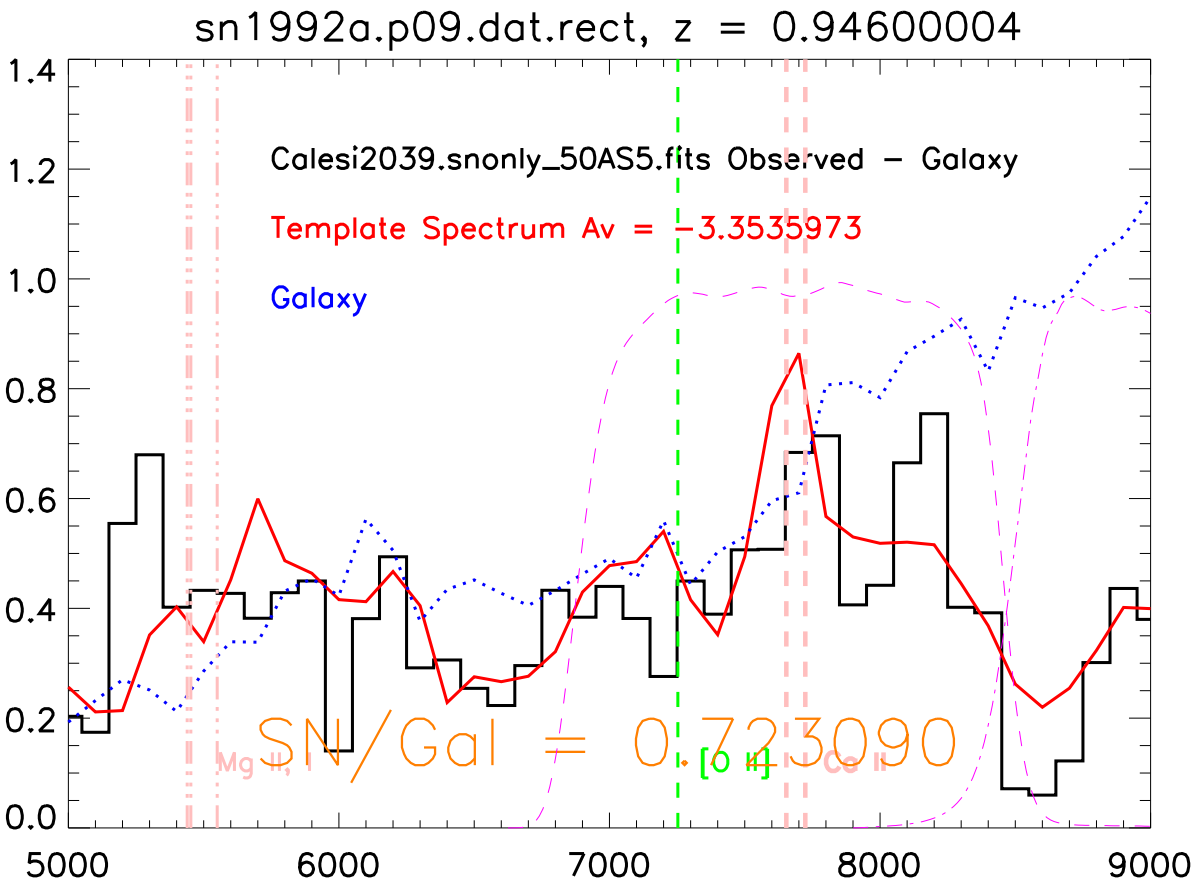


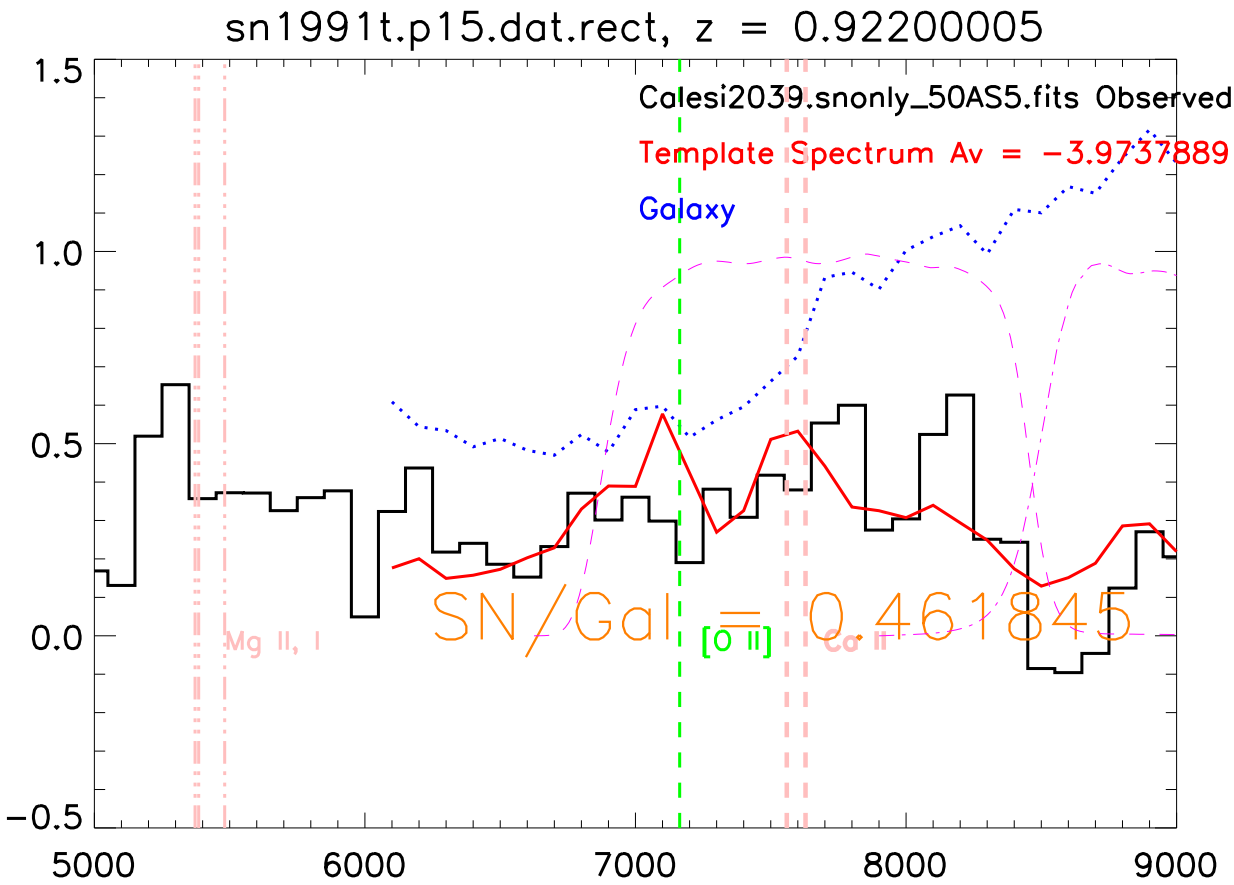
4.0
3.5
3.0
2.5
2.0
1.5
1.0
χ^2
40
20
0
−20
Days
0.5
1.0
1.5
2.0
Δm15

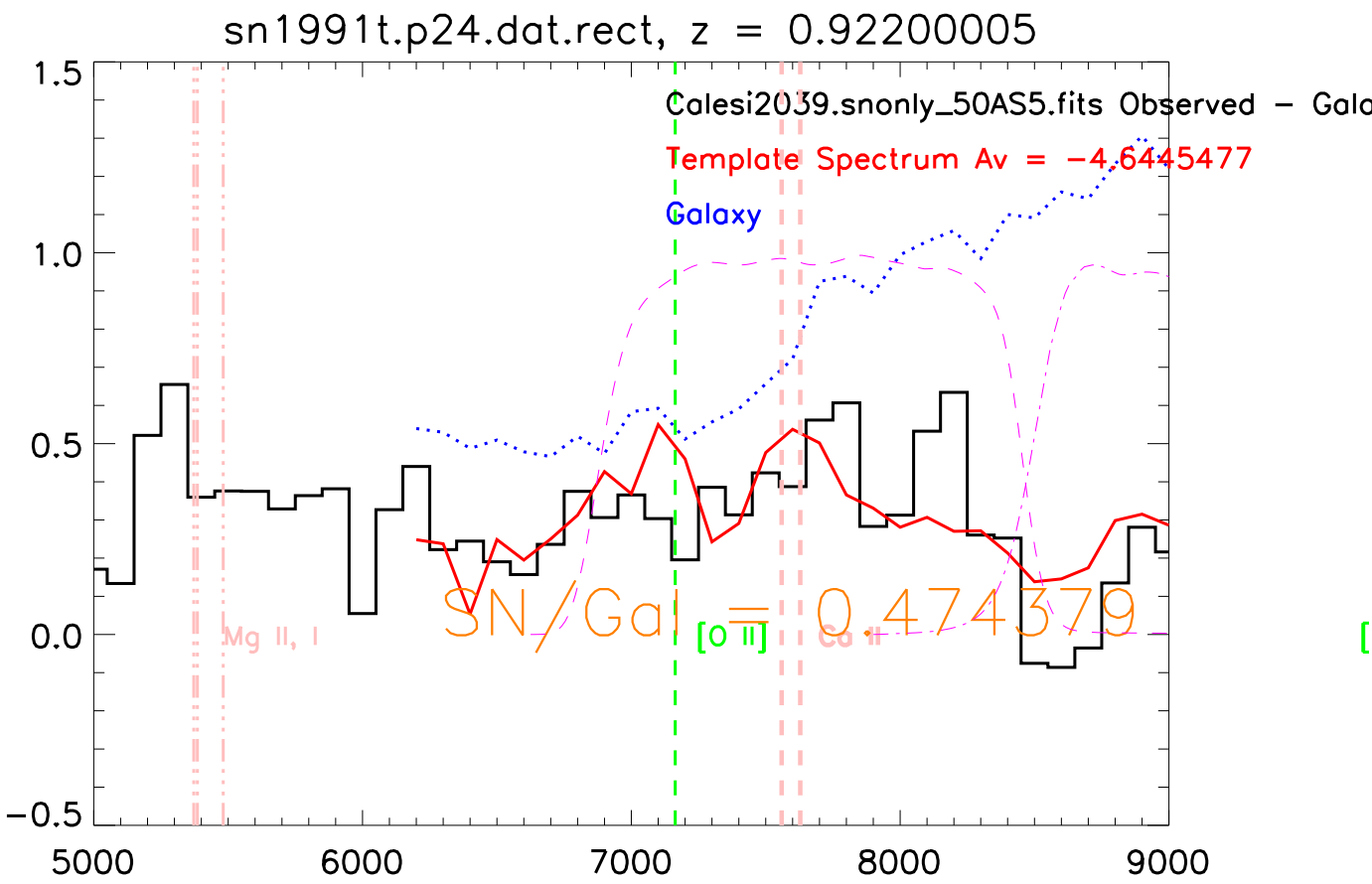

Calesi2039.snonly_50AS5.fits
X^2
z
0
2
4
6
8
10
12
0.84
0.86
0.88
0.90
0.92
0.94
0.96

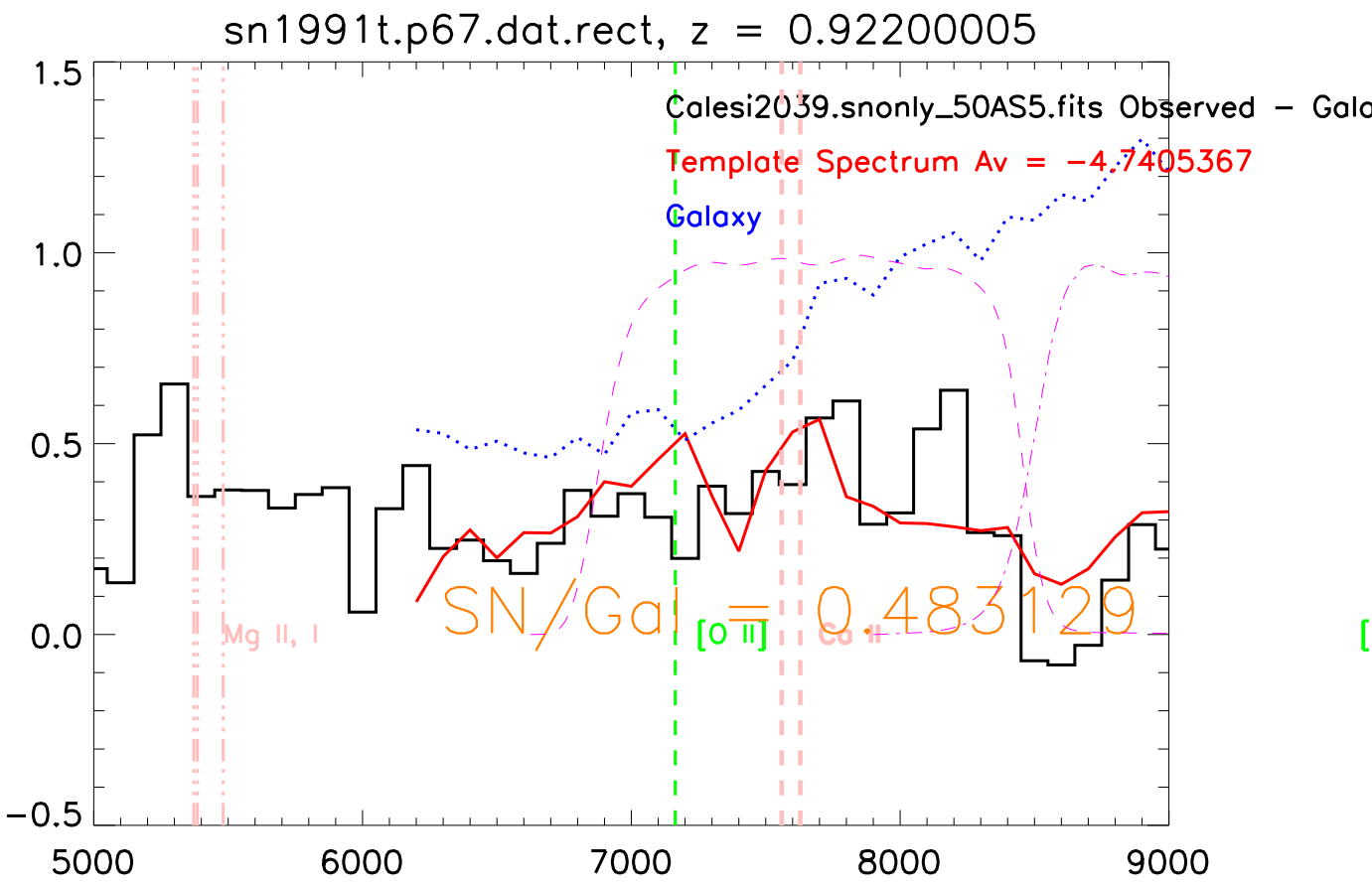

Calesi2039.snonly_50AS5.fits----sn1996x.p07.dat.rect
sn1996x.p07.dat.rect
Mg II, I
[O II]
Ca II
2.0
1.5
1.0
0.5
0.0
5000
6000
7000
8000
9000

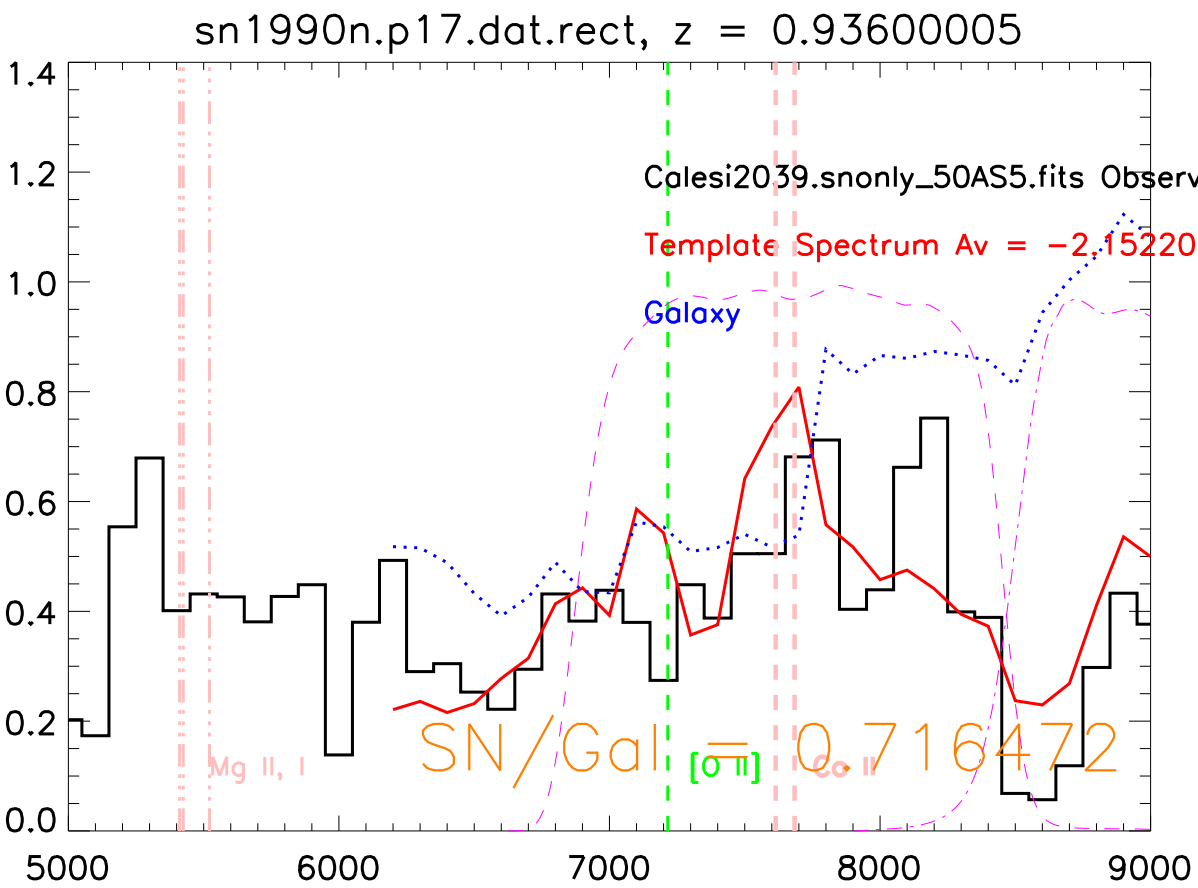

sn1996x.p07.dat.rect, z = 0.93800002
Calesi2039.snonly_50AS5.fits Observed − Galaxy
Template Spectrum Av = −1.7317362
Galaxy
SN/Gal = 0.986929
Mg II, I
[O II]
Ca II
1.2
1.0
0.8
0.6
0.4
0.2
0.0
5000
6000
7000
8000
9000

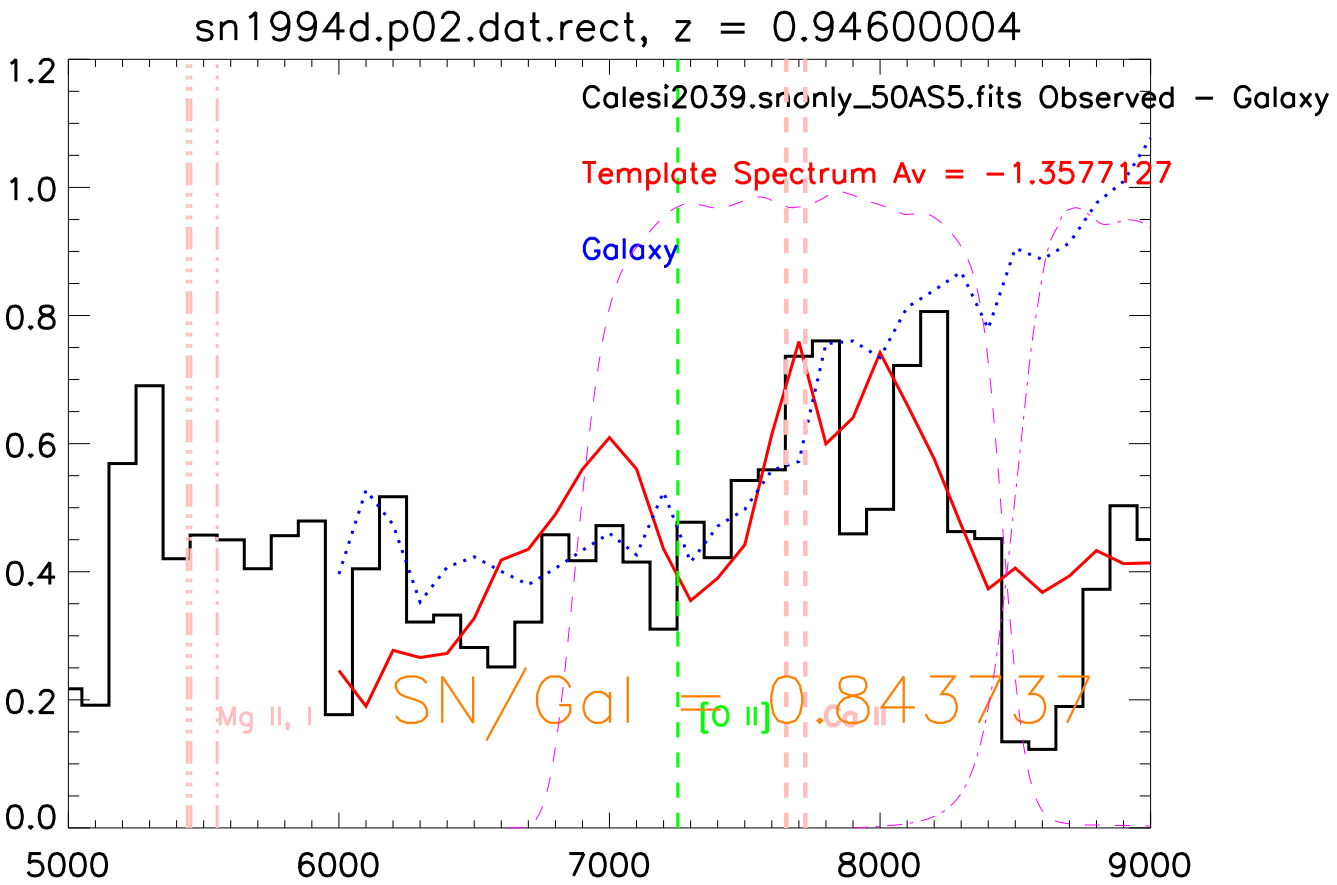

sn1992a.p09.dat.rect, z = 0.94600004
Calesi2039.snonly_50AS5.fits Observed − Galaxy
Template Spectrum Av = −3.3535973
Galaxy
SN/Gal = 0.723090
Mg II
[O II]
Ca II
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
5000
6000
7000
8000
9000

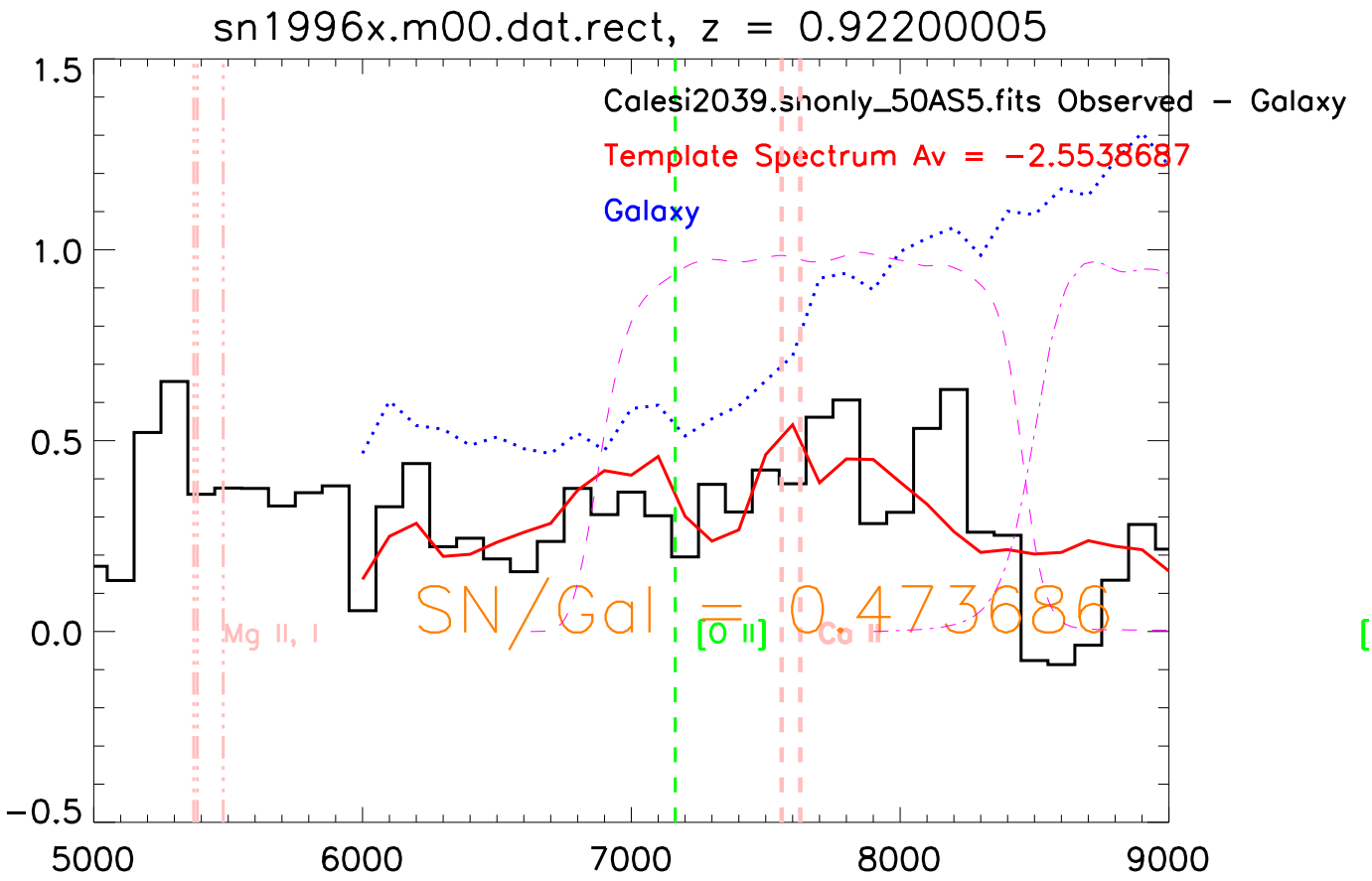

sn1991t.p15.dat.rect, z = 0.92200005
Calesi2039.snonly_50AS5.fits Observed − Galaxy
Template Spectrum Av = −3.9737889
Galaxy
SN/Gal = 0.461845
Mg II, I
[O II]
Ca II
1.5
1.0
0.5
0.0
−0.5
5000
6000
7000
8000
9000

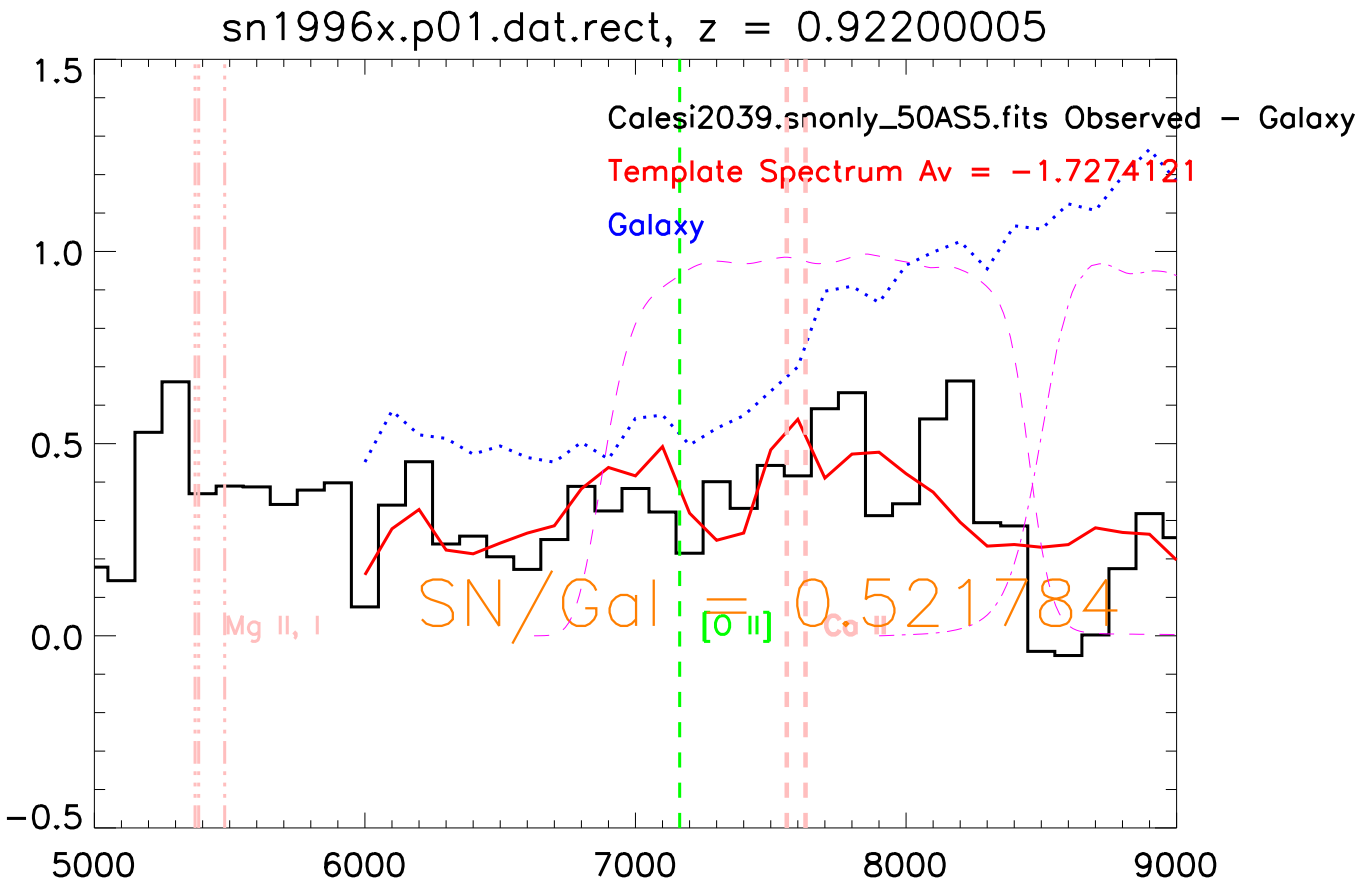

sn1991t.p24.dat.rect, z = 0.92200005
Calesi2039.snonly_50AS5.fits Observed – Gala
Template Spectrum Av = −4.6445477
Galaxy
SN/Gal = 0.474379
Mg II, I
[O II]
Ca II
1.5
1.0
0.5
0.0
−0.5
5000
6000
7000
8000
9000

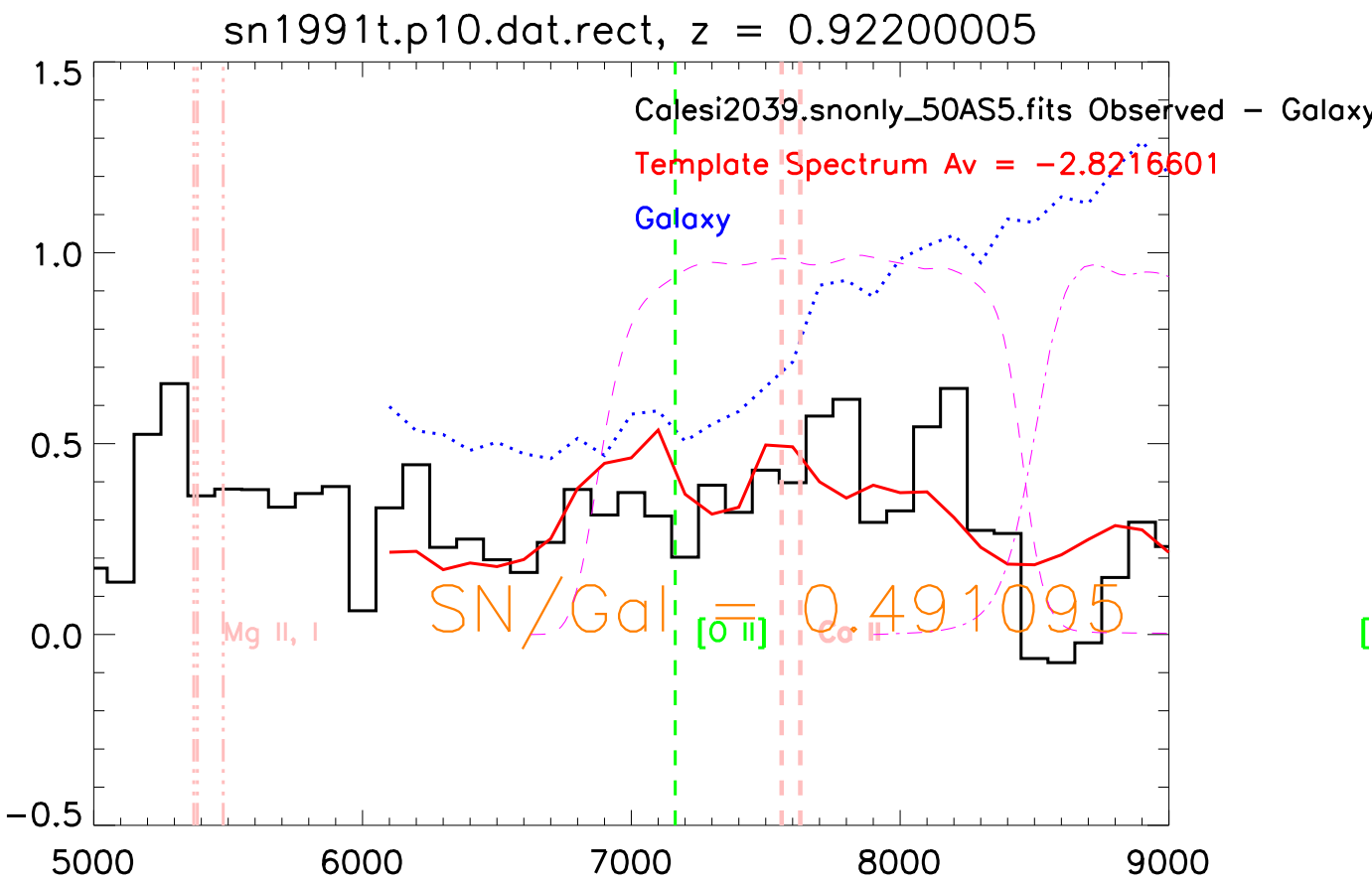

sn1991t.p67.dat.rect, z = 0.92200005
Calesi2039.snonly_50AS5.fits Observed – Gala
Template Spectrum Av = −4.7405367
Galaxy
SN/Gal = 0.483129
Mg II, I
[O II]
Ca II
1.5
1.0
0.5
0.0
−0.5
5000
6000
7000
8000
9000

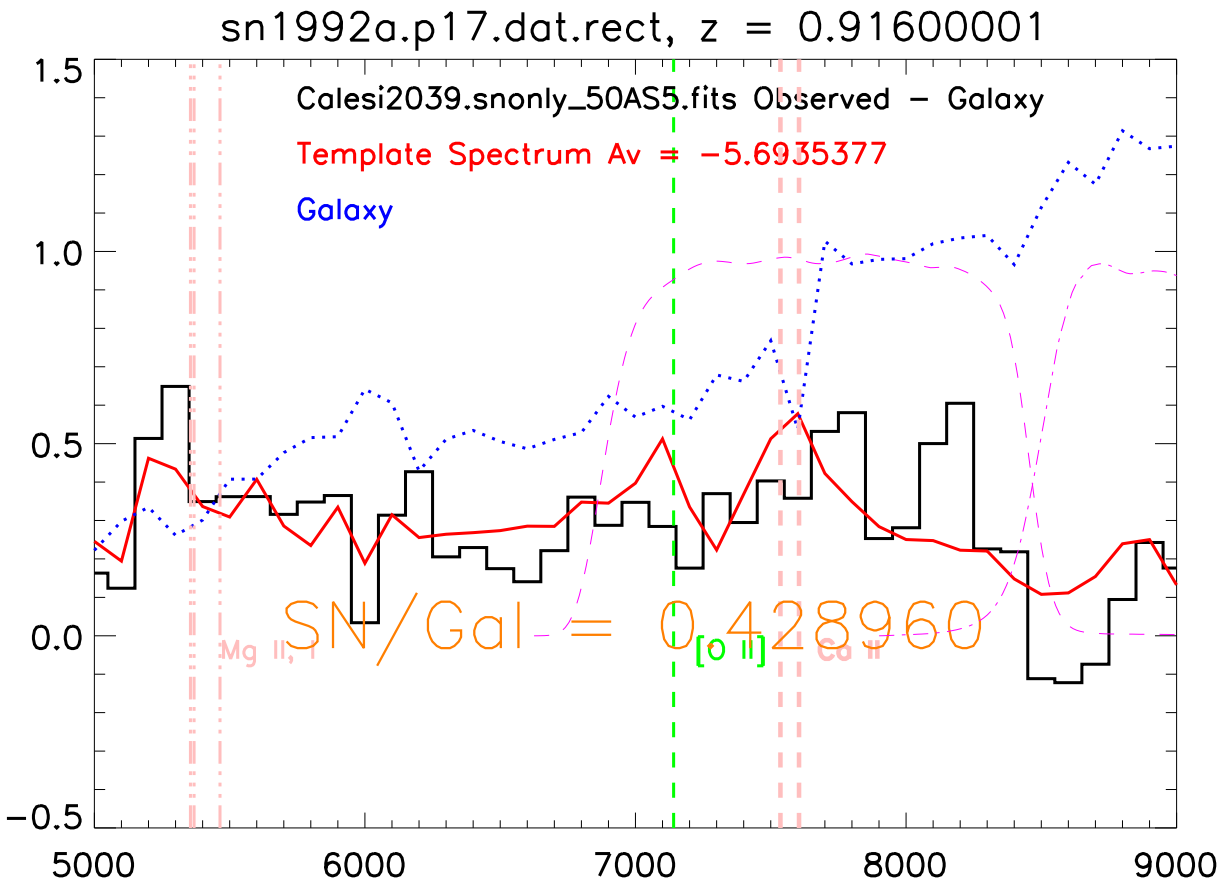

sn1990n.p17.dat.rect, z = 0.93600005
Calesi2039.snonly_50AS5.fits Observed – Gala
Template Spectrum Av = −2.1522013
Galaxy
SN/Gal = 0.716472
Mg II, I
[O II]
Ca II
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
5000
6000
7000
8000
9000

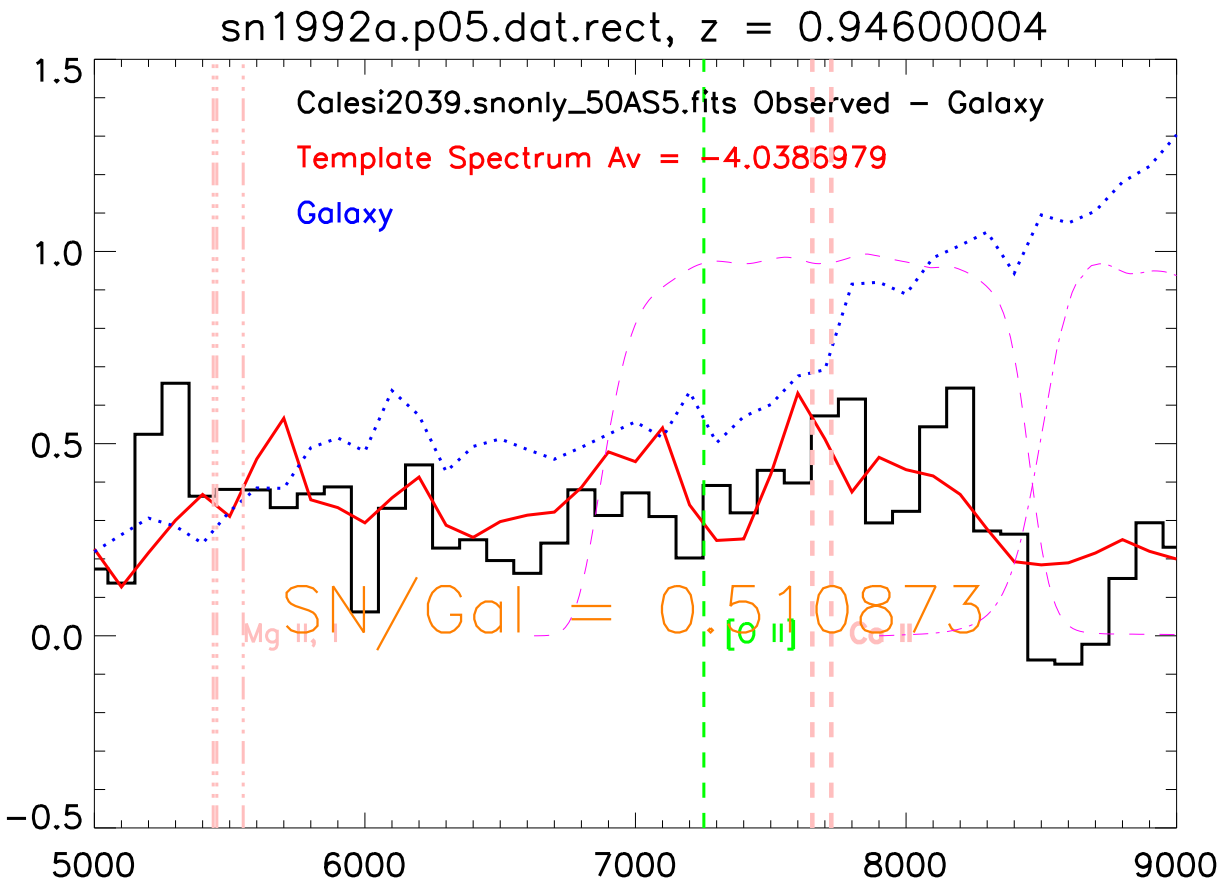

sn1994d.p02.dat.rect, z = 0.94600004
Calesi2039.snonly_50AS5.fits Observed − Galaxy
Template Spectrum Av = −1.3577127
Galaxy
SN/Gal = 0.843737
Mg II, I
[O II]
Ca II
1.2
1.0
0.8
0.6
0.4
0.2
0.0
5000
6000
7000
8000
9000

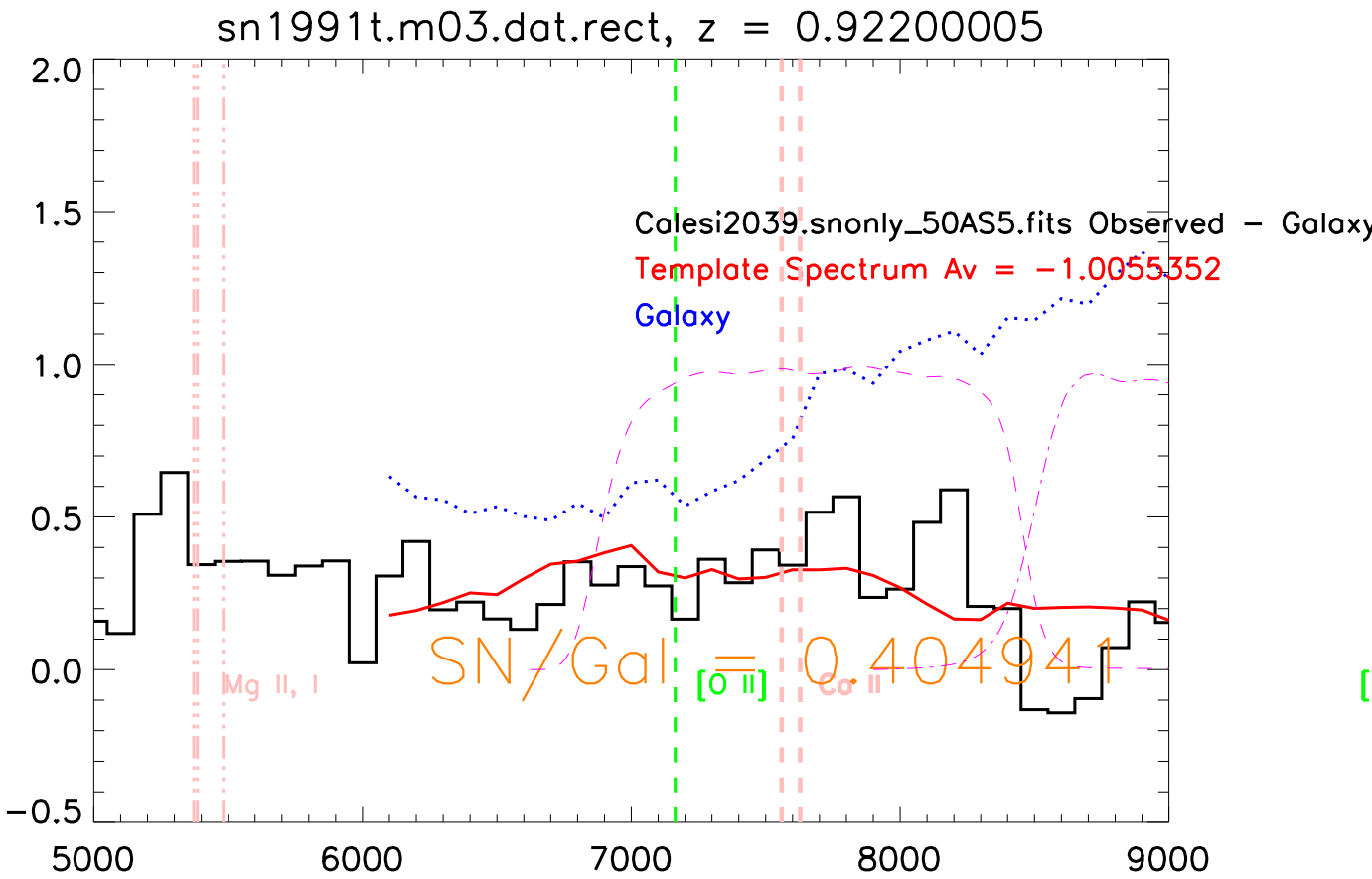

sn1996x.m00.dat.rect, z = 0.92200005
Calesi2039.shonly_50AS5.fits Observed − Galaxy
Template Spectrum Av = −2.5538687
Galaxy
SN/Gal = 0.473686
Mg II, I
[O II]
Ca II
1.5
1.0
0.5
0.0
−0.5
5000
6000
7000
8000
9000

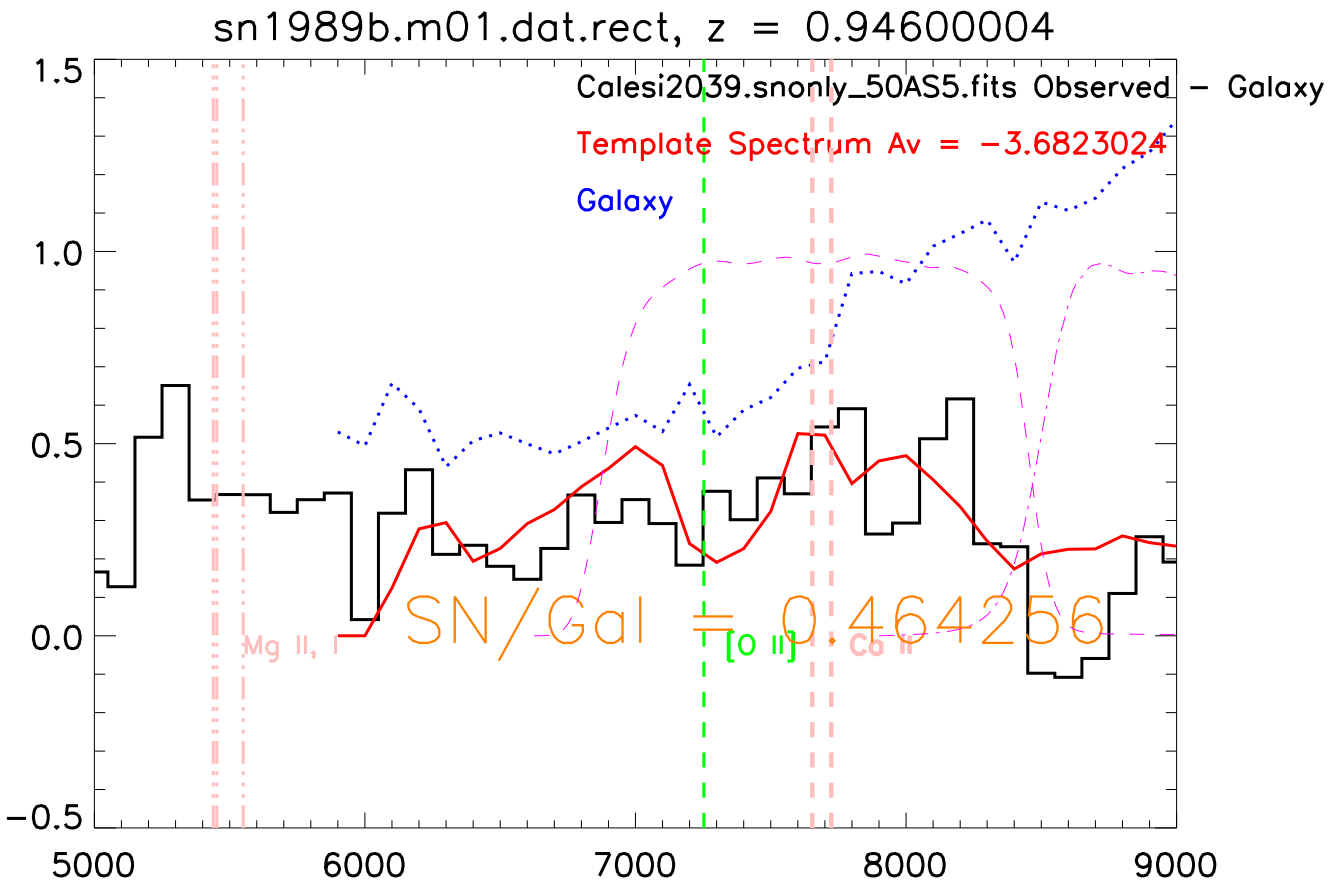

sn1996x.p01.dat.rect, z = 0.92200005
Calesi2039.snonly_50AS5.fits Observed − Galaxy
Template Spectrum Av = −1.7274121
Galaxy
SN/Gal = 0.521784
Mg II, I
[O II]
Ca II
1.5
1.0
0.5
0.0
−0.5
5000
6000
7000
8000
9000

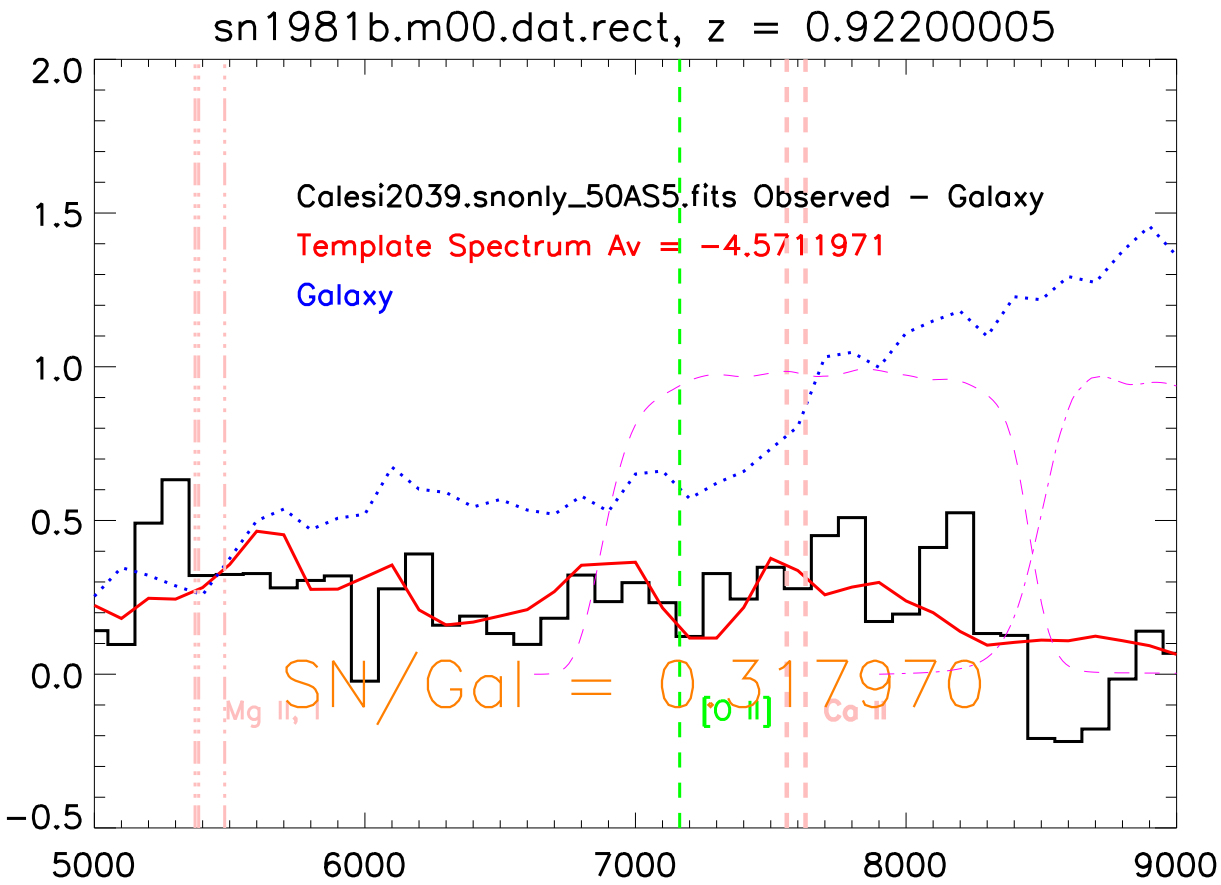

sn1991t.p10.dat.rect, z = 0.92200005
Calesi2039.snonly_50AS5.fits Observed − Galaxy
Template Spectrum Av = −2.8216601
Galaxy
SN/Gal = 0.491095
Mg II, I
[O II]
Ca II
1.5
1.0
0.5
0.0
−0.5
5000
6000
7000
8000
9000

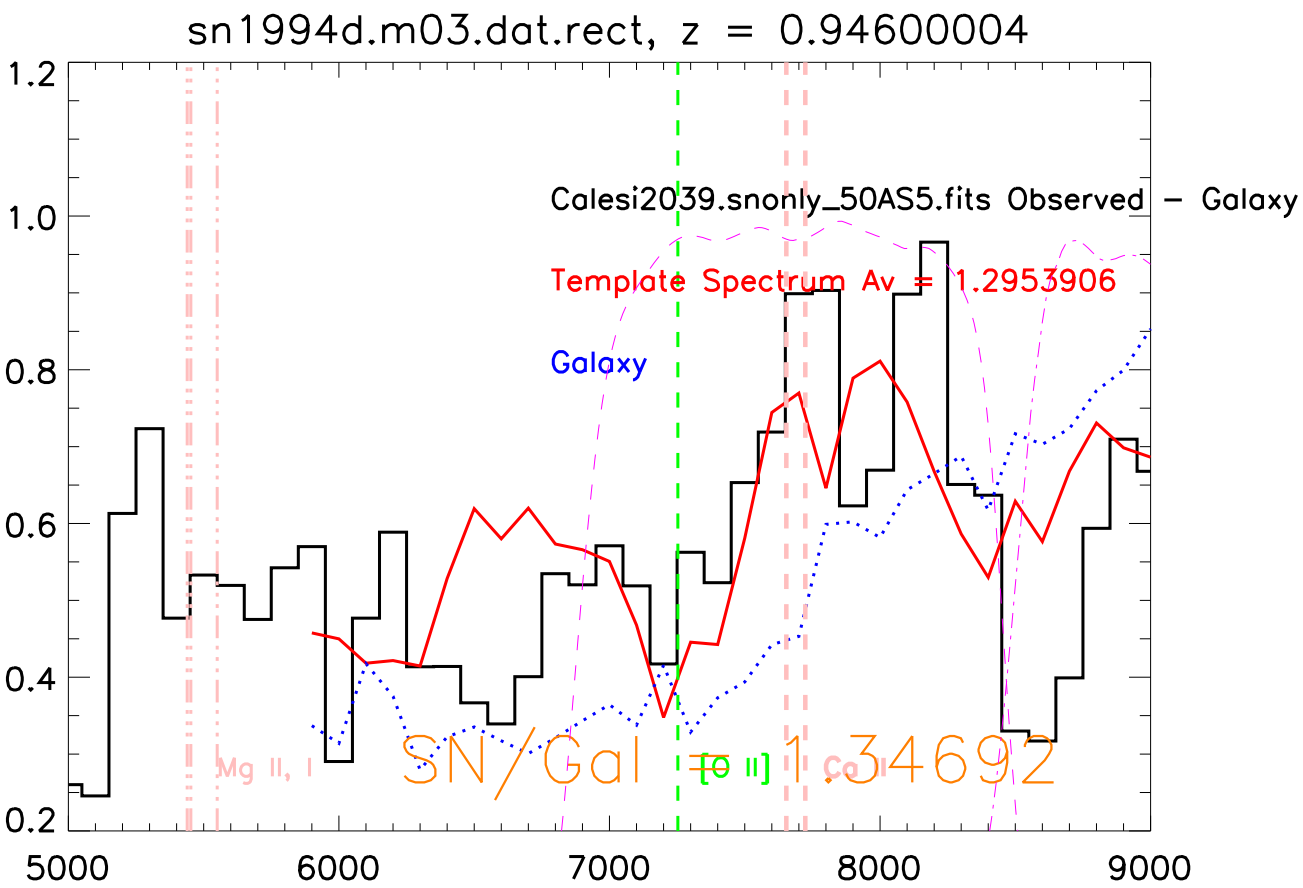

sn1992a.p17.dat.rect, z = 0.91600001
Calesi2039.snonly_50AS5.fits Observed − Galaxy
Template Spectrum Av = −5.6935377
Galaxy
SN/Gal = 0.428960
Mg II,
[O II]
Ca II
1.5
1.0
0.5
0.0
−0.5
5000
6000
7000
8000
9000

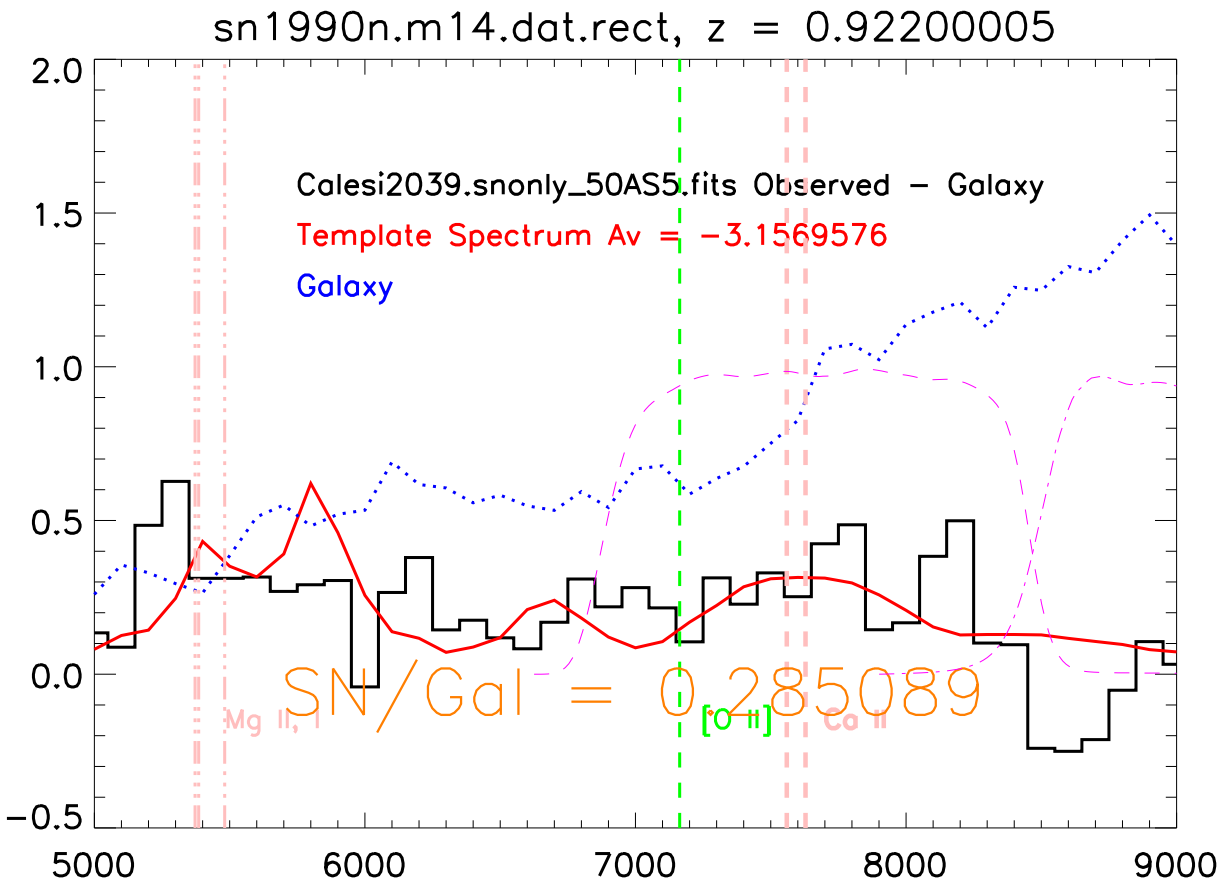

sn1992a.p05.dat.rect, z = 0.94600004
Calesi2039.snonly_50AS5.fits Observed − Galaxy
Template Spectrum Av = −4.0386979
Galaxy
SN/Gal = 0.510873
Mg II, I
[O II]
Ca II
1.5
1.0
0.5
0.0
−0.5
5000
6000
7000
8000
9000

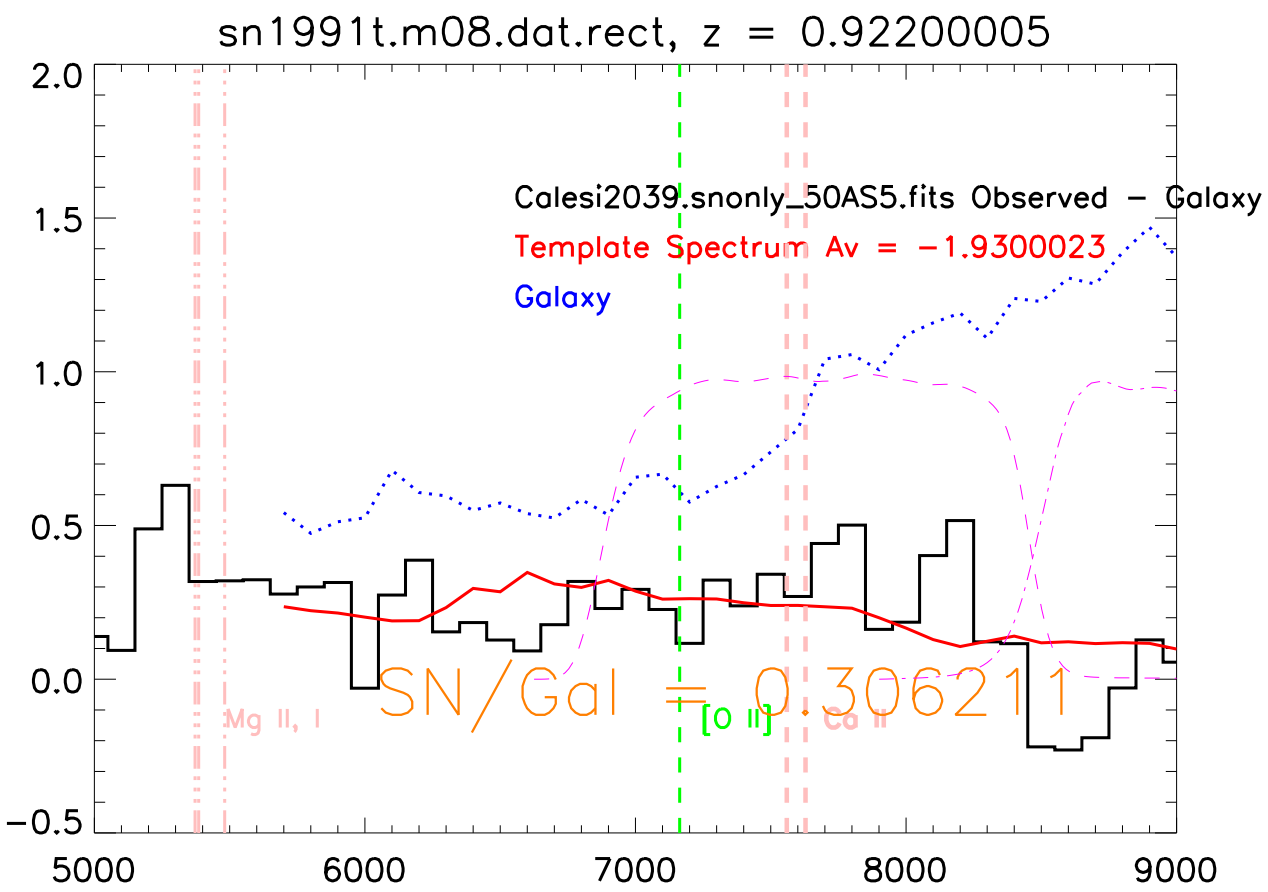

sn1991t.m03.dat.rect, z = 0.92200005
Calesi2039.snonly_50AS5.fits Observed – Galaxy
Template Spectrum Av = −1.0055352
Galaxy
SN/Gal = 0.404941
Mg II, I
[O II]
Ca II
2.0
1.5
1.0
0.5
0.0
−0.5
5000
6000
7000
8000
9000

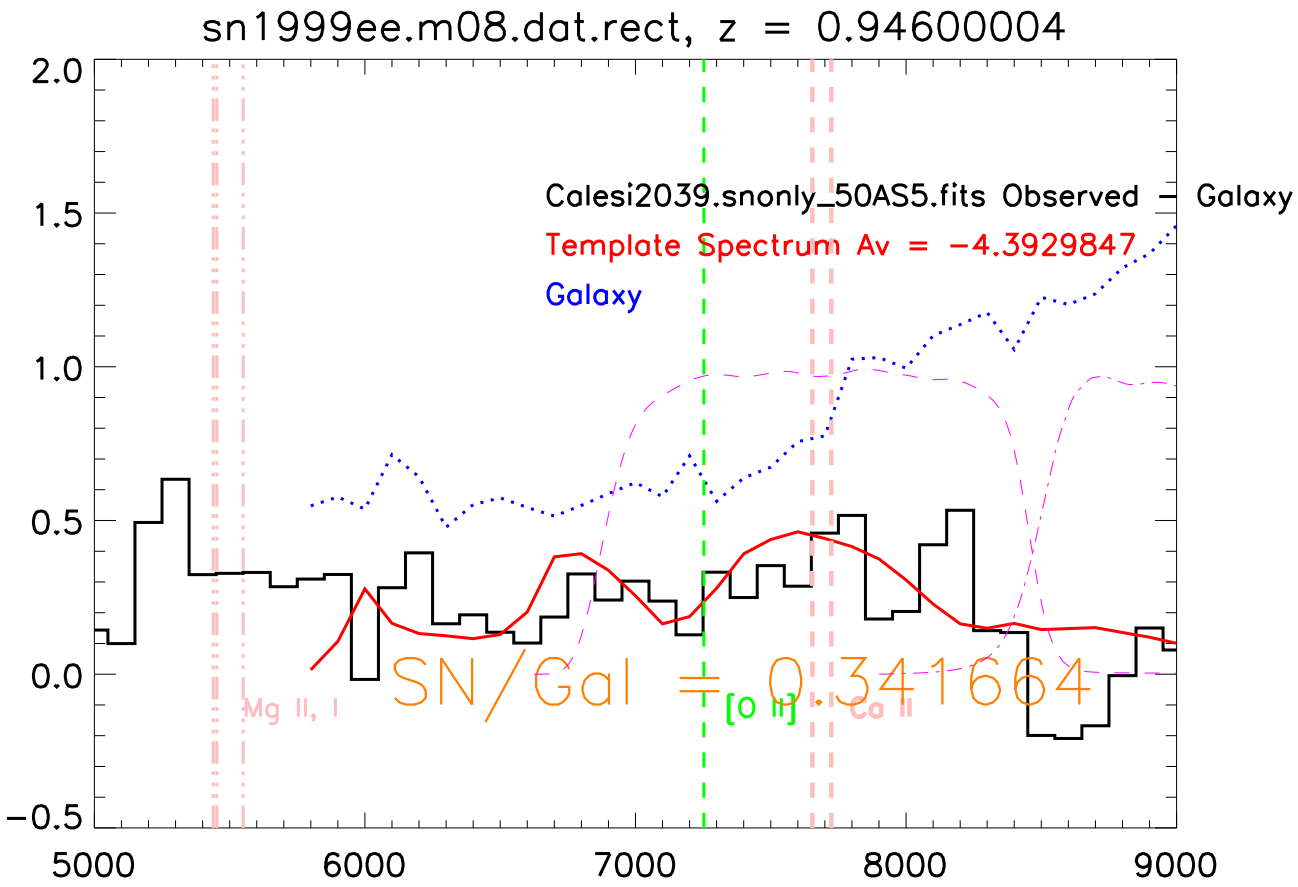

sn1989b.m01.dat.rect, z = 0.94600004
Calesi2039.snonly_50AS5.fits Observed – Galaxy
Template Spectrum Av = −3.6823024
Galaxy
SN/Gal = 0.464256
Mg II, I
[O II]
Ca II
1.5
1.0
0.5
0.0
−0.5
5000
6000
7000
8000
9000

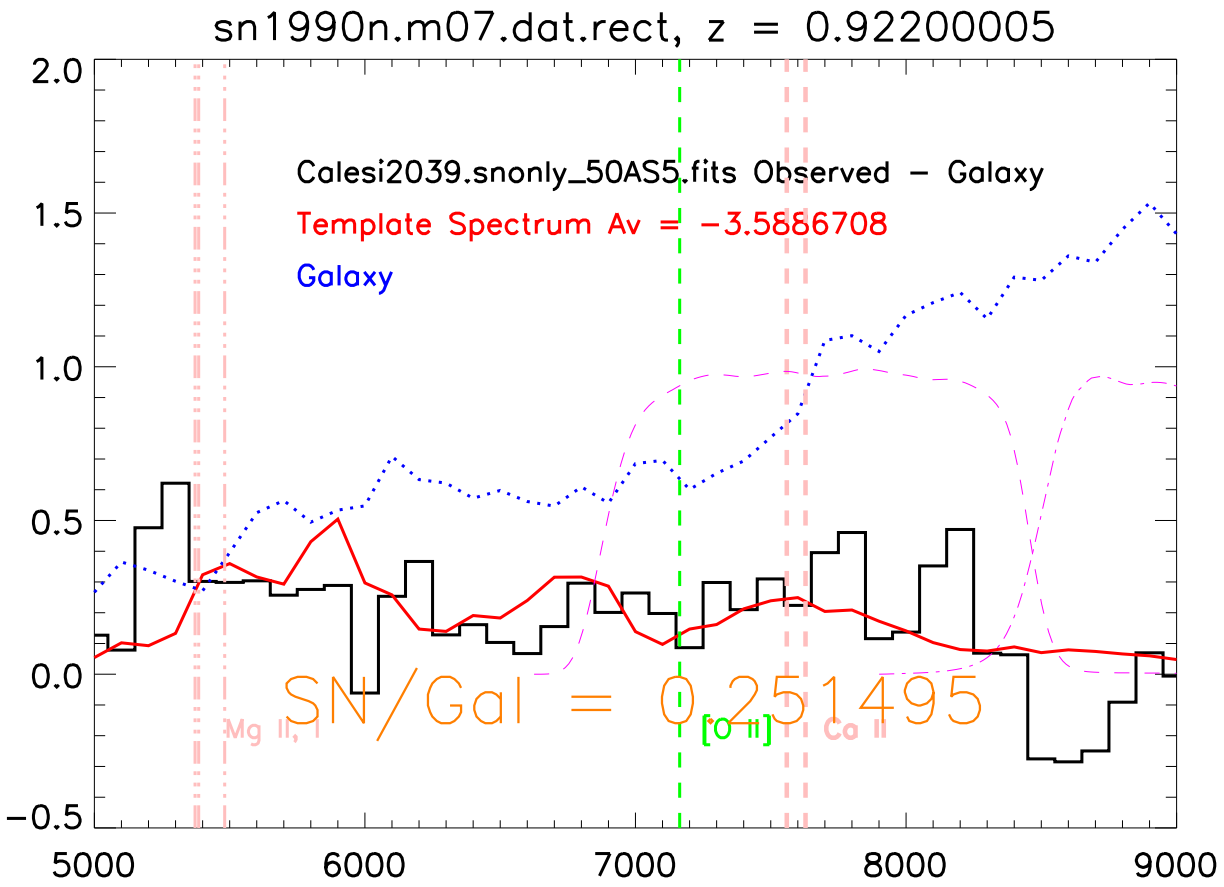

sn1981b.m00.dat.rect, z = 0.92200005
Calesi2039.snonly_50AS5.fits Observed − Galaxy
Template Spectrum Av = −4.5711971
Galaxy
SN/Gal = 0.317970
Mg II, I
[O II]
Ca II
2.0
1.5
1.0
0.5
0.0
−0.5
5000
6000
7000
8000
9000

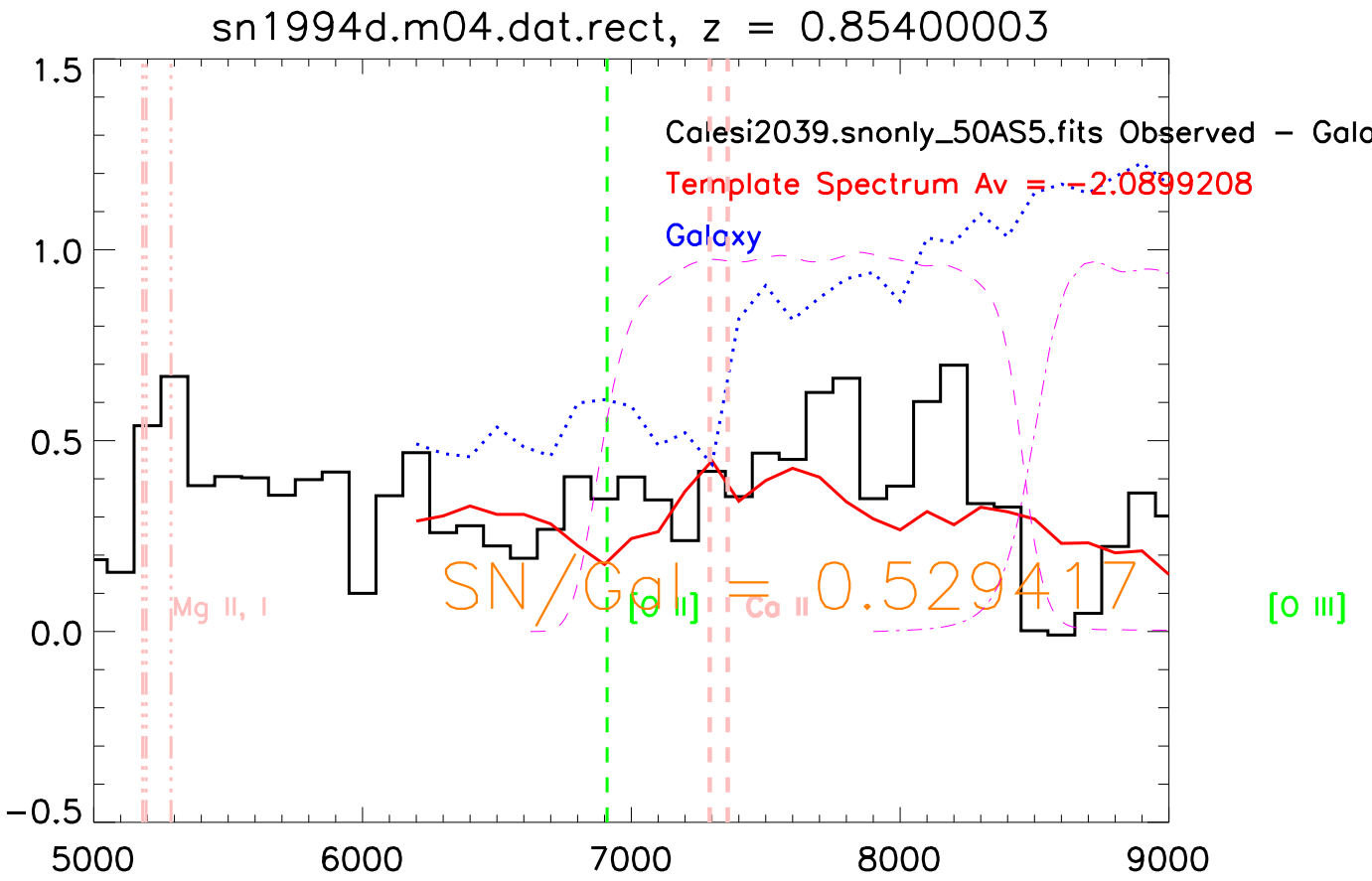

sn1994d.m03.dat.rect, z = 0.94600004
Calesi2039.snonly_50AS5.fits Observed − Galaxy
Template Spectrum Av = 1.2953906
Galaxy
SN/Gal = 1.34692
Mg II, I
[O II]
Ca II
1.2
1.0
0.8
0.6
0.4
0.2
5000
6000
7000
8000
9000

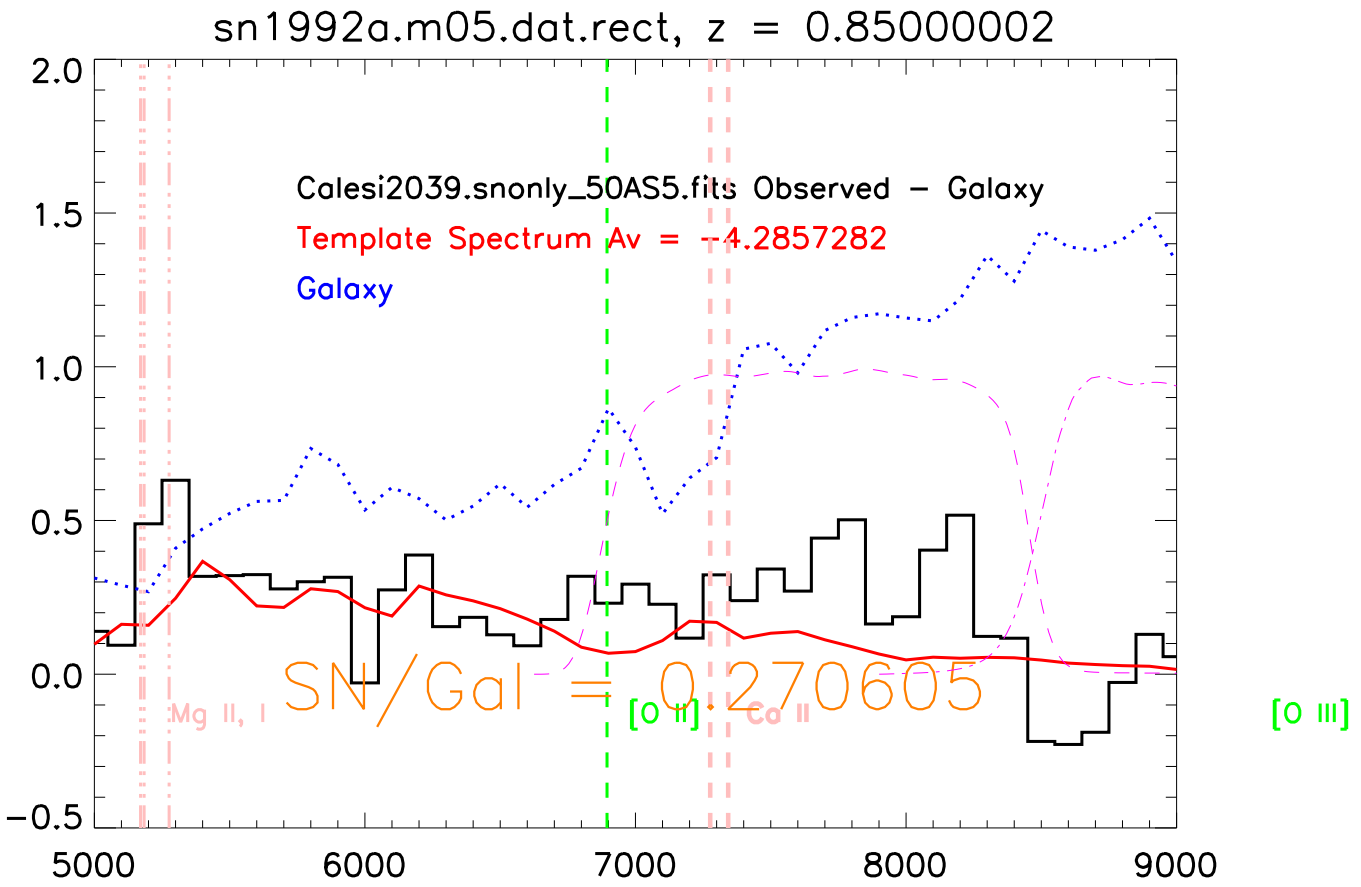

sn1990n.m14.dat.rect, z = 0.92200005
Calesi2039.snonly_50AS5.fits Observed − Galaxy
Template Spectrum Av = −3.1569576
Galaxy
SN/Gal = 0.285089
Mg II, 1
[O II]
Ca II
2.0
1.5
1.0
0.5
0.0
−0.5
5000
6000
7000
8000
9000

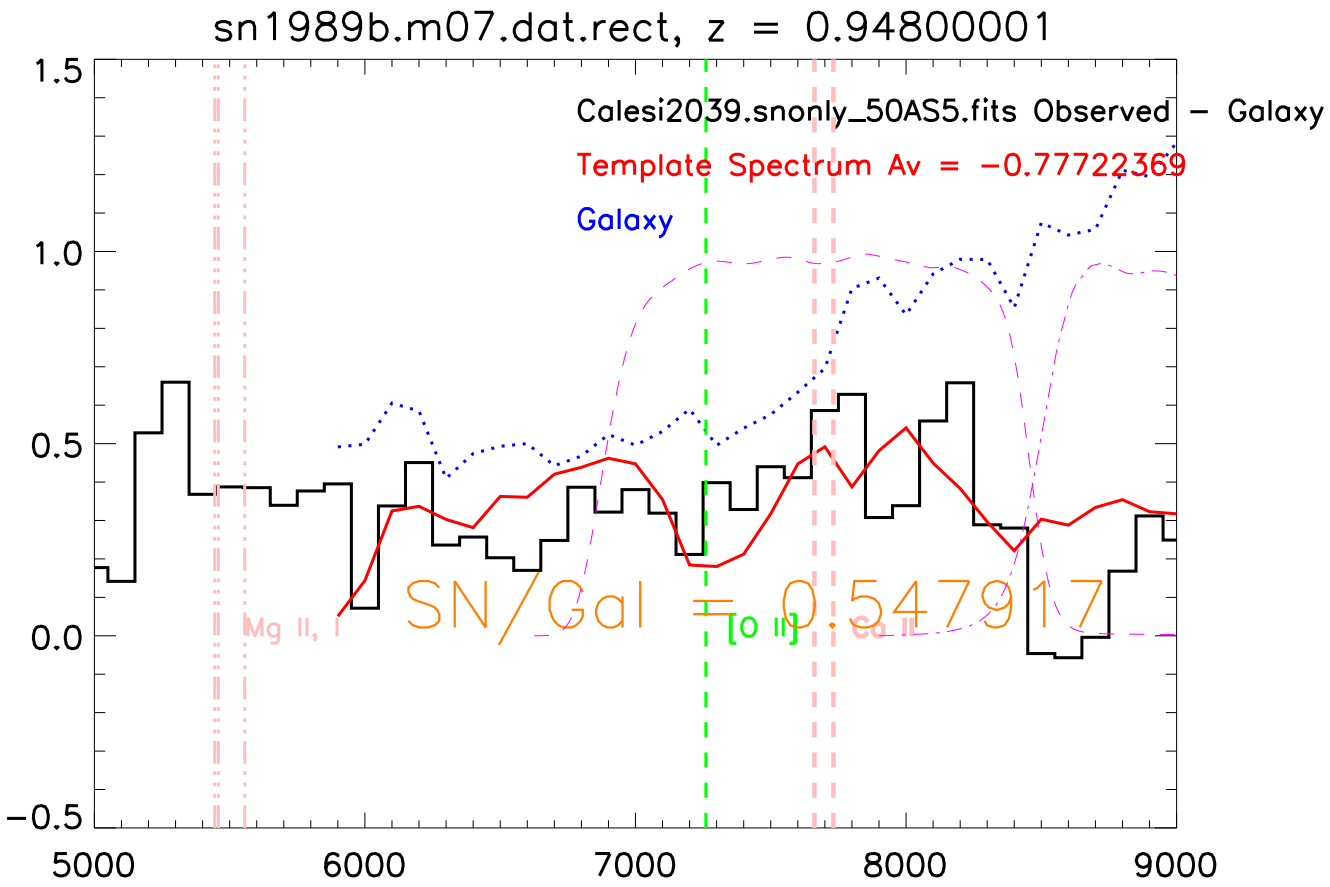

sn1991t.m08.dat.rect, z = 0.92200005
Calesi2039.snonly_50AS5.fits Observed − Galaxy
Template Spectrum Av = −1.9300023
Galaxy
SN/Gal = 0.306211
Mg II, I
[O II]
Ca II
2.0
1.5
1.0
0.5
0.0
−0.5
5000
6000
7000
8000
9000

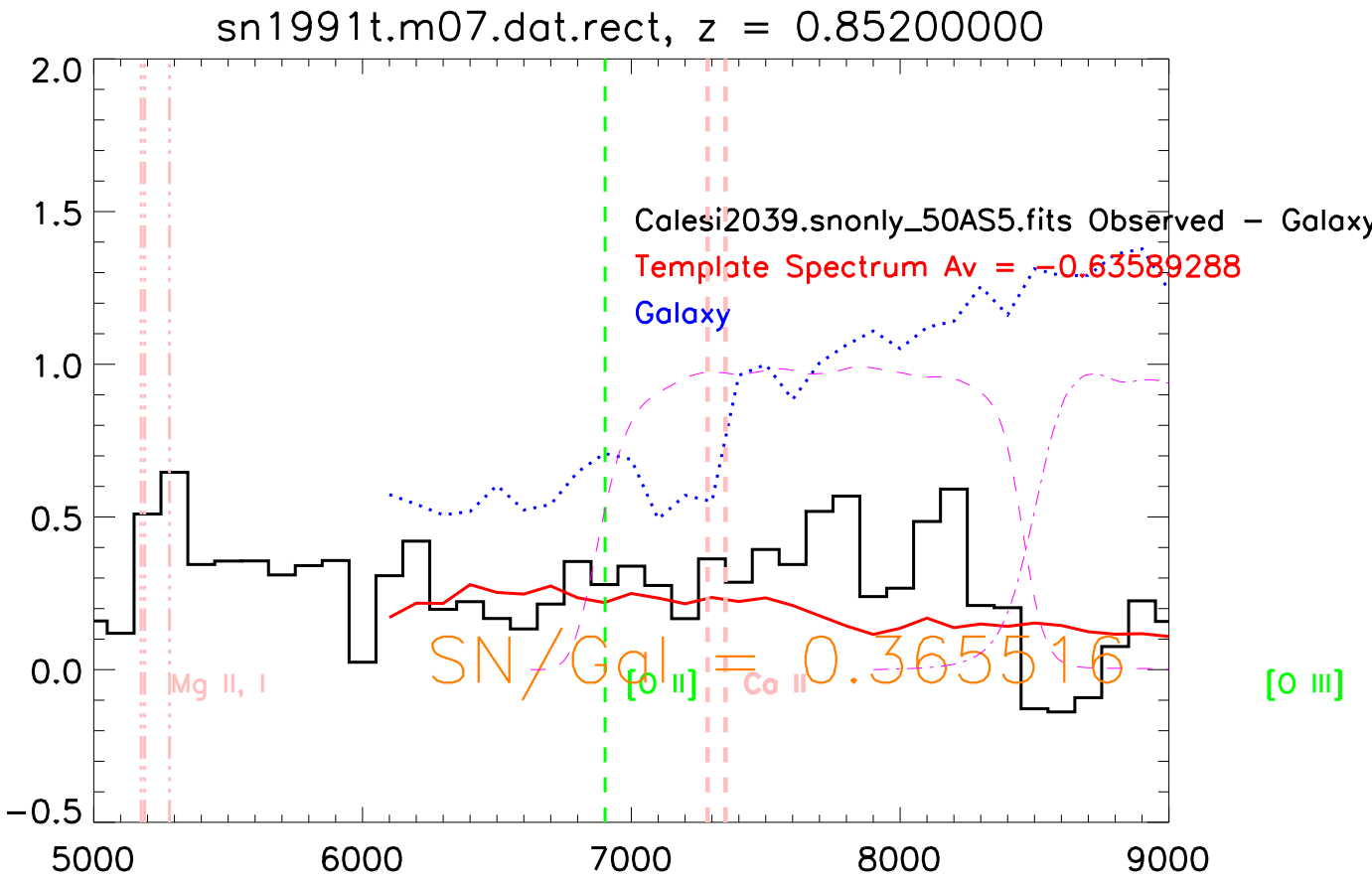

sn1999ee.m08.dat.rect, z = 0.94600004
Calesi2039.snonly_50AS5.fits Observed – Galaxy
Template Spectrum Av = -4.3929847
Galaxy
SN/Gal = 0.341664
Mg II, I
[O II]
Ca II
2.0
1.5
1.0
0.5
0.0
-0.5
5000
6000
7000
8000
9000

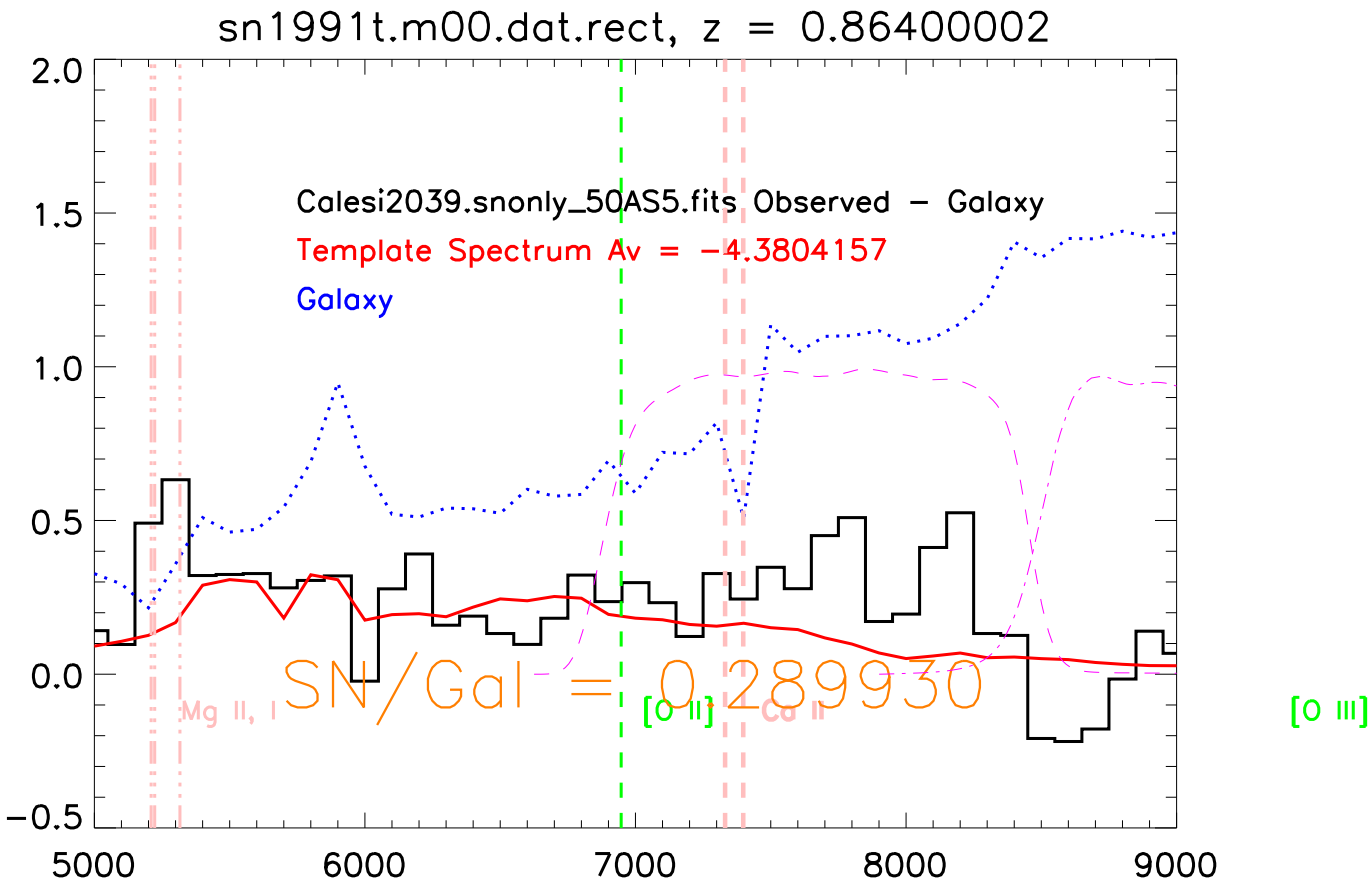

sn1990n.m07.dat.rect, z = 0.92200005
Calesi2039.snonly_50AS5.fits Observed − Galaxy
Template Spectrum Av = −3.5886708
Galaxy
SN/Gal = 0.251495
Mg II, I
[O II]
Ca II
2.0
1.5
1.0
0.5
0.0
−0.5
5000
6000
7000
8000
9000

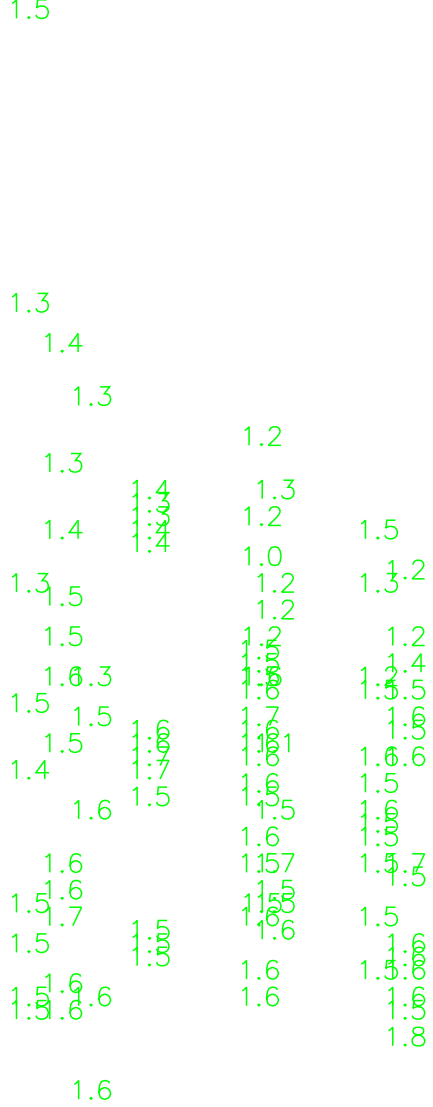

sn1994d.m04.dat.rect, z = 0.85400003
Calesi2039.snonly_50AS5.fits Observed – Gala
Template Spectrum Av = −2.0899208
Galaxy
SN/Gal = 0.529417
Mg II, I
[O II]
Ca II
[O III]
1.5
1.0
0.5
0.0
−0.5
5000
6000
7000
8000
9000

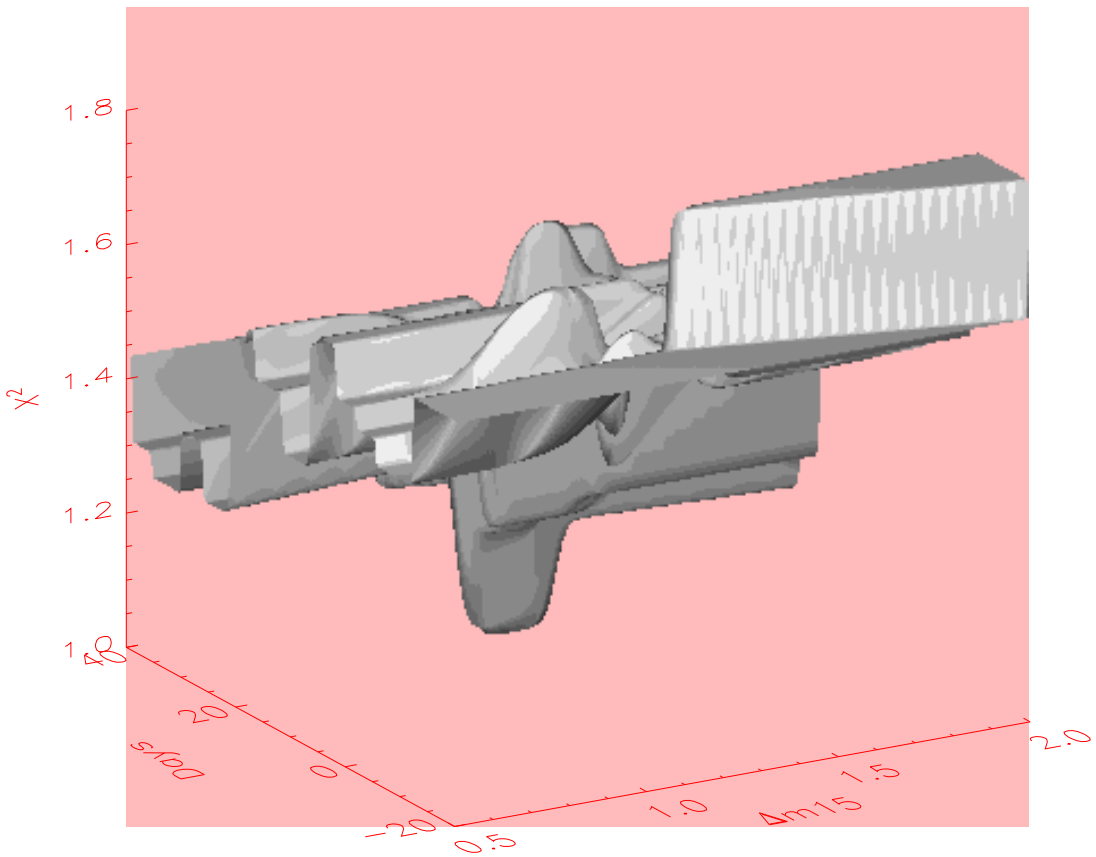

sn1992a.m05.dat.rect, z = 0.85000002
Calesi2039.snonly_50AS5.fits Observed − Galaxy
Template Spectrum Av = -4.2857282
Galaxy
SN/Gal = 0.270605
Mg II, I
[O II]
Co II
[O III]
2.0
1.5
1.0
0.5
0.0
−0.5
5000
6000
7000
8000
9000


sn1989b.m07.dat.rect, z = 0.94800001
Calesi2039.snonly_50AS5.fits Observed − Galaxy
Template Spectrum Av = −0.77722369
Galaxy
SN/Gal = 0.547917
Mg II, I
[O II]
Ca II
1.5
1.0
0.5
0.0
−0.5
5000
6000
7000
8000
9000

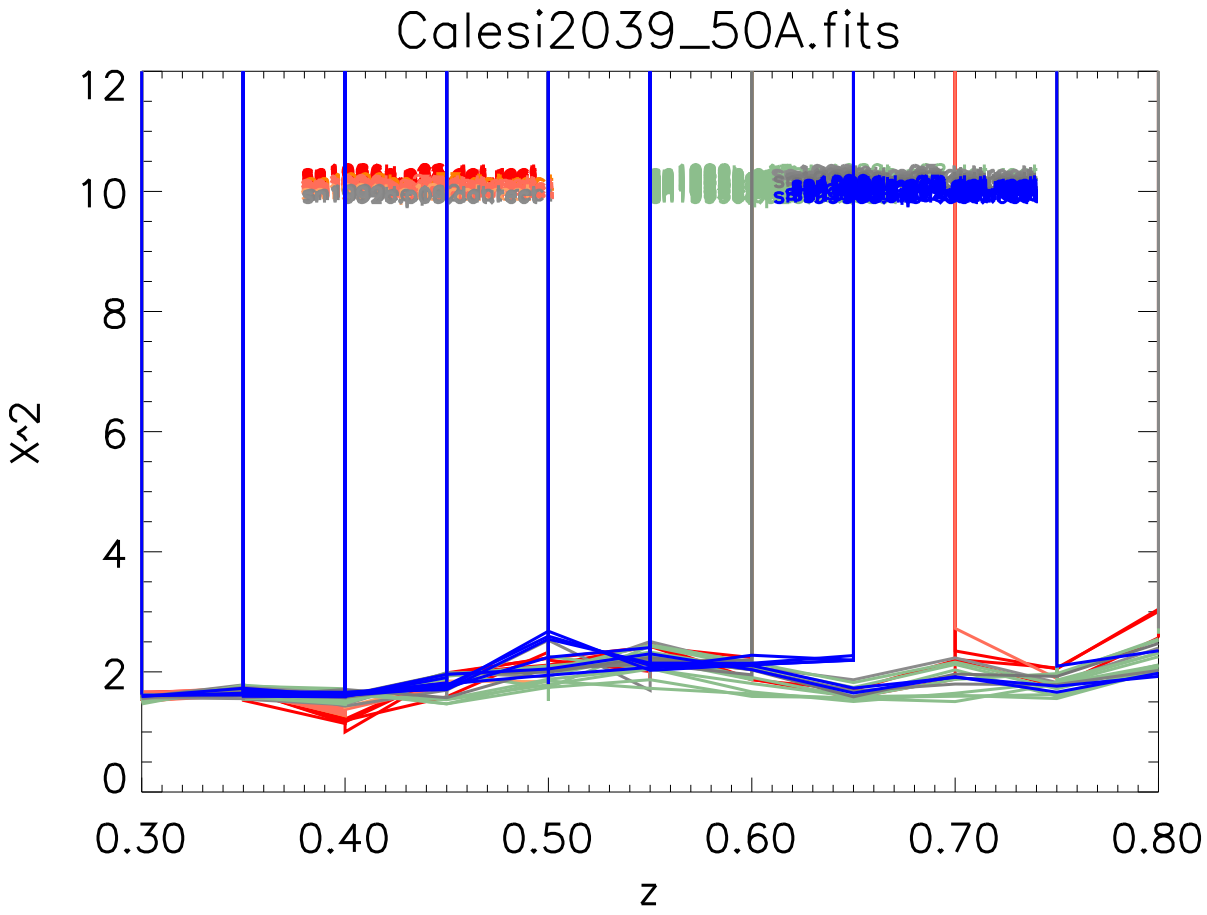

sn1991t.m07.dat.rect, z = 0.85200000
Calesi2039.snonly_50AS5.fits Observed − Galaxy
Template Spectrum Av = −0.63589288
Galaxy
SN/Gal = 0.365516
Mg II, I
[O II]
Ca II
[O III]
2.0
1.5
1.0
0.5
0.0
−0.5
5000
6000
7000
8000
9000

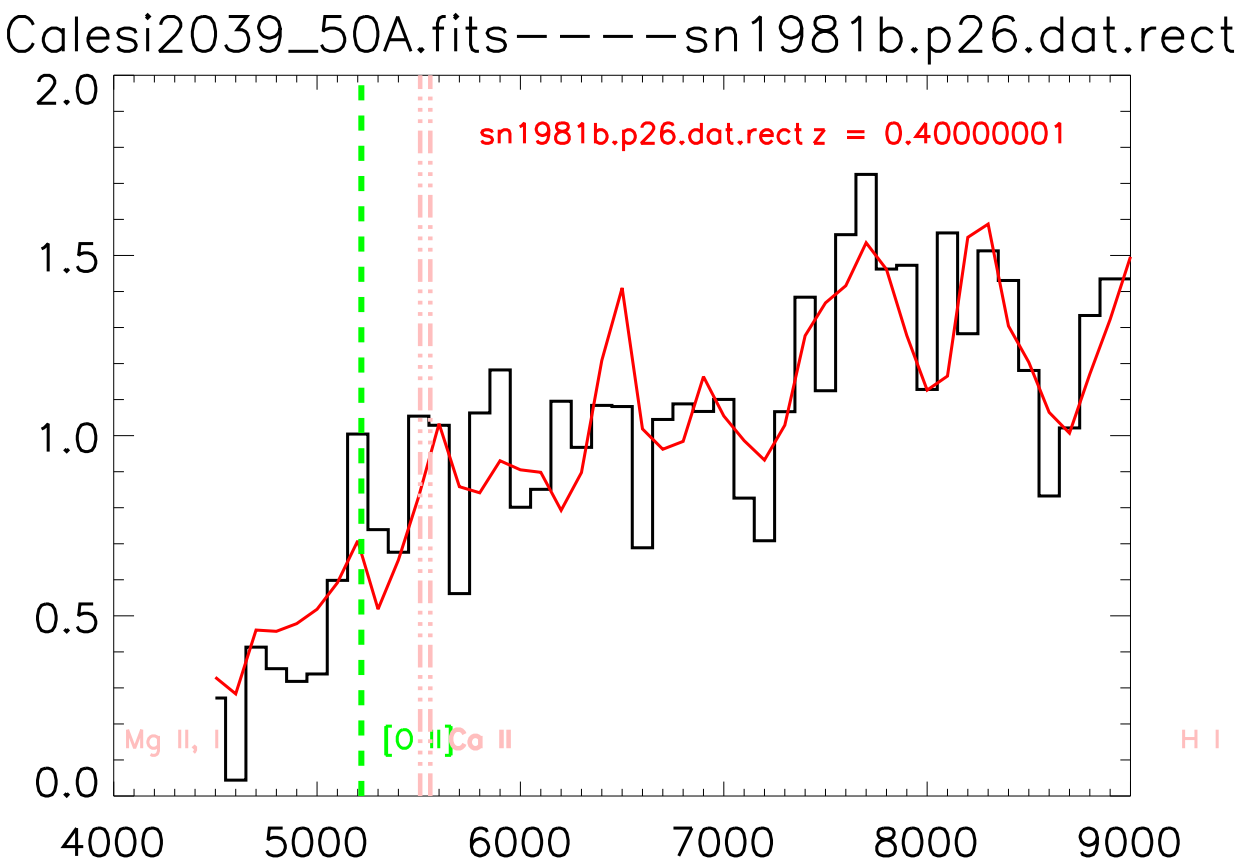

sn1991t.m00.dat.rect, z = 0.86400002
Calesi2039.snonly_50AS5.fits Observed − Galaxy
Template Spectrum Av = −4.3804157
Galaxy
SN/Gal = 0.289930
Mg II, I
[O II]
Ca II
[O III]
2.0
1.5
1.0
0.5
0.0
−0.5
5000
6000
7000
8000
9000

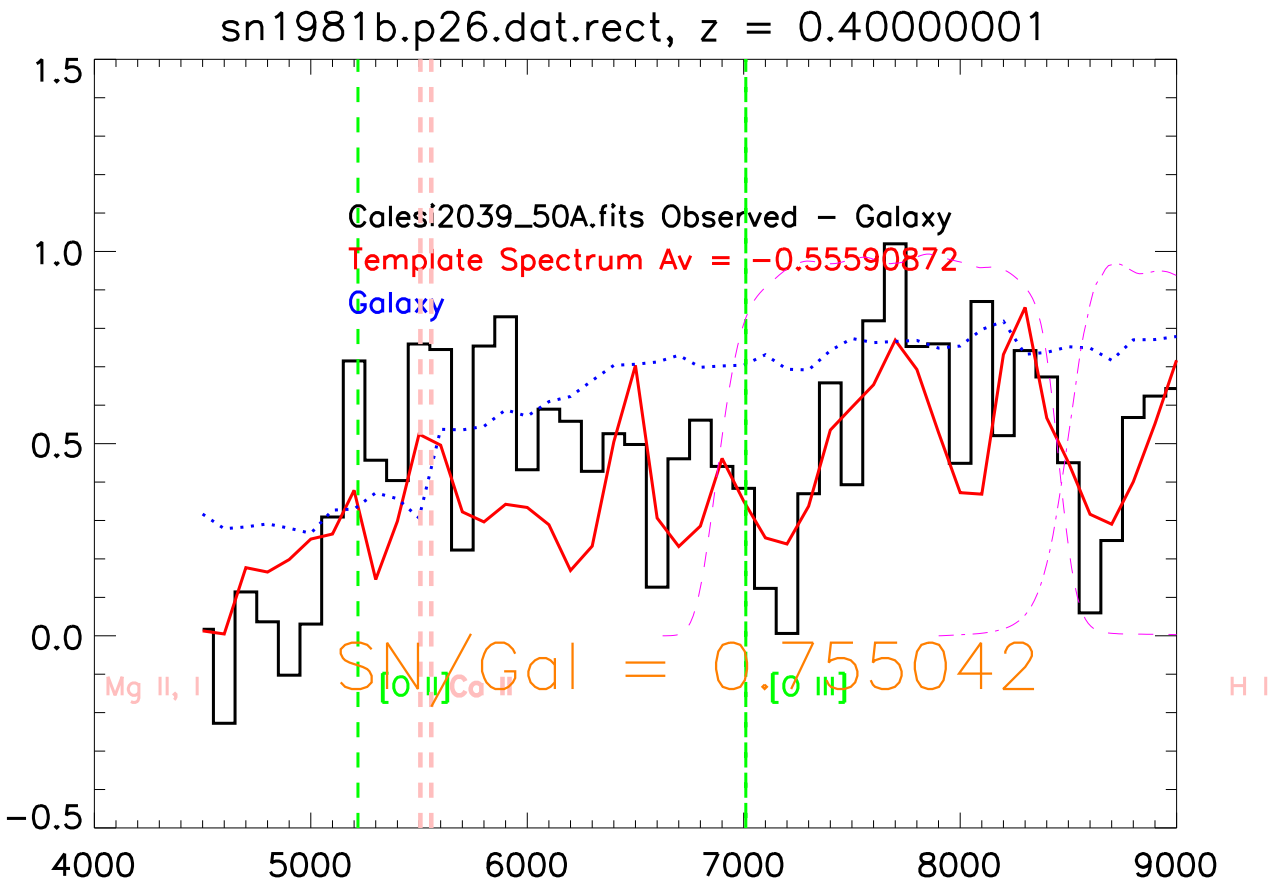


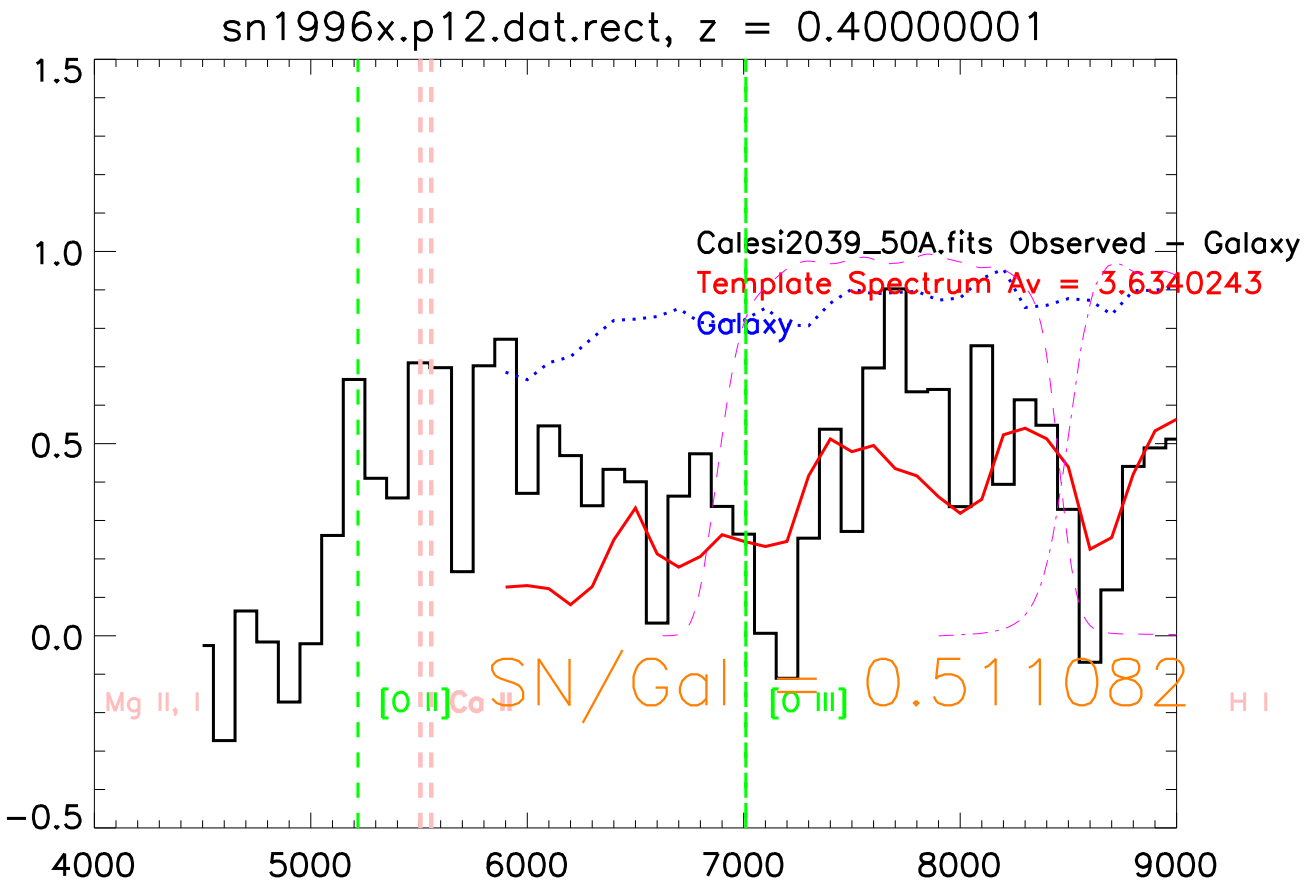


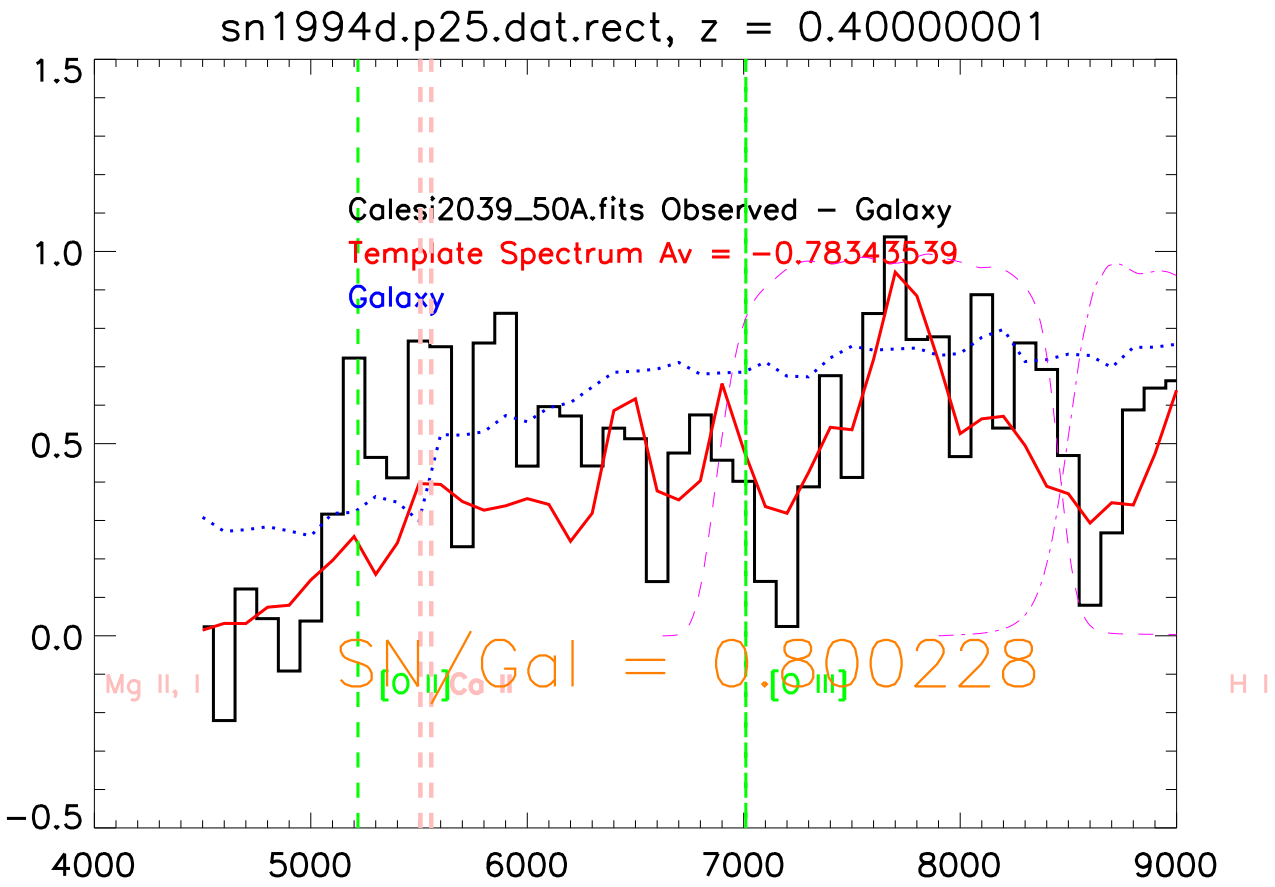
1.8
1.6
1.4
1.2
1.0
χ^2
40
20
0
−20
Days
0.5
1.0
1.5
2.0
Δm15

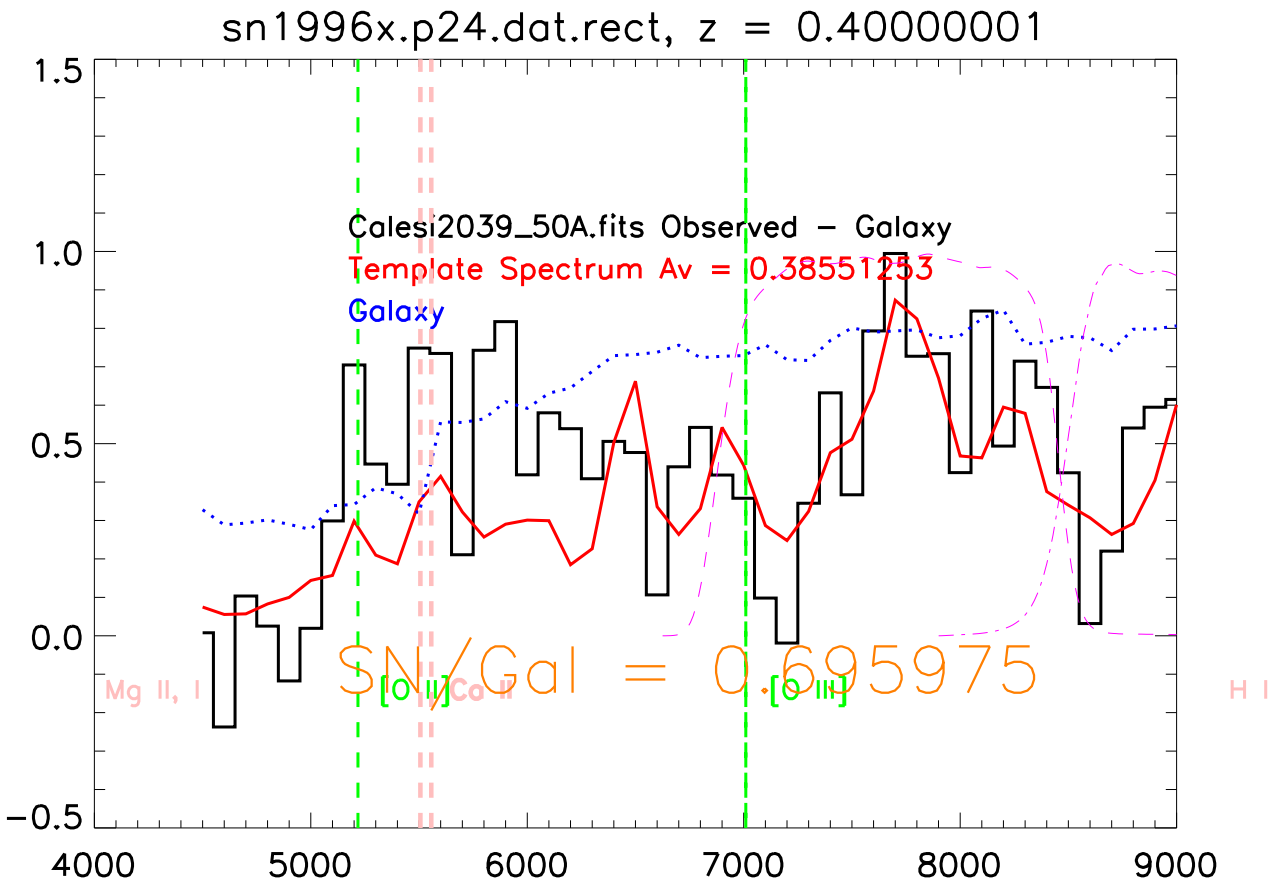

Calesi2039_50A.fits
12
10
8
6
4
2
0
X^2
0.30
0.40
0.50
0.60
0.70
0.80
z

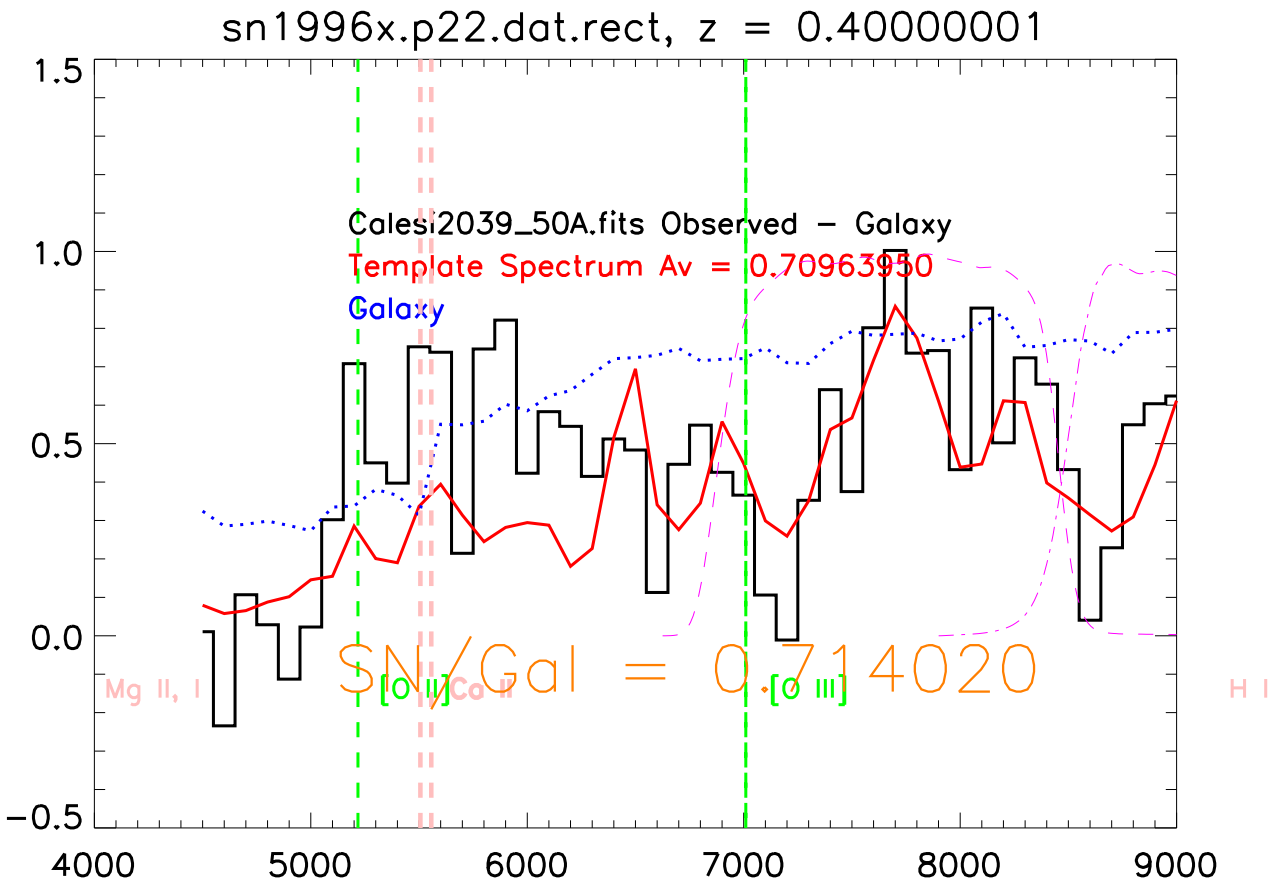

Calesi2039_50A.fits----sn1981b.p26.dat.rect
sn1981b.p26.dat.rect z = 0.40000001
Mg II, I
[O II]
Ca II
H I
2.0
1.5
1.0
0.5
0.0
4000
5000
6000
7000
8000
9000

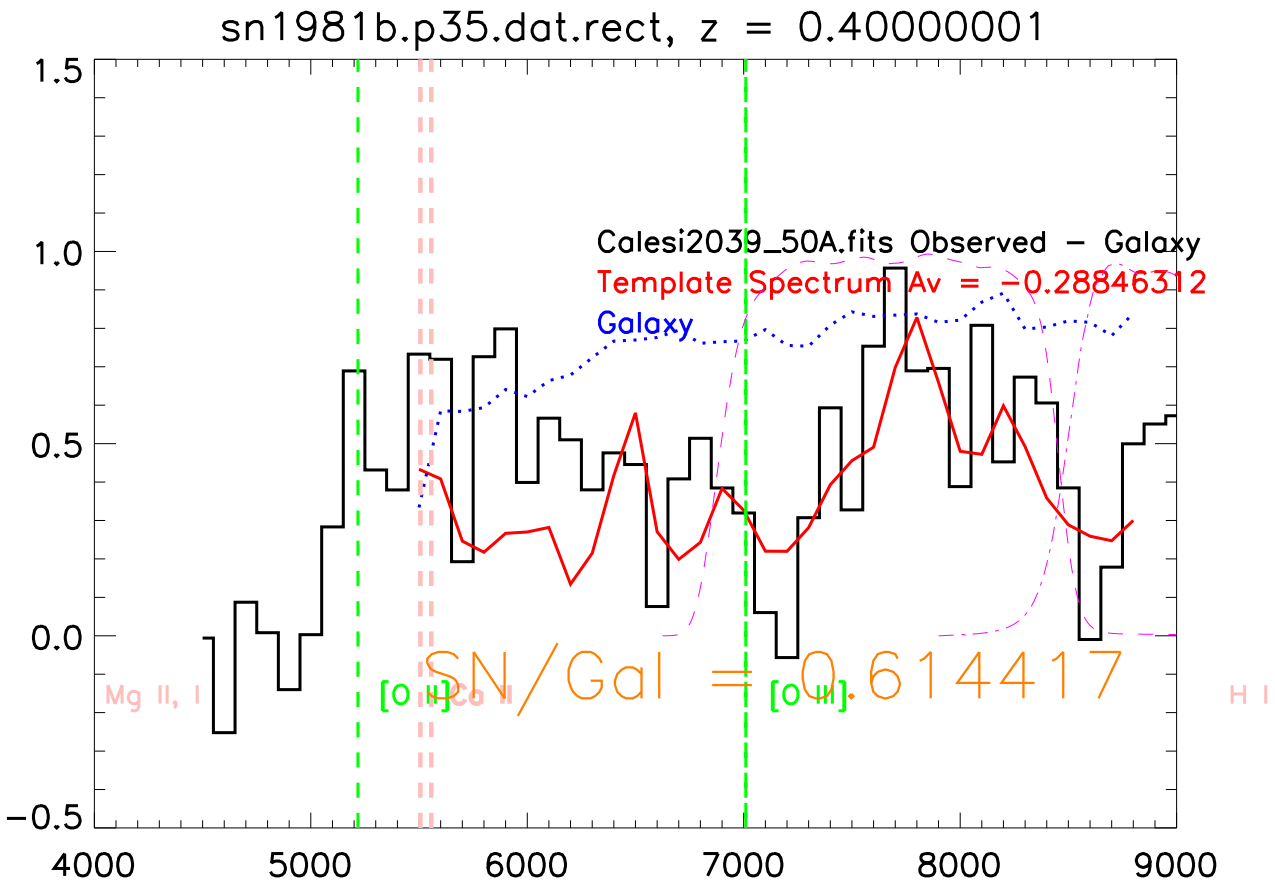

sn1981b.p26.dat.rect, z = 0.40000001
Cales!2039_50A.fits Observed − Galaxy
Template Spectrum Av = −0.55590872
Galaxy
S/N/Gal = 0.755042
Mg II, I
[O II]
Ca II
[O III]
H I
1.5
1.0
0.5
0.0
−0.5
4000
5000
6000
7000
8000
9000

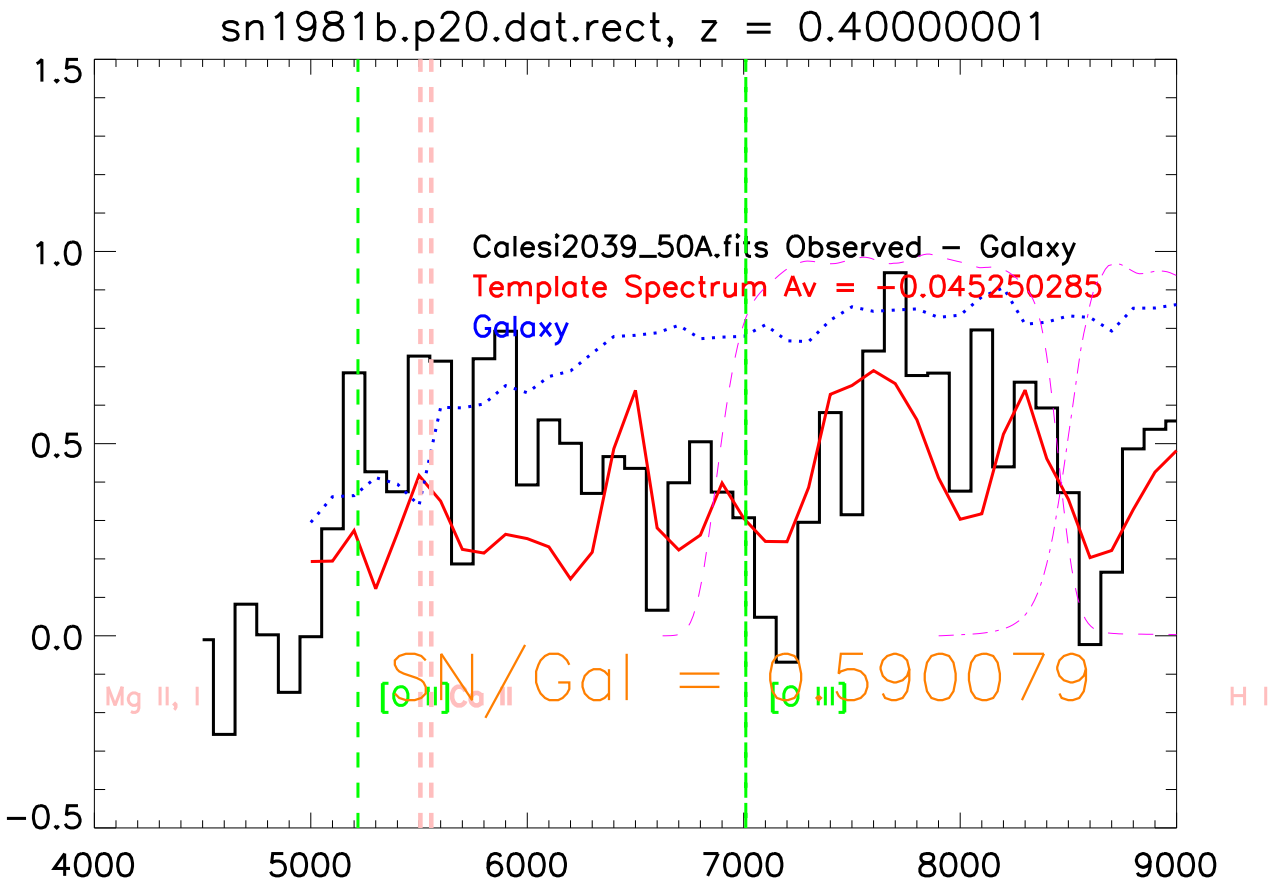

sn1996x.p12.dat.rect, z = 0.40000001
Calesi2039_50A.fits Observed – Galaxy
Template Spectrum Av = 3.6340243
Galaxy
SN/Gal = 0.511082
Mg II, I
[O II]
Ca II
[O III]
H I
1.5
1.0
0.5
0.0
−0.5
4000
5000
6000
7000
8000
9000

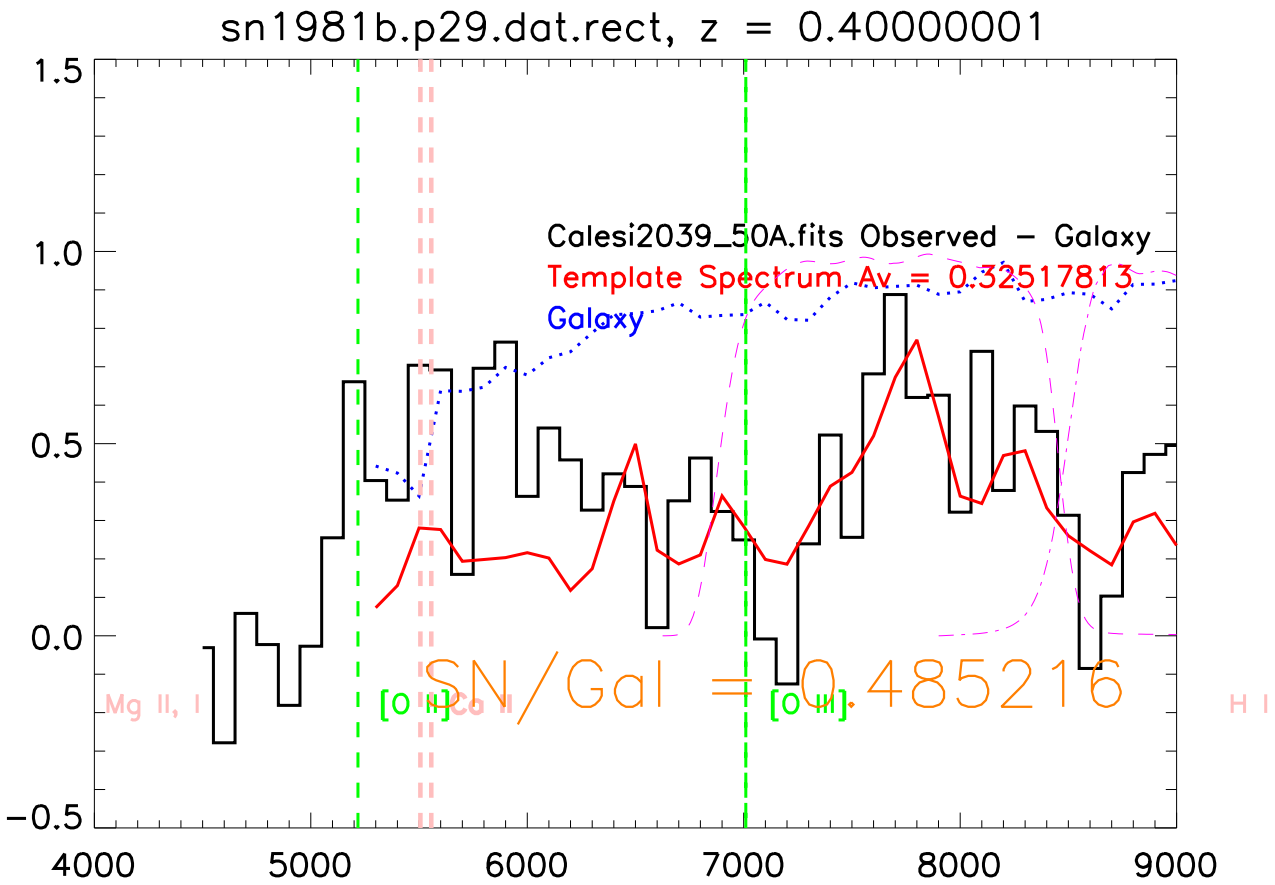

sn1994d.p25.dat.rect, z = 0.40000001
Calesi2039_50A.fits Observed − Galaxy
Template Spectrum Av = −0.78343539
Galaxy
S/N/Gal = 0.800228
Mg II, I
[O II]
Ca II
[O III]
H I
1.5
1.0
0.5
0.0
−0.5
4000
5000
6000
7000
8000
9000

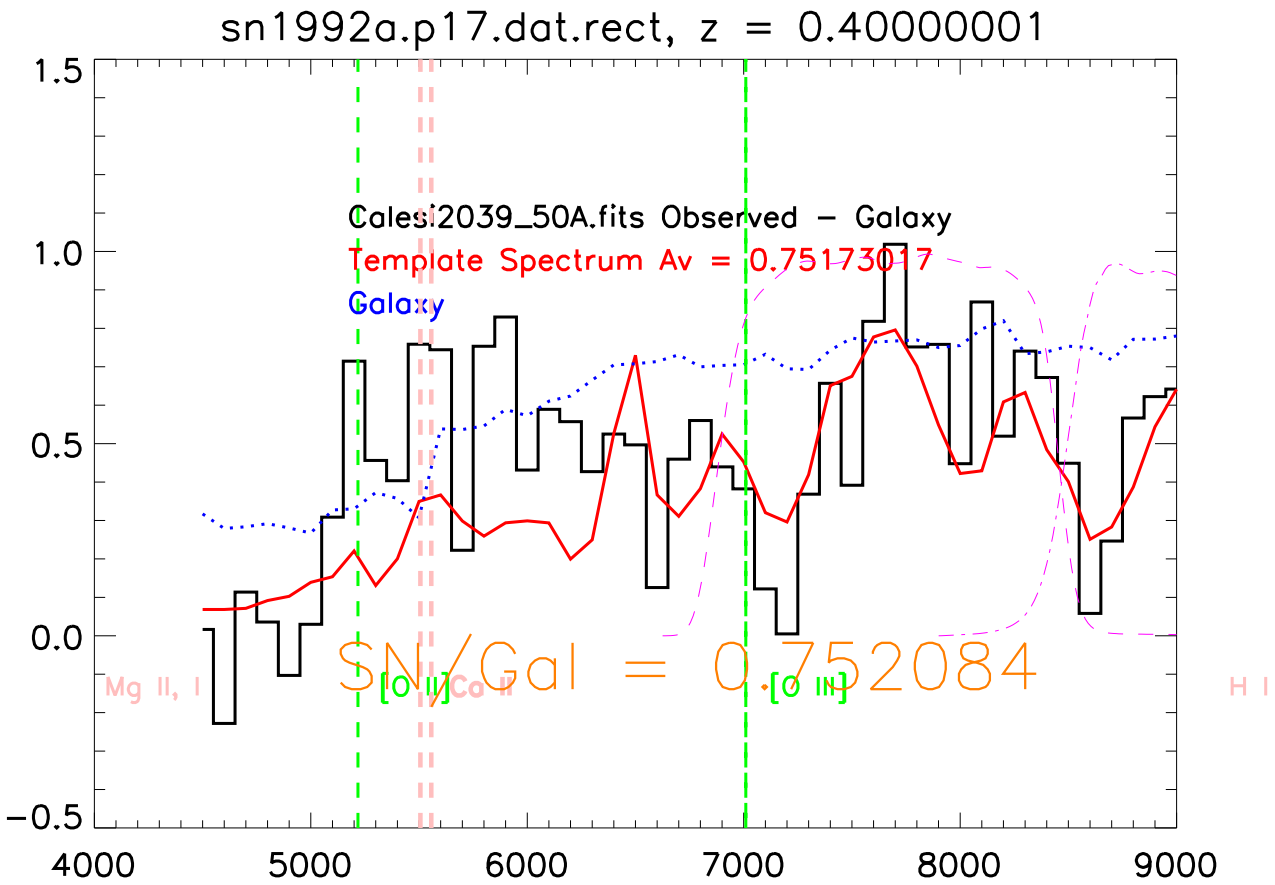

sn1996x.p24.dat.rect, z = 0.40000001
Calesi2039_50A.fits Observed − Galaxy
Template Spectrum Av = 0.38551253
Galaxy
SN/Gal = 0.695975
Mg II, I
[O II]
Ca II
[O III]
H I
1.5
1.0
0.5
0.0
−0.5
4000
5000
6000
7000
8000
9000

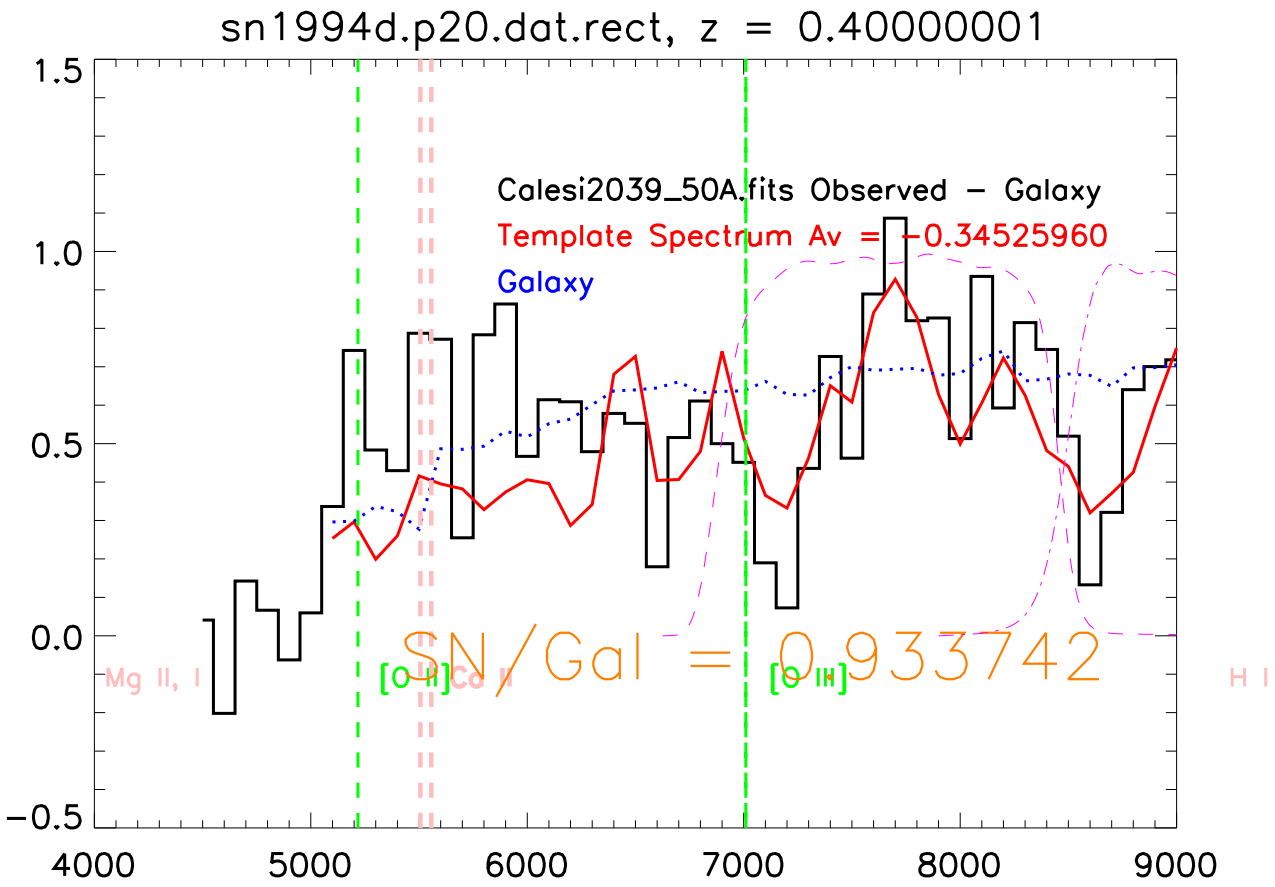

sn1996x.p22.dat.rect, z = 0.40000001
Calesi2039_50A.fits Observed − Galaxy
Template Spectrum Av = 0.70963950
Galaxy
SN/Gal = 0.714020
Mg II, I
[O II]
Ca II
[O III]
H I
1.5
1.0
0.5
0.0
−0.5
4000
5000
6000
7000
8000
9000

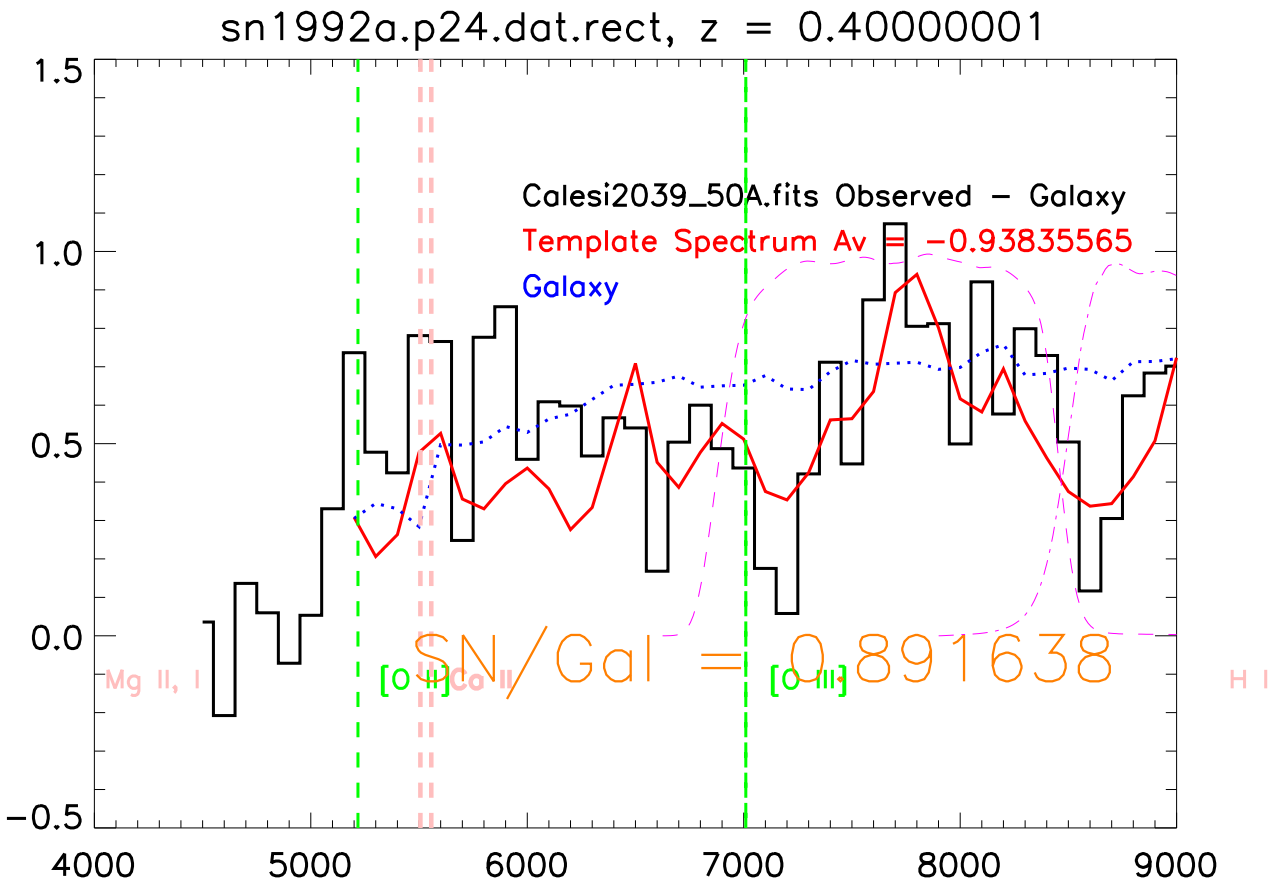

sn1981b.p35.dat.rect, z = 0.40000001
Calesi2039_50A.fits Observed − Galaxy
Template Spectrum Av = −0.28846312
Galaxy
SN/Gal = 0.614417
[O II]
[O III]
Mg II, I
H I
1.5
1.0
0.5
0.0
−0.5
4000
5000
6000
7000
8000
9000

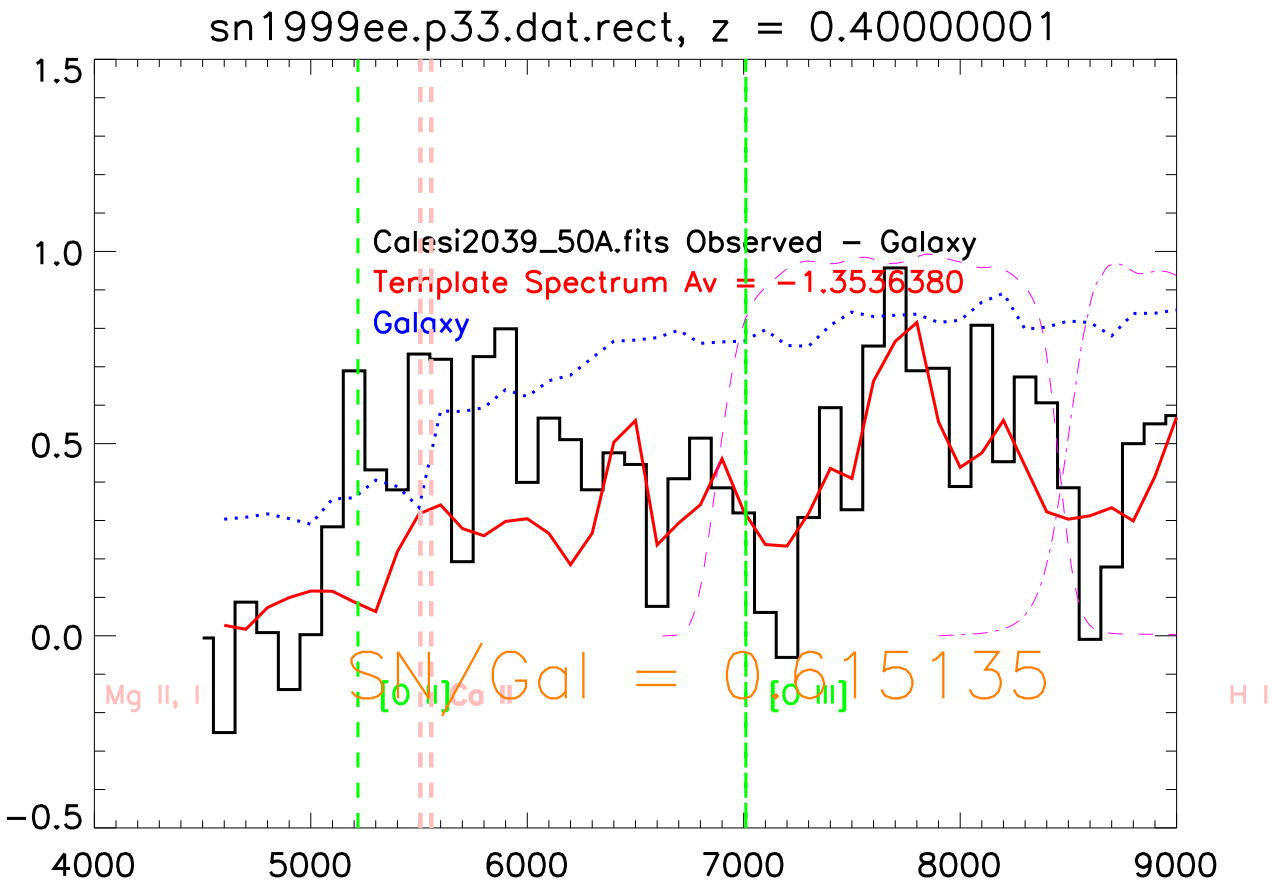

sn1981b.p20.dat.rect, z = 0.40000001
Calesi2039_50A.fits Observed − Galaxy
Template Spectrum Av = −0.045250285
Galaxy
SN/Gal = 0.590079
Mg II, I
[O II]
Ca II
[O III]
H I
1.5
1.0
0.5
0.0
−0.5
4000
5000
6000
7000
8000
9000

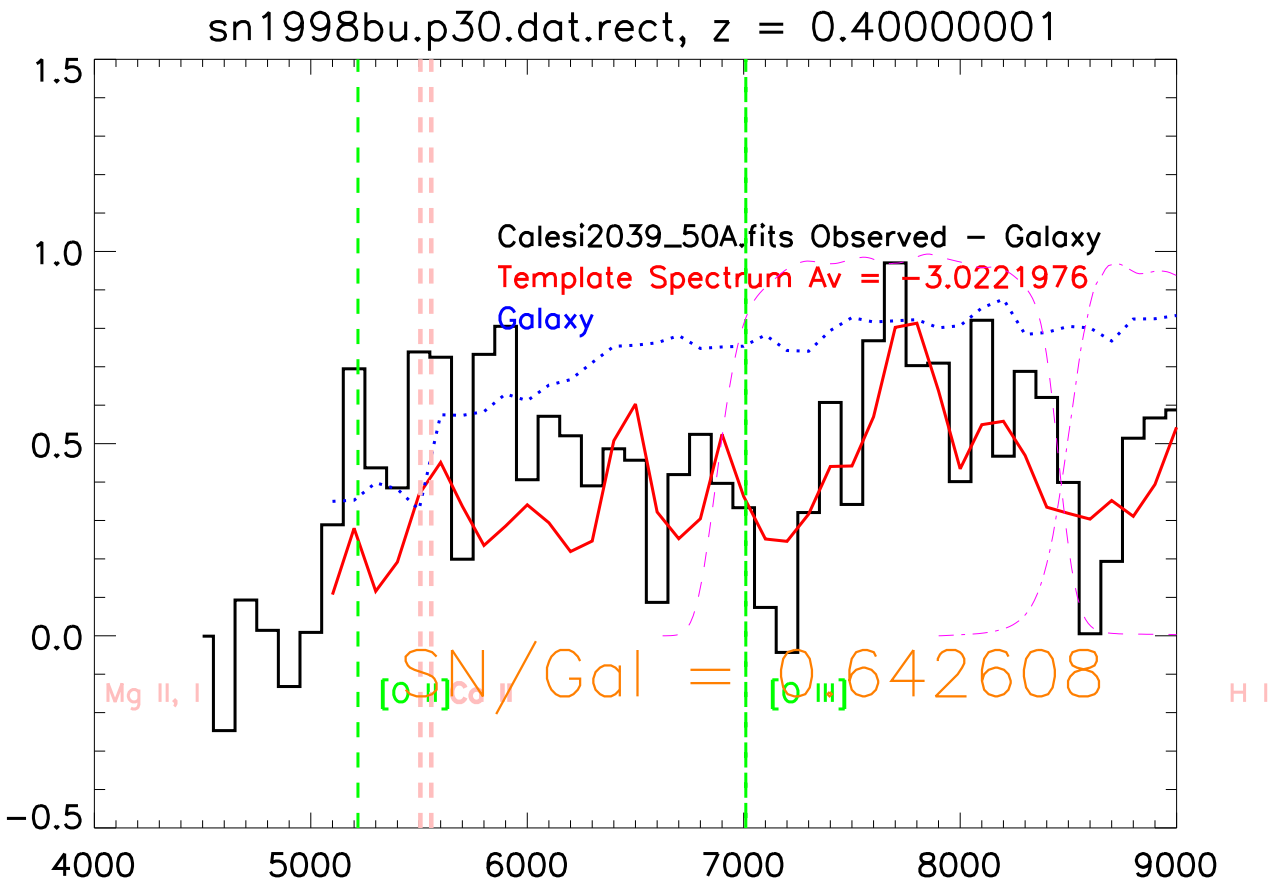

sn1981b.p29.dat.rect, z = 0.40000001
Calesi2039_50A.fits Observed − Galaxy
Template Spectrum Av. = 0.32517813
Galaxy
SN/Gal = 0.485216
Mg II, I
[O II]
Ca II
[O III]
H I
1.5
1.0
0.5
0.0
−0.5
4000
5000
6000
7000
8000
9000

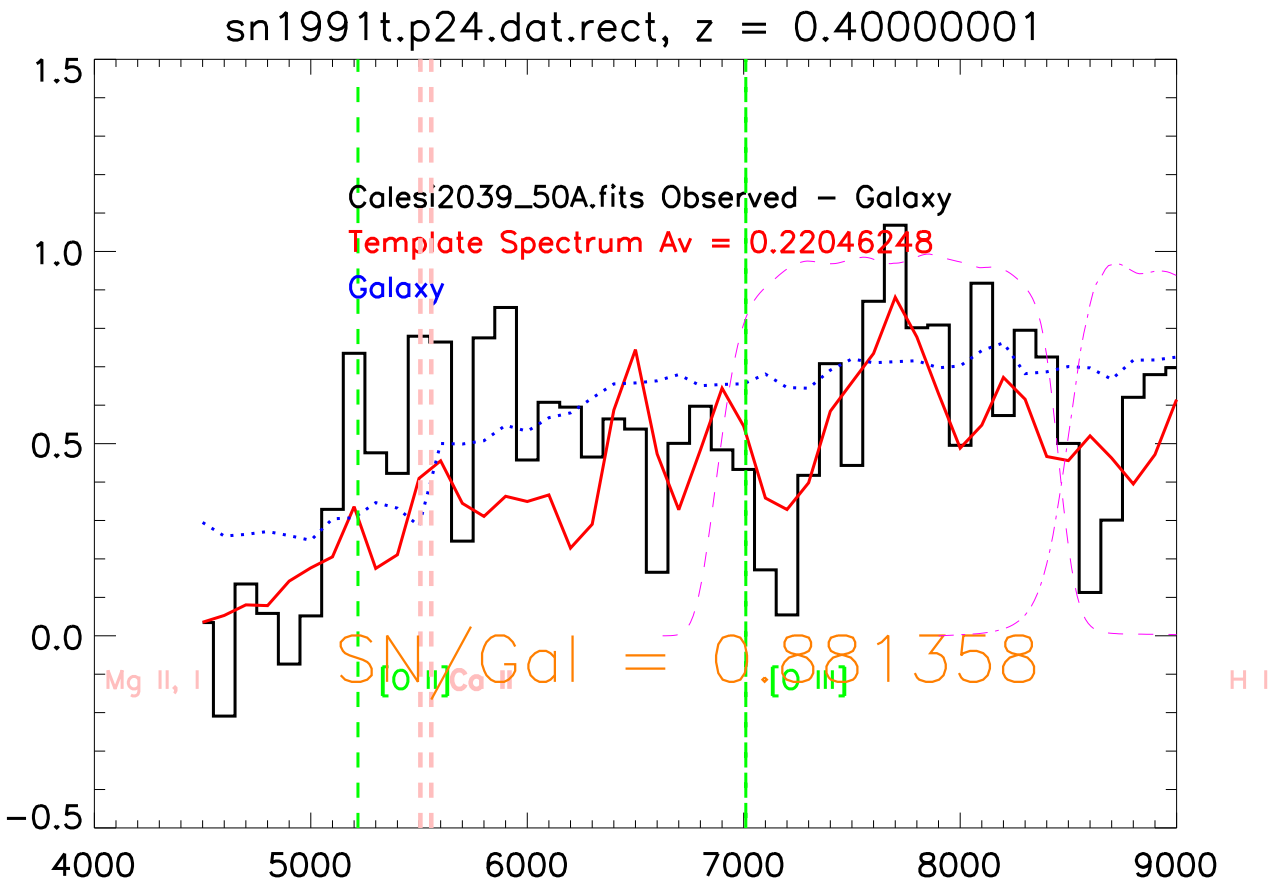

sn1992a.p17.dat.rect, z = 0.40000001
Cales2039_50A.fits Observed − Galaxy
Template Spectrum Av = 0.75173017
Galaxy
S/N/Gal = 0.752084
Mg II, I
[O II]
Ca II
[O III]
H I
1.5
1.0
0.5
0.0
−0.5
4000
5000
6000
7000
8000
9000

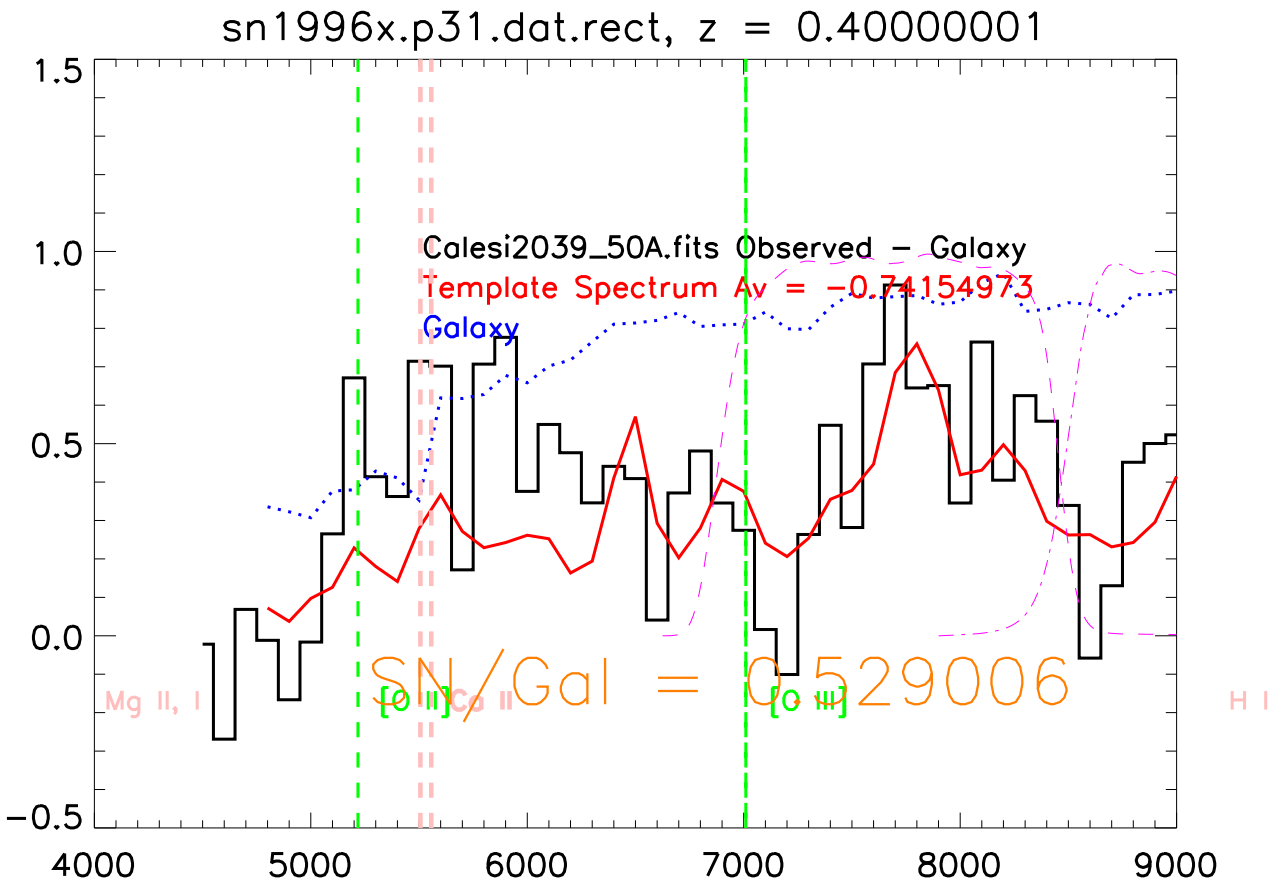

sn1994d.p20.dat.rect, z = 0.40000001
Calesi2039_50A.fits Observed − Galaxy
Template Spectrum Av = −0.34525960
Galaxy
SN/Gal = 0.933742
Mg II, I
[O II]
Ca II
[O III]
H I
1.5
1.0
0.5
0.0
−0.5
4000
5000
6000
7000
8000
9000

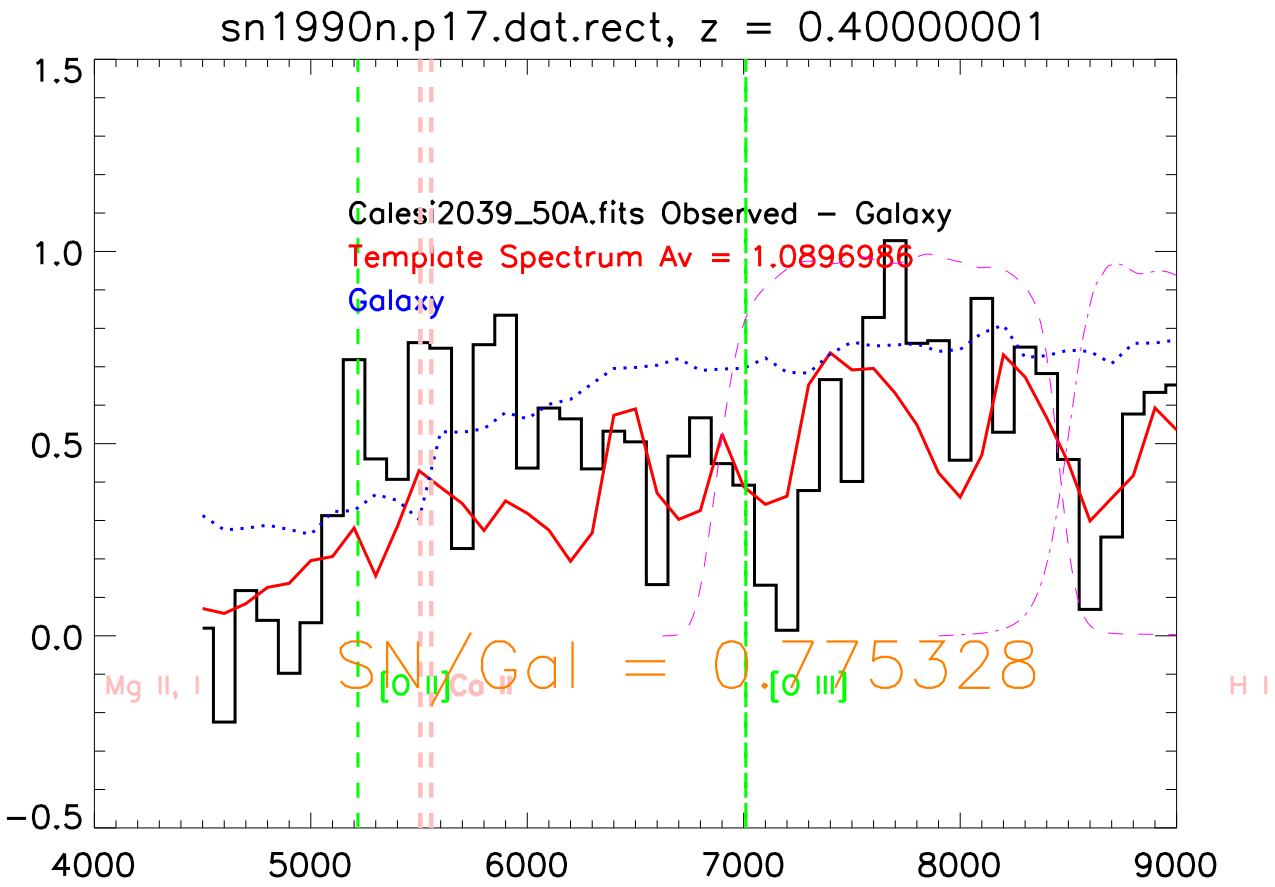

sn1992a.p24.dat.rect, z = 0.40000001
Calesi2039_50A.fits Observed − Galaxy
Template Spectrum Av = −0.93835565
Galaxy
SN/Gal = 0.891638
Mg II, I
[O II]
Ca II
[O III]
H I
1.5
1.0
0.5
0.0
−0.5
4000
5000
6000
7000
8000
9000

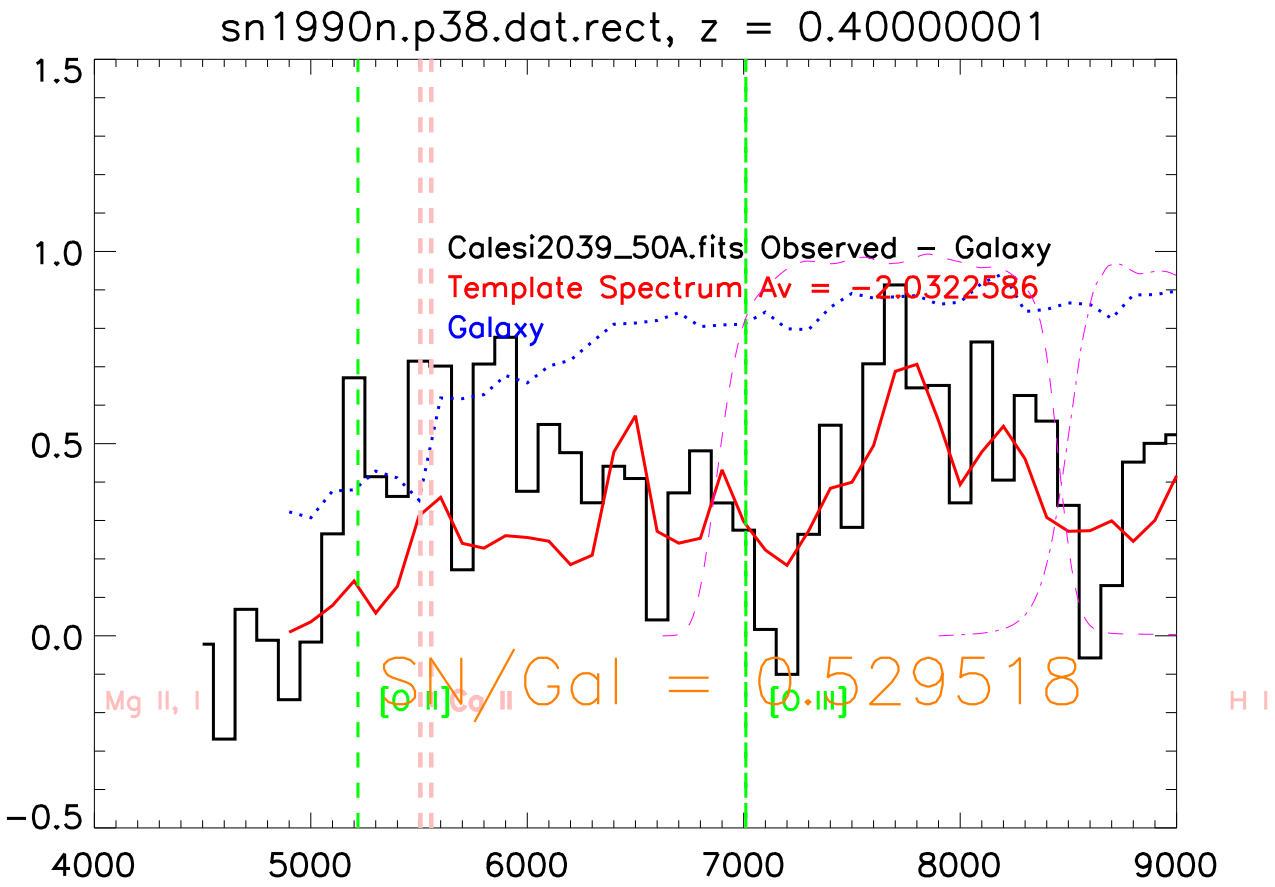

sn1999ee.p33.dat.rect, z = 0.40000001
Calsi2039_50A.fits Observed − Galaxy
Template Spectrum Av = −1.3536380
Galaxy
SN/Gal = 0.6615135
Mg II, I
[O II]
Ca II
[O III]
H I
1.5
1.0
0.5
0.0
−0.5
4000
5000
6000
7000
8000
9000

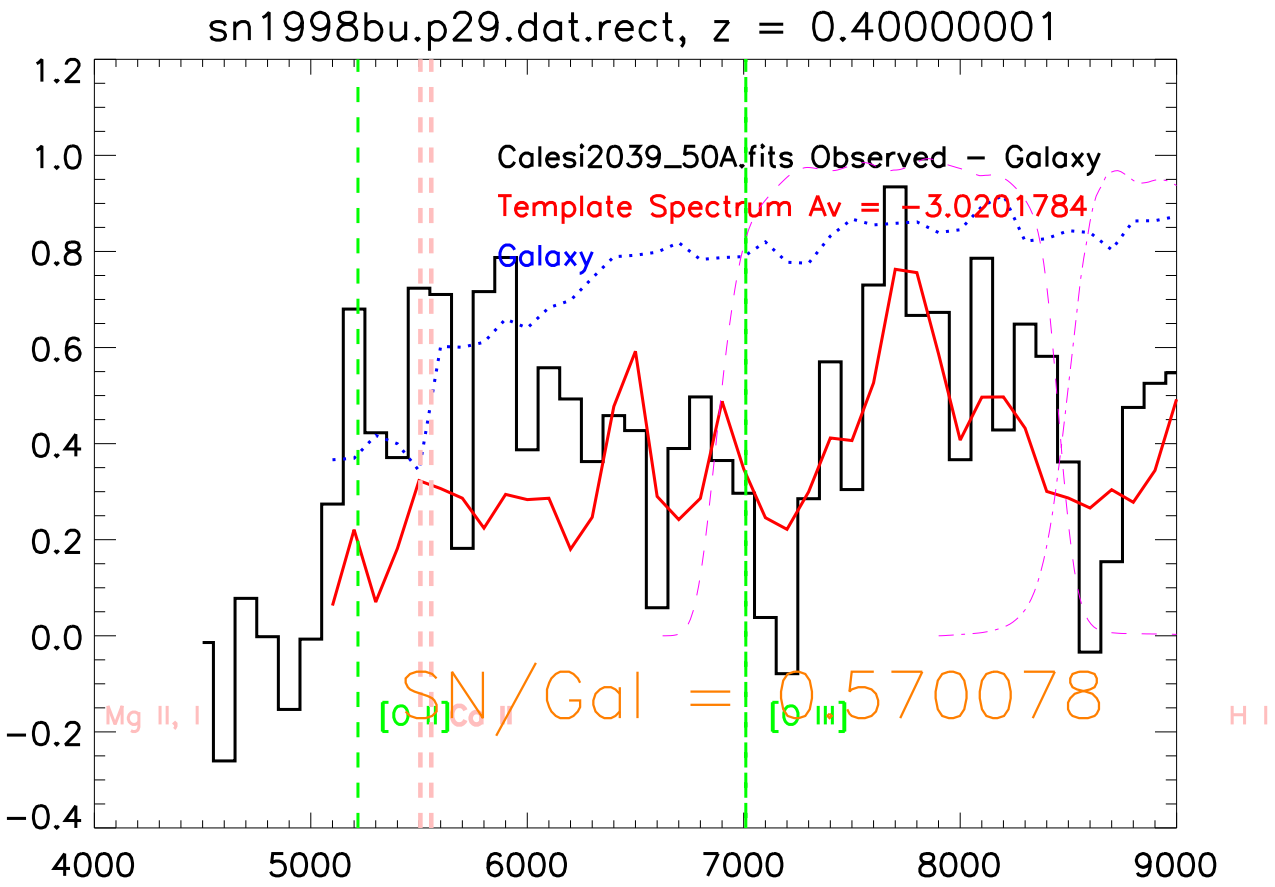

sn1998bu.p30.dat.rect, z = 0.40000001
Calesi2039_50A.fits Observed − Galaxy
Template Spectrum Av = −3.0221976
Galaxy
SN/Gal = 0.642608
Mg II, I
[O II]
Ca II
[O III]
H I
1.5
1.0
0.5
0.0
−0.5
4000
5000
6000
7000
8000
9000

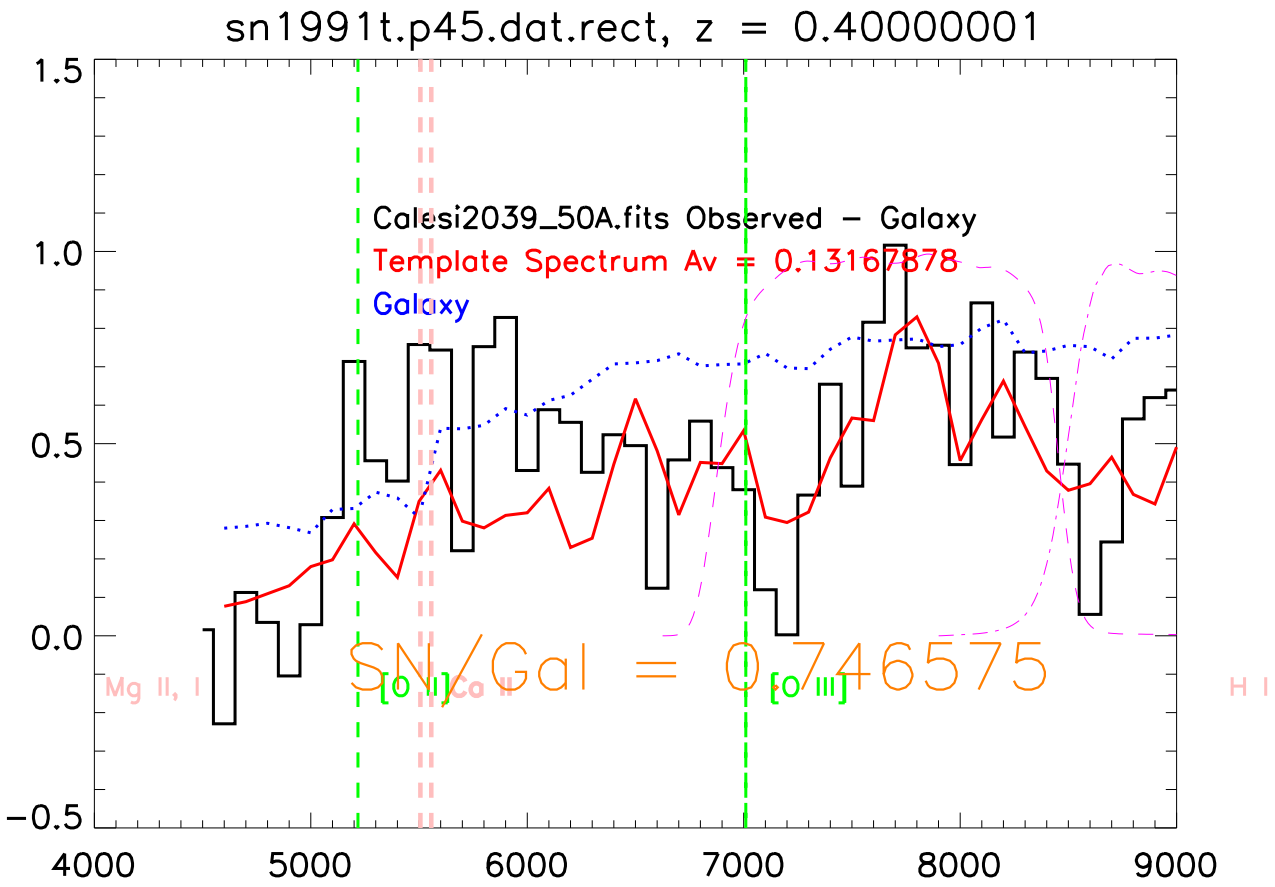

sn1991t.p24.dat.rect, z = 0.40000001
Calesi2039_50A.fits Observed − Galaxy
Template Spectrum Av = 0.22046248
Galaxy
SN/Gal = 0.881358
Mg II, I
[O II]
Ca II
[O III]
H I
1.5
1.0
0.5
0.0
−0.5
4000
5000
6000
7000
8000
9000

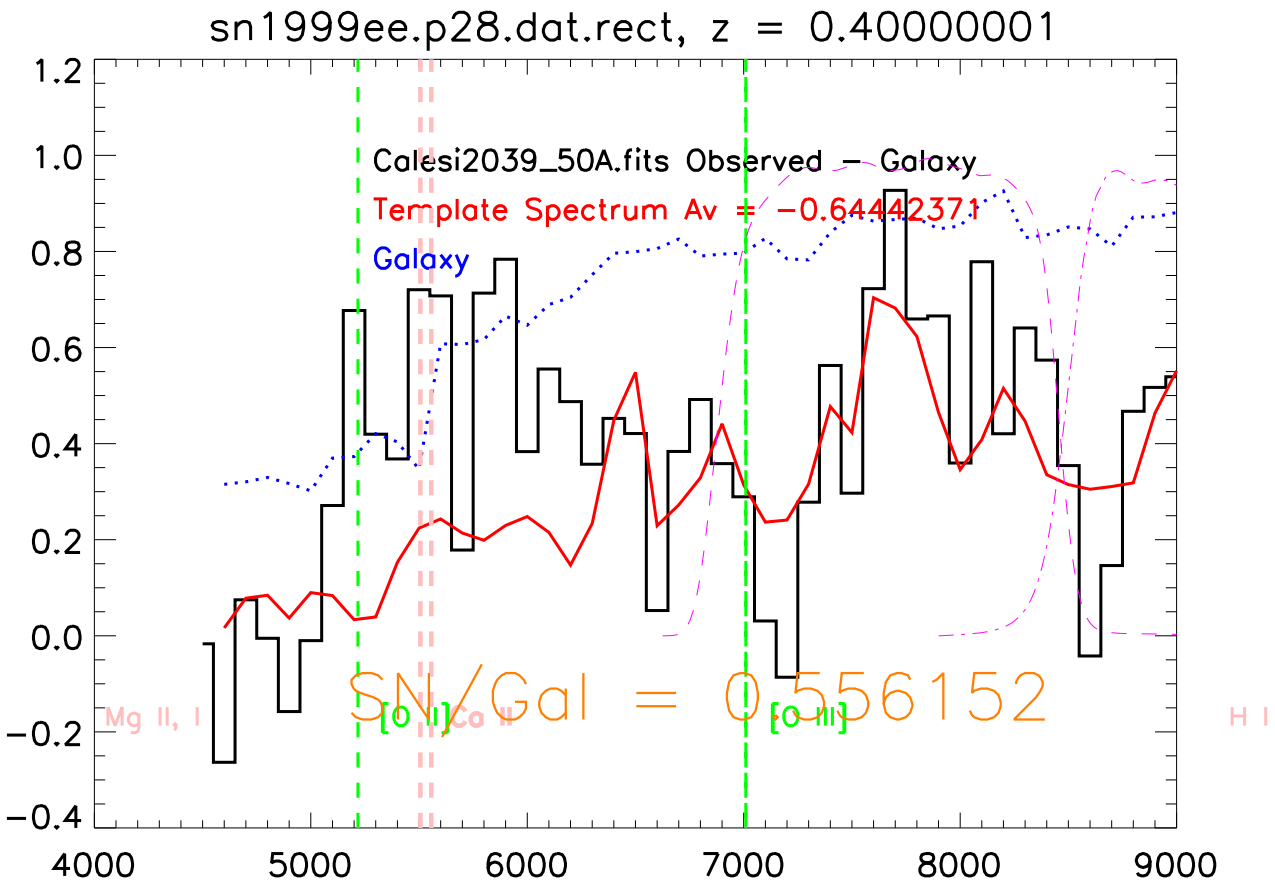

sn1996x.p31.dat.rect, z = 0.40000001
Calesi2039_50A.fits Observed − Galaxy
Template Spectrum Av = −0.74154973
Galaxy
SN/Gal = G529006
Mg II, I
[O II]
Ca II
[O III]
H I
1.5
1.0
0.5
0.0
−0.5
4000
5000
6000
7000
8000
9000

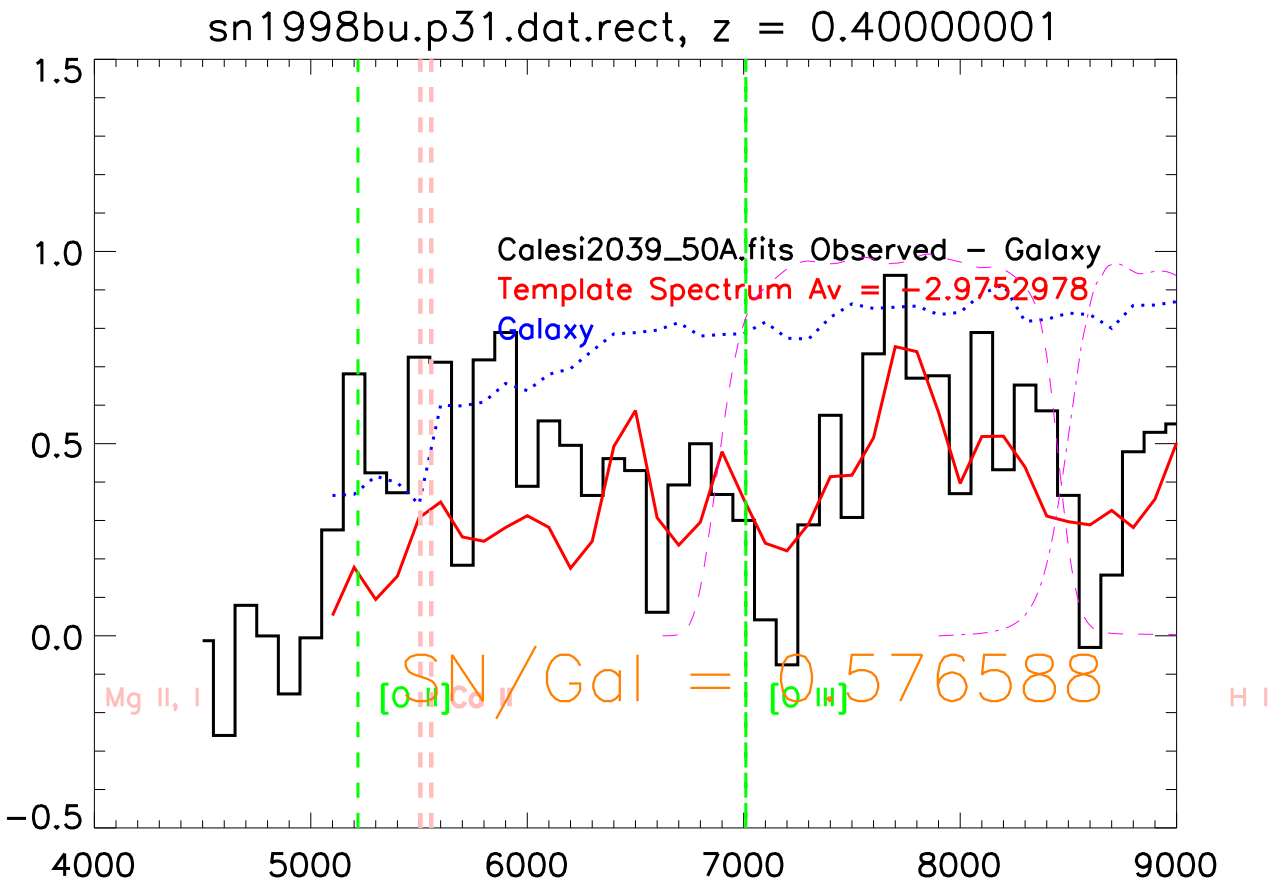

sn1990n.p17.dat.rect, z = 0.40000001
Calesi2039_50A.fits Observed − Galaxy
Template Spectrum Av = 1.0896986
Galaxy
S/N/Gal = 0.775328
Mg II, I
[O II]
Ca II
[O III]
H I
1.5
1.0
0.5
0.0
−0.5
4000
5000
6000
7000
8000
9000

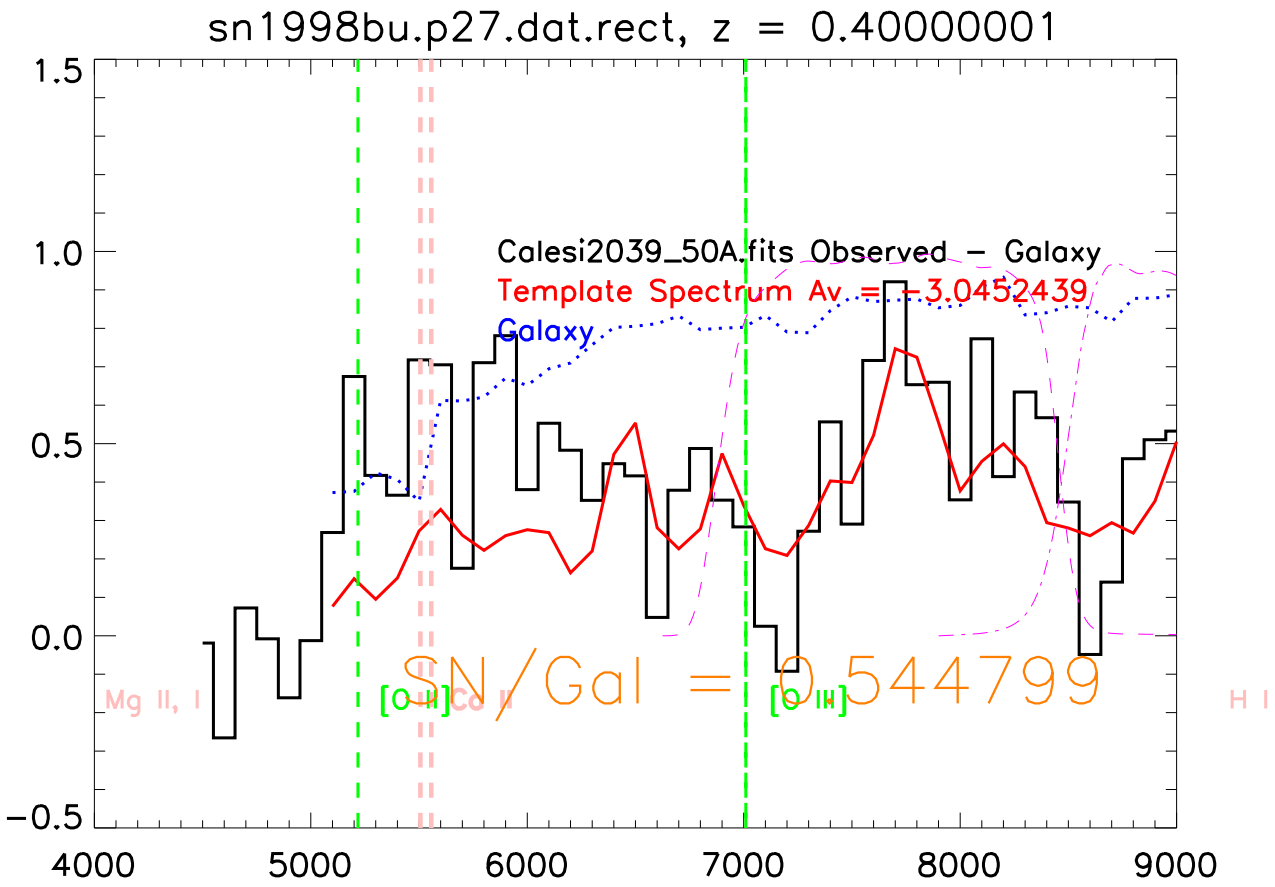

sn1990n.p38.dat.rect, z = 0.40000001
Calesi2039_50A.fits Observed - Galaxy
Template Spectrum Av = -2.0322586
Galaxy
SN/Gal = 0.529518
Mg II, I
[O II]
Ca II
[O III]
H I
1.5
1.0
0.5
0.0
−0.5
4000
5000
6000
7000
8000
9000

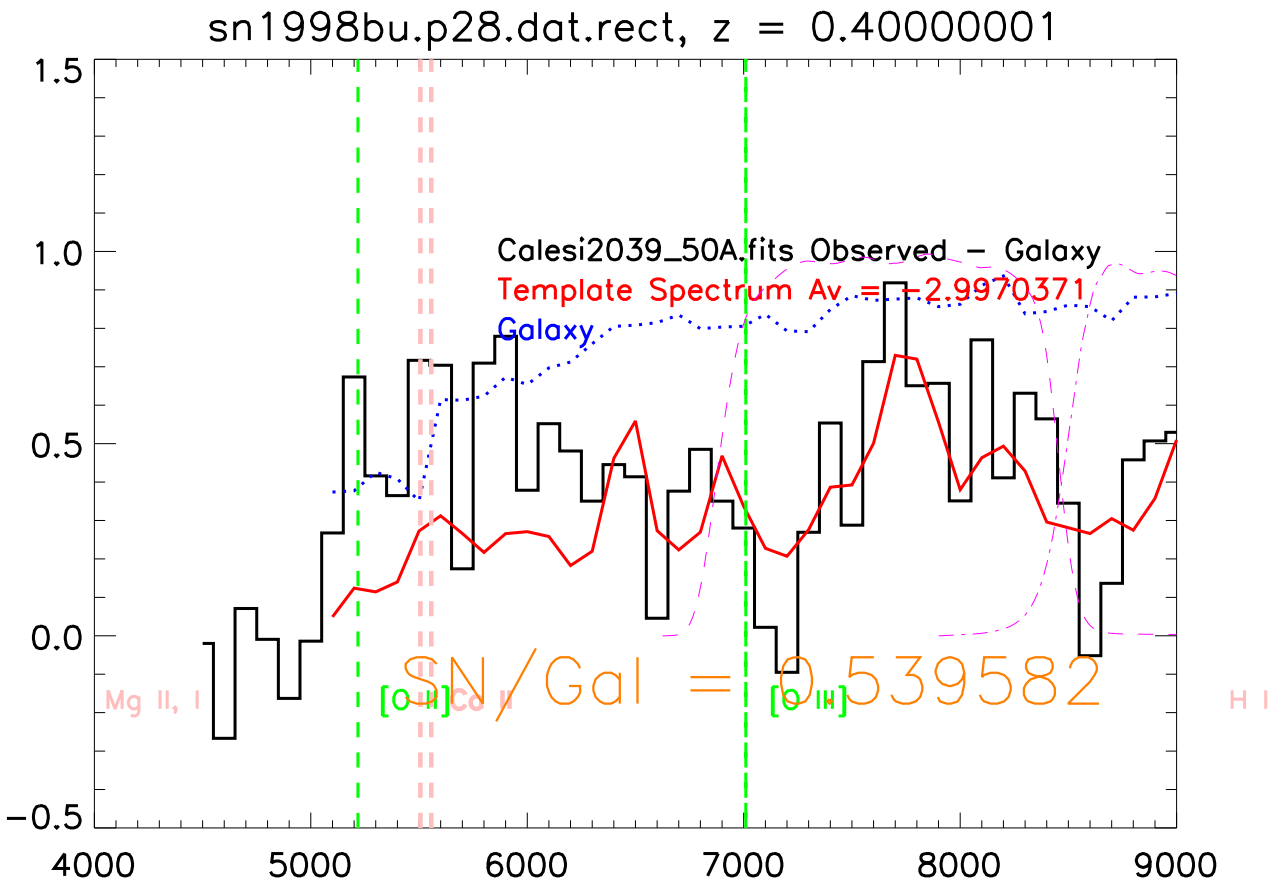

sn1998bu.p29.dat.rect, z = 0.40000001
Calesi2039_50A.fits Observed − Galaxy
Template Spectrum Av = −3.0201784
Galaxy
SN/Gal = 0.570078
Mg II, I
[O II]
Ca II
[O III]
H I
1.2
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
−0.4
4000
5000
6000
7000
8000
9000

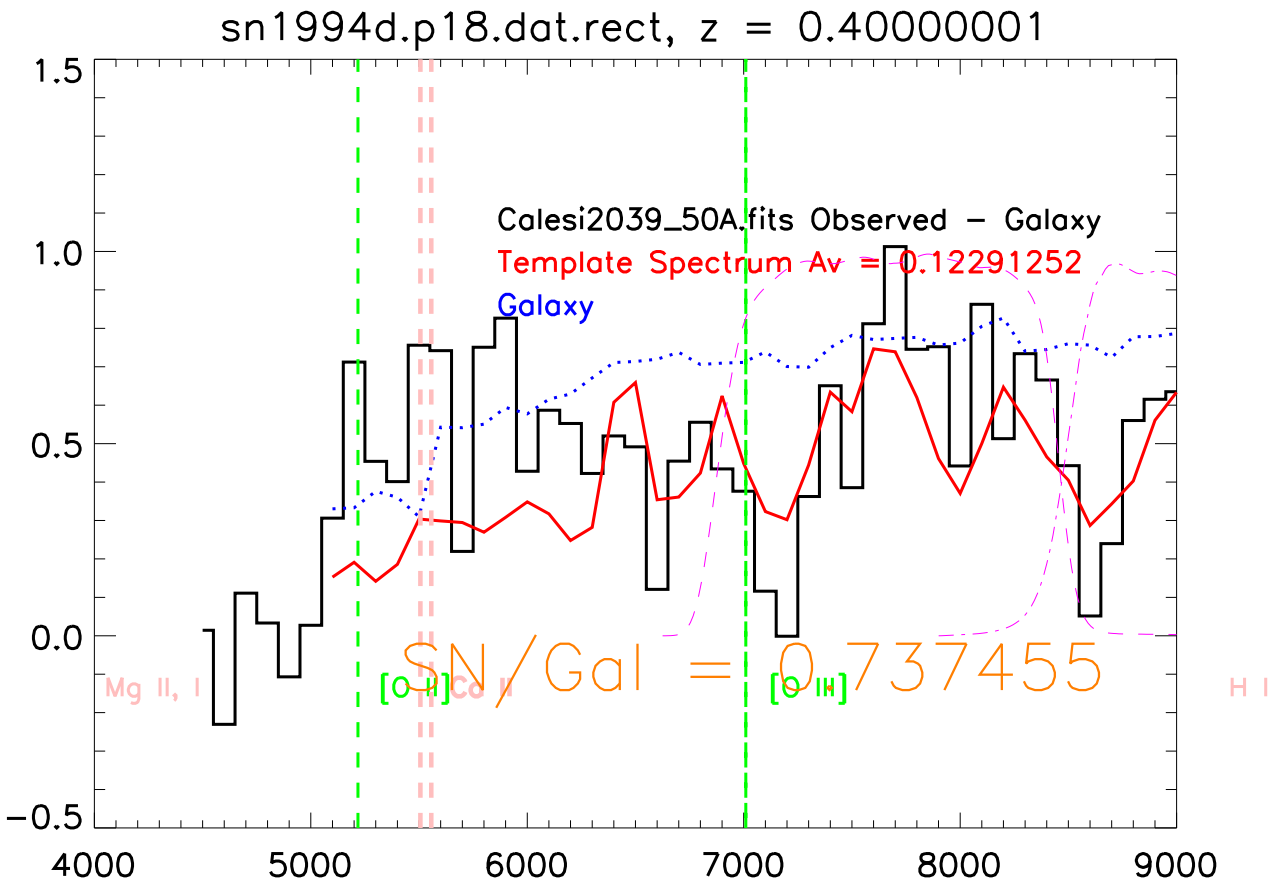

sn1991t.p45.dat.rect, z = 0.40000001
Calesi2039_50A.fits Observed − Galaxy
Template Spectrum Av = 0.13167878
Galaxy
SN/Gal = 0.746575
Mg II, I
[O II]
Ca II
[O III]
H I
1.5
1.0
0.5
0.0
−0.5
4000
5000
6000
7000
8000
9000

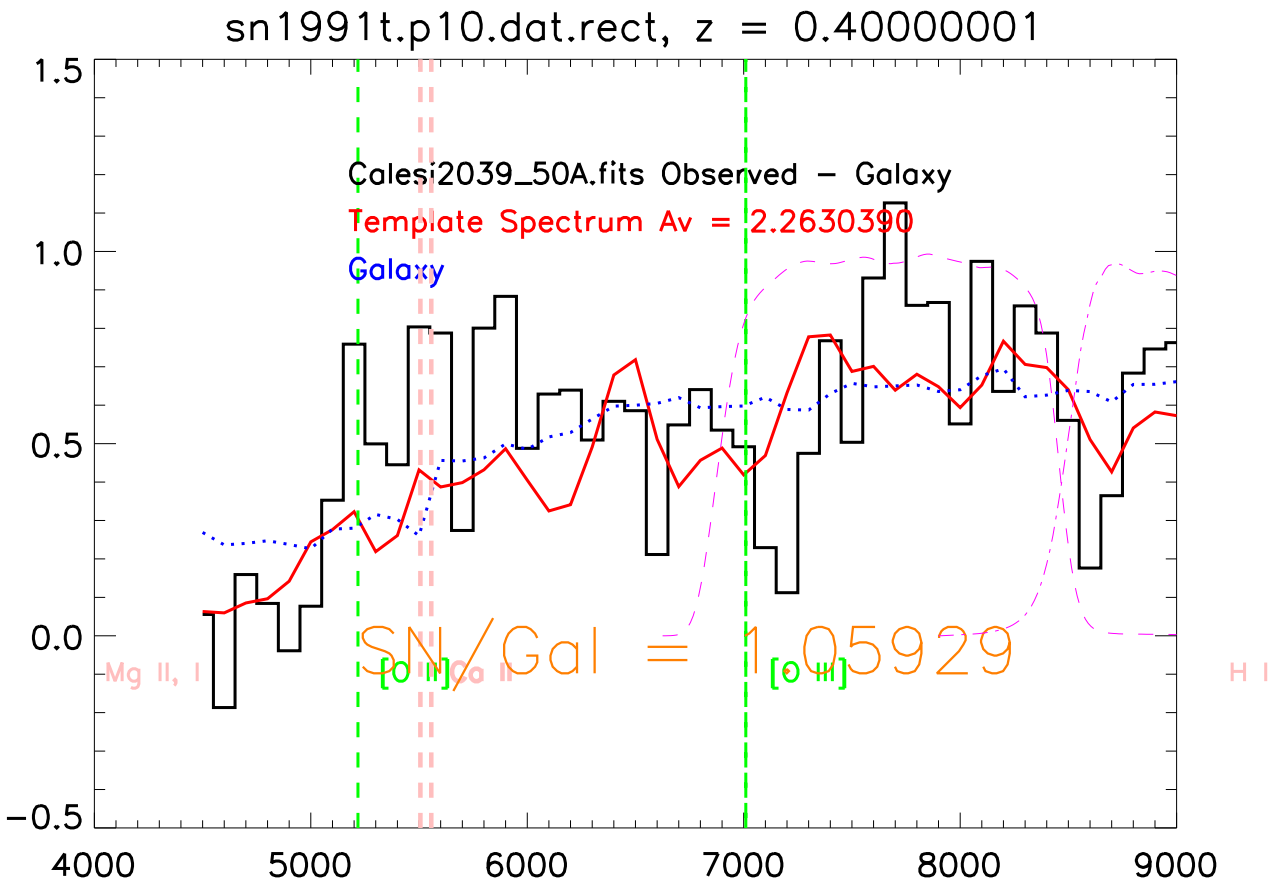

sn1999ee.p28.dat.rect, z = 0.40000001
Calesi2039_50A.fits Observed – Galaxy
Template Spectrum Av = −0.64442371
Galaxy
SN/Gal = 0.556152
Mg II, I
[O II]
Ca II
[O III]
H I
1.2
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
−0.4
4000
5000
6000
7000
8000
9000

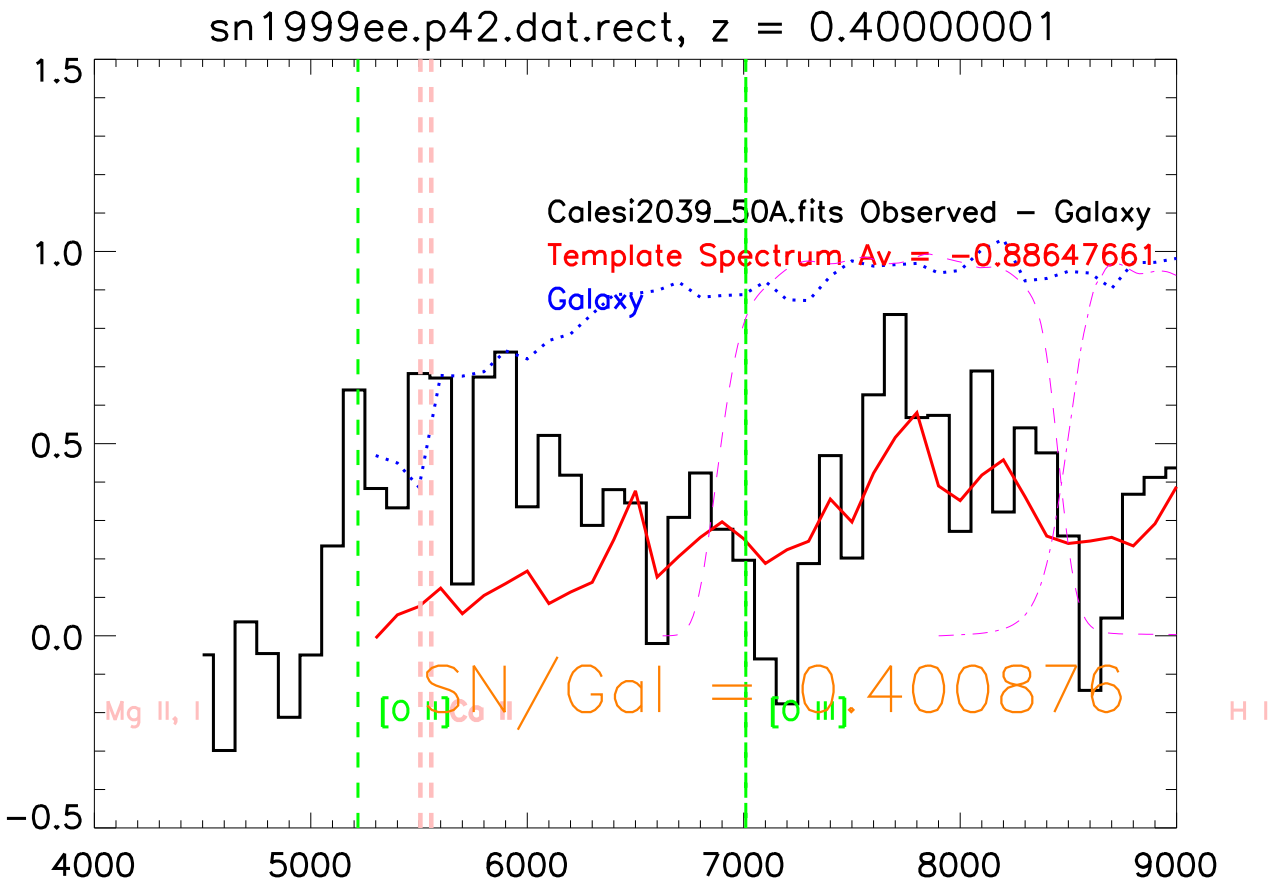

sn1998bu.p31.dat.rect, z = 0.40000001
Calesi2039_50A.fits Observed − Galaxy
Template Spectrum Av = −2.9752978
Galaxy
SN/Gal = 0.576588
Mg II, I
[O II]
Ca II
[O III]
H I
1.5
1.0
0.5
0.0
−0.5
4000
5000
6000
7000
8000
9000

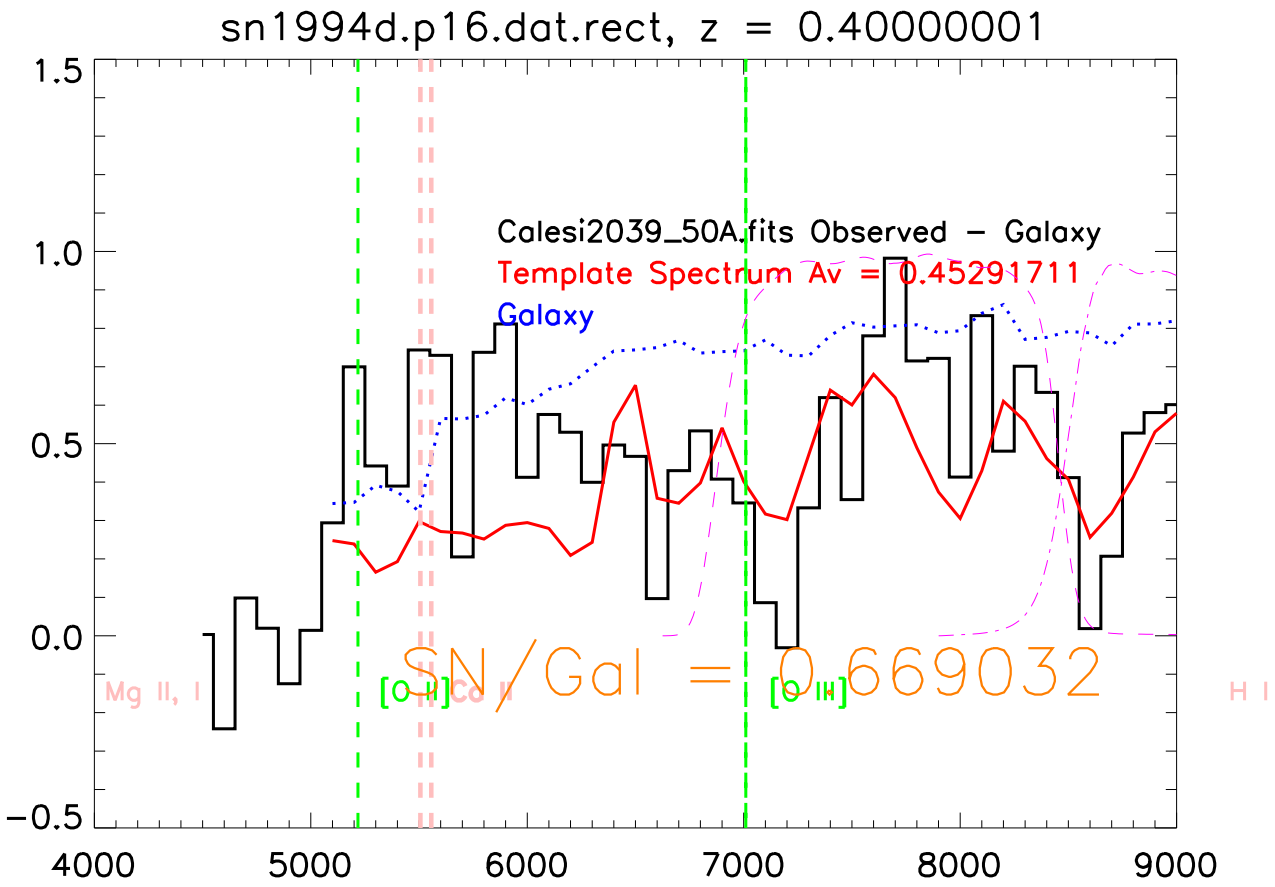

sn1998bu.p27.dat.rect, z = 0.40000001
Calesi2039_50A.fits Observed − Galaxy
Template Spectrum Av = 3.0452439
Galaxy
SN/Gal = 0.544799
Mg II, I
[O II]
Ca II
[O III]
H I
1.5
1.0
0.5
0.0
−0.5
4000
5000
6000
7000
8000
9000

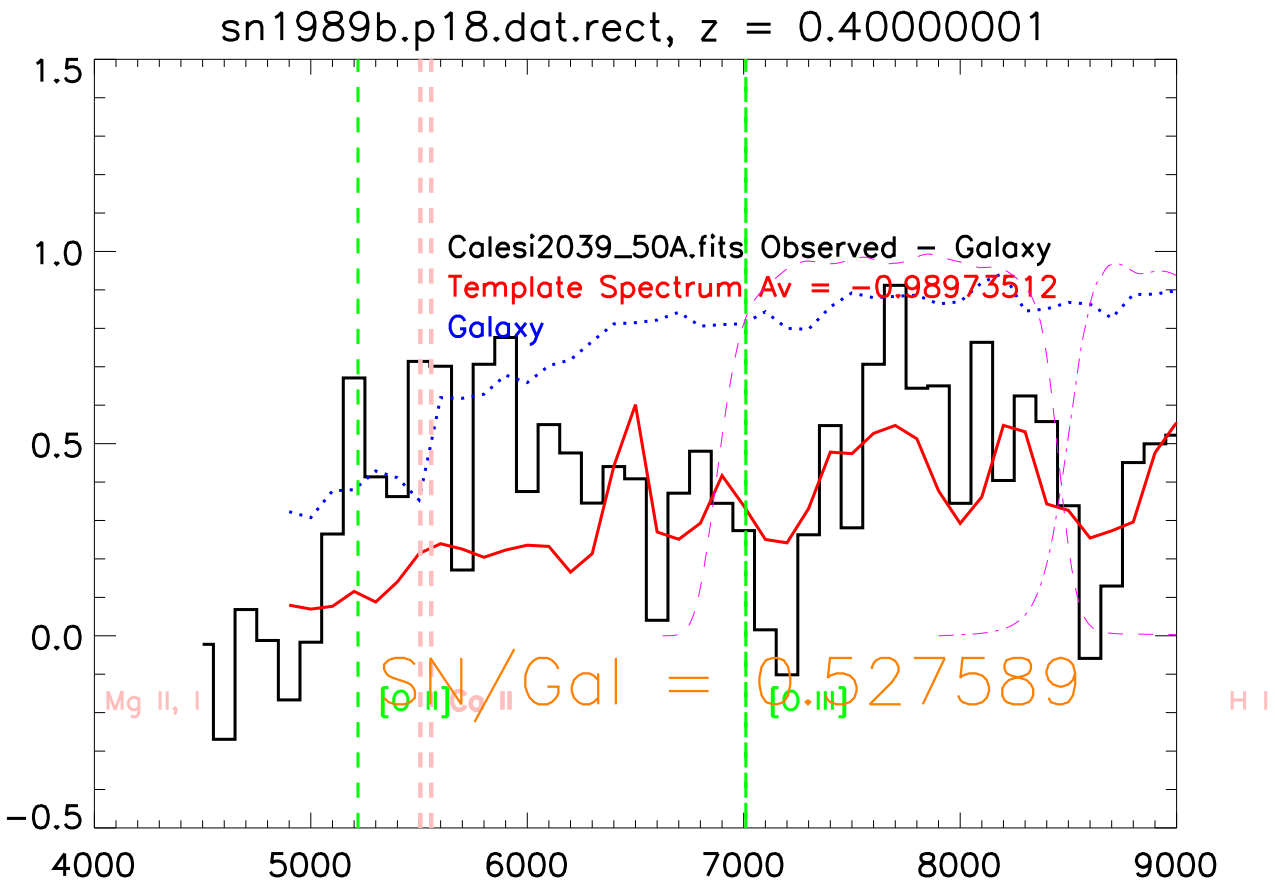

sn1998bu.p28.dat.rect, z = 0.40000001
Calesi2039_50A.fits Observed − Galaxy
Template Spectrum Av = 2.9970371
Galaxy
SN/Gal = 0.539582
Mg II, I
[O II]
Ca II
[O III]
H I
1.5
1.0
0.5
0.0
−0.5
4000
5000
6000
7000
8000
9000

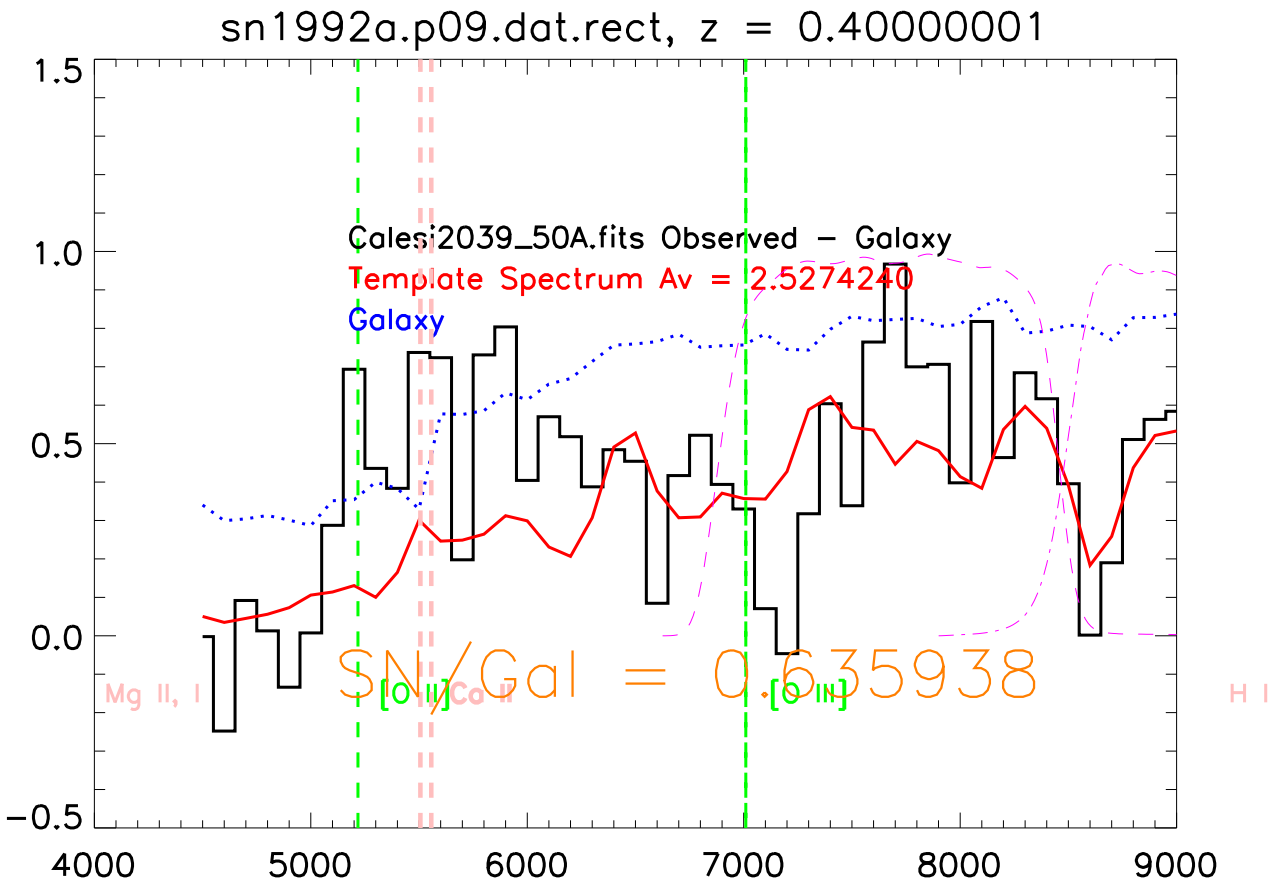

sn1994d.p18.dat.rect, z = 0.40000001
Calesi2039_50A.fits Observed − Galaxy
Template Spectrum Av = 0.12291252
Galaxy
SN/Gal = 0.737455
Mg II, I
[O II]
Ca II
[O III]
H I
1.5
1.0
0.5
0.0
−0.5
4000
5000
6000
7000
8000
9000

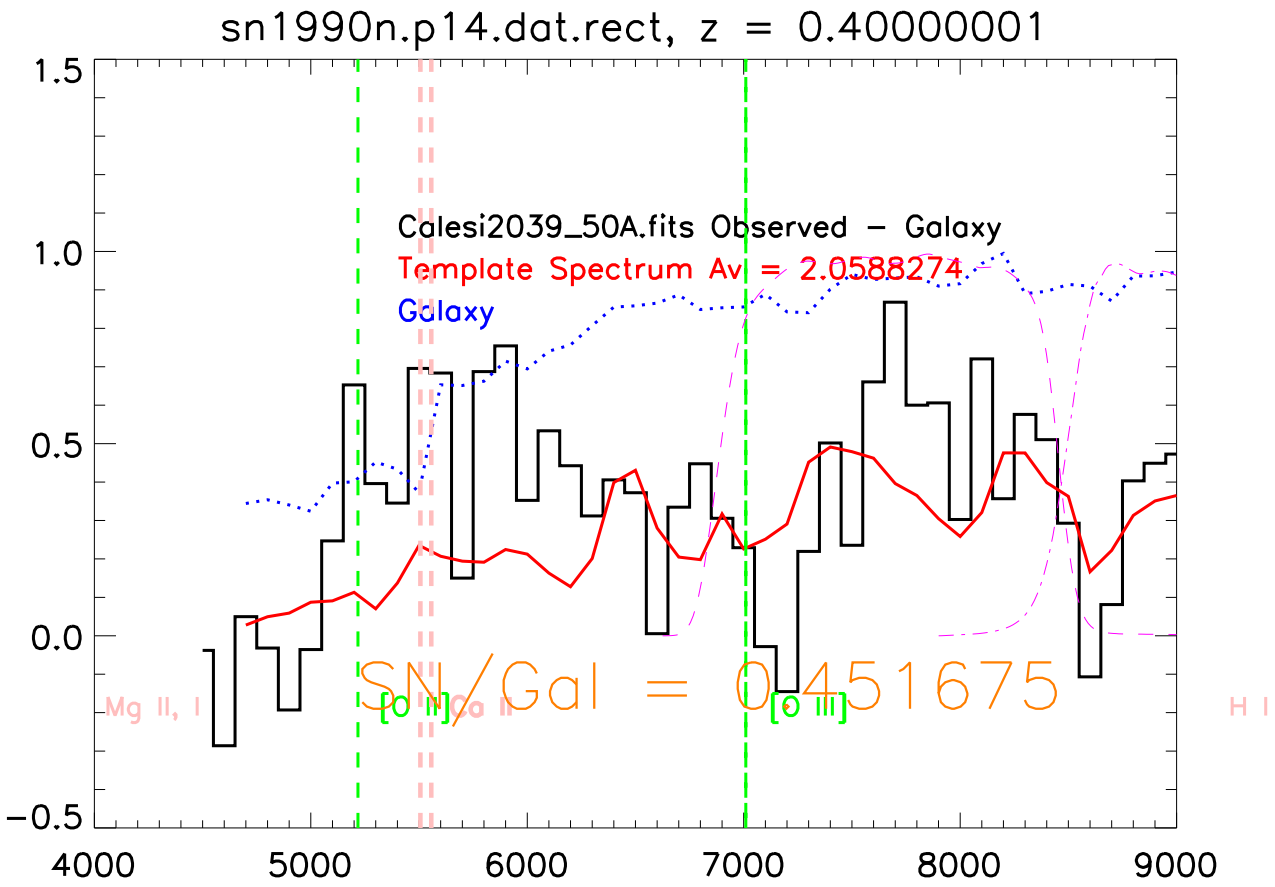

sn1991t.p10.dat.rect, z = 0.40000001
Calesi2039_50A.fits Observed − Galaxy
Template Spectrum Av = 2.2630390
Galaxy
SN/Gal = 1.05929
Mg II, I
[O II]
Ca II
[O III]
H I
1.5
1.0
0.5
0.0
−0.5
4000
5000
6000
7000
8000
9000

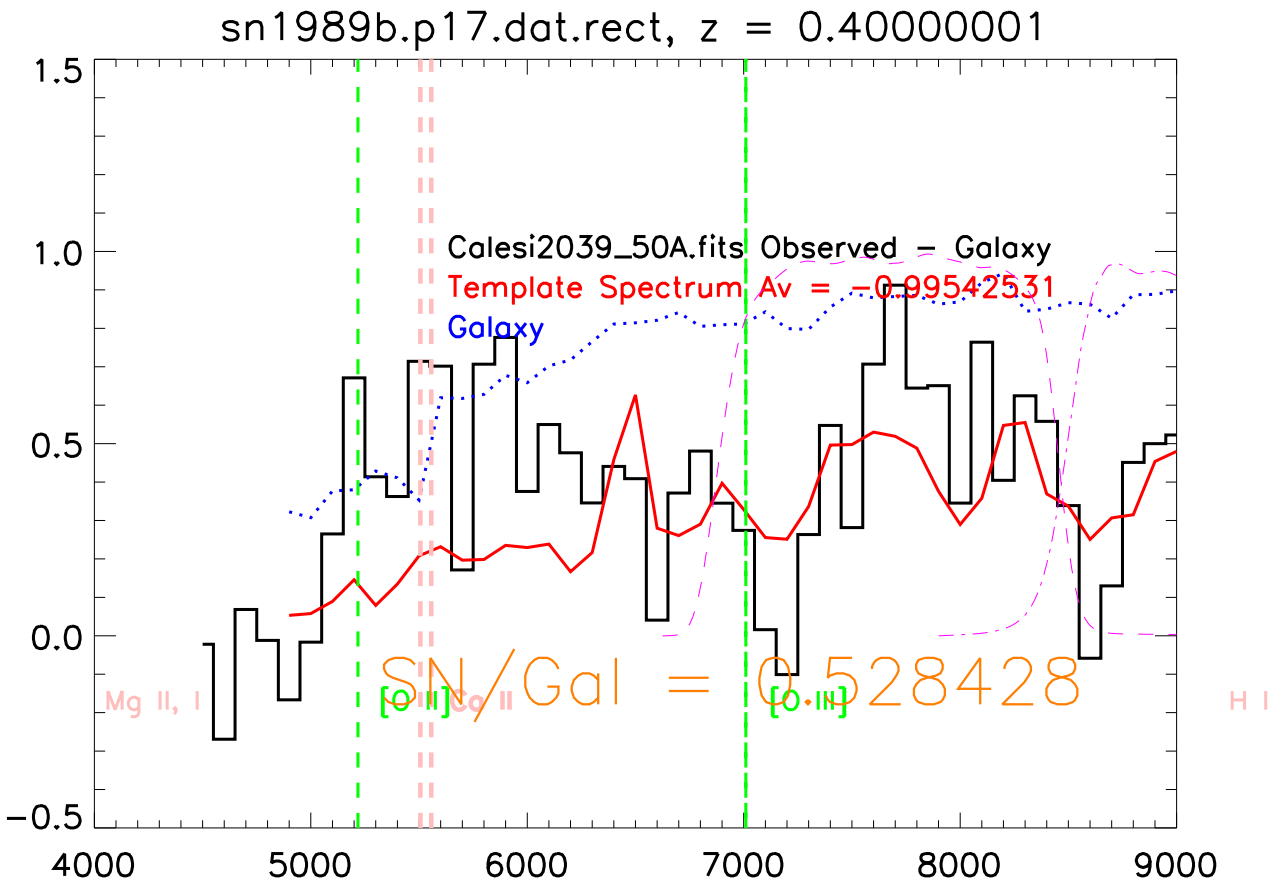

sn1999ee.p42.dat.rect, z = 0.40000001
Calesi2039_50A.fits Observed − Galaxy
Template Spectrum Av = −0.88647661
Galaxy
SN/Gal = 0.400876
Mg II, I
[O II]
Ca II
[O III]
H I
1.5
1.0
0.5
0.0
−0.5
4000
5000
6000
7000
8000
9000

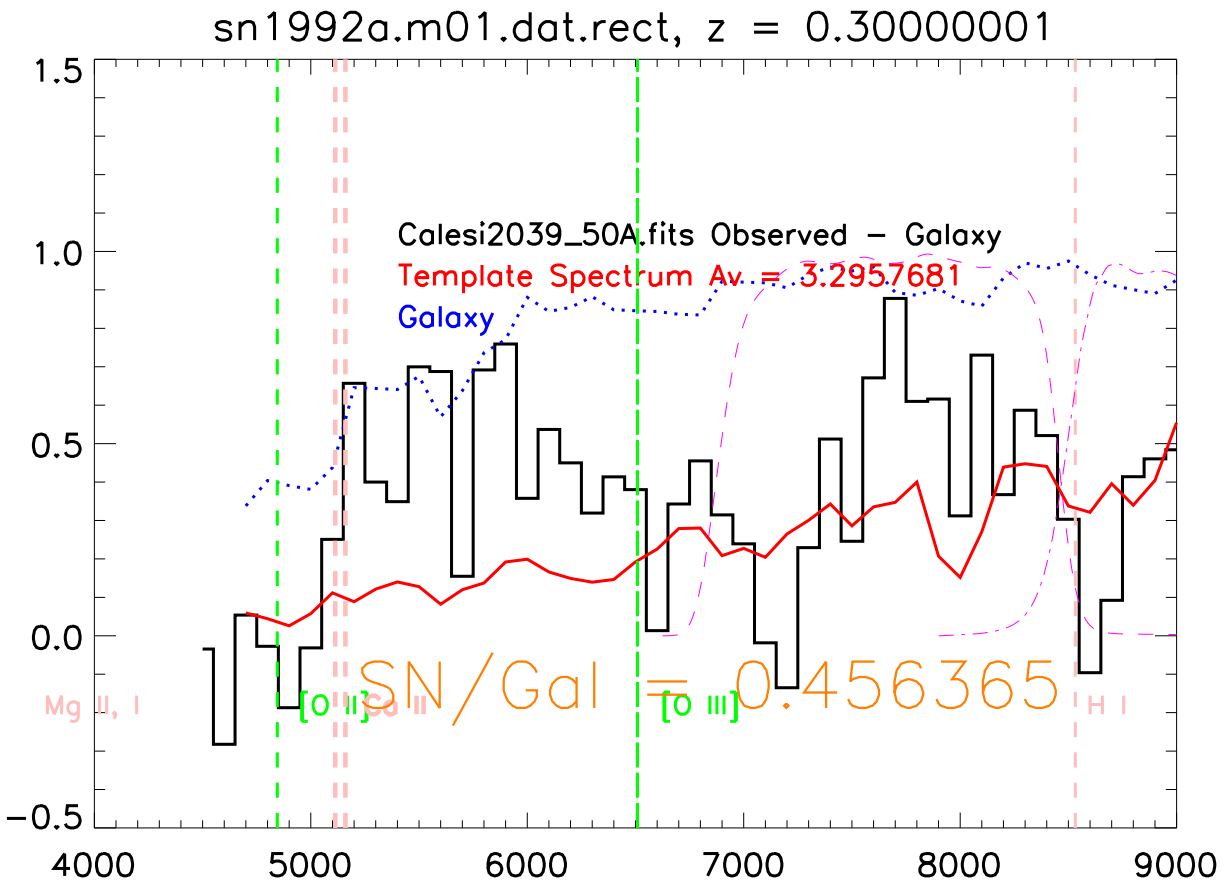

sn1994d.p16.dat.rect, z = 0.40000001
Calesi2039_50A.fits Observed − Galaxy
Template Spectrum Av = 0.45291711
Galaxy
SN/Gal = 0.669032
Mg II, I
[O II]
Ca II
[O III]
H I
1.5
1.0
0.5
0.0
−0.5
4000
5000
6000
7000
8000
9000

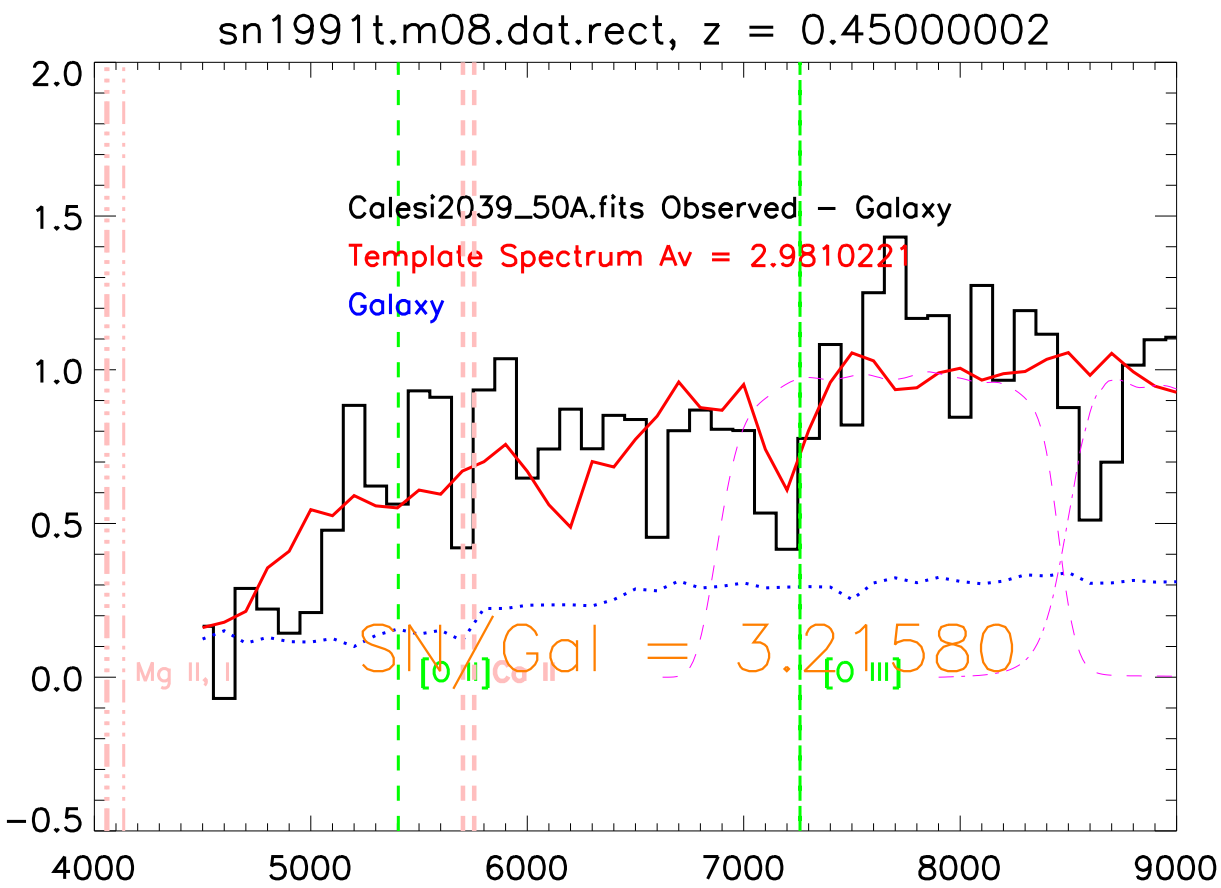

sn1989b.p18.dat.rect, z = 0.40000001
Calesi2039_50A.fits Observed - Galaxy
Template Spectrum Av = -0.98973512
Galaxy
SN/Gal = 0.527589
Mg II, I
[O II]
Ca II
[O III]
H I
1.5
1.0
0.5
0.0
−0.5
4000
5000
6000
7000
8000
9000

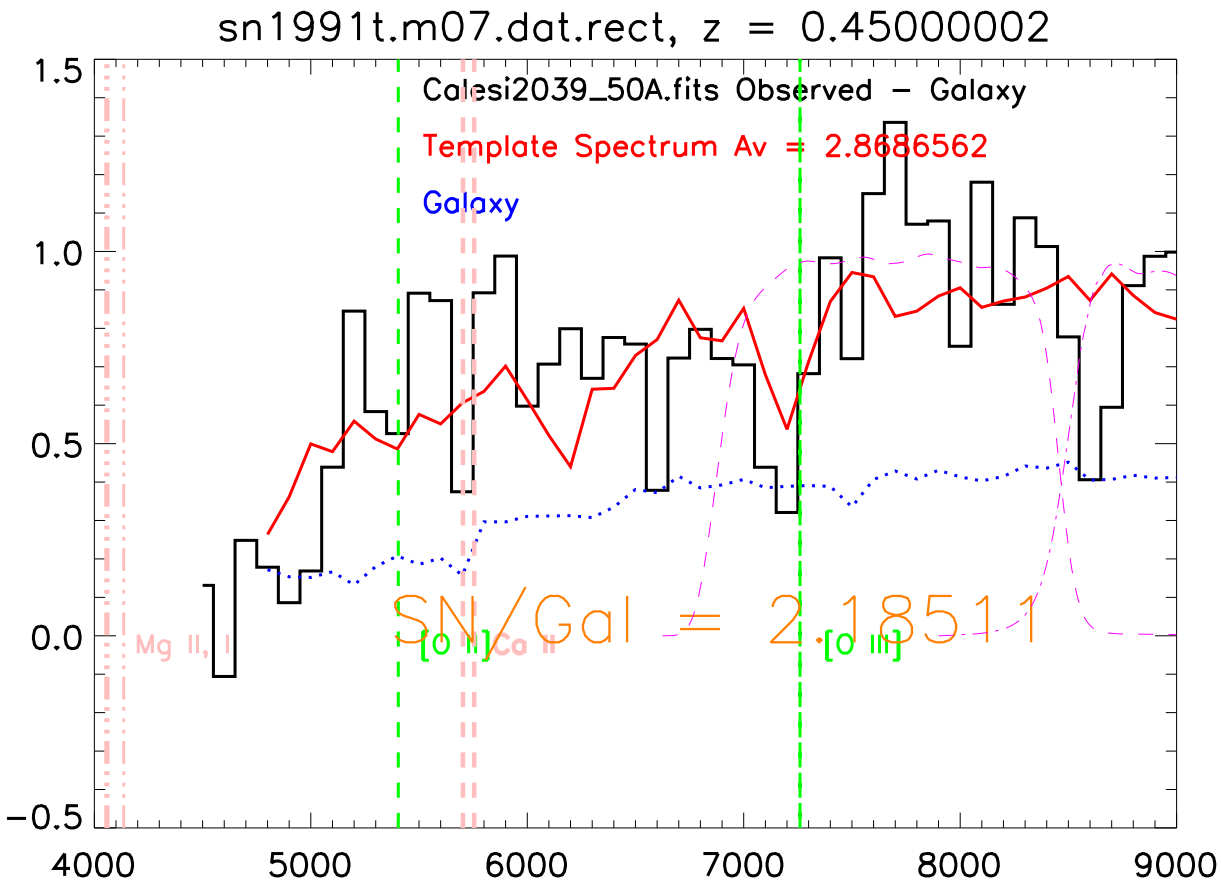

sn1992a.p09.dat.rect, z = 0.40000001
Calesi2039_50A.fits Observed − Galaxy
Template Spectrum Av = 2.5274240
Galaxy
SN/Gal = 0.635938
Mg II, I
[O II]
Ca II
[O III]
H I
1.5
1.0
0.5
0.0
−0.5
4000
5000
6000
7000
8000
9000

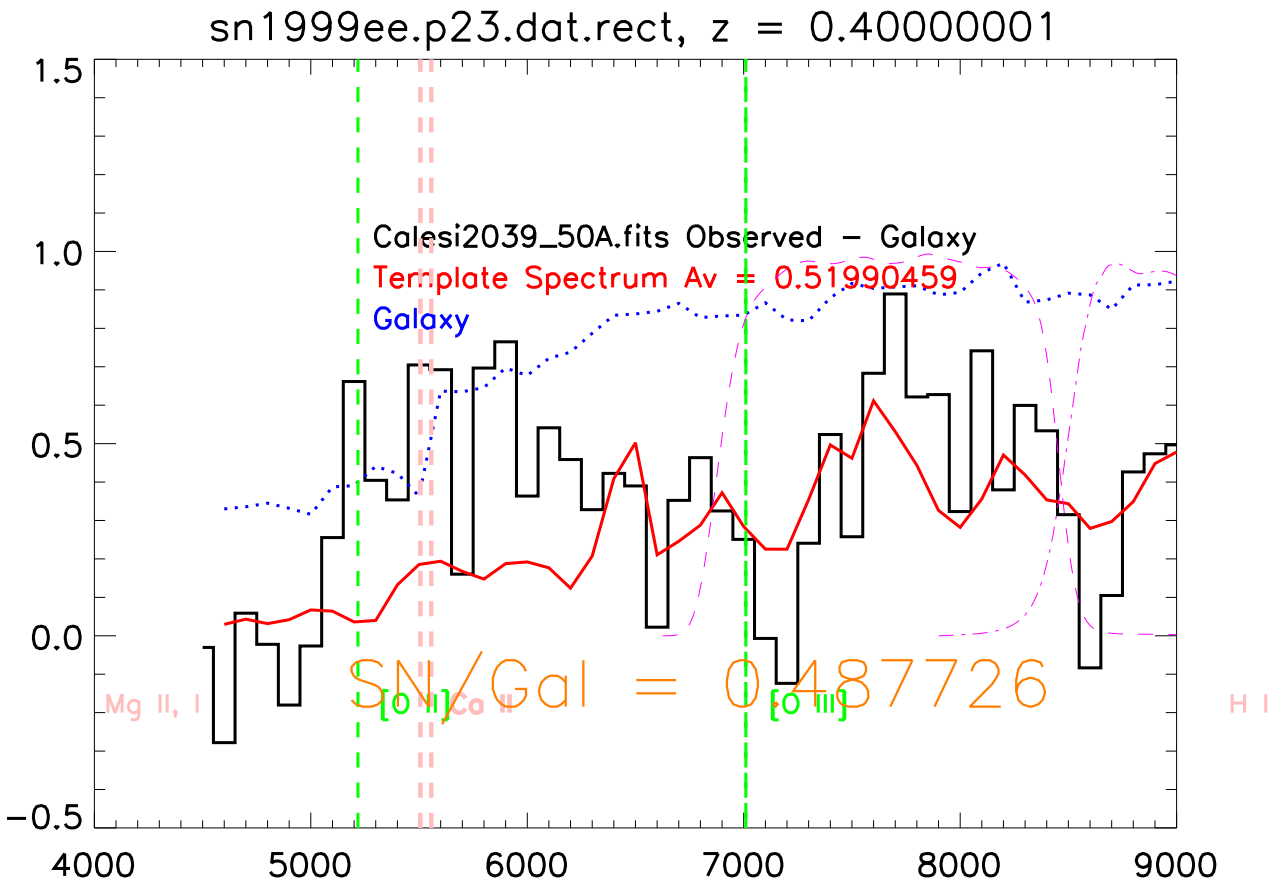

sn1990n.p14.dat.rect, z = 0.40000001
Calesi2039_50A.fits Observed − Galaxy
Template Spectrum Av = 2.0588274
Galaxy
SN/Gal = 0.451675
[O II]
[O III]
Mg II, I
Ca II
H I
1.5
1.0
0.5
0.0
−0.5
4000
5000
6000
7000
8000
9000

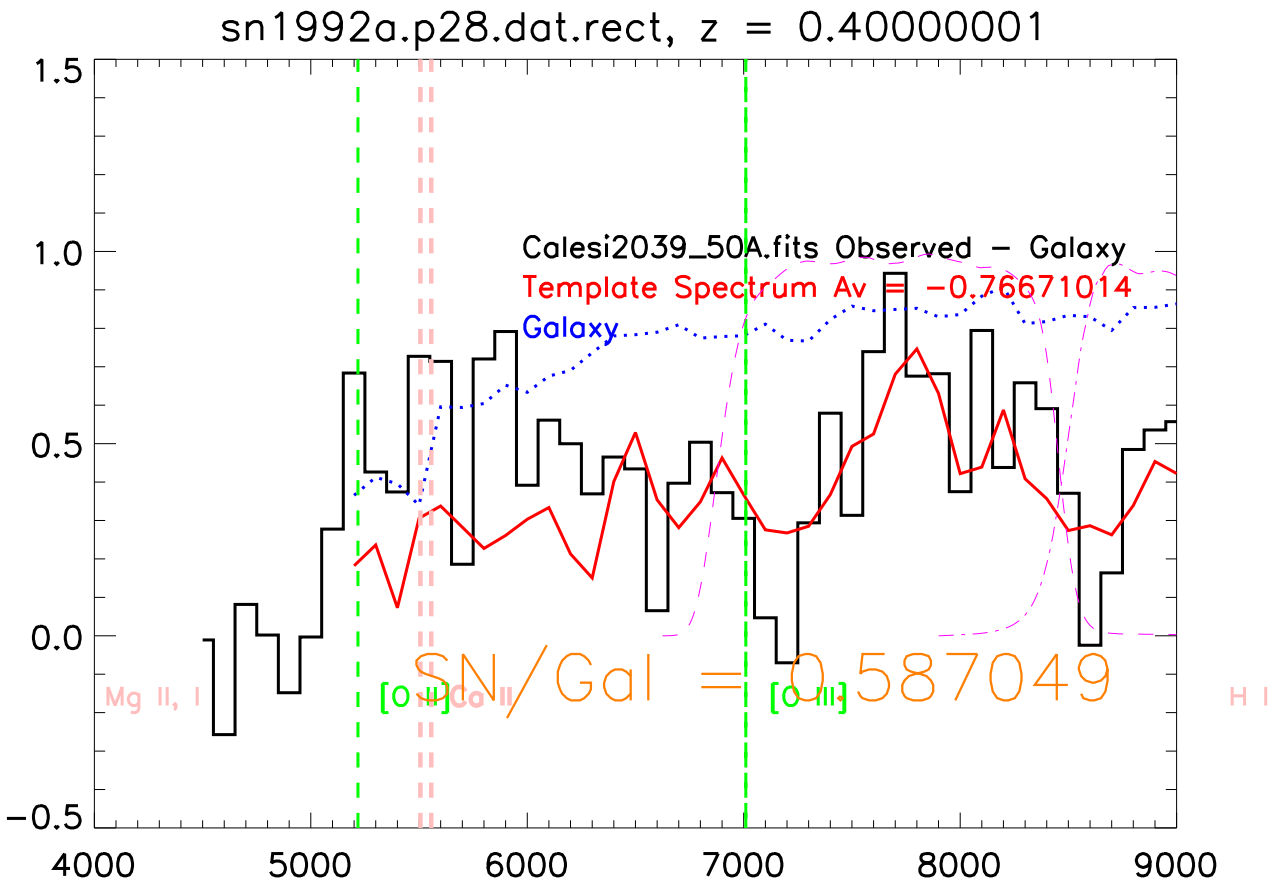

sn1989b.p17.dat.rect, z = 0.40000001
Calesi2039_50A.fits Observed - Galaxy
Template Spectrum Av = -0.99542531
Galaxy
SN/Gal = 0.528428
Mg II, I
[O II]
Ca II
[O III]
H I
1.5
1.0
0.5
0.0
−0.5
4000
5000
6000
7000
8000
9000

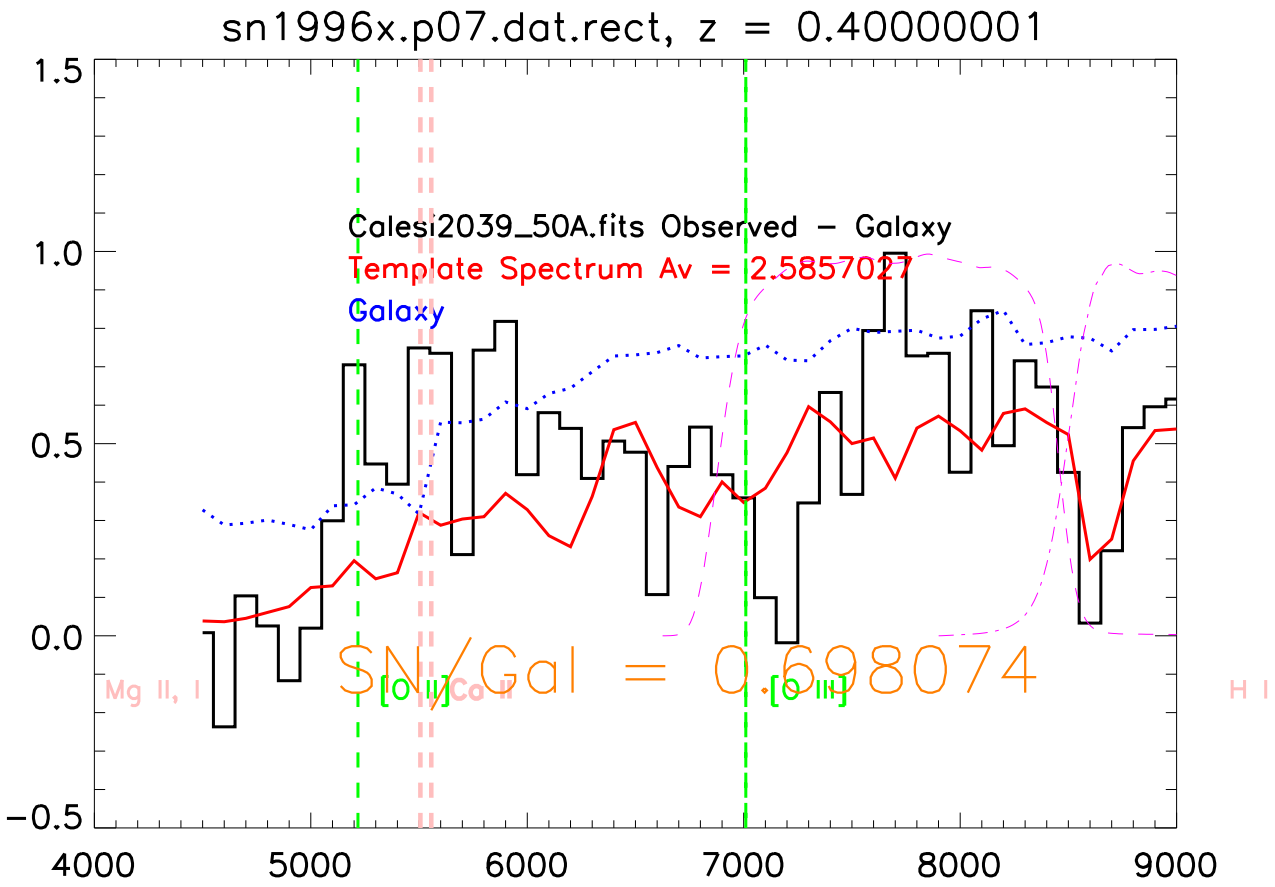

sn1992a.m01.dat.rect, z = 0.30000001
Calesi2039_50A.fits Observed − Galaxy
Template Spectrum Av = 3.2957681
Galaxy
SN/Gal = 0.456365
Mg II, I
[O II]
Ca II
[O III]
H I
1.5
1.0
0.5
0.0
−0.5
4000
5000
6000
7000
8000
9000

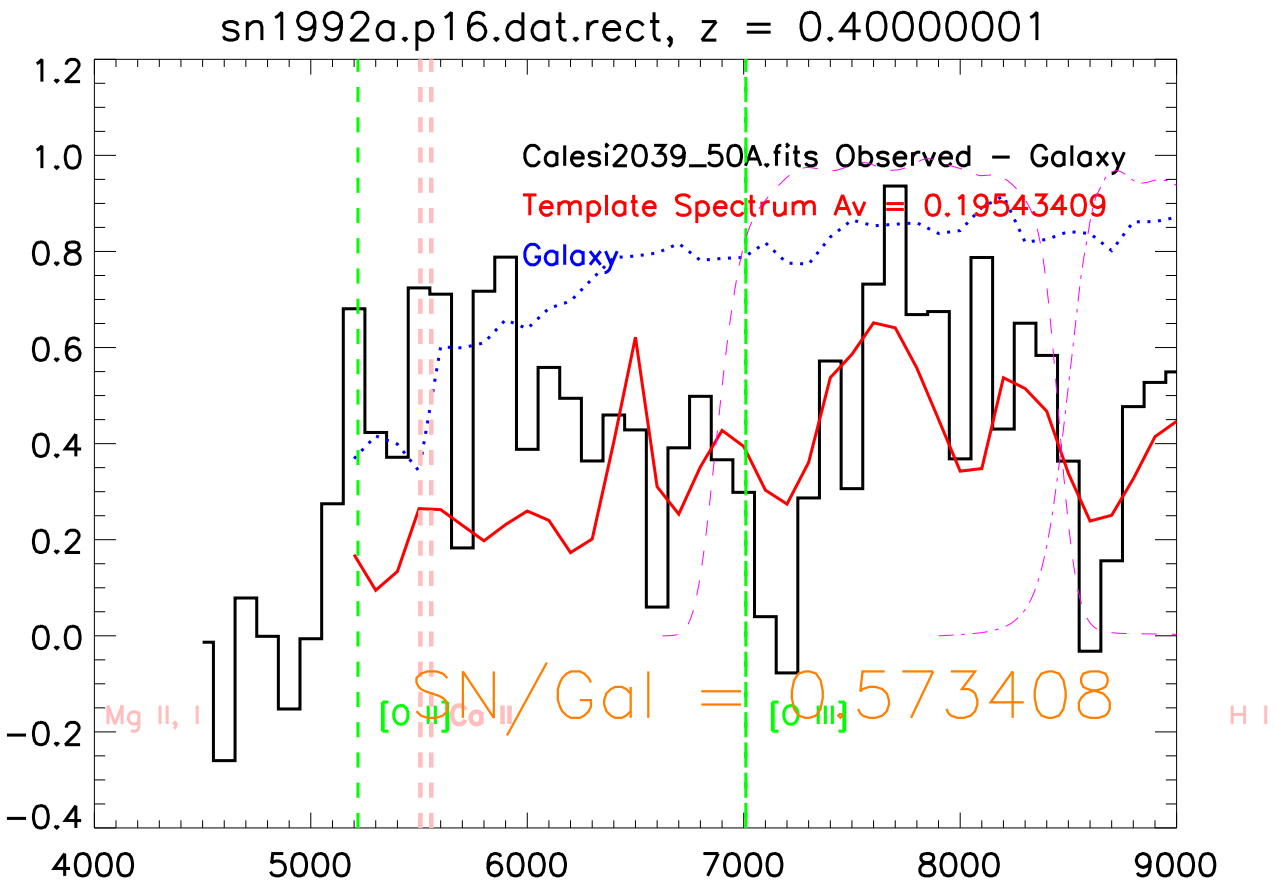

sn1991t.m08.dat.rect, z = 0.45000002
Calesi2039_50A.fits Observed − Galaxy
Template Spectrum Av = 2.9810221
Galaxy
SN/Gal = 3.21580
Mg II, I
[O II]
Ca II
[O III]
H I
2.0
1.5
1.0
0.5
0.0
−0.5
4000
5000
6000
7000
8000
9000

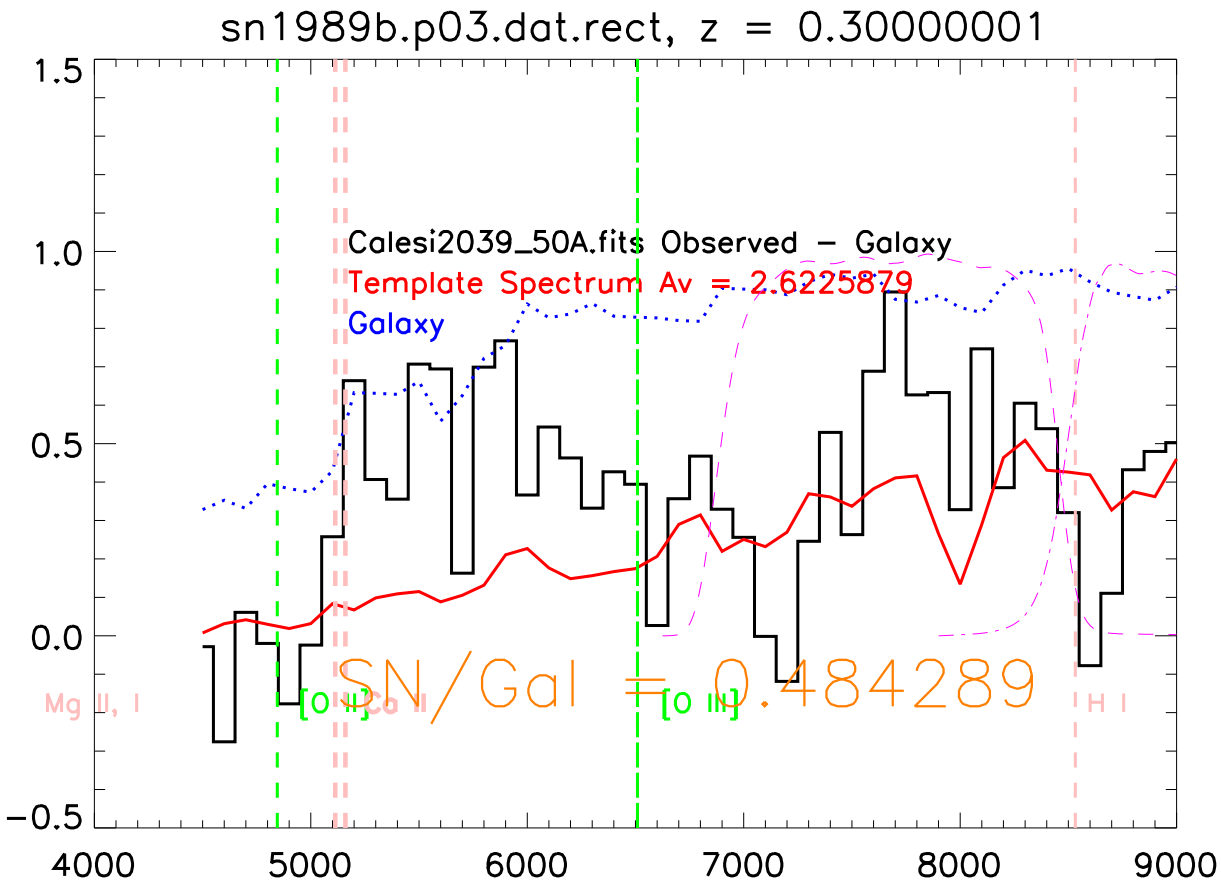

sn1991t.m07.dat.rect, z = 0.45000002
Calesi2039_50A.fits Observed − Galaxy
Template Spectrum Av = 2.8686562
Galaxy
SN/Gal = 2.18511
Mg II, I
[O II]
Ca II
[O III]
H I
1.5
1.0
0.5
0.0
−0.5
4000
5000
6000
7000
8000
9000

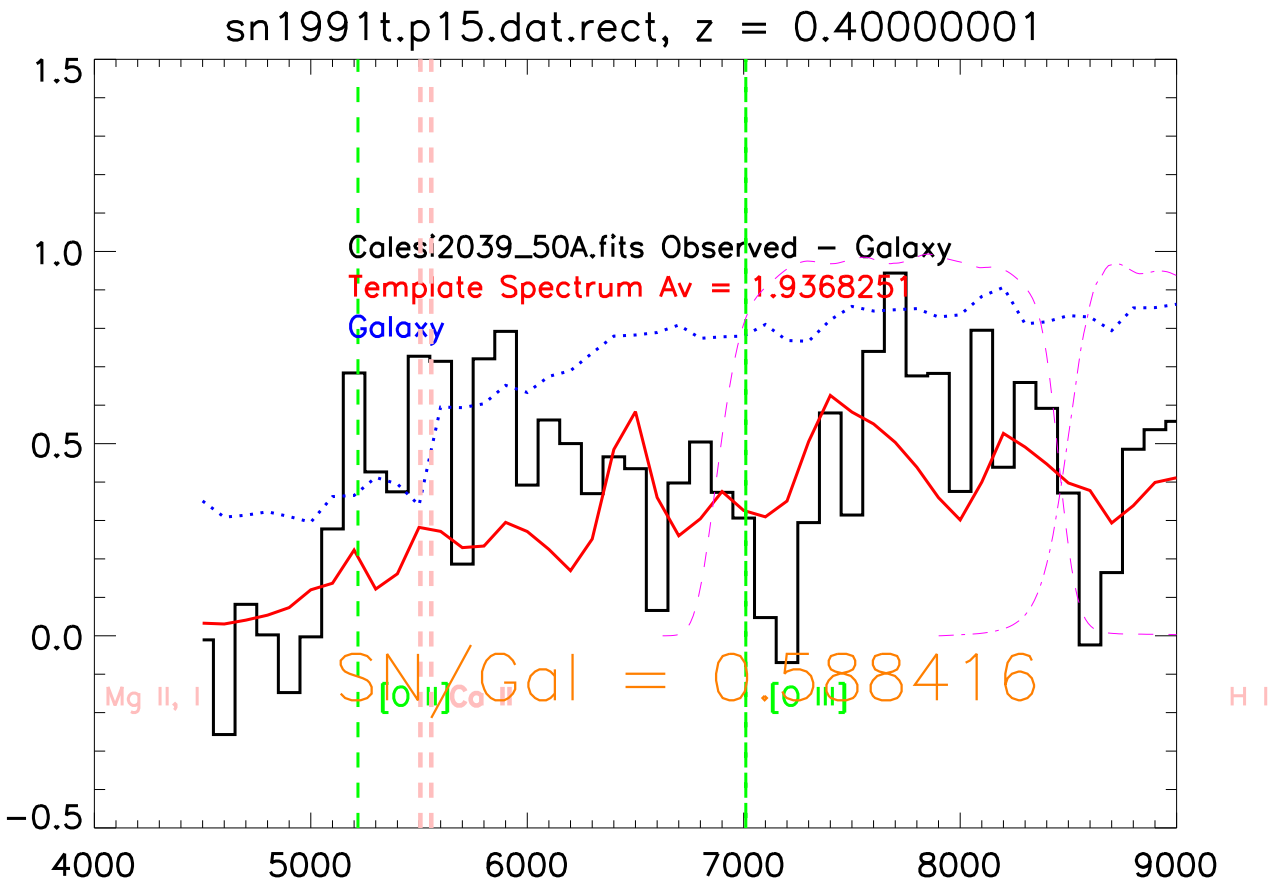

sn1999ee.p23.dat.rect, z = 0.40000001
Calesi2039_50A.fits Observed − Galaxy
Template Spectrum Av = 0.51990459
Galaxy
SN/Gal = 0.487726
Mg II, I
[O II]
Ca II
[O III]
H I
1.5
1.0
0.5
0.0
−0.5
4000
5000
6000
7000
8000
9000

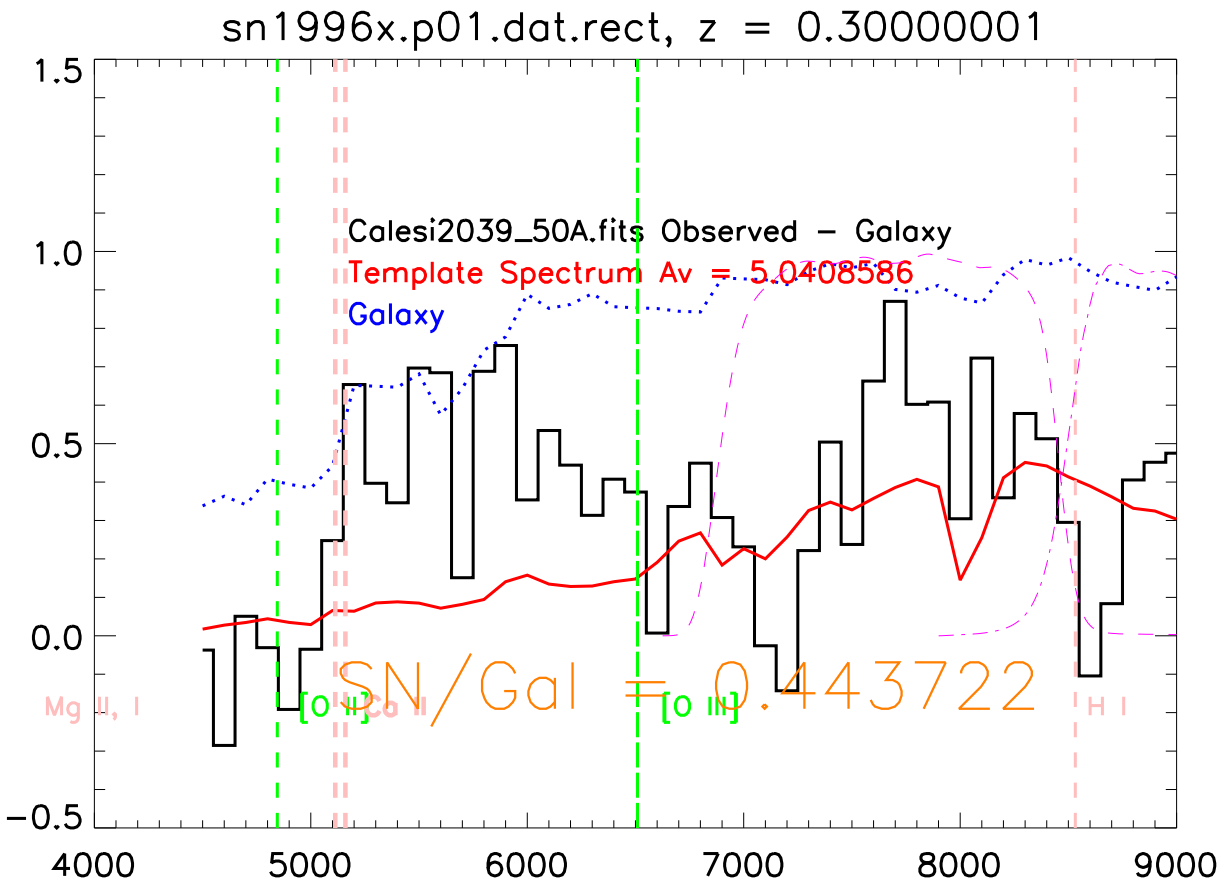

sn1992a.p28.dat.rect, z = 0.40000001
Calesi2039_50A.fits Observed − Galaxy
Template Spectrum Av = −0.76671014
Galaxy
SN/Gal = 0.587049
Mg II, I
[O II]
Ca II
[O III]
H I
1.5
1.0
0.5
0.0
−0.5
4000
5000
6000
7000
8000
9000

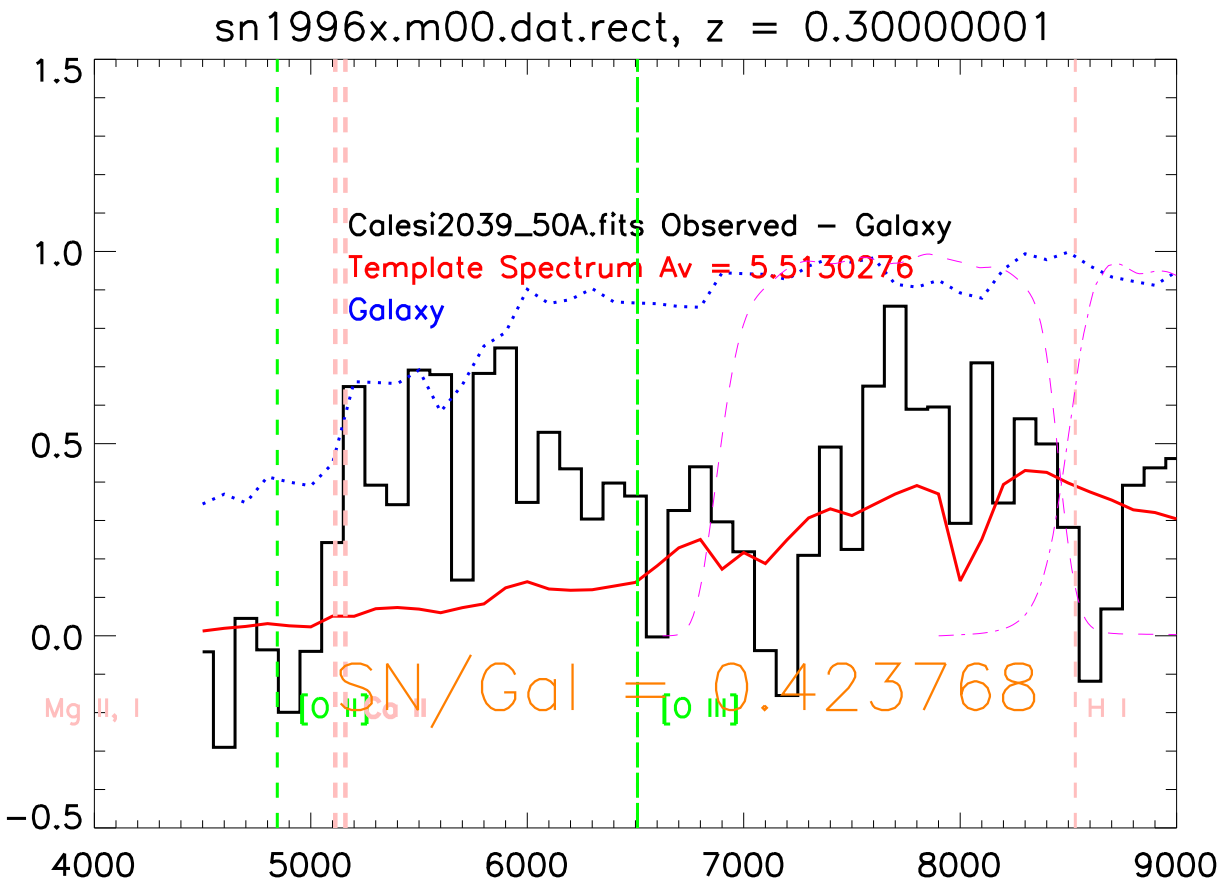

sn1996x.p07.dat.rect, z = 0.40000001
Calesi2039_50A.fits Observed − Galaxy
Template Spectrum Av = 2.5857027
Galaxy
SN/Gal = 0.698074
Mg II, I
[O II]
Ca II
[O III]
H I
1.5
1.0
0.5
0.0
−0.5
4000
5000
6000
7000
8000
9000

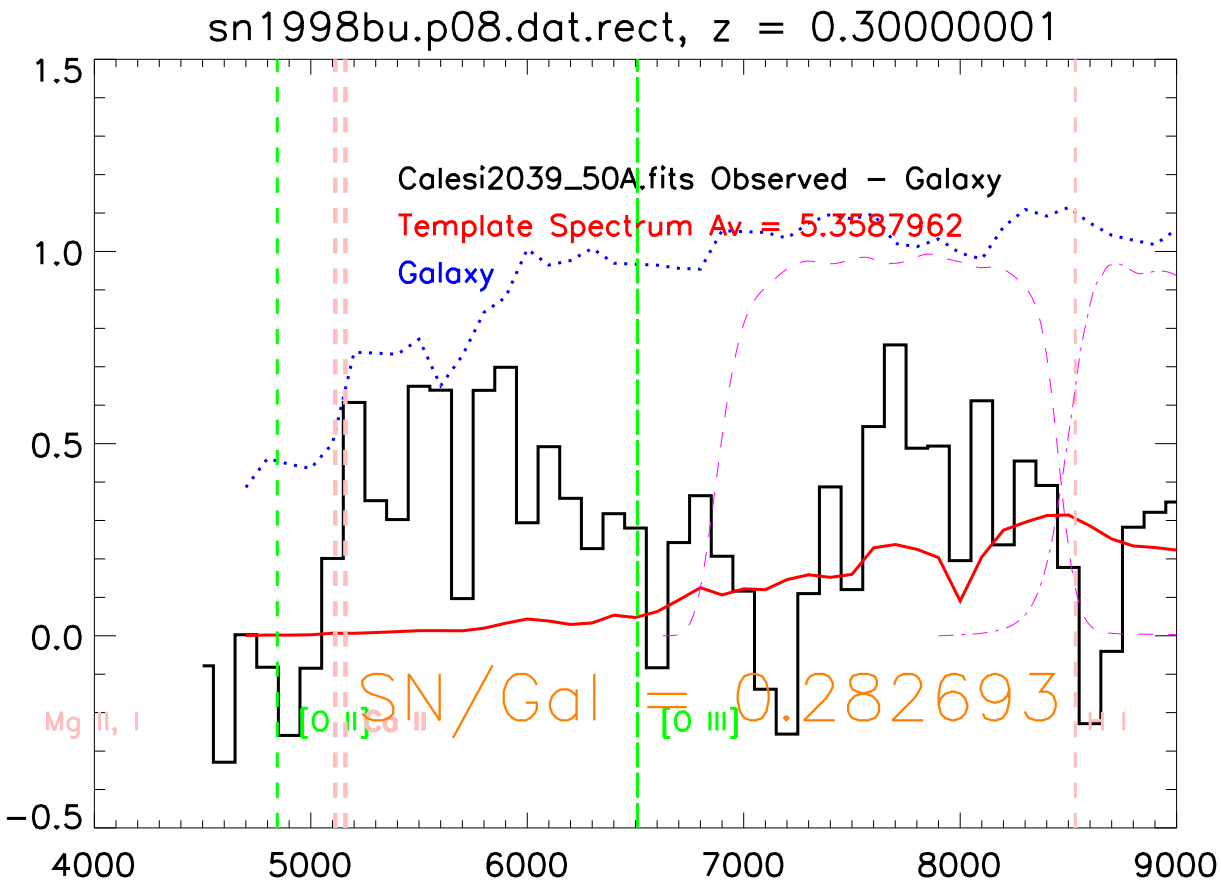

sn1992a.p16.dat.rect, z = 0.40000001
Calesi2039_50A.fits Observed − Galaxy
Template Spectrum Av = 0.19543409
Galaxy
SN/Gal = 0.573408
Mg II, I
[O II]
Ca II
[O III]
H I
1.2
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
−0.4
4000
5000
6000
7000
8000
9000

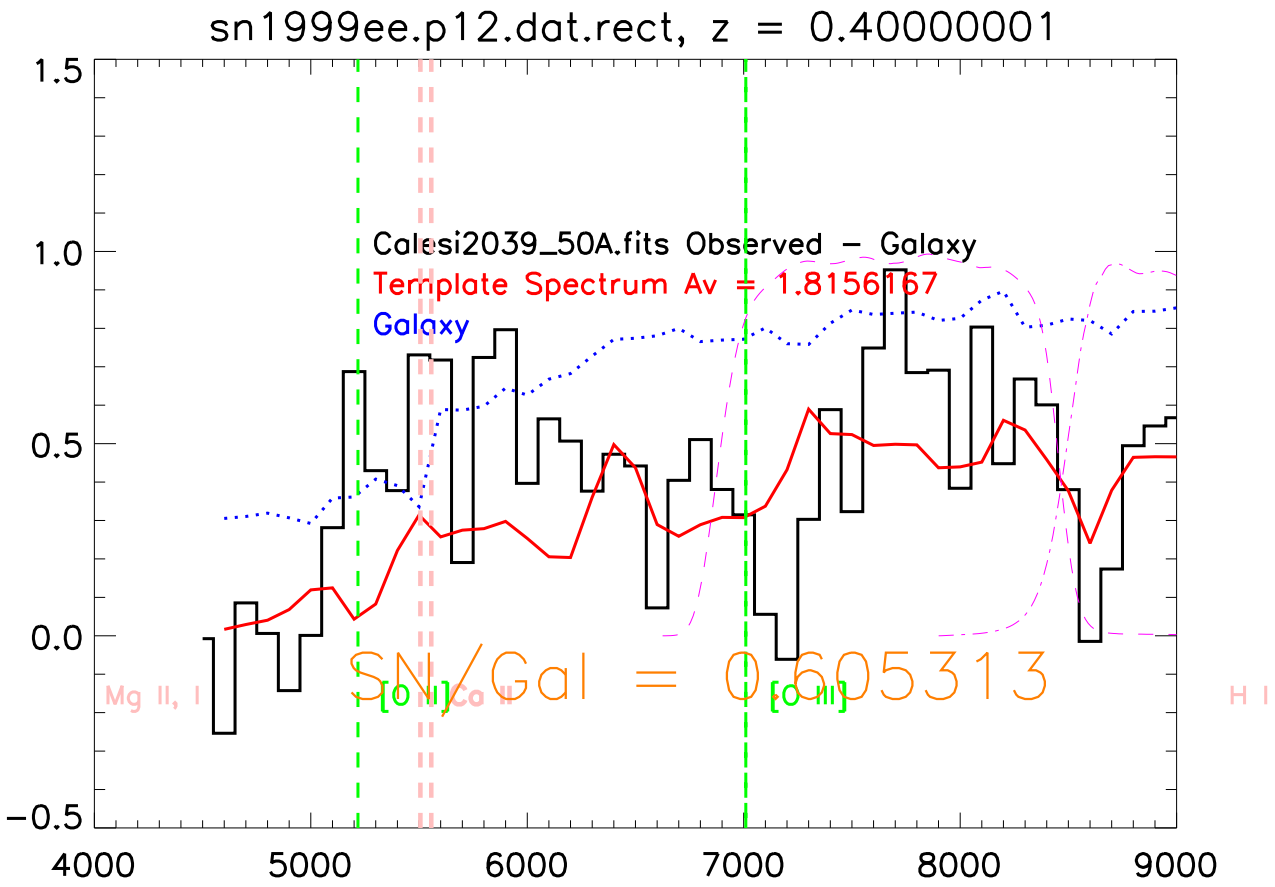

sn1989b.p03.dat.rect, z = 0.30000001
Calesi2039_50A.fits Observed − Galaxy
Template Spectrum Av = 2.6225879
Galaxy
SN/Gal = 0.484289
Mg II, I
[O II]
Ca II
[O III]
H I
1.5
1.0
0.5
0.0
−0.5
4000
5000
6000
7000
8000
9000

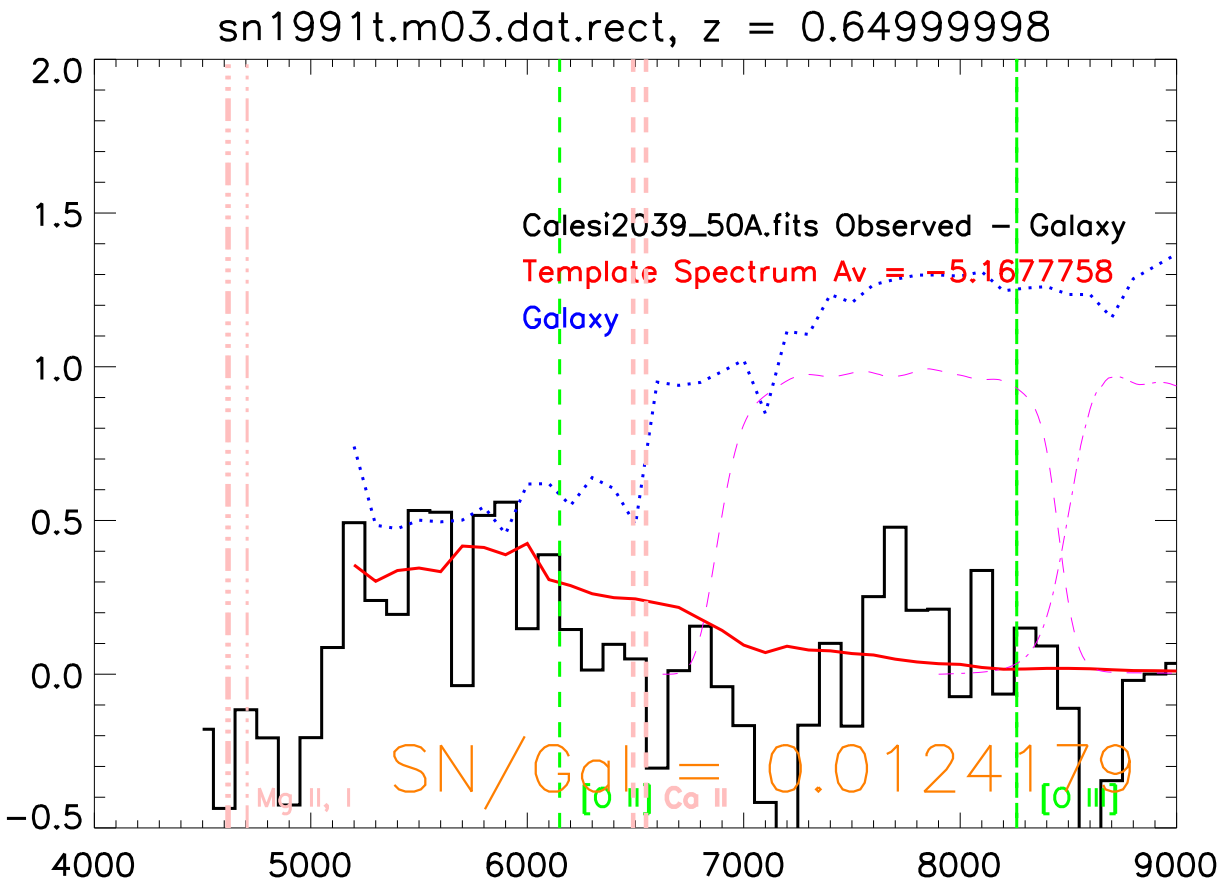

sn1991t.p15.dat.rect, z = 0.40000001
Cales!2039_50A.fits Observed − Galaxy
Template Spectrum Av = 1.9368251
Galaxy
SN/Gal = 0.588416
Mg II, I
[O II]
Ca II
[O III]
H I
1.5
1.0
0.5
0.0
−0.5
4000
5000
6000
7000
8000
9000

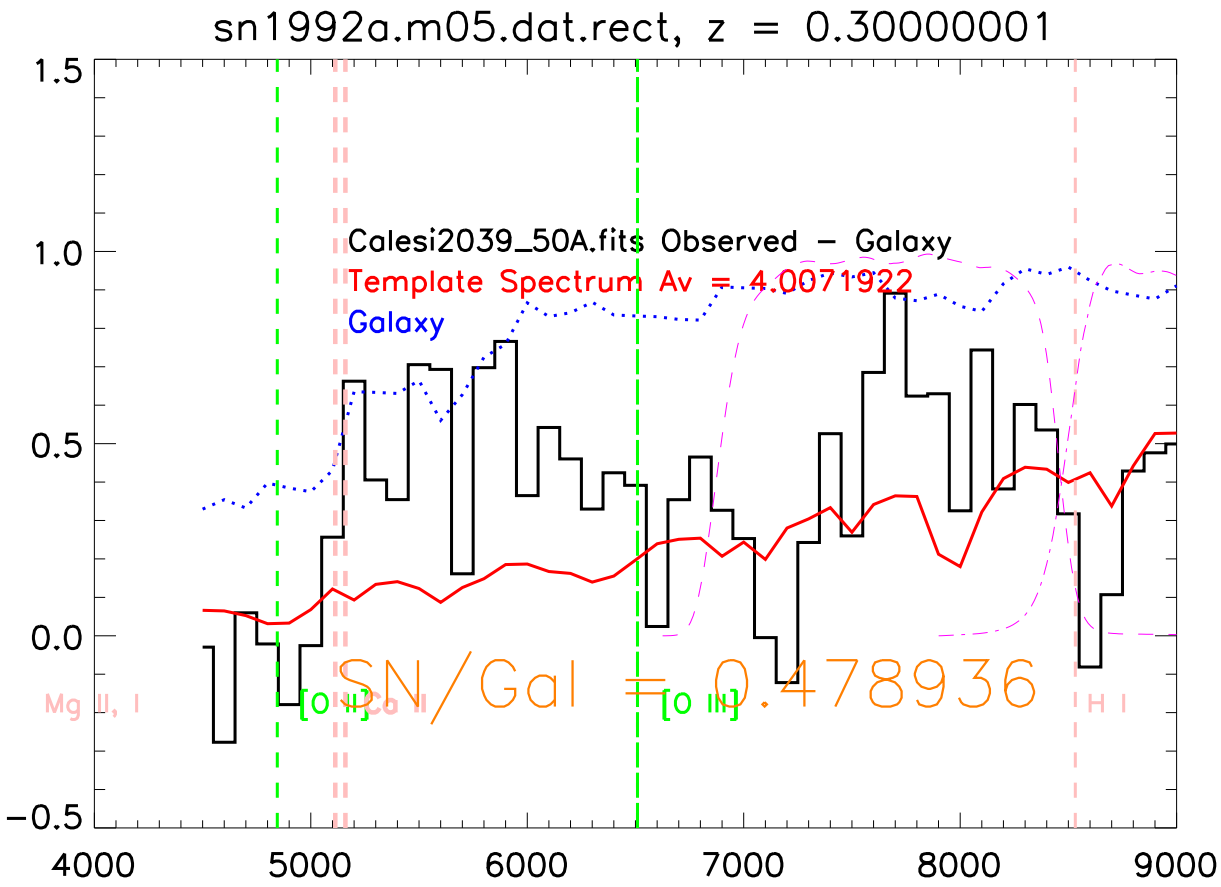

sn1996x.p01.dat.rect, z = 0.30000001
Calesi2039_50A.fits Observed − Galaxy
Template Spectrum Av = 5.0408586
Galaxy
SN/Gal = 0.443722
Mg II, I
[O II]
Ca II
[O III]
H I
1.5
1.0
0.5
0.0
−0.5
4000
5000
6000
7000
8000
9000

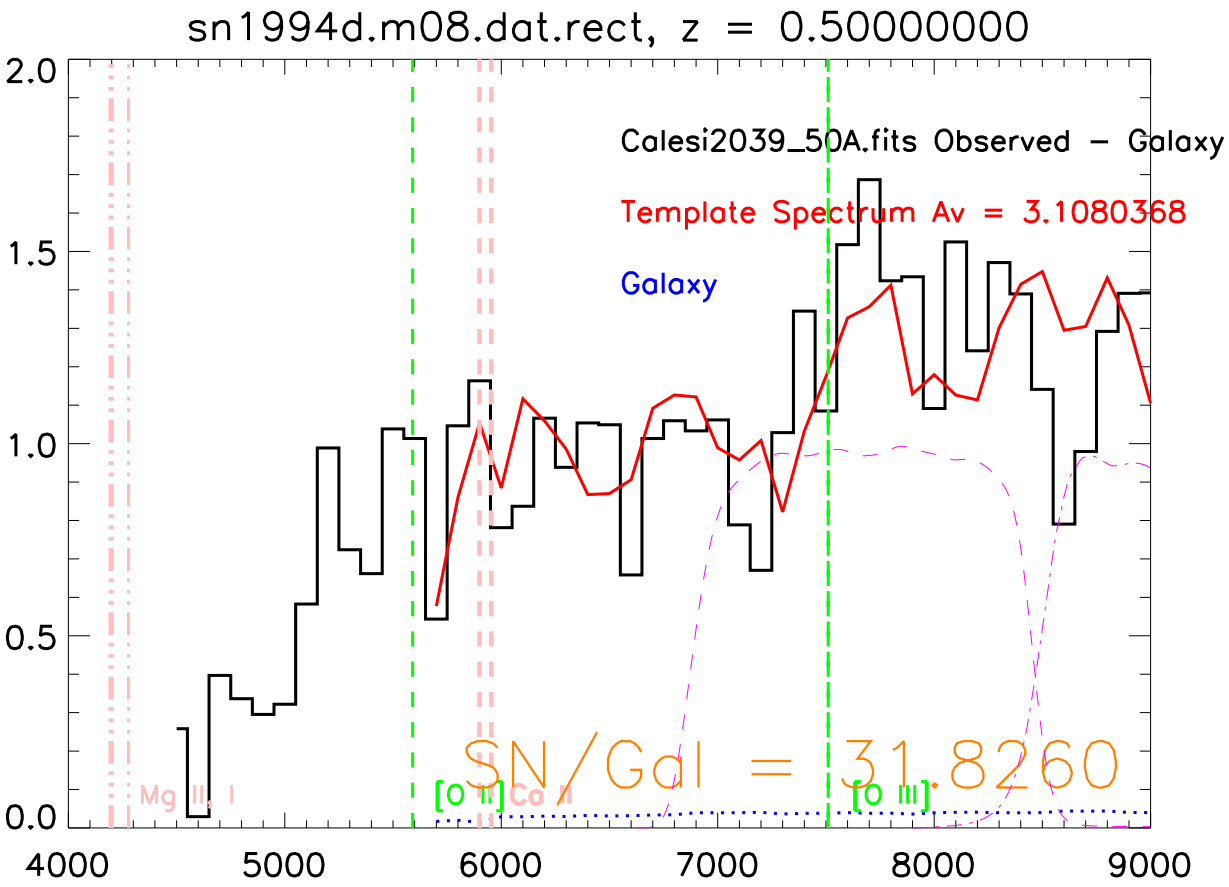

sn1996x.m00.dat.rect, z = 0.30000001
Calesi2039_50A.fits Observed − Galaxy
Template Spectrum Av = 5.5130276
Galaxy
SN/Gal = 0.423768
Mg II, I
[O II]
Ca II
[O III]
H I
1.5
1.0
0.5
0.0
−0.5
4000
5000
6000
7000
8000
9000

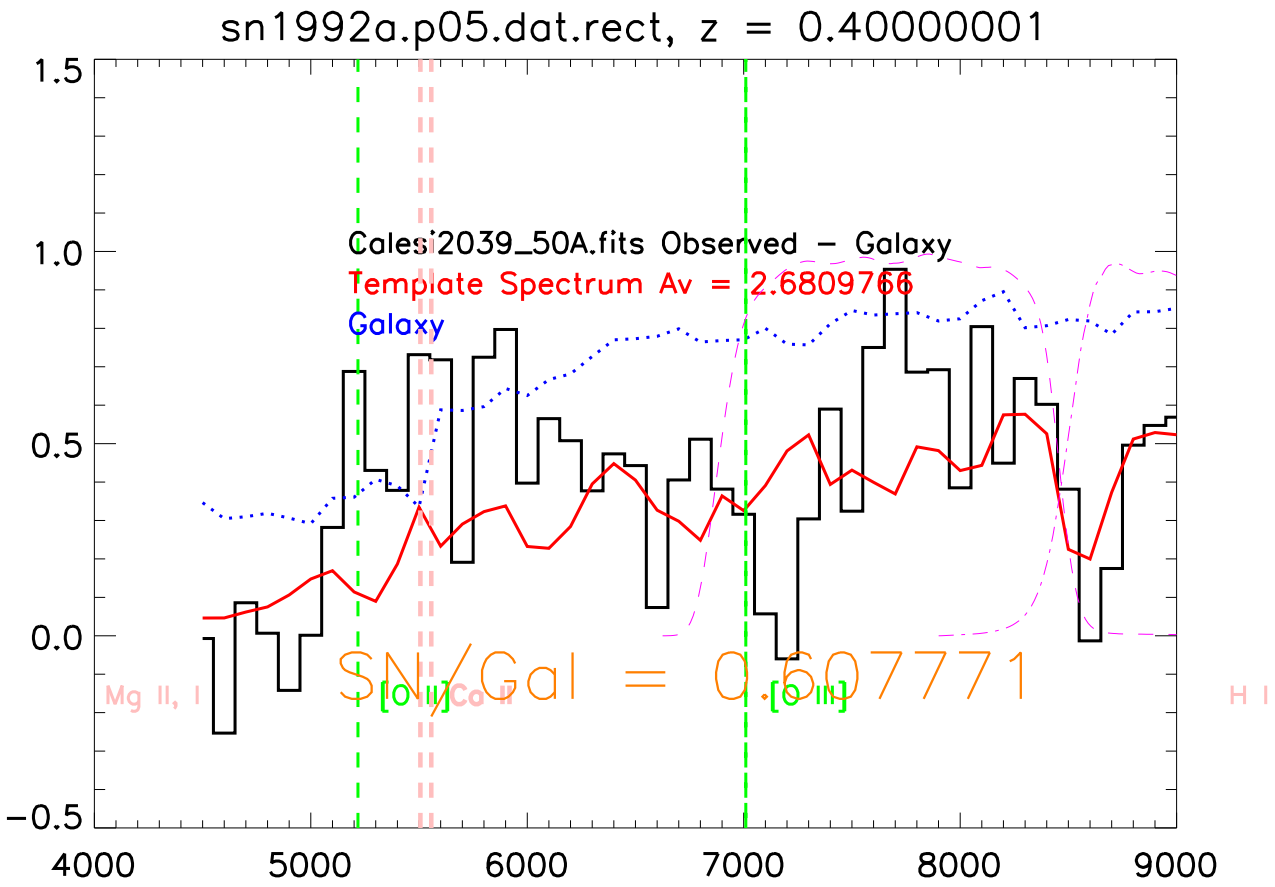

sn1998bu.p08.dat.rect, z = 0.30000001
Calesi2039_50A.fits Observed − Galaxy
Template Spectrum Av = 5.3587962
Galaxy
SN/Gal = 0.282693
Mg II, I
[O II]
Ca II
[O III]
1.5
1.0
0.5
0.0
−0.5
4000
5000
6000
7000
8000
9000

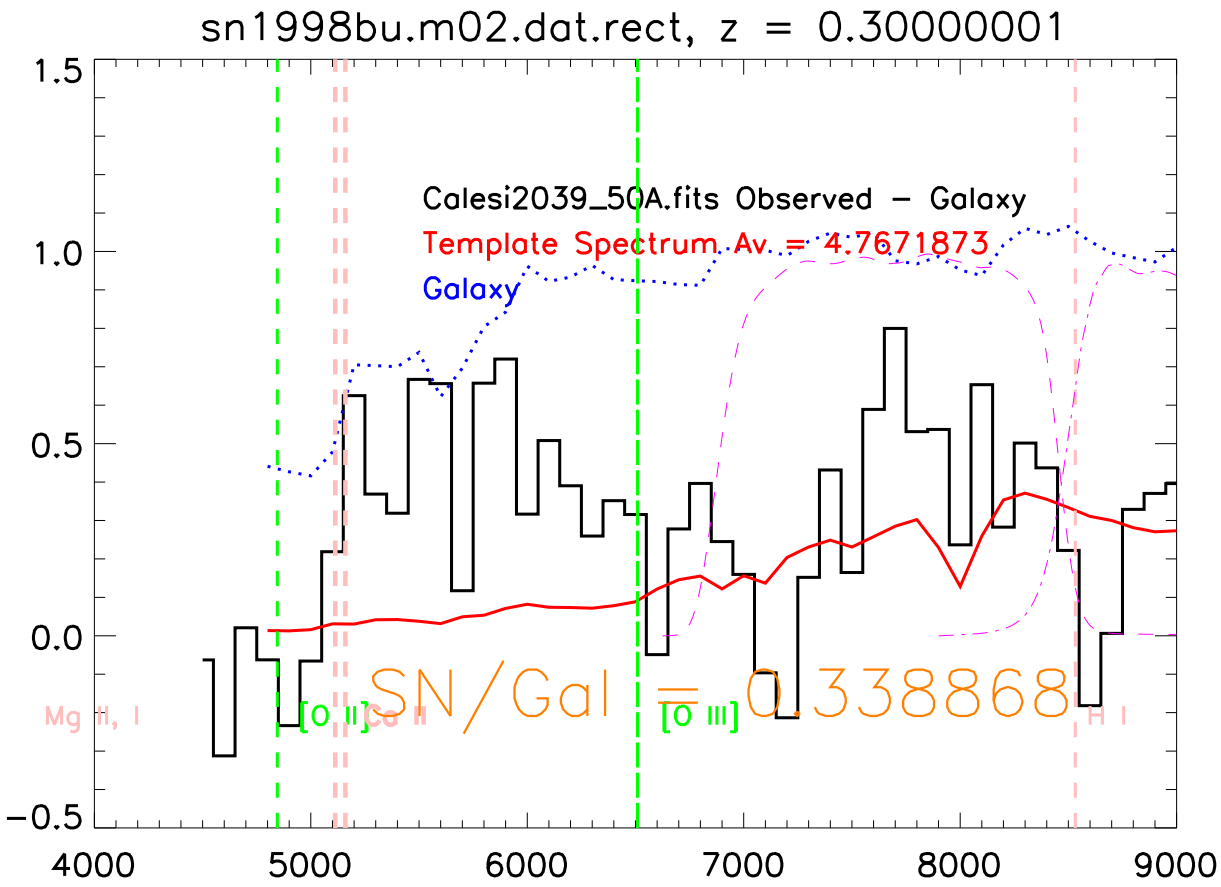

sn1999ee.p12.dat.rect, z = 0.40000001
Calesi2039_50A.fits Observed − Galaxy
Template Spectrum Av = 1.8156167
Galaxy
SN/Gal = 0.605313
Mg II, I
[O II]
Ca II
[O III]
H I
1.5
1.0
0.5
0.0
−0.5
4000
5000
6000
7000
8000
9000

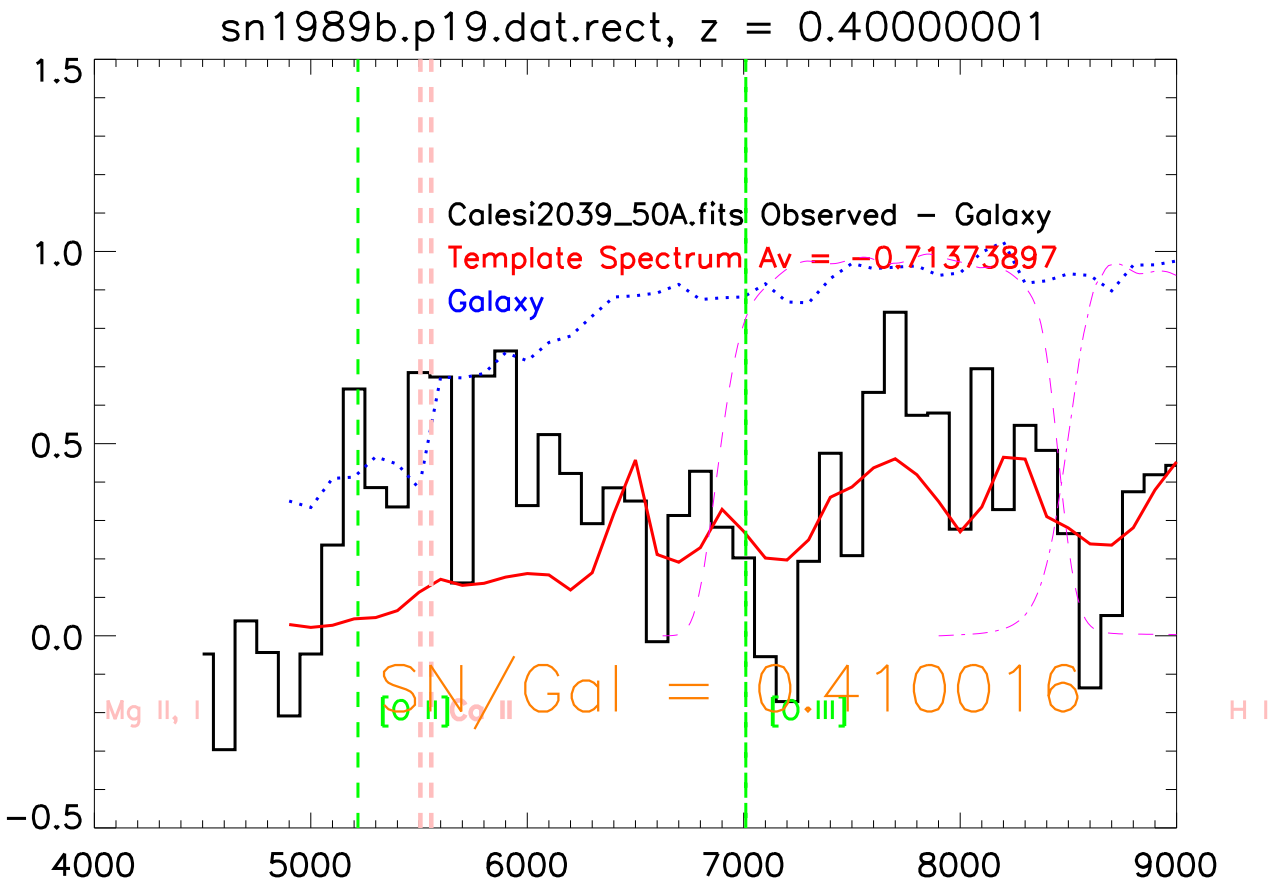

sn1991t.m03.dat.rect, z = 0.64999998
Calesi2039_50A.fits Observed − Galaxy
Template Spectrum Av = −5.1677758
Galaxy
SN/Gal = 0.0124179
Mg II, I
[O II]
Ca II
[O III]
2.0
1.5
1.0
0.5
0.0
−0.5
4000
5000
6000
7000
8000
9000

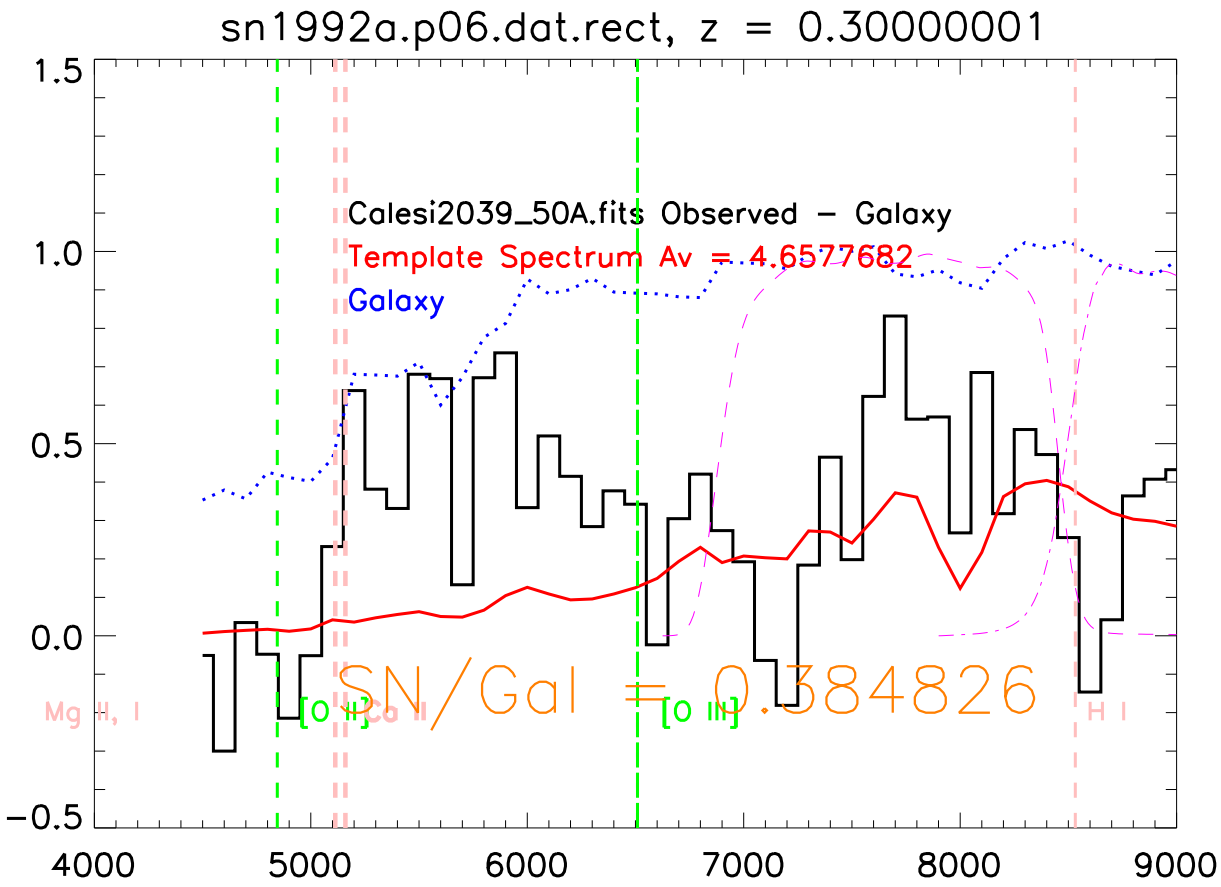

sn1992a.m05.dat.rect, z = 0.30000001
Calesi2039_50A.fits Observed − Galaxy
Template Spectrum Av = 4.0071922
Galaxy
SN/Gal = 0.478936
Mg II, I
[O II]
Ca II
[O III]
H I
1.5
1.0
0.5
0.0
−0.5
4000
5000
6000
7000
8000
9000

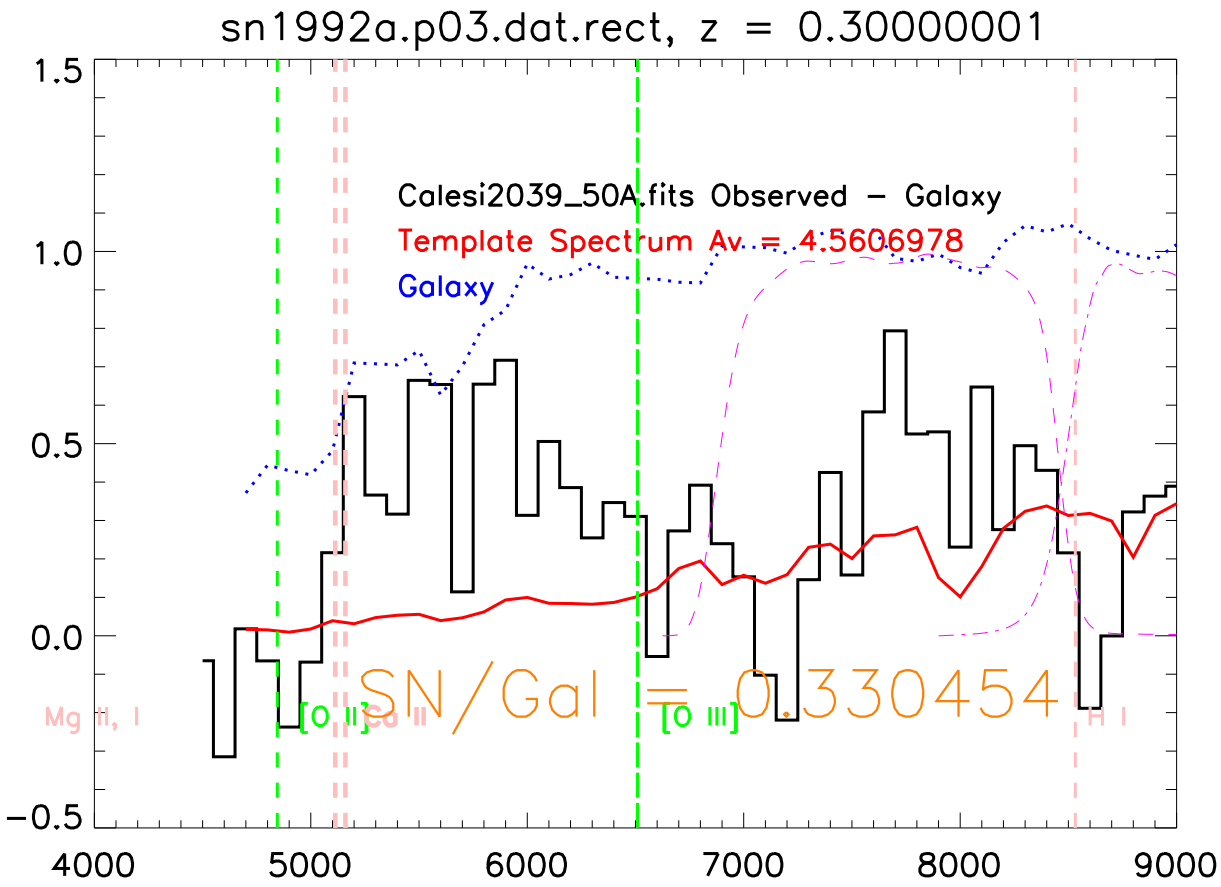

sn1994d.m08.dat.rect, z = 0.50000000
Calesi2039_50A.fits Observed − Galaxy
Template Spectrum Av = 3.1080368
Galaxy
SN/Gal = 31.8260
Mg II
[O II]
Ca II
[O III]
2.0
1.5
1.0
0.5
0.0
4000
5000
6000
7000
8000
9000

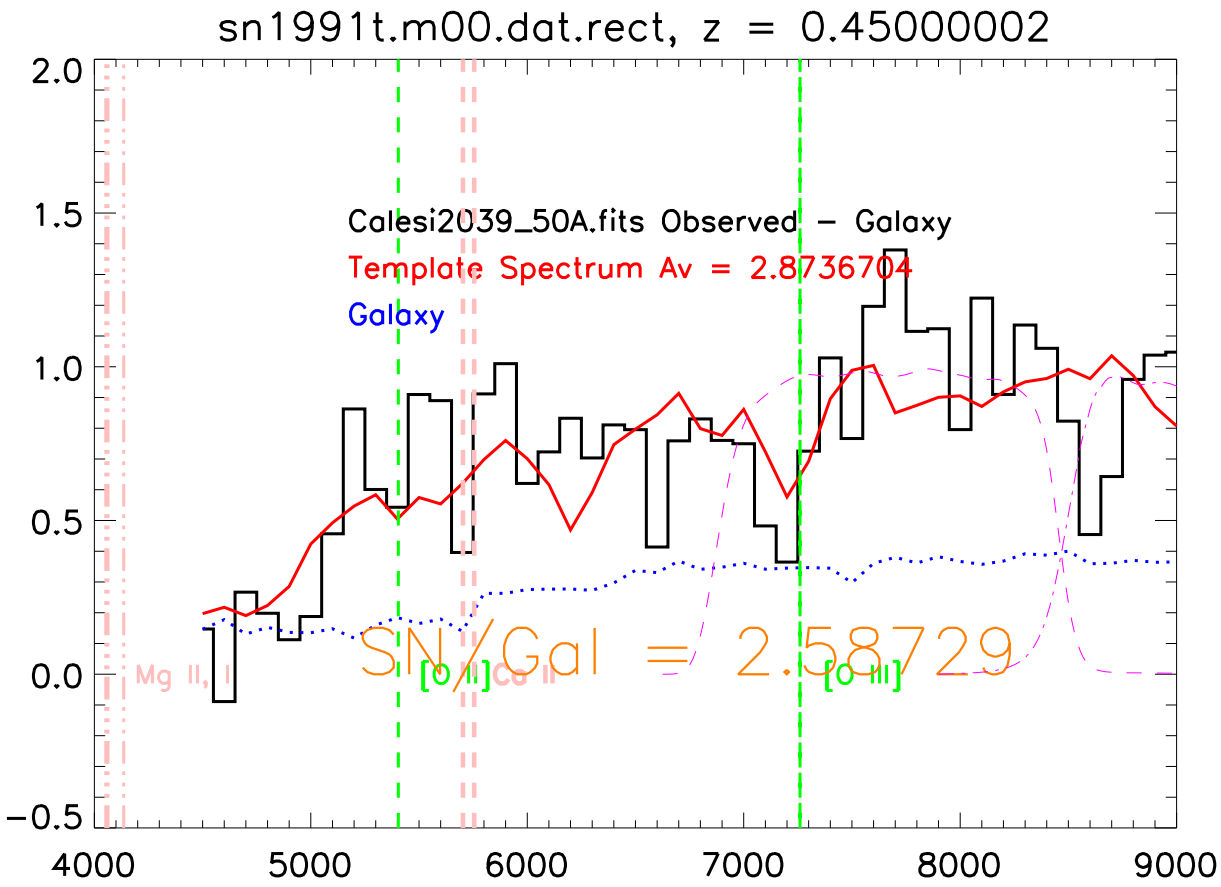

sn1992a.p05.dat.rect, z = 0.40000001
Calesi2039_50A.fits Observed − Galaxy
Template Spectrum Av = 2.6809766
Galaxy
SN/Gal = 0.607771
Mg II, I
[O II]
Ca II
[O III]
H I
1.5
1.0
0.5
0.0
−0.5
4000
5000
6000
7000
8000
9000

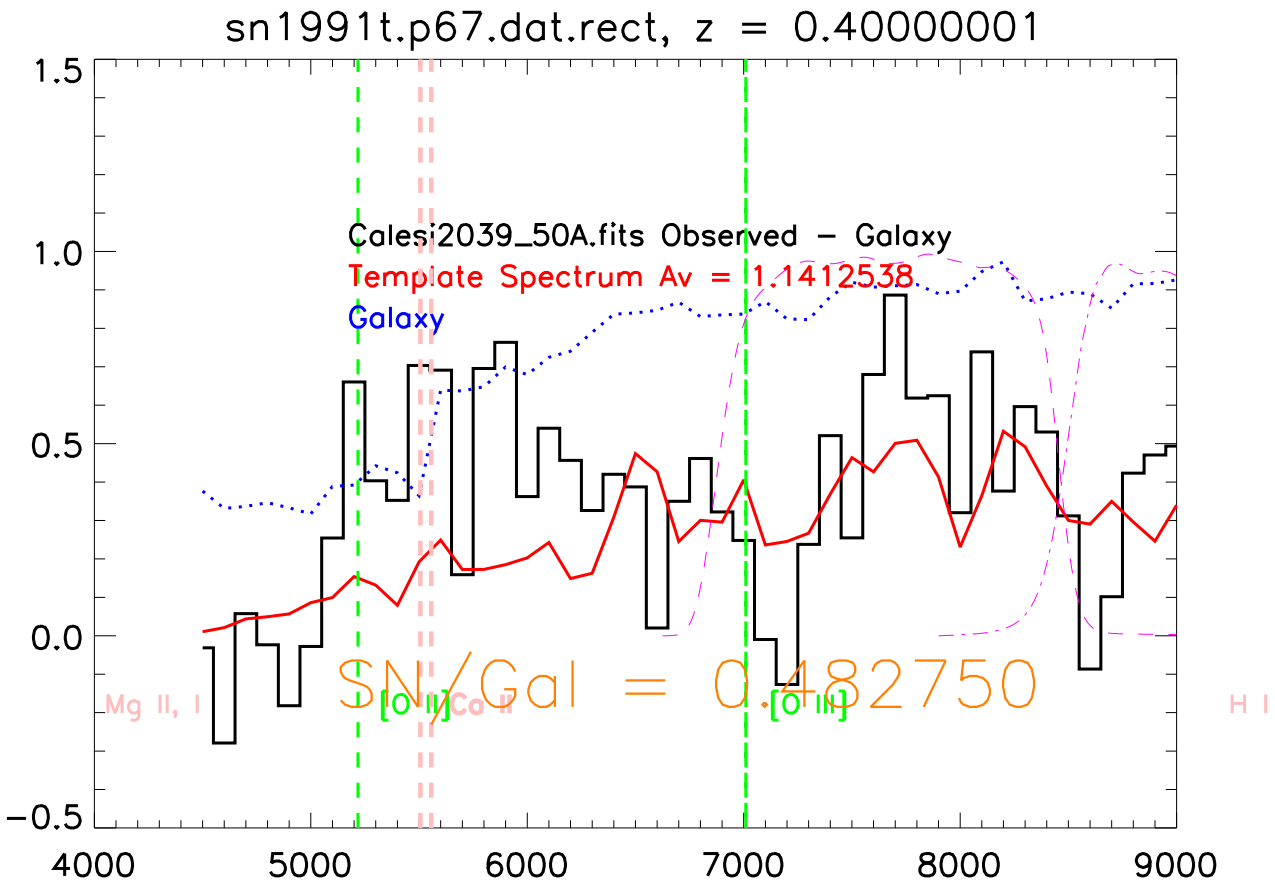

sn1998bu.m02.dat.rect, z = 0.30000001
Calesi2039_50A.fits Observed − Galaxy
Template Spectrum Av. = 4.7671873
Galaxy
SN/Gal = 0.338868
Mg II, I
[O II]
Ca II
[O III]
H I
1.5
1.0
0.5
0.0
−0.5
4000
5000
6000
7000
8000
9000

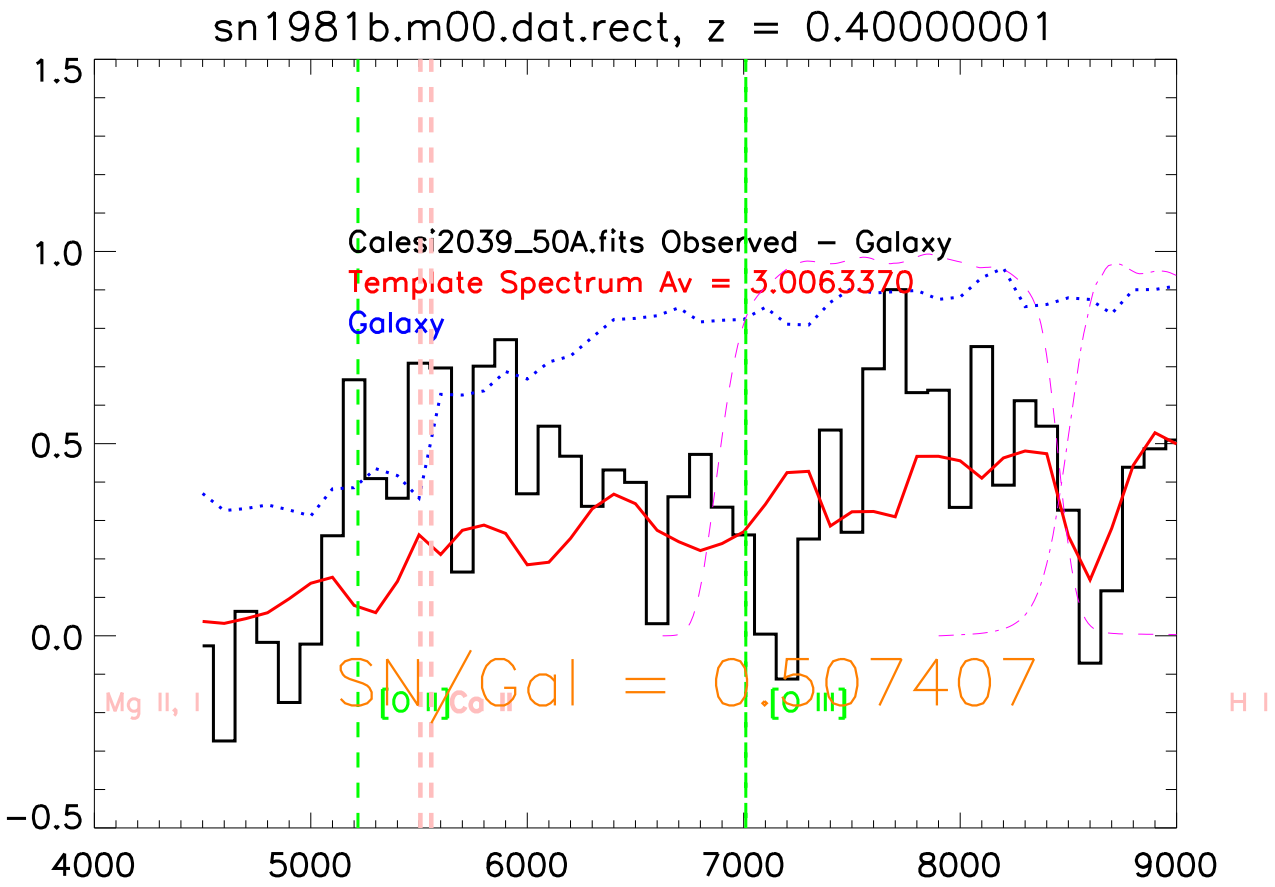

sn1989b.p19.dat.rect, z = 0.40000001
Calesi2039_50A.fits Observed − Galaxy
Template Spectrum Av = −0.71373897
Galaxy
SN/Gal = 0.410016
Mg II, I
[O II]
Ca II
[O III]
H I
1.5
1.0
0.5
0.0
−0.5
4000
5000
6000
7000
8000
9000

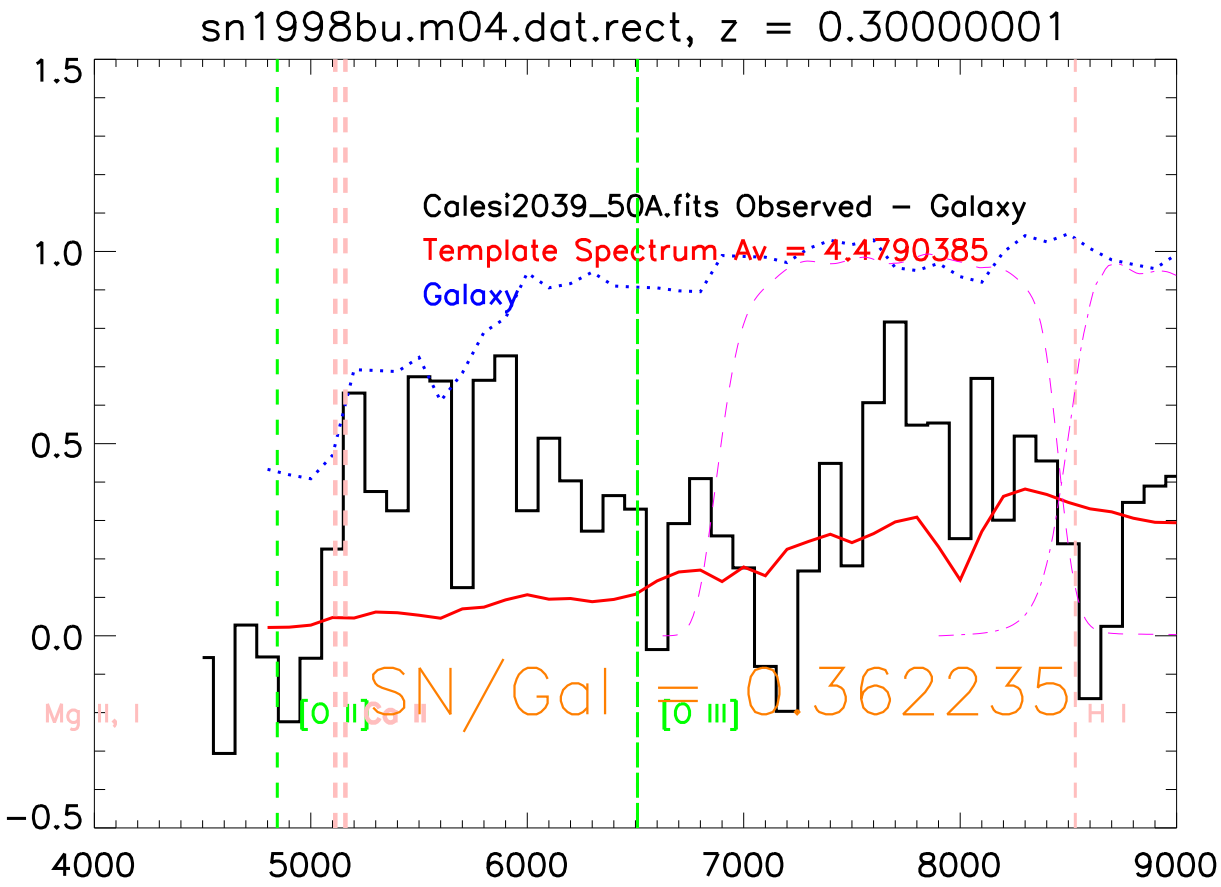

sn1992a.p06.dat.rect, z = 0.30000001
Calesi2039_50A.fits Observed − Galaxy
Template Spectrum Av = 4.6577682
Galaxy
SN/Gal = 0.384826
Mg II, I
[O II]
Ca II
[O III]
H I
1.5
1.0
0.5
0.0
−0.5
4000
5000
6000
7000
8000
9000

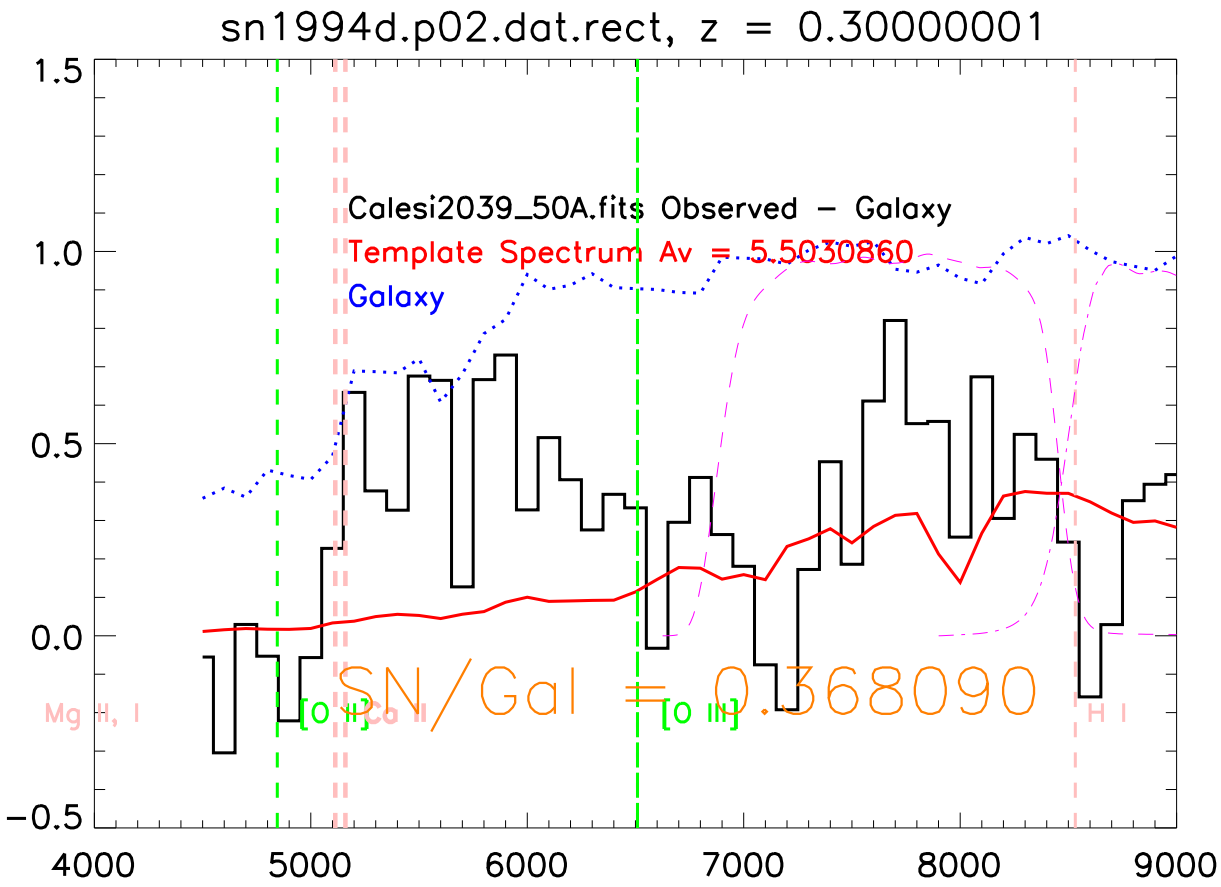

sn1992a.p03.dat.rect, z = 0.30000001
Calesi2039_50A.fits Observed − Galaxy
Template Spectrum Av = 4.5606978
Galaxy
SN/Gal = 0.330454
[O II]
[O III]
1.5
1.0
0.5
0.0
−0.5
4000
5000
6000
7000
8000
9000

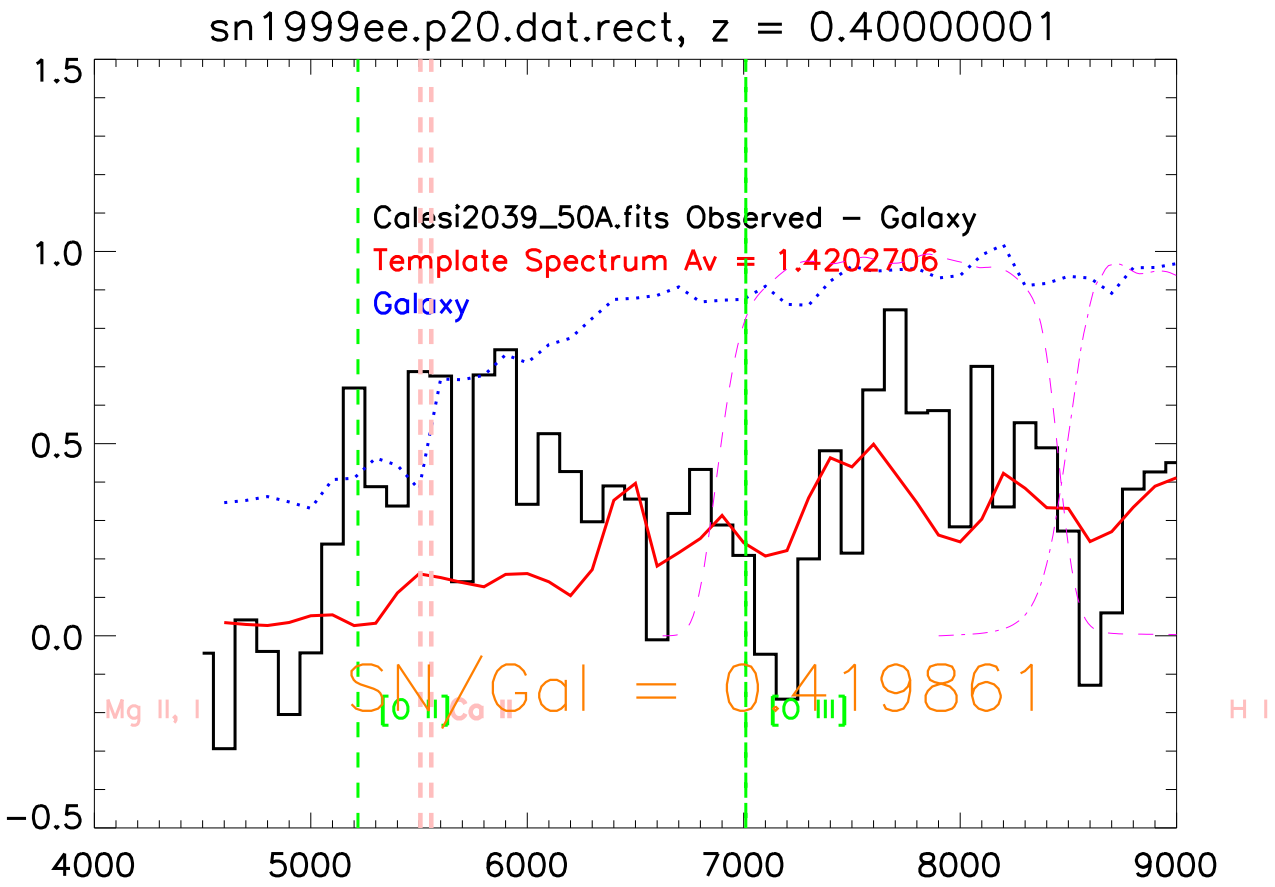

sn1991t.m00.dat.rect, z = 0.45000002
Calesi2039_50A.fits Observed − Galaxy
Template Spectrum Av = 2.8736704
Galaxy
SN/Gal = 2.58729
[O II]
[O III]
2.0
1.5
1.0
0.5
0.0
−0.5
4000
5000
6000
7000
8000
9000

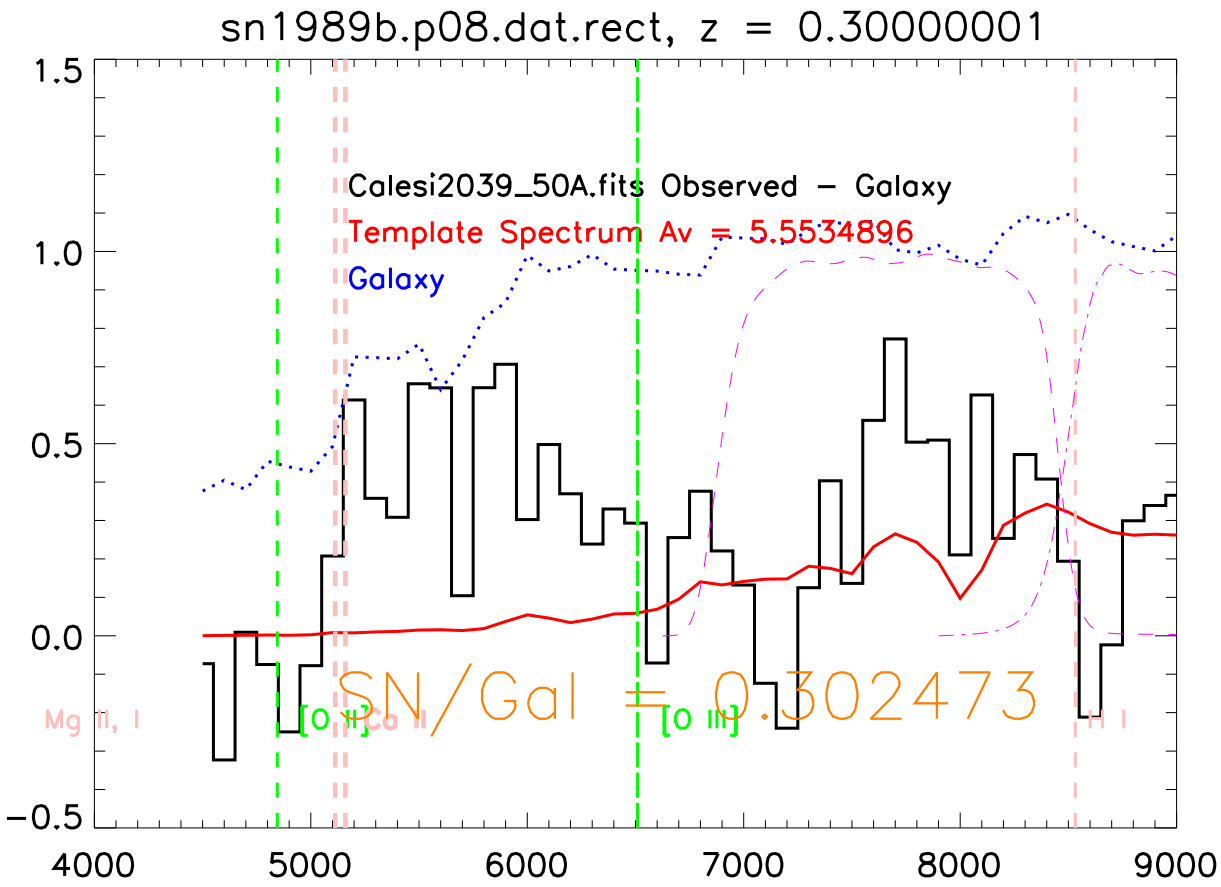

sn1991t.p67.dat.rect, z = 0.40000001
Calesi2039_50A.fits Observed − Galaxy
Template Spectrum Av = 1.1412538
Galaxy
SN/Gal = 0.482750
Mg II, I
[O II]
Ca II
[O III]
H I
1.5
1.0
0.5
0.0
−0.5
4000
5000
6000
7000
8000
9000

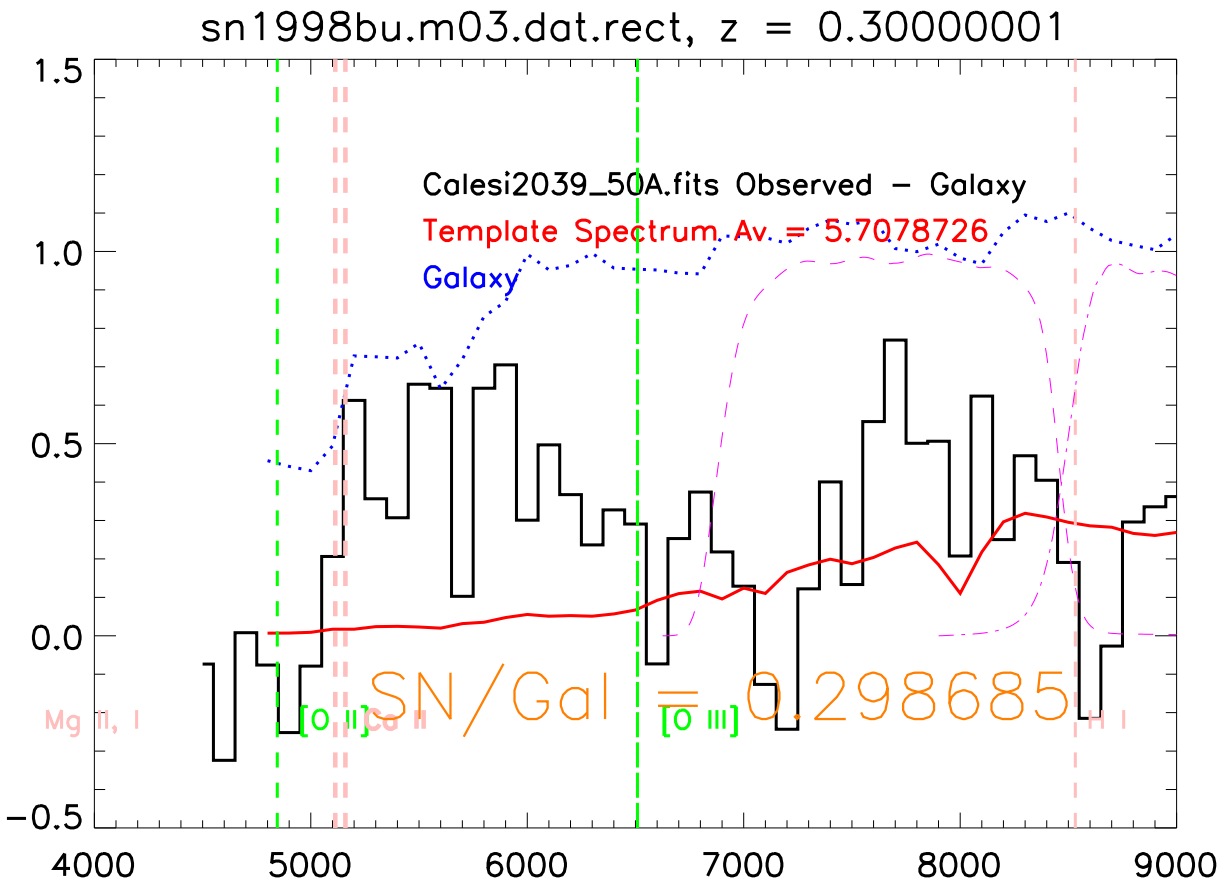

sn1981b.m00.dat.rect, z = 0.40000001
Calesi2039_50A.fits Observed − Galaxy
Template Spectrum Av = 3.0063370
Galaxy
SN/Gal = 0.507407
Mg II, I
[O II]
Ca II
[O III]
H I
1.5
1.0
0.5
0.0
−0.5
4000
5000
6000
7000
8000
9000

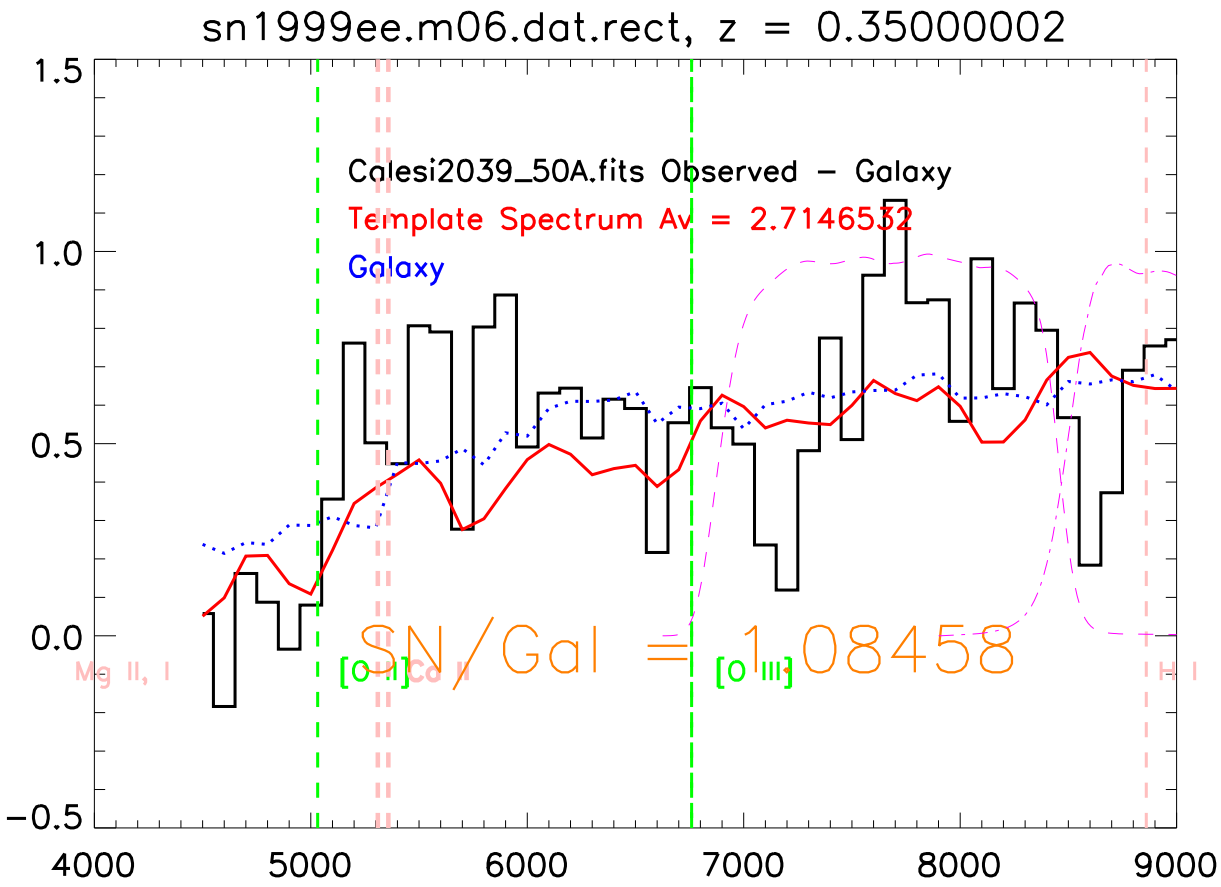

sn1998bu.m04.dat.rect, z = 0.30000001
Calesi2039_50A.fits Observed − Galaxy
Template Spectrum Av = 4.4790385
Galaxy
SN/Gal = 0.362235
[O II]
[O III]
1.5
1.0
0.5
0.0
−0.5
4000
5000
6000
7000
8000
9000

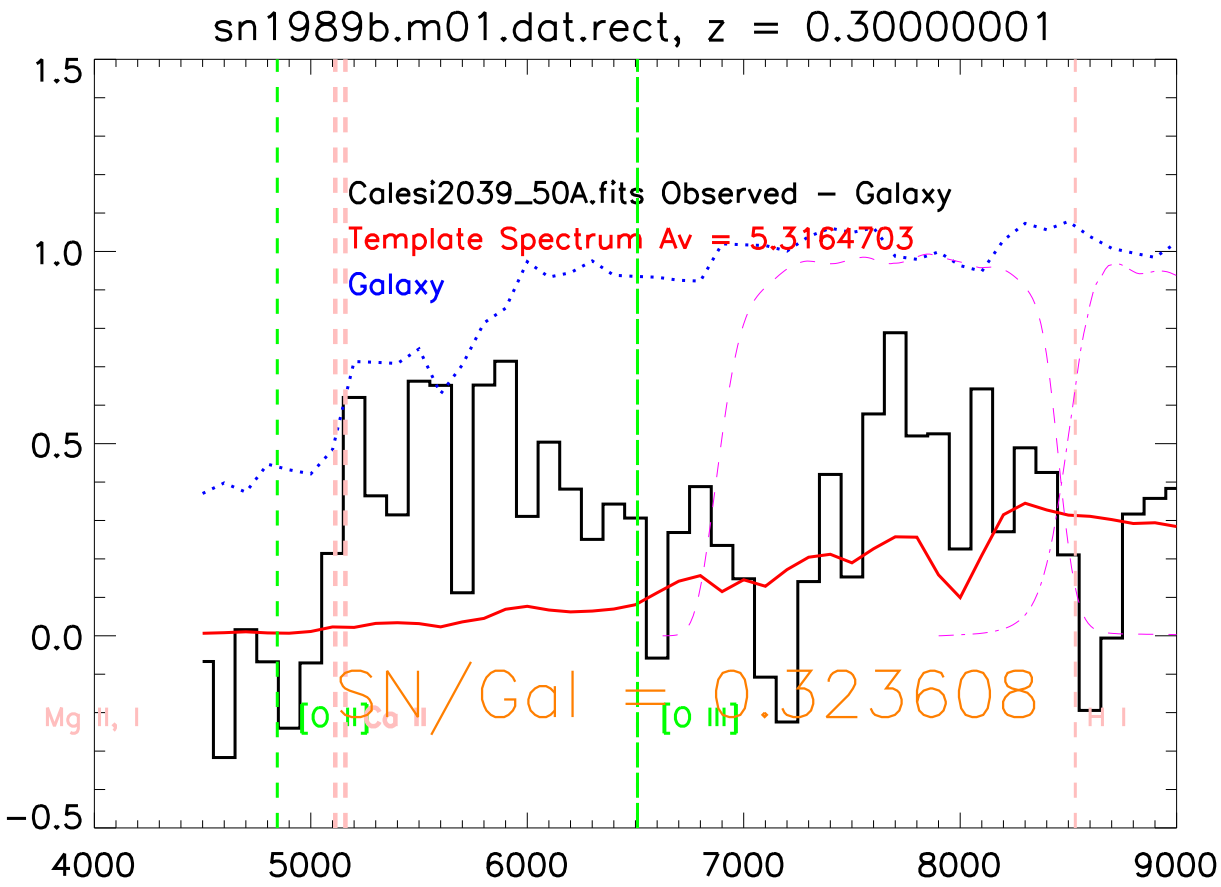

sn1994d.p02.dat.rect, z = 0.30000001
Calesi2039_50A.fits Observed − Galaxy
Template Spectrum Av = 5.5030860
Galaxy
SN/Gal = 0.0368090
Mg II, I
[O II]
Ca II
[O III]
H I
1.5
1.0
0.5
0.0
−0.5
4000
5000
6000
7000
8000
9000

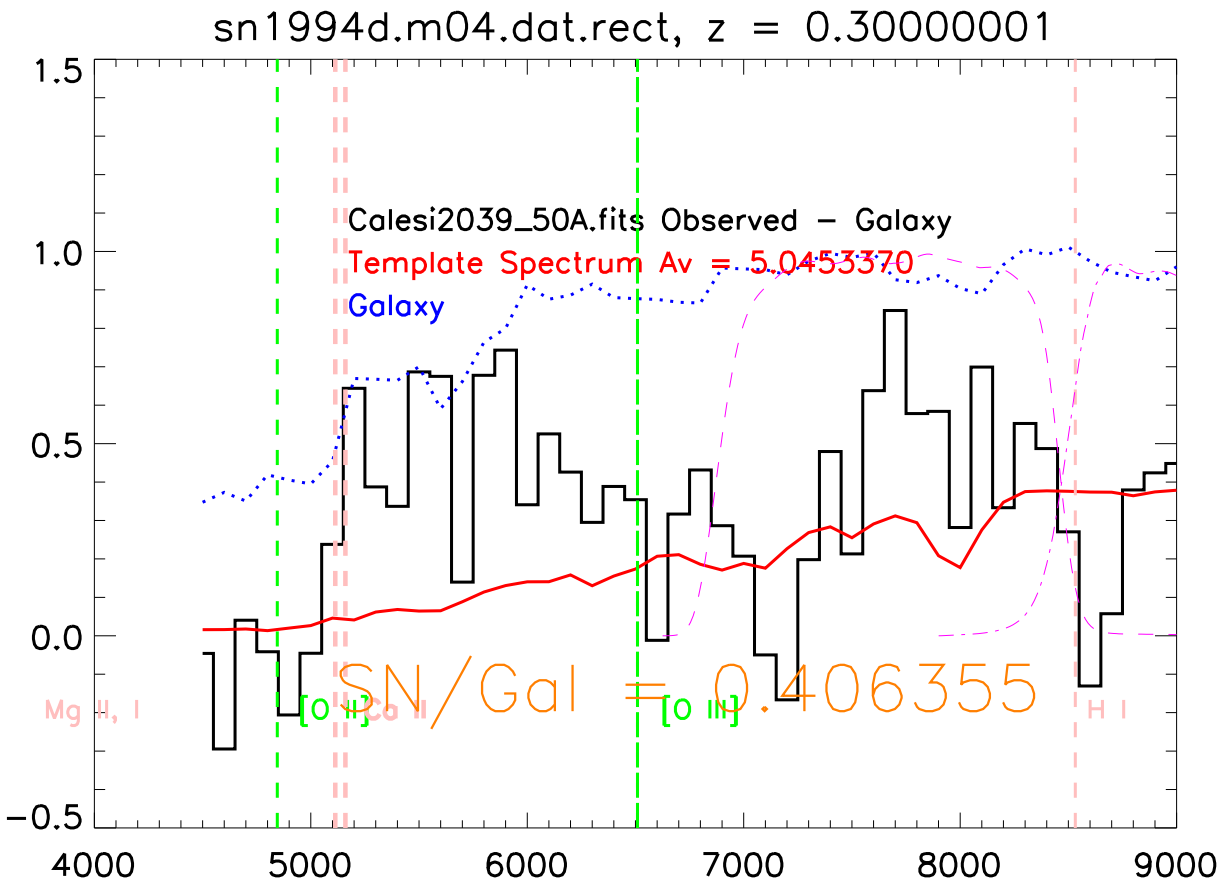

sn1999ee.p20.dat.rect, z = 0.40000001
Calesi2039_50A.fits Observed − Galaxy
Template Spectrum Av = 1.4202706
Galaxy
SN/Gal = 0.419861
Mg II, I
[O II]
Ca II
[O III]
H I
1.5
1.0
0.5
0.0
−0.5
4000
5000
6000
7000
8000
9000

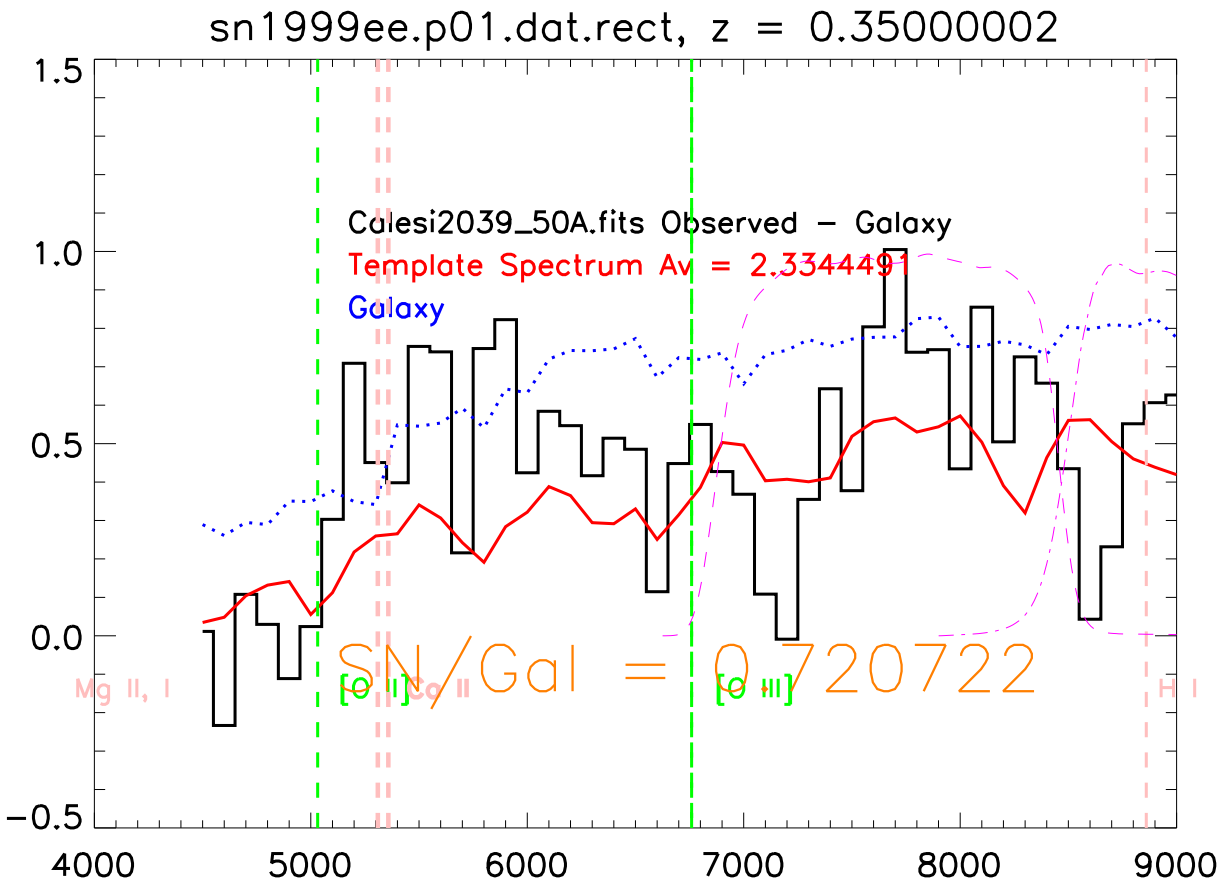

sn1989b.p08.dat.rect, z = 0.30000001
Calesi2039_50A.fits Observed − Galaxy
Template Spectrum Av = 5.5534896
Galaxy
SN/Gal = 0.302473
Mg II, I
[O II]
Ca II
[O III]
H I
1.5
1.0
0.5
0.0
−0.5
4000
5000
6000
7000
8000
9000

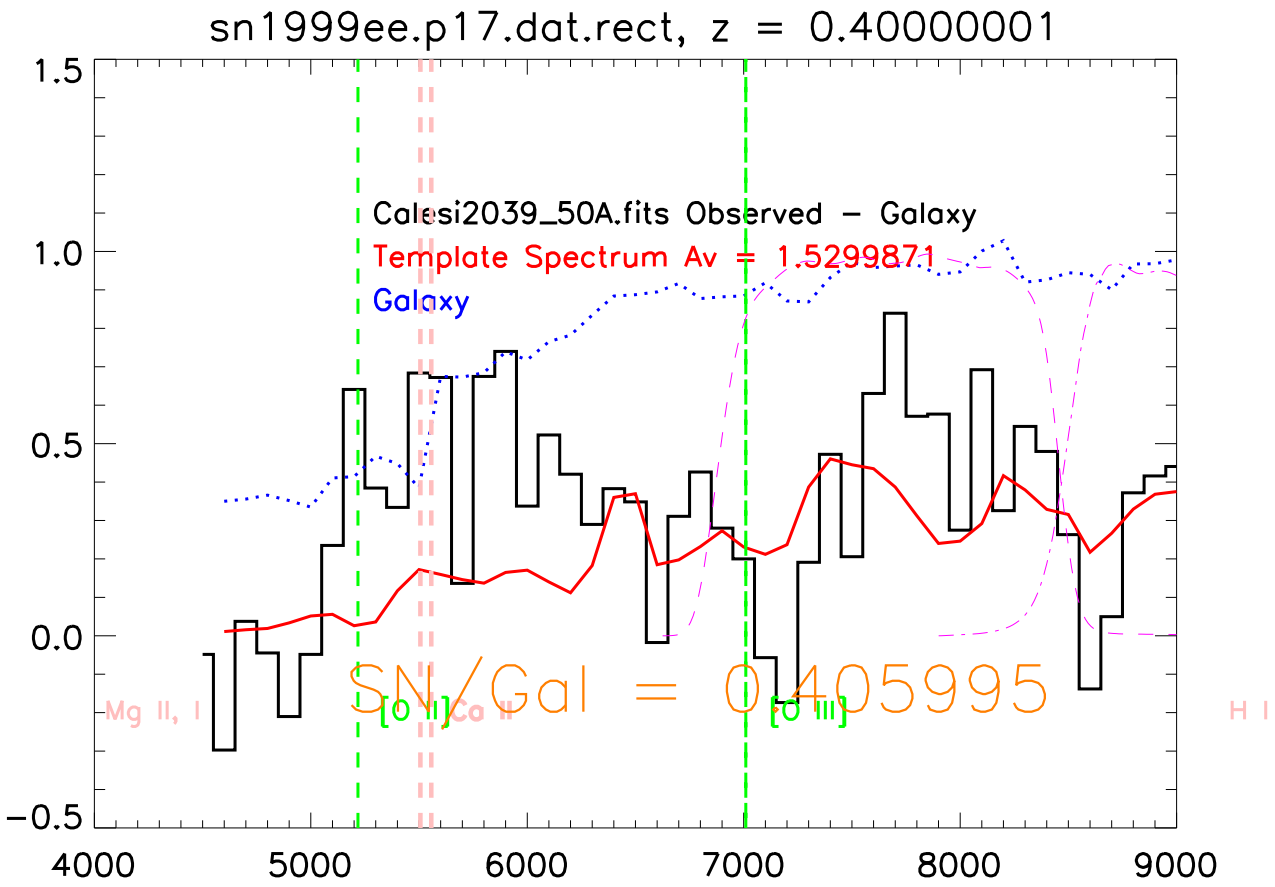

sn1998bu.m03.dat.rect, z = 0.30000001
Calesi2039_50A.fits Observed − Galaxy
Template Spectrum Av. = 5.7078726
Galaxy
SN/Gal = 0.298685
Mg II, I
[O II]
Ca II
[O III]
H I
1.5
1.0
0.5
0.0
−0.5
4000
5000
6000
7000
8000
9000

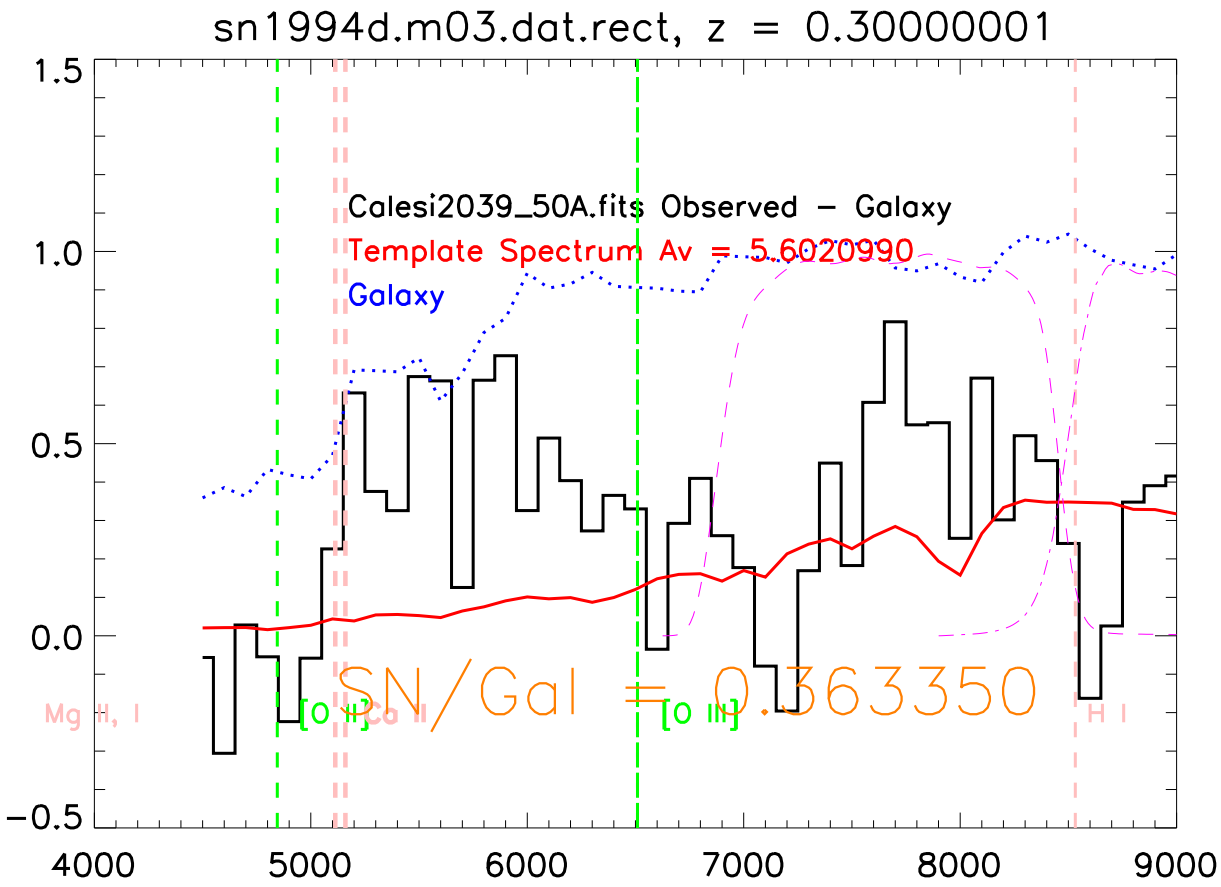

sn1999ee.m06.dat.rect, z = 0.35000002
Calesi2039_50A.fits Observed − Galaxy
Template Spectrum Av = 2.7146532
Galaxy
SN/Gal = 1.08458
Mg II, I
[O II]
Ca II
[O III]
H I
1.5
1.0
0.5
0.0
−0.5
4000
5000
6000
7000
8000
9000

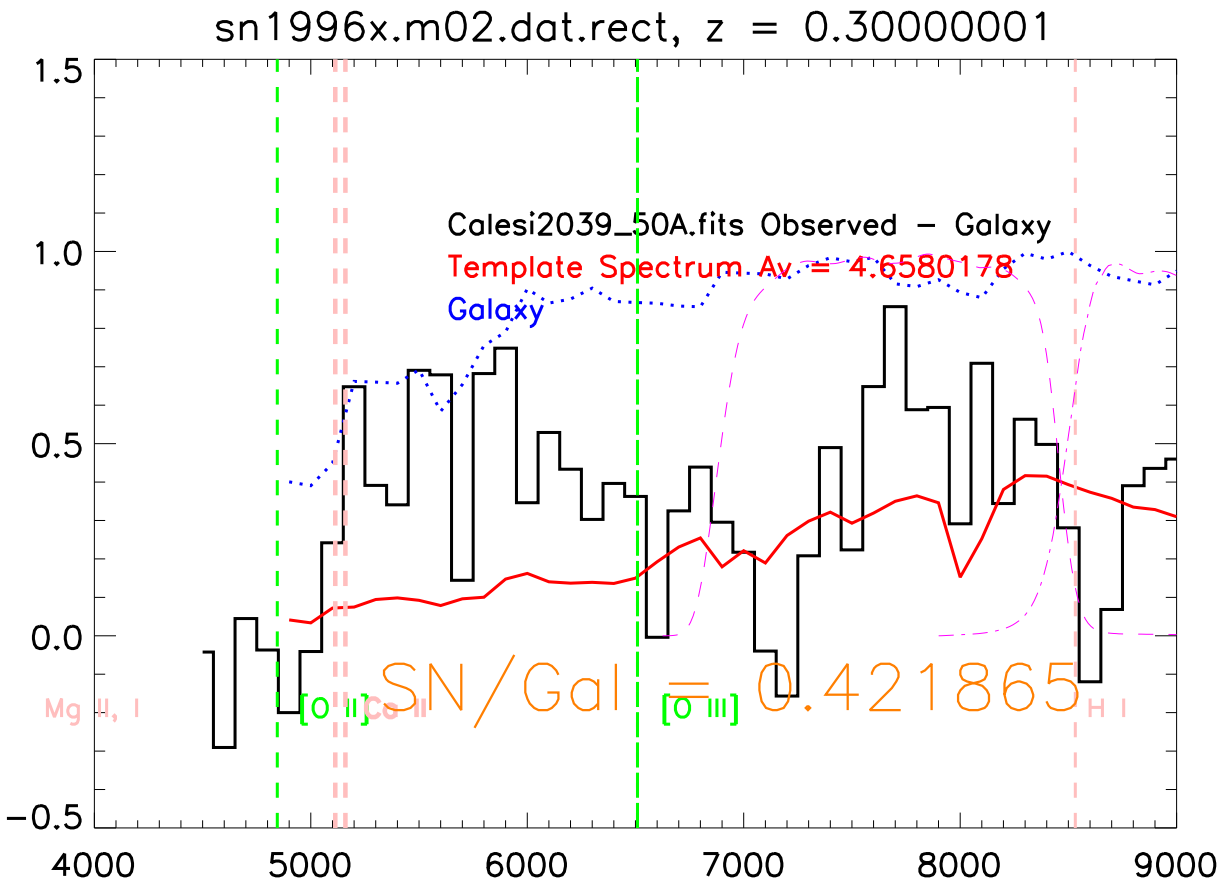

sn1989b.m01.dat.rect, z = 0.30000001
Calesi2039_50A.fits Observed − Galaxy
Template Spectrum Av = 5.3164703
Galaxy
SN/Gal = 0.323608
Mg II, I
[O II]
Ca II
[O III]
H I
1.5
1.0
0.5
0.0
−0.5
4000
5000
6000
7000
8000
9000

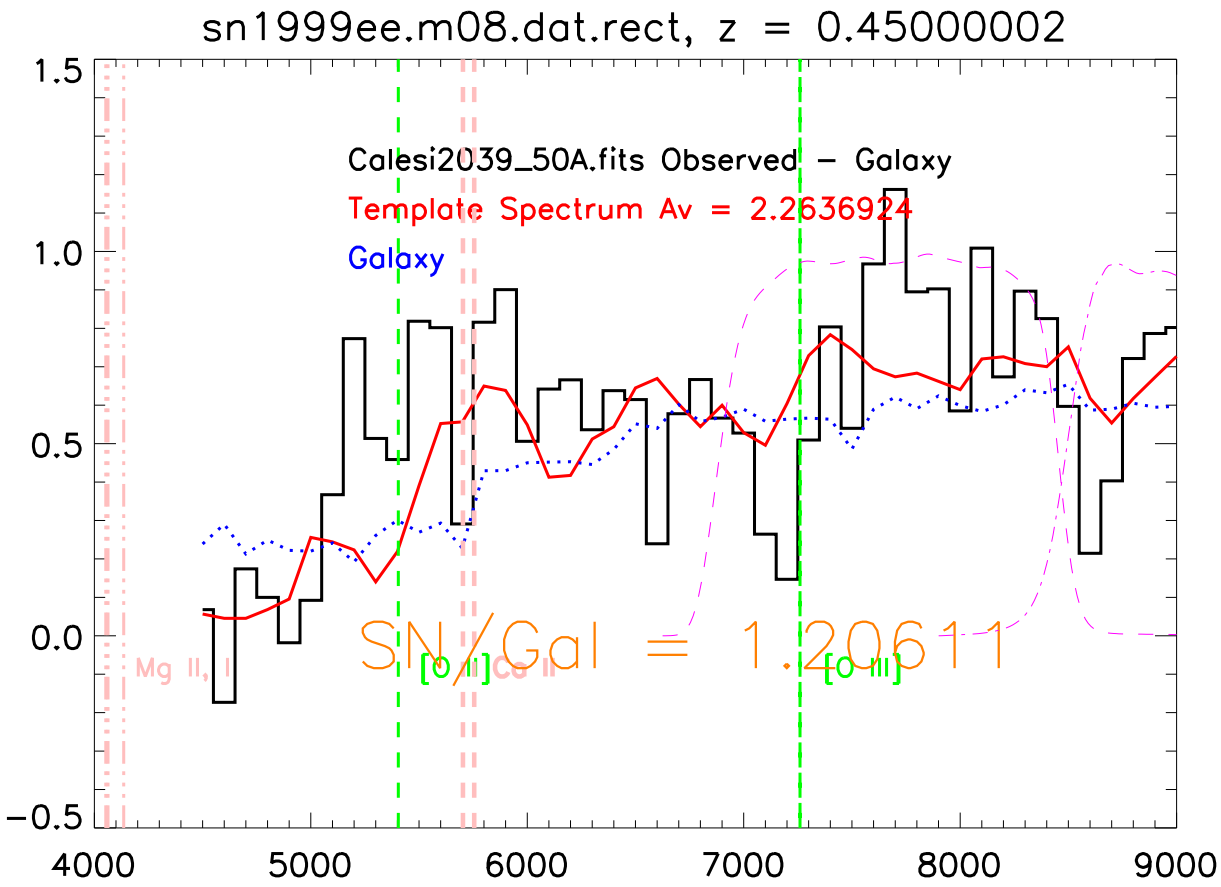

sn1994d.m04.dat.rect, z = 0.30000001
Calesi2039_50A.fits Observed − Galaxy
Template Spectrum Av = 5.0453370
Galaxy
SN/Gal = 0.406355
[O II]
[O III]
H I
1.5
1.0
0.5
0.0
−0.5
4000
5000
6000
7000
8000
9000

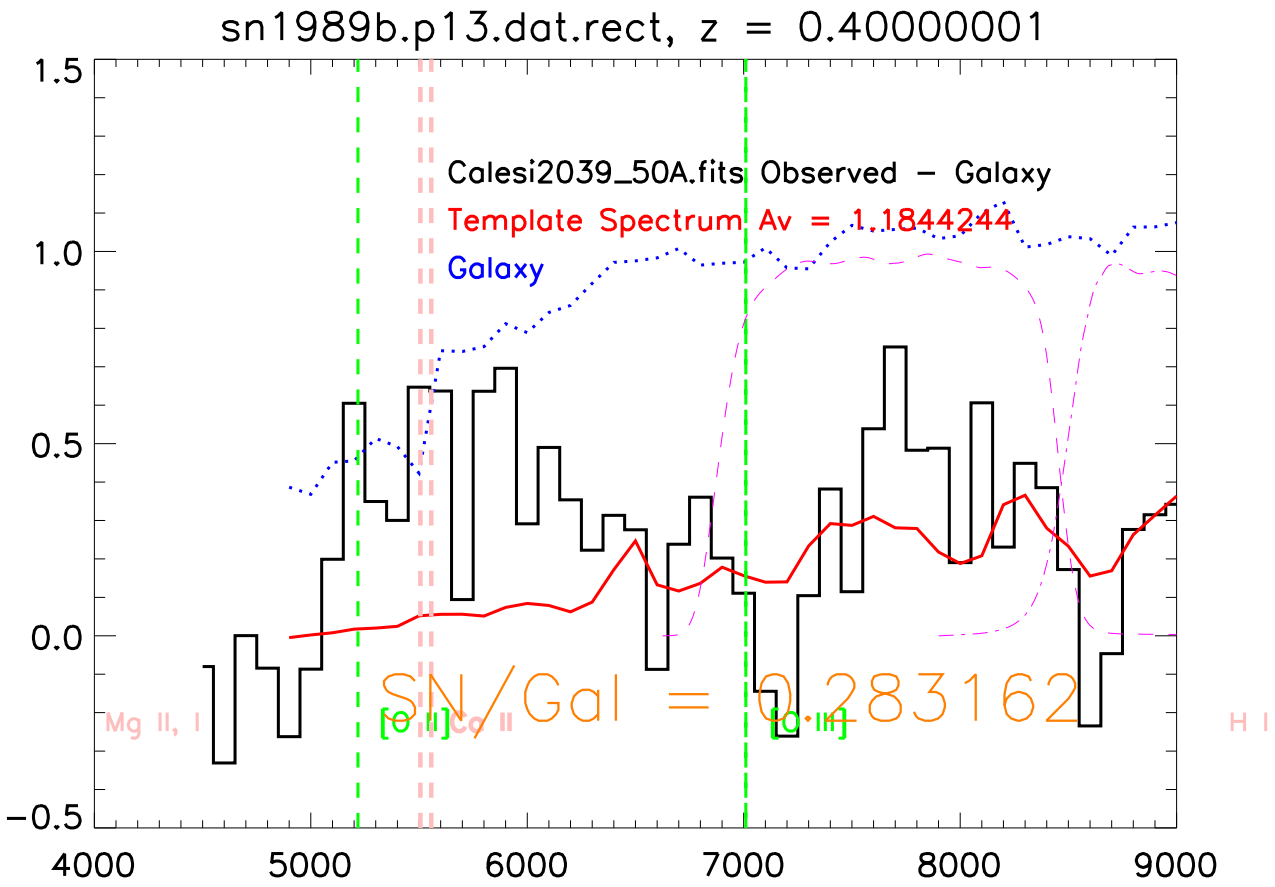

sn1999ee.p01.dat.rect, z = 0.35000002
Calesi2039_50A.fits Observed − Galaxy
Template Spectrum Av = 2.3344491
Galaxy
SN/Gal = 0.720722
Mg II, I
[O II]
Ca II
[O III]
H I
1.5
1.0
0.5
0.0
−0.5
4000
5000
6000
7000
8000
9000

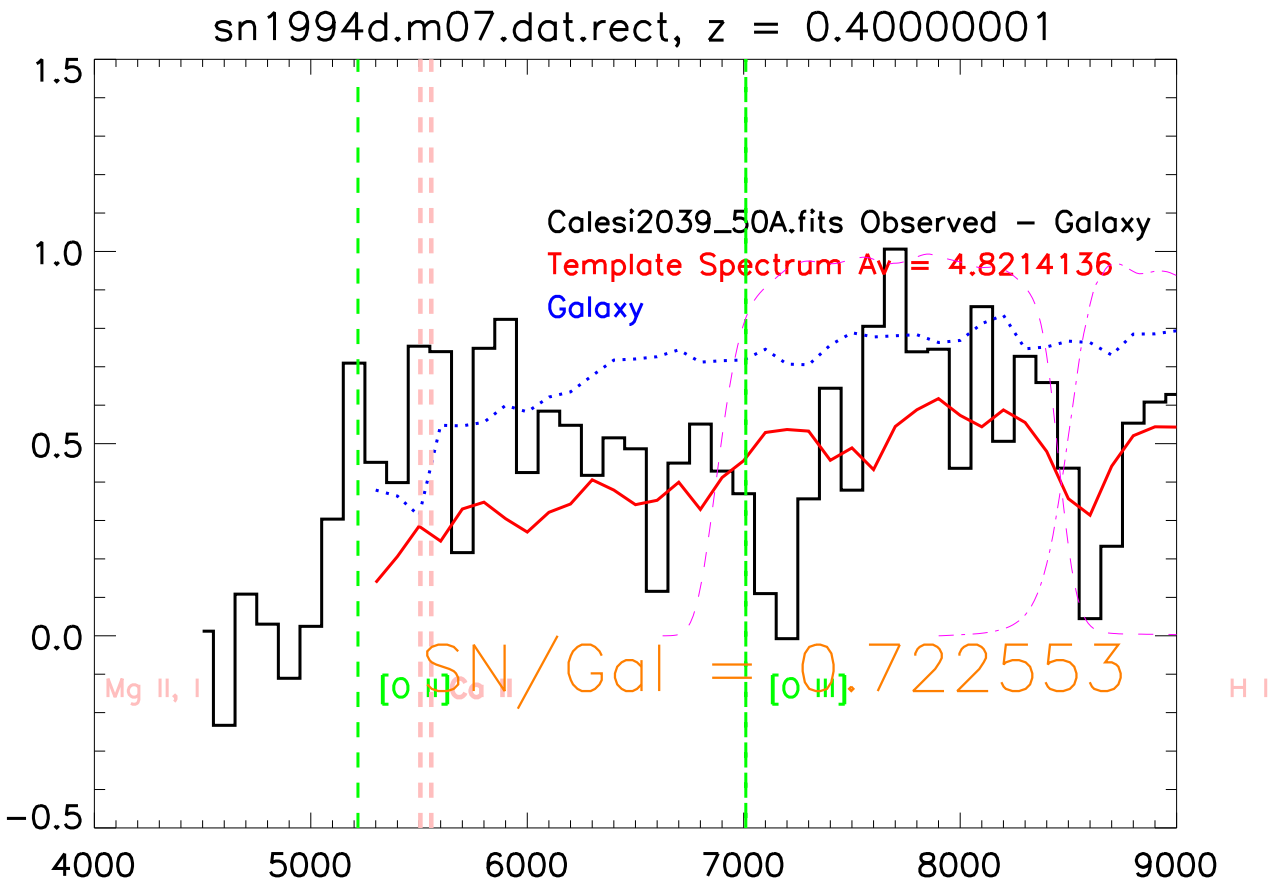

sn1999ee.p17.dat.rect, z = 0.40000001
Calsi2039_50A.fits Observed − Galaxy
Template Spectrum Av = 1.5299871
Galaxy
SN/Gal = 0.405995
Mg II, I
[O II]
Ca II
[O III]
H I
1.5
1.0
0.5
0.0
−0.5
4000
5000
6000
7000
8000
9000

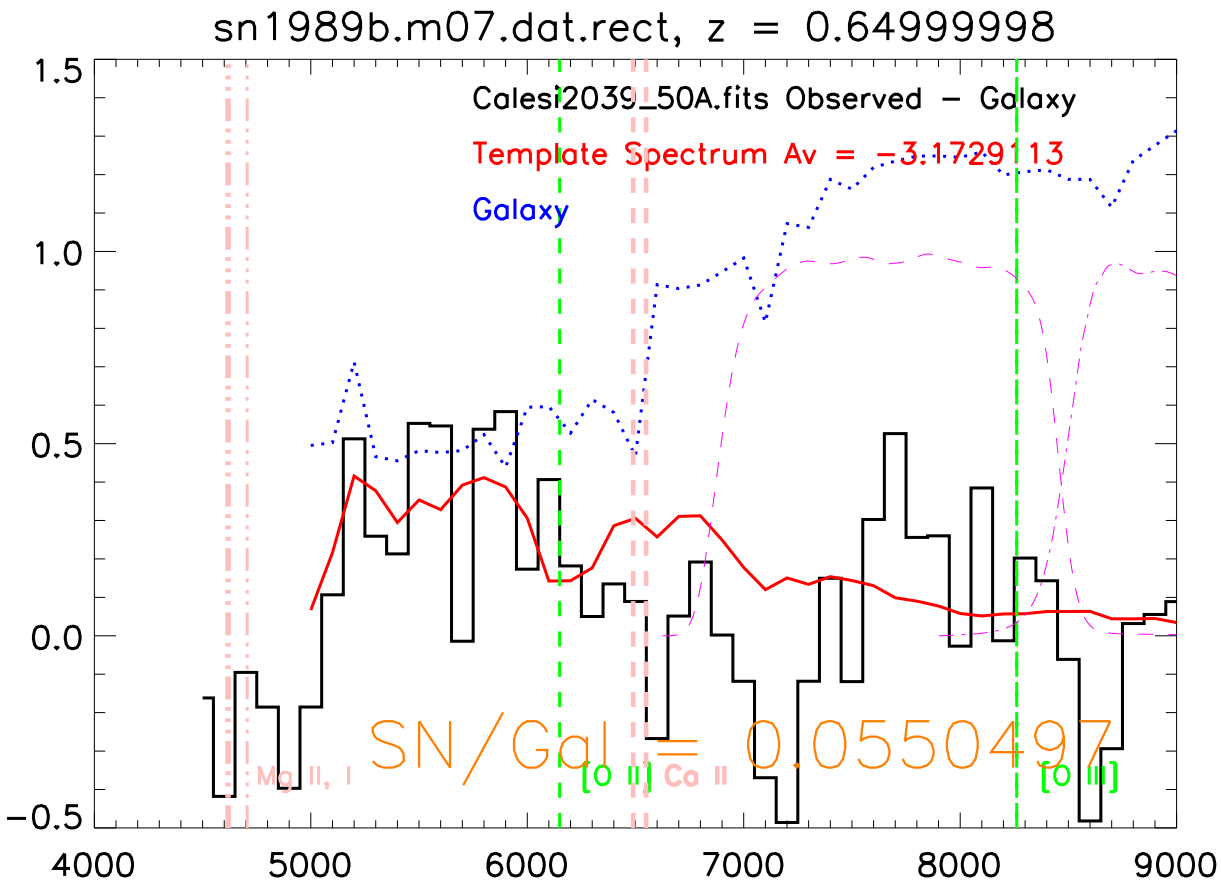

sn1994d.m03.dat.rect, z = 0.30000001
Calesi2039_50A.fits Observed − Galaxy
Template Spectrum Av = 5.6020990
Galaxy
SN/Gal = 0.0363350
Mg II, I
[O II]
Ca II
[O III]
H I
1.5
1.0
0.5
0.0
−0.5
4000
5000
6000
7000
8000
9000

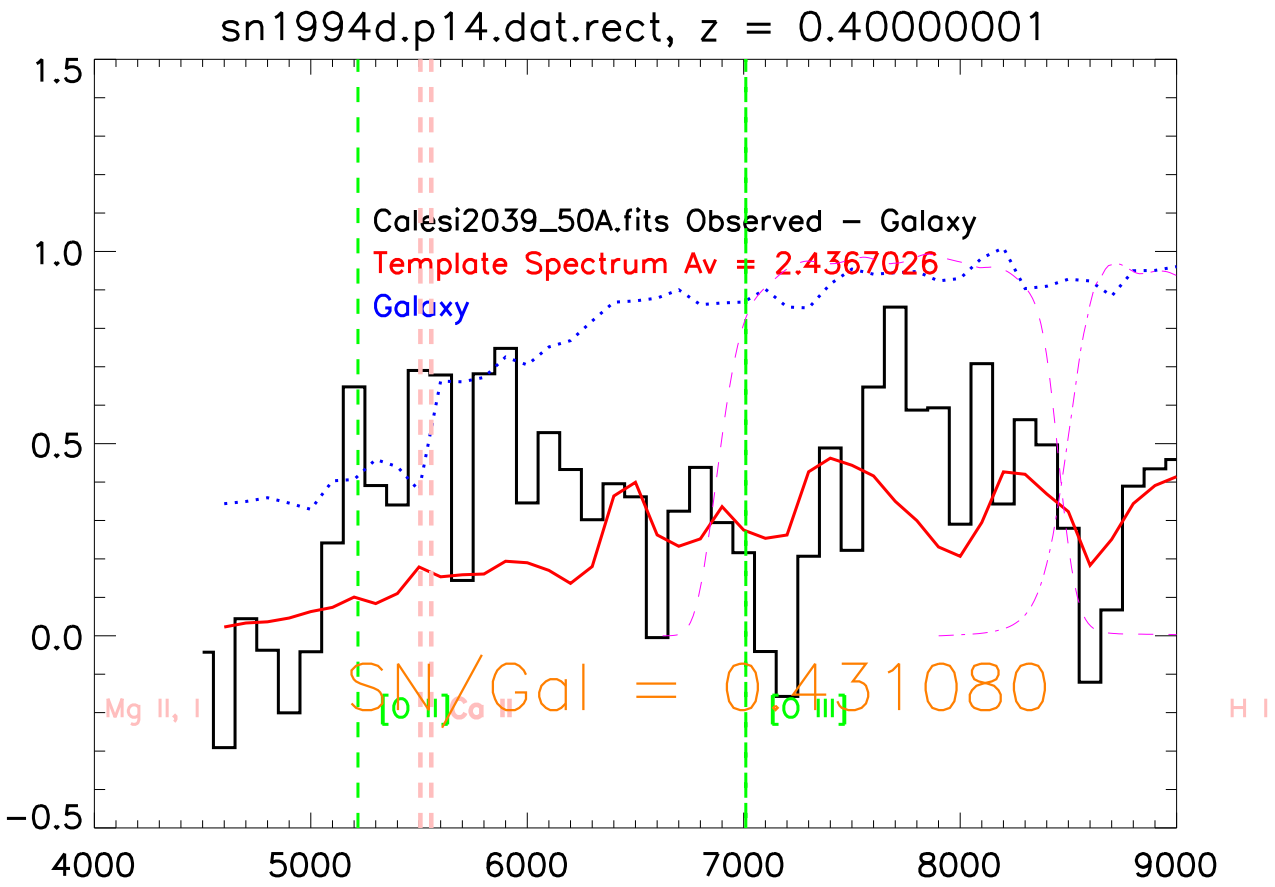

sn1996x.m02.dat.rect, z = 0.30000001
Calesi2039_50A.fits Observed − Galaxy
Template Spectrum Av = 4.6580178
Galaxy
SN/Gal = 0.421865
[O II]
Ca II
[O III]
H I
Mg II, I
1.5
1.0
0.5
0.0
−0.5
4000
5000
6000
7000
8000
9000

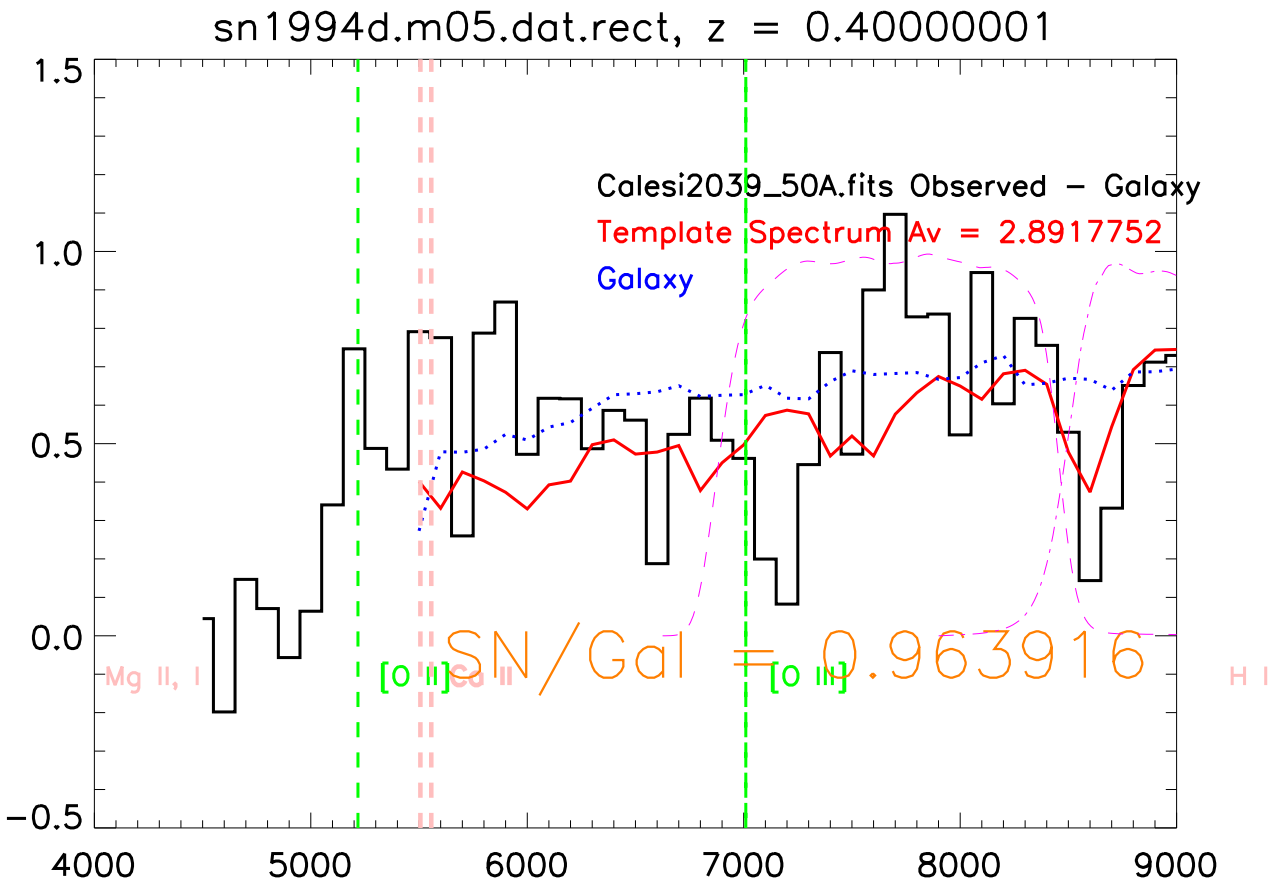

sn1999ee.m08.dat.rect, z = 0.45000002
Calesi2039_50A.fits Observed − Galaxy
Template Spectrum Av = 2.2636924
Galaxy
SN/Gal = 1.20611
Mg II, I
[O II]
Ca II
[O III]
H I
1.5
1.0
0.5
0.0
−0.5
4000
5000
6000
7000
8000
9000

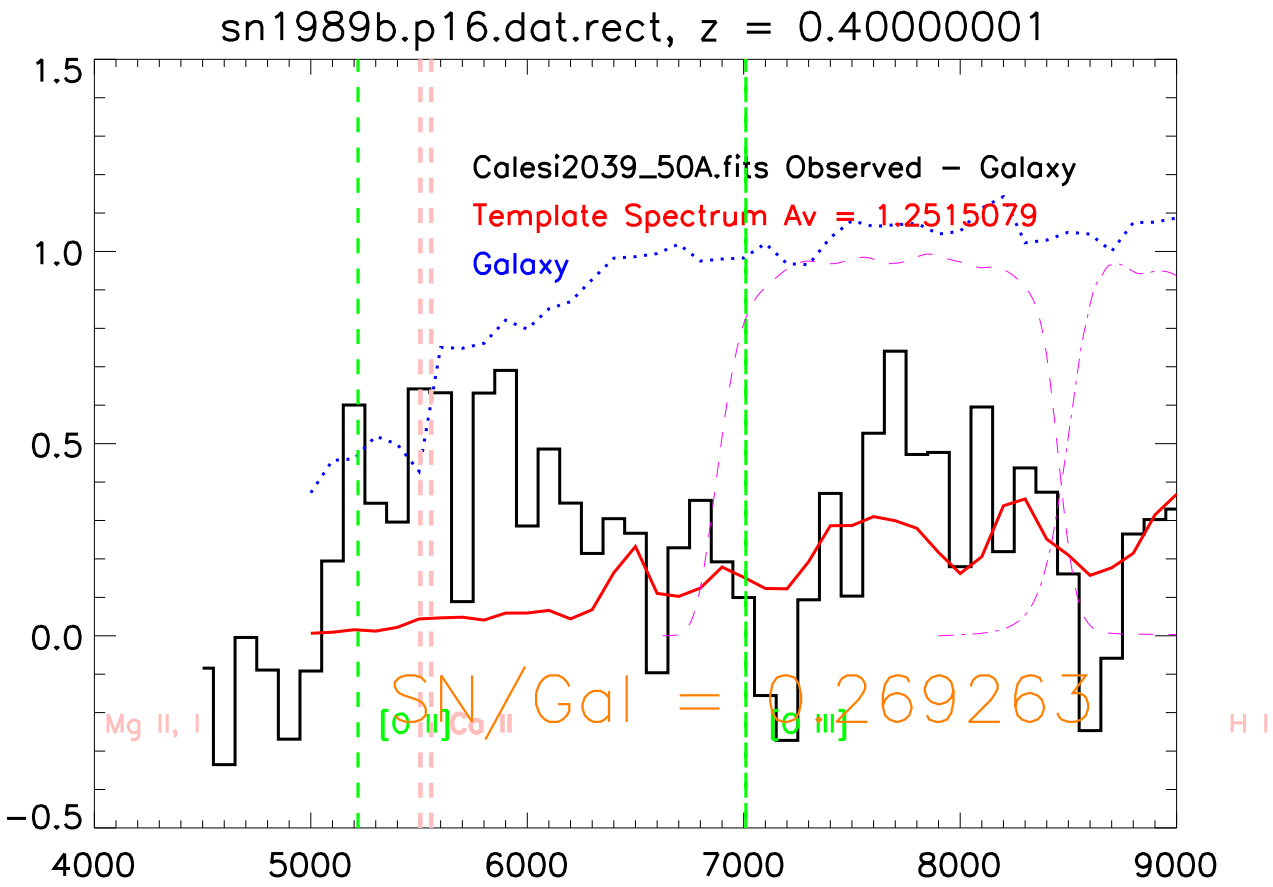

sn1989b.p13.dat.rect, z = 0.40000001
Calesi2039_50A.fits Observed − Galaxy
Template Spectrum Av = 1.1844244
Galaxy
SN/Gal = 0.283162
Mg II, I
[O II]
Ca II
[O III]
H I
1.5
1.0
0.5
0.0
−0.5
4000
5000
6000
7000
8000
9000

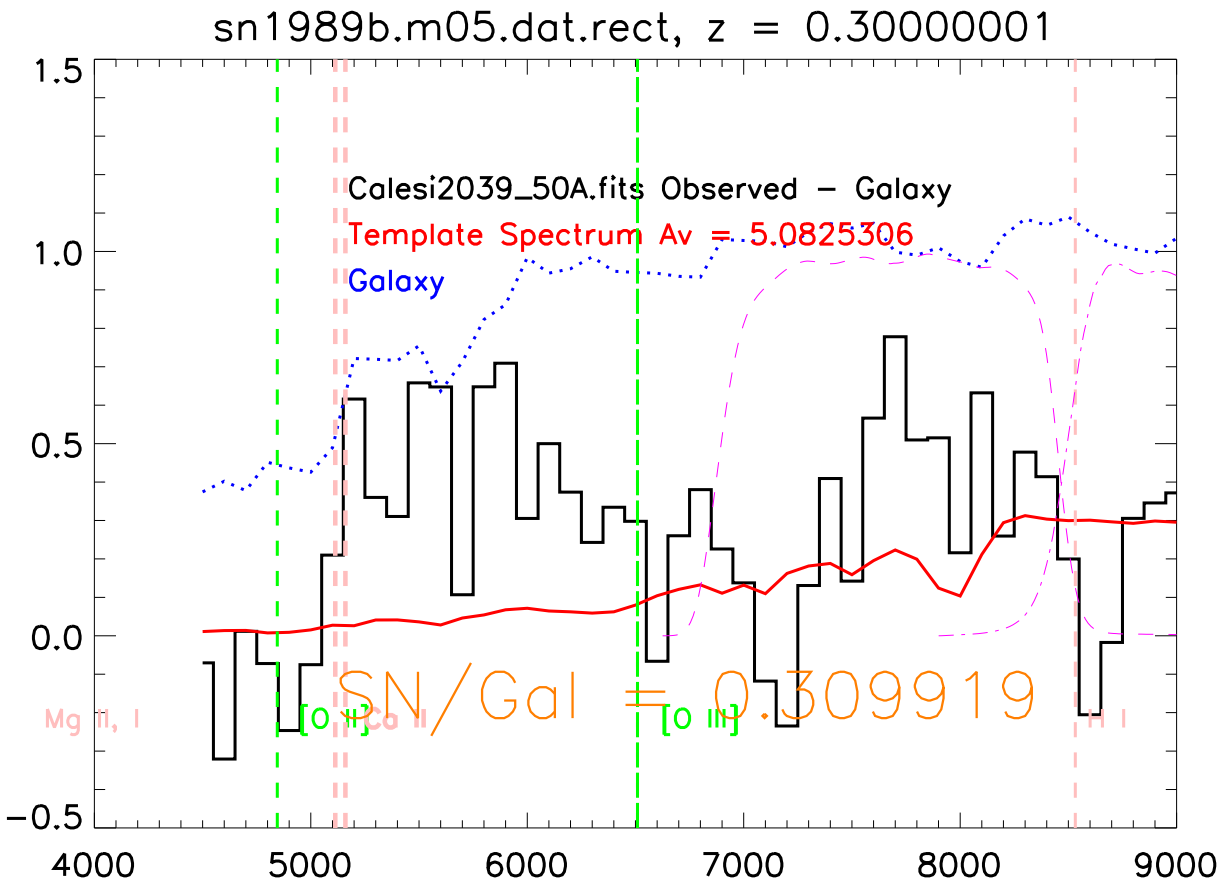

sn1994d.m07.dat.rect, z = 0.40000001
Calesi2039_50A.fits Observed − Galaxy
Template Spectrum Av = 4.8214136
Galaxy
SN/Gal = 0.722553
Mg II, I
[O II]
Ca II
[O III]
H I
1.5
1.0
0.5
0.0
−0.5
4000
5000
6000
7000
8000
9000

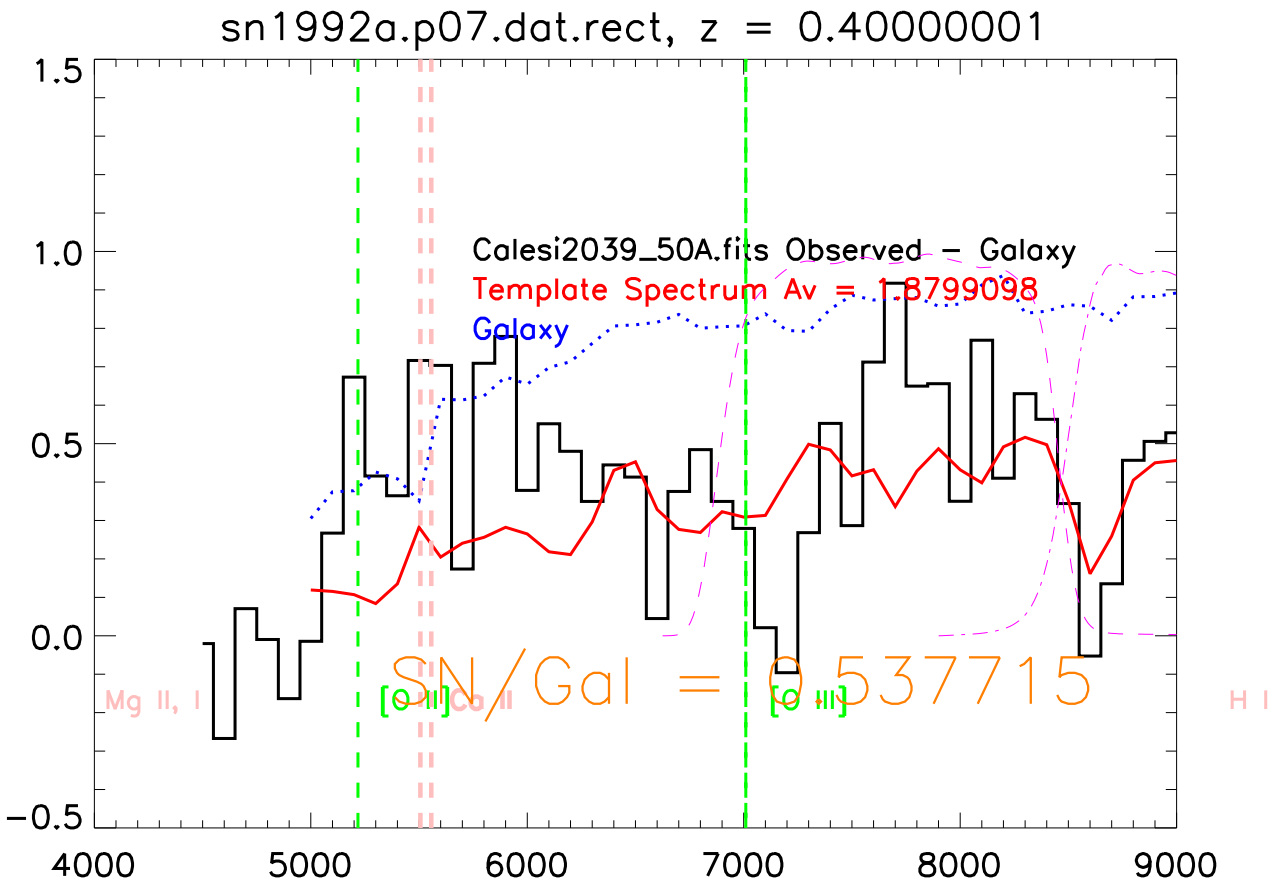

sn1989b.m07.dat.rect, z = 0.64999998
Calesi2039_50A.fits Observed − Galaxy
Template Spectrum Av = −3.1729113
Galaxy
SN/Gal = 0.0550497
Mg II, I
[O II]
Ca II
[O III]
1.5
1.0
0.5
0.0
−0.5
4000
5000
6000
7000
8000
9000

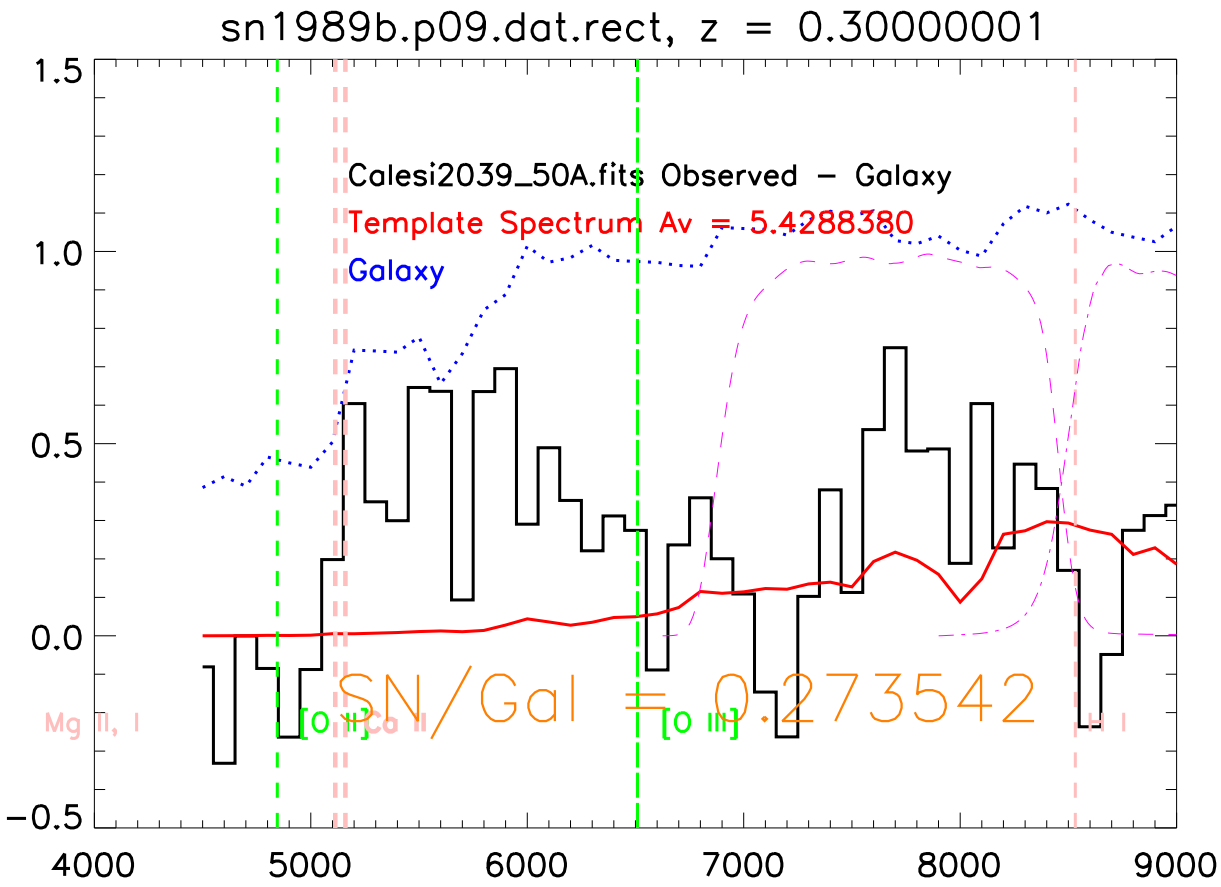

sn1994d.p14.dat.rect, z = 0.40000001
Calesi2039_50A.fits Observed − Galaxy
Template Spectrum Av = 2.4367026
Galaxy
SN/Gal = 0.431080
Mg II, I
[O II]
Ca II
[O III]
H I
1.5
1.0
0.5
0.0
−0.5
4000
5000
6000
7000
8000
9000

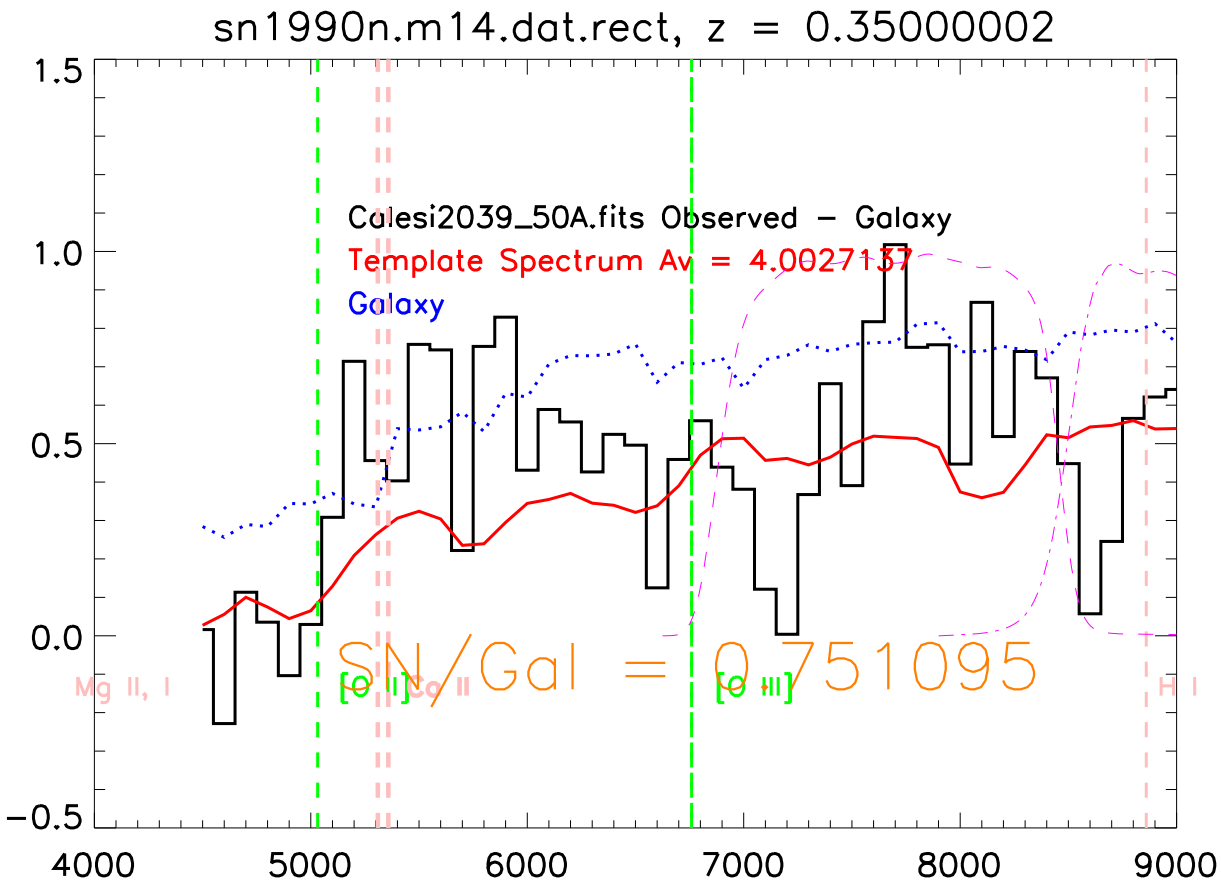

sn1994d.m05.dat.rect, z = 0.40000001
Calesi2039_50A.fits Observed − Galaxy
Template Spectrum Av = 2.8917752
Galaxy
SN/Gal = 0.963916
Mg II, I
[O II]
Ca II
[O III]
H I
1.5
1.0
0.5
0.0
−0.5
4000
5000
6000
7000
8000
9000

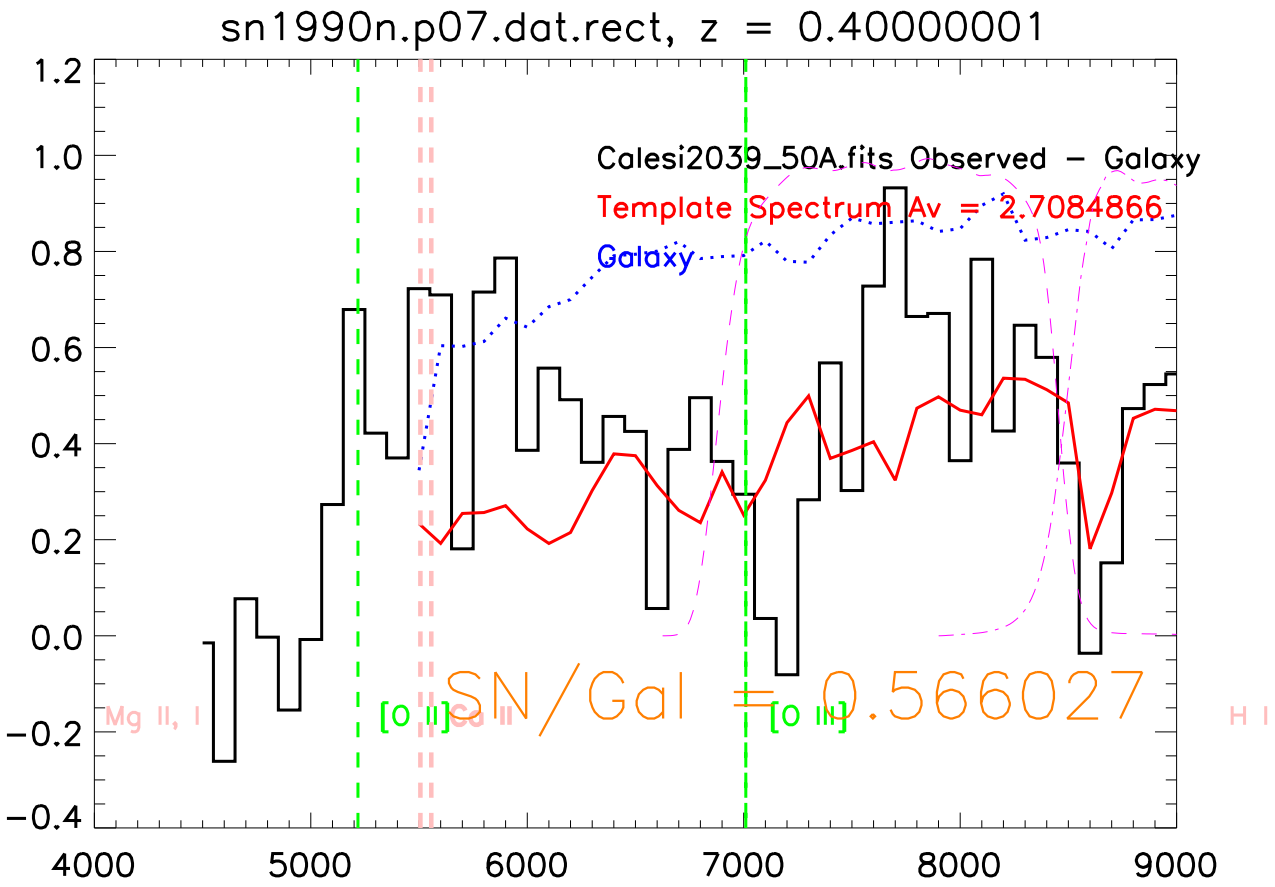

sn1989b.p16.dat.rect, z = 0.40000001
Calesi2039_50A.fits Observed − Galaxy
Template Spectrum Av = 1.2515079
Galaxy
SN/Gal = 0.269263
Mg II, I
[O II]
Ca II
[O III]
H I
1.5
1.0
0.5
0.0
−0.5
4000
5000
6000
7000
8000
9000

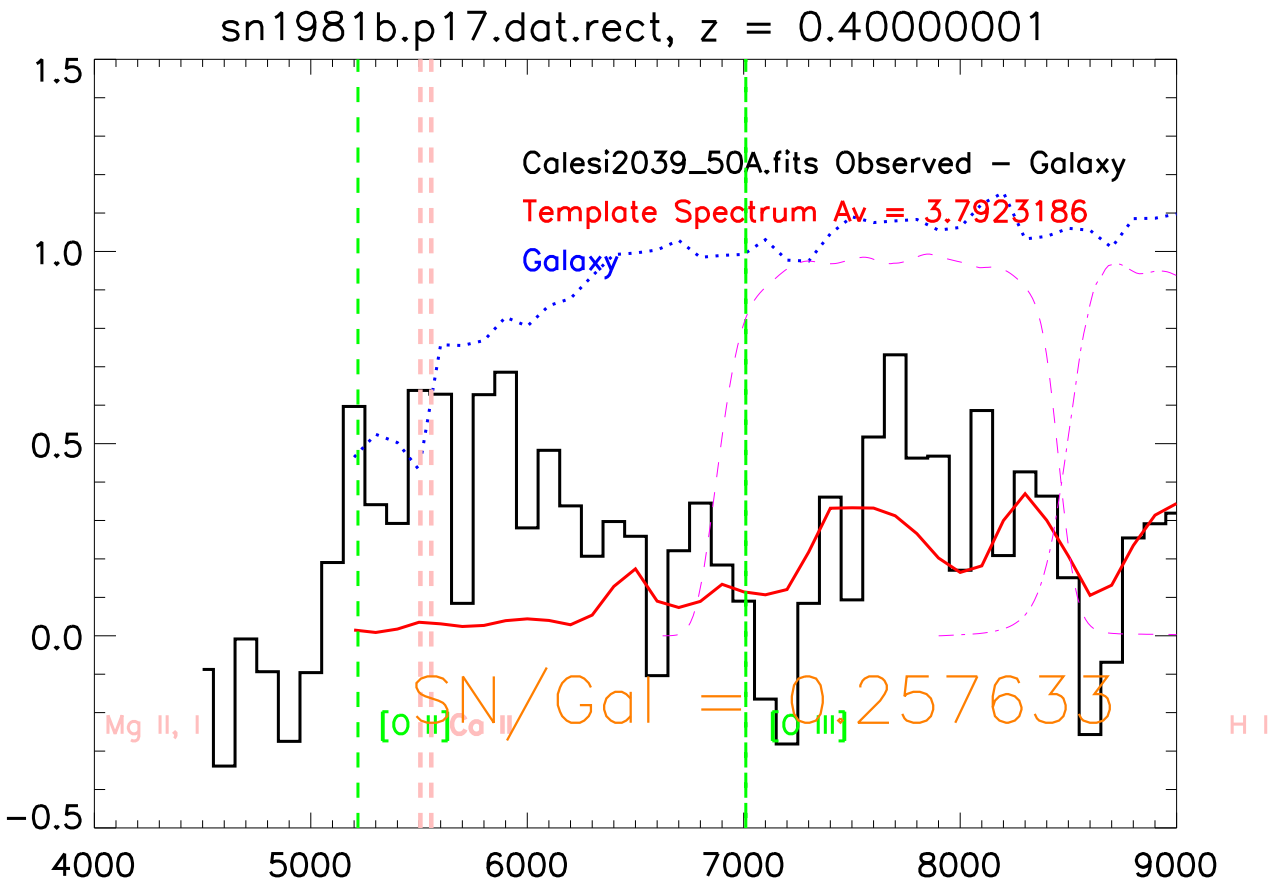

sn1989b.m05.dat.rect, z = 0.30000001
Calesi2039_50A.fits Observed − Galaxy
Template Spectrum Av = 5.0825306
Galaxy
SN/Gal = 0.309919
Mg II, I
[O II]
Ca II
[O III]
H I
1.5
1.0
0.5
0.0
−0.5
4000
5000
6000
7000
8000
9000

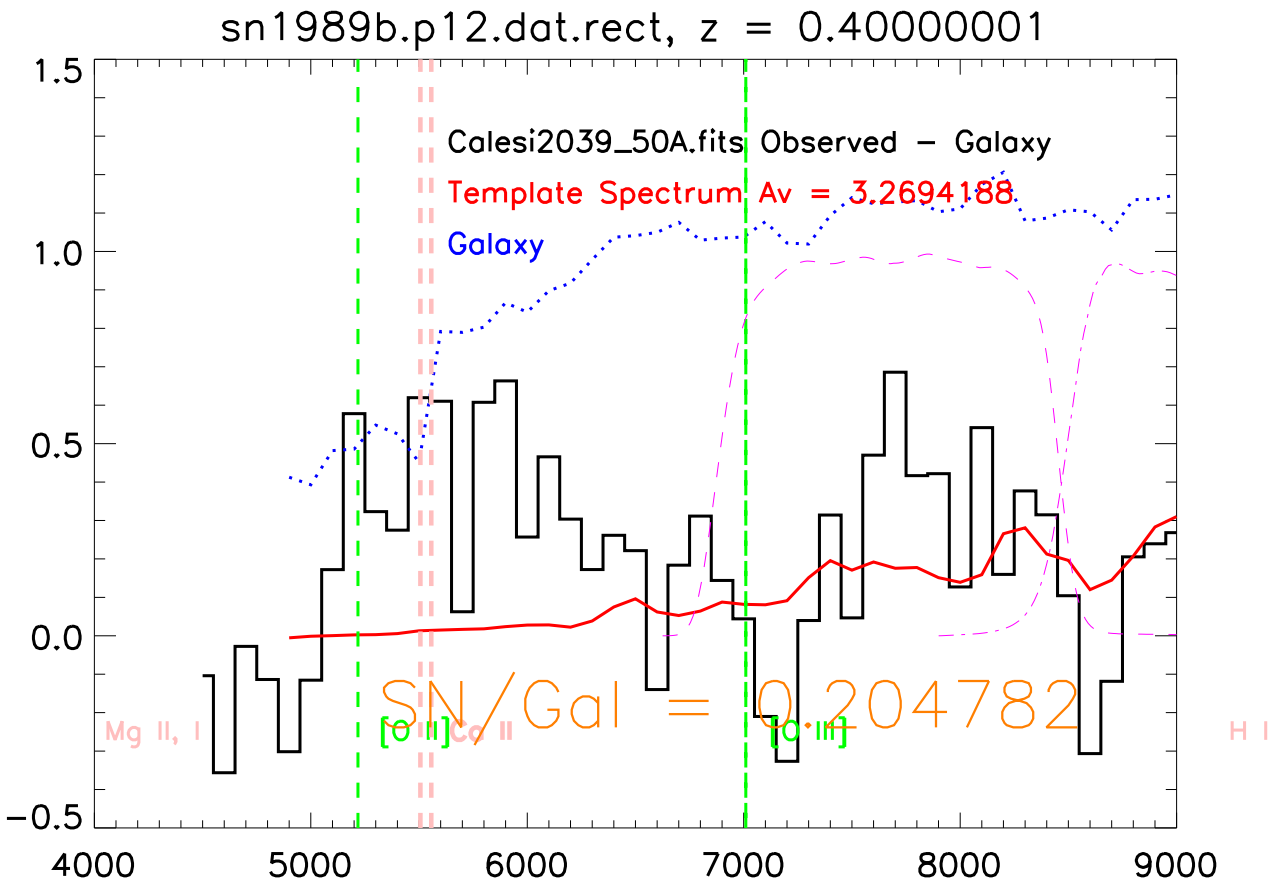

sn1992a.p07.dat.rect, z = 0.40000001
Calesi2039_50A.fits Observed − Galaxy
Template Spectrum Av = 1.8799098
Galaxy
SN/Gal = 0.537715
Mg II, I
[O II]
Ca II
[O III]
H I
1.5
1.0
0.5
0.0
−0.5
4000
5000
6000
7000
8000
9000

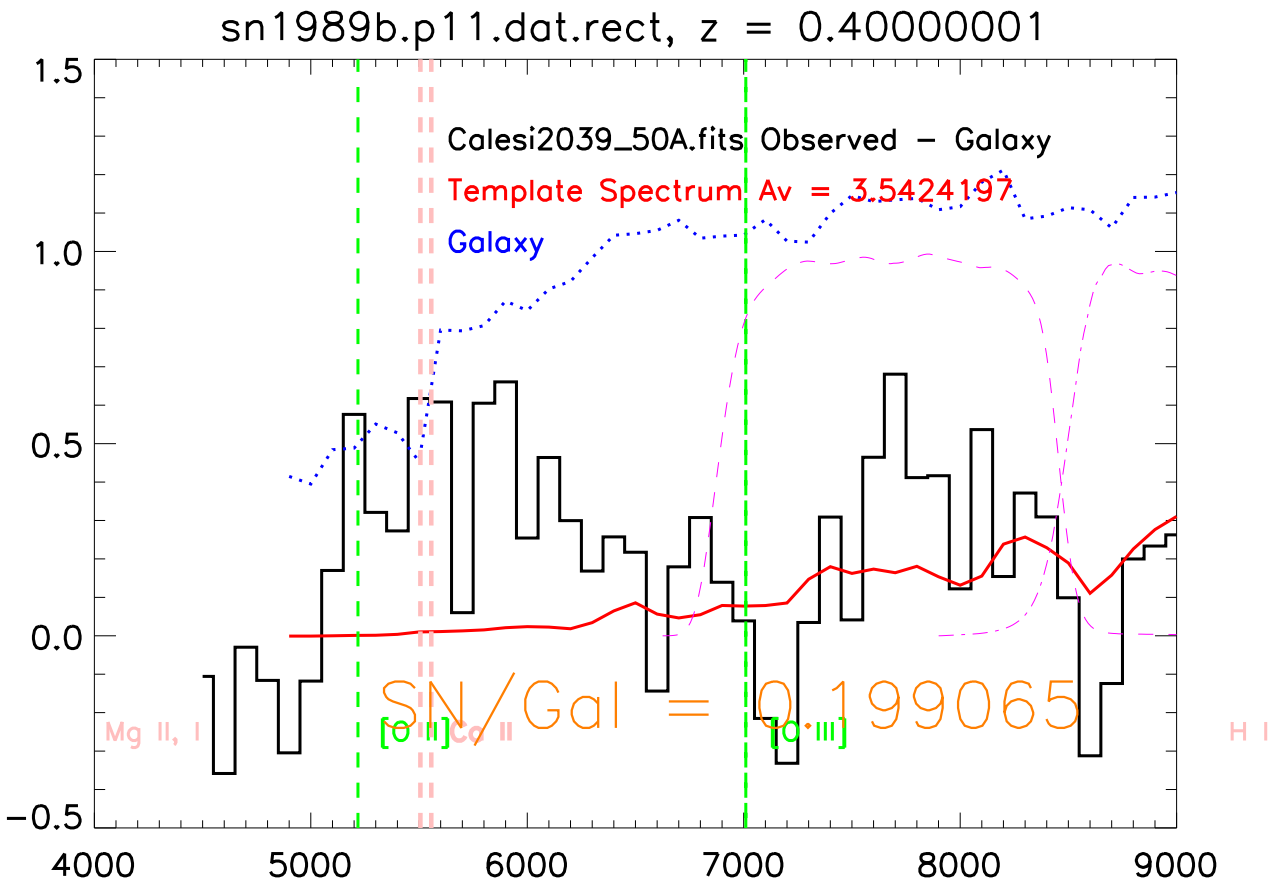

sn1989b.p09.dat.rect, z = 0.30000001
Calesi2039_50A.fits Observed − Galaxy
Template Spectrum Av = 5.4288380
Galaxy
SN/Gal = 0.273542
[O II]
[O III]
1.5
1.0
0.5
0.0
−0.5
4000
5000
6000
7000
8000
9000

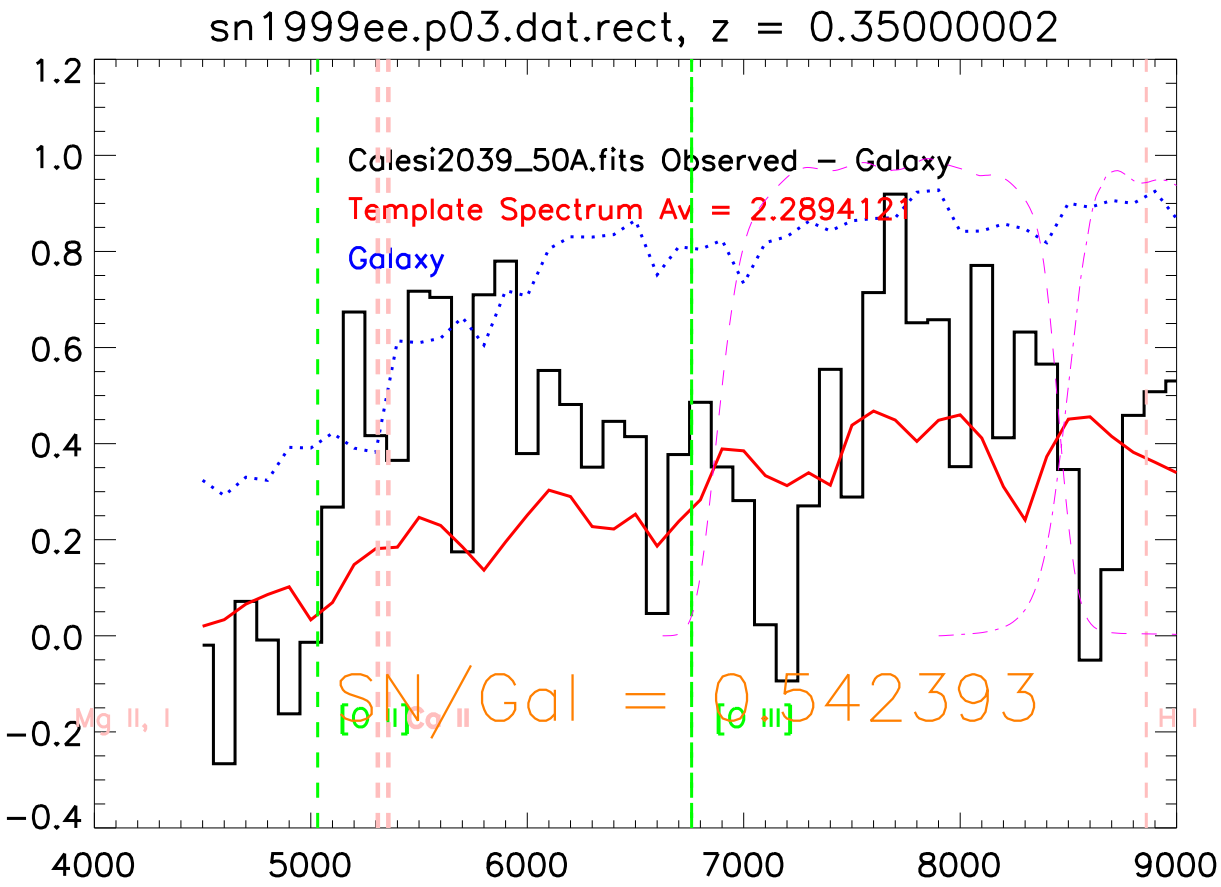

sn1990n.m14.dat.rect, z = 0.35000002
Calesi2039_50A.fits Observed − Galaxy
Template Spectrum Av = 4.0027137
Galaxy
SN/Gal = 0.751095
Mg II, I
[O II]
Ca II
[O III]
H I
1.5
1.0
0.5
0.0
−0.5
4000
5000
6000
7000
8000
9000

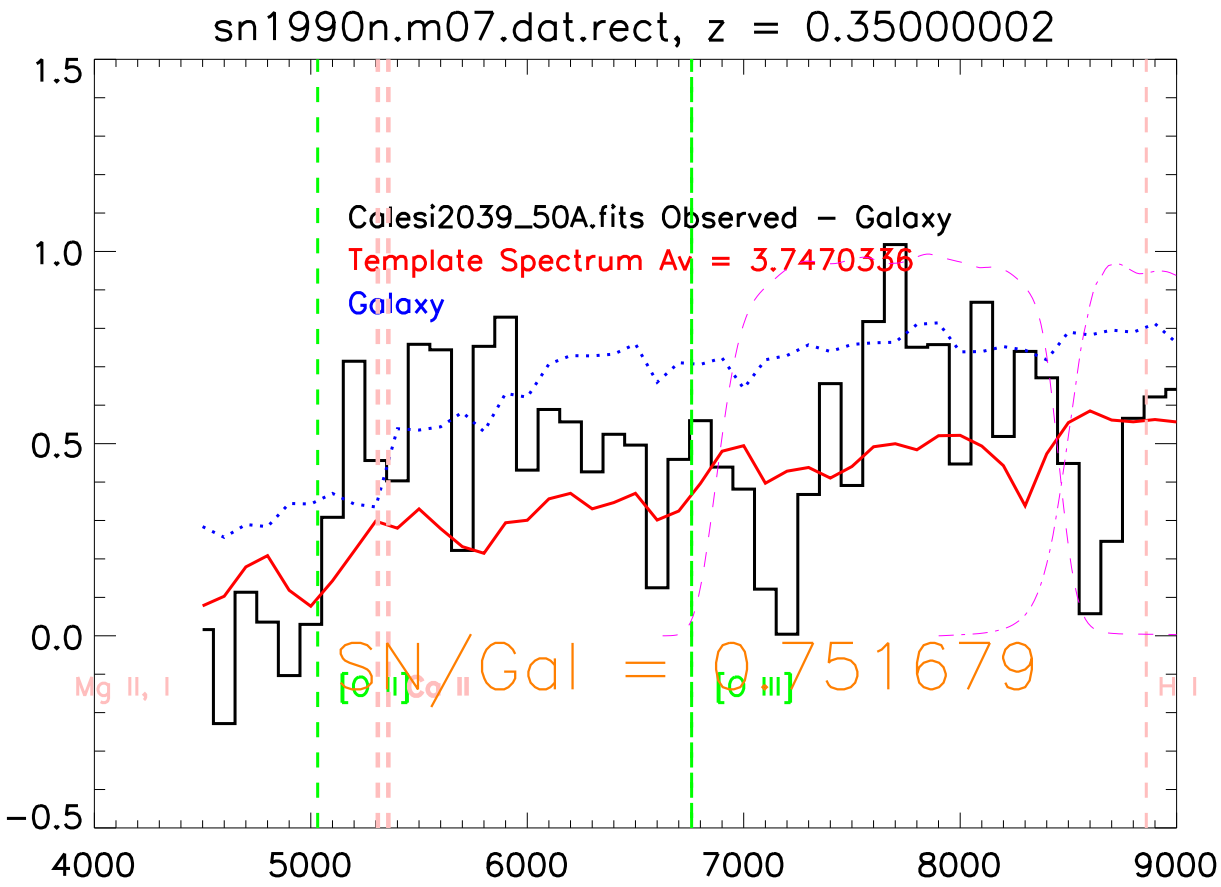

sn1990n.p07.dat.rect, z = 0.40000001
Calesi2039_50A.fits Observed − Galaxy
Template Spectrum Av = 2.7084866
Galaxy
SN/Gal = 0.566027
Mg II, I
[O II]
Ca II
[O III]
H I
1.2
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
−0.4
4000
5000
6000
7000
8000
9000

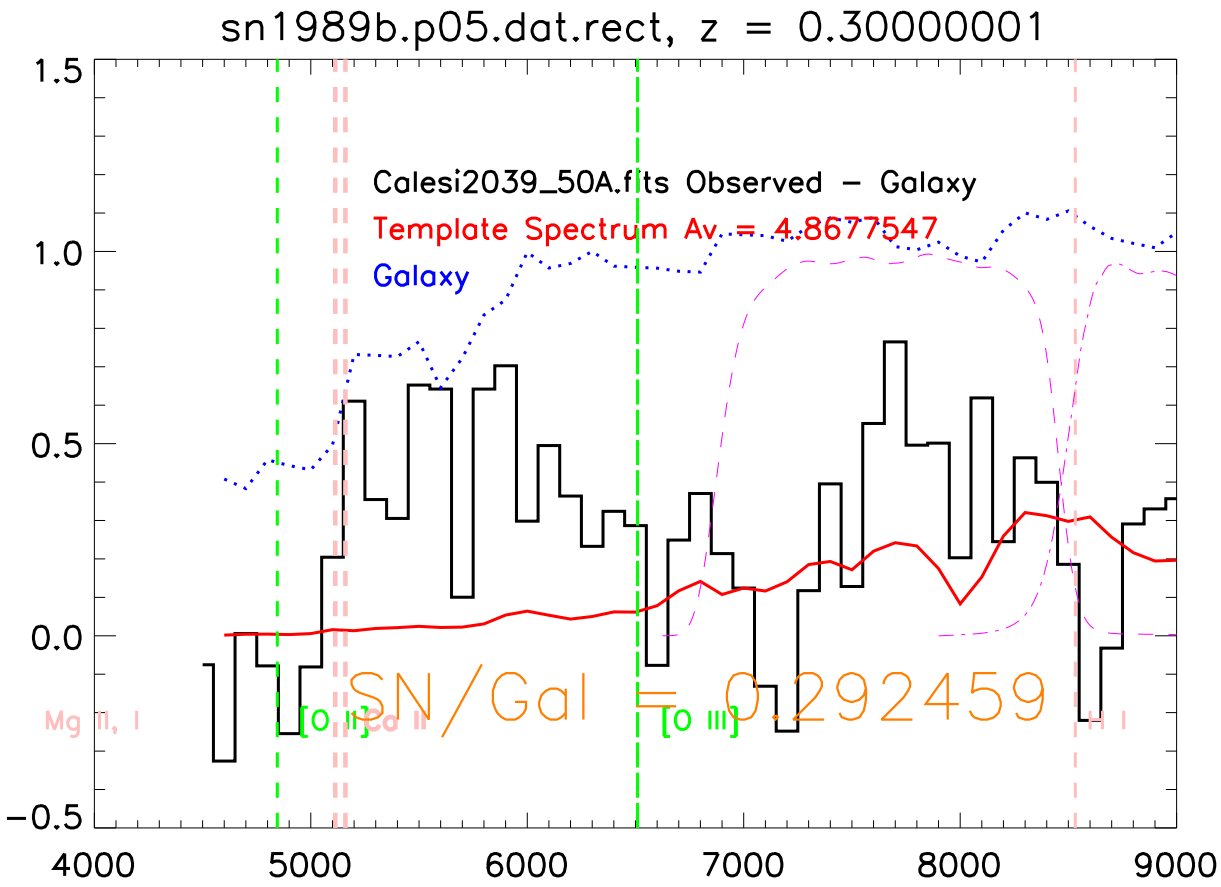

sn1981b.p17.dat.rect, z = 0.40000001
Calesi2039_50A.fits Observed − Galaxy
Template Spectrum Av = 3.7923186
Galaxy
SN/Gal = 0.257633
Mg II, I
[O II]
Ca II
[O III]
H I
1.5
1.0
0.5
0.0
−0.5
4000
5000
6000
7000
8000
9000

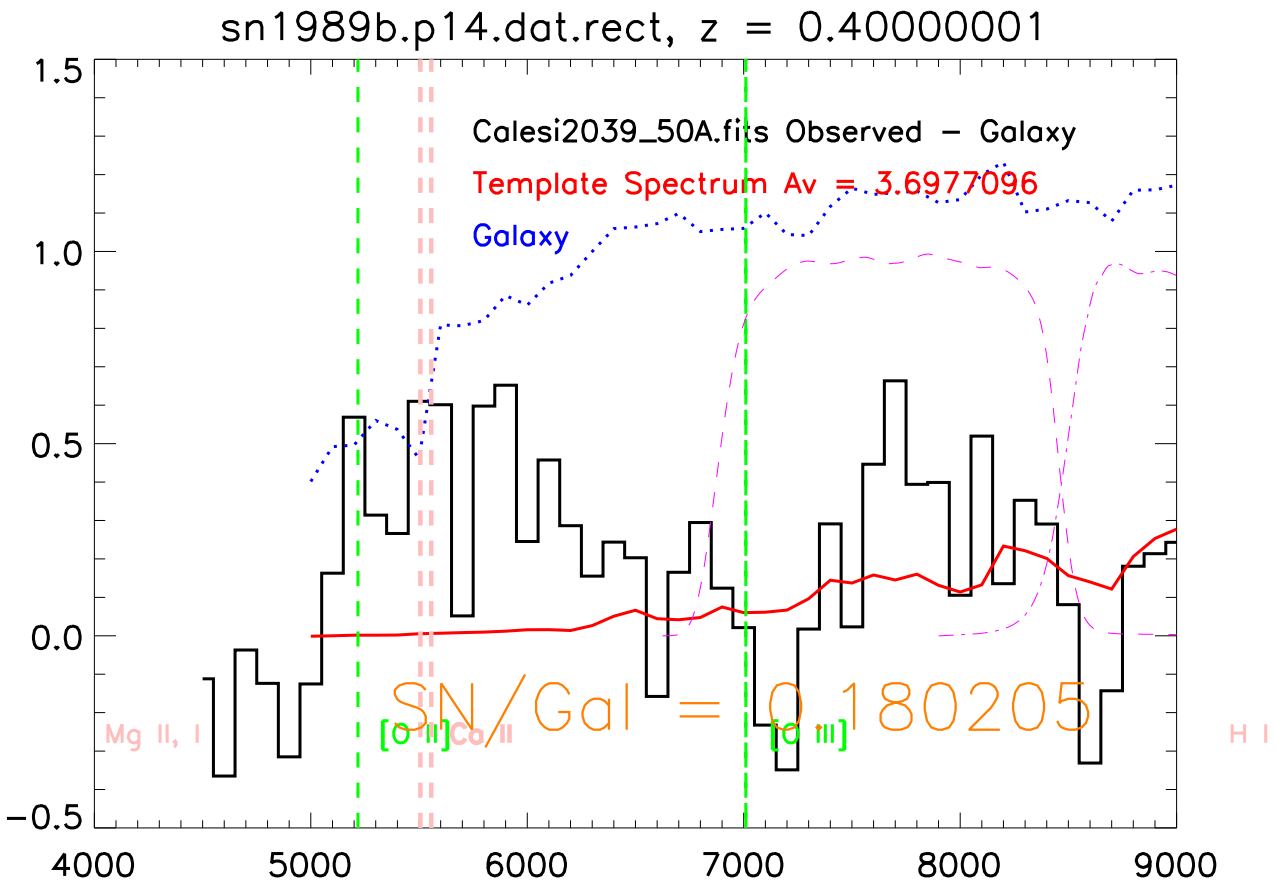

sn1989b.p12.dat.rect, z = 0.40000001
Calesi2039_50A.fits Observed − Galaxy
Template Spectrum Av = 3.2694188
Galaxy
SN/Gal = 0.204782
Mg II, I
[O II]
Ca II
[O III]
H I
1.5
1.0
0.5
0.0
−0.5
4000
5000
6000
7000
8000
9000

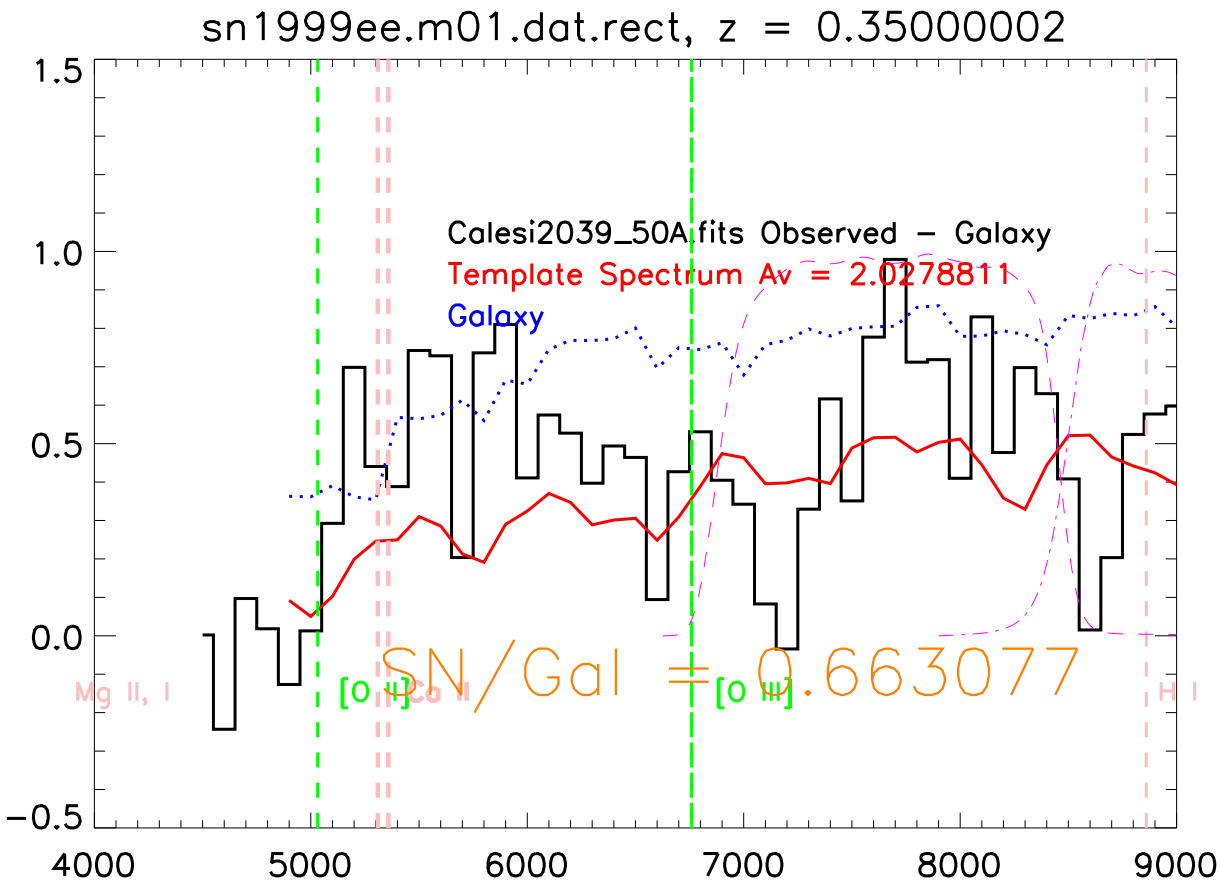

sn1989b.p11.dat.rect, z = 0.40000001
Calesi2039_50A.fits Observed − Galaxy
Template Spectrum Av = 3.5424197
Galaxy
SN/Gal = 0.199065
Mg II, I
[O II]
Ca II
[O III]
H I
1.5
1.0
0.5
0.0
−0.5
4000
5000
6000
7000
8000
9000

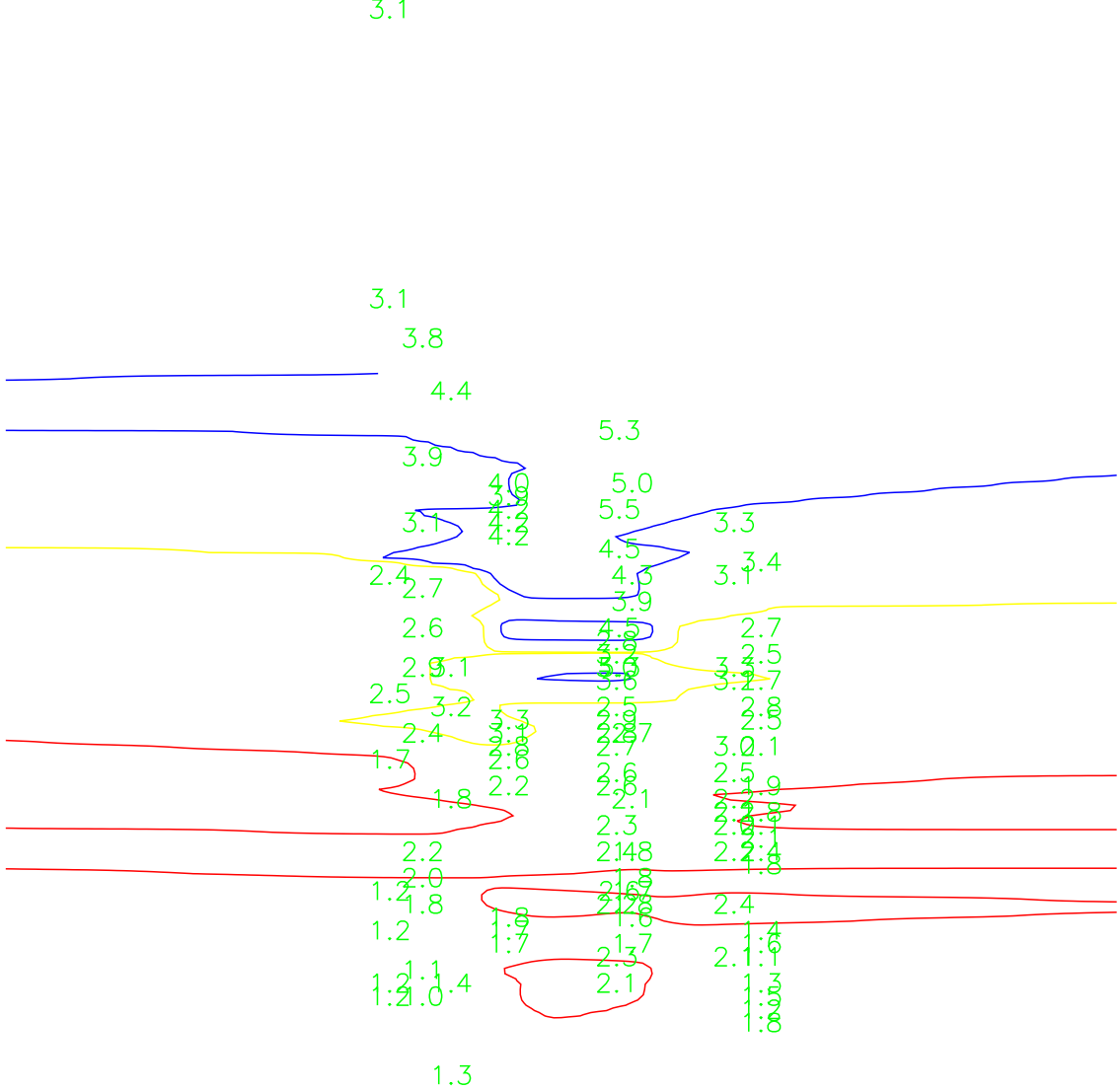

sn1999ee.p03.dat.rect, z = 0.35000002
Calesi2039_50A.fits Observed – Galaxy
Template Spectrum Av = 2.2894121
Galaxy
SN/Gal = 0.542393
Mg II, I
[O II]
Ca II
[O III]
H I
1.2
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
−0.4
4000
5000
6000
7000
8000
9000

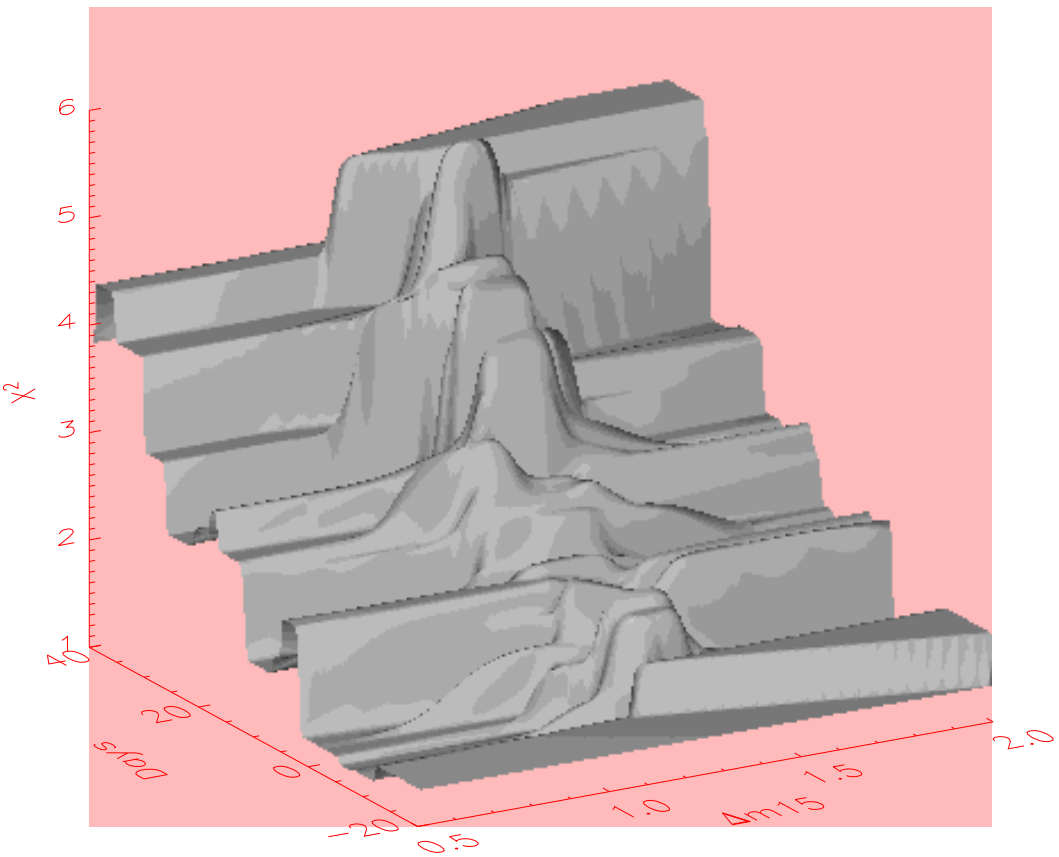

sn1990n.m07.dat.rect, z = 0.35000002
Calesi2039_50A.fits Observed − Galaxy
Template Spectrum Av = 3.7470336
Galaxy
SN/Gal = 0.751679
Mg II, I
[O II]
Ca II
[O III]
H I
1.5
1.0
0.5
0.0
−0.5
4000
5000
6000
7000
8000
9000


sn1989b.p05.dat.rect, z = 0.30000001
Calesi2039_50A.fits Observed − Galaxy
Template Spectrum Av = 4.8677547
Galaxy
SN/Gal = 0.292459
[O II]
[O III]
1.5
1.0
0.5
0.0
−0.5
4000
5000
6000
7000
8000
9000

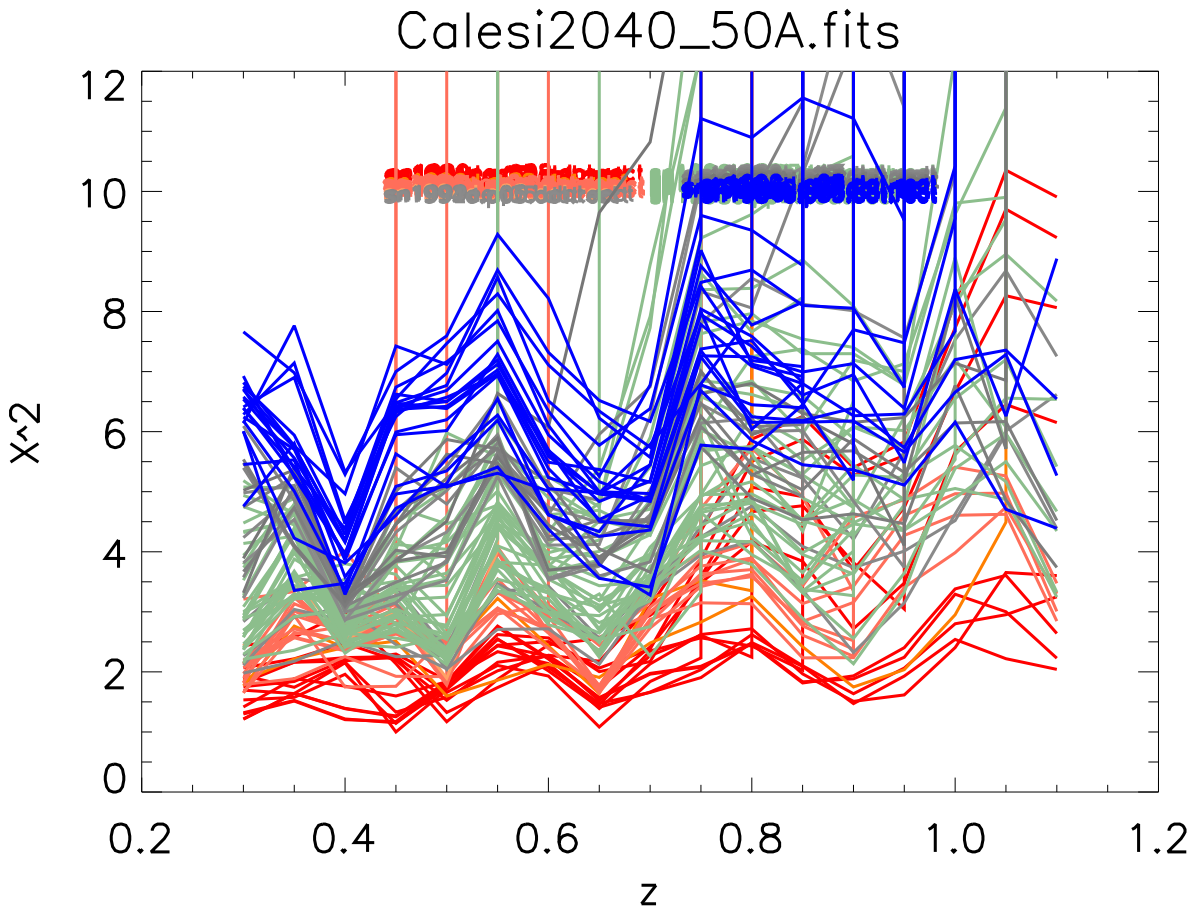

sn1989b.p14.dat.rect, z = 0.40000001
Calesi2039_50A.fits Observed − Galaxy
Template Spectrum Av = 3.6977096
Galaxy
SN/Gal = 0.180205
Mg II, I
[O II]
Ca II
[O III]
H I
1.5
1.0
0.5
0.0
−0.5
4000
5000
6000
7000
8000
9000

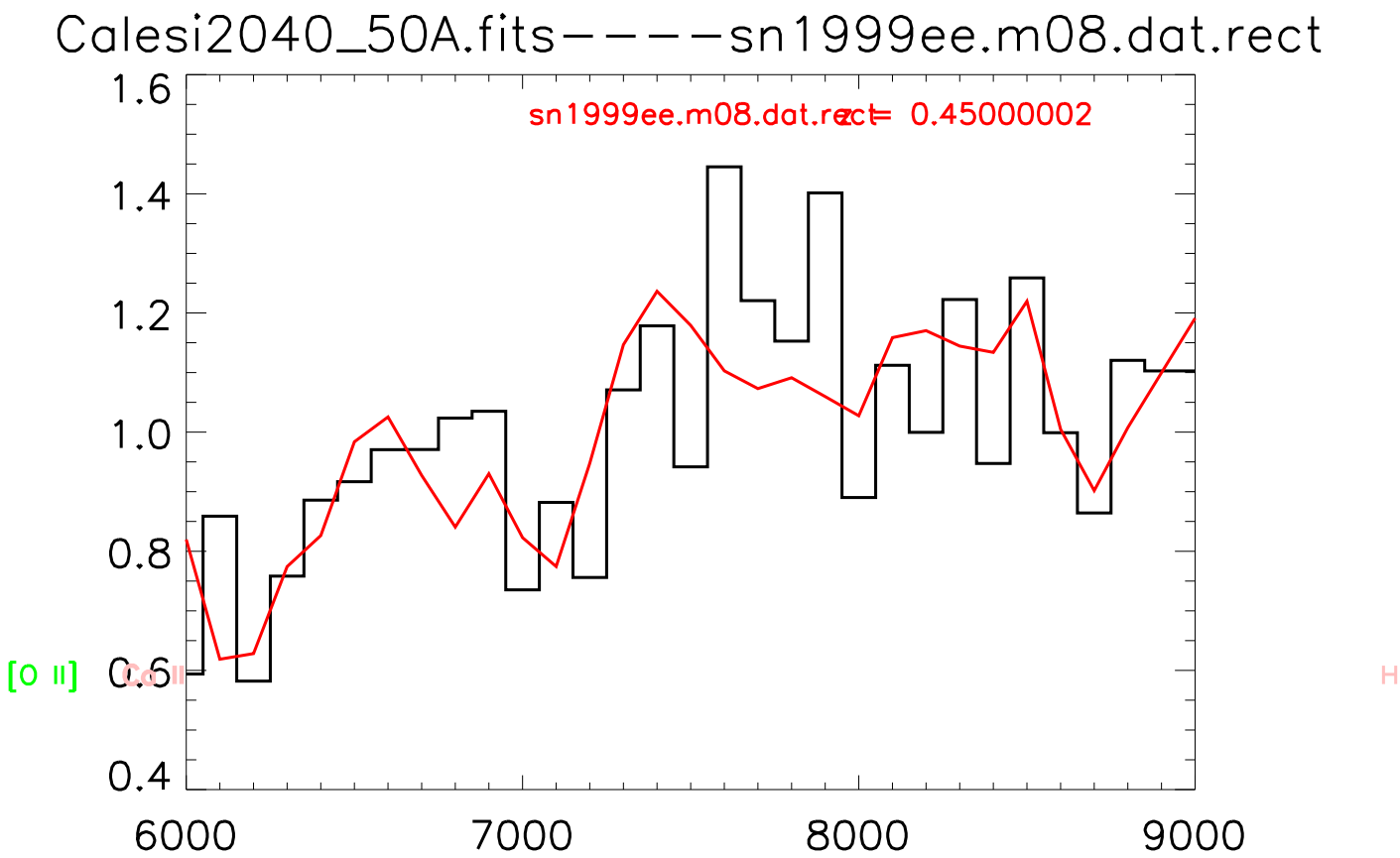

sn1999ee.m01.dat.rect, z = 0.35000002
Calesi2039_50A.fits Observed − Galaxy
Template Spectrum Av = 2.0278811
Galaxy
SN/Gal = 0.663077
Mg II, I
[O II]
Ca II
[O III]
H I
1.5
1.0
0.5
0.0
−0.5
4000
5000
6000
7000
8000
9000

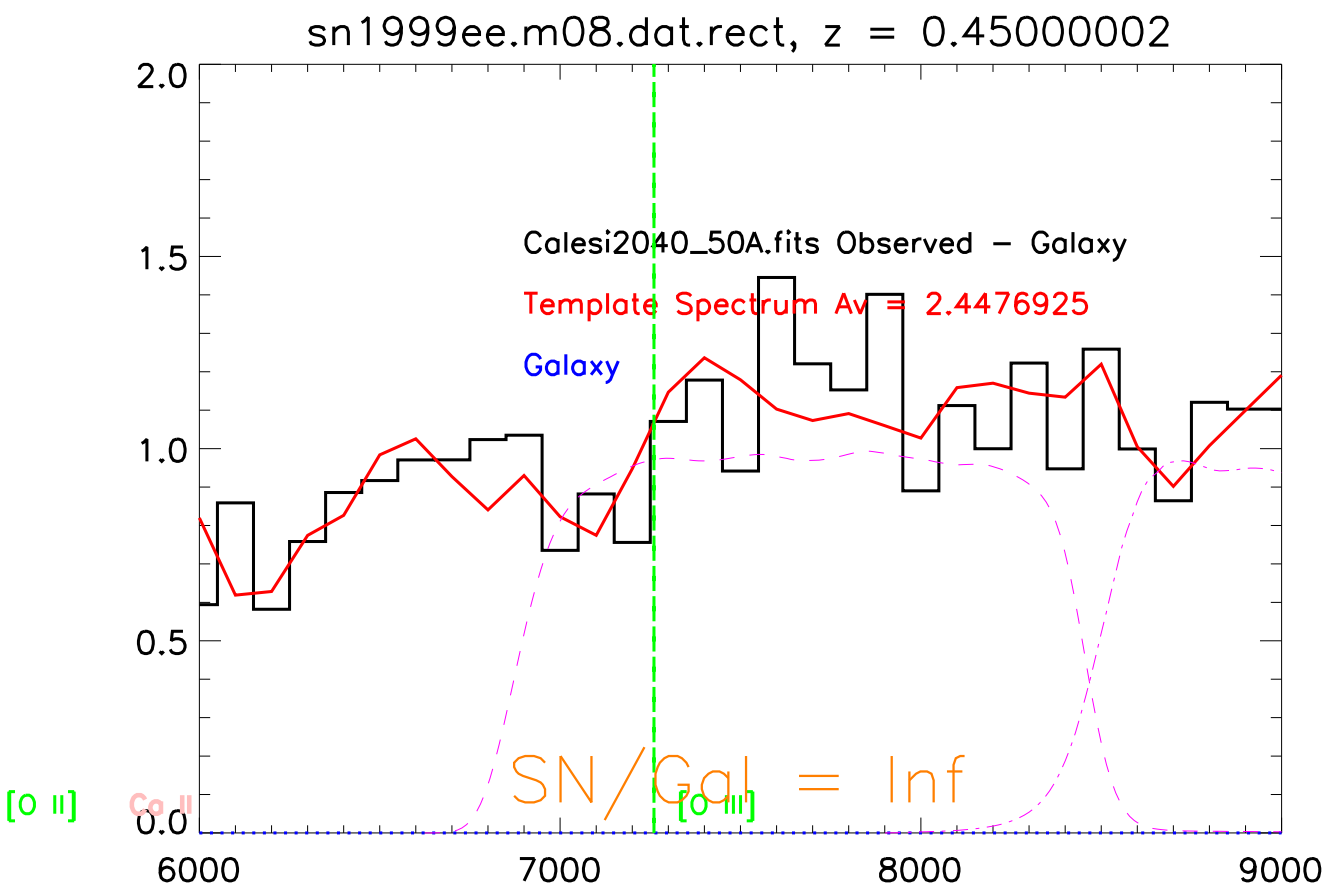


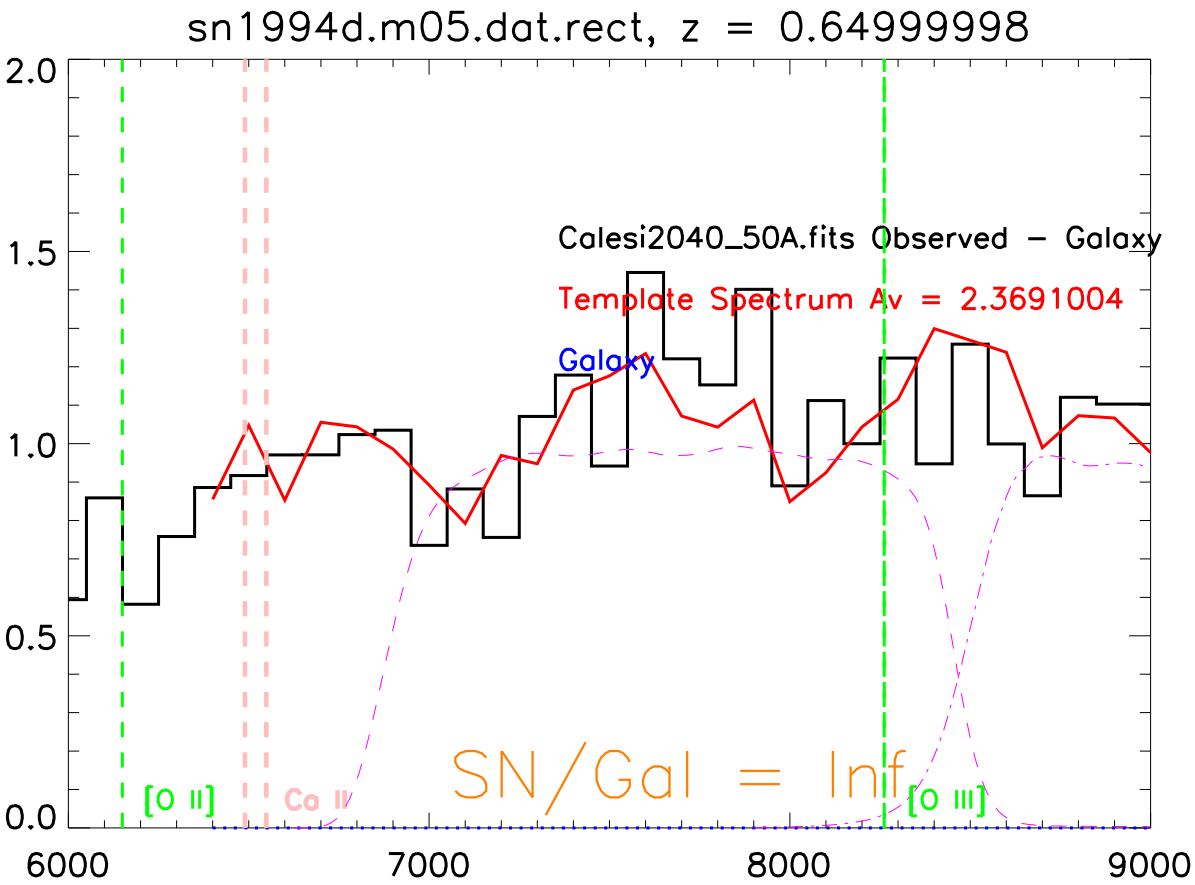


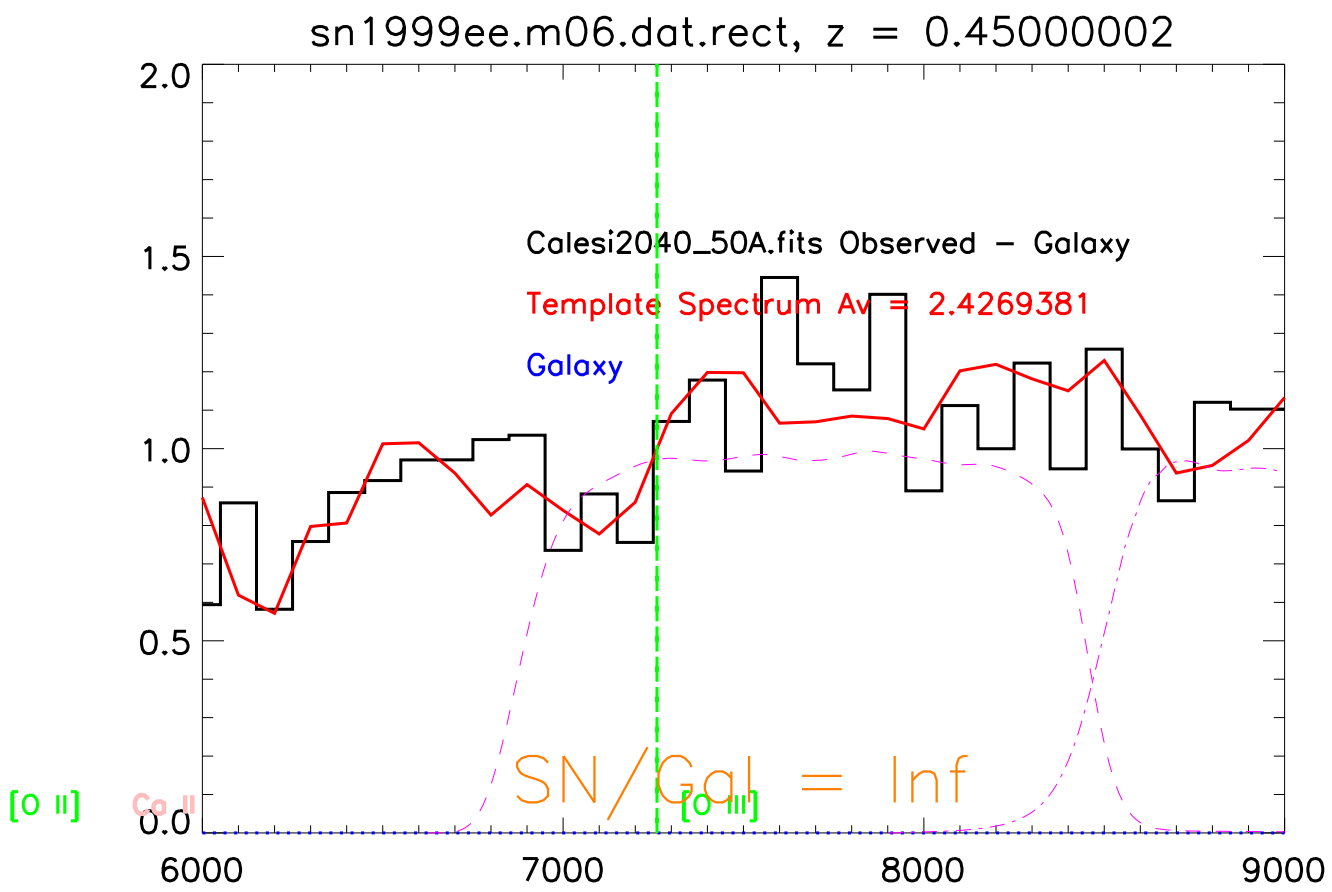
6
5
4
3
2
1
χ^2
40
20
0
−20
Days
0.5
1.0
1.5
2.0
Δm15

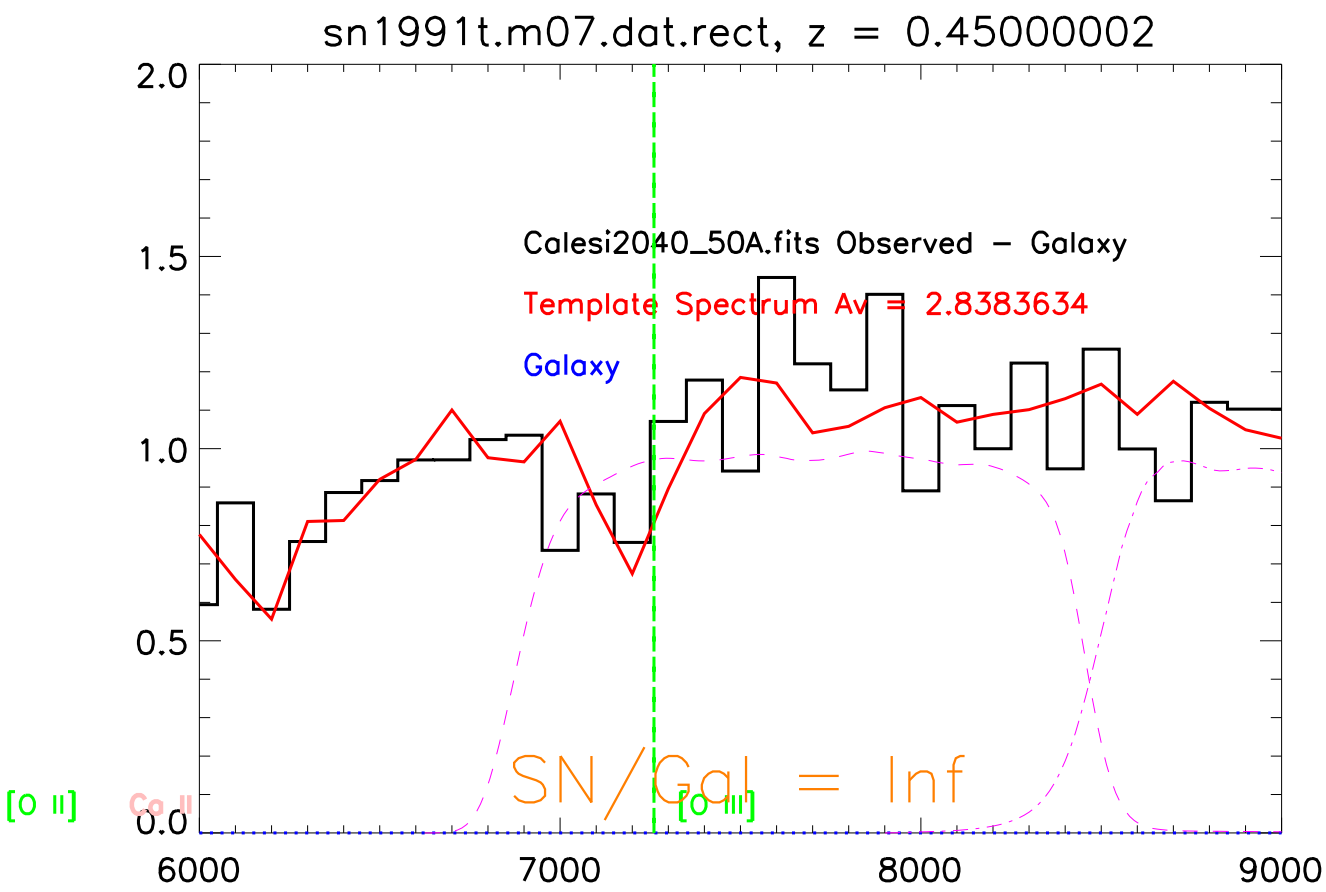

Calesi2040_50A.fits
X^2
z
0
2
4
6
8
10
12
0.2
0.4
0.6
0.8
1.0
1.2

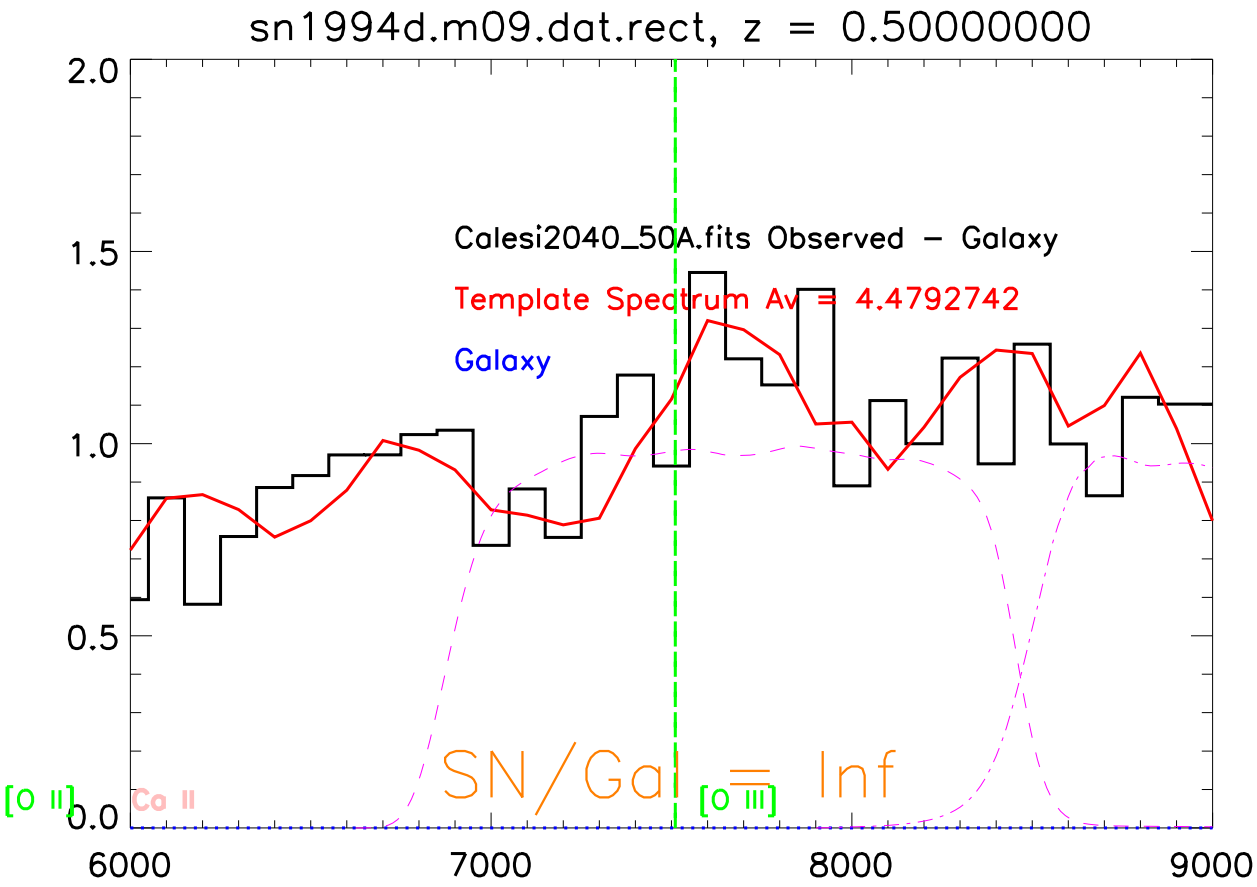

Calesi2040_50A.fits----sn1999ee.m08.dat.rect
sn1999ee.m08.dat.rect= 0.45000002
1.6
1.4
1.2
1.0
0.8
0.6
0.4
6000
7000
8000
9000
[O II]
Ca II
H

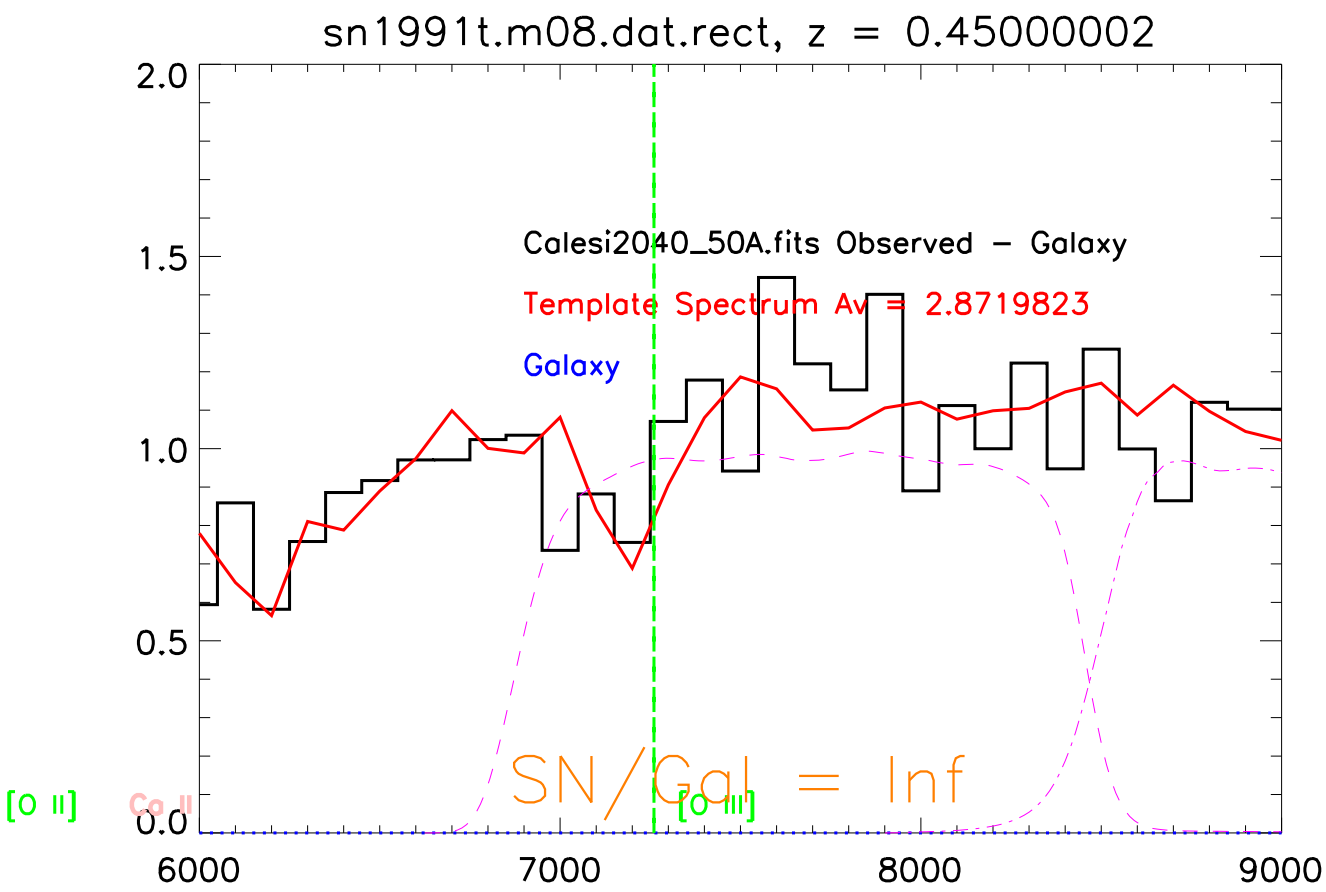

sn1999ee.m08.dat.rect, z = 0.45000002
Calesi2040_50A.fits Observed − Galaxy
Template Spectrum Av = 2.4476925
Galaxy
SN/Gal = Inf
[O II]
Ca II
[O III]
2.0
1.5
1.0
0.5
0.0
6000
7000
8000
9000

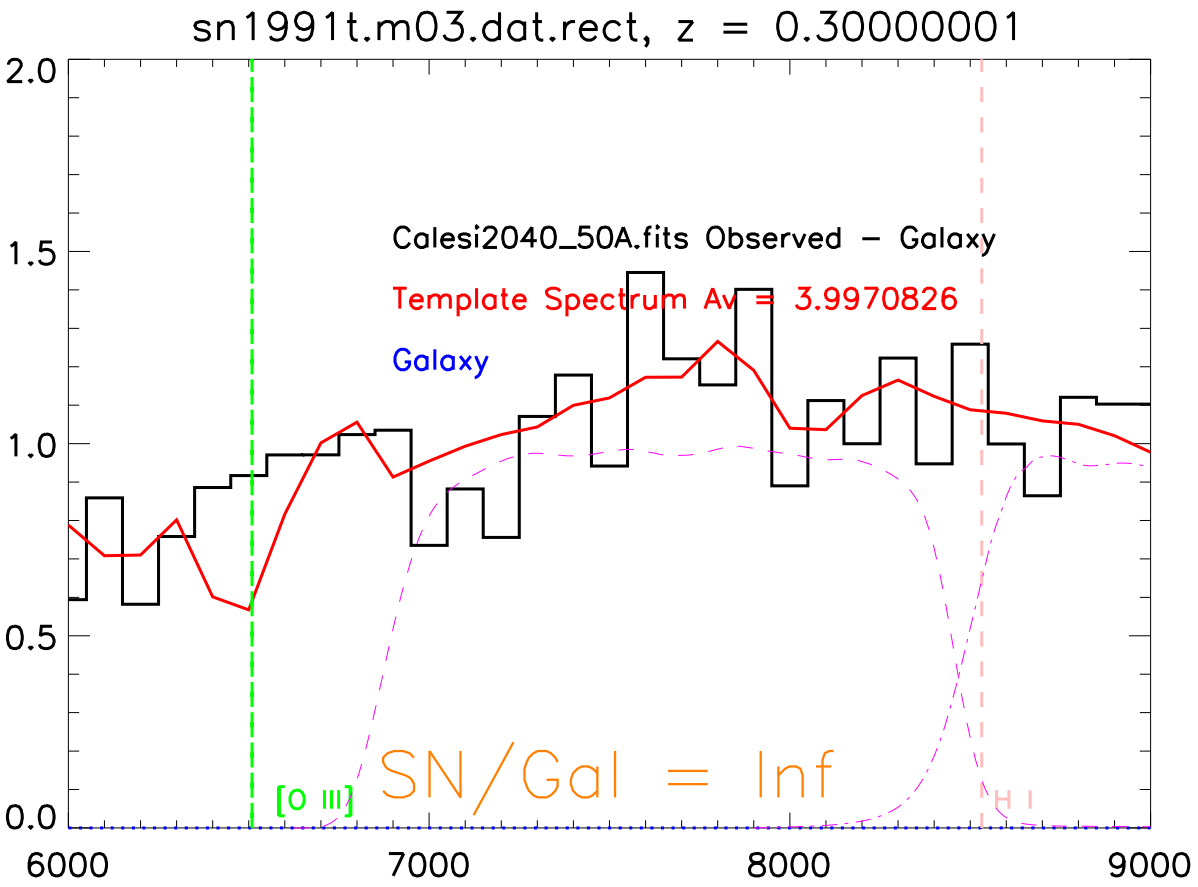

sn1994d.m05.dat.rect, z = 0.64999998
Calesi2040_50A.fits Observed − Galaxy
Template Spectrum Av = 2.3691004
Galaxy
SN/Gal = Inf
[O II]
Ca II
[O III]
2.0
1.5
1.0
0.5
0.0
6000
7000
8000
9000


sn1999ee.m06.dat.rect, z = 0.45000002
Calesi2040_50A.fits Observed − Galaxy
Template Spectrum Av = 2.4269381
Galaxy
SN/Gal = Inf
[O II]
Ca II
[O III]
2.0
1.5
1.0
0.5
0.0
6000
7000
8000
9000

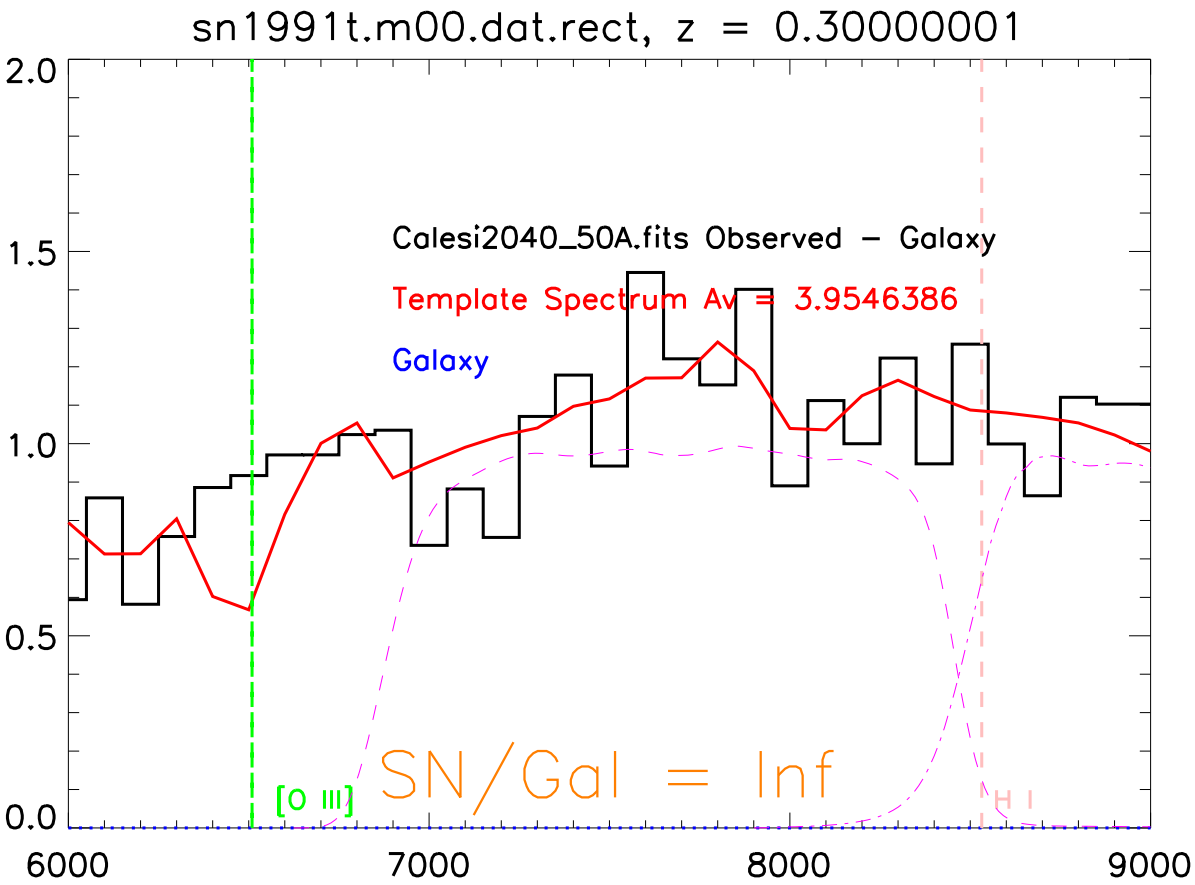

sn1991t.m07.dat.rect, z = 0.45000002
Calesi2040_50A.fits Observed − Galaxy
Template Spectrum Av = 2.8383634
Galaxy
SN/Gal = Inf
[O II]
Ca II
[O III]
2.0
1.5
1.0
0.5
0.0
6000
7000
8000
9000


sn1994d.m09.dat.rect, z = 0.50000000
Calesi2040_50A.fits Observed − Galaxy
Template Spectrum Av = 4.4792742
Galaxy
SN/Gal = Inf
[O II]
Ca II
[O III]
2.0
1.5
1.0
0.5
0.0
6000
7000
8000
9000

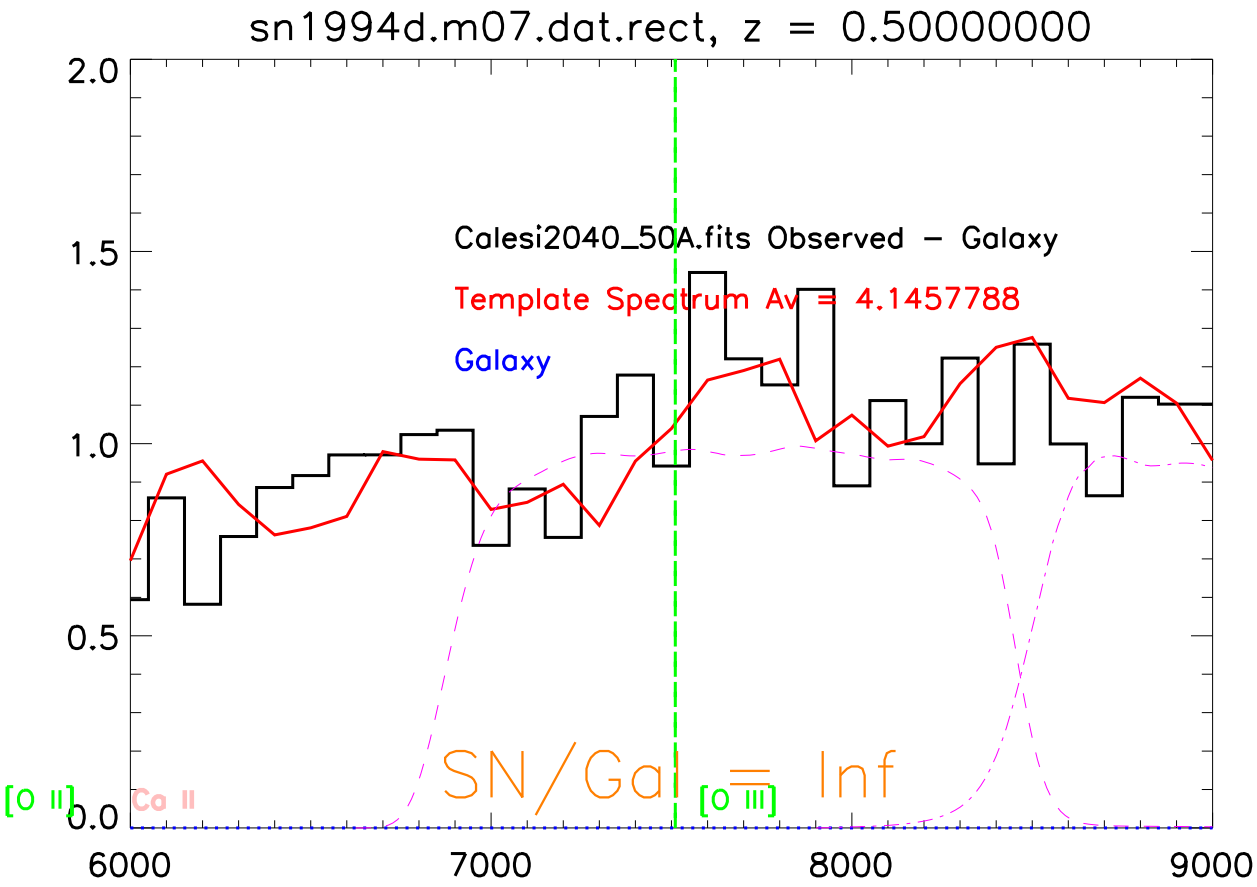

sn1991t.m08.dat.rect, z = 0.45000002
Calesi2040_50A.fits Observed − Galaxy
Template Spectrum Av = 2.8719823
Galaxy
SN/Gal = Inf
[O II]
Ca II
[O III]
2.0
1.5
1.0
0.5
0.0
6000
7000
8000
9000


sn1991t.m03.dat.rect, z = 0.30000001
Calesi2040_50A.fits Observed − Galaxy
Template Spectrum Av = 3.9970826
Galaxy
SN/Gal = Inf
[O III]
H I
2.0
1.5
1.0
0.5
0.0
6000
7000
8000
9000

II] Ca II


sn1991t.m00.dat.rect, z = 0.30000001
Calesi2040_50A.fits Observed − Galaxy
Template Spectrum Av = 3.9546386
Galaxy
SN/Gal = Inf
[O III]
H I
2.0
1.5
1.0
0.5
0.0
6000
7000
8000
9000

II] Ca II


sn1994d.m07.dat.rect, z = 0.50000000
Calesi2040_50A.fits Observed − Galaxy
Template Spectrum Av = 4.1457788
Galaxy
SN/Gal = Inf
[O II]
Ca II
[O III]
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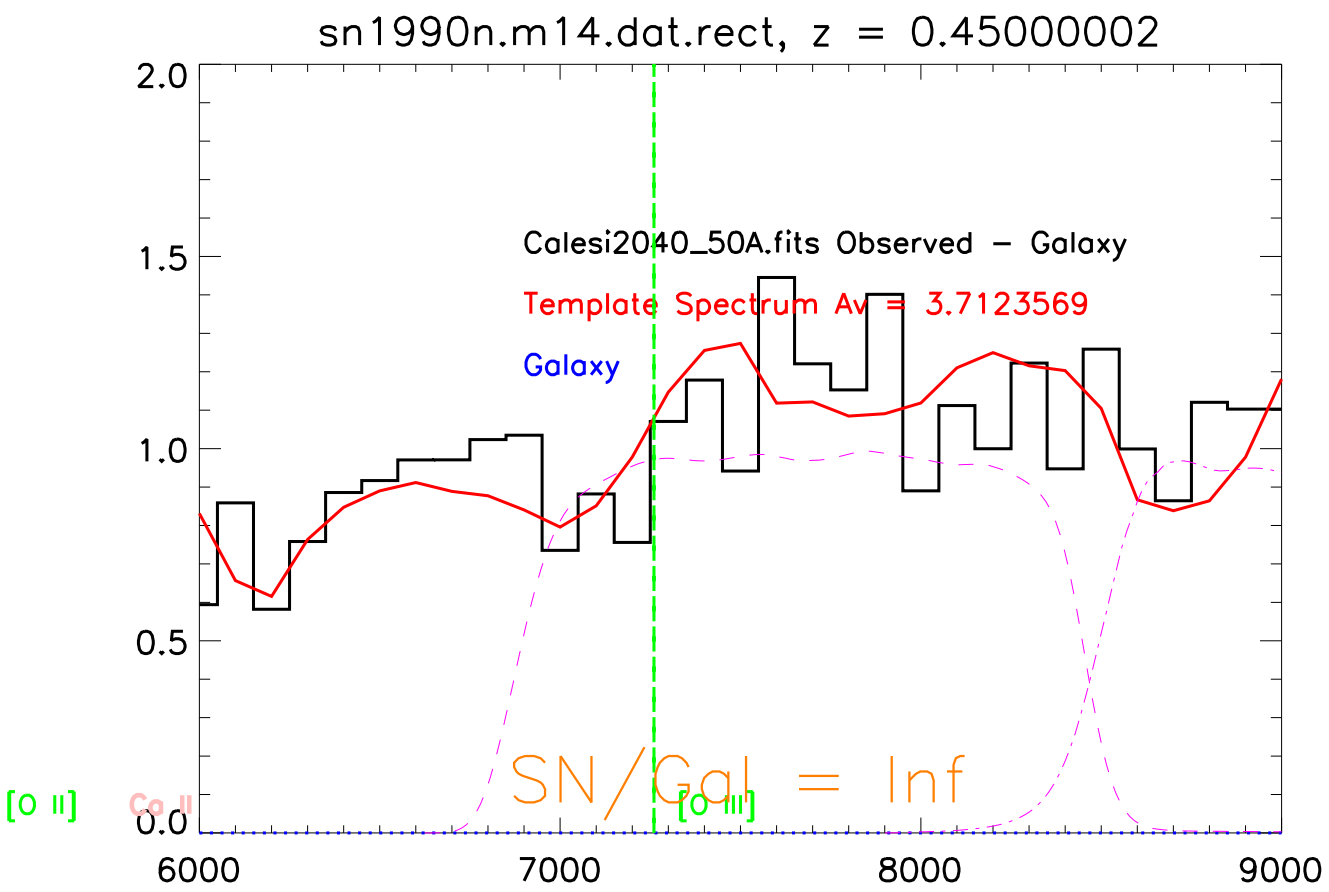
1.5
1.0
0.5
0.0
6000
7000
8000
9000


sn1990n.m14.dat.rect, z = 0.45000002
Calesi2040_50A.fits Observed − Galaxy
Template Spectrum Av = 3.7123569
Galaxy
SN/Gal = Inf
[O II]
Ca II
[O III]
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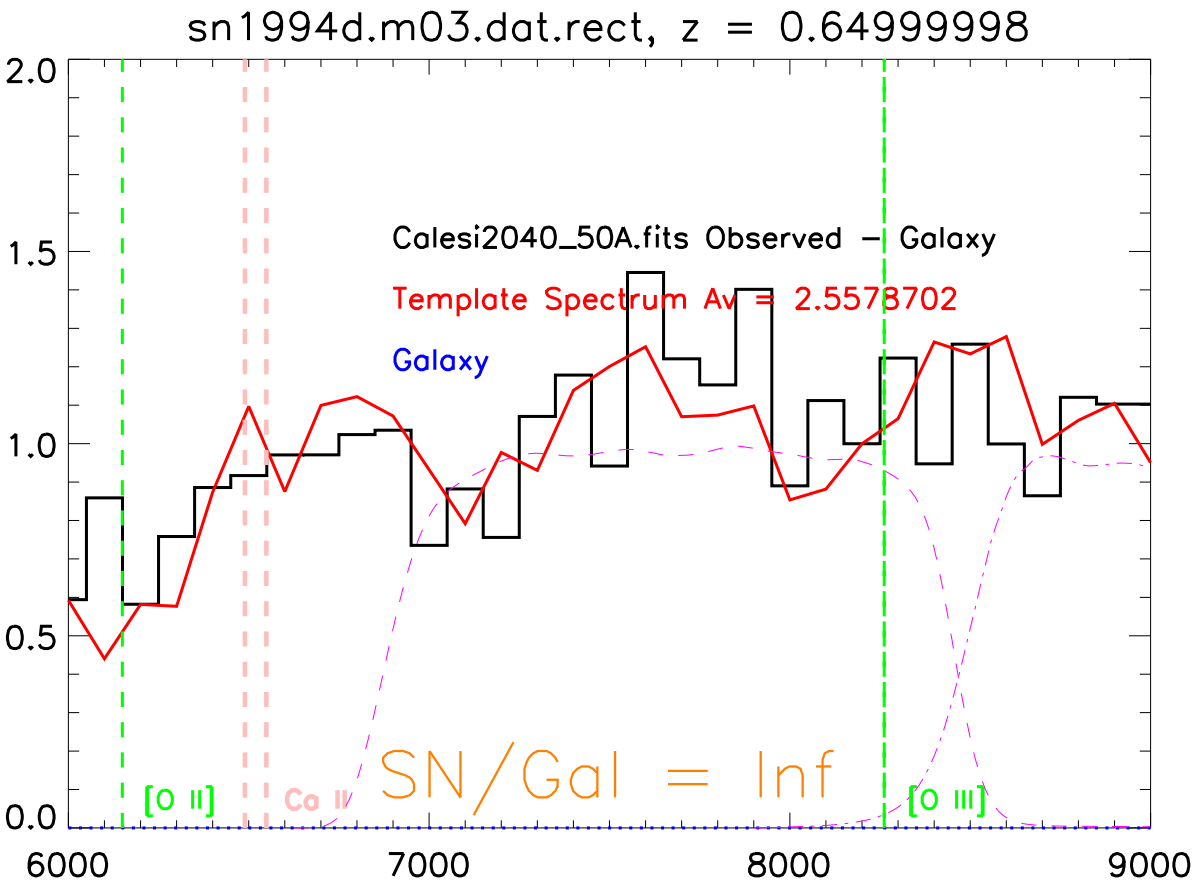
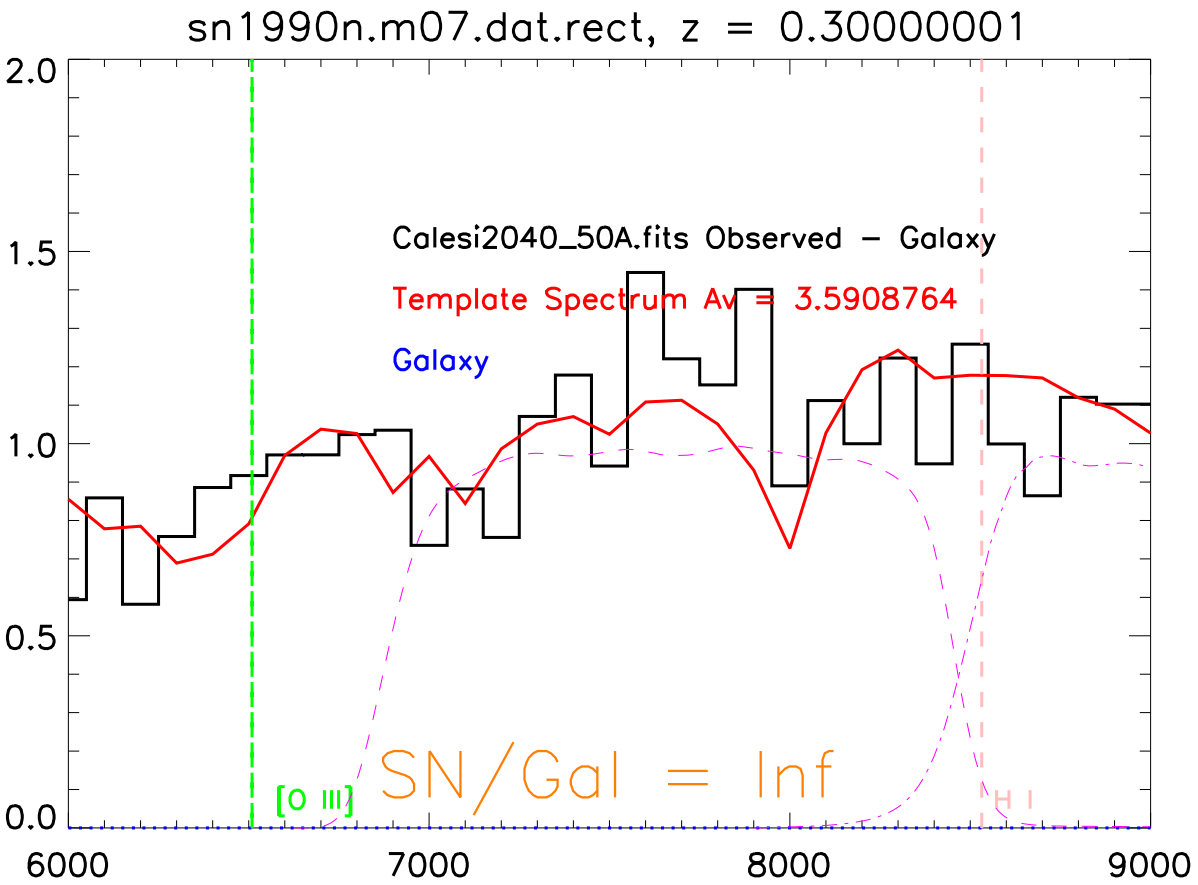
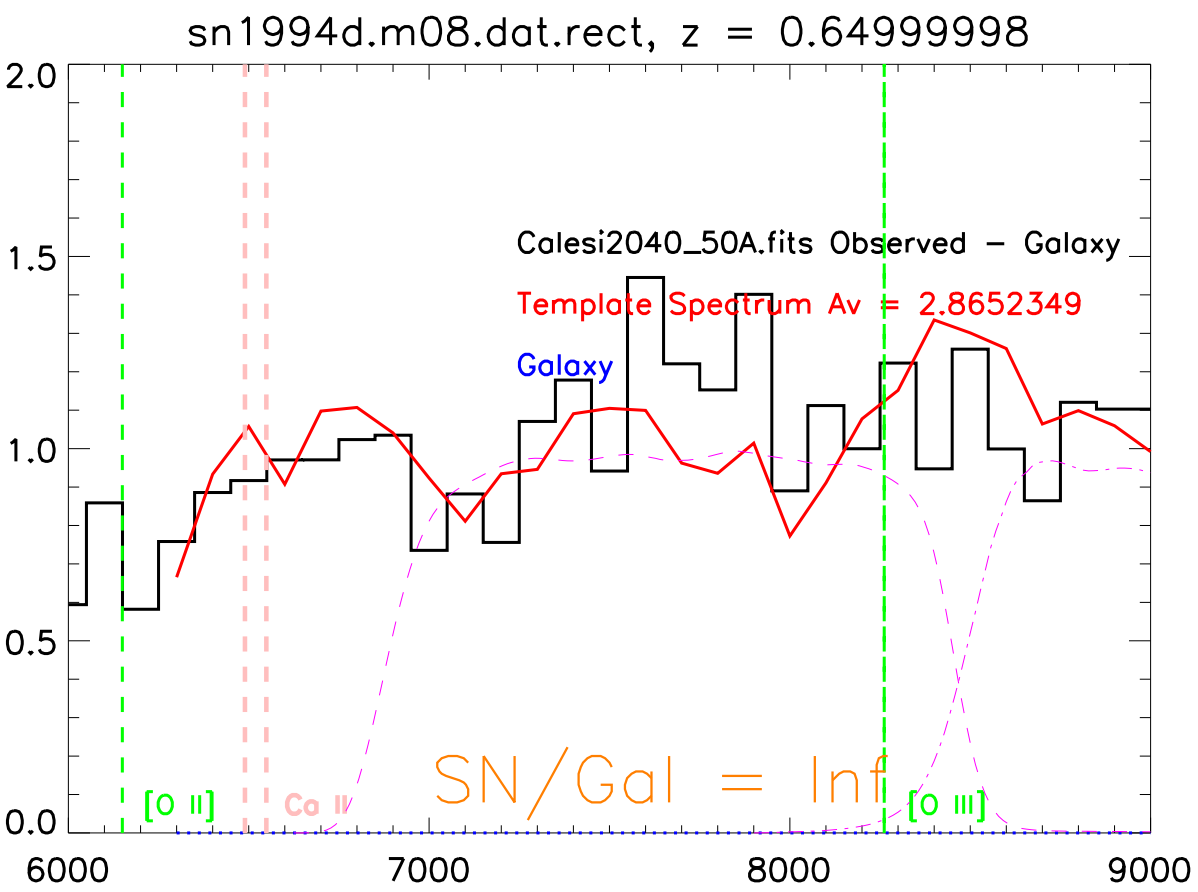
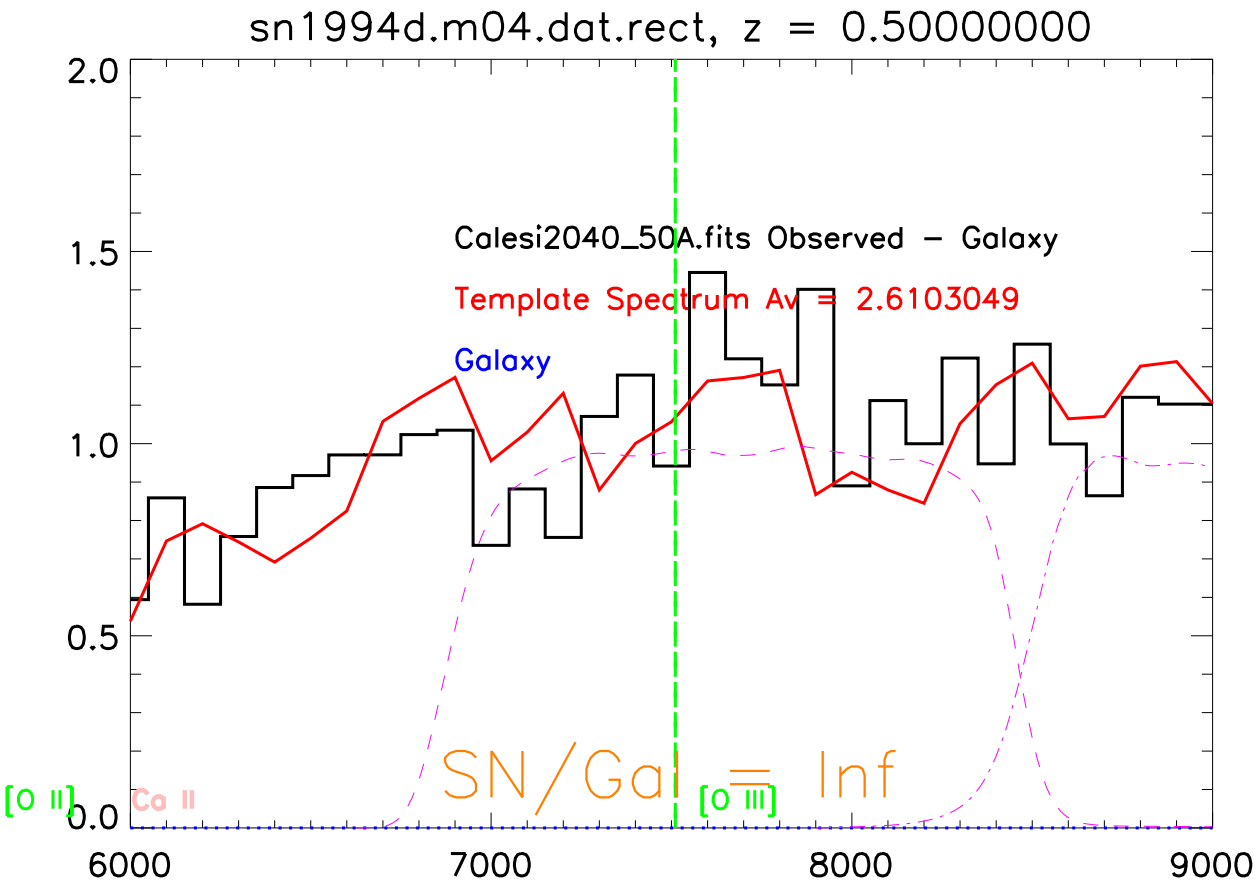
1.5
1.0
0.5
0.0
6000
7000
8000
9000


sn1994d.m03.dat.rect, z = 0.64999998
Calesi2040_50A.fits Observed – Galaxy
Template Spectrum Av = 2.5578702
Galaxy
SN/Gal = Inf
[O II]
Ca II
[O III]
2.0
1.5
1.0
0.5
0.0
6000
7000
8000
9000


sn1990n.m07.dat.rect, z = 0.30000001
Calesi2040_50A.fits Observed − Galaxy
Template Spectrum Av = 3.5908764
Galaxy
SN/Gal = Inf
[O III]
H I
2.0
1.5
1.0
0.5
0.0
6000
7000
8000
9000

II] Ca II


sn1994d.m08.dat.rect, z = 0.64999998
Calesi2040_50A.fits Observed − Galaxy
Template Spectrum Av = 2.8652349
Galaxy
SN/Gal = Inf
[O II]
Ca II
[O III]
2.0
1.5
1.0
0.5
0.0
6000
7000
8000
9000


sn1994d.m04.dat.rect, z = 0.50000000
Calesi2040_50A.fits Observed − Galaxy
Template Spectrum Av = 2.6103049
Galaxy
SN/Gal = Inf
[O II]
Ca II
[O III]
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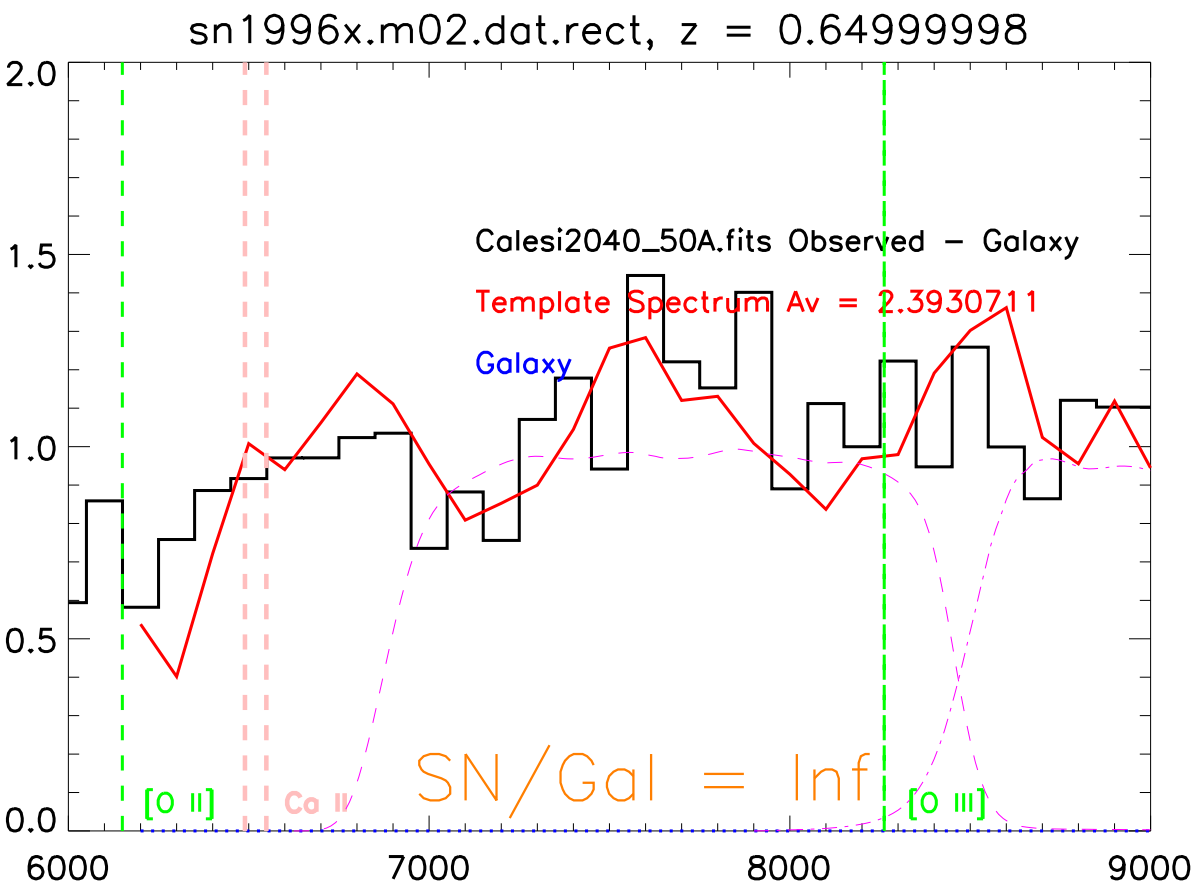
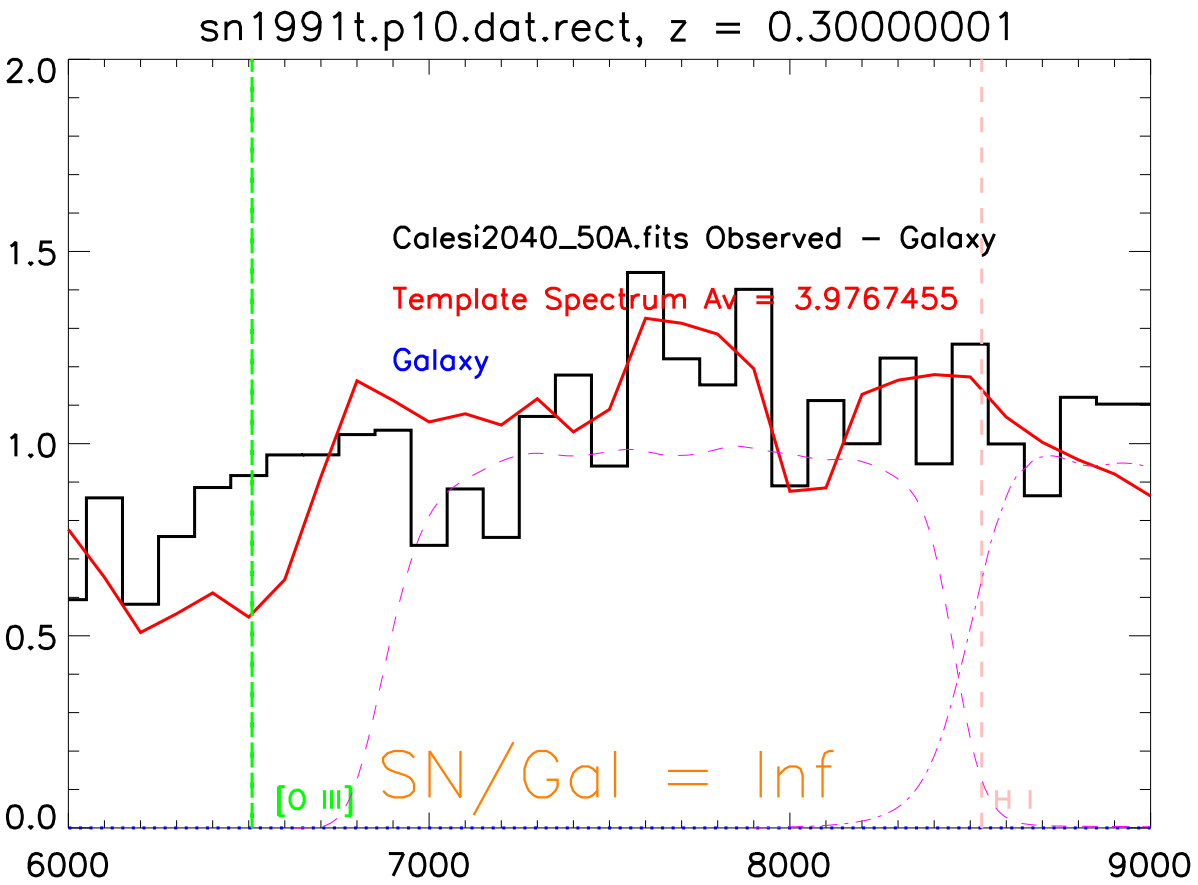
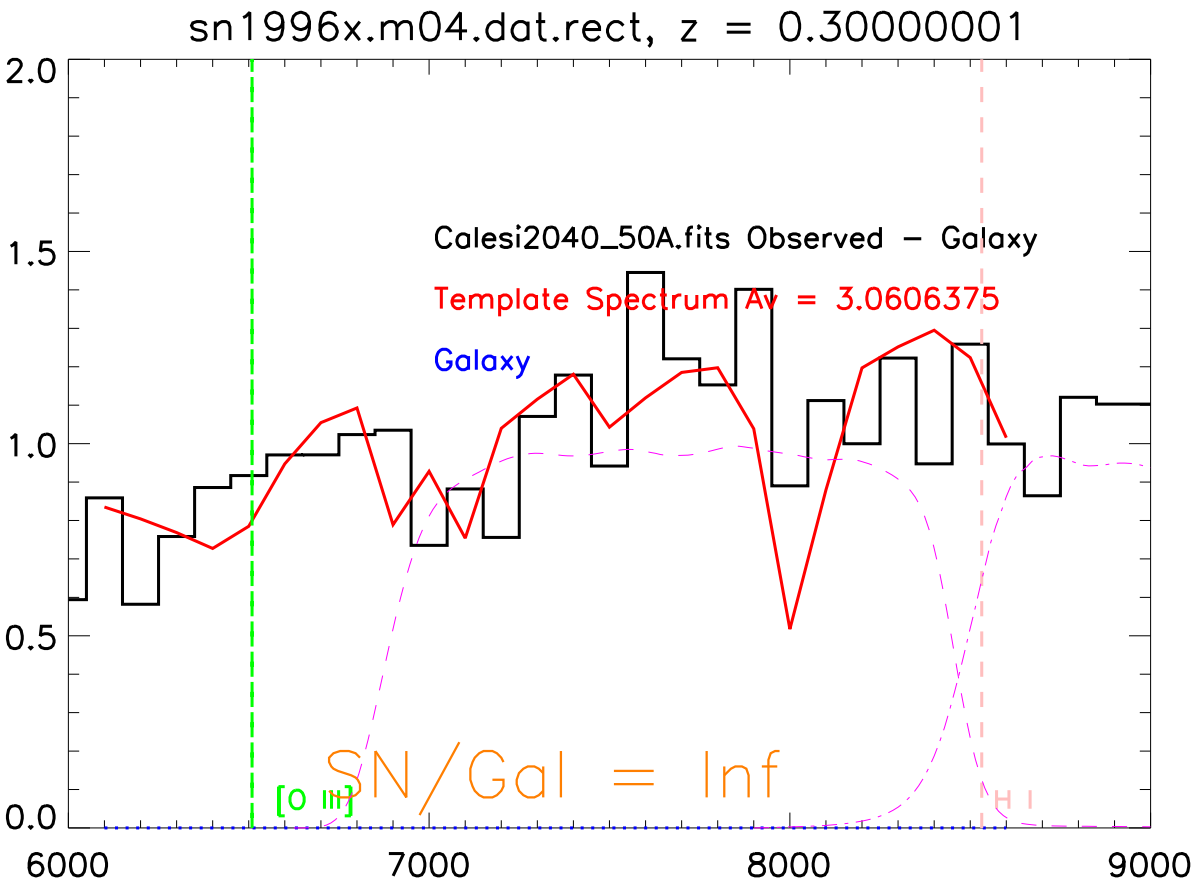
1.5
1.0
0.5
0.0
6000
7000
8000
9000

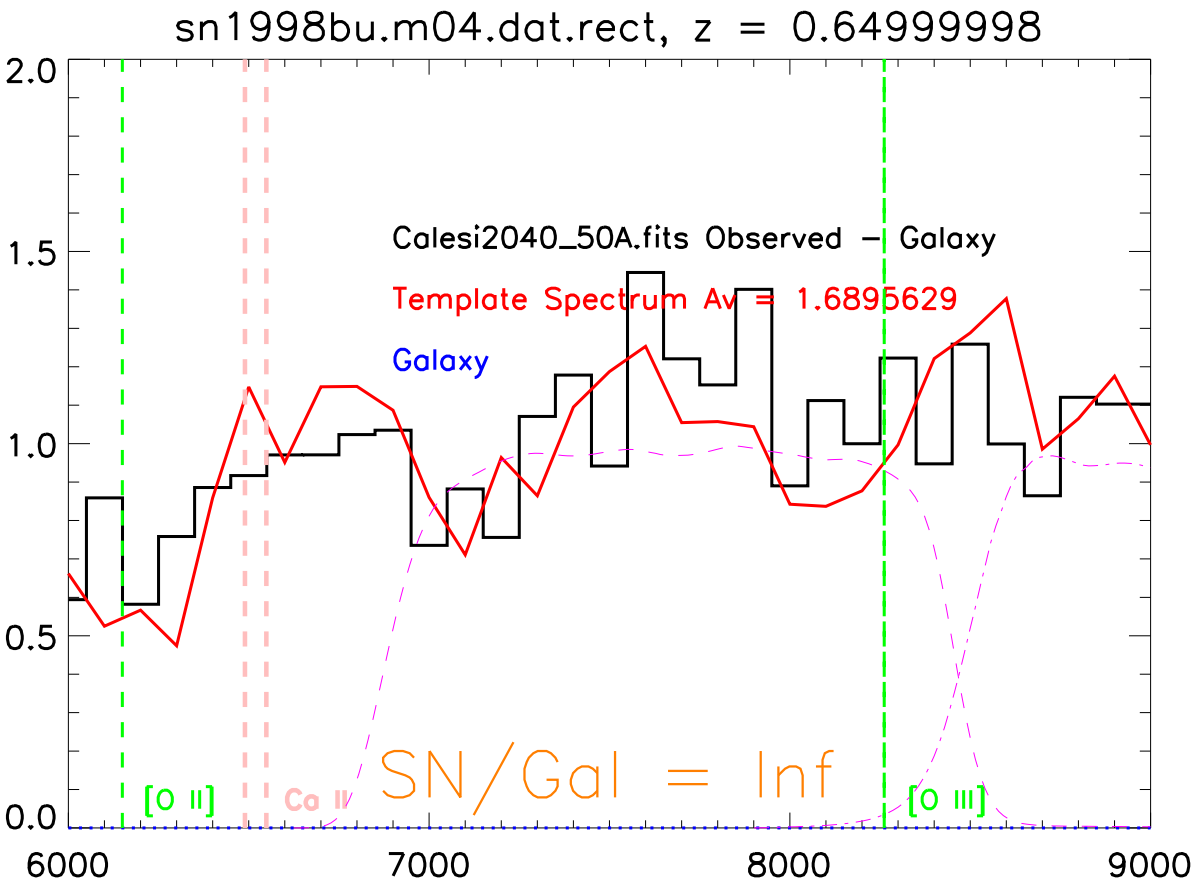

sn1996x.m02.dat.rect, z = 0.64999998
Calesi2040_50A.fits Observed − Galaxy
Template Spectrum Av = 2.3930711
Galaxy
SN/Gal = Inf
[O II]
Ca II
[O III]
2.0
1.5
1.0
0.5
0.0
6000
7000
8000
9000

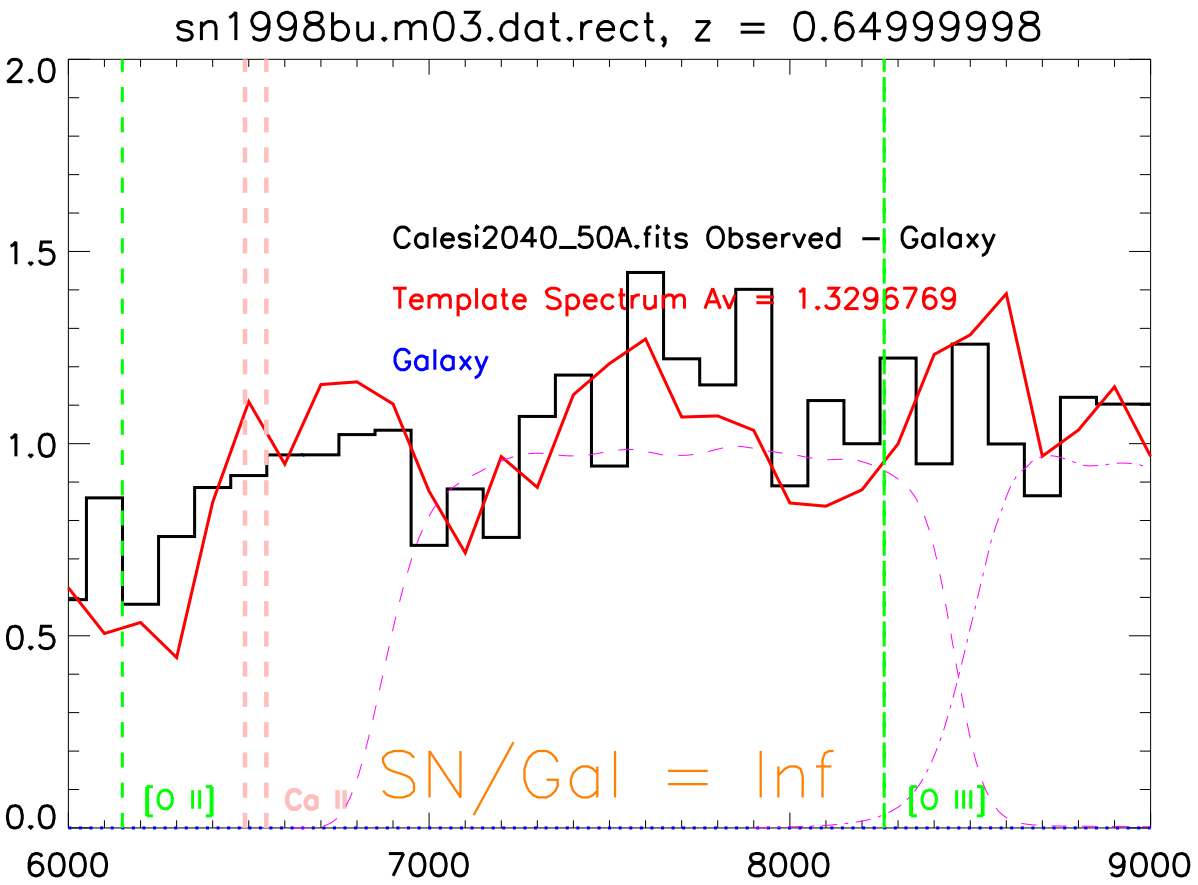

sn1991t.p10.dat.rect, z = 0.30000001
Calesi2040_50A.fits Observed − Galaxy
Template Spectrum Av = 3.9767455
Galaxy
SN/Gal = Inf
[O III]
H I
2.0
1.5
1.0
0.5
0.0
6000
7000
8000
9000

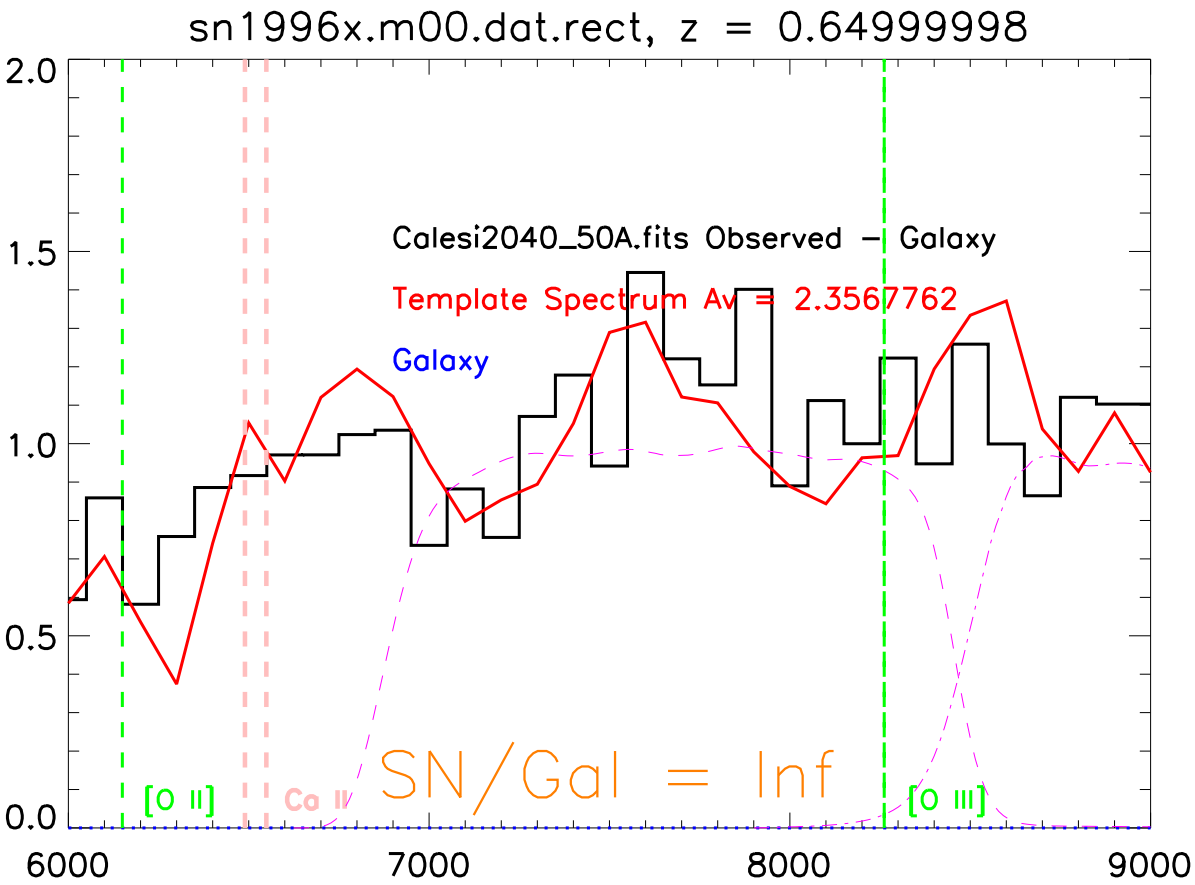
II] Ca II

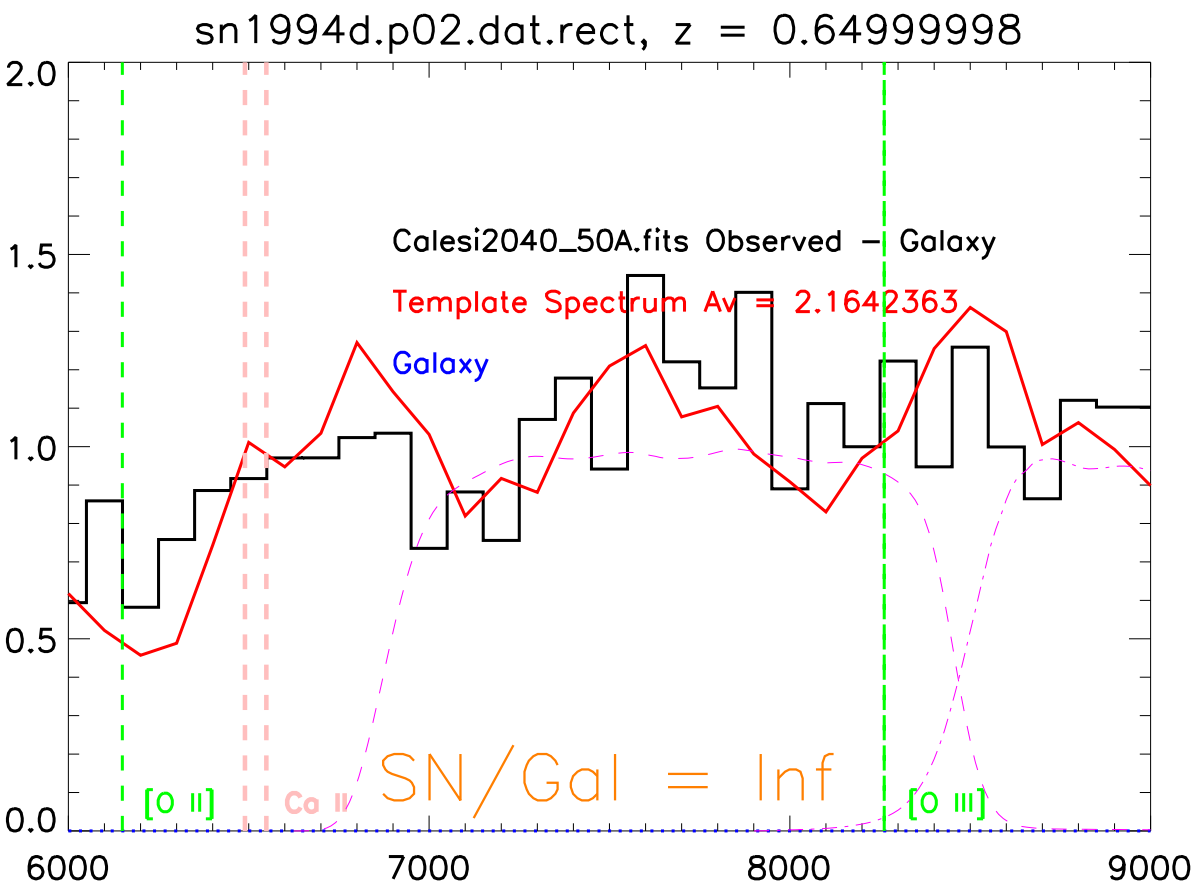

sn1996x.m04.dat.rect, z = 0.30000001
Calesi2040_50A.fits Observed − Galaxy
Template Spectrum Av = 3.0606375
Galaxy
SN/Gal = Inf
[O III]
H I
2.0
1.5
1.0
0.5
0.0
6000
7000
8000
9000

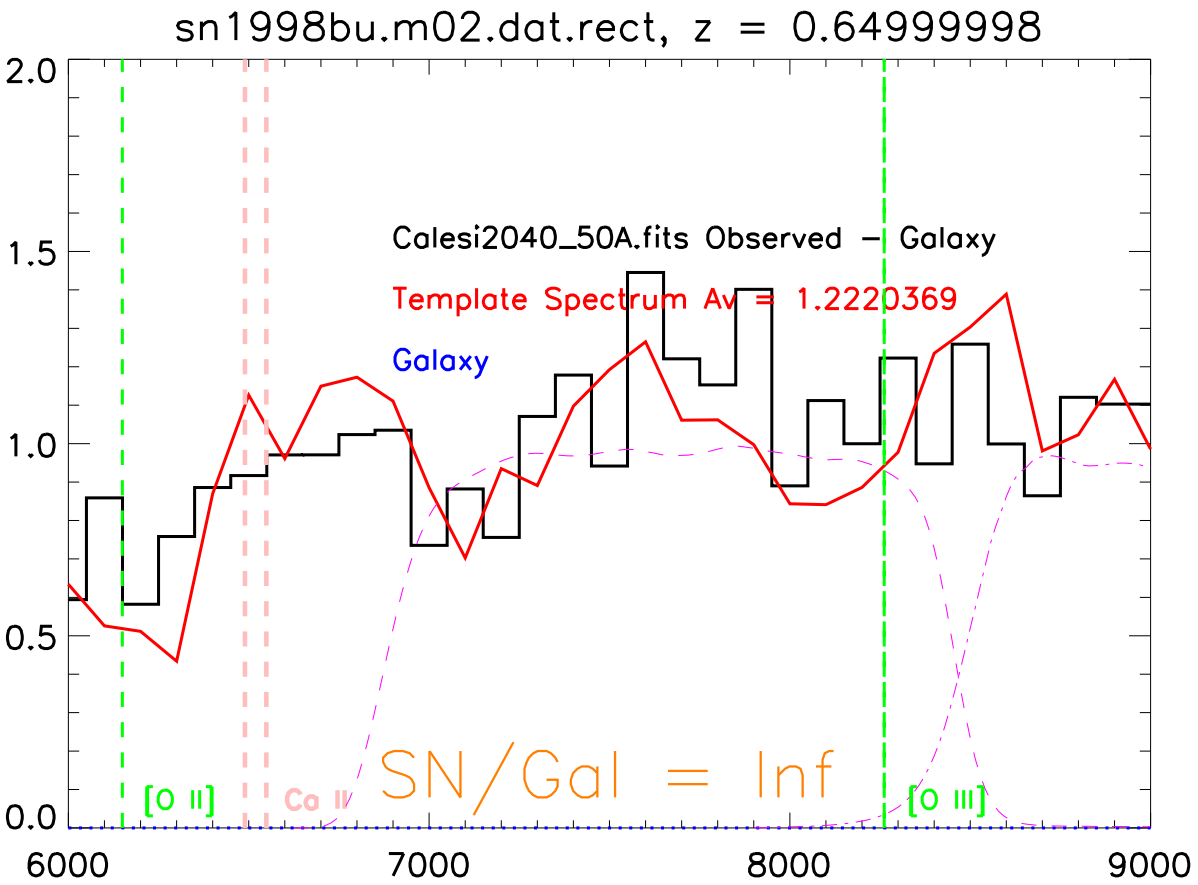
II] Ca II

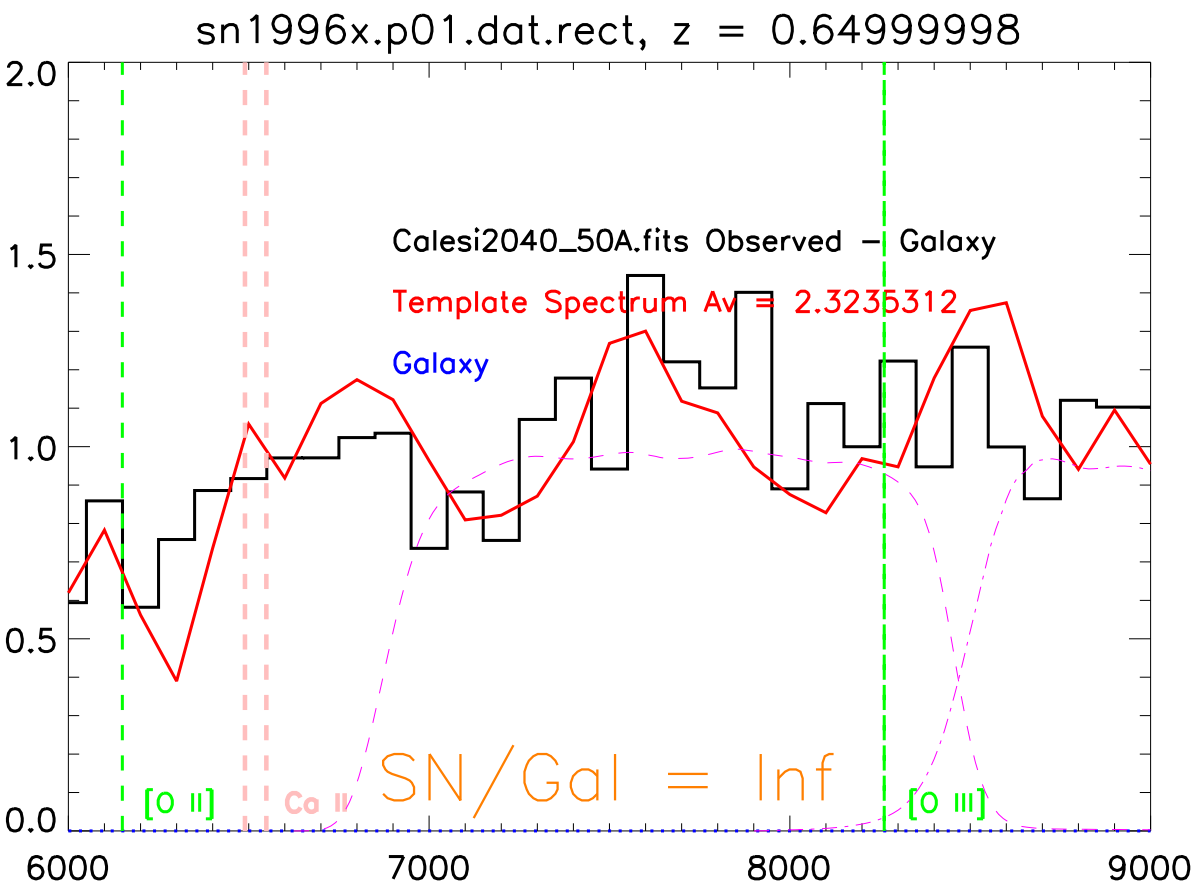

sn1998bu.m04.dat.rect, z = 0.64999998
Calesi2040_50A.fits Observed – Galaxy
Template Spectrum Av = 1.6895629
Galaxy
SN/Gal = Inf
[O II]
Ca II
[O III]
2.0
1.5
1.0
0.5
0.0
6000
7000
8000
9000

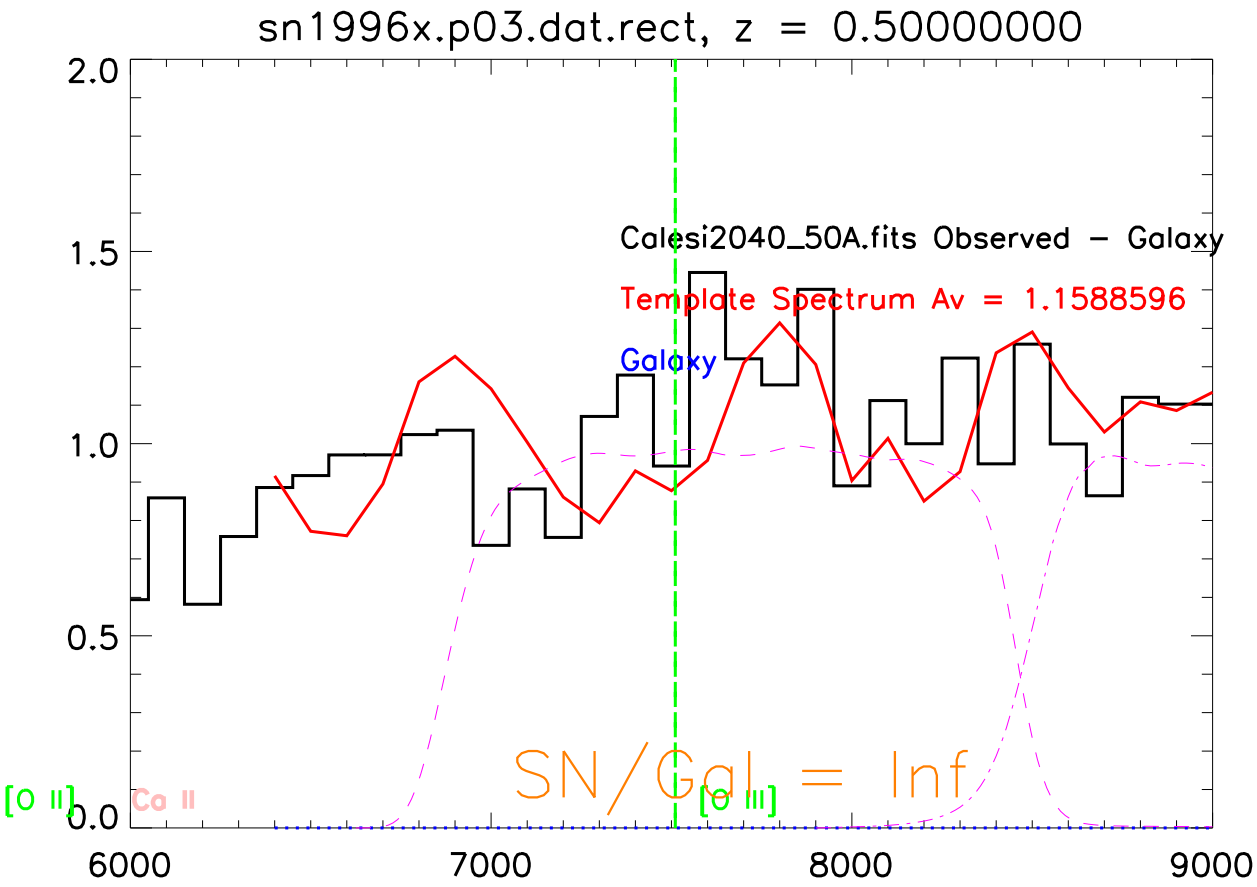

sn1998bu.m03.dat.rect, z = 0.64999998
Calesi2040_50A.fits Observed – Galaxy
Template Spectrum Av = 1.3296769
Galaxy
SN/Gal = Inf
[O II]
Ca II
[O III]
2.0
1.5
1.0
0.5
0.0
6000
7000
8000
9000

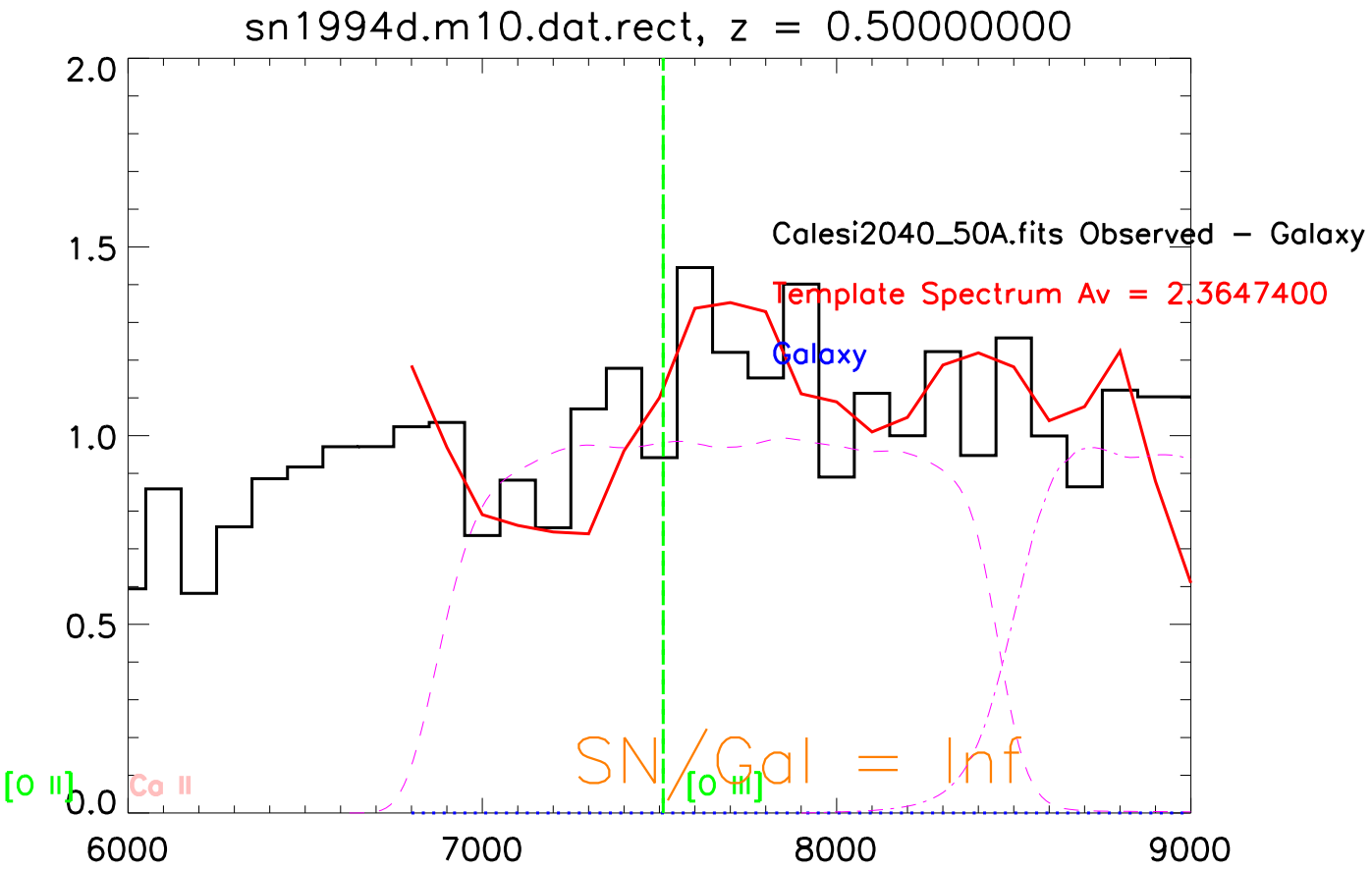

sn1996x.m00.dat.rect, z = 0.64999998
Calesi2040_50A.fits Observed – Galaxy
Template Spectrum Av = 2.3567762
Galaxy
SN/Gal = Inf
[O II]
Ca II
[O III]
2.0
1.5
1.0
0.5
0.0
6000
7000
8000
9000

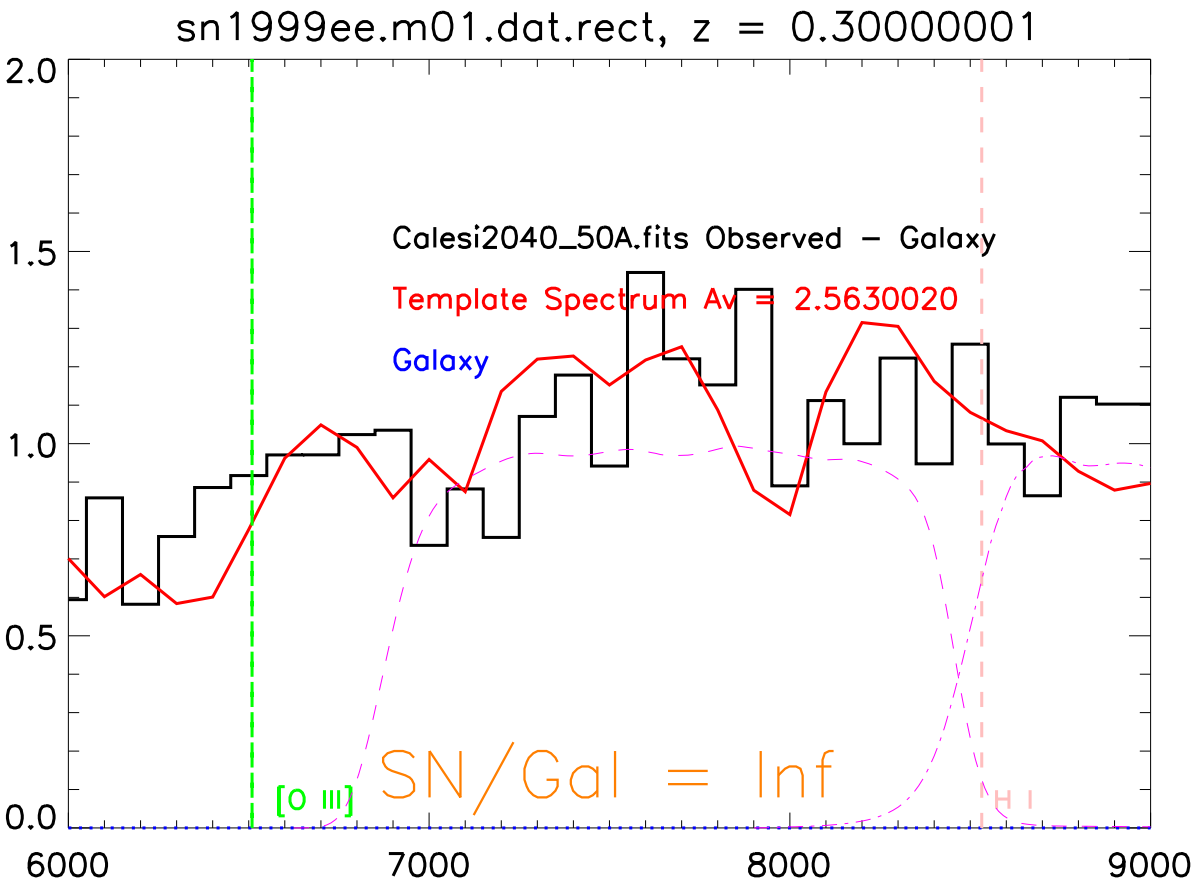

sn1994d.p02.dat.rect, z = 0.64999998
Calesi2040_50A.fits Observed − Galaxy
Template Spectrum Av = 2.1642363
Galaxy
SN/Gal = Inf
[O II]
Ca II
[O III]
2.0
1.5
1.0
0.5
0.0
6000
7000
8000
9000


sn1998bu.m02.dat.rect, z = 0.64999998
Calesi2040_50A.fits Observed – Galaxy
Template Spectrum Av = 1.2220369
Galaxy
SN/Gal = Inf
[O II]
Ca II
[O III]
2.0
1.5
1.0
0.5
0.0
6000
7000
8000
9000

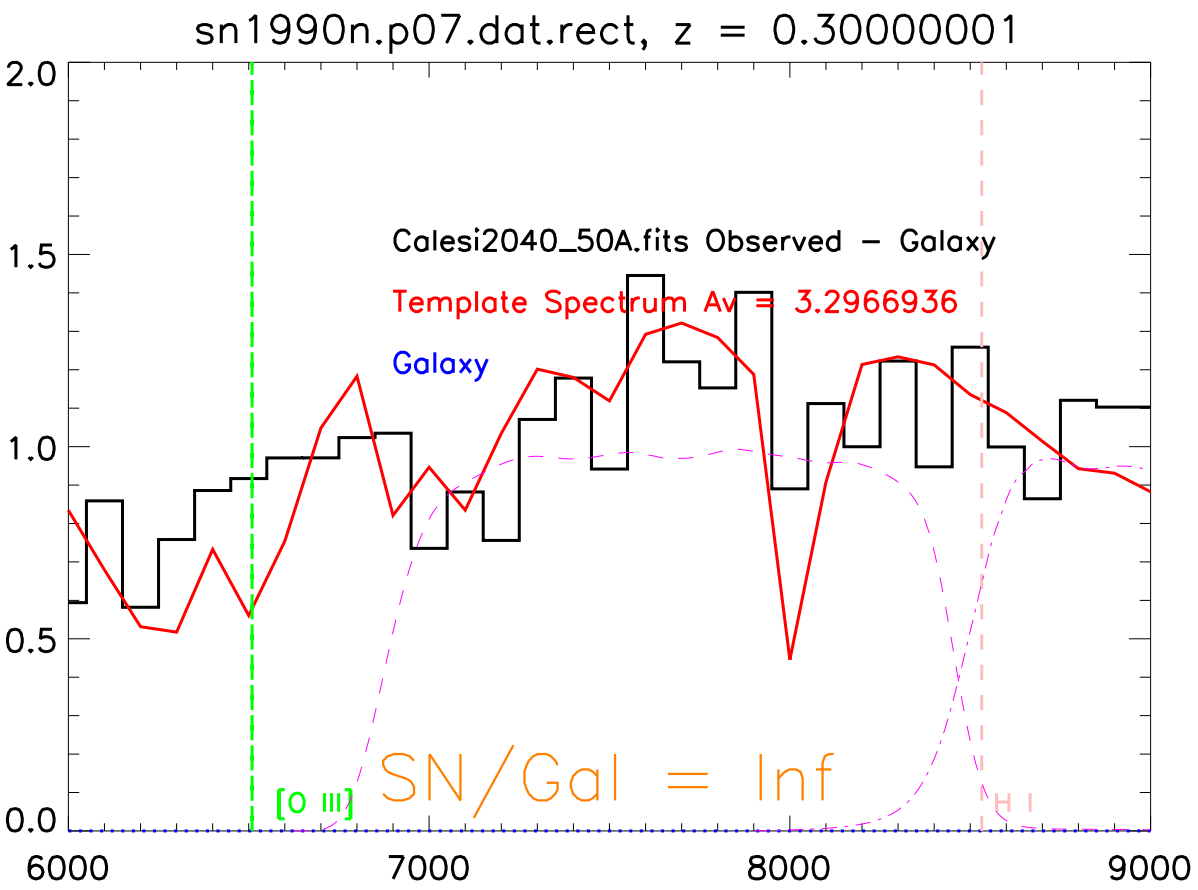

sn1996x.p01.dat.rect, z = 0.64999998
Calesi2040_50A.fits Observed – Galaxy
Template Spectrum Av = 2.3235312
Galaxy
SN/Gal = Inf
[O II]
Ca II
[O III]
2.0
1.5
1.0
0.5
0.0
6000
7000
8000
9000


sn1996x.p03.dat.rect, z = 0.50000000
Calesi2040_50A.fits Observed − Galaxy
Template Spectrum Av = 1.1588596
Galaxy
SN/Gal = Inf
[O II]
Ca II
[O III]
2.0
1.5
1.0
0.5
0.0
6000
7000
8000
9000

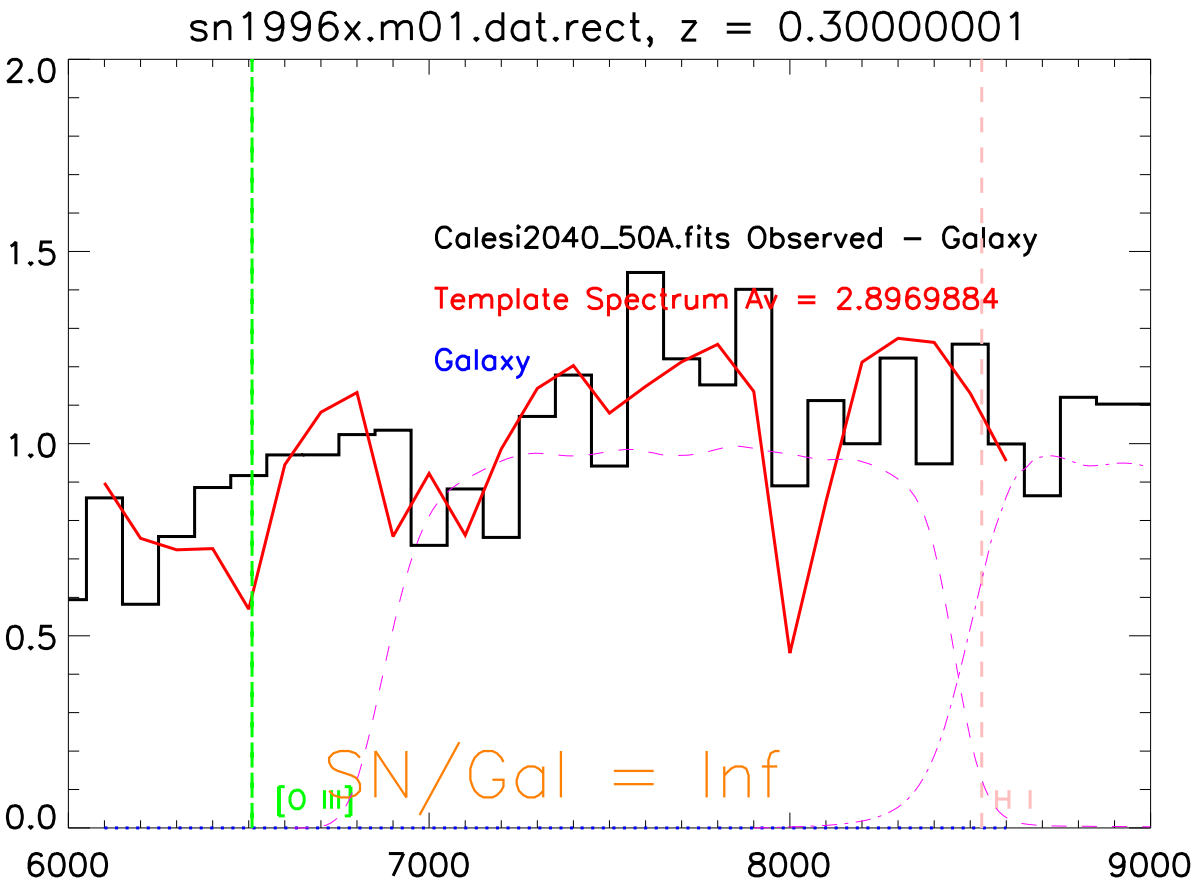

sn1994d.m10.dat.rect, z = 0.50000000
2.0
1.5
1.0
0.5
0.0
6000
7000
8000
9000
Calesi2040_50A.fits Observed − Galaxy
Template Spectrum Av = 2.3647400
Galaxy
SN/Gal = Inf
[O II]
Ca II
[O III]


sn1999ee.m01.dat.rect, z = 0.30000001
Calesi2040_50A.fits Observed − Galaxy
Template Spectrum Av = 2.5630020
Galaxy
SN/Gal = Inf
[O III]
H I
2.0
1.5
1.0
0.5
0.0
6000
7000
8000
9000

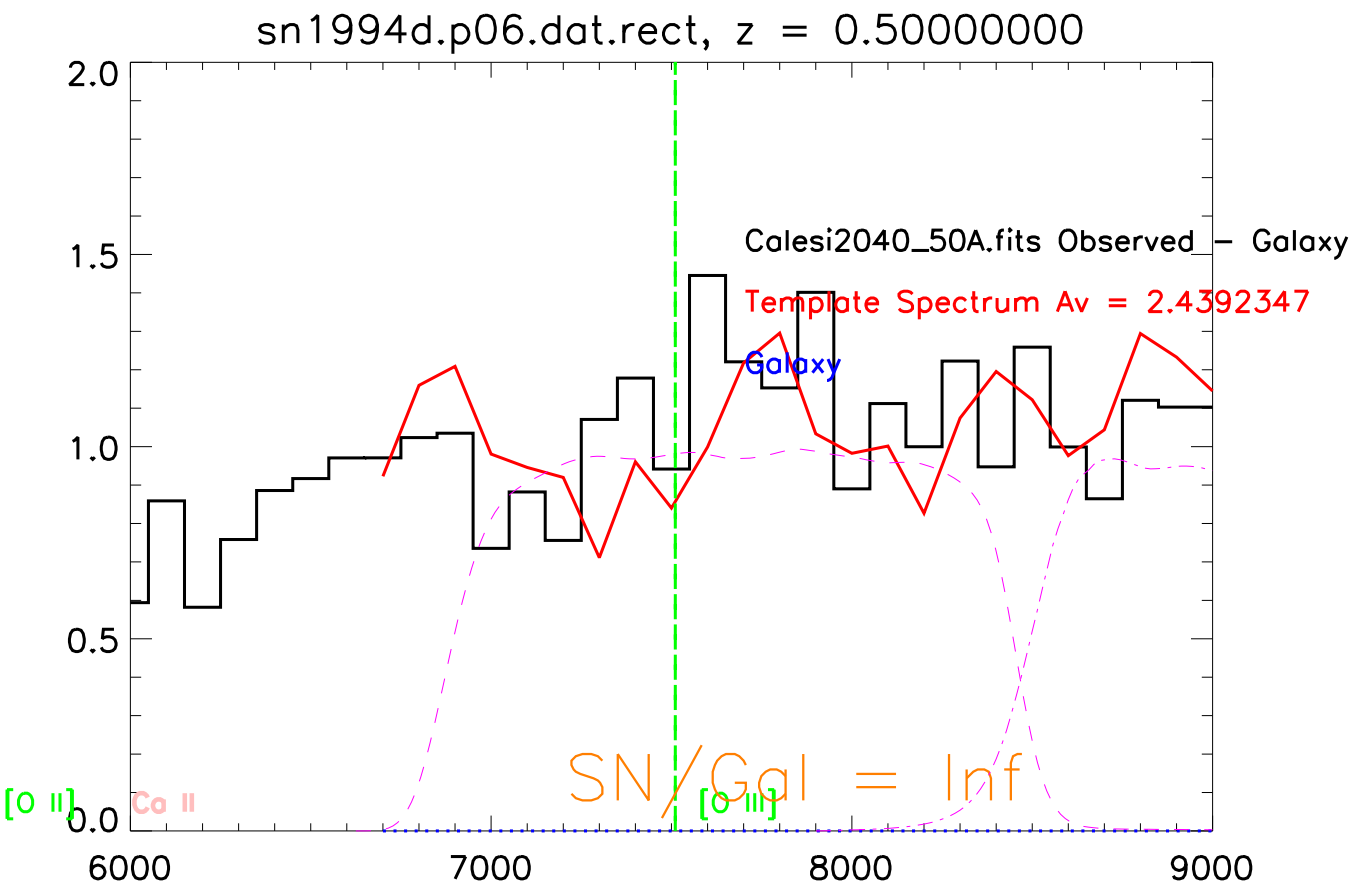
II] Ca II

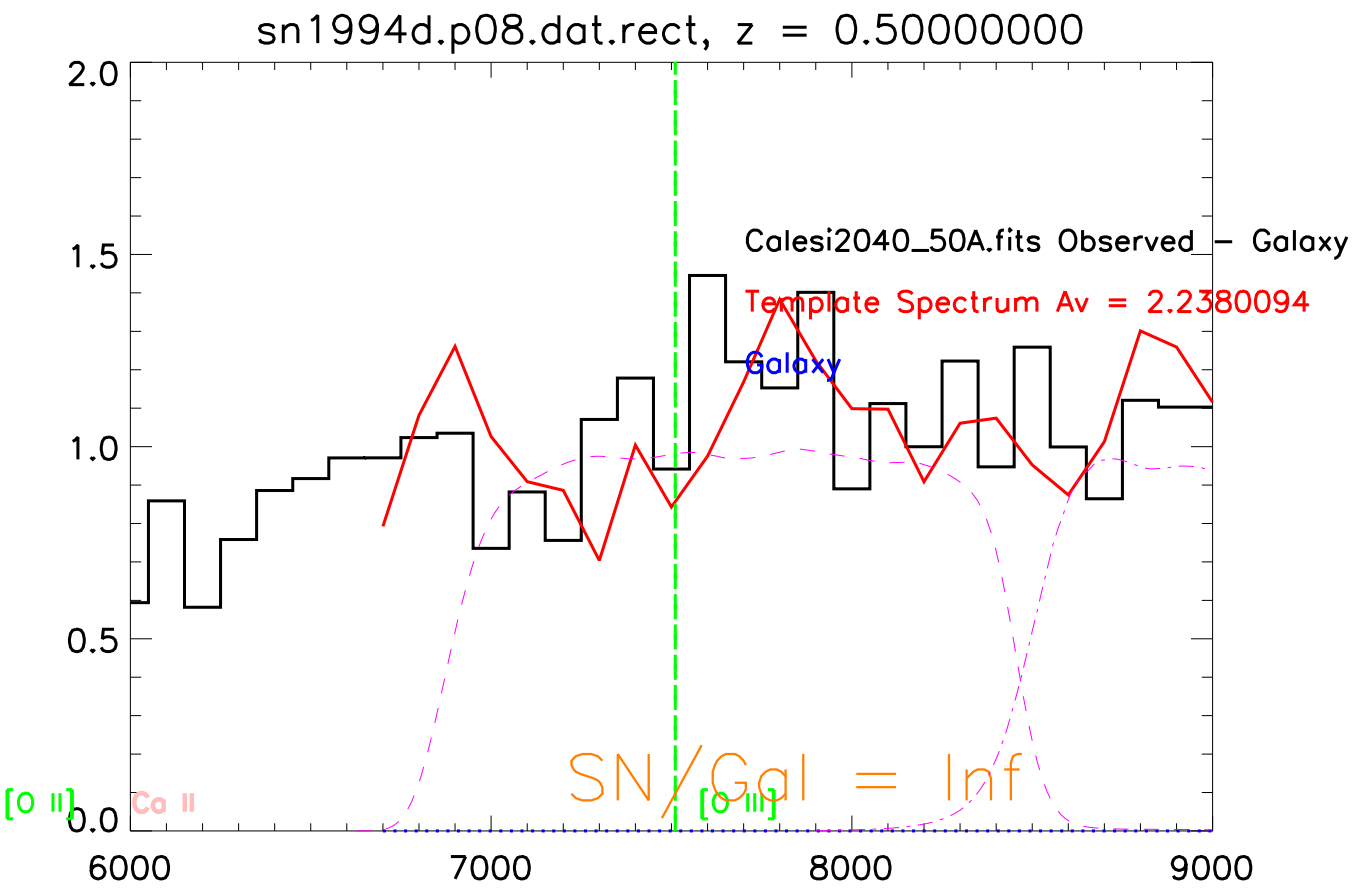

sn1990n.p07.dat.rect, z = 0.30000001
Calesi2040_50A.fits Observed − Galaxy
Template Spectrum Av = 3.2966936
Galaxy
SN/Gal = Inf
[O III]
H I
2.0
1.5
1.0
0.5
0.0
6000
7000
8000
9000

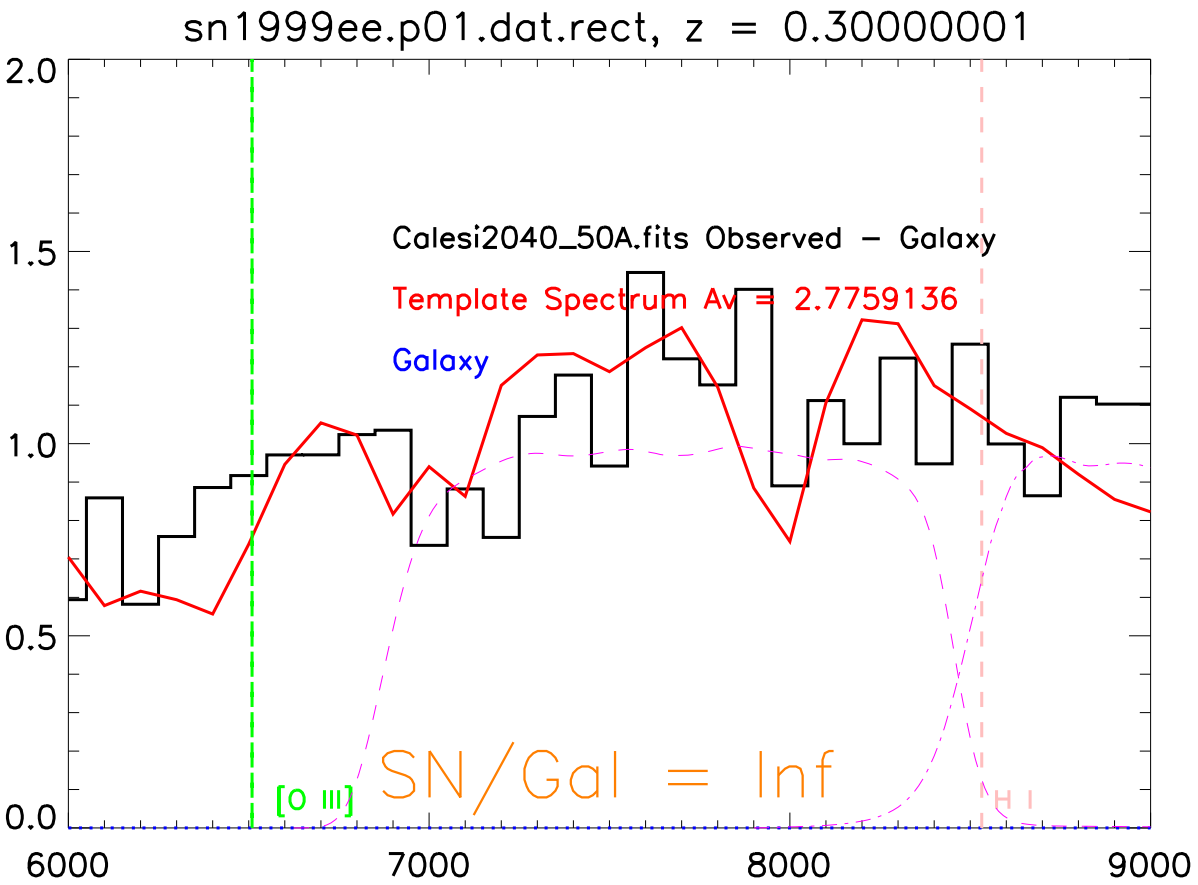
II] Ca II


sn1996x.m01.dat.rect, z = 0.30000001
Calesi2040_50A.fits Observed − Galaxy
Template Spectrum Av = 2.8969884
Galaxy
SN/Gal = Inf
[O III]
H I
2.0
1.5
1.0
0.5
0.0
6000
7000
8000
9000

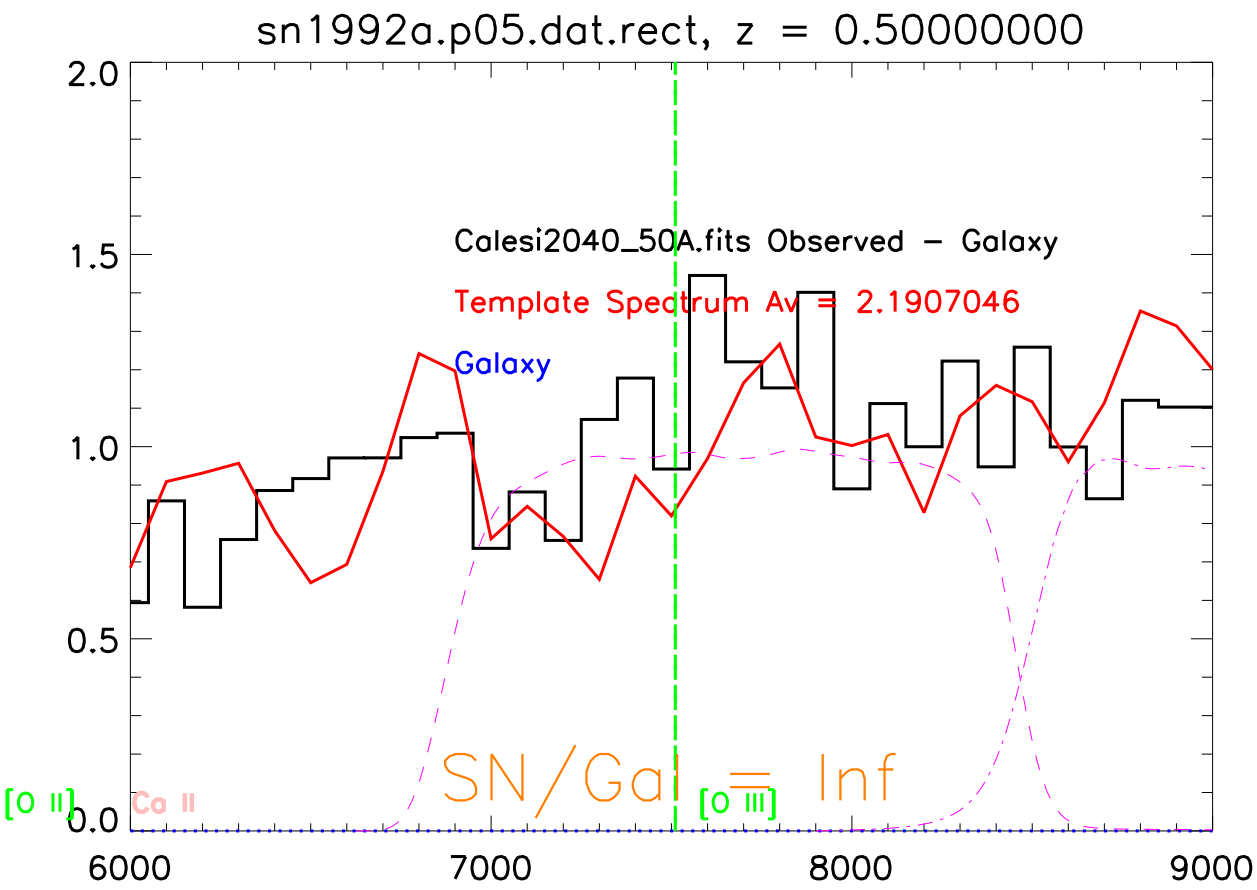
II] Ca II

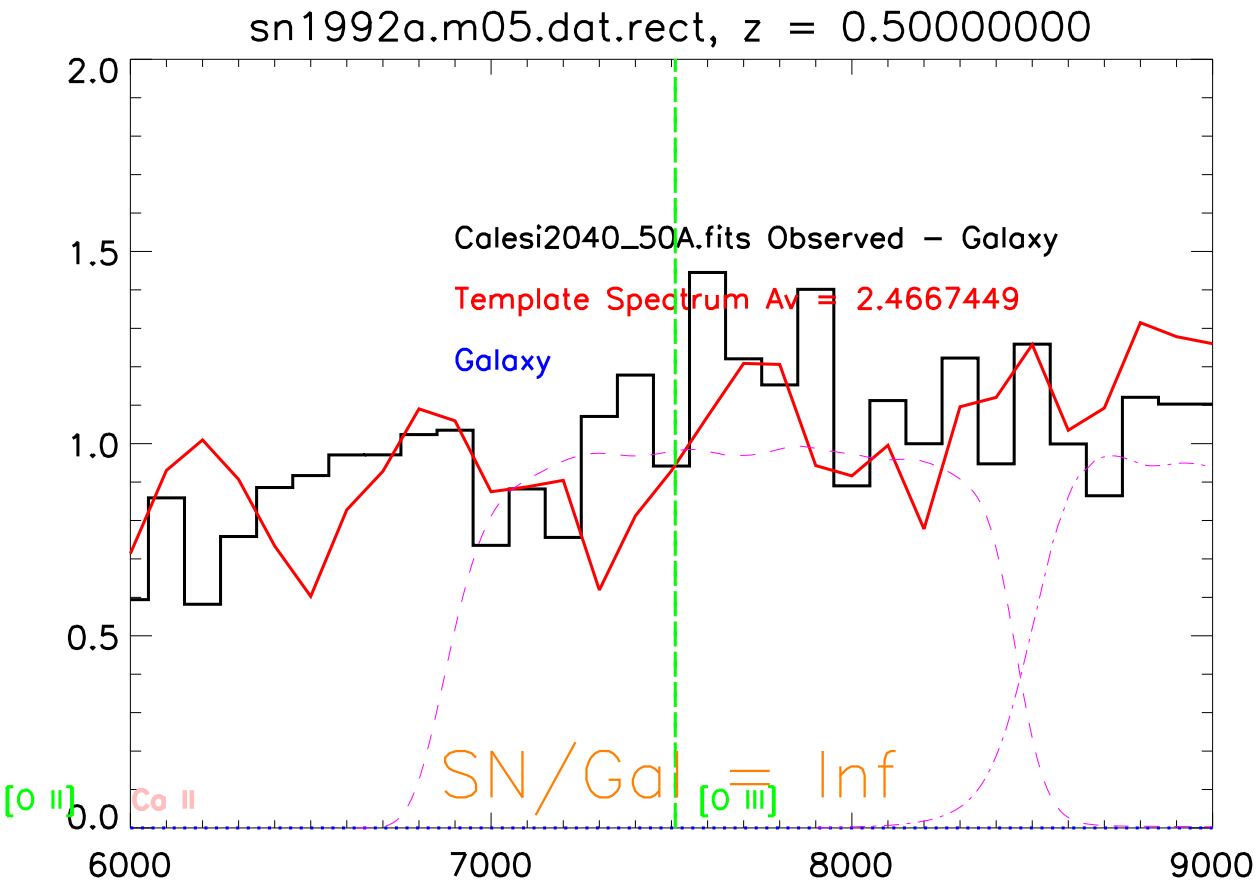

sn1994d.p06.dat.rect, z = 0.50000000
2.0
1.5
1.0
0.5
0.0
6000
7000
8000
9000
Calesi2040_50A.fits Observed – Galaxy
Template Spectrum Av = 2.4392347
Galaxy
SN/Gal = Inf
[O II]
Ca II
[O III]

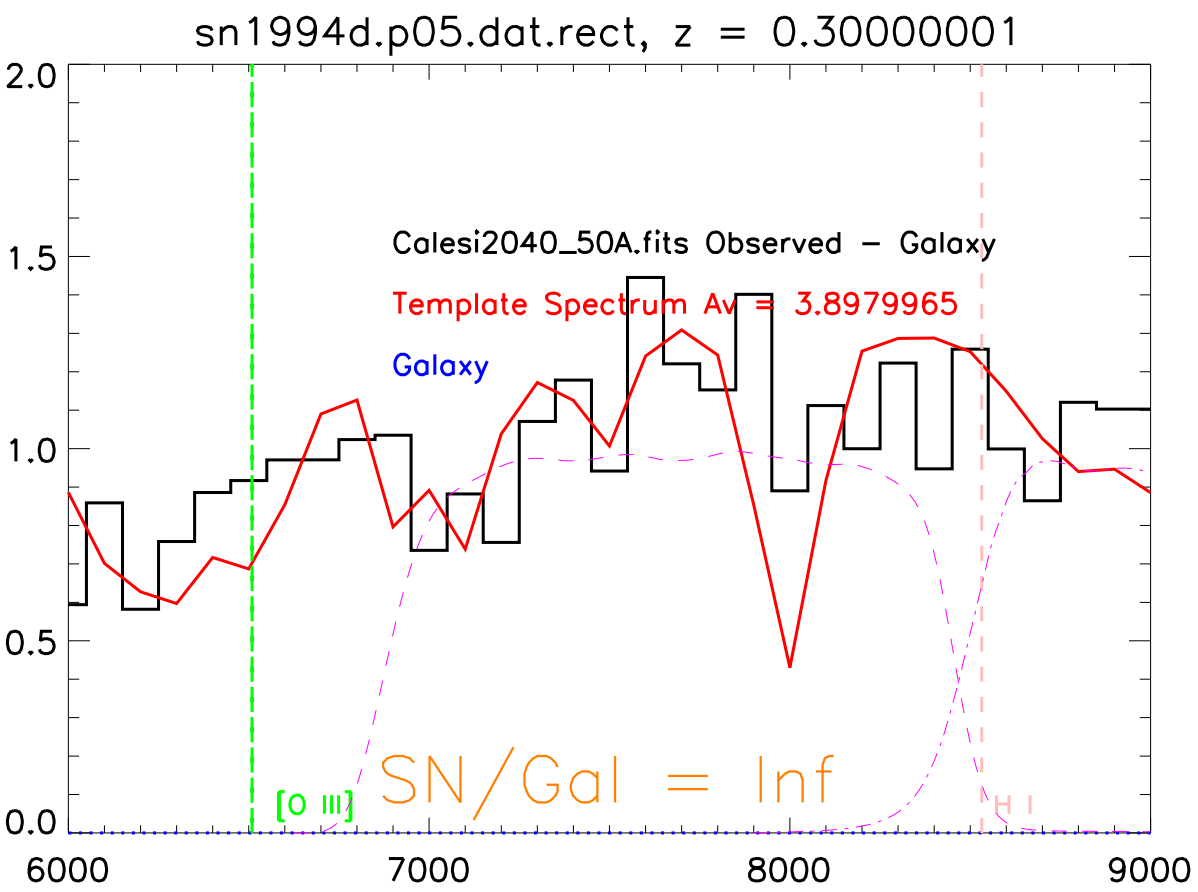

sn1994d.p08.dat.rect, z = 0.50000000
2.0
1.5
1.0
0.5
0.0
6000
7000
8000
9000
Calesi2040_50A.fits Observed – Galaxy
Template Spectrum Av = 2.2380094
Galaxy
SN/Gal = Inf
[O II]
Ca II
[O III]


sn1999ee.p01.dat.rect, z = 0.30000001
Calesi2040_50A.fits Observed − Galaxy
Template Spectrum Av = 2.7759136
Galaxy
SN/Gal = Inf
[O III]
H I
2.0
1.5
1.0
0.5
0.0
6000
7000
8000
9000

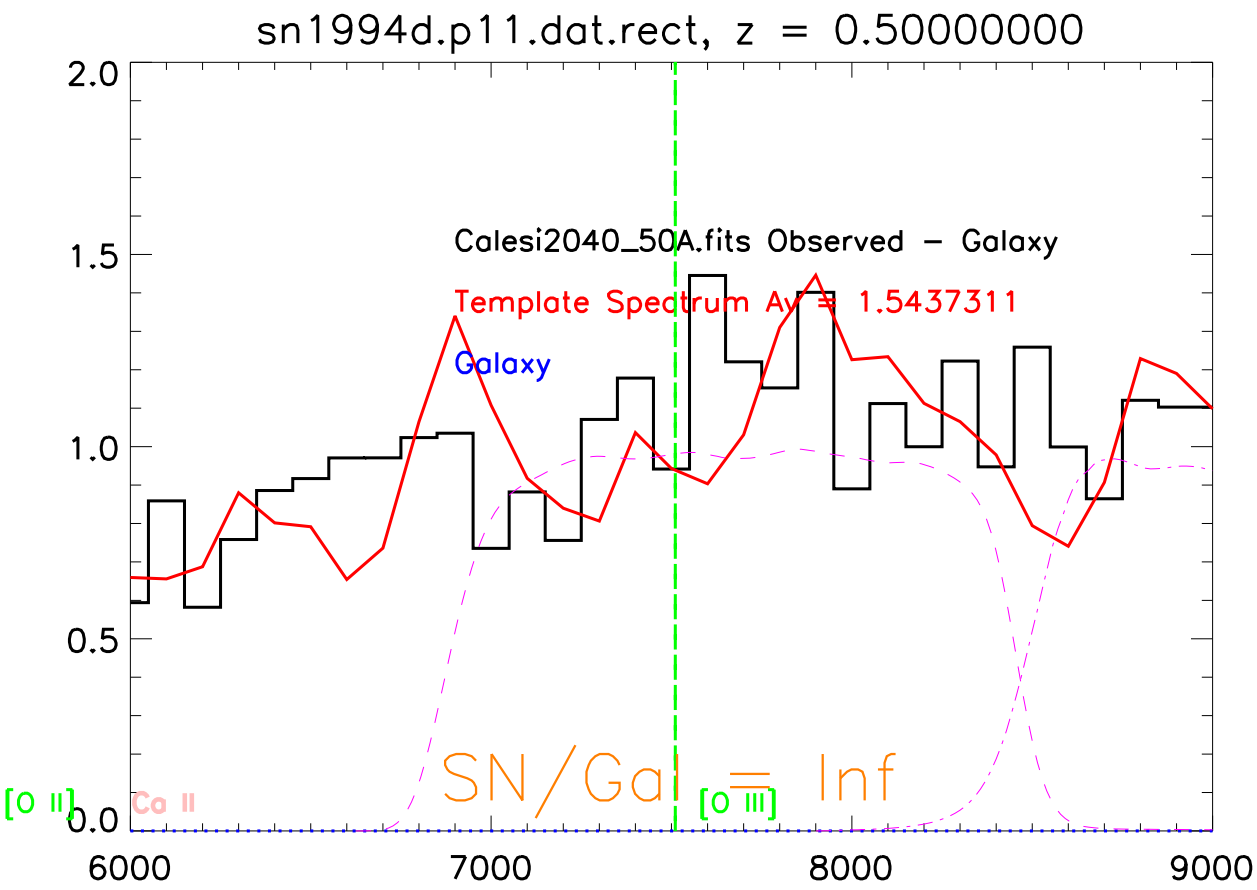
II] Ca II

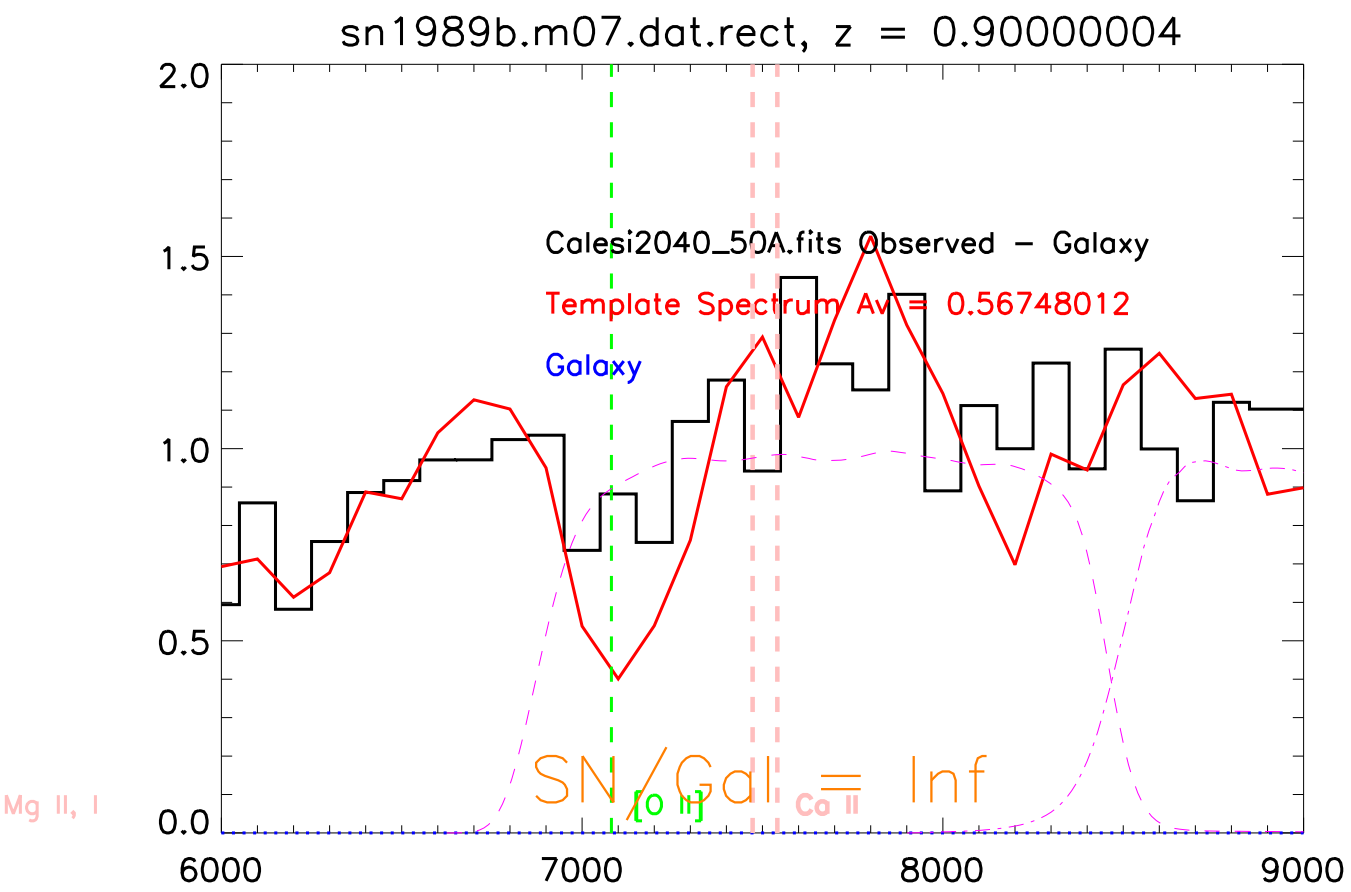

sn1992a.p05.dat.rect, z = 0.50000000
Calesi2040_50A.fits Observed − Galaxy
Template Spectrum Av = 2.1907046
Galaxy
SN/Gal = Inf
[O II]
Ca II
[O III]
2.0
1.5
1.0
0.5
0.0
6000
7000
8000
9000

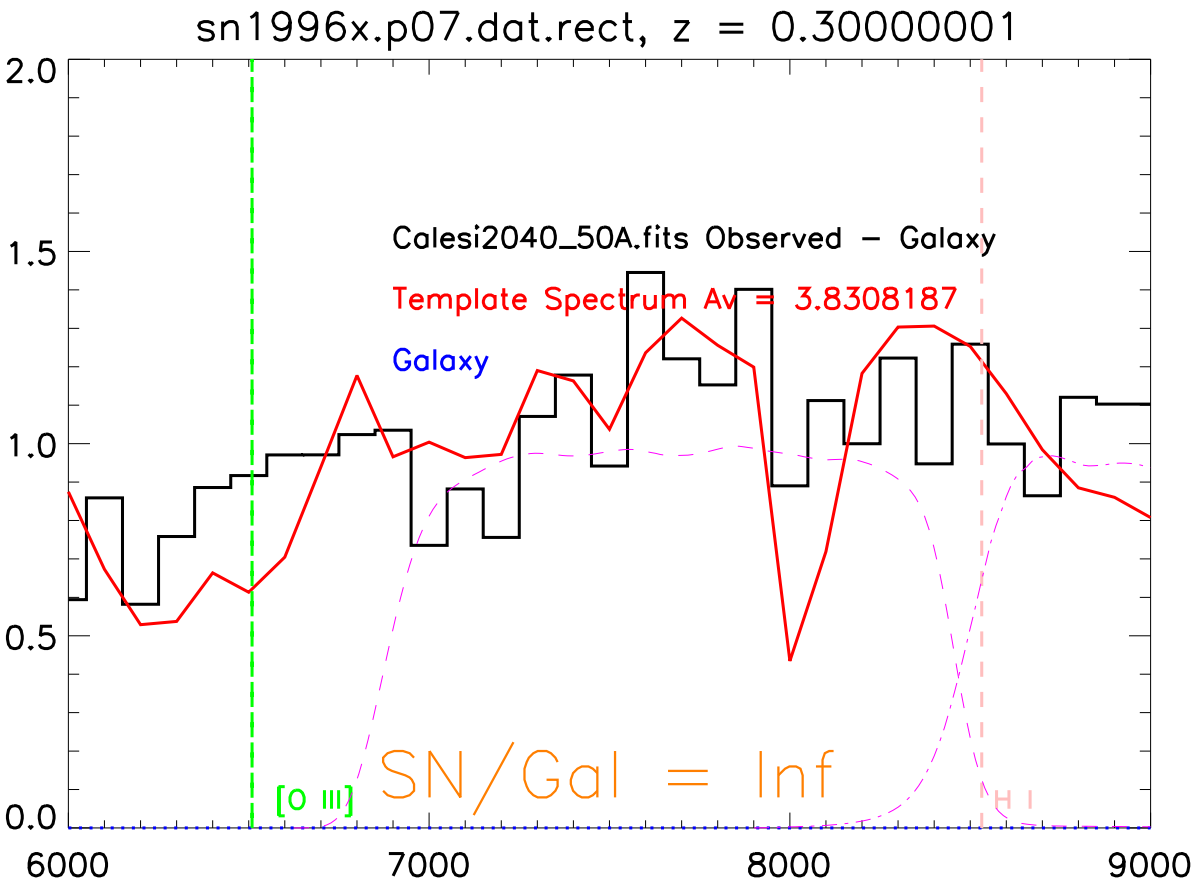

sn1992a.m05.dat.rect, z = 0.50000000
Calesi2040_50A.fits Observed − Galaxy
Template Spectrum Av = 2.4667449
Galaxy
SN/Gal = Inf
[O II]
Ca II
[O III]
2.0
1.5
1.0
0.5
0.0
6000
7000
8000
9000


sn1994d.p05.dat.rect, z = 0.30000001
Calesi2040_50A.fits Observed − Galaxy
Template Spectrum Av = 3.8979965
Galaxy
SN/Gal = Inf
[O III]
H I
2.0
1.5
1.0
0.5
0.0
6000
7000
8000
9000

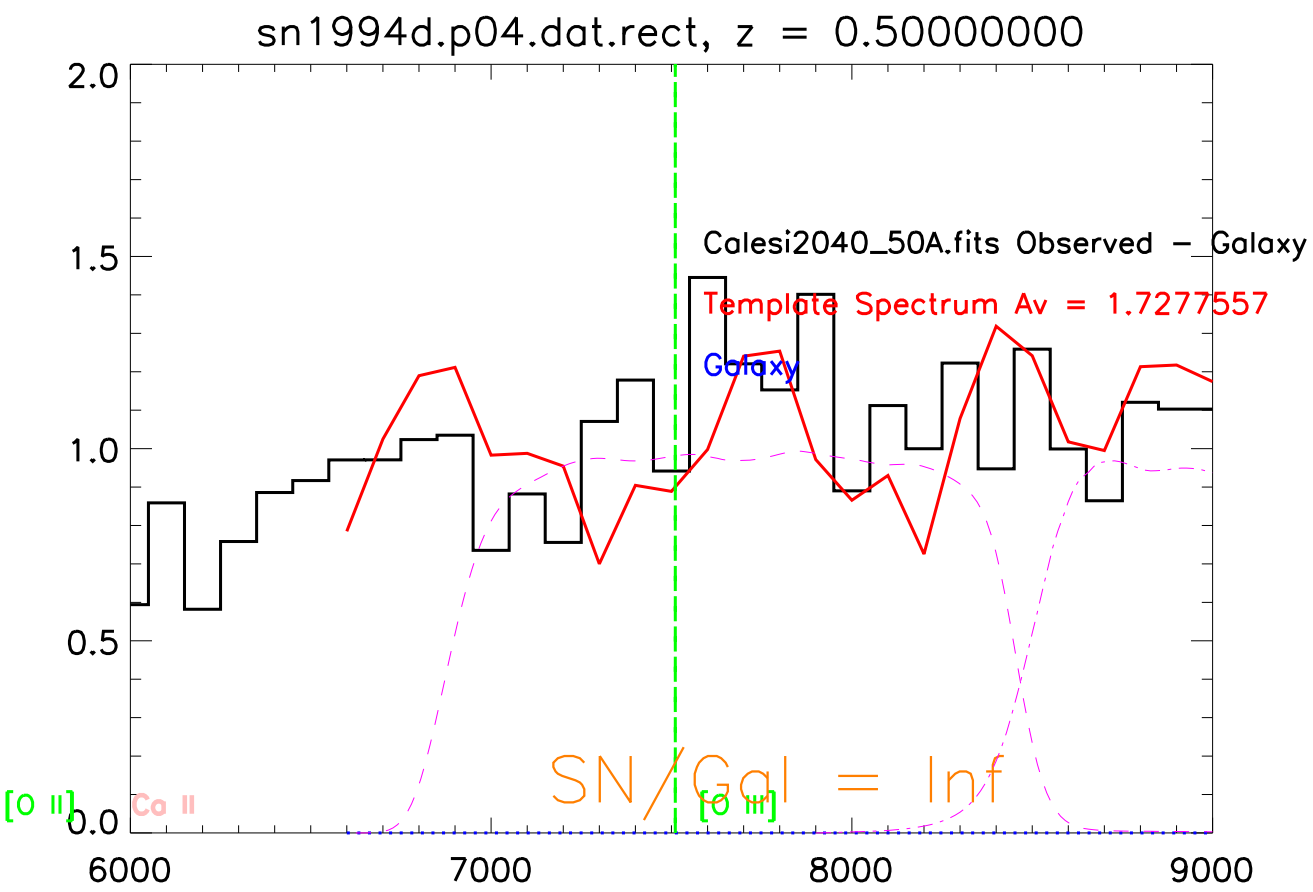
II] Ca II

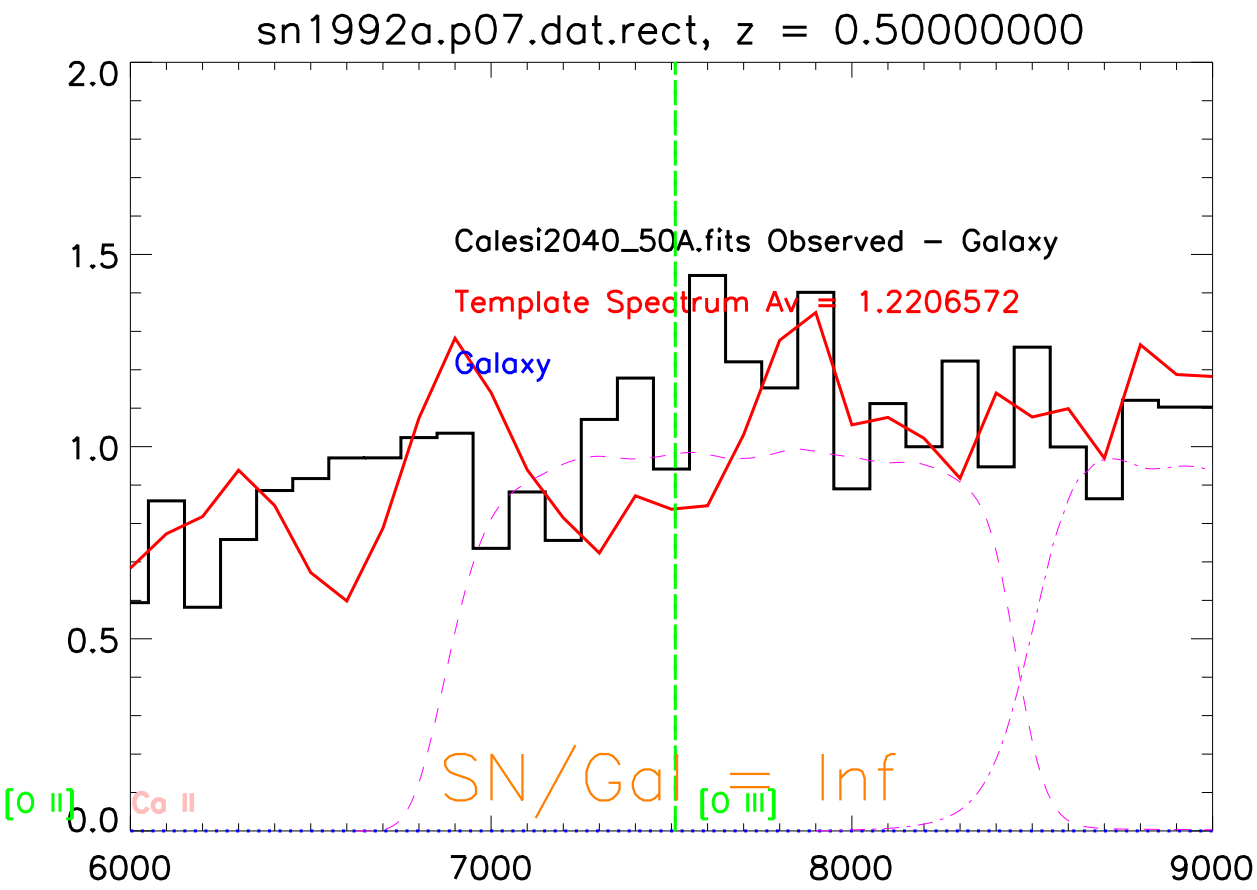

sn1994d.p11.dat.rect, z = 0.50000000
Calesi2040_50A.fits Observed − Galaxy
Template Spectrum Av = 1.5437311
Galaxy
SN/Gal = Inf
[O II]
Ca II
[O III]
2.0
1.5
1.0
0.5
0.0
6000
7000
8000
9000


sn1989b.m07.dat.rect, z = 0.90000004
Calesi2040_50A.fits Observed − Galaxy
Template Spectrum Av = 0.56748012
Galaxy
SN/Gal = Inf
[O II]
Ca II
Mg II, I
2.0
1.5
1.0
0.5
0.0
6000
7000
8000
9000


sn1996x.p07.dat.rect, z = 0.30000001
Calesi2040_50A.fits Observed − Galaxy
Template Spectrum Av = 3.8308187
Galaxy
SN/Gal = Inf
[O III]
H I
2.0
1.5
1.0
0.5
0.0
6000
7000
8000
9000

II] Ca II


sn1994d.p04.dat.rect, z = 0.50000000
Calesi2040_50A.fits Observed − Galaxy
Template Spectrum Av = 1.7277557
Galaxy
SN/Gal = Inf
[O II]
Ca II
[O III]
2.0
1.5
1.0
0.5
0.0
6000
7000
8000
9000


sn1992a.p07.dat.rect, z = 0.50000000
Calesi2040_50A.fits Observed − Galaxy
Template Spectrum Av = 1.2206572
Galaxy
SN/Gal = Inf
[O II]
Ca II
[O III]
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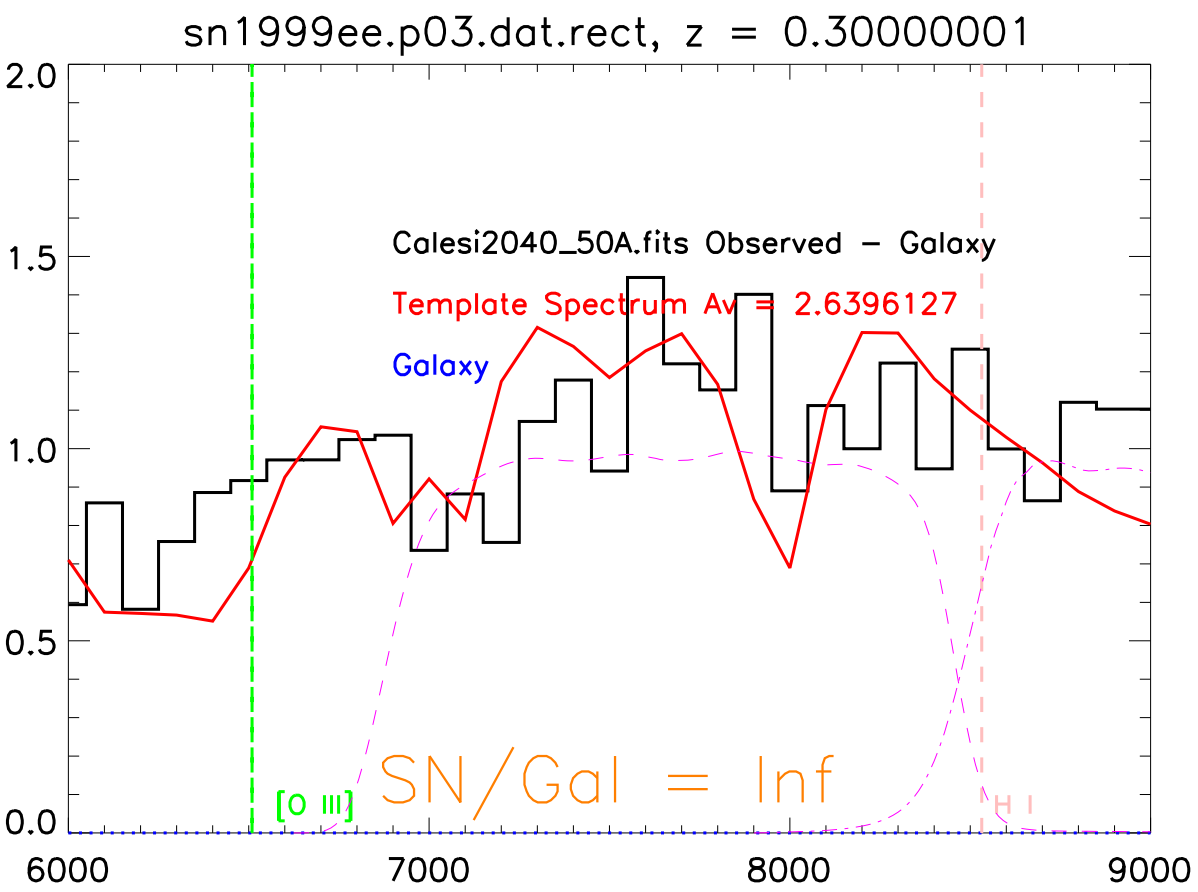
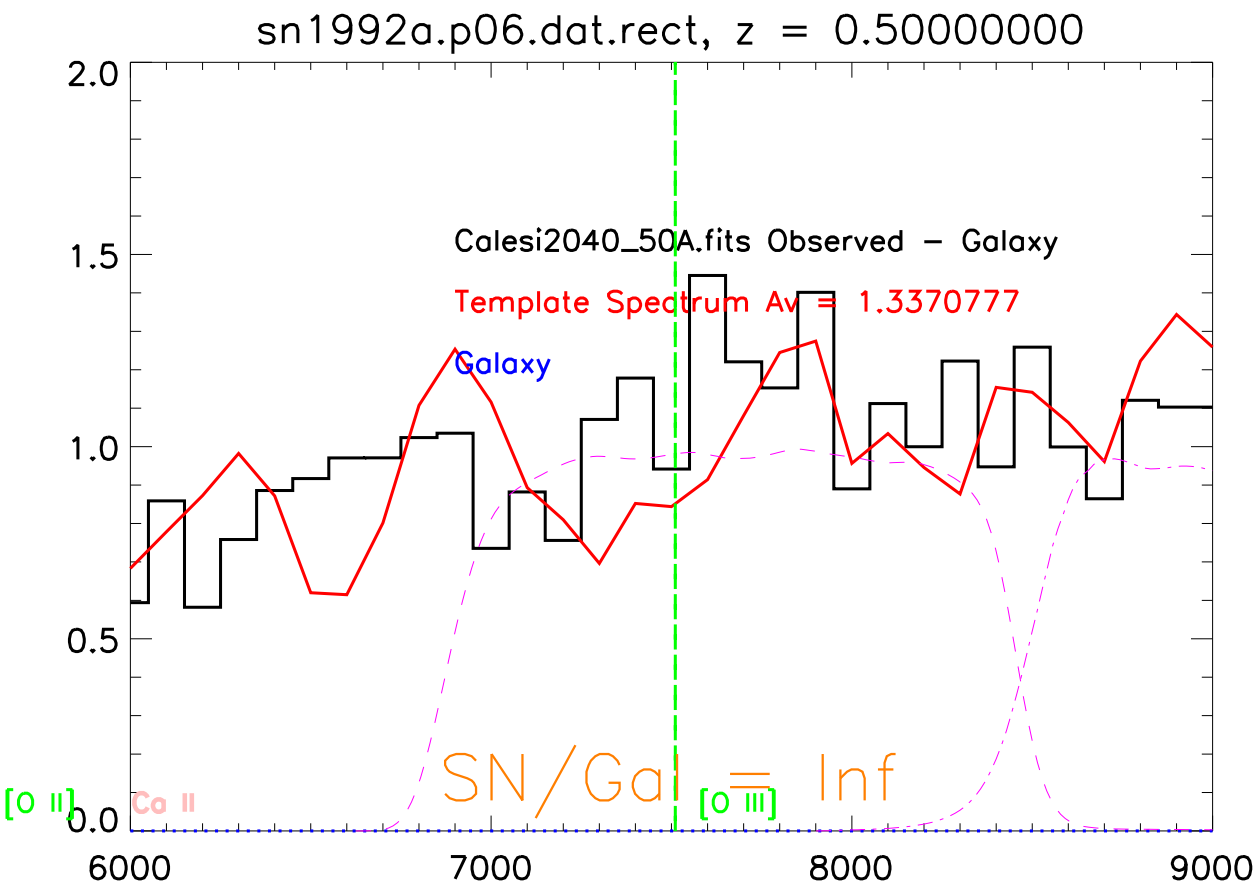
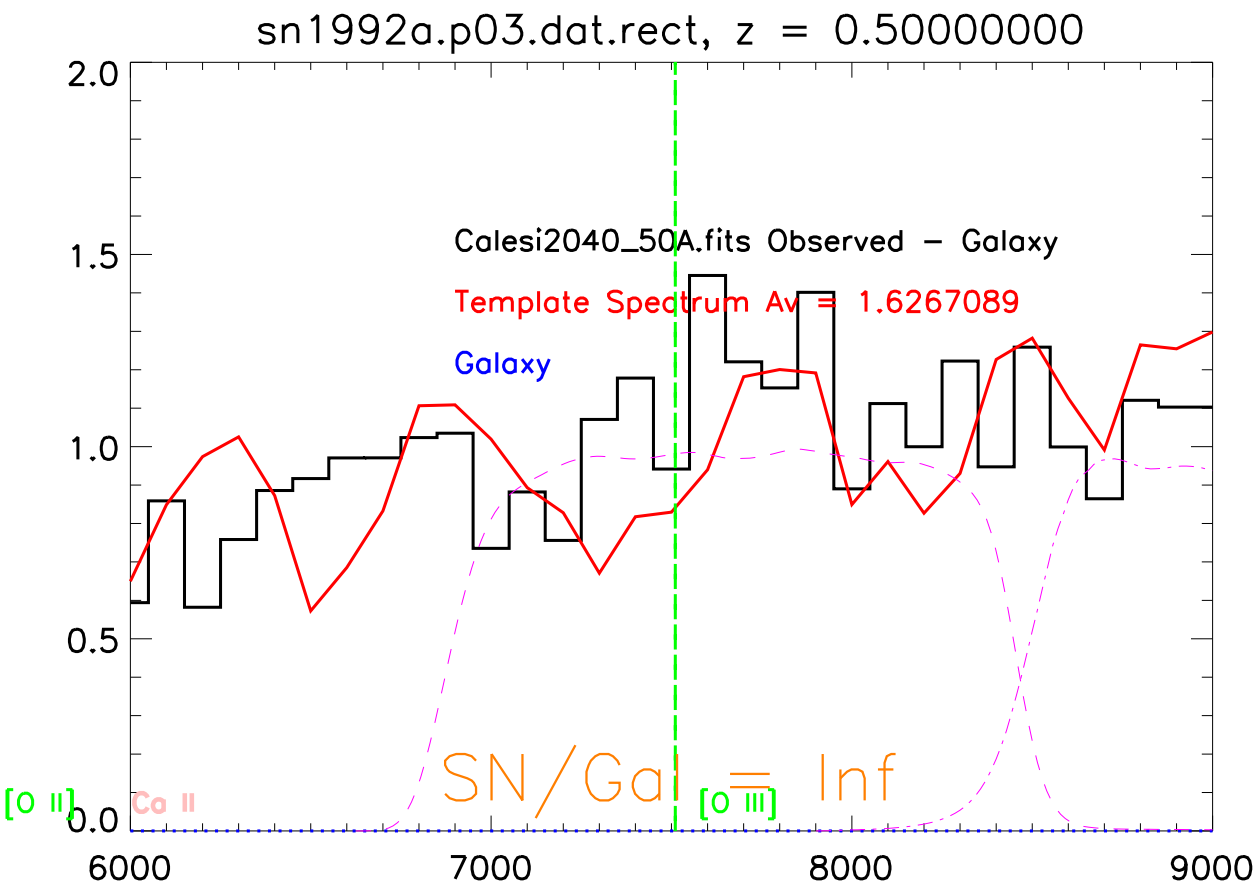
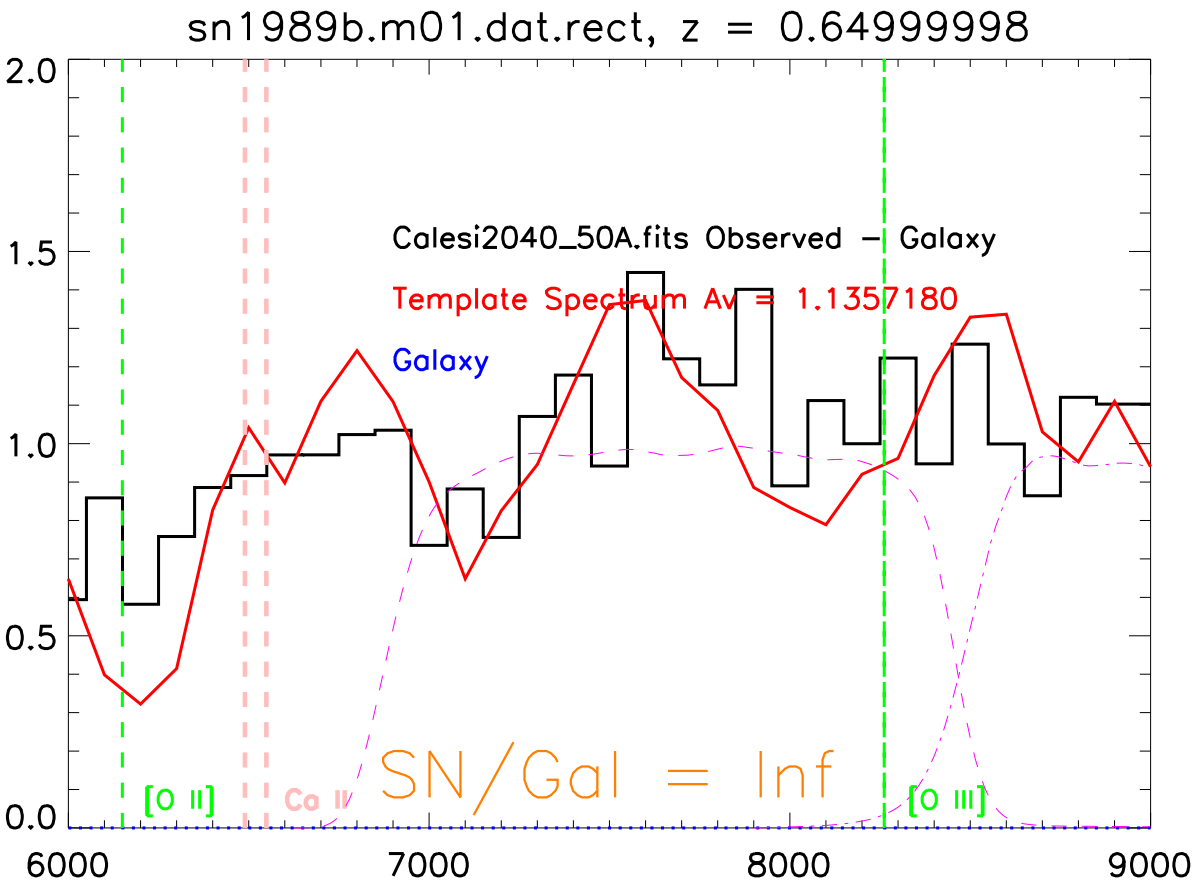
1.5
1.0
0.5
0.0
6000
7000
8000
9000


sn1999ee.p03.dat.rect, z = 0.30000001
Calesi2040_50A.fits Observed − Galaxy
Template Spectrum Av = 2.6396127
Galaxy
SN/Gal = Inf
[O III]
H I
2.0
1.5
1.0
0.5
0.0
6000
7000
8000
9000

II] Ca II


sn1992a.p06.dat.rect, z = 0.50000000
Calesi2040_50A.fits Observed − Galaxy
Template Spectrum Av = 1.3370777
Galaxy
SN/Gal = Inf
[O II]
Ca II
[O III]
2.0
1.5
1.0
0.5
0.0
6000
7000
8000
9000


sn1992a.p03.dat.rect, z = 0.50000000
Calesi2040_50A.fits Observed − Galaxy
Template Spectrum Av = 1.6267089
Galaxy
SN/Gal = Inf
[O II]
Ca II
[O III]
2.0
1.5
1.0
0.5
0.0
6000
7000
8000
9000


sn1989b.m01.dat.rect, z = 0.64999998
Calesi2040_50A.fits Observed – Galaxy
Template Spectrum Av = 1.1357180
Galaxy
SN/Gal = Inf
[O II]
Ca II
[O III]
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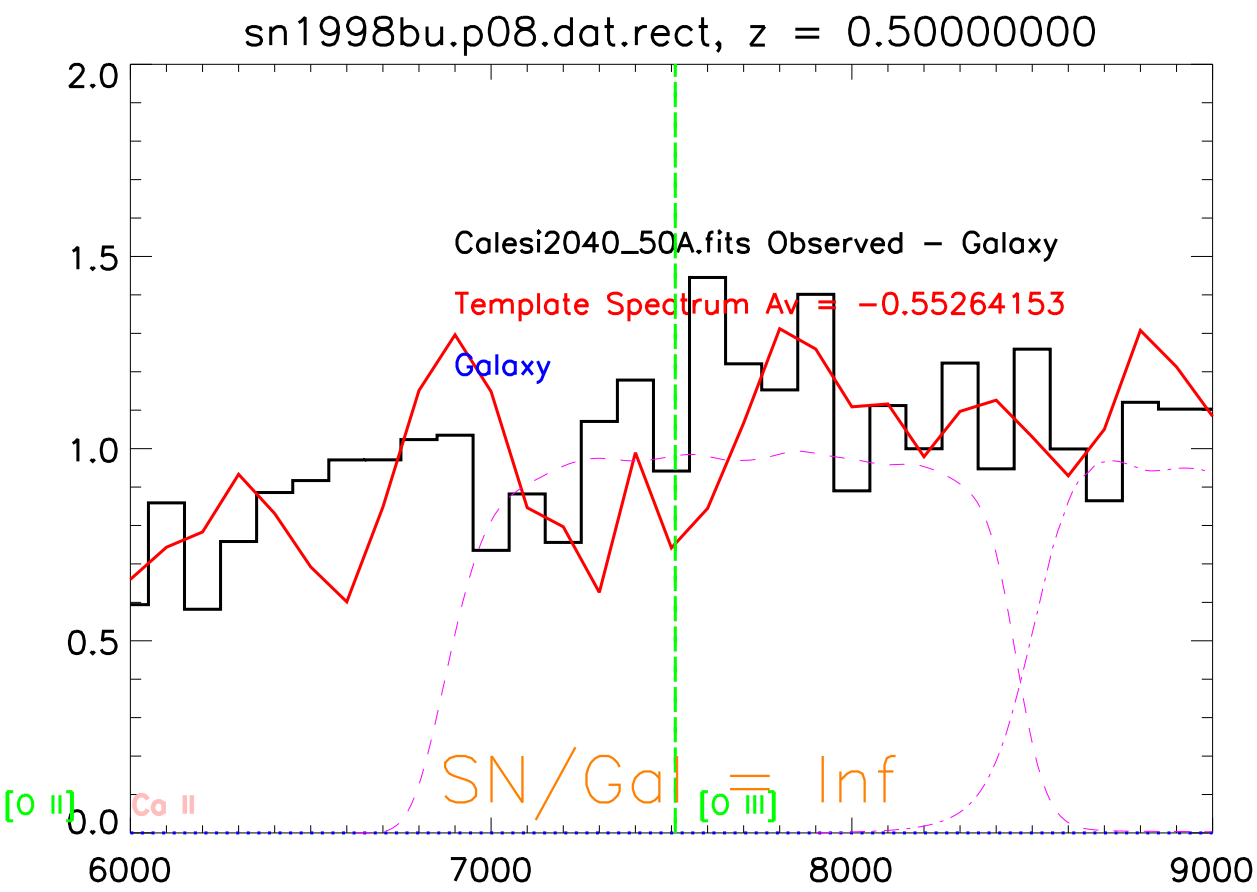
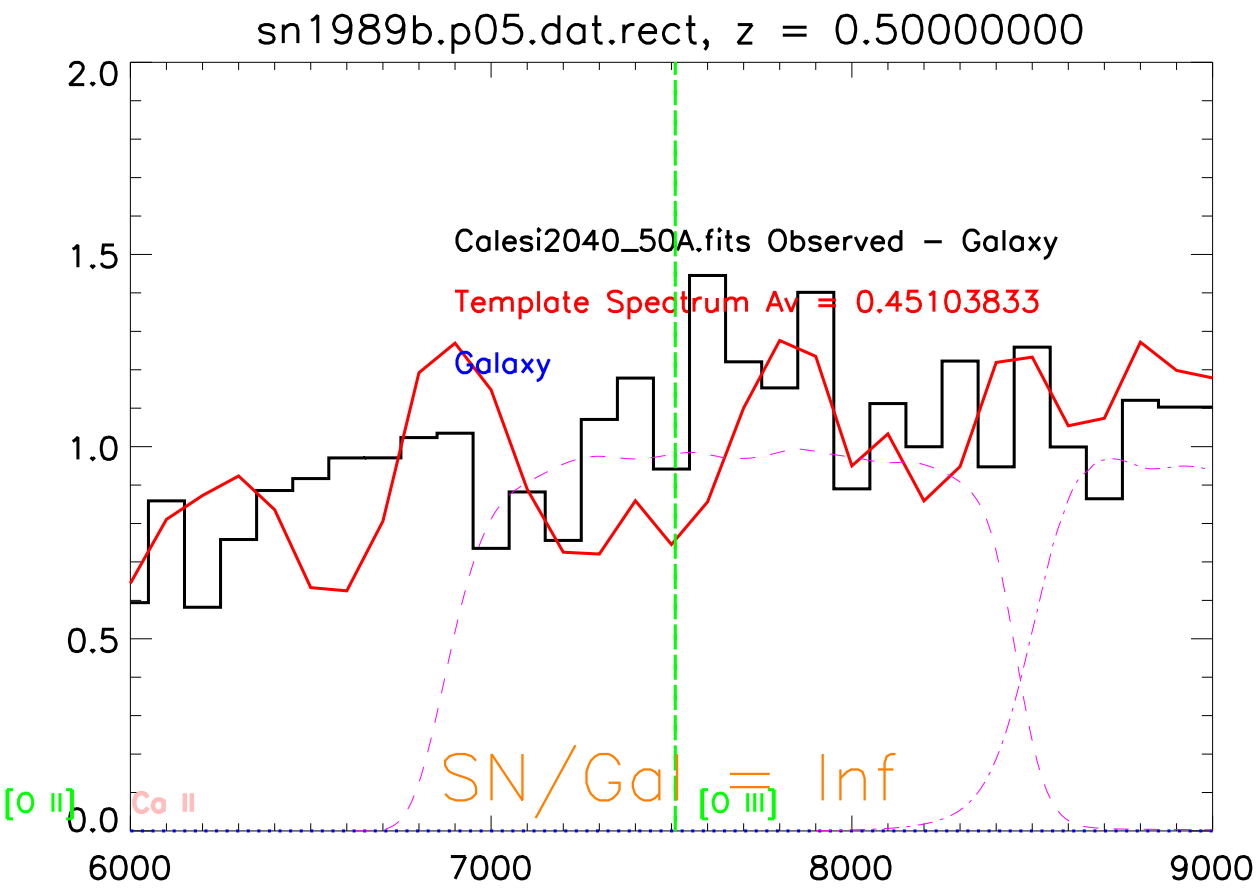
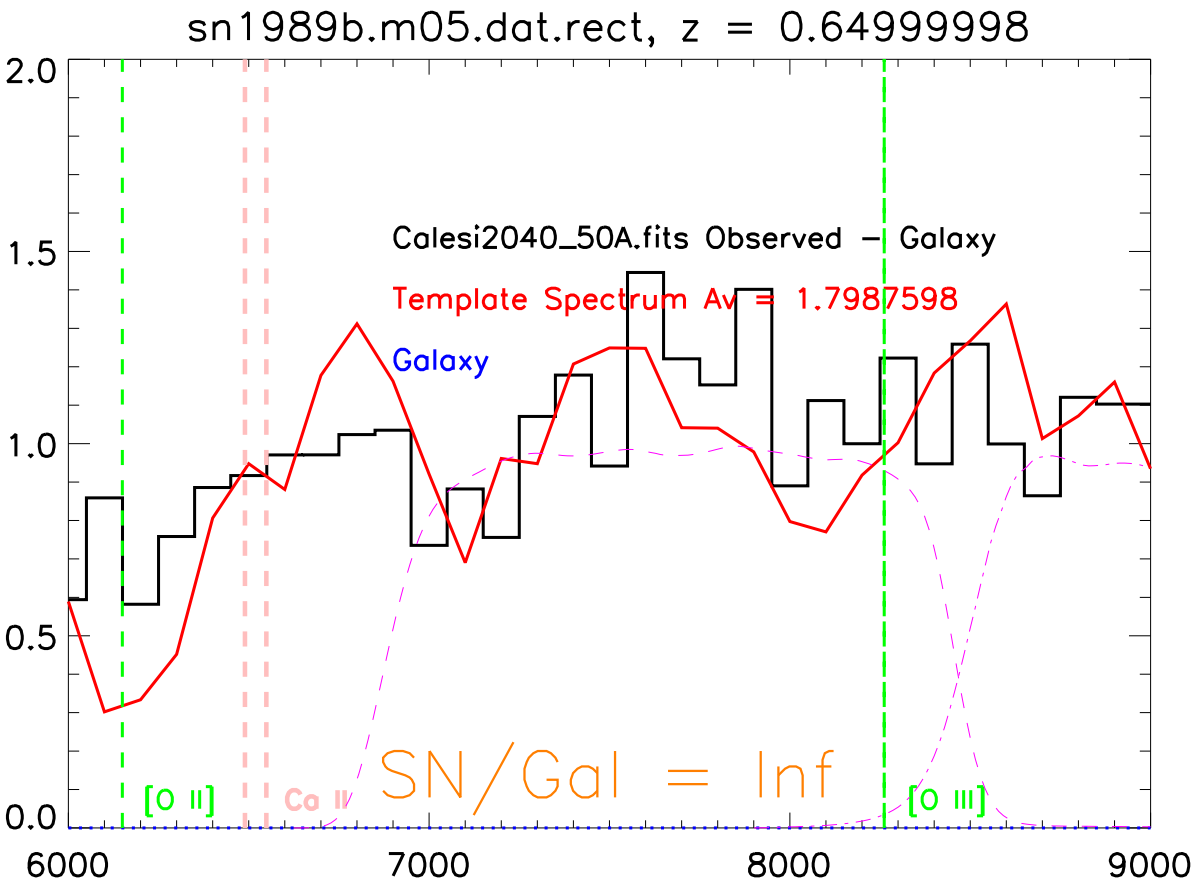
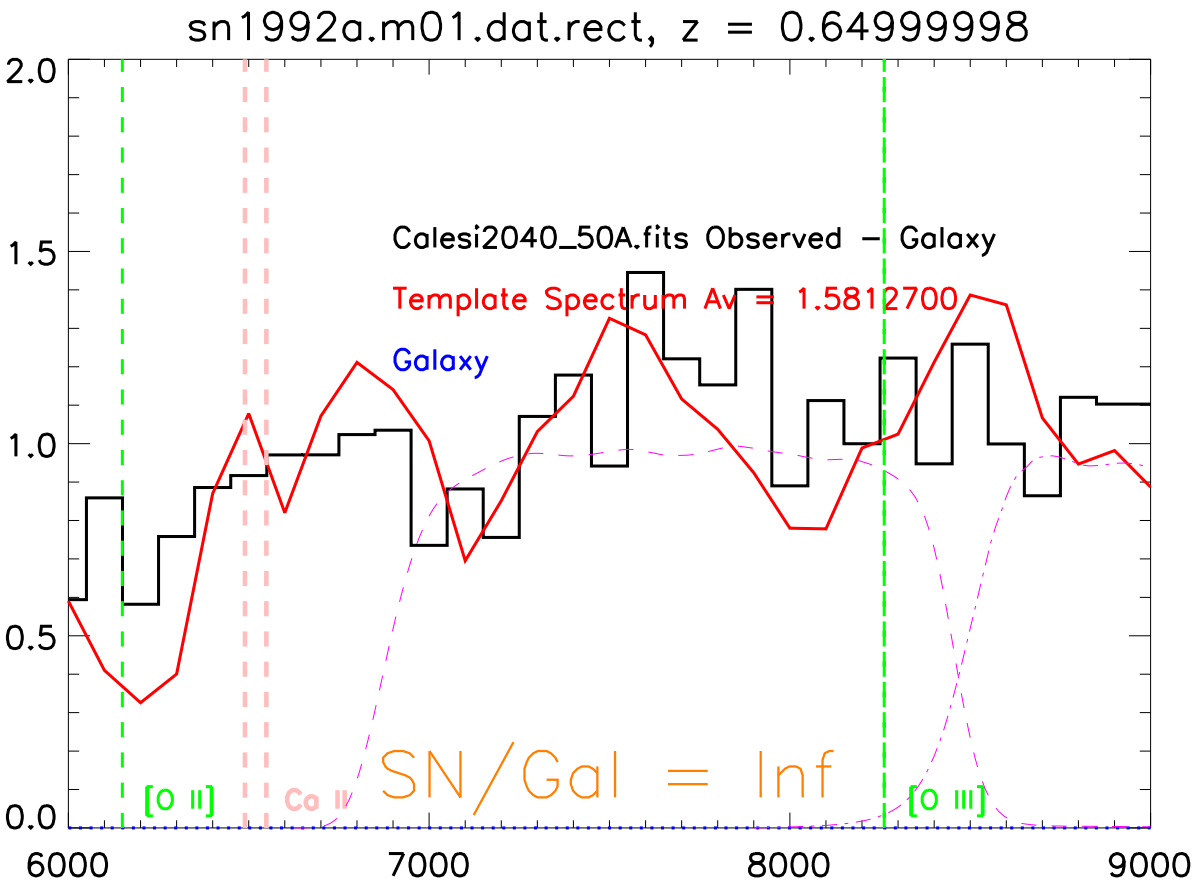
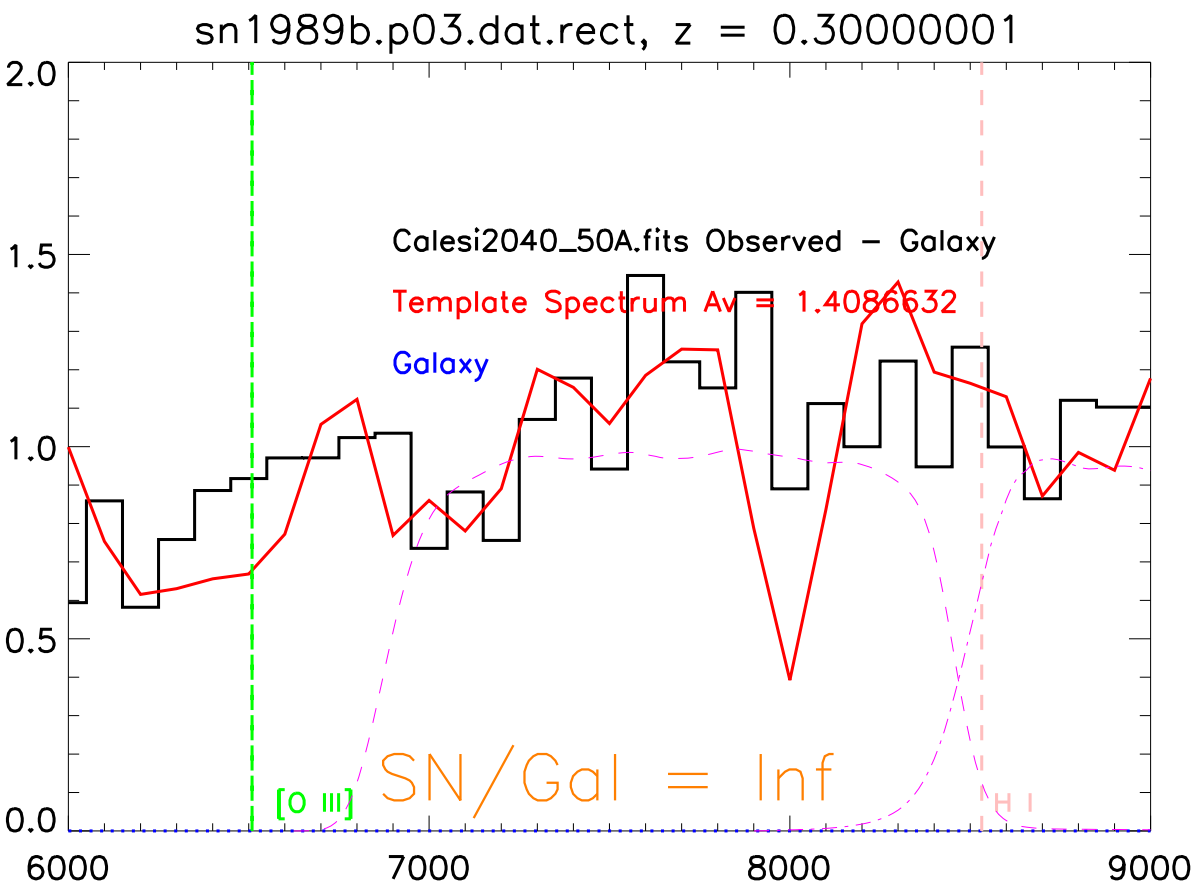
1.5
1.0
0.5
0.0
6000
7000
8000
9000


sn1998bu.p08.dat.rect, z = 0.50000000
Calesi2040_50A.fits Observed − Galaxy
Template Spectrum Av = −0.55264153
Galaxy
SN/Gal = Inf
[O II]
Ca II
[O III]
2.0
1.5
1.0
0.5
0.0
6000
7000
8000
9000

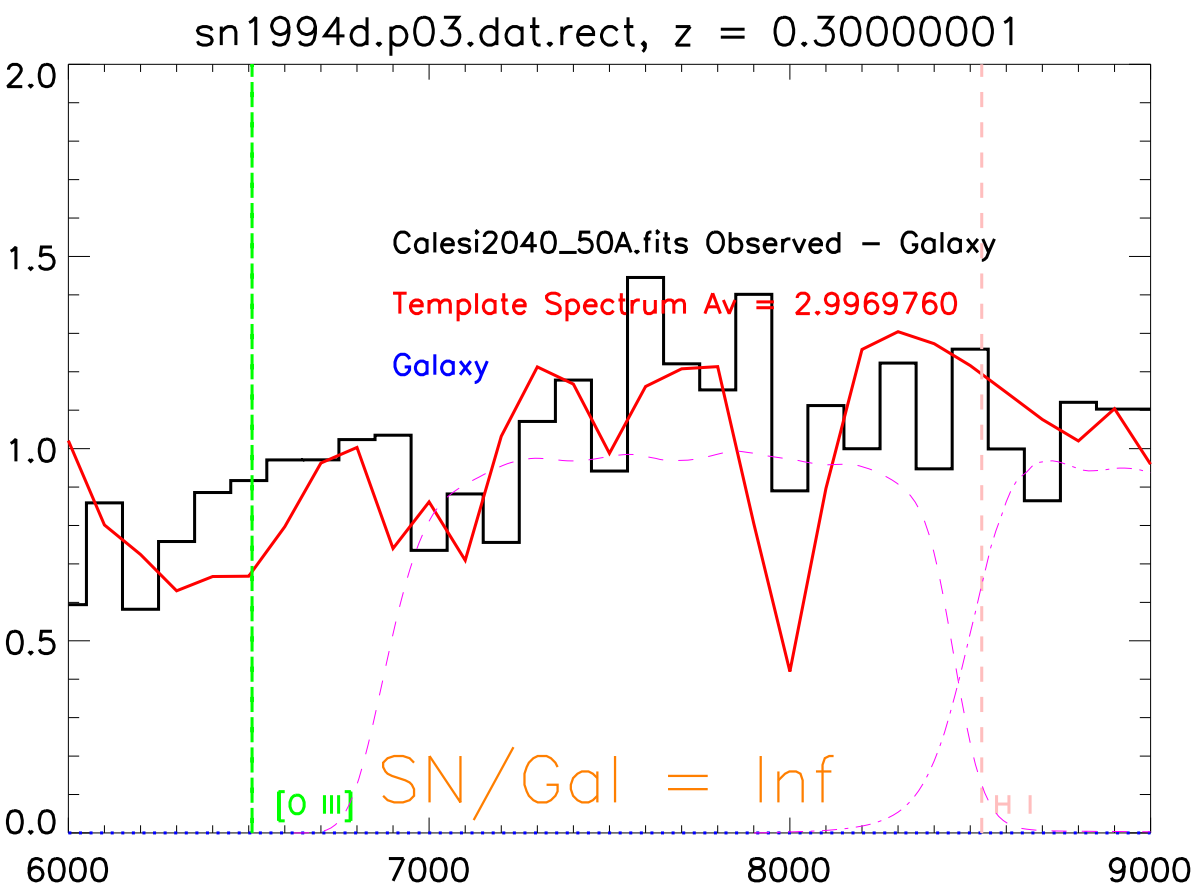

sn1989b.p05.dat.rect, z = 0.50000000
Calesi2040_50A.fits Observed − Galaxy
Template Spectrum Av = 0.45103833
Galaxy
SN/Gal = Inf
[O II]
Ca II
[O III]
2.0
1.5
1.0
0.5
0.0
6000
7000
8000
9000


sn1989b.m05.dat.rect, z = 0.64999998
Calesi2040_50A.fits Observed – Galaxy
Template Spectrum Av = 1.7987598
Galaxy
SN/Gal = Inf
[O II]
Ca II
[O III]
2.0
1.5
1.0
0.5
0.0
6000
7000
8000
9000

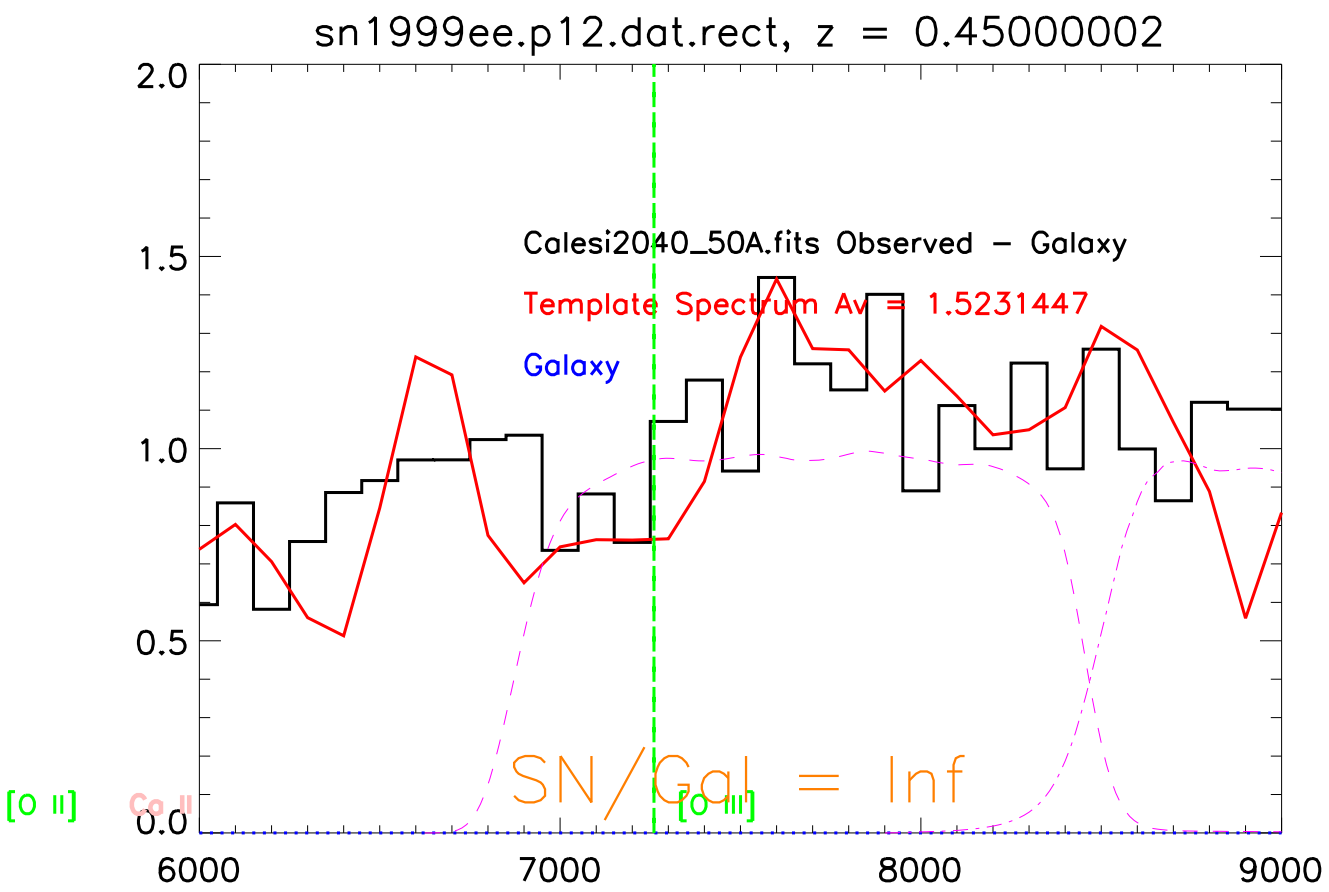

sn1992a.m01.dat.rect, z = 0.64999998
Calesi2040_50A.fits Observed – Galaxy
Template Spectrum Av = 1.5812700
Galaxy
SN/Gal = Inf
[O II]
Ca II
[O III]
2.0
1.5
1.0
0.5
0.0
6000
7000
8000
9000

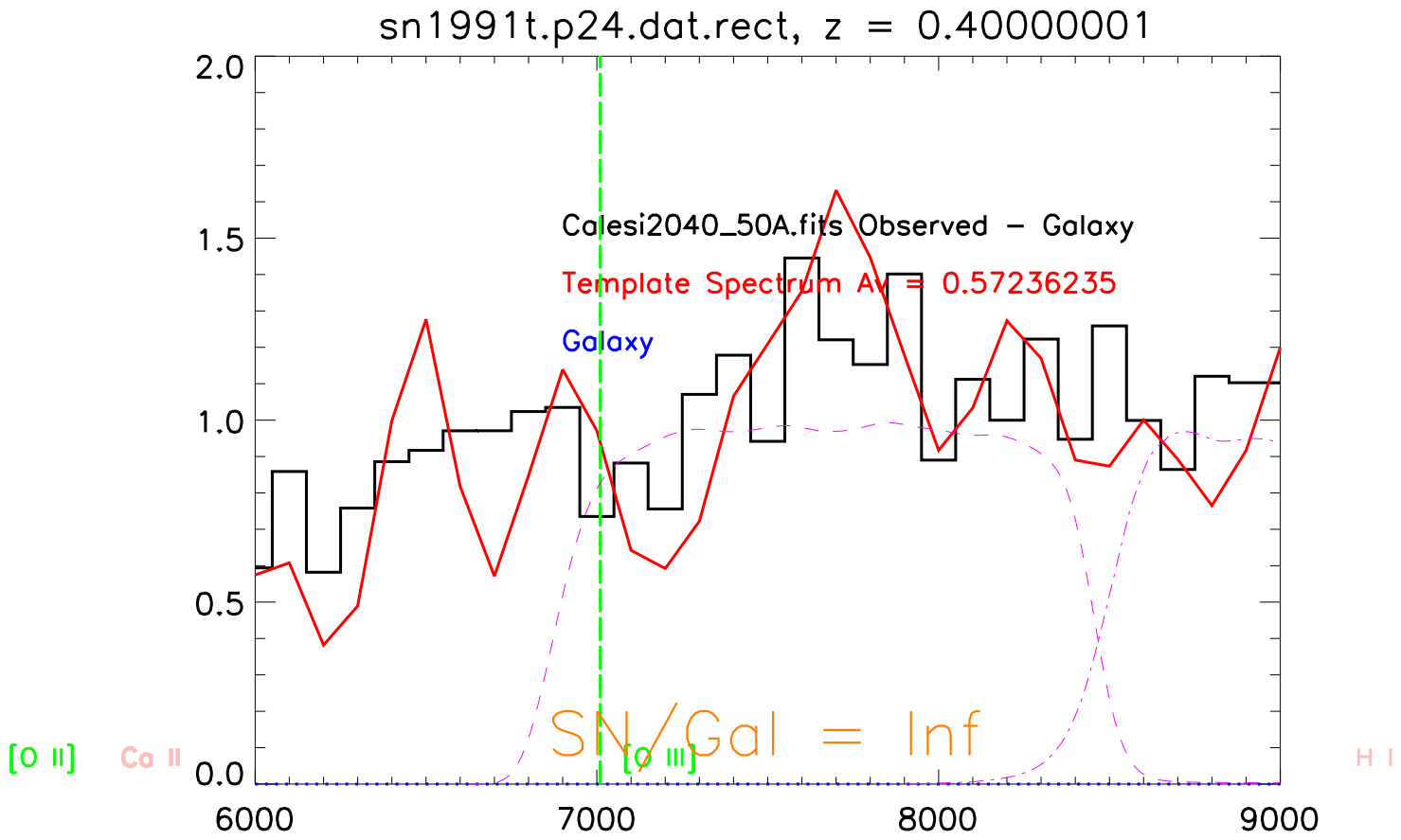

sn1989b.p03.dat.rect, z = 0.30000001
Calesi2040_50A.fits Observed − Galaxy
Template Spectrum Av = 1.4086632
Galaxy
SN/Gal = Inf
[O III]
H I
2.0
1.5
1.0
0.5
0.0
6000
7000
8000
9000

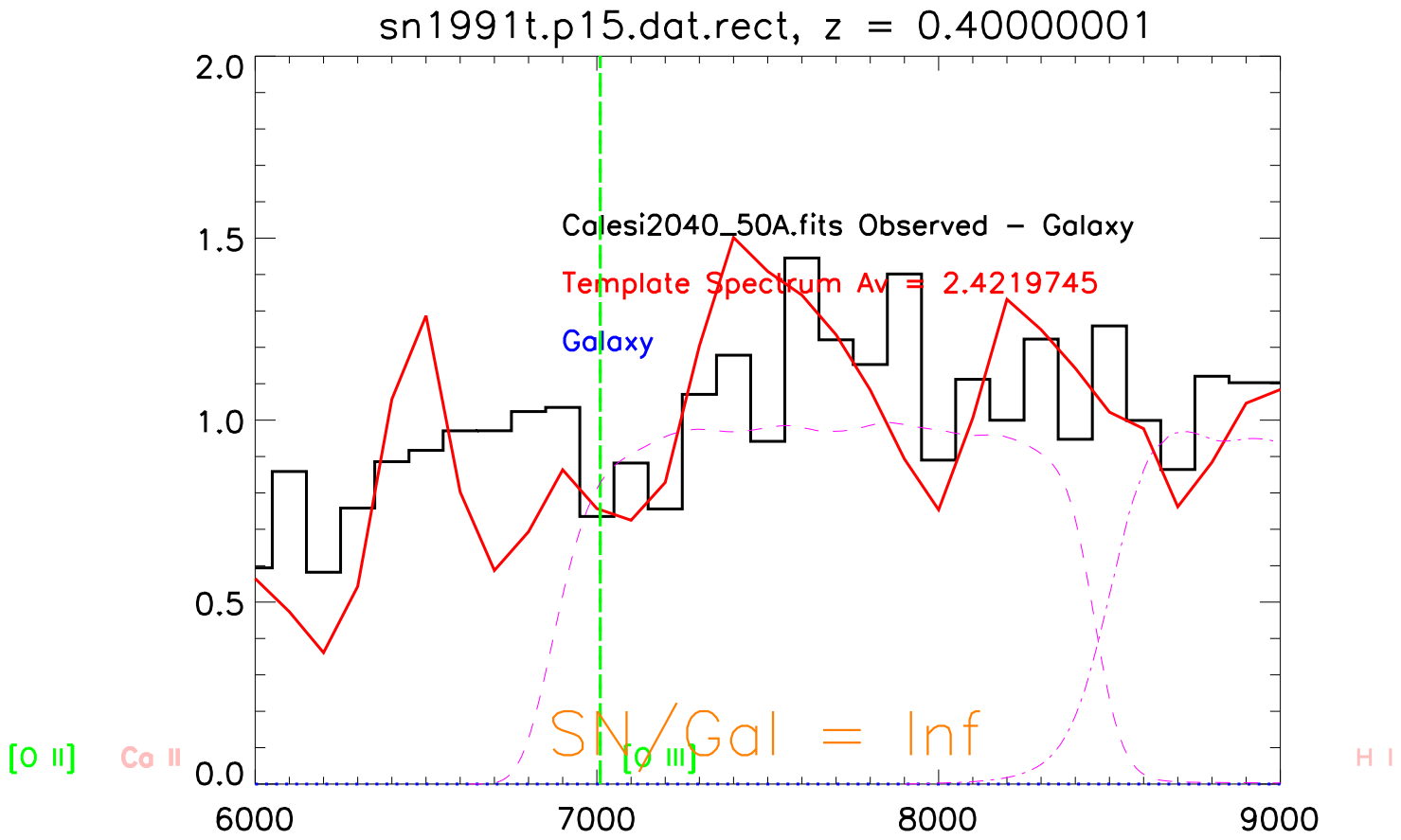
II] Ca II

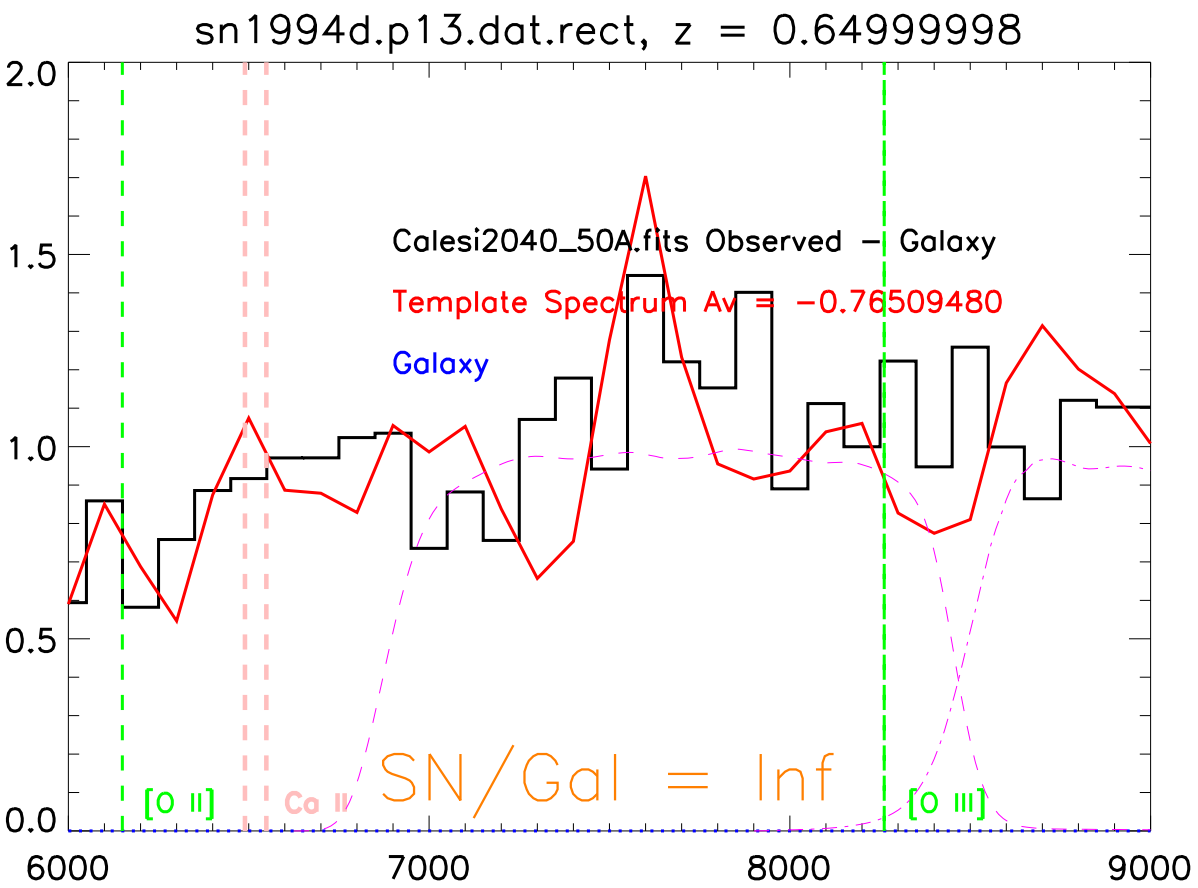

sn1994d.p03.dat.rect, z = 0.30000001
Calesi2040_50A.fits Observed − Galaxy
Template Spectrum Av = 2.9969760
Galaxy
SN/Gal = Inf
[O III]
H I
2.0
1.5
1.0
0.5
0.0
6000
7000
8000
9000

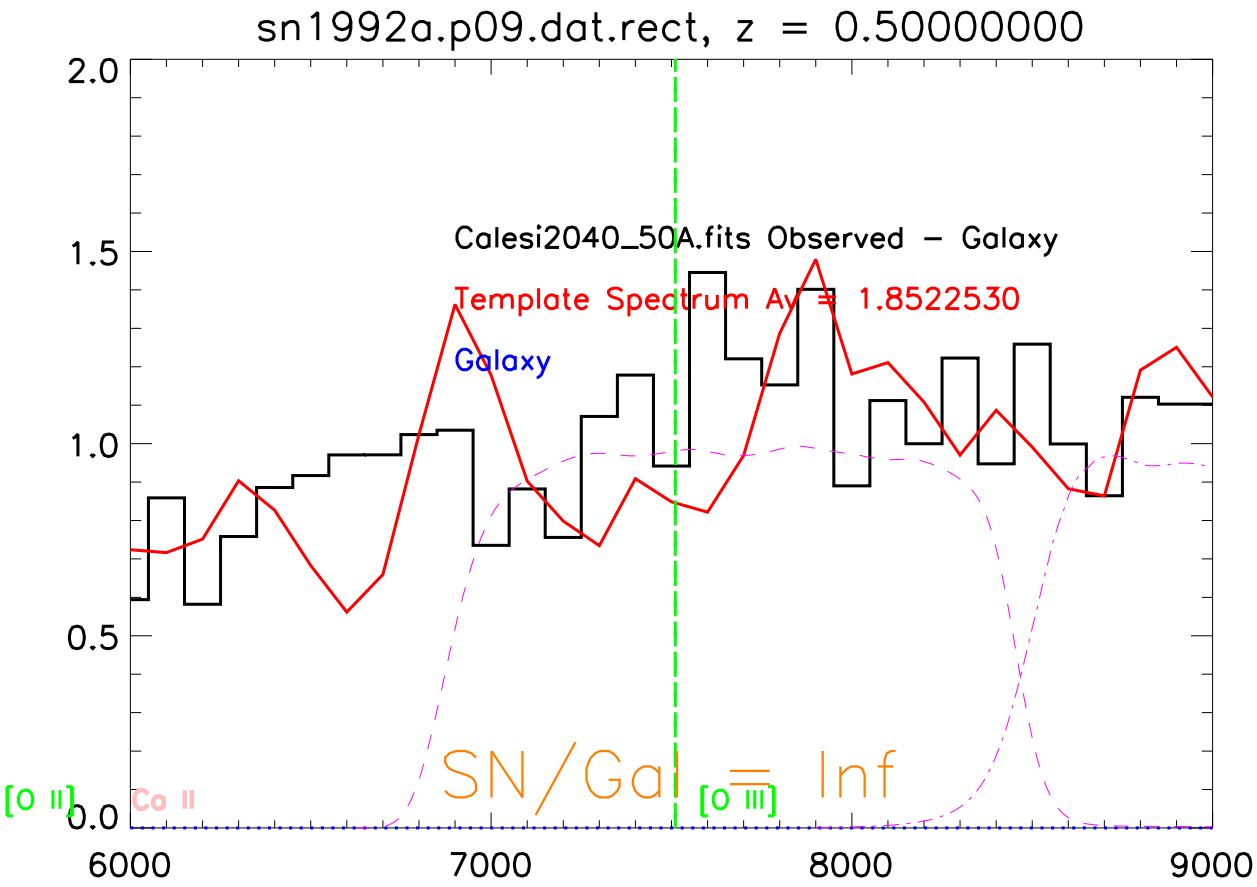
II] Ca II

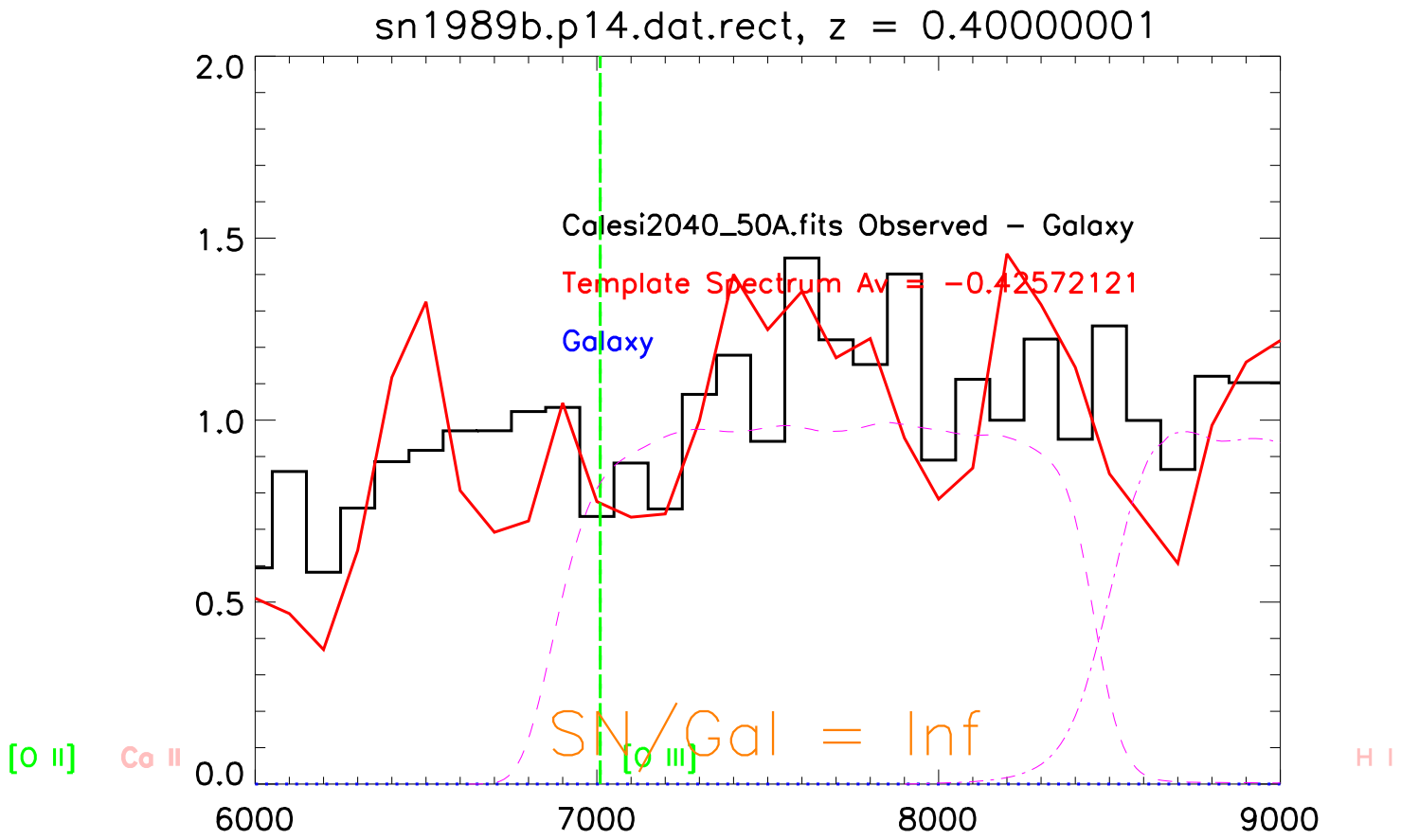

sn1999ee.p12.dat.rect, z = 0.45000002
Calesi2040_50A.fits Observed − Galaxy
Template Spectrum Av = 1.5231447
Galaxy
SN/Gal = Inf
[O II]
Ca II
[O III]
2.0
1.5
1.0
0.5
0.0
6000
7000
8000
9000

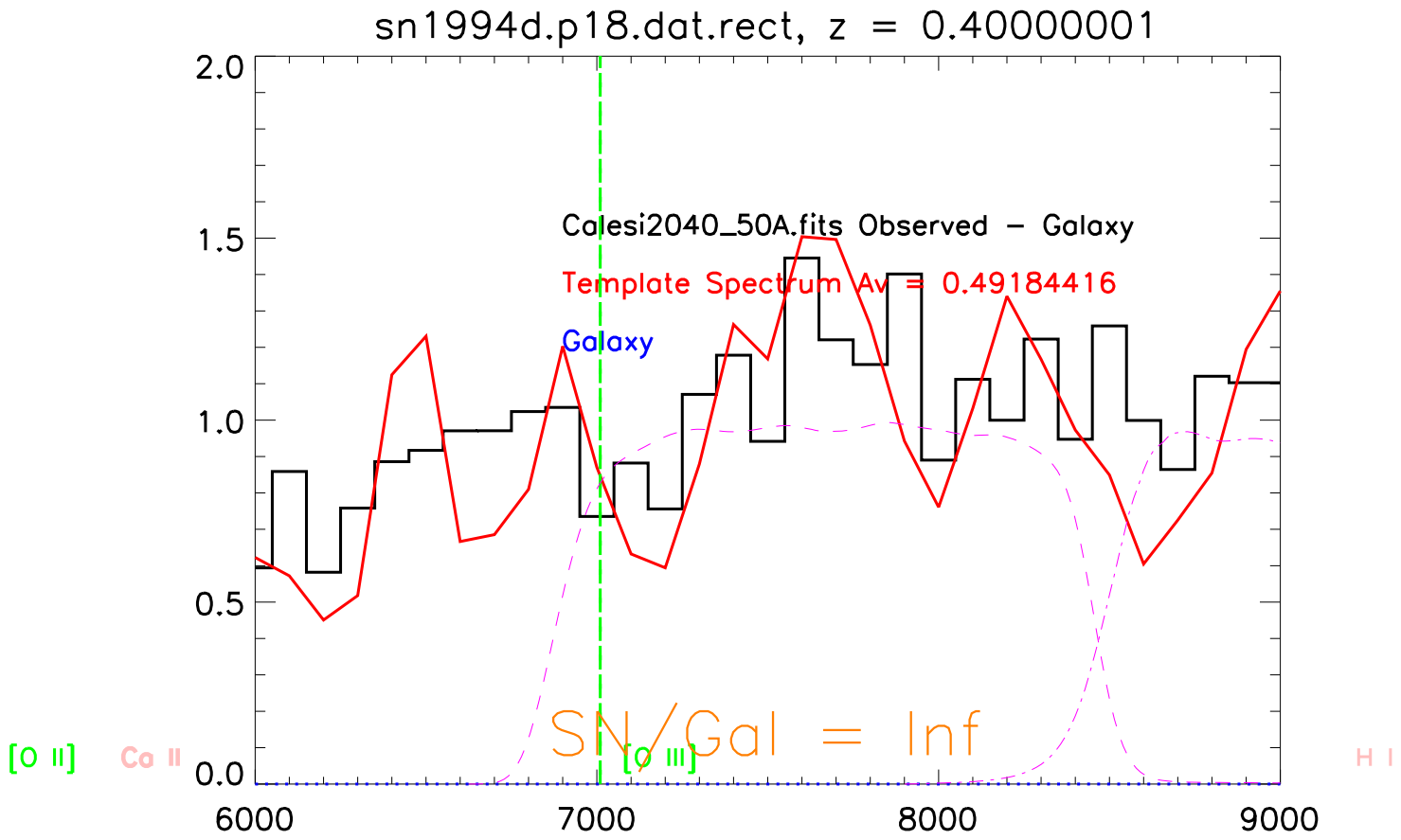

sn1991t.p24.dat.rect, z = 0.40000001
Calesi2040_50A.fits Observed – Galaxy
Template Spectrum Av = 0.57236235
Galaxy
SN/Gal = Inf
[O II]
Ca II
[O III]
H I
2.0
1.5
1.0
0.5
0.0
6000
7000
8000
9000


sn1991t.p15.dat.rect, z = 0.40000001
Calesi2040_50A.fits Observed − Galaxy
Template Spectrum Av = 2.4219745
Galaxy
SN/Gal = Inf
[O II]
Ca II
[O III]
H I
2.0
1.5
1.0
0.5
0.0
6000
7000
8000
9000


sn1994d.p13.dat.rect, z = 0.64999998
Calesi2040_50A.fits Observed − Galaxy
Template Spectrum Av = −0.76509480
Galaxy
SN/Gal = Inf
[O II]
Ca II
[O III]
2.0
1.5
1.0
0.5
0.0
6000
7000
8000
9000


sn1992a.p09.dat.rect, z = 0.50000000
Calesi2040_50A.fits Observed − Galaxy
Template Spectrum Av = 1.8522530
Galaxy
SN/Gal = Inf
[O II]
Ca II
[O III]
2.0
1.5
1.0
0.5
0.0
6000
7000
8000
9000


sn1989b.p14.dat.rect, z = 0.40000001
Calesi2040_50A.fits Observed − Galaxy
Template Spectrum Av = −0.42572121
Galaxy
SN/Gal = Inf
[O II]
Ca II
[O III]
H I
2.0
1.5
1.0
0.5
0.0
6000
7000
8000
9000


sn1994d.p18.dat.rect, z = 0.40000001
Calesi2040_50A.fits Observed − Galaxy
Template Spectrum Av = 0.49184416
Galaxy
SN/Gal = Inf
[O II]
Ca II
[O III]
H I
2.0
1.5
1.0
0.5
0.0
6000
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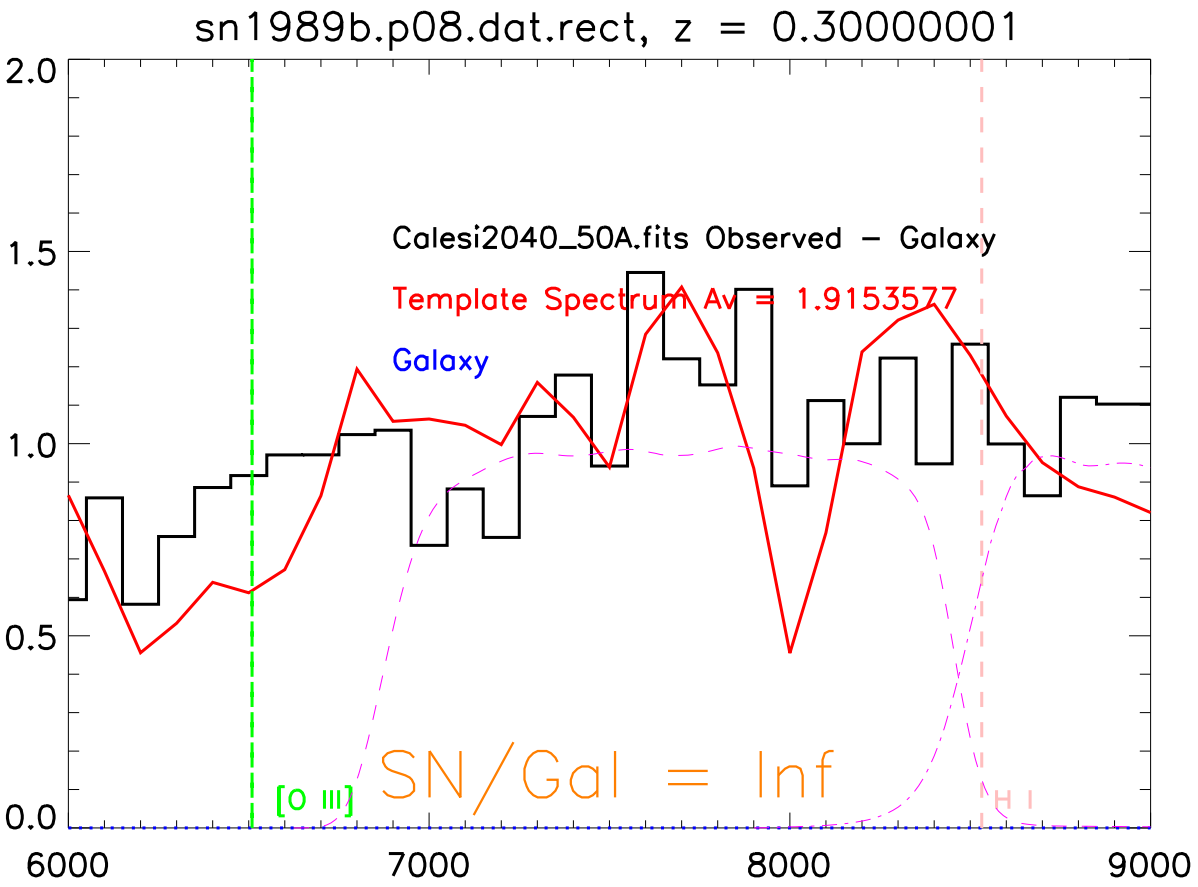
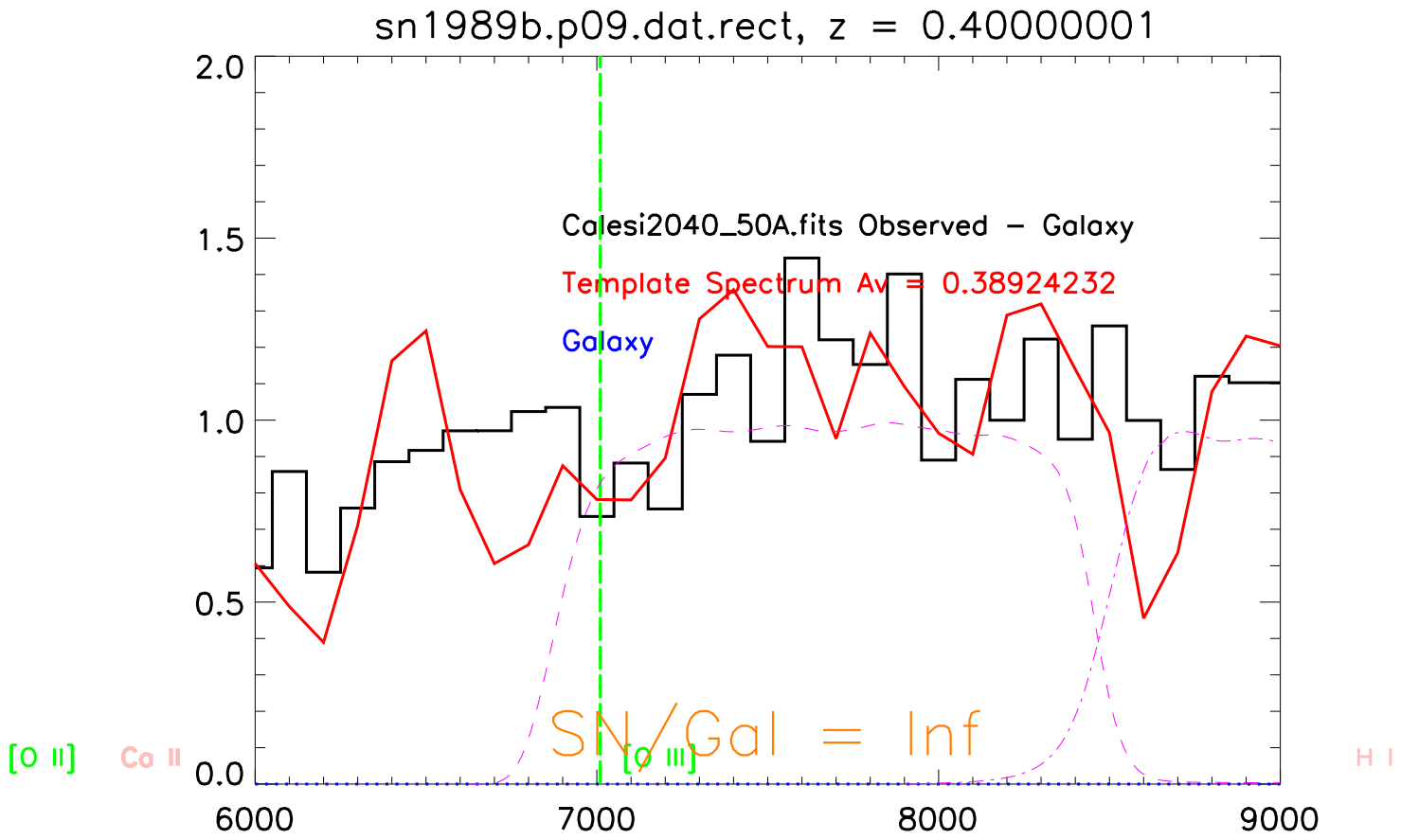
8000
9000


sn1989b.p08.dat.rect, z = 0.30000001
Calesi2040_50A.fits Observed − Galaxy
Template Spectrum Av = 1.9153577
Galaxy
SN/Gal = Inf
[O III]
H I
2.0
1.5
1.0
0.5
0.0
6000
7000
8000
9000

II] Ca II


sn1989b.p09.dat.rect, z = 0.40000001
Calesi2040_50A.fits Observed − Galaxy
Template Spectrum Av = 0.38924232
Galaxy
SN/Gal = Inf
[O II]
Ca II
[O III]
H I
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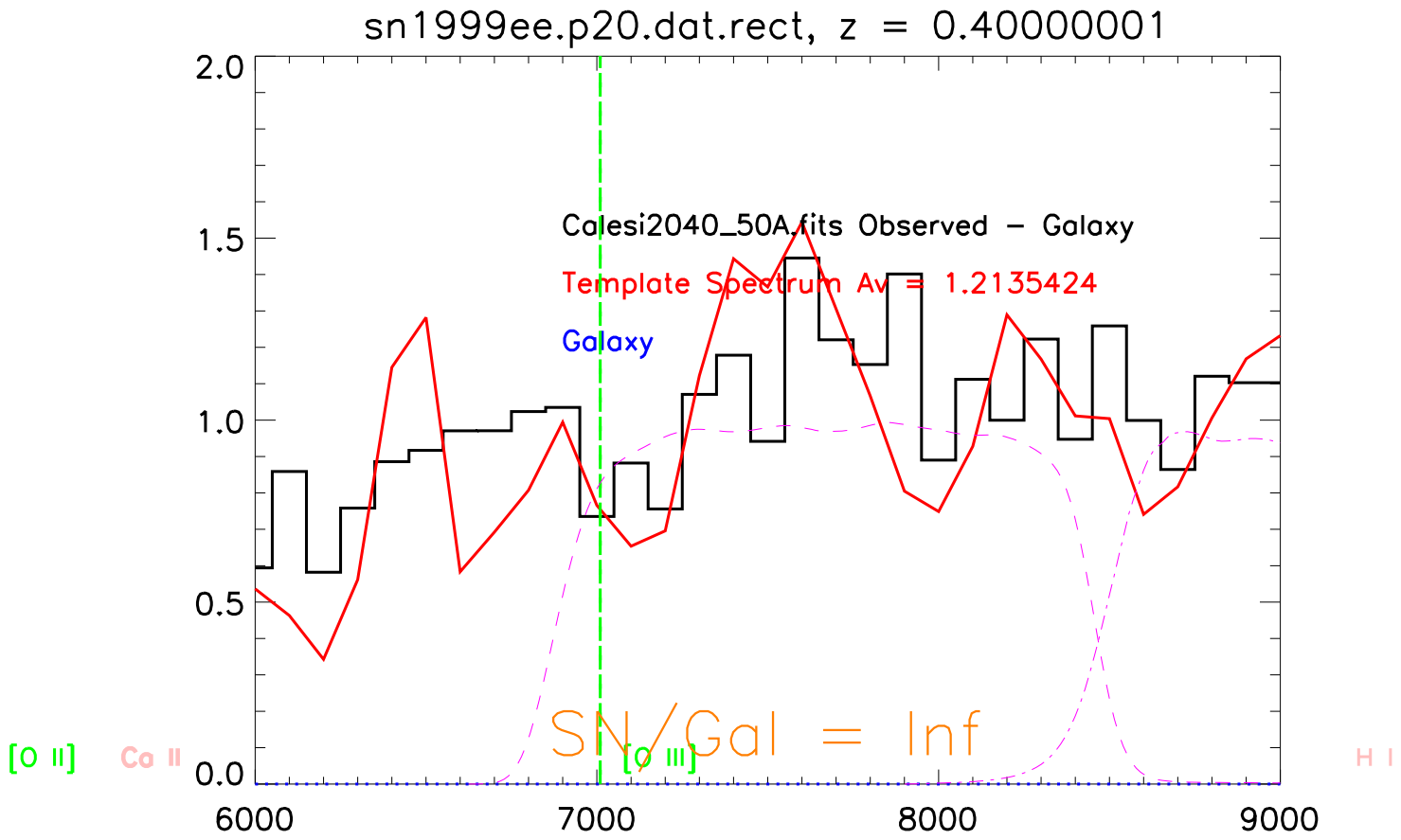
1.0
0.5
0.0
6000
7000
8000
9000


sn1999ee.p20.dat.rect, z = 0.40000001
Calesi2040_50A.fits Observed − Galaxy
Template Spectrum Av = 1.2135424
Galaxy
SN/Gal = Inf
[O II]
Ca II
[O III]
H I
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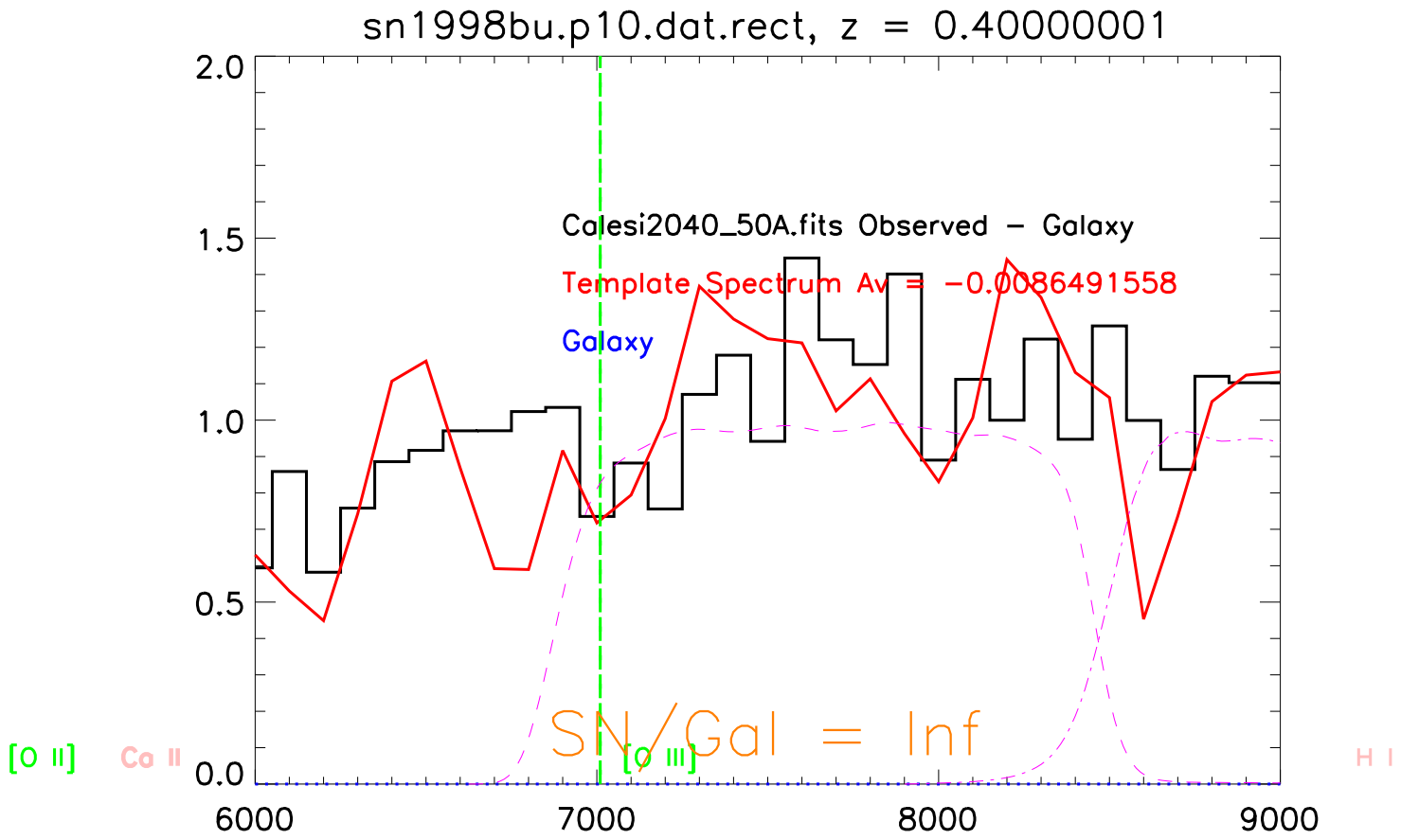
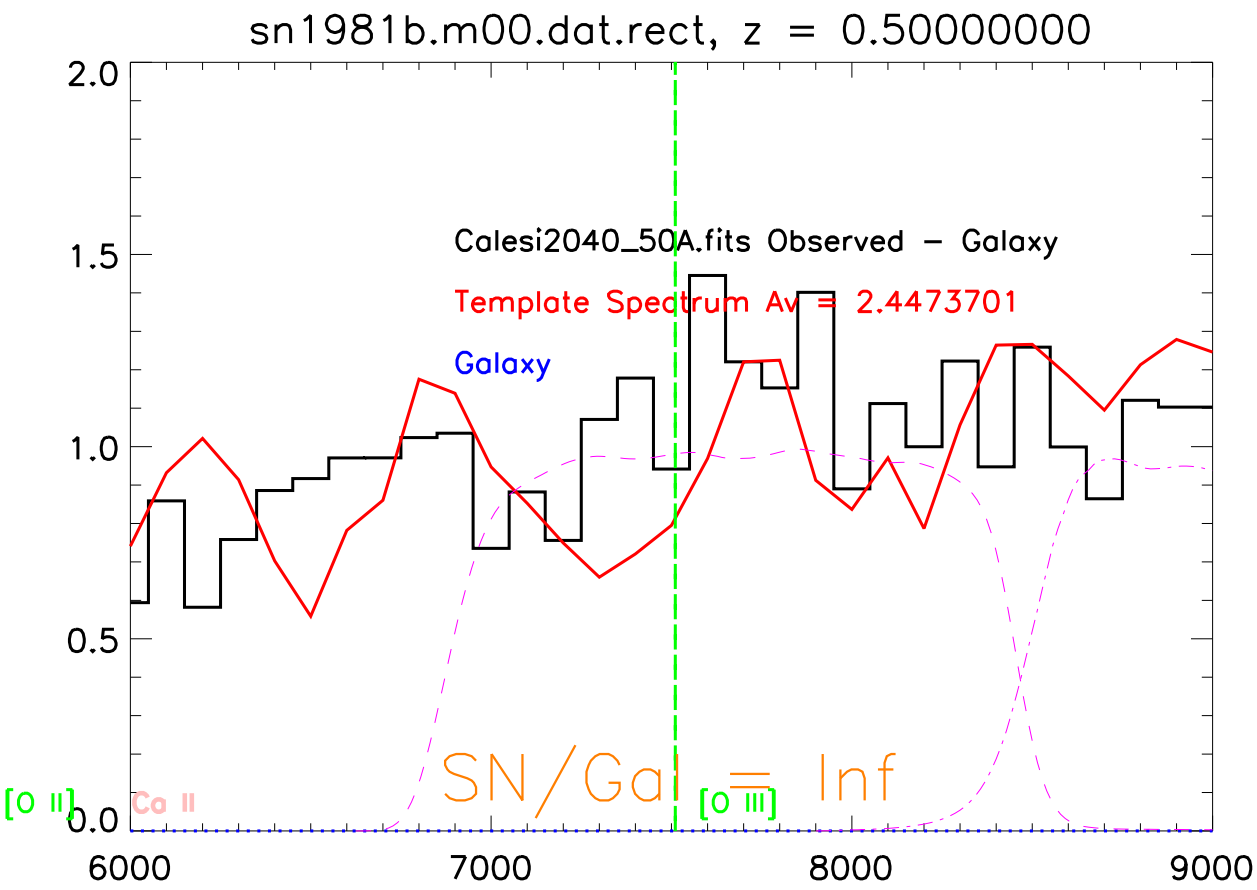
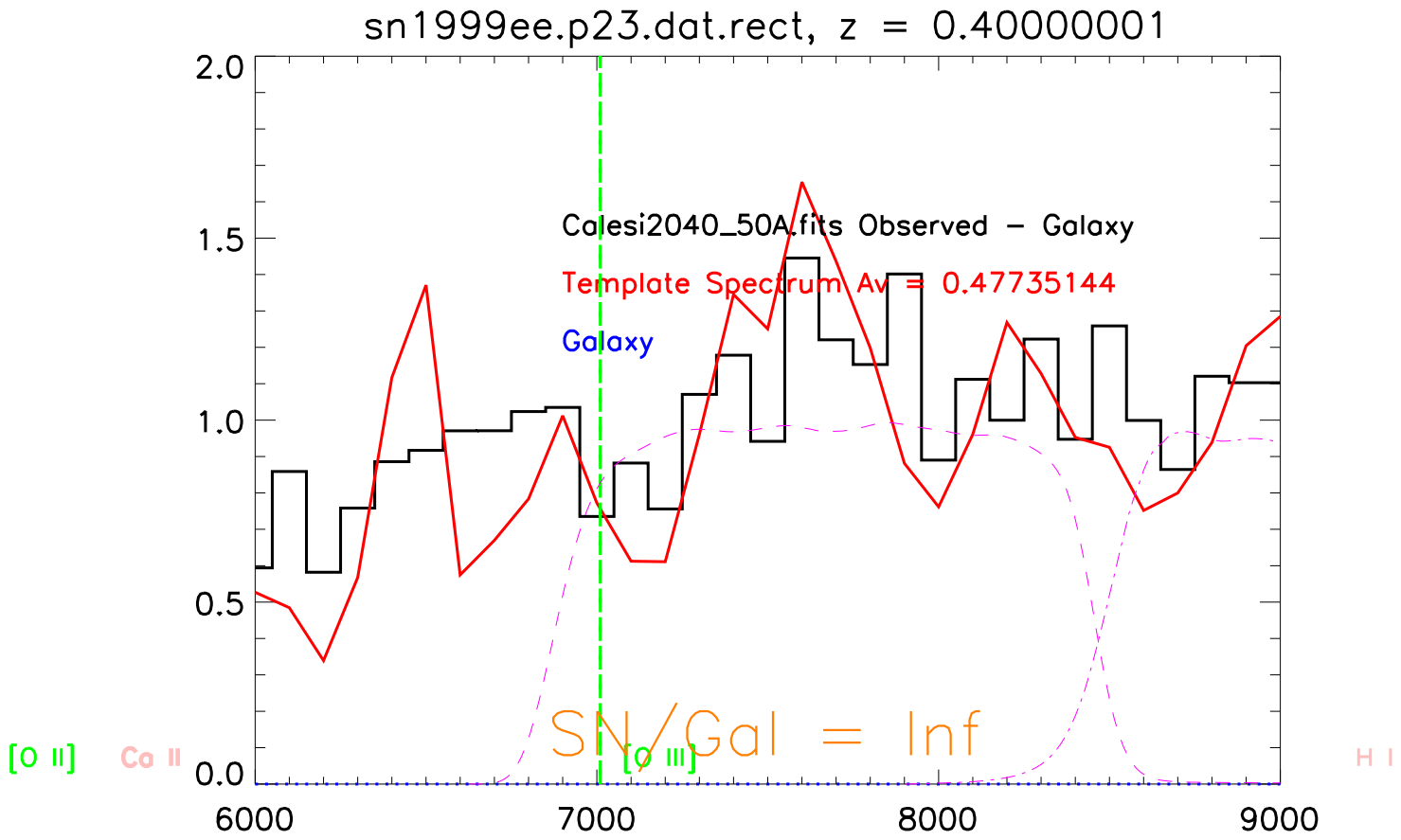
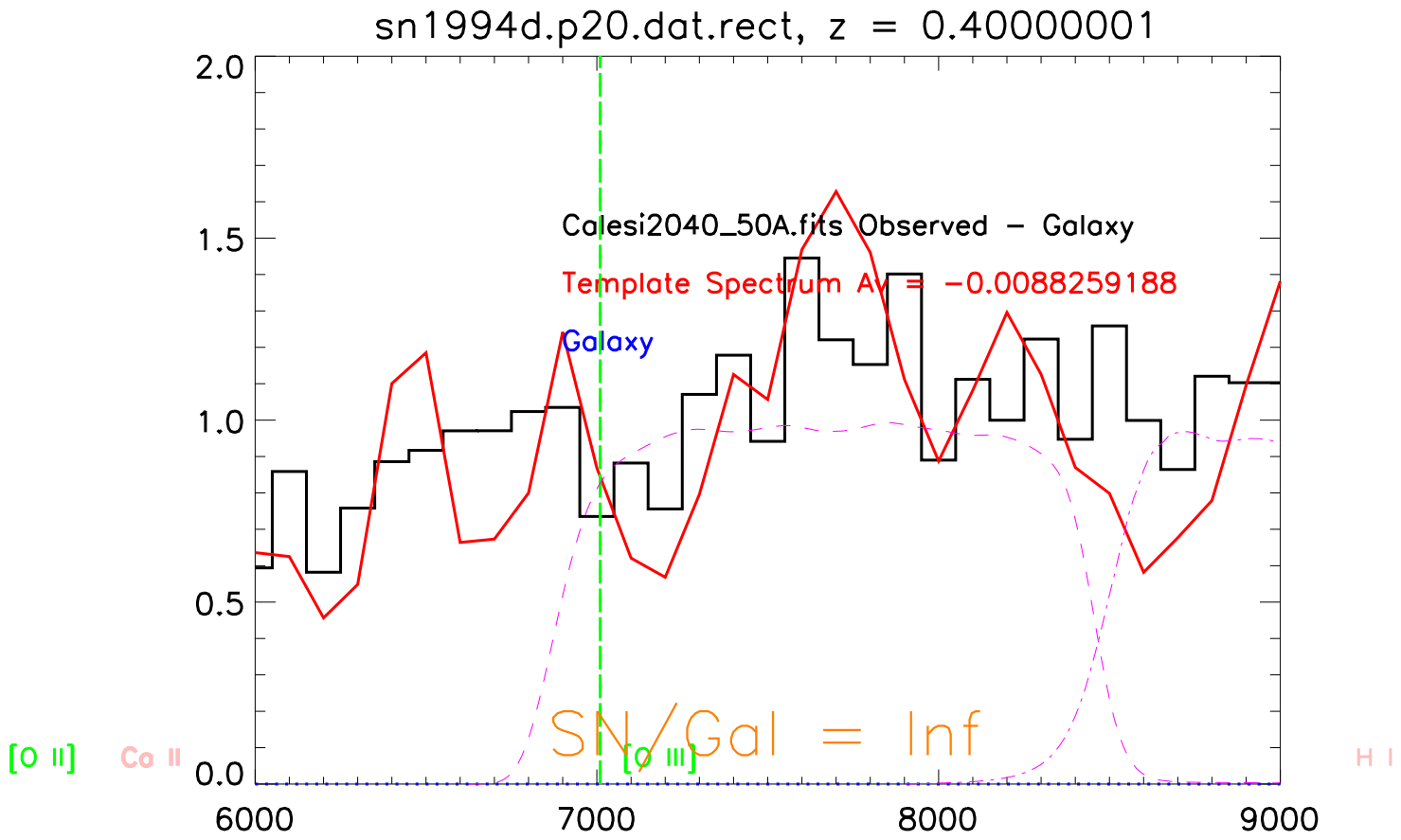
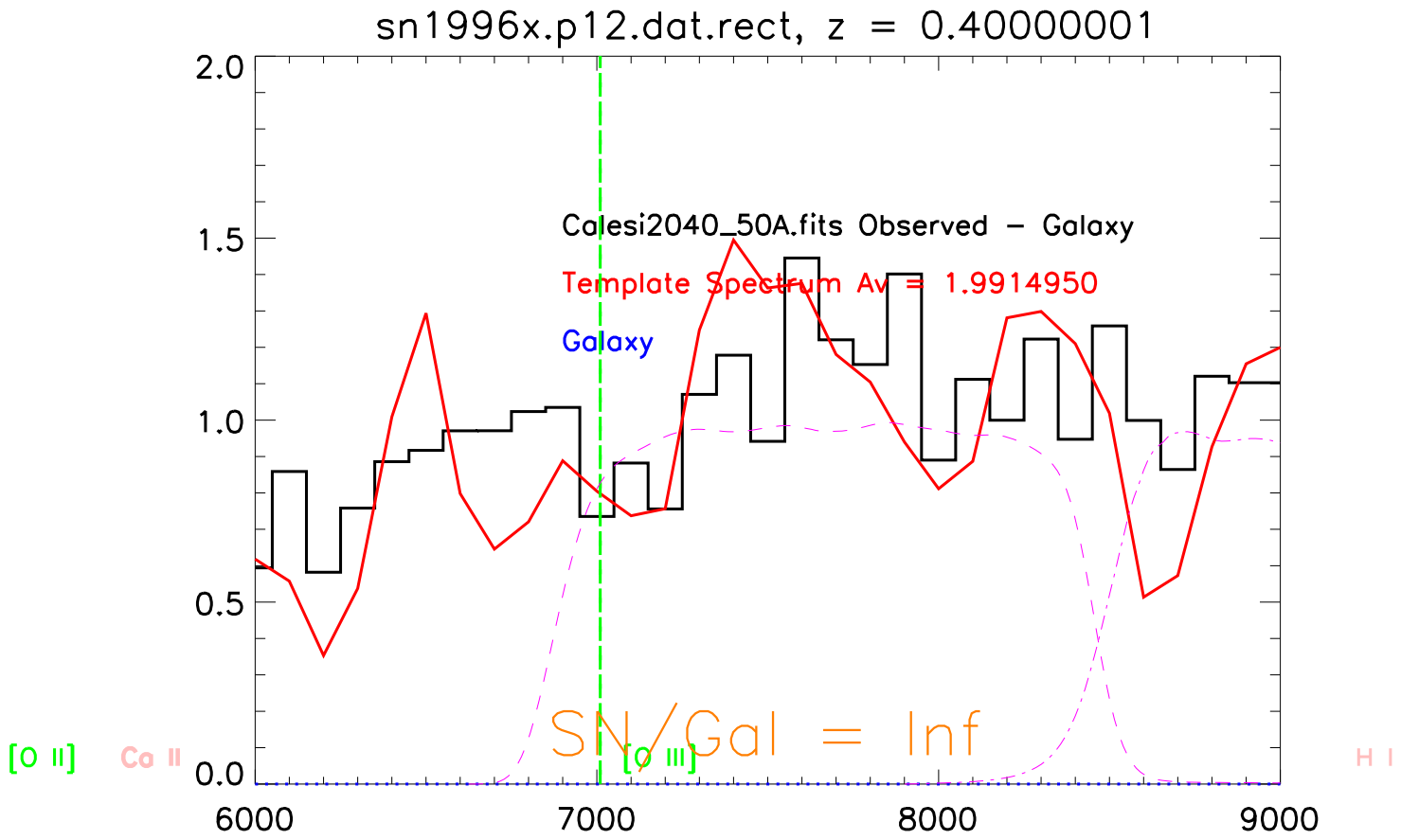
1.5
1.0
0.5
0.0
6000
7000
8000
9000

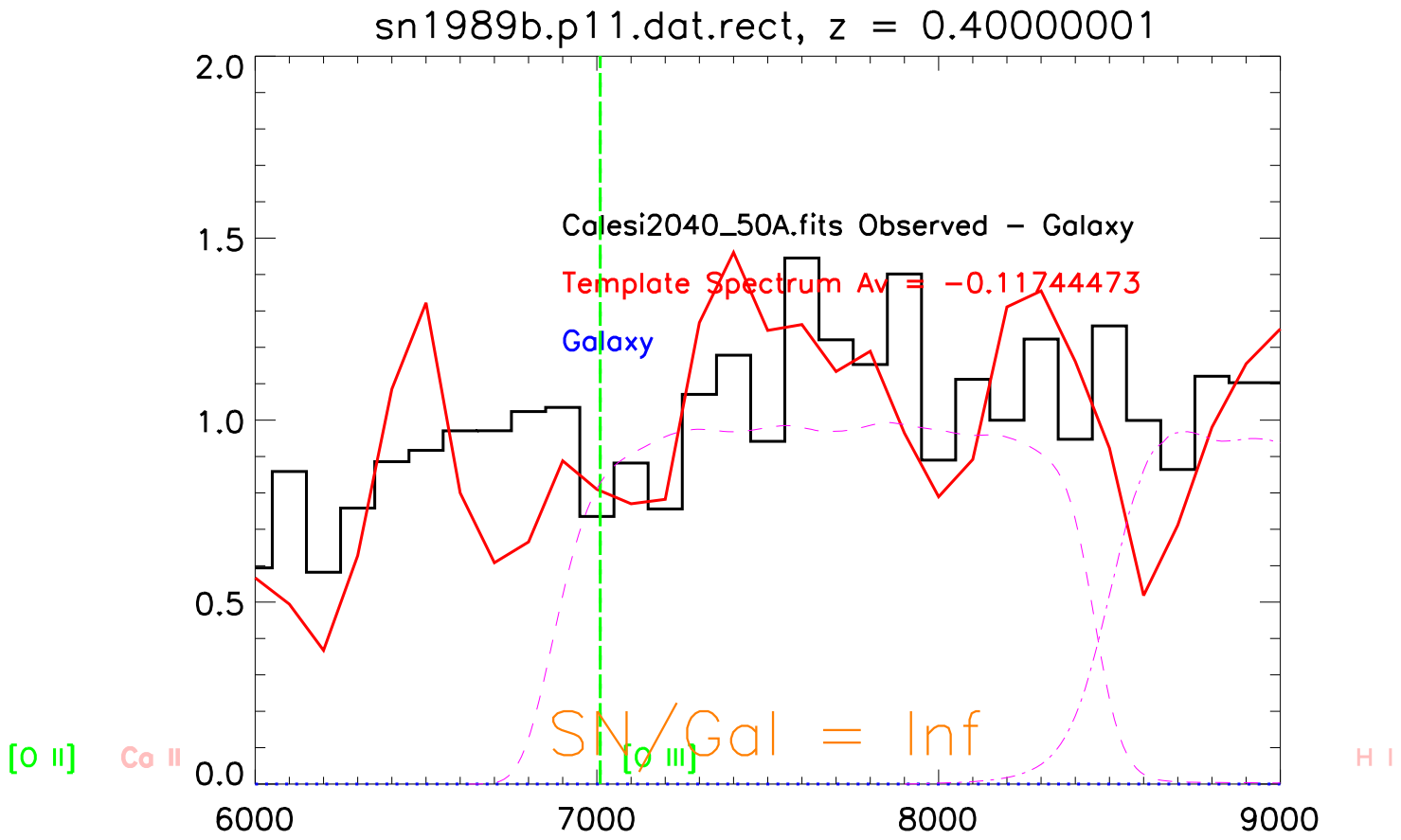

sn1998bu.p10.dat.rect, z = 0.40000001
Calesi2040_50A.fits Observed − Galaxy
Template Spectrum Av = −0.0086491558
Galaxy
SN/Gal = Inf
[O II]
Ca II
[O III]
H I
2.0
1.5
1.0
0.5
0.0
6000
7000
8000
9000

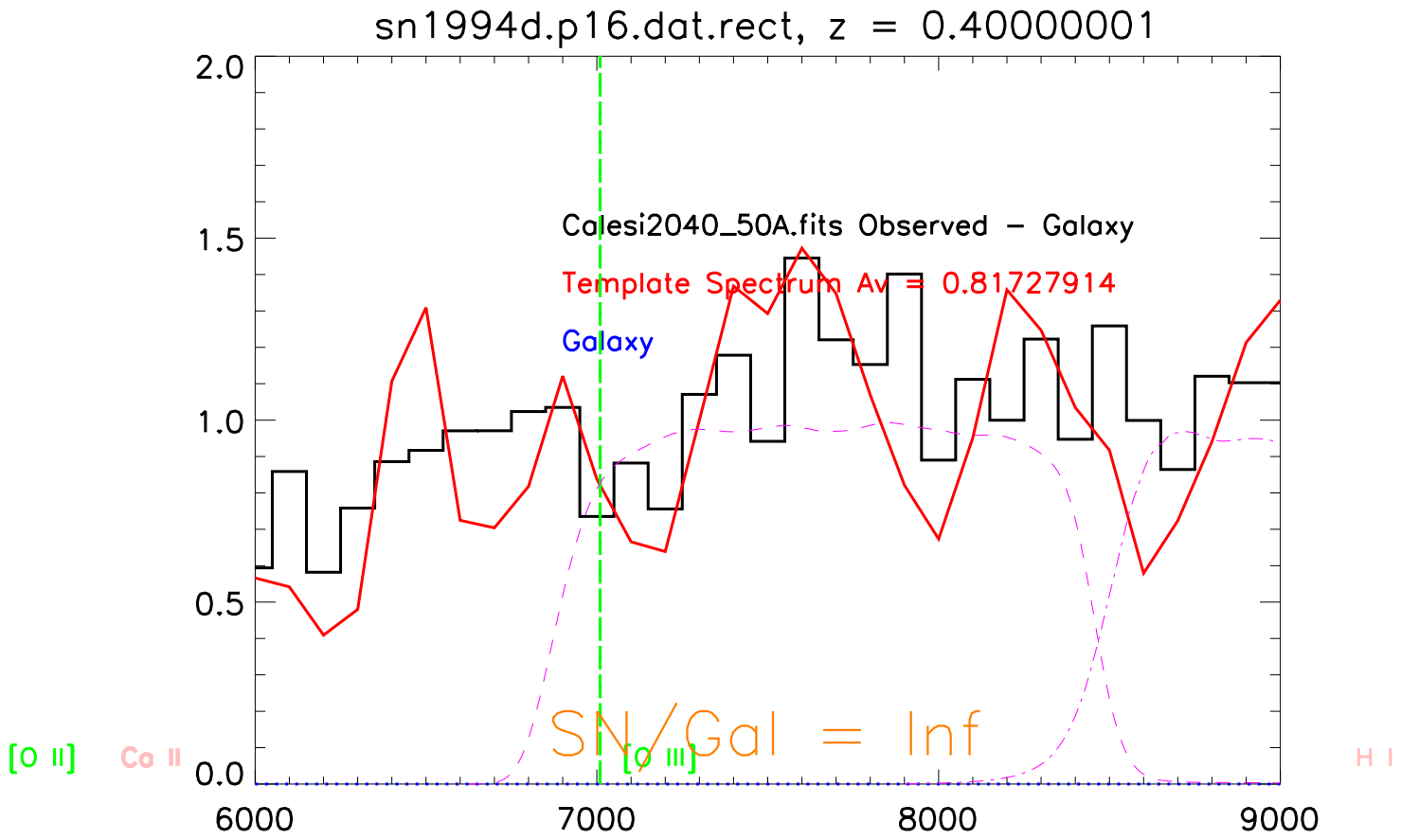

sn1981b.m00.dat.rect, z = 0.50000000
Calesi2040_50A.fits Observed − Galaxy
Template Spectrum Av = 2.4473701
Galaxy
SN/Gal = Inf
[O II]
Ca II
[O III]
2.0
1.5
1.0
0.5
0.0
6000
7000
8000
9000

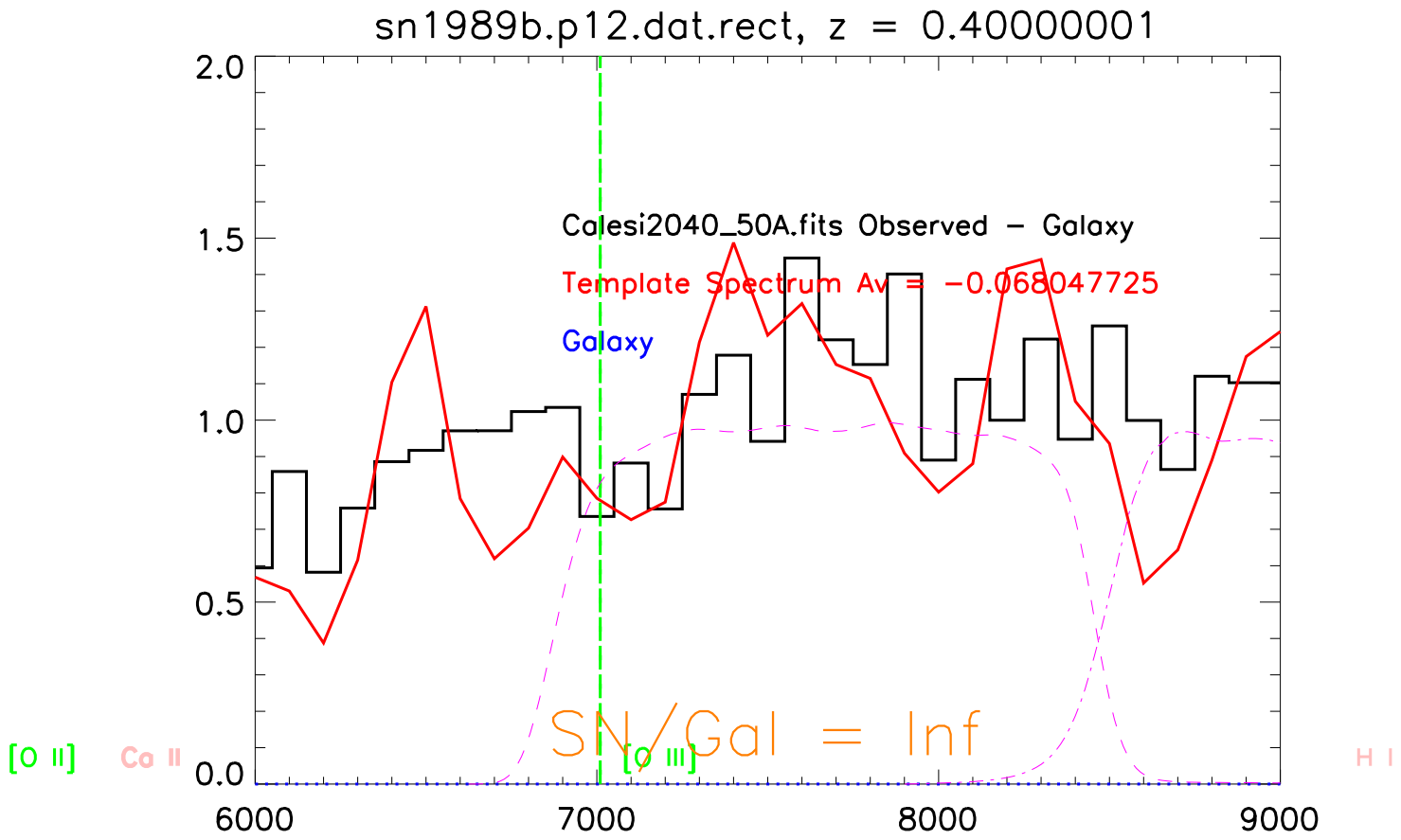

sn1999ee.p23.dat.rect, z = 0.40000001
Calesi2040_50A.fits Observed − Galaxy
Template Spectrum Av = 0.47735144
Galaxy
SN/Gal = Inf
[O II]
Ca II
[O III]
H I
2.0
1.5
1.0
0.5
0.0
6000
7000
8000
9000

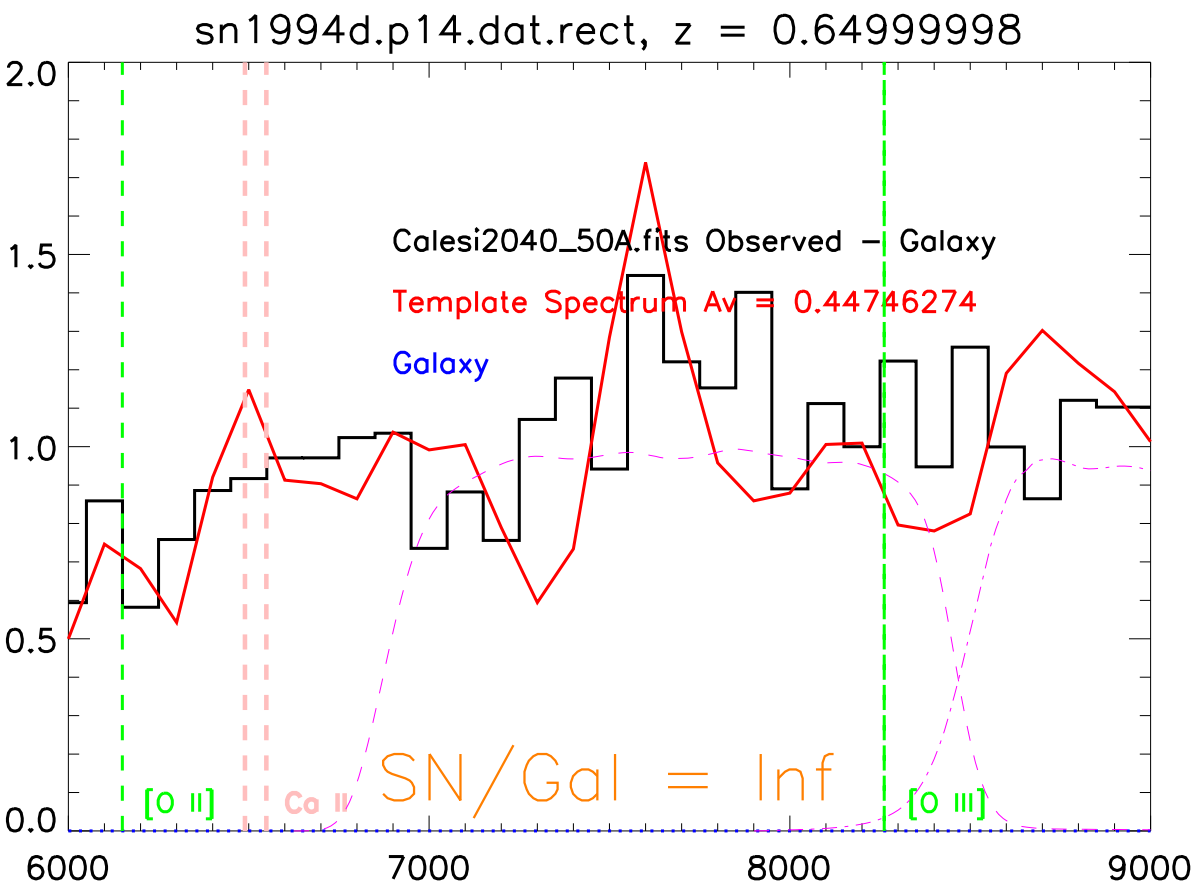

sn1994d.p20.dat.rect, z = 0.40000001
Calesi2040_50A.fits Observed − Galaxy
Template Spectrum Av = −0.0088259188
Galaxy
SN/Gal = Inf
[O II]
Ca II
[O III]
H I
2.0
1.5
1.0
0.5
0.0
6000
7000
8000
9000

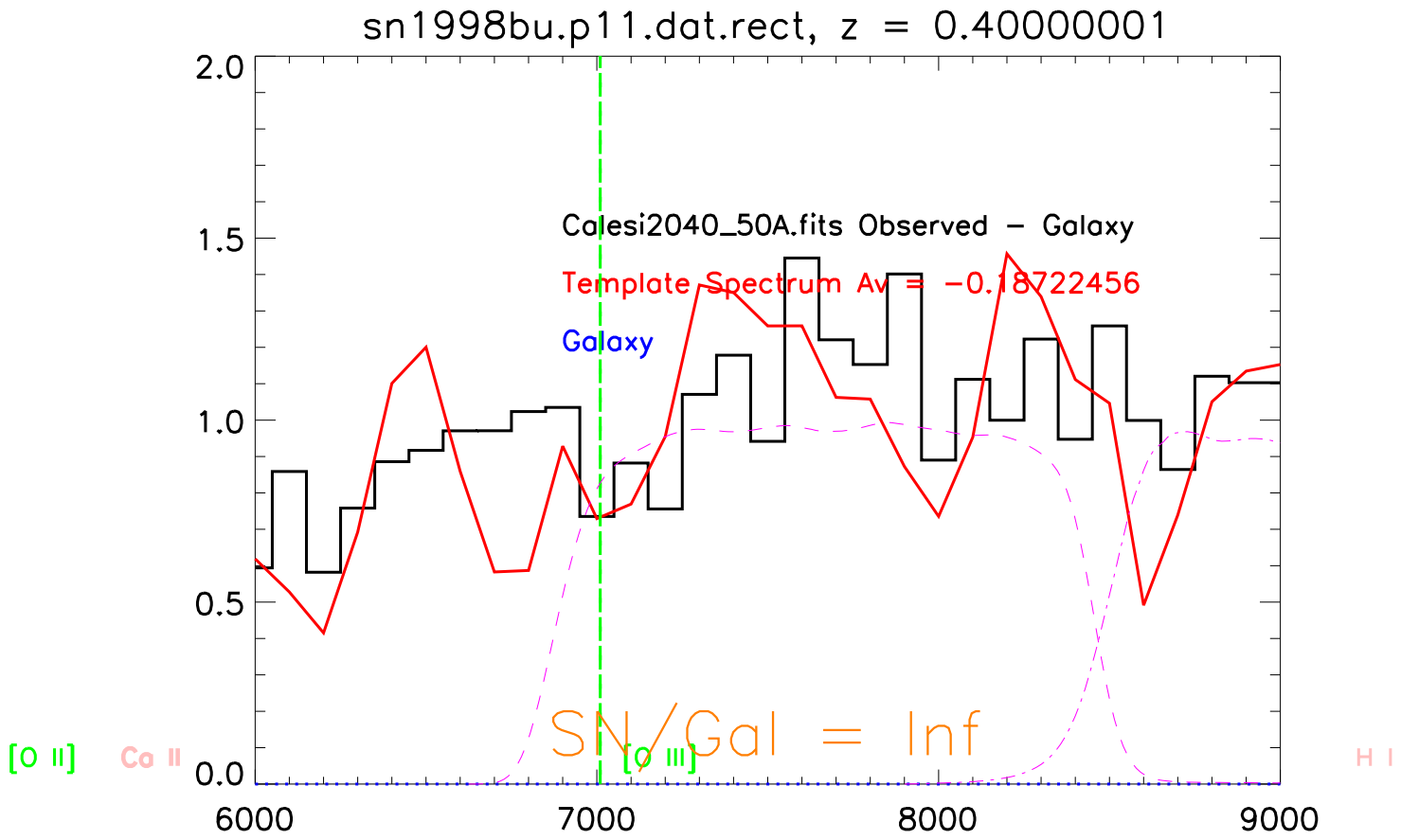

sn1996x.p12.dat.rect, z = 0.40000001
Calesi2040_50A.fits Observed − Galaxy
Template Spectrum Av = 1.9914950
Galaxy
SN/Gal = Inf
[O II]
Ca II
[O III]
H I
2.0
1.5
1.0
0.5
0.0
6000
7000
8000
9000

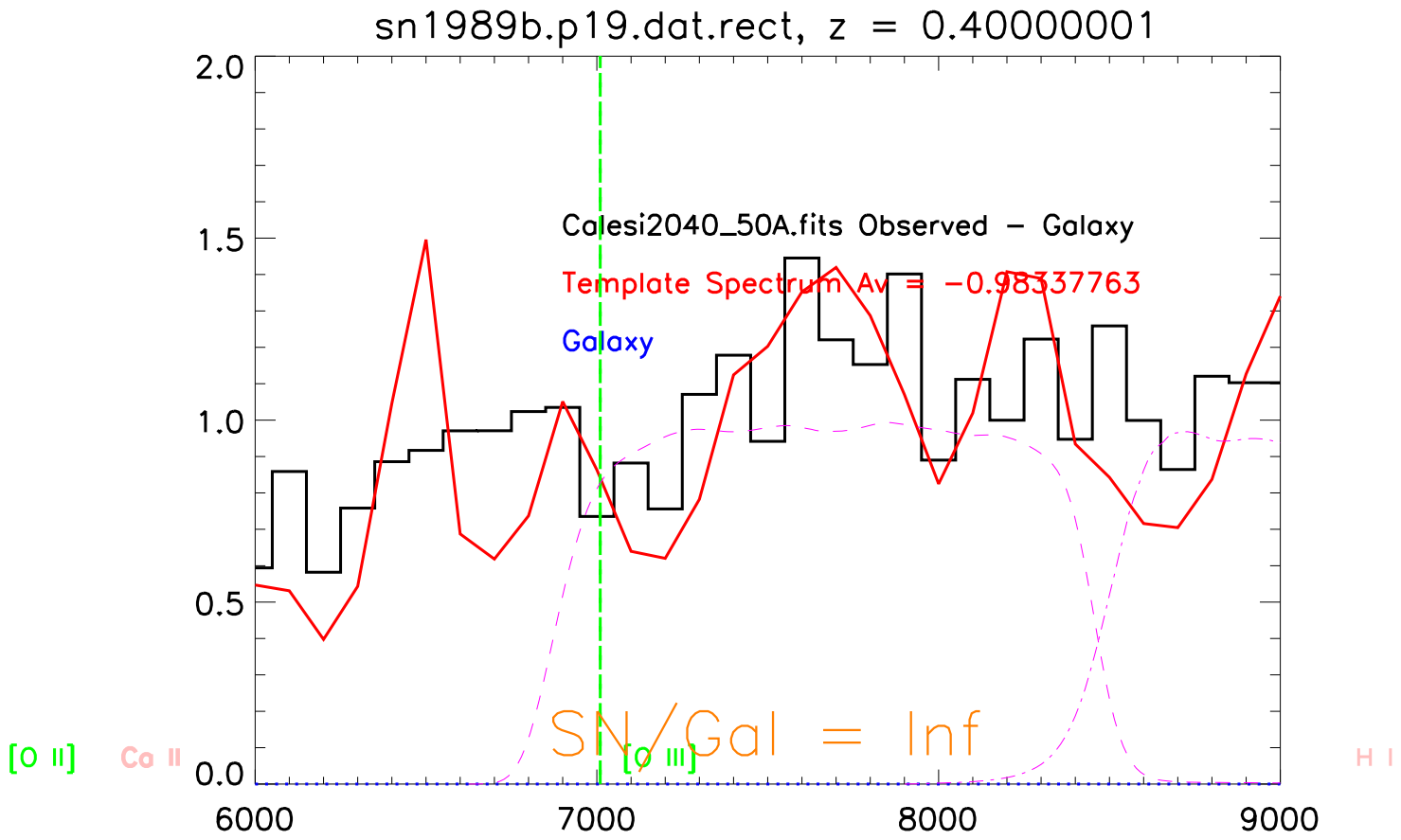

sn1989b.p11.dat.rect, z = 0.40000001
Calesi2040_50A.fits Observed − Galaxy
Template Spectrum Av = −0.11744473
Galaxy
SN/Gal = Inf
[O II]
Ca II
[O III]
H I
2.0
1.5
1.0
0.5
0.0
6000
7000
8000
9000

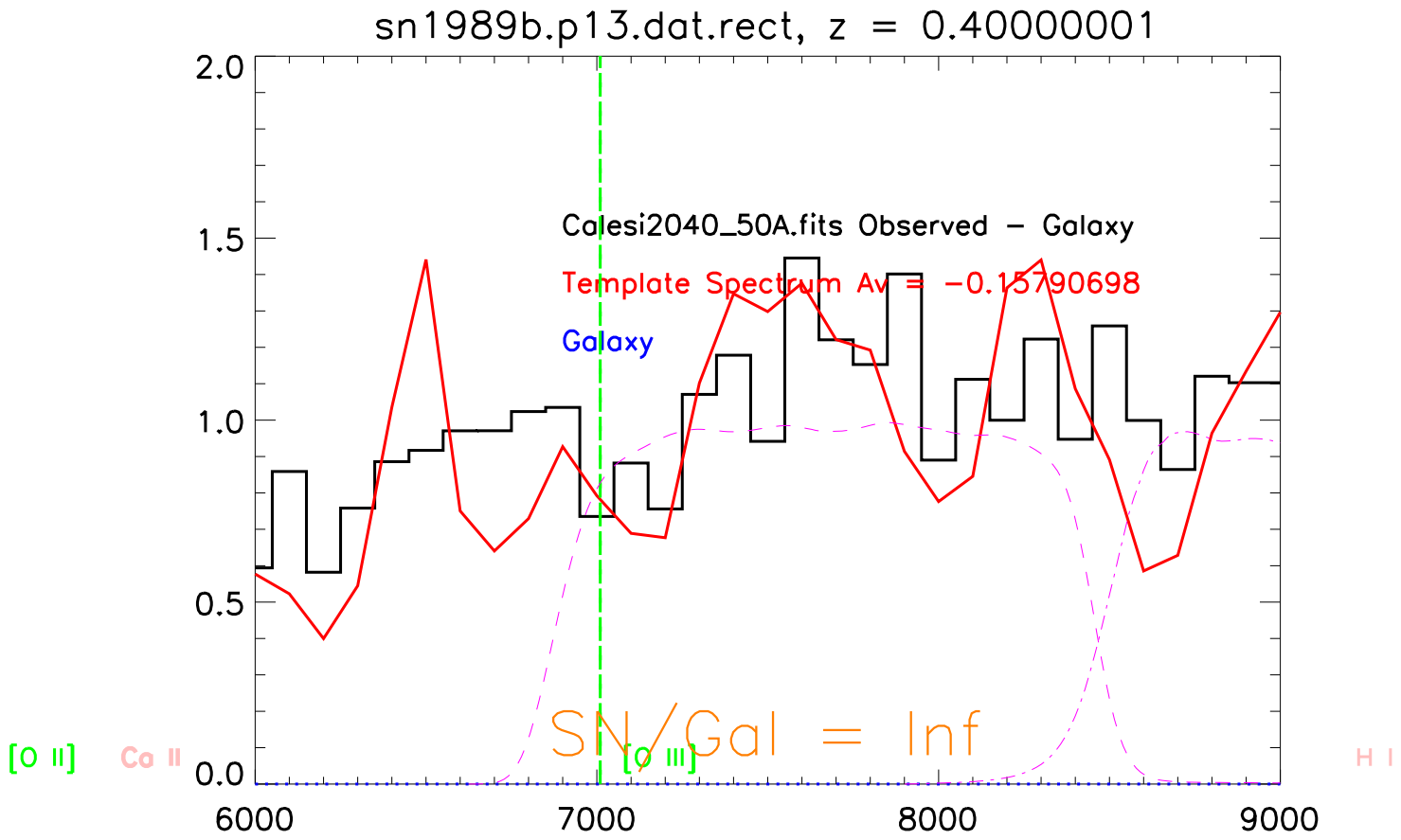

sn1994d.p16.dat.rect, z = 0.40000001
Calesi2040_50A.fits Observed − Galaxy
Template Spectrum Av = 0.81727914
Galaxy
SN/Gal = Inf
[O II]
Ca II
[O III]
H I
2.0
1.5
1.0
0.5
0.0
6000
7000
8000
9000

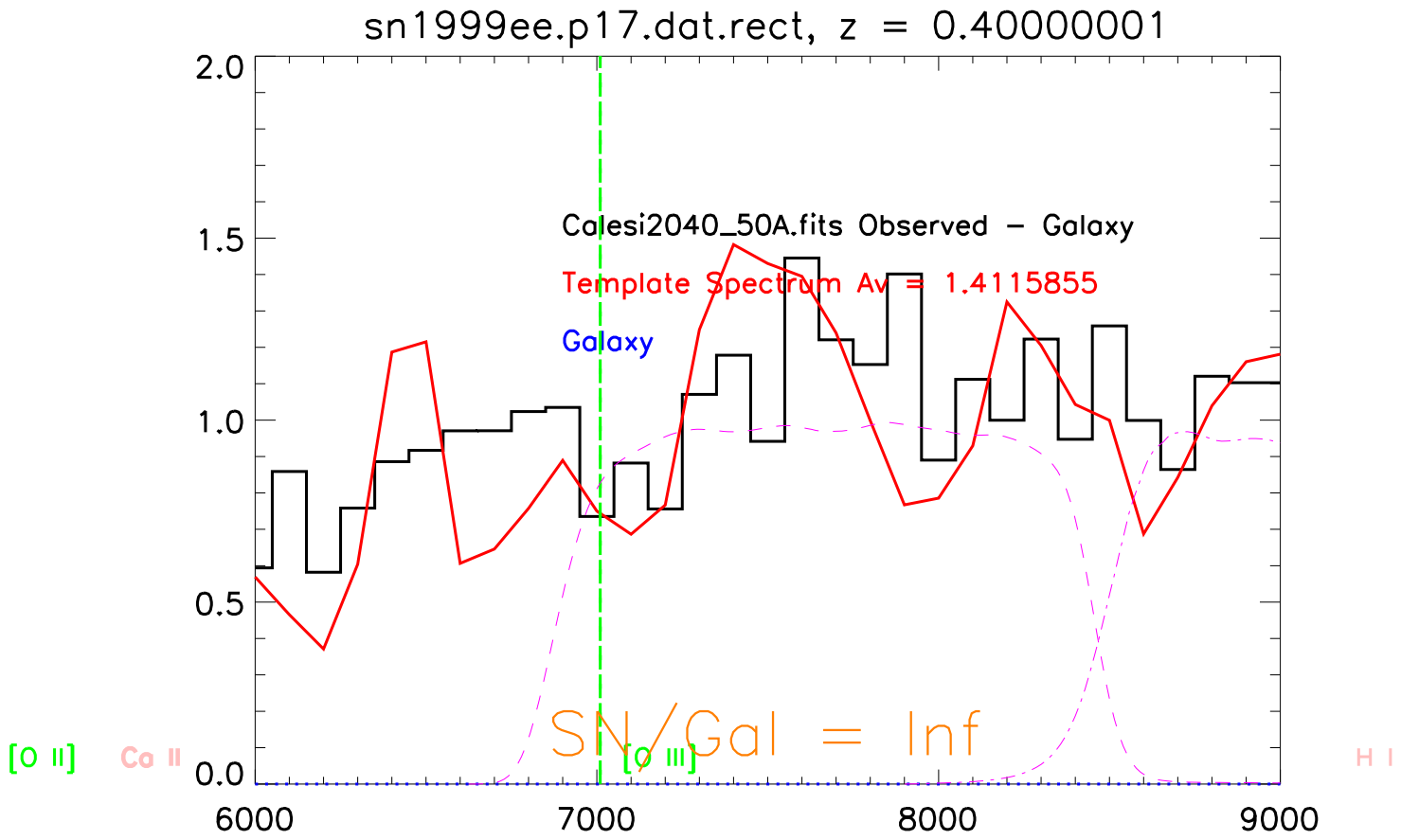

sn1989b.p12.dat.rect, z = 0.40000001
Calesi2040_50A.fits Observed − Galaxy
Template Spectrum Av = −0.068047725
Galaxy
SN/Gal = Inf
[O II]
Ca II
[O III]
H I
2.0
1.5
1.0
0.5
0.0
6000
7000
8000
9000

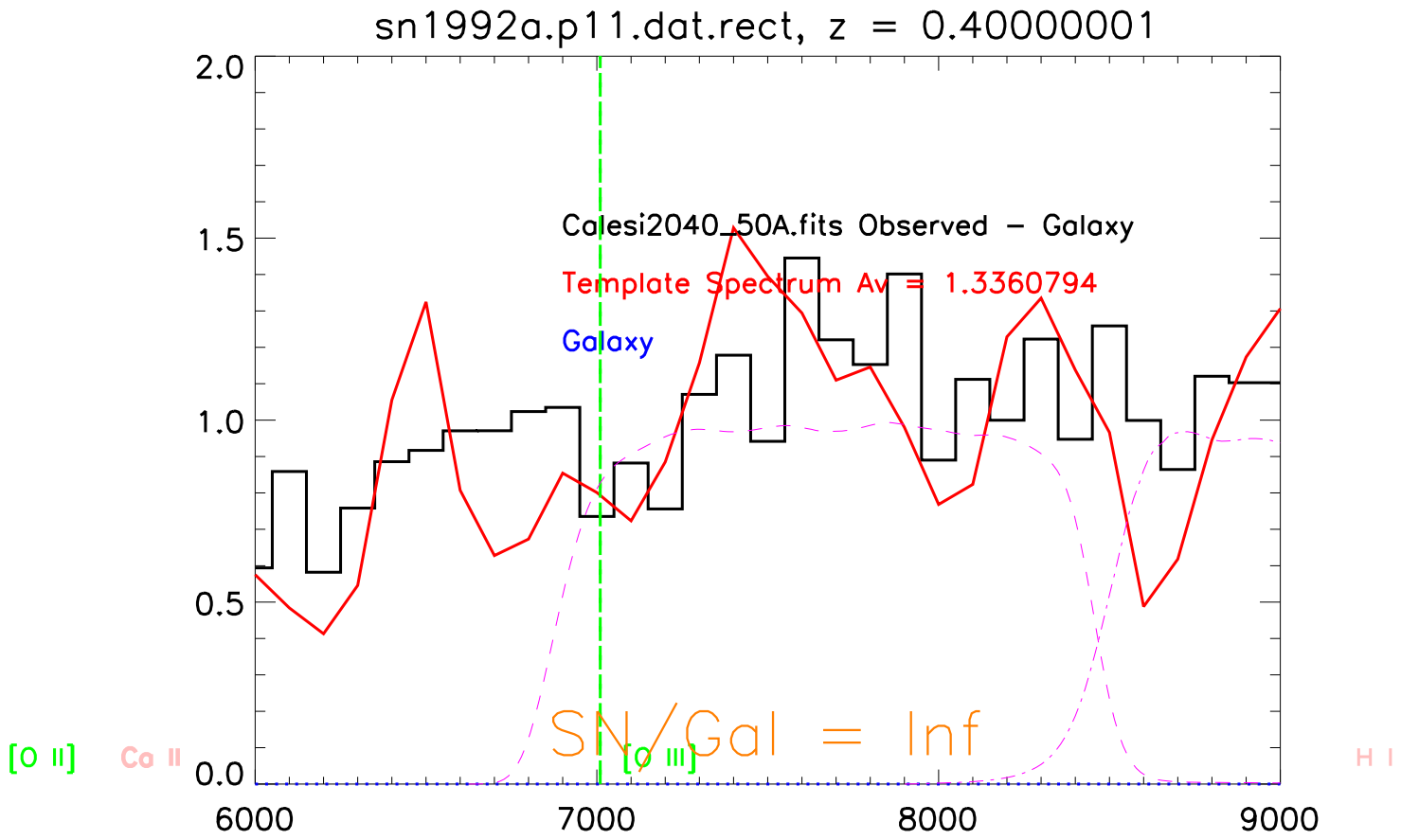

sn1994d.p14.dat.rect, z = 0.64999998
Calesi2040_50A.fits Observed – Galaxy
Template Spectrum Av = 0.44746274
Galaxy
SN/Gal = Inf
[O II]
Ca II
[O III]
2.0
1.5
1.0
0.5
0.0
6000
7000
8000
9000

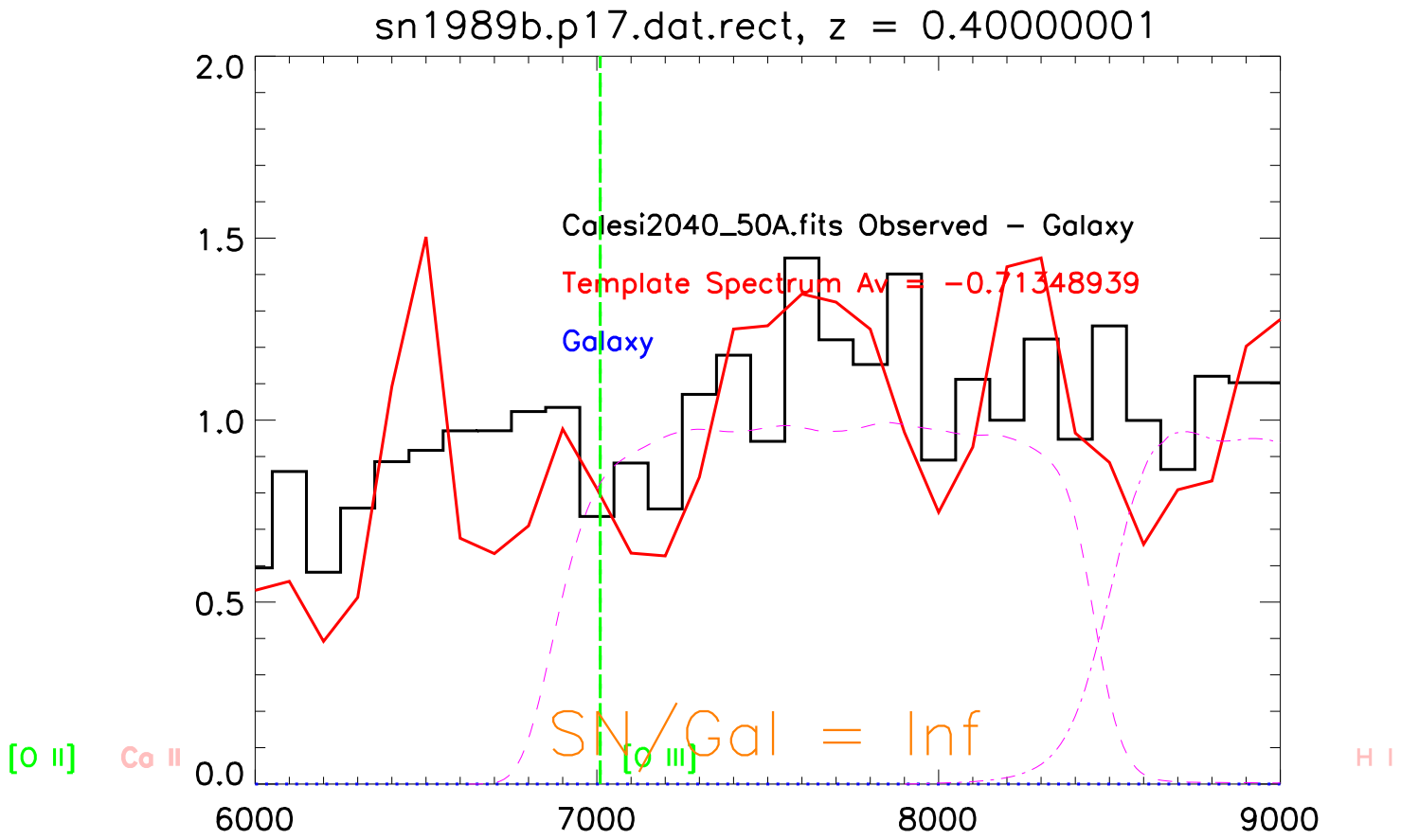

sn1998bu.p11.dat.rect, z = 0.40000001
Calesi2040_50A.fits Observed − Galaxy
Template Spectrum Av = −0.18722456
Galaxy
SN/Gal = Inf
[O II]
Ca II
[O III]
H I
2.0
1.5
1.0
0.5
0.0
6000
7000
8000
9000

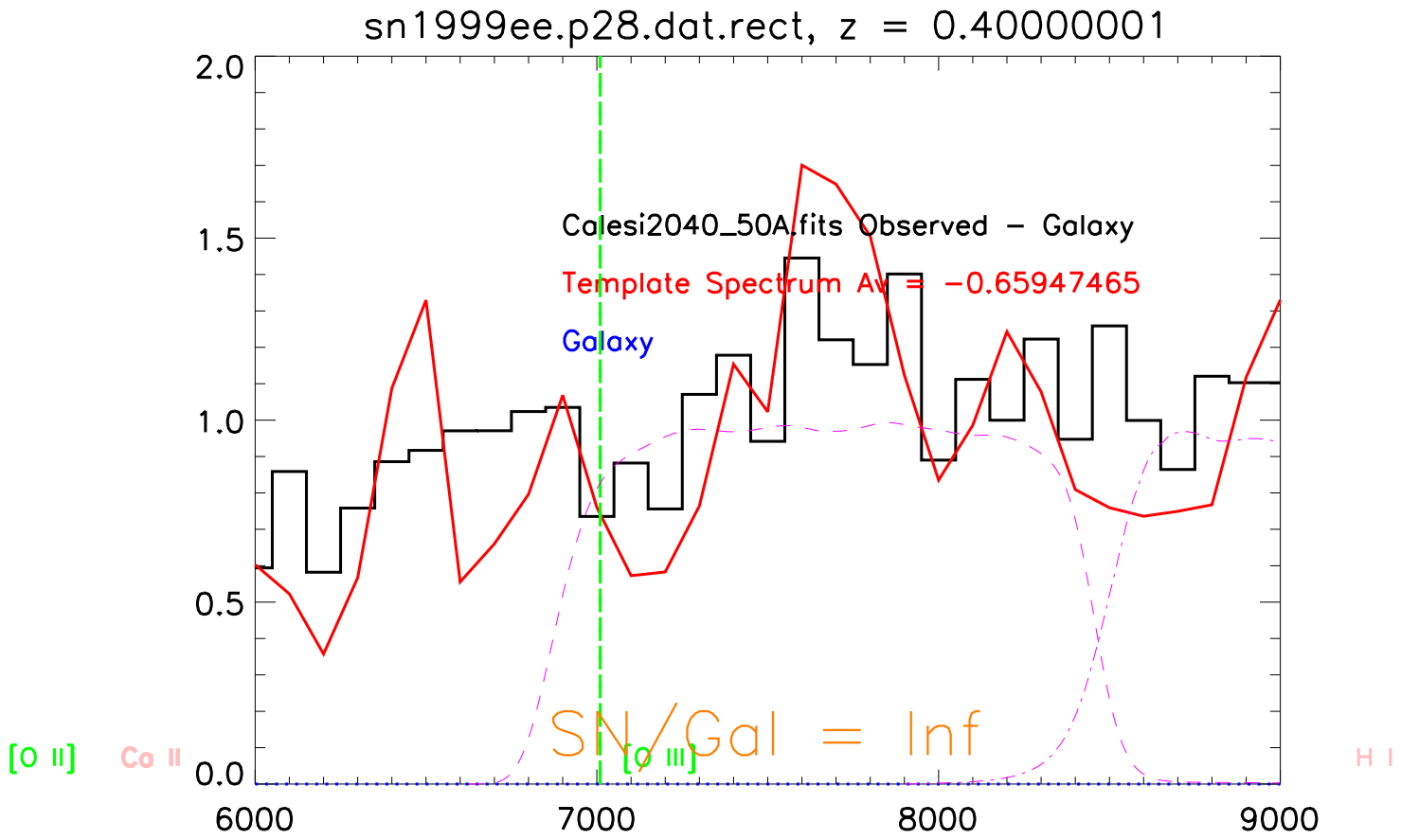

sn1989b.p19.dat.rect, z = 0.40000001
Calesi2040_50A.fits Observed − Galaxy
Template Spectrum Av = −0.98337763
Galaxy
SN/Gal = Inf
[O II]
Ca II
[O III]
H I
2.0
1.5
1.0
0.5
0.0
6000
7000
8000
9000

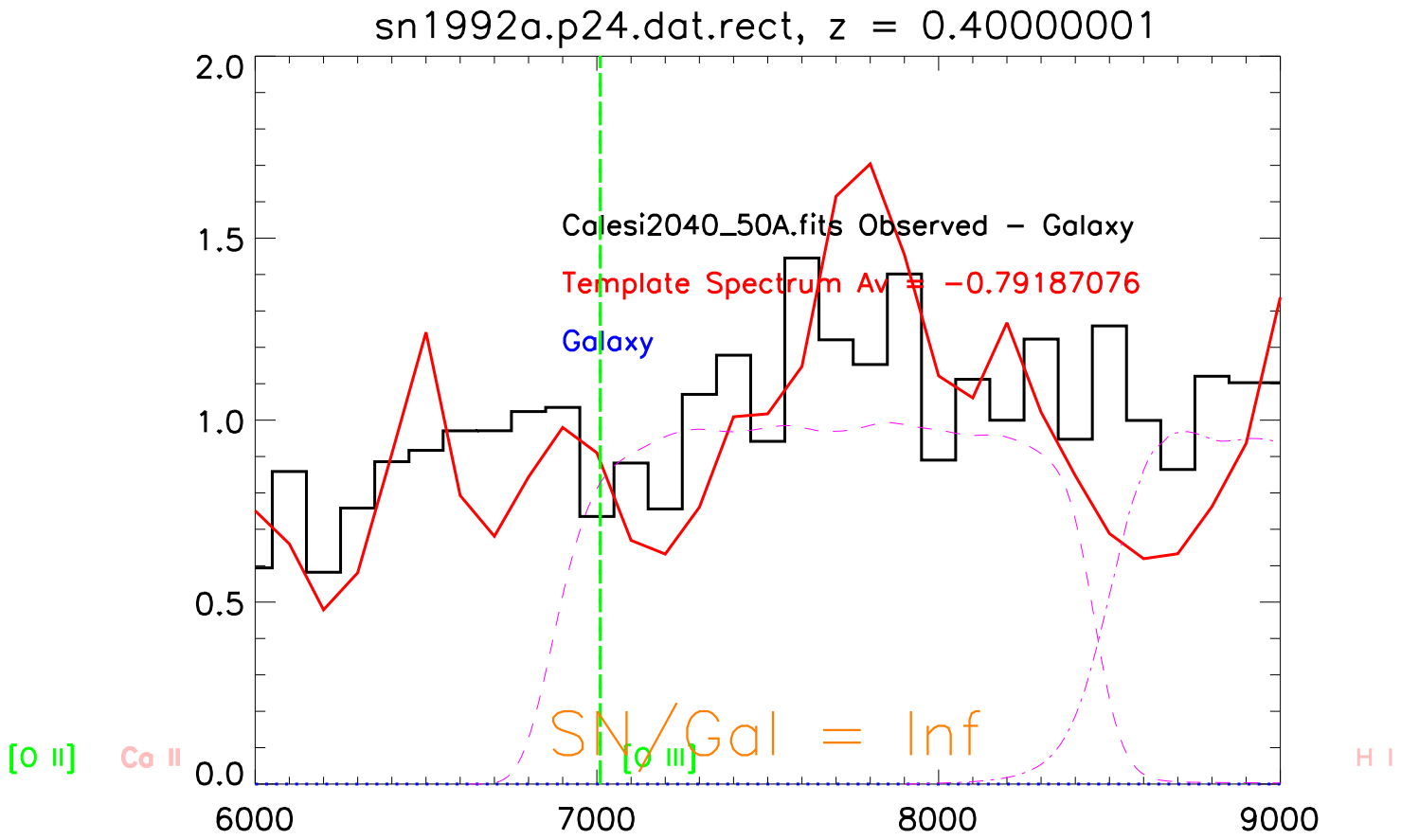

sn1989b.p13.dat.rect, z = 0.40000001
Calesi2040_50A.fits Observed − Galaxy
Template Spectrum Av = −0.15790698
Galaxy
SN/Gal = Inf
[O II]
Ca II
[O III]
H I
2.0
1.5
1.0
0.5
0.0
6000
7000
8000
9000

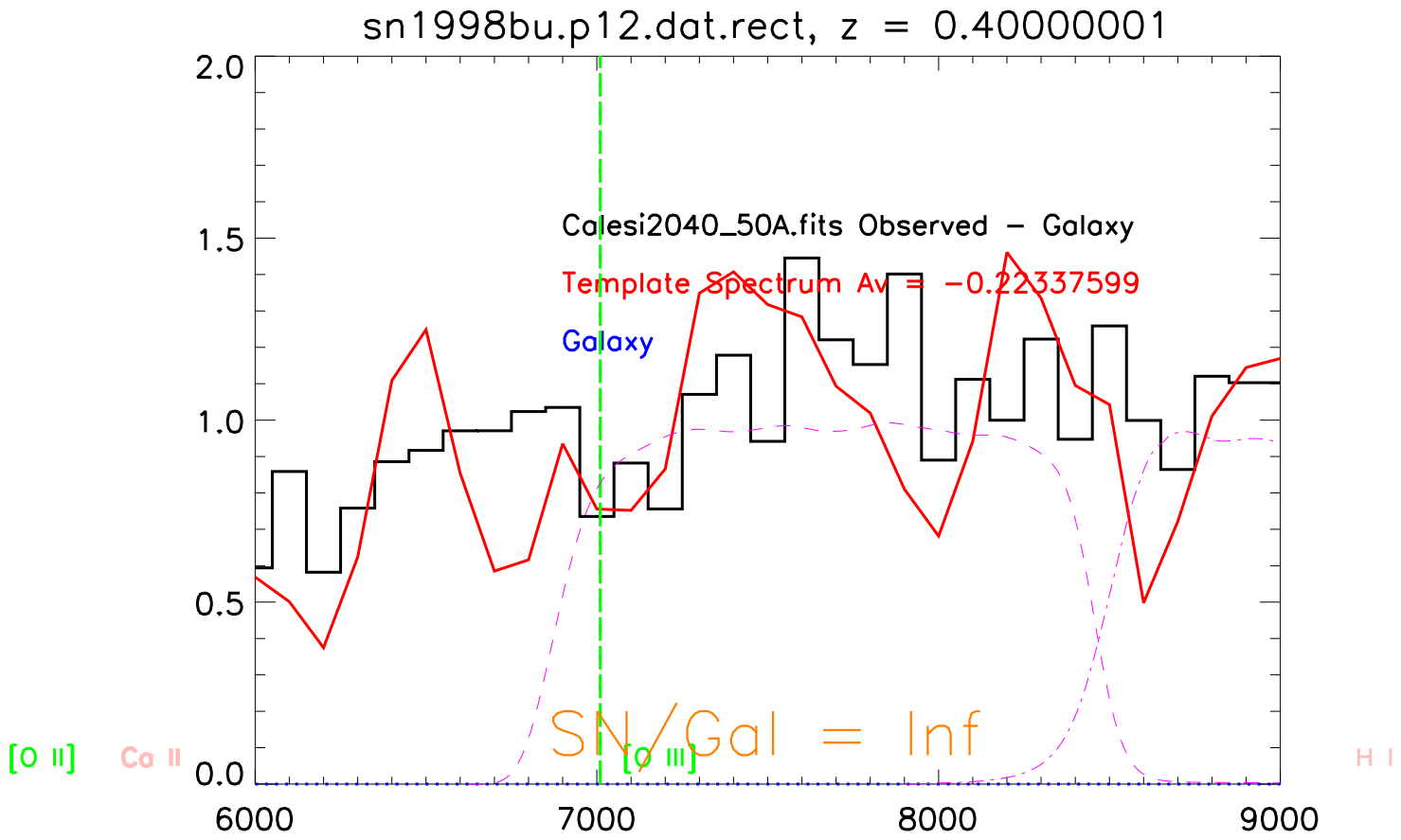

sn1999ee.p17.dat.rect, z = 0.40000001
Calesi2040_50A.fits Observed − Galaxy
Template Spectrum Av = 1.4115855
Galaxy
SN/Gal = Inf
[O II]
Ca II
[O III]
H I
2.0
1.5
1.0
0.5
0.0
6000
7000
8000
9000

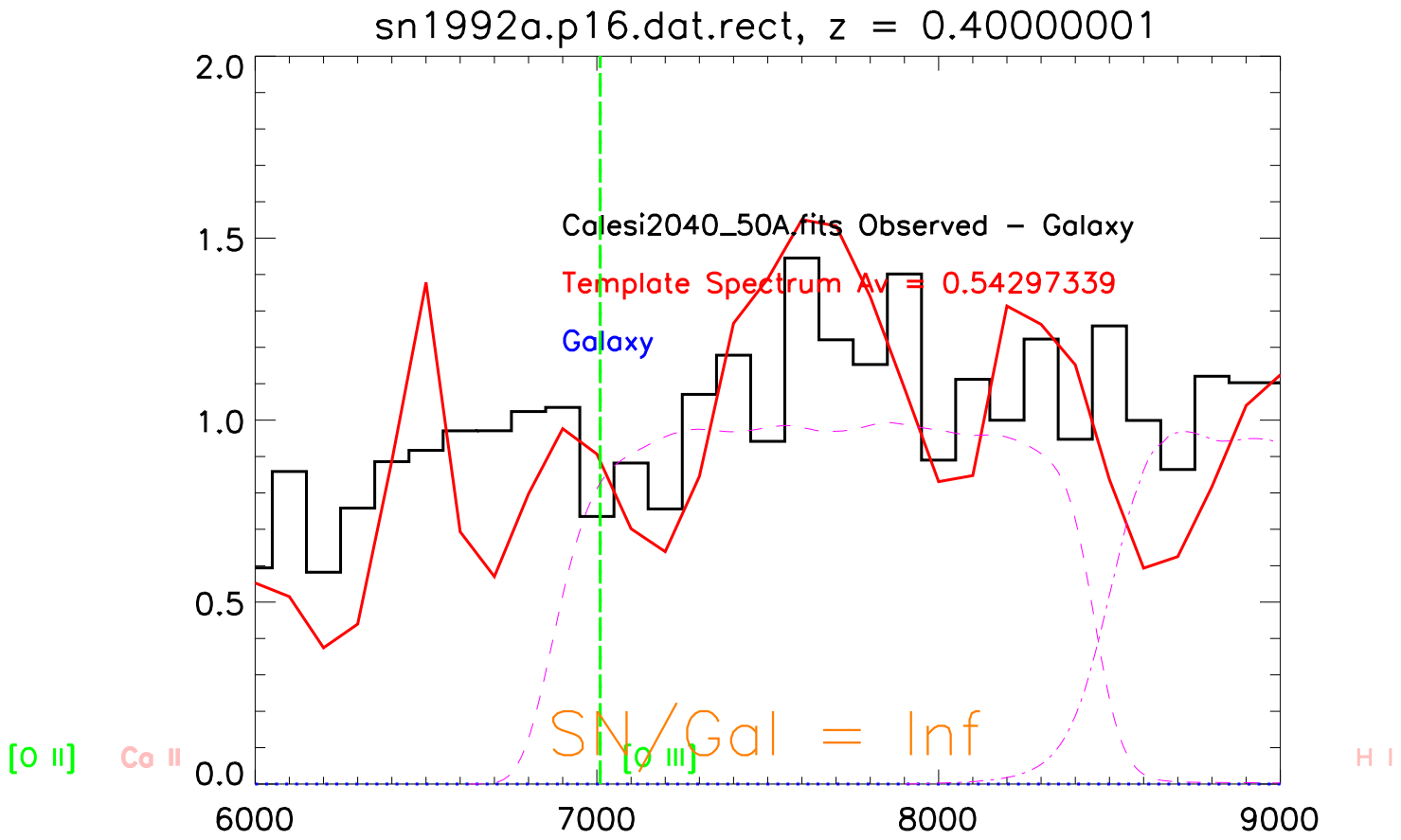

sn1992a.p11.dat.rect, z = 0.40000001
Calesi2040_50A.fits Observed – Galaxy
Template Spectrum Av = 1.3360794
Galaxy
SN/Gal = Inf
[O II]
Ca II
[O III]
H I
2.0
1.5
1.0
0.5
0.0
6000
7000
8000
9000

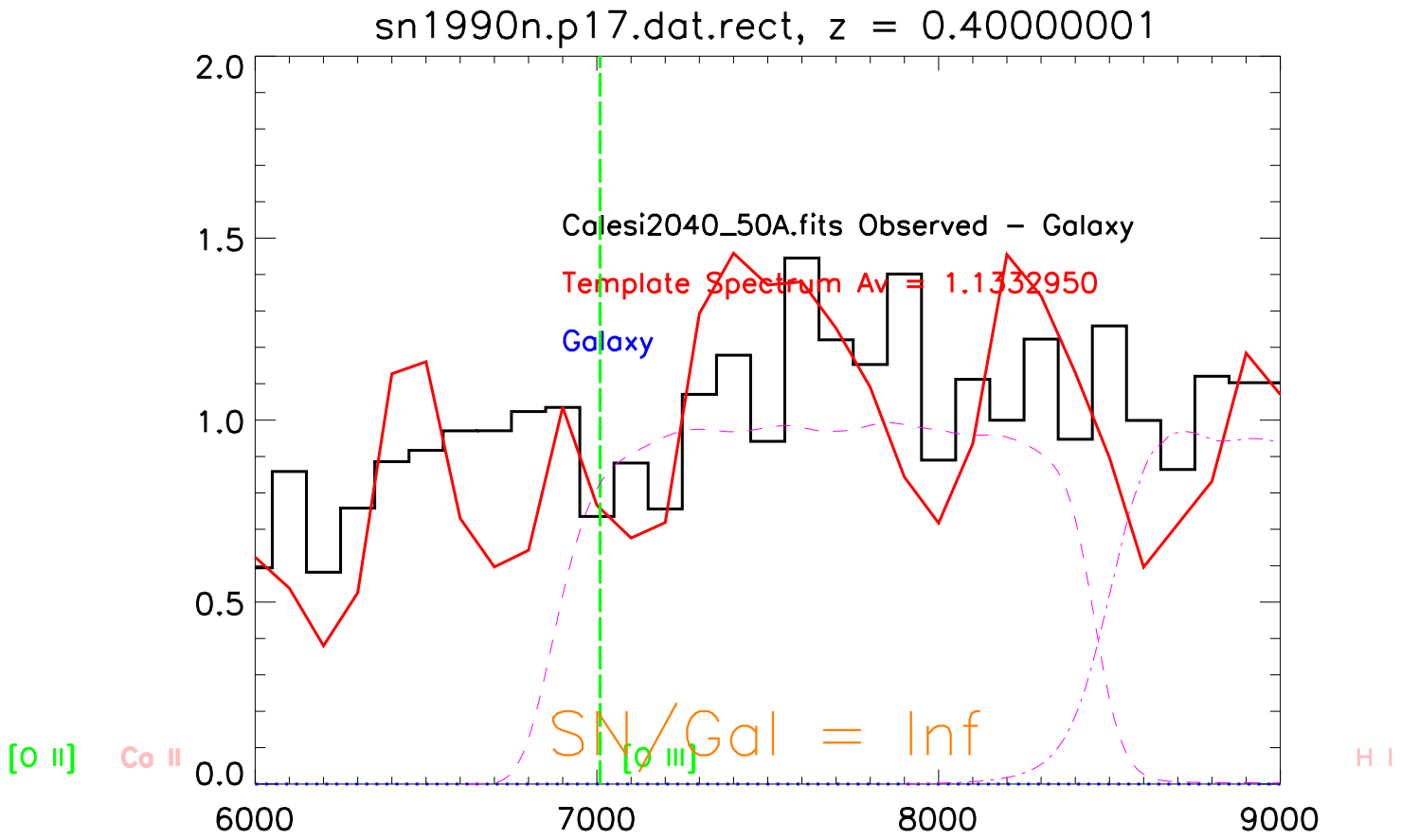

sn1989b.p17.dat.rect, z = 0.40000001
Calesi2040_50A.fits Observed − Galaxy
Template Spectrum Av = −0.71348939
Galaxy
SN/Gal = Inf
[O II]
Ca II
[O III]
H I
2.0
1.5
1.0
0.5
0.0
6000
7000
8000
9000

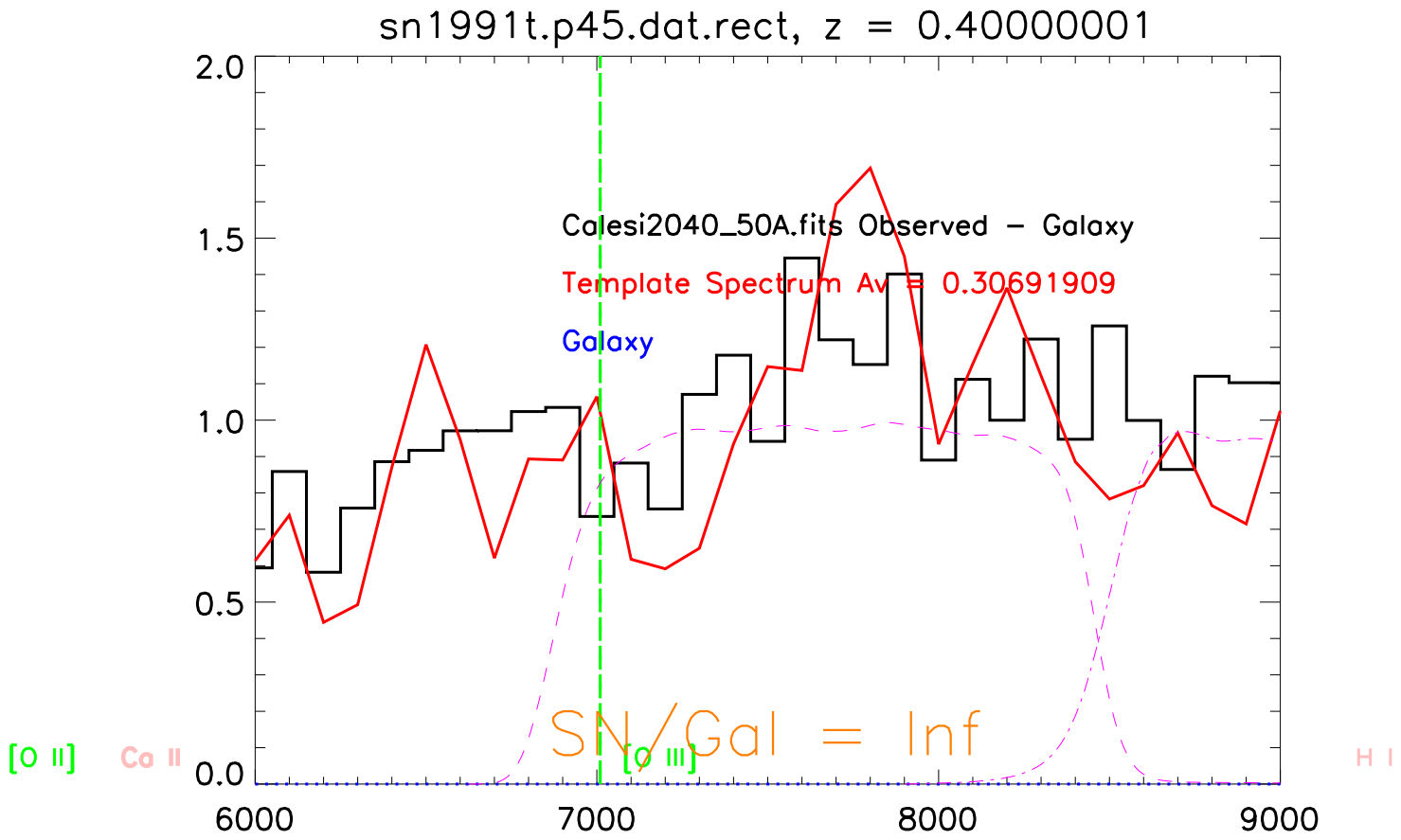

sn1999ee.p28.dat.rect, z = 0.40000001
Calesi2040_50A.fits Observed − Galaxy
Template Spectrum Av = −0.65947465
Galaxy
SN/Gal = Inf
[O II]
Ca II
[O III]
H I
2.0
1.5
1.0
0.5
0.0
6000
7000
8000
9000

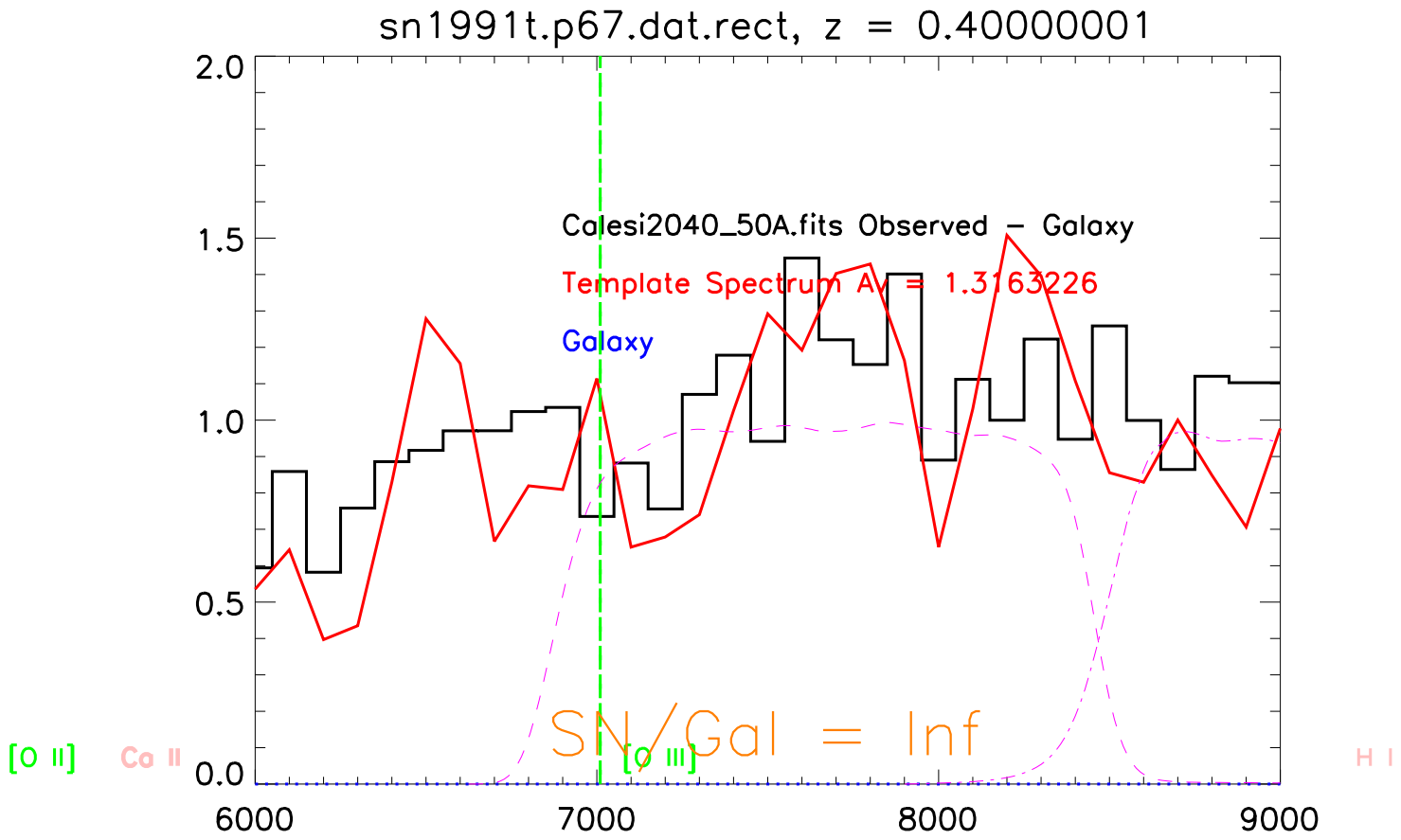

sn1992a.p24.dat.rect, z = 0.40000001
Calesi2040_50A.fits Observed − Galaxy
Template Spectrum Av = −0.79187076
Galaxy
SN/Gal = Inf
[O II]
Ca II
[O III]
H I
2.0
1.5
1.0
0.5
0.0
6000
7000
8000
9000

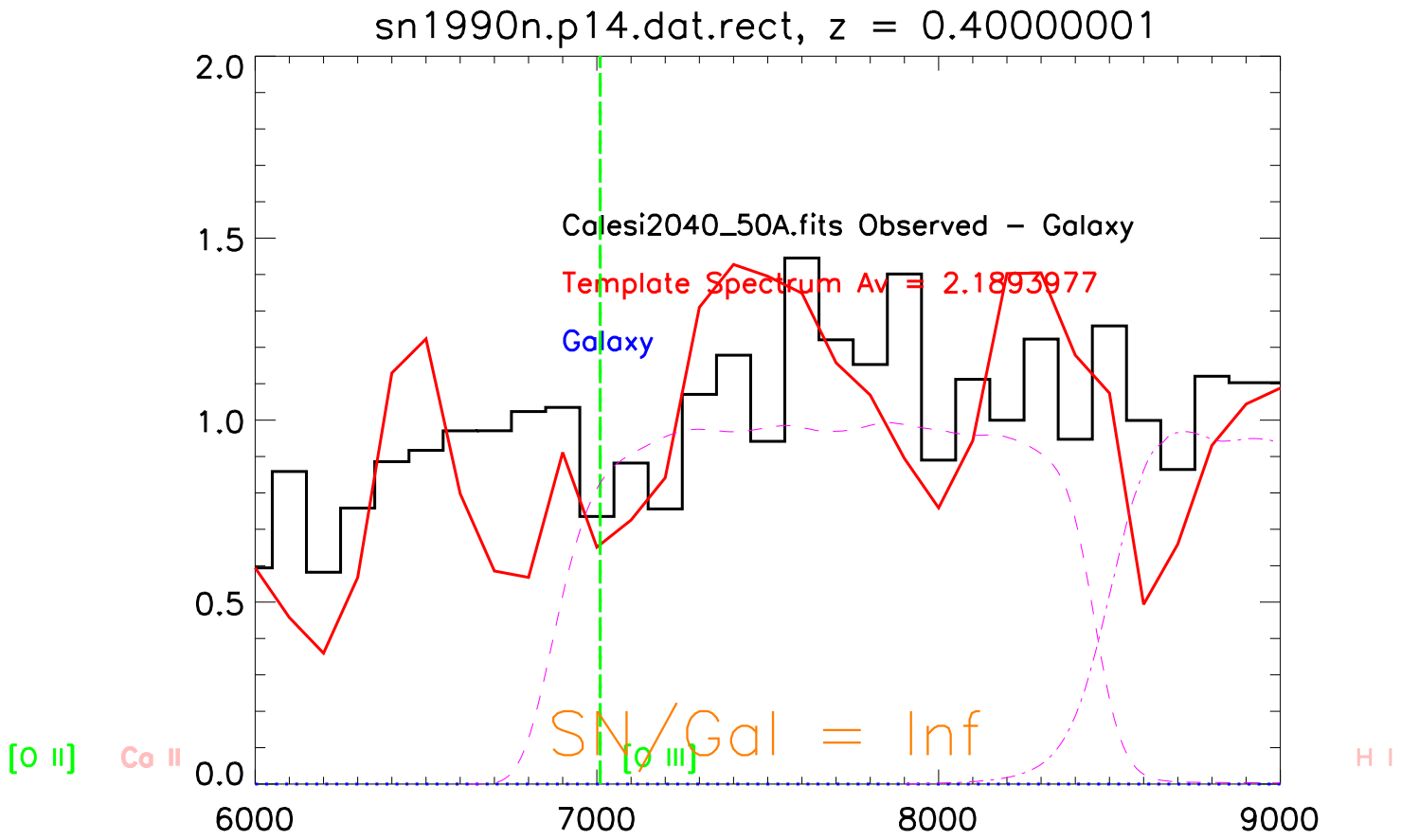

sn1998bu.p12.dat.rect, z = 0.40000001
Calesi2040_50A.fits Observed − Galaxy
Template Spectrum Av = −0.22337599
Galaxy
SN/Gal = Inf
[O II]
Ca II
[O III]
H I
2.0
1.5
1.0
0.5
0.0
6000
7000
8000
9000


sn1992a.p16.dat.rect, z = 0.40000001
Calesi2040_50A.fits Observed − Galaxy
Template Spectrum Av = 0.54297339
Galaxy
SN/Gal = Inf
[O II]
Ca II
[O III]
H I
2.0
1.5
1.0
0.5
0.0
6000
7000
8000
9000


sn1990n.p17.dat.rect, z = 0.40000001
Calesi2040_50A.fits Observed − Galaxy
Template Spectrum Av = 1.1332950
Galaxy
SN/Gal = Inf
[O II]
Ca II
[O III]
H I
2.0
1.5
1.0
0.5
0.0
6000
7000
8000
9000


sn1991t.p45.dat.rect, z = 0.40000001
Calesi2040_50A.fits Observed − Galaxy
Template Spectrum Av = 0.30691909
Galaxy
SN/Gal = Inf
[O II]
Ca II
[O III]
H I
2.0
1.5
1.0
0.5
0.0
6000
7000
8000
9000


sn1991t.p67.dat.rect, z = 0.40000001
Calesi2040_50A.fits Observed − Galaxy
Template Spectrum Av = 1.3163226
Galaxy
SN/Gal = Inf
[O II]
Ca II
[O III]
H I
2.0
1.5
1.0
0.5
0.0
6000
7000
8000
9000


sn1990n.p14.dat.rect, z = 0.40000001
Calesi2040_50A.fits Observed − Galaxy
Template Spectrum Av = 2.1893977
Galaxy
SN/Gal = Inf
[O II]
Ca II
[O III]
H I
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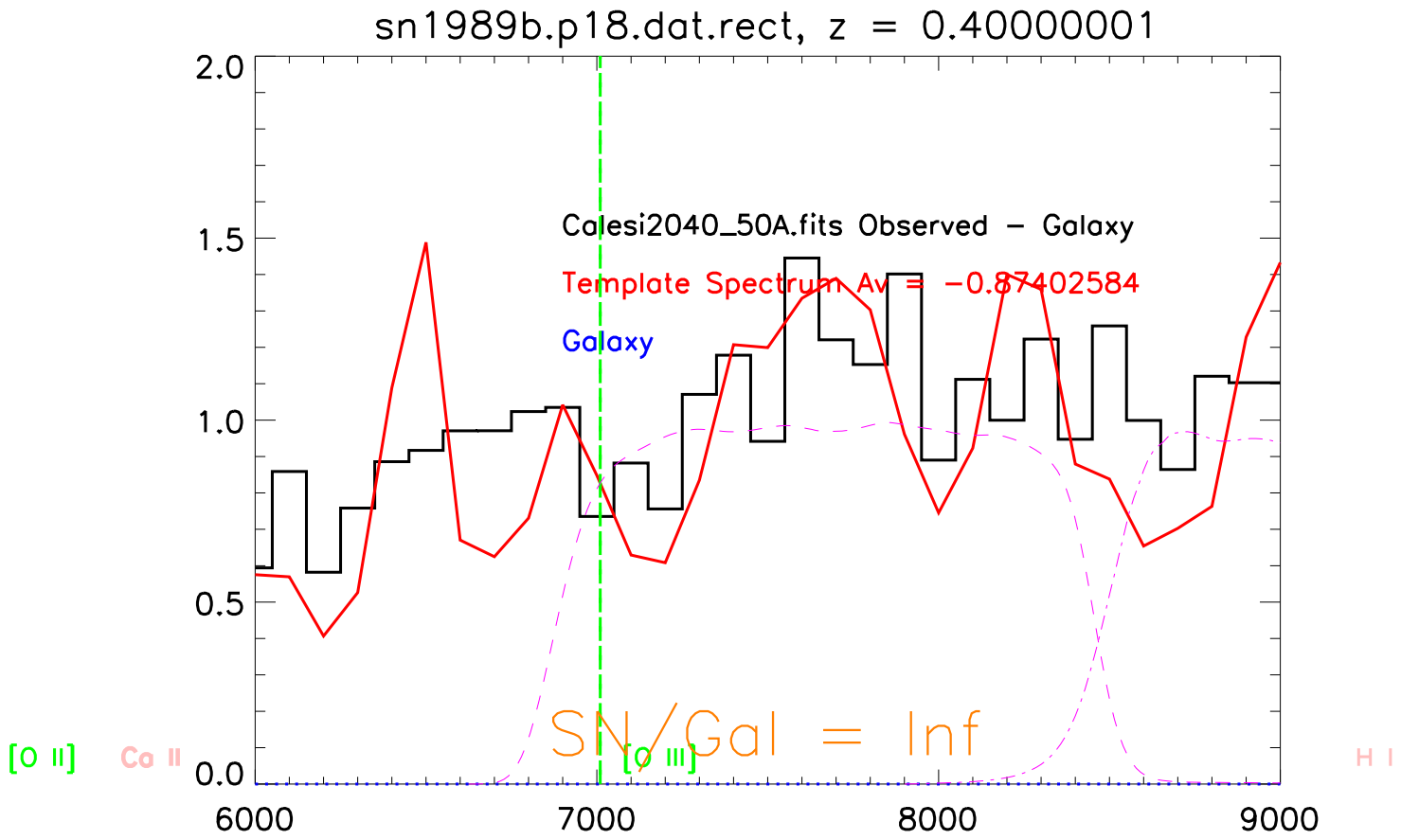
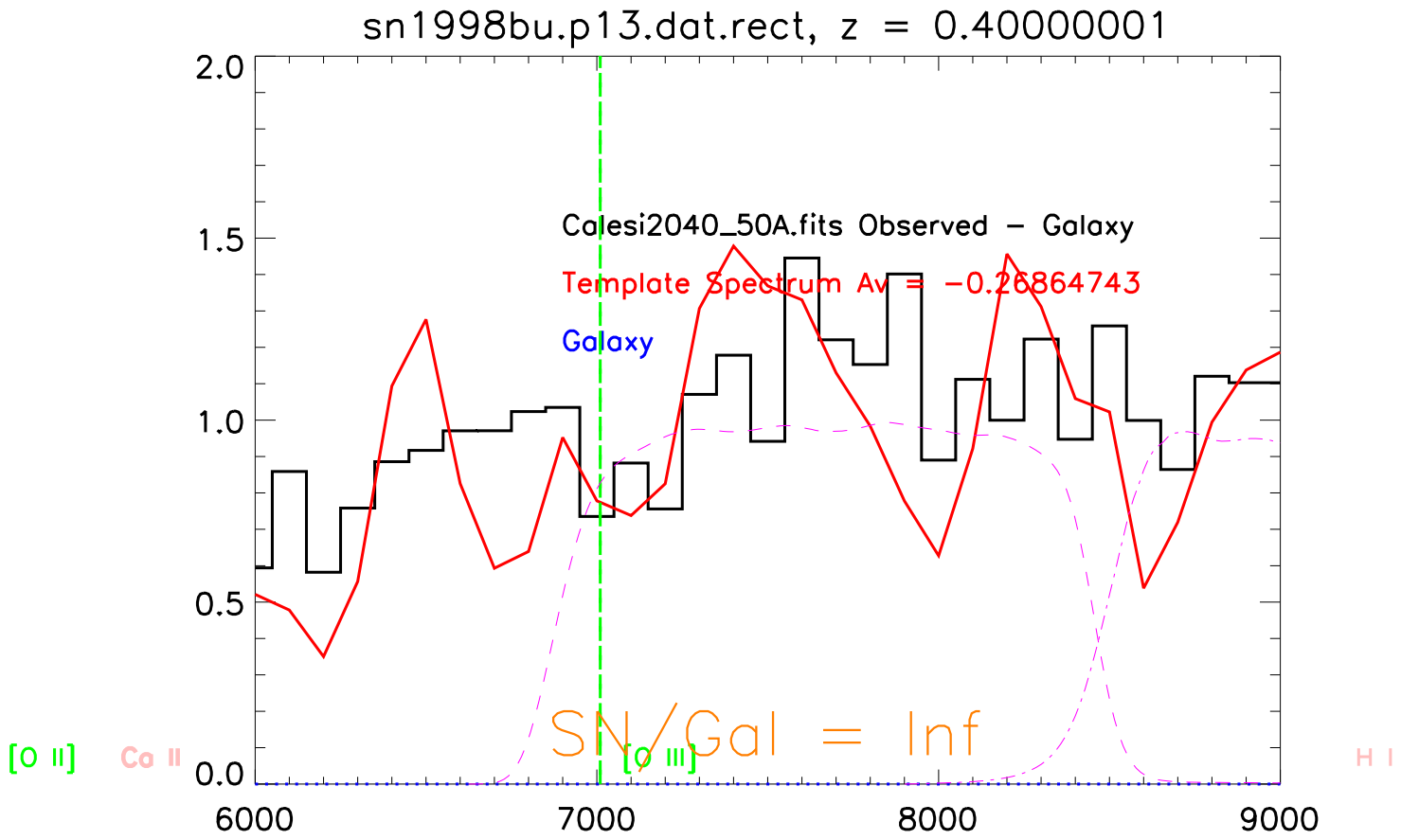
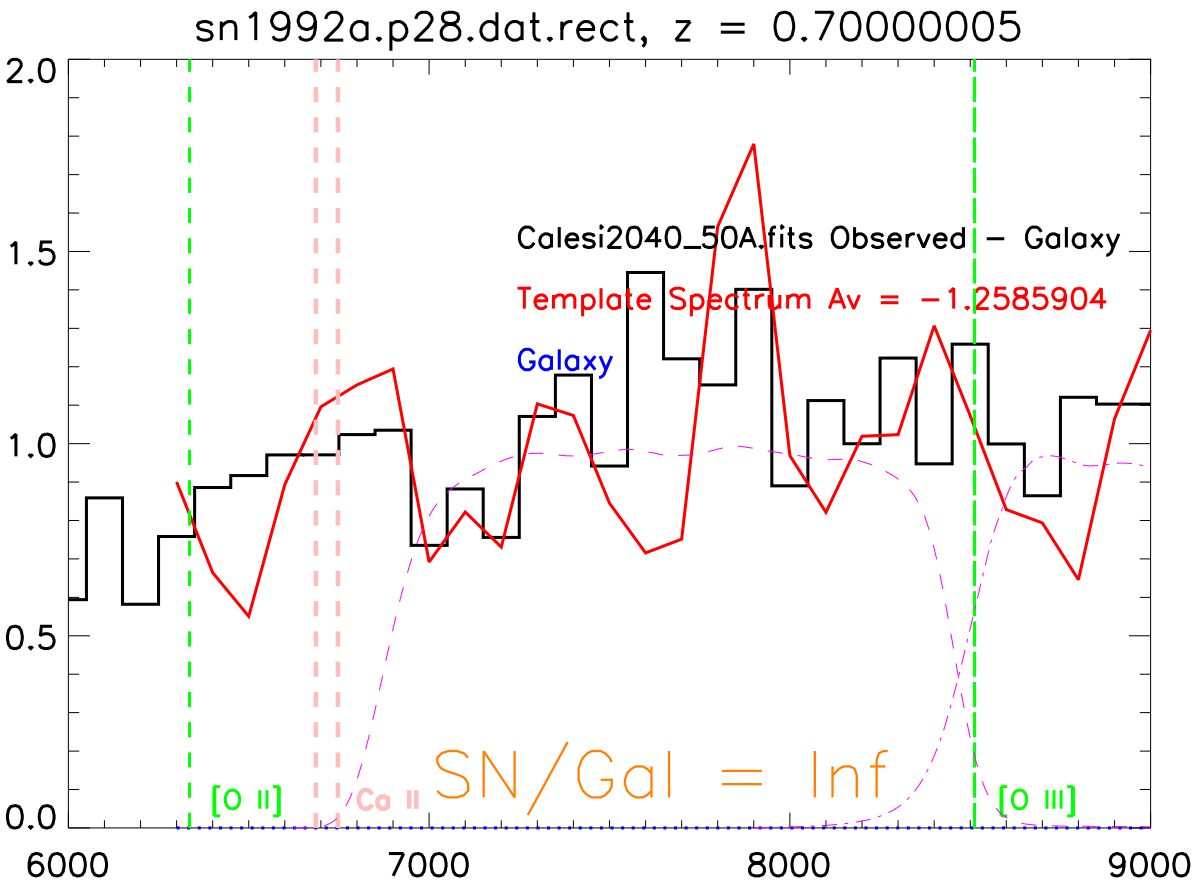
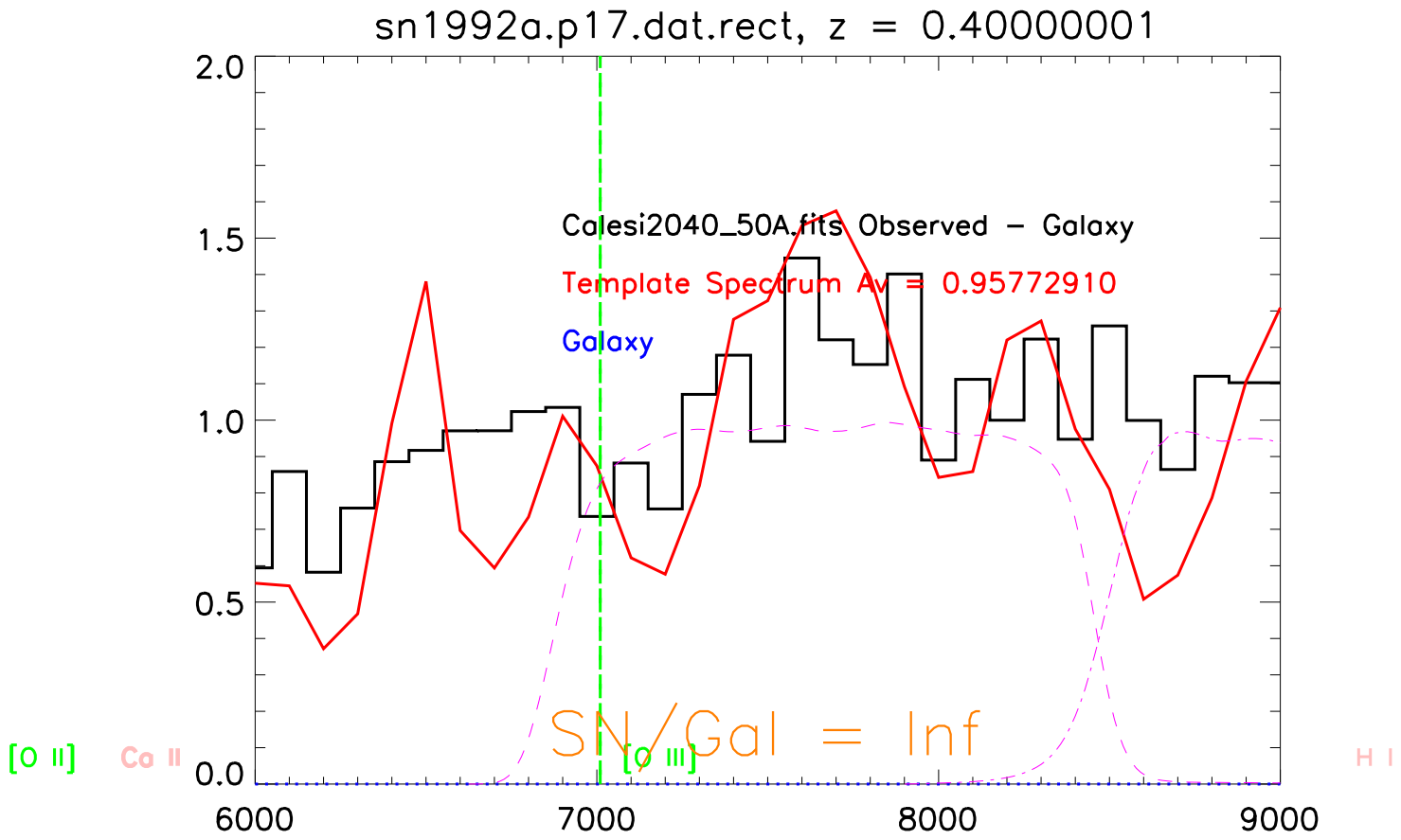
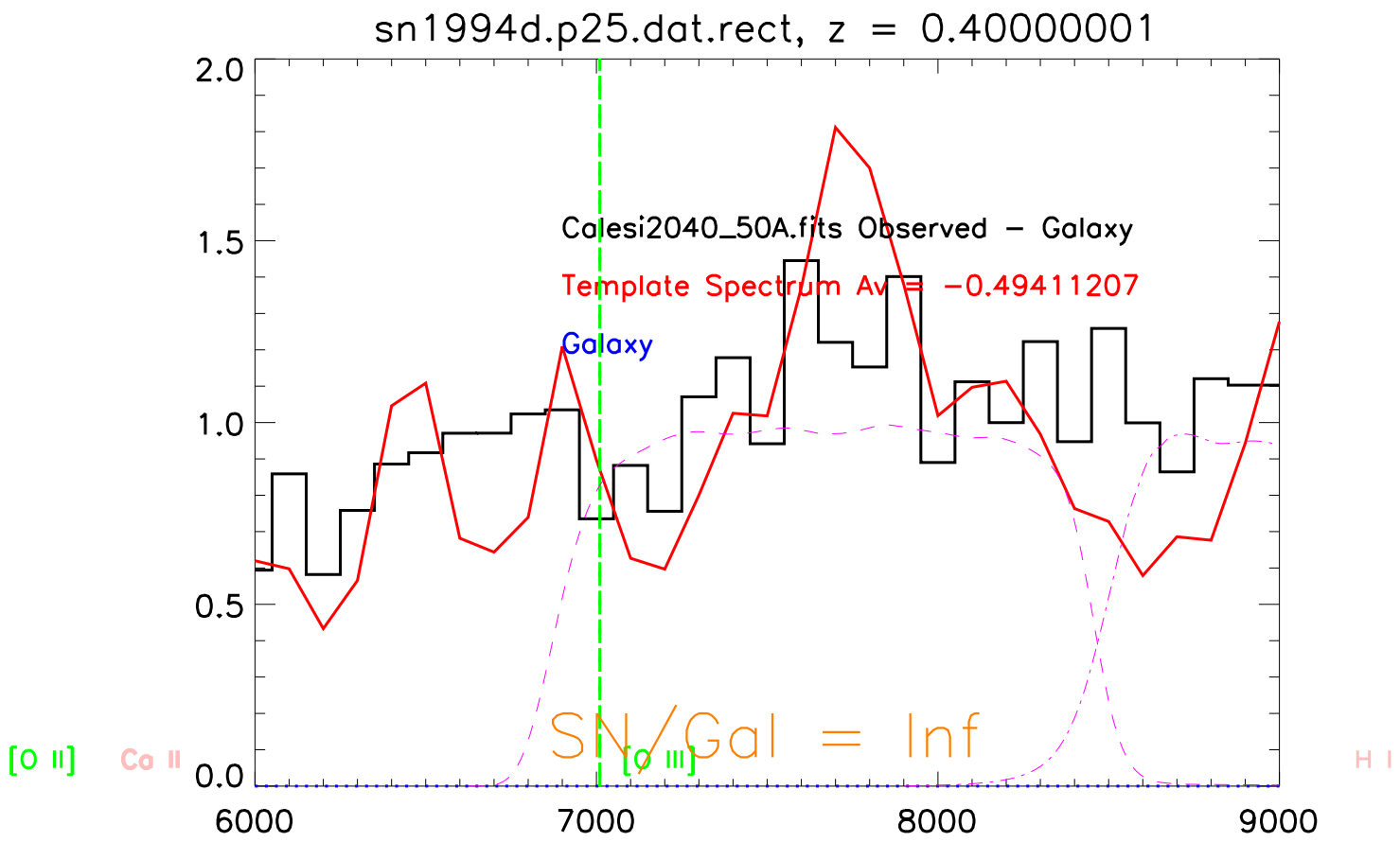
1.5
1.0
0.5
0.0
6000
7000
8000
9000

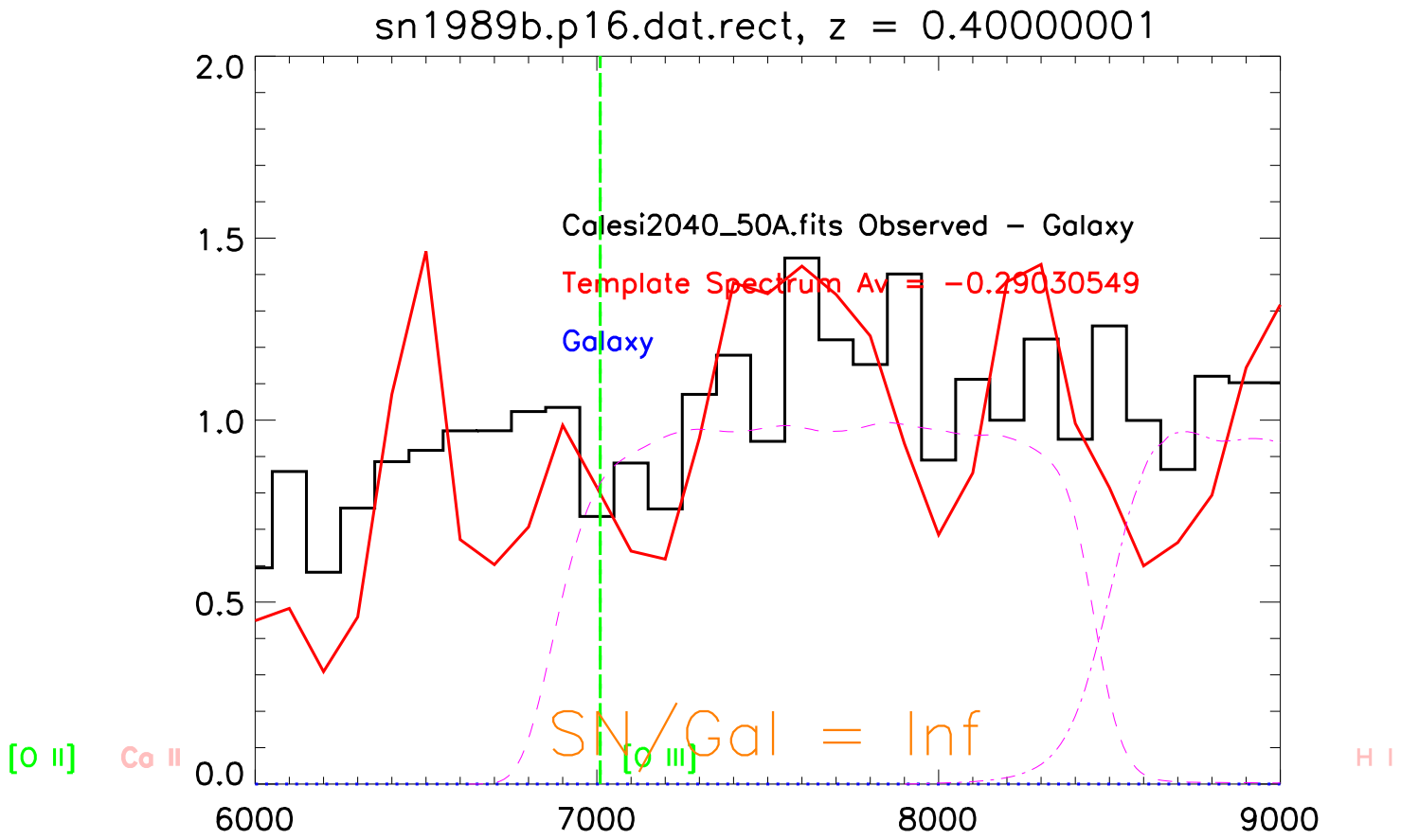

sn1989b.p18.dat.rect, z = 0.40000001
Calesi2040_50A.fits Observed − Galaxy
Template Spectrum Av = −0.87402584
Galaxy
SN/Gal = Inf
[O II]
Ca II
[O III]
H I
2.0
1.5
1.0
0.5
0.0
6000
7000
8000
9000

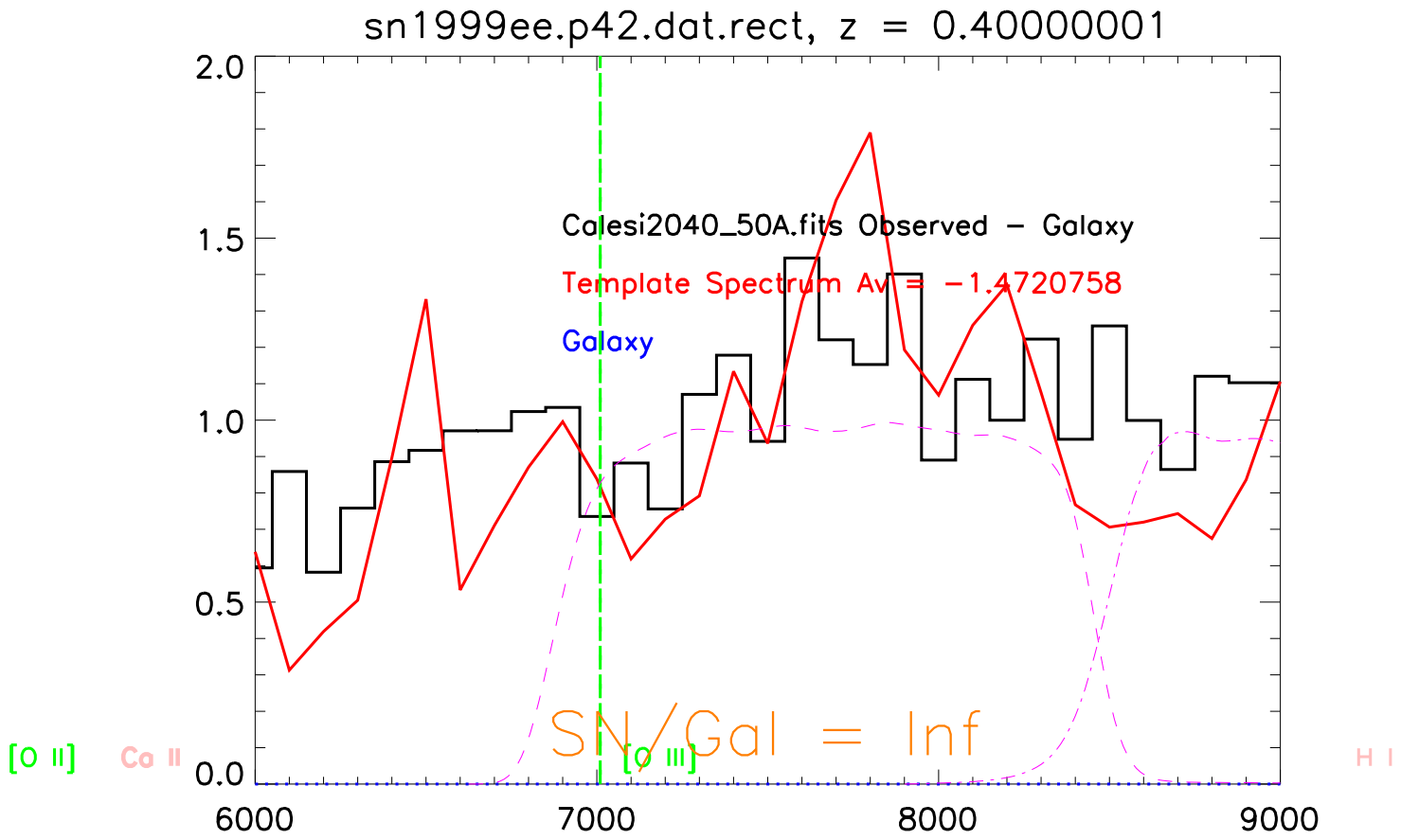

sn1998bu.p13.dat.rect, z = 0.40000001
Calesi2040_50A.fits Observed − Galaxy
Template Spectrum Av = −0.26864743
Galaxy
SN/Gal = Inf
[O II]
Ca II
[O III]
H I
2.0
1.5
1.0
0.5
0.0
6000
7000
8000
9000

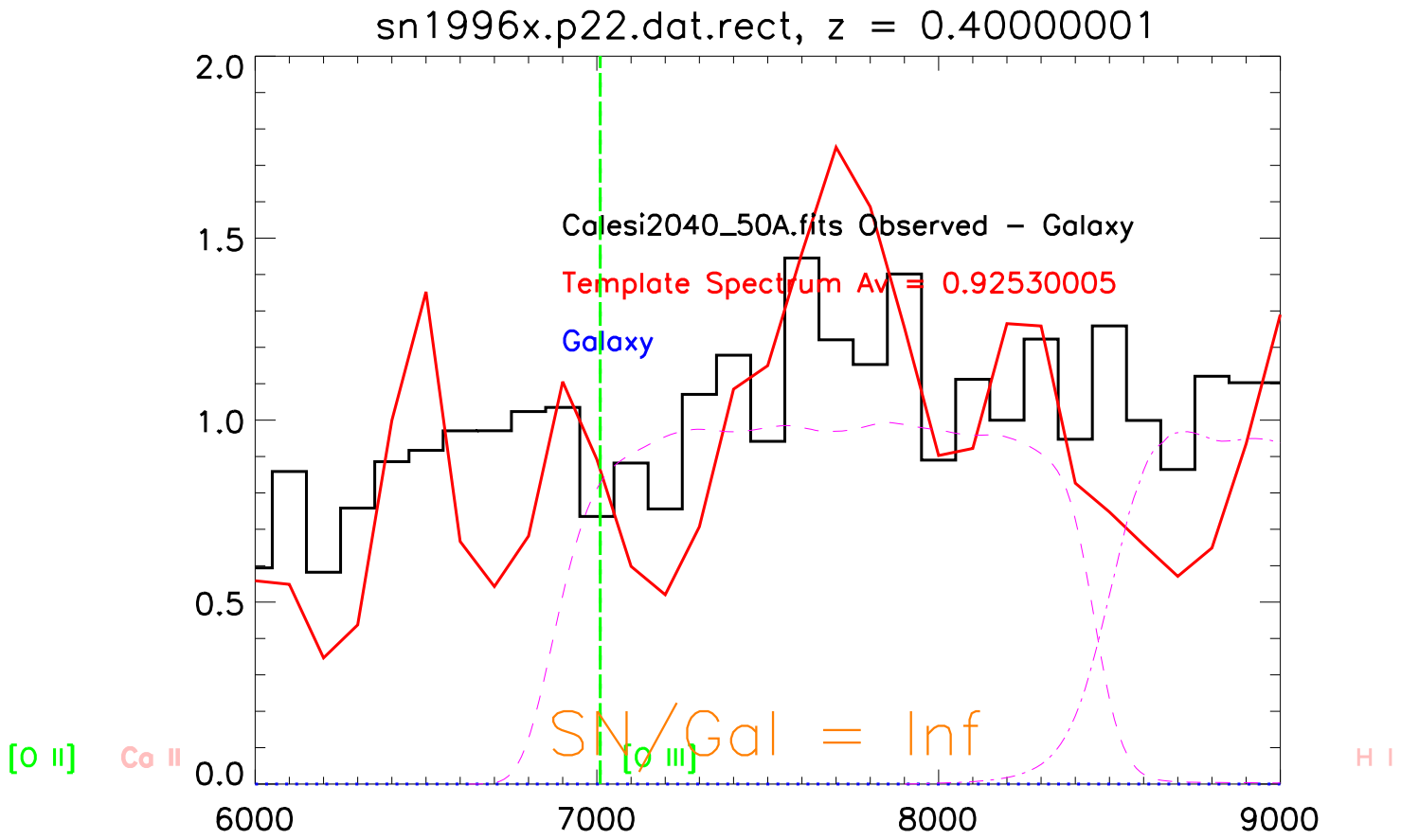

sn1992a.p28.dat.rect, z = 0.70000005
Calesi2040_50A.fits Observed − Galaxy
Template Spectrum Av = −1.2585904
Galaxy
SN/Gal = Inf
[O II]
Ca II
[O III]
2.0
1.5
1.0
0.5
0.0
6000
7000
8000
9000

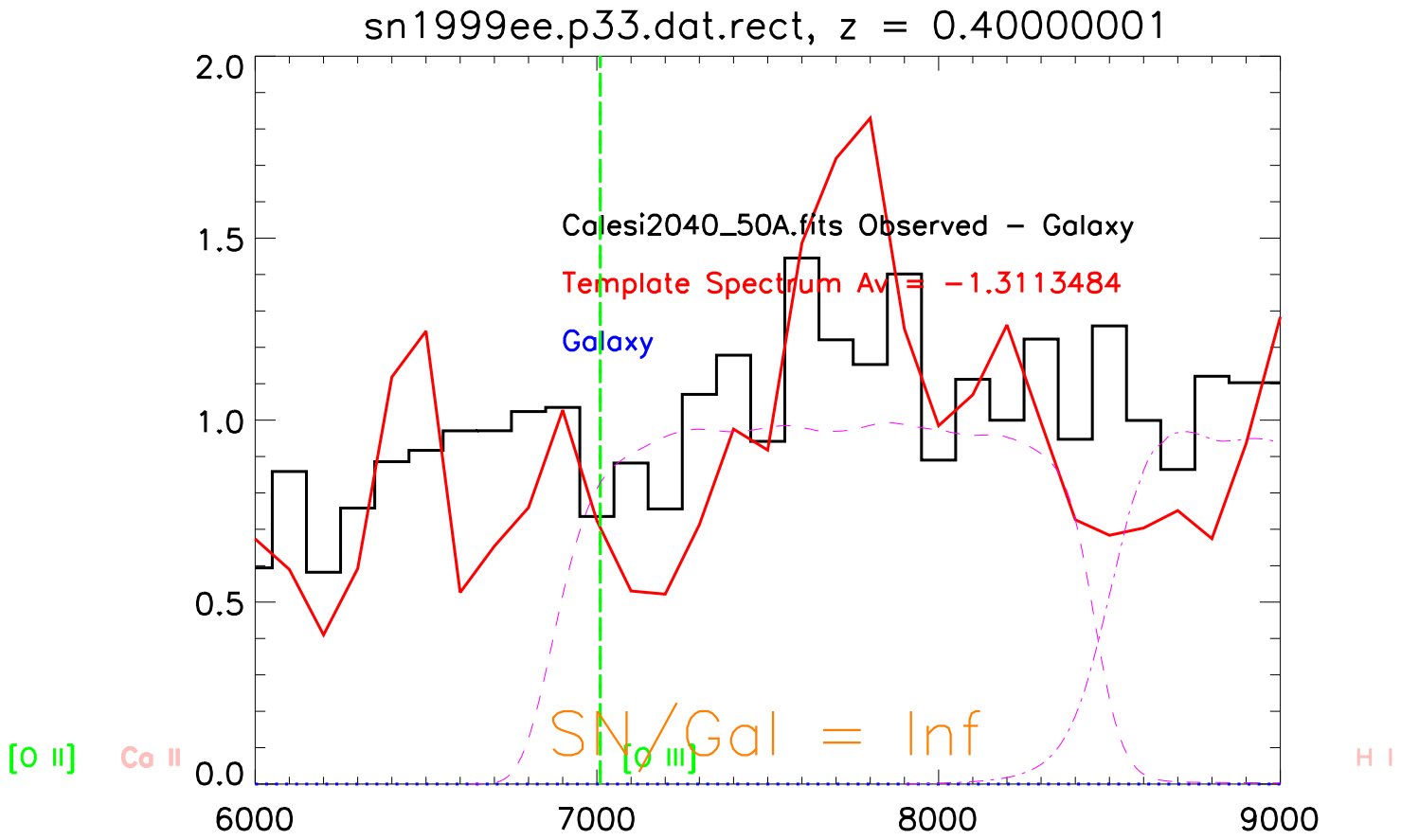

sn1992a.p17.dat.rect, z = 0.40000001
Calesi2040_50A.fits Observed − Galaxy
Template Spectrum Av = 0.95772910
Galaxy
SN/Gal = Inf
[O II]
Ca II
[O III]
H I
2.0
1.5
1.0
0.5
0.0
6000
7000
8000
9000


sn1994d.p25.dat.rect, z = 0.40000001
Calesi2040_50A.fits Observed − Galaxy
Template Spectrum Av = −0.49411207
Galaxy
SN/Gal = Inf
[O II]
Ca II
[O III]
H I
2.0
1.5
1.0
0.5
0.0
6000
7000
8000
9000


sn1989b.p16.dat.rect, z = 0.40000001
Calesi2040_50A.fits Observed − Galaxy
Template Spectrum Av = −0.29030549
Galaxy
SN/Gal = Inf
[O II]
Ca II
[O III]
H I
2.0
1.5
1.0
0.5
0.0
6000
7000
8000
9000


sn1999ee.p42.dat.rect, z = 0.40000001
Calesi2040_50A.fits Observed − Galaxy
Template Spectrum Av = −1.4720758
Galaxy
SN/Gal = Inf
[O II]
Ca II
[O III]
H I
2.0
1.5
1.0
0.5
0.0
6000
7000
8000
9000


sn1996x.p22.dat.rect, z = 0.40000001
Calesi2040_50A.fits Observed − Galaxy
Template Spectrum Avl = 0.92530005
Galaxy
SN/Gal = Inf
[O II]
Ca II
[O III]
H I
2.0
1.5
1.0
0.5
0.0
6000
7000
8000
9000


sn1999ee.p33.dat.rect, z = 0.40000001
Calesi2040_50A.fits Observed − Galaxy
Template Spectrum Av = −1.3113484
Galaxy
SN/Gal = Inf
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Ca II
[O III]
H I
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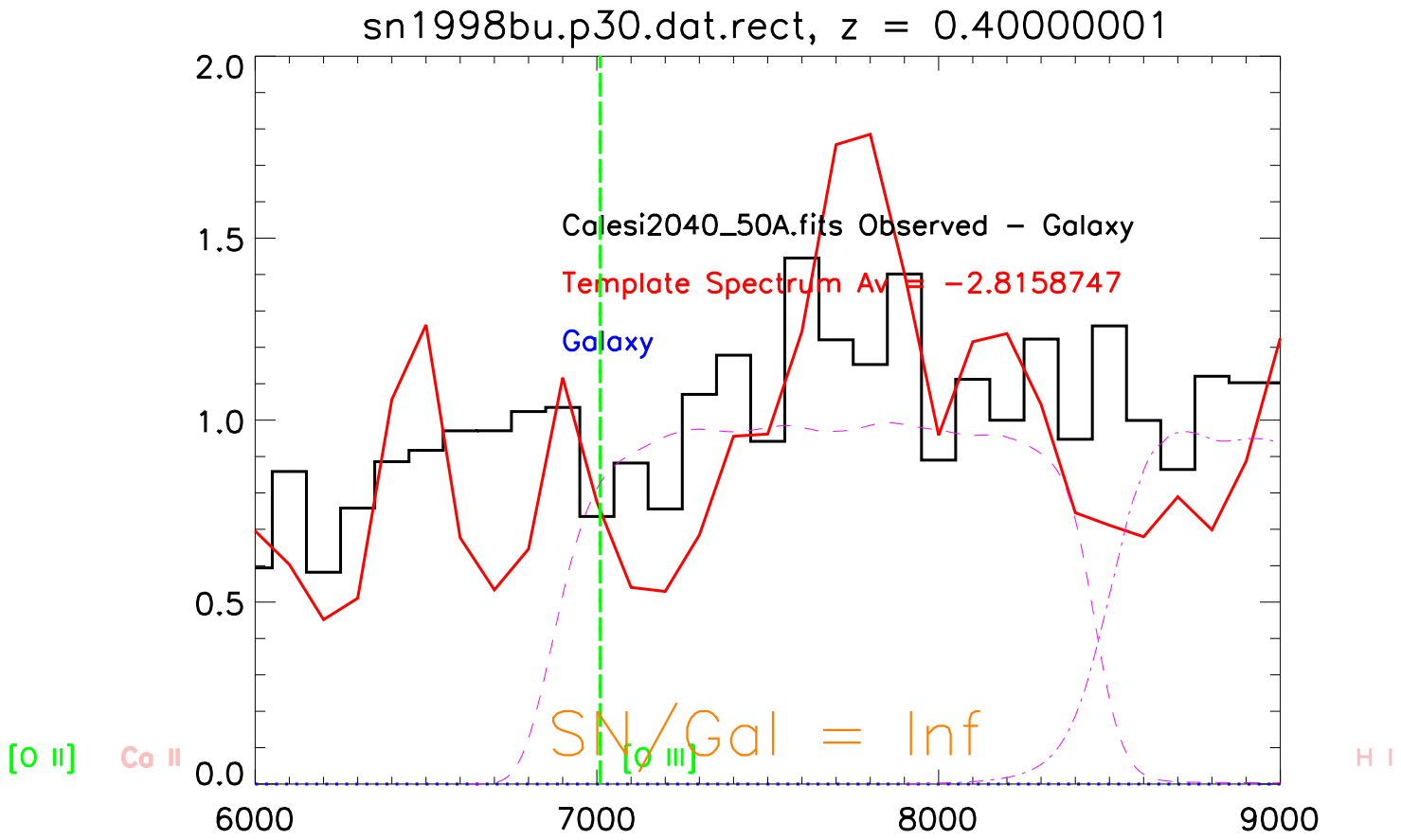
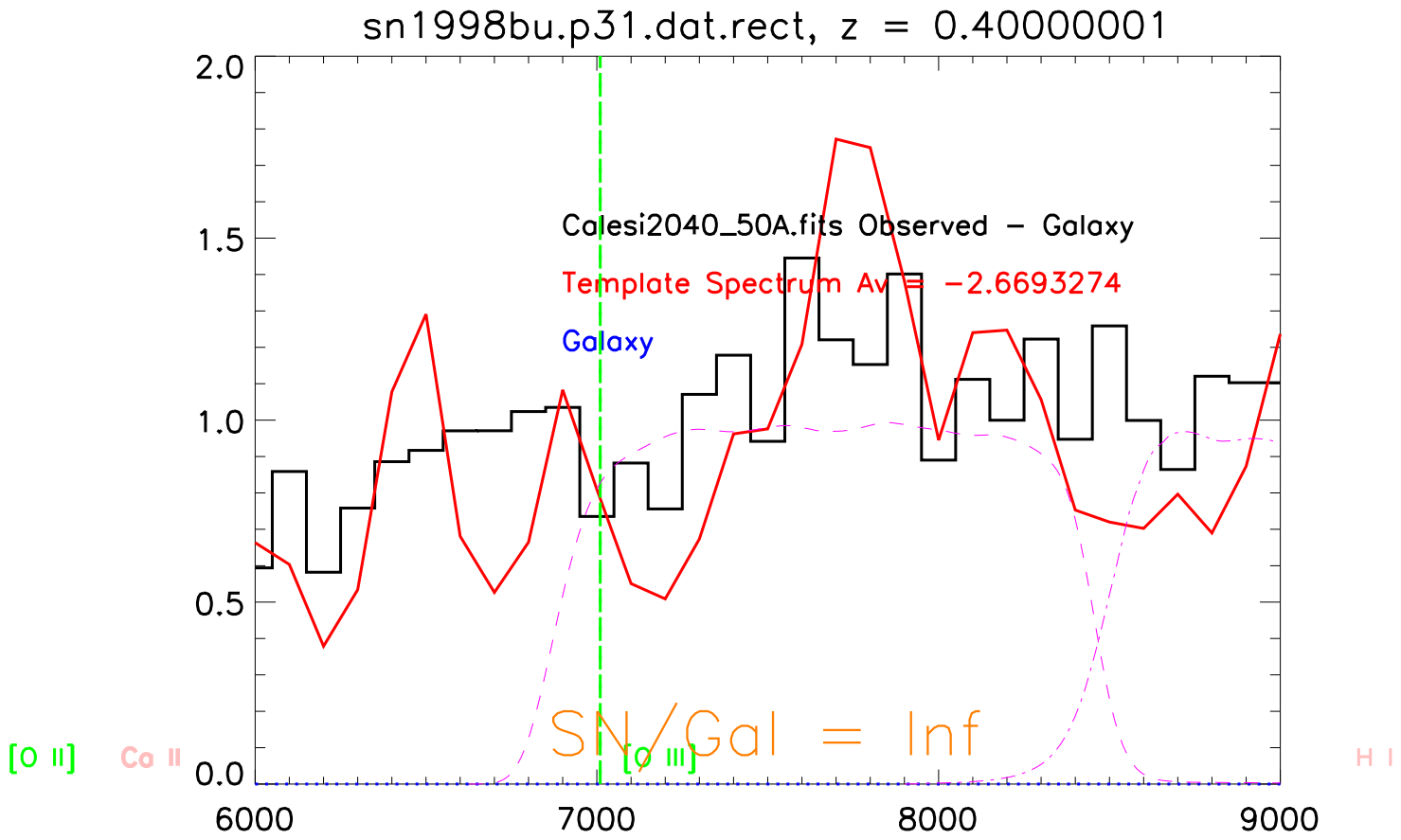
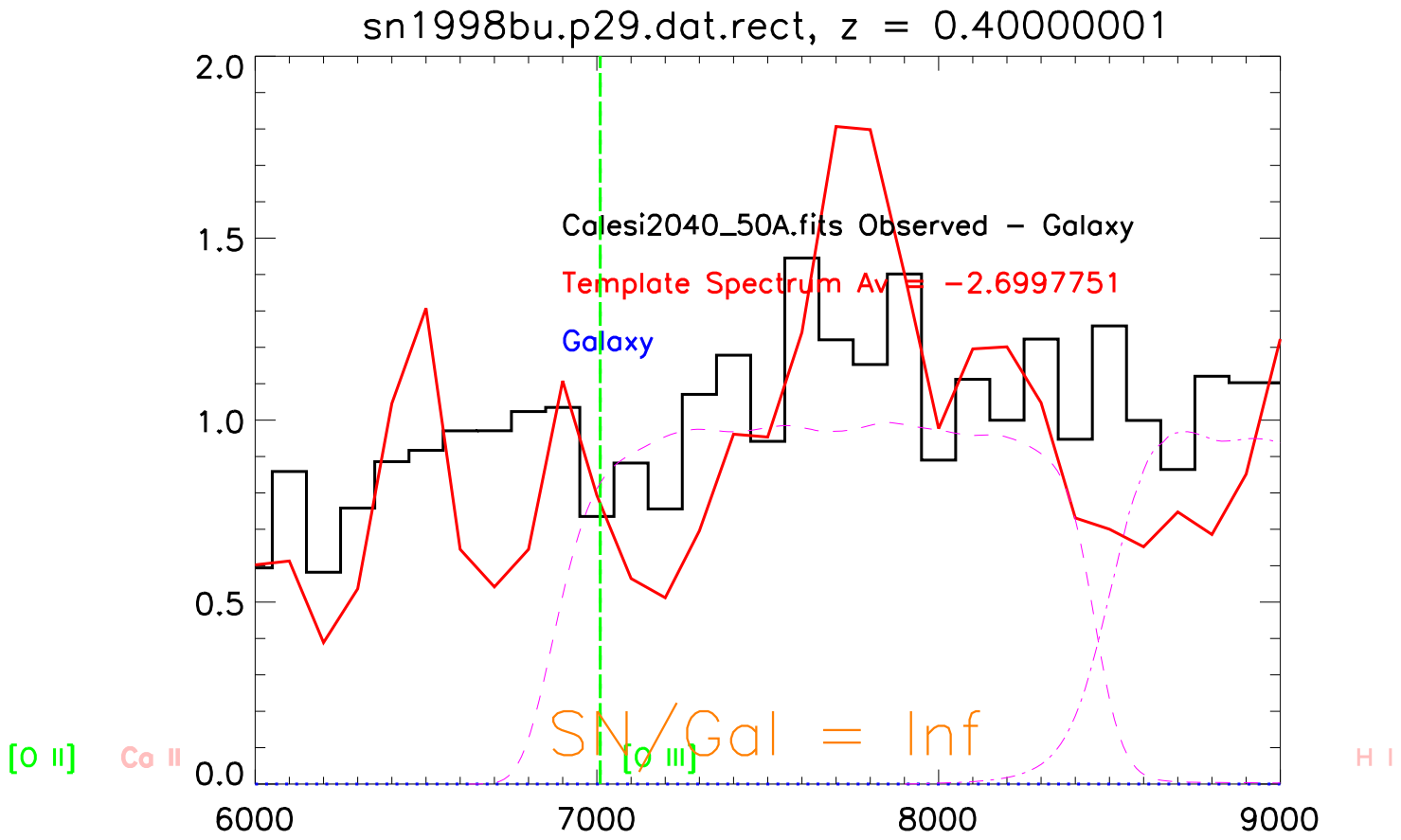
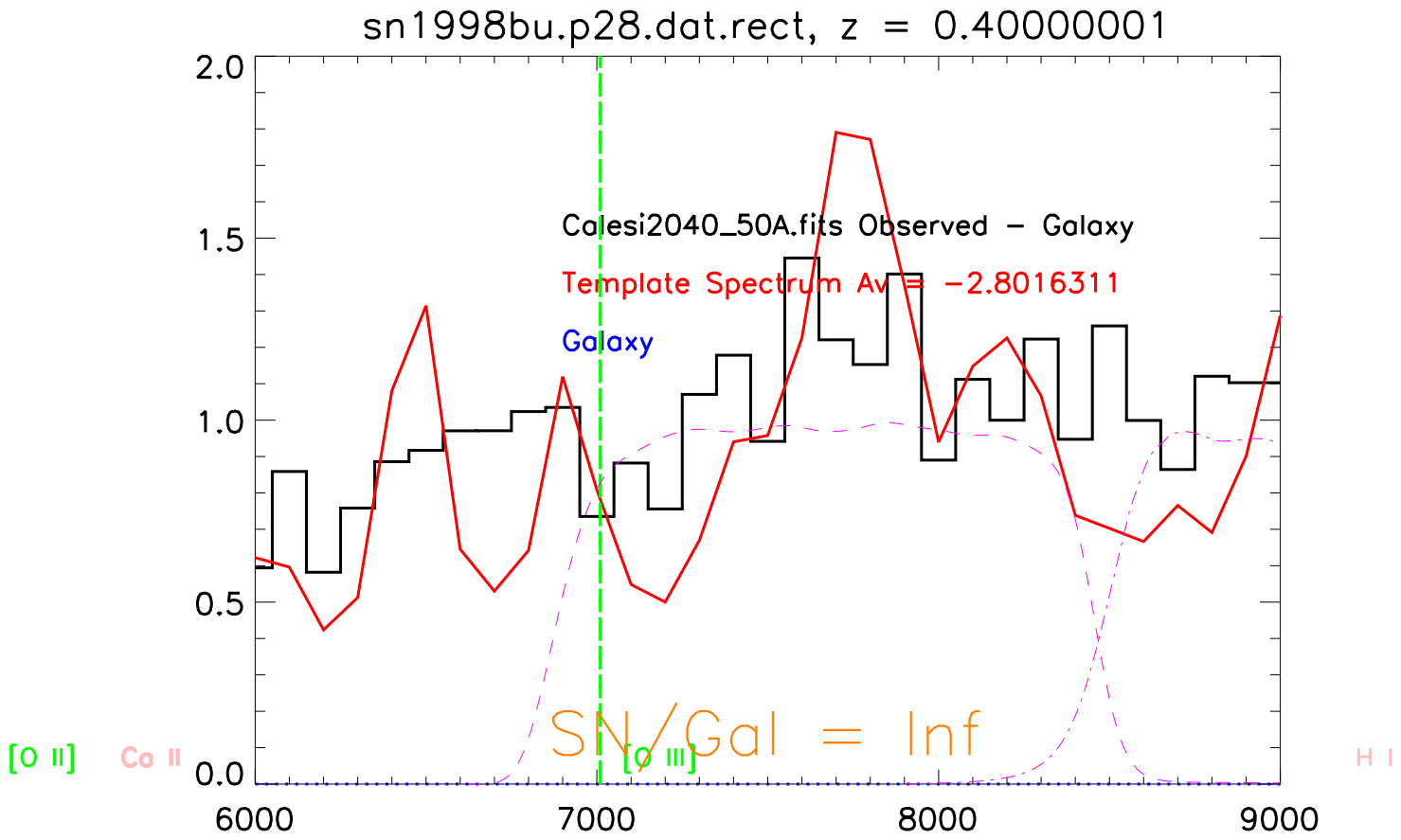
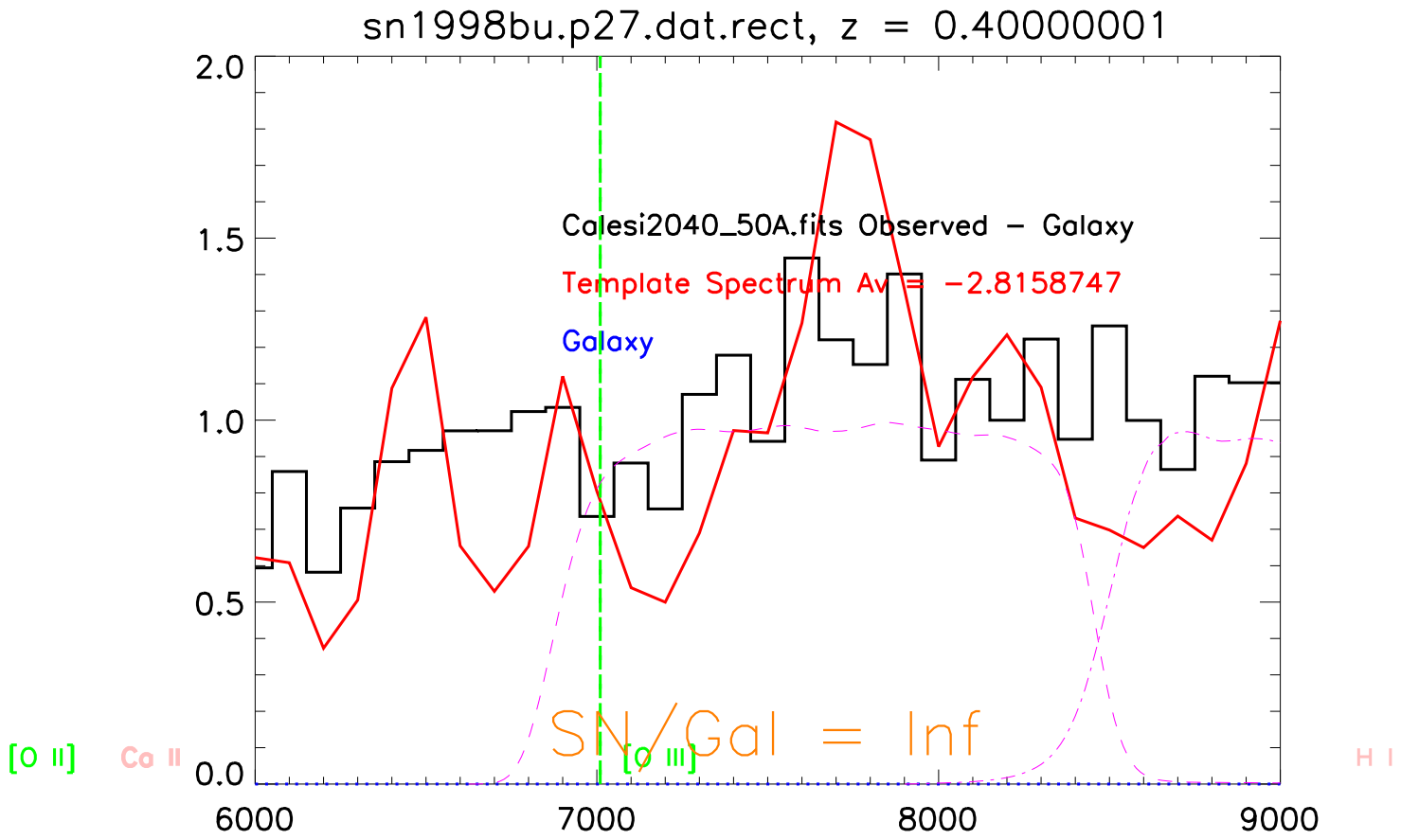
1.5
1.0
0.5
0.0
6000
7000
8000
9000


sn1998bu.p30.dat.rect, z = 0.40000001
Calesi2040_50A.fits Observed − Galaxy
Template Spectrum Av = −2.8158747
Galaxy
SN/Gal = Inf
[O II]
Ca II
[O III]
H I
2.0
1.5
1.0
0.5
0.0
6000
7000
8000
9000


sn1998bu.p31.dat.rect, z = 0.40000001
Calesi2040_50A.fits Observed − Galaxy
Template Spectrum Av = −2.6693274
Galaxy
SN/Gal = Inf
[O II]
Ca II
[O III]
H I
2.0
1.5
1.0
0.5
0.0
6000
7000
8000
9000


sn1998bu.p29.dat.rect, z = 0.40000001
Calesi2040_50A.fits Observed − Galaxy
Template Spectrum Av = −2.6997751
Galaxy
SN/Gal = Inf
[O II]
Ca II
[O III]
H I
2.0
1.5
1.0
0.5
0.0
6000
7000
8000
9000


sn1998bu.p28.dat.rect, z = 0.40000001
Calesi2040_50A.fits Observed − Galaxy
Template Spectrum Av = −2.8016311
Galaxy
SN/Gal = Inf
[O II]
Ca II
[O III]
H I
2.0
1.5
1.0
0.5
0.0
6000
7000
8000
9000


sn1998bu.p27.dat.rect, z = 0.40000001
Calesi2040_50A.fits Observed − Galaxy
Template Spectrum Av = −2.8158747
Galaxy
SN/Gal = Inf
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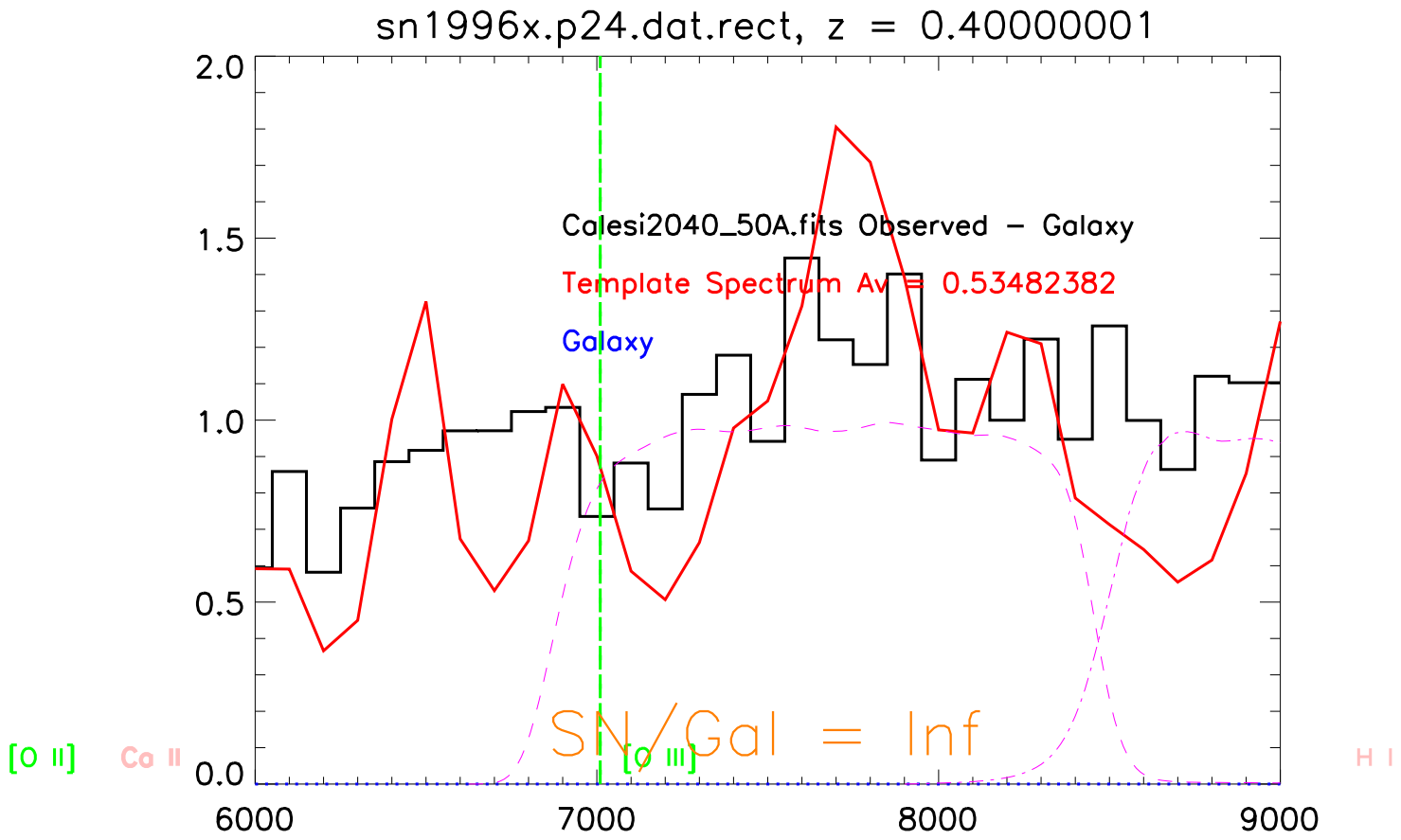
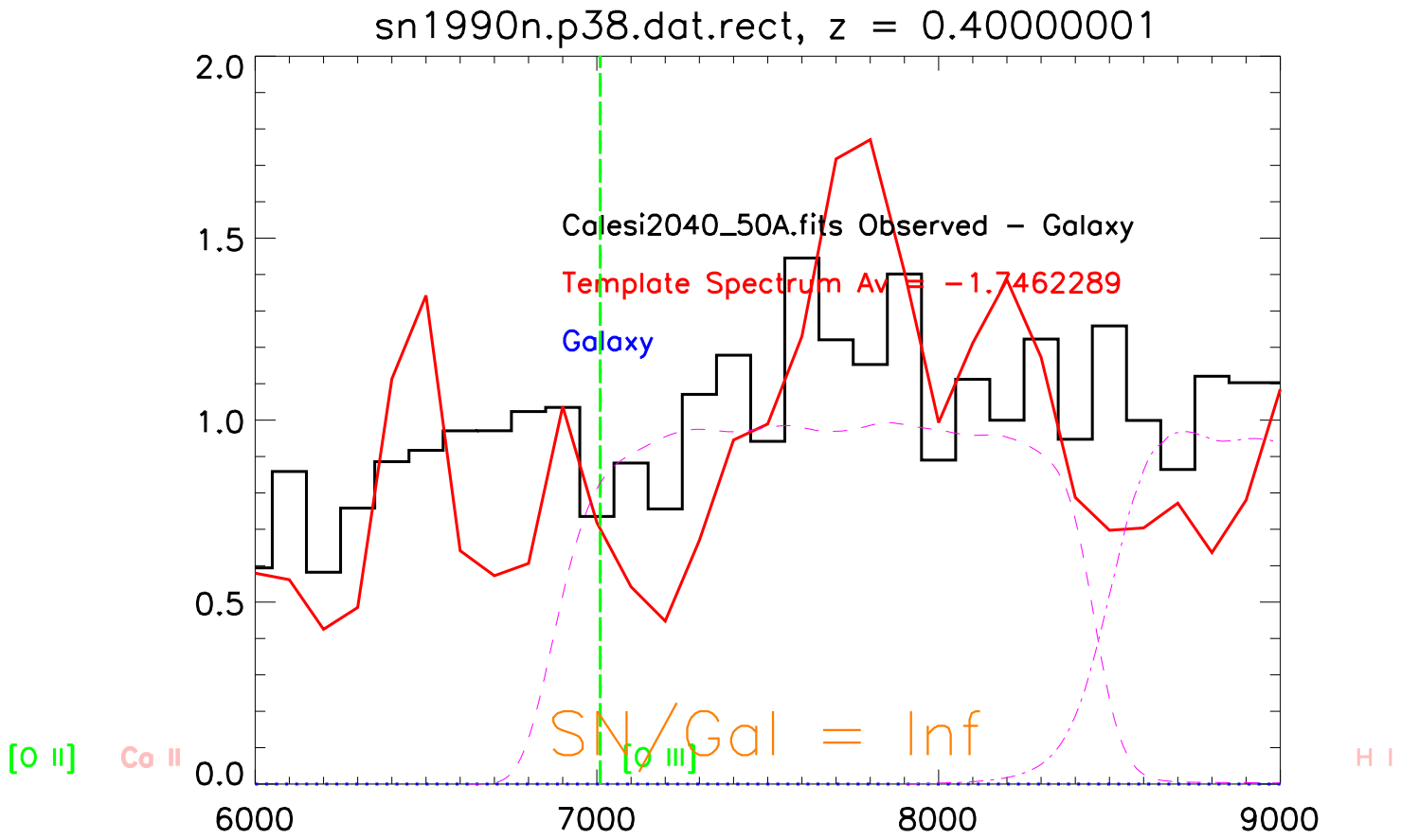
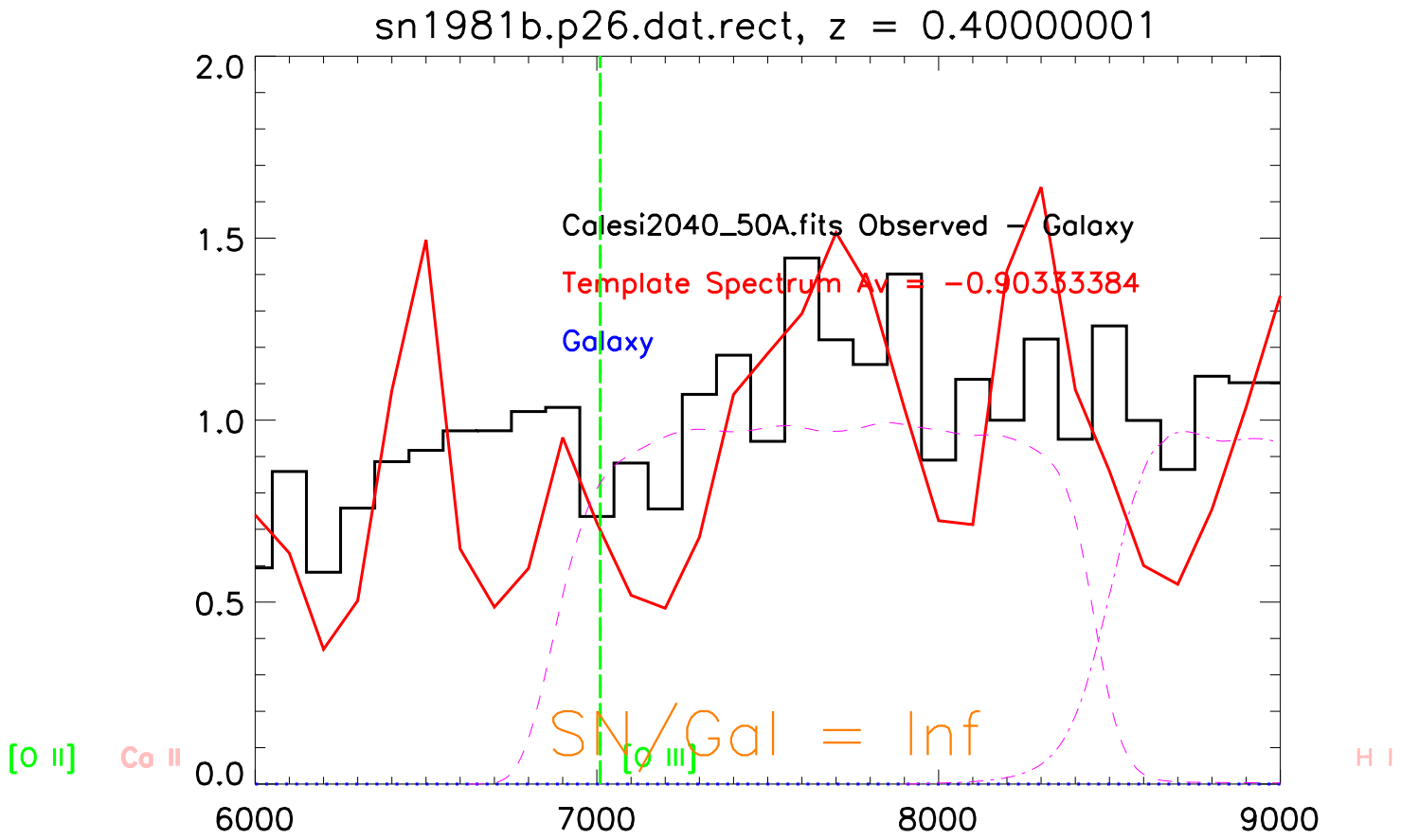
Ca II
[O III]
H I
2.0
1.5
1.0
0.5
0.0
6000
7000
8000
9000


sn1996x.p24.dat.rect, z = 0.40000001
Calesi2040_50A.fits Observed − Galaxy
Template Spectrum Av = 0.53482382
Galaxy
SN/Gal = Inf
[O II]
Ca II
[O III]
H I
2.0
1.5
1.0
0.5
0.0
6000
7000
8000
9000


sn1990n.p38.dat.rect, z = 0.40000001
Calesi2040_50A.fits Observed − Galaxy
Template Spectrum Av = −1.7462289
Galaxy
SN/Gal = Inf
[O II]
Ca II
[O III]
H I
2.0
1.5
1.0
0.5
0.0
6000
7000
8000
9000


sn1981b.p26.dat.rect, z = 0.40000001
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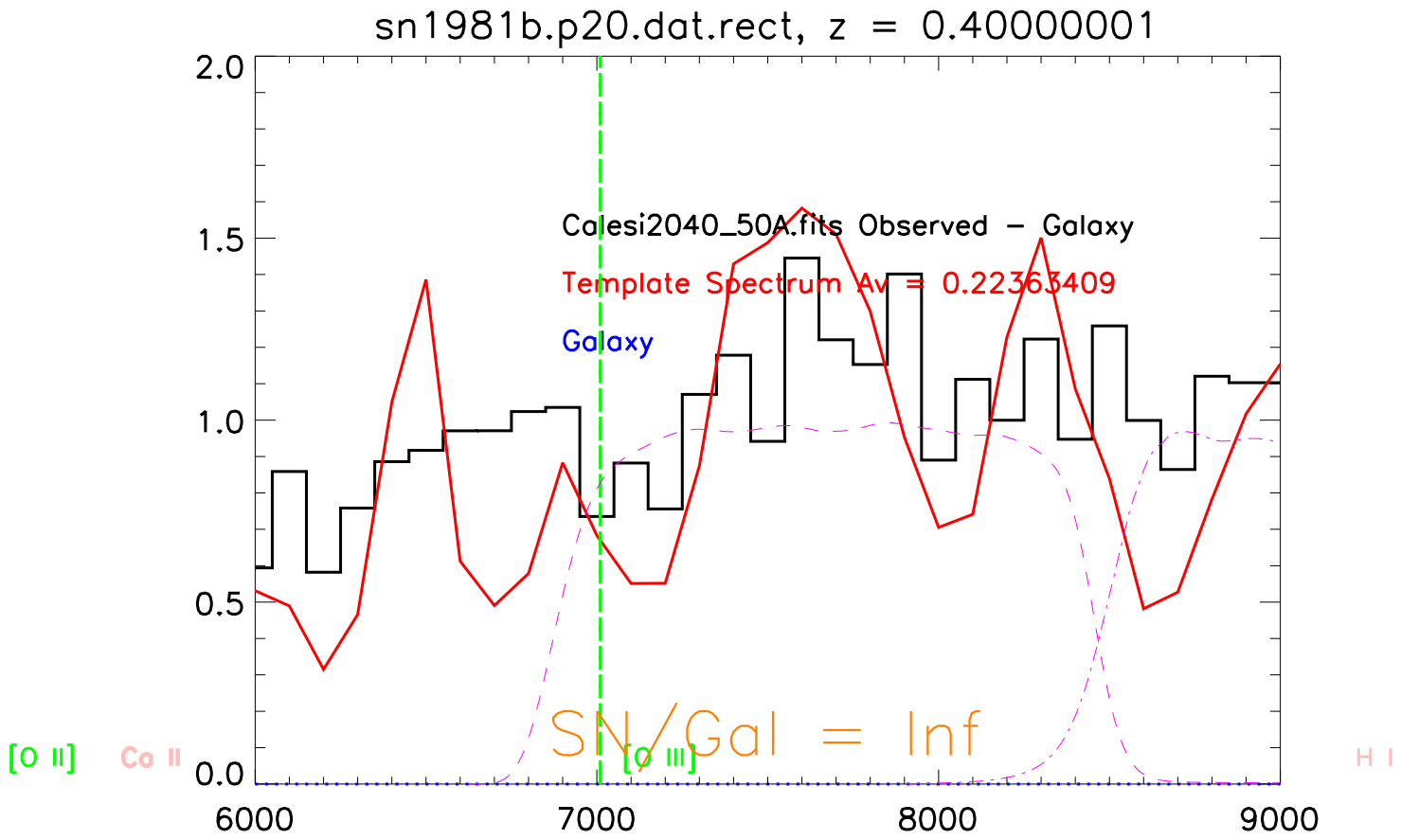
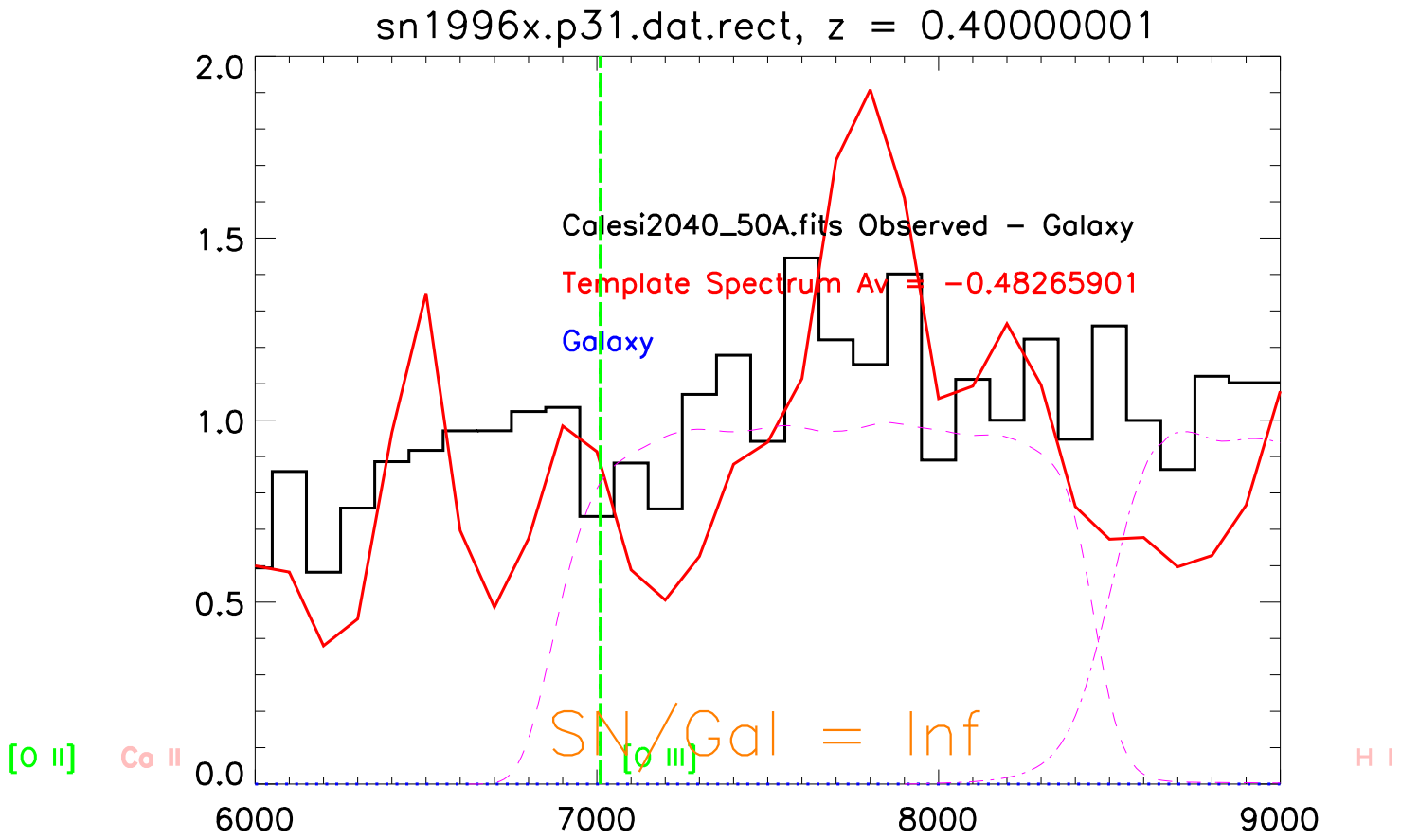
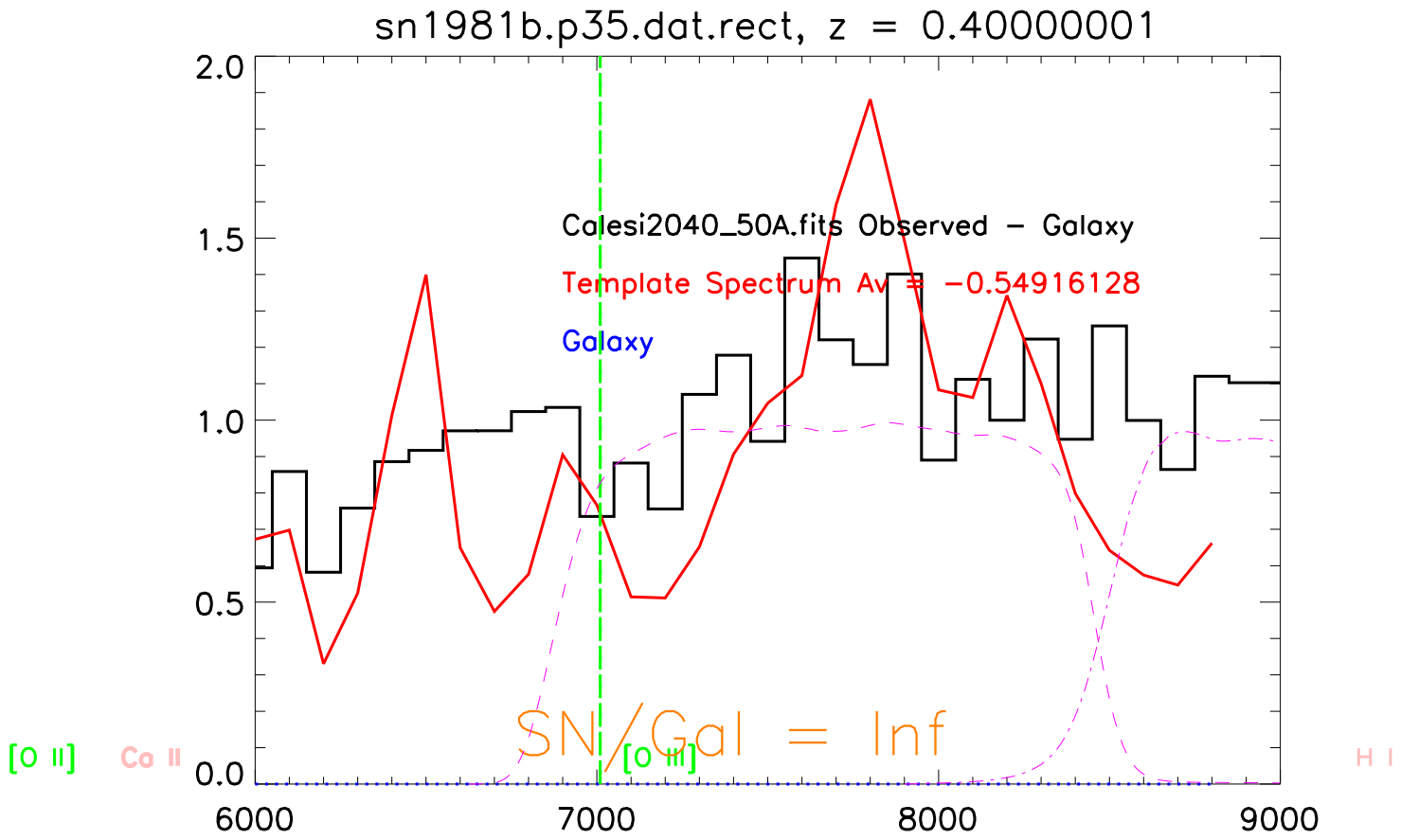
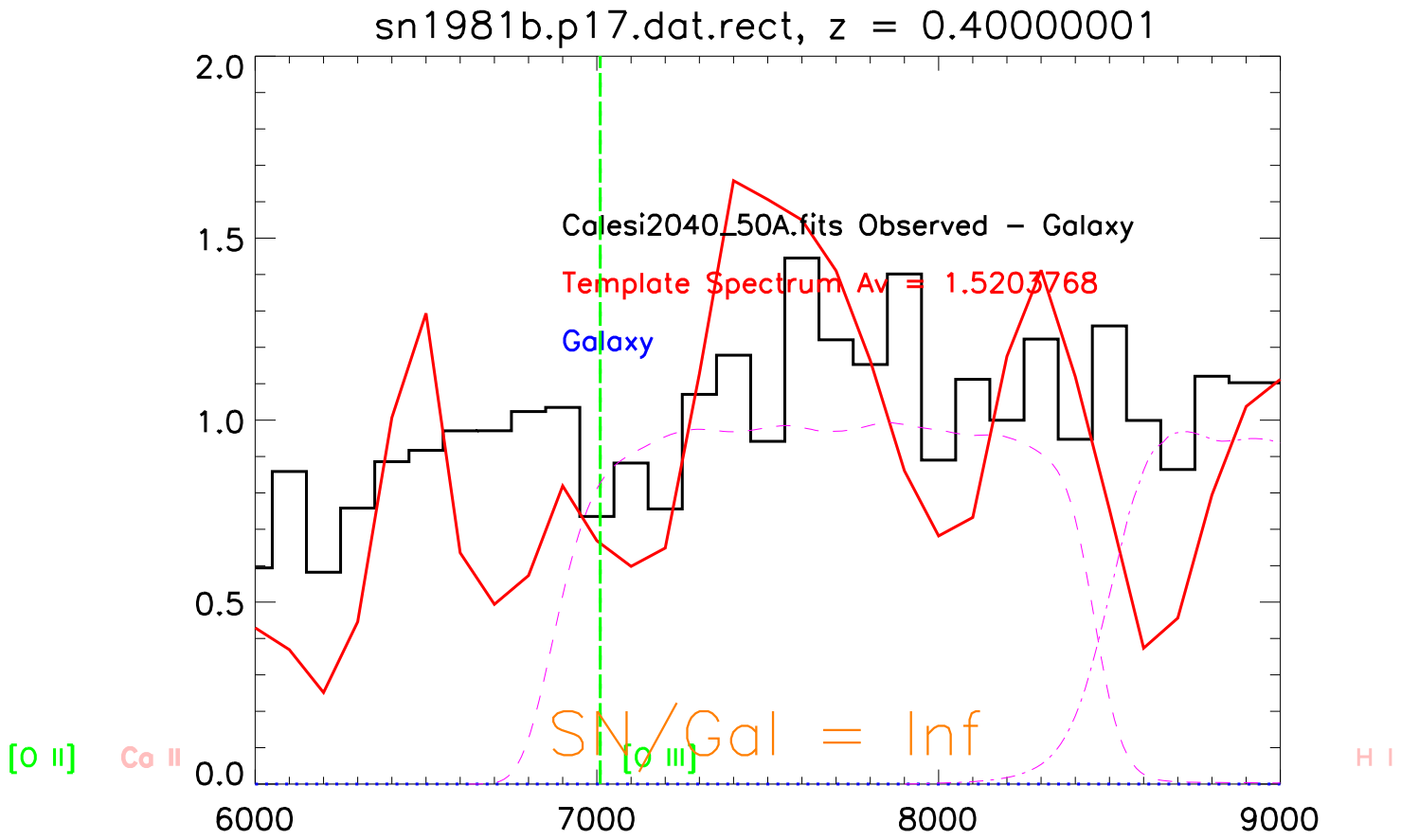
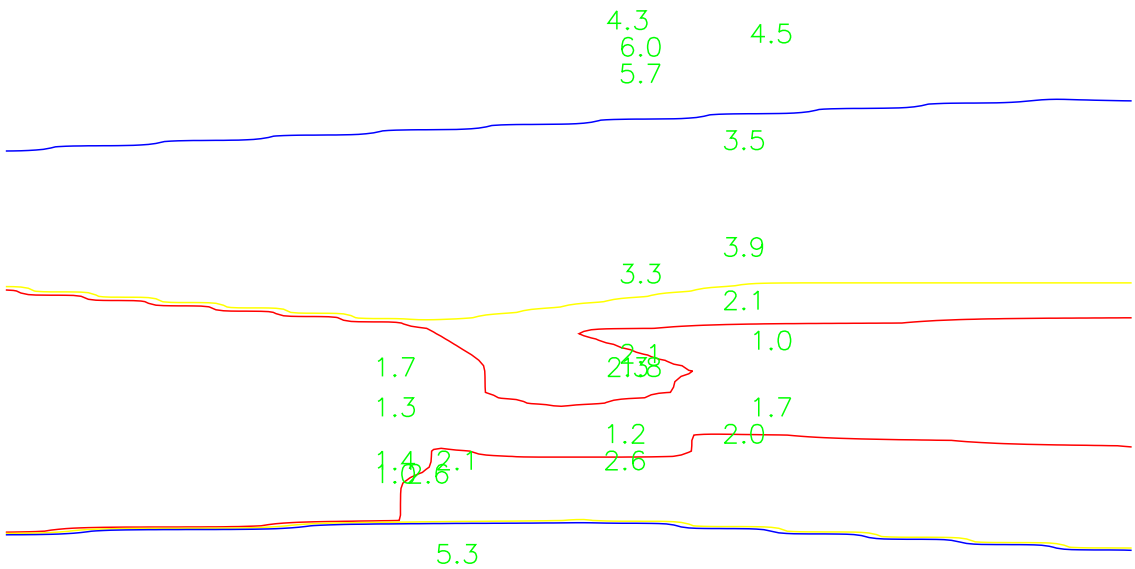
1.5
1.0
0.5
0.0
6000
7000
8000
9000
Calesi2040_50A.fits Observed – Galaxy
Template Spectrum Av = −0.90333384
Galaxy
SN/Gal = Inf
[O II]
Ca II
[O III]
H I

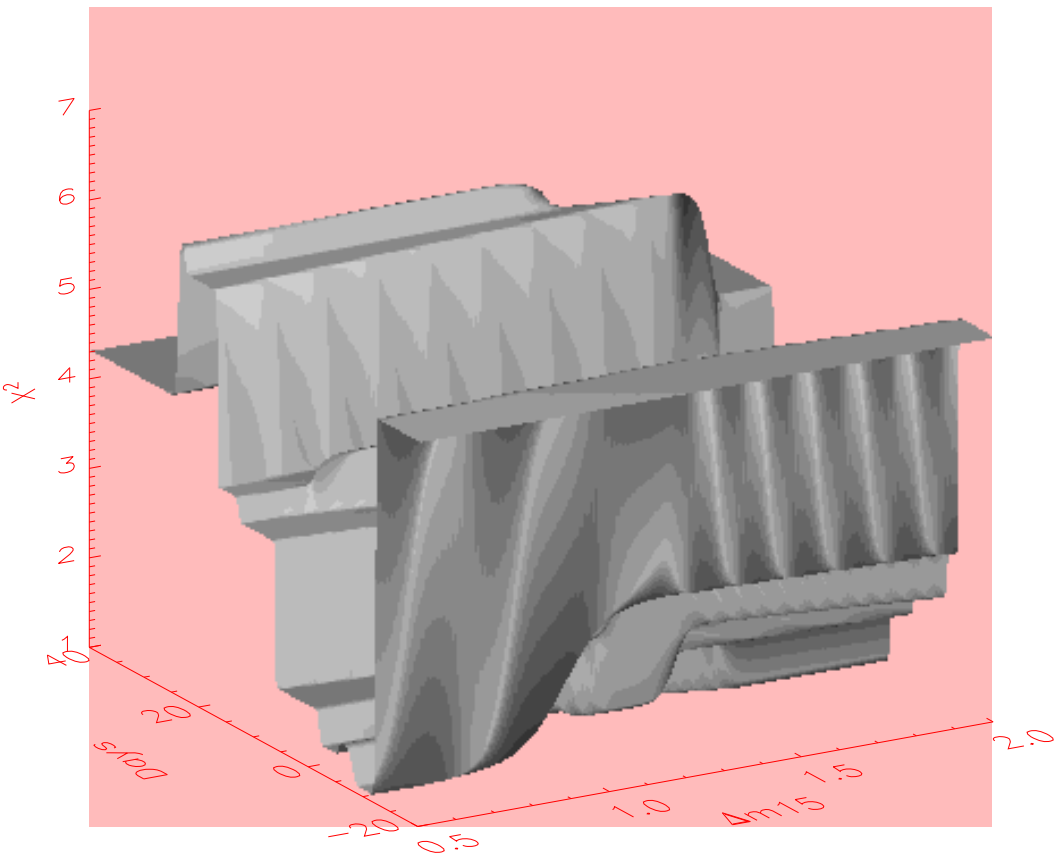

sn1981b.p20.dat.rect, z = 0.40000001
Calesi2040_50A.fits Observed − Galaxy
Template Spectrum Av = 0.22363409
Galaxy
SN/Gal = Inf
[O II]
Ca II
[O III]
H I
2.0
1.5
1.0
0.5
0.0
6000
7000
8000
9000


sn1996x.p31.dat.rect, z = 0.40000001
Calesi2040_50A.fits Observed − Galaxy
Template Spectrum Av = −0.48265901
Galaxy
SN/Gal = Inf
[O II]
Ca II
[O III]
H I
2.0
1.5
1.0
0.5
0.0
6000
7000
8000
9000

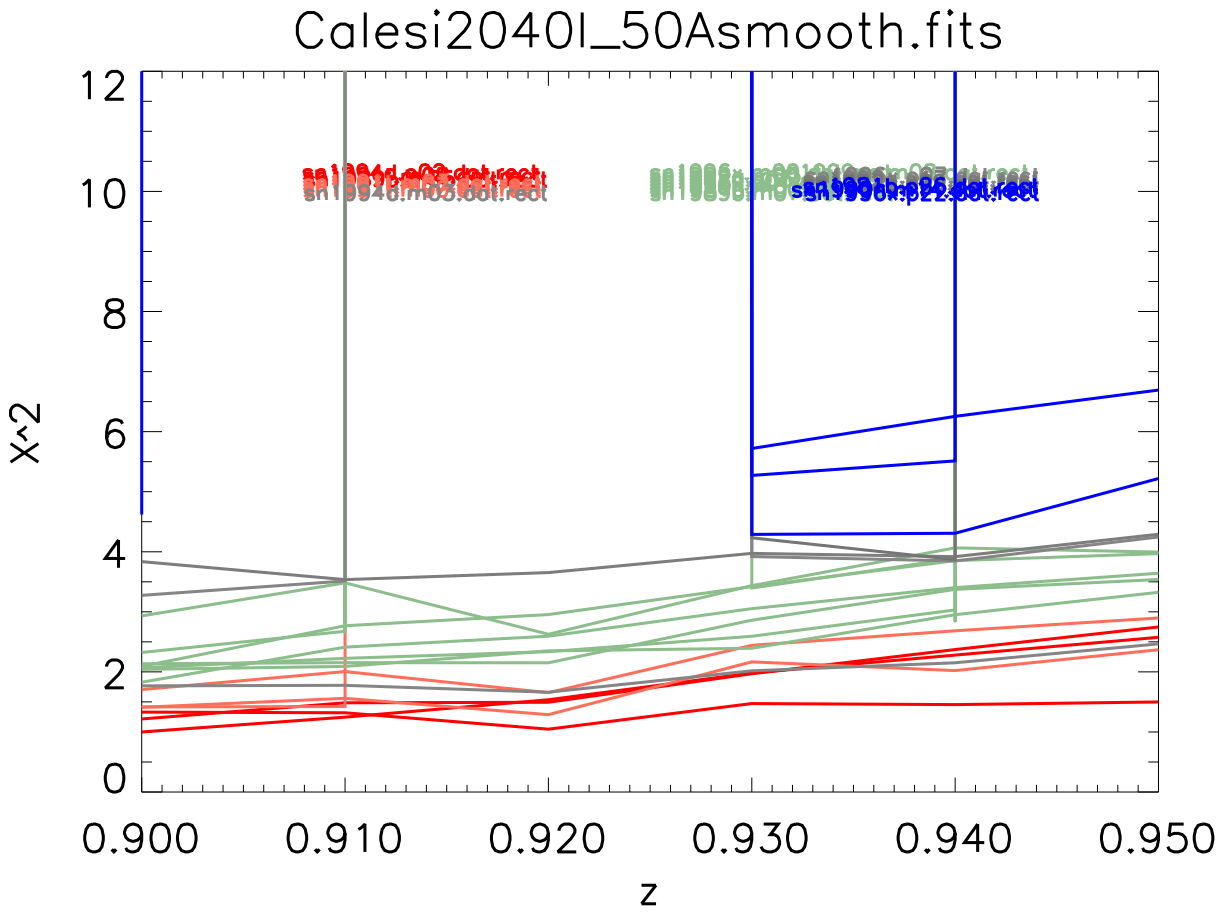

sn1981b.p35.dat.rect, z = 0.40000001
Calesi2040_50A.fits Observed − Galaxy
Template Spectrum Av = −0.54916128
Galaxy
SN/Gal = Inf
[O II]
Ca II
[O III]
H I
2.0
1.5
1.0
0.5
0.0
6000
7000
8000
9000

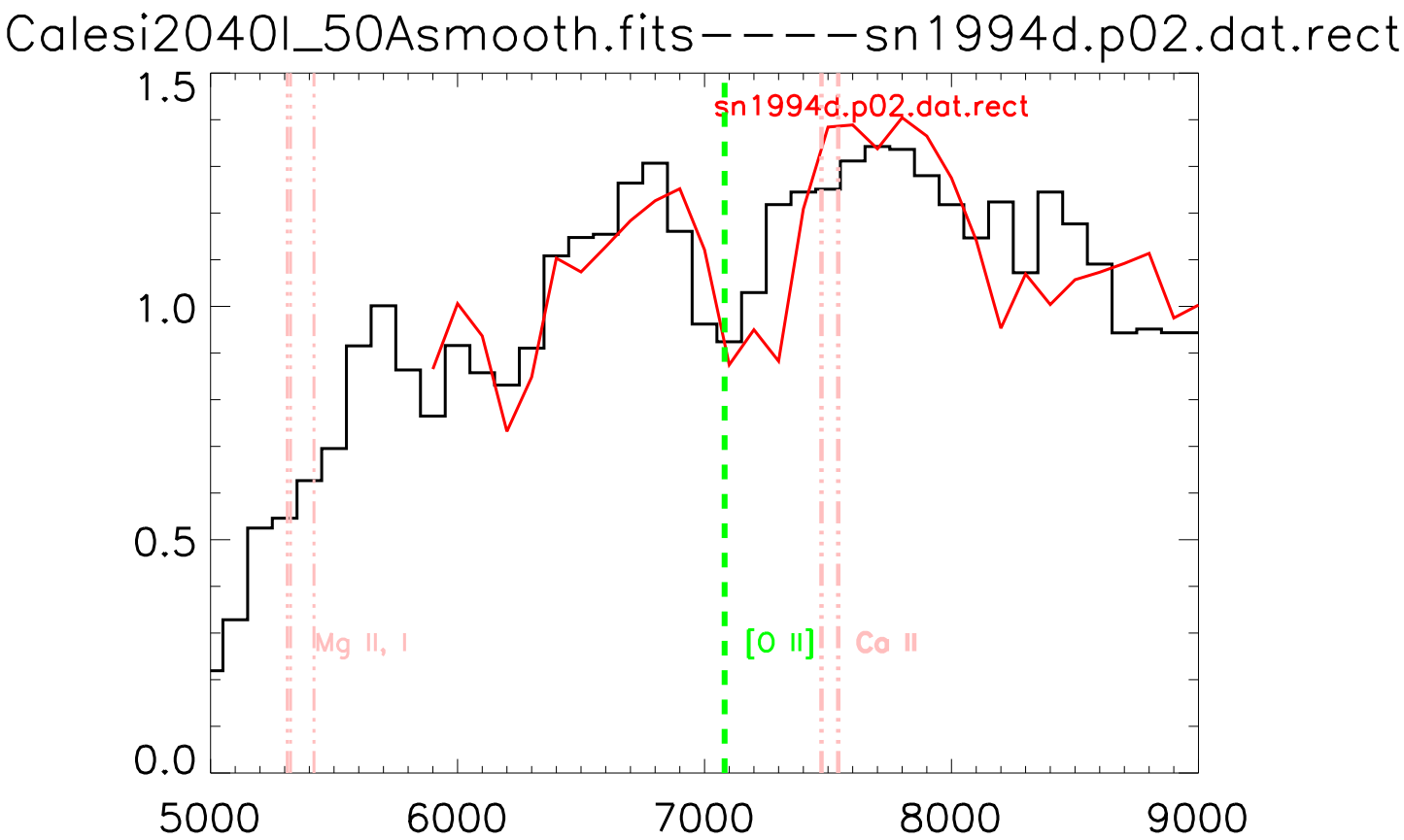

sn1981b.p17.dat.rect, z = 0.40000001
Calesi2040_50A.fits Observed − Galaxy
Template Spectrum Av = 1.5203768
Galaxy
SN/Gal = Inf
[O II]
Ca II
[O III]
H I
2.0
1.5
1.0
0.5
0.0
6000
7000
8000
9000

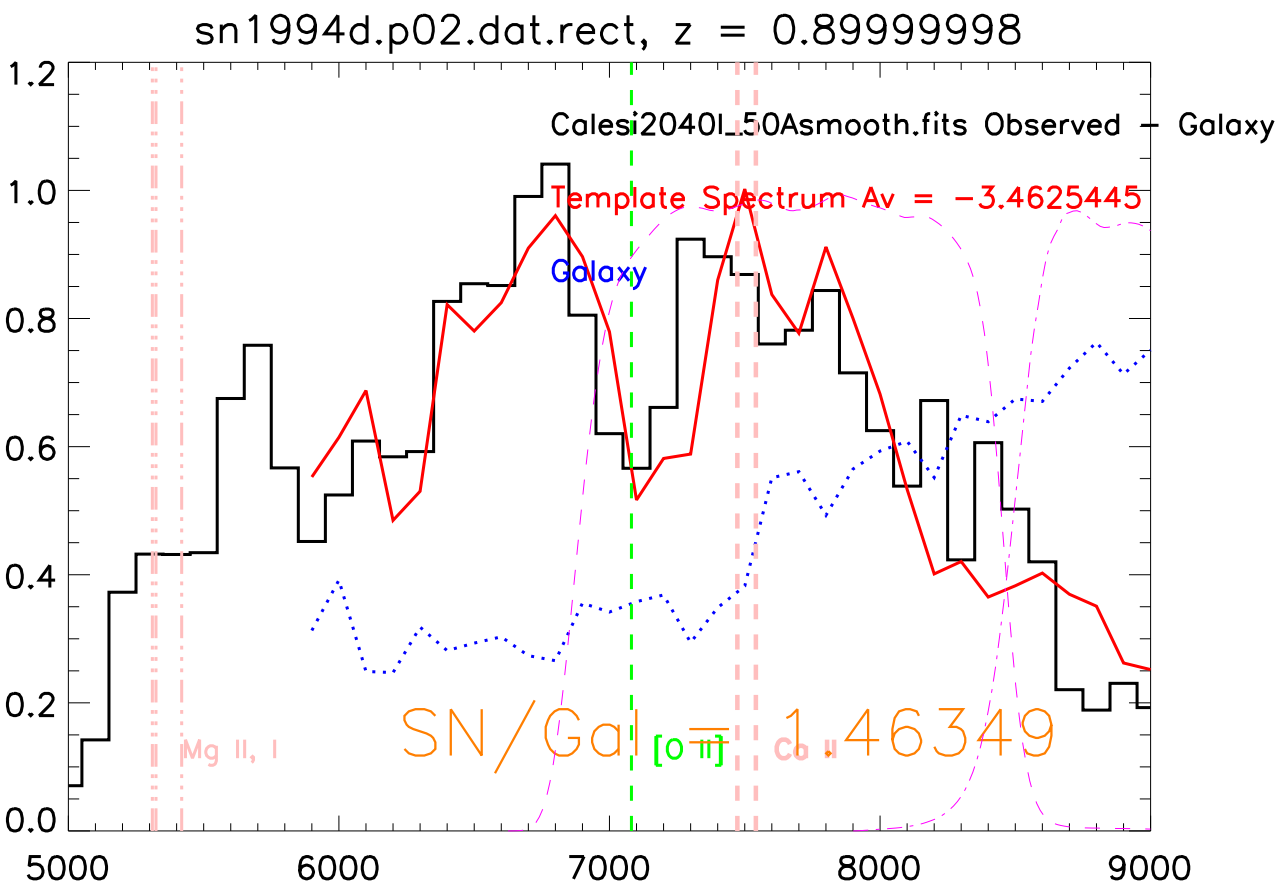

4.3
6.0
5.7
4.5
3.5
3.9
3.3
2.1
1.0
1.7
1.3
1.7
2.0
1.2
2.6
5.3

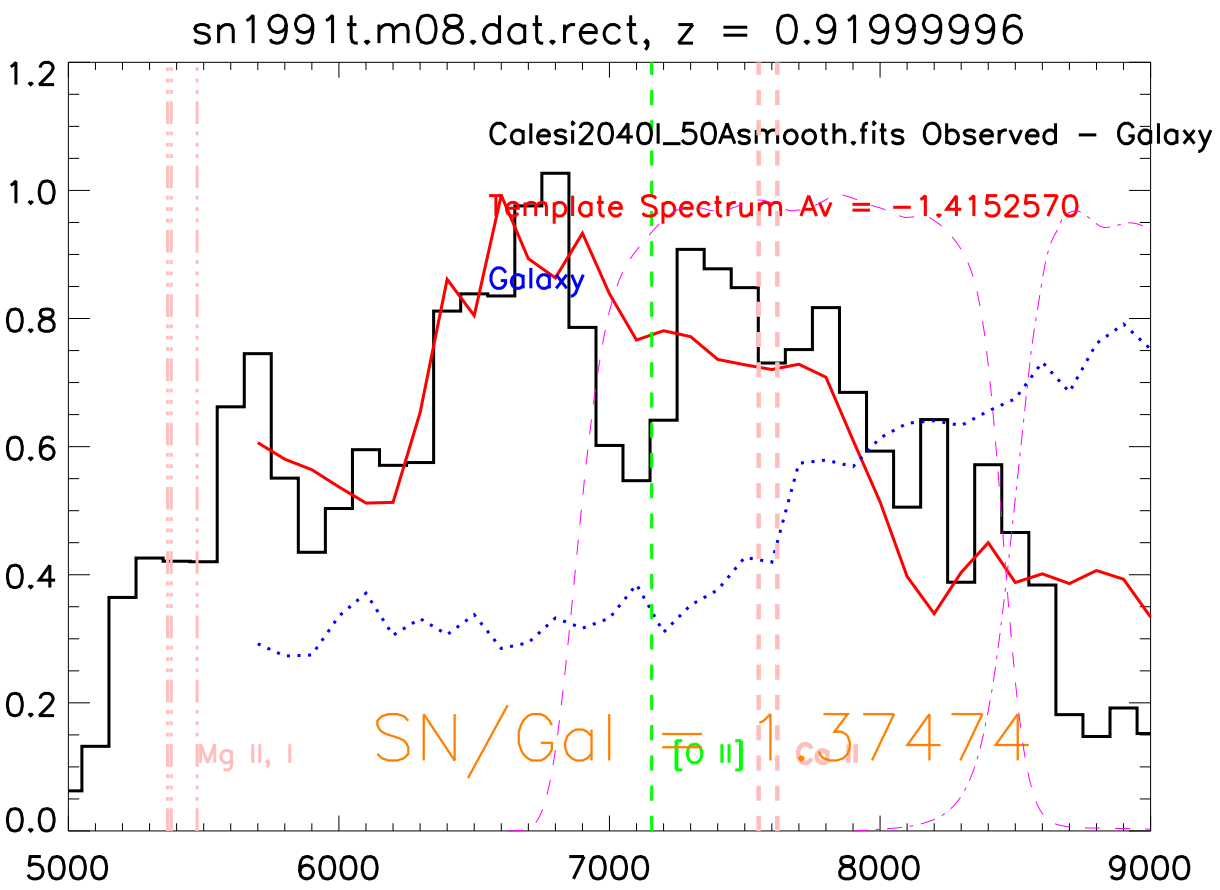


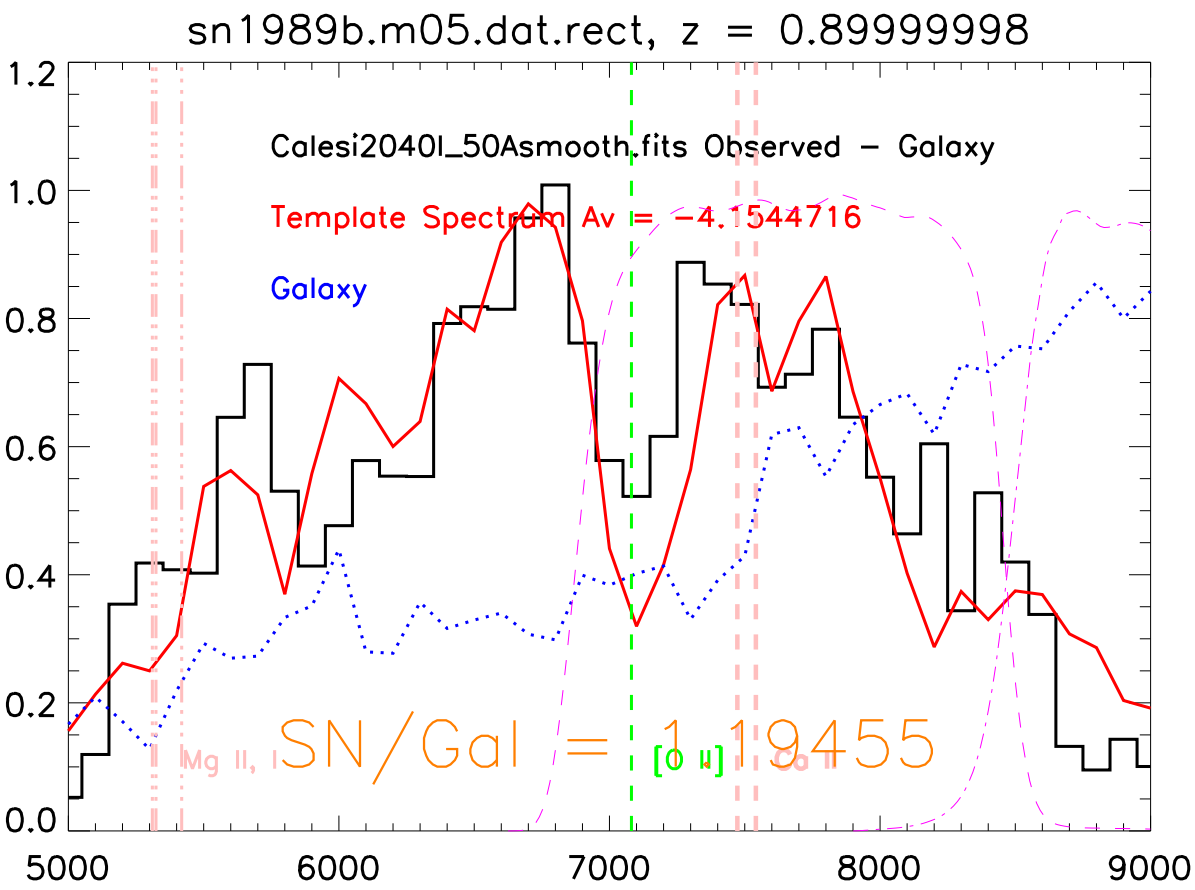
7
6
5
4
3
2
1
χ^2
40
20
0
−20
Days
0.5
1.0
1.5
2.0
Δm15

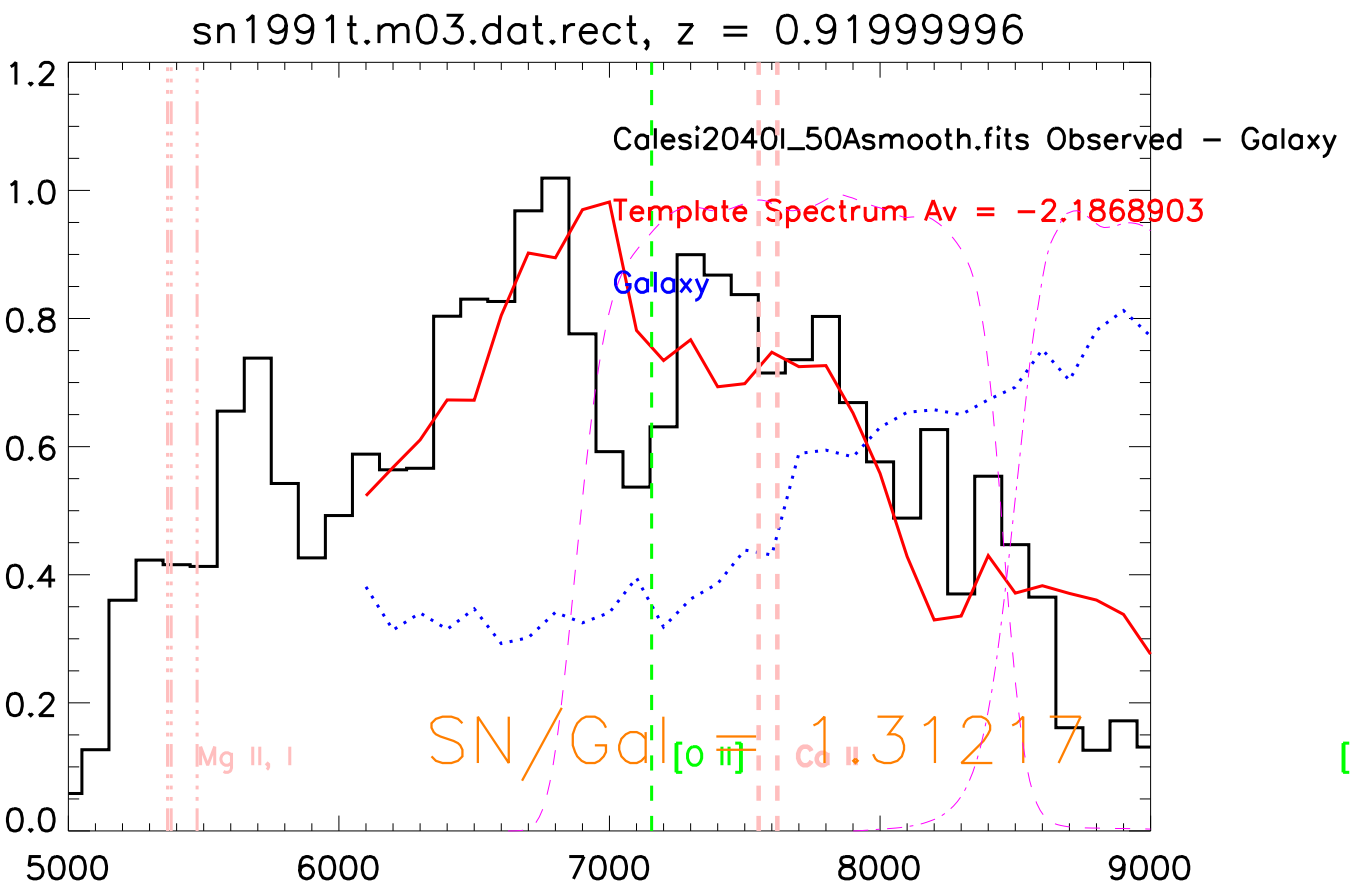

Calesi2040l_50Asmooth.fits
X^2
z
0
2
4
6
8
10
12
0.900
0.910
0.920
0.930
0.940
0.950

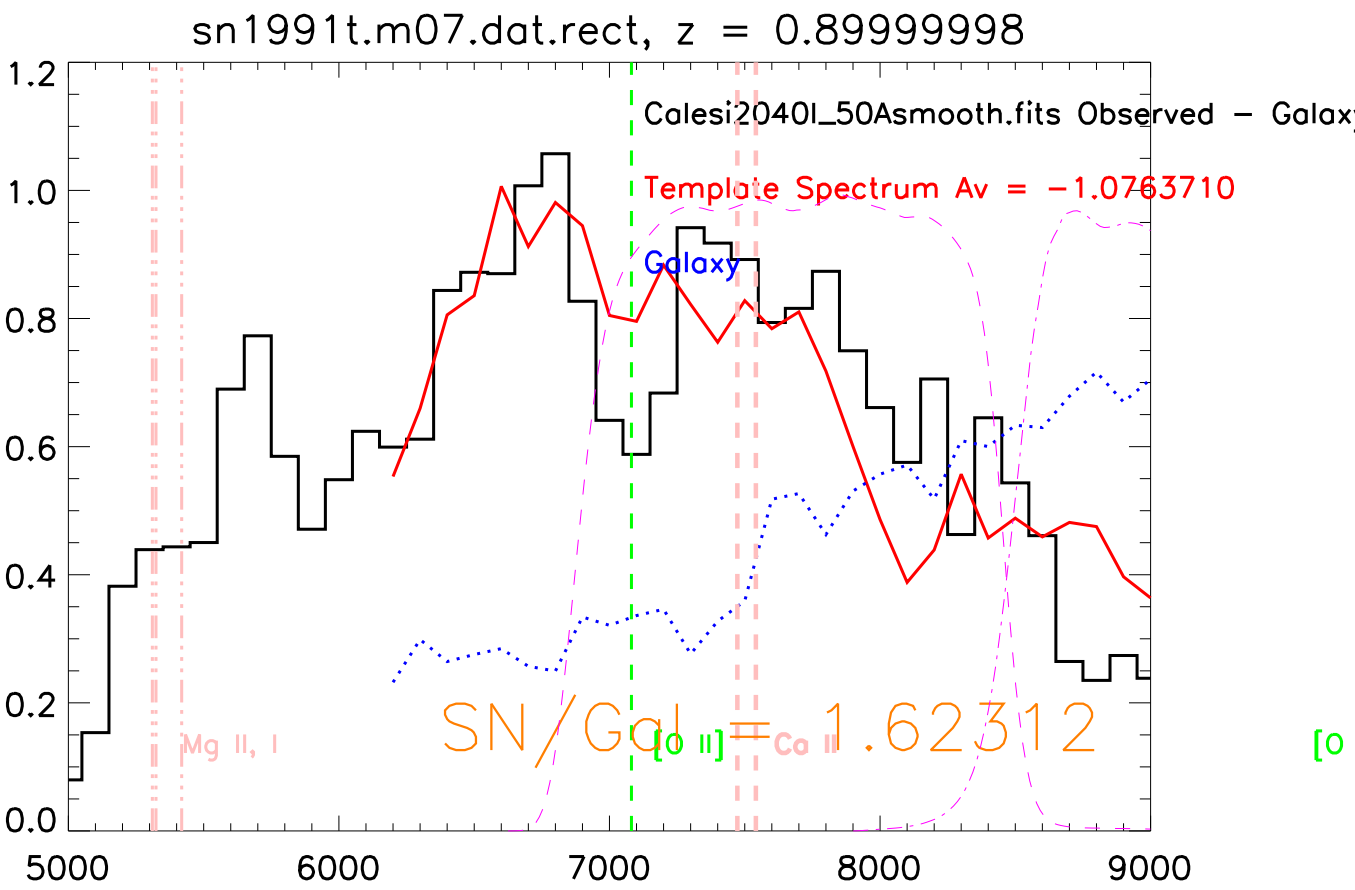

Calesi2040I_50Asmooth.fits----sn1994d.p02.dat.rect
sn1994d.p02.dat.rect
Mg II, I
[O II]
Ca II
1.5
1.0
0.5
0.0
5000
6000
7000
8000
9000

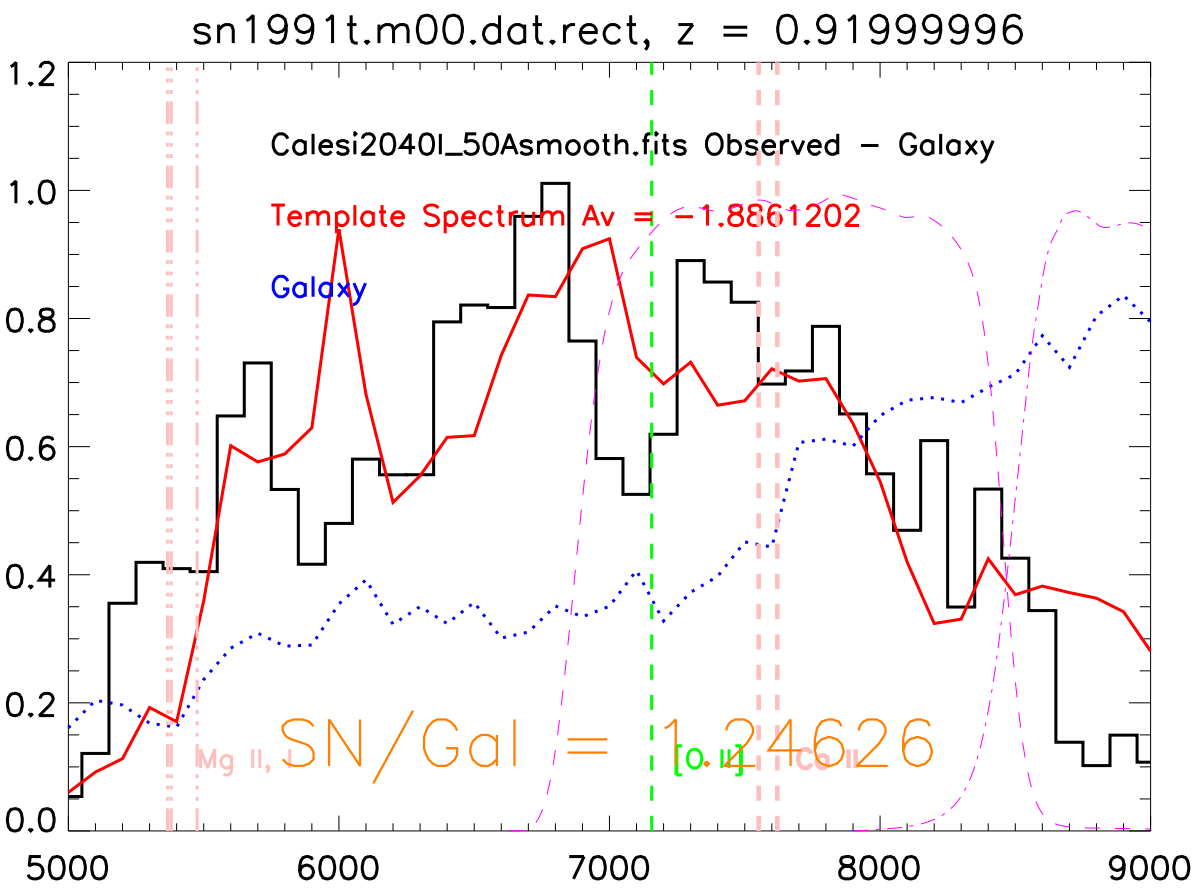

sn1994d.p02.dat.rect, z = 0.89999998
Calesi2040l_50Asmooth.fits Observed – Galaxy
Template Spectrum Av = -3.4625445
Galaxy
SN/Gal = 1.46349
Mg II, I
[O II]
Ca II
[O
1.2
1.0
0.8
0.6
0.4
0.2
0.0
5000
6000
7000
8000
9000

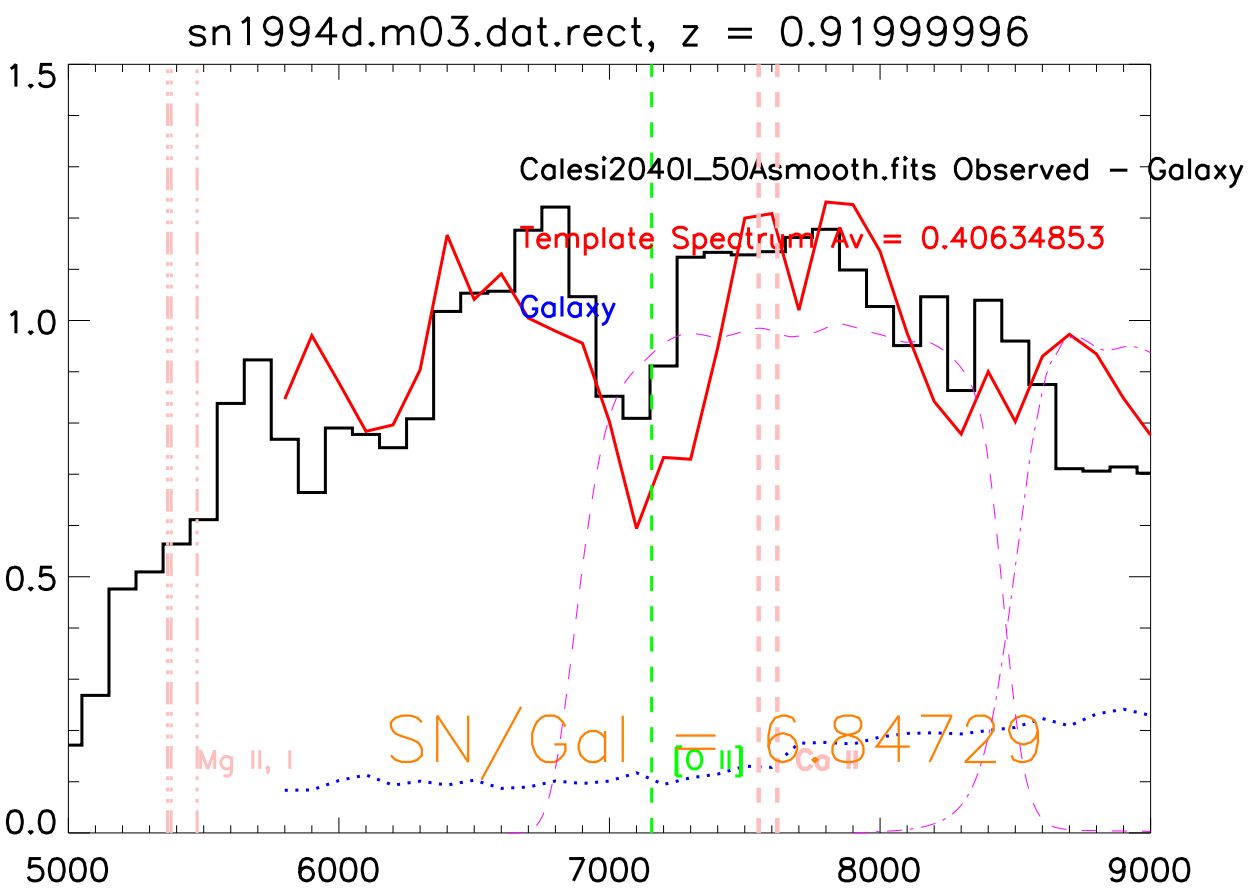

sn1991t.m08.dat.rect, z = 0.91999996
Calesi2040l_50Asmooth.fits Observed − Galaxy
Template Spectrum Av = −1.4152570
Galaxy
SN/Gal
1.37474
Mg II, I
[O II]
Ca II
1.2
1.0
0.8
0.6
0.4
0.2
0.0
5000
6000
7000
8000
9000

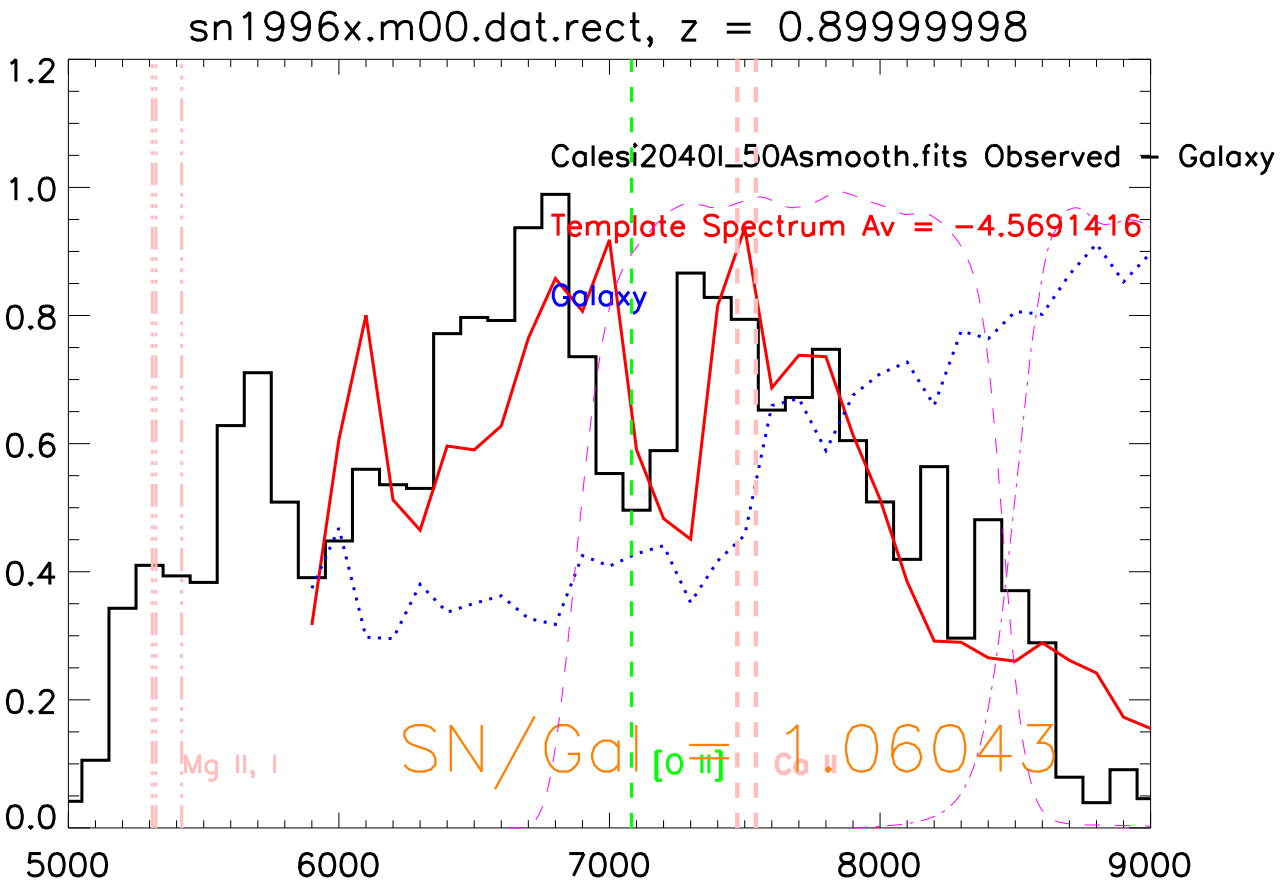

sn1989b.m05.dat.rect, z = 0.89999998
Calesi2040l_50Asmooth.fits Observed − Galaxy
Template Spectrum Av = −4.1544716
Galaxy
SN/Gal = 1.19455
Mg II, I
[O II]
Ca II
[O
1.2
1.0
0.8
0.6
0.4
0.2
0.0
5000
6000
7000
8000
9000

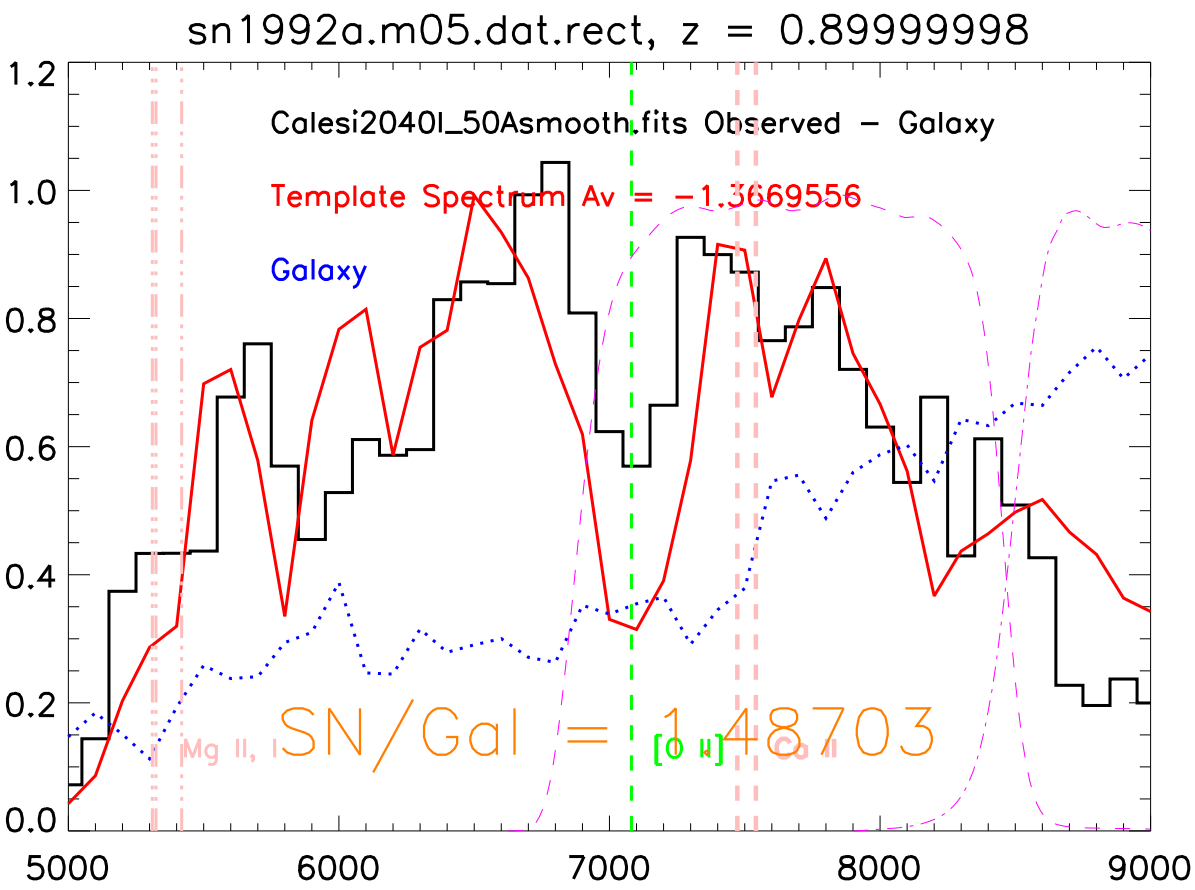

sn1991t.m03.dat.rect, z = 0.91999996
Calesi20401_50Asmooth.fits Observed – Galaxy
Template Spectrum Av = −2.1868903
Galaxy
SN/Gal = 1.31217
Mg II, I
[O II]
Ca II
1.2
1.0
0.8
0.6
0.4
0.2
0.0
5000
6000
7000
8000
9000


sn1991t.m07.dat.rect, z = 0.89999998
Calesi2040l_50Asmooth.fits Observed – Galax
Template Spectrum Av = −1.0763710
Galaxy
SN/Gal = 1.62312
Mg II, I
[O II]
Ca II
[O
1.2
1.0
0.8
0.6
0.4
0.2
0.0
5000
6000
7000
8000
9000


sn1991t.m00.dat.rect, z = 0.91999996
Calesi2040l_50Asmooth.fits Observed – Galaxy
Template Spectrum Av = 1.8861202
Galaxy
SN/Gal = 1.24626
[O II]
1.2
1.0
0.8
0.6
0.4
0.2
0.0
5000
6000
7000
8000
9000


sn1994d.m03.dat.rect, z = 0.91999996
Calesi2040l_50Asmooth.fits Observed – Galaxy
Template Spectrum Av = 0.40634853
Galaxy
SN/Gal = 6.84729
Mg II, I
[O II]
Ca II
1.5
1.0
0.5
0.0
5000
6000
7000
8000
9000


sn1996x.m00.dat.rect, z = 0.89999998
Calesi2040l_50Asmooth.fits Observed – Galaxy
Template Spectrum Av = -4.5691416
Galaxy
SN/Gal = 1.06043
Mg II, I
[O II]
Ca II
[O
1.2
1.0
0.8
0.6
0.4
0.2
0.0
5000
6000
7000
8000
9000


sn1992a.m05.dat.rect, z = 0.89999998
Calesi2040l_50Asmooth.fits Observed − Galaxy
Template Spectrum Av = −1.3669556
Galaxy
SN/Gal = 1.48703
[O II]
Ca II
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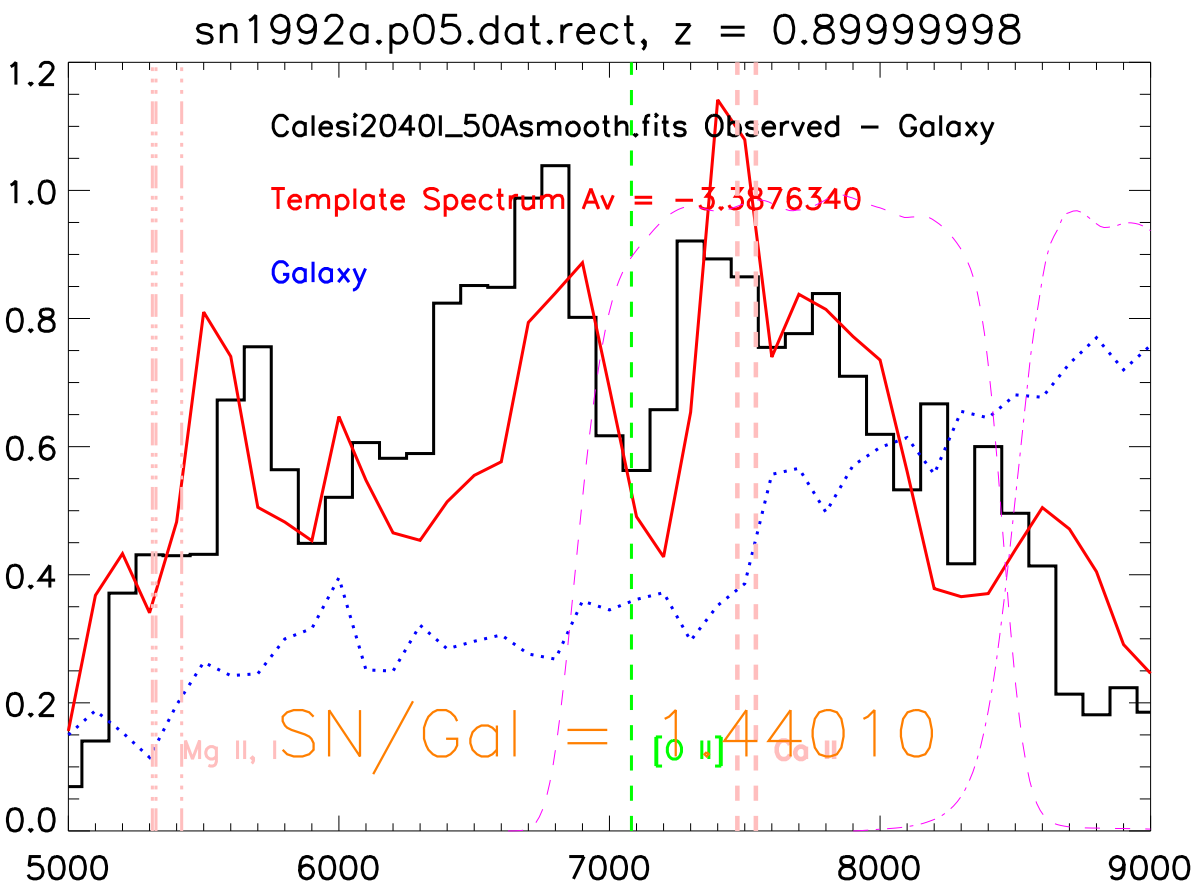
1.0
0.8
0.6
0.4
0.2
0.0
5000
6000
7000
8000
9000


sn1992a.p05.dat.rect, z = 0.89999998
Calesi2040l_50Asmooth.fits Observed − Galaxy
Template Spectrum Av = −3.3876340
Galaxy
SN/Gal = 1.44010
[O II]
Ca II
1.2
1.0
0.8
0.6
0.4
0.2
0.0
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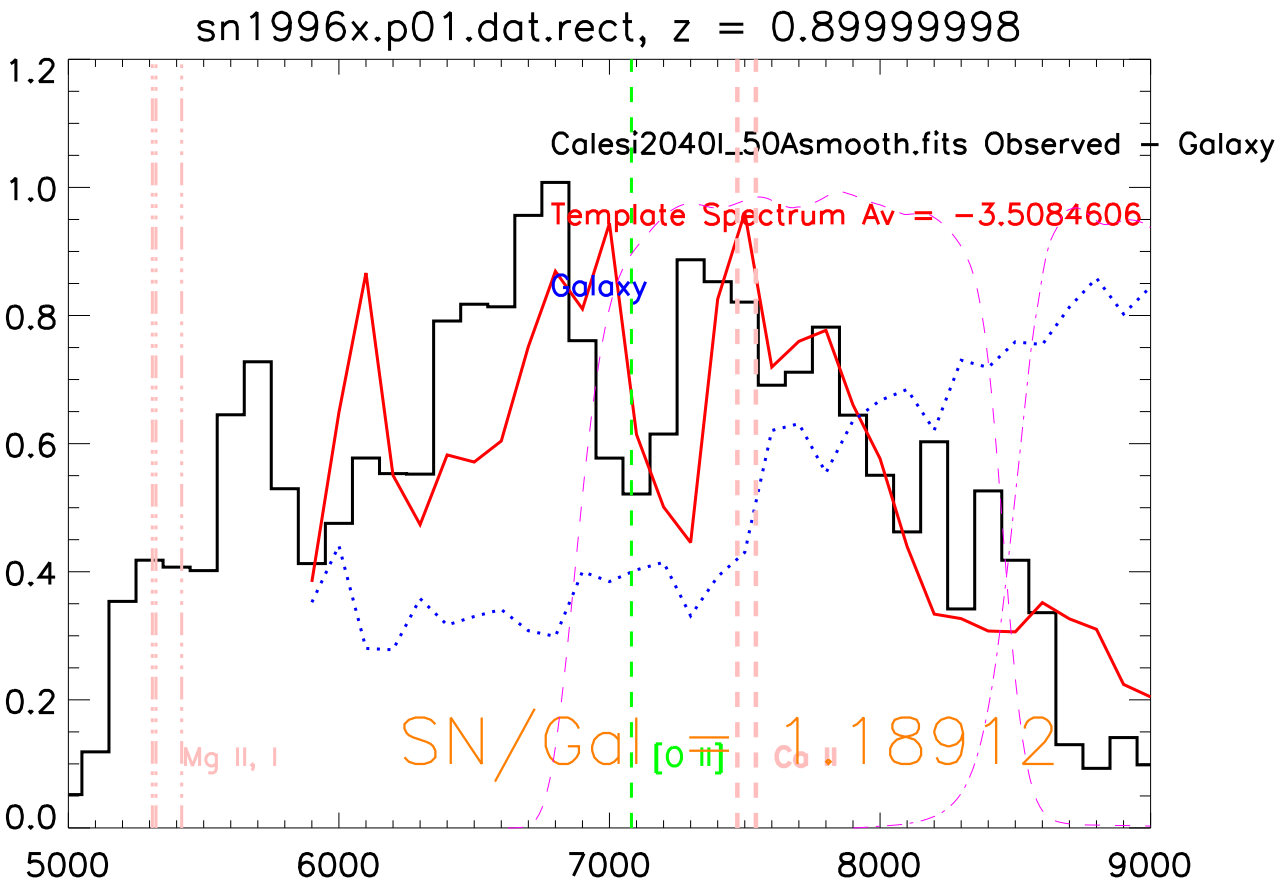
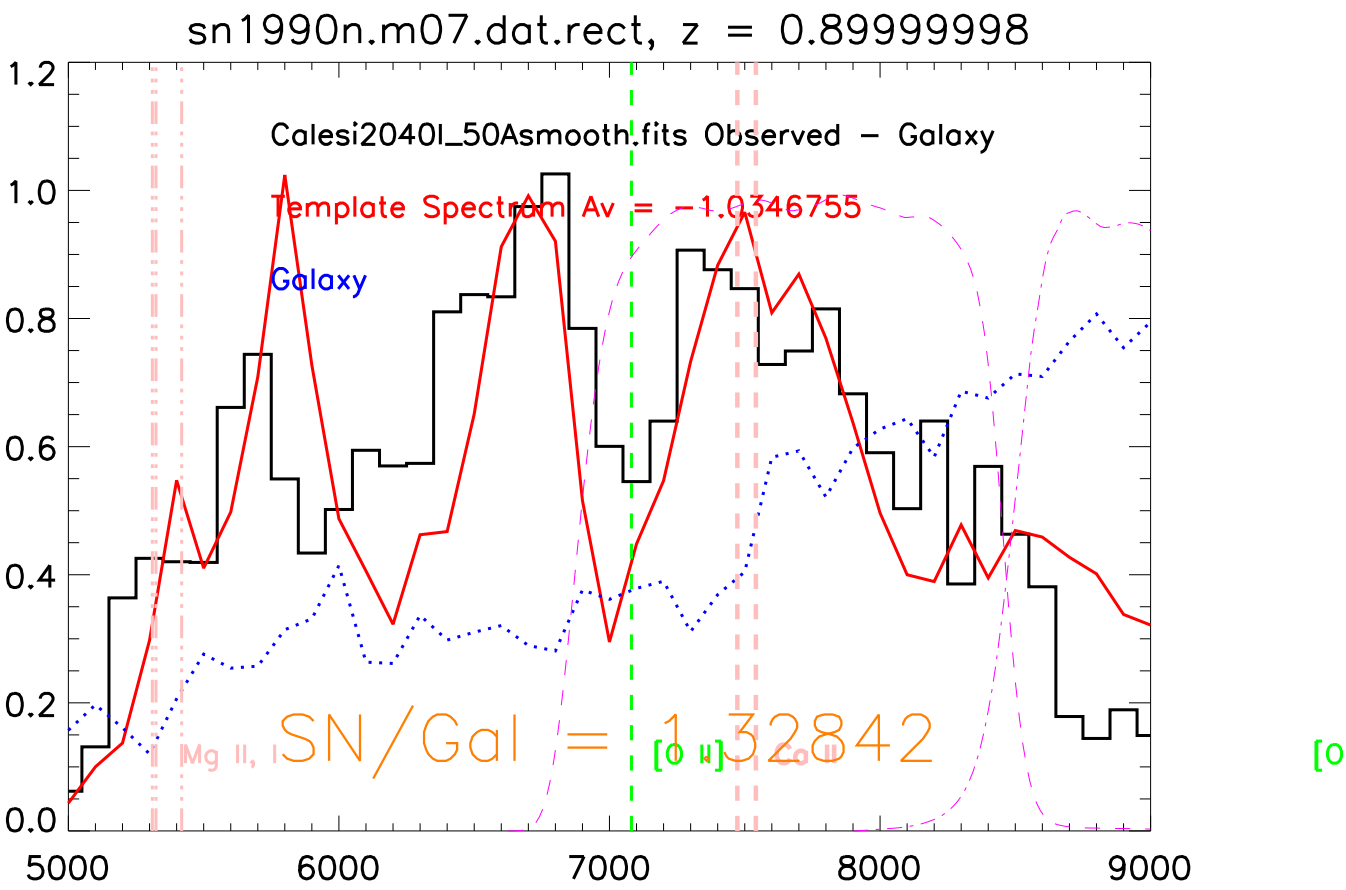
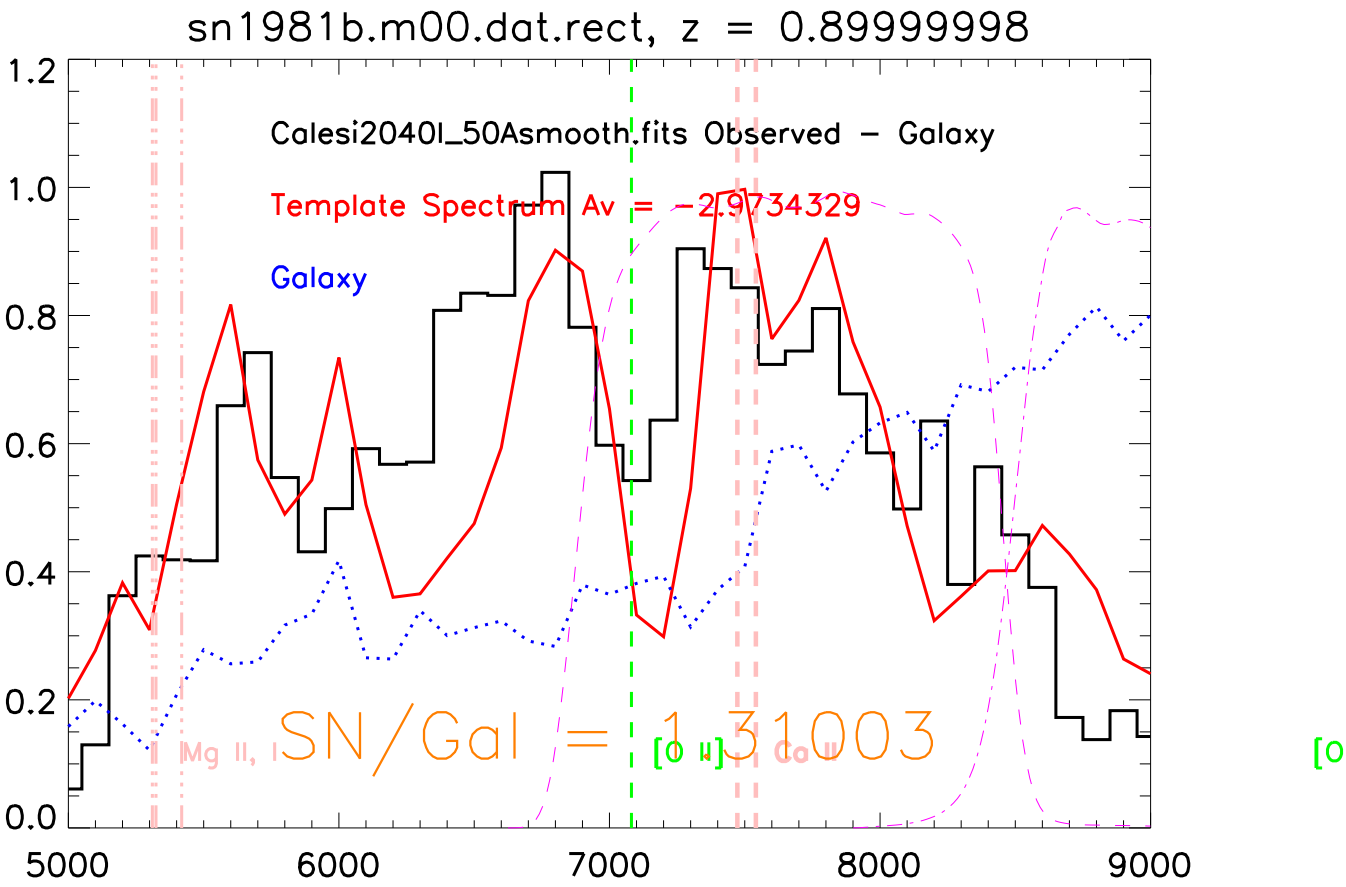
6000
7000
8000
9000


sn1996x.p01.dat.rect, z = 0.89999998
Calesi2040l_50Asmooth.fits Observed – Galaxy
Template Spectrum Av = -3.5084606
Galaxy
SN/Gal = 1.18912
Mg II, I
[O II]
Ca II
[O
1.2
1.0
0.8
0.6
0.4
0.2
0.0
5000
6000
7000
8000
9000


sn1990n.m07.dat.rect, z = 0.89999998
Calesi2040l_50Asmooth.fits Observed − Galaxy
Template Spectrum Av = −1.0346755
Galaxy
SN/Gal = 1.32842
Mg II, I
[O II]
Ca II
[O
1.2
1.0
0.8
0.6
0.4
0.2
0.0
5000
6000
7000
8000
9000


sn1981b.m00.dat.rect, z = 0.89999998
Calesi2040l_50Asmooth.fits Observed − Galaxy
Template Spectrum Av = −2.9734329
Galaxy
SN/Gal = 1.31003
Mg II, I
[O II]
Ca II
[O
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0.8
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8000
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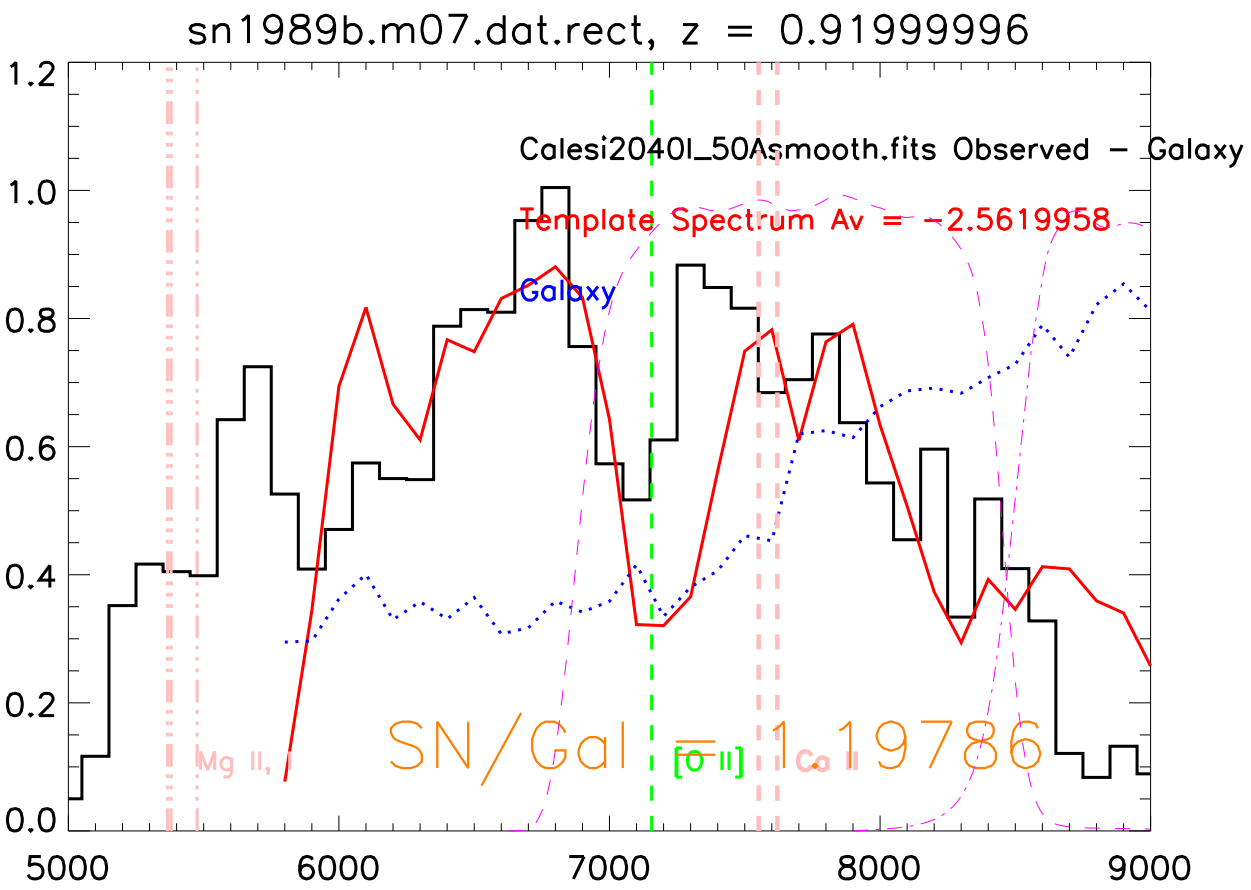
sn1989b.m07.dat.rect, z = 0.91999996
Calesi2040l_50Asmooth.fits Observed – Galaxy
Template Spectrum Av = -2.5619958
Galaxy
SN/Gal = 1.19786
Mg II,
[O II]
Ca II
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0.8
0.6
0.4
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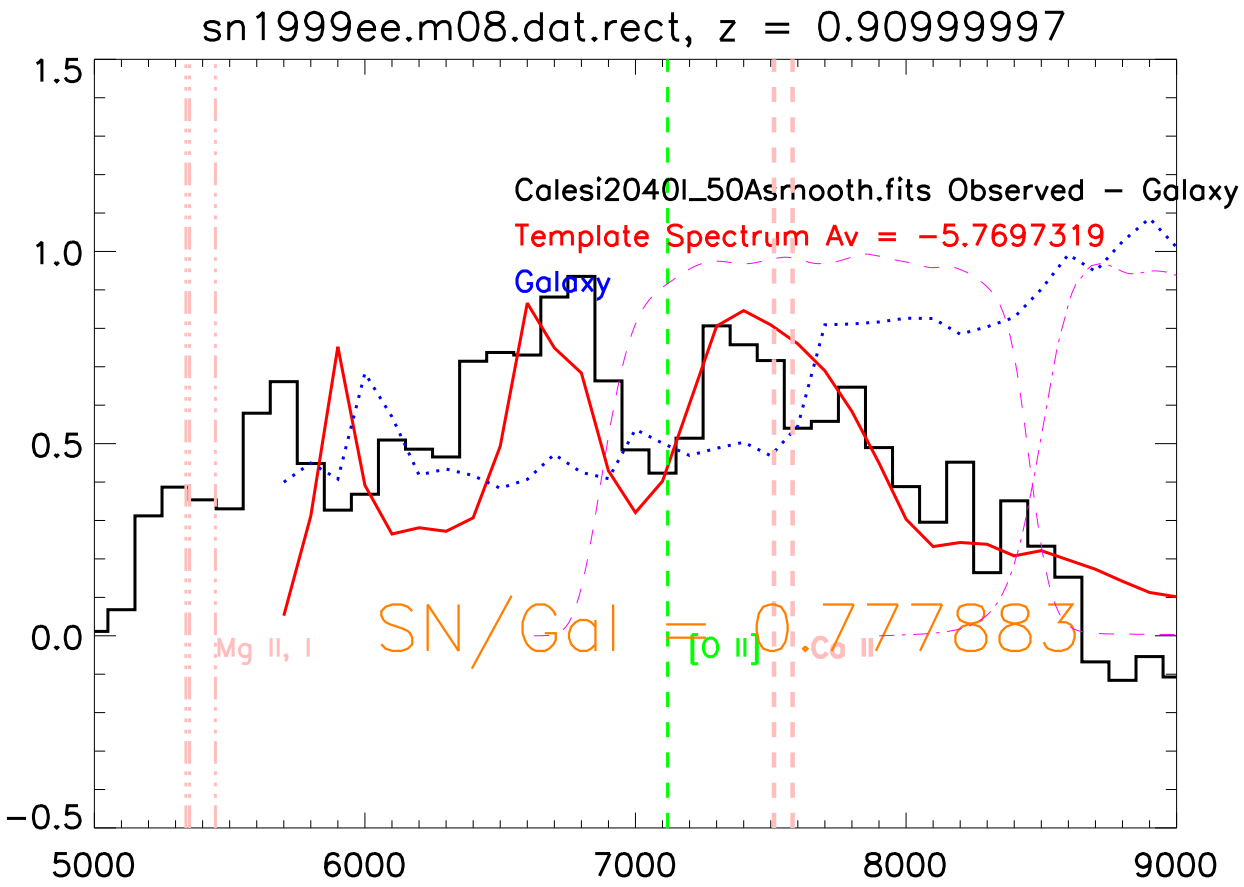
7000
8000
9000


sn1999ee.m08.dat.rect, z = 0.90999997
Calesi2040l_50Asmooth.fits Observed − Galaxy
Template Spectrum Av = −5.7697319
Galaxy
SN/Gal = 0.777883
Mg II, I
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Ca II
[O
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0.5
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−0.5
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6000
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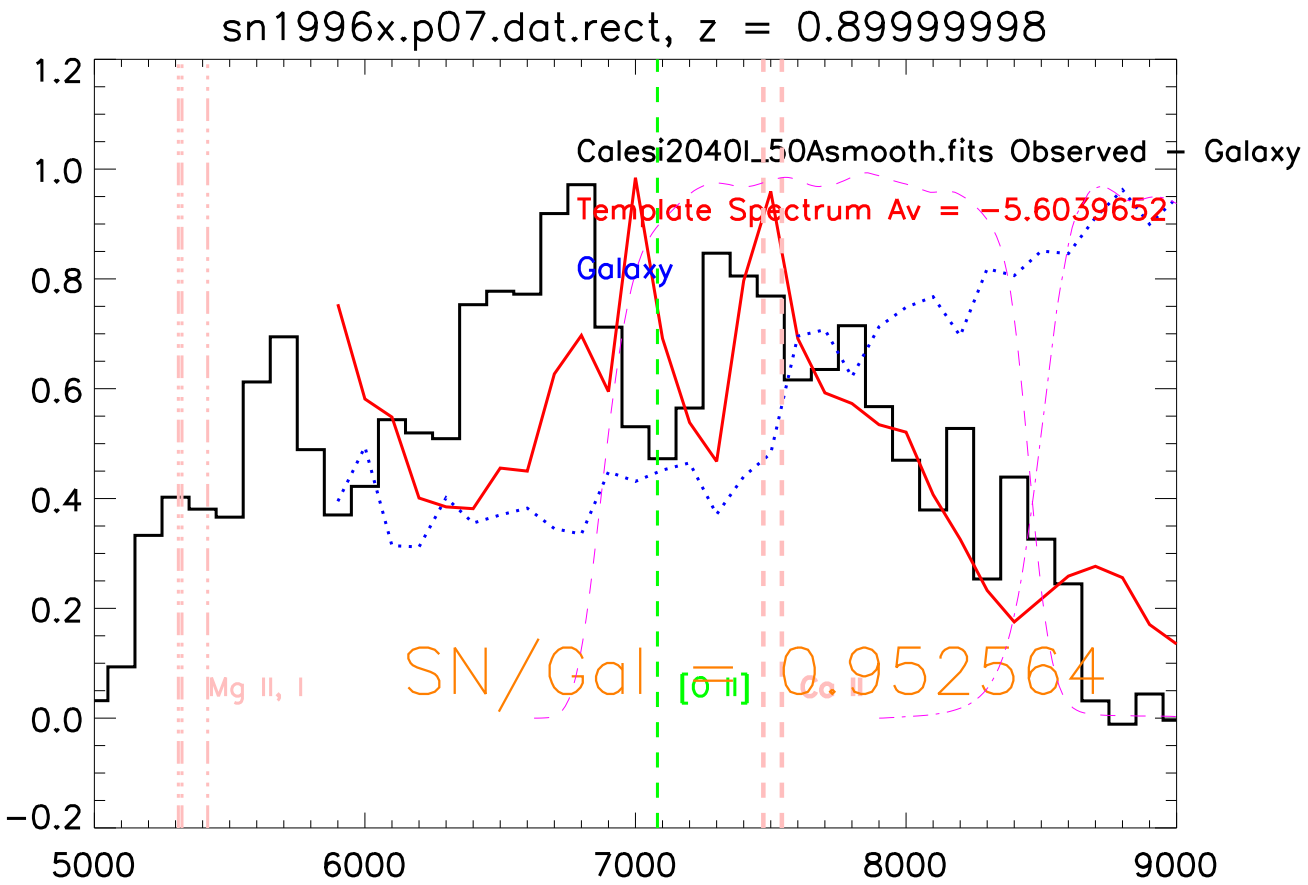
sn1996x.p07.dat.rect, z = 0.89999998
Calesi2040l_50Asmooth.fits Observed − Galaxy
Template Spectrum Av = −5.6039652
Galaxy
SN/Gal = 0.952564
Mg II, I
[O II]
Ca II
[O
1.2
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0.8
0.6
0.4
0.2
0.0
−0.2
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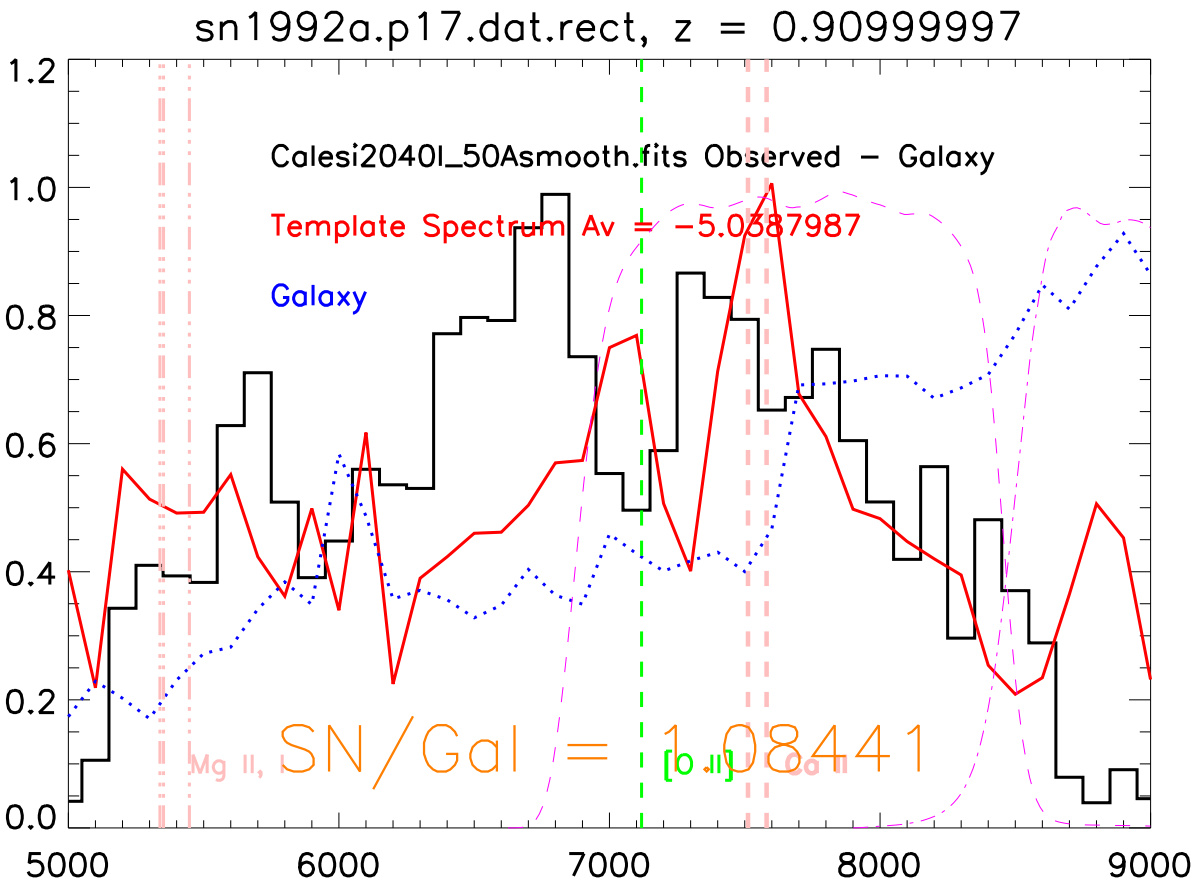
6000
7000
8000
9000


sn1992a.p17.dat.rect, z = 0.90999997
Calesi2040l_50Asmooth.fits Observed − Galaxy
Template Spectrum Av = −5.0387987
Galaxy
SN/Gal = 1.08441
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0.4
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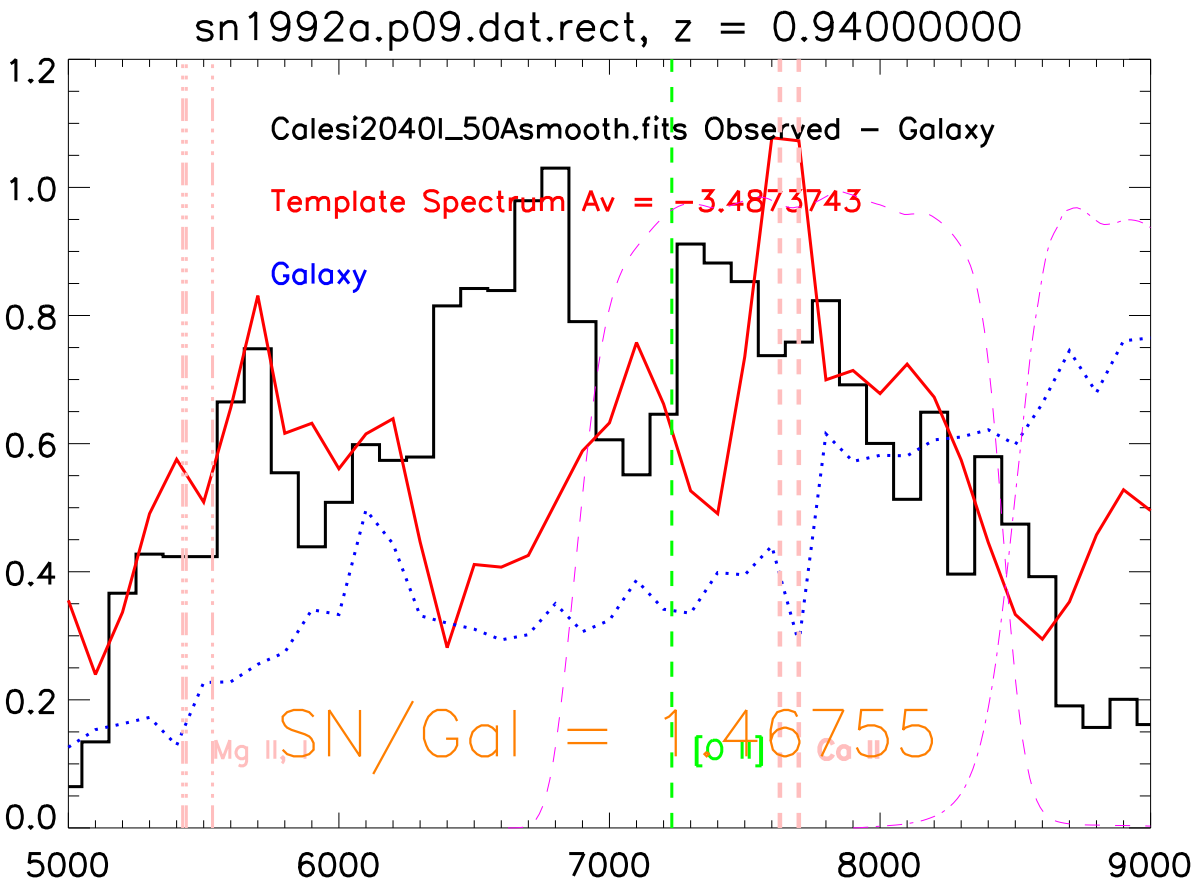
8000
9000


sn1992a.p09.dat.rect, z = 0.94000000
Calesi2040l_50Asmooth.fits Observed − Galaxy
Template Spectrum Av = −3.4873743
Galaxy
SN/Gal = 1.46755
Mg II
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Ca II
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0.8
0.6
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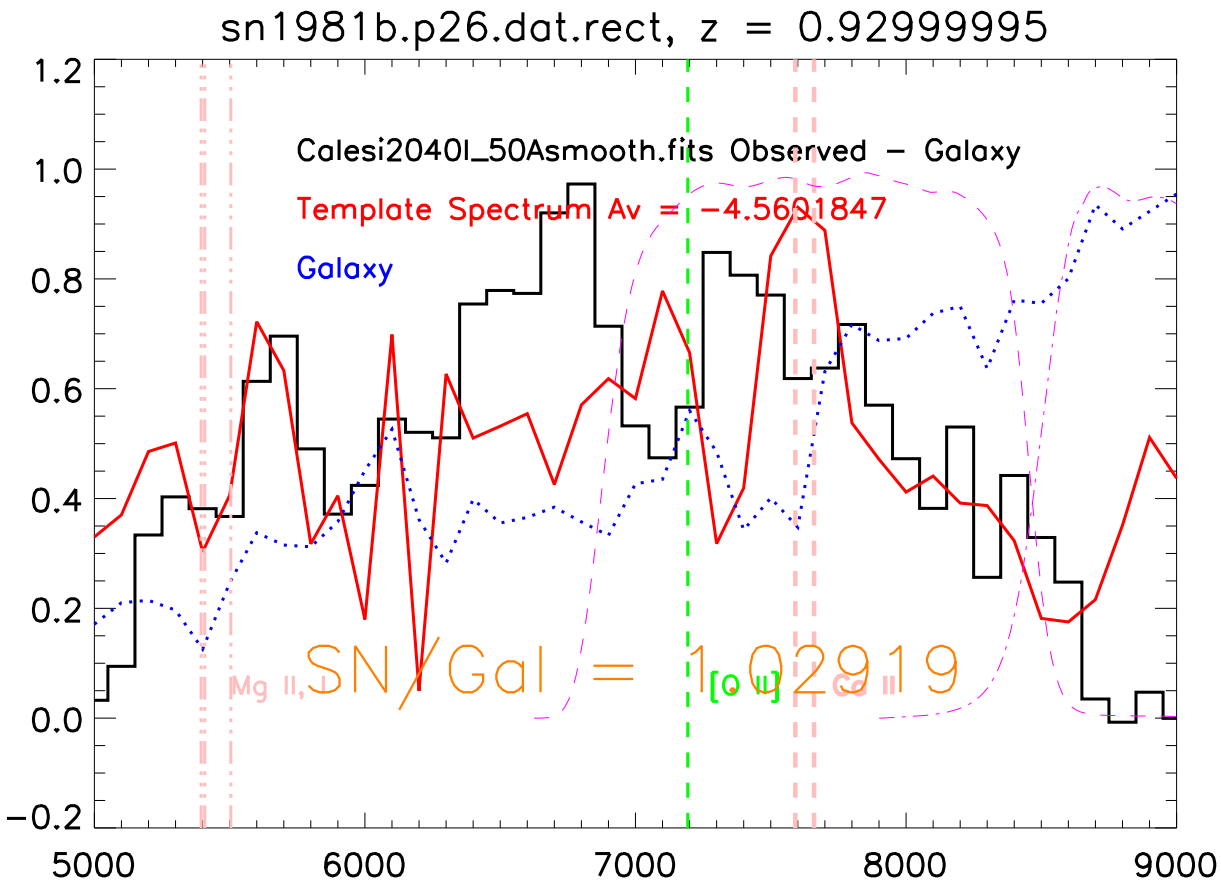
8000
9000


sn1981b.p26.dat.rect, z = 0.92999995
Calesi2040l_50Asmooth.fits Observed − Galaxy
Template Spectrum Av = −4.5691847
Galaxy
SN/Gal = 1.02919
Mg II,
[O II]
Ca II
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0.8
0.6
0.4
0.2
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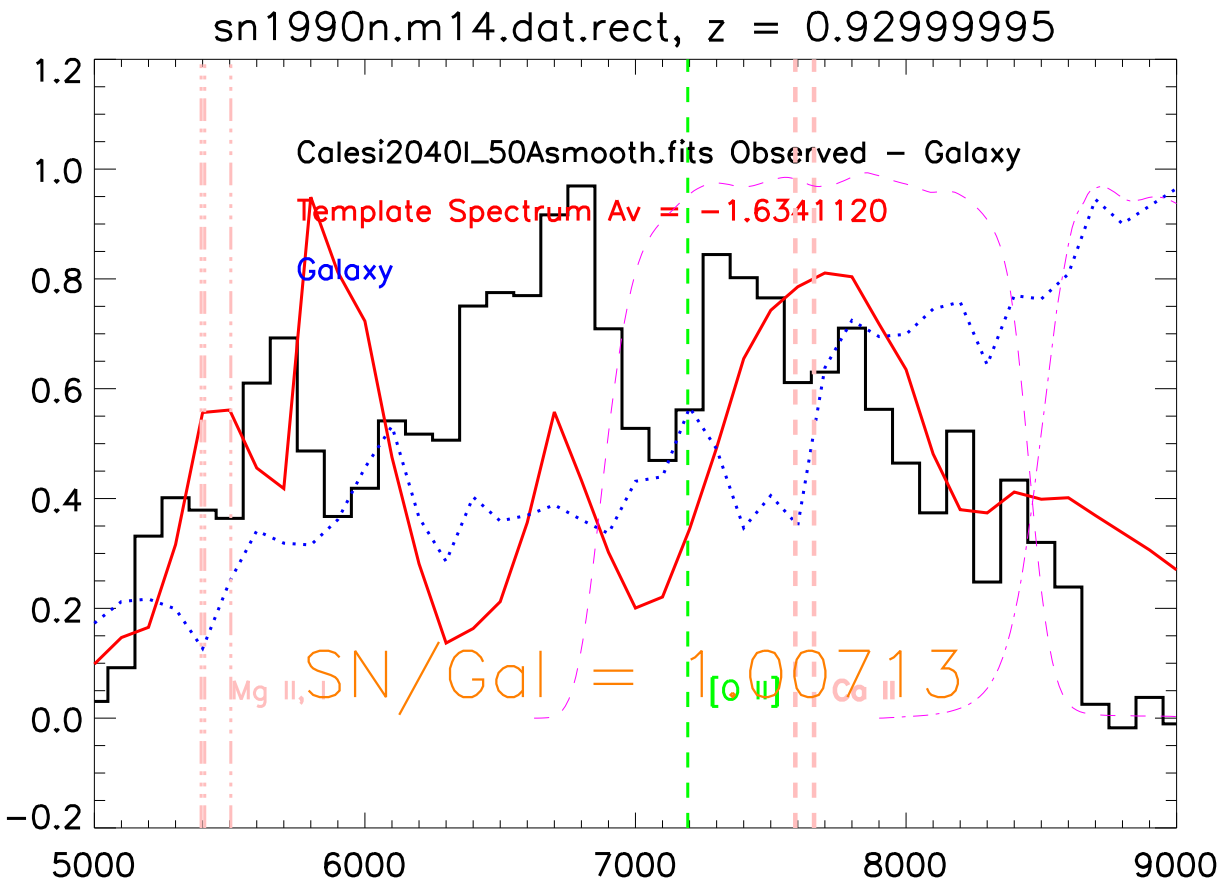
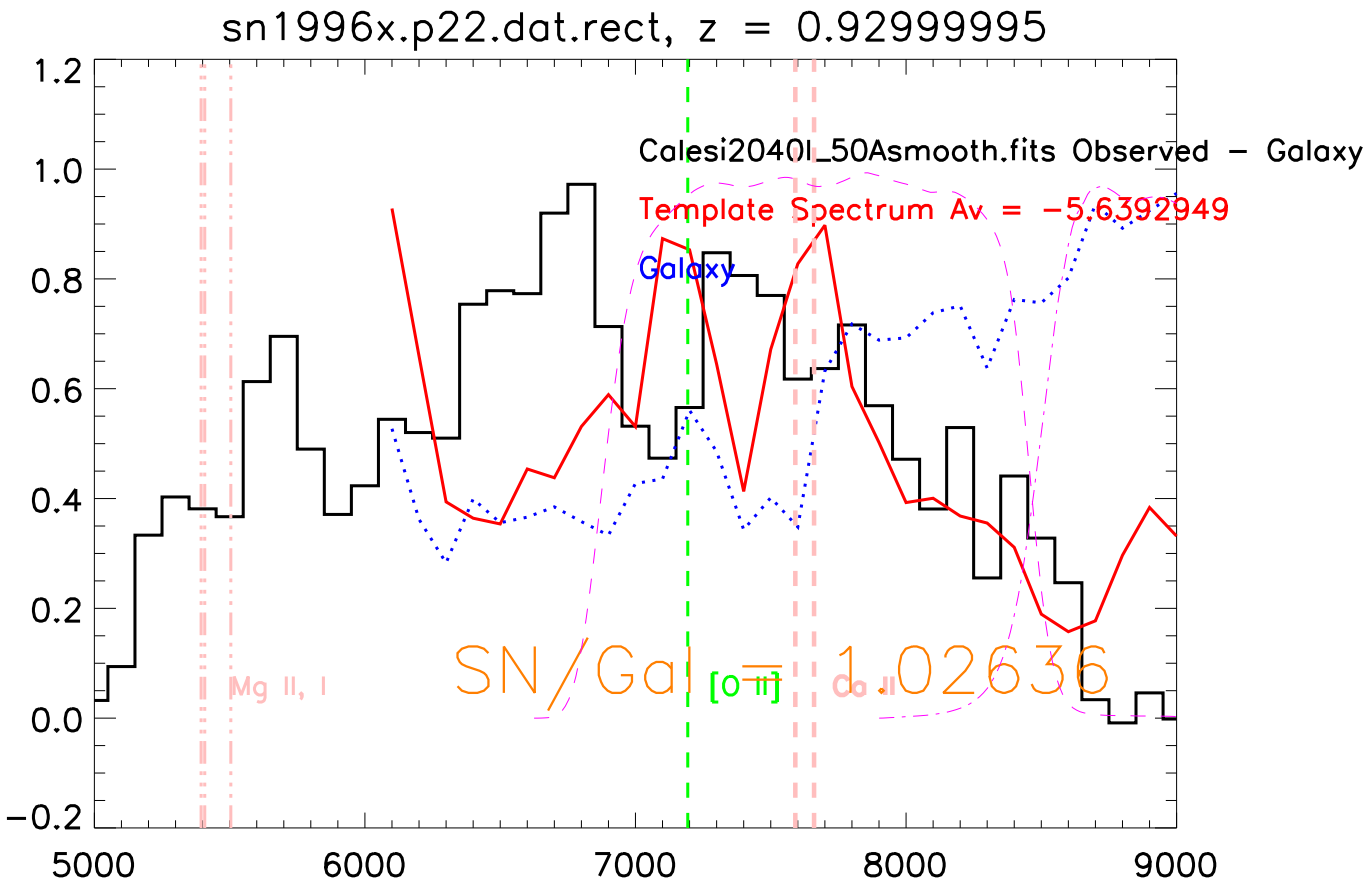
−0.2
5000
6000
7000
8000
9000


sn1990n.m14.dat.rect, z = 0.92999995
Calesi2040l_50Asmooth.fits Observed − Galaxy
Template Spectrum Av = −1.6341120
Galaxy
SN/Gal = 1.00713
Mg II,
[O II]
Ca II
1.2
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
5000
6000
7000
8000
9000


sn1996x.p22.dat.rect, z = 0.92999995
Calesi2040I_50Asmooth.fits Observed – Galaxy
Template Spectrum Av = −5.6392949
Galaxy
SN/Gal = 1.02636
Mg II, I
[O II]
Ca II
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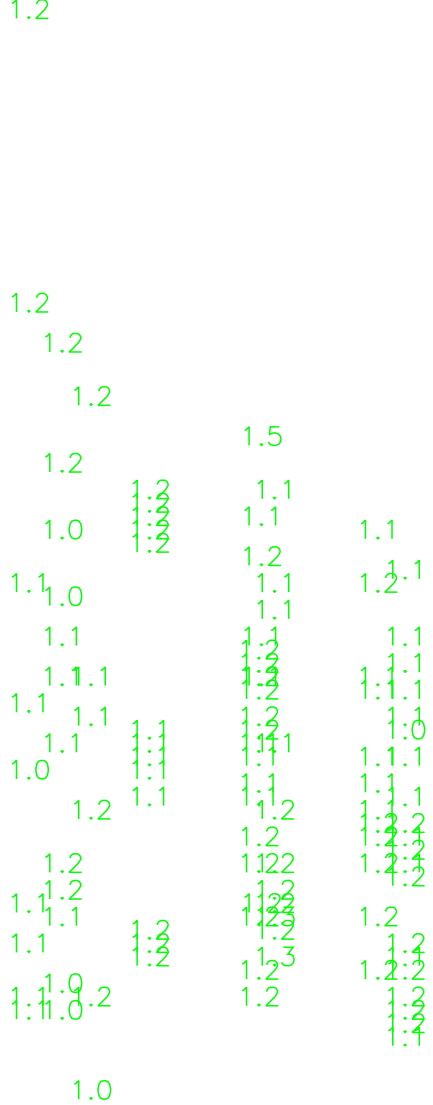
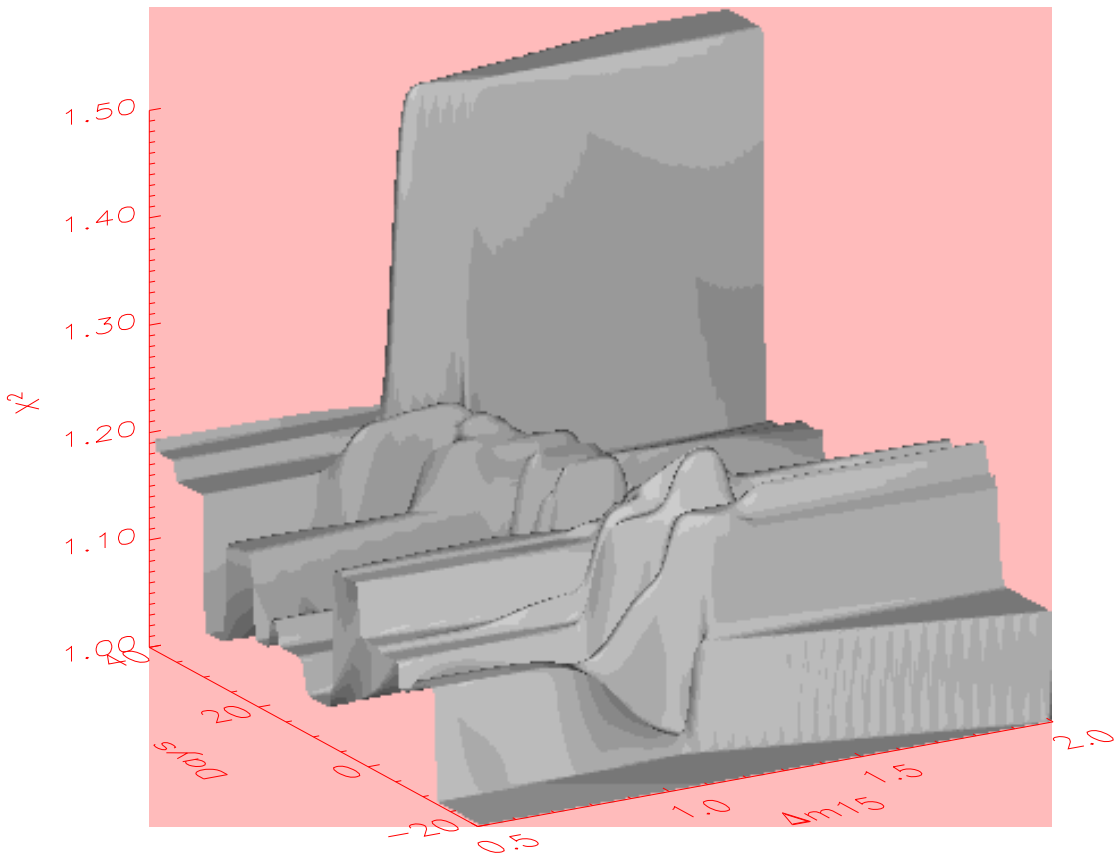
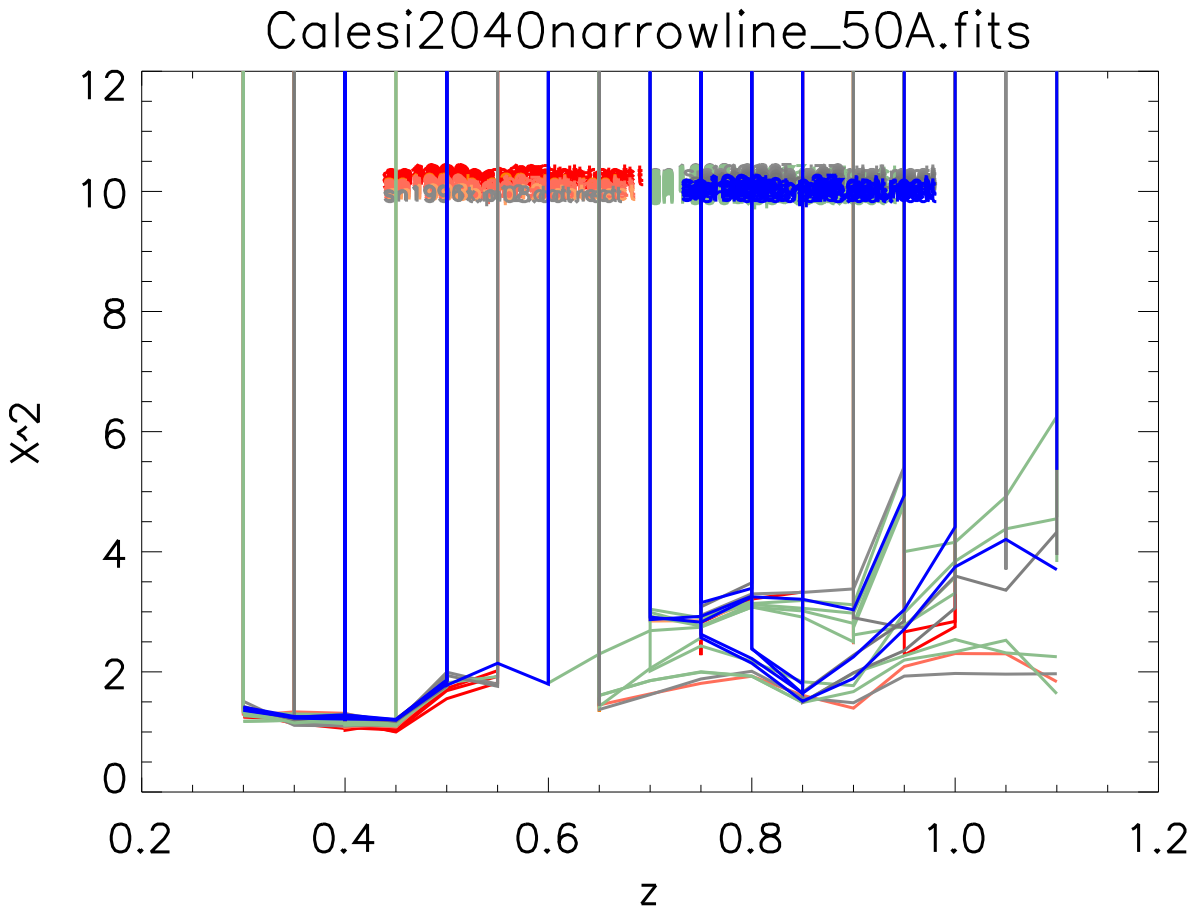
0.8
0.6
0.4
0.2
0.0
−0.2
5000
6000
7000
8000
9000


1.2
1.2
1.2
1.2
1.5
1.2
1.2
1.2
1.2
1.2
1.0
1.2
1.2
1.1
1.1
1.1
1.0
1.1
1.1
1.1



1.50
1.40
1.30
1.20
1.10
1.00
χ^2
40
20
0
−20
Days
0.5
1.0
1.5
2.0
Δm15


Calesi2040narrowline_50A.fits
X^2
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4
6
8
10
12
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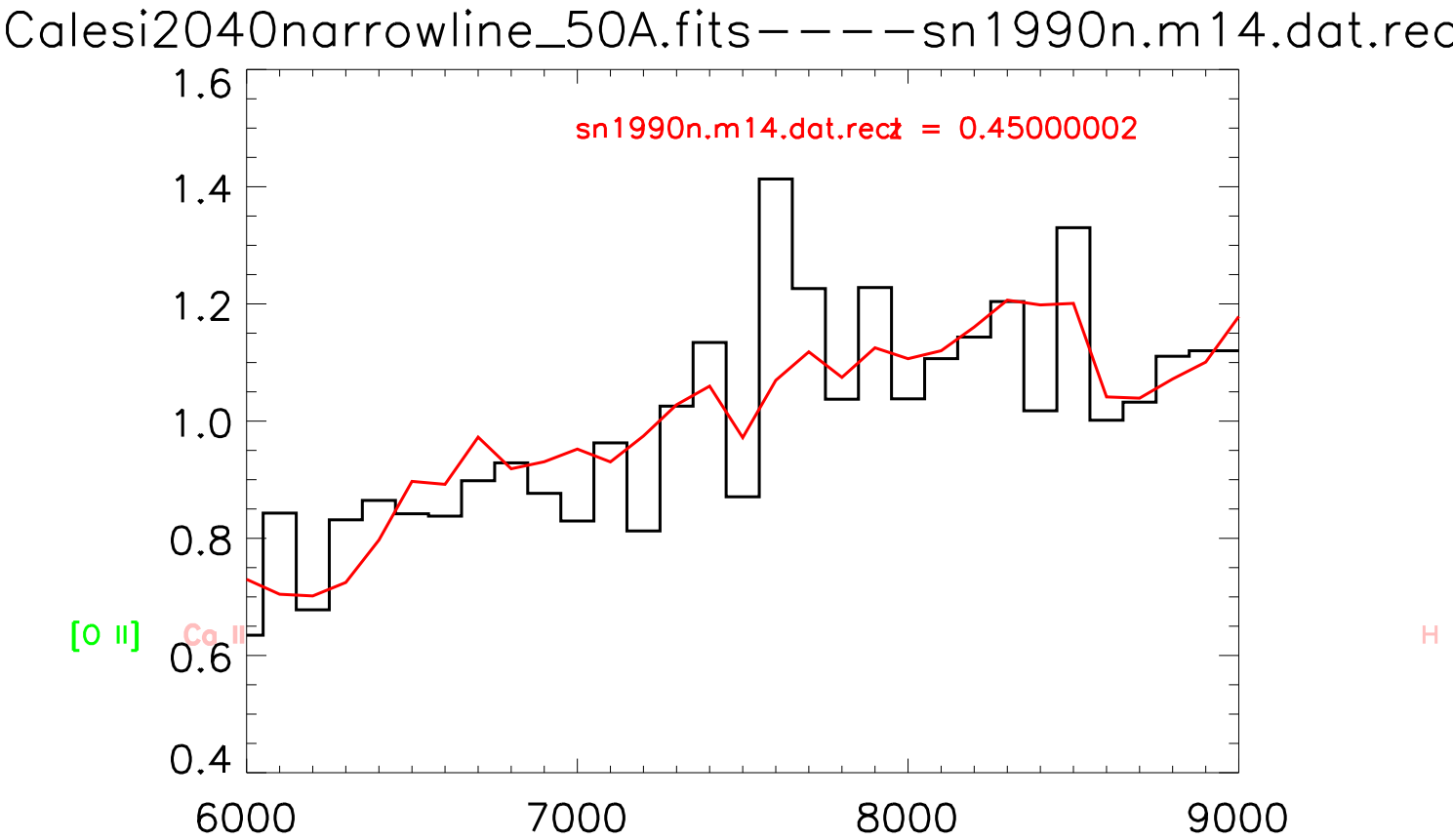
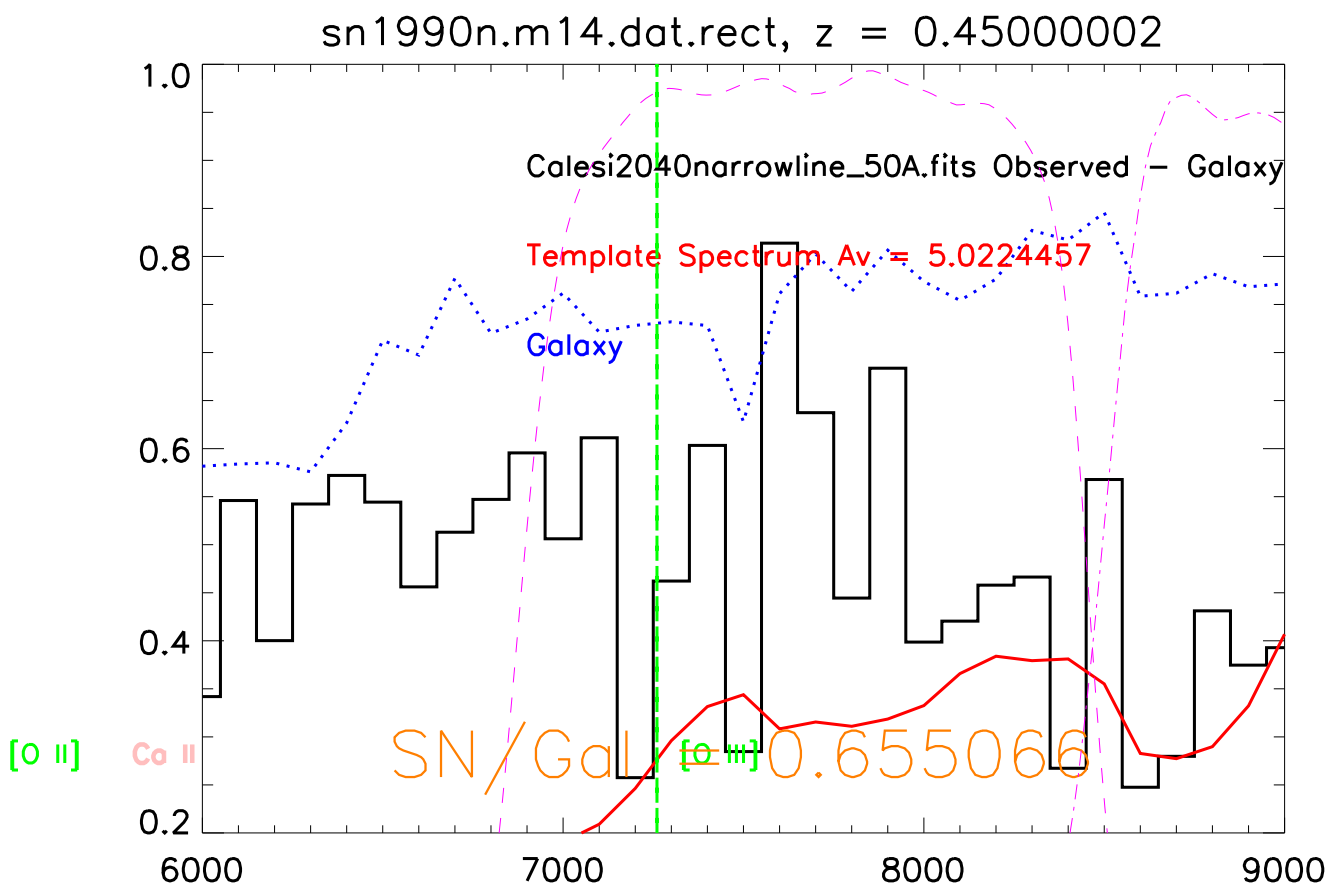
0.4
0.6
0.8
1.0
1.2


Calesi2040narrowline_50A.fits----sn1990n.m14.dat.rec
sn1990n.m14.dat.rect z = 0.45000002
1.6
1.4
1.2
1.0
0.8
0.6
0.4
6000
7000
8000
9000
[O II]
Ca II
H


sn1990n.m14.dat.rect, z = 0.45000002
Calesi2040narrowline_50A.fits Observed − Galaxy
Template Spectrum Av = 5.0224457
Galaxy
SN/Gal [O III] 0.655066
[O II]
Ca II
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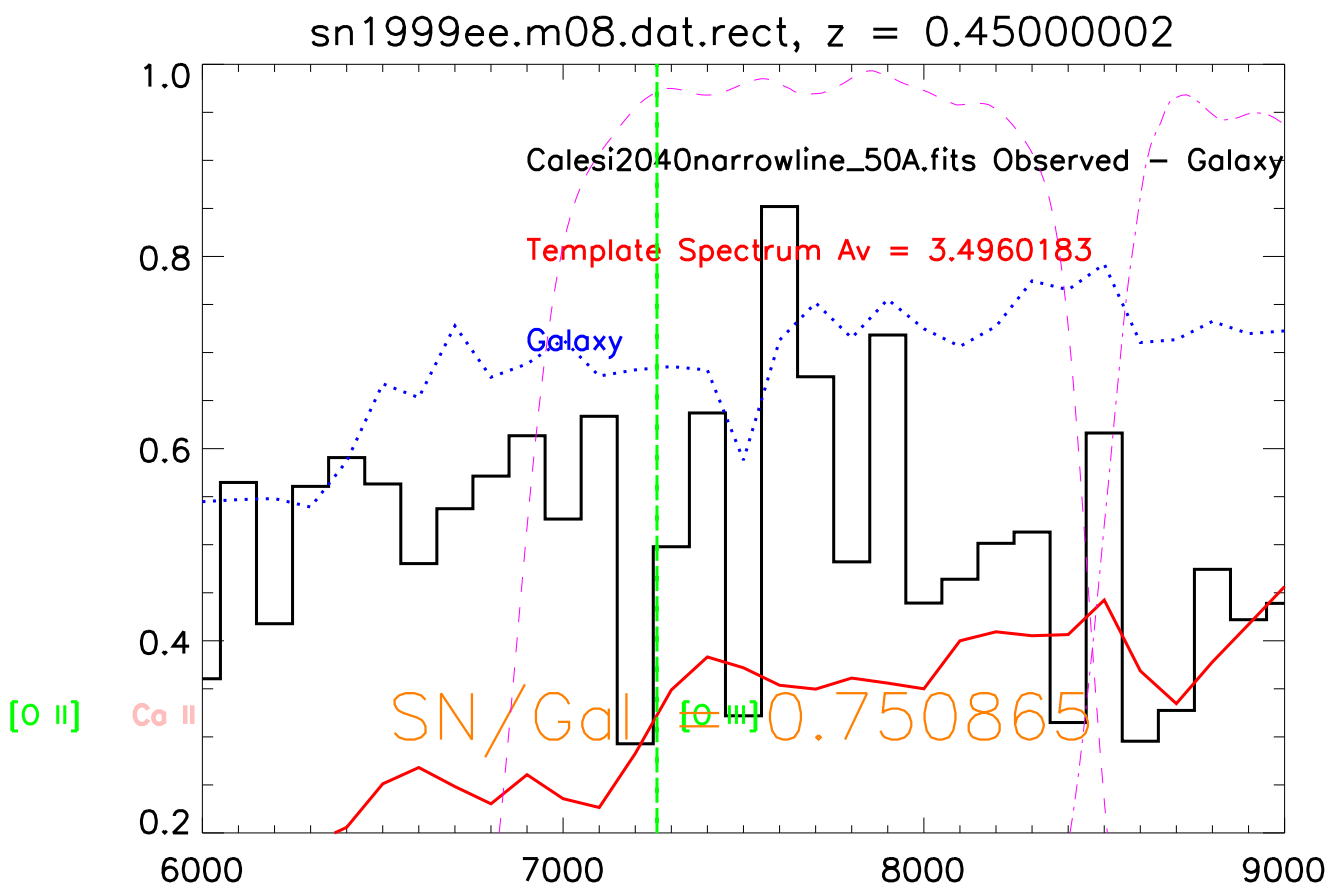
0.8
0.6
0.4
0.2
6000
7000
8000
9000


sn1999ee.m08.dat.rect, z = 0.45000002
Calesi2040narrowline_50A.fits Observed – Galaxy
Template Spectrum Av = 3.4960183
Galaxy
SN/Gal: 0.750865
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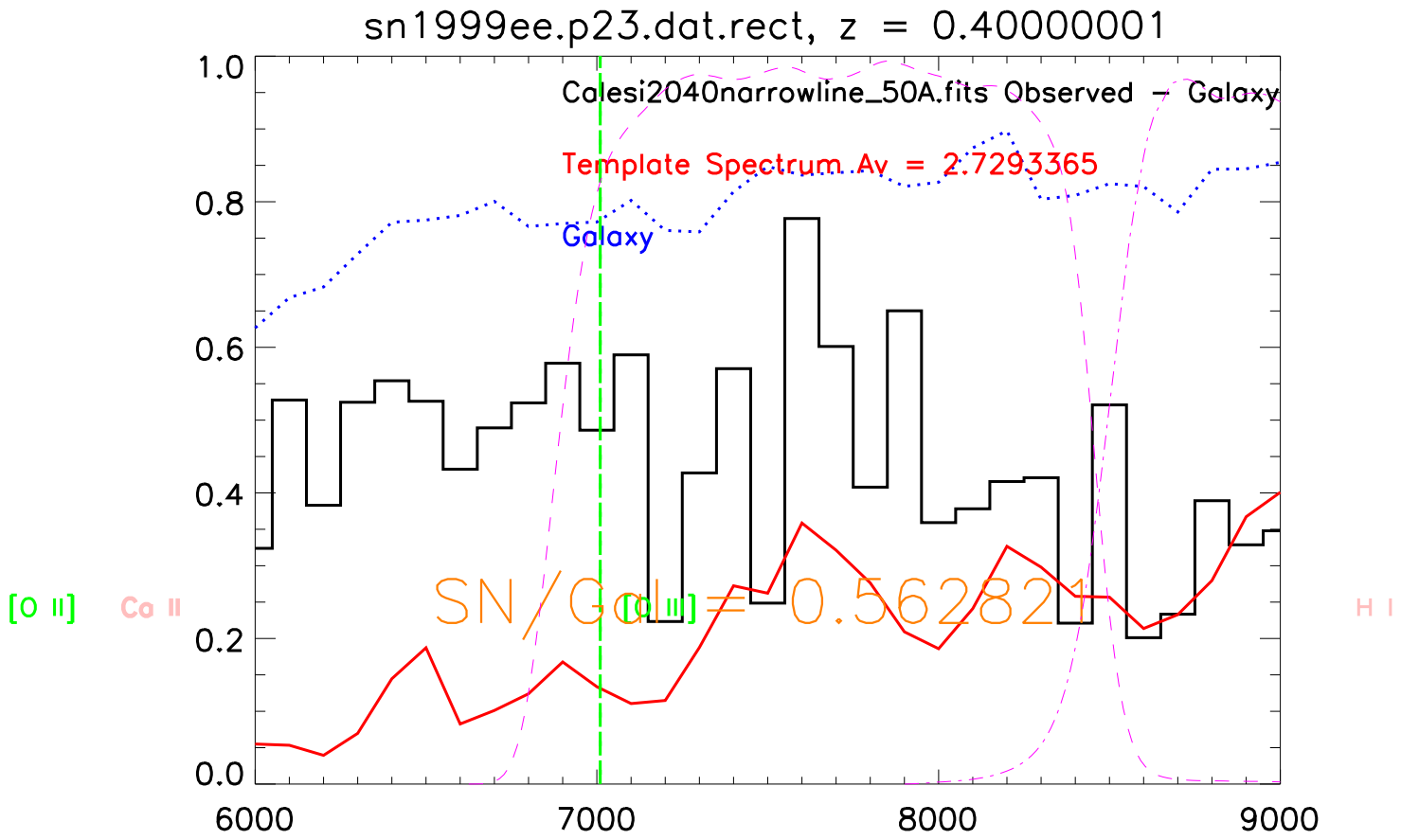
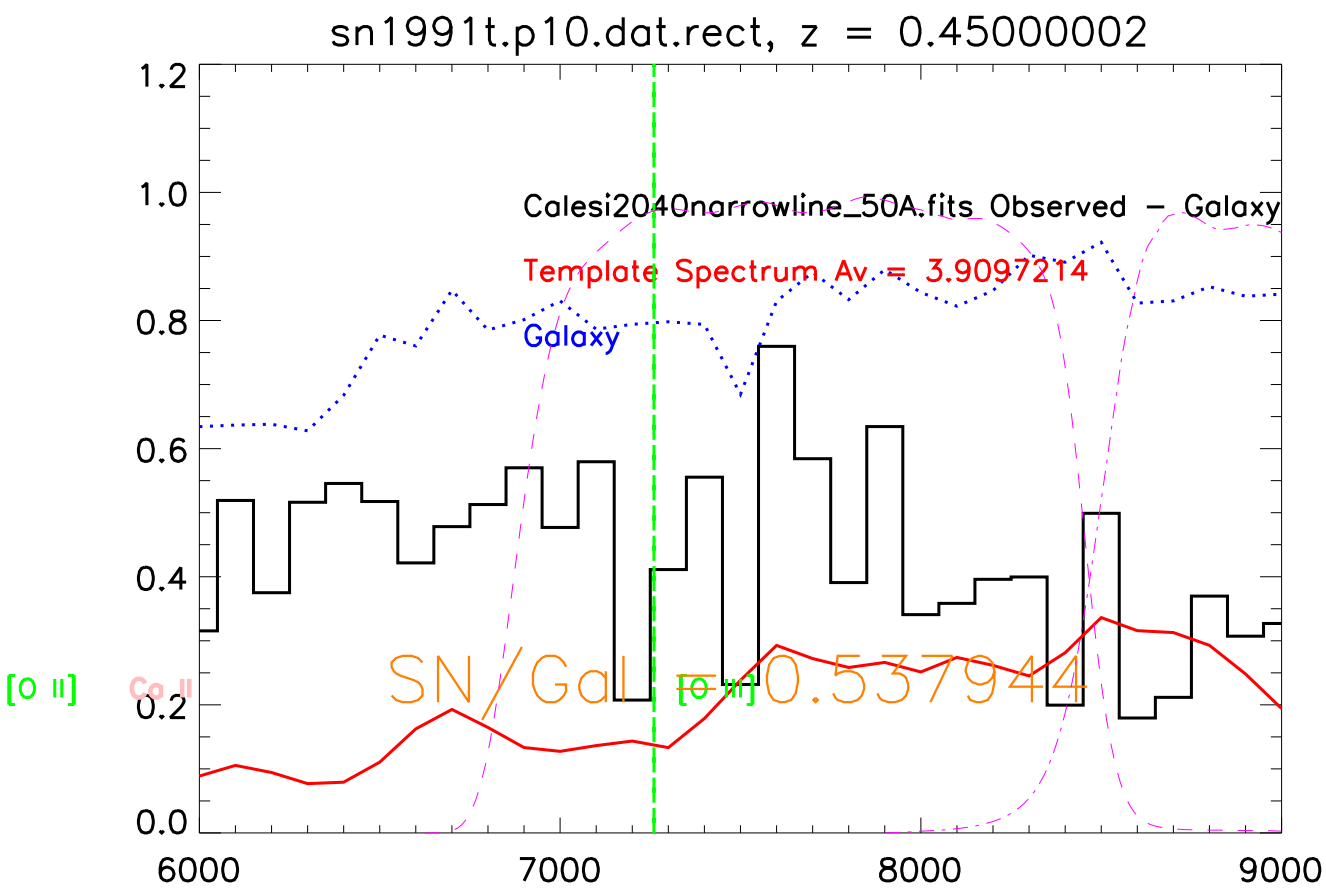
Ca II
[O III]
1.0
0.8
0.6
0.4
0.2
6000
7000
8000
9000


sn1999ee.p23.dat.rect, z = 0.40000001
Calesi2040narrowline_50A.fits Observed – Galaxy
Template Spectrum Av = 2.7293365
Galaxy
SN/Gal=0.562821
[O II]
Ca II
[O III]
H I
1.0
0.8
0.6
0.4
0.2
0.0
6000
7000
8000
9000


sn1991t.p10.dat.rect, z = 0.45000002
Calesi2040narrowline_50A.fits Observed – Galaxy
Template Spectrum Av = 3.9097214
Galaxy
SN/Gal: 0.537944
[O II]
Ca II
[O III]
1.2
1.0
0.8
0.6
0.4
0.2
0.0
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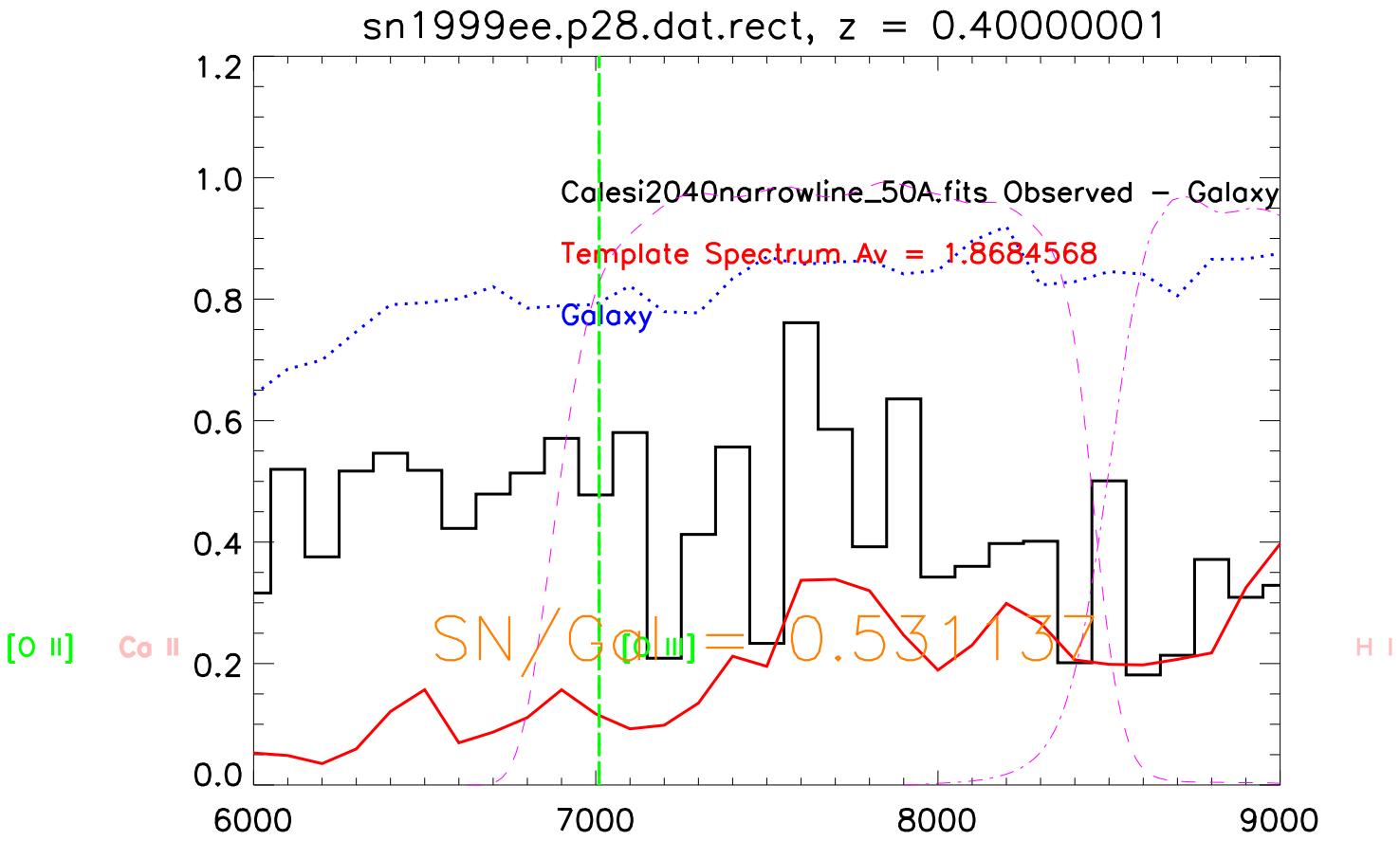
7000
8000
9000


sn1999ee.p28.dat.rect, z = 0.40000001
Calesi2040narrowline_50A.fits Observed – Galaxy
Template Spectrum Av = 1.8684568
Galaxy
SN/Gal=0.531137
[O II]
Ca II
[O III]
H I
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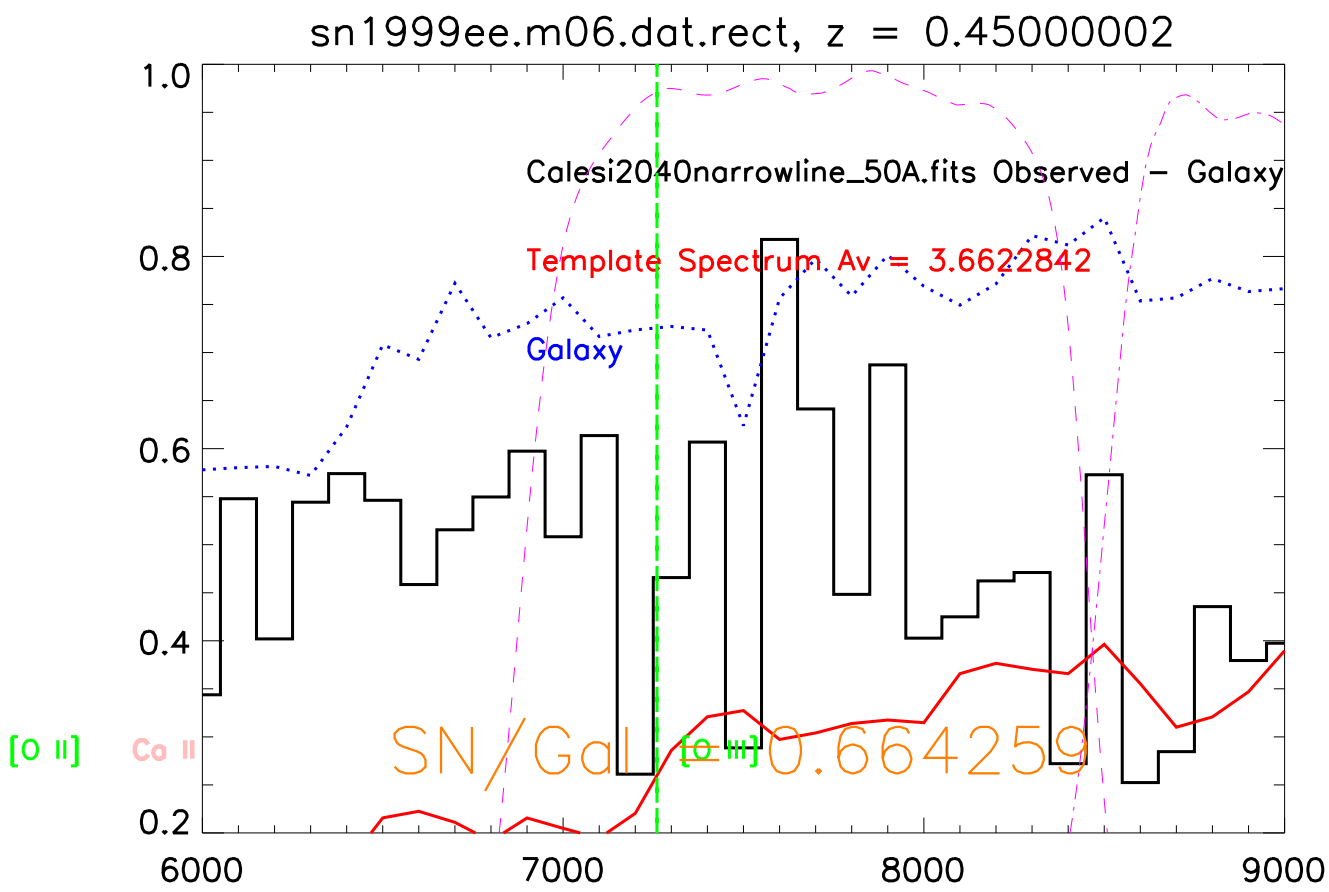
1.0
0.8
0.6
0.4
0.2
0.0
6000
7000
8000
9000


sn1999ee.m06.dat.rect, z = 0.45000002
Calesi2040narrowline_50A.fits Observed − Galaxy
Template Spectrum Av = 3.6622842
Galaxy
SN/Gal [O III]0.664259
[O II]
Ca II
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0.8
0.6
0.4
0.2
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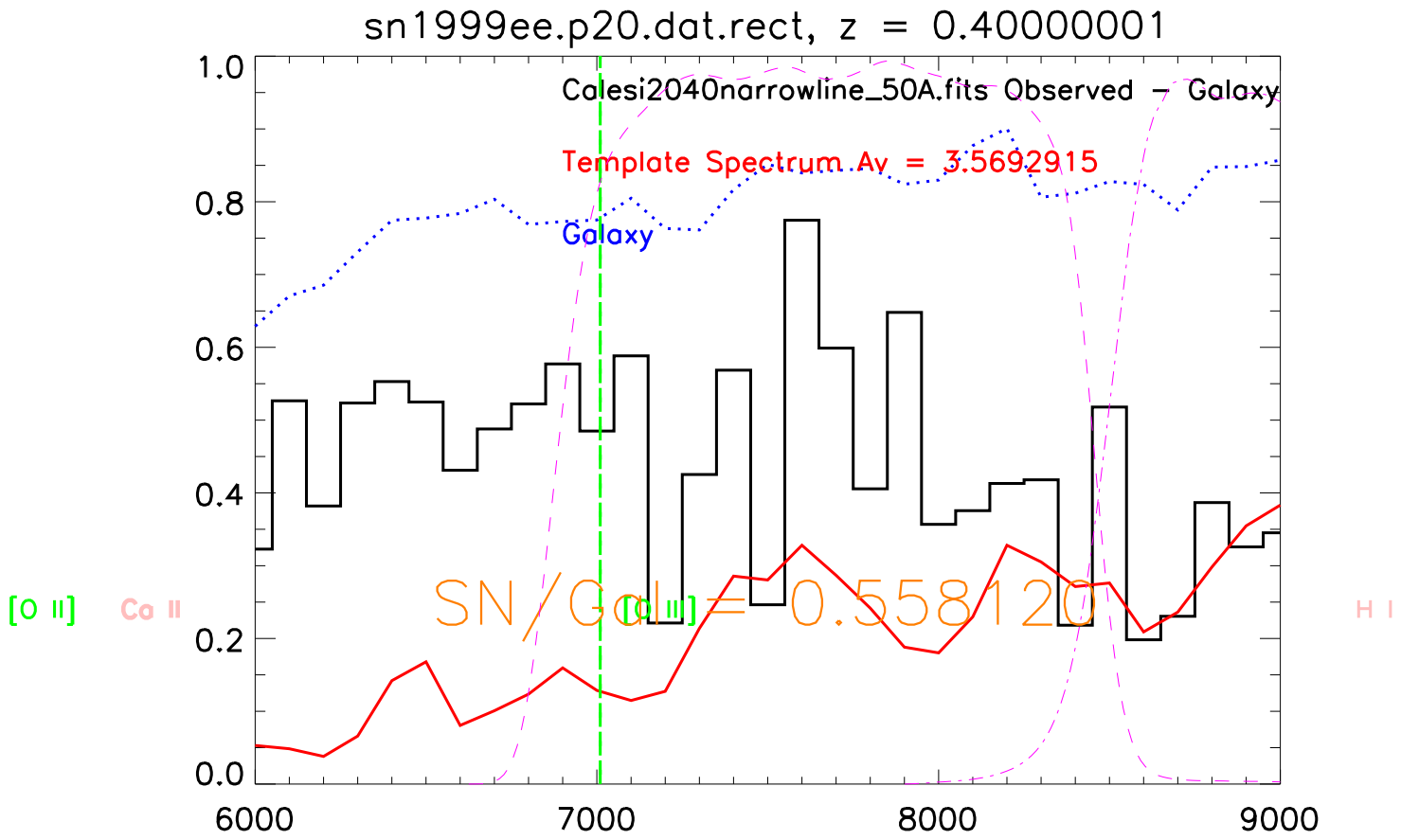
7000
8000
9000


sn1999ee.p20.dat.rect, z = 0.40000001
Calesi2040narrowline_50A.fits Observed – Galaxy
Template Spectrum Av = 3.5692915
Galaxy
SN/Gal[O III]=0.558120
[O II]
Ca II
H I
1.0
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0.6
0.4
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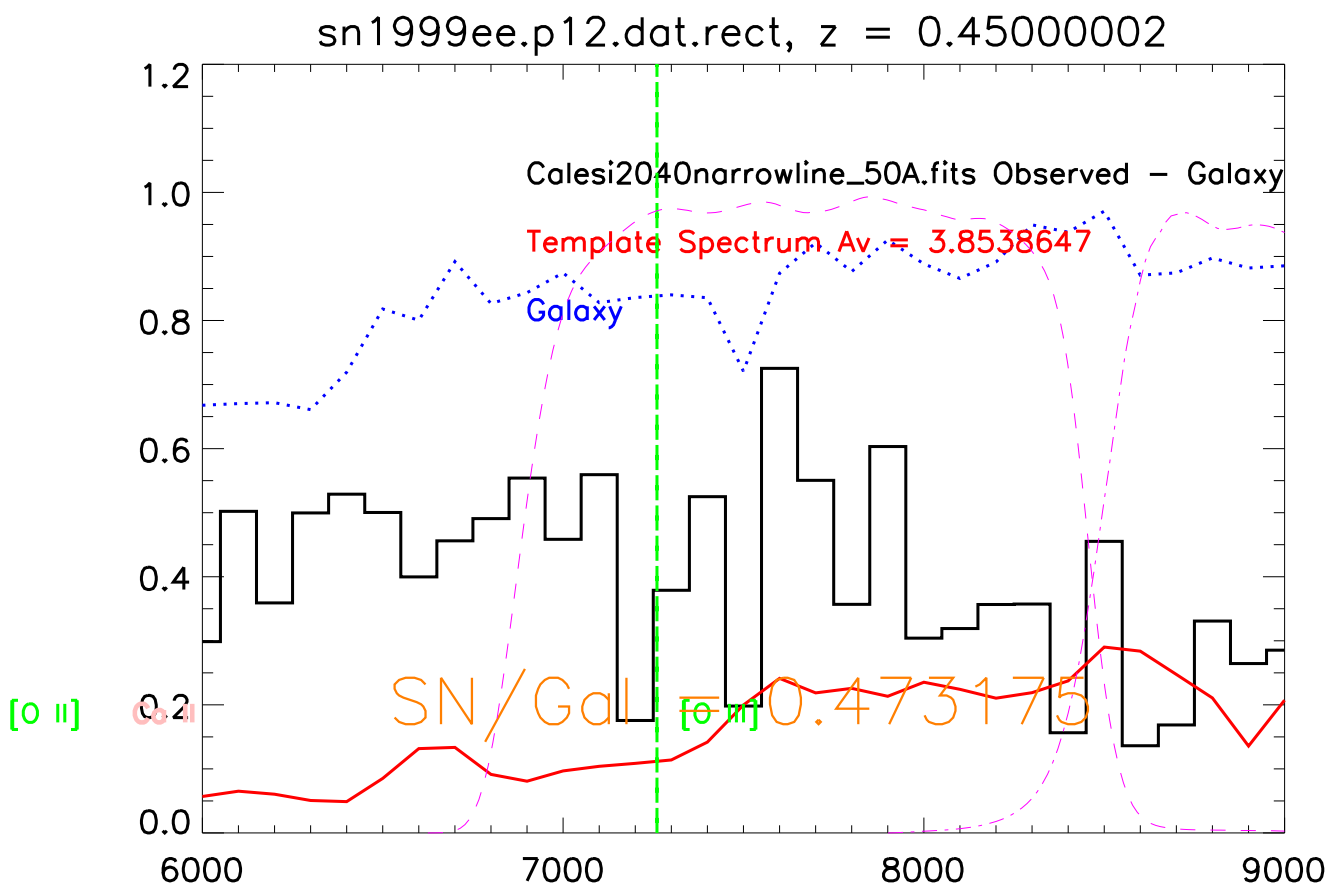
8000
9000


sn1999ee.p12.dat.rect, z = 0.45000002
Calesi2040narrowline_50A.fits Observed – Galaxy
Template Spectrum Av. = 3.8538647
Galaxy
SN/Gal = 0.473175
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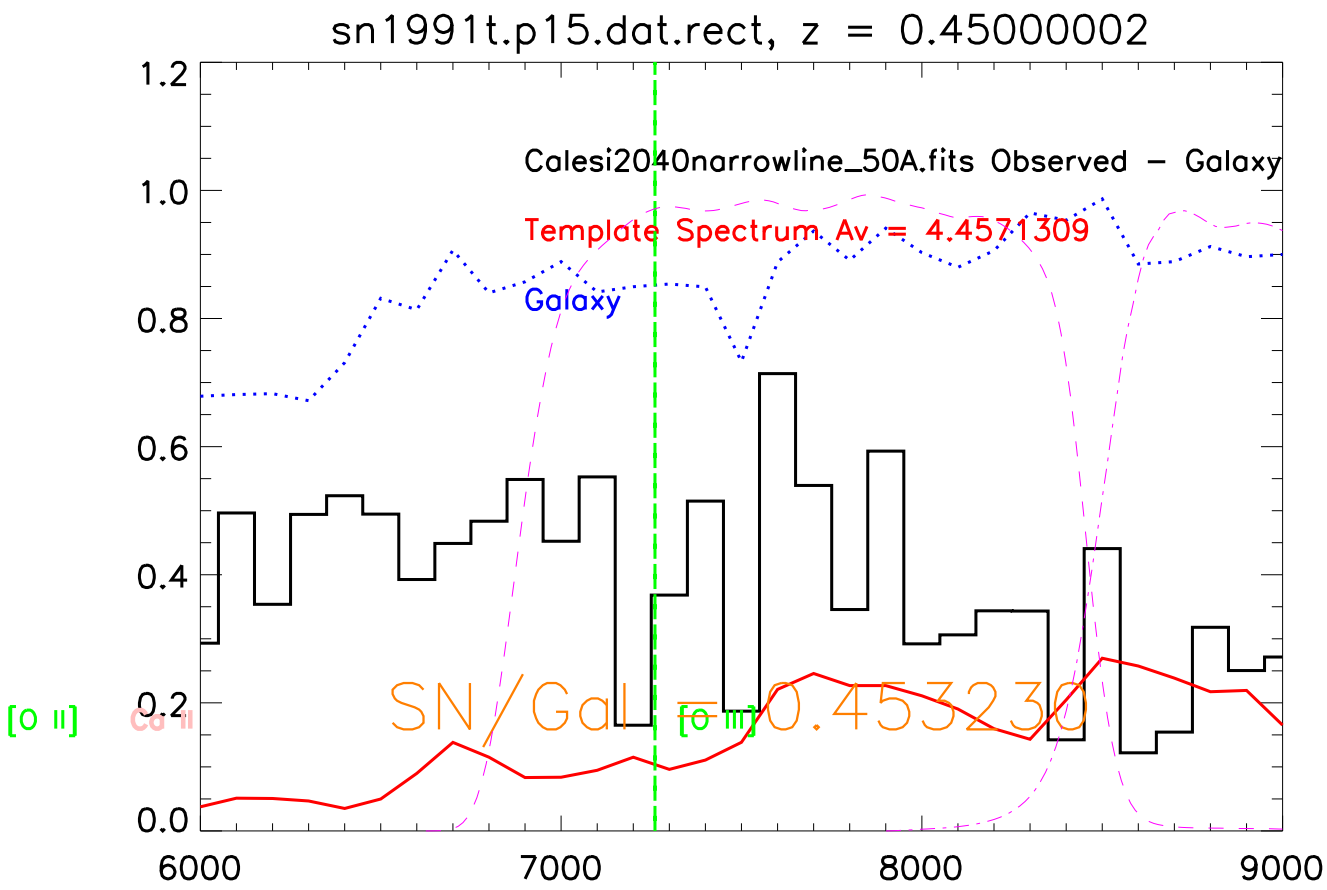
[O III]
1.2
1.0
0.8
0.6
0.4
0.2
0.0
6000
7000
8000
9000


sn1991t.p15.dat.rect, z = 0.45000002
Calesi2040narrowline_50A.fits Observed − Galaxy
Template Spectrum Av = 4.4571309
Galaxy
SN/GaL = 0.453230
[O II]
Ca II
[O III]
1.2
1.0
0.8
0.6
0.4
0.2
0.0
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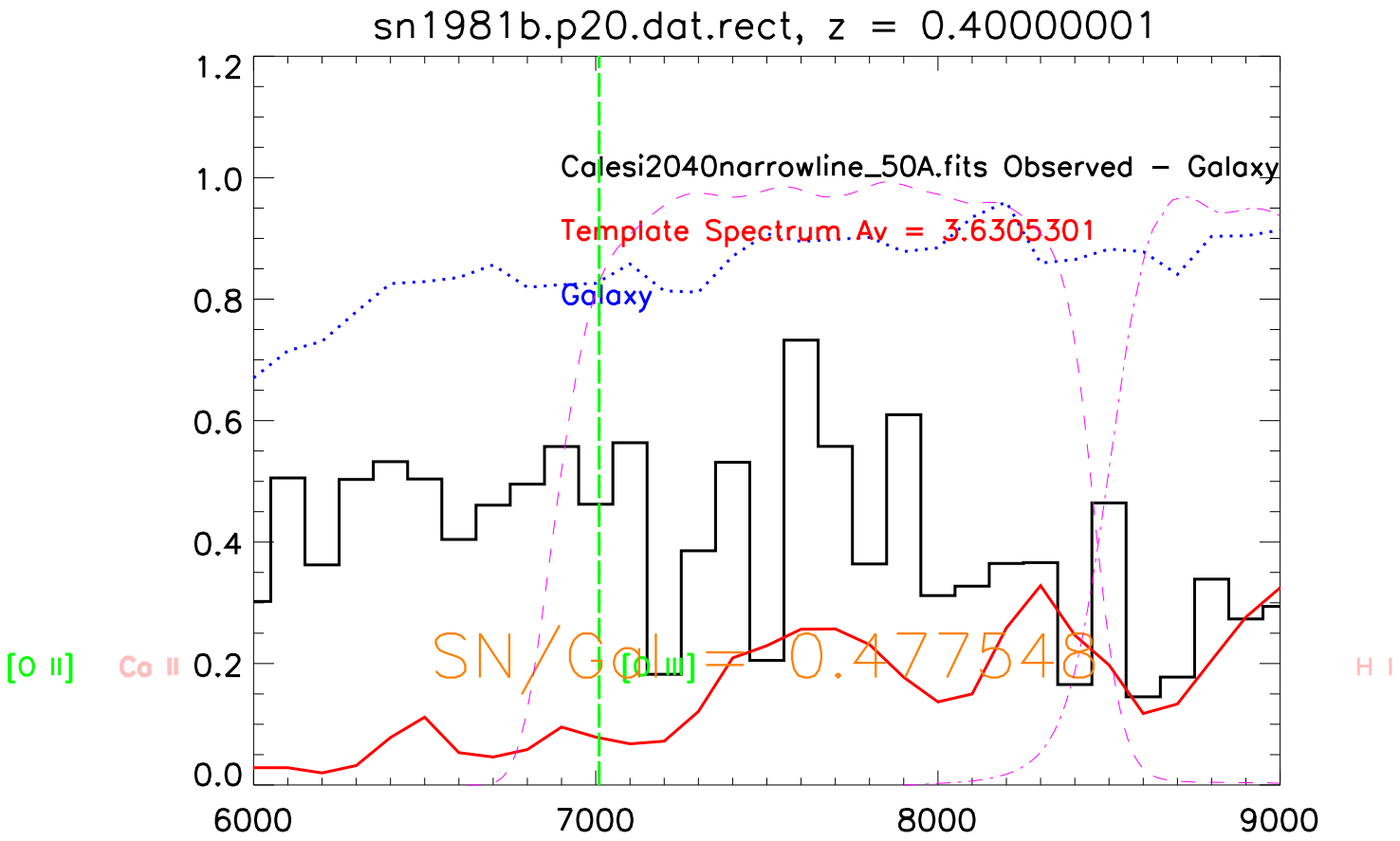
7000
8000
9000


sn1981b.p20.dat.rect, z = 0.40000001
Calesi2040narrowline_50A.fits Observed – Galaxy
Template Spectrum Av = 3.6305301
Galaxy
SN/Gal=0.477548
[O II]
Ca II
[O III]
H I
1.2
1.0
0.8
0.6
0.4
0.2
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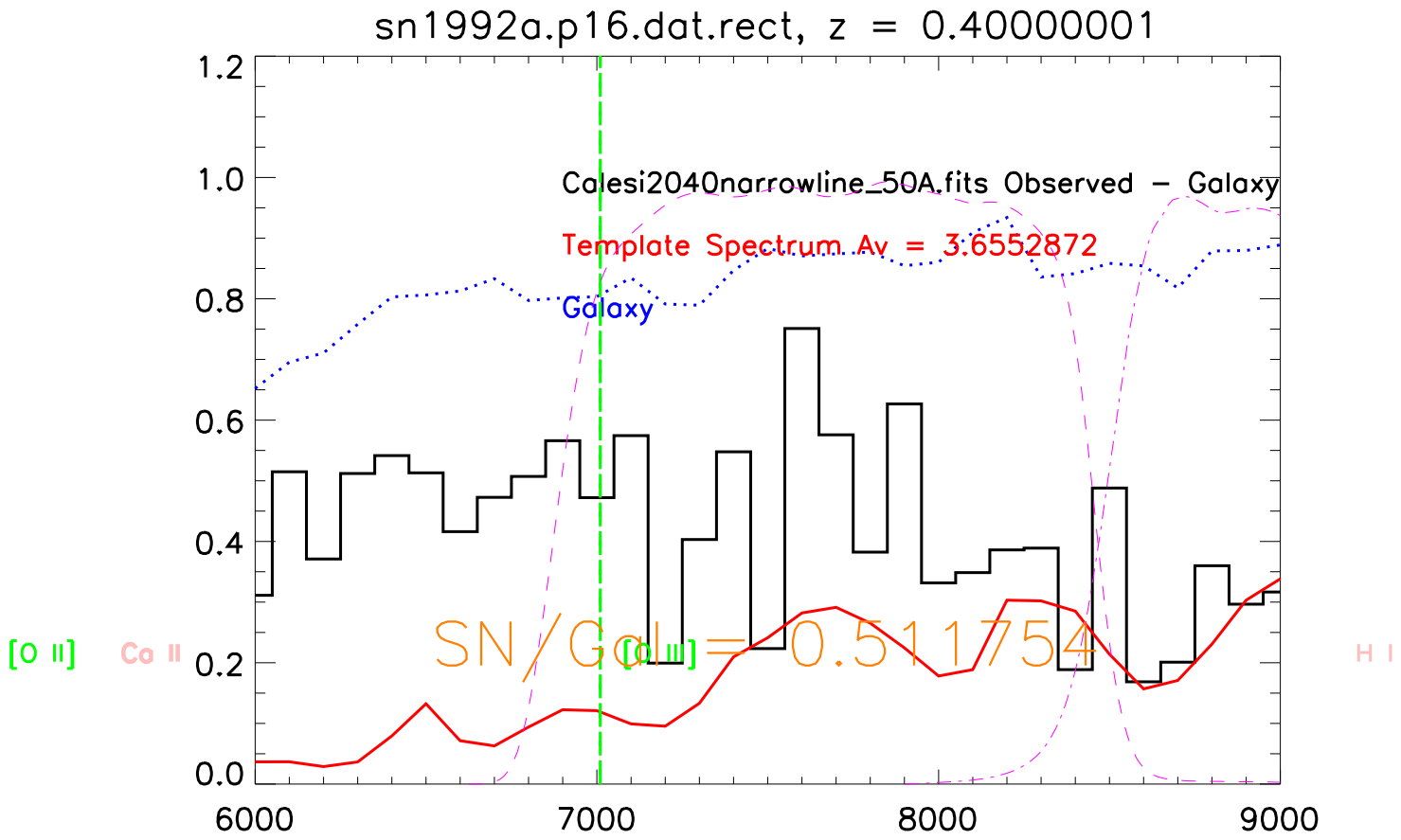
7000
8000
9000


sn1992a.p16.dat.rect, z = 0.40000001
Calesi2040narrowline_50A.fits Observed − Galaxy
Template Spectrum Av = 3.6552872
Galaxy
SN/Gal = 0.511754
[O II]
Ca II
[O III]
H I
1.2
1.0
0.8
0.6
0.4
0.2
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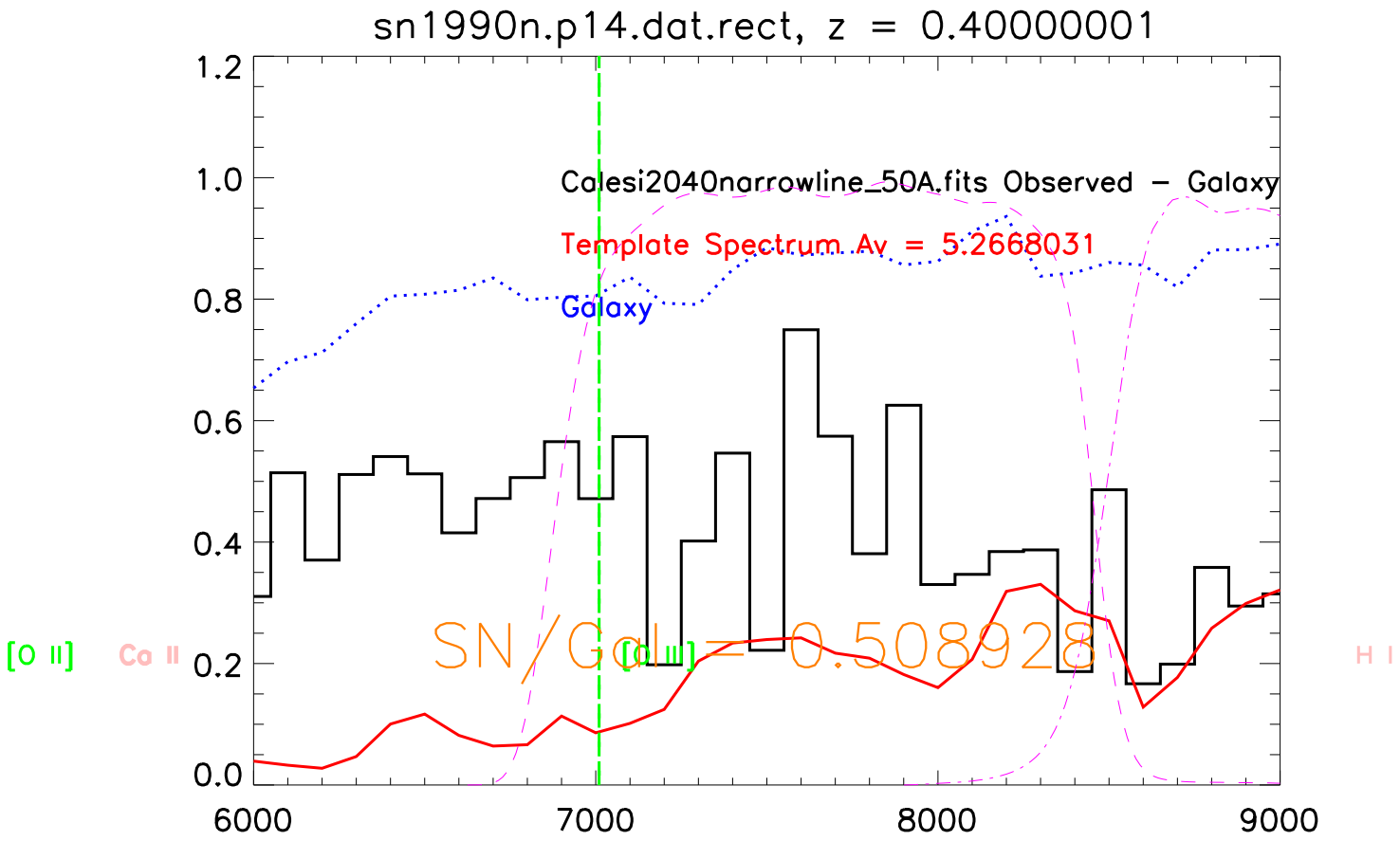
7000
8000
9000


sn1990n.p14.dat.rect, z = 0.40000001
Calesi2040narrowline_50A.fits Observed − Galaxy
Template Spectrum Av = 5.2668031
Galaxy
SN/Gal z=0.508928
[O II]
Ca II
[O III]
H I
1.2
1.0
0.8
0.6
0.4
0.2
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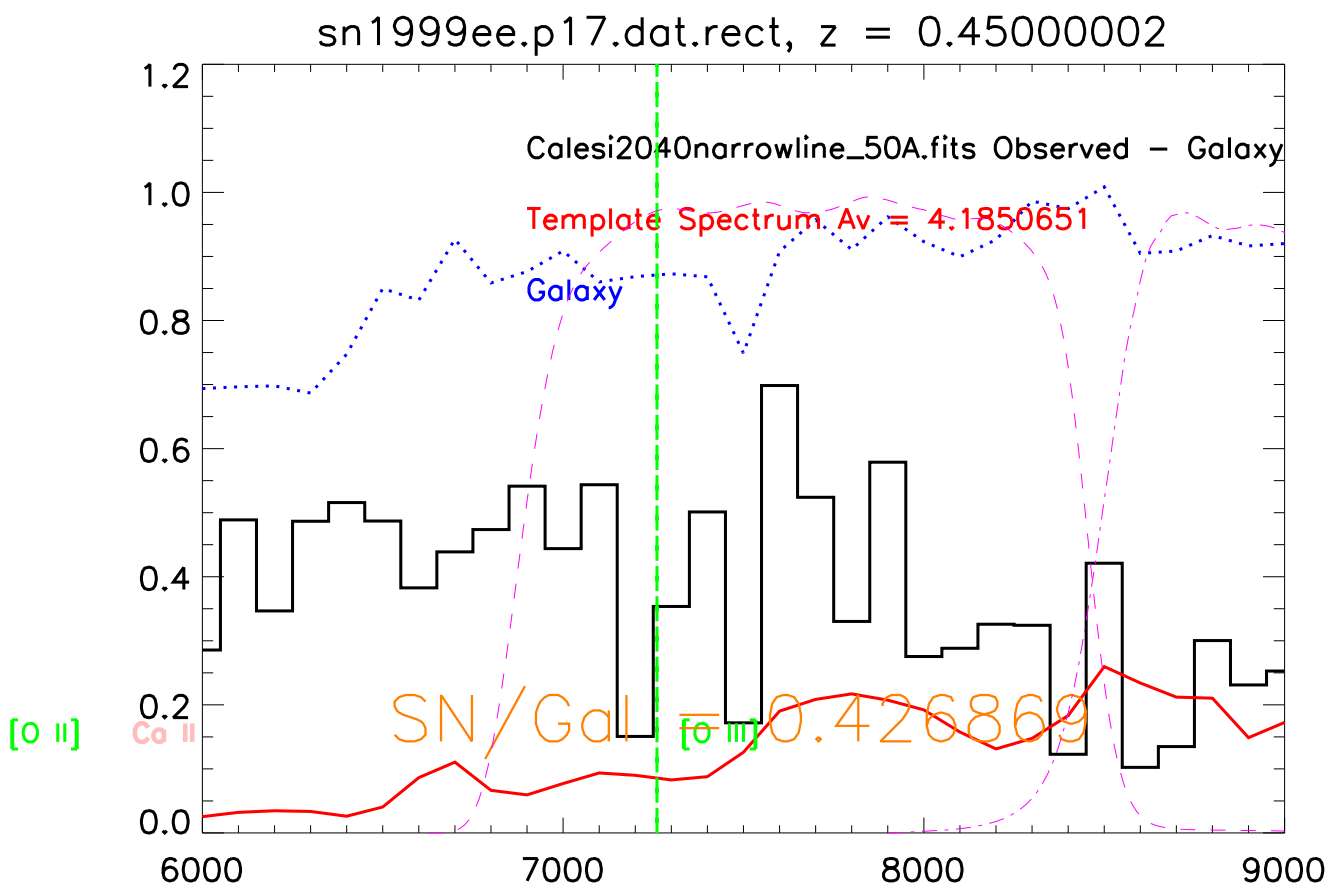
7000
8000
9000


sn1999ee.p17.dat.rect, z = 0.45000002
Calesi2040narrowline_50A.fits Observed – Galaxy
Template Spectrum Av = 4.1850651
Galaxy
SN/Gal = 0.426869
[O II]
Ca II
[O III]
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1.0
0.8
0.6
0.4
0.2
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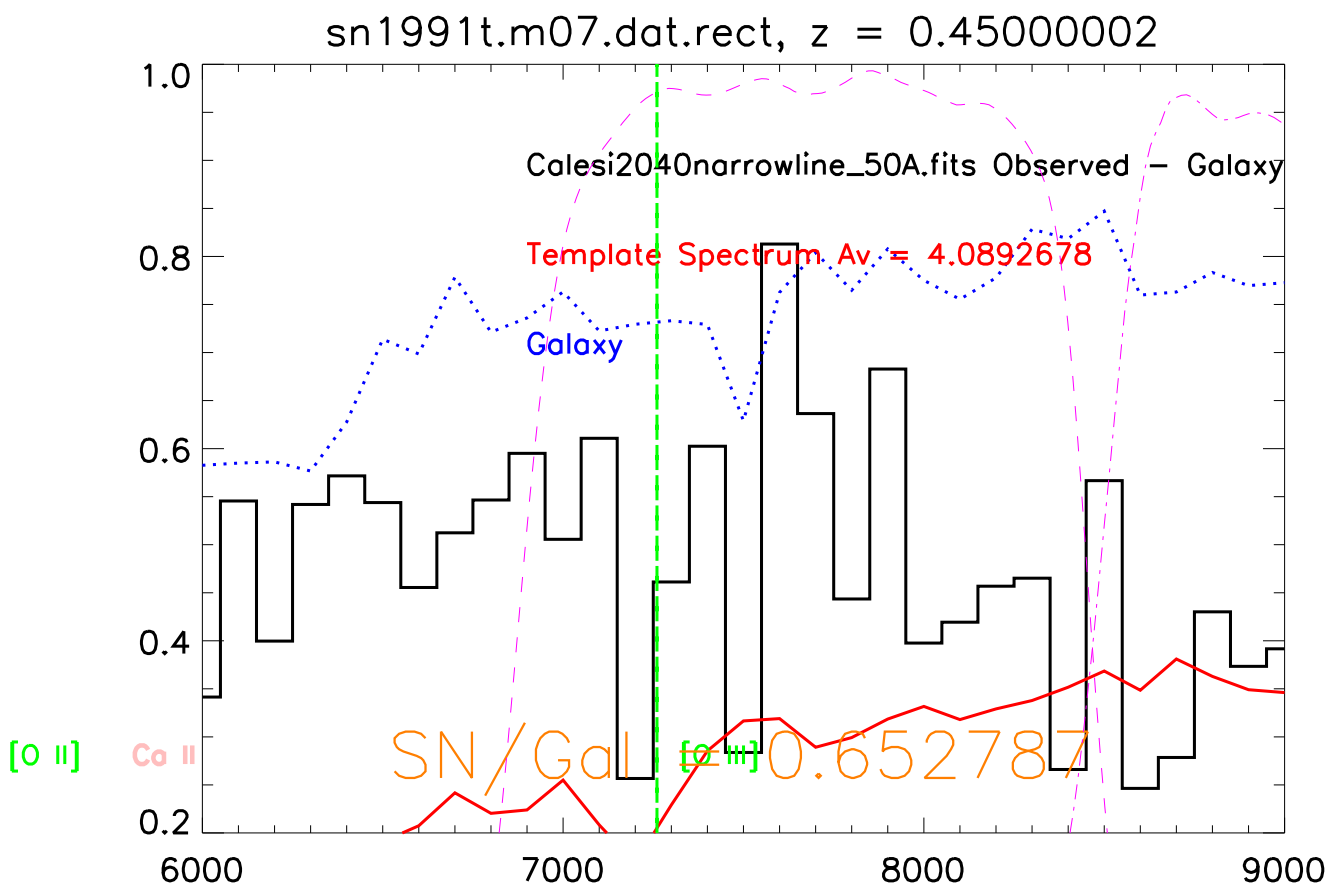
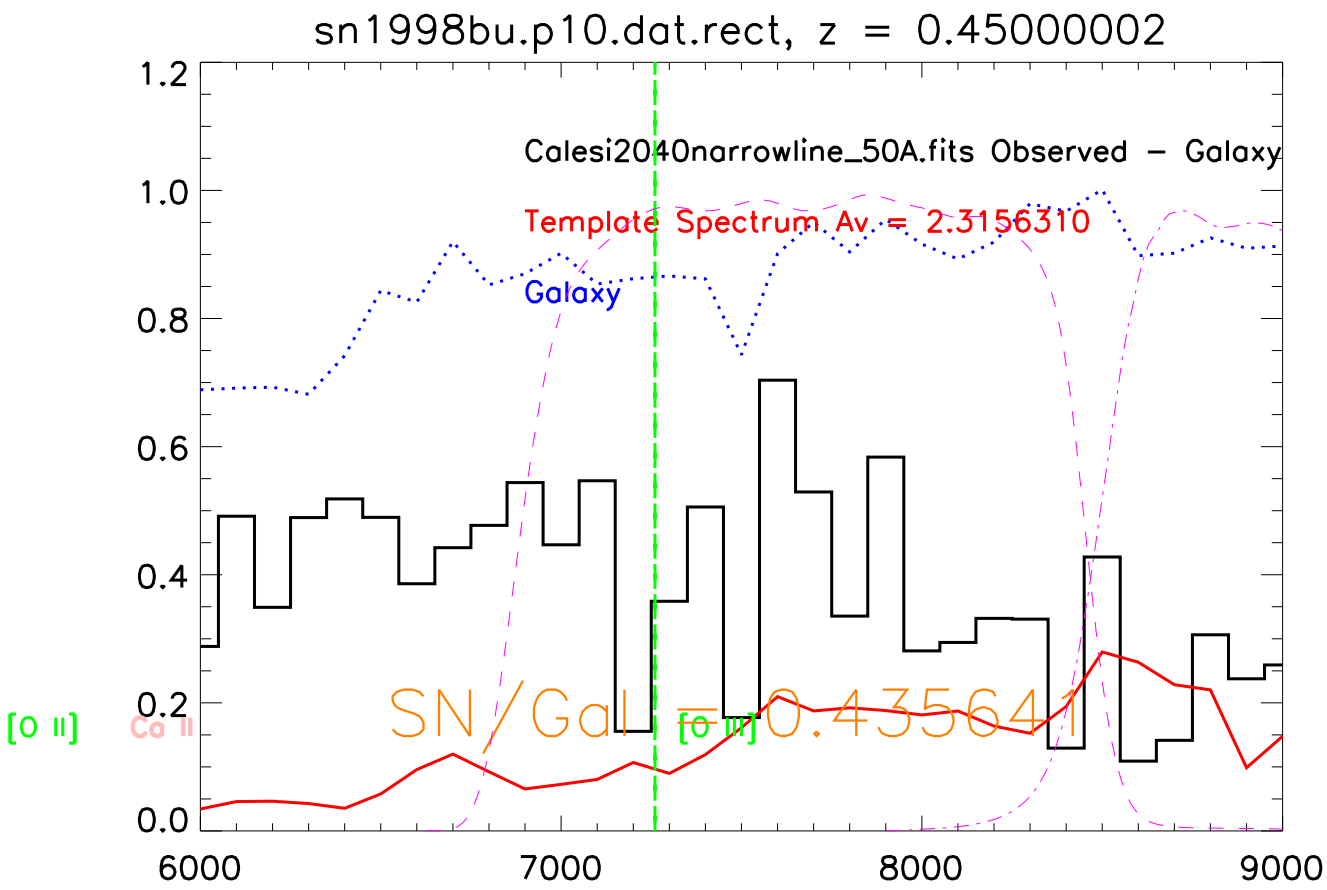
8000
9000


sn1991t.m07.dat.rect, z = 0.45000002
Calesi2040narrowline_50A.fits Observed – Galaxy
Template Spectrum Av = 4.0892678
Galaxy
SN/Gal [O III] 0.652787
[O II]
Ca II
1.0
0.8
0.6
0.4
0.2
6000
7000
8000
9000


sn1998bu.p10.dat.rect, z = 0.45000002
Calesi2040narrowline_50A.fits Observed – Galaxy
Template Spectrum Av. = 2.3156310
Galaxy
SN/Gal = 0.435641
[O II]
Ca II
[O III]
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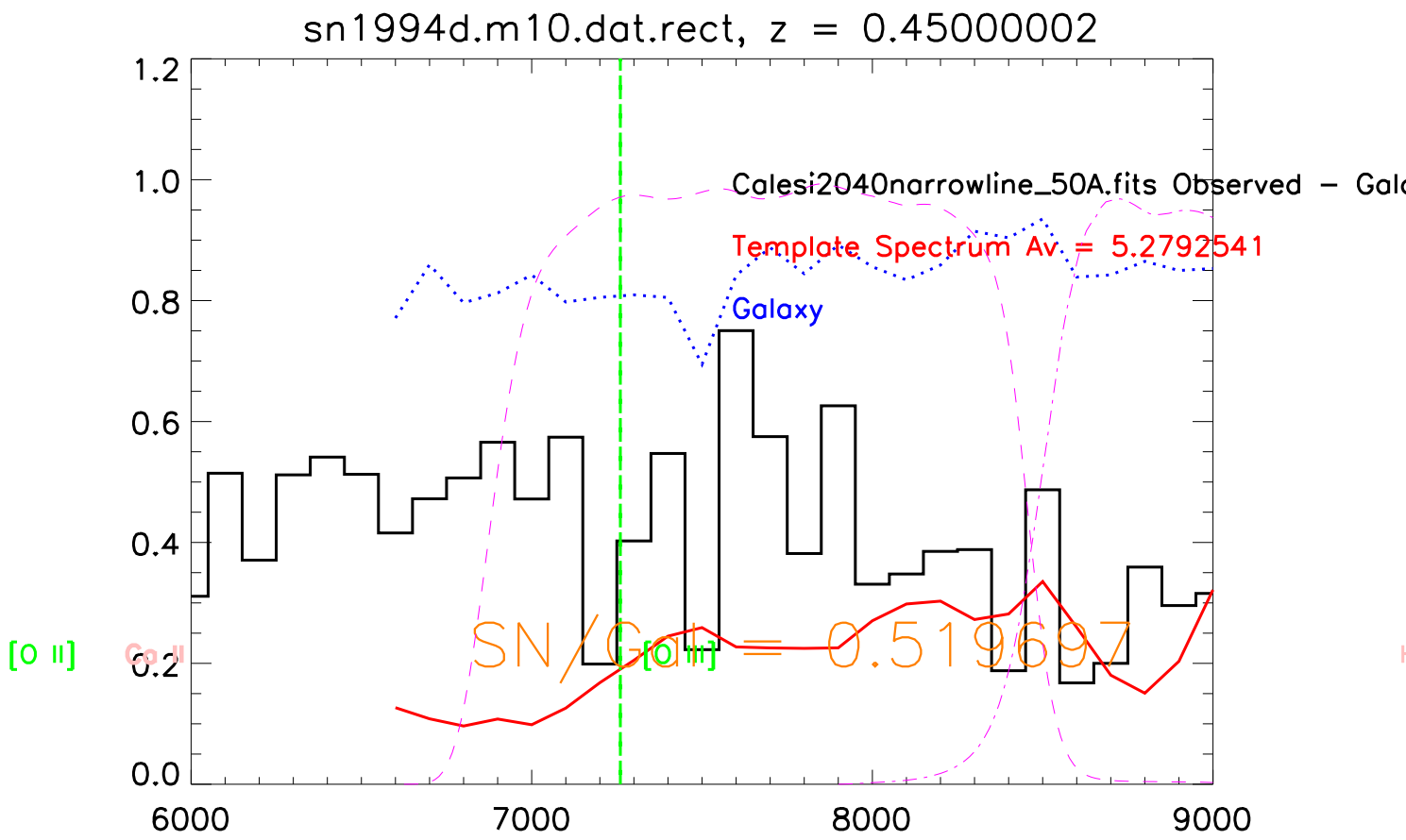
1.0
0.8
0.6
0.4
0.2
0.0
6000
7000
8000
9000


sn1994d.m10.dat.rect, z = 0.45000002
Calesi2040narrowline_50A.fits Observed – Gala
Template Spectrum Av = 5.2792541
Galaxy
SN/Gal = 0.519697
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1.2
1.0
0.8
0.6
0.4
0.2
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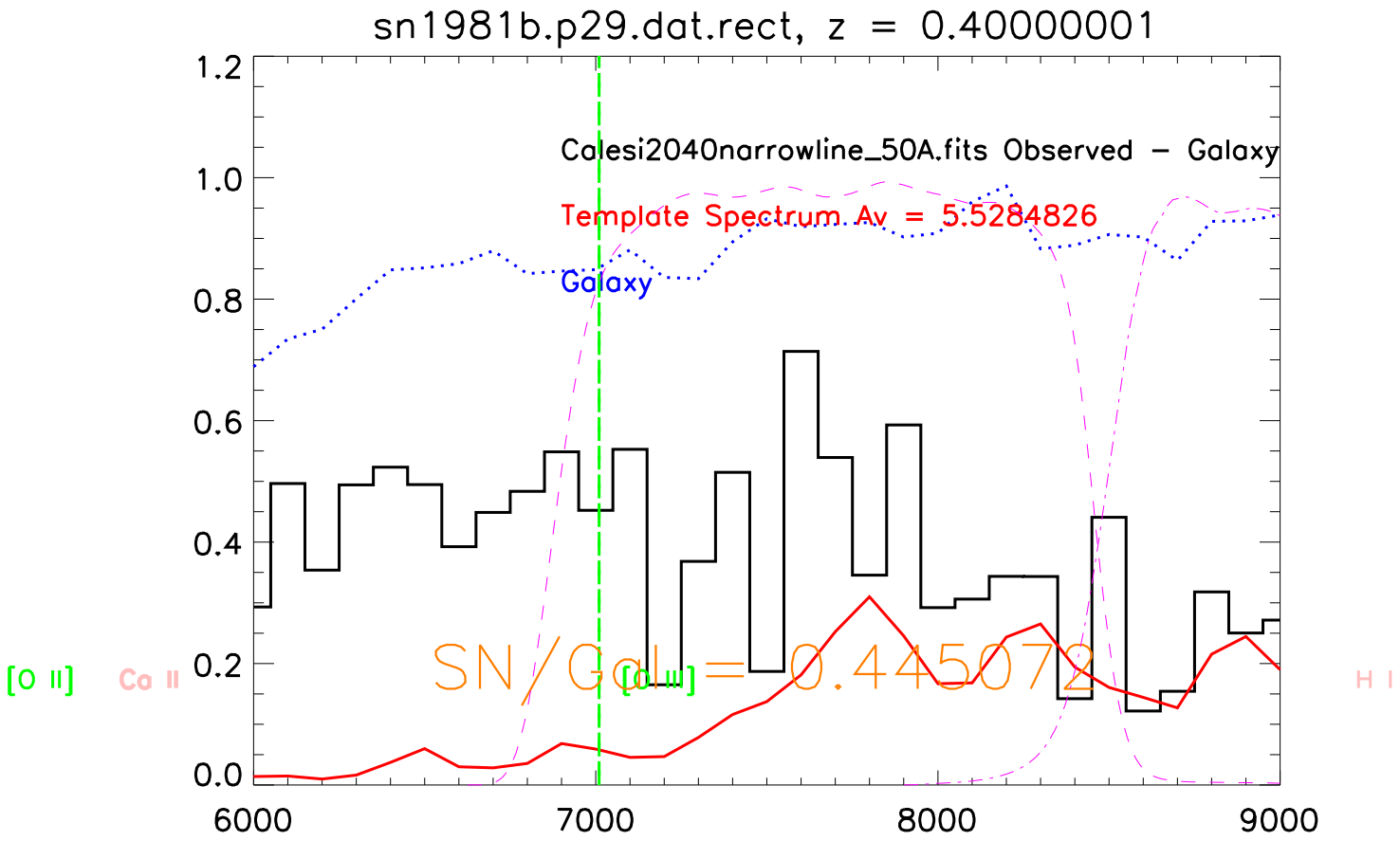
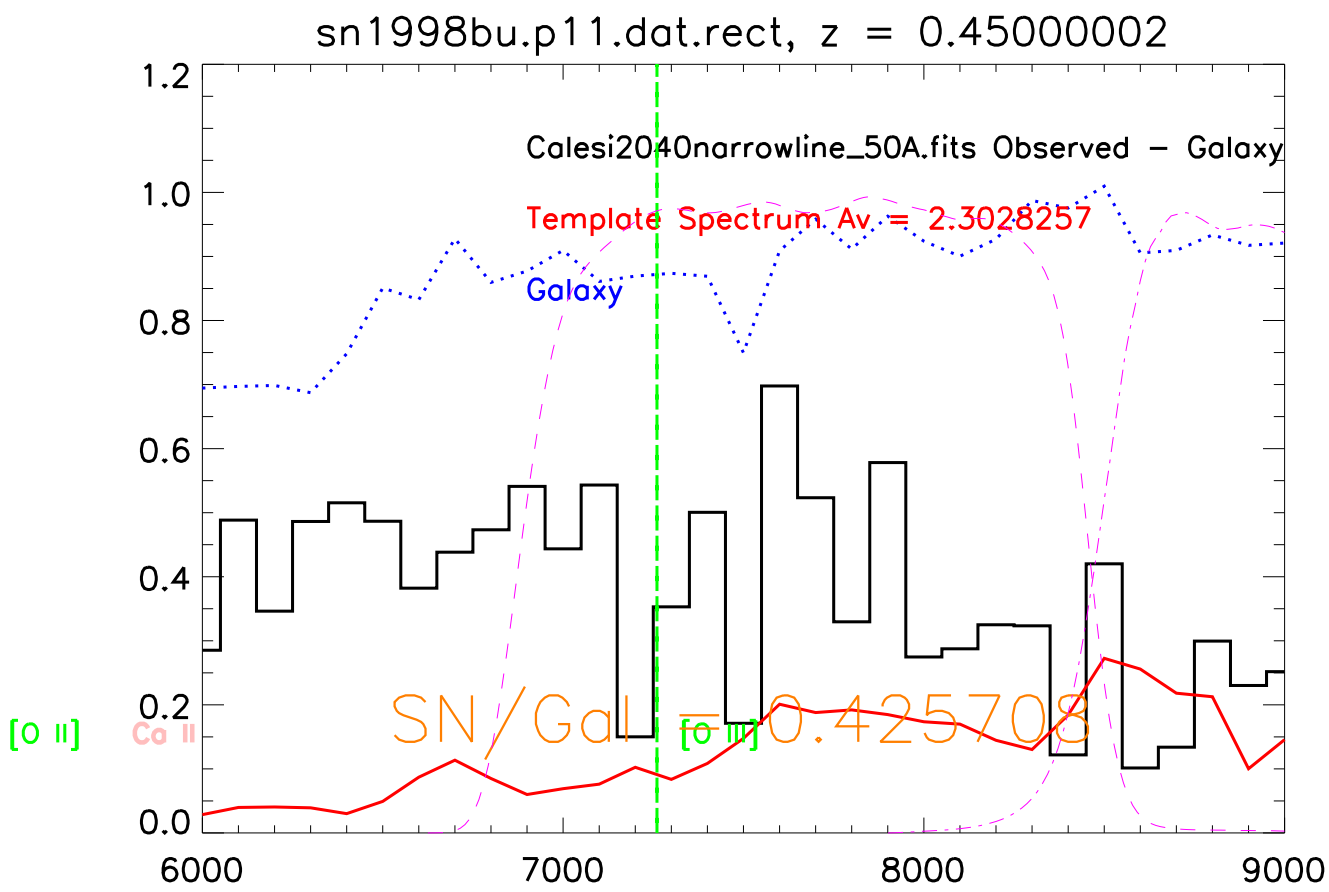
6000
7000
8000
9000


sn1981b.p29.dat.rect, z = 0.40000001
Calesi2040narrowline_50A.fits Observed – Galaxy
Template Spectrum Av = 5.5284826
Galaxy
SN/Gal=0.445072
[O II]
Ca II
[O III]
H I
1.2
1.0
0.8
0.6
0.4
0.2
0.0
6000
7000
8000
9000


sn1998bu.p11.dat.rect, z = 0.45000002
Calesi2040narrowline_50A.fits Observed – Galaxy
Template Spectrum Av = 2.3028257
Galaxy
SN/Gal = 0.425708
[O II]
Ca II
[O III]
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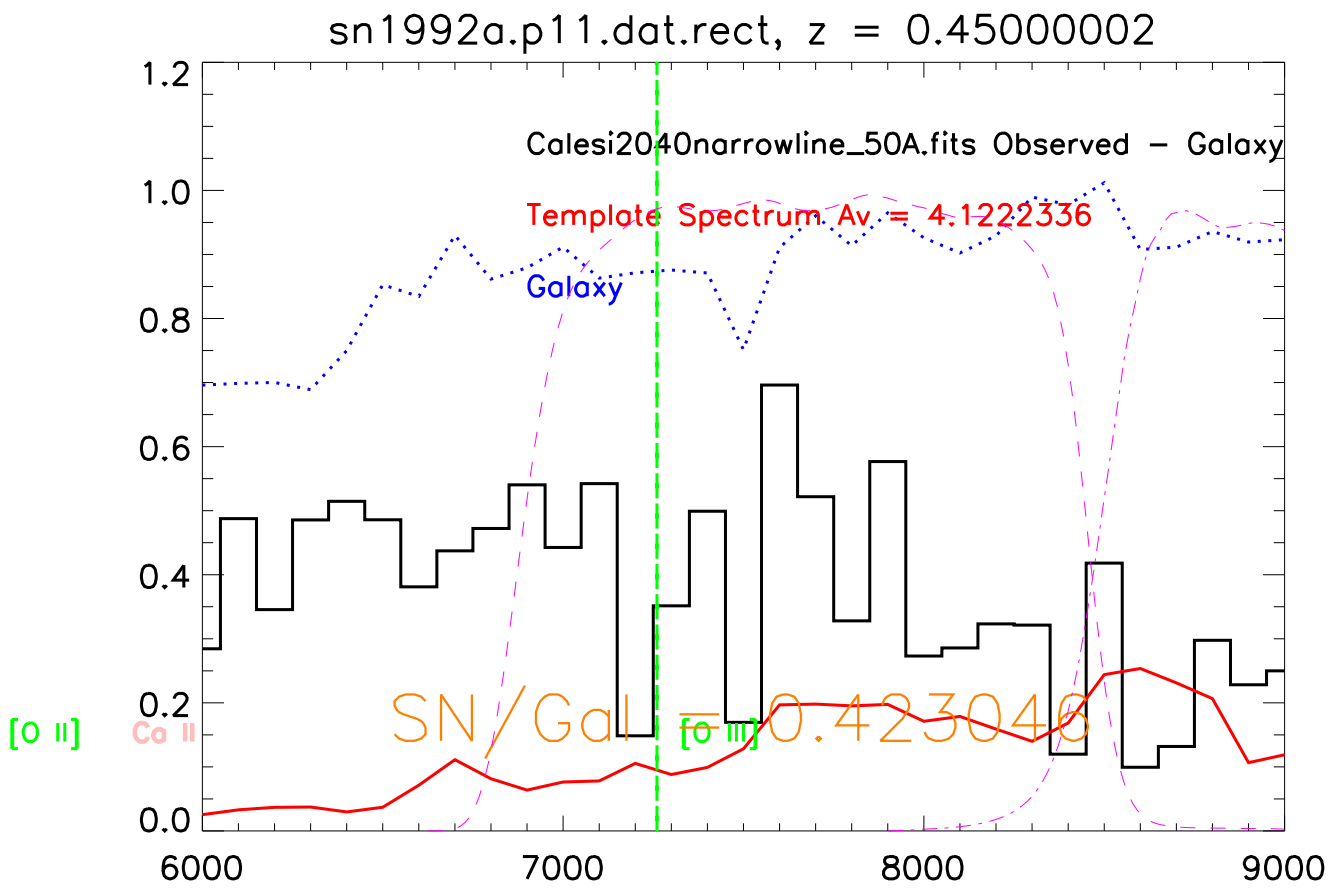
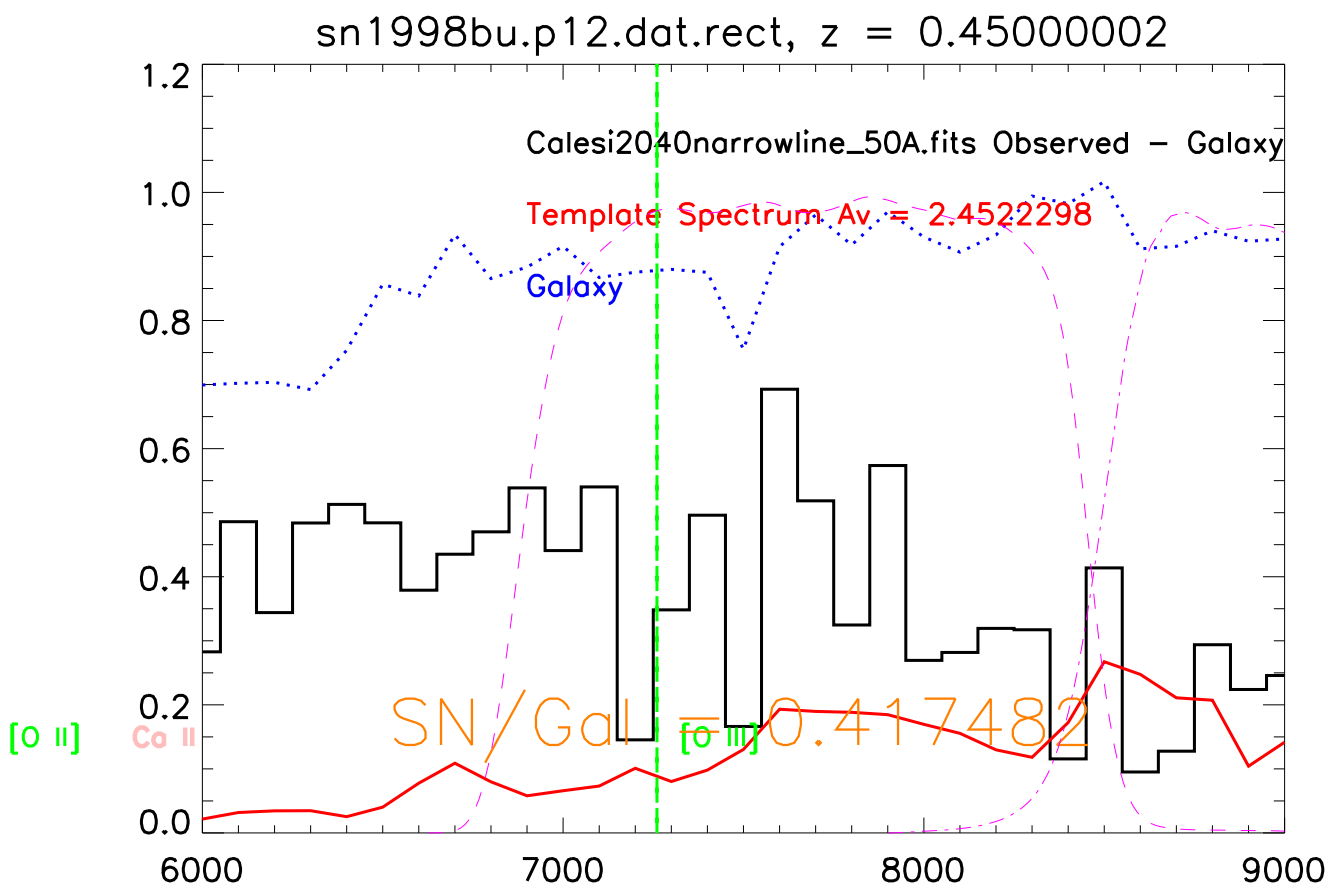
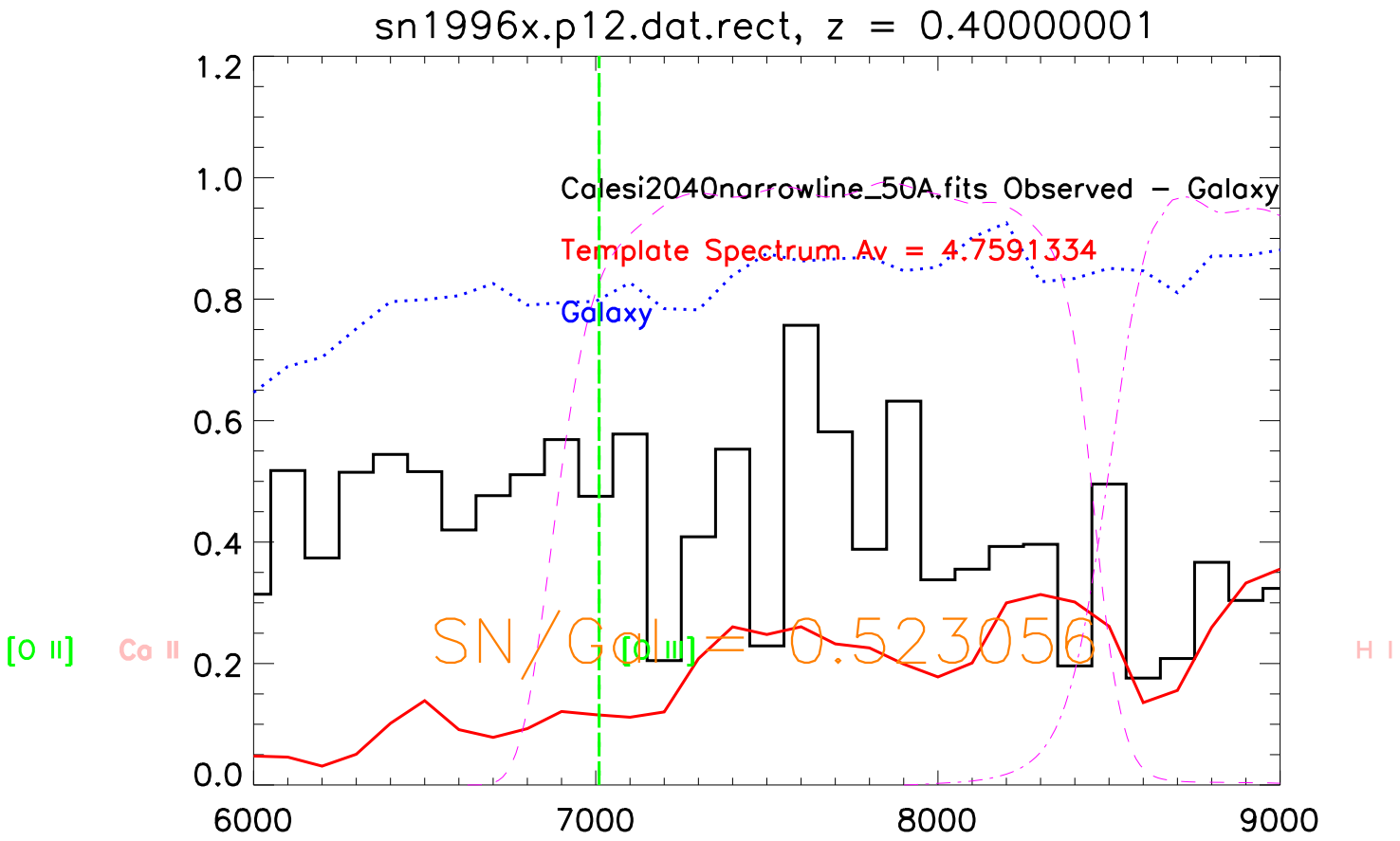
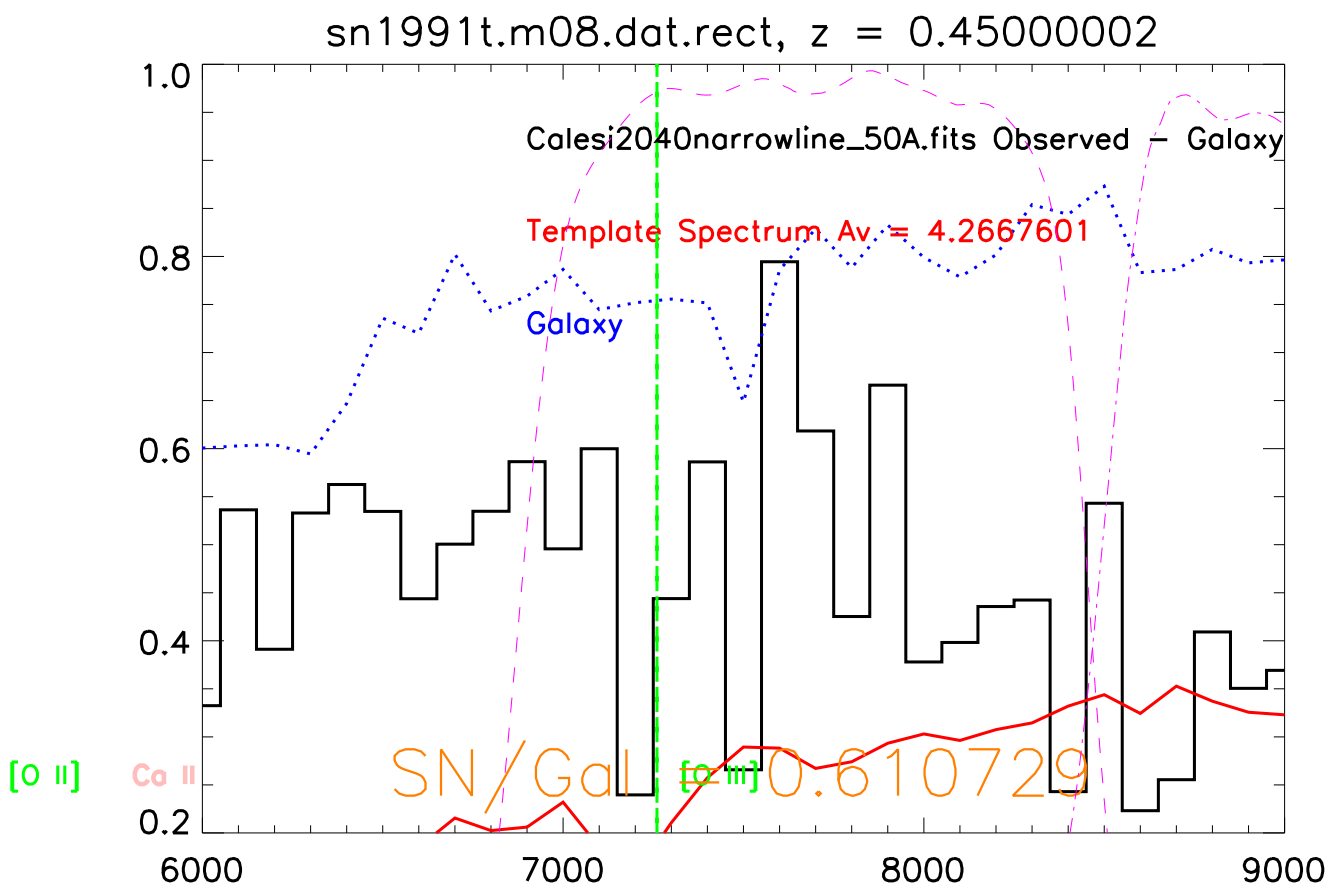
1.0
0.8
0.6
0.4
0.2
0.0
6000
7000
8000
9000

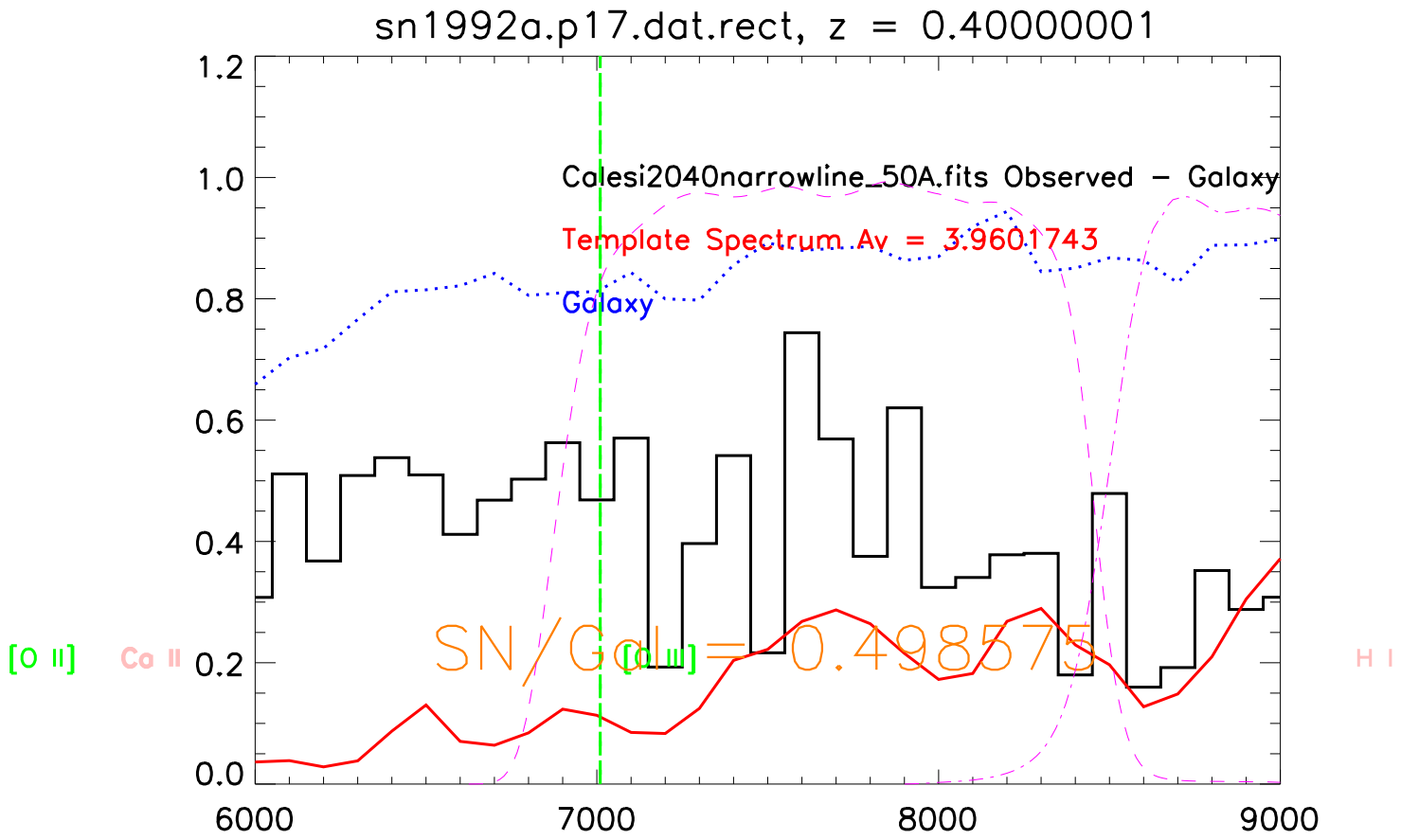

sn1992a.p11.dat.rect, z = 0.45000002
Calesi2040narrowline_50A.fits Observed – Galaxy
Template Spectrum Av = 4.1222336
Galaxy
SN/Gal = 0.423046
[O II]
Ca II
[O III]
1.2
1.0
0.8
0.6
0.4
0.2
0.0
6000
7000
8000
9000

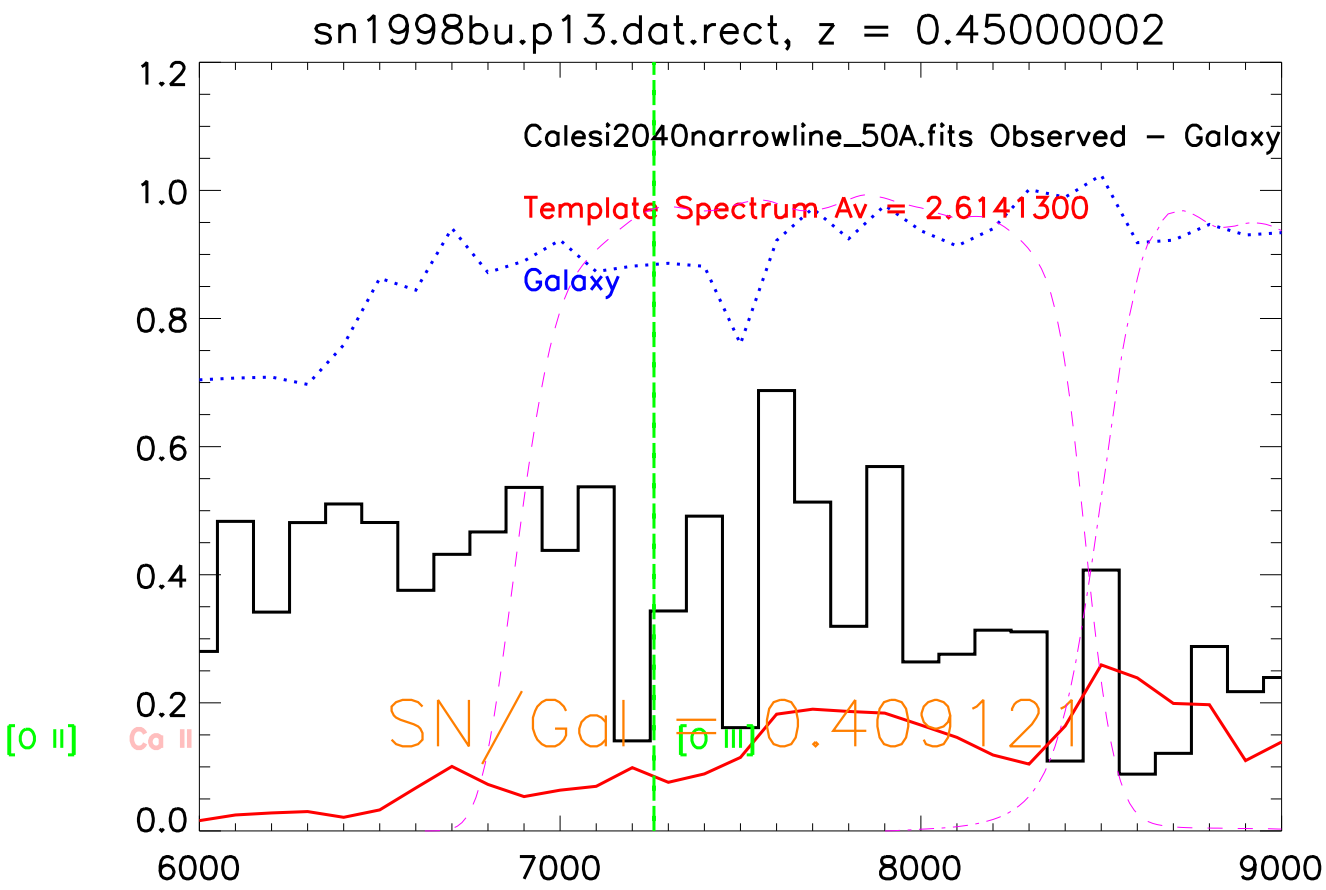

sn1998bu.p12.dat.rect, z = 0.45000002
Calesi2040narrowline_50A.fits Observed – Galaxy
Template Spectrum Av = 2.4522298
Galaxy
SN/Gal = 0.417482
[O II]
Ca II
[O III]
1.2
1.0
0.8
0.6
0.4
0.2
0.0
6000
7000
8000
9000

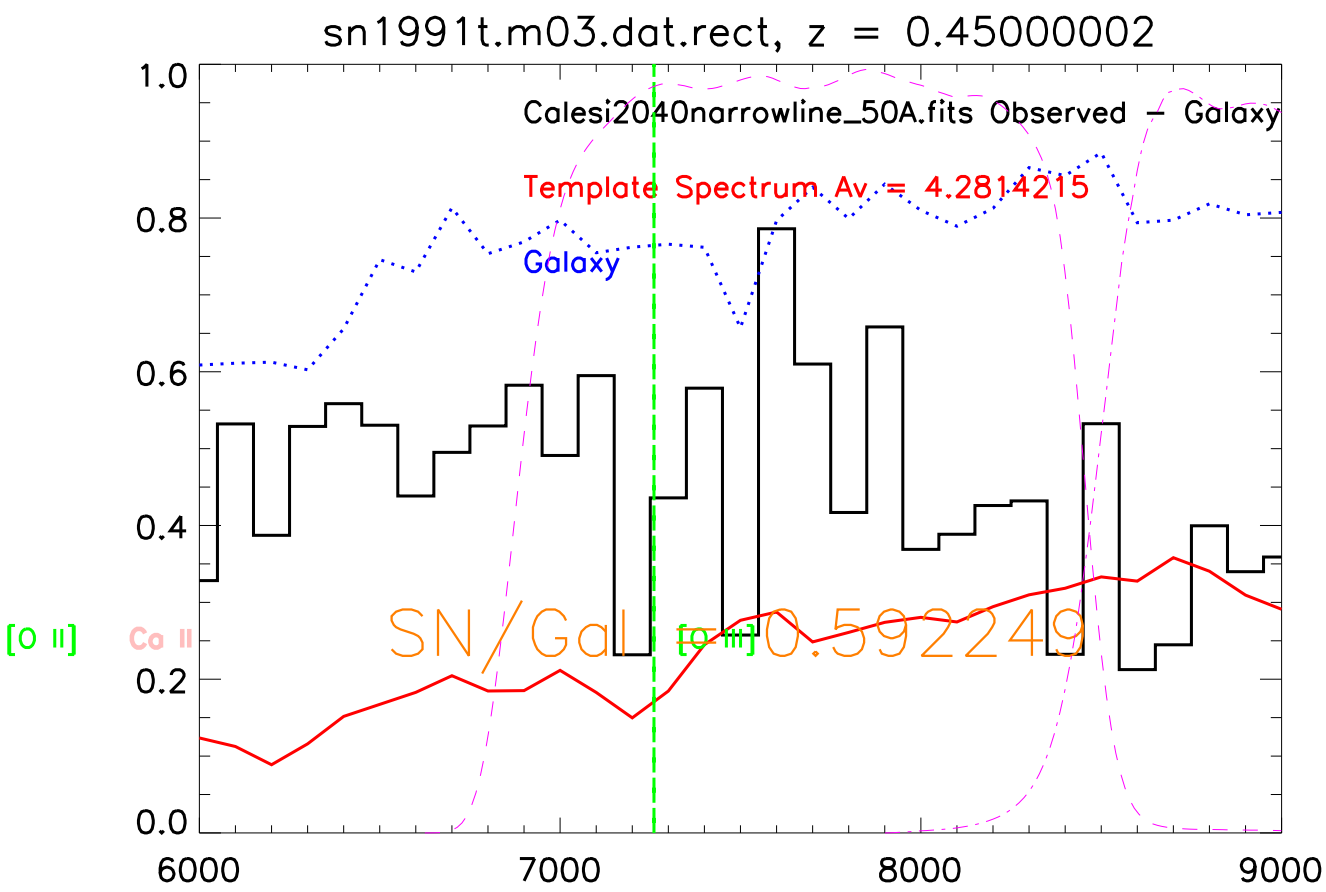

sn1996x.p12.dat.rect, z = 0.40000001
Calesi2040narrowline_50A.fits Observed – Galaxy
Template Spectrum Av = 4.7591334
Galaxy
SN/Gal=0.523056
[O II]
Ca II
[O III]
H I
1.2
1.0
0.8
0.6
0.4
0.2
0.0
6000
7000
8000
9000

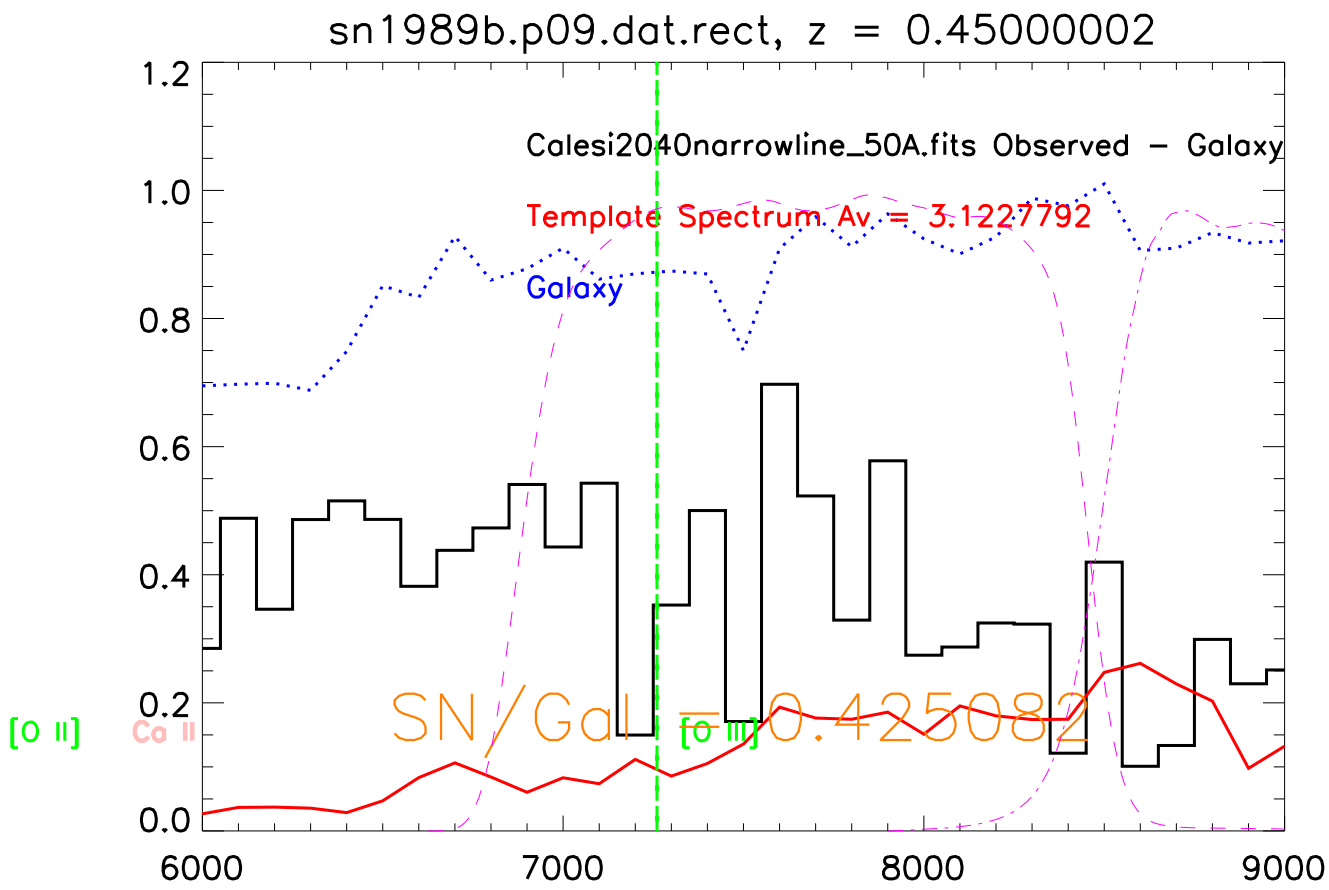


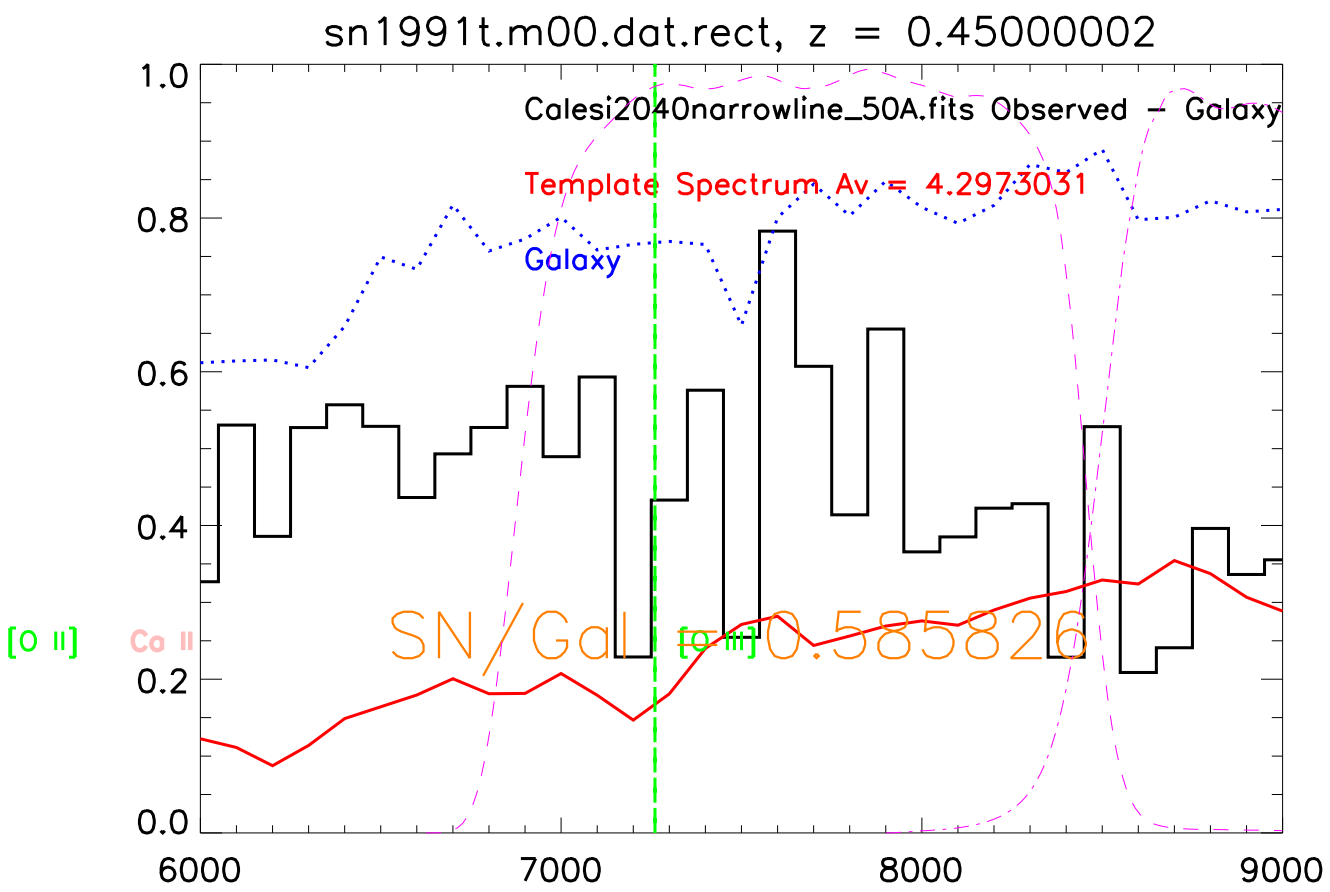
sn1991t.m08.dat.rect, z = 0.45000002
Calesi2040narrowline_50A.fits Observed - Galaxy
Template Spectrum Av = 4.2667601
Galaxy
SN/Gal = 0.610729
[O II]
Ca II
[O III]
1.0
0.8
0.6
0.4
0.2
6000
7000
8000
9000

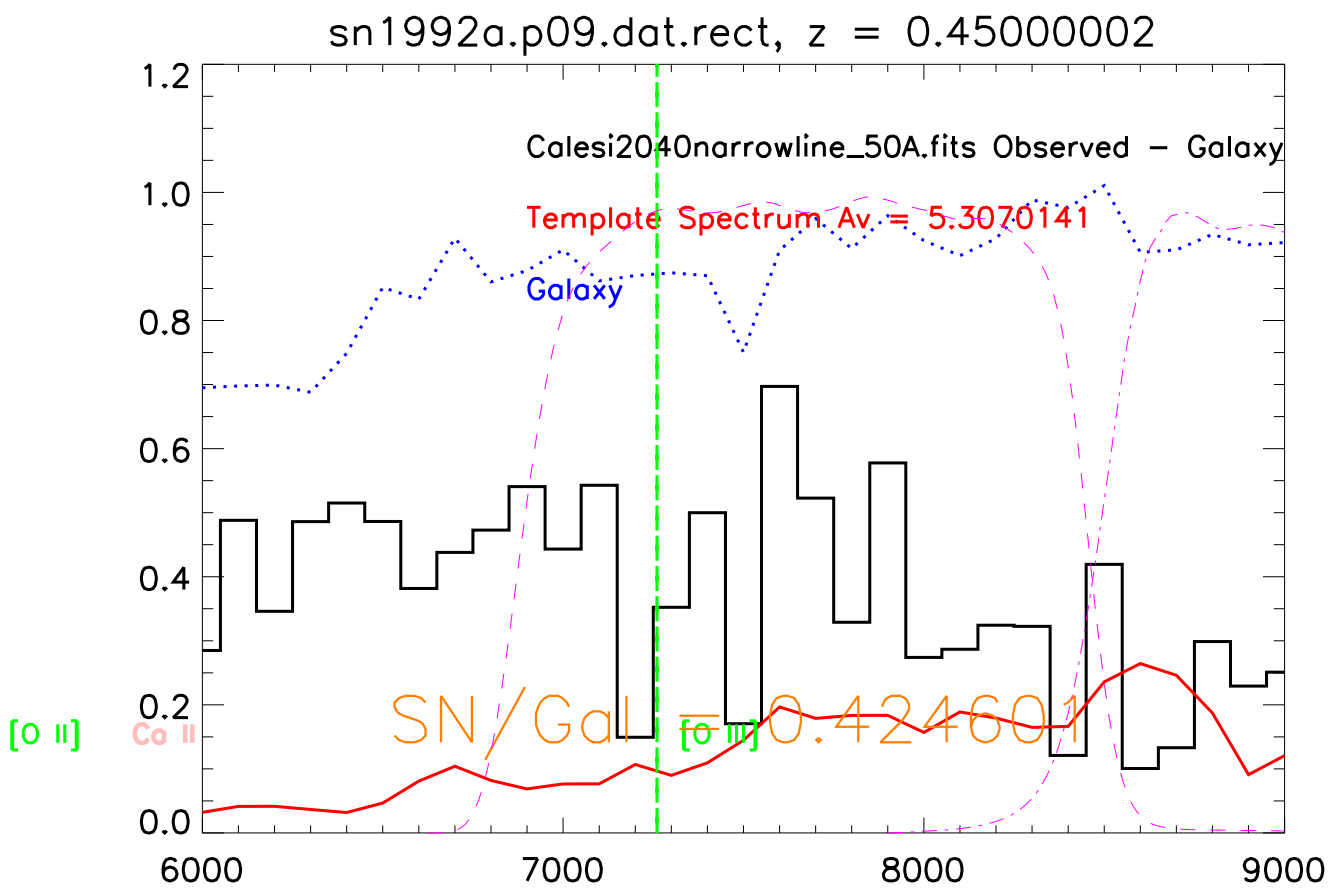

sn1992a.p17.dat.rect, z = 0.40000001
Calesi2040narrowline_50A.fits Observed – Galaxy
Template Spectrum Av = 3.9601743
Galaxy
SN/Gal=0.498575
[O II]
Co II
[O III]
H I
1.2
1.0
0.8
0.6
0.4
0.2
0.0
6000
7000
8000
9000

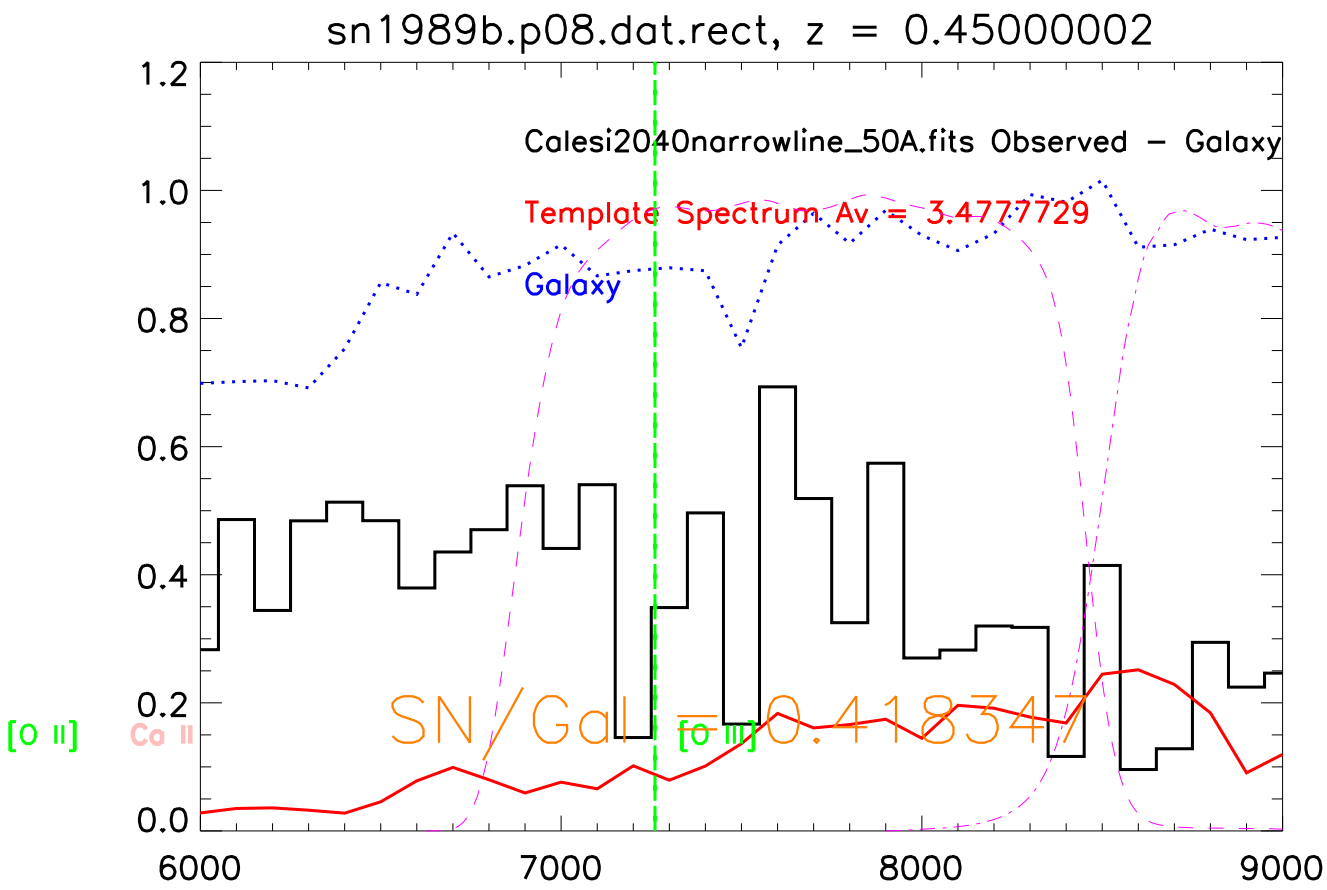

sn1998bu.p13.dat.rect, z = 0.45000002
Calesi2040narrowline_50A.fits Observed – Galaxy
Template Spectrum Av. = 2.6141300
Galaxy
SN/Gal = 0.409121
[O II]
Ca II
[O III]
1.2
1.0
0.8
0.6
0.4
0.2
0.0
6000
7000
8000
9000

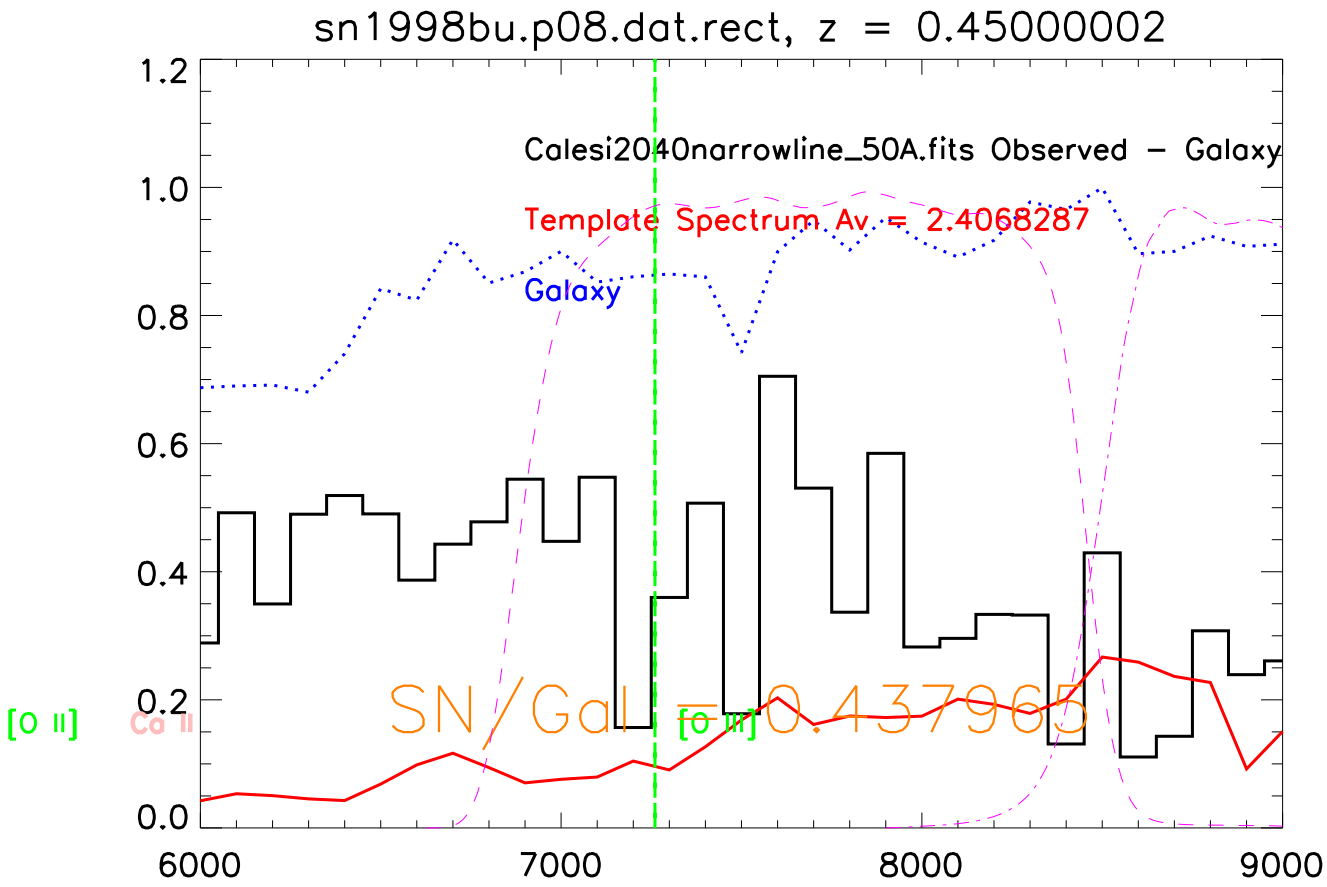

sn1991t.m03.dat.rect, z = 0.45000002
Calesi2040narrowline_50A.fits Observed – Galaxy
Template Spectrum Av = 4.2814215
Galaxy
SN/Gal: 0.592249
[O II]
Ca II
[O III]
1.0
0.8
0.6
0.4
0.2
0.0
6000
7000
8000
9000

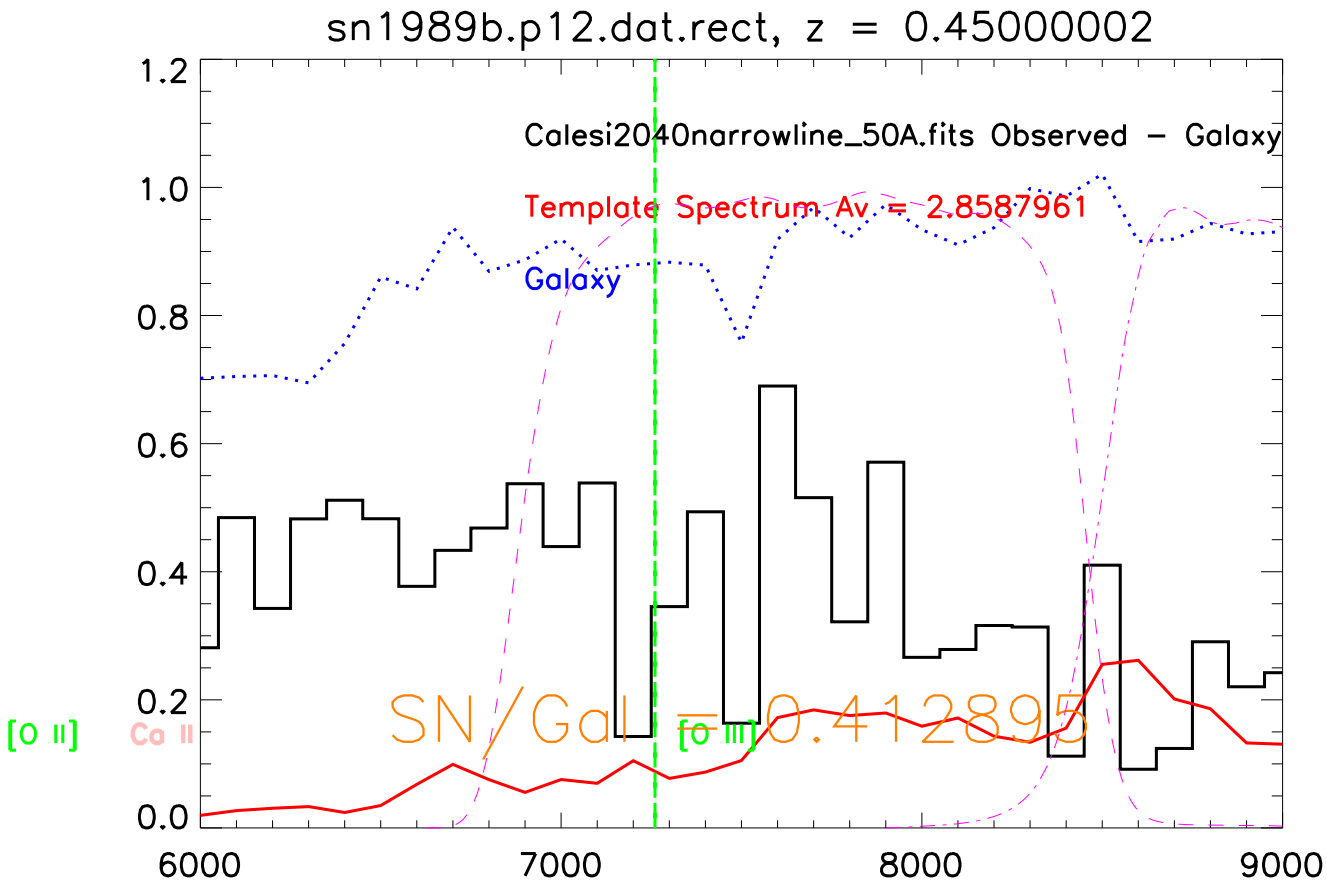

sn1989b.p09.dat.rect, z = 0.45000002
Calesi2040narrowline_50A.fits Observed – Galaxy
Template Spectrum Av = 3.1227792
Galaxy
SN/Gal = 0.425082
[O II]
Ca II
[O III]
1.2
1.0
0.8
0.6
0.4
0.2
0.0
6000
7000
8000
9000

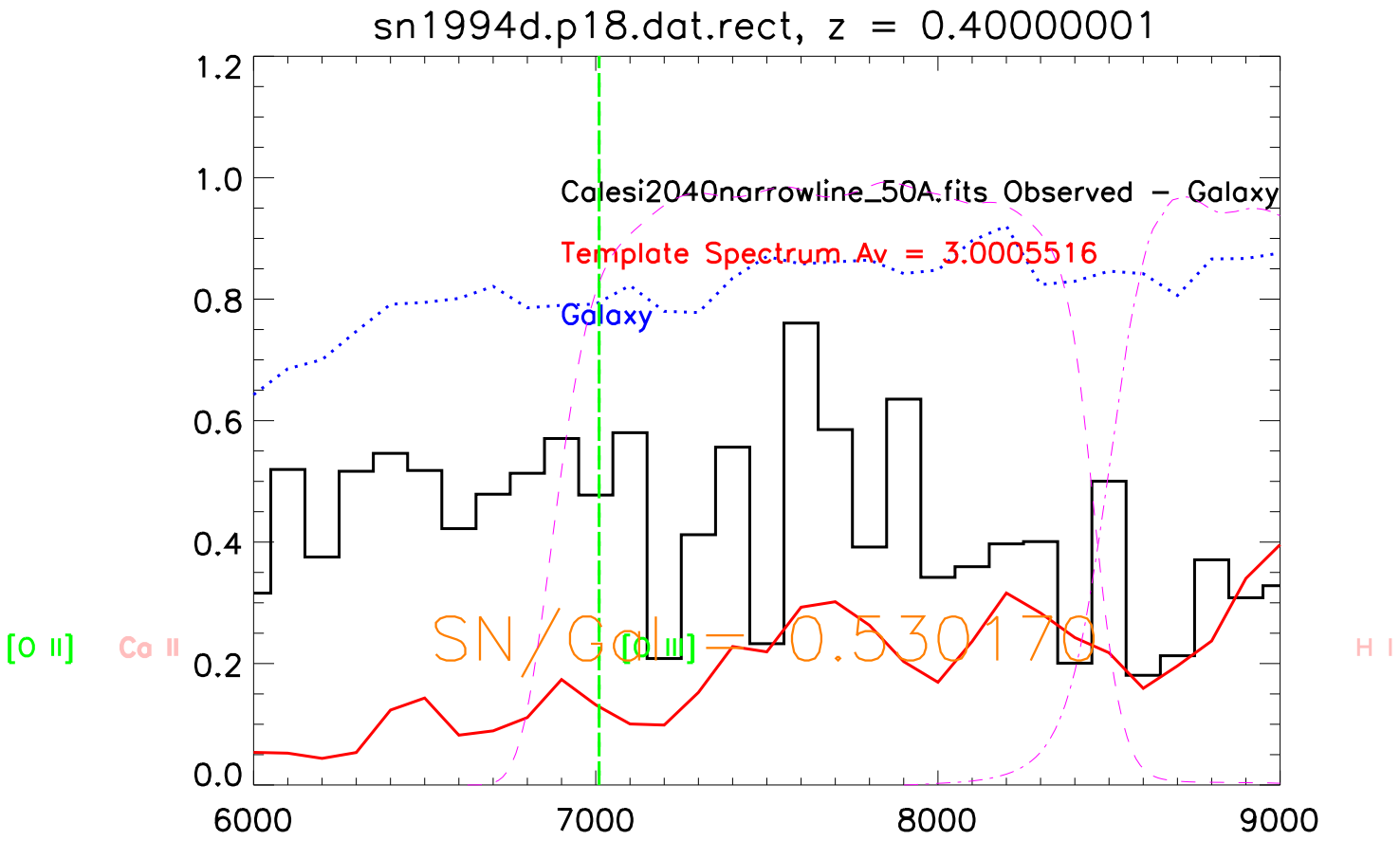

sn1991t.m00.dat.rect, z = 0.45000002
Calesi2040narrowline_50A.fits Observed – Galaxy
Template Spectrum Av = 4.2973031
Galaxy
SN/Gal: 0.585826
[O II]
Ca II
[O III]
1.0
0.8
0.6
0.4
0.2
0.0
6000
7000
8000
9000

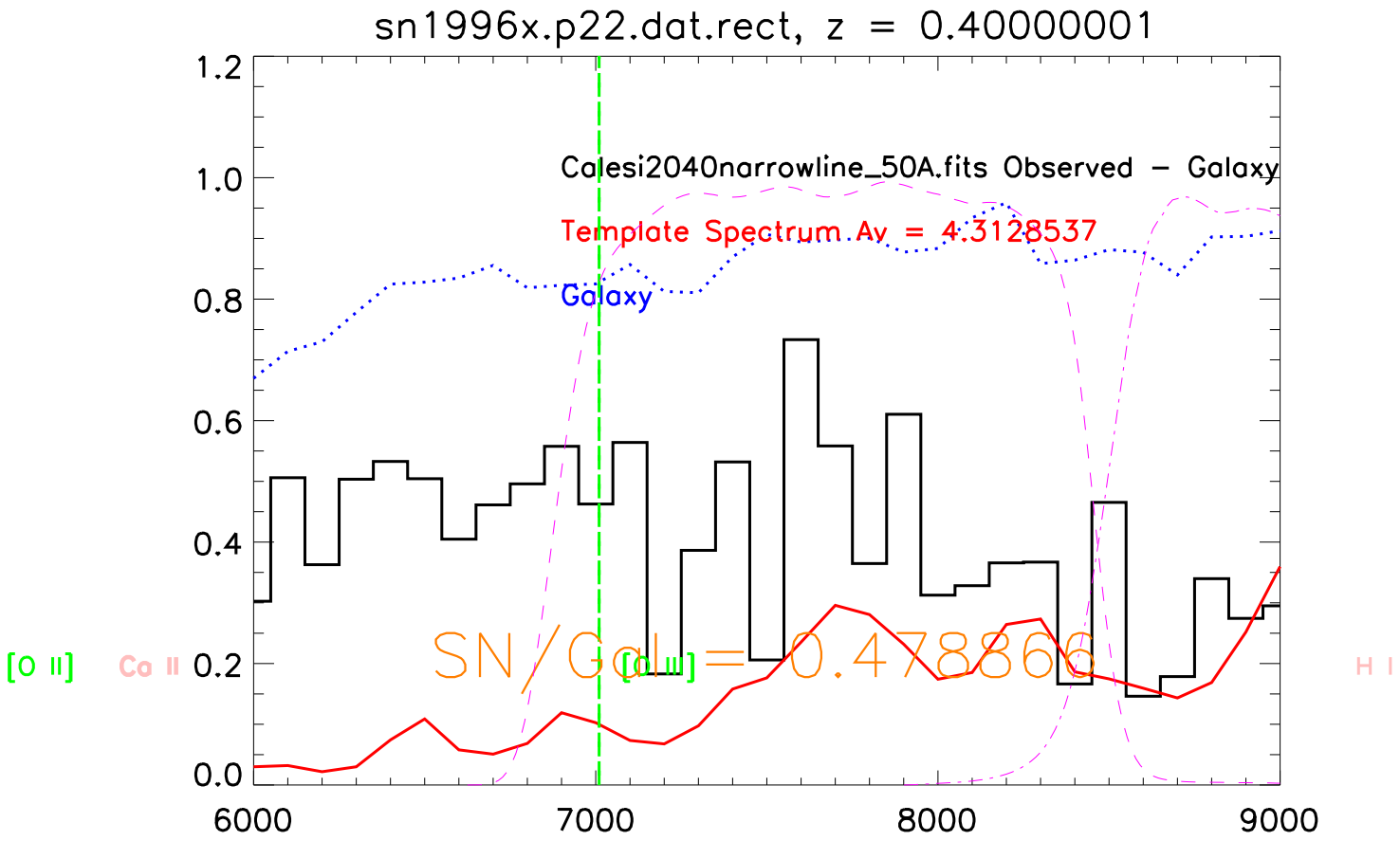

sn1992a.p09.dat.rect, z = 0.45000002
Calesi2040narrowline_50A.fits Observed – Galaxy
Template Spectrum Av = 5.3070141
Galaxy
SN/Gal = 0.424601
[O II]
Ca II
[O III]
1.2
1.0
0.8
0.6
0.4
0.2
0.0
6000
7000
8000
9000

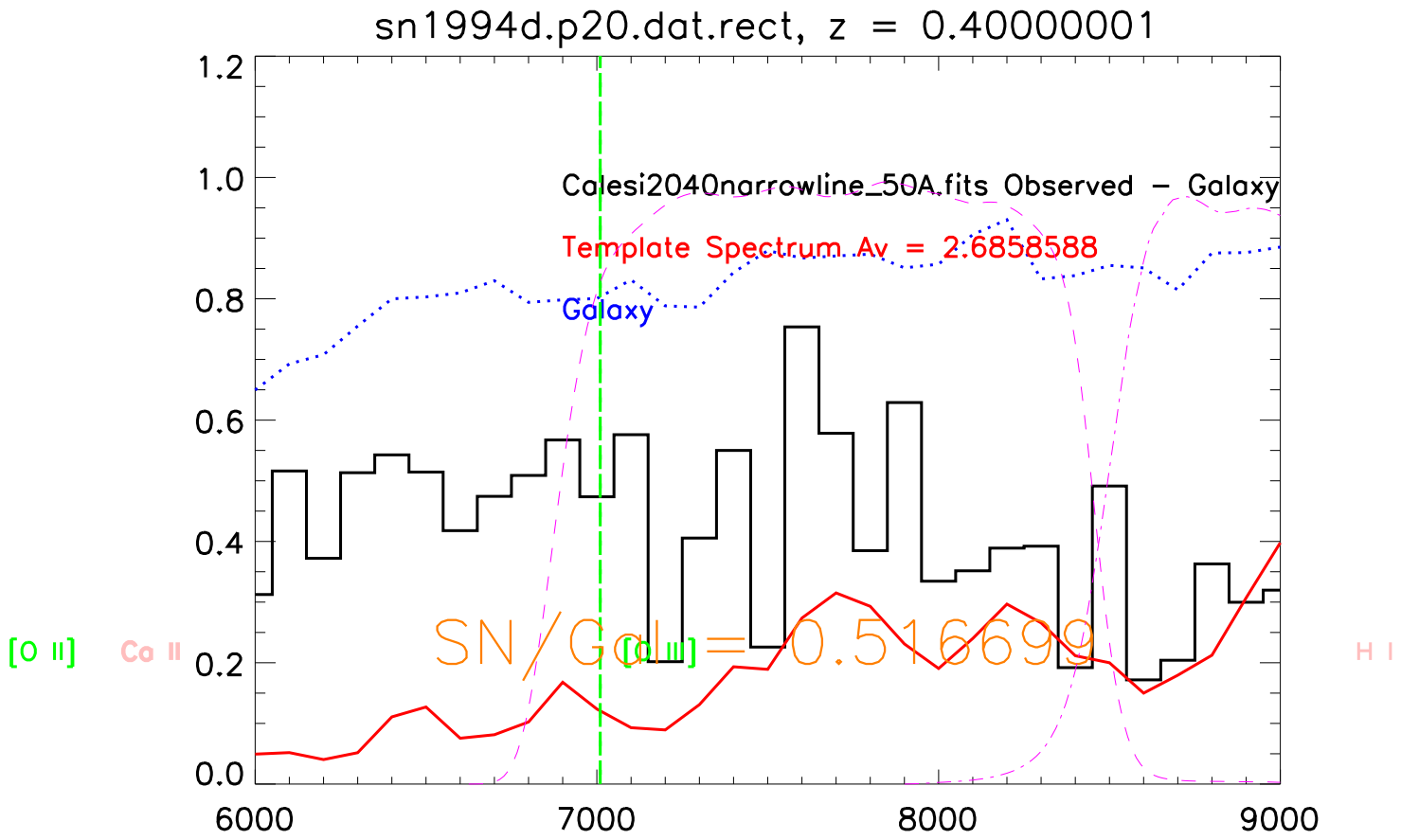

sn1989b.p08.dat.rect, z = 0.45000002
Calesi2040narrowline_50A.fits Observed – Galaxy
Template Spectrum Av = 3.4777729
Galaxy
SN/Gal = 0.418347
[O II]
Ca II
[O III]
1.2
1.0
0.8
0.6
0.4
0.2
0.0
6000
7000
8000
9000

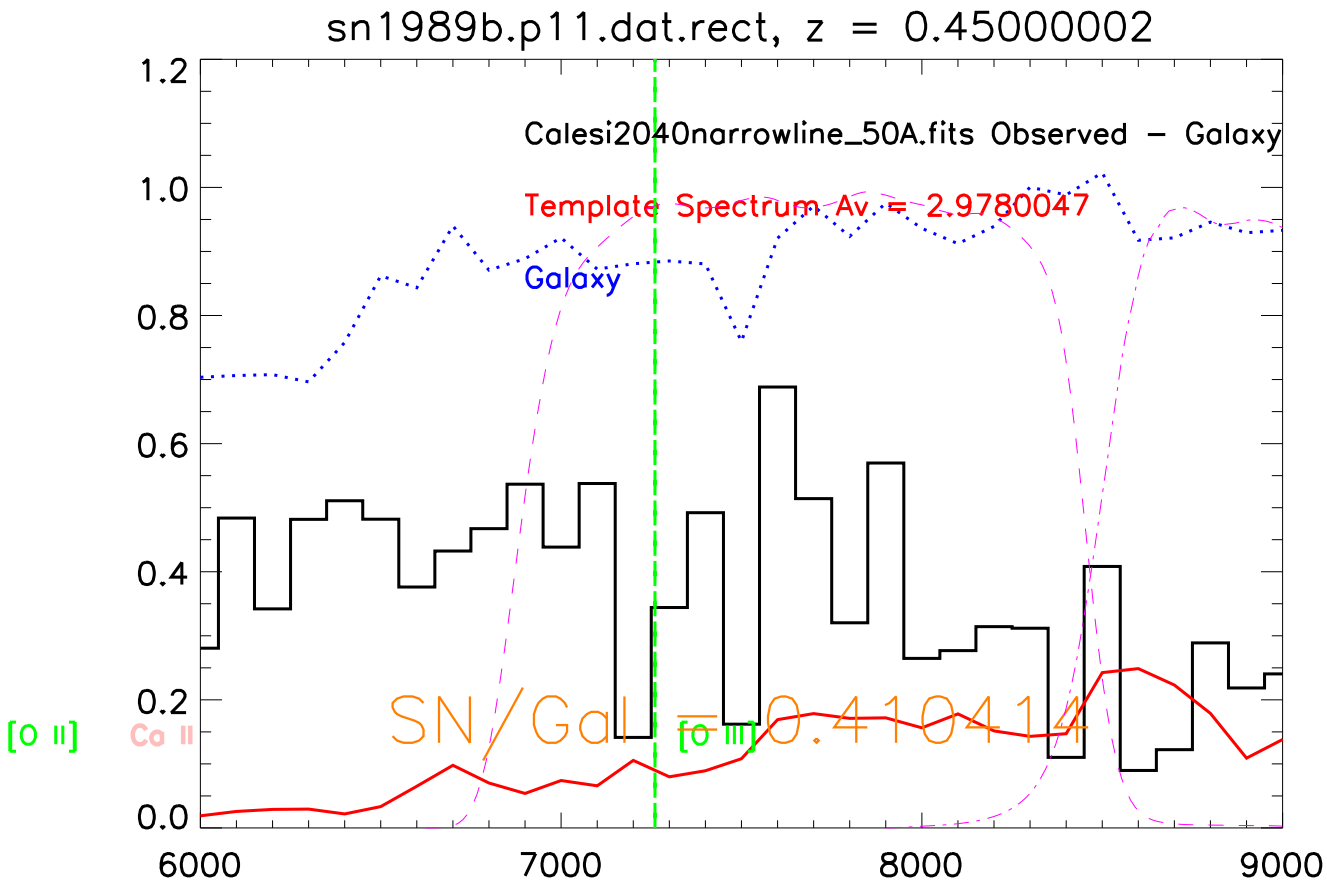

sn1998bu.p08.dat.rect, z = 0.45000002
Calesi2040narrowline_50A.fits Observed – Galaxy
Template Spectrum Av. = 2.4068287
Galaxy
SN/Gal = 0.437965
[O II]
Ca II
[O III]
1.2
1.0
0.8
0.6
0.4
0.2
0.0
6000
7000
8000
9000

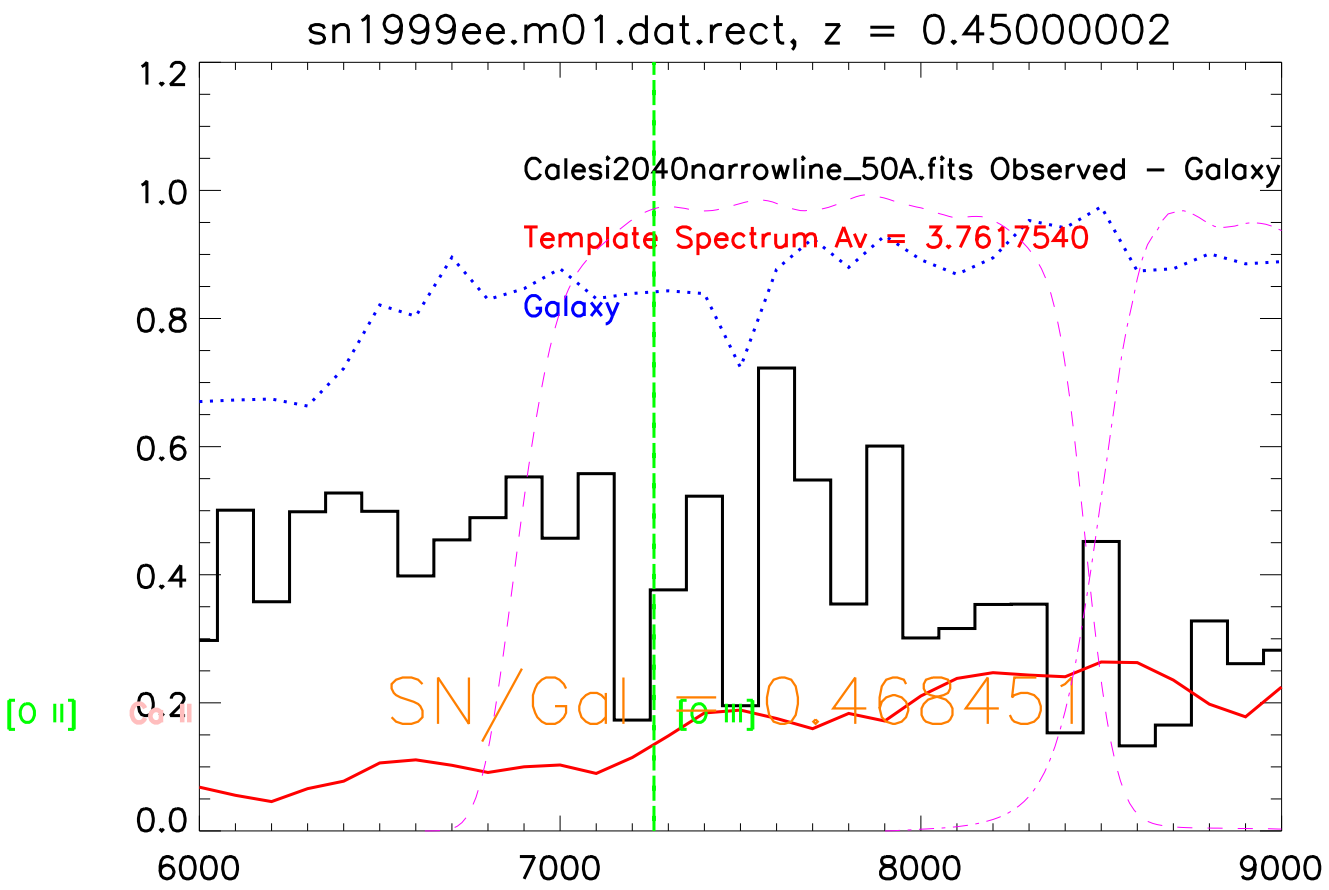

sn1989b.p12.dat.rect, z = 0.45000002
Calesi2040narrowline_50A.fits Observed – Galaxy
Template Spectrum Av. = 2.8587961
Galaxy
SN/Gal = 0.412895
[O II]
Ca II
[O III]
1.2
1.0
0.8
0.6
0.4
0.2
0.0
6000
7000
8000
9000

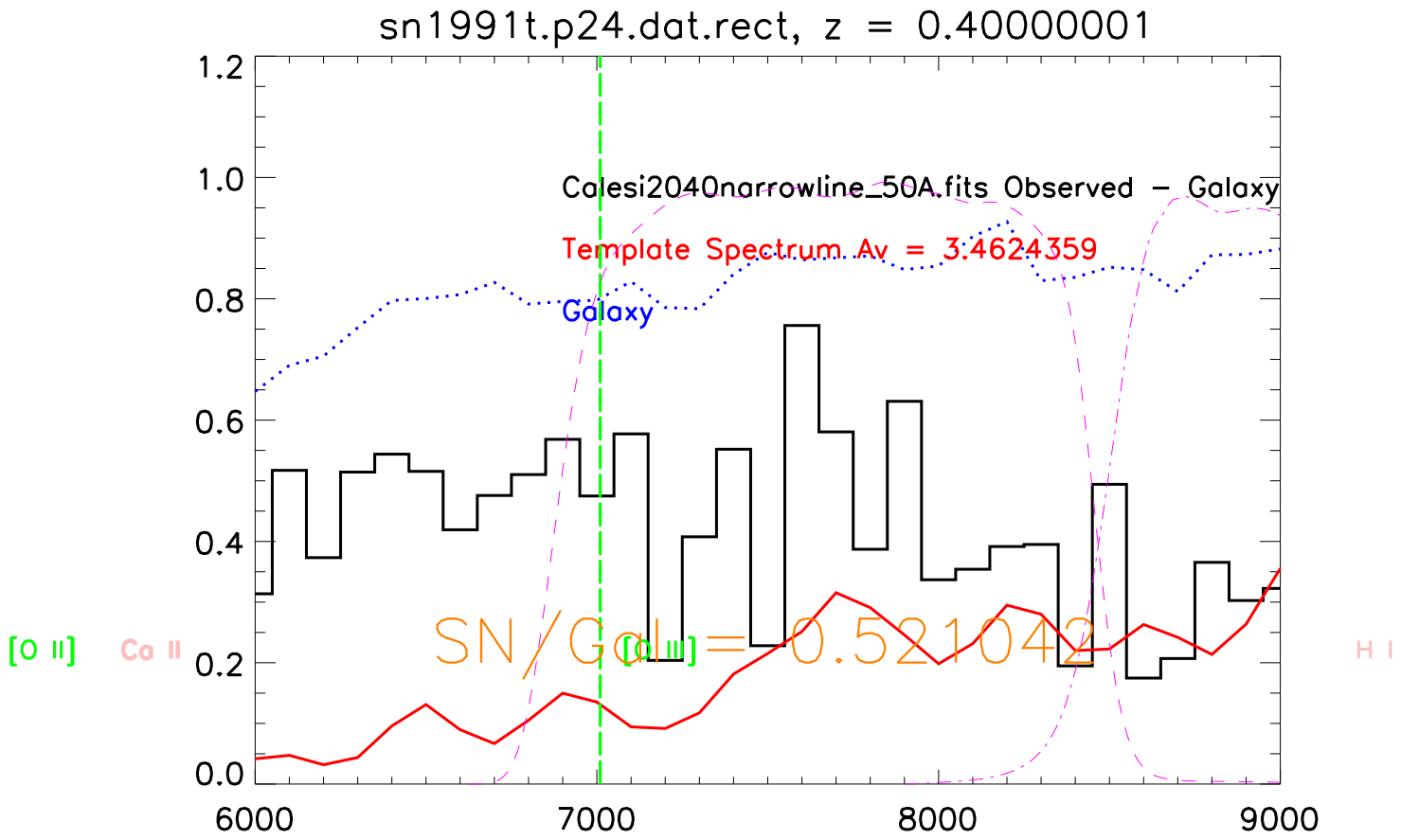

sn1994d.p18.dat.rect, z = 0.40000001
Calesi2040narrowline_50A.fits Observed – Galaxy
Template Spectrum Av = 3.0005516
Galaxy
SN/Gal=0.530176
[O II]
Ca II
[O III]
H I
1.2
1.0
0.8
0.6
0.4
0.2
0.0
6000
7000
8000
9000

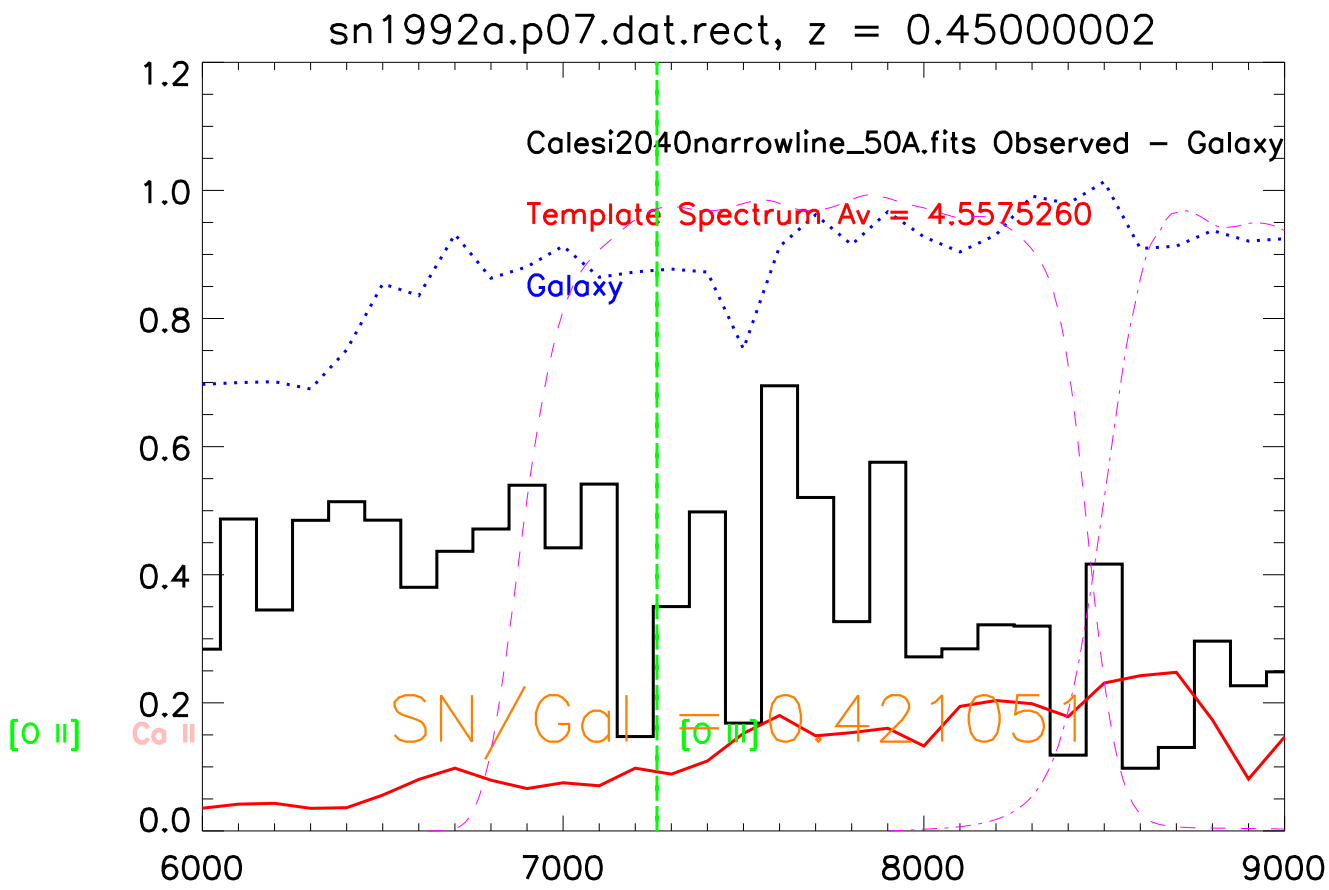

sn1996x.p22.dat.rect, z = 0.40000001
Calesi2040narrowline_50A.fits Observed – Galaxy
Template Spectrum.Av = 4.3128537
Galaxy
SN/Gal=0.478866
[O II]
Ca II
[O III]
H I
1.2
1.0
0.8
0.6
0.4
0.2
0.0
6000
7000
8000
9000

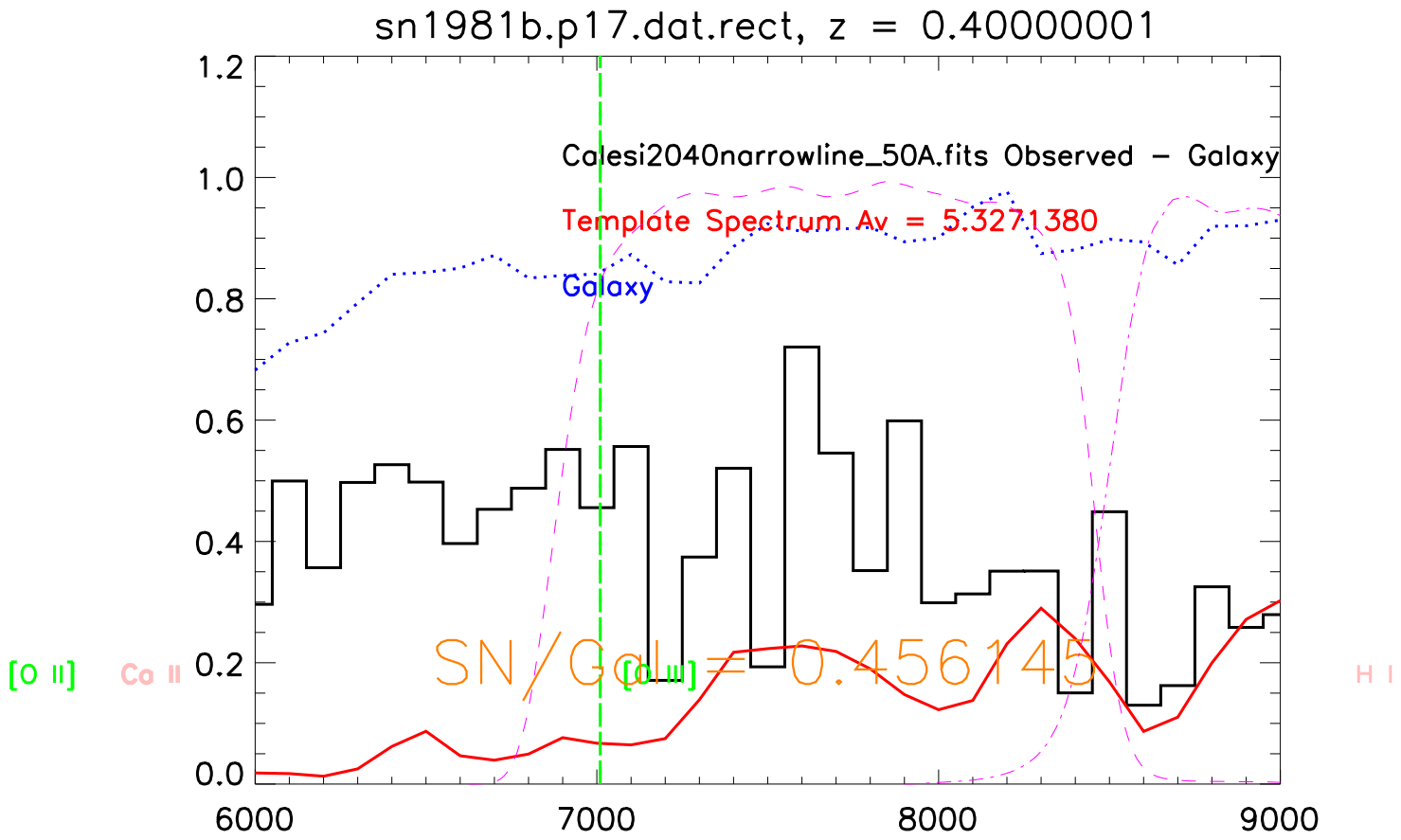

sn1994d.p20.dat.rect, z = 0.40000001
Calesi2040narrowline_50A.fits Observed − Galaxy
Template Spectrum Av = 2.6858588
Galaxy
SN/Gal=0.516699
[O II]
Ca II
[O III]
H I
1.2
1.0
0.8
0.6
0.4
0.2
0.0
6000
7000
8000
9000

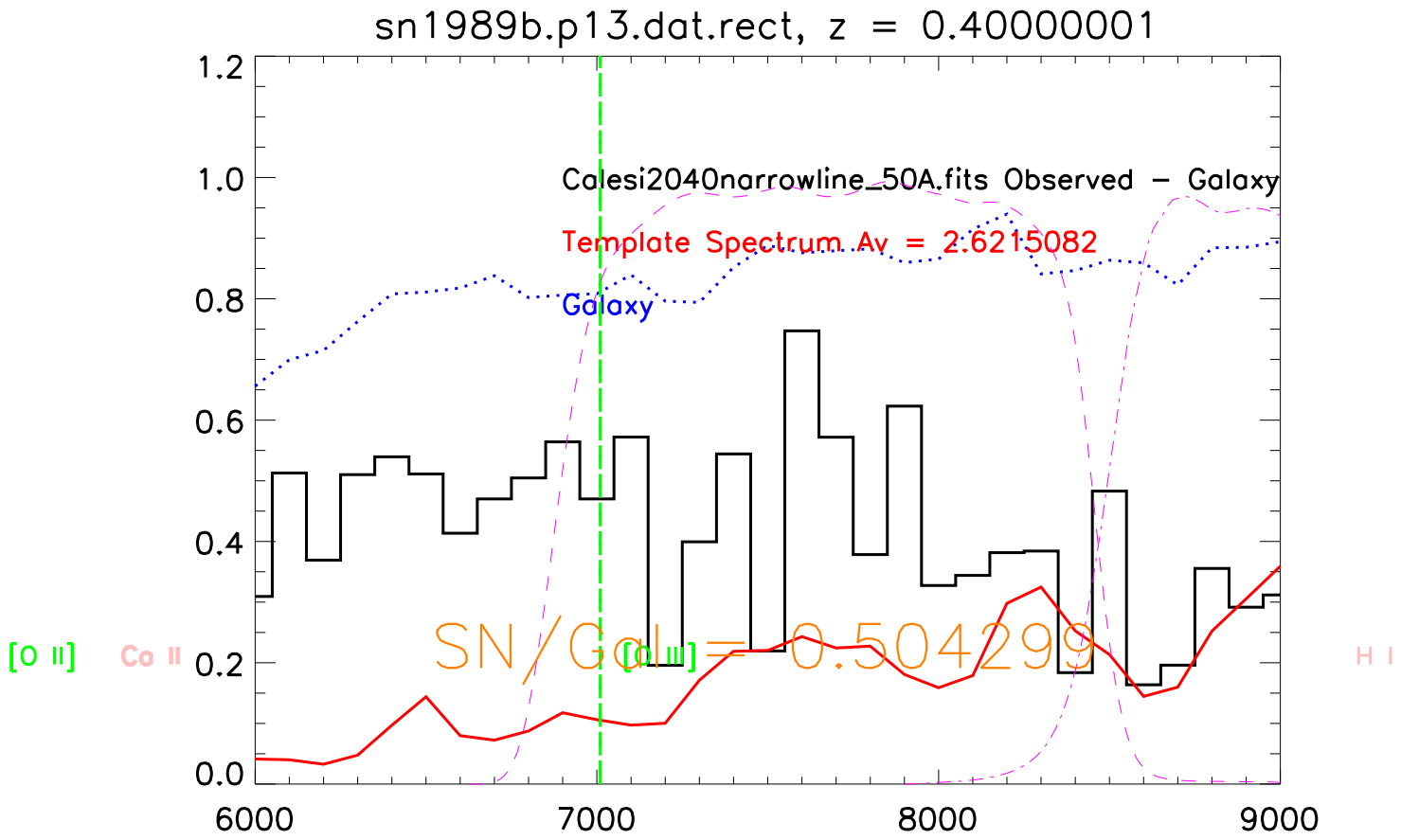

sn1989b.p11.dat.rect, z = 0.45000002
Calesi2040narrowline_50A.fits Observed – Galaxy
Template Spectrum Av. = 2.9780047
Galaxy
SN/Gal = 0.4104414
[O II]
Ca II
[O III]
1.2
1.0
0.8
0.6
0.4
0.2
0.0
6000
7000
8000
9000

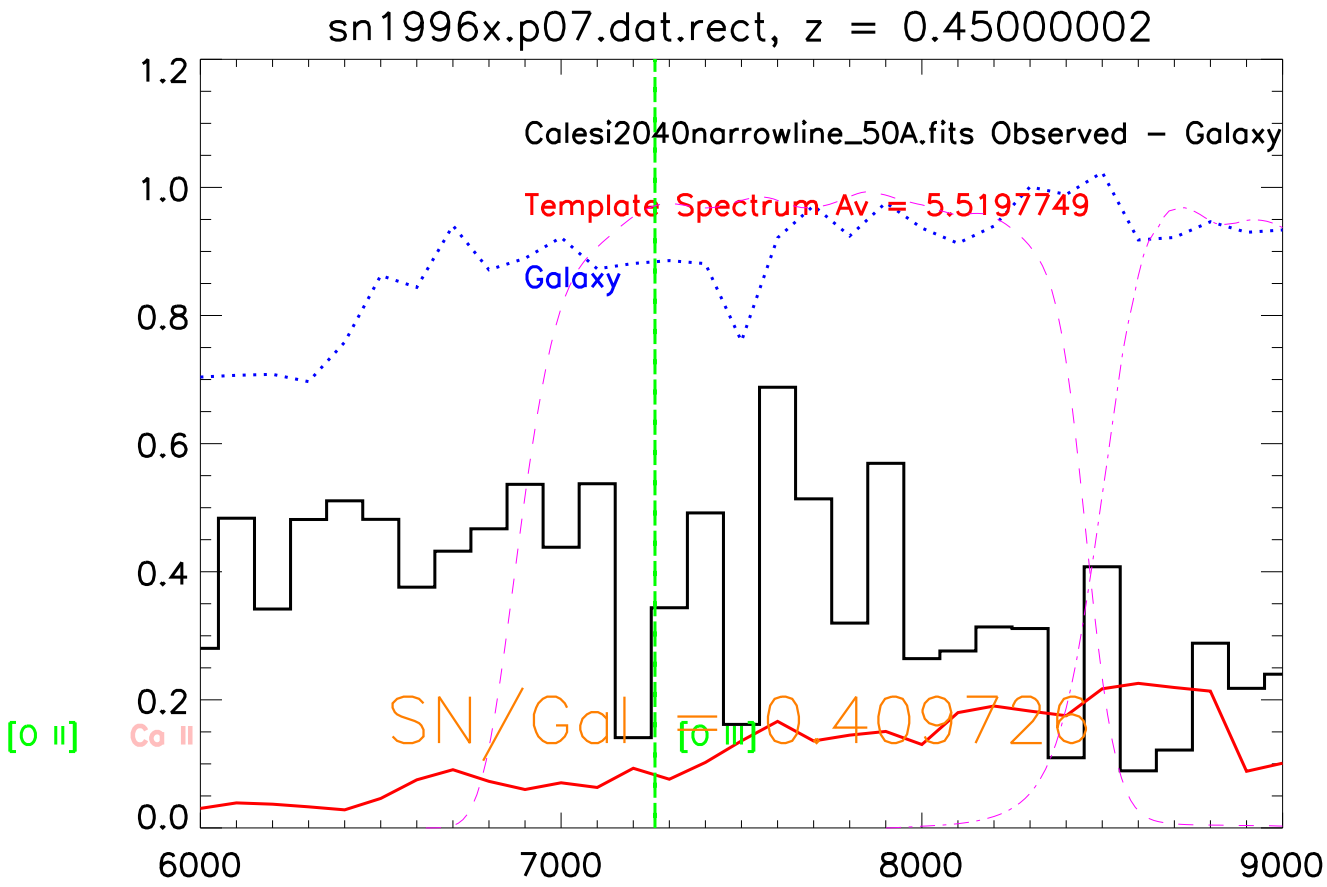

sn1999ee.m01.dat.rect, z = 0.45000002
Calesi2040narrowline_50A.fits Observed – Galaxy
Template Spectrum Av. = 3.7617540
Galaxy
SN/Gal. F=0.468451
[O II]
[O III]
1.2
1.0
0.8
0.6
0.4
0.2
0.0
6000
7000
8000
9000

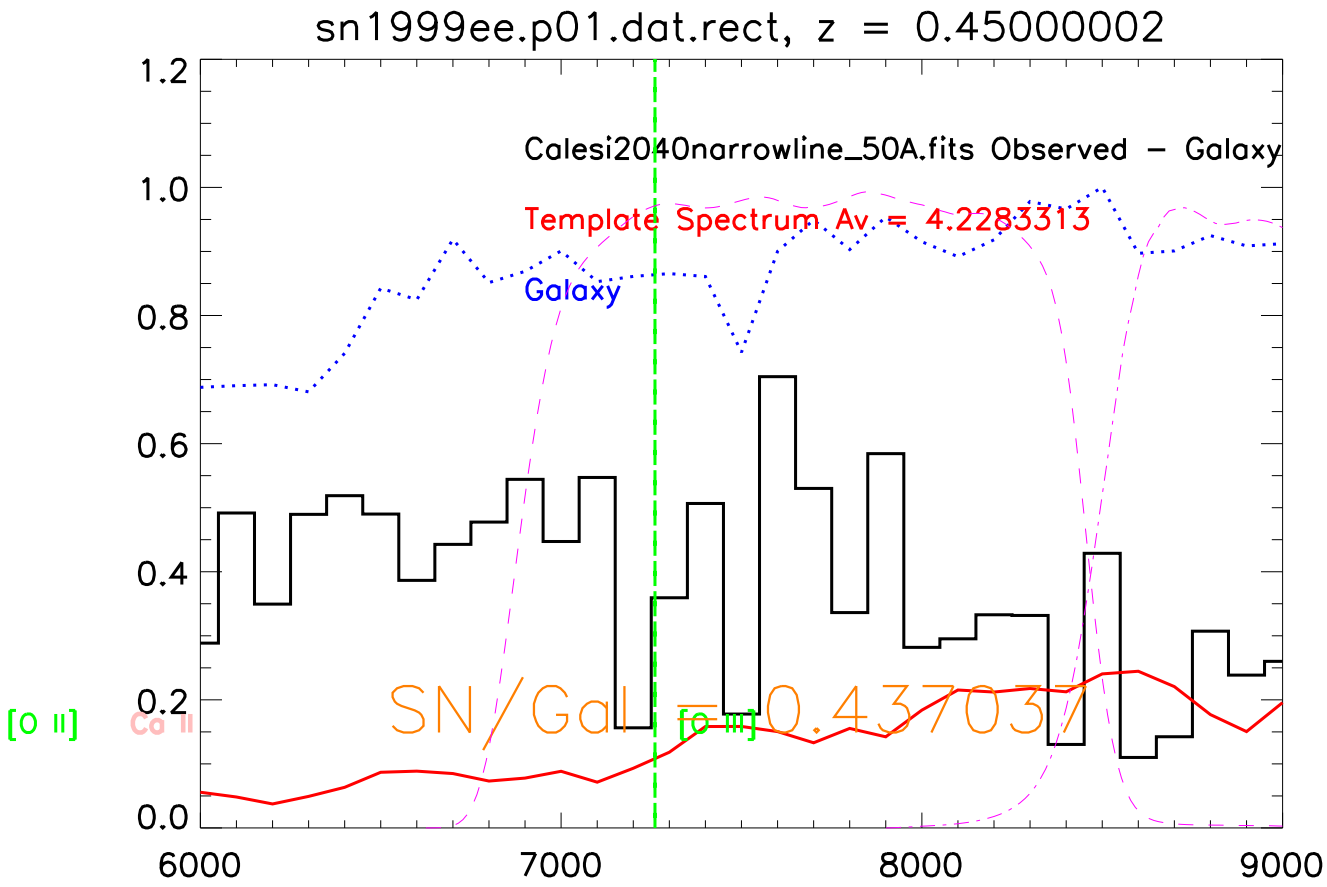

sn1991t.p24.dat.rect, z = 0.40000001
Calesi2040narrowline_50A.fits Observed – Galaxy
Template Spectrum Av = 3.4624359
Galaxy
SN/Gal=0.521042
[O II]
Ca II
[O III]
H I
1.2
1.0
0.8
0.6
0.4
0.2
0.0
6000
7000
8000
9000

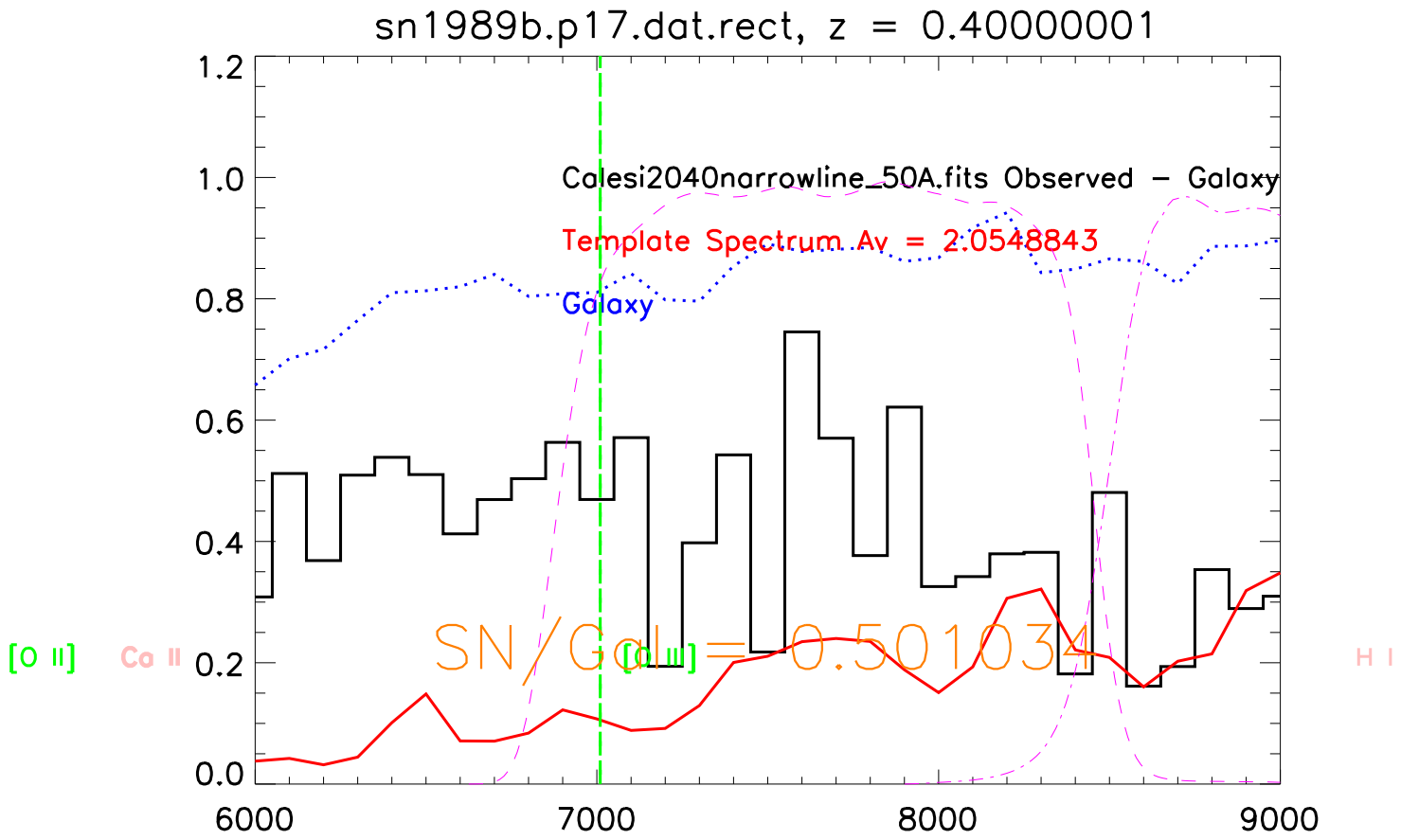

sn1992a.p07.dat.rect, z = 0.45000002
Calesi2040narrowline_50A.fits Observed – Galaxy
Template Spectrum Av = 4.5575260
Galaxy
SN/Gal = 0.421051
[O II]
Ca II
[O III]
1.2
1.0
0.8
0.6
0.4
0.2
0.0
6000
7000
8000
9000

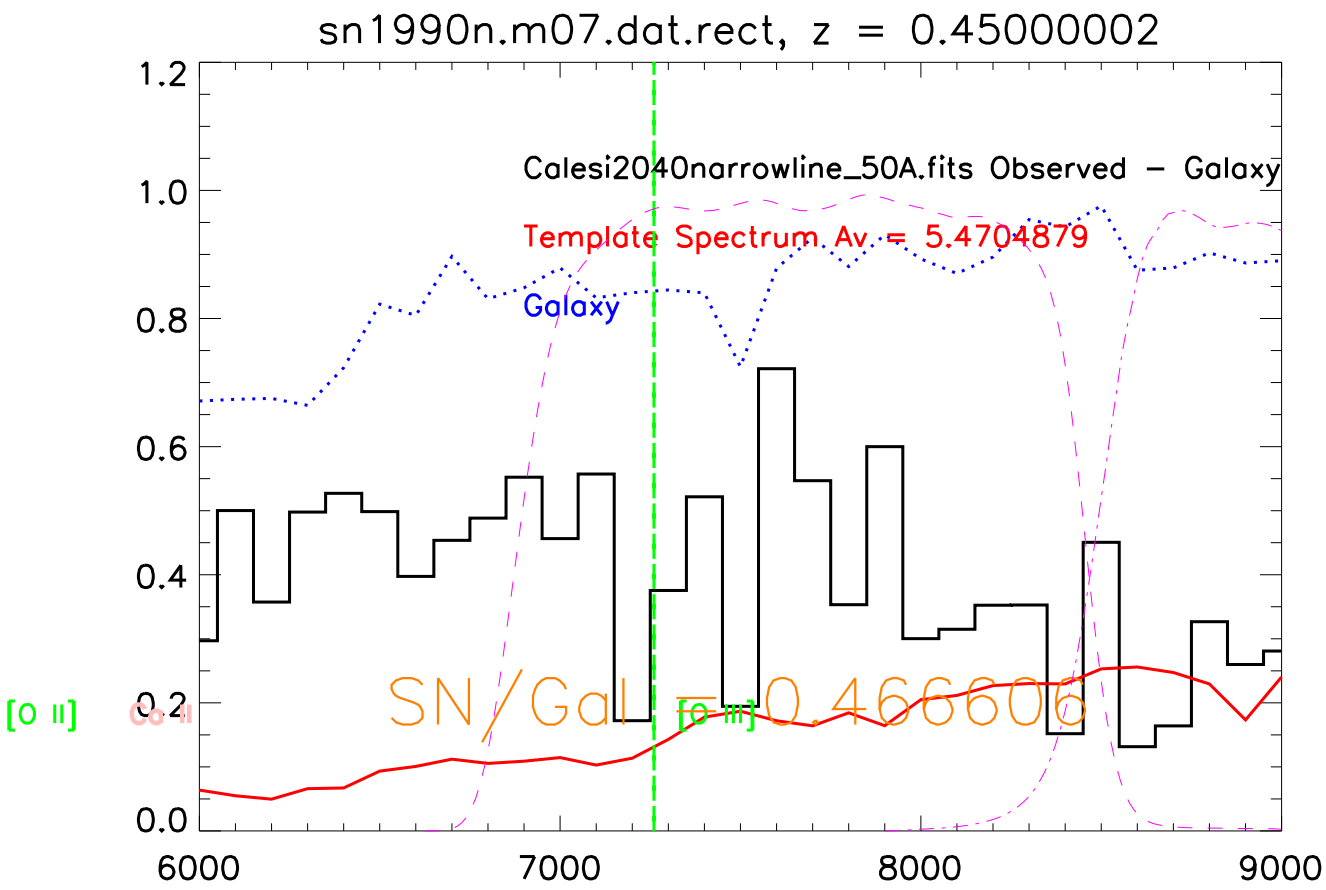

sn1981b.p17.dat.rect, z = 0.40000001
Calesi2040narrowline_50A.fits Observed – Galaxy
Template Spectrum Av = 5.3271380
Galaxy
SN/Gal=0.456145
[O II]
Ca II
[O III]
H I
1.2
1.0
0.8
0.6
0.4
0.2
0.0
6000
7000
8000
9000

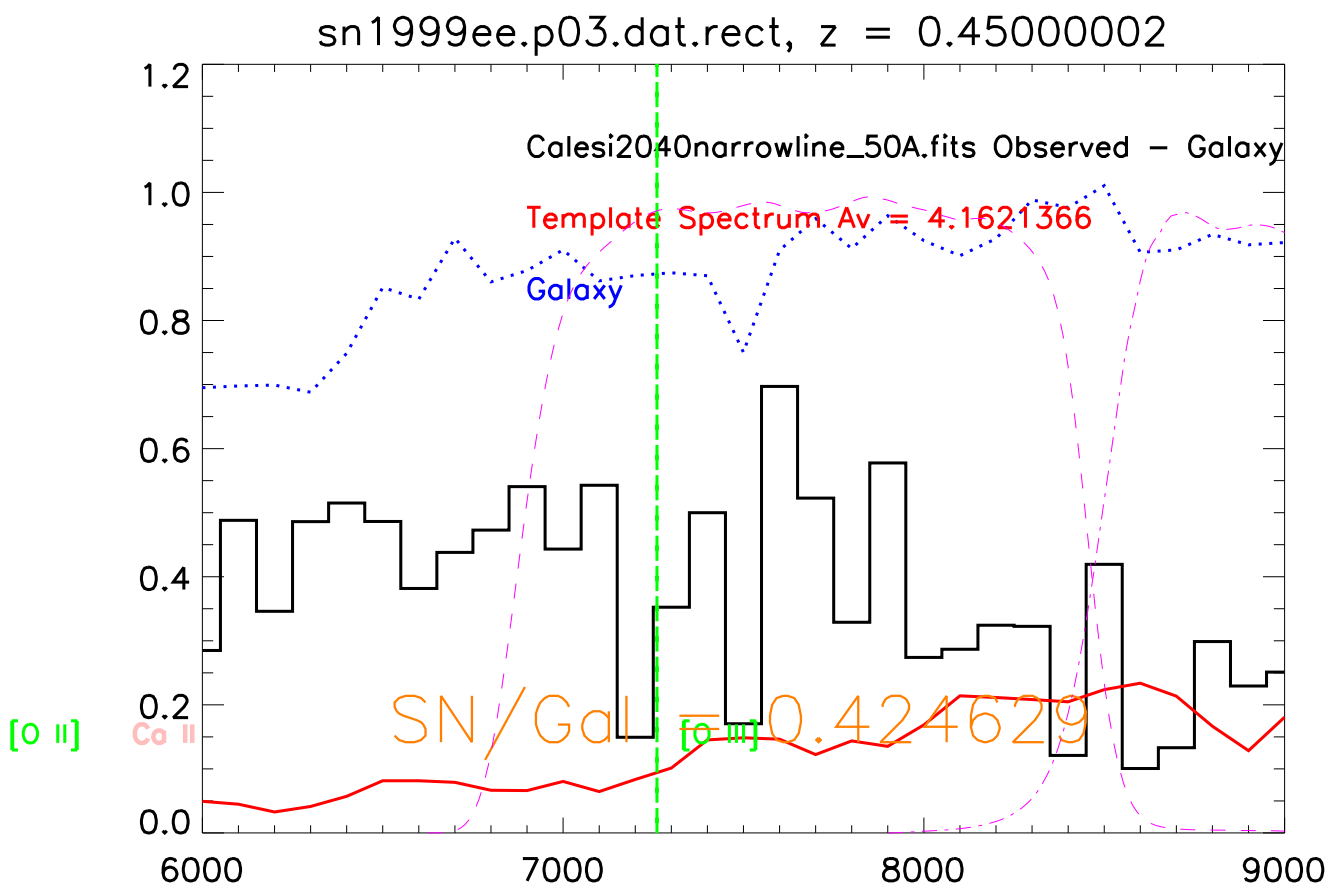

sn1989b.p13.dat.rect, z = 0.40000001
Calesi2040narrowline_50A.fits Observed – Galaxy
Template Spectrum Av = 2.6215082
Galaxy
SN/Gal=0.504299
[O II]
Ca II
[O III]
H I
1.2
1.0
0.8
0.6
0.4
0.2
0.0
6000
7000
8000
9000

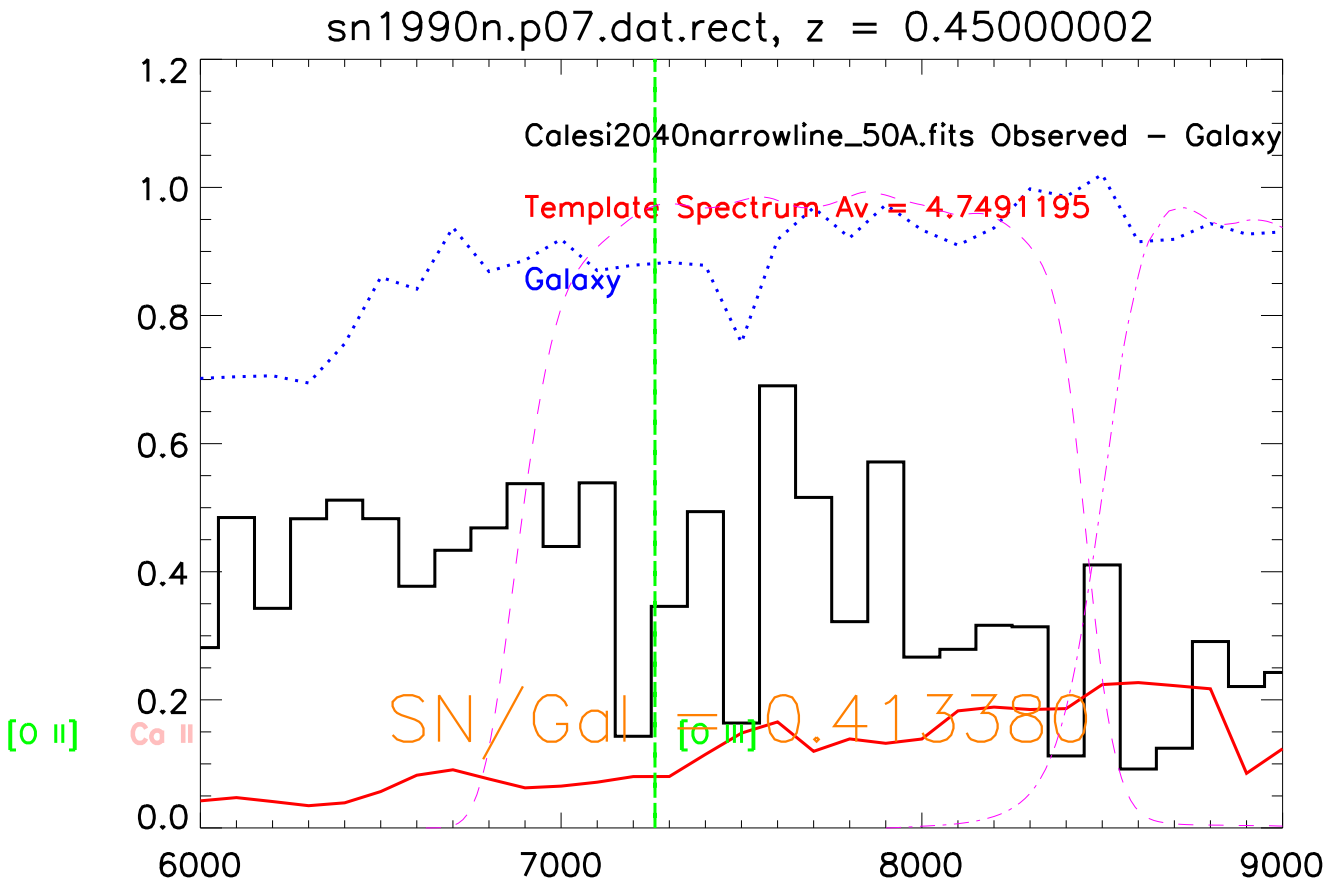

sn1996x.p07.dat.rect, z = 0.45000002
Calesi2040narrowline_50A.fits Observed – Galaxy
Template Spectrum Av. = 5.5197749
Galaxy
SN/Gal = 0.409726
[O II]
Ca II
[O III]
1.2
1.0
0.8
0.6
0.4
0.2
0.0
6000
7000
8000
9000

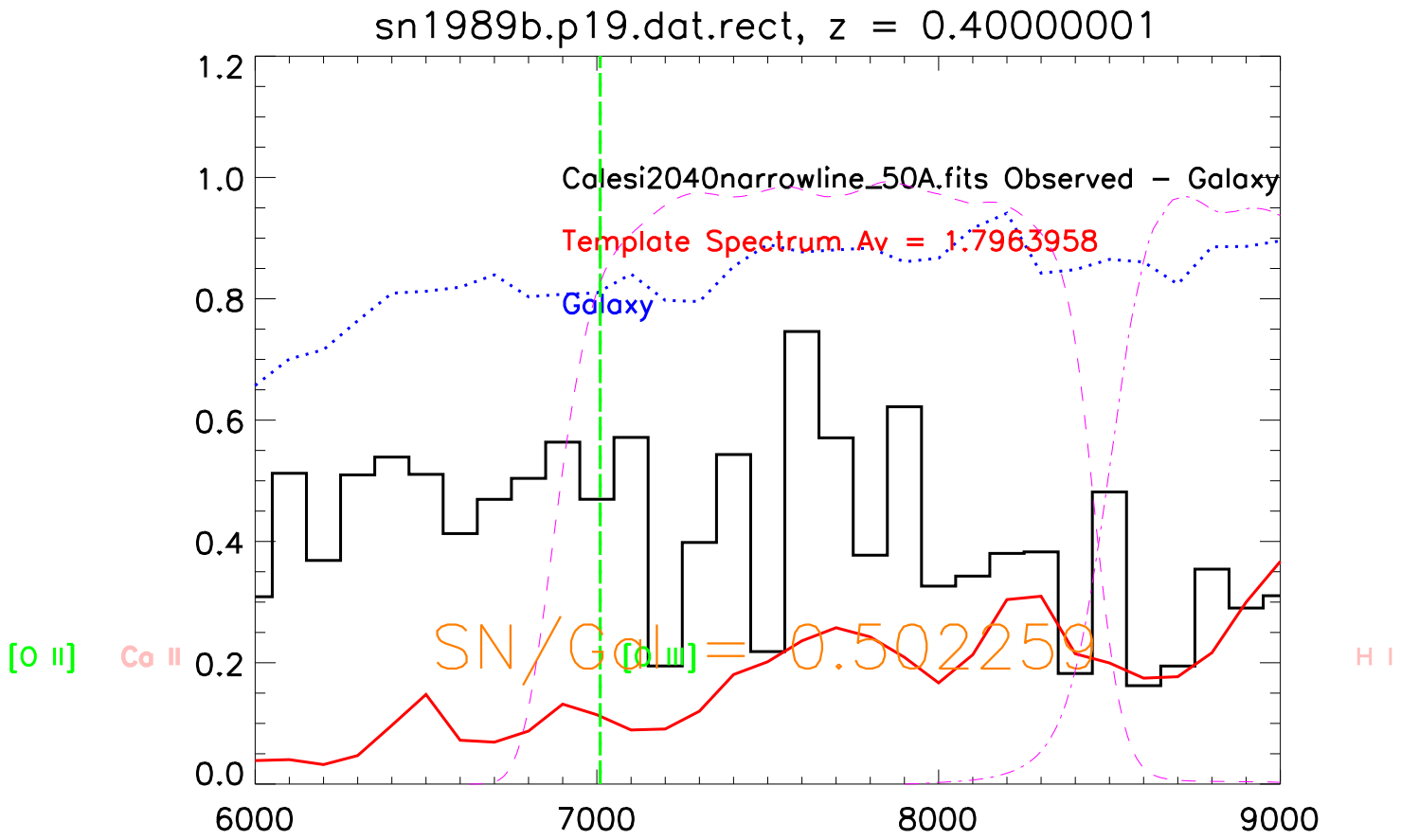

sn1999ee.p01.dat.rect, z = 0.45000002
Calesi2040narrowline_50A.fits Observed – Galaxy
Template Spectrum Av. = 4.2283313
Galaxy
SN/Gal = 0.437037
[O II]
Ca II
[O III]
1.2
1.0
0.8
0.6
0.4
0.2
0.0
6000
7000
8000
9000

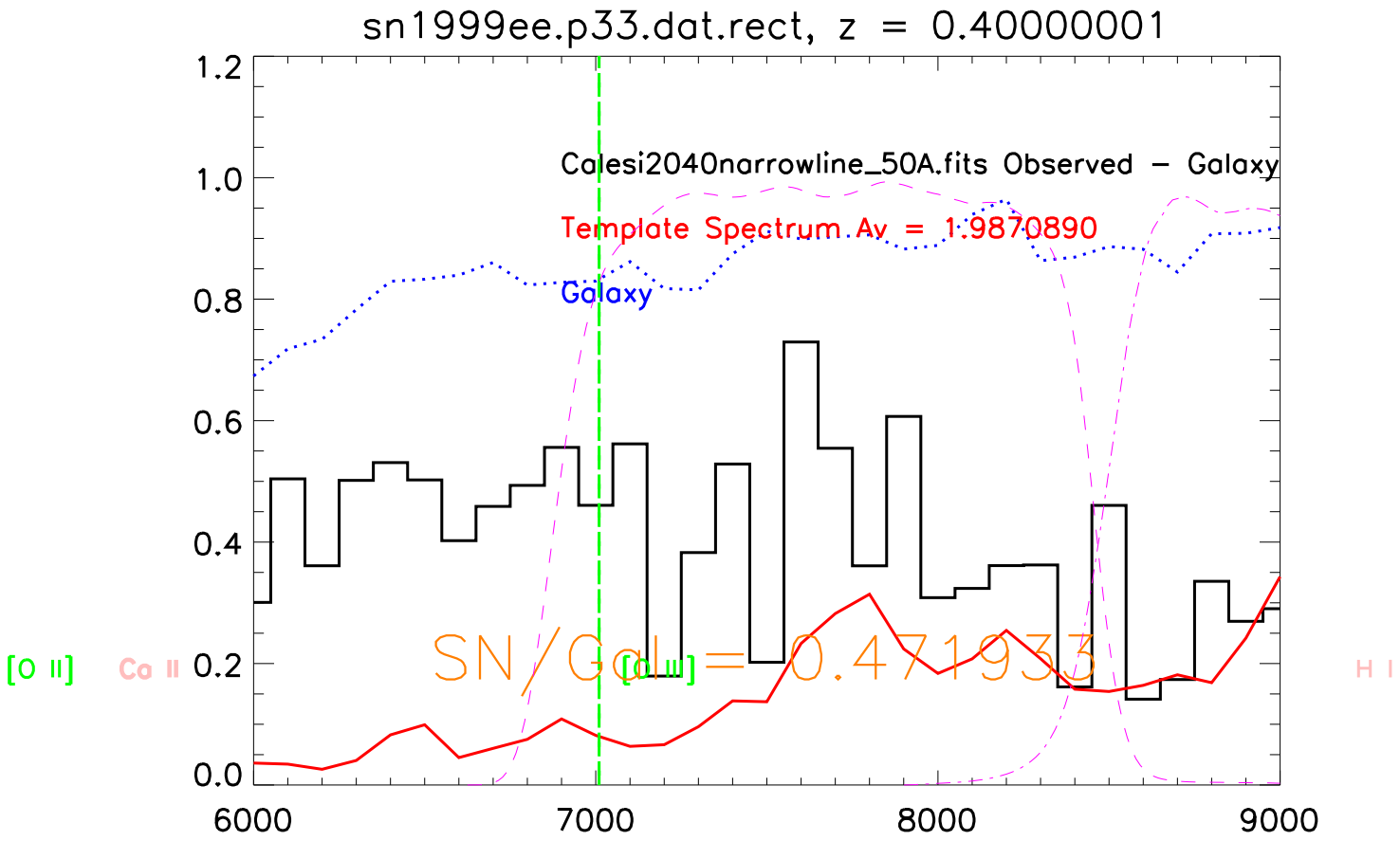

sn1989b.p17.dat.rect, z = 0.40000001
Calesi2040narrowline_50A.fits Observed – Galaxy
Template Spectrum Av = 2.0548843
Galaxy
SN/Gal=0.501034
[O II]
Ca II
[O III]
H I
1.2
1.0
0.8
0.6
0.4
0.2
0.0
6000
7000
8000
9000

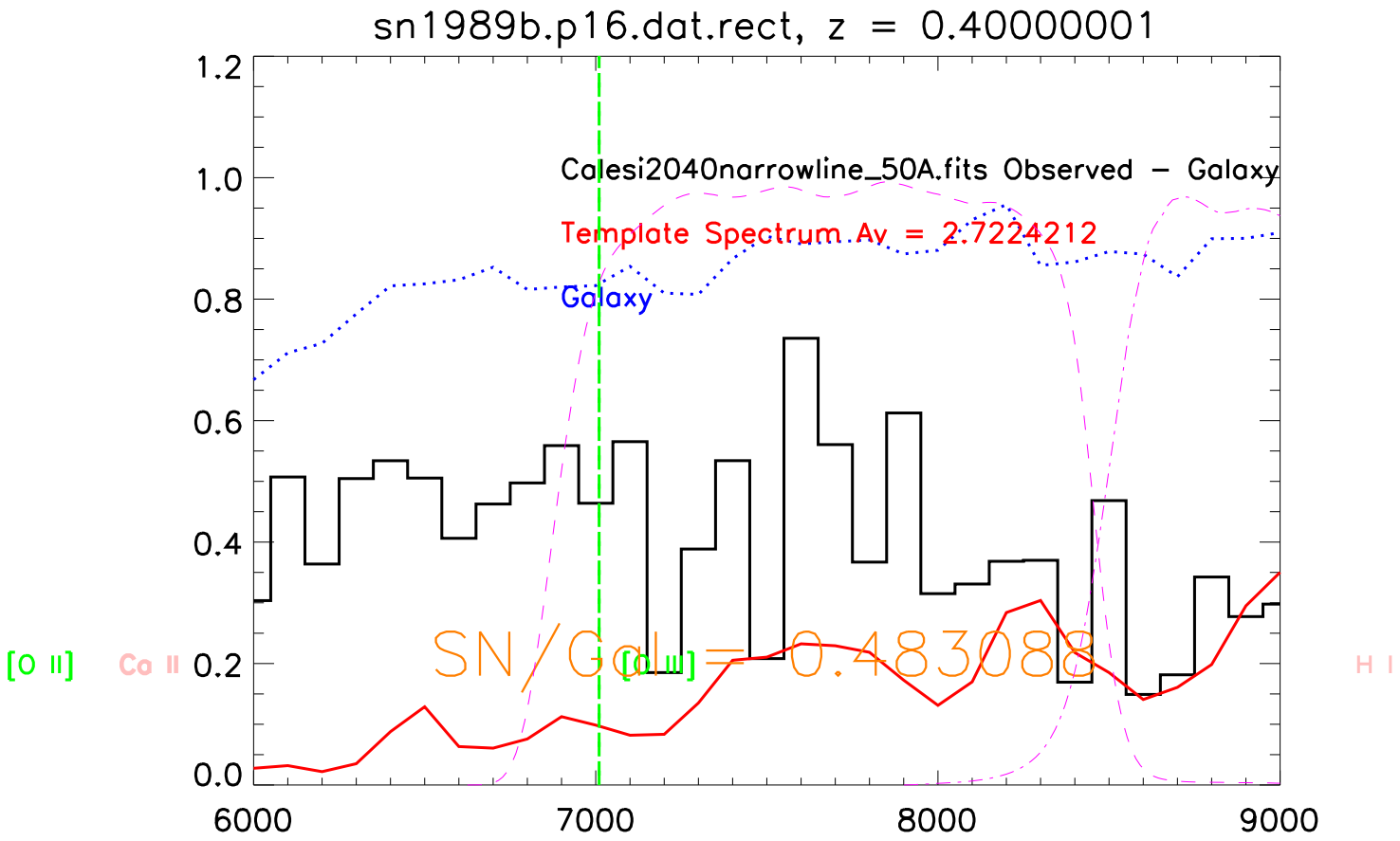

sn1990n.m07.dat.rect, z = 0.45000002
Calesi2040narrowline_50A.fits Observed – Galaxy
Template Spectrum Av. = 5.4704879
Galaxy
SN/Gal [O III] 0.466606
[O II]
1.2
1.0
0.8
0.6
0.4
0.2
0.0
6000
7000
8000
9000

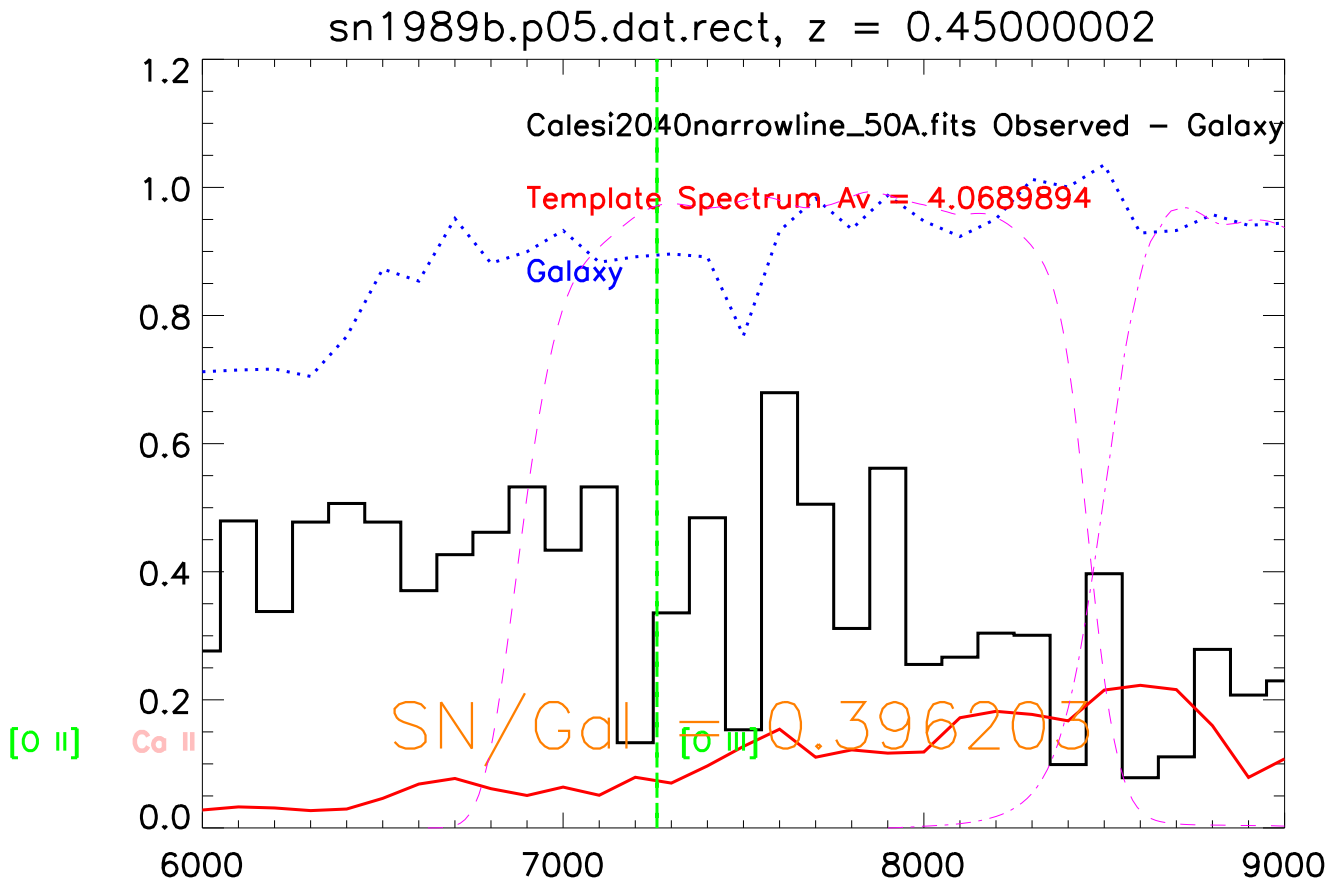

sn1999ee.p03.dat.rect, z = 0.45000002
Calesi2040narrowline_50A.fits Observed – Galaxy
Template Spectrum Av = 4.1621366
Galaxy
SN/Gal = 0.424629
[O II]
Ca II
[O III]
1.2
1.0
0.8
0.6
0.4
0.2
0.0
6000
7000
8000
9000


sn1990n.p07.dat.rect, z = 0.45000002
Calesi2040narrowline_50A.fits Observed – Galaxy
Template Spectrum Av. = 4.7491195
Galaxy
SN/Gal = 0.413380
[O II]
Ca II
[O III]
1.2
1.0
0.8
0.6
0.4
0.2
0.0
6000
7000
8000
9000


sn1989b.p19.dat.rect, z = 0.40000001
Calesi2040narrowline_50A.fits Observed − Galaxy
Template Spectrum Av = 1.7963958
Galaxy
SN/Gal = 0.502259
[O II]
Ca II
[O III]
H I
1.2
1.0
0.8
0.6
0.4
0.2
0.0
6000
7000
8000
9000


sn1999ee.p33.dat.rect, z = 0.40000001
Calesi2040narrowline_50A.fits Observed – Galaxy
Template Spectrum Av = 1.9870890
Galaxy
SN/Gal=0.471933
[O II]
Ca II
[O III]
H I
1.2
1.0
0.8
0.6
0.4
0.2
0.0
6000
7000
8000
9000


sn1989b.p16.dat.rect, z = 0.40000001
Calesi2040narrowline_50A.fits Observed – Galaxy
Template Spectrum Av = 2.7224212
Galaxy
SN/Gal=0.483088
[O II]
Ca II
[O III]
H I
1.2
1.0
0.8
0.6
0.4
0.2
0.0
6000
7000
8000
9000


sn1989b.p05.dat.rect, z = 0.45000002
Calesi2040narrowline_50A.fits Observed – Galaxy
Template Spectrum Av = 4.0689894
Galaxy
SN/Gal = 0.396205
[O II]
Ca II
[O III]
1.2
1.0
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0.6
0.4
0.2
0.0
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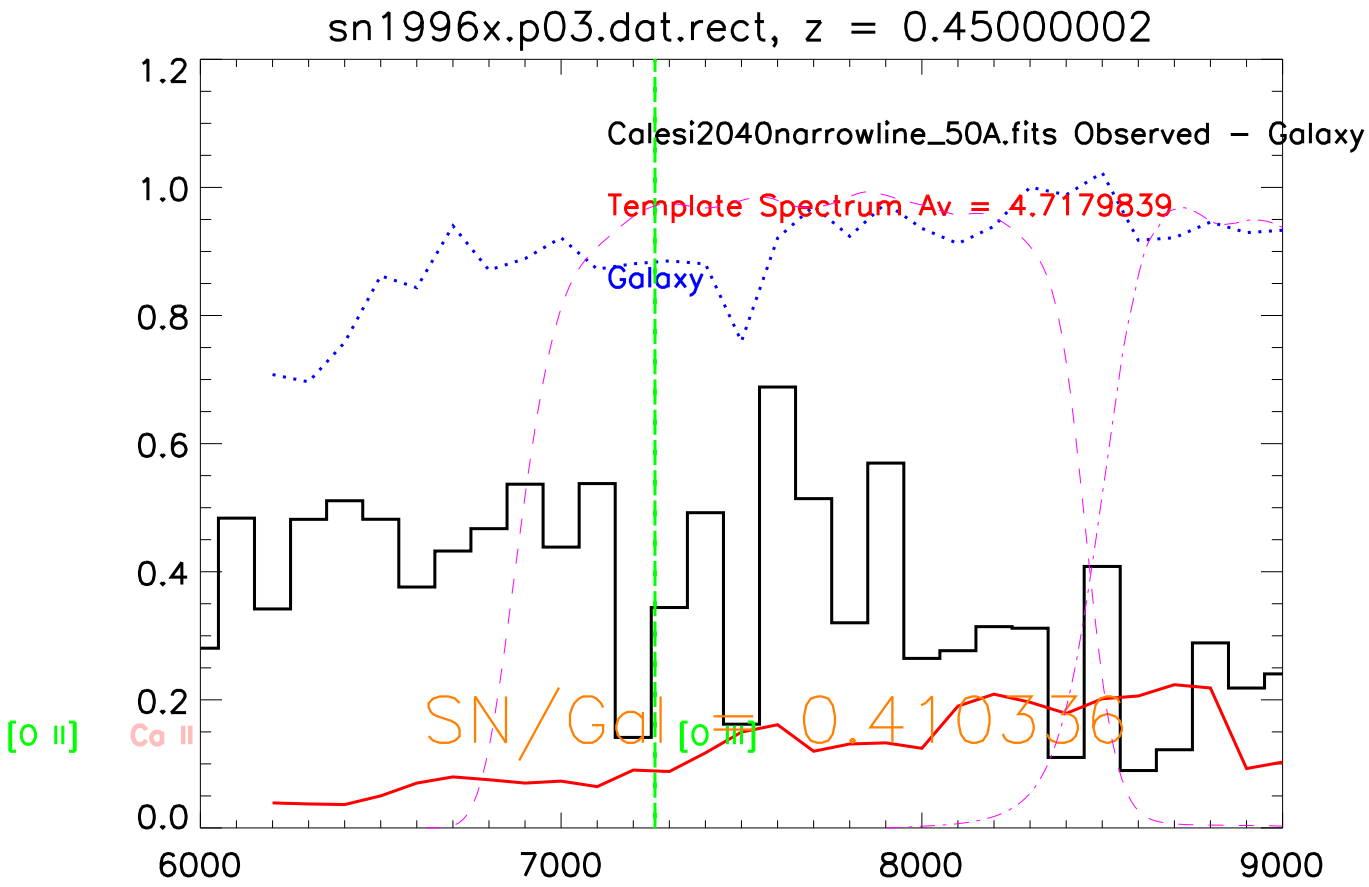
7000
8000
9000


sn1996x.p03.dat.rect, z = 0.45000002
Calesi2040narrowline_50A.fits Observed – Galaxy
Template Spectrum Av = 4.7179839
Galaxy
SN/Gal = 0.410356
[O II]
Ca II
[O III]
1.2
1.0
0.8
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0.4
0.2
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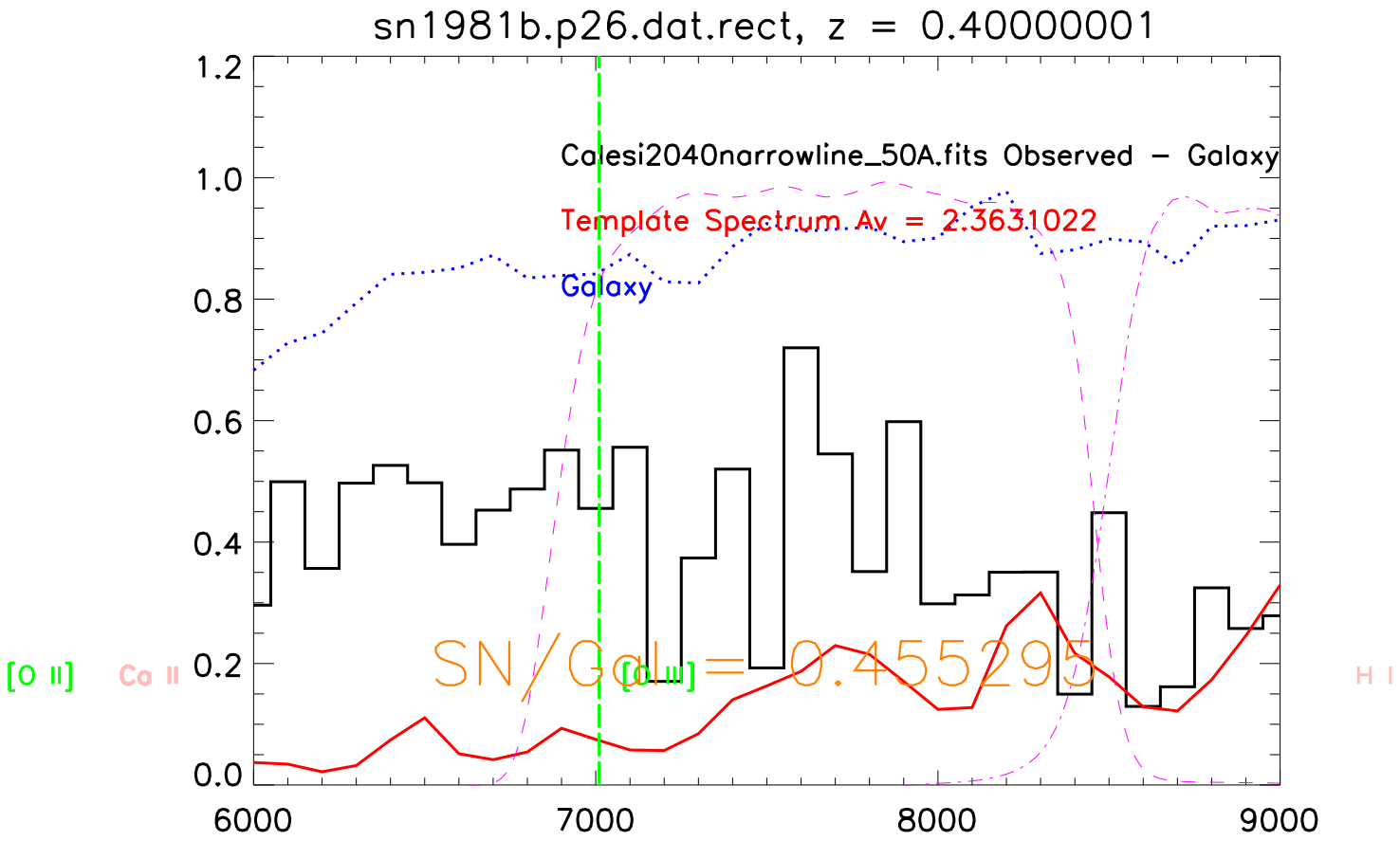
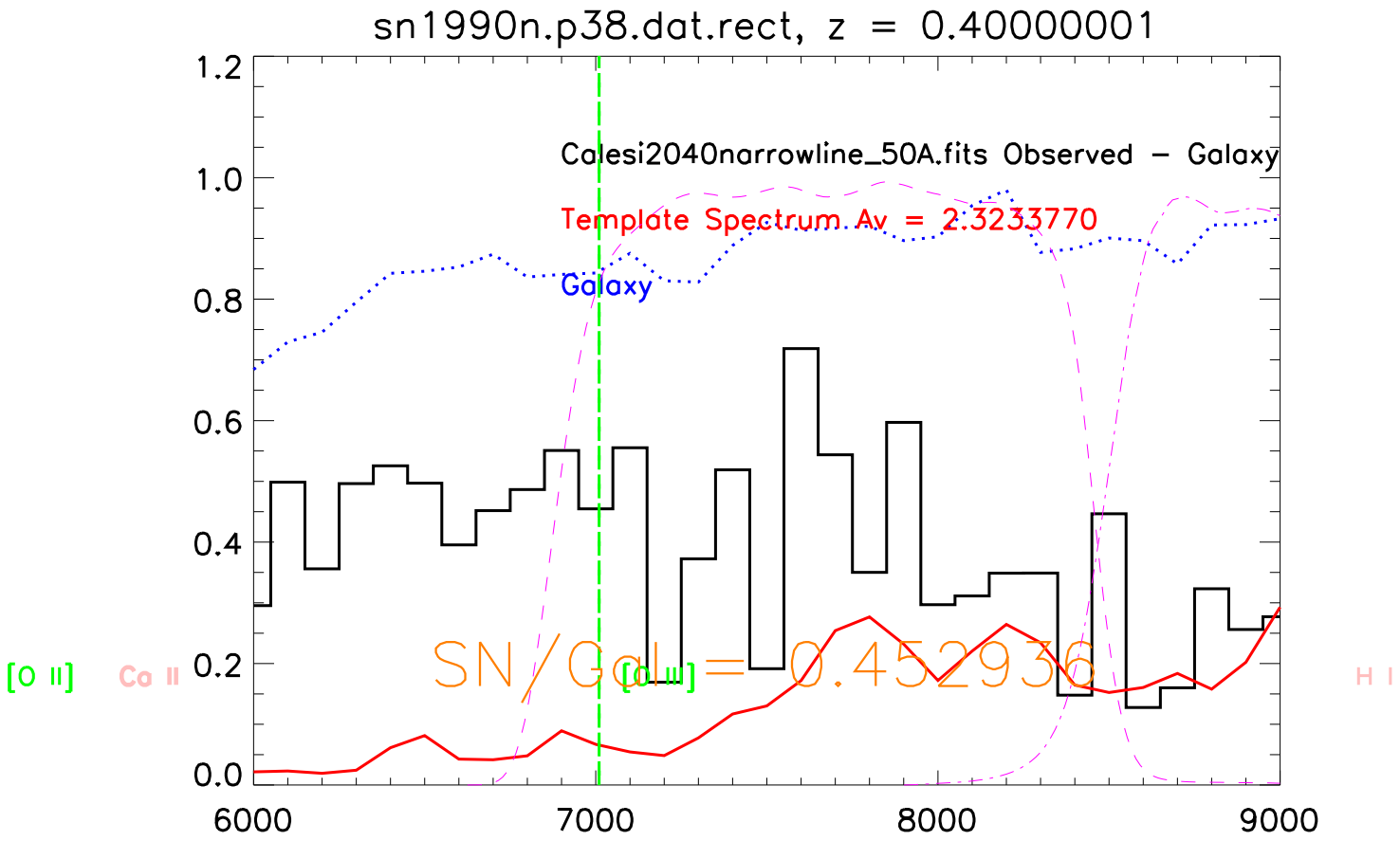
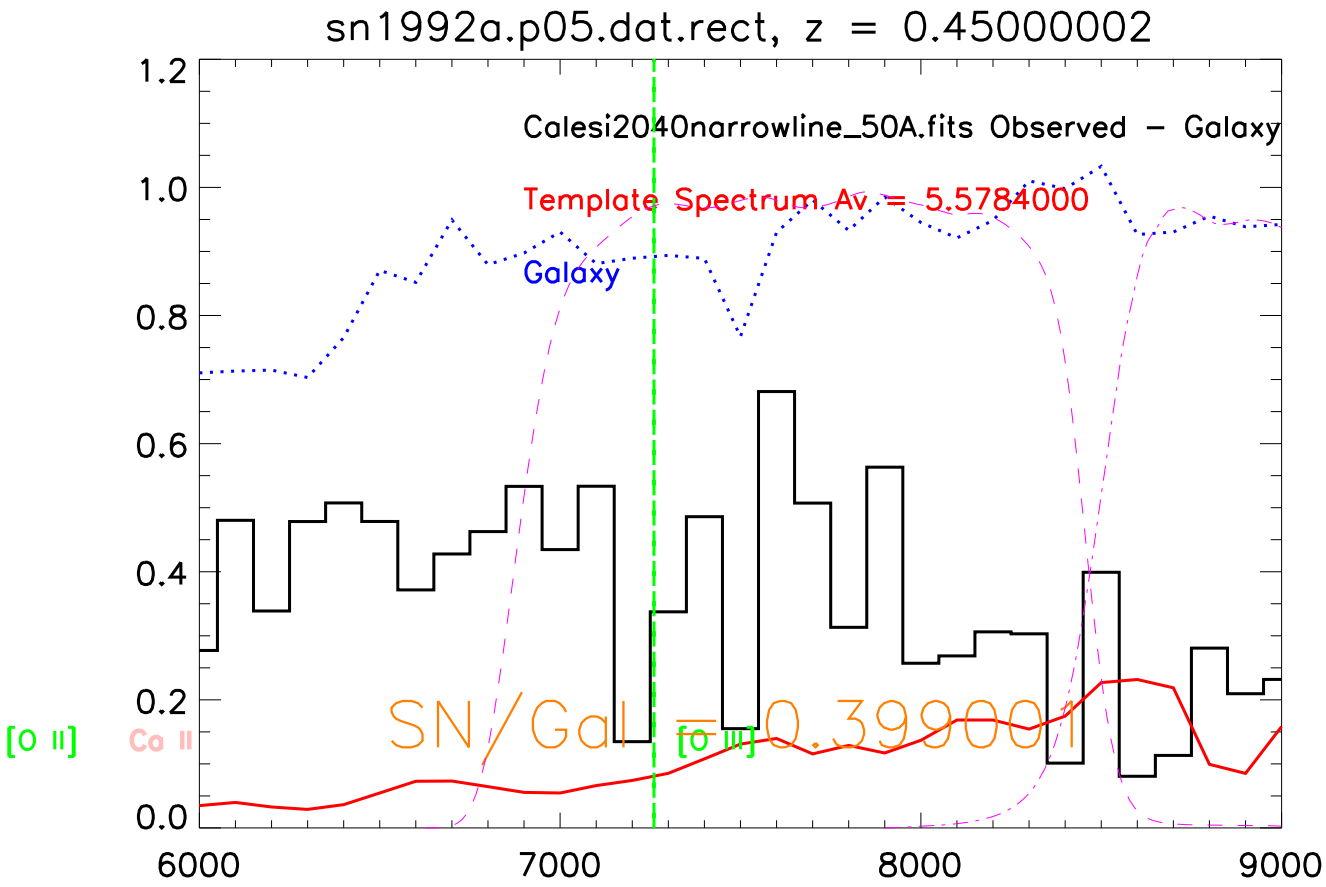
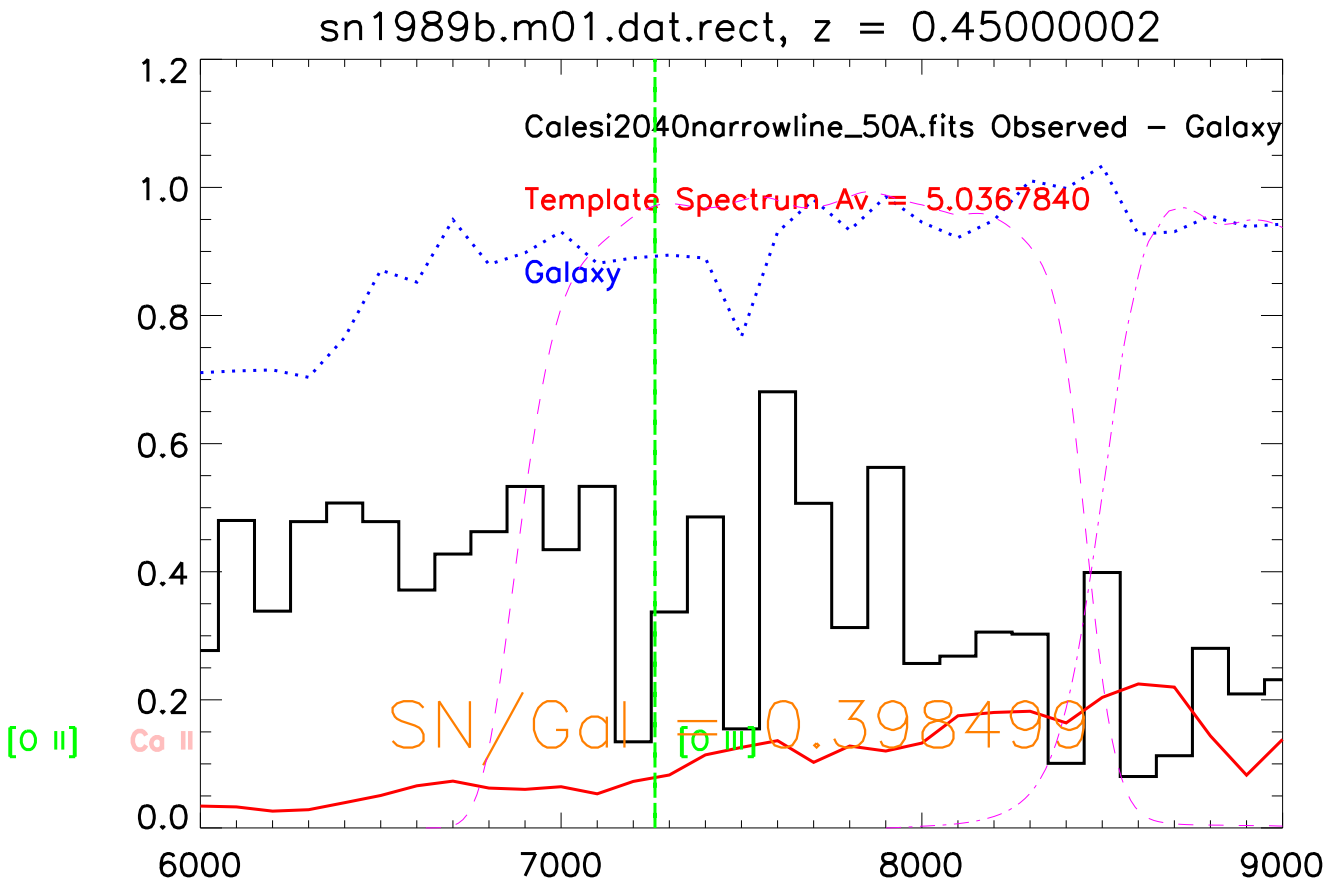
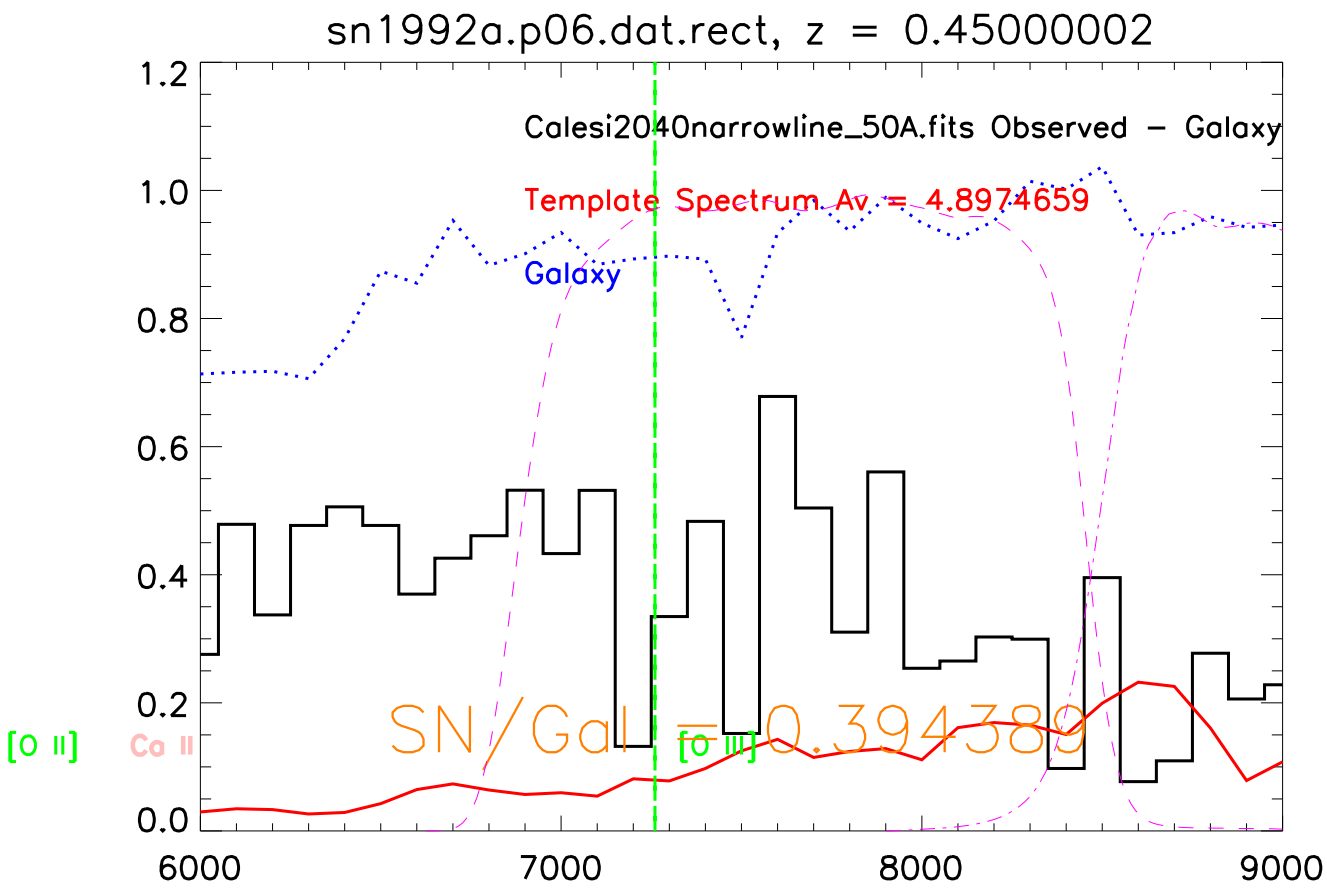
6000
7000
8000
9000

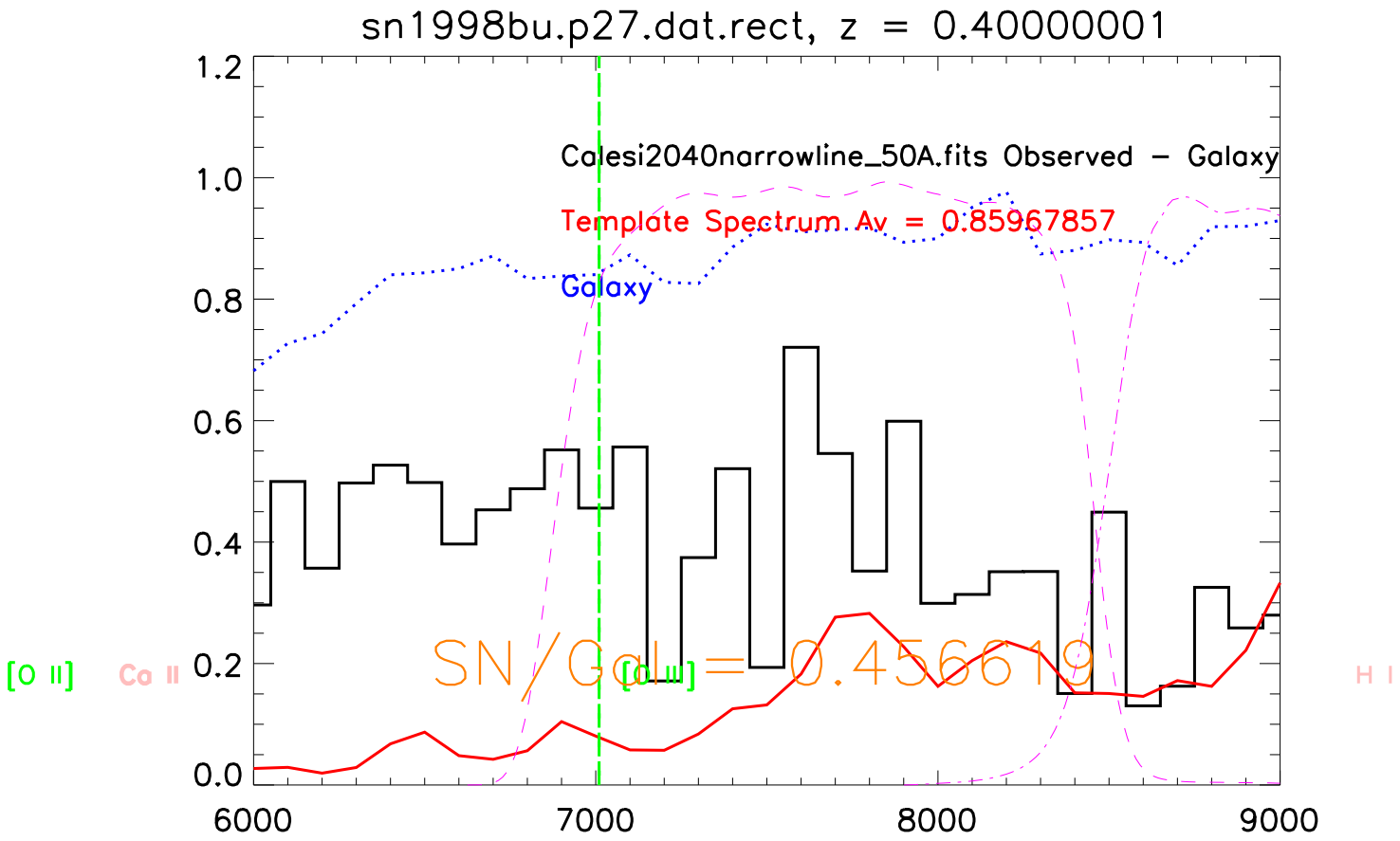

sn1981b.p26.dat.rect, z = 0.40000001
Calesi2040narrowline_50A.fits Observed – Galaxy
Template Spectrum Av = 2.3631022
Galaxy
SN/Gdl=0.455295
[O II]
Ca II
[O III]
H I
1.2
1.0
0.8
0.6
0.4
0.2
0.0
6000
7000
8000
9000

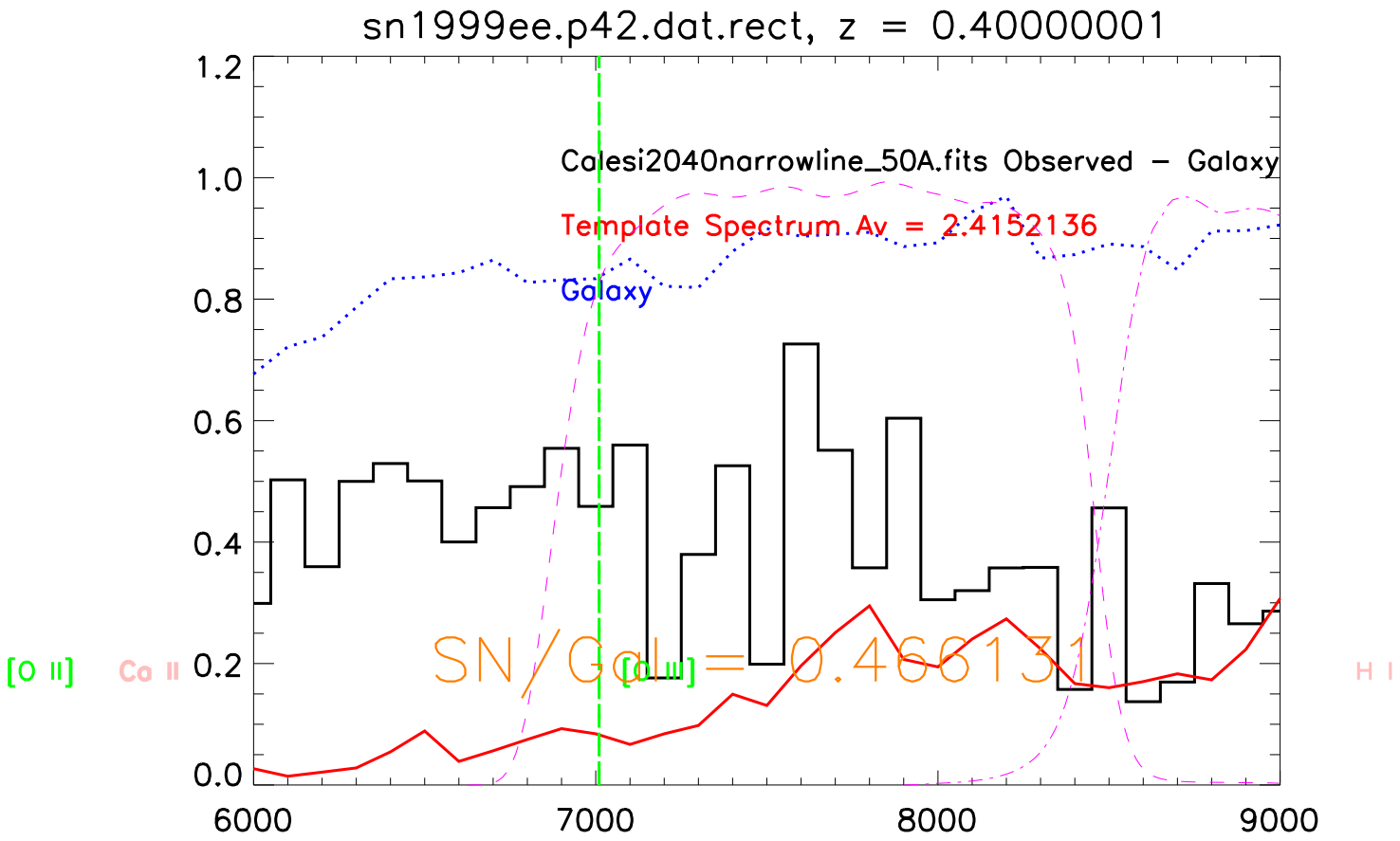

sn1990n.p38.dat.rect, z = 0.40000001
Calesi2040narrowline_50A.fits Observed – Galaxy
Template Spectrum Av = 2.3233770
Galaxy
SN/Gal=0.452936
[O II]
Ca II
[O III]
H I
1.2
1.0
0.8
0.6
0.4
0.2
0.0
6000
7000
8000
9000

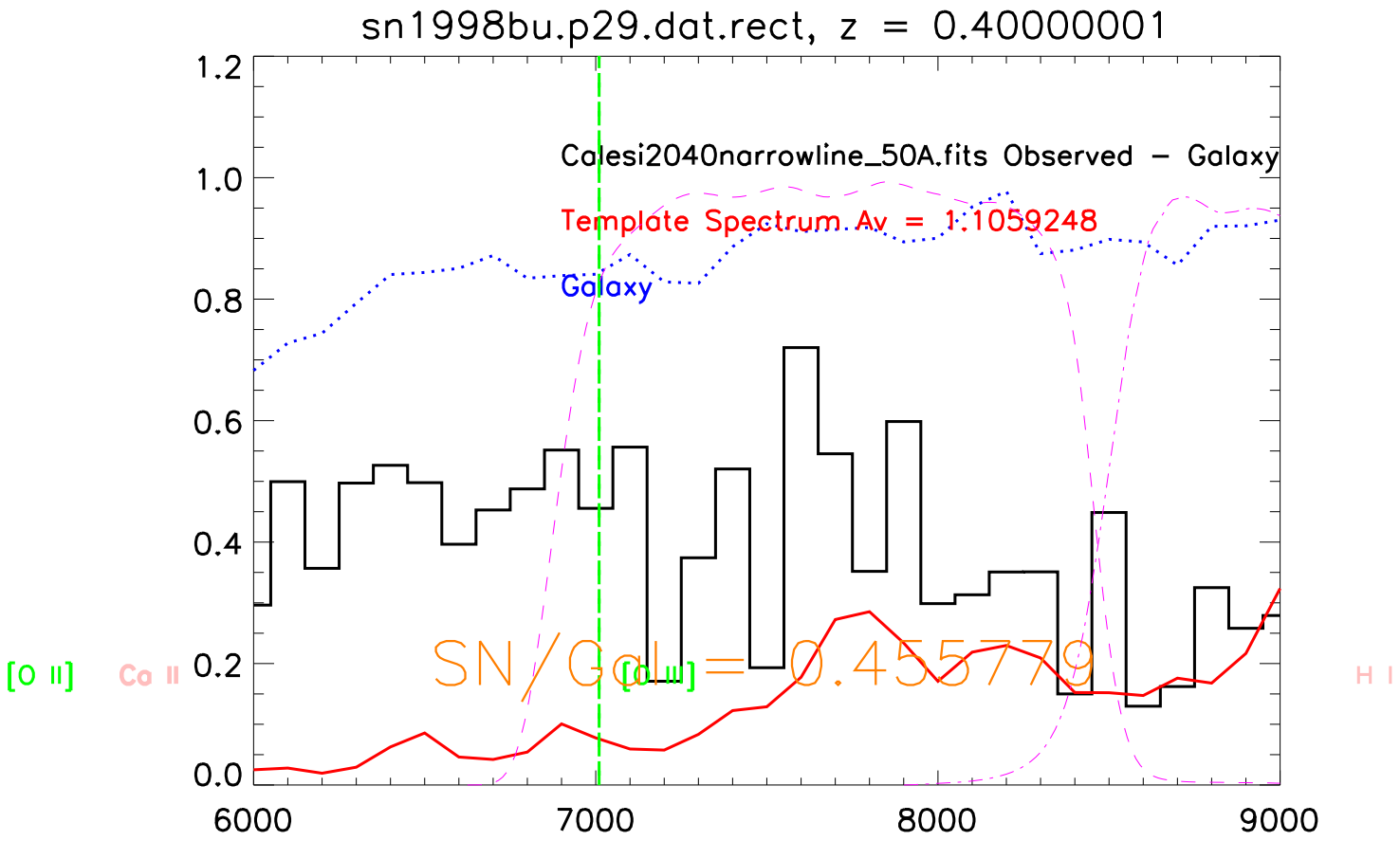

sn1992a.p05.dat.rect, z = 0.45000002
Calesi2040narrowline_50A.fits Observed − Galaxy
Template Spectrum Av = 5.5784000
Galaxy
SN/Gal = 0.399001
[O II]
Ca II
[O III]
1.2
1.0
0.8
0.6
0.4
0.2
0.0
6000
7000
8000
9000

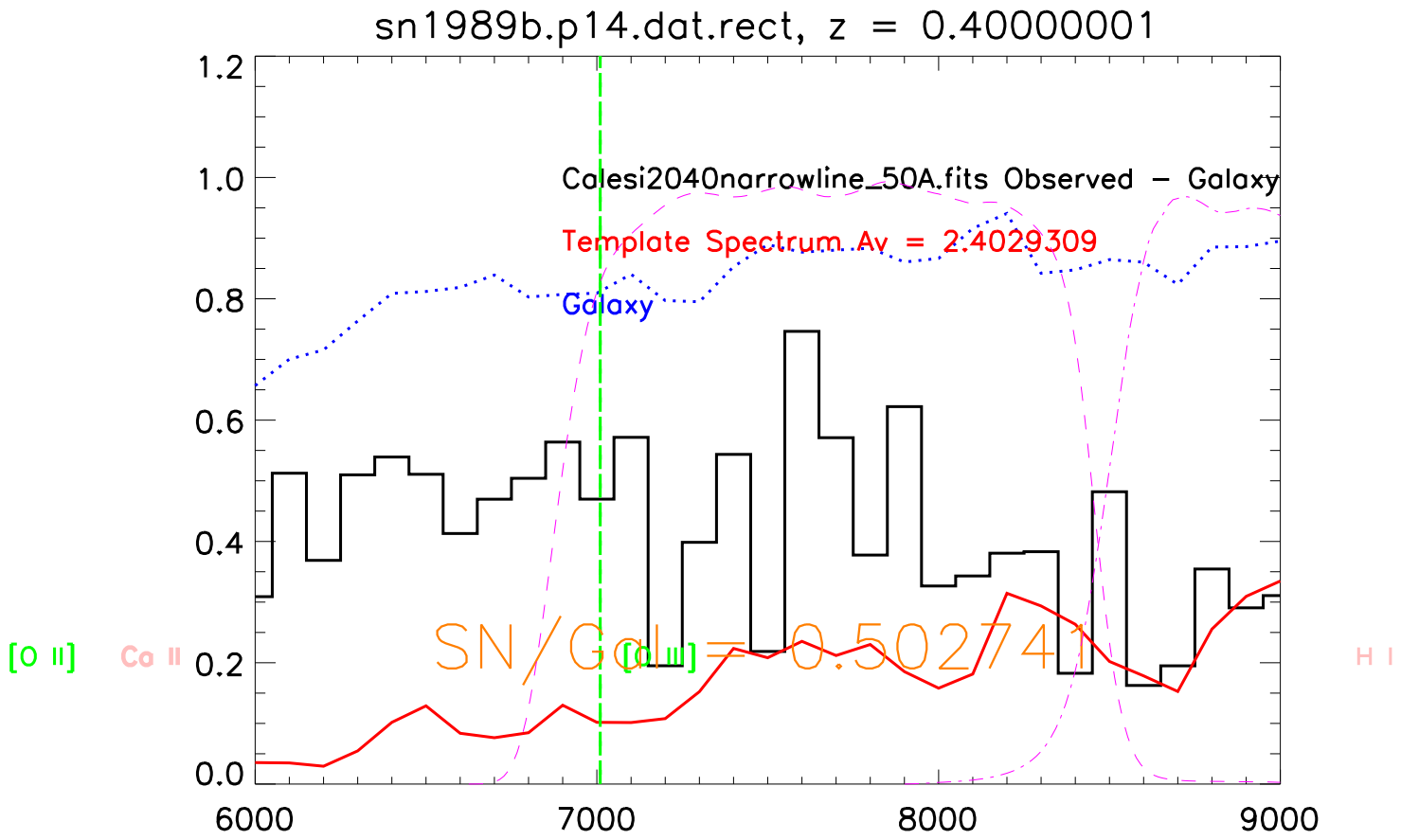

sn1989b.m01.dat.rect, z = 0.45000002
Calesi2040narrowline_50A.fits Observed − Galaxy
Template Spectrum Av = 5.0367840
Galaxy
SN/Gal = 0.398499
[O II]
Ca II
[O III]
1.2
1.0
0.8
0.6
0.4
0.2
0.0
6000
7000
8000
9000

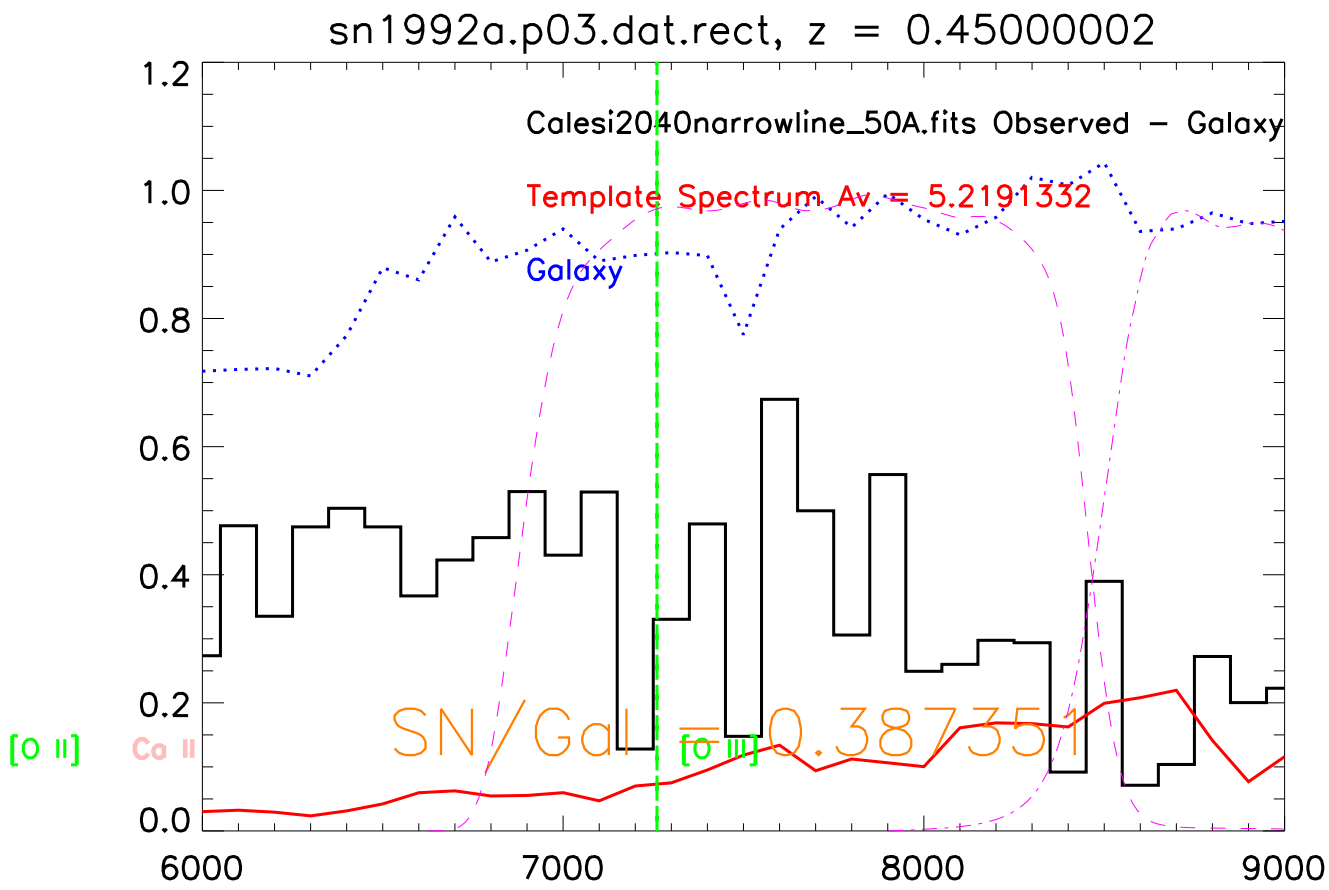

sn1992a.p06.dat.rect, z = 0.45000002
Calesi2040narrowline_50A.fits Observed − Galaxy
Template Spectrum Av = 4.8974659
Galaxy
SN/Gal = 0.394389
[O II]
Ca II
[O III]
1.2
1.0
0.8
0.6
0.4
0.2
0.0
6000
7000
8000
9000

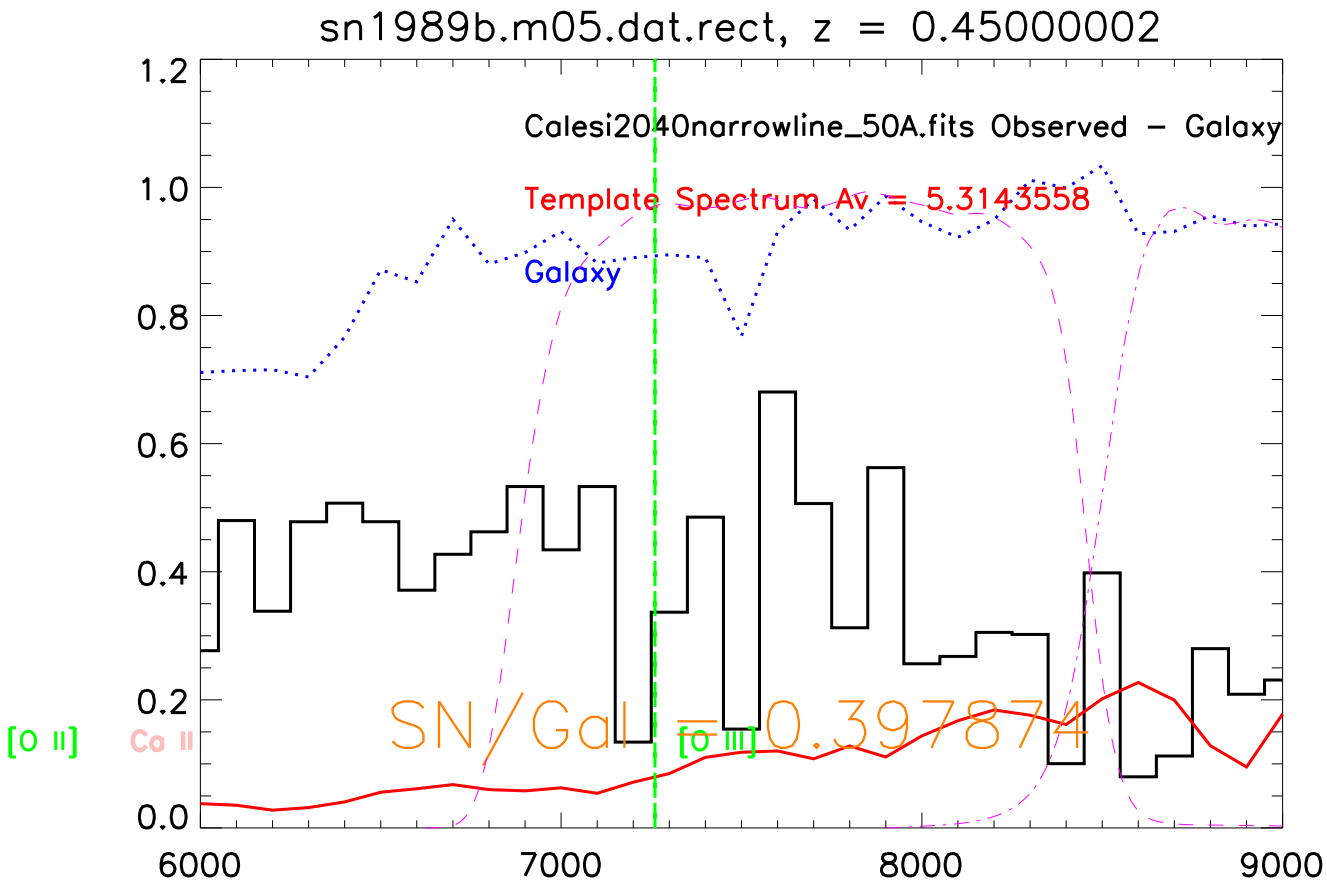

sn1998bu.p27.dat.rect, z = 0.40000001
Calesi2040narrowline_50A.fits Observed – Galaxy
Template Spectrum Av = 0.85967857
Galaxy
SN/Gdl=0.456619
[O II]
Ca II
[O III]
H I
1.2
1.0
0.8
0.6
0.4
0.2
0.0
6000
7000
8000
9000

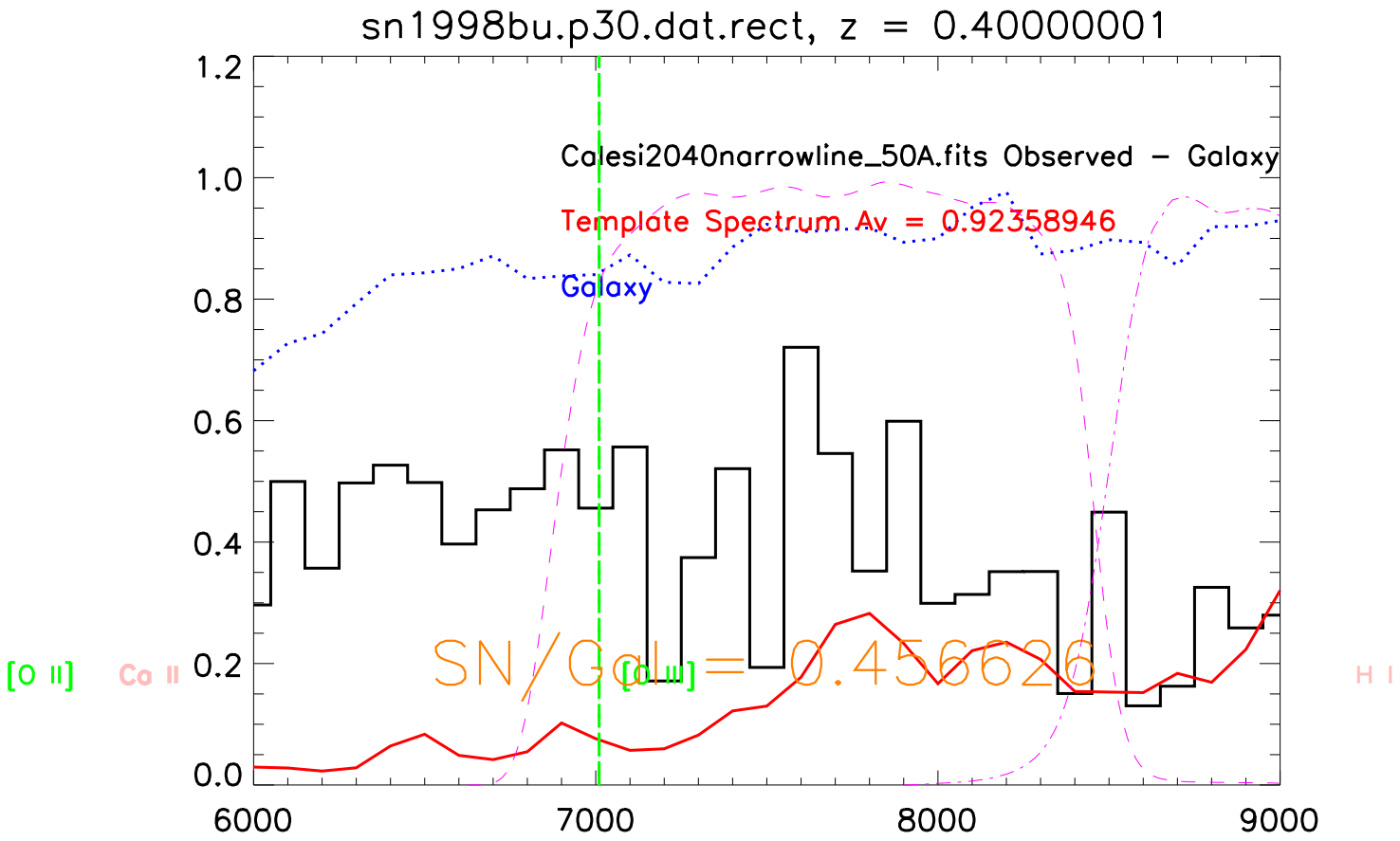

sn1999ee.p42.dat.rect, z = 0.40000001
Calesi2040narrowline_50A.fits Observed – Galaxy
Template Spectrum Av = 2.4152136
Galaxy
SN/Gal = 0.466131
[O II]
Ca II
[O III]
H I
1.2
1.0
0.8
0.6
0.4
0.2
0.0
6000
7000
8000
9000

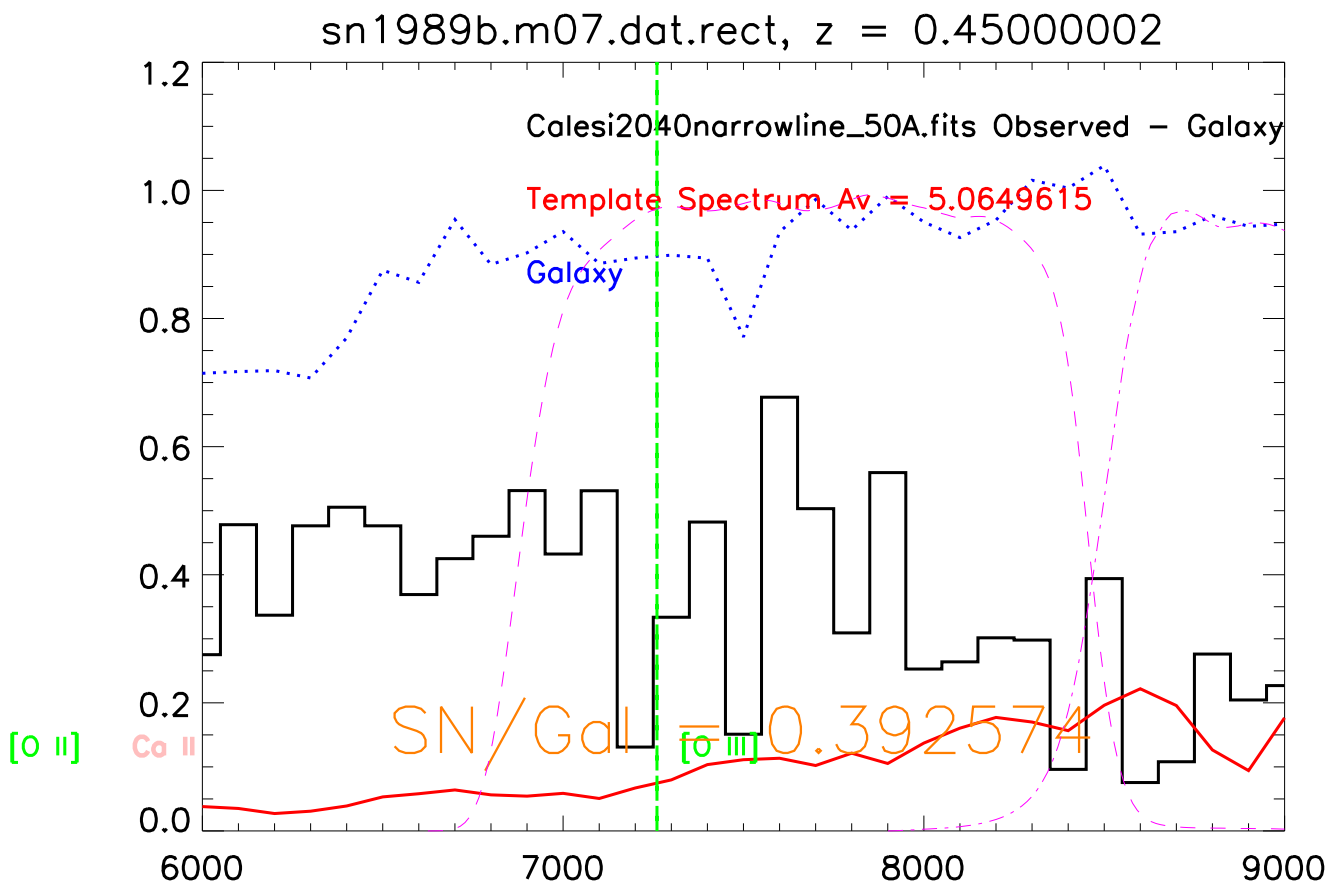

sn1998bu.p29.dat.rect, z = 0.40000001
Calesi2040narrowline_50A.fits Observed – Galaxy
Template Spectrum Av = 1.1059248
Galaxy
SN/Gal=0.455779
[O II]
Ca II
[O III]
H I
1.2
1.0
0.8
0.6
0.4
0.2
0.0
6000
7000
8000
9000

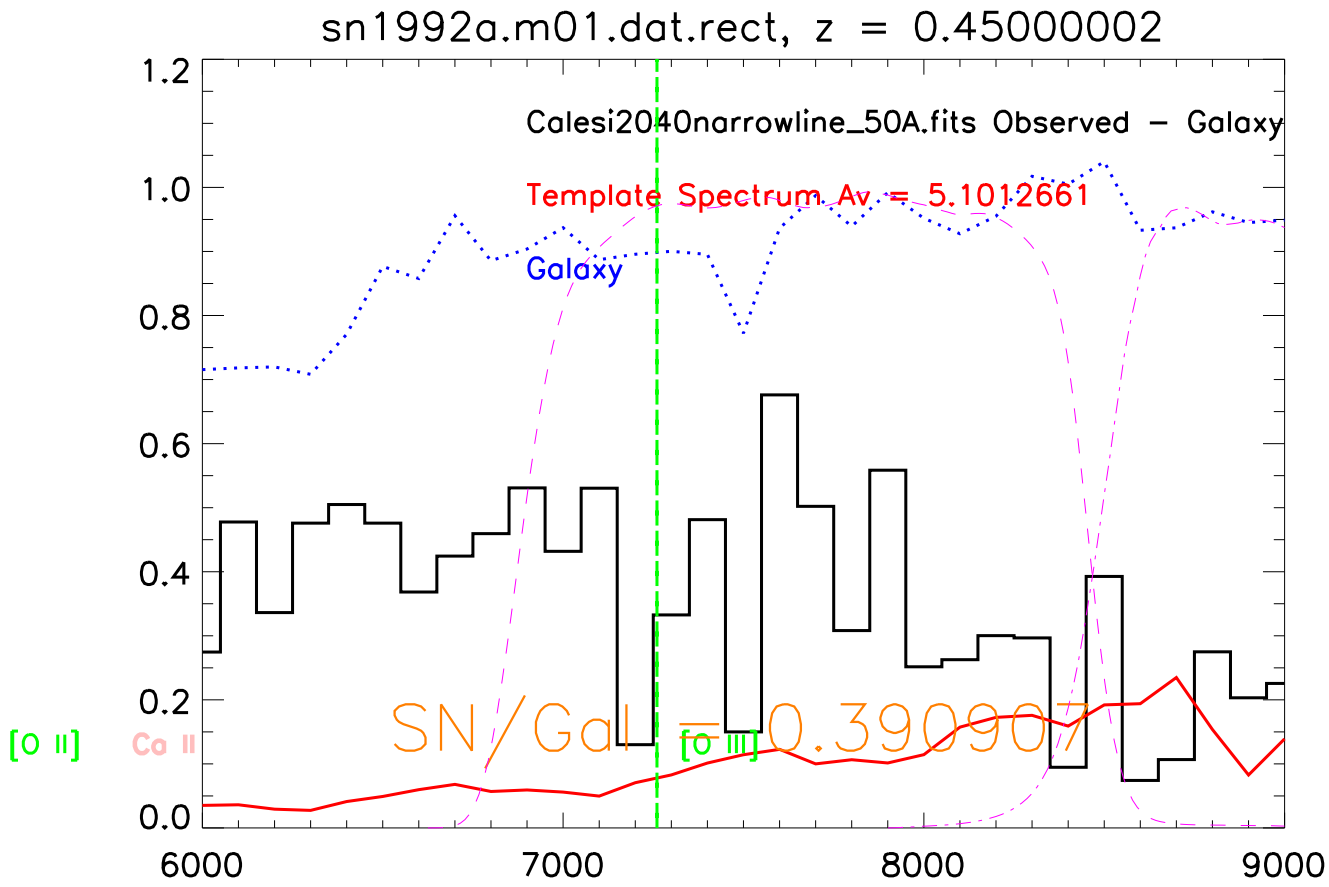

sn1989b.p14.dat.rect, z = 0.40000001
Calesi2040narrowline_50A.fits Observed – Galaxy
Template Spectrum Av = 2.4029309
Galaxy
SN/Gal=0.502741
[O II]
Ca II
[O III]
H I
1.2
1.0
0.8
0.6
0.4
0.2
0.0
6000
7000
8000
9000

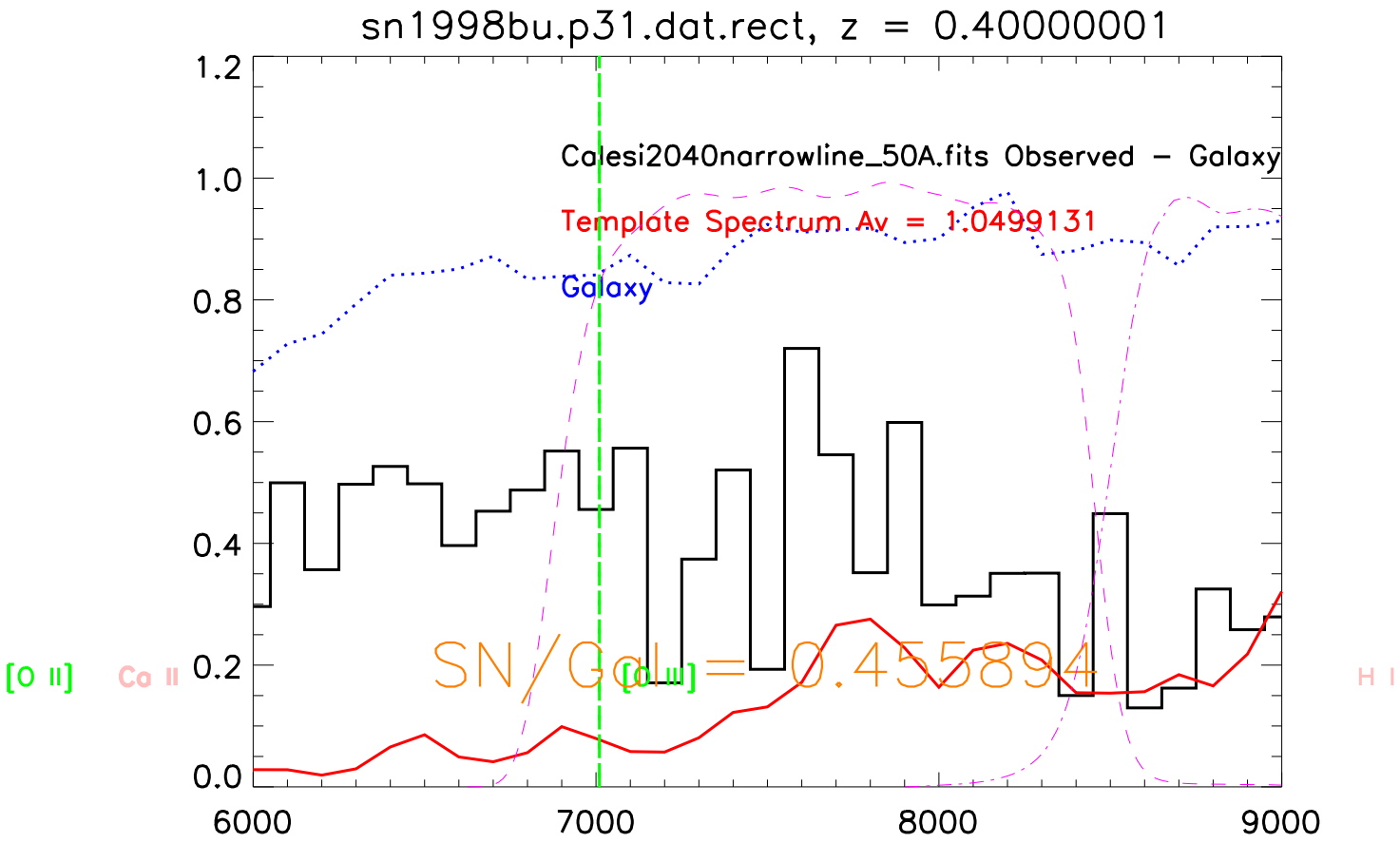

sn1992a.p03.dat.rect, z = 0.45000002
Calesi2040narrowline_50A.fits Observed – Galaxy
Template Spectrum Av = 5.2191332
Galaxy
SN/Gal = 0.387351
[O II]
Ca II
[O III]
1.2
1.0
0.8
0.6
0.4
0.2
0.0
6000
7000
8000
9000

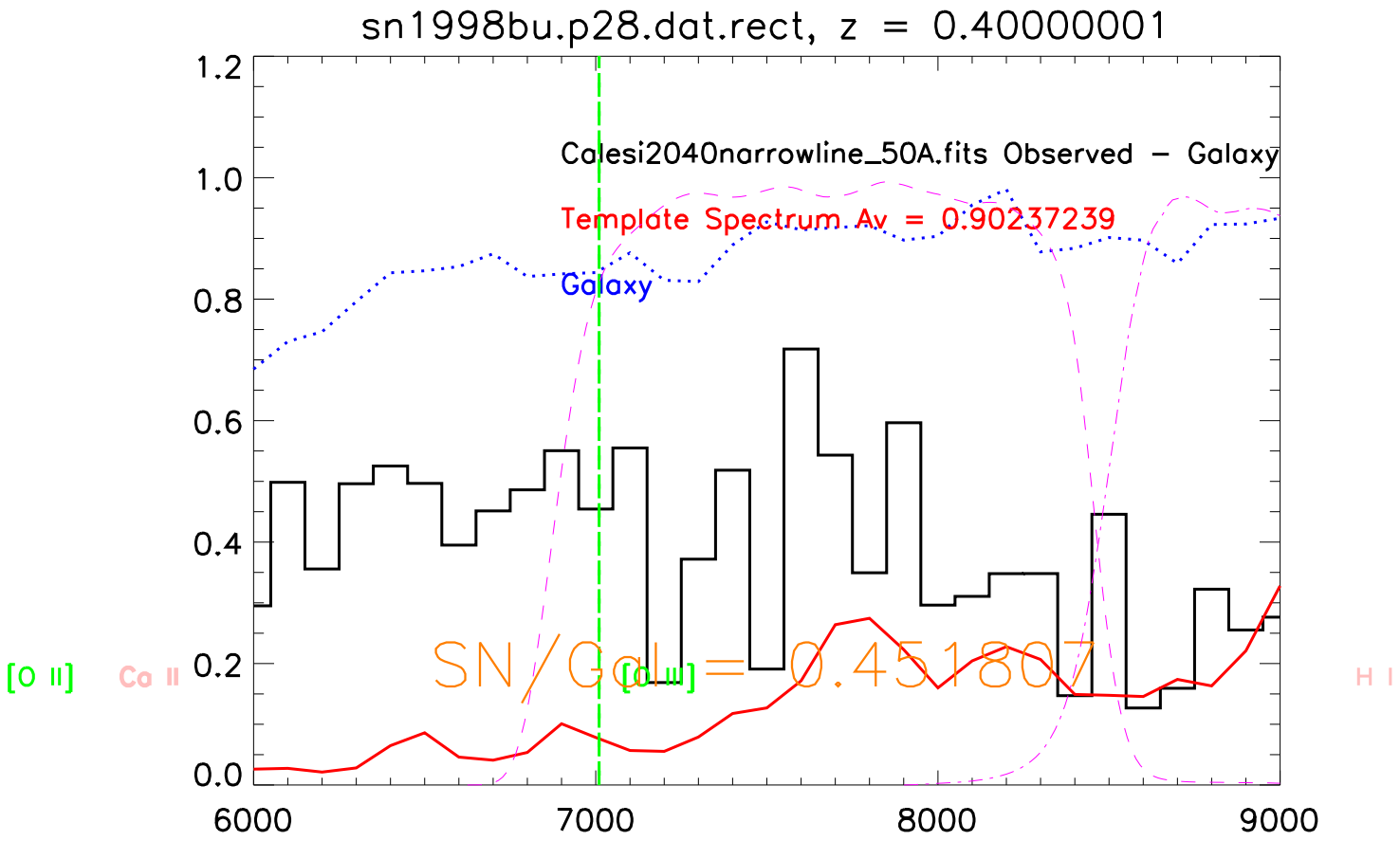

sn1989b.m05.dat.rect, z = 0.45000002
Calesi2040narrowline_50A.fits Observed − Galaxy
Template Spectrum Av = 5.3143558
Galaxy
SN/Gal = 0.397874
[O II]
Ca II
[O III]
1.2
1.0
0.8
0.6
0.4
0.2
0.0
6000
7000
8000
9000

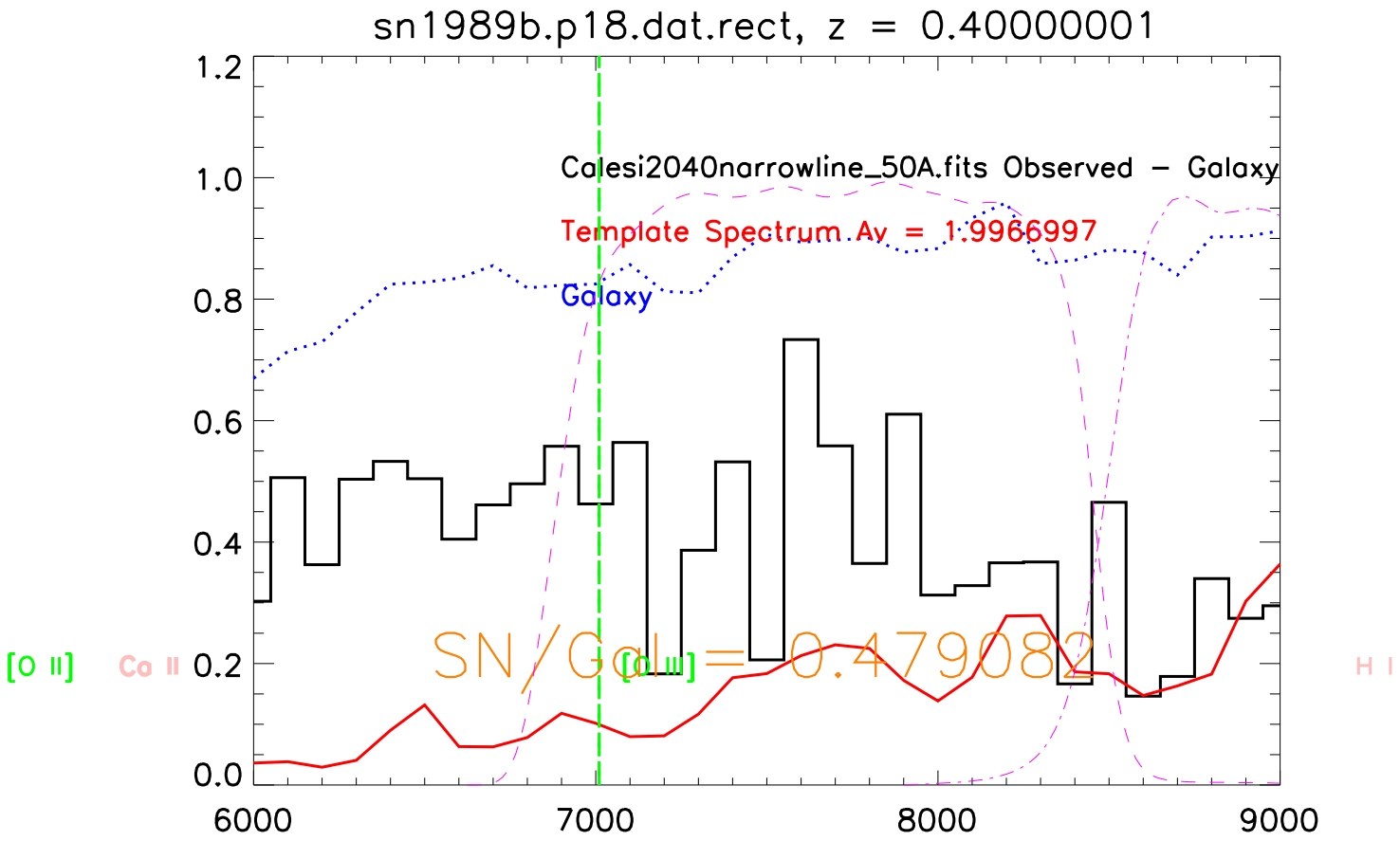

sn1998bu.p30.dat.rect, z = 0.40000001
Calesi2040narrowline_50A.fits Observed – Galaxy
Template Spectrum Av = 0.92358946
Galaxy
SN/Gal = 0.456626
[O II]
Ca II
[O III]
H I
1.2
1.0
0.8
0.6
0.4
0.2
0.0
6000
7000
8000
9000

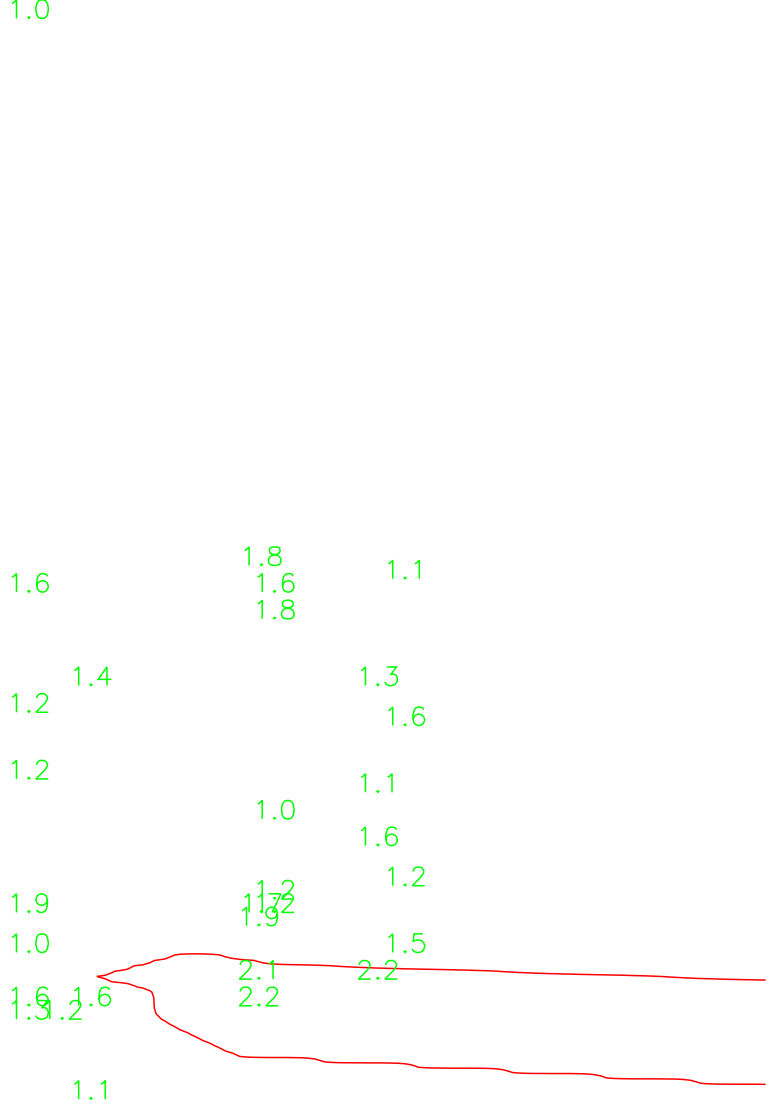

sn1989b.m07.dat.rect, z = 0.45000002
Calesi2040narrowline_50A.fits Observed − Galaxy
Template Spectrum Av = 5.0649615
Galaxy
SN/Gal = 0.392574
[O II]
Ca II
[O III]
1.2
1.0
0.8
0.6
0.4
0.2
0.0
6000
7000
8000
9000

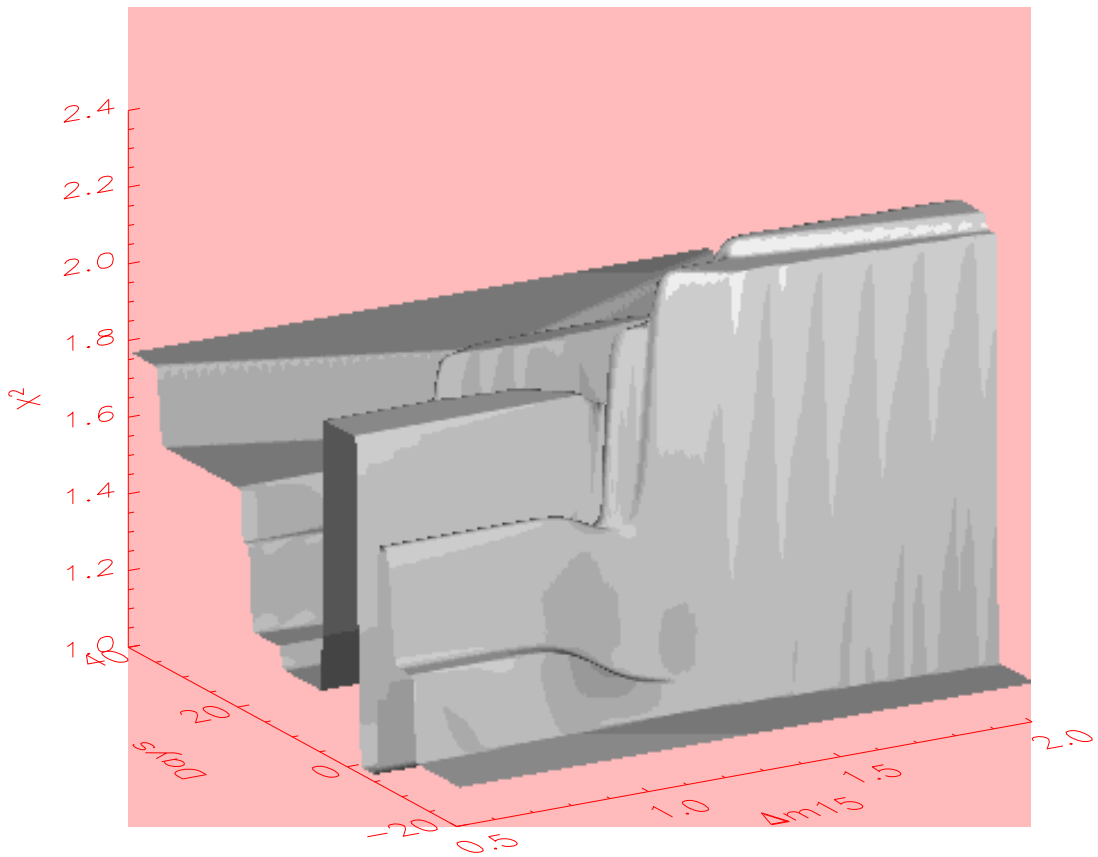

sn1992a.m01.dat.rect, z = 0.45000002
Calesi2040narrowline_50A.fits Observed – Galaxy
Template Spectrum Av = 5.1012661
Galaxy
SN/Gal = 0.390907
[O II]
Ca II
[O III]
1.2
1.0
0.8
0.6
0.4
0.2
0.0
6000
7000
8000
9000


sn1998bu.p31.dat.rect, z = 0.40000001
Calesi2040narrowline_50A.fits Observed – Galaxy
Template Spectrum Av = 1.0499131
Galaxy
SN/Gal=0.455894
[O II]
Ca II
[O III]
H I
1.2
1.0
0.8
0.6
0.4
0.2
0.0
6000
7000
8000
9000

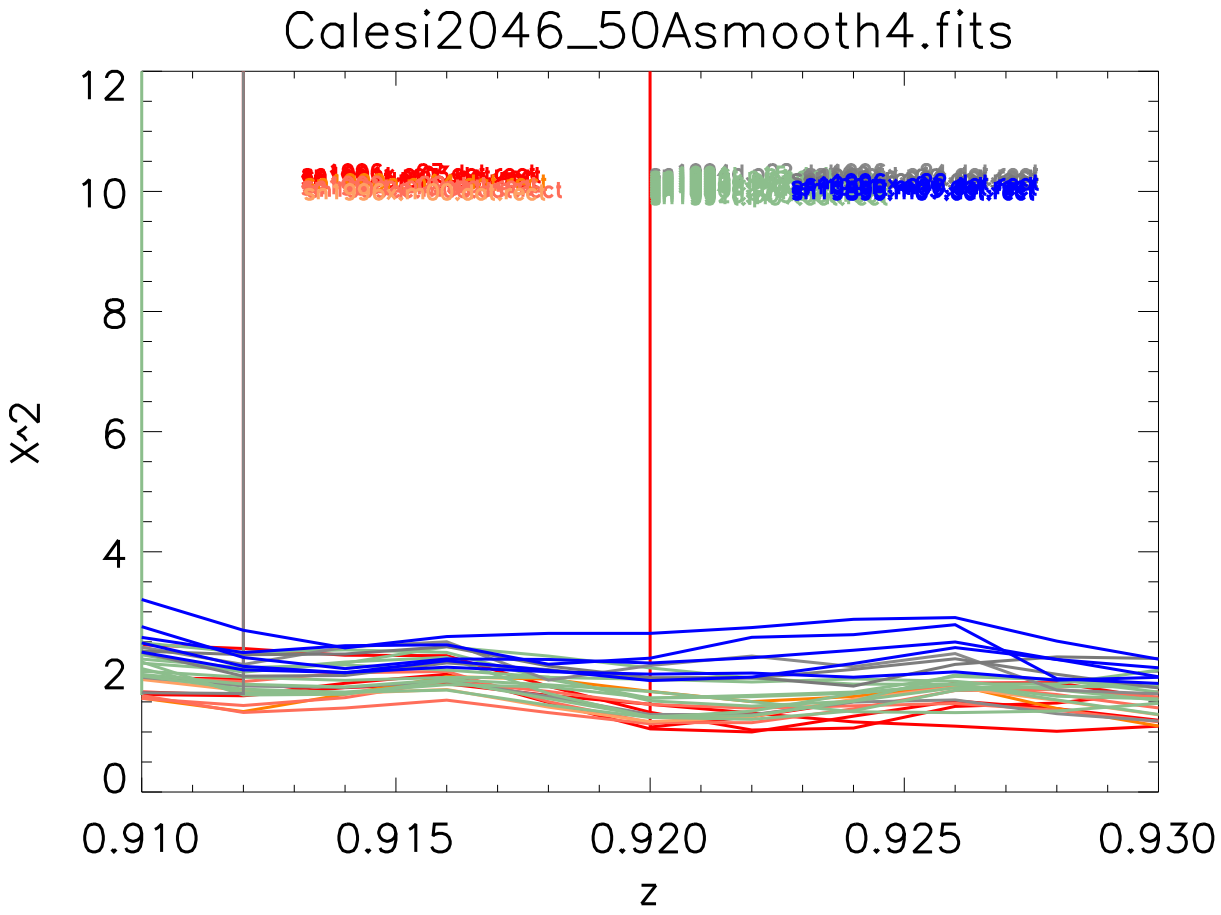

sn1998bu.p28.dat.rect, z = 0.40000001
Calesi2040narrowline_50A.fits Observed – Galaxy
Template Spectrum Av = 0.90237239
Galaxy
SN/Gal=0.451807
[O II]
Ca II
[O III]
H I
1.2
1.0
0.8
0.6
0.4
0.2
0.0
6000
7000
8000
9000

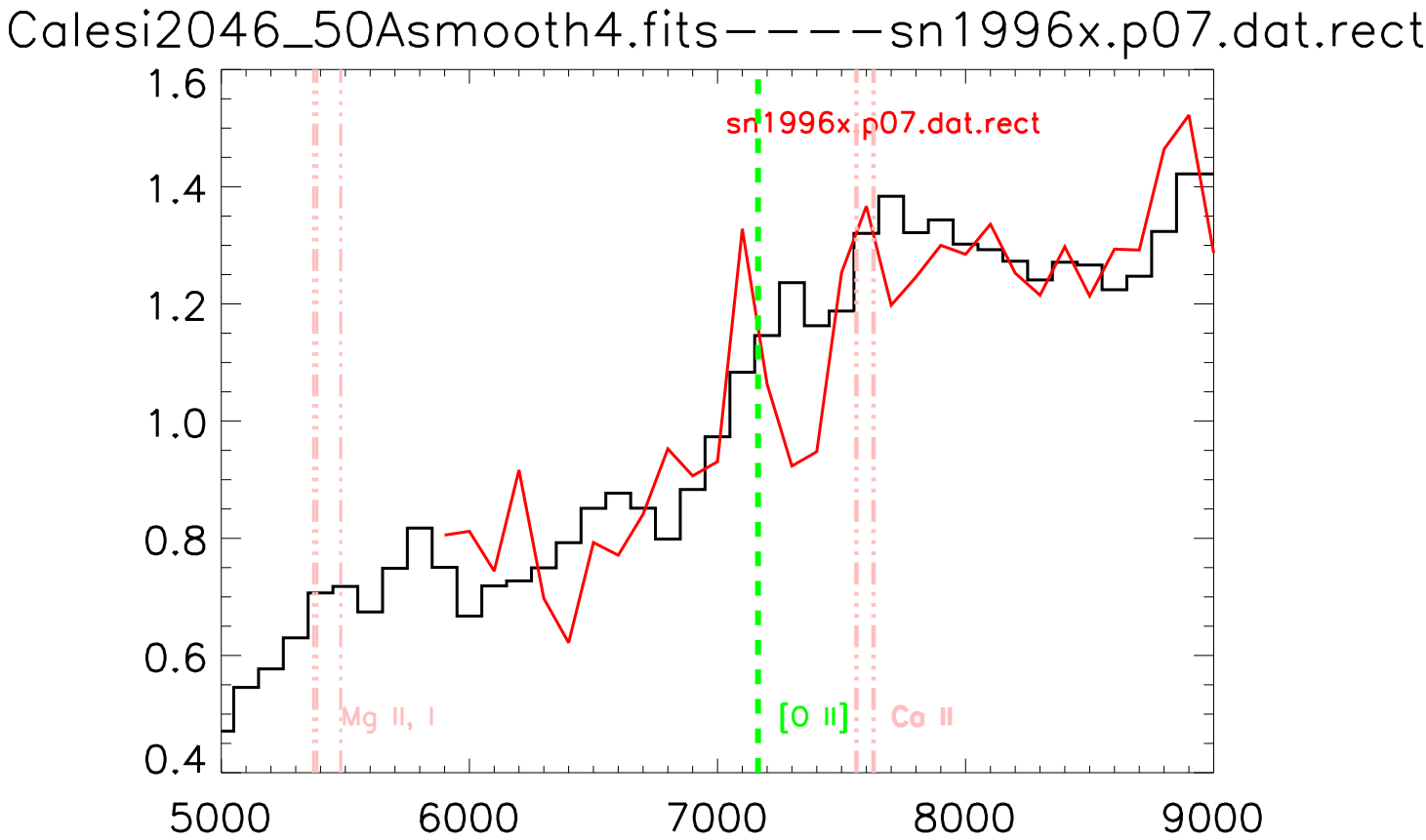

sn1989b.p18.dat.rect, z = 0.40000001
Calesi2040narrowline_50A.fits Observed – Galaxy
Template Spectrum.Av = 1.9966997
Galaxy
SN/Gal=0.479082
[O II]
Ca II
[O III]
H I
1.2
1.0
0.8
0.6
0.4
0.2
0.0
6000
7000
8000
9000

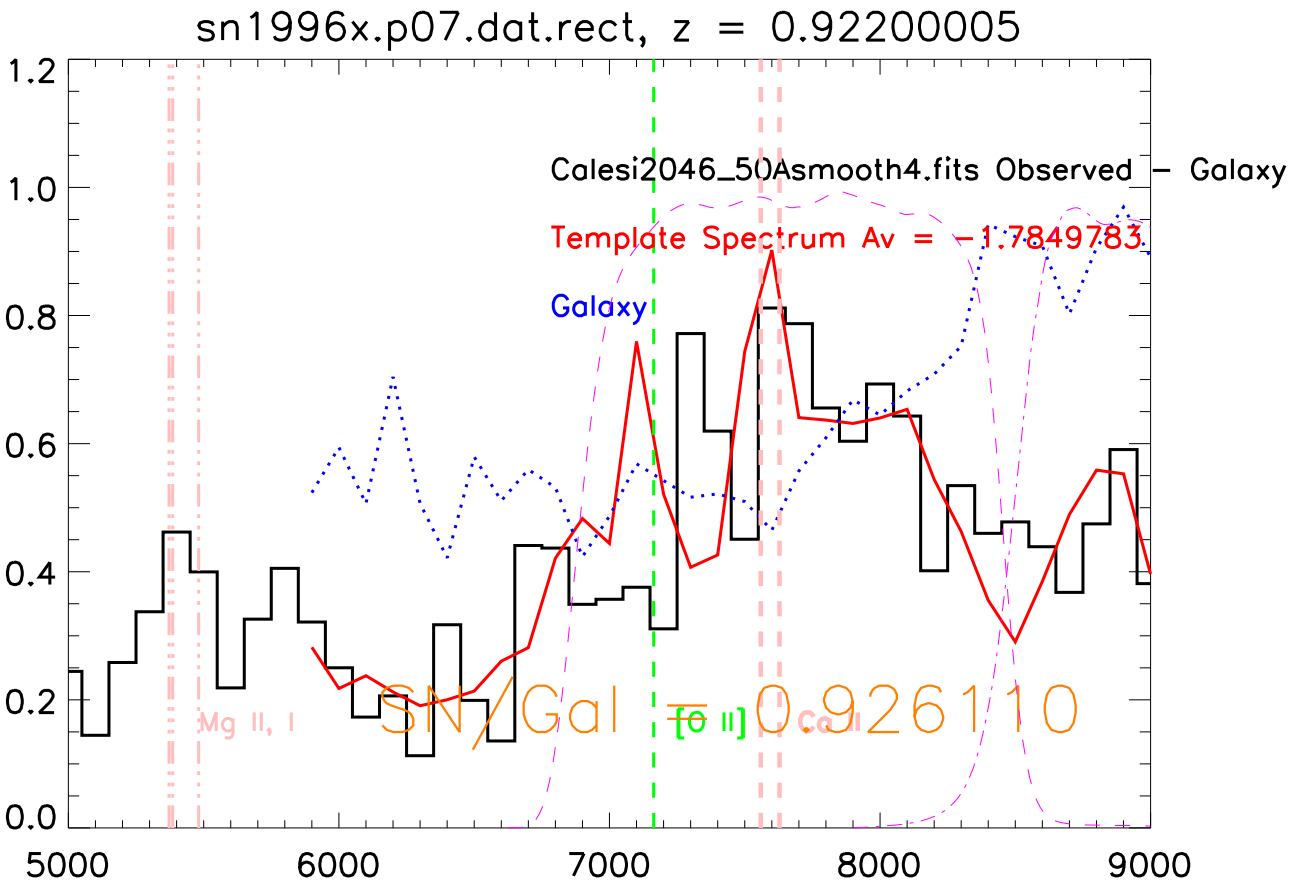

1.0
1.8
1.1
1.6
1.6
1.8
1.4
1.3
1.2
1.6
1.2
1.1
1.0
1.6
1.2
1.2
1.9
1.9
1.0
1.5
2.1
2.2
1.6
2.2
1.1

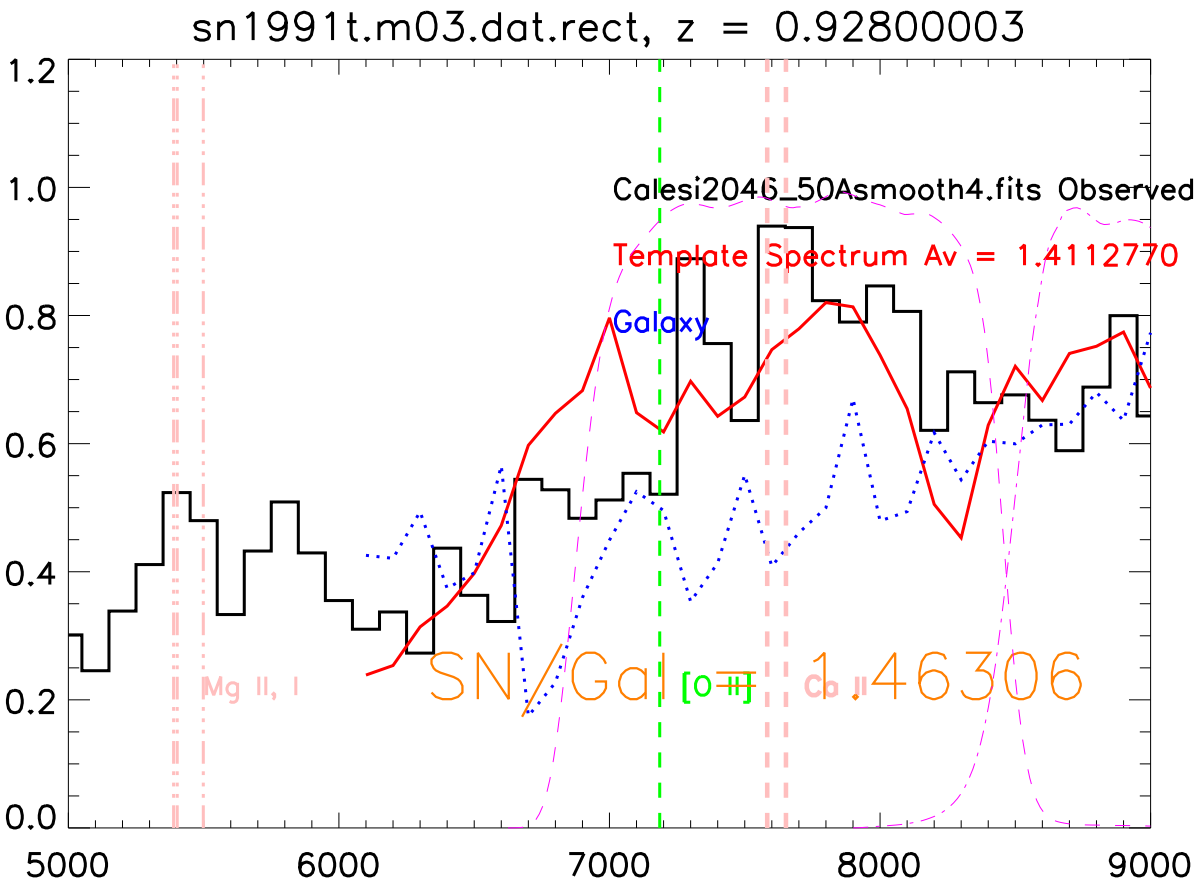


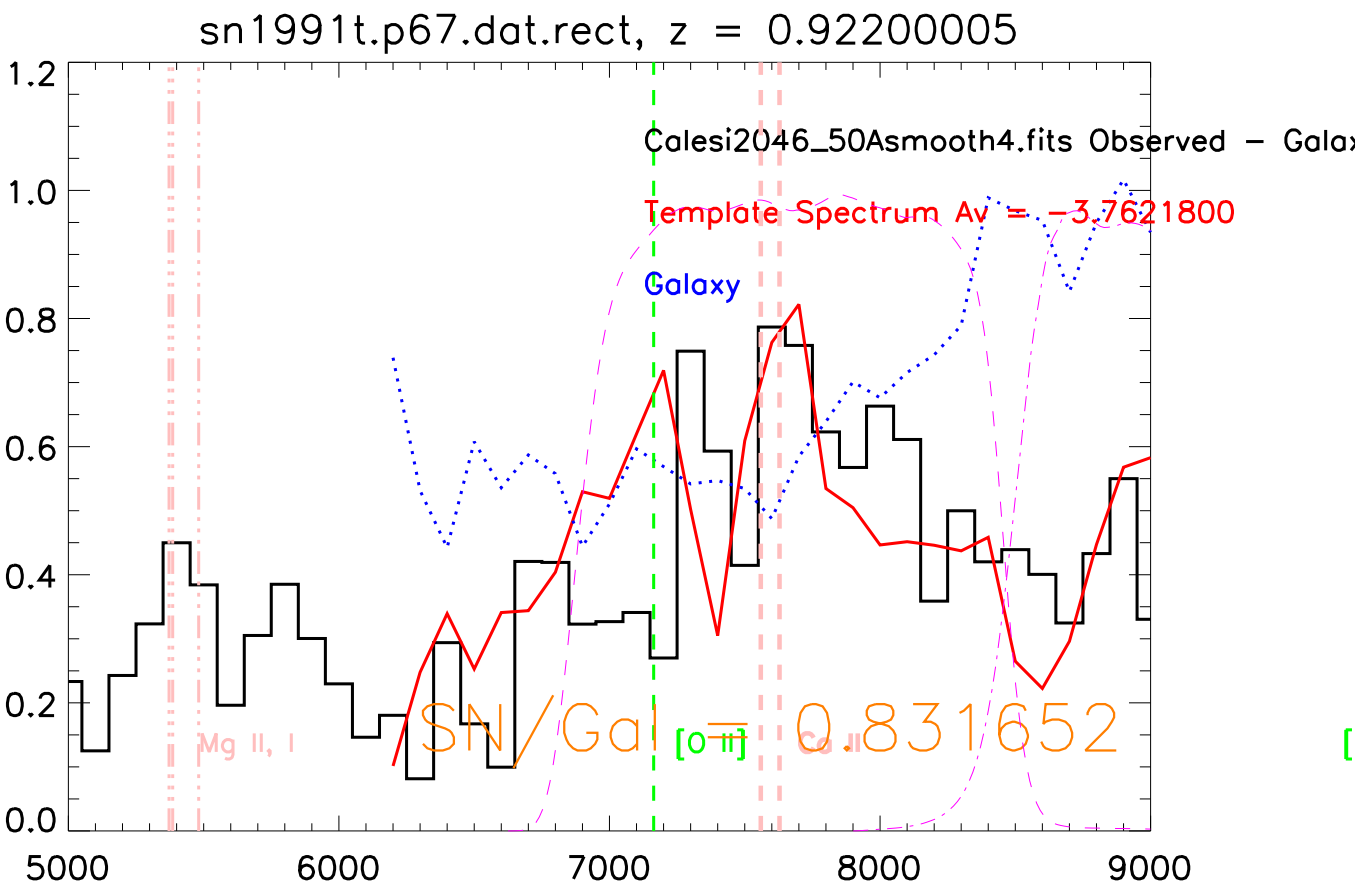
2.4
2.2
2.0
1.8
1.6
1.4
1.2
1.0
χ^2
40
20
0
−20
Days
0.5
1.0
1.5
2.0
Δm15

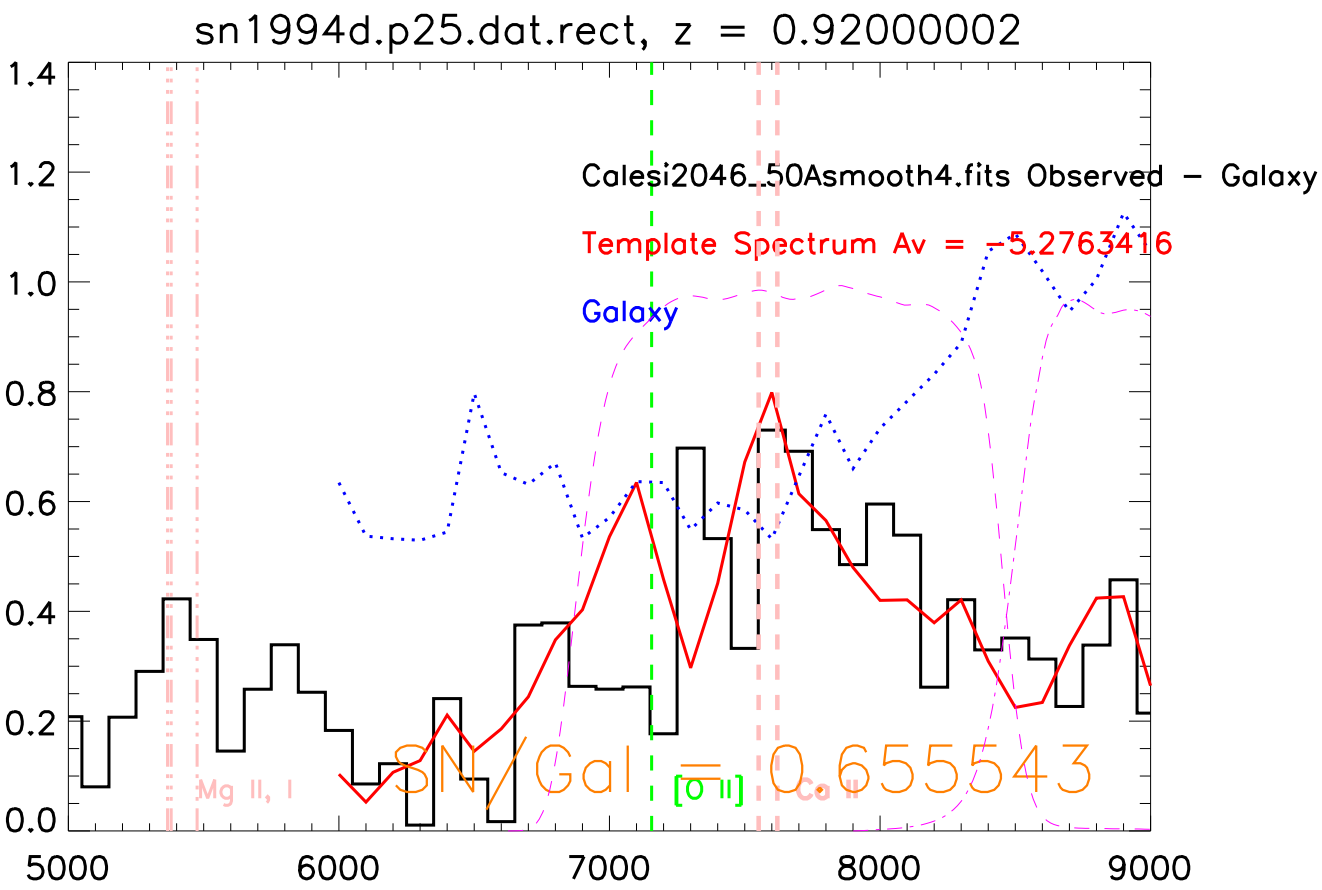

Calesi2046_50Asmooth4.fits
X^2
z
0
2
4
6
8
10
12
0.910
0.915
0.920
0.925
0.930

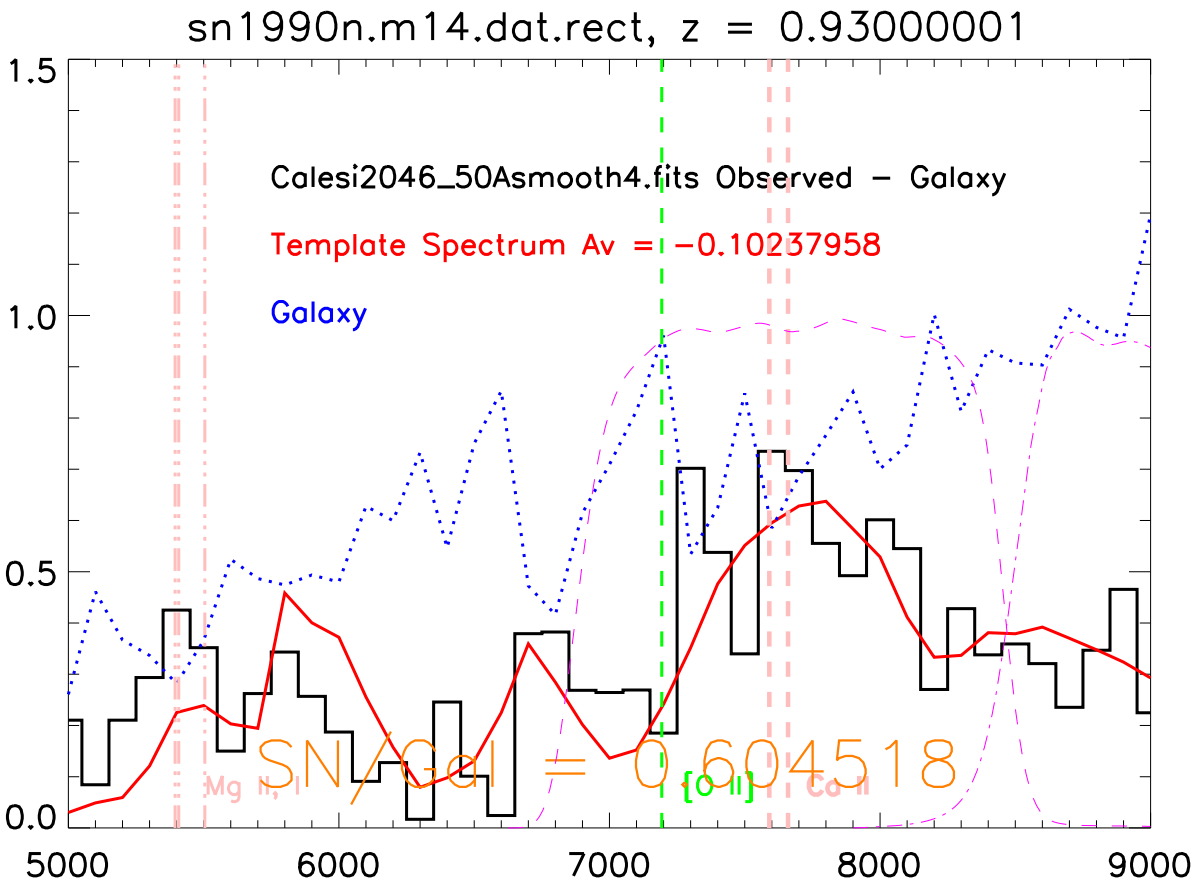

Calesi2046_50Asmooth4.fits----sn1996x.p07.dat.rect
sn1996x.p07.dat.rect
Mg II, I
[O II]
Ca II
1.6
1.4
1.2
1.0
0.8
0.6
0.4
5000
6000
7000
8000
9000

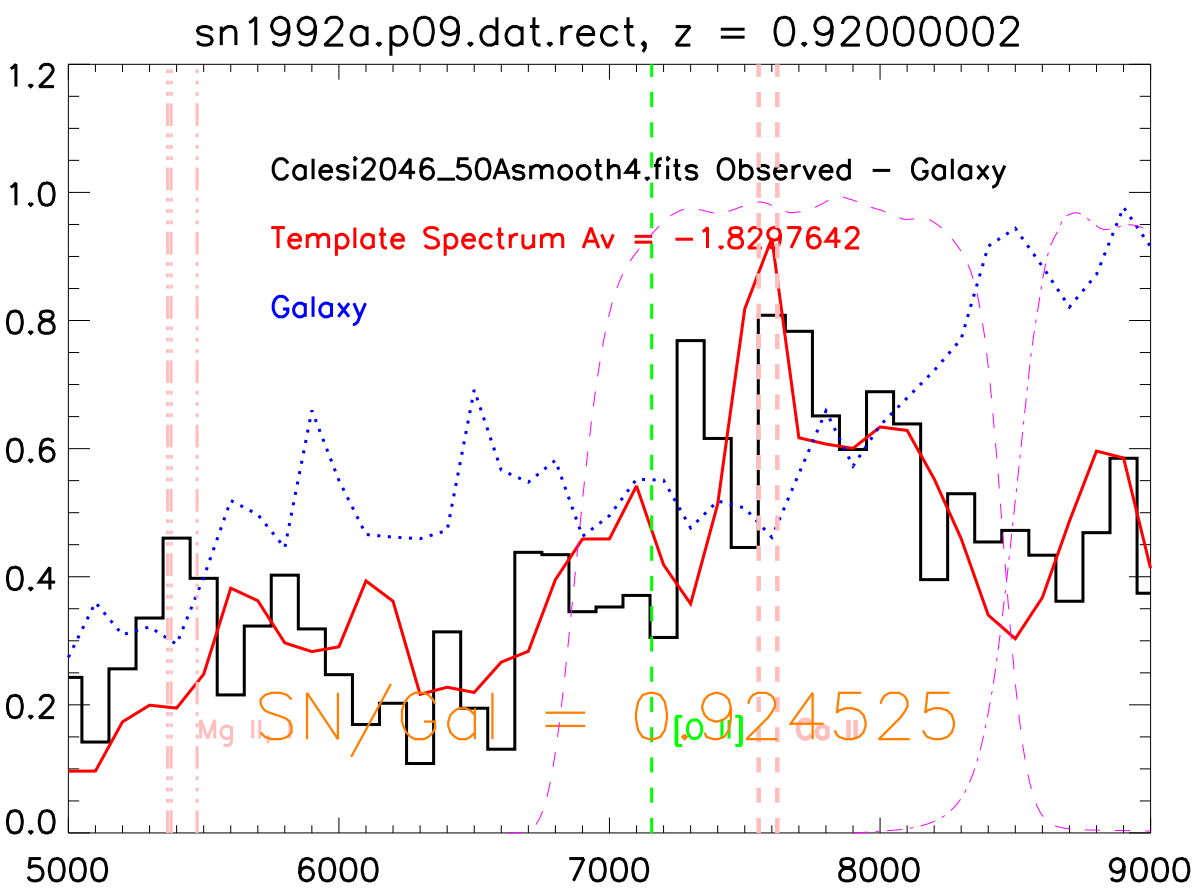

sn1996x.p07.dat.rect, z = 0.92200005
Calesi2046_50Asmooth4.fits Observed – Galaxy
Template Spectrum Av = –1.7849783
Galaxy
SN/Gal = 0.926110
Mg II, I
[O II]
Ca II
1.2
1.0
0.8
0.6
0.4
0.2
0.0
5000
6000
7000
8000
9000


sn1991t.m03.dat.rect, z = 0.92800003
Calesi2046_50Asmooth4.fits Observed – Galaxy
Template Spectrum Av = 1.4112770
Galaxy
SN/Gal = 1.46306
Mg II, I
[O III]
Ca II
1.2
1.0
0.8
0.6
0.4
0.2
0.0
5000
6000
7000
8000
9000


sn1991t.p67.dat.rect, z = 0.92200005
Calesi2046_50Asmooth4.fits Observed – Galax
Template Spectrum Av = –3.7621800
Galaxy
SN/Gal = 0.831652
Mg II, I
[O II]
Ca II
1.2
1.0
0.8
0.6
0.4
0.2
0.0
5000
6000
7000
8000
9000


sn1994d.p25.dat.rect, z = 0.92000002
Calesi2046_50Asmooth4.fits Observed − Galaxy
Template Spectrum Av = −5.2763416
Galaxy
SN/Gal = 0.655543
Mg II, I
[O II]
Ca II
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
5000
6000
7000
8000
9000


sn1990n.m14.dat.rect, z = 0.93000001
Calesi2046_50Asmooth4.fits Observed − Galaxy
Template Spectrum Av = −0.10237958
Galaxy
SN/Gal = 0.604518
[O II]
1.5
1.0
0.5
0.0
5000
6000
7000
8000
9000


sn1992a.p09.dat.rect, z = 0.92000002
Calesi2046_50Asmooth4.fits Observed − Galaxy
Template Spectrum Av = −1.8297642
Galaxy
SN/Gal = 0.924525
Mg II
[O II]
Ca II
1.2
1.0
0.8
0.6
0.4
0.2
0.0
5000
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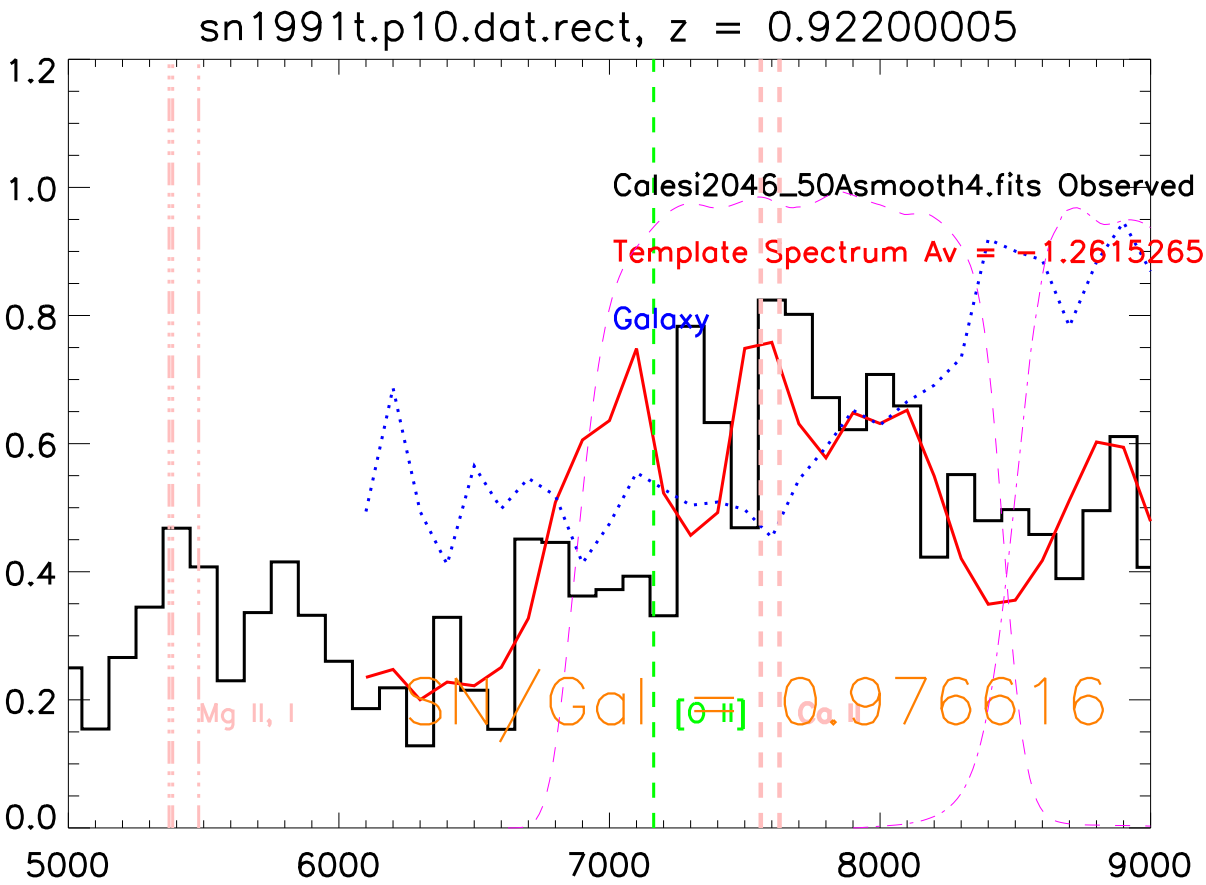
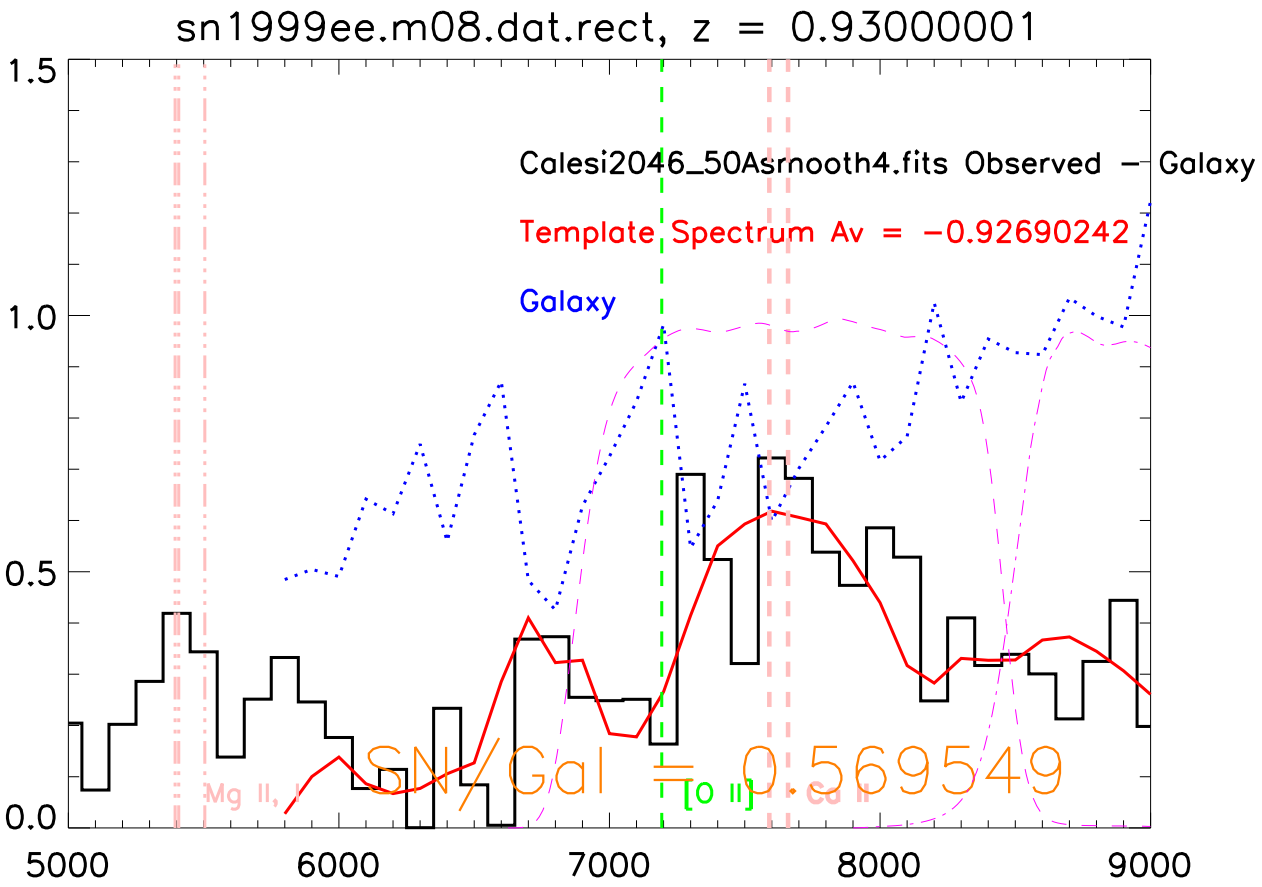
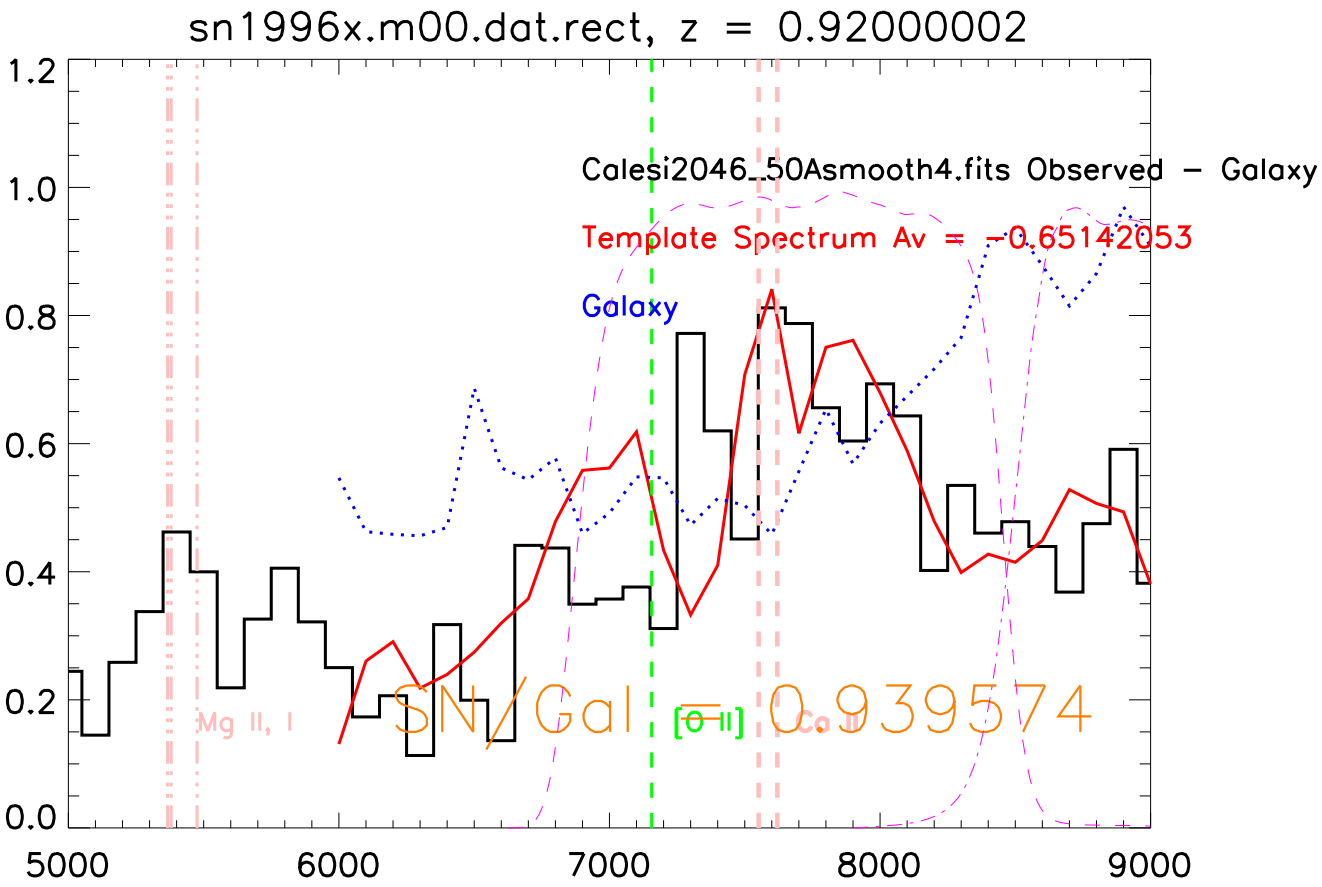
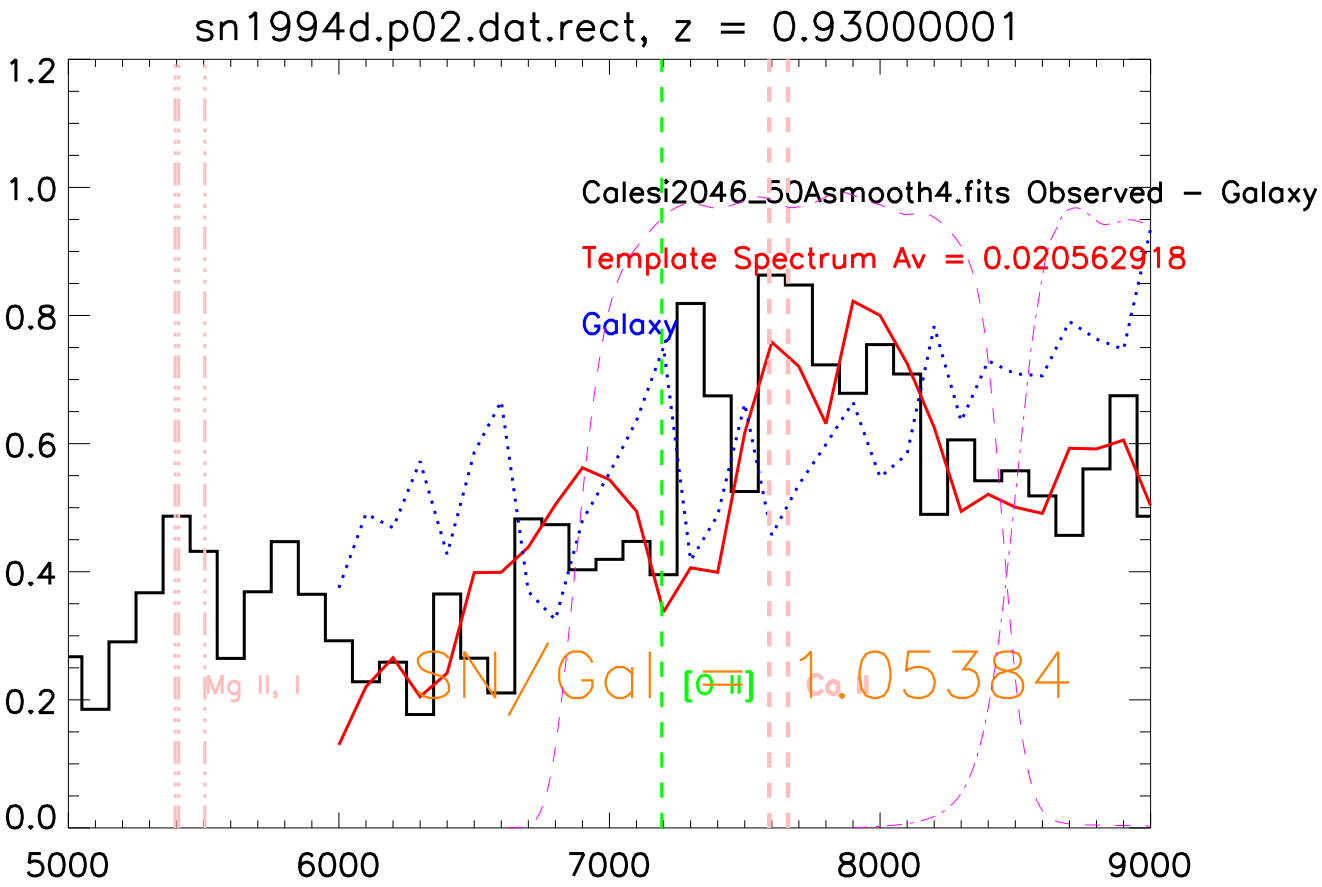
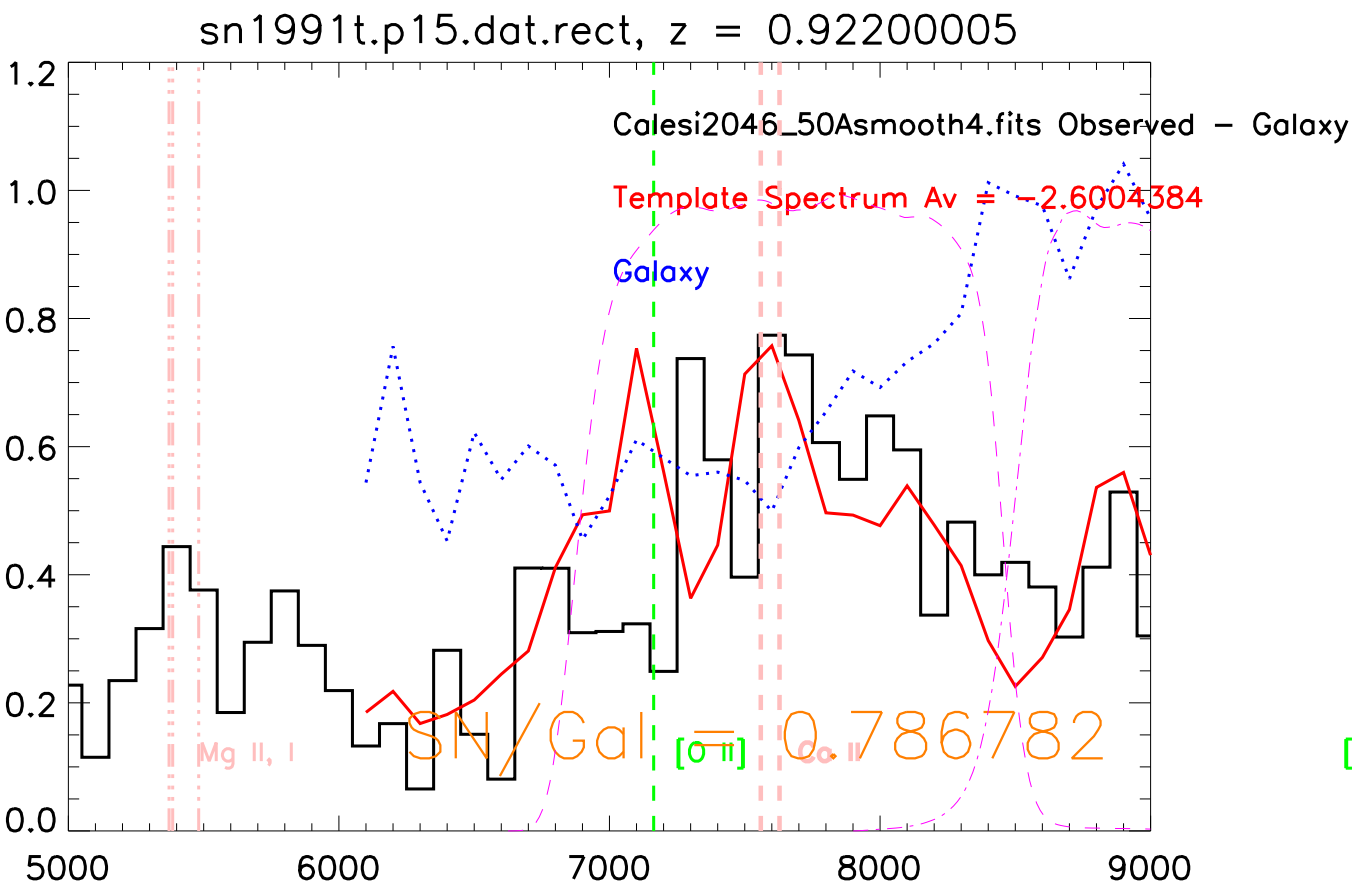
7000
8000
9000

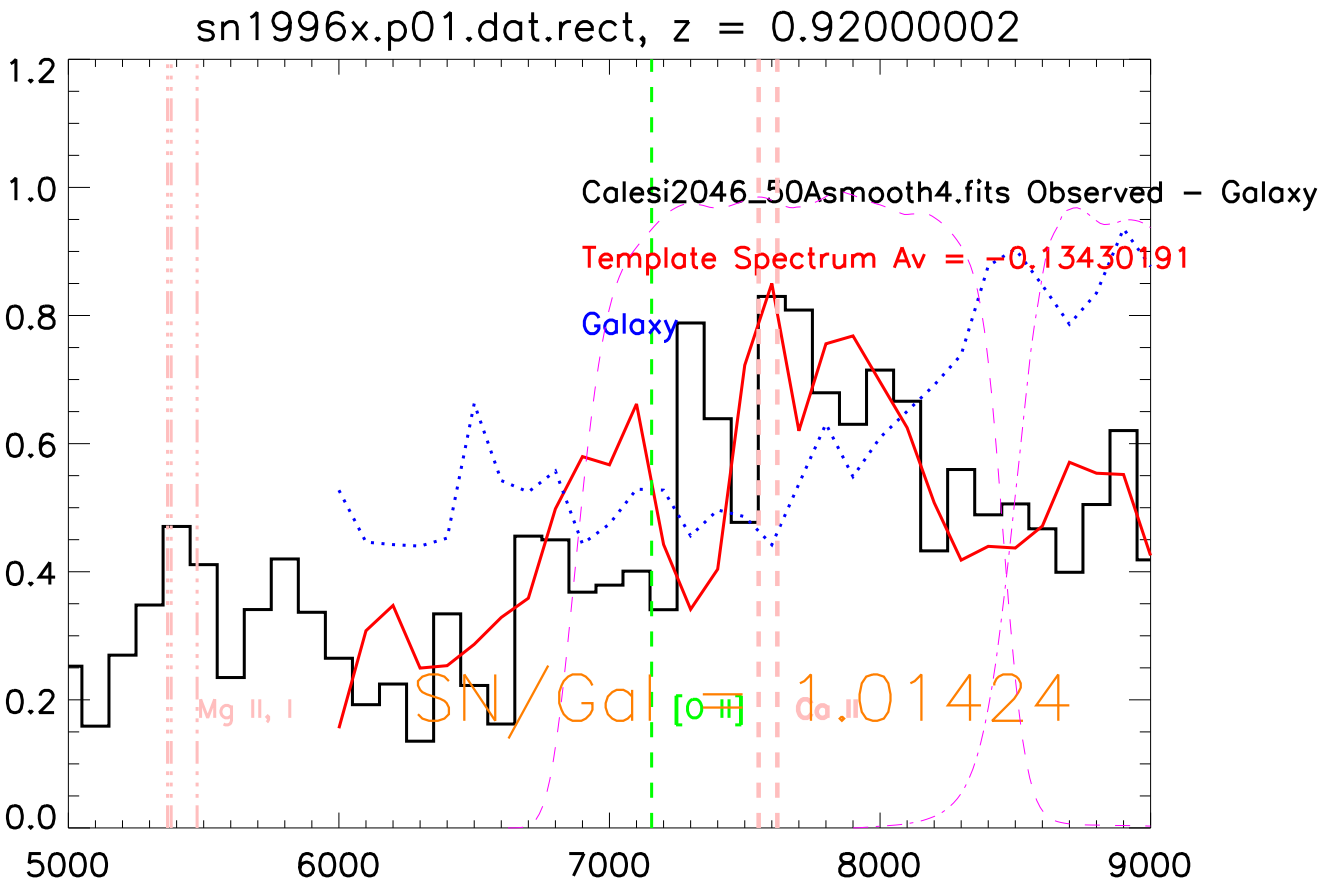

sn1991t.p10.dat.rect, z = 0.92200005
Calesi2046_50Asmooth4.fits Observed − Galaxy
Template Spectrum Av = −1.2615265
Galaxy
SN/Gal = 0.976616
Mg II, I
[O II]
Ca II
1.2
1.0
0.8
0.6
0.4
0.2
0.0
5000
6000
7000
8000
9000

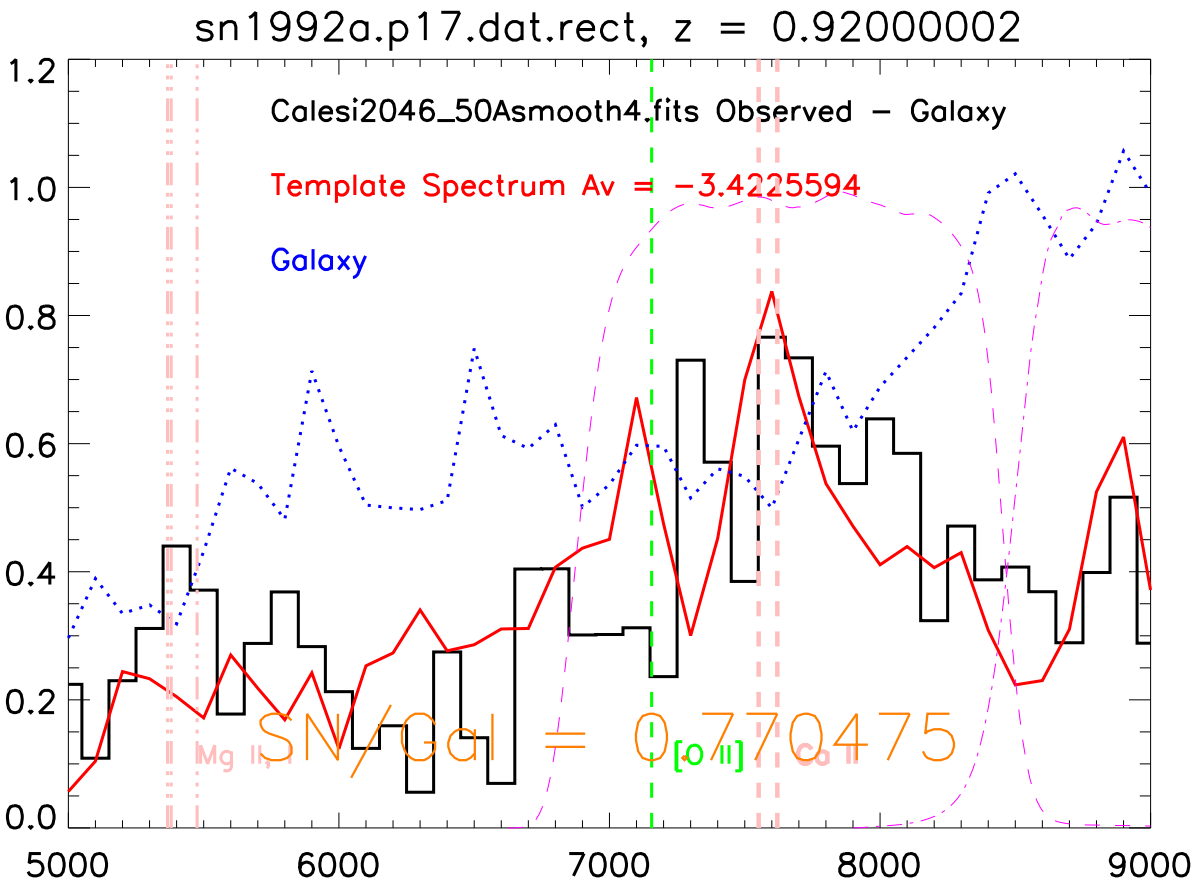

sn1999ee.m08.dat.rect, z = 0.93000001
Calesi2046_50Asmooth4.fits Observed
Galaxy
Template Spectrum Av = -0.92690242
Galaxy
SN/Gal = 0.569549
[O II]
1.5
1.0
0.5
0.0
5000
6000
7000
8000
9000

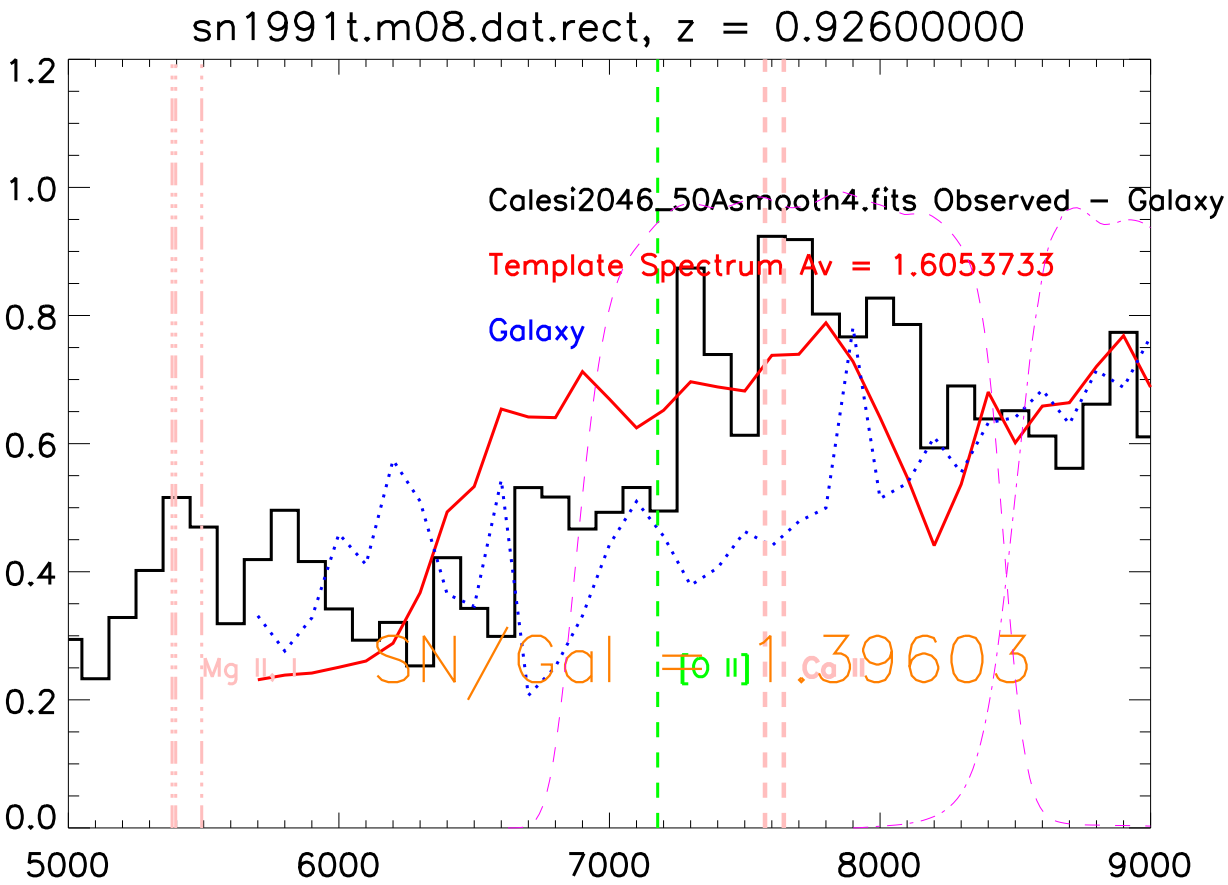

sn1996x.m00.dat.rect, z = 0.92000002
Calesi2046_50Asmooth4.fits Observed − Galaxy
Template Spectrum Av = −0.65142053
Galaxy
SN/Gal = 0.939574
Mg II, I
[O II]
Ca II
1.2
1.0
0.8
0.6
0.4
0.2
0.0
5000
6000
7000
8000
9000

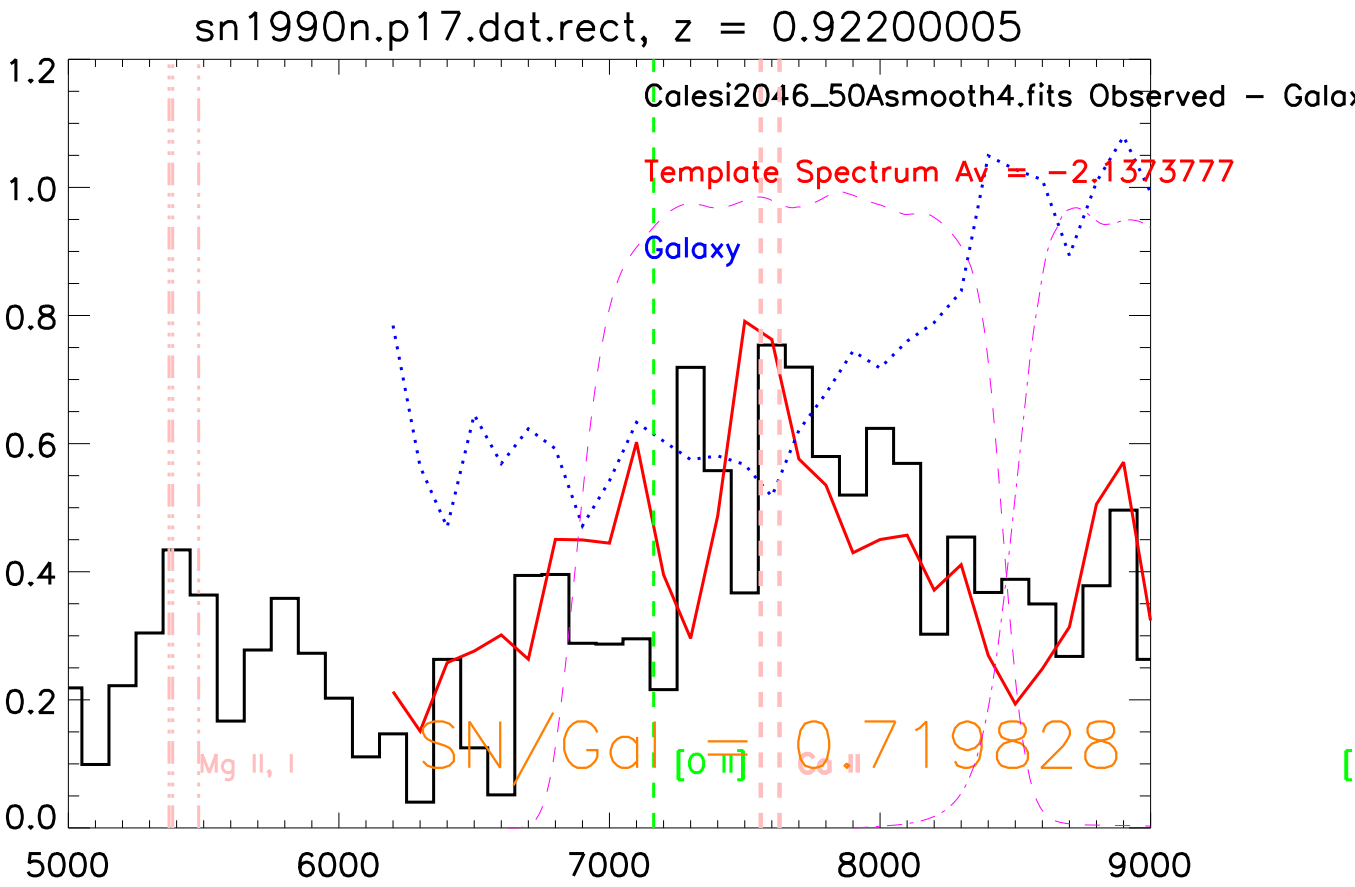

sn1994d.p02.dat.rect, z = 0.93000001
Calesi2046_50Asmooth4.fits Observed – Galaxy
Template Spectrum Av = 0.0205629.18
Galaxy
SN/Gal 1.05384
Mg II, I
[O II]
Ca, I
1.2
1.0
0.8
0.6
0.4
0.2
0.0
5000
6000
7000
8000
9000

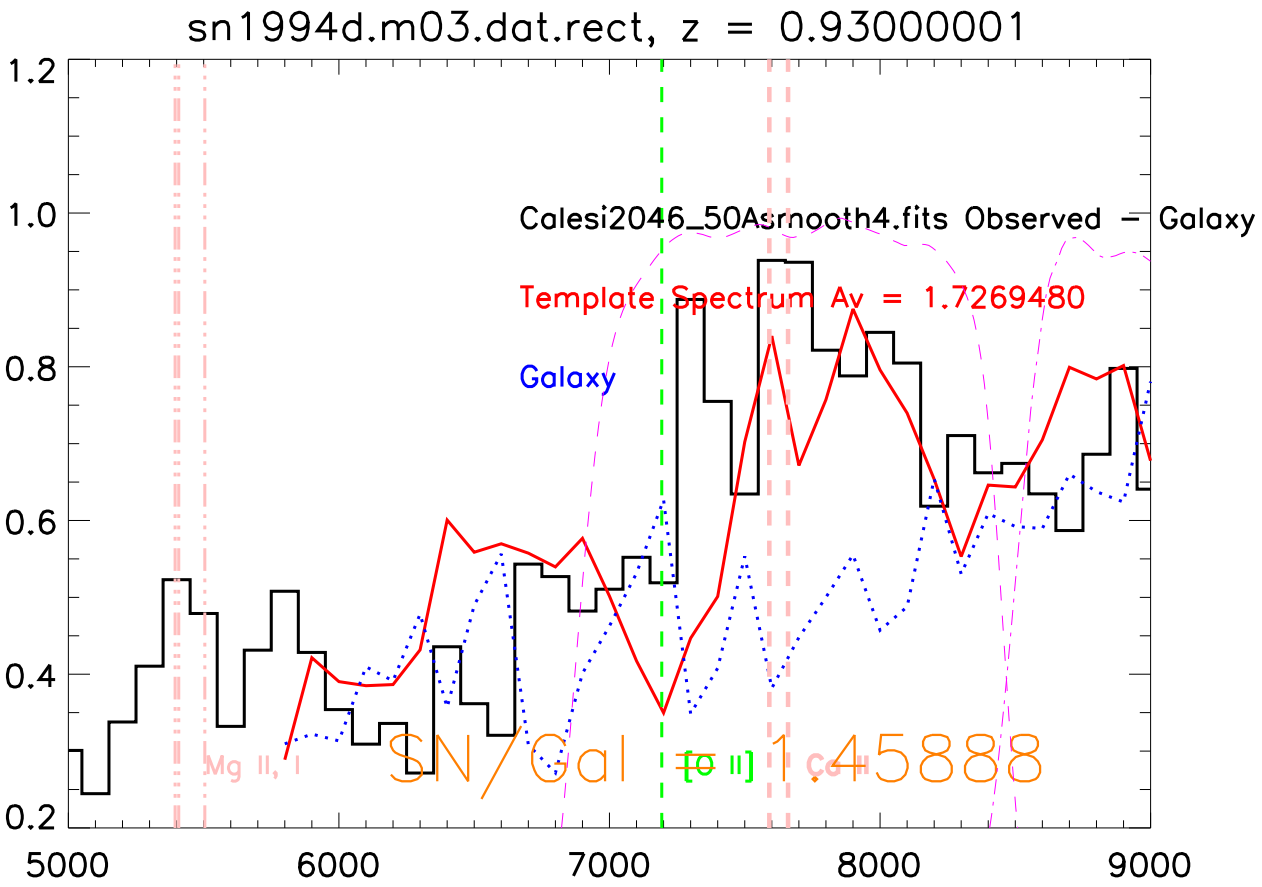

sn1991t.p15.dat.rect, z = 0.92200005
Calesi2046_50Asmooth4.fits Observed – Galaxy
Template Spectrum Av = 2.6004384
Galaxy
SN/Gal = 0.786782
Mg II, I
[O II]
Ca II
1.2
1.0
0.8
0.6
0.4
0.2
0.0
5000
6000
7000
8000
9000

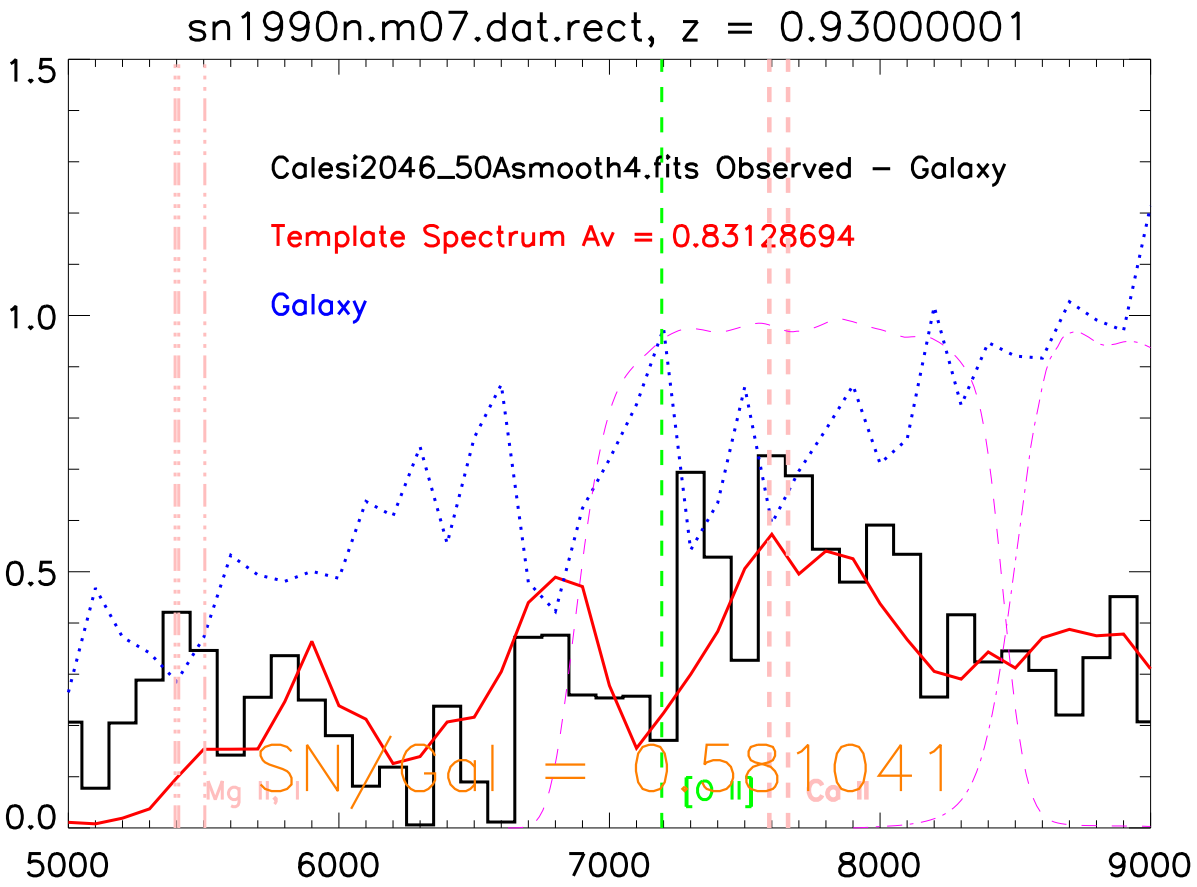

sn1996x.p01.dat.rect, z = 0.92000002
Calesi2046_50Asmooth4.fits Observed − Galaxy
Template Spectrum Av = −0.13430191
Galaxy
SN/Gal = 1.01424
Mg II, I
[O III]
Ca II
1.2
1.0
0.8
0.6
0.4
0.2
0.0
5000
6000
7000
8000
9000

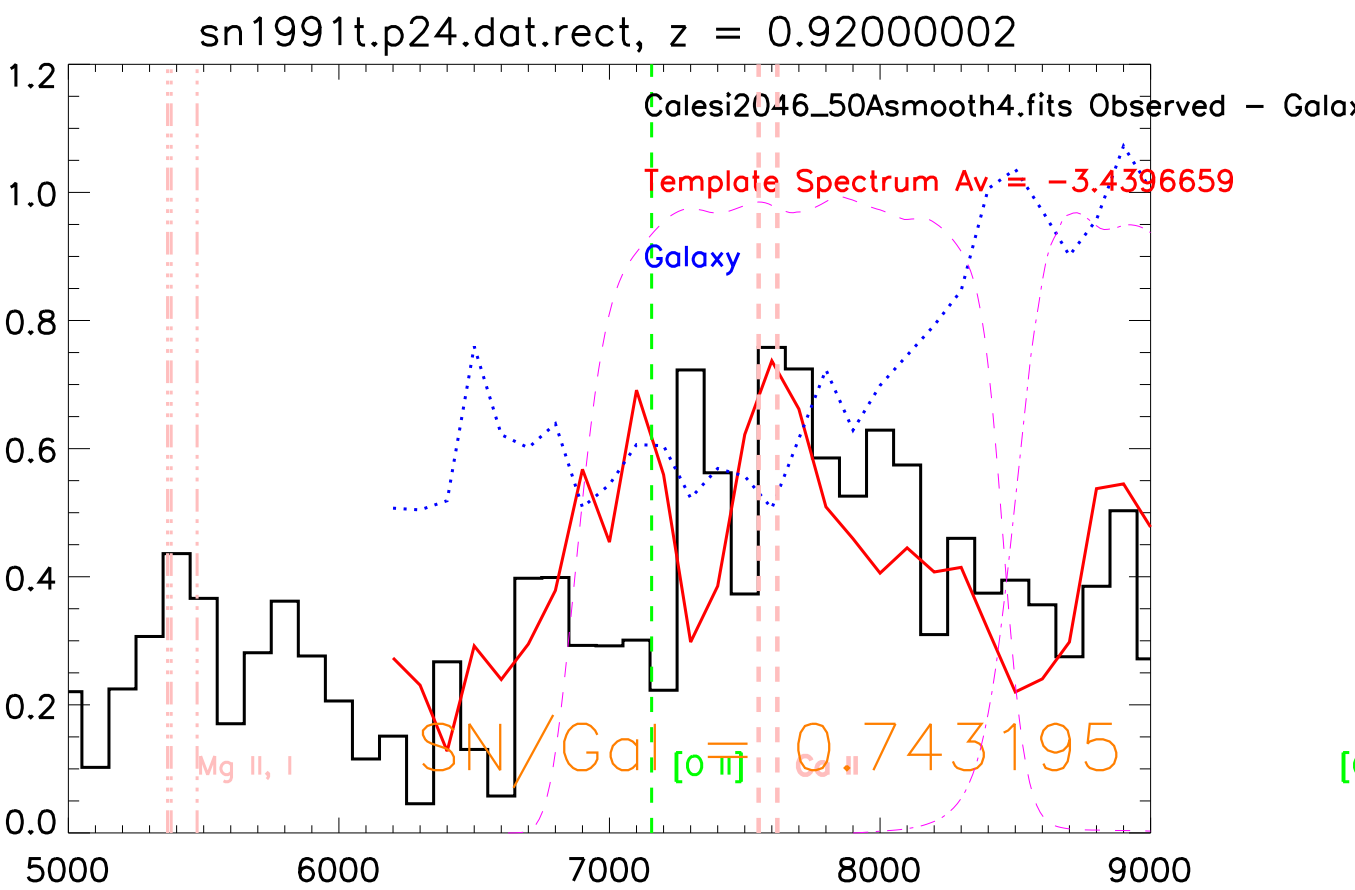

sn1992a.p17.dat.rect, z = 0.92000002
Calesi2046_50Asmooth4.fits Observed − Galaxy
Template Spectrum Av = −3.4225594
Galaxy
SN/Gal = 0.770475
[O II]
1.2
1.0
0.8
0.6
0.4
0.2
0.0
5000
6000
7000
8000
9000

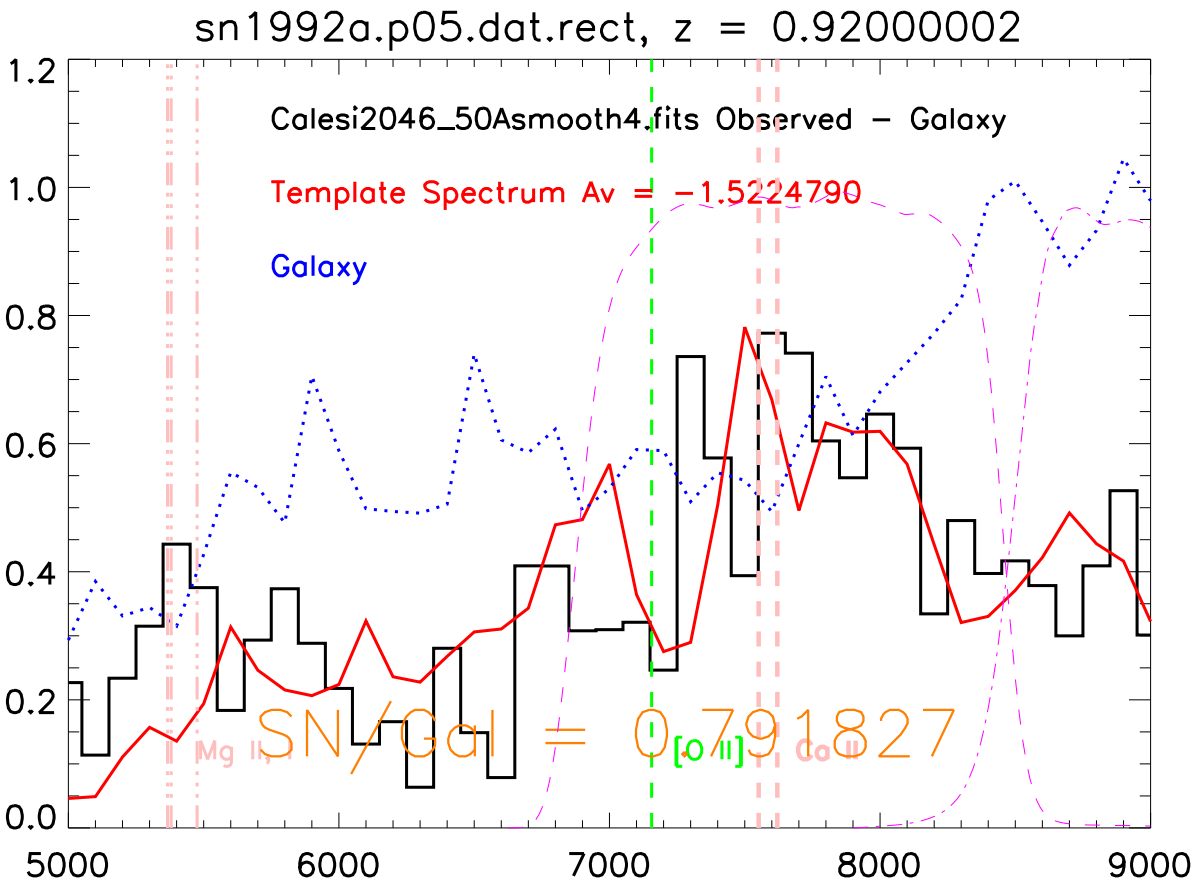

sn1991t.m08.dat.rect, z = 0.92600000
Calesi2046_50Asmooth4.fits Observed – Galaxy
Template Spectrum Av = 1.6053733
Galaxy
SN/Gal = 1.39603
Mg II
[O II]
Ca II
1.2
1.0
0.8
0.6
0.4
0.2
0.0
5000
6000
7000
8000
9000

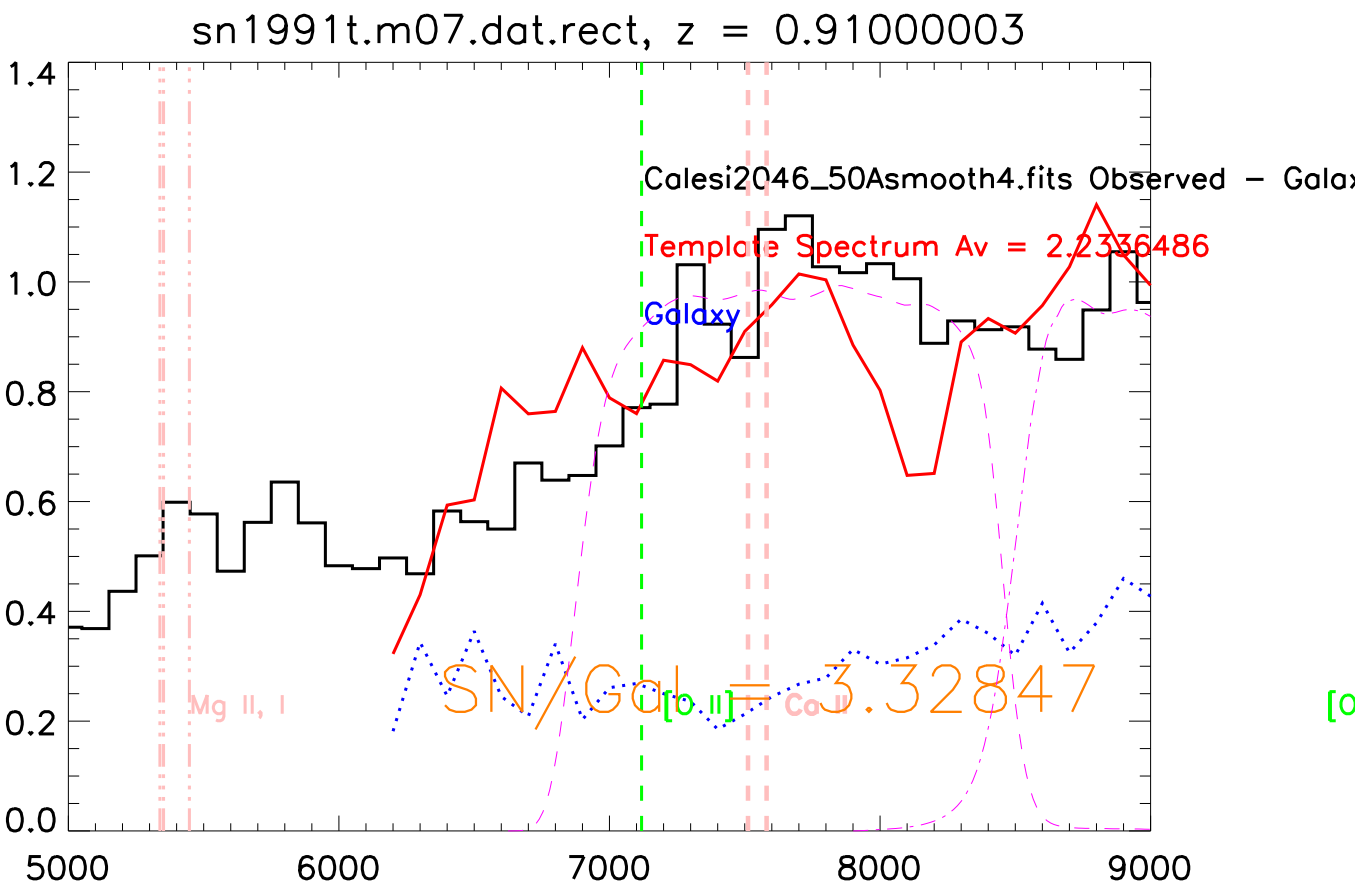

sn1990n.p17.dat.rect, z = 0.92200005
Calesi2046_50Asmooth4.fits Observed – Galax
Template Spectrum Av = -2.1373777
Galaxy
SN/Gal = 0.719828
Mg II, I
[O II]
Ca II
1.2
1.0
0.8
0.6
0.4
0.2
0.0
5000
6000
7000
8000
9000

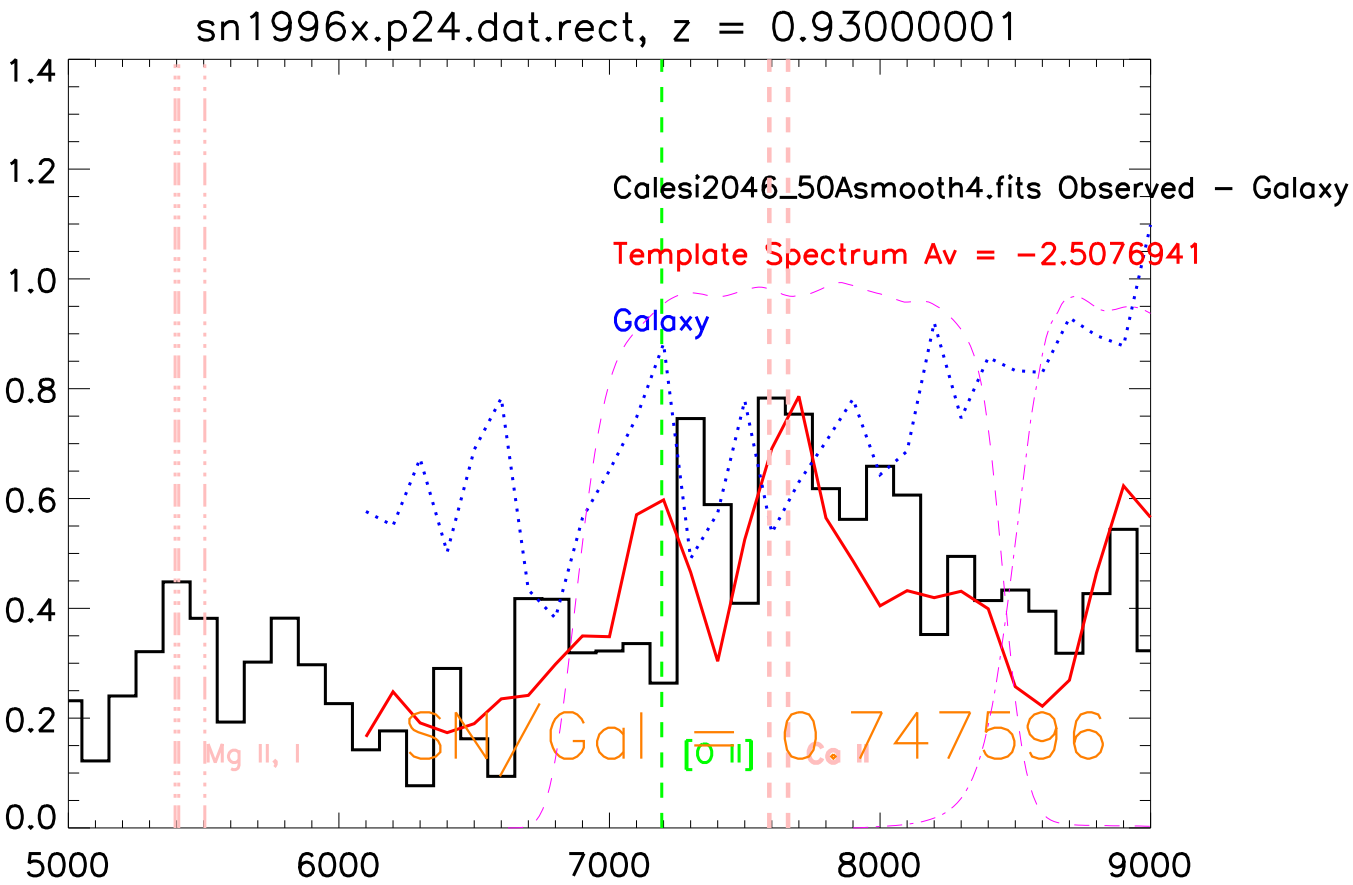

sn1994d.m03.dat.rect, z = 0.93000001
Calesi2046_50Asrnooth4.fits Observed
Galaxy
Template Spectrum Av = 1.7269480
Galaxy
SN/Gal 1.45888
1.2
1.0
0.8
0.6
0.4
0.2
5000
6000
7000
8000
9000

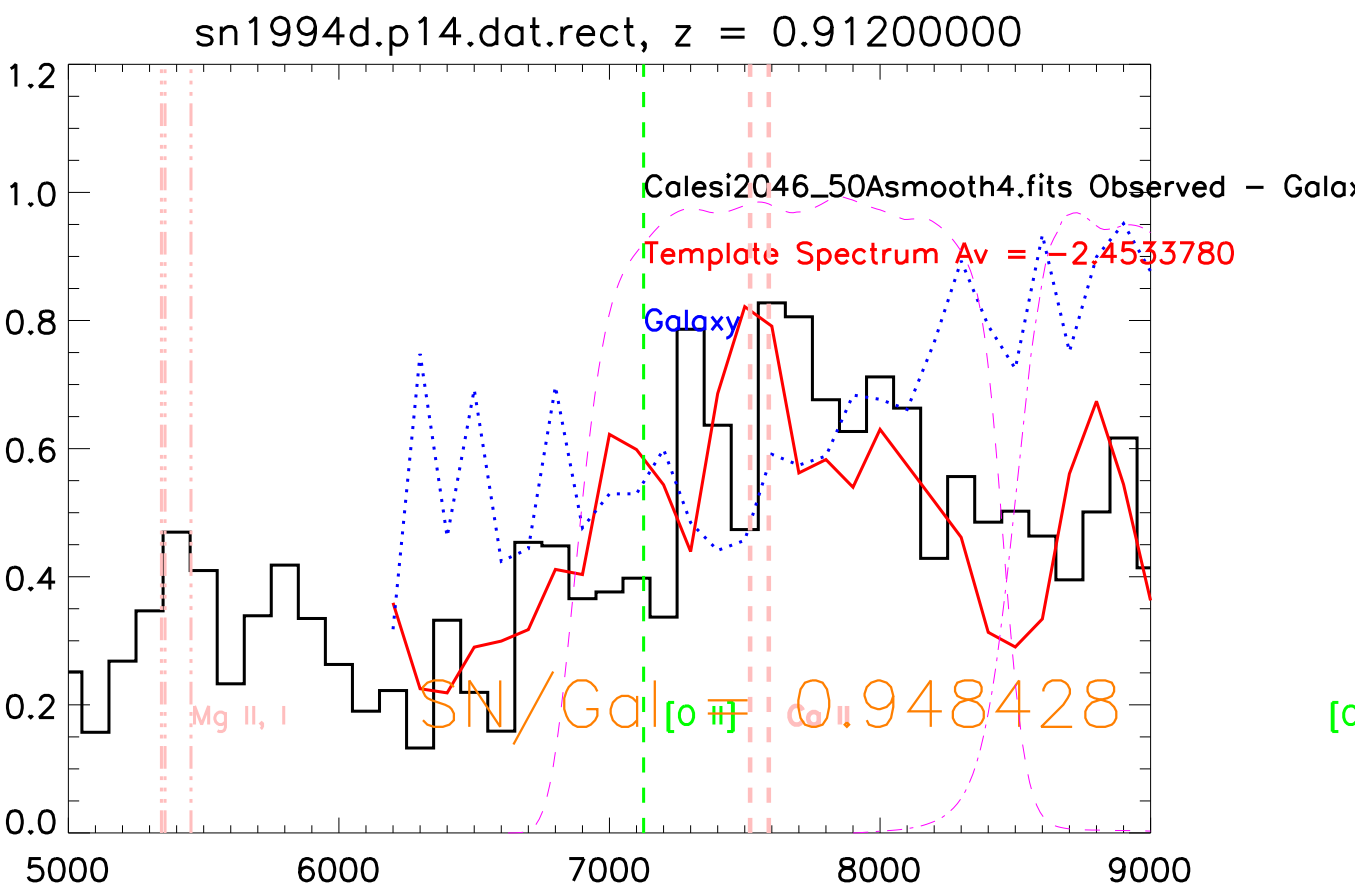

sn1990n.m07.dat.rect, z = 0.93000001
Calesi2046_50Asmooth4.fits Observed − Galaxy
Template Spectrum Av = 0.83128694
Galaxy
SN/Gal = 0.581041
[O II]
1.5
1.0
0.5
0.0
5000
6000
7000
8000
9000

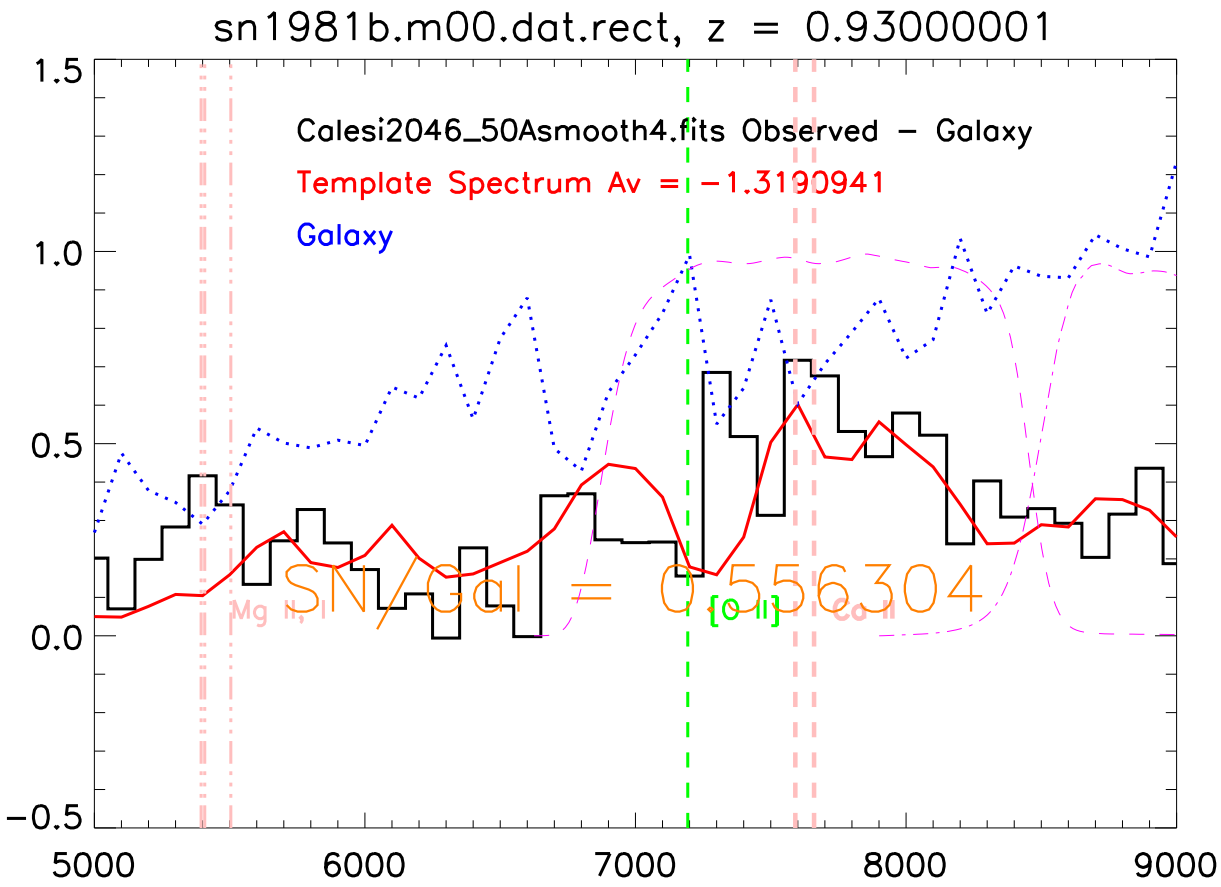

sn1991t.p24.dat.rect, z = 0.92000002
Calesi2046_50Asmooth4.fits Observed – Galax
Template Spectrum Av = -3.4396659
Galaxy
SN/Gal = 0.743195
Mg II, I
[O II]
Ca II
1.2
1.0
0.8
0.6
0.4
0.2
0.0
5000
6000
7000
8000
9000

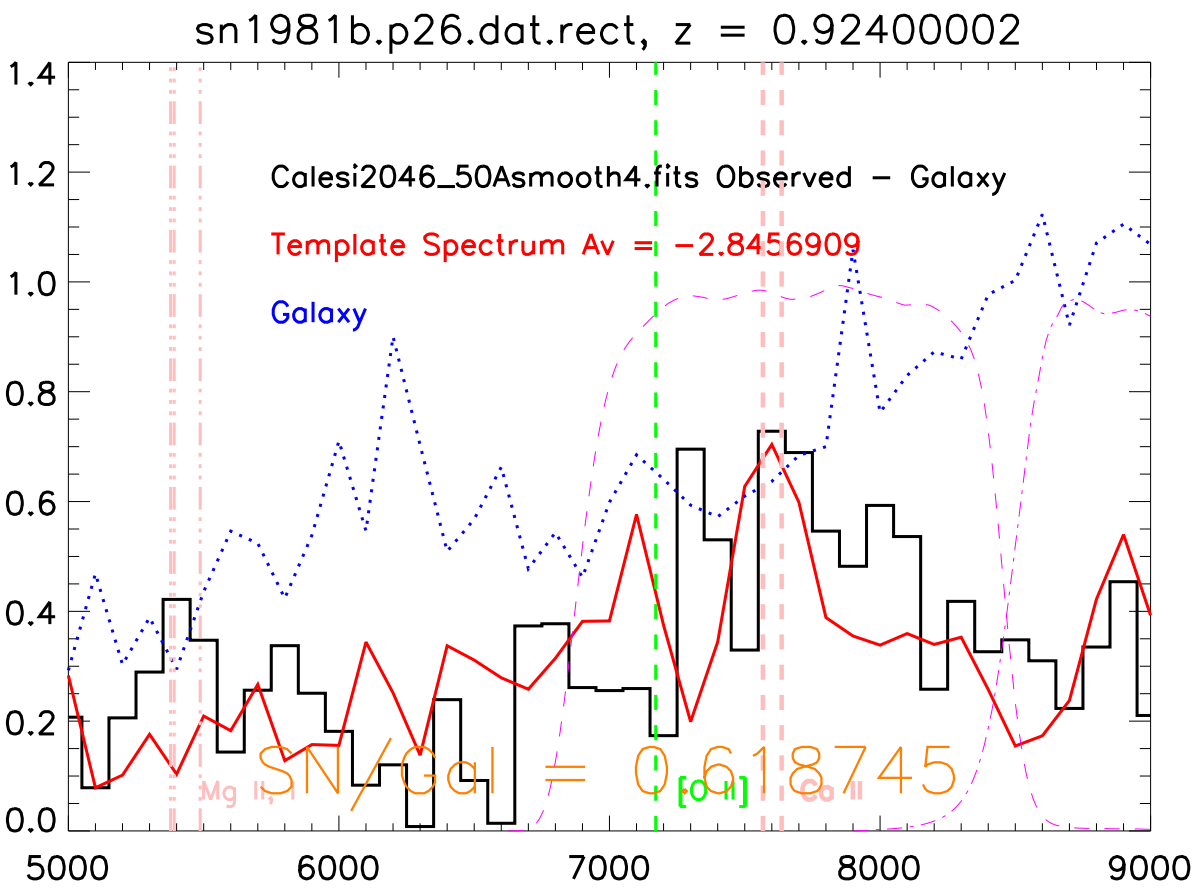

sn1992a.p05.dat.rect, z = 0.92000002
Calesi2046_50Asmooth4.fits Observed − Galaxy
Template Spectrum Av = −1.5224790
Galaxy
SN/Gal = 0.791827
[O II]
1.2
1.0
0.8
0.6
0.4
0.2
0.0
5000
6000
7000
8000
9000

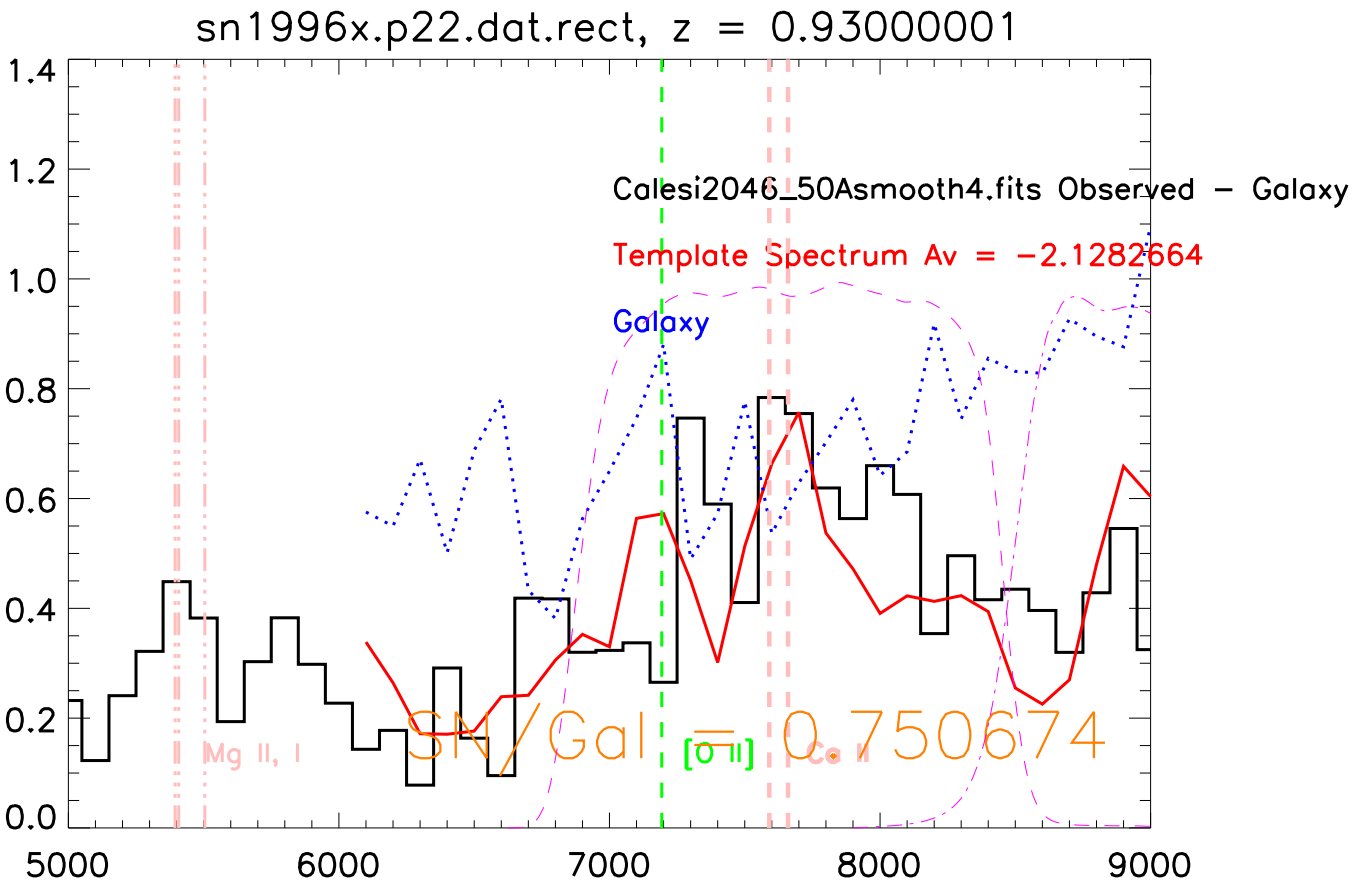

sn1991t.m07.dat.rect, z = 0.91000003
Calesi2046_50Asmooth4.fits Observed – Galax
Template Spectrum Av = 2.2336486
Galdxy
SN/Gal = 3.32847
Mg II, I
[O II]
Ca II
[O
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
5000
6000
7000
8000
9000

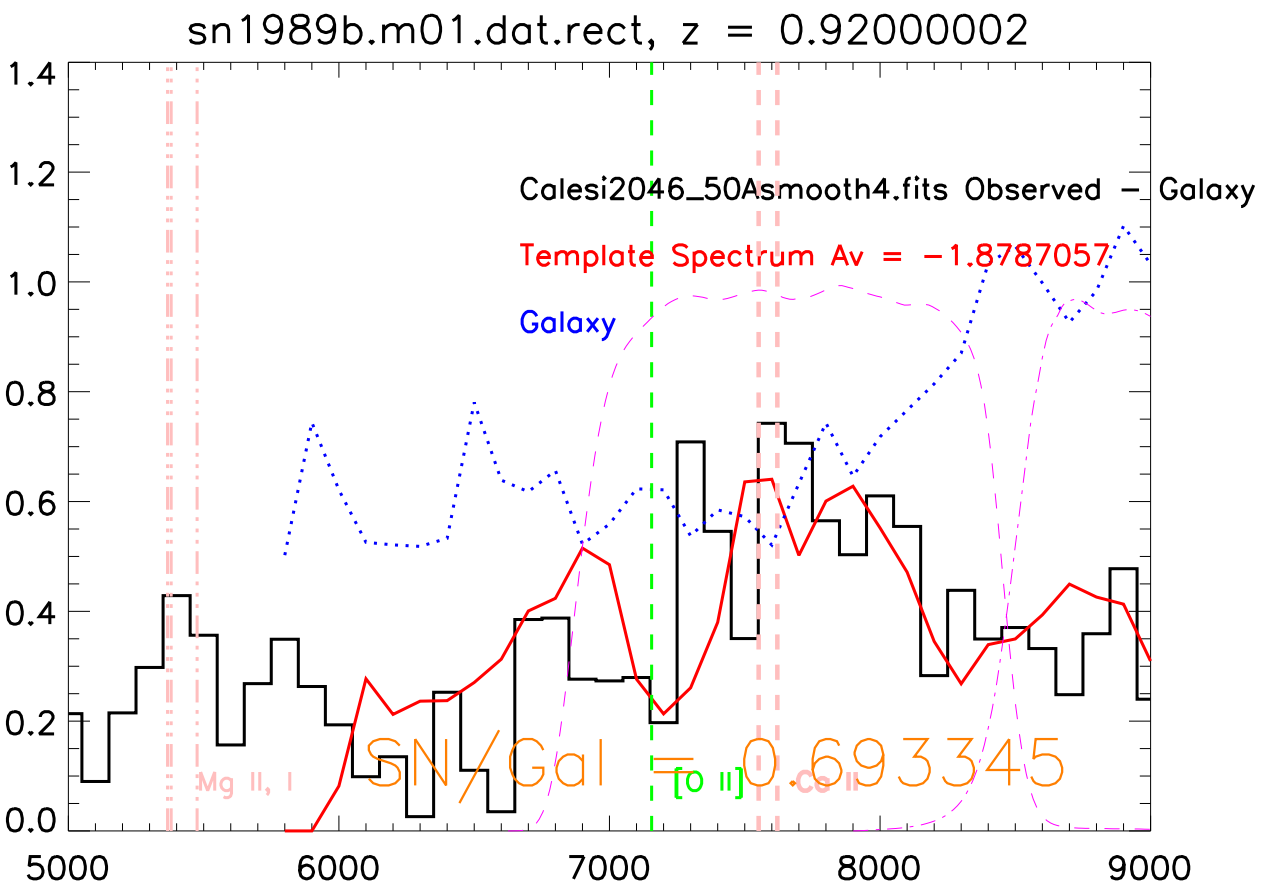

sn1996x.p24.dat.rect, z = 0.93000001
Calesi2046_50Asmooth4.fits Observed – Galaxy
Template Spectrum Av = −2.5076941
Galaxy
SN/Gal = 0.747596
Mg II, I
[O II]
Ca II
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
5000
6000
7000
8000
9000

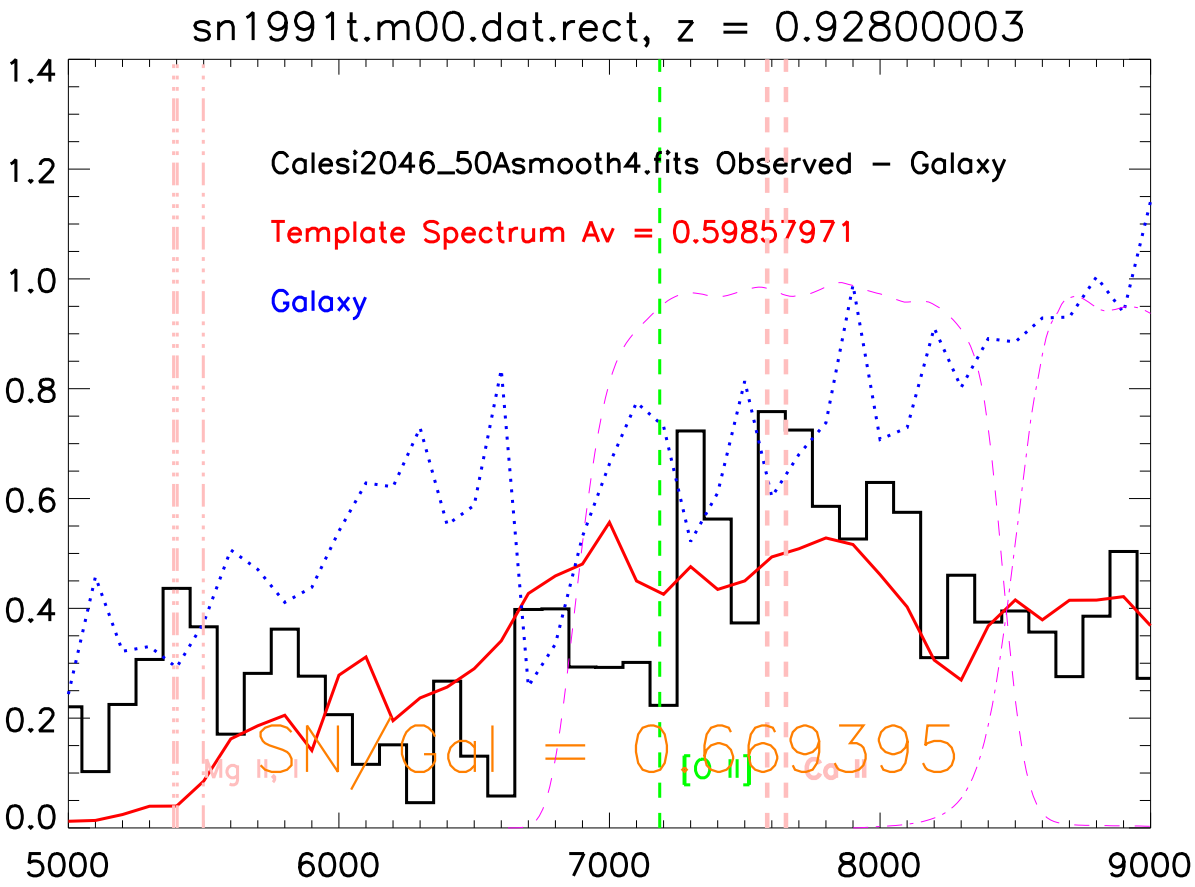

sn1994d.p14.dat.rect, z = 0.91200000
Calesi2046_50Asmooth4.fits Observed – Galax
Template Spectrum Av = 2.4533780
Galaxy
SN/Gal = 0.948428
Mg II, I
[O II]
Ca II
[C
1.2
1.0
0.8
0.6
0.4
0.2
0.0
5000
6000
7000
8000
9000

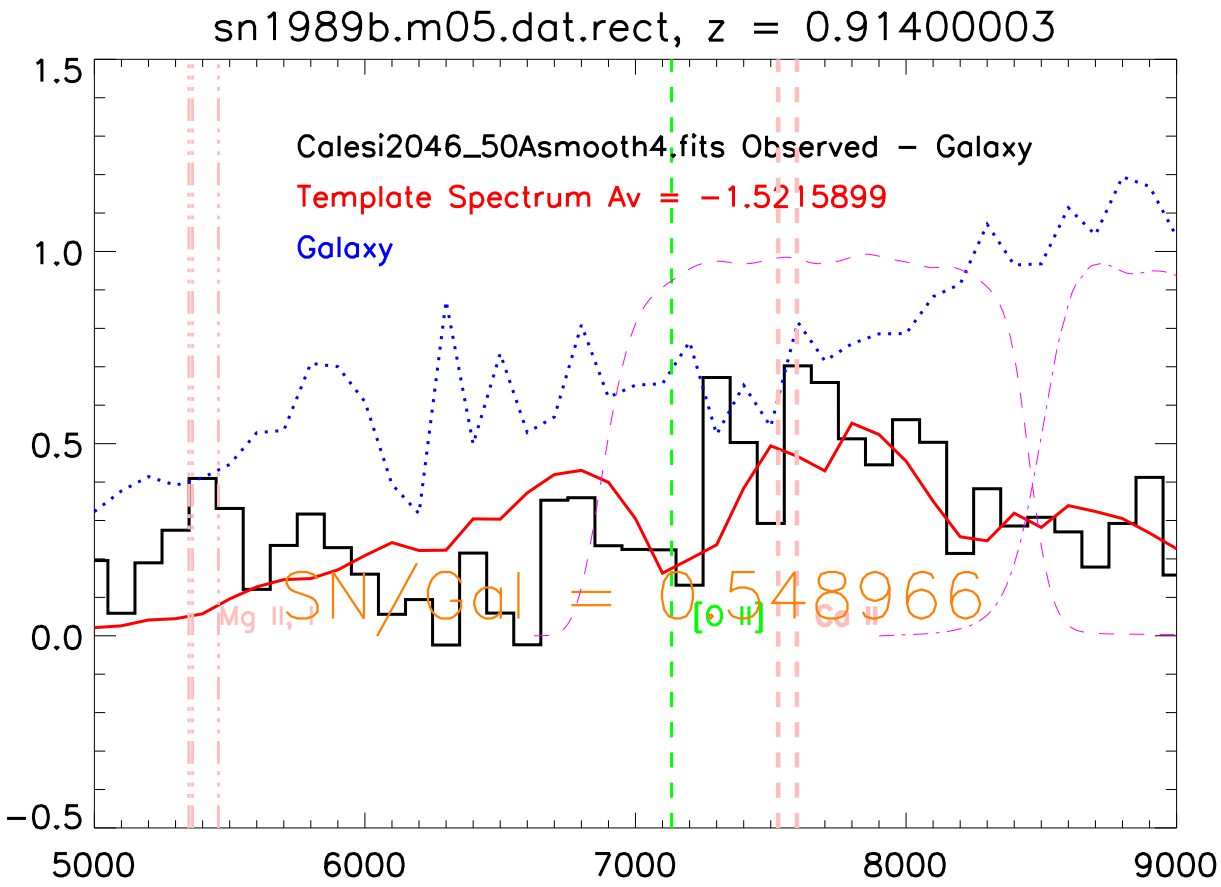

sn1981b.m00.dat.rect, z = 0.93000001
Calesi2046_50Asmooth4.fits Observed − Galaxy
Template Spectrum Av = −1.3190941
Galaxy
SN/Gal = 0.556304
[O II]
1.5
1.0
0.5
0.0
−0.5
5000
6000
7000
8000
9000

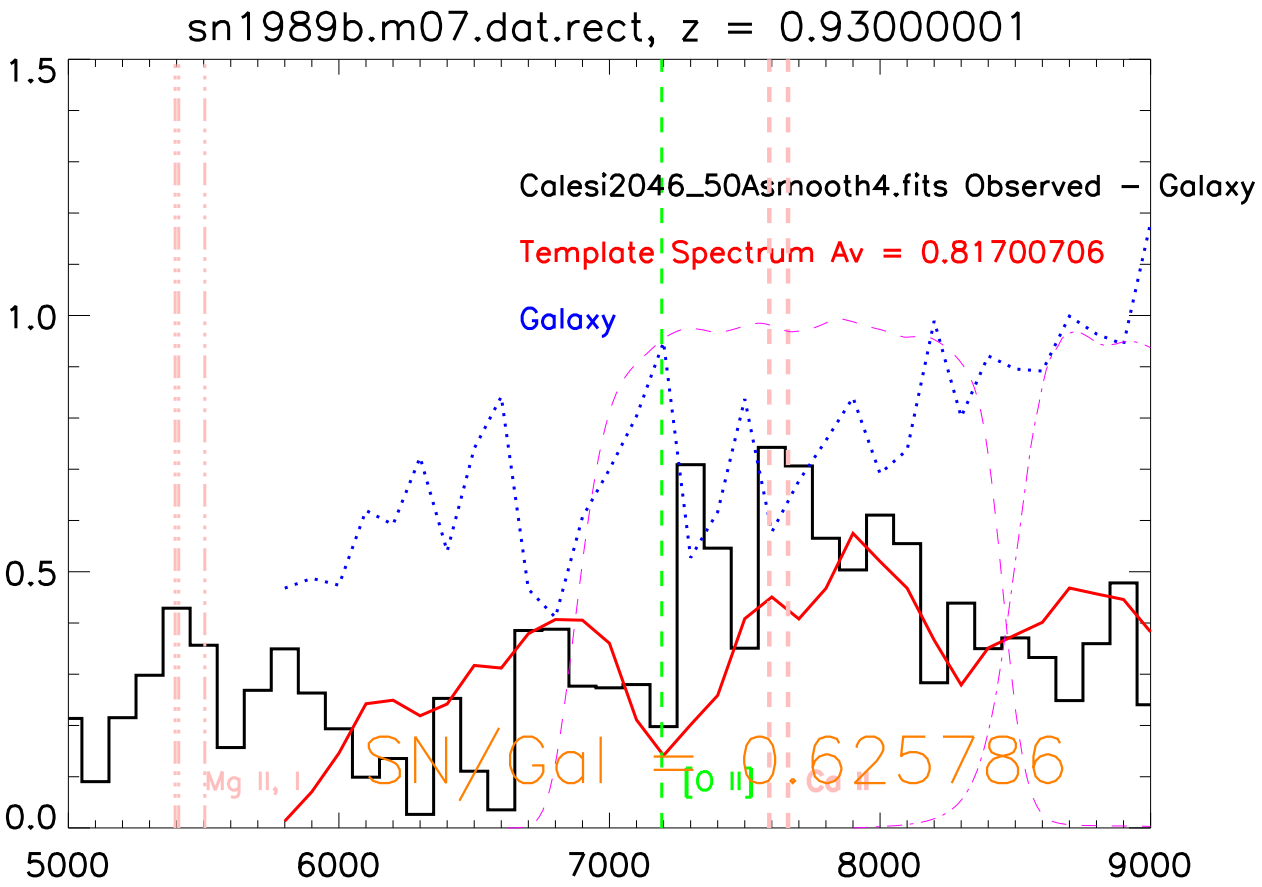

sn1981b.p26.dat.rect, z = 0.92400002
Calesi2046_50Asmooth4.fits Observed − Galaxy
Template Spectrum Av = −2.8456909
Galaxy
SN/Gal = 0.618745
[O II]
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
5000
6000
7000
8000
9000


sn1996x.p22.dat.rect, z = 0.93000001
Calesi2046_50Asmooth4.fits Observed – Galaxy
Template Spectrum Av = −2.1282664
Galaxy
SN/Gal = 0.750674
Mg II, I
[O II]
Ca II
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
5000
6000
7000
8000
9000


sn1989b.m01.dat.rect, z = 0.92000002
Calesi2046_50Asmooth4.fits Observed
Galaxy
Template Spectrum Av = -1.8787057
Galaxy
SN/Gal = 0.693345
Mg II, I
[O II]
Ca II
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
5000
6000
7000
8000
9000


sn1991t.m00.dat.rect, z = 0.92800003
Calesi2046_50Asmooth4.fits Observed − Galaxy
Template Spectrum Av = 0.59857971
Galaxy
SN/Gal = 0.669395
[O II]
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
5000
6000
7000
8000
9000


sn1989b.m05.dat.rect, z = 0.91400003
Calesi2046_50Asmooth4.fits Observed − Galaxy
Template Spectrum Av = −1.5215899
Galaxy
SN/Gal = 0.548966
Mg II,
[O II]
Ca II
1.5
1.0
0.5
0.0
−0.5
5000
6000
7000
8000
9000


sn1989b.m07.dat.rect, z = 0.93000001
Calesi2046_50Asmooth4.fits Observed − Galaxy
Template Spectrum Av = 0.81700706
Galaxy
SN/Gal = 0.625786
[O II]
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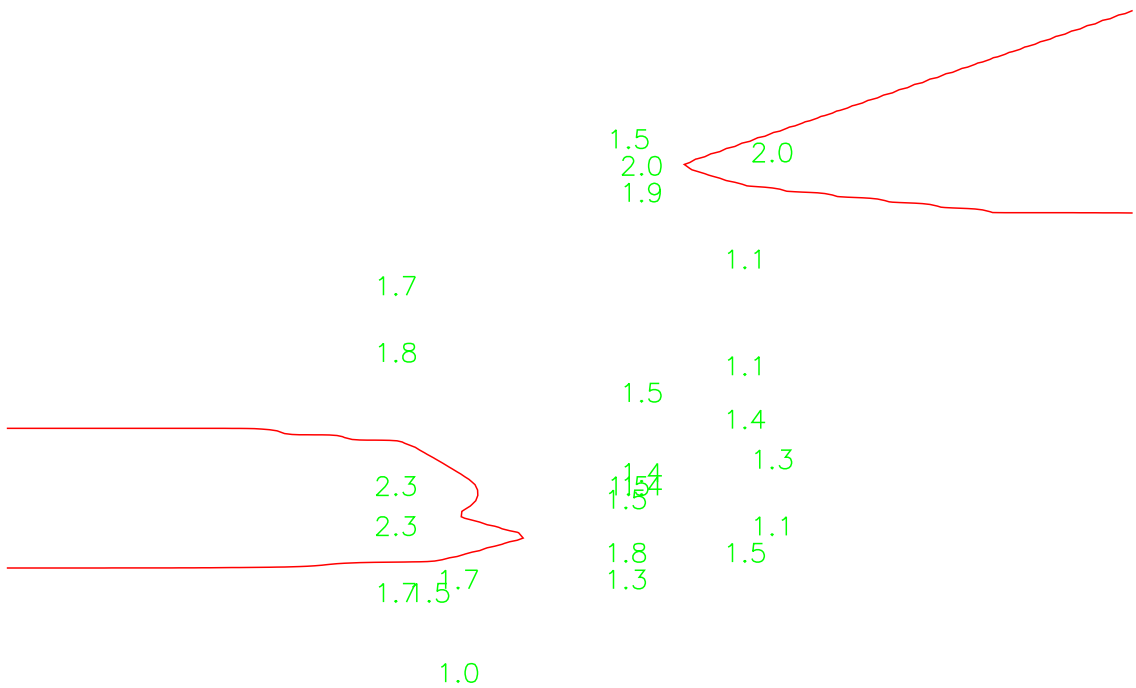
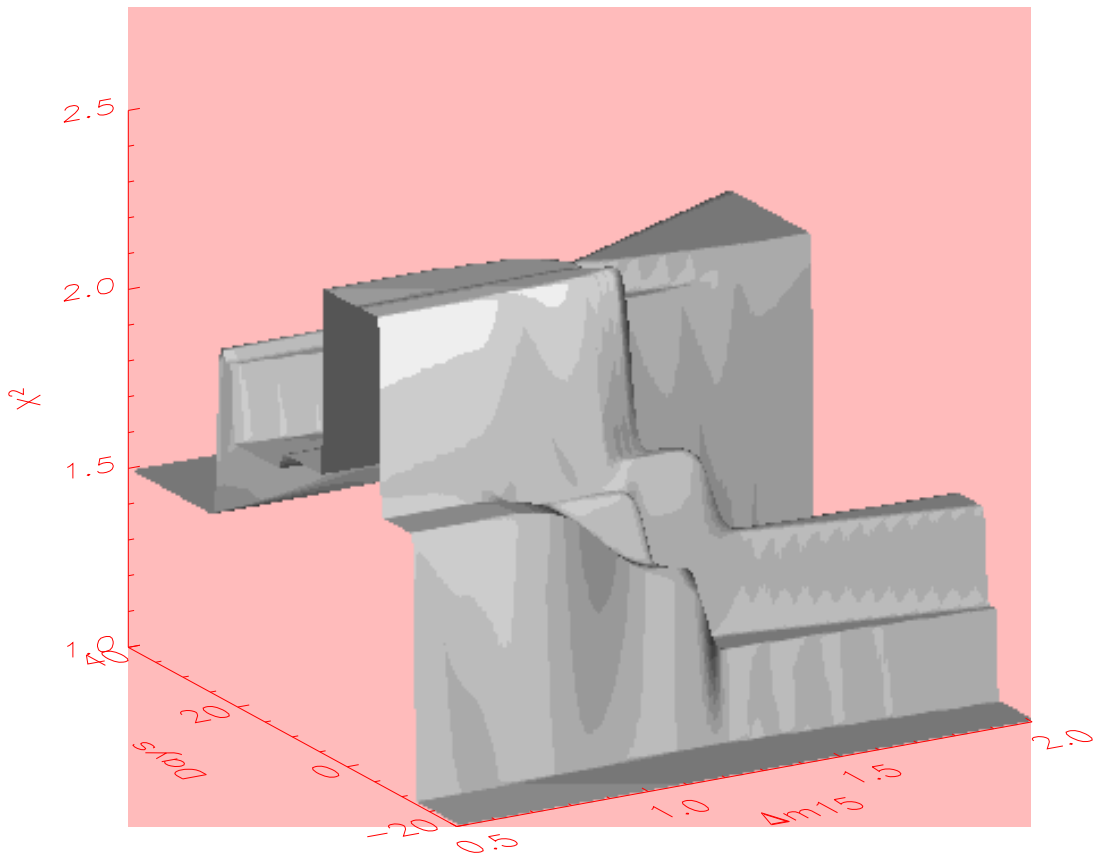
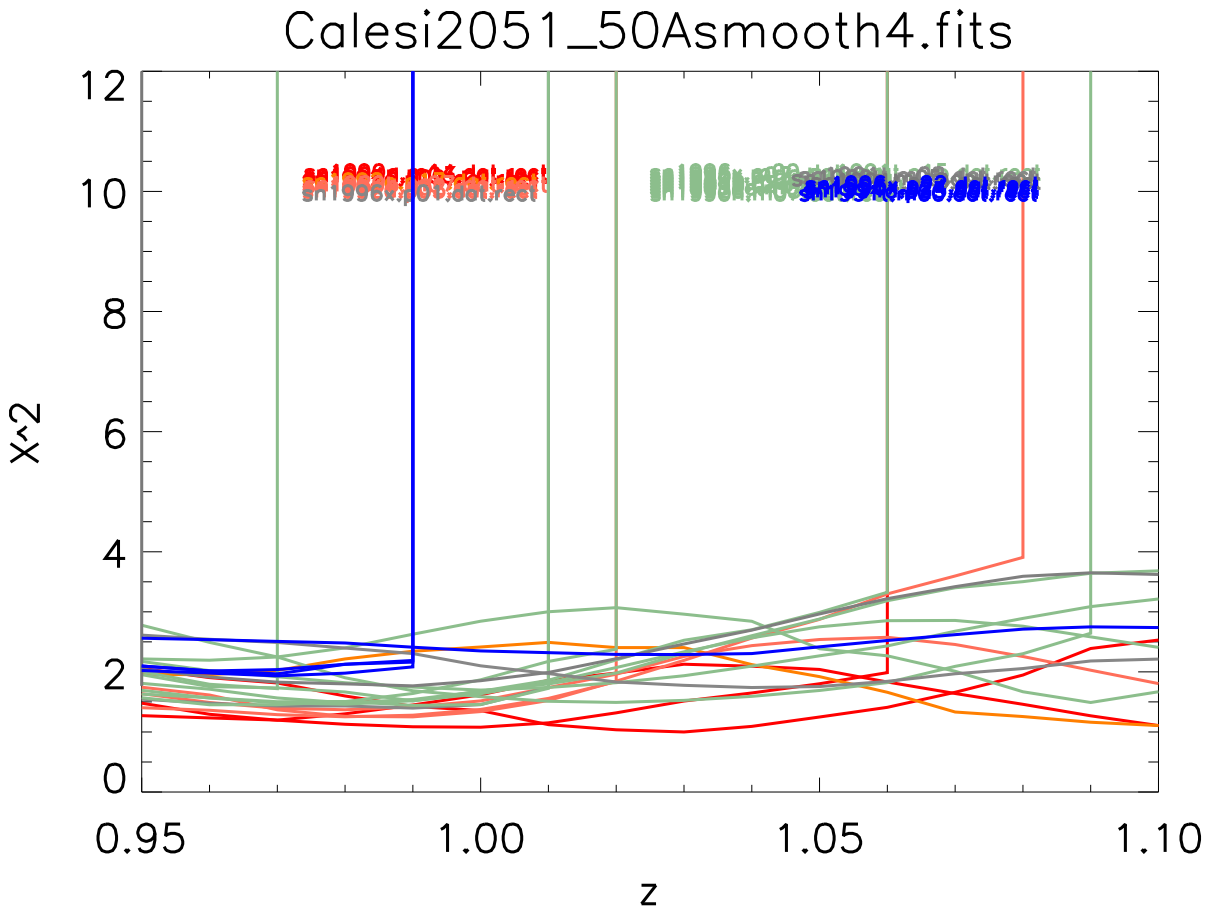
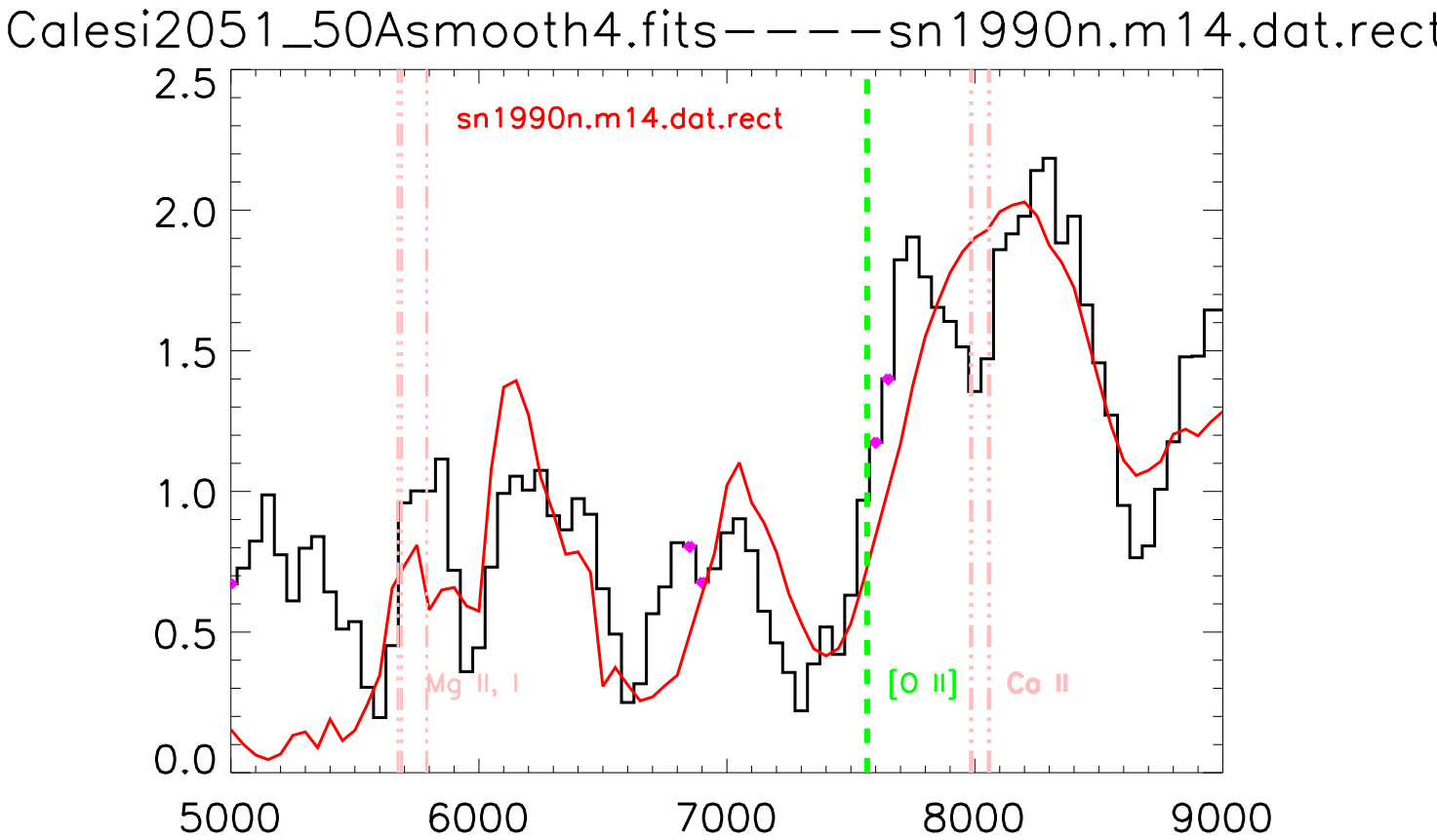
1.0
0.5
0.0
5000
6000
7000
8000
9000

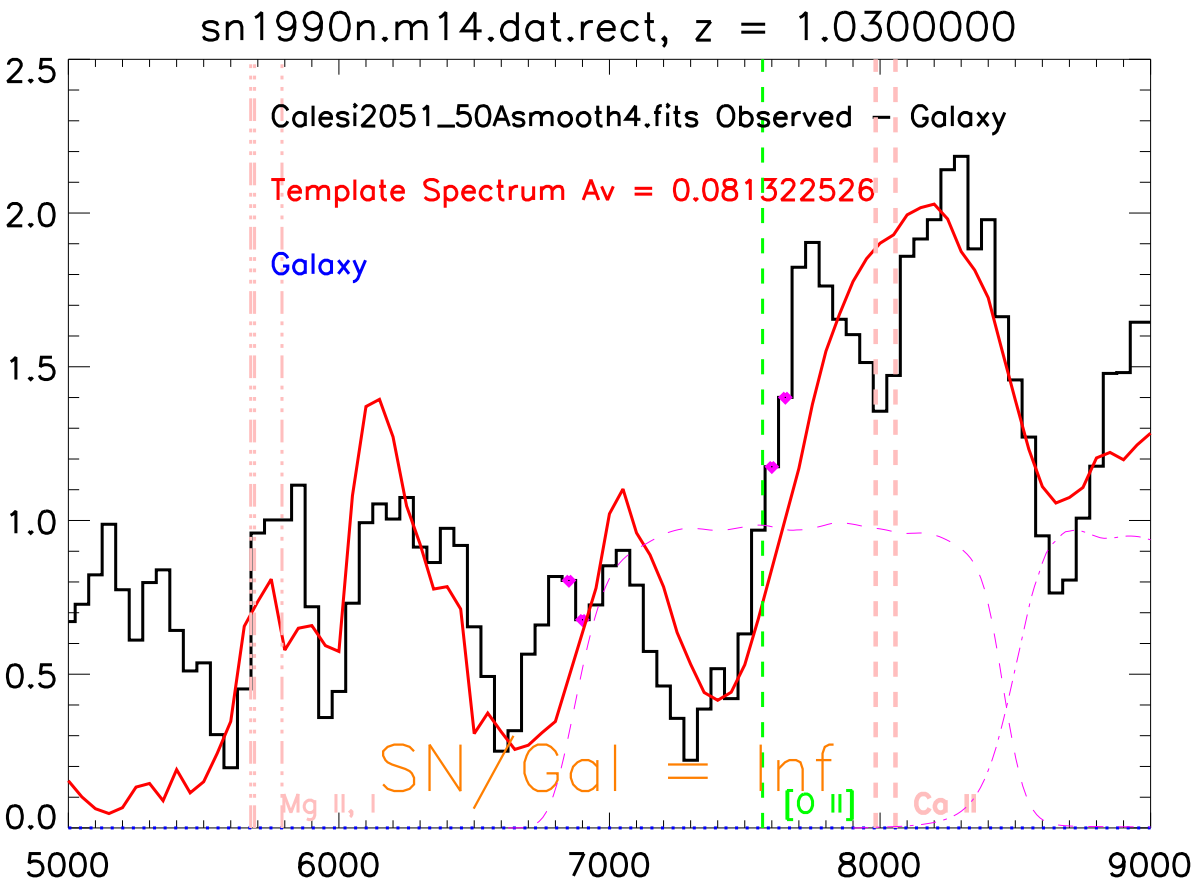

1.5
2.0
1.9
2.0
1.1
1.7
1.8
1.1
1.5
1.4
1.3
1.4
1.5
2.3
1.5
2.3
1.1
1.8
1.5
1.7
1.3
1.7
1.5
1.0

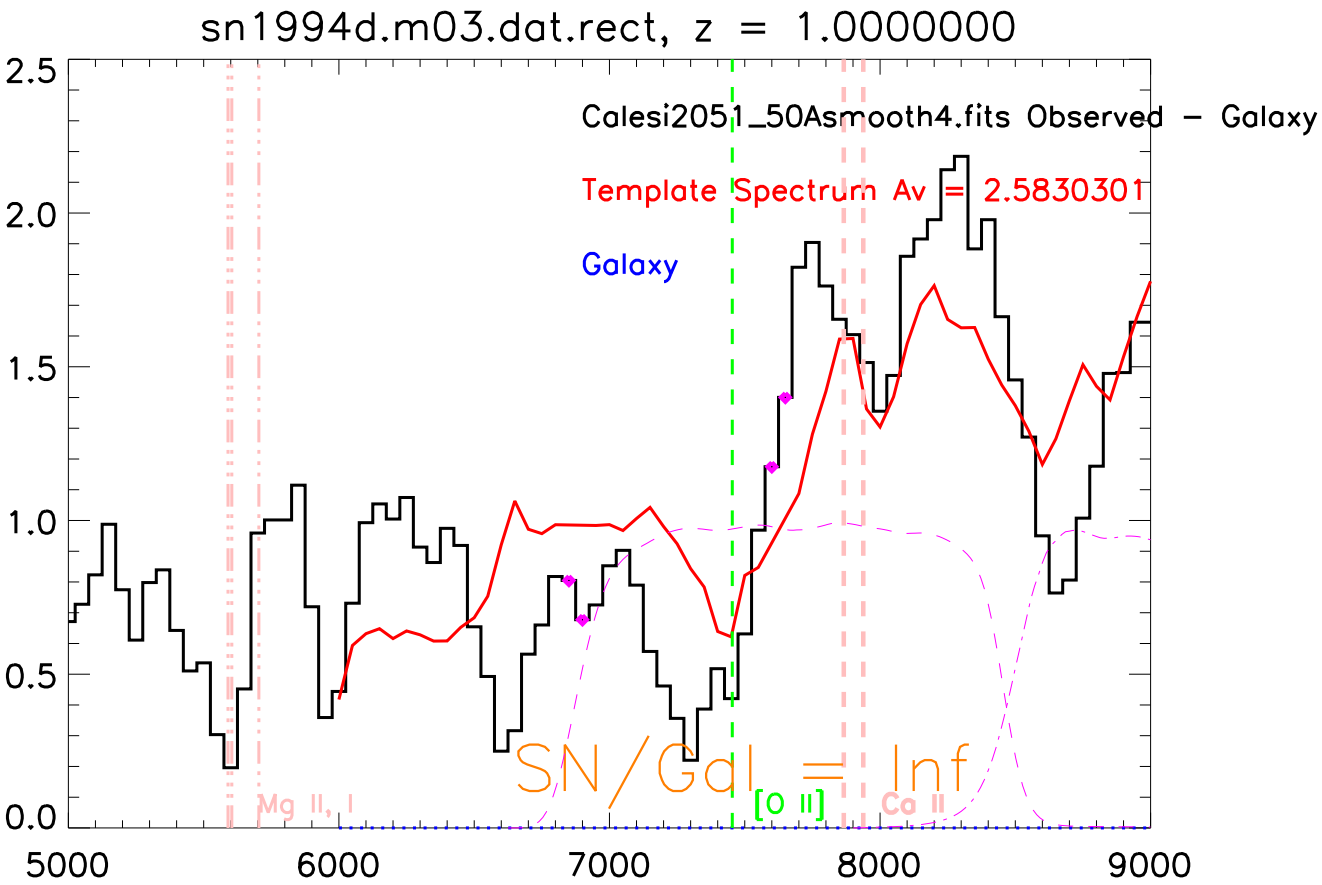


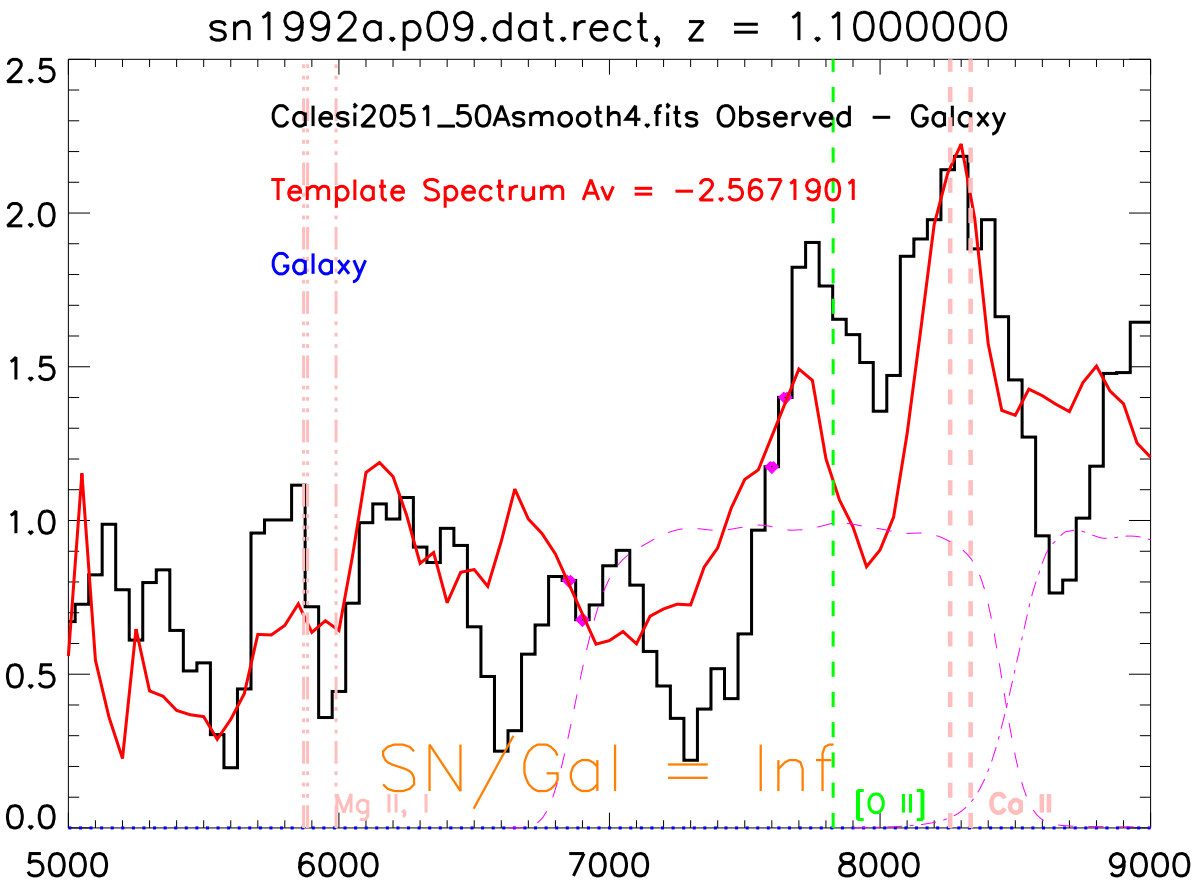
2.5
2.0
1.5
1.0
χ^2
40
20
0
−20
Days
0.5
1.0
1.5
2.0
Δm15

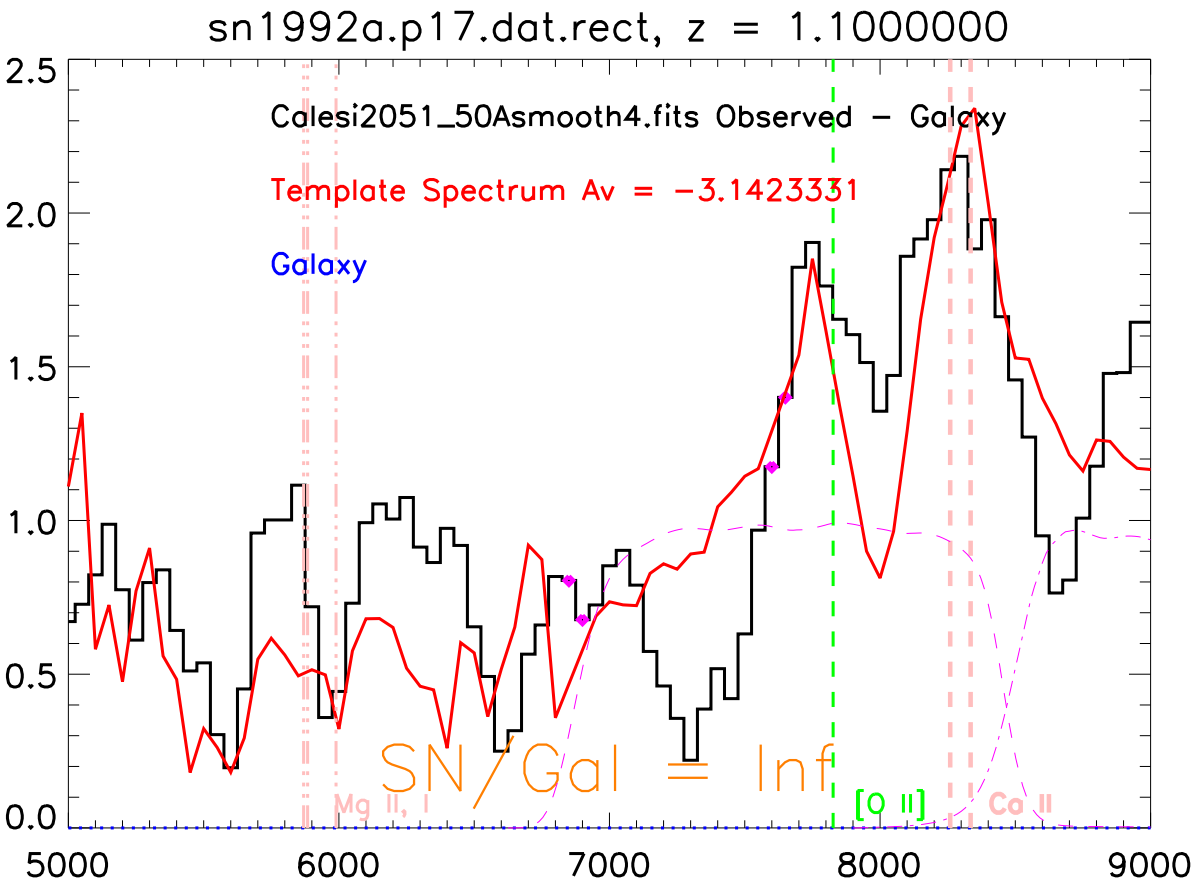

Calesi2051_50Asmooth4.fits
X^2
z
0
2
4
6
8
10
12
0.95
1.00
1.05
1.10

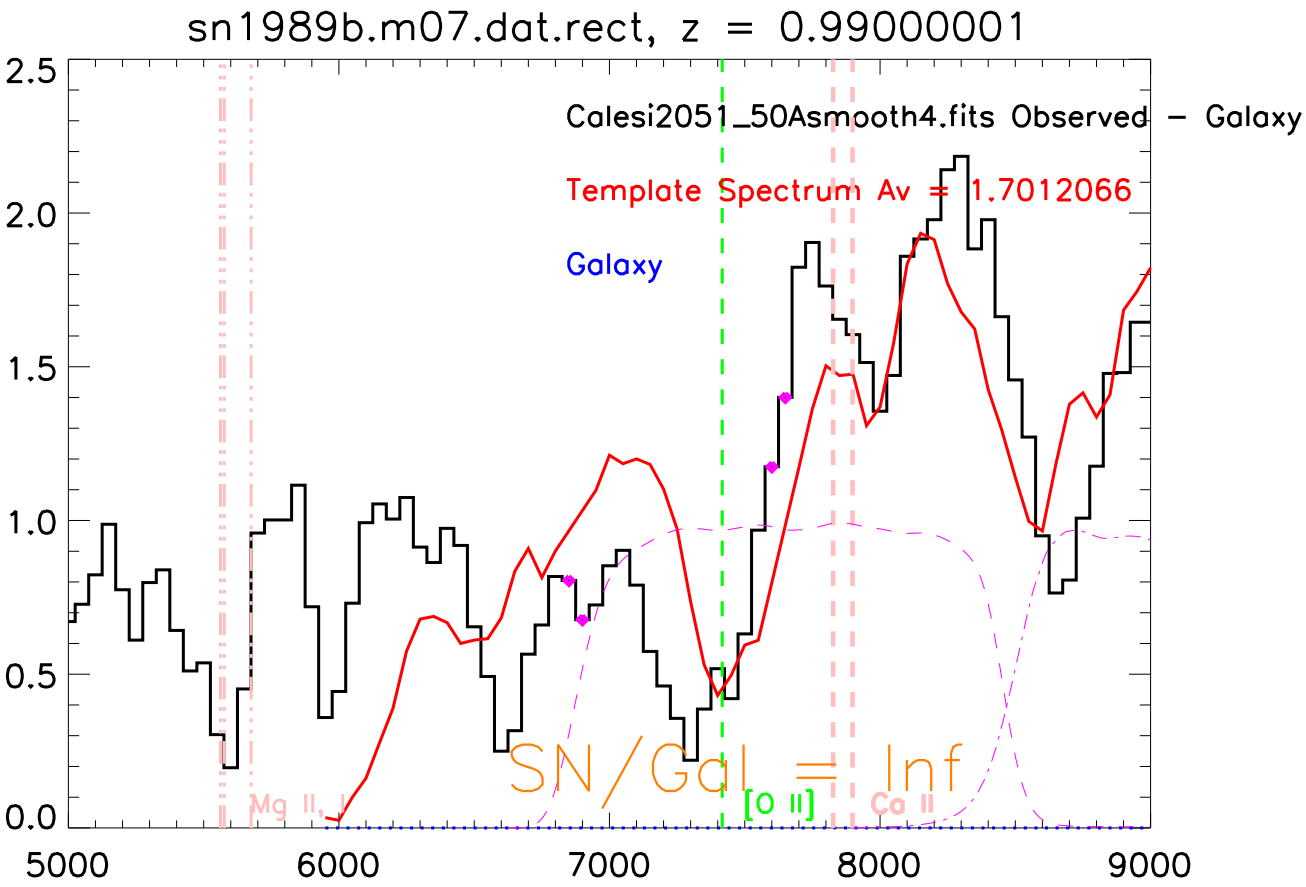

Calesi2051_50Asmooth4.fits----sn1990n.m14.dat.rect
sn1990n.m14.dat.rect
Mg II, I
[O II]
Ca II
2.5
2.0
1.5
1.0
0.5
0.0
5000
6000
7000
8000
9000

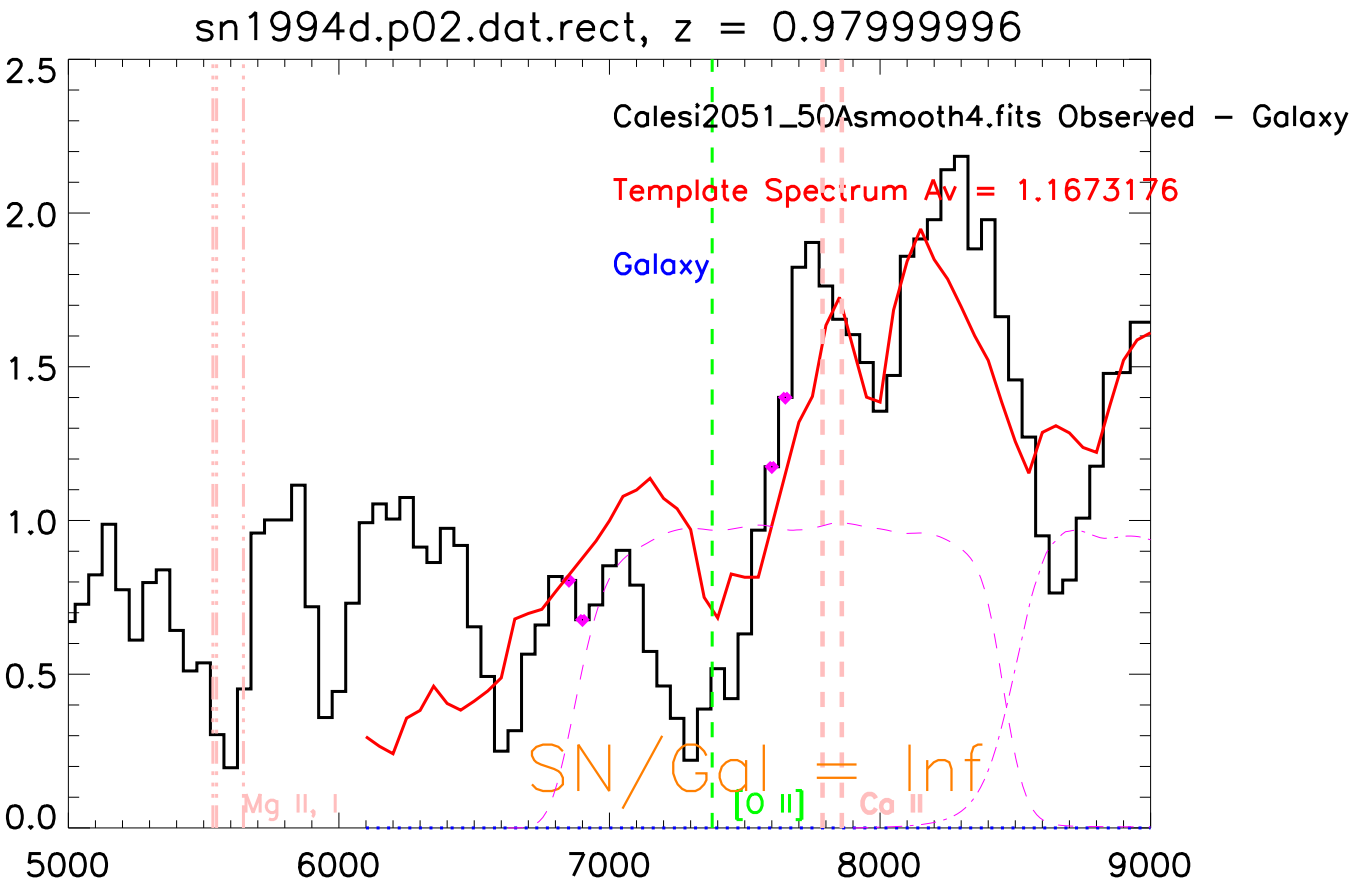

sn1990n.m14.dat.rect, z = 1.0300000
Calesi2051_50Asmooth4.fits Observed – Galaxy
Template Spectrum Av = 0.081322526
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
2.5
2.0
1.5
1.0
0.5
0.0
5000
6000
7000
8000
9000

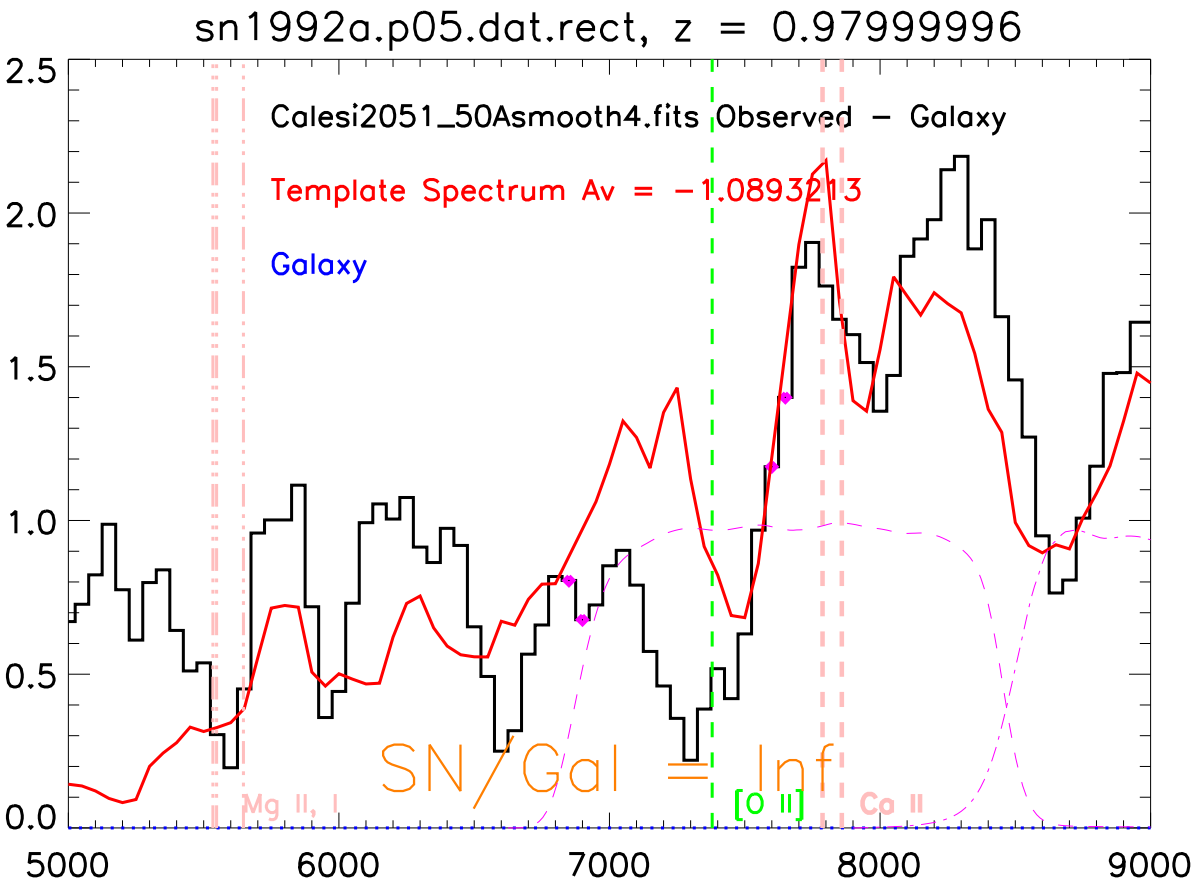

sn1994d.m03.dat.rect, z = 1.0000000
Calesi2051_50Asmooth4.fits Observed − Galaxy
Template Spectrum Av = 2.5830301
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
2.5
2.0
1.5
1.0
0.5
0.0
5000
6000
7000
8000
9000

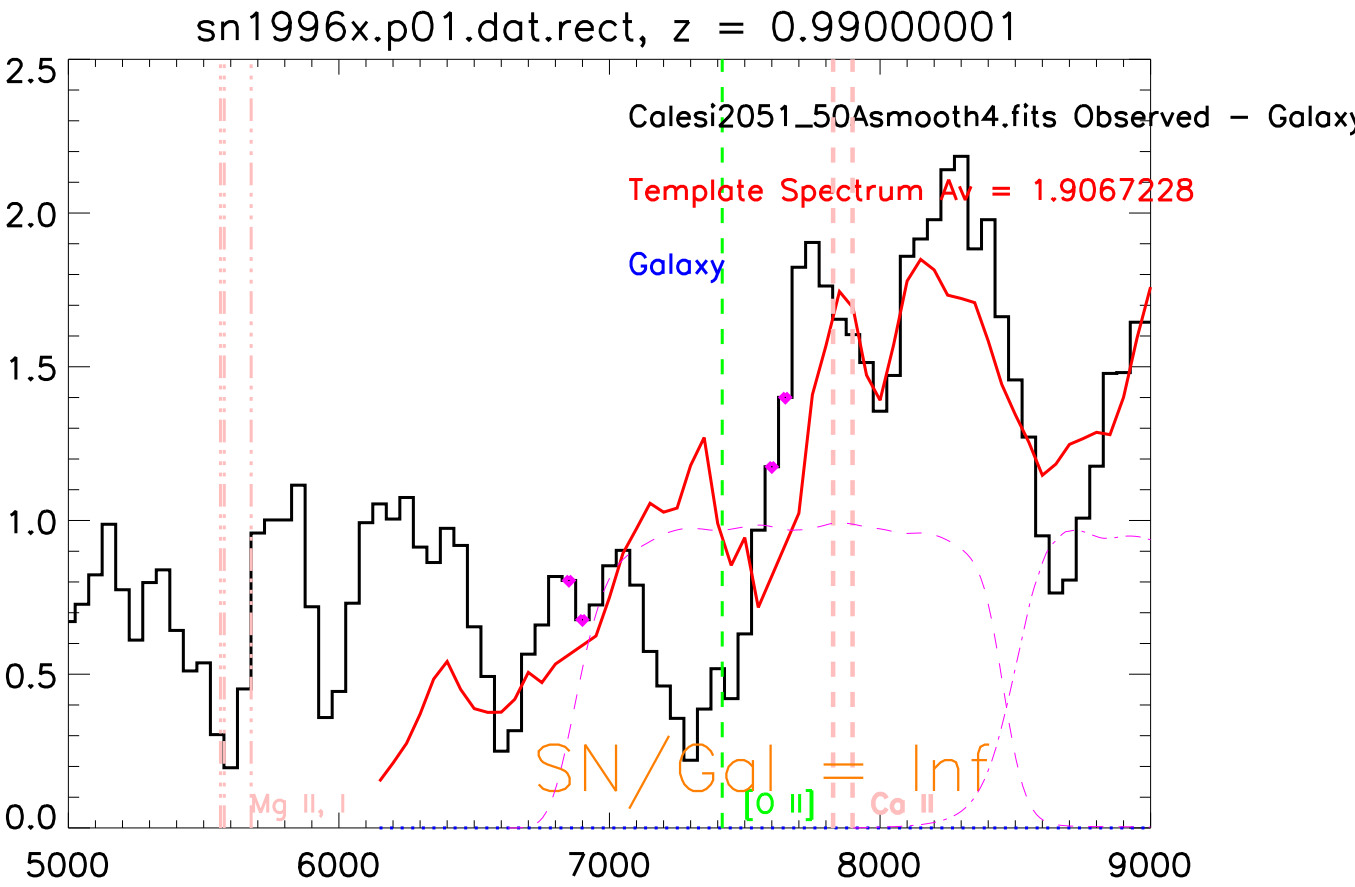

sn1992a.p09.dat.rect, z = 1.1000000
Calesi2051_50Asmooth4.fits Observed − Galaxy
Template Spectrum Av = −2.5671901
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
2.5
2.0
1.5
1.0
0.5
0.0
5000
6000
7000
8000
9000

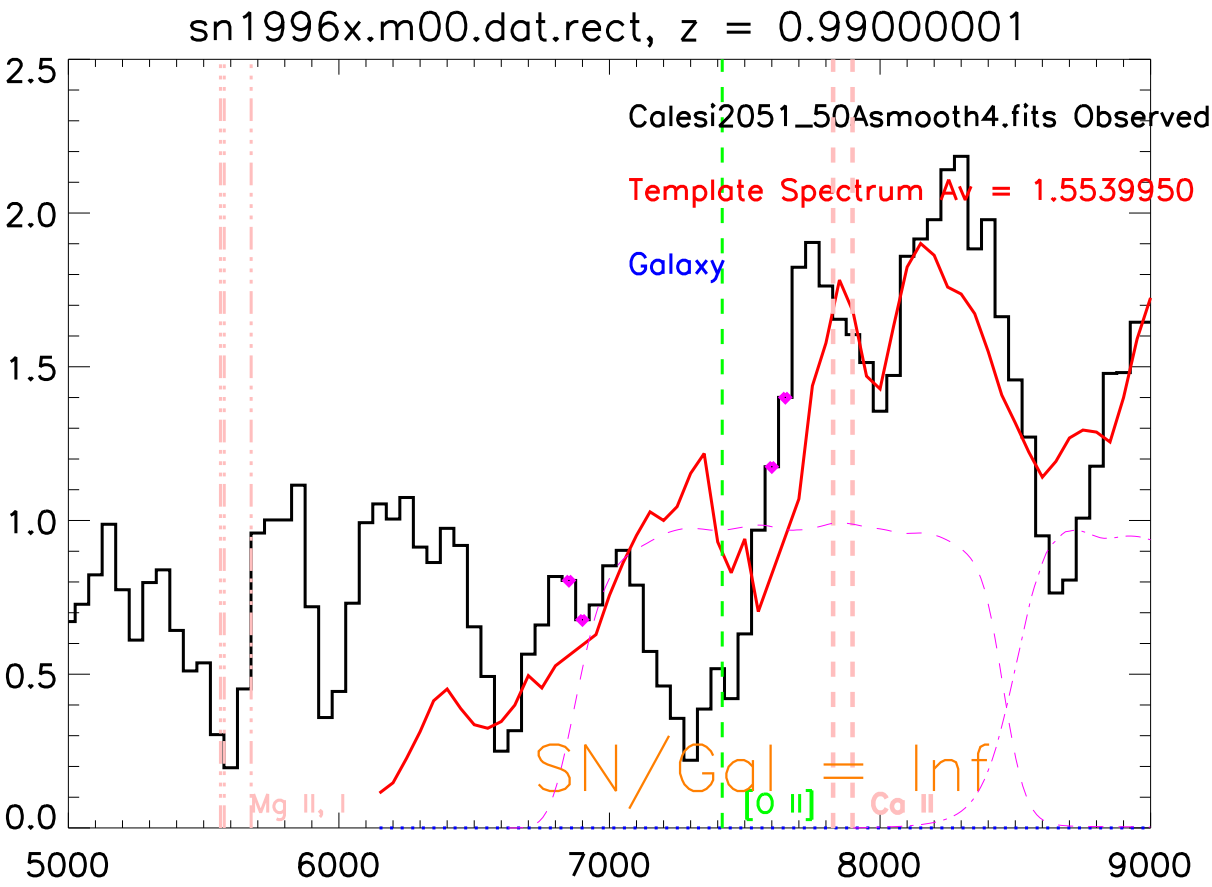

sn1992a.p17.dat.rect, z = 1.1000000
Calesi2051_50Asmooth4.fits Observed − Galaxy
Template Spectrum Av = −3.1423331
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
2.5
2.0
1.5
1.0
0.5
0.0
5000
6000
7000
8000
9000

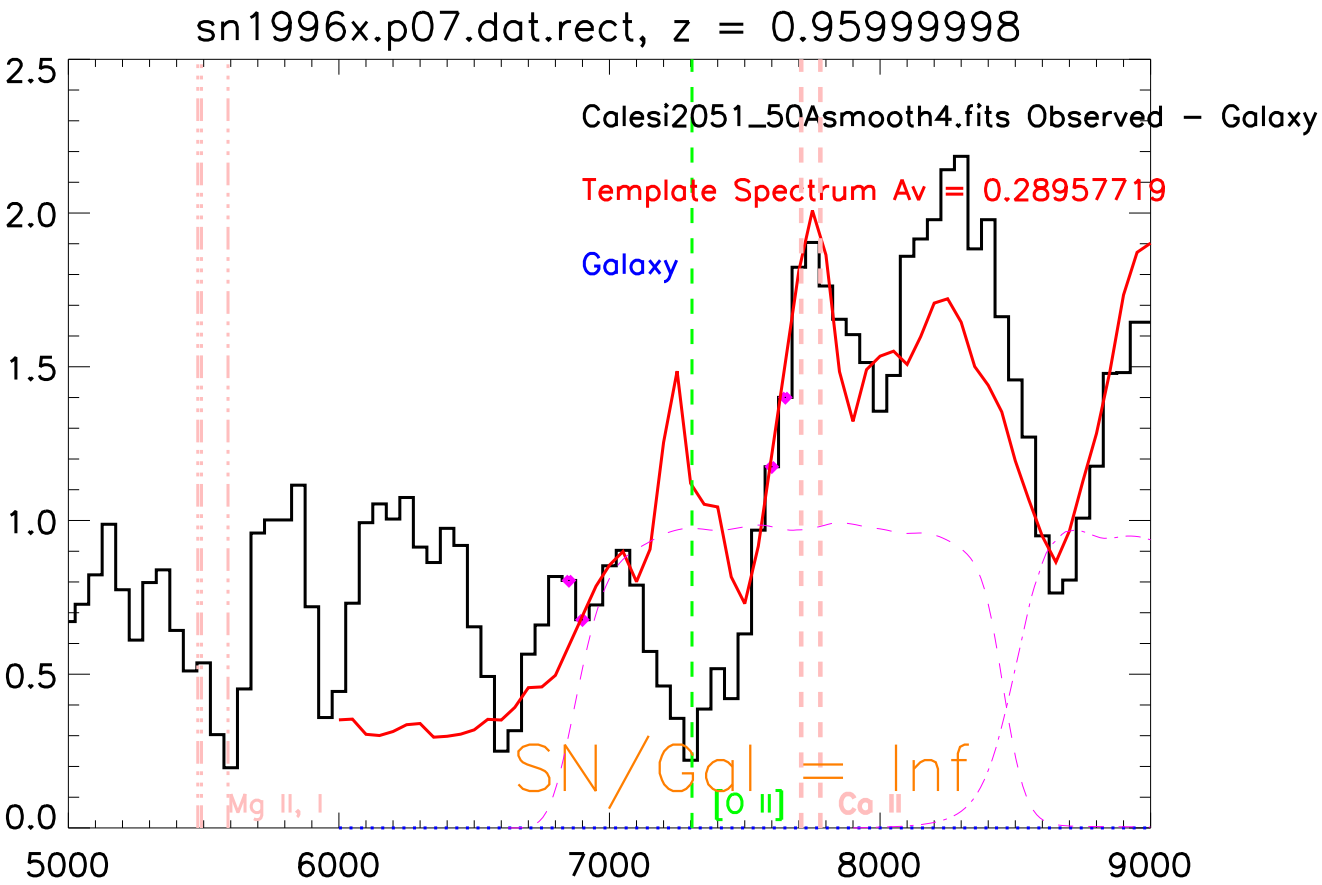

sn1989b.m07.dat.rect, z = 0.99000001
Calesi2051_50Asmooth4.fits Observed – Galaxy
Template Spectrum Av = 1.7012066
Galaxy
SN/Gal = Inf
Mg II,
[O II]
Ca II
2.5
2.0
1.5
1.0
0.5
0.0
5000
6000
7000
8000
9000

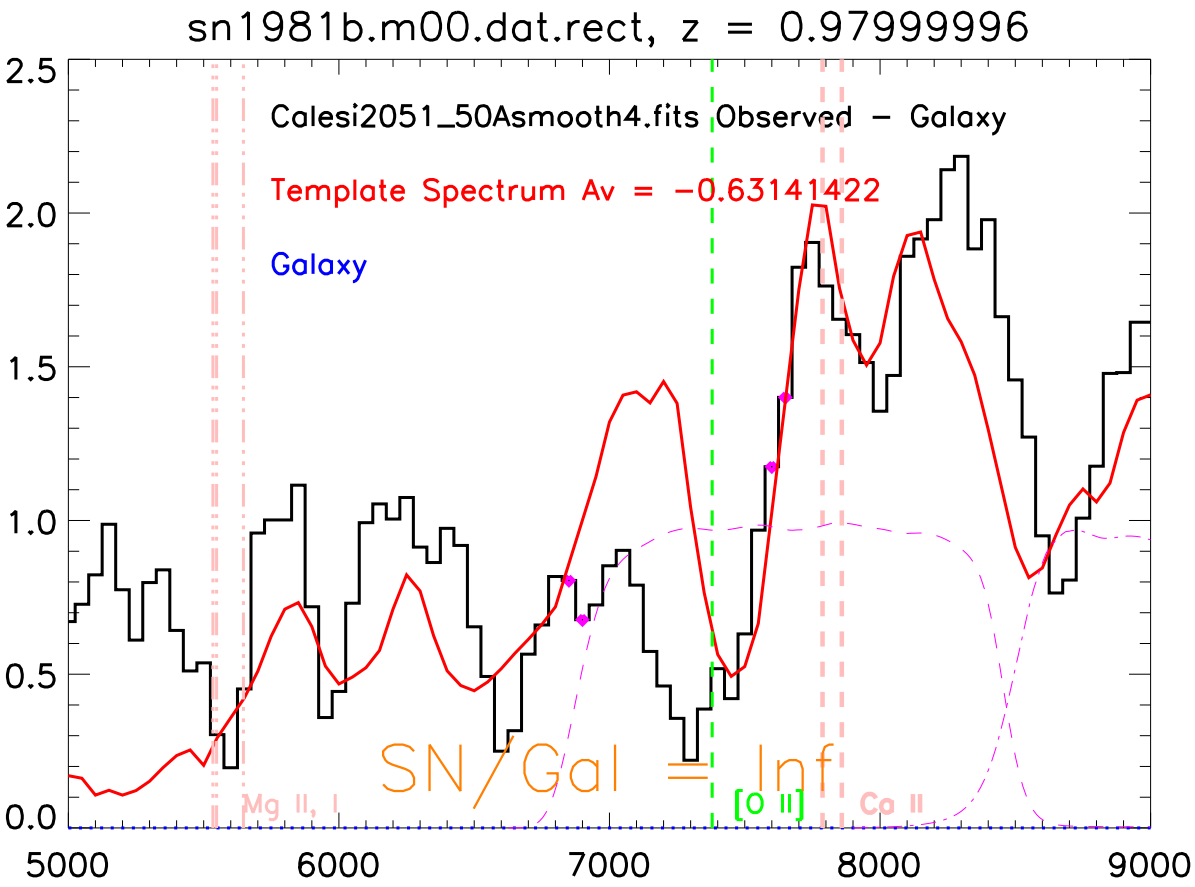

sn1994d.p02.dat.rect, z = 0.97999996
Calesi2051_50Asmooth4.fits Observed − Galaxy
Template Spectrum Av = 1.1673176
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
2.5
2.0
1.5
1.0
0.5
0.0
5000
6000
7000
8000
9000

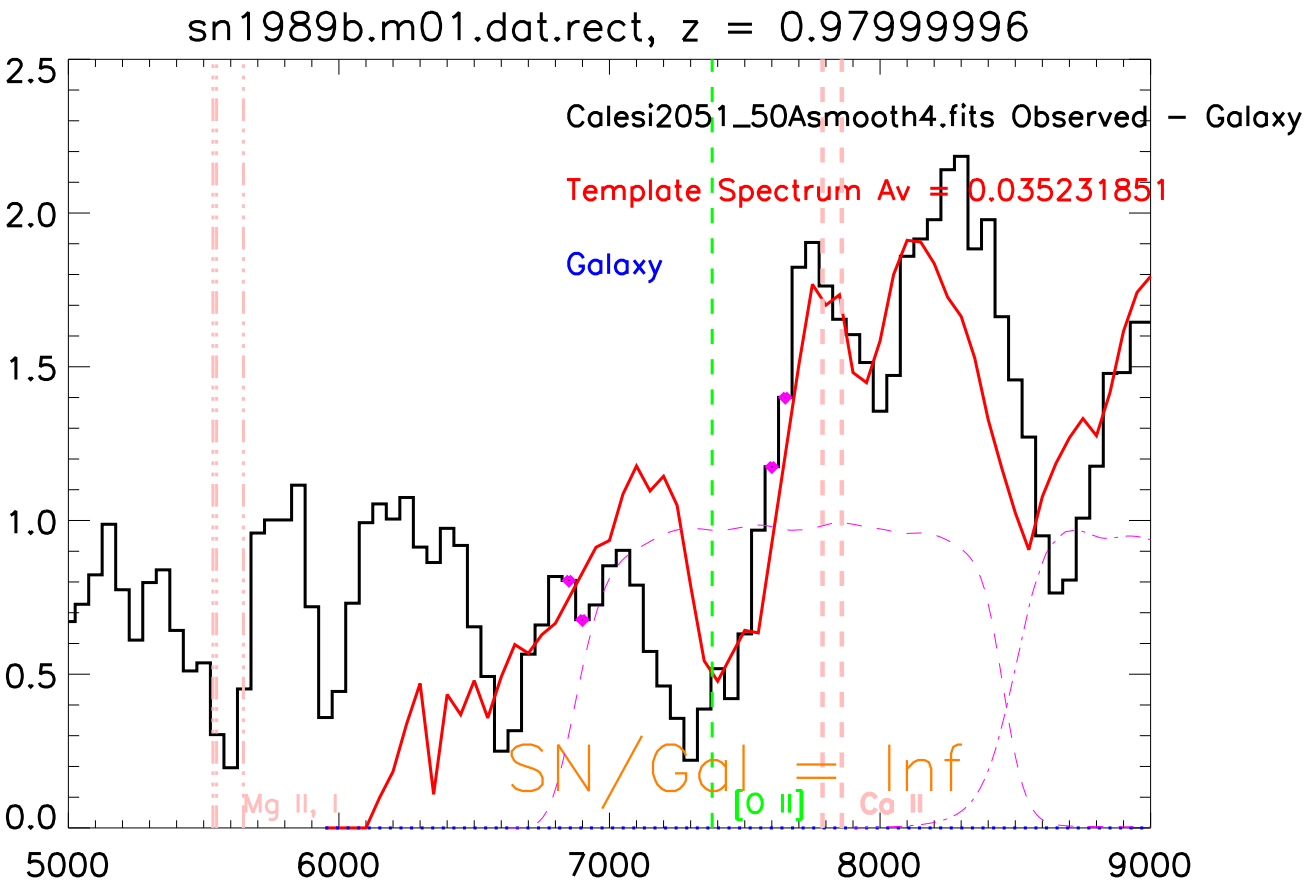

sn1992a.p05.dat.rect, z = 0.97999996
Calesi2051_50Asmooth4.fits Observed − Galaxy
Template Spectrum Av = −1.0893213
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
2.5
2.0
1.5
1.0
0.5
0.0
5000
6000
7000
8000
9000

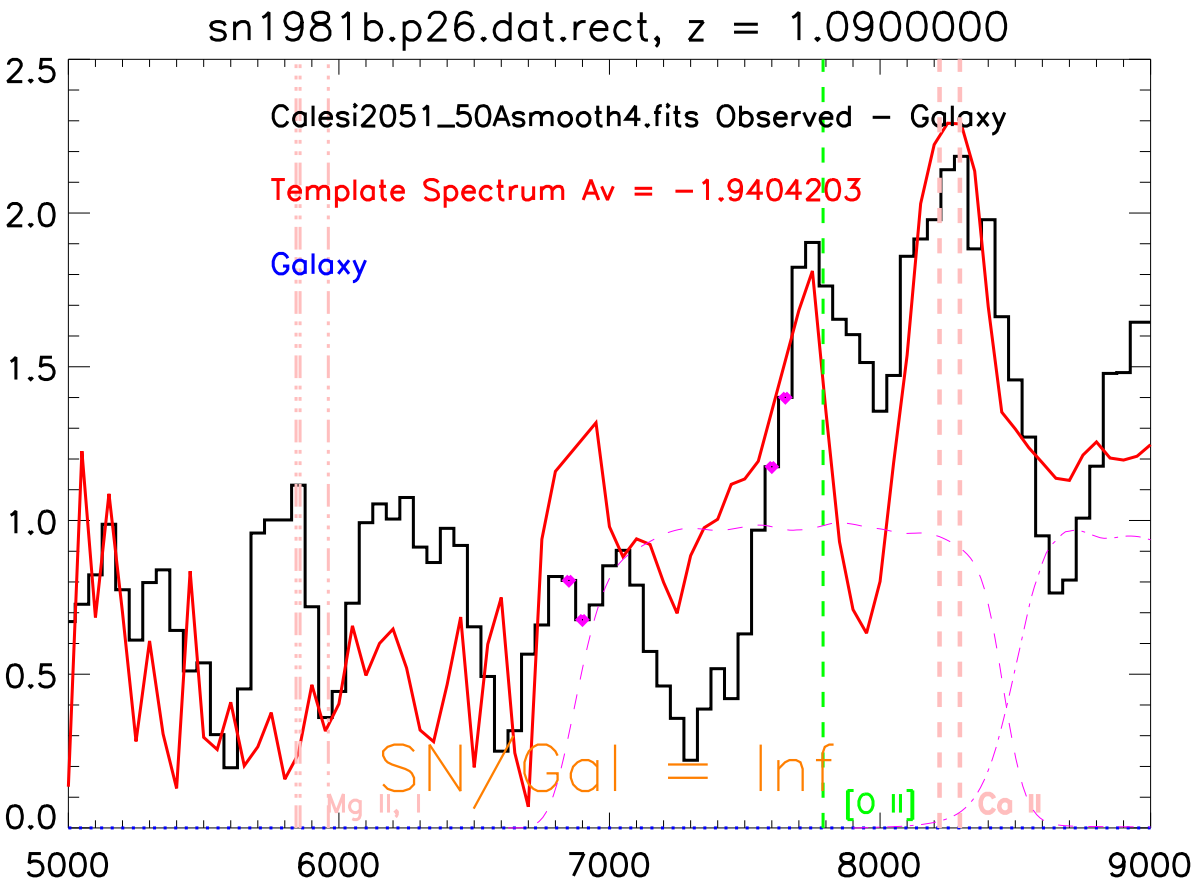

sn1996x.p01.dat.rect, z = 0.99000001
Calesi2051_50Asmooth4.fits Observed − Galaxy
Template Spectrum Av = 1.9067228
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
2.5
2.0
1.5
1.0
0.5
0.0
5000
6000
7000
8000
9000

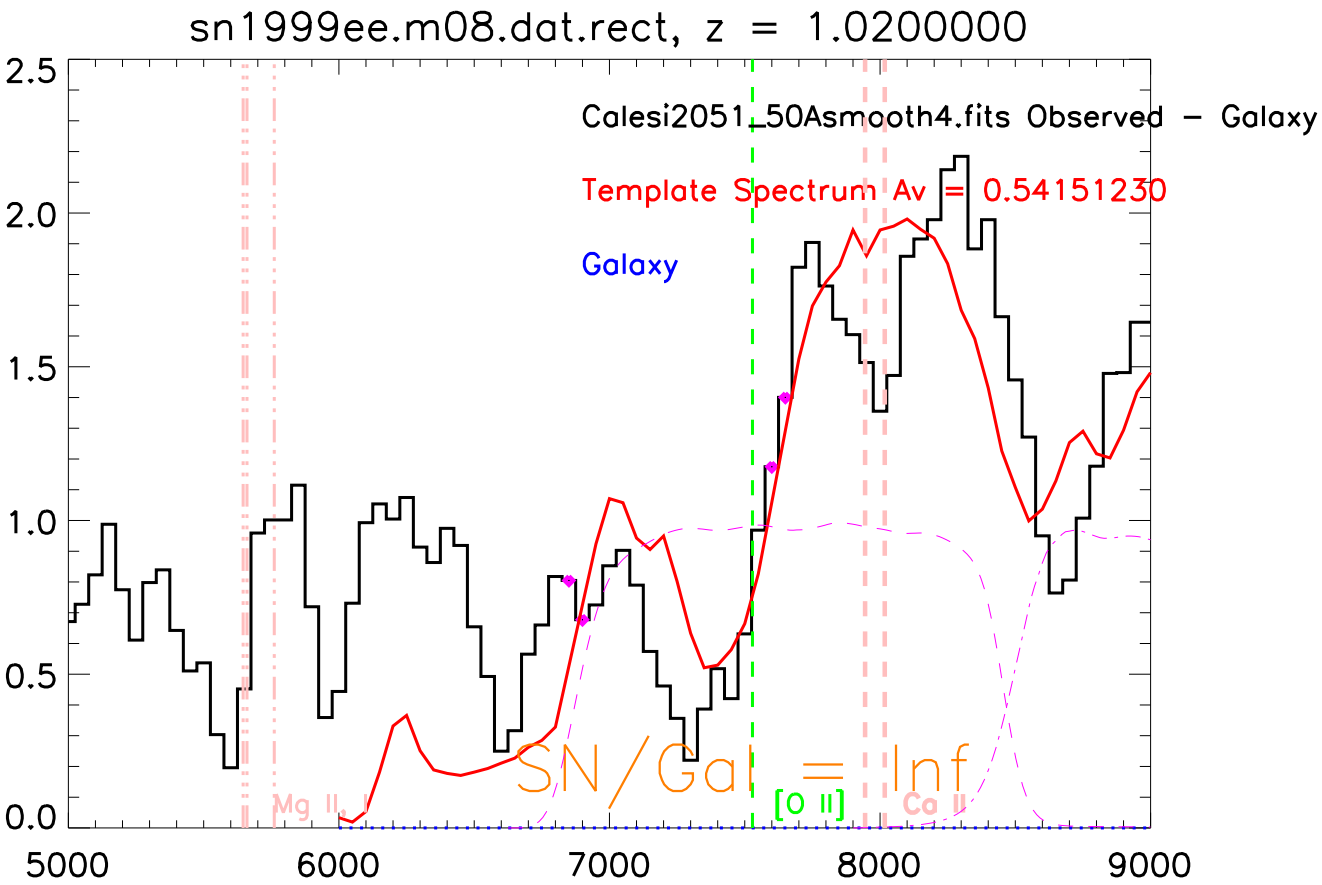

sn1996x.m00.dat.rect, z = 0.99000001
Calesi2051_50Asmooth4.fits Observed − Galaxy
Template Spectrum Av = 1.5539950
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
2.5
2.0
1.5
1.0
0.5
0.0
5000
6000
7000
8000
9000

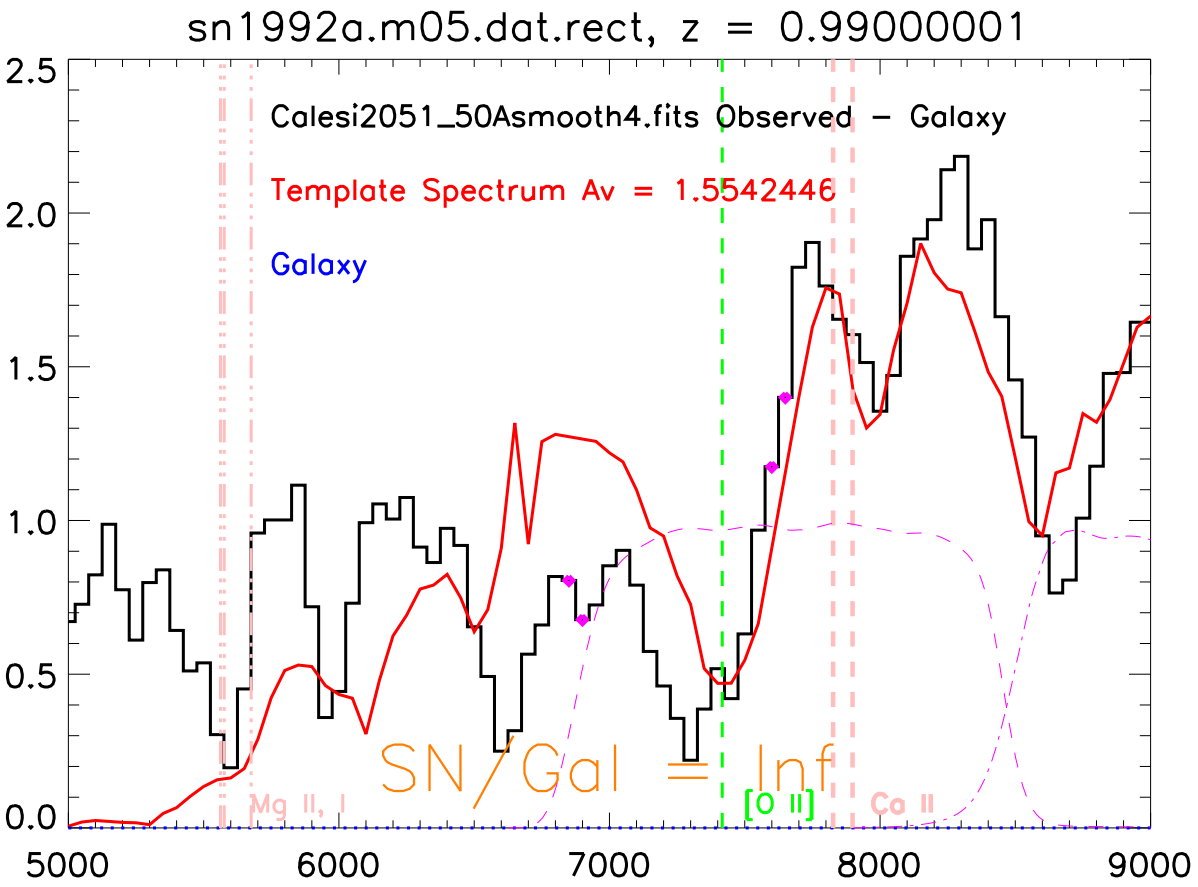

sn1996x.p07.dat.rect, z = 0.95999998
Calesi2051_50Asmooth4.fits Observed − Galaxy
Template Spectrum Av = 0.28957719
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
2.5
2.0
1.5
1.0
0.5
0.0
5000
6000
7000
8000
9000

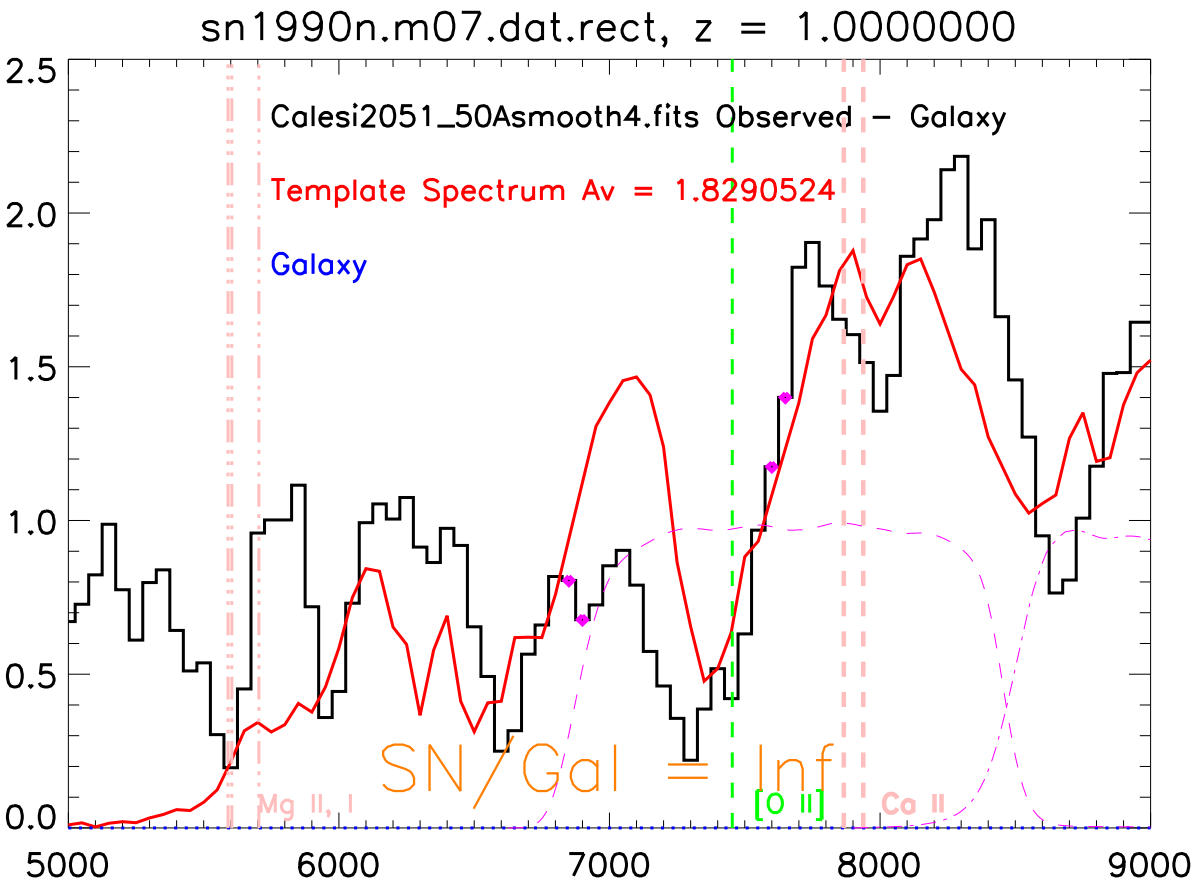

sn1981b.m00.dat.rect, z = 0.97999996
Calesi2051_50Asmooth4.fits Observed − Galaxy
Template Spectrum Av = −0.63141422
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
2.5
2.0
1.5
1.0
0.5
0.0
5000
6000
7000
8000
9000

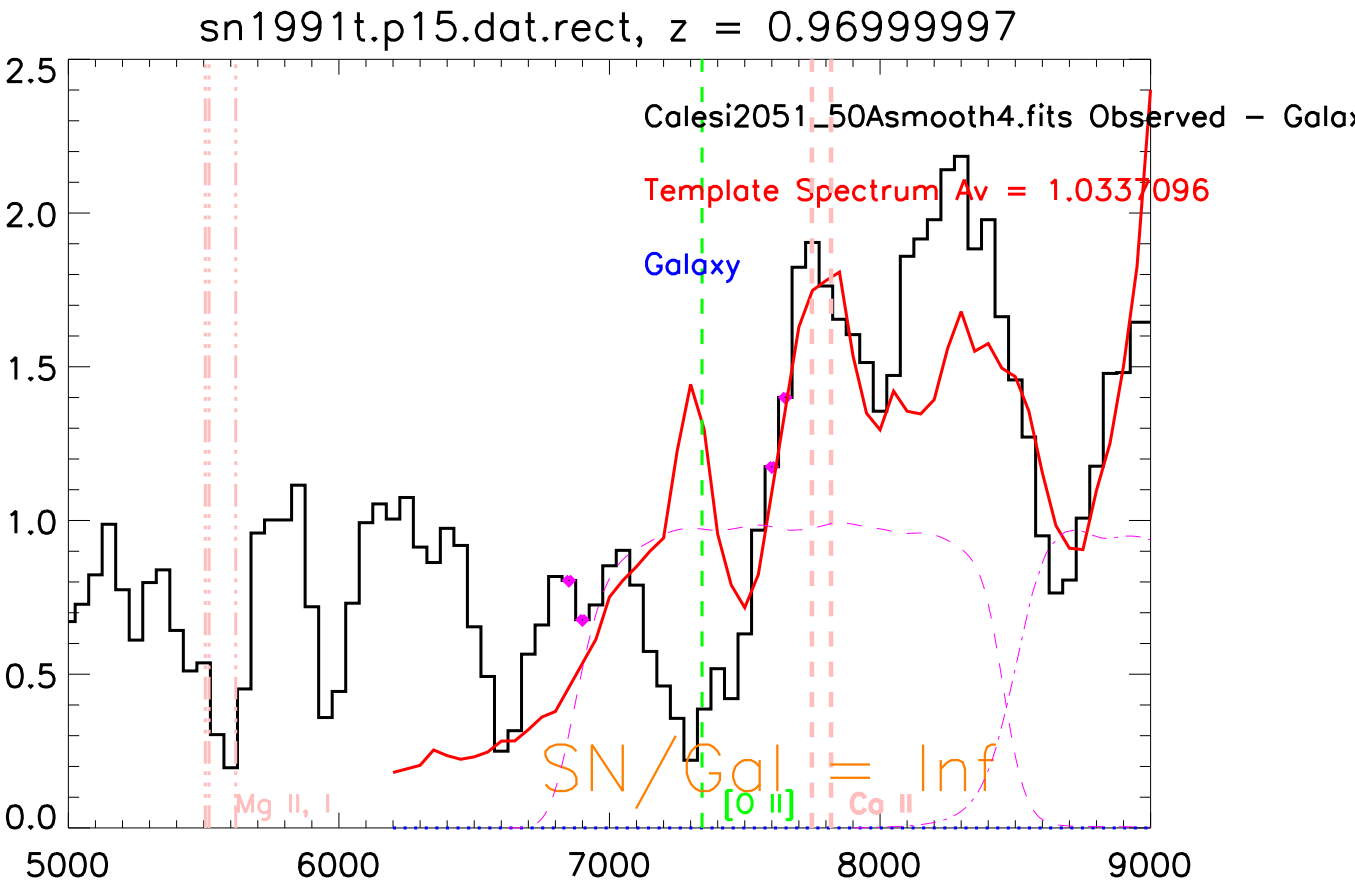

sn1989b.m01.dat.rect, z = 0.97999996
Calesi2051_50Asmooth4.fits Observed – Galaxy
Template Spectrum Av = 0.035231851
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
2.5
2.0
1.5
1.0
0.5
0.0
5000
6000
7000
8000
9000

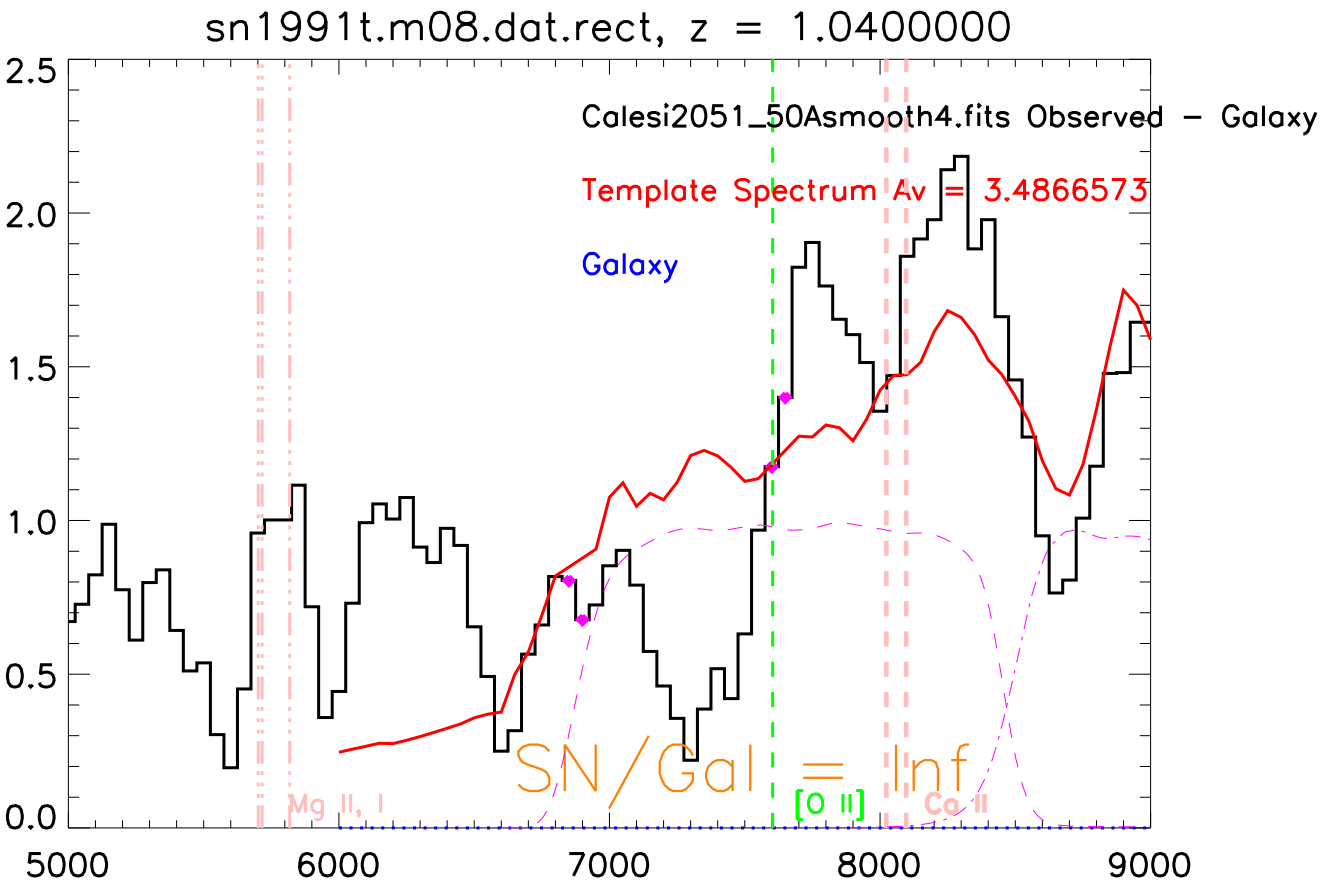

sn1981b.p26.dat.rect, z = 1.0900000
Calesi2051_50Asmooth4.fits Observed − Galaxy
Template Spectrum Av = −1.9404203
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
2.5
2.0
1.5
1.0
0.5
0.0
5000
6000
7000
8000
9000

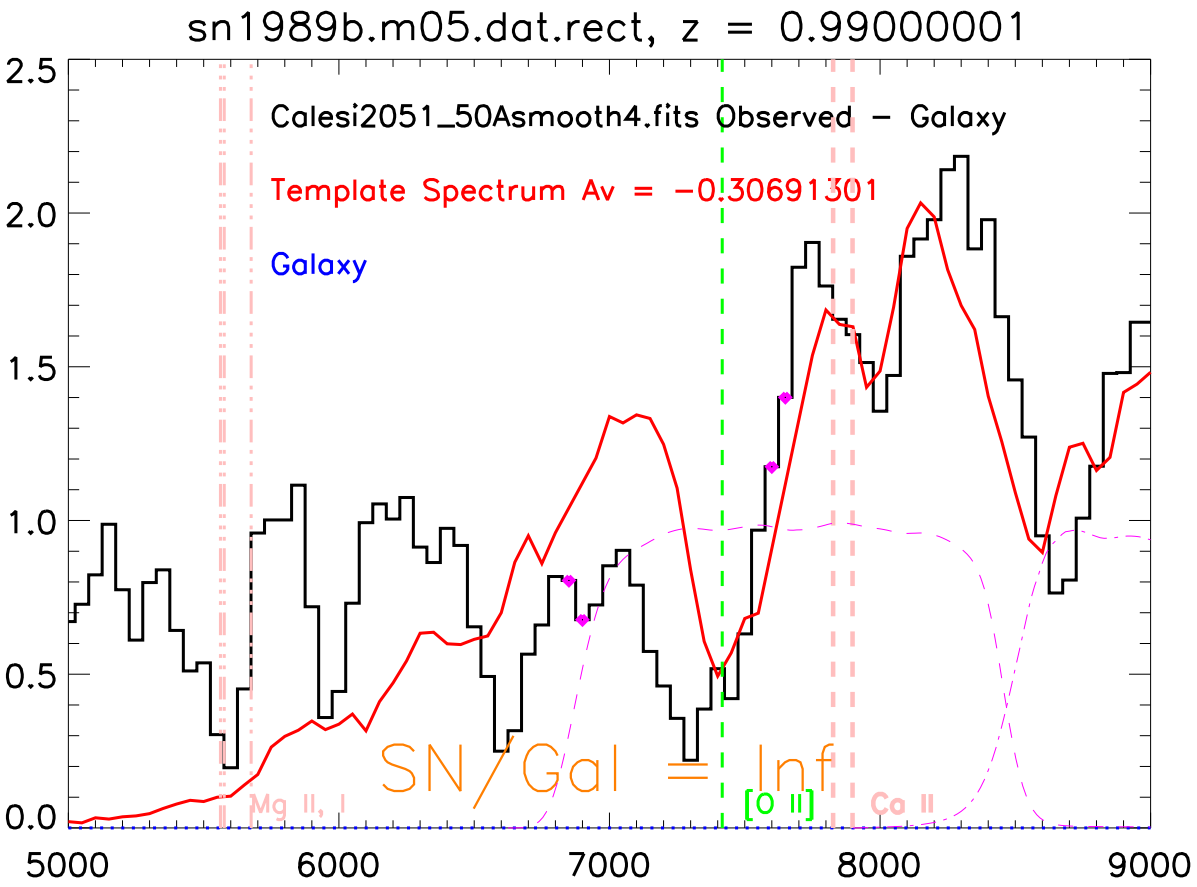

sn1999ee.m08.dat.rect, z = 1.0200000
Calesi2051_50Asmooth4.fits Observed − Galaxy
Template Spectrum Av = 0.54151230
Galaxy
SN/Gal = Inf
[O II]
Ca II
2.5
2.0
1.5
1.0
0.5
0.0
5000
6000
7000
8000
9000

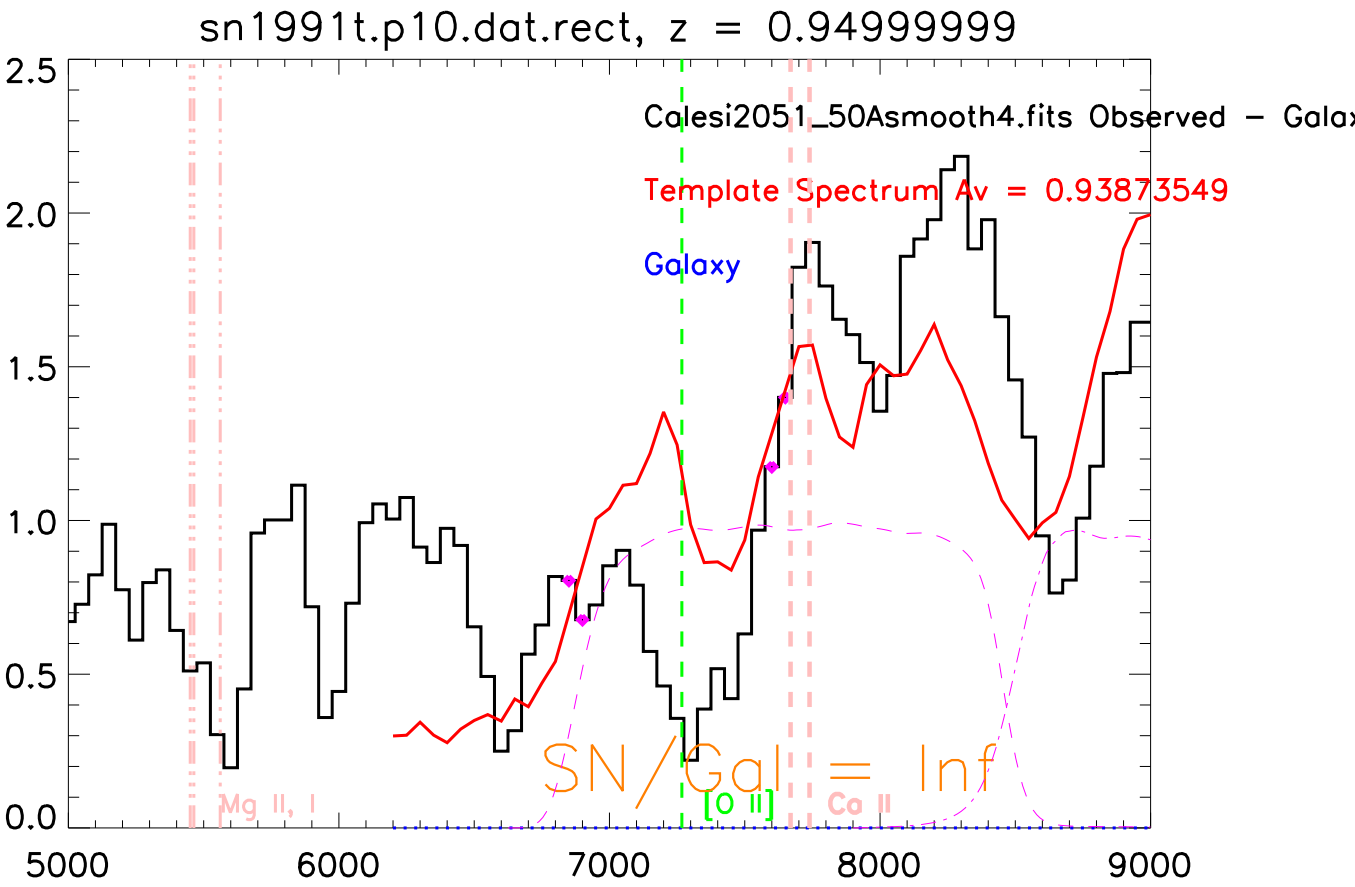

sn1992a.m05.dat.rect, z = 0.99000001
Calesi2051_50Asmooth4.fits Observed − Galaxy
Template Spectrum Av = 1.5542446
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
2.5
2.0
1.5
1.0
0.5
0.0
5000
6000
7000
8000
9000

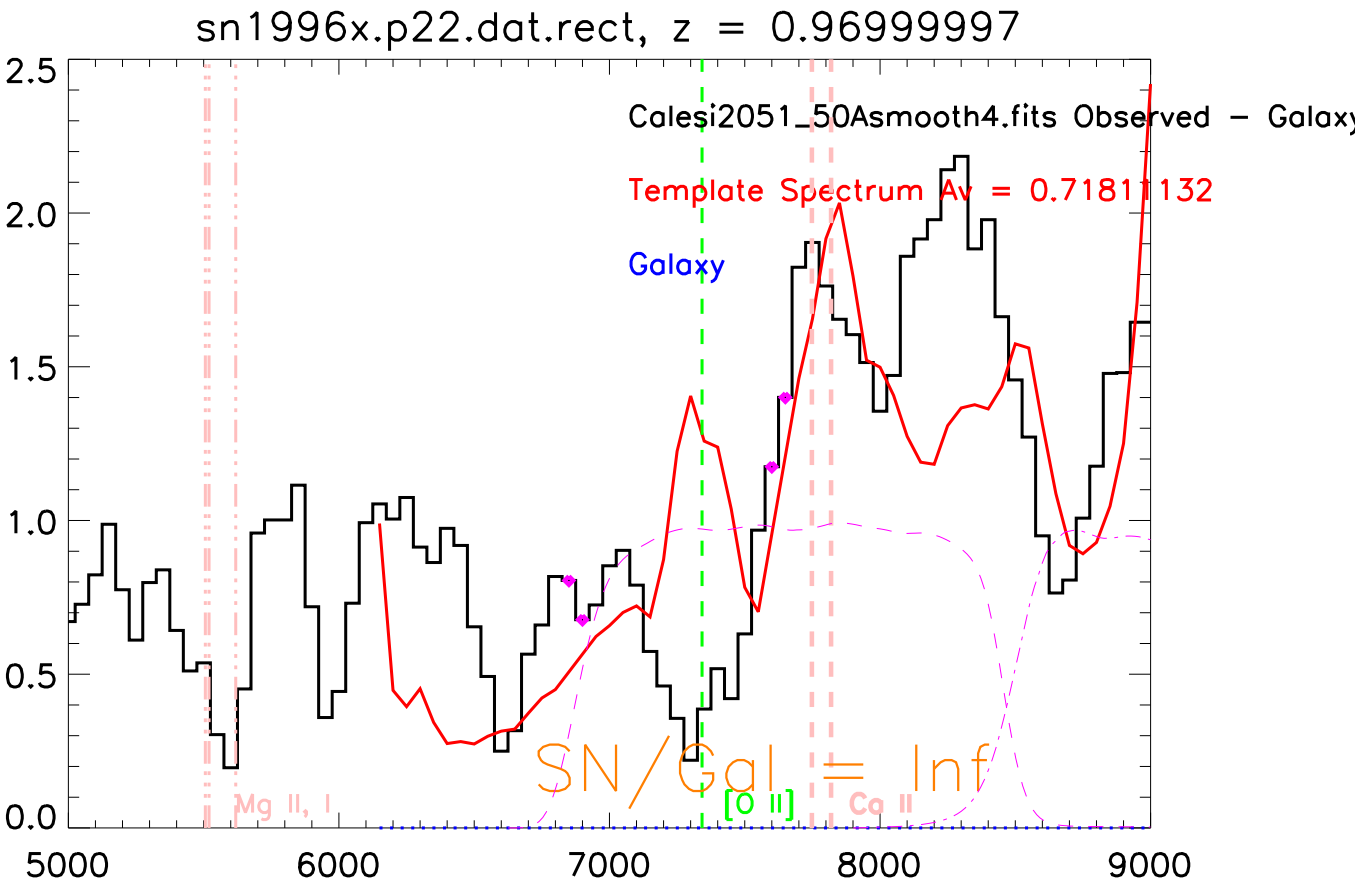

sn1990n.m07.dat.rect, z = 1.0000000
Calesi2051_50Asmooth4.fits Observed − Galaxy
Template Spectrum Av = 1.8290524
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
2.5
2.0
1.5
1.0
0.5
0.0
5000
6000
7000
8000
9000

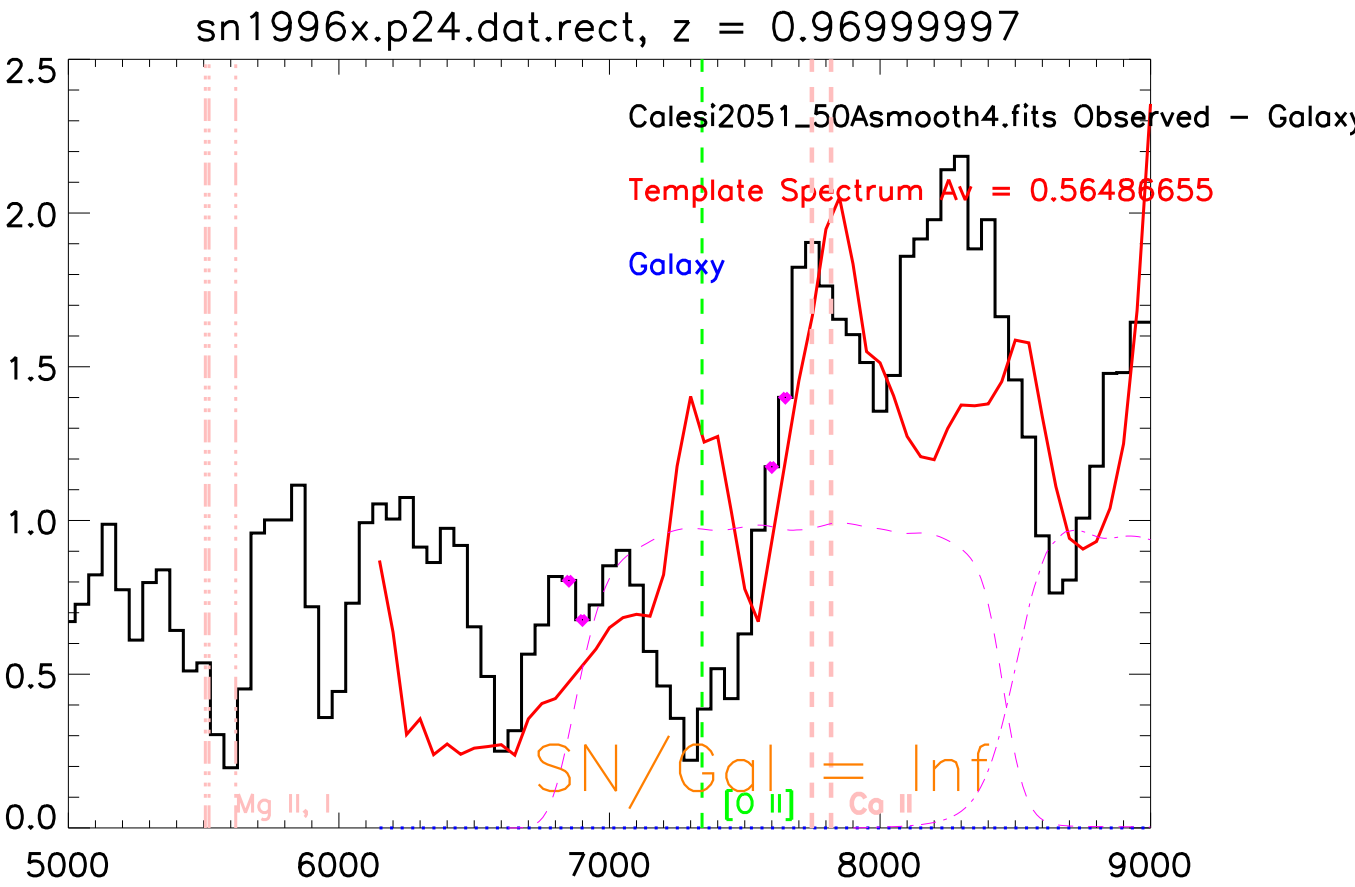

sn1991t.p15.dat.rect, z = 0.96999997
Calesi2051_50Asmooth4.fits Observed – Galax
Template Spectrum Av = 1.0337096
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
2.5
2.0
1.5
1.0
0.5
0.0
5000
6000
7000
8000
9000

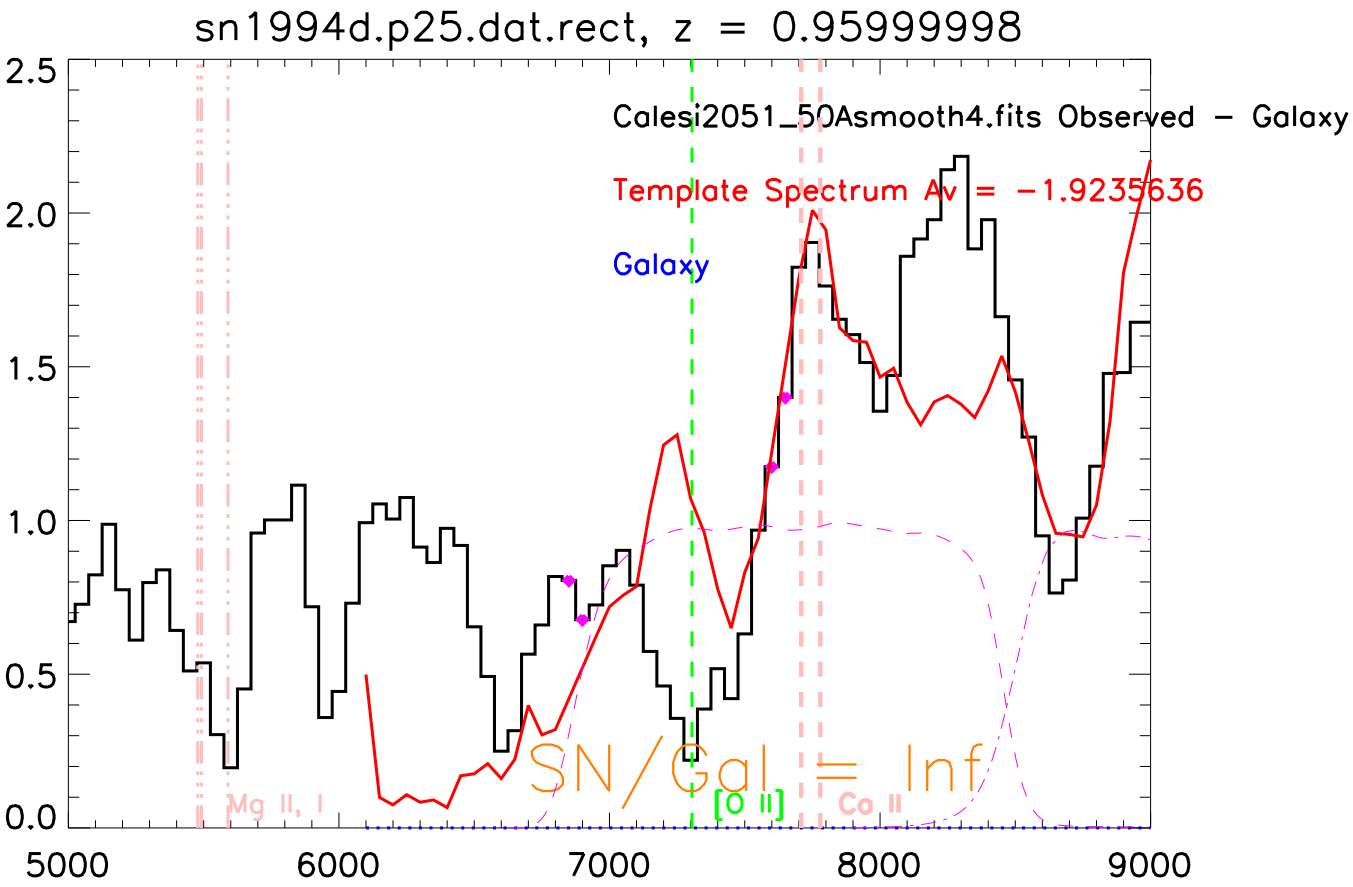

sn1991t.m08.dat.rect, z = 1.0400000
Calesi2051_50Asmooth4.fits Observed − Galaxy
Template Spectrum Av = 3.4866573
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
2.5
2.0
1.5
1.0
0.5
0.0
5000
6000
7000
8000
9000

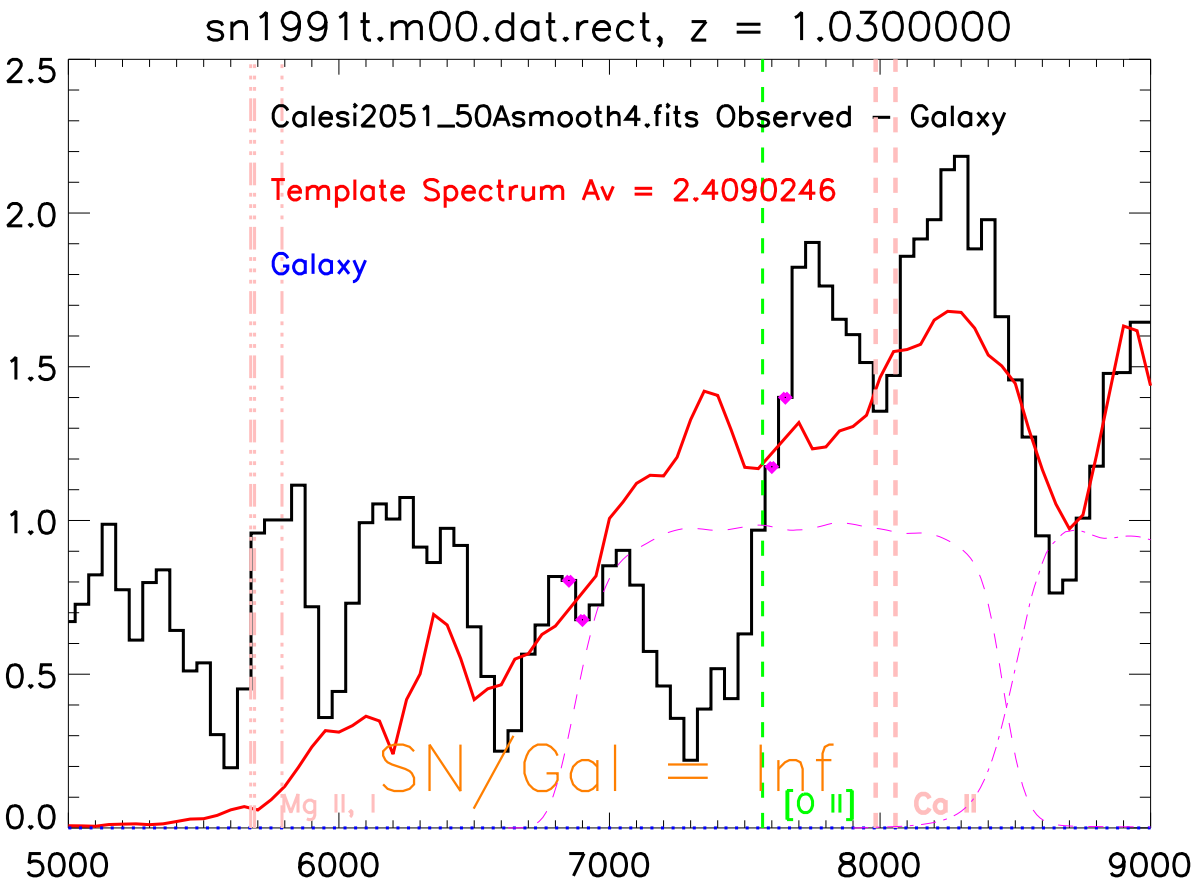

sn1989b.m05.dat.rect, z = 0.99000001
Calesi2051_50Asmooth4.fits Observed − Galaxy
Template Spectrum Av = −0.30691301
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
2.5
2.0
1.5
1.0
0.5
0.0
5000
6000
7000
8000
9000

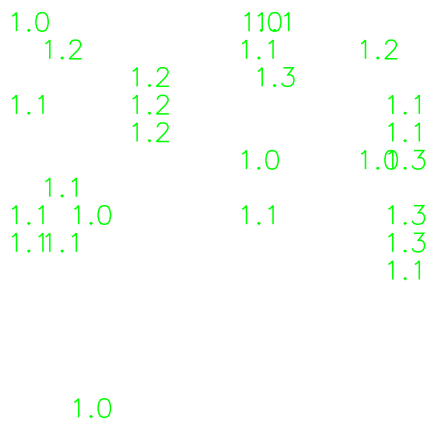

sn1991t.p10.dat.rect, z = 0.94999999
Calesi2051_50Asmooth4.fits Observed – Galax
Template Spectrum Av = 0.93873549
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
2.5
2.0
1.5
1.0
0.5
0.0
5000
6000
7000
8000
9000

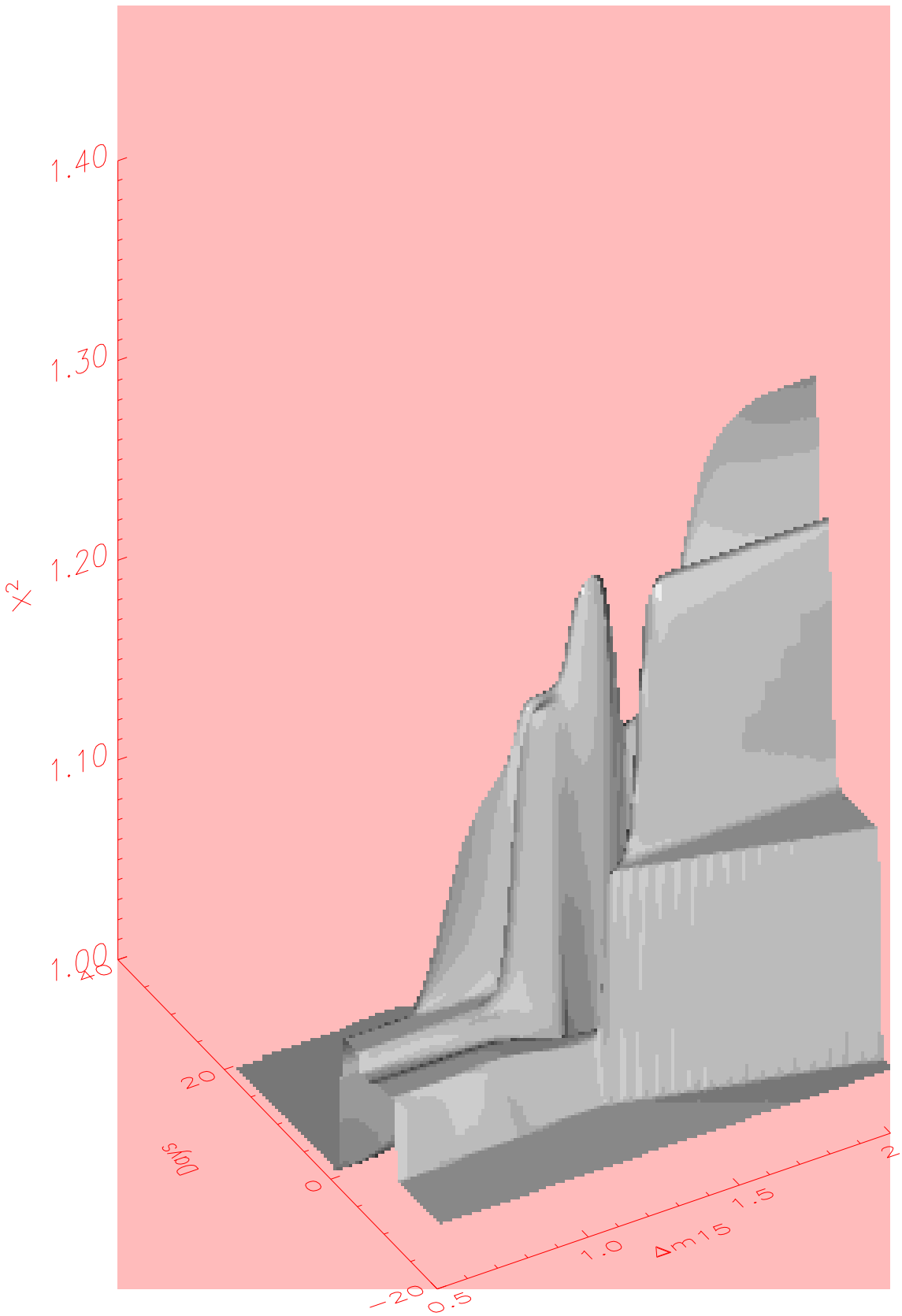

sn1996x.p22.dat.rect, z = 0.96999997
Calesi2051_50Asmooth4.fits Observed − Galaxy
Template Spectrum Av = 0.71811132
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
2.5
2.0
1.5
1.0
0.5
0.0
5000
6000
7000
8000
9000


sn1996x.p24.dat.rect, z = 0.96999997
Calesi2051_50Asmooth4.fits Observed − Galaxy
Template Spectrum Av = 0.56486655
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
2.5
2.0
1.5
1.0
0.5
0.0
5000
6000
7000
8000
9000

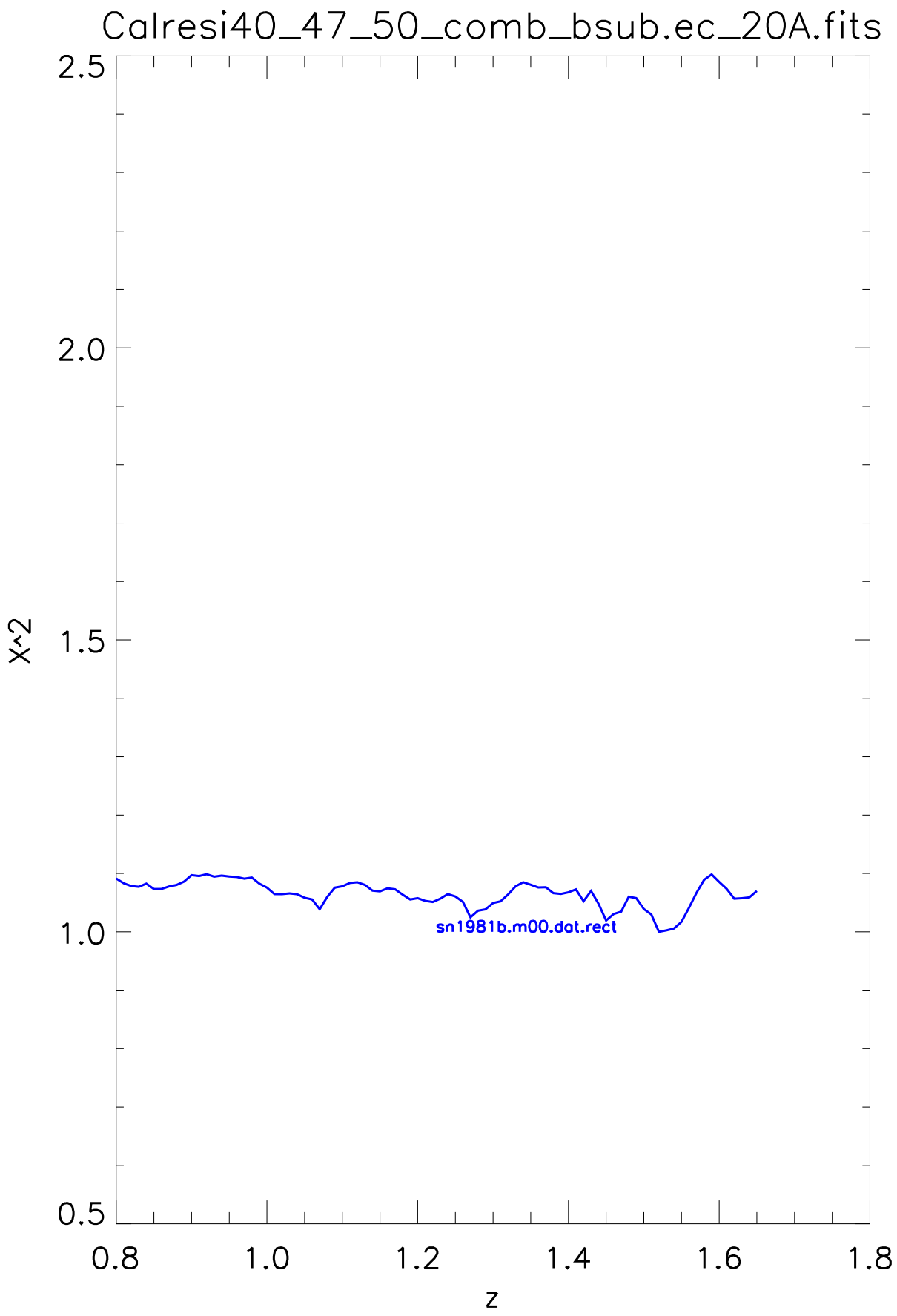

sn1994d.p25.dat.rect, z = 0.95999998
Calesi2051_50Asmooth4.fits Observed − Galaxy
Template Spectrum Av = −1.9235636
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
2.5
2.0
1.5
1.0
0.5
0.0
5000
6000
7000
8000
9000

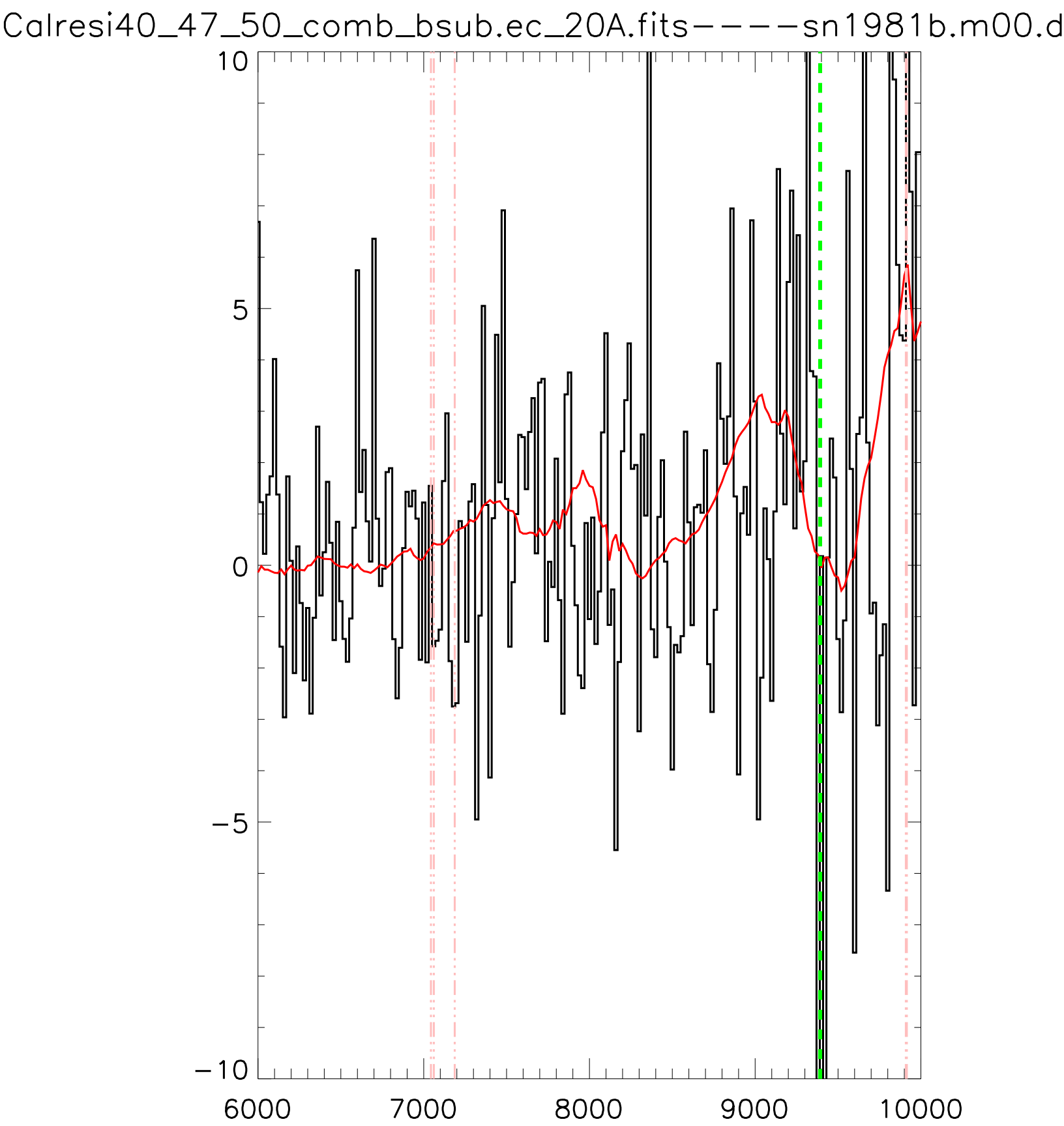

sn1991t.m00.dat.rect, z = 1.0300000
Calesi2051_50Asmooth4.fits Observed – Galaxy
Template Spectrum Av = 2.4090246
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
2.5
2.0
1.5
1.0
0.5
0.0
5000
6000
7000
8000
9000

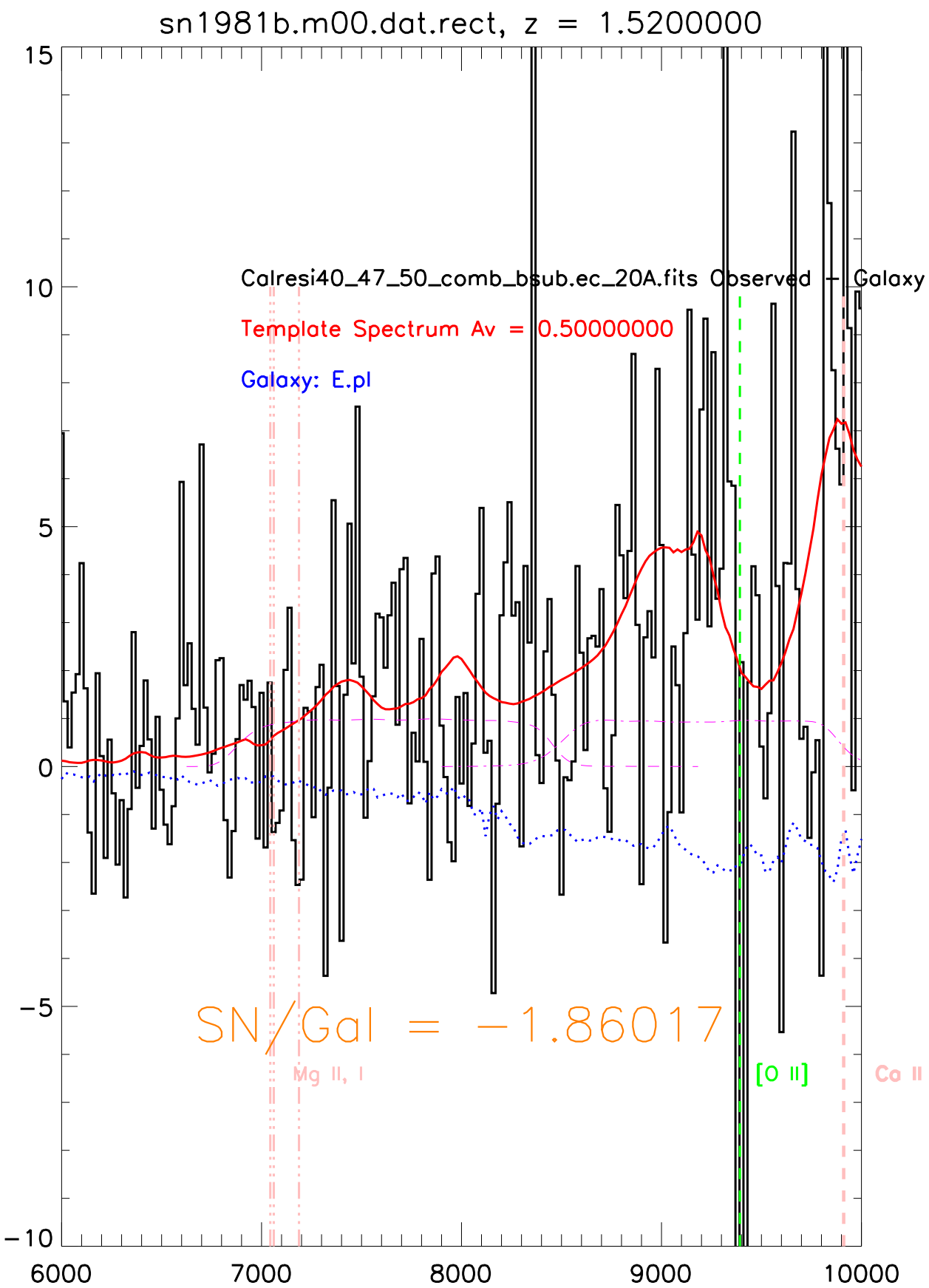

1.0
1.2
1.2
1.1
1.2
1.2
1.1
1.1
1.1
1.0
1.1
1.1
1.0
1.1
1.1
1.1
1101
1.1
1.2
1.3
1.0
1.1
1.1
1.0
1.3
1.1
1.3
1.3
1.1
1.0



1.40
1.30
1.20
1.10
1.00
χ^2
40
20
0
−20
Days
0.5
1.0
1.5
2.0
Δm15


Calresi40_47_50_comb_bsub.ec_20A.fits
2.5
2.0
1.5
1.0
0.5
X^2
0.8
1.0
1.2
1.4
1.6
1.8
z
sn1981b.m00.dat.rect


Calresi40_47_50_comb_bsub.ec_20A.fits----sn1981b.m00.d
10
5
0
−5
−10
6000
7000
8000
9000
10000

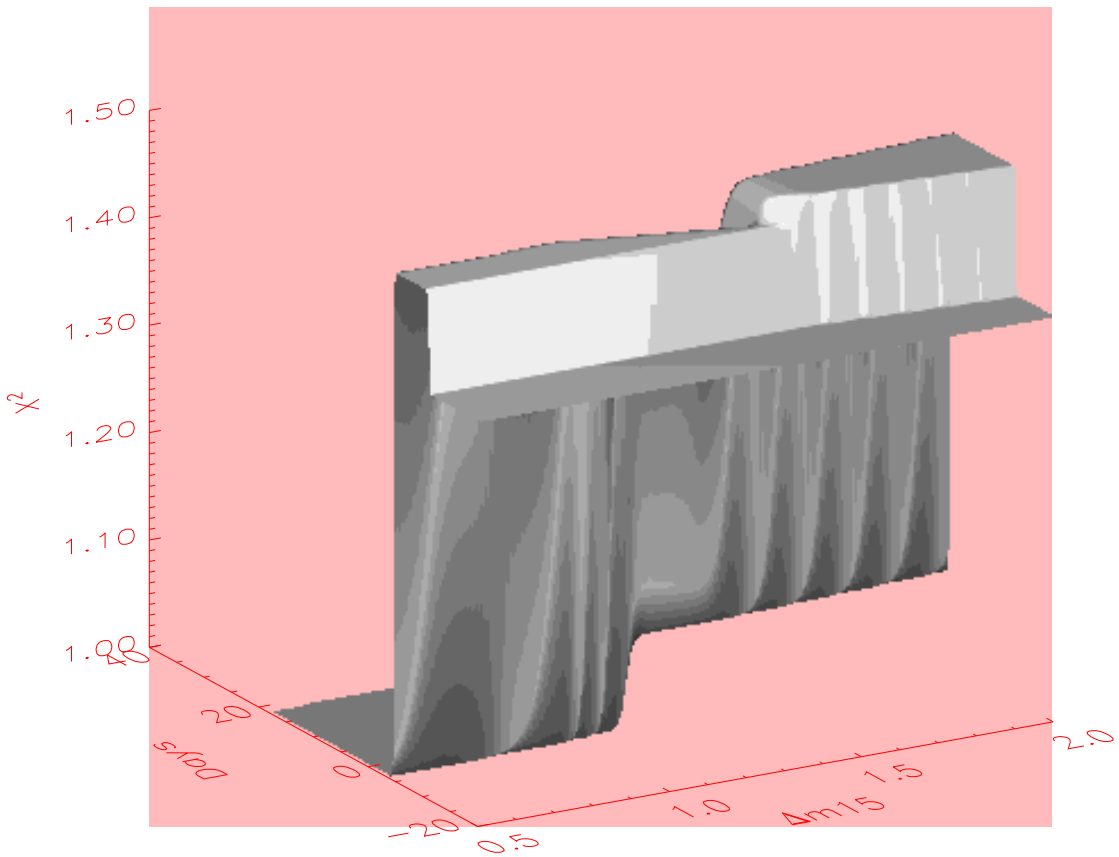

sn1981b.m00.dat.rect, z = 1.5200000
Calresi40_47_50_comb_bsub.ec_20A.fits Observed − Galaxy
Template Spectrum Av = 0.50000000
Galaxy: E.pl
SN/Gal = −1.86017
Mg II, I
[O II]
Ca II
15
10
5
0
−5
−10
6000
7000
8000
9000
10000

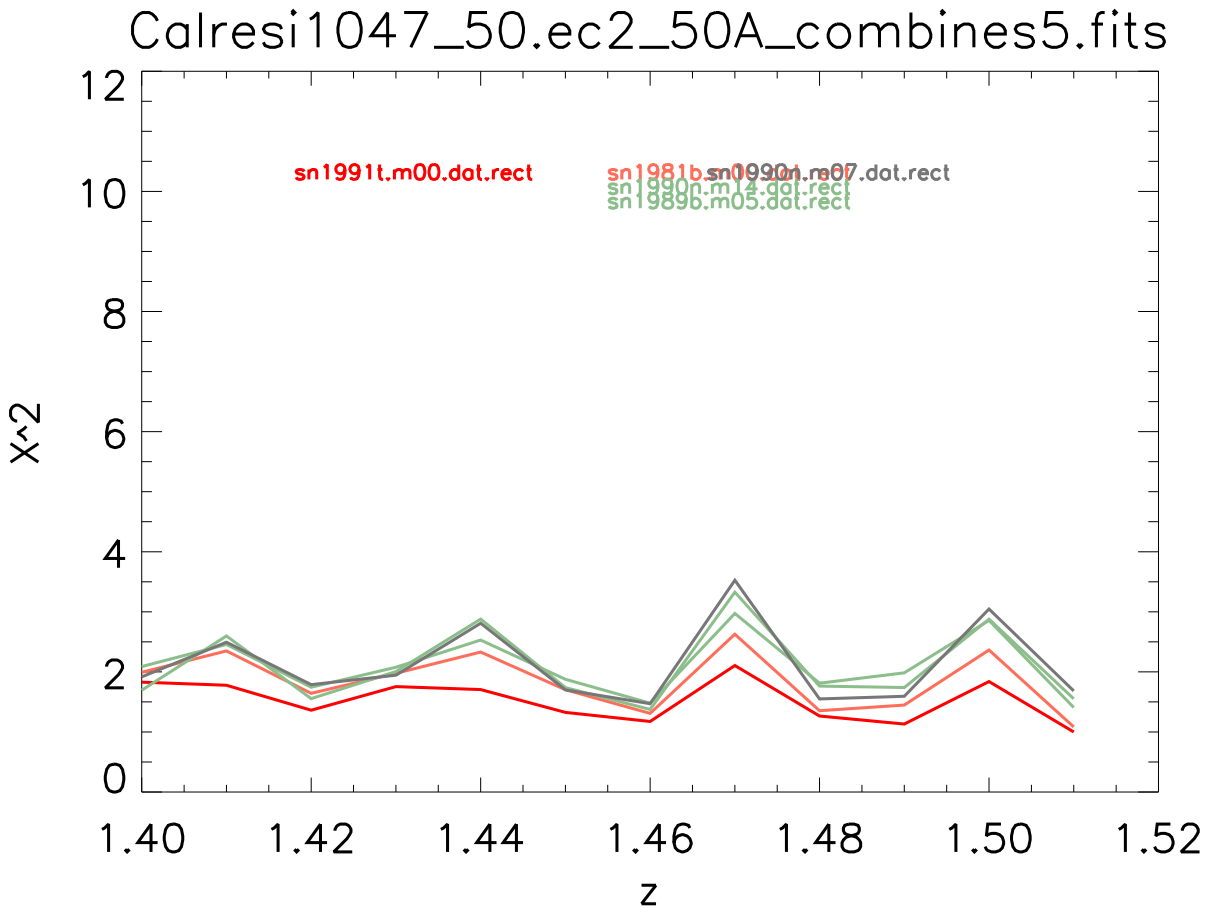
1.0 1.1

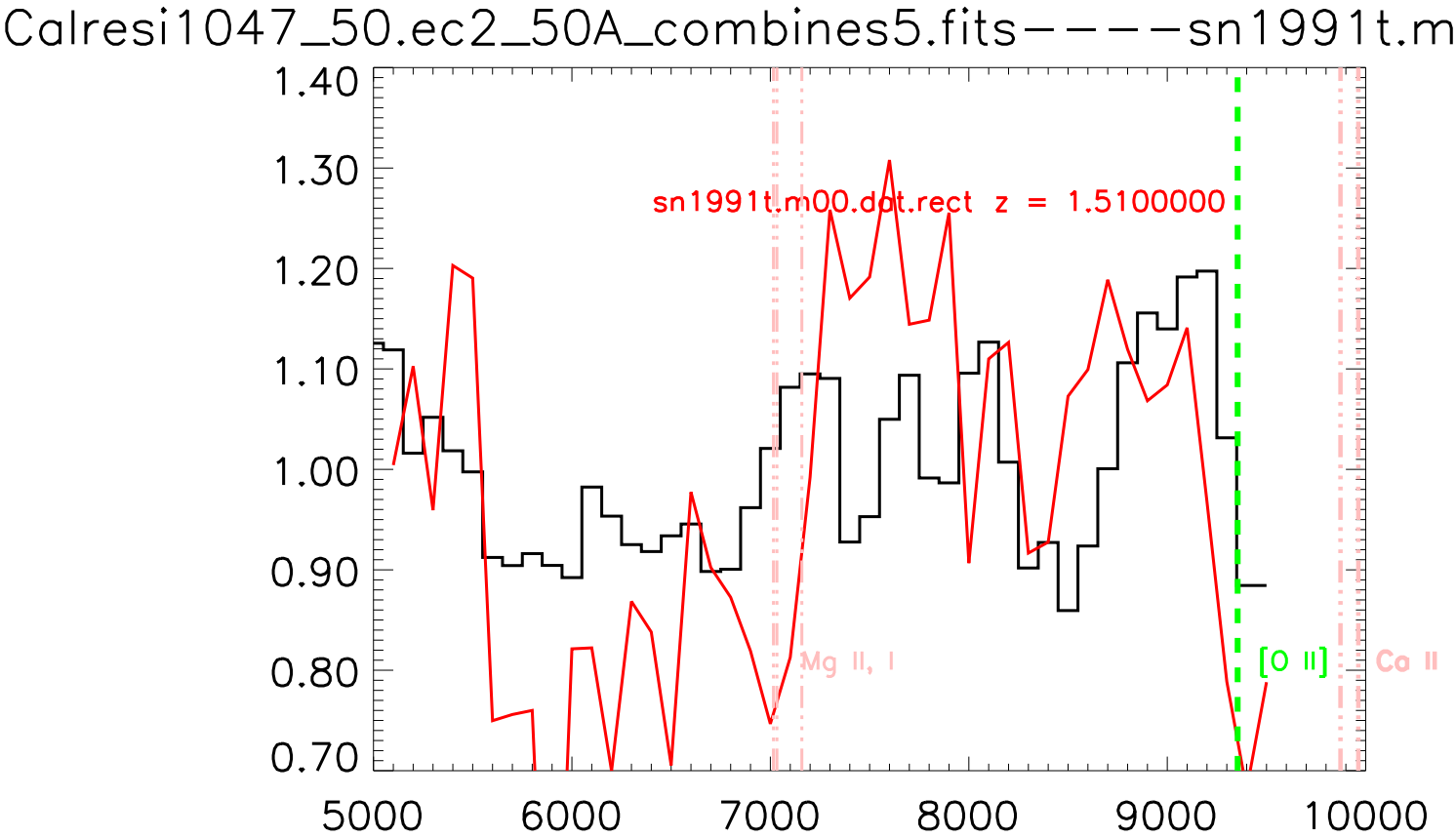
1.4 1.5

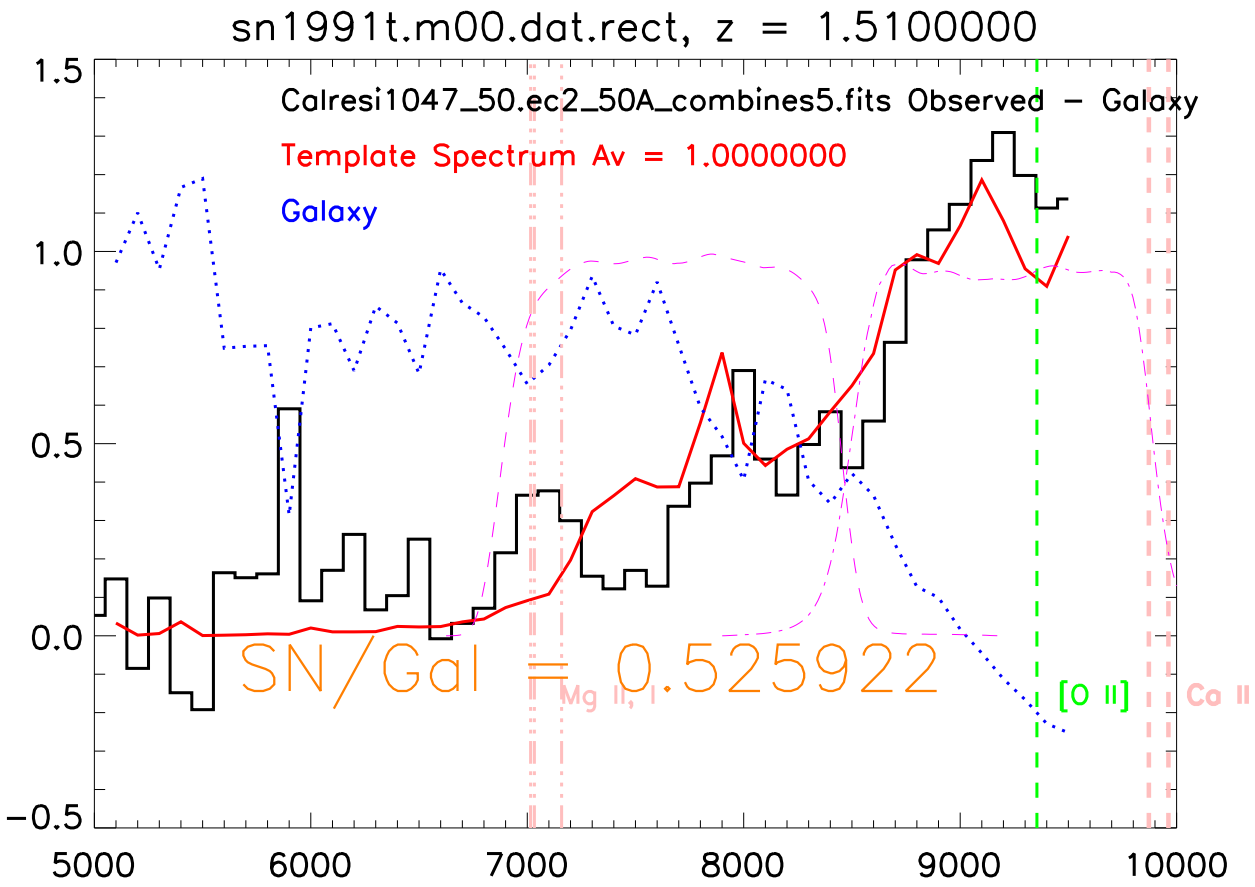
1.5

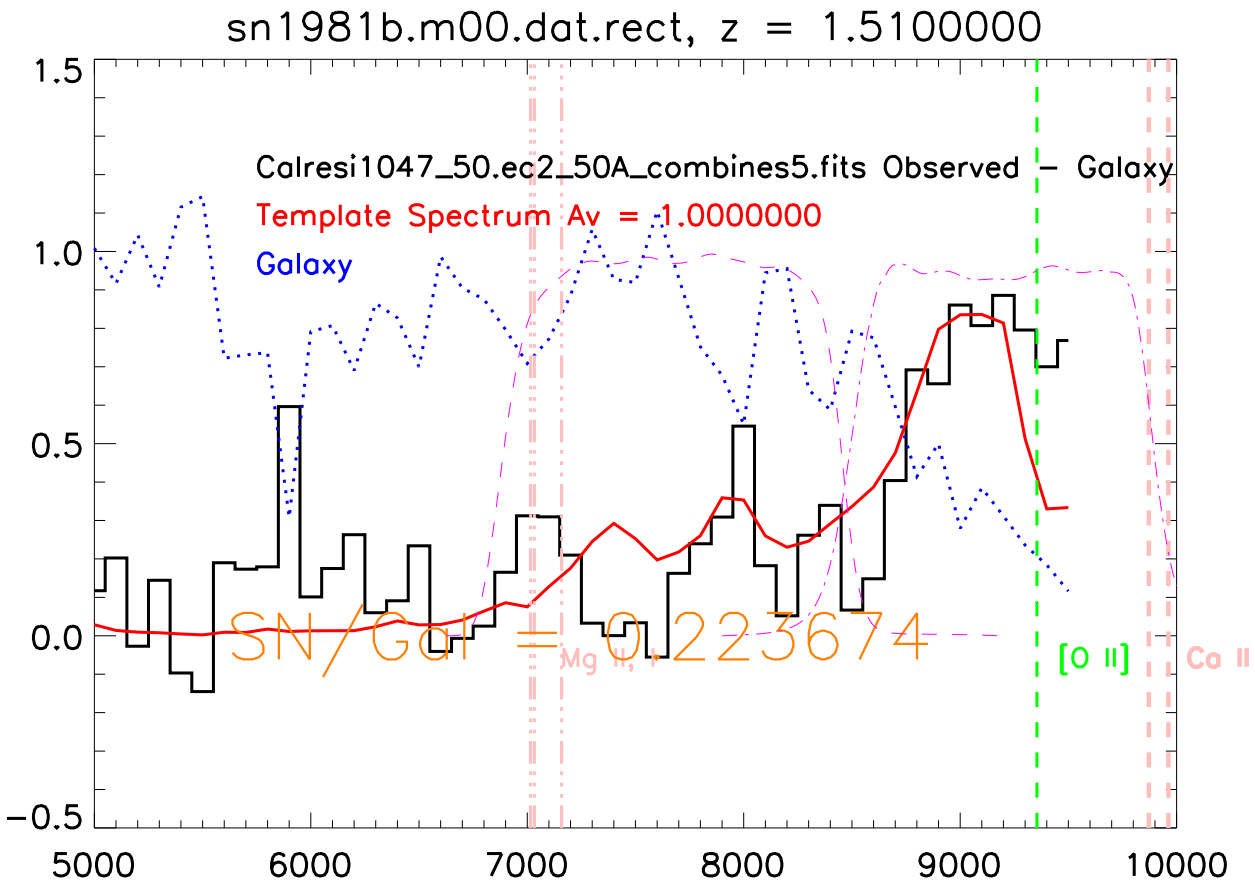
1.4

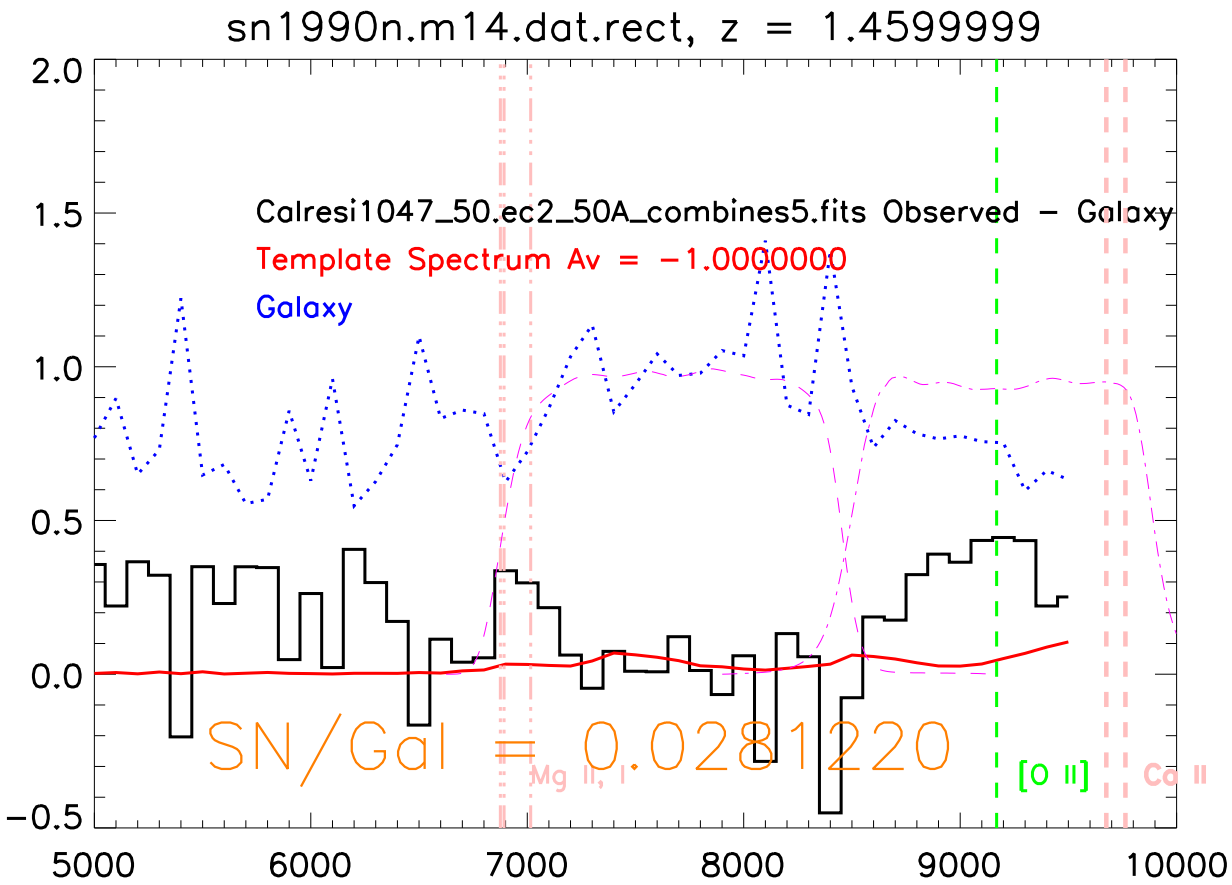

1.50
1.40
1.30
1.20
1.10
1.00
χ²
40
20
0
−20
Δm15
0.5
1.0
1.5
2.0

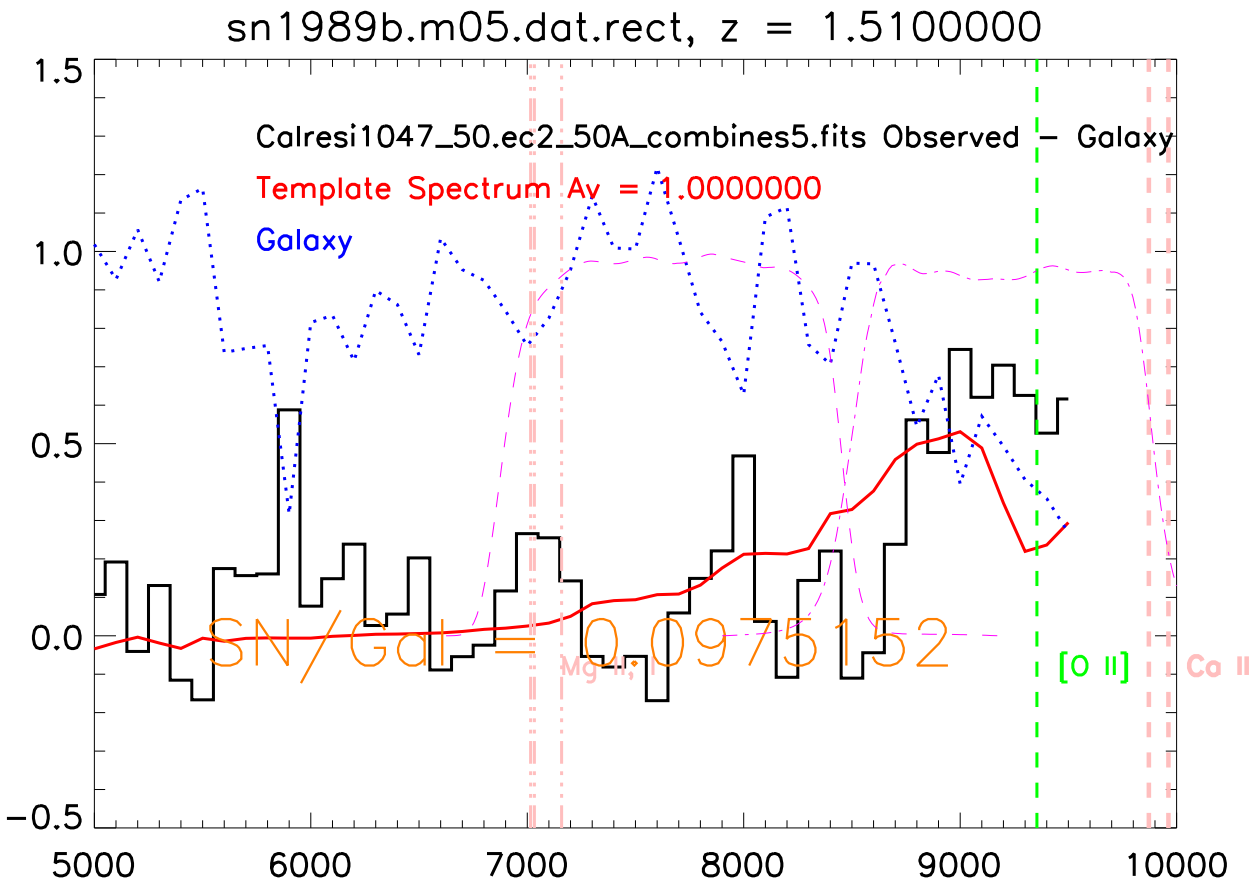

Calresi1047_50.ec2_50A_combines5.fits
sn1991t.m00.dat.rect
sn1981b.sn0990n.m07.dat.rect
sn1990n.m14.dat.rect
sn1989b.m05.dat.rect
X^2
z
0
2
4
6
8
10
12
1.40
1.42
1.44
1.46
1.48
1.50
1.52

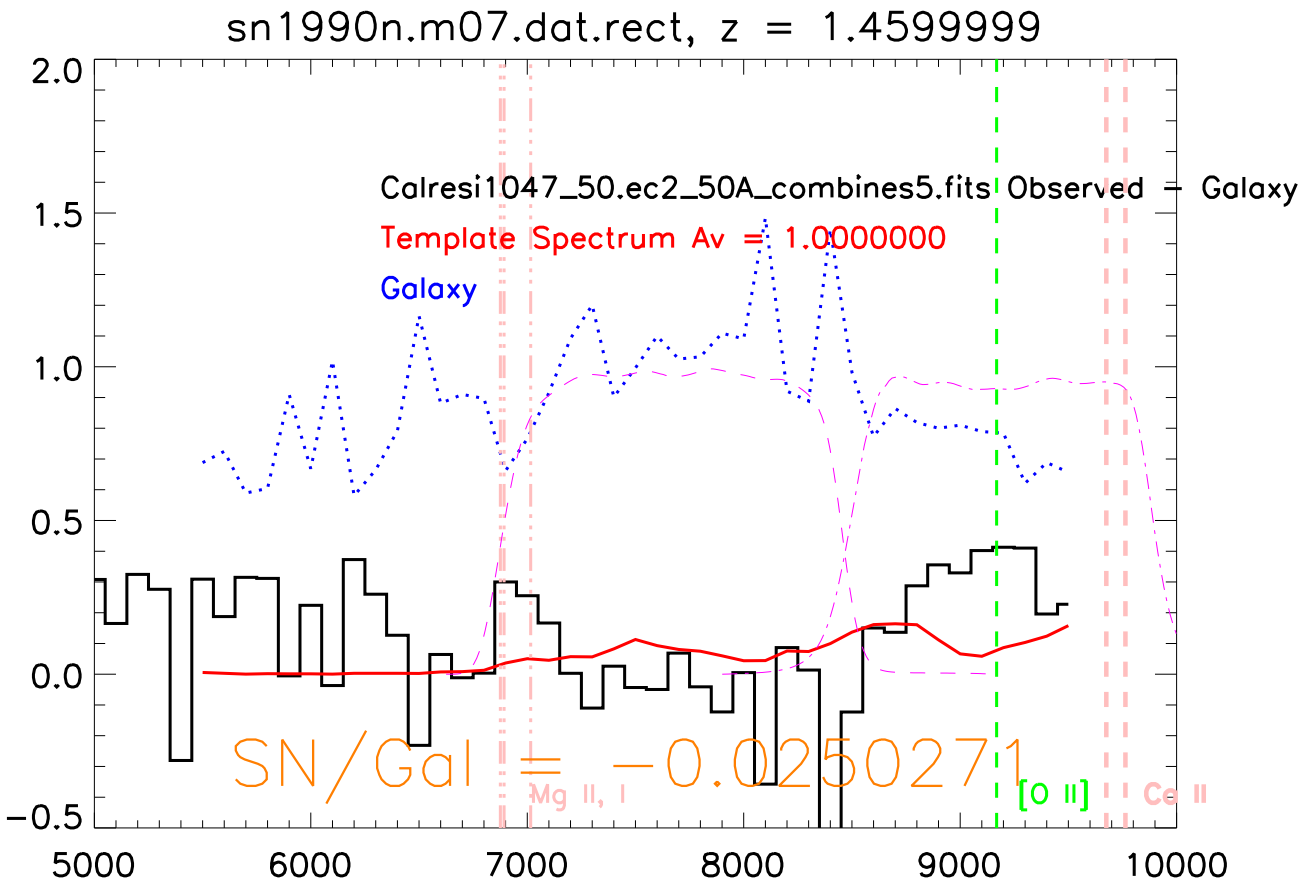

Calresi1047_50.ec2_50A_combines5.fits----sn1991t.m00.do
sn1991t.m00.dat.rect z = 1.5100000
Mg II, I
[O II]
Ca II
1.40
1.30
1.20
1.10
1.00
0.90
0.80
0.70
5000
6000
7000
8000
9000
10000

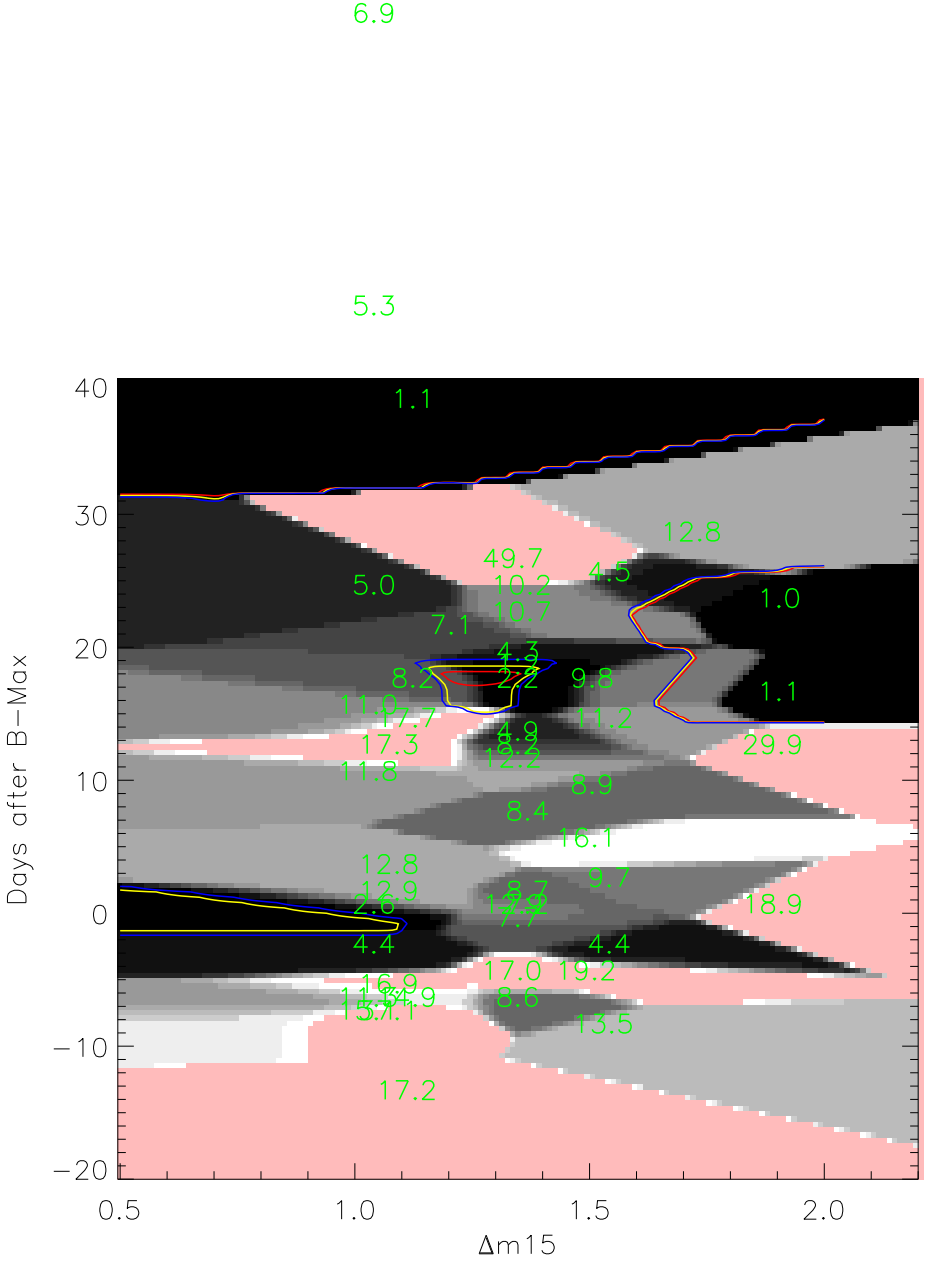

sn1991t.m00.dat.rect, z = 1.5100000
Calresi1047_50.ec2_50A_combines5.fits Observed − Galaxy
Template Spectrum Av = 1.0000000
Galaxy
SN/Gal = 0.525922
Mg II, I
[O II]
Ca II
1.5
1.0
0.5
0.0
−0.5
5000
6000
7000
8000
9000
10000

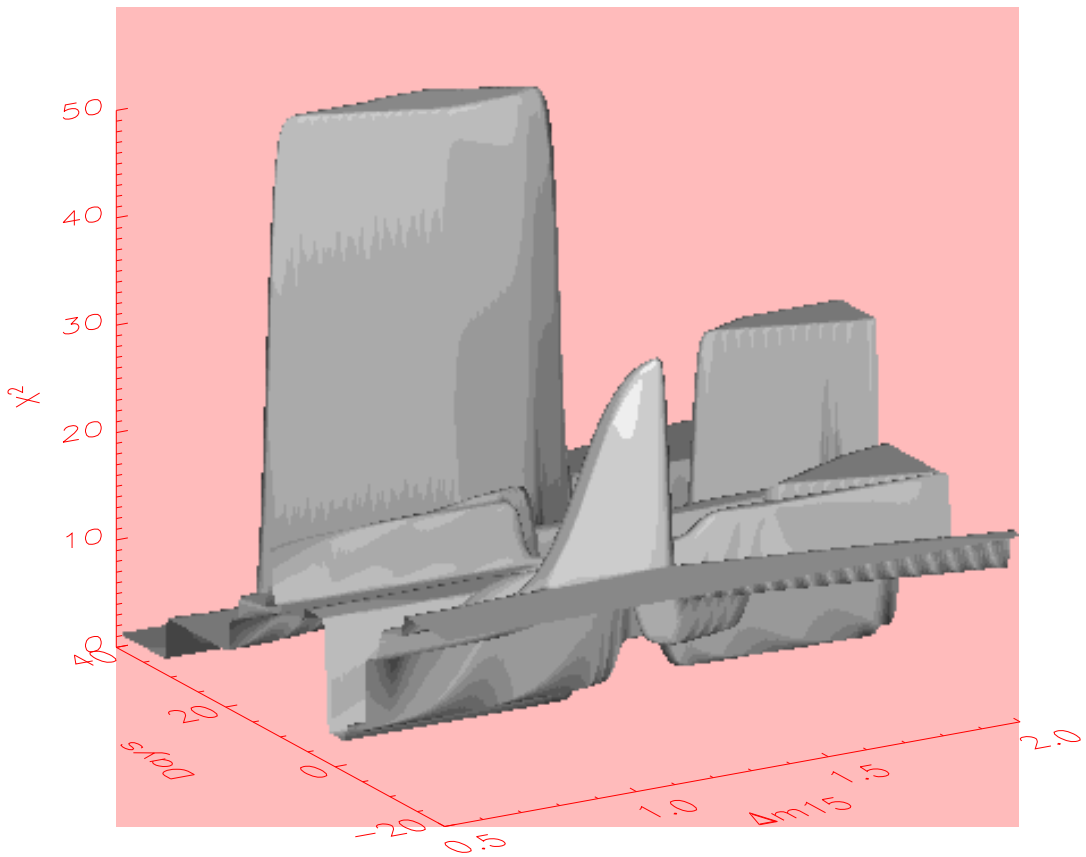

sn1981b.m00.dat.rect, z = 1.5100000
Calresi1047_50.ec2_50A_combines5.fits Observed – Galaxy
Template Spectrum Av = 1.0000000
Galaxy
SN/Gal = 0.223674
Mg II, 1
[O II]
Ca II
1.5
1.0
0.5
0.0
−0.5
5000
6000
7000
8000
9000
10000


sn1990n.m14.dat.rect, z = 1.4599999
Calresi1047_50.ec2_50A_combines5.fits Observed – Galaxy
Template Spectrum Av = −1.0000000
Galaxy
SN/Gal = 0.0281220
Mg II, I
[O II]
Ca II
2.0
1.5
1.0
0.5
0.0
−0.5
5000
6000
7000
8000
9000
10000

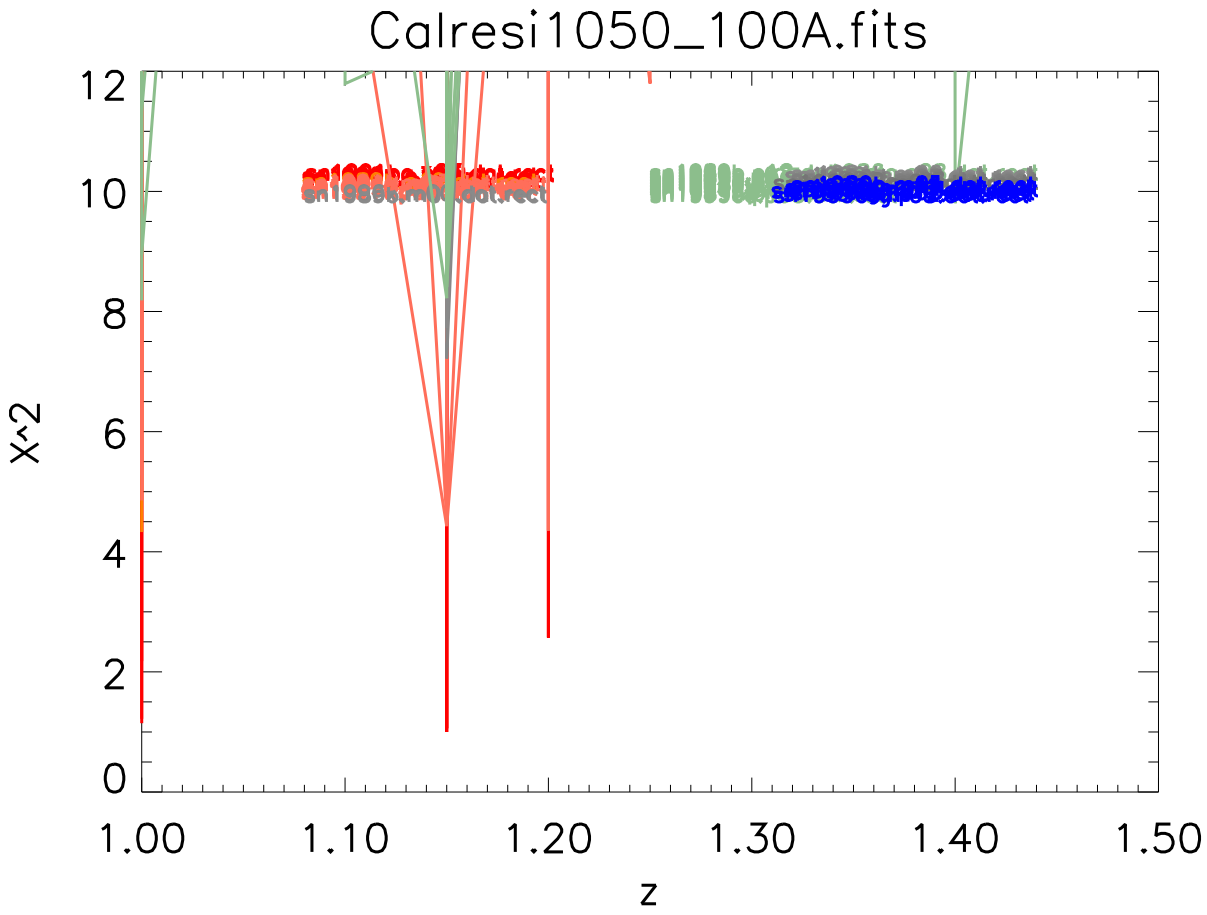

sn1989b.m05.dat.rect, z = 1.5100000
Calresi1047_50.ec2_50A_combines5.fits Observed – Galaxy
Template Spectrum Av = 1.0000000
Galaxy
SN/Gal = 0.0975152
[O II]
Ca II
1.5
1.0
0.5
0.0
−0.5
5000
6000
7000
8000
9000
10000

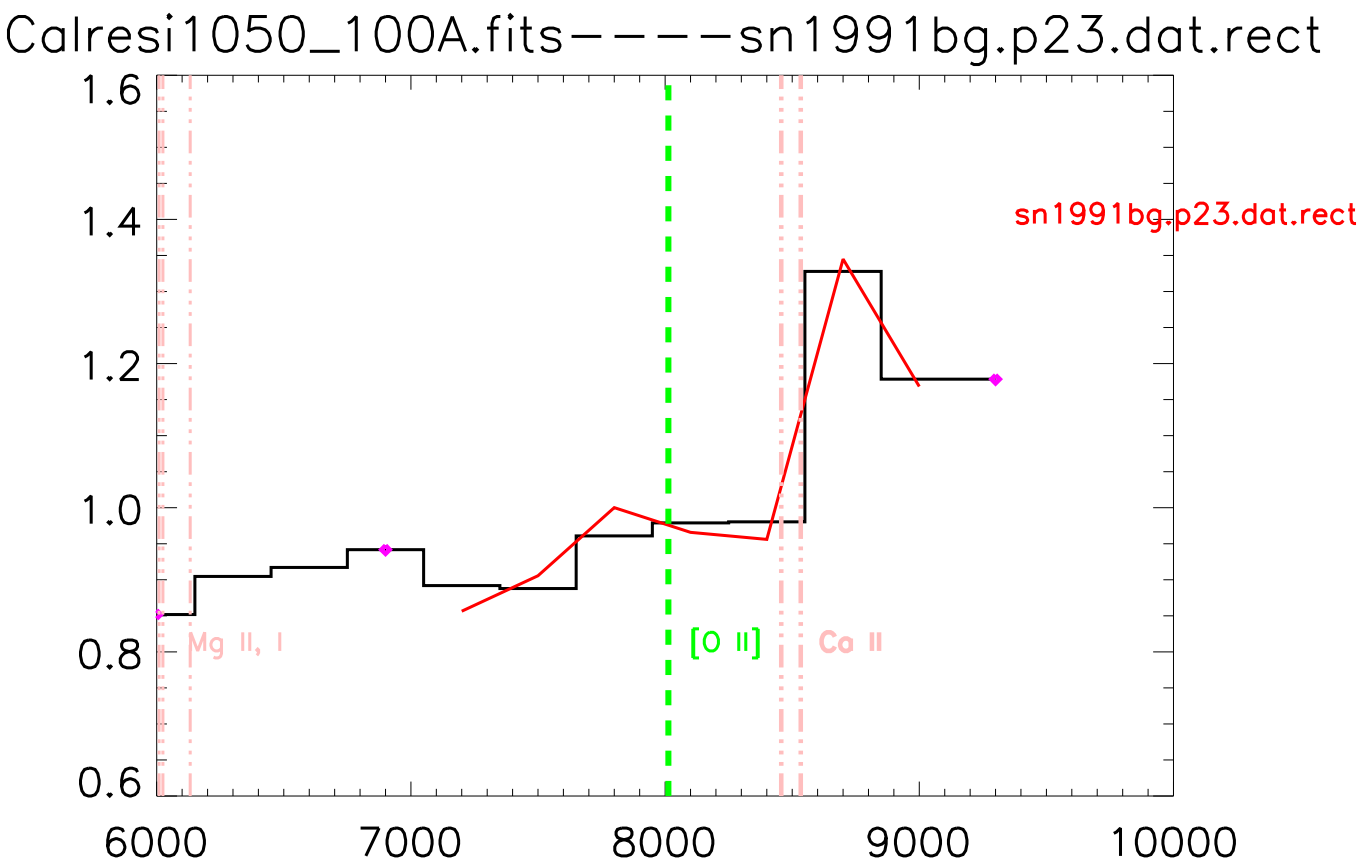

sn1990n.m07.dat.rect, z = 1.4599999
Calresi1047_50.ec2_50A_combines5.fits Observed - Galaxy
Template Spectrum Av = 1.0000000
Galaxy
SN/Gal = -0.0250271
Mg II, I
[O II]
Ca II
2.0
1.5
1.0
0.5
0.0
-0.5
5000
6000
7000
8000
9000
10000

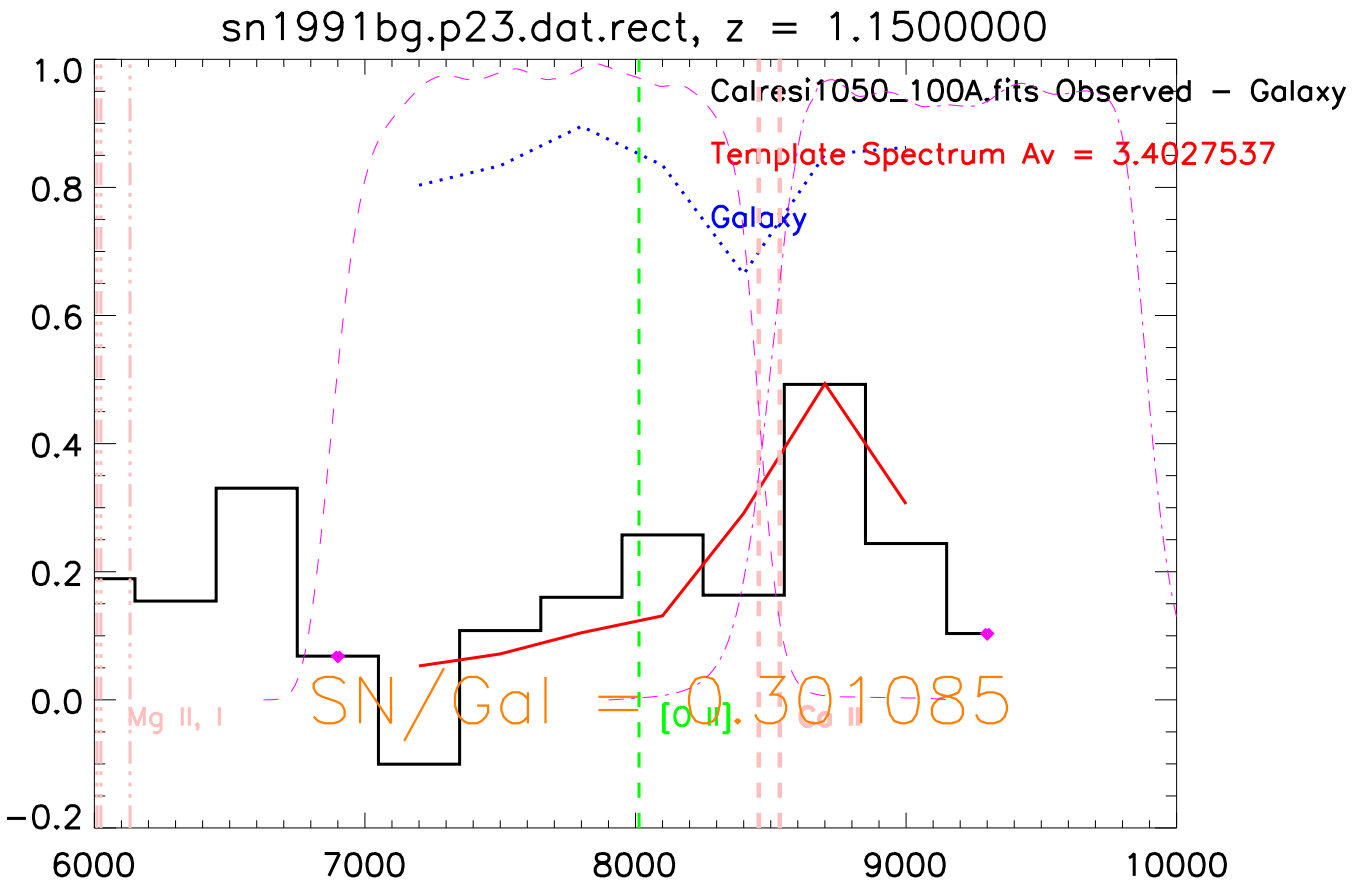

6.9
5.3
1.1
12.8
49.7
4.5
5.0
10.2
1.0
10.7
7.1
4.3
8.2
9.8
1.1
11.2
17.3
29.9
11.8
8.9
8.4
16.1
12.8
9.7
18.9
4.4
4.4
17.0
19.2
8.6
13.5
17.2
40
30
20
10
0
−10
−20
0.5
1.0
1.5
2.0
Days after B−Max
Δm15

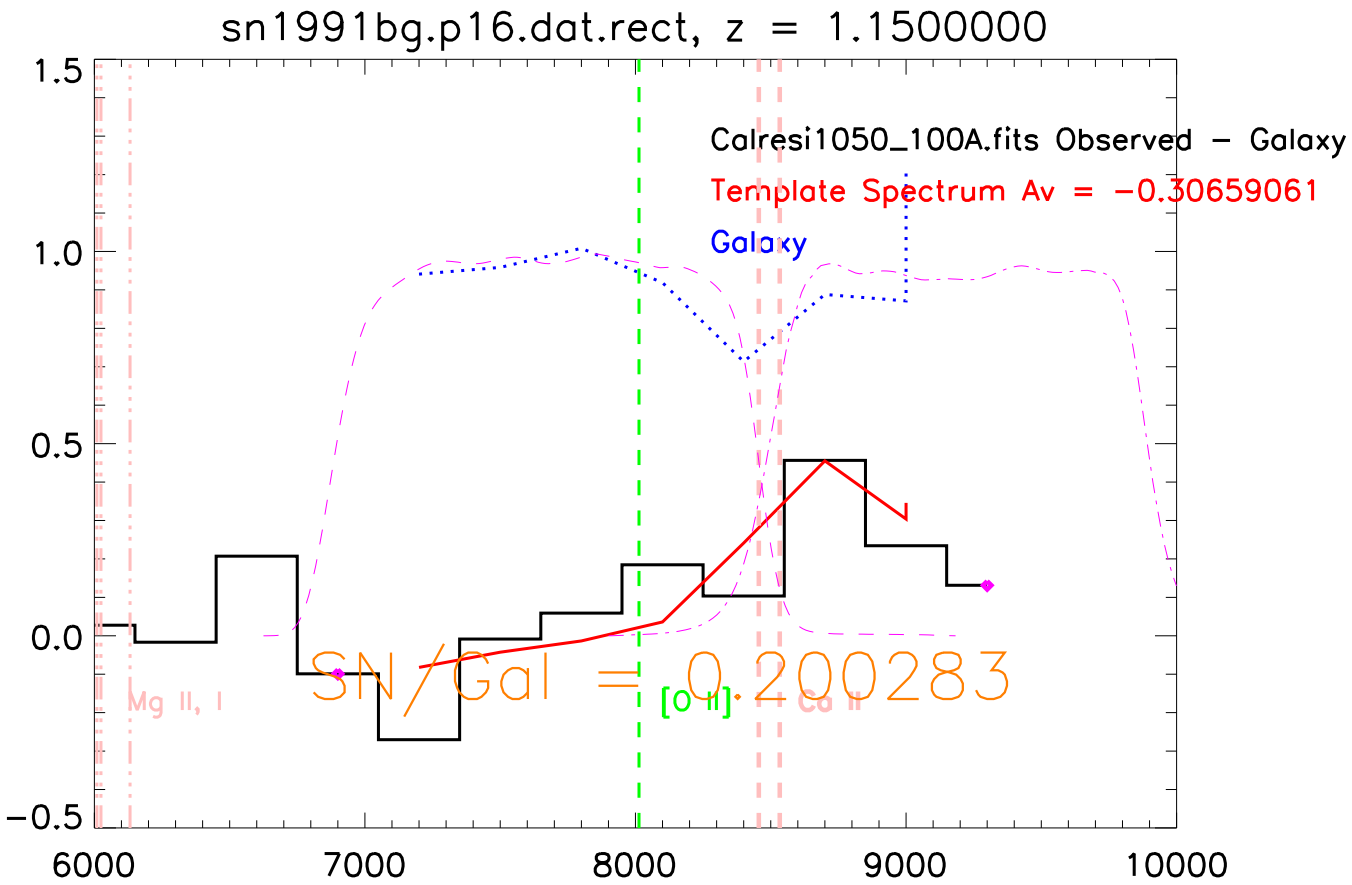


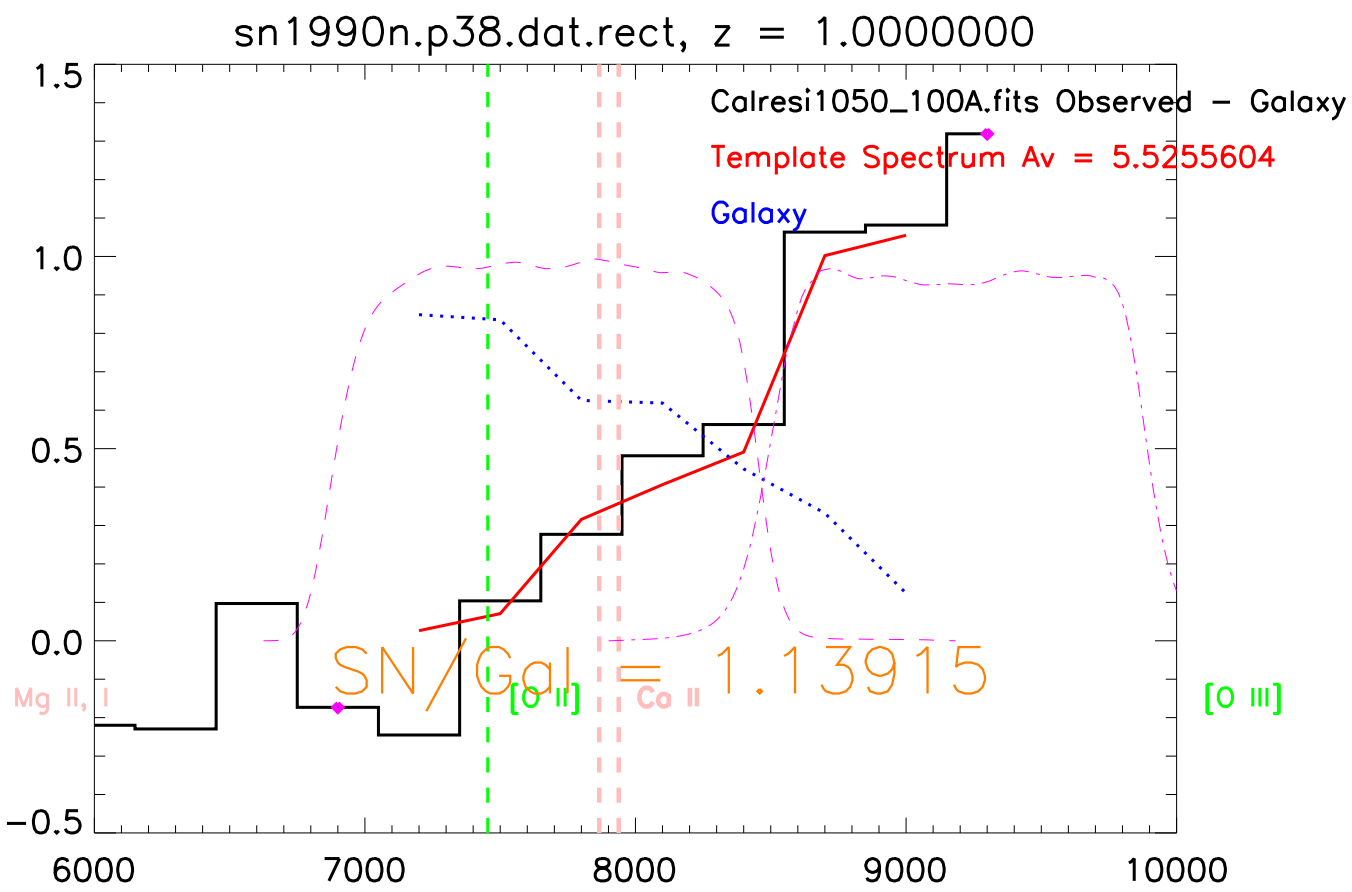
50
40
30
20
10
0
χ^2
40
20
0
−20
Days
0.5
1.0
1.5
2.0
Δm15

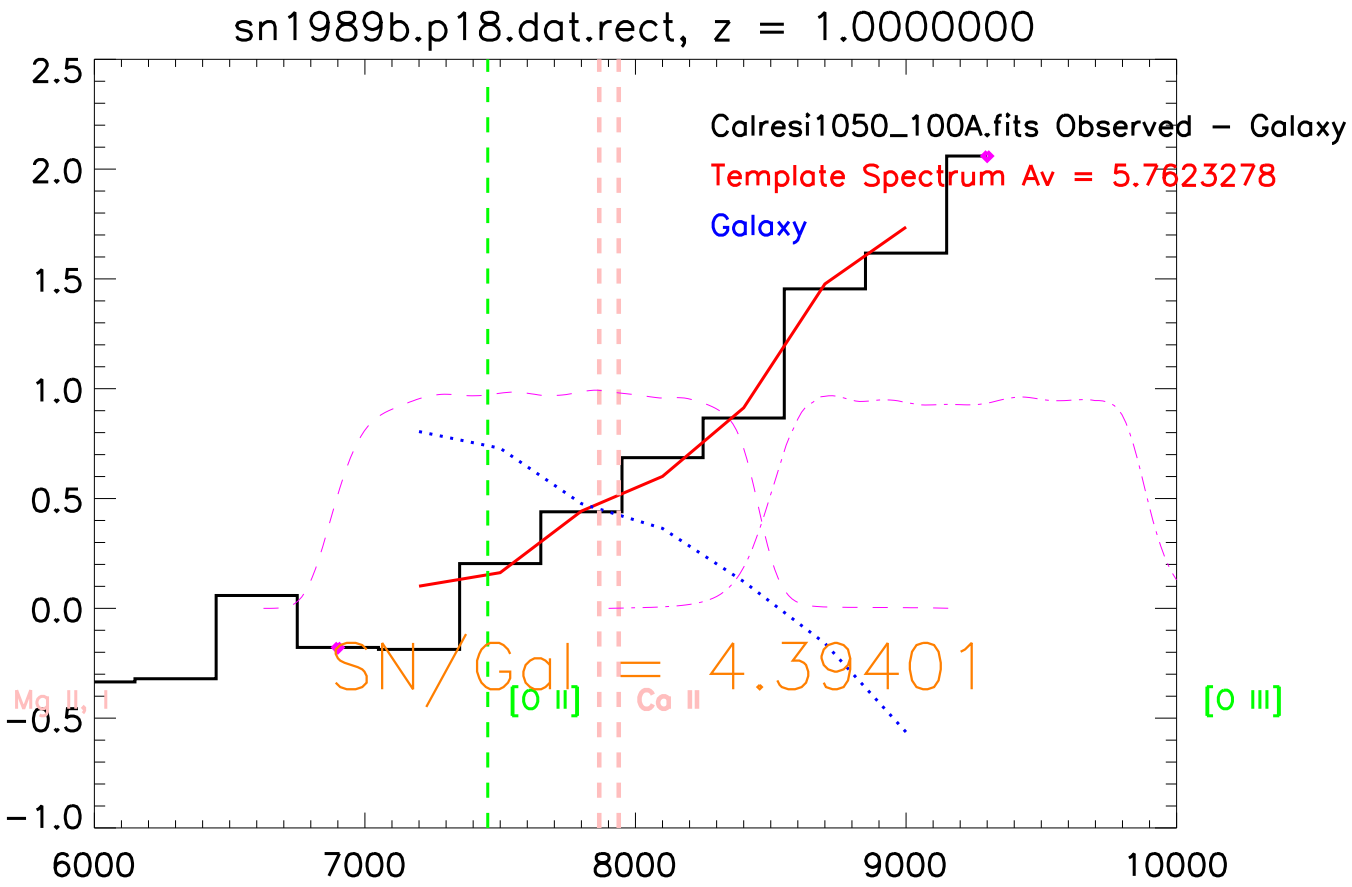

Calresi1050_100A.fits
X^2
z
0
2
4
6
8
10
12
1.00
1.10
1.20
1.30
1.40
1.50

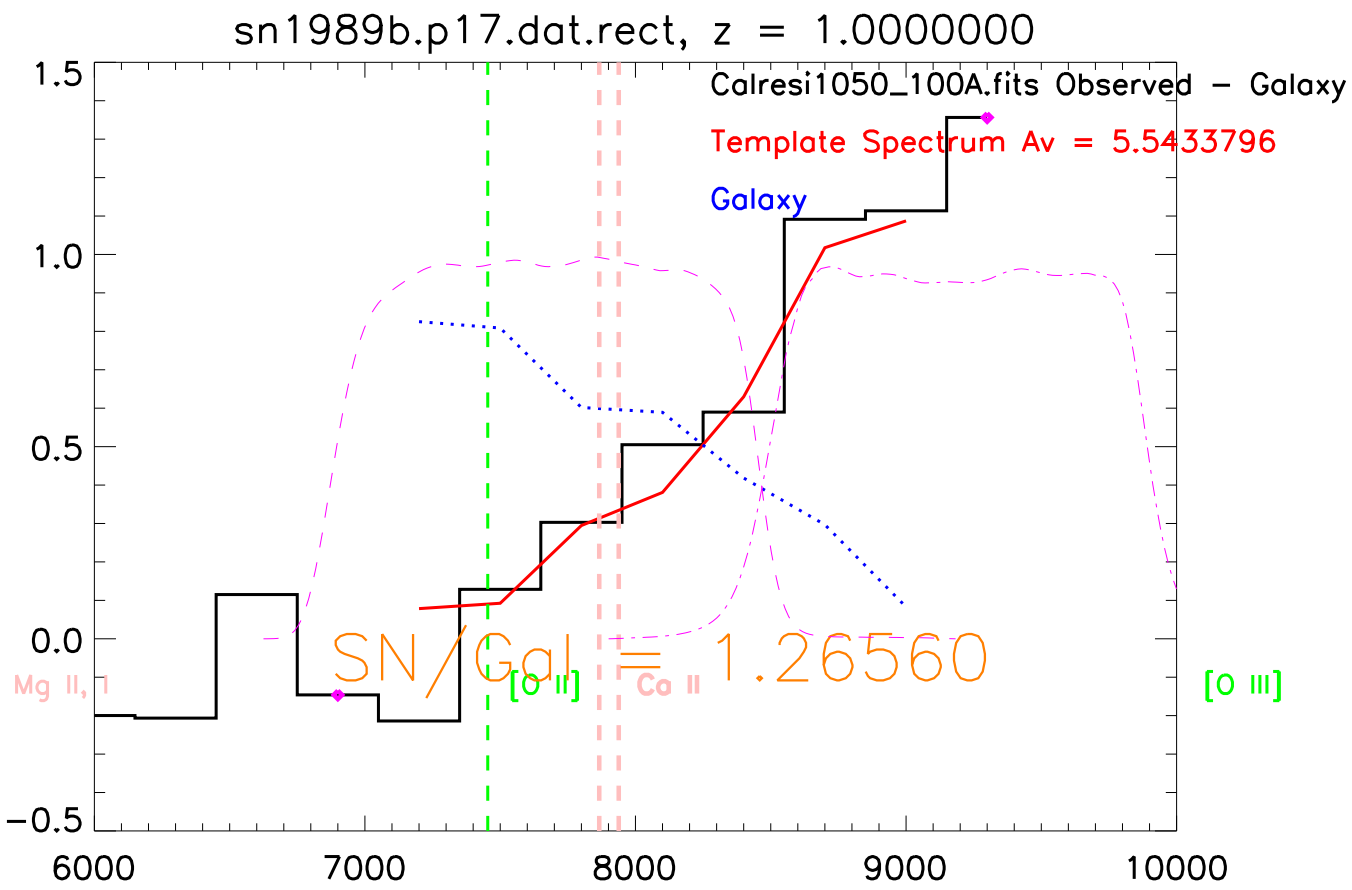

Calresi1050_100A.fits----sn1991bg.p23.dat.rect
sn1991bg.p23.dat.rect
Mg II, I
[O II]
Ca II
1.6
1.4
1.2
1.0
0.8
0.6
6000
7000
8000
9000
10000

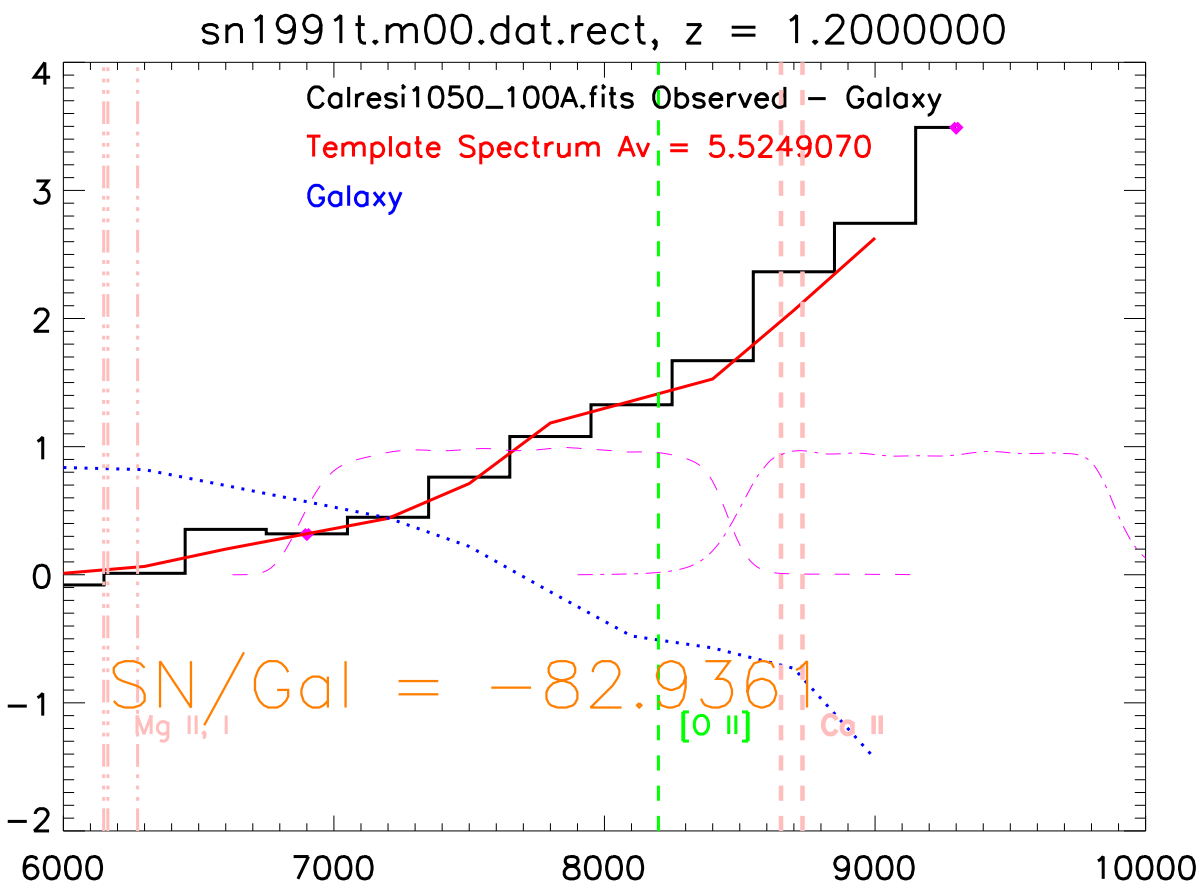

sn1991bg.p23.dat.rect, z = 1.1500000
Calresi1050_100A.fits Observed − Galaxy
Template Spectrum Av = 3.4027537
Galaxy
SN/Gal = 0.301085
Mg II, I
[O II]
Ca II
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
6000
7000
8000
9000
10000

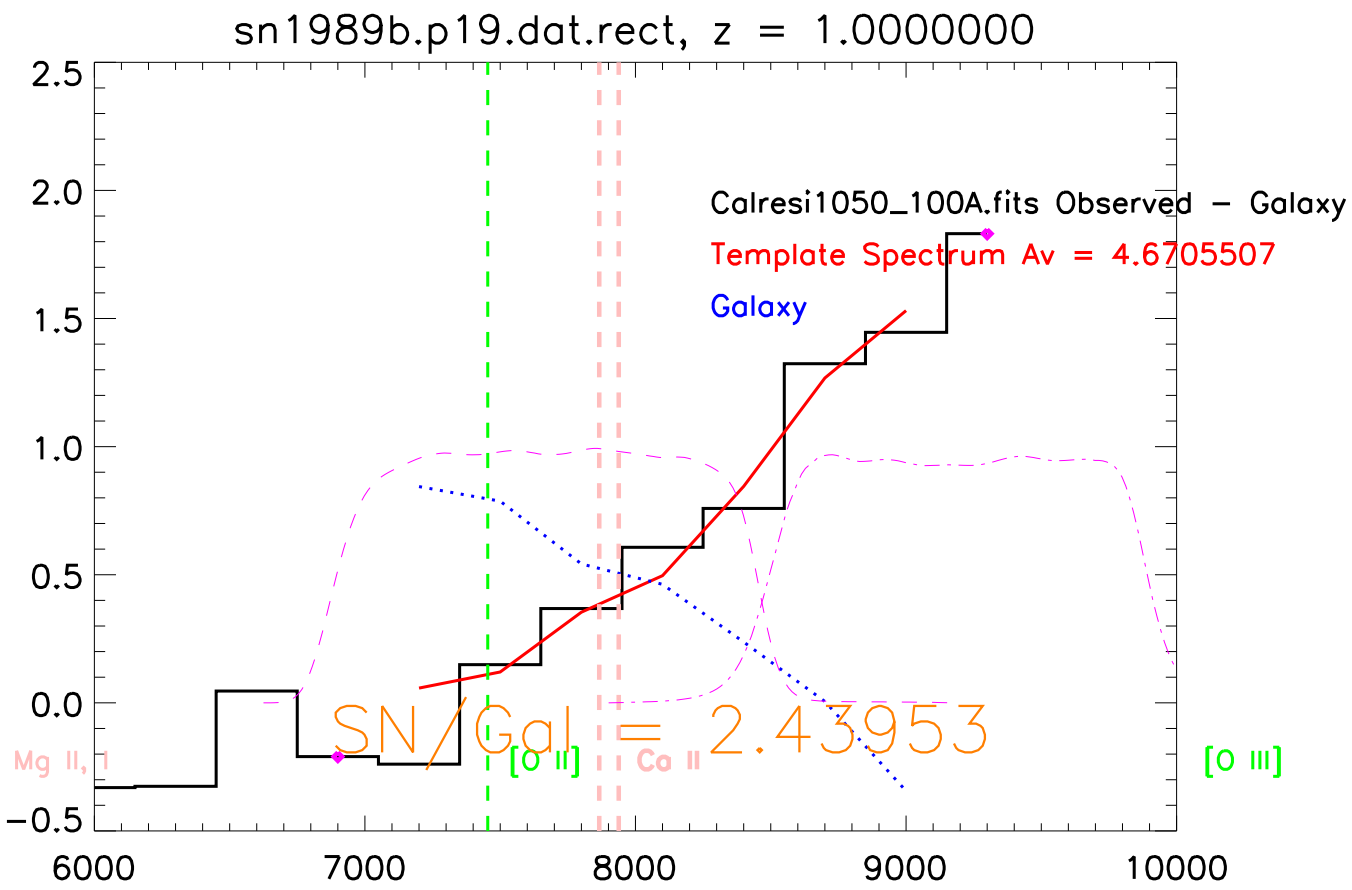

sn1991bg.p16.dat.rect, z = 1.1500000
Calresi1050_100A.fits Observed − Galaxy
Template Spectrum Av = −0.30659061
Galaxy
SN/Gal = 0.200283
Mg II, I
[O II]
Ca II
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

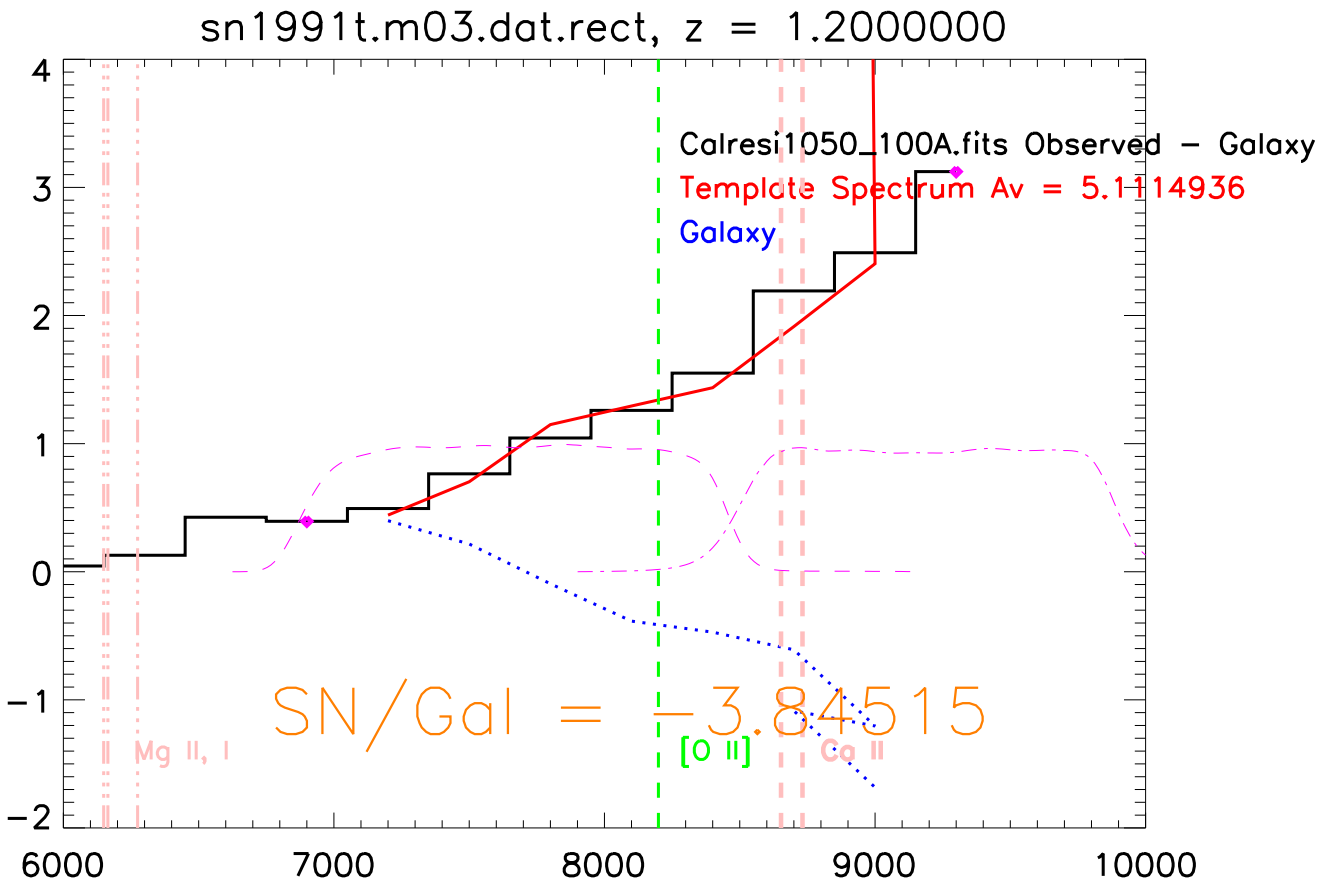

sn1990n.p38.dat.rect, z = 1.0000000
Calresi1050_100A.fits Observed − Galaxy
Template Spectrum Av = 5.5255604
Galaxy
SN/Gal = 1.13915
Mg II, I
[O II]
Ca II
[O III]
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

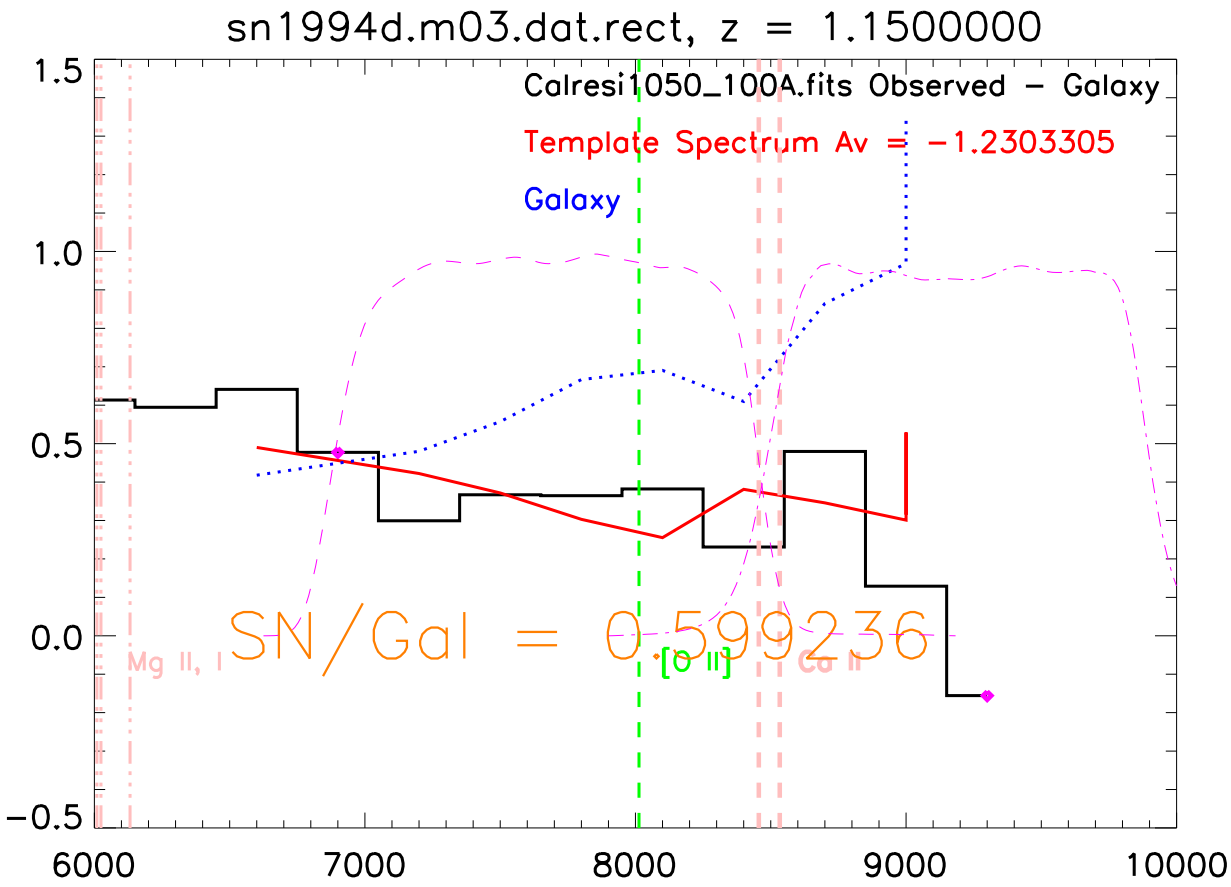

sn1989b.p18.dat.rect, z = 1.0000000
Calresi1050_100A.fits Observed − Galaxy
Template Spectrum Av = 5.7623278
Galaxy
SN/Gal = 4.39401
Mg II
[O II]
Ca II
[O III]
2.5
2.0
1.5
1.0
0.5
0.0
−0.5
−1.0
6000
7000
8000
9000
10000

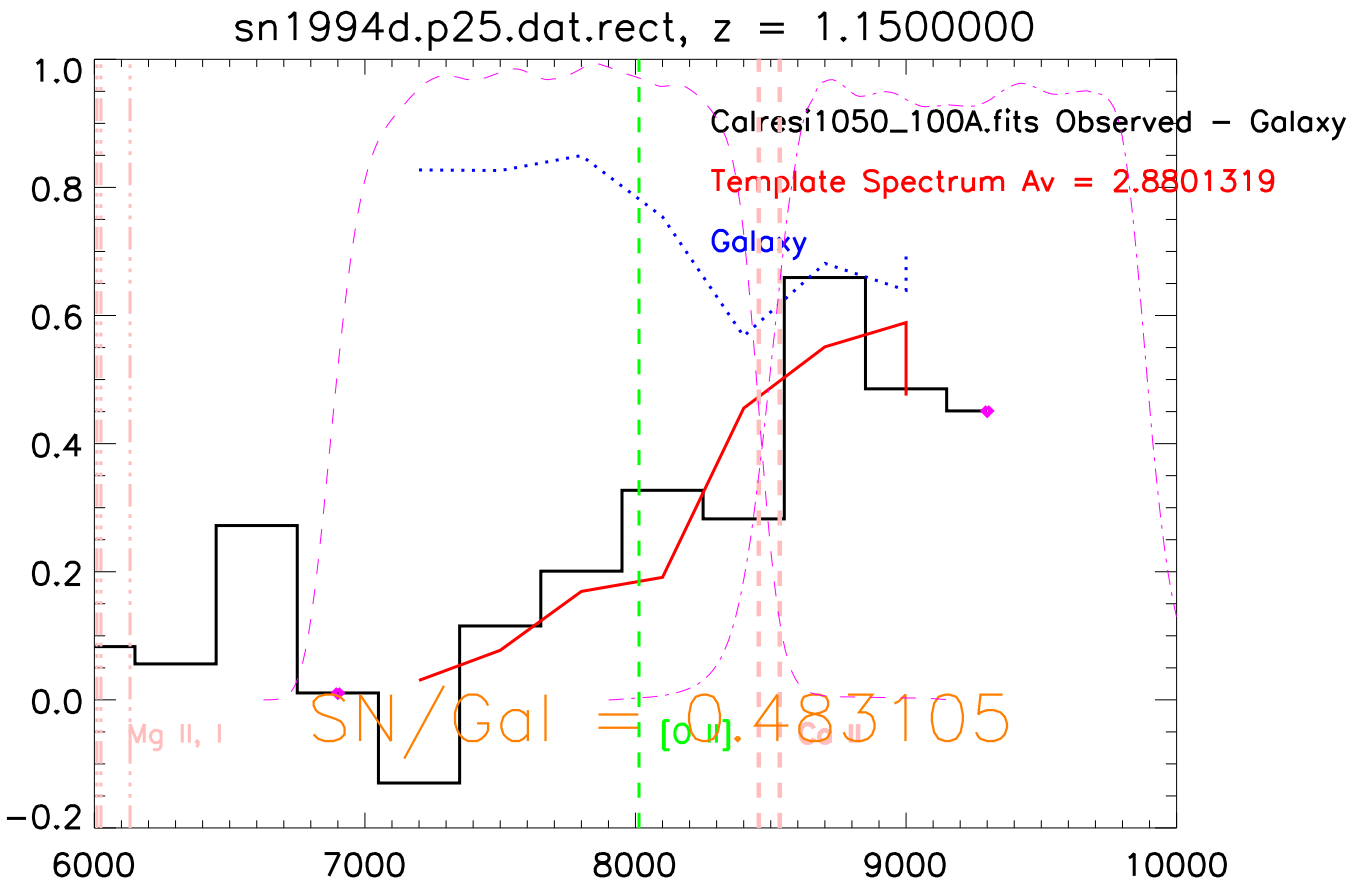

sn1989b.p17.dat.rect, z = 1.0000000
Calresi1050_100A.fits Observed − Galaxy
Template Spectrum Av = 5.5433796
Galaxy
SN/Gal = 1.26560
Mg II, 1
[O II]
Ca II
[O III]
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

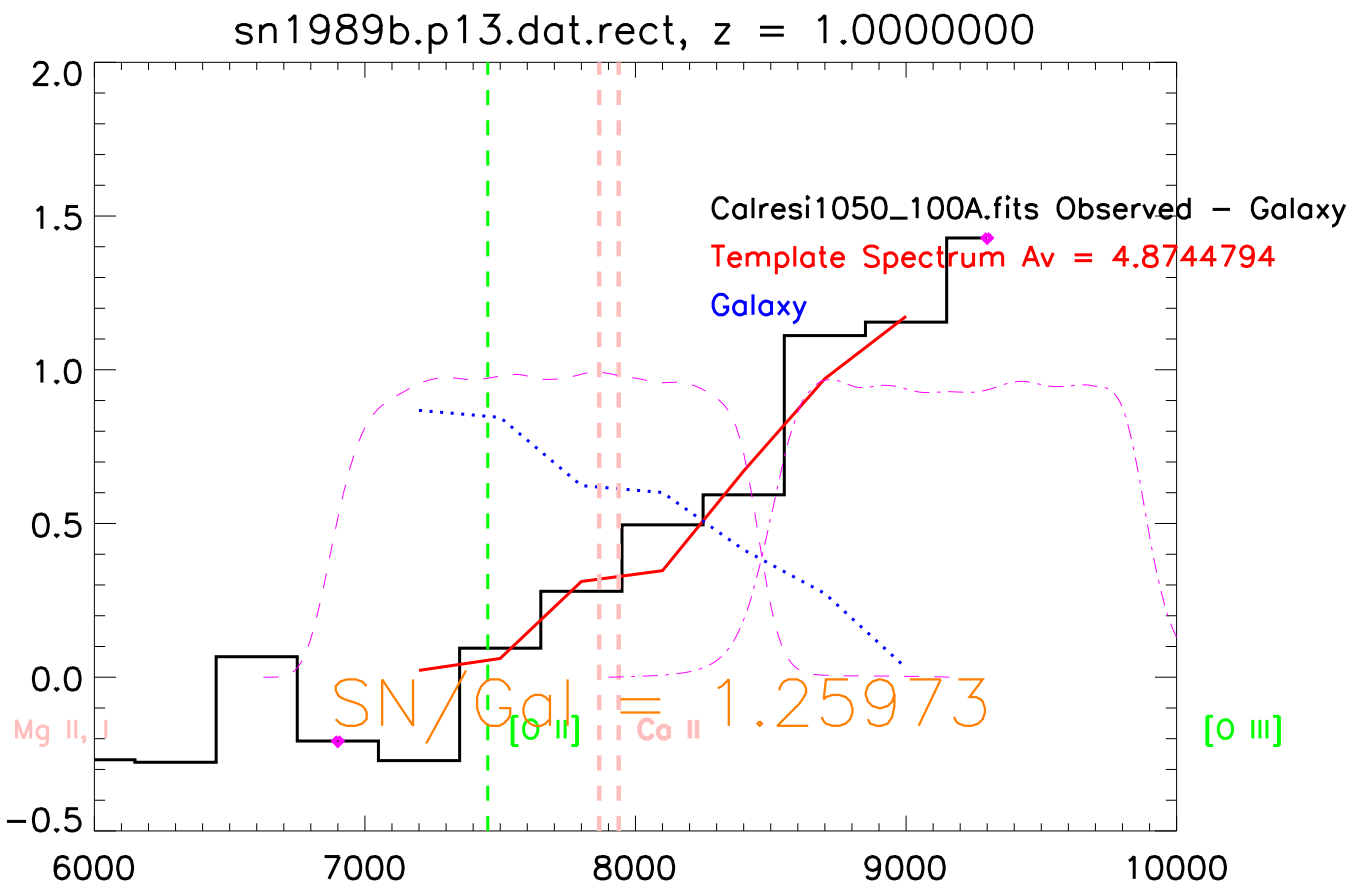

sn1991t.m00.dat.rect, z = 1.2000000
Calresi1050_100A.fits Observed − Galaxy
Template Spectrum Av = 5.5249070
Galaxy
SN/Gal = −82.9361
Mg II, I
[O II]
Ca II
4
3
2
1
0
−1
−2
6000
7000
8000
9000
10000

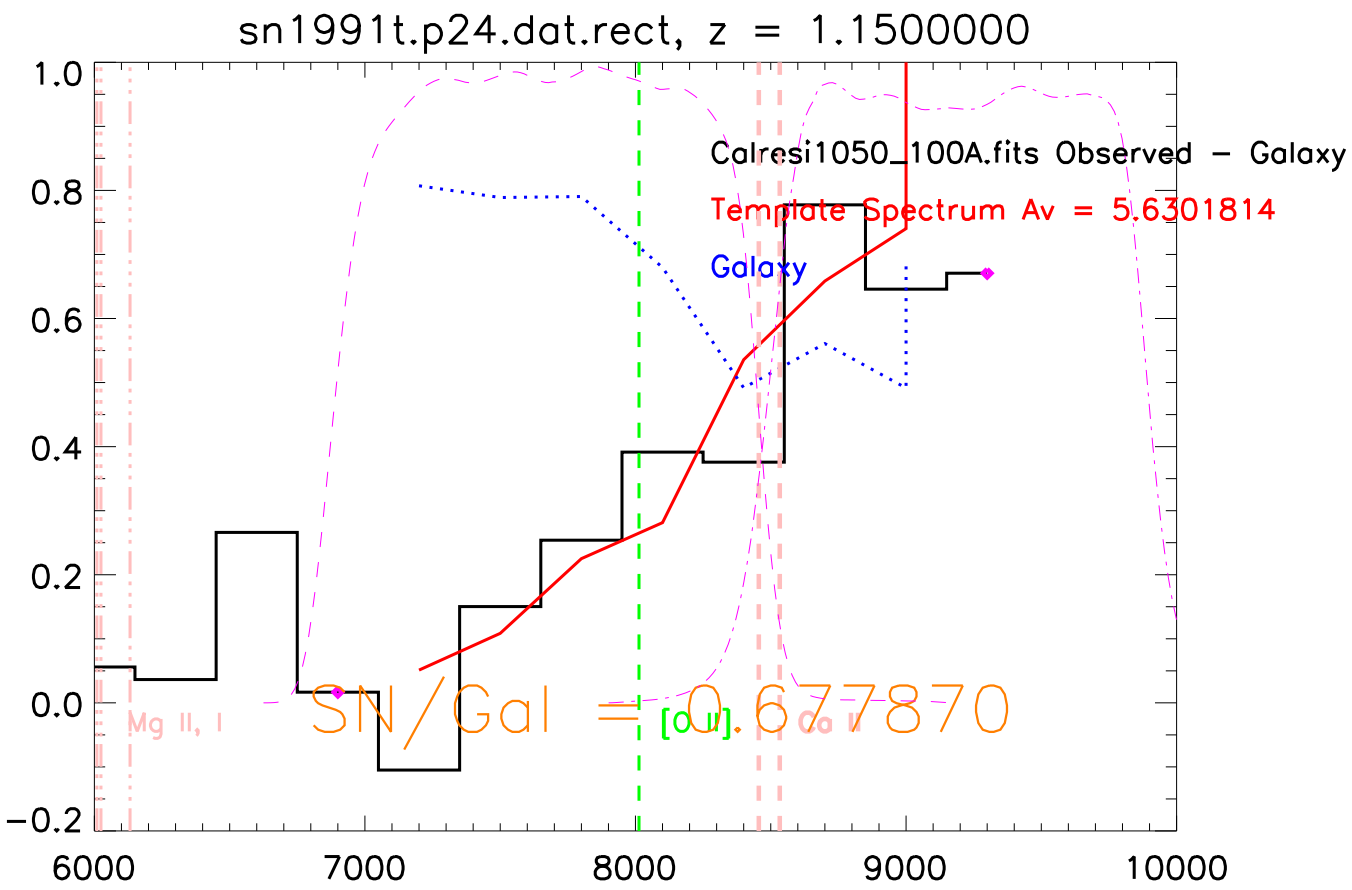

sn1989b.p19.dat.rect, z = 1.0000000
Calresi1050_100A.fits Observed – Galaxy
Template Spectrum Av = 4.6705507
Galaxy
SN/Gal = 2.43953
Mg II,]
[O II]
Ca II
[O III]
2.5
2.0
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

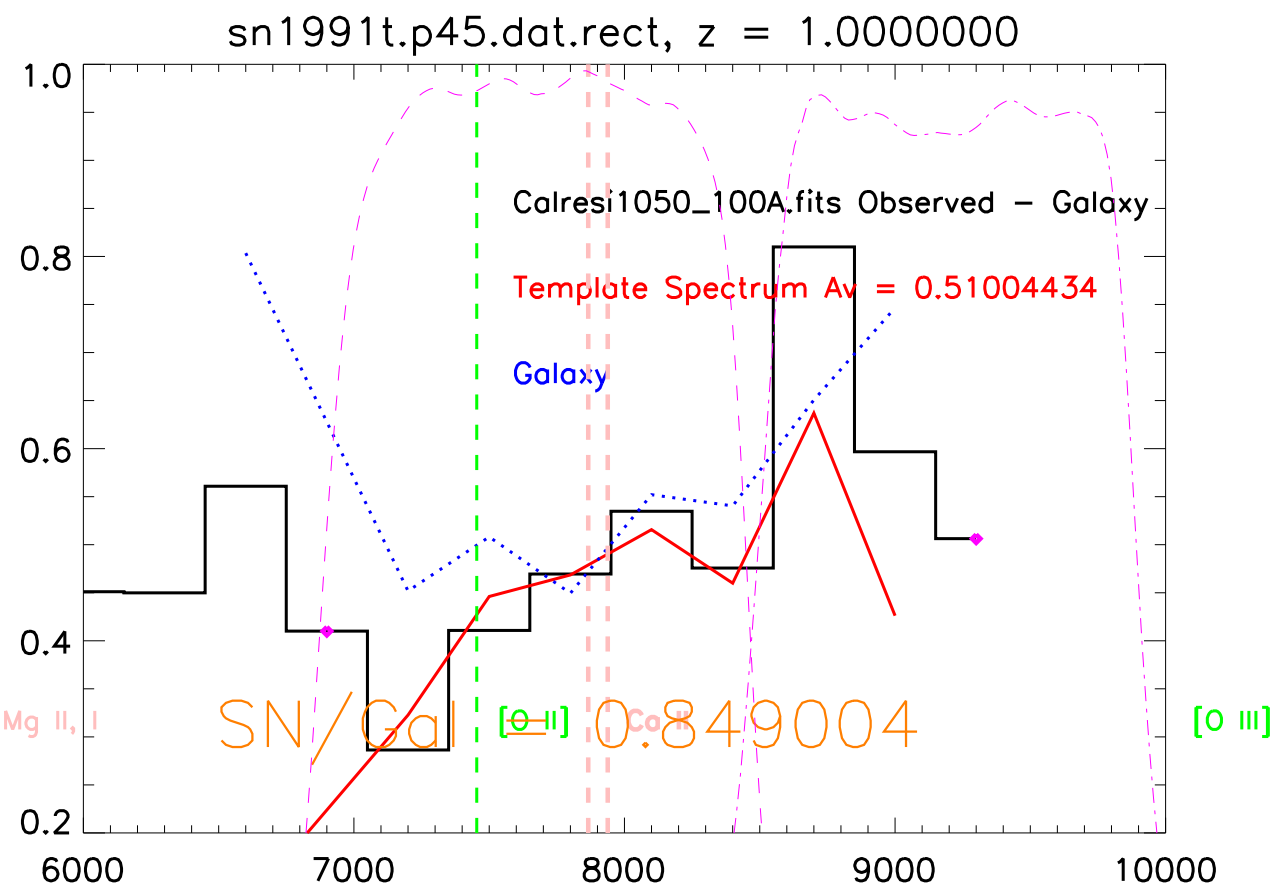

sn1991t.m03.dat.rect, z = 1.2000000
Calresi1050_100A.fits Observed − Galaxy
Template Spectrum Av = 5.1114936
Galaxy
SN/Gal = −3.84515
Mg II, I
[O II]
Ca II
4
3
2
1
0
−1
−2
6000
7000
8000
9000
10000

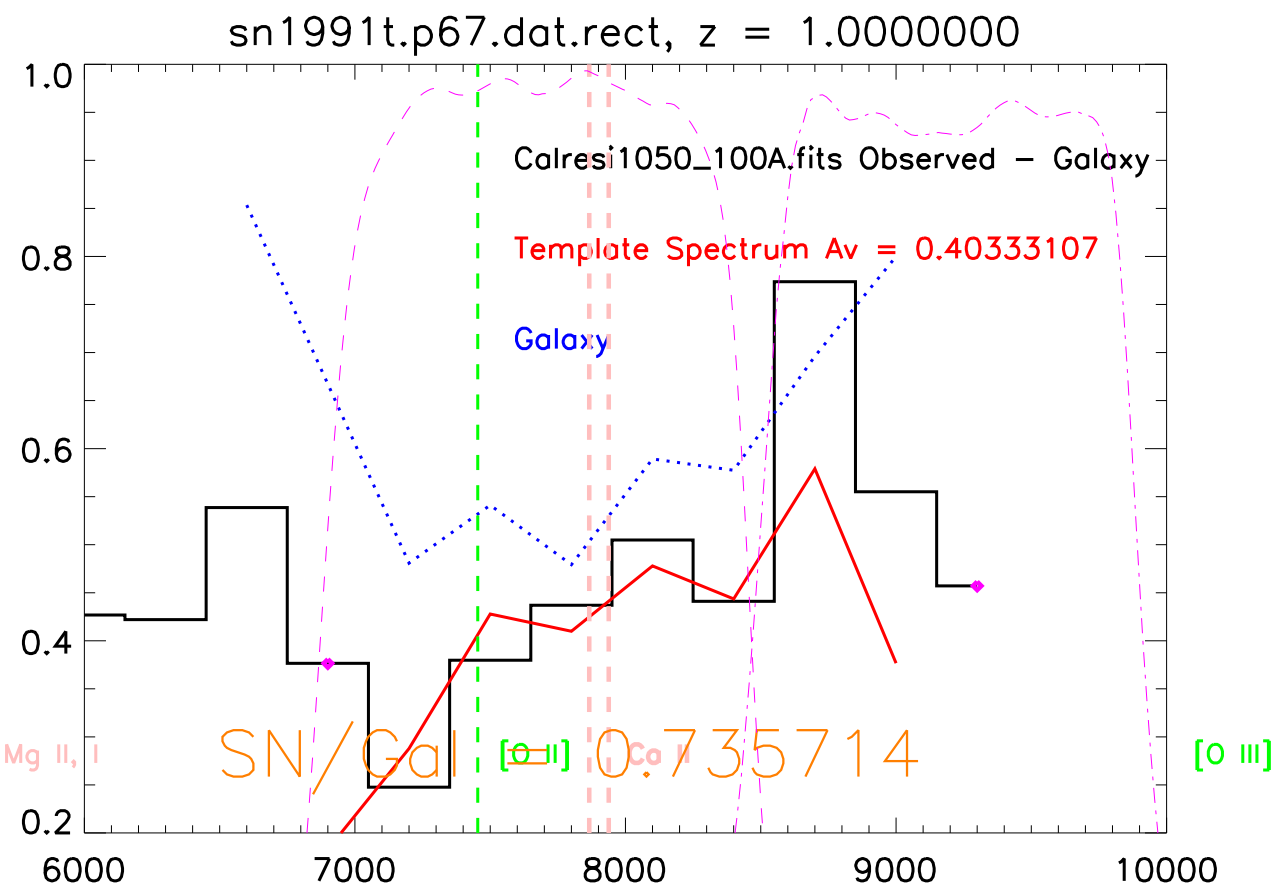

sn1994d.m03.dat.rect, z = 1.1500000
Calresi1050_100A.fits Observed − Galaxy
Template Spectrum Av = −1.2303305
Galaxy
SN/Gal = 0.599236
Mg II, I
[O II]
Ca II
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

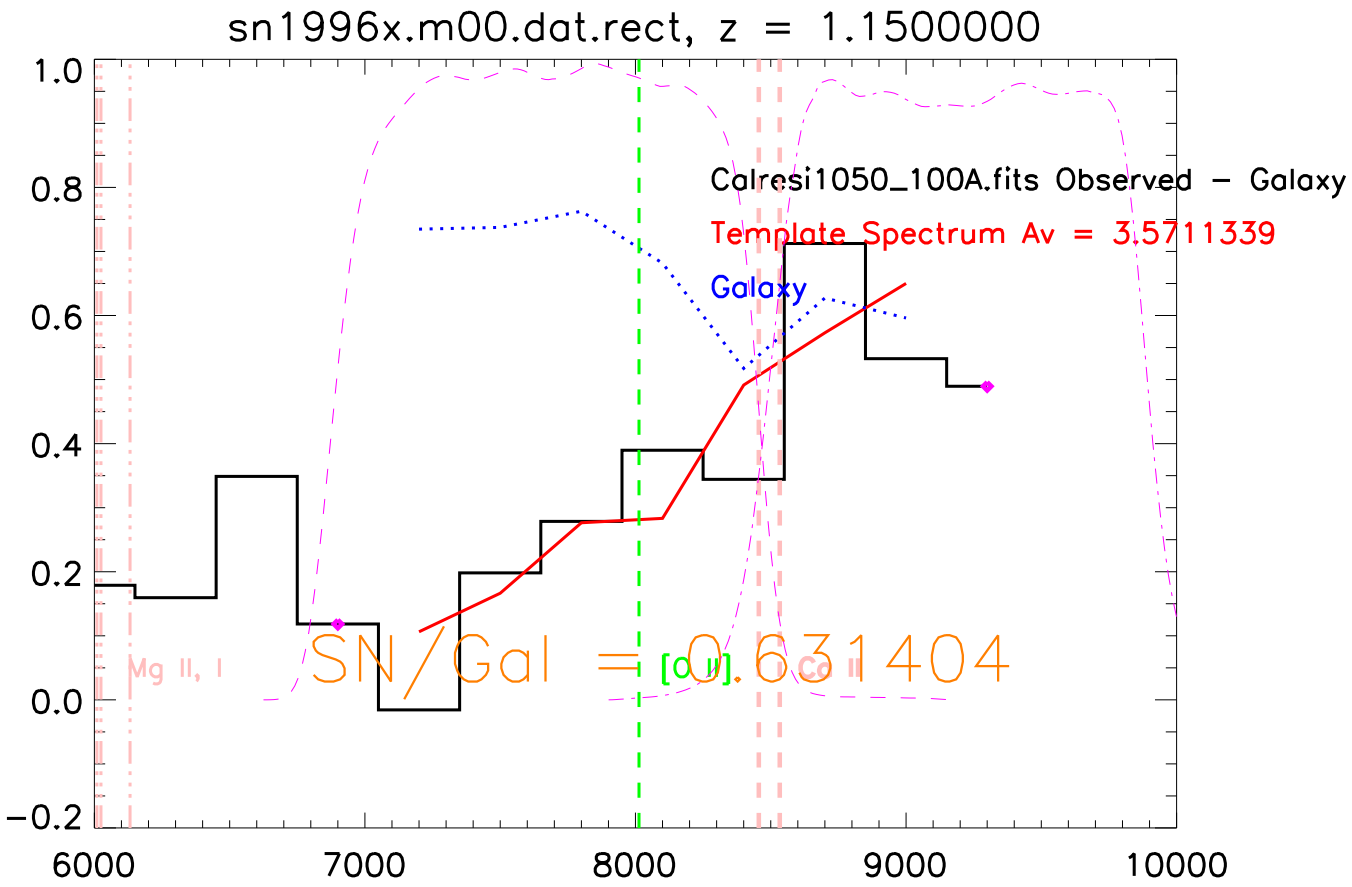

sn1994d.p25.dat.rect, z = 1.1500000
Calresi1050_100A.fits Observed – Galaxy
Template Spectrum Av = 2.8801319
Galaxy
SN/Gal = 0.483105
Mg II, I
[O II]
Ca II
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
6000
7000
8000
9000
10000

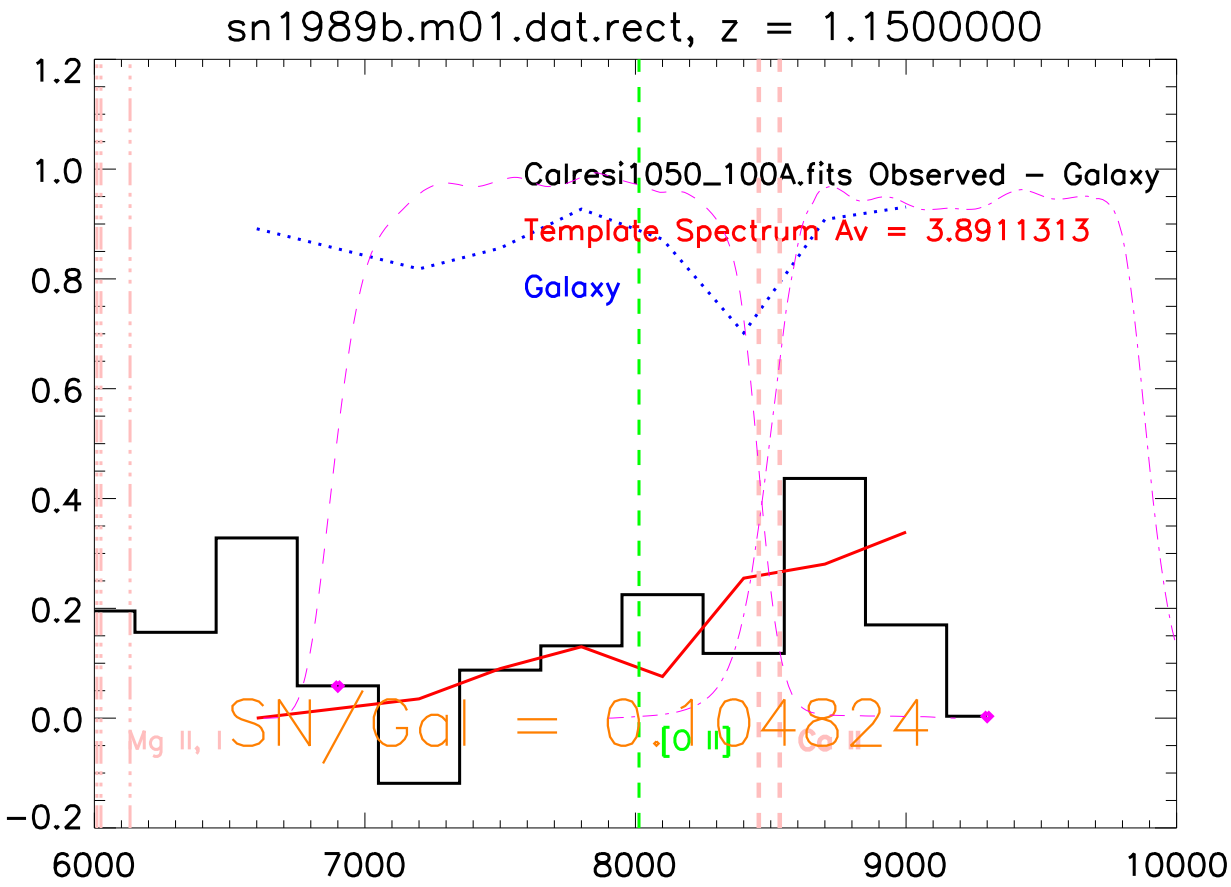

sn1989b.p13.dat.rect, z = 1.0000000
Calresi1050_100A.fits Observed − Galaxy
Template Spectrum Av = 4.8744794
Galaxy
SN/Gal = 1.25973
Mg II, I
[O II]
Ca II
[O III]
2.0
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

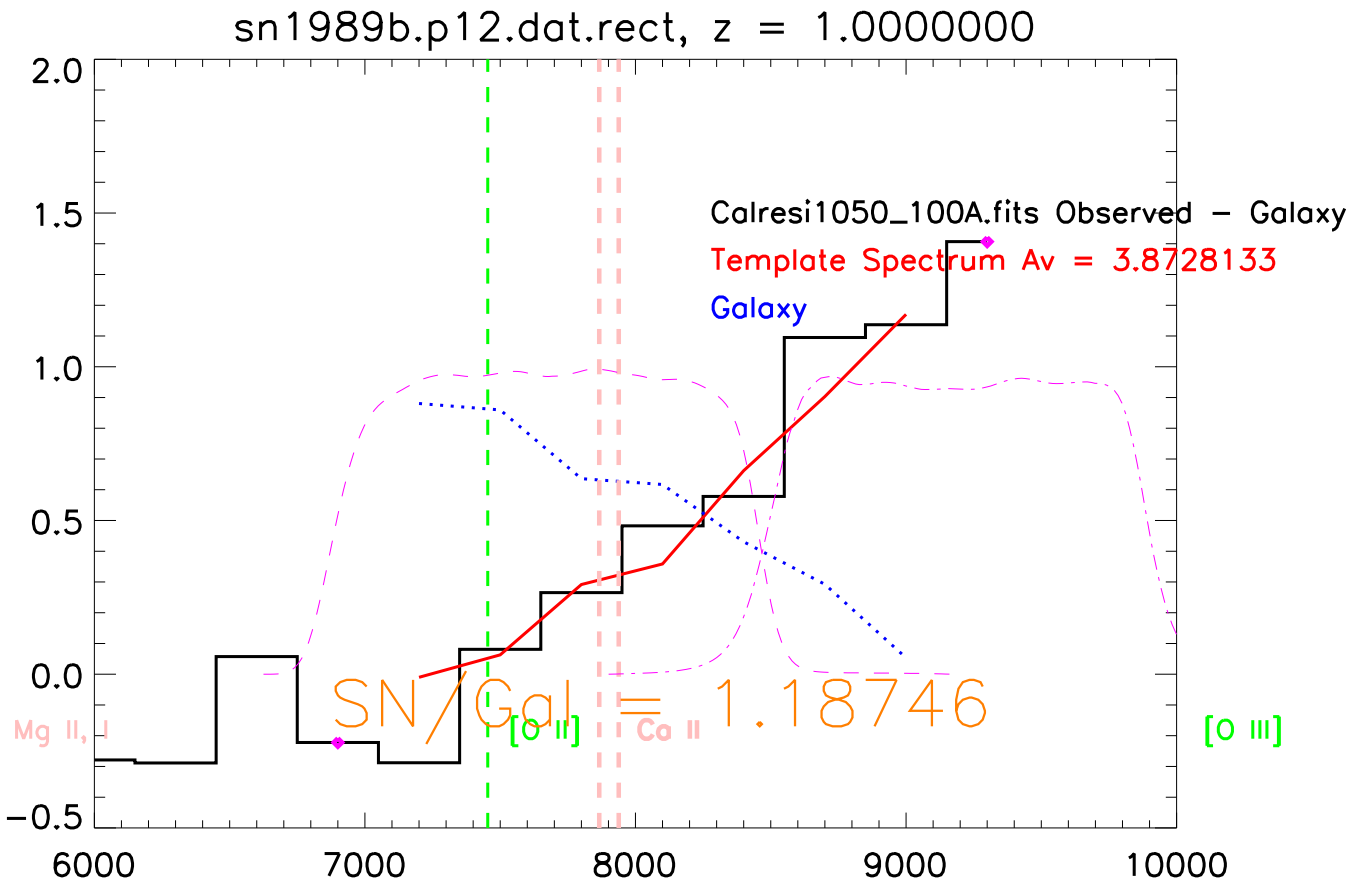

sn1991t.p24.dat.rect, z = 1.1500000
Calresi1050_100A.fits Observed − Galaxy
Template Spectrum Av = 5.6301814
Galaxy
SN/Gal = 0.677870
Mg II, I
[O II].
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
6000
7000
8000
9000
10000

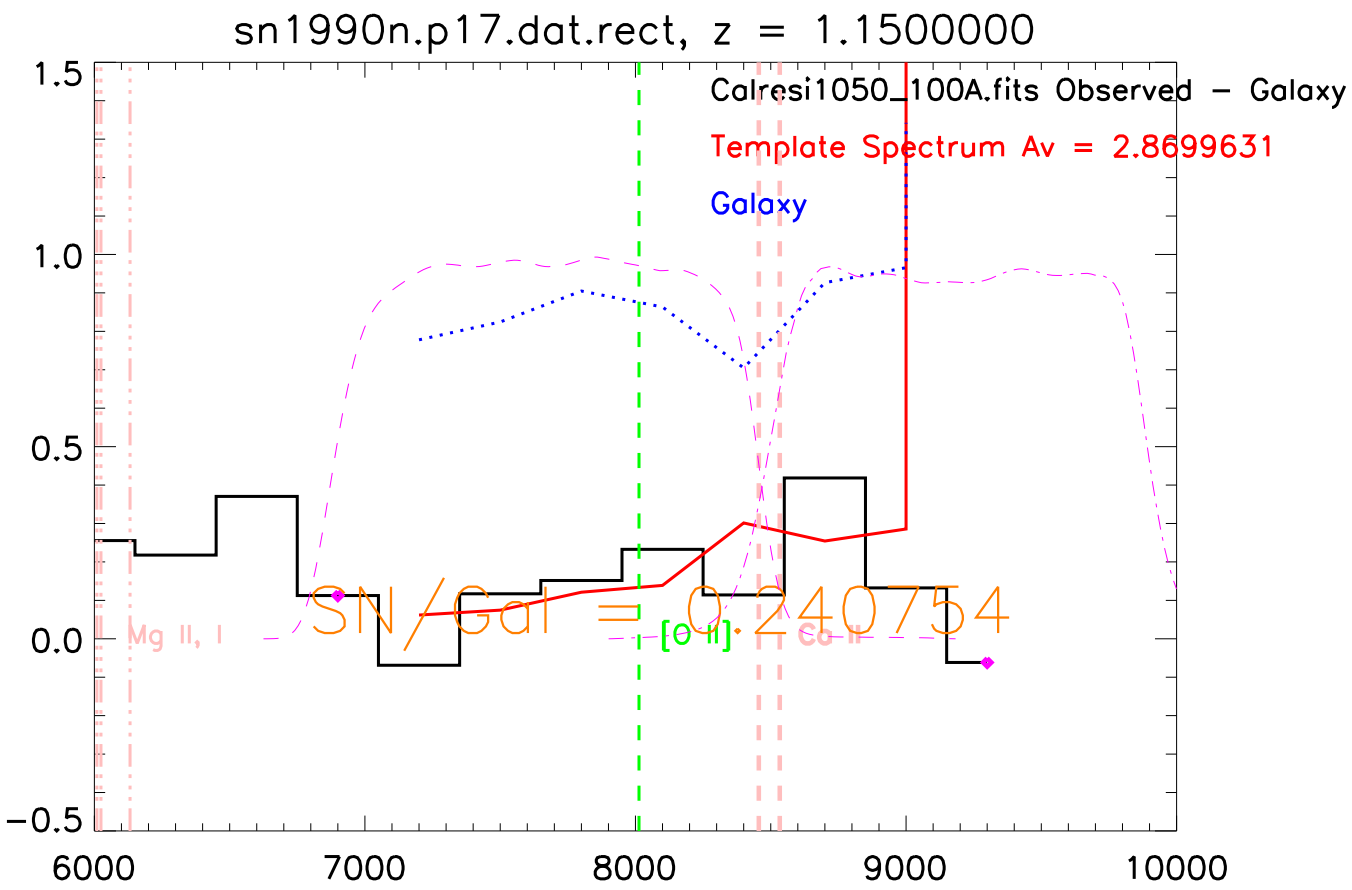

sn1991t.p45.dat.rect, z = 1.0000000
Calresi1050_100A.fits Observed – Galaxy
Template Spectrum Av = 0.51004434
Galaxy
SN/Gal = 0.849004
Mg II, I
[O II]
Ca II
[O III]
1.0
0.8
0.6
0.4
0.2
6000
7000
8000
9000
10000

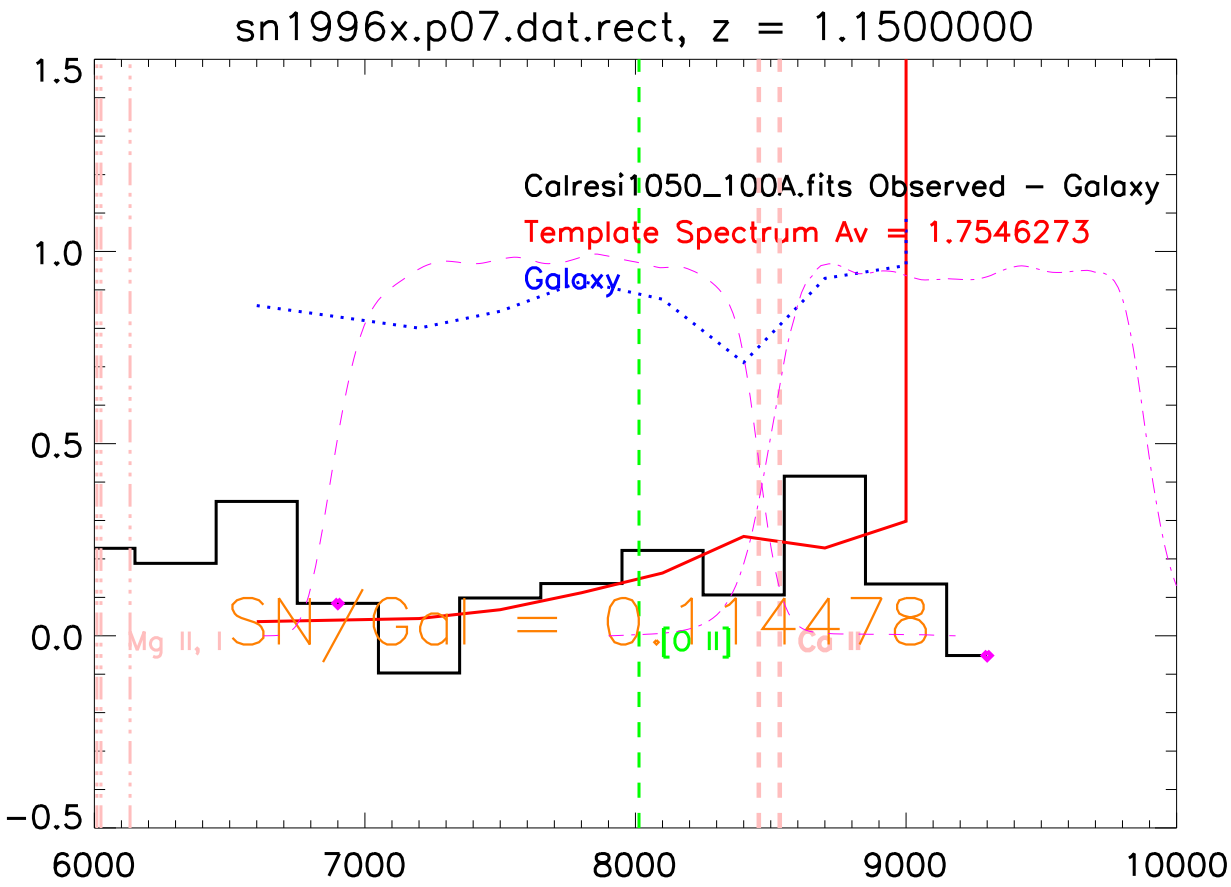

sn1991t.p67.dat.rect, z = 1.0000000
Calresi1050_100A.fits Observed – Galaxy
Template Spectrum Av = 0.40333107
Galaxy
SN/Gal = 0.735714
Mg II, I
[O II]
Ca I
[O III]
1.0
0.8
0.6
0.4
0.2
6000
7000
8000
9000
10000

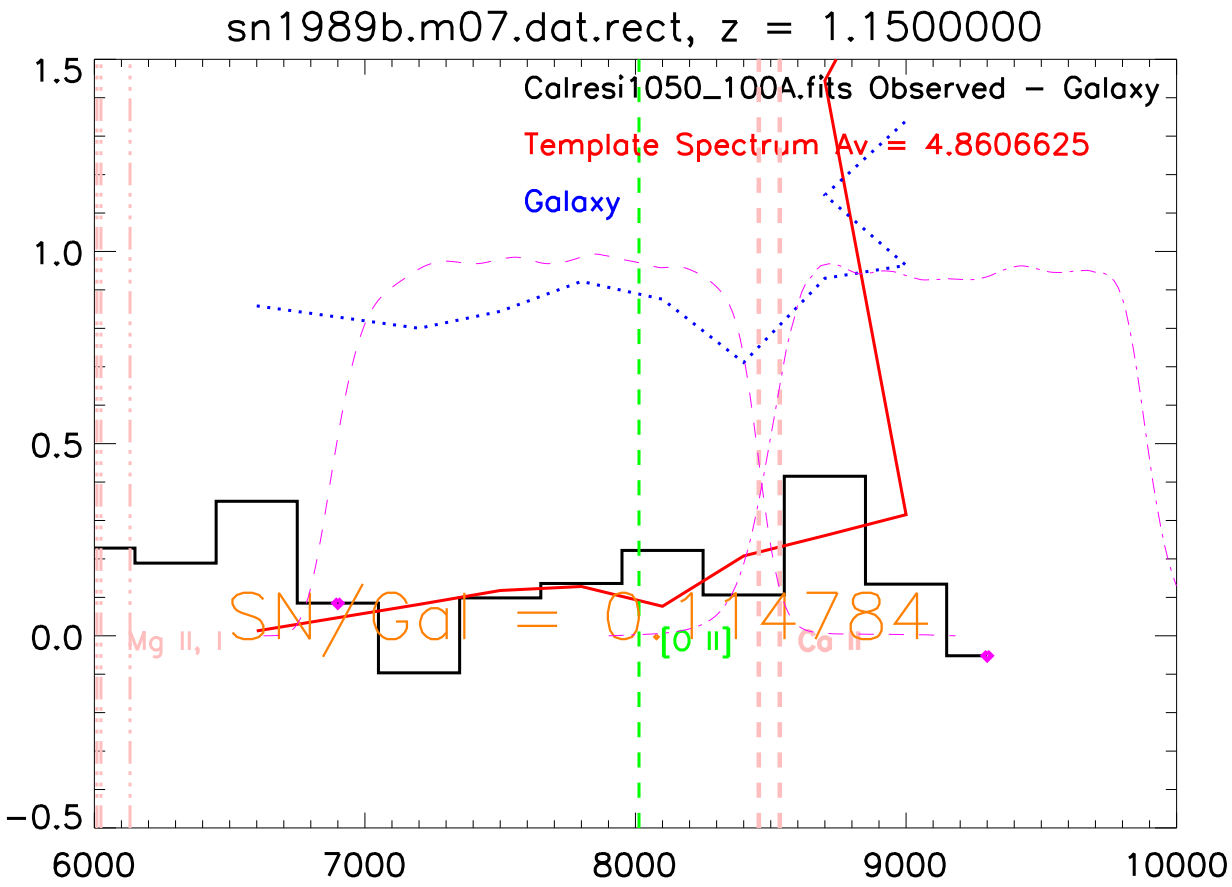

sn1996x.m00.dat.rect, z = 1.1500000
Calresi1050_100A.fits Observed − Galaxy
Template Spectrum Av = 3.5711339
Galaxy
SN/Gal = 0.631404
Mg II, I
[O II]
Ca II
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
6000
7000
8000
9000
10000

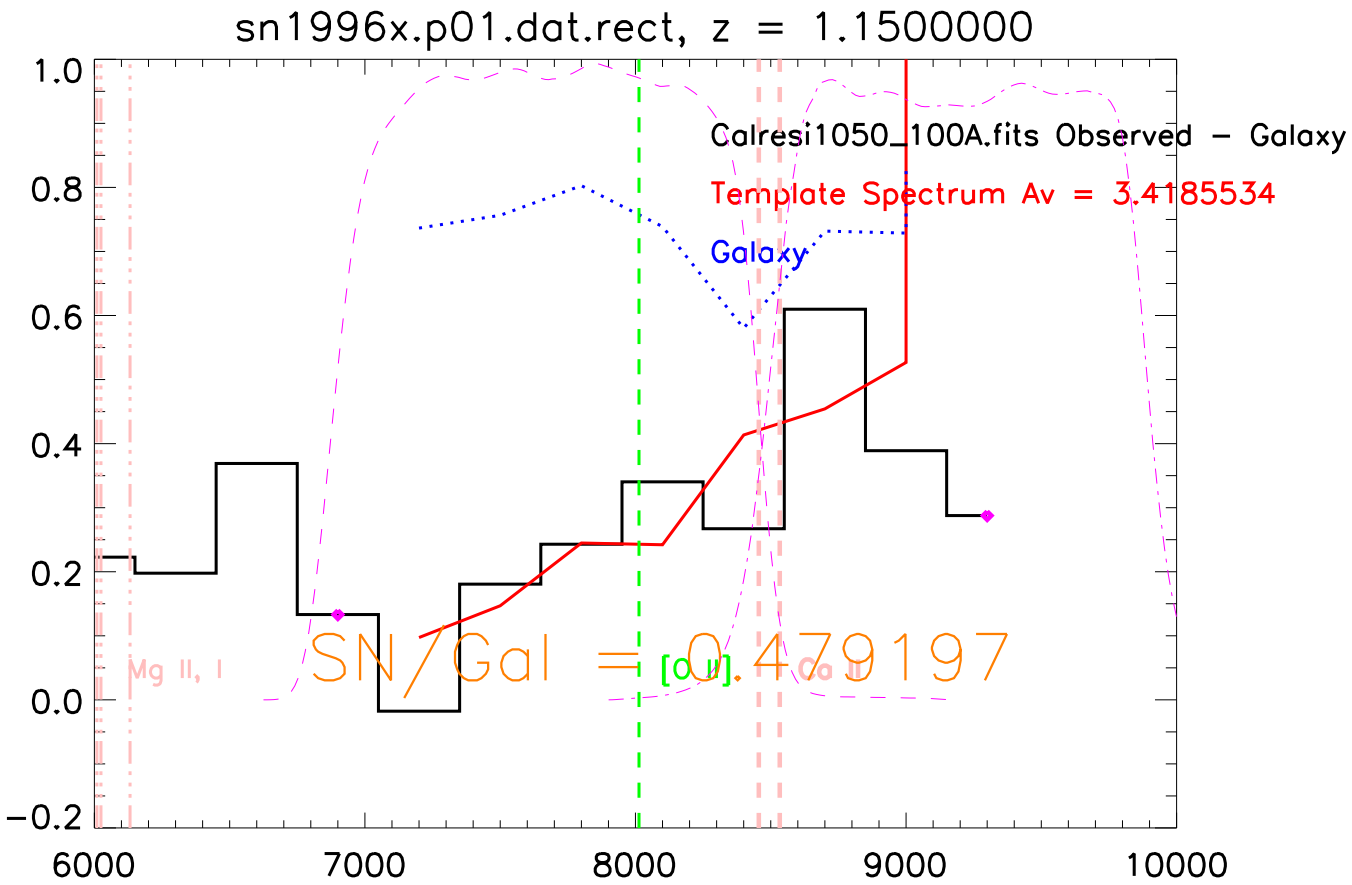

sn1989b.m01.dat.rect, z = 1.1500000
Calresi1050_100A.fits Observed − Galaxy
Template Spectrum Av = 3.8911313
Galaxy
SN/Gal = 0.104824
[O II]
1.2
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
6000
7000
8000
9000
10000

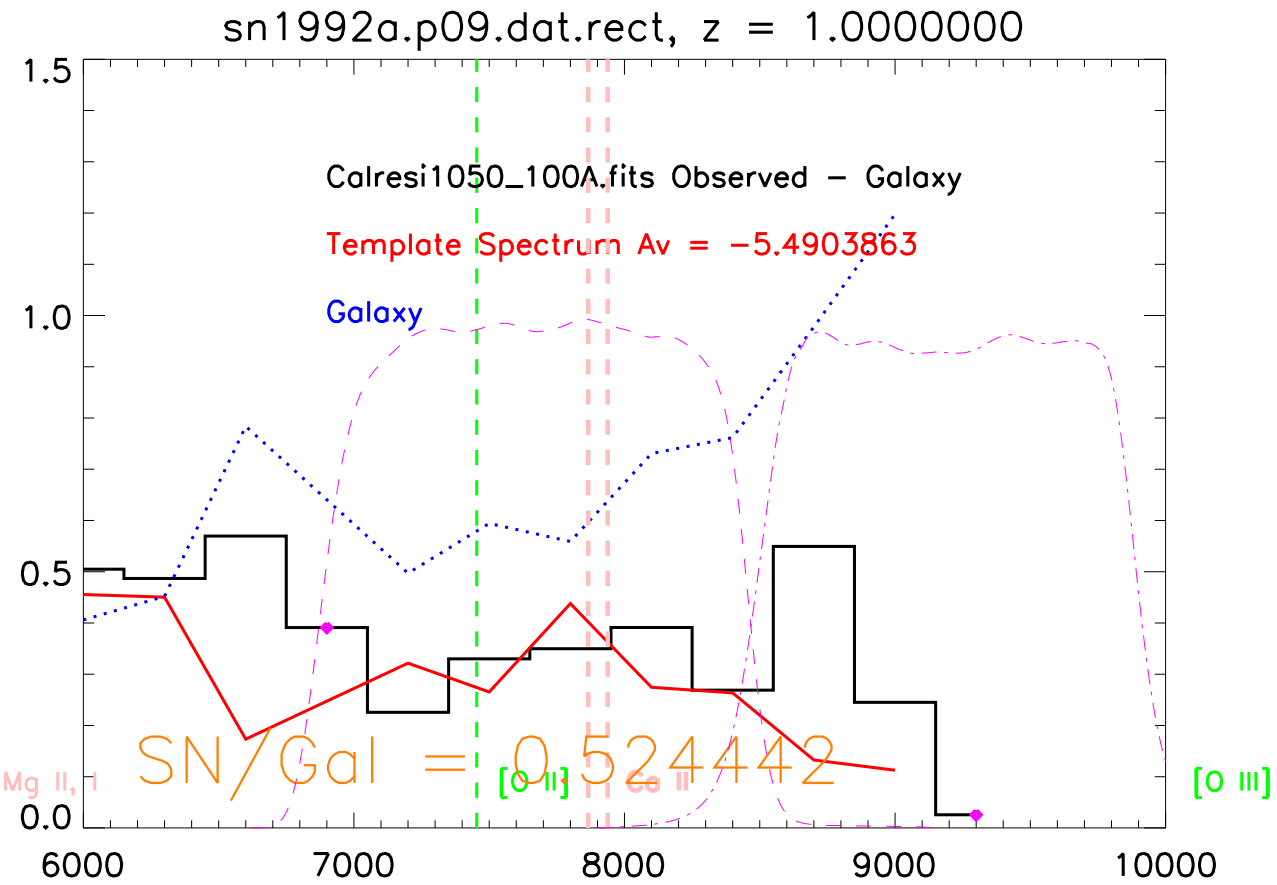

sn1989b.p12.dat.rect, z = 1.0000000
Calresi1050_100A.fits Observed − Galaxy
Template Spectrum Av = 3.8728133
Galaxy
SN/Gal = 1.18746
Mg II, I
[O II]
Ca II
[O III]
2.0
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

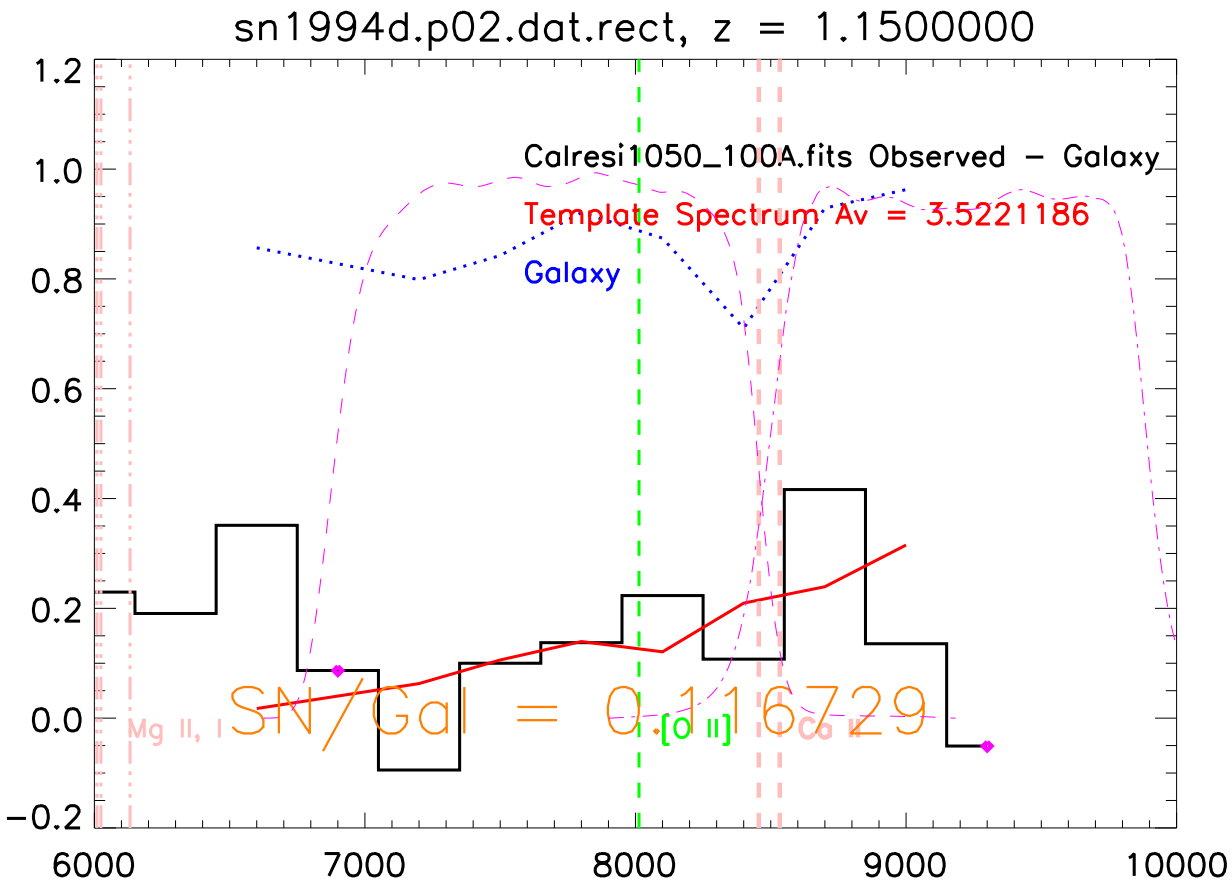

sn1990n.p17.dat.rect, z = 1.1500000
Calresi1050_100A.fits Observed − Galaxy
Template Spectrum Av = 2.8699631
Galaxy
SN/Gal = 0.240754
Mg II, I
[O II]
Ca II
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

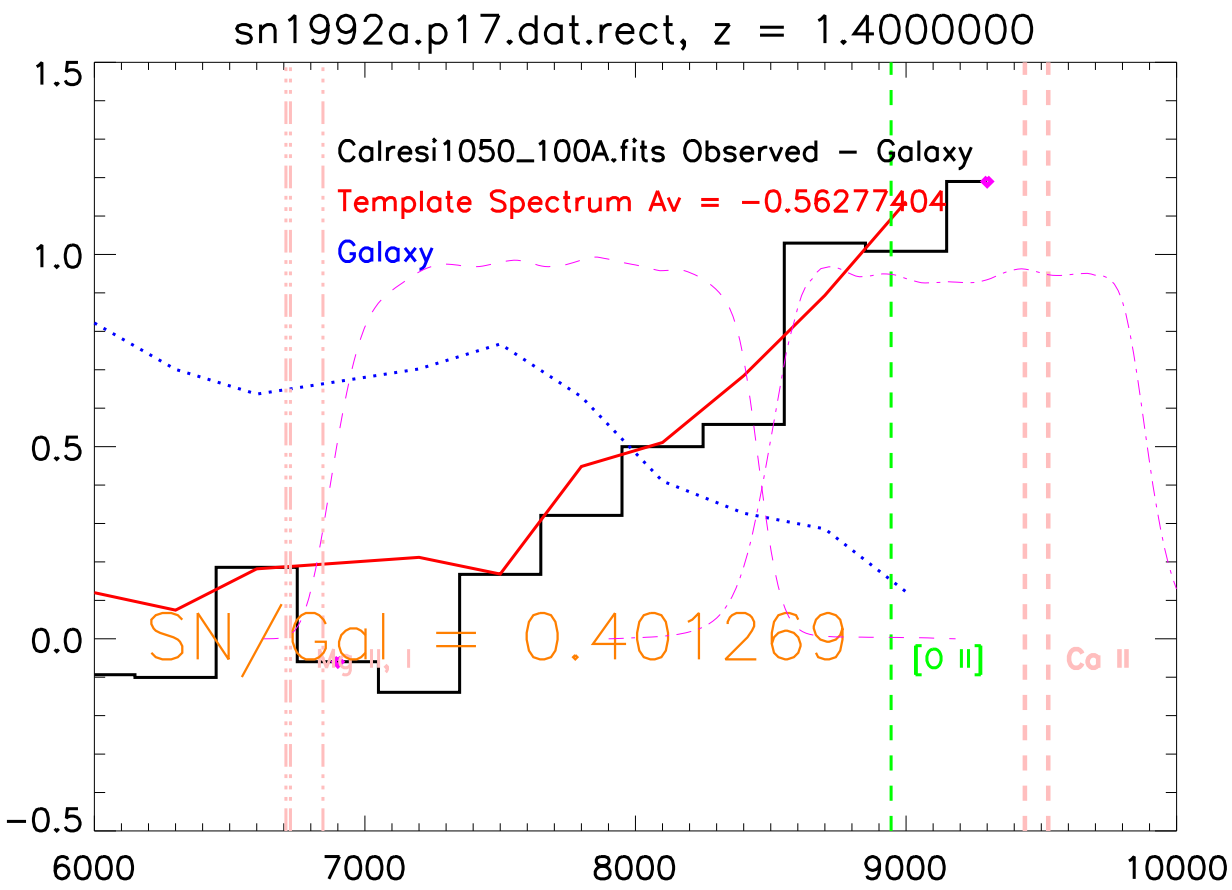

sn1996x.p07.dat.rect, z = 1.1500000
Calresi1050_100A.fits Observed − Galaxy
Template Spectrum Av = 1.7546273
Galaxy
S/N/Gal = 0.114478
Mg II, I
[O II]
Ca II
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

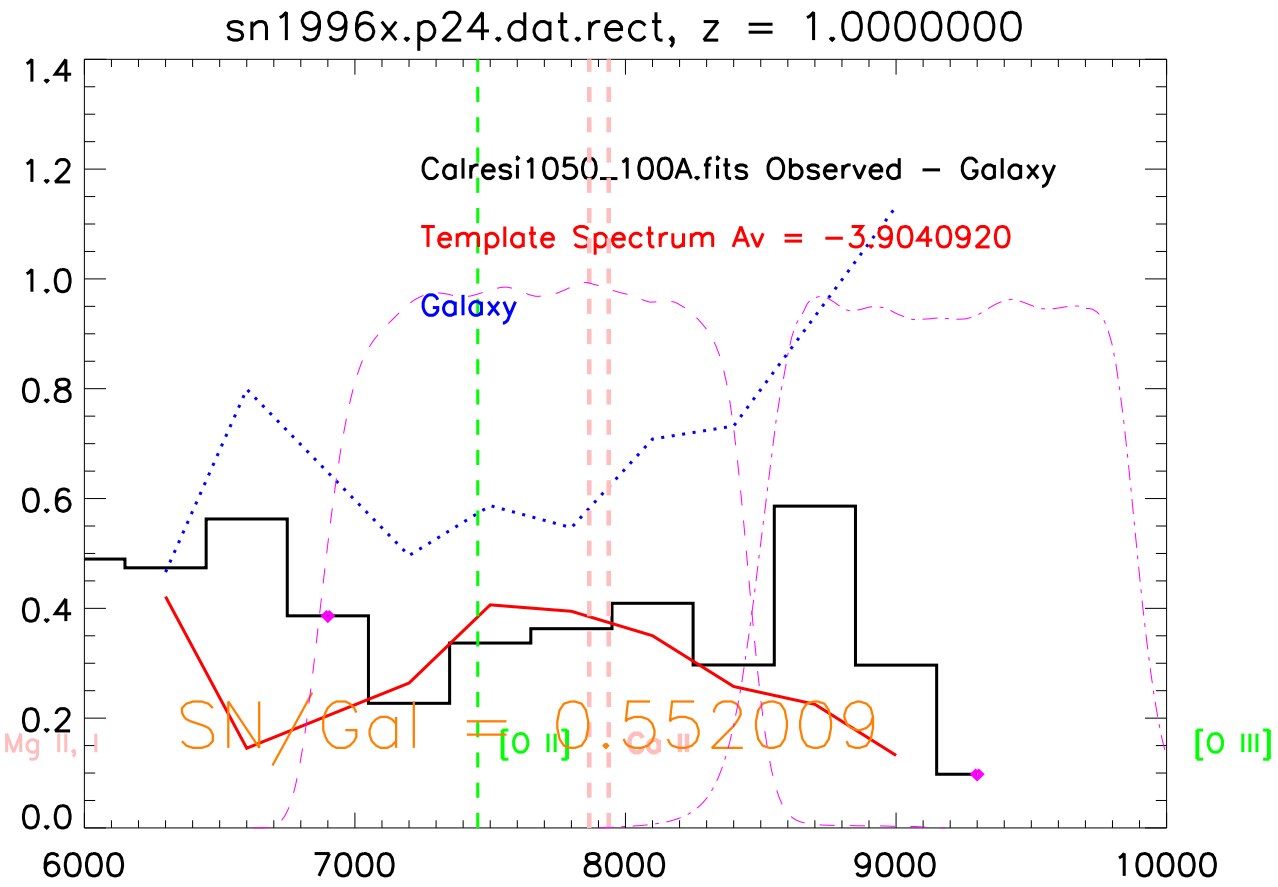

sn1989b.m07.dat.rect, z = 1.1500000
Calresi1050_100A.fits Observed − Galaxy
Template Spectrum Av = 4.8606625
Galaxy
SN/Gal = 0.114784
Mg II, I
[O II]
Ca II
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

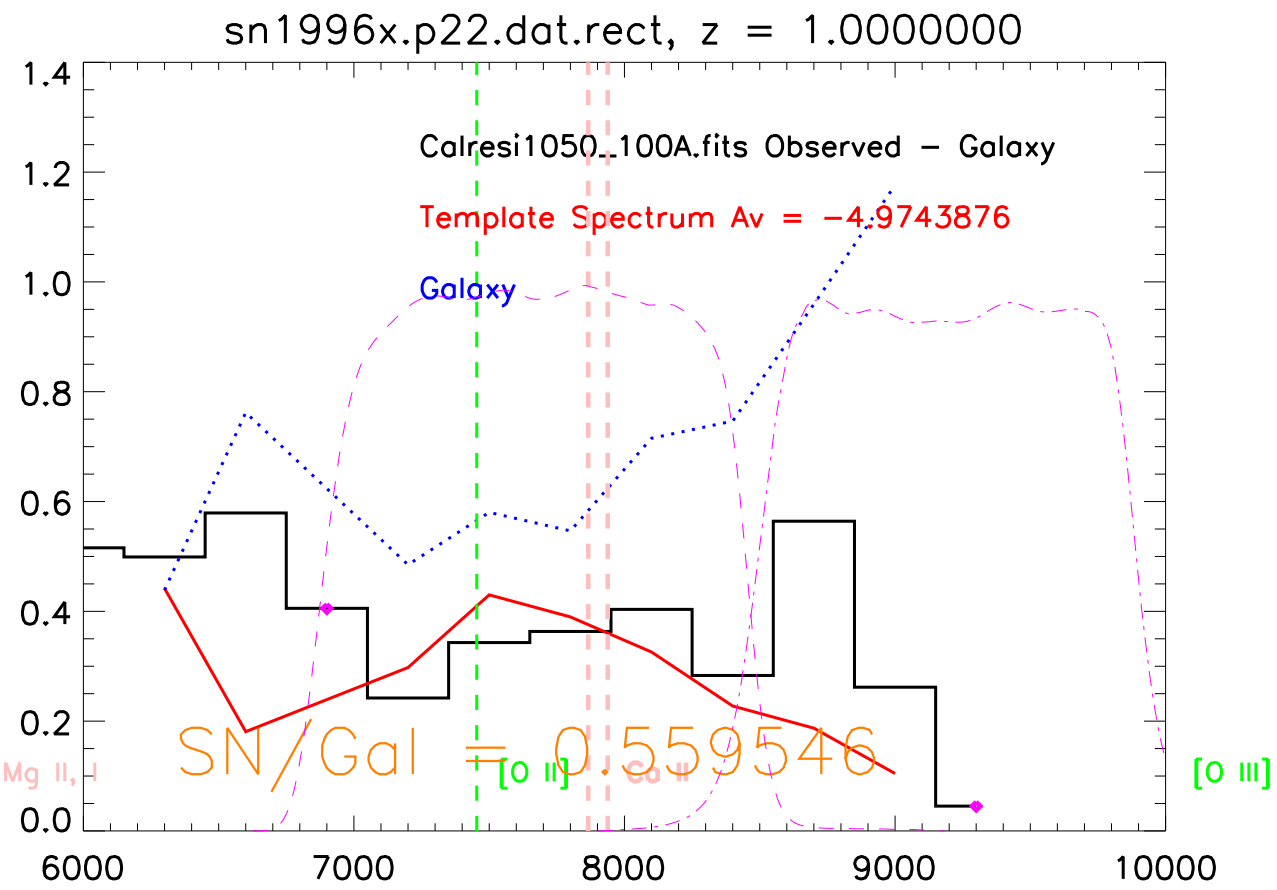

sn1996x.p01.dat.rect, z = 1.1500000
Calresi1050_100A.fits Observed − Galaxy
Template Spectrum Av = 3.4185534
Galaxy
SN/Gal = 0.479197
Mg II, I
[O II]
Ca II
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
6000
7000
8000
9000
10000

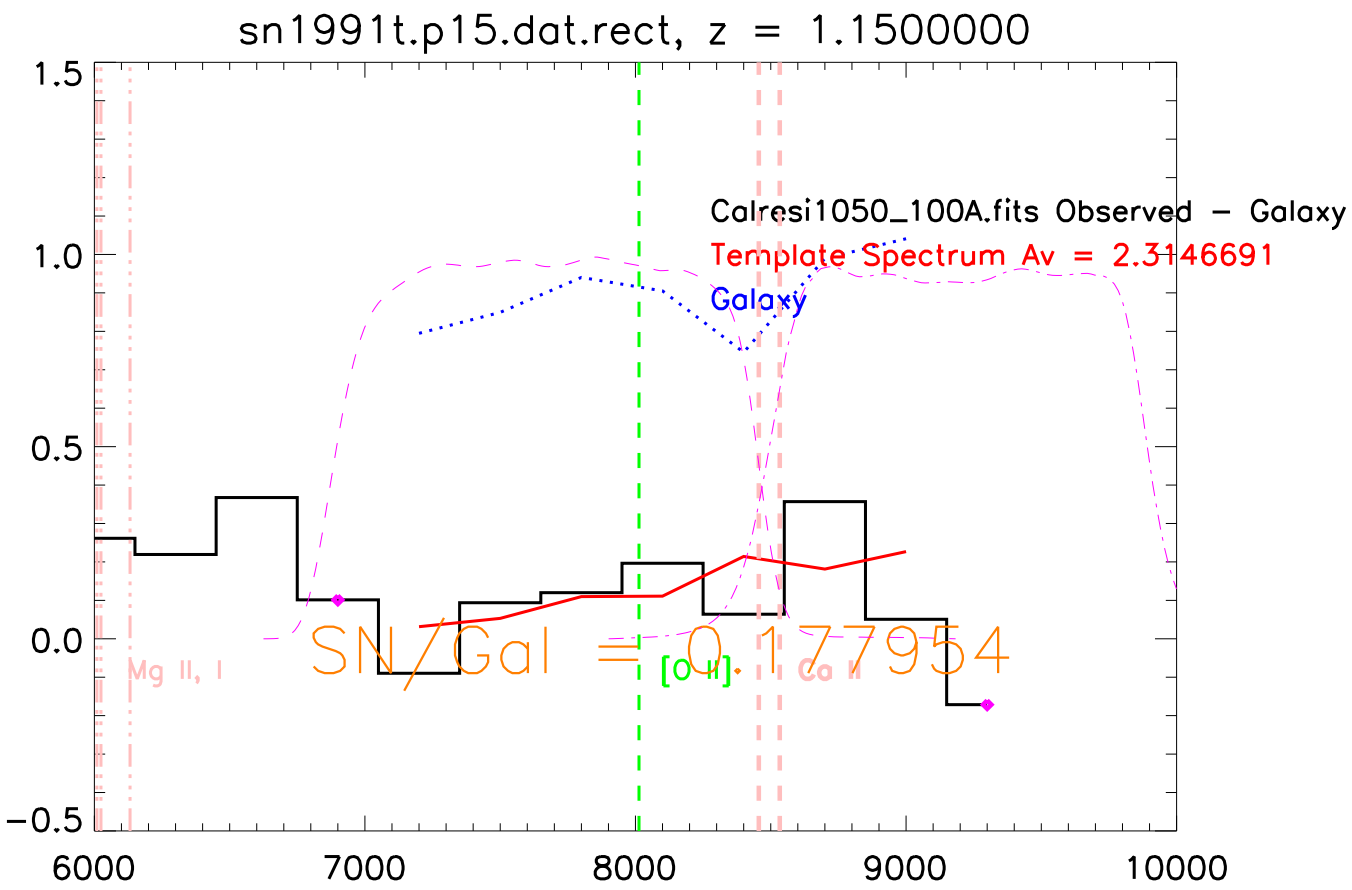

sn1992a.p09.dat.rect, z = 1.0000000
Calresi1050_100A.fits Observed − Galaxy
Template Spectrum Av = −5.4903863
Galaxy
SN/Gal = 0.524442
[O II]
[O III]
1.5
1.0
0.5
0.0
6000
7000
8000
9000
10000

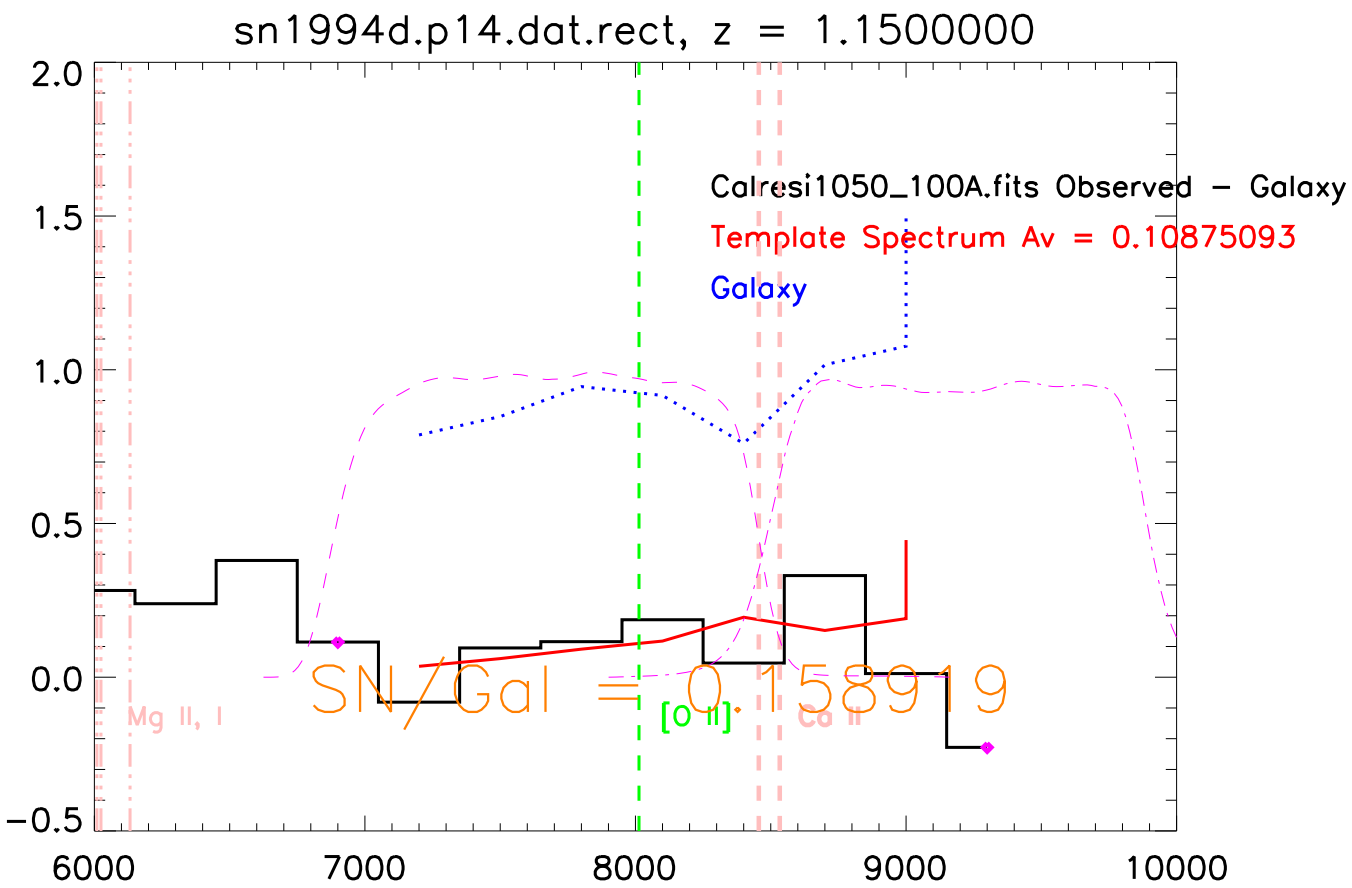

sn1994d.p02.dat.rect, z = 1.1500000
Calresi1050_100A.fits Observed − Galaxy
Template Spectrum Av = 3.5221186
Galaxy
SN/Gal = 0.116729
Mg II, I
[O II]
Ca II
1.2
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
6000
7000
8000
9000
10000

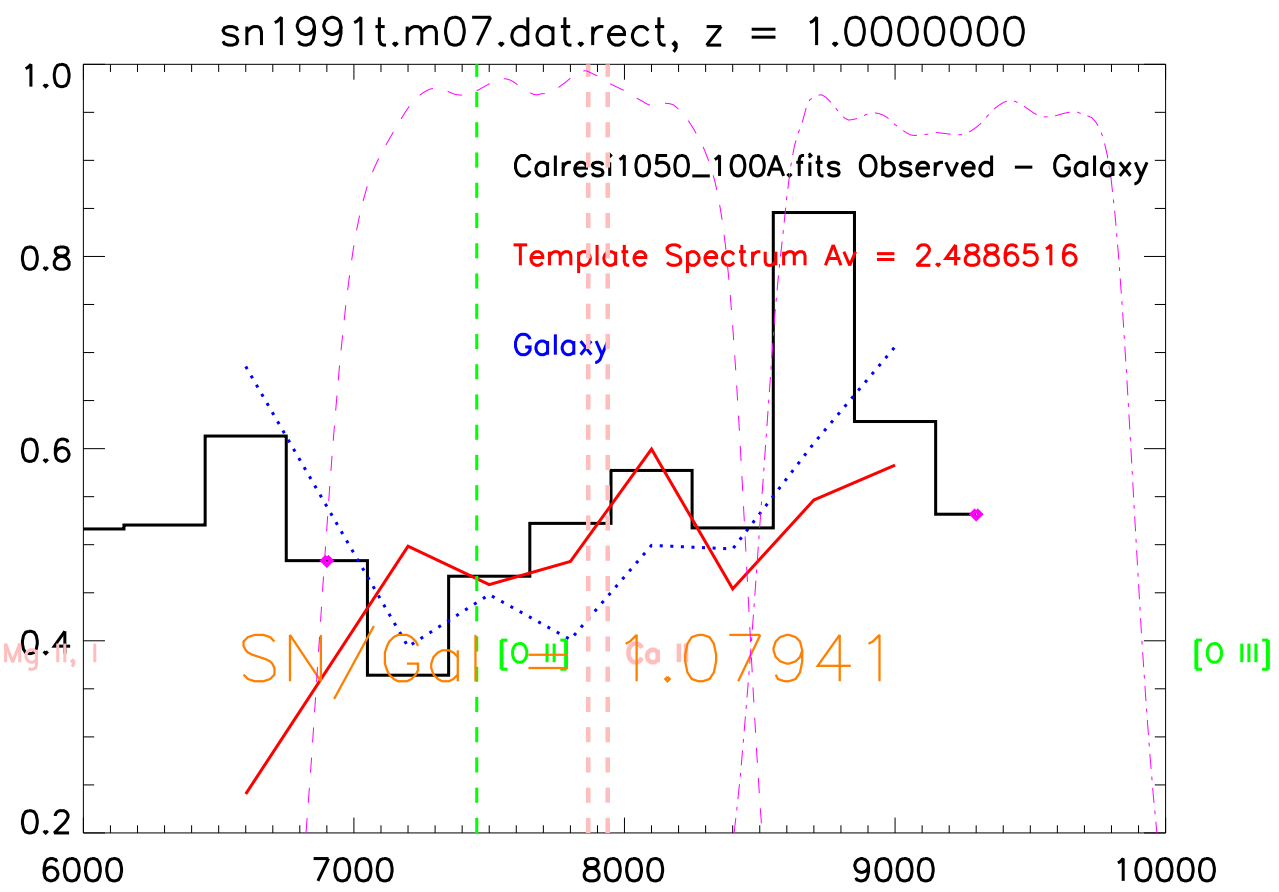

sn1992a.p17.dat.rect, z = 1.4000000
Calresi1050_100A.fits Observed − Galaxy
Template Spectrum Av = −0.56277404
Galaxy
SN/Gal = 0.401269
[O II]
Ca II
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

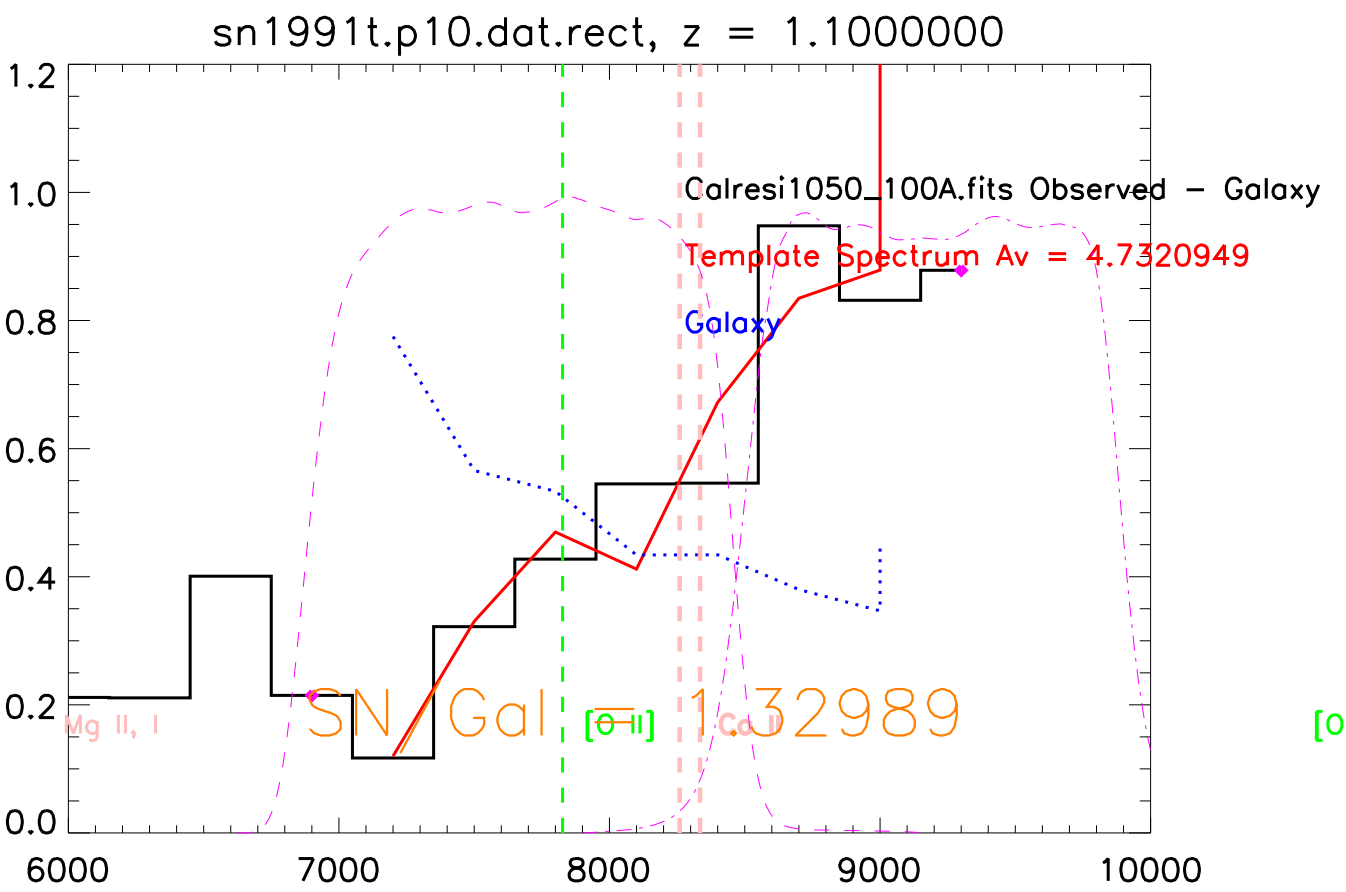

sn1996x.p24.dat.rect, z = 1.0000000
Calresi1050_100A.fits Observed − Galaxy
Template Spectrum Av = −3.9040920
Galaxy
SN/Gal = 0.552009
Mg II, I
[O II]
Ca II
[O III]
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
6000
7000
8000
9000
10000

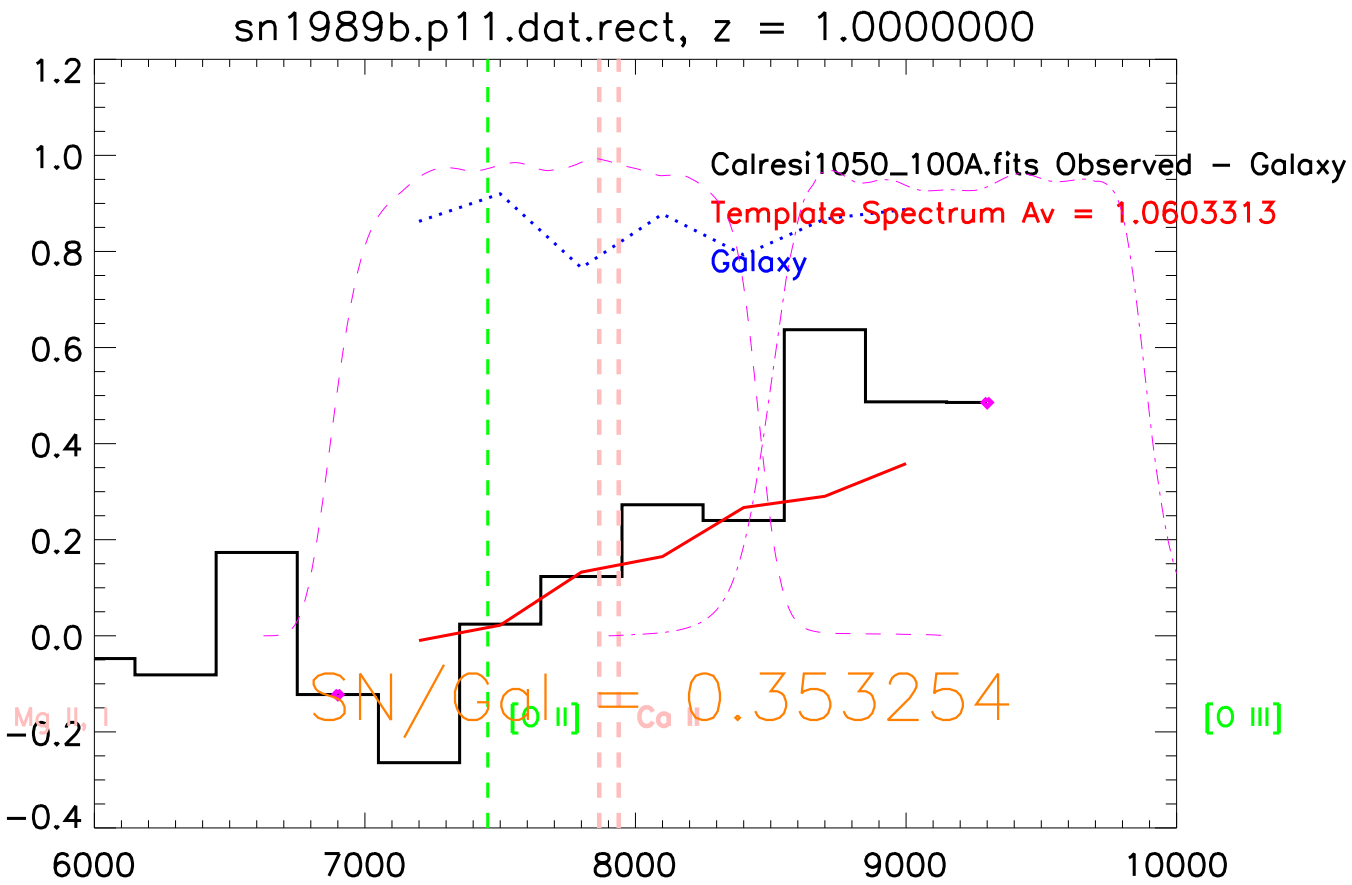

sn1996x.p22.dat.rect, z = 1.0000000
Calresi1050_100A.fits Observed − Galaxy
Template Spectrum Av = −4.9743876
Galaxy
SN/Gal = 0.559546
[O II]
[O III]
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
6000
7000
8000
9000
10000

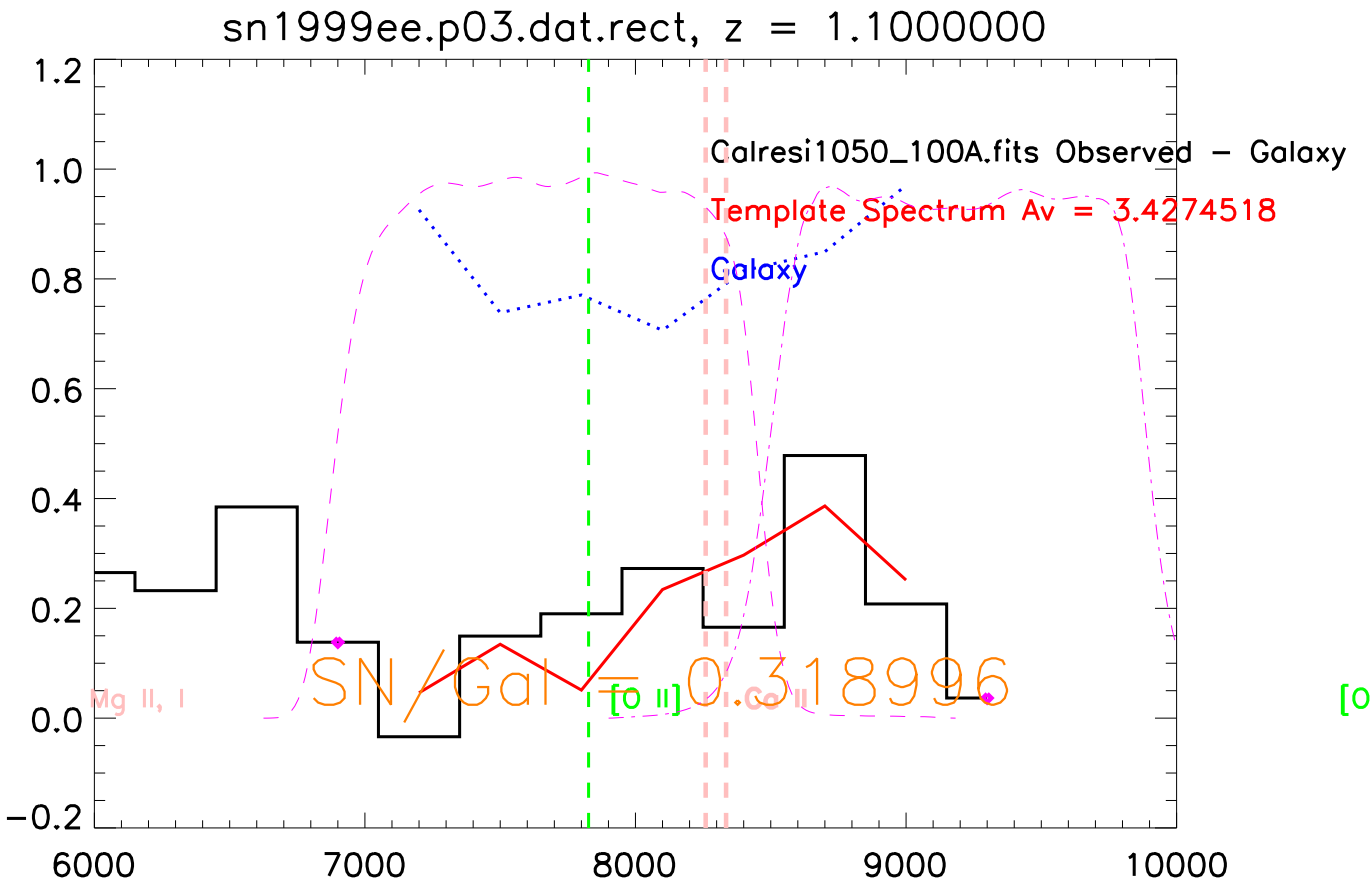

sn1991t.p15.dat.rect, z = 1.1500000
Calresi1050_100A.fits Observed − Galaxy
Template Spectrum Av = 2.3146691
Galaxy
SN/Gal = 0.177954
Mg II, I
[O II]
Ca II
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

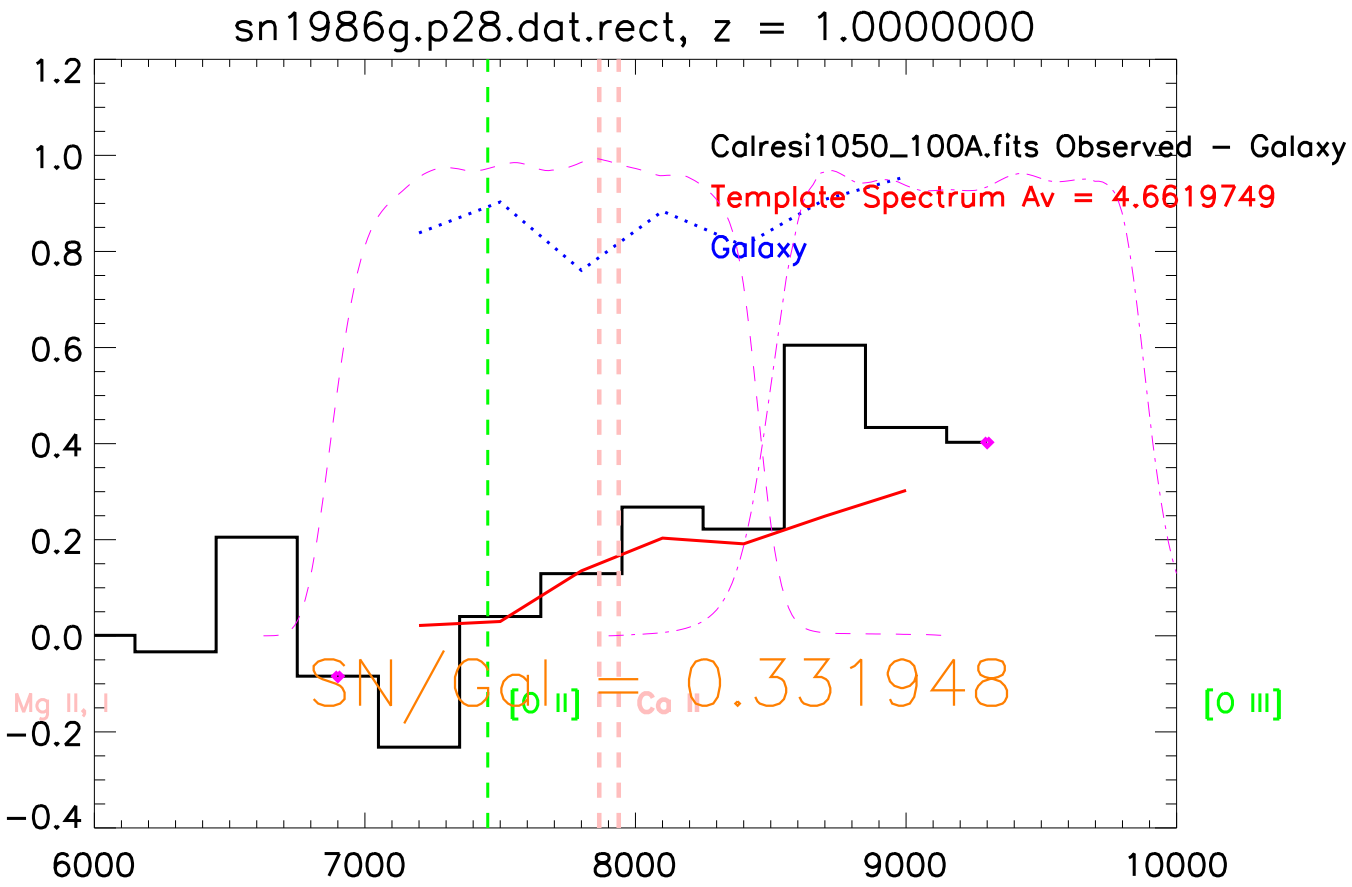

sn1994d.p14.dat.rect, z = 1.1500000
Calresi1050_100A.fits Observed − Galaxy
Template Spectrum Av = 0.10875093
Galaxy
SN/Gal = 0.158919
Mg II, I
[O II]
Ca II
2.0
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

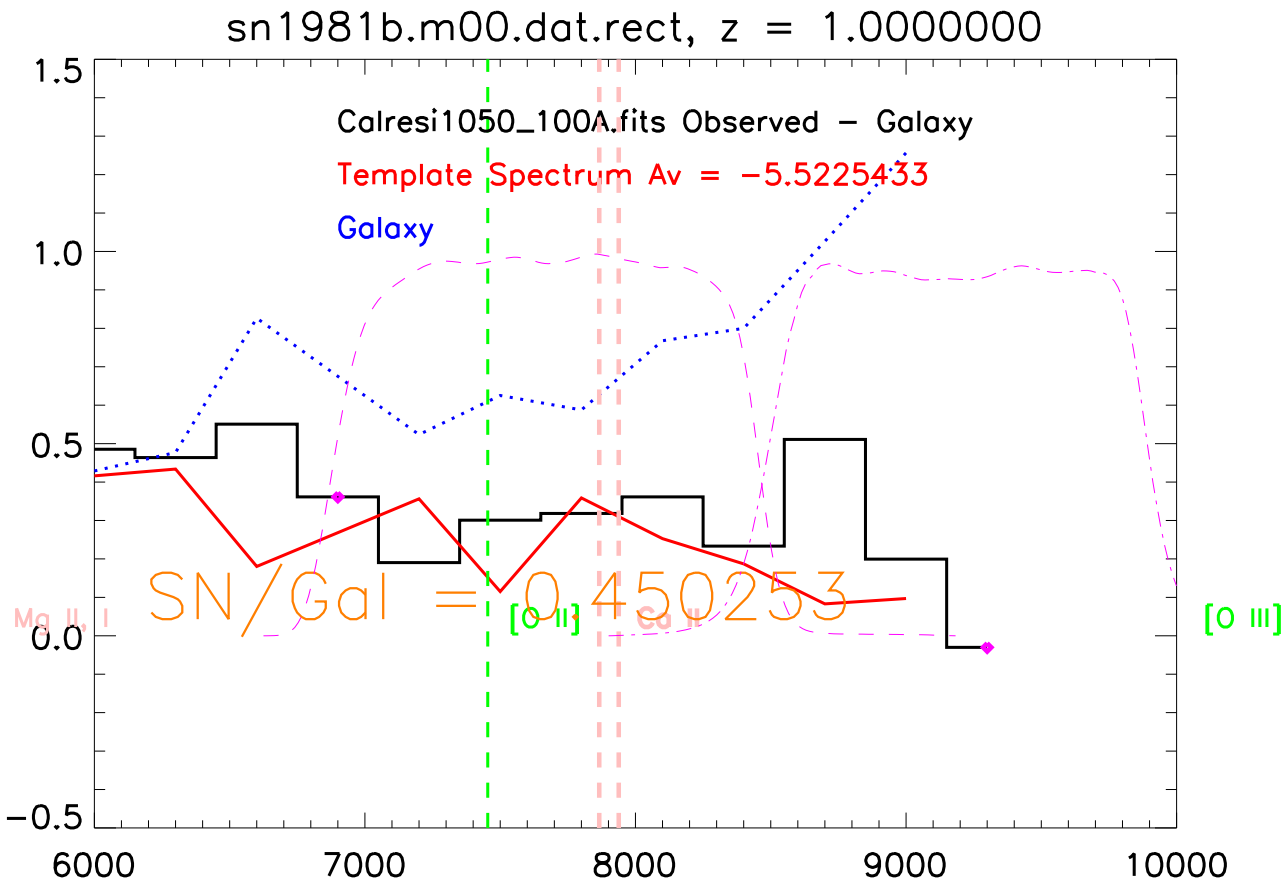

sn1991t.m07.dat.rect, z = 1.0000000
Calresi1050_100A.fits Observed − Galaxy
Template Spectrum Av = 2.4886516
Galaxy
SN/Gal = 1.07941
[O III]
[O III]
1.0
0.8
0.6
0.4
0.2
6000
7000
8000
9000
10000

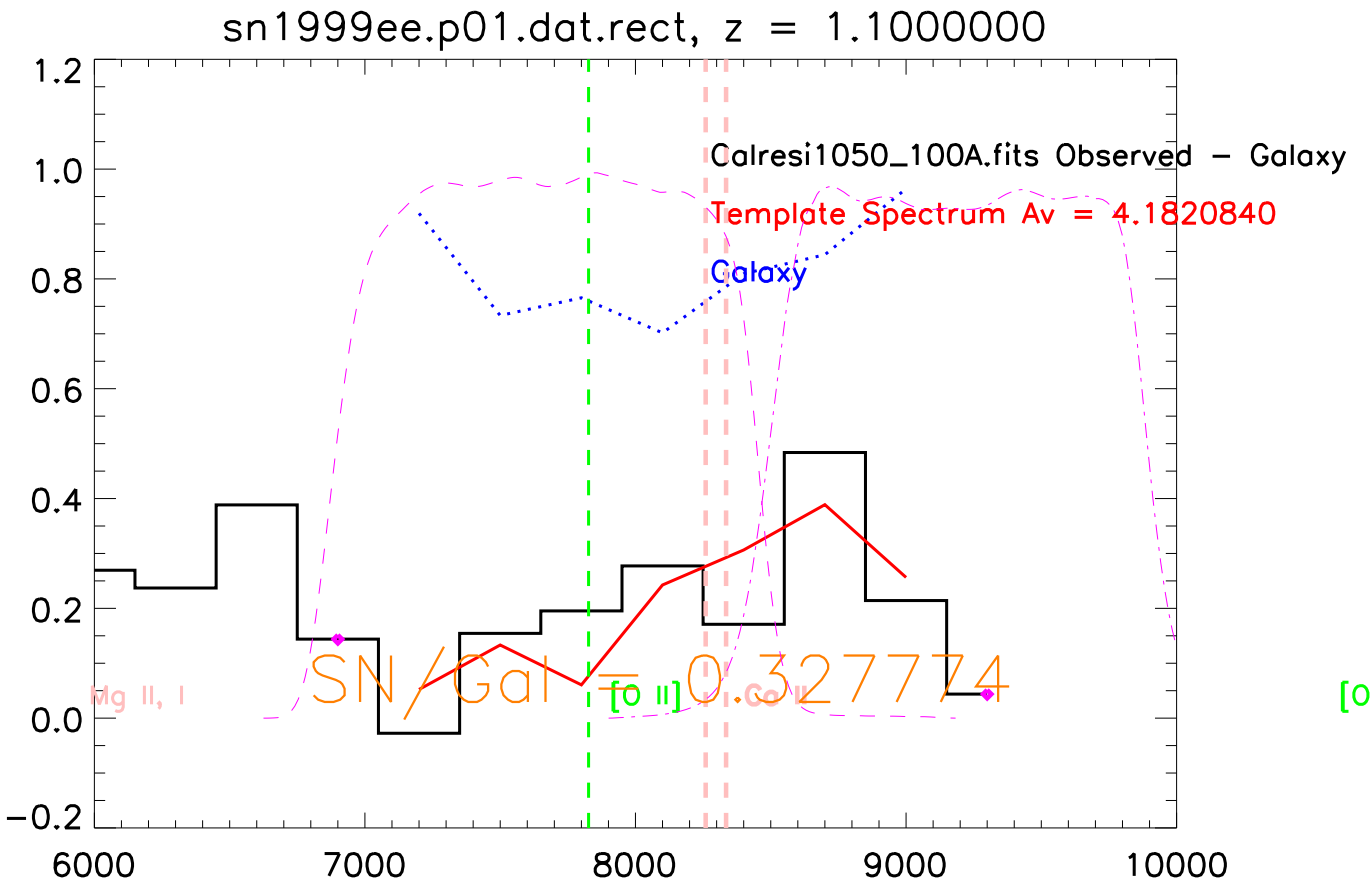

sn1991t.p10.dat.rect, z = 1.1000000
Calresi1050_100A.fits Observed – Galaxy
Template Spectrum Av = 4.7320949
Galaxy
SN / Gal = 1.32989
Mg II, I
[O II]
Ca II
[O
1.2
1.0
0.8
0.6
0.4
0.2
0.0
6000
7000
8000
9000
10000

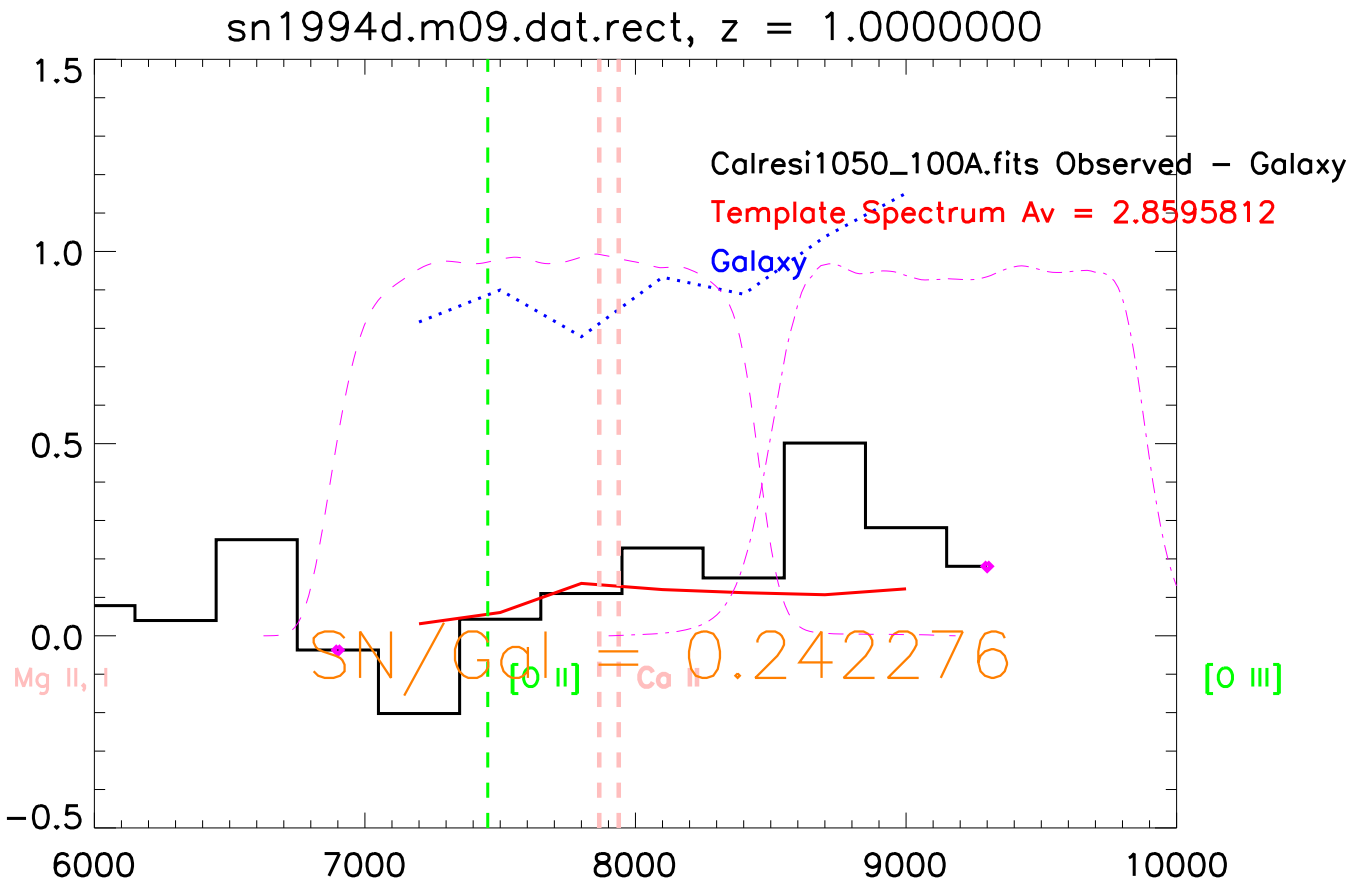

sn1989b.p11.dat.rect, z = 1.0000000
Calresi1050_100A.fits Observed − Galaxy
Template Spectrum Av = 1.0603313
Galaxy
SN/Gal = 0.353254
Mg II, I
[O II]
Ca II
[O III]
1.2
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
−0.4
6000
7000
8000
9000
10000

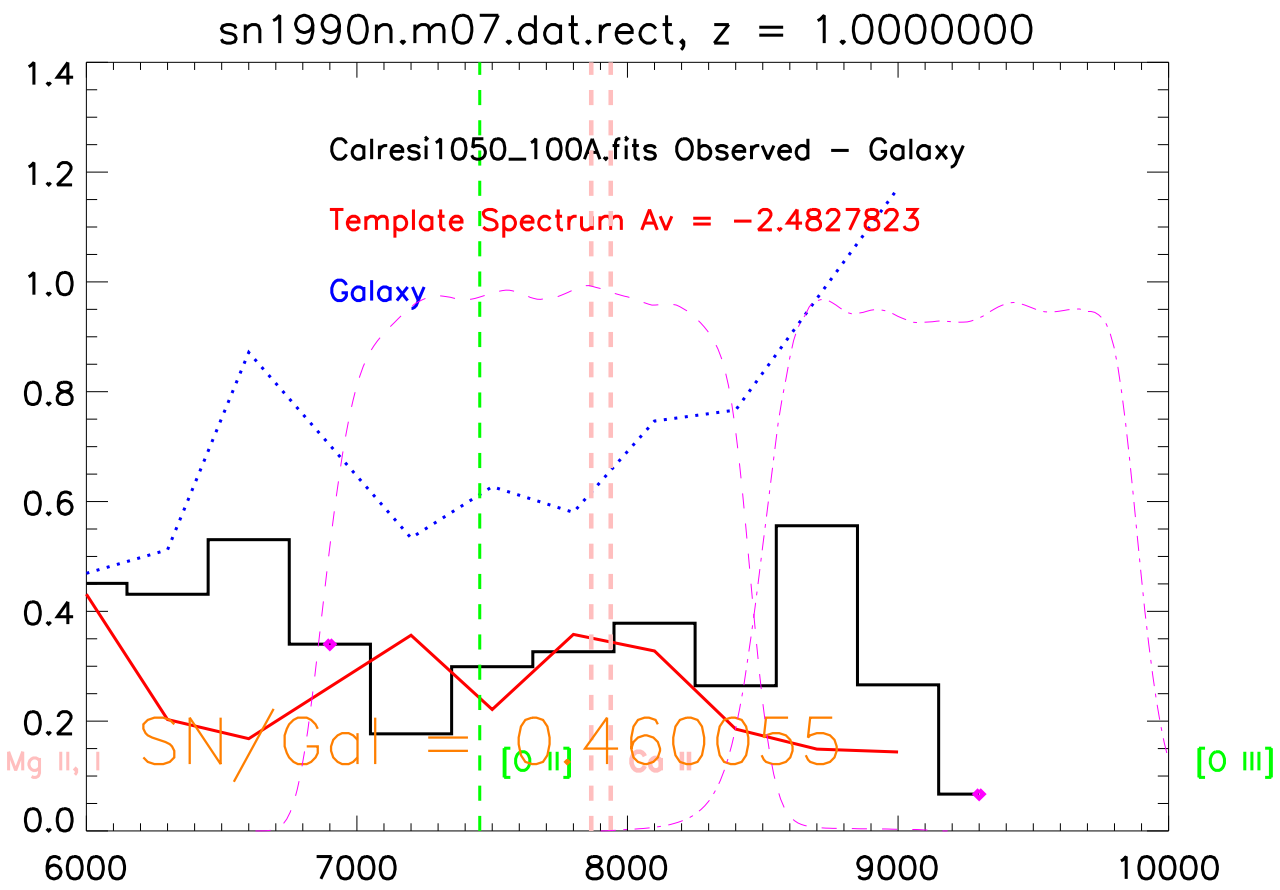

sn1999ee.p03.dat.rect, z = 1.1000000
Calresi1050_100A.fits Observed − Galaxy
Template Spectrum Av = 3.4274518
Galaxy
SN/Gal = 0.318996
Mg II, I
[O II]
Ca II
[O
1.2
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
6000
7000
8000
9000
10000

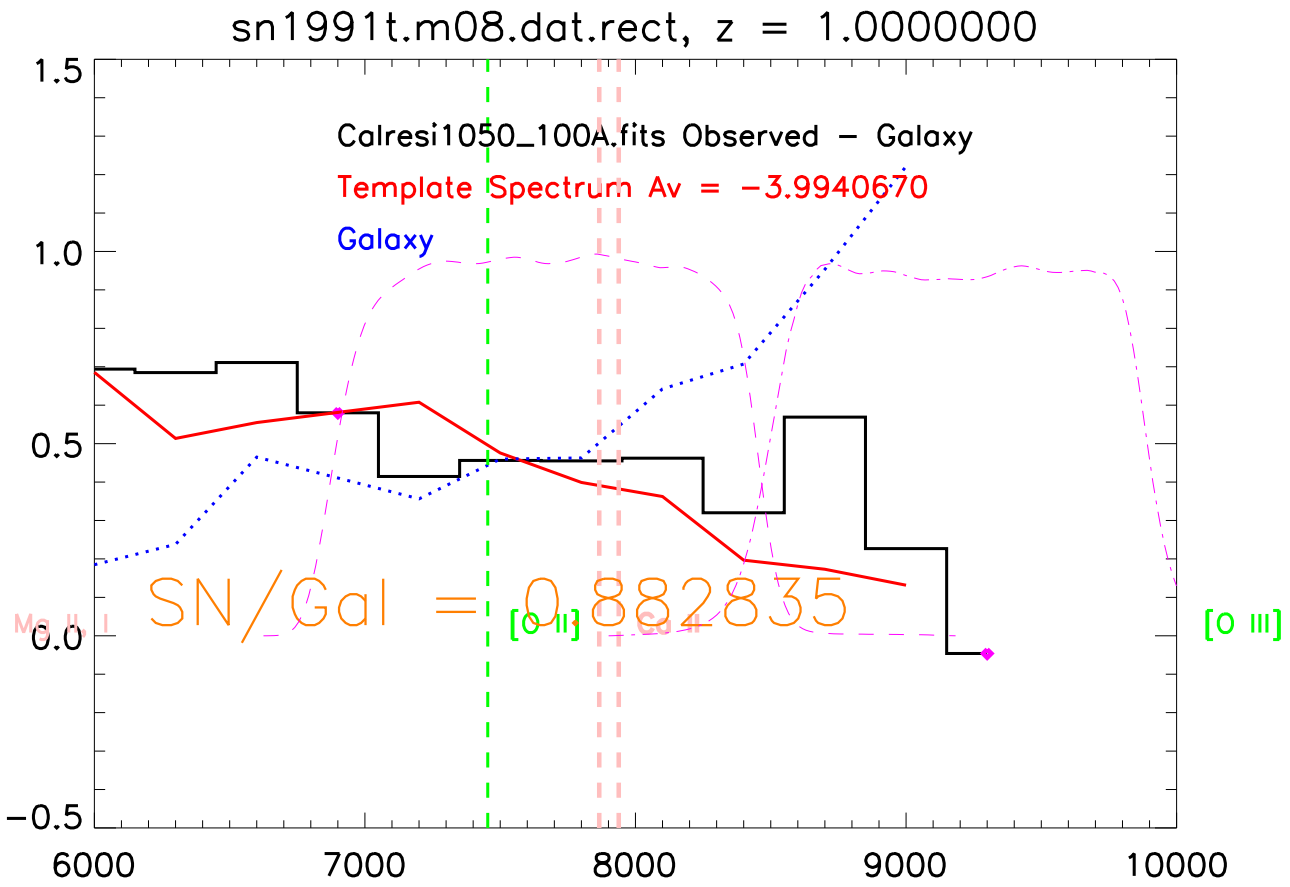

sn1986g.p28.dat.rect, z = 1.0000000
Calresi1050_100A.fits Observed − Galaxy
Template Spectrum Av = 4.6619749
Galaxy
SN/Gal = 0.331948
Mg II, I
[O II]
Ca II
[O III]
1.2
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
−0.4
6000
7000
8000
9000
10000

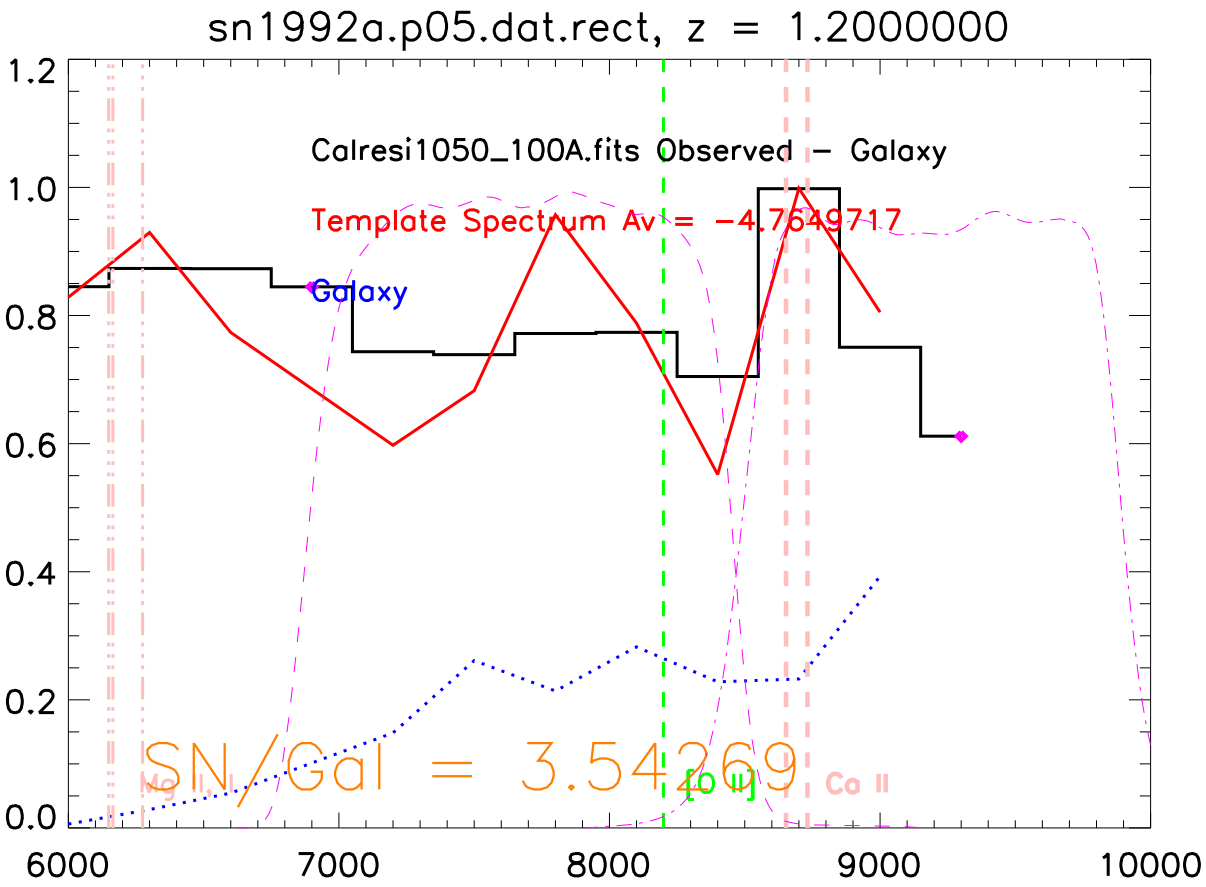

sn1981b.m00.dat.rect, z = 1.0000000
Calresi1050_100A.fits Observed − Galaxy
Template Spectrum Av = −5.5225433
Galaxy
SN/Gal = 0.450253
Mg II
[O II]
Ca II
[O III]
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

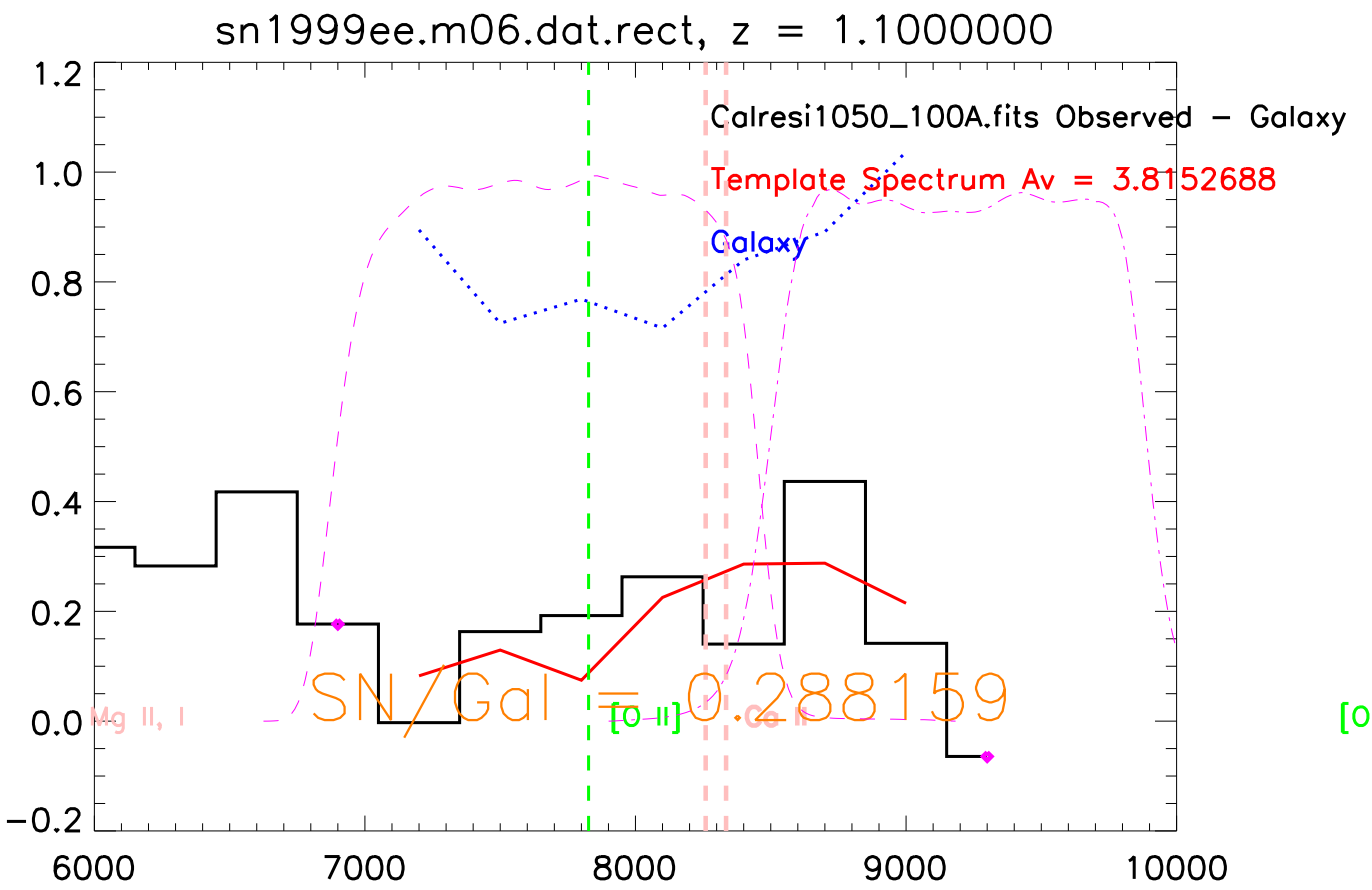

sn1999ee.p01.dat.rect, z = 1.1000000
Calresi1050_100A.fits Observed − Galaxy
Template Spectrum Av = 4.1820840
Galaxy
SN/Gal = 0.327774
Mg II, I
[O II]
Ca II
[O
1.2
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
6000
7000
8000
9000
10000

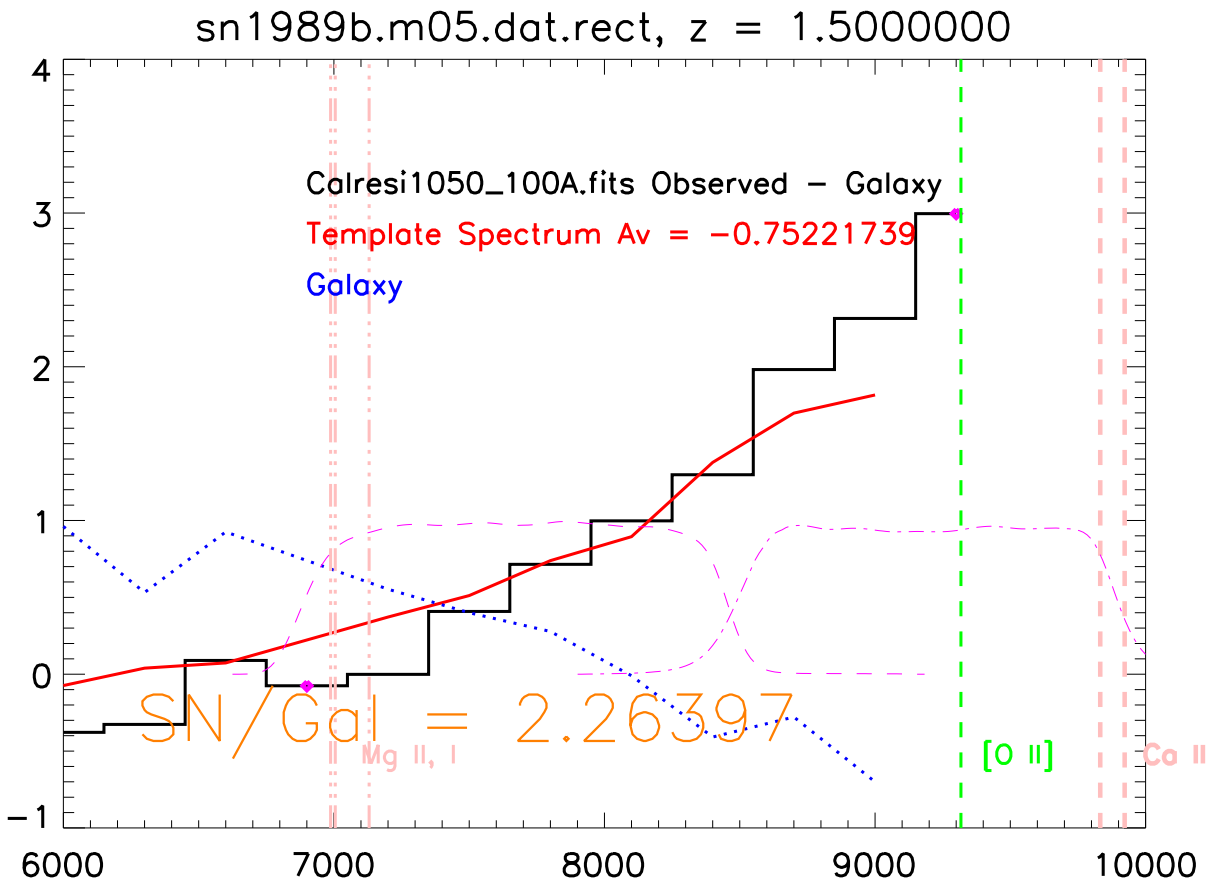

sn1994d.m09.dat.rect, z = 1.0000000
Calresi1050_100A.fits Observed − Galaxy
Template Spectrum Av = 2.8595812
Galaxy
SN/Gal = 0.242276
Mg II, I
[O II]
Ca II
[O III]
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

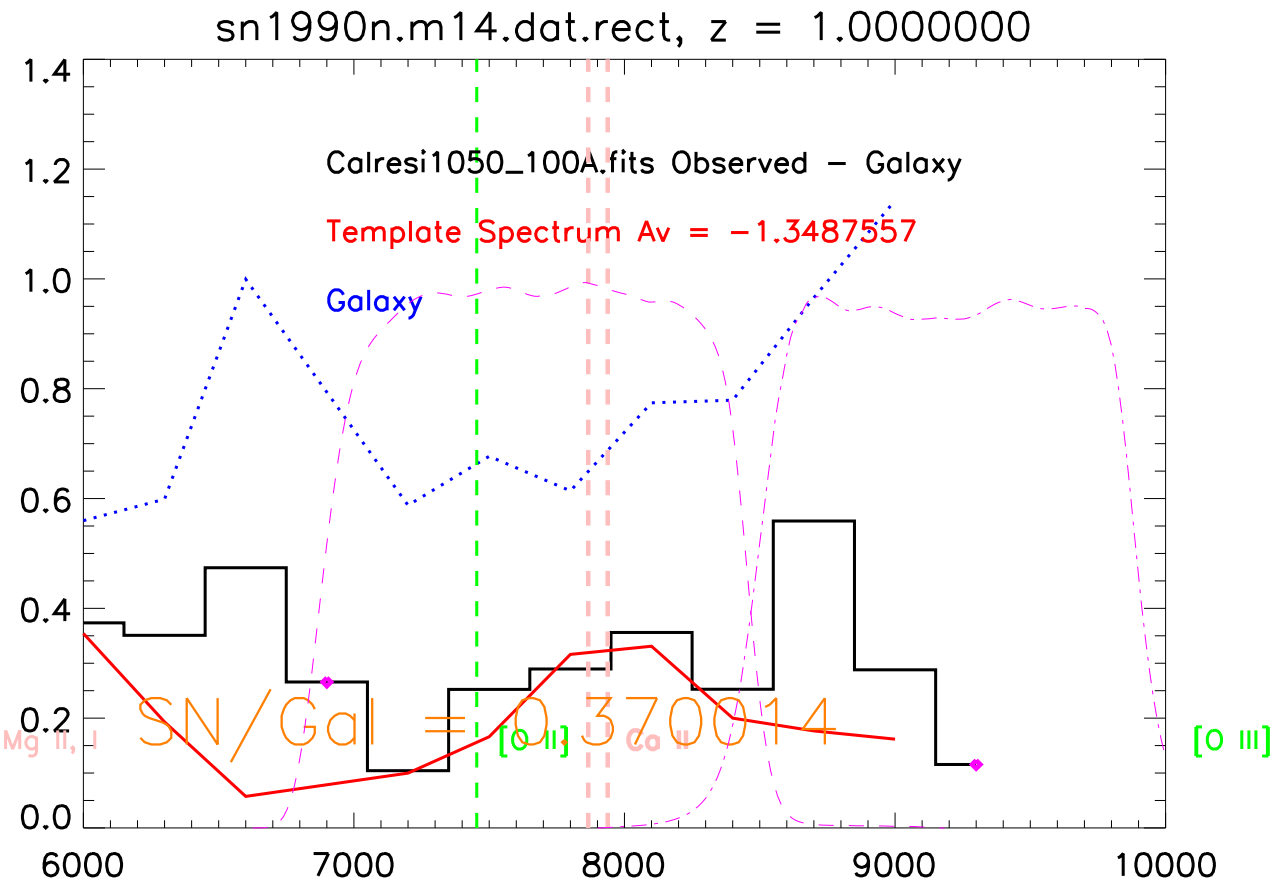

sn1990n.m07.dat.rect, z = 1.0000000
Calresi1050_100A.fits Observed − Galaxy
Template Spectrum Av = −2.4827823
Galaxy
SN/Gal = 0.460055
Mg II, I
[O II]
Ca II
[O III]
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
6000
7000
8000
9000
10000

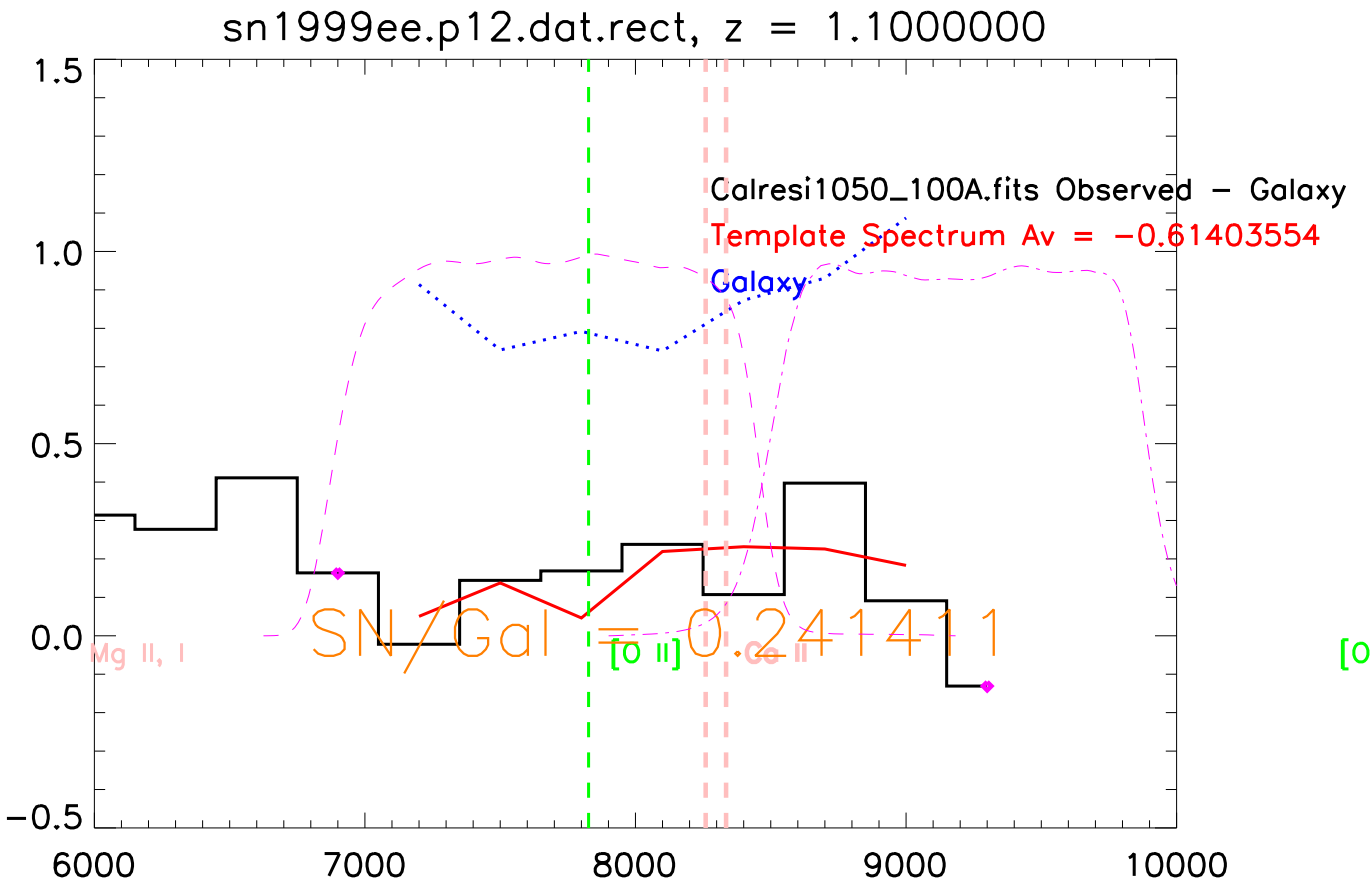

sn1991t.m08.dat.rect, z = 1.0000000
Calresi1050_100A.fits Observed − Galaxy
Template Spectrum Av = −3.9940670
Galaxy
SN/Gal = 0.882835
[O II]
[O III]
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

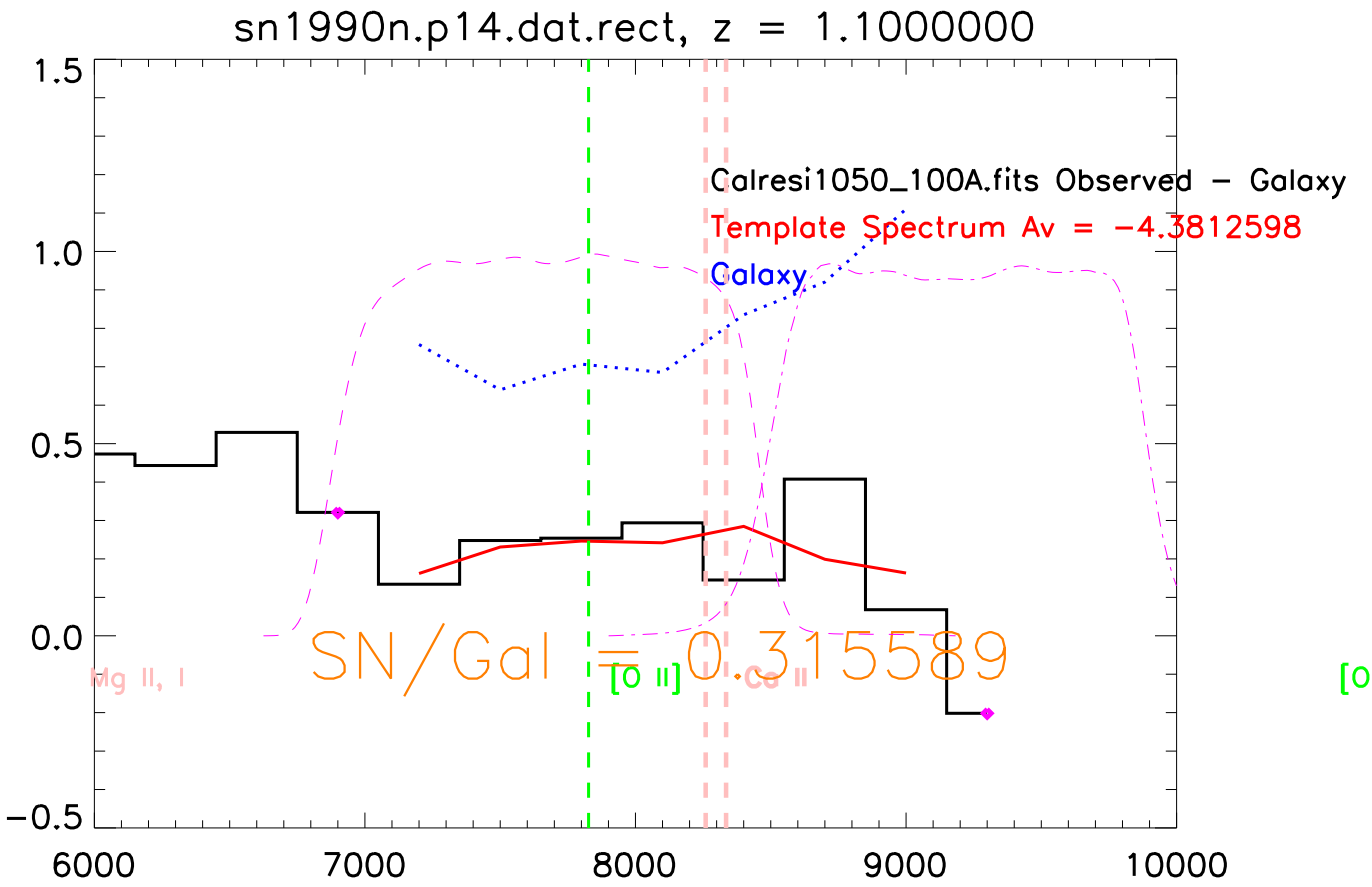

sn1992a.p05.dat.rect, z = 1.2000000
Calresi1050_100A.fits Observed – Galaxy
Template Spectrum Av = -4.7649717
Galaxy
SN/Gal = 3.54269
Mg II
[O II]
Ca II
1.2
1.0
0.8
0.6
0.4
0.2
0.0
6000
7000
8000
9000
10000

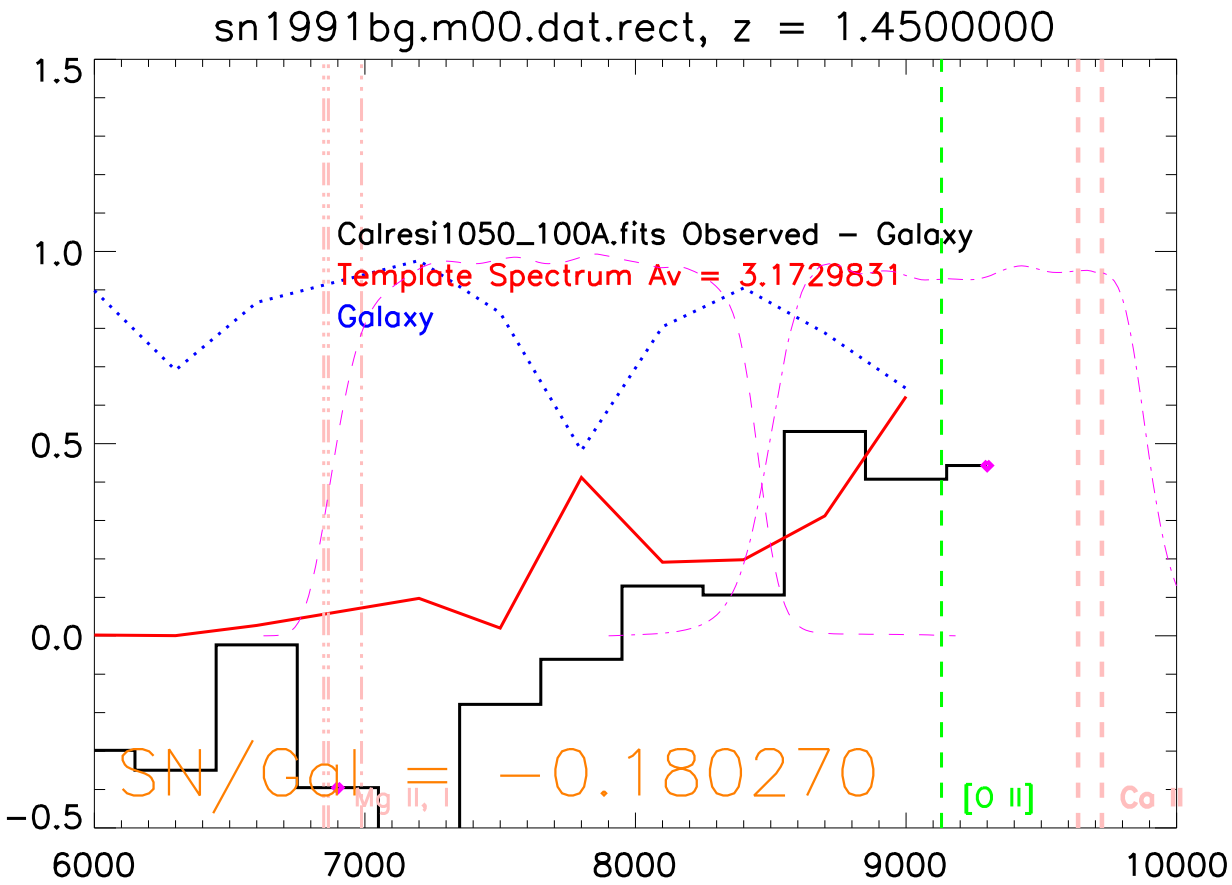

sn1999ee.m06.dat.rect, z = 1.1000000
Calresi1050_100A.fits Observed − Galaxy
Template Spectrum Av = 3.8152688
Galaxy
SN/Gal = 0.288159
[O II]
1.2
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
6000
7000
8000
9000
10000

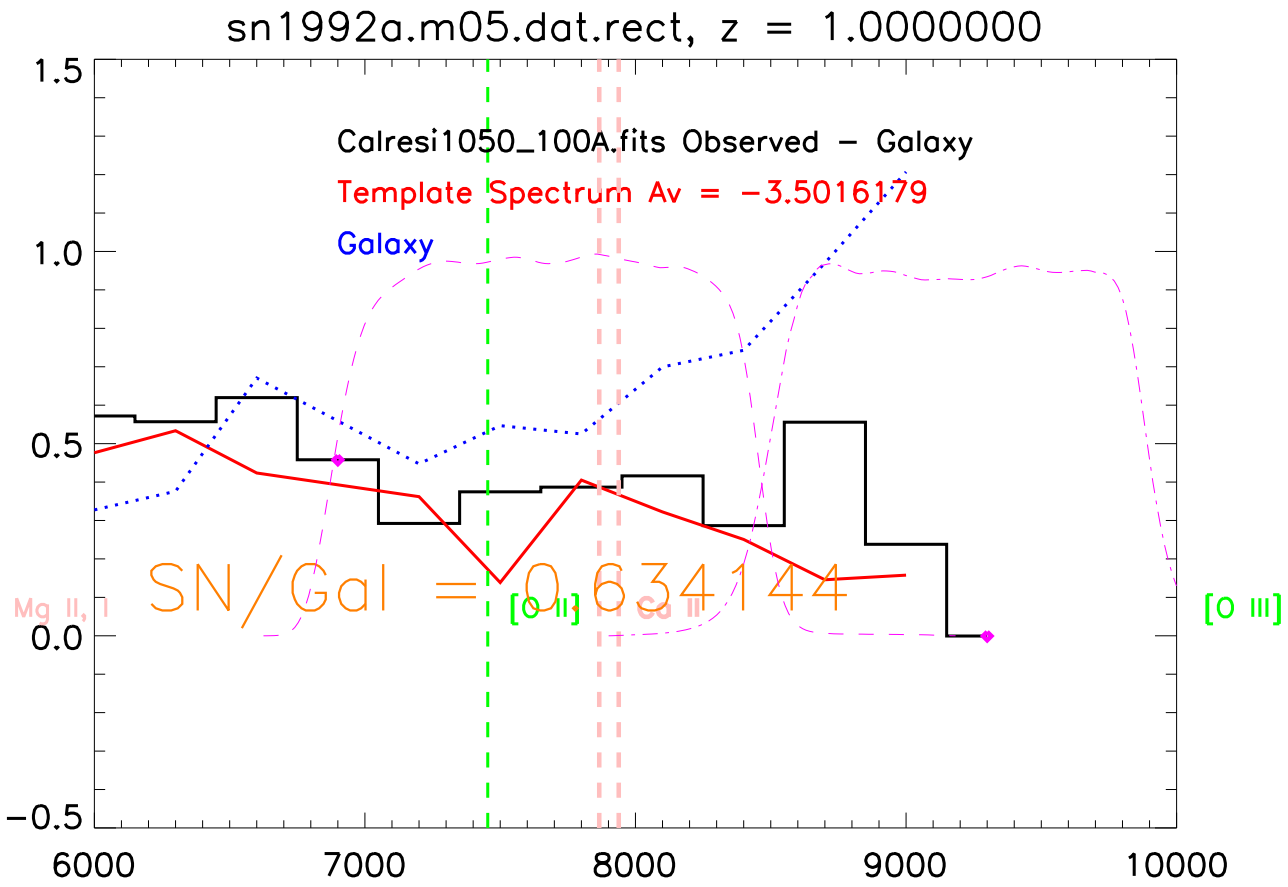

sn1989b.m05.dat.rect, z = 1.5000000
Calresi1050_100A.fits Observed − Galaxy
Template Spectrum Av = −0.75221739
Galaxy
SN/Gal = 2.26397
Mg II, I
[O II]
Ca II
4
3
2
1
0
−1
6000
7000
8000
9000
10000

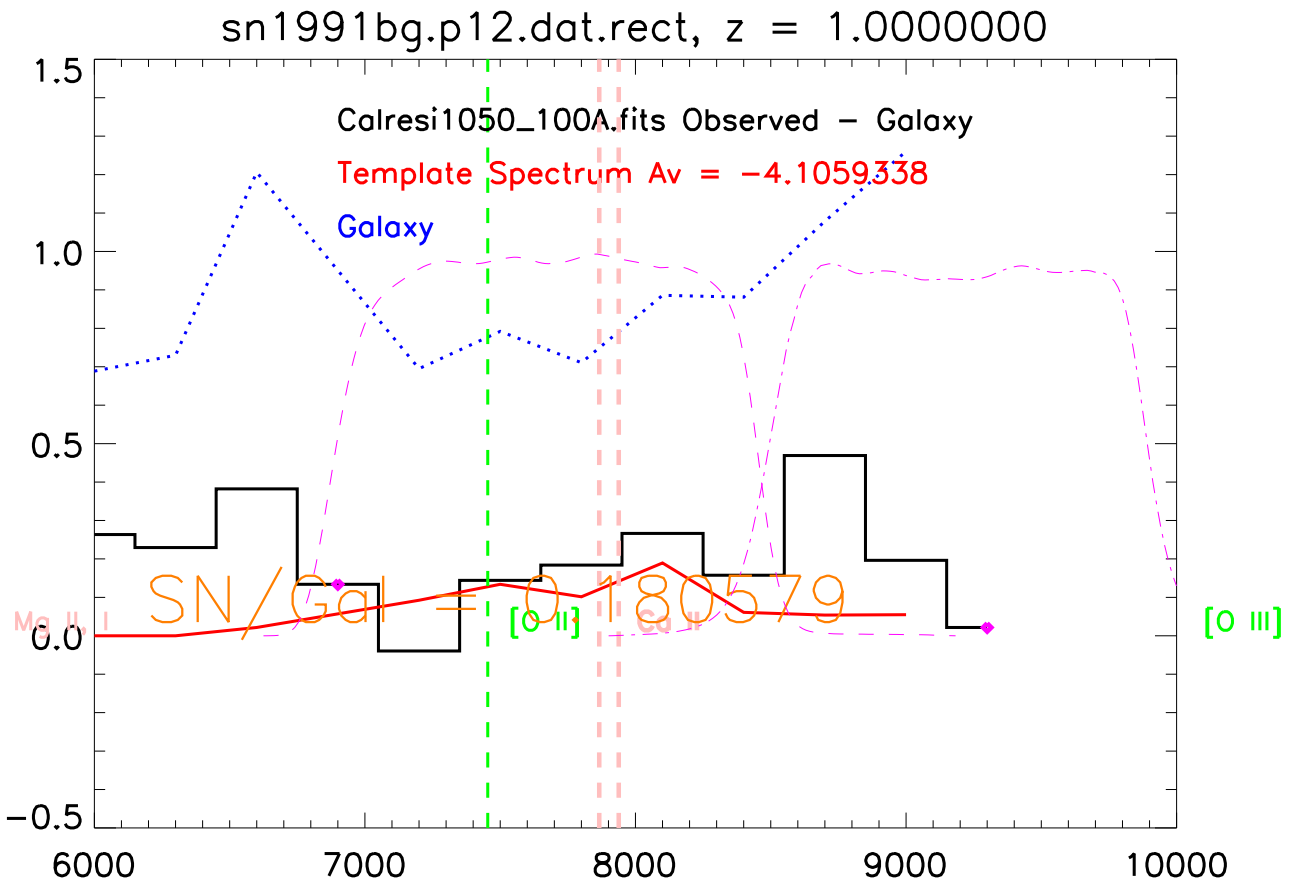

sn1990n.m14.dat.rect, z = 1.0000000
Calresi1050_100A.fits Observed − Galaxy
Template Spectrum Av = −1.3487557
Galaxy
SN/Gal = 0.370014
Mg II, I
[O II]
Ca II
[O III]
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
6000
7000
8000
9000
10000

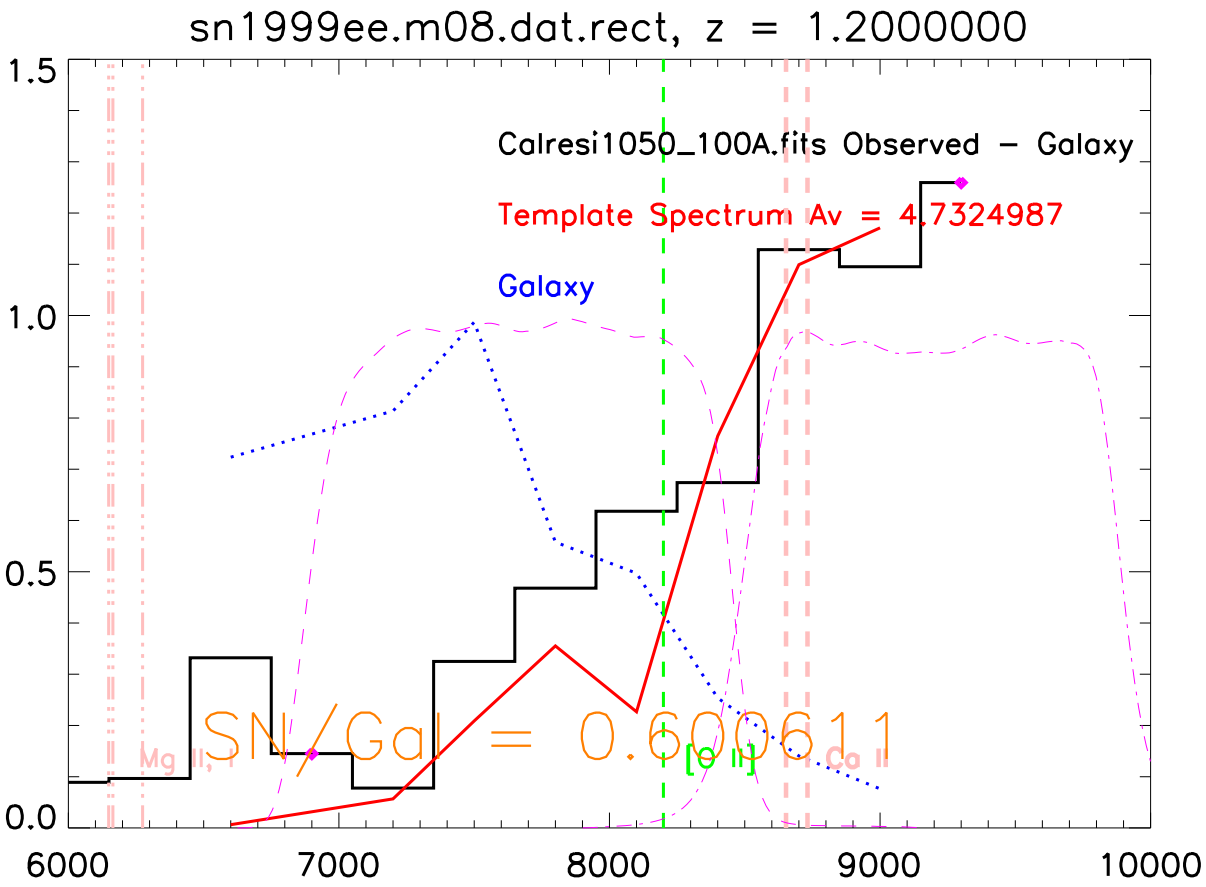

sn1999ee.p12.dat.rect, z = 1.1000000
Calresi1050_100A.fits Observed − Galaxy
Template Spectrum Av = −0.61403554
Galaxy
SN/Gal = 0.241411
Mg II, I
[O II]
Ca II
[O
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

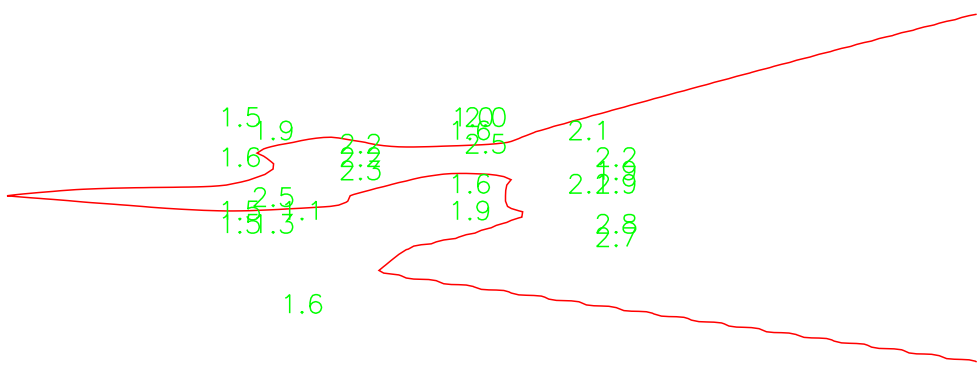

sn1990n.p14.dat.rect, z = 1.1000000
Calresi1050_100A.fits Observed − Galaxy
Template Spectrum Av = −4.3812598
Galaxy
SN/Gal = 0.315589
Mg II, I
[O II]
Ca II
[O
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

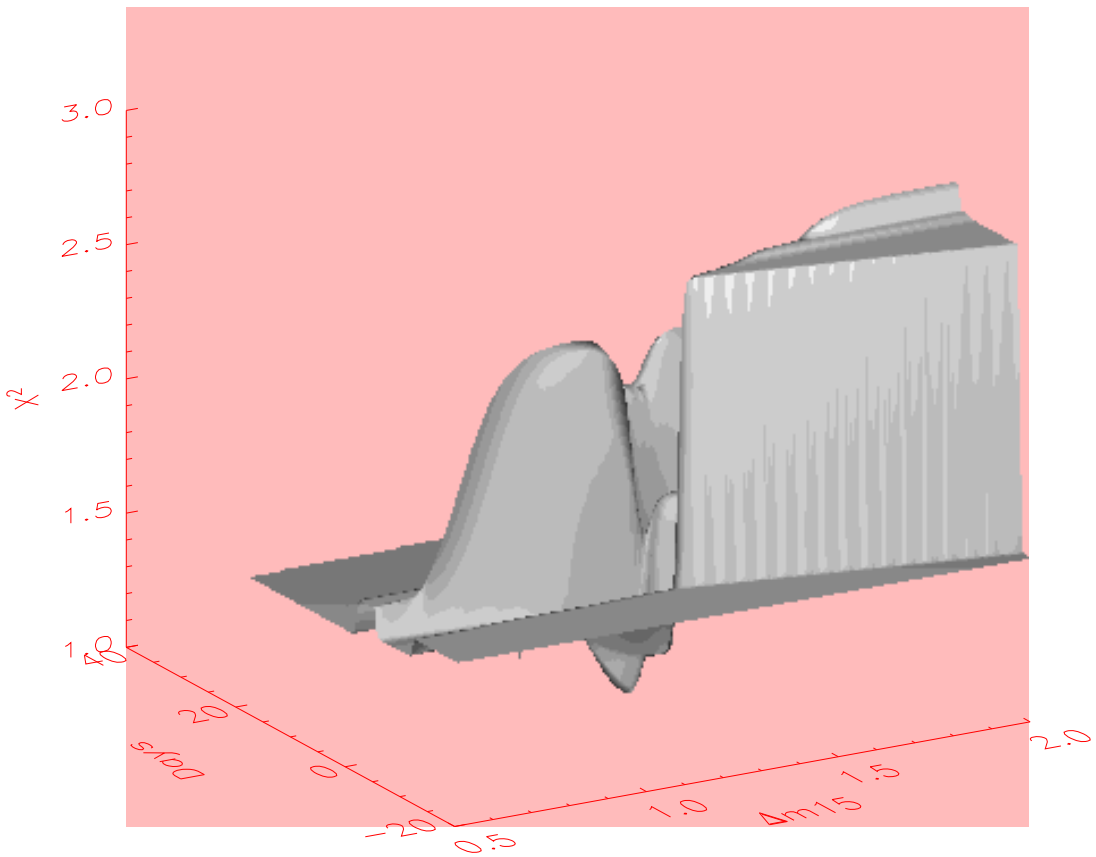

sn1991bg.m00.dat.rect, z = 1.4500000
Calresi1050_100A.fits Observed − Galaxy
Template Spectrum Av = 3.1729831
Galaxy
SN/Gal = −0.180270
Mg II, I
[O II]
Ca II
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000


sn1992a.m05.dat.rect, z = 1.0000000
Calresi1050_100A.fits Observed − Galaxy
Template Spectrum Av = −3.5016179
Galaxy
SN/Gal = 0.634144
Mg II, 1
[O II]
Ca III
[O III]
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

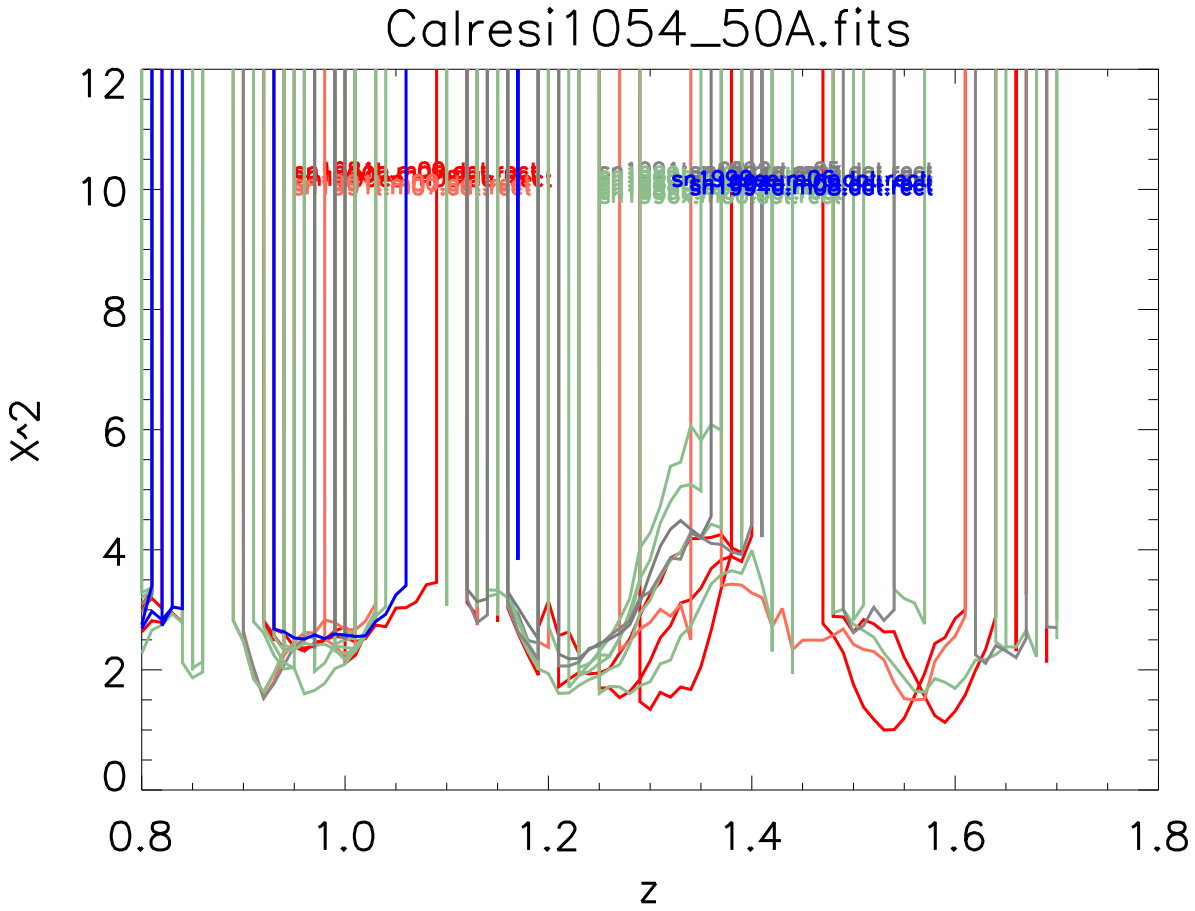

sn1991bg.p12.dat.rect, z = 1.0000000
Calresi1050_100A.fits Observed − Galaxy
Template Spectrum Av = −4.1059338
Galaxy
SN/Gal = 0.180579
[O II]
[O III]
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

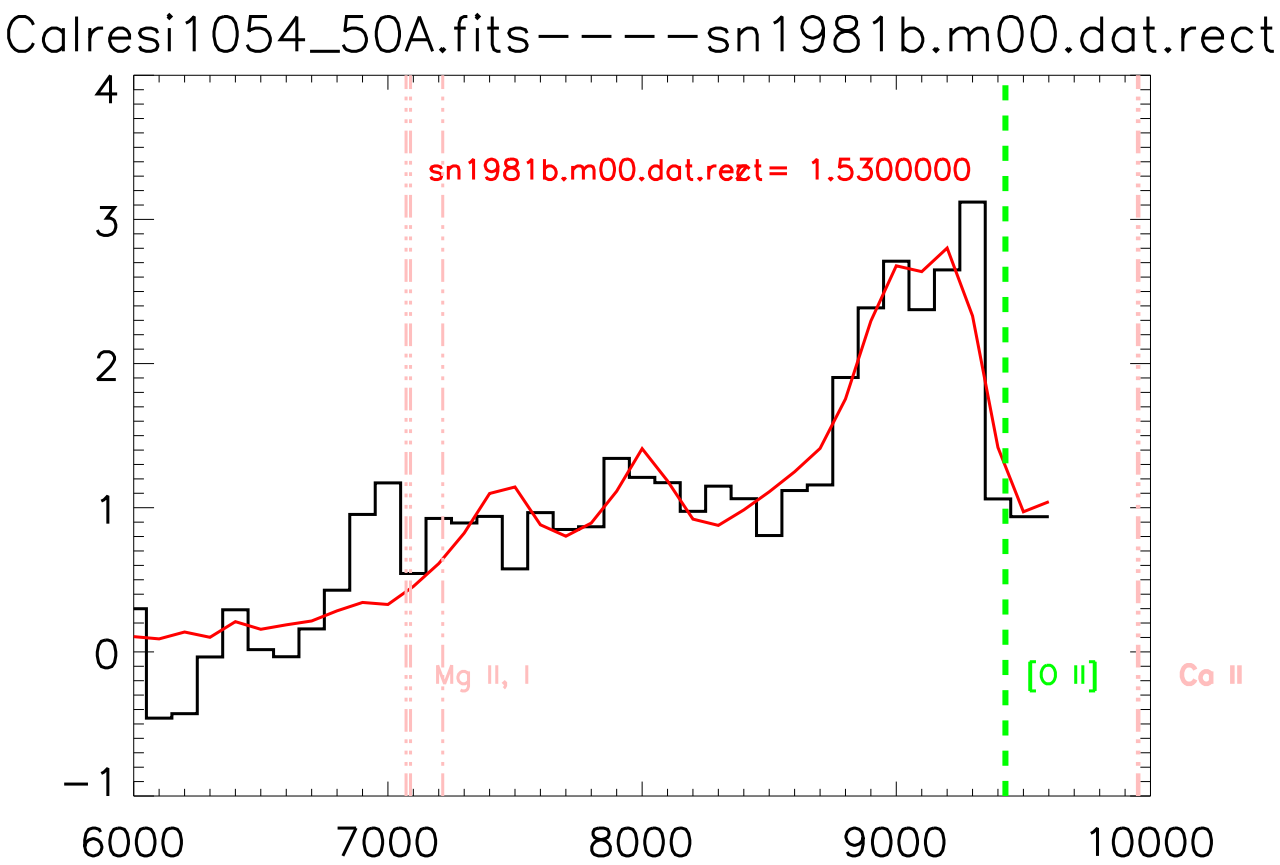

sn1999ee.m08.dat.rect, z = 1.2000000
Calresi1050_100A.fits Observed − Galaxy
Template Spectrum Av = 4.7324987
Galaxy
SN/Gal = 0.600611
Mg II
[O II]
Ca II
1.5
1.0
0.5
0.0
6000
7000
8000
9000
10000

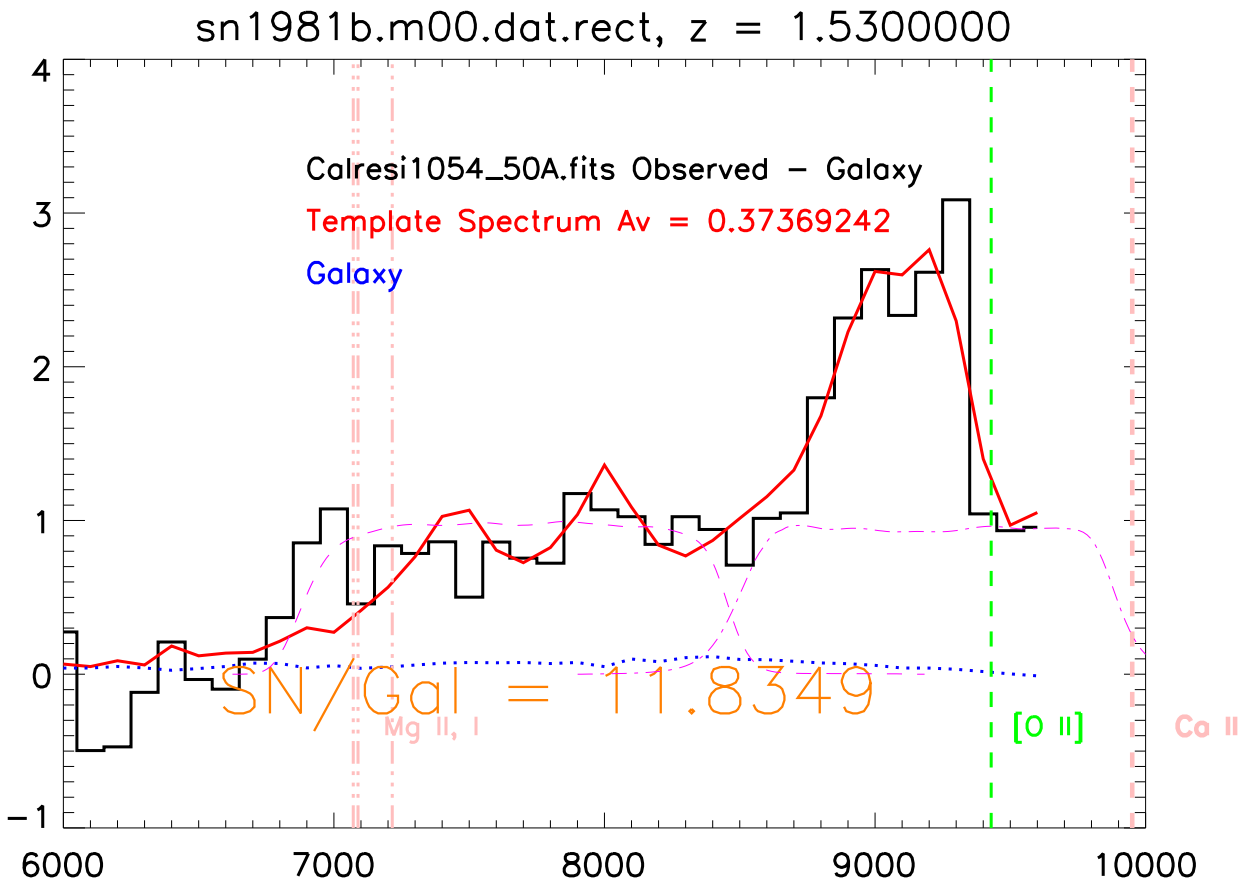

1.5
1.9
1.6
2.2
2.3
2.5
1.1
1.3
1.6
1.6
1.9
2.1
2.2
2.9
2.8
2.7

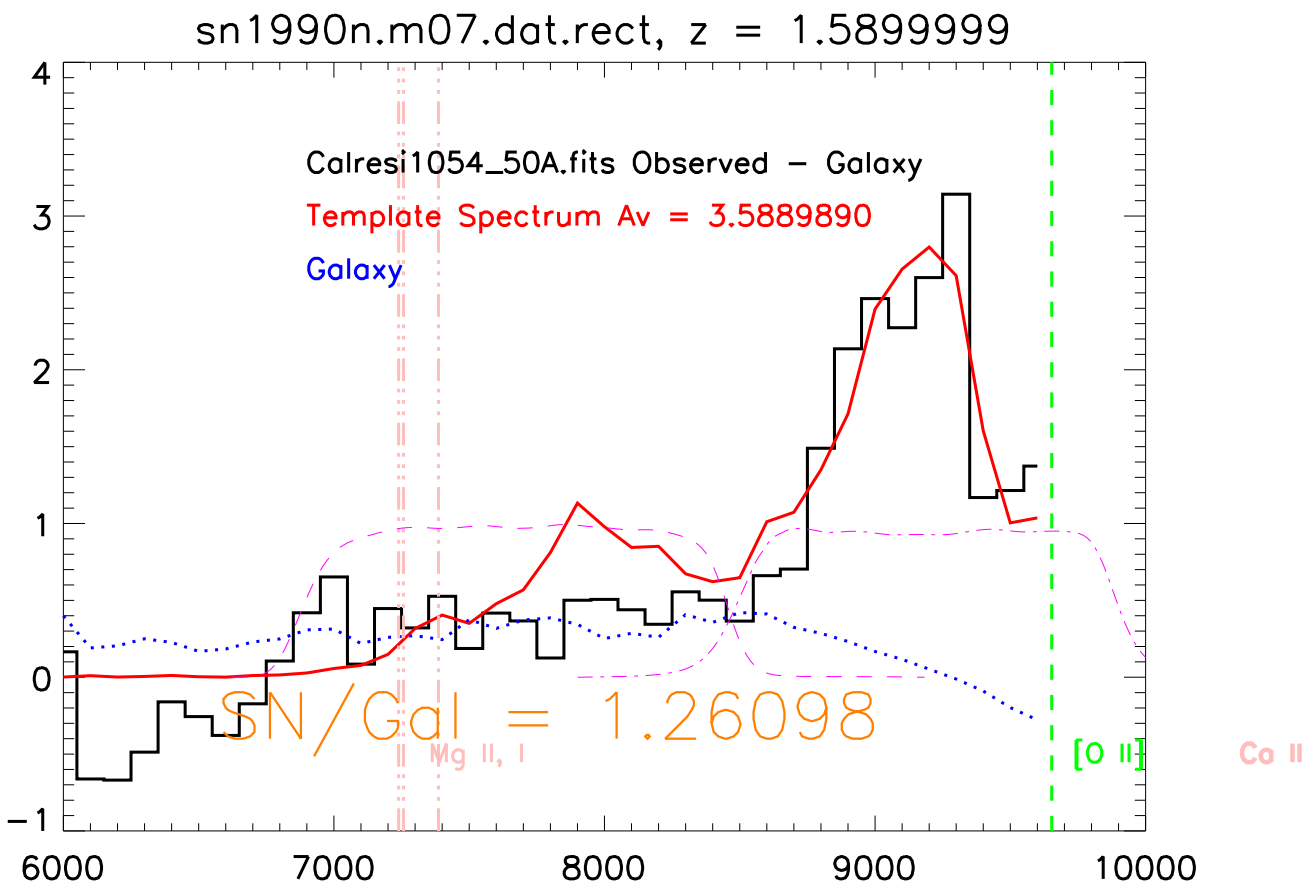


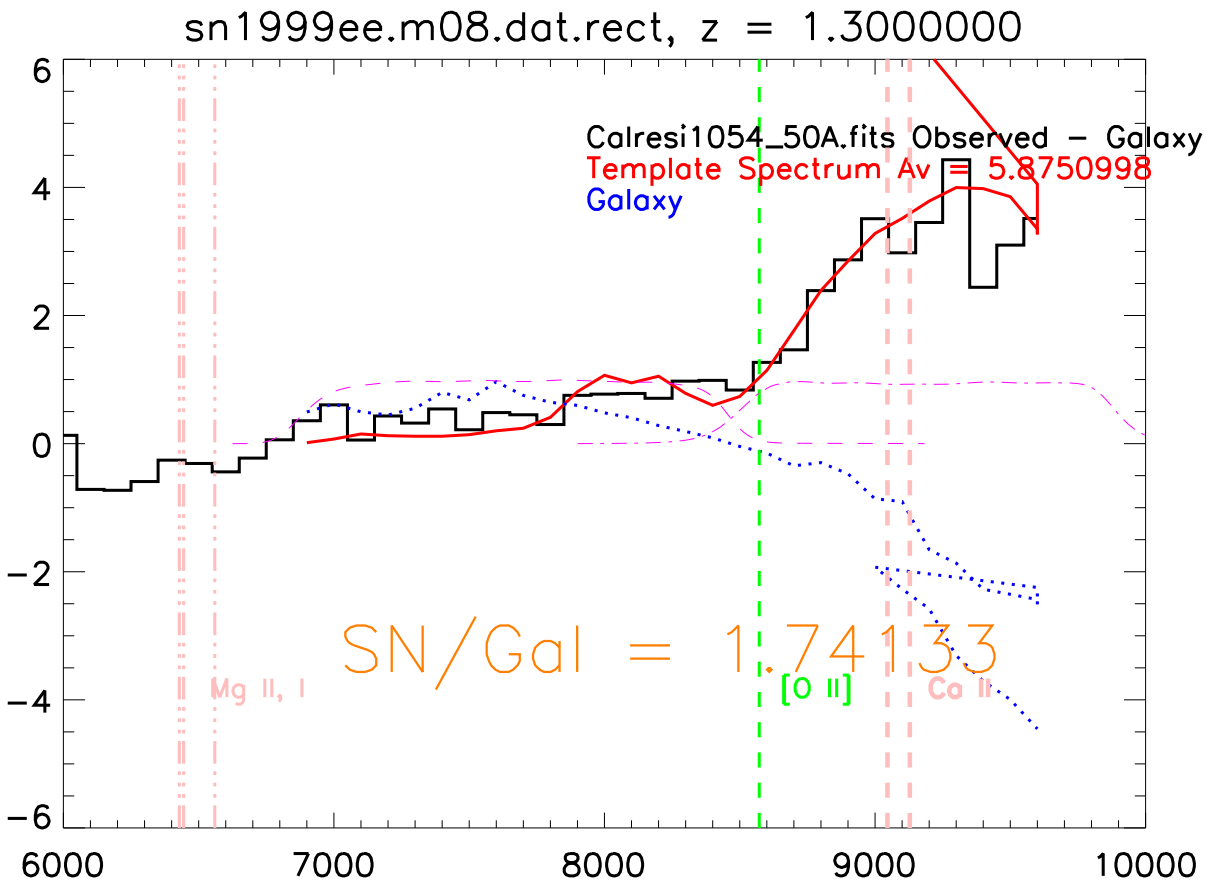
3.0
2.5
2.0
1.5
1.0
χ^2
40
20
0
−20
Days
0.5
1.0
1.5
2.0
Δm15

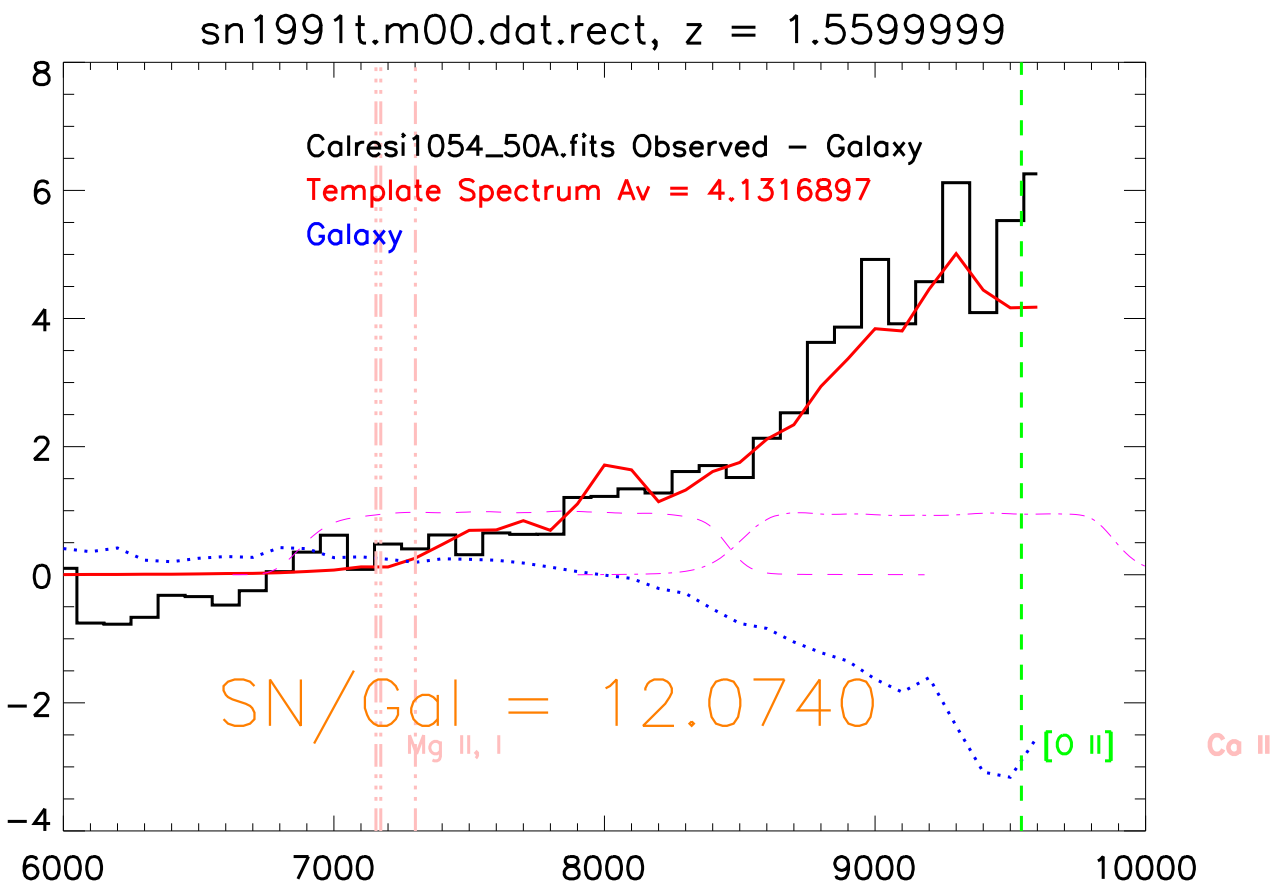

Calresi1054_50A.fits
12
10
8
6
4
2
0
X^2
0.8
1.0
1.2
1.4
1.6
1.8
z

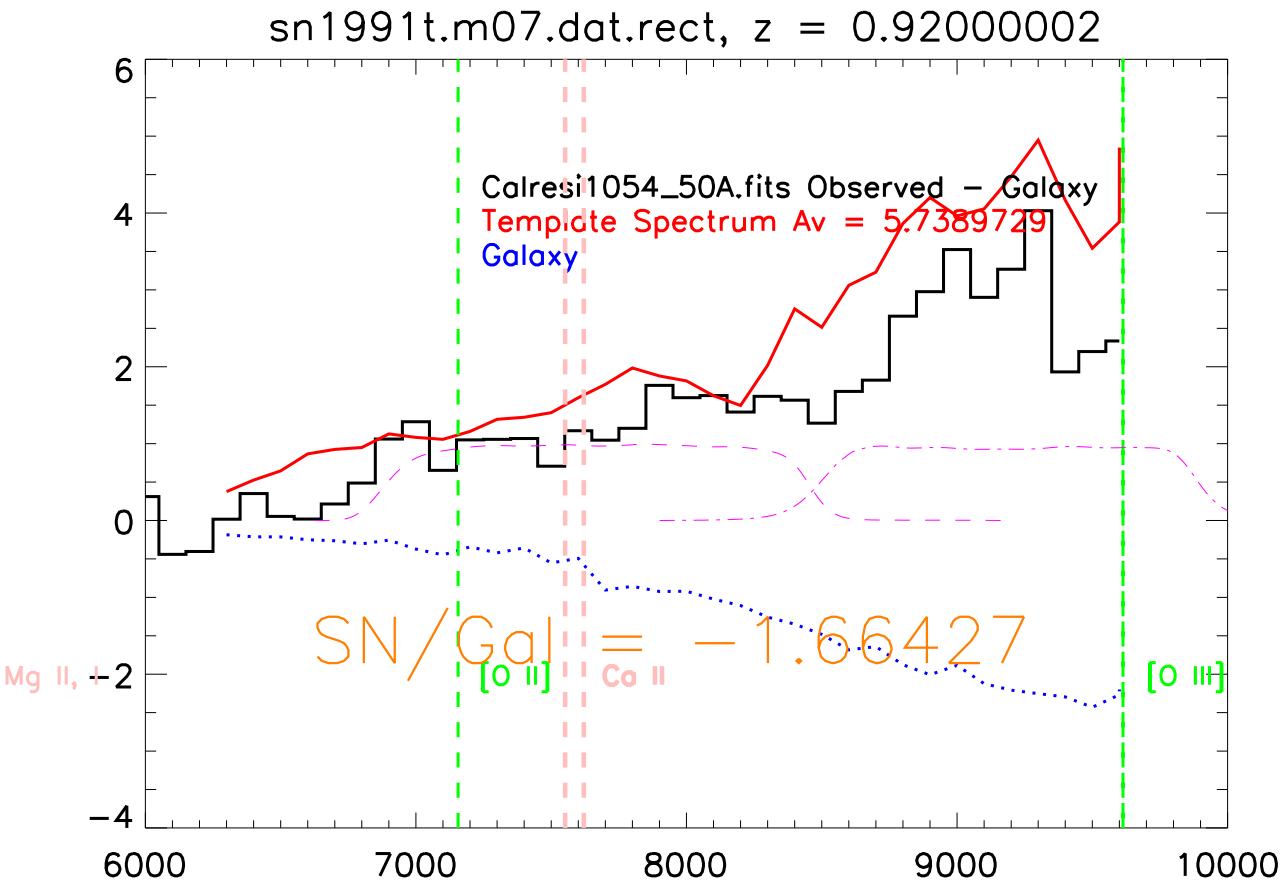

Calresi1054_50A.fits----sn1981b.m00.dat.rect
sn1981b.m00.dat.rect z= 1.5300000
Mg II, I
[O II]
Ca II
4
3
2
1
0
−1
6000
7000
8000
9000
10000

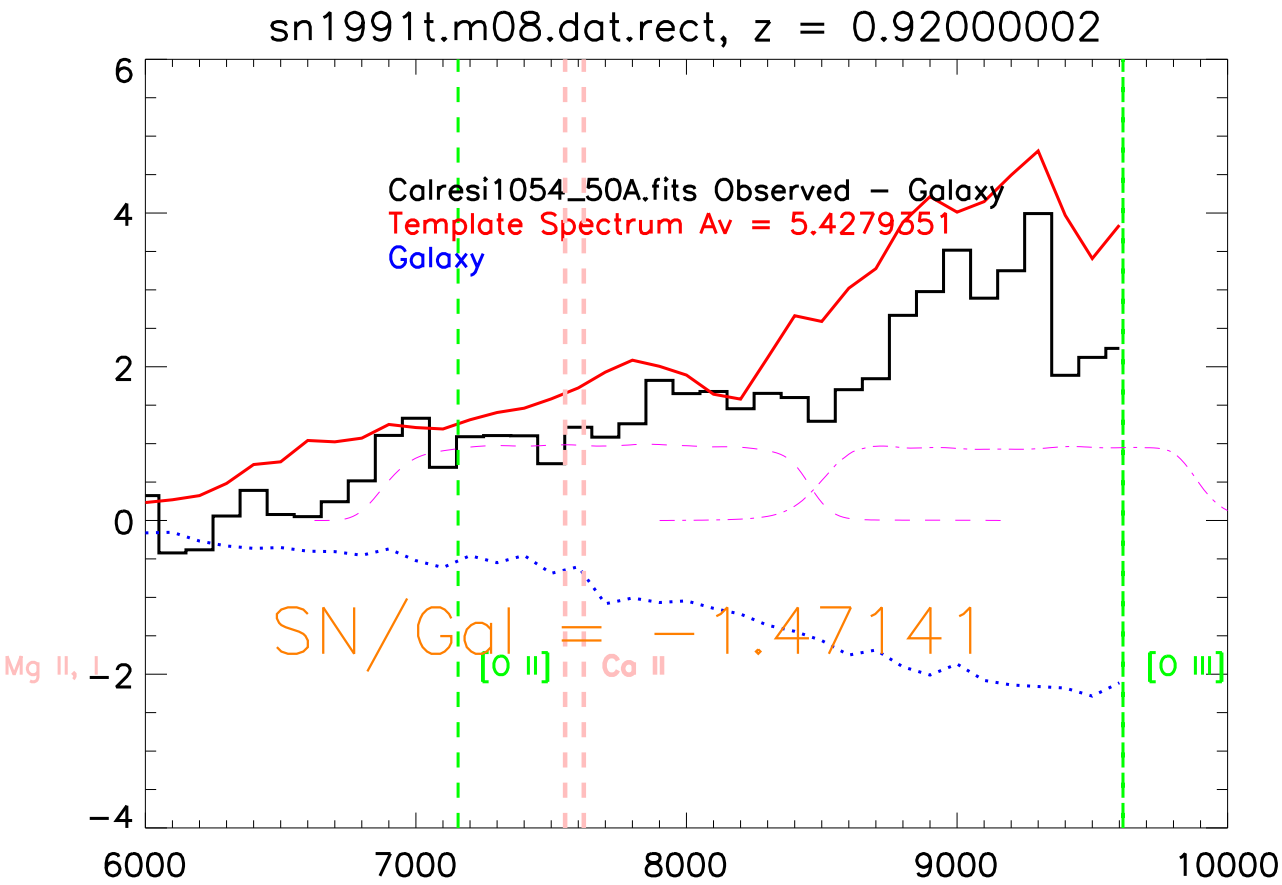

sn1981b.m00.dat.rect, z = 1.5300000
Calresi1054_50A.fits Observed − Galaxy
Template Spectrum Av = 0.37369242
Galaxy
SN/Gal = 11.8349
Mg II, I
[O II]
Ca II
4
3
2
1
0
−1
6000
7000
8000
9000
10000

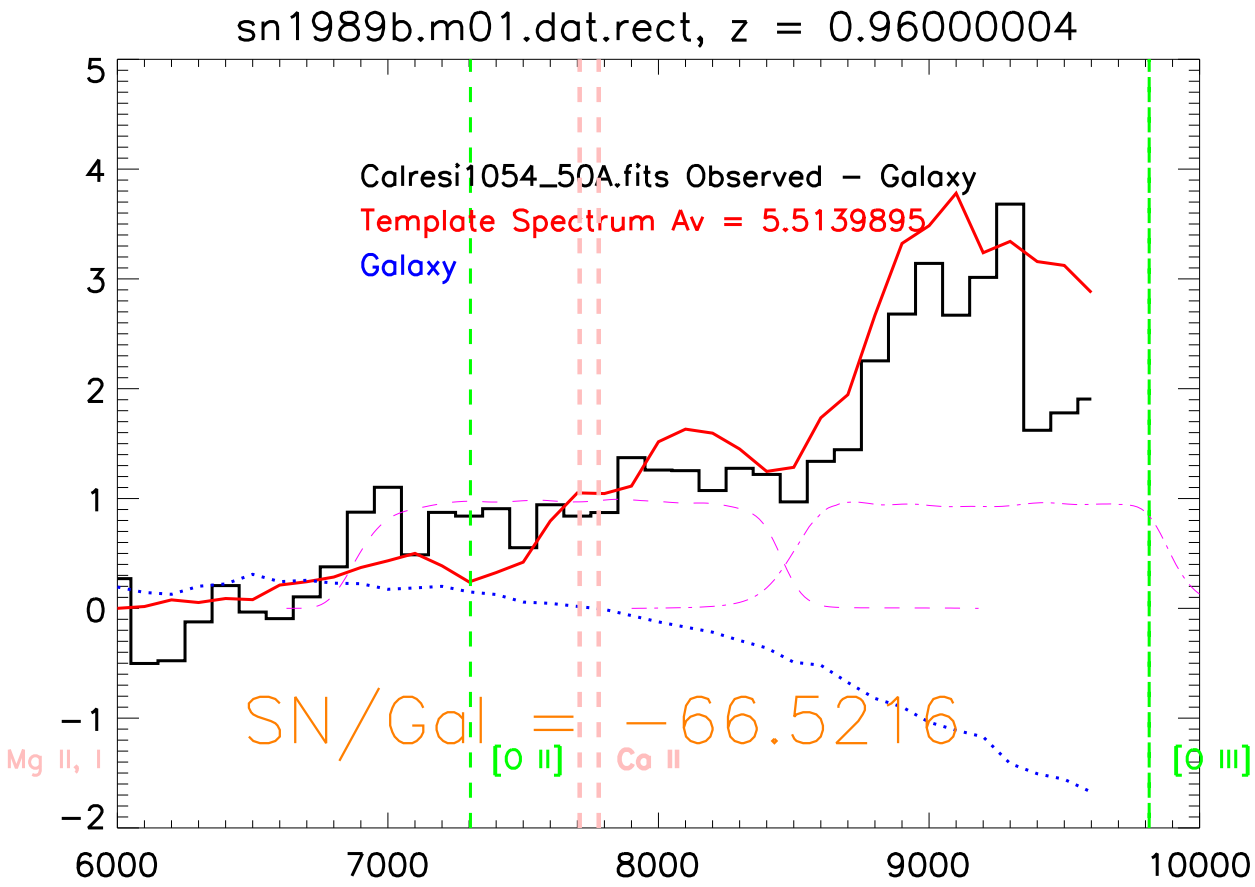

sn1990n.m07.dat.rect, z = 1.5899999
Calresi1054_50A.fits Observed − Galaxy
Template Spectrum Av = 3.5889890
Galaxy
SN/Gal = 1.26098
Mg II, I
[O II]
Ca II
4
3
2
1
0
−1
6000
7000
8000
9000
10000

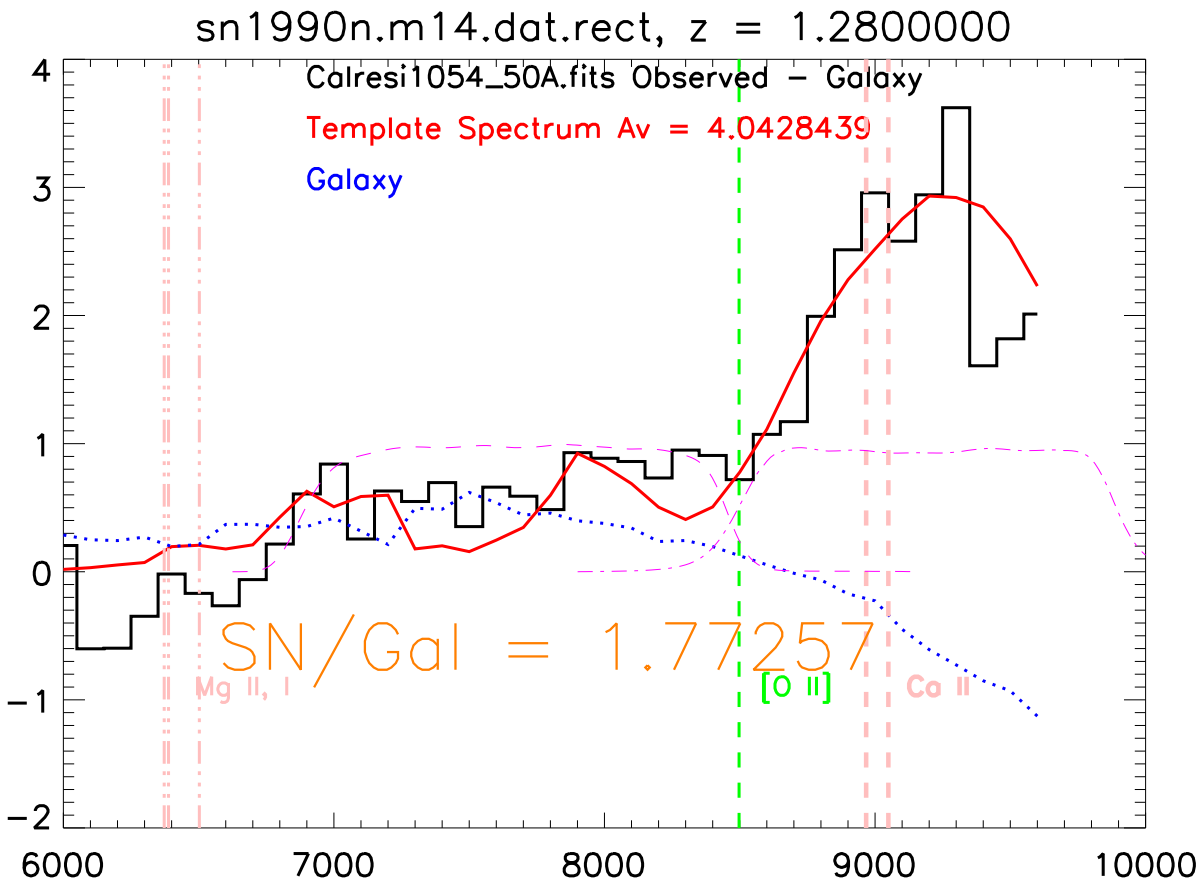

sn1999ee.m08.dat.rect, z = 1.3000000
Calresi1054_50A.fits Observed − Galaxy
Template Spectrum Av = 5.8750998
Galaxy
SN/Gal = 1.74133
Mg II, I
[O II]
Ca II
6
4
2
0
−2
−4
−6
6000
7000
8000
9000
10000

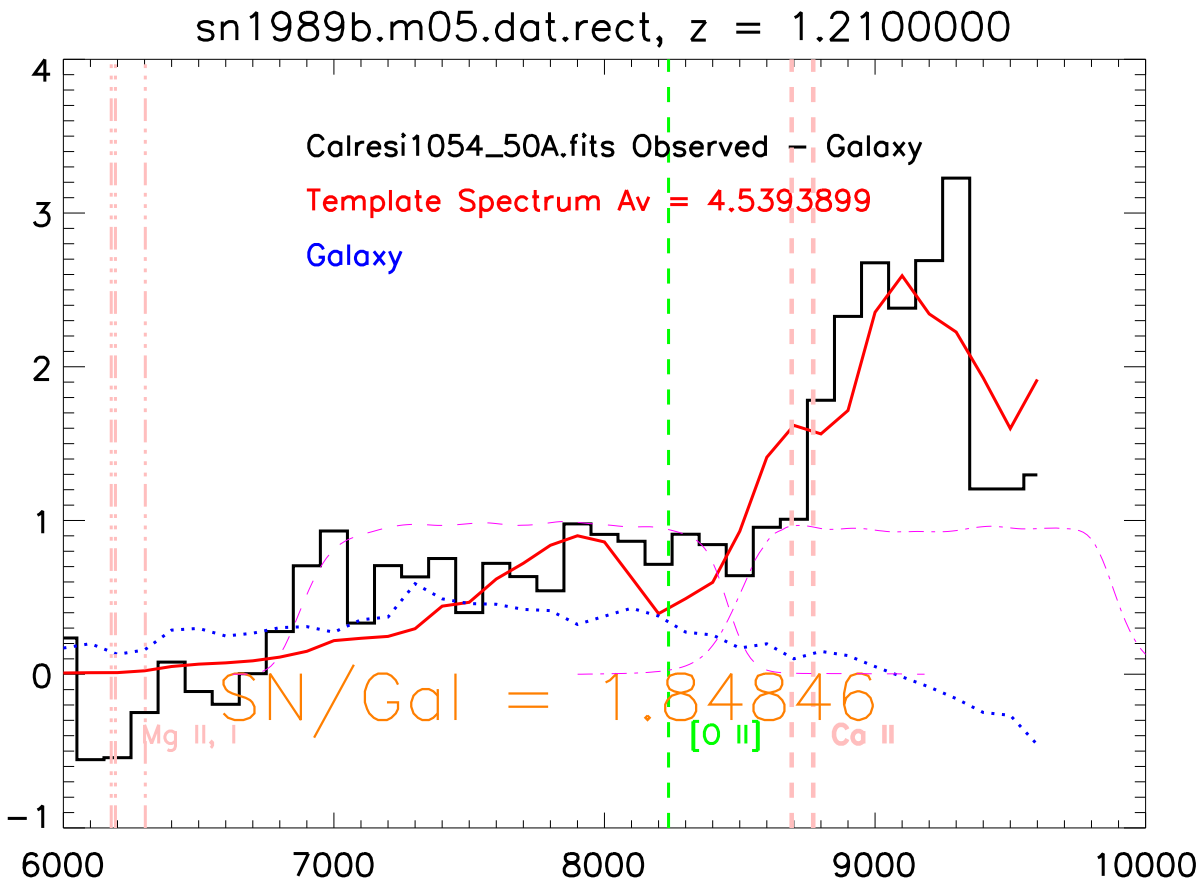

sn1991t.m00.dat.rect, z = 1.5599999
Calresi1054_50A.fits Observed − Galaxy
Template Spectrum Av = 4.1316897
Galaxy
SN/Gal = 12.0740
Mg II, I
[O II]
Ca II
8
6
4
2
0
−2
−4
6000
7000
8000
9000
10000

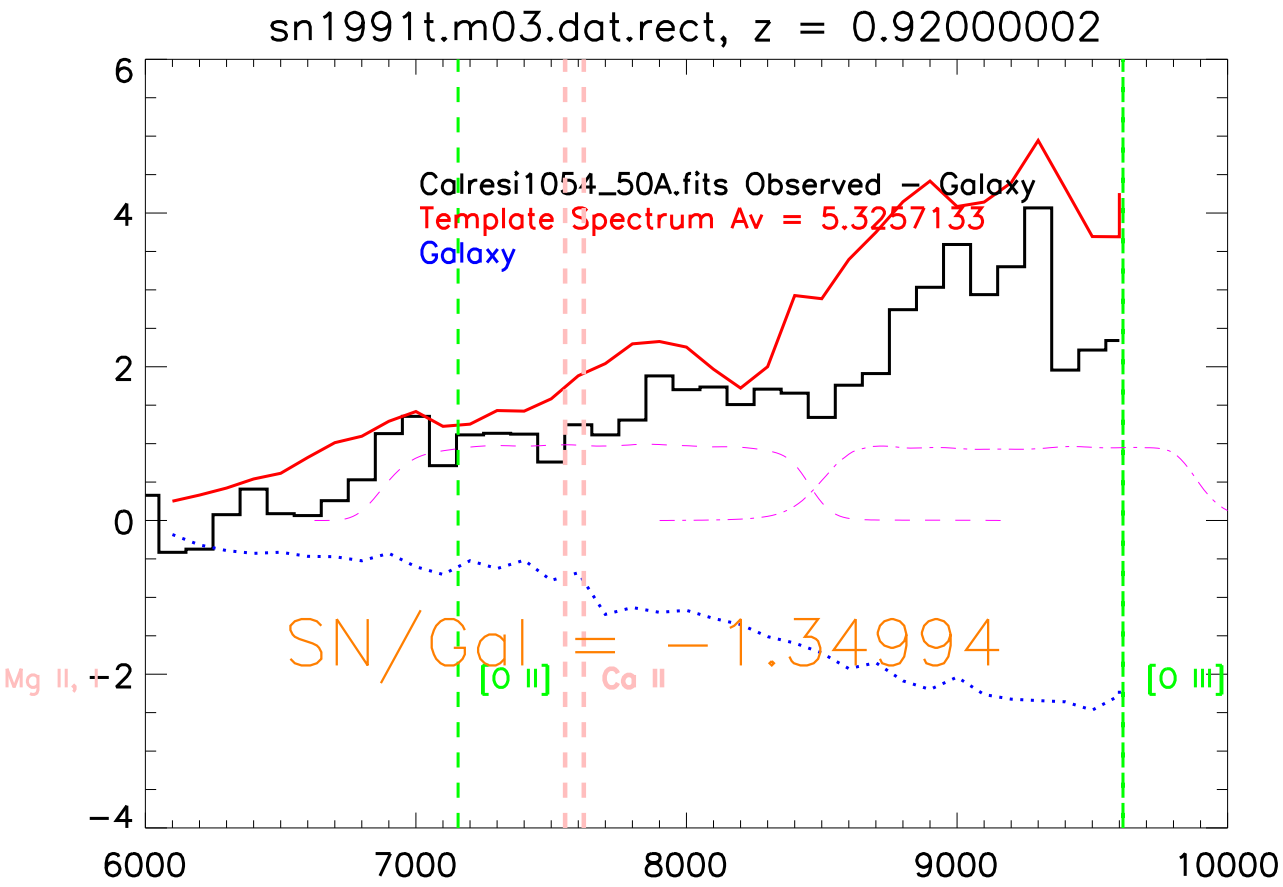

sn1991t.m07.dat.rect, z = 0.92000002
Calresi1054_50A.fits Observed − Galaxy
Template Spectrum Av = 5.7389729
Galaxy
SN/Gal = −1.66427
[O II]
Ca II
[O III]
Mg II,
6
4
2
0
−2
−4
6000
7000
8000
9000
10000

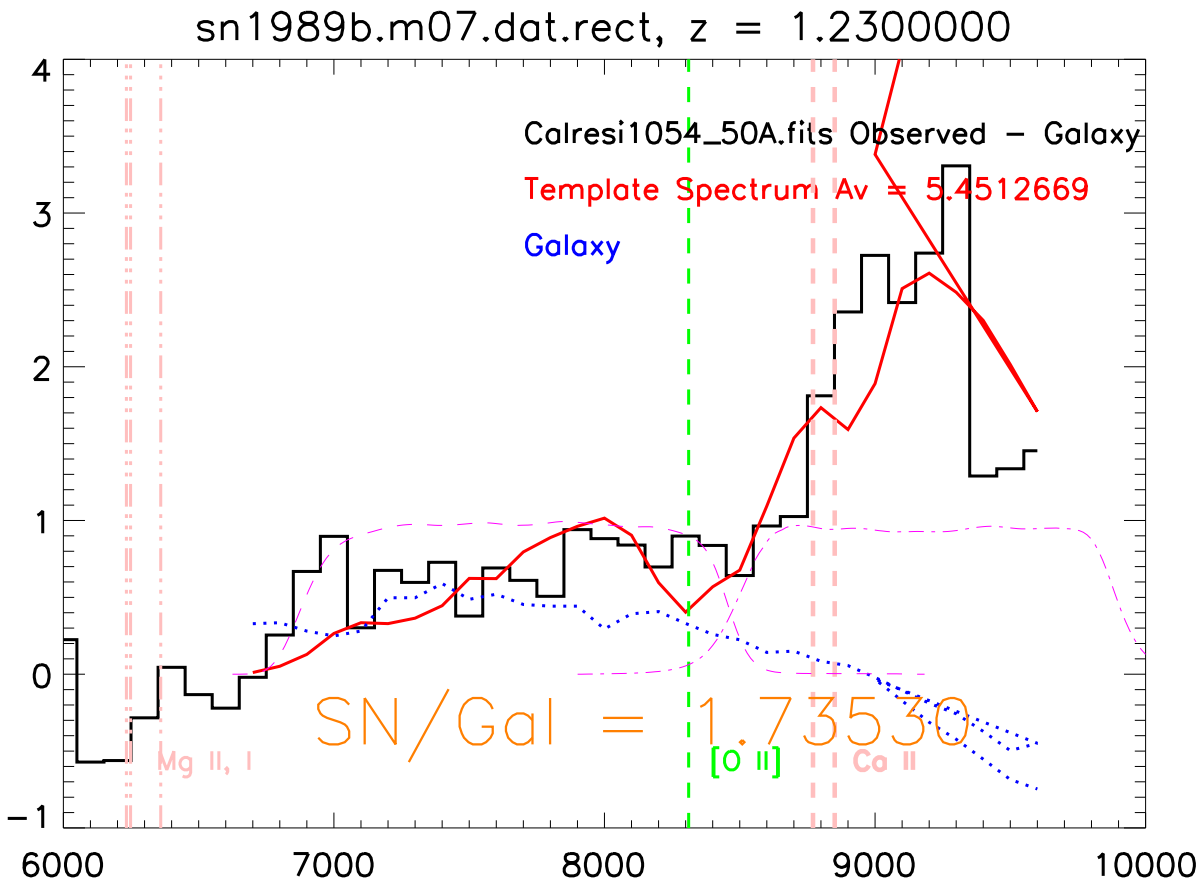

sn1991t.m08.dat.rect, z = 0.92000002
Calresi1054_50A.fits Observed − Galaxy
Template Spectrum Av = 5.4279351
Galaxy
SN/Gal = −1.47141
Mg II, ⊥
[O II]
Ca II
[O III]
6
4
2
0
−2
−4
6000
7000
8000
9000
10000

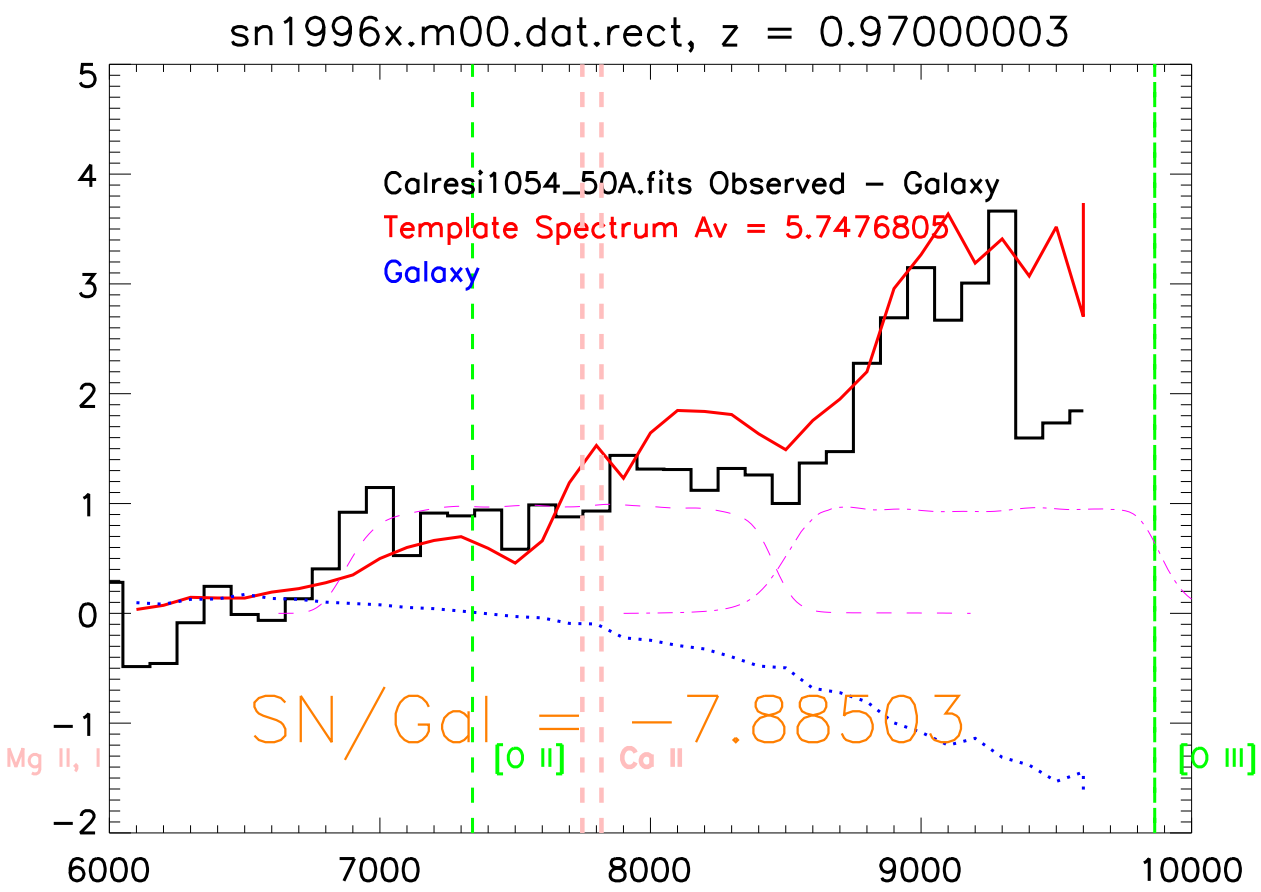

sn1989b.m01.dat.rect, z = 0.96000004
Calresi1054_50A.fits Observed − Galaxy
Template Spectrum Av = 5.5139895
Galaxy
SN/Gal = −66.5216
Mg II, I
[O II]
Ca II
[O III]
5
4
3
2
1
0
−1
−2
6000
7000
8000
9000
10000

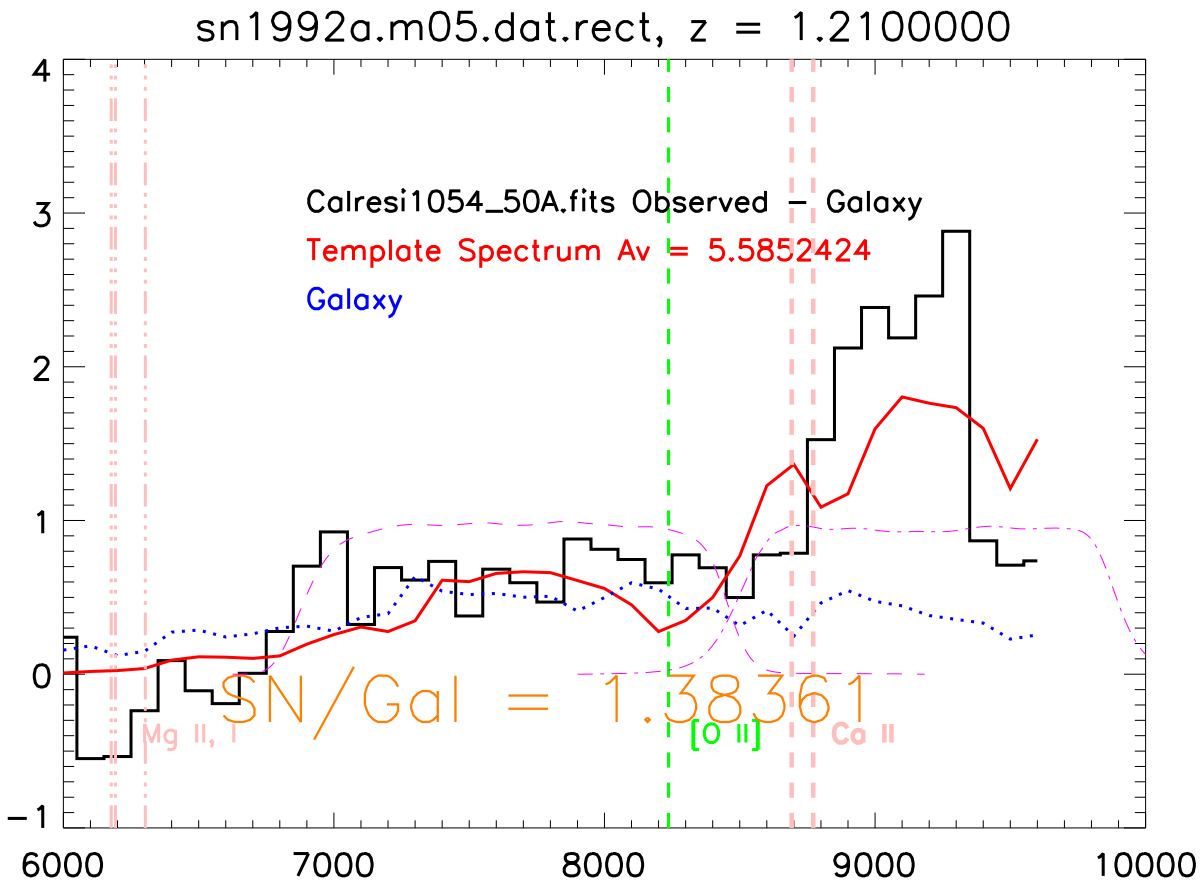

sn1990n.m14.dat.rect, z = 1.2800000
Calresi1054_50A.fits Observed − Galaxy
Template Spectrum Av = 4.0428439
Galaxy
SN/Gal = 1.77257
Mg II, I
[O II]
Ca II
4
3
2
1
0
−1
−2
6000
7000
8000
9000
10000

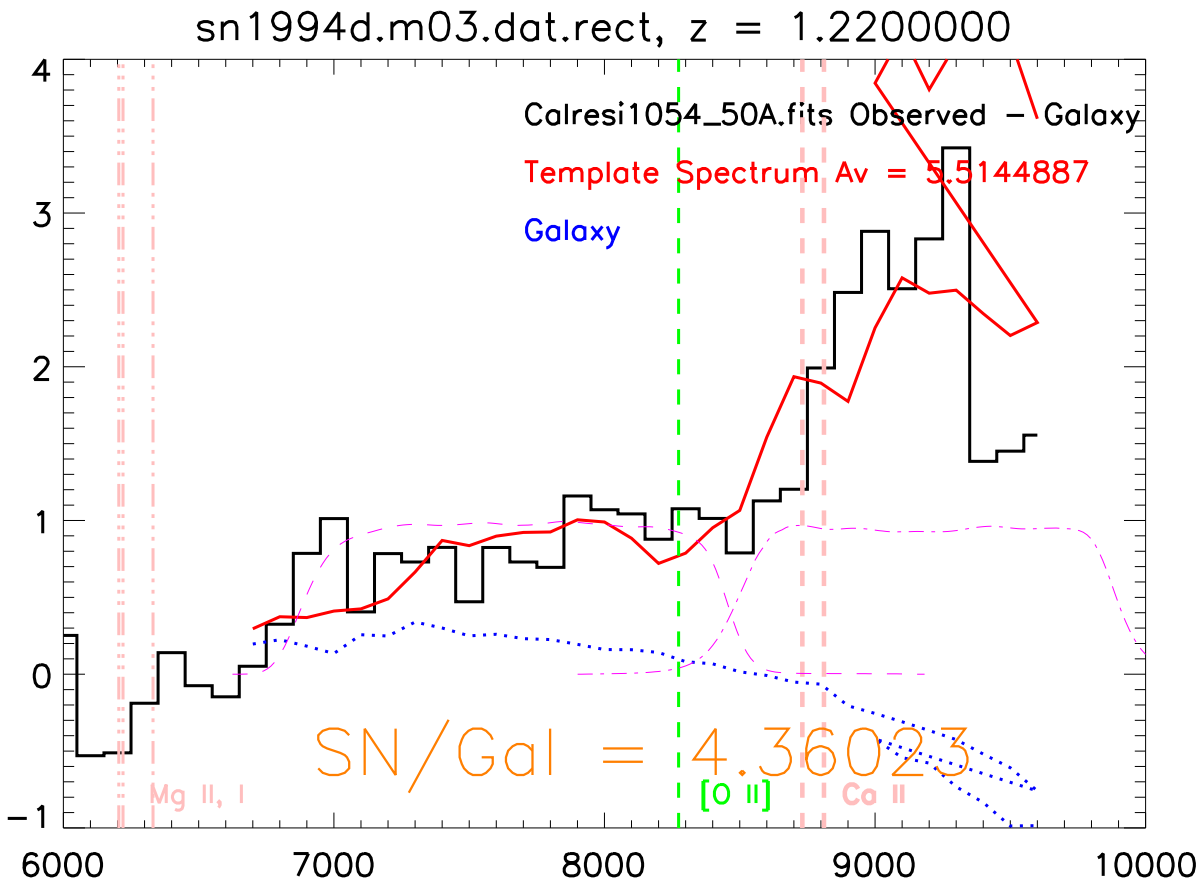

sn1989b.m05.dat.rect, z = 1.2100000
Calresi1054_50A.fits Observed – Galaxy
Template Spectrum Av = 4.5393899
Galaxy
SN/Gal = 1.84846
Mg II, I
[O II]
Ca II
4
3
2
1
0
−1
6000
7000
8000
9000
10000

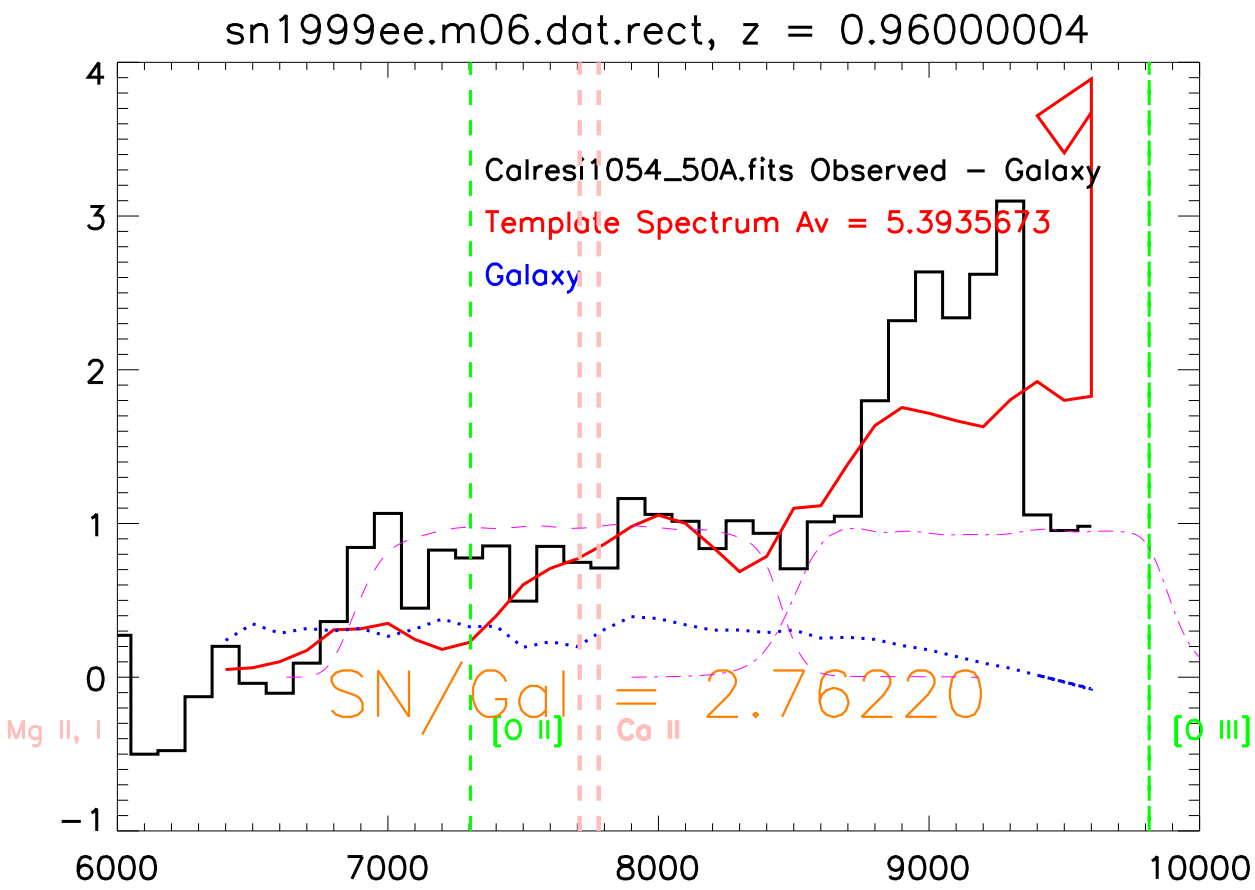

sn1991t.m03.dat.rect, z = 0.92000002
Calresi1054_50A.fits Observed – Galaxy
Template Spectrum Av = 5.3257133
Galaxy
SN/Gal = −1.34994
[O II]
Ca II
[O III]
Mg II,
6
4
2
0
−2
−4
6000
7000
8000
9000
10000

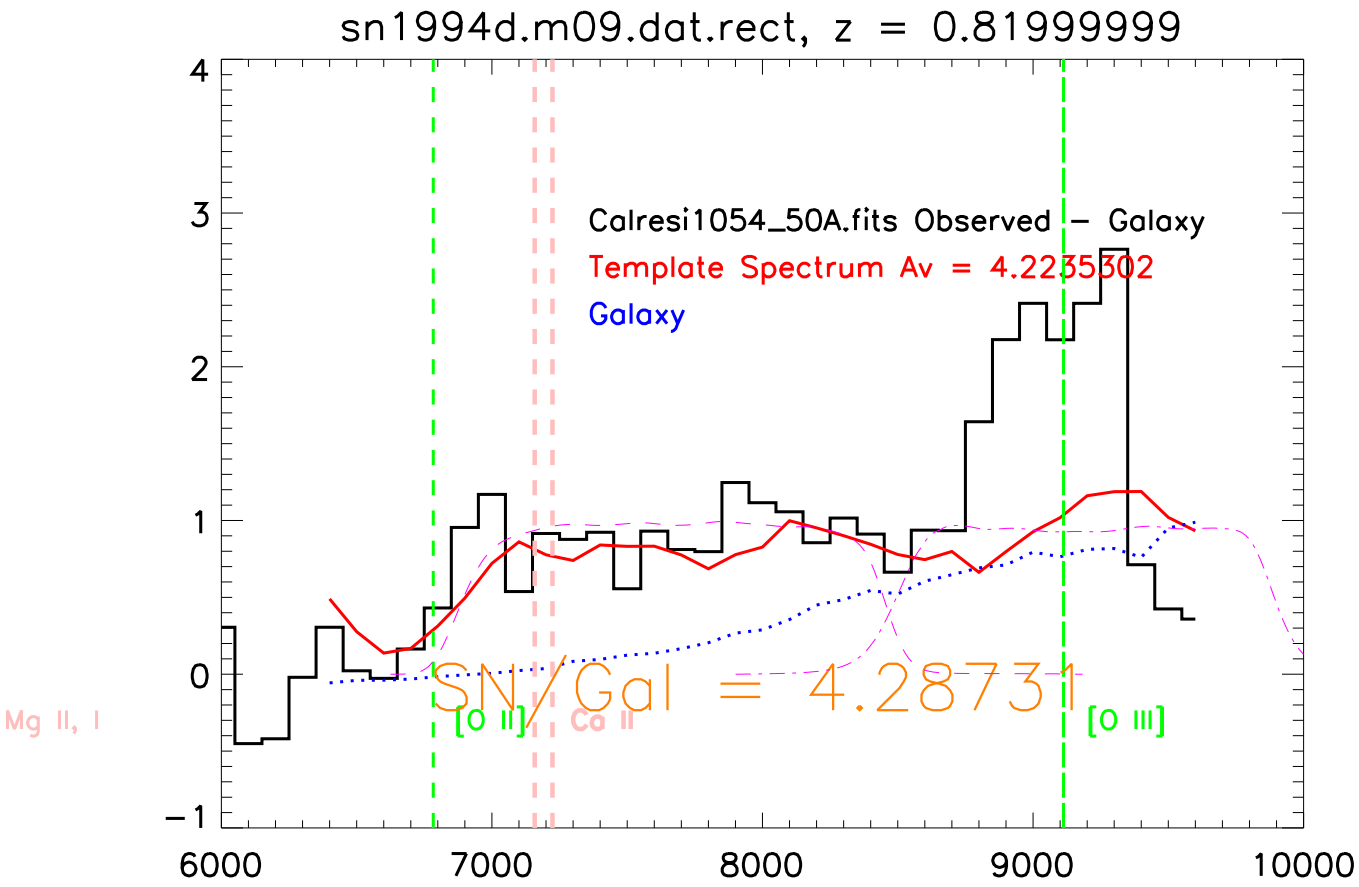

sn1989b.m07.dat.rect, z = 1.2300000
Calresi1054_50A.fits Observed − Galaxy
Template Spectrum Av = 5.4512669
Galaxy
SN/Gal = 1.73530
Mg II, I
[O II]
Ca II
4
3
2
1
0
−1
6000
7000
8000
9000
10000

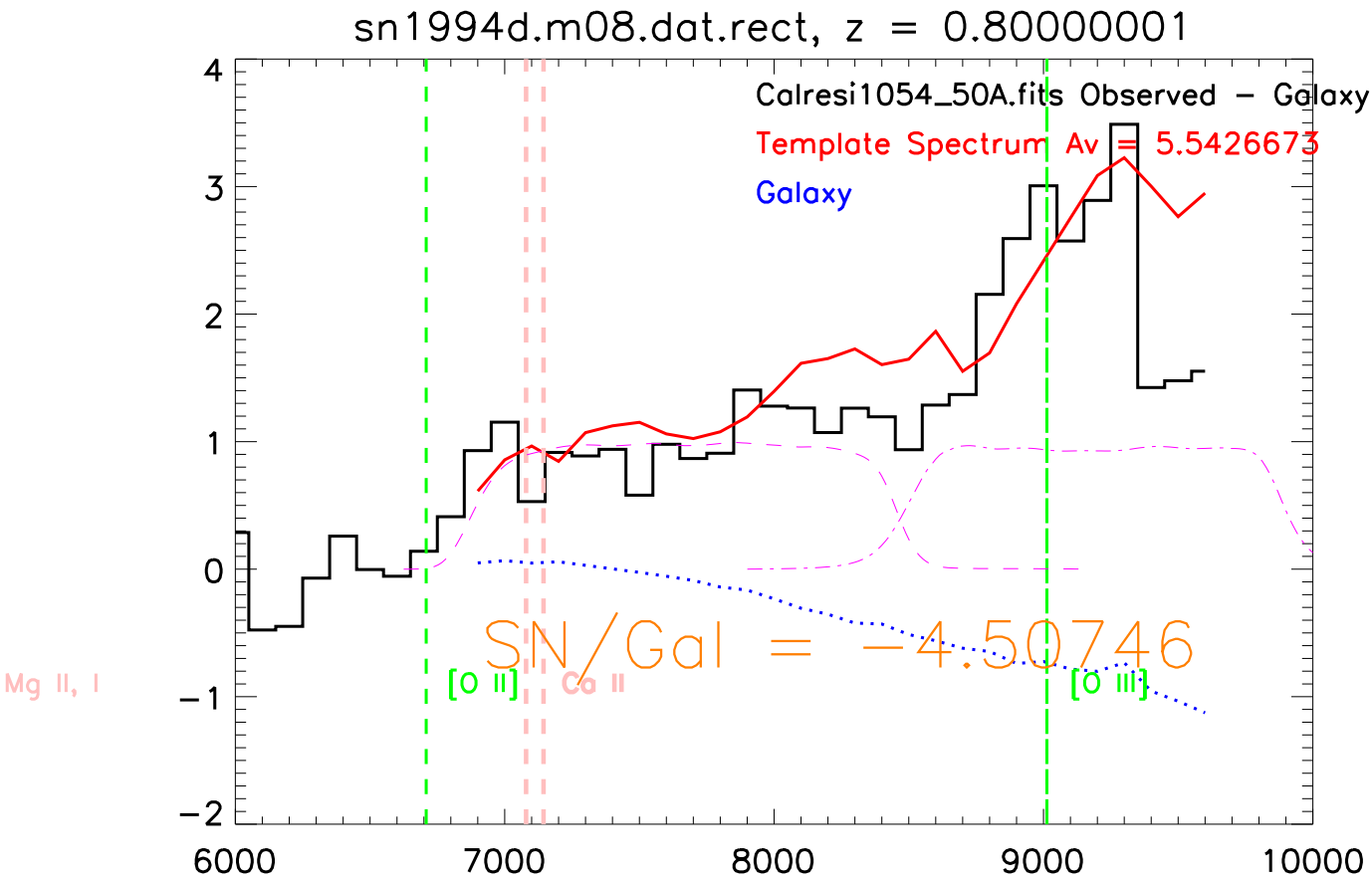

sn1996x.m00.dat.rect, z = 0.97000003
Calresi1054_50A.fits Observed − Galaxy
Template Spectrum Av = 5.7476805
Galaxy
SN/Gal = −7.88503
Mg II, I
[O II]
Ca II
[O III]
5
4
3
2
1
0
−1
−2
6000
7000
8000
9000
10000

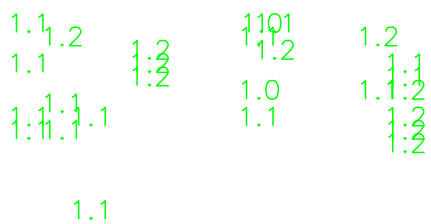

sn1992a.m05.dat.rect, z = 1.2100000
Calresi1054_50A.fits Observed − Galaxy
Template Spectrum Av = 5.5852424
Galaxy
SN/Gal = 1.38361
Mg II, I
[O II]
Ca II
4
3
2
1
0
−1
6000
7000
8000
9000
10000

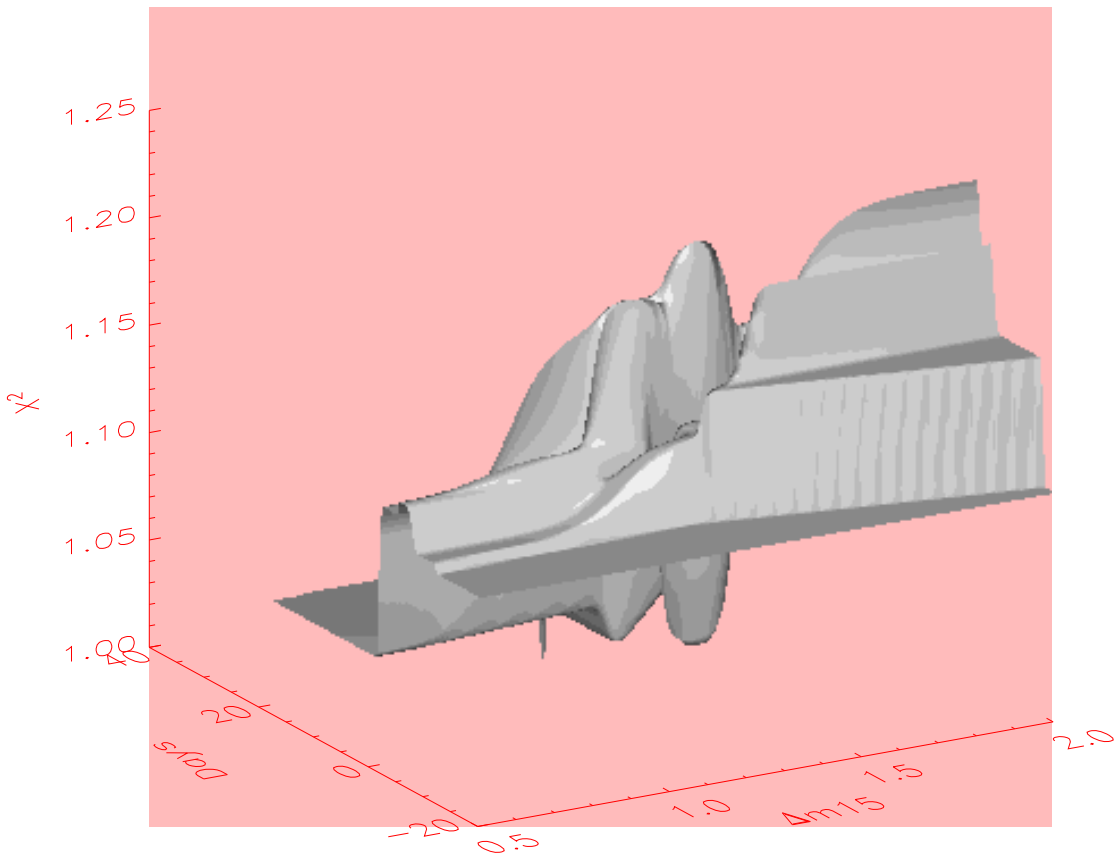

sn1994d.m03.dat.rect, z = 1.2200000
Calresi1054_50A.fits Observed – Galaxy
Template Spectrum Av = 5.5144887
Galaxy
SN/Gal = 4.36023
Mg II, I
[O II]
Ca II
4
3
2
1
0
−1
6000
7000
8000
9000
10000


sn1999ee.m06.dat.rect, z = 0.96000004
Calresi1054_50A.fits Observed − Galaxy
Template Spectrum Av = 5.3935673
Galaxy
SN/Gal = 2.76220
Mg II, I
[O II]
Ca II
[O III]
4
3
2
1
0
−1
6000
7000
8000
9000
10000

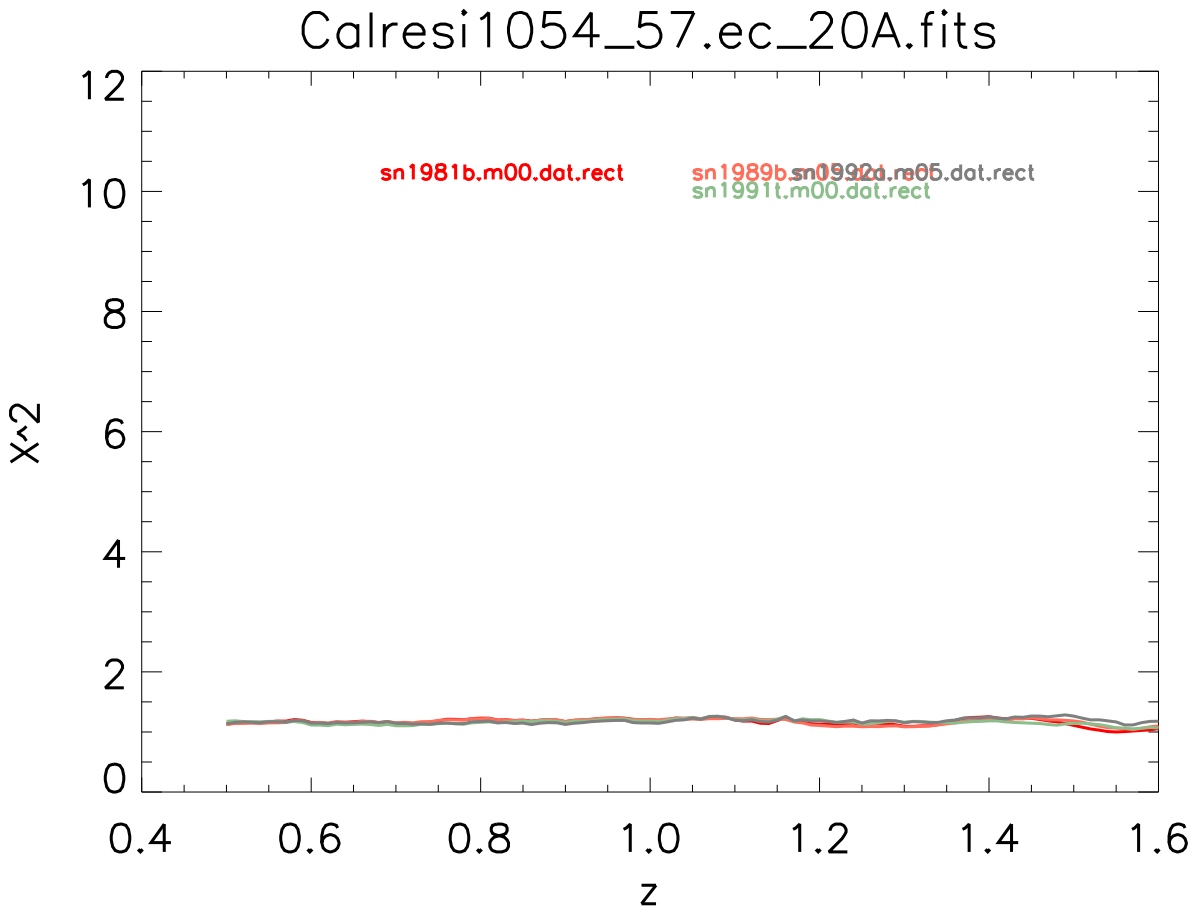

sn1994d.m09.dat.rect, z = 0.81999999
Calresi1054_50A.fits Observed − Galaxy
Template Spectrum Av = 4.2235302
Galaxy
SN/Gal = 4.28731
Mg II, I
[O II]
Ca II
[O III]
4
3
2
1
0
−1
6000
7000
8000
9000
10000

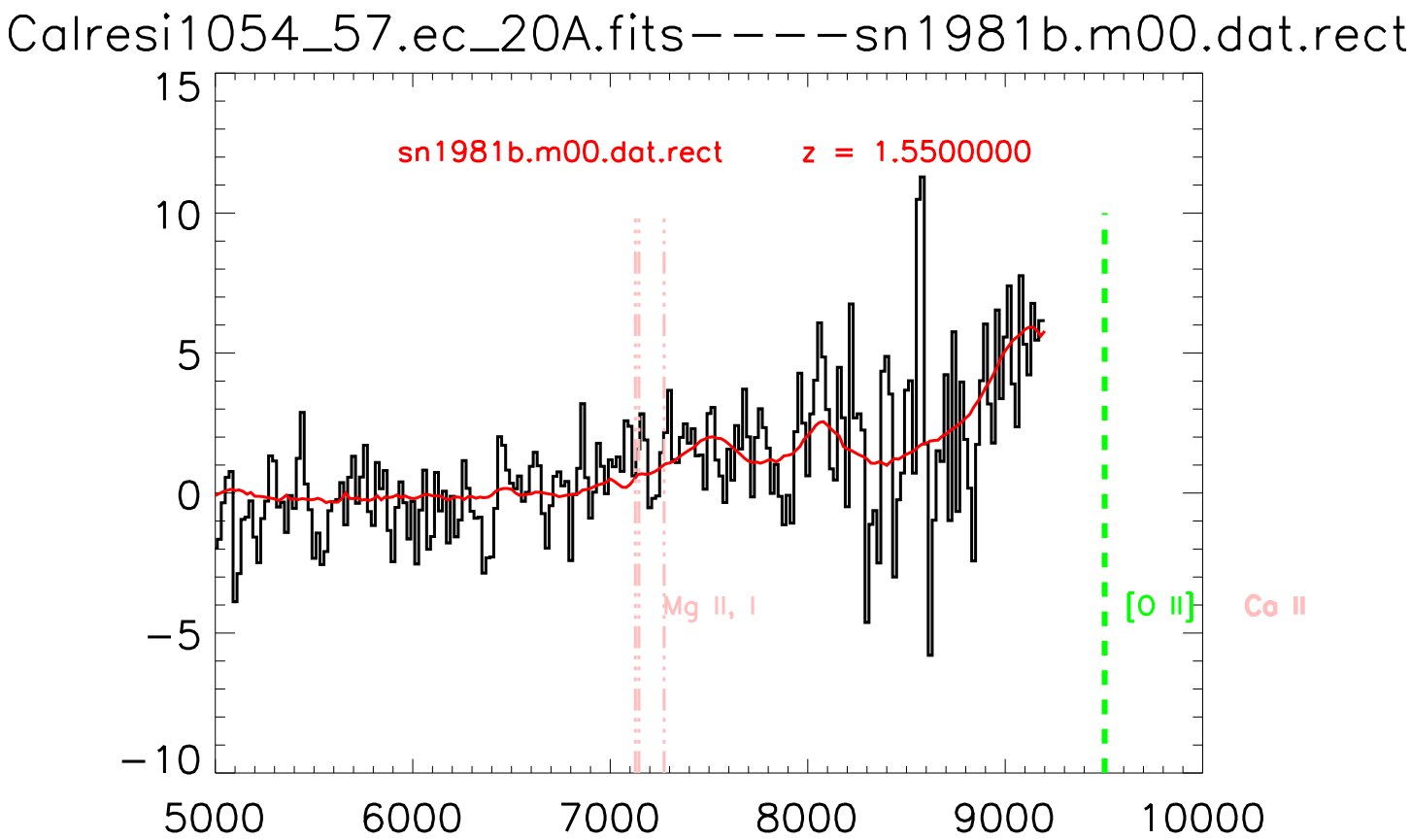

sn1994d.m08.dat.rect, z = 0.80000001
Calresi1054_50A.fits Observed − Galaxy
Template Spectrum Av = 5.5426673
Galaxy
SN/Gal = −4.50746
[O II]
Ca II
[O III]
Mg II, I
4
3
2
1
0
−1
−2
6000
7000
8000
9000
10000

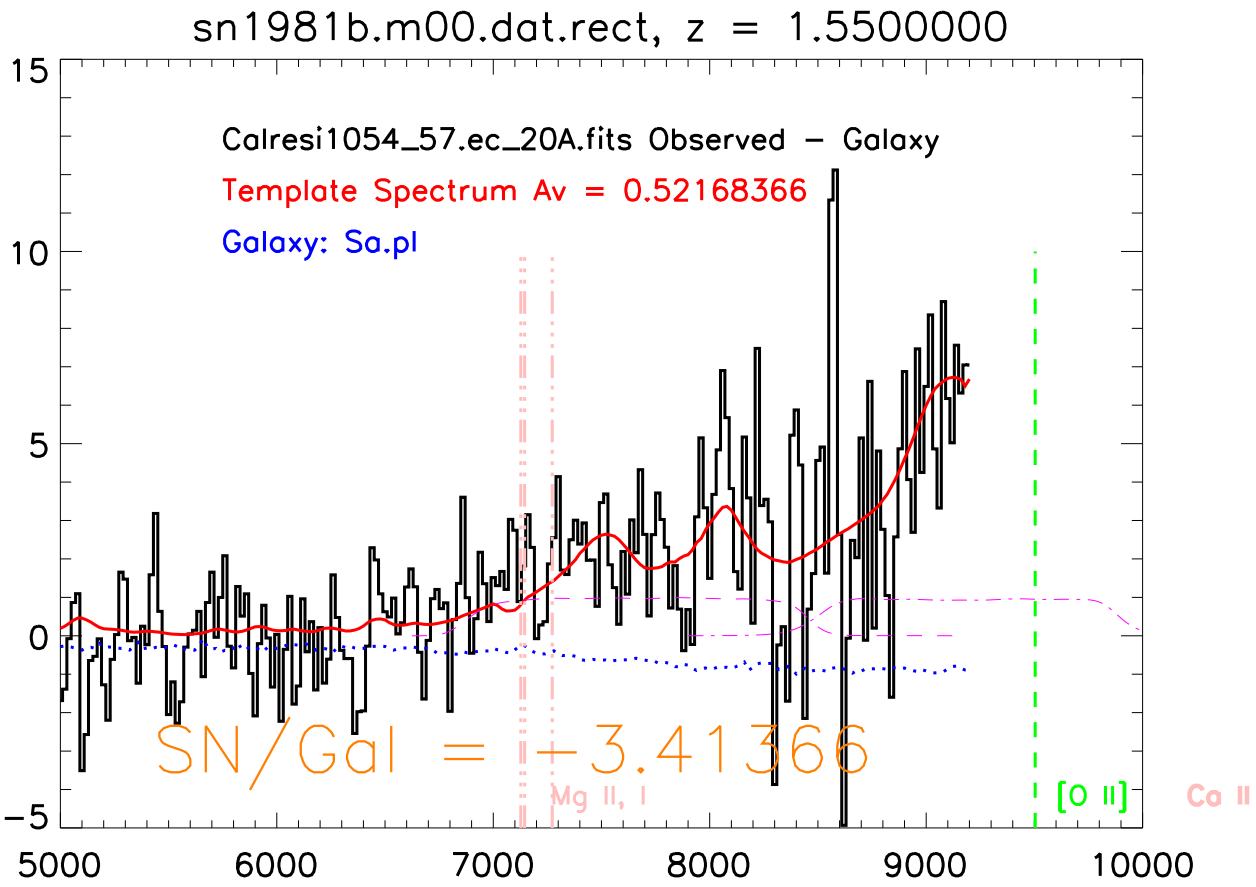


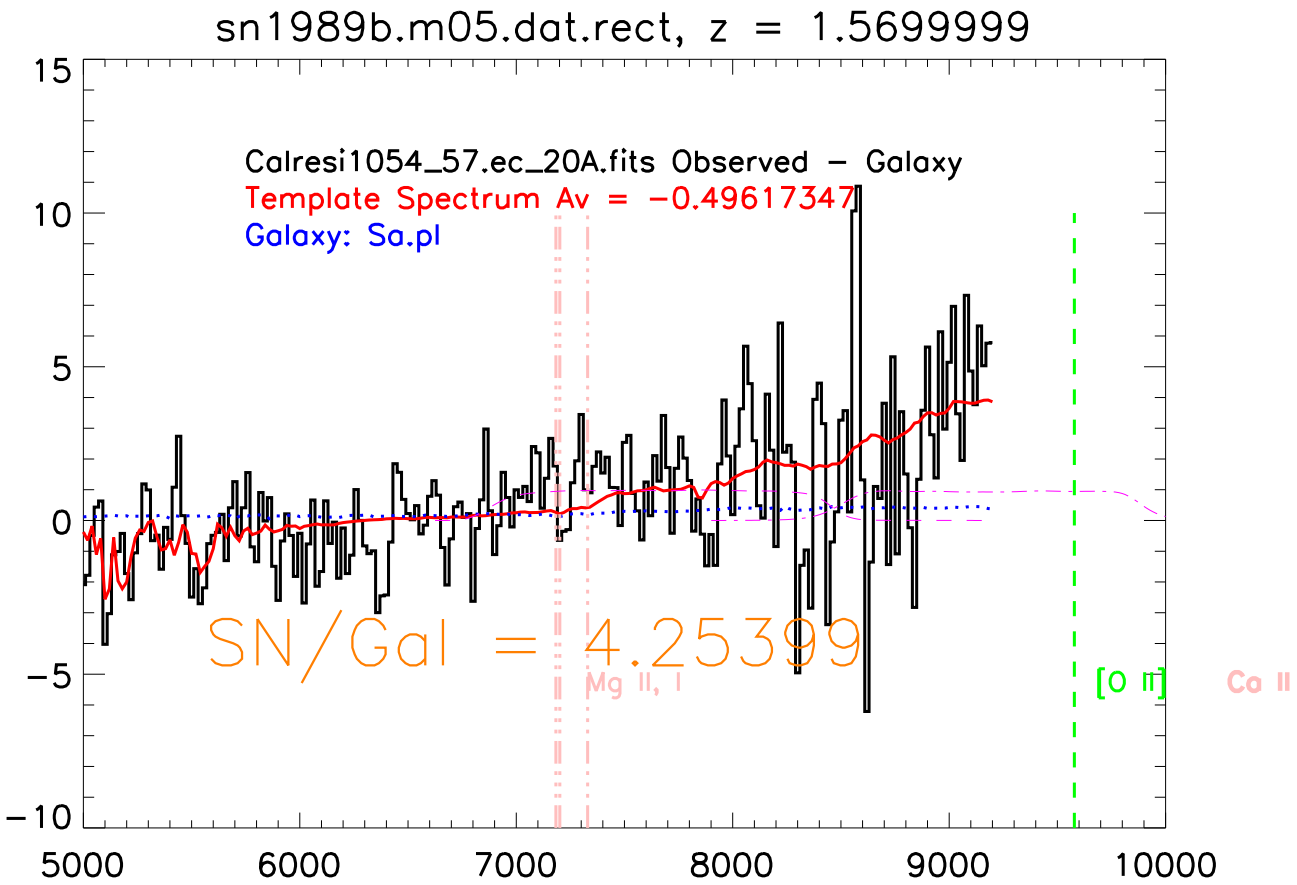


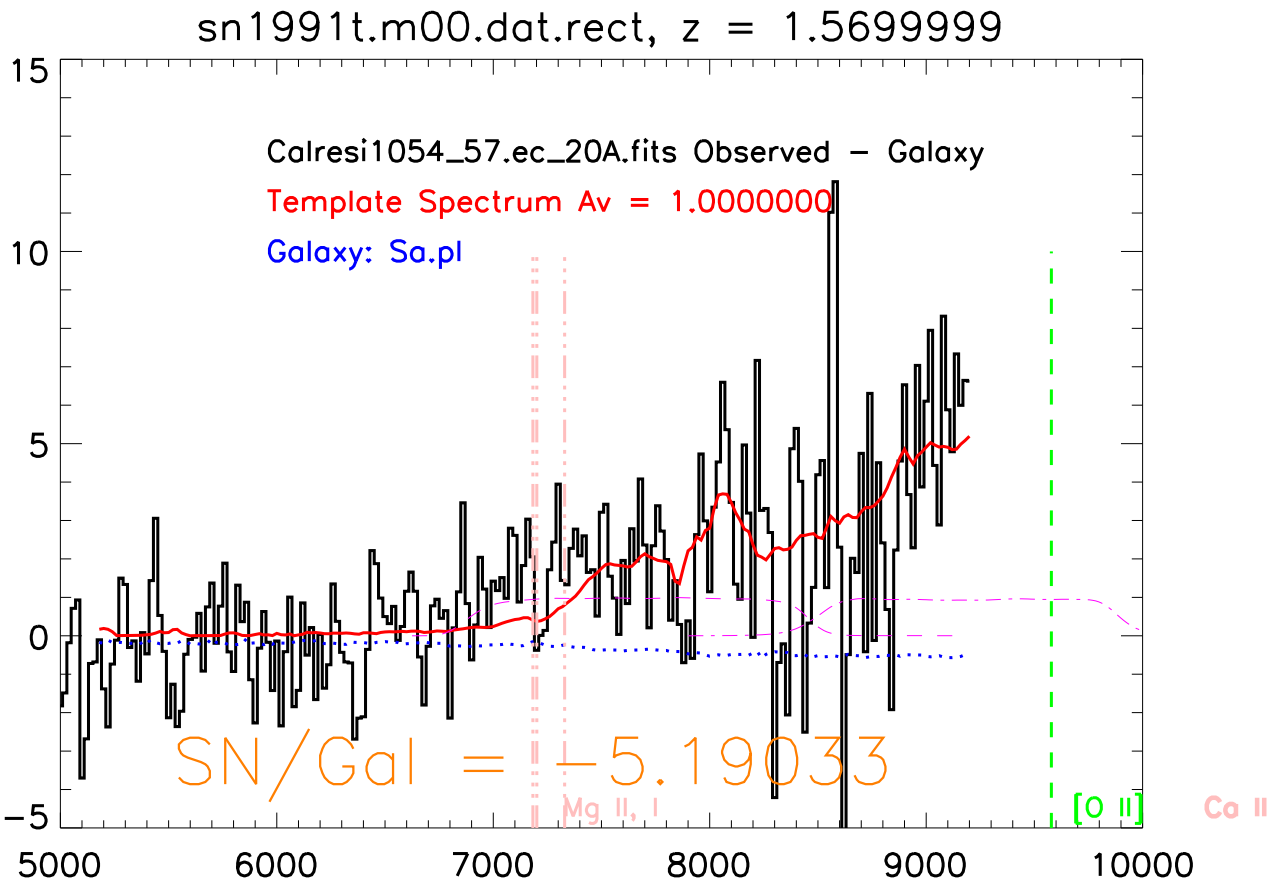
1.25
1.20
1.15
1.10
1.05
1.00
χ^2
40
20
0
−20
Days
0.5
1.0
1.5
2.0
Δm15

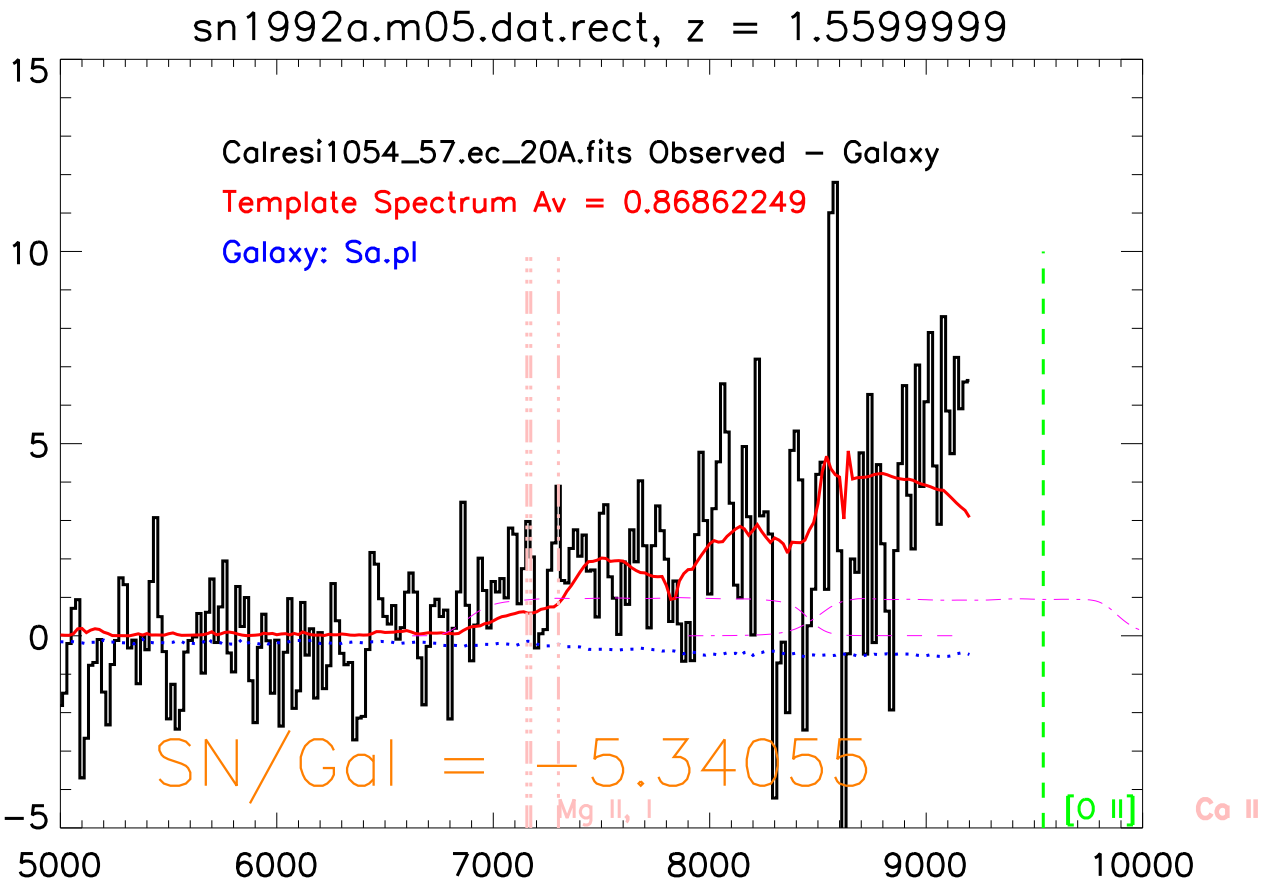

Calresi1054_57.ec_20A.fits
sn1981b.m00.dat.rect
sn1991t.m00.dat.rect
X^2
z
0
2
4
6
8
10
12
0.4
0.6
0.8
1.0
1.2
1.4
1.6

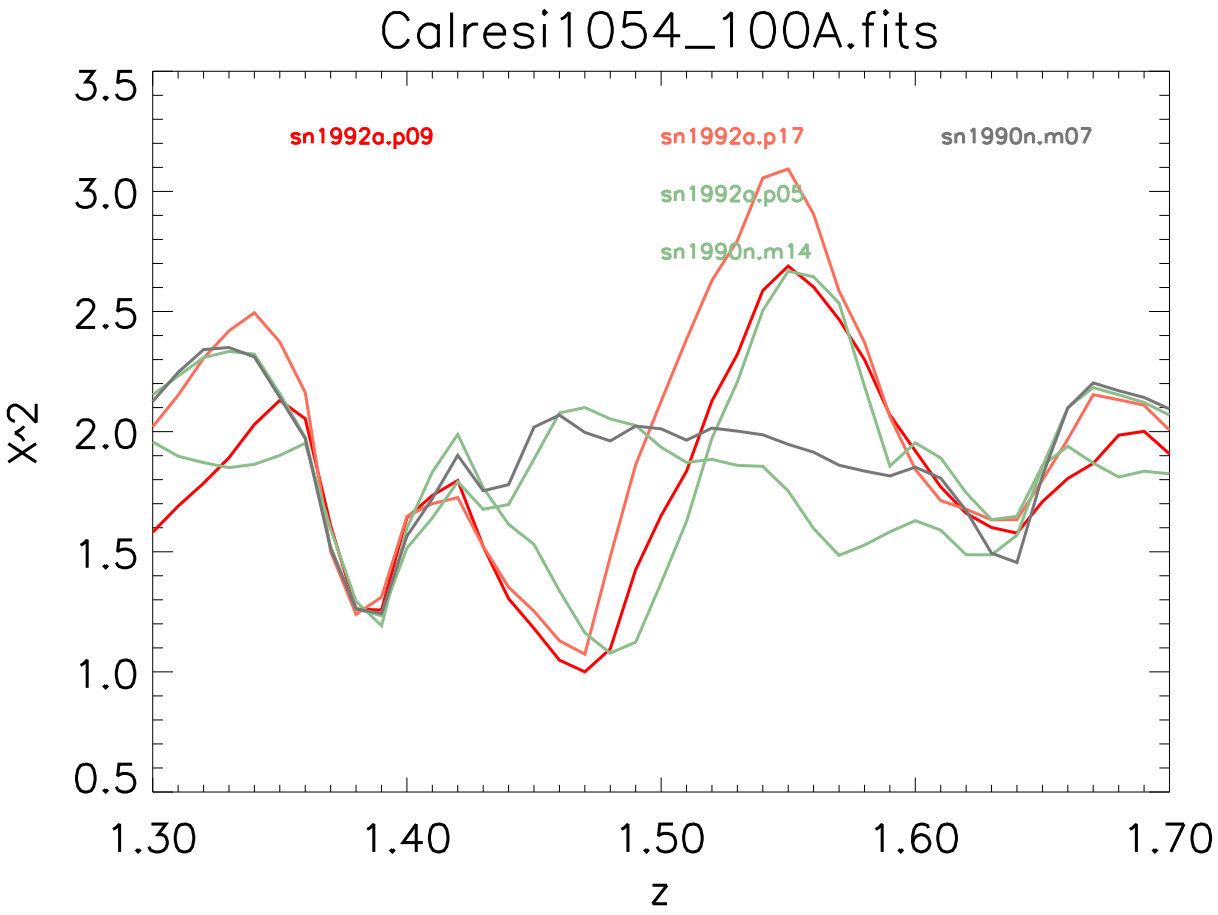

Calresi1054_57.ec_20A.fits----sn1981b.m00.dat.rect
sn1981b.m00.dat.rect
z = 1.5500000
Mg II, I
[O II]
Ca II
15
10
5
0
−5
−10
5000
6000
7000
8000
9000
10000

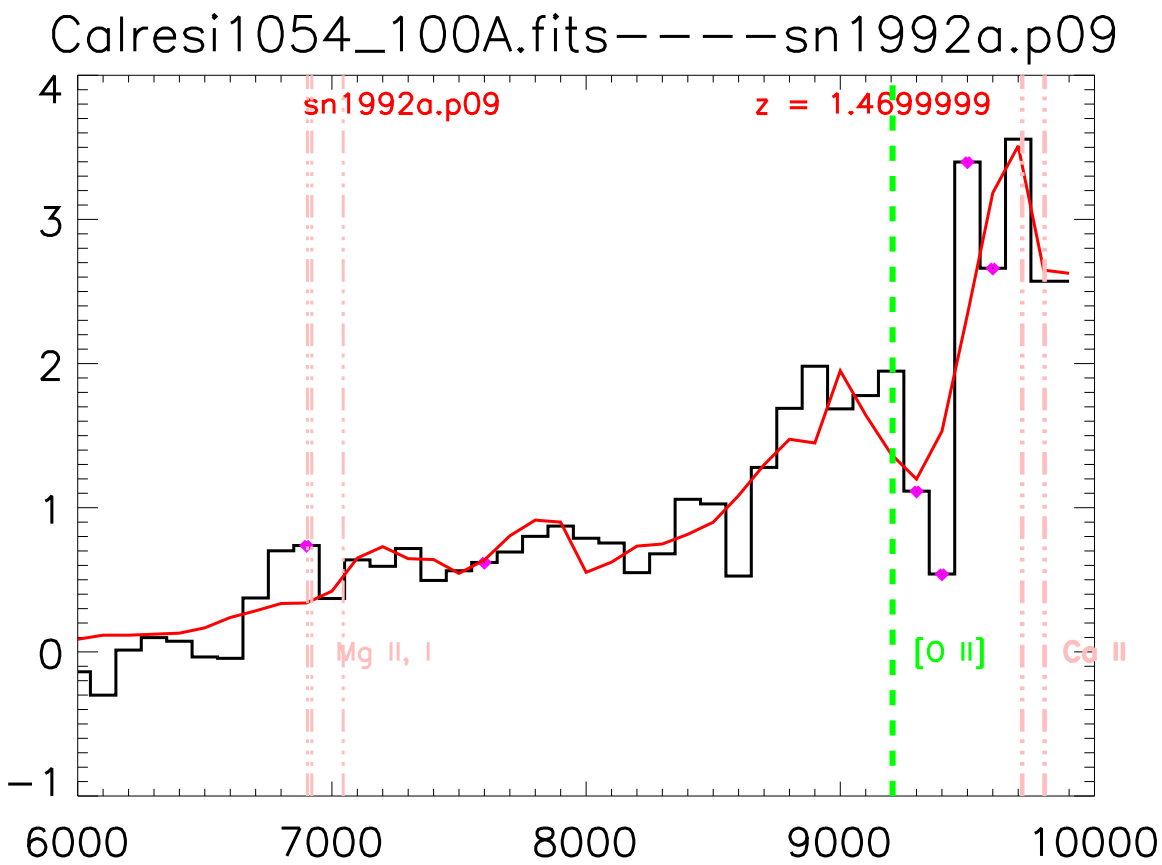

sn1981b.m00.dat.rect, z = 1.5500000
Calresi1054_57.ec_20A.fits Observed − Galaxy
Template Spectrum Av = 0.52168366
Galaxy: Sa.pl
SN/Gal = −3.41366
Mg II, I
[O II]
Ca II
15
10
5
0
−5
5000
6000
7000
8000
9000
10000

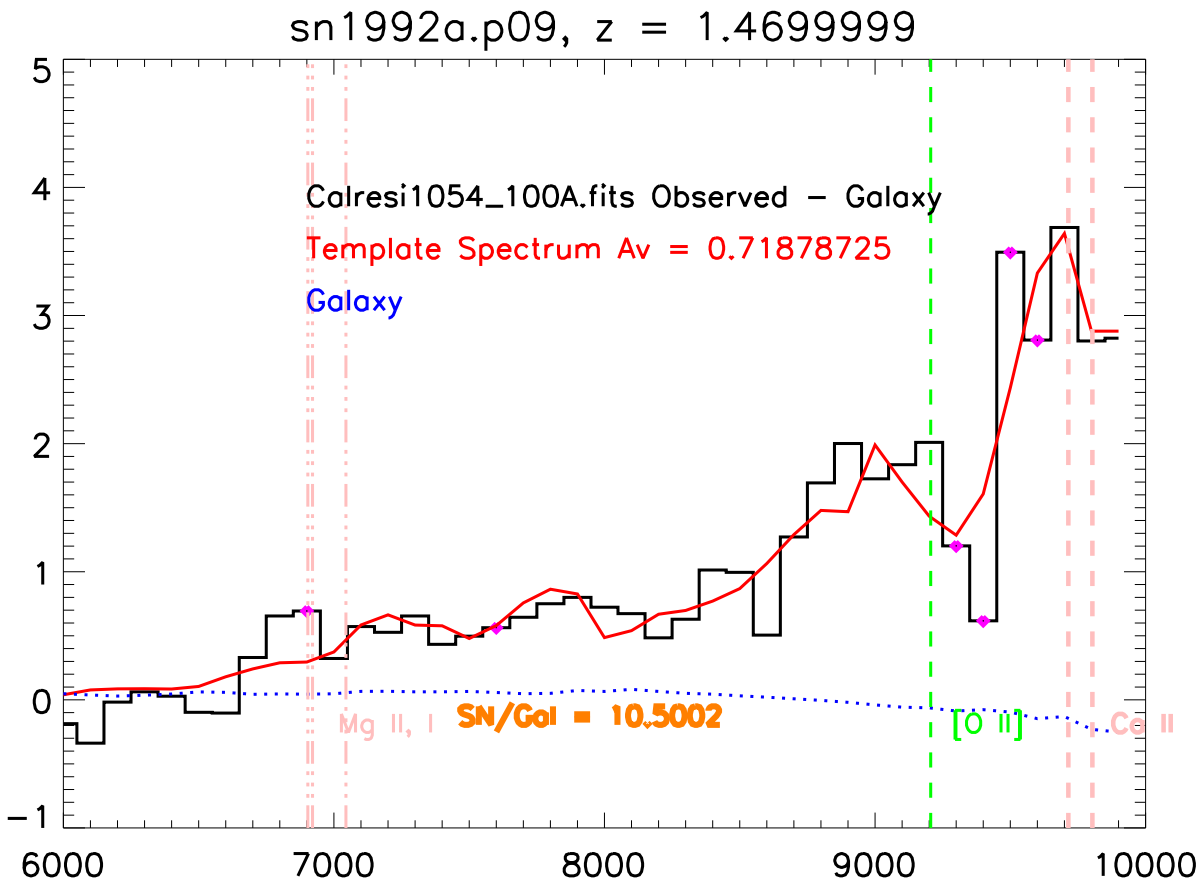

sn1989b.m05.dat.rect, z = 1.5699999
Calresi1054_57.ec_20A.fits Observed − Galaxy
Template Spectrum Av = −0.49617347
Galaxy: Sa.pl
SN/Gal = 4.25399
Mg II, 1
[O II]
Ca II
15
10
5
0
−5
−10
5000
6000
7000
8000
9000
10000

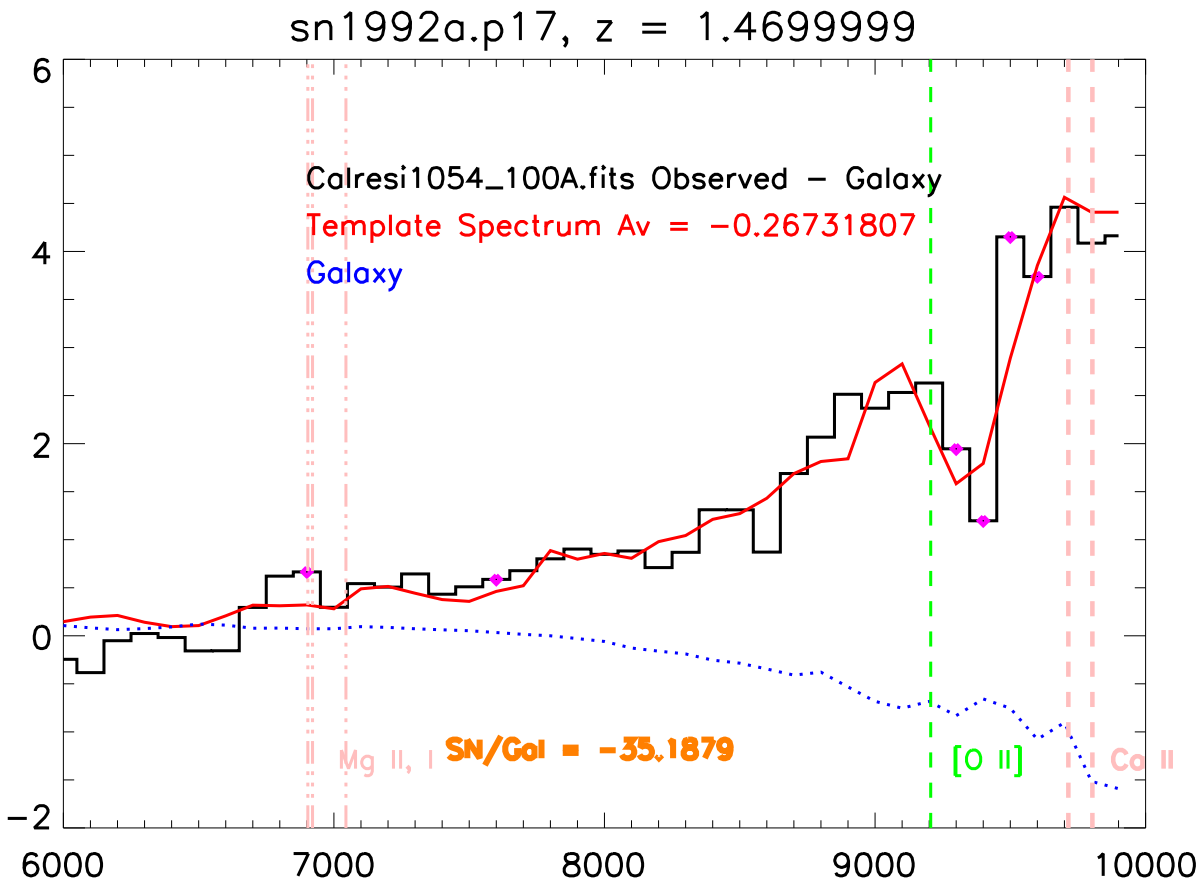

sn1991t.m00.dat.rect, z = 1.5699999
Calresi1054_57.ec_20A.fits Observed − Galaxy
Template Spectrum Av = 1.0000000
Galaxy: Sa.pl
SN/Gal = −5.19033
Mg II, I
[O II]
Ca II
15
10
5
0
−5
5000
6000
7000
8000
9000
10000

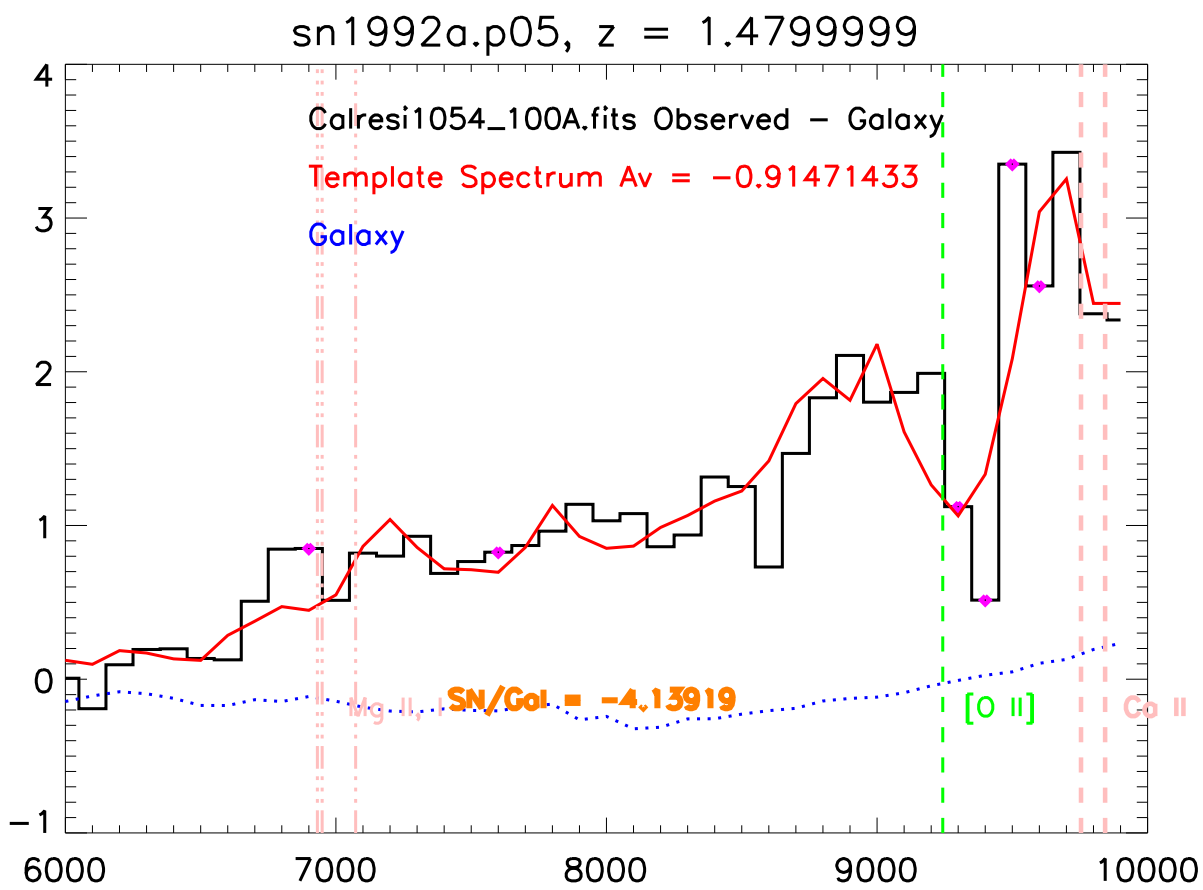

sn1992a.m05.dat.rect, z = 1.5599999
Calresi1054_57.ec_20A.fits Observed − Galaxy
Template Spectrum Av = 0.86862249
Galaxy: Sa.pl
SN/Gal = −5.34055
Mg II, I
[O II]
Ca II
15
10
5
0
−5
5000
6000
7000
8000
9000
10000

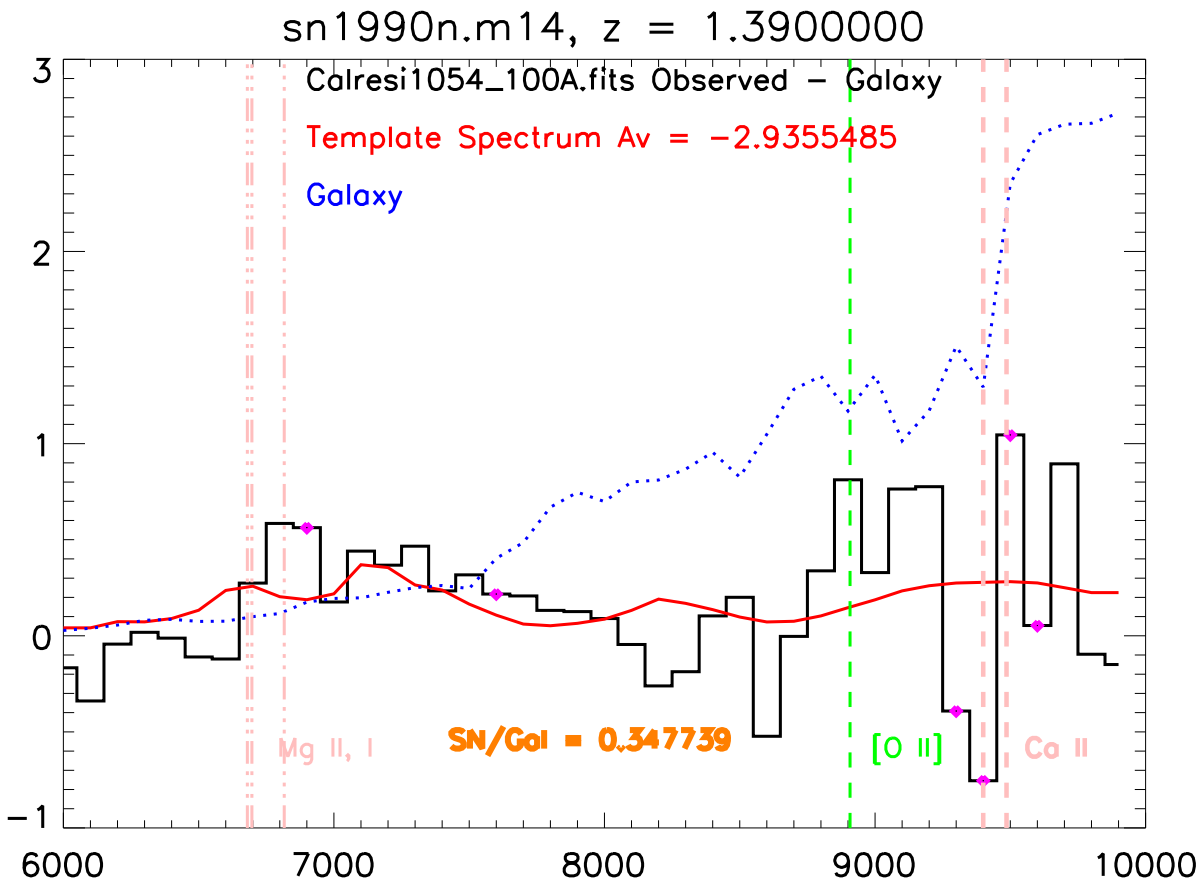

Calresi1054_100A.fits
sn1992a.p09
sn1992a.p17
sn1990n.m07
sn1992a.p05
sn1990n.m14
3.5
3.0
2.5
2.0
1.5
1.0
0.5
X^2
1.30
1.40
1.50
1.60
1.70
z

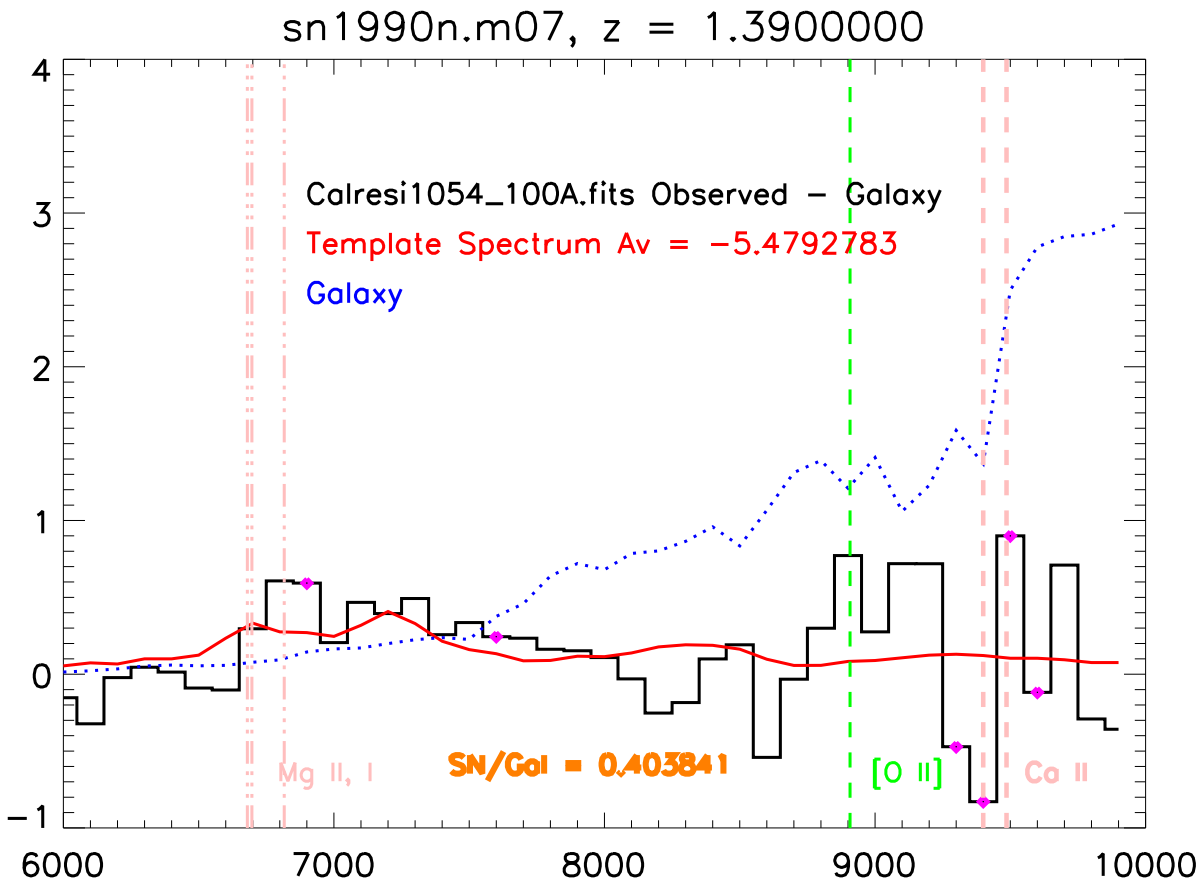

Calresi1054_100A.fits----sn1992a.p09
sn1992a.p09
z = 1.4699999
Mg II, I
[O II]
Ca II
4
3
2
1
0
−1
6000
7000
8000
9000
10000

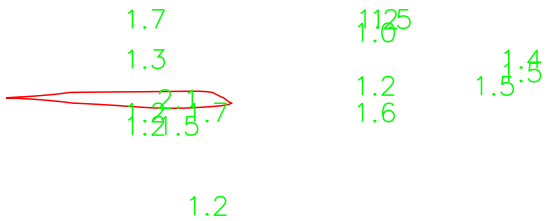

sn1992a.p09, z = 1.4699999
Calresi1054_100A.fits Observed − Galaxy
Template Spectrum Av = 0.71878725
Galaxy
SN/Gal = 10.5002
Mg II, I
[O II]
Ca II
5
4
3
2
1
0
−1
6000
7000
8000
9000
10000

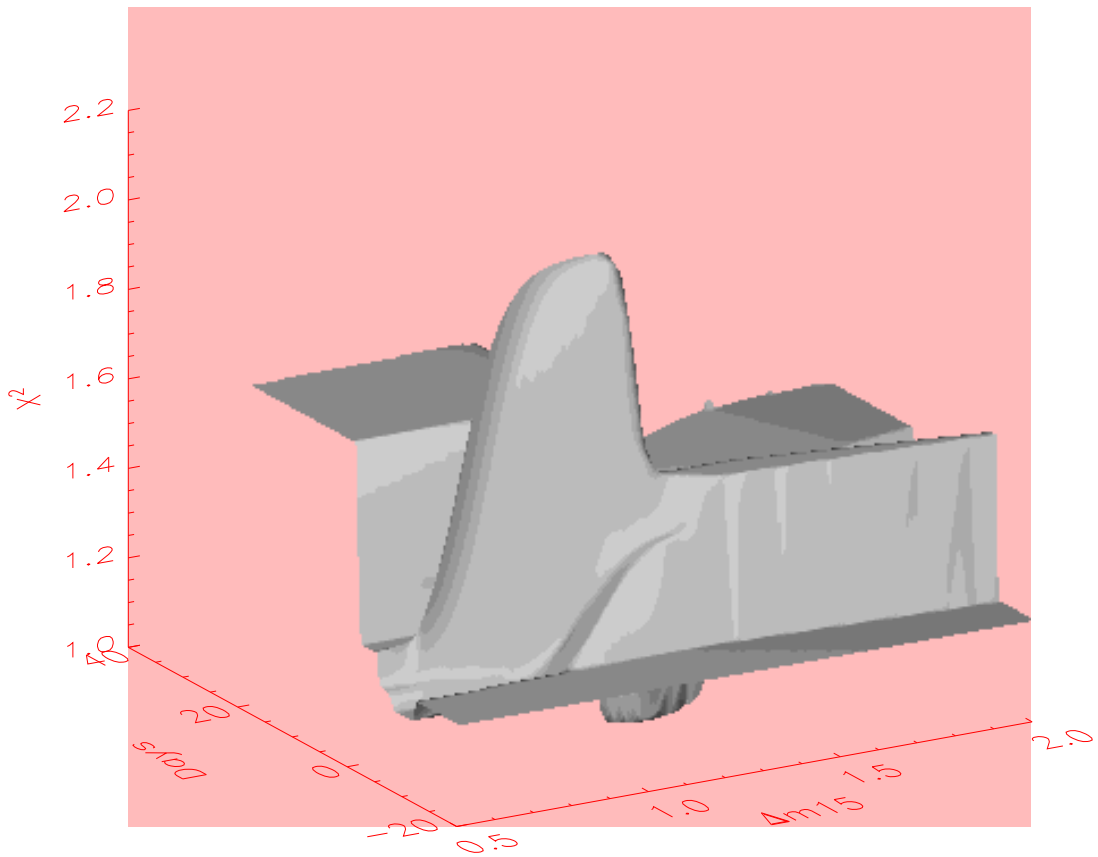

sn1992a.p17, z = 1.4699999
Calresi1054_100A.fits Observed − Galaxy
Template Spectrum Av = −0.26731807
Galaxy
SN/Gal = −35.1879
Mg II, I
[O II]
Ca II
6
4
2
0
−2
6000
7000
8000
9000
10000


sn1992a.p05, z = 1.4799999
Calresi1054_100A.fits Observed − Galaxy
Template Spectrum Av = −0.91471433
Galaxy
SN/Gal = −4.13919
[O II]
Ca II
4
3
2
1
0
−1
6000
7000
8000
9000
10000

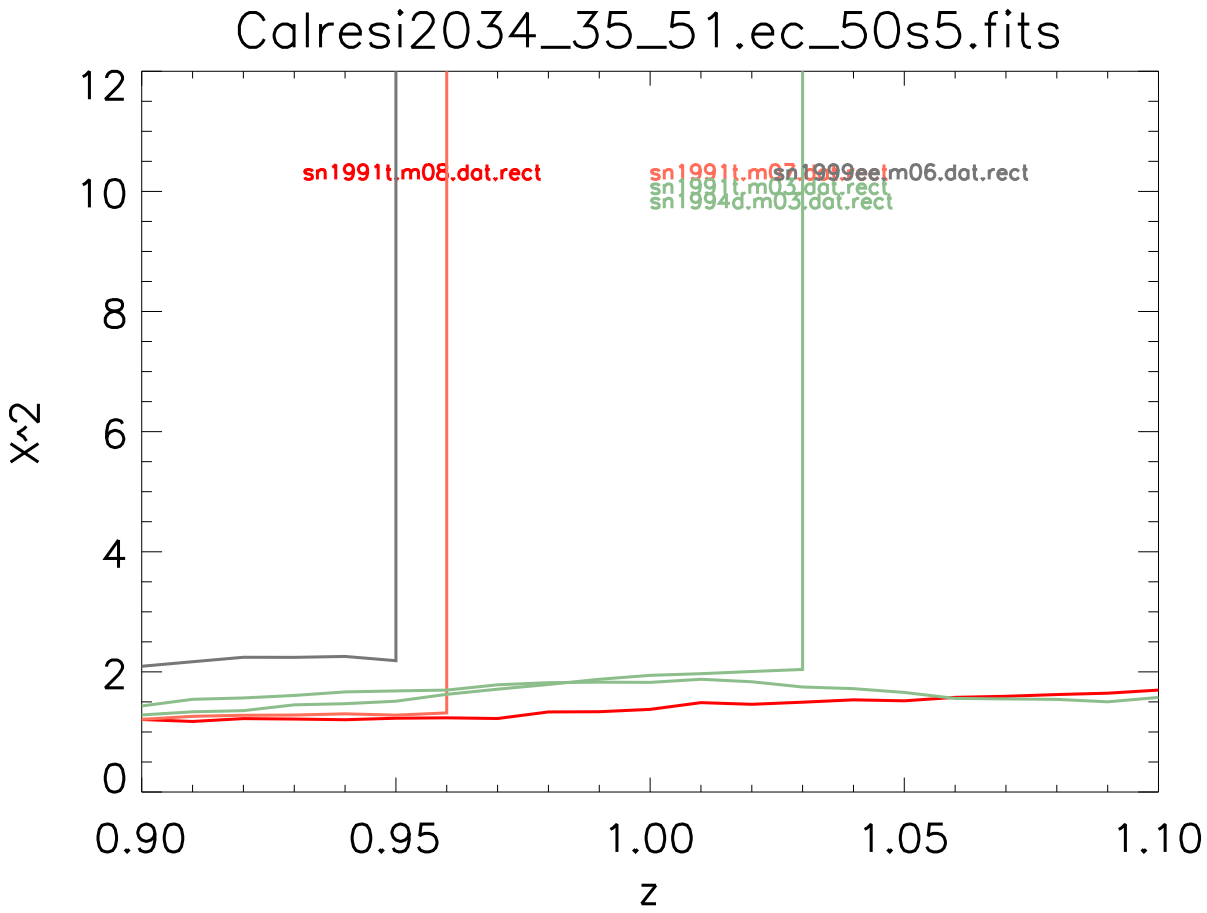

sn1990n.m14, z = 1.3900000
Calresi1054_100A.fits Observed − Galaxy
Template Spectrum Av = −2.9355485
Galaxy
SN/Gal = 0.347739
Mg II, I
[O II]
Ca II
3
2
1
0
−1
6000
7000
8000
9000
10000

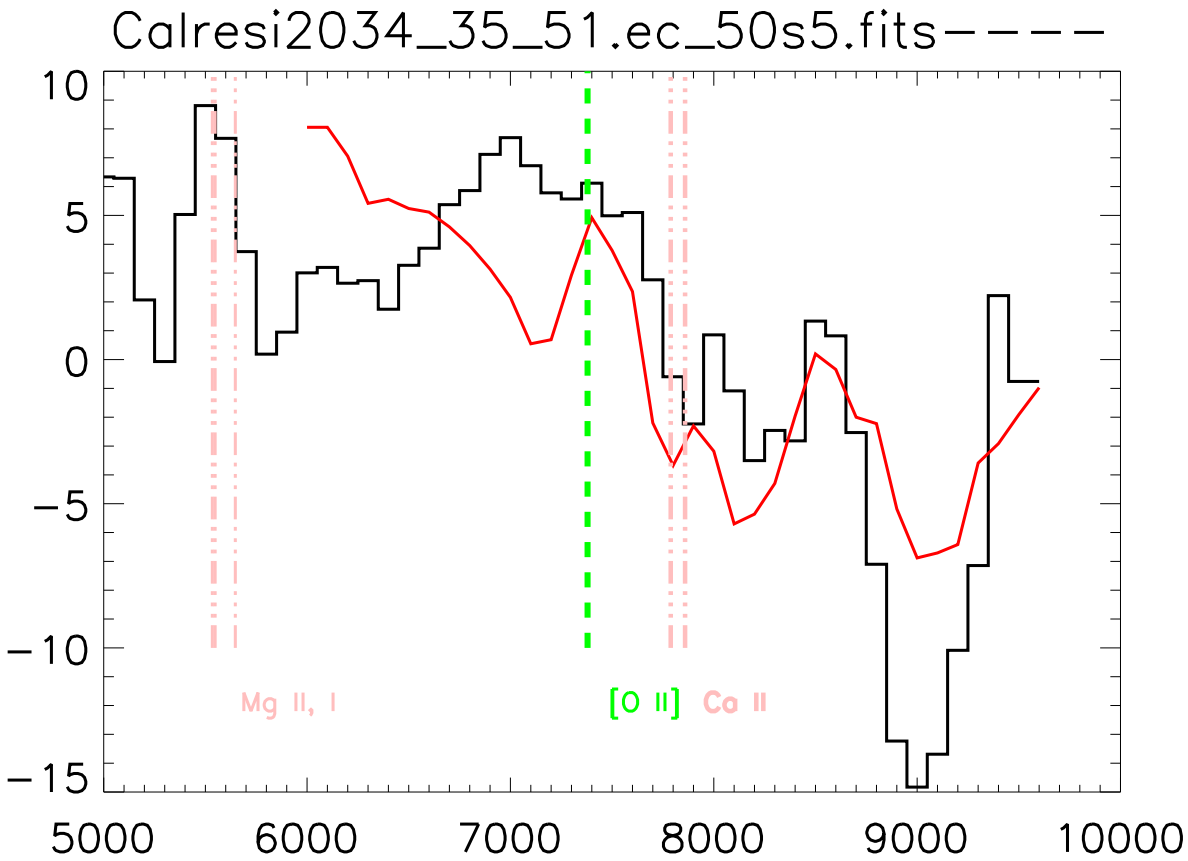

sn1990n.m07, z = 1.3900000
Calresi1054_100A.fits Observed − Galaxy
Template Spectrum Av = −5.4792783
Galaxy
SN/Gal = 0.403841
Mg II, I
[O II]
Ca II
4
3
2
1
0
−1
6000
7000
8000
9000
10000

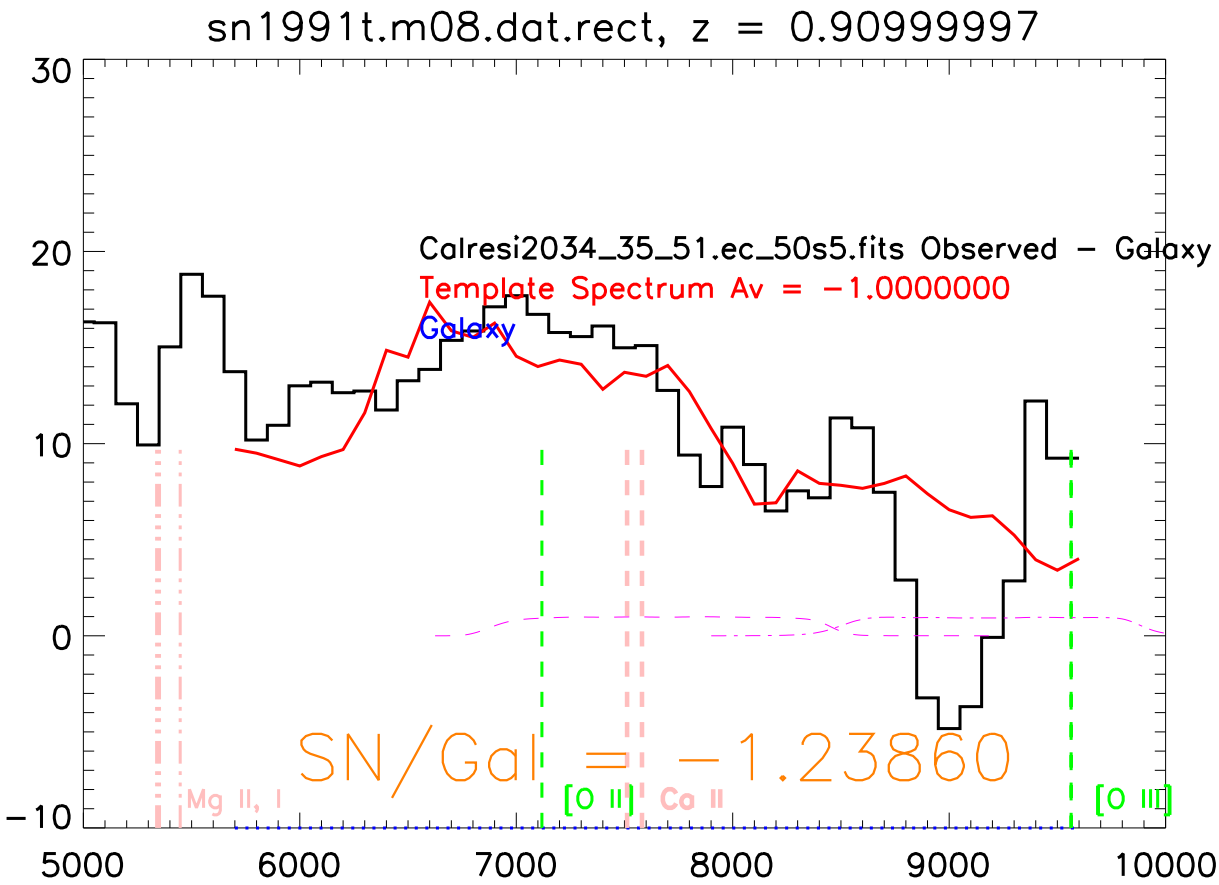

1.7
1.3
2.1
1.2
1.5
1.7
1.2
1.2
1.6
1.5
1.5
1.4
1.5

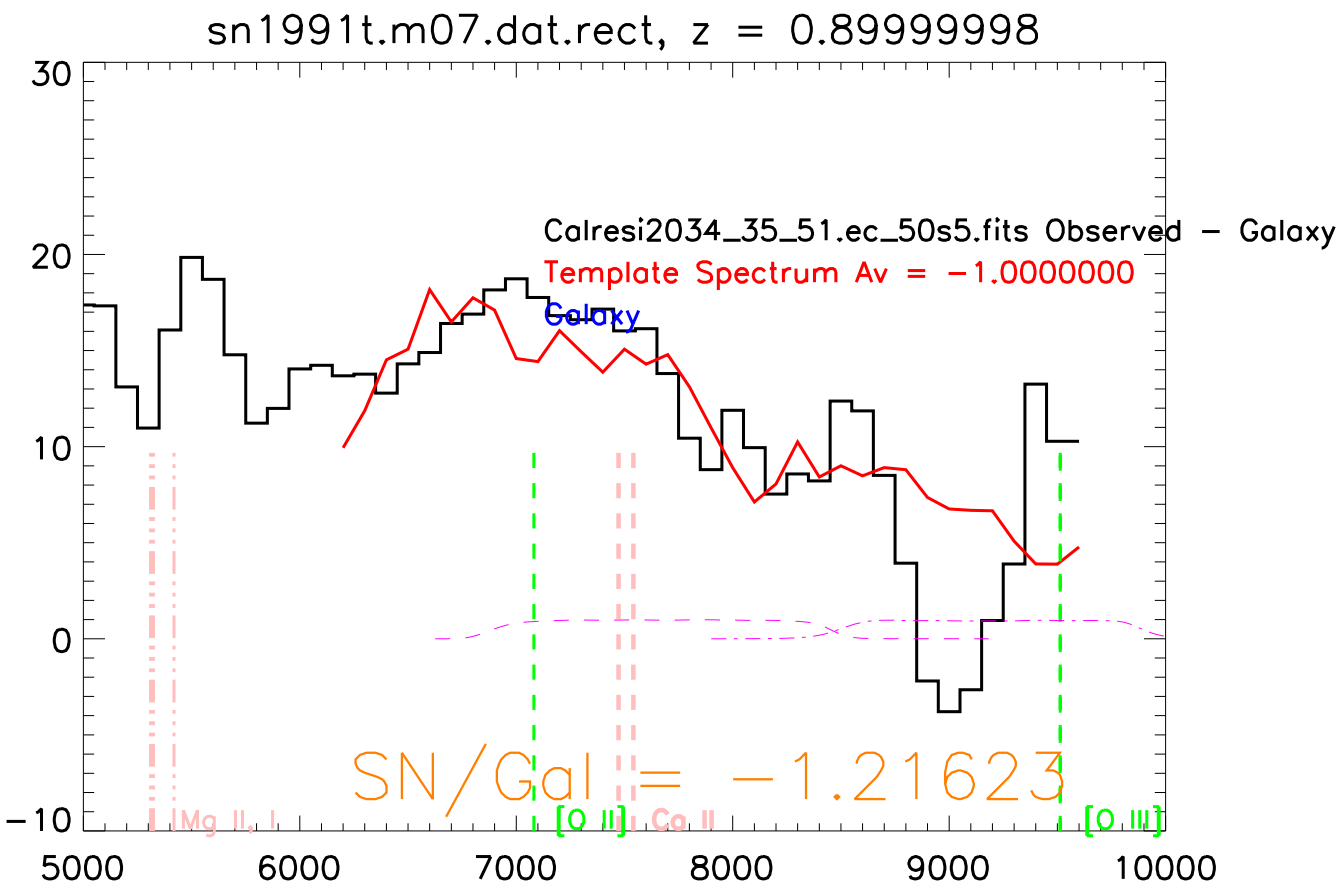


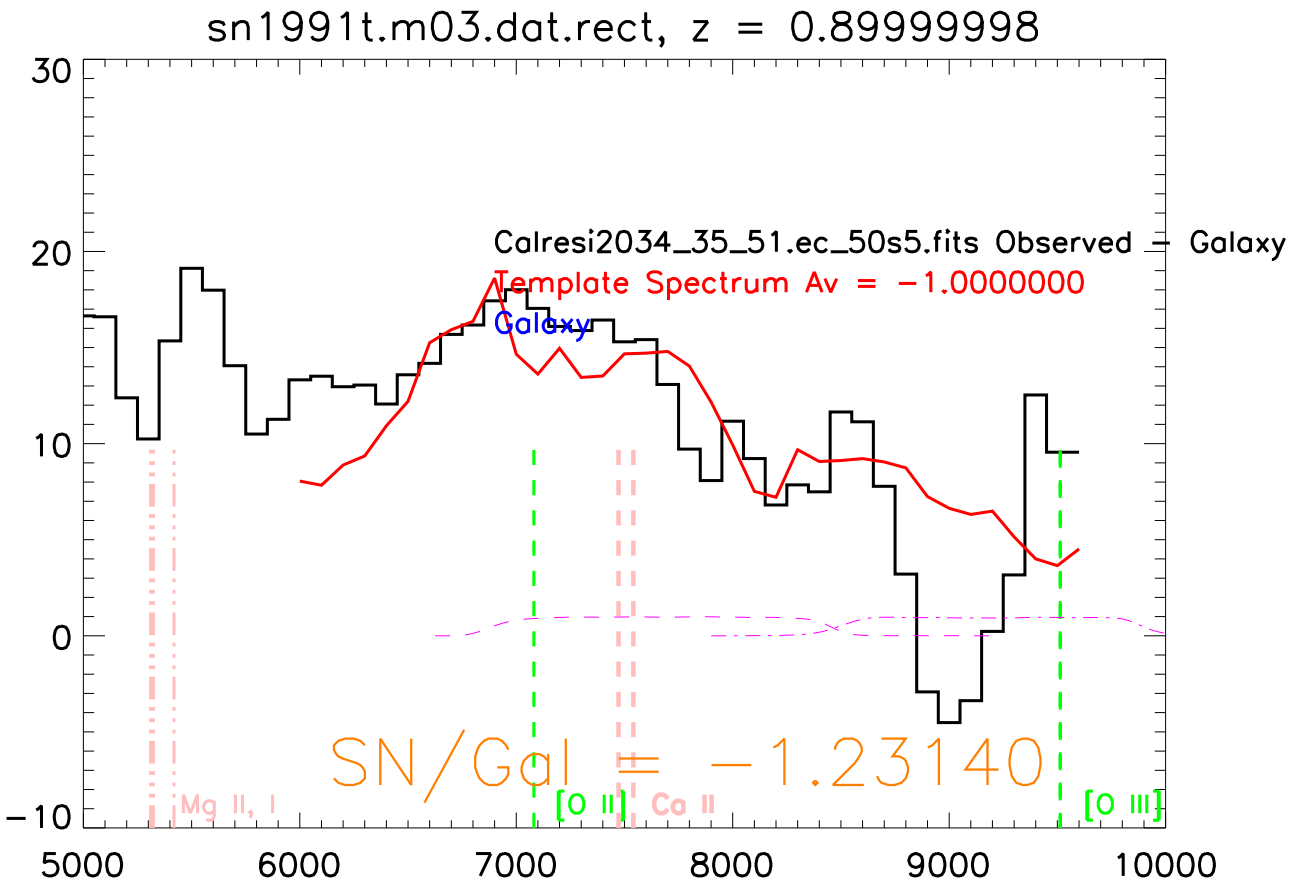
2.2
2.0
1.8
1.6
1.4
1.2
1.0
χ^2
40
20
0
−20
Days
0.5
1.0
1.5
2.0
Δm15

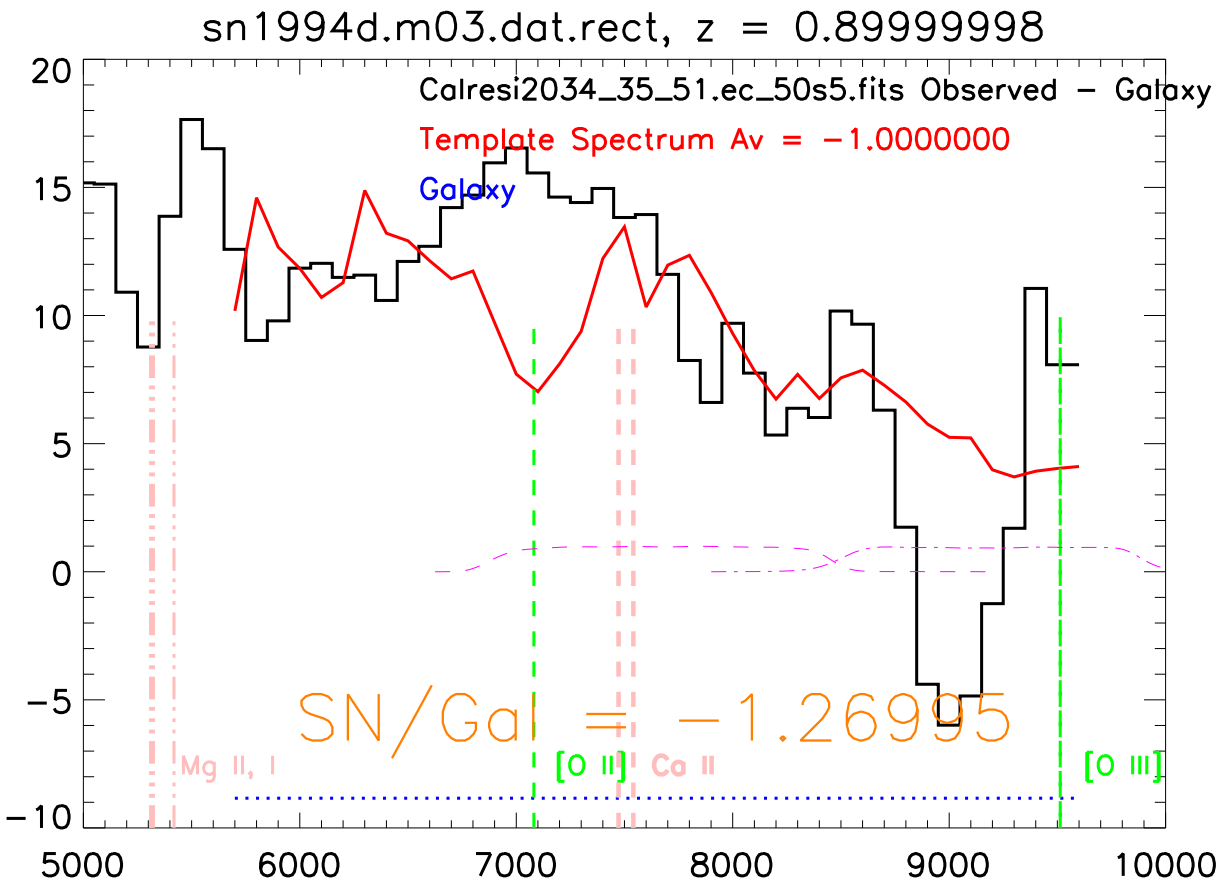

Calresi2034_35_51.ec_50s5.fits
sn1991t.m08.dat.rect
sn1991t.m07.dat.rect
sn1999ee.m06.dat.rect
sn1991t.m03.dat.rect
sn1994d.m03.dat.rect
X^2
z
0
2
4
6
8
10
12
0.90
0.95
1.00
1.05
1.10

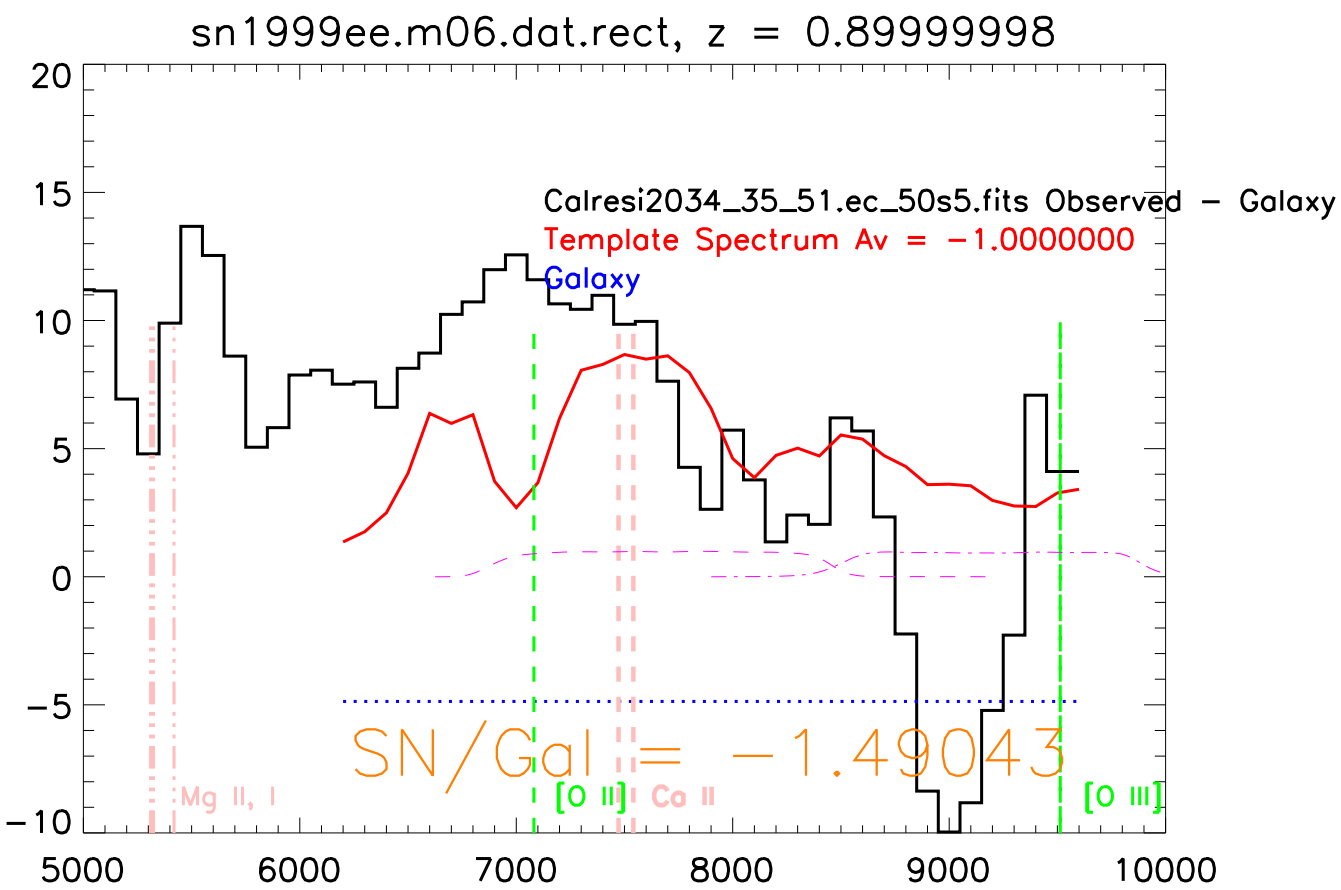

Calresi2034_35_51.ec_50s5.fits----
10
5
0
−5
−10
−15
5000
6000
7000
8000
9000
10000
Mg II, I
[O II]
Ca II

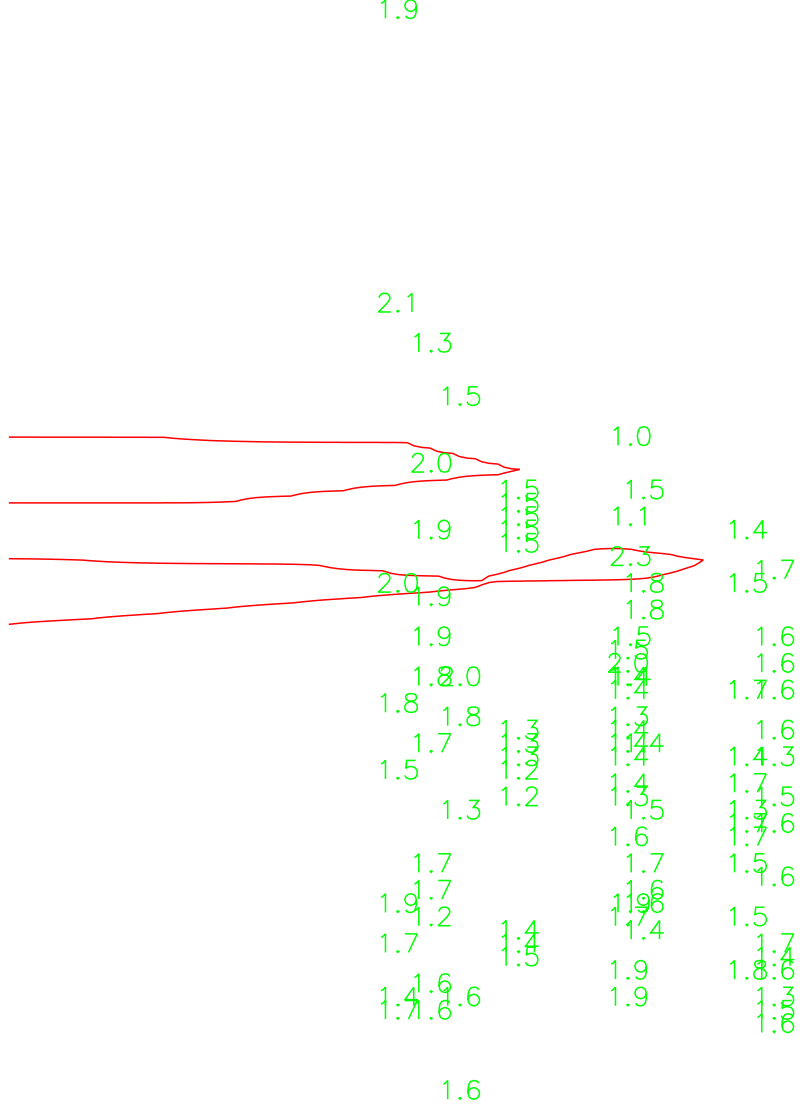

sn1991t.m08.dat.rect, z = 0.90999997
Calresi2034_35_51.ec_50s5.fits Observed − Galaxy
Template Spectrum Av = −1.0000000
Galaxy
SN/Gal = −1.23860
Mg II, I
[O II]
Ca II
[O III]
30
20
10
0
−10
5000
6000
7000
8000
9000
10000

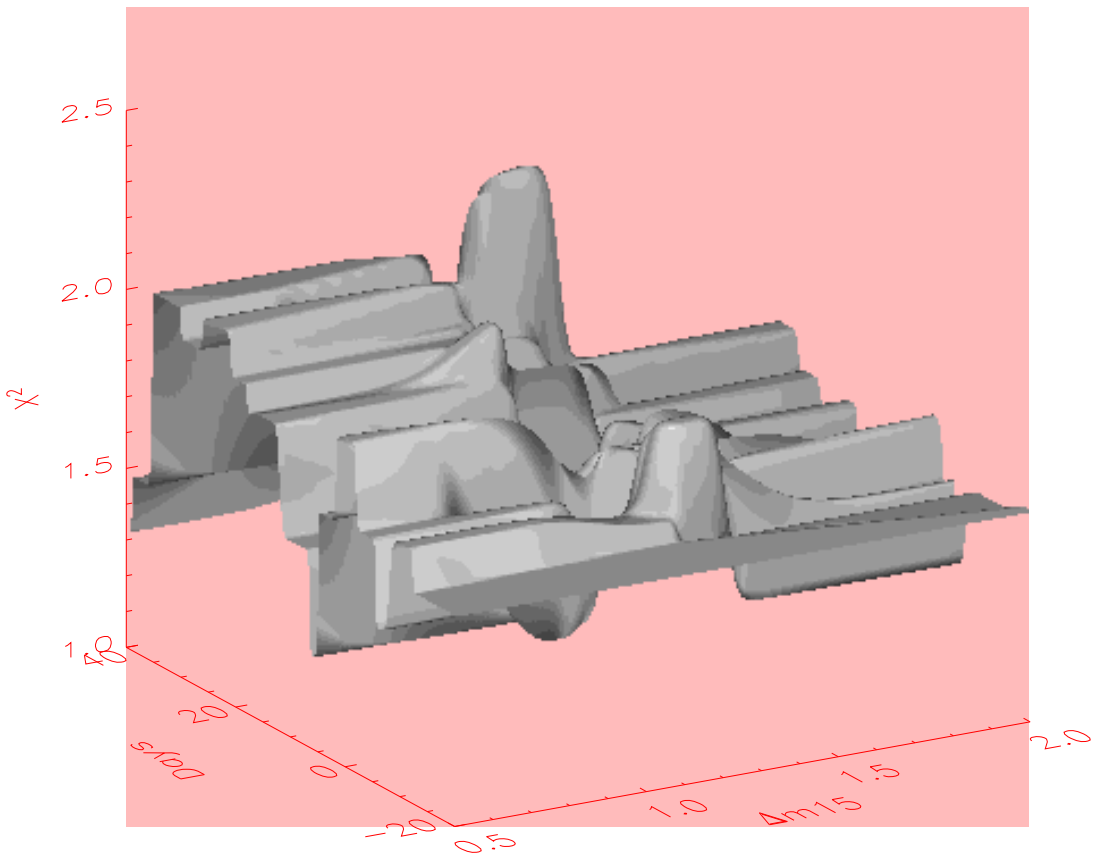

sn1991t.m07.dat.rect, z = 0.89999998
Calresi2034_35_51.ec_50s5.fits Observed − Galaxy
Template Spectrum Av = −1.0000000
Galaxy
SN/Gal = −1.21623
Mg II, I
[O II]
Ca II
[O III]
30
20
10
0
−10
5000
6000
7000
8000
9000
10000

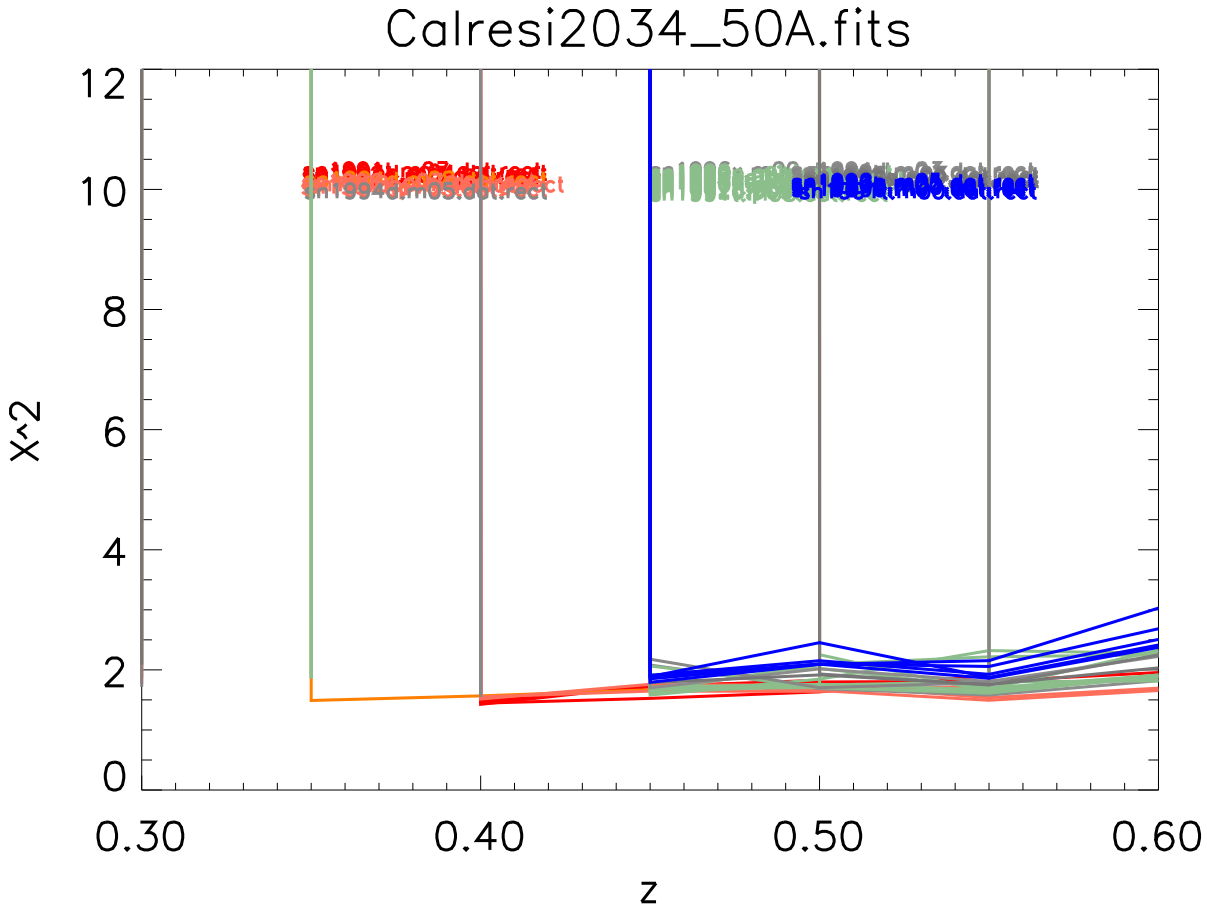

sn1991t.m03.dat.rect, z = 0.89999998
Calresi2034_35_51.ec_50s5.fits Observed
Galaxy
Template Spectrum Av = −1.0000000
Galaxy
SN/Gal = −1.23140
Mg II, I
[O II]
Ca II
[O III]
30
20
10
0
−10
5000
6000
7000
8000
9000
10000

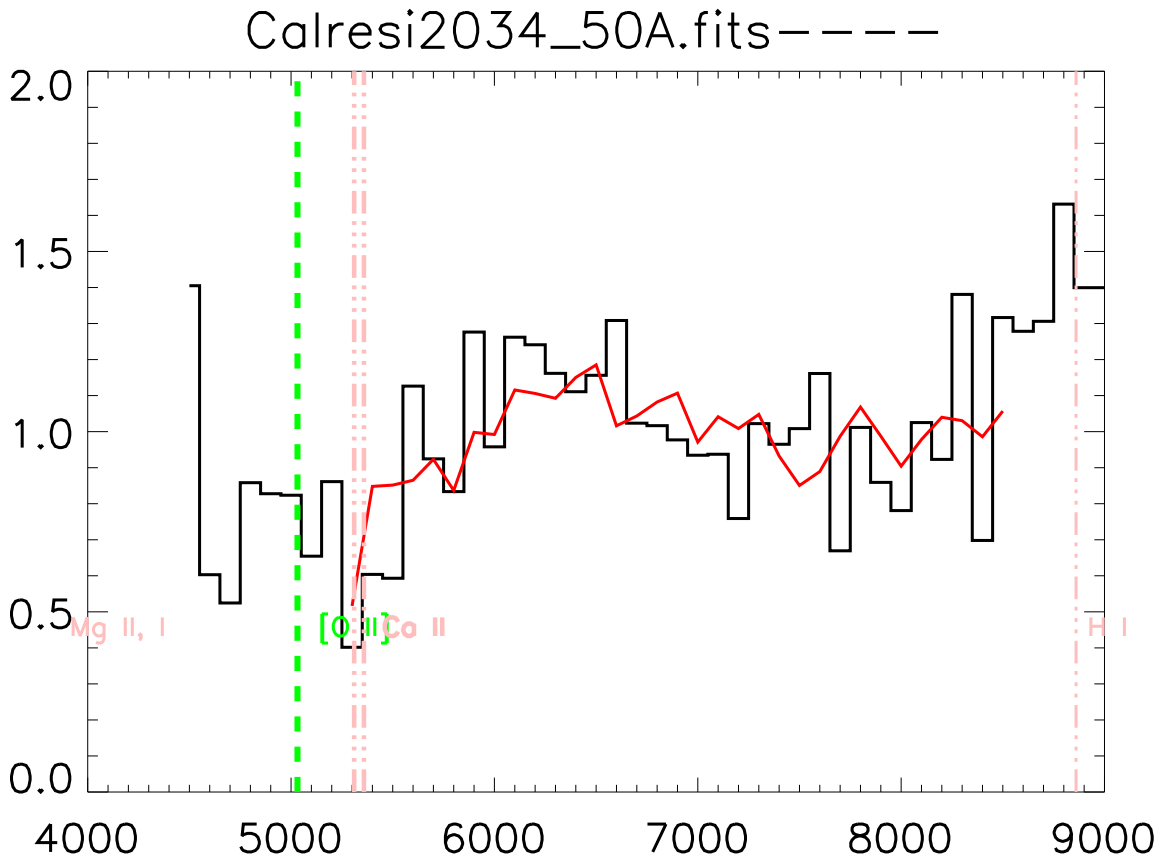

sn1994d.m03.dat.rect, z = 0.89999998
Calresi2034_35_51.ec_50s5.fits Observed − Galaxy
Template Spectrum Av = −1.0000000
Galaxy
SN/Gal = −1.26995
Mg II, I
[O II]
Ca II
[O III]
20
15
10
5
0
−5
−10
5000
6000
7000
8000
9000
10000

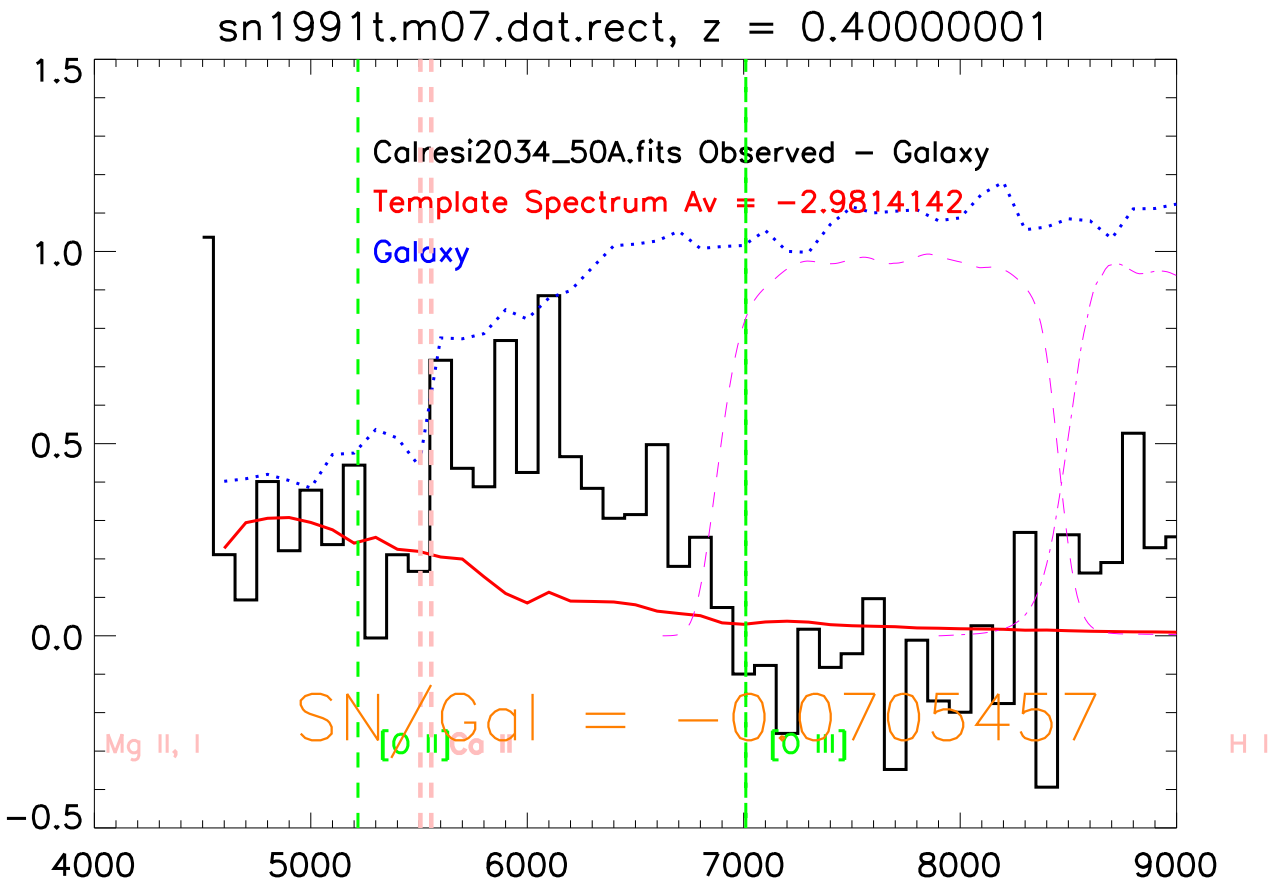

sn1999ee.m06.dat.rect, z = 0.89999998
Calresi2034_35_51.ec_50s5.fits Observed − Galaxy
Template Spectrum Av = −1.0000000
Galaxy
SN/Gal = −1.49043
Mg II, I
[O II]
Ca II
[O III]
20
15
10
5
0
−5
−10
5000
6000
7000
8000
9000
10000

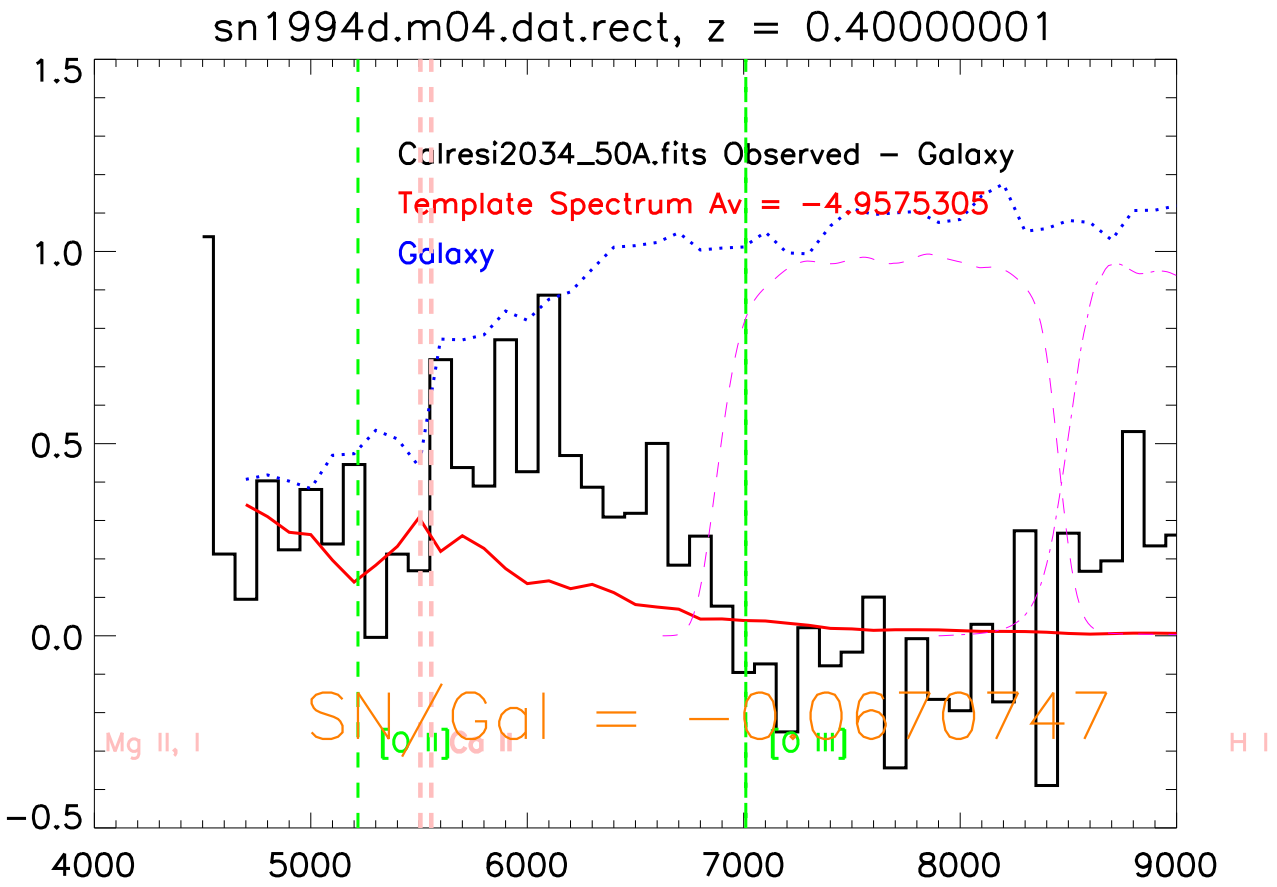


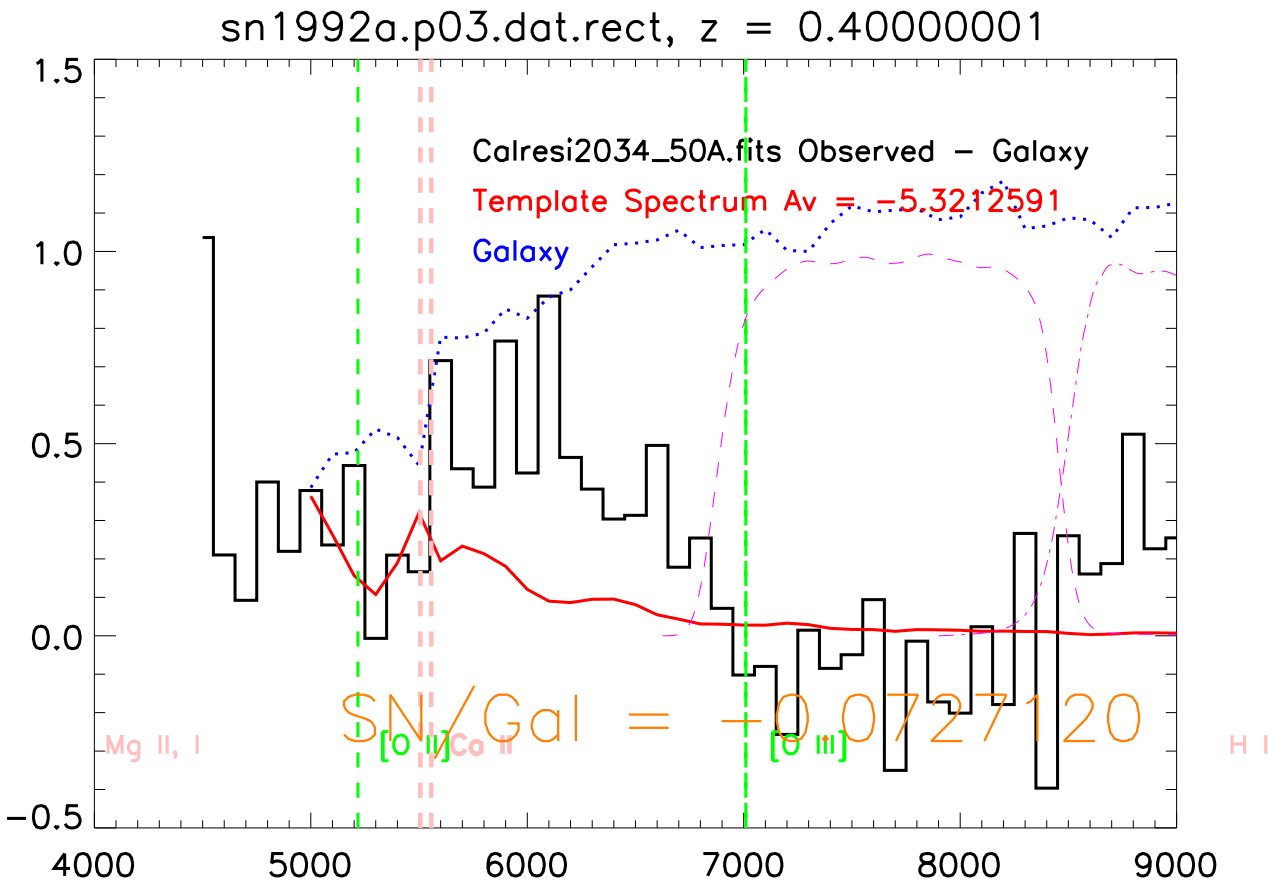

2.5
2.0
1.5
1.0
χ^2
40
20
0
−20
dφ/s
0.5
1.0
1.5
2.0
Δm15

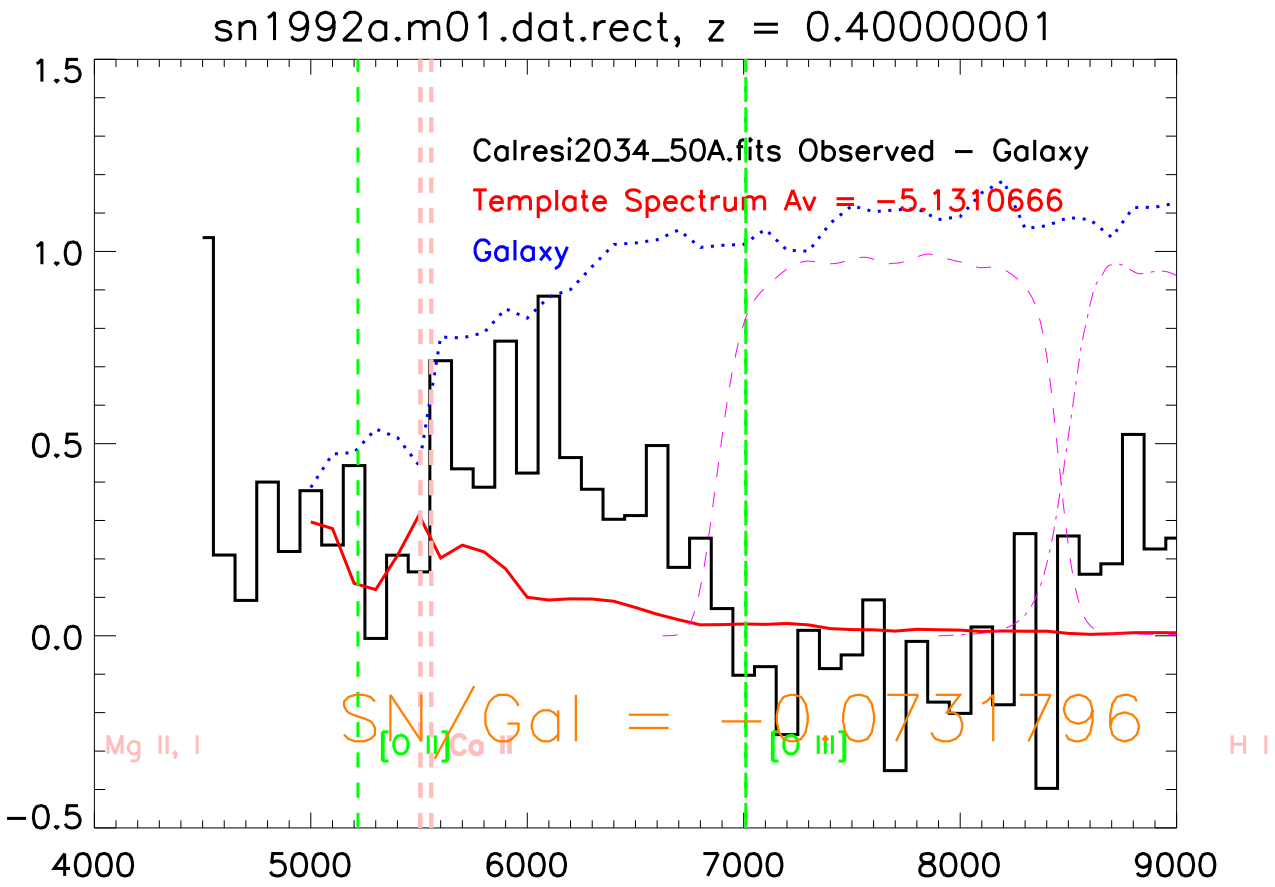

Calresi2034_50A.fits
12
10
8
6
4
2
0
X^2
0.30
0.40
0.50
0.60
z

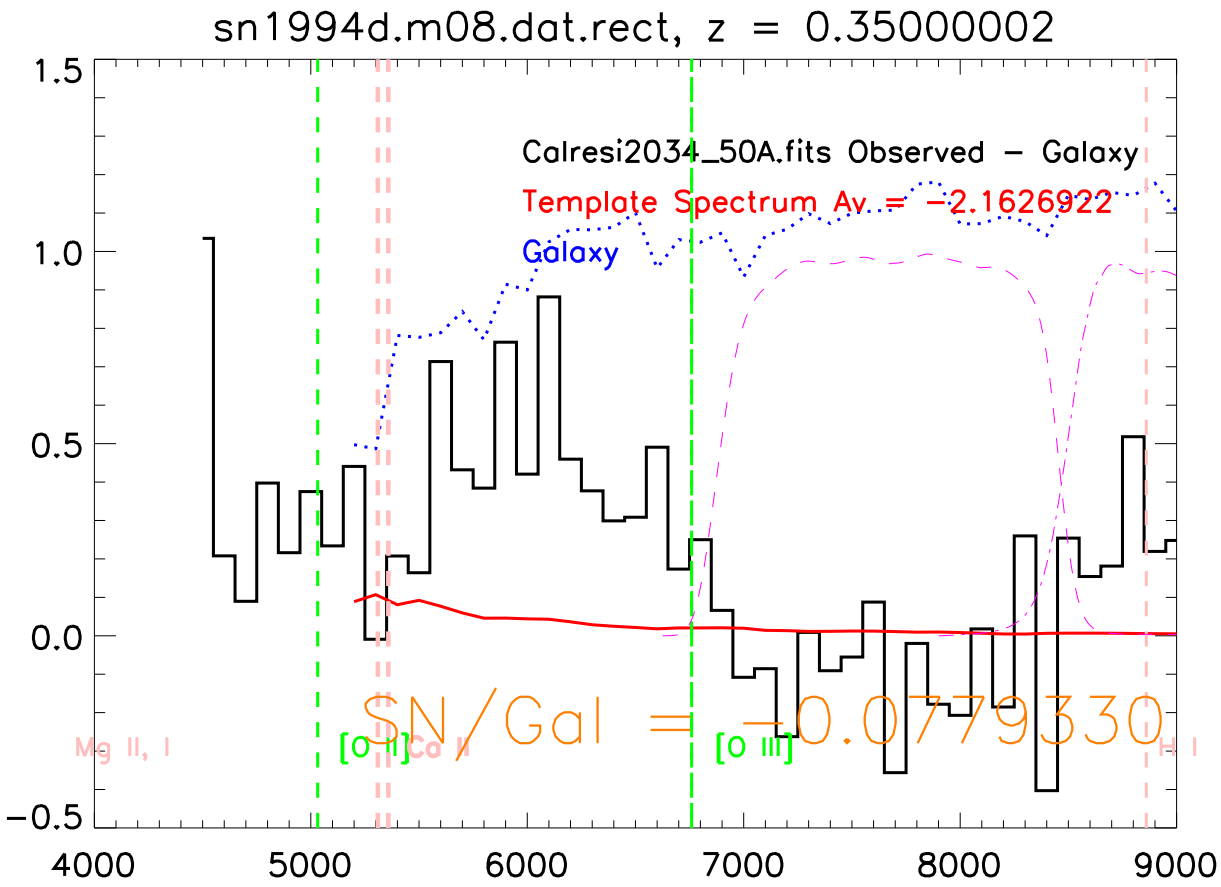

Calresi2034_50A.fits----
2.0
1.5
1.0
0.5
0.0
4000
5000
6000
7000
8000
9000
Mg II, I
[O II]
Ca II
H I

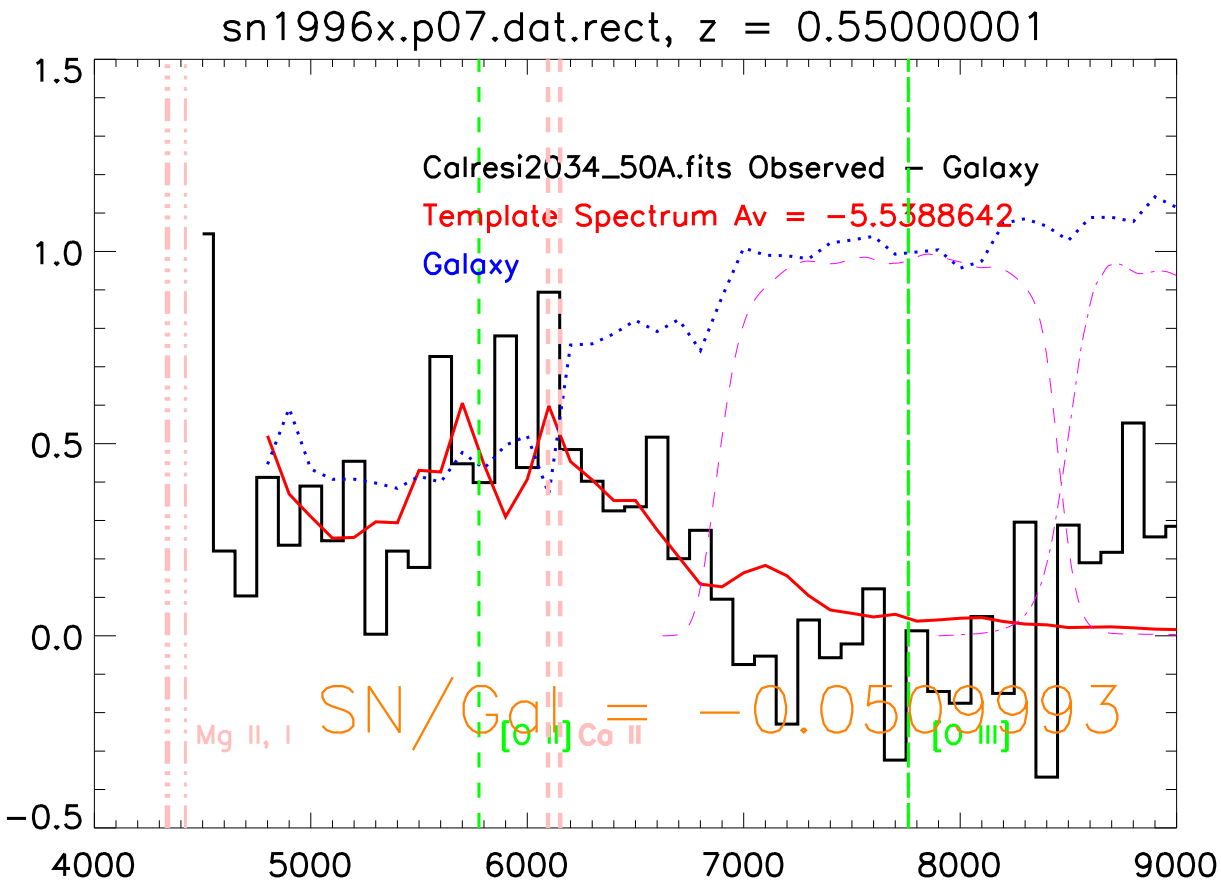

sn1991t.m07.dat.rect, z = 0.40000001
Calresi2034_50A.fits Observed − Galaxy
Template Spectrum Av = −2.9814142
Galaxy
SN/Gal = −0.070705457
Mg II, I
[O II]
Ca II
[O III]
H I
1.5
1.0
0.5
0.0
−0.5
4000
5000
6000
7000
8000
9000

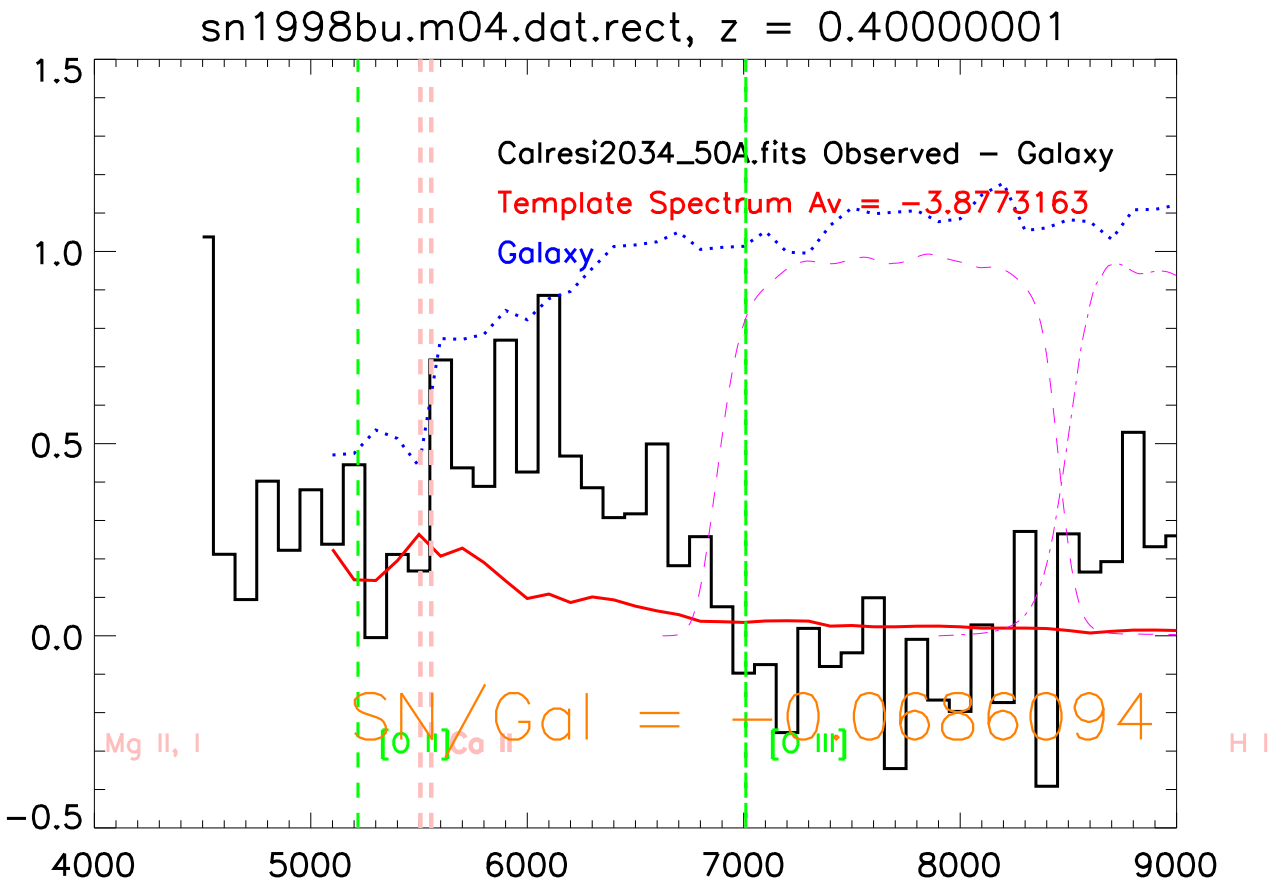

sn1994d.m04.dat.rect, z = 0.40000001
Calresi2034_50A.fits Observed − Galaxy
Template Spectrum Av = −4.9575305
Galaxy
SN/Gal = −0.06770747
Mg II, I
[O II]
Ca II
[O III]
H I
1.5
1.0
0.5
0.0
−0.5
4000
5000
6000
7000
8000
9000

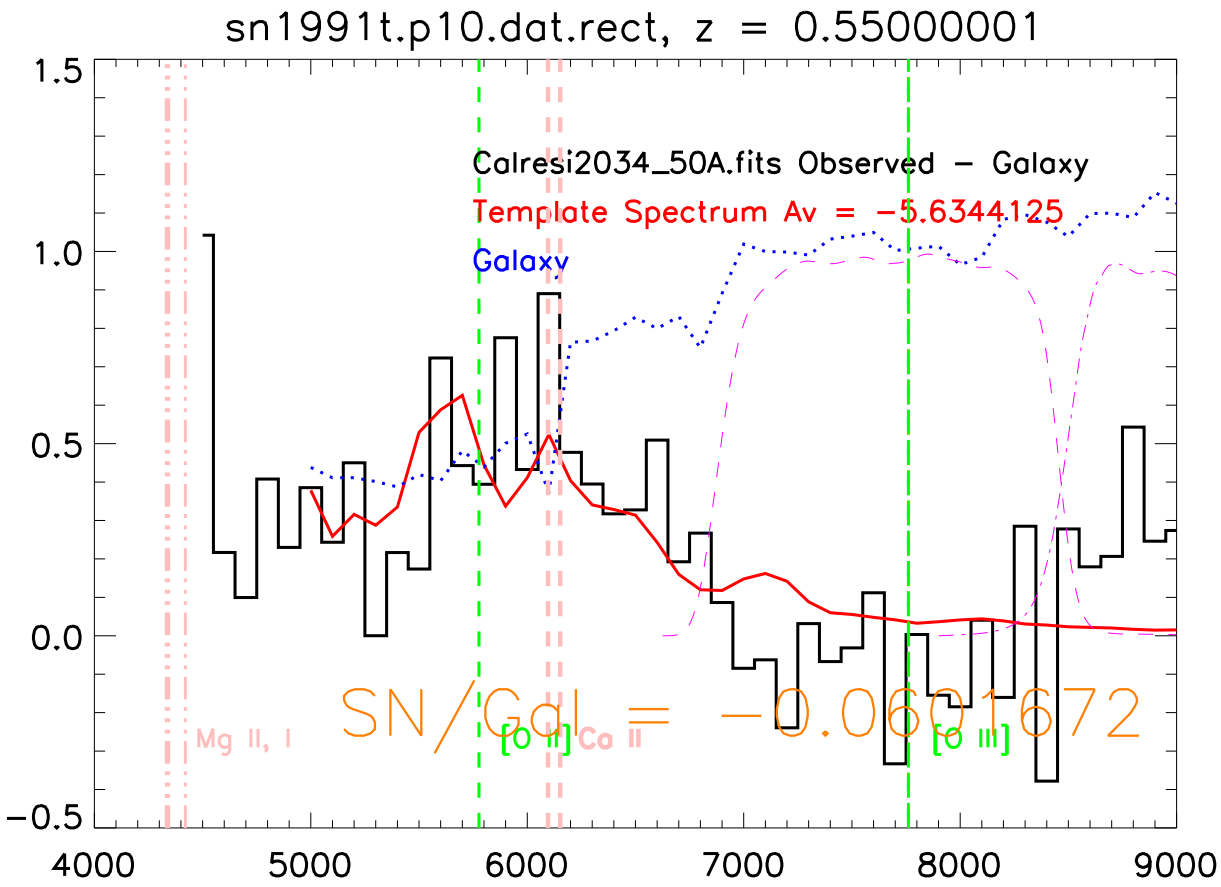

sn1992a.p03.dat.rect, z = 0.40000001
Calresi2034_50A.fits Observed − Galaxy
Template Spectrum Av = −5.3212591
Galaxy
SN/Gal = +0.072712
Mg II, I
[O II]
Ca II
[O III]
H I
1.5
1.0
0.5
0.0
−0.5
4000
5000
6000
7000
8000
9000

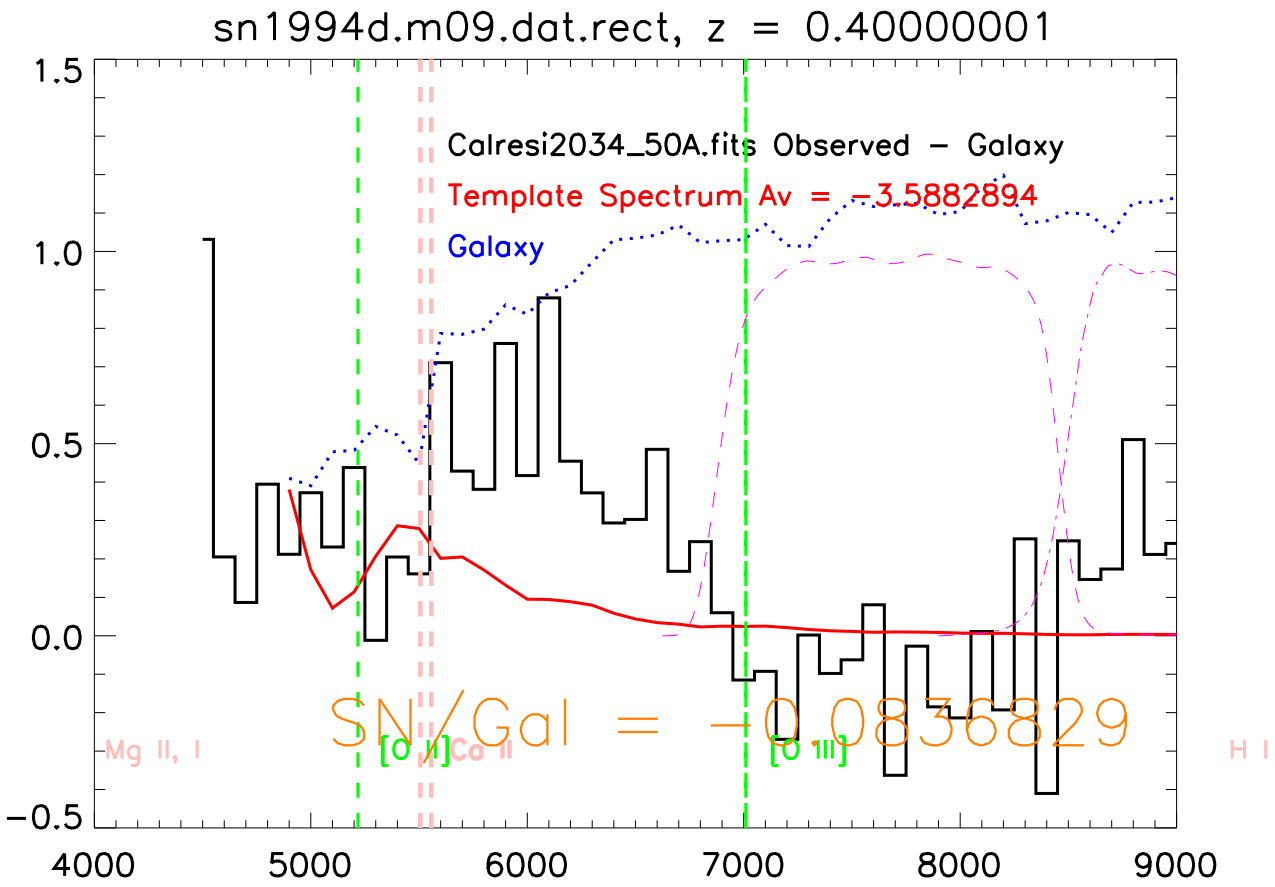

sn1992a.m01.dat.rect, z = 0.40000001
Calresi2034_50A.fits Observed − Galaxy
Template Spectrum Av = −5.1310666
Galaxy
SN/Gal = +0.073171796
Mg II, I
[O II]
Ca II
[O III]
H I
1.5
1.0
0.5
0.0
−0.5
4000
5000
6000
7000
8000
9000

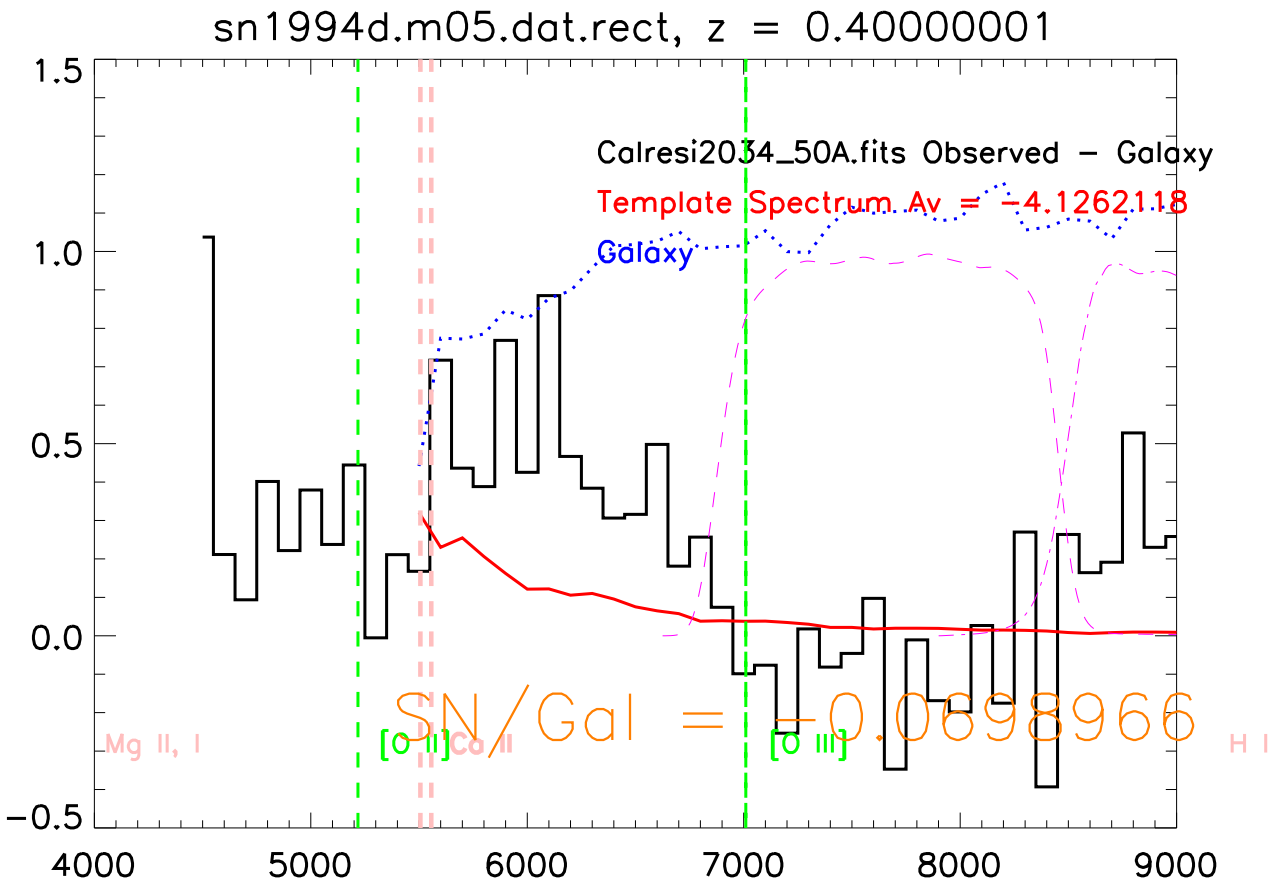

sn1994d.m08.dat.rect, z = 0.35000002
Calresi2034_50A.fits Observed − Galaxy
Template Spectrum Av. = −2.1626922
Galaxy
SN/Gal = −0.0779330
Mg II, I
[O II]
Ca II
[O III]
H I
1.5
1.0
0.5
0.0
−0.5
4000
5000
6000
7000
8000
9000

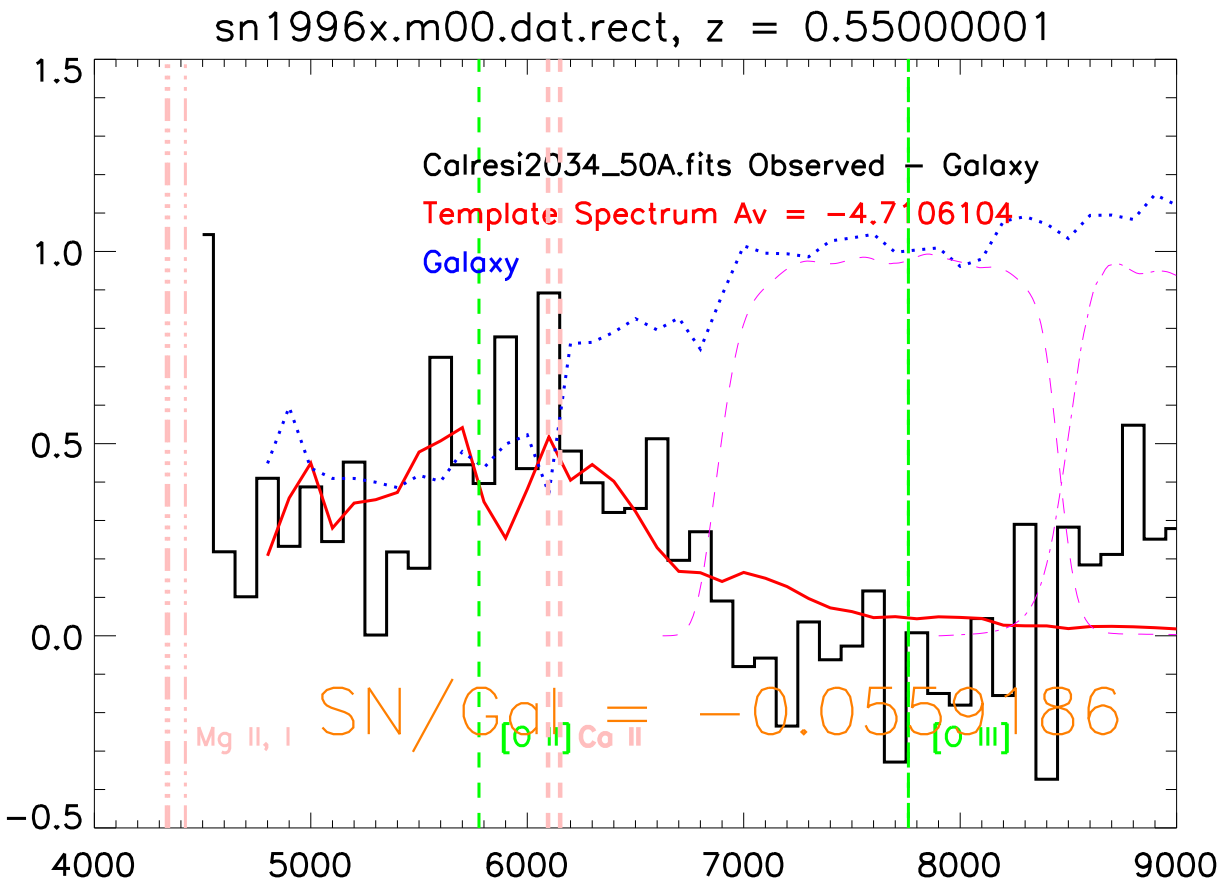

sn1996x.p07.dat.rect, z = 0.55000001
Calresi2034_50A.fits Observed − Galaxy
Template Spectrum Av = −5.5388642
Galaxy
SN/Gal = −0.0509993
Mg II, I
[O II]
Ca II
[O III]
1.5
1.0
0.5
0.0
−0.5
4000
5000
6000
7000
8000
9000

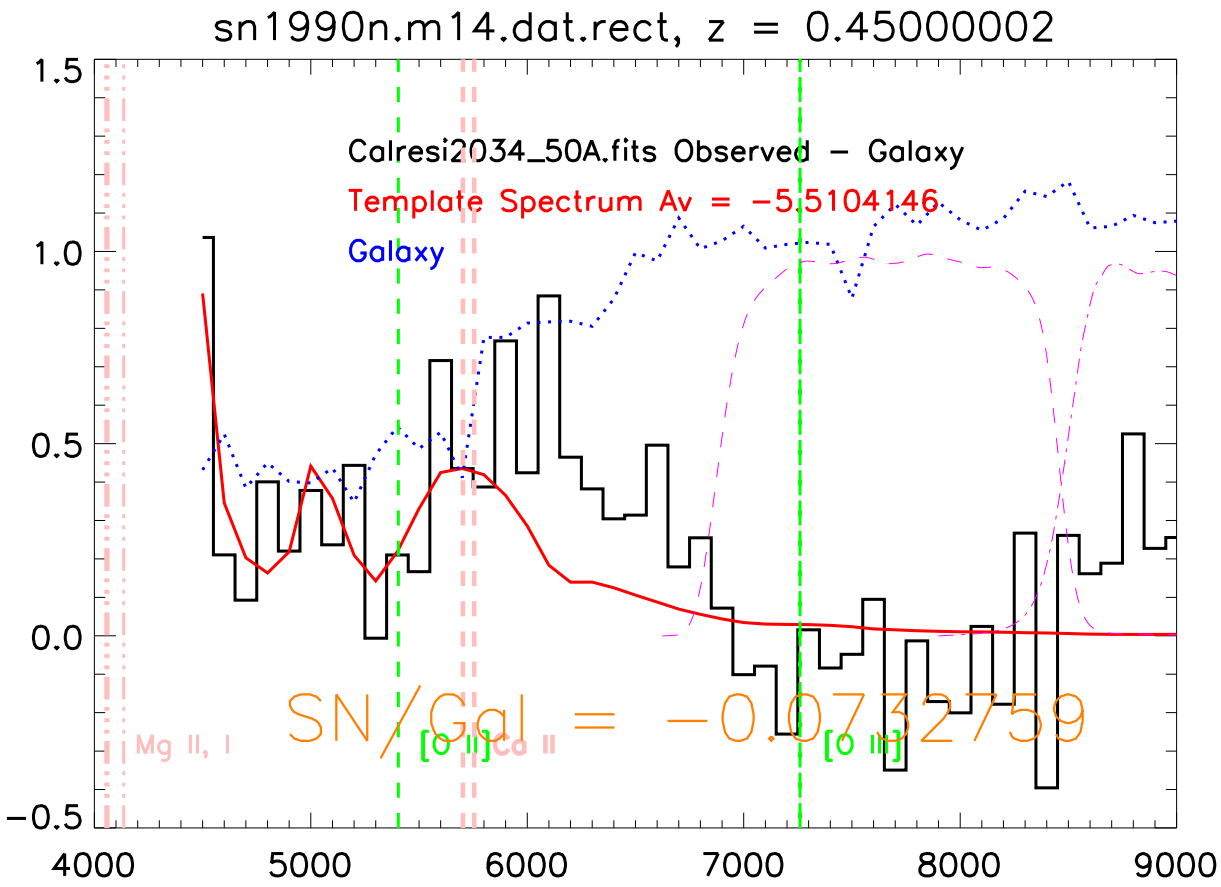

sn1998bu.m04.dat.rect, z = 0.40000001
Calresi2034_50A.fits Observed − Galaxy
Template Spectrum Av = −3.8773163
Galaxy
SN/Gal = +0.0686094
Mg II, I
[O II]
Ca II
[O III]
H I
1.5
1.0
0.5
0.0
−0.5
4000
5000
6000
7000
8000
9000

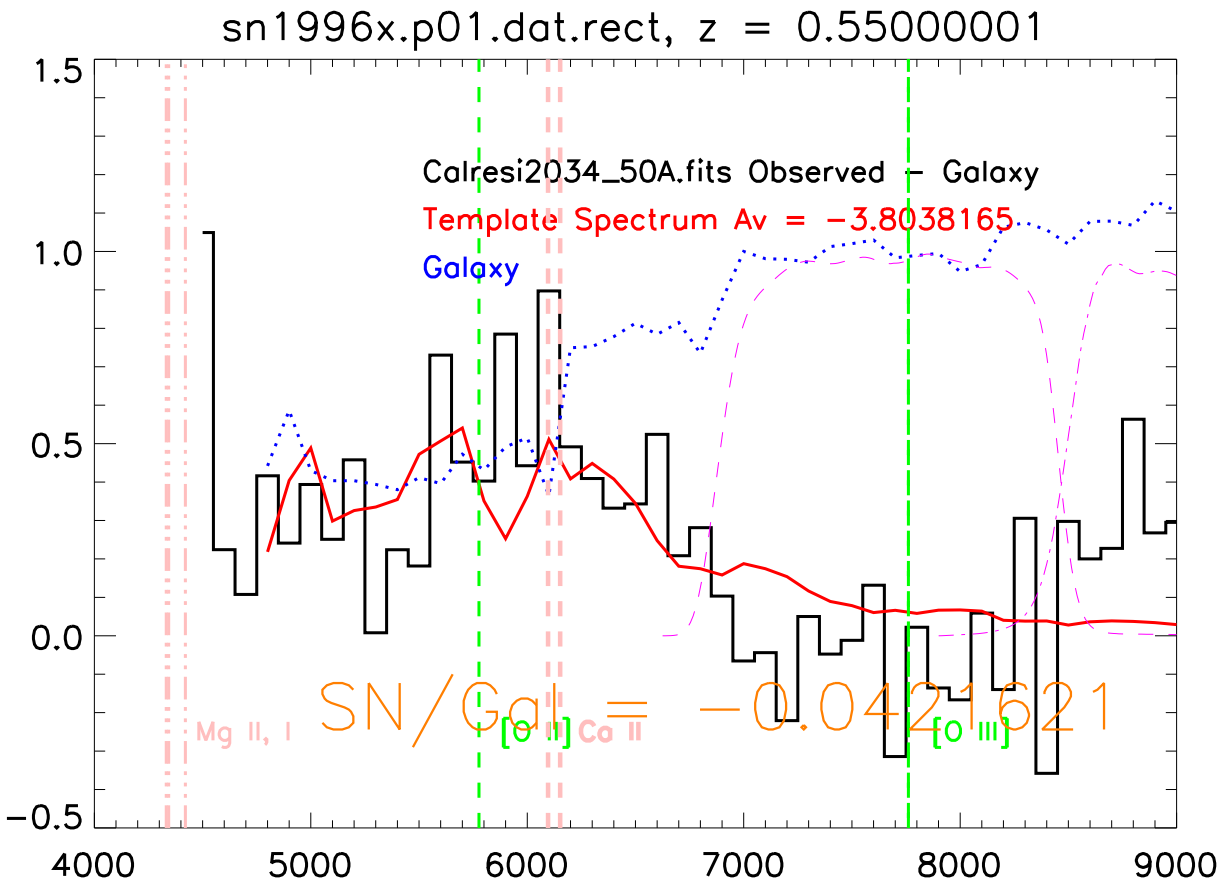

sn1991t.p10.dat.rect, z = 0.55000001
Calresi2034_50A.fits Observed − Galaxy
Template Spectrum Av = −5.6344125
Galaxy
SN/Gal = −0.0601672
Mg II, I
[O II]
Ca II
[O III]
1.5
1.0
0.5
0.0
−0.5
4000
5000
6000
7000
8000
9000

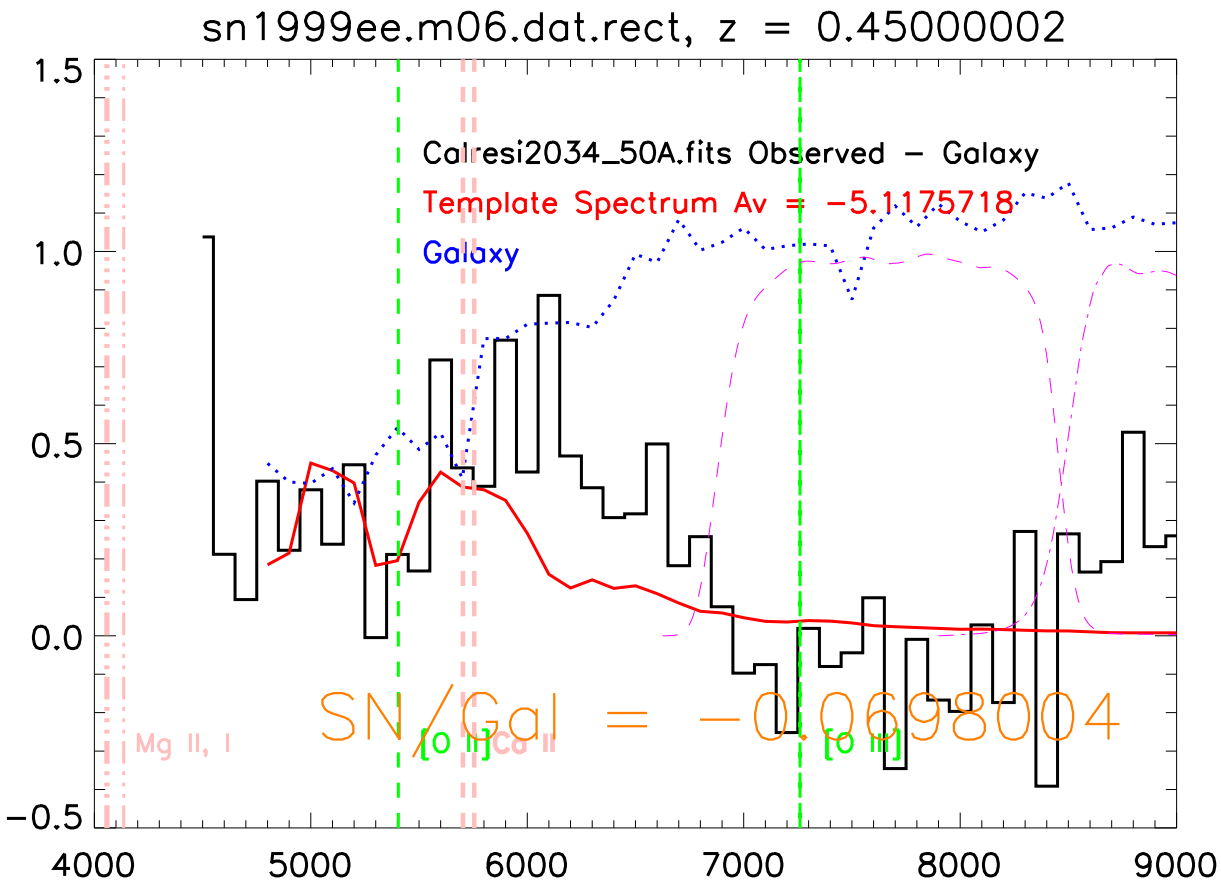

sn1994d.m09.dat.rect, z = 0.40000001
Calresi2034_50A.fits Observed − Galaxy
Template Spectrum Av = −3.5882894
Galaxy
SN/Gal = +0.083668829
Mg II, I
[O II]
Ca II
[O III]
H I
1.5
1.0
0.5
0.0
−0.5
4000
5000
6000
7000
8000
9000

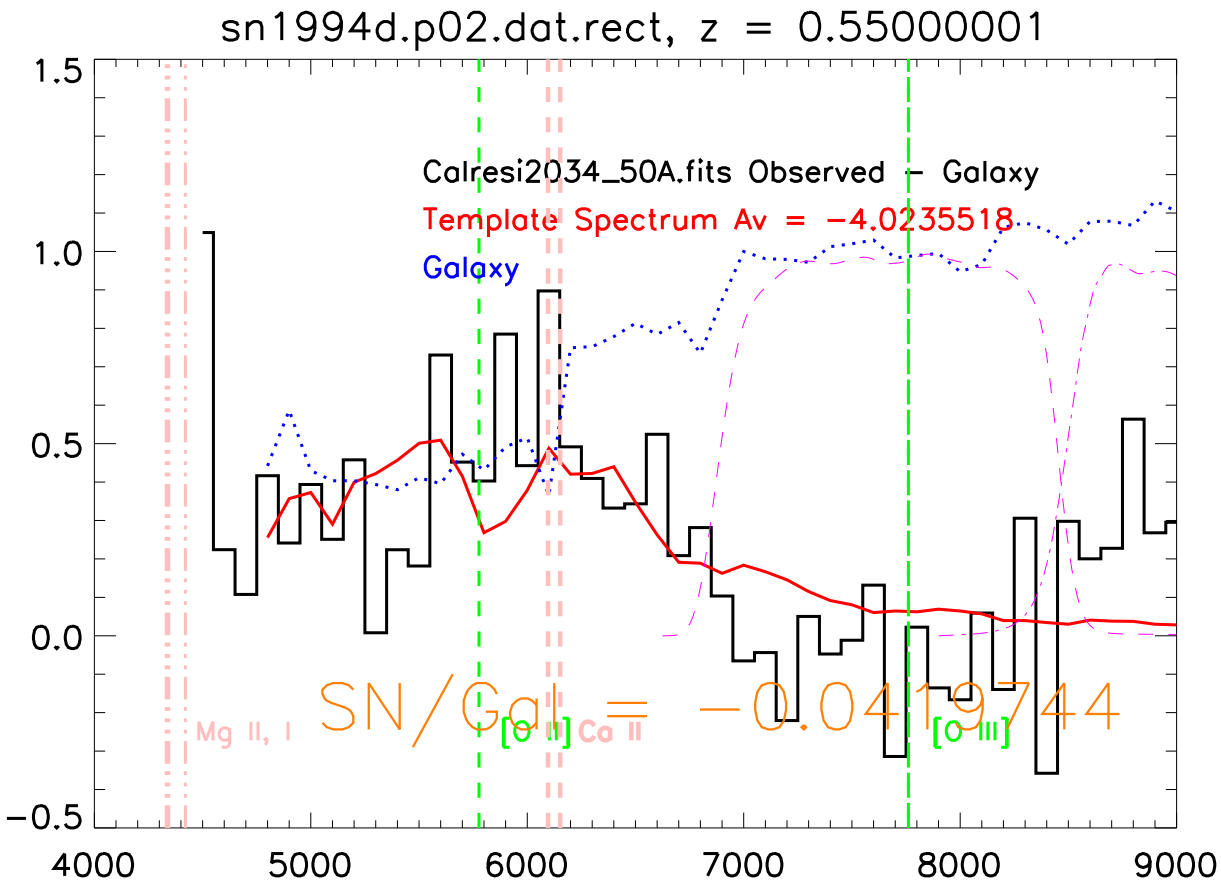

sn1994d.m05.dat.rect, z = 0.40000001
Calresi2034_50A.fits Observed − Galaxy
Template Spectrum Av = −4.1262118
Galaxy
SN/Gal = −0.0698966
Mg II, I
[O II]
Ca II
[O III]
H I
1.5
1.0
0.5
0.0
−0.5
4000
5000
6000
7000
8000
9000

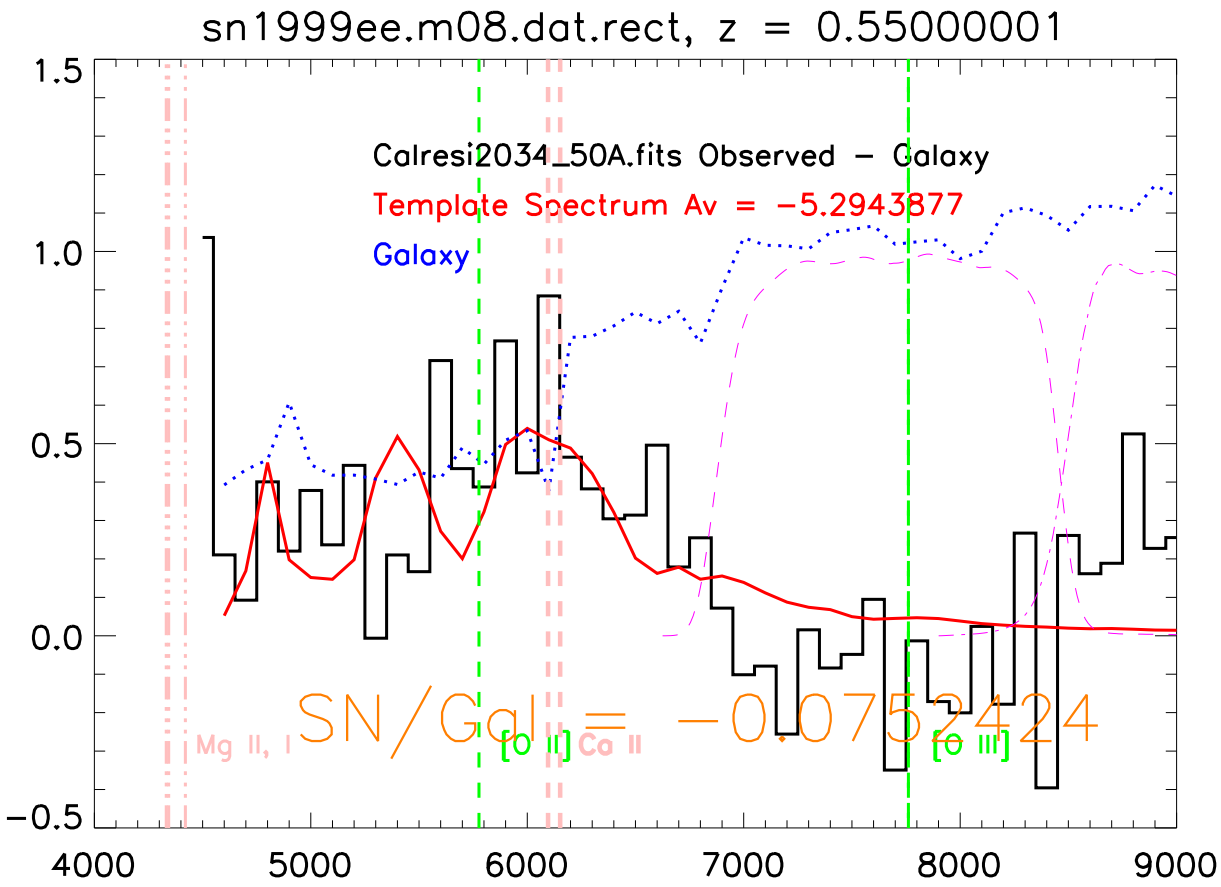

sn1996x.m00.dat.rect, z = 0.55000001
Calresi2034_50A.fits Observed – Galaxy
Template Spectrum Av = −4.7106104
Galaxy
SN/Gal = −0.0559186
Mg II, I
[O II]
Ca II
[O III]
1.5
1.0
0.5
0.0
−0.5
4000
5000
6000
7000
8000
9000

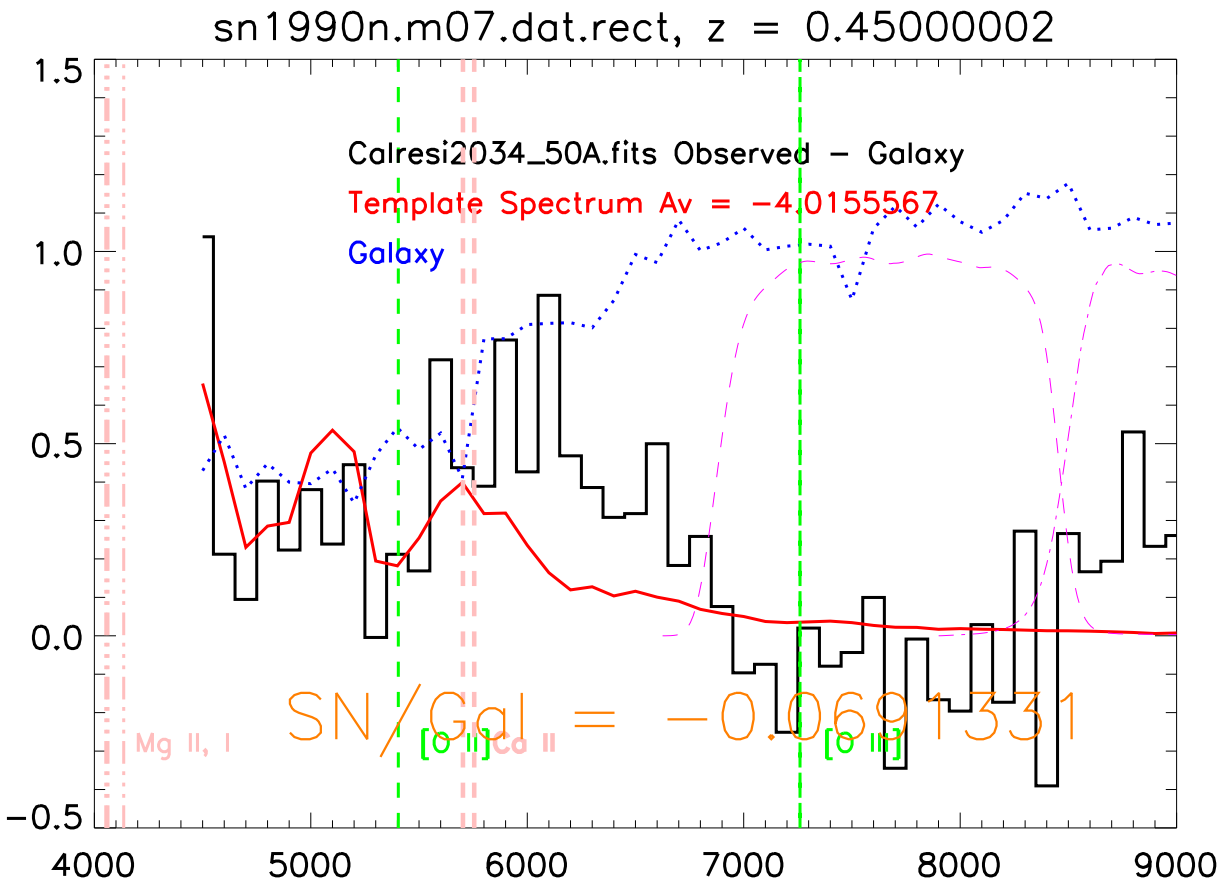

sn1990n.m14.dat.rect, z = 0.45000002
Calresi2034_50A.fits Observed − Galaxy
Template Spectrum Av = −5.5104146
Galaxy
SN/Gal = −0.0732759
Mg II, I
[O II]
Ca II
[O III]
H I
1.5
1.0
0.5
0.0
−0.5
4000
5000
6000
7000
8000
9000

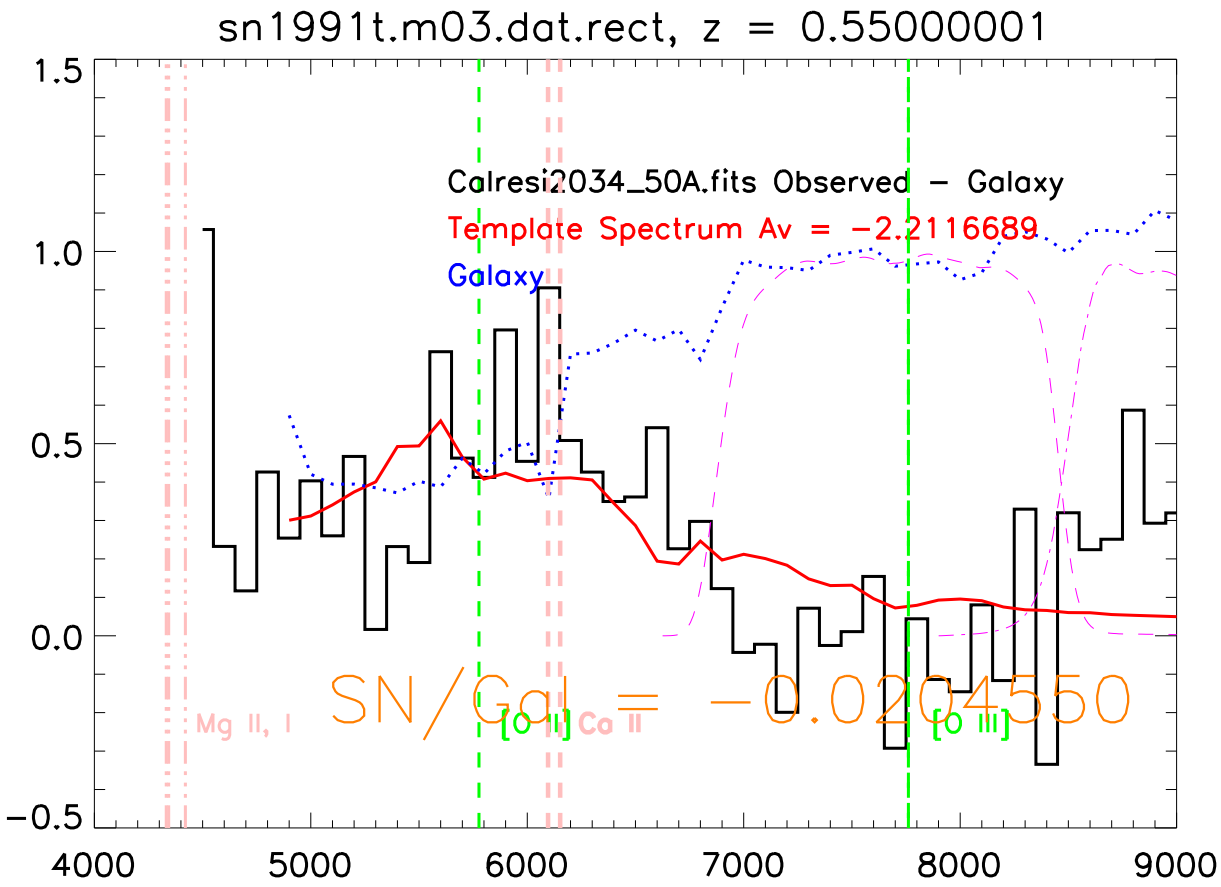

sn1996x.p01.dat.rect, z = 0.55000001
Calresi2034_50A.fits Observed – Galaxy
Template Spectrum Av = −3.8038165
Galaxy
SN/Gal = −0.042161621
Mg II, I
[O II]
Ca II
[O III]
1.5
1.0
0.5
0.0
−0.5
4000
5000
6000
7000
8000
9000

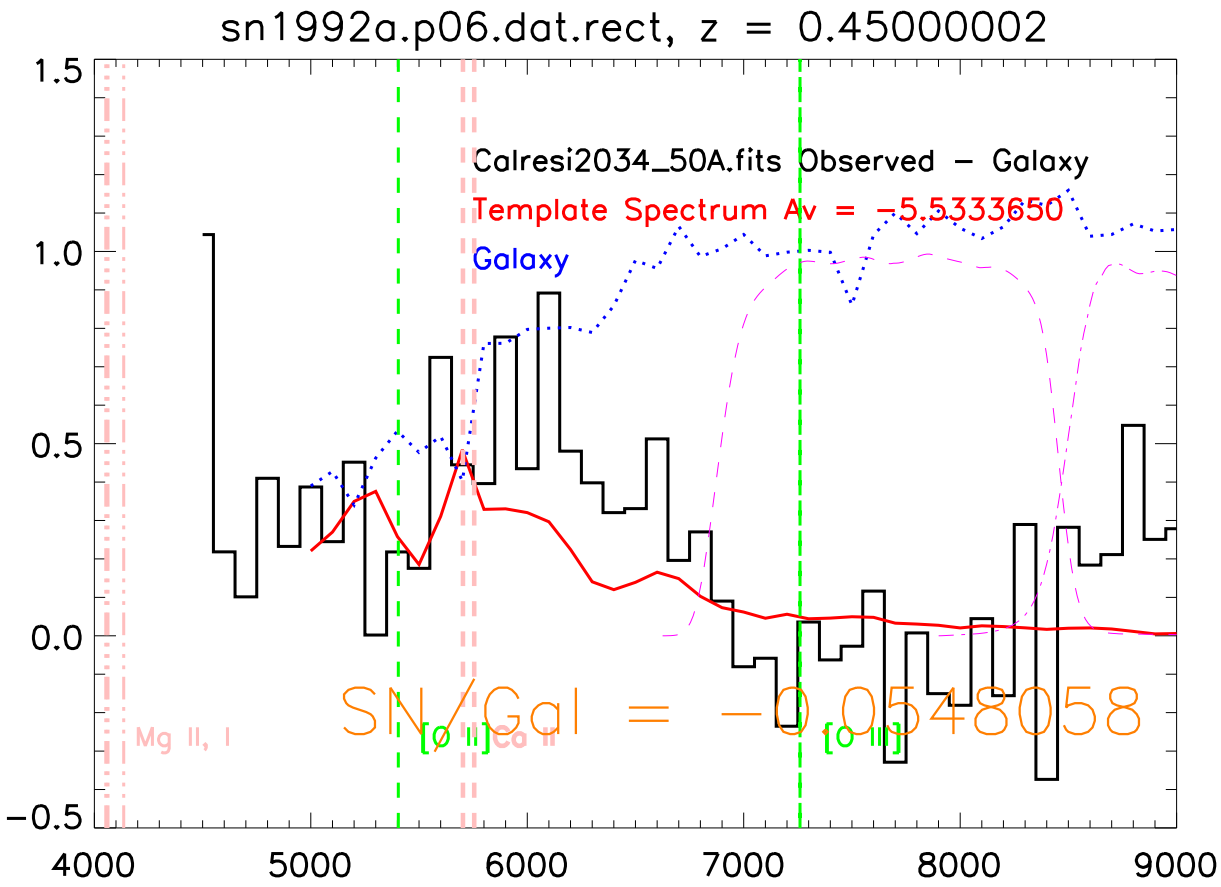

sn1999ee.m06.dat.rect, z = 0.45000002
Calresi2034_50A.fits Observed − Galaxy
Template Spectrum Av = −5.1175718
Galaxy
SN/Gal = −0.06980004
Mg II, I
[O II]
Ca II
[O III]
H I
1.5
1.0
0.5
0.0
−0.5
4000
5000
6000
7000
8000
9000

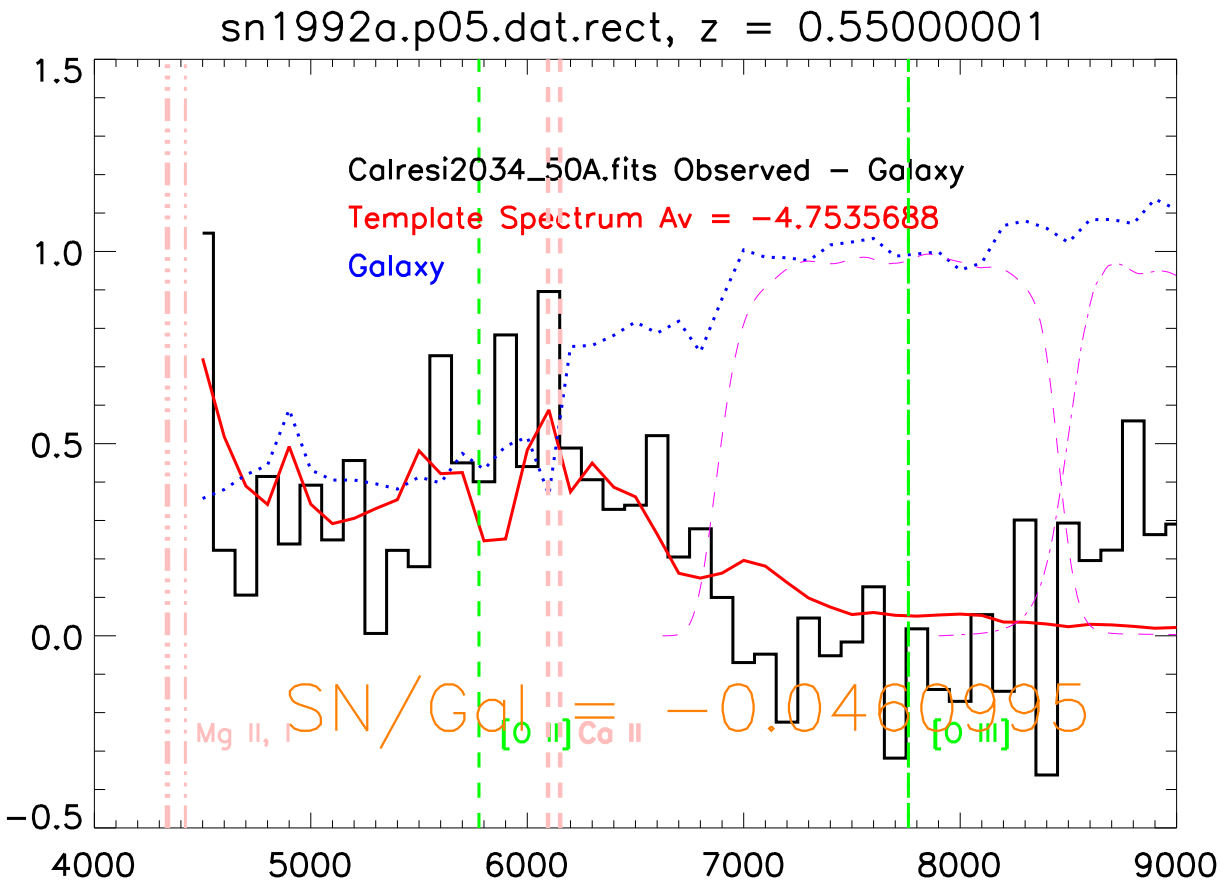

sn1994d.p02.dat.rect, z = 0.55000001
Calresi2034_50A.fits Observed – Galaxy
Template Spectrum Av = −4.0235518
Galaxy
SN/Gal = −0.0419744
Mg II, I
[O II]
Ca II
[O III]
1.5
1.0
0.5
0.0
−0.5
4000
5000
6000
7000
8000
9000


sn1999ee.m08.dat.rect, z = 0.55000001
Calresi2034_50A.fits Observed − Galaxy
Template Spectrum Av = −5.2943877
Galaxy
SN/Gal = −0.0752424
Mg II, I
[O II]
Ca II
[O III]
1.5
1.0
0.5
0.0
−0.5
4000
5000
6000
7000
8000
9000

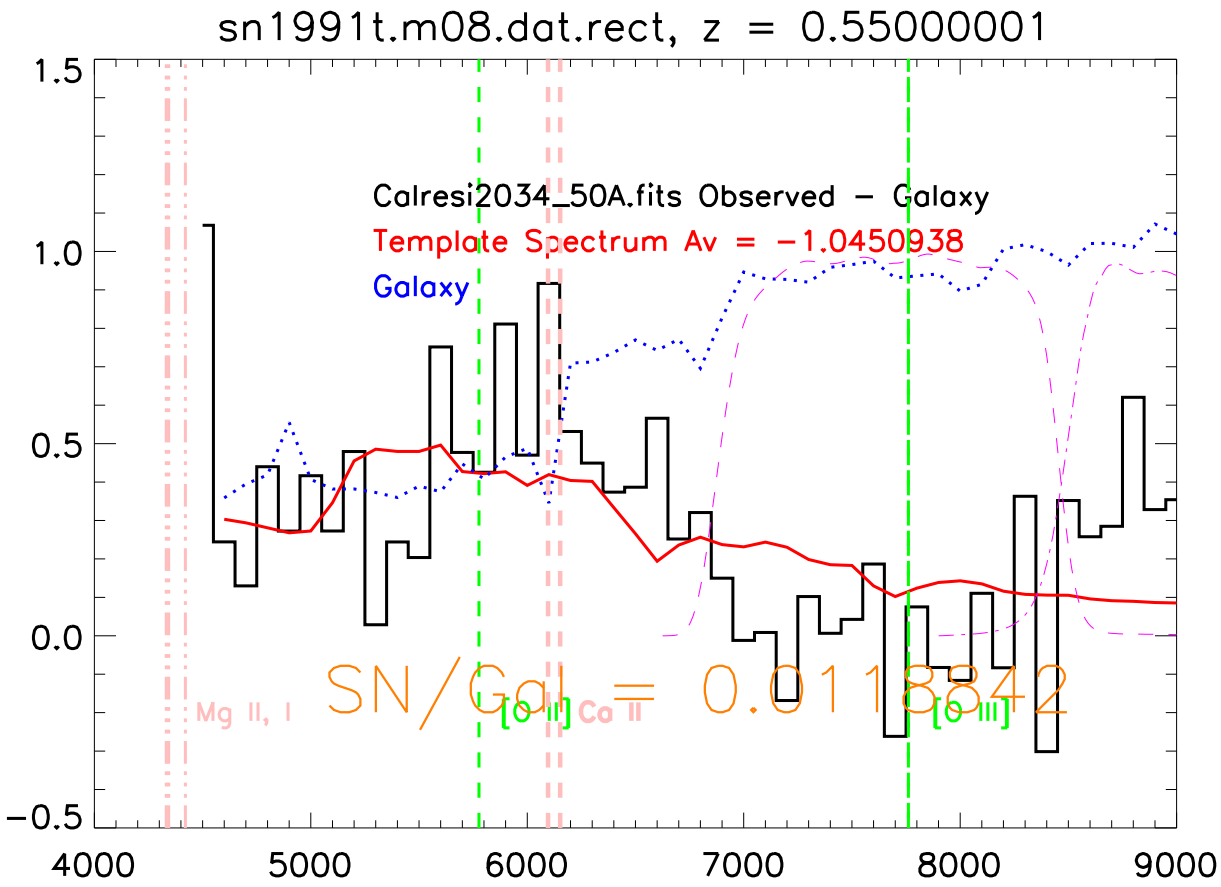

sn1990n.m07.dat.rect, z = 0.45000002
Calresi2034_50A.fits Observed − Galaxy
Template Spectrum Av = −4.0155567
Galaxy
SN/Gal = −0.069131331
Mg II, I
[O II]
Ca II
[O III]
H I
1.5
1.0
0.5
0.0
−0.5
4000
5000
6000
7000
8000
9000

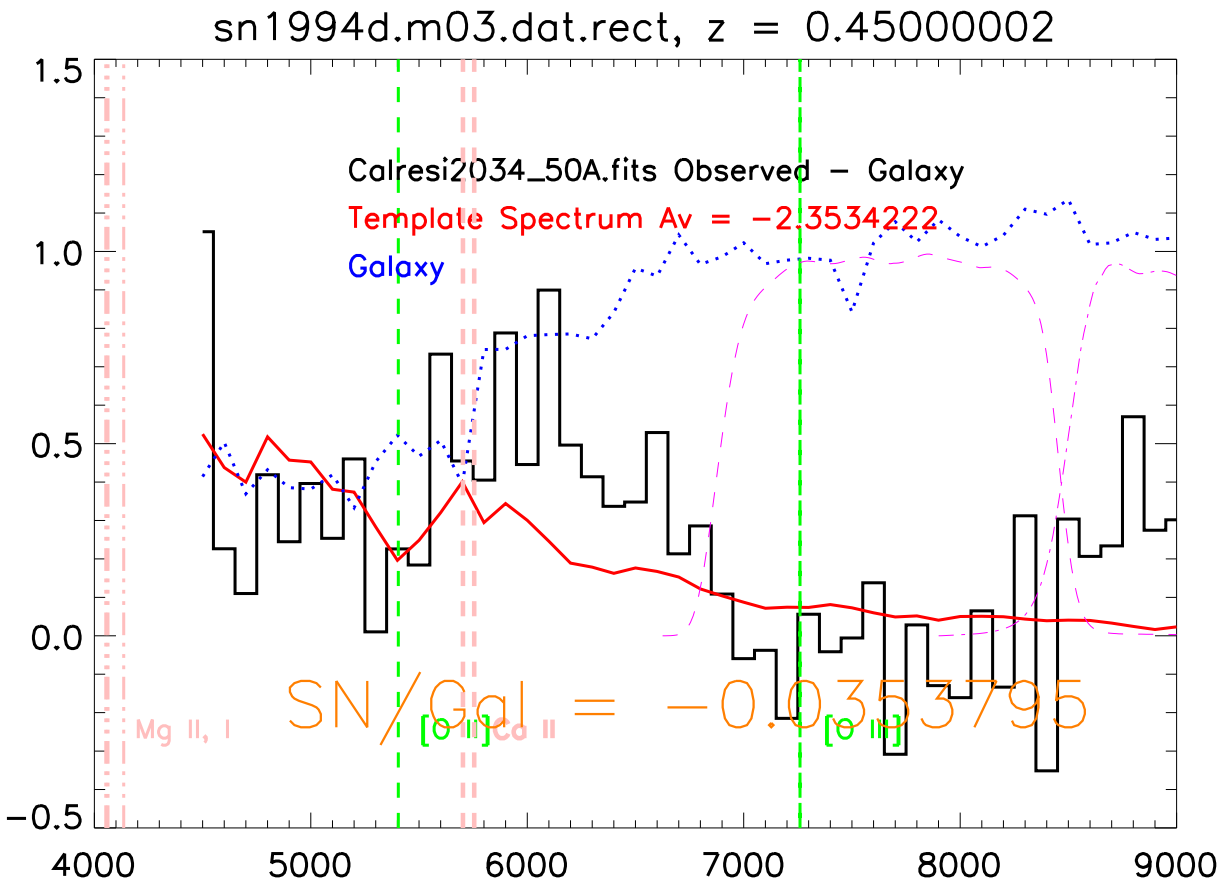

sn1991t.m03.dat.rect, z = 0.55000001
Calresi2034_50A.fits Observed − Galaxy
Template Spectrum Av = −2.2116689
Galaxy
SN/Gal = −0.020045500
Mg II, I
[O II]
Ca II
[O III]
1.5
1.0
0.5
0.0
−0.5
4000
5000
6000
7000
8000
9000

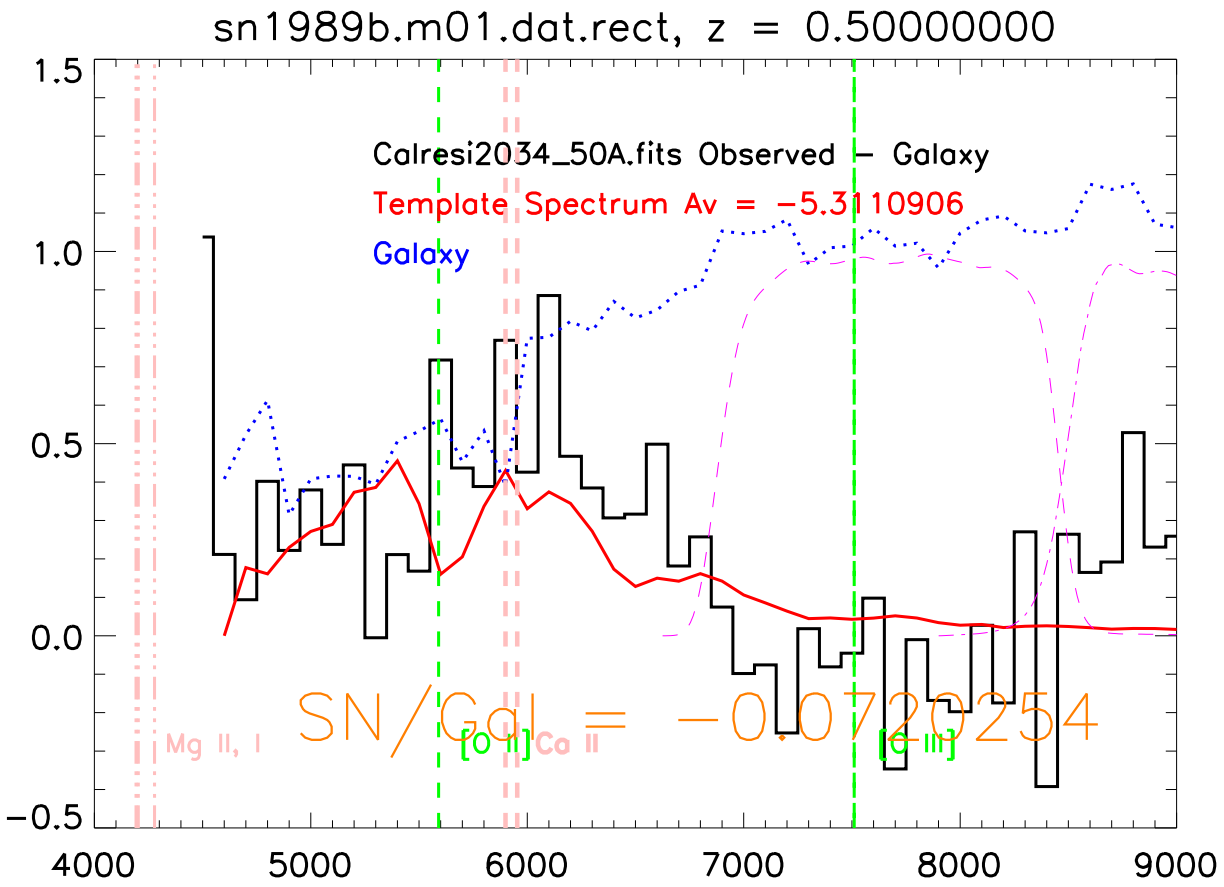

sn1992a.p06.dat.rect, z = 0.45000002
Calresi2034_50A.fits Observed − Galaxy
Template Spectrum Av = −5.5333650
Galaxy
SN/Gal = −0.05480058
Mg II, I
[O II]
Ca II
[O III]
H I
1.5
1.0
0.5
0.0
−0.5
4000
5000
6000
7000
8000
9000

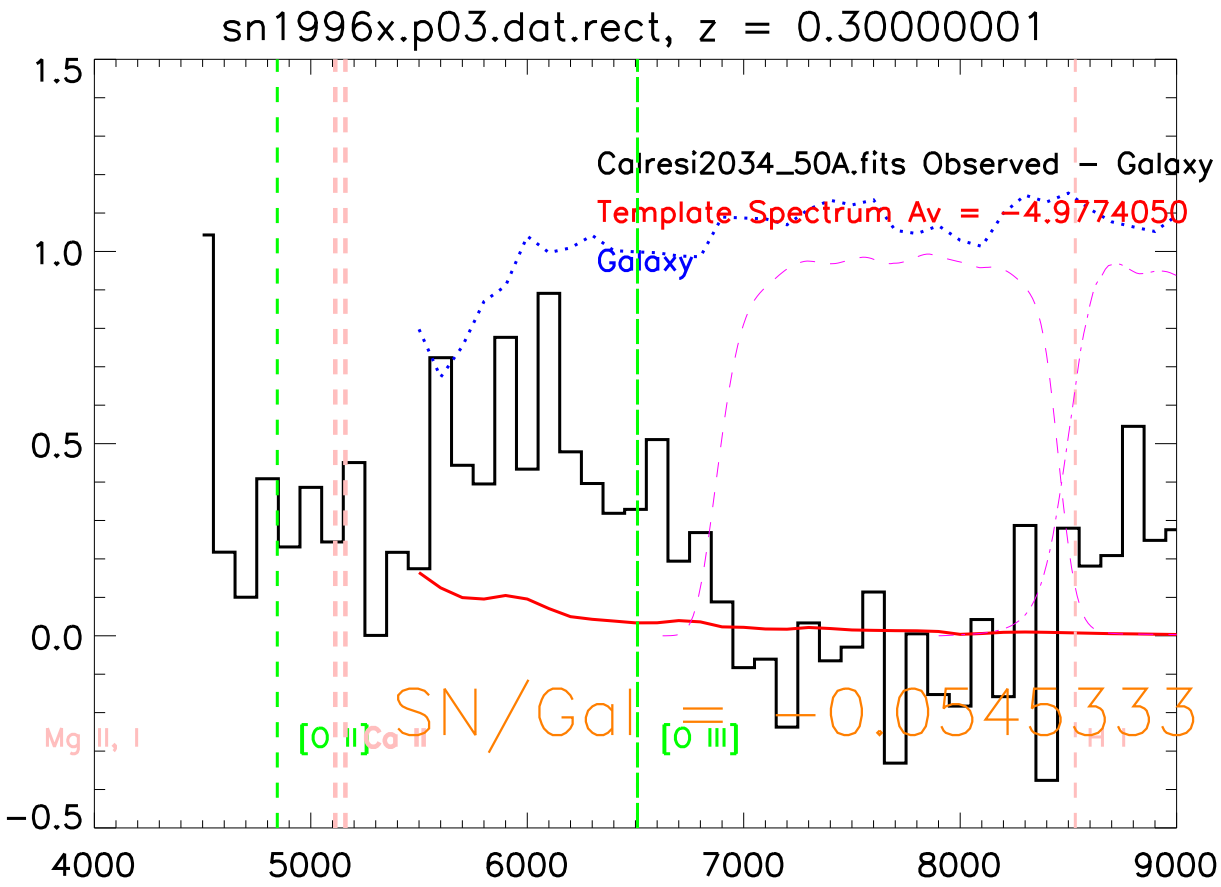


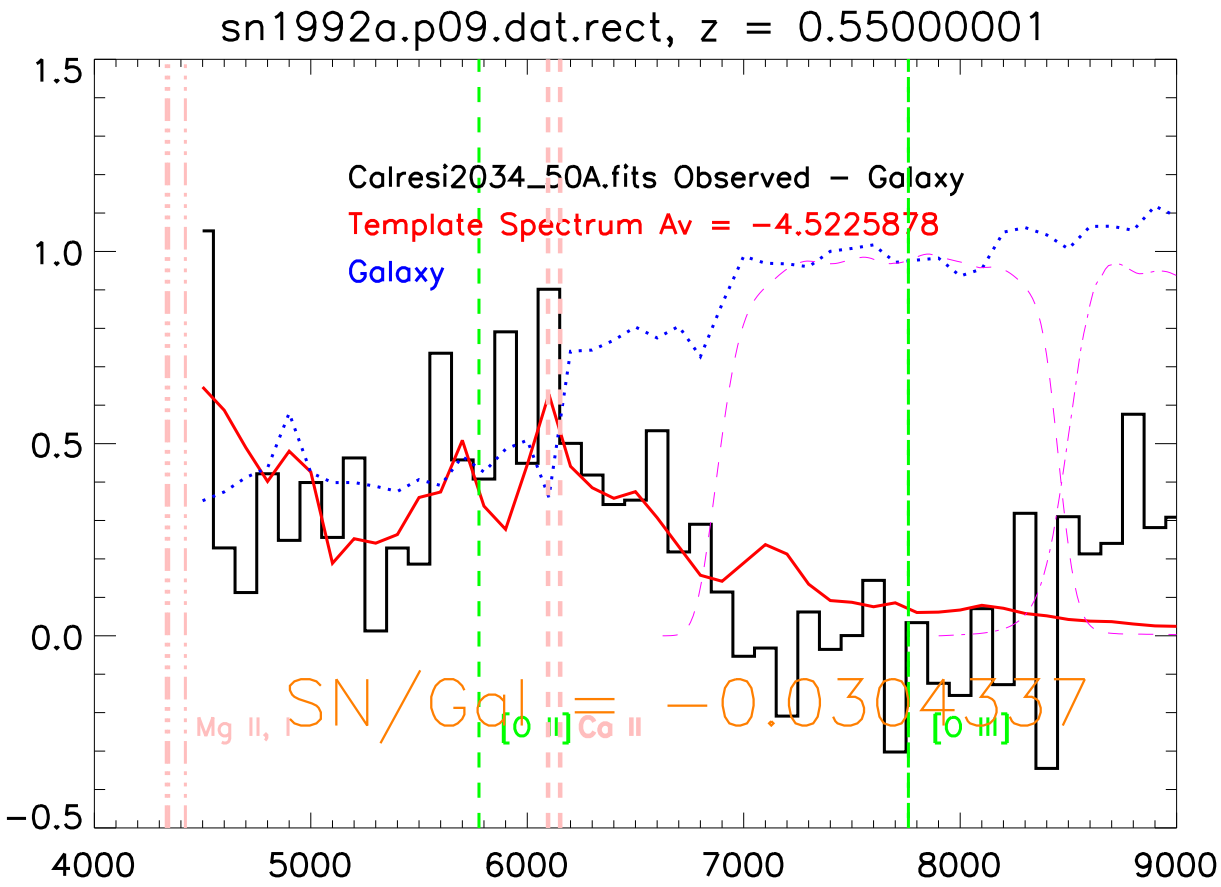
sn1992a.p05.dat.rect, z = 0.55000001
Calresi2034_50A.fits Observed − Galaxy
Template Spectrum Av = −4.7535688
Galaxy
SN/Gal = −0.0460995
Mg II, I
[O II]
Ca II
[O III]
1.5
1.0
0.5
0.0
−0.5
4000
5000
6000
7000
8000
9000

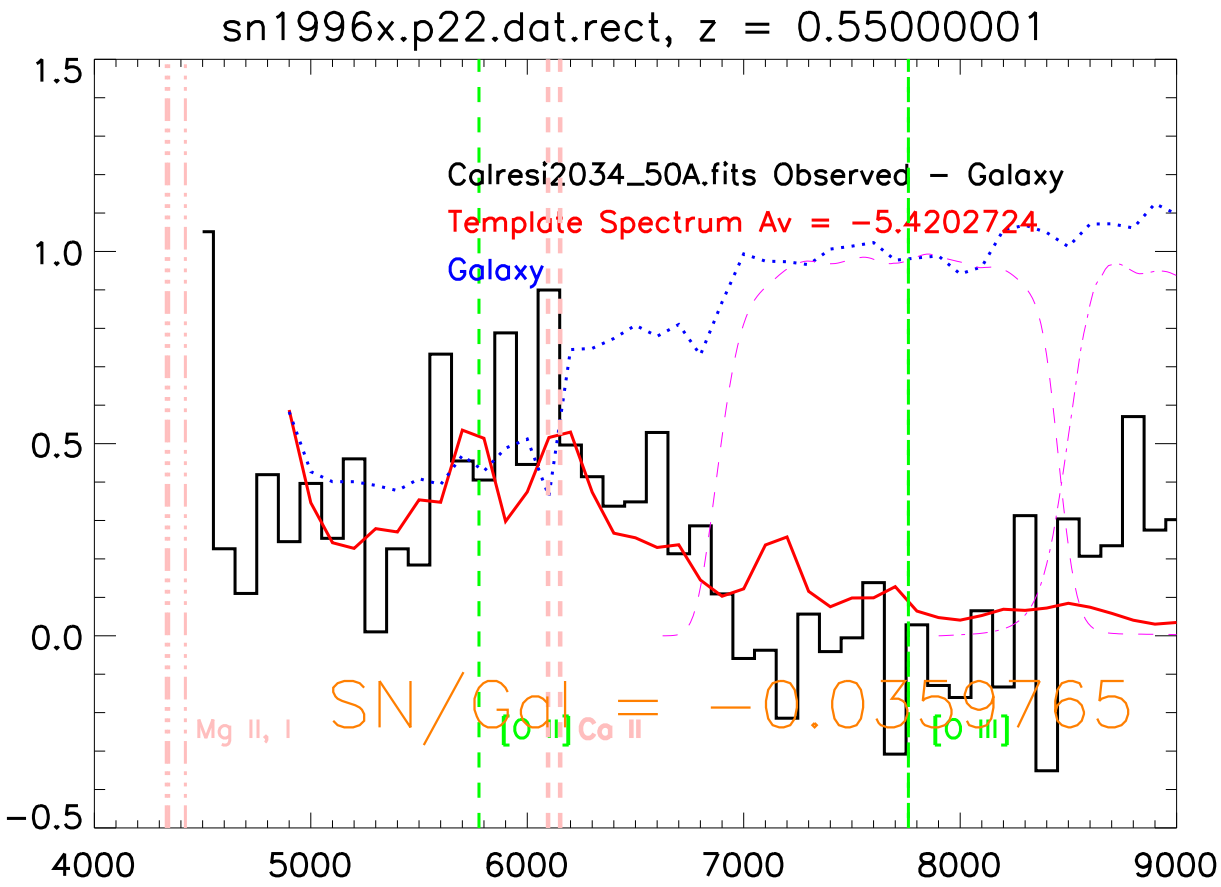

sn1991t.m08.dat.rect, z = 0.55000001
Calresi2034_50A.fits Observed − Galaxy
Template Spectrum Av = −1.0450938
Galaxy
SN/Gal = 0.011883
Mg II, I
[O II]
Ca II
[O III]
1.5
1.0
0.5
0.0
−0.5
4000
5000
6000
7000
8000
9000

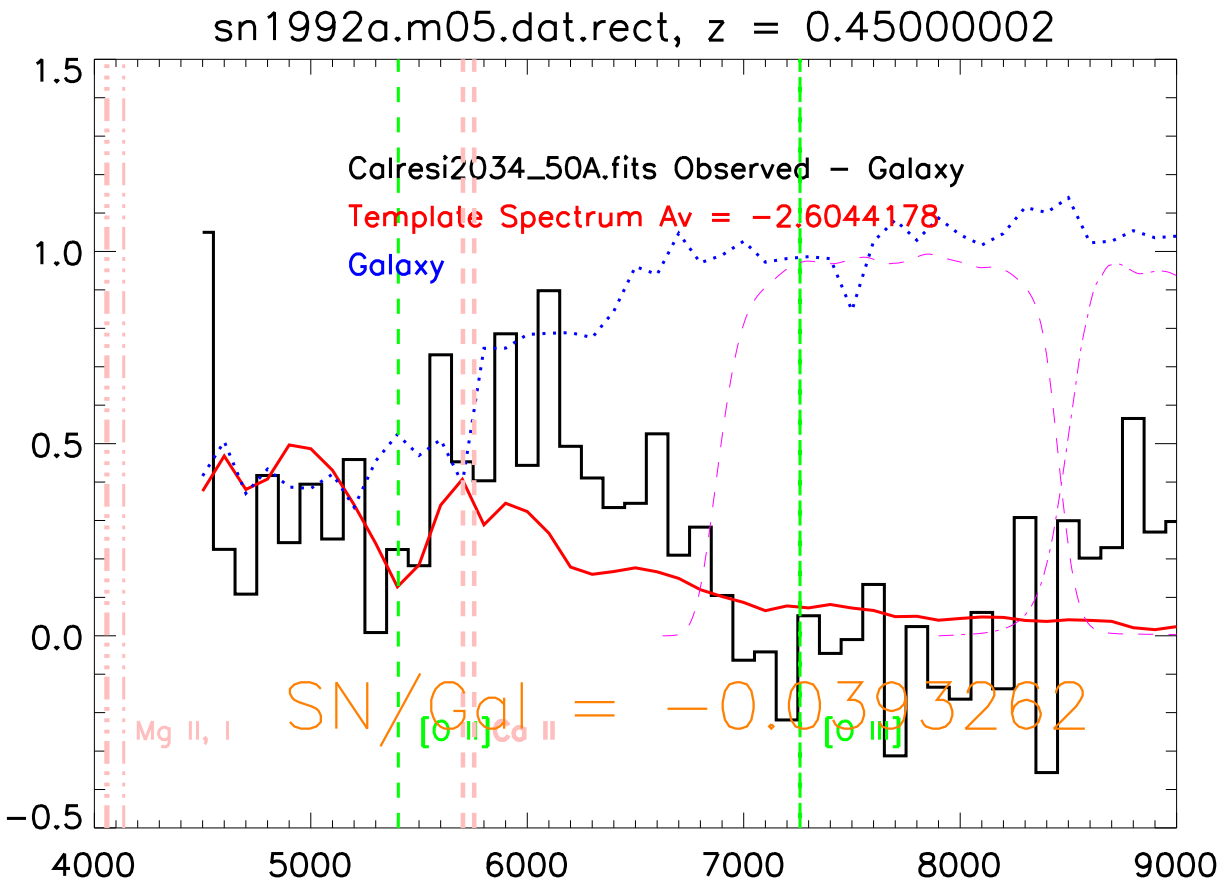

sn1994d.m03.dat.rect, z = 0.45000002
Calresi2034_50A.fits Observed − Galaxy
Template Spectrum Av = −2.3534222
Galaxy
SN/Gal = −0.0353795
Mg II, I
[O II]Ca II
[O III]
H I
1.5
1.0
0.5
0.0
−0.5
4000
5000
6000
7000
8000
9000

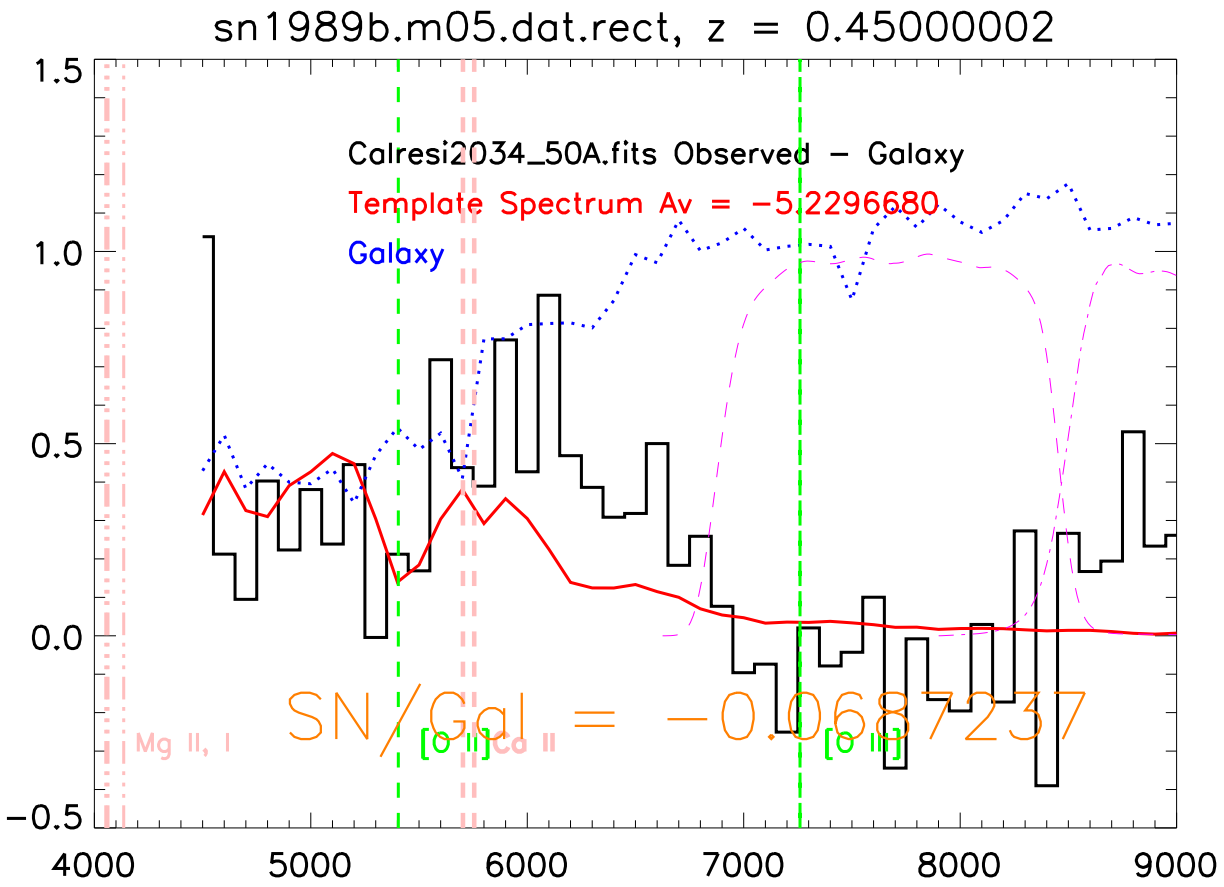

sn1989b.m01.dat.rect, z = 0.50000000
Calresi2034_50A.fits Observed – Galaxy
Template Spectrum Av = −5.3110906
Galaxy
SN/Gal = −0.0072020254
Mg II, I
[O II]
Ca II
[6 III]
1.5
1.0
0.5
0.0
−0.5
4000
5000
6000
7000
8000
9000

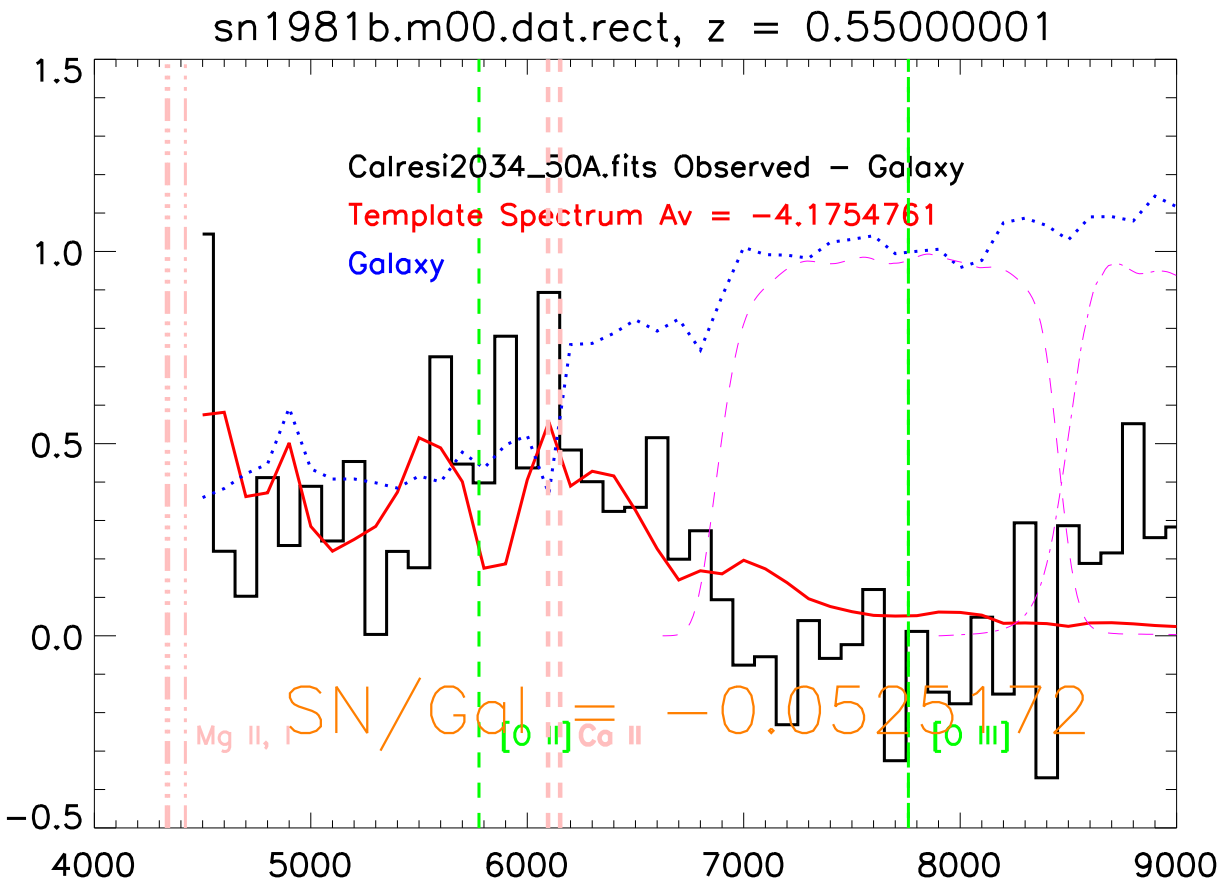

sn1996x.p03.dat.rect, z = 0.30000001
Calresi2034_50A.fits Observed – Galaxy
Template Spectrum Av = -4.9774050
Galaxy
SN/Gal = -0.054545333
Mg II, I
[O II]
Ca II
[O III]
H I
1.5
1.0
0.5
0.0
−0.5
4000
5000
6000
7000
8000
9000

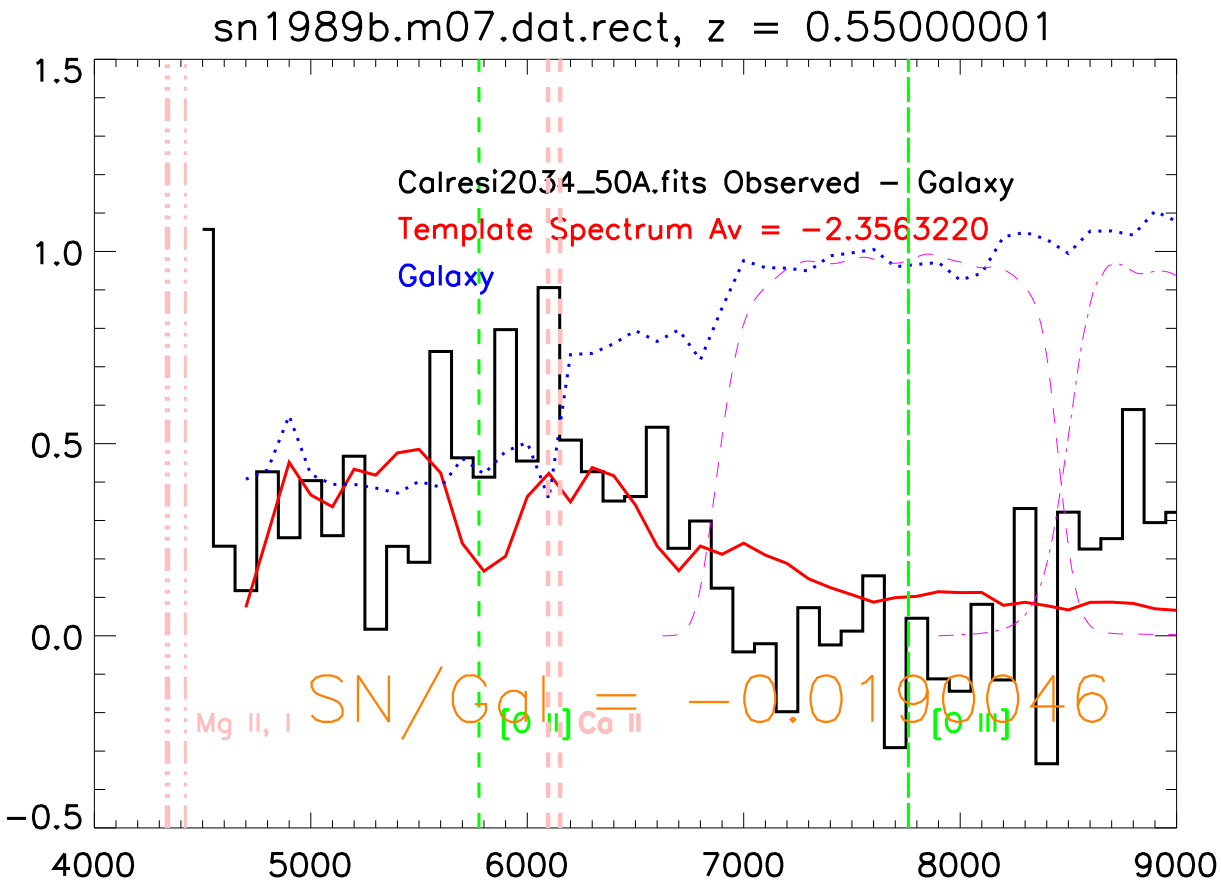

sn1992a.p09.dat.rect, z = 0.55000001
Calresi2034_50A.fits Observed − Galaxy
Template Spectrum Av = −4.5225878
Galaxy
SN/Gal = −0.030435537
Mg II,
[O II]
Ca II
[O III]
1.5
1.0
0.5
0.0
−0.5
4000
5000
6000
7000
8000
9000

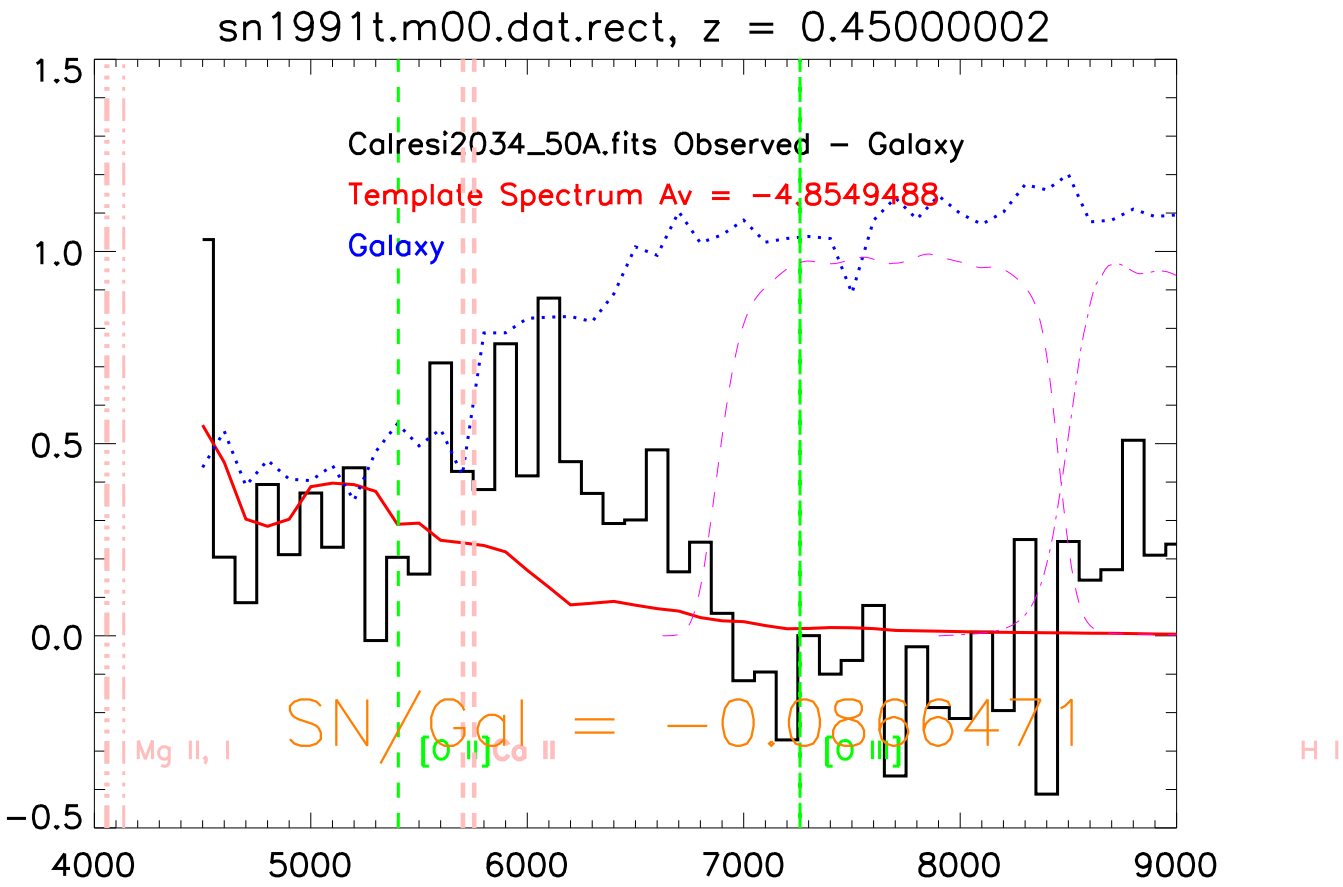

sn1996x.p22.dat.rect, z = 0.55000001
Calresi2034_50A.fits Observed − Galaxy
Template Spectrum Av = −5.4202724
Galaxy
SN/Gal = −0.0359765
Mg II, I
[O II]
Ca II
[O III]
1.5
1.0
0.5
0.0
−0.5
4000
5000
6000
7000
8000
9000

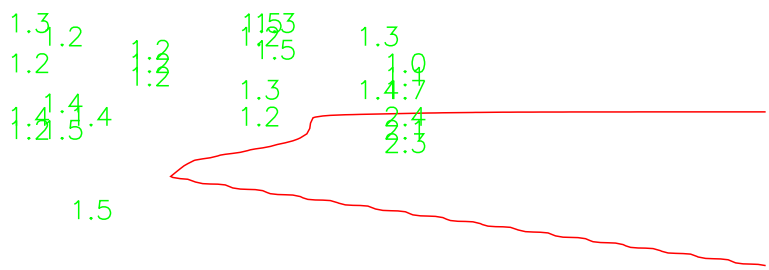

sn1992a.m05.dat.rect, z = 0.45000002
Calresi2034_50A.fits Observed − Galaxy
Template Spectrum Av = −2.6044178
Galaxy
SN/Gal = −0.0393262
Mg II, I
[O II]
Ca II
[O III]
H I
1.5
1.0
0.5
0.0
−0.5
4000
5000
6000
7000
8000
9000

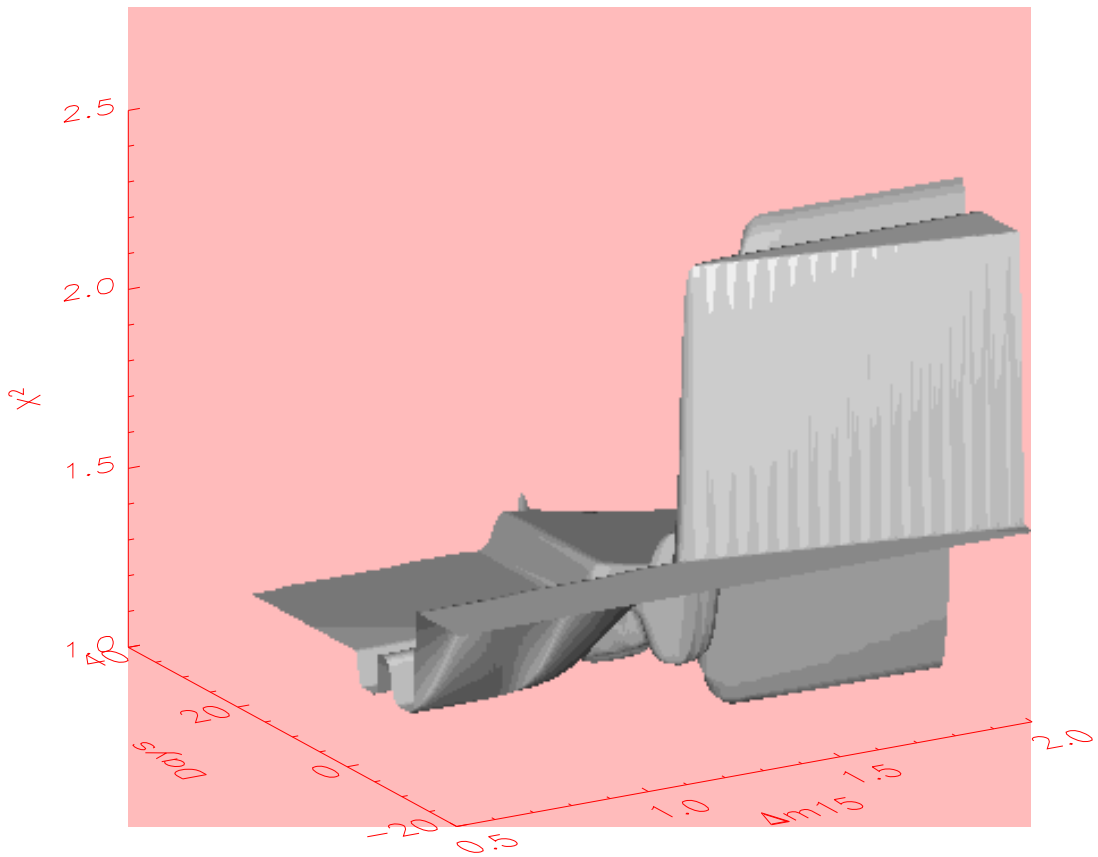

sn1989b.m05.dat.rect, z = 0.45000002
Calresi2034_50A.fits Observed − Galaxy
Template Spectrum Av = −5.2296680
Galaxy
SN/Gal = −0.0687237
Mg II, I
[O II]
Ca II
[O III]
H I
1.5
1.0
0.5
0.0
−0.5
4000
5000
6000
7000
8000
9000


sn1981b.m00.dat.rect, z = 0.55000001
Calresi2034_50A.fits Observed − Galaxy
Template Spectrum Av = −4.1754761
Galaxy
SN/Gal = −0.0525172
Mg II, Fe
[O II]
Ca II
[O III]
1.5
1.0
0.5
0.0
−0.5
4000
5000
6000
7000
8000
9000

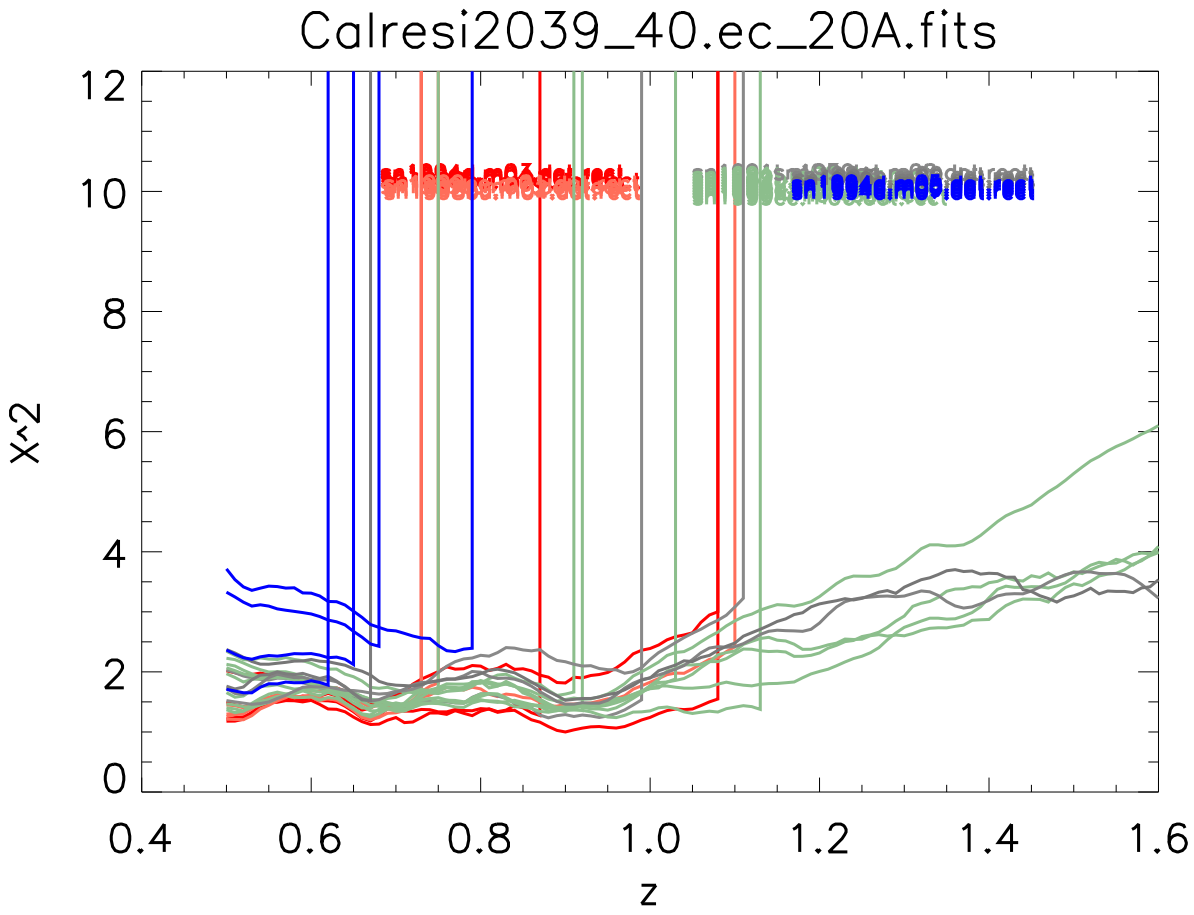

sn1989b.m07.dat.rect, z = 0.55000001
Calresi2034_50A.fits Observed − Galaxy
Template Spectrum Av = −2.3563220
Galaxy
SN/Gal = −0.0199046
Mg II, I
[O II]
Ca II
[O III]
1.5
1.0
0.5
0.0
−0.5
4000
5000
6000
7000
8000
9000

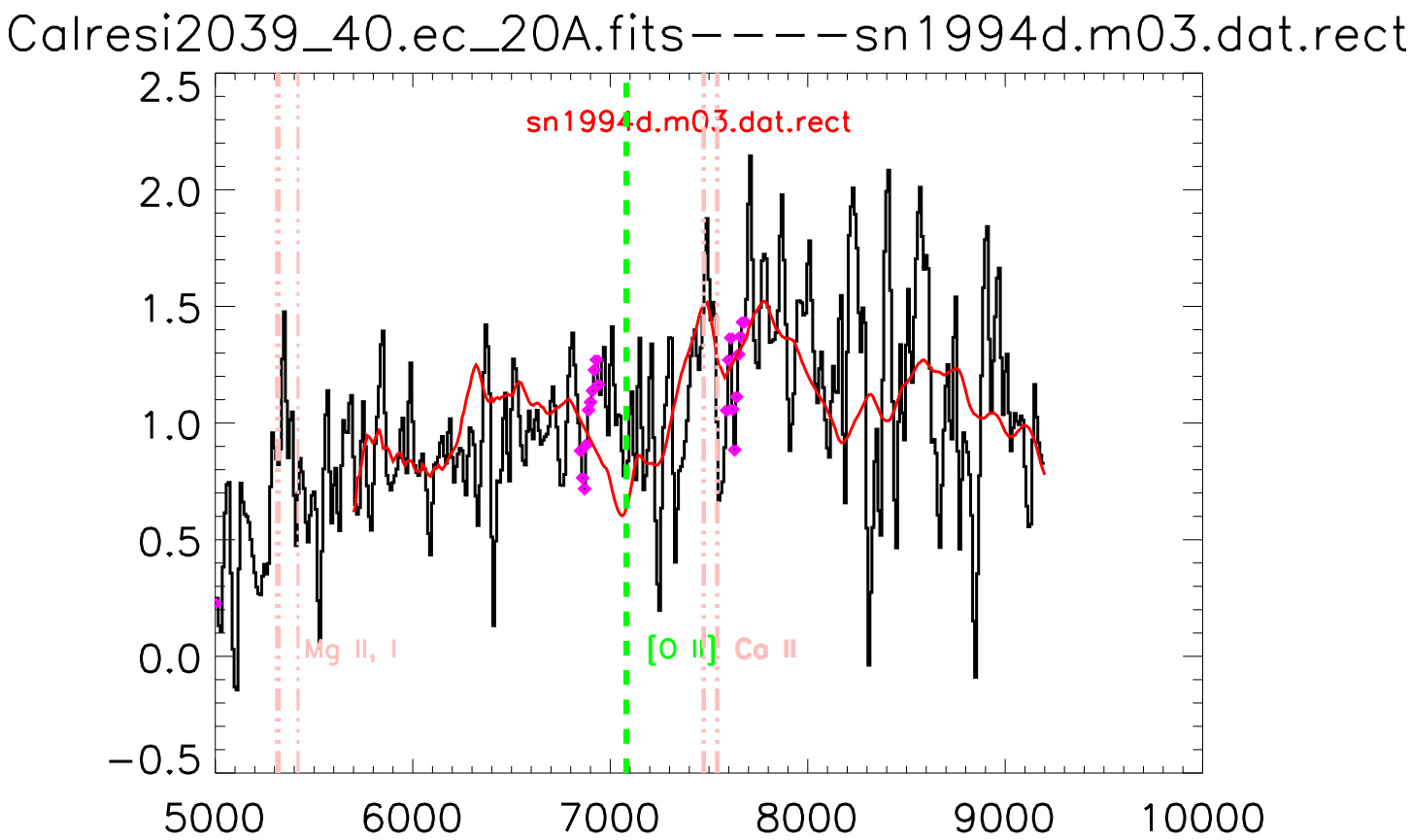

sn1991t.m00.dat.rect, z = 0.45000002
Calresi2034_50A.fits Observed − Galaxy
Template Spectrum Av = −4.8549488
Galaxy
SN/Gal = −0.0866471
Mg II, I
[O II]
Ca II
[O III]
H I
1.5
1.0
0.5
0.0
−0.5
4000
5000
6000
7000
8000
9000

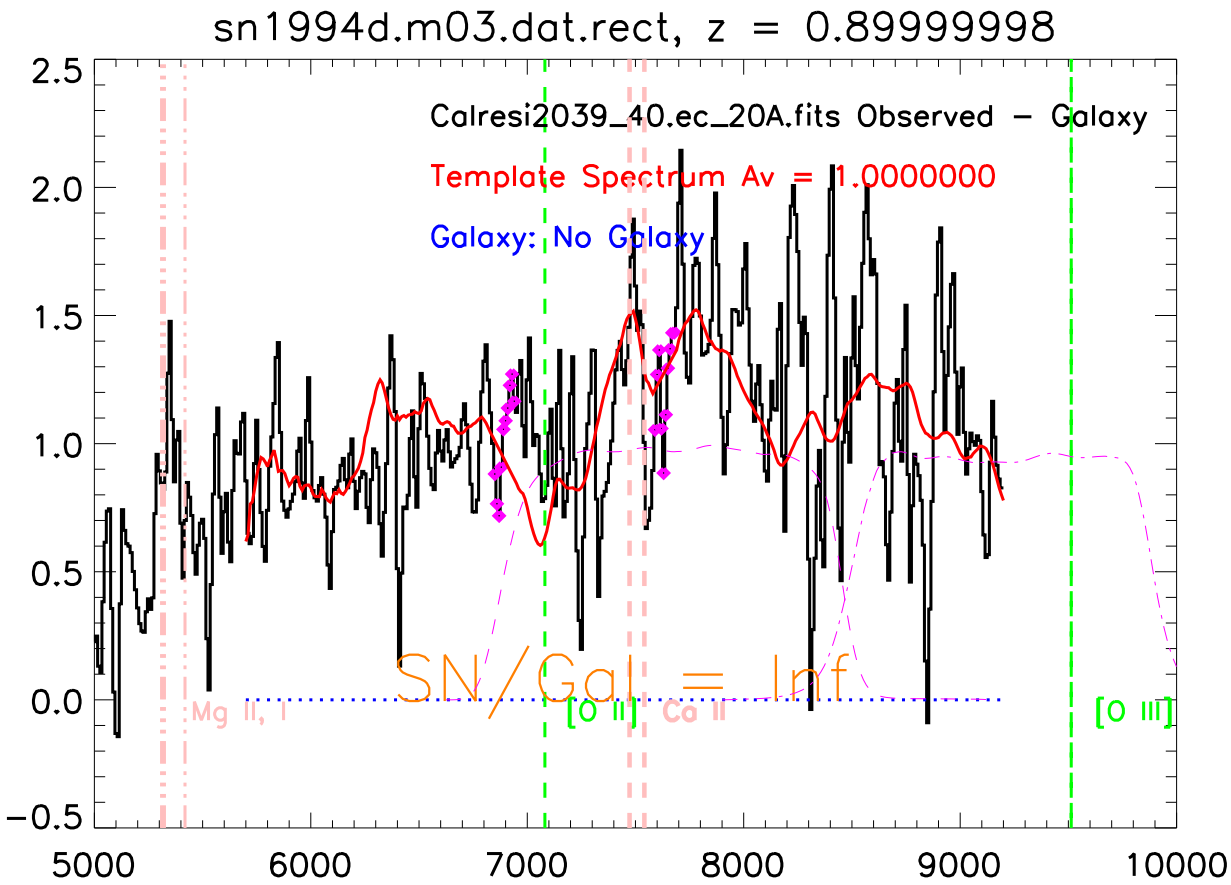

1.3
1.2
1.2
1.2
1.2
1.2
1.4
1.4
1.4
1.2
1.5
1.5
1.3
1.2
1.5
1.3
1.0
1.4
1.7
2.4
2.3

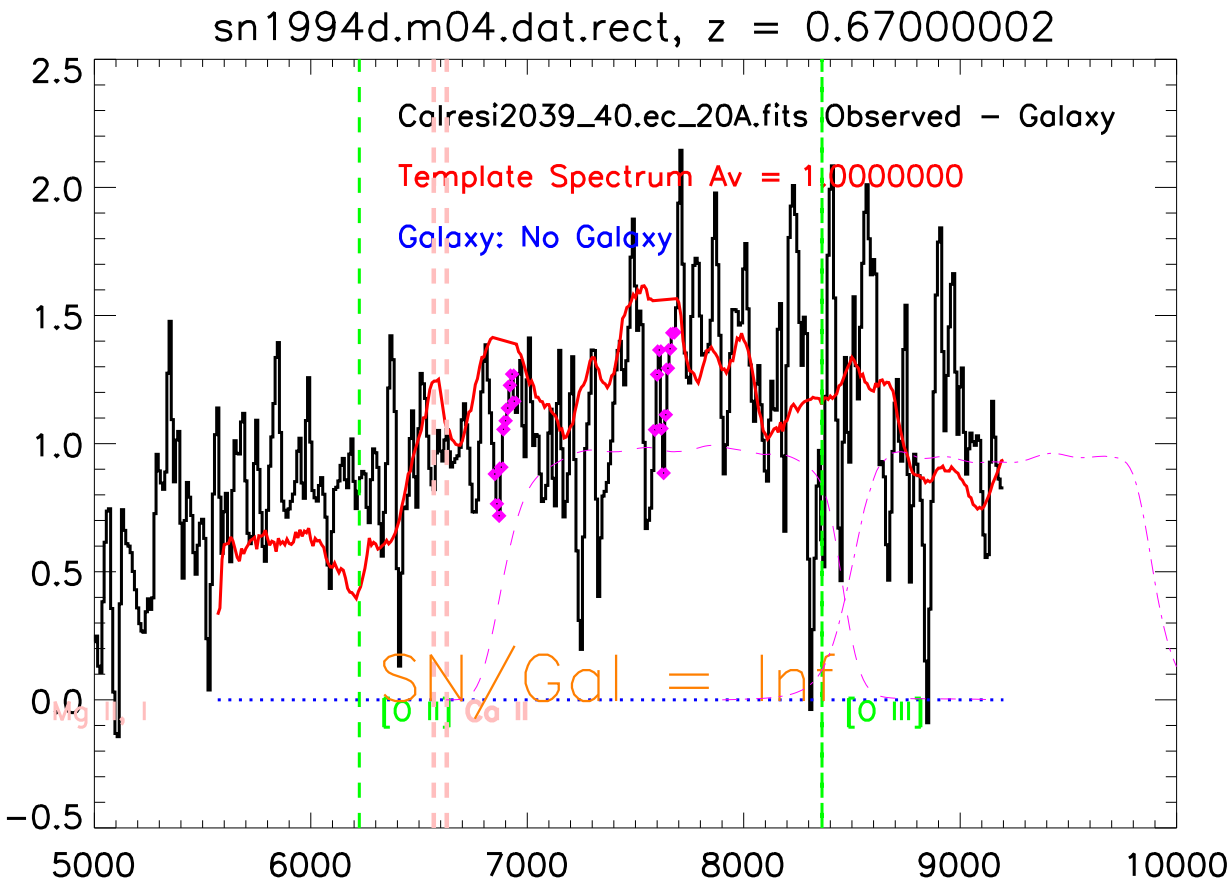


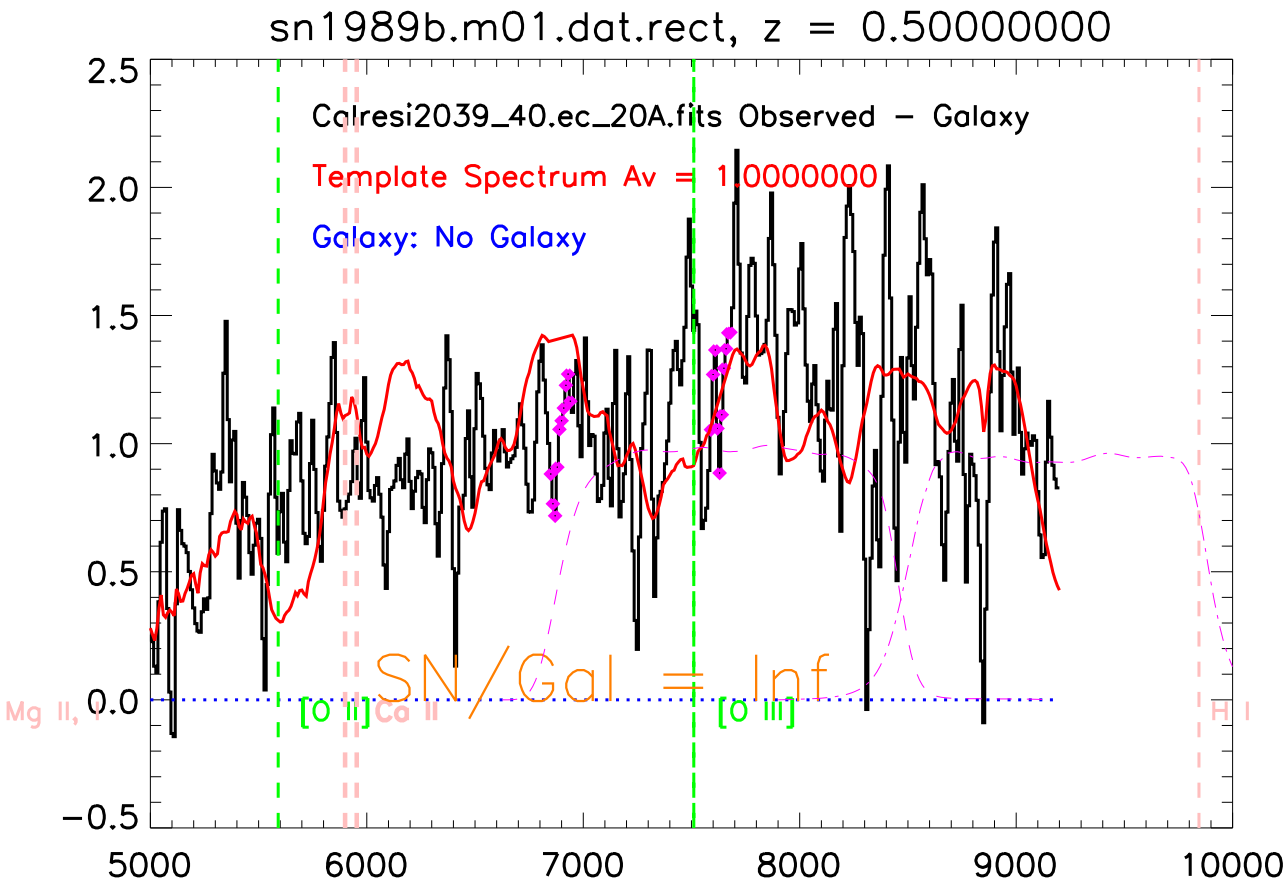
2.5
2.0
1.5
1.0
χ^2
40
20
0
−20
Days
0.5
1.0
1.5
2.0
Δm15

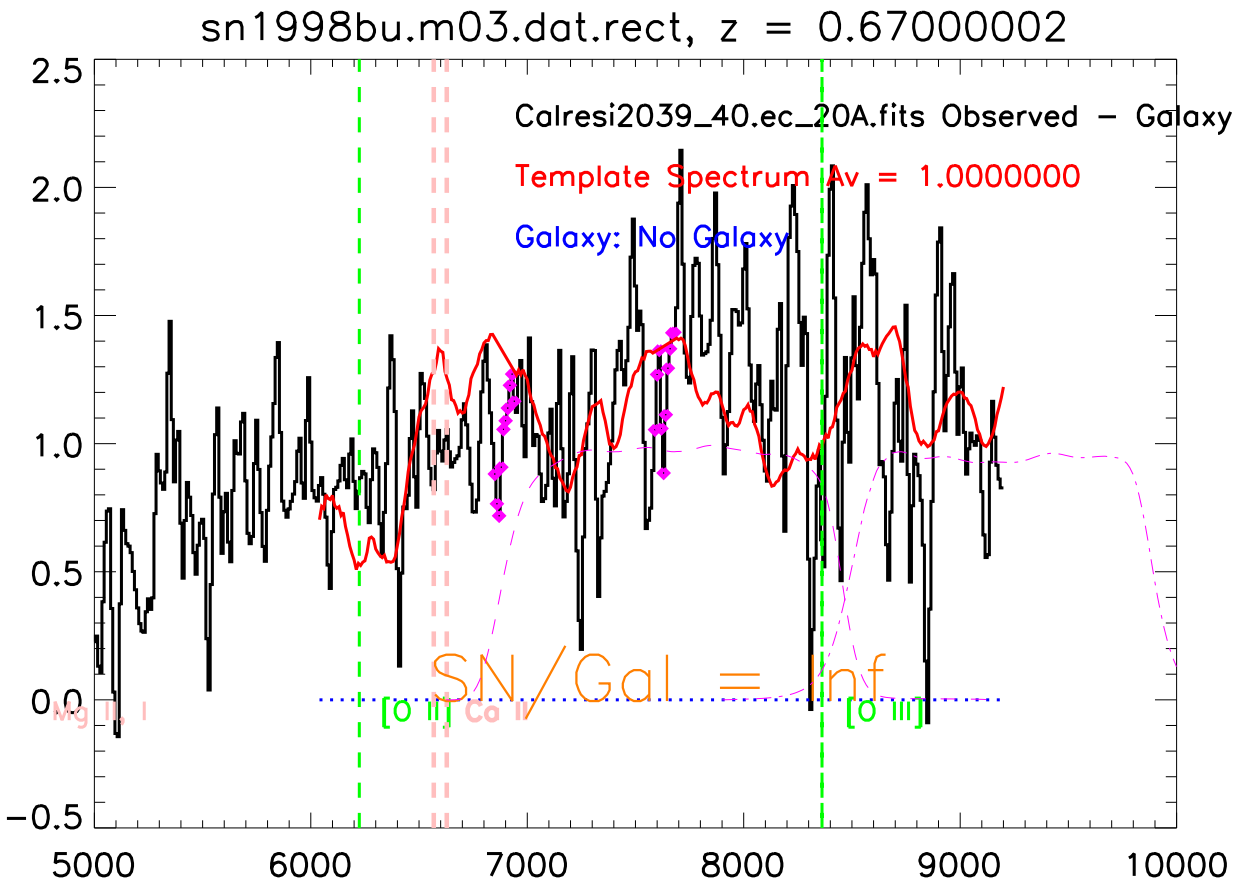

Calresi2039_40.ec_20A.fits
X^2
z
0
2
4
6
8
10
12
0.4
0.6
0.8
1.0
1.2
1.4
1.6

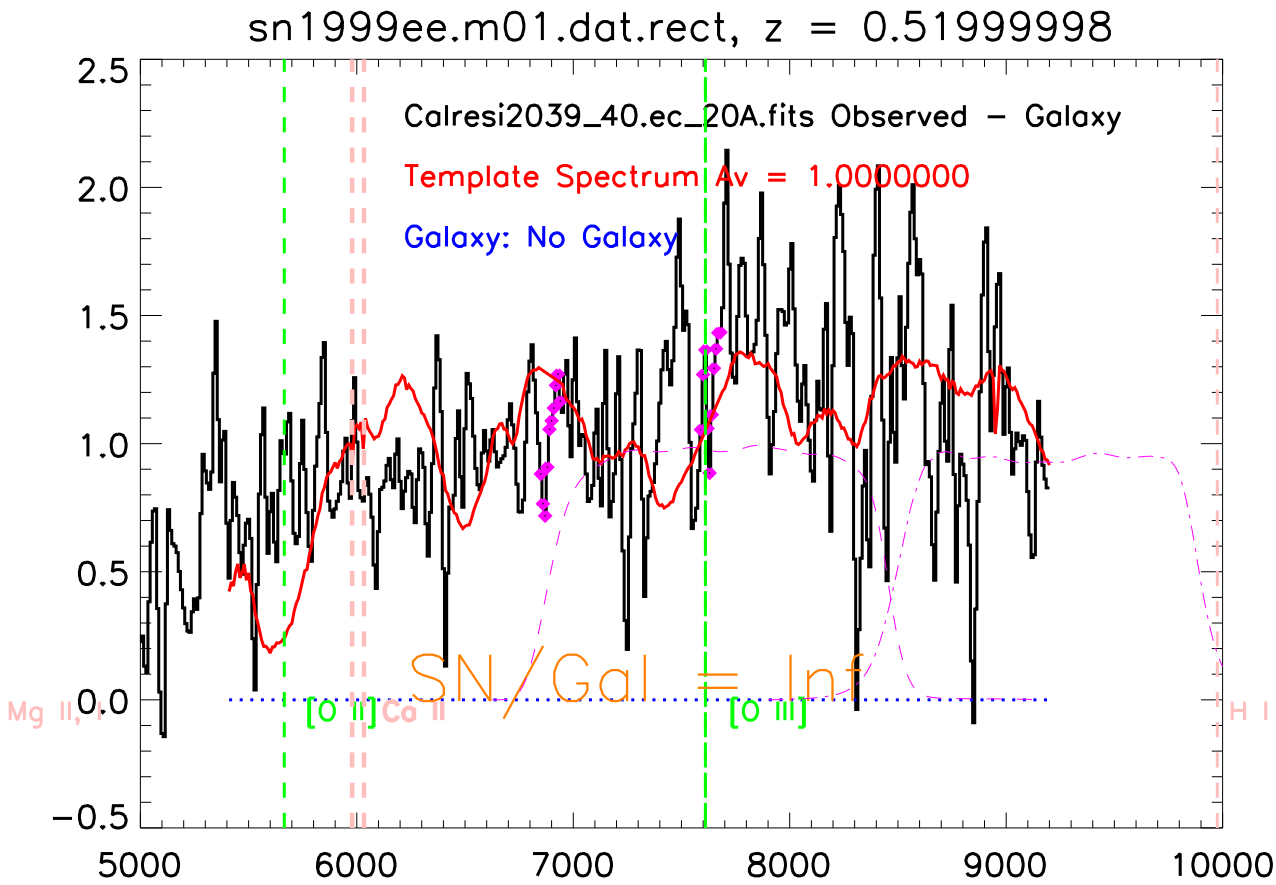

Calresi2039_40.ec_20A.fits----sn1994d.m03.dat.rect
sn1994d.m03.dat.rect
Mg II, I
[O II]
Ca II
2.5
2.0
1.5
1.0
0.5
0.0
−0.5
5000
6000
7000
8000
9000
10000

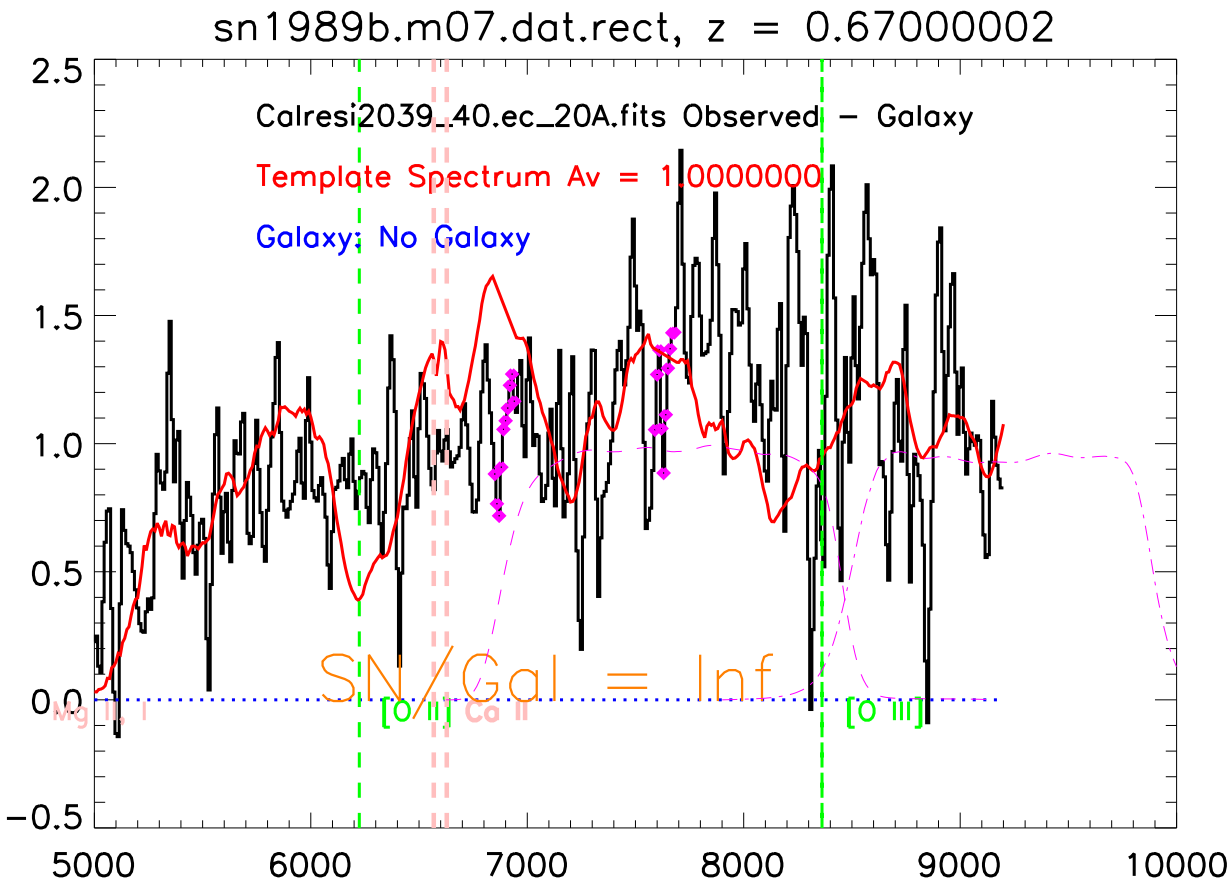

sn1994d.m03.dat.rect, z = 0.89999998
Calresi2039_40.ec_20A.fits Observed − Galaxy
Template Spectrum Av = 1.0000000
Galaxy: No Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
2.5
2.0
1.5
1.0
0.5
0.0
−0.5
5000
6000
7000
8000
9000
10000

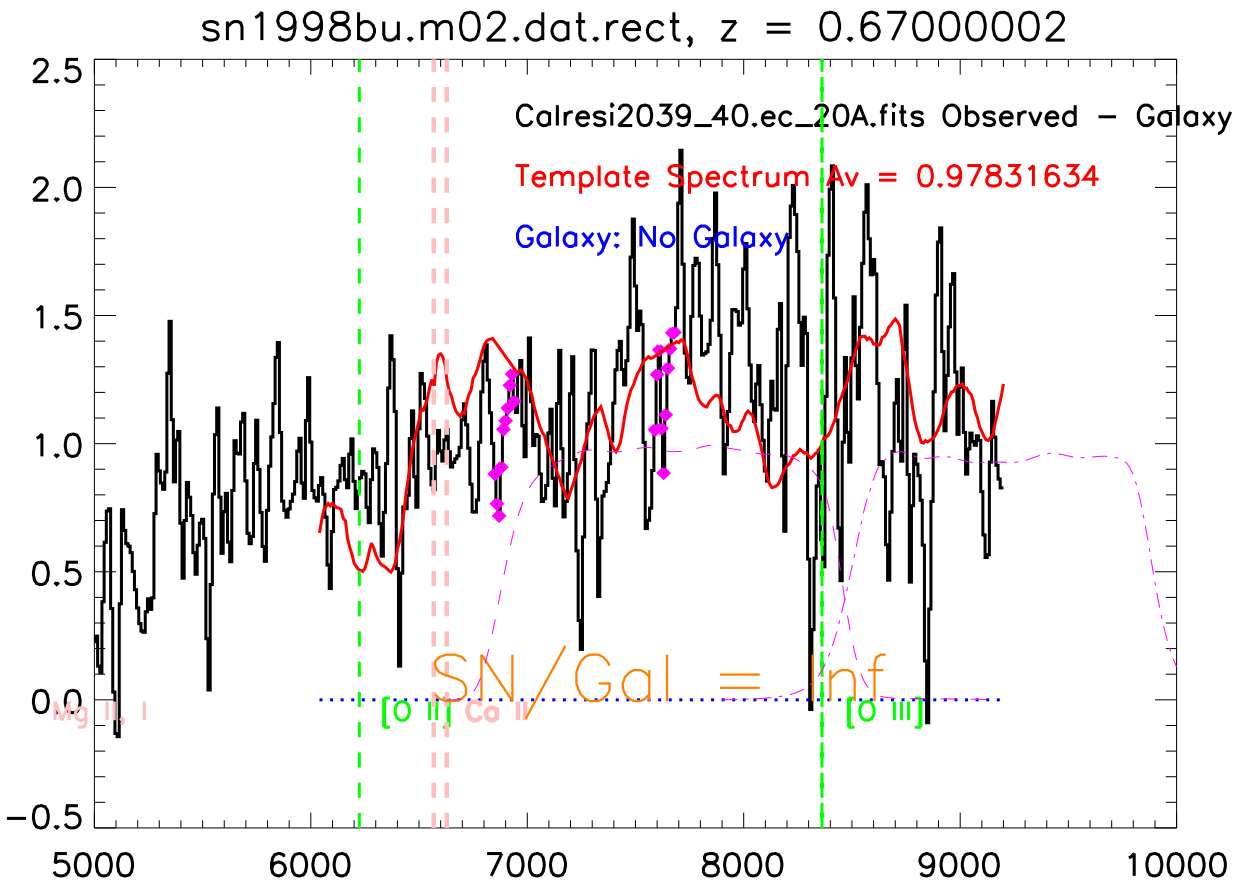

sn1994d.m04.dat.rect, z = 0.67000002
Calresi2039_40.ec_20A.fits Observed − Galaxy
Template Spectrum Av = 1.0000000
Galaxy: No Galaxy
SN/Gal = Inf
[O II]
Ca II
[O III]
2.5
2.0
1.5
1.0
0.5
0.0
−0.5
5000
6000
7000
8000
9000
10000

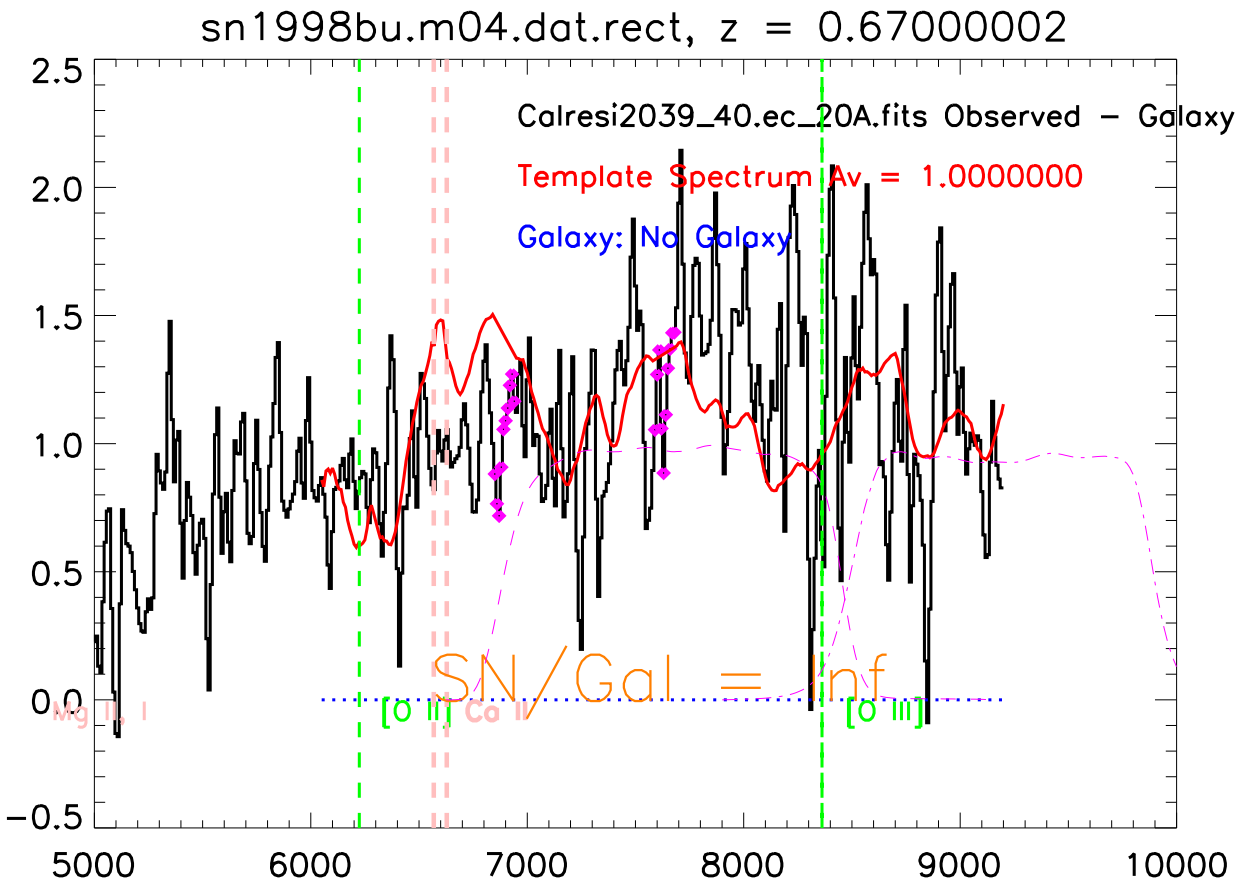

sn1989b.m01.dat.rect, z = 0.50000000
Calresi2039_40.ec_20A.fits Observed − Galaxy
Template Spectrum Av = 1.0000000
Galaxy: No Galaxy
SN/Gal = Inf
[O II]
Ca II
[O III]
Mg II,
H I
2.5
2.0
1.5
1.0
0.5
0.0
−0.5
5000
6000
7000
8000
9000
10000

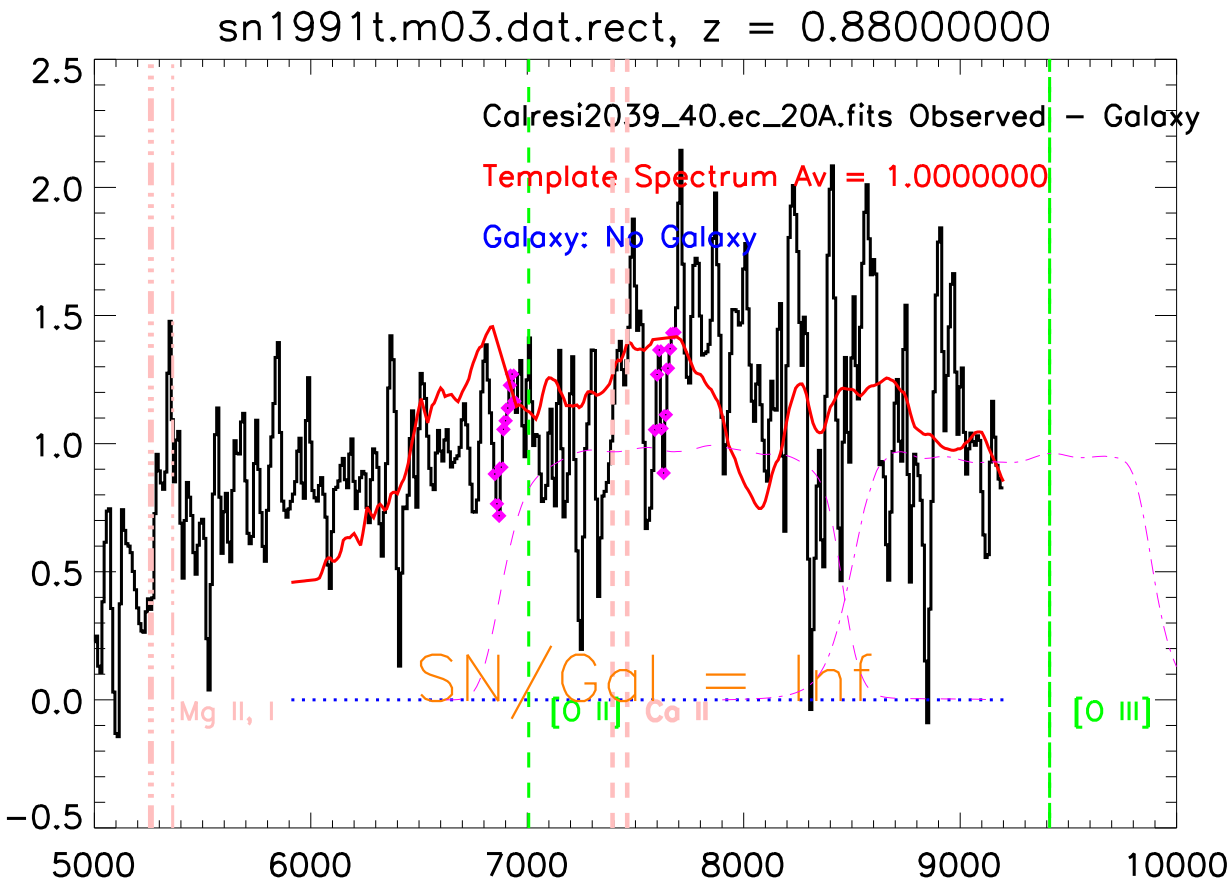

sn1998bu.m03.dat.rect, z = 0.67000002
Calresi2039_40.ec_20A.fits Observed − Galaxy
Template Spectrum Av = 1.0000000
Galaxy: No Galaxy
SN/Gal = Inf
[O II]
Ca II
[O III]
Mg II, I
2.5
2.0
1.5
1.0
0.5
0.0
−0.5
5000
6000
7000
8000
9000
10000

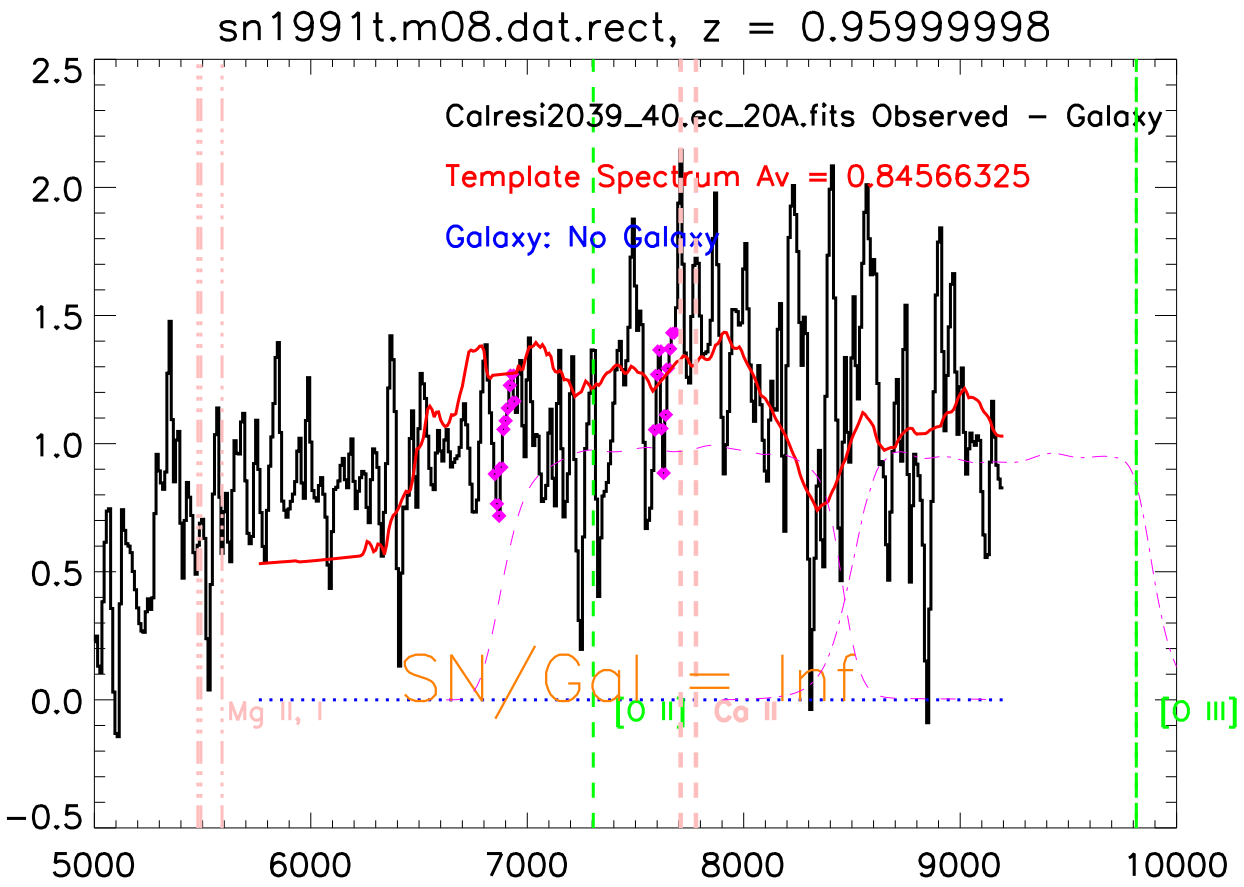

sn1999ee.m01.dat.rect, z = 0.51999998
Calresi2039_40.ec_20A.fits Observed − Galaxy
Template Spectrum Av = 1.0000000
Galaxy: No Galaxy
SN/Gal = Inf
[O II]
Ca II
[O III]
Mg II
H I
2.5
2.0
1.5
1.0
0.5
0.0
−0.5
5000
6000
7000
8000
9000
10000

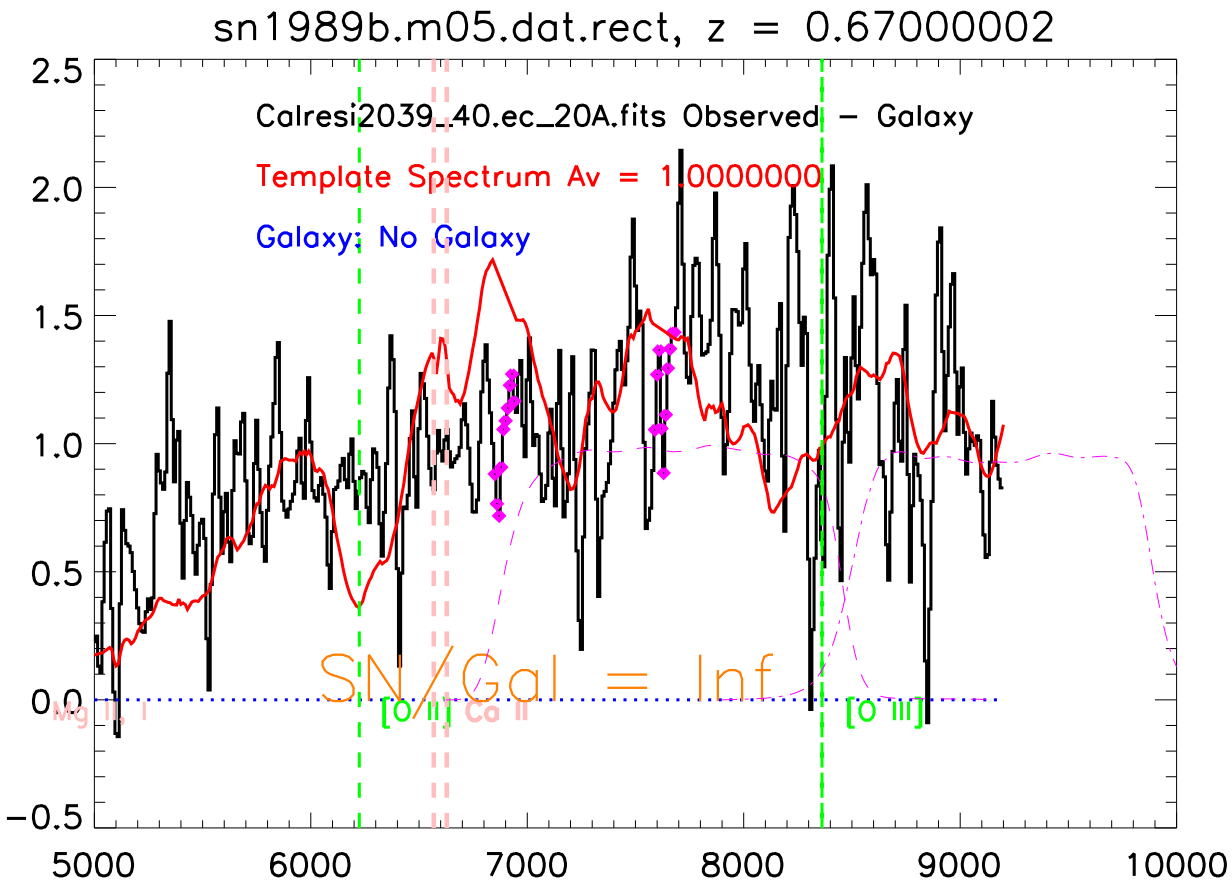

sn1989b.m07.dat.rect, z = 0.67000002
Calresi2039_40.ec_20A.fits Observed − Galaxy
Template Spectrum Av = 1.0000000
Galaxy: No Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
2.5
2.0
1.5
1.0
0.5
0.0
−0.5
5000
6000
7000
8000
9000
10000

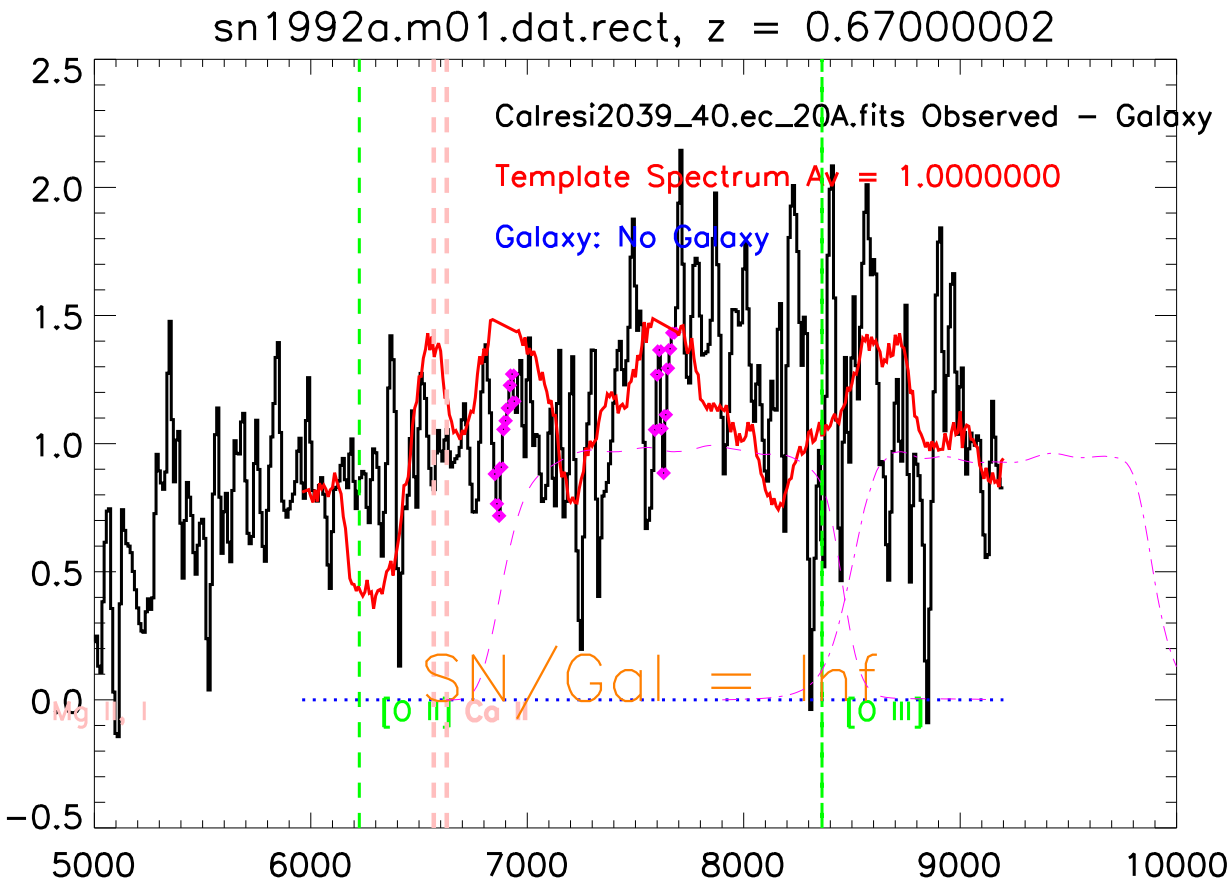

sn1998bu.m02.dat.rect, z = 0.67000002
Calresi2039_40.ec_20A.fits Observed − Galaxy
Template Spectrum Av = 0.97831634
Galaxy: No Galaxy
SN/Gal = Inf
[O II]
Ca II
[O III]
Mg II, I
2.5
2.0
1.5
1.0
0.5
0.0
−0.5
5000
6000
7000
8000
9000
10000

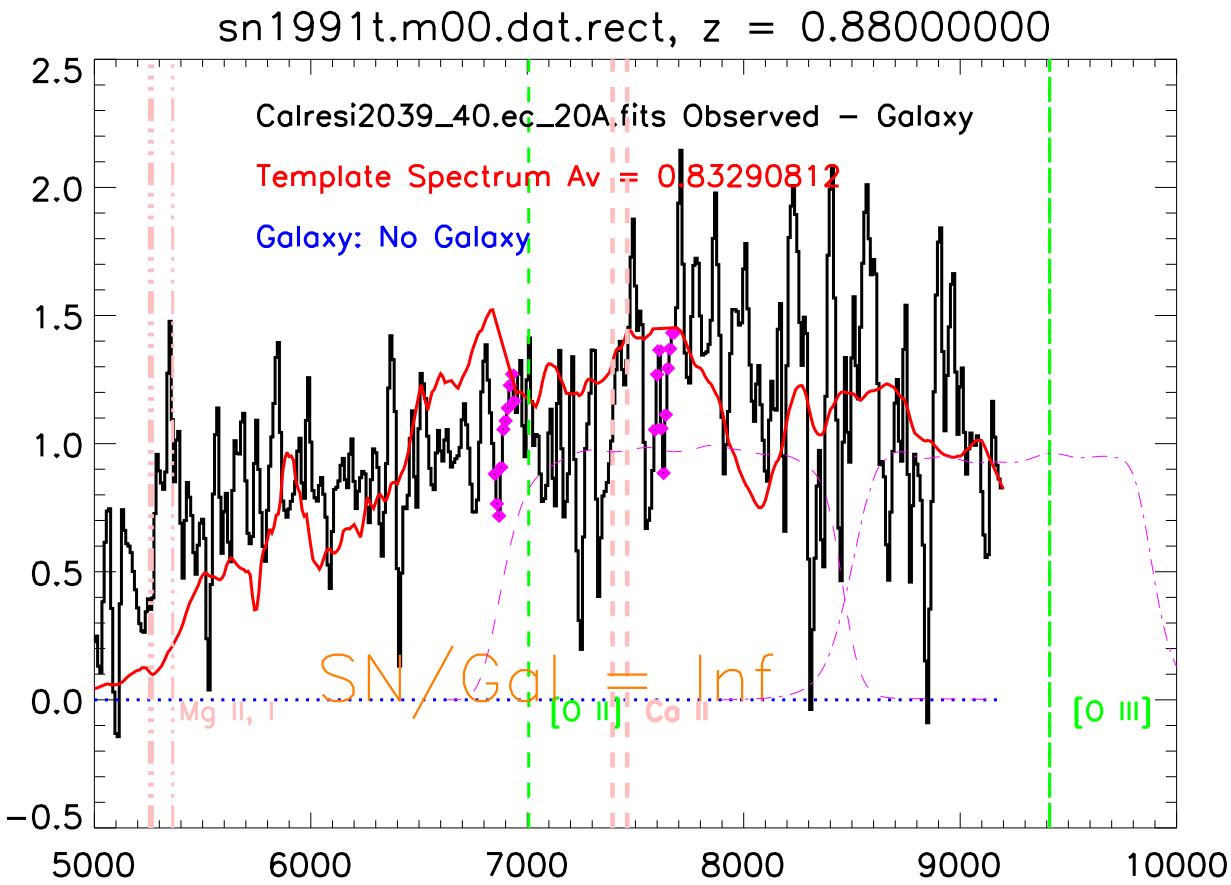

sn1998bu.m04.dat.rect, z = 0.67000002
Calresi2039_40.ec_20A.fits Observed − Galaxy
Template Spectrum Av = 1.0000000
Galaxy: No Galaxy
SN/Gal = Inf
[O II] Ca II
[O III]
Mg II, I
2.5
2.0
1.5
1.0
0.5
0.0
−0.5
5000
6000
7000
8000
9000
10000

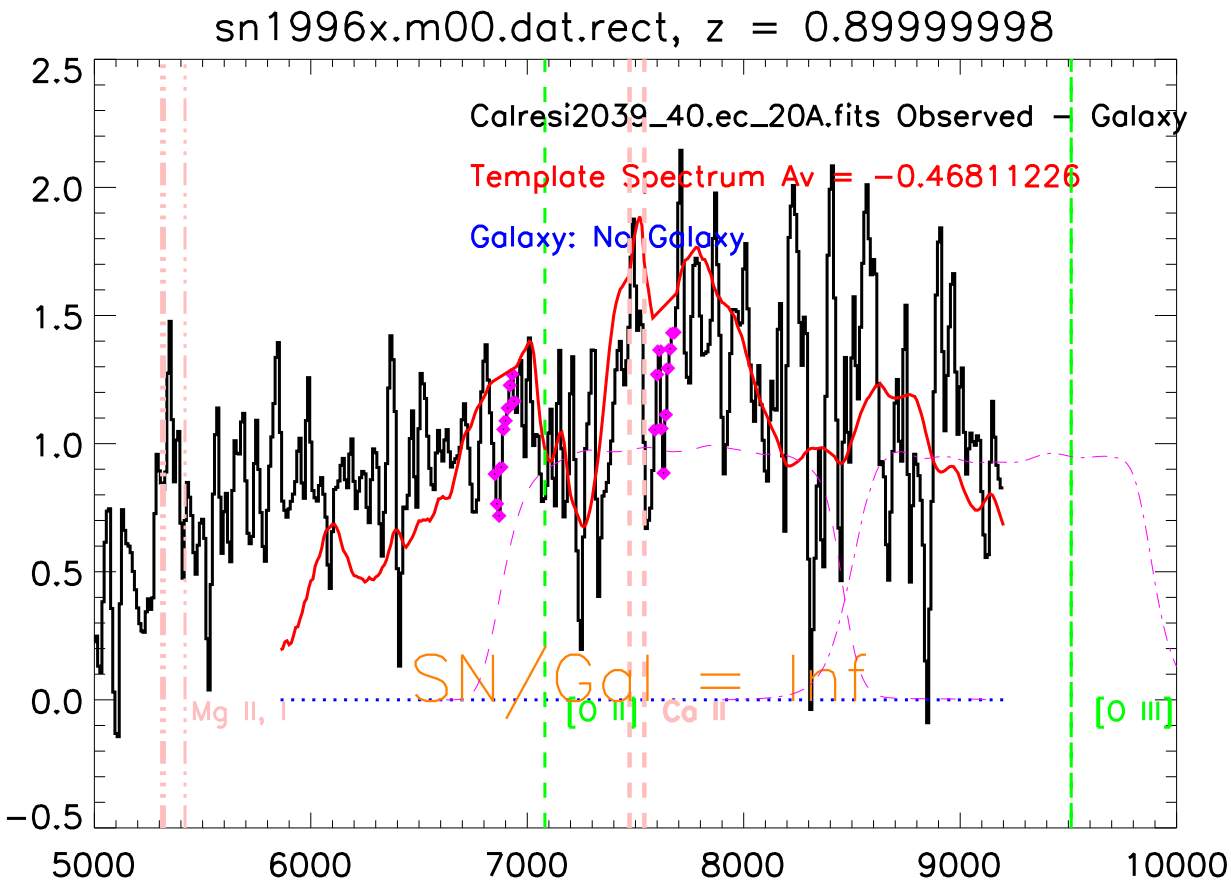

sn1991t.m03.dat.rect, z = 0.88000000
Calresi2039_40.ec_20A.fits Observed − Galaxy
Template Spectrum Av = 1.0000000
Galaxy: No Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
2.5
2.0
1.5
1.0
0.5
0.0
−0.5
5000
6000
7000
8000
9000
10000

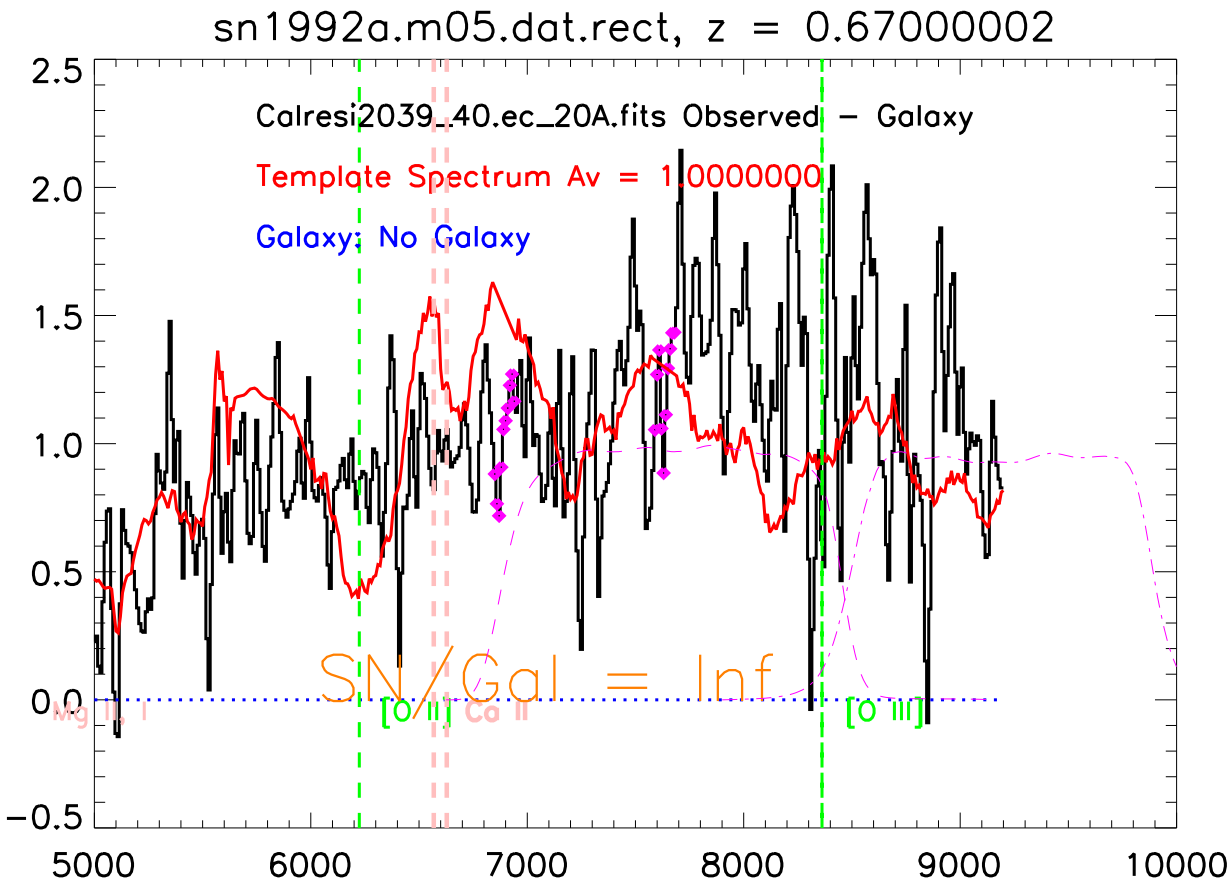

sn1991t.m08.dat.rect, z = 0.95999998
Calresi2039_40.ec_20A.fits Observed − Galaxy
Template Spectrum Av. = 0.84566325
Galaxy: No Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
2.5
2.0
1.5
1.0
0.5
0.0
−0.5
5000
6000
7000
8000
9000
10000

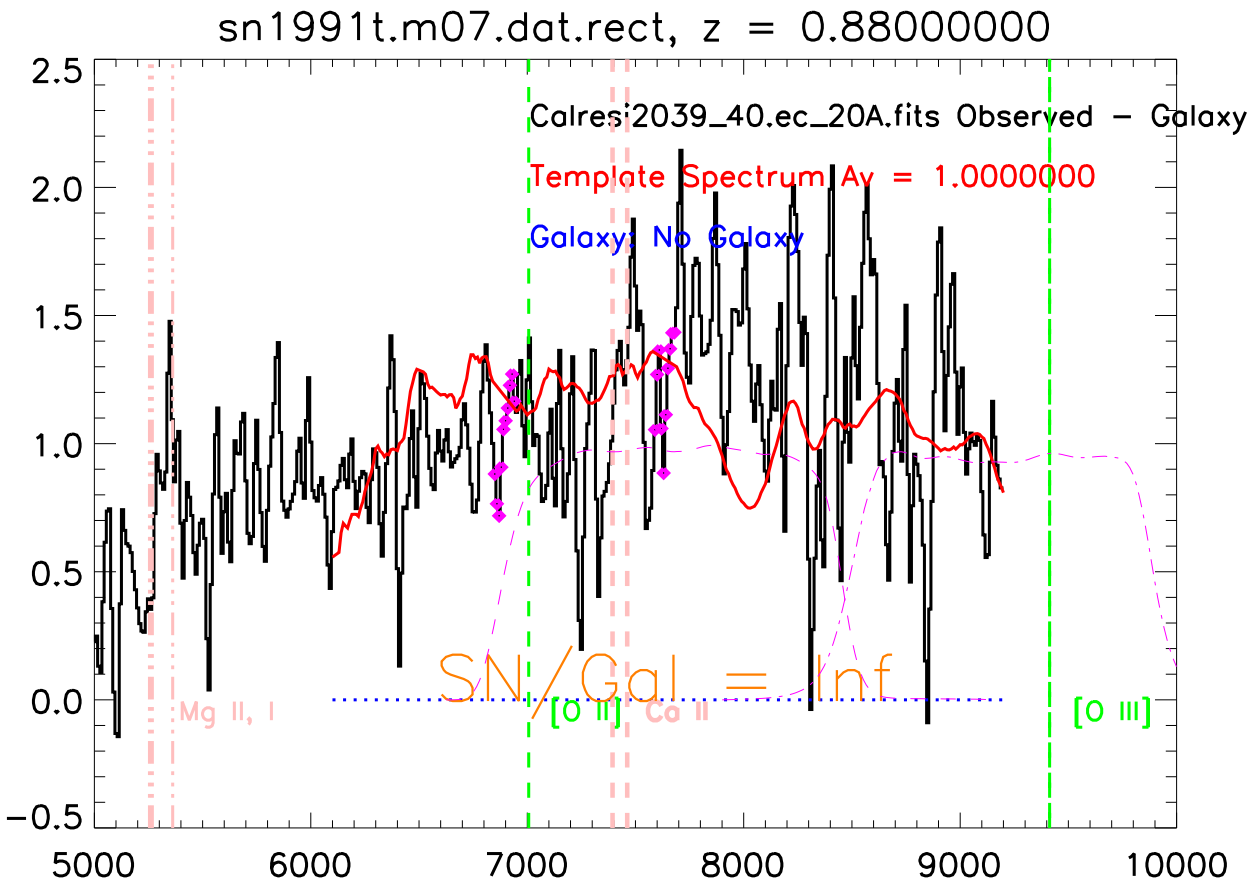

sn1989b.m05.dat.rect, z = 0.67000002
Calresi2039_40.ec_20A.fits Observed − Galaxy
Template Spectrum Av = 1.0000000
Galaxy: No Galaxy
SN/Gal = Inf
Mg II
[O II]
Ca II
[O III]
2.5
2.0
1.5
1.0
0.5
0.0
−0.5
5000
6000
7000
8000
9000
10000

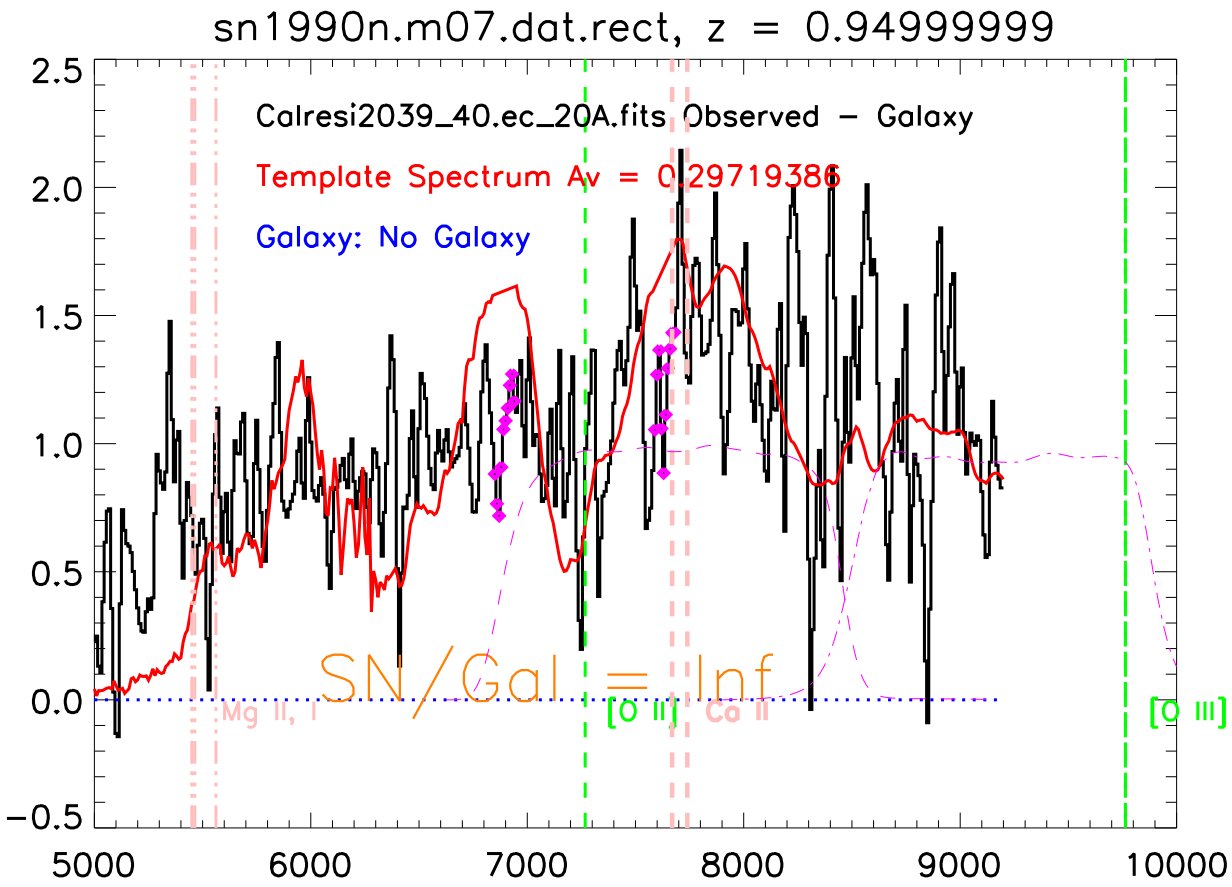

sn1992a.m01.dat.rect, z = 0.67000002
Calresi2039_40.ec_20A.fits Observed − Galaxy
Template Spectrum, Av = 1.0000000
Galaxy: No Galaxy
SN/Gal = Inf
[O II]
Ca II
[O III]
Mg II, I
2.5
2.0
1.5
1.0
0.5
0.0
−0.5
5000
6000
7000
8000
9000
10000

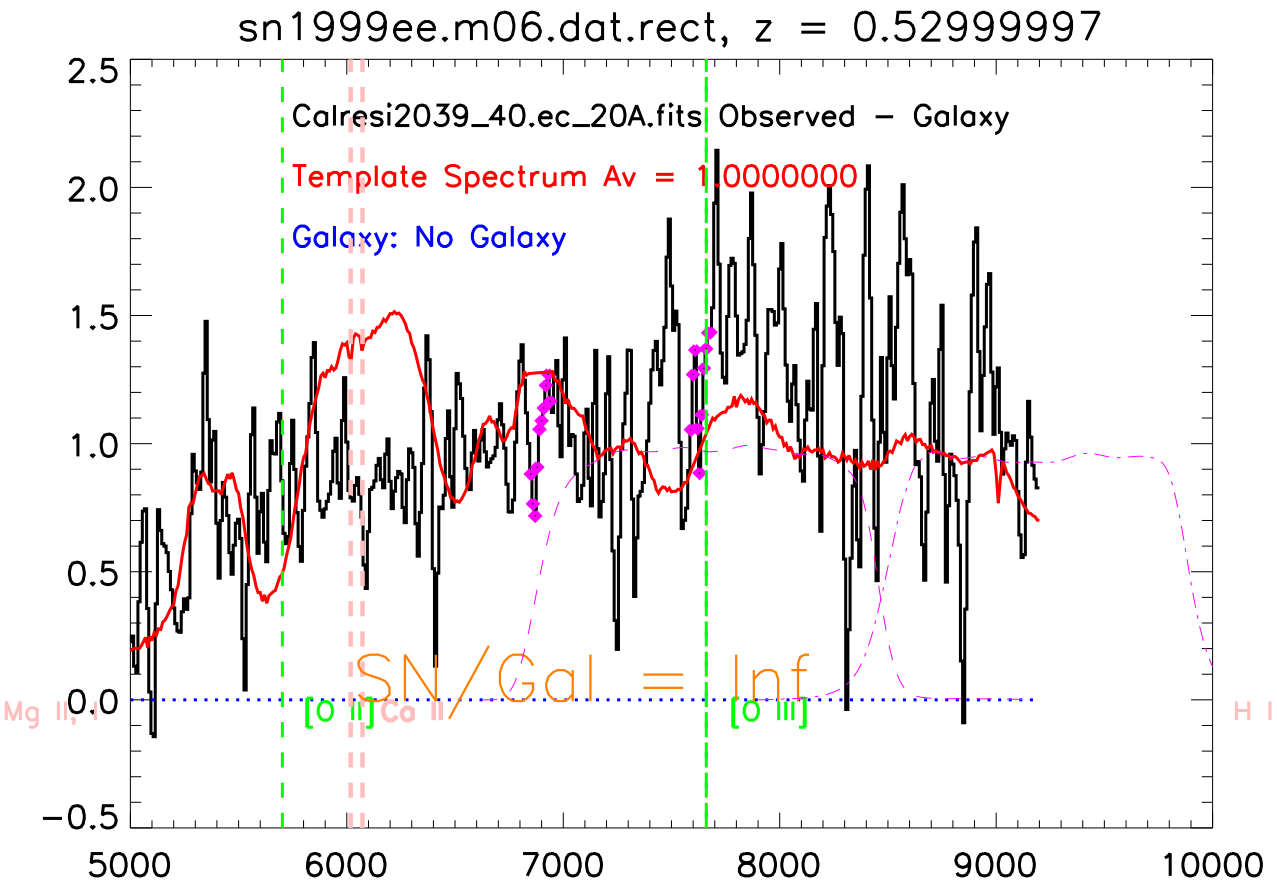

sn1991t.m00.dat.rect, z = 0.88000000
Calresi2039_40.ec_20A.fits Observed − Galaxy
Template Spectrum Av = 0.83290812
Galaxy: No Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
2.5
2.0
1.5
1.0
0.5
0.0
−0.5
5000
6000
7000
8000
9000
10000

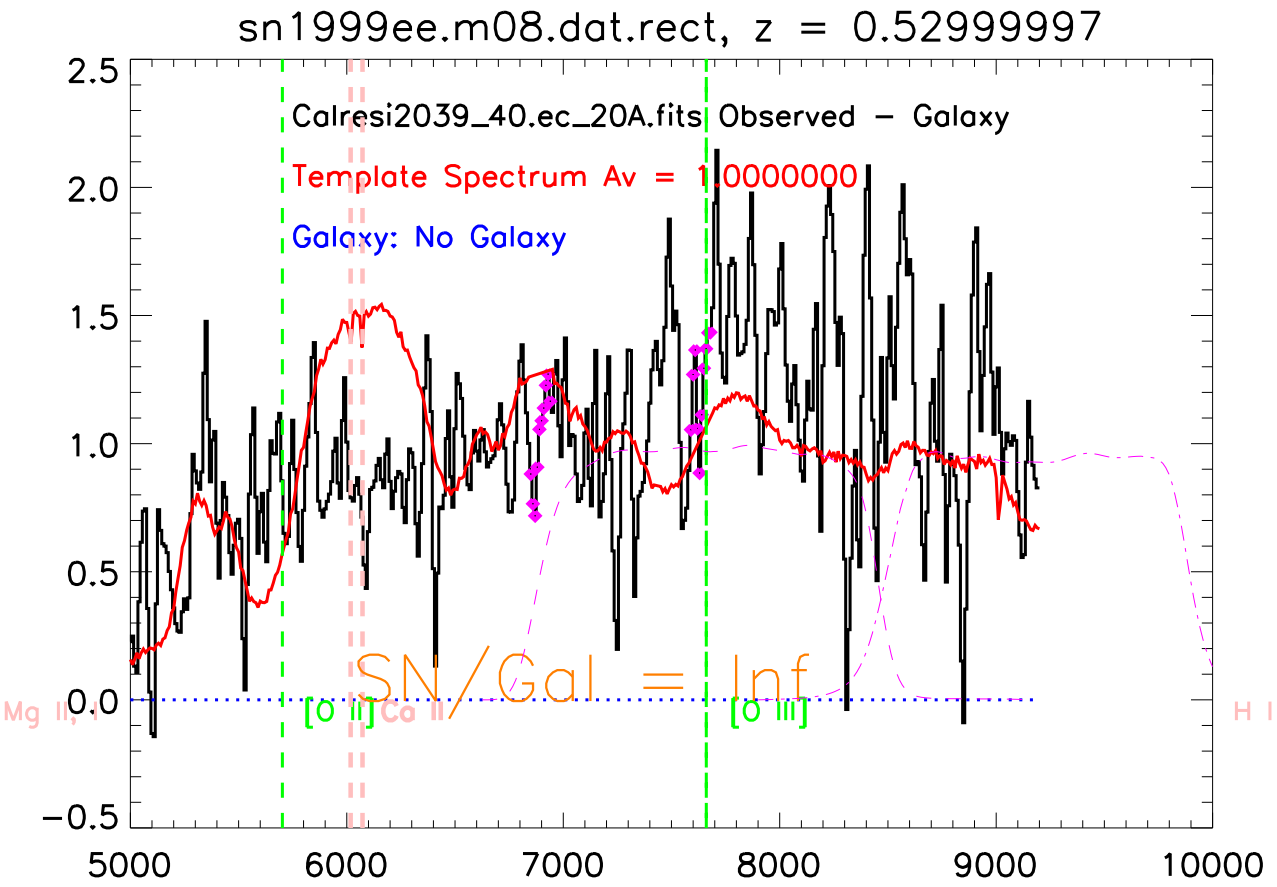

sn1996x.m00.dat.rect, z = 0.89999998
Calresi2039_40.ec_20A.fits Observed – Galaxy
Template Spectrum Av = −0.46811226
Galaxy: No Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
2.5
2.0
1.5
1.0
0.5
0.0
−0.5
5000
6000
7000
8000
9000
10000

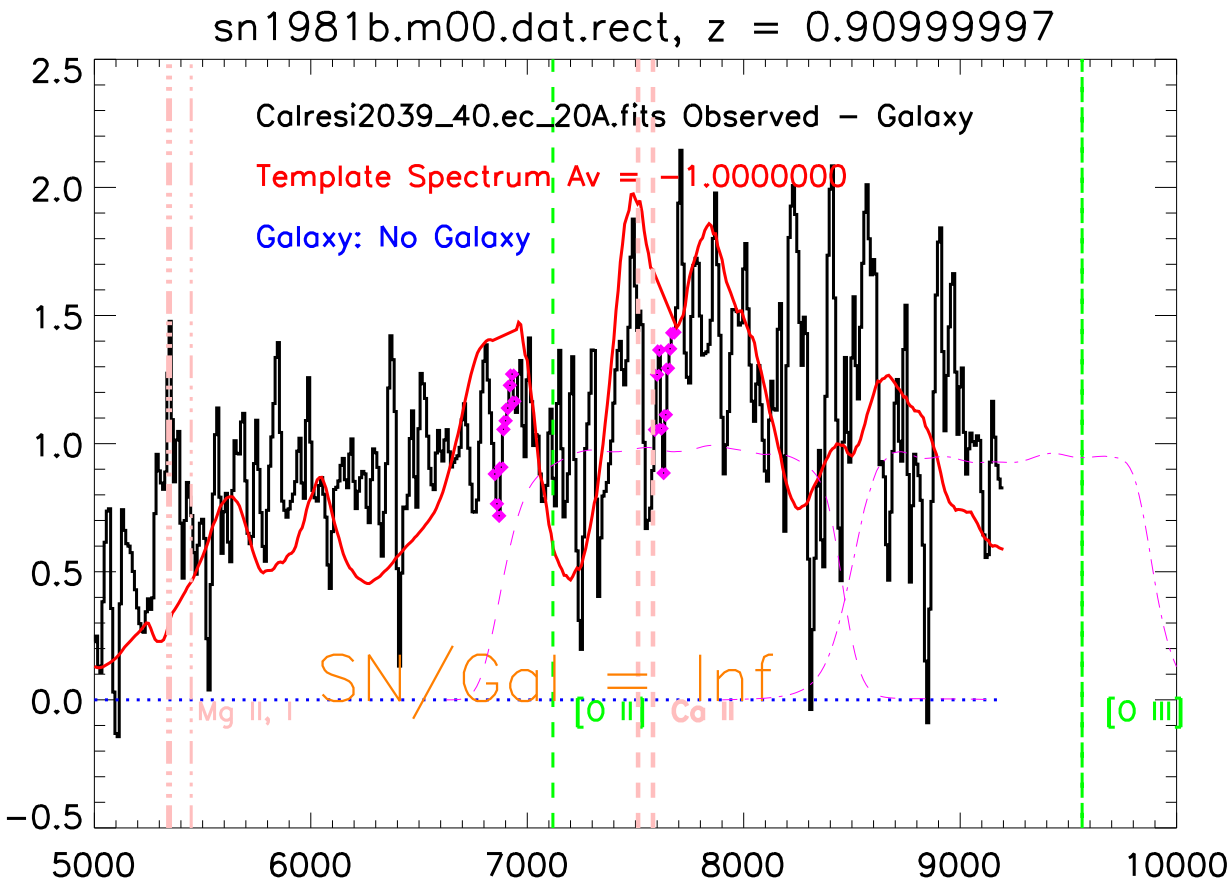

sn1992a.m05.dat.rect, z = 0.67000002
Calresi2039_40.ec_20A.fits Observed − Galaxy
Template Spectrum Av = 1.0000000
Galaxy: No Galaxy
SN/Gal = Inf
Mg II
[O II]
Ca II
[O III]
2.5
2.0
1.5
1.0
0.5
0.0
−0.5
5000
6000
7000
8000
9000
10000

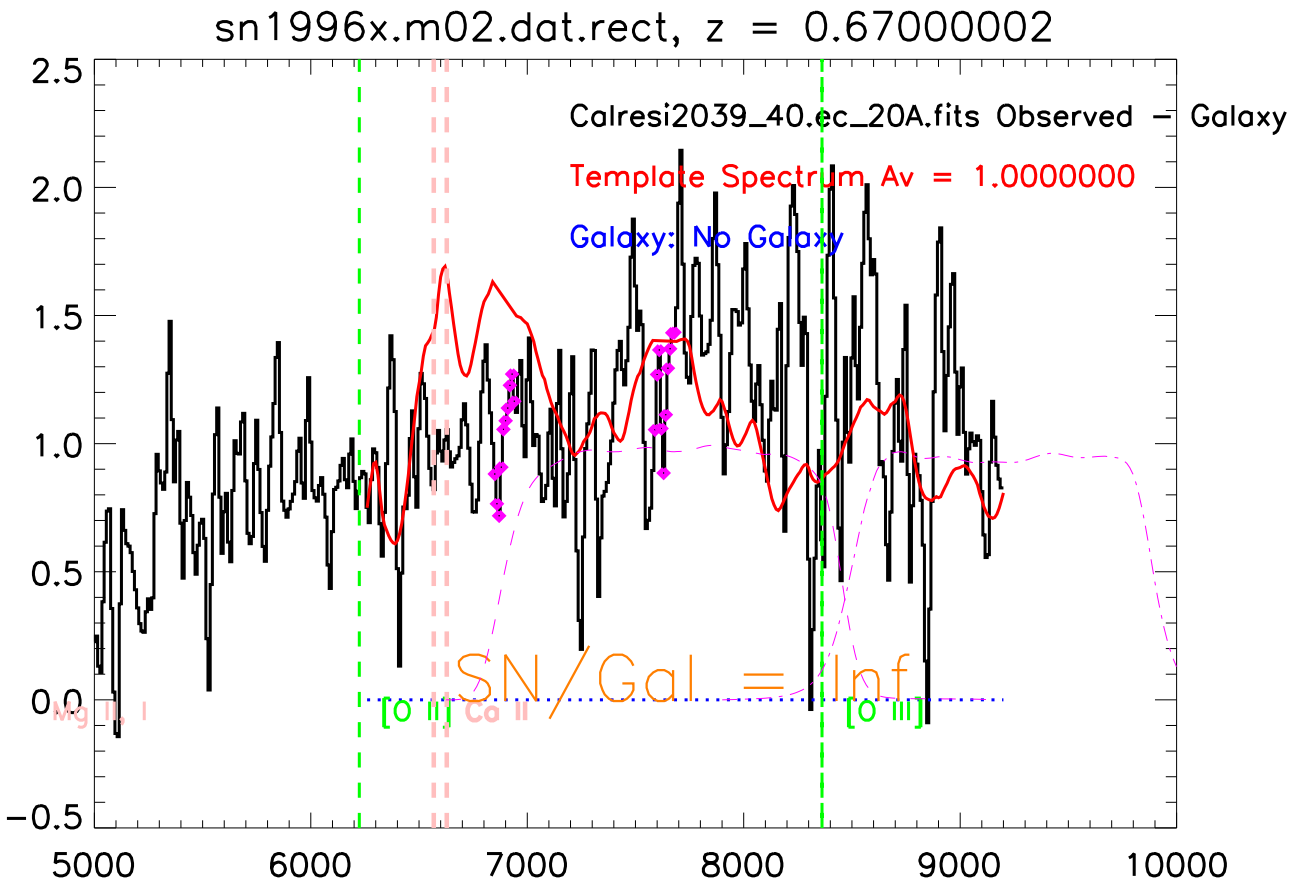

sn1991t.m07.dat.rect, z = 0.88000000
Calres:2039_40.ec_20A.fits Observed − Galaxy
Template Spectrum Av = 1.0000000
Galaxy: No Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
2.5
2.0
1.5
1.0
0.5
0.0
−0.5
5000
6000
7000
8000
9000
10000

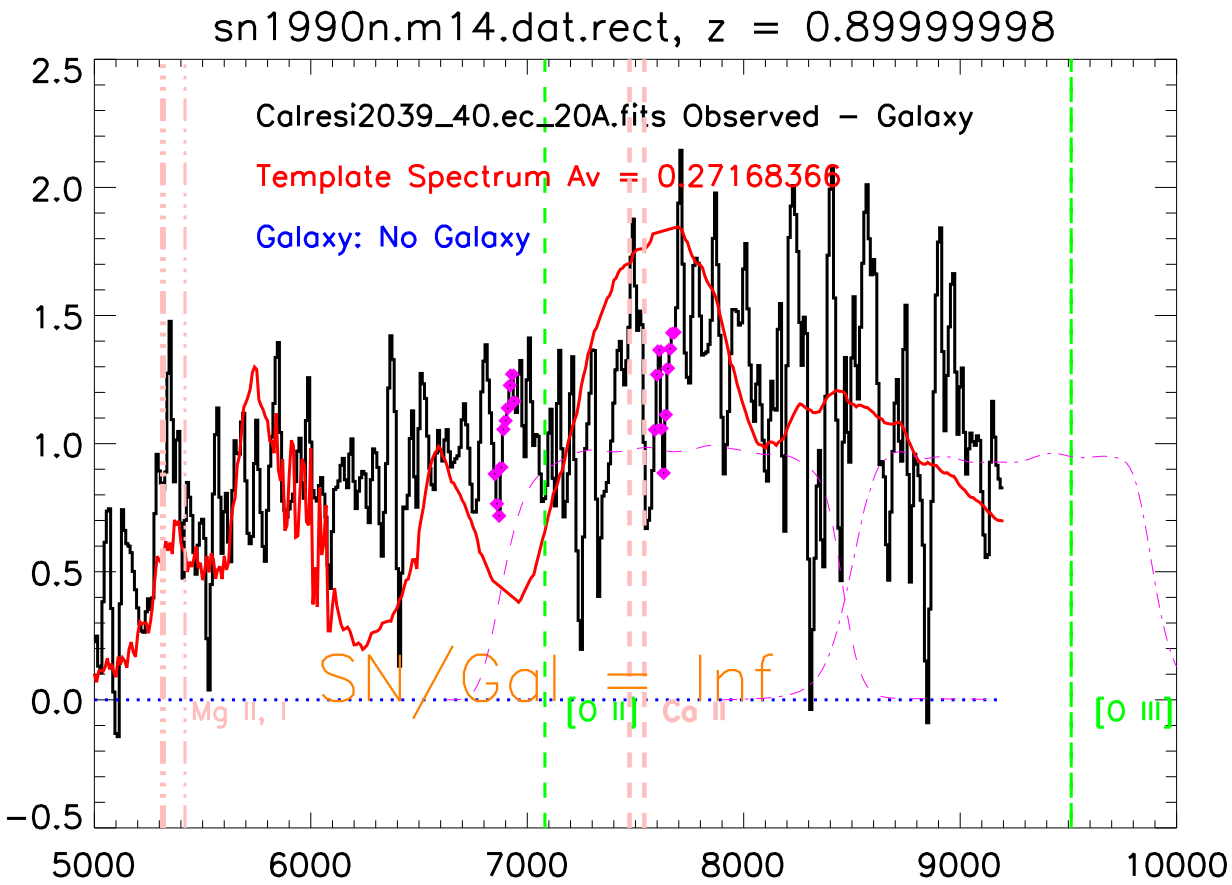

sn1990n.m07.dat.rect, z = 0.94999999
Calresi2039_40.ec_20A.fits Observed − Galaxy
Template Spectrum Av = 0.29719386
Galaxy: No Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
2.5
2.0
1.5
1.0
0.5
0.0
−0.5
5000
6000
7000
8000
9000
10000

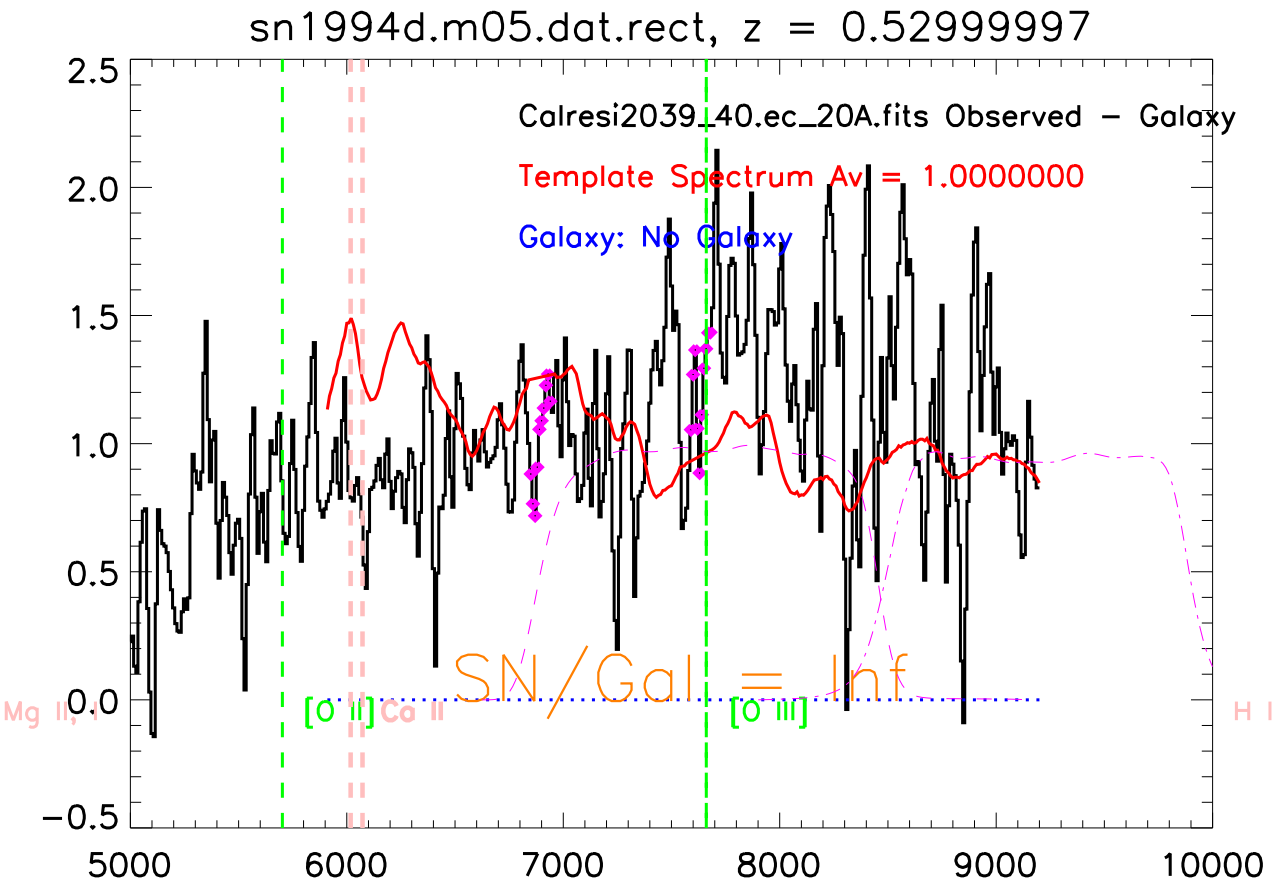

sn1999ee.m06.dat.rect, z = 0.52999997
Calresi2039_40.ec_20A.fits Observed − Galaxy
Template Spectrum Av = 1.0000000
Galaxy: No Galaxy
SN/Gal = Inf
[O II]
Ca II
[O III]
Mg II
H I
2.5
2.0
1.5
1.0
0.5
0.0
−0.5
5000
6000
7000
8000
9000
10000

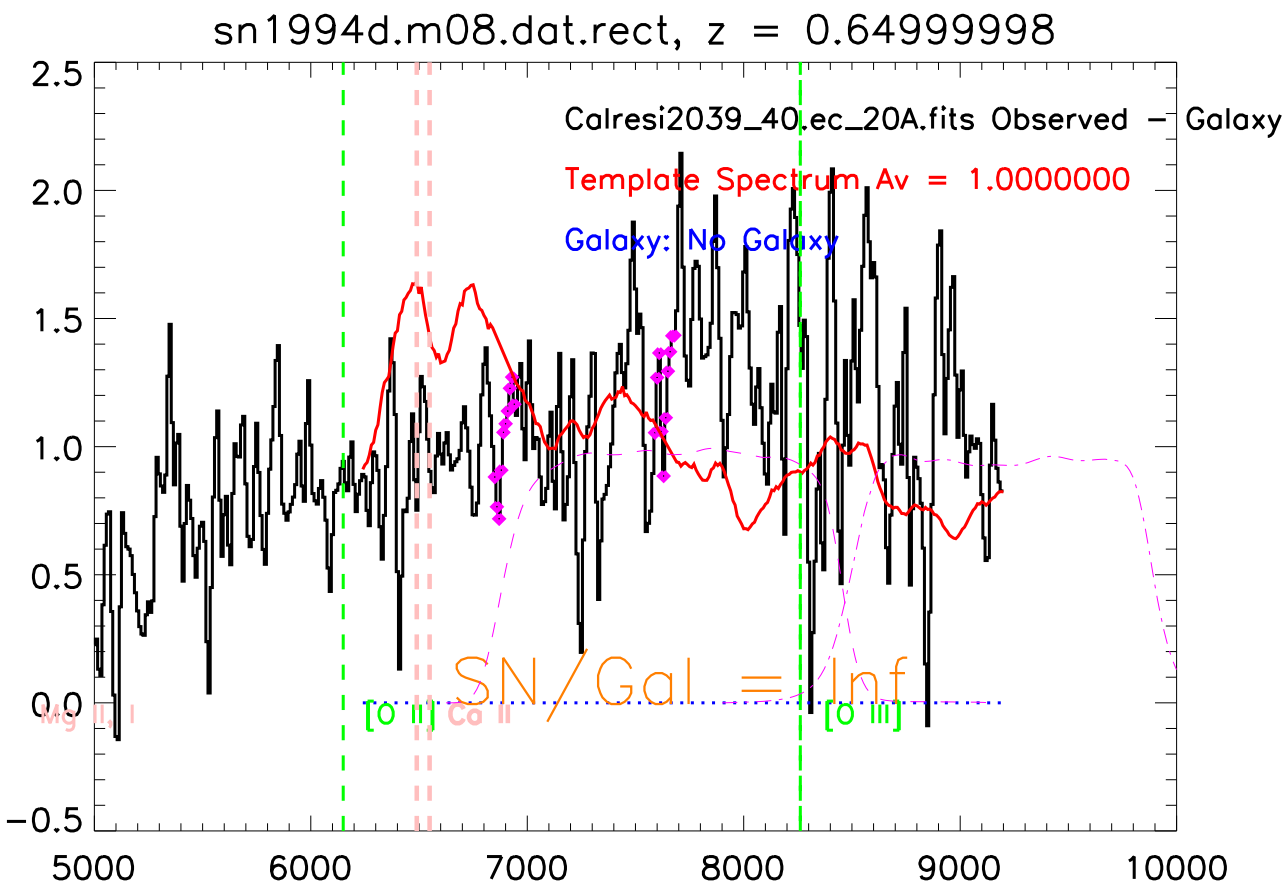

sn1999ee.m08.dat.rect, z = 0.52999997
Calresi2039_40.ec_20A.fits Observed − Galaxy
Template Spectrum Av = 1.0000000
Galaxy: No Galaxy
SN/Gal = Inf
[O II]
Ca II
[O III]
Mg II
H I
2.5
2.0
1.5
1.0
0.5
0.0
−0.5
5000
6000
7000
8000
9000
10000

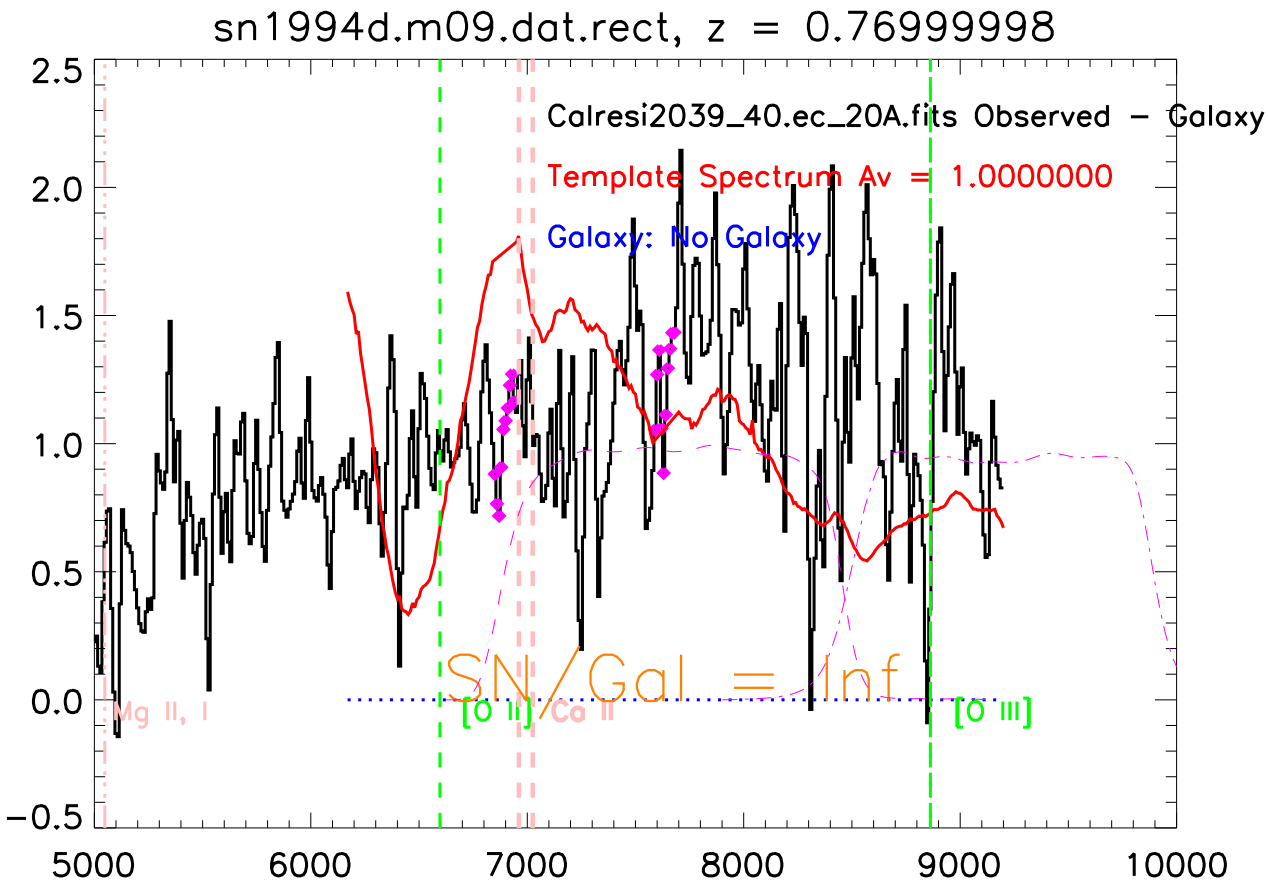

sn1981b.m00.dat.rect, z = 0.90999997
Calresi2039_40.ec_20A.fits Observed − Galaxy
Template Spectrum, Av = −1.0000000
Galaxy: No Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
2.5
2.0
1.5
1.0
0.5
0.0
−0.5
5000
6000
7000
8000
9000
10000

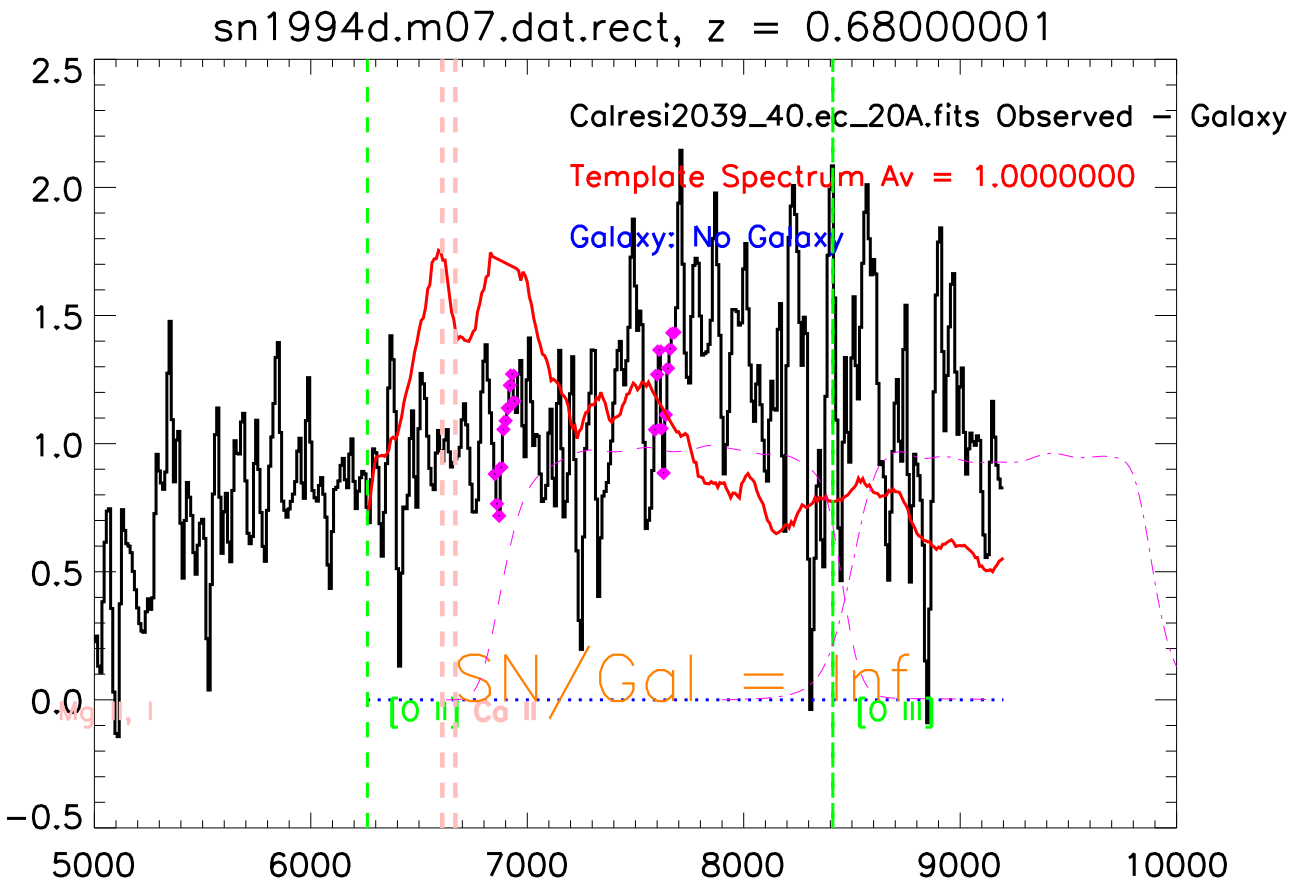

sn1996x.m02.dat.rect, z = 0.67000002
Calresi2039_40.ec_20A.fits Observed
Galaxy
Template Spectrum, Av = 1.0000000
Galaxy: No Galaxy
SN/Gal = Inf
[O II]
Ca II
[O III]
Mg II, I
2.5
2.0
1.5
1.0
0.5
0.0
−0.5
5000
6000
7000
8000
9000
10000

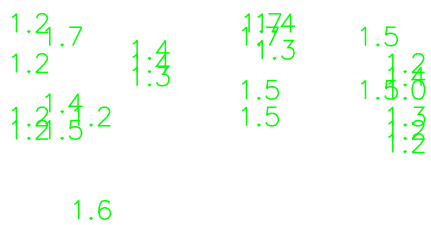

sn1990n.m14.dat.rect, z = 0.89999998
Calresi2039_40.ec_20A.fits Observed − Galaxy
Template Spectrum Av = 0.27168366
Galaxy: No Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
2.5
2.0
1.5
1.0
0.5
0.0
−0.5
5000
6000
7000
8000
9000
10000

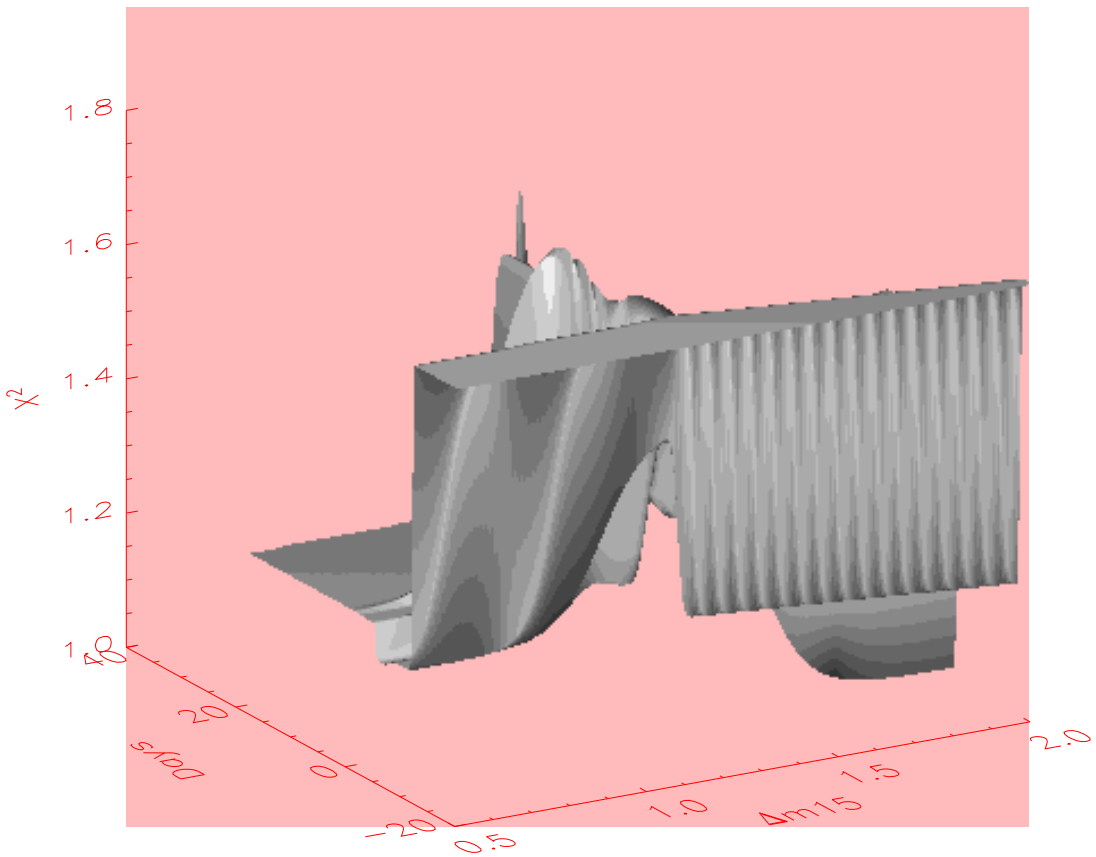

sn1994d.m05.dat.rect, z = 0.52999997
Calresi2039_40.ec_20A.fits Observed − Galaxy
Template Spectrum Av = 1.0000000
Galaxy: No Galaxy
SN/Gal = Inf
Mg II
[O II]
Ca II
[O III]
H I
2.5
2.0
1.5
1.0
0.5
0.0
−0.5
5000
6000
7000
8000
9000
10000


sn1994d.m08.dat.rect, z = 0.64999998
Calresi2039_40.ec_20A.fits Observed
Galaxy
Template Spectrum, Av = 1.0000000
Galaxy: No Galaxy
SN/Gal = Inf
[O II]
Ca II
[O III]
2.5
2.0
1.5
1.0
0.5
0.0
−0.5
5000
6000
7000
8000
9000
10000

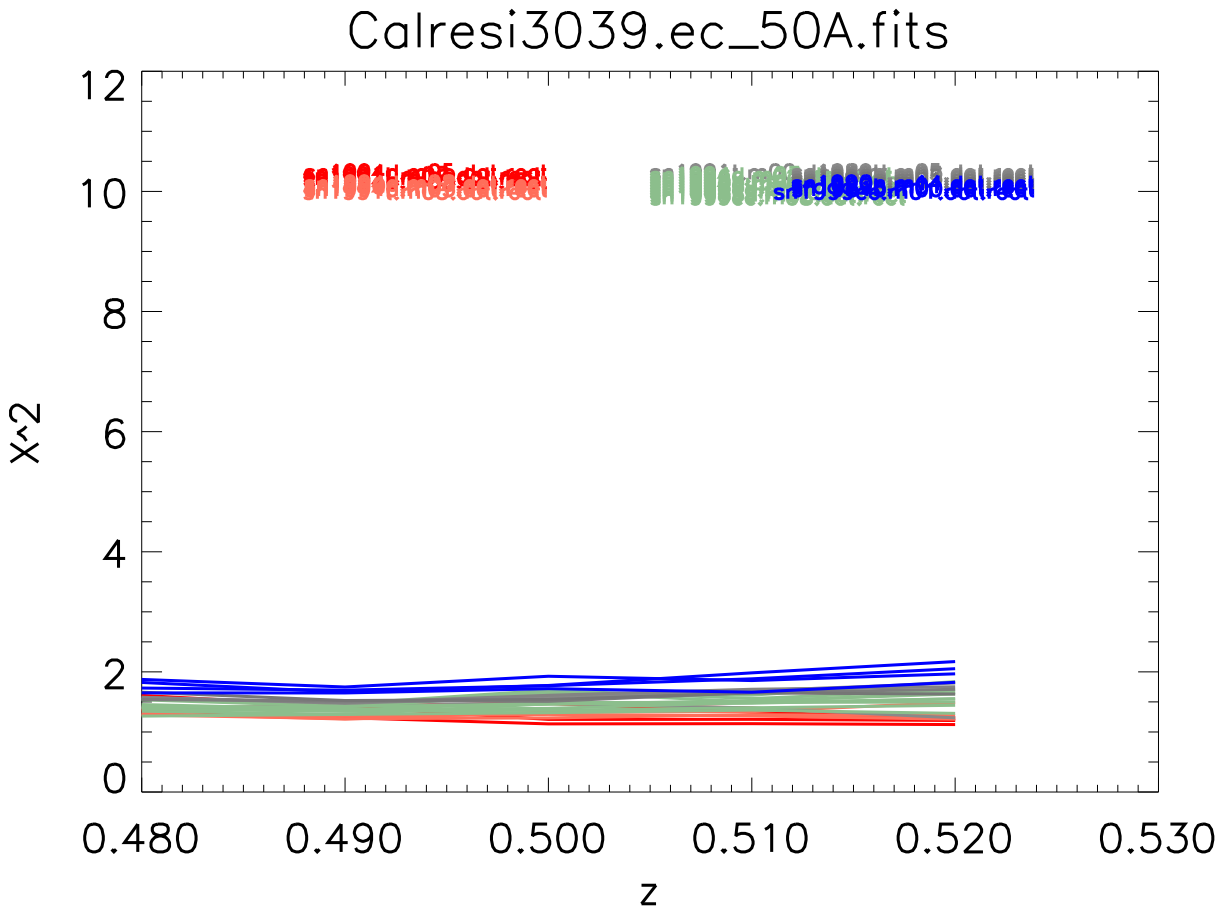

sn1994d.m09.dat.rect, z = 0.76999998
Calresi2039_40.ec_20A.fits Observed − Galaxy
Template Spectrum Av = 1.0000000
Galaxy: No Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
2.5
2.0
1.5
1.0
0.5
0.0
−0.5
5000
6000
7000
8000
9000
10000

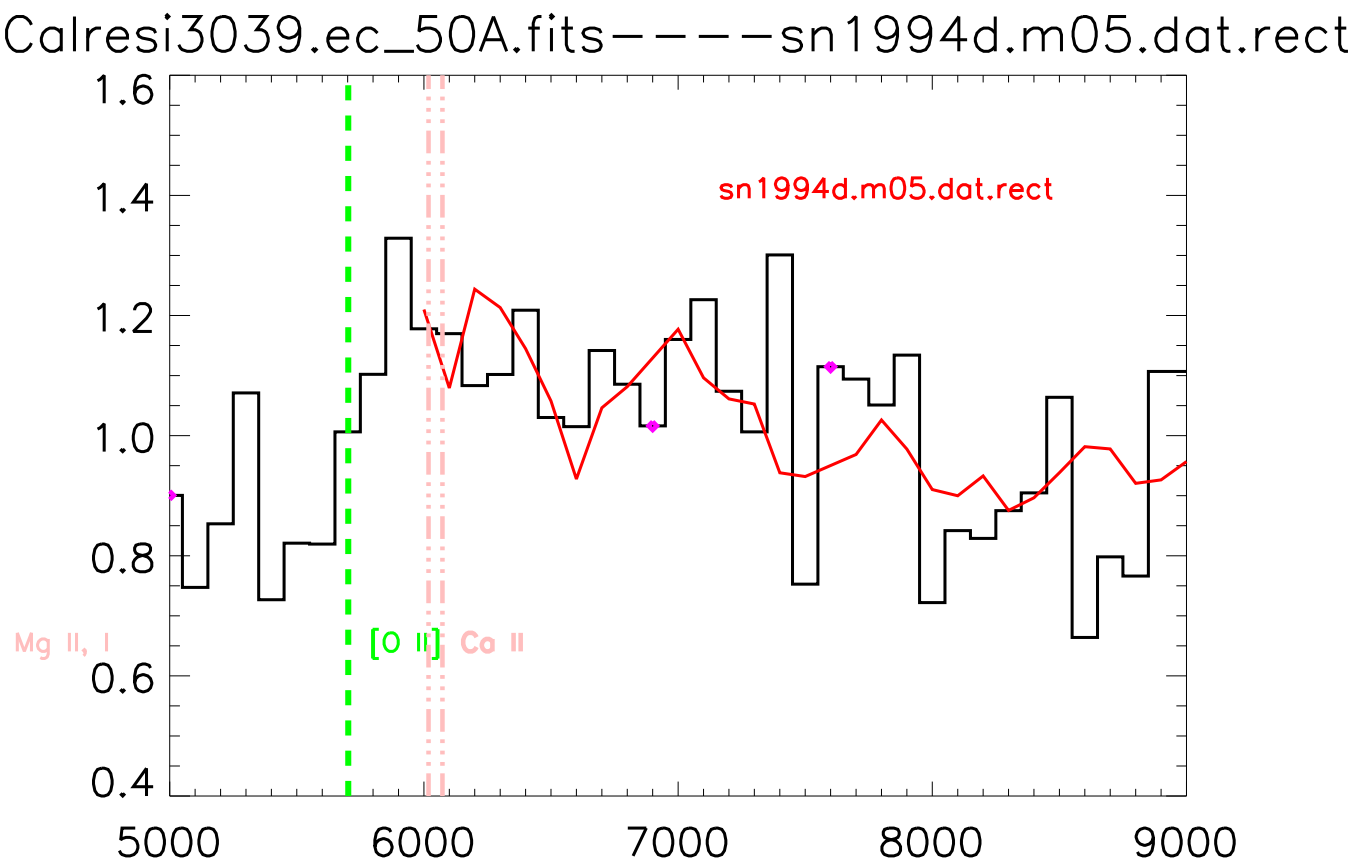

sn1994d.m07.dat.rect, z = 0.68000001
Calresi2039_40.ec_20A.fits Observed
Galaxy
Template Spectrum, Av = 1.0000000
Galaxy: No Galaxy
SN/Gal = Inf
[O II]
Ca II
[O III]
Mg II, I
2.5
2.0
1.5
1.0
0.5
0.0
−0.5
5000
6000
7000
8000
9000
10000

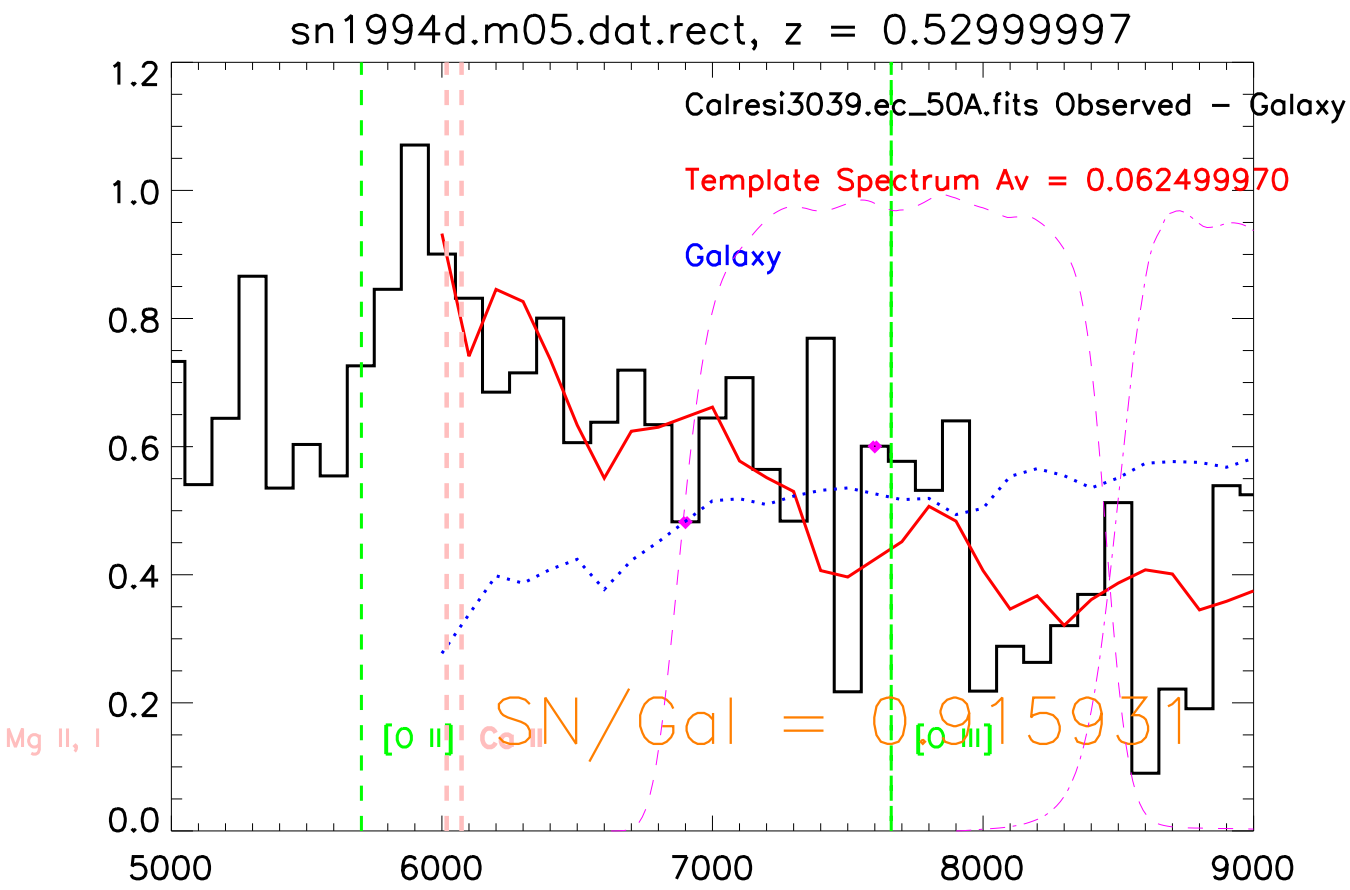

1.2
1.7
1.2
1.4
1.3
1.4
1.2
1.5
1.6
1.5
1.3
1.5
1.5
1.5
1.2

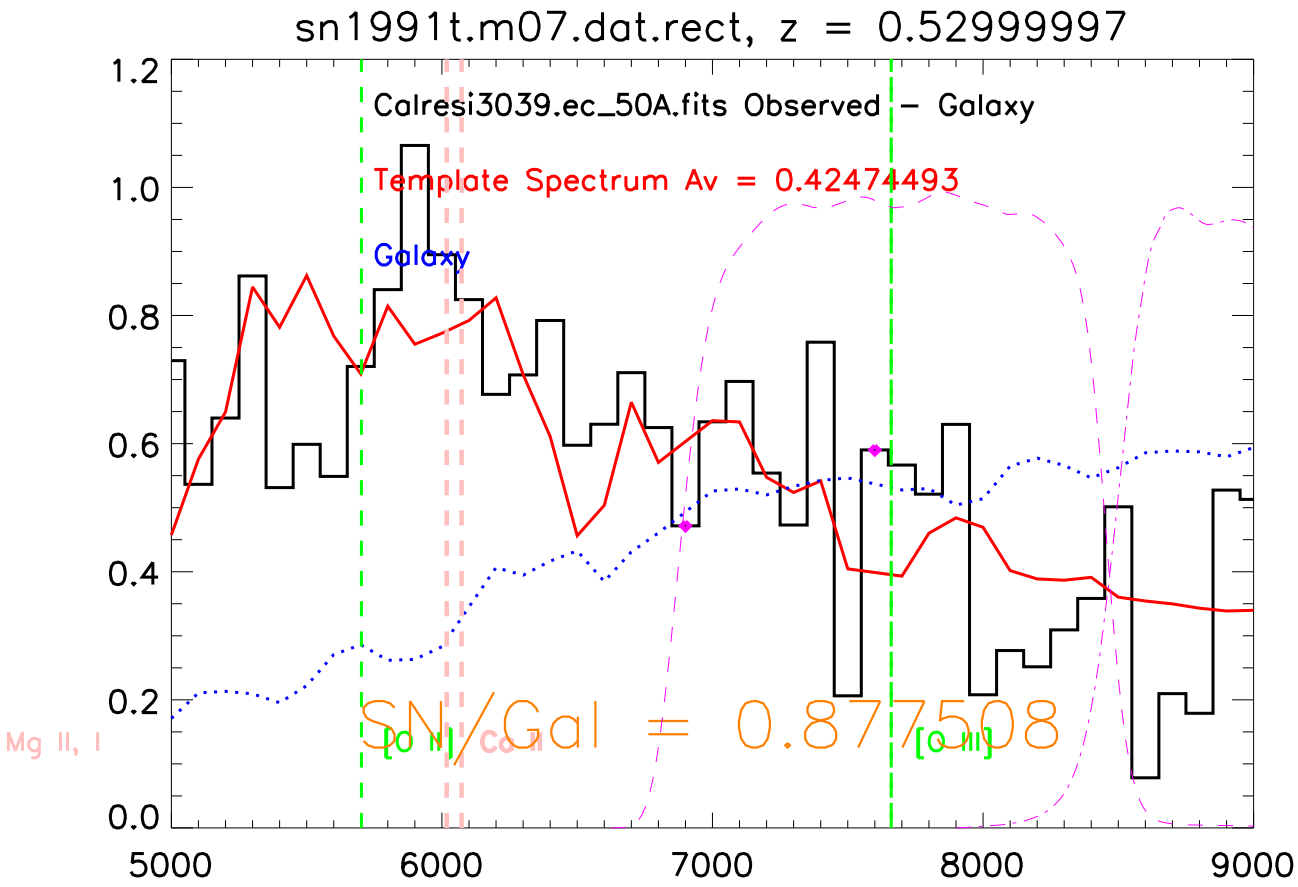


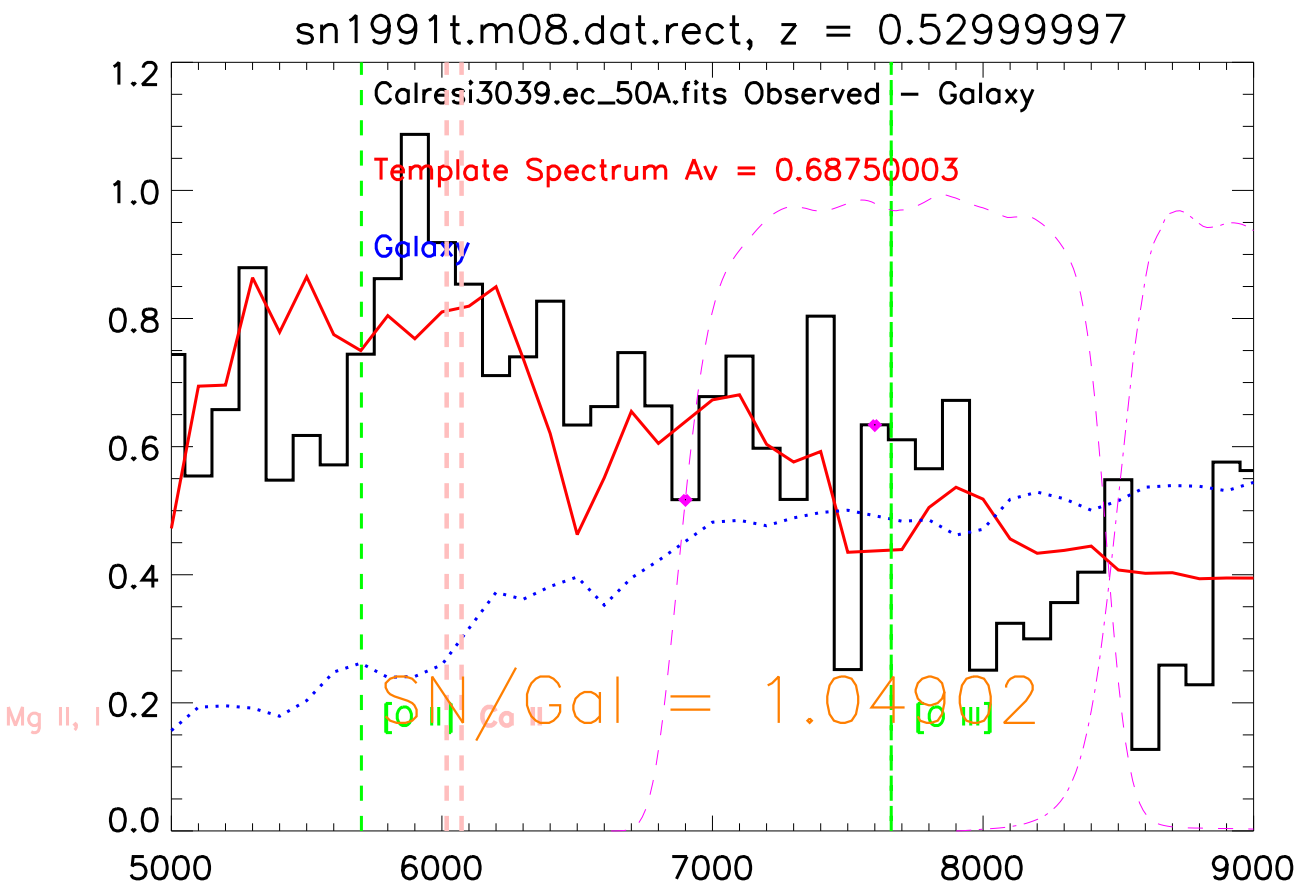
1.8
1.6
1.4
1.2
1.0
χ^2
40
20
0
−20
Days
0.5
1.0
1.5
2.0
Δm15

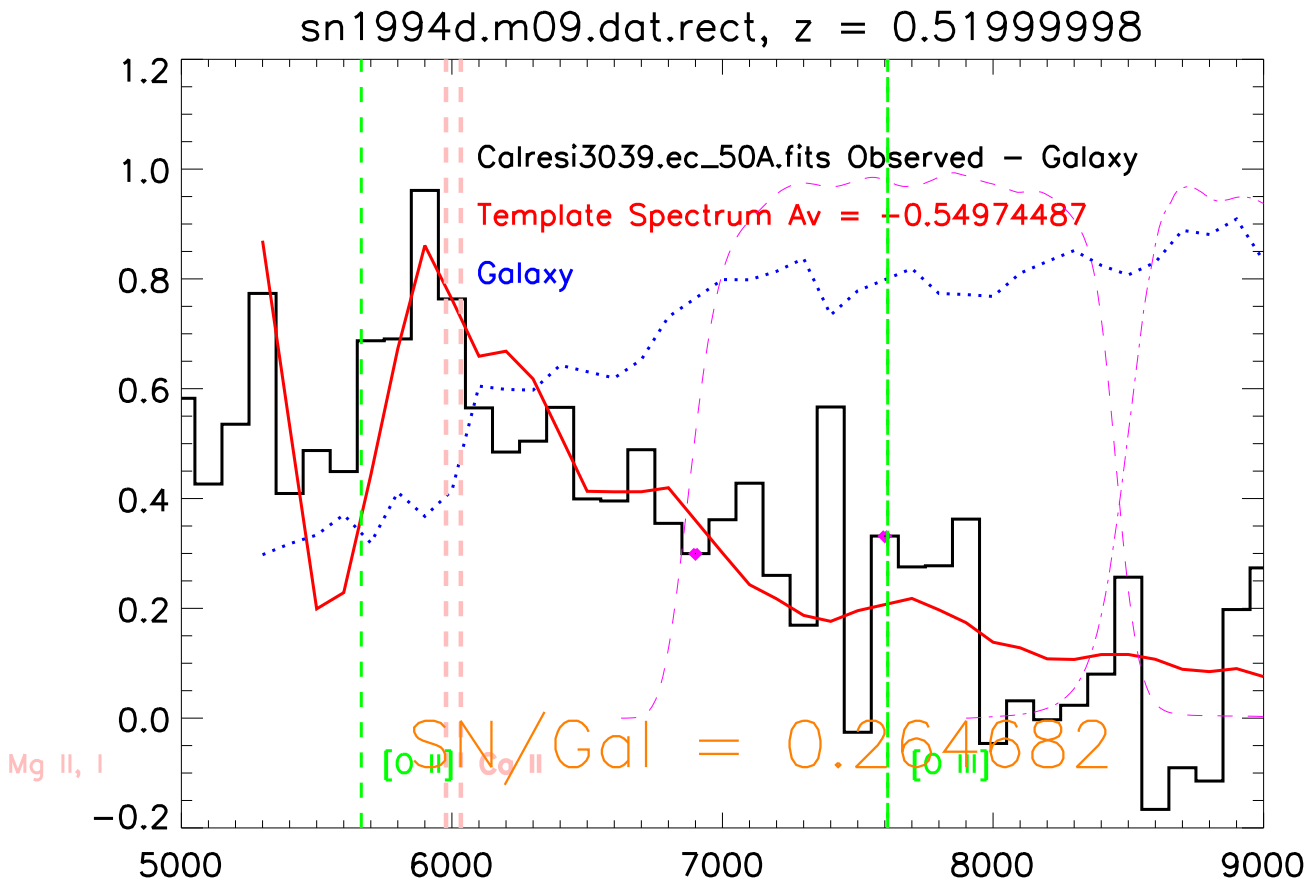

Calresi3039.ec_50A.fits
12
10
8
6
4
2
0
X^2
0.480
0.490
0.500
0.510
0.520
0.530
z

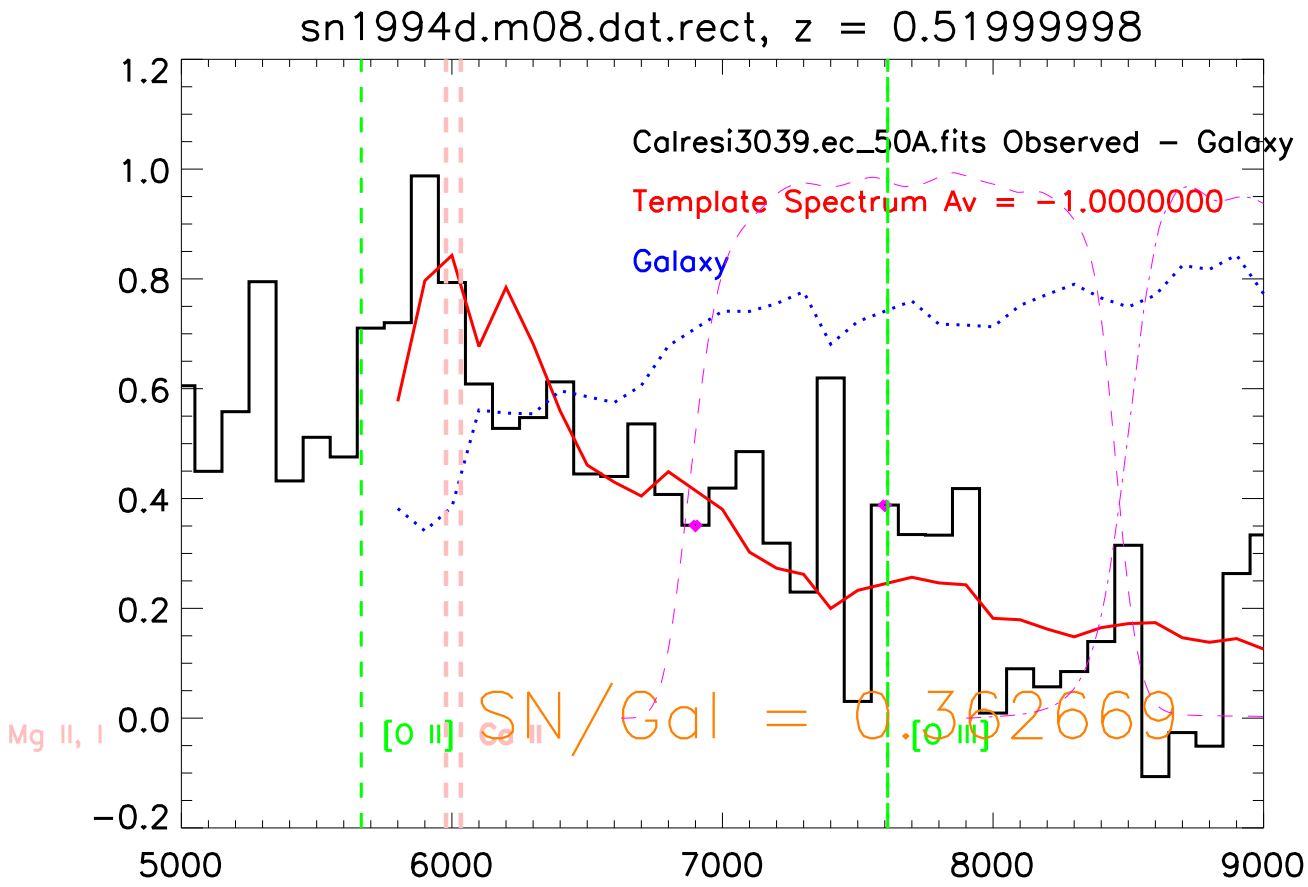

Calresi3039.ec_50A.fits----sn1994d.m05.dat.rect
sn1994d.m05.dat.rect
Mg II, I
[O II]
Ca II
1.6
1.4
1.2
1.0
0.8
0.6
0.4
5000
6000
7000
8000
9000

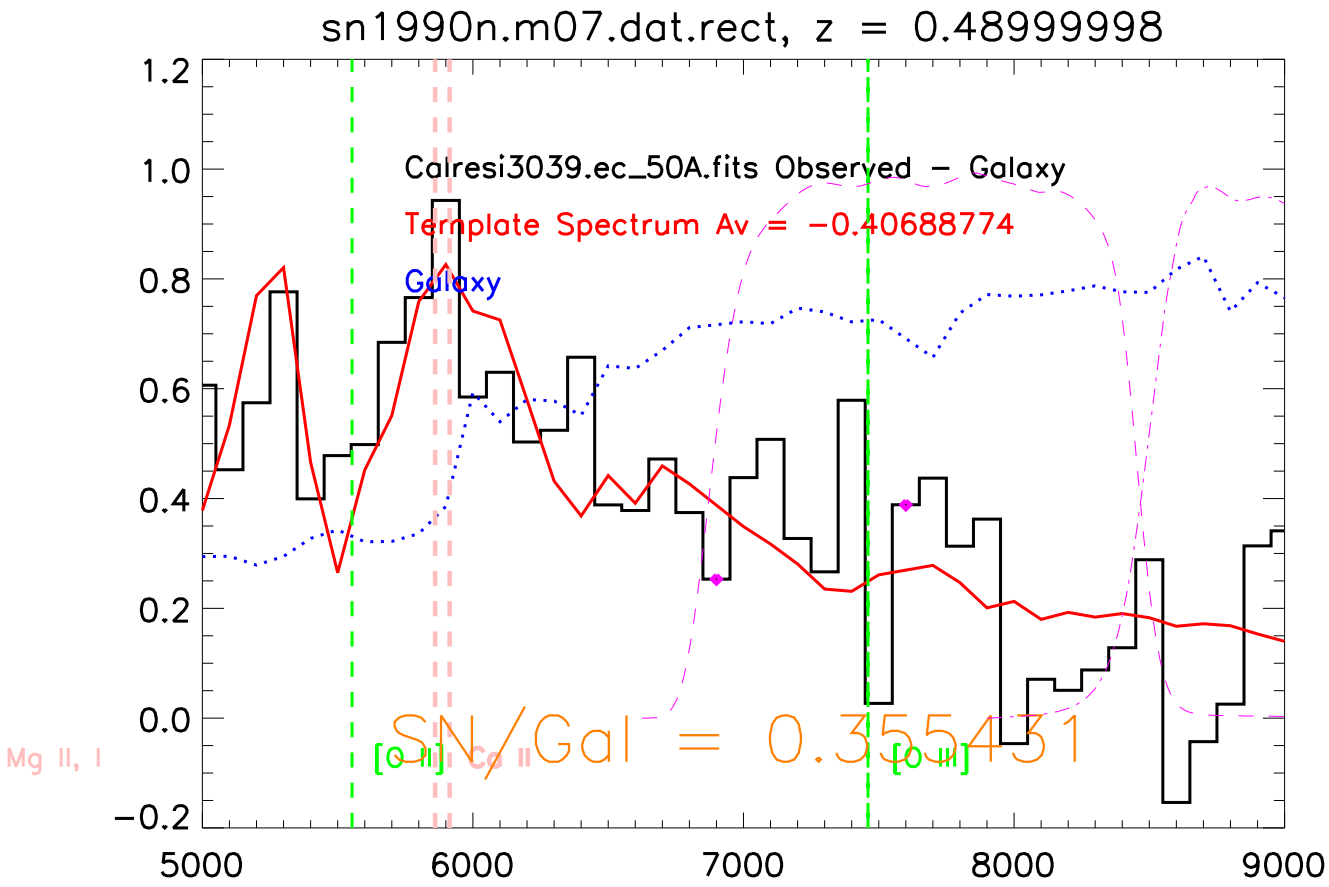

sn1994d.m05.dat.rect, z = 0.52999997
Calresi3039.ec_50A.fits Observed – Galaxy
Template Spectrum Av = 0.062499970
Galaxy
SN/Gal = 0.915931
Mg II, I
[O II]
Ca II
[O III]
1.2
1.0
0.8
0.6
0.4
0.2
0.0
5000
6000
7000
8000
9000

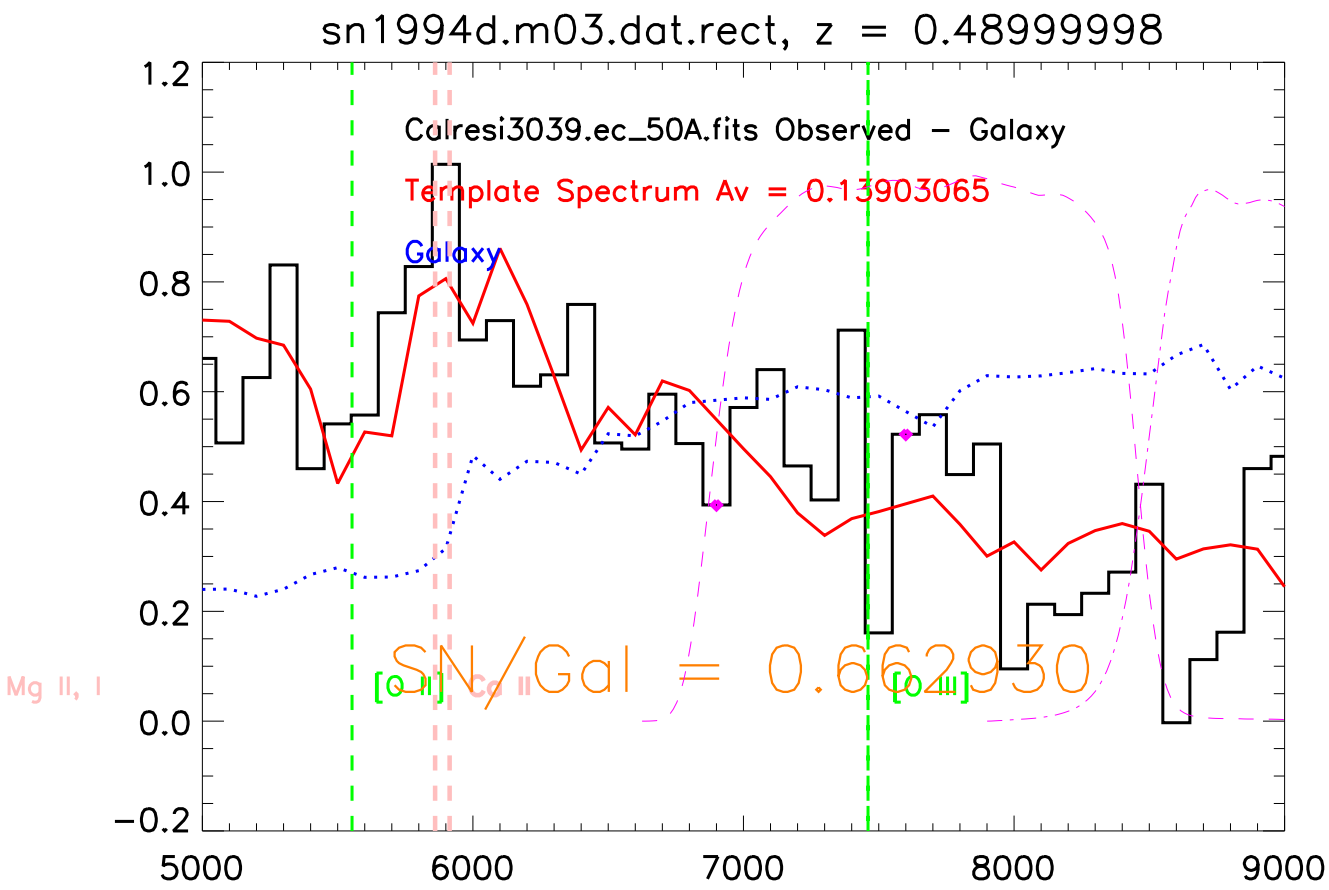

sn1991t.m07.dat.rect, z = 0.52999997
Calresi3039.ec_50A.fits Observed – Galaxy
Template Spectrum Av = 0.42474493
Galaxy
SN/Gal = 0.877508
[O II]
Ca II
[O III]
Mg II, I
1.2
1.0
0.8
0.6
0.4
0.2
0.0
5000
6000
7000
8000
9000

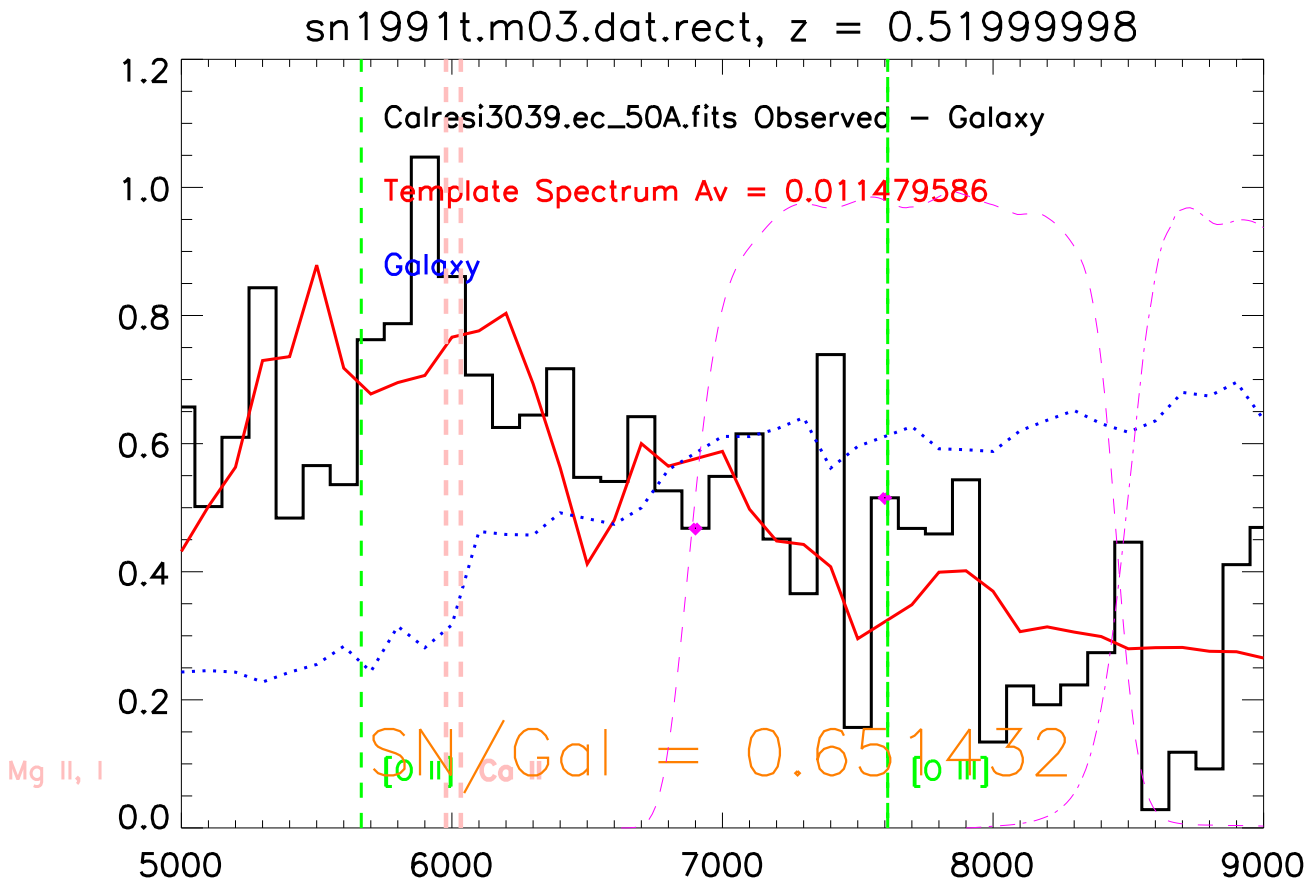

sn1991t.m08.dat.rect, z = 0.52999997
Calresi3039.ec_50A.fits Observed – Galaxy
Template Spectrum Av = 0.68750003
Galaxy
SN/Gal = 1.04802
[O II]
Ca II
[O III]
Mg II, I
1.2
1.0
0.8
0.6
0.4
0.2
0.0
5000
6000
7000
8000
9000

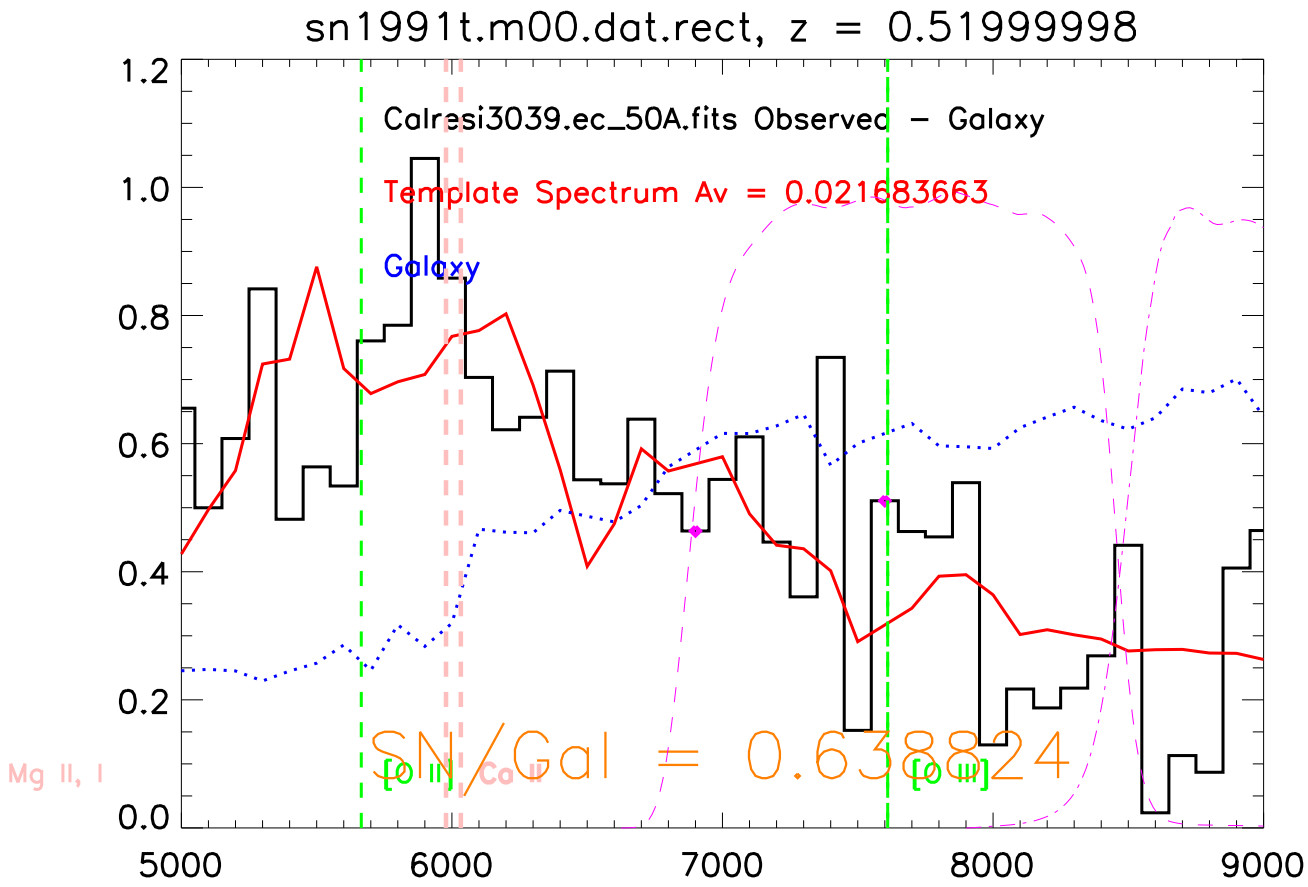

sn1994d.m09.dat.rect, z = 0.51999998
Calresi3039.ec_50A.fits Observed − Galaxy
Template Spectrum Av = 0.54974487
Galaxy
SN/Gal = 0.264682
Mg II, I
[O II]
Ca II
[O III]
1.2
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
5000
6000
7000
8000
9000

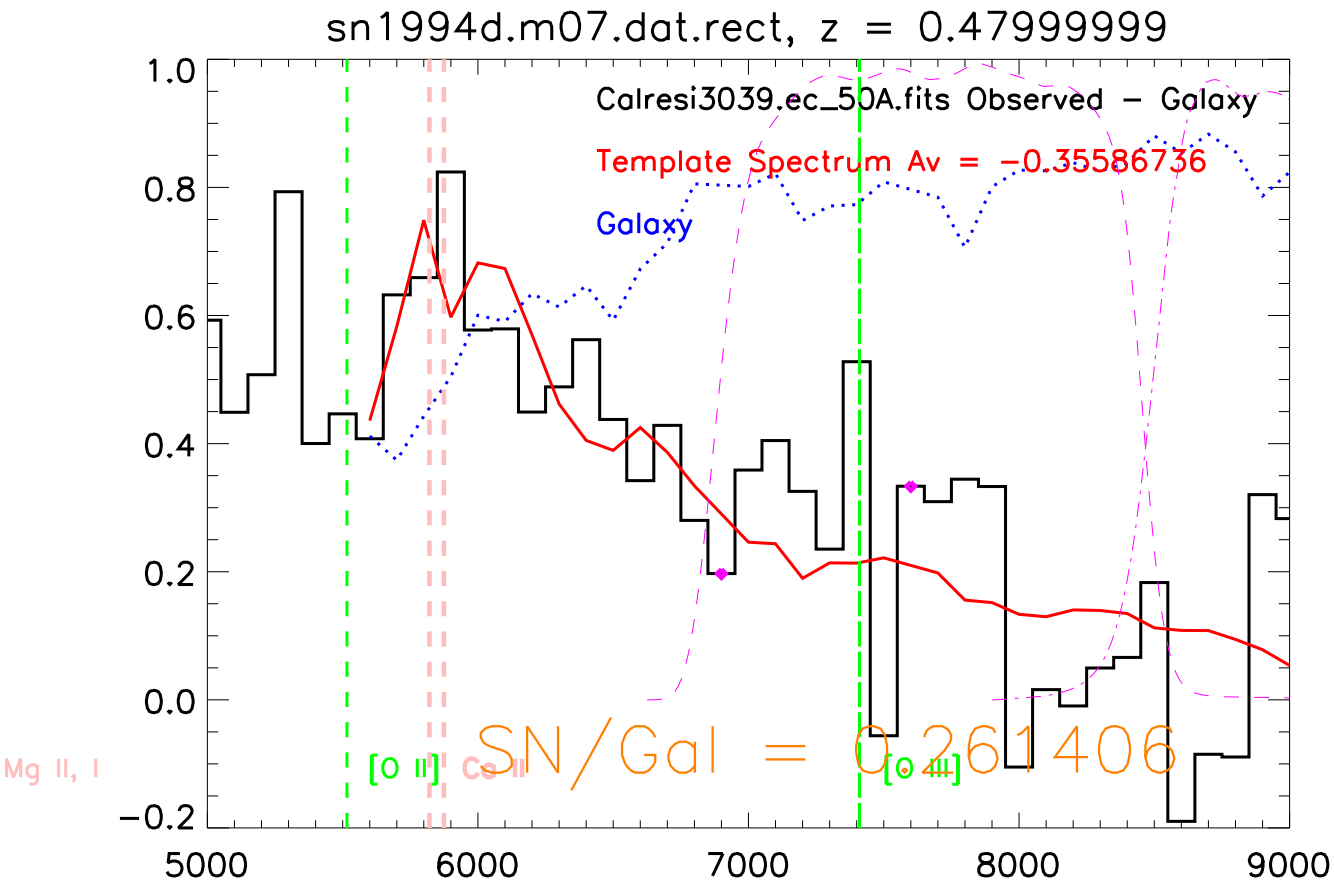

sn1994d.m08.dat.rect, z = 0.51999998
Calresi3039.ec_50A.fits Observed − Galaxy
Template Spectrum Av = −1.0000000
Galaxy
SN/Gal = 0.362669
Mg II, I
[O II]
Ca II
[O III]
1.2
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
5000
6000
7000
8000
9000

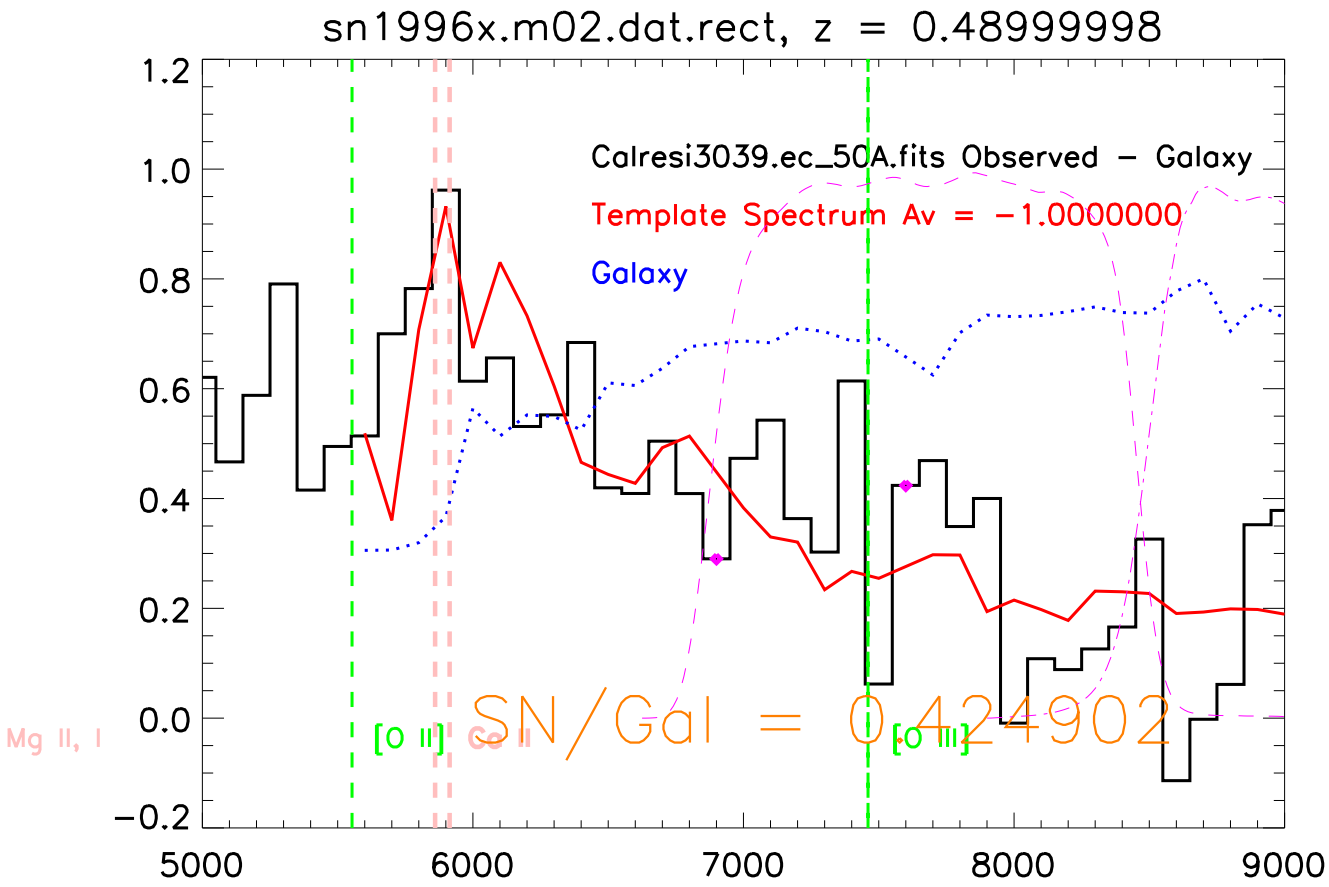

sn1990n.m07.dat.rect, z = 0.48999998
Calresi3039.ec_50A.fits Observed − Galaxy
Template Spectrum Av = −0.40688774
Galaxy
SN/Gal = 0.355431
Mg II, I
[O II]
Ca II
[O III]
1.2
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
5000
6000
7000
8000
9000

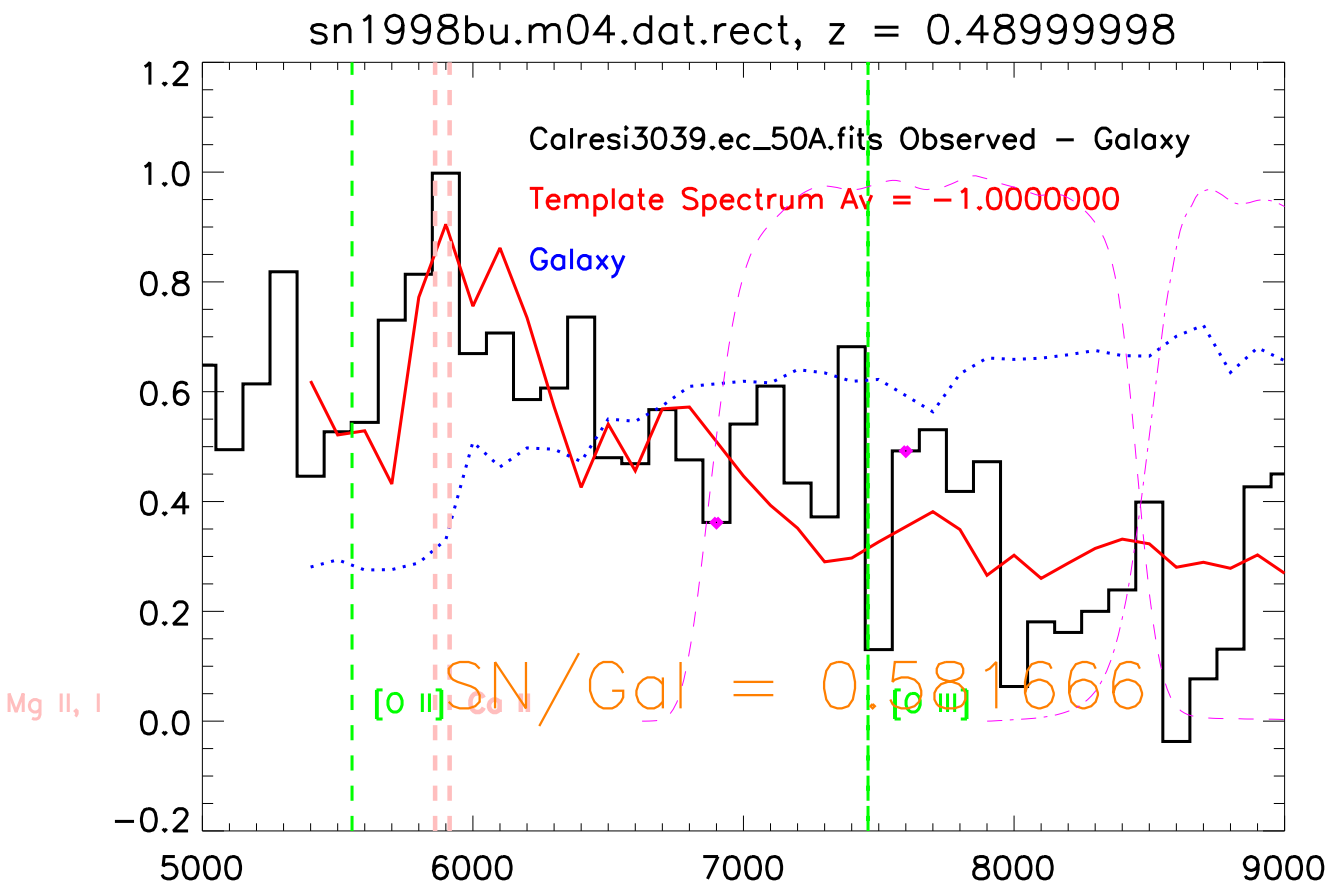

sn1994d.m03.dat.rect, z = 0.48999998
Calresi3039.ec_50A.fits Observed − Galaxy
Template Spectrum Av = 0.13903065
Galaxy
SN/Gal = 0.662930
Mg II, I
[O II]
Ca II
[O III]
1.2
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
5000
6000
7000
8000
9000

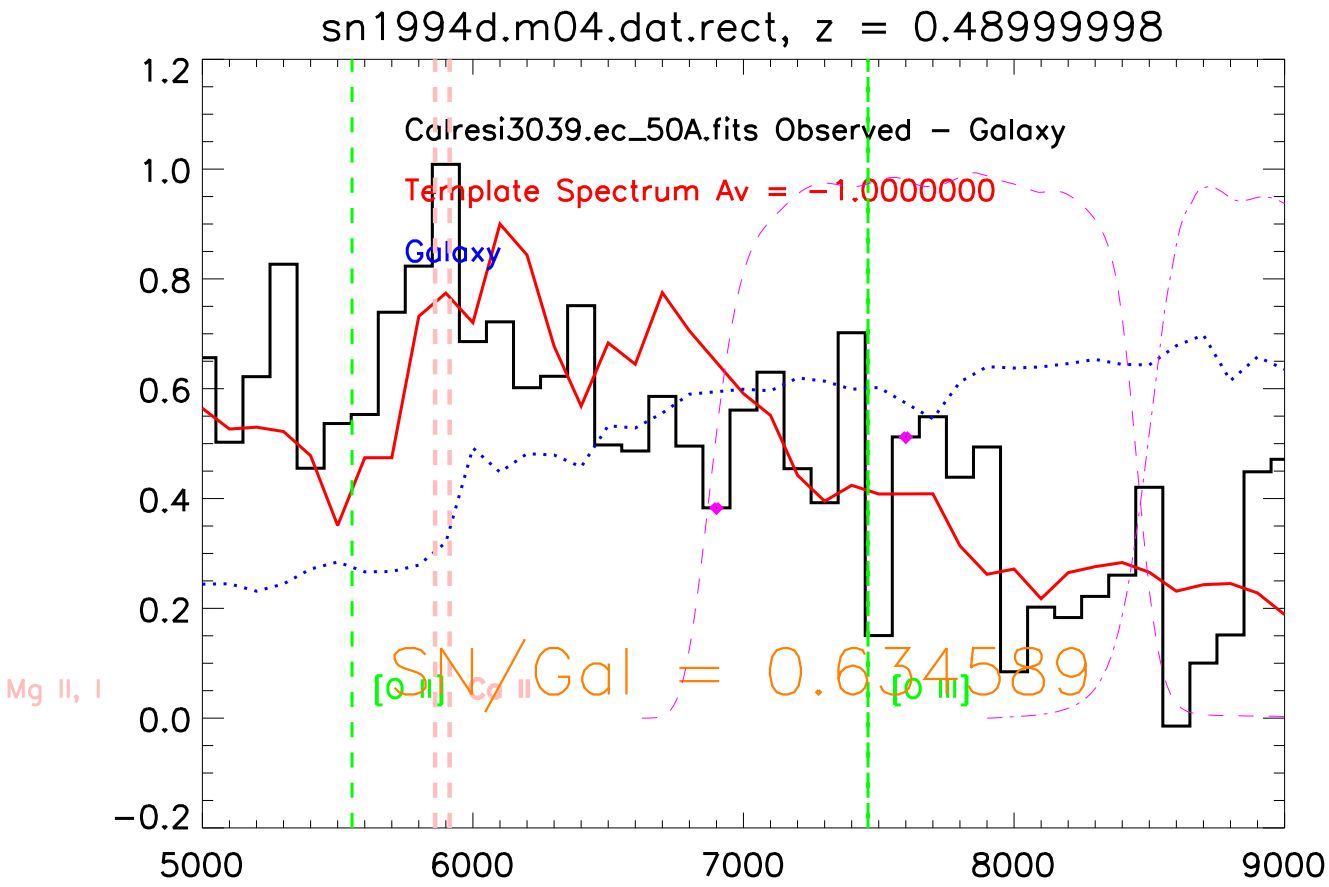

sn1991t.m03.dat.rect, z = 0.51999998
Calresi3039.ec_50A.fits Observed − Galaxy
Template Spectrum Av = 0.011479586
Galaxy
SN/Gal = 0.651432
Mg II, I
[O II]
Ca II
[O III]
1.2
1.0
0.8
0.6
0.4
0.2
0.0
5000
6000
7000
8000
9000

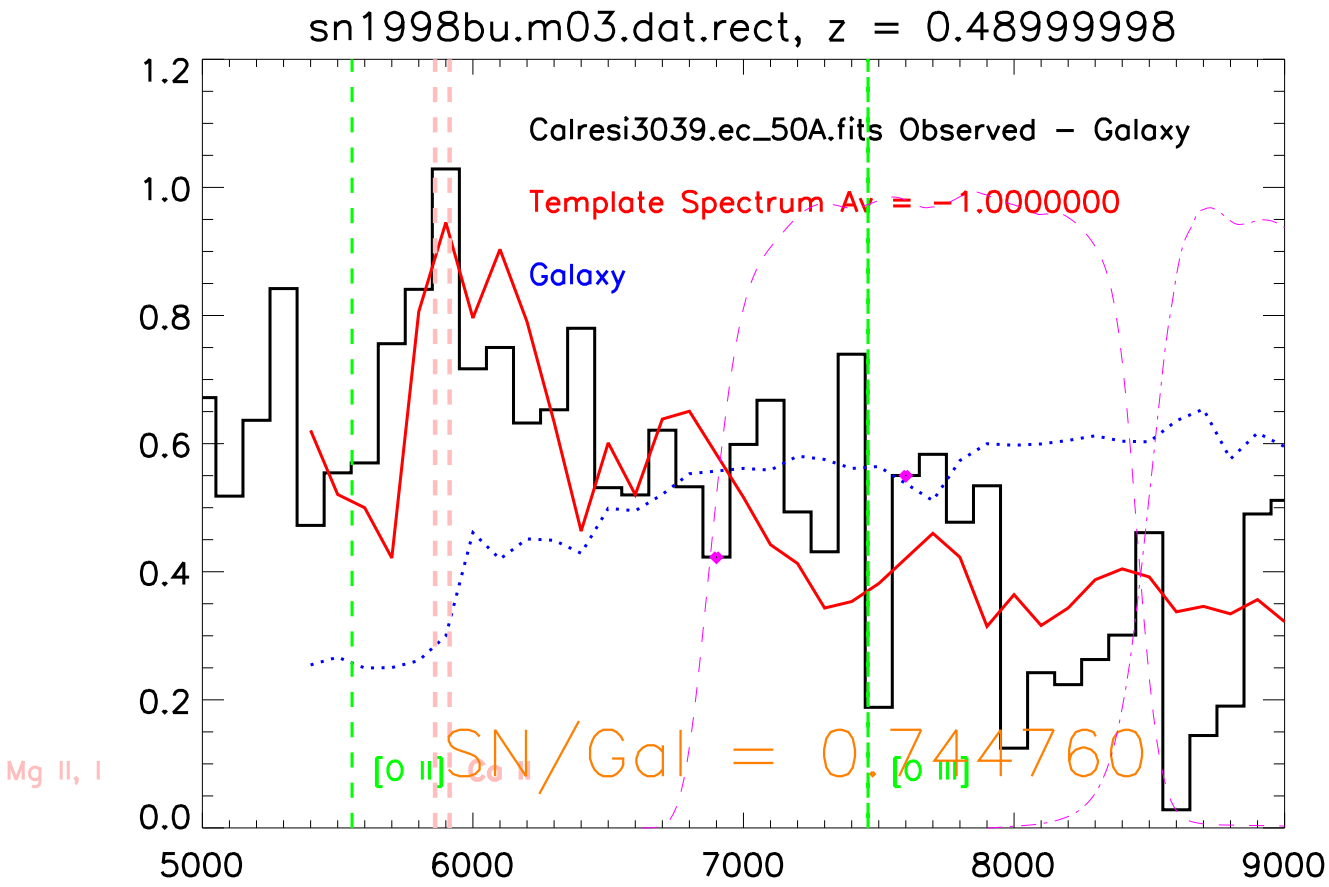

sn1991t.m00.dat.rect, z = 0.51999998
Calresi3039.ec_50A.fits Observed – Galaxy
Template Spectrum Av = 0.021683663
Galaxy
SN/Gal = 0.638824
Mg II, I
[O II]
Ca II
[O III]
1.2
1.0
0.8
0.6
0.4
0.2
0.0
5000
6000
7000
8000
9000

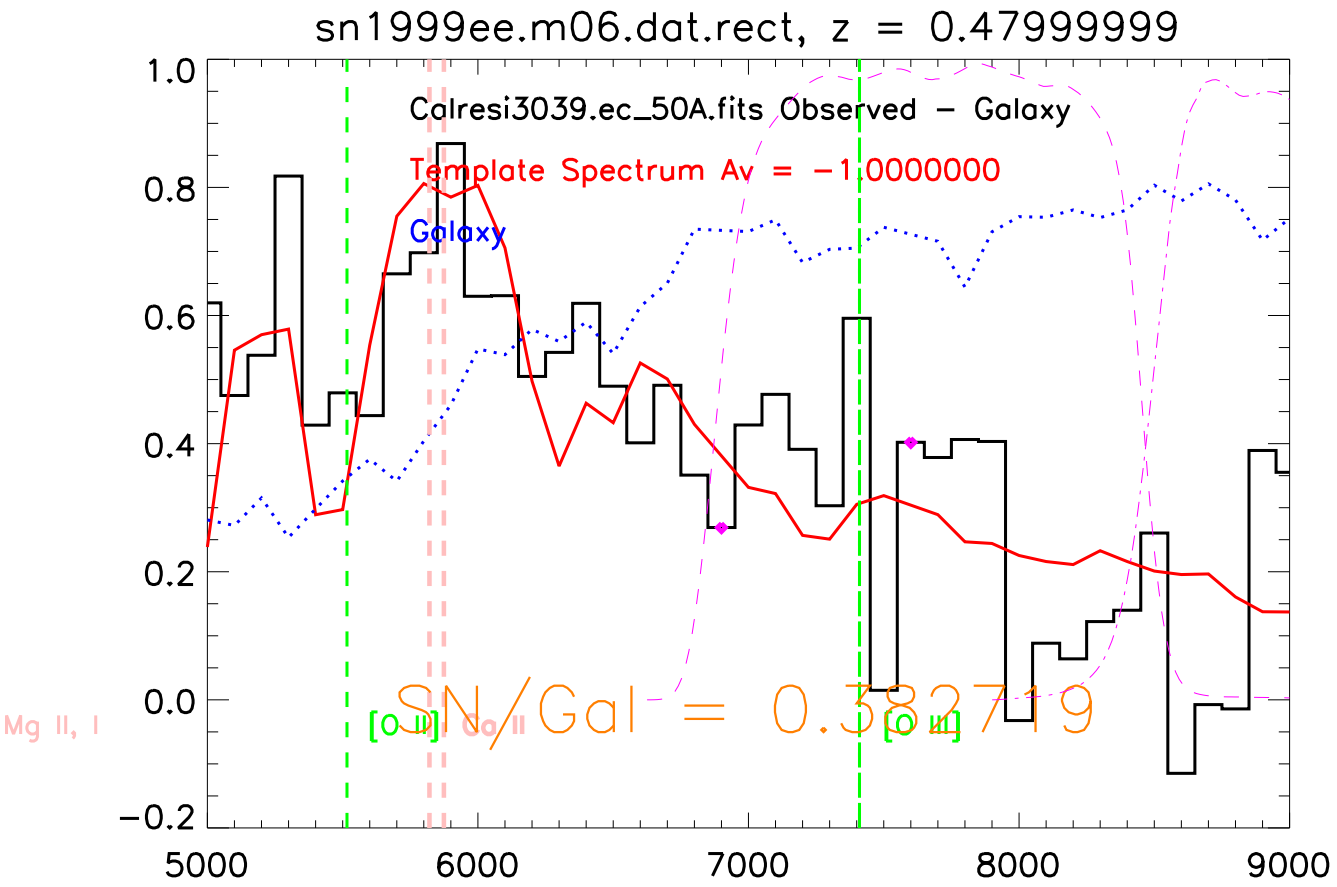

sn1994d.m07.dat.rect, z = 0.47999999
Calresi3039.ec_50A.fits Observed – Galaxy
Template Spectrum Av = –0.35586736
Galaxy
SN/Gal = 0.261406
Mg II, I
[O II]
Ca II
[O III]
1.0
0.8
0.6
0.4
0.2
0.0
–0.2
5000
6000
7000
8000
9000

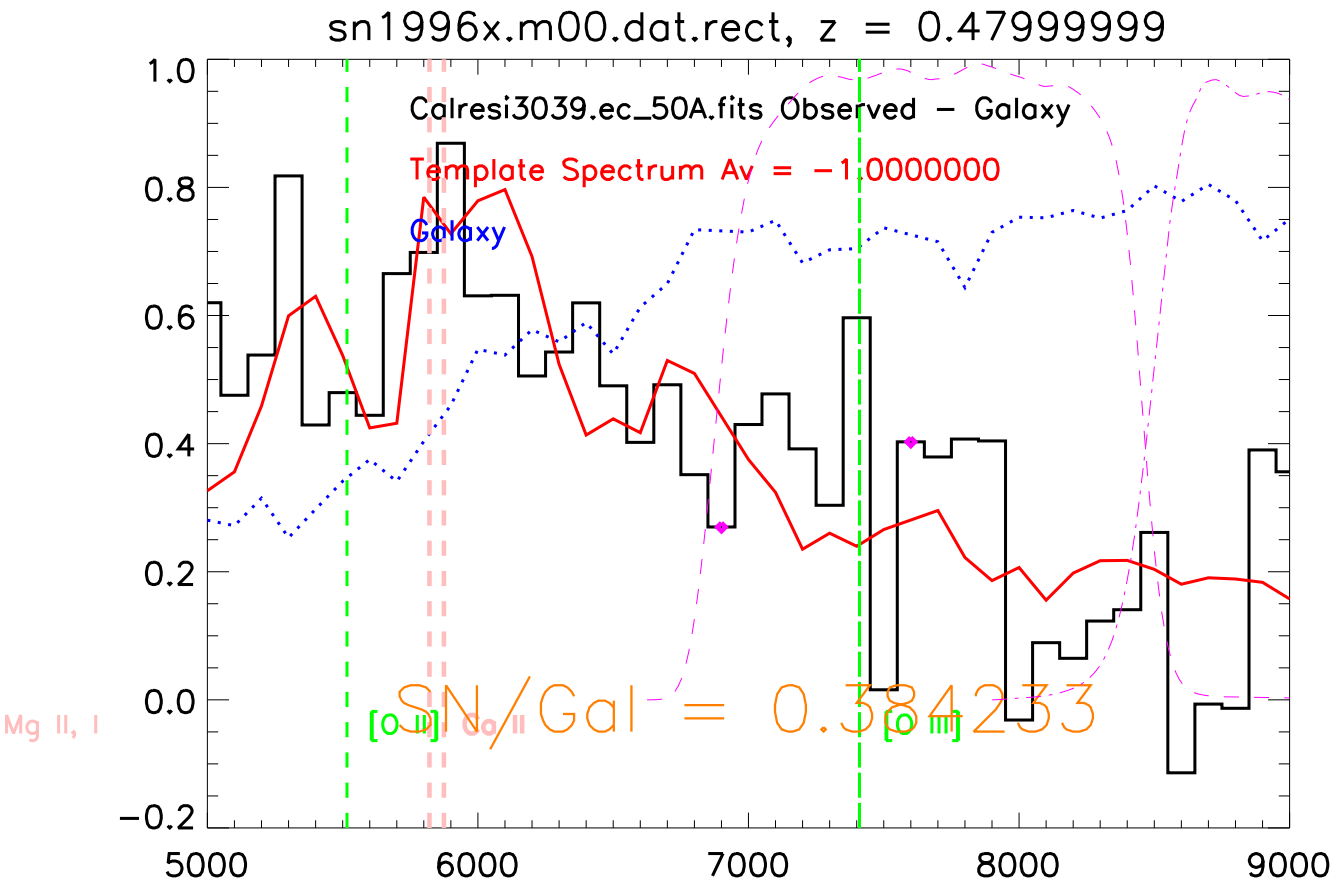

sn1996x.m02.dat.rect, z = 0.48999998
Calresi3039.ec_50A.fits Observed − Galaxy
Template Spectrum Av = −1.0000000
Galaxy
SN/Gal = 0.424902
Mg II, I
[O II]
Ca II
[O III]
1.2
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
5000
6000
7000
8000
9000

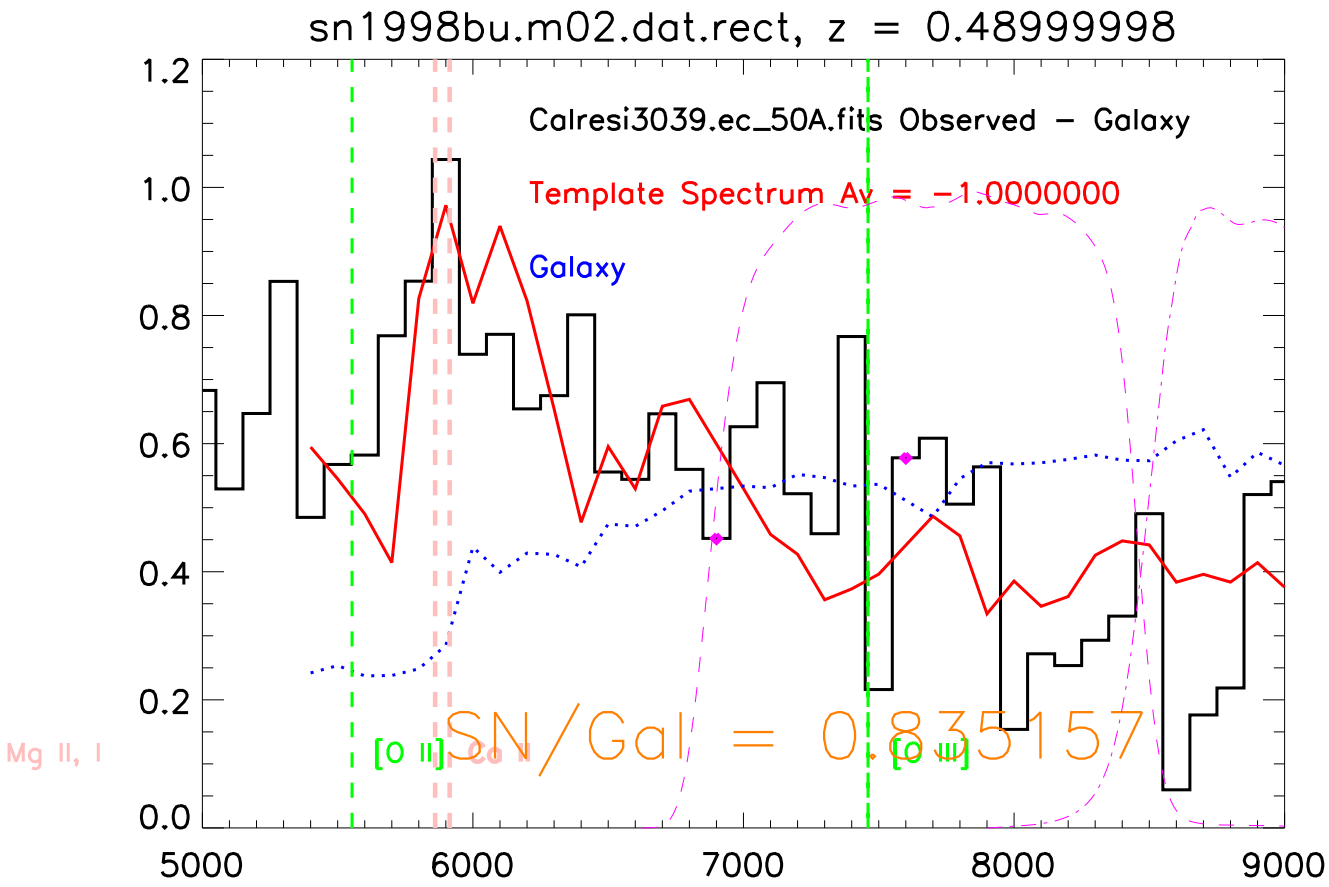

sn1998bu.m04.dat.rect, z = 0.48999998
Calresi3039.ec_50A.fits Observed − Galaxy
Template Spectrum Av = −1.0000000
Galaxy
SN/Gal = 0.581666
Mg II, I
[O II]
Ca II
[O III]
1.2
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
5000
6000
7000
8000
9000

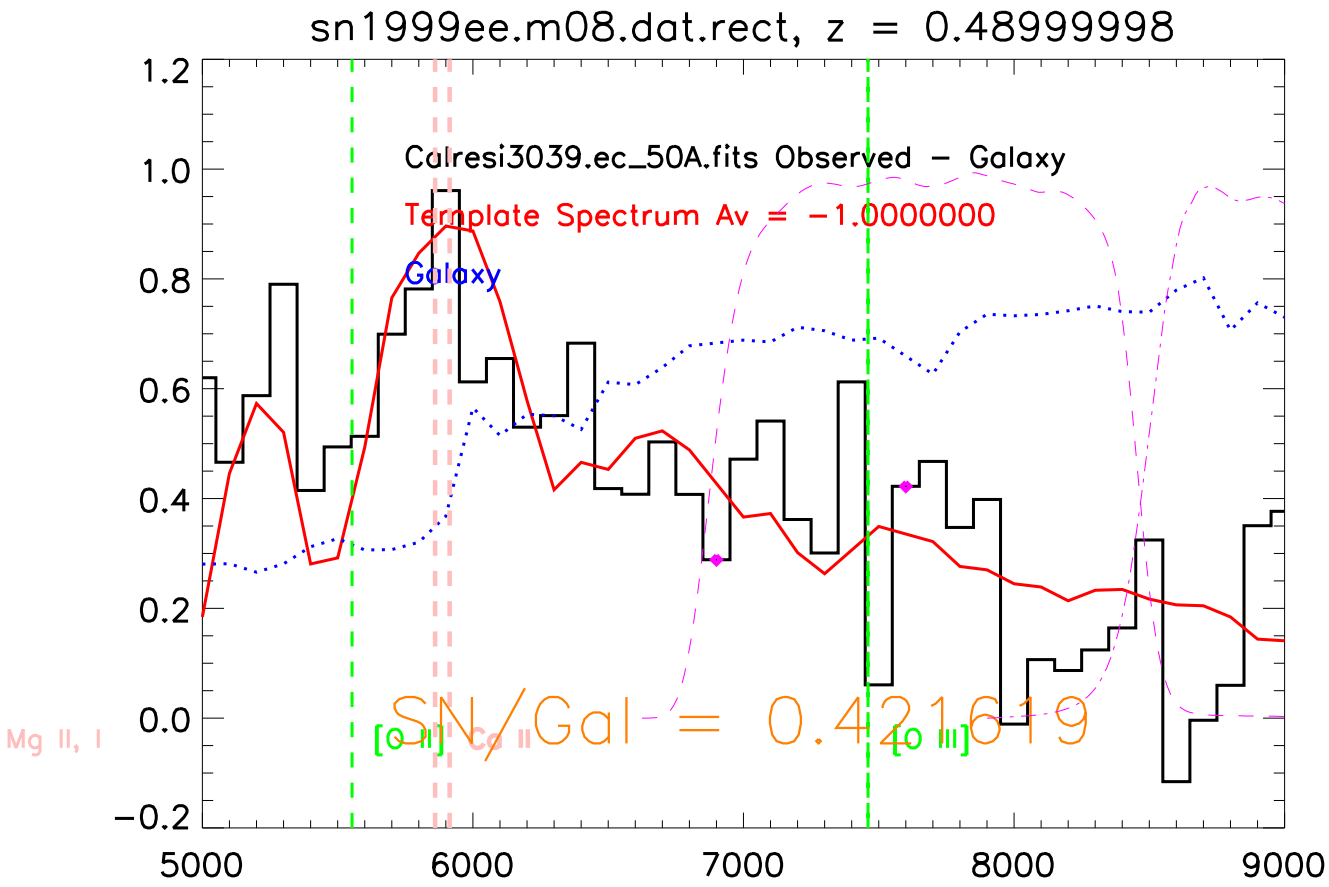

sn1994d.m04.dat.rect, z = 0.48999998
Calresi3039.ec_50A.fits Observed − Galaxy
Template Spectrum Av = −1.0000000
Galaxy
SN/Gal = 0.634589
Mg II, I
[O II]
Ca II
[O III]
1.2
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
5000
6000
7000
8000
9000

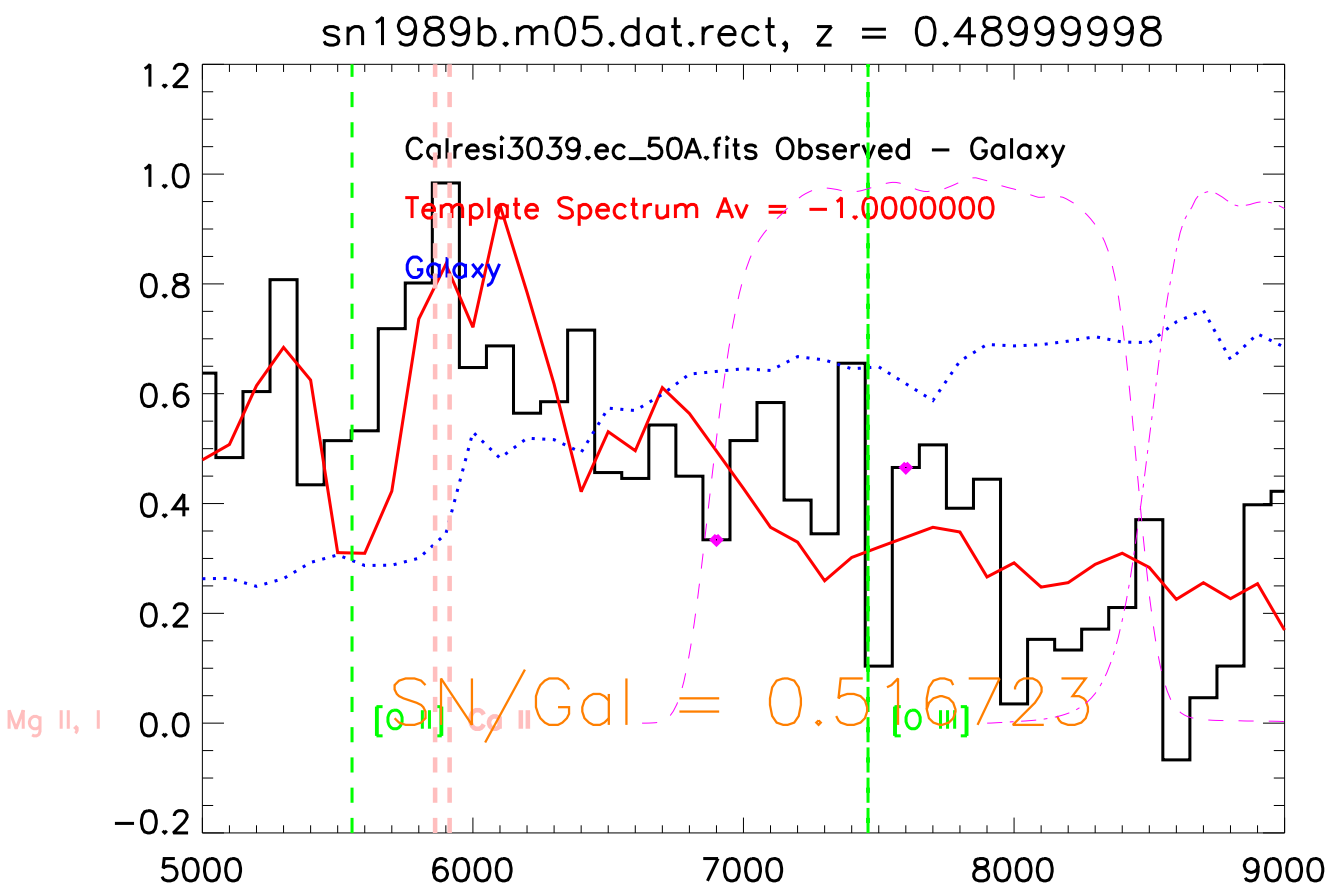

sn1998bu.m03.dat.rect, z = 0.48999998
Calresi3039.ec_50A.fits Observed − Galaxy
Template Spectrum Av = −1.0000000
Galaxy
SN/Gal = 0.744760
[O II]
[O III]
Mg II, I
1.2
1.0
0.8
0.6
0.4
0.2
0.0
5000
6000
7000
8000
9000

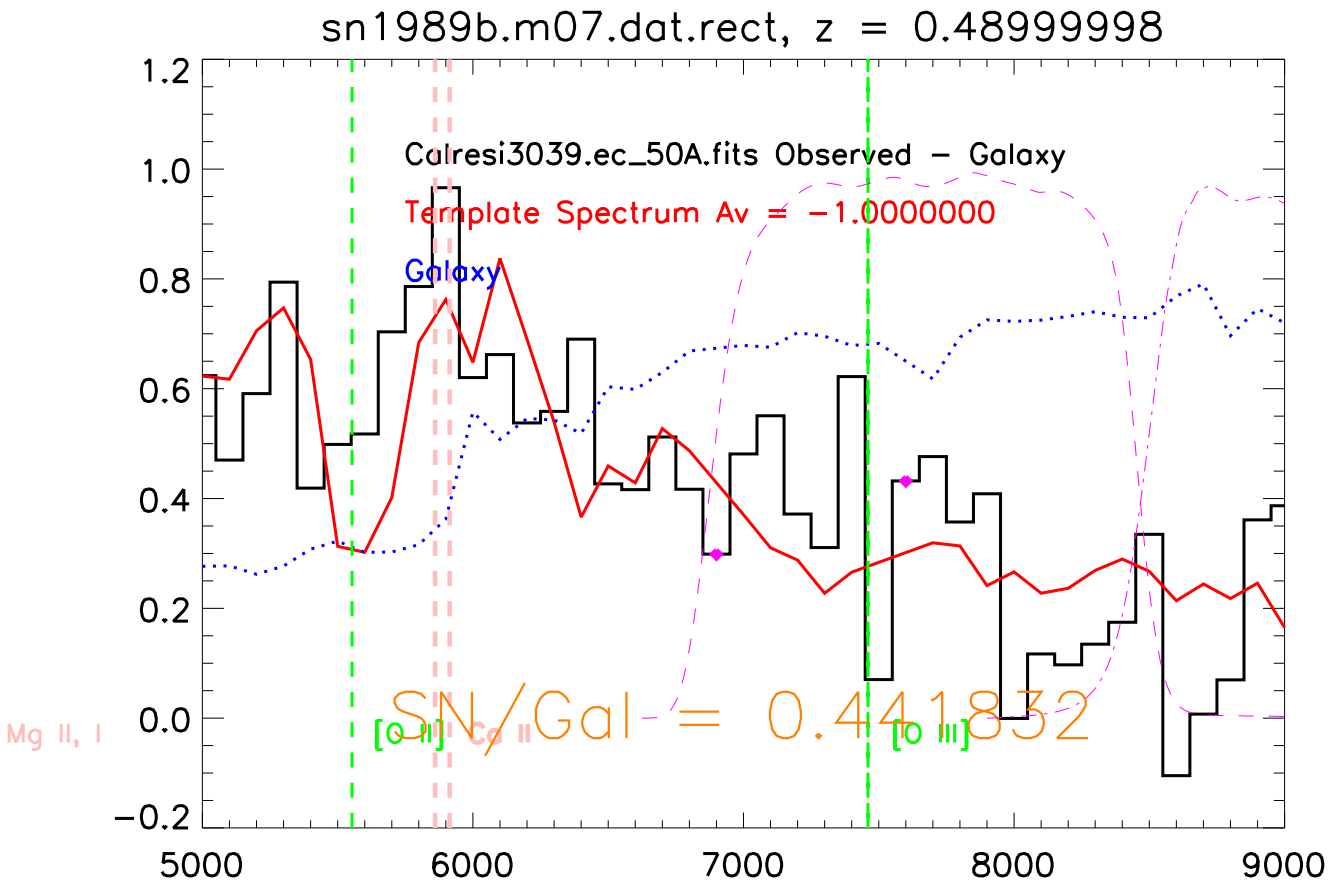

sn1999ee.m06.dat.rect, z = 0.47999999
Calresi3039.ec_50A.fits Observed − Galaxy
Template Spectrum Av = −1.0000000
Galaxy
SN/Gal = 0.382719
Mg II, I
[O II]
Ca II
[O III]
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
5000
6000
7000
8000
9000

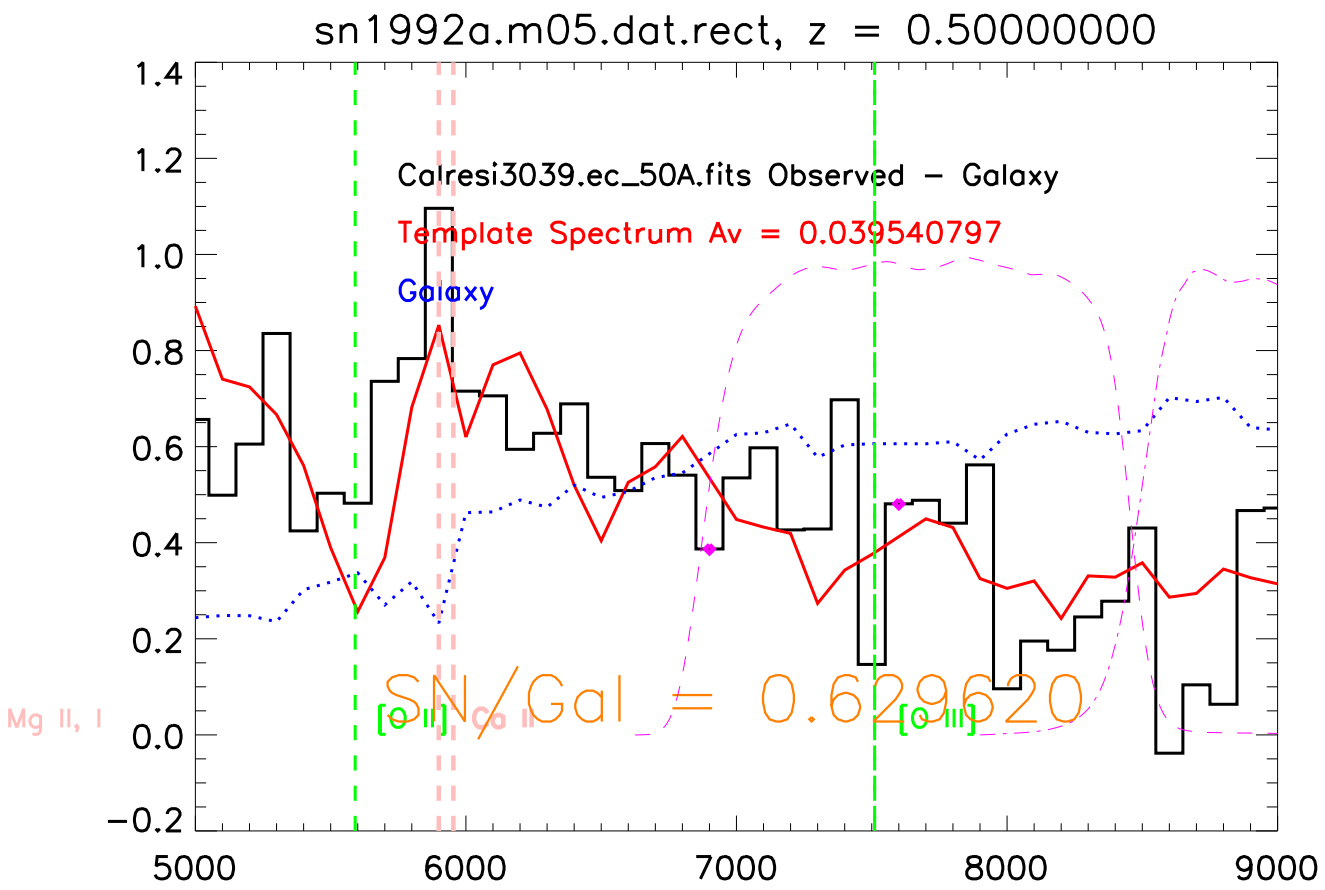

sn1996x.m00.dat.rect, z = 0.47999999
Calresi3039.ec_50A.fits Observed − Galaxy
Template Spectrum Av = −1.0000000
Galaxy
SN/Gal = 0.384233
Mg II, I
[O II]
Ca II
[O III]
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
5000
6000
7000
8000
9000

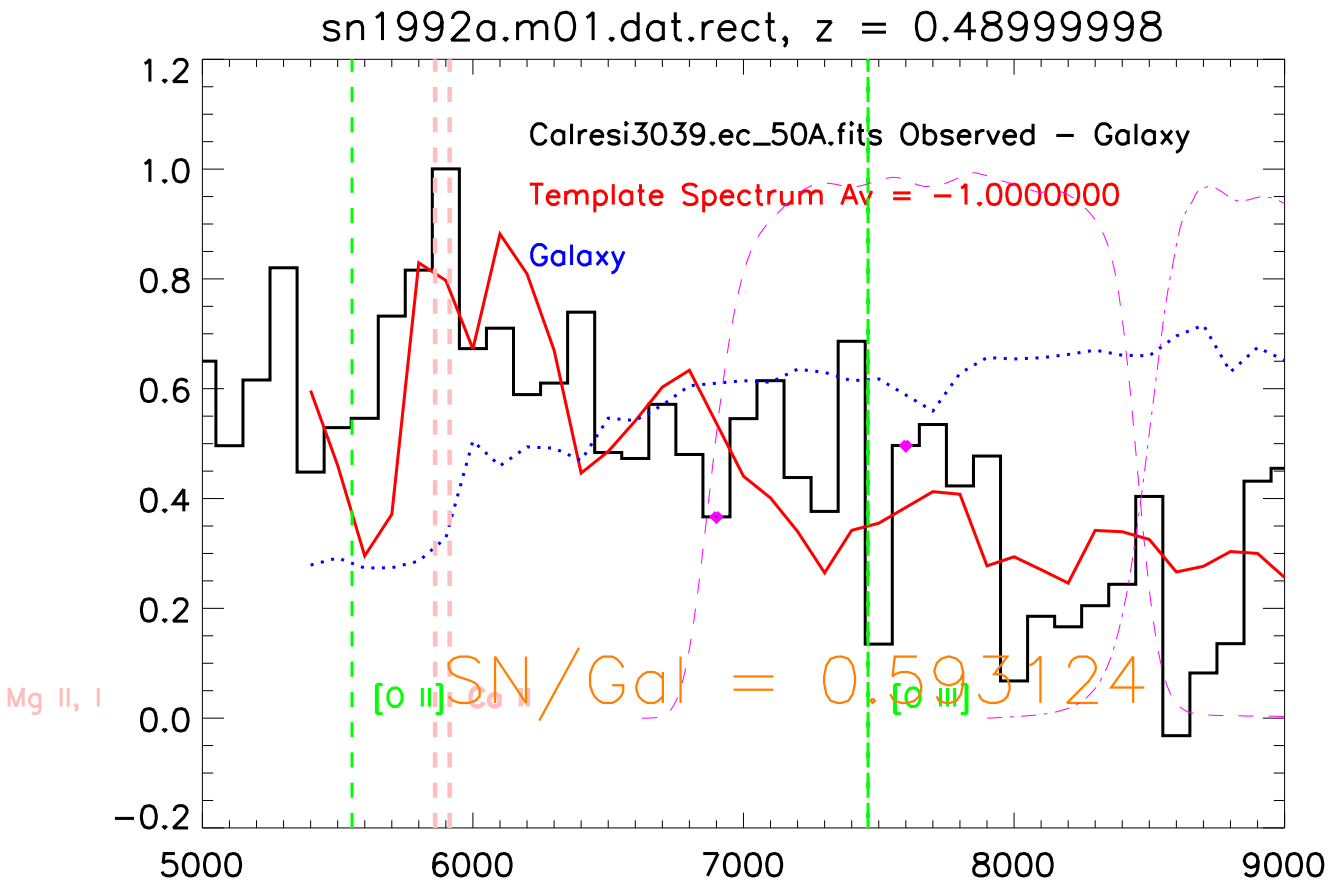

sn1998bu.m02.dat.rect, z = 0.48999998
Calresi3039.ec_50A.fits Observed − Galaxy
Template Spectrum Av = −1.0000000
Galaxy
SN/Gal = 0.835157
Mg II, I
[O II]
Ca II
[O III]
1.2
1.0
0.8
0.6
0.4
0.2
0.0
5000
6000
7000
8000
9000

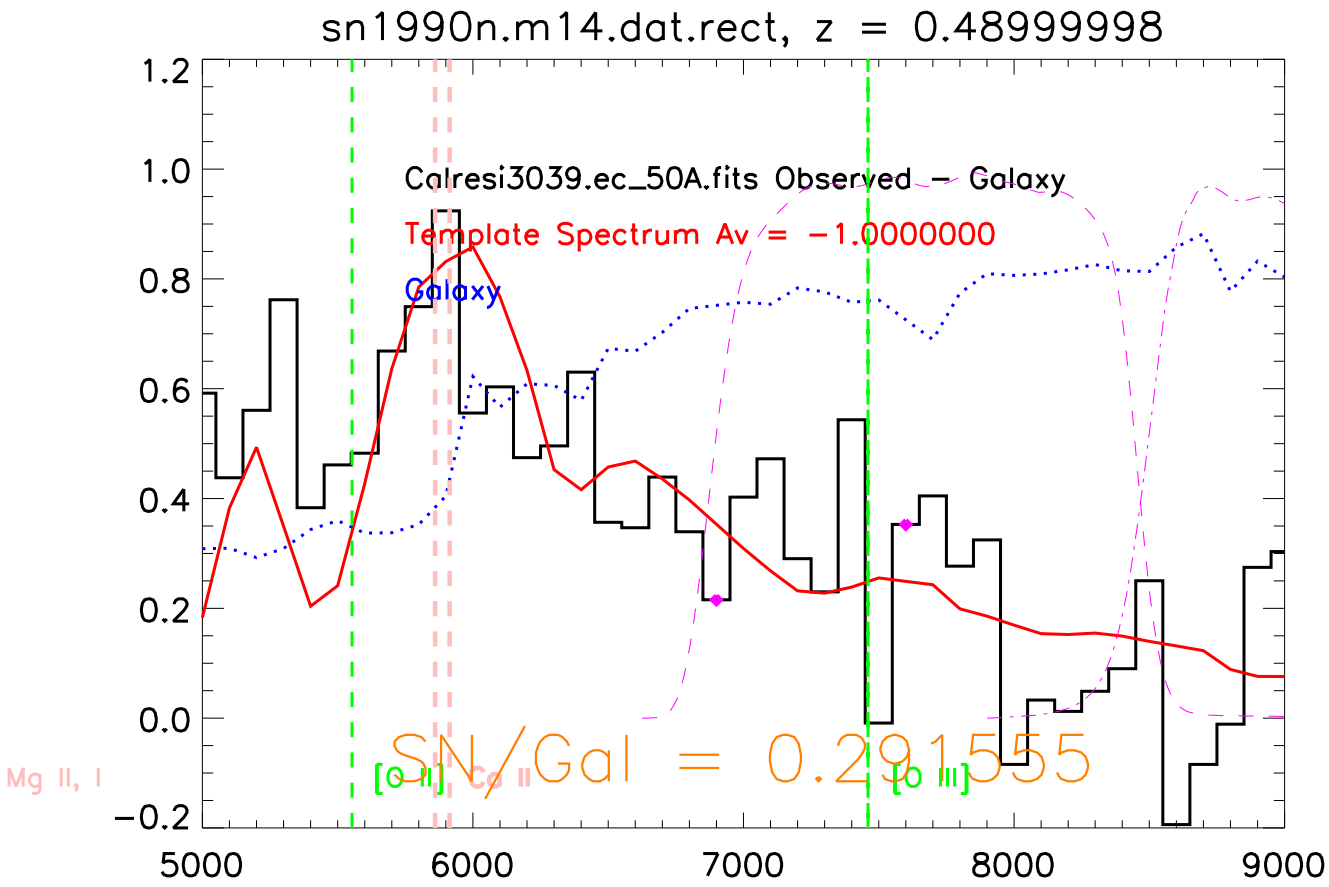

sn1999ee.m08.dat.rect, z = 0.48999998
Calresi3039.ec_50A.fits Observed − Galaxy
Template Spectrum Av = −1.0000000
Galaxy
SN/Gal = 0.421619
Mg II, I
[O II]
Ca II
[O III]
1.2
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
5000
6000
7000
8000
9000

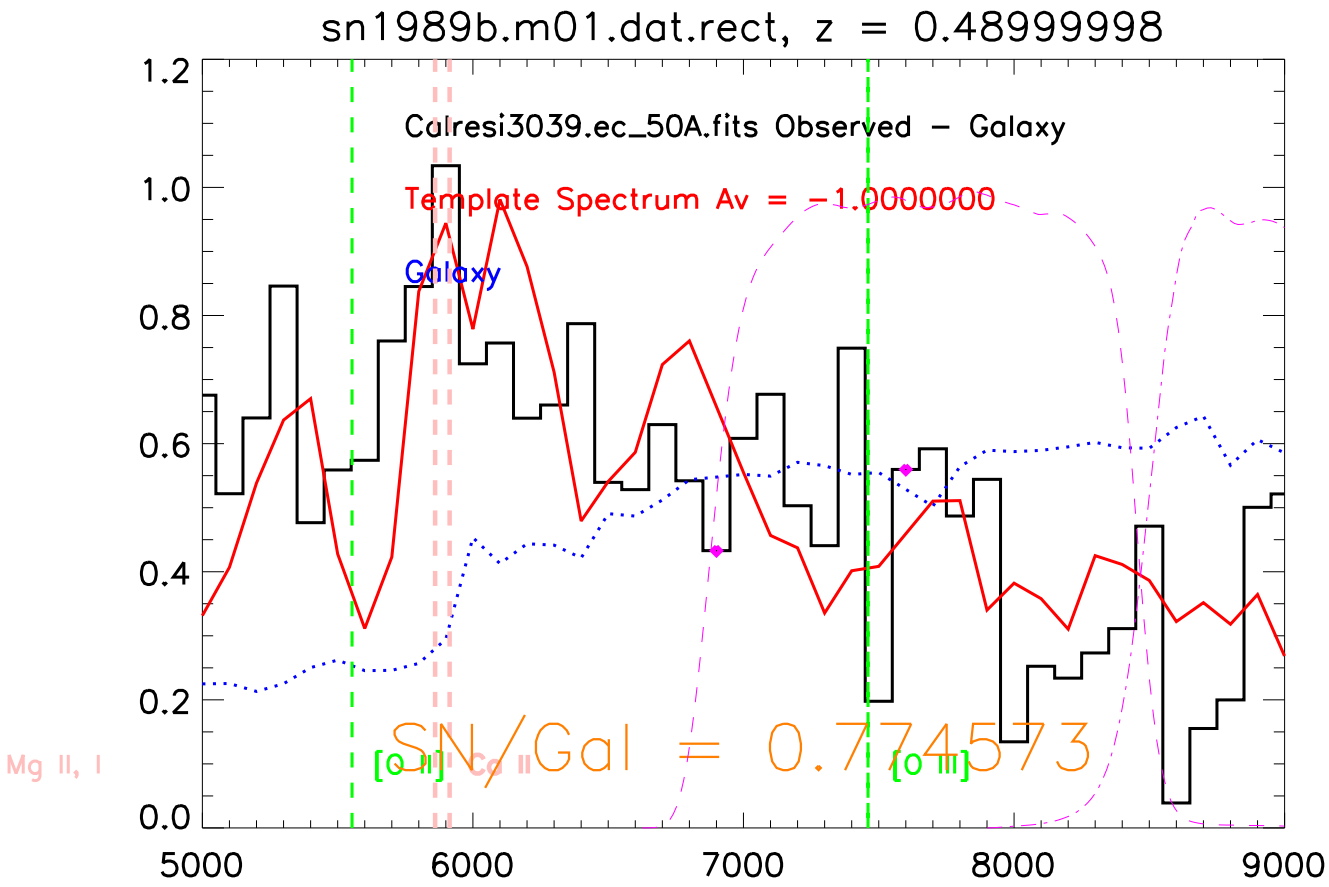

sn1989b.m05.dat.rect, z = 0.48999998
Calresi3039.ec_50A.fits Observed − Galaxy
Template Spectrum Av = −1.0000000
Galaxy
SN/Gal = 0.516723
Mg II, I
[O II]
Ca II
[O III]
1.2
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
5000
6000
7000
8000
9000

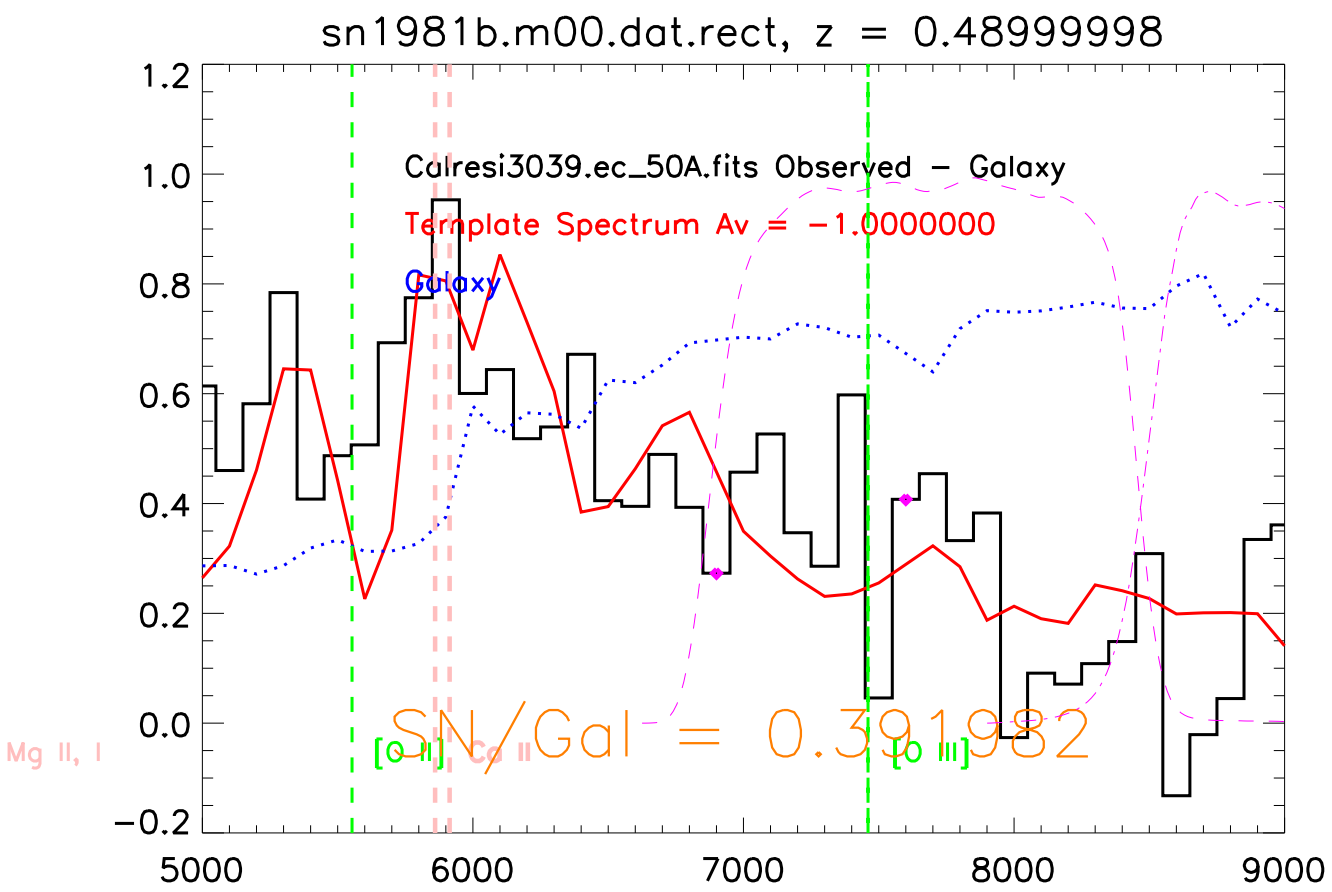

sn1989b.m07.dat.rect, z = 0.48999998
Calresi3039.ec_50A.fits Observed − Galaxy
Template Spectrum Av = −1.0000000
Galaxy
SN/Gal = 0.441832
Mg II, I
[O II]
Ca II
[O III]
1.2
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
5000
6000
7000
8000
9000

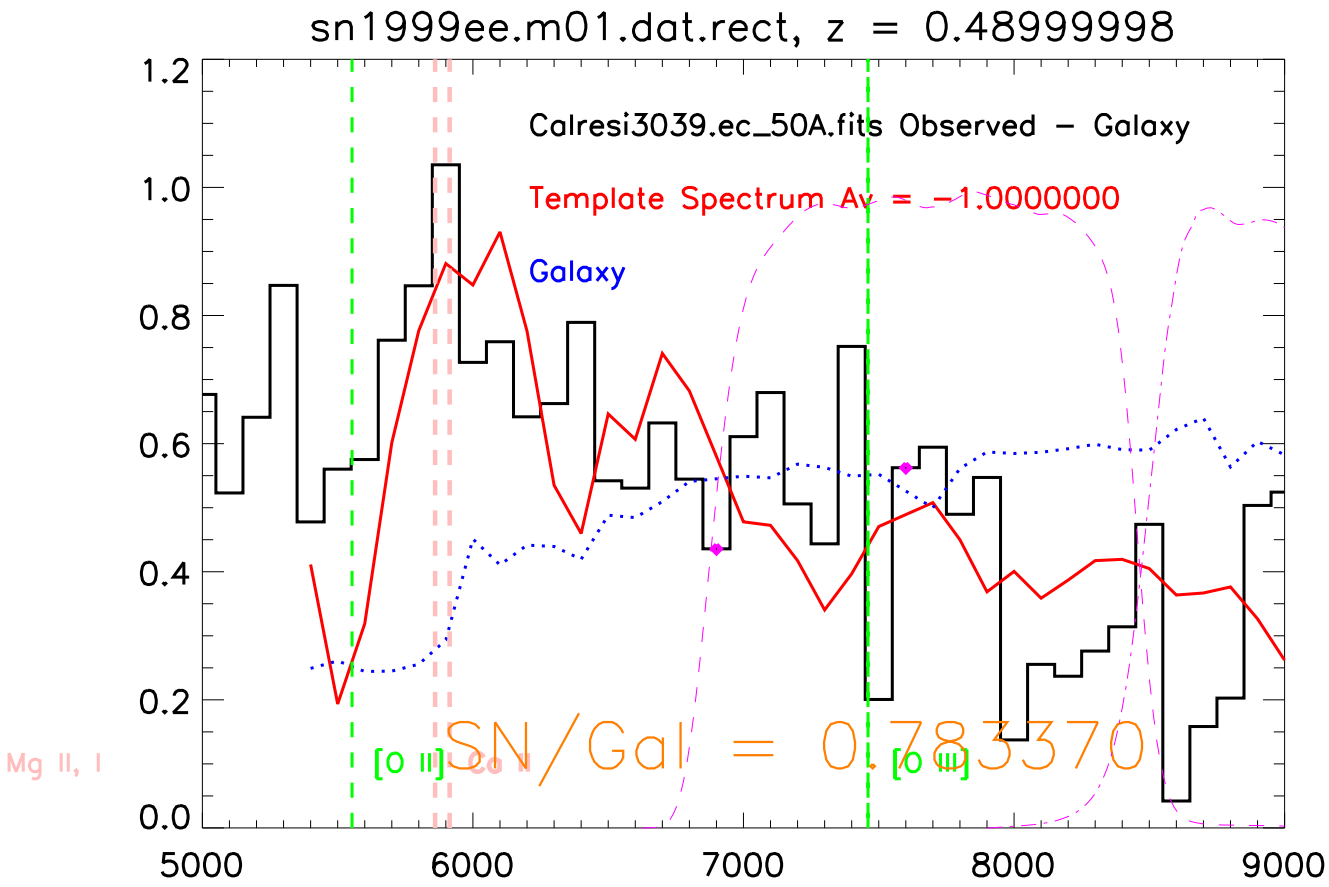

sn1992a.m05.dat.rect, z = 0.50000000
Calresi3039.ec_50A.fits Observed − Galaxy
Template Spectrum Av = 0.039540797
Galaxy
SN/Gal = 0.629620
Mg II, I
[O II]
Ca II
[O III]
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
5000
6000
7000
8000
9000

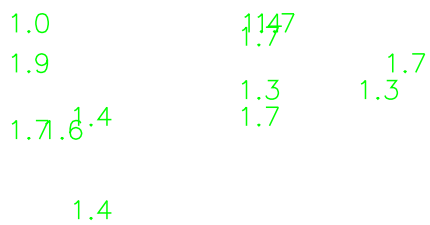

sn1992a.m01.dat.rect, z = 0.48999998
Calresi3039.ec_50A.fits Observed − Galaxy
Template Spectrum Av = −1.0000000
Galaxy
SN/Gal = 0.593124
[O II]
Ca II
[O III]
Mg II, I
1.2
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
5000
6000
7000
8000
9000

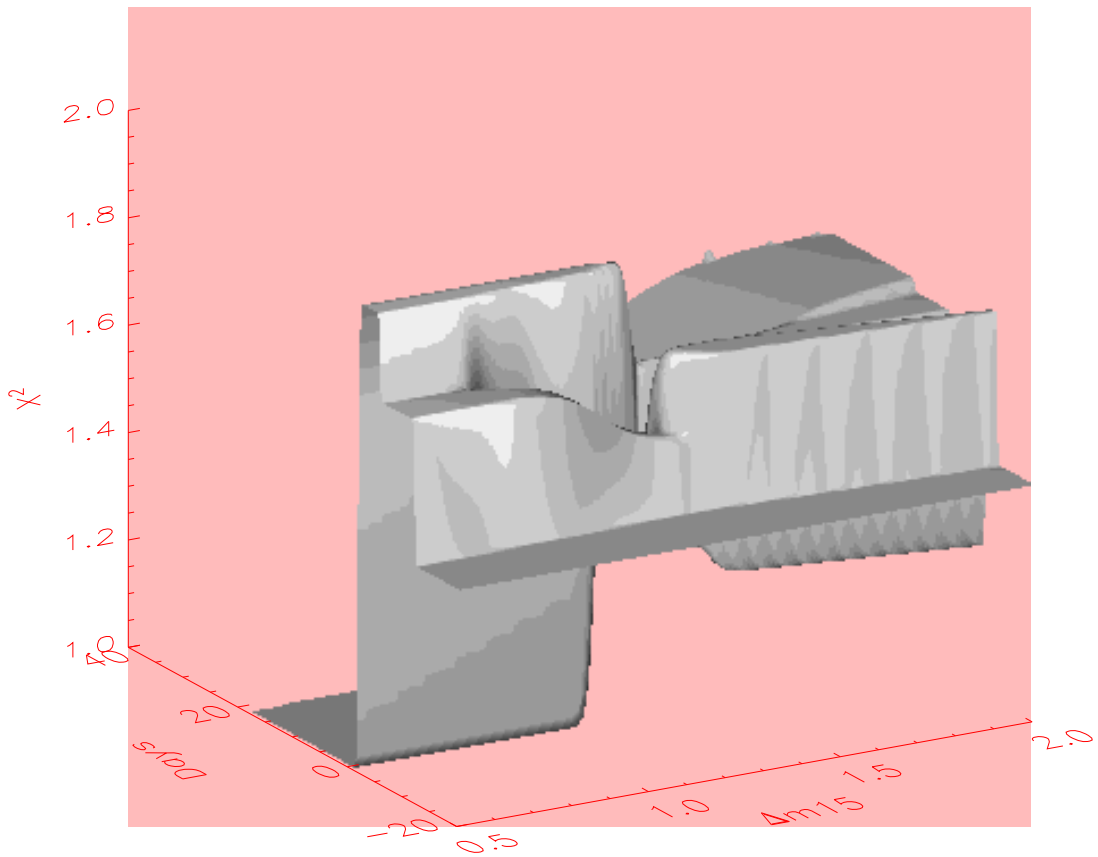

sn1990n.m14.dat.rect, z = 0.48999998
Calresi3039.ec_50A.fits Observed – Galaxy
Template Spectrum Av = −1.0000000
Galaxy
SN/Gal = 0.291555
Mg II, I
[O II]
Ca II
[O III]
1.2
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
5000
6000
7000
8000
9000

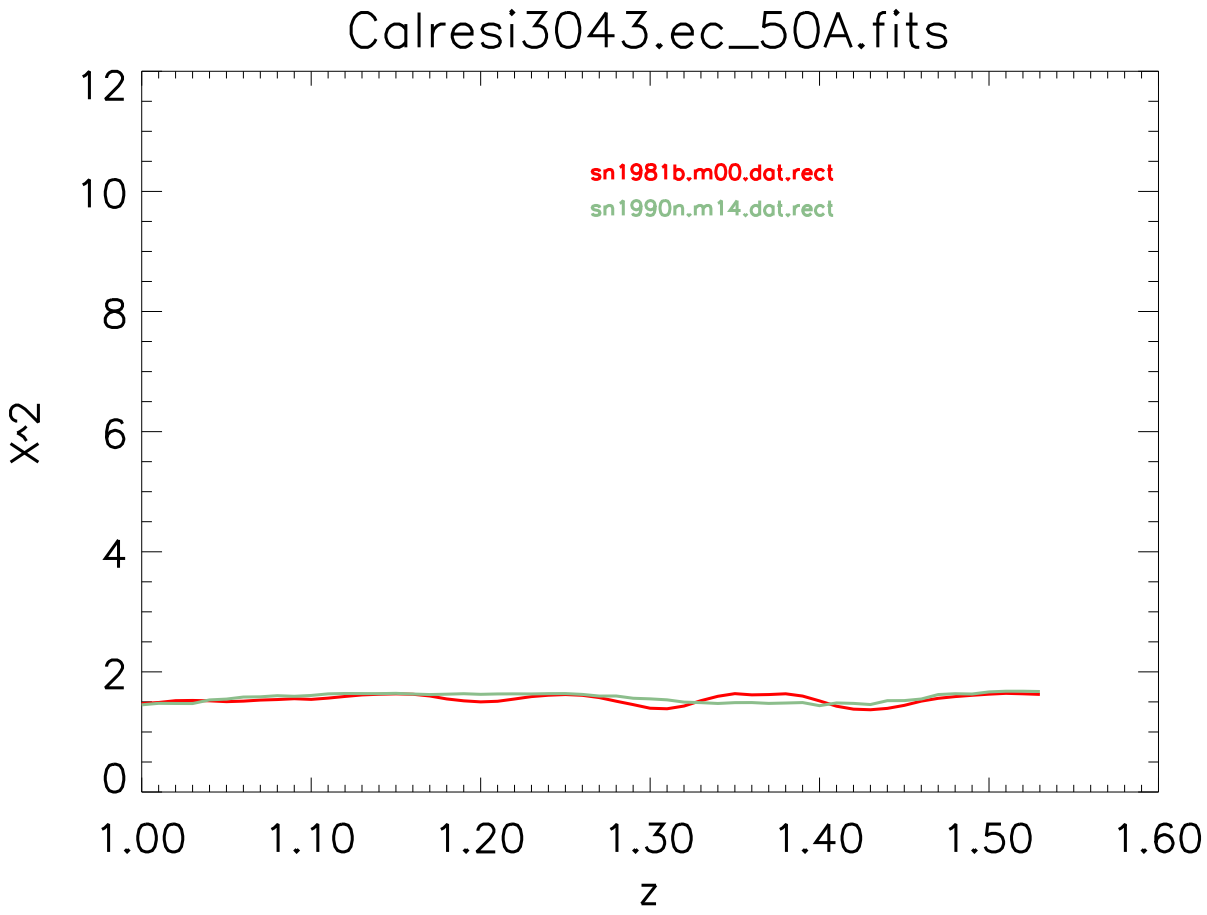

sn1989b.m01.dat.rect, z = 0.48999998
Calresi3039.ec_50A.fits Observed − Galaxy
Template Spectrum Av = −1.0000000
Galaxy
SN/Gal = 0.774573
Mg II, I
[O II]
Ca II
[O III]
1.2
1.0
0.8
0.6
0.4
0.2
0.0
5000
6000
7000
8000
9000

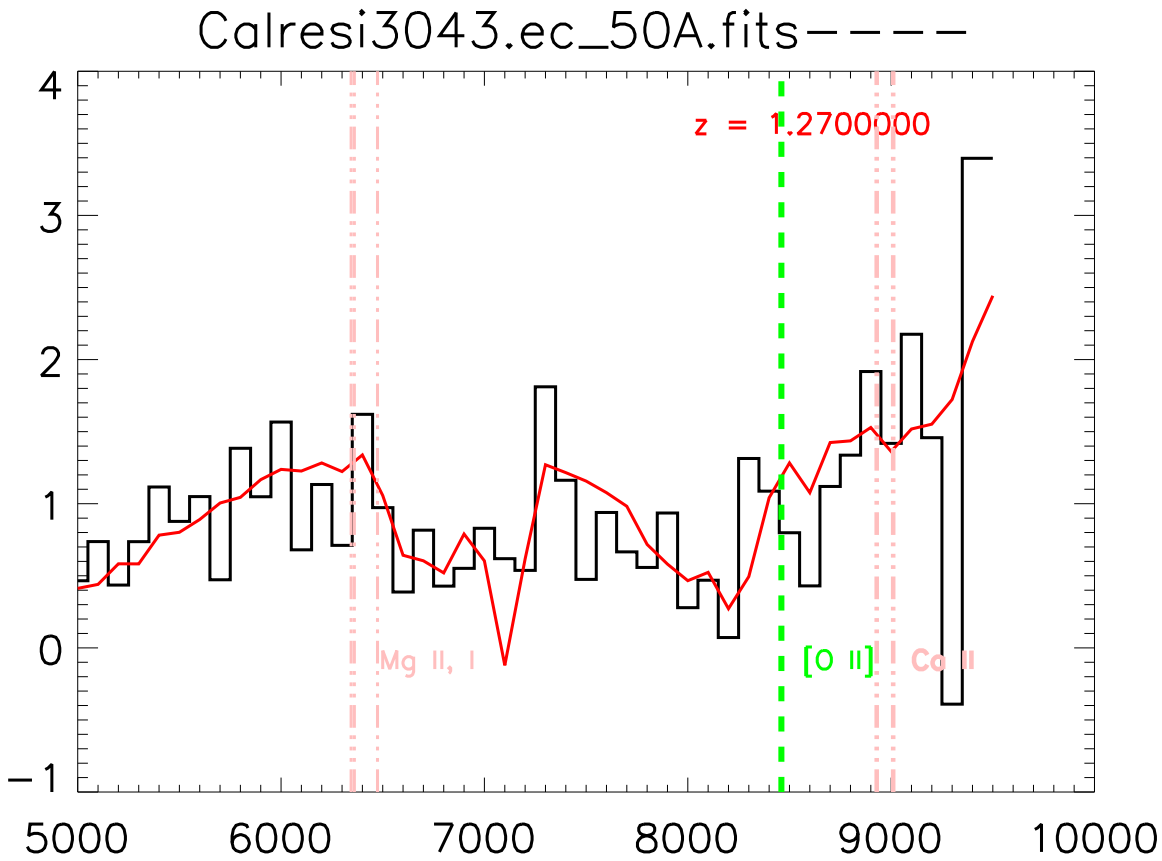

sn1981b.m00.dat.rect, z = 0.48999998
Calresi3039.ec_50A.fits Observed − Galaxy
Template Spectrum Av = −1.0000000
Galaxy
SN/Gal = 0.391982
Mg II, I
[O II]
Ca II
[O III]
1.2
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
5000
6000
7000
8000
9000

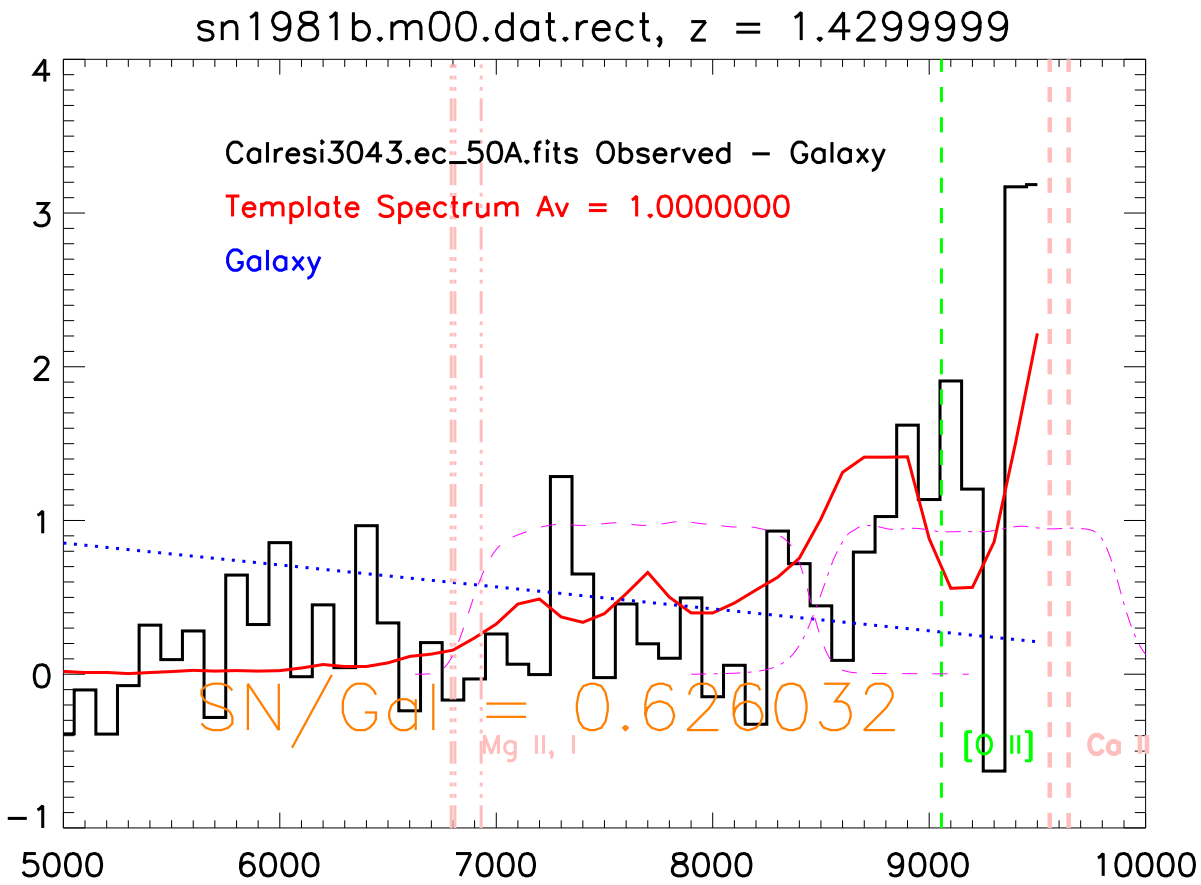

sn1999ee.m01.dat.rect, z = 0.48999998
Calresi3039.ec_50A.fits Observed − Galaxy
Template Spectrum Av = −1.0000000
Galaxy
SN/Gal = 0.783370
[O II]
[O III]
1.2
1.0
0.8
0.6
0.4
0.2
0.0
5000
6000
7000
8000
9000

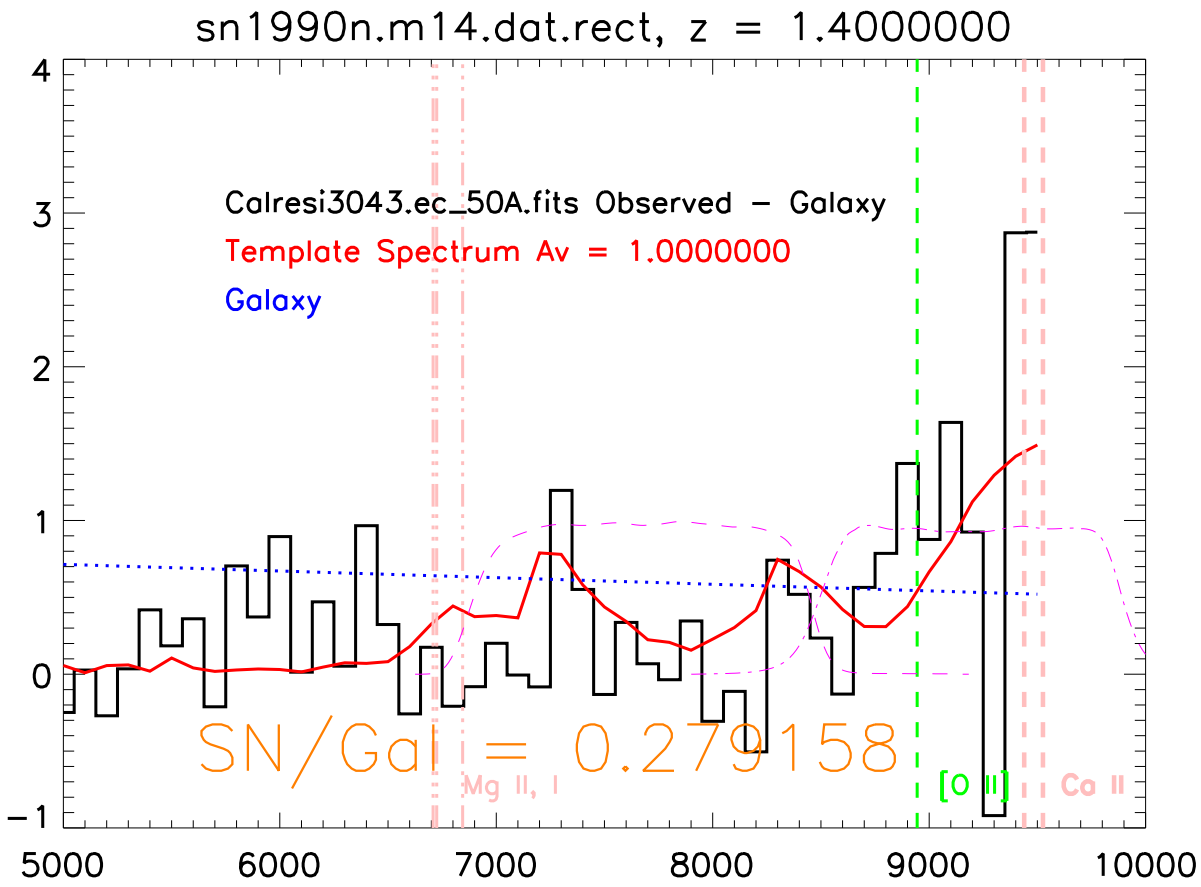

1.0
1.9
1.7
1.6
1.4
1.4
1.7
1.7
1.3
1.3
1.7

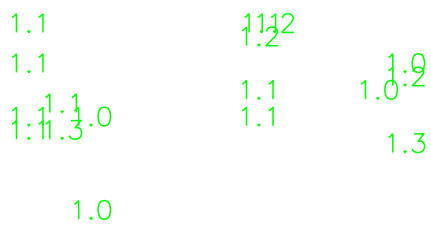

2.0
1.8
1.6
1.4
1.2
1.0
χ²
40
20
0
−20
Dots
0.5
1.0
1.5
2.0
Δm15

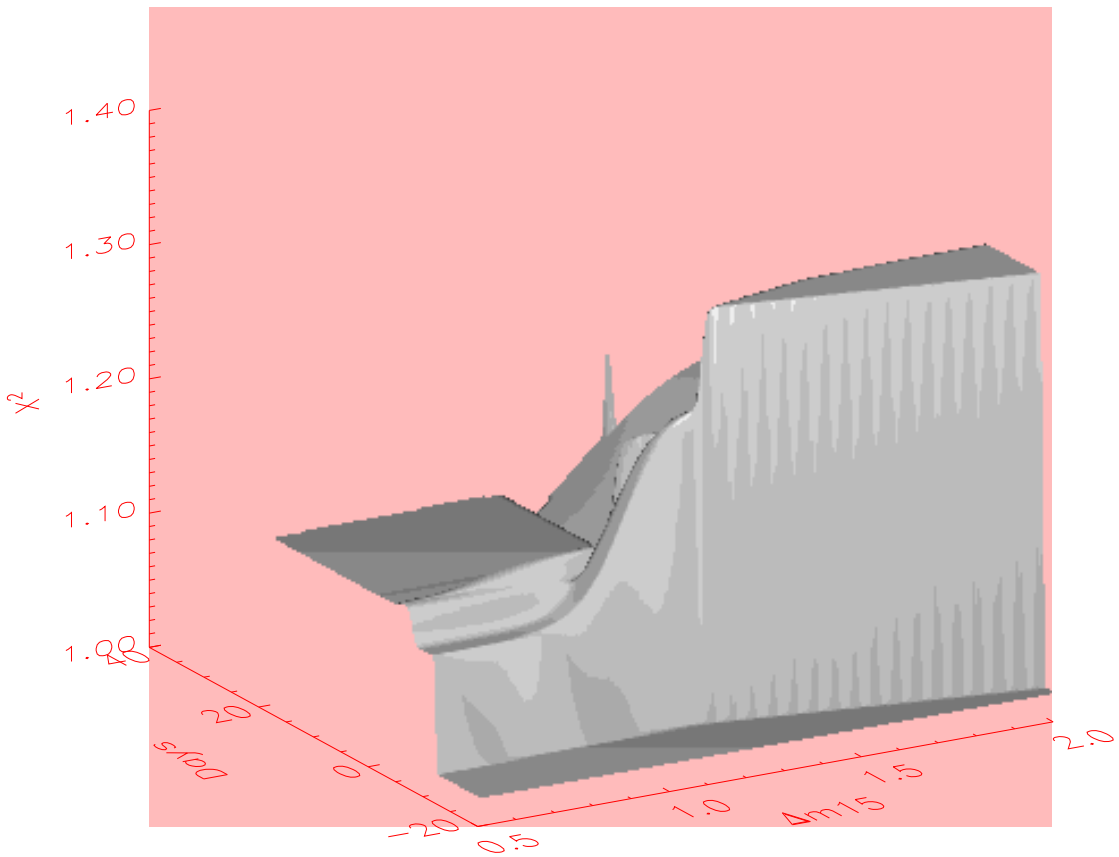

Calresi3043.ec_50A.fits
sn1981b.m00.dat.rect
sn1990n.m14.dat.rect
X^2
z
0
2
4
6
8
10
12
1.00
1.10
1.20
1.30
1.40
1.50
1.60

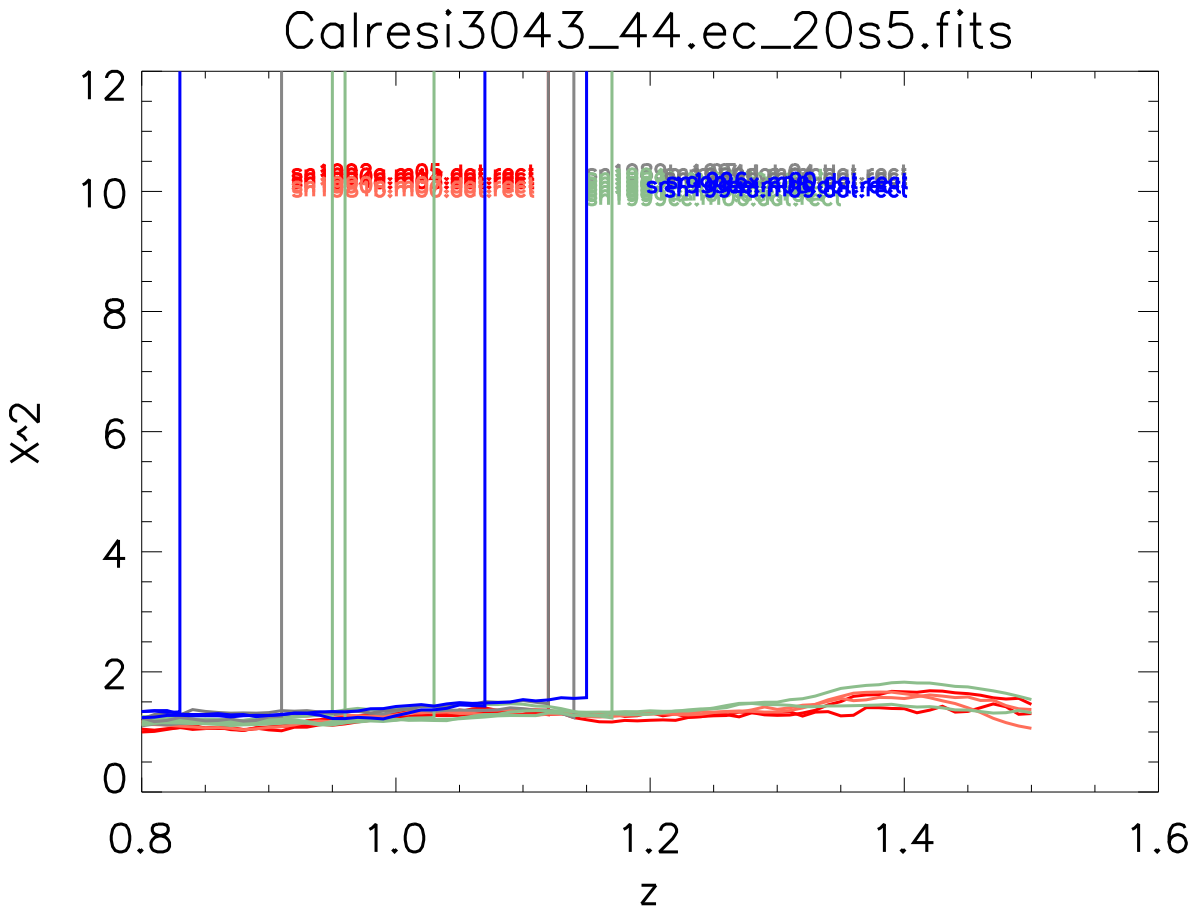

CaIresi3043.ec_50A.fits----
z = 1.2700000
Mg II, I
[O II]
Ca II
4
3
2
1
0
−1
5000
6000
7000
8000
9000
10000

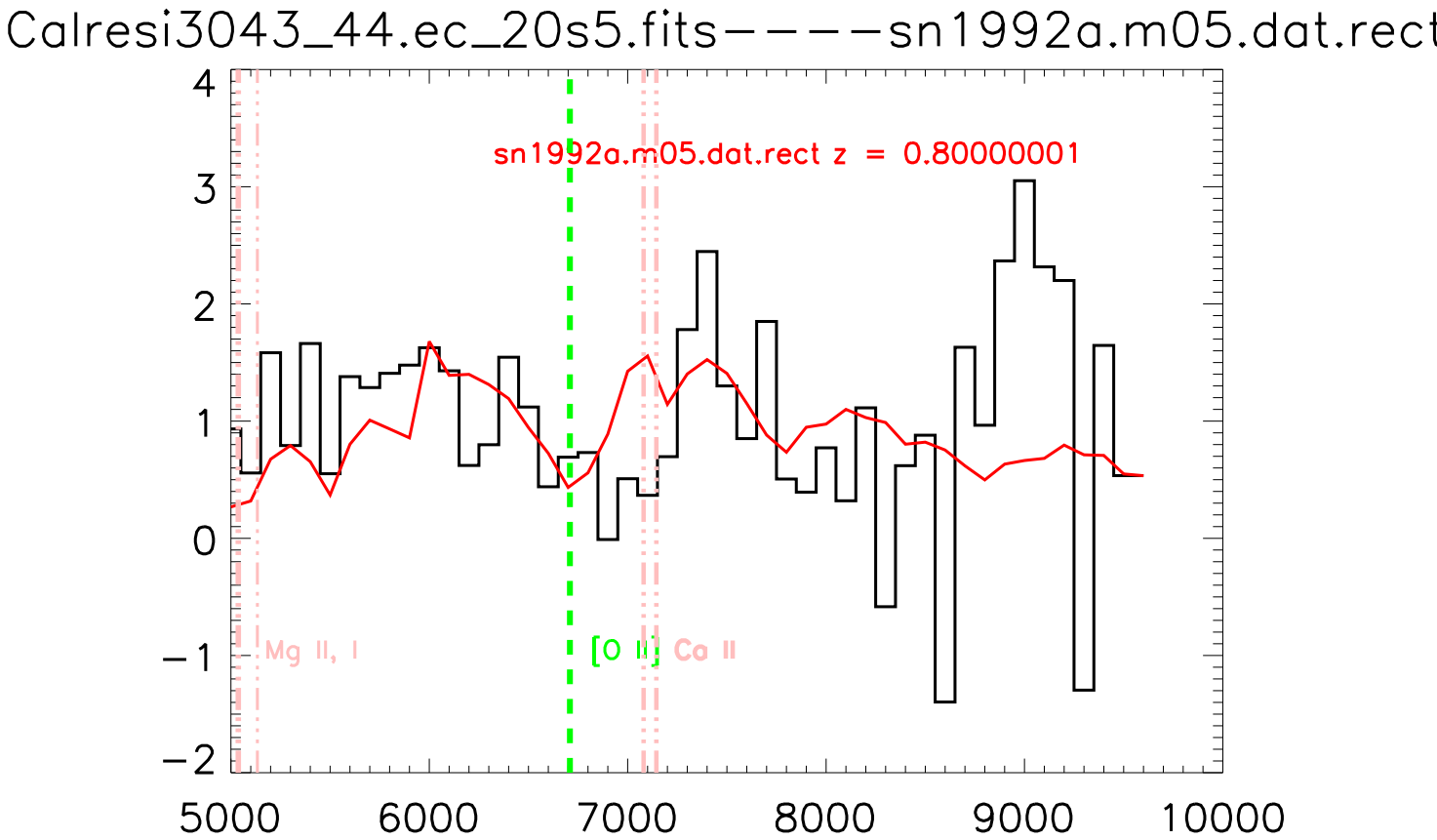

sn1981b.m00.dat.rect, z = 1.4299999
Calresi3043.ec_50A.fits Observed − Galaxy
Template Spectrum Av = 1.0000000
Galaxy
SN/Gal = 0.6266032
Mg II, I
[O III]
Ca II
4
3
2
1
0
−1
5000
6000
7000
8000
9000
10000

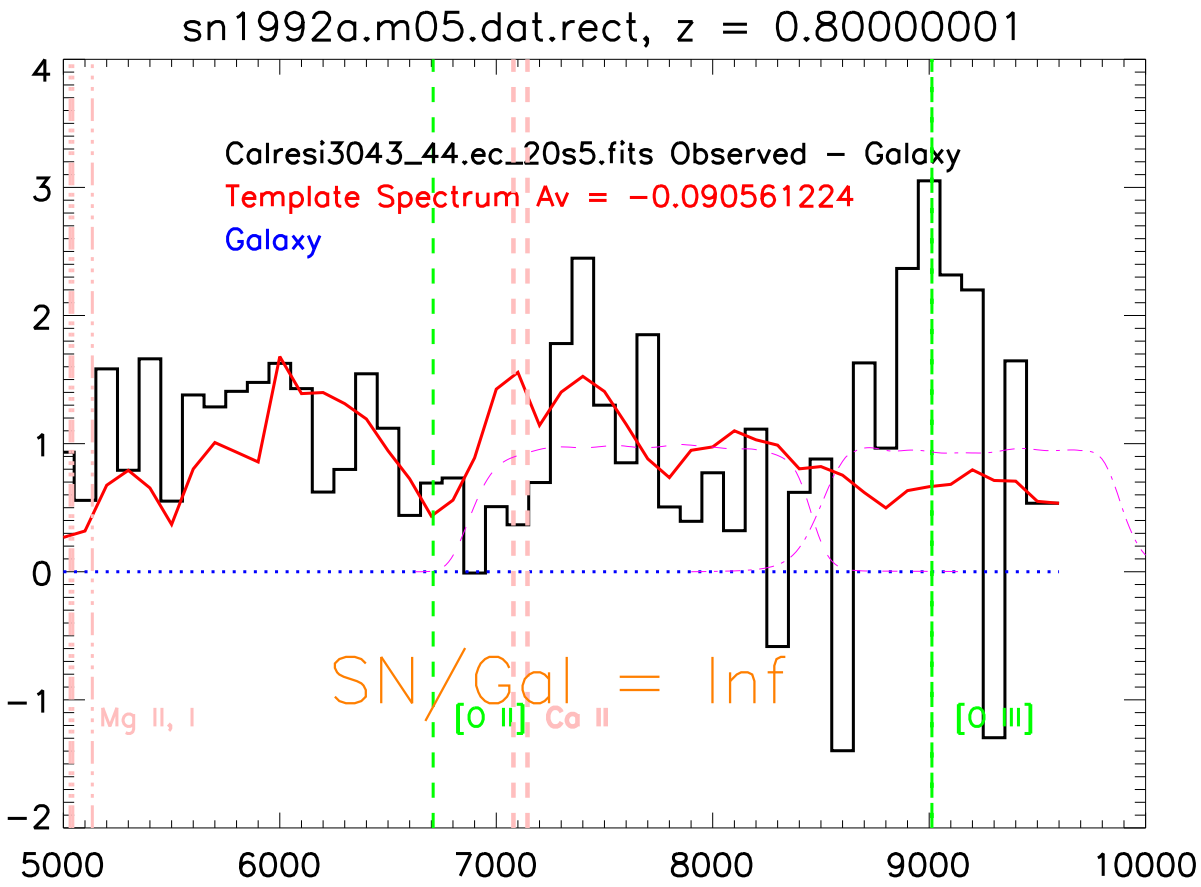

sn1990n.m14.dat.rect, z = 1.4000000
Calresi3043.ec_50A.fits Observed − Galaxy
Template Spectrum Av = 1.0000000
Galaxy
SN/Gal = 0.279158
Mg II, I
[O II]
Ca II
4
3
2
1
0
−1
5000
6000
7000
8000
9000
10000

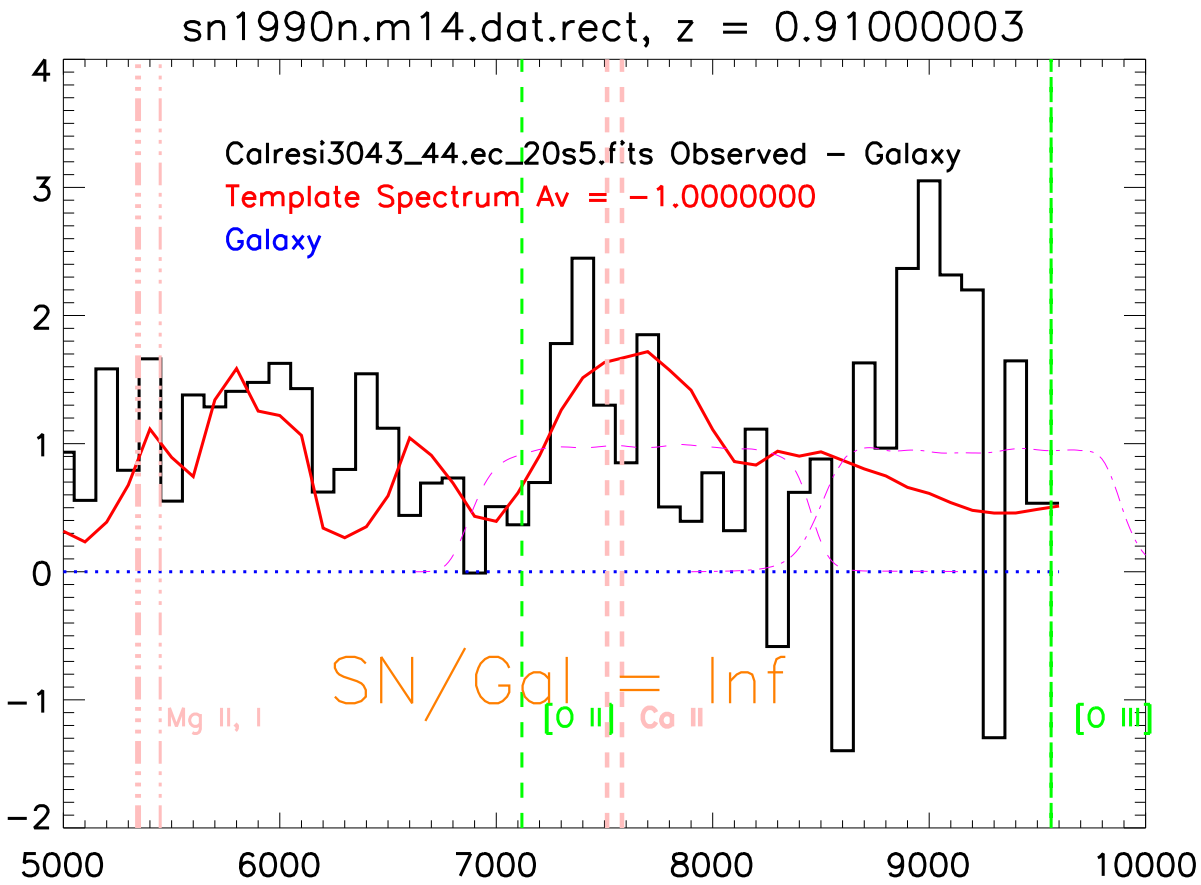

1.1
1.1
1.1
1.1
1.1
1.3
1.0
1.1
1.2
1.1
1.1
1.0
1.2
1.3

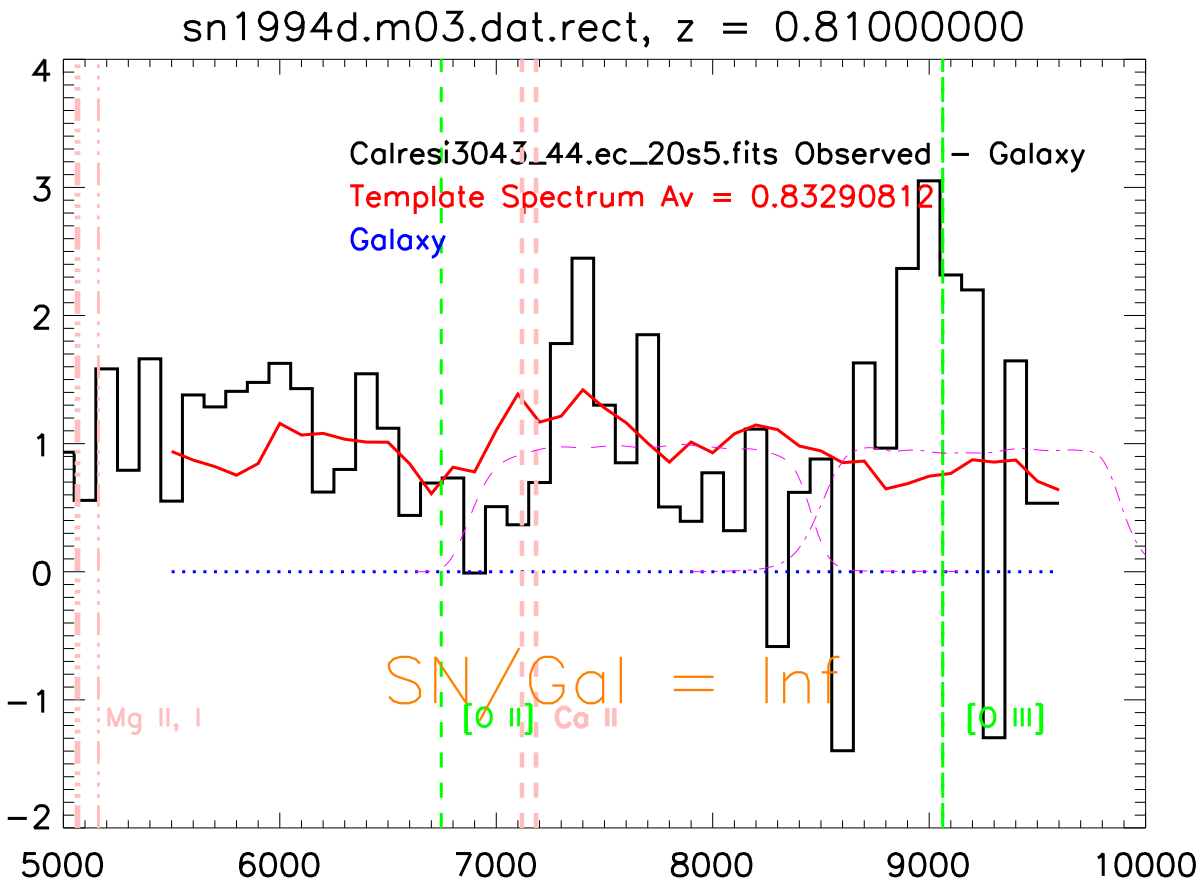

1.40
1.30
1.20
1.10
1.00
χ²
40
20
0
−20
Δm15
0.5
1.0
1.5
2.0

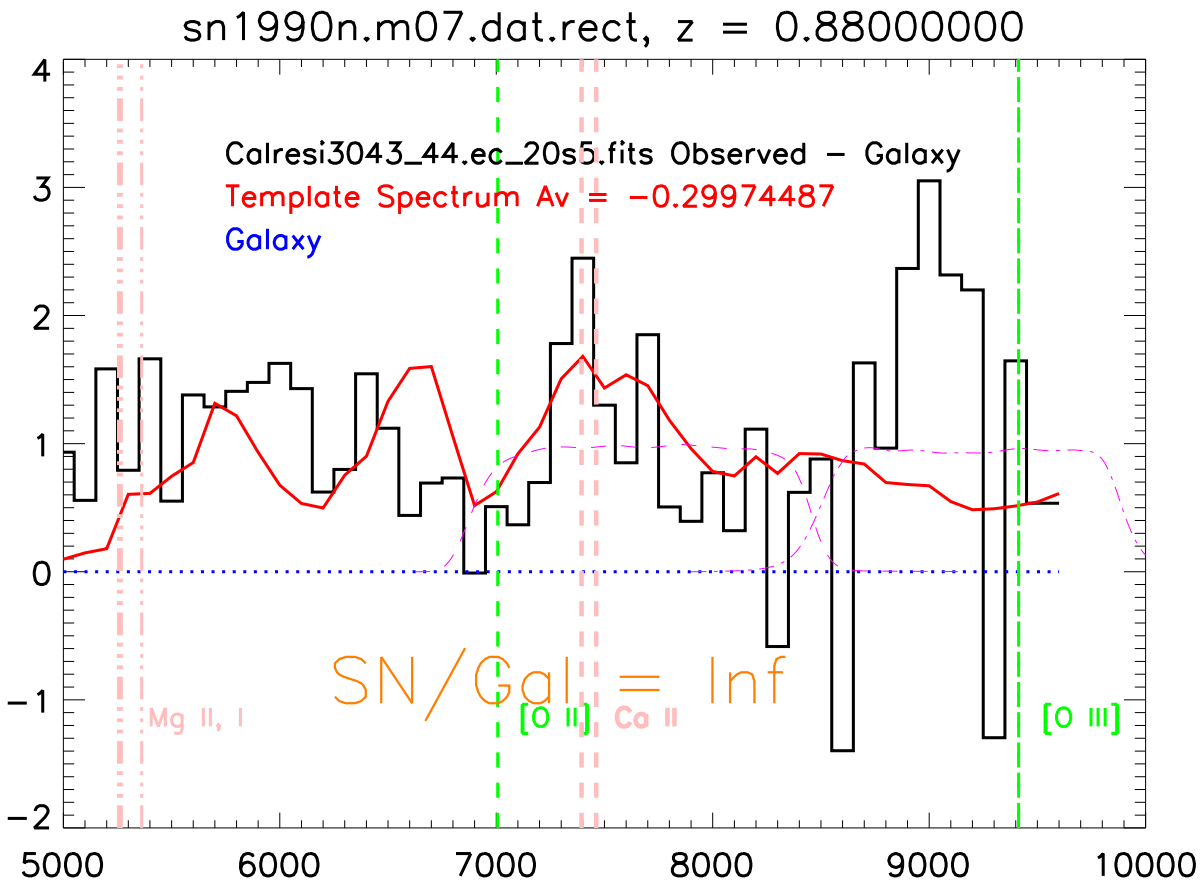

Calresi3043_44.ec_20s5.fits
X^2
z
0
2
4
6
8
10
12
0.8
1.0
1.2
1.4
1.6

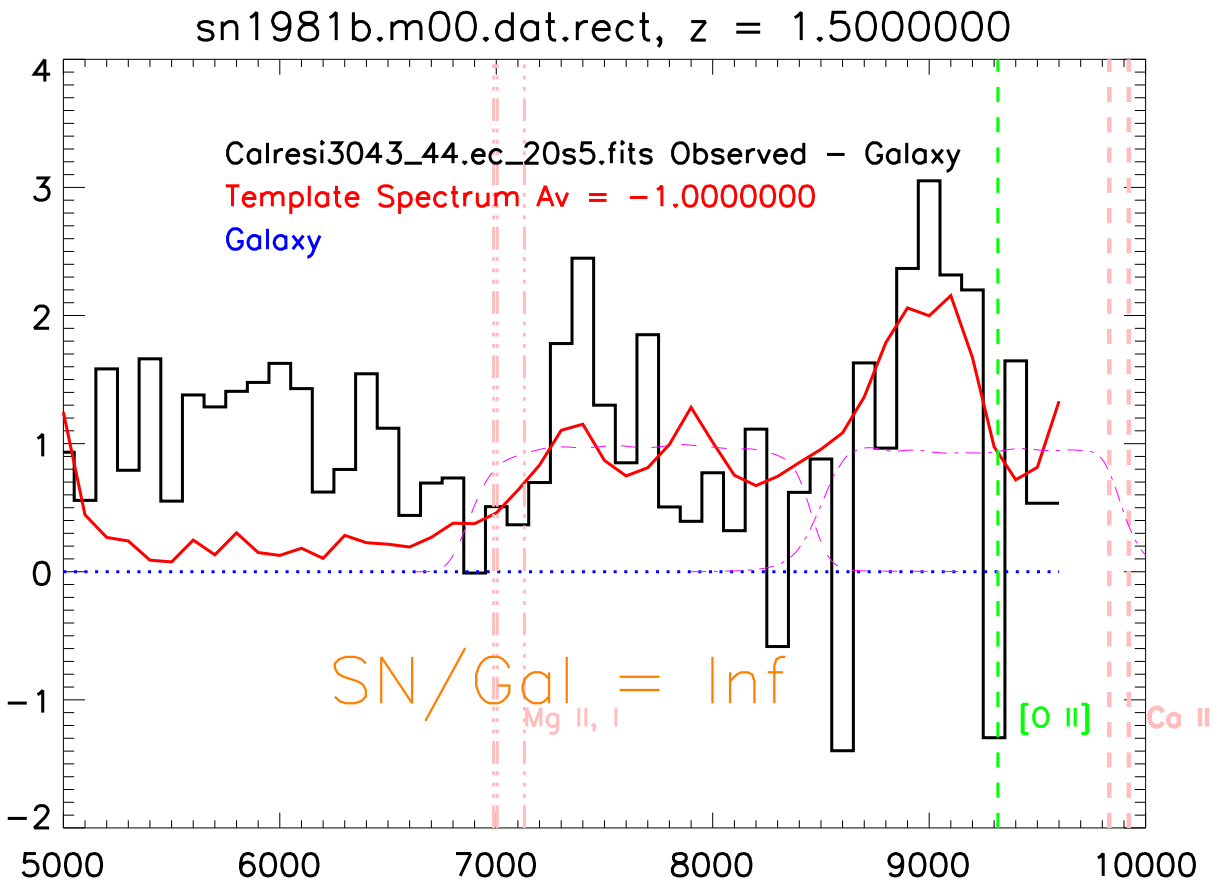

Calresi3043_44.ec_20s5.fits----sn1992a.m05.dat.rect
sn1992a.m05.dat.rect z = 0.80000001
Mg II, I
[O II]
Ca II
4
3
2
1
0
−1
−2
5000
6000
7000
8000
9000
10000

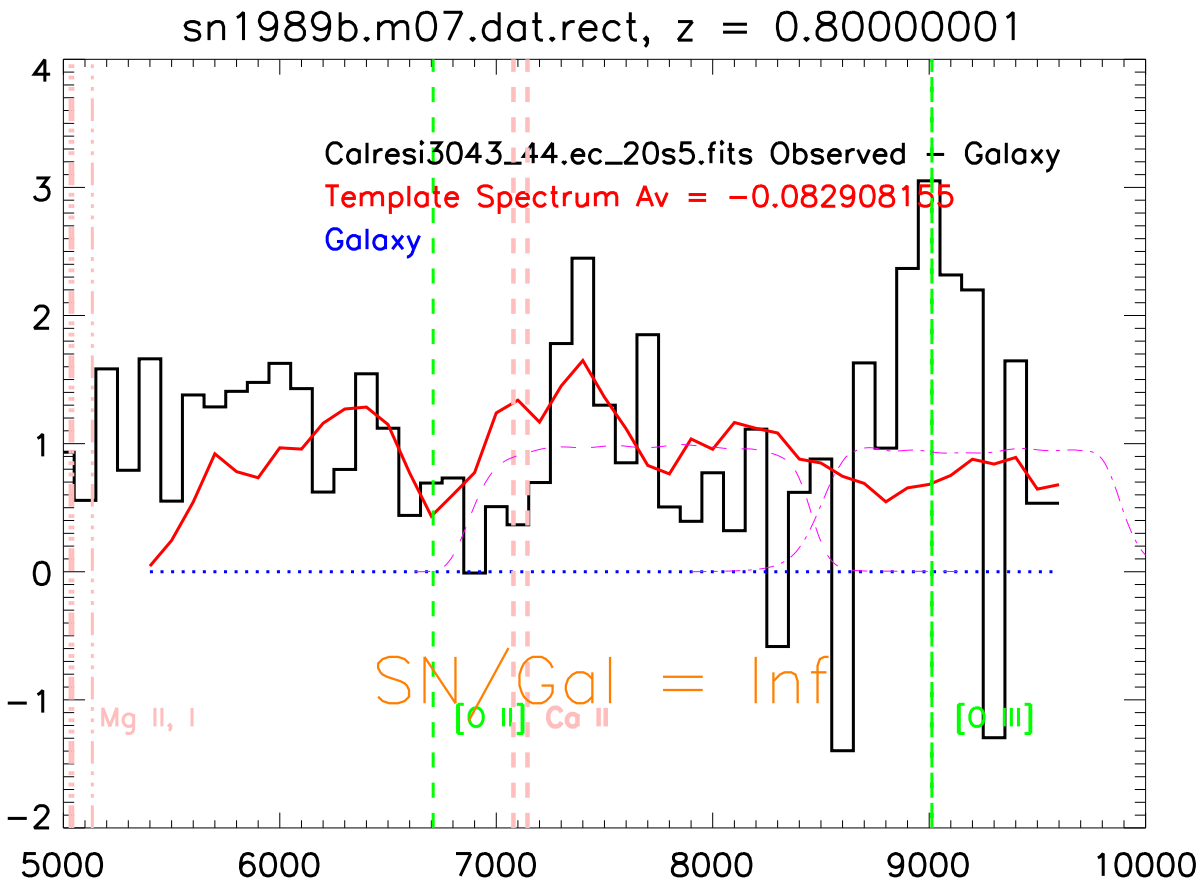

sn1992a.m05.dat.rect, z = 0.80000001
Calresi3043_44.ec_20s5.fits Observed − Galaxy
Template Spectrum Av = −0.090561224
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
4
3
2
1
0
−1
−2
5000
6000
7000
8000
9000
10000

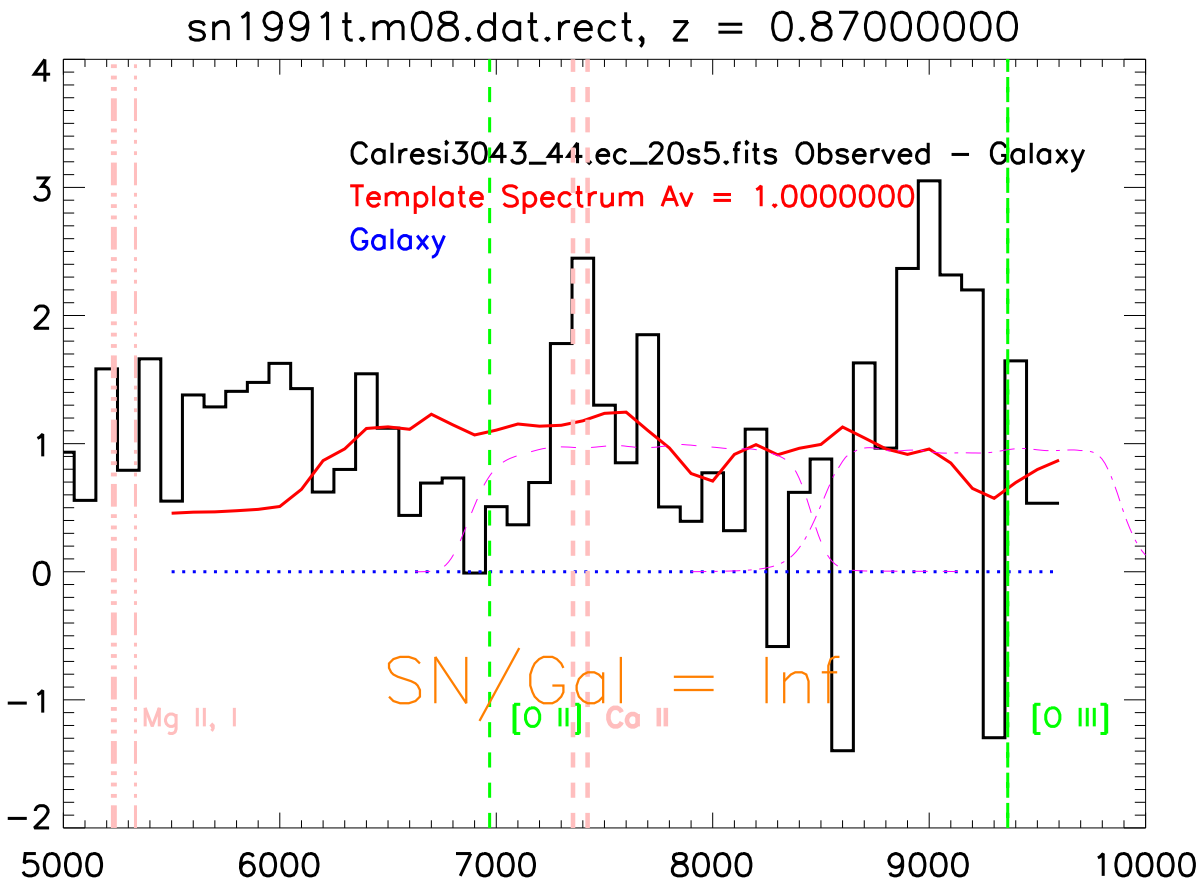

sn1990n.m14.dat.rect, z = 0.91000003
Calresi3043_44.ec_20s5.fits Observed − Galaxy
Template Spectrum Av = −1.0000000
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
4
3
2
1
0
−1
−2
5000
6000
7000
8000
9000
10000

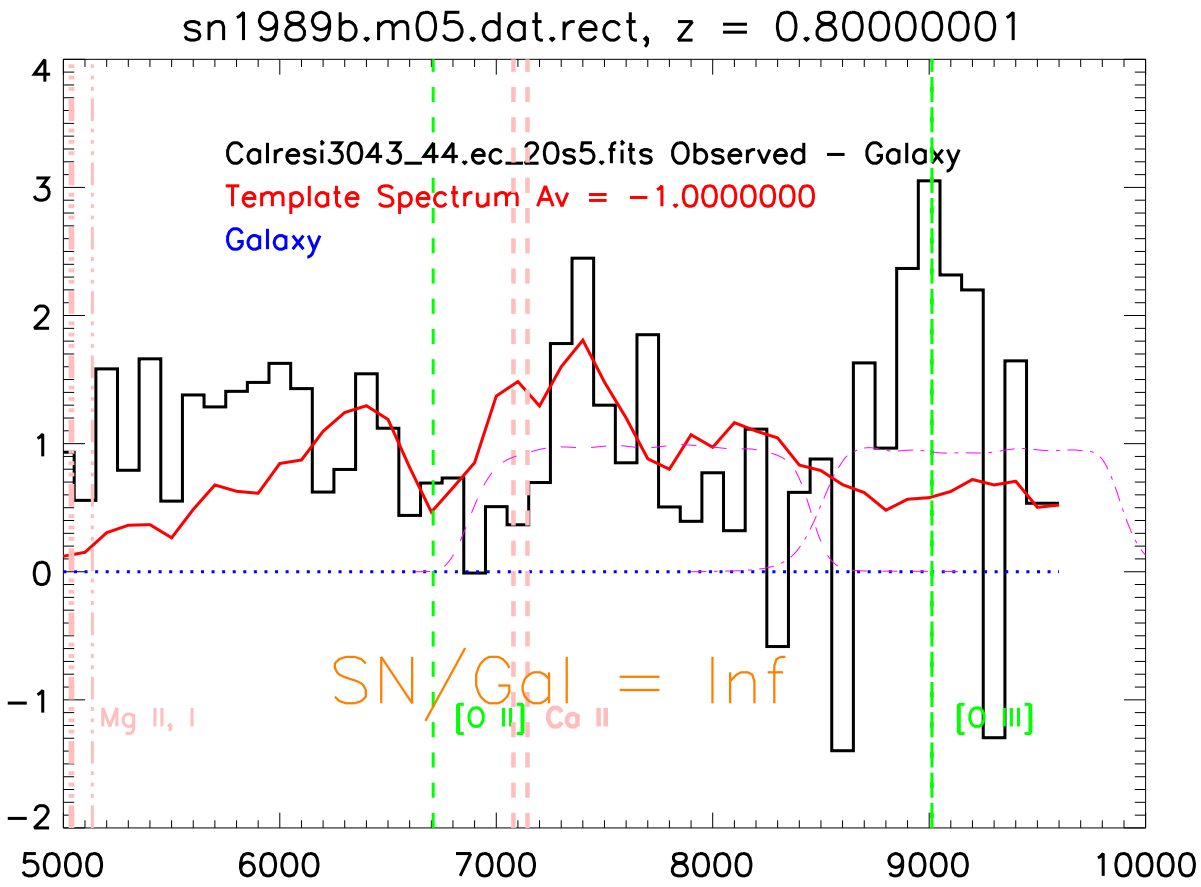

sn1994d.m03.dat.rect, z = 0.81000000
Calresi3043_44.ec_20s5.fits Observed − Galaxy
Template Spectrum Av = 0.83290812
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
4
3
2
1
0
−1
−2
5000
6000
7000
8000
9000
10000

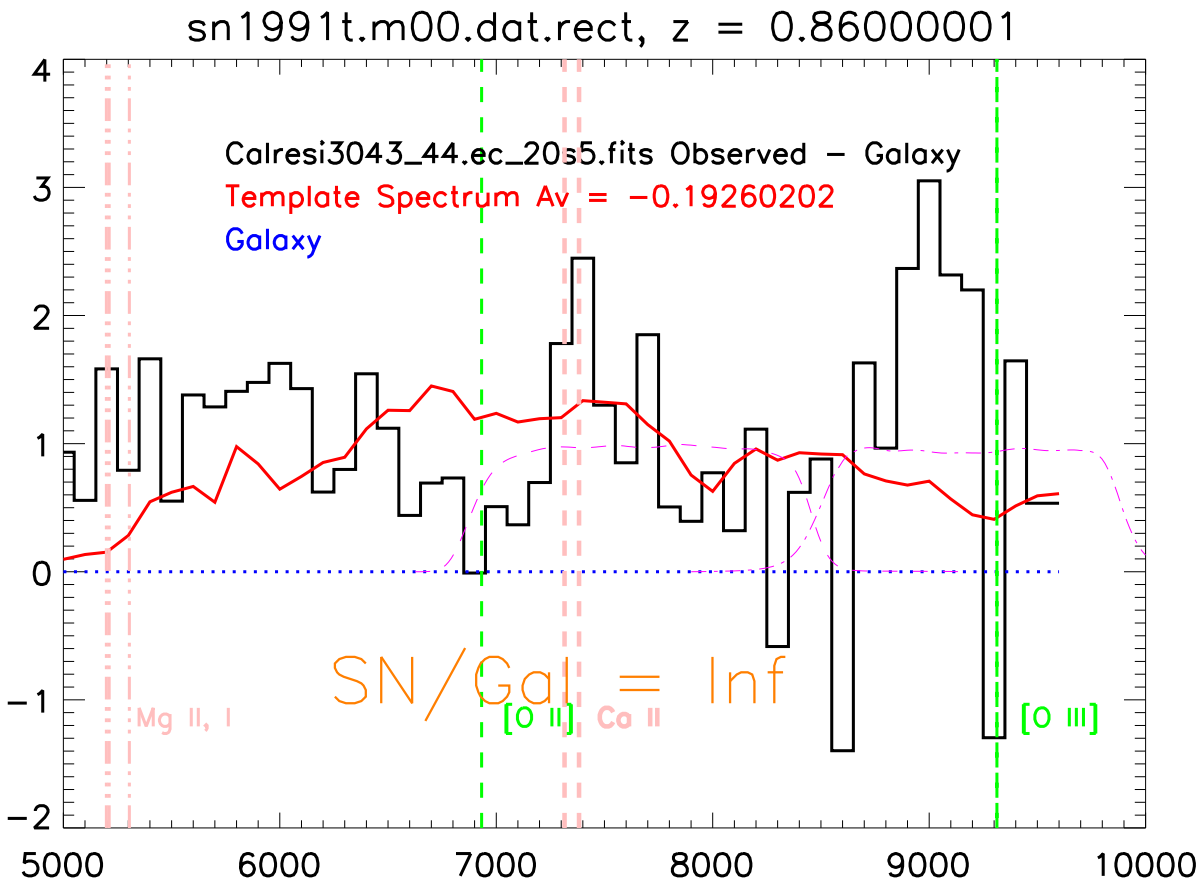

sn1990n.m07.dat.rect, z = 0.88000000
Calresi3043_44.ec_20s5.fits Observed − Galaxy
Template Spectrum Av = −0.29974487
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
4
3
2
1
0
−1
−2
5000
6000
7000
8000
9000
10000

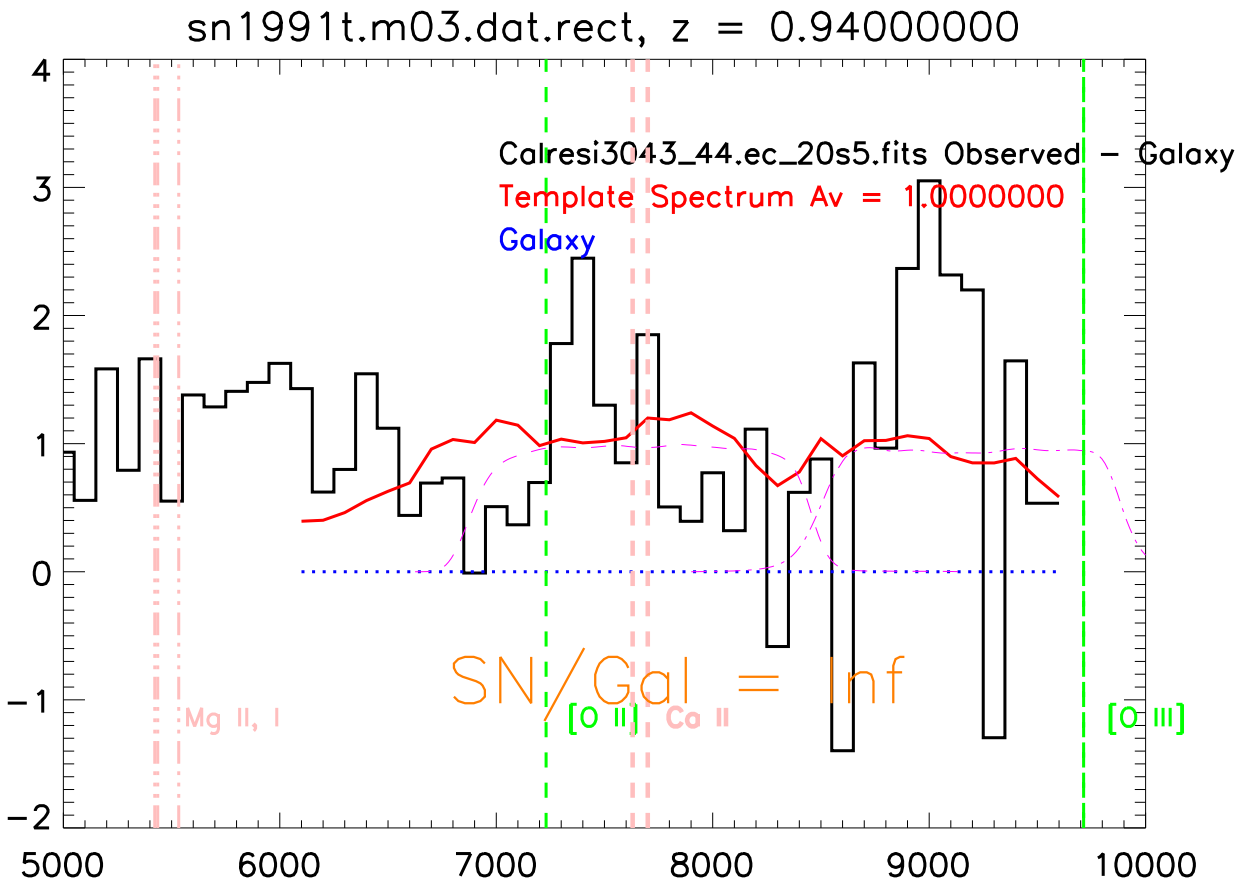

sn1981b.m00.dat.rect, z = 1.5000000
Calresi3043_44.ec_20s5.fits Observed − Galaxy
Template Spectrum Av = −1.0000000
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
4
3
2
1
0
−1
−2
5000
6000
7000
8000
9000
10000

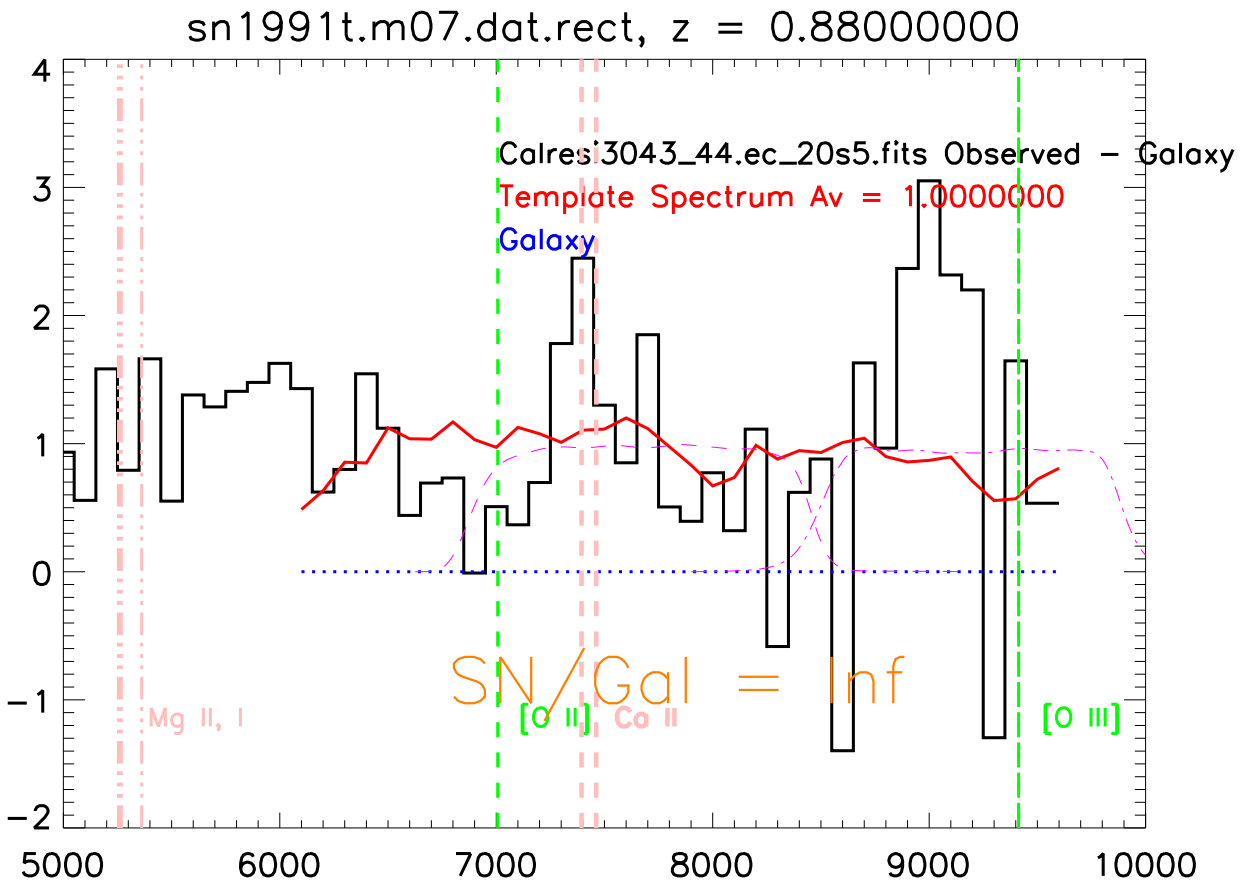

sn1989b.m07.dat.rect, z = 0.80000001
Calresi3043_44.ec_20s5.fits Observed + Galaxy
Template Spectrum Av = −0.082908155
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
4
3
2
1
0
−1
−2
5000
6000
7000
8000
9000
10000

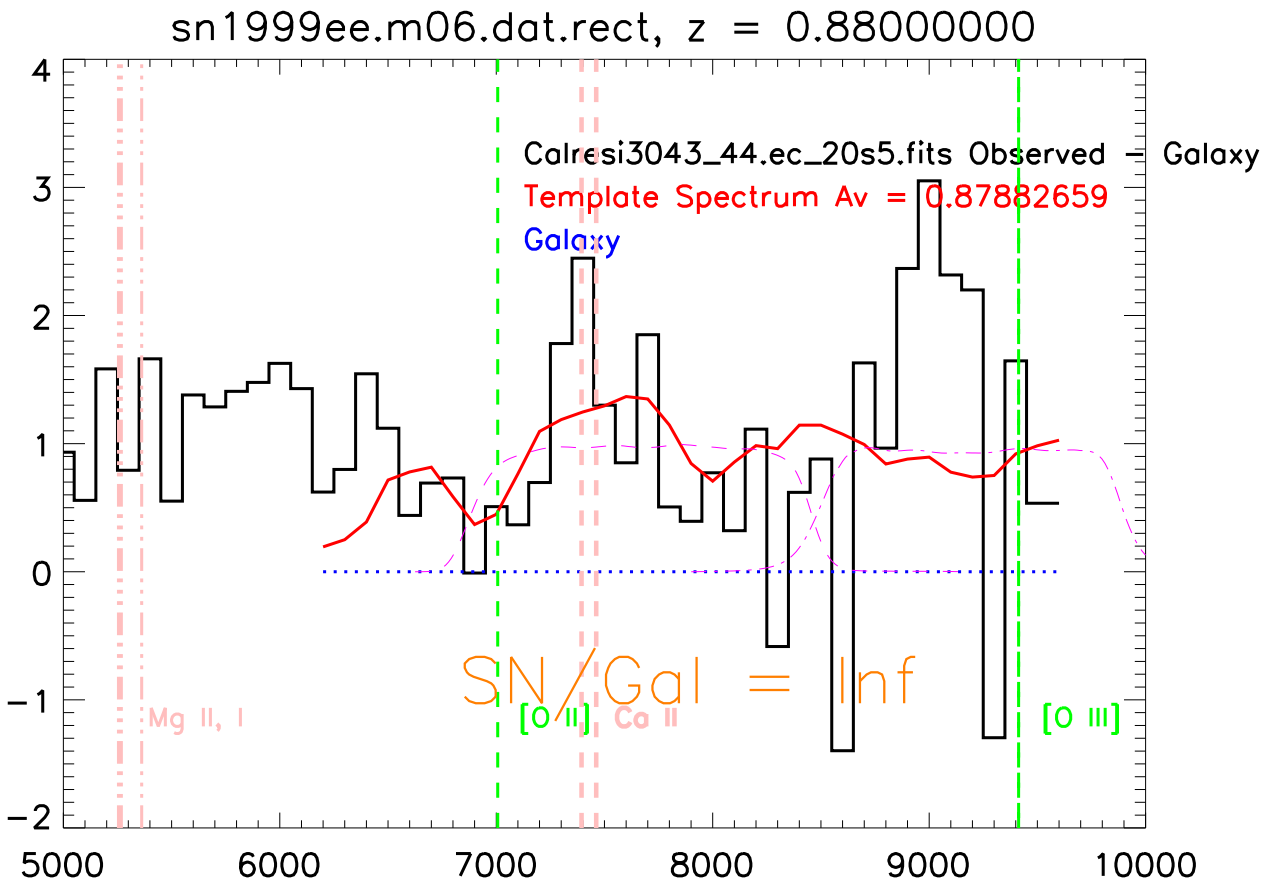

sn1991t.m08.dat.rect, z = 0.87000000
Calresi3043_44.ec_20s5.fits Observed − Galaxy
Template Spectrum Av = 1.0000000
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
4
3
2
1
0
−1
−2
5000
6000
7000
8000
9000
10000

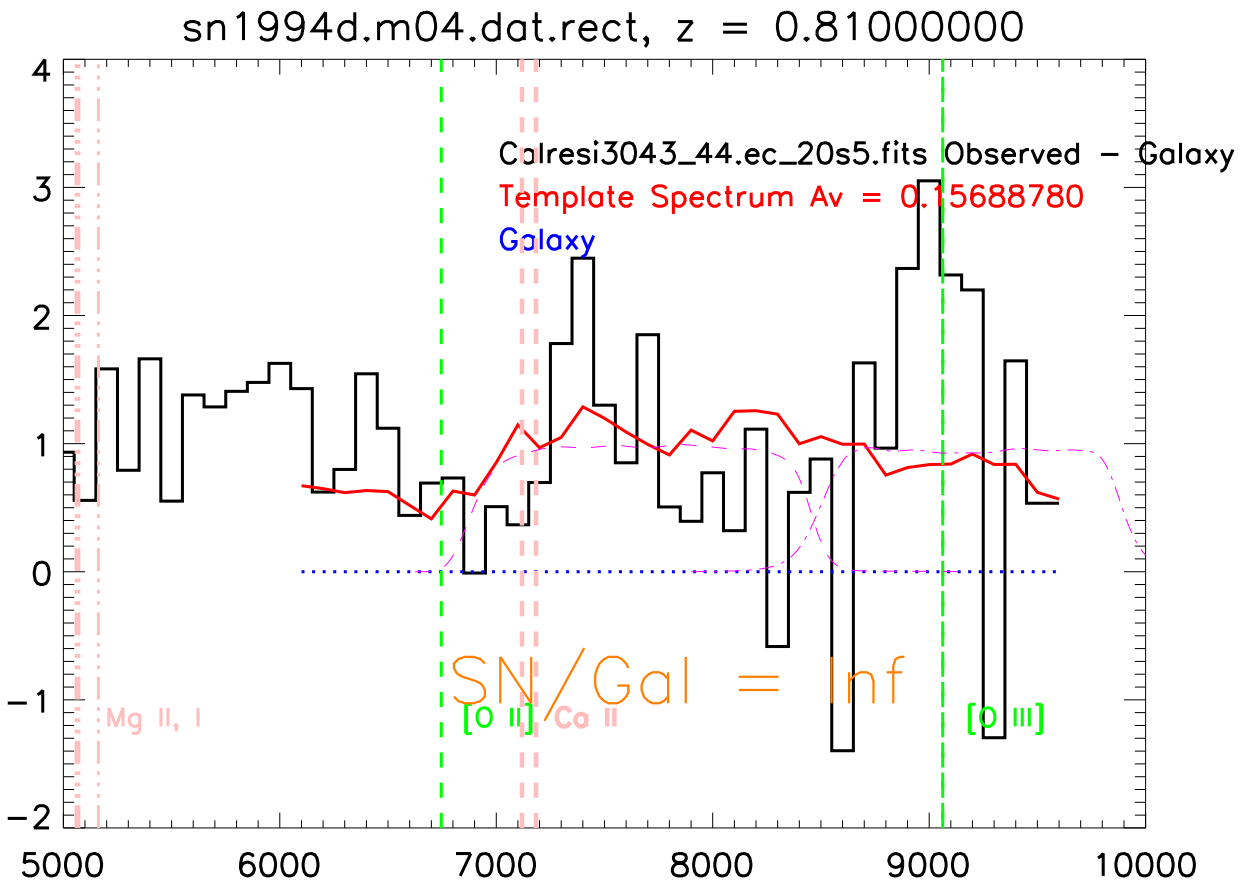

sn1989b.m05.dat.rect, z = 0.80000001
Calresi3043_44.ec_20s5.fits Observed − Galaxy
Template Spectrum Av = −1.0000000
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
4
3
2
1
0
−1
−2
5000
6000
7000
8000
9000
10000

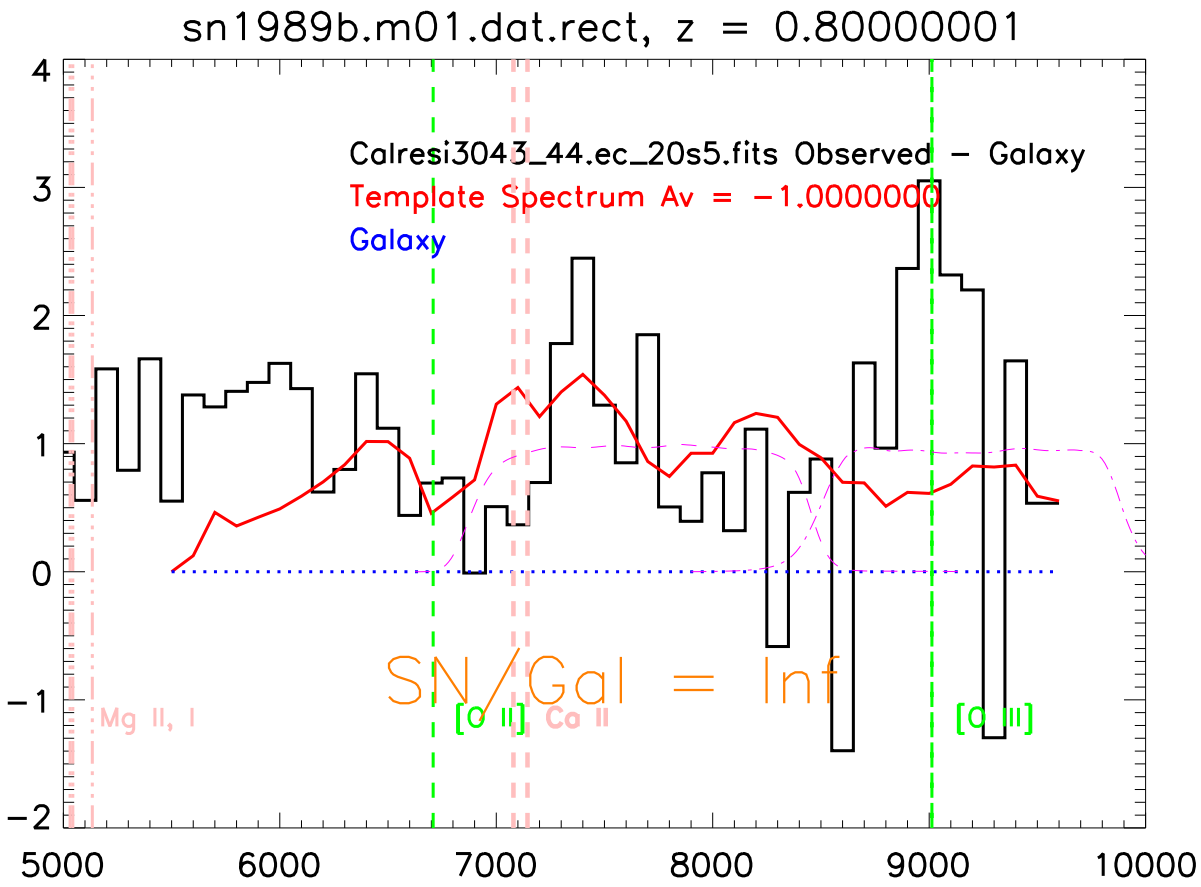

sn1991t.m00.dat.rect, z = 0.86000001
Calresi3043_44.ec_20s5.fits Observed − Galaxy
Template Spectrum Av = −0.19260202
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
4
3
2
1
0
−1
−2
5000
6000
7000
8000
9000
10000

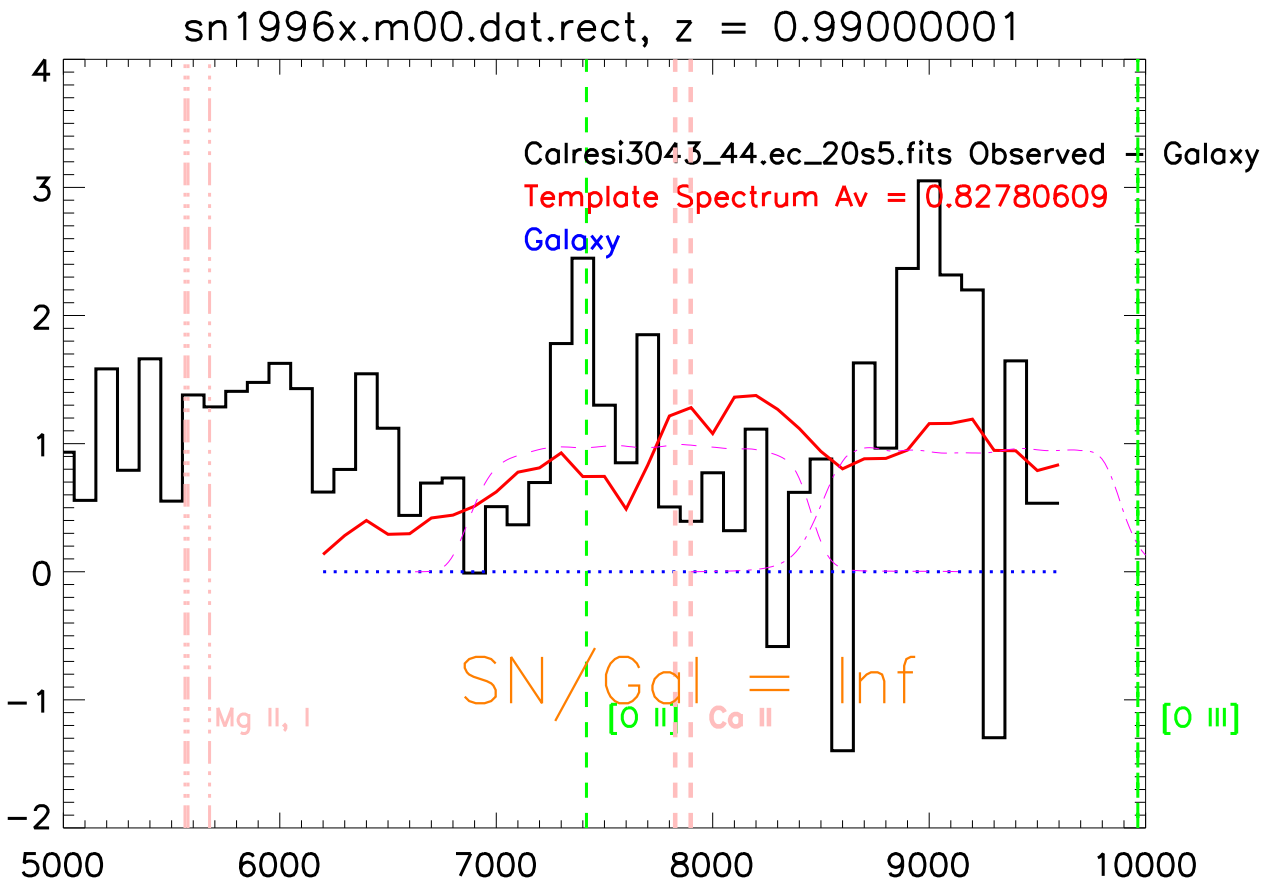

sn1991t.m03.dat.rect, z = 0.94000000
Calresi3043_44.ec_20s5.fits Observed − Galaxy
Template Spectrum Av = 1.0000000
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
4
3
2
1
0
−1
−2
5000
6000
7000
8000
9000
10000

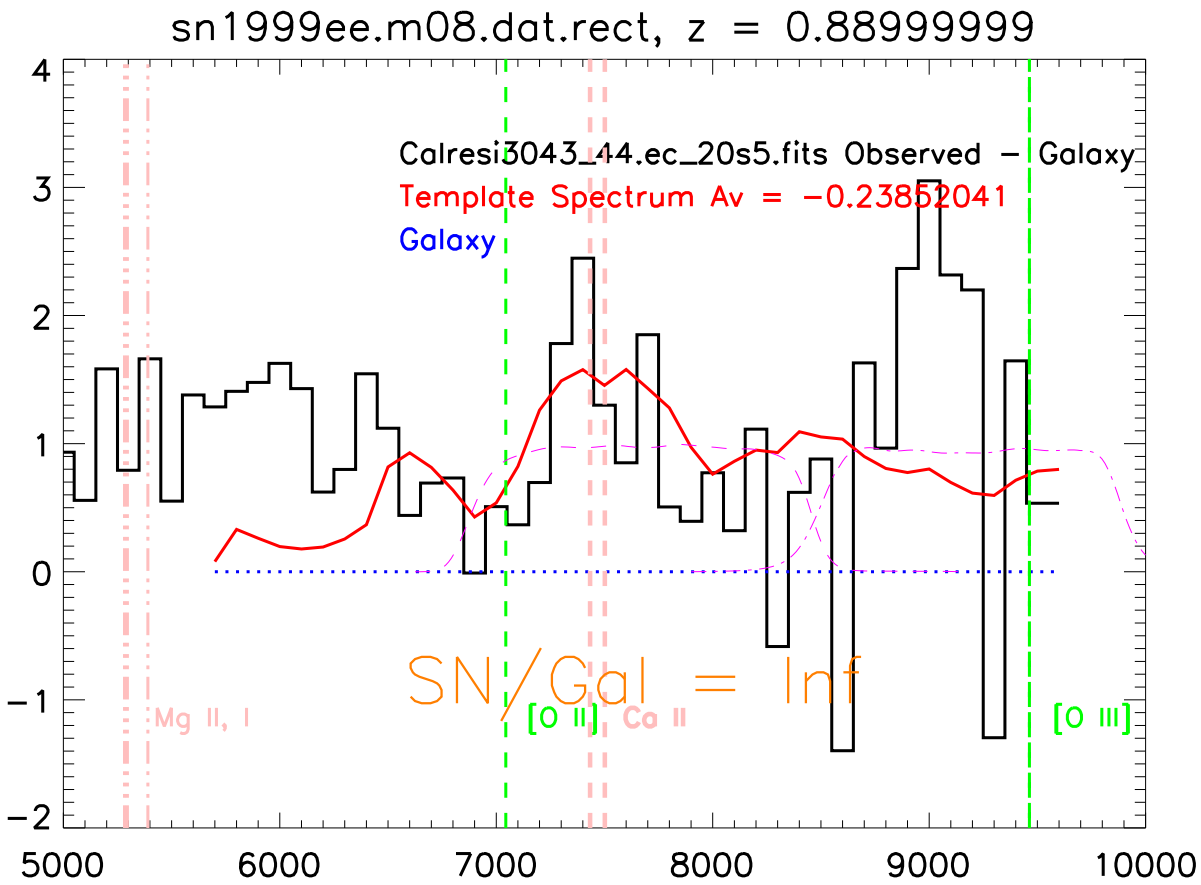

sn1991t.m07.dat.rect, z = 0.88000000
Calres'3043_44.ec_20s5.fits Observed − Galaxy
Template Spectrum Av = 1.0000000
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
4
3
2
1
0
−1
−2
5000
6000
7000
8000
9000
10000

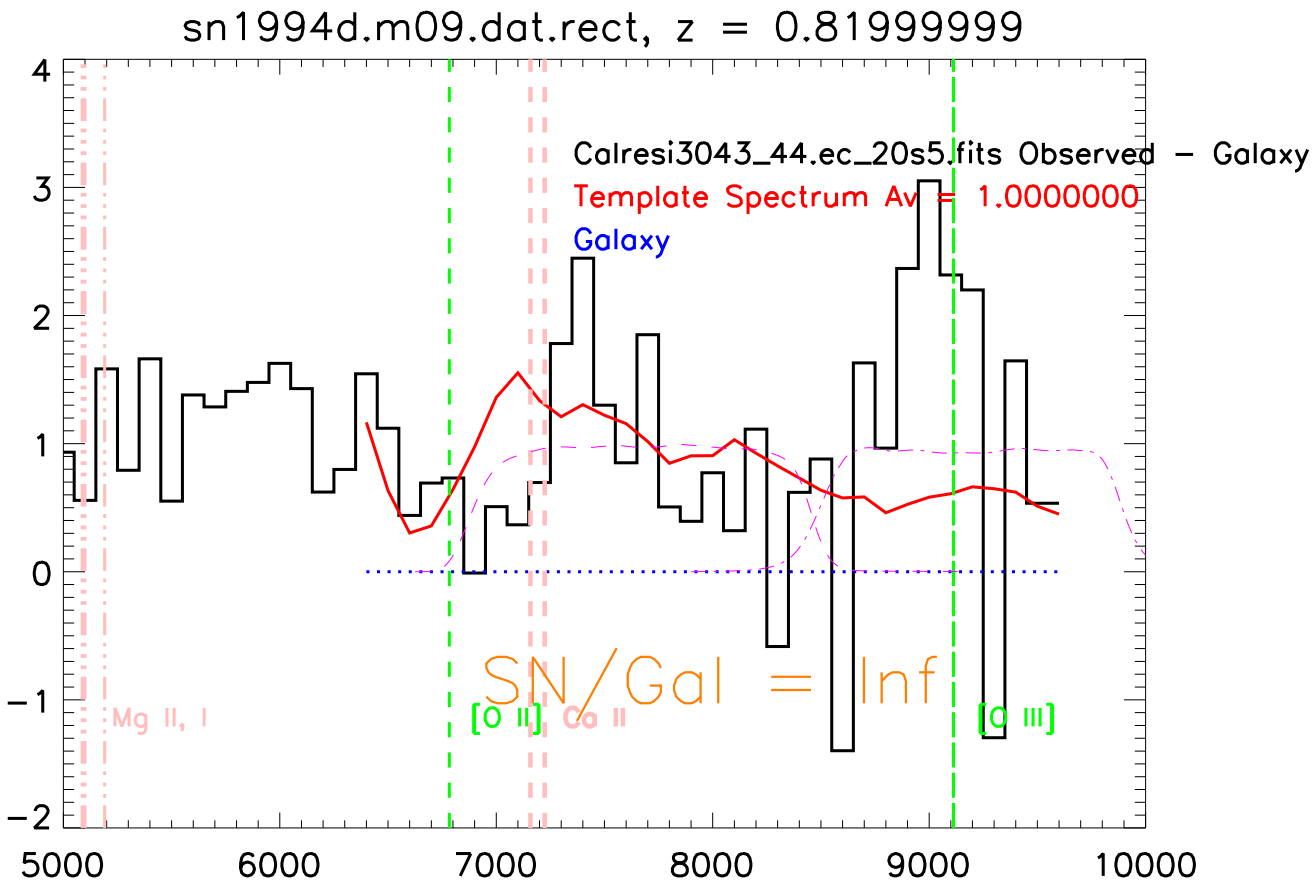

sn1999ee.m06.dat.rect, z = 0.88000000
Calresi3043_44.ec_20s5.fits Observed – Galaxy
Template Spectrum Av = 0.87882659
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
4
3
2
1
0
−1
−2
5000
6000
7000
8000
9000
10000

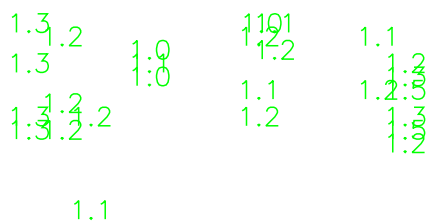

sn1994d.m04.dat.rect, z = 0.81000000
Calresi3043_44.ec_20s5.fits Observed − Galaxy
Template Spectrum Av = 0.15688780
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
4
3
2
1
0
−1
−2
5000
6000
7000
8000
9000
10000

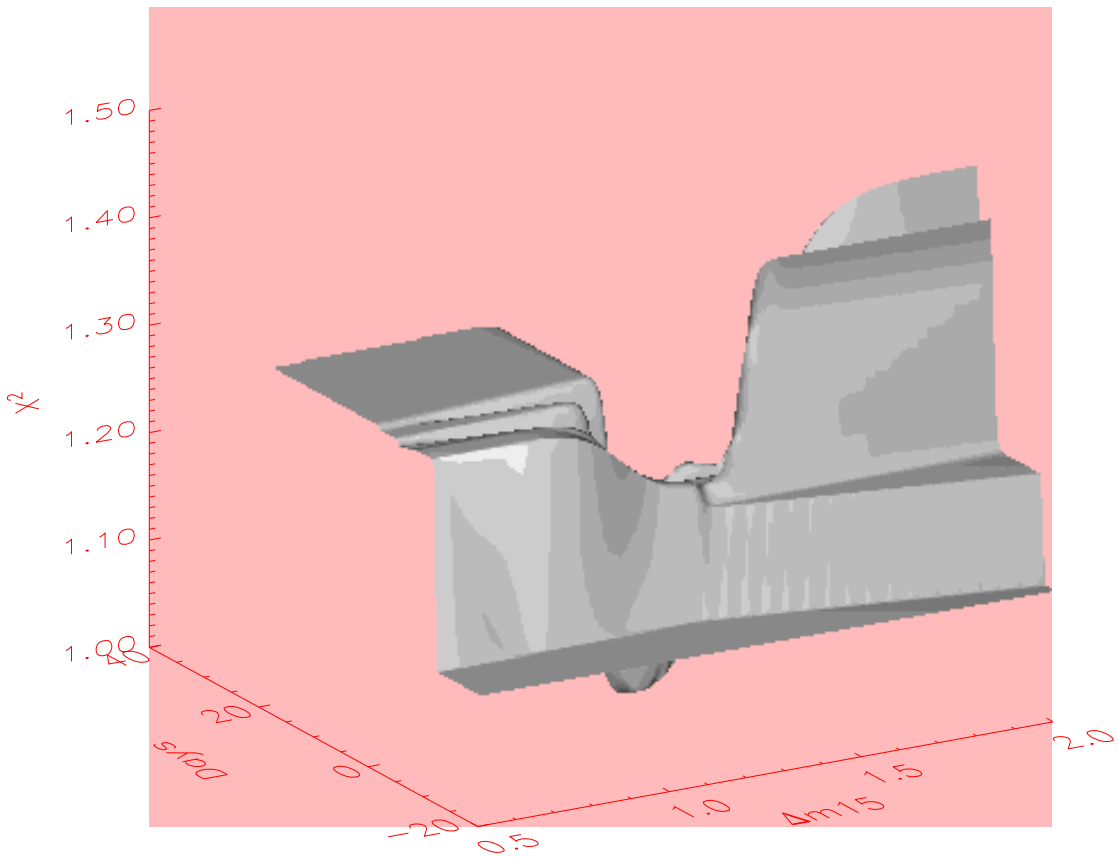

sn1989b.m01.dat.rect, z = 0.80000001
Calresi3043_44.ec_20s5.fits Observed − Galaxy
Template Spectrum Av = −1.0000000
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
4
3
2
1
0
−1
−2
5000
6000
7000
8000
9000
10000


sn1996x.m00.dat.rect, z = 0.99000001
Calresi3043_44.ec_20s5.fits Observed - Galaxy
Template Spectrum Av = 0.82780609
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
4
3
2
1
0
−1
−2
5000
6000
7000
8000
9000
10000

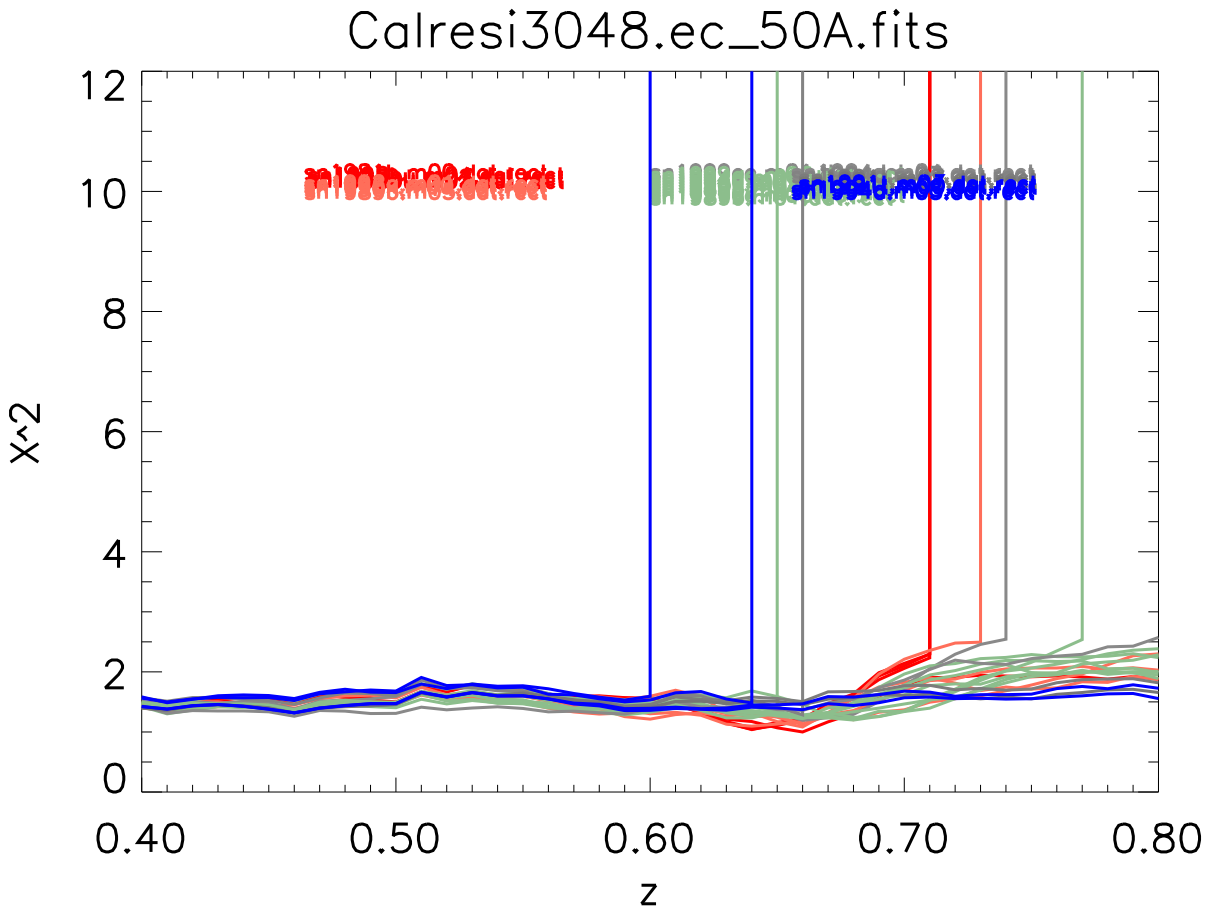

sn1999ee.m08.dat.rect, z = 0.88999999
Calresi3043_44.ec_20s5.fits Observed − Galaxy
Template Spectrum Av = −0.23852041
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
4
3
2
1
0
−1
−2
5000
6000
7000
8000
9000
10000

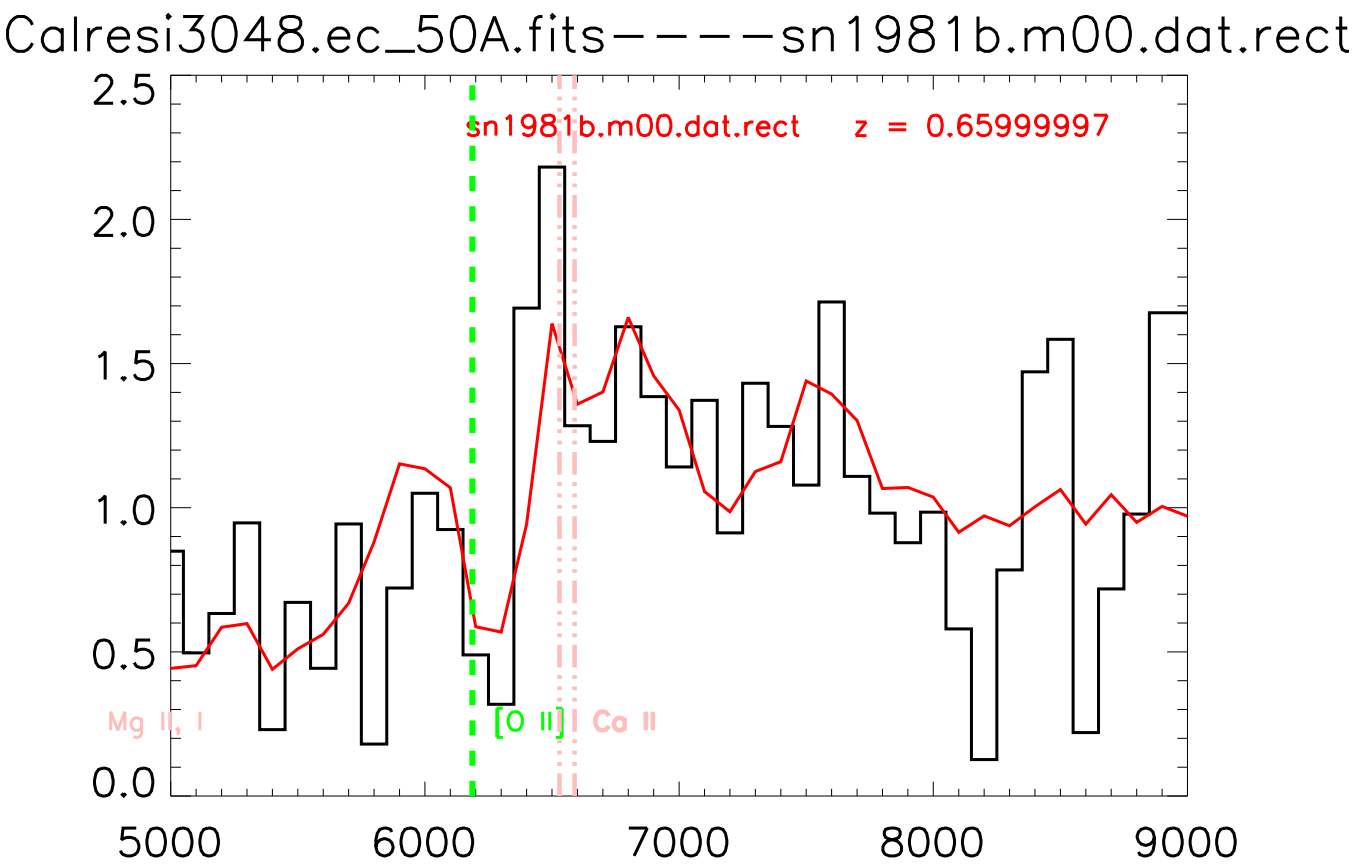

sn1994d.m09.dat.rect, z = 0.81999999
Calresi3043_44.ec_20s5.fits Observed − Galaxy
Template Spectrum Av = 1.0000000
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
4
3
2
1
0
−1
−2
5000
6000
7000
8000
9000
10000

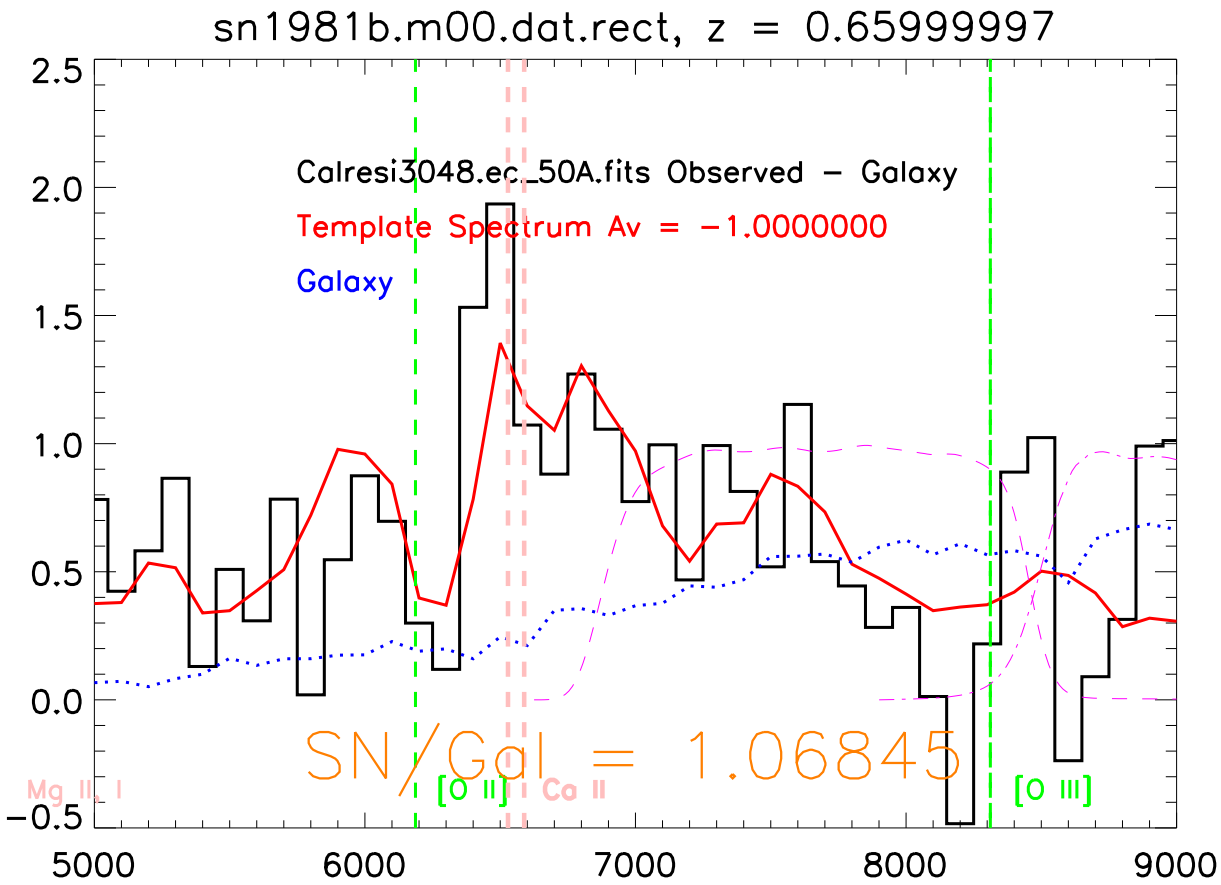

1.3
1.2
1.3
1.0
1.0
1.2
1.3
1.2
1.3
1.2
1.1
1.2
1.1
1.2
1.2
1.1

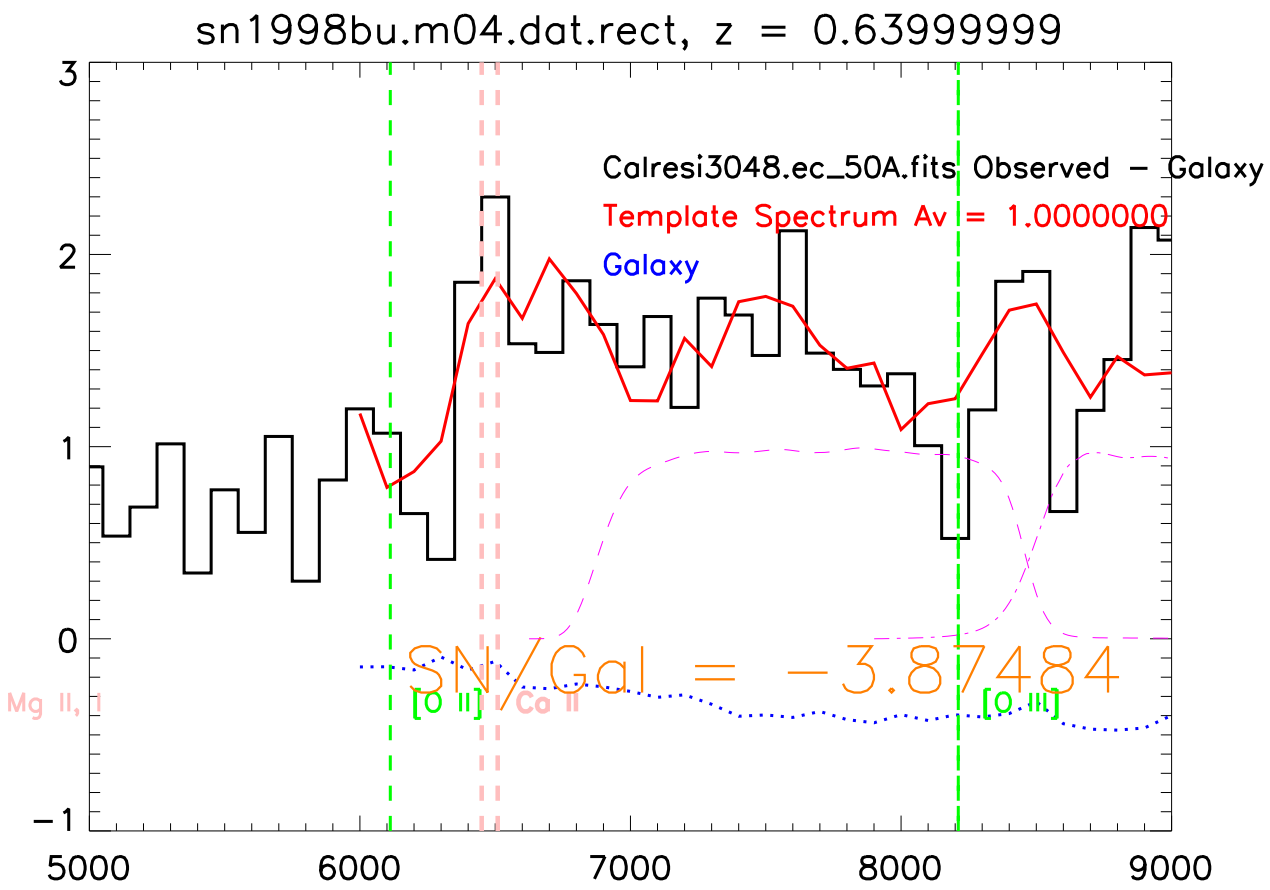


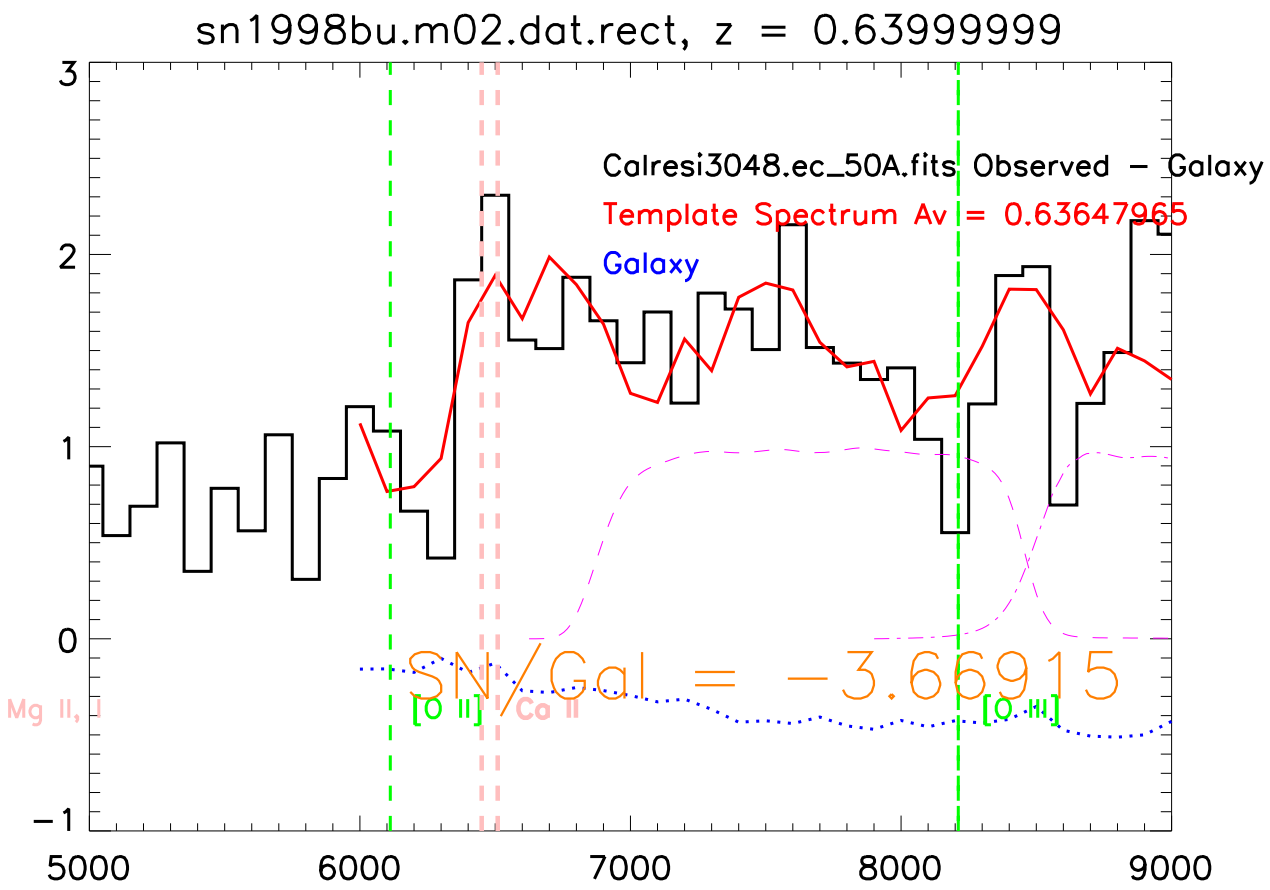
1.50
1.40
1.30
1.20
1.10
1.00
χ^2
40
20
0
−20
Days
0.5
1.0
1.5
2.0
Δm15

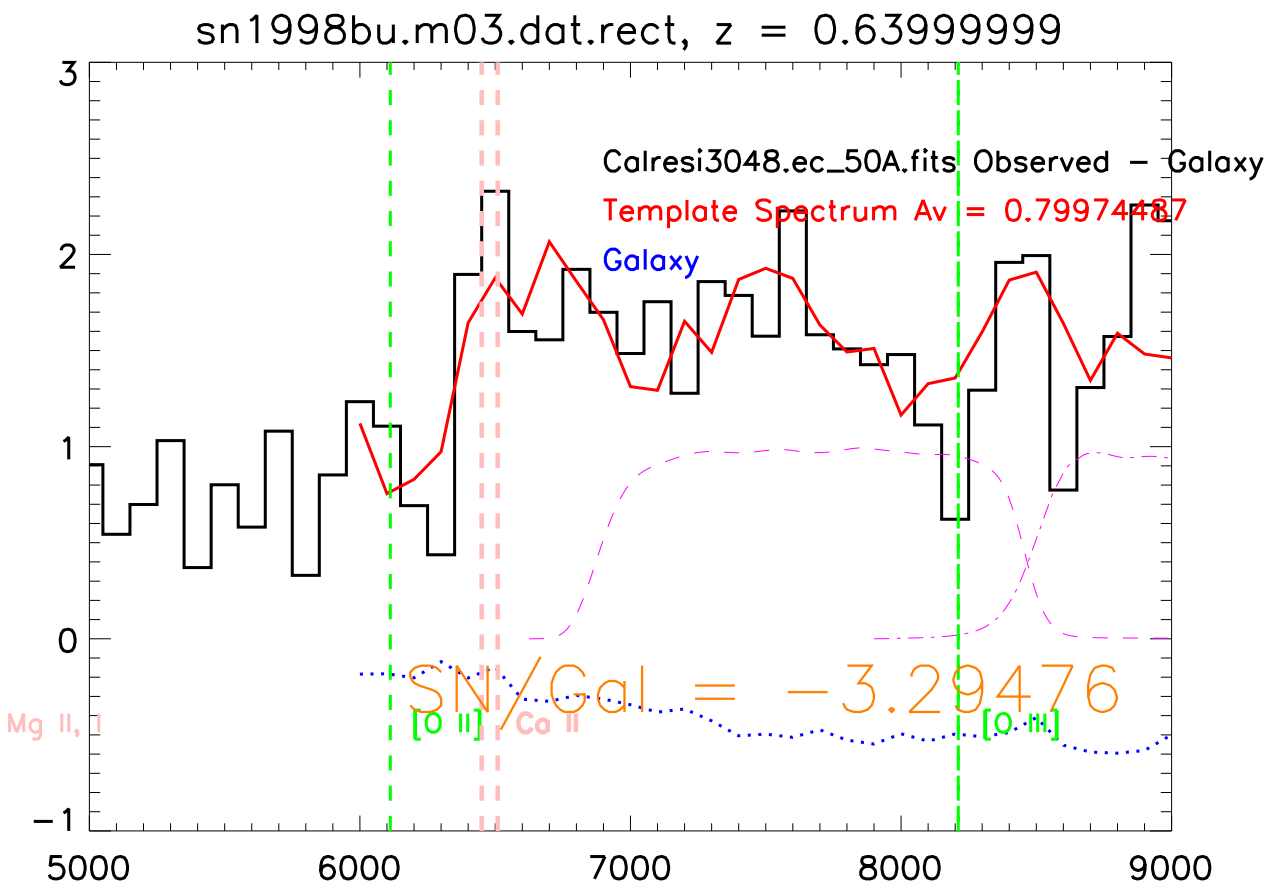

Calresi3048.ec_50A.fits
12
10
8
6
4
2
0
X^2
0.40
0.50
0.60
0.70
0.80
z

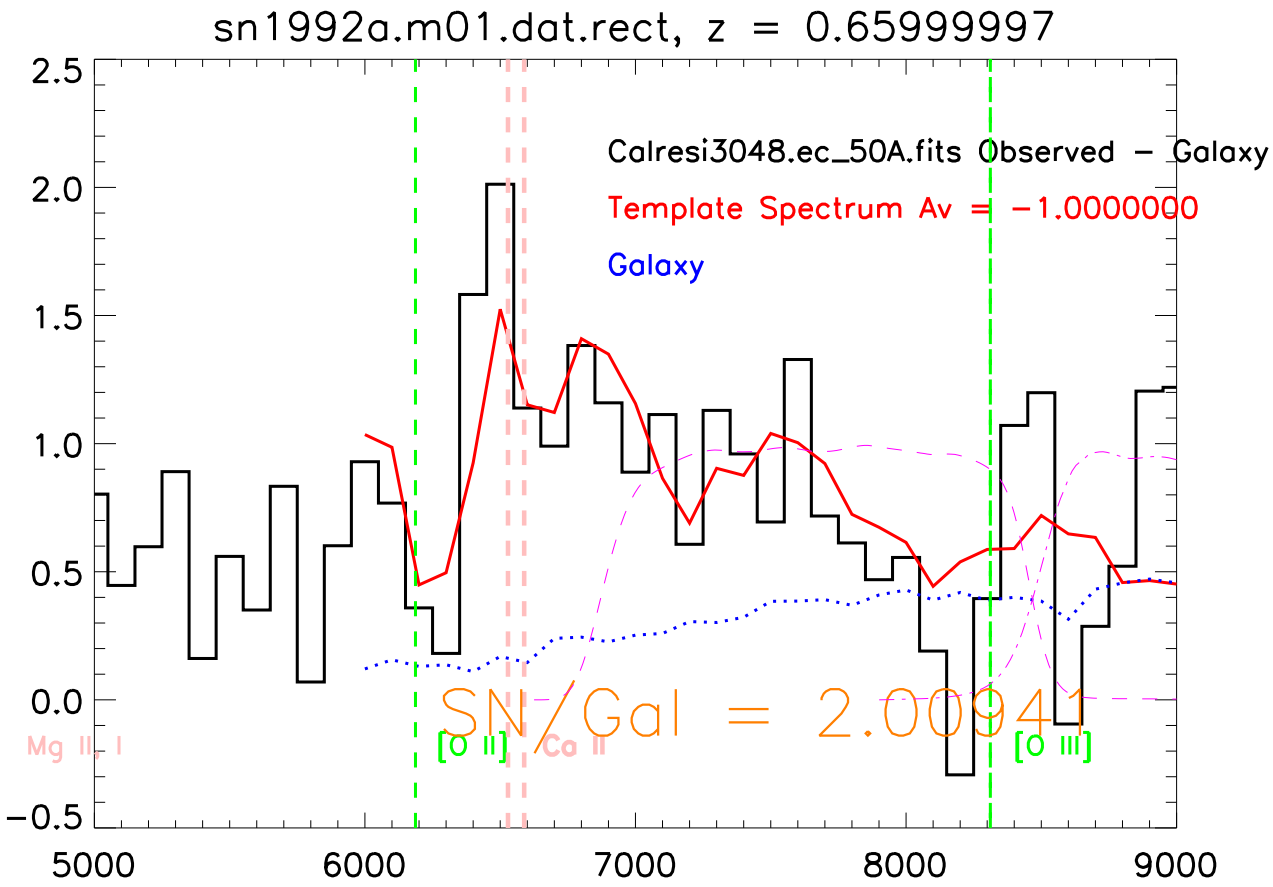

Calresi3048.ec_50A.fits----sn1981b.m00.dat.rect
sn1981b.m00.dat.rect z = 0.65999997
Mg II, I
[O II]
Ca II
2.5
2.0
1.5
1.0
0.5
0.0
5000
6000
7000
8000
9000

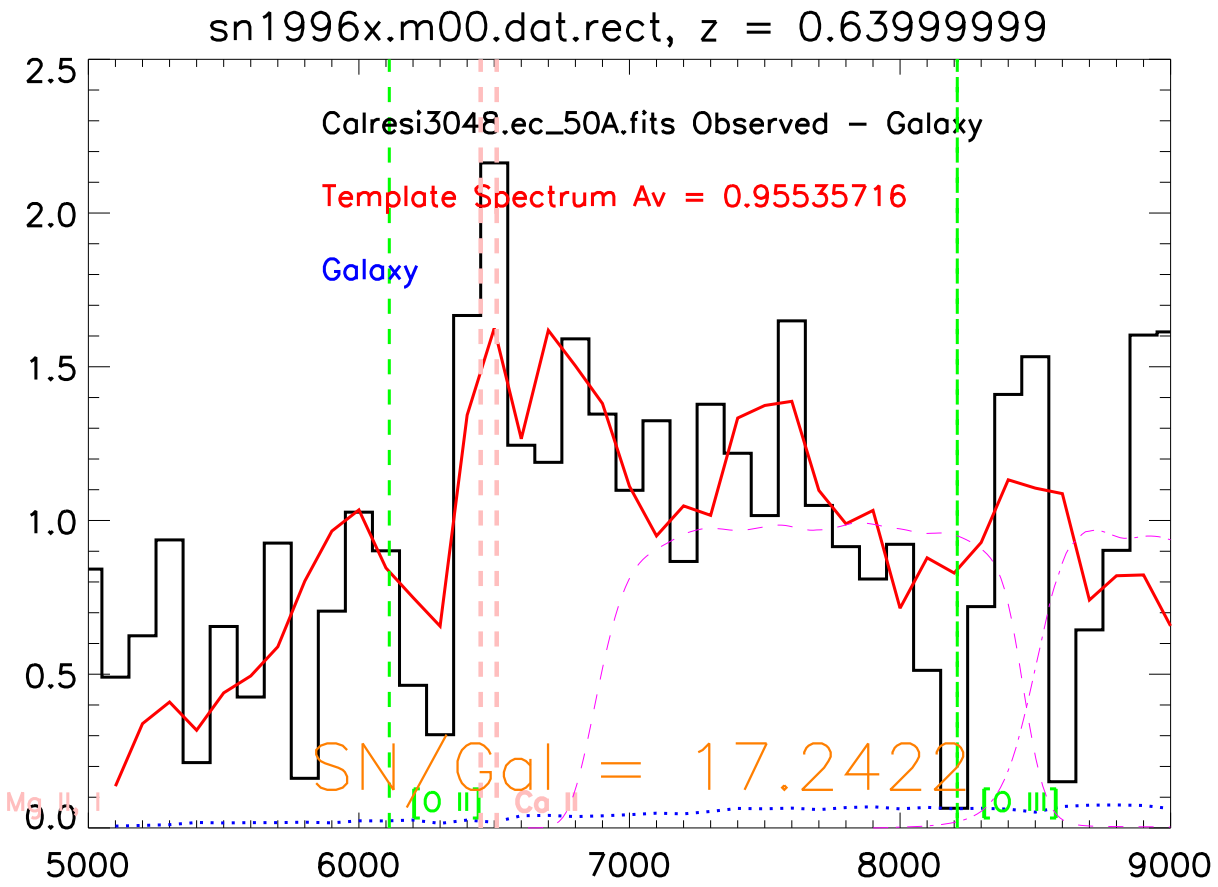

sn1981b.m00.dat.rect, z = 0.65999997
Calresi3048.ec_50A.fits Observed − Galaxy
Template Spectrum Av = −1.0000000
Galaxy
SN/Gal = 1.06845
Mg II
[O II]
Ca II
[O III]
2.5
2.0
1.5
1.0
0.5
0.0
−0.5
5000
6000
7000
8000
9000

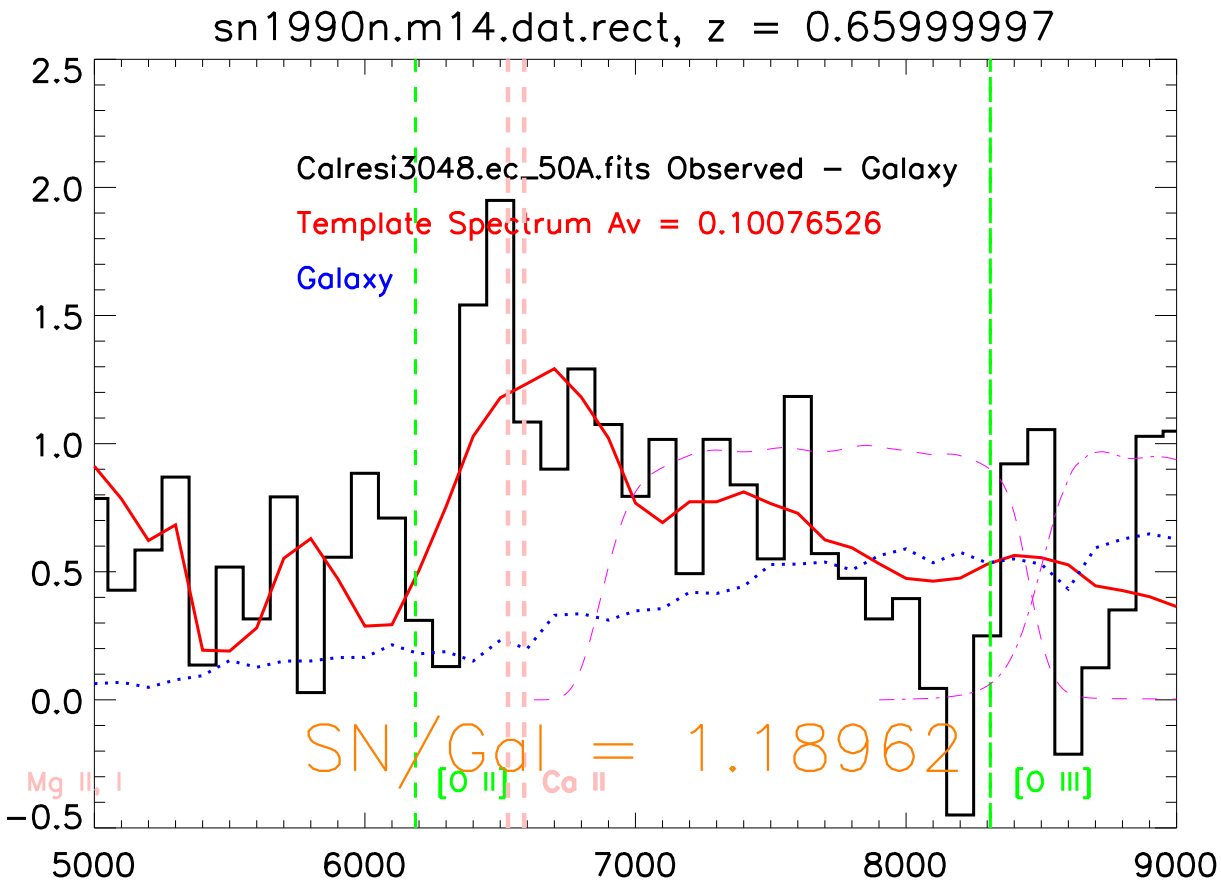

sn1998bu.m04.dat.rect, z = 0.63999999
Calresi3048.ec_50A.fits Observed − Galaxy
Template Spectrum Av = 1.0000000
Galaxy
SN/Gal = −3.87484
Mg II,
[O II]
Ca II
[O III]
3
2
1
0
−1
5000
6000
7000
8000
9000

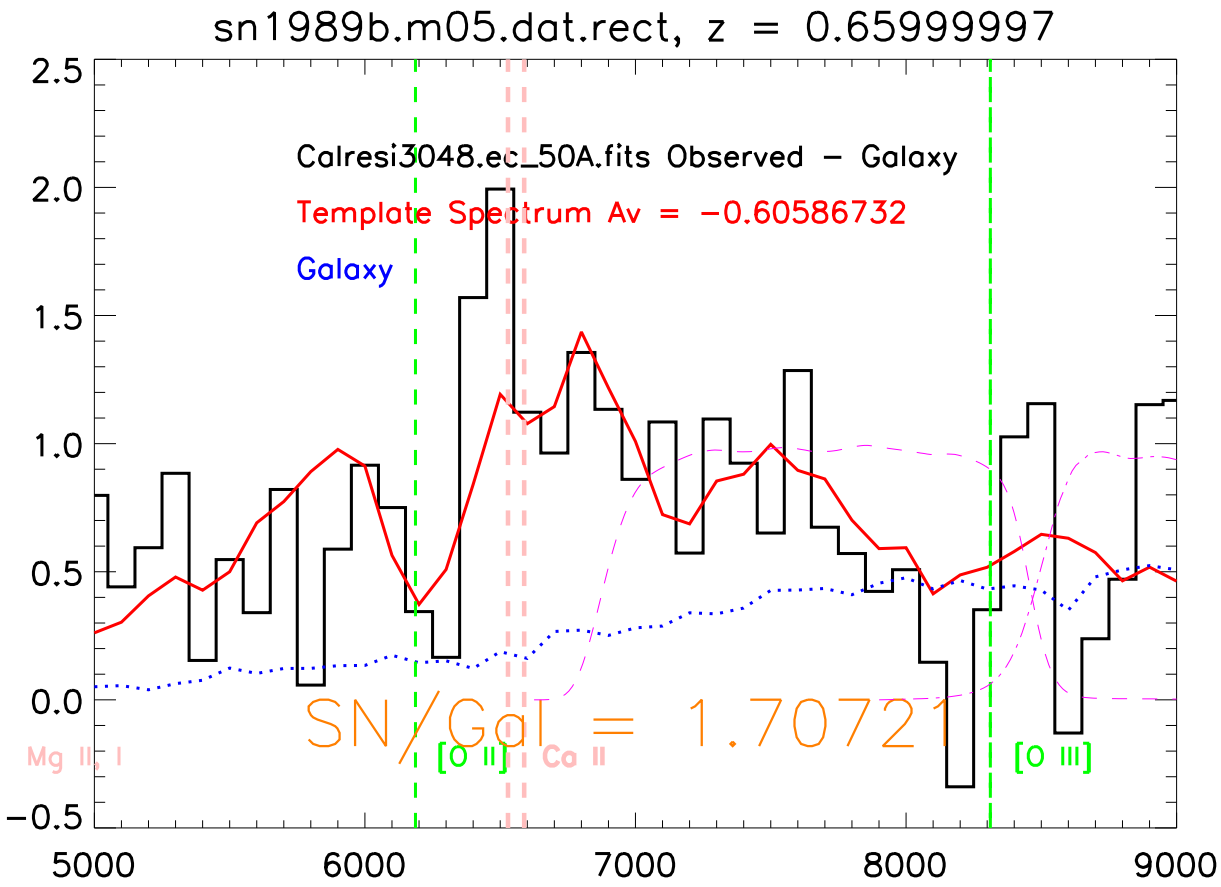

sn1998bu.m02.dat.rect, z = 0.63999999
Calresi3048.ec_50A.fits Observed − Galaxy
Template Spectrum Av = 0.63647965
Galaxy
SN/Gal = −3.66915
Mg II,
[O II]
Ca II
[O III]
3
2
1
0
−1
5000
6000
7000
8000
9000

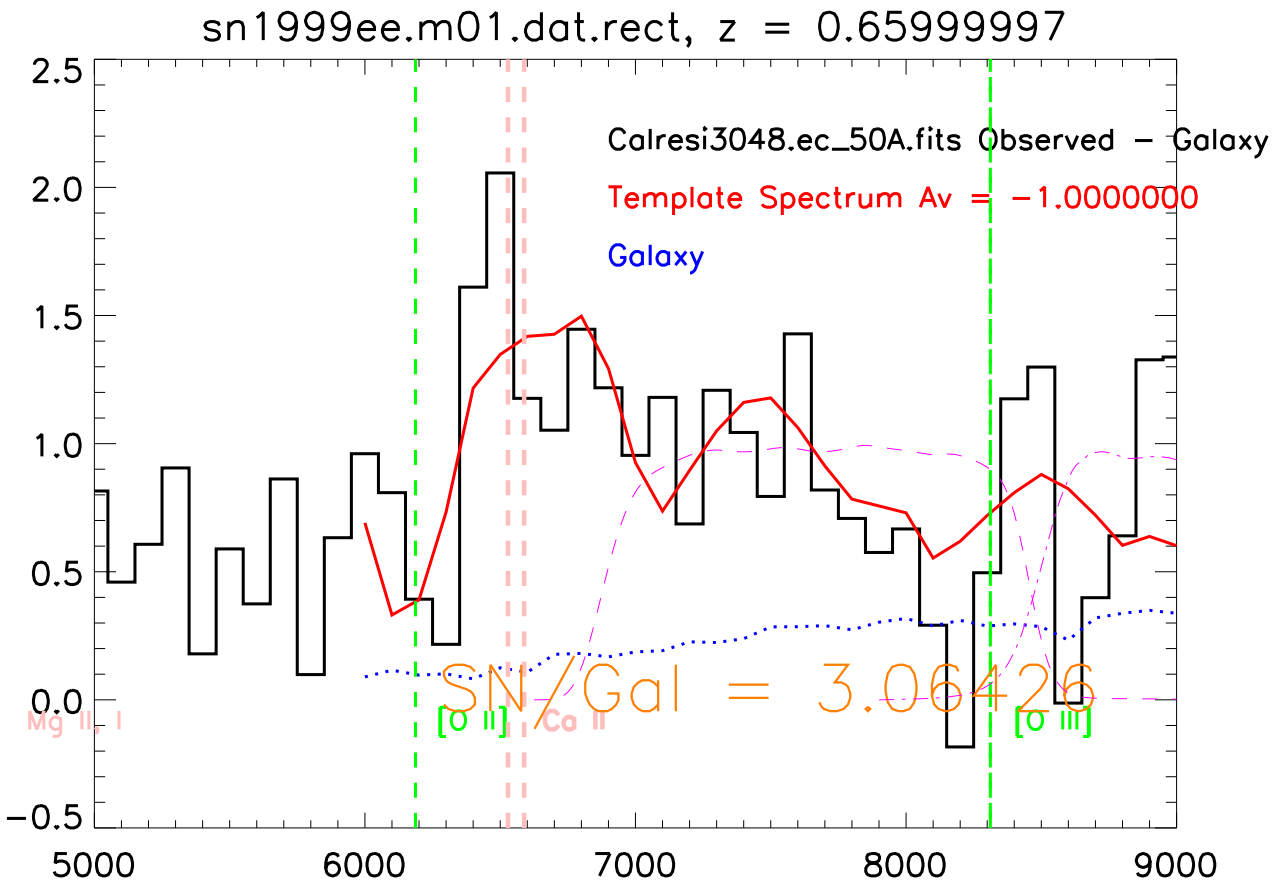

sn1998bu.m03.dat.rect, z = 0.63999999
Calresi3048.ec_50A.fits Observed − Galaxy
Template Spectrum Av = 0.79974487
Galaxy
SN/Gal = −3.29476
Mg II, 1
[O II]
Ca II
[O III]
3
2
1
0
−1
5000
6000
7000
8000
9000

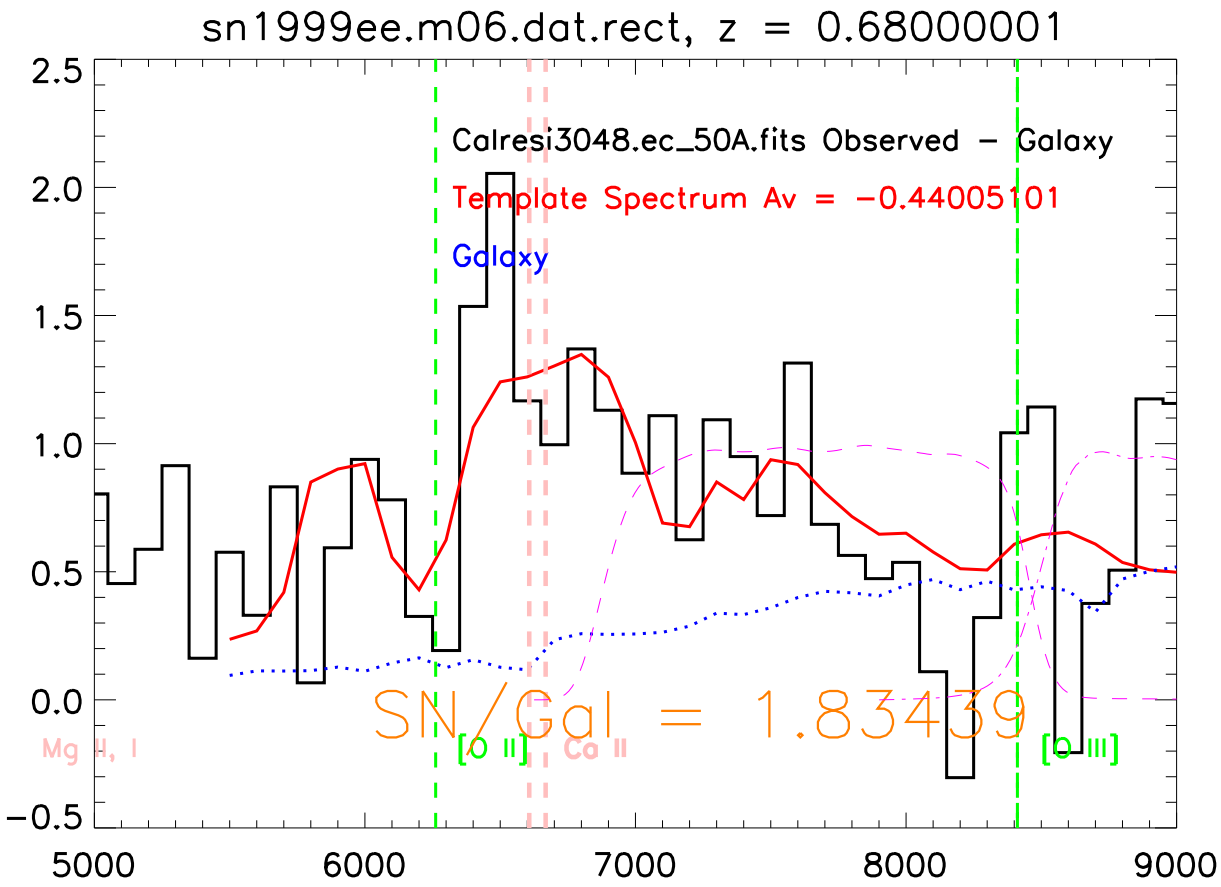

sn1992a.m01.dat.rect, z = 0.65999997
Calresi3048.ec_50A.fits Observed − Galaxy
Template Spectrum Av = −1.0000000
Galaxy
SN/Gal = 2.00941
Mg II, I
[O II]
Ca II
[O III]
2.5
2.0
1.5
1.0
0.5
0.0
−0.5
5000
6000
7000
8000
9000

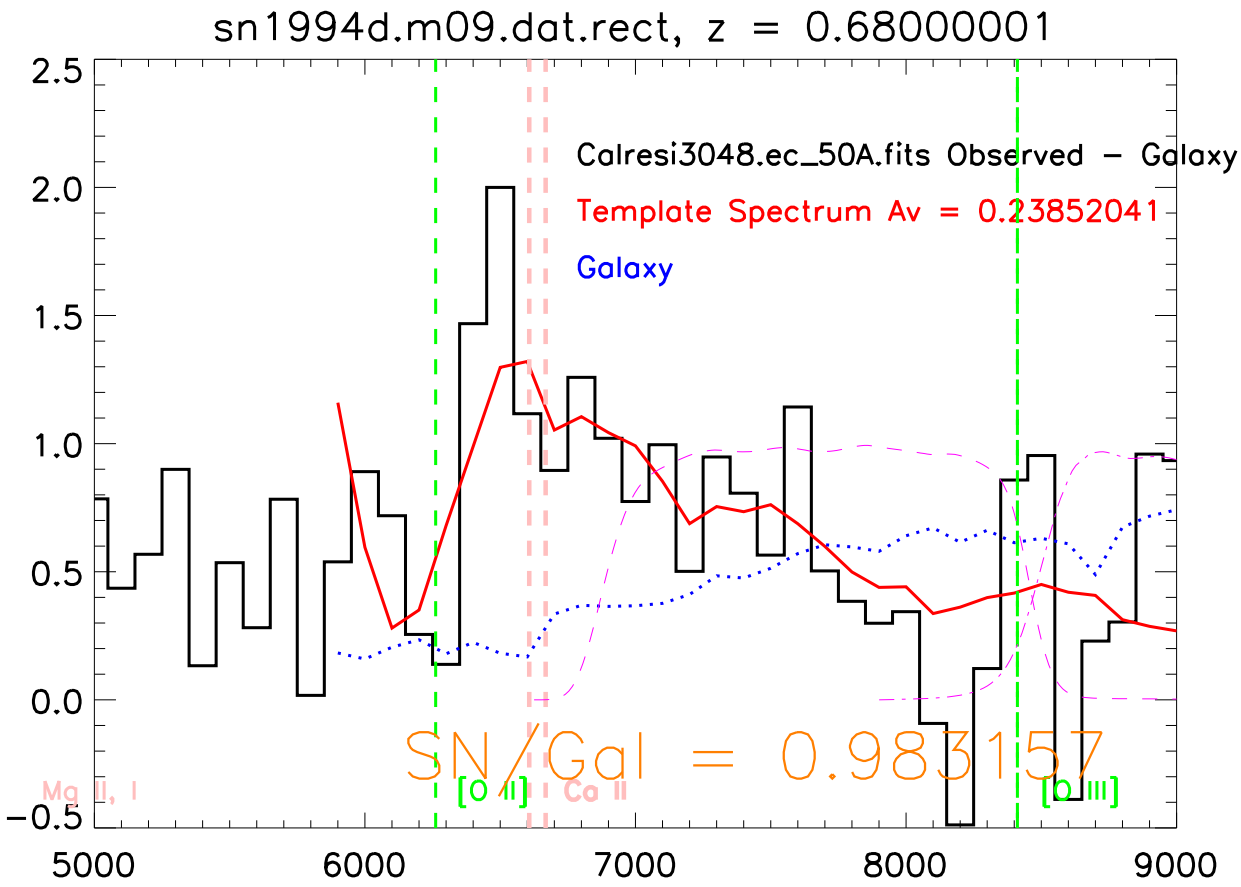

sn1996x.m00.dat.rect, z = 0.63999999
Calresi3048.ec_50A.fits Observed − Galaxy
Template Spectrum Av = 0.95535716
Galaxy
SN/Gal = 17.2422
[O II]
Ca II
[O III]
2.5
2.0
1.5
1.0
0.5
0.0
5000
6000
7000
8000
9000

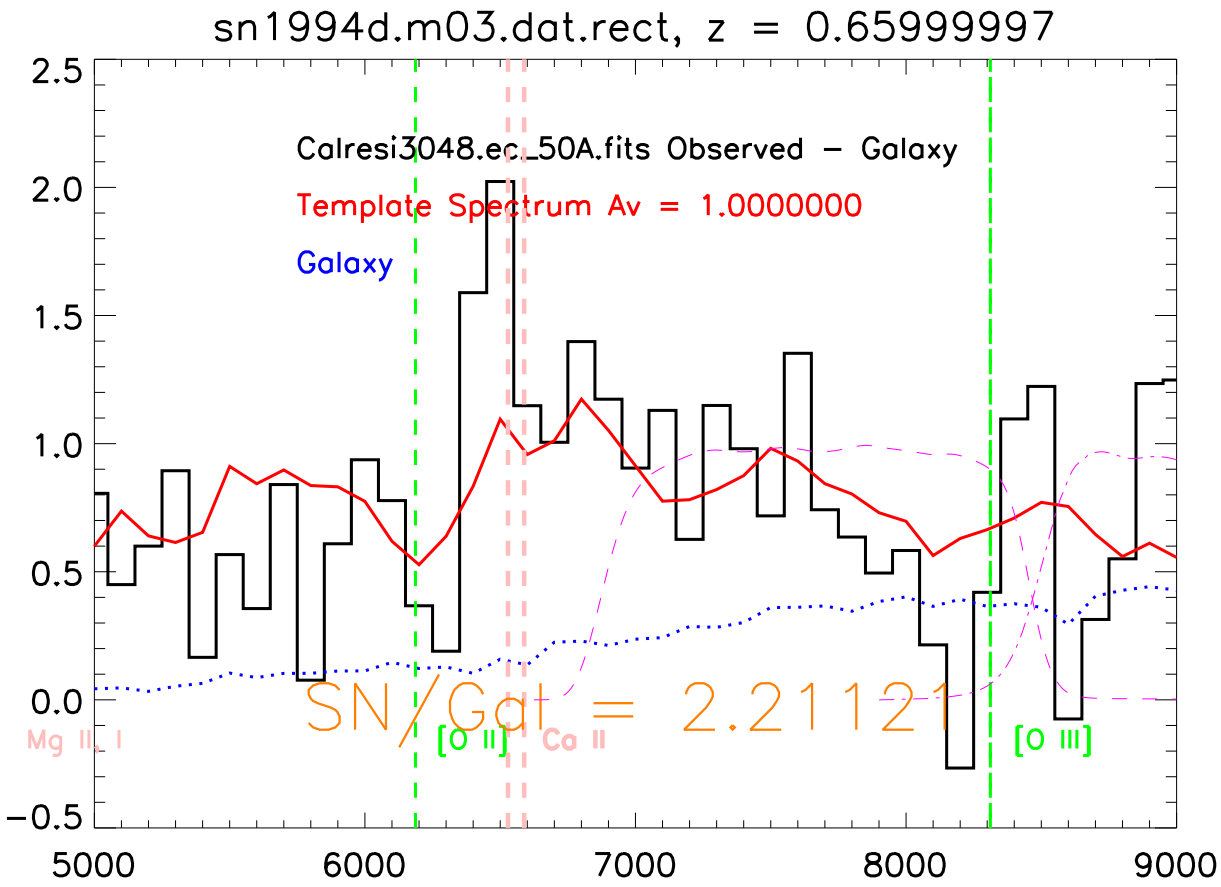

sn1990n.m14.dat.rect, z = 0.65999997
Calresi3048.ec_50A.fits Observed − Galaxy
Template Spectrum Av = 0.10076526
Galaxy
SN/Gal = 1.18962
Mg II, I
[O II]
Ca II
[O III]
2.5
2.0
1.5
1.0
0.5
0.0
−0.5
5000
6000
7000
8000
9000

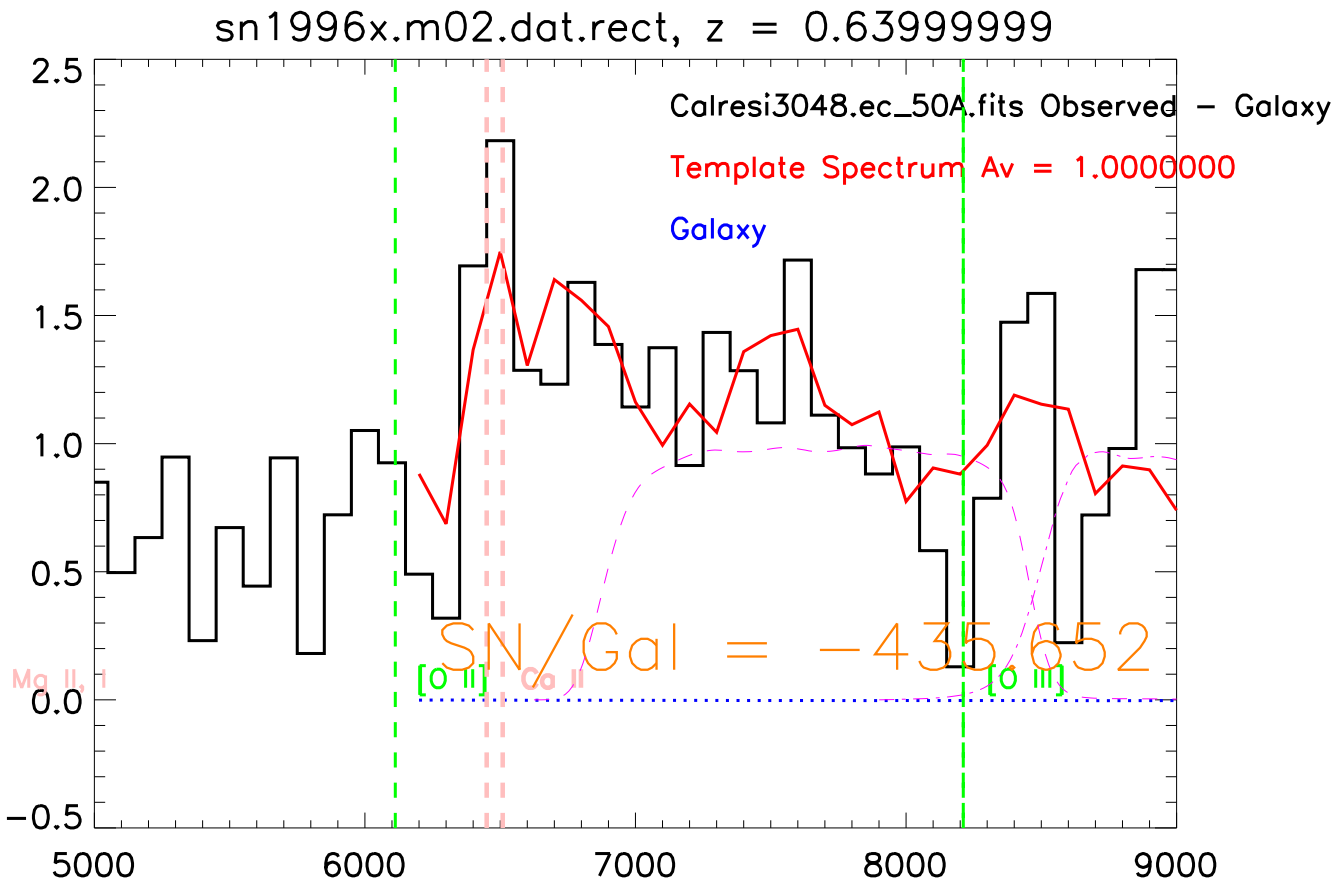

sn1989b.m05.dat.rect, z = 0.65999997
Calresi3048.ec_50A.fits Observed − Galaxy
Template Spectrum Av = −0.60586732
Galaxy
SN/Gal = 1.70721
Mg II, I
[O II]
Ca II
[O III]
2.5
2.0
1.5
1.0
0.5
0.0
−0.5
5000
6000
7000
8000
9000

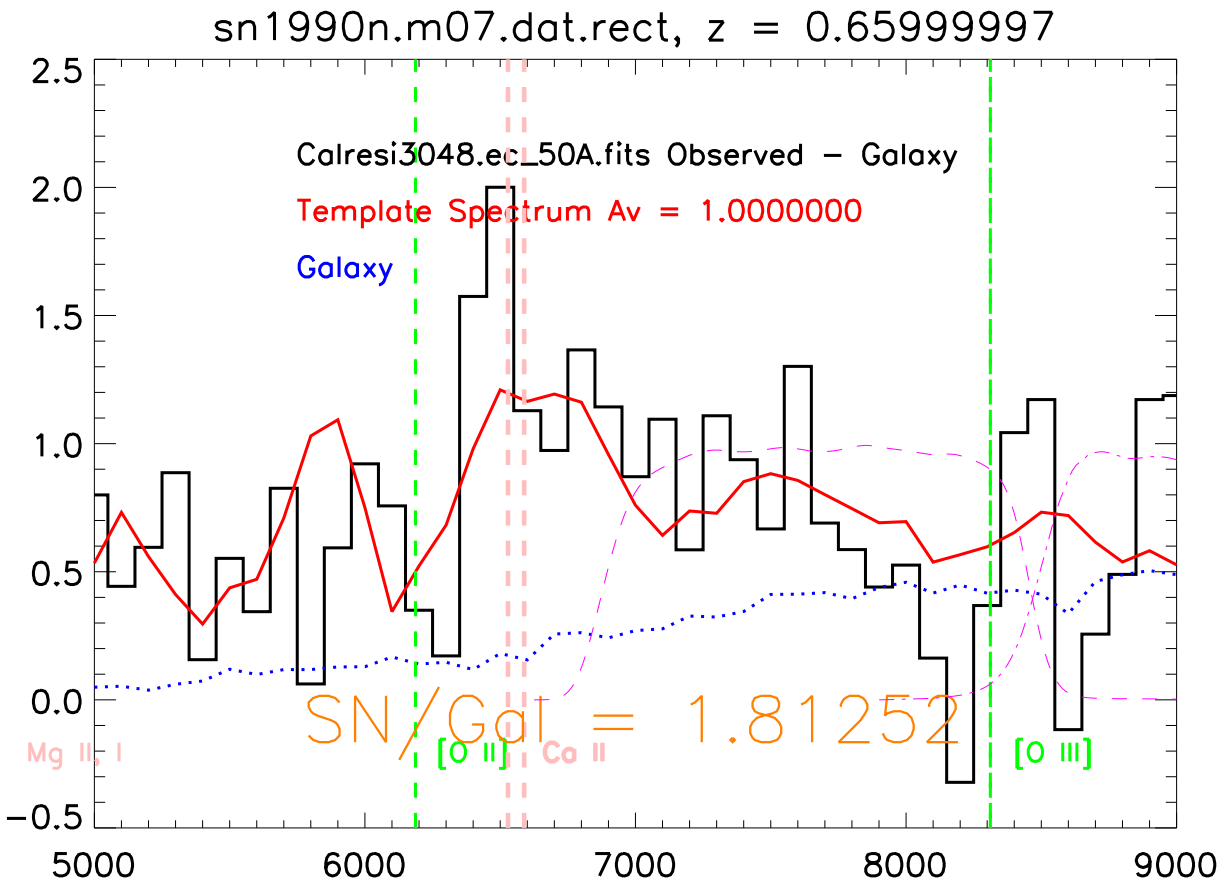

sn1999ee.m01.dat.rect, z = 0.65999997
Calresi3048.ec_50A.fits Observed − Galaxy
Template Spectrum Av = −1.0000000
Galaxy
SN/Gal = 3.06426
Mg II, I
[O II]
Ca II
[O III]
2.5
2.0
1.5
1.0
0.5
0.0
−0.5
5000
6000
7000
8000
9000

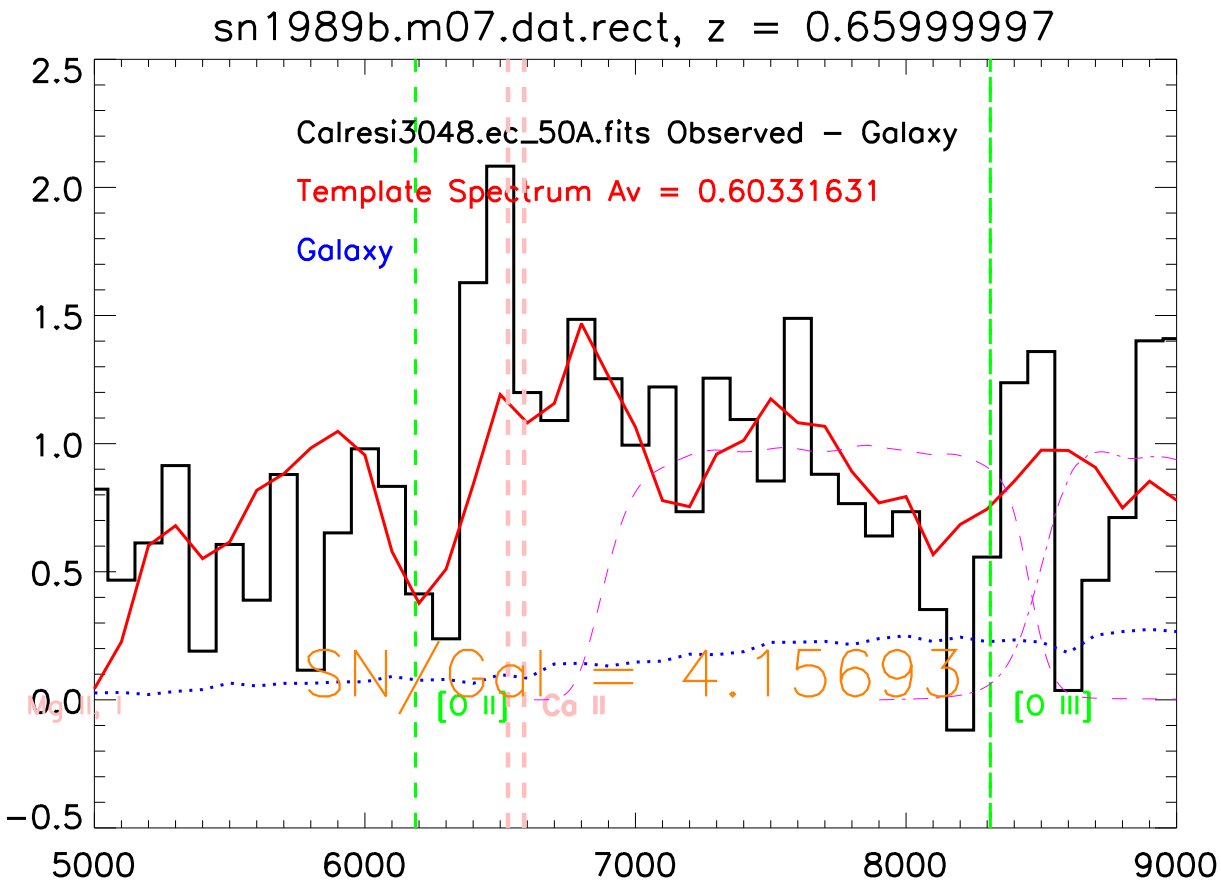

sn1999ee.m06.dat.rect, z = 0.68000001
Calresi3048.ec_50A.fits Observed − Galaxy
Template Spectrum Av = −0.44005101
Galaxy
SN/Gal = 1.83439
Mg II, I
[O II]
Ca II
[O III]
2.5
2.0
1.5
1.0
0.5
0.0
−0.5
5000
6000
7000
8000
9000

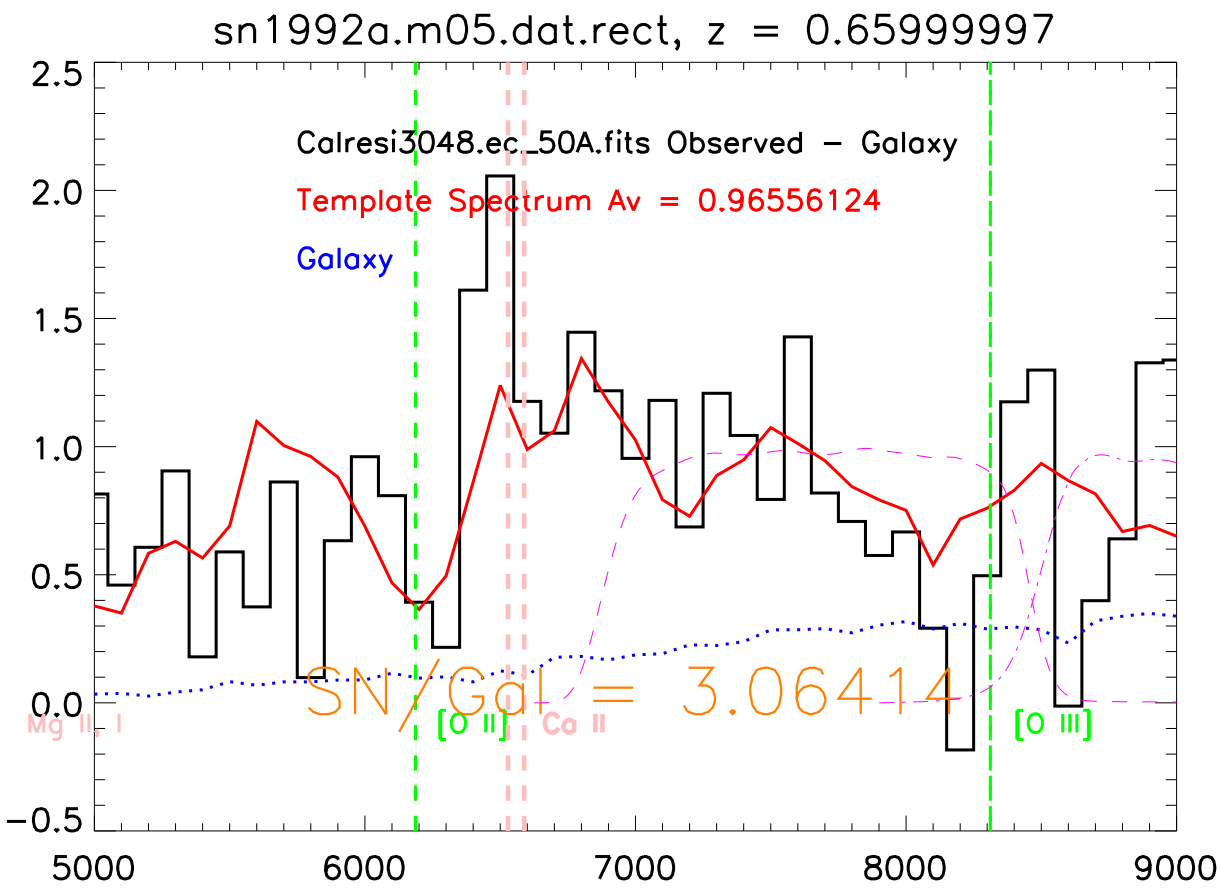

sn1994d.m09.dat.rect, z = 0.68000001
Calresi3048.ec_50A.fits Observed − Galaxy
Template Spectrum Av = 0.23852041
Galaxy
SN/Gal = 0.983157
Mg II, I
[O II]
Ca II
[O III]
2.5
2.0
1.5
1.0
0.5
0.0
−0.5
5000
6000
7000
8000
9000

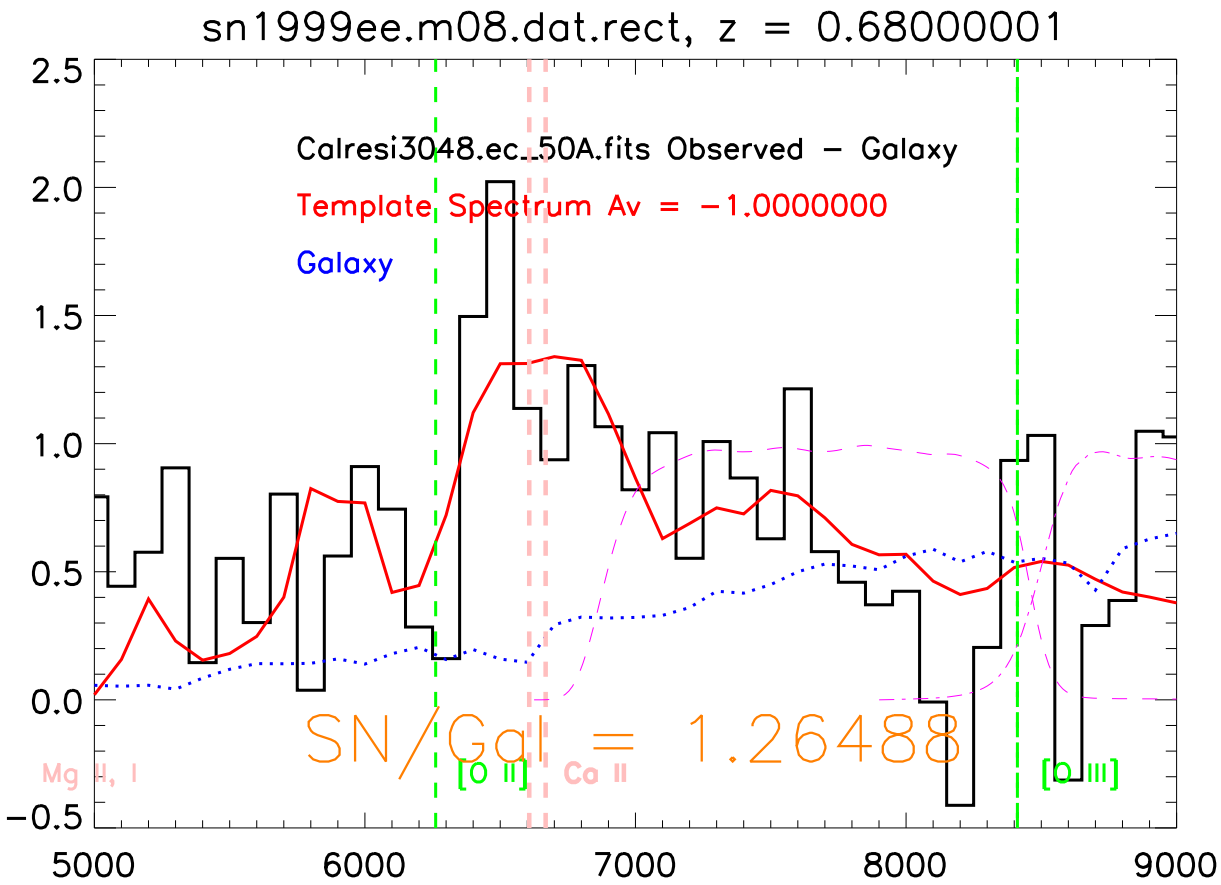

sn1994d.m03.dat.rect, z = 0.65999997
Calresi3048.ec_50A.fits Observed − Galaxy
Template Spectrum Av = 1.0000000
Galaxy
SN/Gal = 2.21121
Mg II, I
[O II]
Ca II
[O III]
2.5
2.0
1.5
1.0
0.5
0.0
−0.5
5000
6000
7000
8000
9000

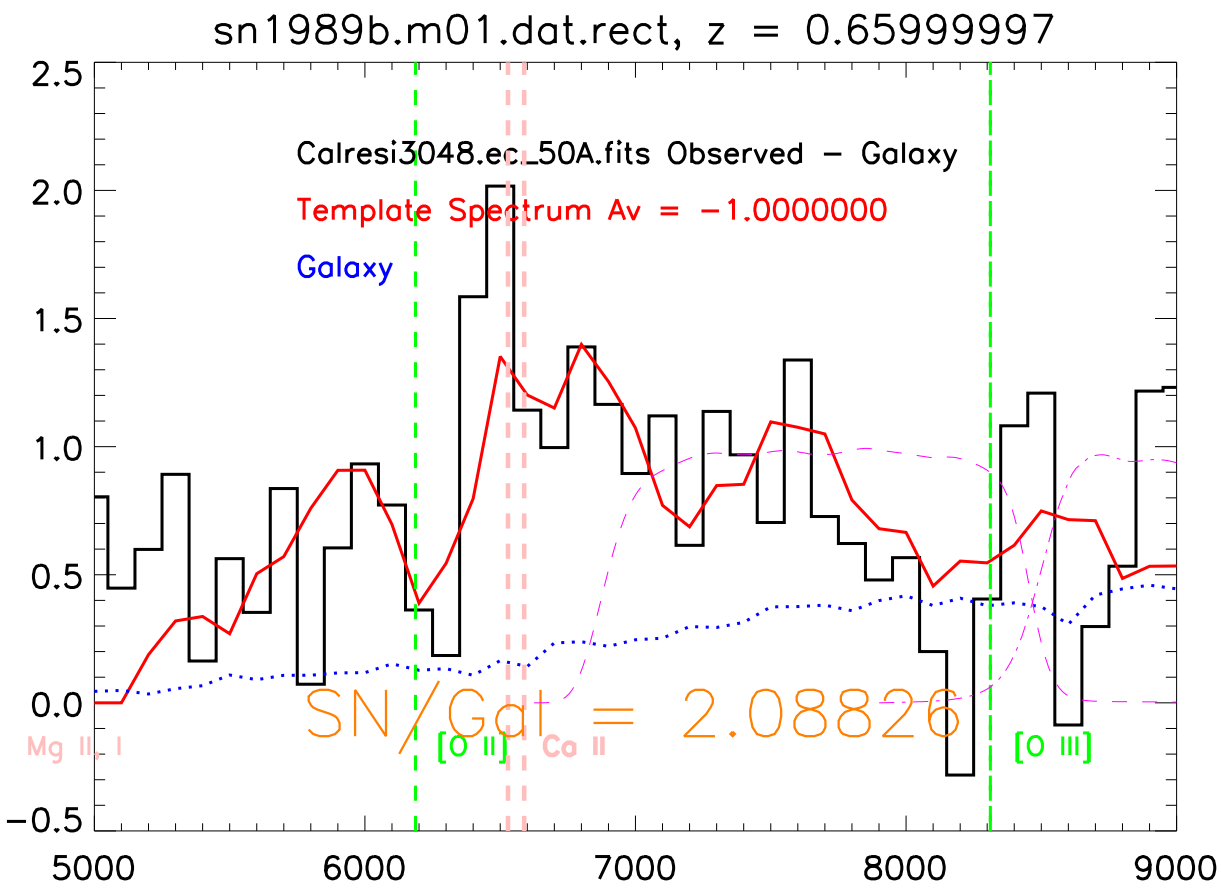

sn1996x.m02.dat.rect, z = 0.63999999
Calresi3048.ec_50A.fits Observed − Galaxy
Template Spectrum Av = 1.0000000
Galaxy
SN/Gal = −435.652
Mg II
[O II]
Ca II
[O III]
2.5
2.0
1.5
1.0
0.5
0.0
−0.5
5000
6000
7000
8000
9000

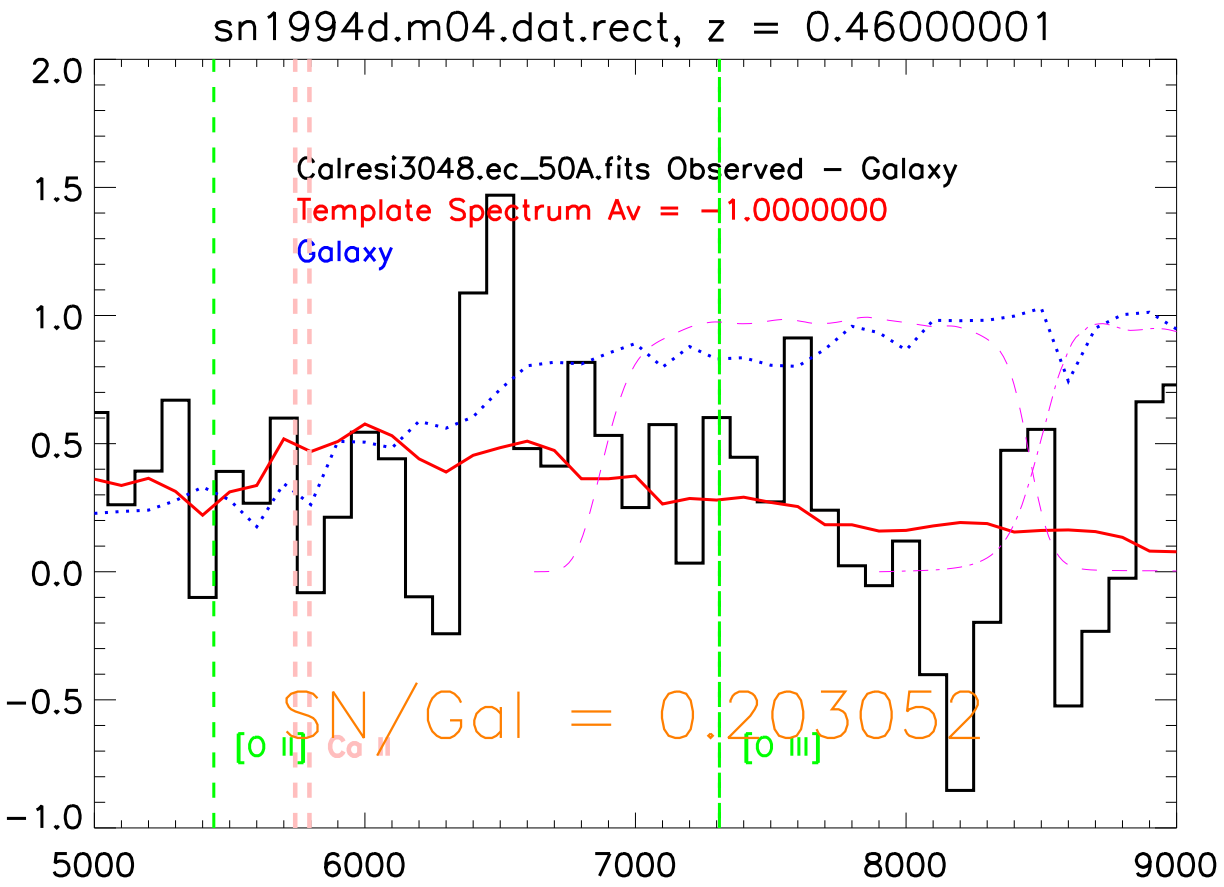

sn1990n.m07.dat.rect, z = 0.65999997
Calresi3048.ec_50A.fits Observed − Galaxy
Template Spectrum Av = 1.0000000
Galaxy
SN/Gal = 1.81252
Mg II, I
[O II]
Ca II
[O III]
2.5
2.0
1.5
1.0
0.5
0.0
−0.5
5000
6000
7000
8000
9000

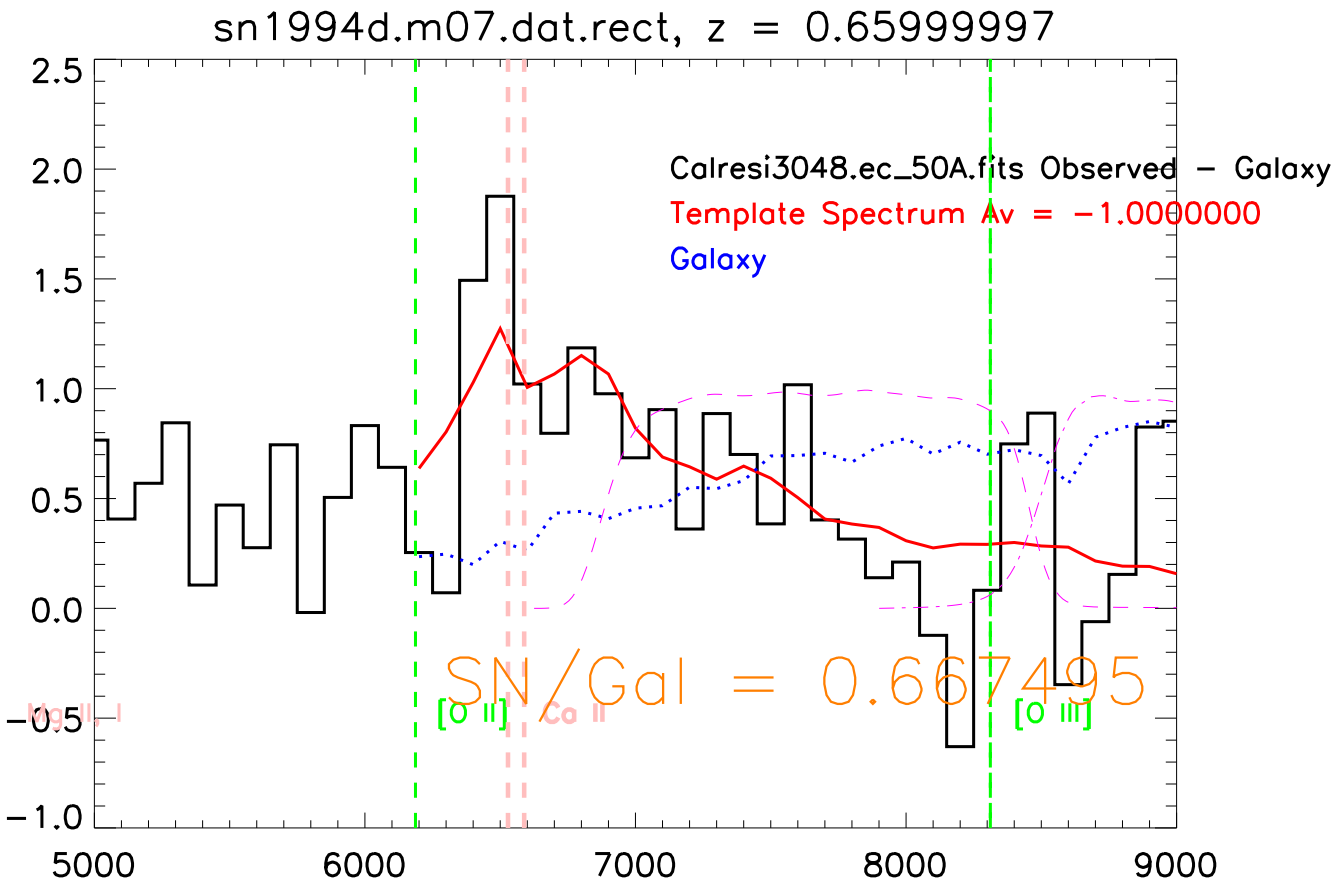

sn1989b.m07.dat.rect, z = 0.65999997
Calresi3048.ec_50A.fits Observed − Galaxy
Template Spectrum Av = 0.60331631
Galaxy
SN/Gal = 4.15693
[O II]
Ca II
[O III]
2.5
2.0
1.5
1.0
0.5
0.0
−0.5
5000
6000
7000
8000
9000

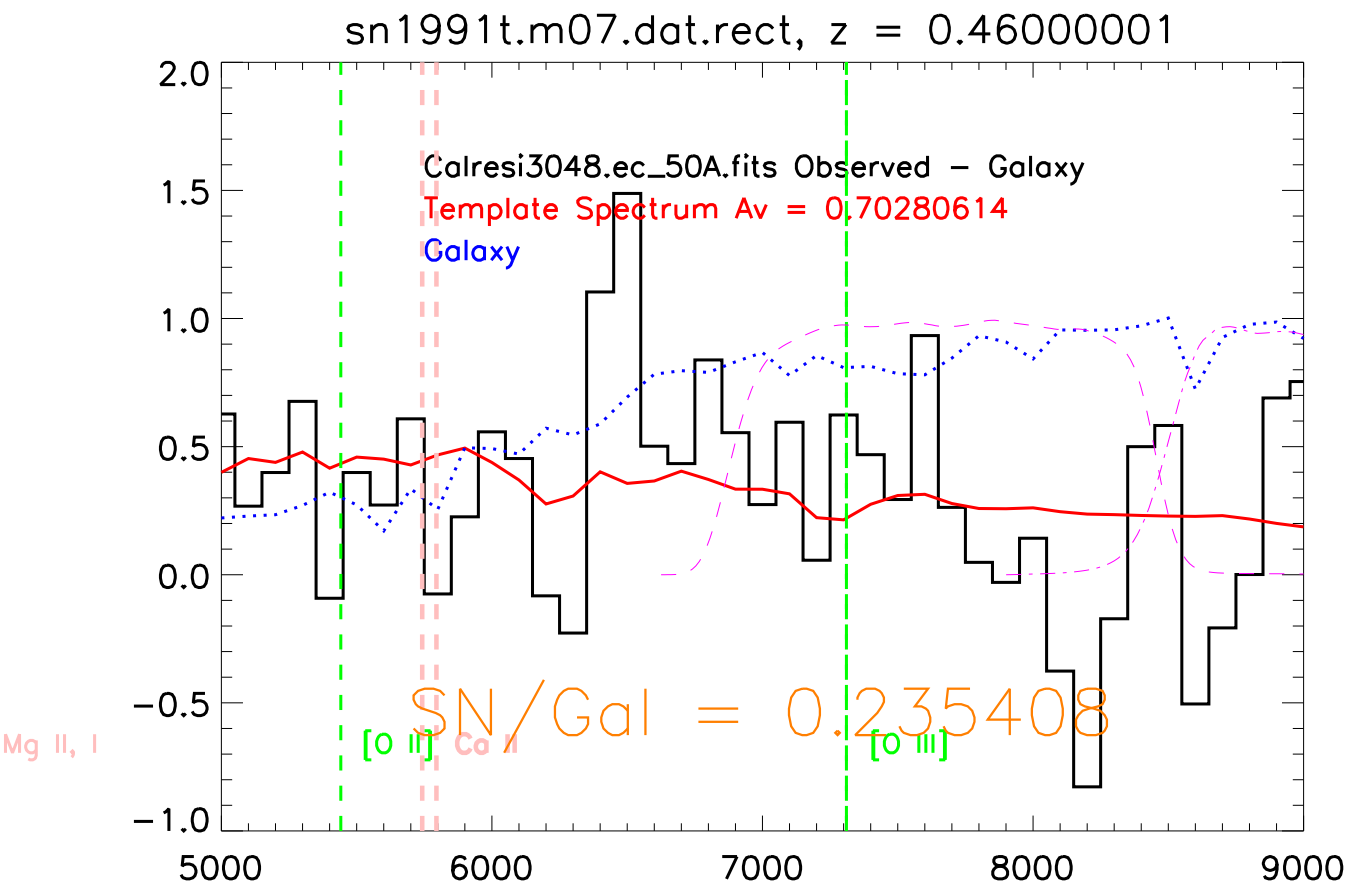

sn1992a.m05.dat.rect, z = 0.65999997
Calresi3048.ec_50A.fits Observed − Galaxy
Template Spectrum Av = 0.96556124
Galaxy
SN/Gal = 3.06414
Mg II
[O II]
Ca II
[O III]
2.5
2.0
1.5
1.0
0.5
0.0
−0.5
5000
6000
7000
8000
9000


sn1999ee.m08.dat.rect, z = 0.68000001
Calresi3048.ec..50A.fits Observed − Galaxy
Template Spectrum Av = −1.0000000
Galaxy
SN/Gal = 1.26488
Mg II, I
[O II]
Ca II
[O III]
2.5
2.0
1.5
1.0
0.5
0.0
−0.5
5000
6000
7000
8000
9000


sn1989b.m01.dat.rect, z = 0.65999997
Calresi3048.ec_50A.fits Observed − Galaxy
Template Spectrum Av = −1.0000000
Galaxy
SN/Gal = 2.08826
Mg II, I
[O II]
Ca II
[O III]
2.5
2.0
1.5
1.0
0.5
0.0
−0.5
5000
6000
7000
8000
9000


sn1994d.m04.dat.rect, z = 0.46000001
Calresi3048.ec_50A.fits Observed − Galaxy
Template Spectrum Av = −1.0000000
Galaxy
SN/Gal = 0.203052
[O II]
[O III]
2.0
1.5
1.0
0.5
0.0
−0.5
−1.0
5000
6000
7000
8000
9000


sn1994d.m07.dat.rect, z = 0.65999997
Calresi3048.ec_50A.fits Observed − Galaxy
Template Spectrum Av = −1.0000000
Galaxy
SN/Gal = 0.667495
[O II]
Ca II
[O III]
2.5
2.0
1.5
1.0
0.5
0.0
−0.5
−1.0
5000
6000
7000
8000
9000


sn1991t.m07.dat.rect, z = 0.46000001
Calresi3048.ec_50A.fits Observed − Galaxy
Template Spectrum Av = 0.70280614
Galaxy
SN/Gal = 0.235408
[O II]
[O III]
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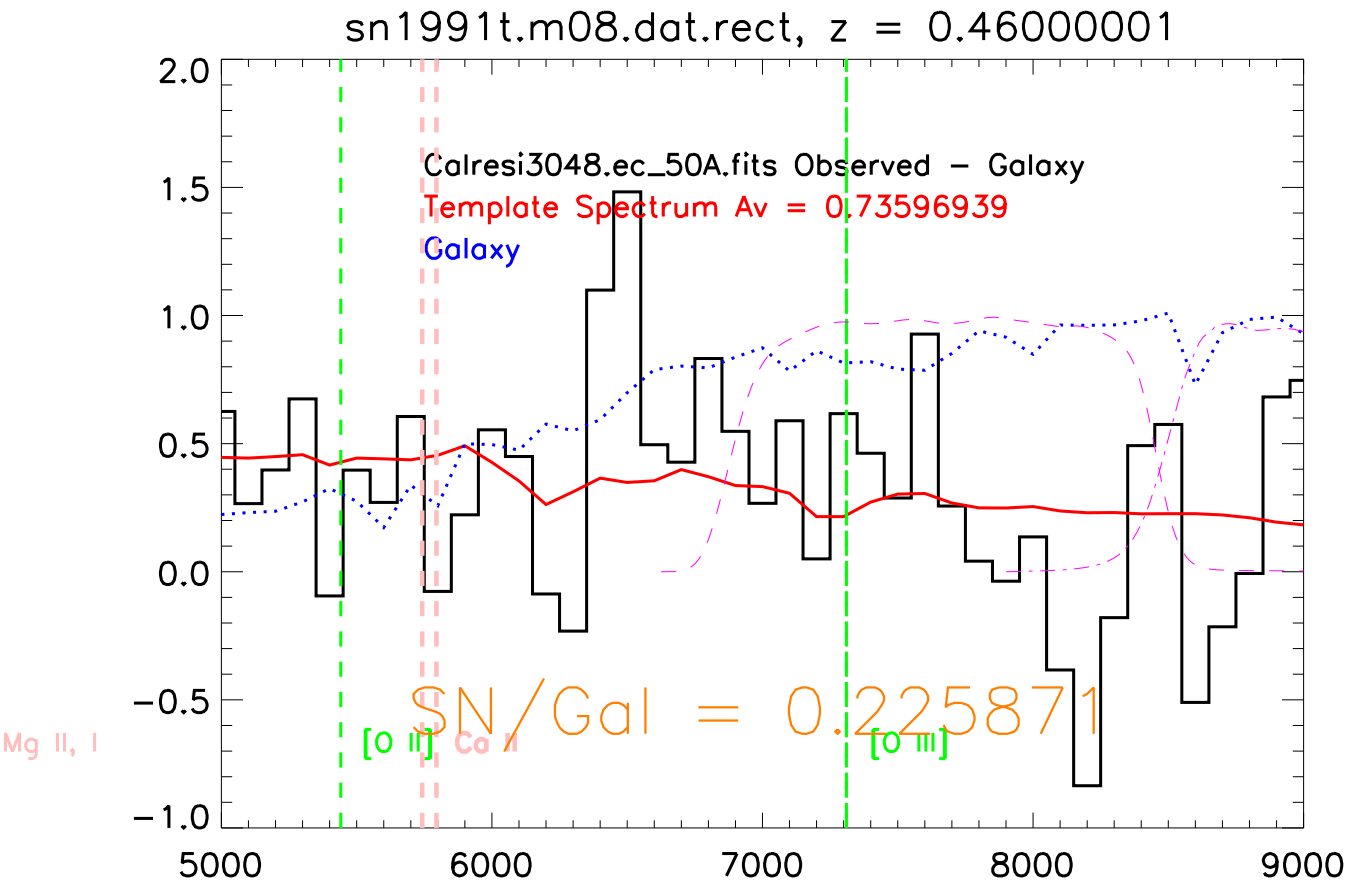
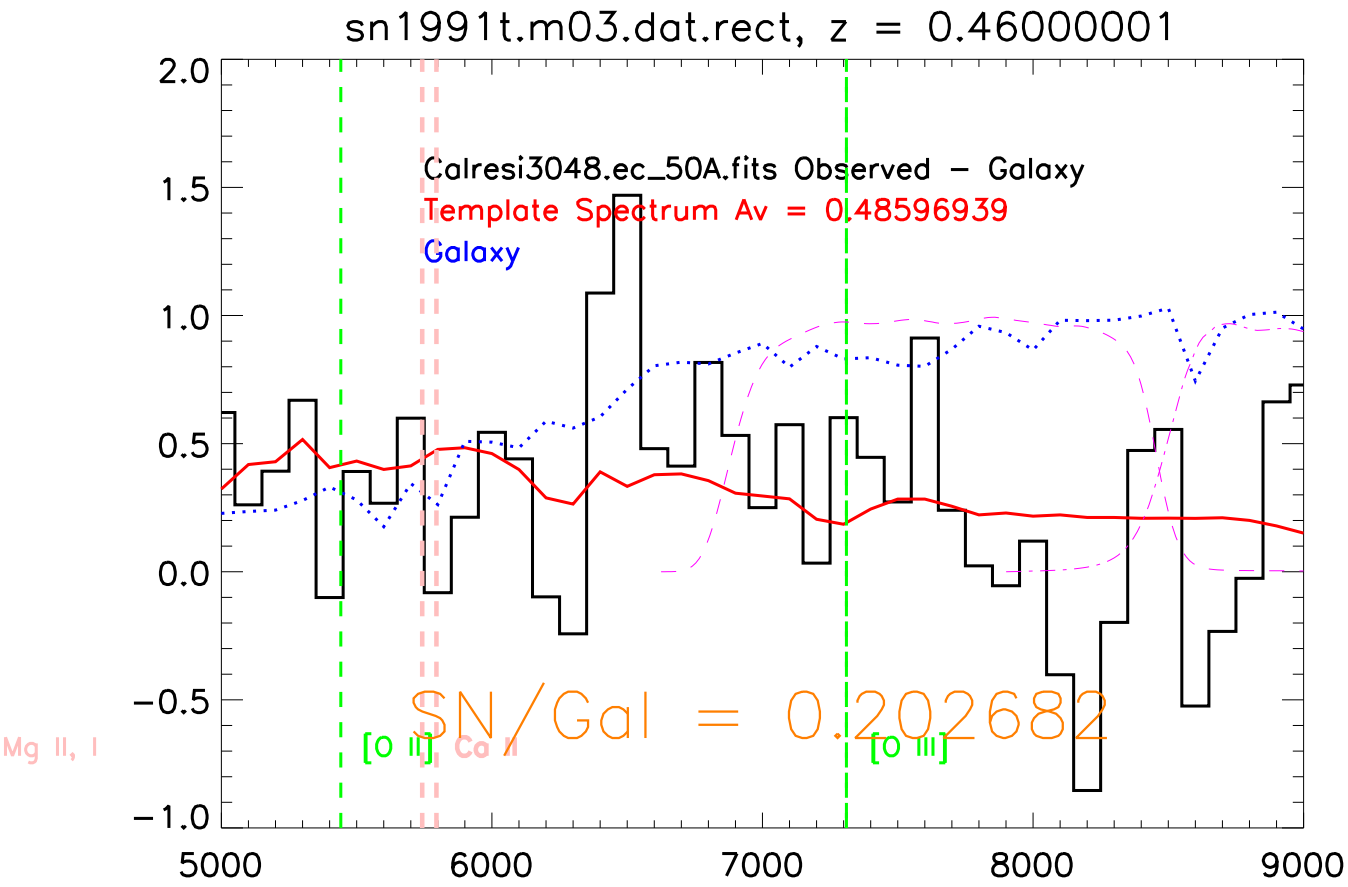
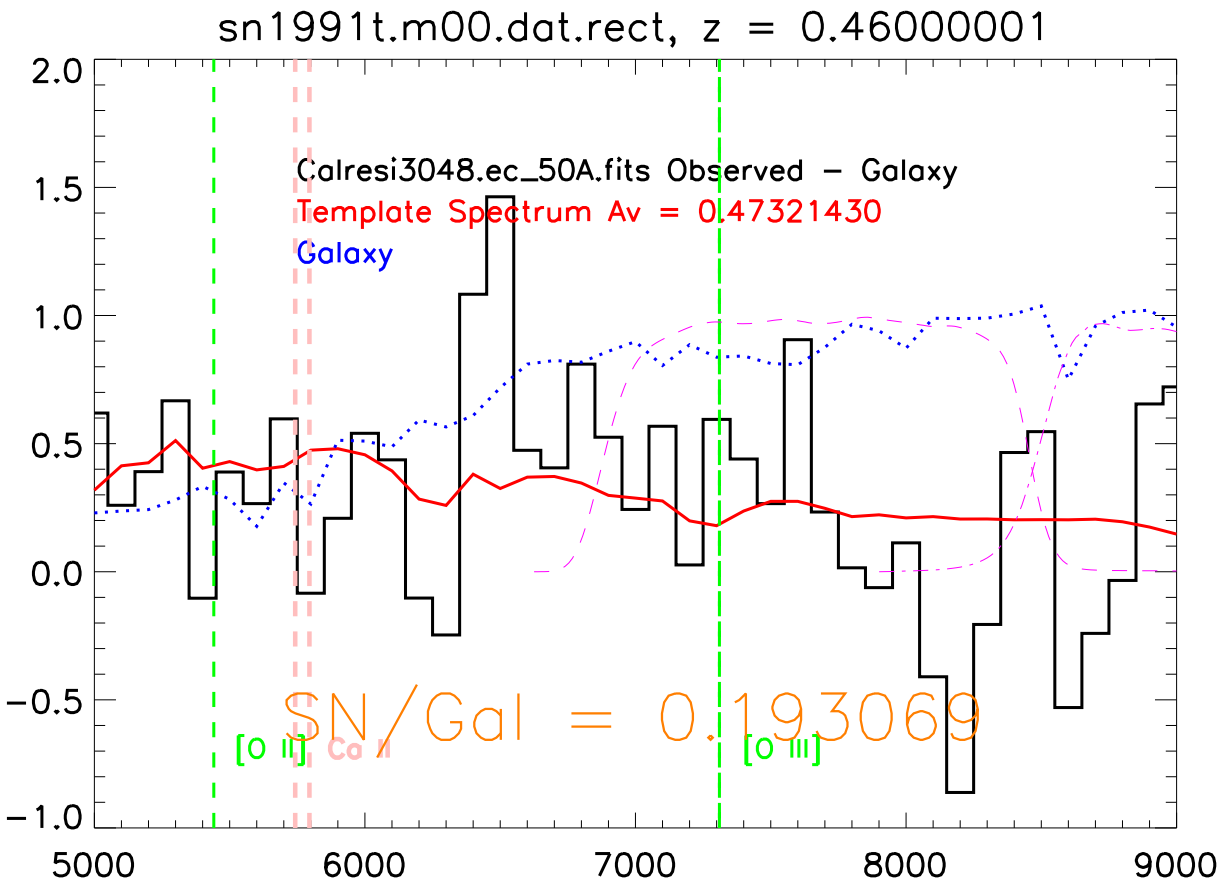
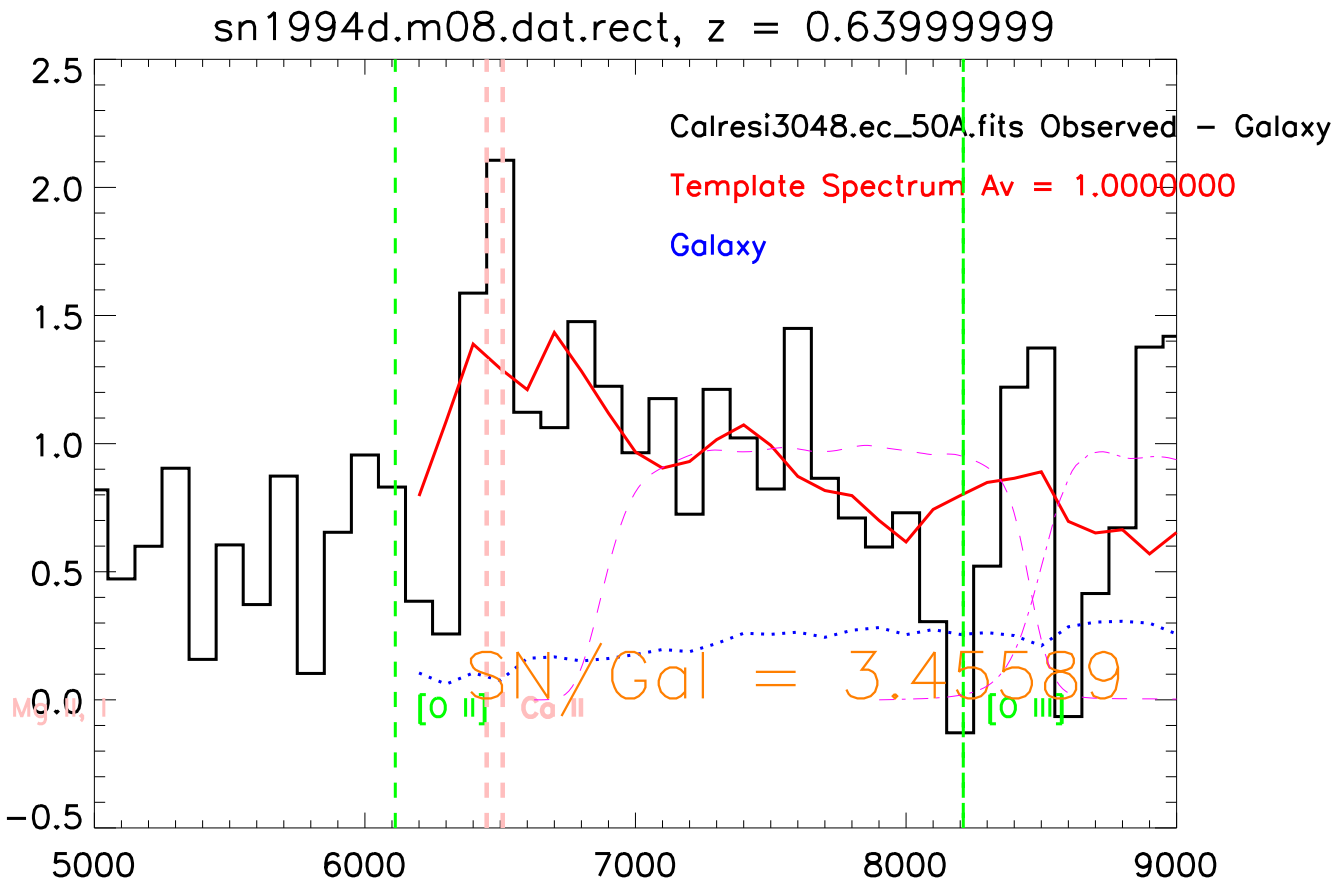
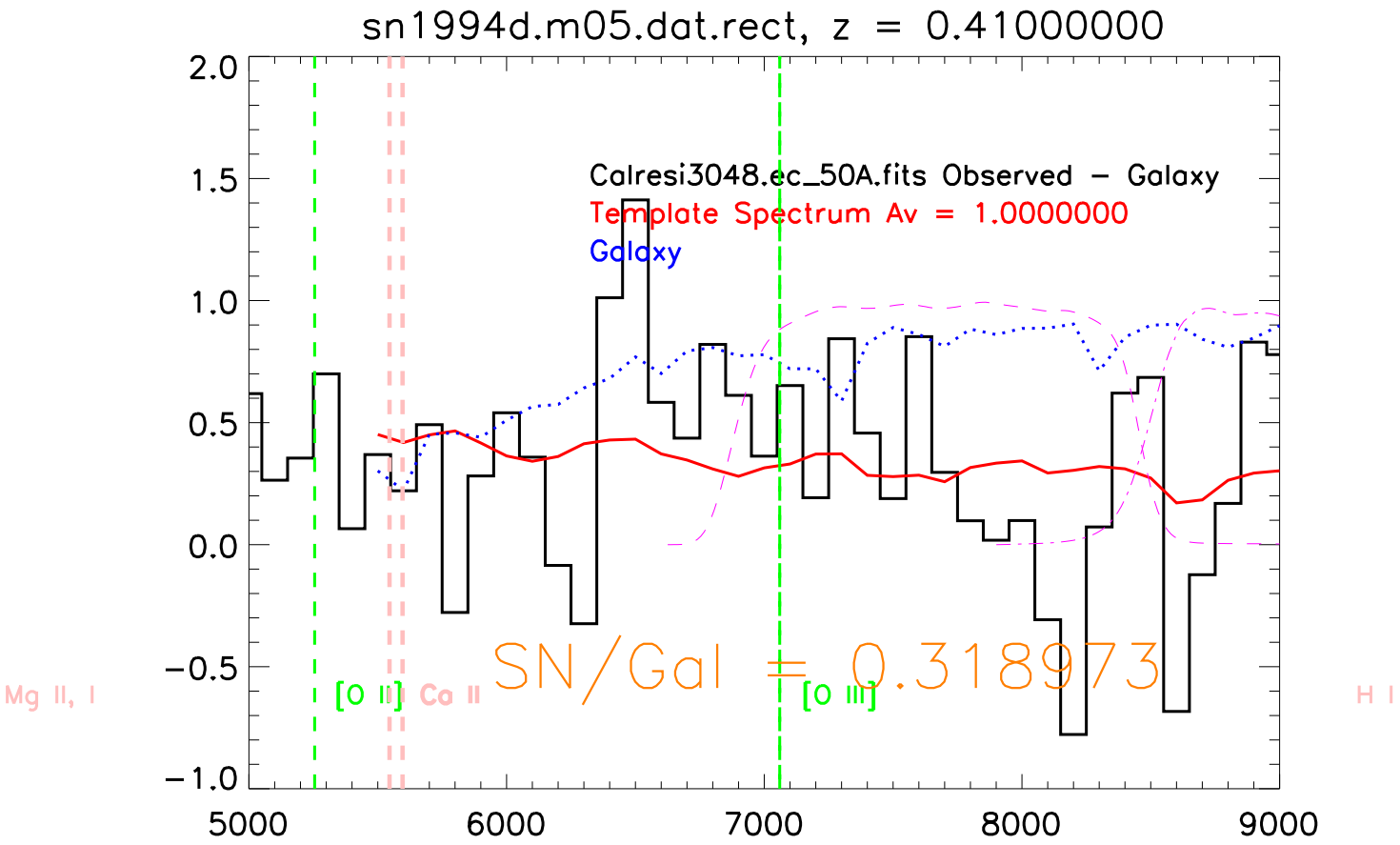
1.5
1.0
0.5
0.0
−0.5
−1.0
5000
6000
7000
8000
9000

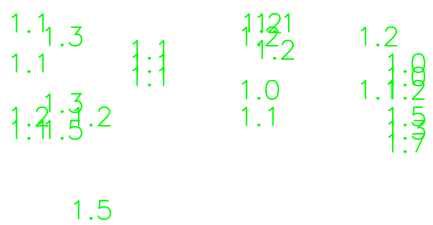

sn1991t.m08.dat.rect, z = 0.46000001
Calresi3048.ec_50A.fits Observed − Galaxy
Template Spectrum Av = 0.73596939
Galaxy
SN/Gal = 0.225871
[O II]
Ca II
[O III]
Mg II, I
H
2.0
1.5
1.0
0.5
0.0
−0.5
−1.0
5000
6000
7000
8000
9000

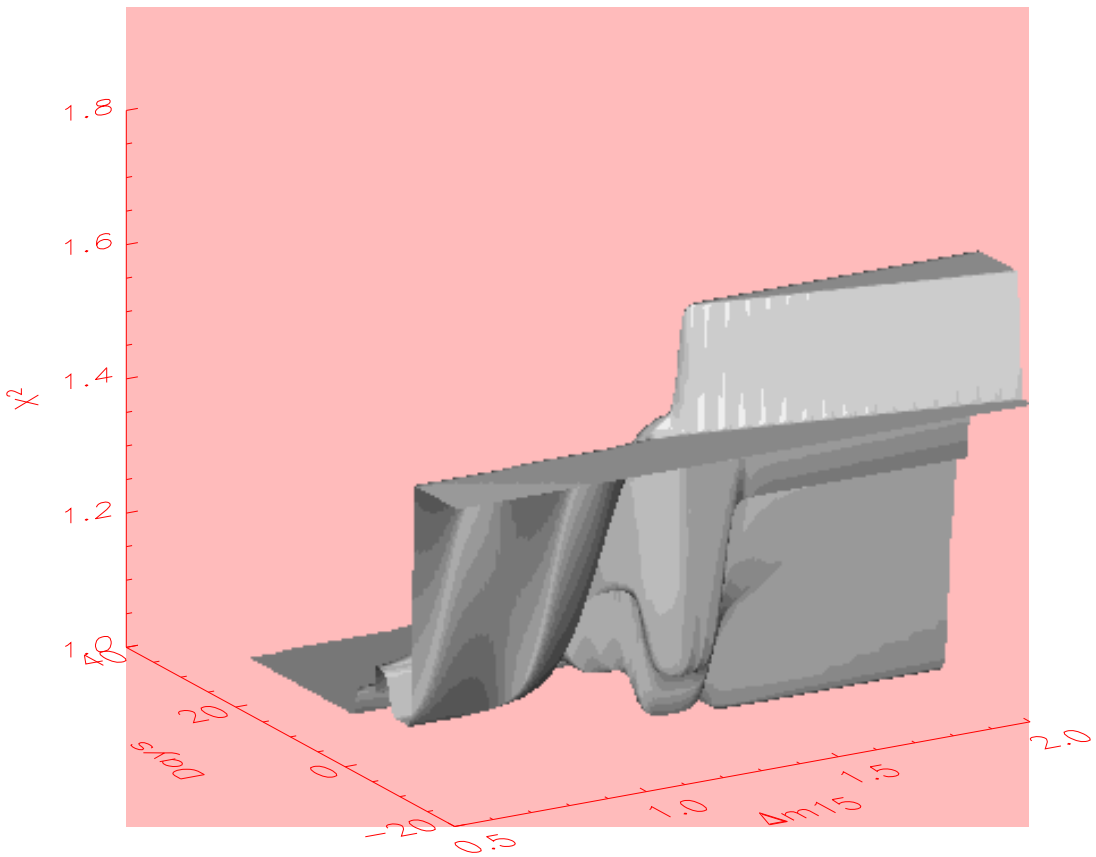

sn1991t.m03.dat.rect, z = 0.46000001
Calresi3048.ec_50A.fits Observed − Galaxy
Template Spectrum Av = 0.48596939
Galaxy
SN/Gal = 0.202682
[O II]
Ca II
[O III]
2.0
1.5
1.0
0.5
0.0
−0.5
−1.0
5000
6000
7000
8000
9000


sn1991t.m00.dat.rect, z = 0.46000001
Calresi3048.ec_50A.fits Observed − Galaxy
Template Spectrum Av = 0.47321430
Galaxy
SN/Gal = 0.193069
[O II]
Ca II
[O III]
2.0
1.5
1.0
0.5
0.0
−0.5
−1.0
5000
6000
7000
8000
9000

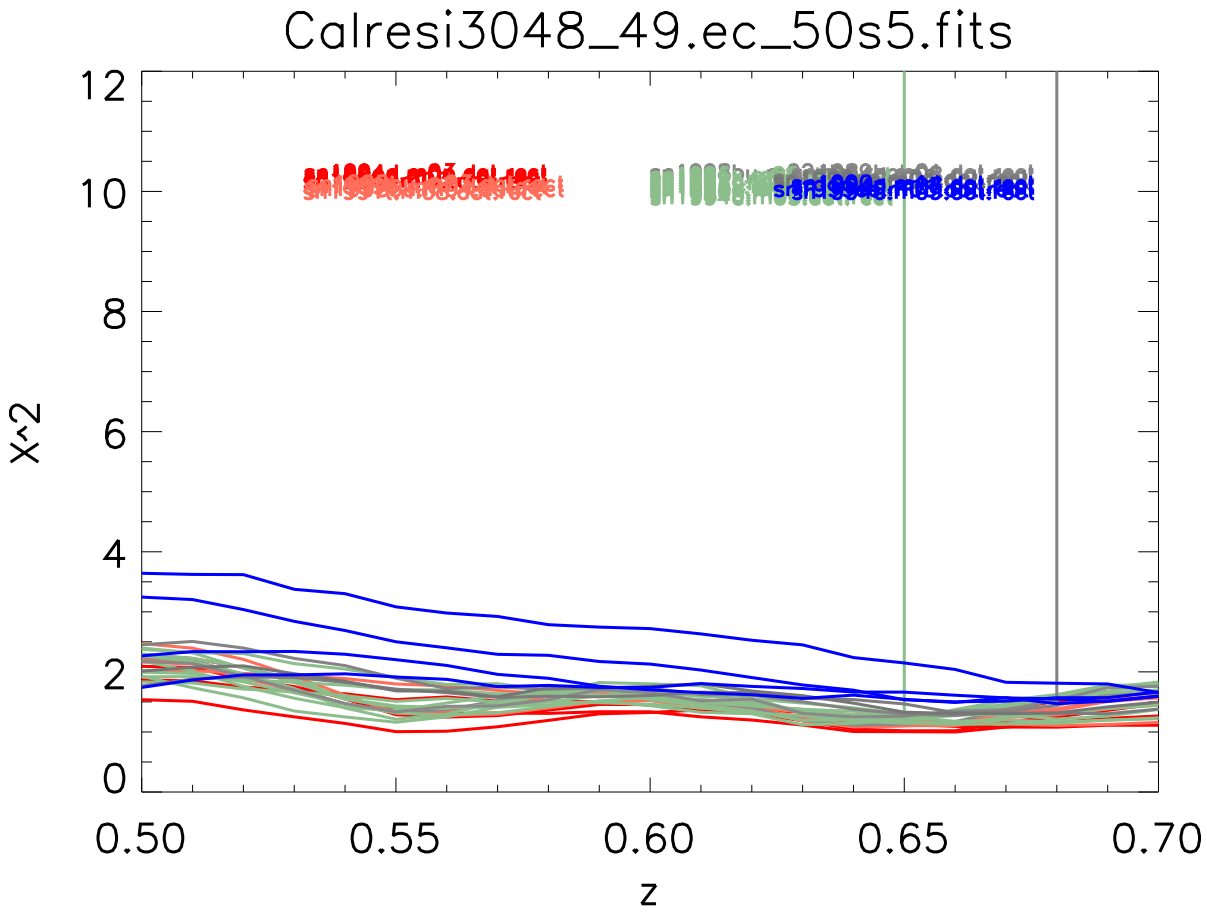

sn1994d.m08.dat.rect, z = 0.63999999
Calresi3048.ec_50A.fits Observed − Galaxy
Template Spectrum Av = 1.0000000
Galaxy
SN/Gal = 3.45589
[O II]
Ca II
[O III]
2.5
2.0
1.5
1.0
0.5
0.0
−0.5
5000
6000
7000
8000
9000

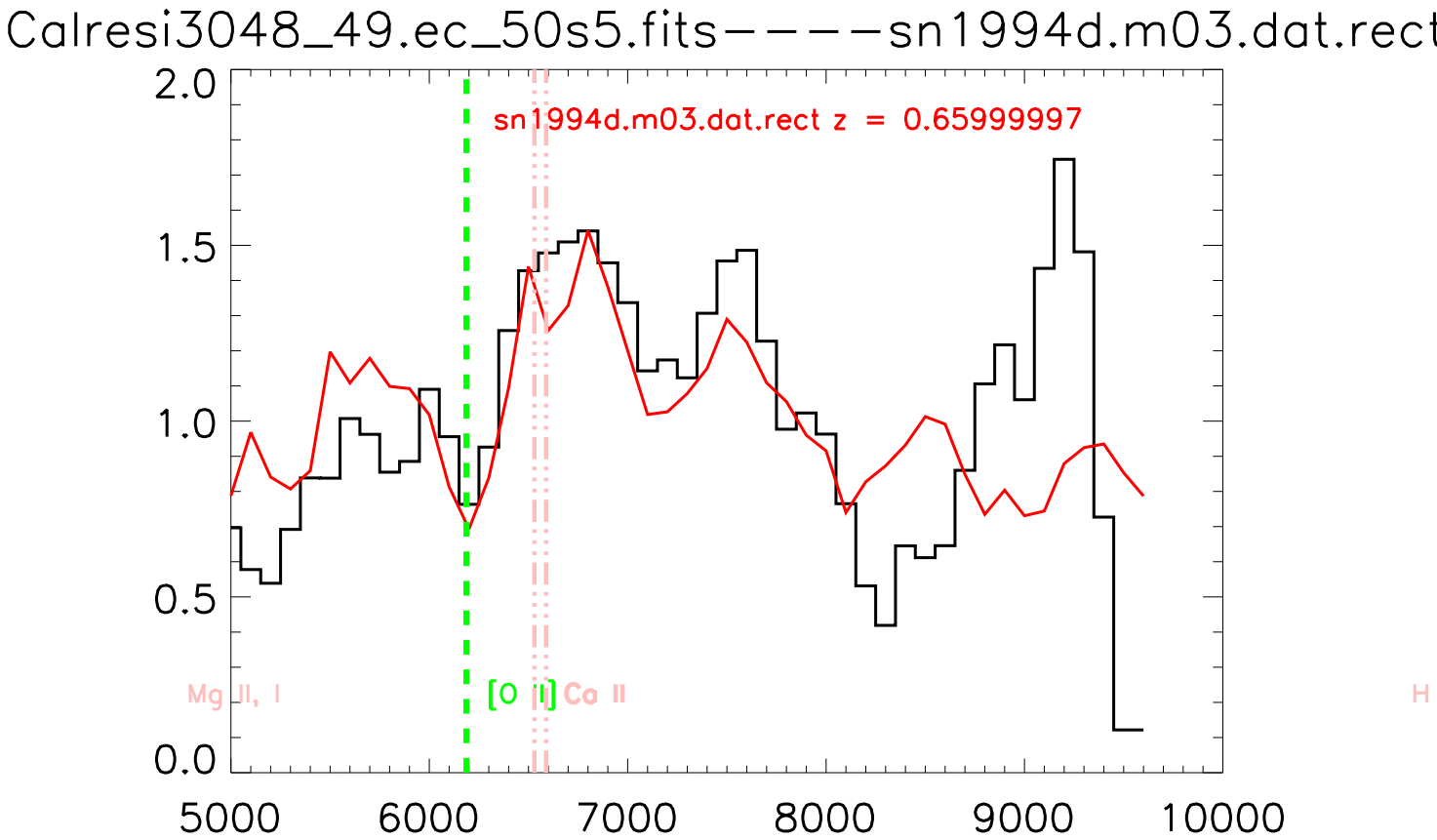

sn1994d.m05.dat.rect, z = 0.41000000
Calresi3048.ec_50A.fits Observed − Galaxy
Template Spectrum Av = 1.0000000
Galaxy
SN/Gal = 0.318973
Mg II, I
[O II]
Ca II
[O III]
H I
2.0
1.5
1.0
0.5
0.0
−0.5
−1.0
5000
6000
7000
8000
9000

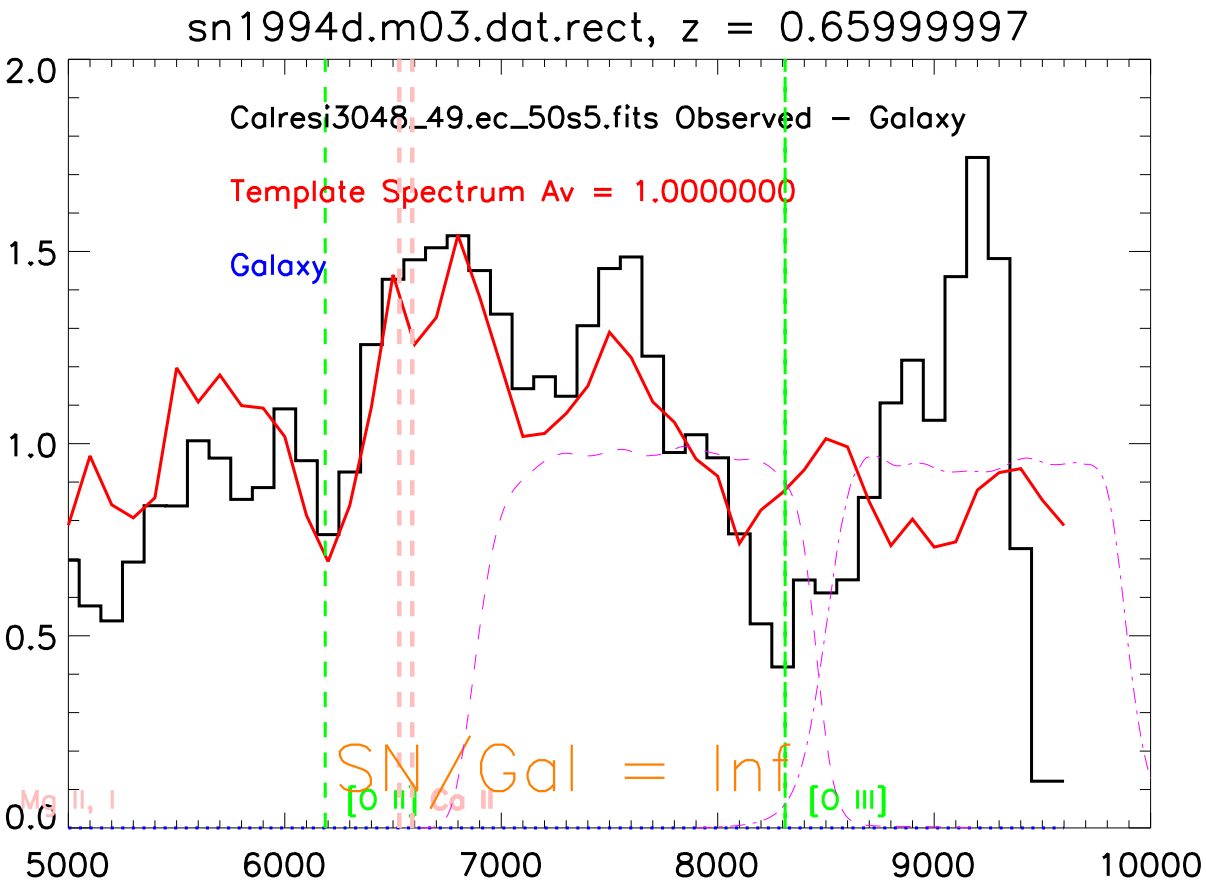


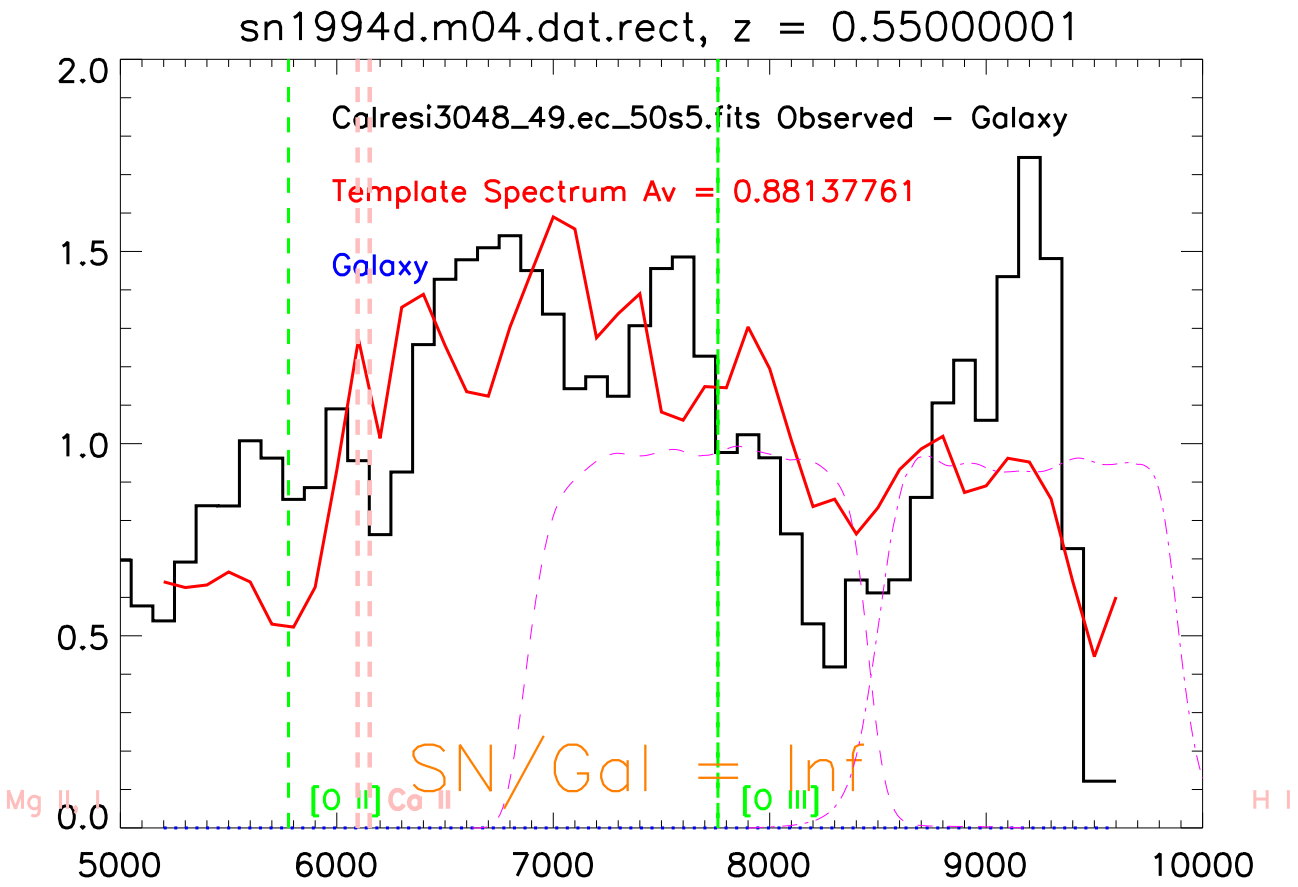


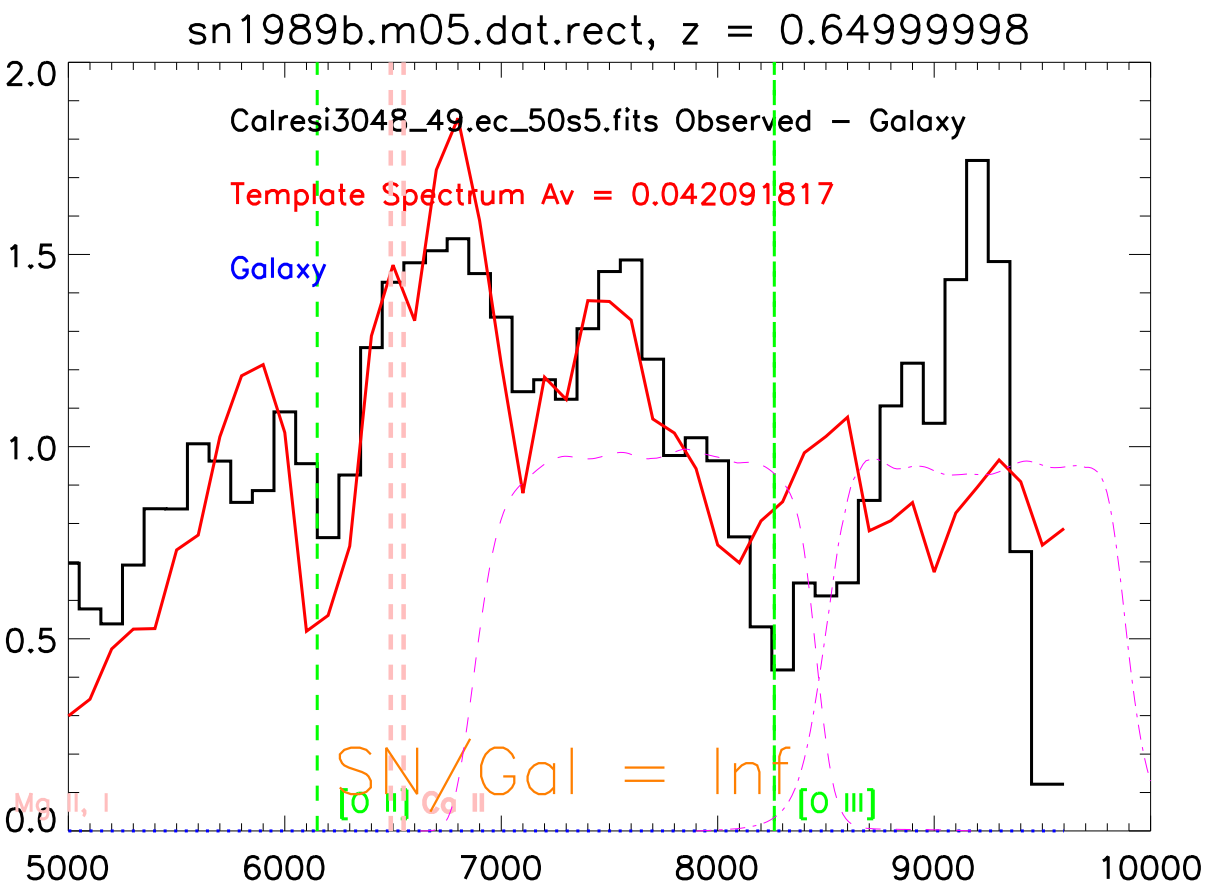
1.8
1.6
1.4
1.2
1.0
χ^2
40
20
0
−20
Days
0.5
1.0
1.5
2.0
Δm15

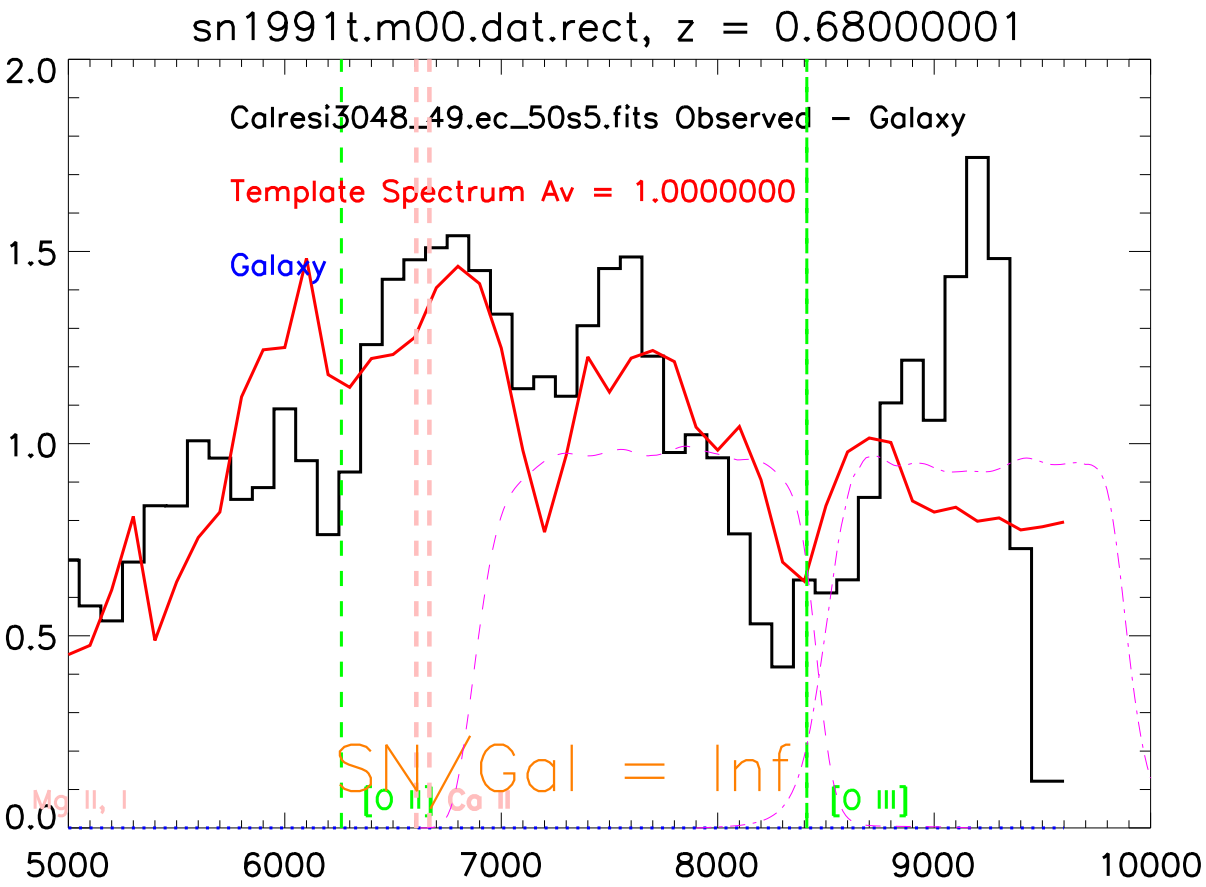

Calresi3048_49.ec_50s5.fits
12
10
8
6
4
2
0
X^2
0.50
0.55
0.60
0.65
0.70
z

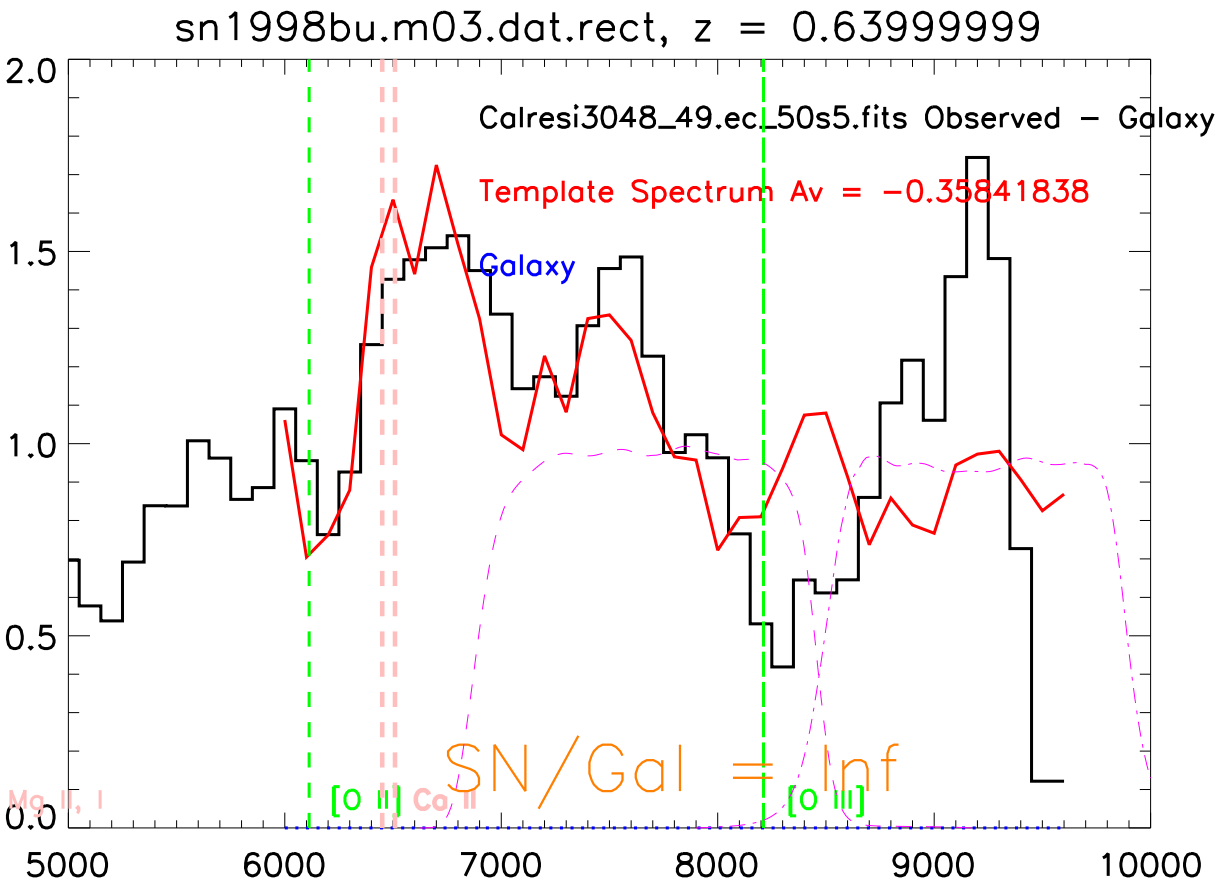

Calresi3048_49.ec_50s5.fits----sn1994d.m03.dat.rect
sn1994d.m03.dat.rect z = 0.65999997
2.0
1.5
1.0
0.5
0.0
Mg II, I
[O II]
Ca II
H
5000
6000
7000
8000
9000
10000

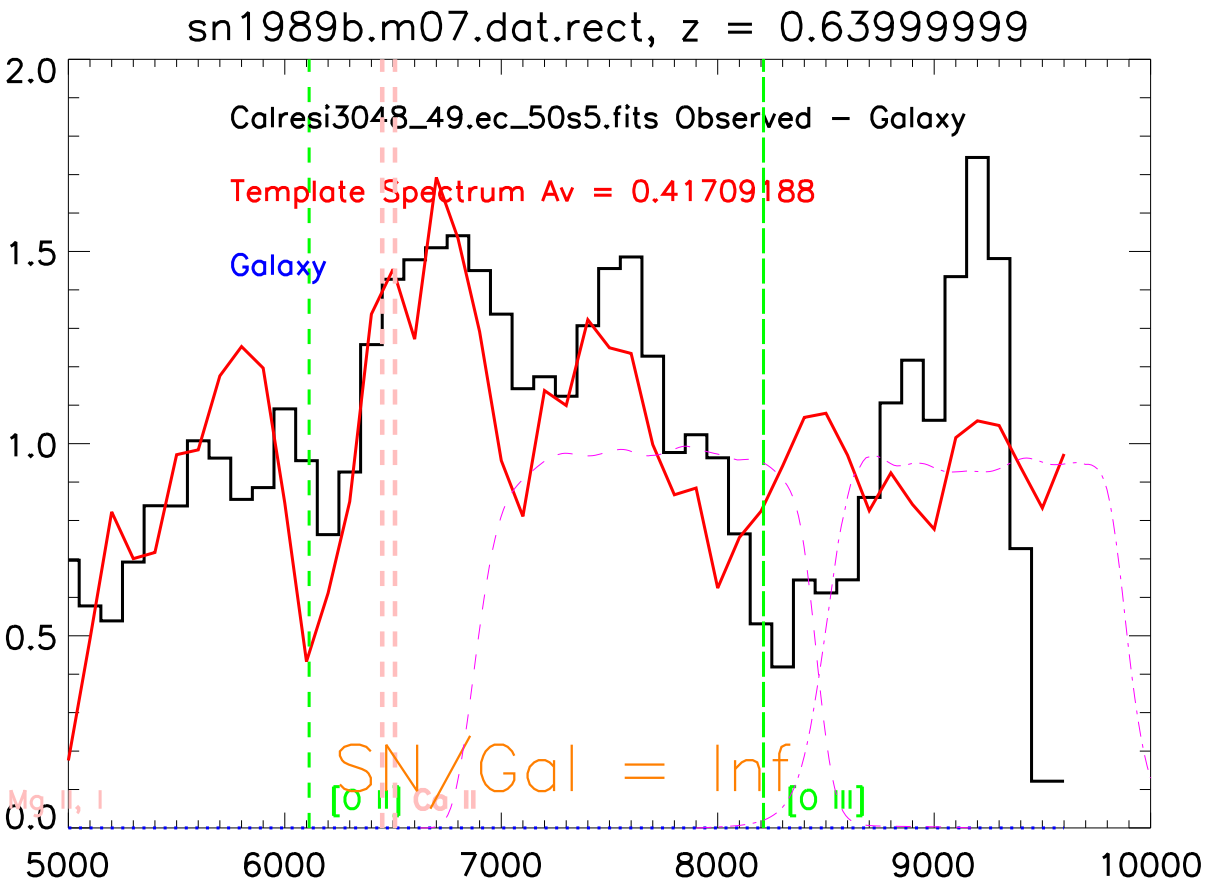

sn1994d.m03.dat.rect, z = 0.65999997
Calresi3048_49.ec_50s5.fits Observed − Galaxy
Template Spectrum Av = 1.0000000
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
2.0
1.5
1.0
0.5
0.0
5000
6000
7000
8000
9000
10000

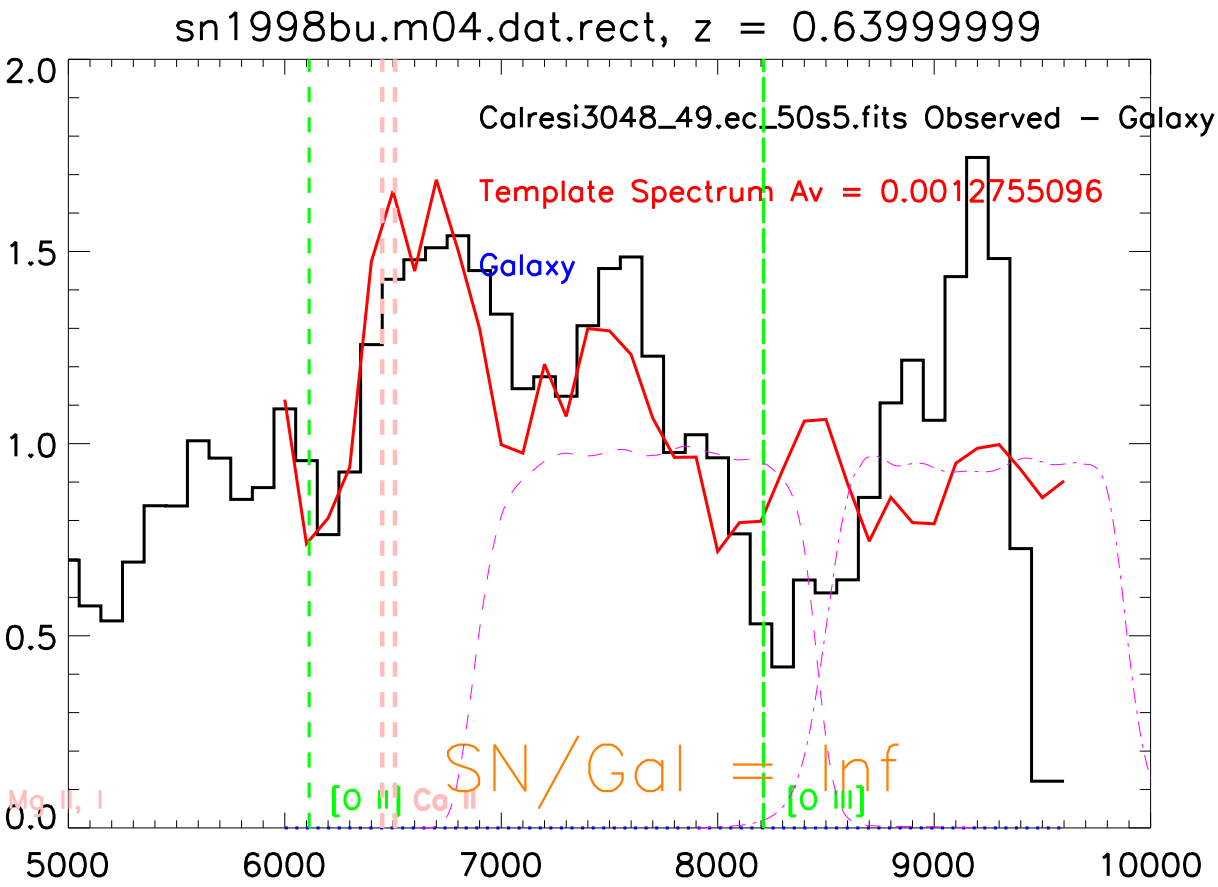

sn1994d.m04.dat.rect, z = 0.55000001
Calresi3048_49.ec_50s5.fits Observed − Galaxy
Template Spectrum Av = 0.88137761
Galaxy
SN/Gal = Inf
[O II]
Ca II
[O III]
Mg II
H I
2.0
1.5
1.0
0.5
0.0
5000
6000
7000
8000
9000
10000

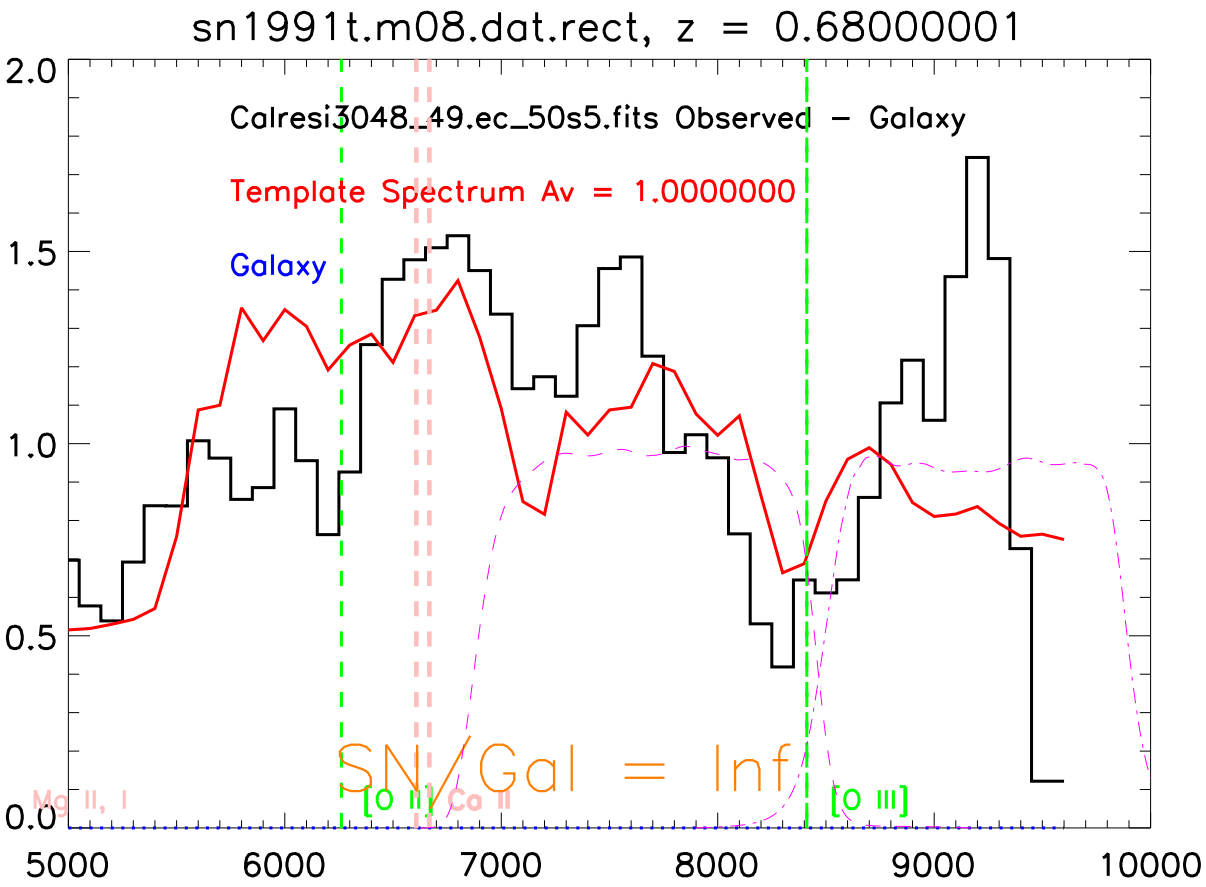

sn1989b.m05.dat.rect, z = 0.64999998
Calresi3048_49.ec_50s5.fits Observed − Galaxy
Template Spectrum Av = 0.042091817
Galaxy
SN/Gal = Inf
[O II] Ca II
[O III]
2.0
1.5
1.0
0.5
0.0
5000
6000
7000
8000
9000
10000

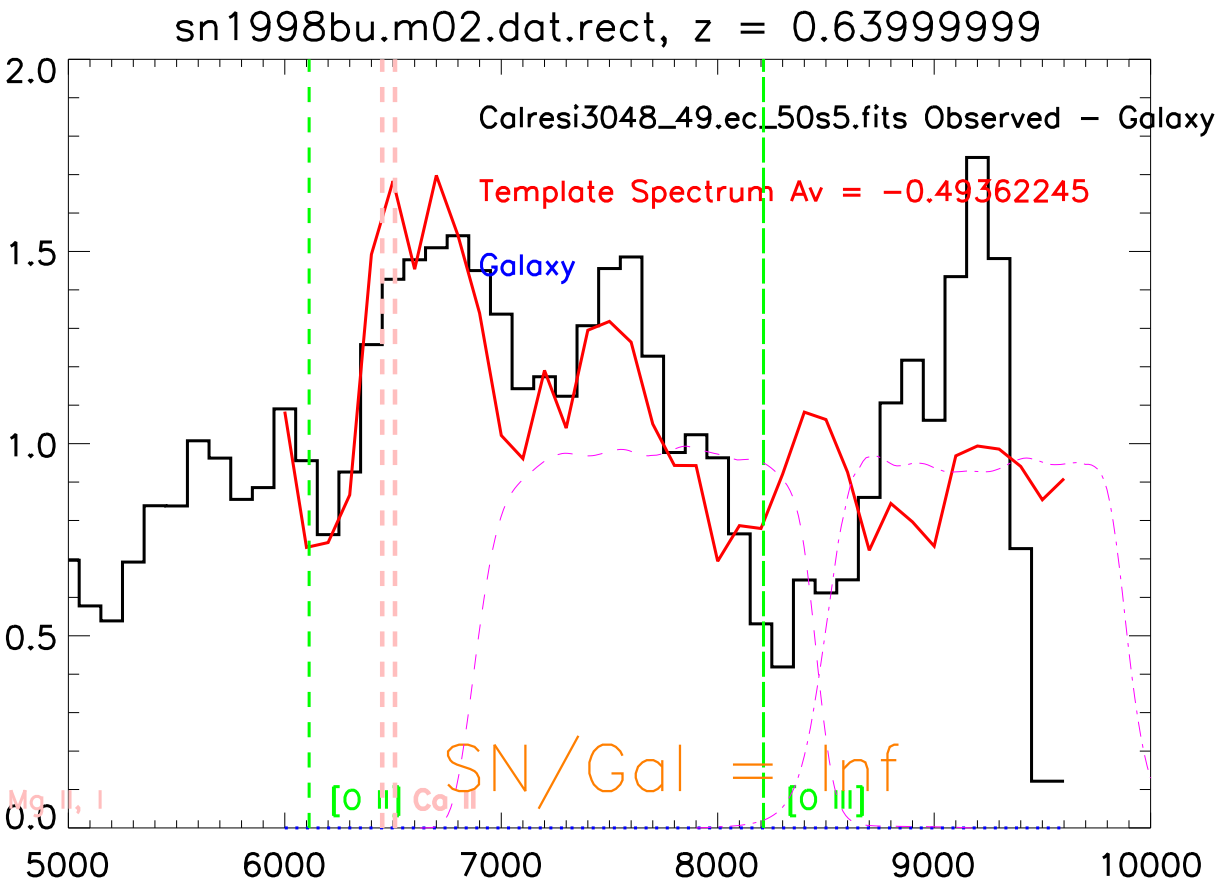

sn1991t.m00.dat.rect, z = 0.68000001
Calresi3048..49.ec_50s5.fits Observed – Galaxy
Template Spectrum Av = 1.0000000
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
2.0
1.5
1.0
0.5
0.0
5000
6000
7000
8000
9000
10000

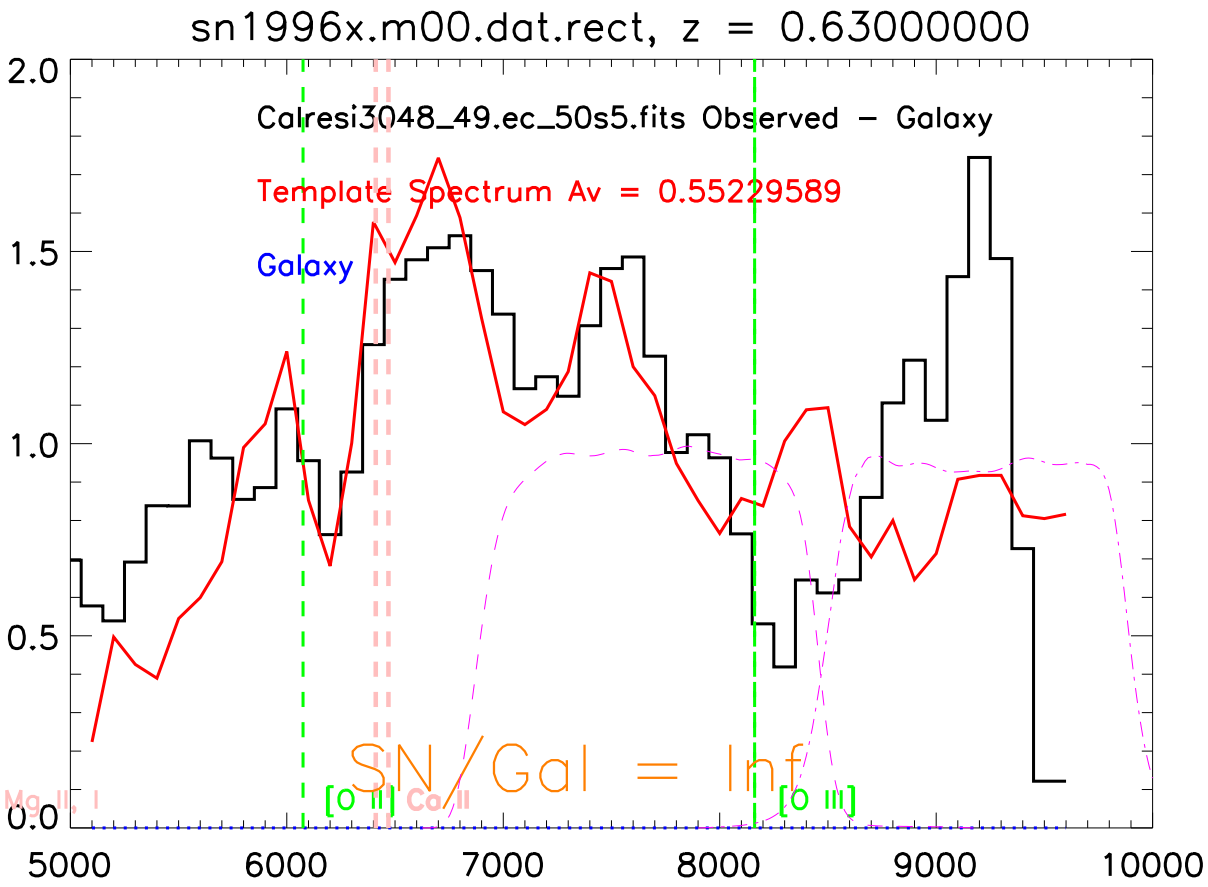

sn1998bu.m03.dat.rect, z = 0.63999999
Calresi3048_49.ec_50s5.fits Observed − Galaxy
Template Spectrum Av = −0.35841838
Galaxy
SN/Gal = Inf
[O II]
Ca, II
[O III]
2.0
1.5
1.0
0.5
0.0
5000
6000
7000
8000
9000
10000

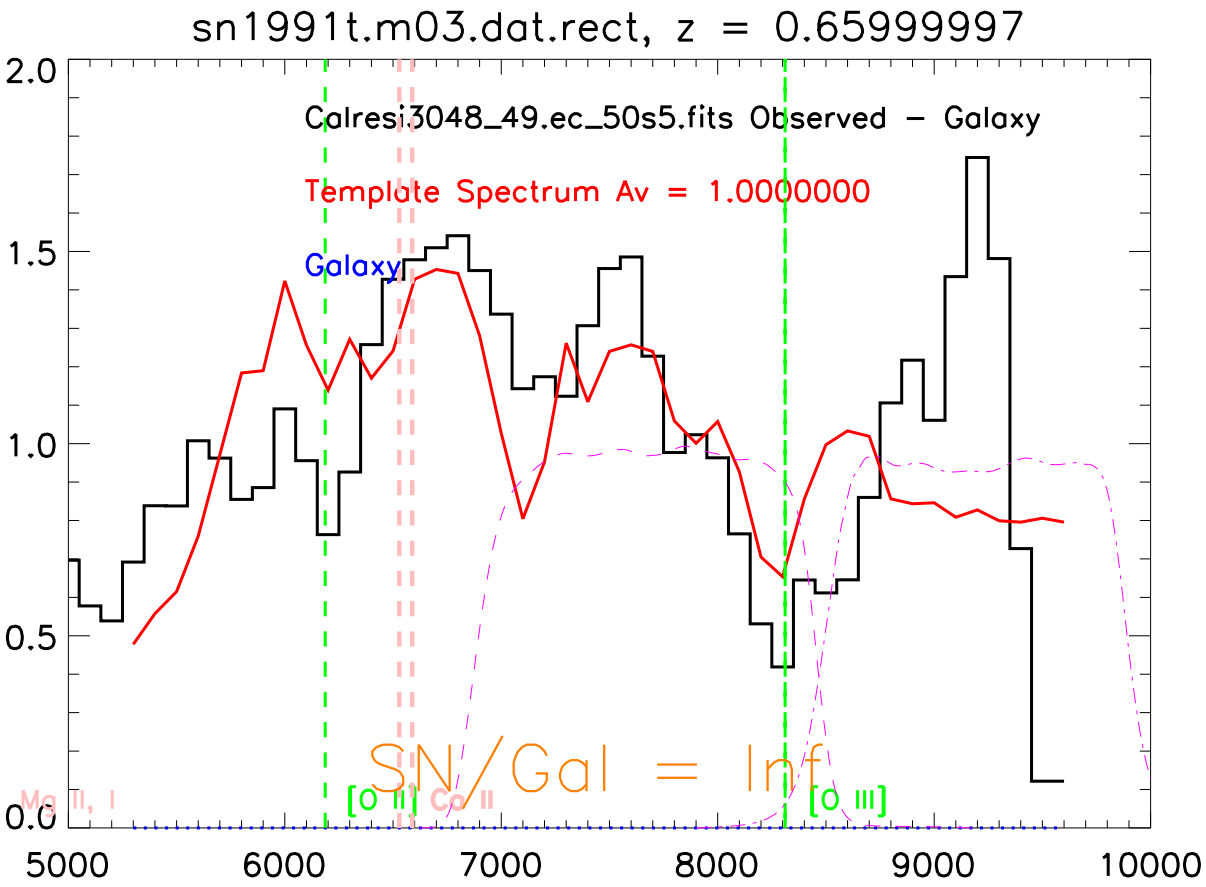

sn1989b.m07.dat.rect, z = 0.63999999
Calresi3048_49.ec_50s5.fits Observed − Galaxy
Template Spectrum Av = 0.41709188
Galaxy
SN/Gal = Inf
[O II]
[O III]
2.0
1.5
1.0
0.5
0.0
5000
6000
7000
8000
9000
10000

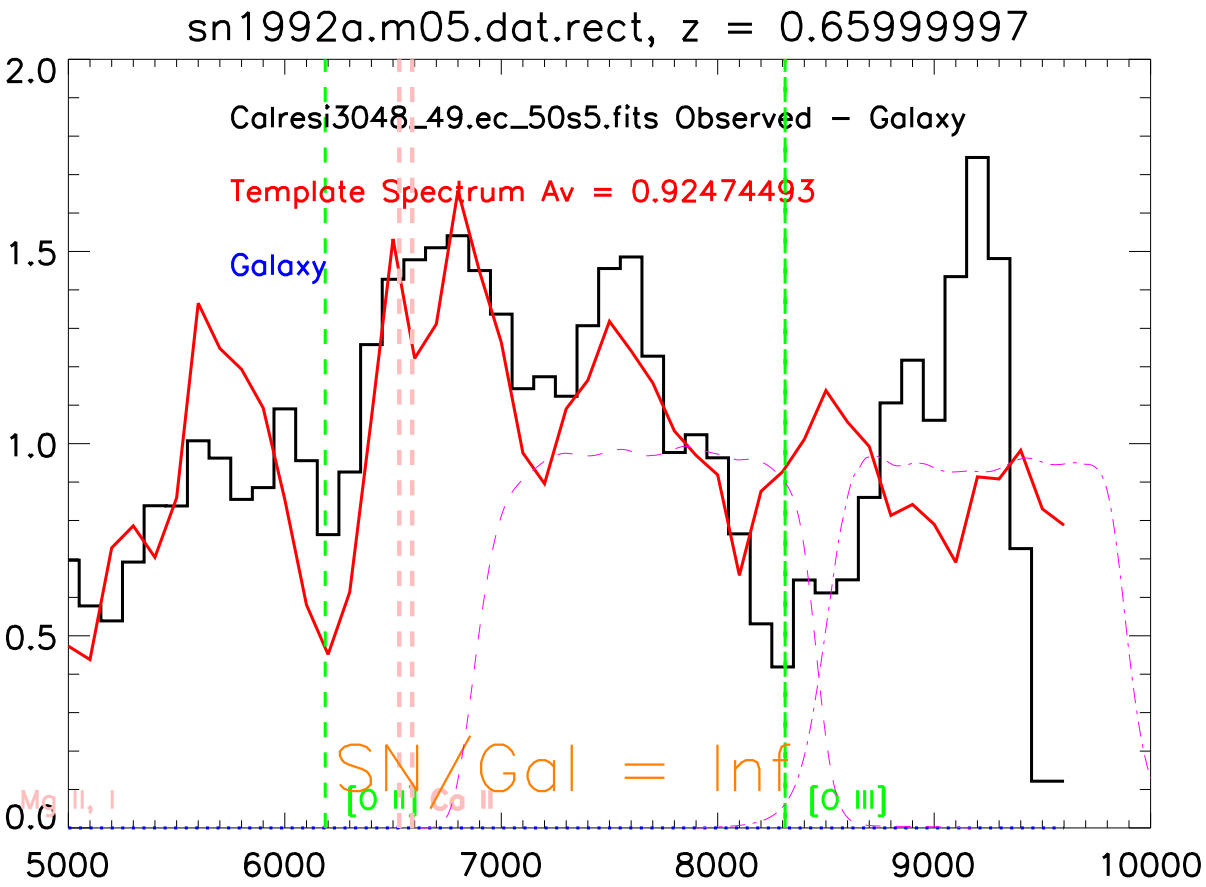

sn1998bu.m04.dat.rect, z = 0.63999999
Calresi3048_49.ec_50s5.fits Observed − Galaxy
Template Spectrum Av = 0.0012755096
Galaxy
SN/Gal = Inf
[O II]
Ca, II
[O III]
2.0
1.5
1.0
0.5
0.0
5000
6000
7000
8000
9000
10000

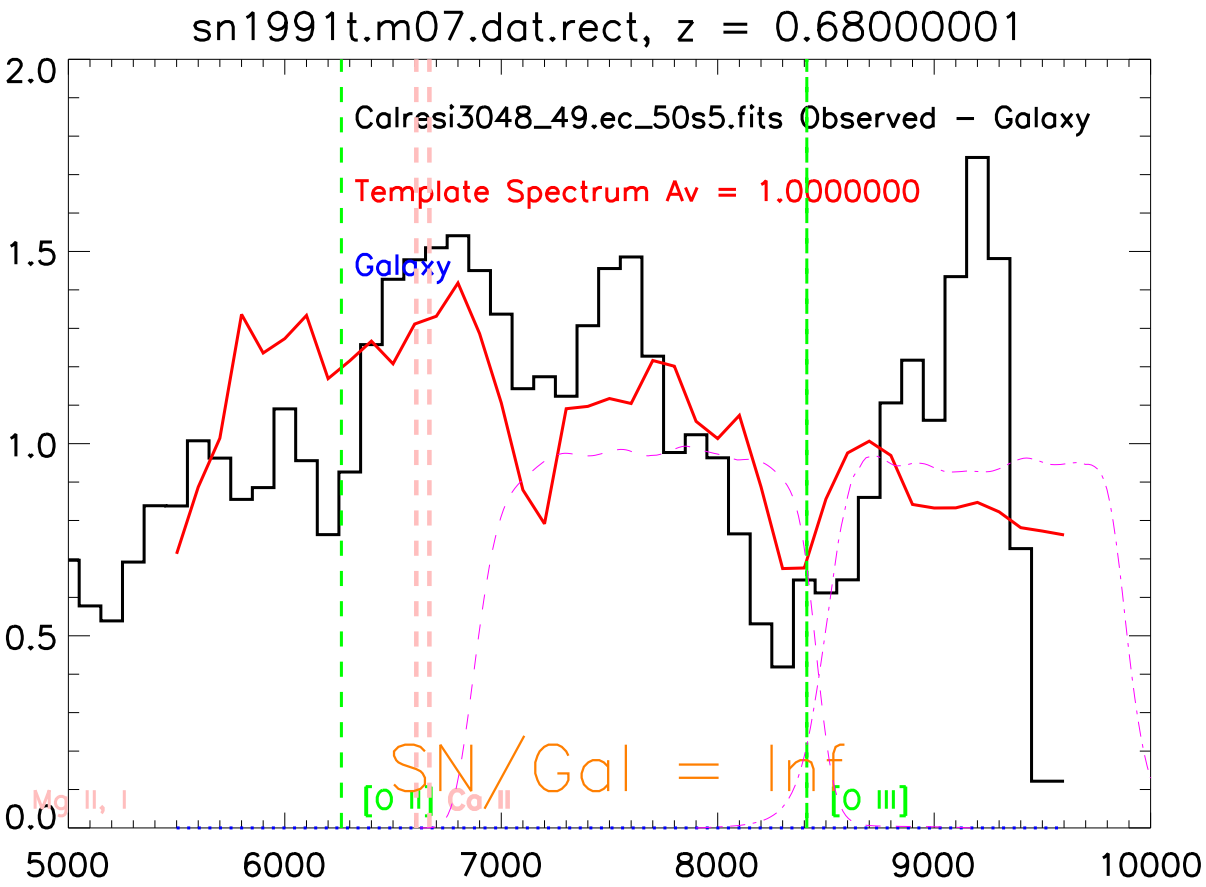

sn1991t.m08.dat.rect, z = 0.68000001
Calresi3048..49.ec_50s5.fits Observed – Galaxy
Template Spectrum Av = 1.0000000
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
2.0
1.5
1.0
0.5
0.0
5000
6000
7000
8000
9000
10000

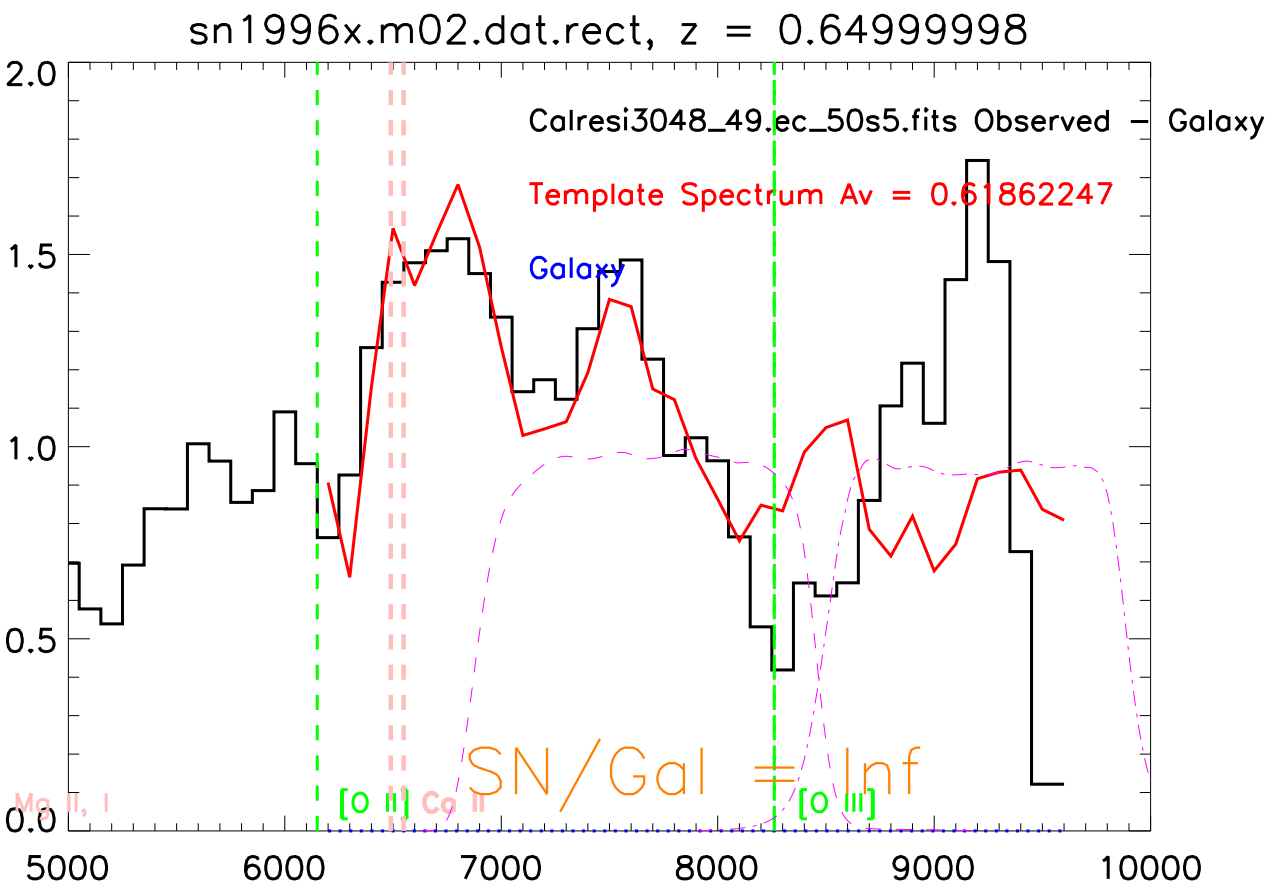

sn1998bu.m02.dat.rect, z = 0.63999999
Calresi3048_49.ec_50s5.fits Observed − Galaxy
Template Spectrum Av = −0.49362245
Galaxy
SN/Gal = Inf
[O II]
Ca, II
[O III]
2.0
1.5
1.0
0.5
0.0
5000
6000
7000
8000
9000
10000

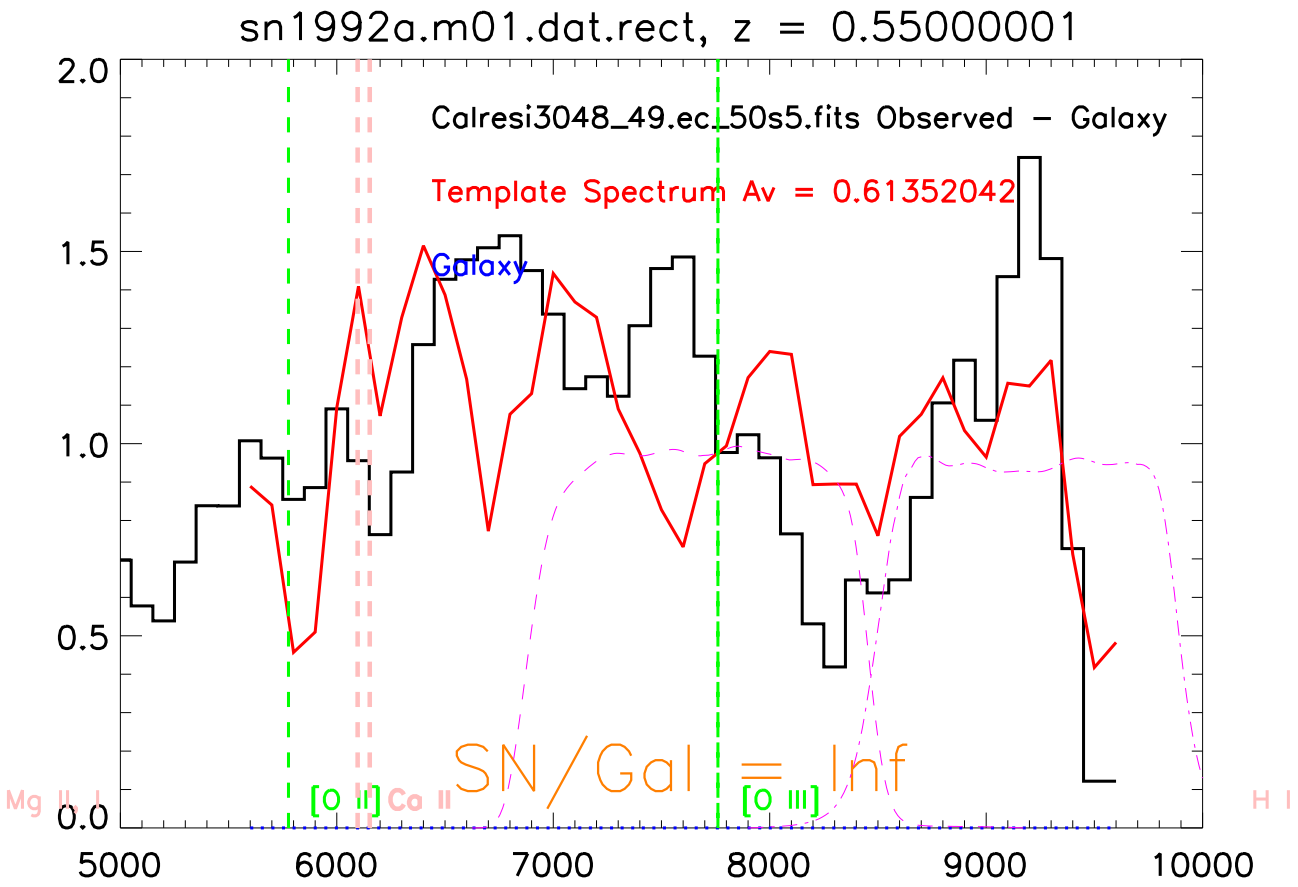

sn1996x.m00.dat.rect, z = 0.63000000
Calresi3048_49.ec_50s5.fits Observed − Galaxy
Template Spectrum Av = 0.55229589
Galaxy
SN/Gal = Inf
[O II]
Ca II
[O III]
Mg II, I
H I
2.0
1.5
1.0
0.5
0.0
5000
6000
7000
8000
9000
10000

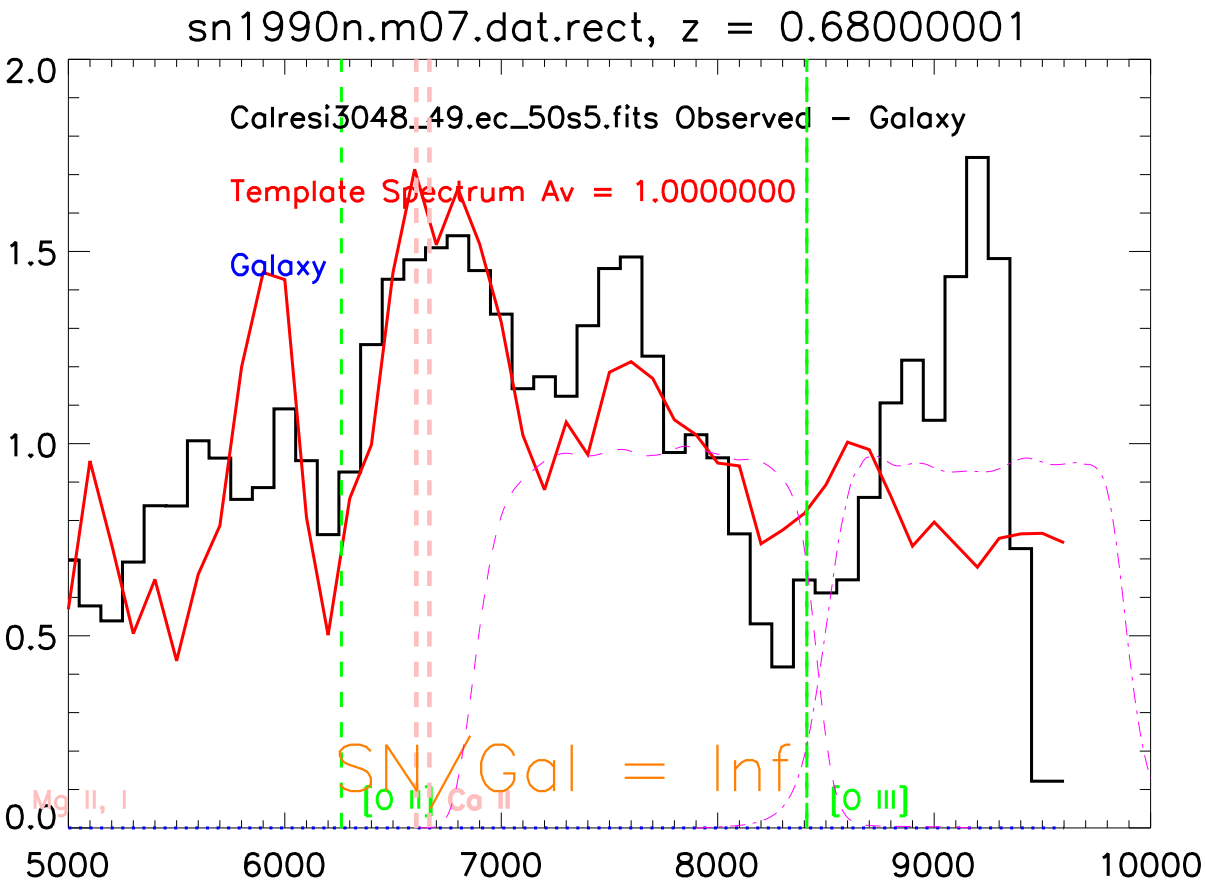

sn1991t.m03.dat.rect, z = 0.65999997
Calresi3048_49.ec_50s5.fits Observed − Galaxy
Template Spectrum Av = 1.0000000
Galaxy
SN/Gal = Inf
Mg II, I
[O II] Co II
[O III]
2.0
1.5
1.0
0.5
0.0
5000
6000
7000
8000
9000
10000

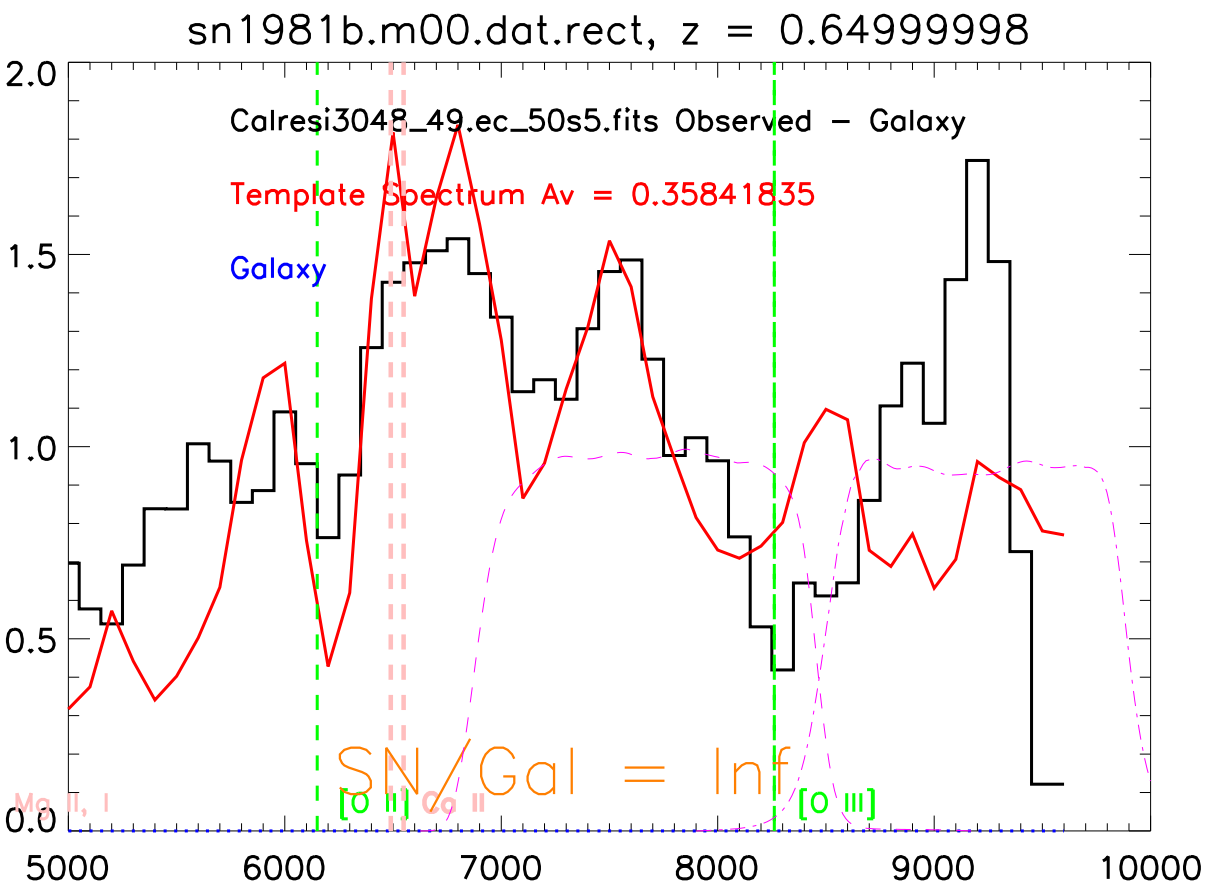

sn1992a.m05.dat.rect, z = 0.65999997
Calresi3048_49.ec_50s5.fits Observed – Galaxy
Template Spectrum Av = 0.92474493
Galaxy
SN/Gal = Inf
[O II]
Ca II
[O III]
Mg II, I
2.0
1.5
1.0
0.5
0.0
5000
6000
7000
8000
9000
10000

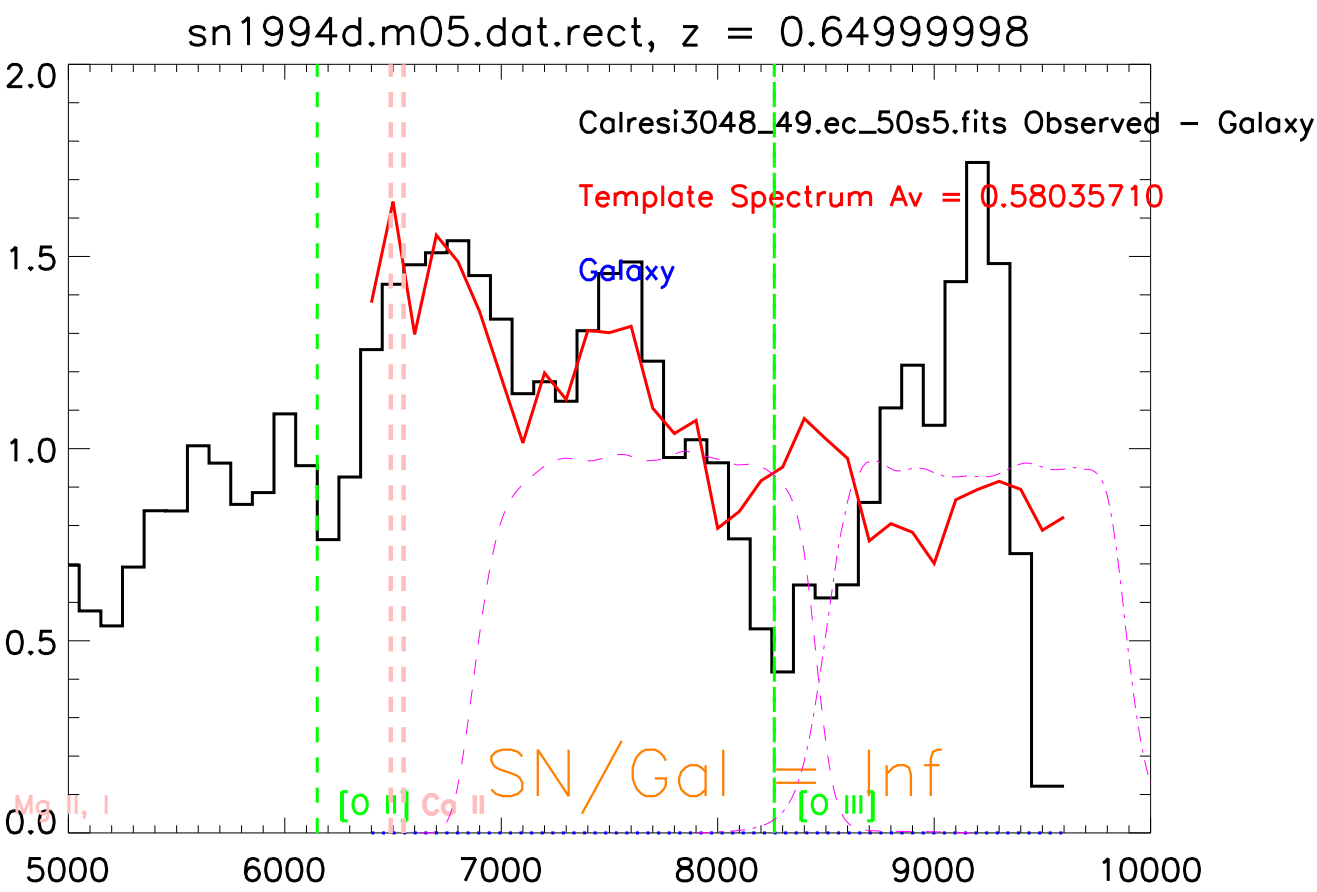

sn1991t.m07.dat.rect, z = 0.68000001
Calresi3048_49.ec_50s5.fits Observed − Galaxy
Template Spectrum Av = 1.0000000
Galaxy
SN/Gal = Inf
Mg II, I
[O II] Ca II
[O III]
2.0
1.5
1.0
0.5
0.0
5000
6000
7000
8000
9000
10000

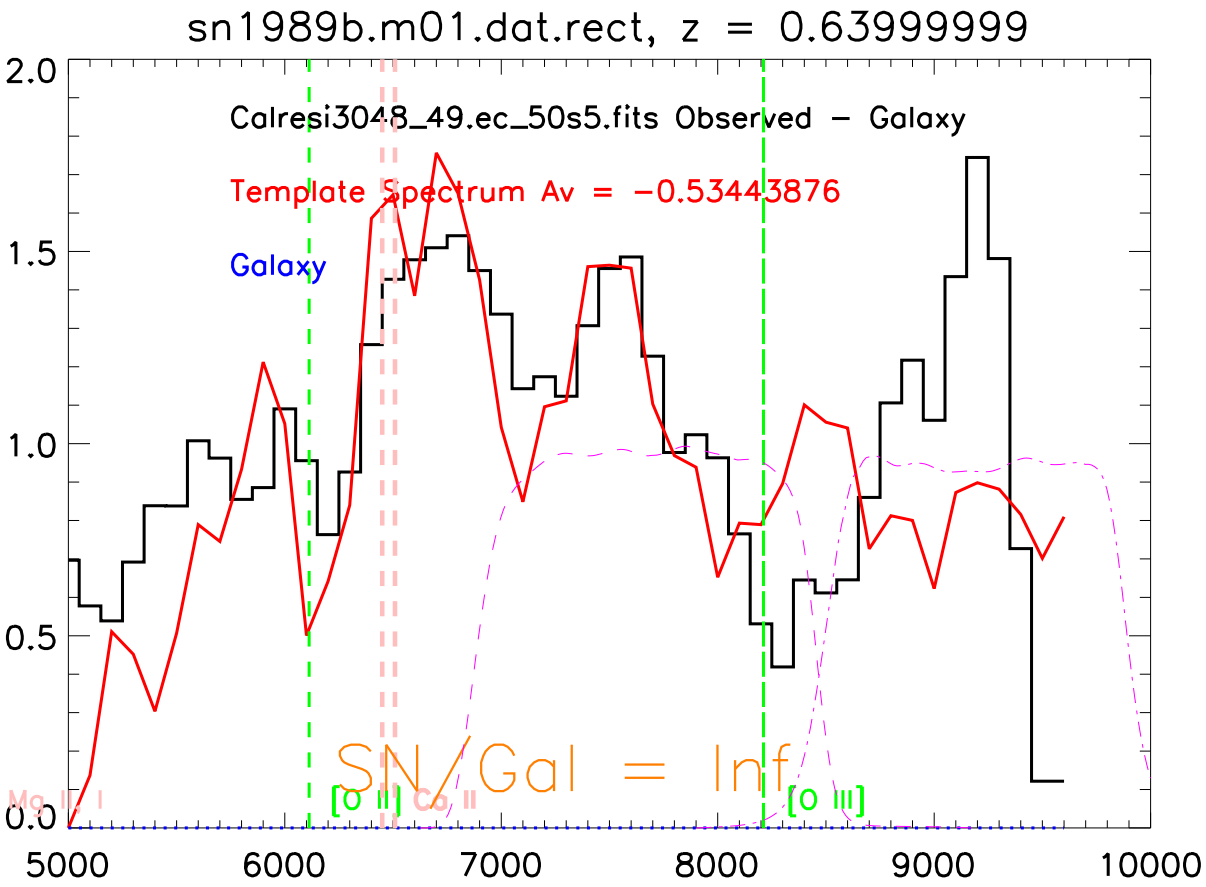

sn1996x.m02.dat.rect, z = 0.64999998
Calresi3048_49.ec_50s5.fits Observed
Galaxy
Template Spectrum Av = 0.61862247
Galaxy
SN/Gal = Inf
[O II]
Ca II
[O III]
Mg II, I
2.0
1.5
1.0
0.5
0.0
5000
6000
7000
8000
9000
10000

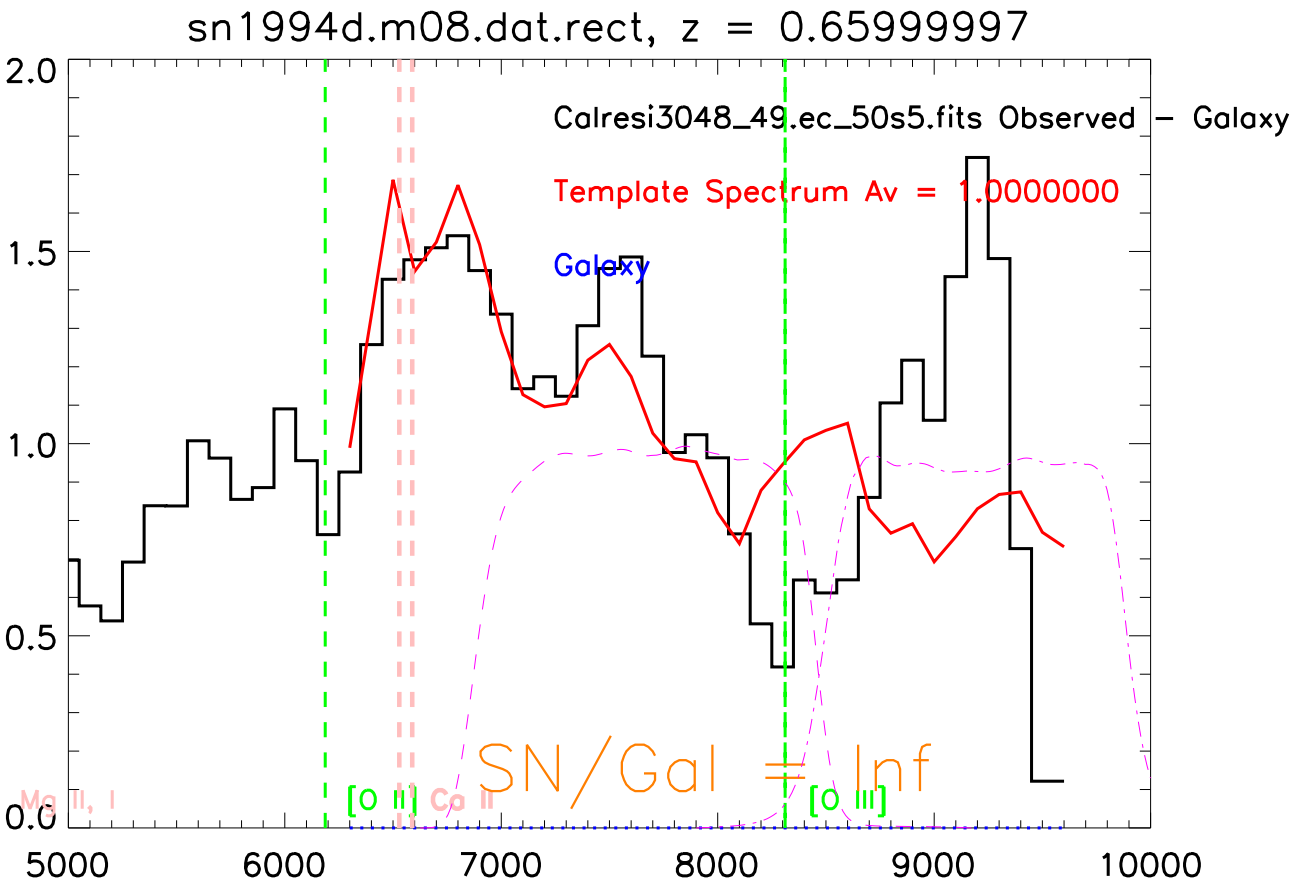

sn1992a.m01.dat.rect, z = 0.55000001
Calresi3048_49.ec_50s5.fits Observed − Galaxy
Template Spectrum Av = 0.61352042
Galaxy
SN/Gal = Inf
[O II]
Ca II
[O III]
Mg II
H I
2.0
1.5
1.0
0.5
0.0
5000
6000
7000
8000
9000
10000

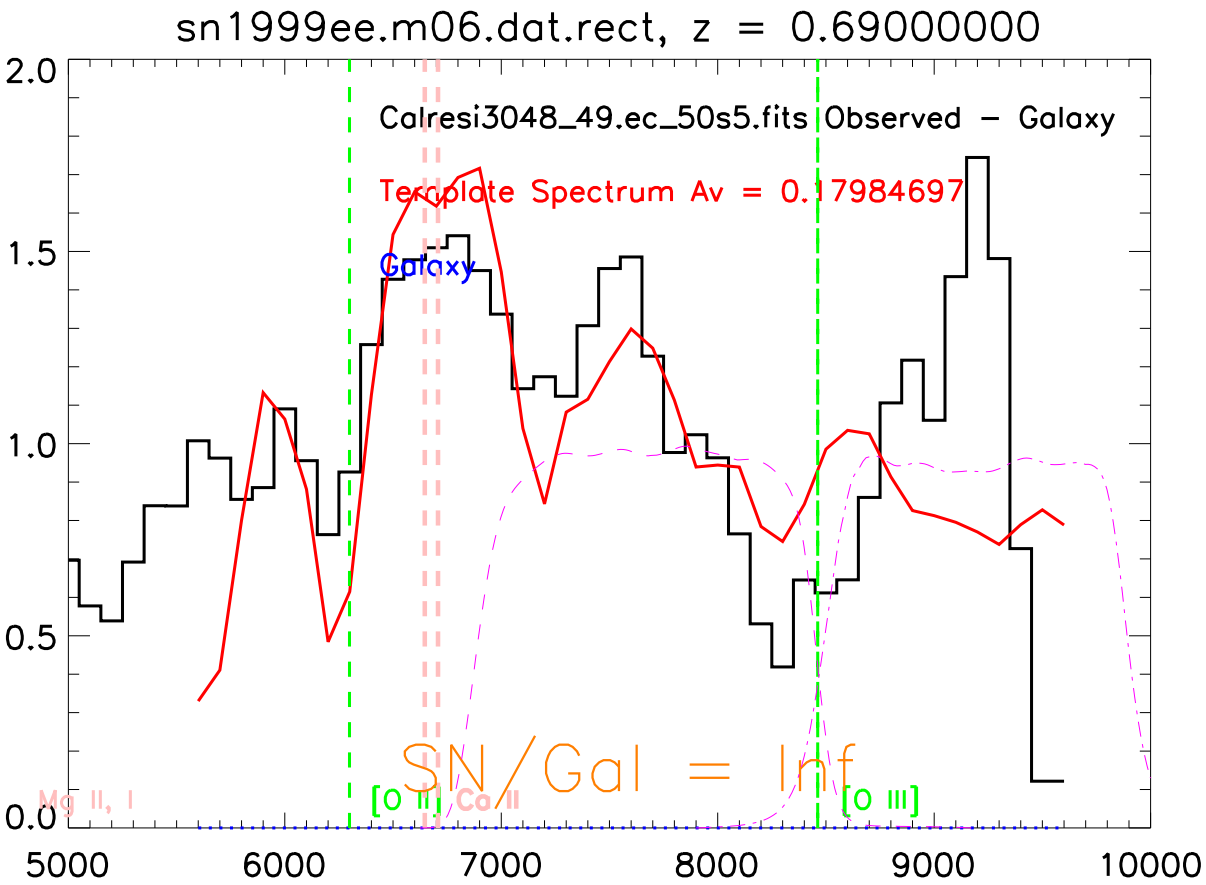

sn1990n.m07.dat.rect, z = 0.68000001
Calresi3048..49.ec_50s5.fits Observed – Galaxy
Template Spectrum Av = 1.0000000
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
2.0
1.5
1.0
0.5
0.0
5000
6000
7000
8000
9000
10000

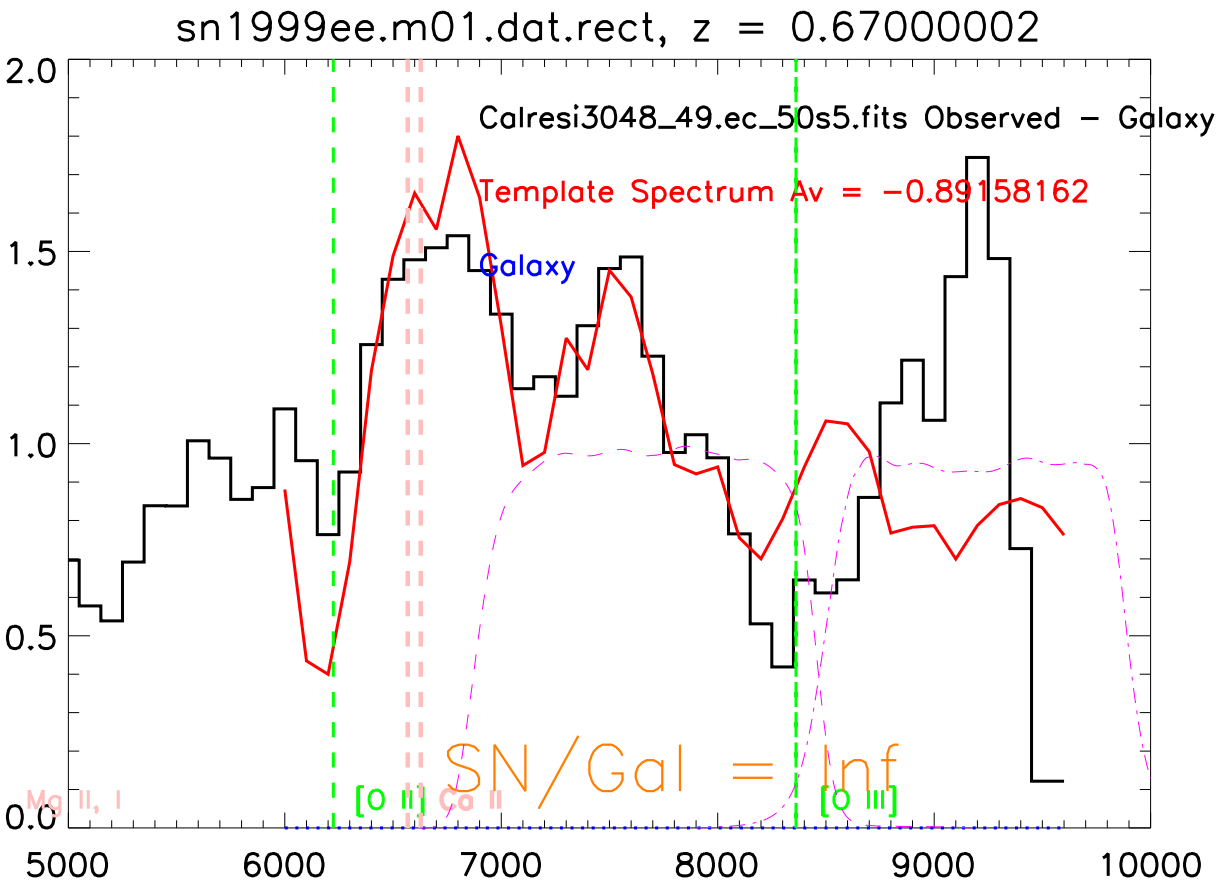

sn1981b.m00.dat.rect, z = 0.64999998
Calresi3048_49.ec_50s5.fits Observed − Galaxy
Template Spectrum Av = 0.35841835
Galaxy
SN/Gal = Inf
[O II]
Ca II
[O III]
2.0
1.5
1.0
0.5
0.0
5000
6000
7000
8000
9000
10000

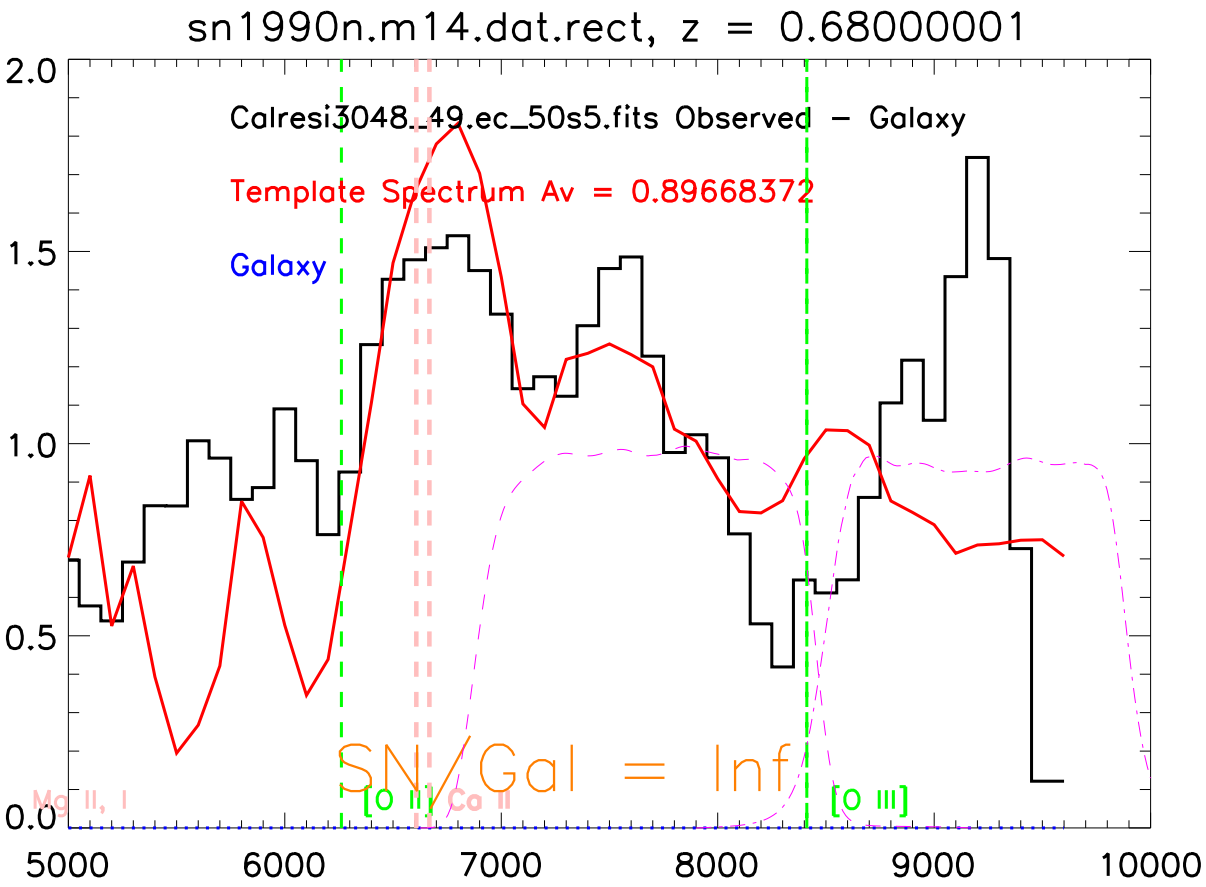

sn1994d.m05.dat.rect, z = 0.64999998
Calresi3048_49.ec_50s5.fits Observed − Galaxy
Template Spectrum Av = 0.58035710
Galaxy
SN/Gal = Inf
[O II]
Ca II
[O III]
Mg II, I
2.0
1.5
1.0
0.5
0.0
5000
6000
7000
8000
9000
10000

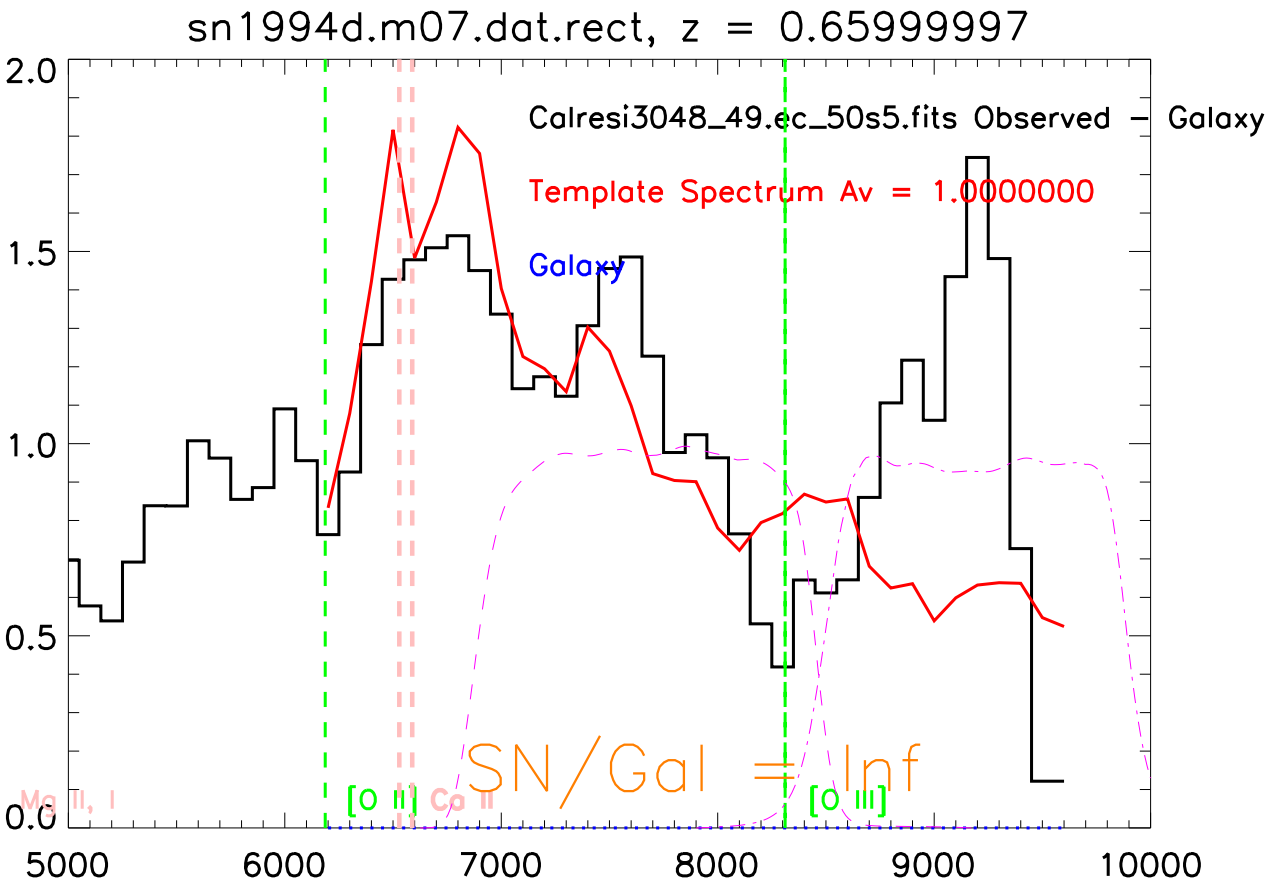

sn1989b.m01.dat.rect, z = 0.63999999
Calresi3048_49.ec_50s5.fits Observed − Galaxy
Template Spectrum Av = −0.53443876
Galaxy
SN/Gal = Inf
[O II]
[O III]
2.0
1.5
1.0
0.5
0.0
5000
6000
7000
8000
9000
10000

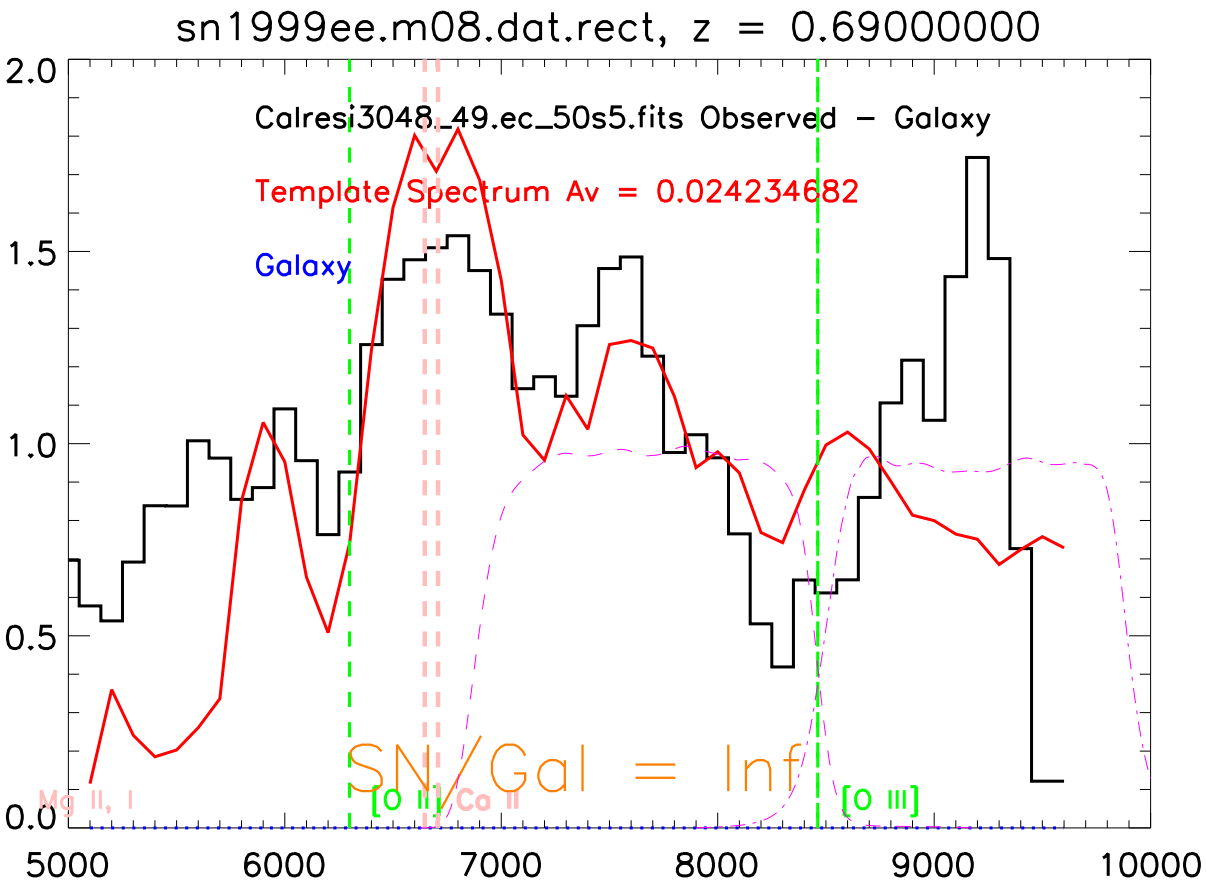

sn1994d.m08.dat.rect, z = 0.65999997
Calresi3048_49.ec_50s5.fits Observed – Galaxy
Template Spectrum Av = 1.0000000
Galaxy
SN/Gal = Inf
Mg II, I
[O II] Ca II
[O III]
2.0
1.5
1.0
0.5
0.0
5000
6000
7000
8000
9000
10000

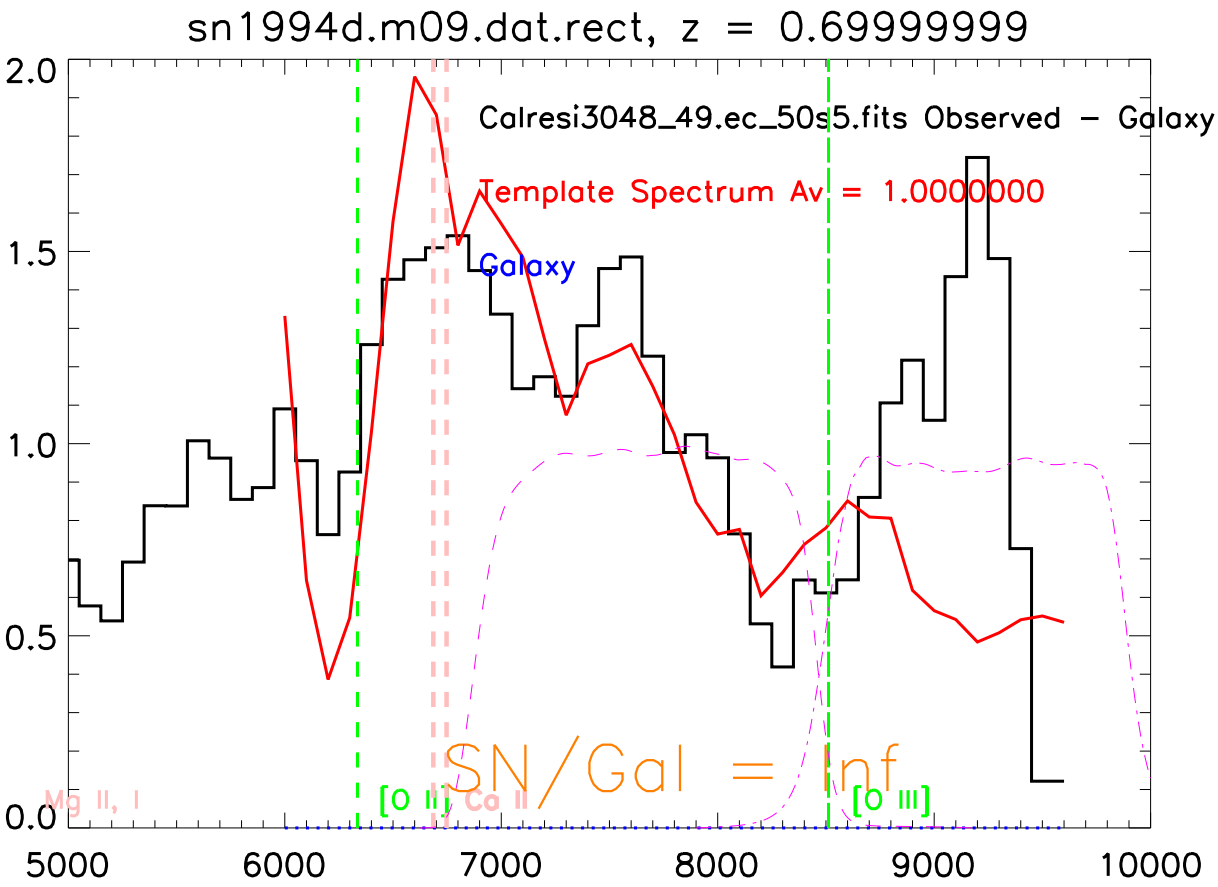

sn1999ee.m06.dat.rect, z = 0.69000000
Calresi3048_49.ec_50s5.fits Observed − Galaxy
Template Spectrum Av = 0.17984697
Galaxy
SN/Gal = Inf
Mg II, I
[O II], Ca II
[O III]
2.0
1.5
1.0
0.5
0.0
5000
6000
7000
8000
9000
10000

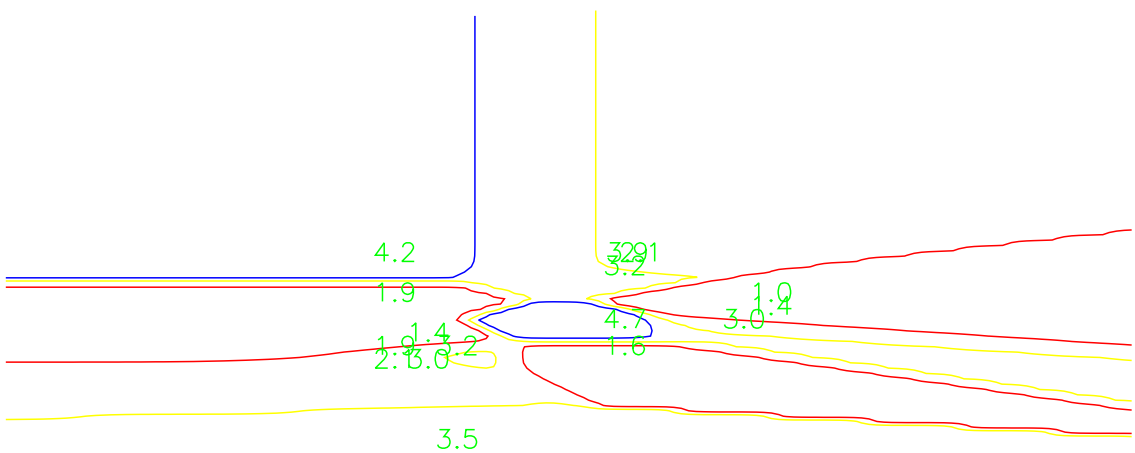

sn1999ee.m01.dat.rect, z = 0.67000002
Calresi3048_49.ec_50s5.fits Observed − Galaxy
Template Spectrum Av = −0.89158162
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
2.0
1.5
1.0
0.5
0.0
5000
6000
7000
8000
9000
10000

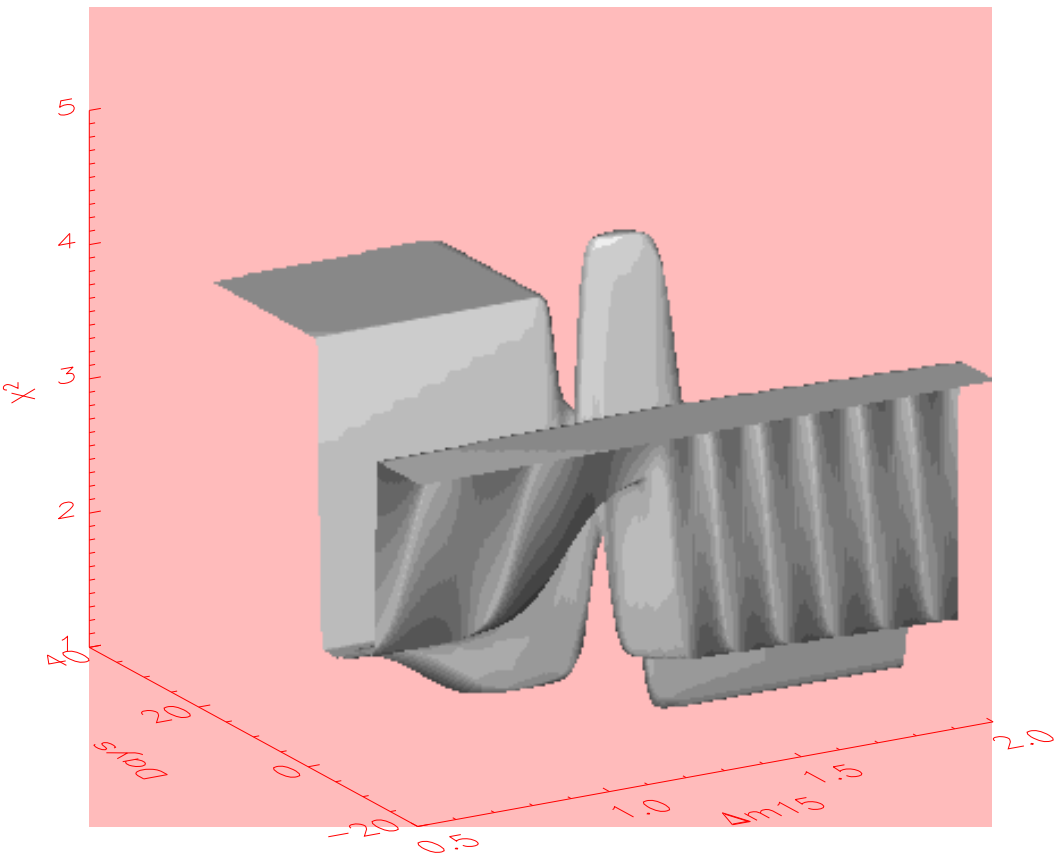

sn1990n.m14.dat.rect, z = 0.68000001
Calresi3048..49.ec_50s5.fits Observed − Galaxy
Template Spectrum Av = 0.89668372
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
2.0
1.5
1.0
0.5
0.0
5000
6000
7000
8000
9000
10000

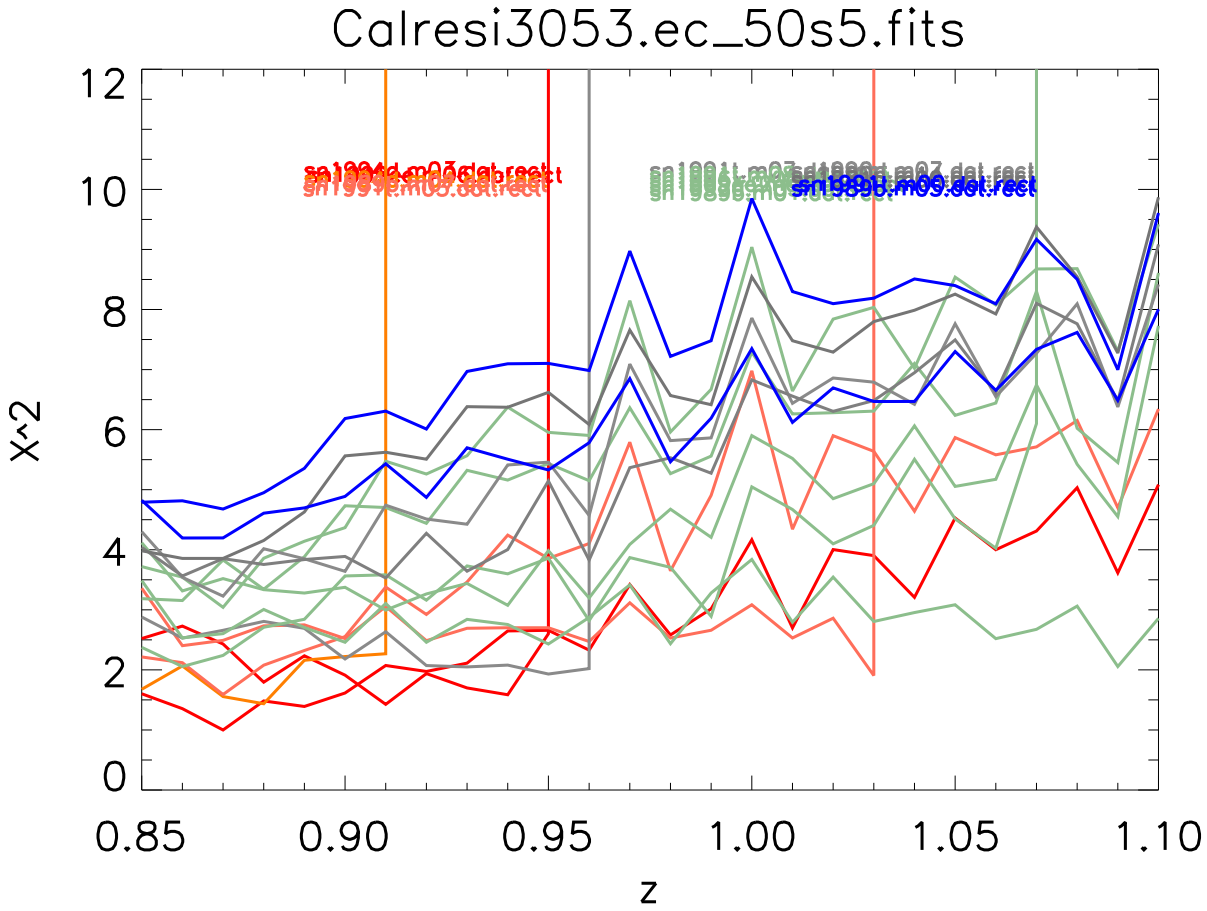

sn1994d.m07.dat.rect, z = 0.65999997
Calresi3048_49.ec_50s5.fits Observed – Galaxy
Template Spectrum Av = 1.0000000
Galaxy
SN/Gal = Inf
Mg II, I
[O II] Ca II
[O III]
2.0
1.5
1.0
0.5
0.0
5000
6000
7000
8000
9000
10000

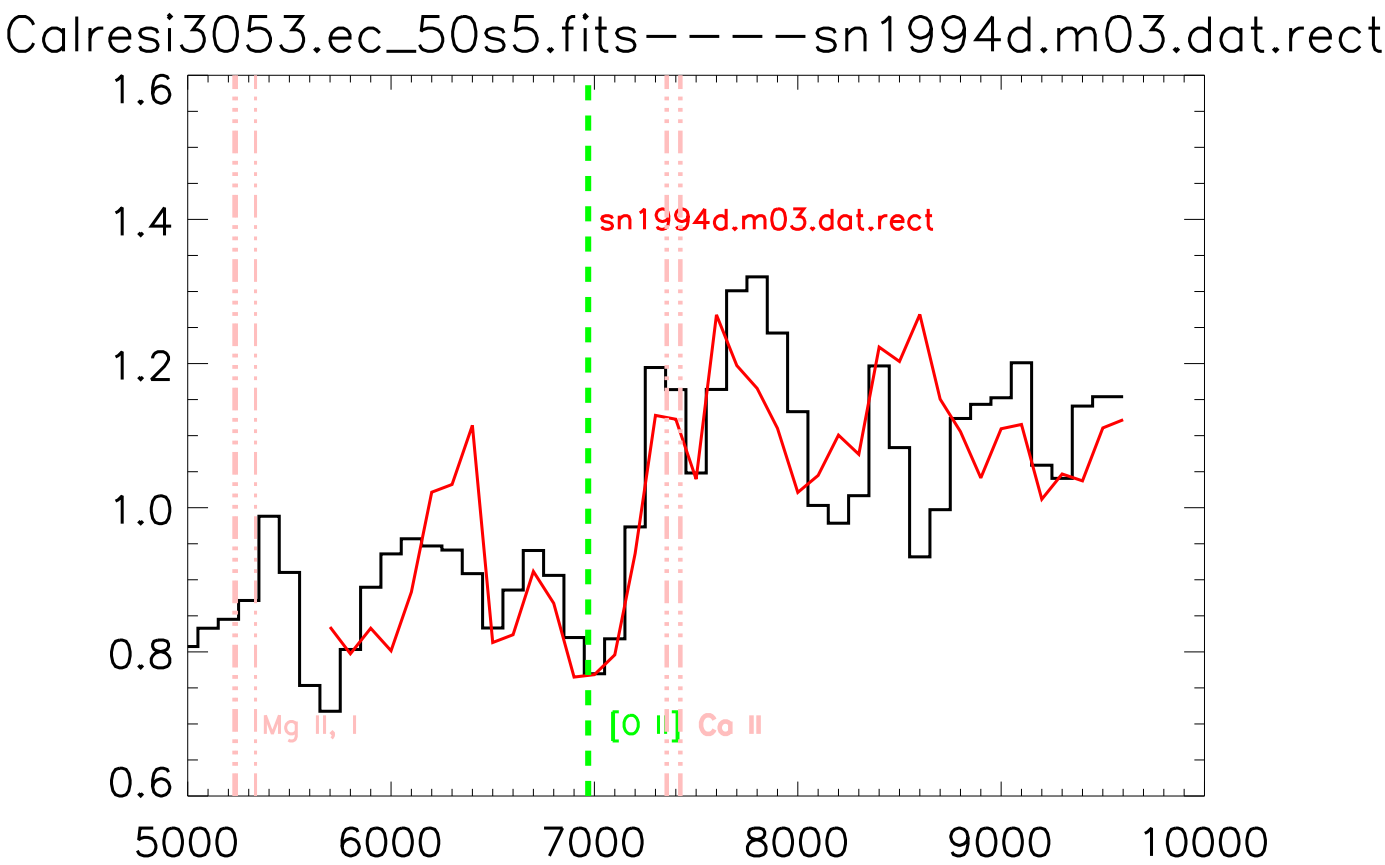

sn1999ee.m08.dat.rect, z = 0.69000000
Calresi3048_49.ec_50s5.fits Observed − Galaxy
Template Spectrum Av = 0.024234682
Galaxy
SN/Gal = Inf
Mg II, I
[O II], Ca II
[O III]
2.0
1.5
1.0
0.5
0.0
5000
6000
7000
8000
9000
10000

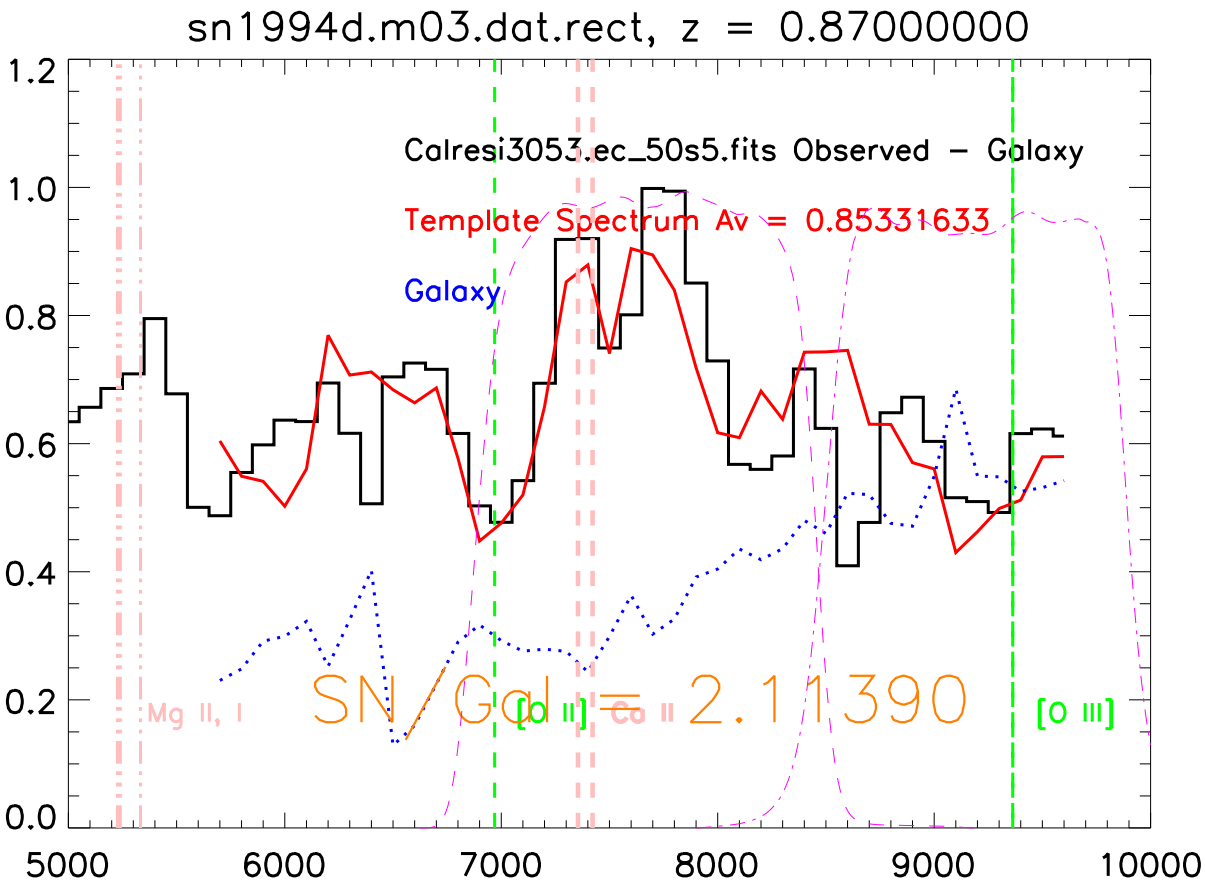

sn1994d.m09.dat.rect, z = 0.69999999
Calresi3048_49.ec_50s5.fits Observed − Galaxy
Template Spectrum Av = 1.0000000
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
2.0
1.5
1.0
0.5
0.0
5000
6000
7000
8000
9000
10000

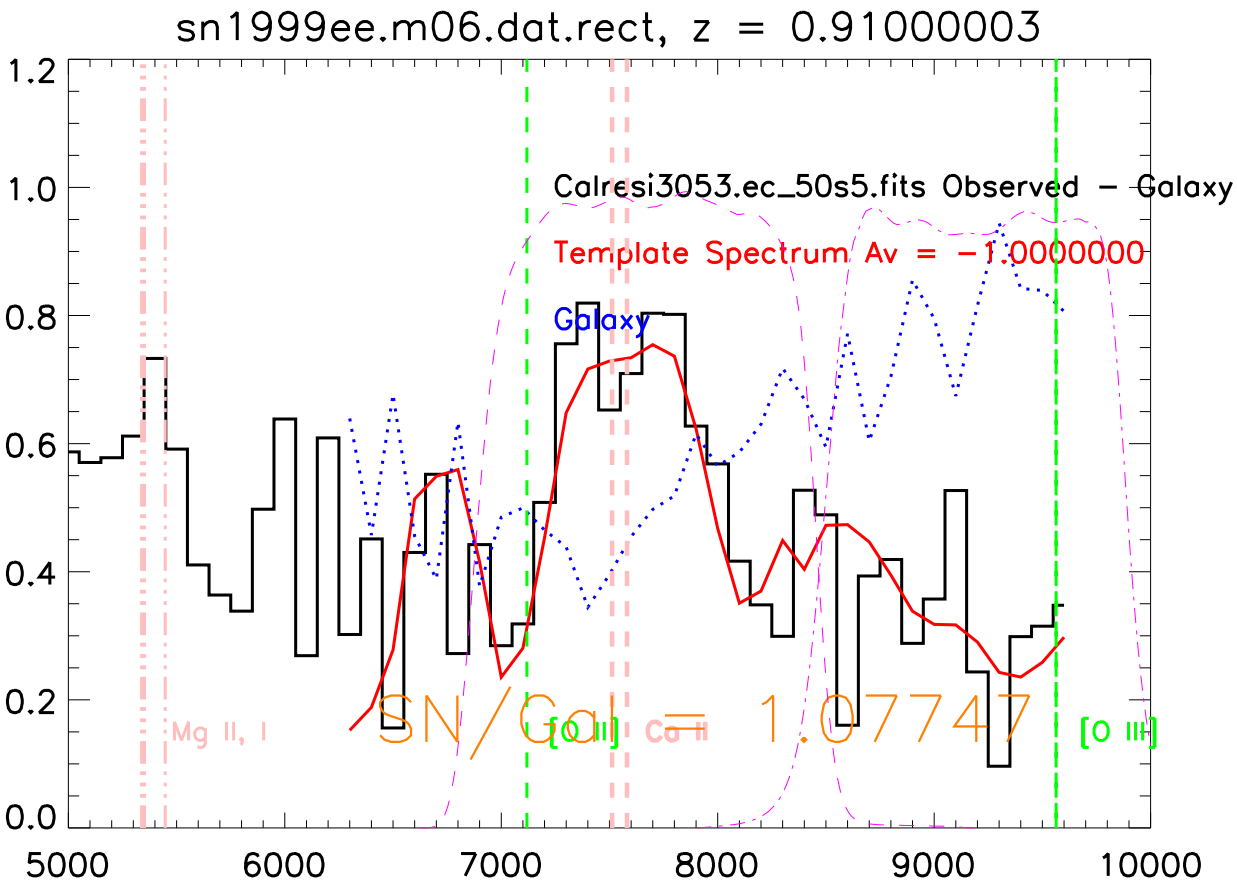

4.2
1.9
3.2
1.0
3.0
4.7
1.6
1.4
3.5

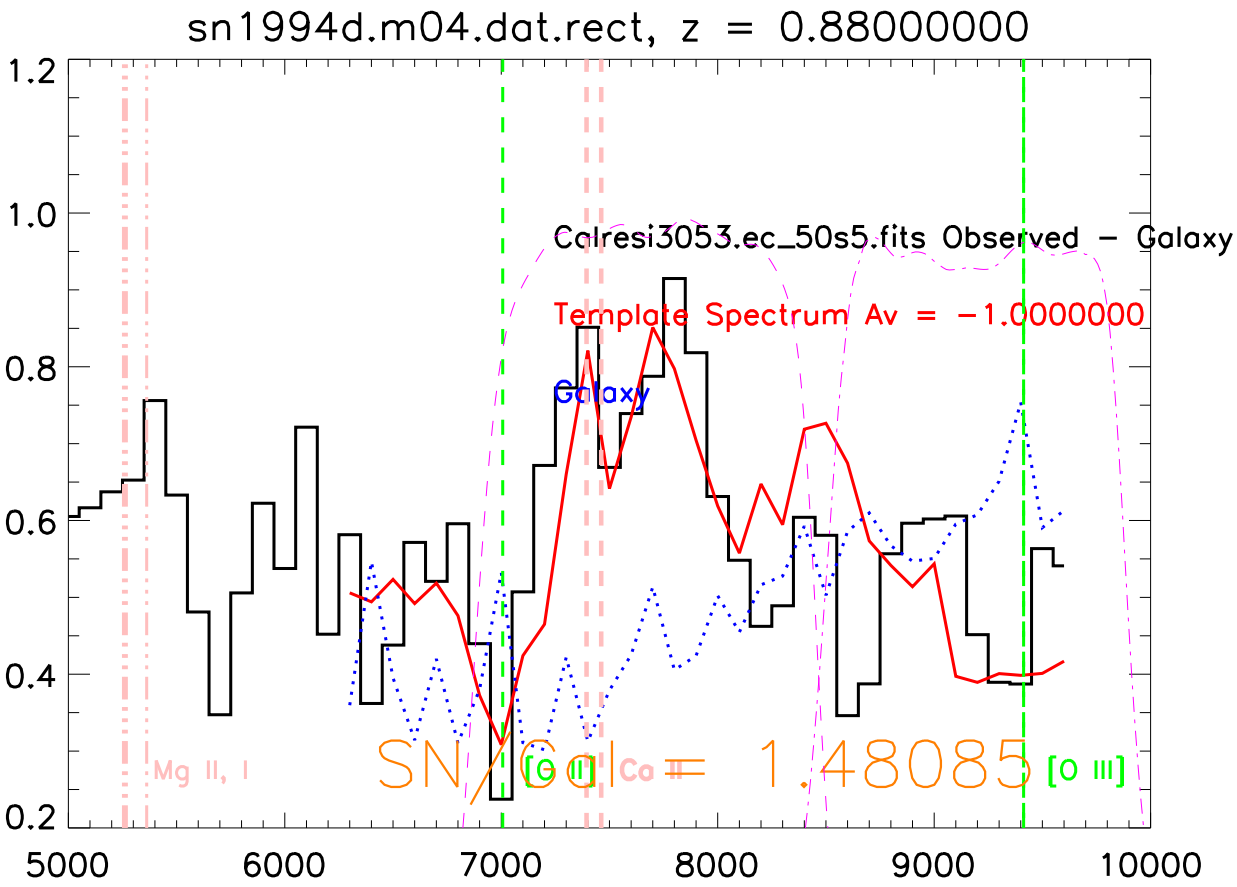

χ^2
5
4
3
2
1
40
20
0
−20
$\sin^2 2\theta$
0.5
1.0
1.5
2.0
Δm^2_{15}

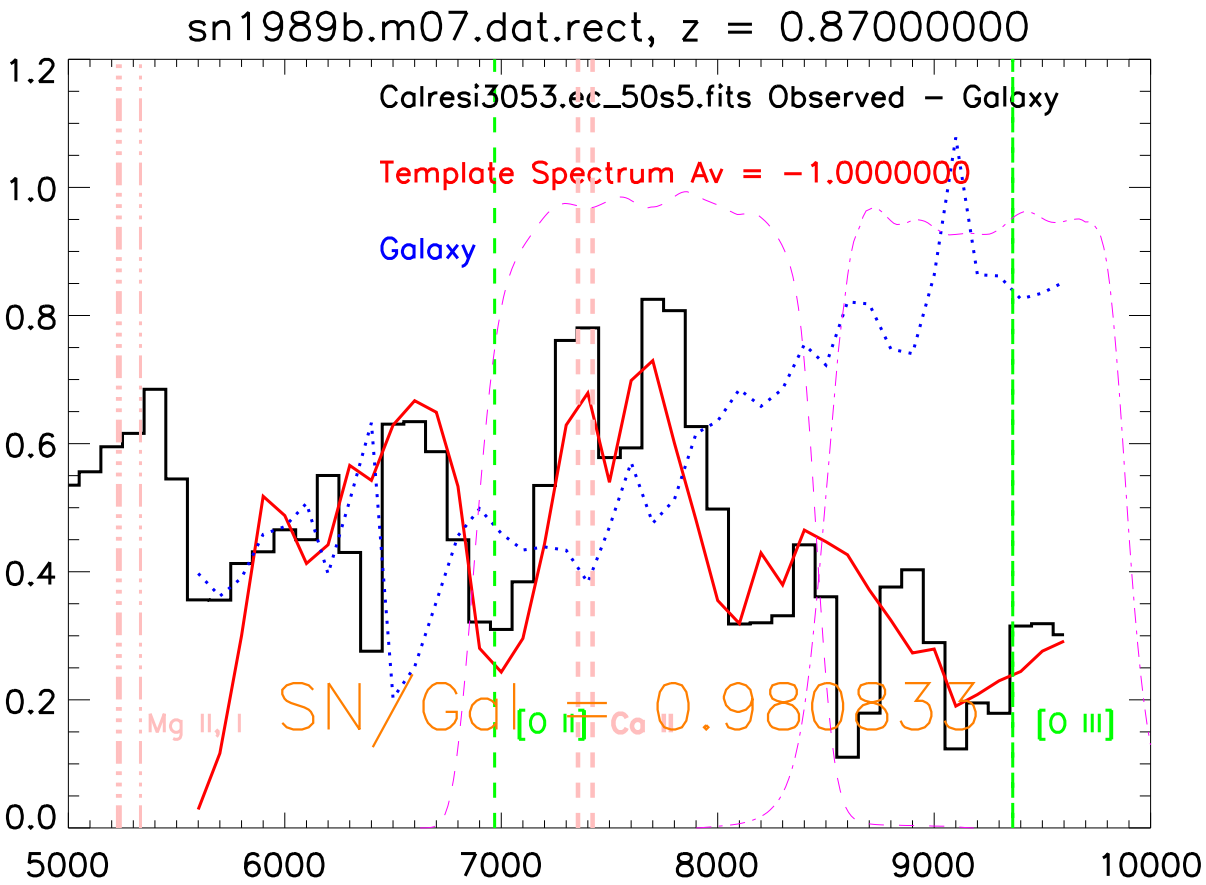

Calresi3053.ec_50s5.fits
X^2
z
0
2
4
6
8
10
12
0.85
0.90
0.95
1.00
1.05
1.10
sn1998b.m09.dat.rect

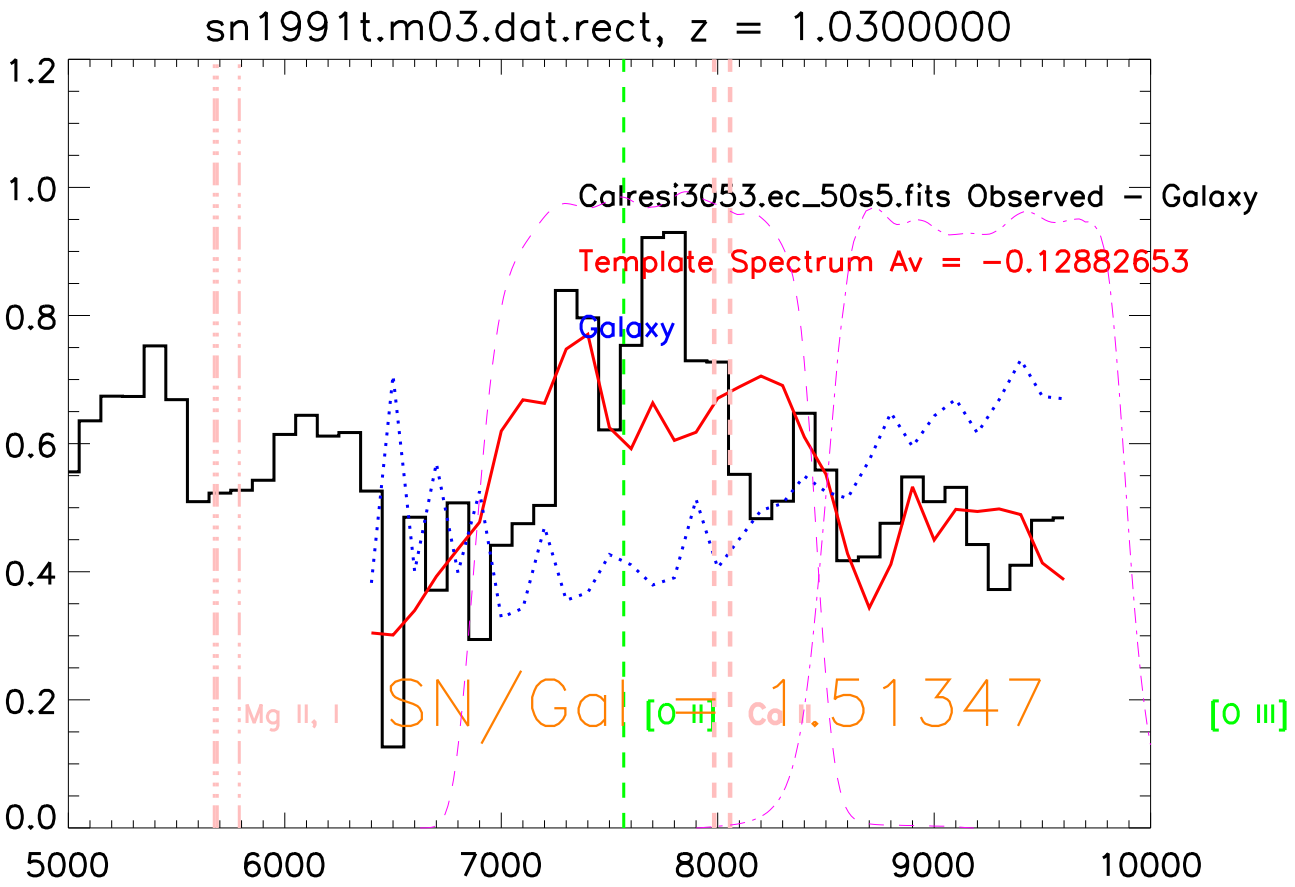

Calresi3053.ec_50s5.fits----sn1994d.m03.dat.rect
sn1994d.m03.dat.rect
Mg II, I
[O II]
Ca II
1.6
1.4
1.2
1.0
0.8
0.6
5000
6000
7000
8000
9000
10000

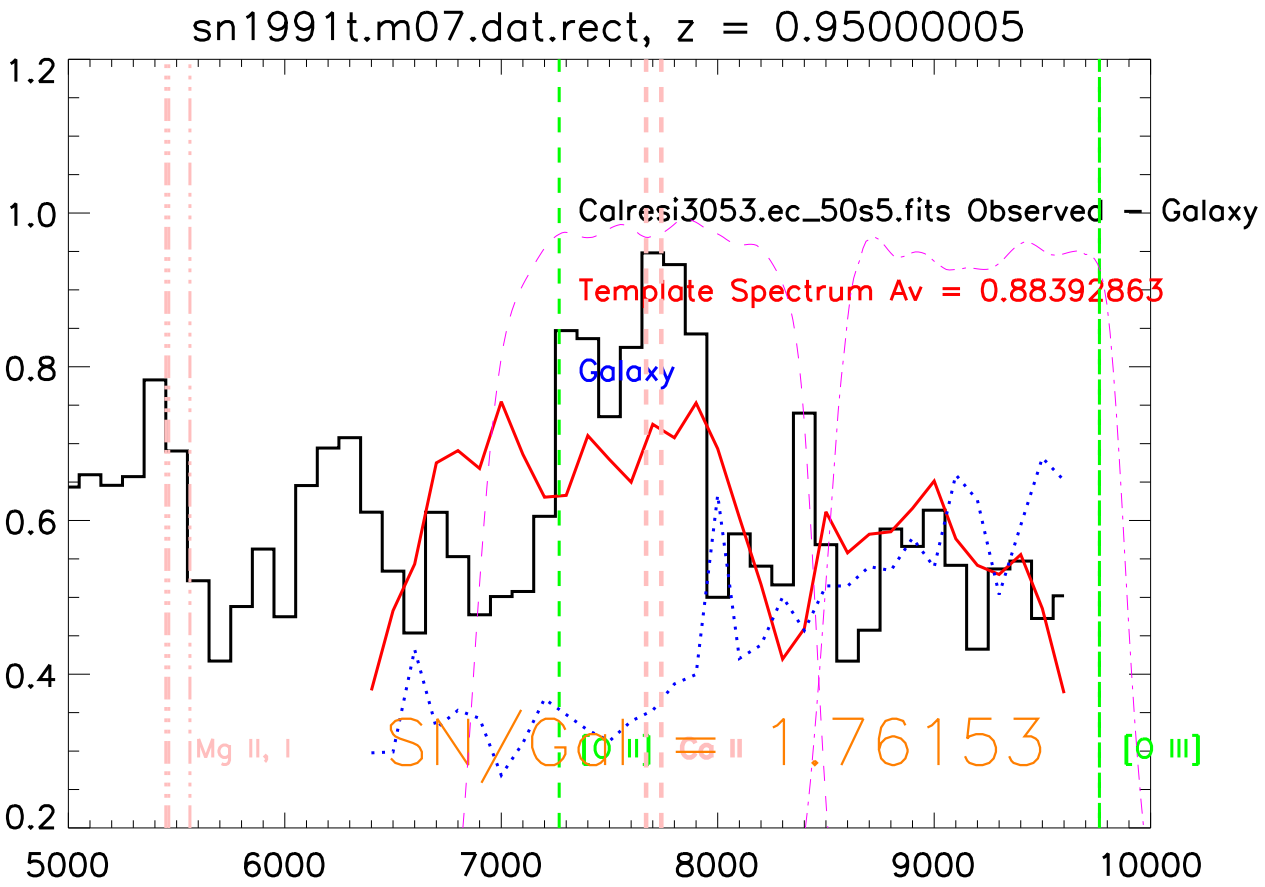

sn1994d.m03.dat.rect, z = 0.87000000
Calresi3053.ec_50s5.fits Observed – Galaxy
Template Spectrum Av = 0.85331633
Galaxy
SN/Gal = 2.11390
Mg II, I
[O II]
Ca II
[O III]
1.2
1.0
0.8
0.6
0.4
0.2
0.0
5000
6000
7000
8000
9000
10000

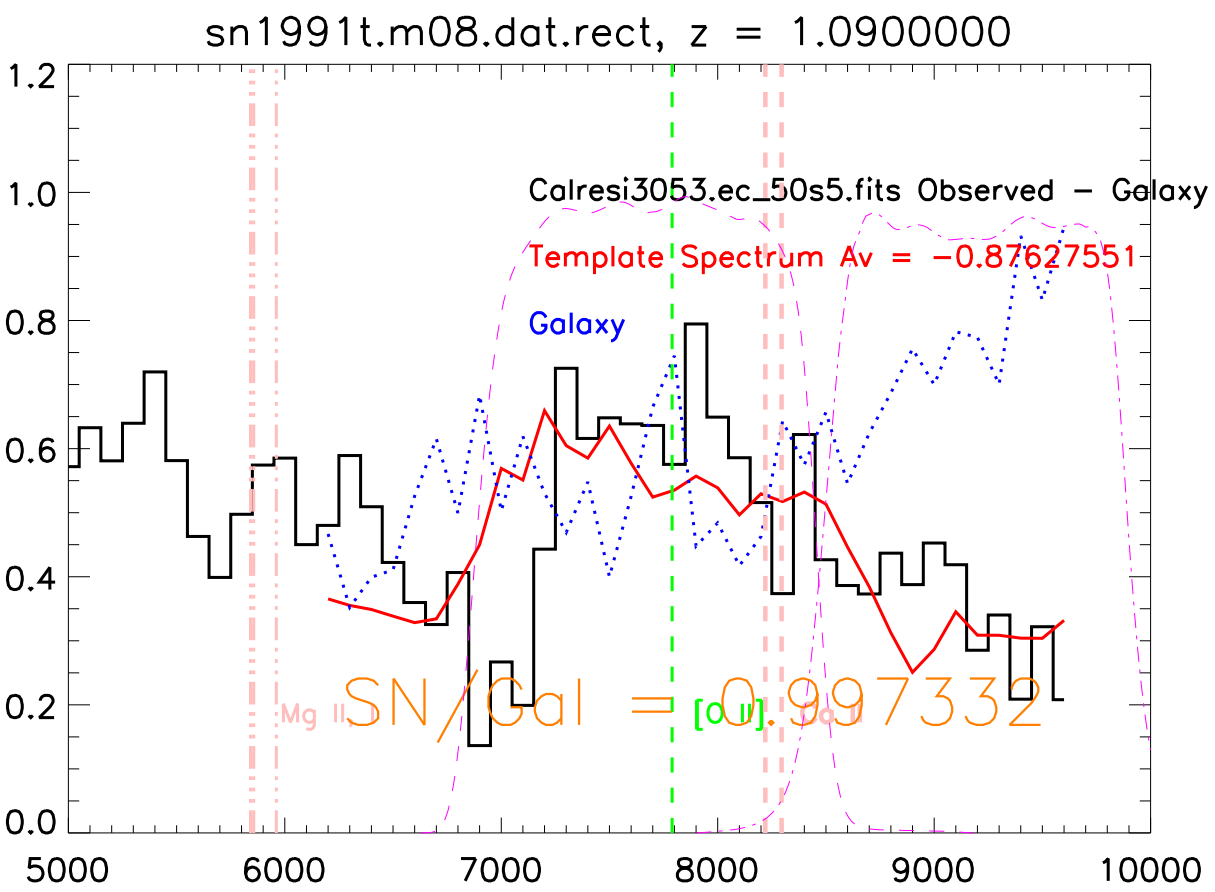

sn1999ee.m06.dat.rect, z = 0.91000003
Calresi3053.ec_50s5.fits Observed − Galaxy
Template Spectrum Av = −1.0000000
Galaxy
SN/Gal = 1.07747
Mg II, I
[O II]
Ca II
[O III]
1.2
1.0
0.8
0.6
0.4
0.2
0.0
5000
6000
7000
8000
9000
10000

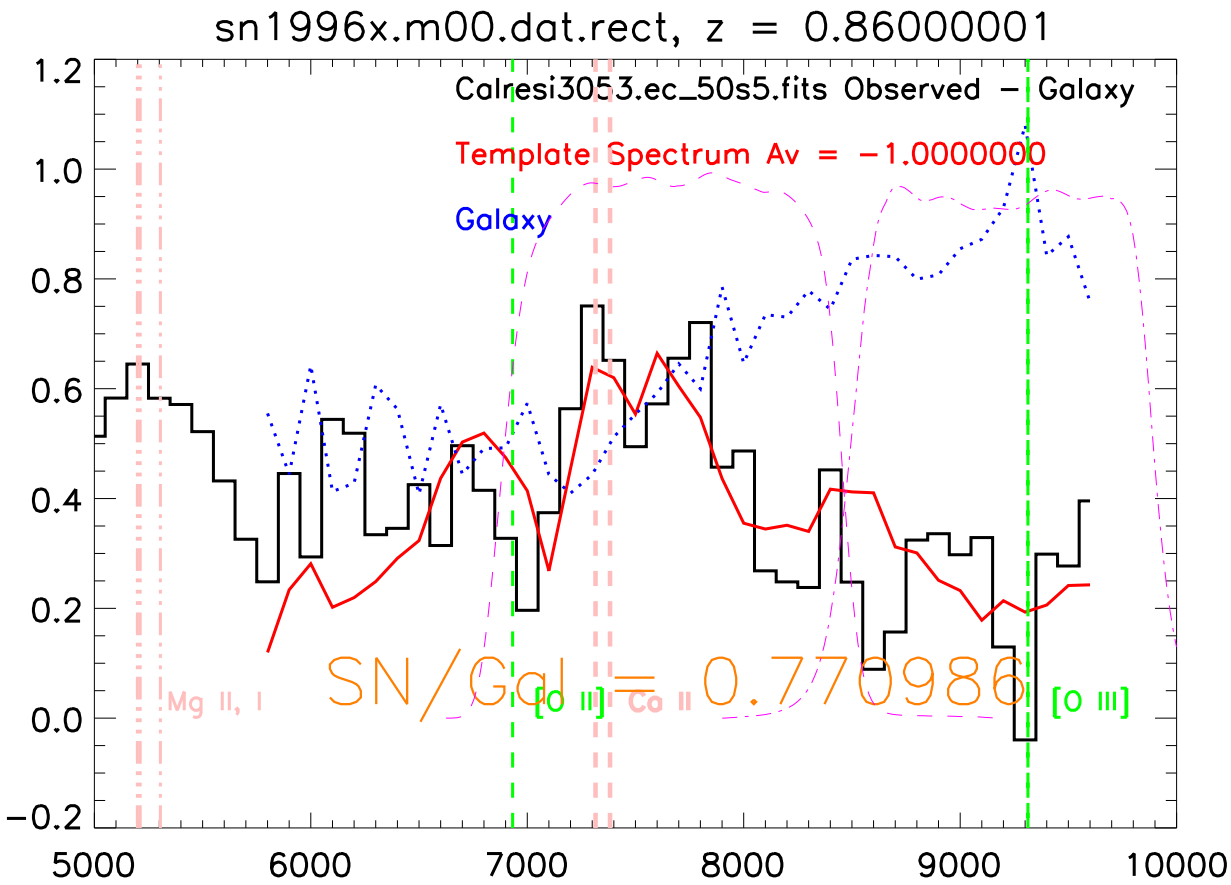

sn1994d.m04.dat.rect, z = 0.88000000
Calresi3053.ec_50s5.fits Observed − Galaxy
Template Spectrum Av = −1.0000000
Galaxy
SN/Gal = 1.48085
Mg II, I
[O II]
Ca II
[O III]
1.2
1.0
0.8
0.6
0.4
0.2
5000
6000
7000
8000
9000
10000

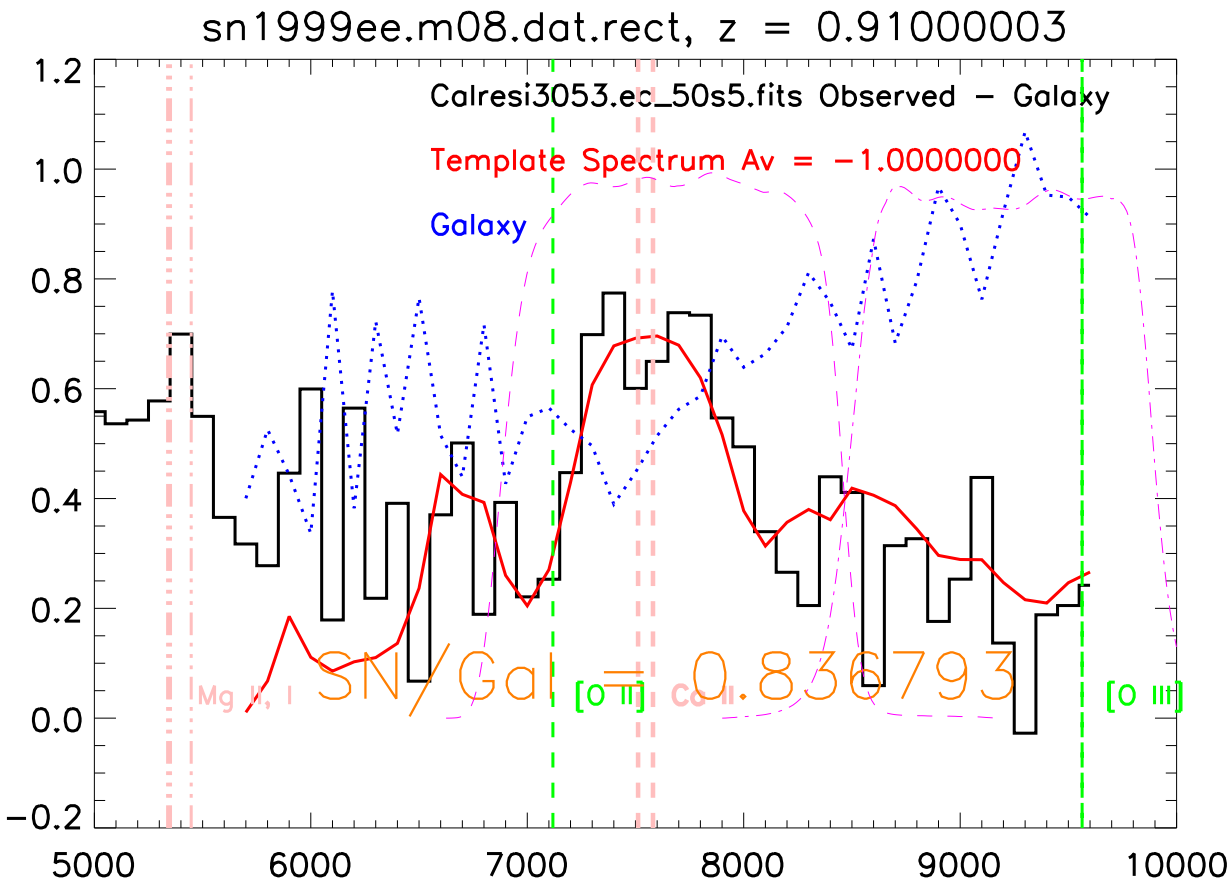

sn1989b.m07.dat.rect, z = 0.87000000
Calresi3053.ec_50s5.fits Observed − Galaxy
Template Spectrum Av = −1.0000000
Galaxy
SN/Gal = 0.980833
Mg II, I
[O II]
Ca II
[O III]
1.2
1.0
0.8
0.6
0.4
0.2
0.0
5000
6000
7000
8000
9000
10000

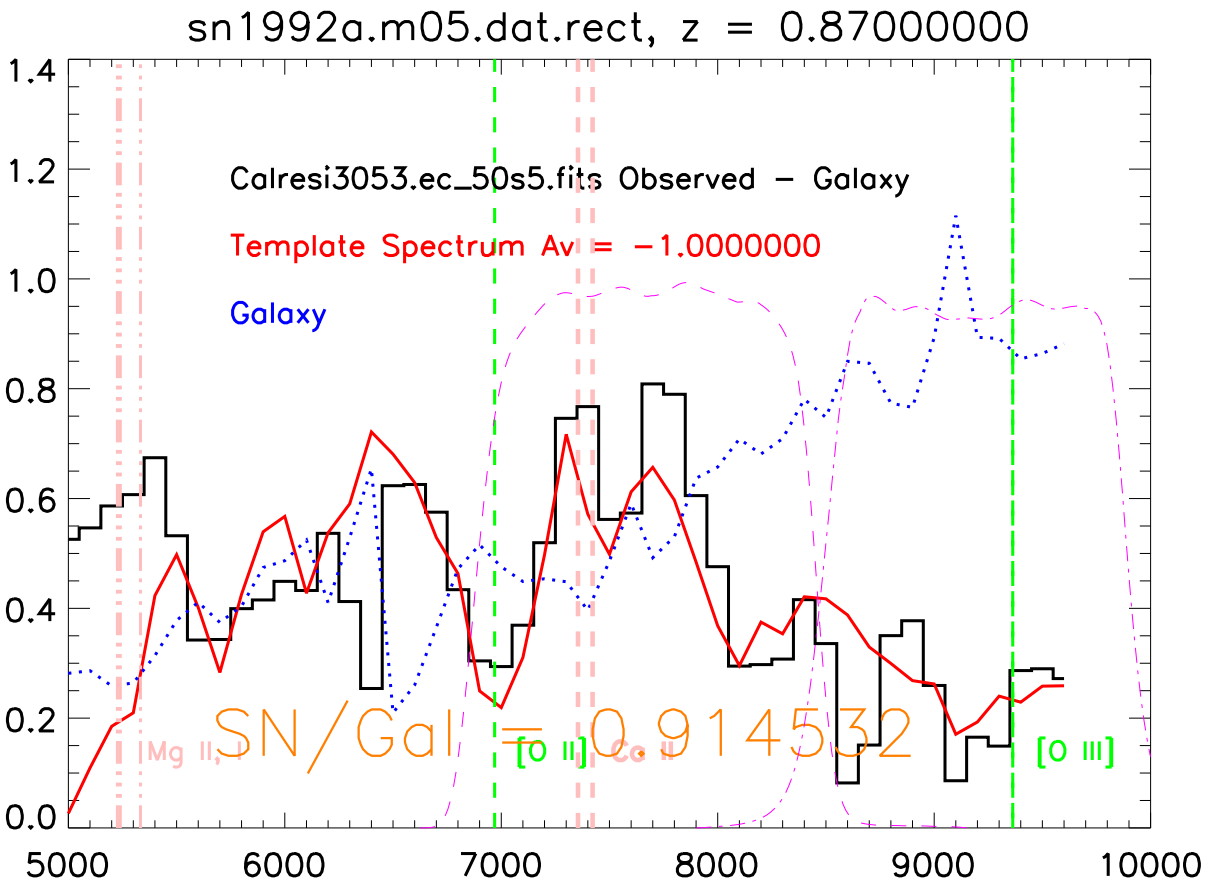

sn1991t.m03.dat.rect, z = 1.0300000
Calresi3053.ec_50s5.fits Observed – Galaxy
Template Spectrum Av = -0.12882653
Galaxy
SN/Gal = 1.51347
Mg II, I
[O II]
Ca II
[O III]
1.2
1.0
0.8
0.6
0.4
0.2
0.0
5000
6000
7000
8000
9000
10000

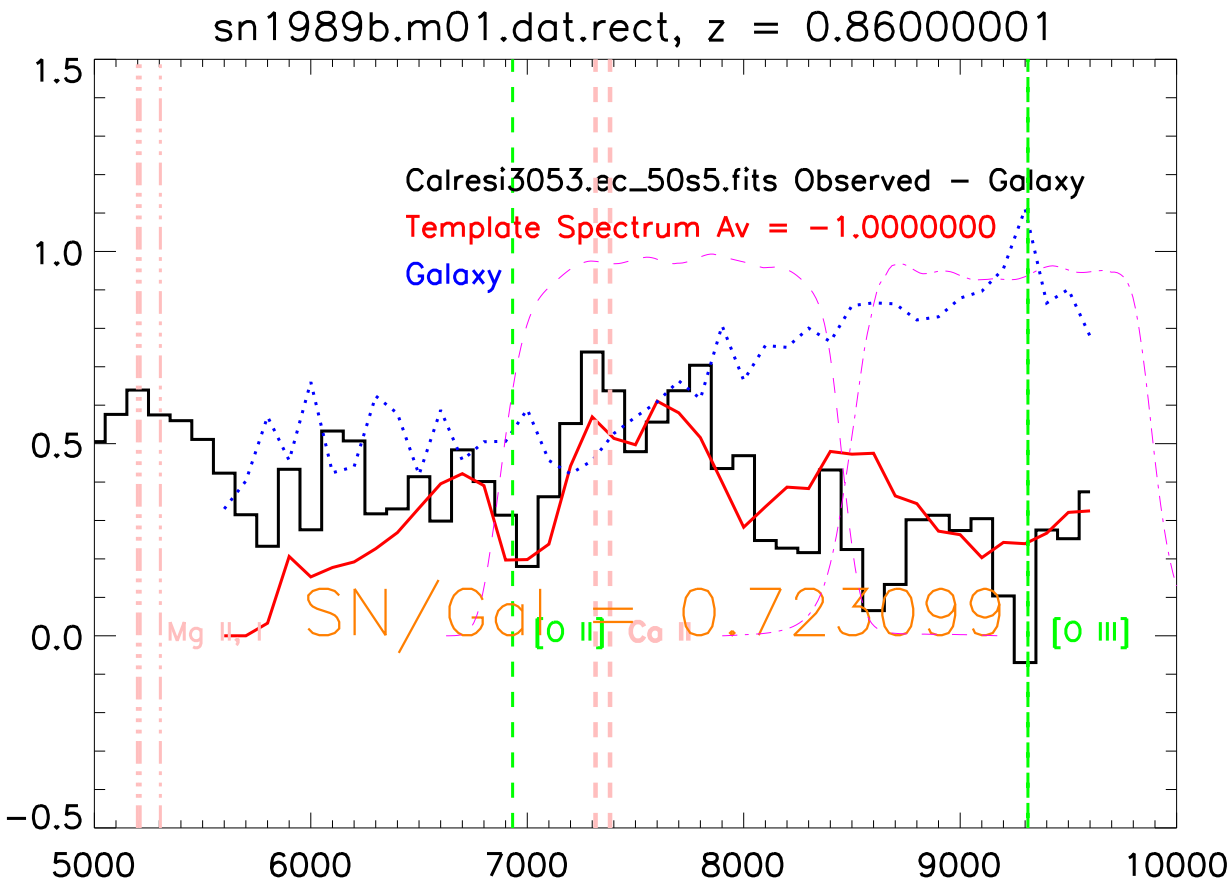

sn1991t.m07.dat.rect, z = 0.95000005
Calresi3053.ec_50s5.fits Observed
Galaxy
Template Spectrum Av = 0.88392863
Galaxy
SN/Gal = 1.76153
Mg II, I
Ca II
[O III]
[O III]
1.2
1.0
0.8
0.6
0.4
0.2
5000
6000
7000
8000
9000
10000

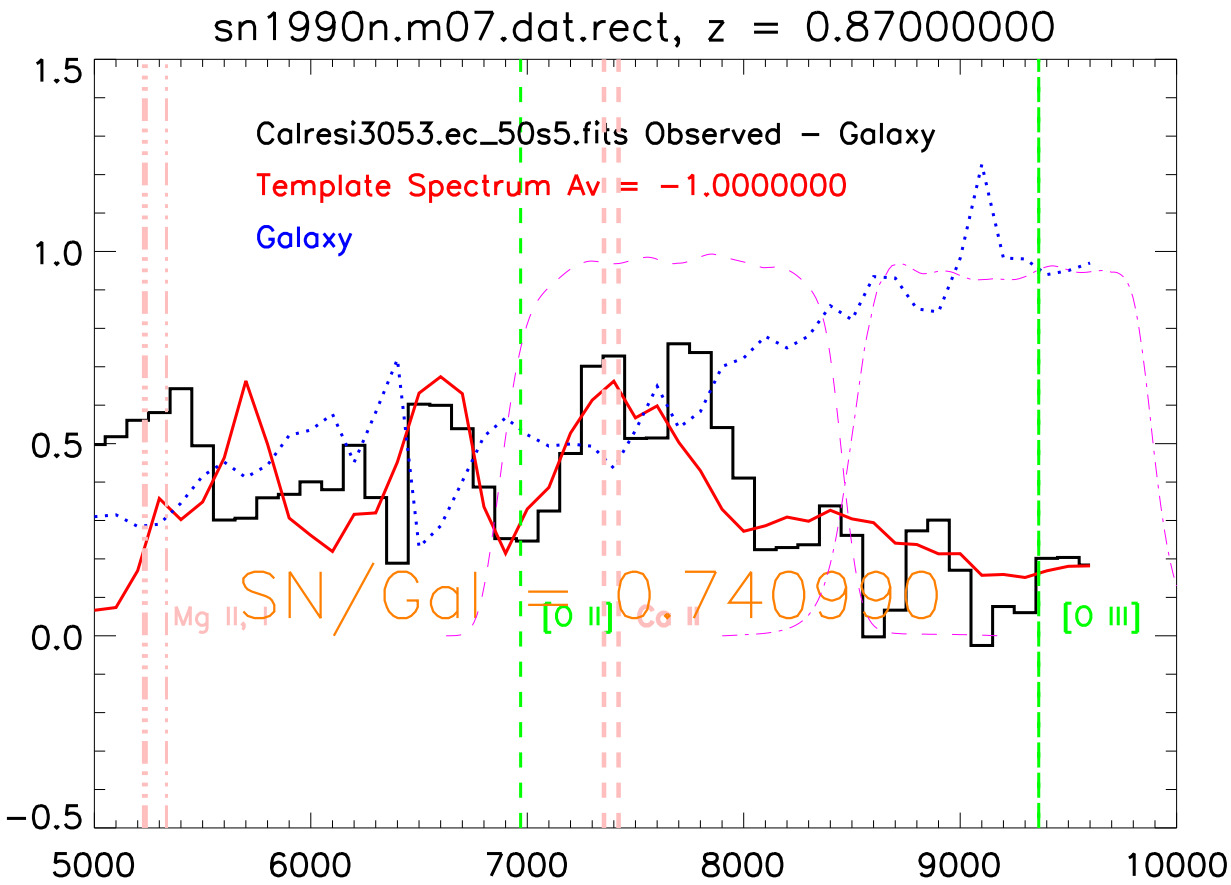

sn1991t.m08.dat.rect, z = 1.0900000
Calresi3053.ec_50s5.fits Observed – Galaxy
Template Spectrum Av = −0.87627551
Galaxy
SN/Gal = 0.997332
Mg II
[O II]
Ca II
[O III]
1.2
1.0
0.8
0.6
0.4
0.2
0.0
5000
6000
7000
8000
9000
10000

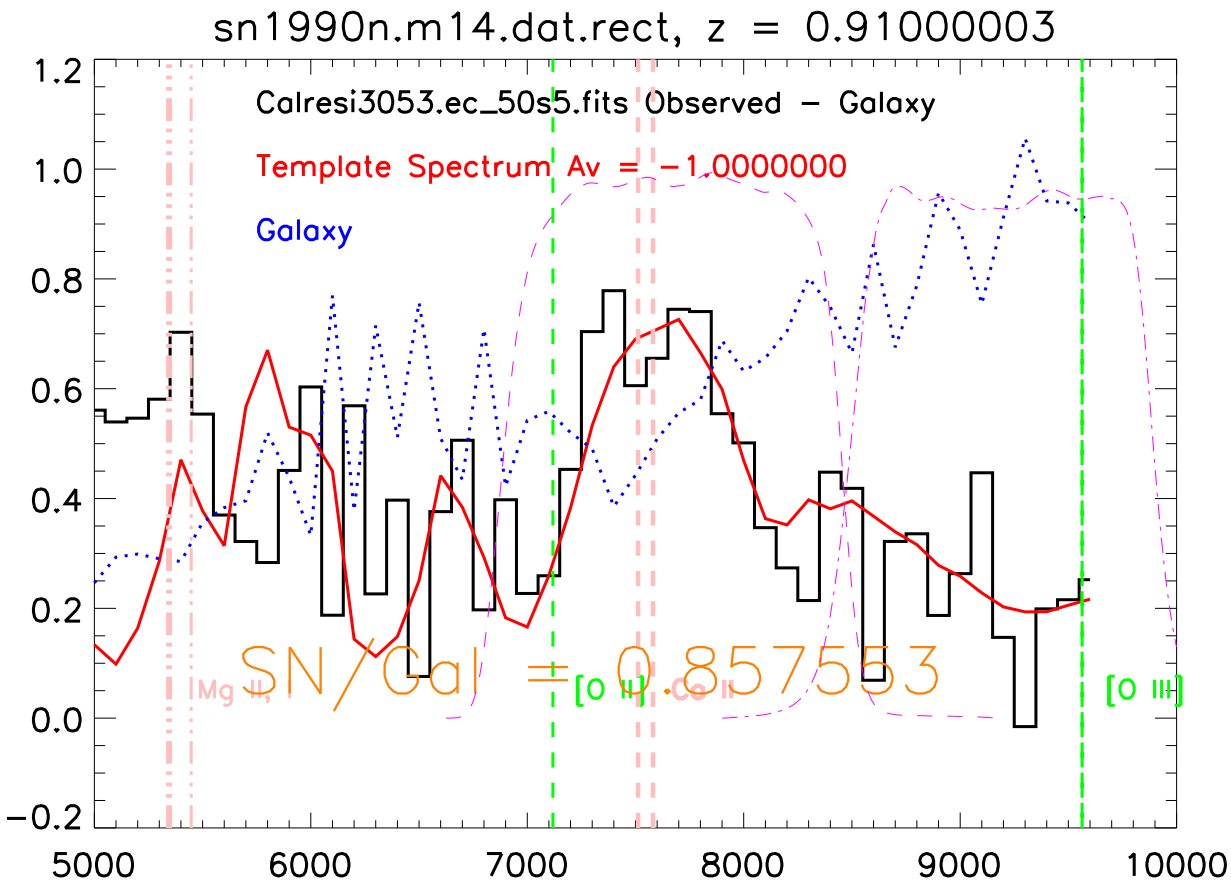

sn1996x.m00.dat.rect, z = 0.86000001
Calresi3053.ec_50s5.fits Observed − Galaxy
Template Spectrum Av = −1.0000000
Galaxy
SN/Gal = 0.770986
Mg II, I
[O II]
Ca II
[O III]
1.2
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
5000
6000
7000
8000
9000
10000

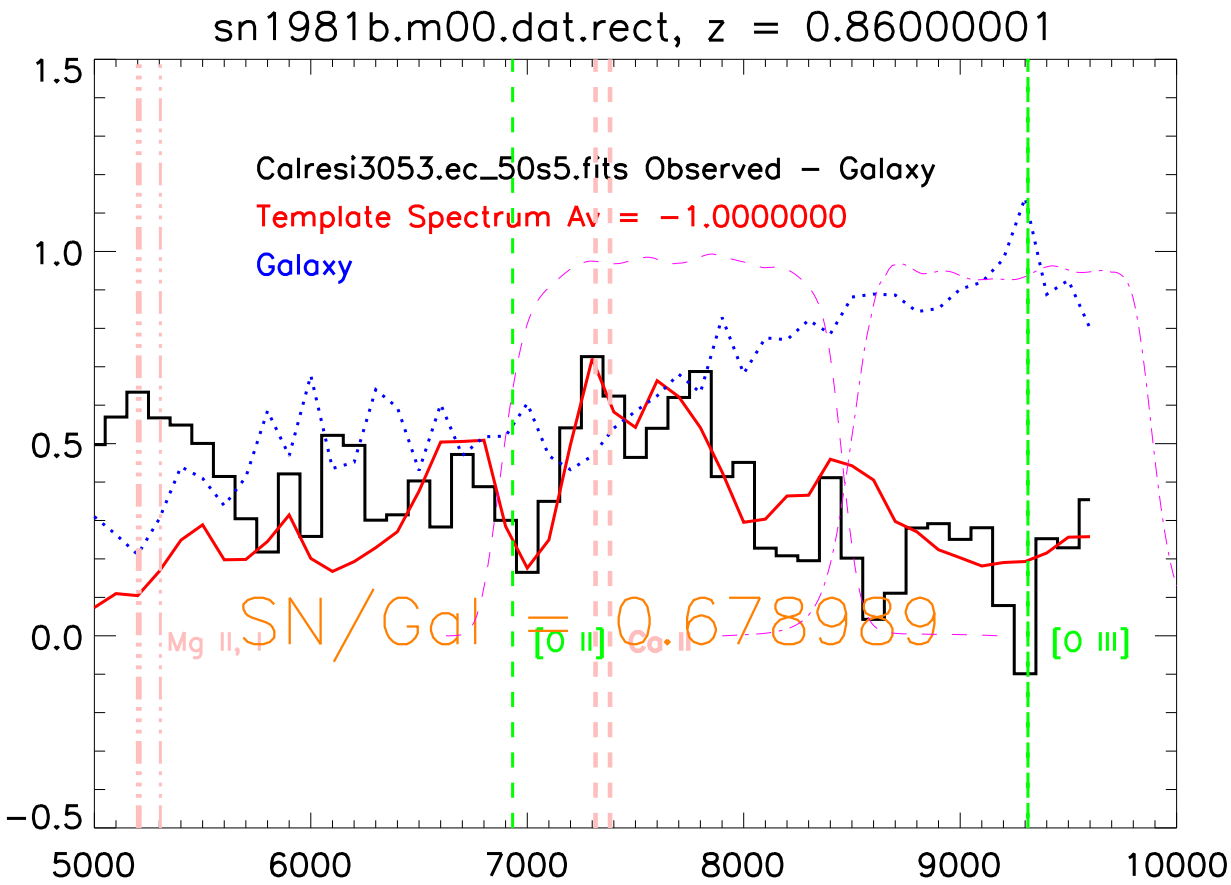

sn1999ee.m08.dat.rect, z = 0.91000003
Calresi3053.ec_50s5.fits Observed − Galaxy
Template Spectrum Av = −1.0000000
Galaxy
SN/Gal = 0.836793
Mg II, I
[O II]
Ca II
[O III]
1.2
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
5000
6000
7000
8000
9000
10000

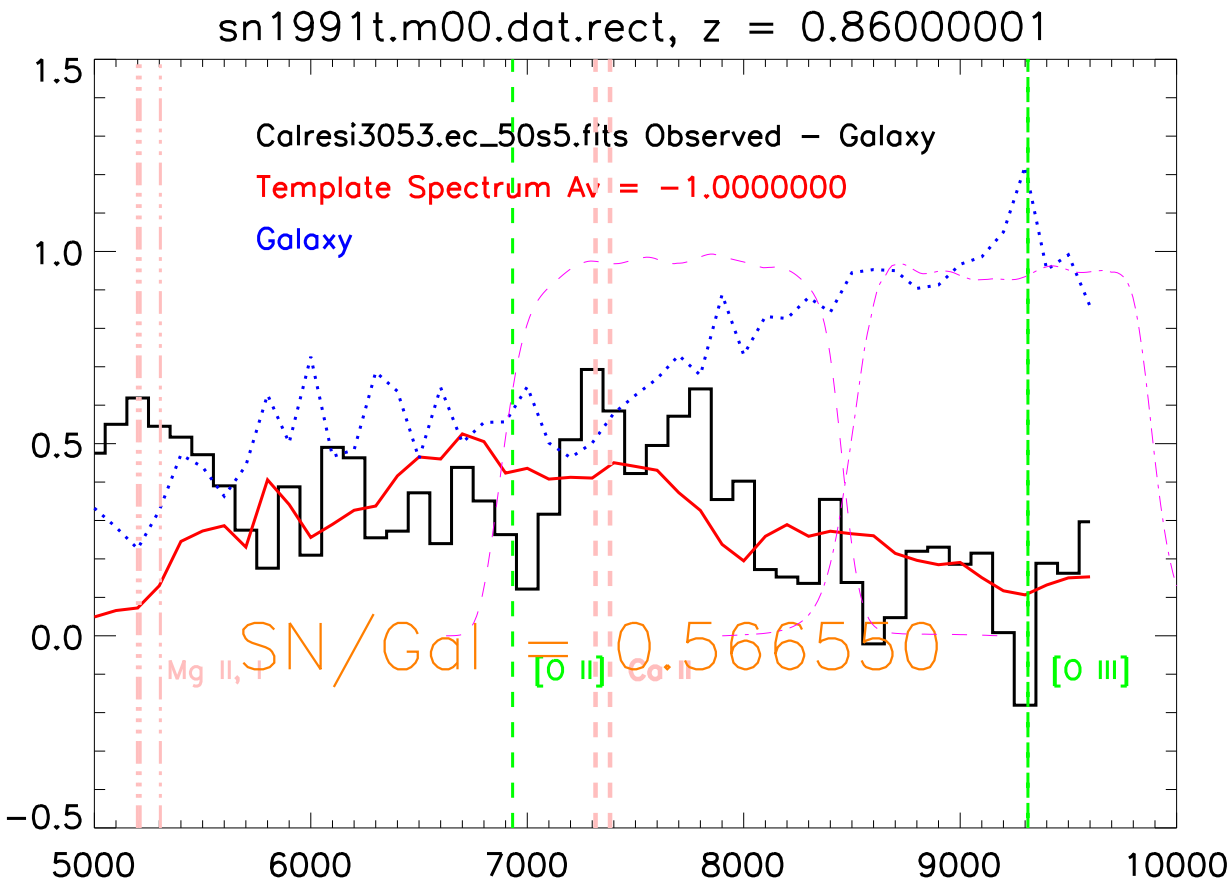

sn1992a.m05.dat.rect, z = 0.87000000
Calresi3053.ec_50s5.fits Observed − Galaxy
Template Spectrum Av = −1.0000000
Galaxy
SN/Gal = 0.914532
[O II]
[O III]
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
5000
6000
7000
8000
9000
10000

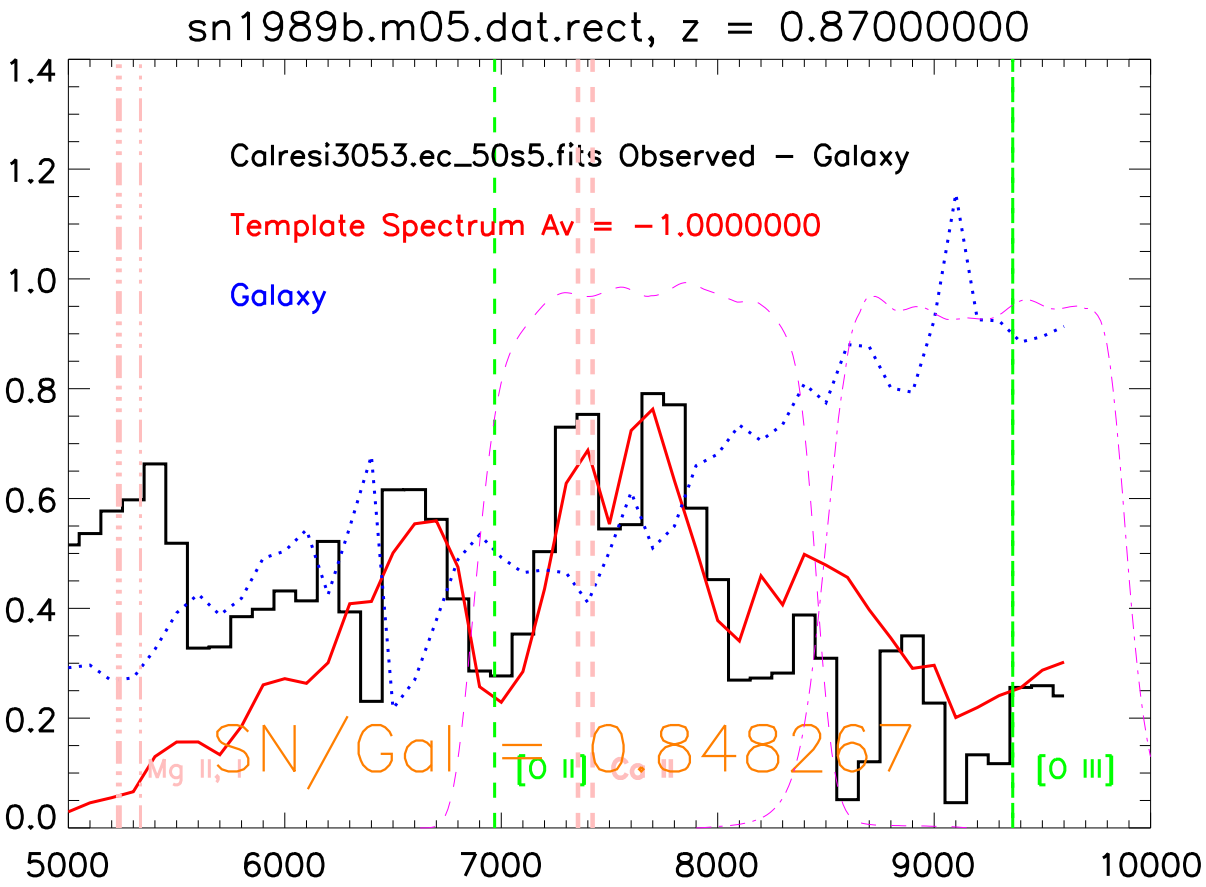

sn1989b.m01.dat.rect, z = 0.86000001
Calresi3053.ec_50s5.fits Observed − Galaxy
Template Spectrum Av = −1.0000000
Galaxy
SN/Gal = 0.723099
Mg II
[O II]
Ca II
[O III]
1.5
1.0
0.5
0.0
−0.5
5000
6000
7000
8000
9000
10000

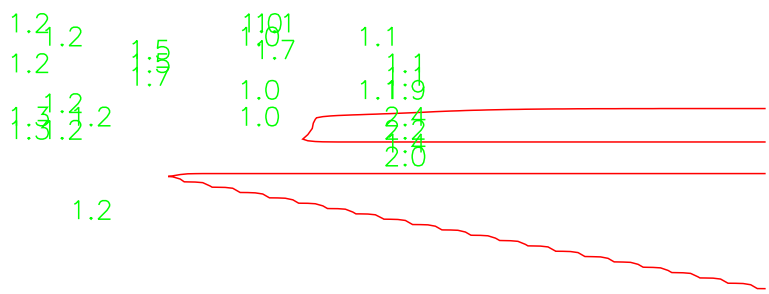

sn1990n.m07.dat.rect, z = 0.87000000
Calresi3053.ec_50s5.fits Observed − Galaxy
Template Spectrum Av = −1.0000000
Galaxy
SN/Gal = 0.740990
Mg II
[O II]
Ca II
[O III]
1.5
1.0
0.5
0.0
−0.5
5000
6000
7000
8000
9000
10000

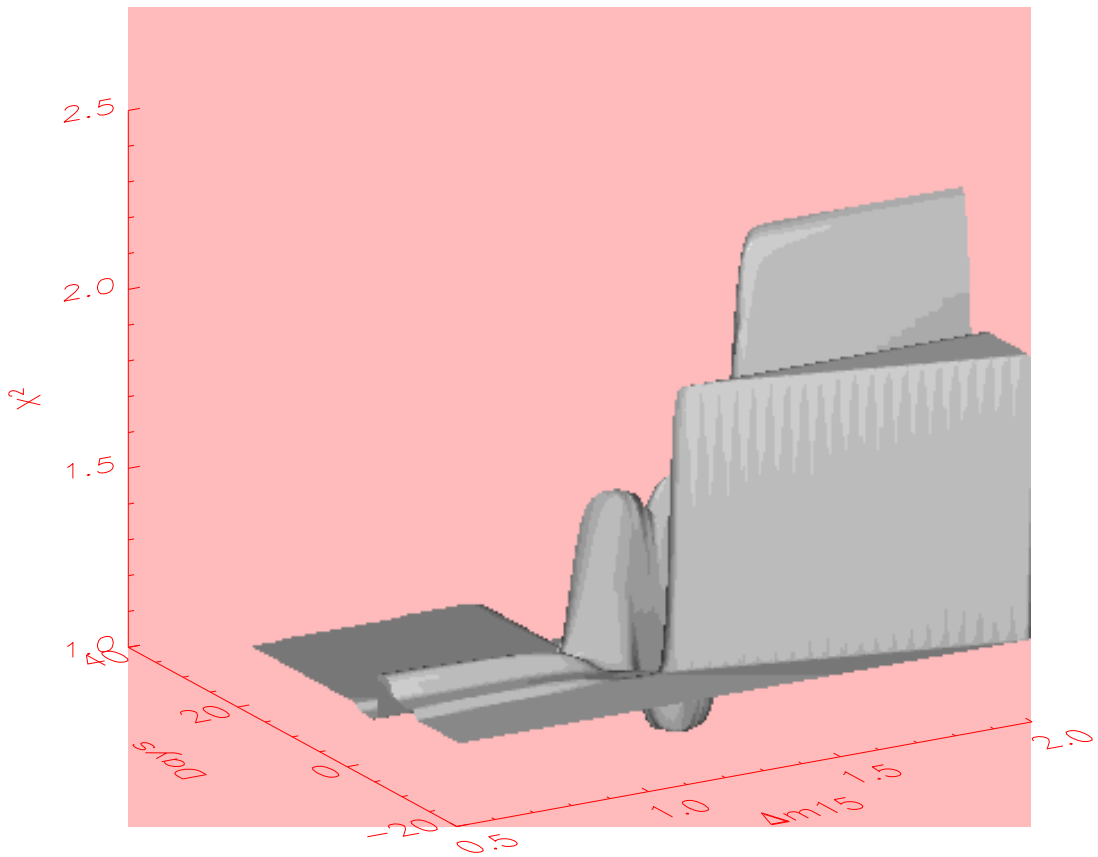

sn1990n.m14.dat.rect, z = 0.91000003
Calresi3053.ec_50s5.fits Observed − Galaxy
Template Spectrum Av = −1.0000000
Galaxy
SN/Gal = 0.857553
Mg II
[O II]
Ca II
[O III]
1.2
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
5000
6000
7000
8000
9000
10000

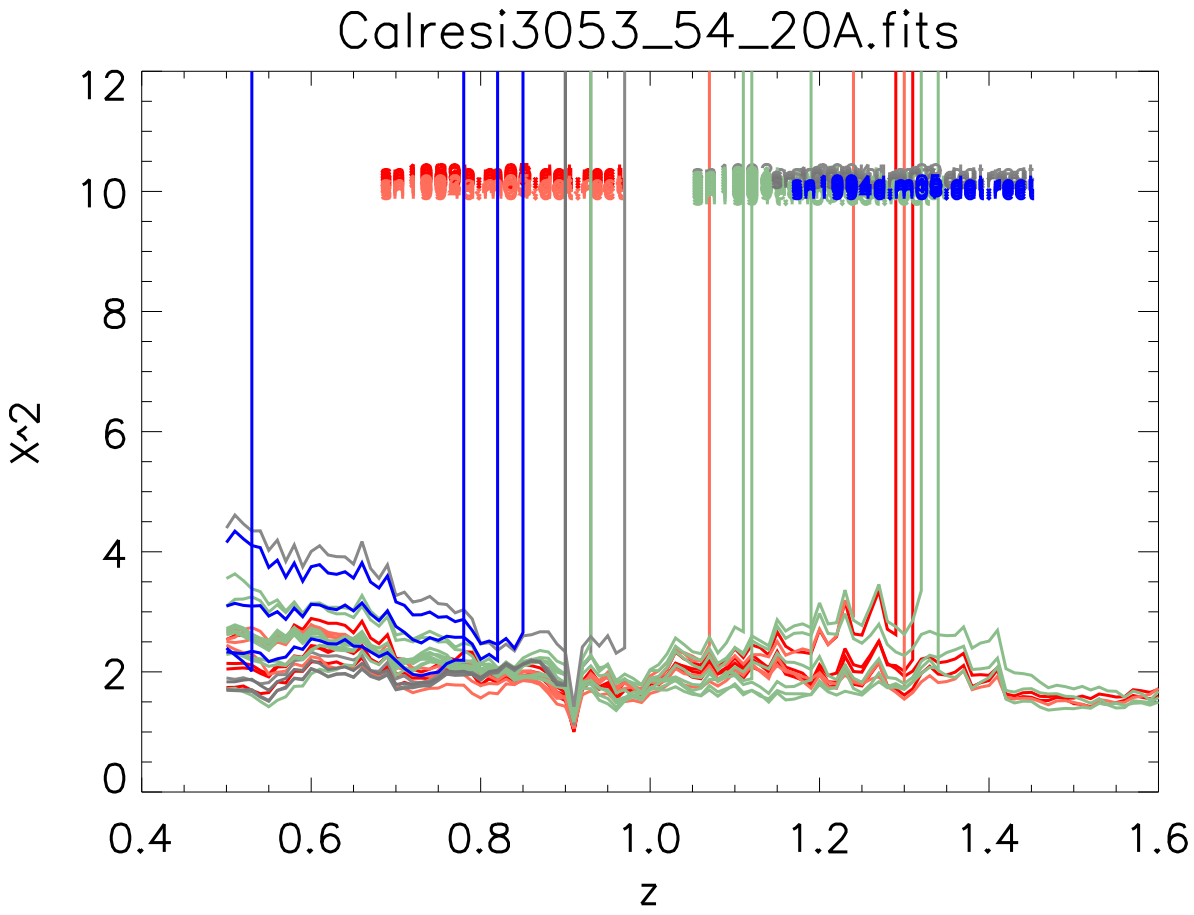

sn1981b.m00.dat.rect, z = 0.86000001
Calresi3053.ec_50s5.fits Observed − Galaxy
Template Spectrum Av = −1.0000000
Galaxy
SN/Gal = 0.678989
Mg II,
[O II]
Ca II
[O III]
1.5
1.0
0.5
0.0
−0.5
5000
6000
7000
8000
9000
10000

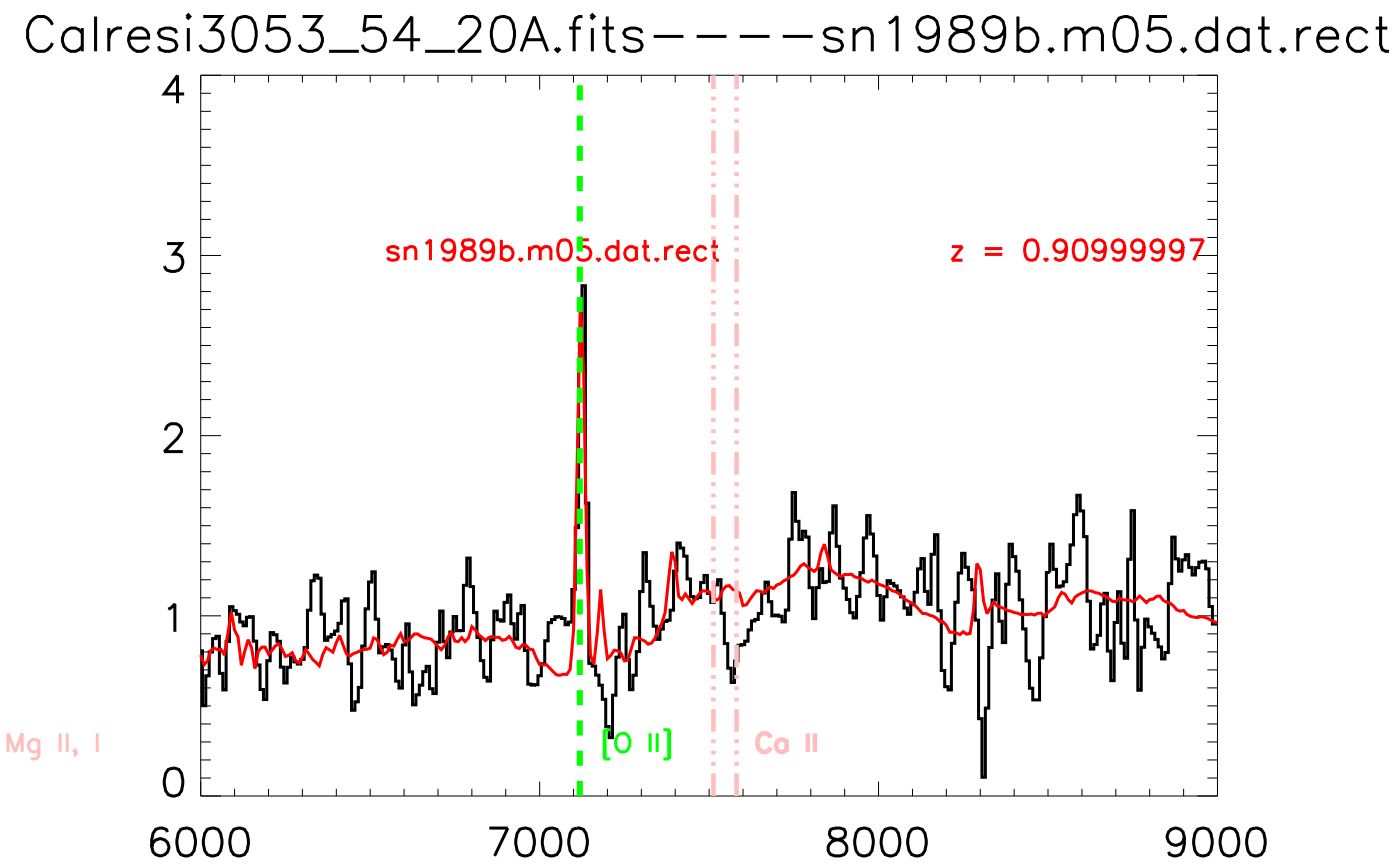

sn1991t.m00.dat.rect, z = 0.86000001
Calresi3053.ec_50s5.fits Observed − Galaxy
Template Spectrum Av = −1.0000000
Galaxy
SN/Gal = 0.566550
Mg II,
[O II]
Ca II
[O III]
1.5
1.0
0.5
0.0
−0.5
5000
6000
7000
8000
9000
10000

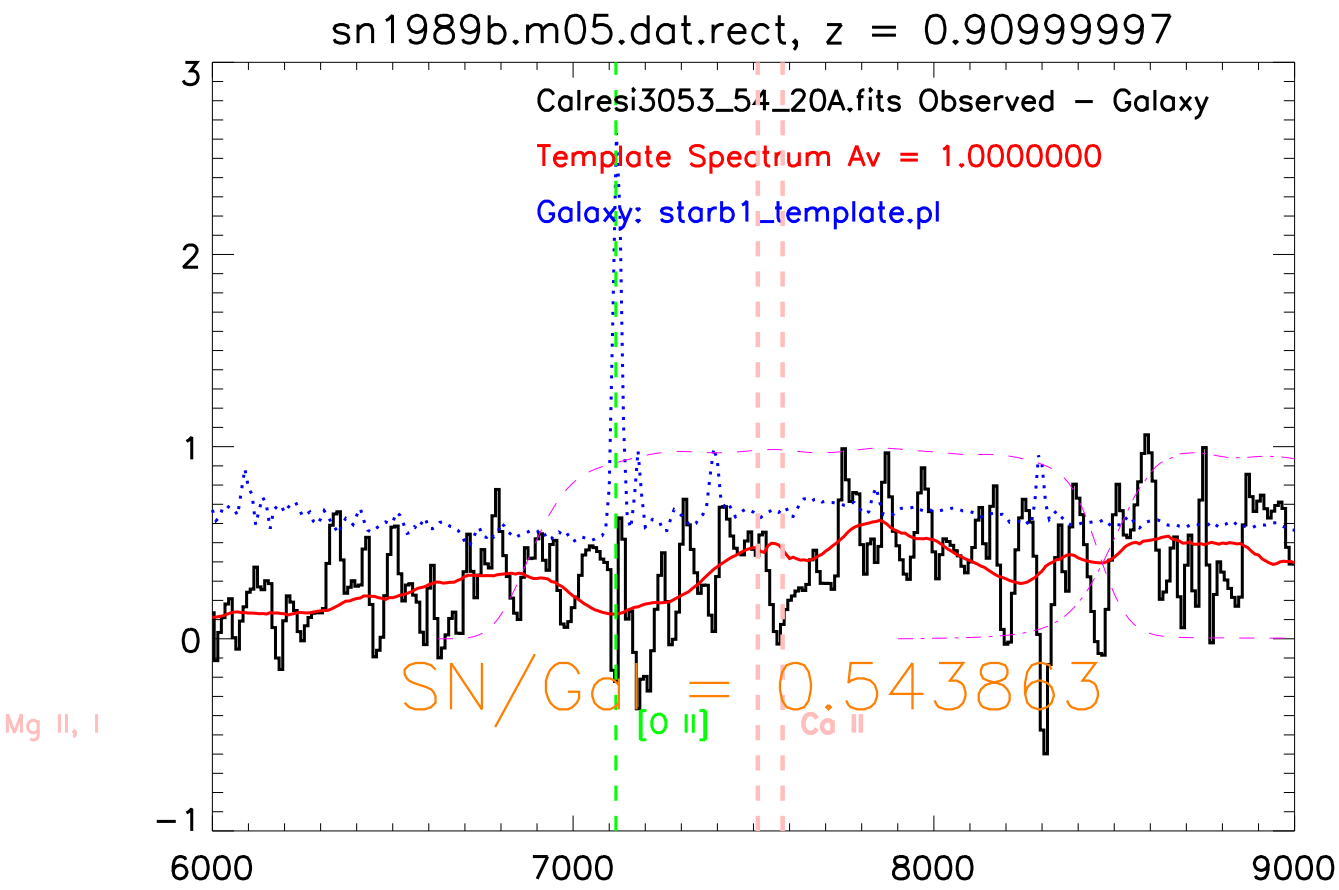

sn1989b.m05.dat.rect, z = 0.87000000
Calresi3053.ec_50s5.fits Observed − Galaxy
Template Spectrum Av = −1.0000000
Galaxy
SN/Gal = 0.848267
[O II]
[O III]
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
5000
6000
7000
8000
9000
10000

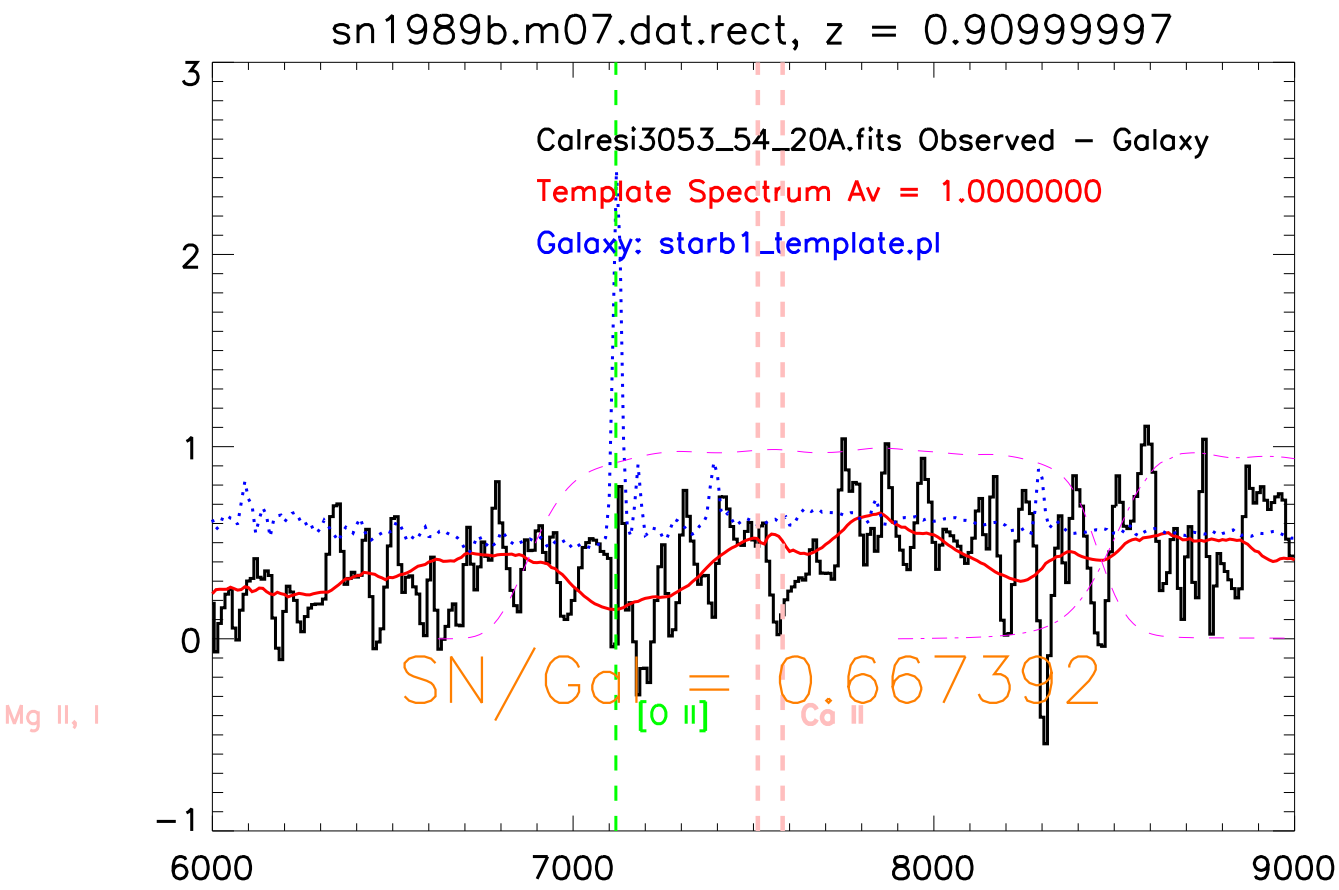

1.2
1.2
1.2

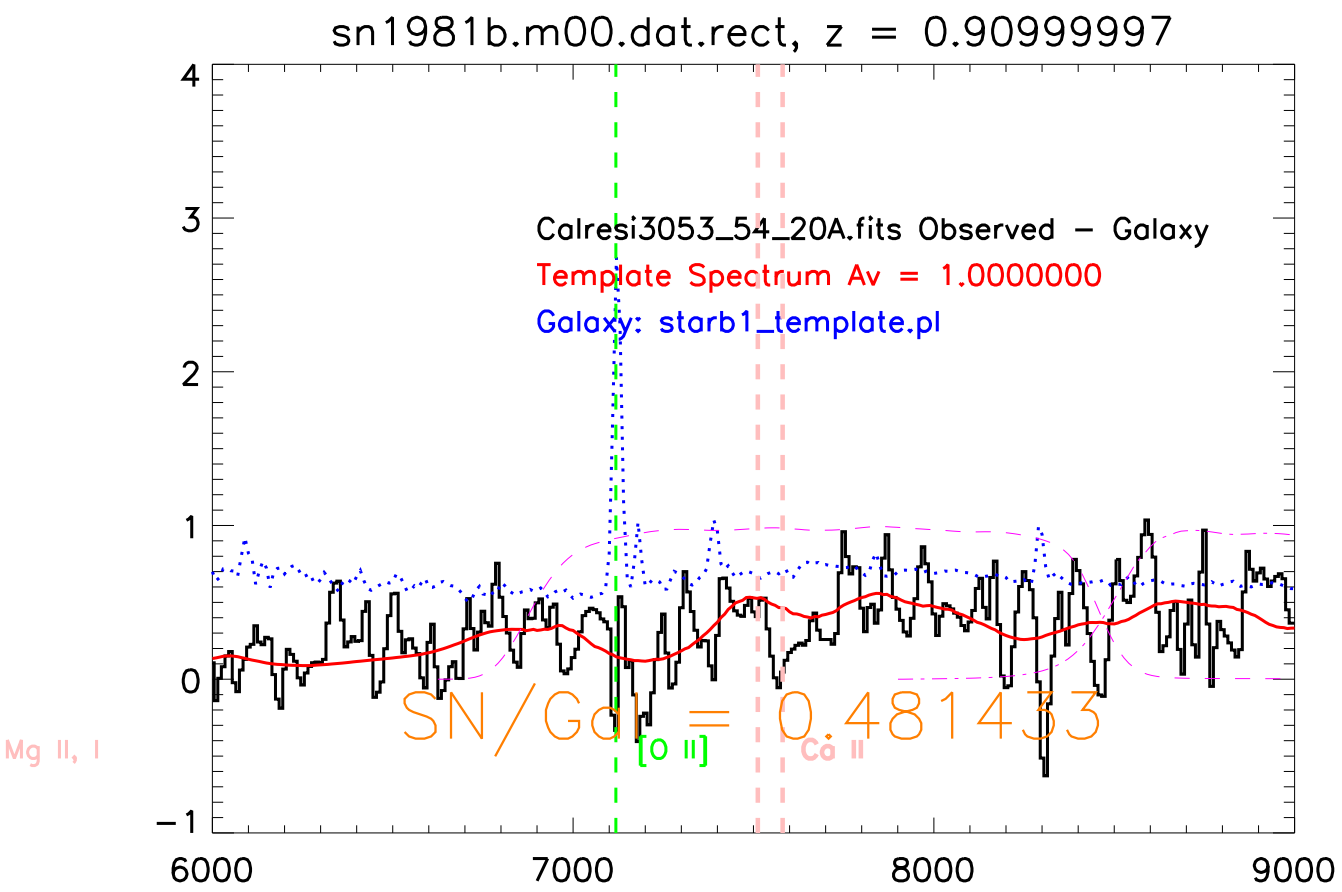

2.5
2.0
1.5
1.0
χ^2
40
20
0
−20
dδ/s
0.5
1.0
1.5
2.0
Δm15

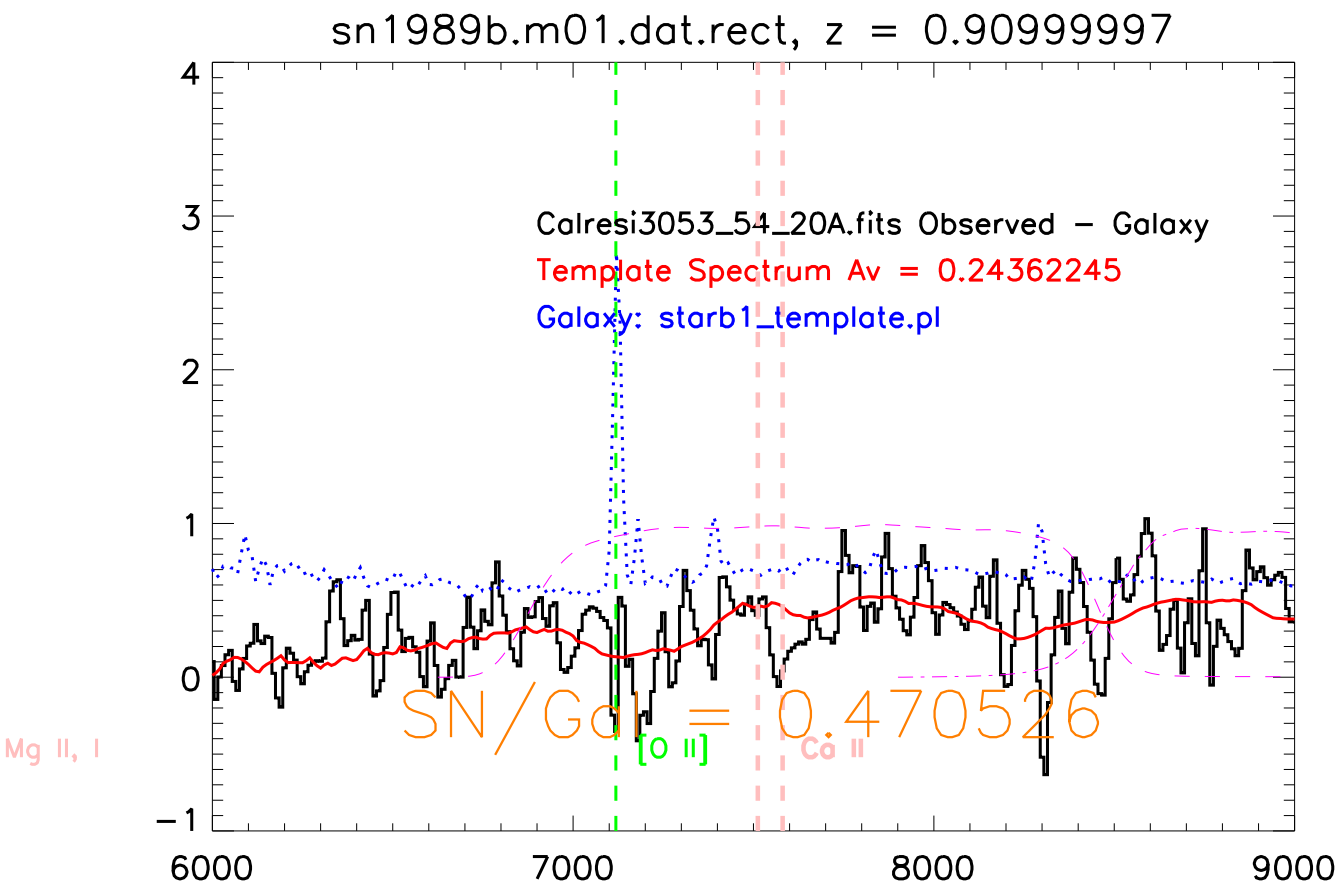

Calresi3053_54_20A.fits
12
10
8
6
4
2
0
X^2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
z

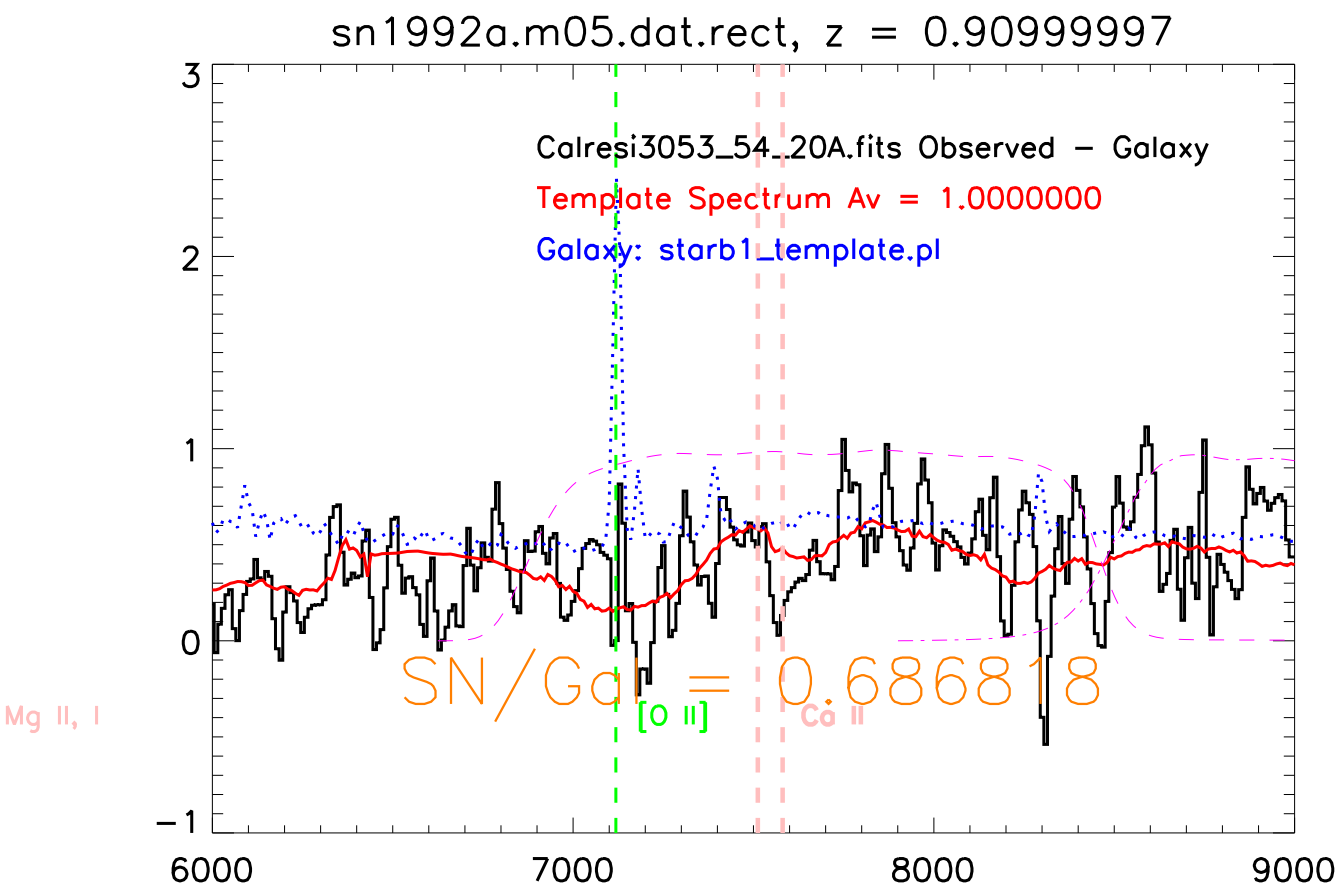

Calresi3053_54_20A.fits----sn1989b.m05.dat.rect
sn1989b.m05.dat.rect
z = 0.90999997
Mg II, I
[O II]
Ca II
0
1
2
3
4
6000
7000
8000
9000

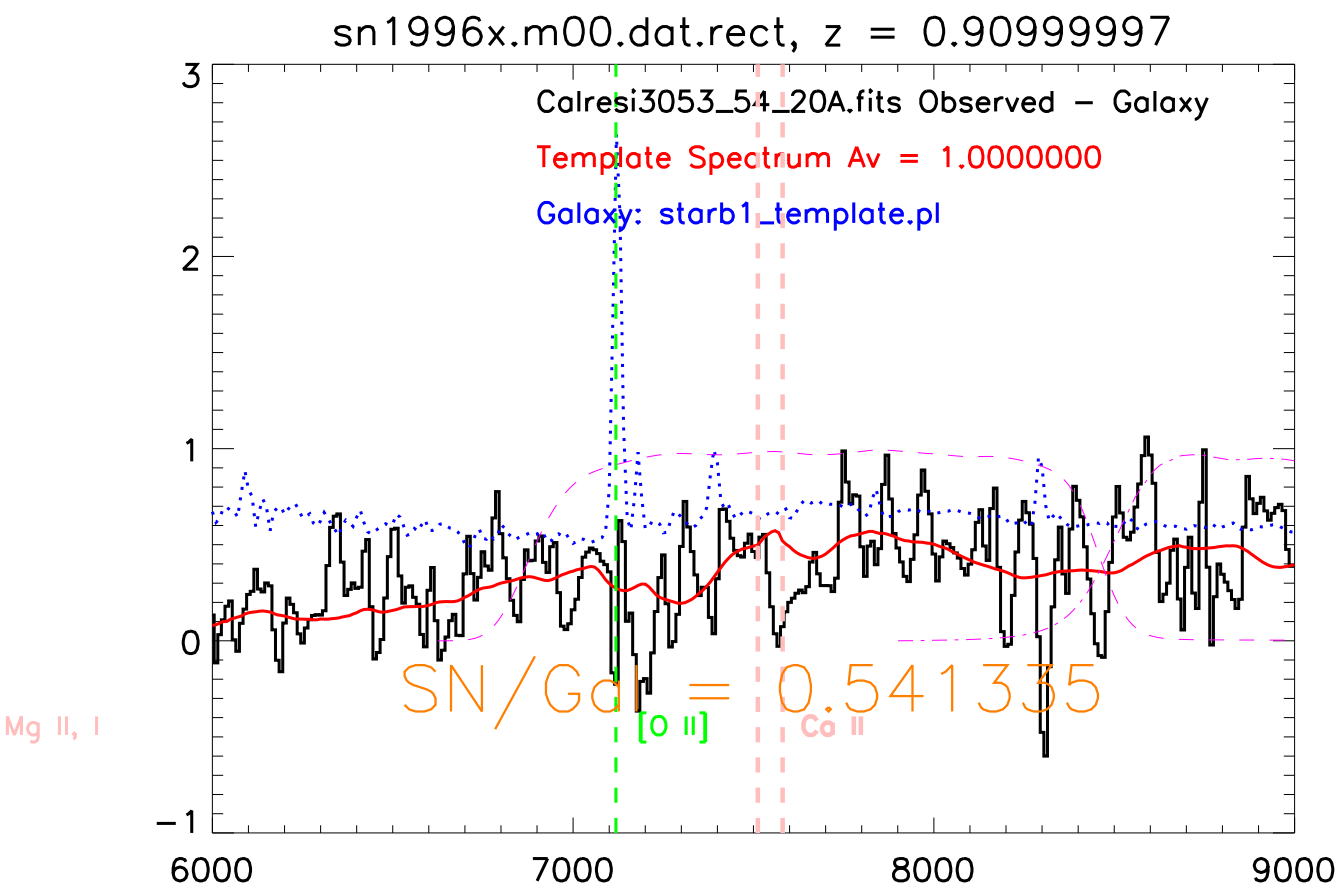

sn1989b.m05.dat.rect, z = 0.90999997
Calresi3053_54_20A.fits Observed − Galaxy
Template Spectrum Av = 1.0000000
Galaxy: starb1_template.pl
SN/Gal = 0.543863
[O II]
Ca II
Mg II, I
3
2
1
0
−1
6000
7000
8000
9000

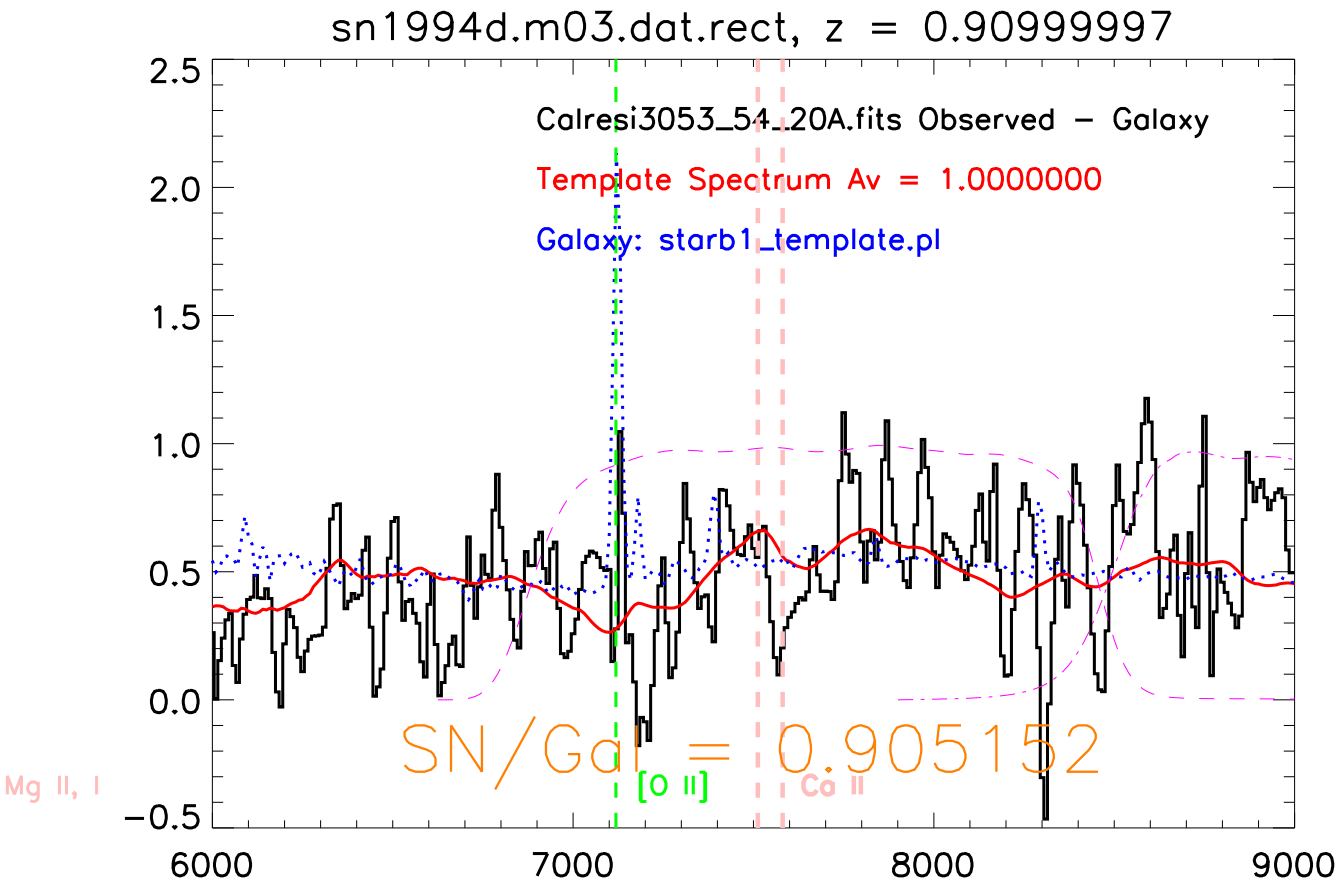

sn1989b.m07.dat.rect, z = 0.90999997
Calresi3053_54_20A.fits Observed − Galaxy
Template Spectrum Av = 1.0000000
Galaxy: starb1_template.pl
SN/Gal = 0.667392
[O II]
Ca II
Mg II, I
3
2
1
0
−1
6000
7000
8000
9000

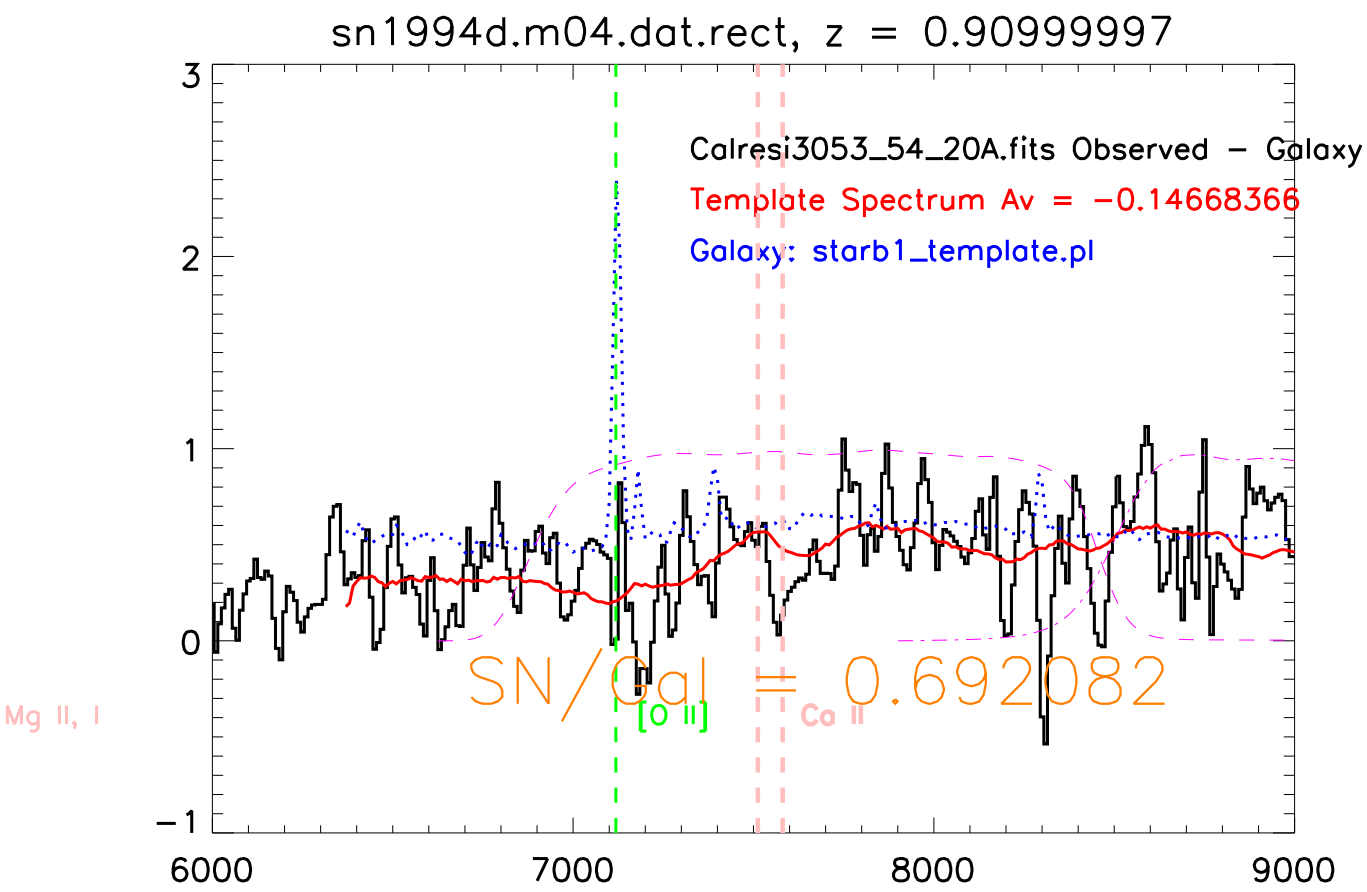

sn1981b.m00.dat.rect, z = 0.90999997
Calresi3053_54_20A.fits Observed − Galaxy
Template Spectrum Av = 1.0000000
Galaxy: starb1_template.pl
SN/Gal = 0.481433
[O II]
Ca II
Mg II, I
4
3
2
1
0
−1
6000
7000
8000
9000

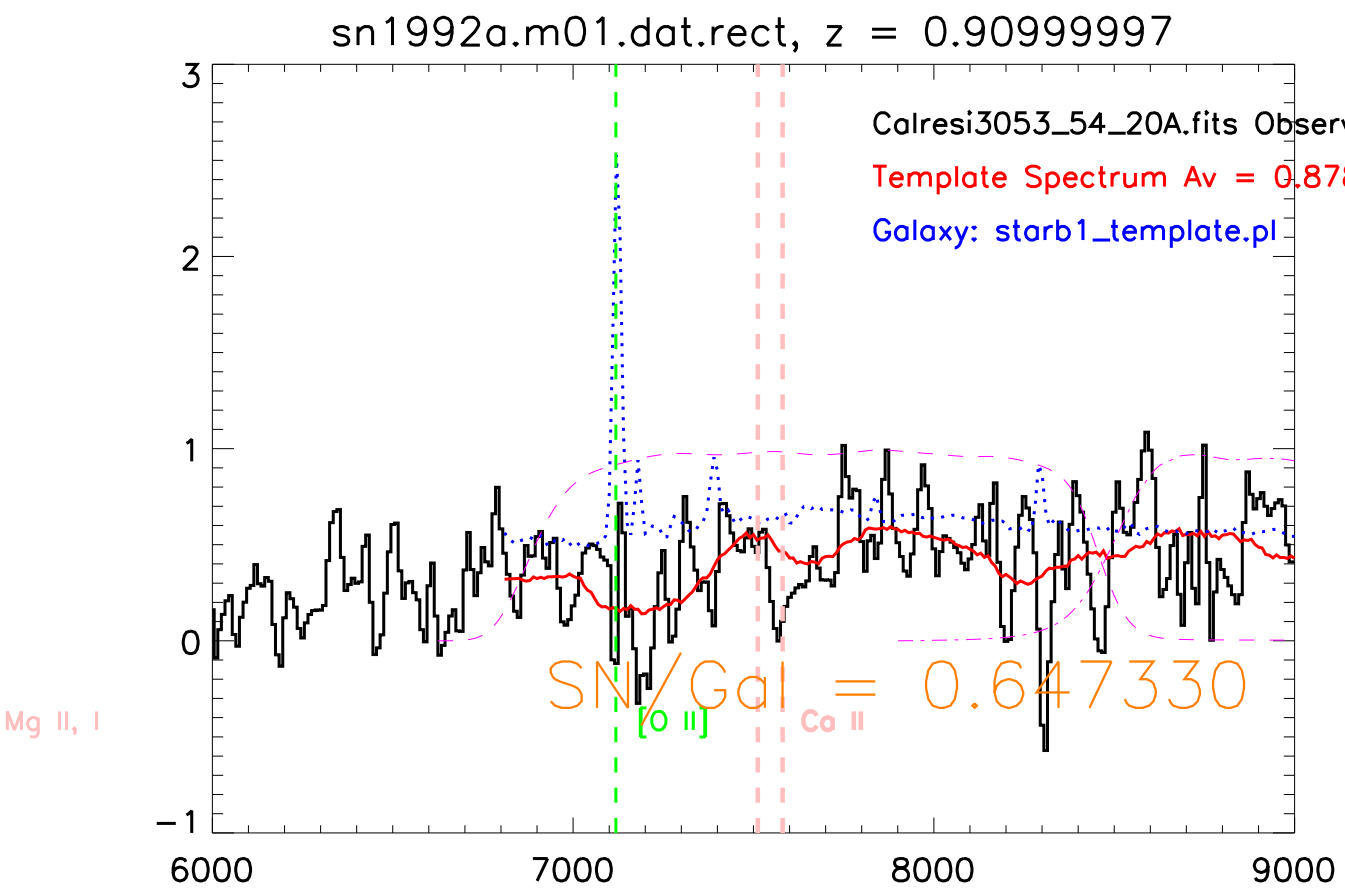

sn1989b.m01.dat.rect, z = 0.90999997
Calresi3053_54_20A.fits Observed − Galaxy
Template Spectrum Av = 0.24362245
Galaxy: starb1_template.pl
SN/Gal = 0.470526
[O II]
Ca II
Mg II, I
4
3
2
1
0
−1
6000
7000
8000
9000

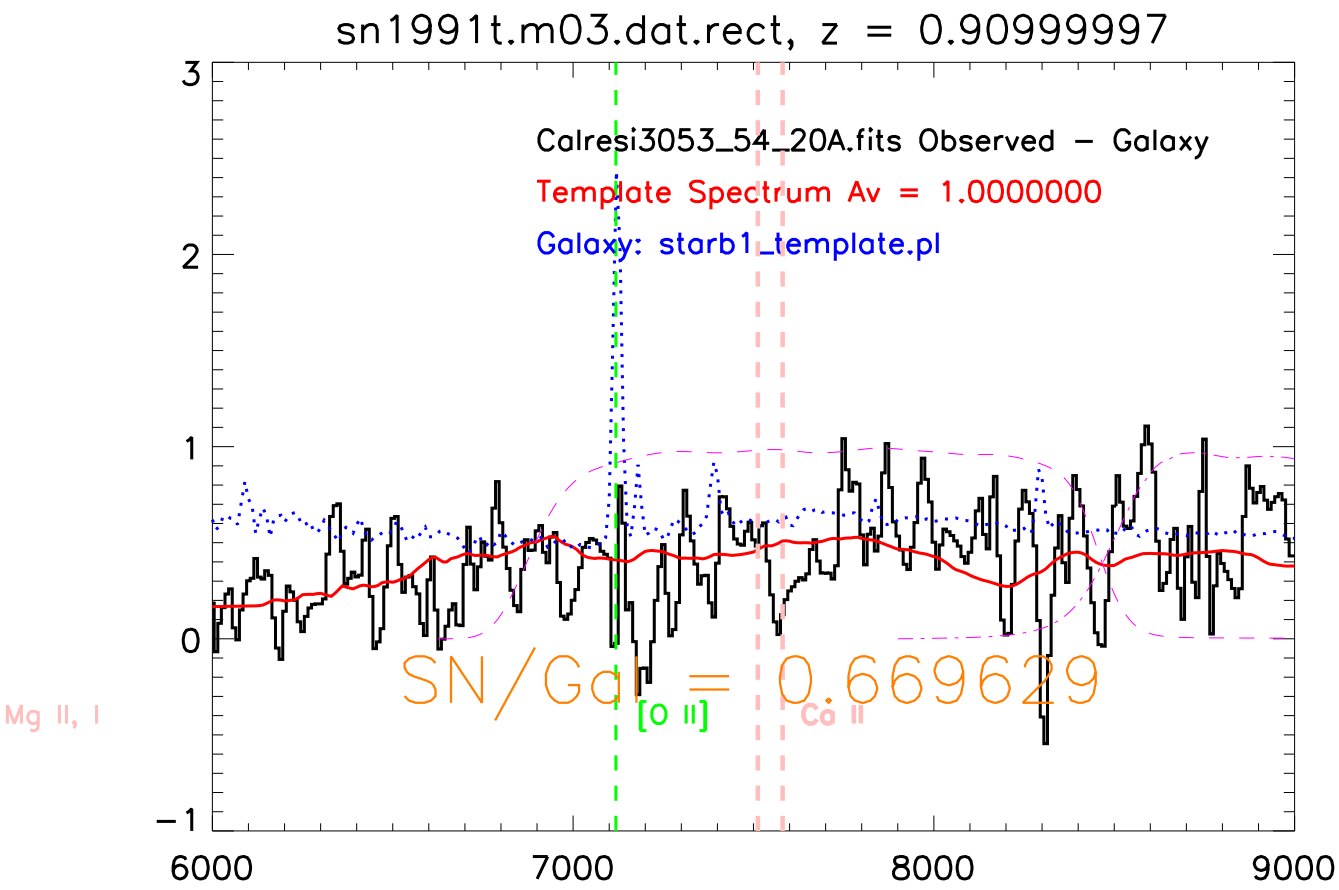

sn1992a.m05.dat.rect, z = 0.90999997
Calresi3053_54_20A.fits Observed – Galaxy
Template Spectrum Av = 1.0000000
Galaxy: starb1_template.pl
SN/Gal = 0.686818
[O II]
Ca II
Mg II, I
3
2
1
0
−1
6000
7000
8000
9000

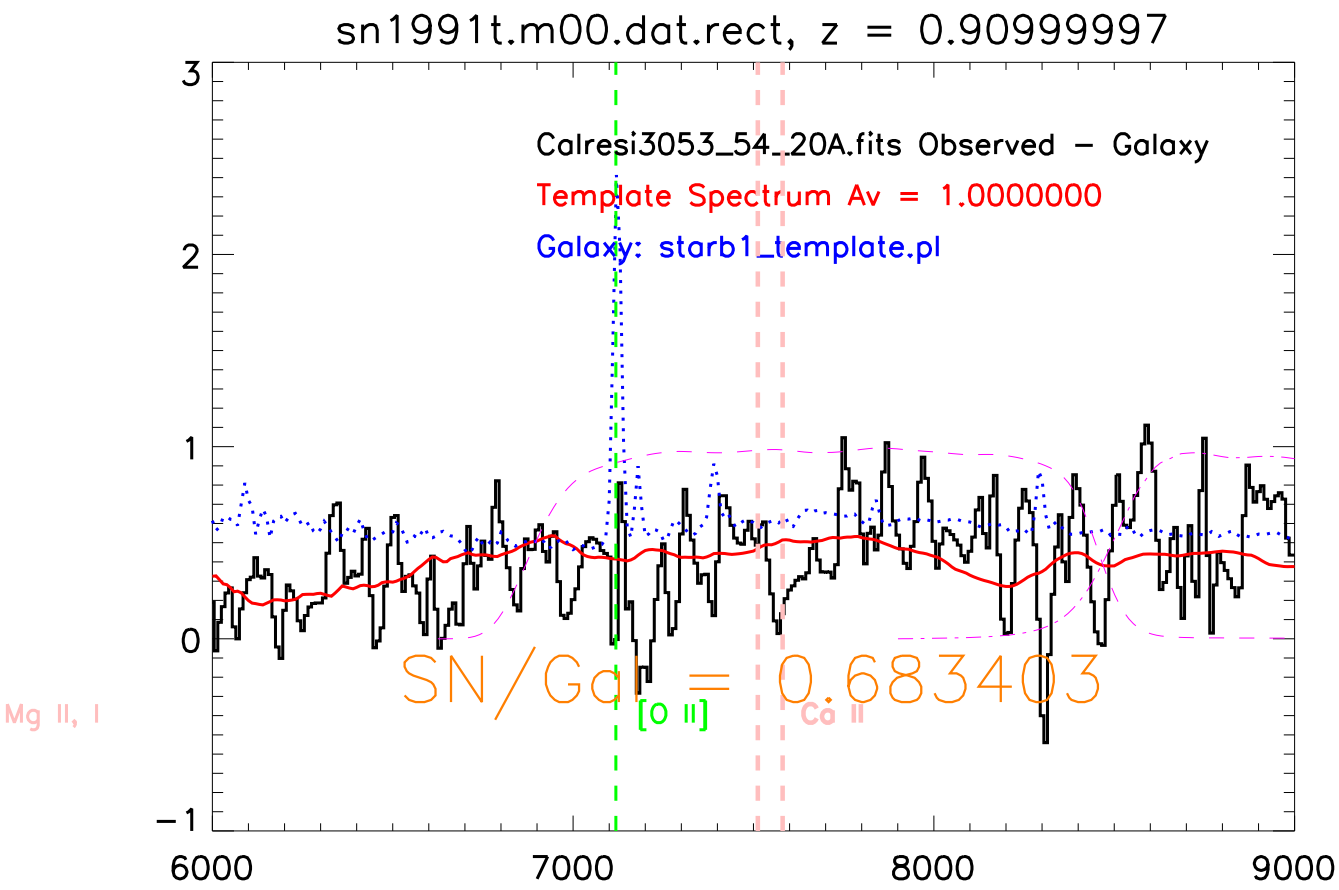

sn1996x.m00.dat.rect, z = 0.90999997
Calresi3053_54_20A.fits Observed − Galaxy
Template Spectrum Av = 1.0000000
Galaxy: starb1_template.pl
SN/Gal = 0.541335
[O II]
Ca II
Mg II, I
3
2
1
0
−1
6000
7000
8000
9000

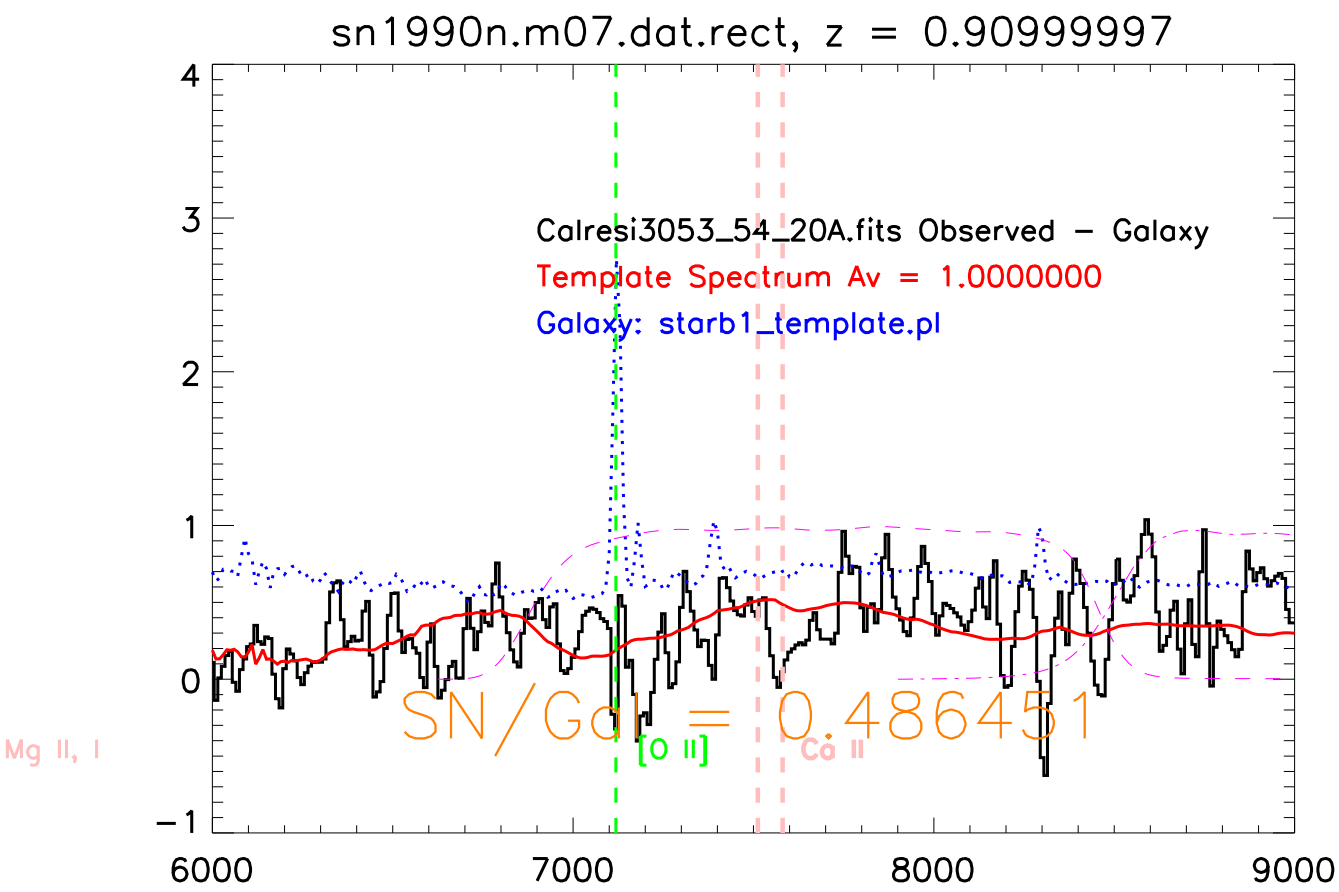

sn1994d.m03.dat.rect, z = 0.90999997
Calresi3053_54_20A.fits Observed – Galaxy
Template Spectrum Av = 1.0000000
Galaxy: starb1_template.pl
SN/Gdf = 0.905152
[O II]
Ca II
Mg II, I
2.5
2.0
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000

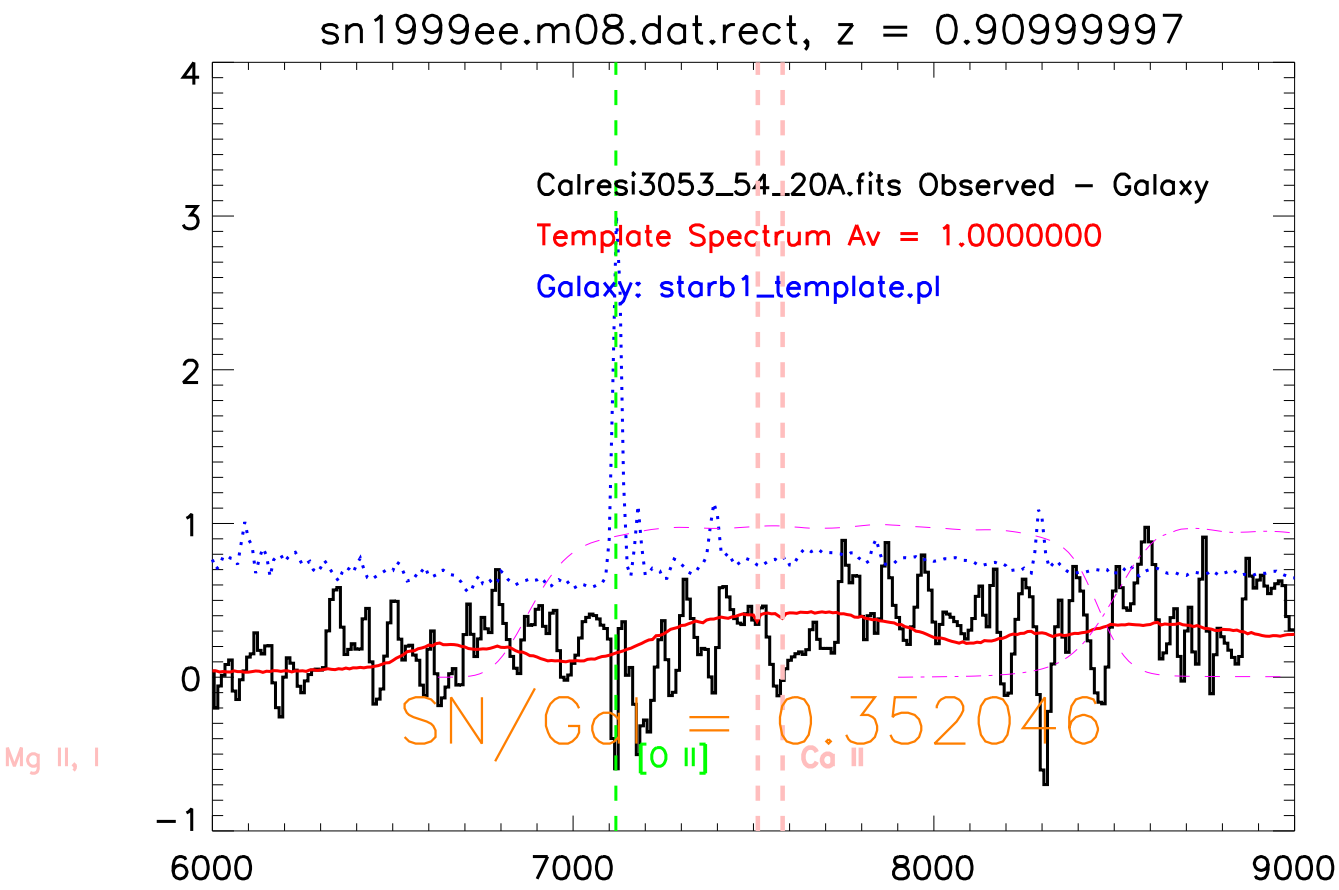

sn1994d.m04.dat.rect, z = 0.90999997
Calresi3053_54_20A.fits Observed − Galaxy
Template Spectrum Av = −0.14668366
Galaxy: starb1_template.pl
SN/Gal = 0.692082
[O II]
Ca II
Mg II, I
3
2
1
0
−1
6000
7000
8000
9000

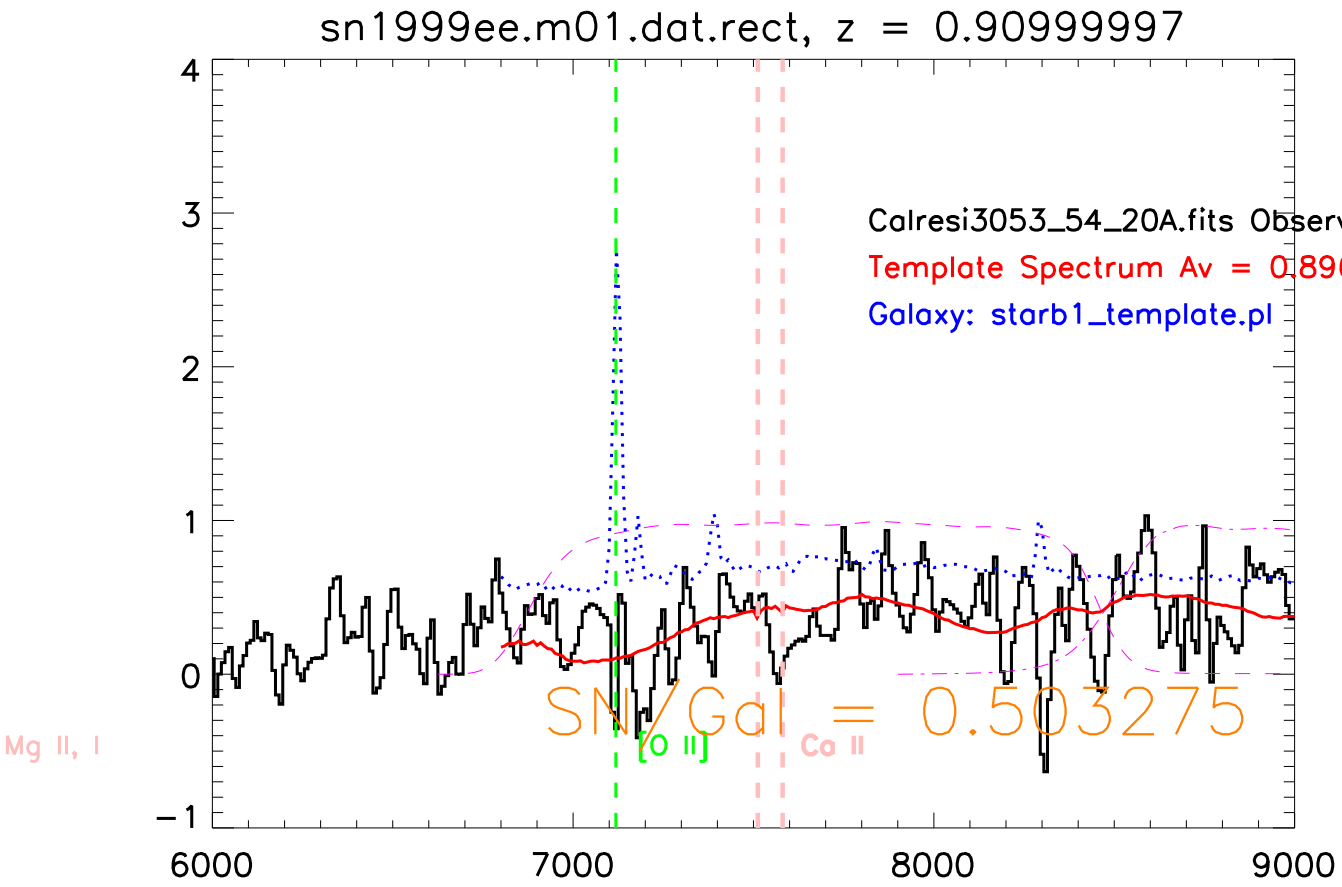

sn1992a.m01.dat.rect, z = 0.90999997
Calresi3053_54_20A.fits Observed – Gal
Template Spectrum Av = 0.87882659
Galaxy: starb1_template.pl
SN/Gal = 0.647330
[O II]
Ca II
Mg II, I
3
2
1
0
−1
6000
7000
8000
9000

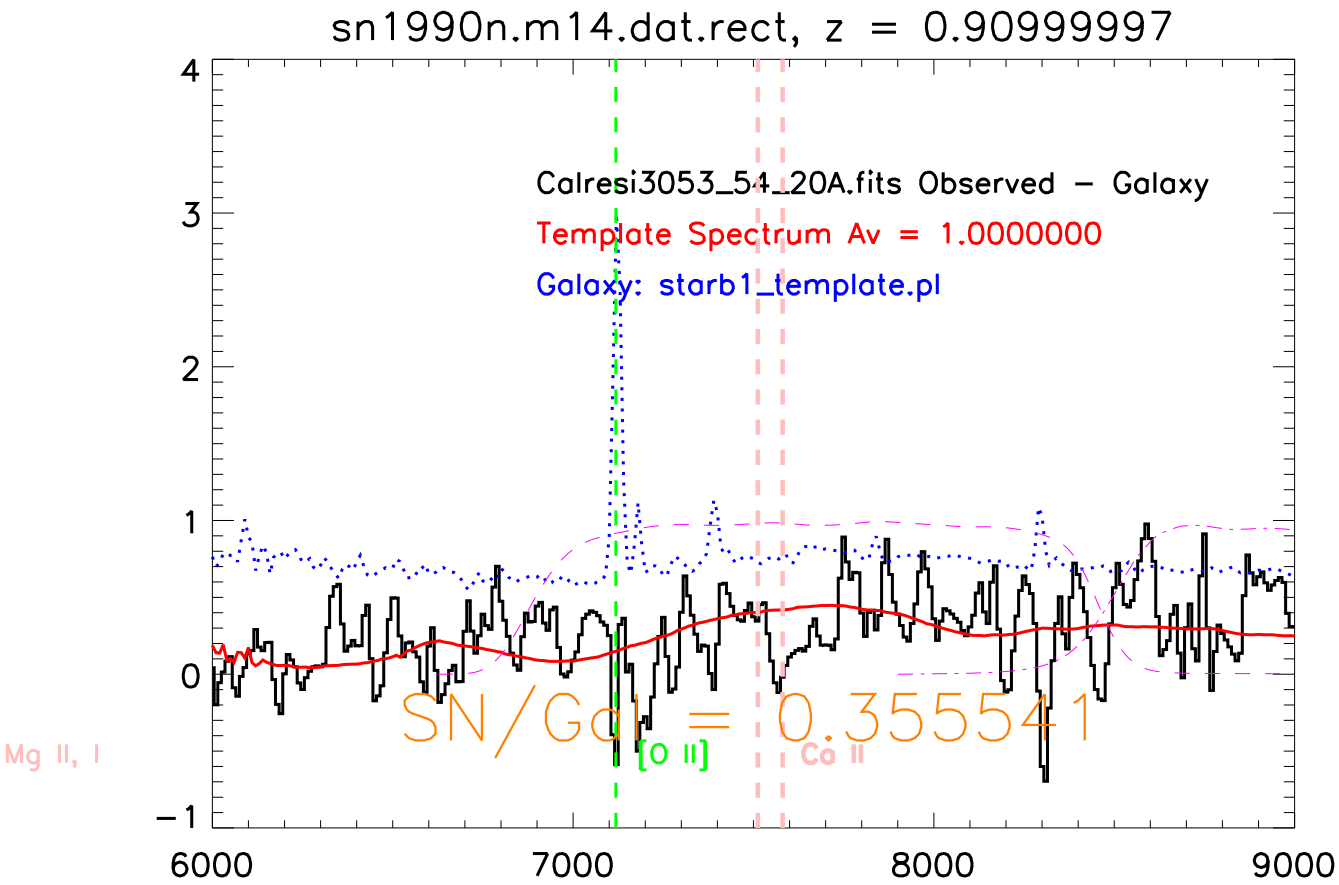

sn1991t.m03.dat.rect, z = 0.90999997
Calresi3053_54_20A.fits Observed − Galaxy
Template Spectrum Av = 1.0000000
Galaxy: starb1_template.pl
SN/Gal = 0.669629
[O II]
Ca II
Mg II, I
3
2
1
0
−1
6000
7000
8000
9000


sn1991t.m00.dat.rect, z = 0.90999997
Calresi3053_54_20A.fits Observed − Galaxy
Template Spectrum Av = 1.0000000
Galaxy: starb1_template.pl
SN/Gal = 0.683403
[O II]
Ca II
Mg II, I
3
2
1
0
−1
6000
7000
8000
9000


sn1990n.m07.dat.rect, z = 0.90999997
Calresi3053_54_20A.fits Observed − Galaxy
Template Spectrum Av = 1.0000000
Galaxy: starb1_template.pl
SN/Gal = 0.486451
[O II]
Ca II
Mg II, I
4
3
2
1
0
−1
6000
7000
8000
9000


sn1999ee.m08.dat.rect, z = 0.90999997
Calresi3053_54_20A.fits Observed − Galaxy
Template Spectrum Av = 1.0000000
Galaxy: starb1_template.pl
SN/Gal = 0.352046
[O II]
Ca II
Mg II, I
4
3
2
1
0
−1
6000
7000
8000
9000


sn1999ee.m01.dat.rect, z = 0.90999997
Calresi3053_54_20A.fits Observed – Gala
Template Spectrum Av = 0.89668372
Galaxy: starb1_template.pl
SN/Gal = 0.503275
[O II]
Ca II
Mg II, I
4
3
2
1
0
−1
6000
7000
8000
9000


sn1990n.m14.dat.rect, z = 0.90999997
Calresi3053_54_20A.fits Observed − Galaxy
Template Spectrum Av = 1.0000000
Galaxy: starb1_template.pl
SN/Gal = 0.355541
[O II]
Ca II
Mg II, I
4
3
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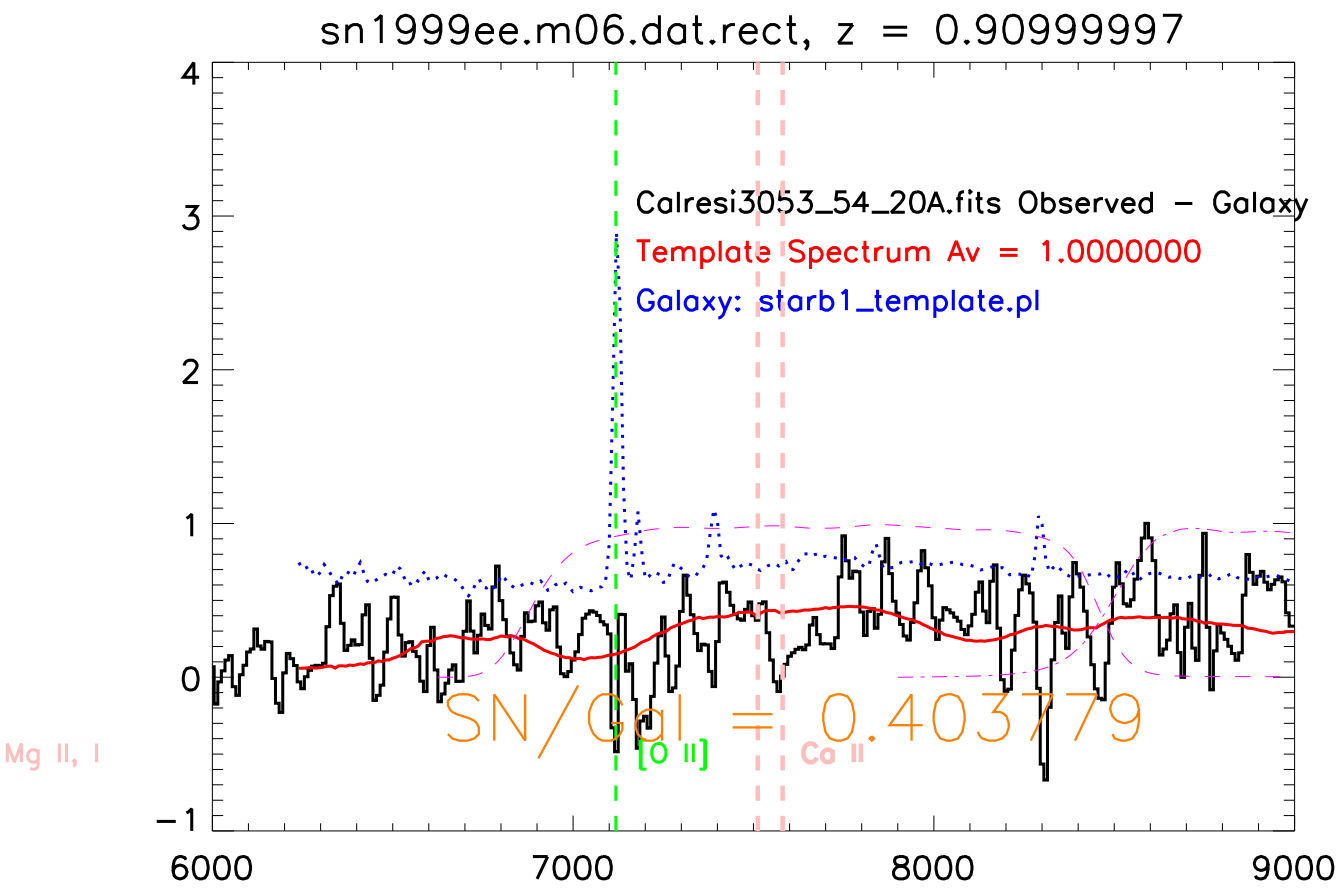
1
0
−1
6000
7000
8000
9000


sn1999ee.m06.dat.rect, z = 0.90999997
Calresi3053_54_20A.fits Observed − Galaxy
Template Spectrum Av = 1.0000000
Galaxy: starb1_template.pl
SN/Gal = 0.403779
[O II]
Ca II
Mg II, I
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1
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−1
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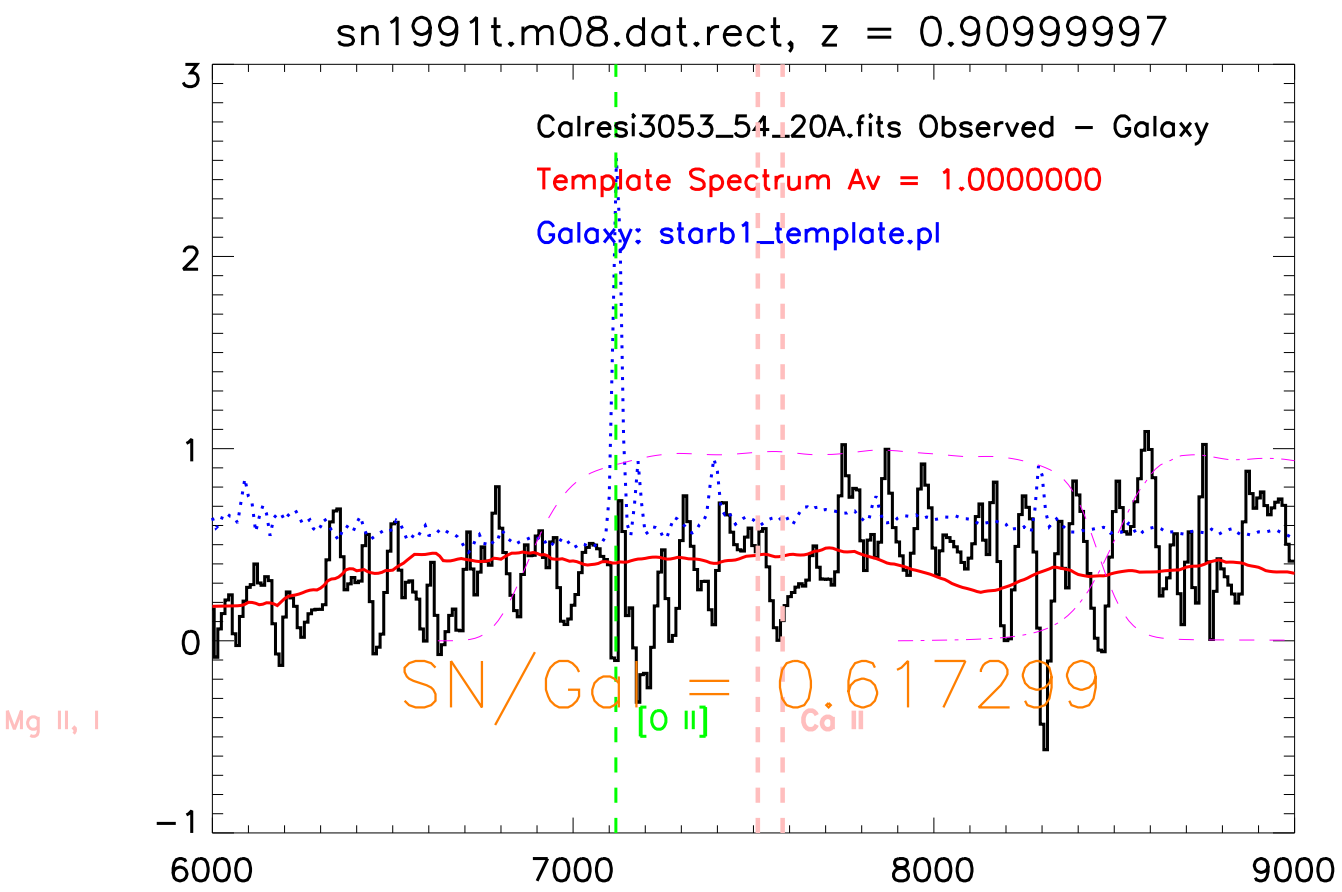
8000
9000


sn1991t.m08.dat.rect, z = 0.90999997
Calresi3053_54_20A.fits Observed − Galaxy
Template Spectrum Av = 1.0000000
Galaxy: starb1_template.pl
SN/Gal = 0.617299
[O II]
Ca II
Mg II, I
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1
0
−1
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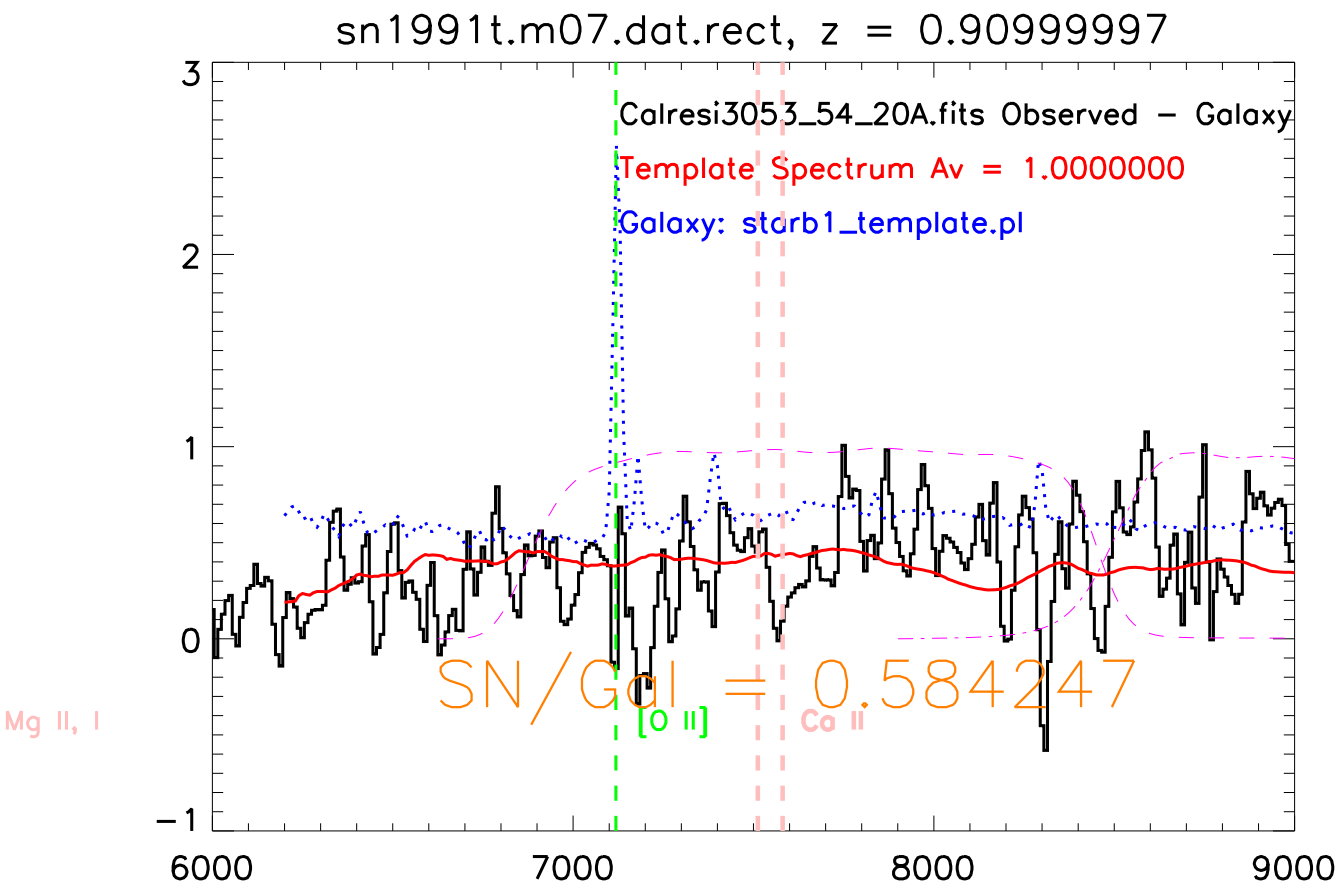
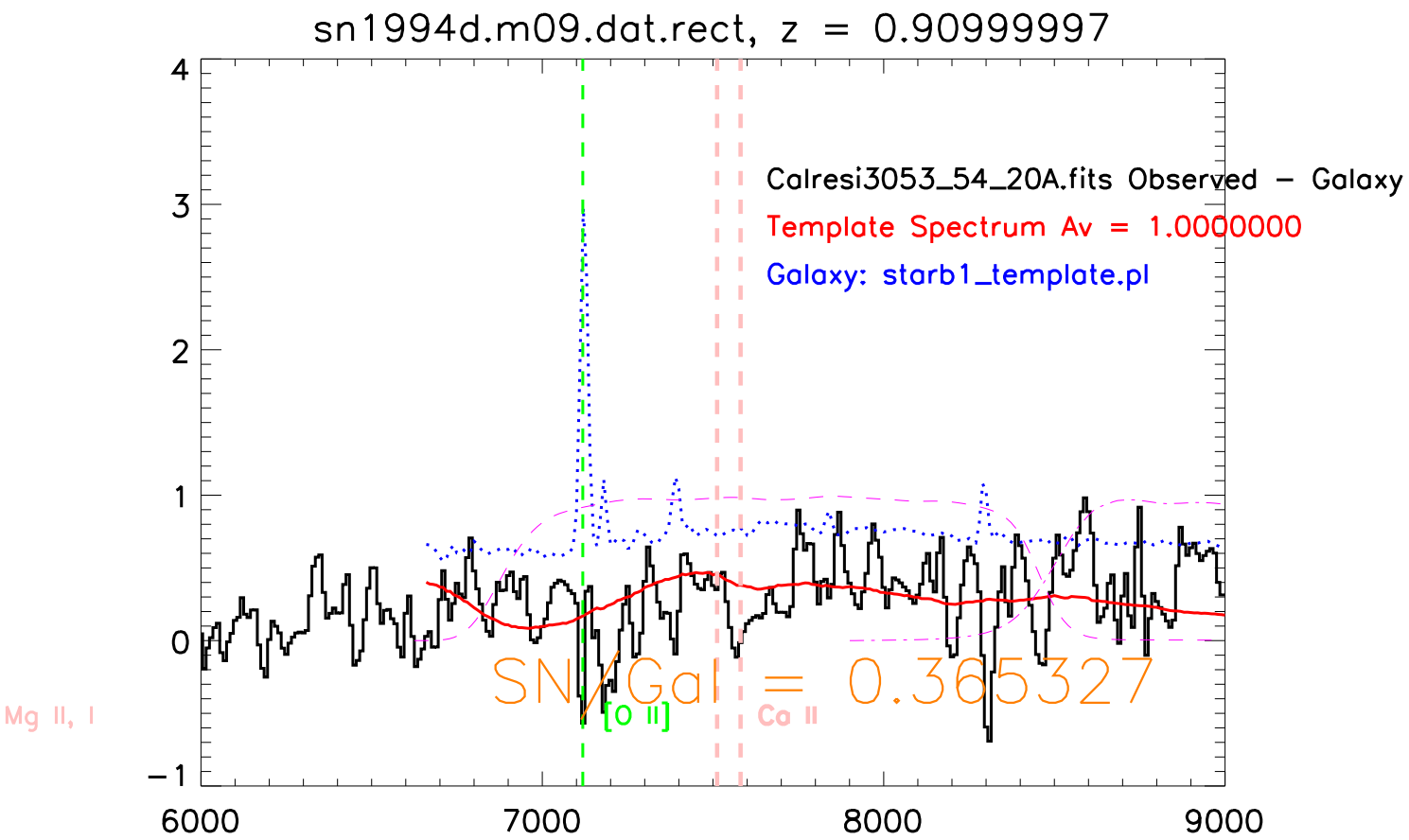
7000
8000
9000


sn1991t.m07.dat.rect, z = 0.90999997
Calresi3053_54_20A.fits Observed − Galaxy
Template Spectrum Av = 1.0000000
Galaxy: starb1_template.pl
SN/Gal = 0.584247
[O II]
Ca II
Mg II, I
3
2
1
0
−1
6000
7000
8000
9000


sn1994d.m09.dat.rect, z = 0.90999997
Calresi3053_54_20A.fits Observed − Galaxy
Template Spectrum Av = 1.0000000
Galaxy: starb1_template.pl
SN/Gal = 0.365327
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Ca II
Mg II, I
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3
2
1
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−1
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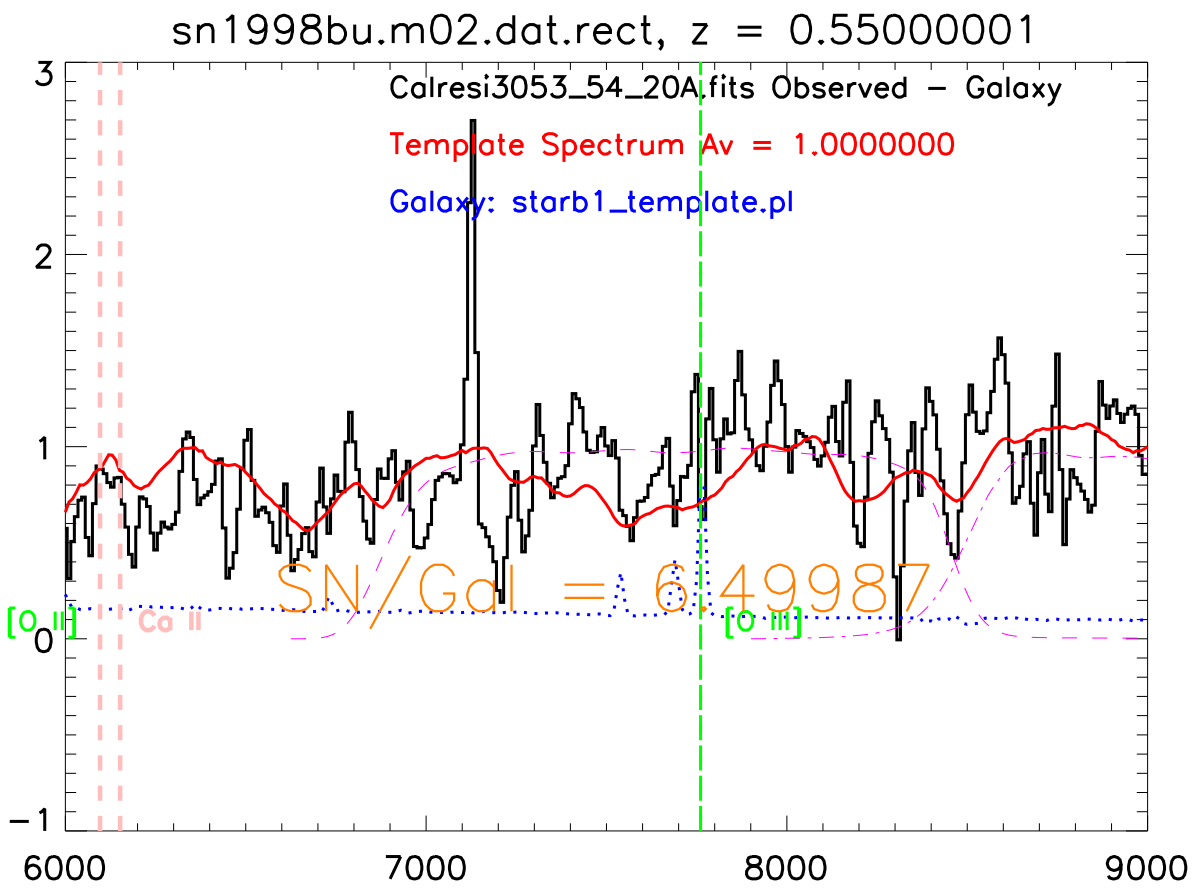
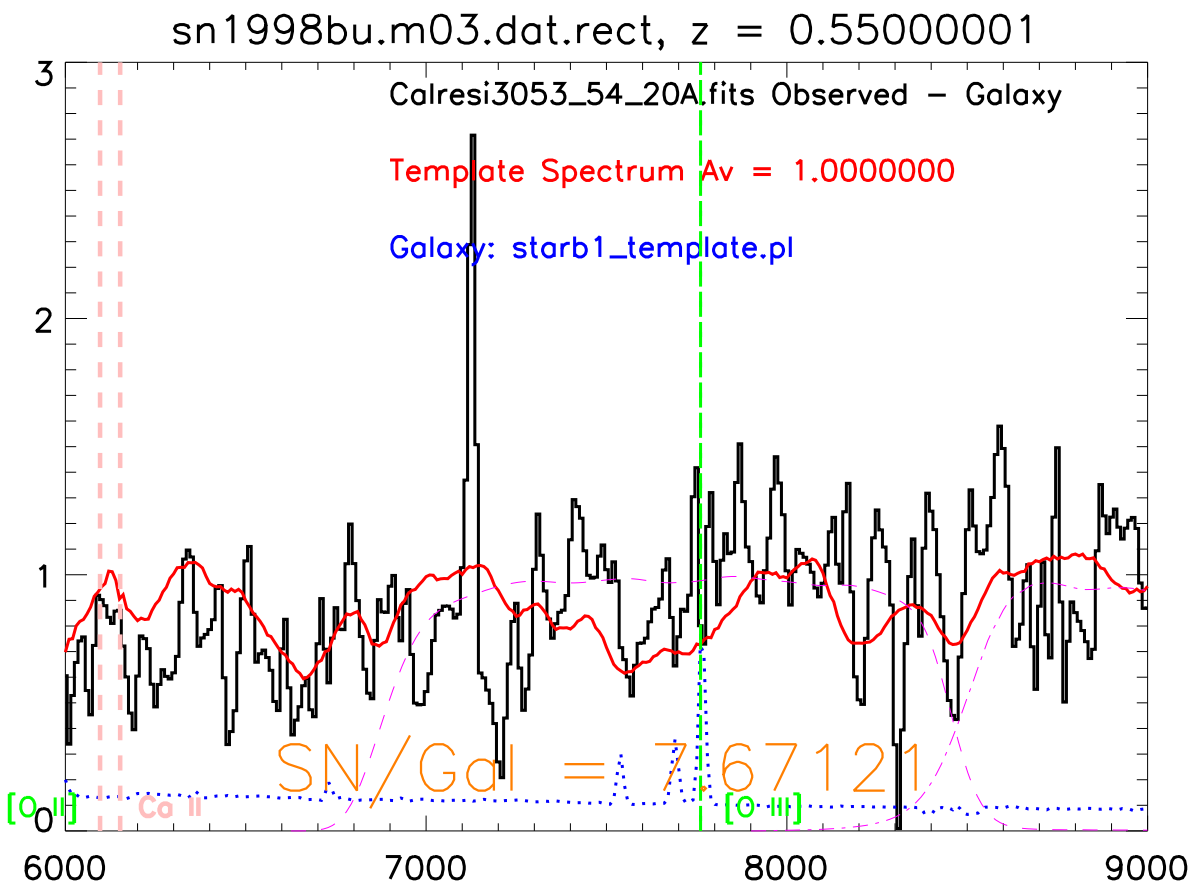
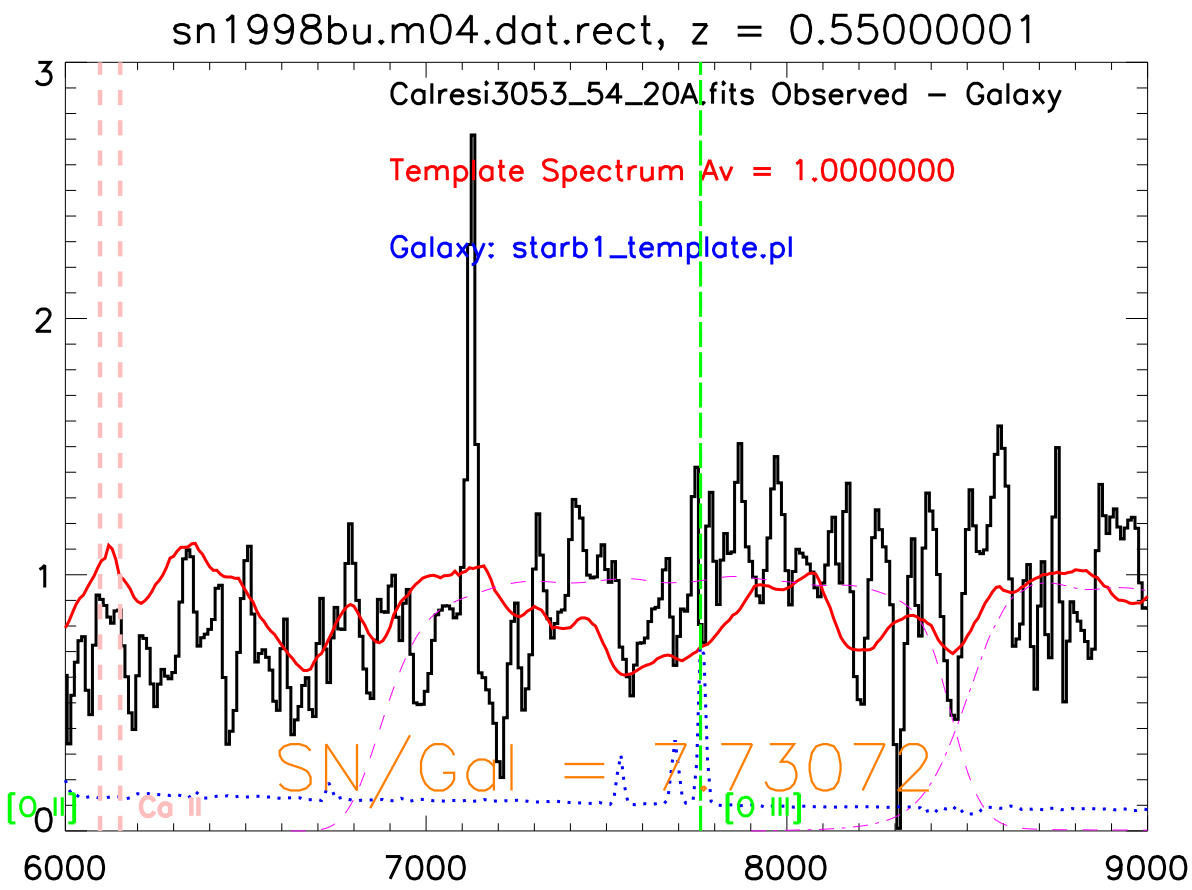
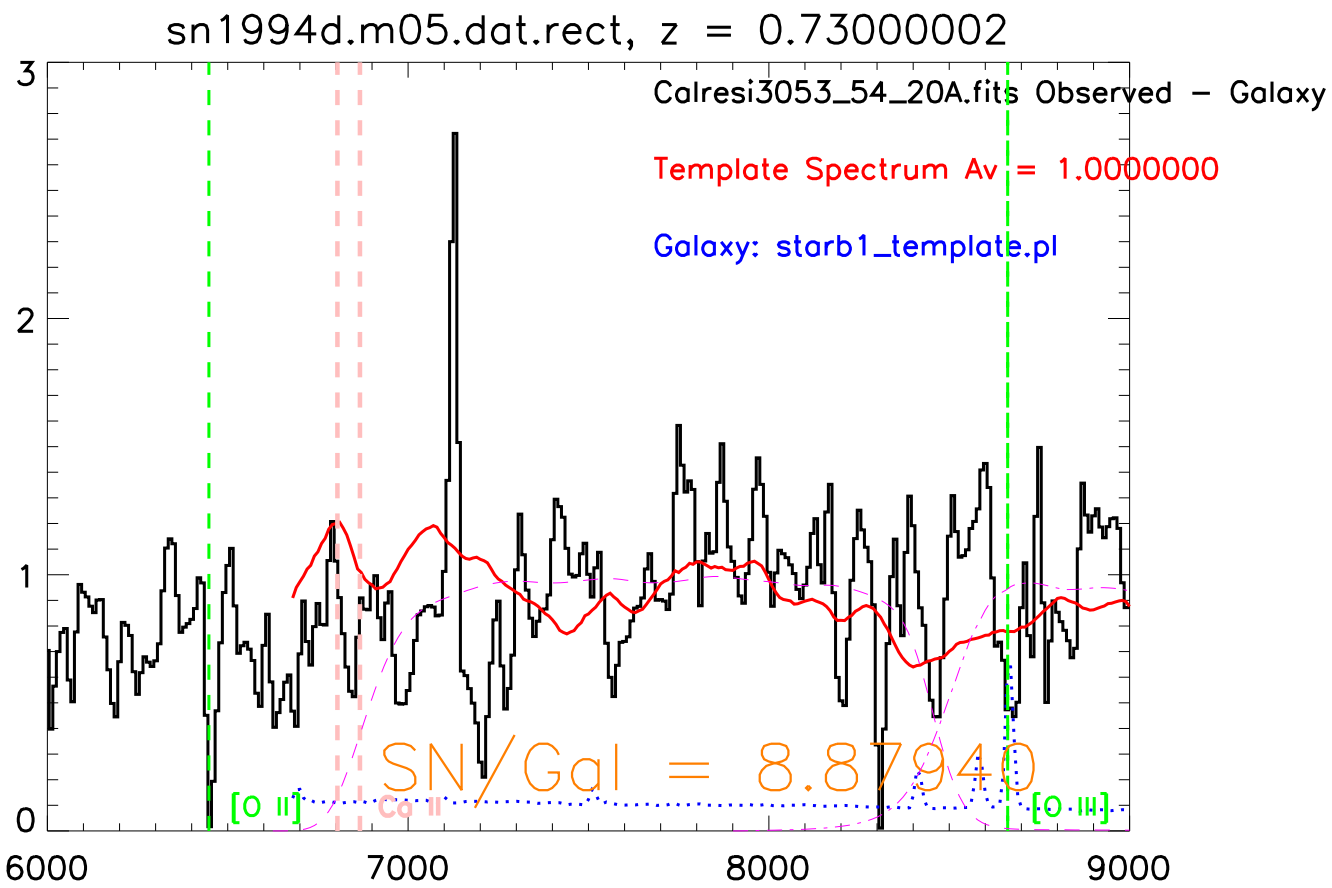
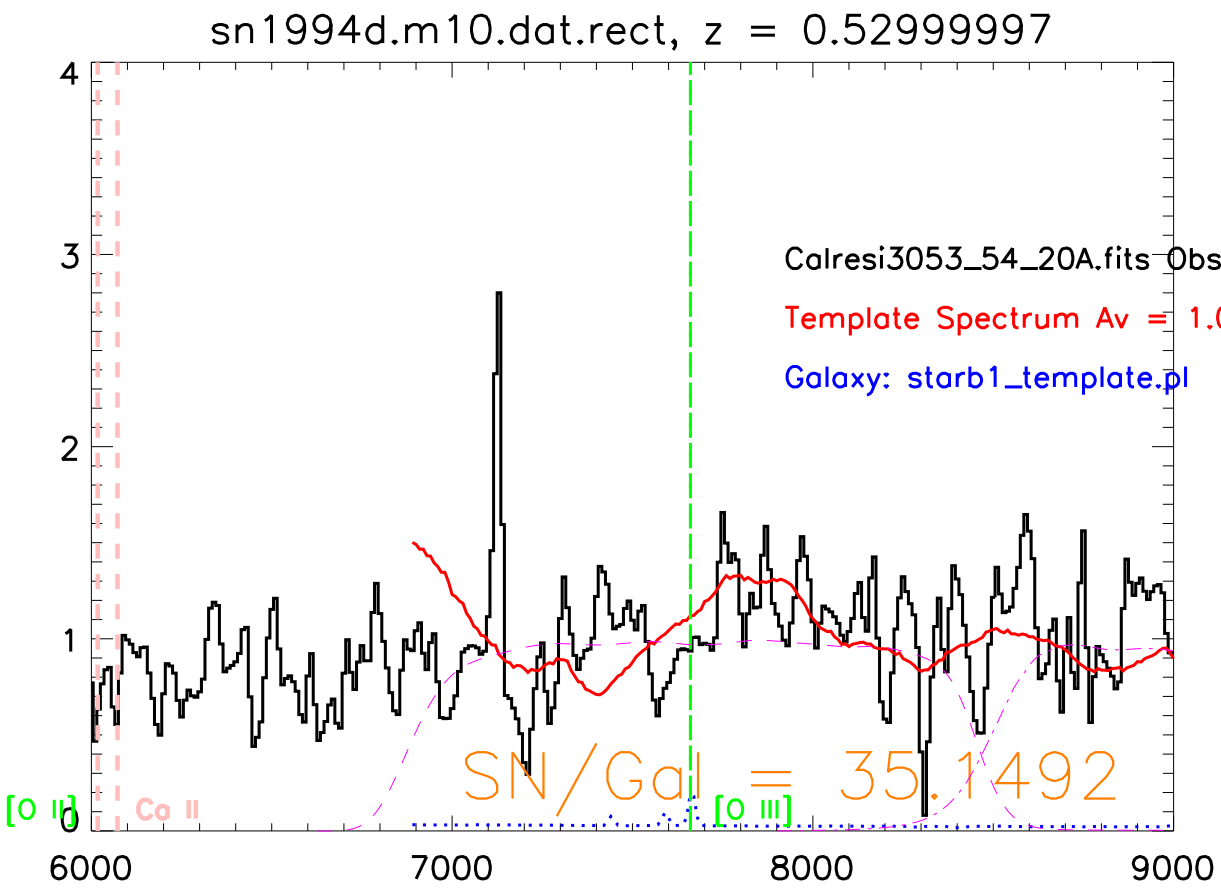
7000
8000
9000

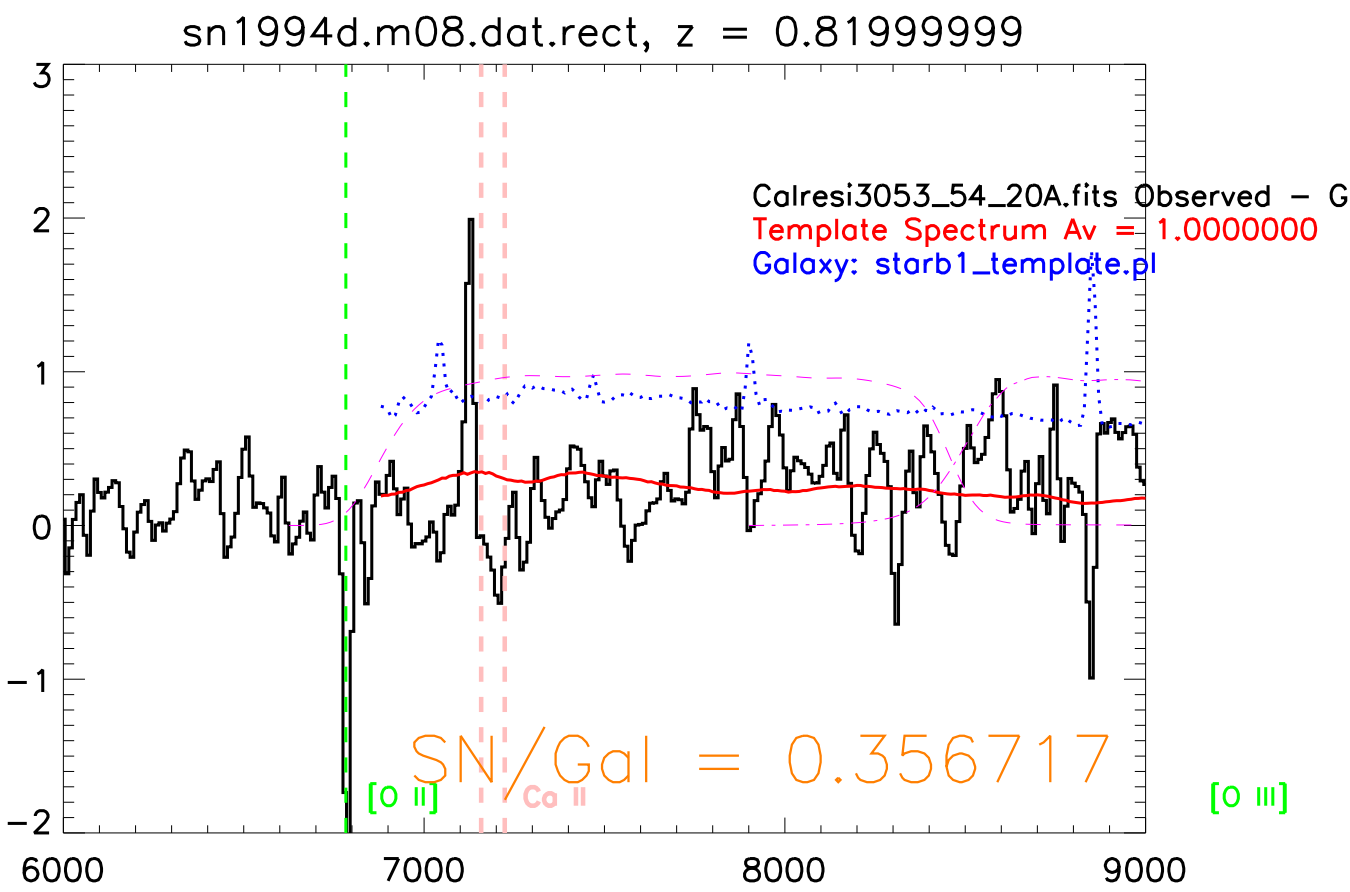

sn1998bu.m02.dat.rect, z = 0.55000001
Calresi3053_54_20A.fits Observed − Galaxy
Template Spectrum Av = 1.0000000
Galaxy: starb1_template.pl
SN/Gal = 6.49987
[O II]
Ca II
[O III]
3
2
1
0
−1
6000
7000
8000
9000

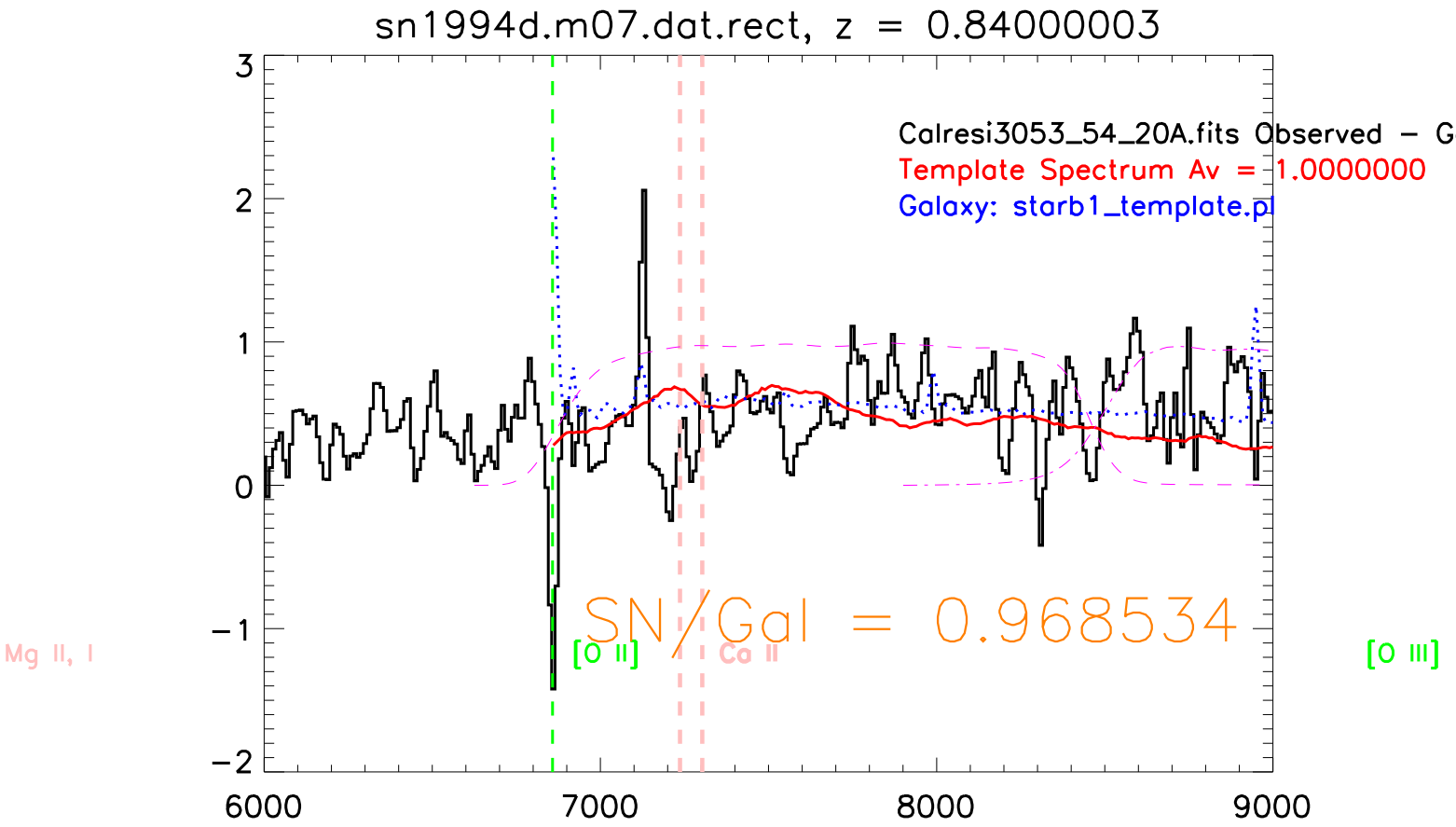

sn1998bu.m03.dat.rect, z = 0.55000001
Calresi3053_54_20A.fits Observed − Galaxy
Template Spectrum Av = 1.0000000
Galaxy: starb1_template.pl
SN/Gal = 7.67121
[O II]
Ca II
[O III]
3
2
1
0
6000
7000
8000
9000

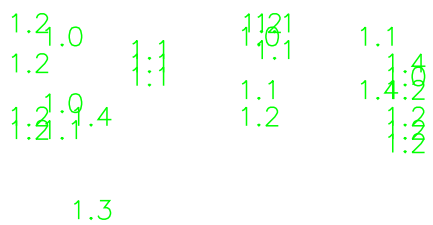

sn1998bu.m04.dat.rect, z = 0.55000001
Calresi3053_54_20A.fits Observed − Galaxy
Template Spectrum Av = 1.0000000
Galaxy: starb1_template.pl
SN/Gal = 7.73072
[O II]
Ca II
[O III]
3
2
1
0
6000
7000
8000
9000

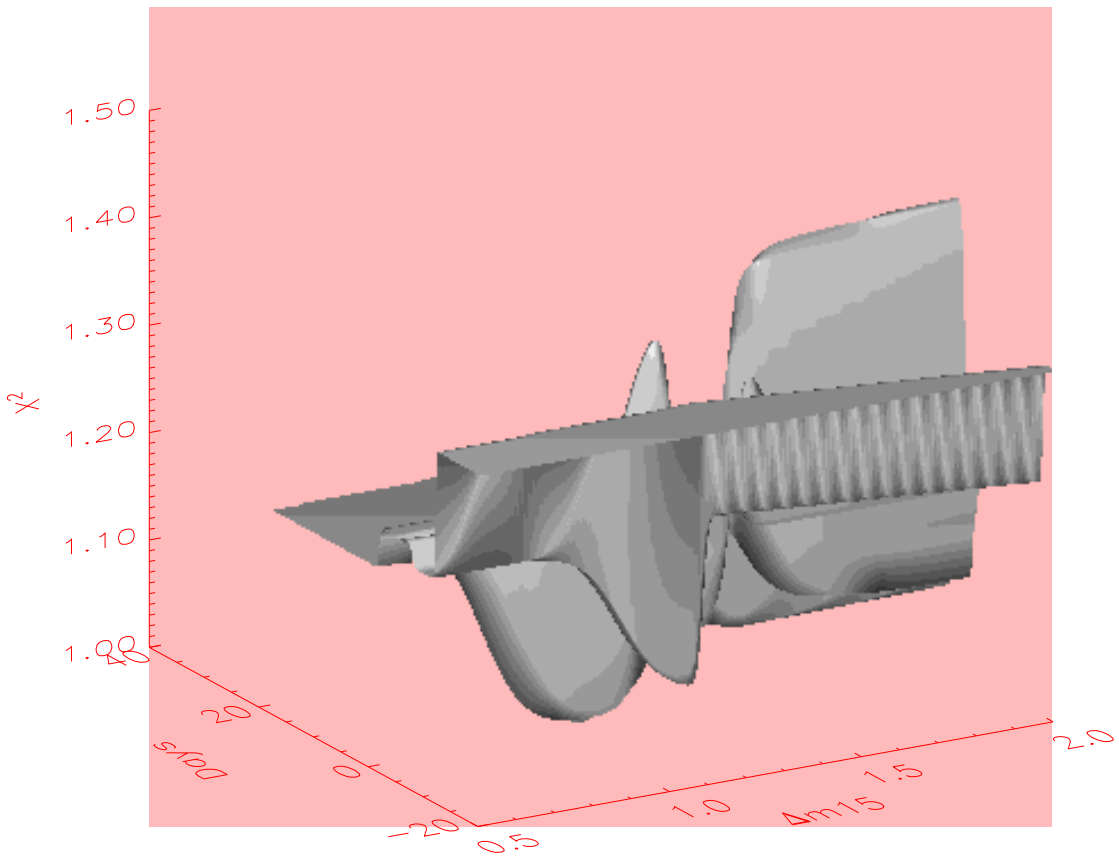

sn1994d.m05.dat.rect, z = 0.73000002
Calresi3053_54_20A.fits Observed − Galaxy
Template Spectrum Av = 1.0000000
Galaxy: starb1_template.pl
SN/Gal = 8.87940
[O II]
Ca II
[O III]
3
2
1
0
6000
7000
8000
9000


sn1994d.m10.dat.rect, z = 0.52999997
Calresi3053_54_20A.fits Observed – G
Template Spectrum Av = 1.0000000
Galaxy: starb1_template.pl
SN/Gal = 35.1492
[O II]
Ca II
[O III]
4
3
2
1
0
6000
7000
8000
9000

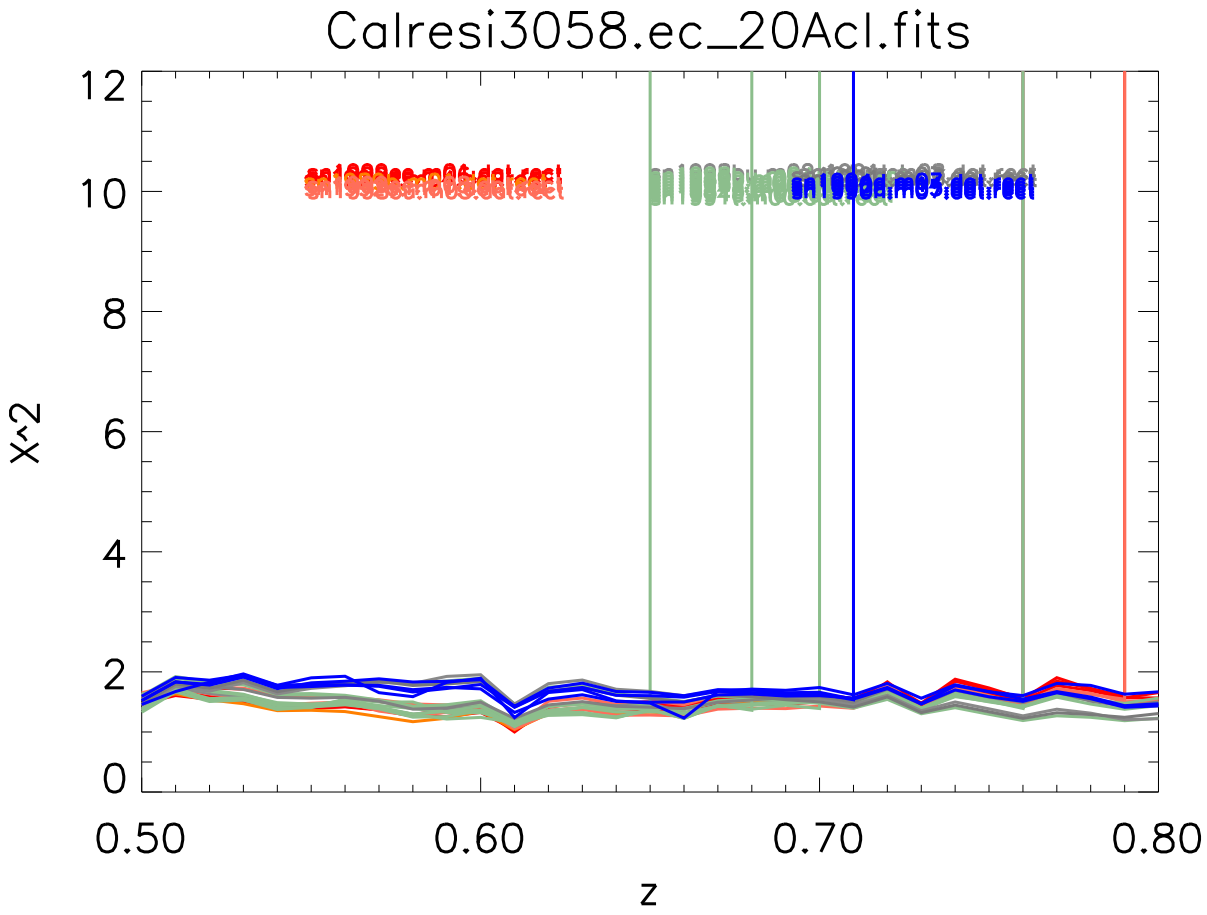

sn1994d.m08.dat.rect, z = 0.81999999
Calresi3053_54_20A.fits Observed – G
Template Spectrum Av = 1.0000000
Galaxy: starb1_template.pl
SN/Gal = 0.356717
Mg II, I
[O II]
Ca II
[O III]
3
2
1
0
−1
−2
6000
7000
8000
9000

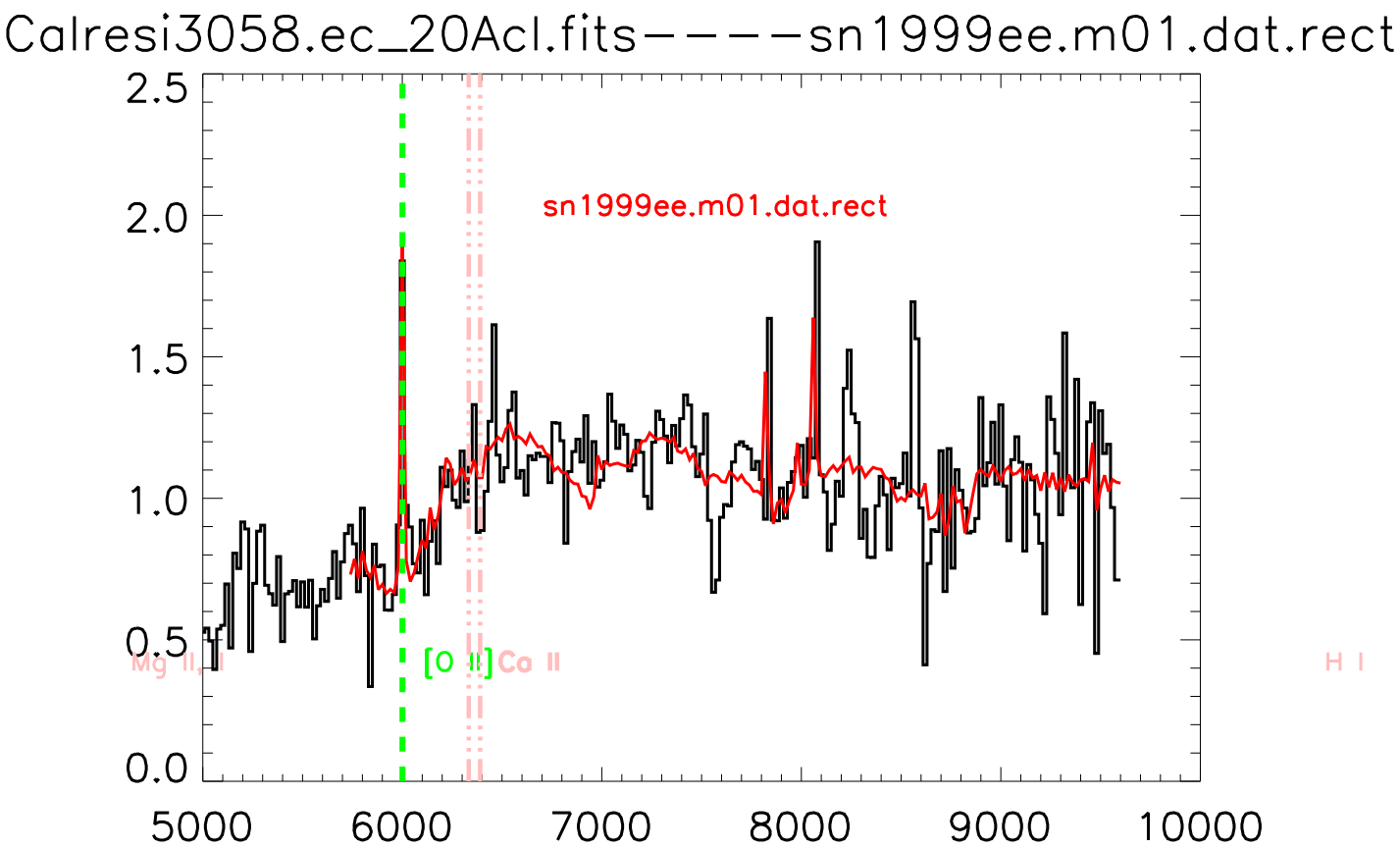

sn1994d.m07.dat.rect, z = 0.84000003
Calresi3053_54_20A.fits Observed – Ga
Template Spectrum Av = 1.0000000
Galaxy: starb1_template.pl
SN/Gal = 0.968534
Mg II, I
[O II]
Ca II
[O III]
3
2
1
0
−1
−2
6000
7000
8000
9000





1.50
1.40
1.30
1.20
1.10
1.00
χ^2
40
20
0
−20
Days
0.5
1.0
1.5
2.0
Δm15


Calresi3058.ec_20Acl.fits
12
10
8
6
4
2
0
X^2
0.50
0.60
0.70
0.80
z


Calresi3058.ec_20Acl.fits----sn1999ee.m01.dat.rect
sn1999ee.m01.dat.rect
[O II]
Ca II
H I
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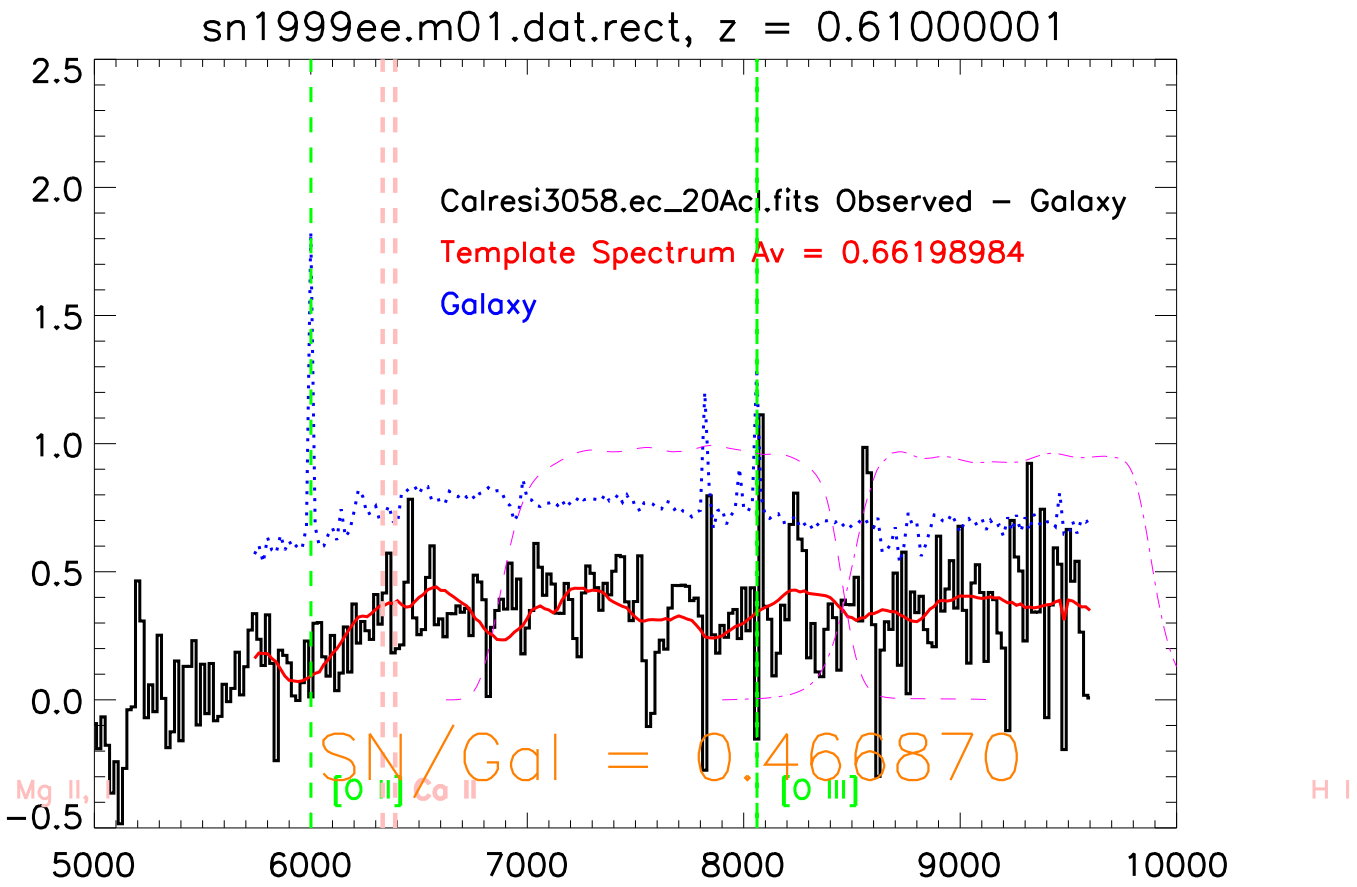
2.0
1.5
1.0
0.5
0.0
5000
6000
7000
8000
9000
10000


sn1999ee.m01.dat.rect, z = 0.61000001
Calresi3058.ec_20Ac1.fits Observed − Galaxy
Template Spectrum Av = 0.66198984
Galaxy
SN/Gal = 0.466870
[O II]
Ca II
[O III]
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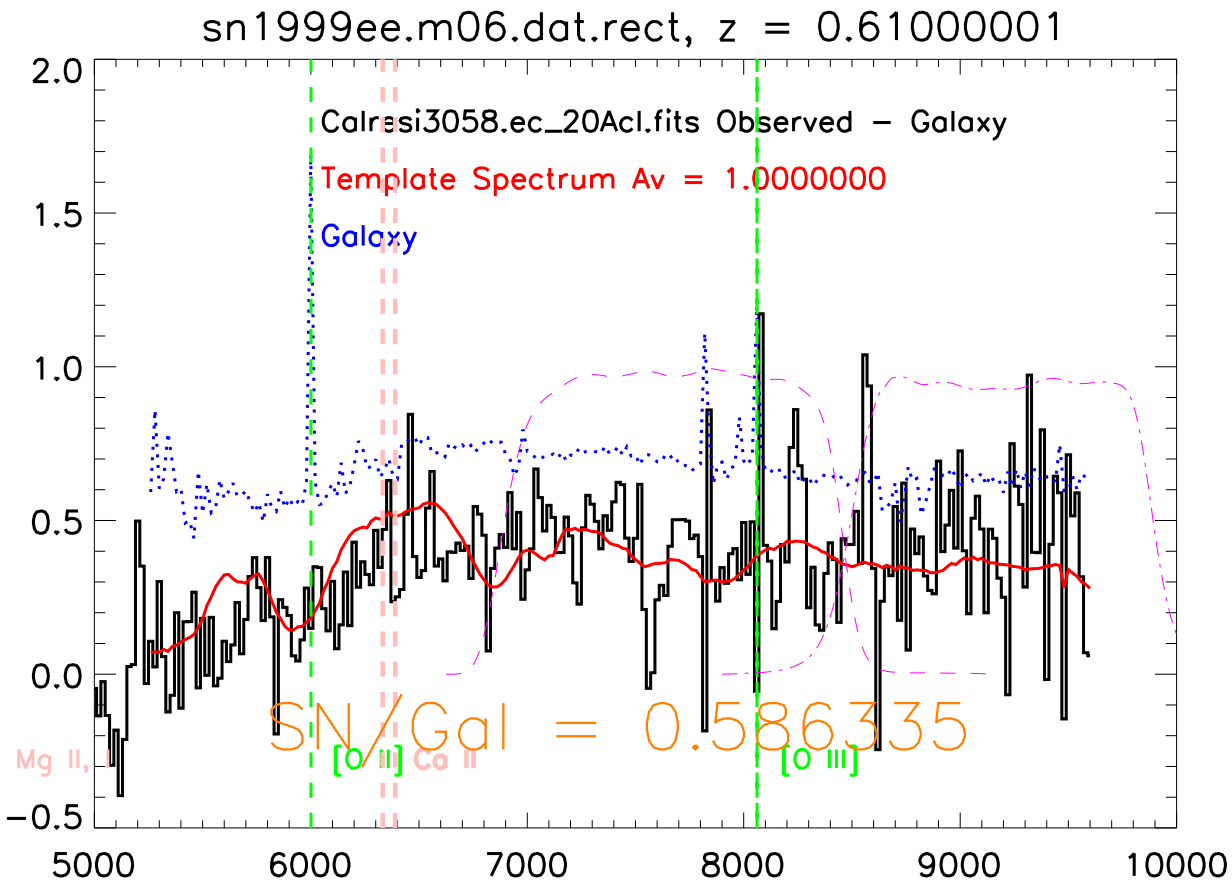
2.0
1.5
1.0
0.5
0.0
−0.5
5000
6000
7000
8000
9000
10000


sn1999ee.m06.dat.rect, z = 0.61000001
Calresi3058.ec_20Acl.fits Observed − Galaxy
Template Spectrum Av = 1.0000000
Galaxy
SN/Gal = 0.586335
[O II]
Ca II
[O III]
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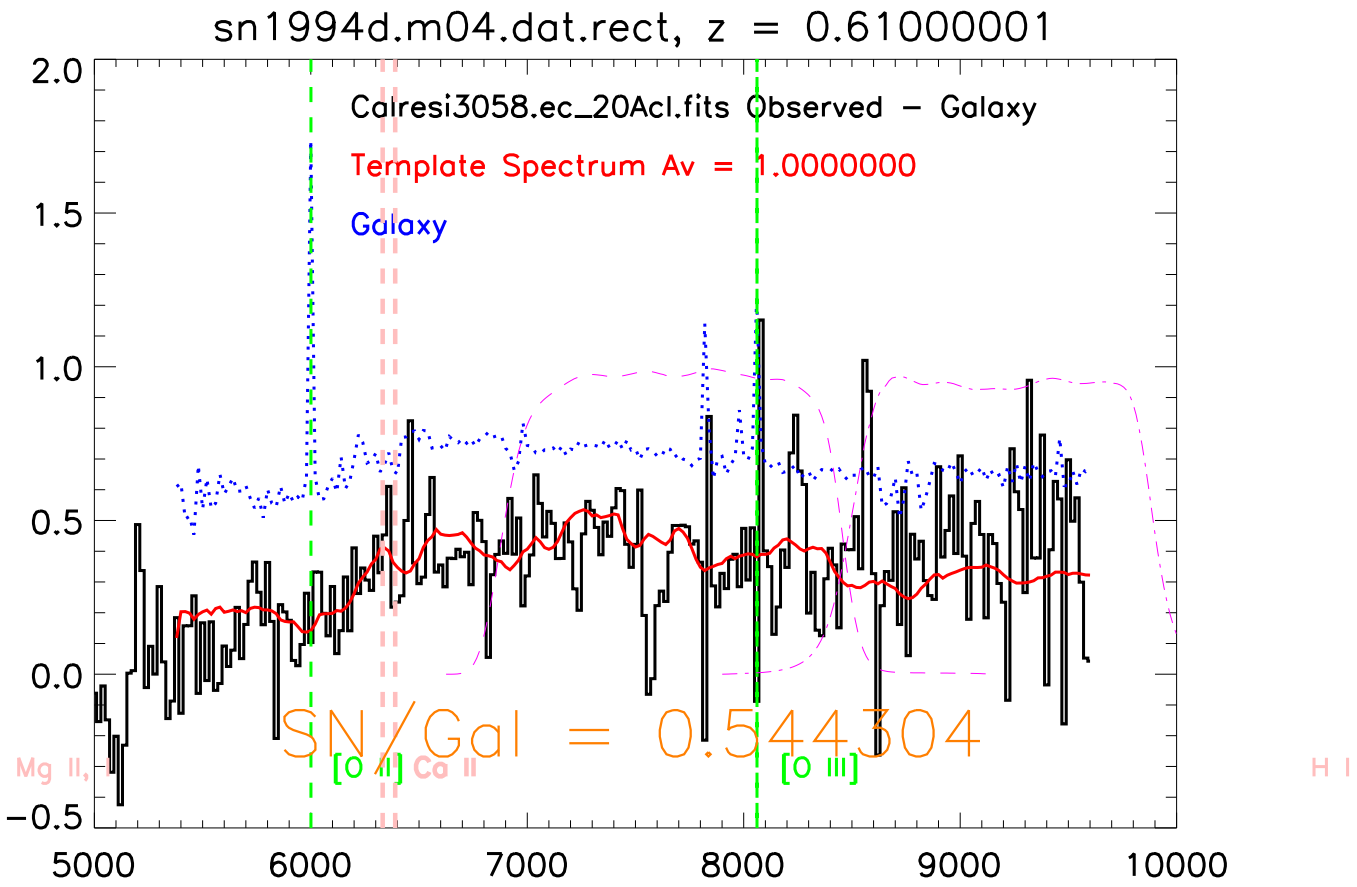
1.5
1.0
0.5
0.0
−0.5
5000
6000
7000
8000
9000
10000


sn1994d.m04.dat.rect, z = 0.61000001
Calresi3058.ec_20Acl.fits Observed − Galaxy
Template Spectrum Av = 1.0000000
Galaxy
SN/Gal = 0.544304
[O II]
Ca II
[O III]
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1.5
1.0
0.5
0.0
−0.5
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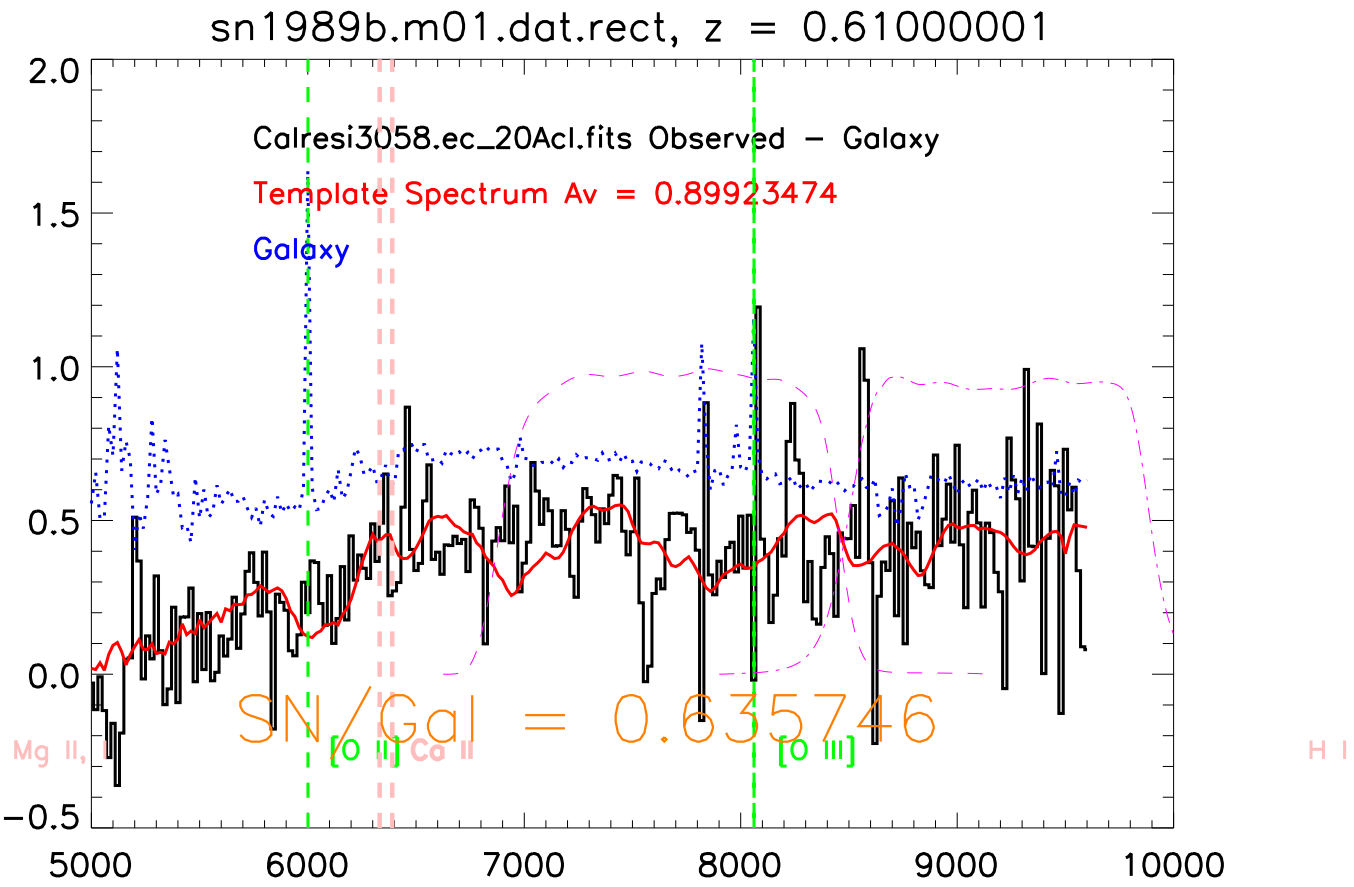
6000
7000
8000
9000
10000


sn1989b.m01.dat.rect, z = 0.61000001
Calresi3058.ec_20Acl.fits Observed − Galaxy
Template Spectrum Av = 0.89923474
Galaxy
SN/Gal = 0.635746
[O II]
Ca II
[O III]
H I
2.0
1.5
1.0
0.5
0.0
−0.5
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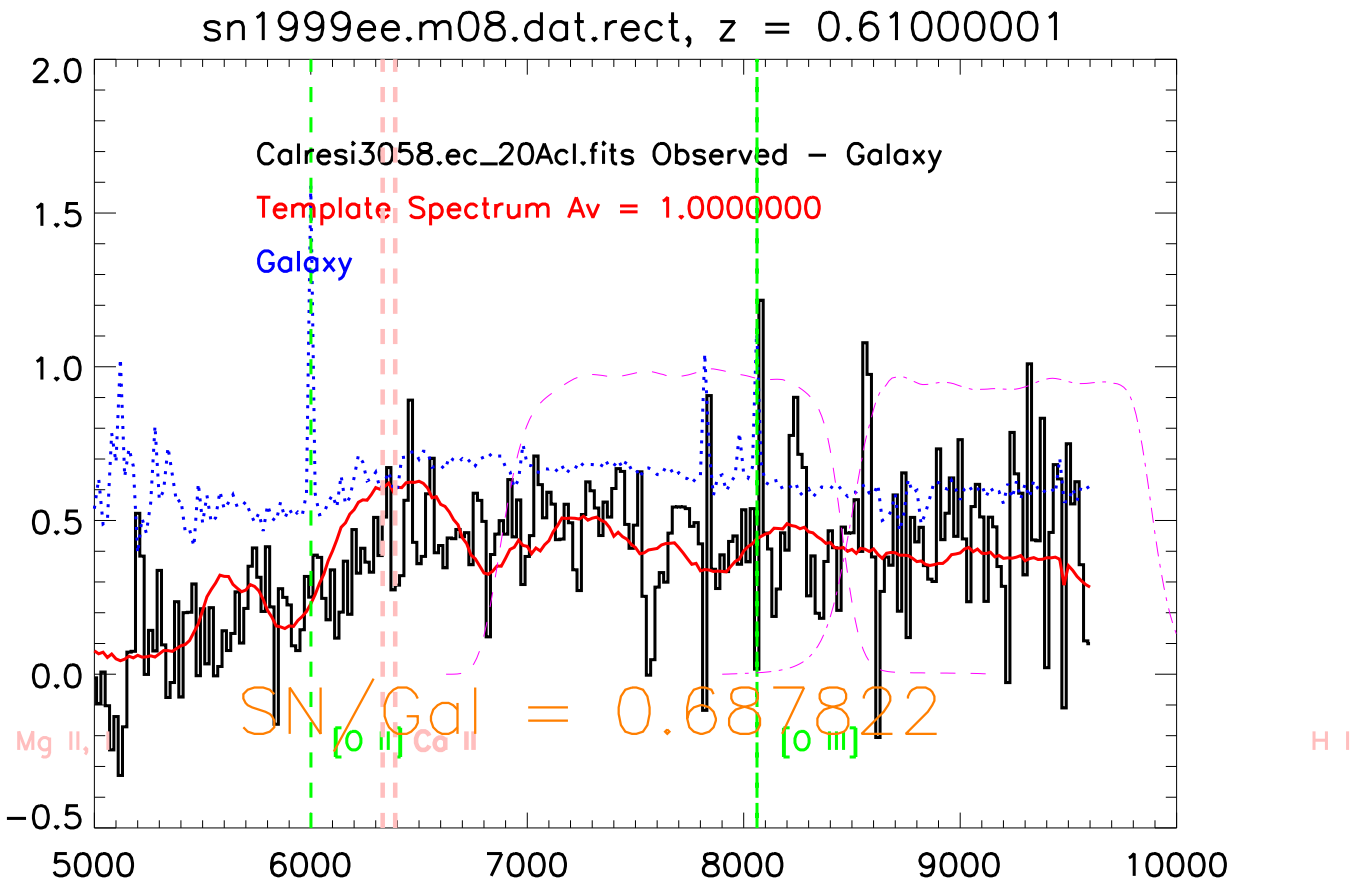
7000
8000
9000
10000


sn1999ee.m08.dat.rect, z = 0.61000001
Calresi3058.ec_20Acl.fits Observed − Galaxy
Template Spectrum Av = 1.0000000
Galaxy
SN/Gal = 0.687822
[O II]
Ca II
[O III]
Mg II,
H I
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1.5
1.0
0.5
0.0
−0.5
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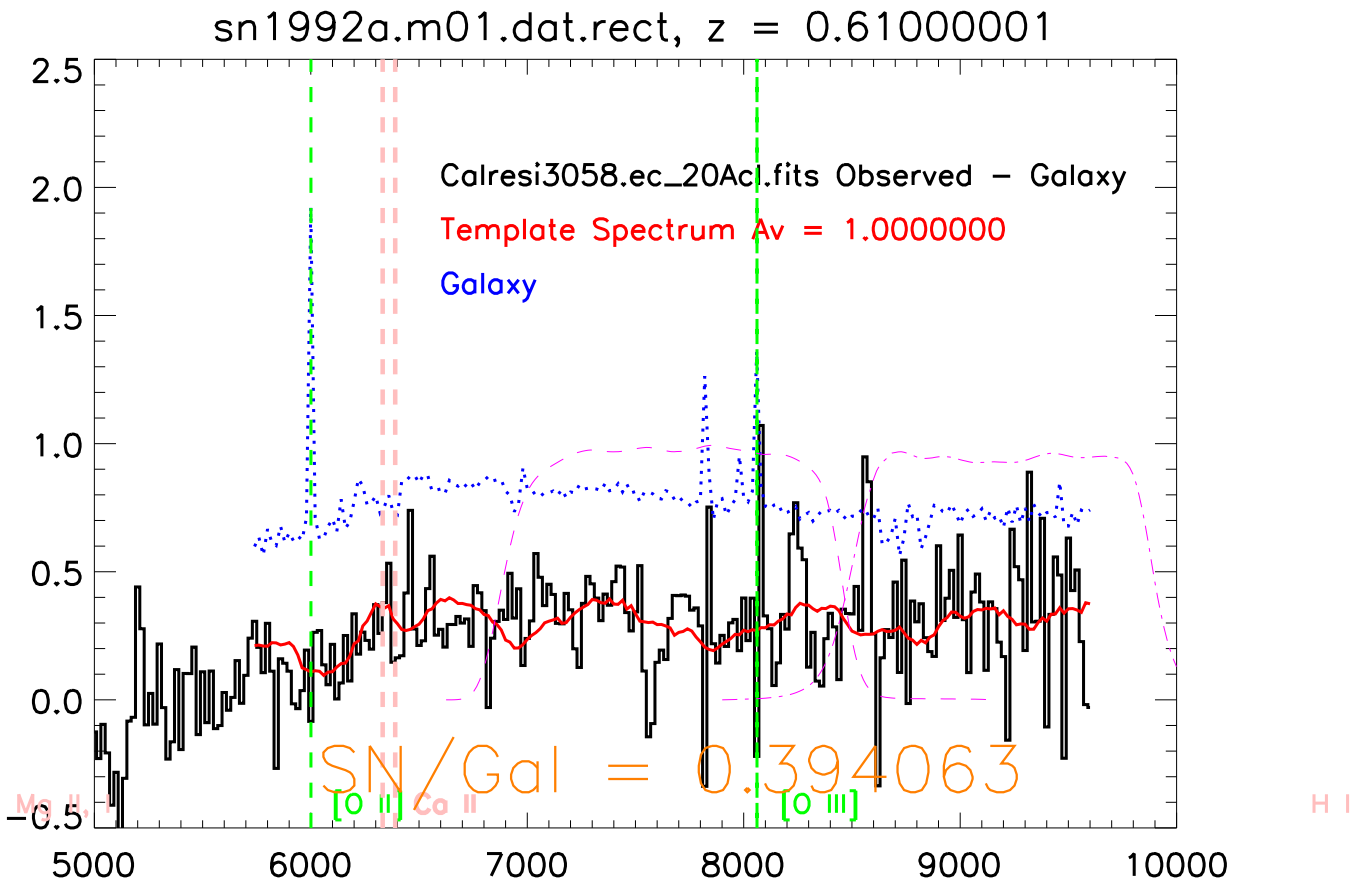
7000
8000
9000
10000


sn1992a.m01.dat.rect, z = 0.61000001
Calresi3058.ec_20Acl.fits Observed − Galaxy
Template Spectrum Av = 1.0000000
Galaxy
SN/Gal = 0.394063
[O II]
Ca II
[O III]
H I
2.5
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1.5
1.0
0.5
0.0
−0.5
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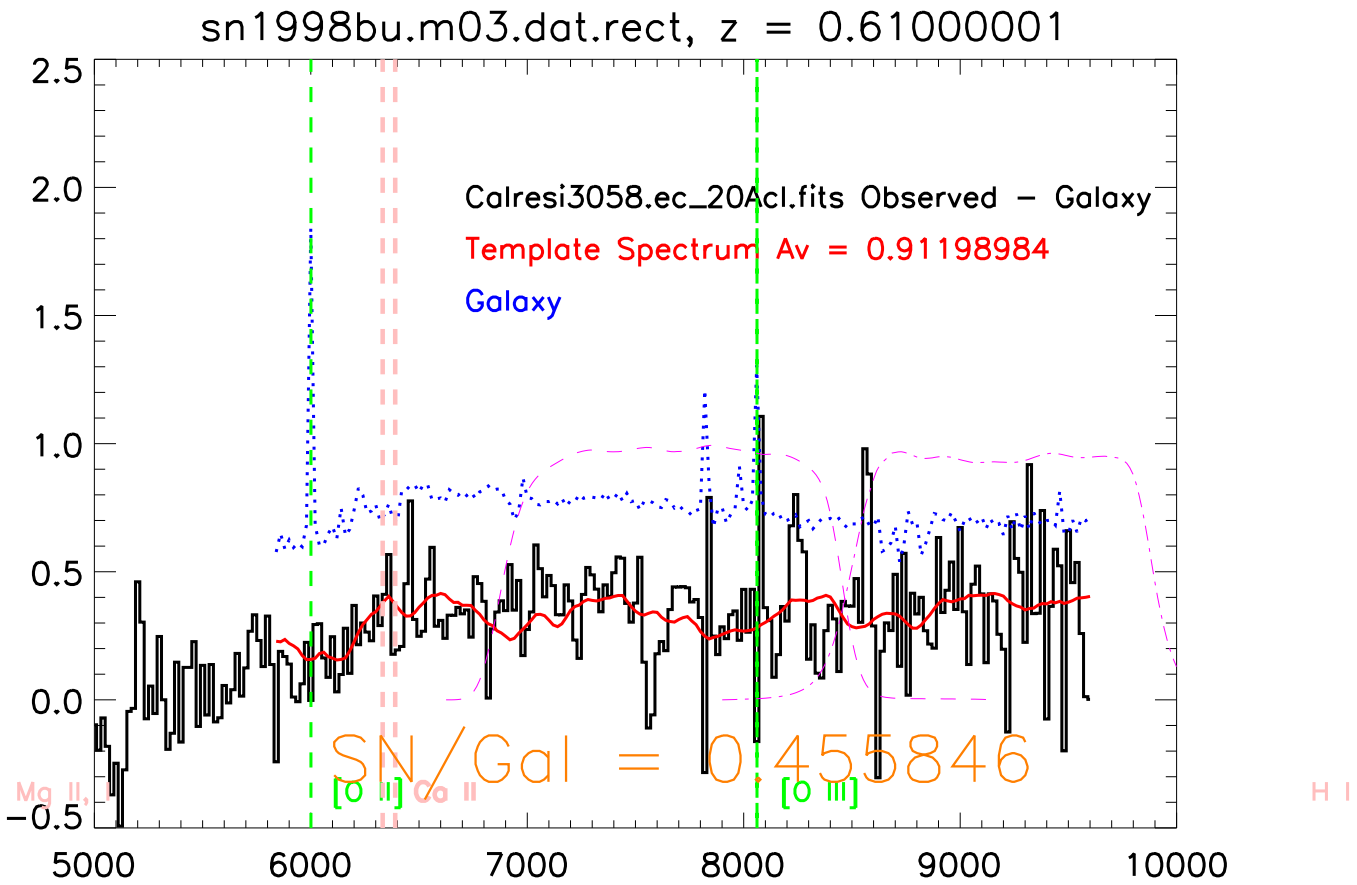
7000
8000
9000
10000


sn1998bu.m03.dat.rect, z = 0.61000001
Calresi3058.ec_20Acl.fits Observed − Galaxy
Template Spectrum Av = 0.91198984
Galaxy
SN/Gal = 0.455846
[O II]
Ca II
[O III]
2.5
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1.5
1.0
0.5
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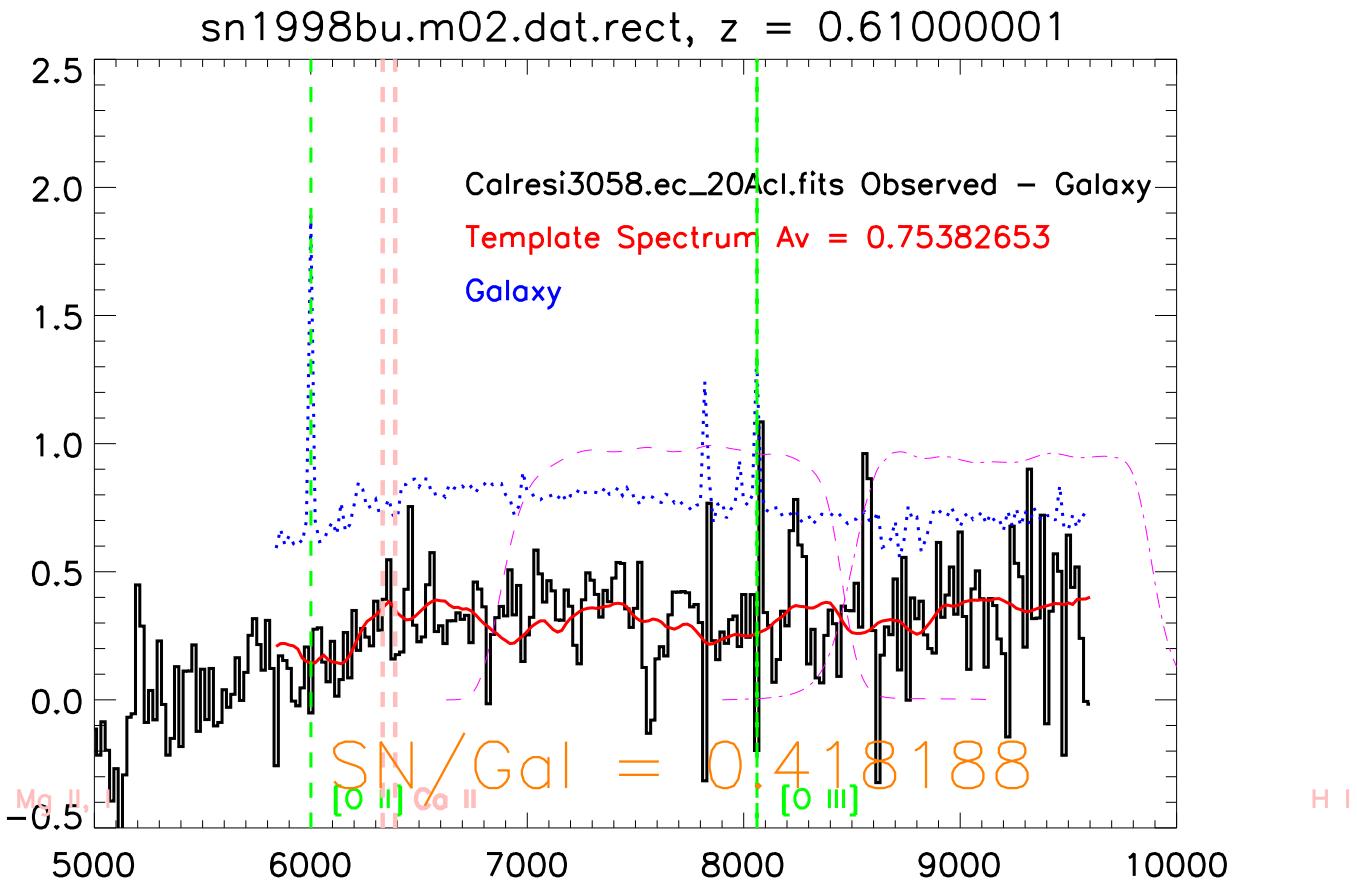
9000
10000


sn1998bu.m02.dat.rect, z = 0.61000001
Calresi3058.ec_20Acl.fits Observed − Galaxy
Template Spectrum Av = 0.75382653
Galaxy
SN/Gal = 0.418188
[O II]
Ca II
[O III]
2.5
2.0
1.5
1.0
0.5
0.0
−0.5
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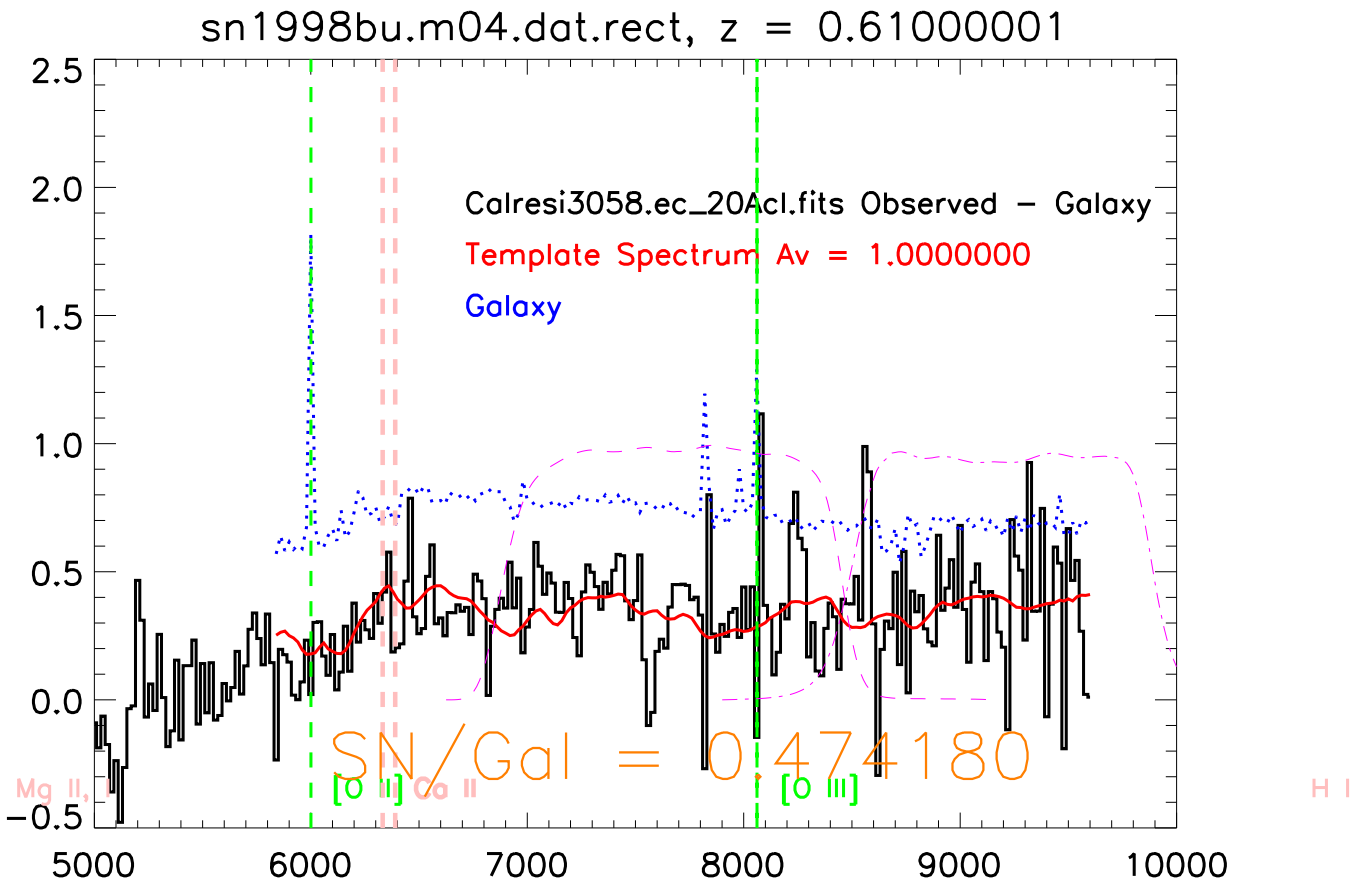
6000
7000
8000
9000
10000


sn1998bu.m04.dat.rect, z = 0.61000001
Calresi3058.ec_20Acl.fits Observed − Galaxy
Template Spectrum Av = 1.0000000
Galaxy
SN/Gal = 0.474180
[O II]
Ca II
[O III]
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2.0
1.5
1.0
0.5
0.0
−0.5
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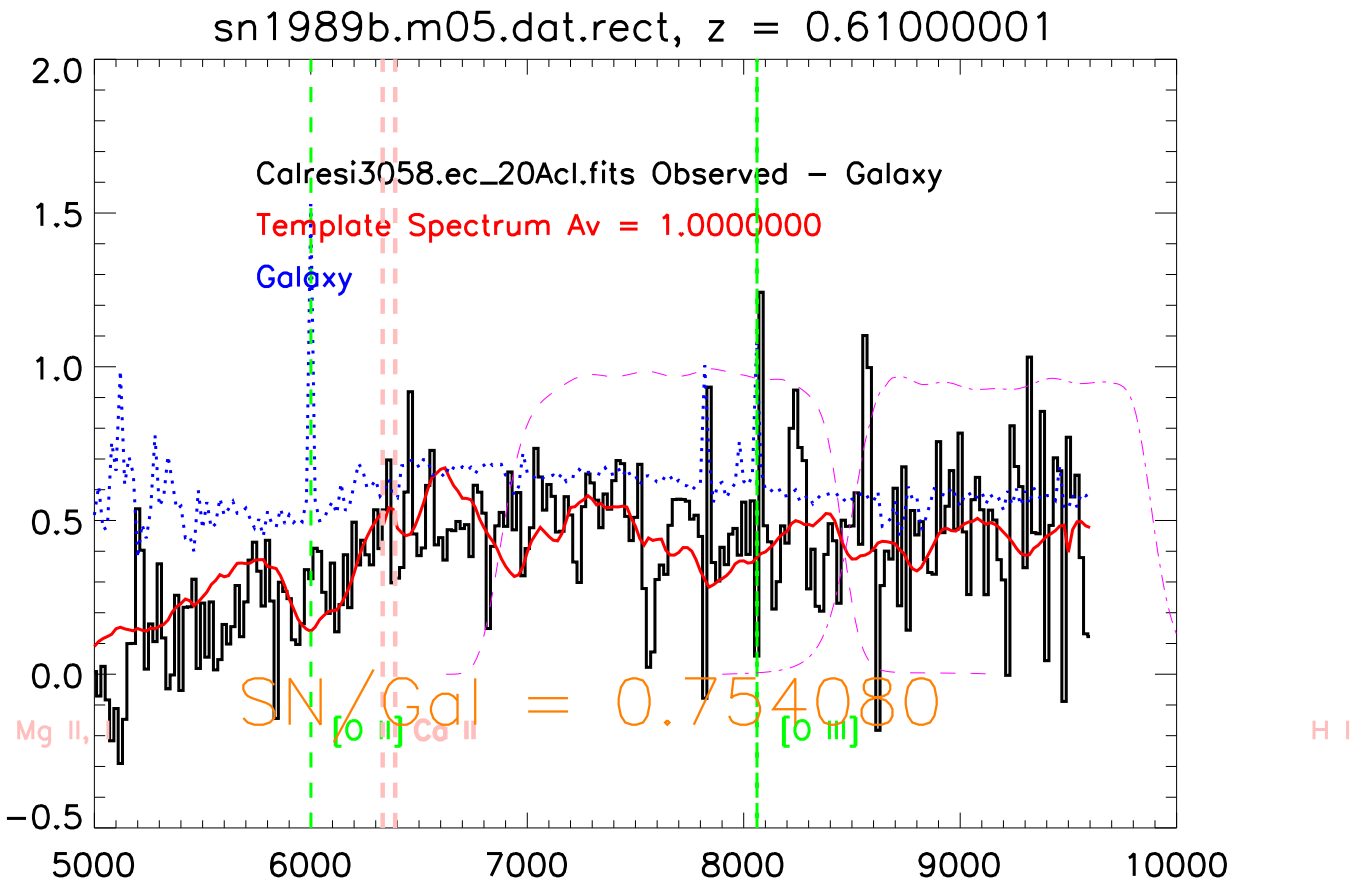
6000
7000
8000
9000
10000


sn1989b.m05.dat.rect, z = 0.61000001
Calresi3058.ec_20Acl.fits Observed − Galaxy
Template Spectrum Av = 1.0000000
Galaxy
SN/Gal = 0.754080
[O II]
Ca II
[O III]
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1.5
1.0
0.5
0.0
−0.5
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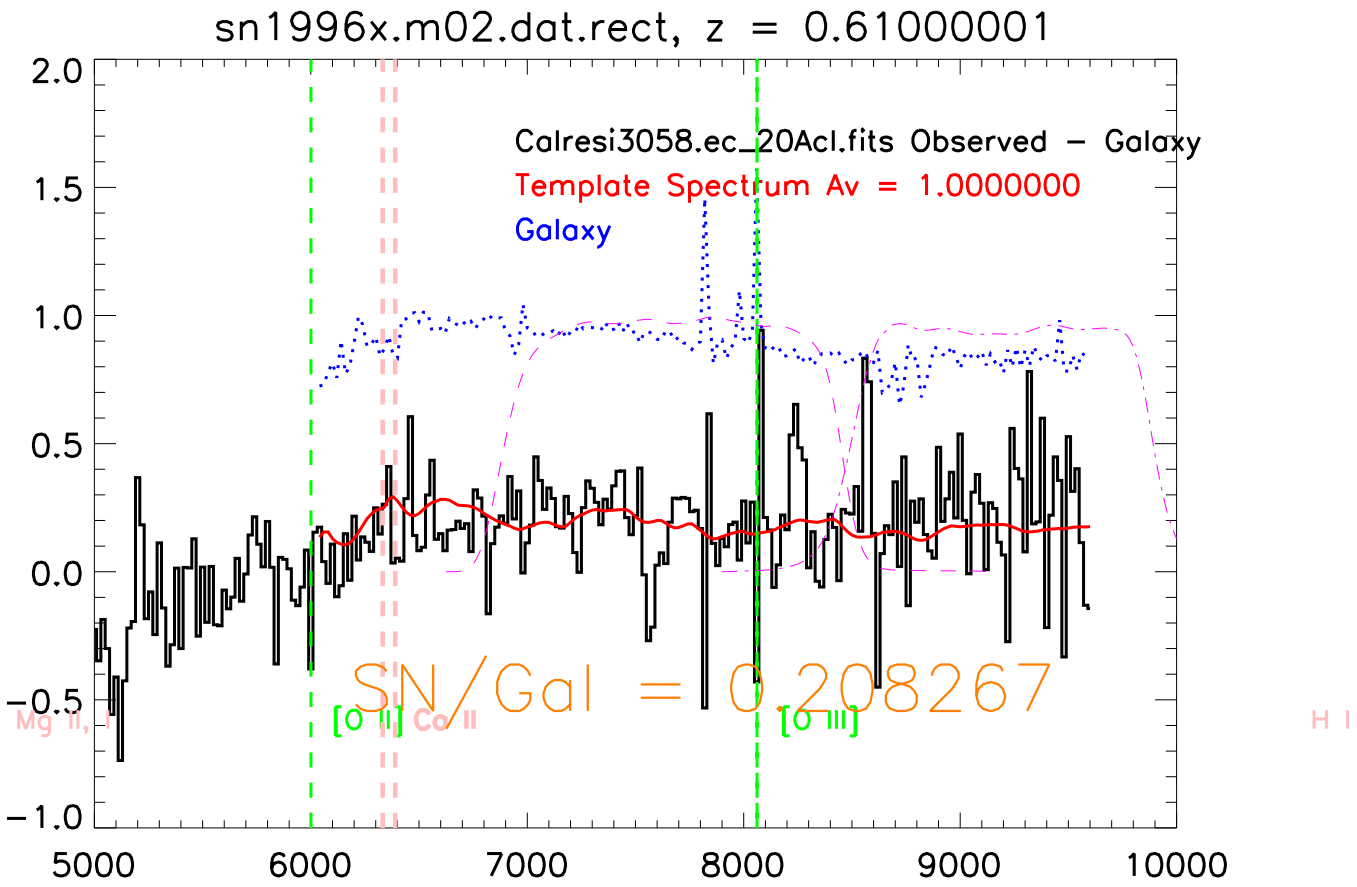
6000
7000
8000
9000
10000


sn1996x.m02.dat.rect, z = 0.61000001
Calresi3058.ec_20Acl.fits Observed − Galaxy
Template Spectrum Av = 1.0000000
Galaxy
SN/Gal = 0.208267
[O II] Ca II
[O III]
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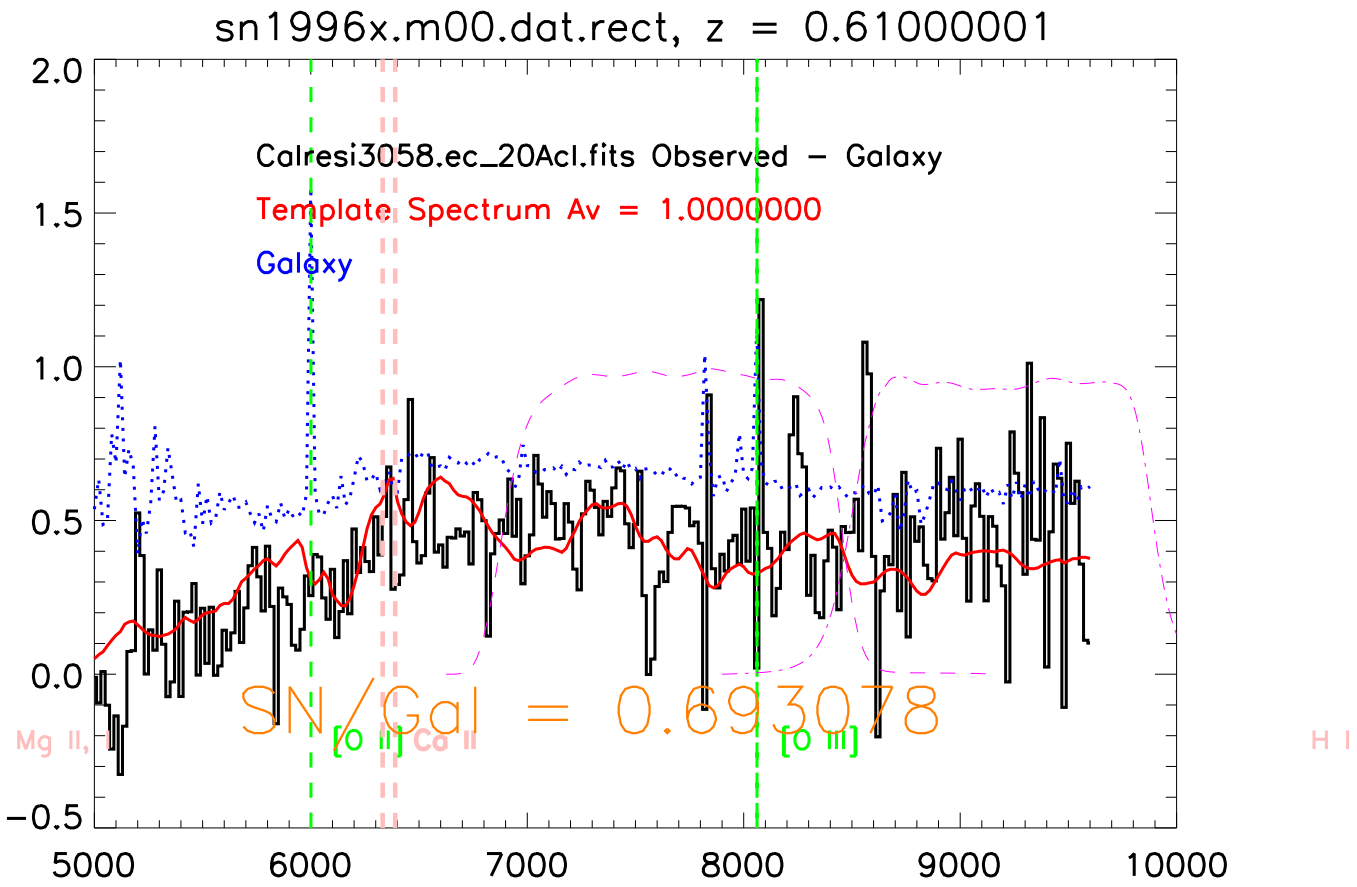
1.5
1.0
0.5
0.0
−0.5
−1.0
5000
6000
7000
8000
9000
10000


sn1996x.m00.dat.rect, z = 0.61000001
Calresi3058.ec_20Acl.fits Observed − Galaxy
Template Spectrum Av = 1.0000000
Galaxy
SN/Gal = 0.693078
[O II]
Ca II
[O III]
H I
2.0
1.5
1.0
0.5
0.0
−0.5
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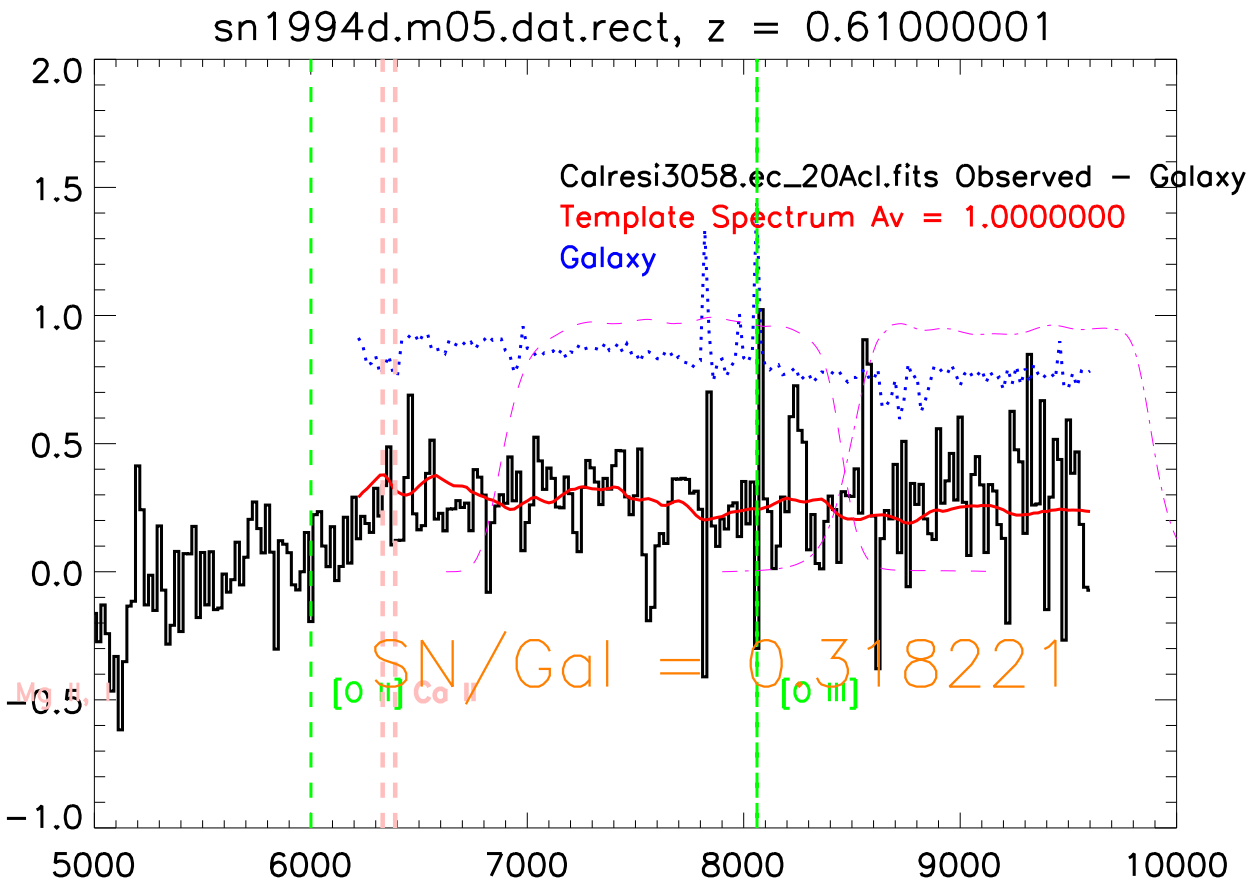
6000
7000
8000
9000
10000


sn1994d.m05.dat.rect, z = 0.61000001
Calresi3058.ec_20Acl.fits Observed − Galaxy
Template Spectrum Av = 1.0000000
Galaxy
SN/Gal = 0.318221
[O II]
[O III]
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1.5
1.0
0.5
0.0
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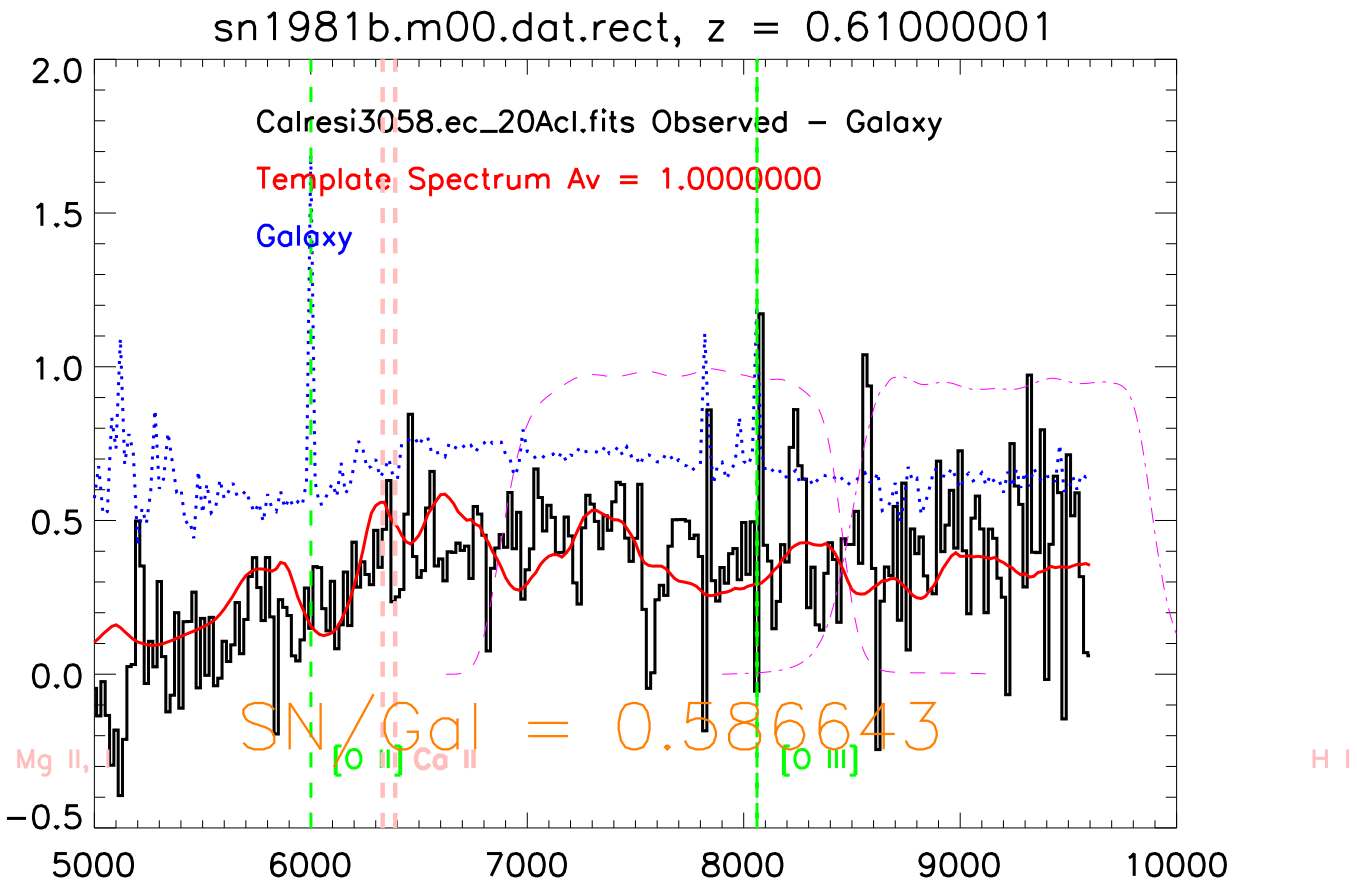
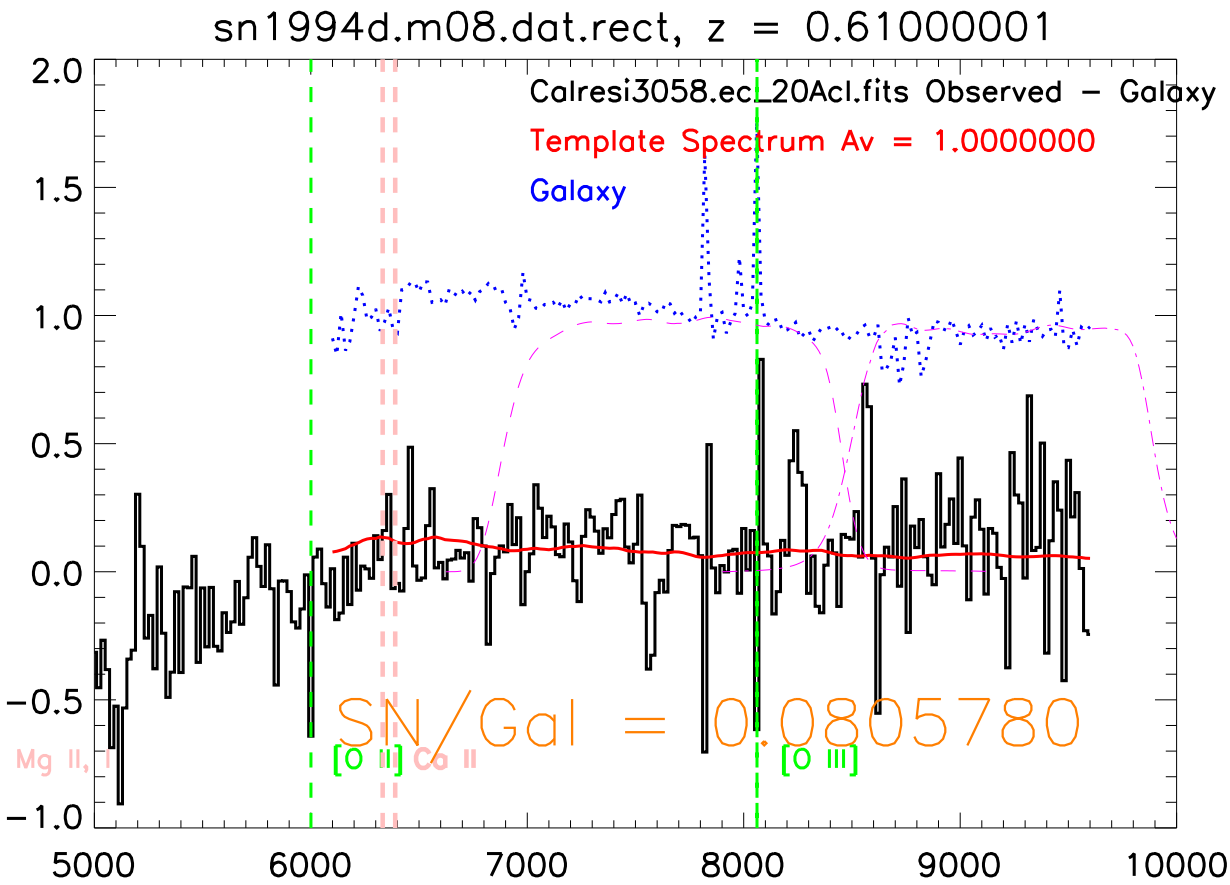
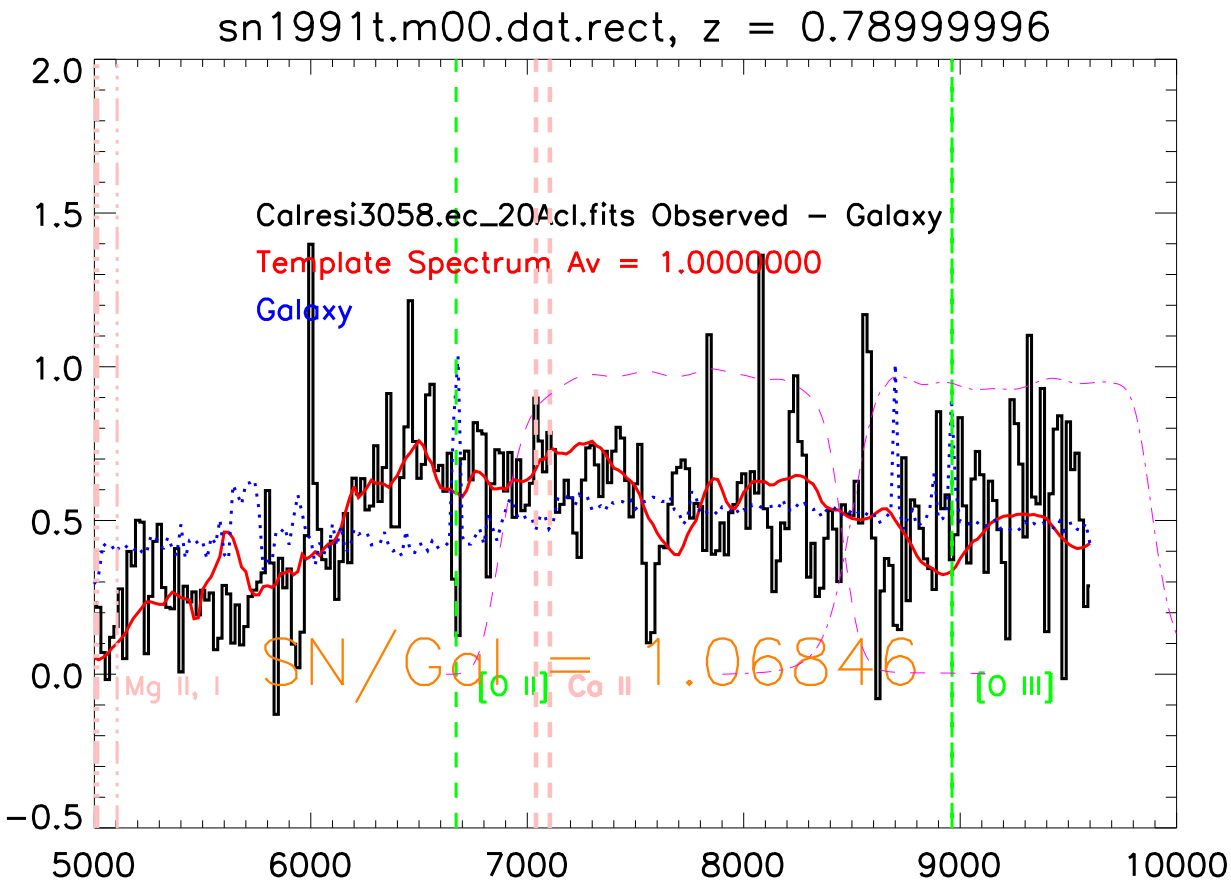
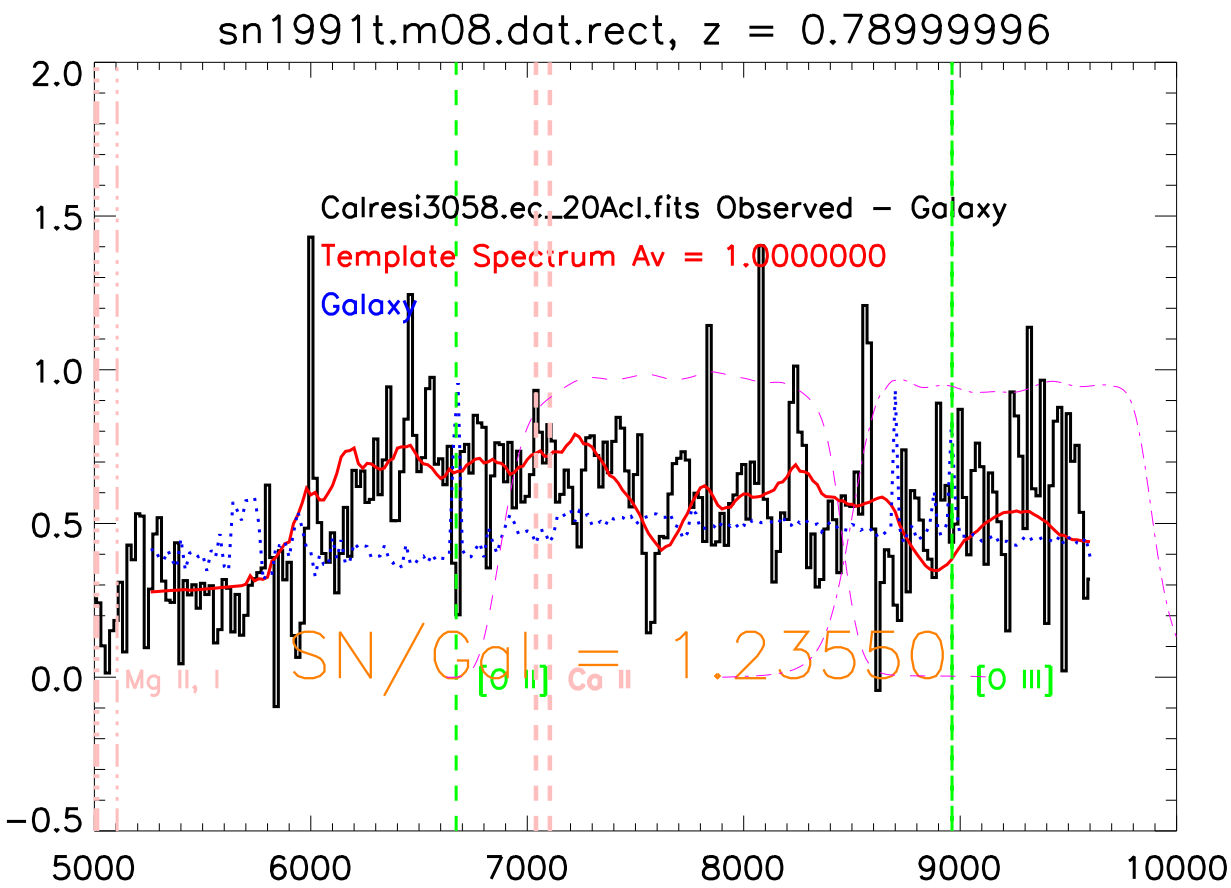
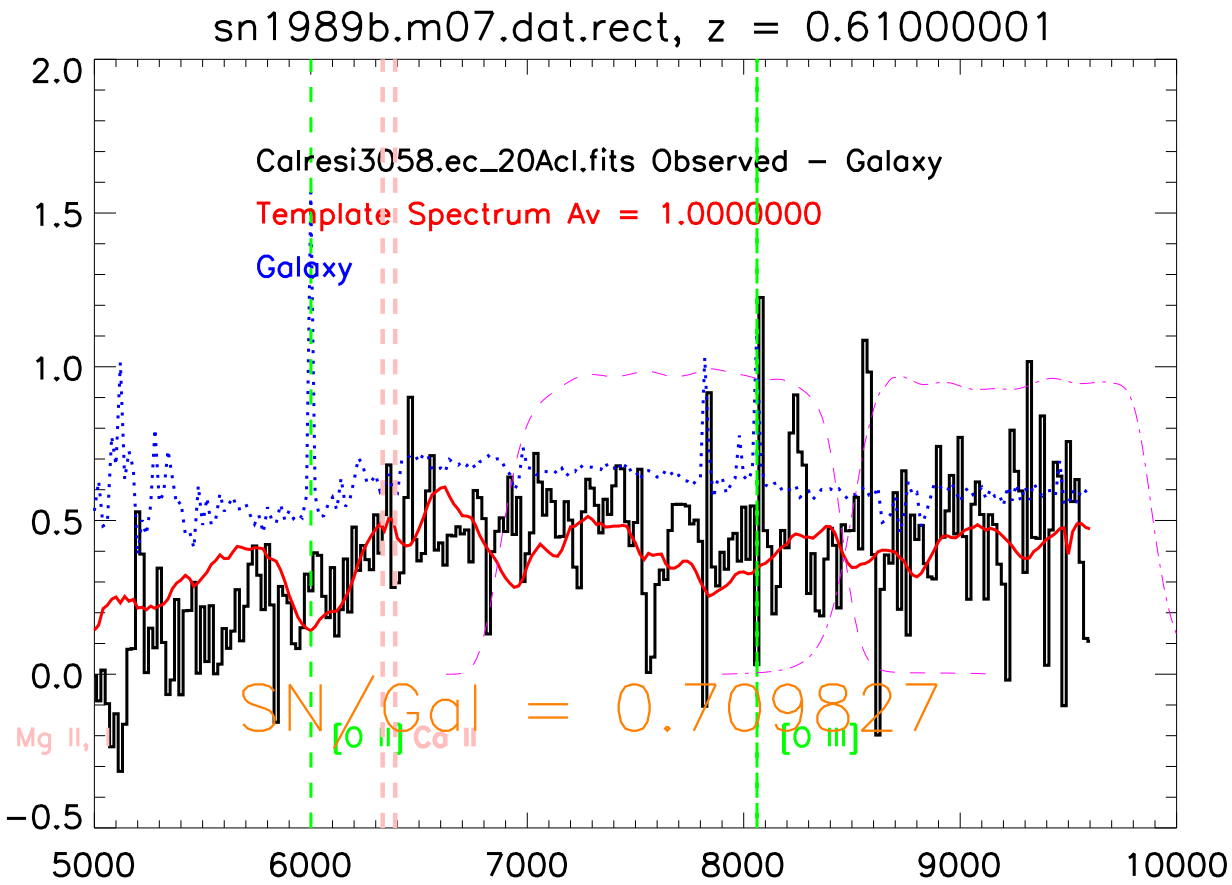
−1.0
5000
6000
7000
8000
9000
10000

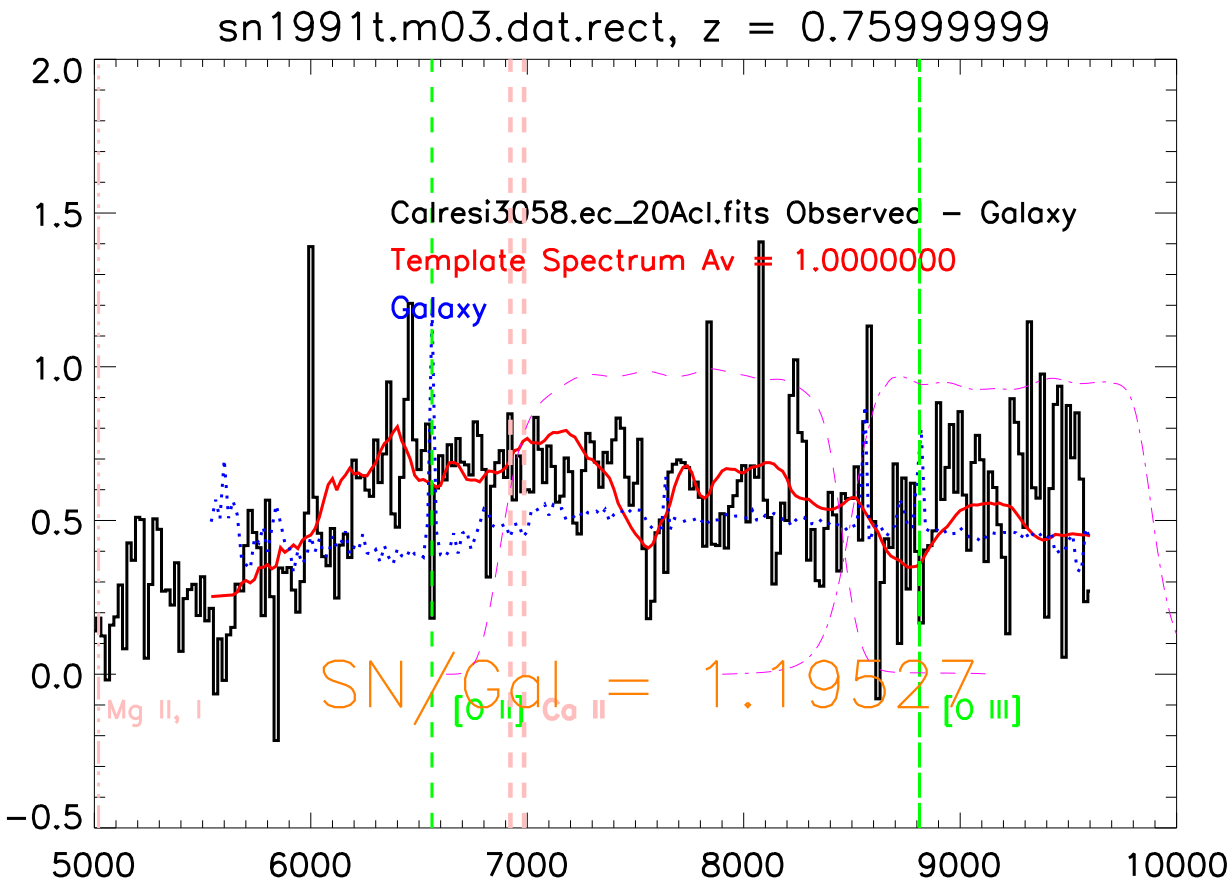

sn1981b.m00.dat.rect, z = 0.61000001
Calresi3058.ec_20Acl.fits Observed − Galaxy
Template Spectrum Av = 1.0000000
Galaxy
SN/Gal = 0.586643
[O II]
Ca II
[O III]
2.0
1.5
1.0
0.5
0.0
−0.5
5000
6000
7000
8000
9000
10000

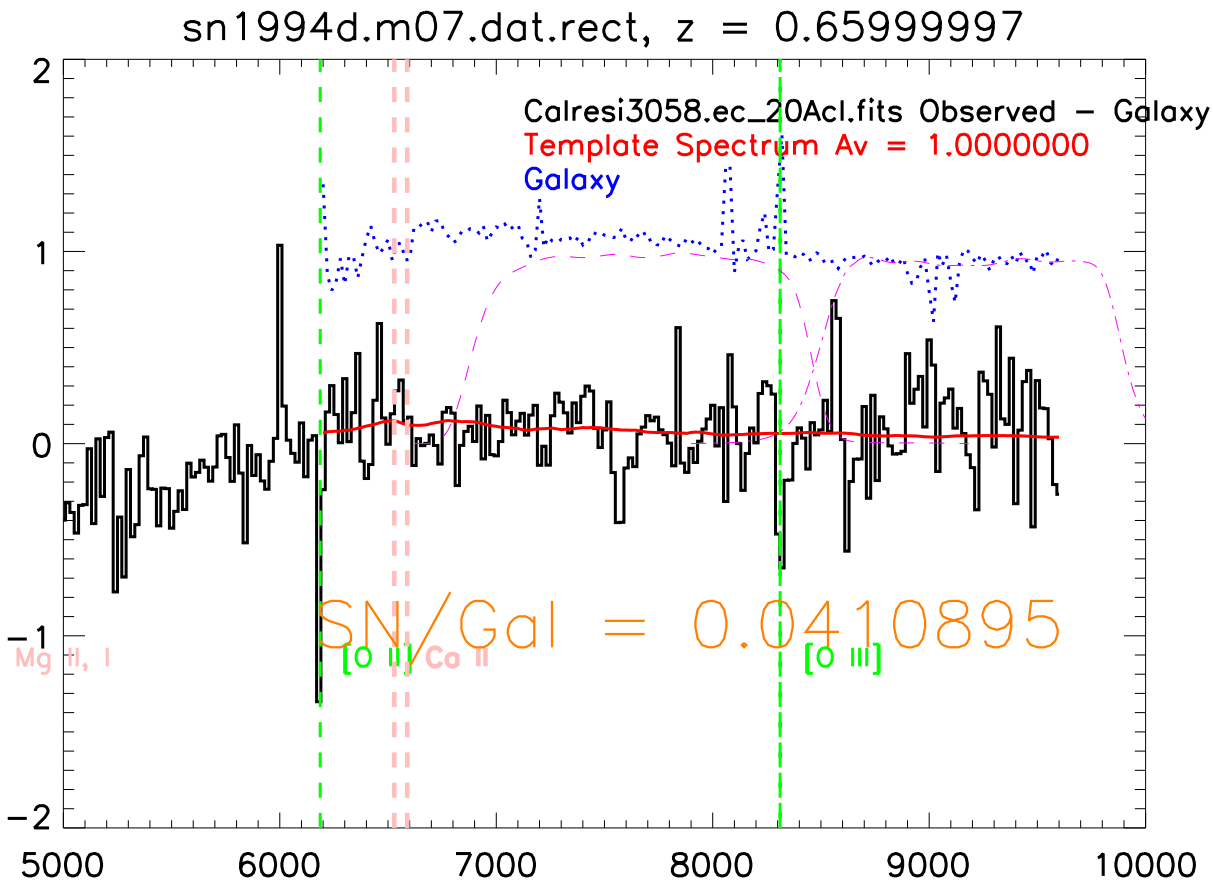

sn1994d.m08.dat.rect, z = 0.61000001
Calresi3058.ec_20Acl.fits Observed − Galaxy
Template Spectrum Av = 1.0000000
Galaxy
SN/Gal = 0.0805780
[O II]
Ca II
[O III]
2.0
1.5
1.0
0.5
0.0
−0.5
−1.0
5000
6000
7000
8000
9000
10000

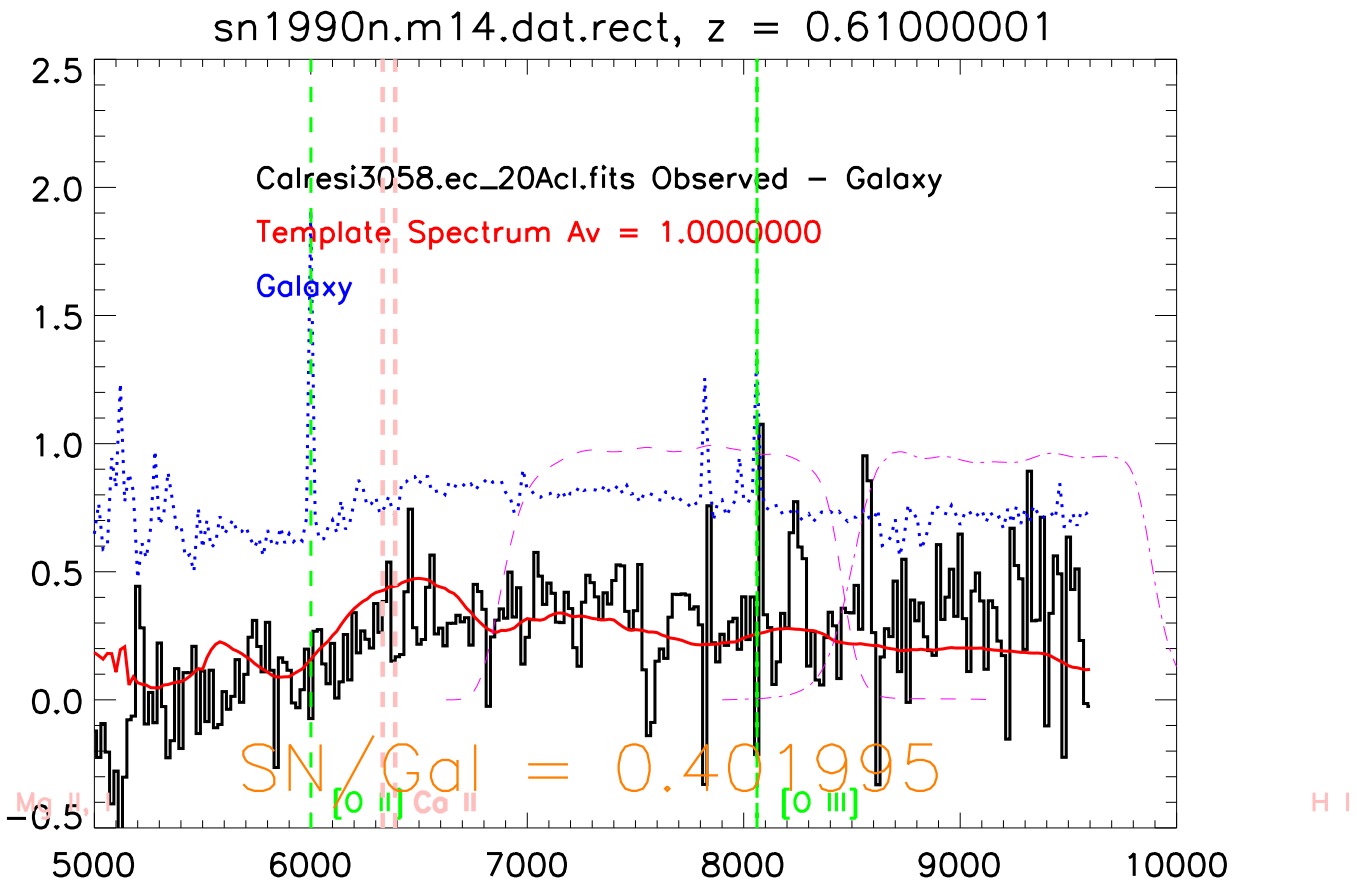

sn1991t.m00.dat.rect, z = 0.78999996
Calresi3058.ec_20Acl.fits Observed − Galaxy
Template Spectrum Av = 1.0000000
Galaxy
SN/Gal = 1.06846
Mg II, I
[O II]
Ca II
[O III]
2.0
1.5
1.0
0.5
0.0
−0.5
5000
6000
7000
8000
9000
10000

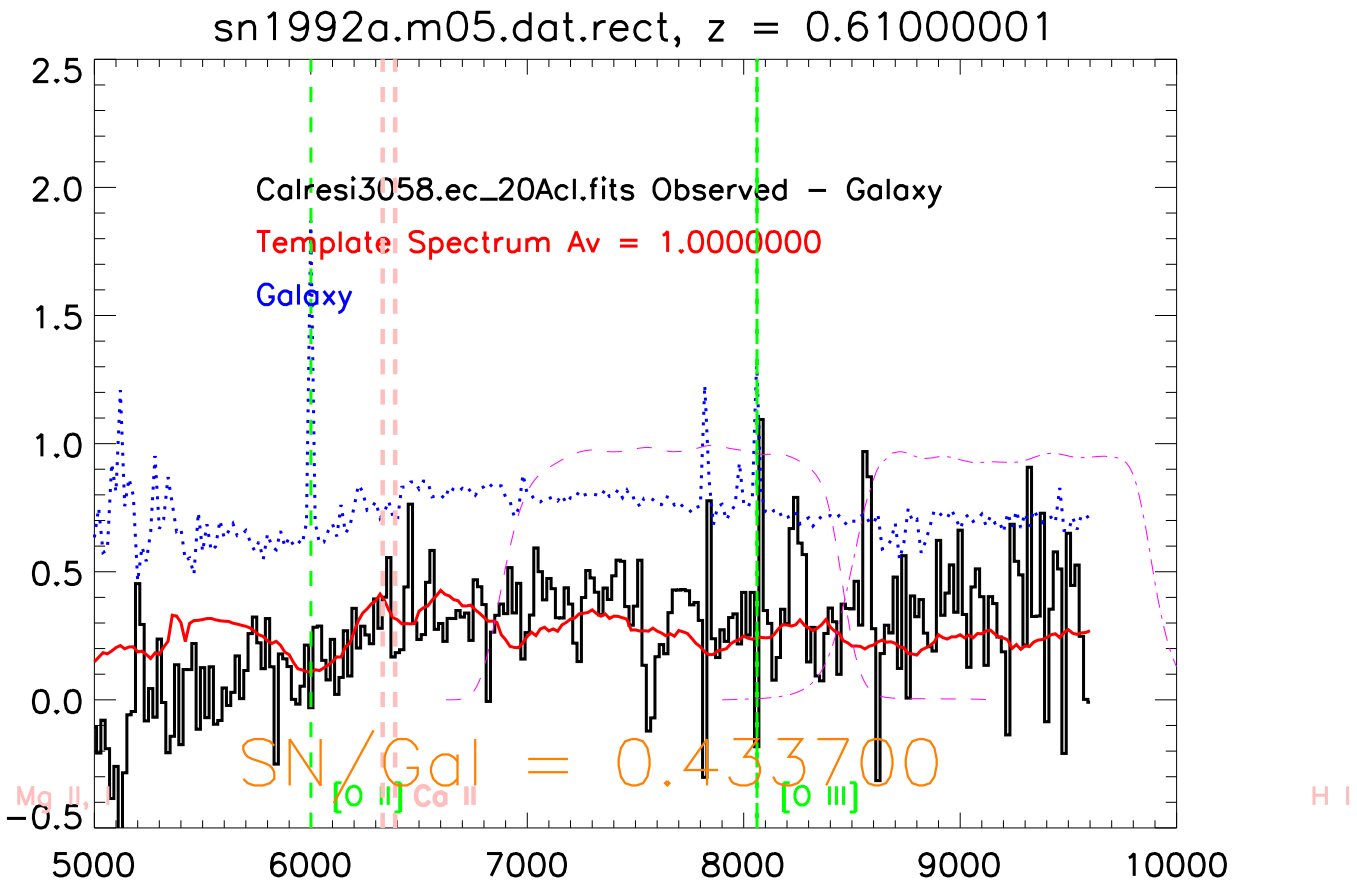

sn1991t.m08.dat.rect, z = 0.78999996
Calresi3058.ec_20Acl.fits Observed − Galaxy
Template Spectrum Av = 1.0000000
Galaxy
SN/Gal = 1.23550
Mg II, I
[O II]
Ca II
[O III]
2.0
1.5
1.0
0.5
0.0
−0.5
5000
6000
7000
8000
9000
10000

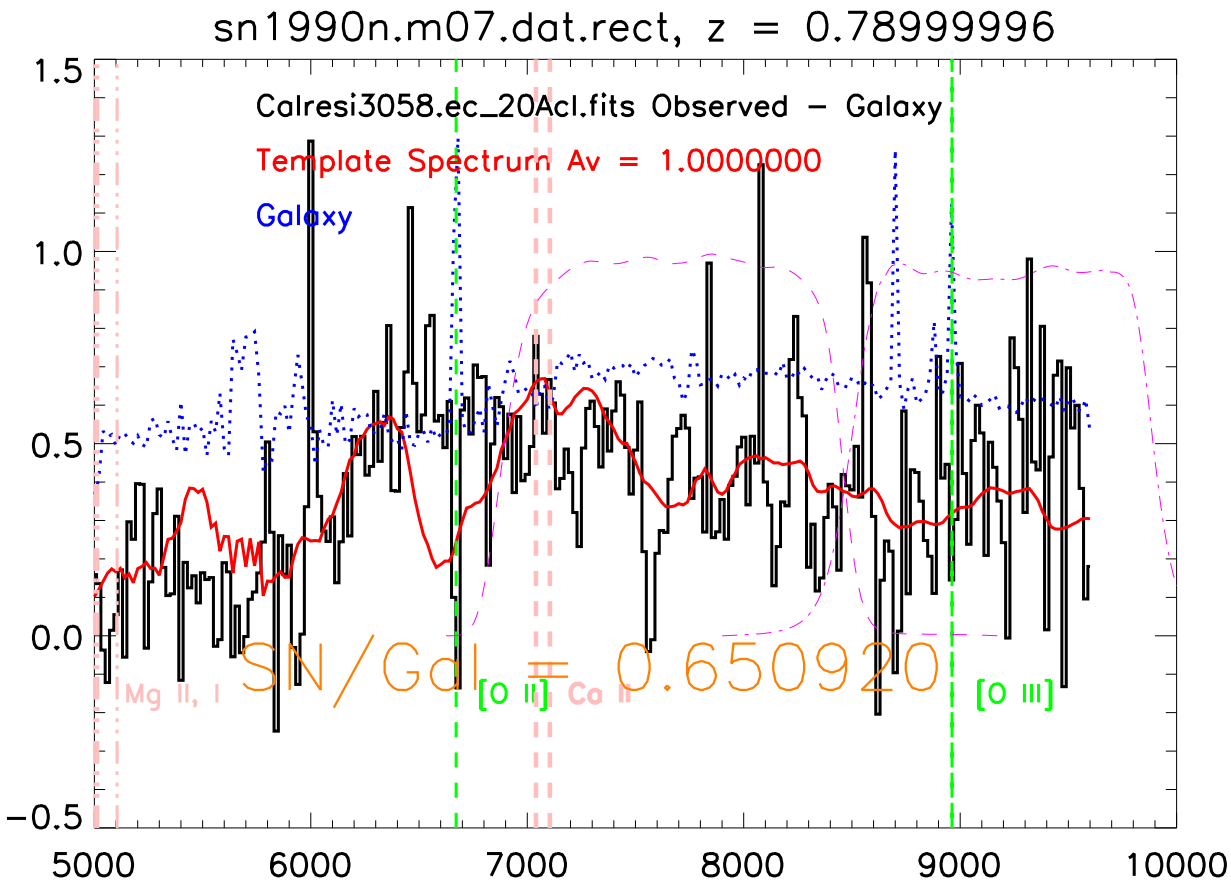

sn1989b.m07.dat.rect, z = 0.61000001
Calresi3058.ec_20Acl.fits Observed − Galaxy
Template Spectrum Av = 1.0000000
Galaxy
SN/Gal = 0.709827
[O II]
Ca II
[O III]
2.0
1.5
1.0
0.5
0.0
−0.5
5000
6000
7000
8000
9000
10000

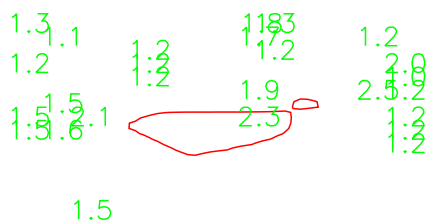

sn1991t.m03.dat.rect, z = 0.75999999
Calresi3058.ec_20Acl.fits Observed − Galaxy
Template Spectrum Av = 1.0000000
Galaxy
SN/Gal = 1.19527
Mg II, I
[O II]
Ca II
[O III]
2.0
1.5
1.0
0.5
0.0
−0.5
5000
6000
7000
8000
9000
10000

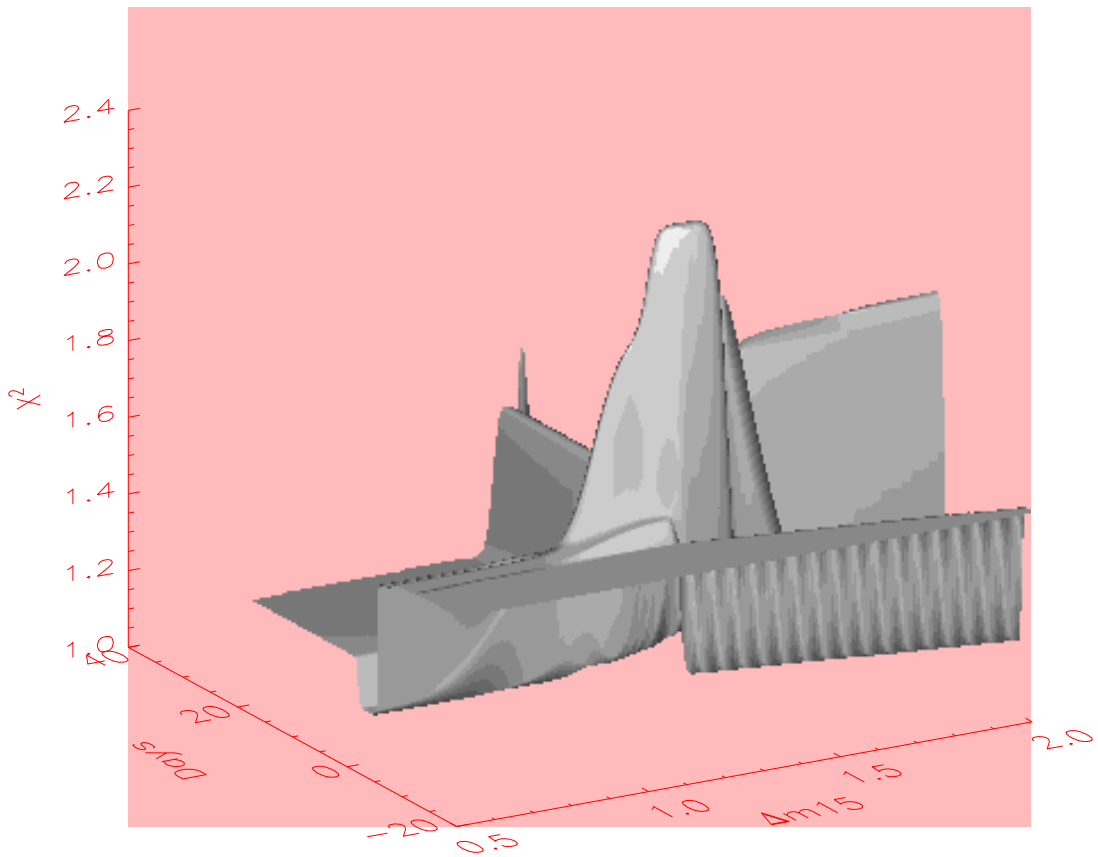

sn1994d.m07.dat.rect, z = 0.65999997
Calresi3058.ec_20Acl.fits Observed − Galaxy
Template Spectrum Av = 1.0000000
Galaxy
SN/Gal = 0.0410895
Mg II, I
[O II]
Ca II
[O III]
2
1
0
−1
−2
5000
6000
7000
8000
9000
10000


sn1990n.m14.dat.rect, z = 0.61000001
Calresi3058.ec_20Acl.fits Observed − Galaxy
Template Spectrum Av = 1.0000000
Galaxy
SN/Gal = 0.401995
[O II]
Ca II
[O III]
H I
2.5
2.0
1.5
1.0
0.5
0.0
−0.5
5000
6000
7000
8000
9000
10000

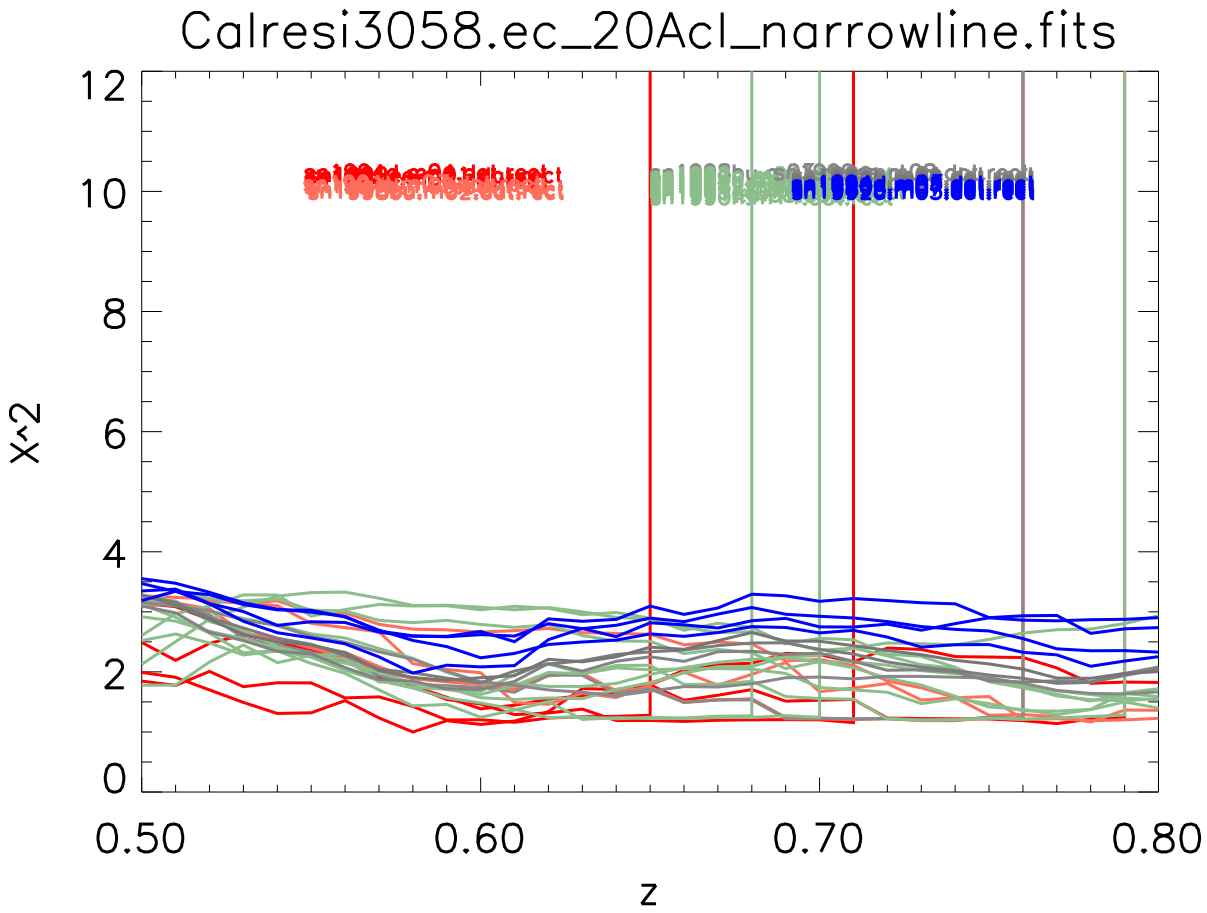

sn1992a.m05.dat.rect, z = 0.61000001
Calresi3058.ec_20Acl.fits Observed − Galaxy
Template Spectrum Av = 1.0000000
Galaxy
SN/Gal = 0.433700
[O II] Ca II
[O III]
H I
2.5
2.0
1.5
1.0
0.5
0.0
−0.5
5000
6000
7000
8000
9000
10000

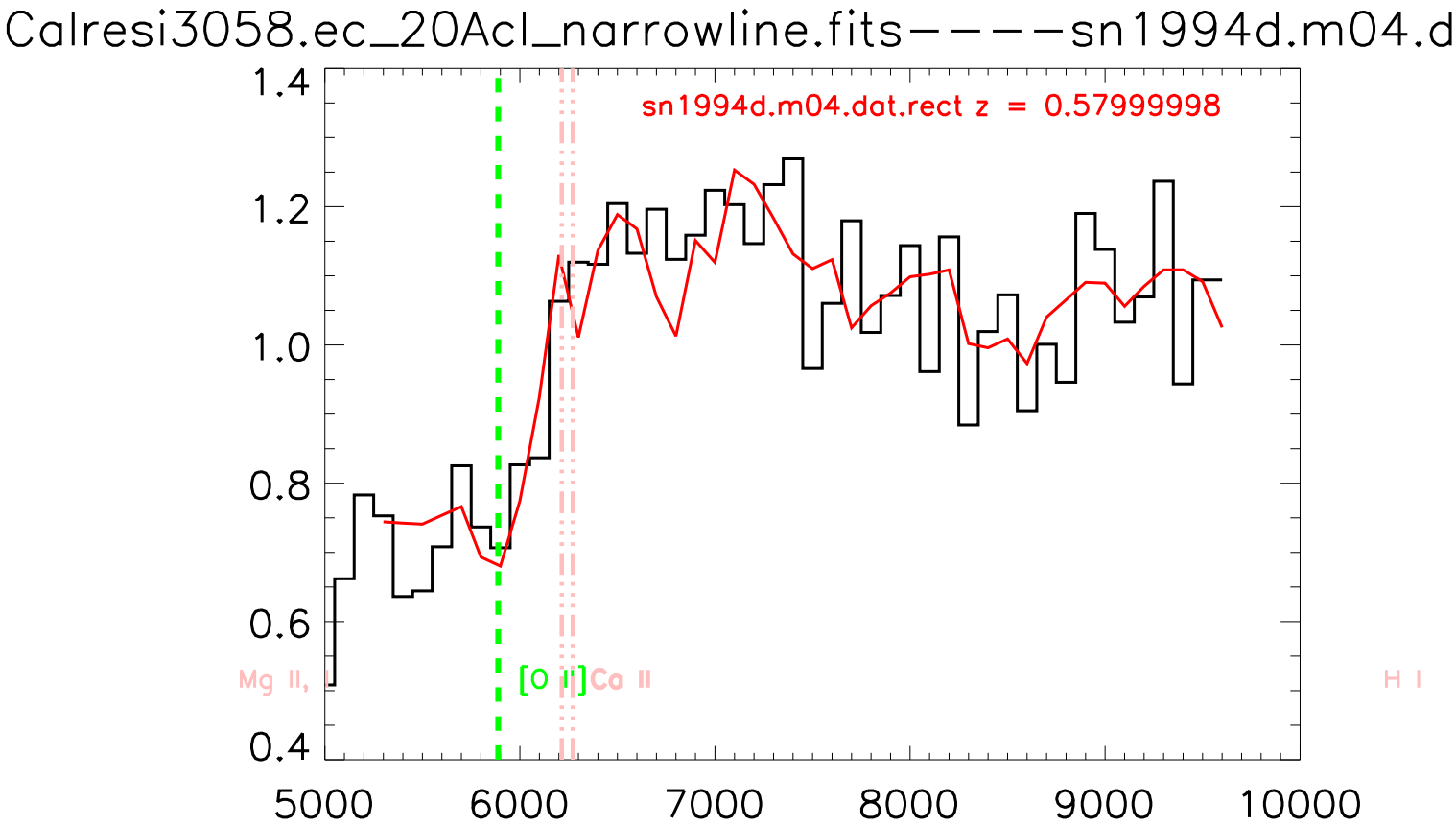

sn1990n.m07.dat.rect, z = 0.78999996
Calresi3058.ec_20Acl.fits Observed − Galaxy
Template Spectrum Av = 1.0000000
Galaxy
SN/Gal = 0.650920
Mg II, I
[O II]
Ca II
[O III]
1.5
1.0
0.5
0.0
−0.5
5000
6000
7000
8000
9000
10000

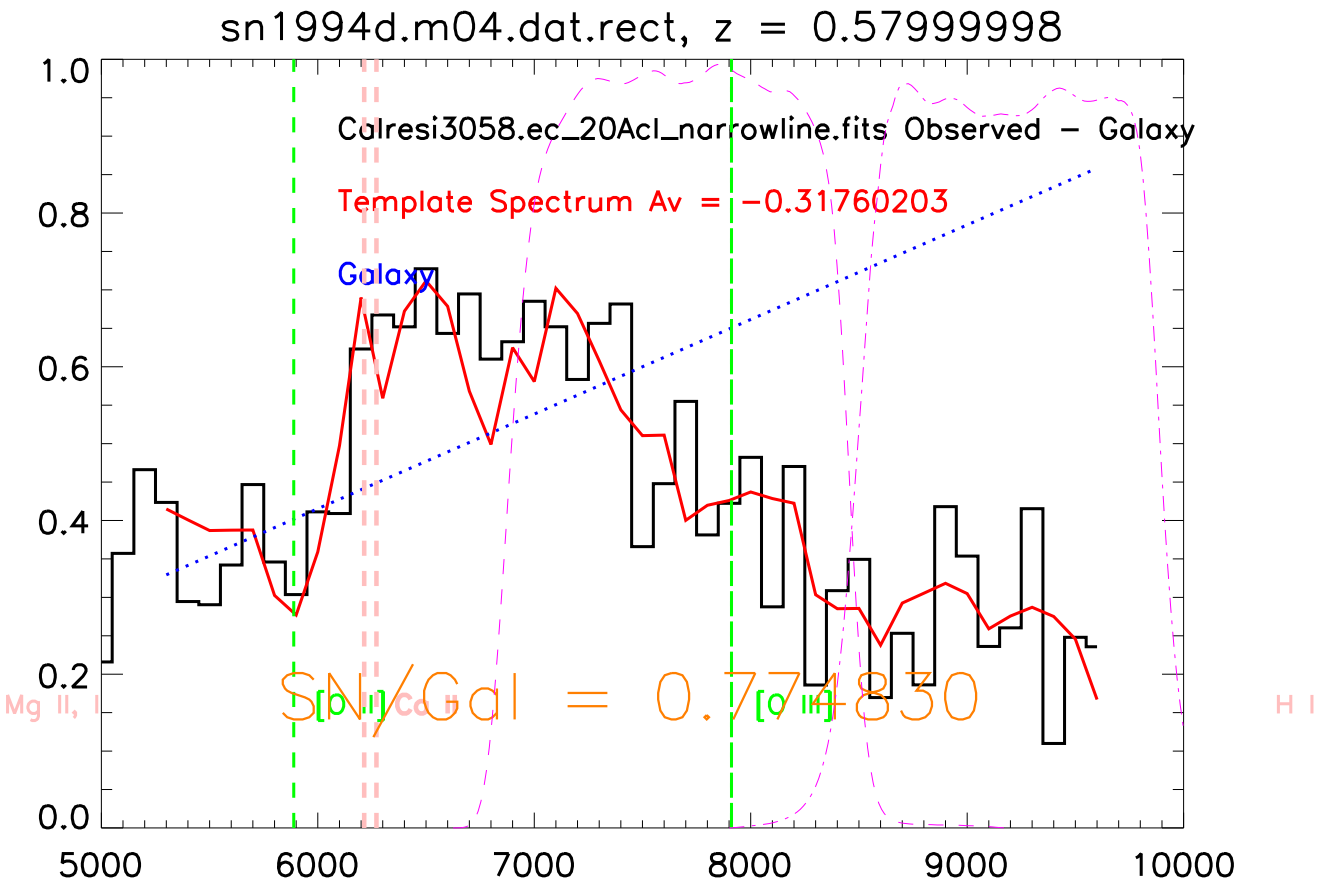

1.3
1.1
1.2
1.2
1.2
1.2
1.2
1.9
2.3
1.5
2.1
1.5
1.6
1.2
2.0
2.5
1.2
1.2
1.2
1.5

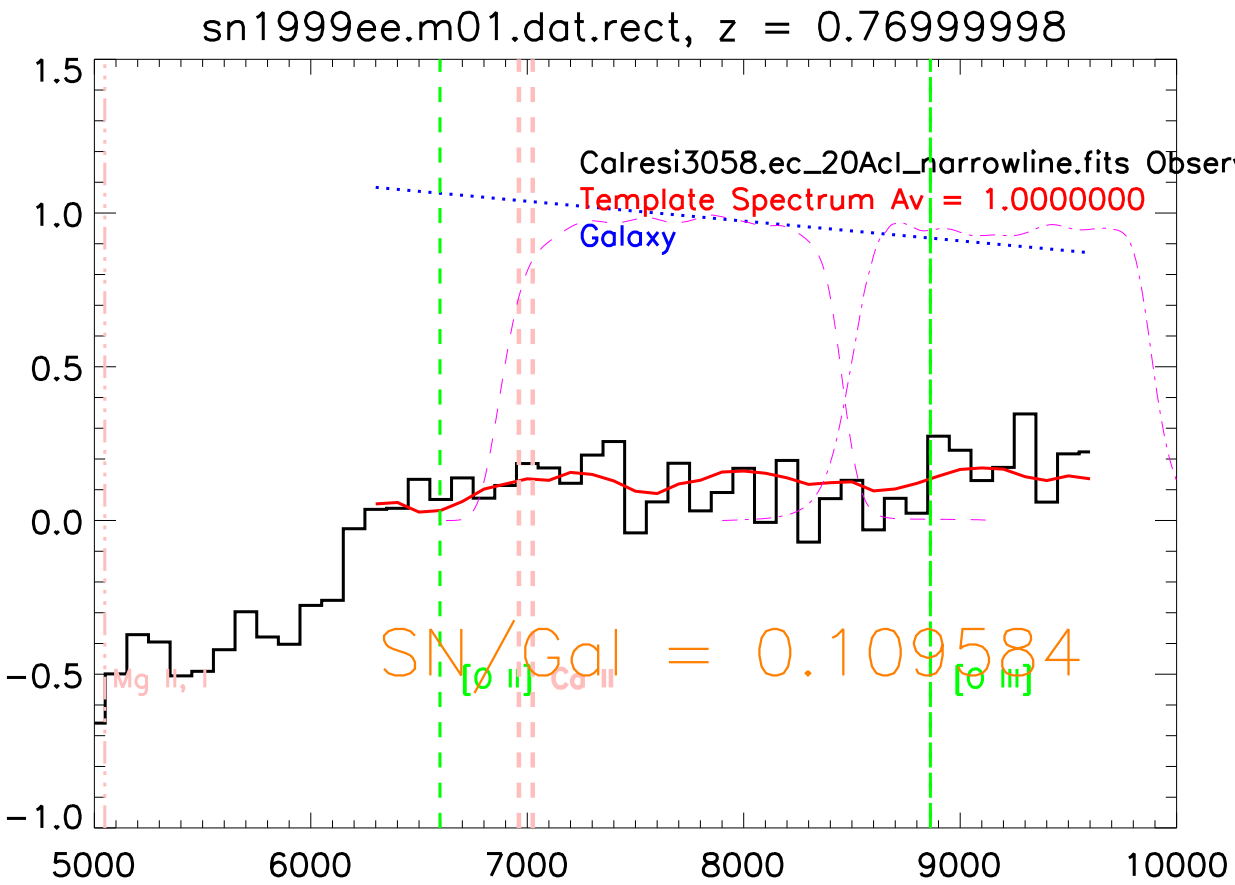


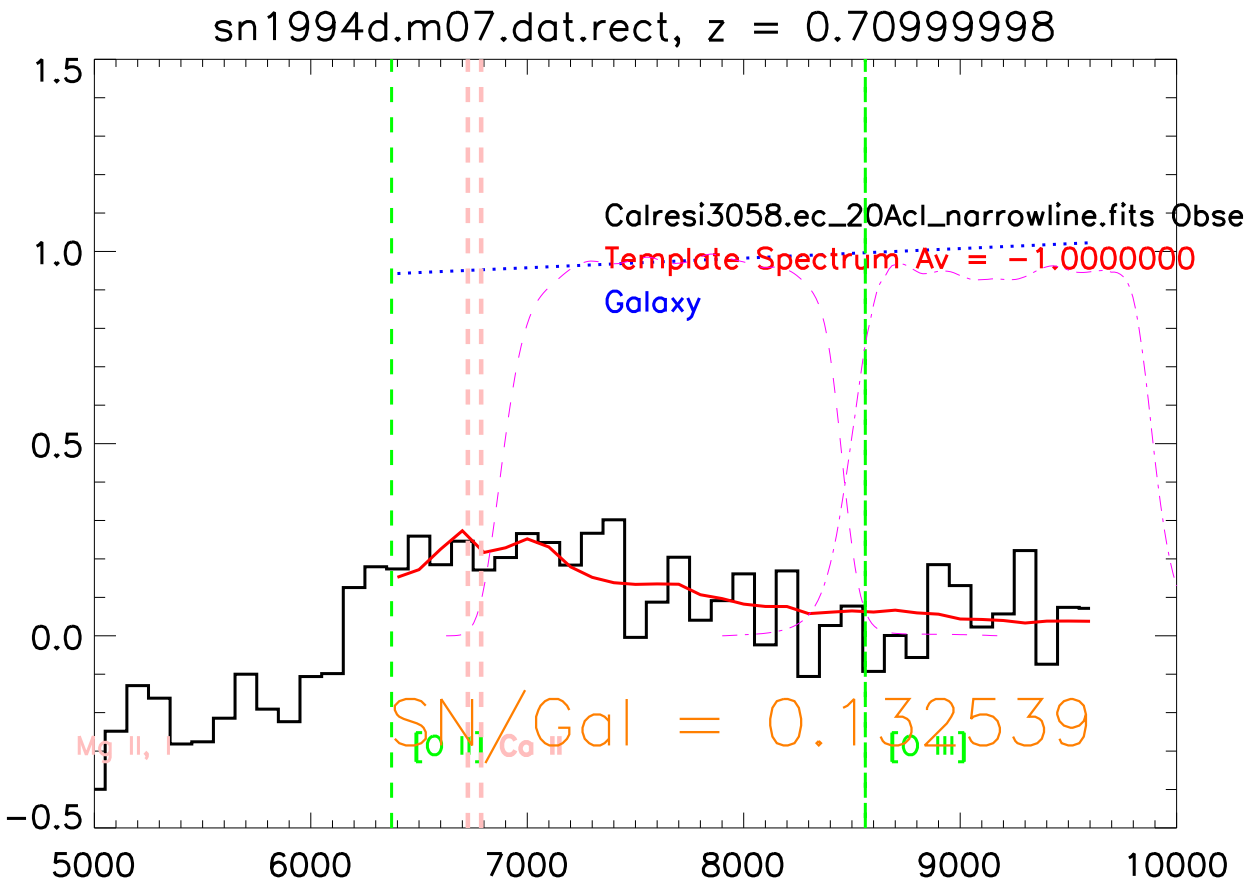
2.4
2.2
2.0
1.8
1.6
1.4
1.2
1.0
χ^2
40
20
0
−20
Days
0.5
1.0
1.5
2.0
Δm15

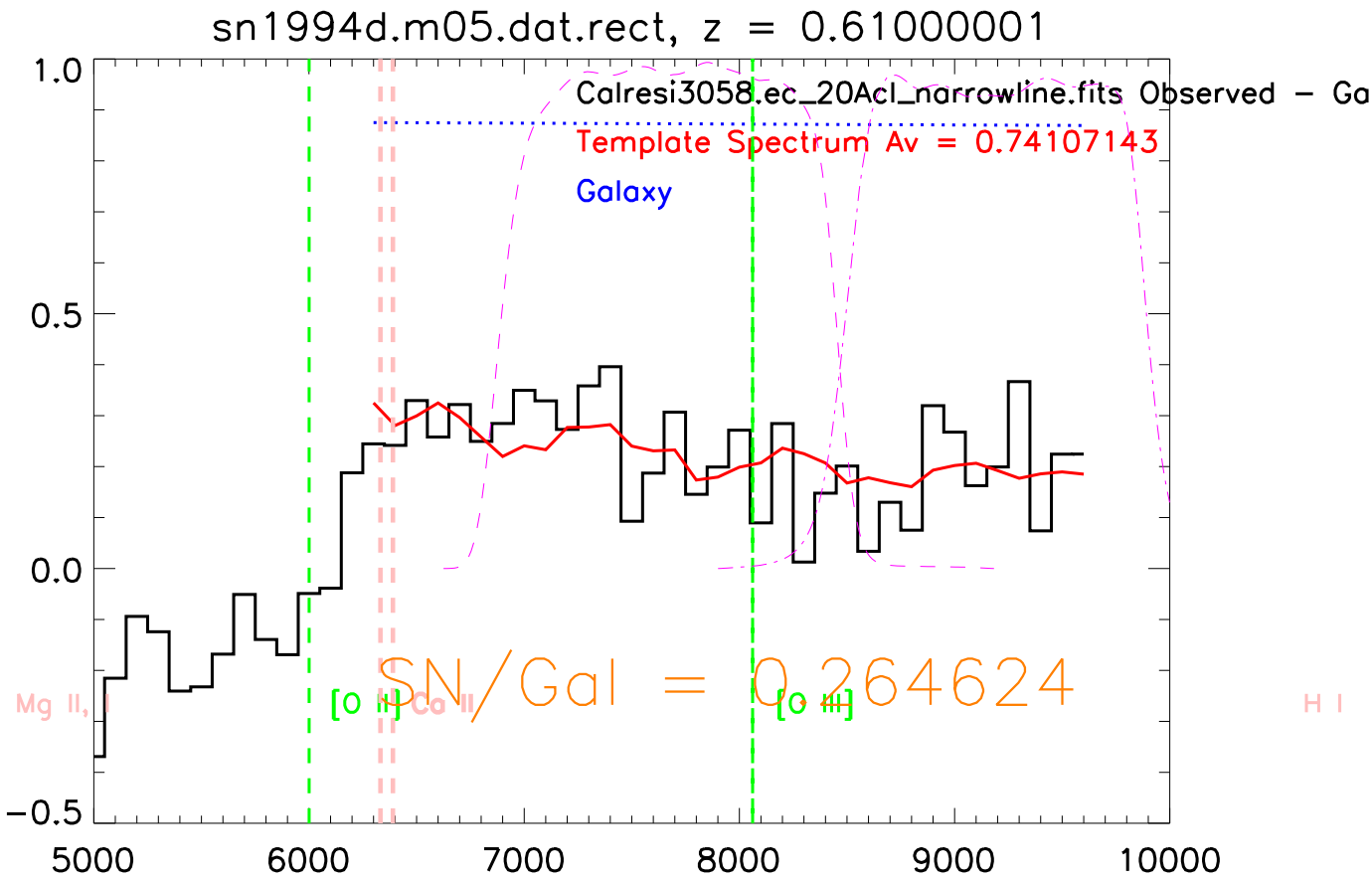

Calresi3058.ec_20Acl_narrowline.fits
12
10
8
6
4
2
0
X^2
0.50
0.60
0.70
0.80
z

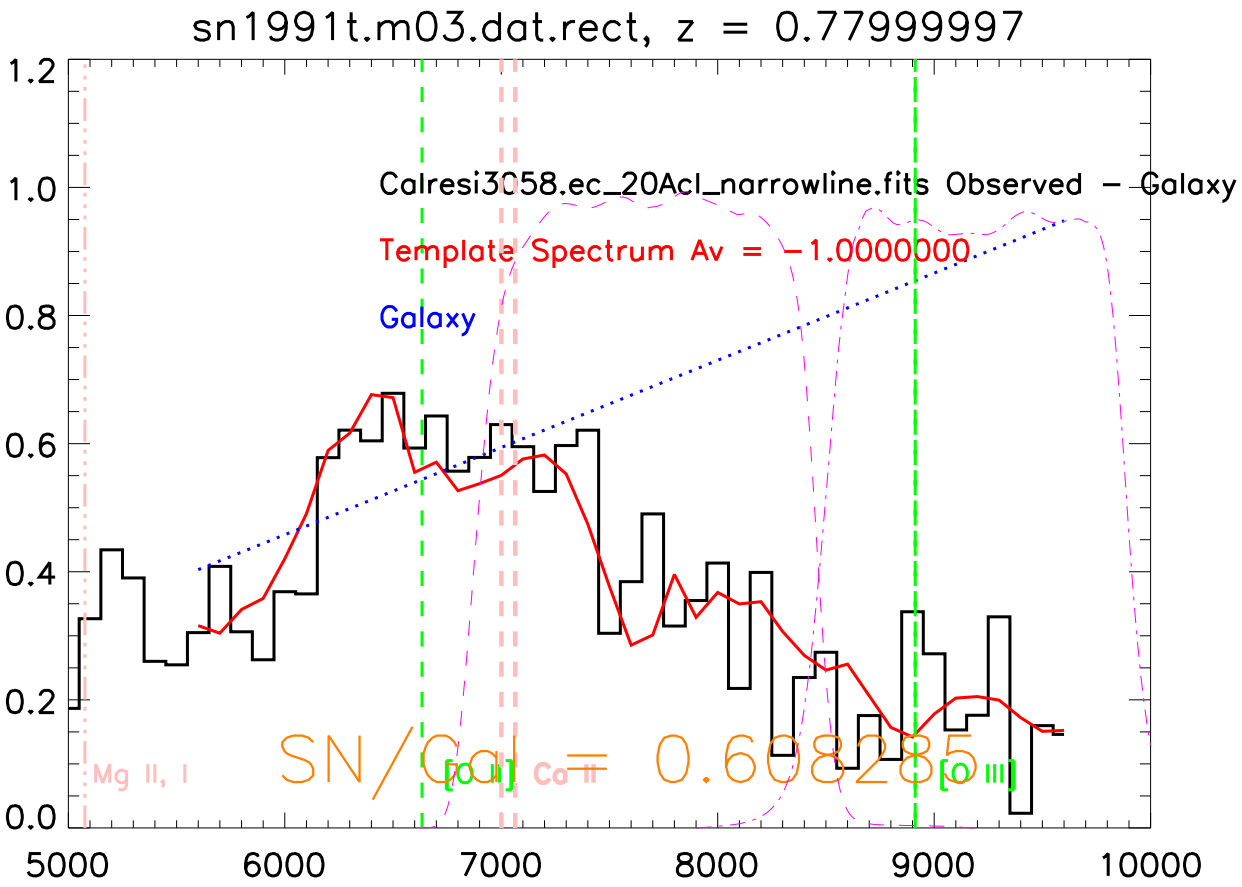

Calresi3058.ec_20Acl_narrowline.fits----sn1994d.m04.dat
sn1994d.m04.dat.rect z = 0.57999998
1.4
1.2
1.0
0.8
0.6
0.4
Mg II,
[O II]
Ca II
H I
5000
6000
7000
8000
9000
10000

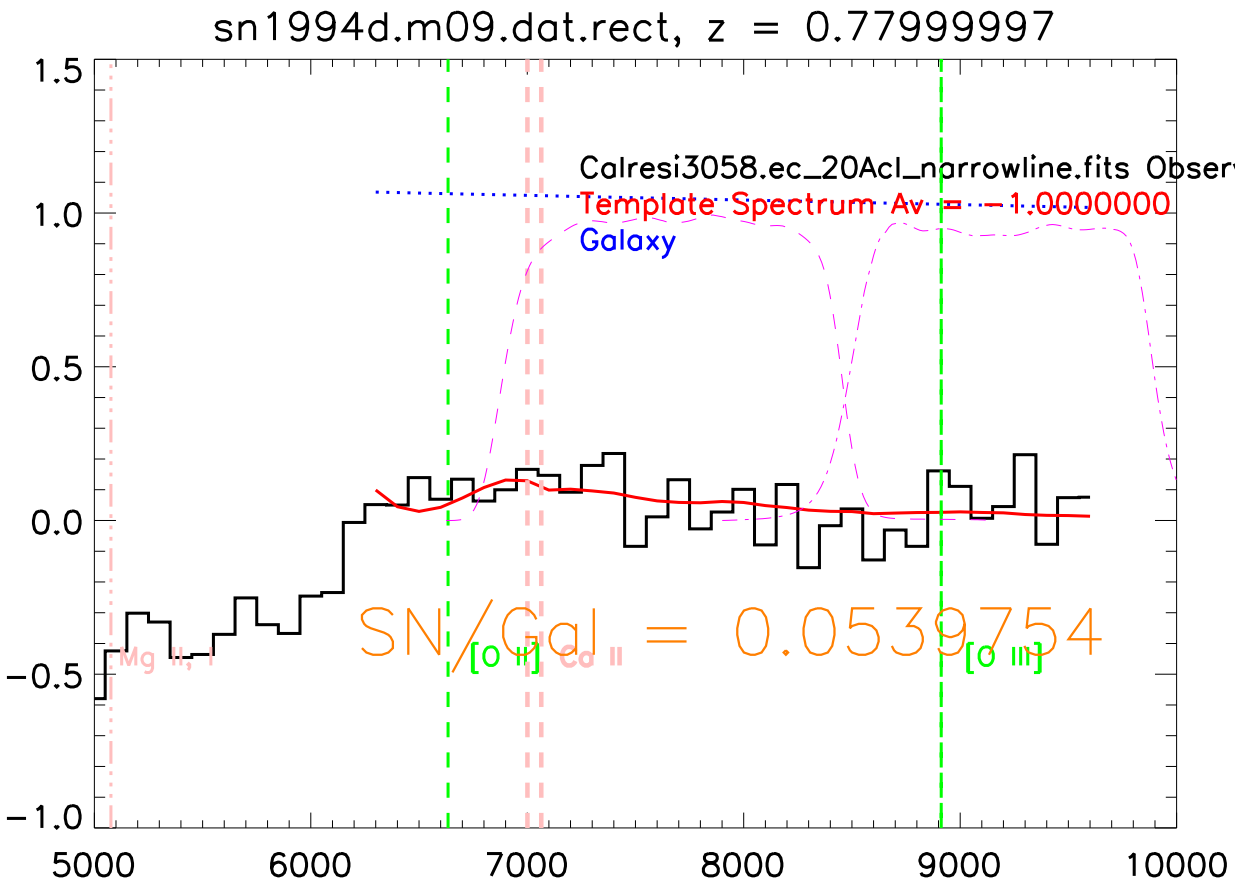

sn1994d.m04.dat.rect, z = 0.57999998
Calresi3058.ec_20Acl_narrowline.fits Observed − Galaxy
Template Spectrum Av = −0.31760203
Galaxy
SN/Gal = 0.774830
[O II]
[O III]
1.0
0.8
0.6
0.4
0.2
0.0
5000
6000
7000
8000
9000
10000

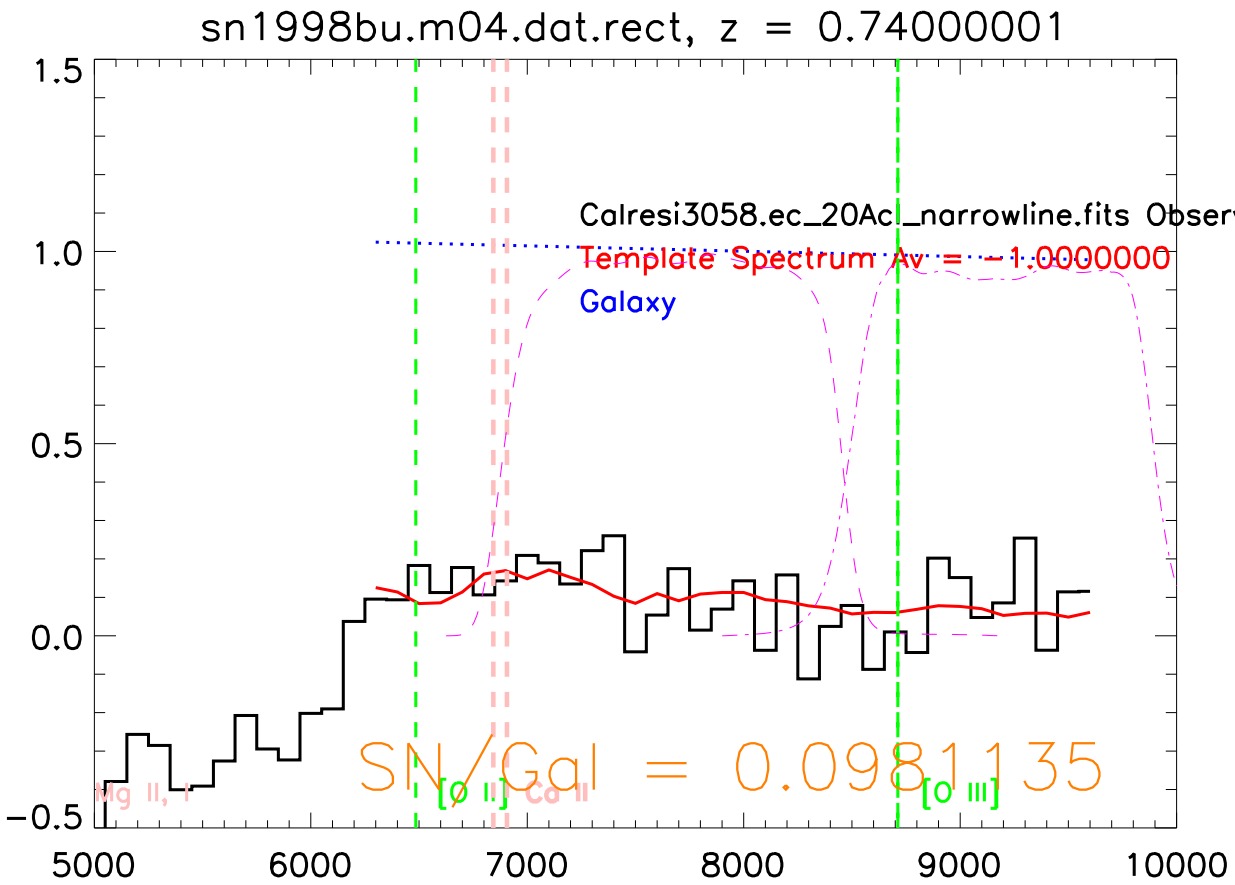

sn1999ee.m01.dat.rect, z = 0.76999998
Calresi3058.ec_20Acl_narrowline.fits Observed – Ga
Template Spectrum Av = 1.0000000
Galaxy
SN/Gal = 0.109584
[O II]
Ca II
[O III]
1.5
1.0
0.5
0.0
−0.5
−1.0
5000
6000
7000
8000
9000
10000

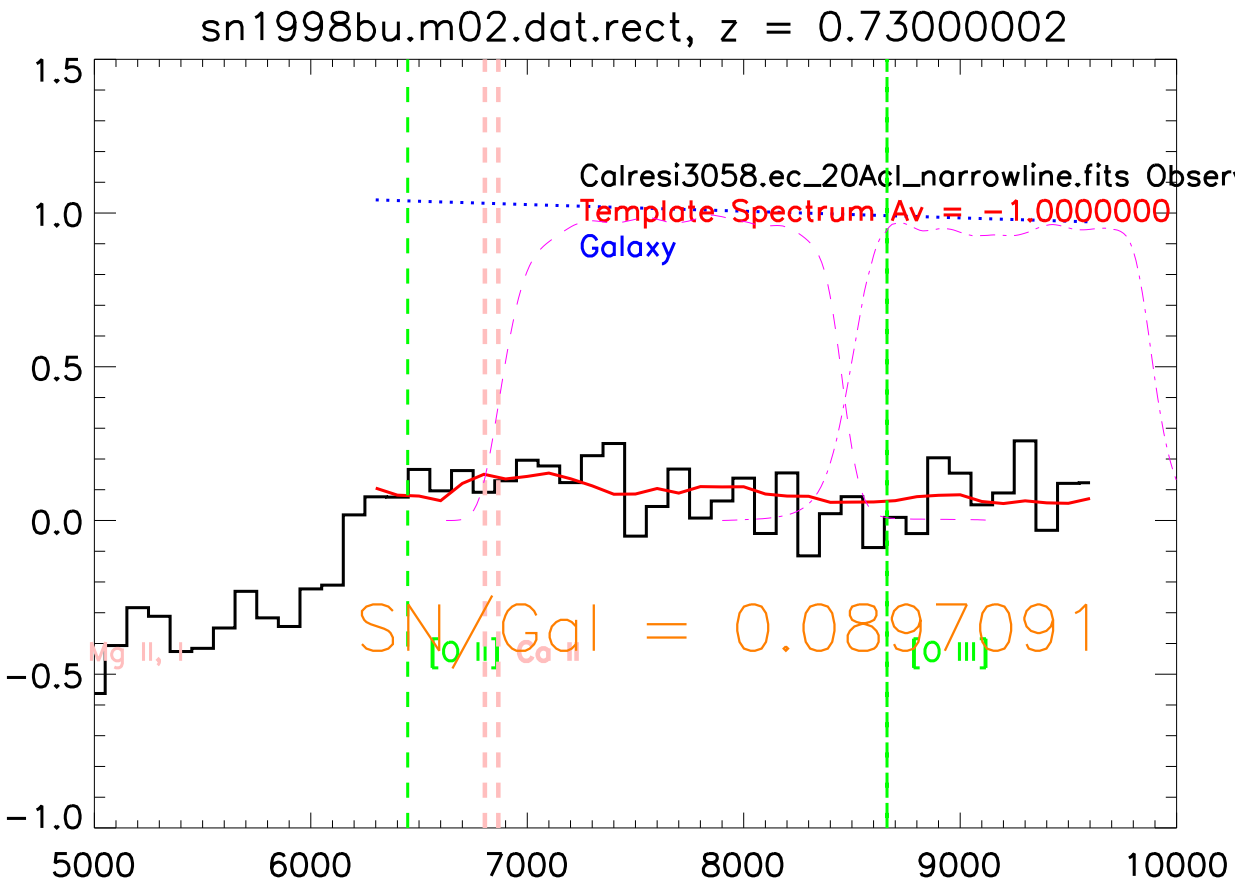

sn1994d.m07.dat.rect, z = 0.70999998
Calresi3058.ec_20Acl_narrowline.fits Observed – G
Template Spectrum Av = −1.0000000
Galaxy
SN/Gal = 0.132539
Mg II, I
[O II]
Ca II
[O III]
1.5
1.0
0.5
0.0
−0.5
5000
6000
7000
8000
9000
10000

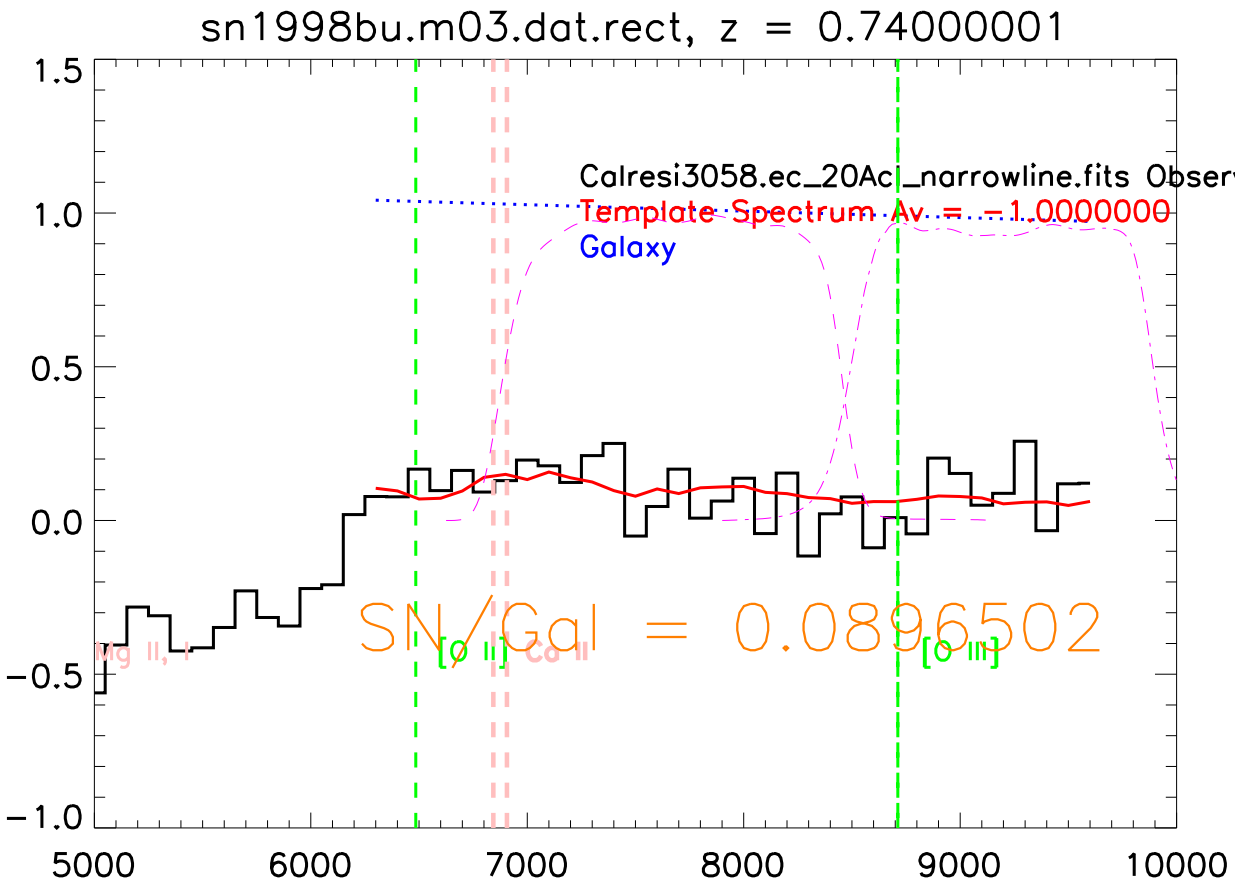

sn1994d.m05.dat.rect, z = 0.61000001
Calresi3058.ec_20Acl_narrowline.fits Observed – Ga
Template Spectrum Av = 0.74107143
Galaxy
SN/Gal = 0.264624
[O II]
Ca II
[O III]
Mg II,
H I
1.0
0.5
0.0
−0.5
5000
6000
7000
8000
9000
10000

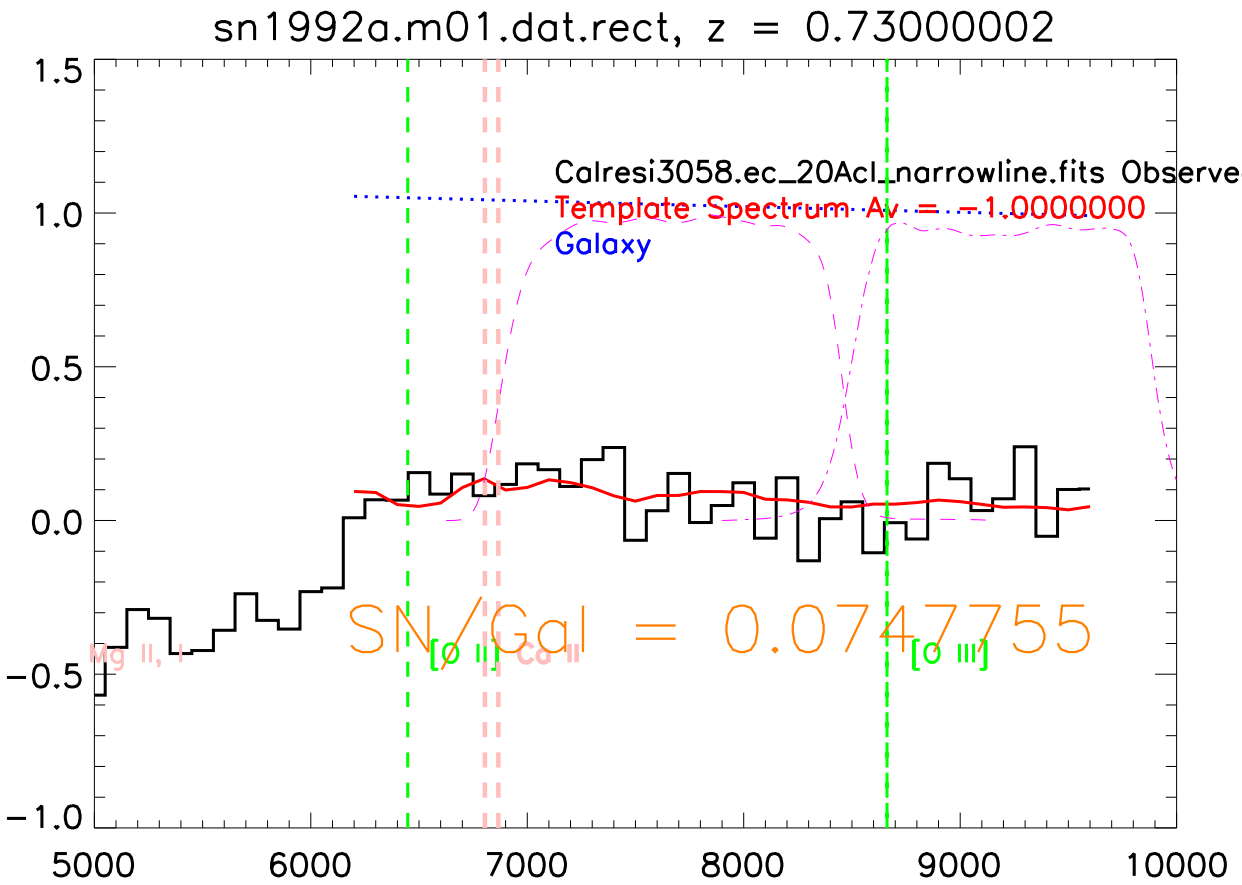

sn1991t.m03.dat.rect, z = 0.77999997
Calresi3058.ec_20Acl_narrowline.fits Observed – Galaxy
Template Spectrum Av = –1.0000000
Galaxy
SN/Cal = 0.608285
Mg II, I
[O II]
Ca II
[O III]
1.2
1.0
0.8
0.6
0.4
0.2
0.0
5000
6000
7000
8000
9000
10000

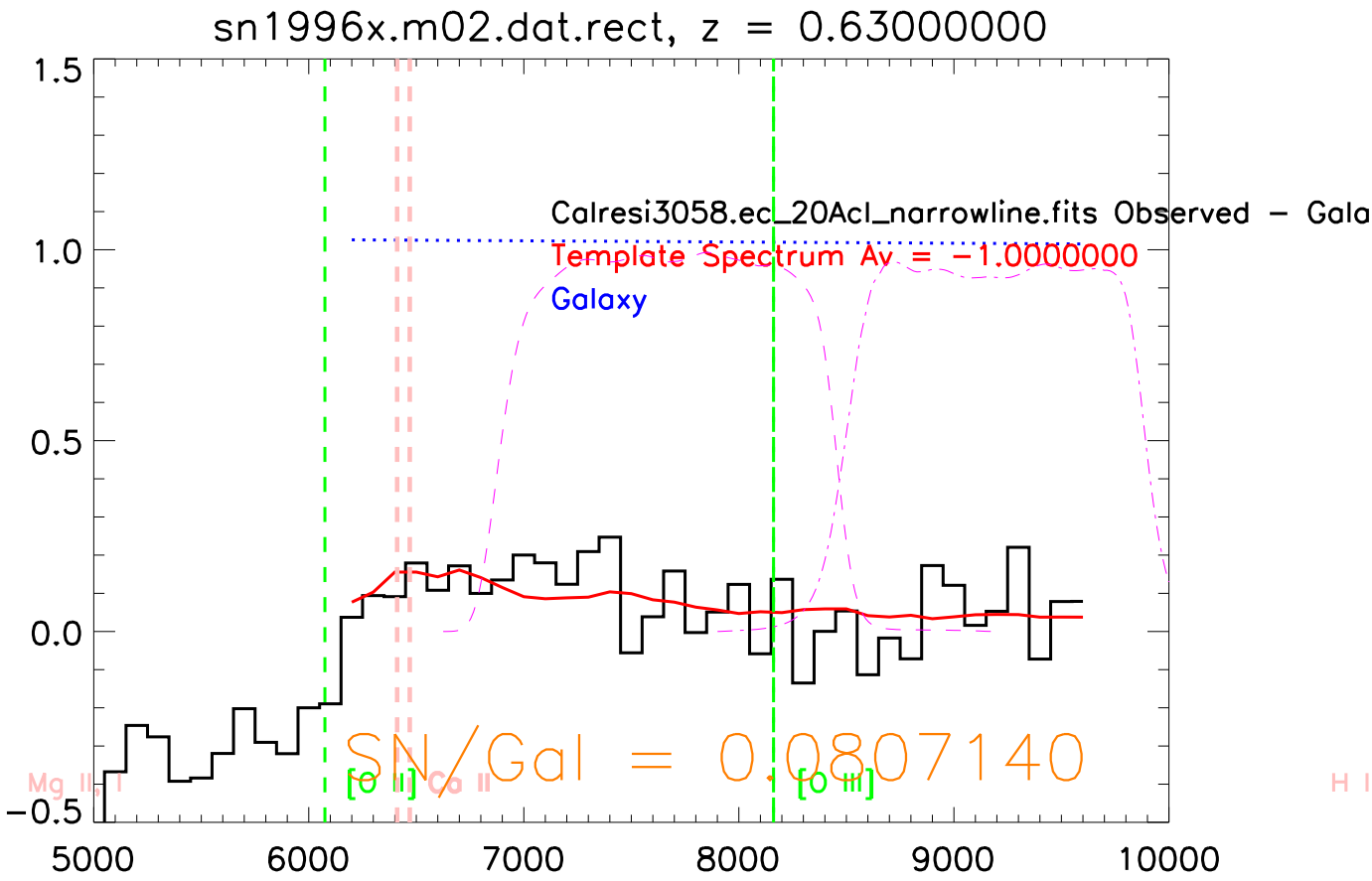

sn1994d.m09.dat.rect, z = 0.77999997
Calresi3058.ec_20Acl_narrowline.fits Observed – Ga
Template Spectrum Av = 1.0000000
Galaxy
SN/Gal = 0.0539754
[O II]
Ca II
[O III]
1.5
1.0
0.5
0.0
−0.5
−1.0
5000
6000
7000
8000
9000
10000

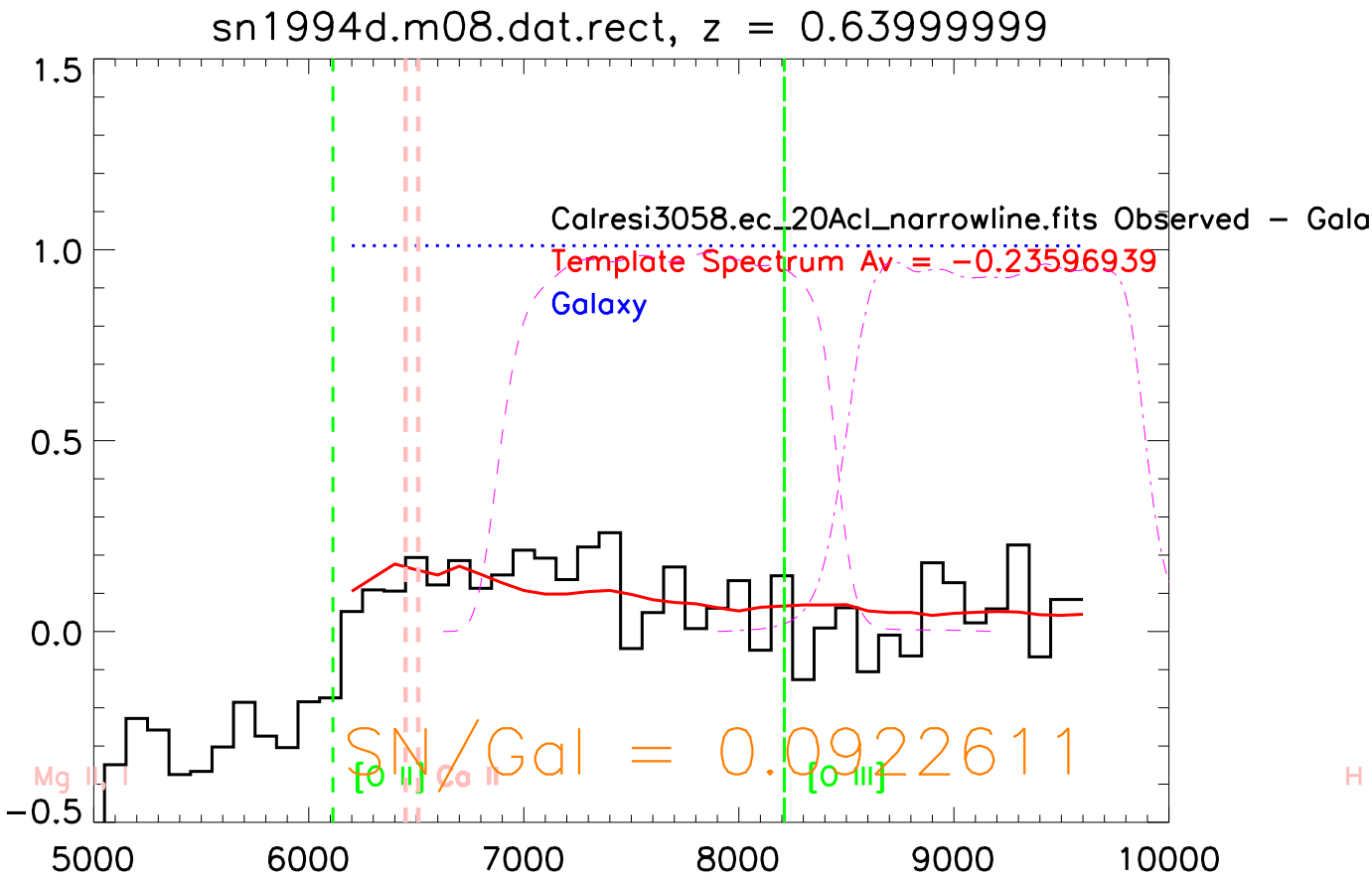

sn1998bu.m04.dat.rect, z = 0.74000001
Calresi3058.ec_20Ac_narrowline.fits Observed – Ga
Template Spectrum Av = −1.0000000
Galaxy
SN/Gal = 0.0981135
[O II]
Ca II
[O III]
1.5
1.0
0.5
0.0
−0.5
5000
6000
7000
8000
9000
10000

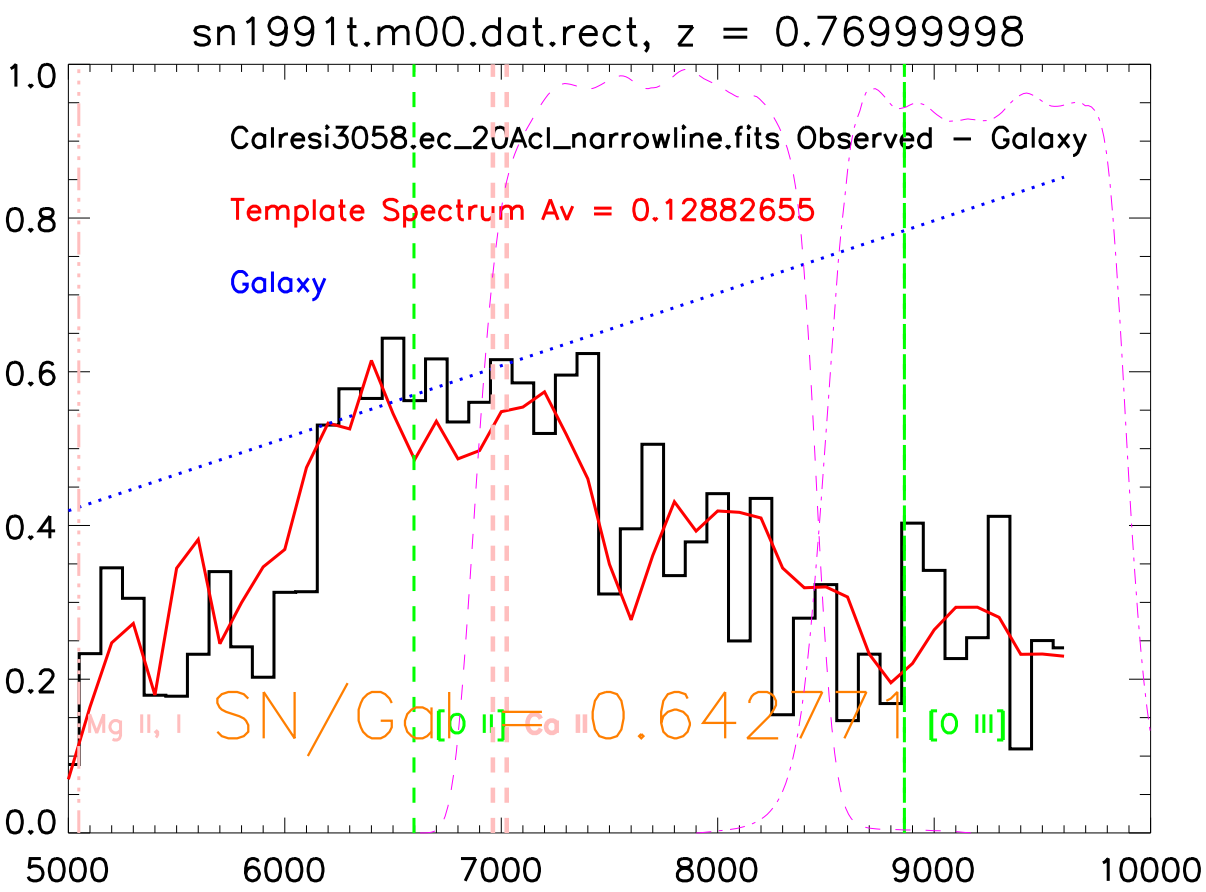

sn1998bu.m02.dat.rect, z = 0.73000002
Calresi3058.ec_20Acl_narrowline.fits Observed – Ga
Template Spectrum Av. = 1.0000000
Galaxy
SN/Gal = 0.0897091
[O II]
Ca II
[O III]
1.5
1.0
0.5
0.0
−0.5
−1.0
5000
6000
7000
8000
9000
10000

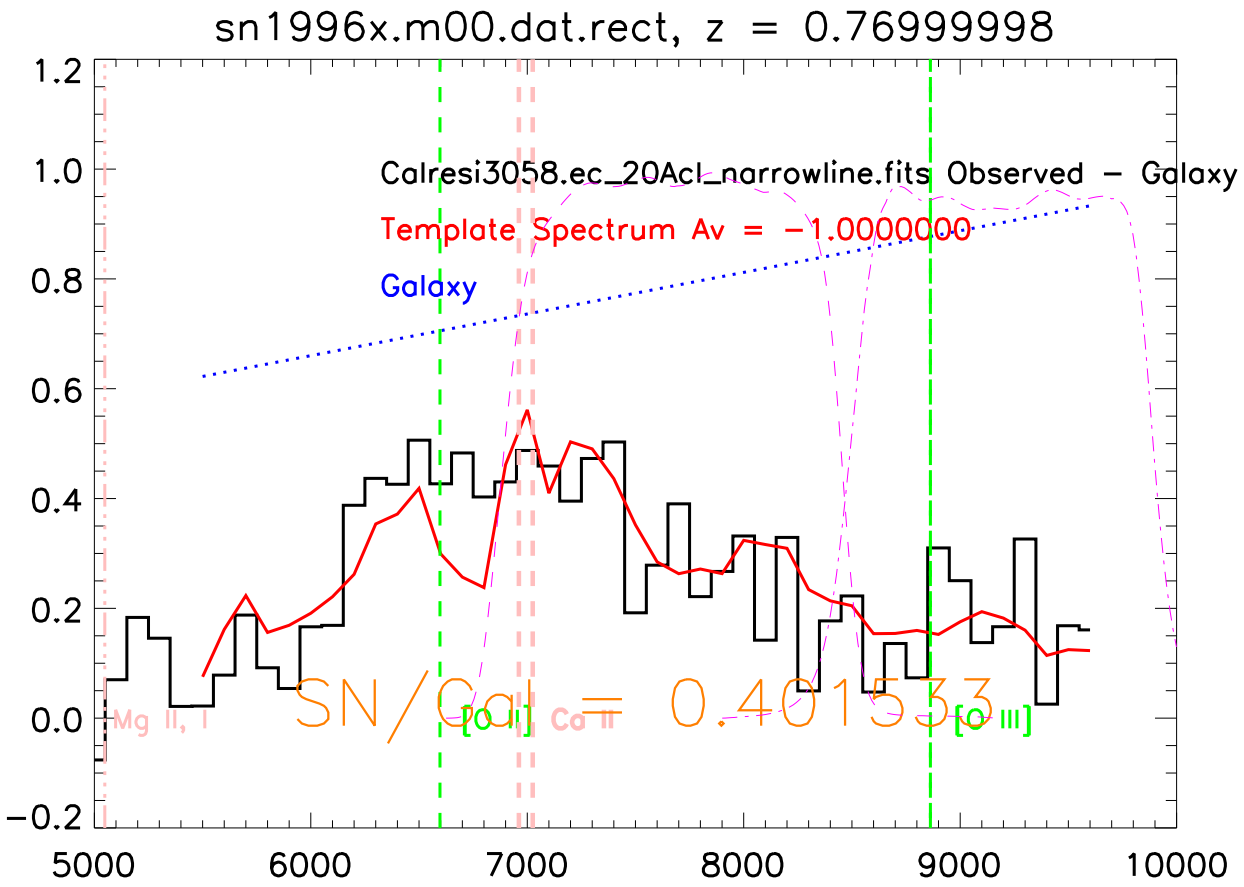

sn1998bu.m03.dat.rect, z = 0.74000001
Calresi3058.ec_20Aci_narrowline.fits Observed – Ga
Template Spectrum Av. = 1.0000000
Galaxy
SN/Gal = 0.0896502
[O II]
Ca II
[O III]
1.5
1.0
0.5
0.0
−0.5
−1.0
5000
6000
7000
8000
9000
10000

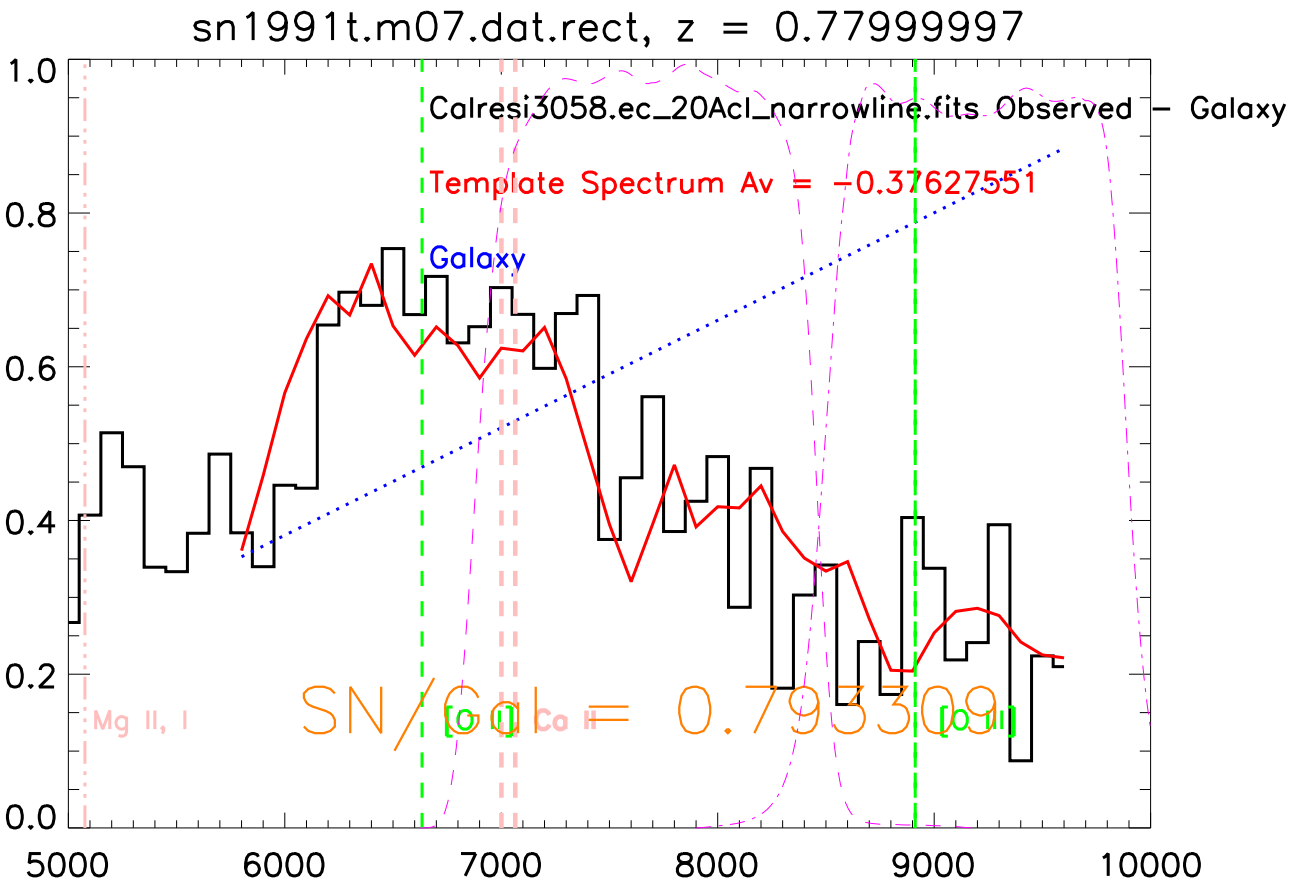

sn1992a.m01.dat.rect, z = 0.73000002
Calresi3058.ec_20Acl_narrowline.fits Observed – Gala
Template Spectrum Av = –1.0000000
Galaxy
SN/Gal = 0.0747755
[O II]
Ca II
[O III]
1.5
1.0
0.5
0.0
−0.5
−1.0
5000
6000
7000
8000
9000
10000

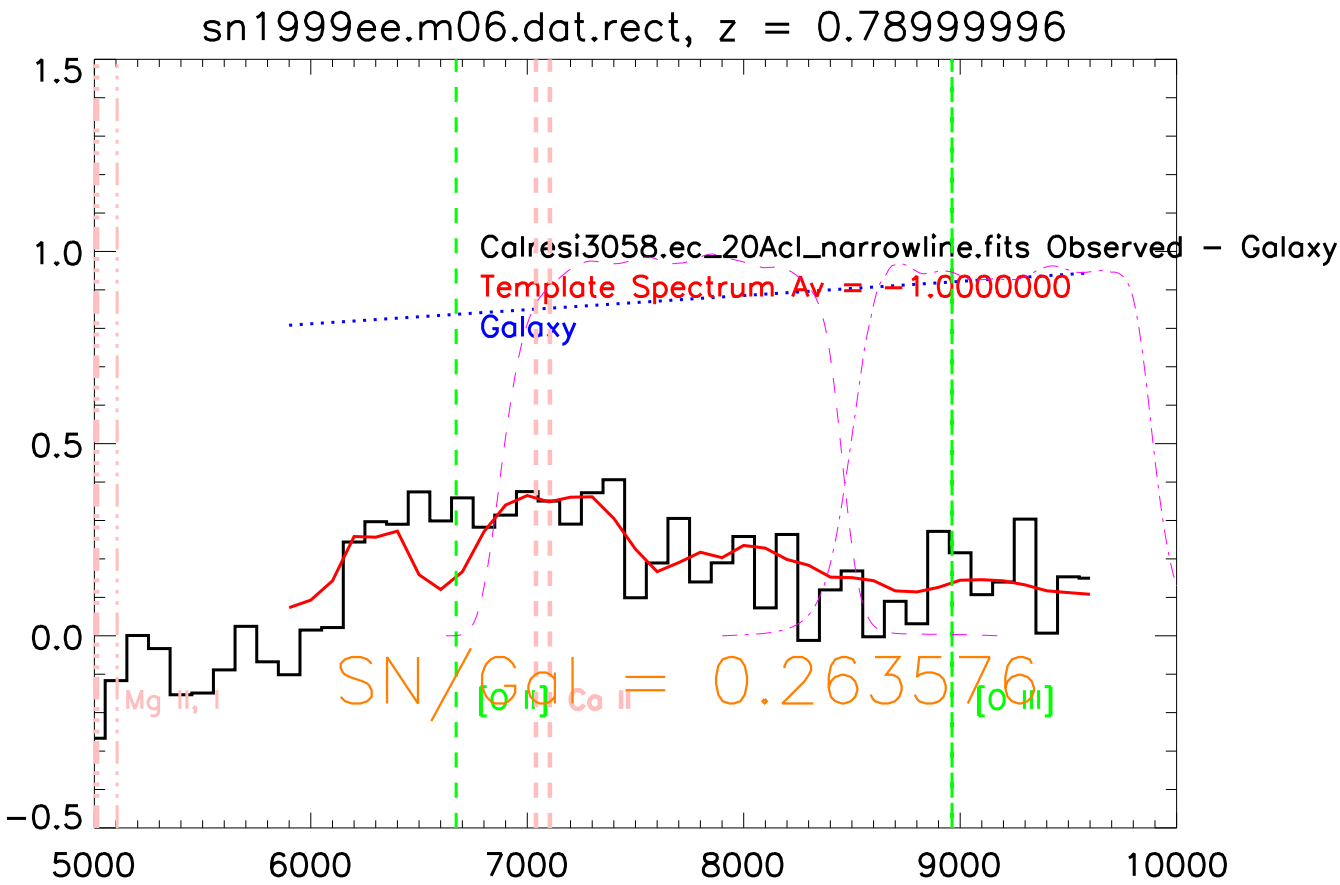

sn1996x.m02.dat.rect, z = 0.63000000
Calresi3058.ec_20Acl_narrowline.fits Observed – Gala
Template Spectrum Av = −1.0000000
Galaxy
SN/Gal = 0.0807140
[O II]
Ca II
[O III]
Mg II
H I
1.5
1.0
0.5
0.0
−0.5
5000
6000
7000
8000
9000
10000

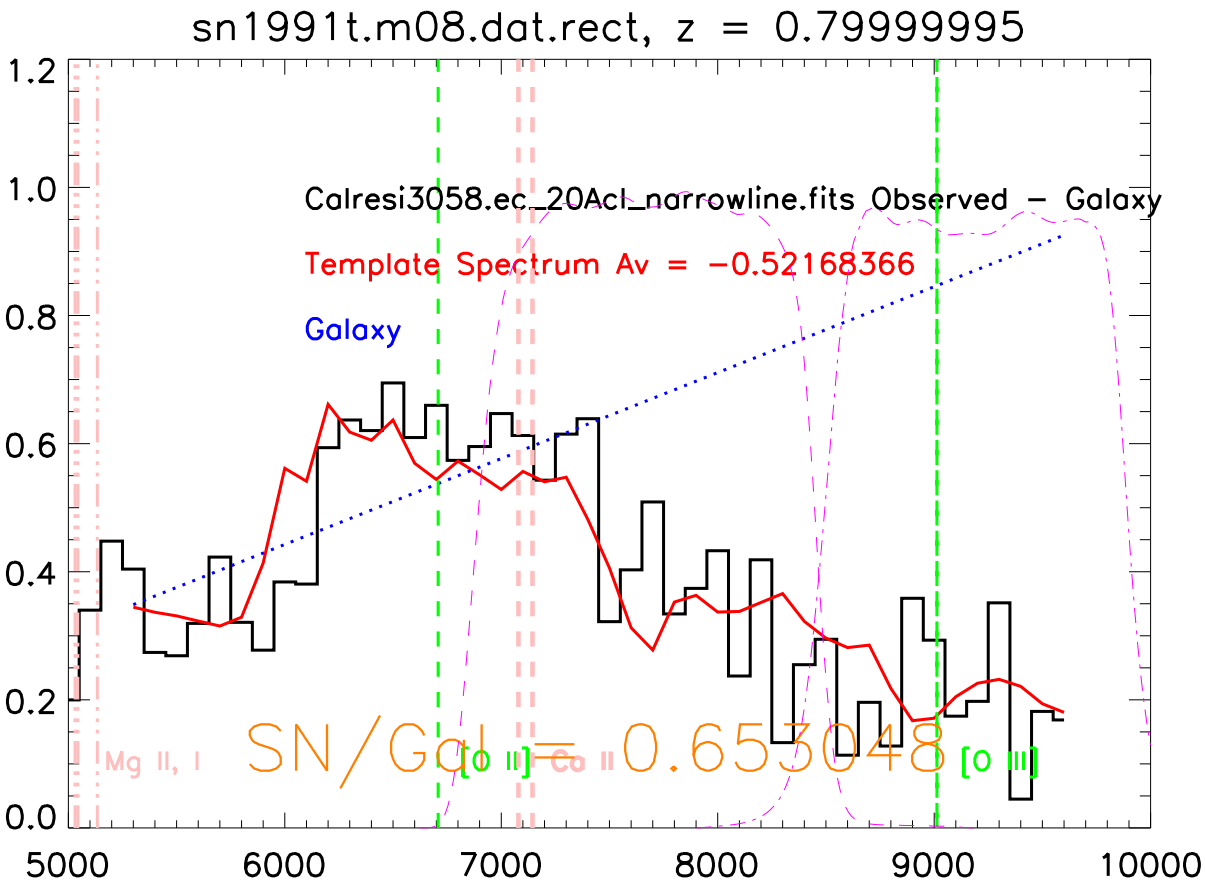

sn1994d.m08.dat.rect, z = 0.63999999
Calresi3058.ec_20Acl_narrowline.fits Observed − Gala
Template Spectrum Av = −0.23596939
Galaxy
SN/Gal = 0.0922611
[O II]
[O III]
1.5
1.0
0.5
0.0
−0.5
5000
6000
7000
8000
9000
10000

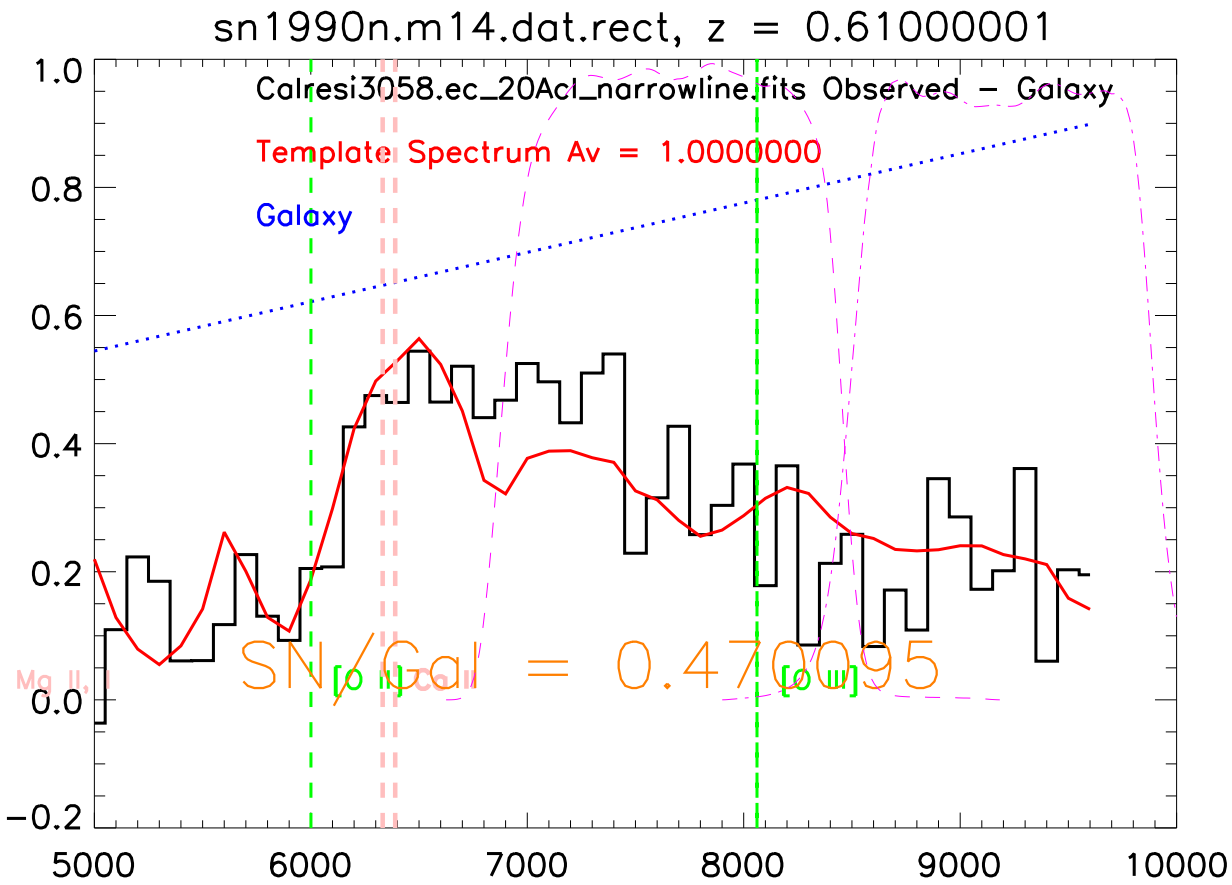

sn1991t.m00.dat.rect, z = 0.76999998
Calresi3058.ec_20Acl_narrowline.fits Observed − Galaxy
Template Spectrum Av = 0.12882655
Galaxy
SN/Gal = 0.642771
Mg II, I
[O II]
Ca II
[O III]
1.0
0.8
0.6
0.4
0.2
0.0
5000
6000
7000
8000
9000
10000

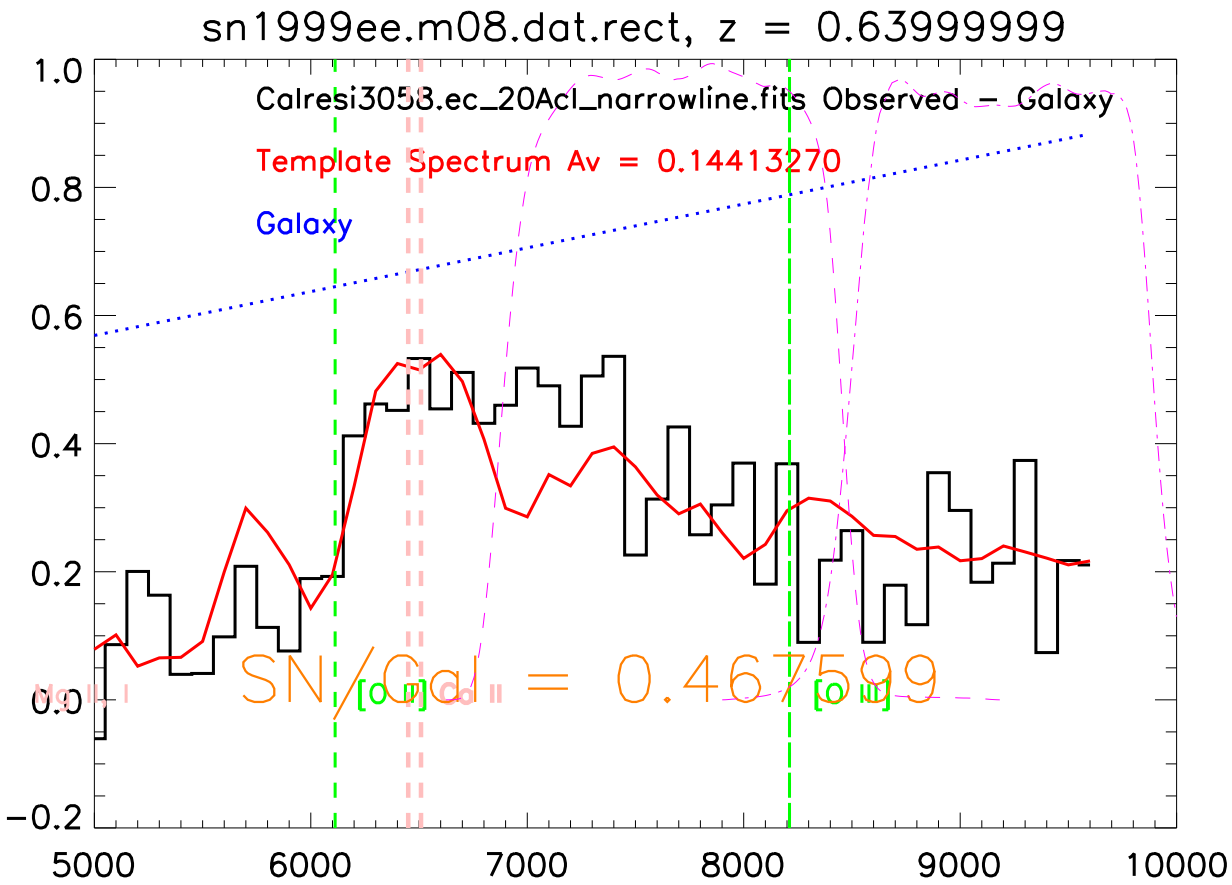

sn1996x.m00.dat.rect, z = 0.76999998
Calresi3058.ec_20Acl_narrowline.fits Observed − Galaxy
Template Spectrum Av = −1.0000000
Galaxy
SN/Gal = 0.401533
Mg II, I
[O II]
Ca II
[O III]
1.2
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
5000
6000
7000
8000
9000
10000

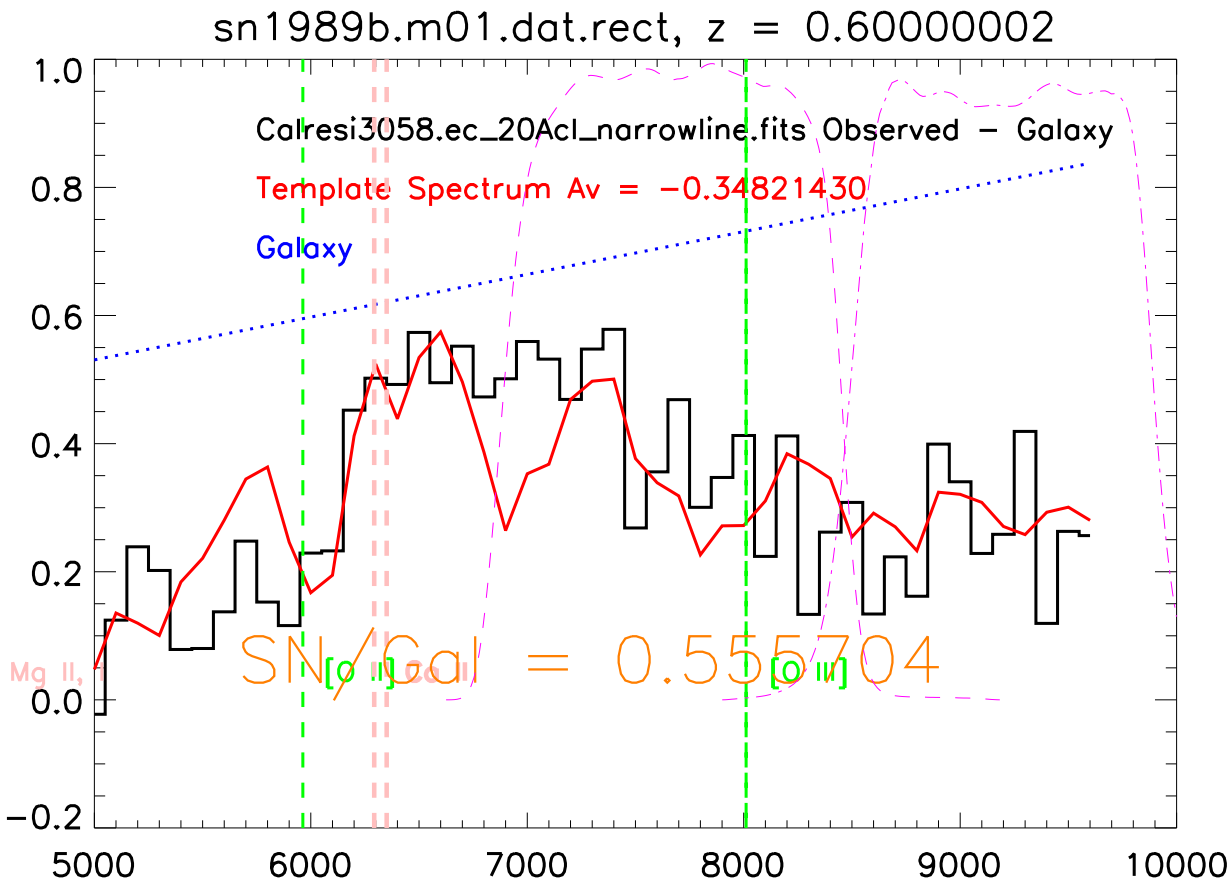

sn1991t.m07.dat.rect, z = 0.77999997
Calresi3058.ec_20Acl_narrowline.fits Observed
Galaxy
Template Spectrum Av = -0.37627551
Galaxy
SN/Gal = 0.793309
Mg II, I
[O II]
Ca II
[O III]
1.0
0.8
0.6
0.4
0.2
0.0
5000
6000
7000
8000
9000
10000

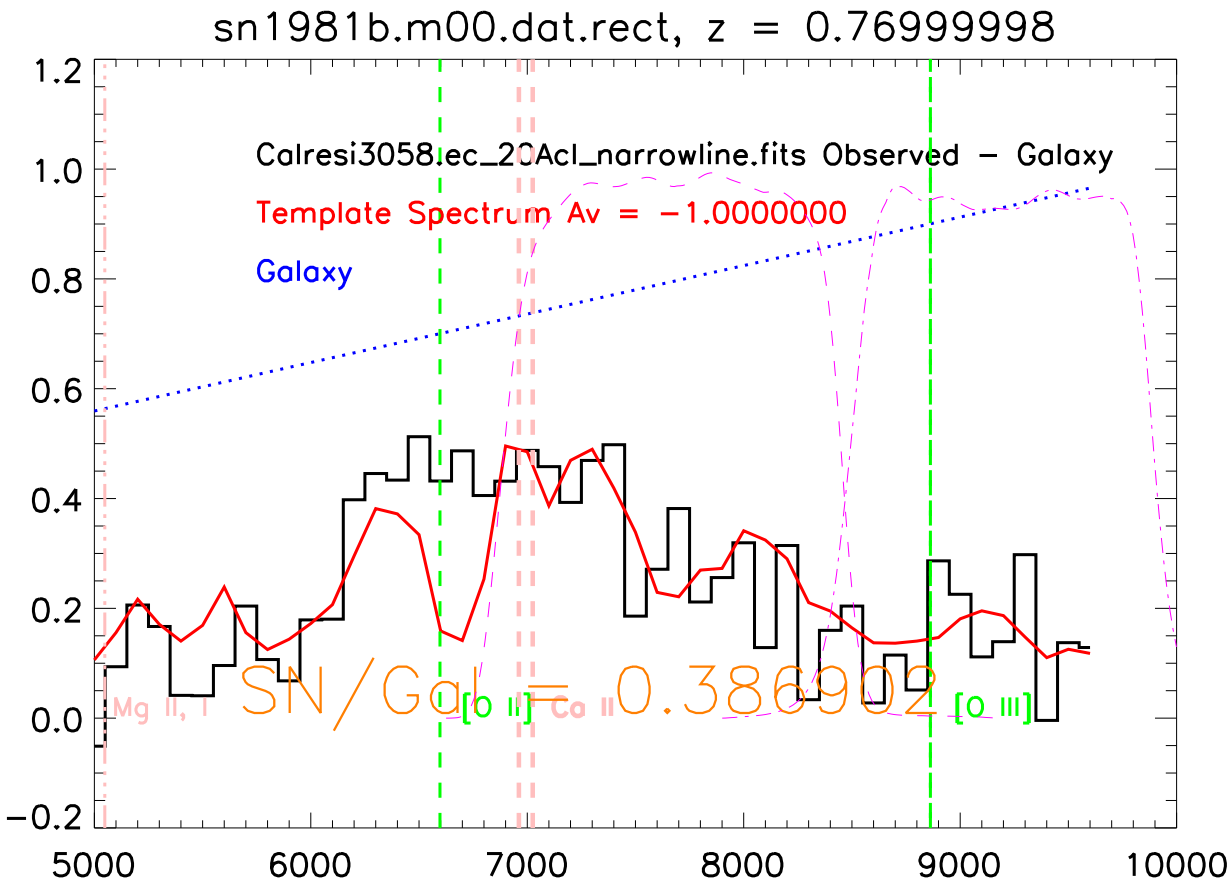

sn1999ee.m06.dat.rect, z = 0.78999996
Calresi3058.ec_20Acl_narrowline.fits Observed − Galaxy
Template Spectrum Av = 1.0000000
Galaxy
SN/Gal = 0.263576
Mg II, I
[O II]
Ca II
[O III]
1.5
1.0
0.5
0.0
−0.5
5000
6000
7000
8000
9000
10000

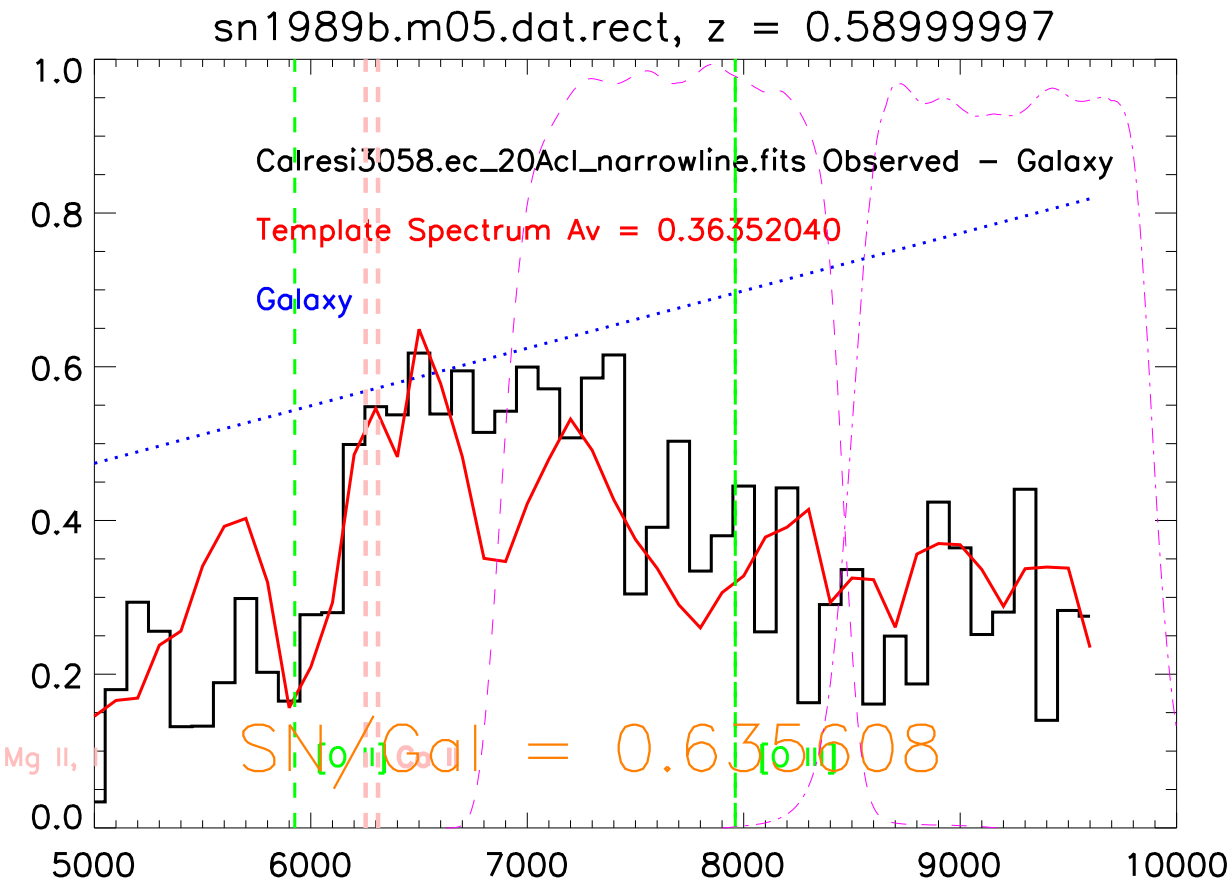

sn1991t.m08.dat.rect, z = 0.79999995
Calresi3058.ec_20Acl_narrowline.fits Observed – Galaxy
Template Spectrum Av = −0.52168366
Galaxy
SN/Gal = 0.653048
Mg II, I
[O II]
Ca II
[O III]
1.2
1.0
0.8
0.6
0.4
0.2
0.0
5000
6000
7000
8000
9000
10000

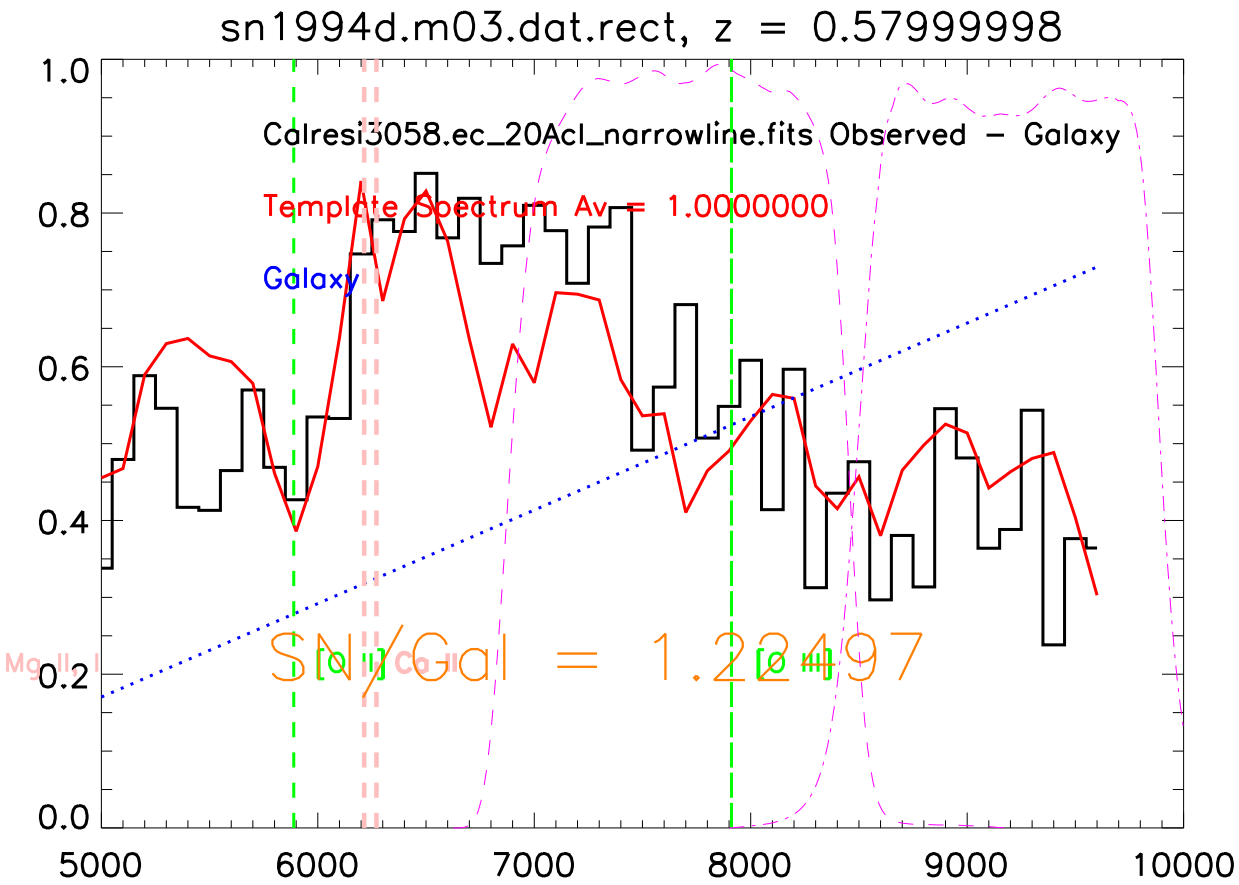

sn1990n.m14.dat.rect, z = 0.61000001
Calresi3058.ec_20Acl_narrowline.fits Observed − Galaxy
Template Spectrum Av = 1.0000000
Galaxy
SN/Gal = 0.4700095
[O II]
[O III]
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
5000
6000
7000
8000
9000
10000


sn1999ee.m08.dat.rect, z = 0.63999999
Calresi3058.ec_20Acl_narrowline.fits Observed – Galaxy
Template Spectrum Av = 0.14413270
Galaxy
SN/Gal = 0.467599
[O II]
[O III]
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
5000
6000
7000
8000
9000
10000


sn1989b.m01.dat.rect, z = 0.60000002
Calresi3058.ec_20Acl_narrowline.fits Observed − Galaxy
Template Spectrum Av = −0.34821430
Galaxy
SN/Gal = 0.555704
[O II]
[O II]
Mg II,
H I
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
5000
6000
7000
8000
9000
10000


sn1981b.m00.dat.rect, z = 0.76999998
Calresi3058.ec_20Acl_narrowline.fits Observed − Galaxy
Template Spectrum Av = −1.0000000
Galaxy
SN/Gal = 0.386902
[O II]
Ca II
[O III]
1.2
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
5000
6000
7000
8000
9000
10000


sn1989b.m05.dat.rect, z = 0.58999997
Calresi3058.ec_20Acl_narrowline.fits Observed – Galaxy
Template Spectrum Av = 0.36352040
Galaxy
SN/Gal = 0.635608
[O II]
[O II]
1.0
0.8
0.6
0.4
0.2
0.0
5000
6000
7000
8000
9000
10000


sn1994d.m03.dat.rect, z = 0.57999998
Calresi3058.ec_20Acl_narrowline.fits Observed – Galaxy
Template Spectrum Av = 1.0000000
Galaxy
S/N/Gal = 1.22497
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0.8
0.6
0.4
0.2
0.0
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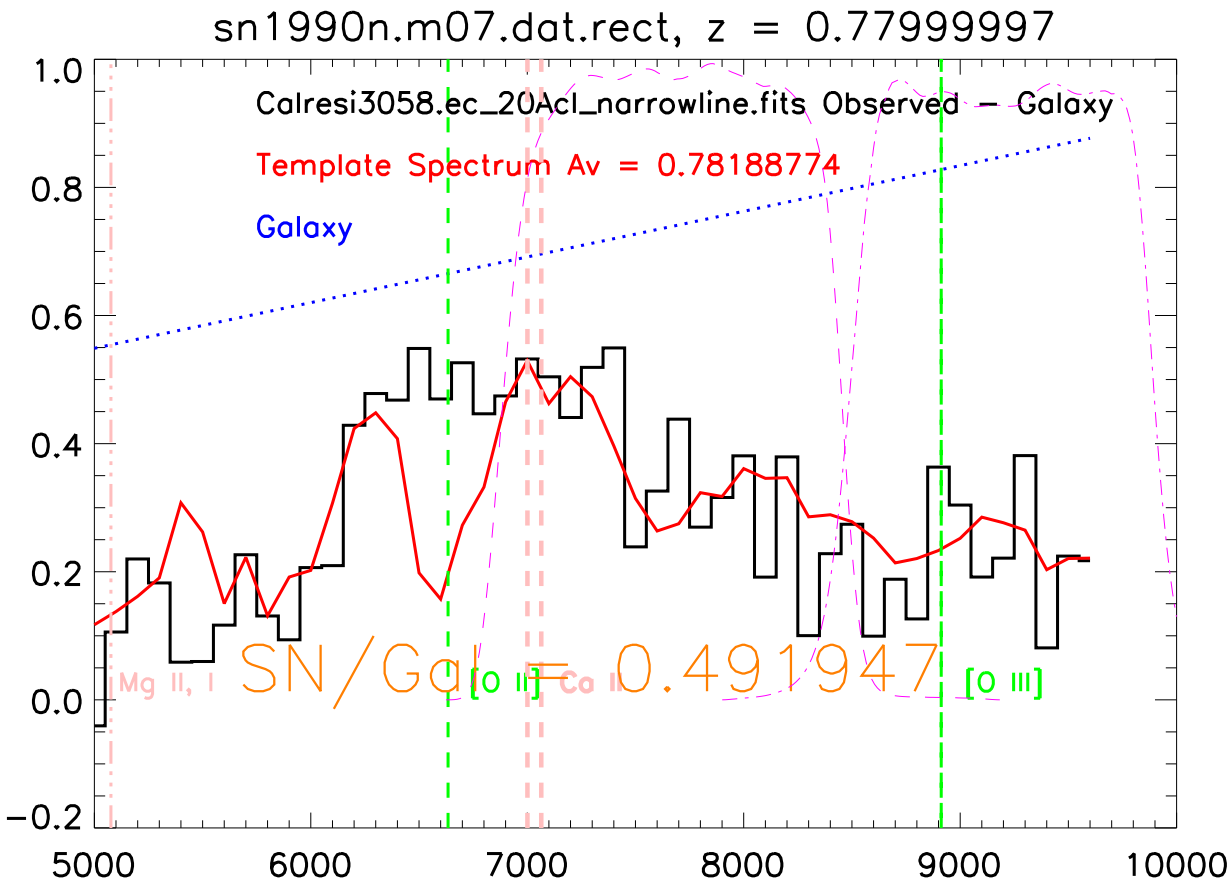
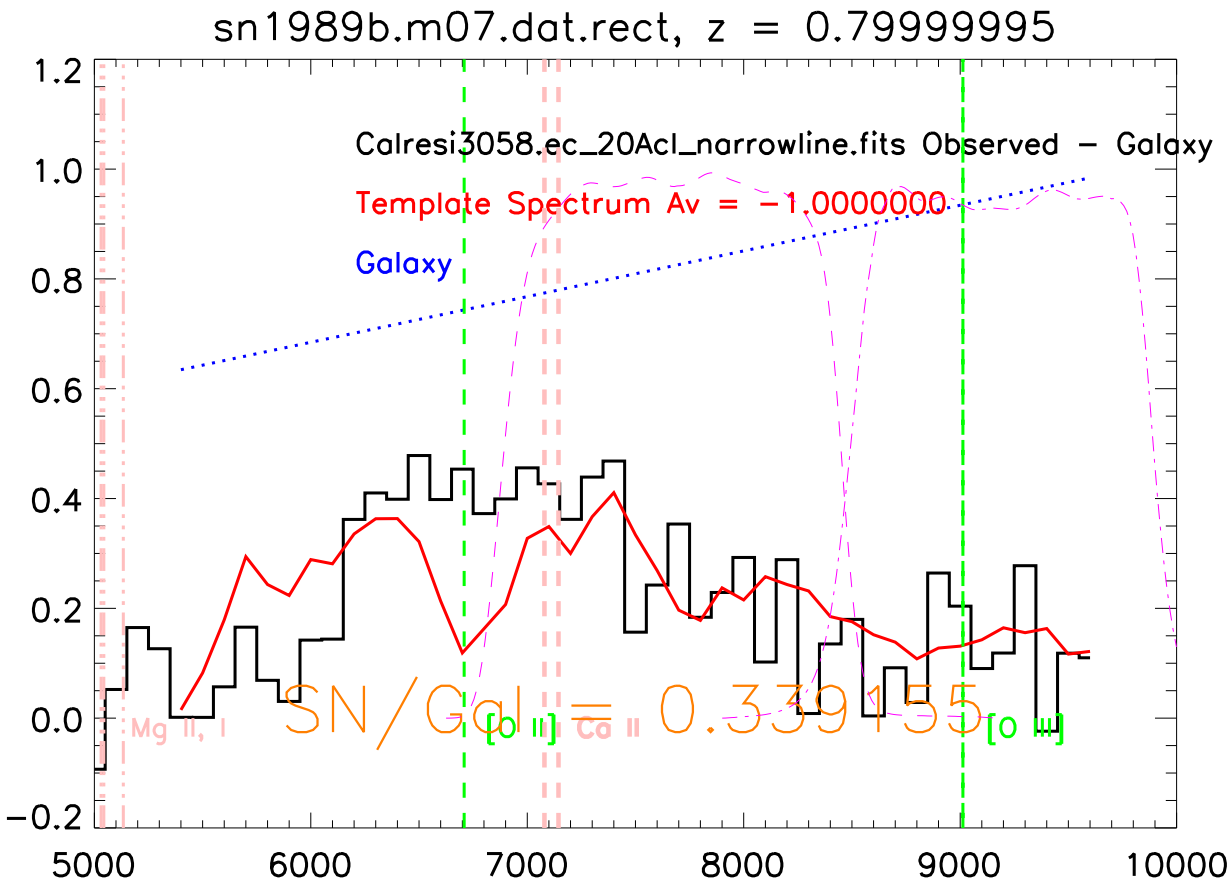
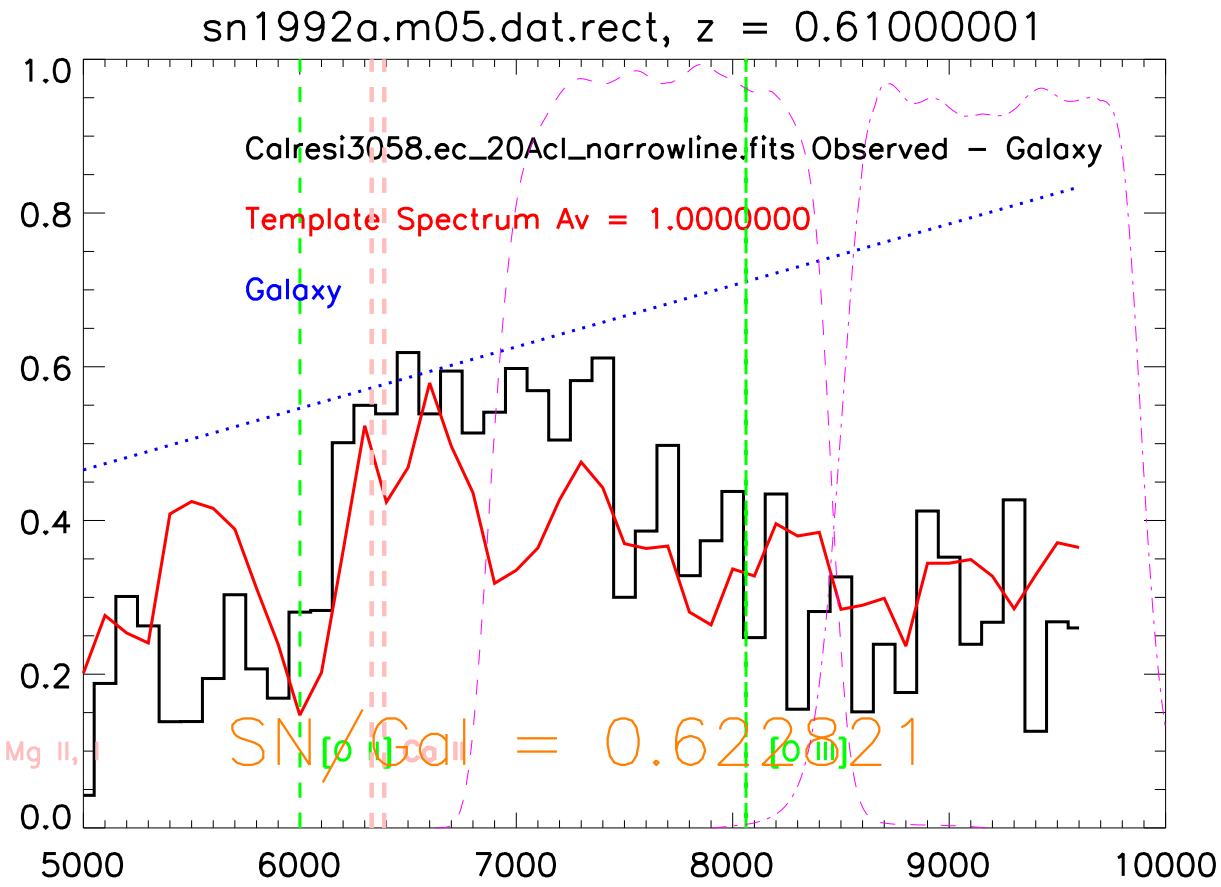
6000
7000
8000
9000
10000


sn1990n.m07.dat.rect, z = 0.77999997
Calresi3058.ec_20Acl_narrowline.fits Observed − Galaxy
Template Spectrum Av = 0.78188774
Galaxy
SN/Gal = 0.491947
[Mg II, I
[O II]
Ca II
[O III]
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
5000
6000
7000
8000
9000
10000


sn1989b.m07.dat.rect, z = 0.79999995
Calresi3058.ec_20Acl_narrowline.fits Observed − Galaxy
Template Spectrum Av = −1.0000000
Galaxy
SN/Gal = 0.339155
Mg II, I
[O II]
Ca II
[O III]
1.2
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
5000
6000
7000
8000
9000
10000


sn1992a.m05.dat.rect, z = 0.61000001
Calresi3058.ec_20Acl_narrowline.fits Observed – Galaxy
Template Spectrum Av = 1.0000000
Galaxy
SN/Gal = 0.622821
[O II]
[O III]
1.0
0.8
0.6
0.4
0.2
0.0
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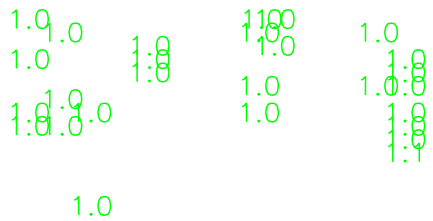
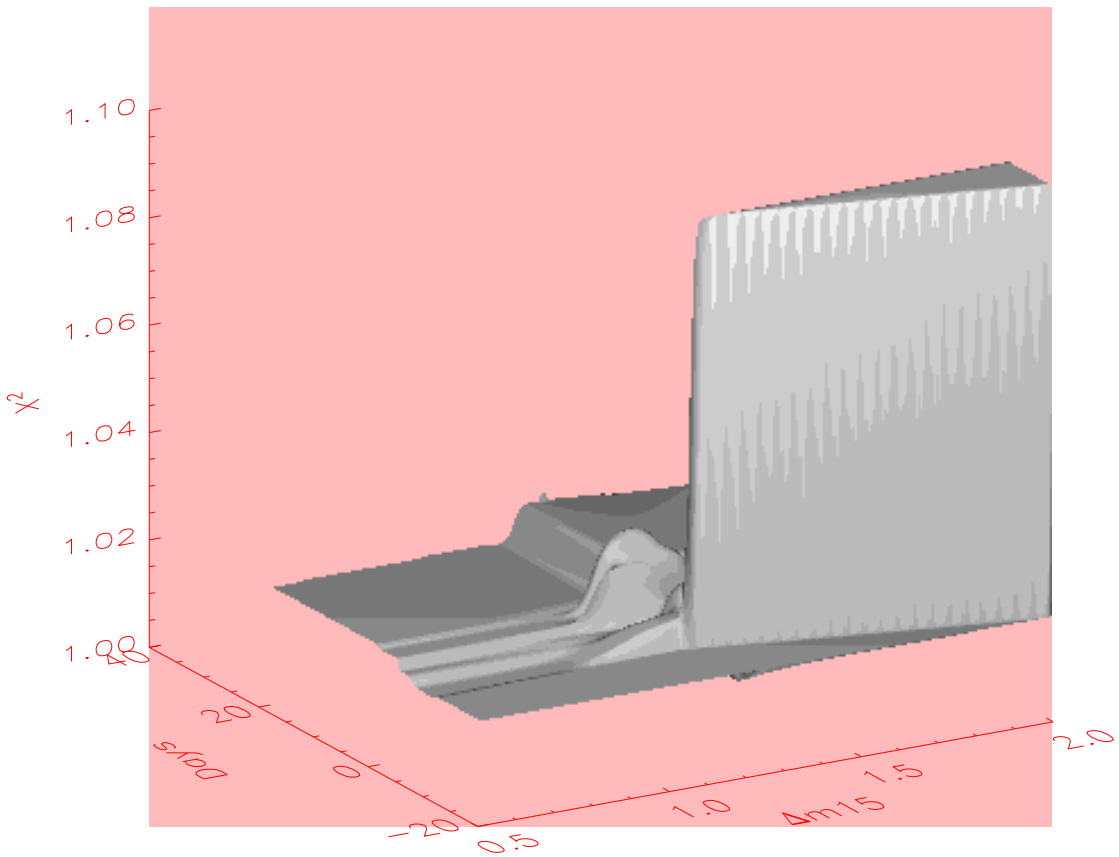
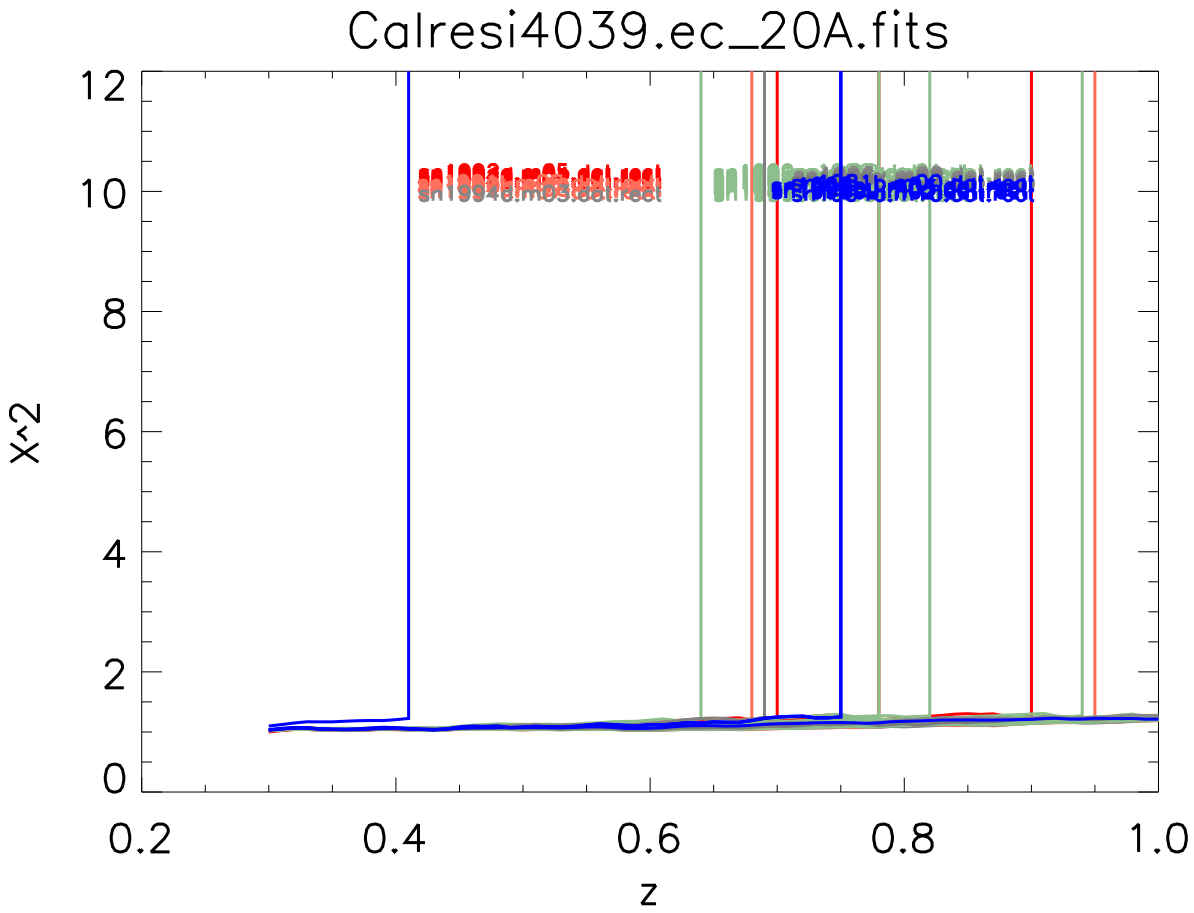
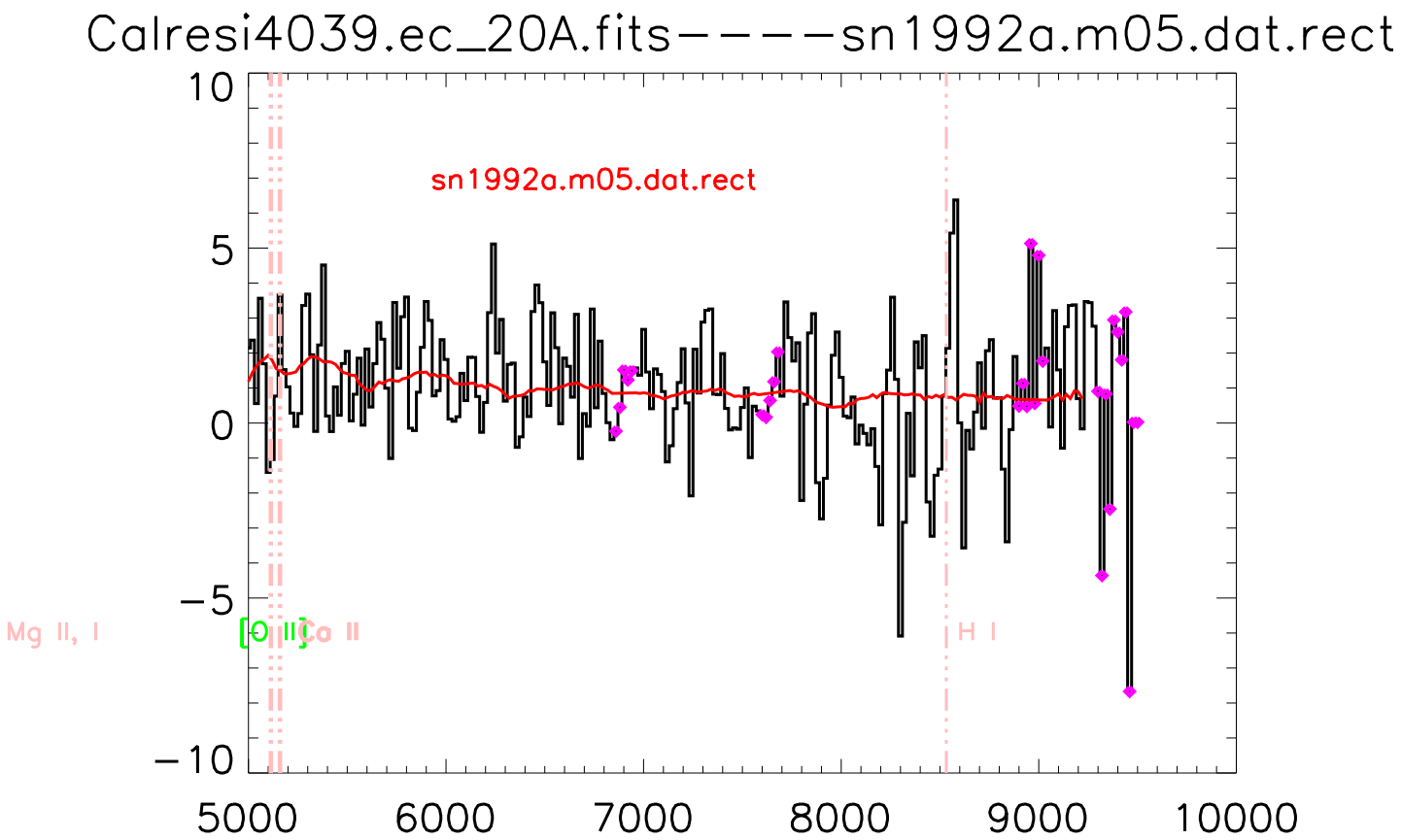
6000
7000
8000
9000
10000

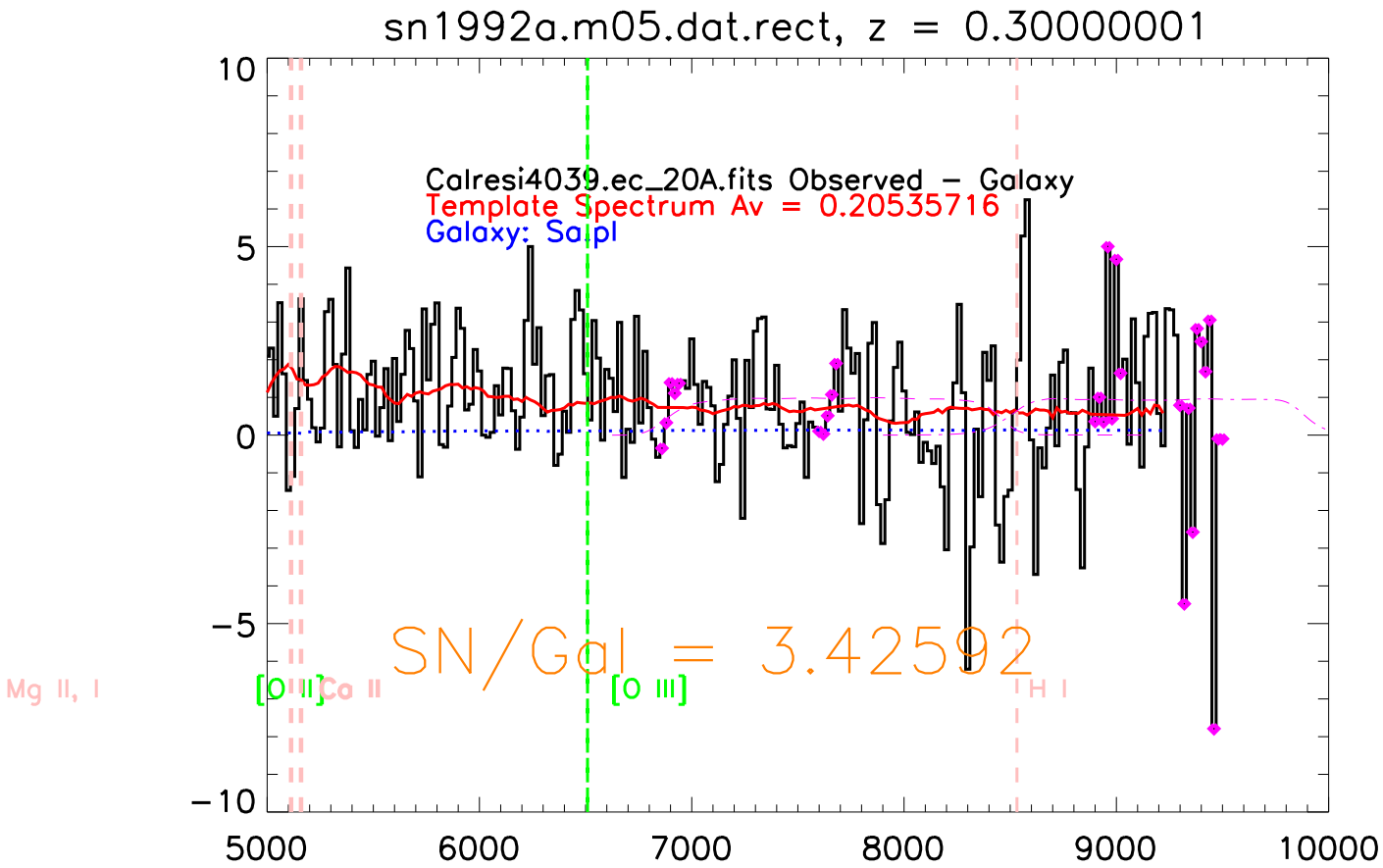

1.0
1.0
1.0

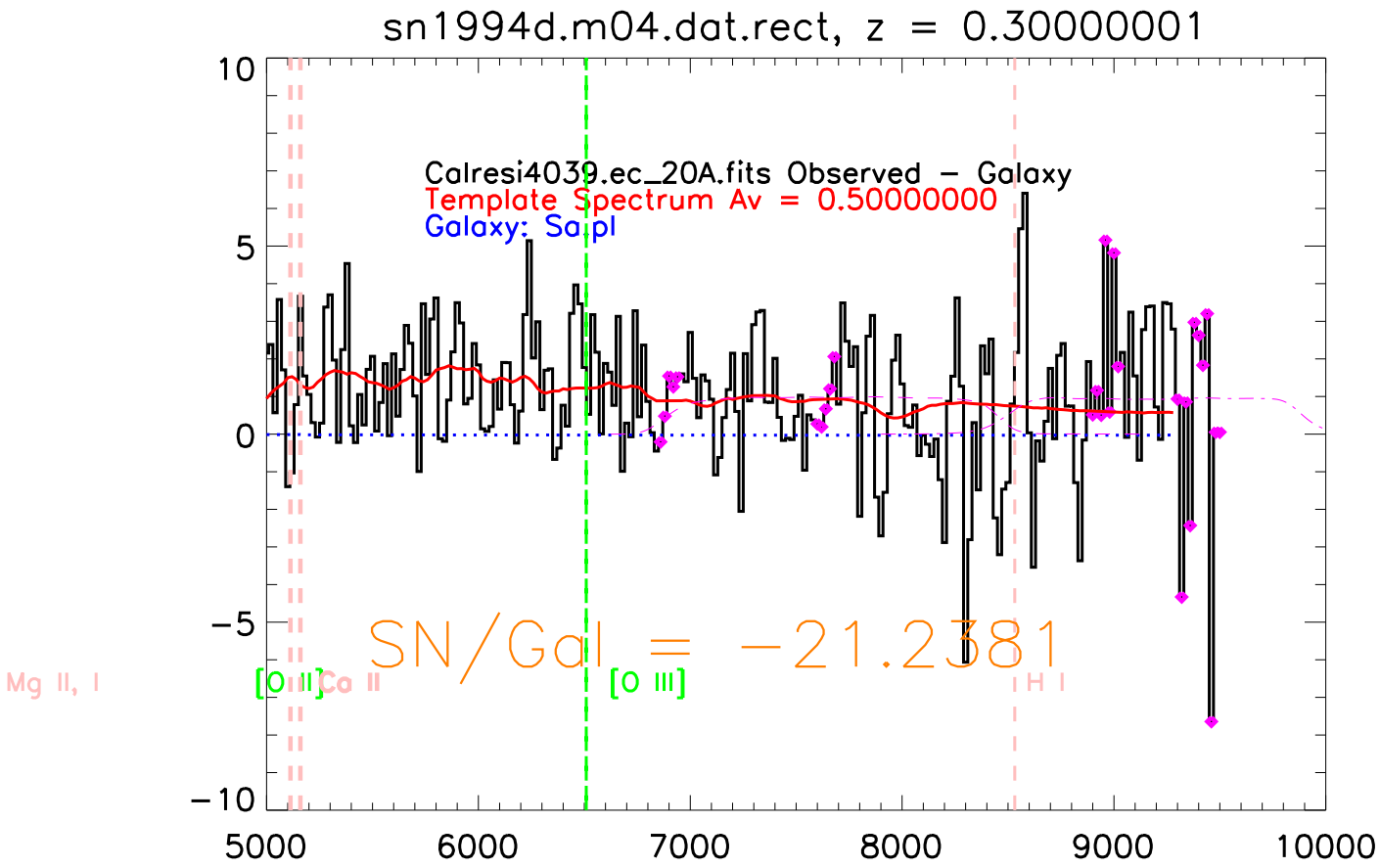


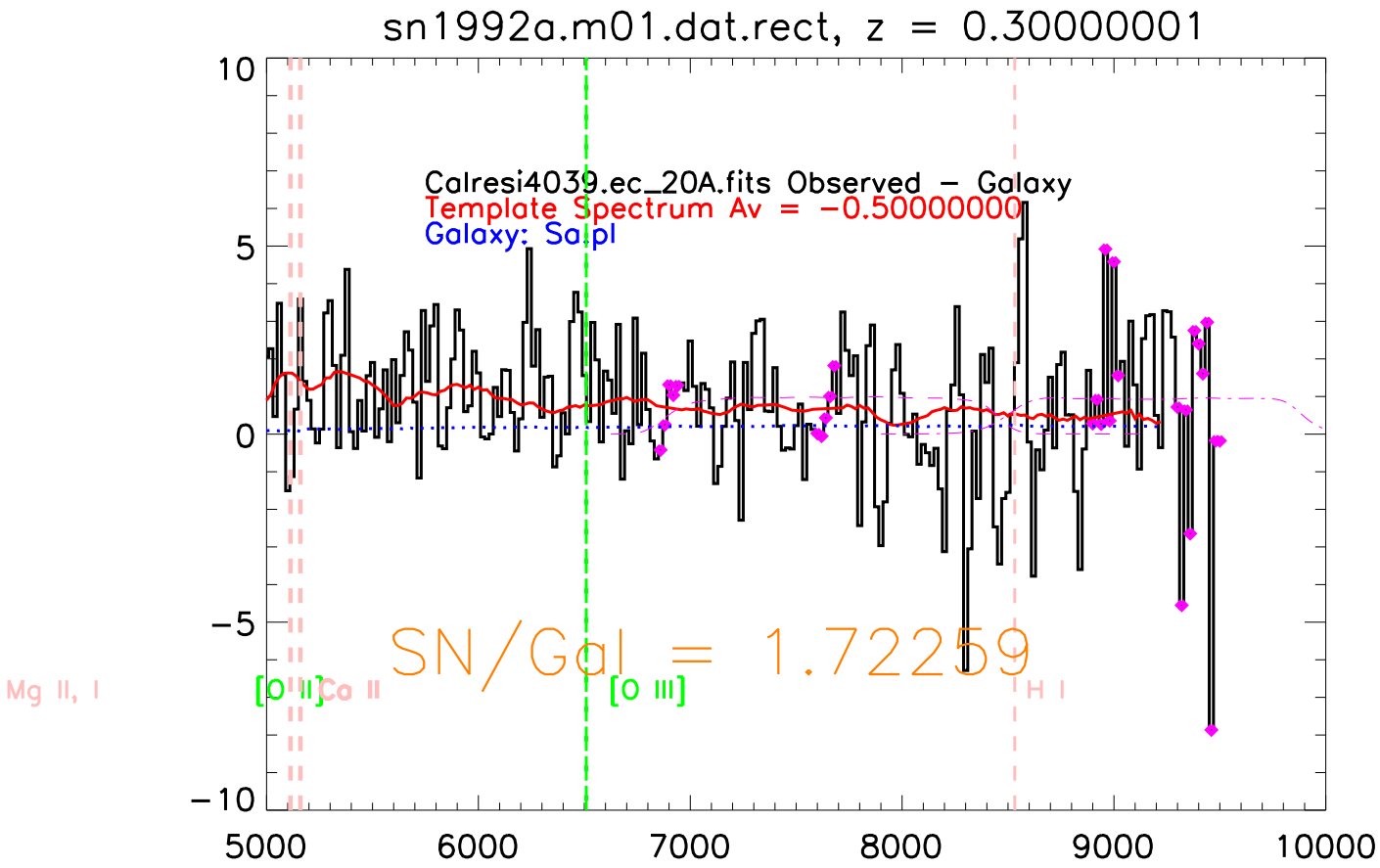
1.10
1.08
1.06
1.04
1.02
1.00
χ^2
40
20
0
−20
Days
0.5
1.0
1.5
2.0
Δm15

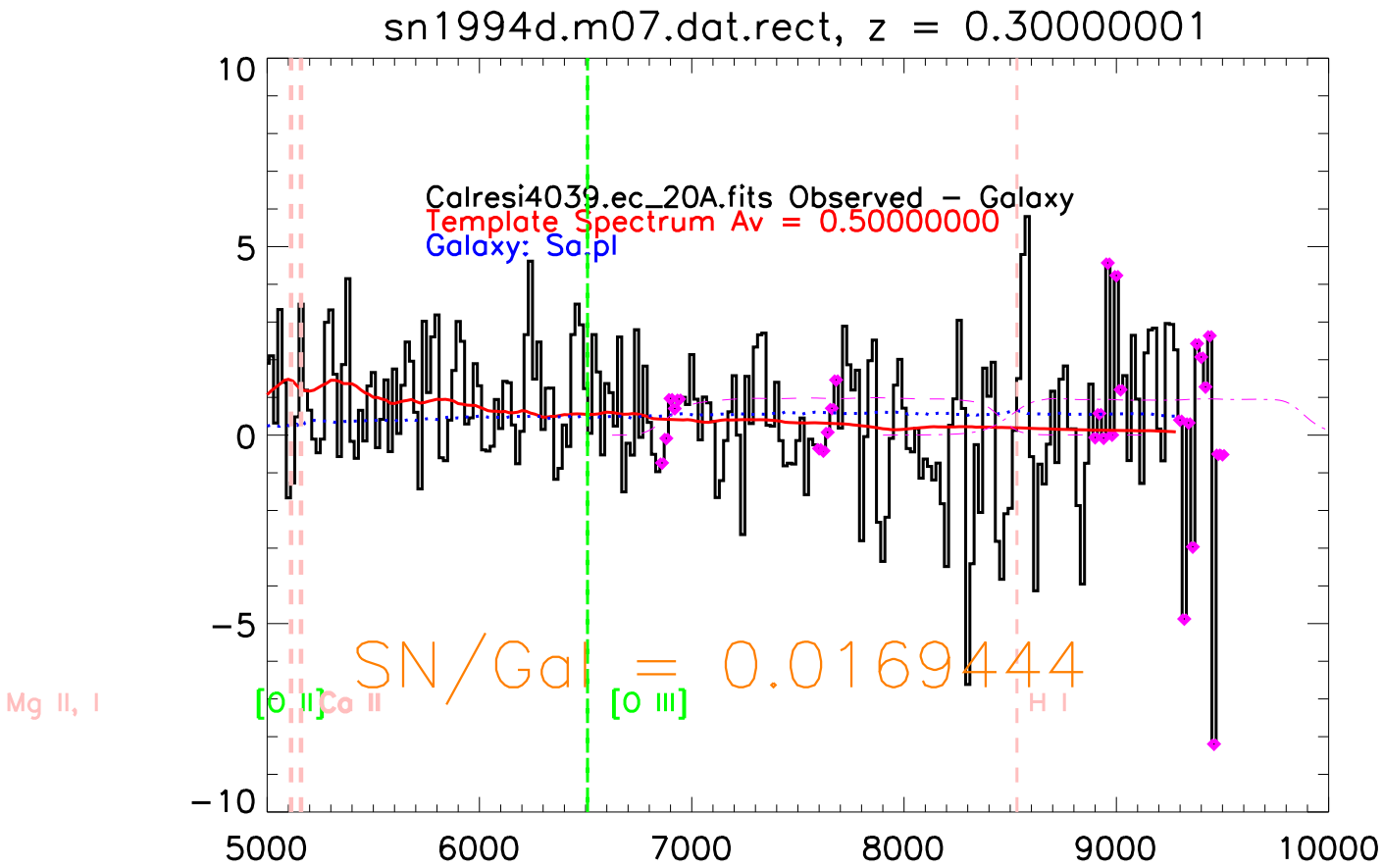

Calresi4039.ec_20A.fits
X^2
z
0
2
4
6
8
10
12
0.2
0.4
0.6
0.8
1.0

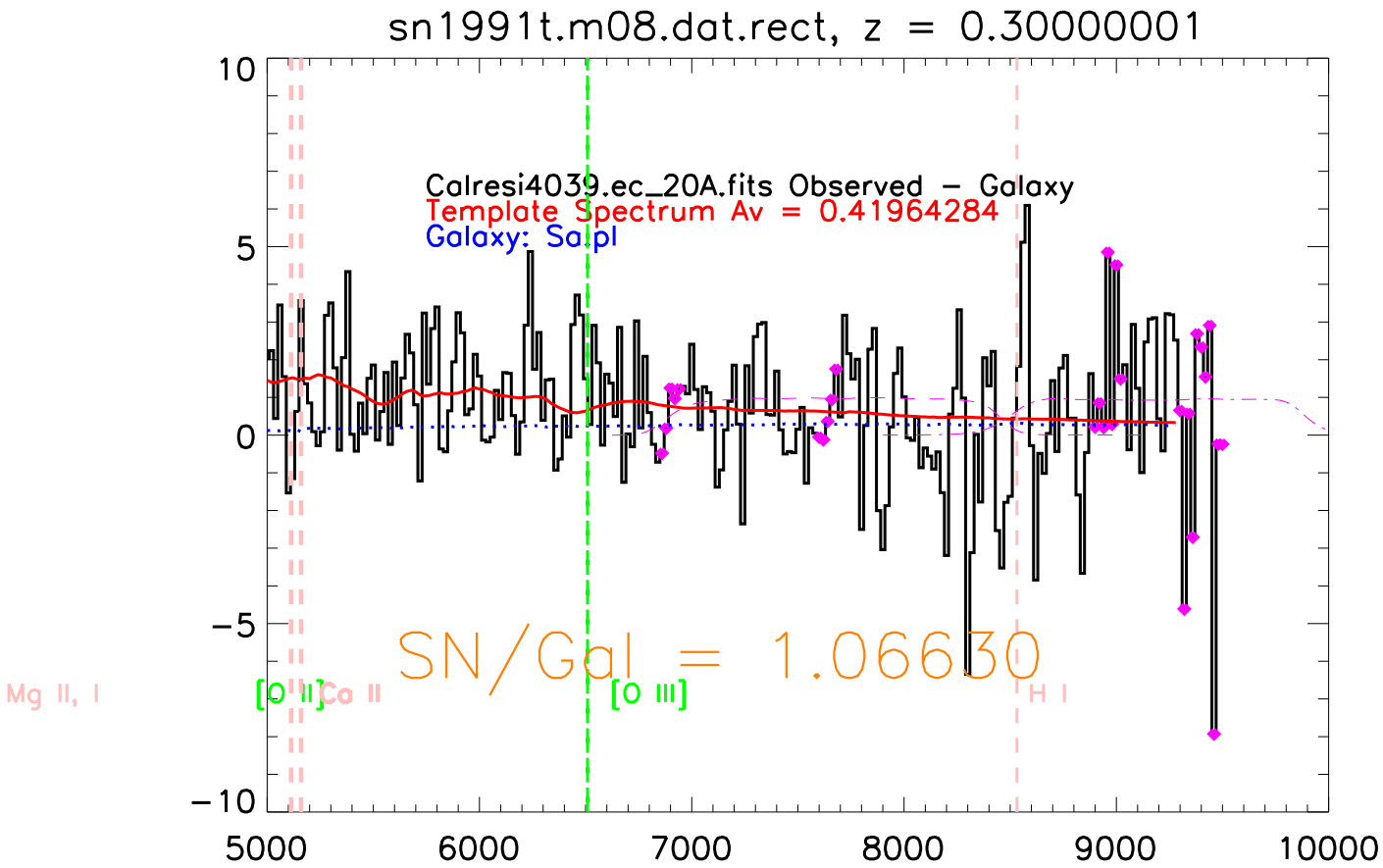

Calresi4039.ec_20A.fits----sn1992a.m05.dat.rect
sn1992a.m05.dat.rect
10
5
0
−5
−10
5000
6000
7000
8000
9000
10000
Mg II, I
[O II]
Ca II
H I

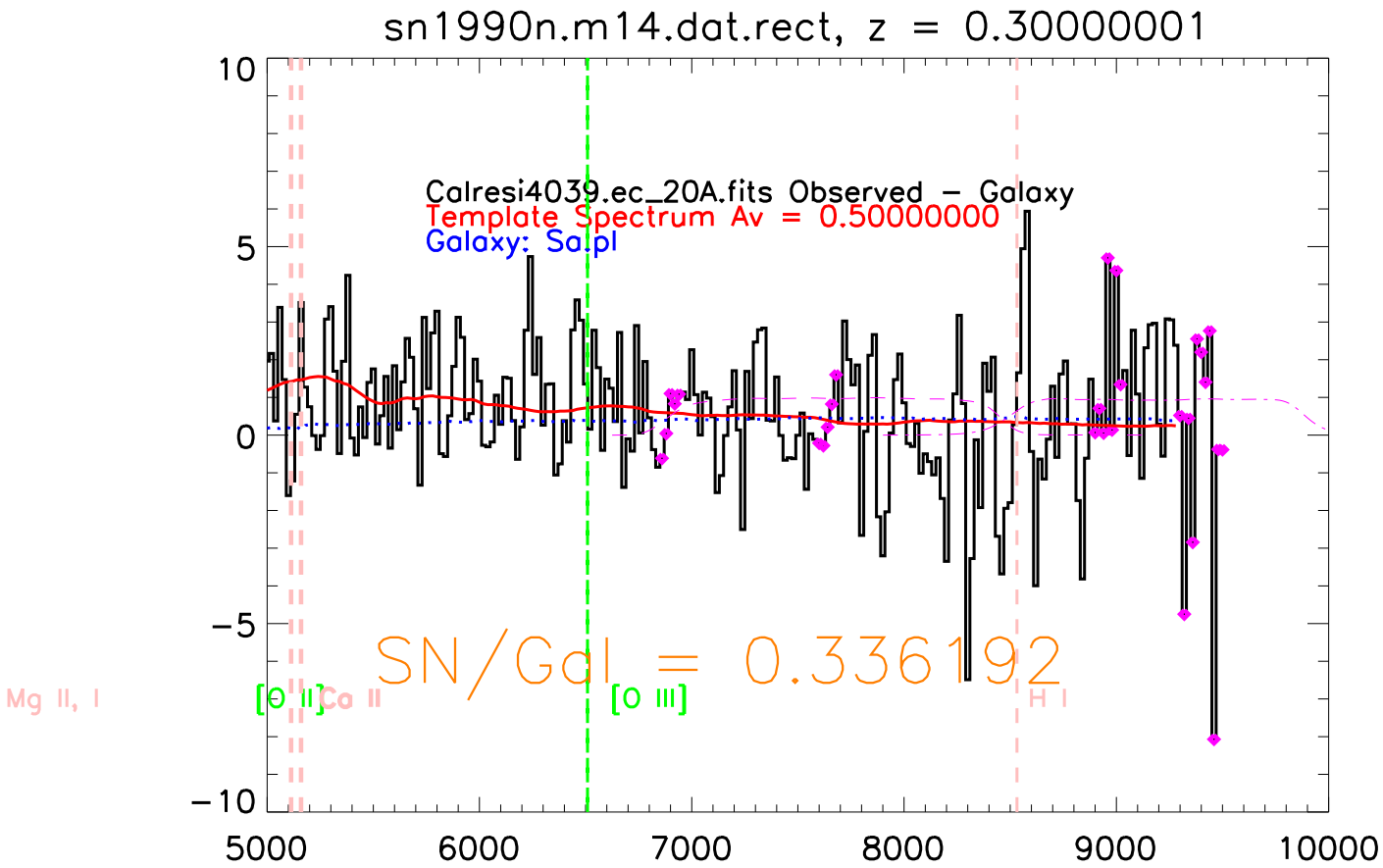

sn1992a.m05.dat.rect, z = 0.30000001
Calresi4039.ec_20A.fits Observed − Galaxy
Template Spectrum Av = 0.20535716
Galaxy: Sa.pl
SN/Gal = 3.42592
Mg II, I
[O II]
Ca II
[O III]
H I
10
5
0
−5
−10
5000
6000
7000
8000
9000
10000

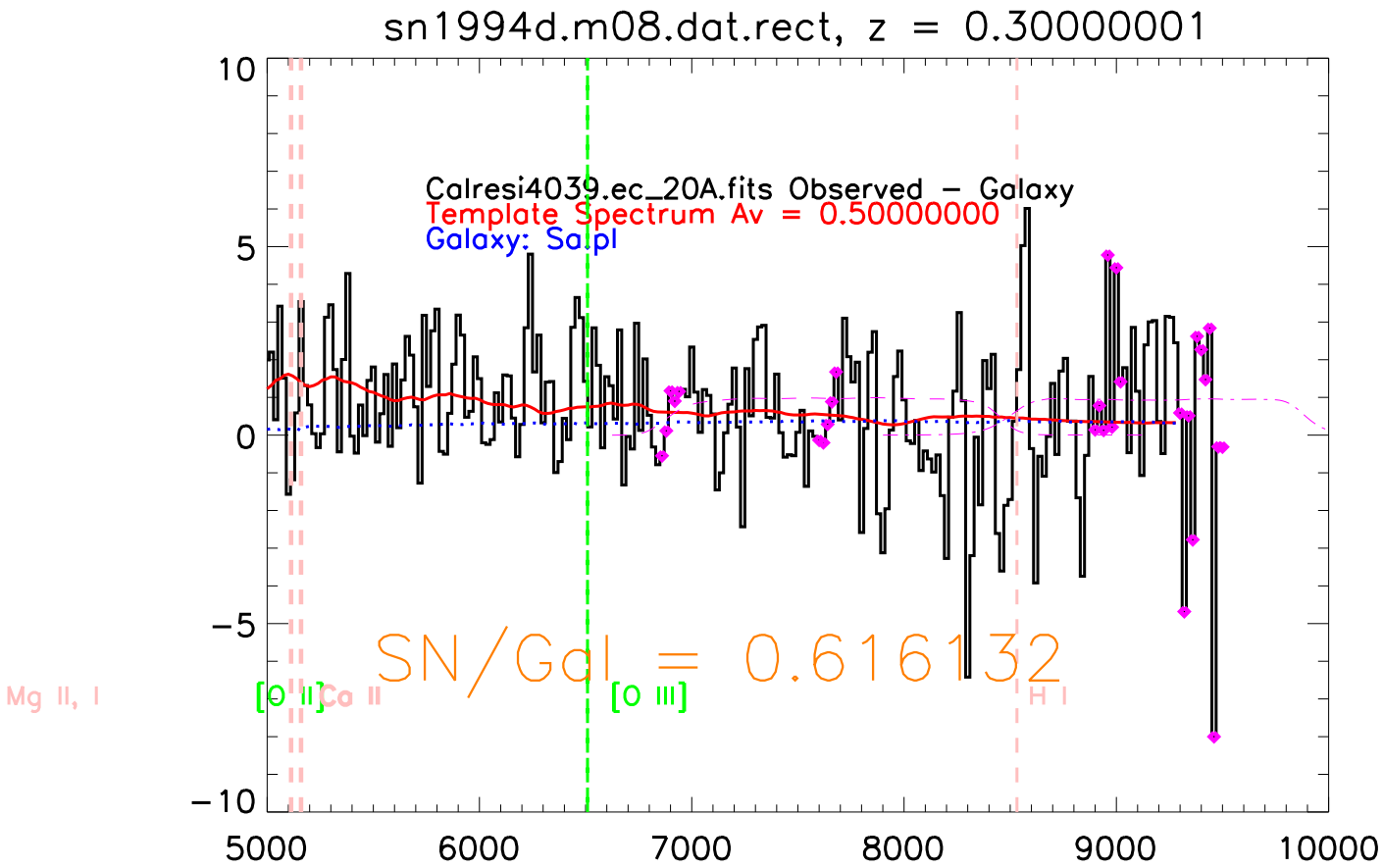

sn1994d.m04.dat.rect, z = 0.30000001
Calresi4039.ec_20A.fits Observed − Galaxy
Template Spectrum Av = 0.50000000
Galaxy: Sa pl
SN/Gal = −21.2381
Mg II, I
[O II]
Ca II
[O III]
H I
10
5
0
−5
−10
5000
6000
7000
8000
9000
10000

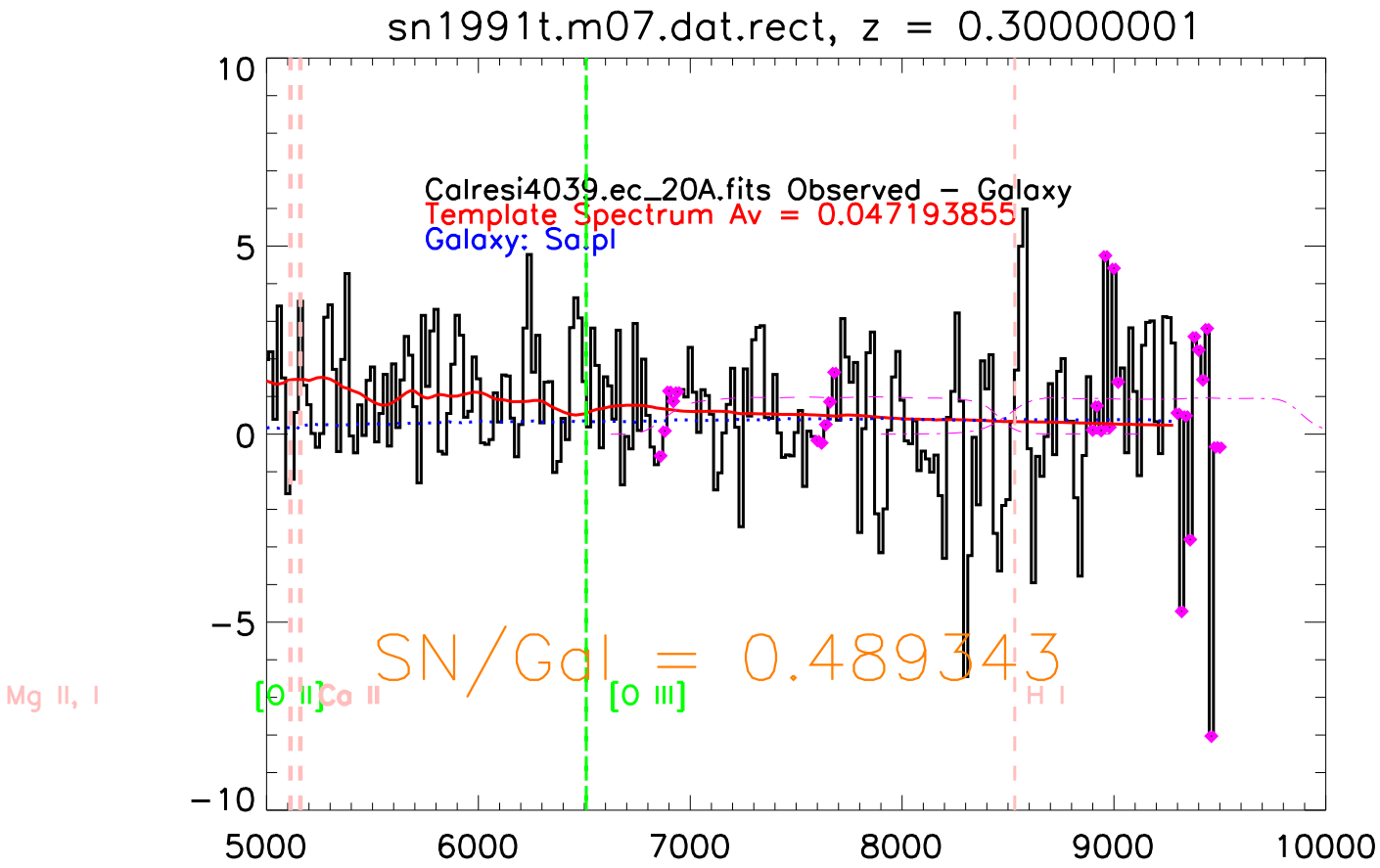

sn1992a.m01.dat.rect, z = 0.30000001
Calresi4039.ec_20A.fits Observed − Galaxy
Template Spectrum Av = −0.50000000
Galaxy: Sa.pl
SN/Gal = 1.72259
Mg II, I
[O II]
Ca II
[O III]
H I
10
5
0
−5
−10
5000
6000
7000
8000
9000
10000

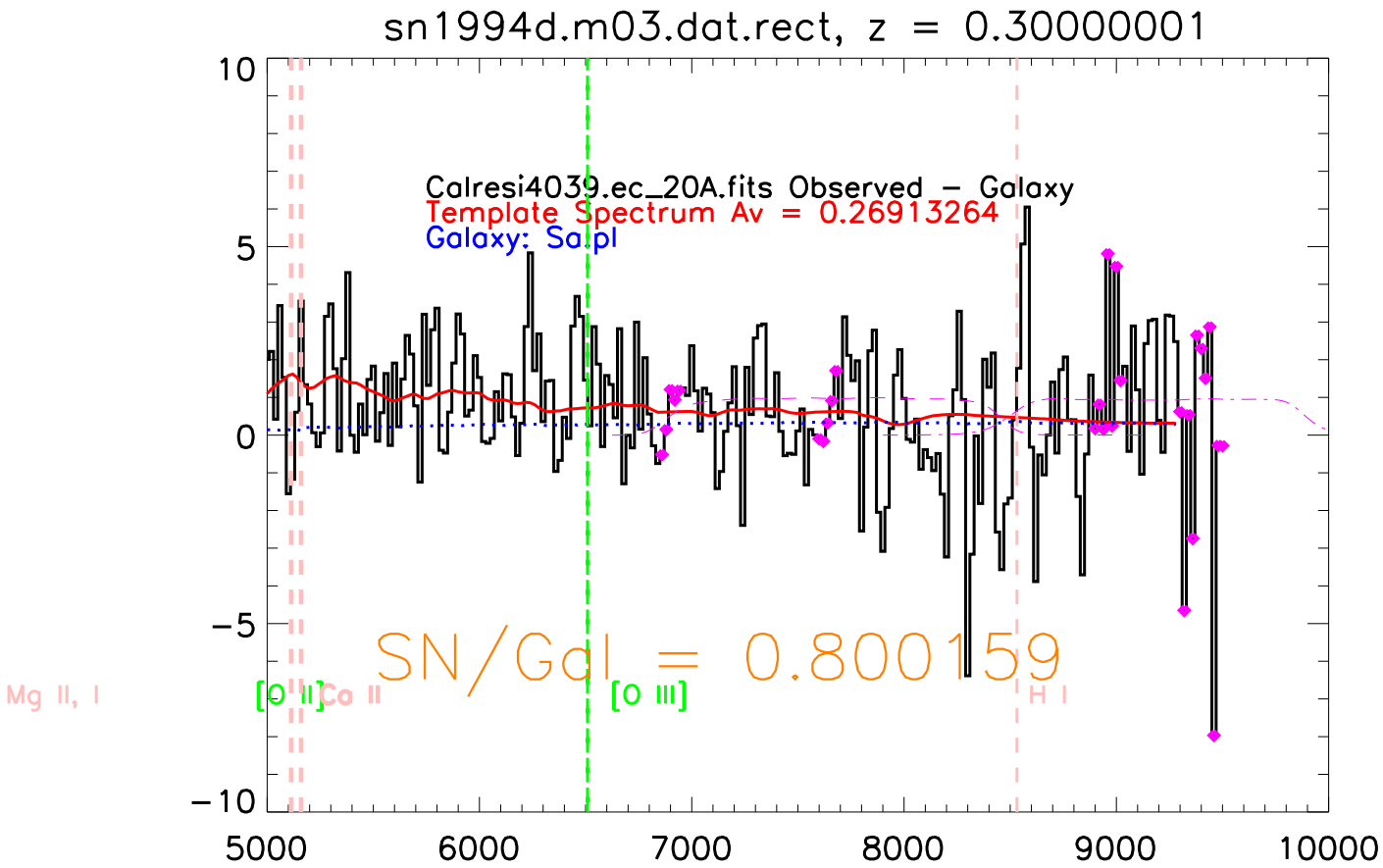

sn1994d.m07.dat.rect, z = 0.30000001
Calresi4039.ec_20A.fits Observed − Galaxy
Template Spectrum Av = 0.50000000
Galaxy: Sa.pl
SN/Gal = 0.0169444
Mg II, I
[O II]
Ca II
[O III]
H I
10
5
0
−5
−10
5000
6000
7000
8000
9000
10000

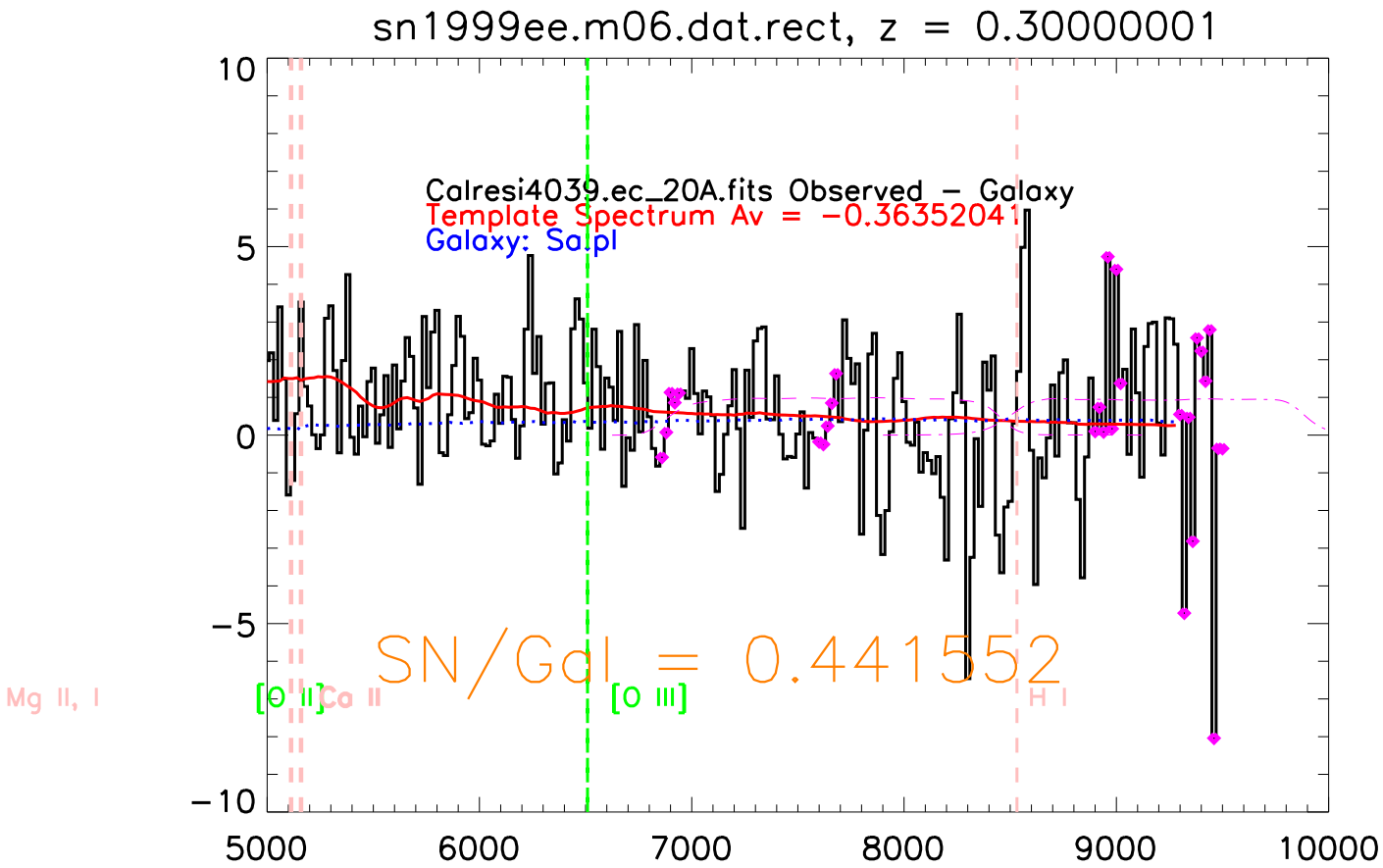

sn1991t.m08.dat.rect, z = 0.30000001
Calresi4039.ec_20A.fits Observed − Galaxy
Template Spectrum Av = 0.41964284
Galaxy: Sa.pl
SN/Gal = 1.06630
Mg II, I
[O II]
Co II
[O III]
H I
10
5
0
−5
−10
5000
6000
7000
8000
9000
10000

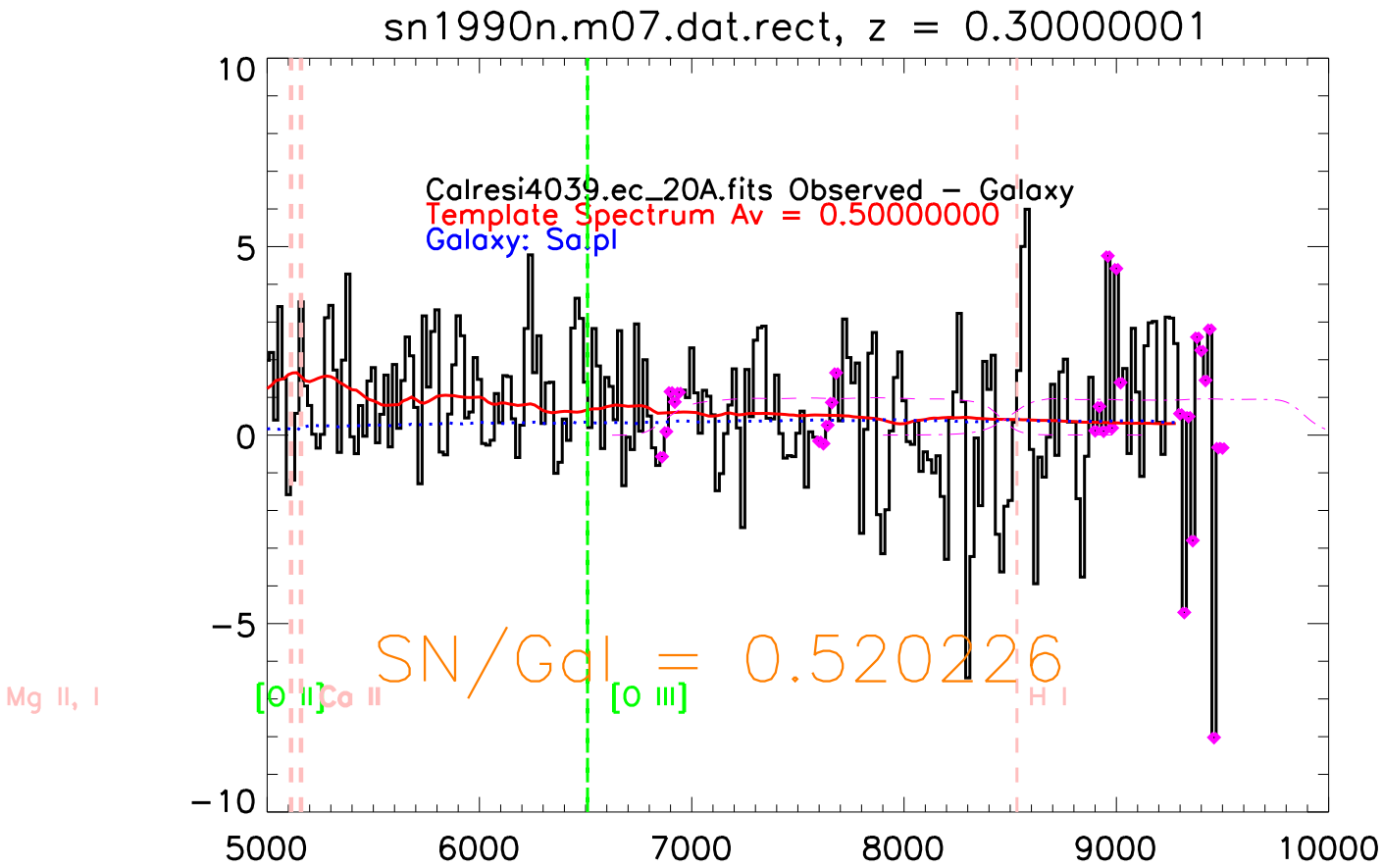

sn1990n.m14.dat.rect, z = 0.30000001
Calresi4039.ec_20A.fits Observed − Galaxy
Template Spectrum Av = 0.50000000
Galaxy: Sa.pl
SN/Gal = 0.336192
Mg II, I
[O II]
Ca II
[O III]
H I
10
5
0
−5
−10
5000
6000
7000
8000
9000
10000

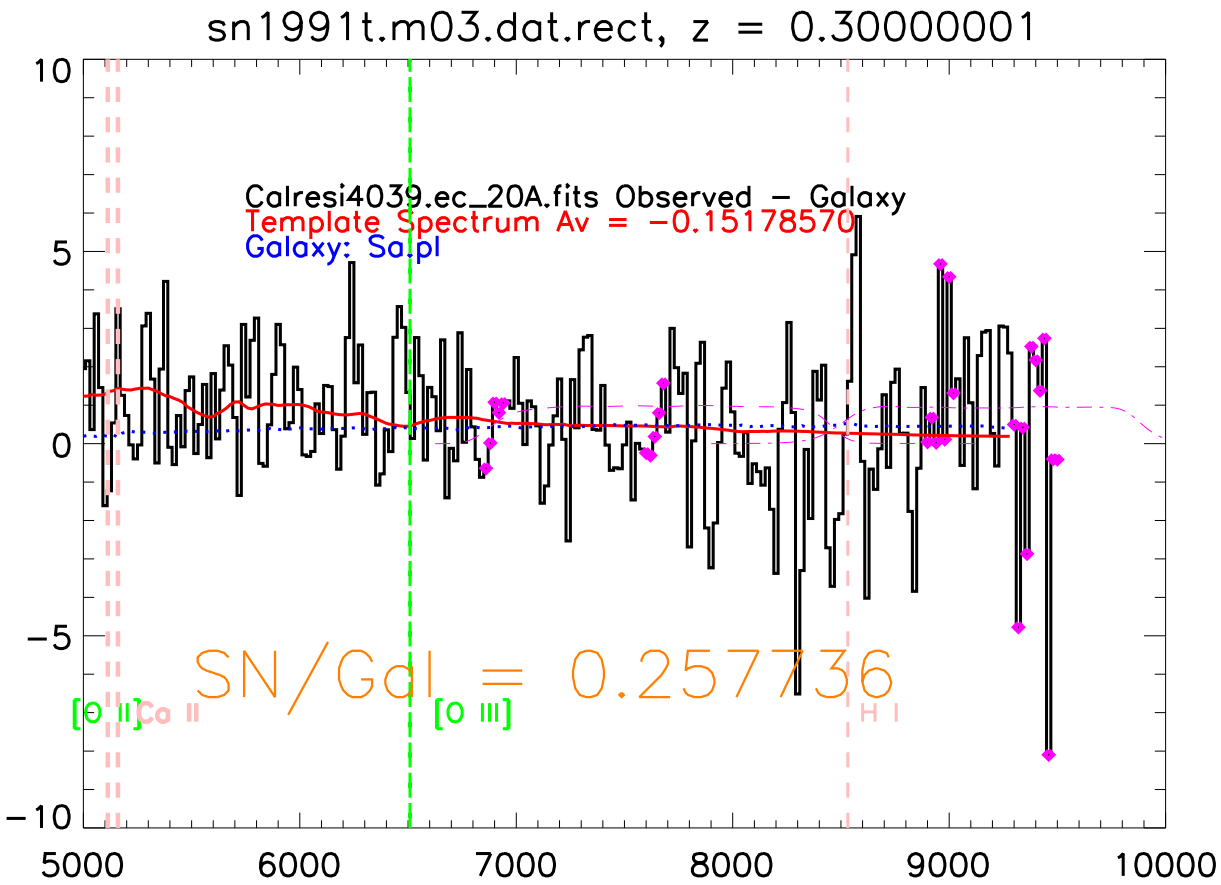

sn1994d.m08.dat.rect, z = 0.30000001
Calresi4039.ec_20A.fits Observed − Galaxy
Template Spectrum Av = 0.50000000
Galaxy: Sa.pl
SN/Gal = 0.616132
Mg II, I
[O II]
Ca II
[O III]
H I
10
5
0
−5
−10
5000
6000
7000
8000
9000
10000

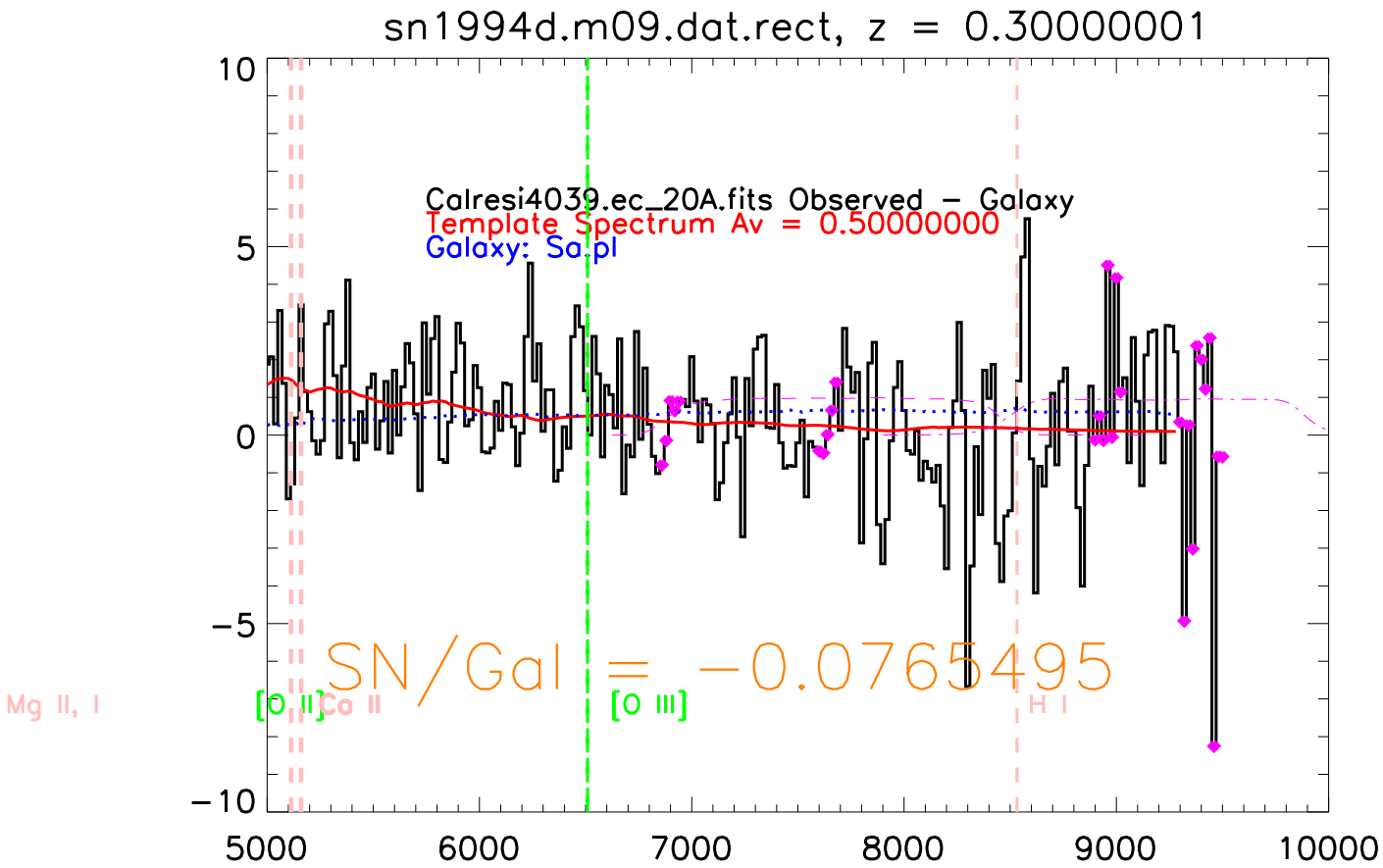

sn1991t.m07.dat.rect, z = 0.30000001
Calresi4039.ec_20A.fits Observed − Galaxy
Template Spectrum Av = 0.047193855
Galaxy: Sa.pl
SN/Gal = 0.489343
Mg II, I
[O II]
Ca II
[O III]
H I
10
5
0
−5
−10
5000
6000
7000
8000
9000
10000

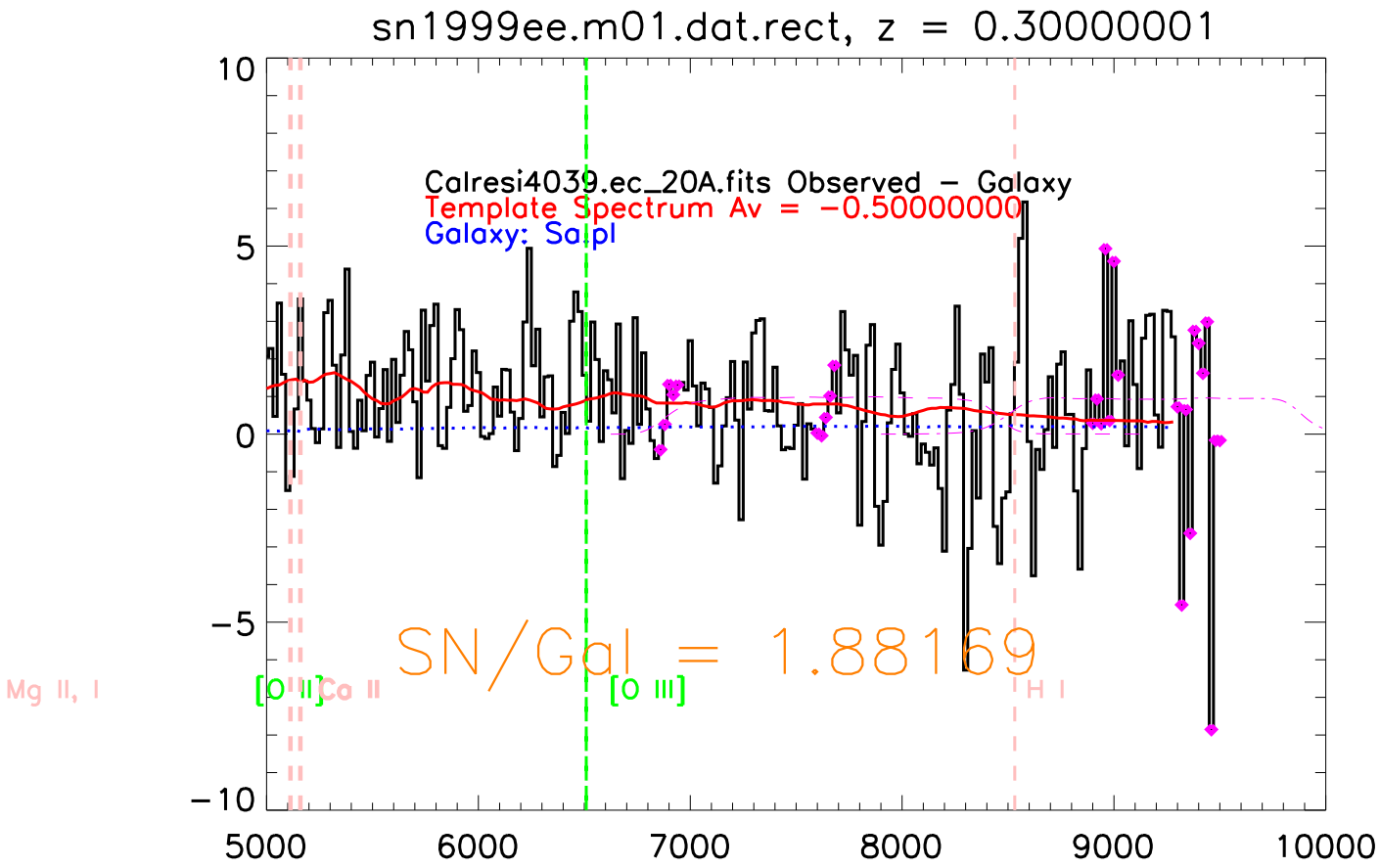

sn1994d.m03.dat.rect, z = 0.30000001
Calresi4039.ec_20A.fits Observed − Galaxy
Template Spectrum Av = 0.26913264
Galaxy: Sa.pl
SN/Gal = 0.800159
Mg II, I
[O II]
Ca II
[O III]
H I
10
5
0
−5
−10
5000
6000
7000
8000
9000
10000


sn1999ee.m06.dat.rect, z = 0.30000001
Calresi4039.ec_20A.fits Observed − Galaxy
Template Spectrum Av = −0.3635204
Galaxy: Sa.pl
SN/Gal = 0.441552
Mg II, I
[O II]
Ca II
[O III]
H I
10
5
0
−5
−10
5000
6000
7000
8000
9000
10000


sn1990n.m07.dat.rect, z = 0.30000001
Calresi4039.ec_20A.fits Observed − Galaxy
Template Spectrum Av = 0.50000000
Galaxy: Sa.pl
SN/Gal = 0.520226
Mg II, I
[O II]
Ca II
[O III]
H I
10
5
0
−5
−10
5000
6000
7000
8000
9000
10000


sn1991t.m03.dat.rect, z = 0.30000001
Calresi4039.ec_20A.fits Observed − Galaxy
Template Spectrum Av = −0.15178570
Galaxy: Sa.pl
SN/Gal = 0.257736
Mg II, I
[O II]
Ca II
[O III]
H I
10
5
0
−5
−10
5000
6000
7000
8000
9000
10000


sn1994d.m09.dat.rect, z = 0.30000001
Calresi4039.ec_20A.fits Observed − Galaxy
Template Spectrum Av = 0.50000000
Galaxy: Sa.pl
SN/Gal = −0.0765495
Mg II, I
[O II]
Ca II
[O III]
H I
10
5
0
−5
−10
5000
6000
7000
8000
9000
10000


sn1999ee.m01.dat.rect, z = 0.30000001
Calresi4039.ec_20A.fits Observed − Galaxy
Template Spectrum Av = −0.50000000
Galaxy: Sa.pl
SN/Gal = 1.88169
Mg II, I
[O II]
Ca II
[O III]
H I
10
5
0
−5
−10
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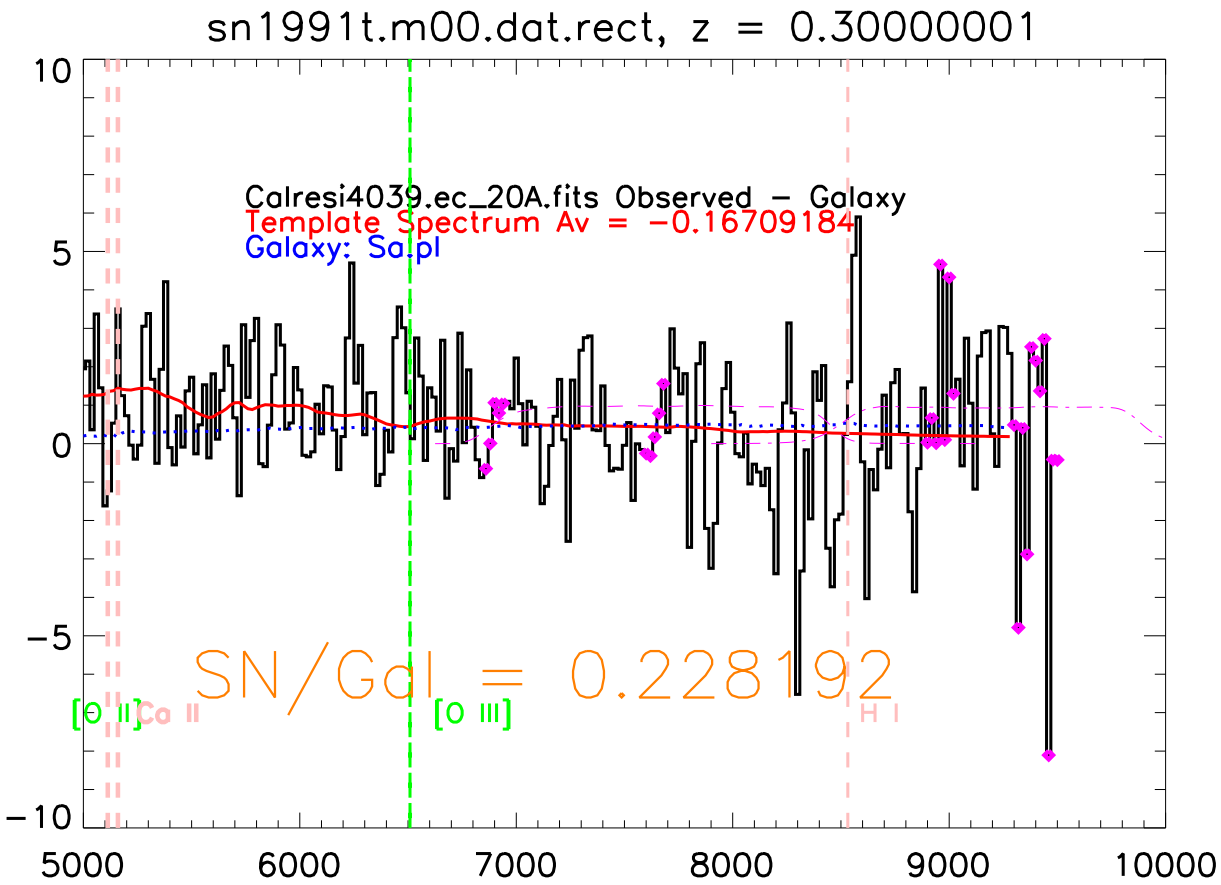
6000
7000
8000
9000
10000


sn1991t.m00.dat.rect, z = 0.30000001
Calresi4039.ec_20A.fits Observed − Galaxy
Template Spectrum Av = −0.16709184
Galaxy: Sa.pl
SN/Gal = 0.228192
Mg II, I
[O II]
Ca II
[O III]
H I
10
5
0
−5
−10
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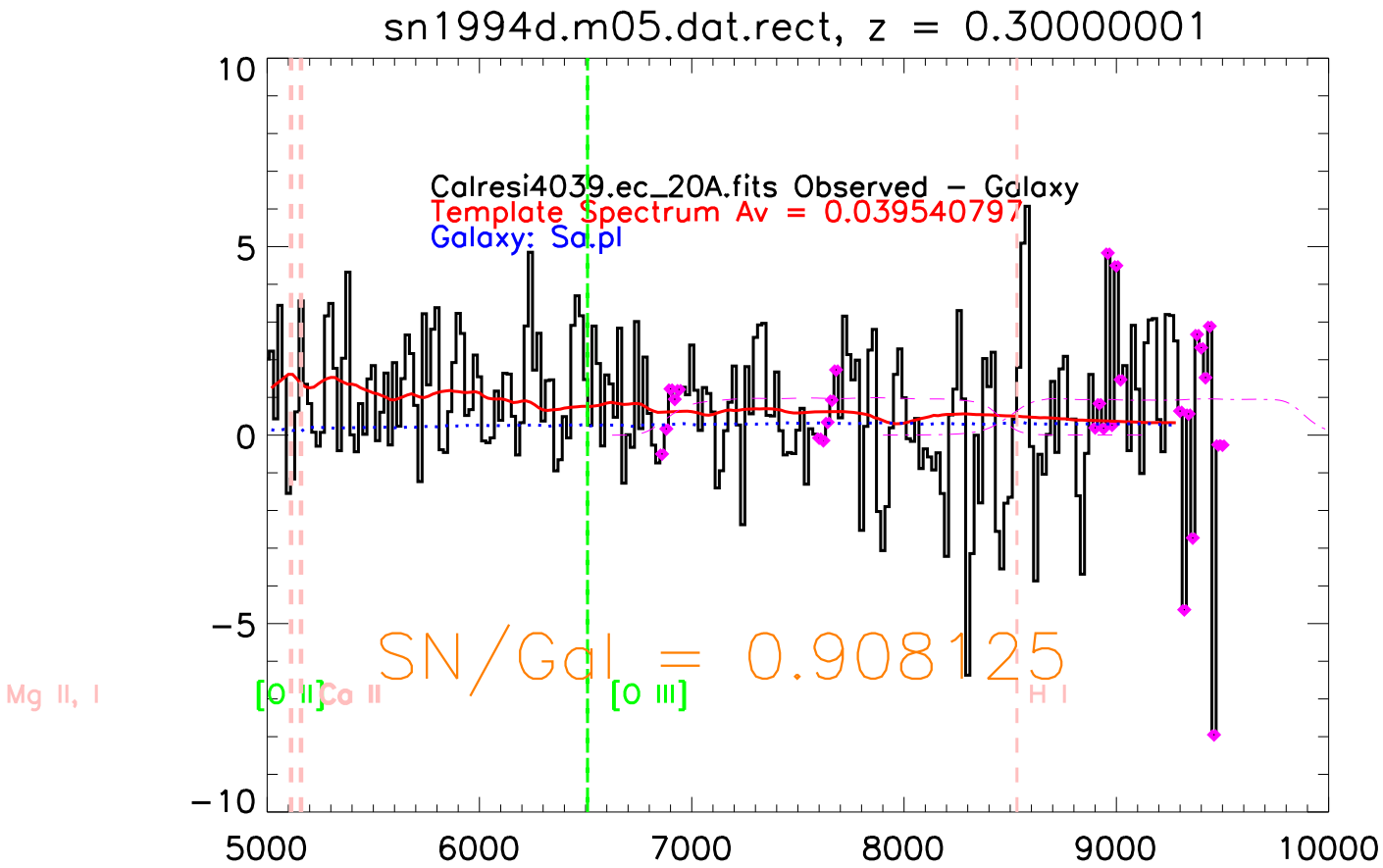
6000
7000
8000
9000
10000


sn1994d.m05.dat.rect, z = 0.30000001
Calresi4039.ec_20A.fits Observed − Galaxy
Template Spectrum Av = 0.039540797
Galaxy: Sa.pl
SN/Gal = 0.908125
Mg II, I
[O II]
Ca II
[O III]
H I
10
5
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−5
−10
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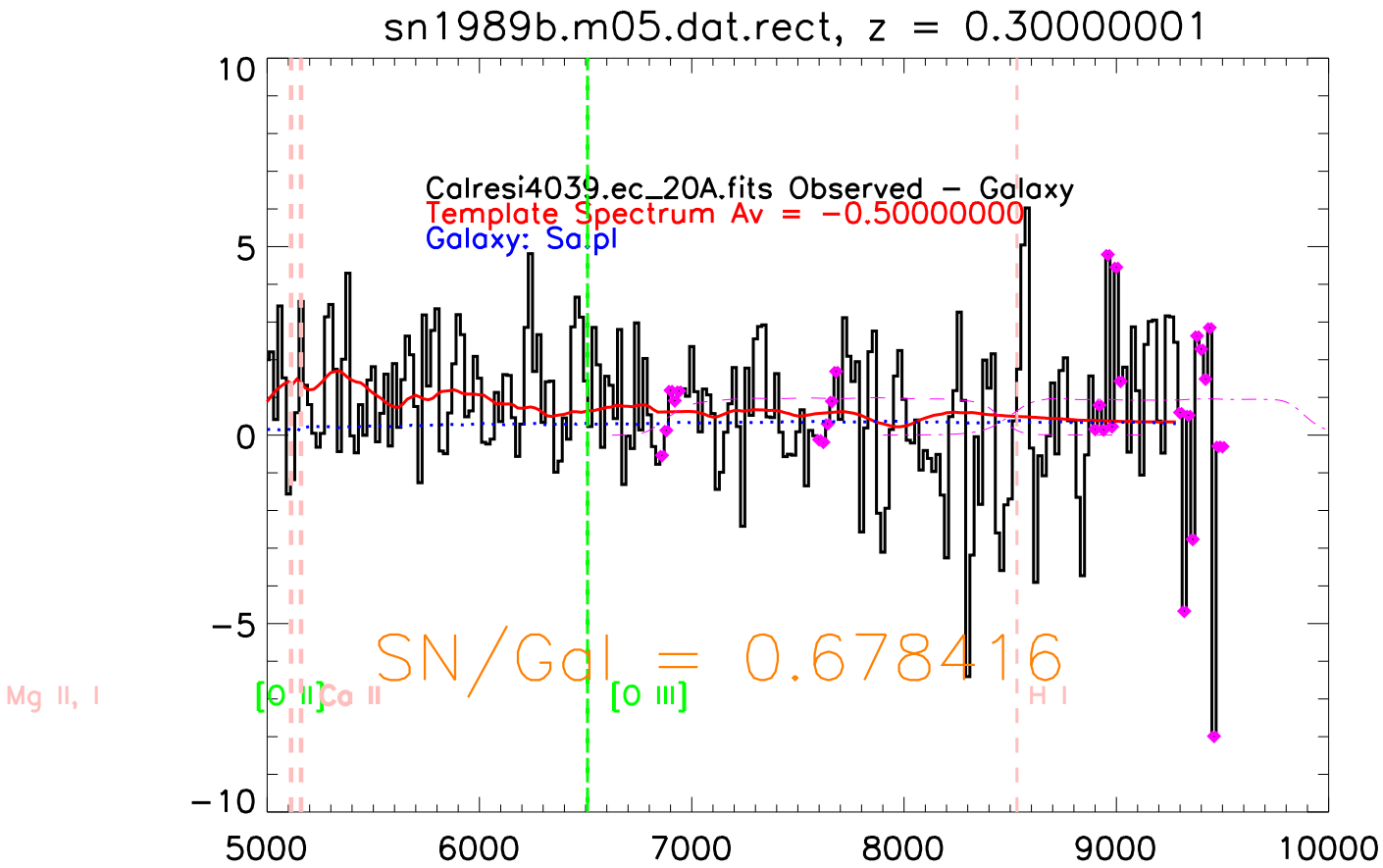
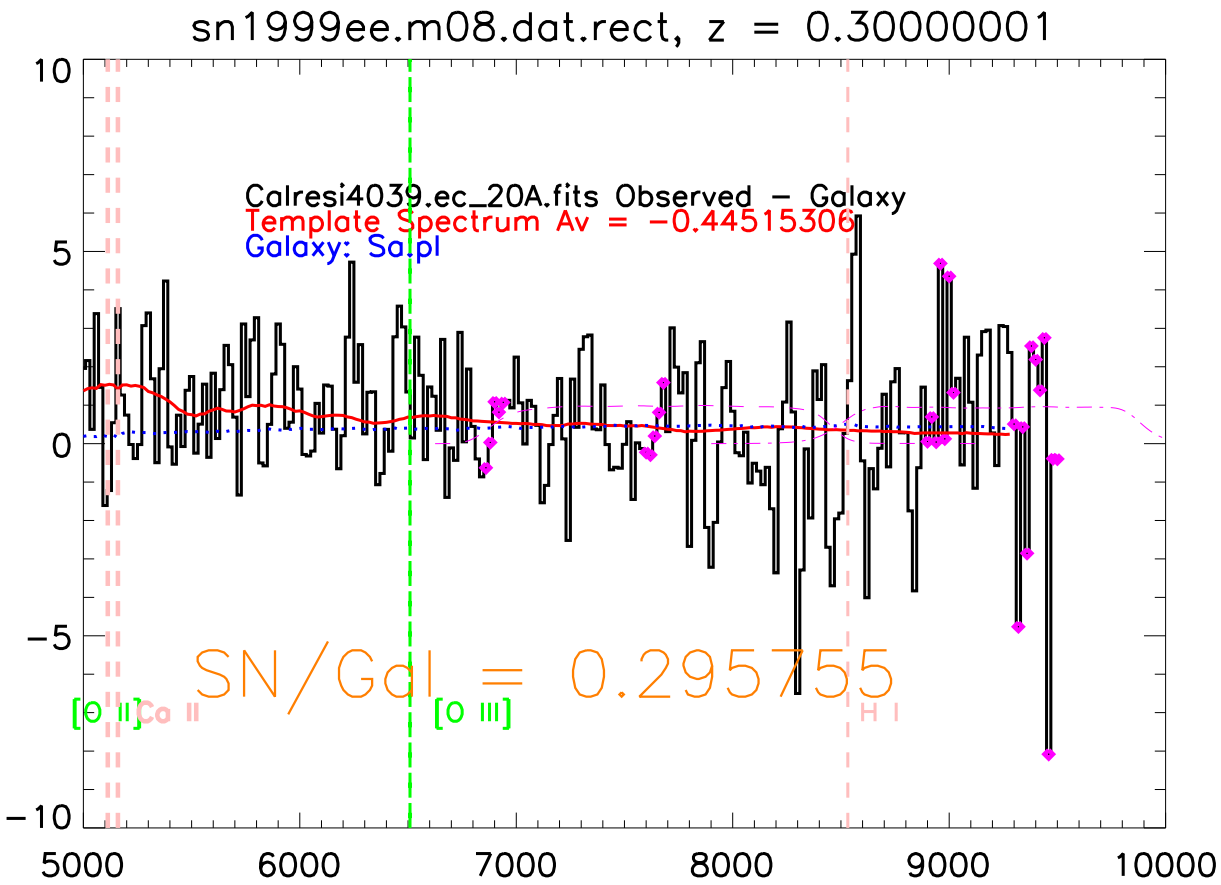
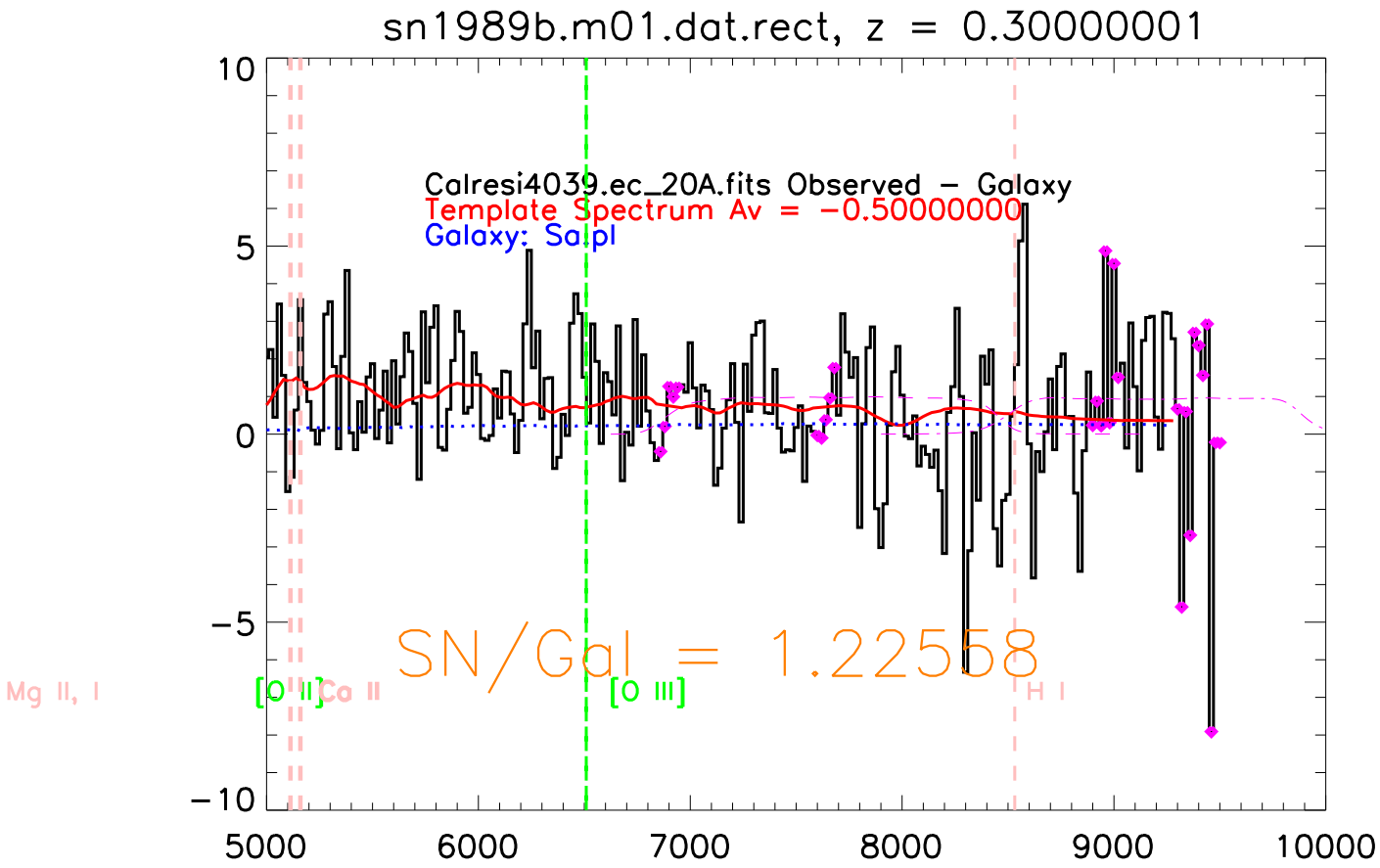
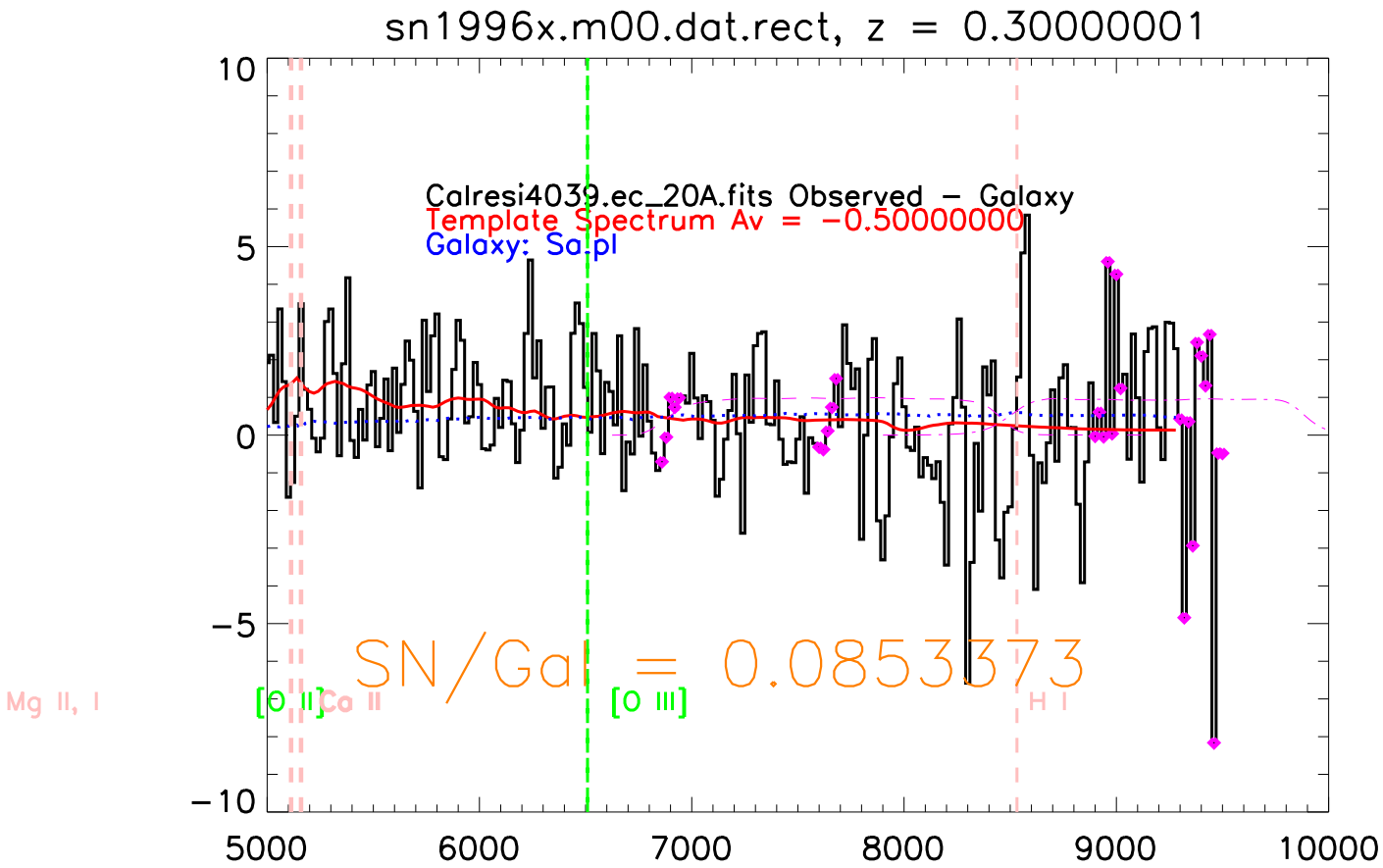
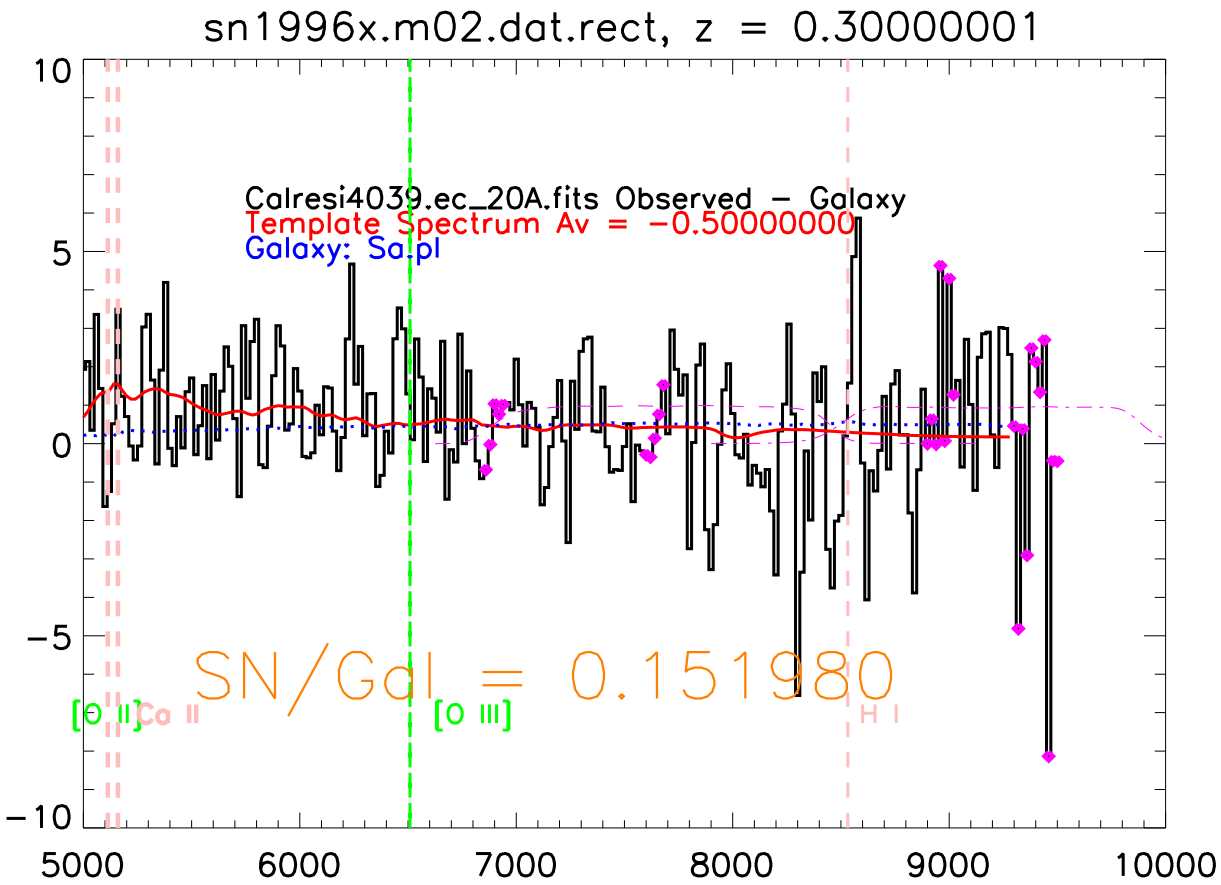
6000
7000
8000
9000
10000

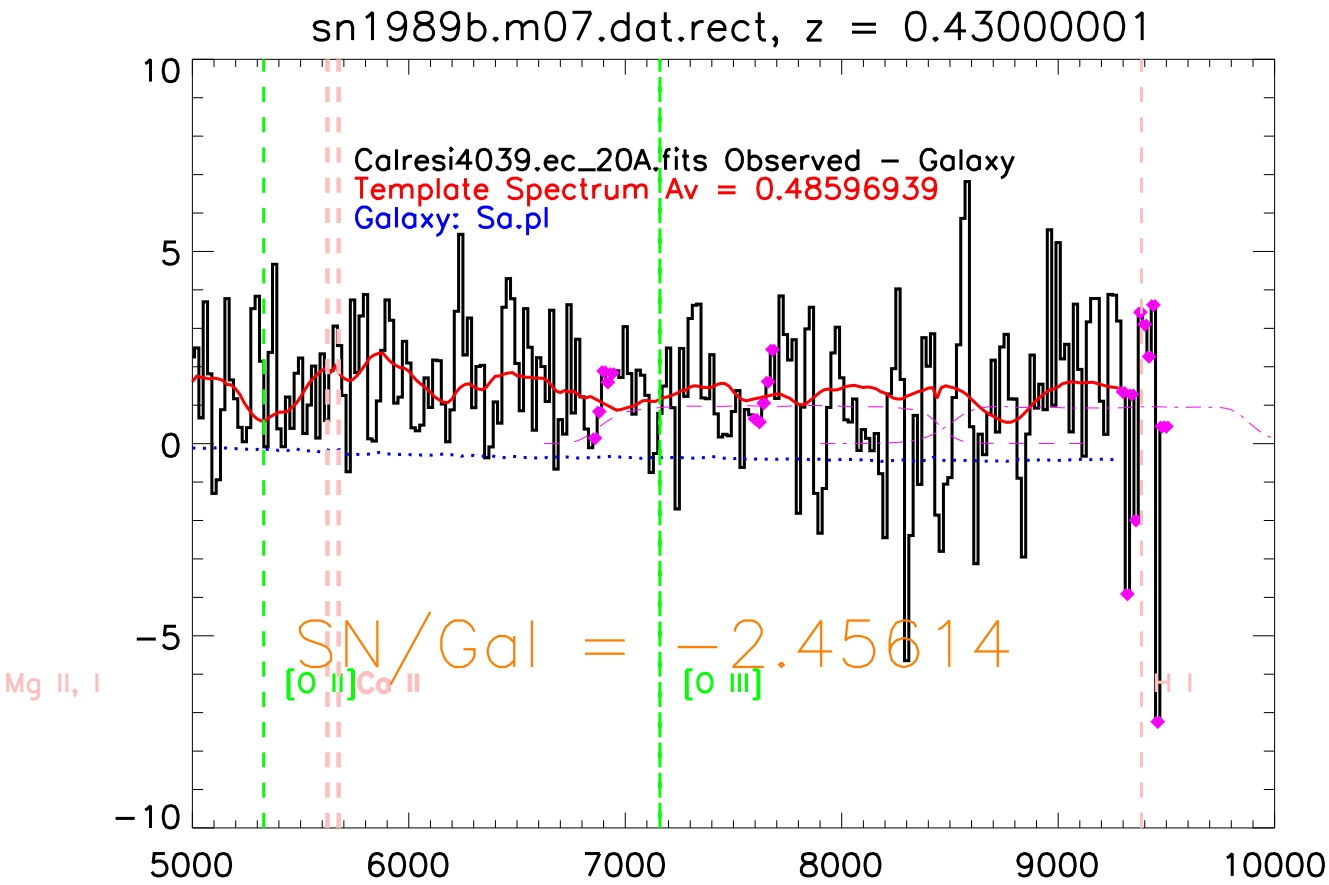

sn1989b.m05.dat.rect, z = 0.30000001
Calresi4039.ec_20A.fits Observed − Galaxy
Template Spectrum Av = −0.50000000
Galaxy: Sa.pl
SN/Gal = 0.678416
Mg II, I
[O II]
Ca II
[O III]
H I
10
5
0
−5
−10
5000
6000
7000
8000
9000
10000


sn1999ee.m08.dat.rect, z = 0.30000001
Calresi4039.ec_20A.fits Observed − Galaxy
Template Spectrum Av = −0.44515306
Galaxy: Sa.pl
SN/Gal = 0.295755
Mg II, I
[O II]
Ca II
[O III]
H I
10
5
0
−5
−10
5000
6000
7000
8000
9000
10000


sn1989b.m01.dat.rect, z = 0.30000001
Calresi4039.ec_20A.fits Observed − Galaxy
Template Spectrum Av = −0.50000000
Galaxy: Sa.pl
SN/Gal = 1.22558
Mg II, I
[O II]
Ca II
[O III]
H I
10
5
0
−5
−10
5000
6000
7000
8000
9000
10000


sn1996x.m00.dat.rect, z = 0.30000001
Calresi4039.ec_20A.fits Observed − Galaxy
Template Spectrum Av = −0.50000000
Galaxy: Sa pl
SN/Gal = 0.0853373
Mg II, I
[O II]
Ca II
[O III]
H I
10
5
0
−5
−10
5000
6000
7000
8000
9000
10000


sn1996x.m02.dat.rect, z = 0.30000001
Calresi4039.ec_20A.fits Observed − Galaxy
Template Spectrum Av = −0.50000000
Galaxy: Sa.pl
SN/Gal = 0.151980
Mg II, I
[O II]
Ca II
[O III]
H I
10
5
0
−5
−10
5000
6000
7000
8000
9000
10000


sn1989b.m07.dat.rect, z = 0.43000001
Calresi4039.ec_20A.fits Observed − Galaxy
Template Spectrum Av = 0.48596939
Galaxy: Sa.pl
SN/Gal = −2.45614
Mg II, I
[O II]
Ca II
[O III]
H I
10
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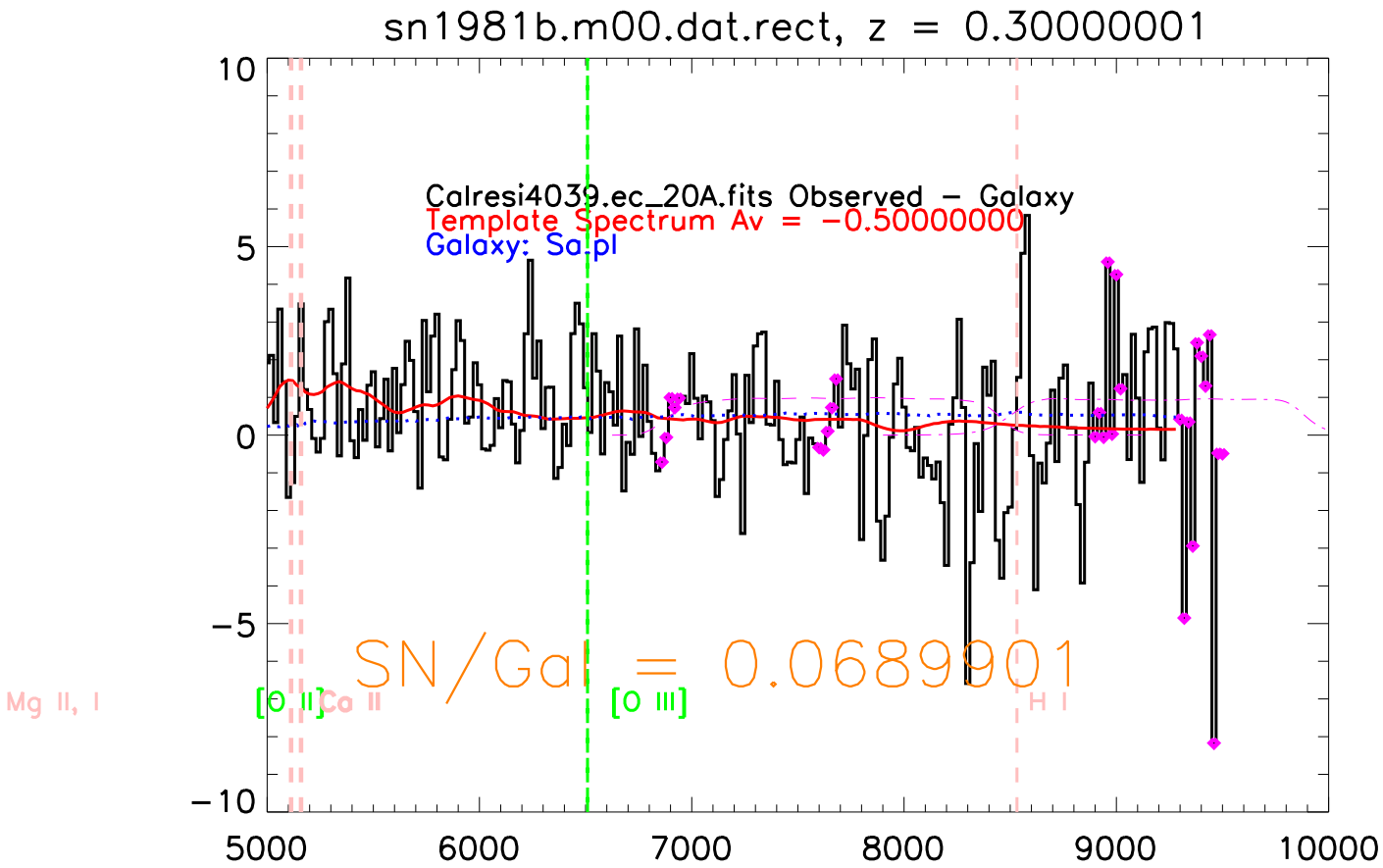
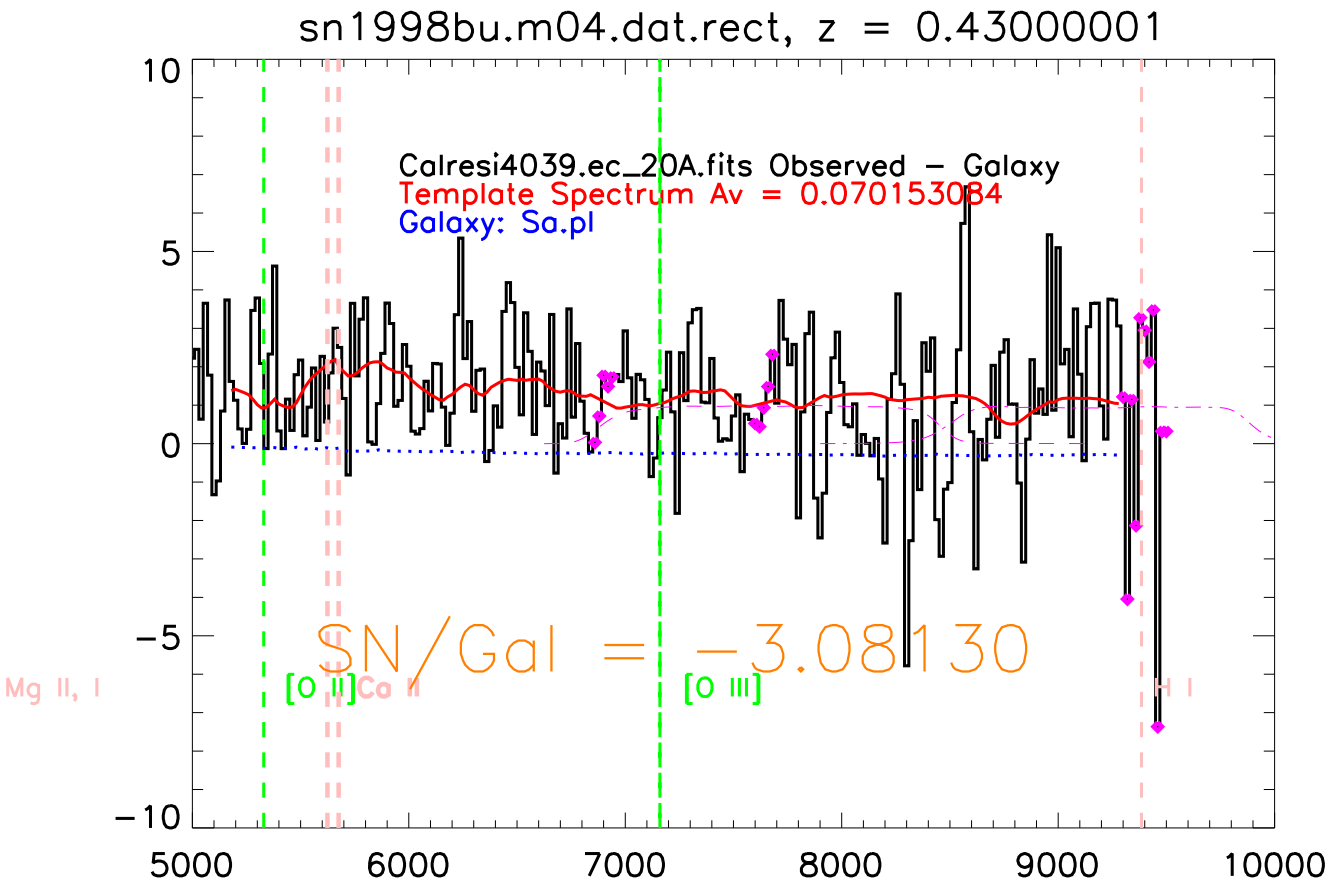
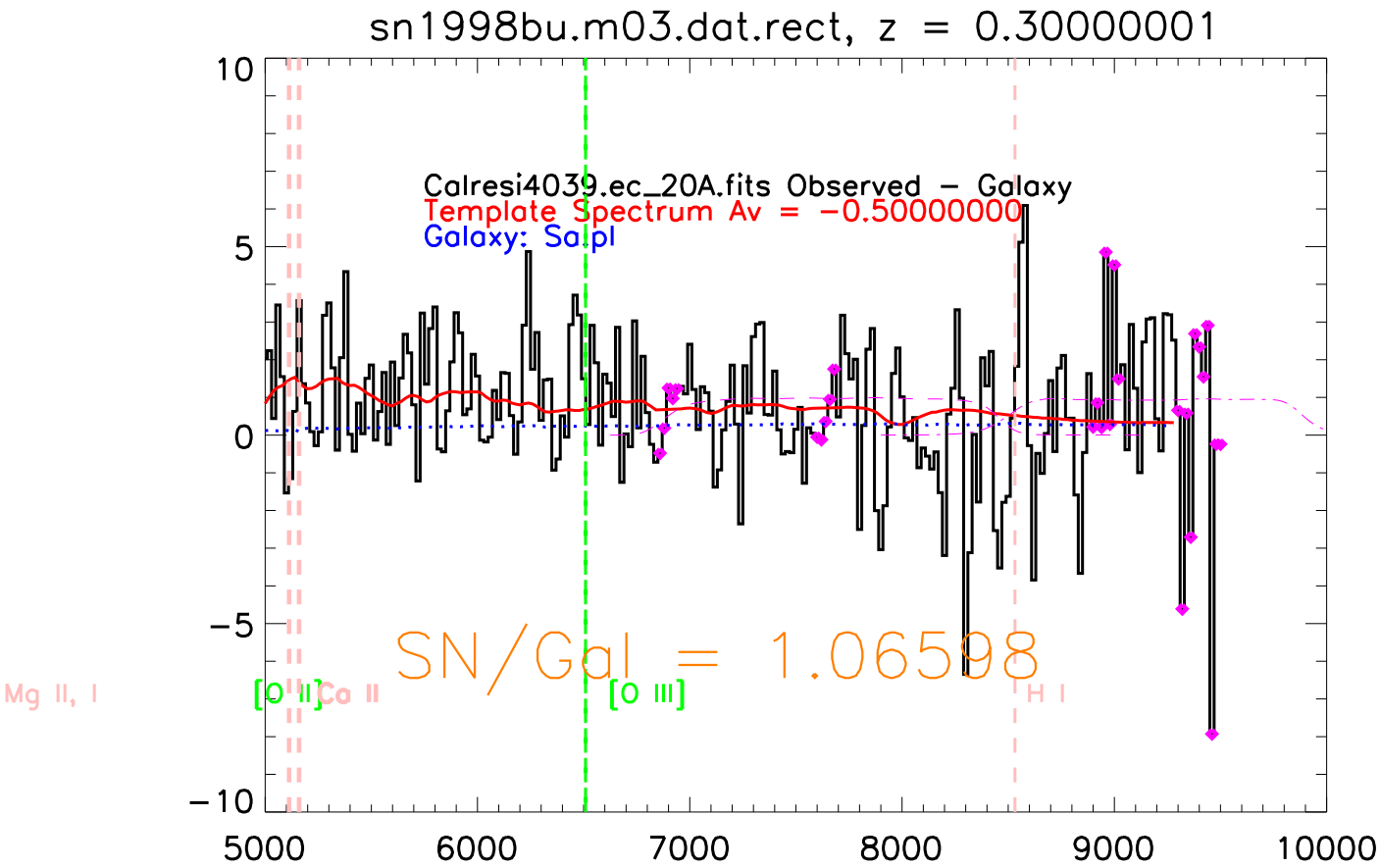
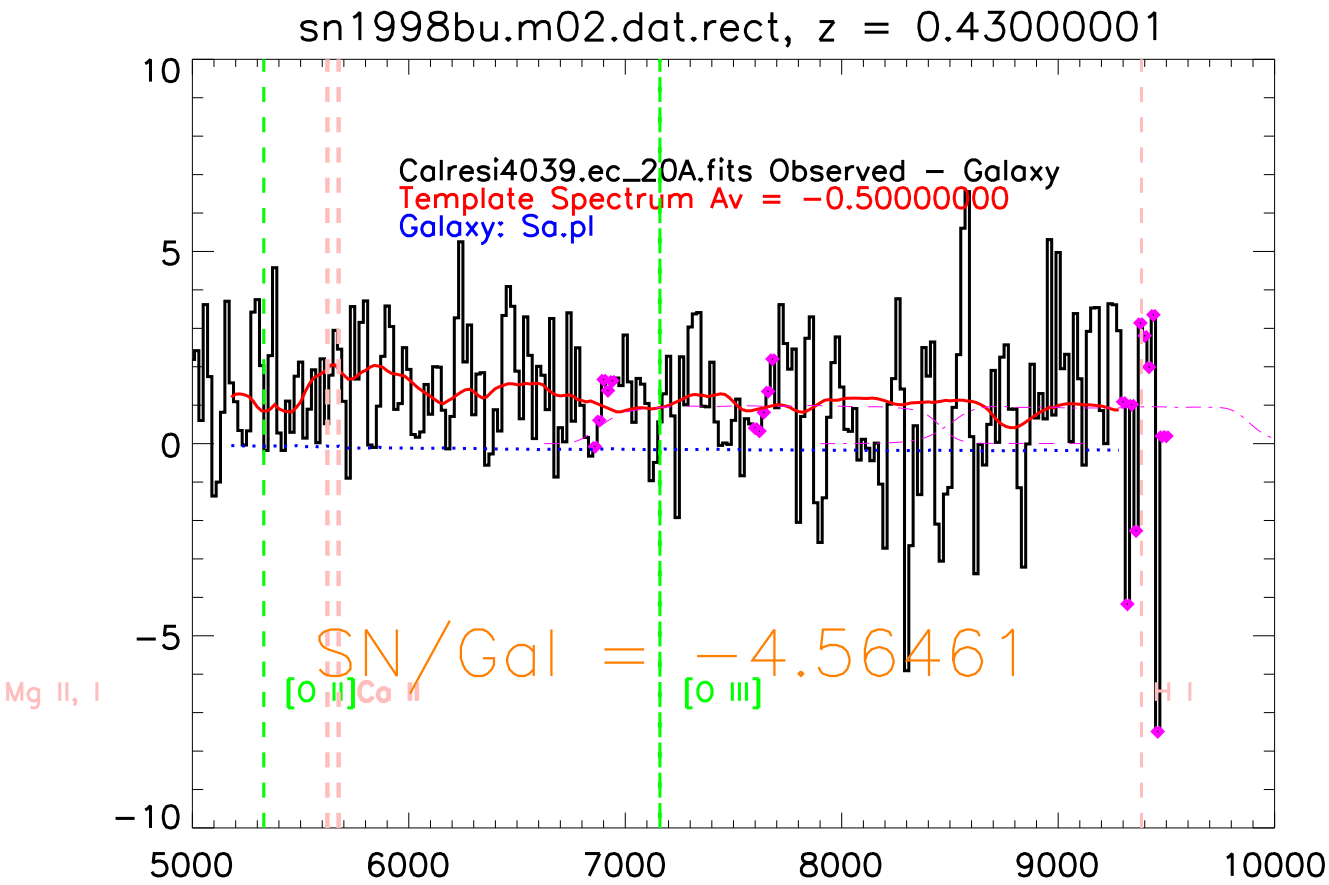
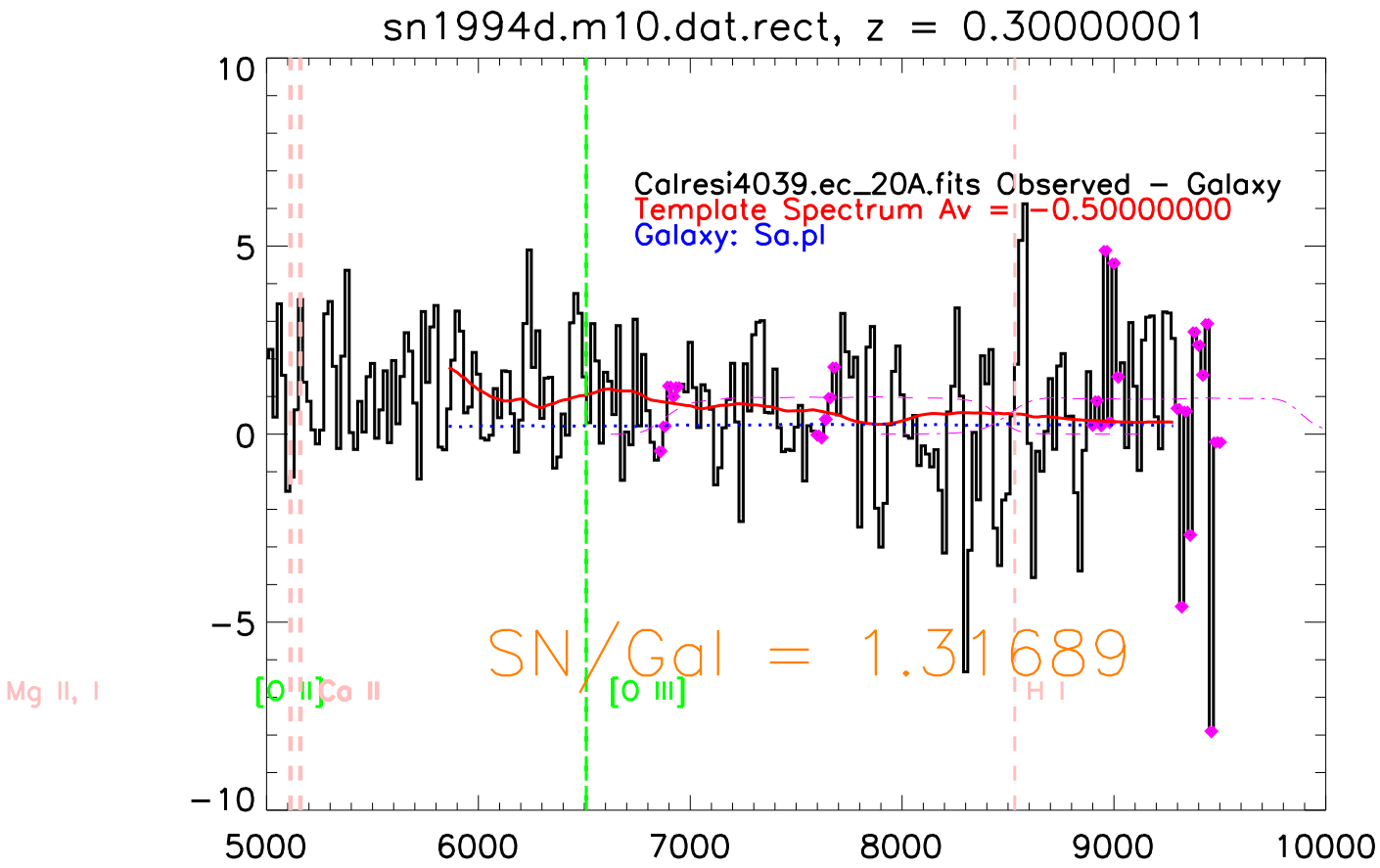
0
−5
−10
5000
6000
7000
8000
9000
10000

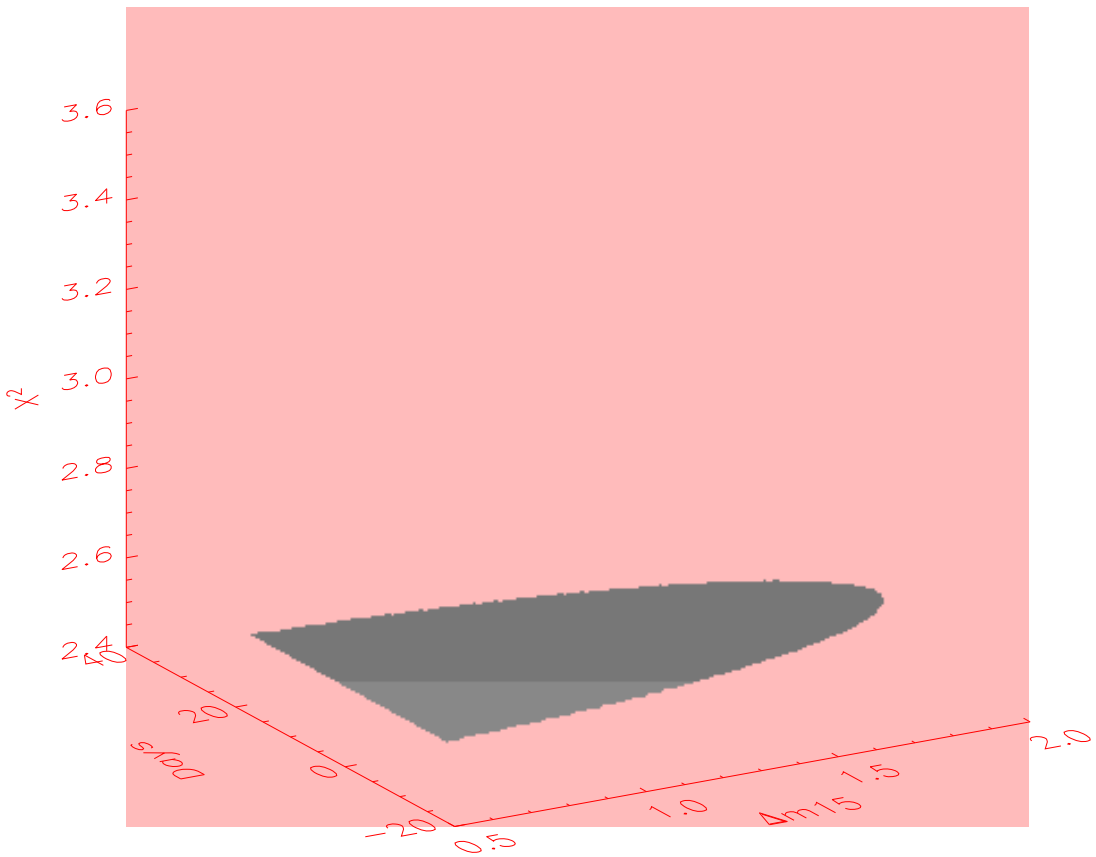

sn1981b.m00.dat.rect, z = 0.30000001
Calresi4039.ec_20A.fits Observed − Galaxy
Template Spectrum Av = −0.50000000
Galaxy: Sa pl
SN/Gal = 0.0689901
Mg II, I
[O II]
Ca II
[O III]
H I
10
5
0
−5
−10
5000
6000
7000
8000
9000
10000


sn1998bu.m04.dat.rect, z = 0.43000001
Calresi4039.ec_20A.fits Observed − Galaxy
Template Spectrum Av = 0.070153084
Galaxy: Sa.pl
SN/Gal = −3.08130
Mg II, I
[O II]
Ca II
[O III]
H I
10
5
0
−5
−10
5000
6000
7000
8000
9000
10000

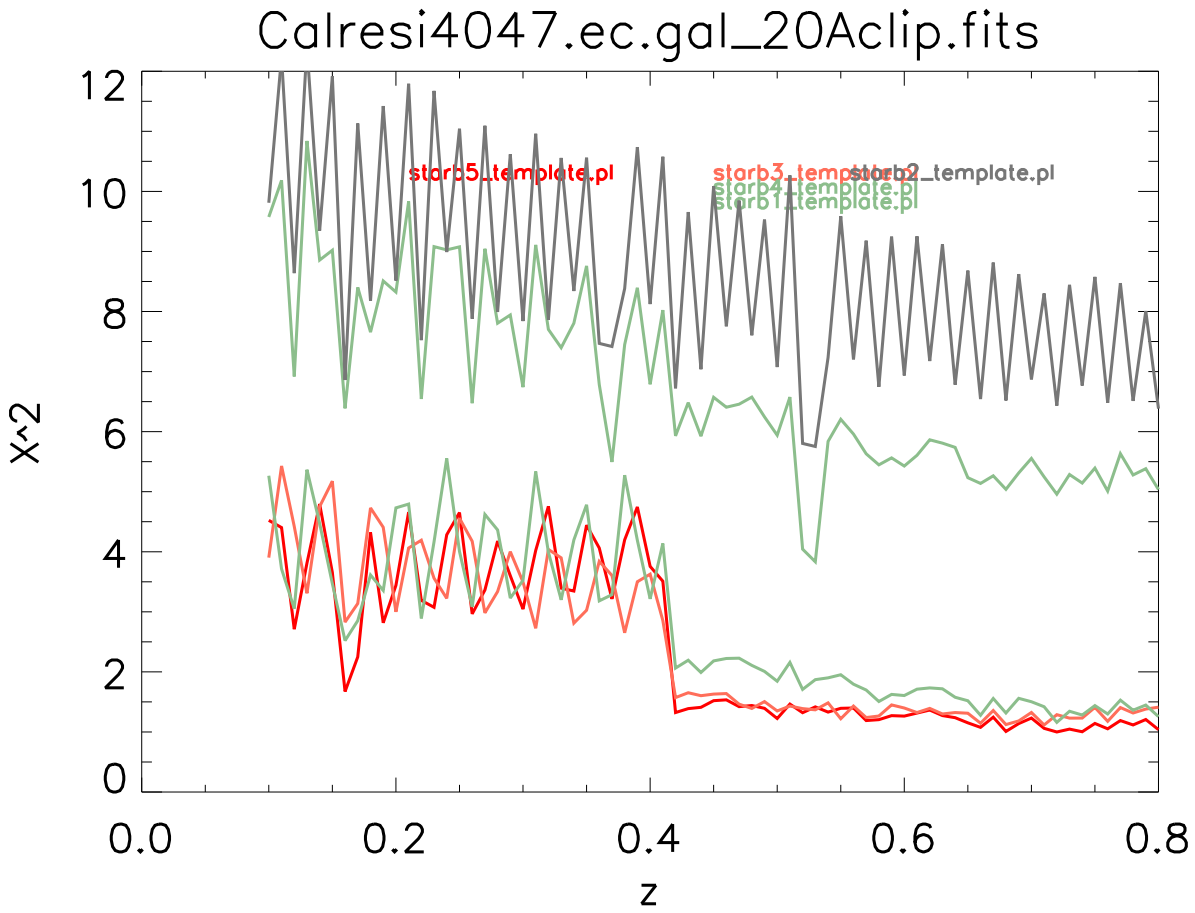

sn1998bu.m03.dat.rect, z = 0.30000001
Calresi4039.ec_20A.fits Observed − Galaxy
Template Spectrum Av = −0.50000000
Galaxy: Sa.pl
SN/Gal = 1.06598
Mg II, I
[O II]
Co II
[O III]
H I
10
5
0
−5
−10
5000
6000
7000
8000
9000
10000

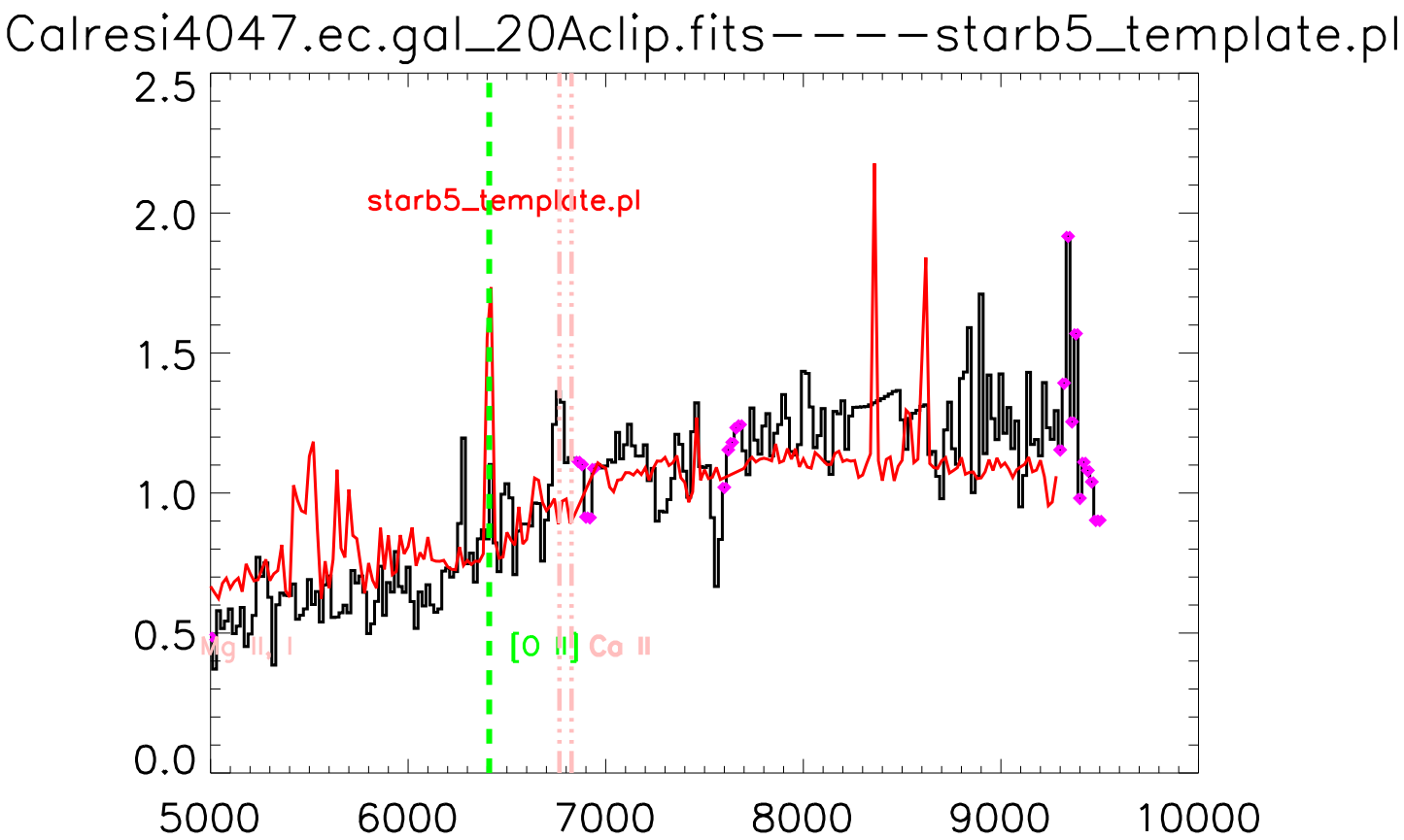

sn1998bu.m02.dat.rect, z = 0.43000001
Calresi4039.ec_20A.fits Observed − Galaxy
Template Spectrum Av = −0.50000000
Galaxy: Sa.pl
SN/Gal = −4.56461
Mg II, I
[O II]
Ca II
[O III]
H I
10
5
0
−5
−10
5000
6000
7000
8000
9000
10000

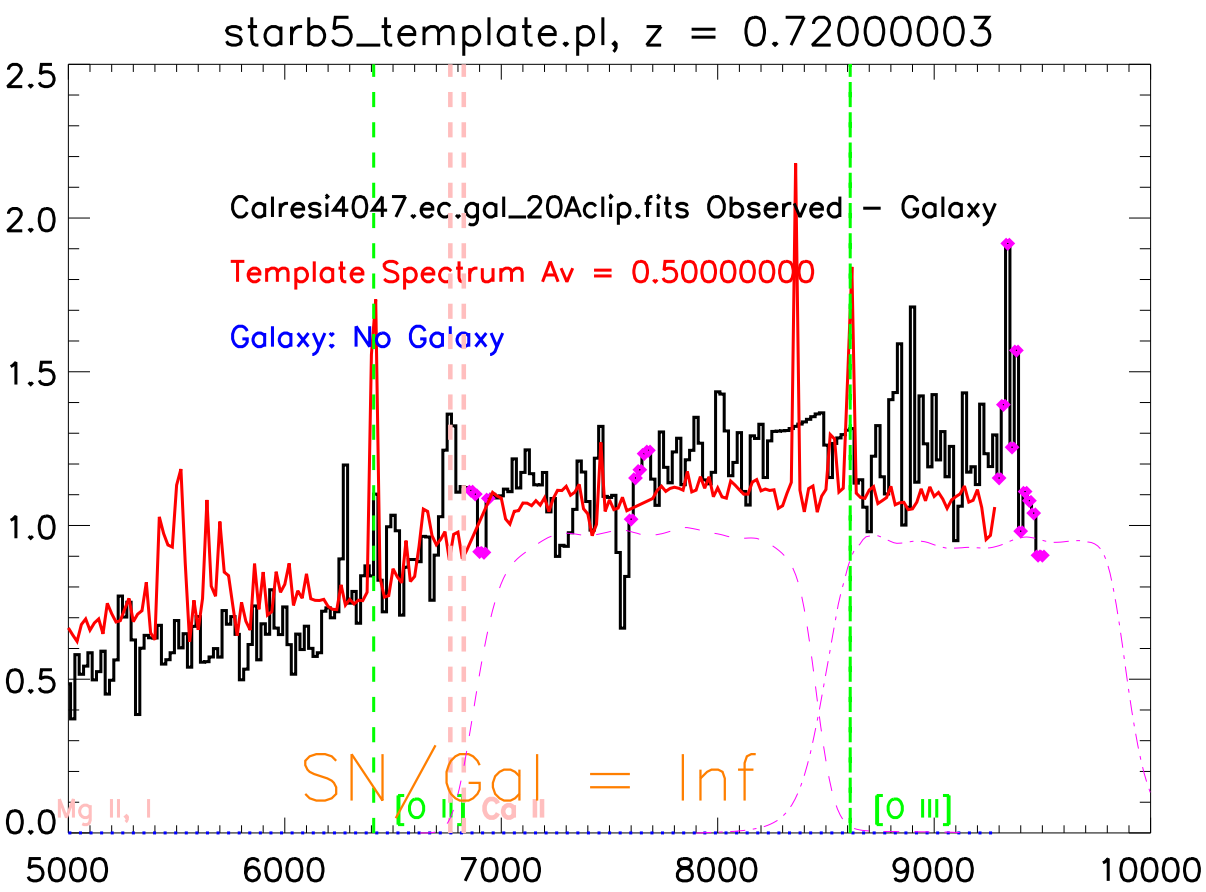

sn1994d.m10.dat.rect, z = 0.30000001
Calresi4039.ec_20A.fits Observed − Galaxy
Template Spectrum Av = −0.50000000
Galaxy: Sa.pl
SN/Gal = 1.31689
Mg II, I
[O II]
Ca II
[O III]
H I
10
5
0
−5
−10
5000
6000
7000
8000
9000
10000

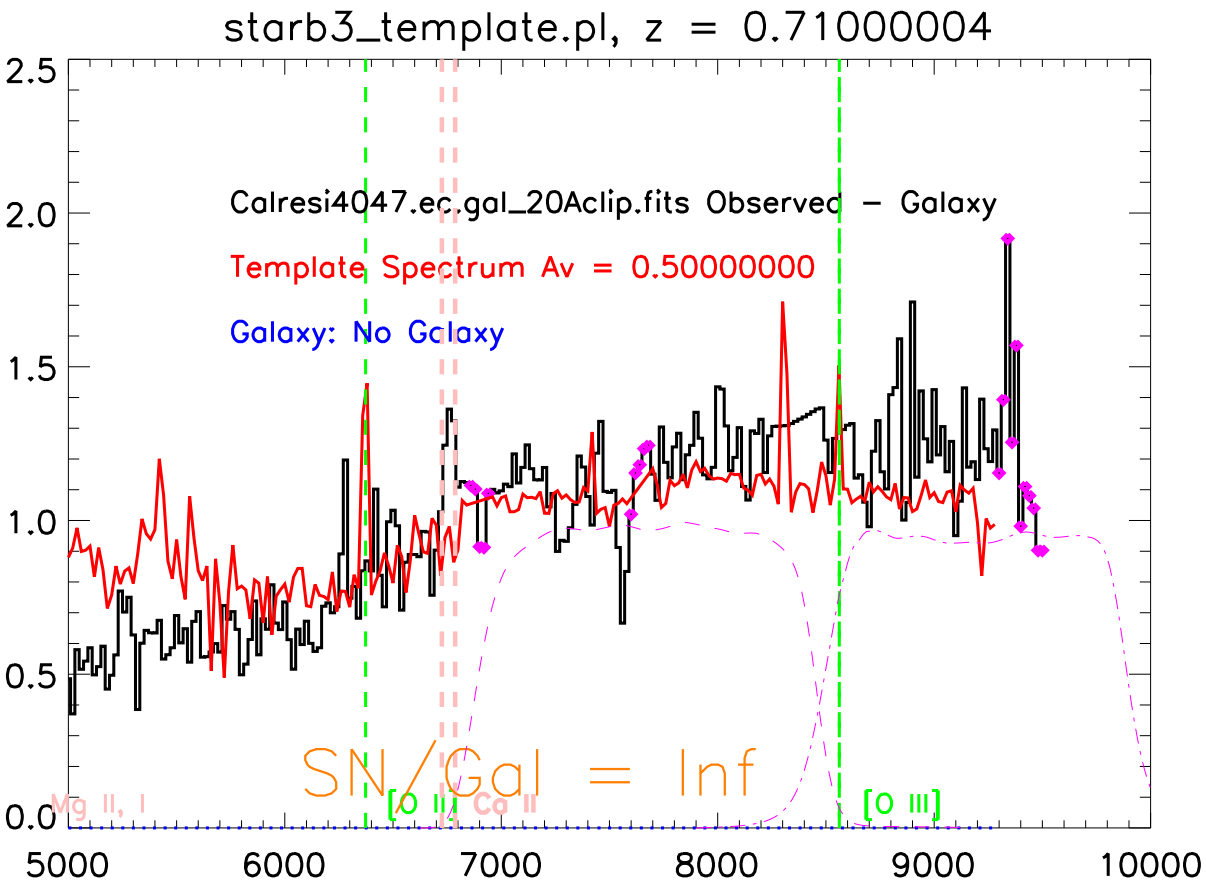


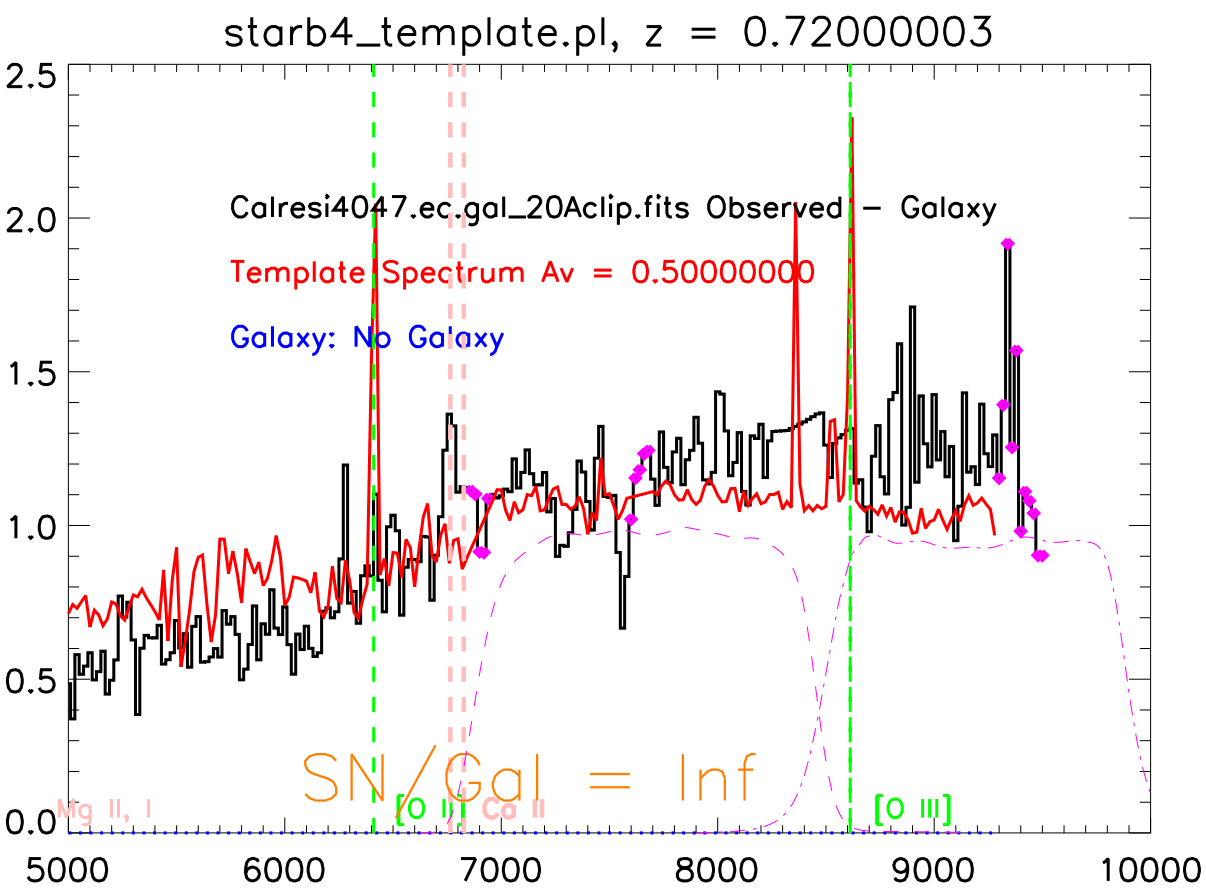
3.6
3.4
3.2
3.0
2.8
2.6
2.4
χ²
40
20
0
−20
Days
0.5
1.0
1.5
2.0
Δm15

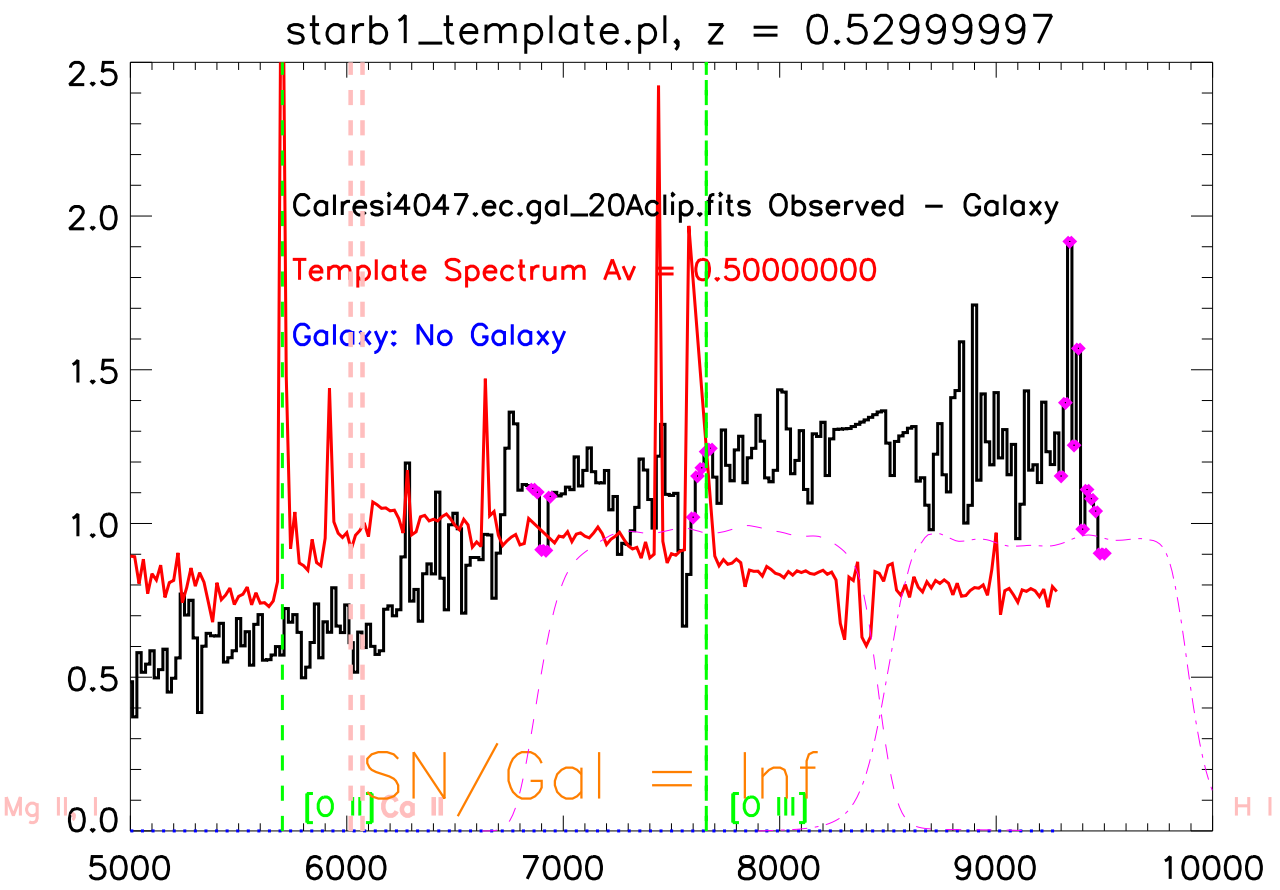

Calresi4047.ec.gal_20Aclip.fits
12
10
8
6
4
2
0
X^2
0.0
0.2
0.4
0.6
0.8
z
starb5_template.pl
starb3_template.pl
starb2_template.pl
starb4_template.pl
starb1_template.pl

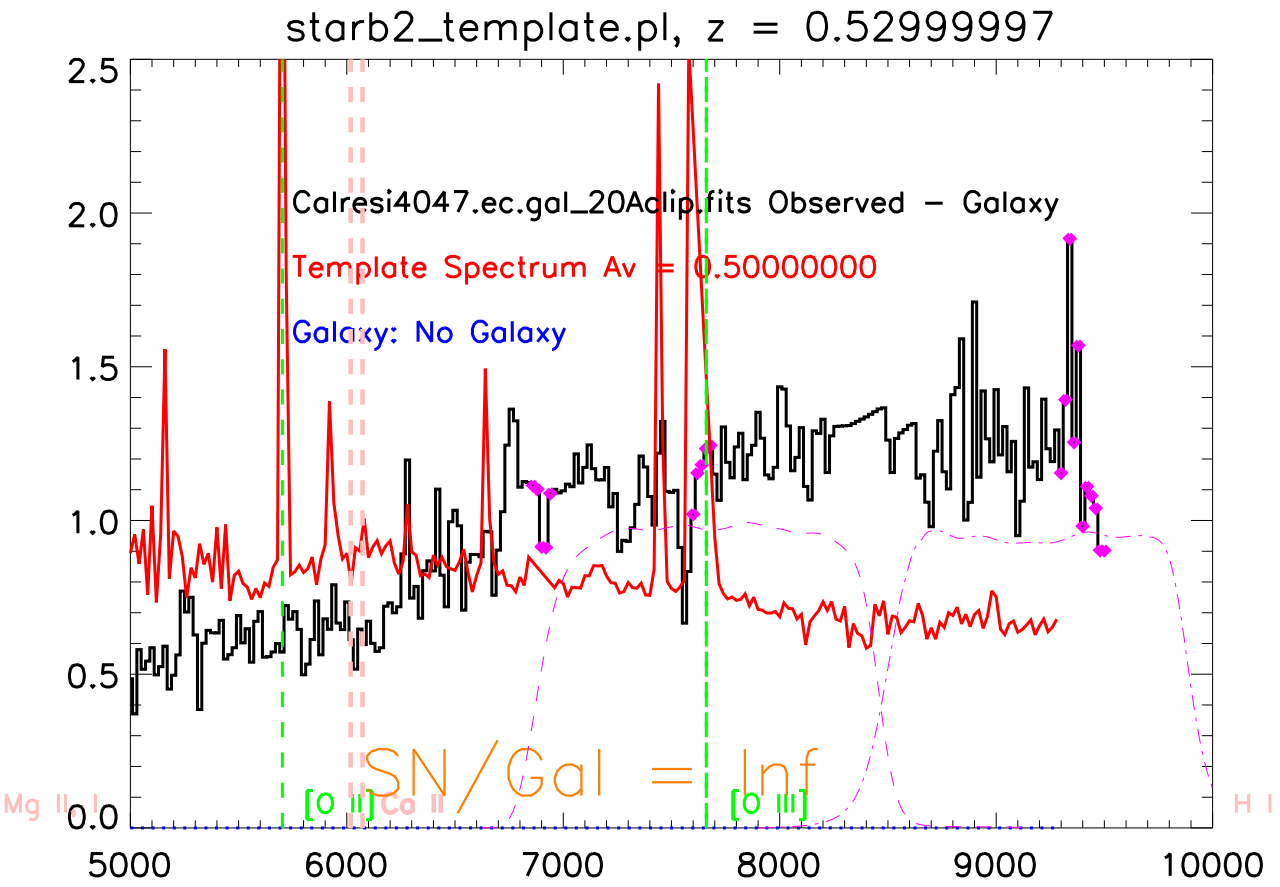

Calresi4047.ec.gal_20Aclip.fits----starb5_template.pl
starb5_template.pl
Mg II, I
[O II]
Ca II
2.5
2.0
1.5
1.0
0.5
0.0
5000
6000
7000
8000
9000
10000

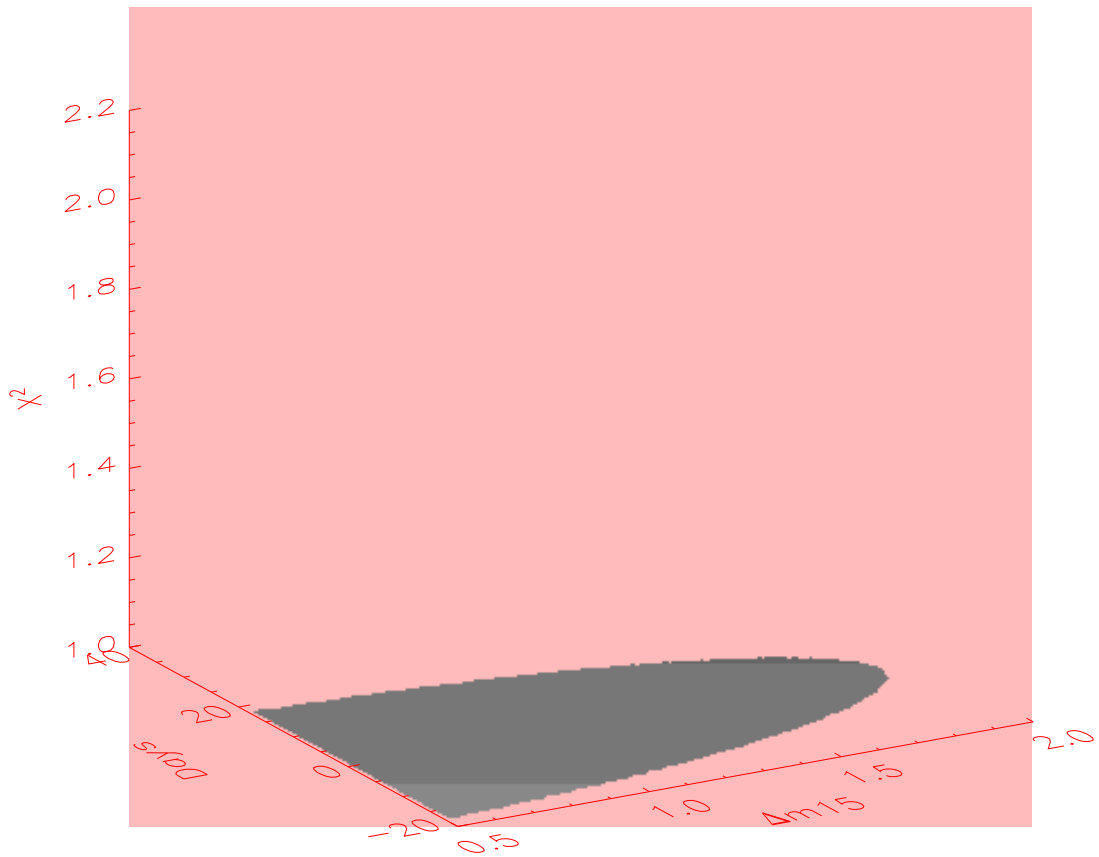

starb5_template.pl, z = 0.72000003
Calresi4047.ec.gal_20Aclip.fits Observed – Galaxy
Template Spectrum Av = 0.50000000
Galaxy: No Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
2.5
2.0
1.5
1.0
0.5
0.0
5000
6000
7000
8000
9000
10000

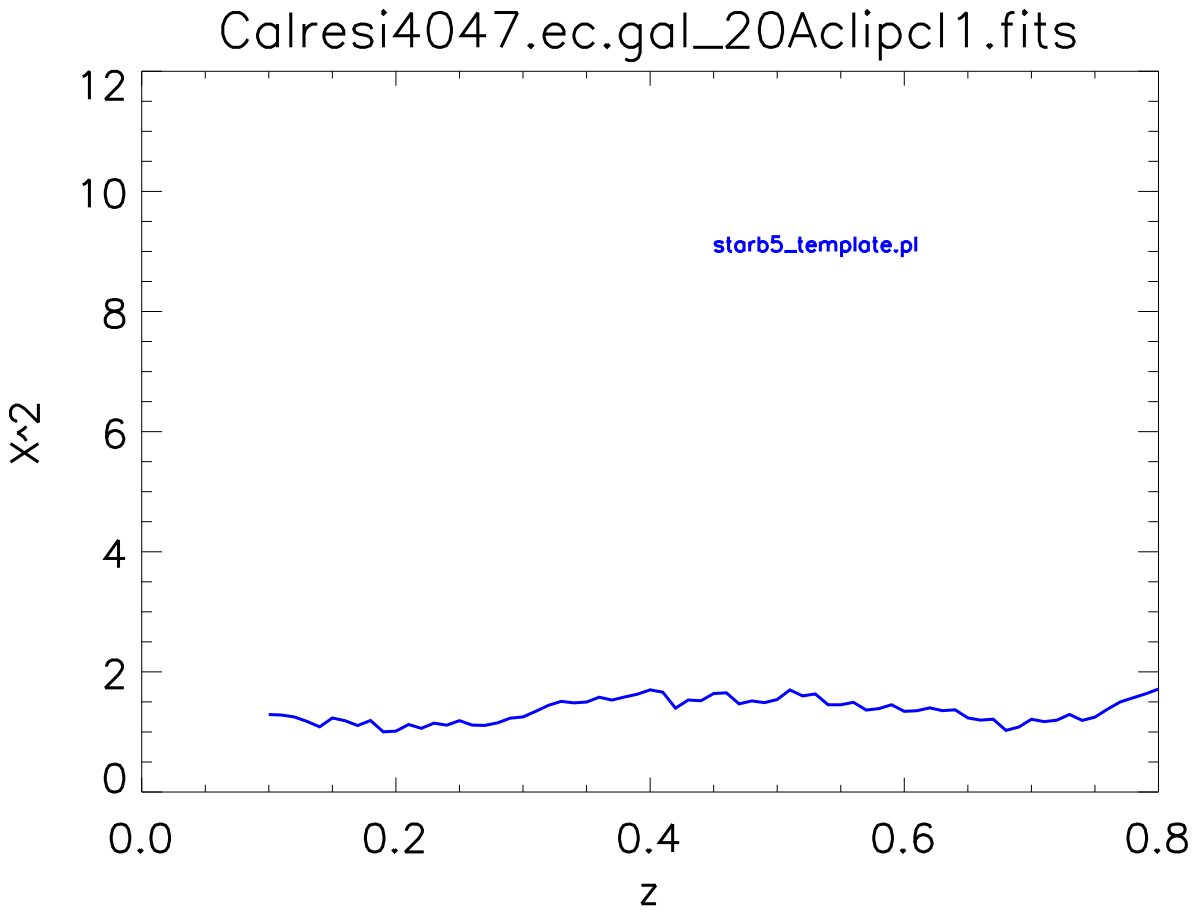

starb3_template.pl, z = 0.71000004
Calresi4047.ec.gal_20Aclip.fits Observed − Galaxy
Template Spectrum Av = 0.50000000
Galaxy: No Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
2.5
2.0
1.5
1.0
0.5
0.0
5000
6000
7000
8000
9000
10000

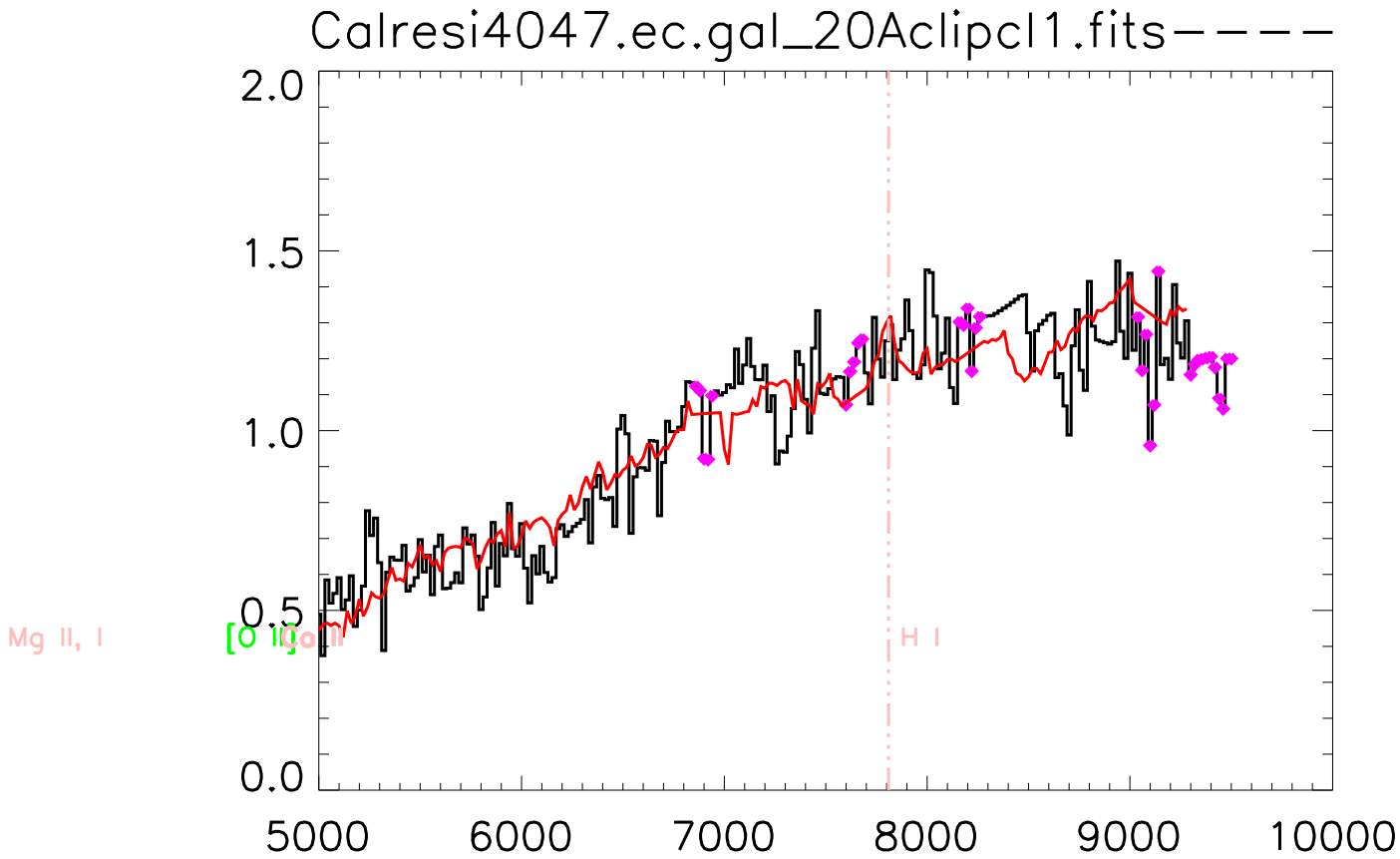

starb4_template.pl, z = 0.72000003
Calresi4047.ec.gal_20Aclip.fits Observed − Galaxy
Template Spectrum Av = 0.50000000
Galaxy: No Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
2.5
2.0
1.5
1.0
0.5
0.0
5000
6000
7000
8000
9000
10000

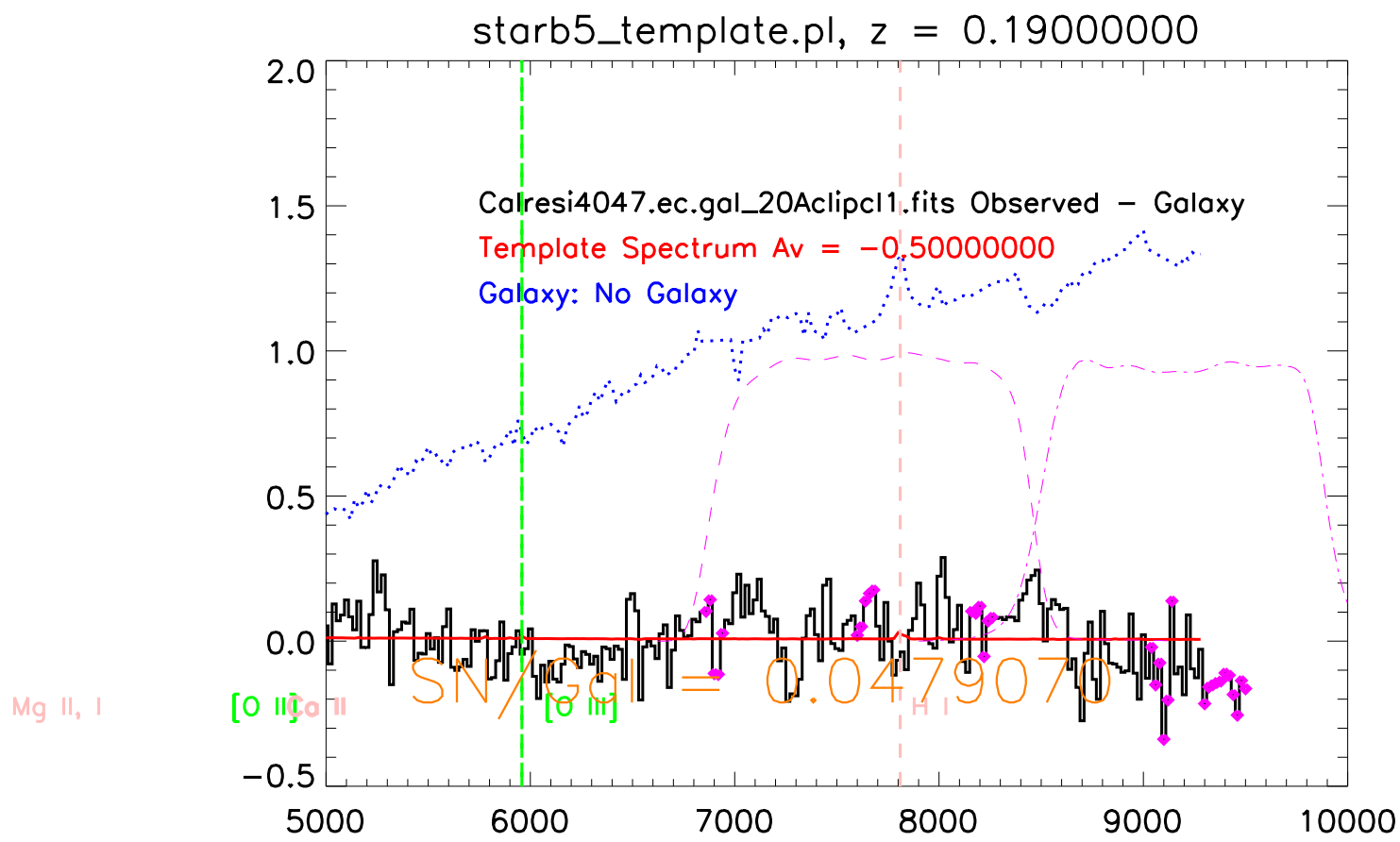

starb1_template.pl, z = 0.52999997
Calresi4047.ec.gal_20Aclip.fits Observed − Galaxy
Template Spectrum Av = 0.50000000
Galaxy: No Galaxy
SN/Gal = Inf
Mg II
[O II]
Ca II
[O III]
H I
2.5
2.0
1.5
1.0
0.5
0.0
5000
6000
7000
8000
9000
10000

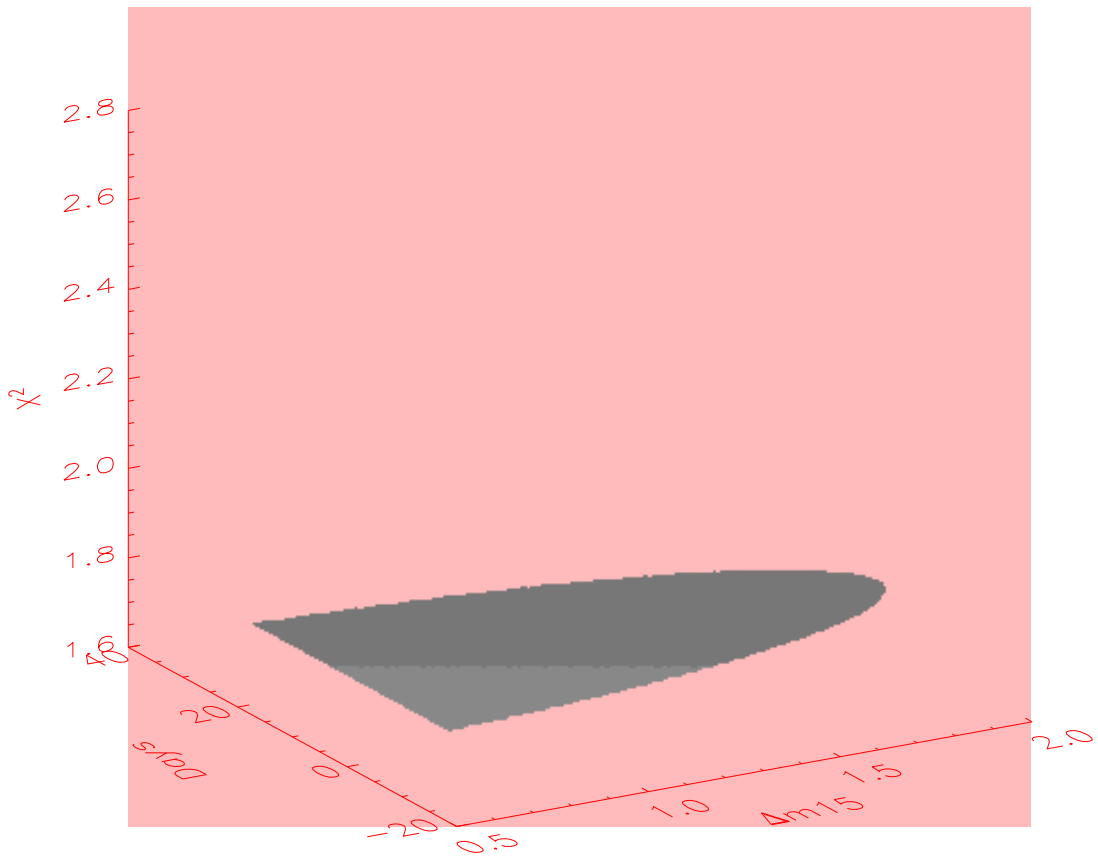

starb2_template.pl, z = 0.52999997
Calresi4047.ec.gal_20Aclip.fits Observed − Galaxy
Template Spectrum Av = 0.50000000
Galaxy: No Galaxy
SN/Gal = Inf
Mg II
[O II]
Ca II
[O III]
H I
2.5
2.0
1.5
1.0
0.5
0.0
5000
6000
7000
8000
9000
10000

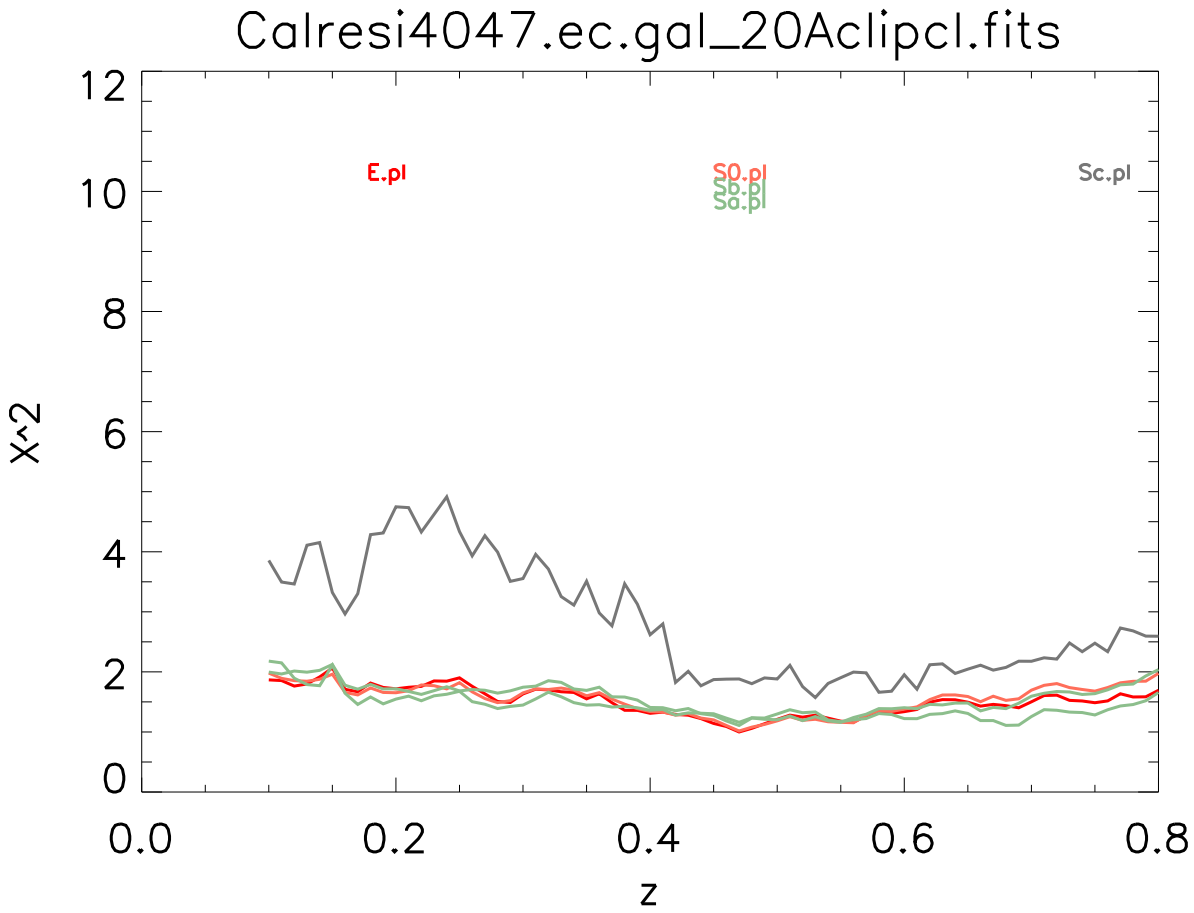

2.2
2.0
1.8
1.6
1.4
1.2
1.0
χ²
40
20
0
−20
δ[deg]
0.5
1.0
1.5
2.0
Δm15

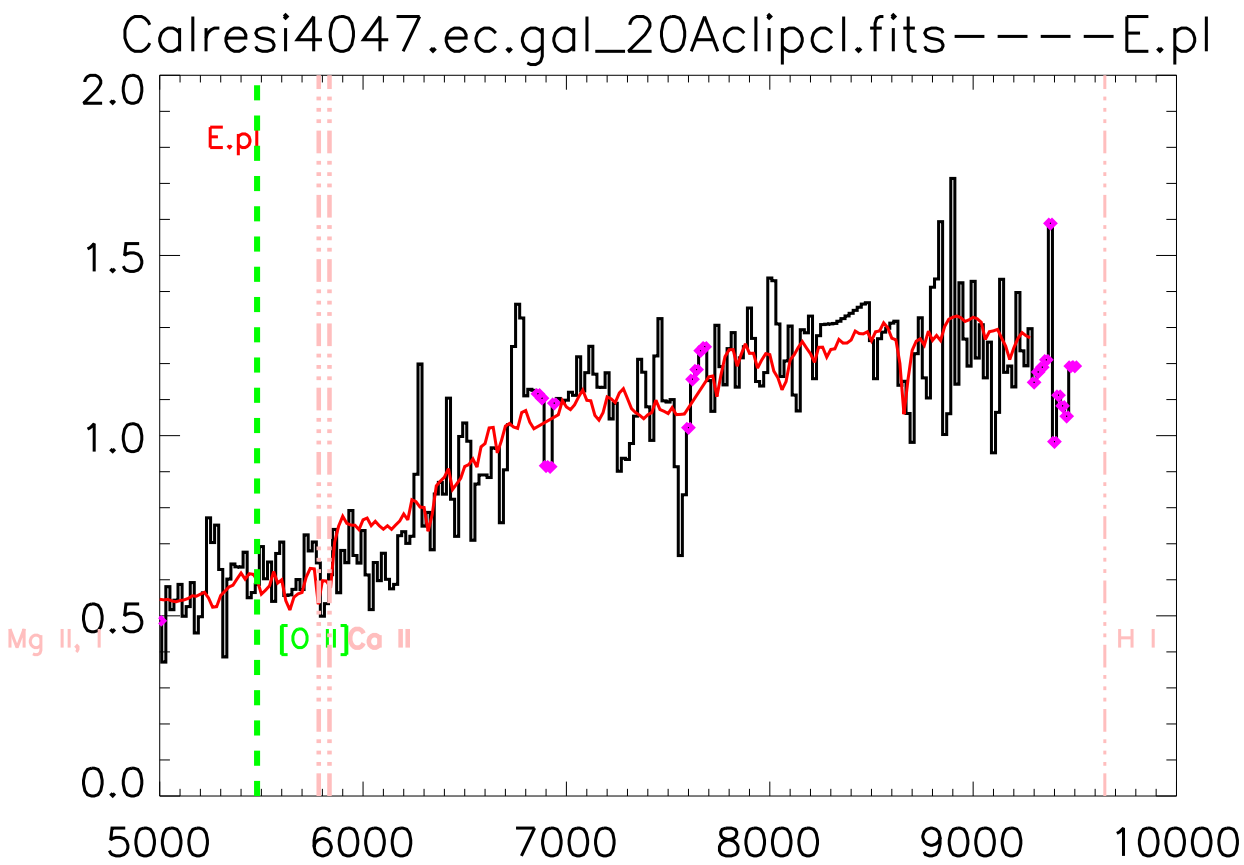

CalresI4047.ec.gal_20AclipcI1.fits
starb5_template.pl
X^2
z
0
2
4
6
8
10
12
0.0
0.2
0.4
0.6
0.8

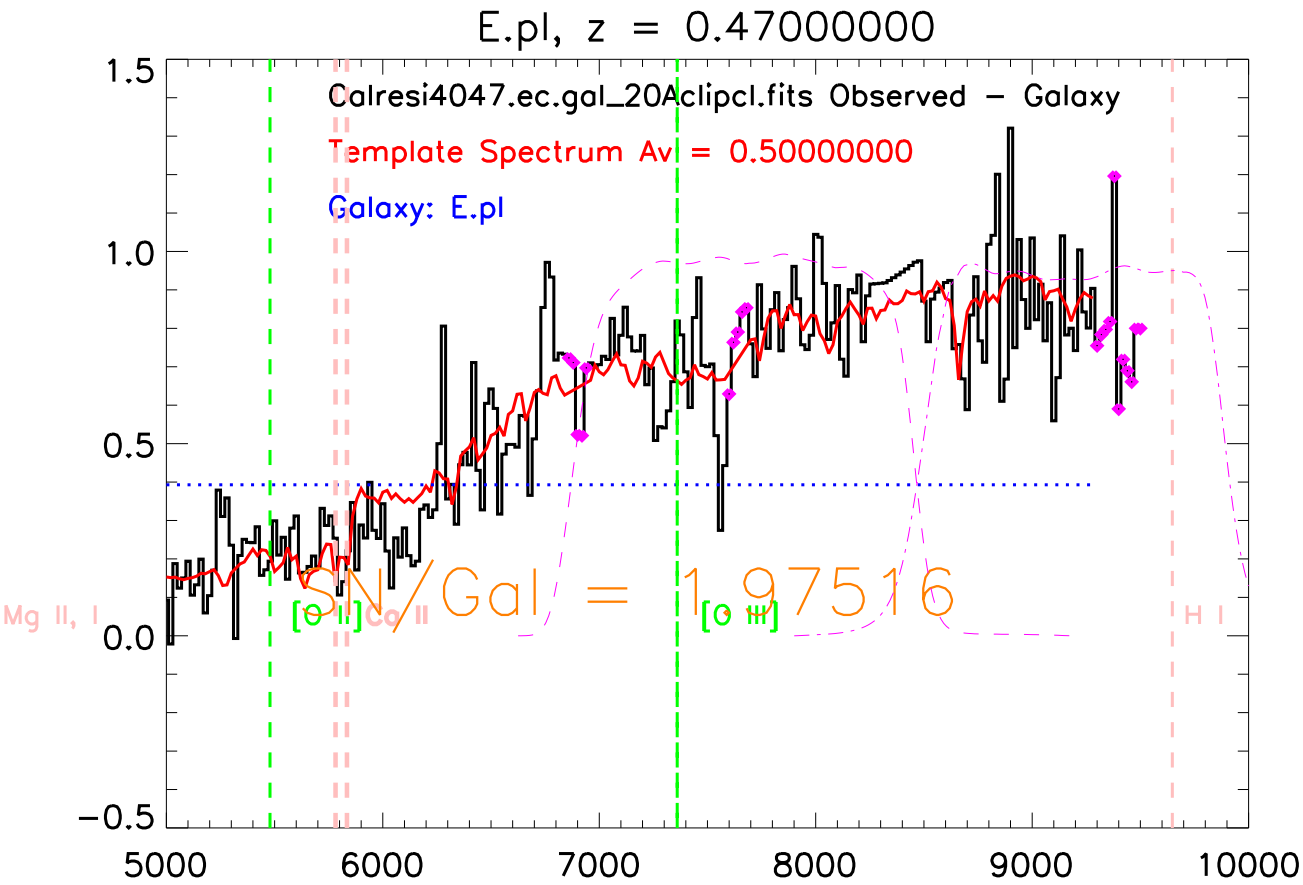

CalresI4047.ec.gal_20AclipcI1.fits----
2.0
1.5
1.0
0.5
0.0
5000
6000
7000
8000
9000
10000
Mg II, I
[O II]
H I

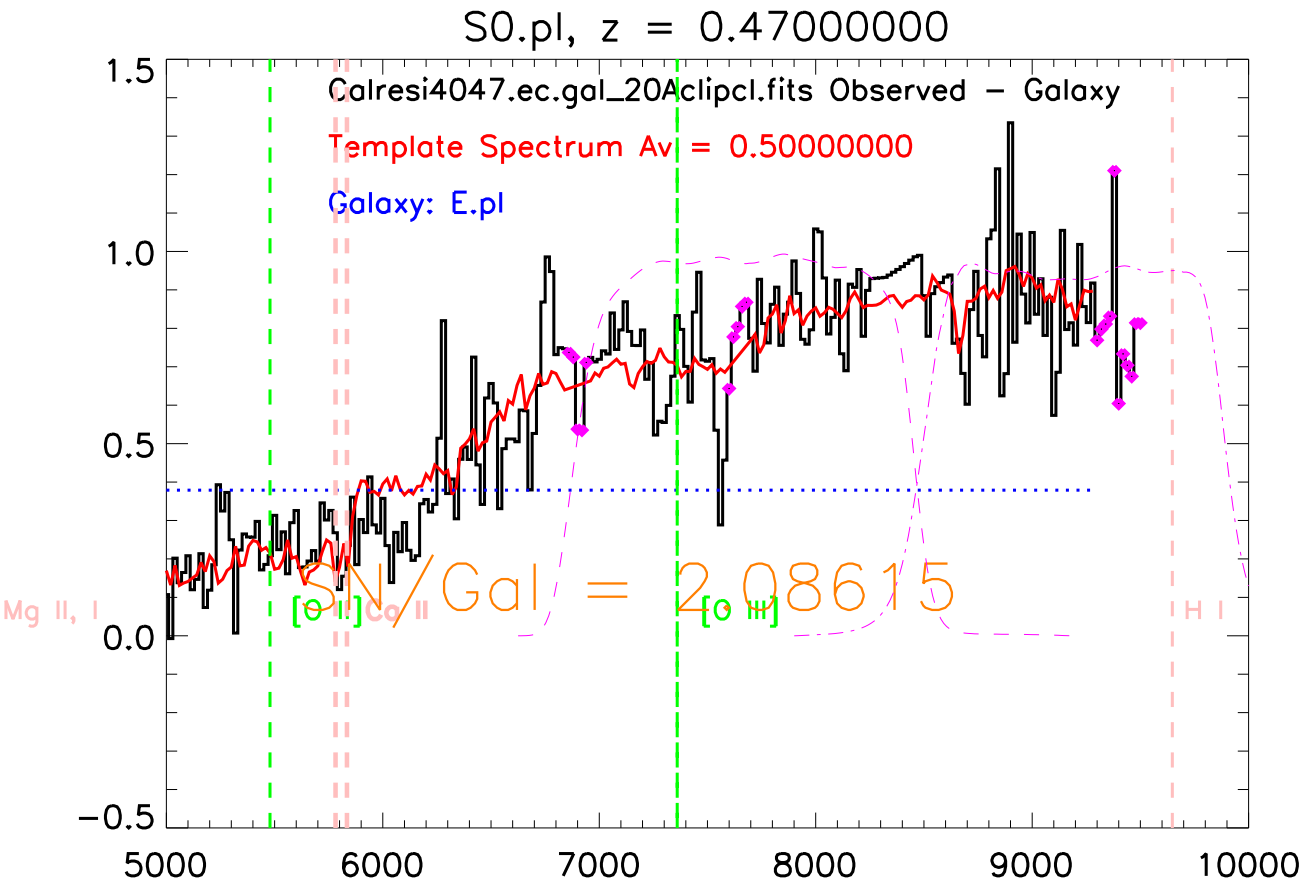

starb5_template.pl, z = 0.19000000
Calresi4047.ec.gal_20Aclipcl1.fits Observed − Galaxy
Template Spectrum Av = −0.50000000
Galaxy: No Galaxy
SN/Gal = 0.0479070
Mg II, I
[O II]
Ca II
[O III]
H I
2.0
1.5
1.0
0.5
0.0
−0.5
5000
6000
7000
8000
9000
10000

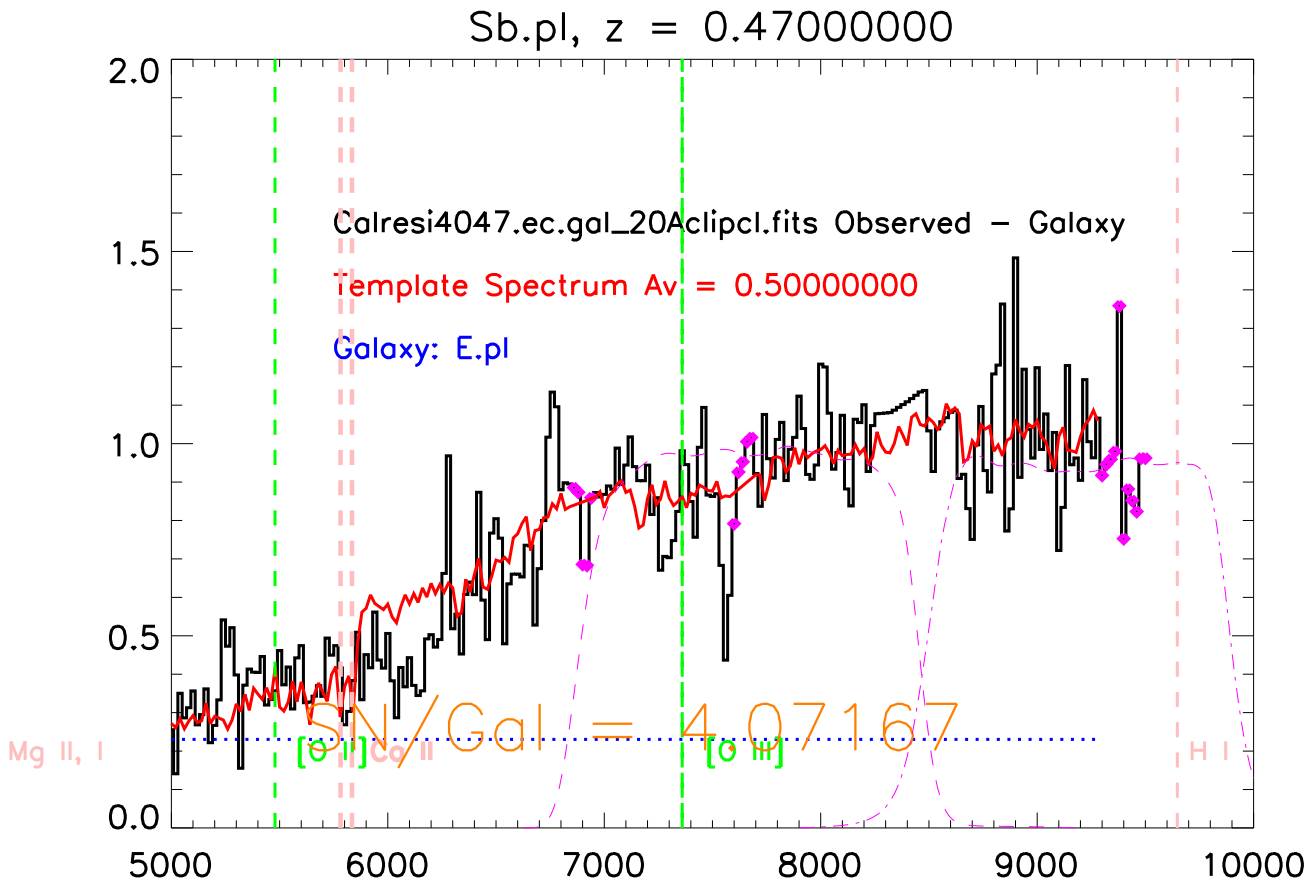

2.8
2.6
2.4
2.2
2.0
1.8
1.6
χ²
40
20
0
−20
Δm15
0.5
1.0
1.5
2.0

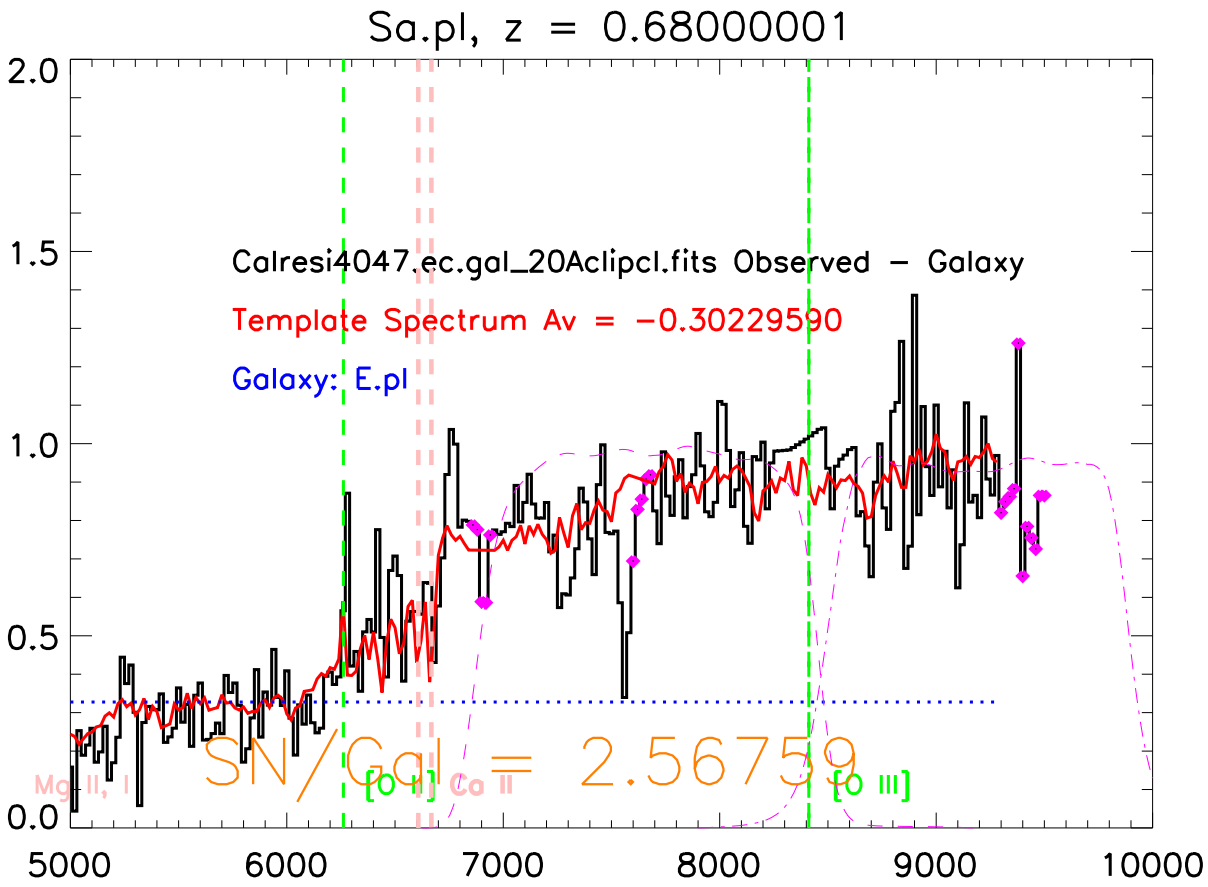

Calresi4047.ec.gal_20Aclipcl.fits
E.pl
S0.pl
Sb.pl
Sa.pl
Sc.pl
X^2
z
0
2
4
6
8
10
12
0.0
0.2
0.4
0.6
0.8

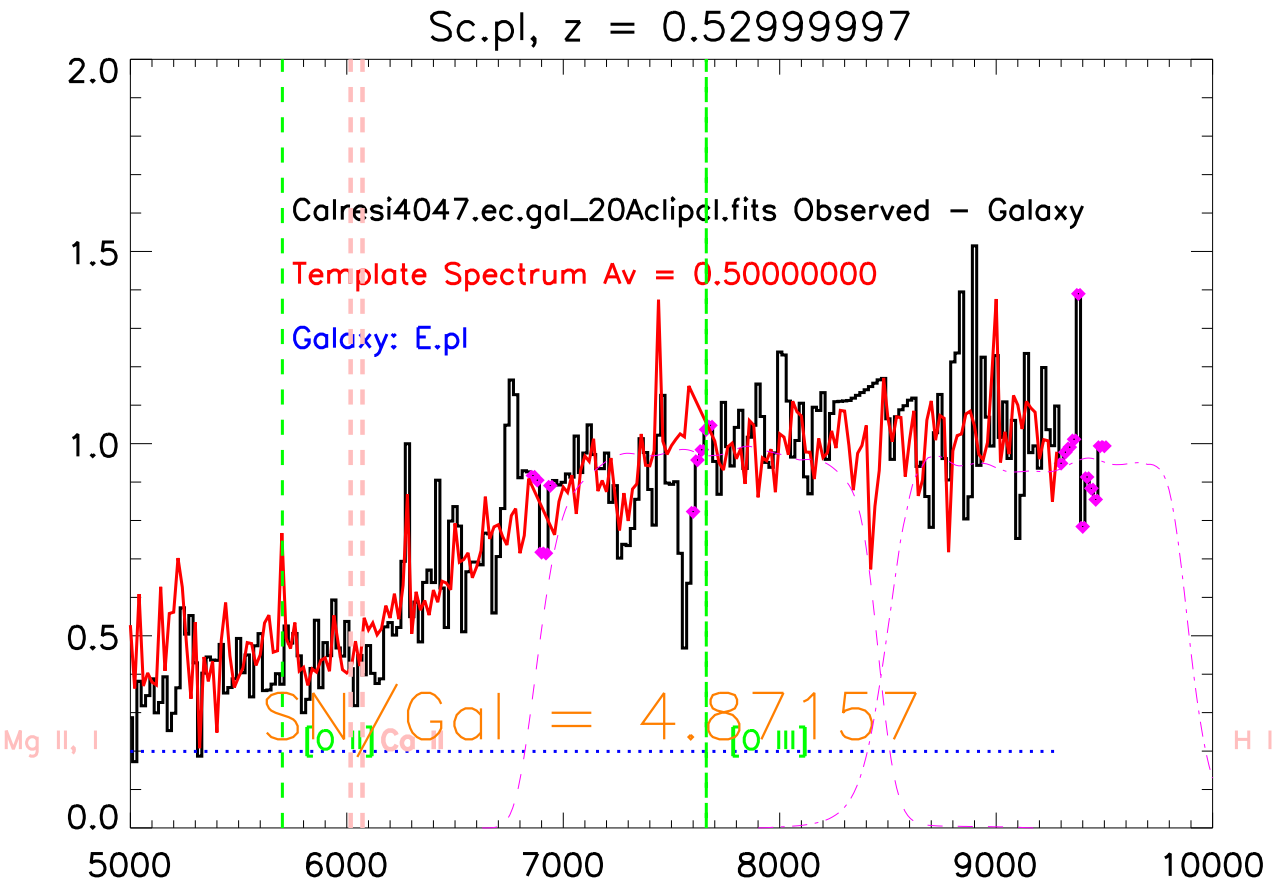

Calresi4047.ec.gal_20Aclipcl.fits----E.pl
2.0
1.5
1.0
0.5
0.0
E.pl
Mg II, I
[O II]
Ca II
H I
5000
6000
7000
8000
9000
10000

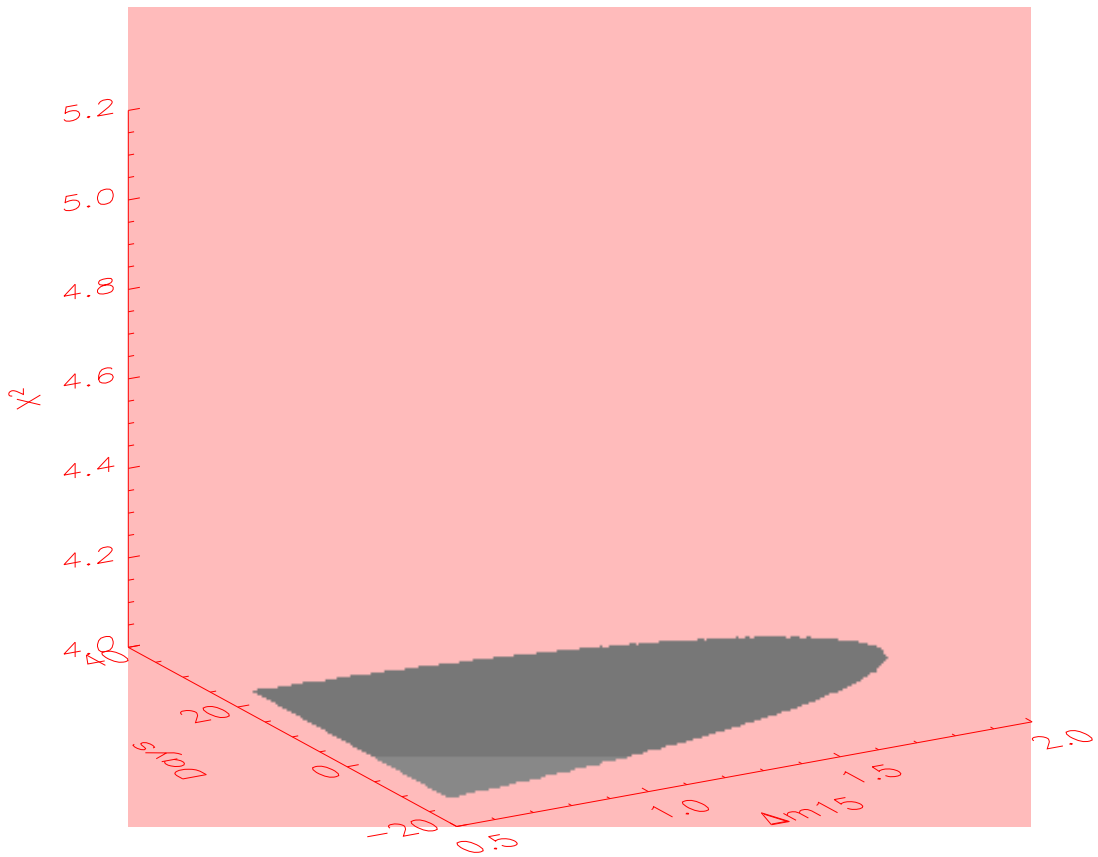

E.pl, z = 0.47000000
Calresi4047.ec.gal_20Aclipcl.fits Observed − Galaxy
Template Spectrum Av = 0.50000000
Galaxy: E.pl
S/N/Gal = 1.97516
1.5
1.0
0.5
0.0
−0.5
5000
6000
7000
8000
9000
10000
Mg II, I
[O II]
Ca II
[O III]
H I

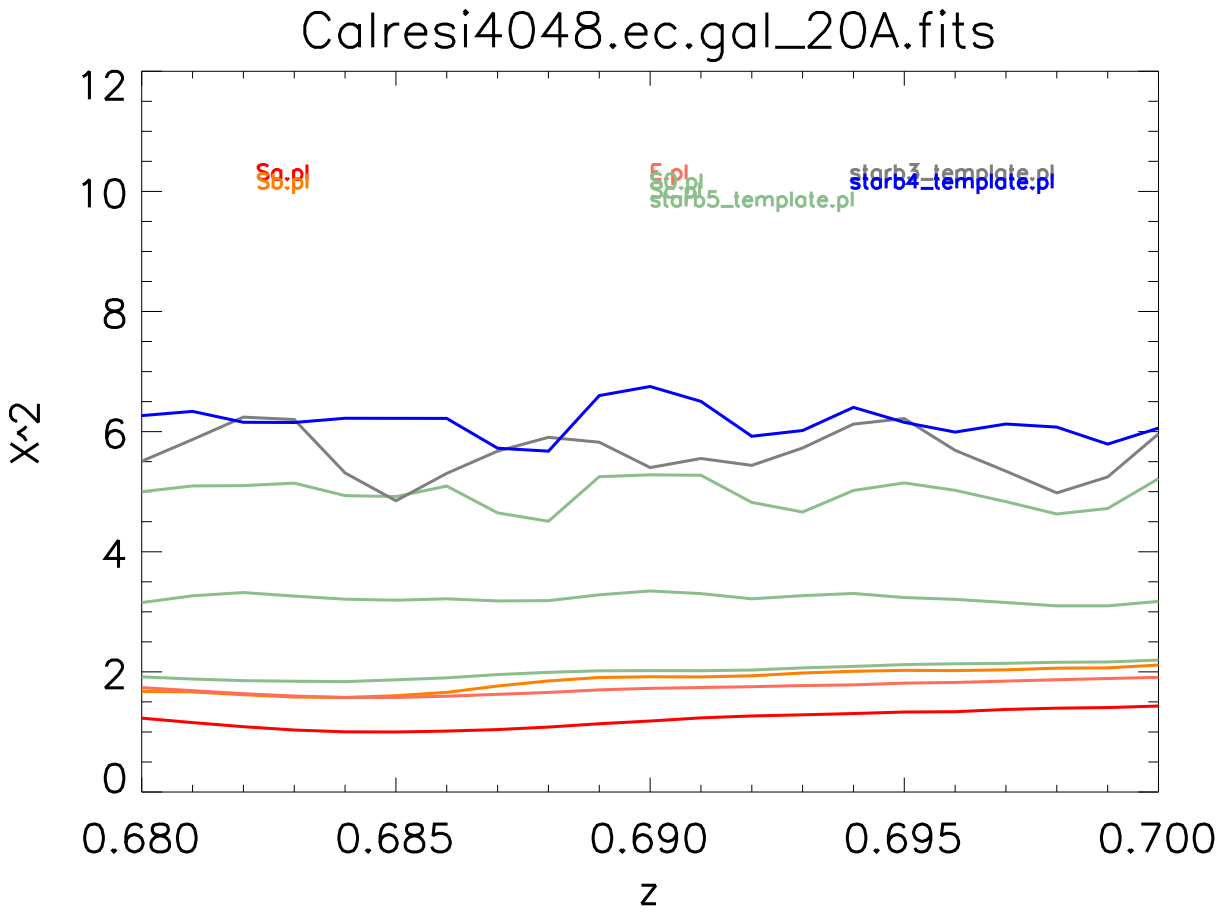

S0.pl, z = 0.47000000
Calresi4047.ec.gal_20Aclipcl.fits Observed − Galaxy
Template Spectrum Av = 0.50000000
Galaxy: E.pl
S/N/Gal = 2.08615
Mg II, I
[O II]
Ca II
[O III]
H I
1.5
1.0
0.5
0.0
−0.5
5000
6000
7000
8000
9000
10000

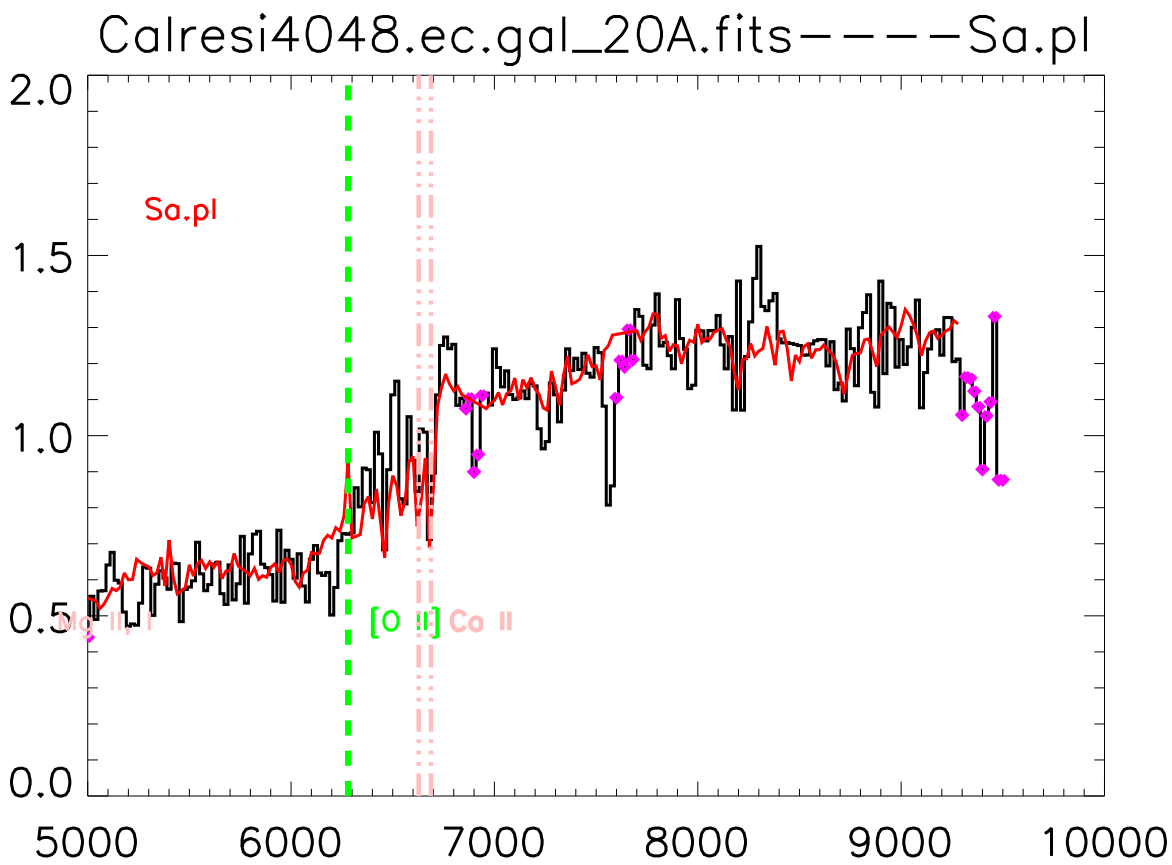

Sb.pl, z = 0.47000000
Calresi4047.ec.gal_20Aclipcl.fits Observed − Galaxy
Template Spectrum Av = 0.50000000
Galaxy: E.pl
S/N/Gal = 4.07167
Mg II, I
[O II]
Ca II
[O III]
H I
2.0
1.5
1.0
0.5
0.0
5000
6000
7000
8000
9000
10000

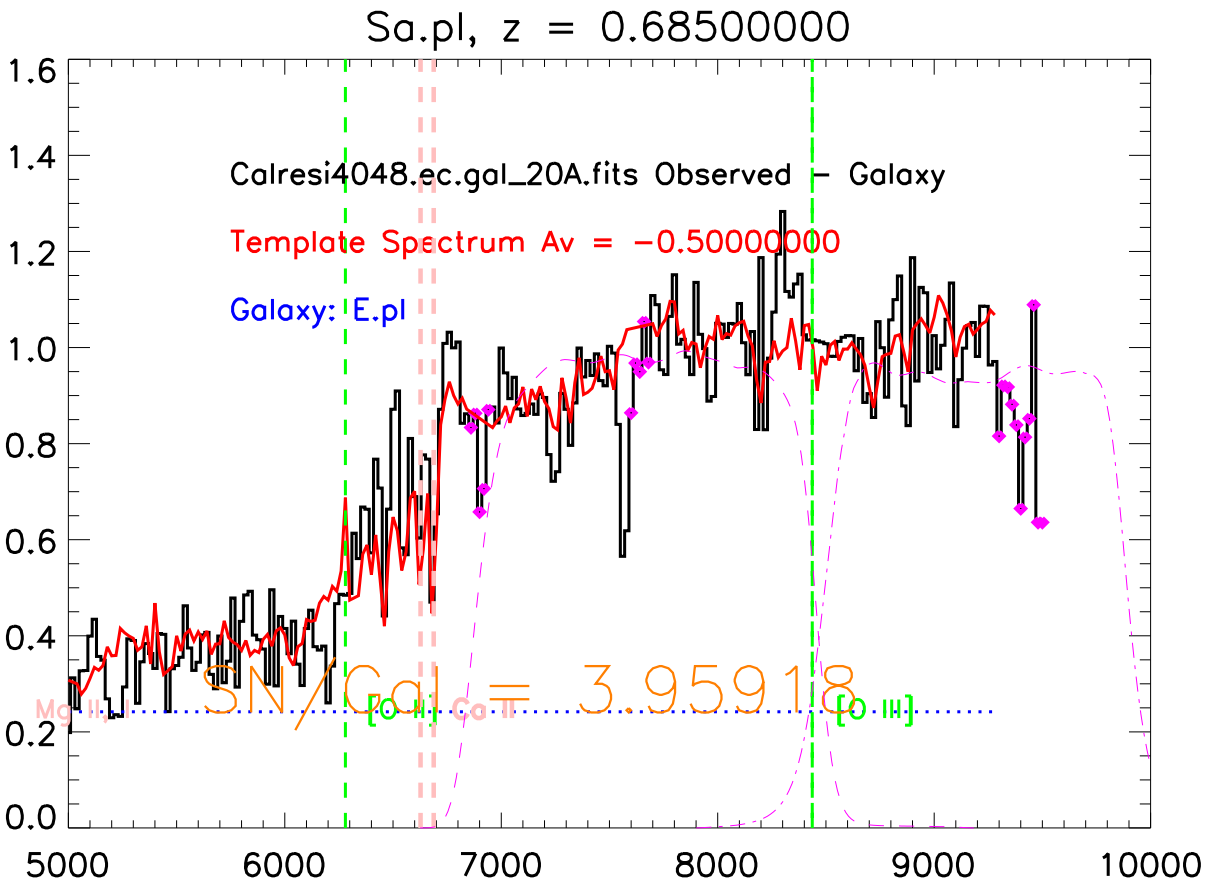

Sa.pl, z = 0.68000001
Calresi4047.ec.gal_20Aclipcl.fits Observed − Galaxy
Template Spectrum Av = −0.30229590
Galaxy: E.pl
SN/Gal = 2.56759
[O II]
Ca II
[O III]
2.0
1.5
1.0
0.5
0.0
5000
6000
7000
8000
9000
10000

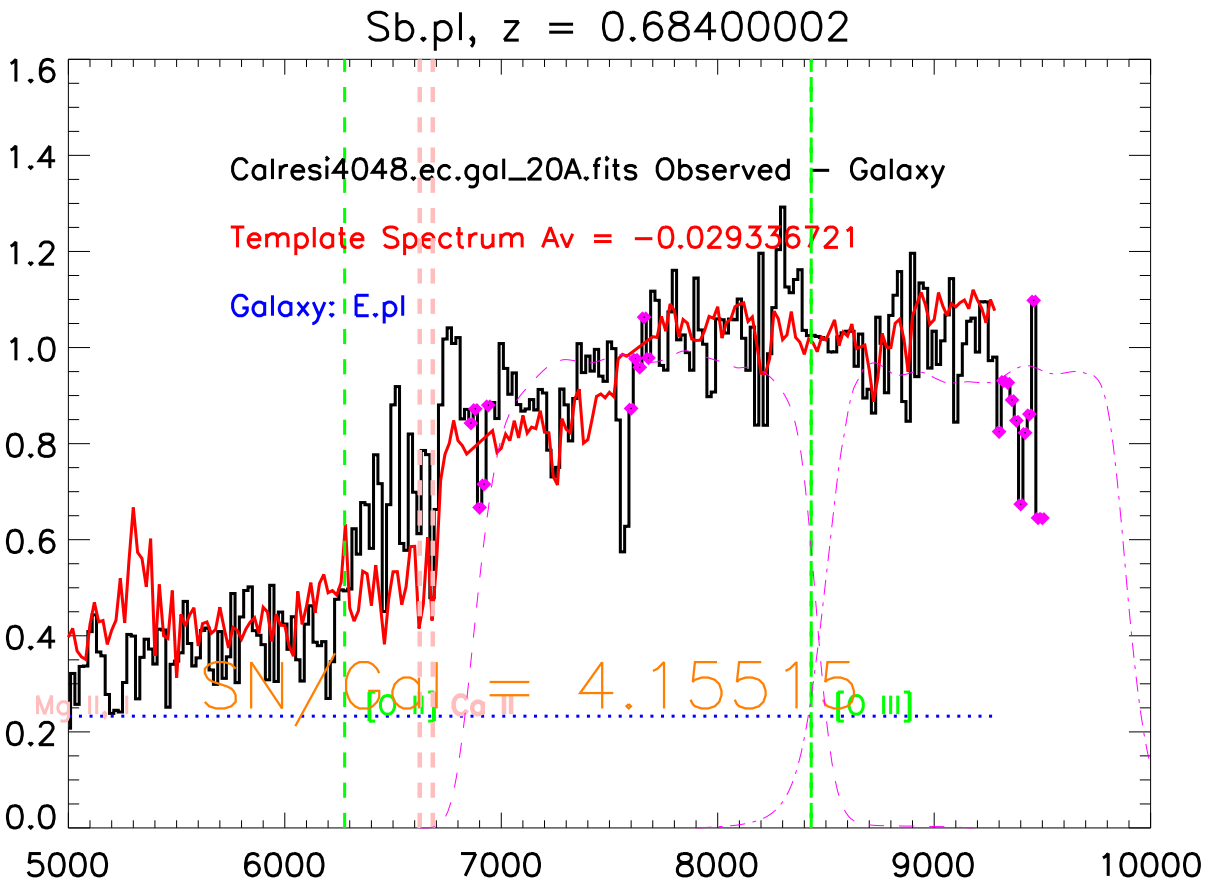

Sc.pl, z = 0.52999997
Calresi4047.ec.gal_20Aclipcl.fits Observed − Galaxy
Template Spectrum Av = 0.50000000
Galaxy: E.pl
S/N/Gal = 4.87157
Mg II, I
[O II]
Ca II
[O III]
H I
2.0
1.5
1.0
0.5
0.0
5000
6000
7000
8000
9000
10000

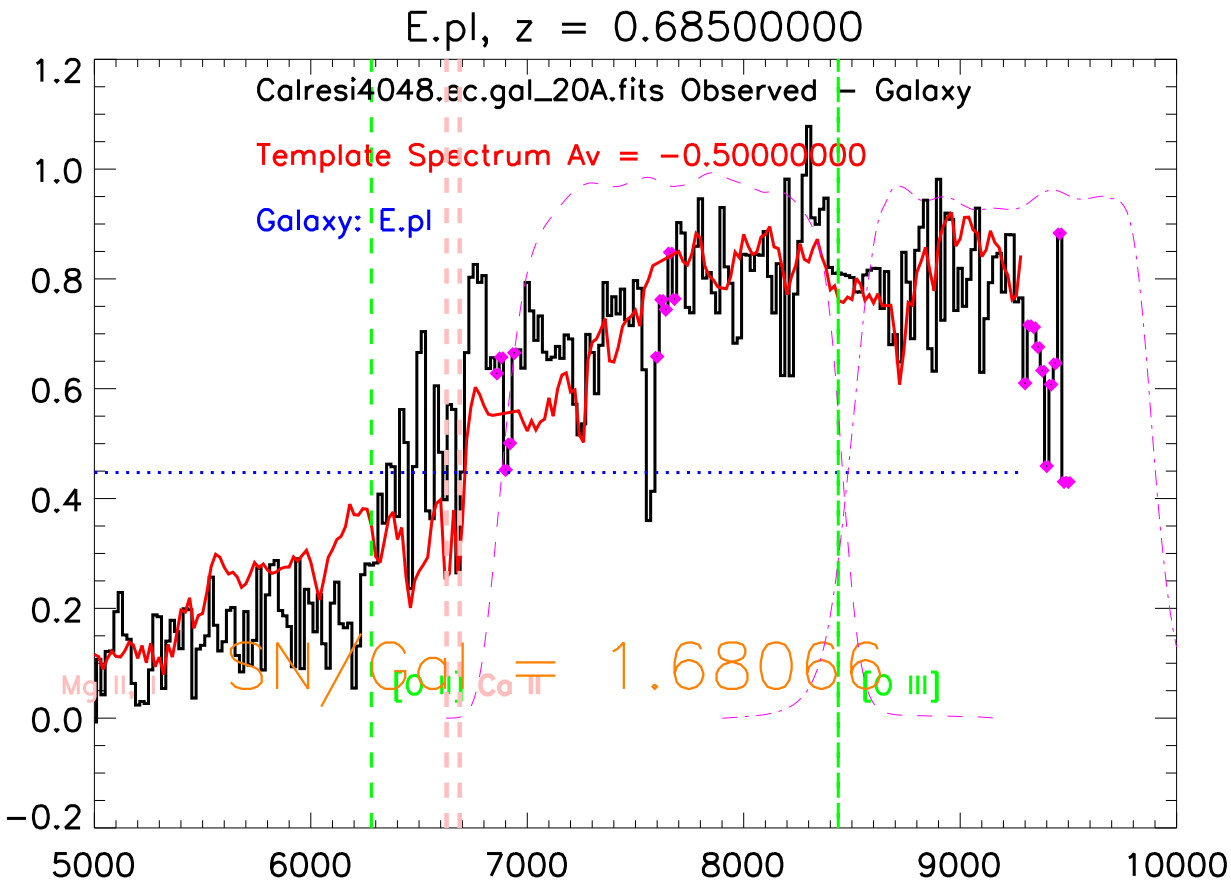

5.2
5.0
4.8
4.6
4.4
4.2
4.0
χ²
40
20
0
−20
Δm15
0.5
1.0
1.5
2.0

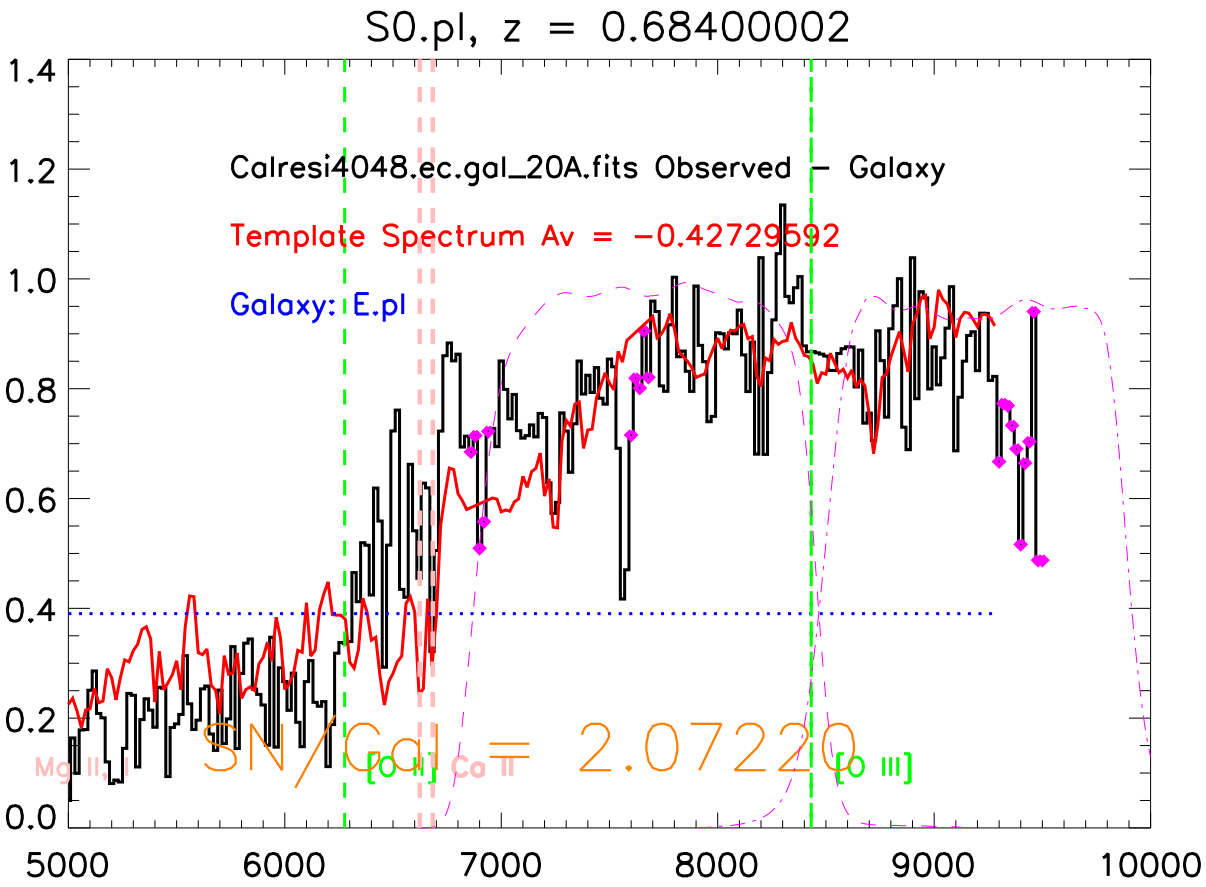

Calresi4048.ec.gal_20A.fits
12
10
8
6
4
2
0
X^2
0.680
0.685
0.690
0.695
0.700
z
Sa.pl
Sb.pl
E.pl
Sc.pl
starb5_template.pl
starb3_template.pl
starb4_template.pl

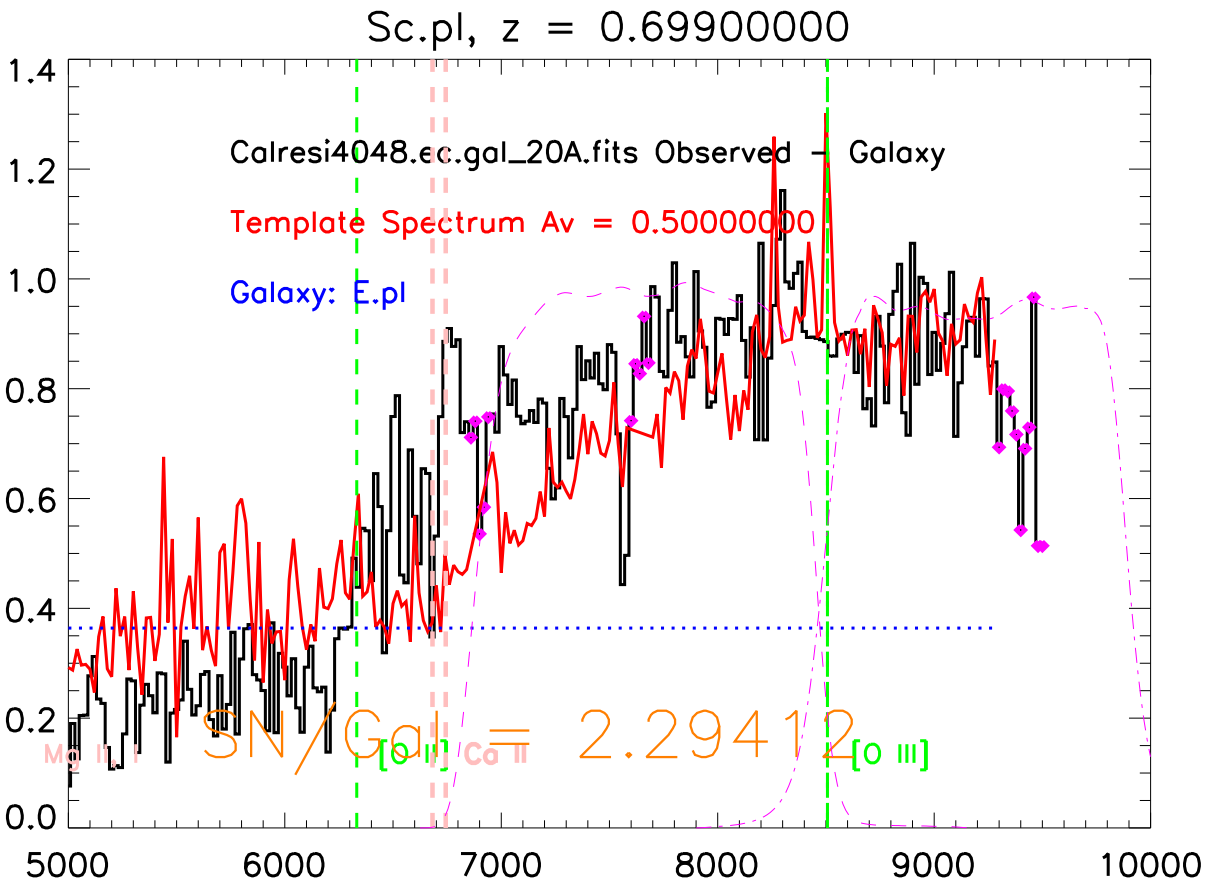

Calresi4048.ec.gal_20A.fits----Sa.pl
Sa.pl
[O II]
Ca II
2.0
1.5
1.0
0.5
0.0
5000
6000
7000
8000
9000
10000

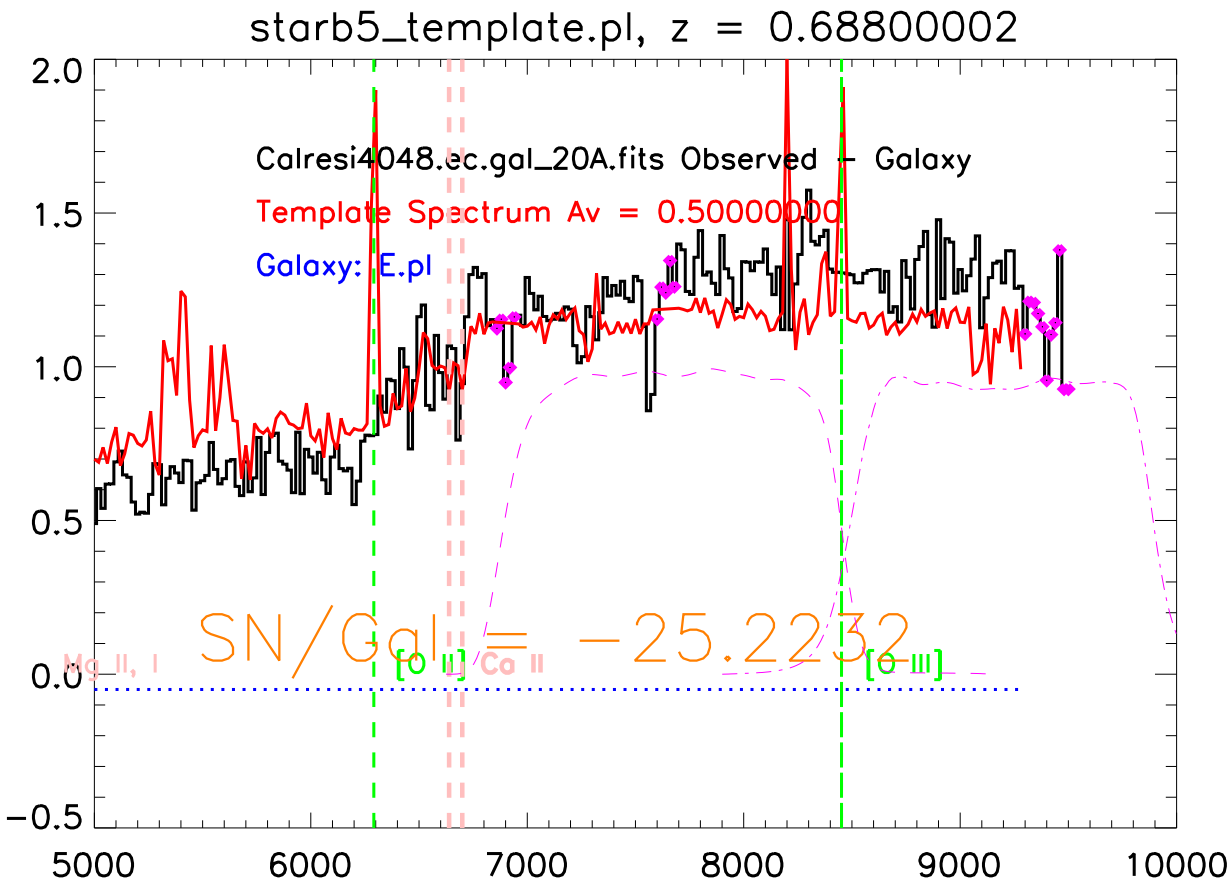

Sa.pl, z = 0.68500000
Calresi4048.ec.gal_20A.fits Observed – Galaxy
Template Spectrum Av = −0.50000000
Galaxy: E.pl
SN/Gal = 3.95918
Mg II
[O II]
Ca II
[O III]
1.6
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
5000
6000
7000
8000
9000
10000

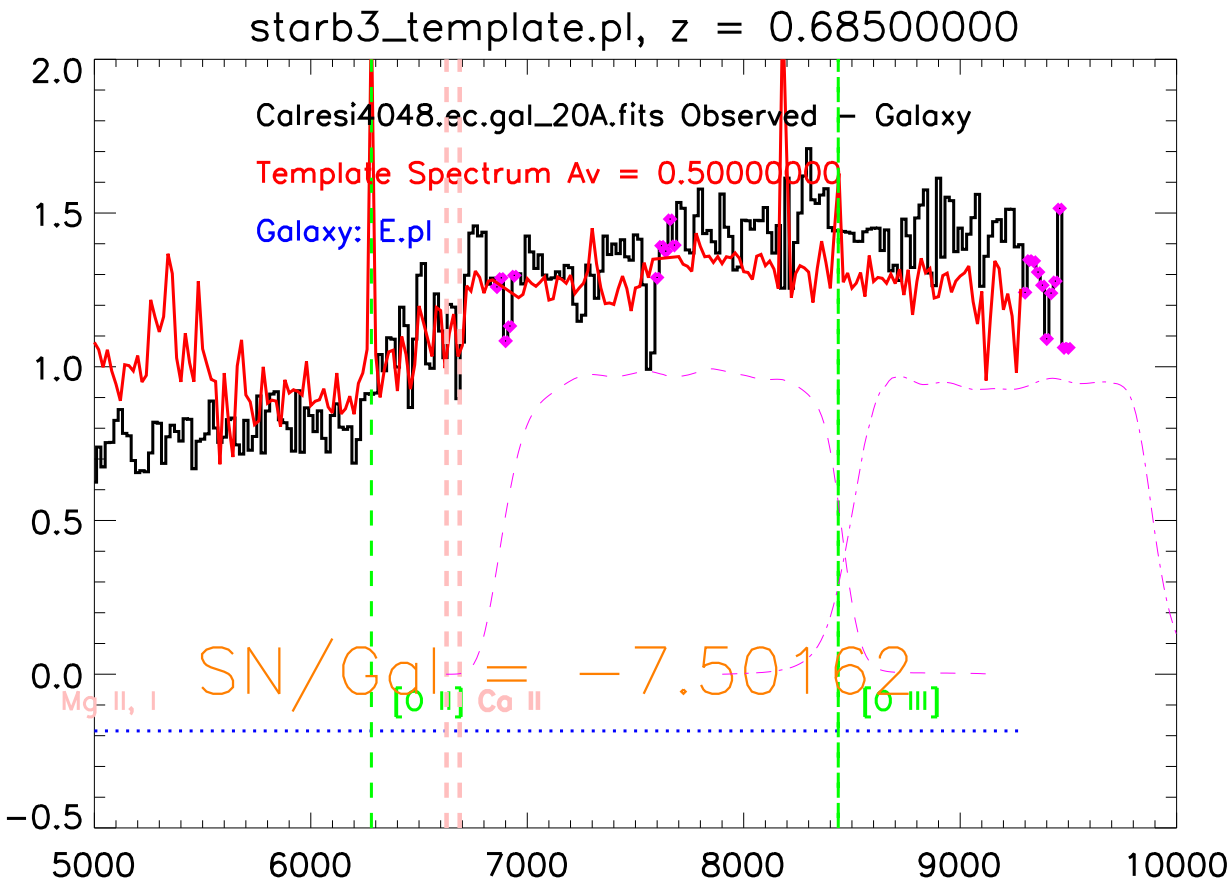

Sb.pl, z = 0.68400002
Calresi4048.ec.gal_20A.fits Observed – Galaxy
Template Spectrum Av = −0.029336721
Galaxy: E.pl
SN/Gal = 4.15515
Mg II
[O II]
Ca II
[O III]
1.6
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
5000
6000
7000
8000
9000
10000

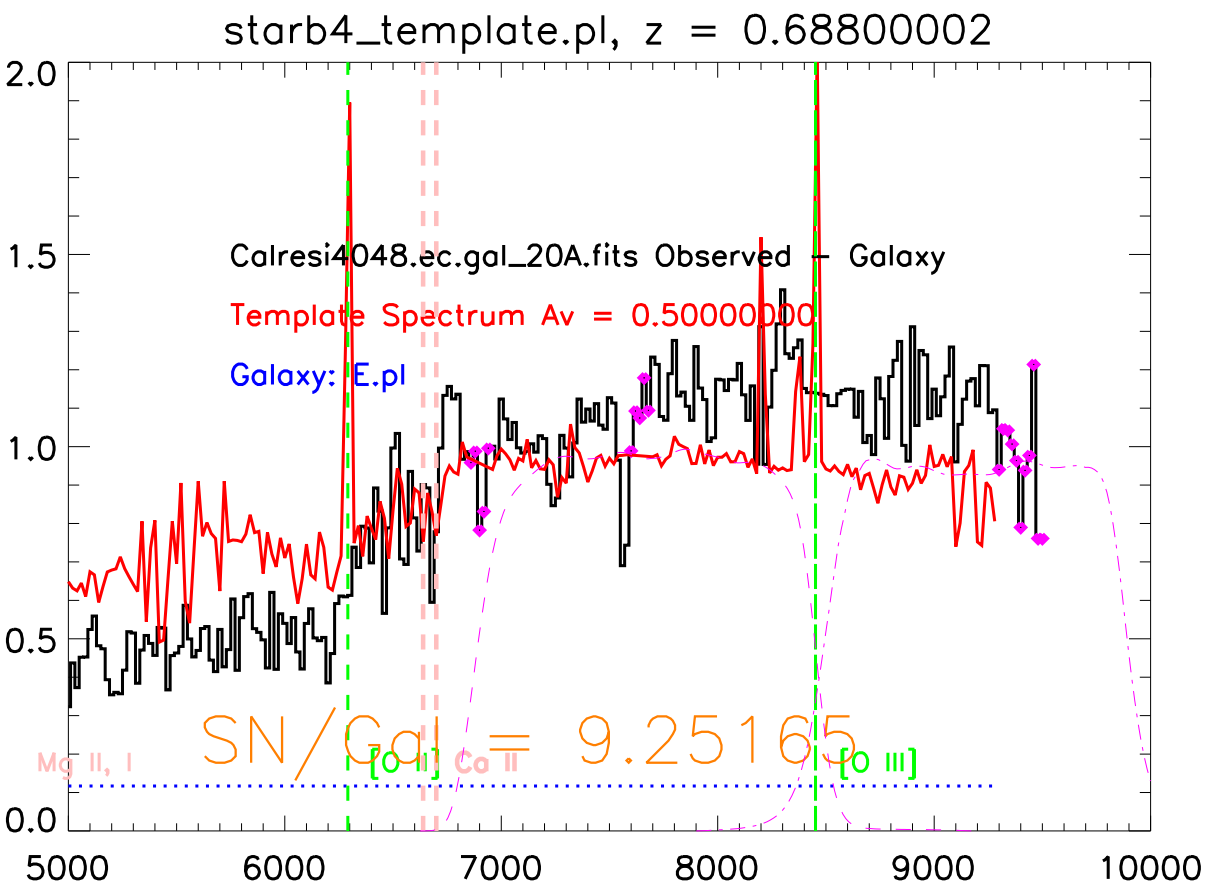

E.pl, z = 0.68500000
Calresi4048.ec.gal_20A.fits Observed – Galaxy
Template Spectrum Av = −0.50000000
Galaxy: E.pl
SN/Cal = 1.68066
Mg II
[O II]
Ca II
[O III]
1.2
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
5000
6000
7000
8000
9000
10000

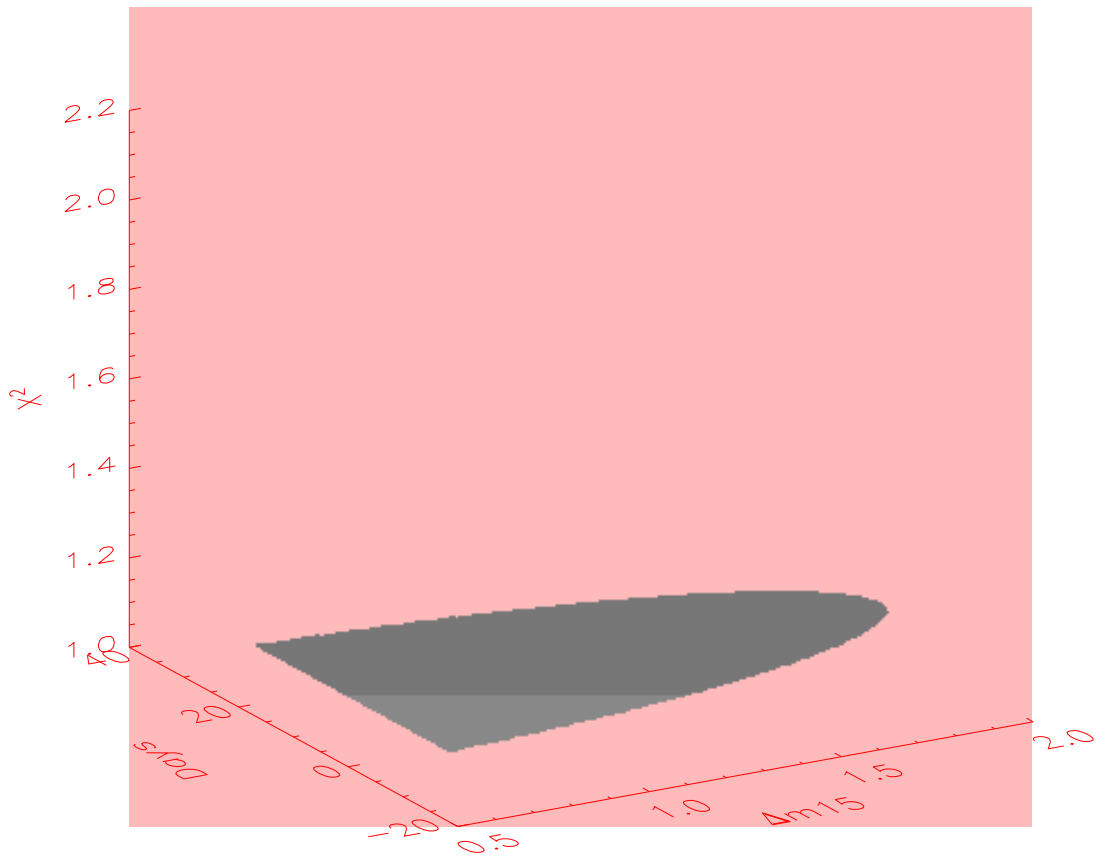

S0.pl, z = 0.68400002
Calresi4048.ec.gal_20A.fits Observed – Galaxy
Template Spectrum Av = −0.42729592
Galaxy: E.pl
SN/Gal = 2.07220
Mg II
[O II]
Ca II
[O III]
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
5000
6000
7000
8000
9000
10000

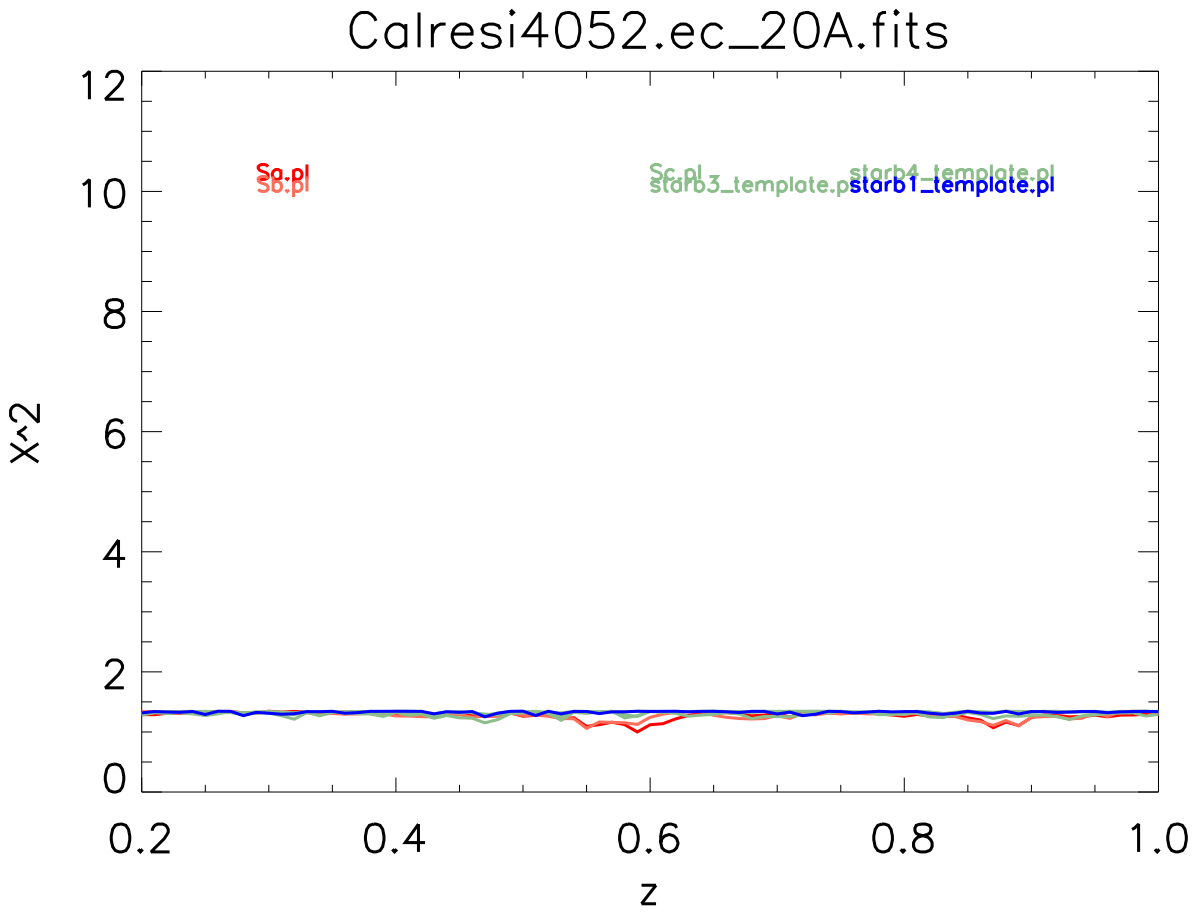

Sc.pl, z = 0.69900000
Calresi4048.ec.gal_20A.fits Observed – Galaxy
Template Spectrum Av = 0.50000000
Galaxy: E.pl
SN/Gal = 2.29412
Mg II
[O II]
Ca II
[O III]
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
5000
6000
7000
8000
9000
10000

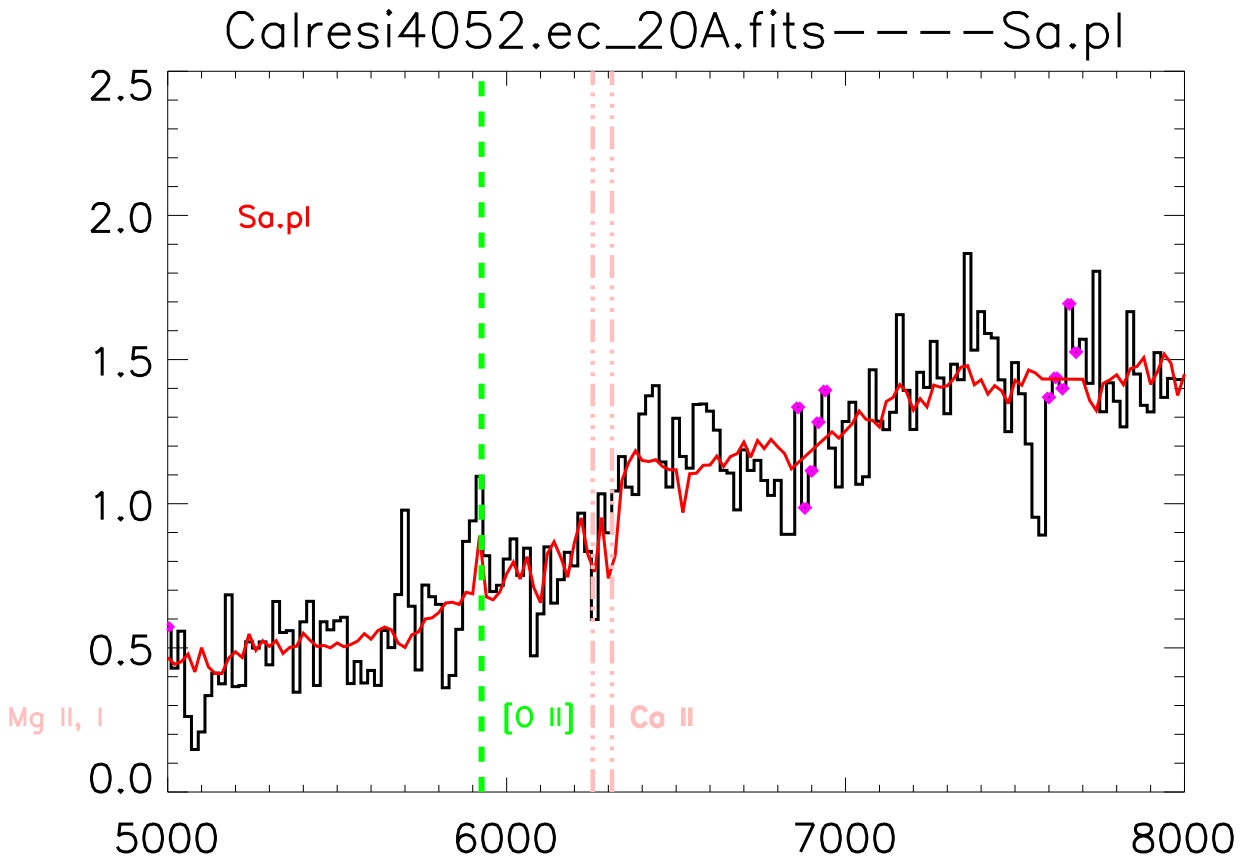

starb5_template.pl, z = 0.68800002
Calresi4048.ec.gal_20A.fits Observed – Galaxy
Template Spectrum Av = 0.50000000
Galaxy: E.pl
SN/Gal = -25.2232
Mg II, I
[O II]
Ca II
[O III]
2.0
1.5
1.0
0.5
0.0
−0.5
5000
6000
7000
8000
9000
10000

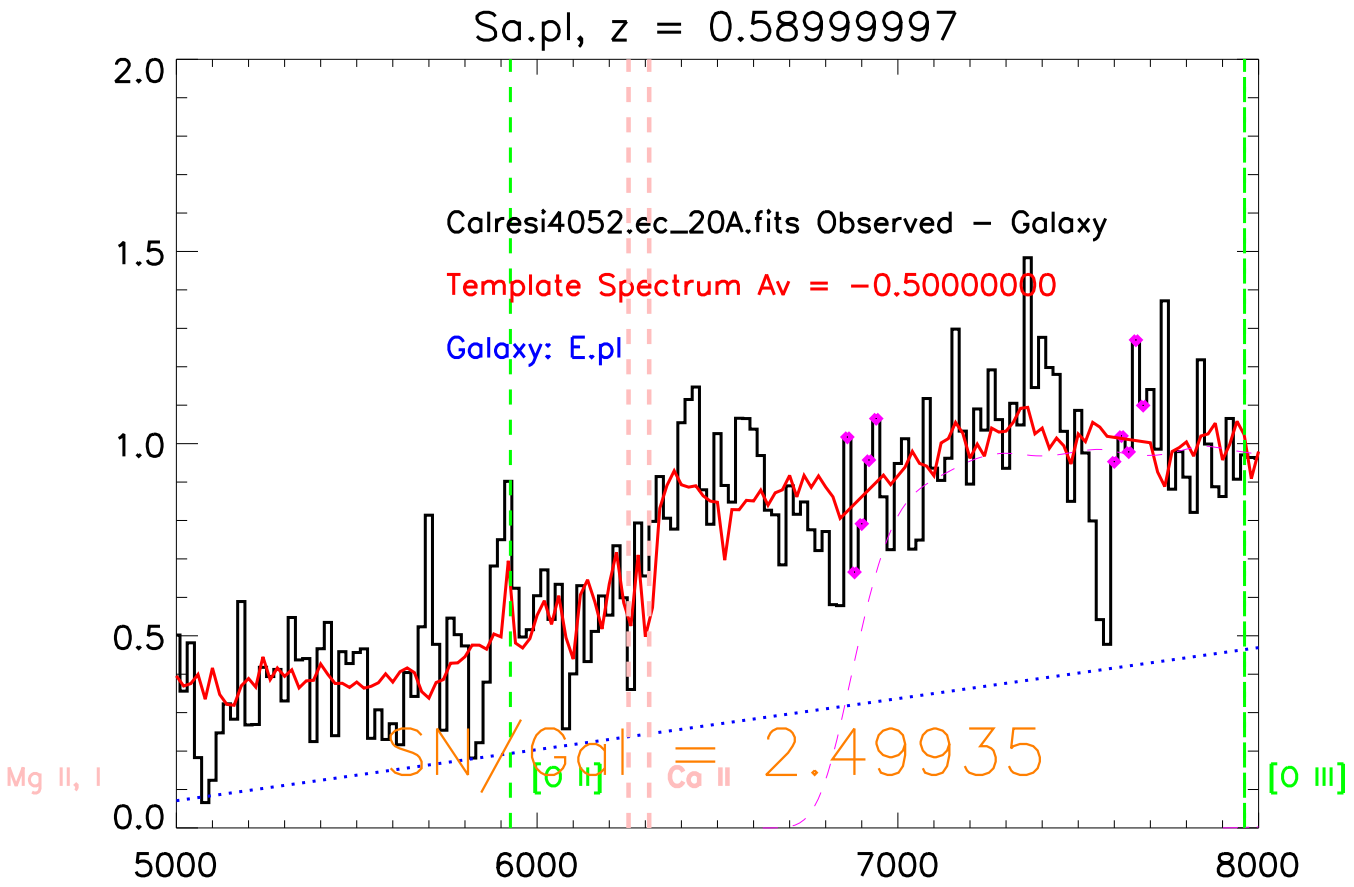

starb3_template.pl, z = 0.68500000
Calresi4048.ec.gal_20A.fits Observed – Galaxy
Template Spectrum Av = 0.50000000
Galaxy: E.pl
SN/Gal = -7.50162
Mg II, I
[O II]
Ca II
[O III]
2.0
1.5
1.0
0.5
0.0
−0.5
5000
6000
7000
8000
9000
10000

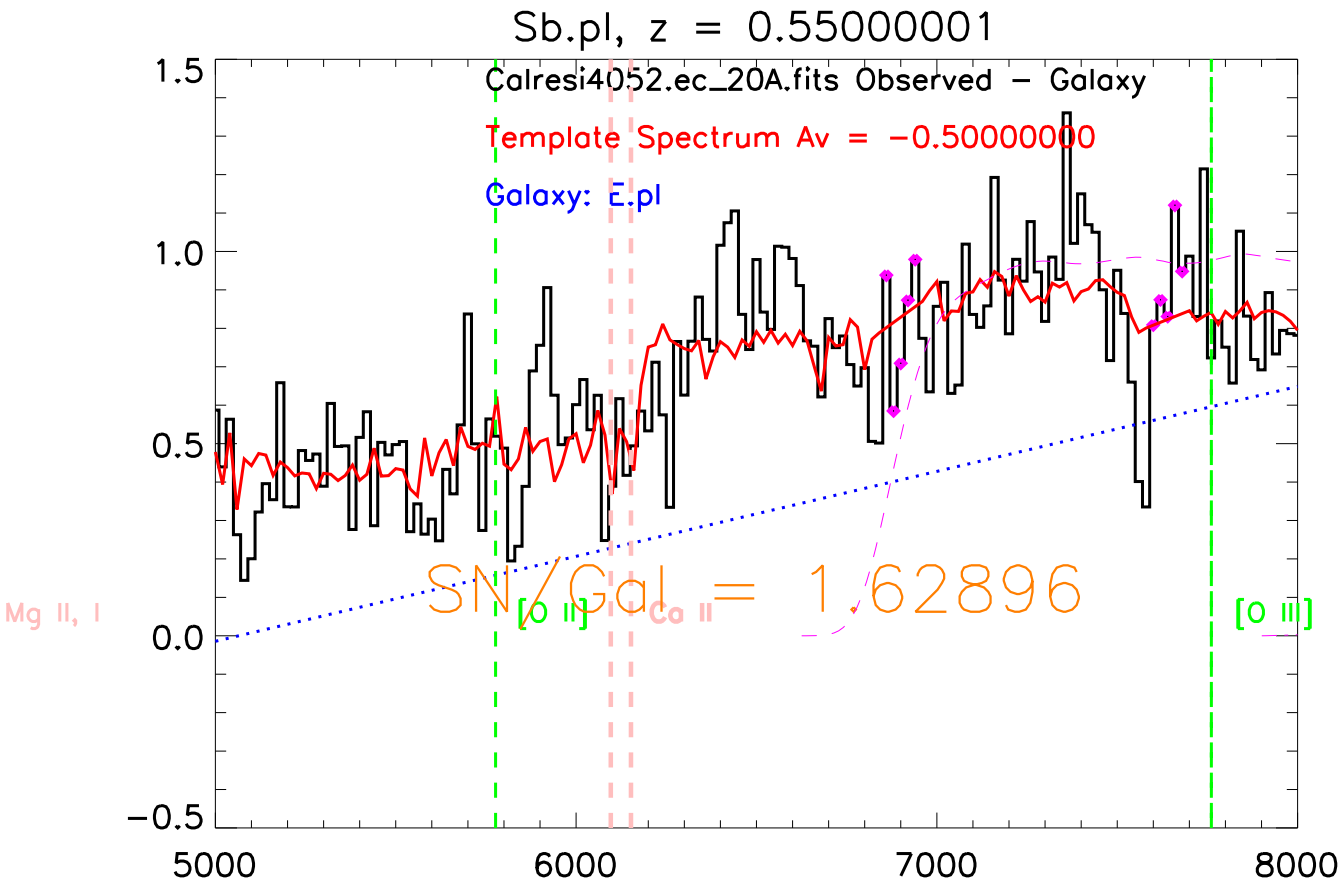

starb4_template.pl, z = 0.68800002
Calresi4048.ec.gal_20A.fits Observed – Galaxy
Template Spectrum Av = 0.50000000
Galaxy: E.pl
SN/Gal = 9.25165
Mg II, I
[O II]
Ca II
[O III]
2.0
1.5
1.0
0.5
0.0
5000
6000
7000
8000
9000
10000

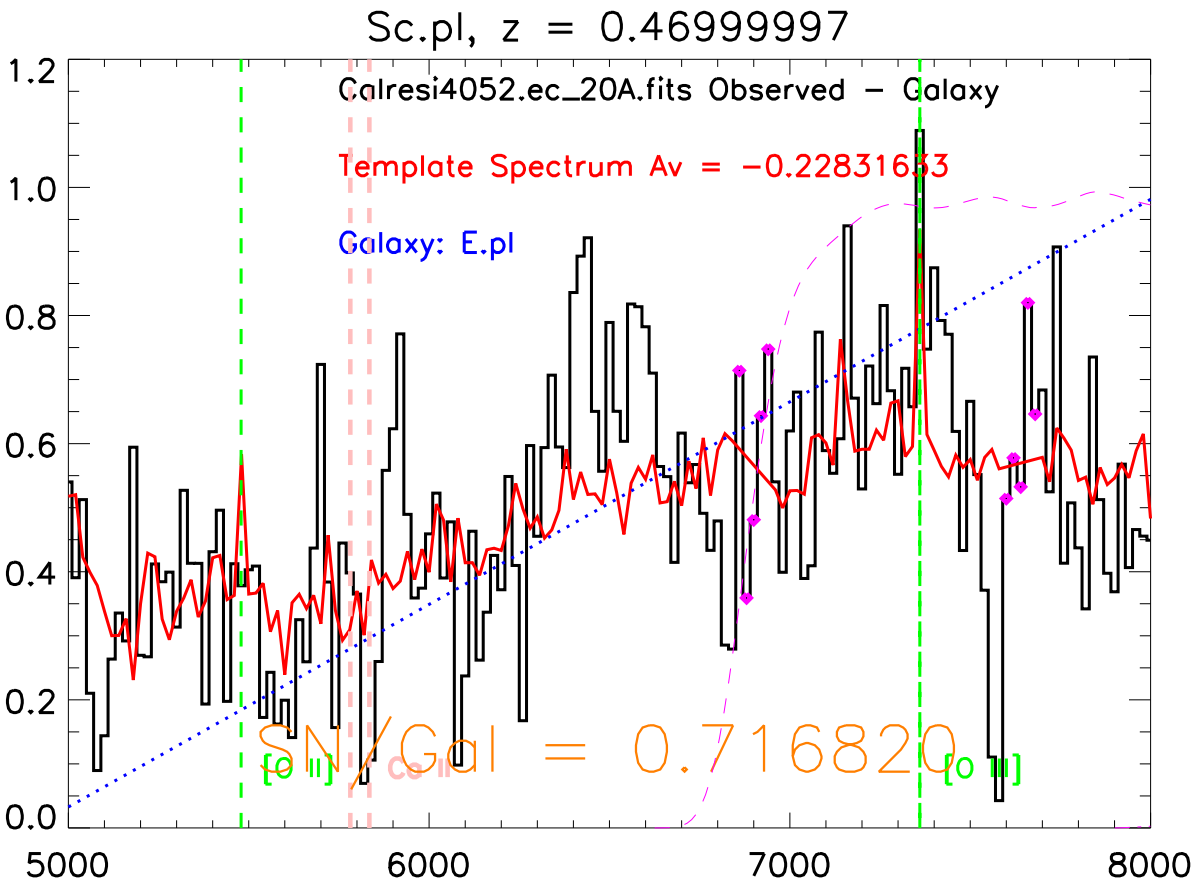

2.2
2.0
1.8
1.6
1.4
1.2
1.0
χ²
40
20
0
−20
dots
0.5
1.0
1.5
2.0
Δm15


Calresi4052.ec_20A.fits
Sa.pl
Sb.pl
Sc.pl
starb3_template.pl
starb4_template.pl
starb1_template.pl
X^2
z
0
2
4
6
8
10
12
0.2
0.4
0.6
0.8
1.0

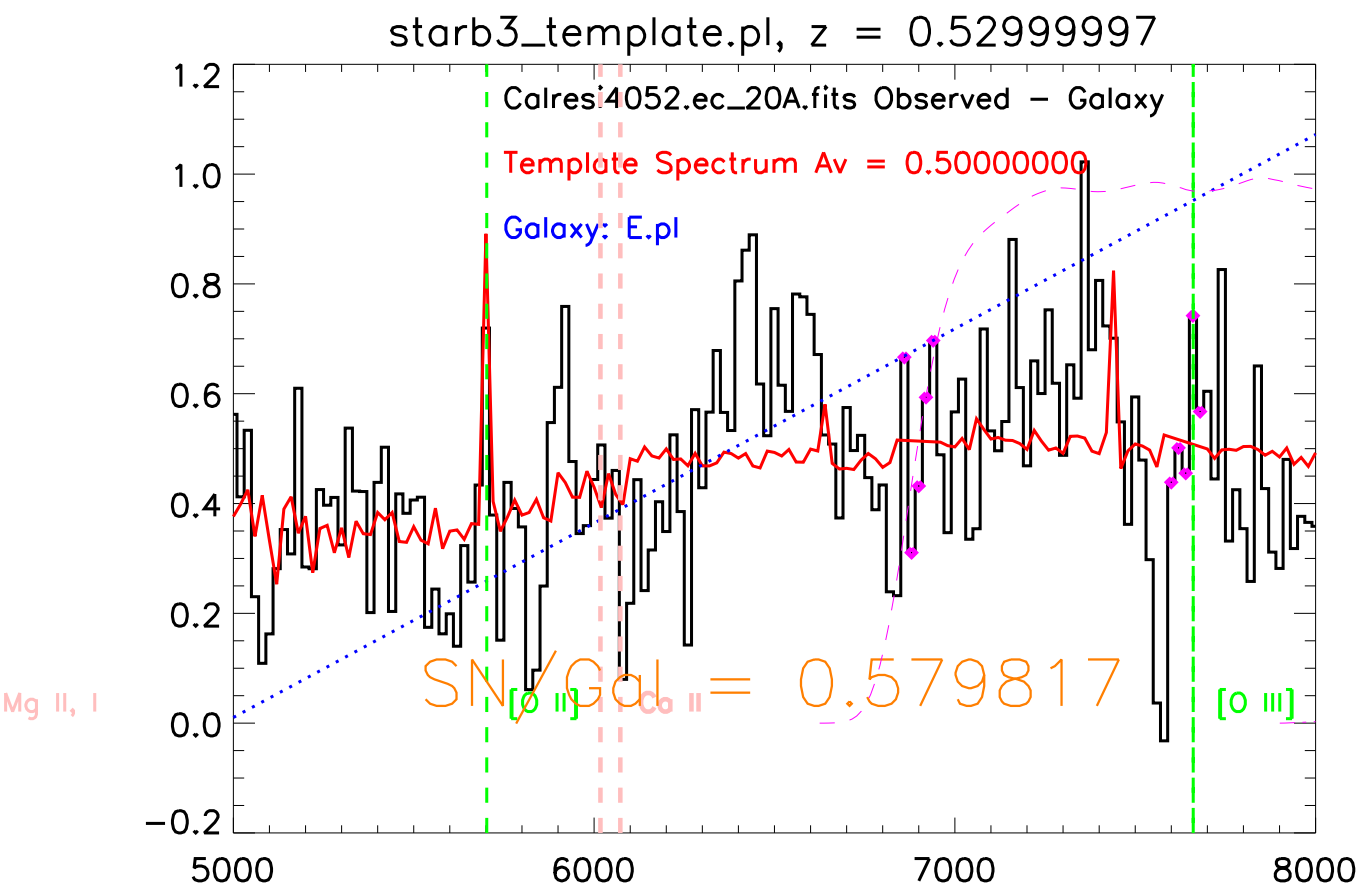

Calresi4052.ec_20A.fits----Sa.pl
2.5
2.0
1.5
1.0
0.5
0.0
Sa.pl
Mg II, I
[O II]
Ca II
5000
6000
7000
8000

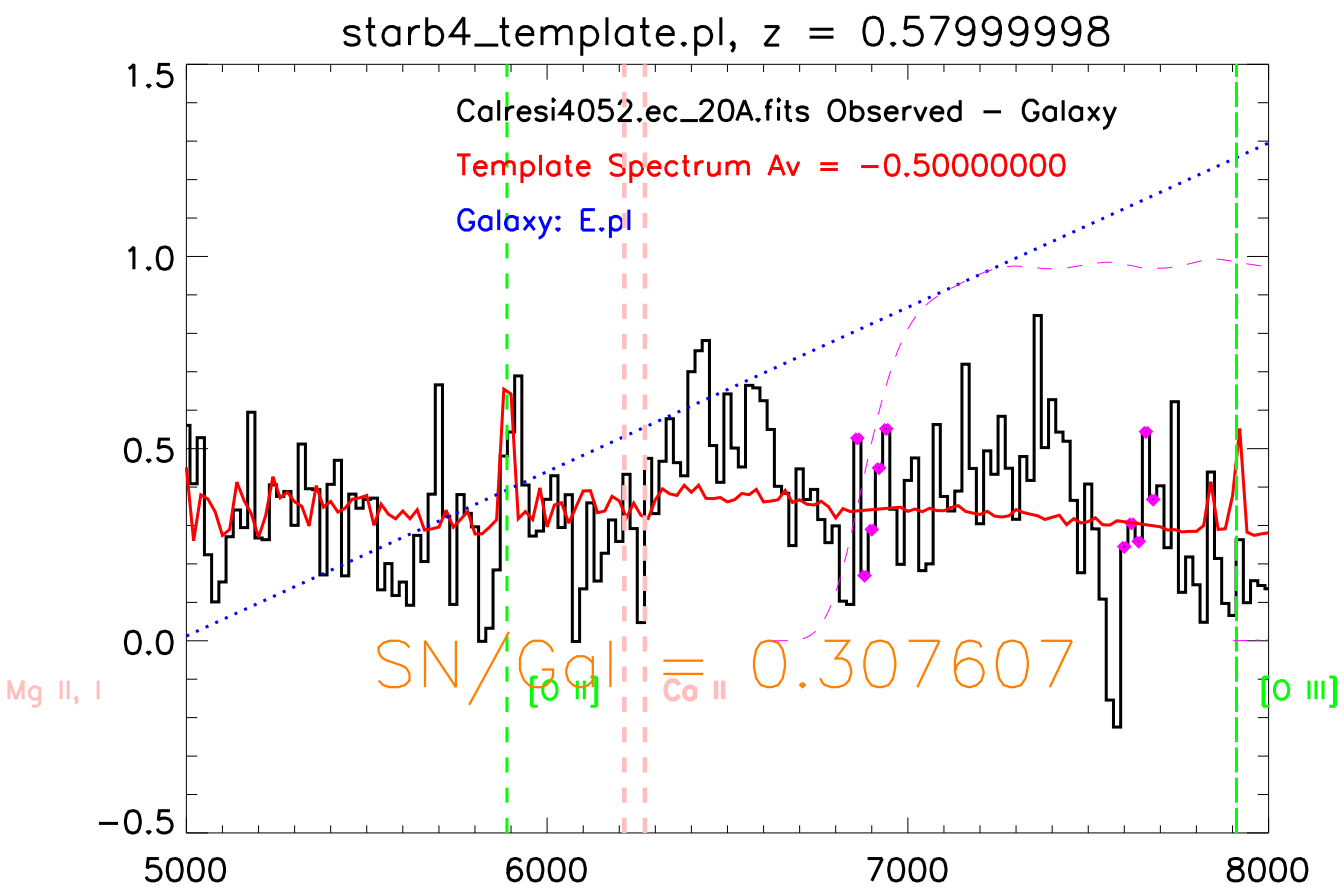

Sa.pl, z = 0.58999997
Calresi4052.ec_20A.fits Observed − Galaxy
Template Spectrum Av = −0.50000000
Galaxy: E.pl
SN/Gal = 2.49935
Mg II, I
[O II]
Ca II
[O III]
2.0
1.5
1.0
0.5
0.0
5000
6000
7000
8000

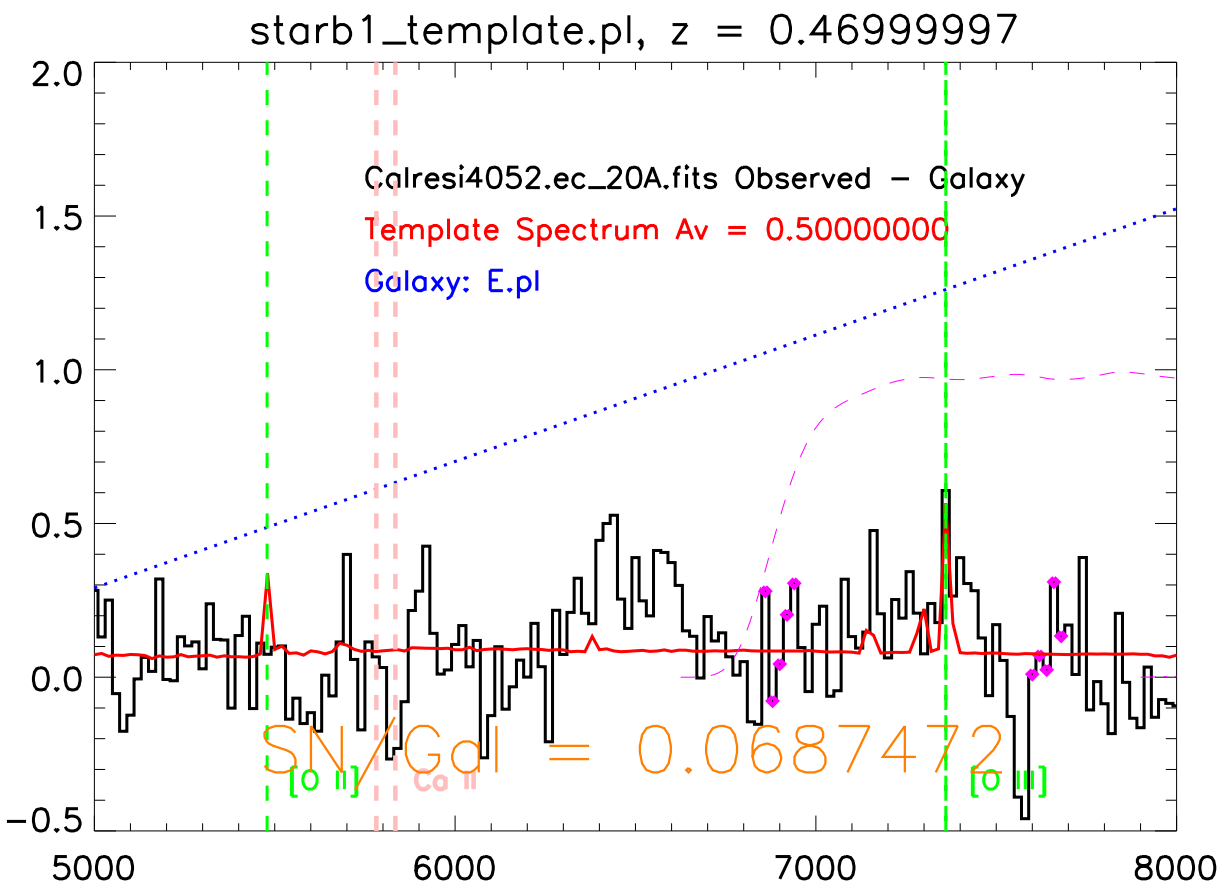

Sb.pl, z = 0.55000001
Calresi4052.ec_20A.fits Observed − Galaxy
Template Spectrum Av = −0.50000000
Galaxy: E.pl
SN/Gal = 1.62896
Mg II, I
[O II]
Ca II
[O III]
1.5
1.0
0.5
0.0
−0.5
5000
6000
7000
8000


Sc.pl, z = 0.46999997
Calresi4052.ec_20A.fits Observed − Galaxy
Template Spectrum Av = −0.22831633
Galaxy: E.pl
S/N/Gal = 0.716820
[O II]
[O III]
1.2
1.0
0.8
0.6
0.4
0.2
0.0
5000
6000
7000
8000

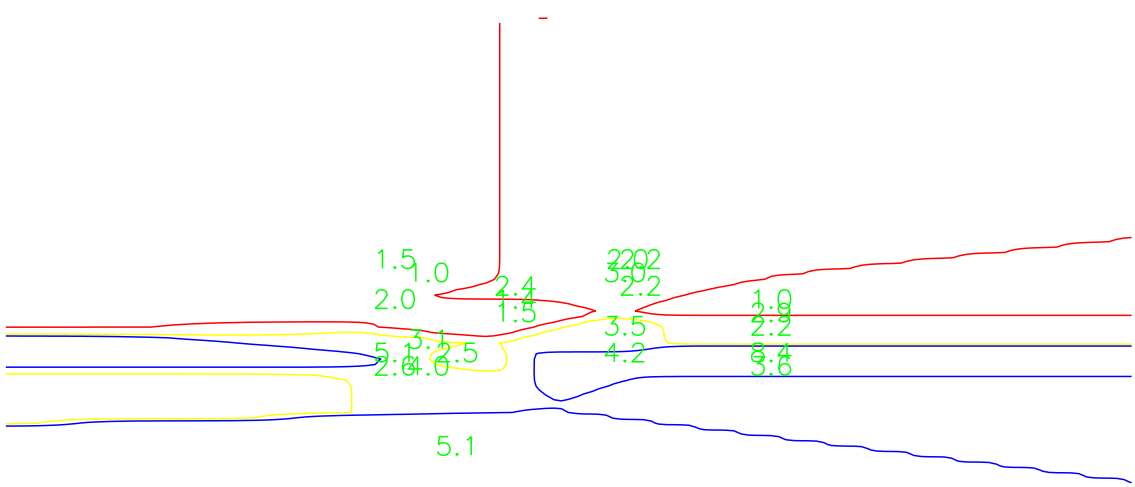
Mg II, I

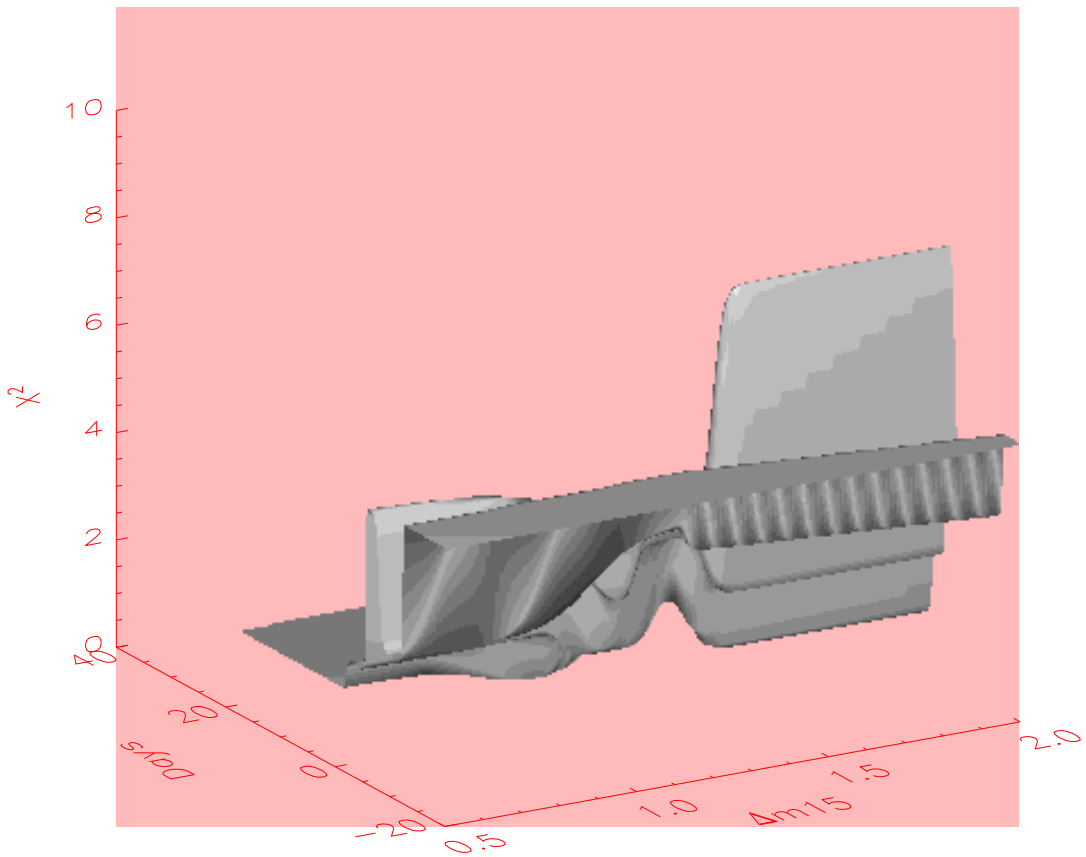

starb3_template.pl, z = 0.52999997
Calres:4052.ec_20A.fits Observed − Galaxy
Template Spectrum Av = 0.50000000
Galaxy: E.pl
SN/Gal = 0.579817
[O II]
Ca II
[O III]
Mg II, I
1.2
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
5000
6000
7000
8000


starb4_template.pl, z = 0.57999998
Calresi4052.ec_20A.fits Observed − Galaxy
Template Spectrum Av = −0.50000000
Galaxy: E.pl
SN/Gal = 0.307607
Mg II, I
[O II]
Ca II
[O III]
1.5
1.0
0.5
0.0
−0.5
5000
6000
7000
8000

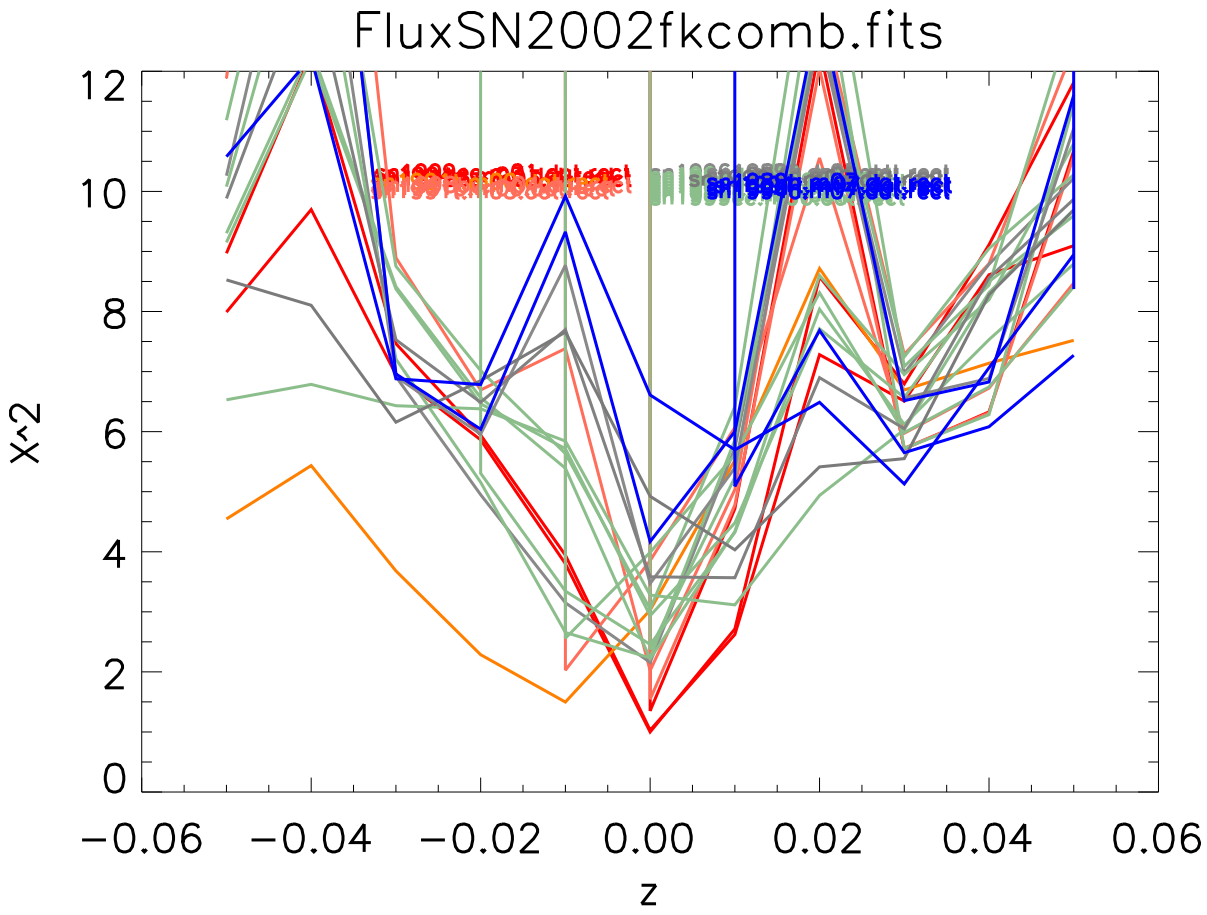

starb1_template.pl, z = 0.46999997
Calresi4052.ec_20A.fits Observed − Galaxy
Template Spectrum Av = 0.50000000
Galaxy: E.pl
SN/Gal = 0.0687472
[O II]
Ca II
[O III]
2.0
1.5
1.0
0.5
0.0
−0.5
5000
6000
7000
8000

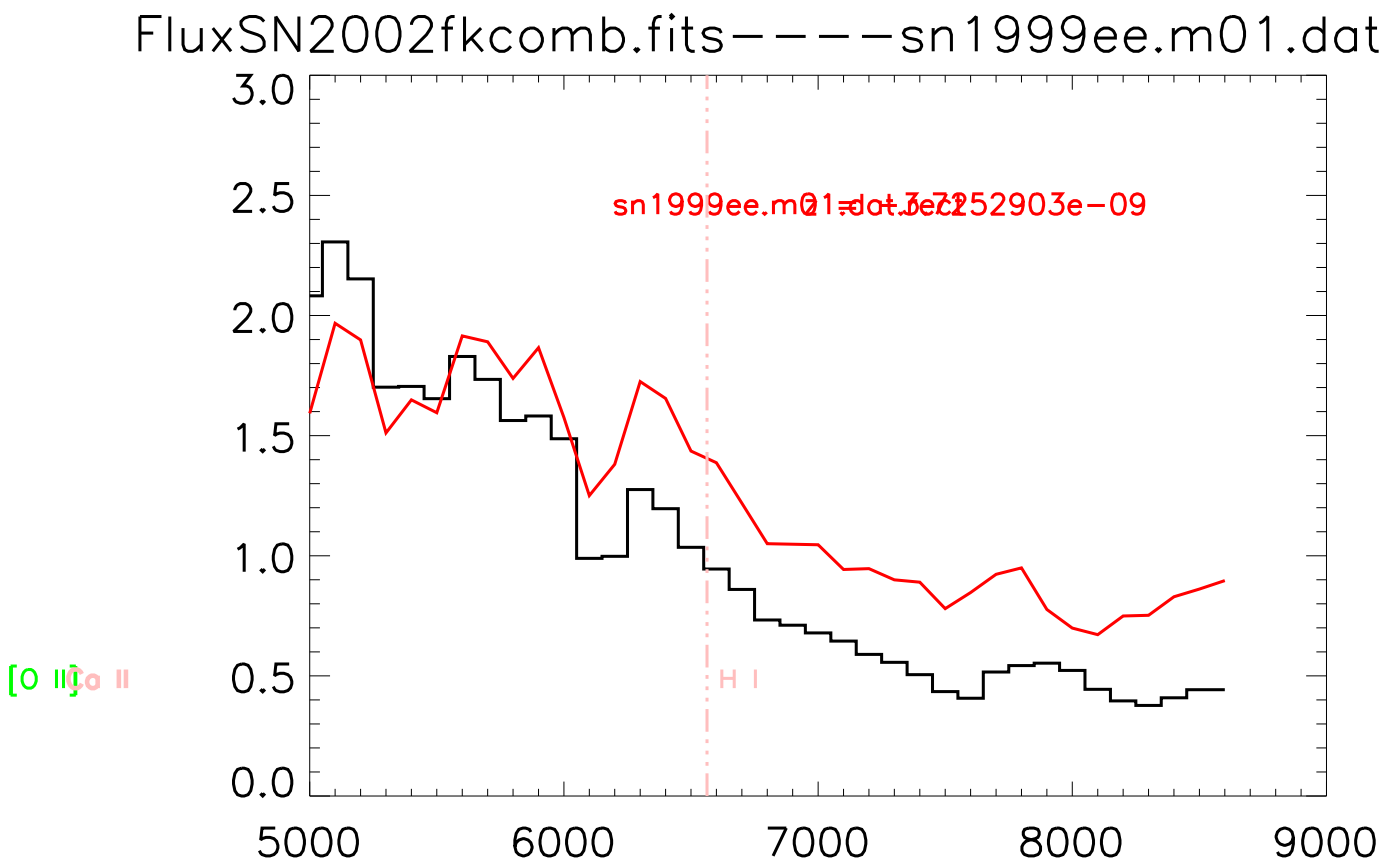
Mg II, I

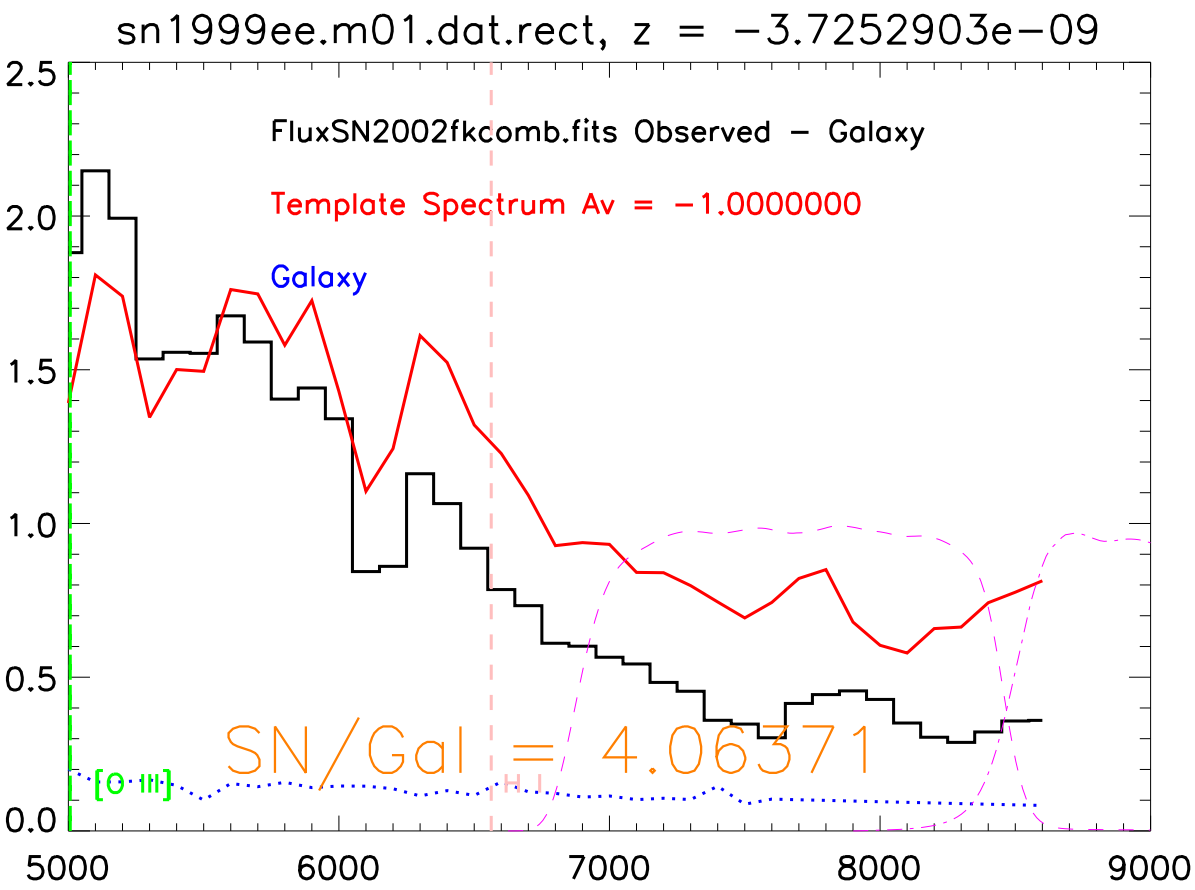

1.5
1.0
2.0
2.4
1.5
3.5
4.2
2.2
3.6
5.1

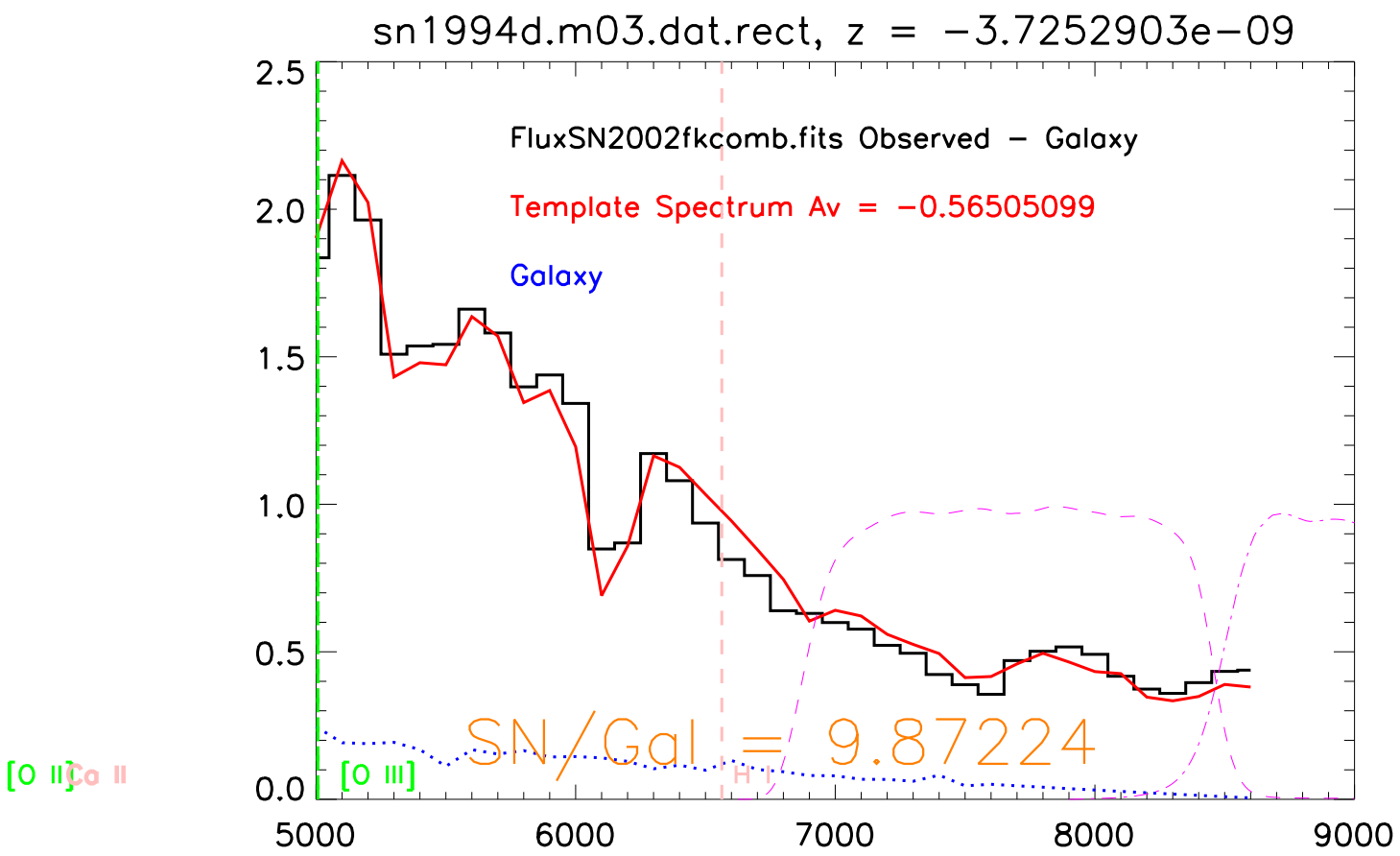


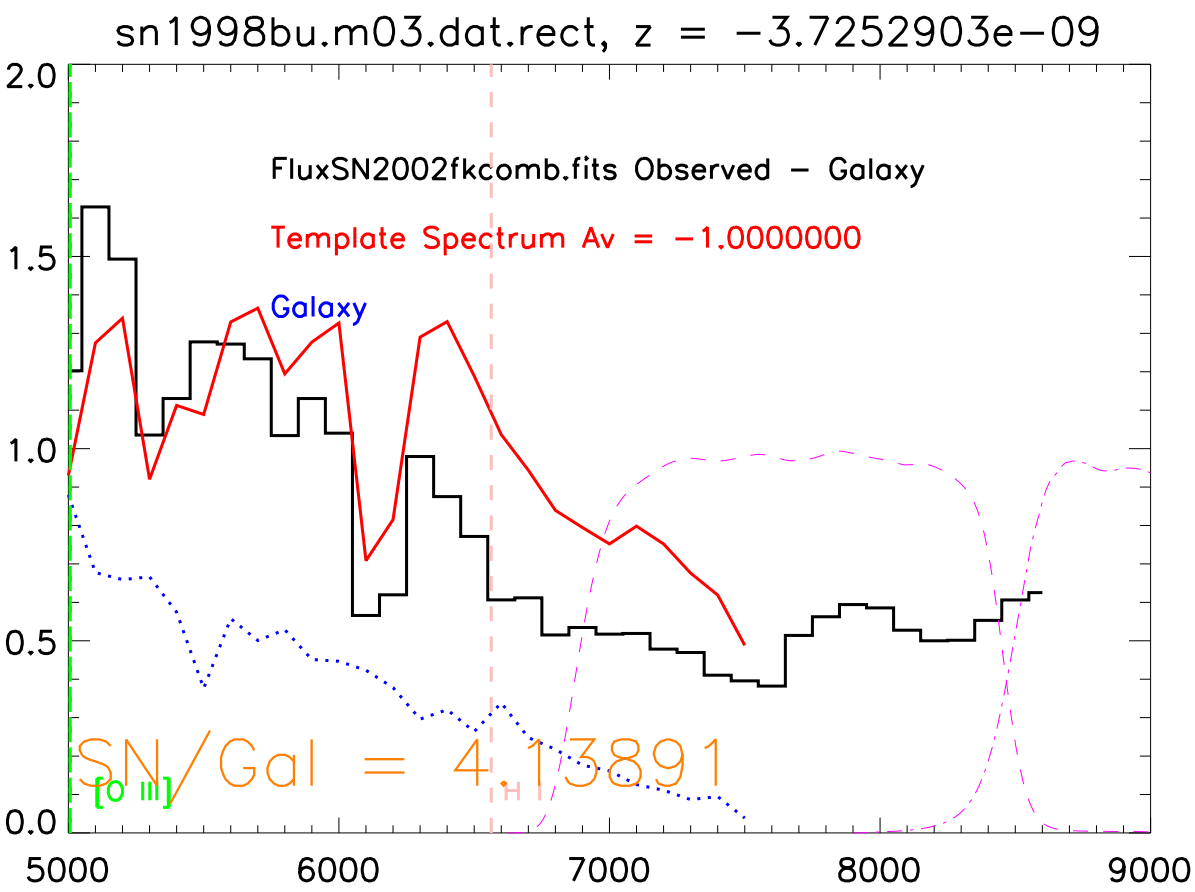
10
8
6
4
2
0
χ^2
40
20
0
−20
Days
0.5
1.0
1.5
2.0
Δm15

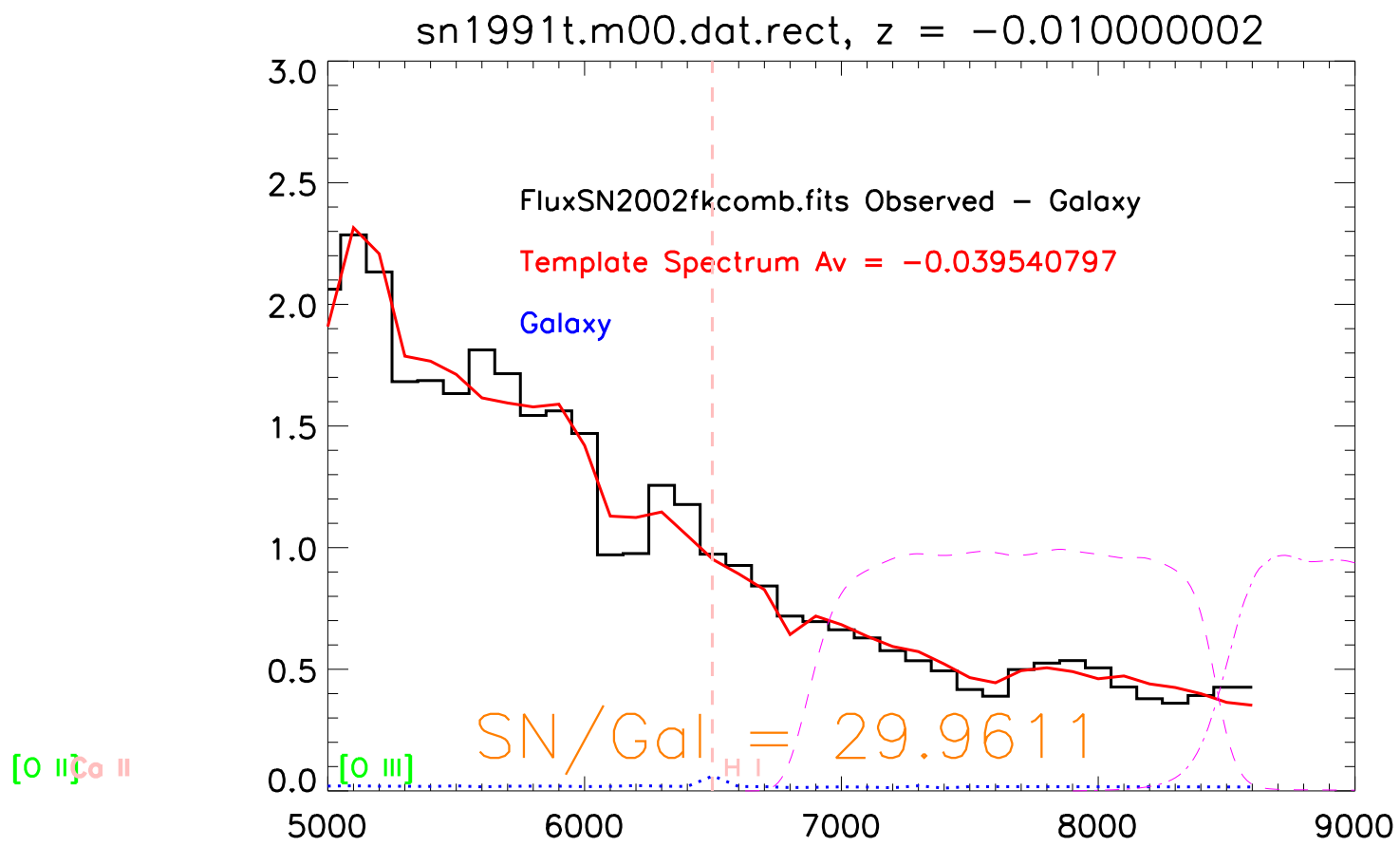

FluxSN2002fkcomb.fits
X^2
z
12
10
8
6
4
2
0
−0.06
−0.04
−0.02
0.00
0.02
0.04
0.06

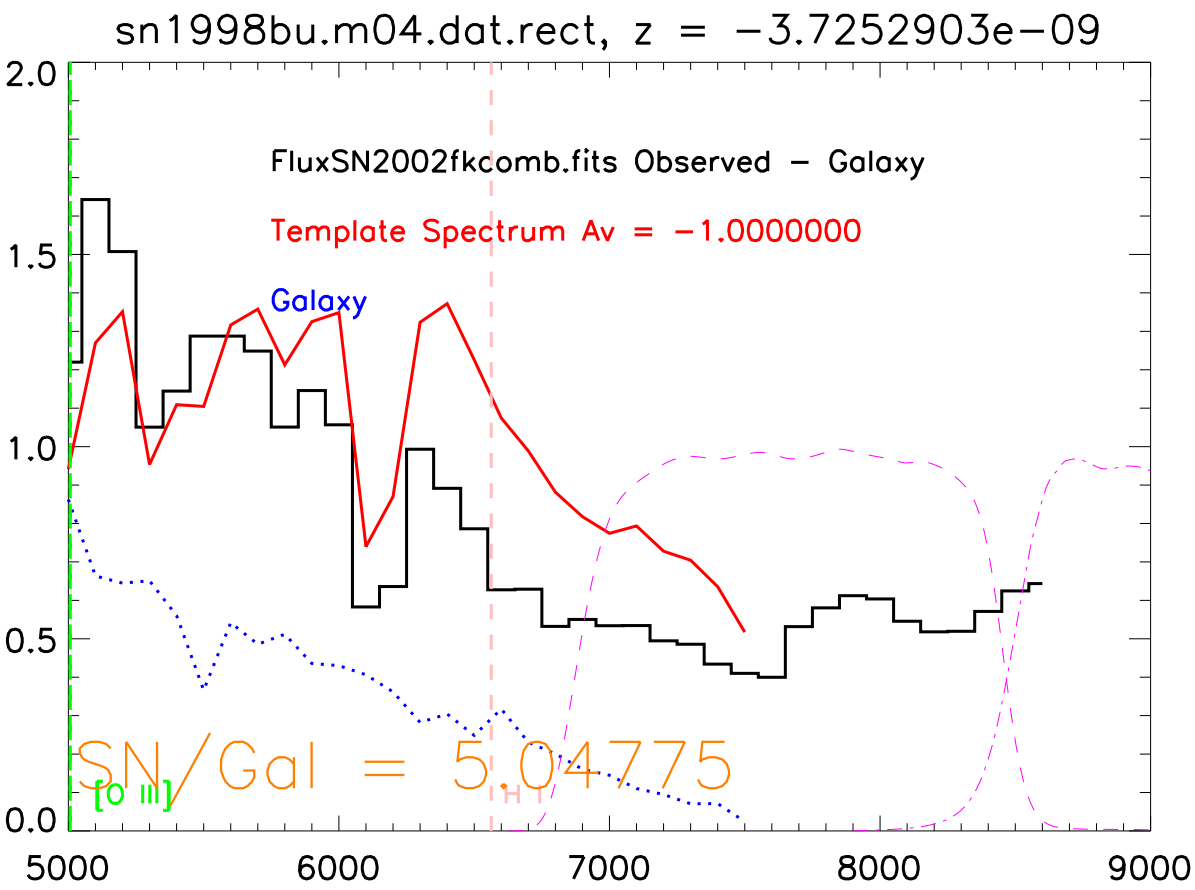

FluxSN2002fkcomb.fits----sn1999ee.m01.dat.rect
sn1999ee.m01.dat.rect 3.72252903e-09
[O II]
Ca II
H I
3.0
2.5
2.0
1.5
1.0
0.5
0.0
5000
6000
7000
8000
9000

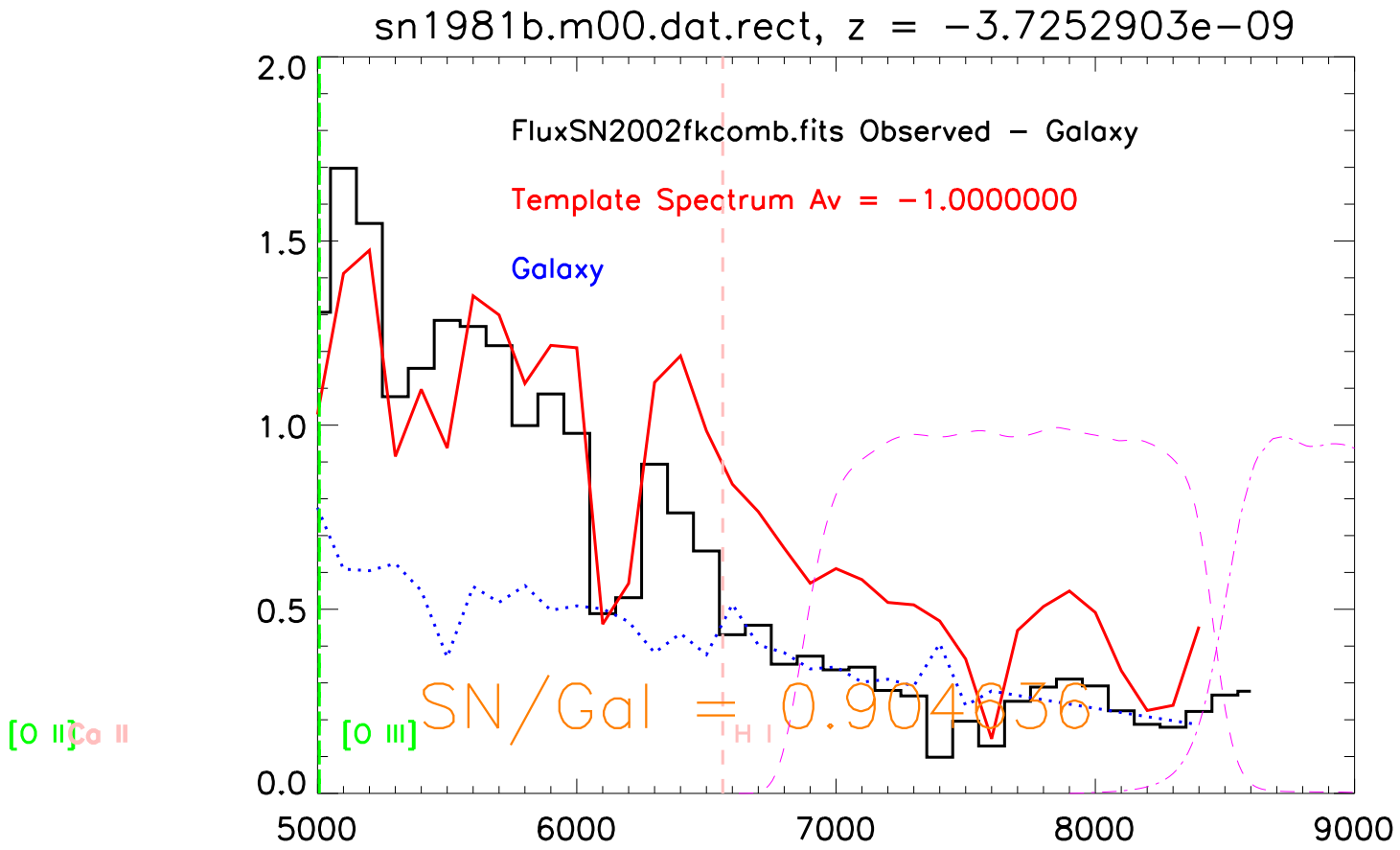

sn1999ee.m01.dat.rect, z = −3.7252903e−09
FluxSN2002fkcomb.fits Observed − Galaxy
Template Spectrum Av = −1.0000000
Galaxy
SN/Gal = 4.06371
[O II]
Ca II
[O III]
H I
2.5
2.0
1.5
1.0
0.5
0.0
5000
6000
7000
8000
9000

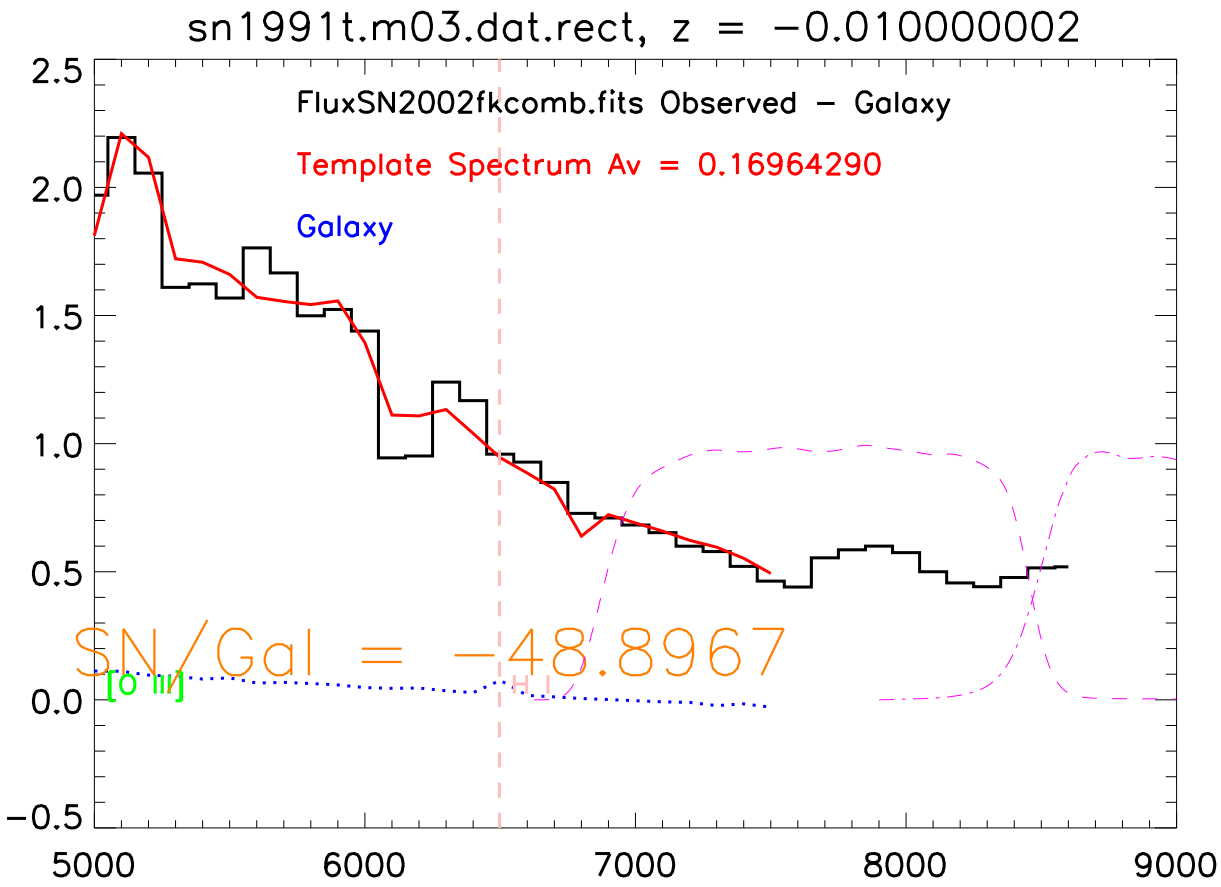

sn1994d.m03.dat.rect, z = −3.7252903e−09
FluxSN2002fkcomb.fits Observed − Galaxy
Template Spectrum Av = −0.56505099
Galaxy
SN/Gal = 9.87224
[O II]
Ca II
[O III]
H I
2.5
2.0
1.5
1.0
0.5
0.0
5000
6000
7000
8000
9000

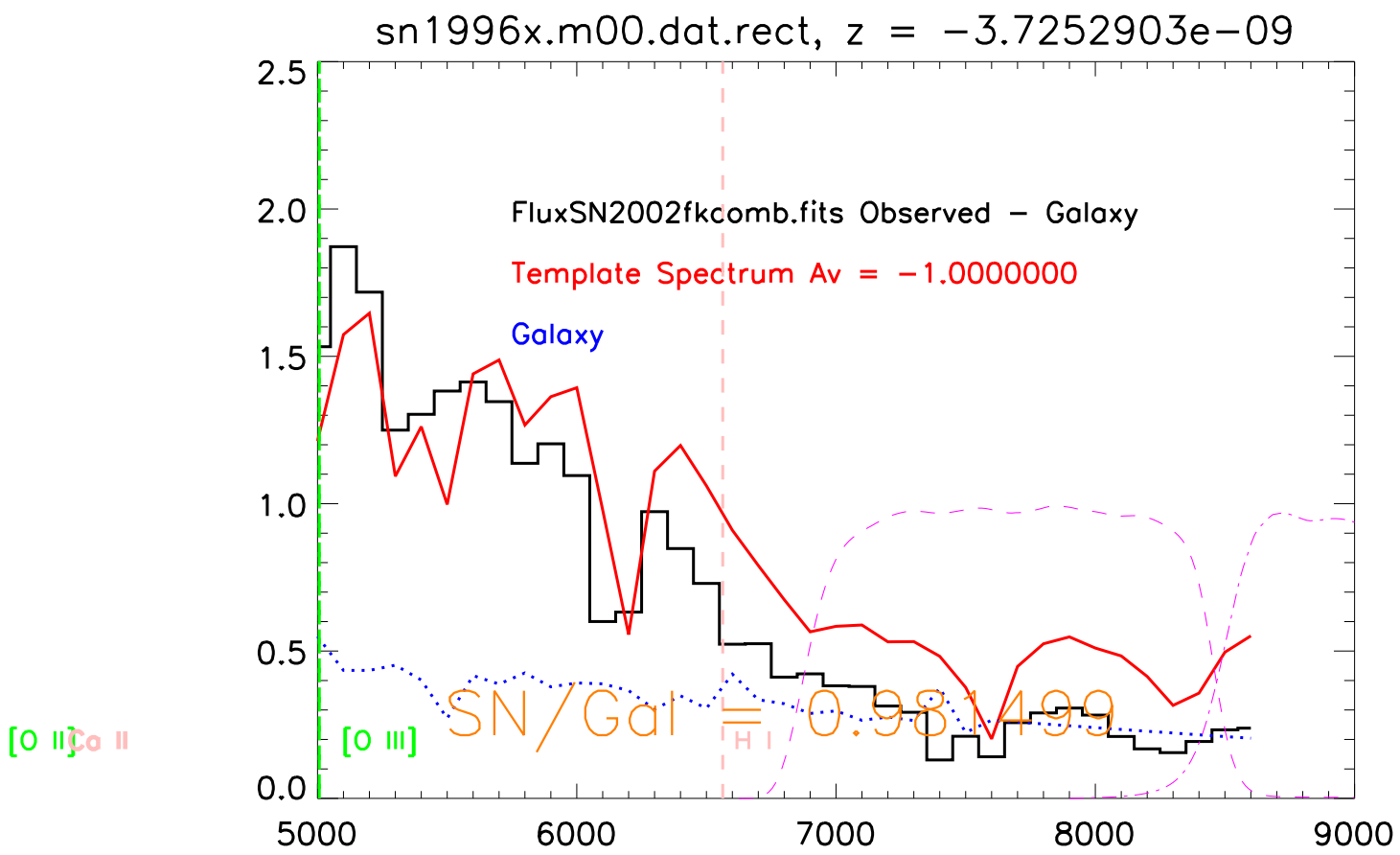

sn1998bu.m03.dat.rect, z = −3.7252903e−09
FluxSN2002fkcomb.fits Observed − Galaxy
Template Spectrum Av = −1.0000000
Galaxy
SN/Gal = 4.13891
[O II]
Ca II
[O III]
H I
2.0
1.5
1.0
0.5
0.0
5000
6000
7000
8000
9000

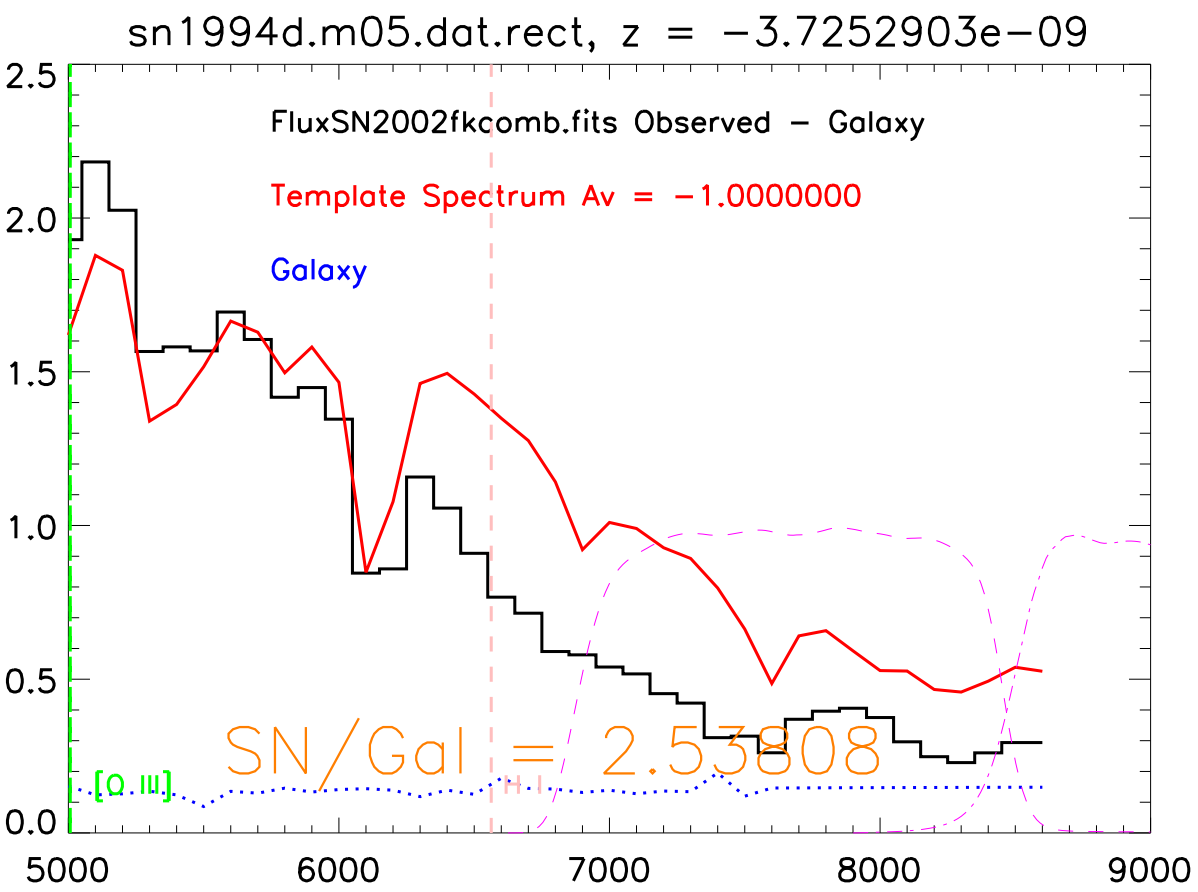

sn1991t.m00.dat.rect, z = −0.010000002
FluxSN2002fkcomb.fits Observed − Galaxy
Template Spectrum Av = −0.039540797
Galaxy
SN/Gal = 29.9611
[O II]
Ca II
[O III]
H I
3.0
2.5
2.0
1.5
1.0
0.5
0.0
5000
6000
7000
8000
9000

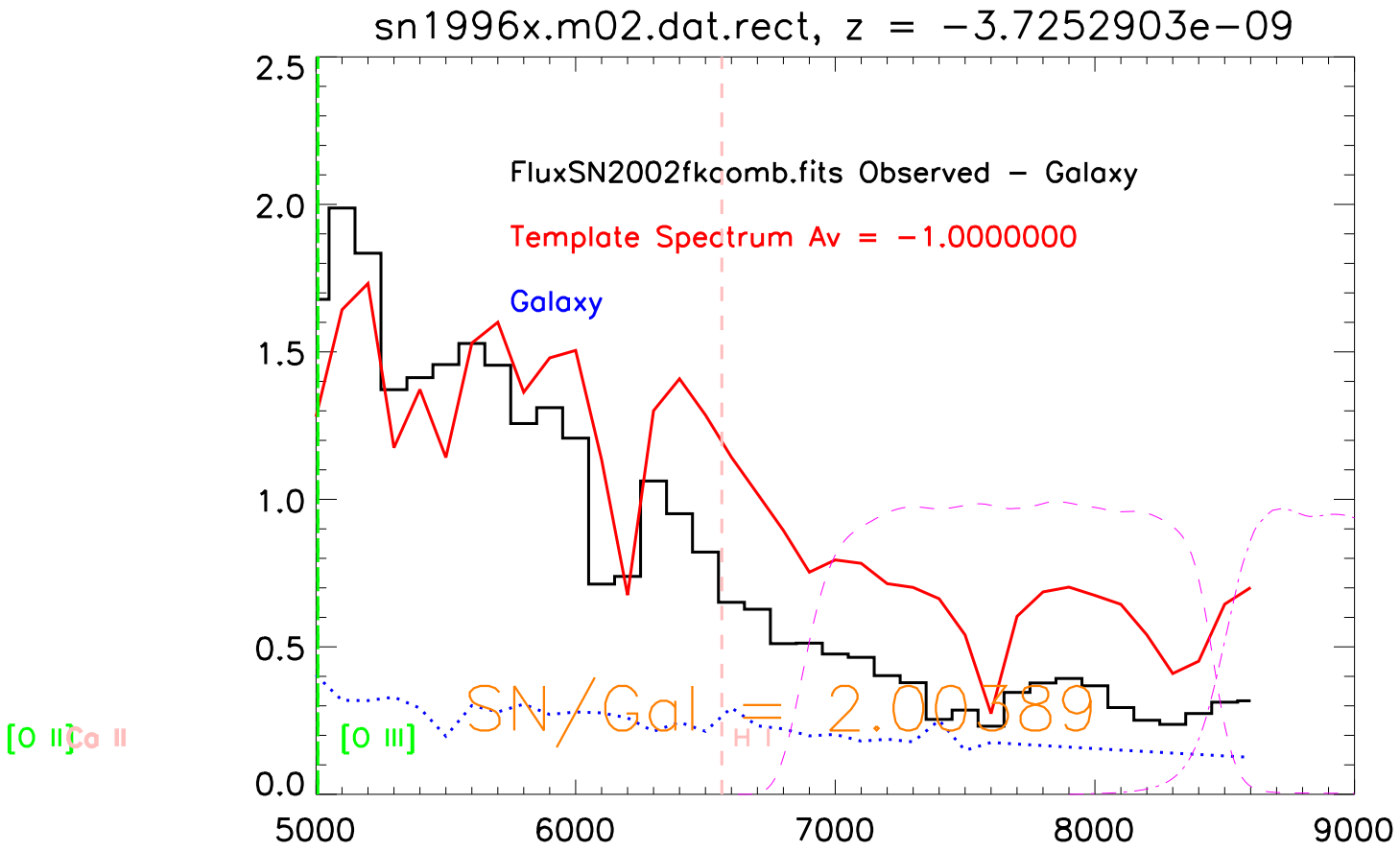

sn1998bu.m04.dat.rect, z = −3.7252903e−09
FluxSN2002fkcomb.fits Observed − Galaxy
Template Spectrum Av = −1.0000000
Galaxy
SN/Gal = 5.04775
[O II]
Ca II
[O III]
H I
2.0
1.5
1.0
0.5
0.0
5000
6000
7000
8000
9000

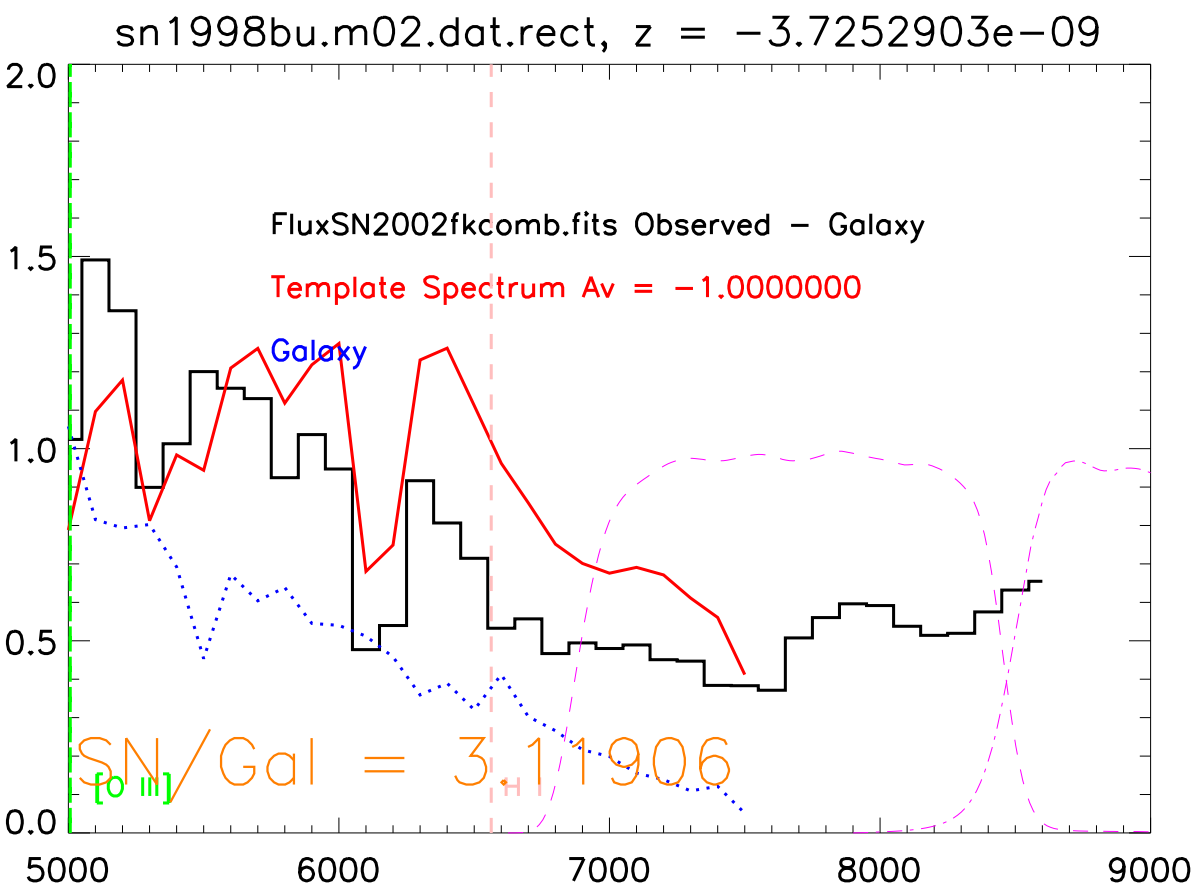

sn1981b.m00.dat.rect, z = −3.7252903e−09
FluxSN2002fkcomb.fits Observed − Galaxy
Template Spectrum Av = −1.0000000
Galaxy
SN/Gal = 0.9046036
[O II]
Ca II
[O III]
H I
2.0
1.5
1.0
0.5
0.0
5000
6000
7000
8000
9000

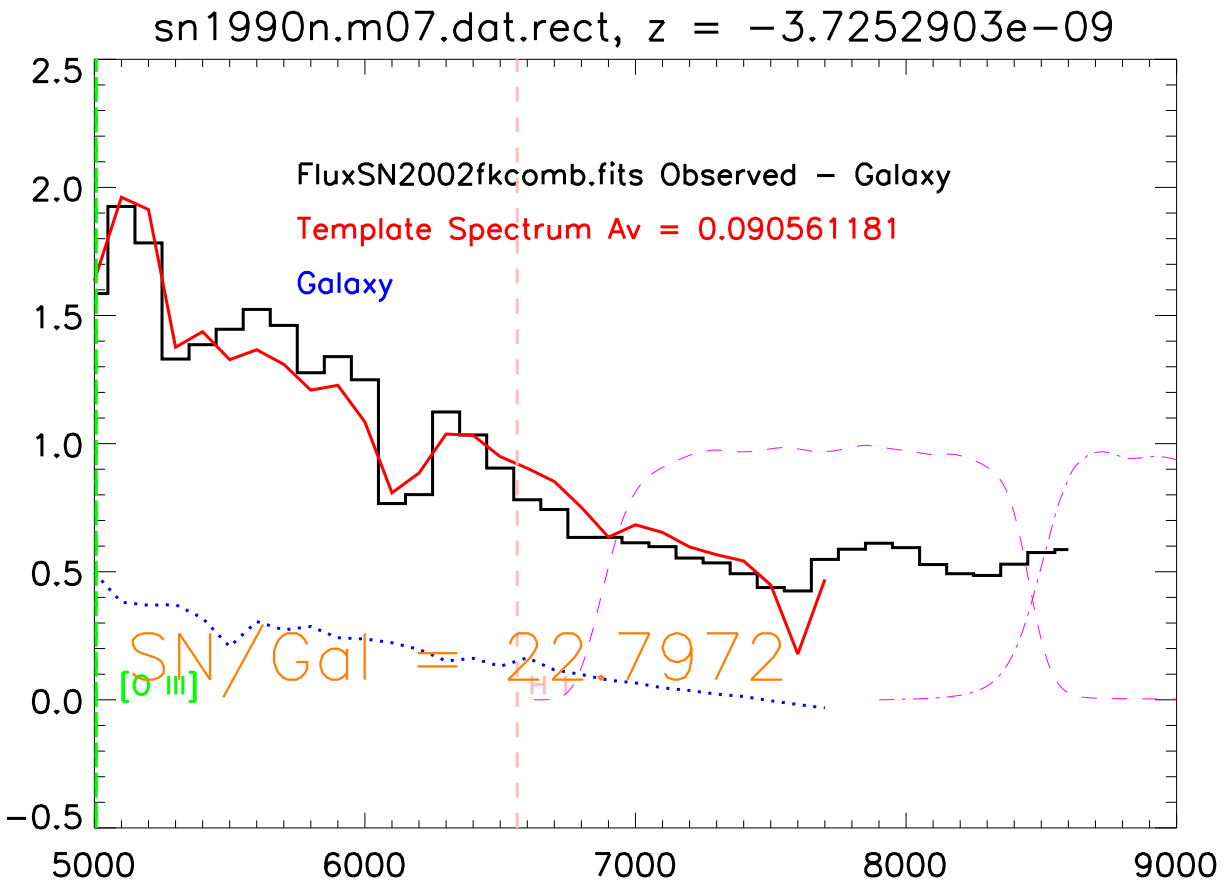

sn1991t.m03.dat.rect, z = −0.010000002
FluxSN2002fkcomb.fits Observed − Galaxy
Template Spectrum Av = 0.16964290
Galaxy
SN/Gal = −48.8967
[O II]
Ca II
[O III]
H I
2.5
2.0
1.5
1.0
0.5
0.0
−0.5
5000
6000
7000
8000
9000

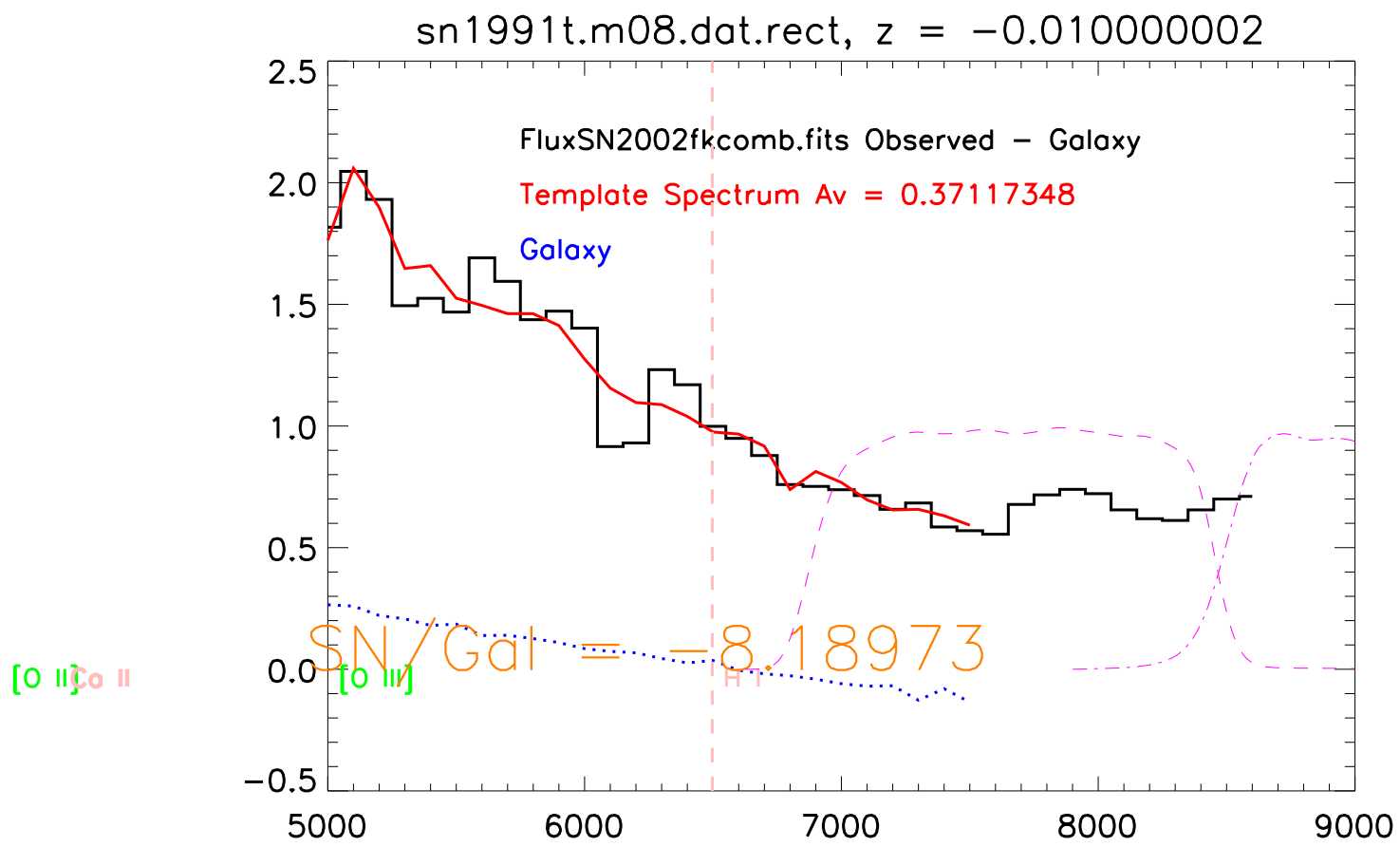

sn1996x.m00.dat.rect, z = −3.7252903e−09
FluxSN2002fkcomb.fits Observed − Galaxy
Template Spectrum Av = −1.0000000
Galaxy
SN/Gal = 0.981499
[O II]
Ca II
[O III]
H I
2.5
2.0
1.5
1.0
0.5
0.0
5000
6000
7000
8000
9000

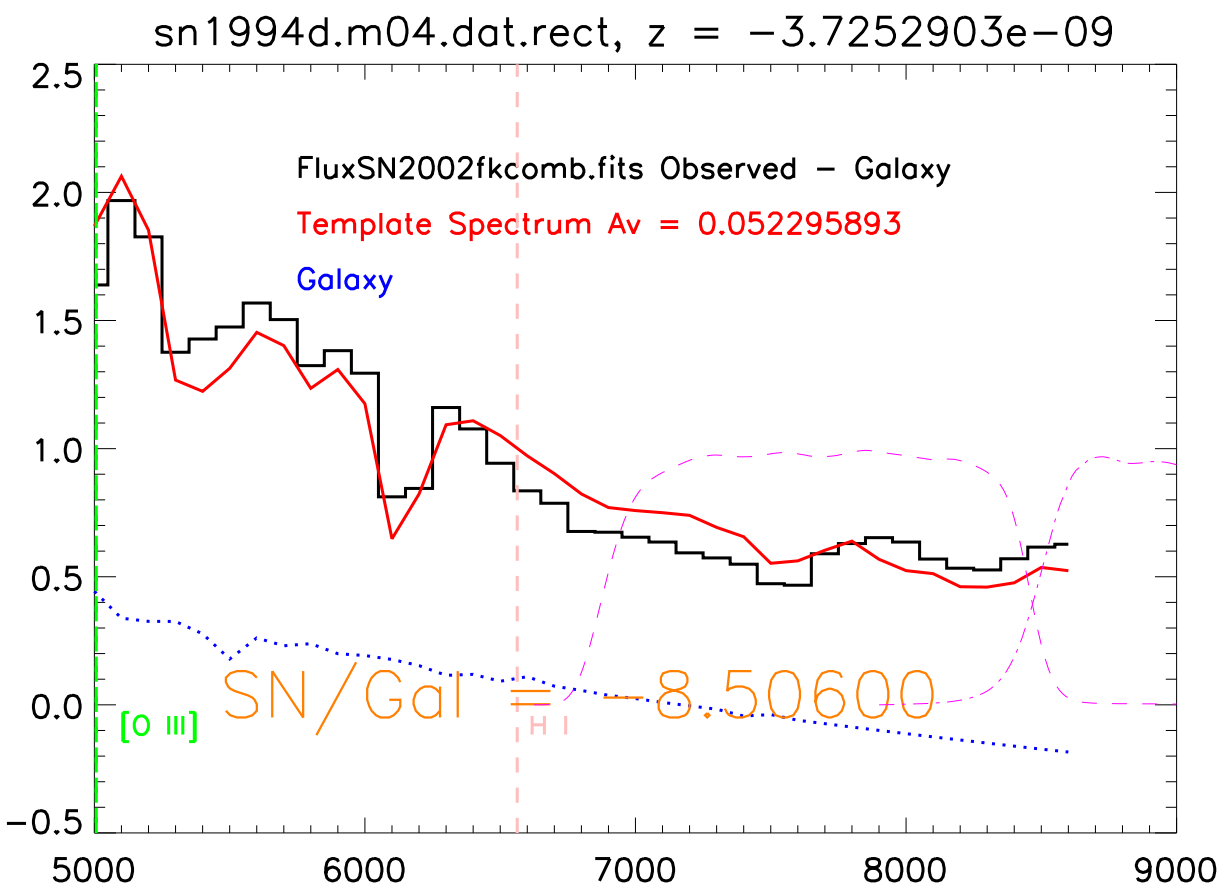

sn1994d.m05.dat.rect, z = −3.7252903e−09
FluxSN2002fkcomb.fits Observed − Galaxy
Template Spectrum Av = −1.0000000
Galaxy
SN/Gal = 2.53808
[O II]
Ca II
[O III]
H I
2.5
2.0
1.5
1.0
0.5
0.0
5000
6000
7000
8000
9000

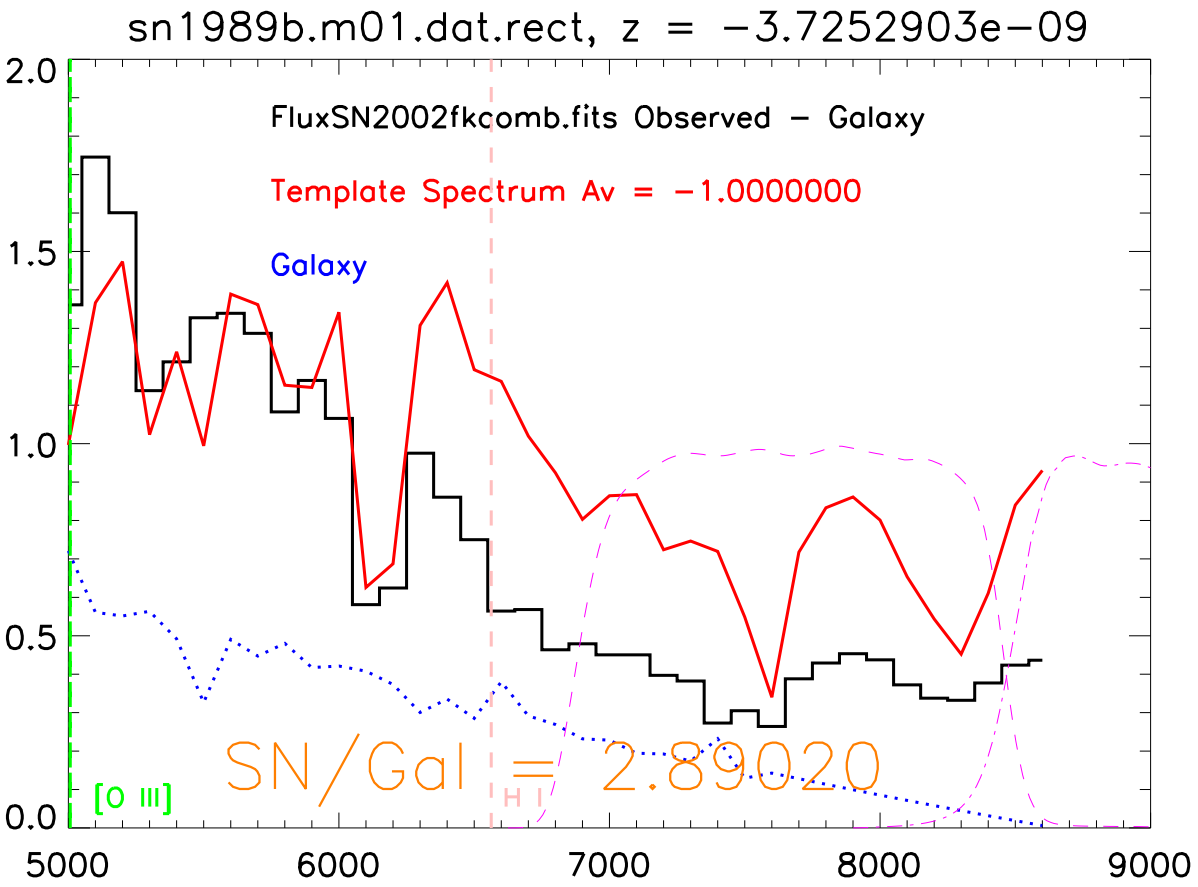

sn1996x.m02.dat.rect, z = −3.7252903e−09
FluxSN2002fkcomb.fits Observed − Galaxy
Template Spectrum Av = −1.0000000
Galaxy
SN/Gal = 2.00589
[O II]
Ca II
[O III]
H I
2.5
2.0
1.5
1.0
0.5
0.0
5000
6000
7000
8000
9000

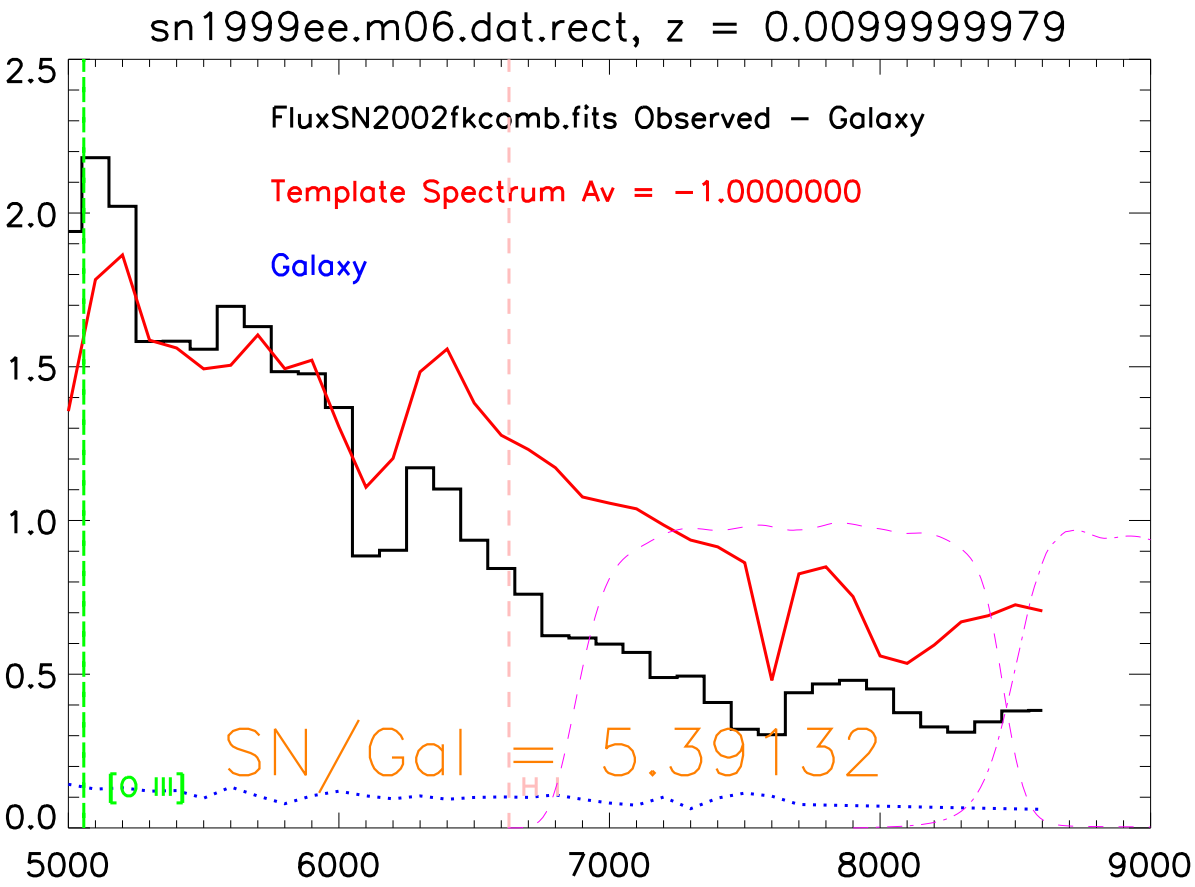

sn1998bu.m02.dat.rect, z = −3.7252903e−09
FluxSN2002fkcomb.fits Observed − Galaxy
Template Spectrum Av = −1.0000000
Galaxy
SN/Gal = 3.11906
[O II]
Ca II
[O III]
H
2.0
1.5
1.0
0.5
0.0
5000
6000
7000
8000
9000

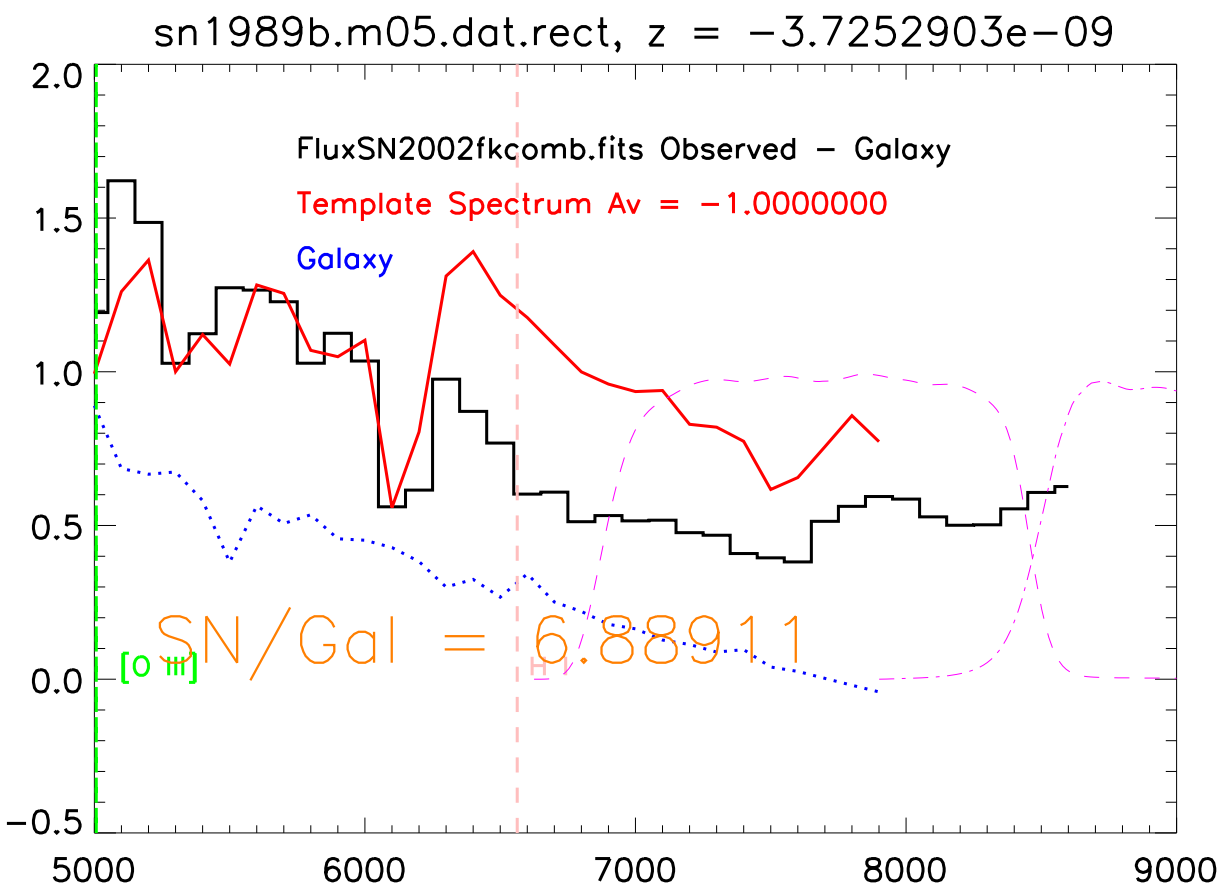

sn1990n.m07.dat.rect, z = −3.7252903e−09
FluxSN2002fkcomb.fits Observed − Galaxy
Template Spectrum Av = 0.090561181
Galaxy
SN/Gal = 22.7972
[O II]
Ca II
[O III]
H γ
2.5
2.0
1.5
1.0
0.5
0.0
−0.5
5000
6000
7000
8000
9000

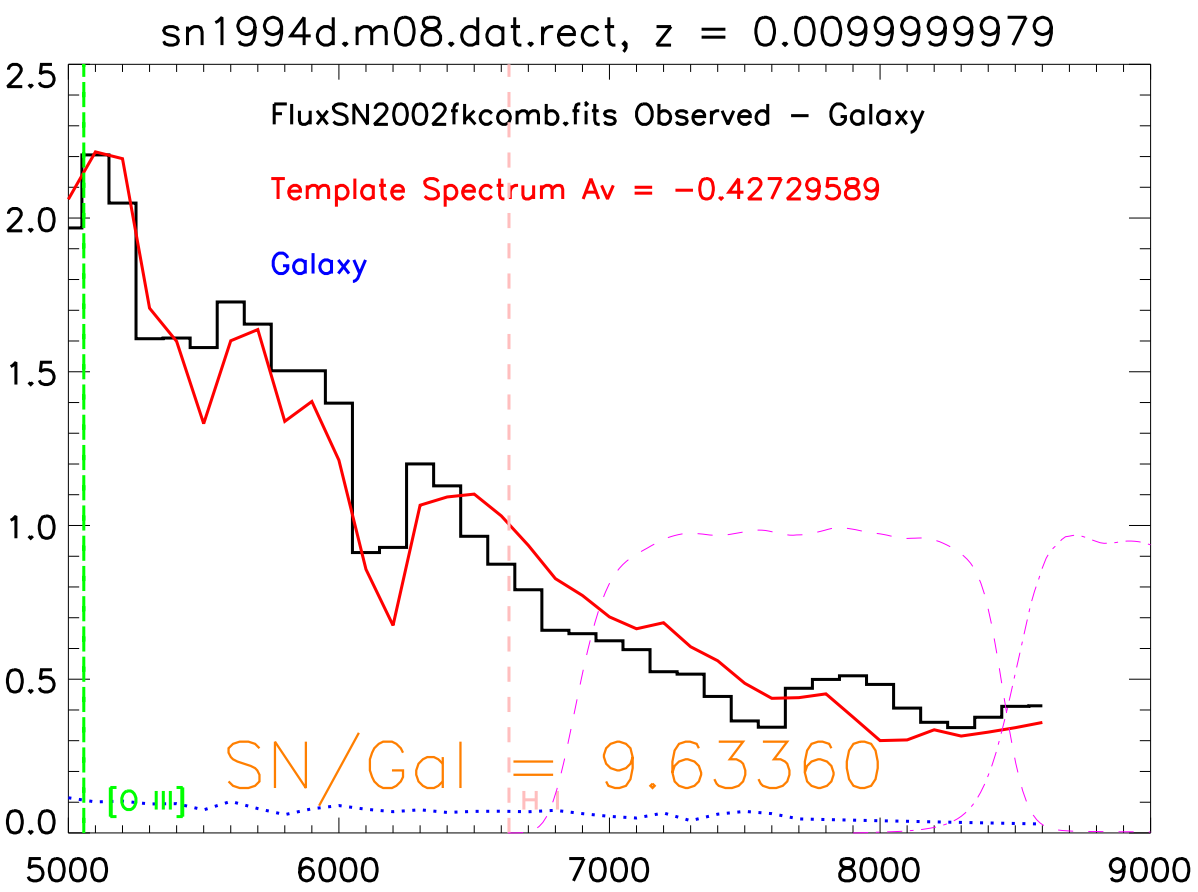

sn1991t.m08.dat.rect, z = −0.010000002
FluxSN2002fkcomb.fits Observed − Galaxy
Template Spectrum Av = 0.37117348
Galaxy
SN/Gal = −8.18973
[O II]
Ca II
[O III]
Hγ
2.5
2.0
1.5
1.0
0.5
0.0
−0.5
5000
6000
7000
8000
9000

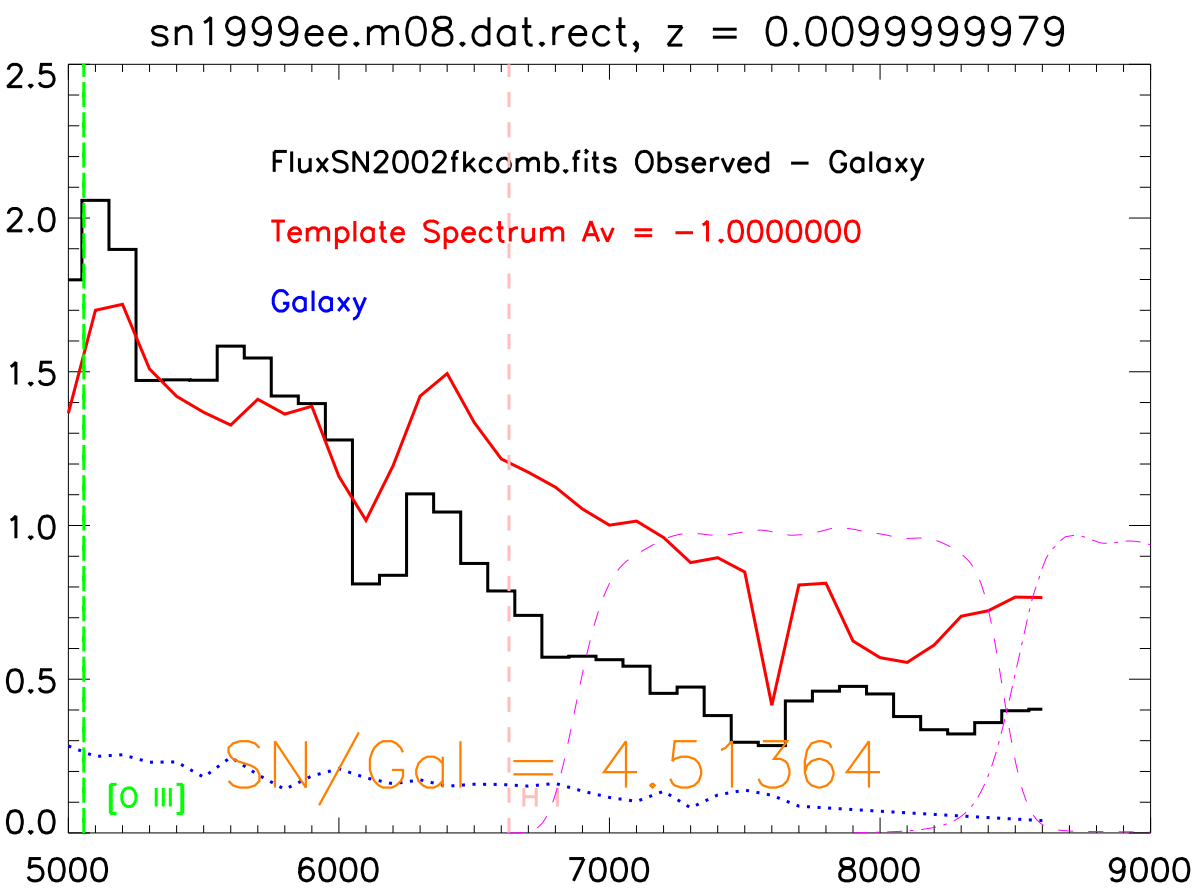

sn1994d.m04.dat.rect, z = −3.7252903e−09
FluxSN2002fkcomb.fits Observed − Galaxy
Template Spectrum Av = 0.052295893
Galaxy
SN/Gal = −8.50600
[O II]
Ca II
[O III]
H I
2.5
2.0
1.5
1.0
0.5
0.0
−0.5
5000
6000
7000
8000
9000

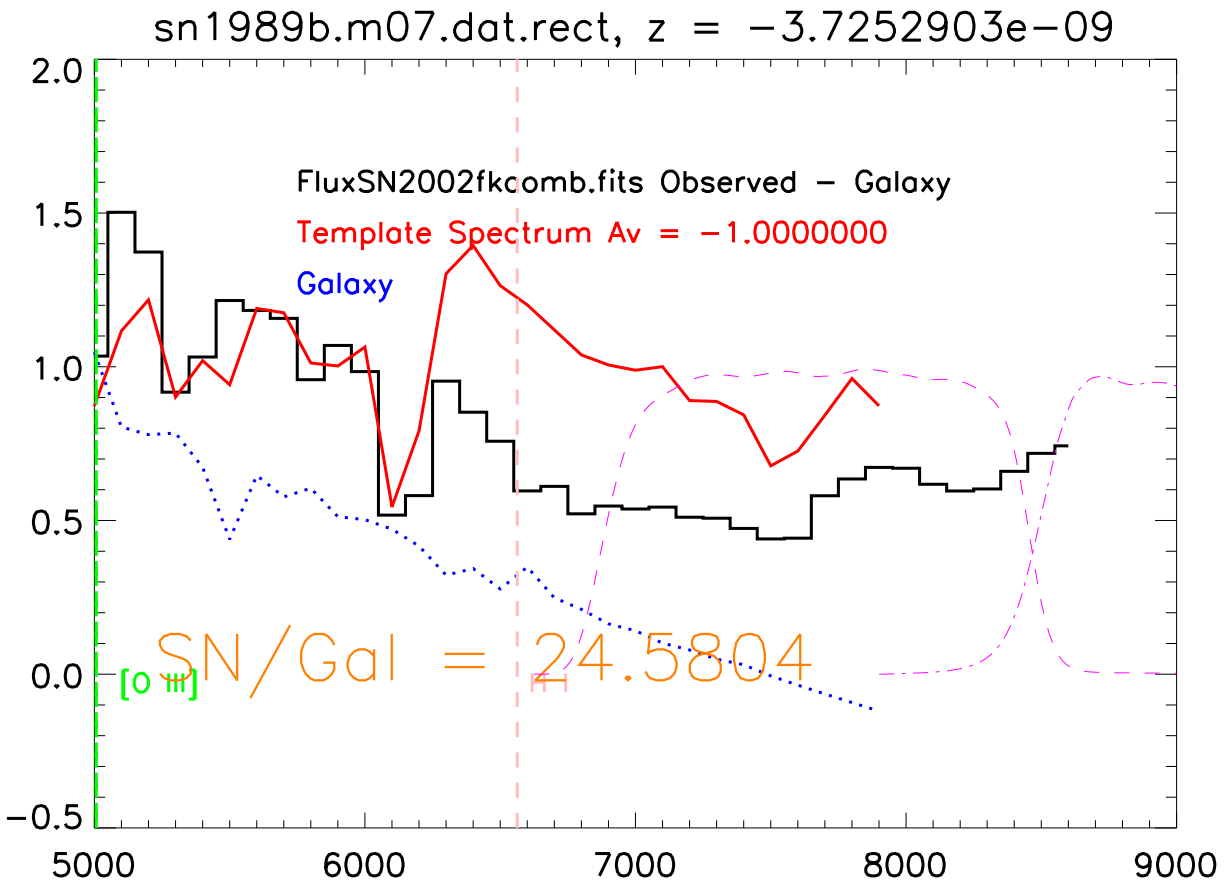

sn1989b.m01.dat.rect, z = −3.7252903e−09
FluxSN2002fkcomb.fits Observed − Galaxy
Template Spectrum Av = −1.0000000
Galaxy
SN/Gal = 2.89020
[O II]
Ca II
[O III]
H I
2.0
1.5
1.0
0.5
0.0
5000
6000
7000
8000
9000

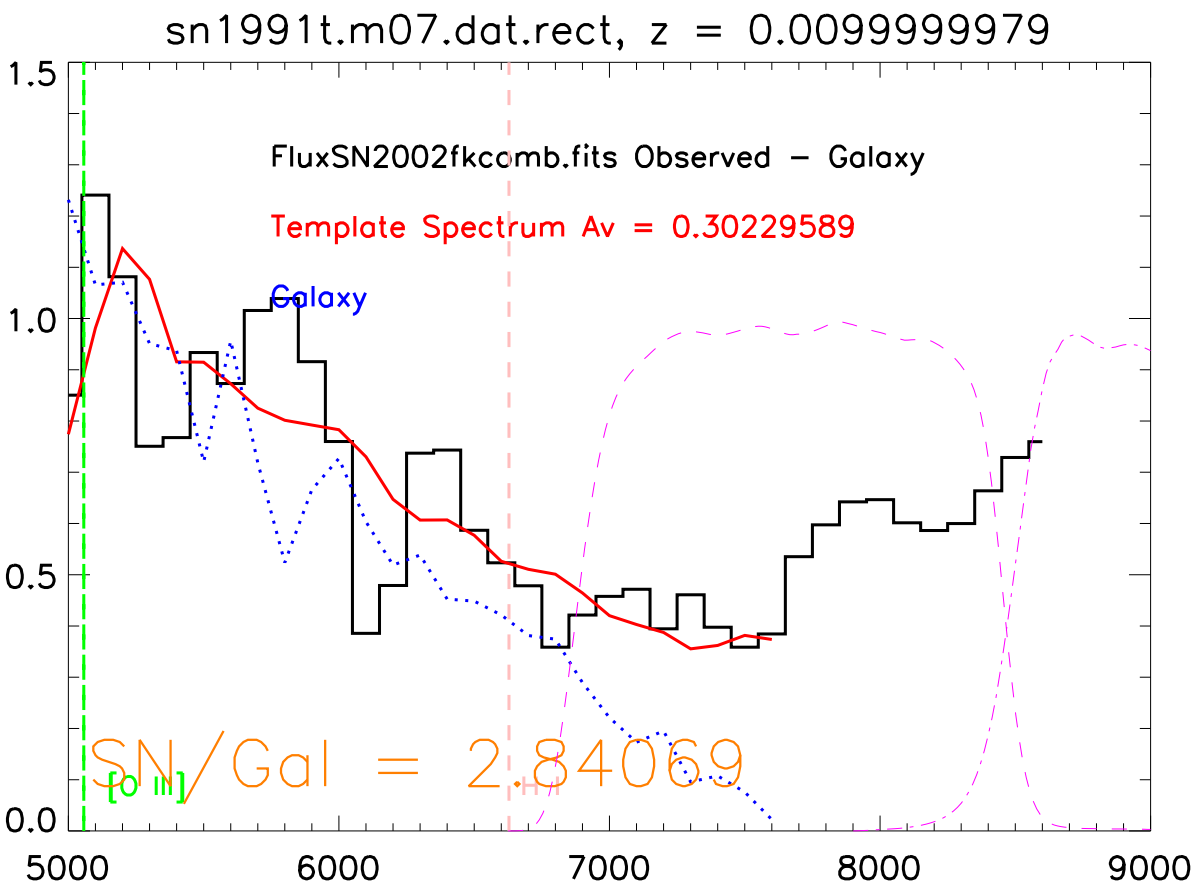

sn1999ee.m06.dat.rect, z = 0.0099999979
FluxSN2002fkcomb.fits Observed − Galaxy
Template Spectrum Av = −1.0000000
Galaxy
SN/Gal = 5.39132
[O II]
Ca II
[O III]
H
2.5
2.0
1.5
1.0
0.5
0.0
5000
6000
7000
8000
9000

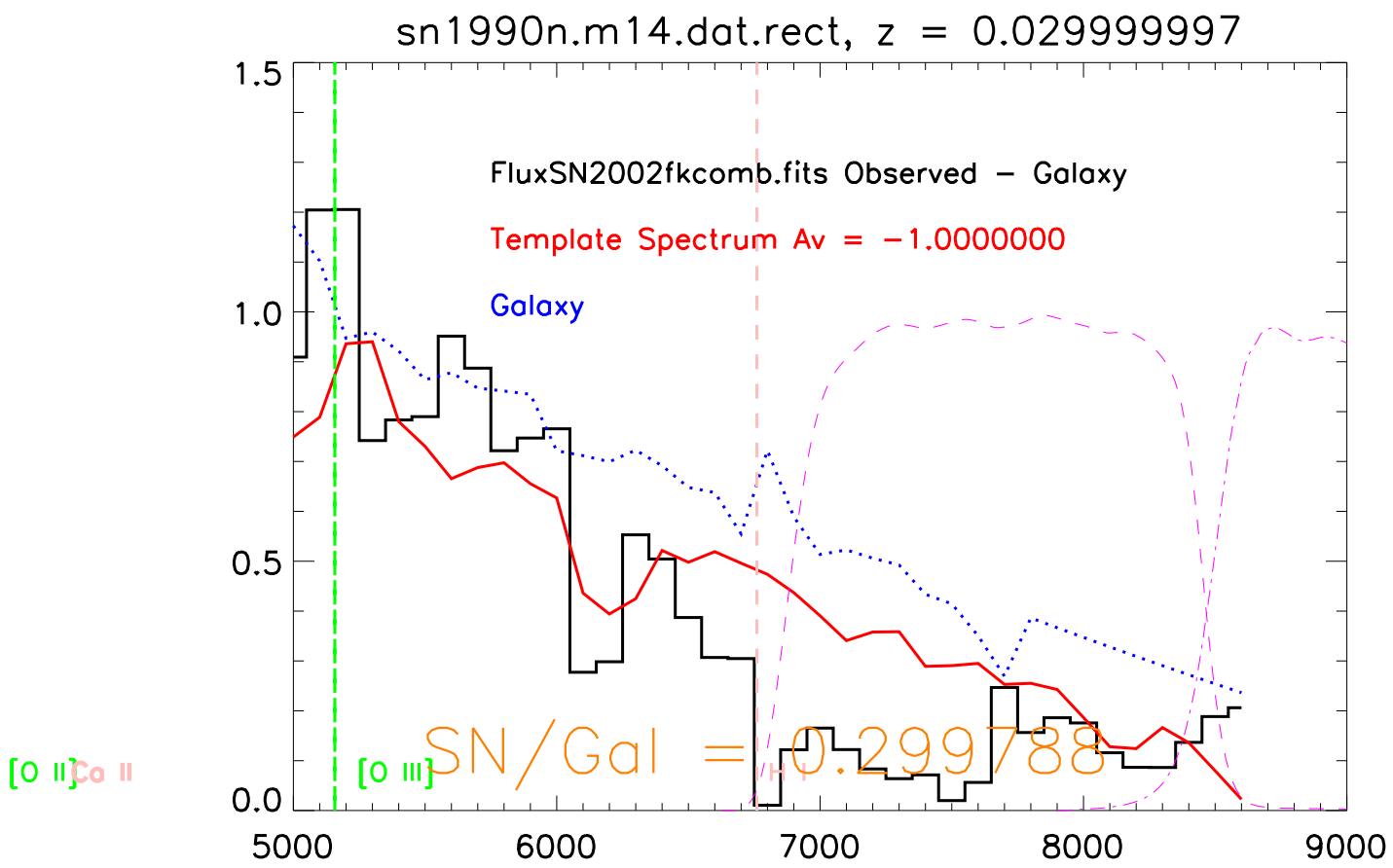

sn1989b.m05.dat.rect, z = −3.7252903e−09
FluxSN2002fkcomb.fits Observed − Galaxy
Template Spectrum Av = −1.0000000
Galaxy
SN/Gal = 6.88911
[O II]
Ca II
[O III]
H γ
2.0
1.5
1.0
0.5
0.0
−0.5
5000
6000
7000
8000
9000

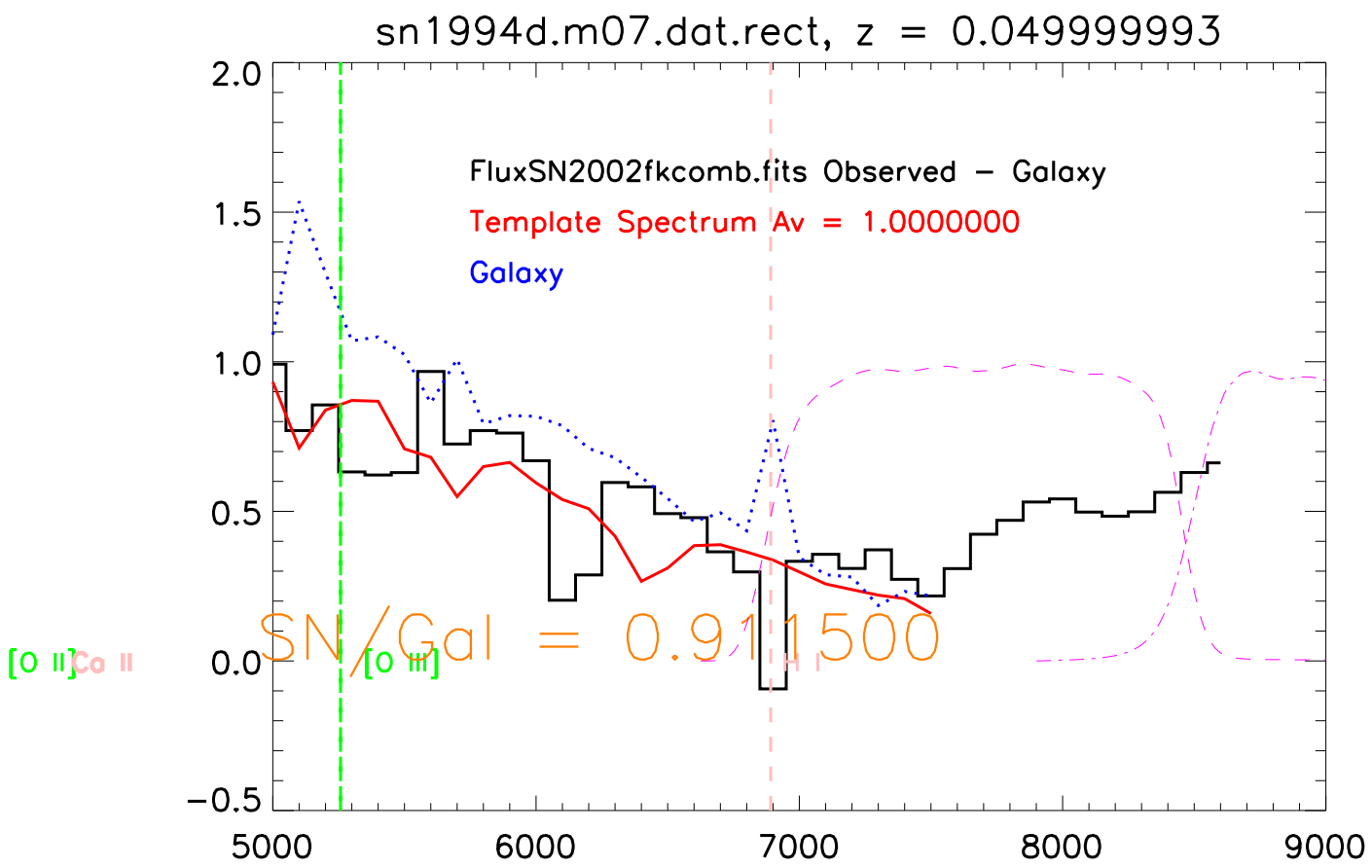

sn1994d.m08.dat.rect, z = 0.0099999979
FluxSN2002fkcomb.fits Observed − Galaxy
Template Spectrum Av = −0.42729589
Galaxy
SN/Gal = 9.63360
[O II]
Ca II
[O III]
H
2.5
2.0
1.5
1.0
0.5
0.0
5000
6000
7000
8000
9000

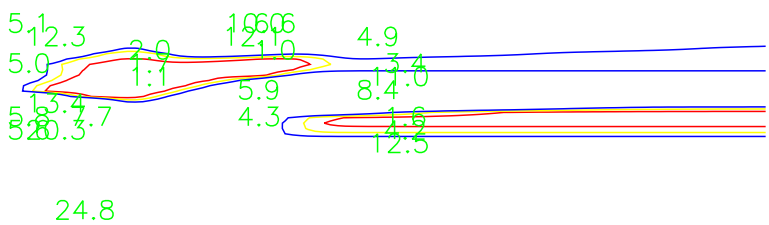

sn1999ee.m08.dat.rect, z = 0.0099999979
FluxSN2002fkcomb.fits Observed − Galaxy
Template Spectrum Av = −1.0000000
Galaxy
SN/Gal = 4.51364
[O II]
Ca II
[O III]
H
2.5
2.0
1.5
1.0
0.5
0.0
5000
6000
7000
8000
9000

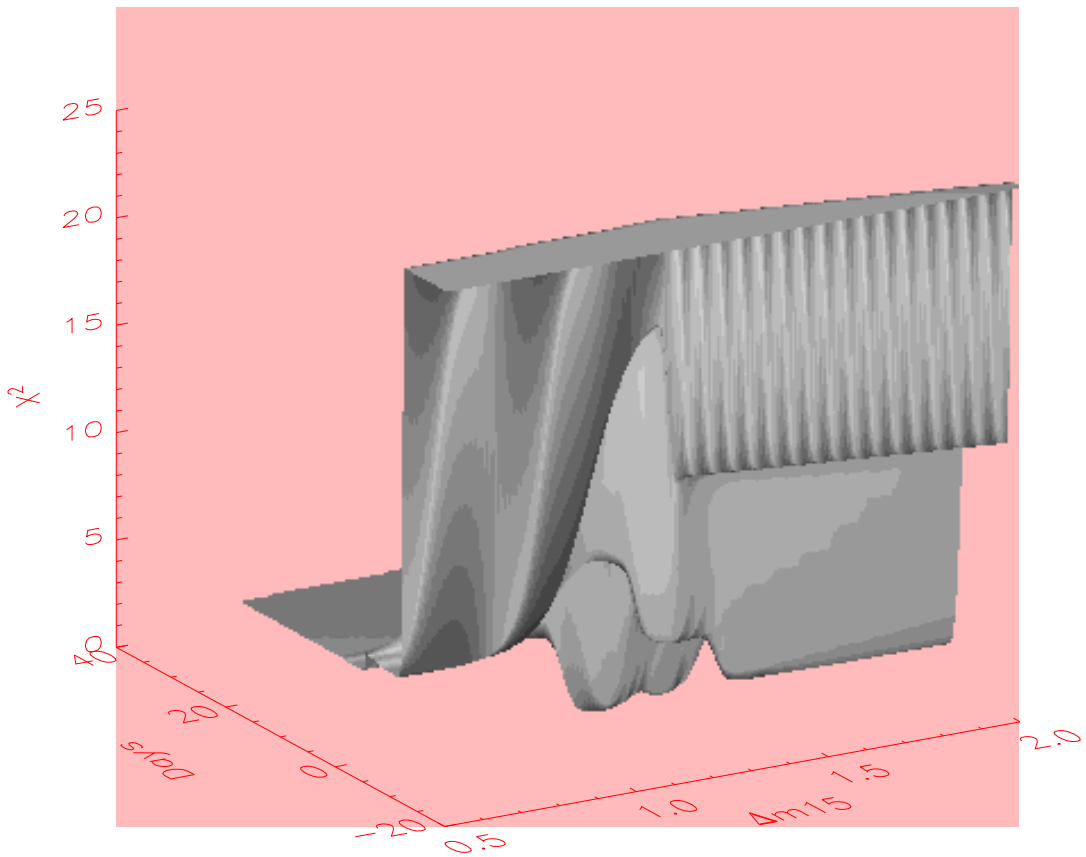

sn1989b.m07.dat.rect, z = −3.7252903e−09
FluxSN2002fkcomb.fits Observed − Galaxy
Template Spectrum Av = −1.0000000
Galaxy
SN/Gal = 24.5804
[O II]
Ca II
[O III]
H
2.0
1.5
1.0
0.5
0.0
−0.5
5000
6000
7000
8000
9000


sn1991t.m07.dat.rect, z = 0.0099999979
FluxSN2002fkcomb.fits Observed − Galaxy
Template Spectrum Av = 0.30229589
Galaxy
SN/Gal = 2.84069
[O II]
Ca II
[O III]
Hβ
1.5
1.0
0.5
0.0
5000
6000
7000
8000
9000

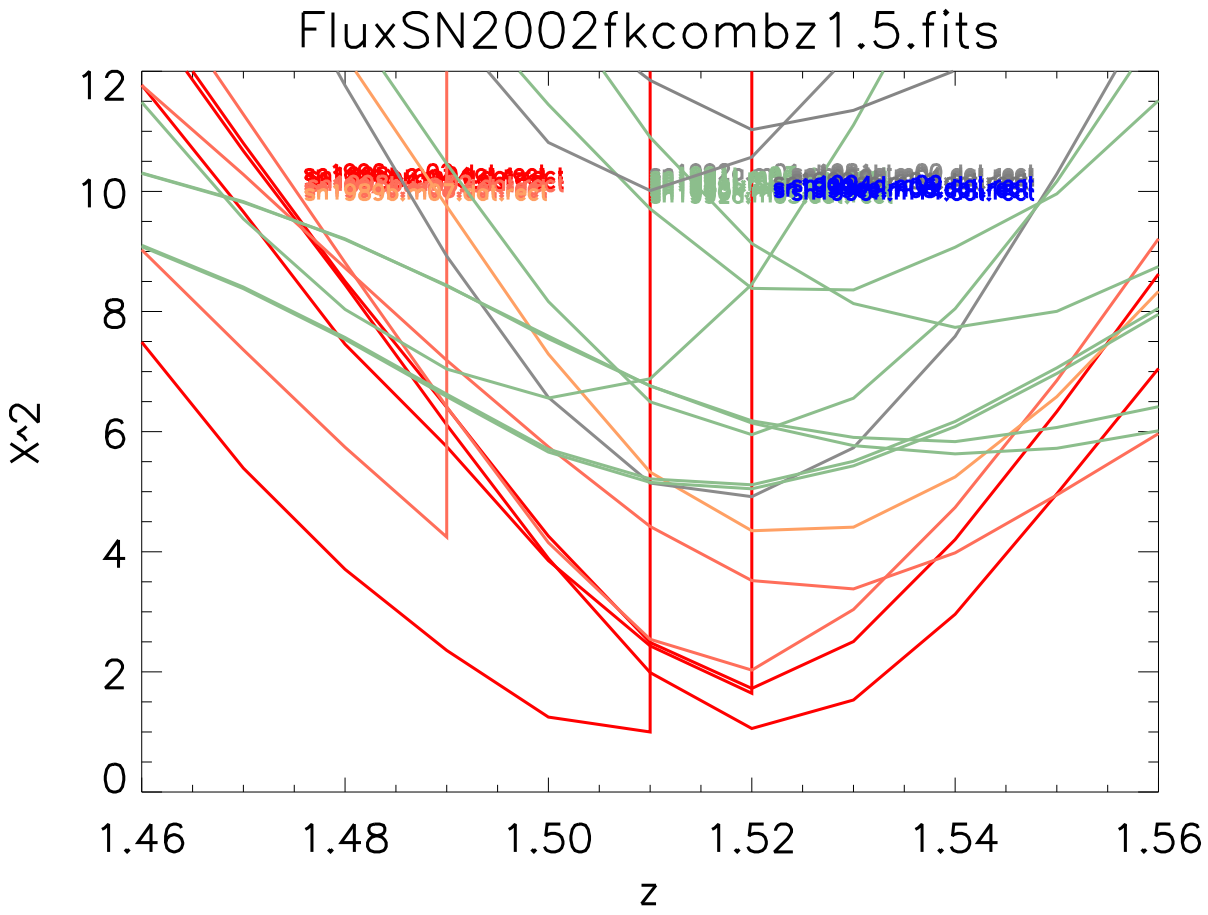

sn1990n.m14.dat.rect, z = 0.029999997
FluxSN2002fkcomb.fits Observed − Galaxy
Template Spectrum Av = −1.0000000
Galaxy
SN/Gal = 0.299788
[O II]
Ca II
[O III]
1.5
1.0
0.5
0.0
5000
6000
7000
8000
9000

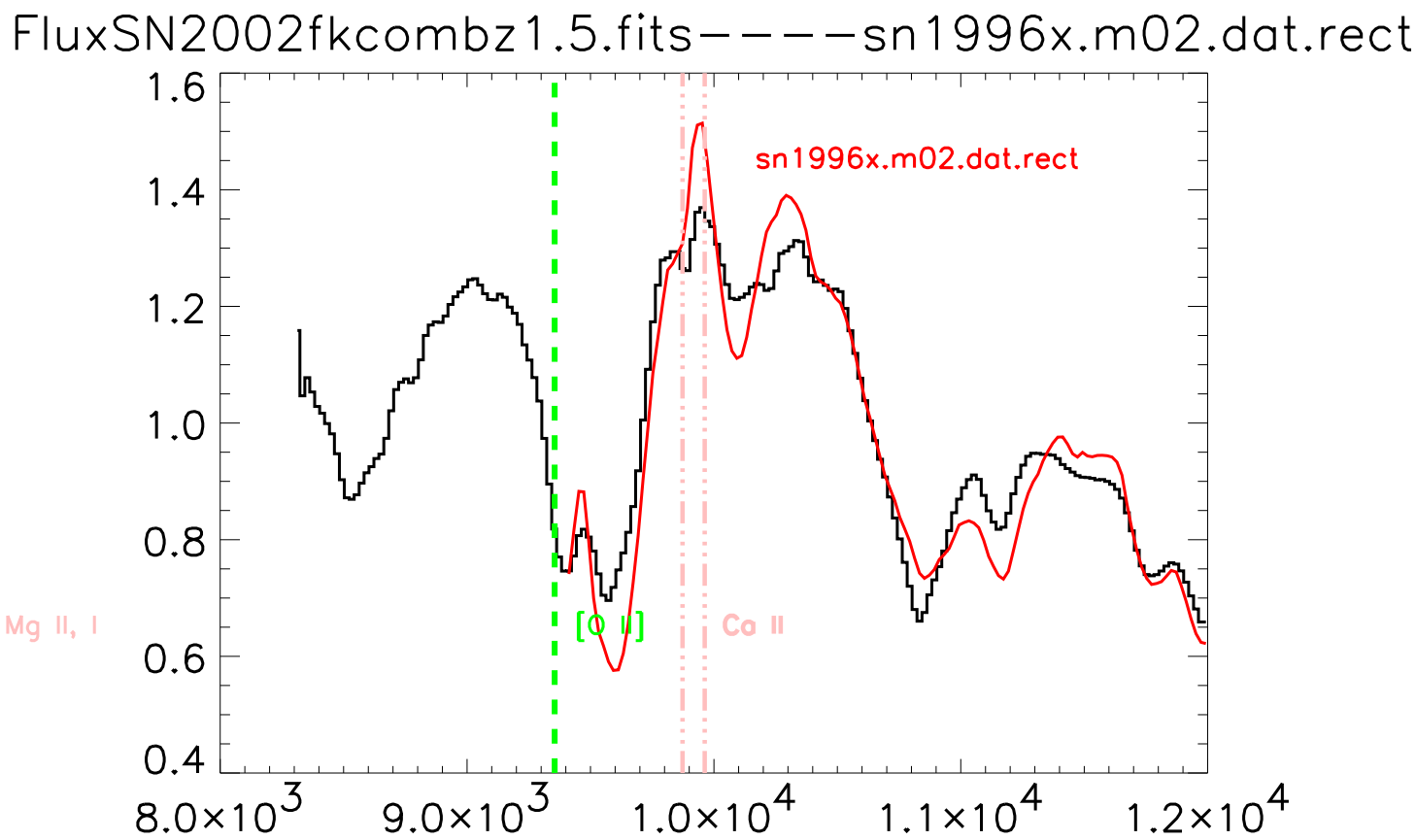

sn1994d.m07.dat.rect, z = 0.049999993
FluxSN2002fkcomb.fits Observed − Galaxy
Template Spectrum Av = 1.0000000
Galaxy
SN/Gal = 0.911500
[O II]
Ca II
[O III]
2.0
1.5
1.0
0.5
0.0
−0.5
5000
6000
7000
8000
9000

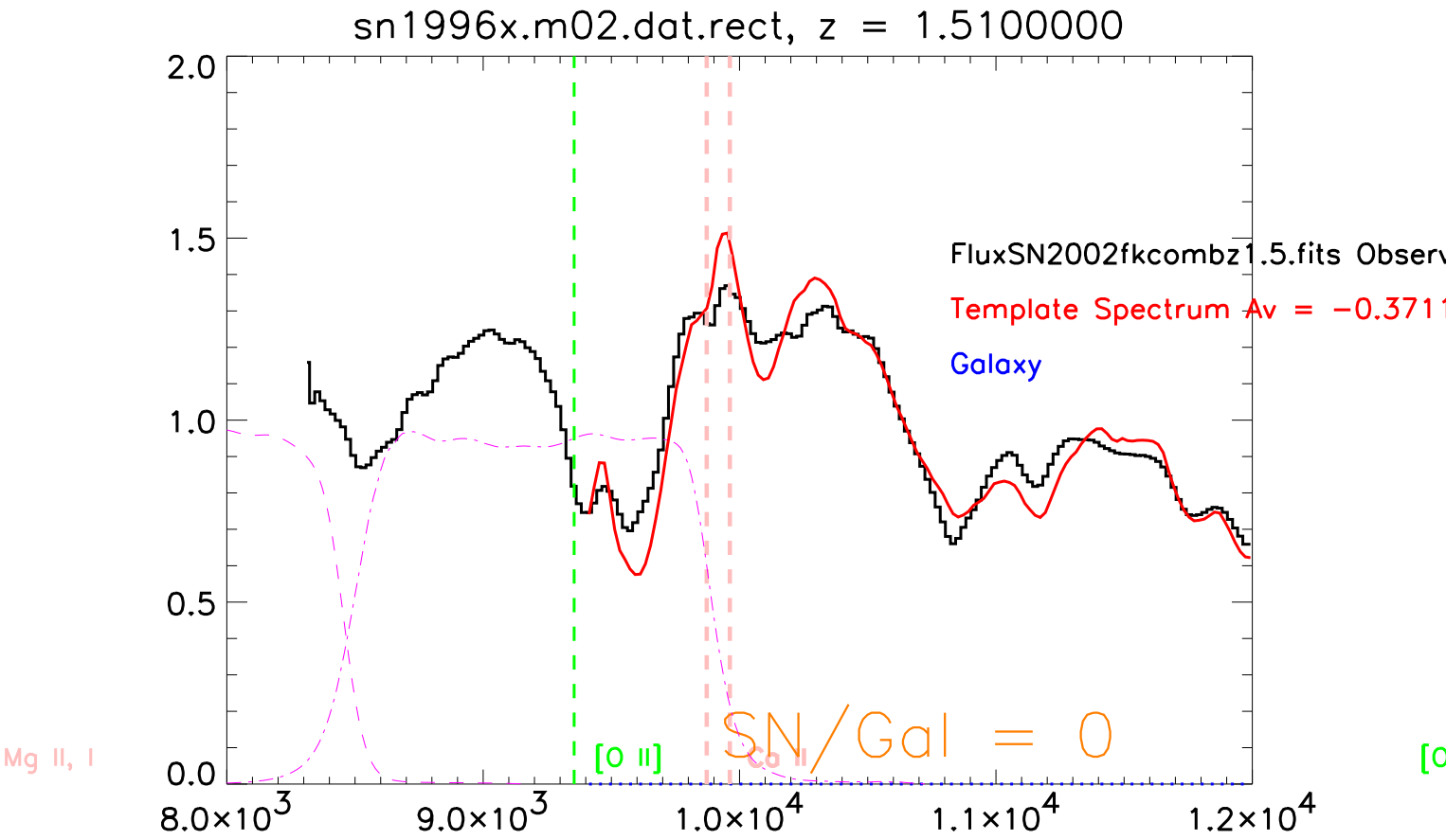

5.1
12.3
5.0
1:1
5.9
4.3
4.9
8.4
12.5
24.8

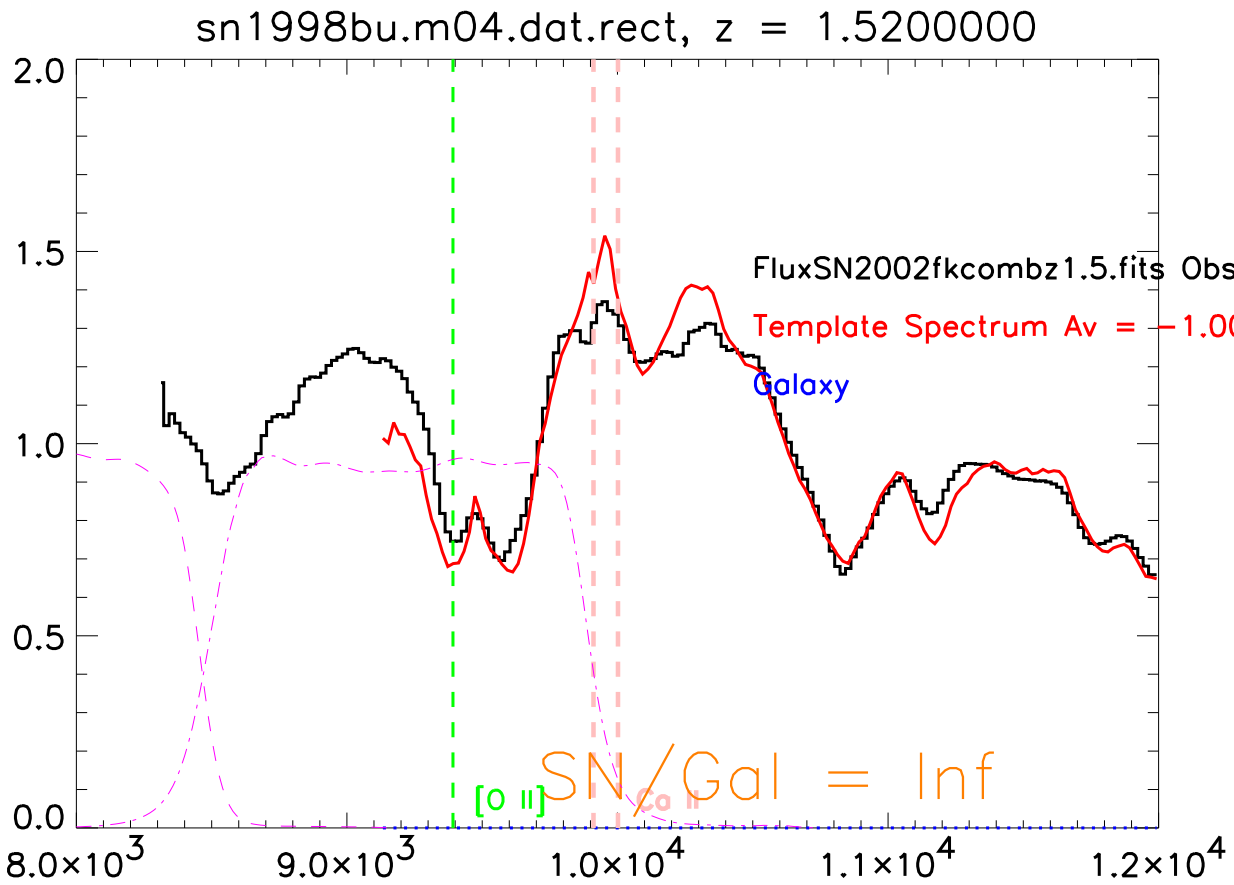


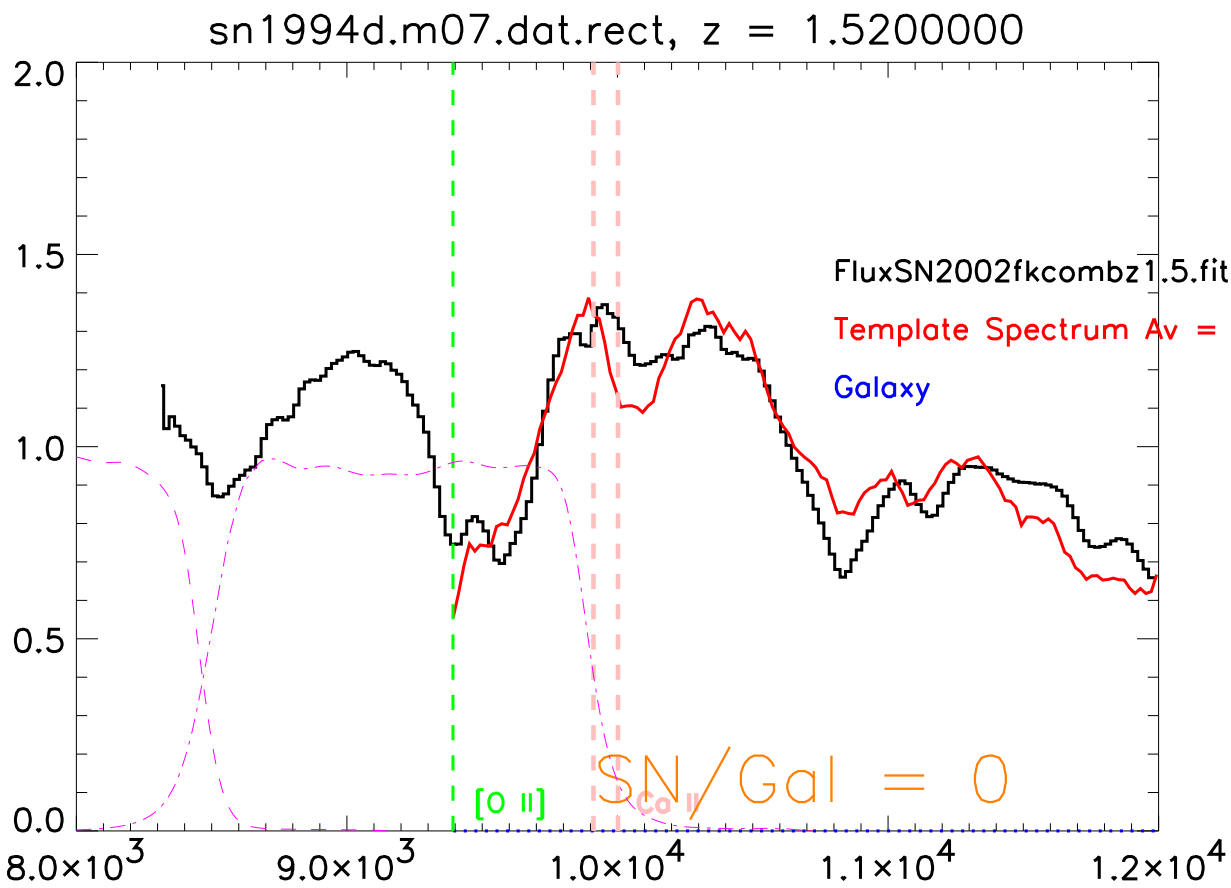
25
20
15
10
5
0
χ^2
40
20
0
−20
Days
0.5
1.0
1.5
2.0
Δm15

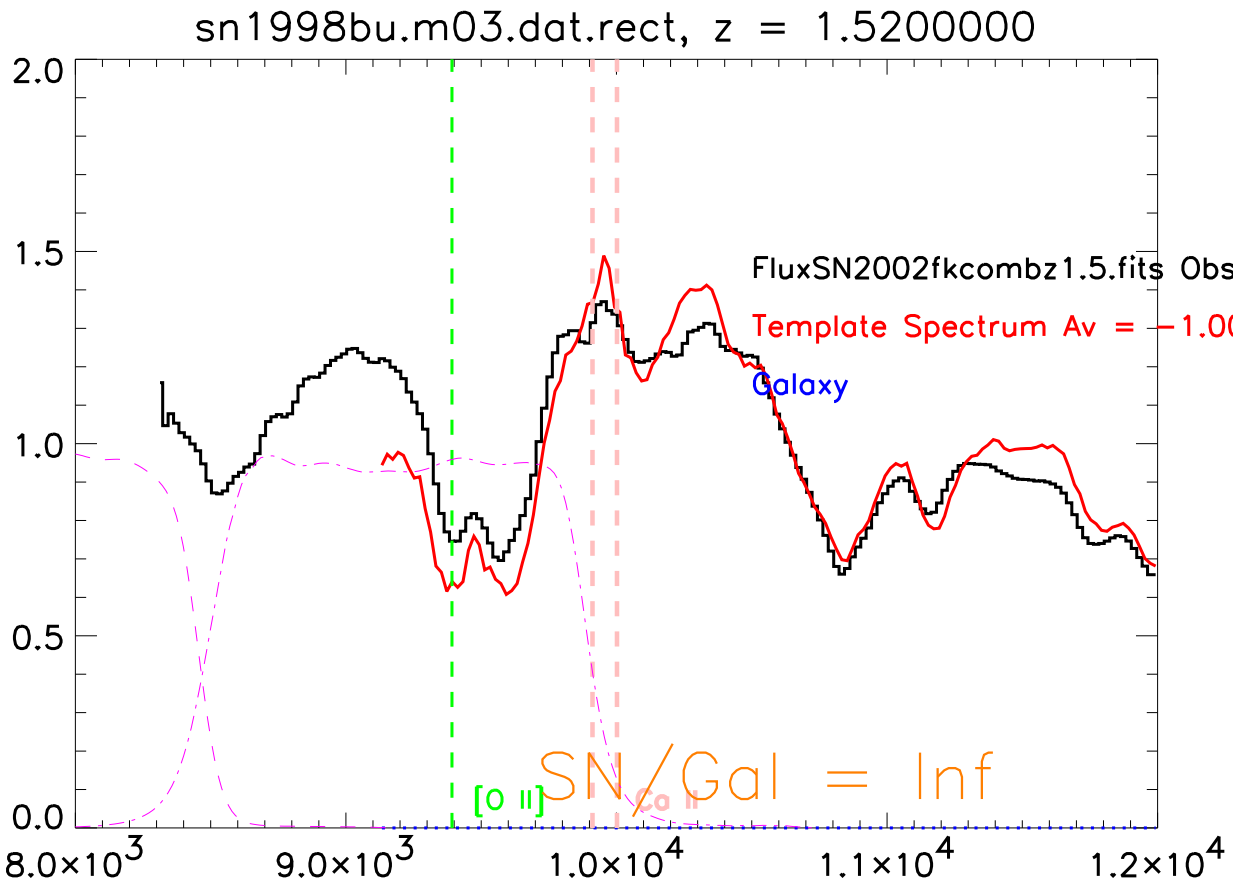

FluxSN2002fkcombz1.5.fits
X^2
z
0
2
4
6
8
10
12
1.46
1.48
1.50
1.52
1.54
1.56

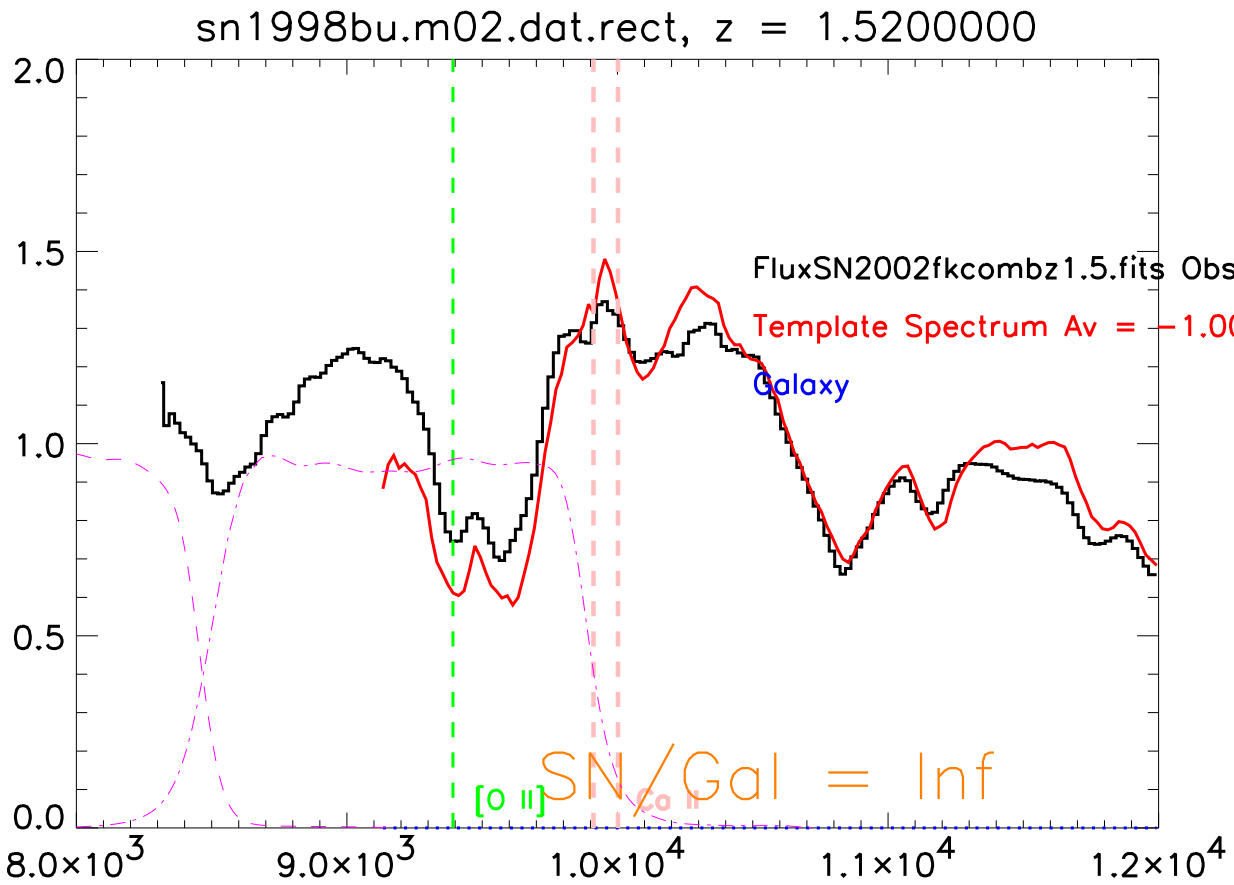

FluxSN2002fkcombz1.5.fits−−−−sn1996x.m02.dat.rect
sn1996x.m02.dat.rect
Mg II, I
[O II]
Ca II
1.6
1.4
1.2
1.0
0.8
0.6
0.4
8.0×10^3
9.0×10^3
1.0×10^4
1.1×10^4
1.2×10^4

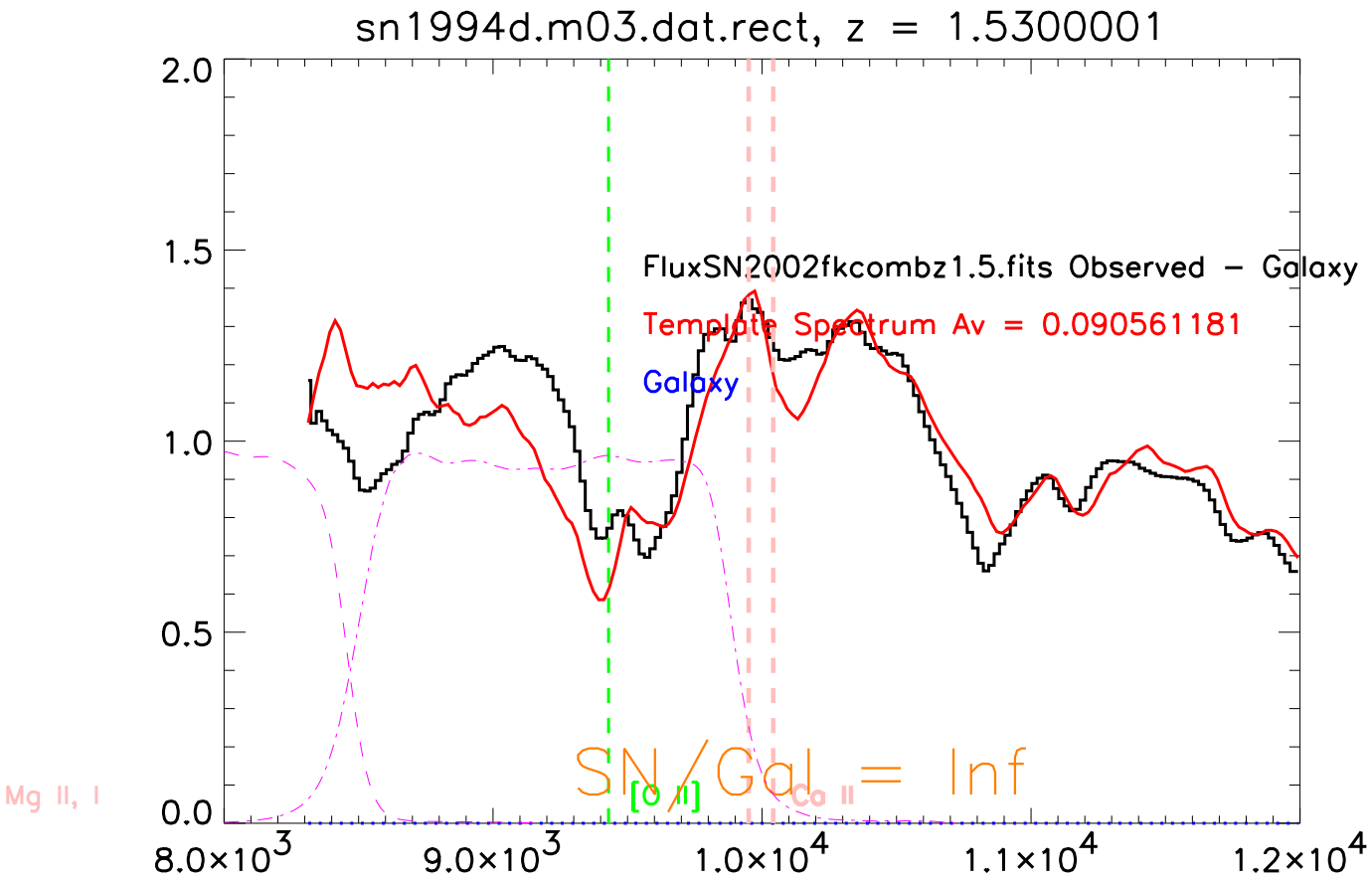

sn1996x.m02.dat.rect, z = 1.5100000
2.0
1.5
1.0
0.5
0.0
8.0×10^3
9.0×10^3
1.0×10^4
1.1×10^4
1.2×10^4
FluxSN2002fkcombz1.5.fits Observ
Template Spectrum Av = −0.371
Galaxy
SN/Gal = 0
[O II]
Mg II, I
[C

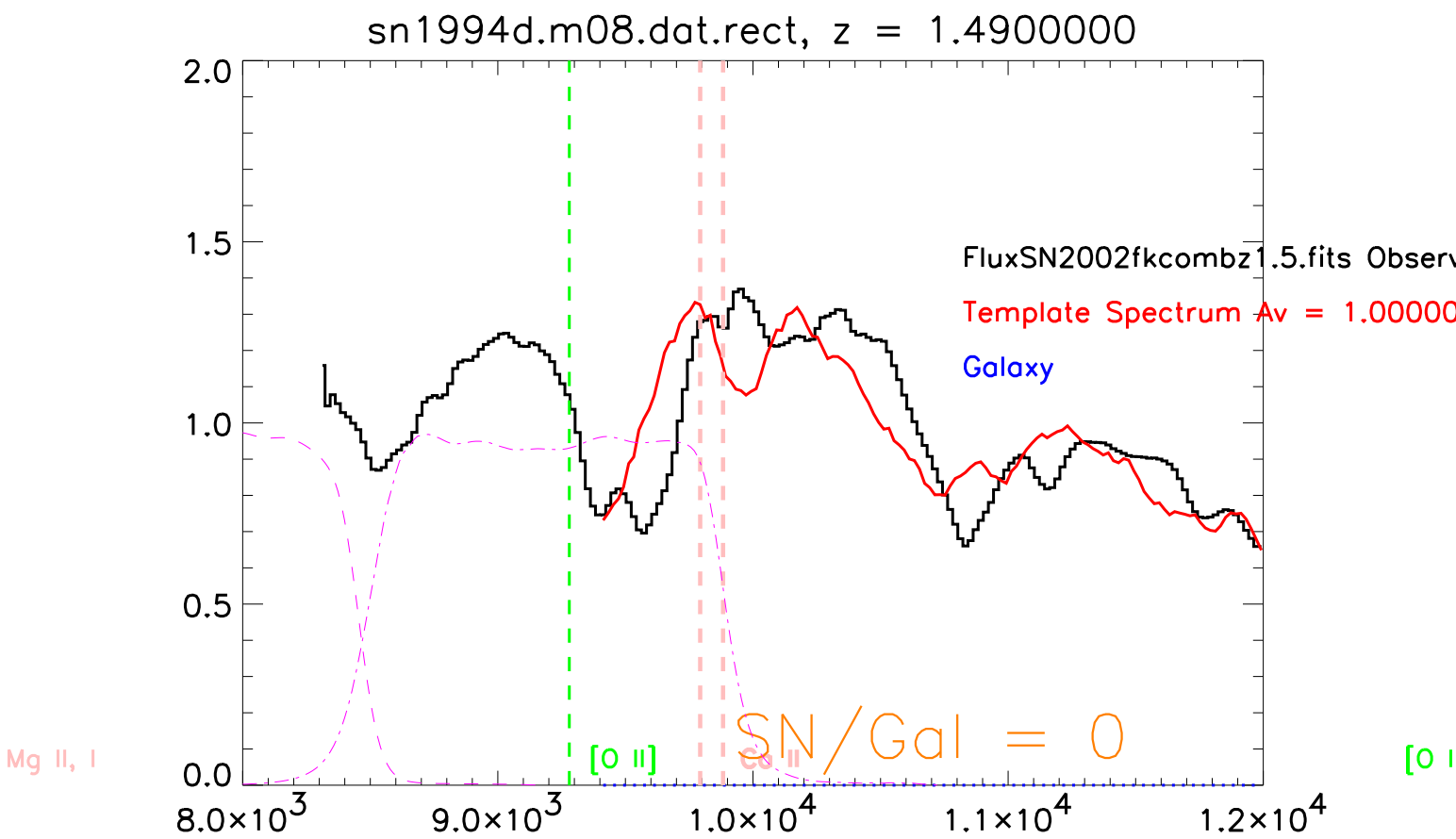

sn1998bu.m04.dat.rect, z = 1.5200000
FluxSN2002fkcombz1.5.fits Observed
Template Spectrum Av = 1.0000000
Galaxy
SN/Gal = Inf
[O II]
Ca II
2.0
1.5
1.0
0.5
0.0
8.0×10^3
9.0×10^3
1.0×10^4
1.1×10^4
1.2×10^4


sn1994d.m07.dat.rect, z = 1.5200000
2.0
1.5
1.0
0.5
0.0
8.0×10^3
9.0×10^3
1.0×10^4
1.1×10^4
1.2×10^4
FluxSN2002fkcombz1.5.fits Observ
Template Spectrum Av = 1.00000
Galaxy
SN/Gal = 0
[O II]
Mg II, I


sn1998bu.m03.dat.rect, z = 1.5200000
2.0
1.5
1.0
0.5
0.0
8.0×10^3
9.0×10^3
1.0×10^4
1.1×10^4
1.2×10^4
FluxSN2002fkcombz1.5.fits Observed –
Template Spectrum Av = –1.0000000
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II

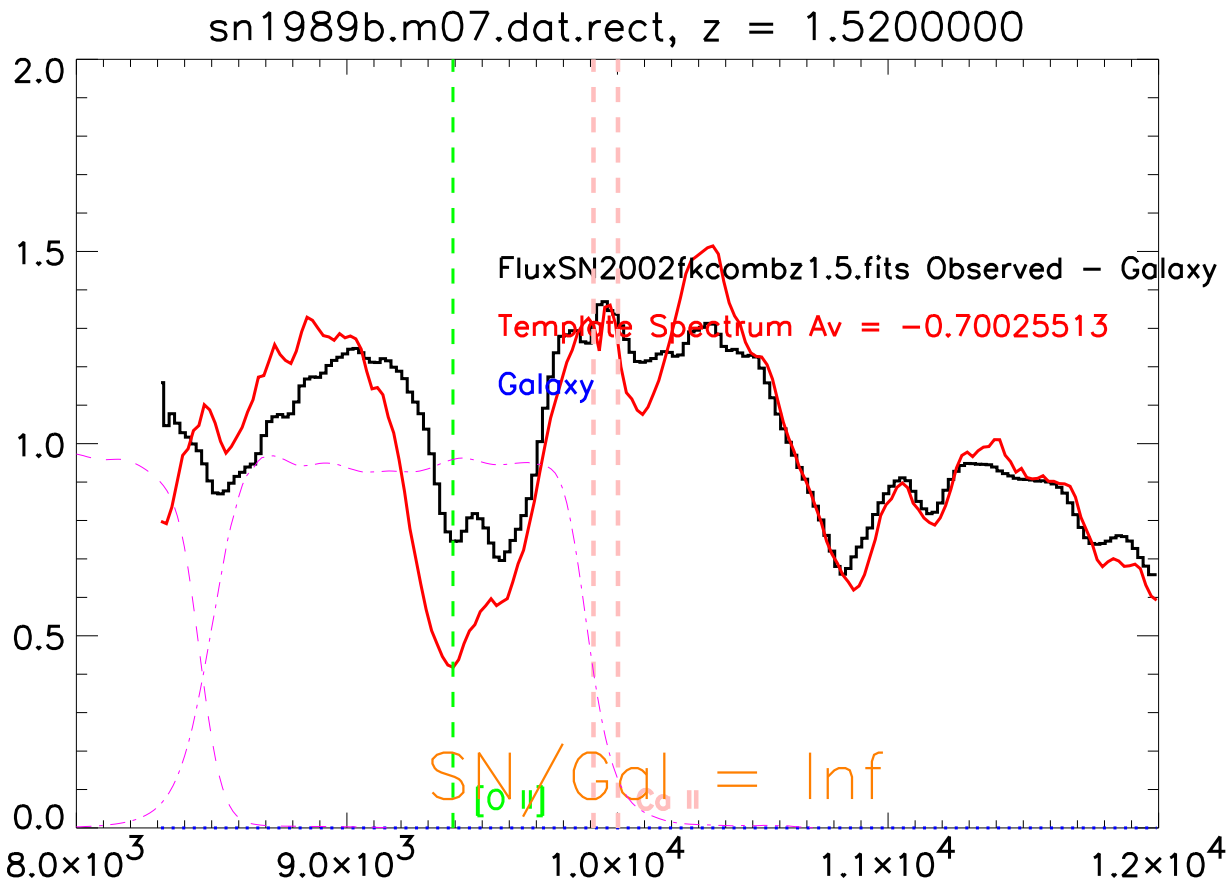

sn1998bu.m02.dat.rect, z = 1.5200000
2.0
1.5
1.0
0.5
0.0
8.0×10^3
9.0×10^3
1.0×10^4
1.1×10^4
1.2×10^4
FluxSN2002fkcombz1.5.fits Observed –
Template Spectrum Av = –1.0000000
Galaxy
SN/Gal = Inf
[O II]
Ca II
Mg II, I

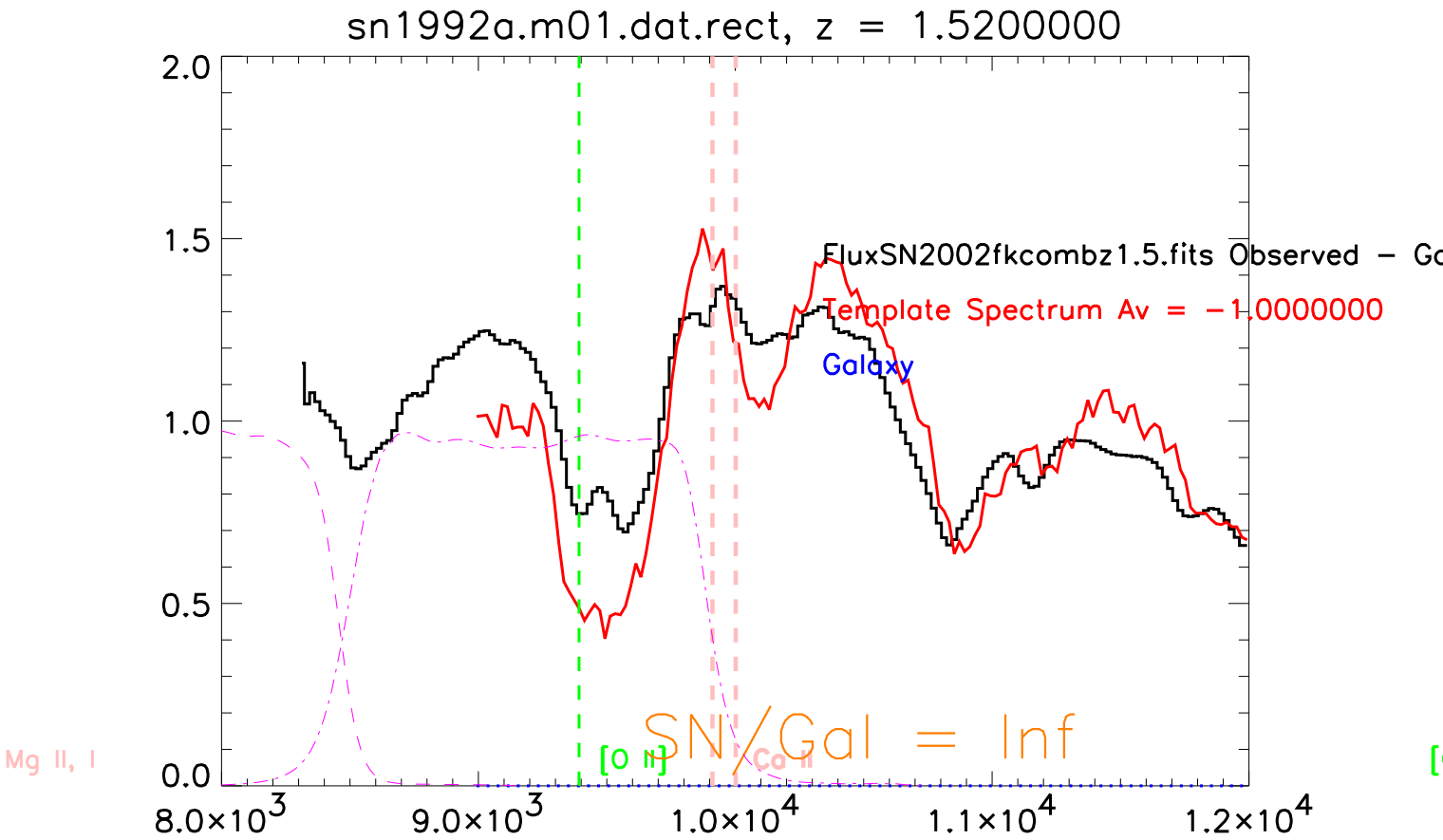

sn1994d.m03.dat.rect, z = 1.5300001
FluxSN2002fkcombz1.5.fits Observed – Galaxy
Template Spectrum Av = 0.090561181
Galaxy
SN/Gal = Inf
[O II]
Ca II
Mg II, I
2.0
1.5
1.0
0.5
0.0
8.0×10^3
9.0×10^3
1.0×10^4
1.1×10^4
1.2×10^4

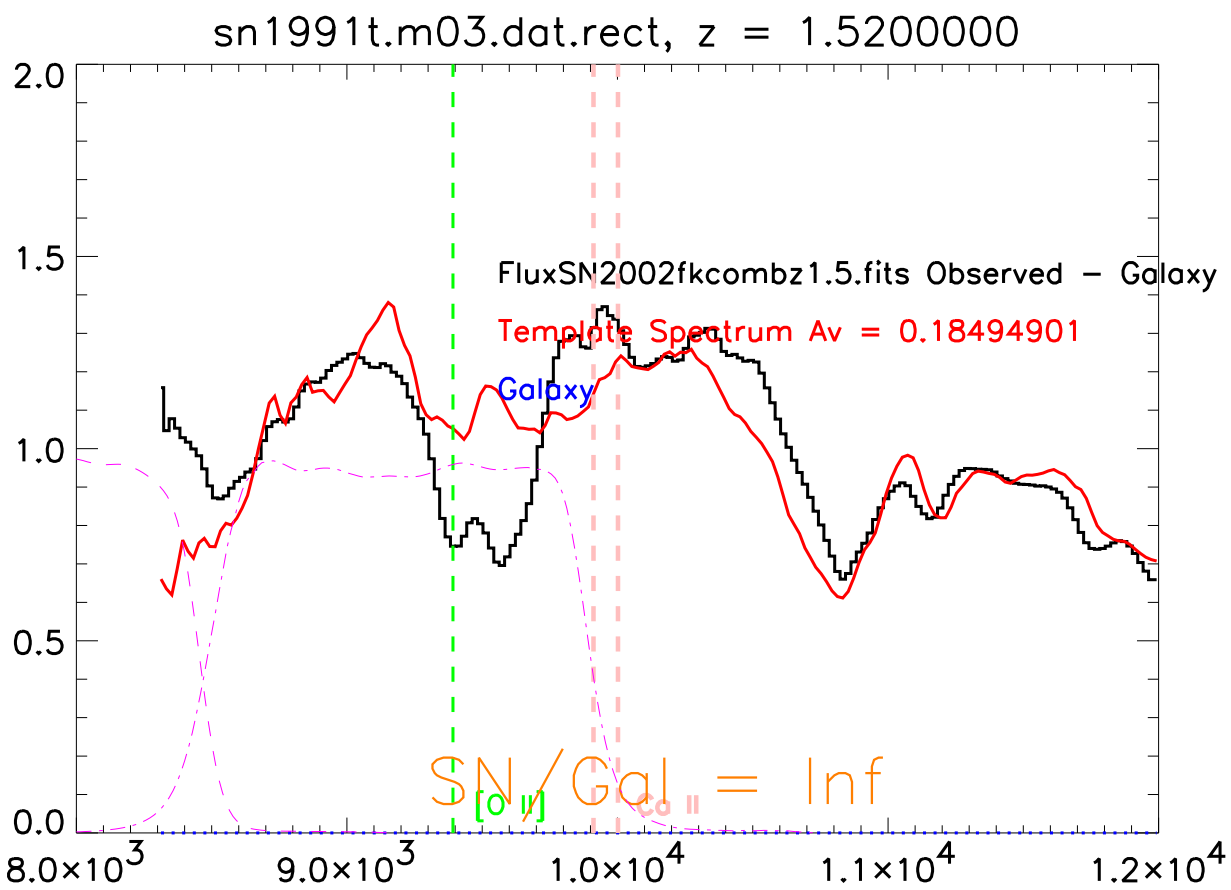

sn1994d.m08.dat.rect, z = 1.4900000
FluxSN2002fkcombz1.5.fits Observ
Template Spectrum Av = 1.00000
Galaxy
SN/Gal = 0
[O II]
Ca II
2.0
1.5
1.0
0.5
0.0
8.0×10^3
9.0×10^3
1.0×10^4
1.1×10^4
1.2×10^4

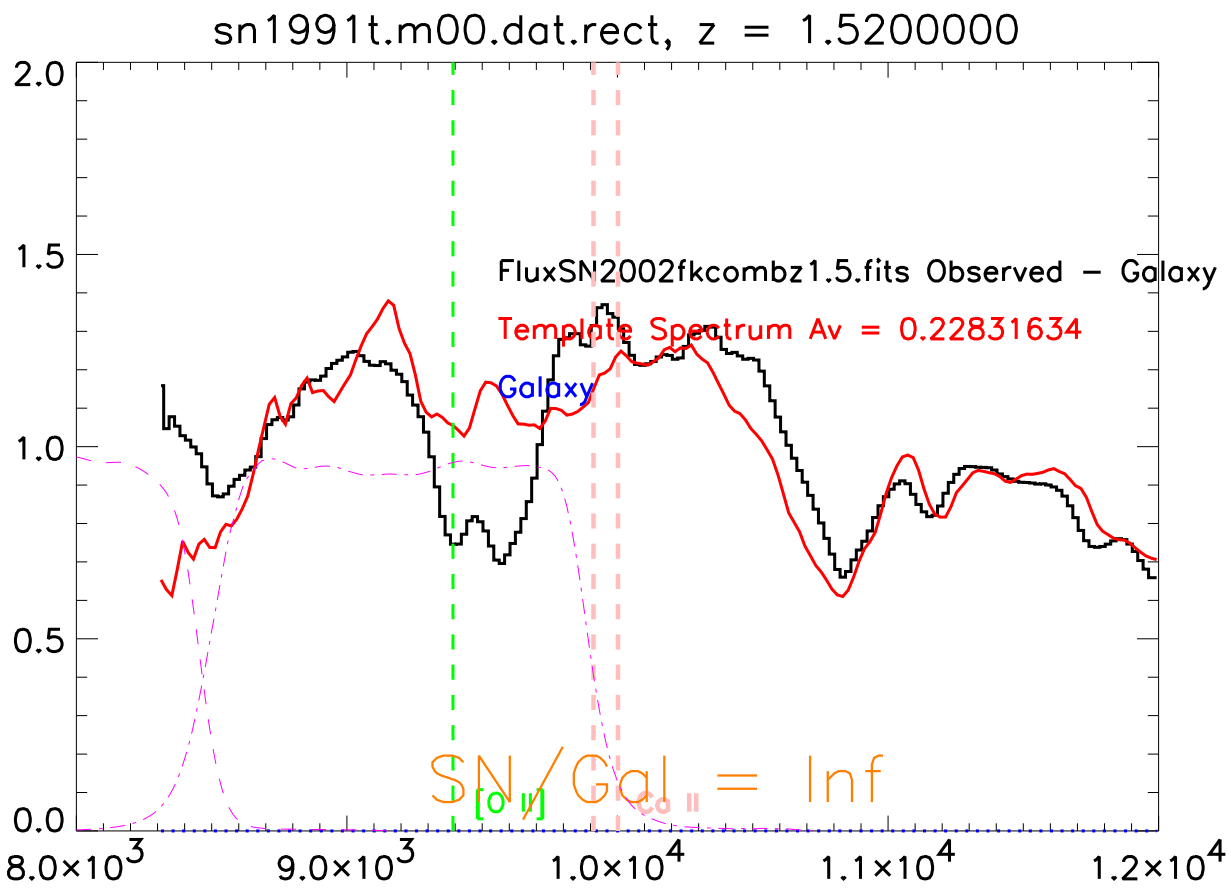
Mg II, I

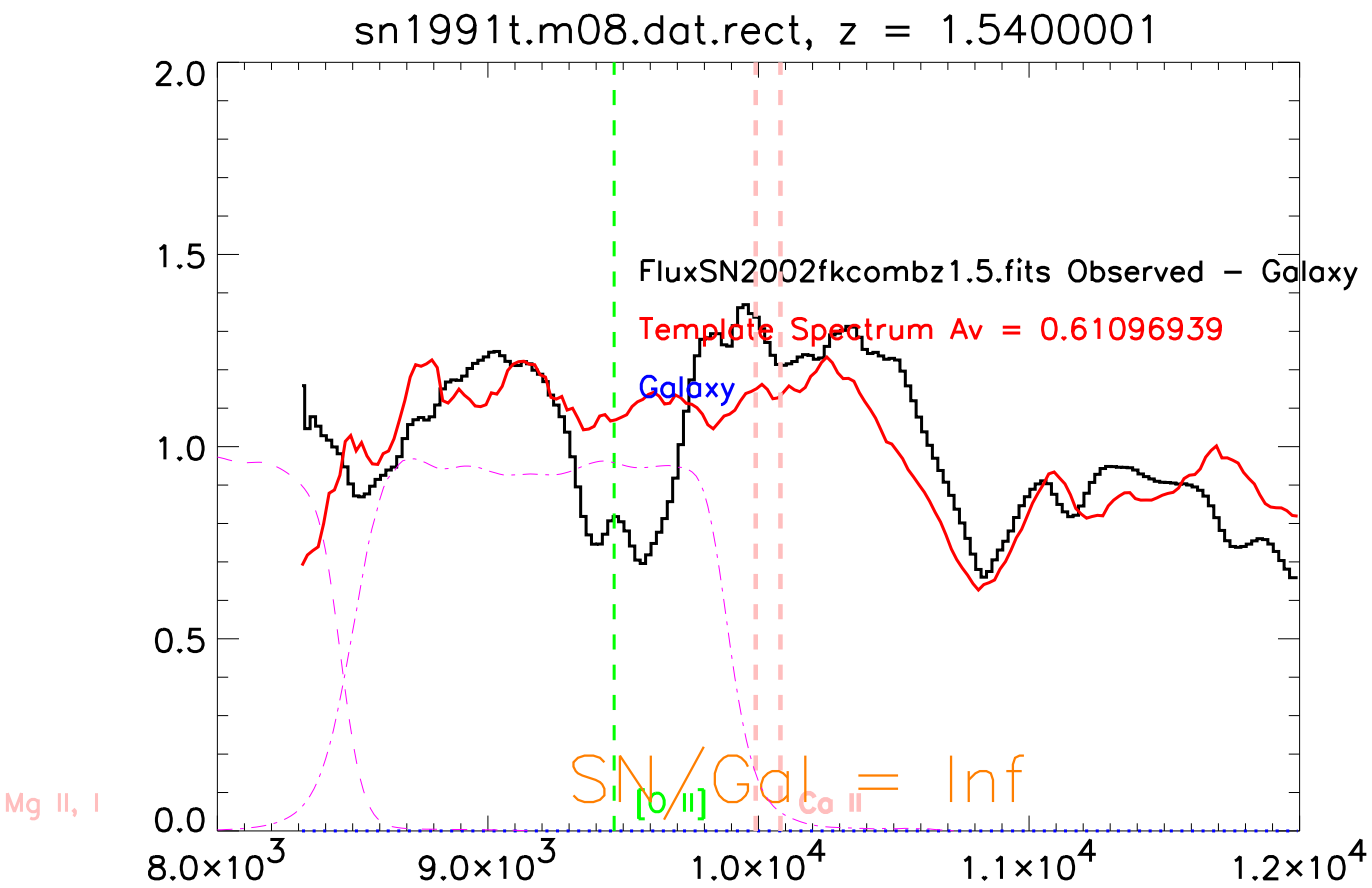
[O I

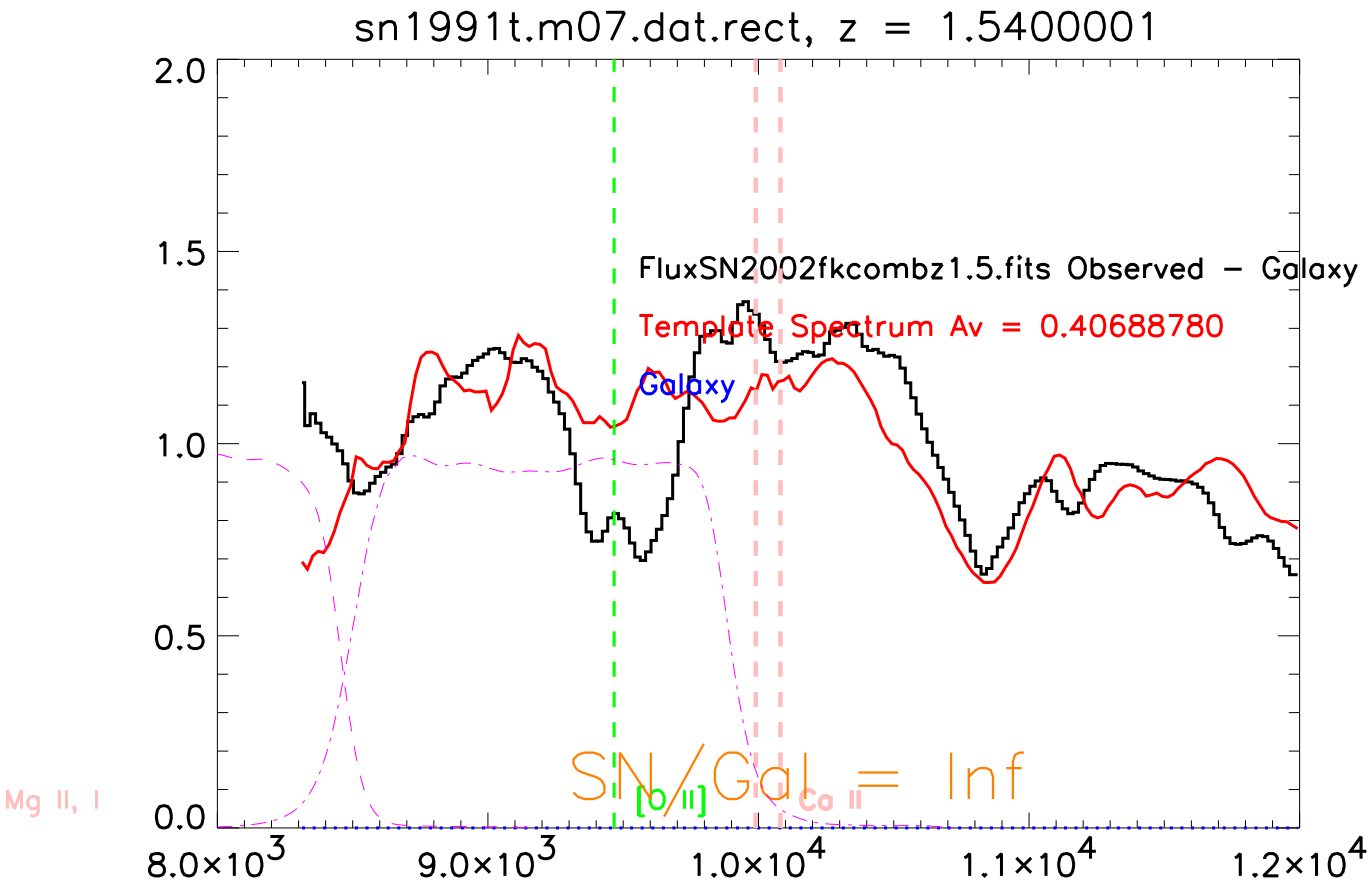

sn1989b.m07.dat.rect, z = 1.5200000
FluxSN2002fkcombz1.5.fits Observed − Galaxy
Template Spectrum Av = −0.70025513
Galaxy
SN/Gal = Inf
[O II]
Ca II
2.0
1.5
1.0
0.5
0.0
8.0×10^3
9.0×10^3
1.0×10^4
1.1×10^4
1.2×10^4

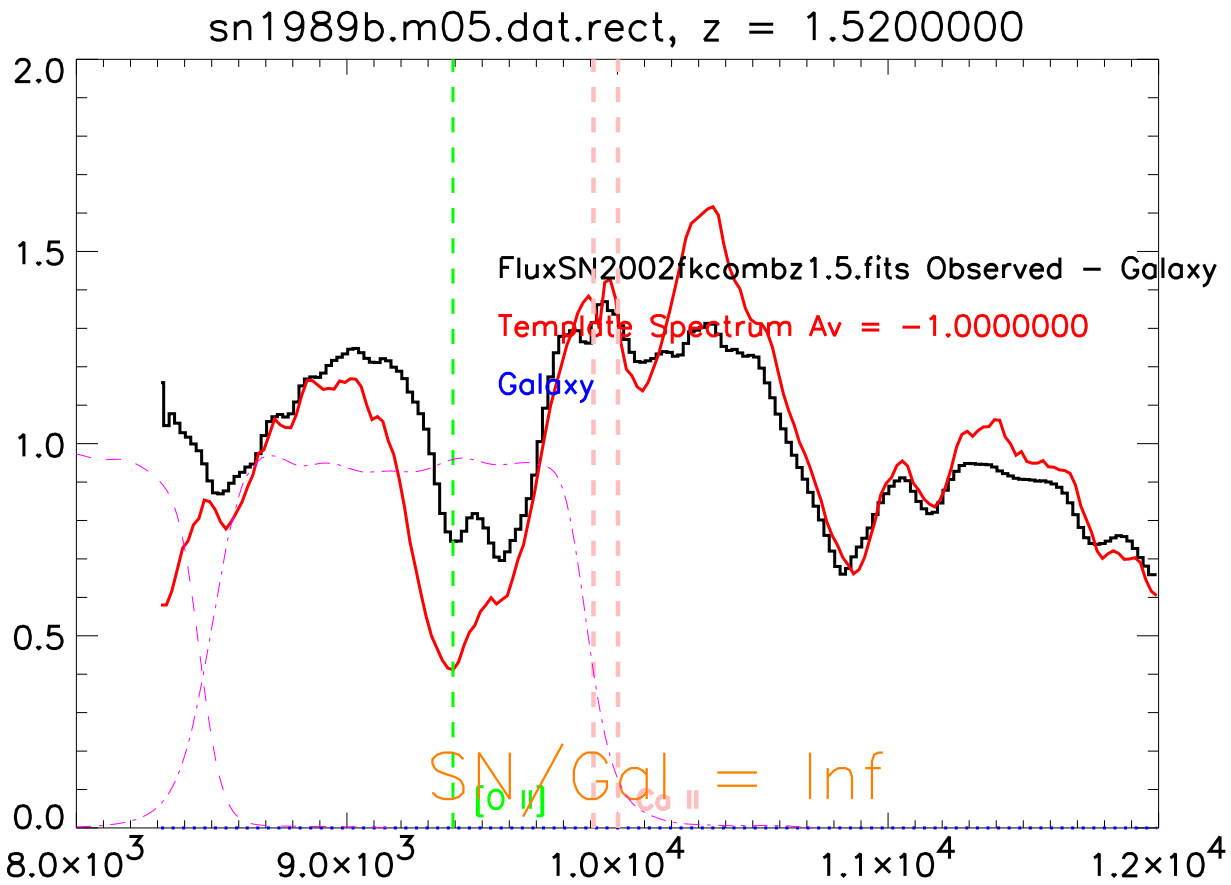

sn1992a.m01.dat.rect, z = 1.5200000
FluxSN2002fkcombz1.5.fits Observed – Ga
Template Spectrum Av = −1.0000000
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
2.0
1.5
1.0
0.5
0.0
8.0×10^3
9.0×10^3
1.0×10^4
1.1×10^4
1.2×10^4

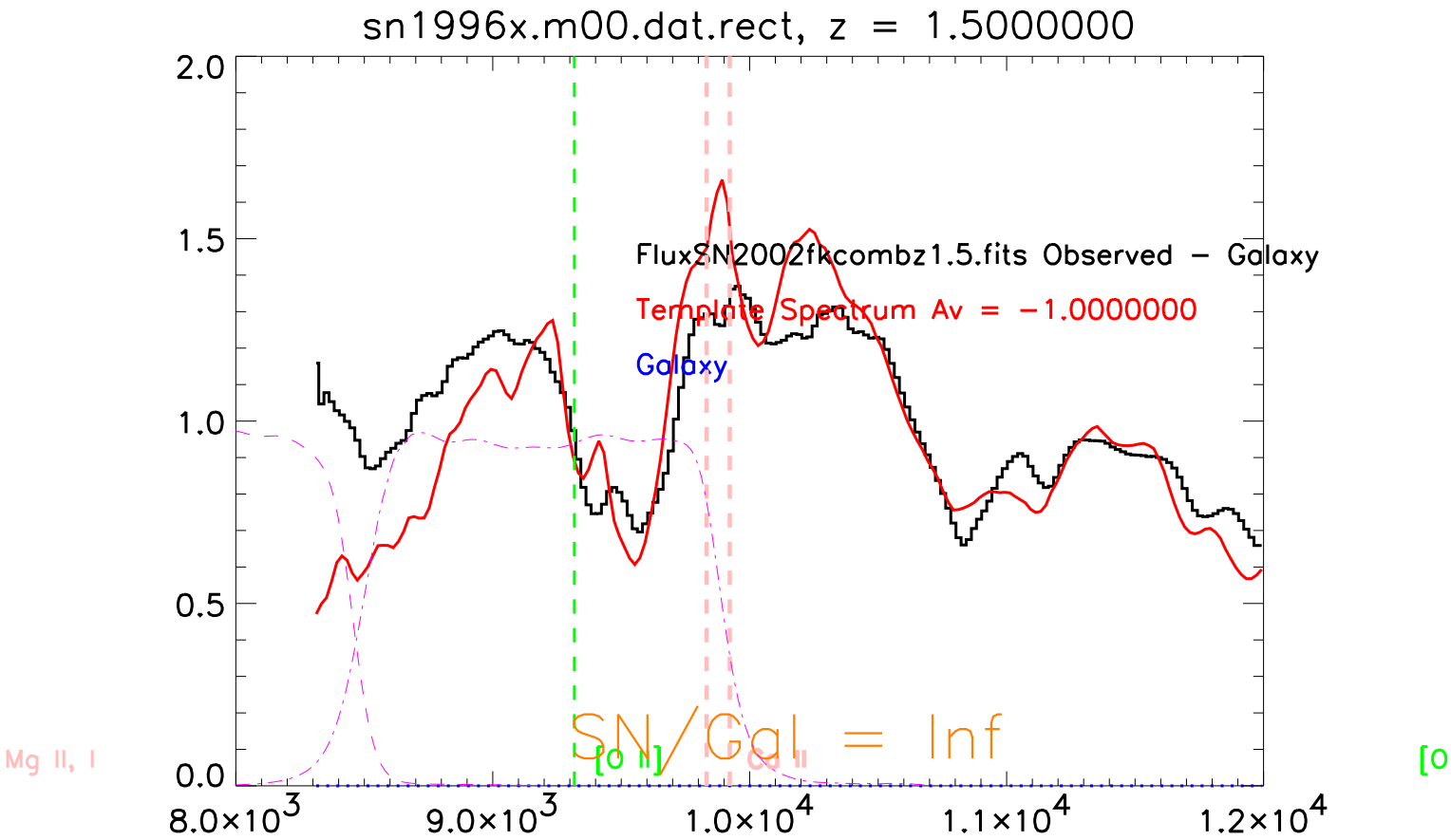

sn1991t.m03.dat.rect, z = 1.5200000
FluxSN2002fkcombz1.5.fits Observed – Galaxy
Template Spectrum Av = 0.18494901
Galaxy
SN/Gal = Inf
[O II]
Ca II
2.0
1.5
1.0
0.5
0.0
8.0×10^3
9.0×10^3
1.0×10^4
1.1×10^4
1.2×10^4

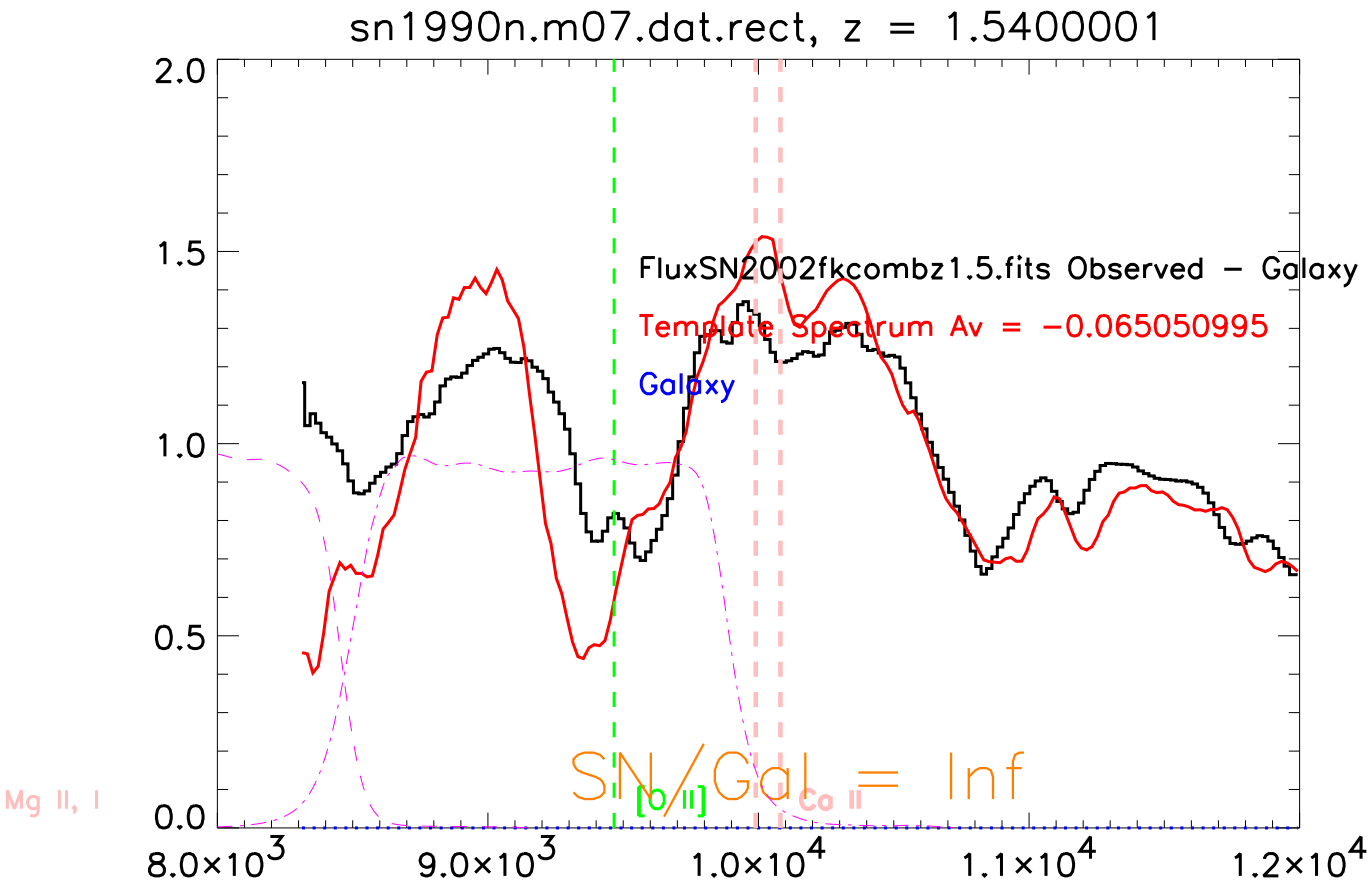

sn1991t.m00.dat.rect, z = 1.5200000
FluxSN2002fkcombz1.5.fits Observed – Galaxy
Template Spectrum Av = 0.22831634
Galaxy
SN/Gal = Inf
[O II]
Ca II
2.0
1.5
1.0
0.5
0.0
8.0×10^3
9.0×10^3
1.0×10^4
1.1×10^4
1.2×10^4

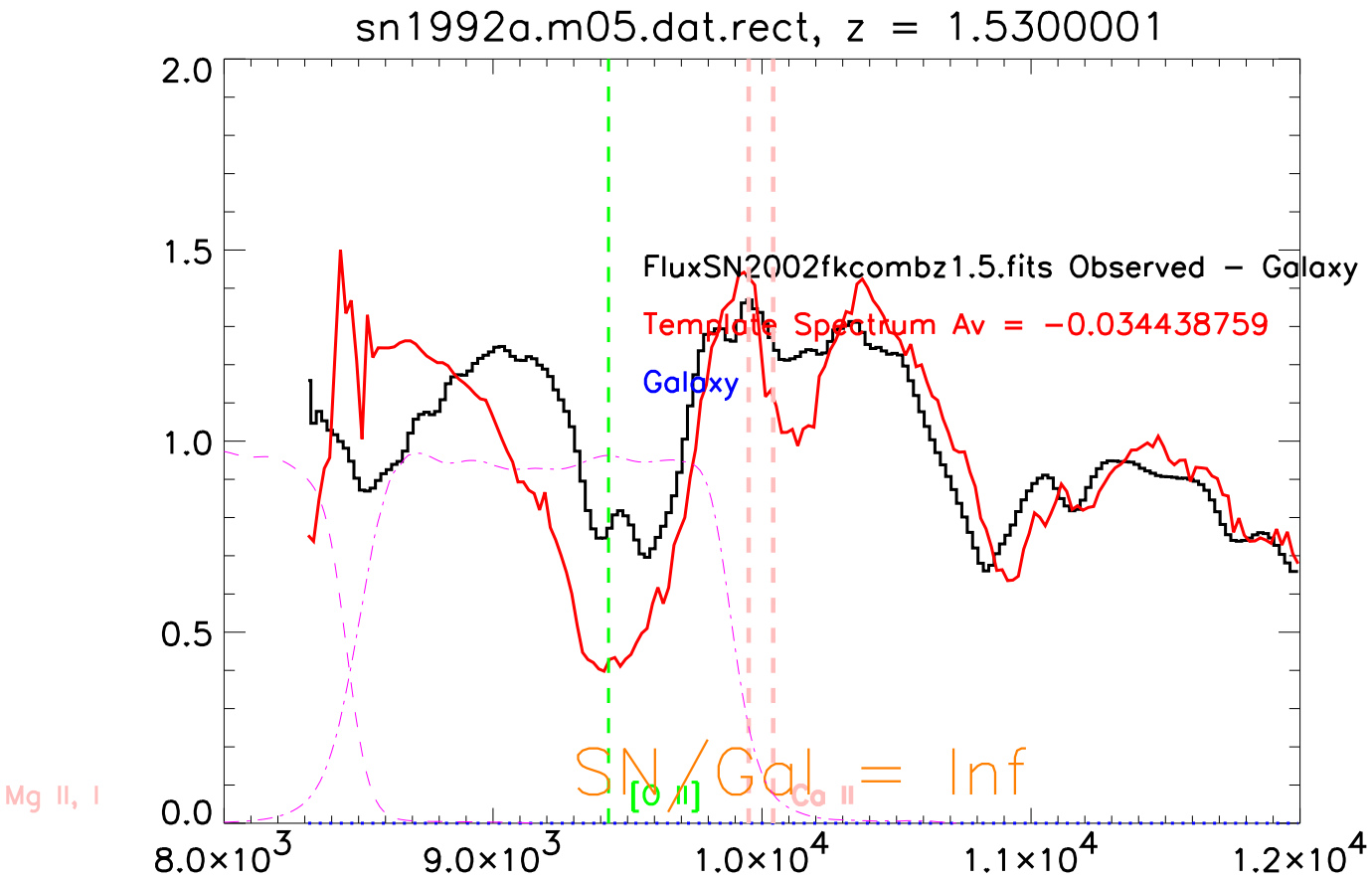

sn1991t.m08.dat.rect, z = 1.5400001
FluxSN2002fkcombz1.5.fits Observed – Galaxy
Template Spectrum Av = 0.61096939
Galaxy
SN/Gal = Inf
[O II]
Ca II
Mg II, I
2.0
1.5
1.0
0.5
0.0
8.0×10^3
9.0×10^3
1.0×10^4
1.1×10^4
1.2×10^4

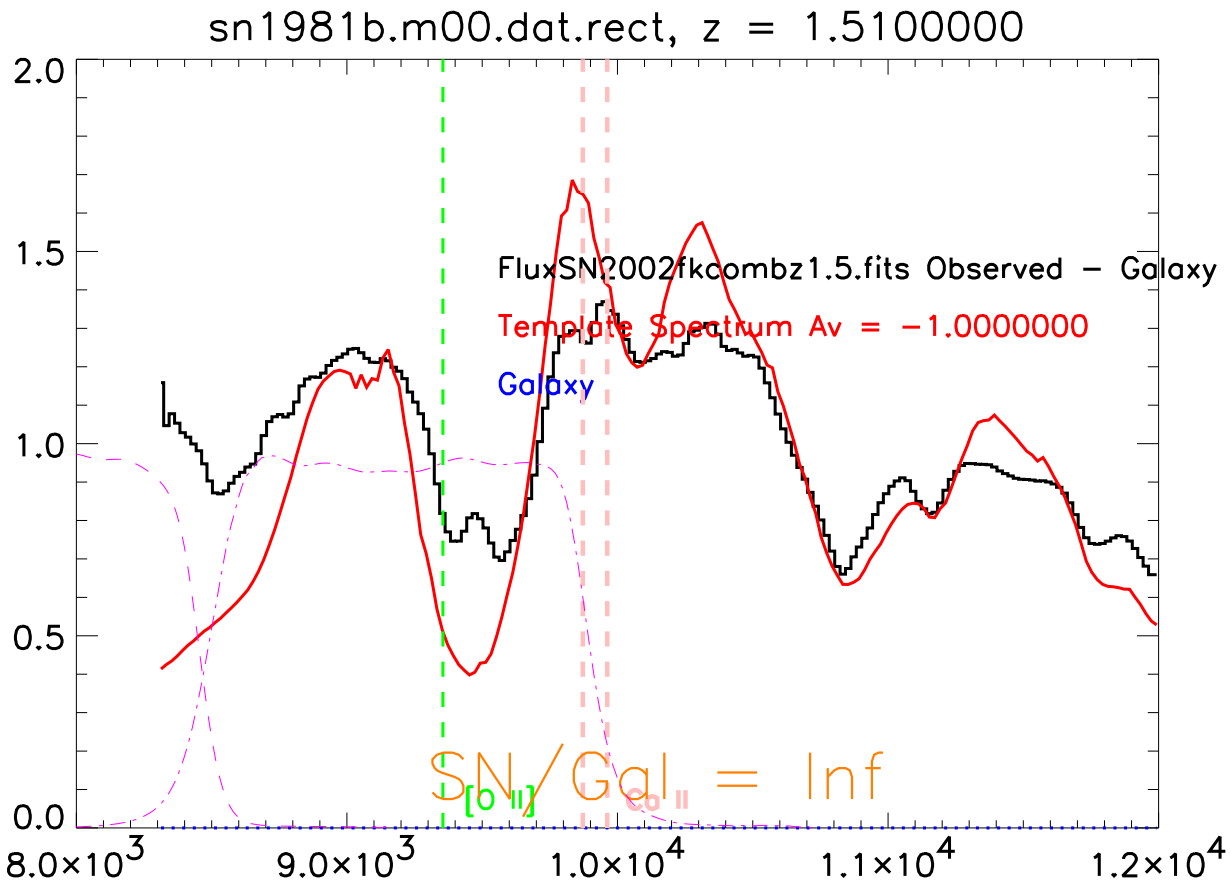

sn1991t.m07.dat.rect, z = 1.5400001
FluxSN2002fkcombz1.5.fits Observed – Galaxy
Template Spectrum Av = 0.40688780
Galaxy
SN/Gal = Inf
[O II]
Ca II
Mg II, I
2.0
1.5
1.0
0.5
0.0
8.0×10^3
9.0×10^3
1.0×10^4
1.1×10^4
1.2×10^4

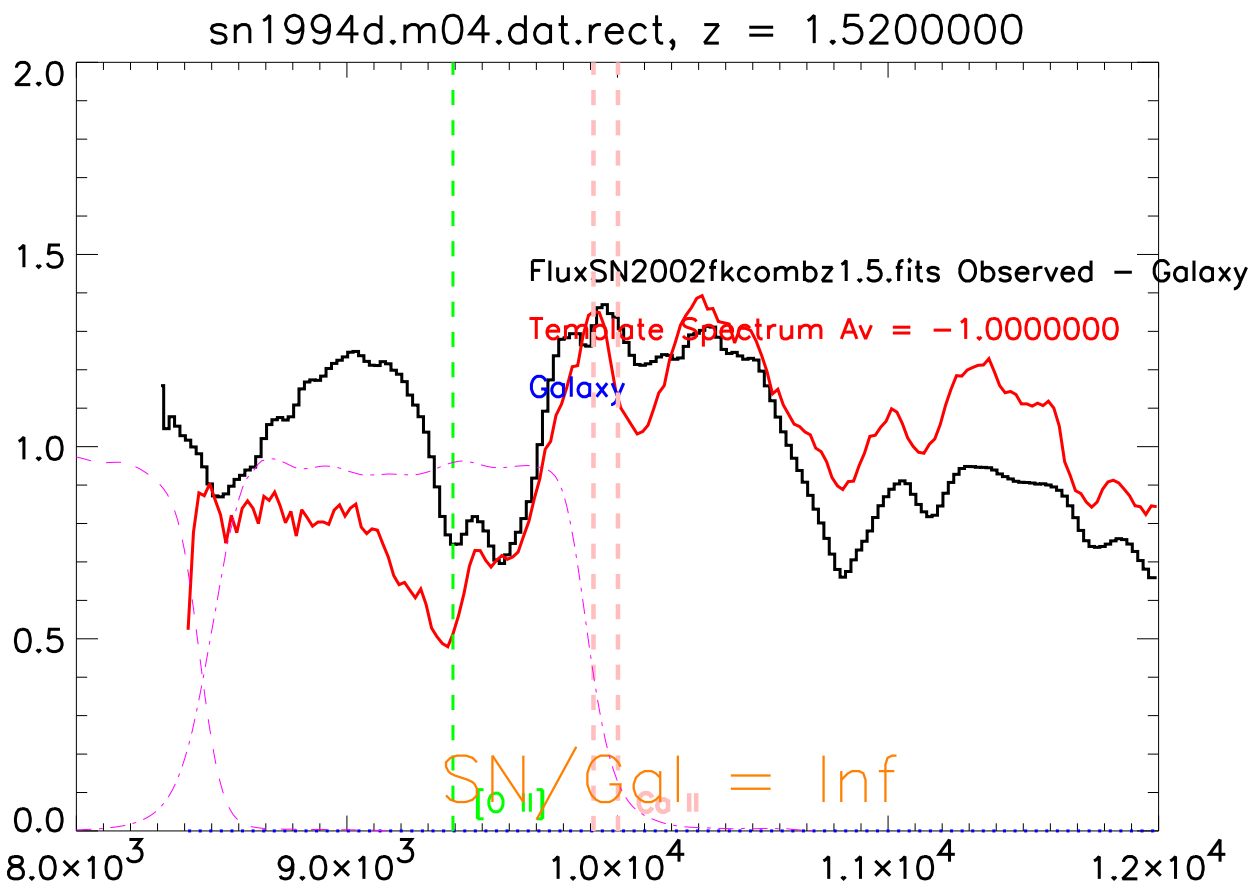

sn1989b.m05.dat.rect, z = 1.5200000
FluxSN2002fkcombz1.5.fits Observed – Galaxy
Template Spectrum Av = −1.0000000
Galaxy
SN/Gal = Inf
[O II]
Ca II
2.0
1.5
1.0
0.5
0.0
8.0×10^3
9.0×10^3
1.0×10^4
1.1×10^4
1.2×10^4

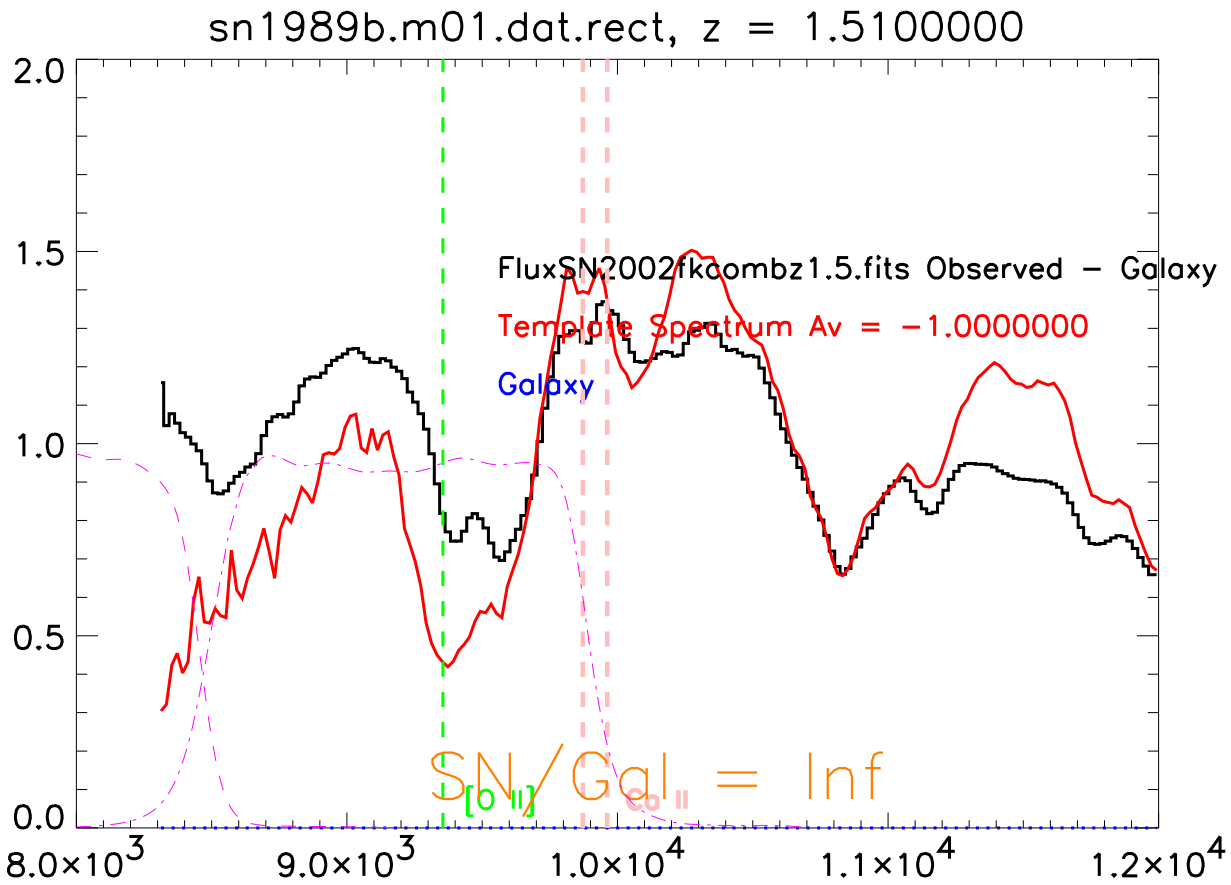

sn1996x.m00.dat.rect, z = 1.5000000
FluxSN2002fkcombz1.5.fits Observed − Galaxy
Template Spectrum Av = −1.0000000
Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O
2.0
1.5
1.0
0.5
0.0
8.0×10^3
9.0×10^3
1.0×10^4
1.1×10^4
1.2×10^4


sn1990n.m07.dat.rect, z = 1.5400001
FluxSN2002fkcombz1.5.fits Observed – Galaxy
Template Spectrum Av = −0.065050995
Galaxy
SN/Gal = Inf
[O II]
Ca II
Mg II, I
2.0
1.5
1.0
0.5
0.0
8.0×10^3
9.0×10^3
1.0×10^4
1.1×10^4
1.2×10^4


sn1992a.m05.dat.rect, z = 1.5300001
FluxSN2002fkcombz1.5.fits Observed – Galaxy
Template Spectrum Av = −0.034438759
Galaxy
SN/Gal = Inf
[O II]
Ca II
Mg II, I
2.0
1.5
1.0
0.5
0.0
8.0×10^3
9.0×10^3
1.0×10^4
1.1×10^4
1.2×10^4

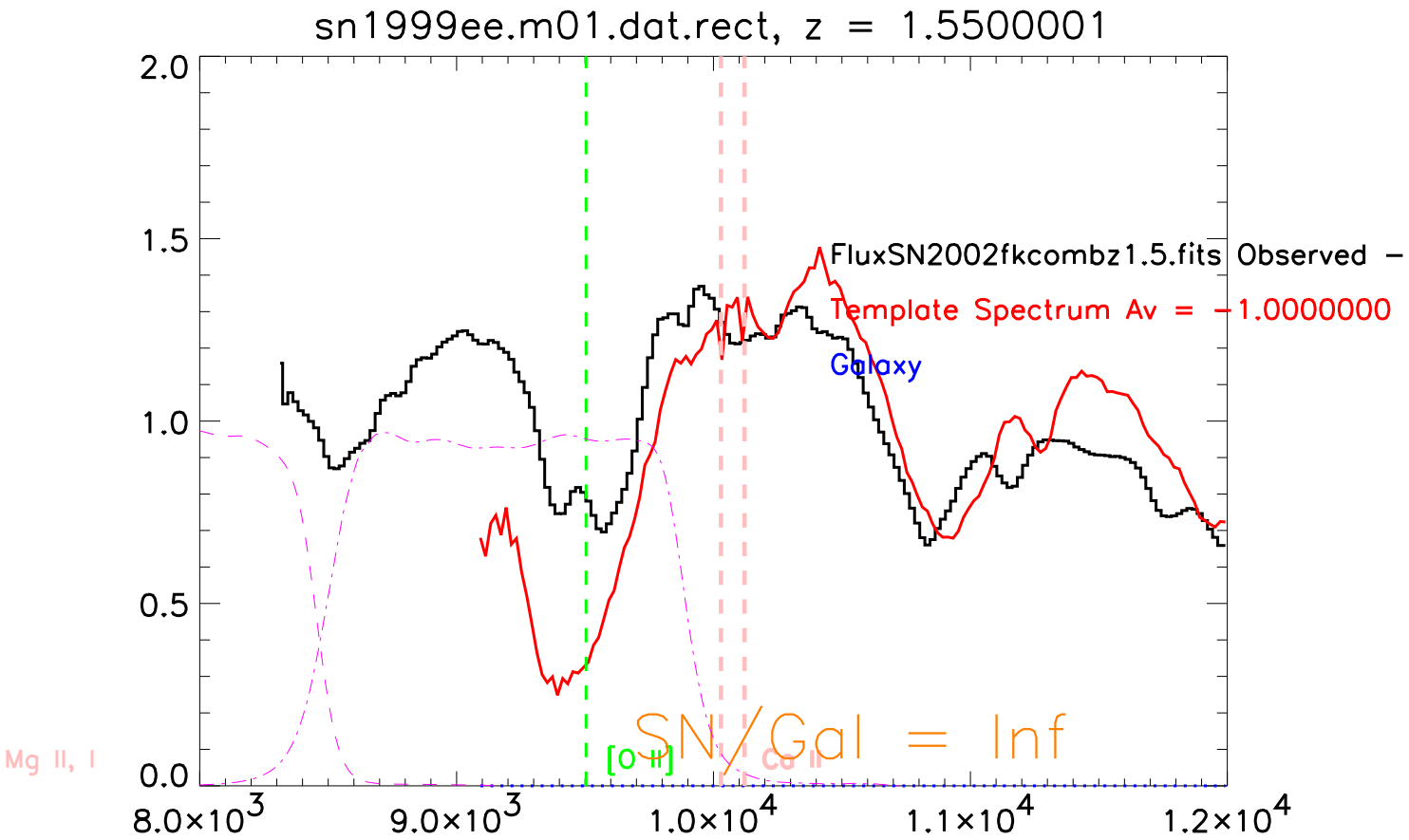

sn1981b.m00.dat.rect, z = 1.5100000
FluxSN2002fkcombz1.5.fits Observed – Galaxy
Template Spectrum Av = −1.0000000
Galaxy
SN/Gal = Inf
[O II]
Ca II
2.0
1.5
1.0
0.5
0.0
8.0×10^3
9.0×10^3
1.0×10^4
1.1×10^4
1.2×10^4

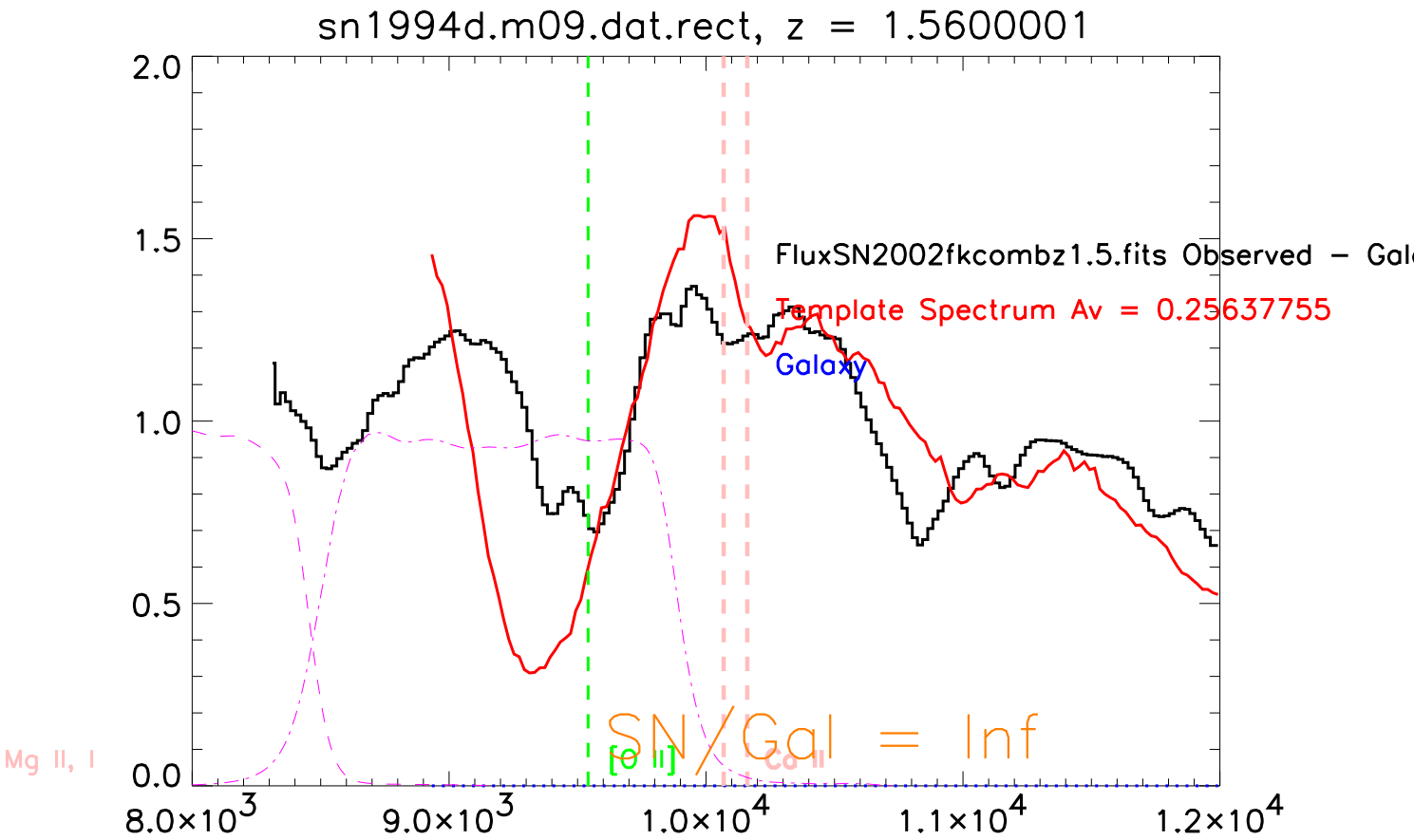

sn1994d.m04.dat.rect, z = 1.5200000
FluxSN2002fkcombz1.5.fits Observed − Galaxy
Template Spectrum Av = −1.0000000
Galaxy
SN/Gal = Inf
[O II]
2.0
1.5
1.0
0.5
0.0
8.0×10^3
9.0×10^3
1.0×10^4
1.1×10^4
1.2×10^4

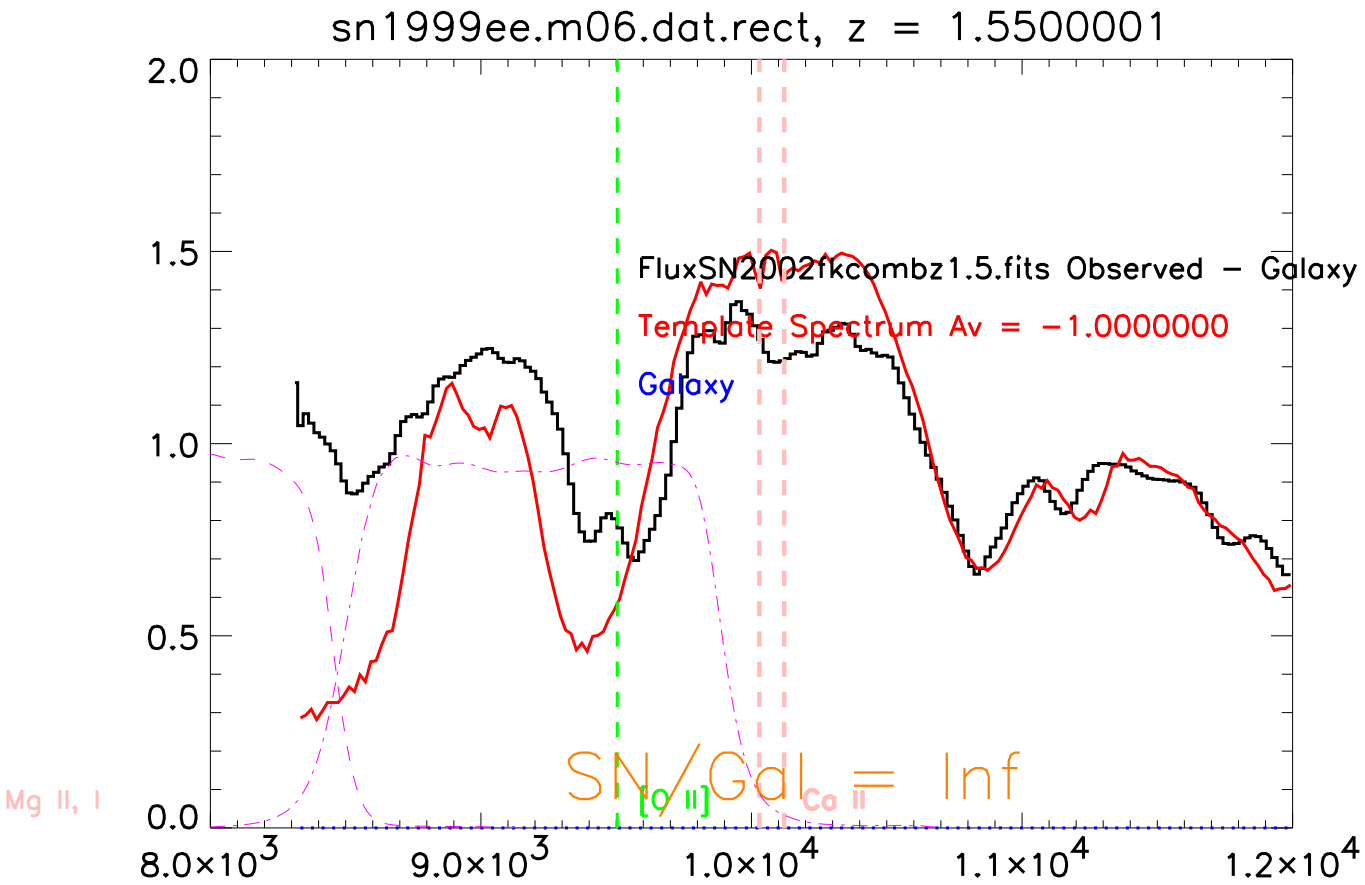

sn1989b.m01.dat.rect, z = 1.5100000
FluxSN2002fkcombz1.5.fits Observed − Galaxy
Template Spectrum Av = −1.0000000
Galaxy
SN/Gal = Inf
[O II]
Ca II
2.0
1.5
1.0
0.5
0.0
8.0×10^3
9.0×10^3
1.0×10^4
1.1×10^4
1.2×10^4

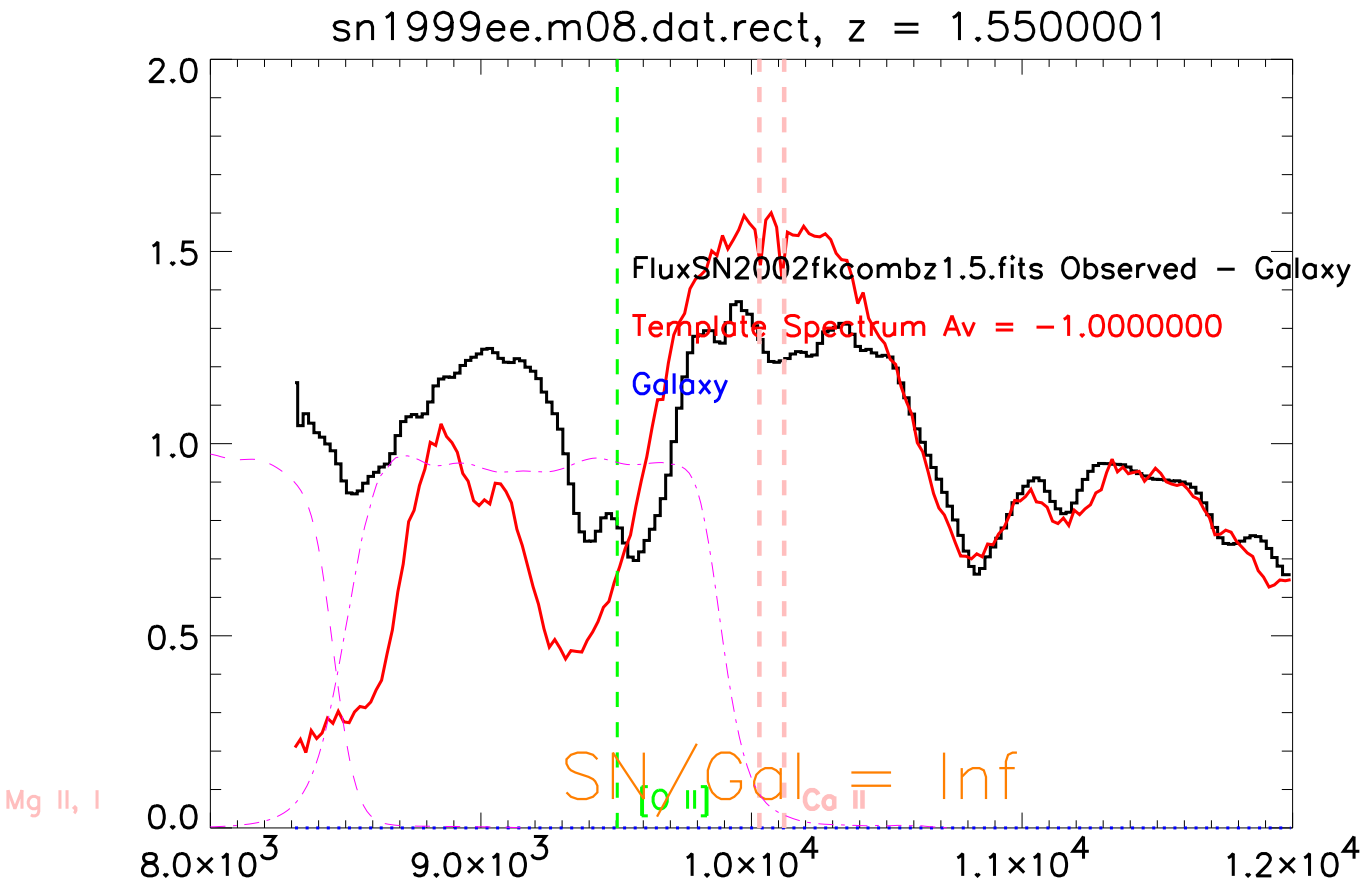
Mg II, I

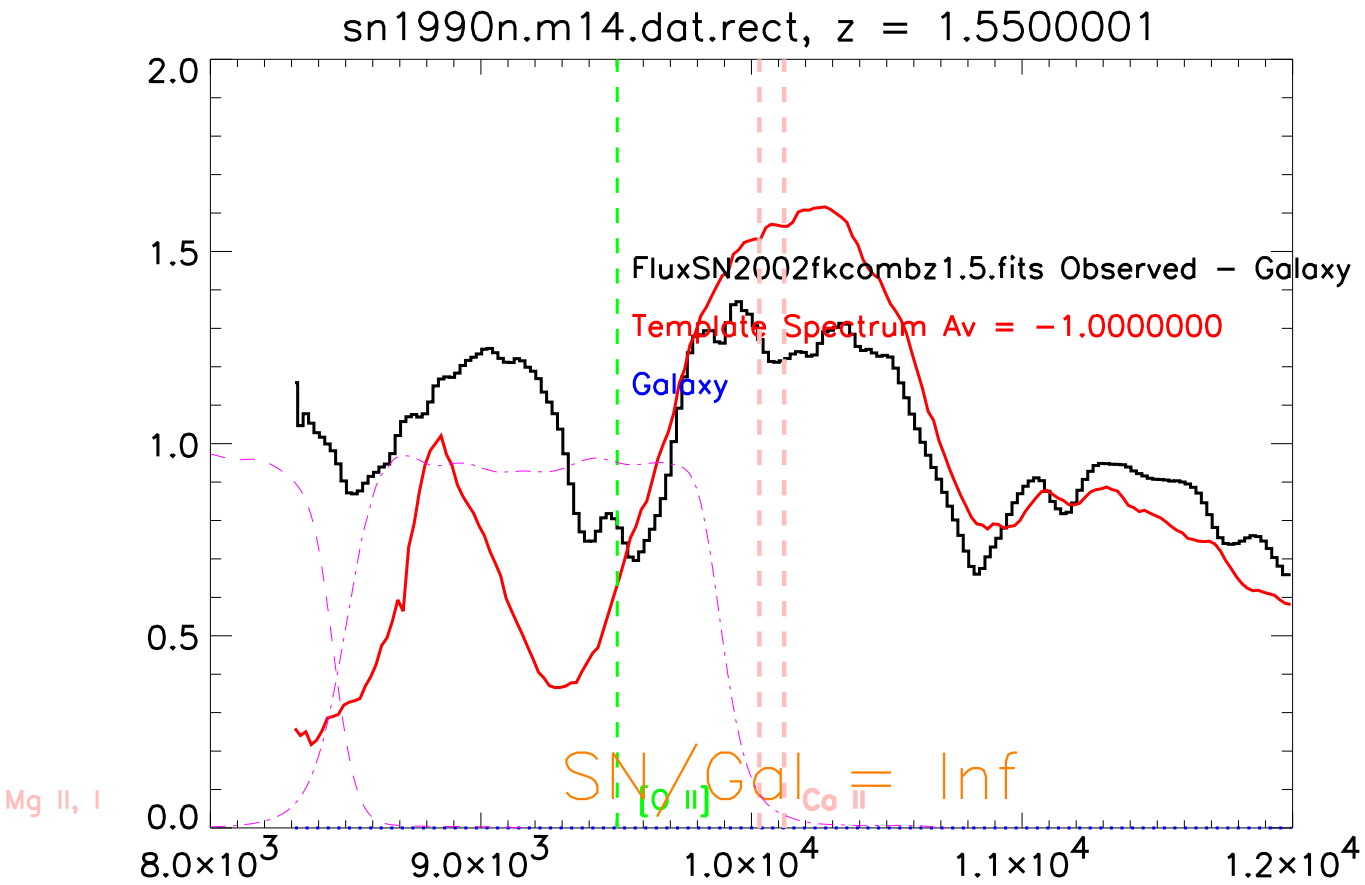
[O

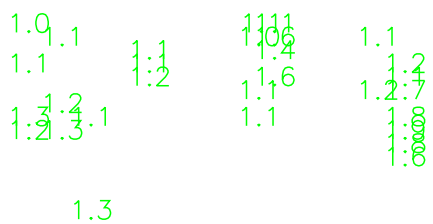

sn1999ee.m01.dat.rect, z = 1.5500001
FluxSN2002fkcombz1.5.fits Observed –
Template Spectrum Av = –1.0000000
Galaxy
SN/Gal = Inf
[O II]
Mg II, I
Ca II
2.0
1.5
1.0
0.5
0.0
8.0×10^3
9.0×10^3
1.0×10^4
1.1×10^4
1.2×10^4

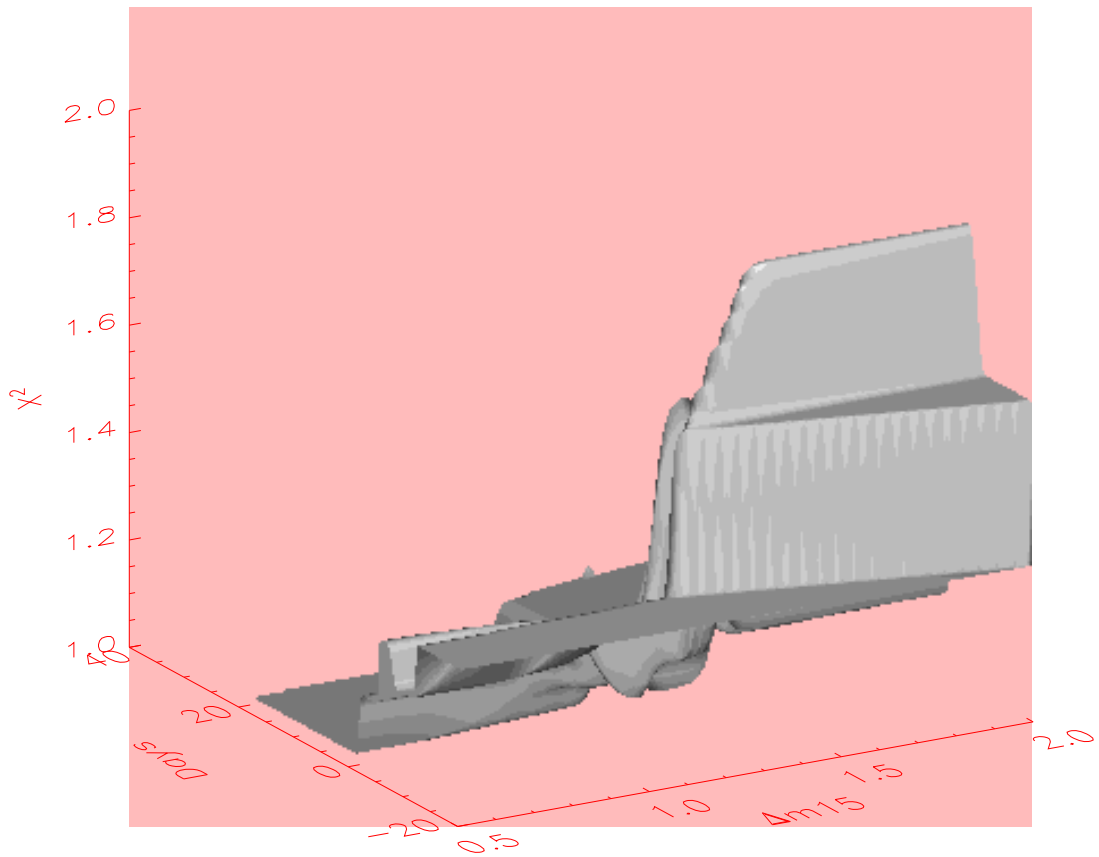

sn1994d.m09.dat.rect, z = 1.5600001
2.0
1.5
1.0
0.5
0.0
8.0×10^3
9.0×10^3
1.0×10^4
1.1×10^4
1.2×10^4
FluxSN2002fkcombz1.5.fits Observed – Gal
Template Spectrum Av = 0.25637755
Galaxy
SN/Gal = Inf
[O II]
Mg II, I
Ca II


sn1999ee.m06.dat.rect, z = 1.5500001
FluxSN2002fkcombz1.5.fits Observed − Galaxy
Template Spectrum Av = −1.0000000
Galaxy
SN/Gal = Inf
[O II]
Ca II
Mg II, I
2.0
1.5
1.0
0.5
0.0
8.0×10^3
9.0×10^3
1.0×10^4
1.1×10^4
1.2×10^4

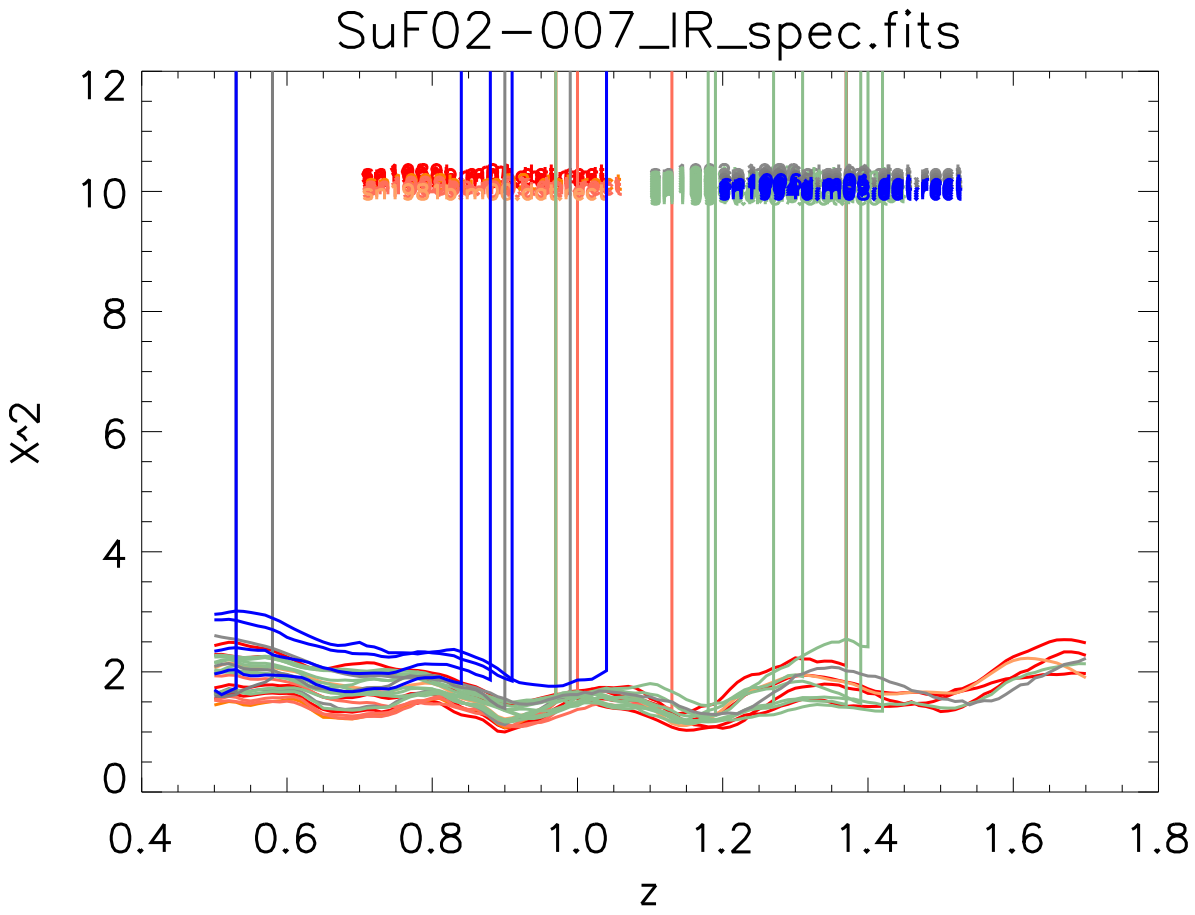

sn1999ee.m08.dat.rect, z = 1.5500001
FluxSN2002fkcombz1.5.fits Observed – Galaxy
Template Spectrum Av = −1.0000000
Galaxy
SN/Gal = Inf
[O II]
Ca II
Mg II, I
2.0
1.5
1.0
0.5
0.0
8.0×10^3
9.0×10^3
1.0×10^4
1.1×10^4
1.2×10^4

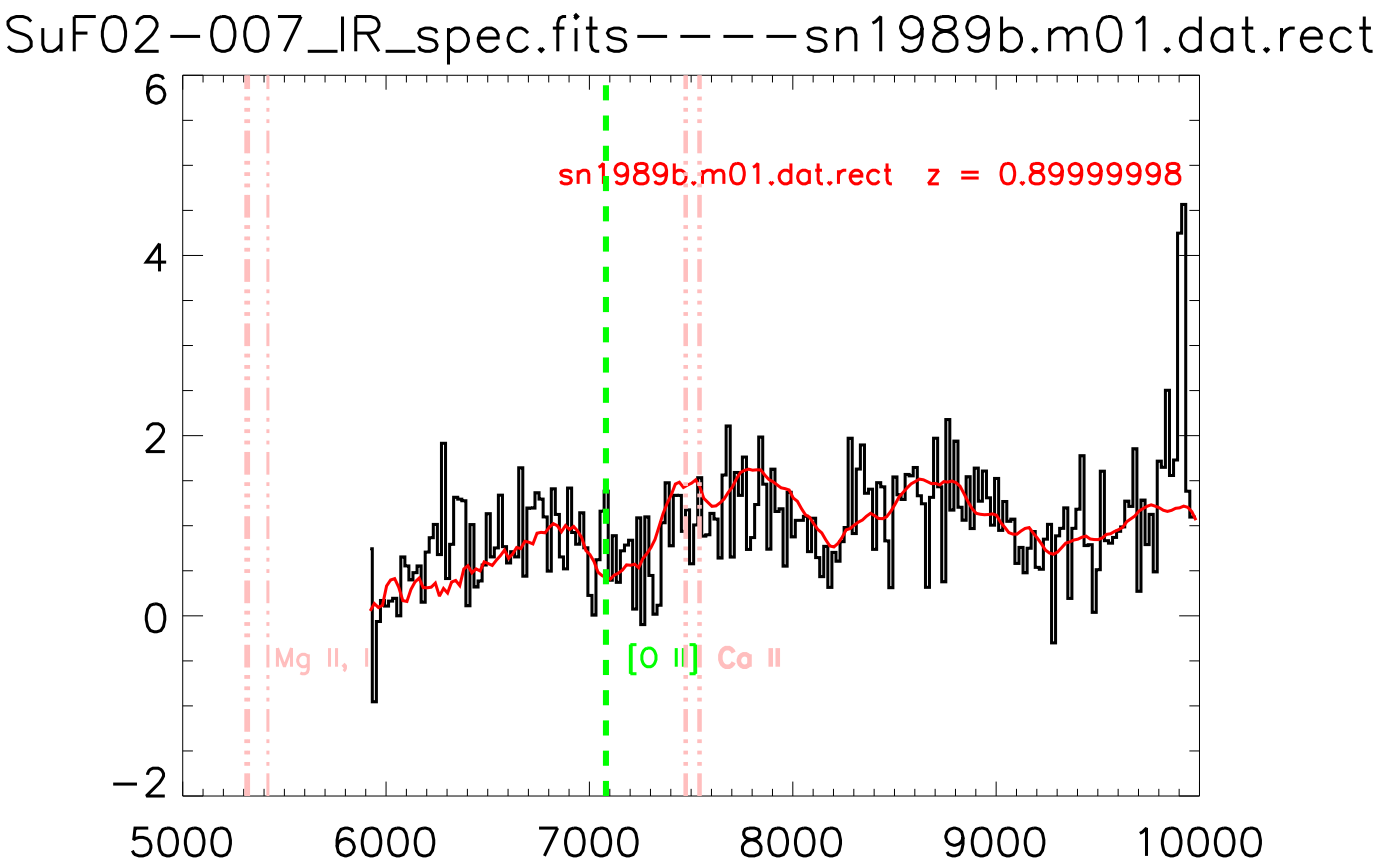

sn1990n.m14.dat.rect, z = 1.5500001
FluxSN2002fkcombz1.5.fits Observed – Galaxy
Template Spectrum Av = −1.0000000
Galaxy
SN/Gal = Inf
[O II]
Ca II
Mg II, I
2.0
1.5
1.0
0.5
0.0
8.0×10^3
9.0×10^3
1.0×10^4
1.1×10^4
1.2×10^4

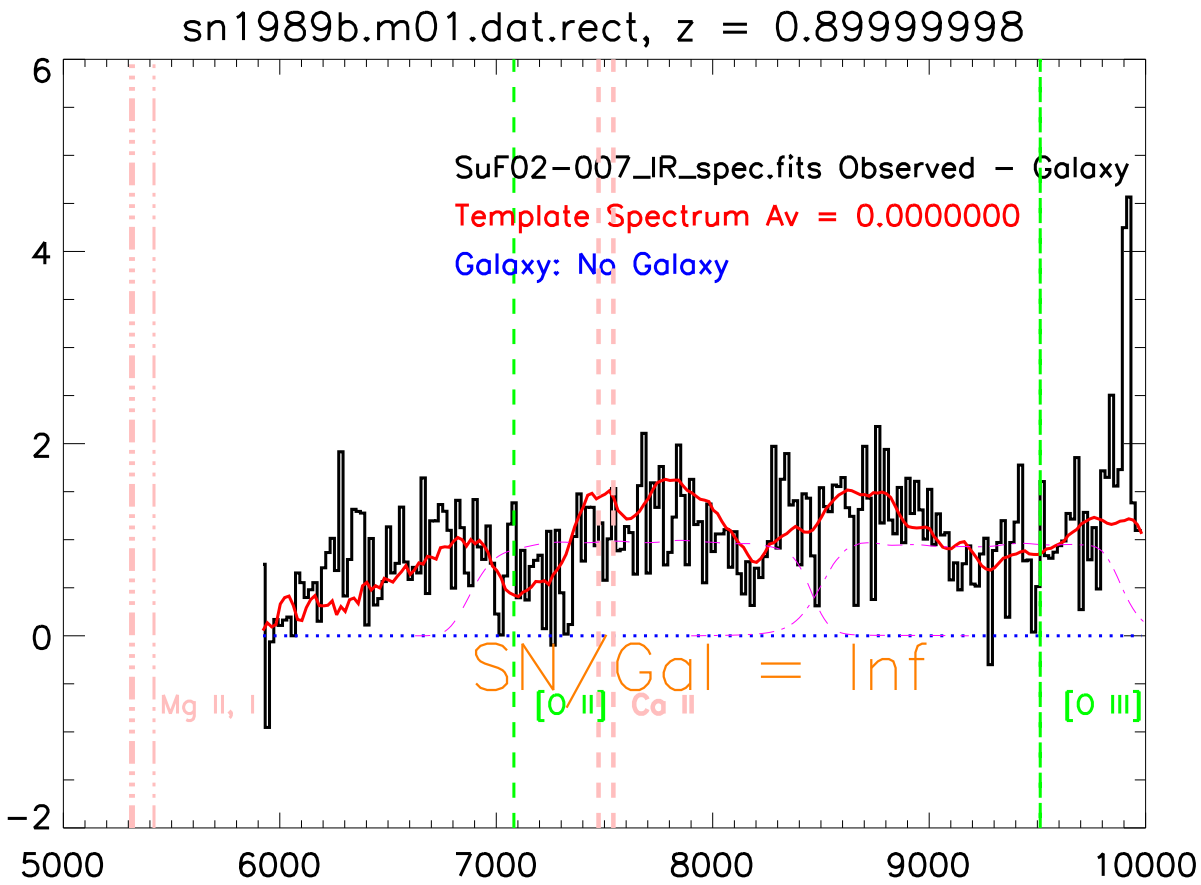

1.0
1.1
1.1
1.2
1.3
1.1
1.1
1:1
1:2
1.1
1.1
1.1

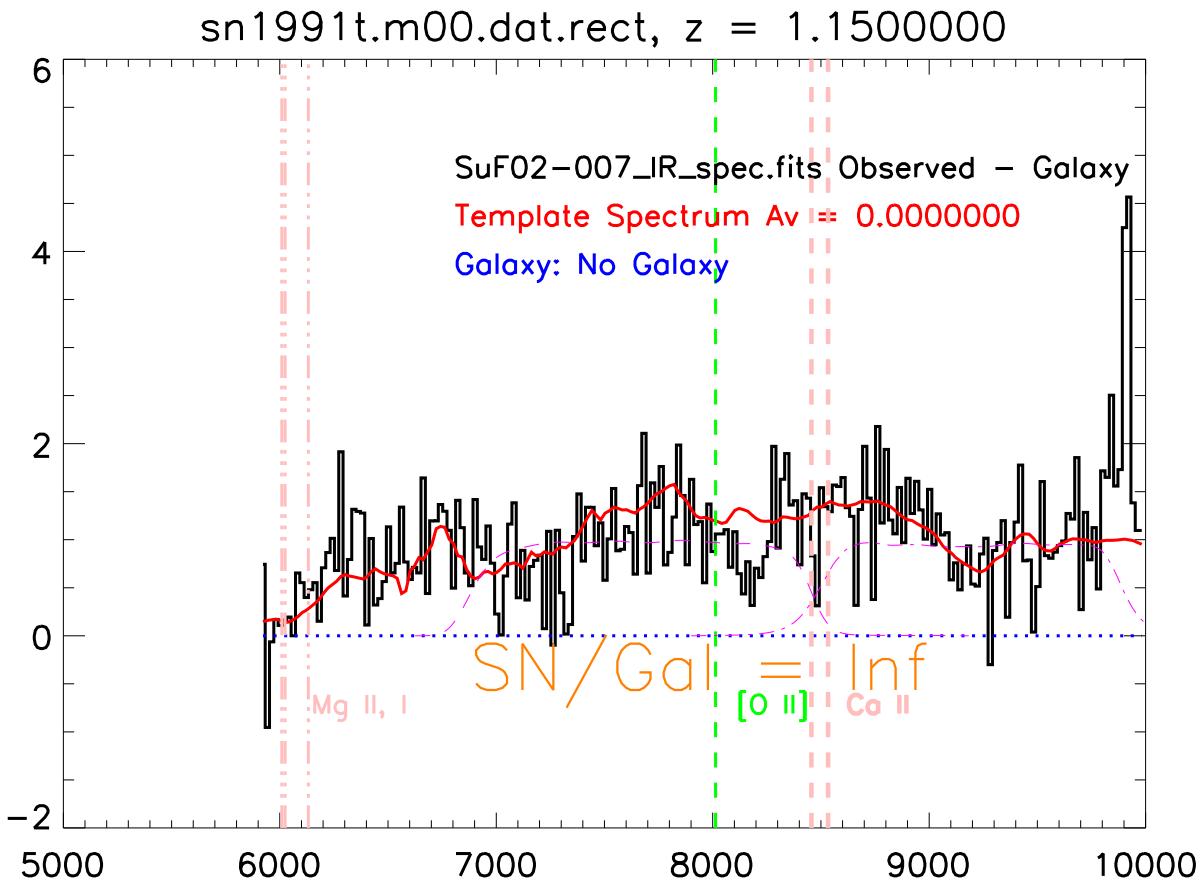


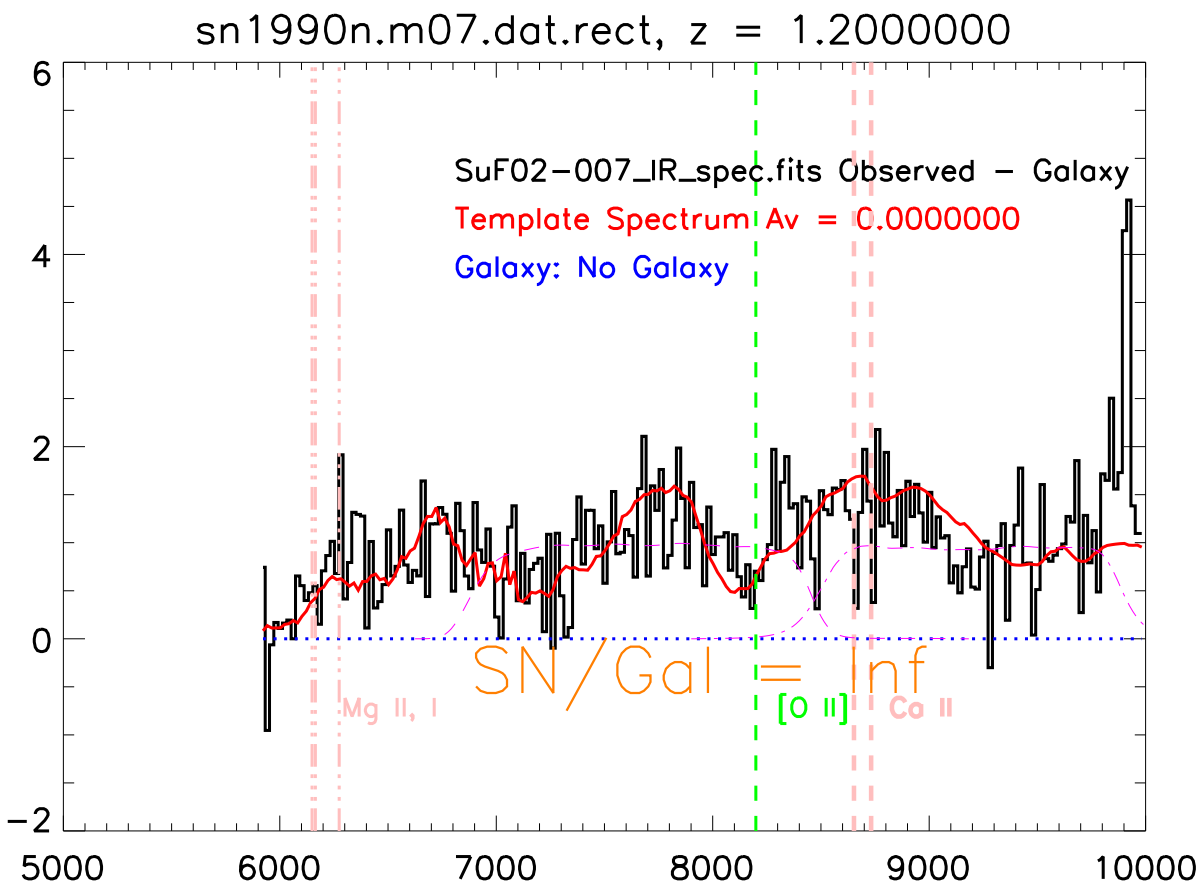
2.0
1.8
1.6
1.4
1.2
1.0
χ^2
40
20
0
−20
Days
0.5
1.0
1.5
2.0
Δm15

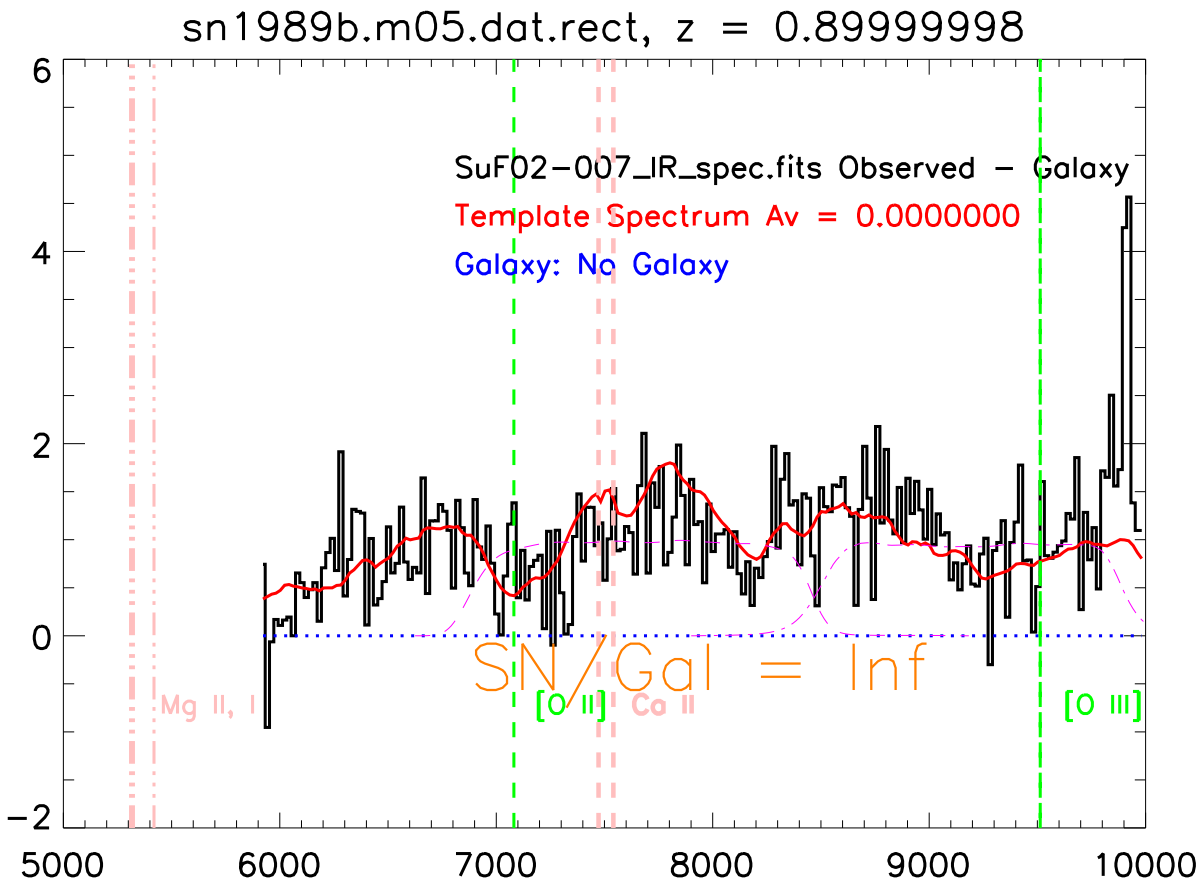

SuF02−007_IR_spec.fits
X^2
z
0
2
4
6
8
10
12
0.4
0.6
0.8
1.0
1.2
1.4
1.6
1.8

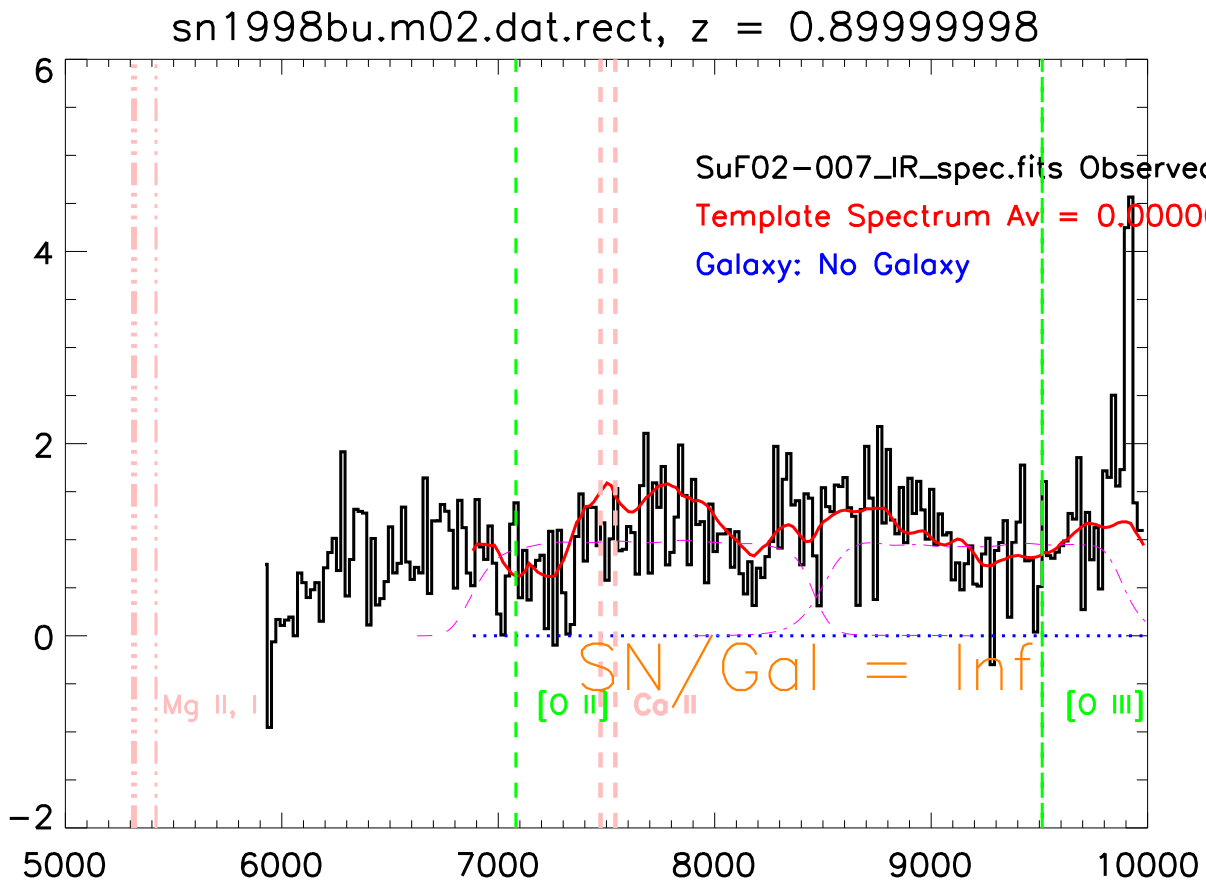

SuF02−007_IR_spec.fits−−−−sn1989b.m01.dat.rect
sn1989b.m01.dat.rect z = 0.89999998
Mg II,
[O II]
Ca II
6
4
2
0
−2
5000
6000
7000
8000
9000
10000

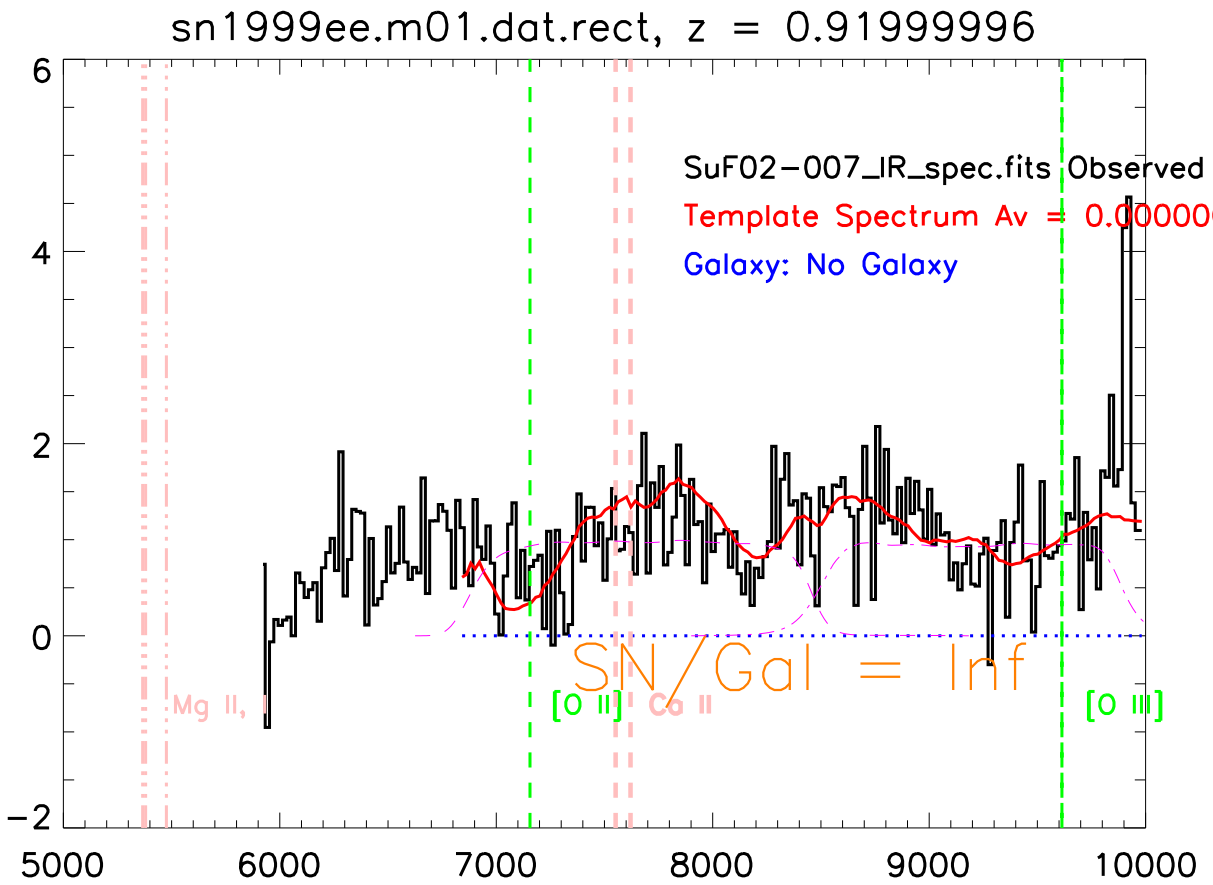

sn1989b.m01.dat.rect, z = 0.89999998
SuF02-007_IR_spec.fits Observed - Galaxy
Template Spectrum Av = 0.0000000
Galaxy: No Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
6
4
2
0
−2
5000
6000
7000
8000
9000
10000

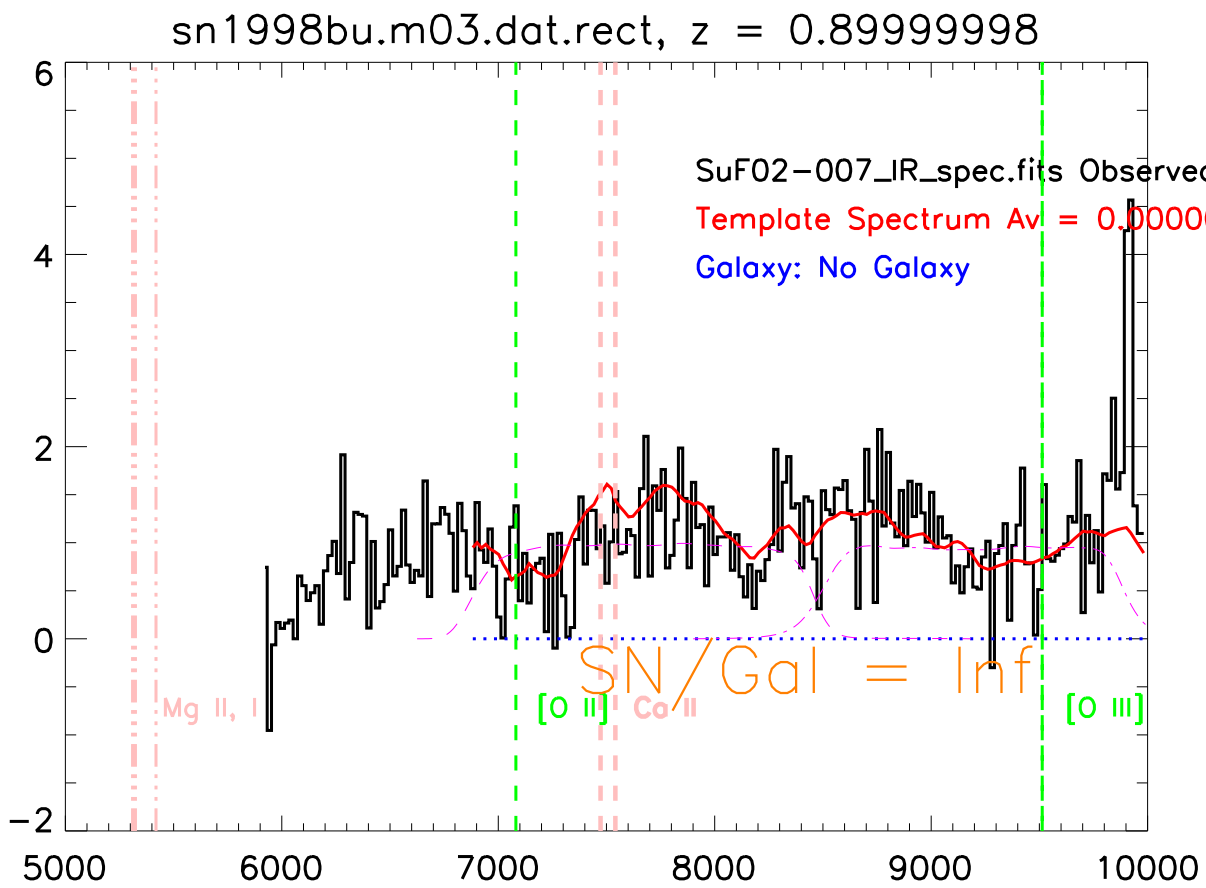

sn1991t.m00.dat.rect, z = 1.1500000
SuF02-007_IR_spec.fits Observed - Galaxy
Template Spectrum Av = 0.0000000
Galaxy: No Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
6
4
2
0
−2
5000
6000
7000
8000
9000
10000

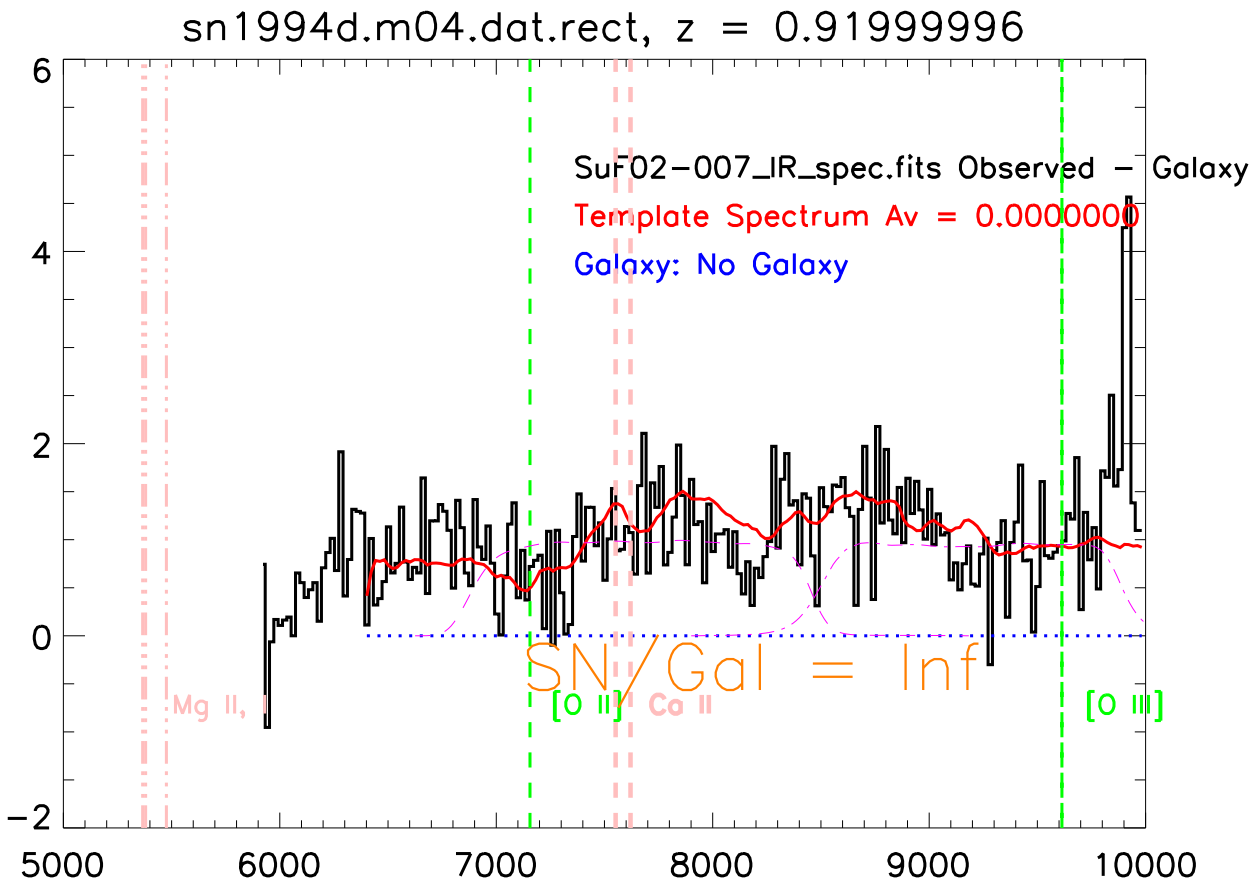

sn1990n.m07.dat.rect, z = 1.2000000
SuF02-007_IR_spec.fits Observed - Galaxy
Template Spectrum Av = 0.0000000
Galaxy: No Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
6
4
2
0
-2
5000
6000
7000
8000
9000
10000

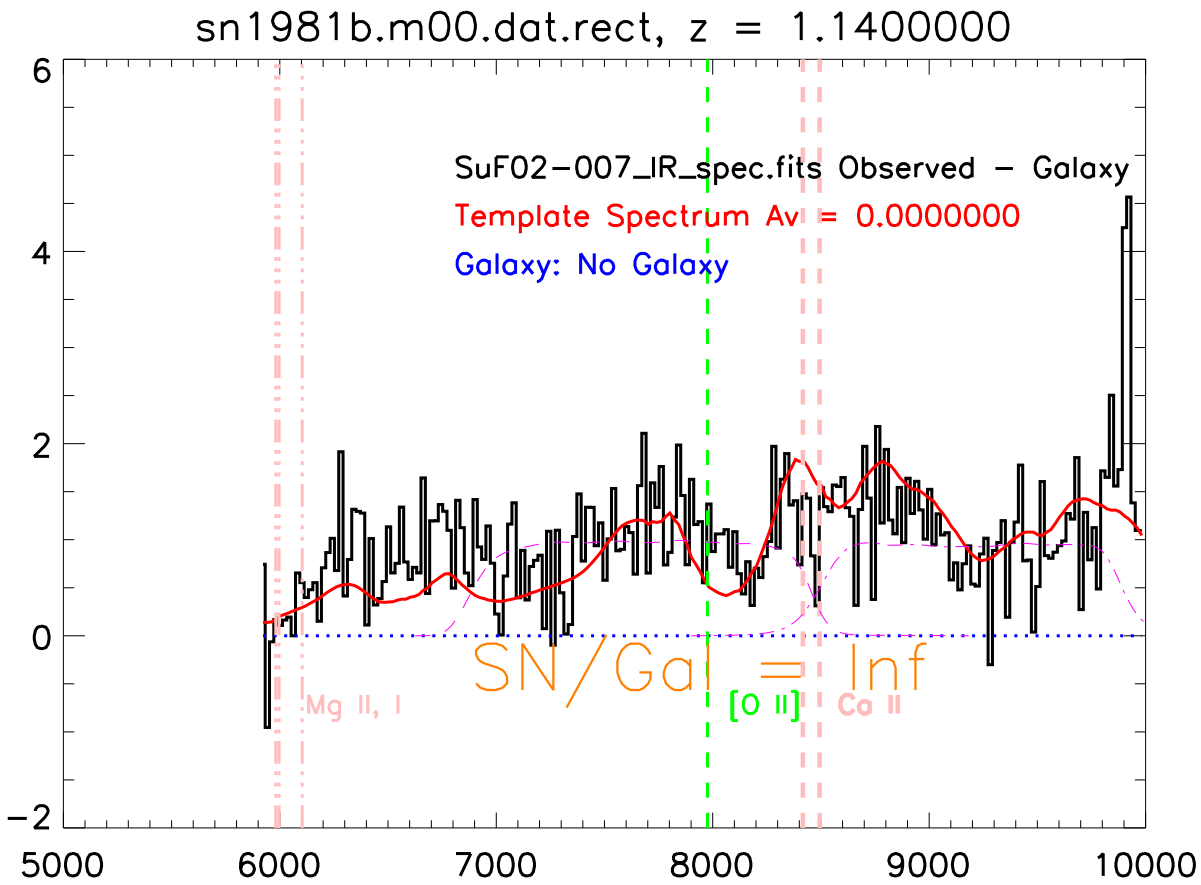

sn1989b.m05.dat.rect, z = 0.89999998
SuF02-007_IR_spec.fits Observed - Galaxy
Template Spectrum Av = 0.0000000
Galaxy: No Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
6
4
2
0
−2
5000
6000
7000
8000
9000
10000

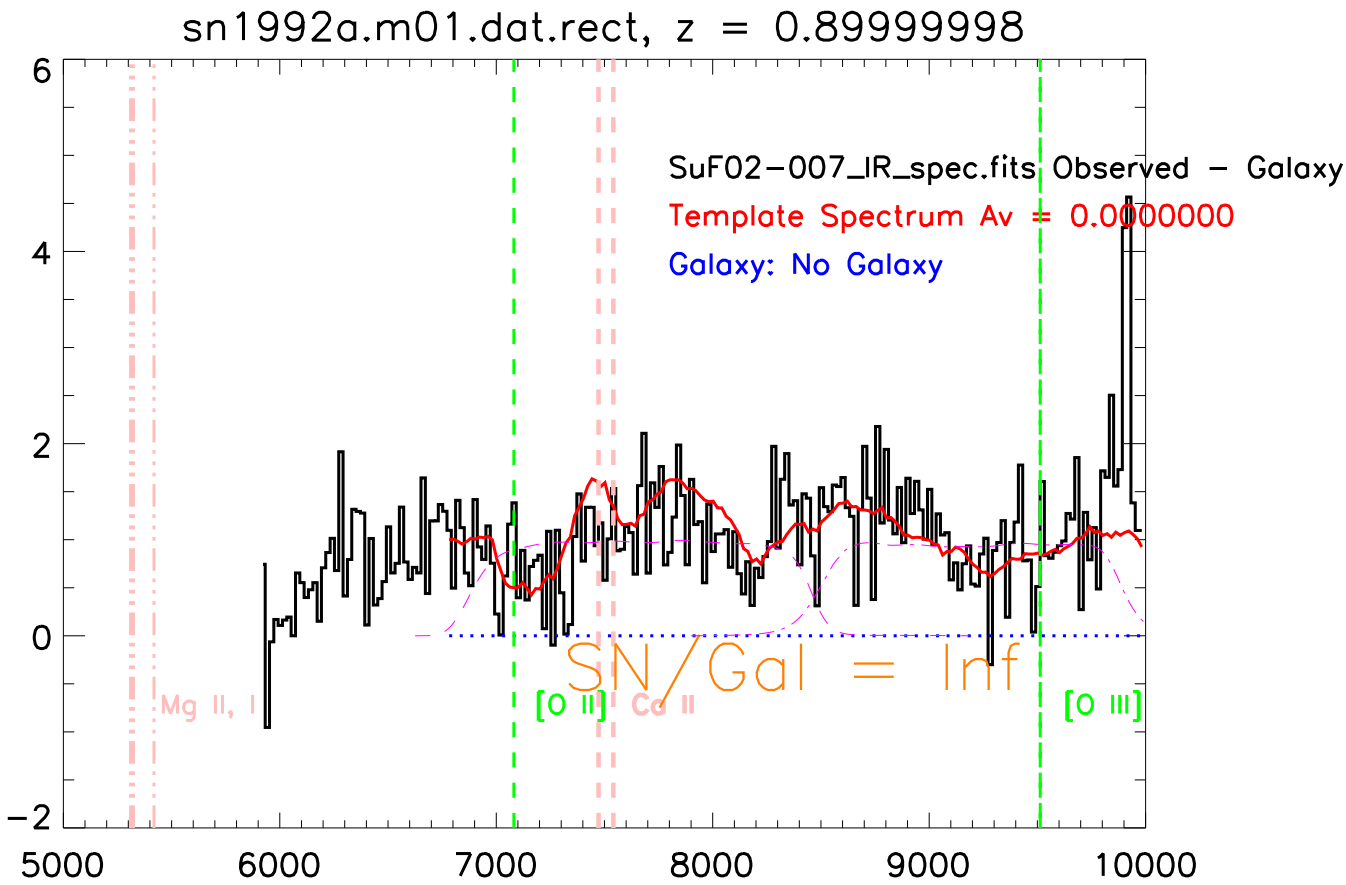

sn1998bu.m02.dat.rect, z = 0.89999998
SuF02-007_IR_spec.fits Observed - Galax
Template Spectrum Av = 0.0000000
Galaxy: No Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
6
4
2
0
−2
5000
6000
7000
8000
9000
10000

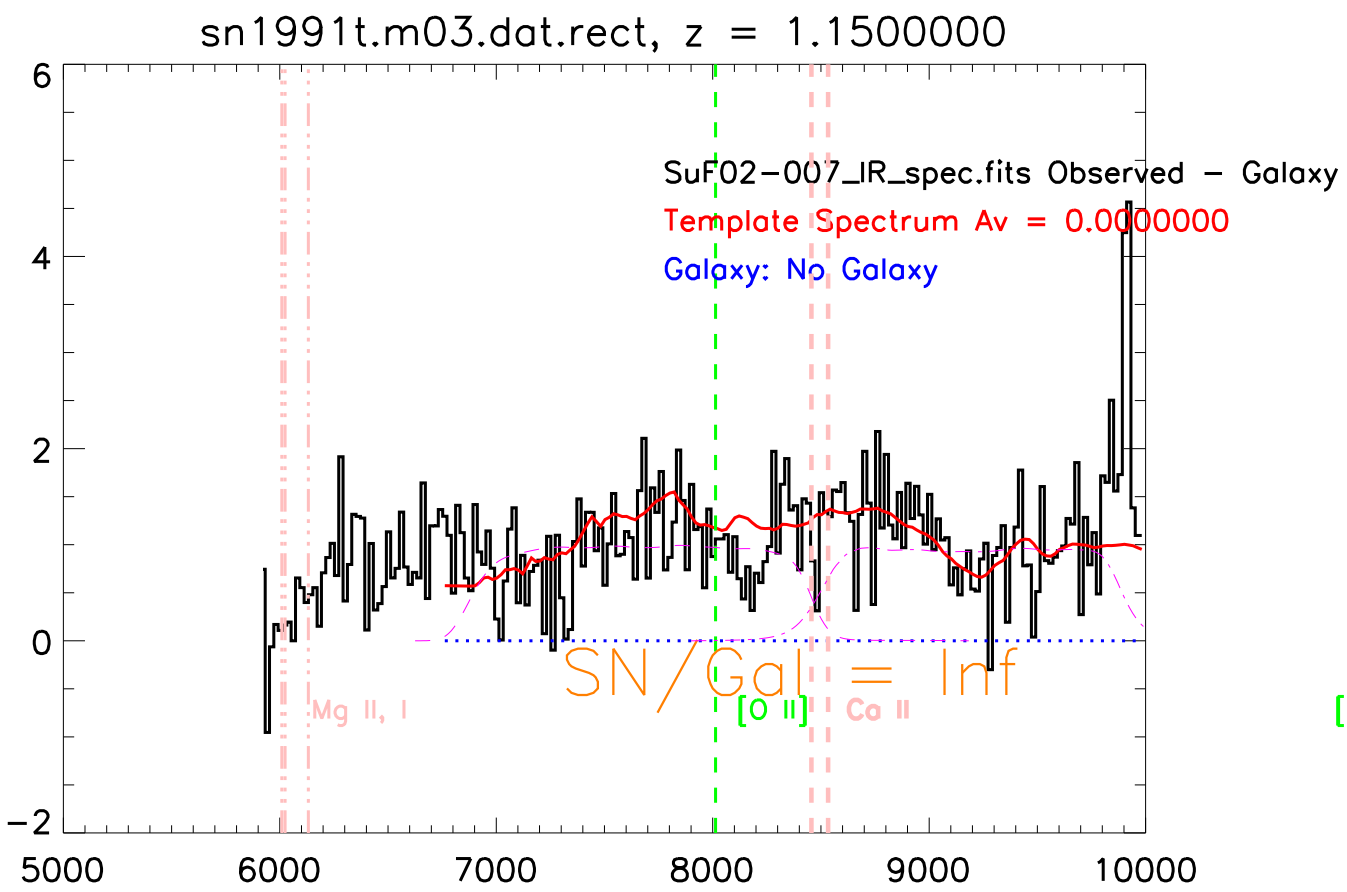

sn1999ee.m01.dat.rect, z = 0.91999996
SuF02-007_IR_spec.fits Observed – Galaxy
Template Spectrum Av = 0.0000000
Galaxy: No Galaxy
SN/Gal = Inf
Mg II,
[O II]
Ca II
[O III]
6
4
2
0
−2
5000
6000
7000
8000
9000
10000

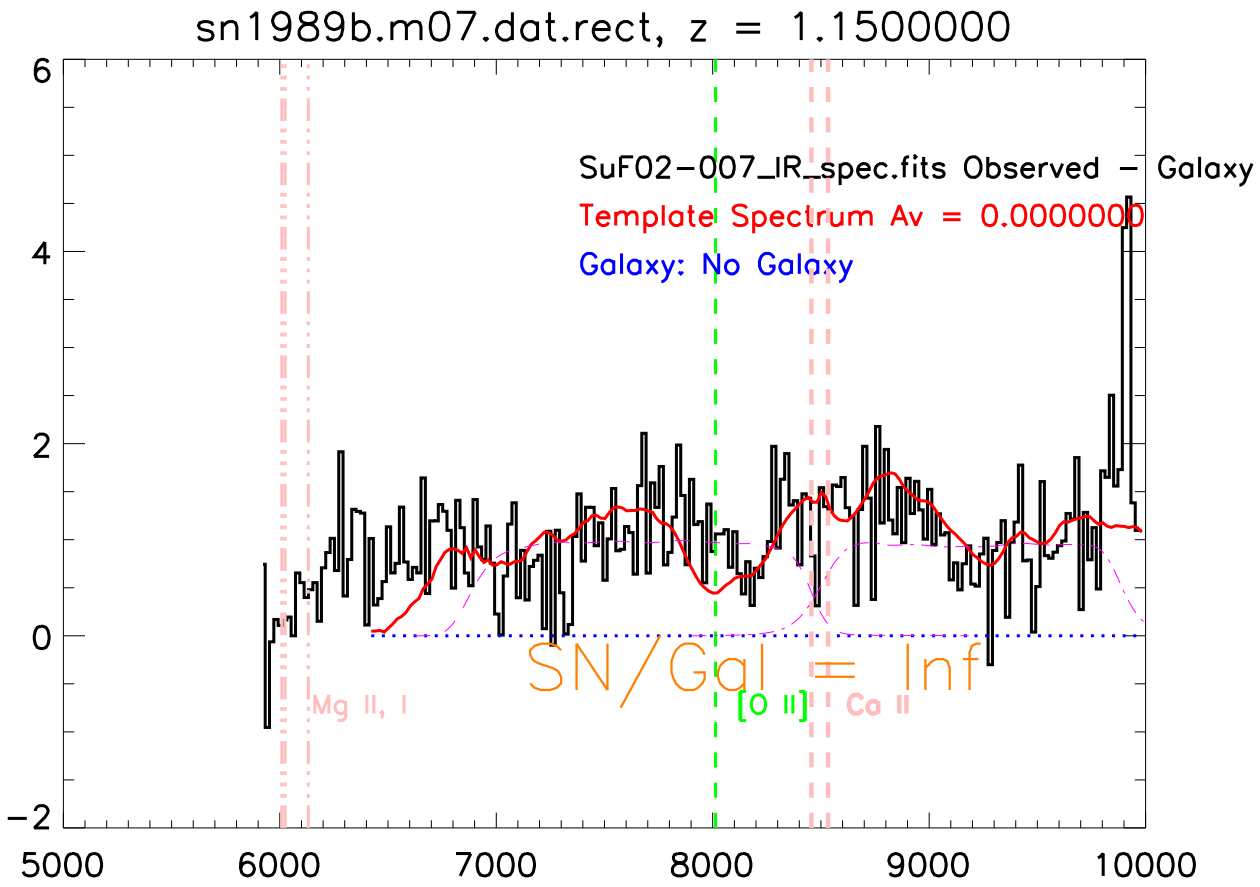

sn1998bu.m03.dat.rect, z = 0.89999998
SuF02-007_IR_spec.fits Observed - Galax
Template Spectrum Av = 0.0000000
Galaxy: No Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
6
4
2
0
−2
5000
6000
7000
8000
9000
10000

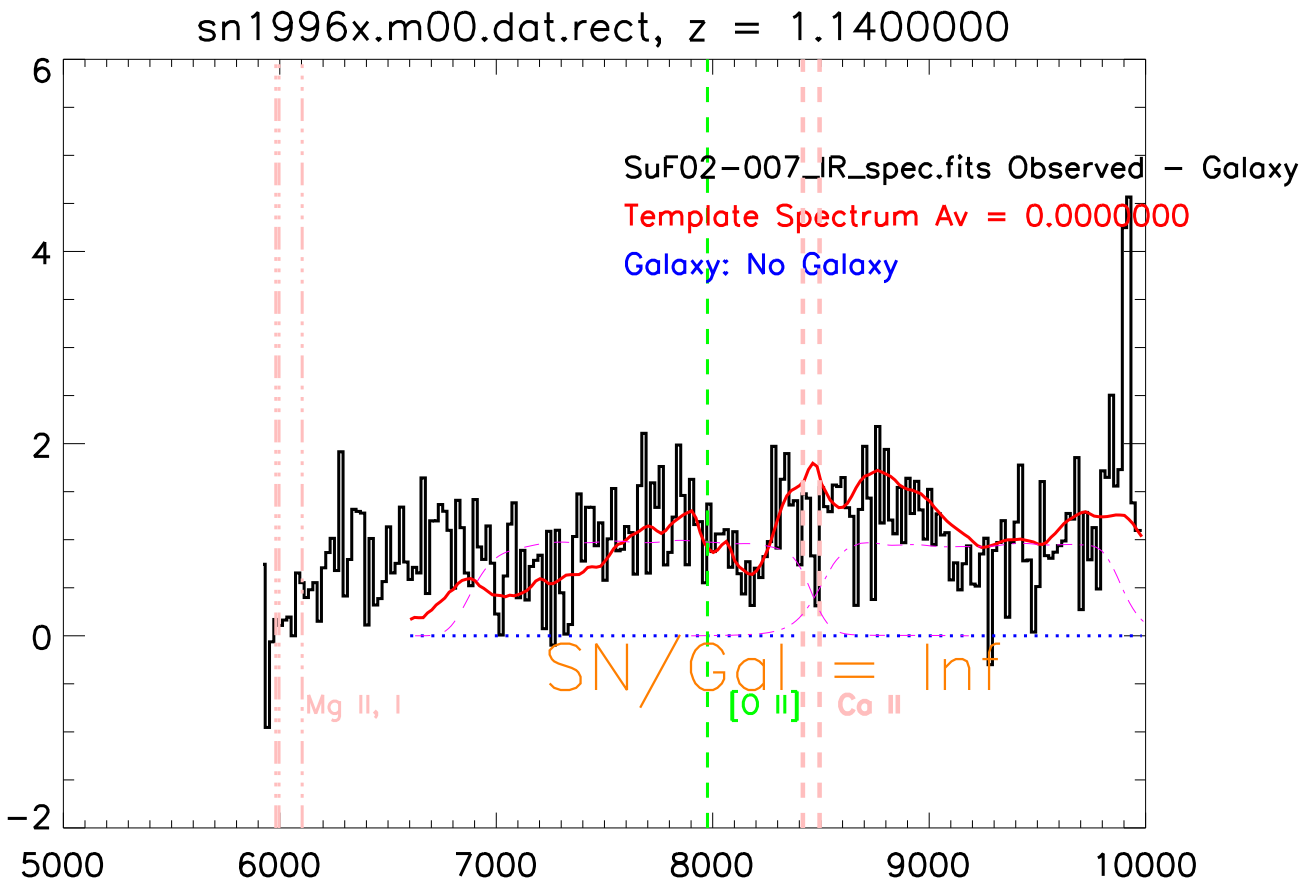

sn1994d.m04.dat.rect, z = 0.91999996
SuF02-007_IR_spec.fits Observed − Galaxy
Template Spectrum Av = 0.0000000
Galaxy: No Galaxy
SN/Gal = Inf
Mg II,
[O II]
Ca II
[O III]
6
4
2
0
−2
5000
6000
7000
8000
9000
10000

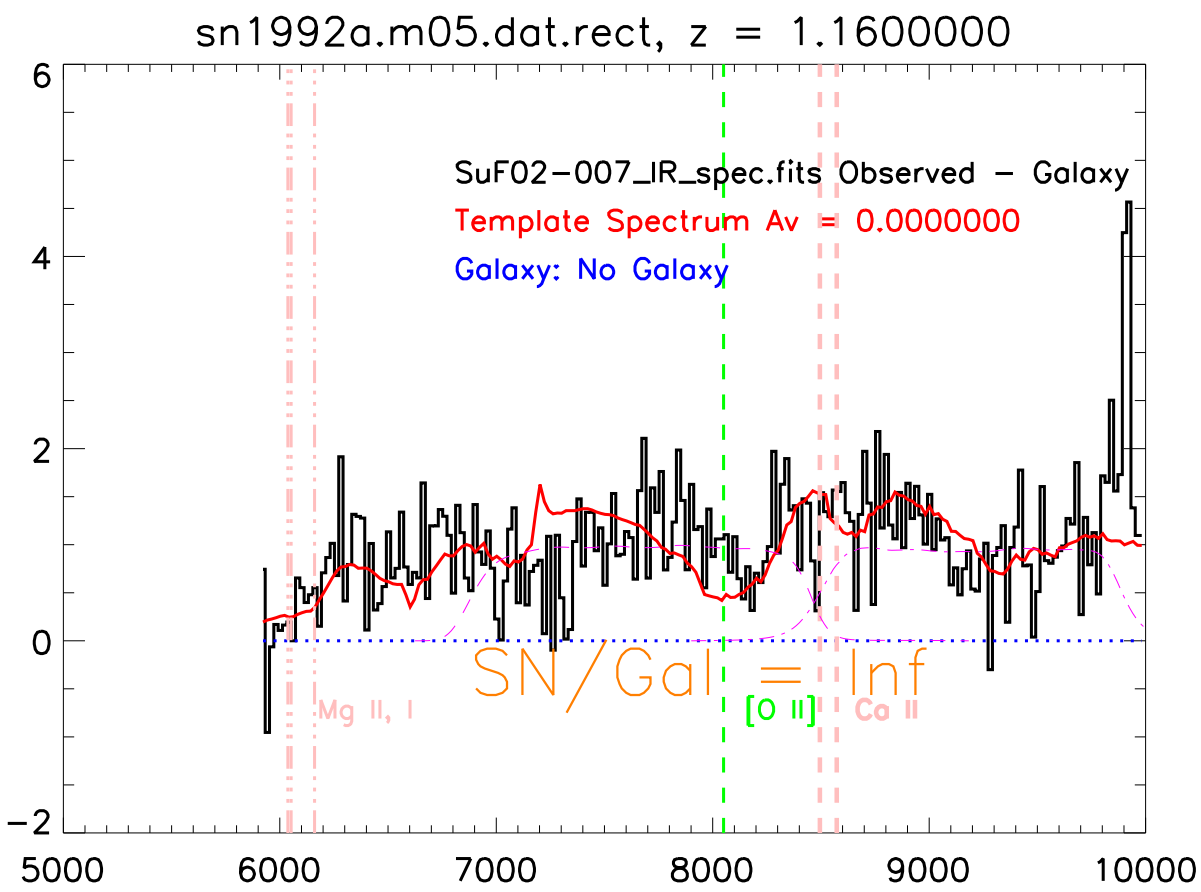

sn1981b.m00.dat.rect, z = 1.1400000
SuF02-007_IR_spec.fits Observed - Galaxy
Template Spectrum Av = 0.0000000
Galaxy: No Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
6
4
2
0
−2
5000
6000
7000
8000
9000
10000

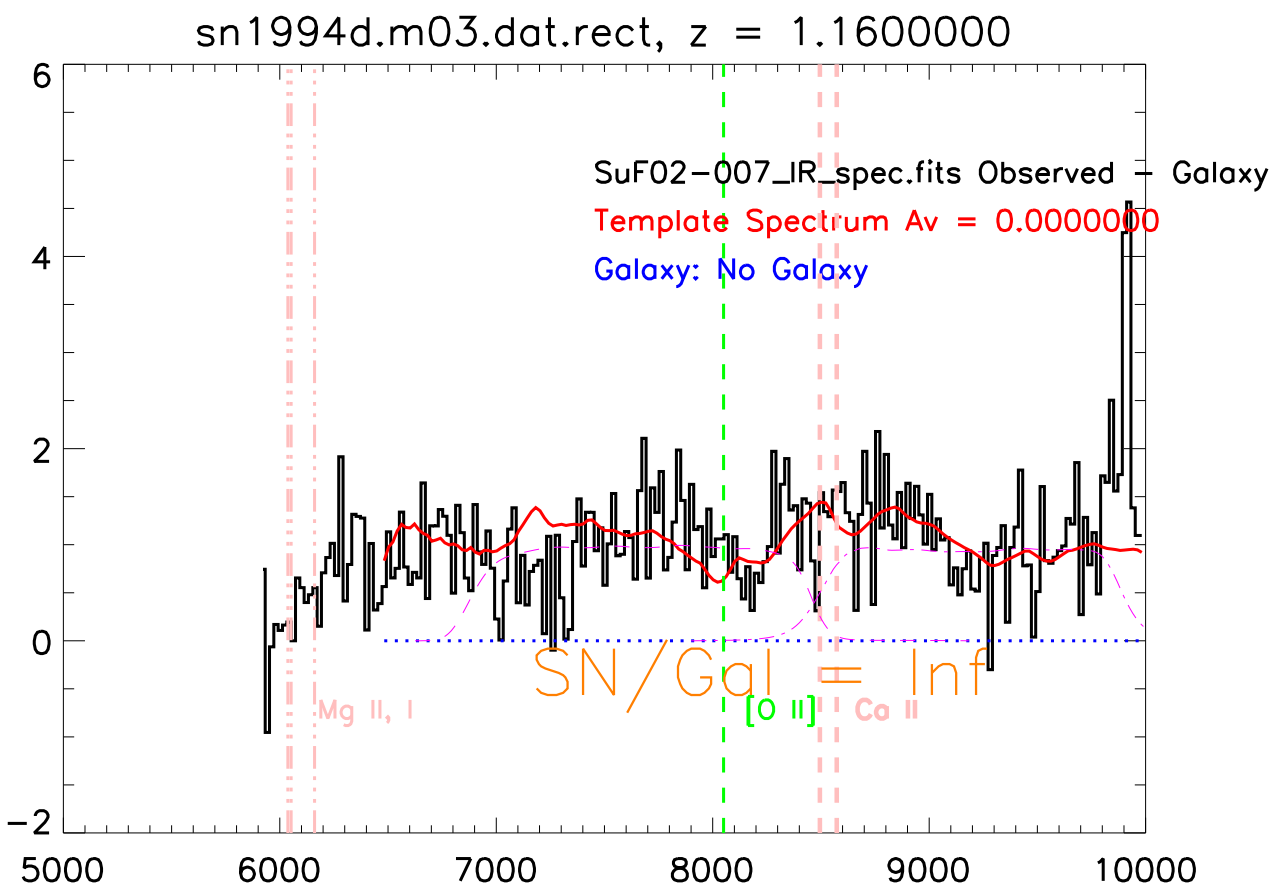

sn1992a.m01.dat.rect, z = 0.89999998
SuF02-007_IR_spec.fits Observed - Galaxy
Template Spectrum Av = 0.0000000
Galaxy: No Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
6
4
2
0
−2
5000
6000
7000
8000
9000
10000

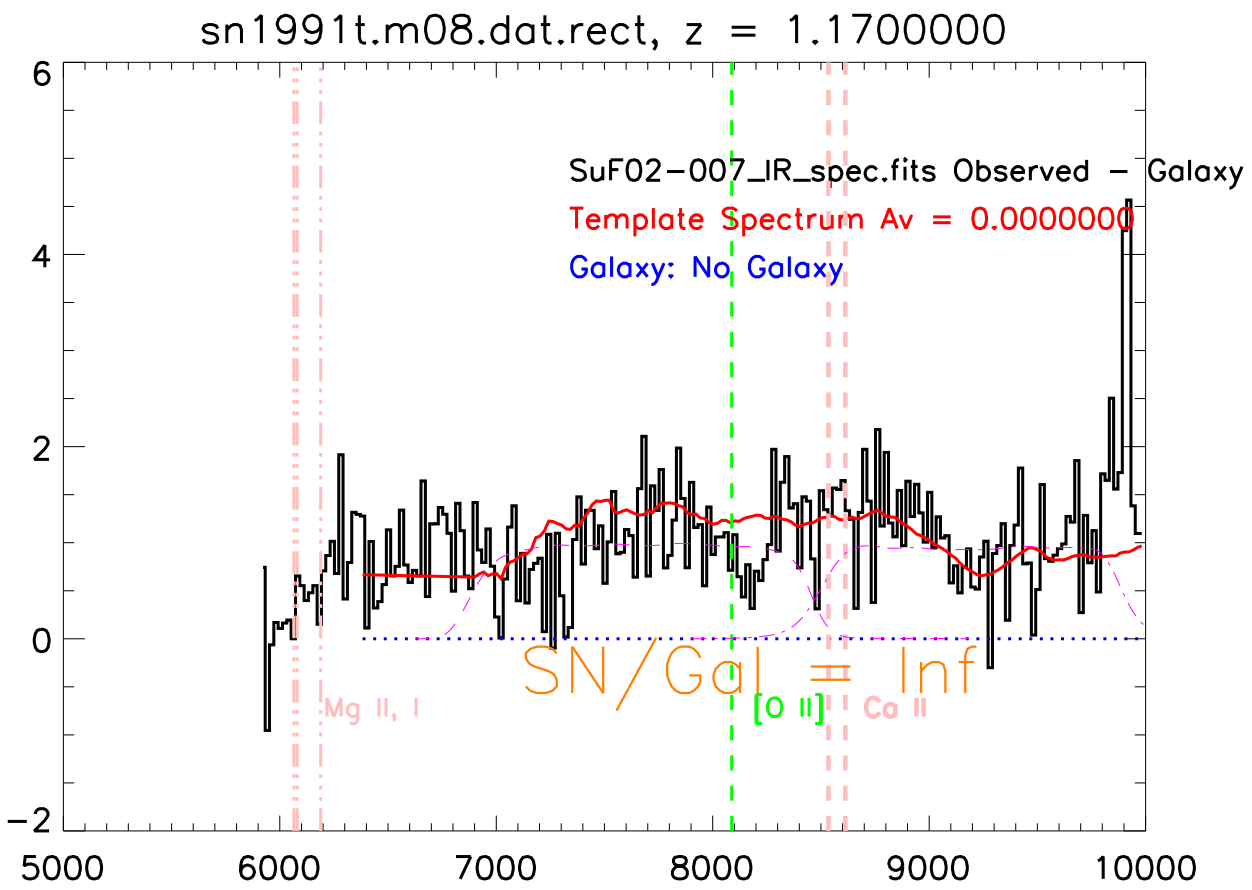

sn1991t.m03.dat.rect, z = 1.1500000
SuF02-007_IR_spec.fits Observed - Galaxy
Template Spectrum Av = 0.0000000
Galaxy: No Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
6
4
2
0
−2
5000
6000
7000
8000
9000
10000

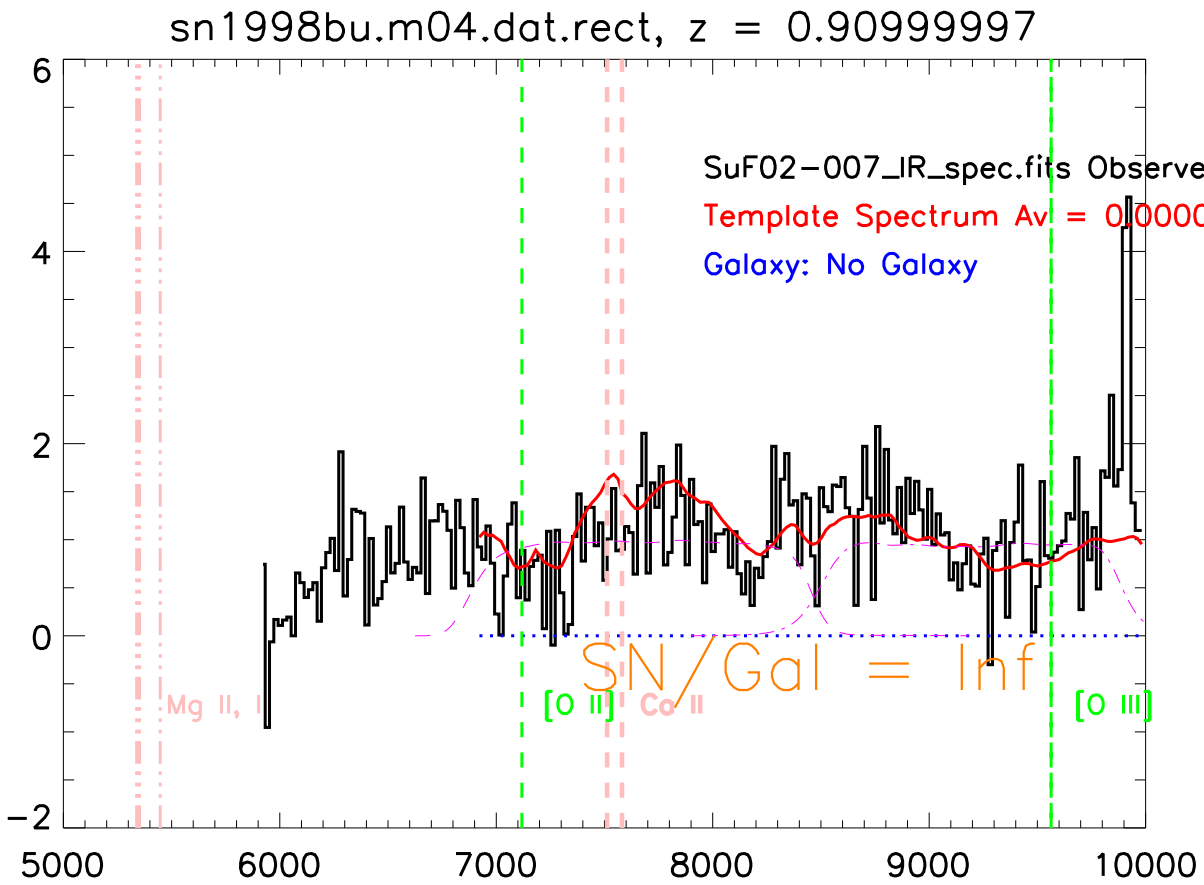

sn1989b.m07.dat.rect, z = 1.1500000
SuF02-007_IR_spec.fits Observed − Galaxy
Template Spectrum Av = 0.0000000
Galaxy: No Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
6
4
2
0
−2
5000
6000
7000
8000
9000
10000

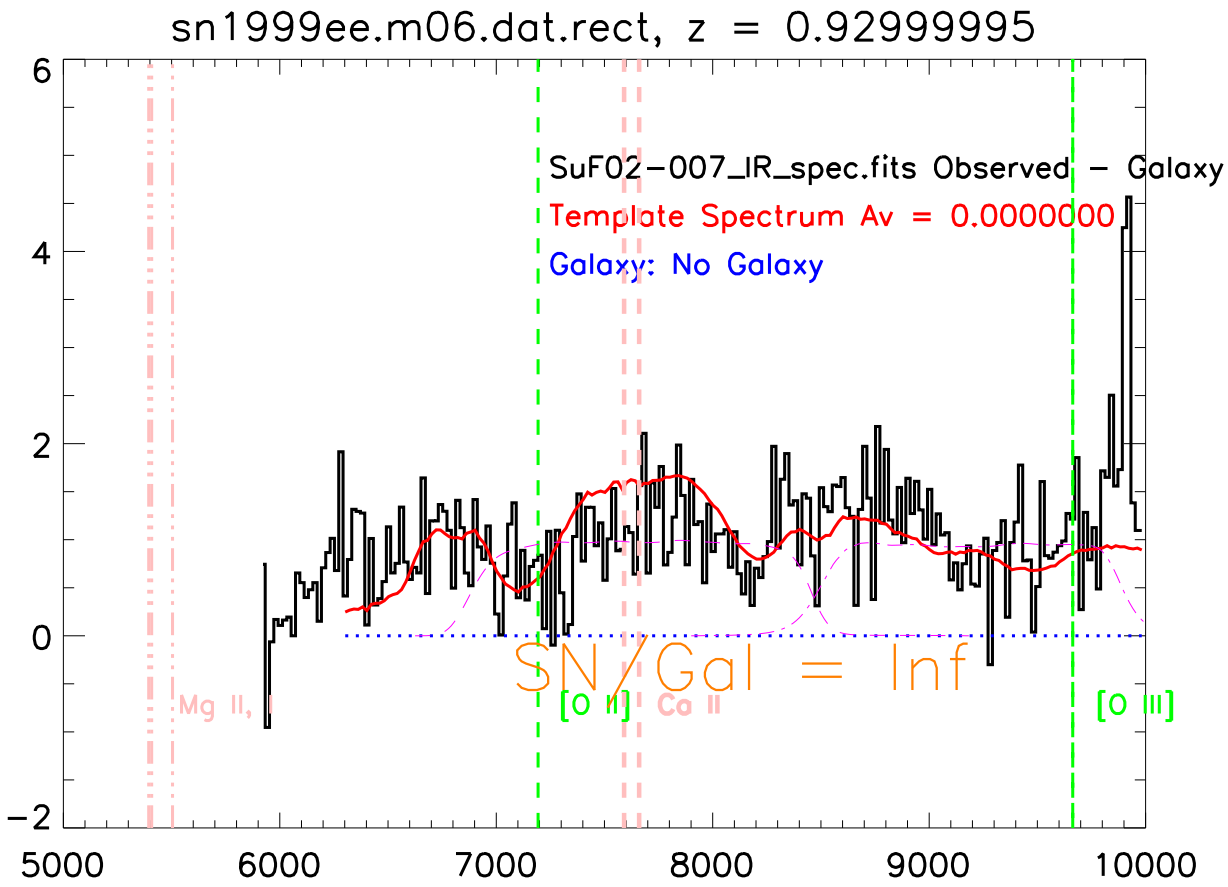

sn1996x.m00.dat.rect, z = 1.1400000
SuF02-007_IR_spec.fits Observed - Galaxy
Template Spectrum Av = 0.0000000
Galaxy: No Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
6
4
2
0
−2
5000
6000
7000
8000
9000
10000

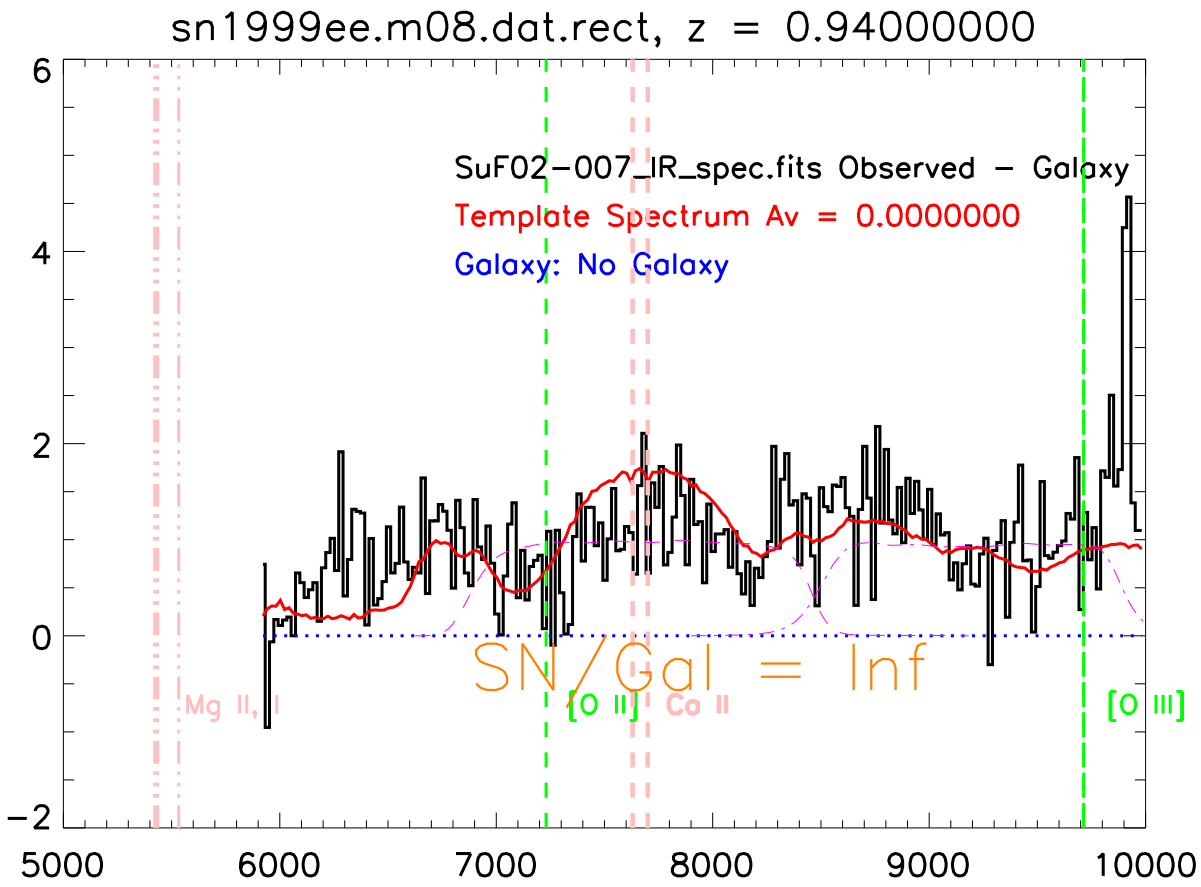

sn1992a.m05.dat.rect, z = 1.1600000
SuF02-007_IR_spec.fits Observed - Galaxy
Template Spectrum Av = 0.0000000
Galaxy: No Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
6
4
2
0
-2
5000
6000
7000
8000
9000
10000

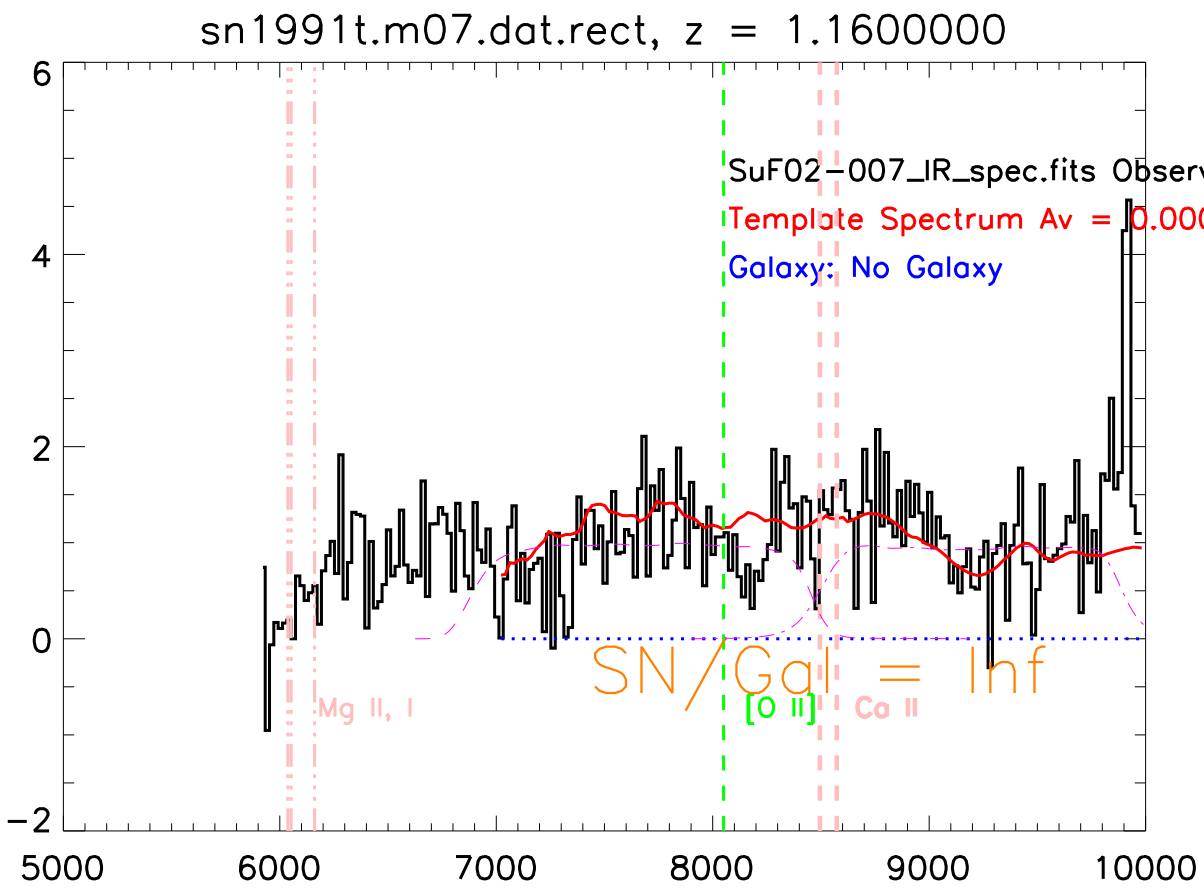

sn1994d.m03.dat.rect, z = 1.1600000
SuF02-007_IR_spec.fits Observed - Galaxy
Template Spectrum Av = 0.0000000
Galaxy: No Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
6
4
2
0
-2
5000
6000
7000
8000
9000
10000

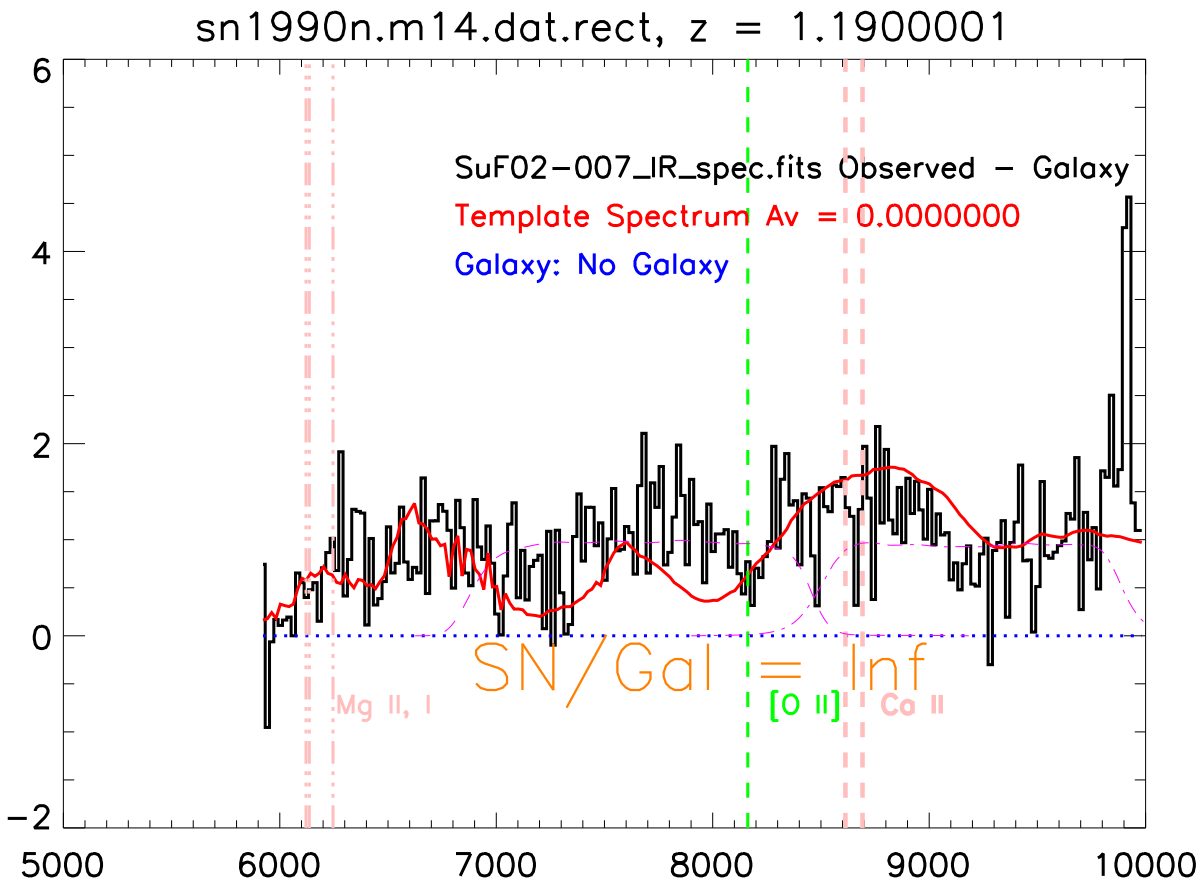

sn1991t.m08.dat.rect, z = 1.1700000
SuF02-007_IR_spec.fits Observed − Galaxy
Template Spectrum Av = 0.0000000
Galaxy: No Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
6
4
2
0
−2
5000
6000
7000
8000
9000
10000

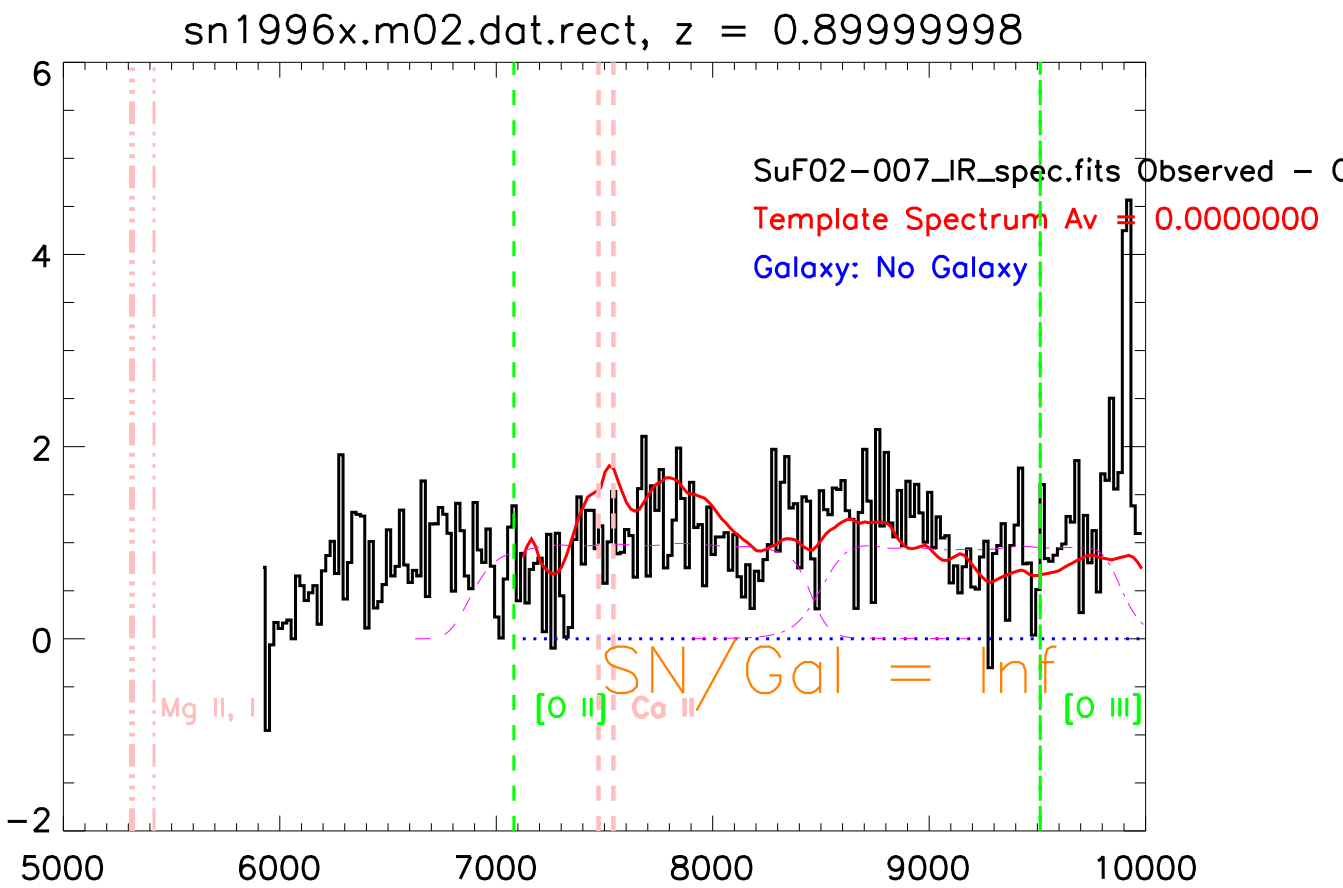

sn1998bu.m04.dat.rect, z = 0.90999997
SuF02-007_IR_spec.fits Observed – Gala
Template Spectrum Av = 0.00000000
Galaxy: No Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Co II
[O III]
6
4
2
0
−2
5000
6000
7000
8000
9000
10000

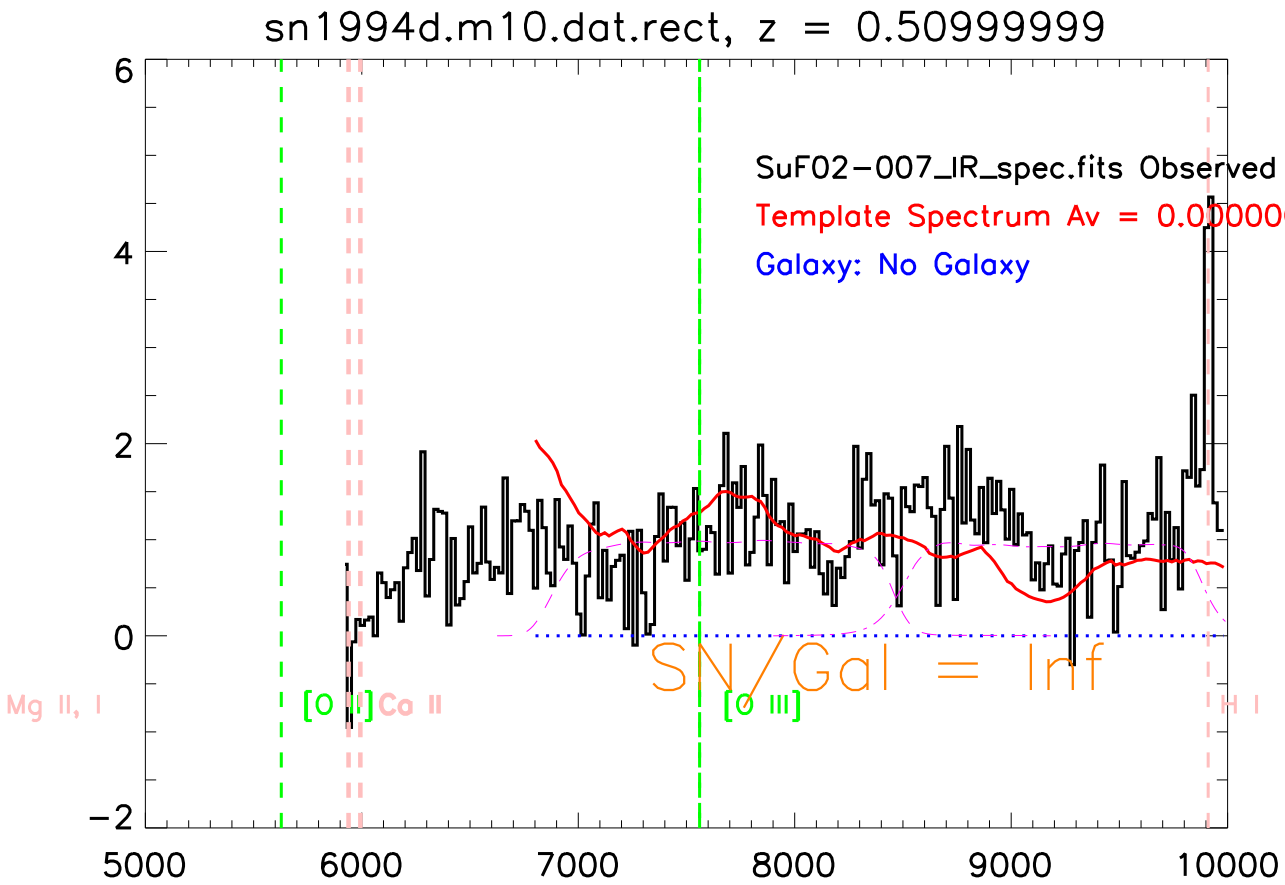

sn1999ee.m06.dat.rect, z = 0.92999995
SuF02-007_IR_spec.fits Observed - Galaxy
Template Spectrum Av = 0.0000000
Galaxy: No Galaxy
SN/Gal = Inf
Mg II,
[O II]
Ca II
[O III]
6
4
2
0
−2
5000
6000
7000
8000
9000
10000

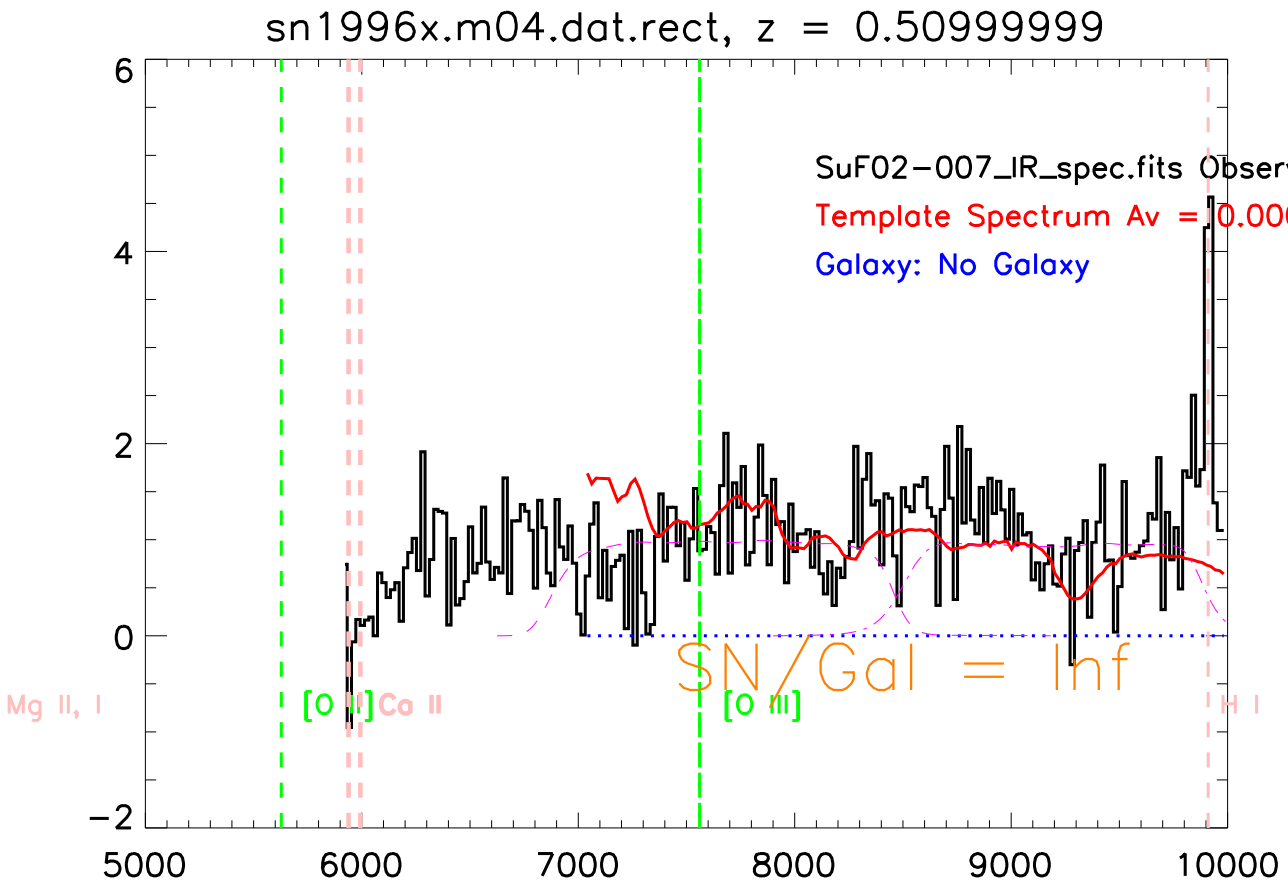

sn1999ee.m08.dat.rect, z = 0.94000000
SuF02-007_IR_spec.fits Observed - Galaxy
Template Spectrum Av = 0.0000000
Galaxy: No Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
6
4
2
0
-2
5000
6000
7000
8000
9000
10000

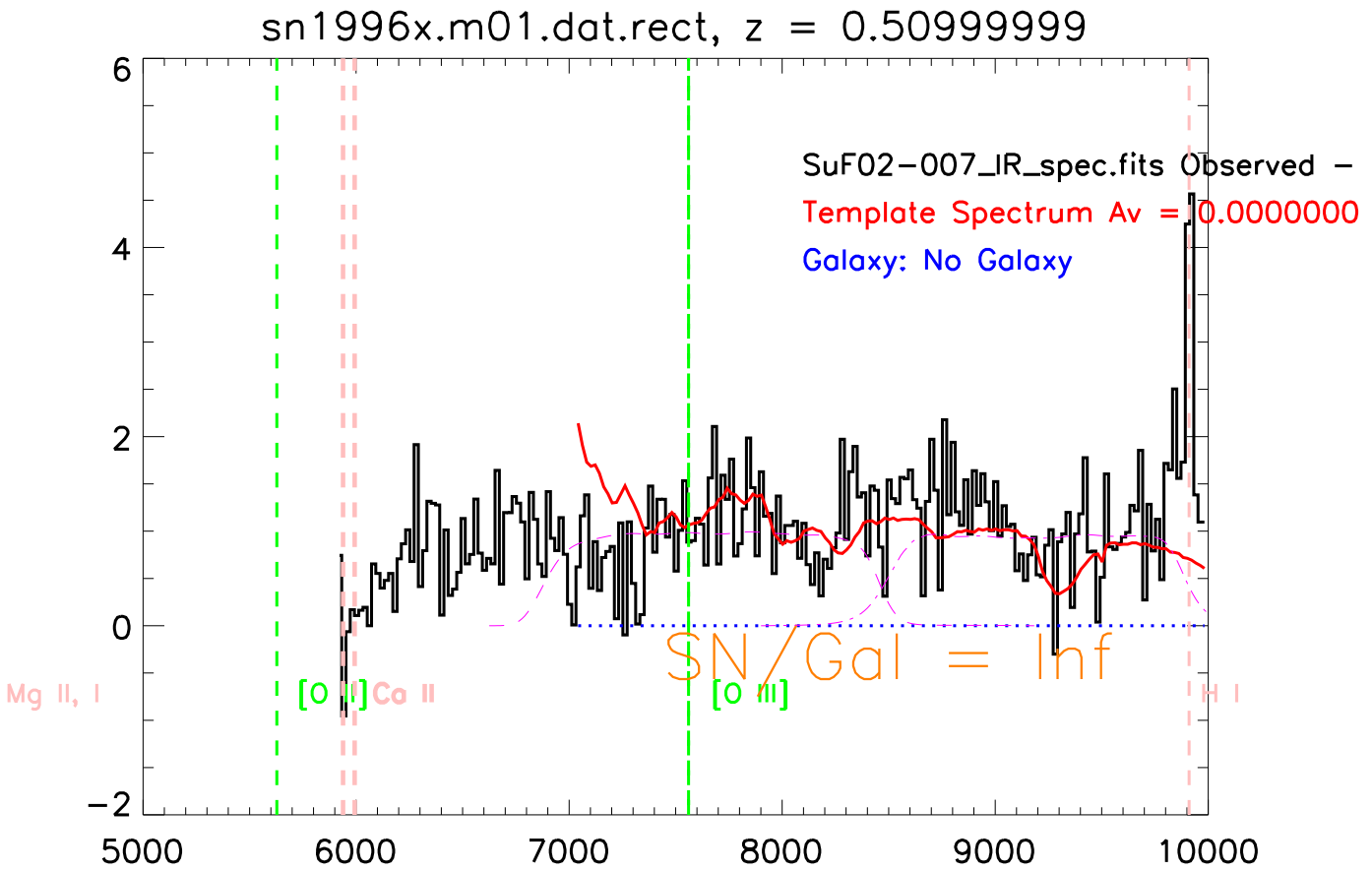

sn1991t.m07.dat.rect, z = 1.1600000
SuF02-007_IR_spec.fits Observed - Gal
Template Spectrum Av = 0.0000000
Galaxy: No Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
6
4
2
0
−2
5000
6000
7000
8000
9000
10000

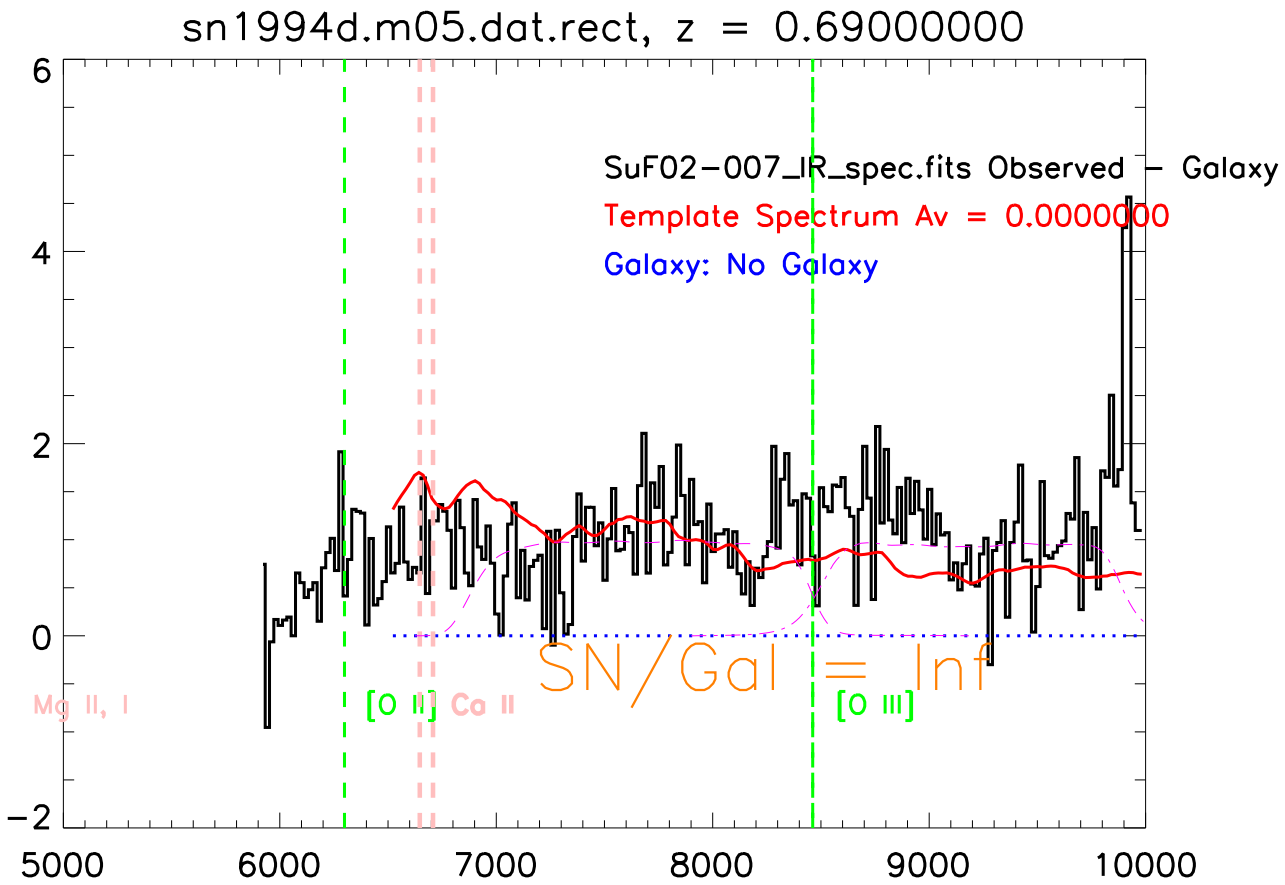

sn1990n.m14.dat.rect, z = 1.1900001
SuF02-007_IR_spec.fits Observed - Galaxy
Template Spectrum Av = 0.0000000
Galaxy: No Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
6
4
2
0
-2
5000
6000
7000
8000
9000
10000

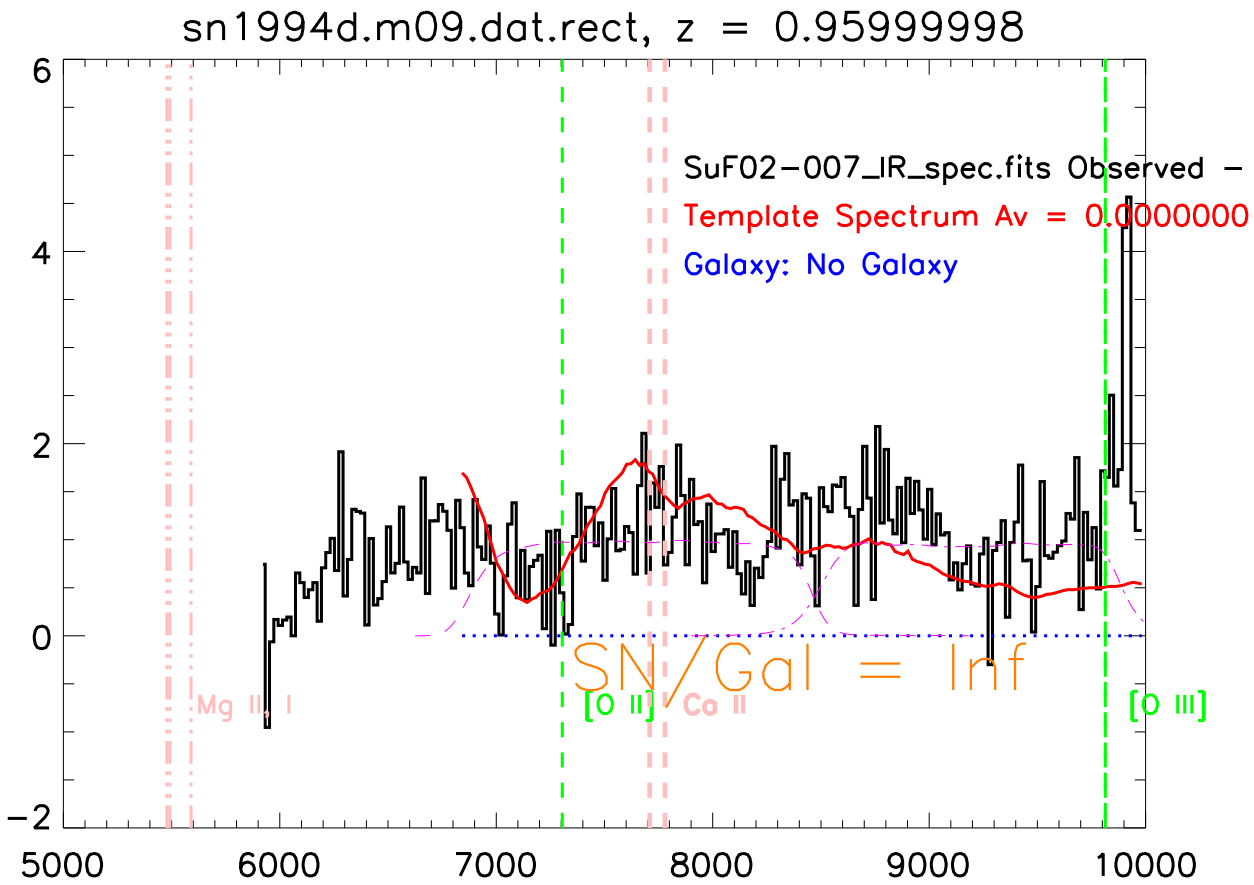

sn1996x.m02.dat.rect, z = 0.89999998
SuF02-007_IR_spec.fits Observed – G
Template Spectrum Av = 0.0000000
Galaxy: No Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
6
4
2
0
−2
5000
6000
7000
8000
9000
10000

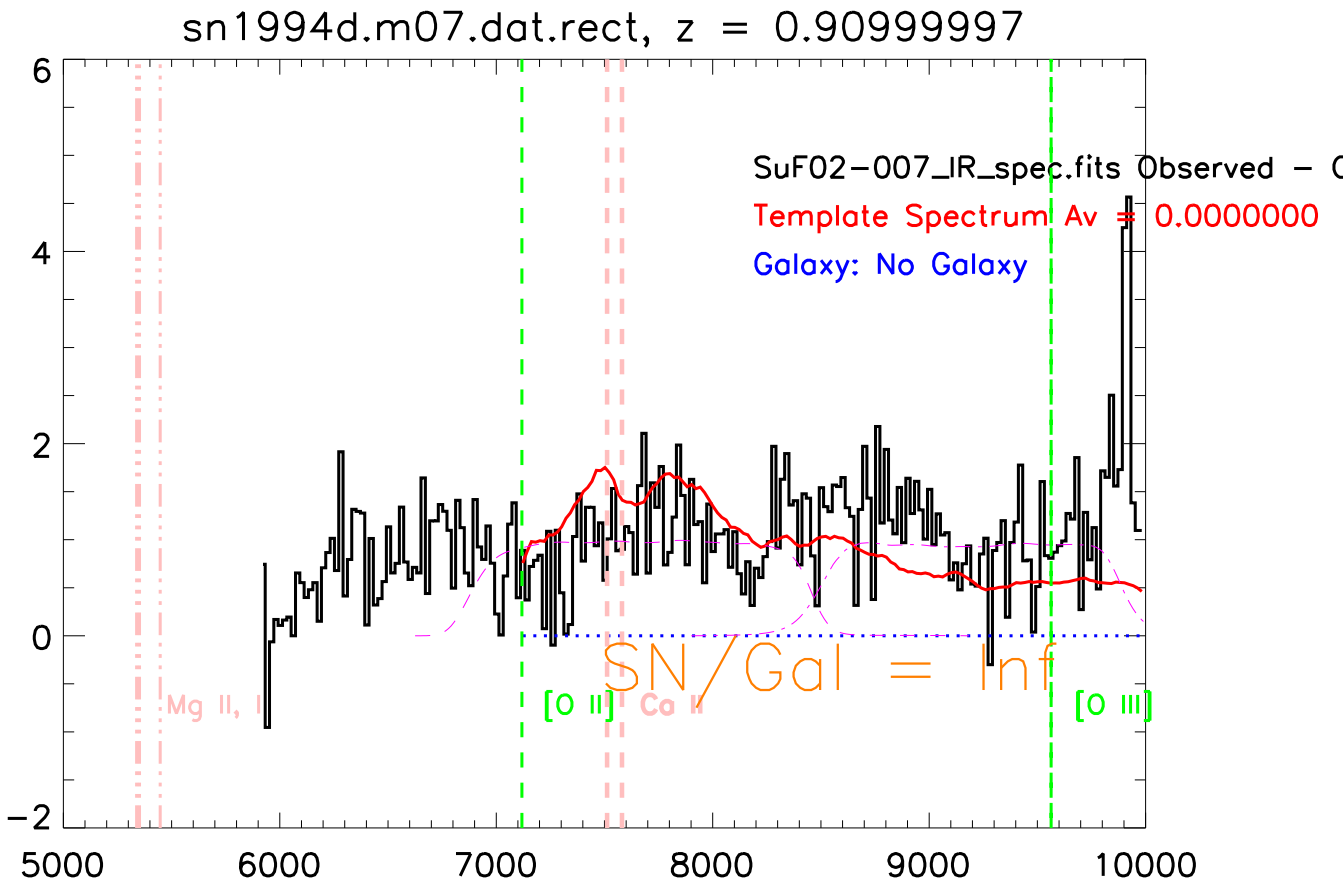

sn1994d.m10.dat.rect, z = 0.50999999
SuF02-007_IR_spec.fits Observed − Galaxy
Template Spectrum Av = 0.0000000
Galaxy: No Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
6
4
2
0
−2
5000
6000
7000
8000
9000
10000

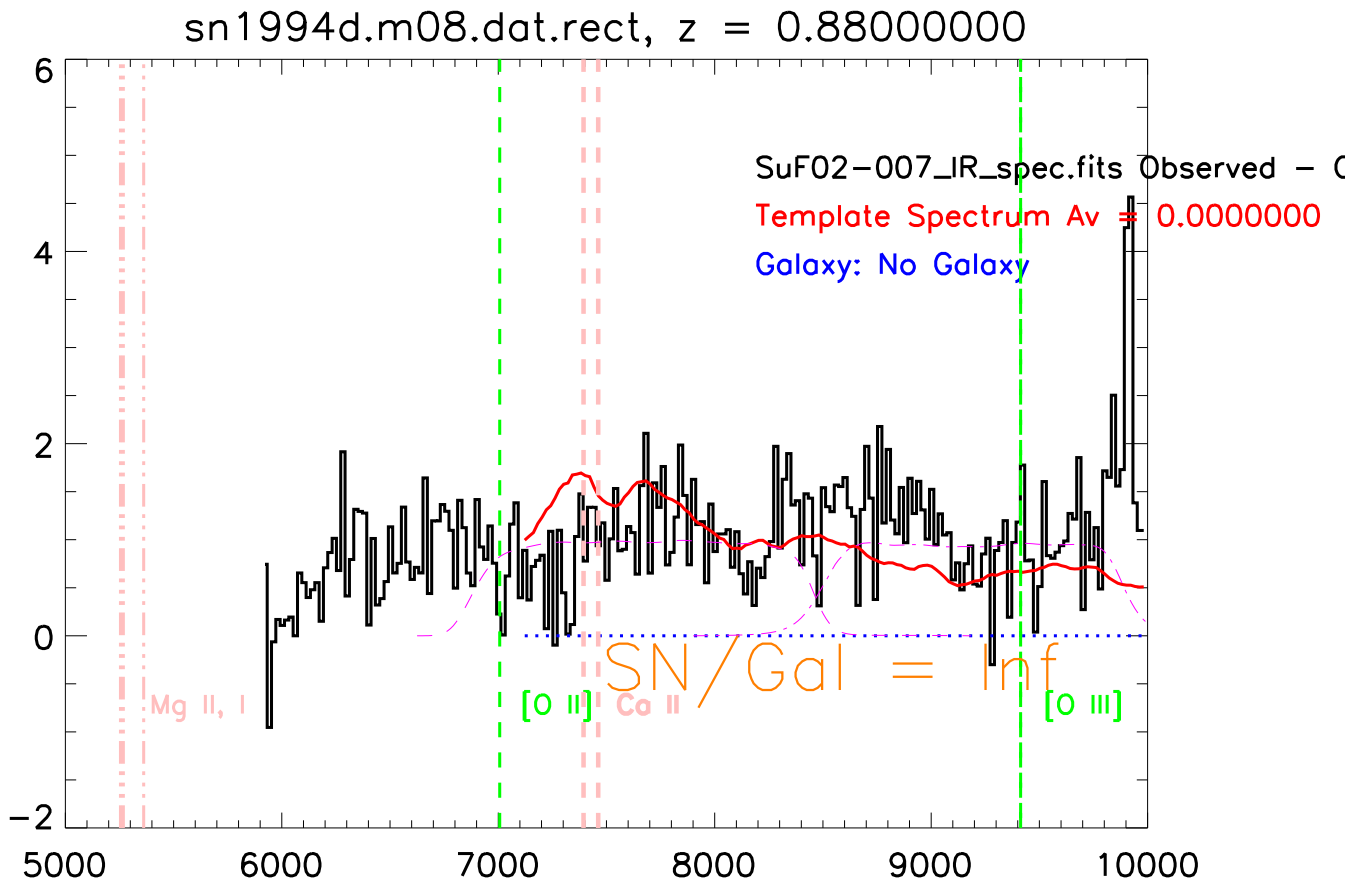

sn1996x.m04.dat.rect, z = 0.50999999
SuF02-007_IR_spec.fits Observed - Ga
Template Spectrum Av = 0.0000000
Galaxy: No Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
6
4
2
0
−2
5000
6000
7000
8000
9000
10000

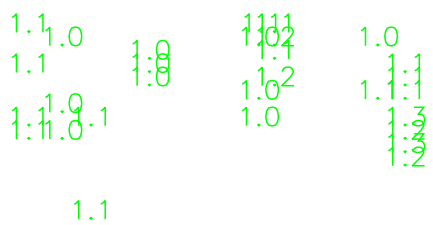

sn1996x.m01.dat.rect, z = 0.50999999
SuF02-007_IR_spec.fits Observed - Ga
Template Spectrum Av = 0.0000000
Galaxy: No Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
H I
6
4
2
0
−2
5000
6000
7000
8000
9000
10000

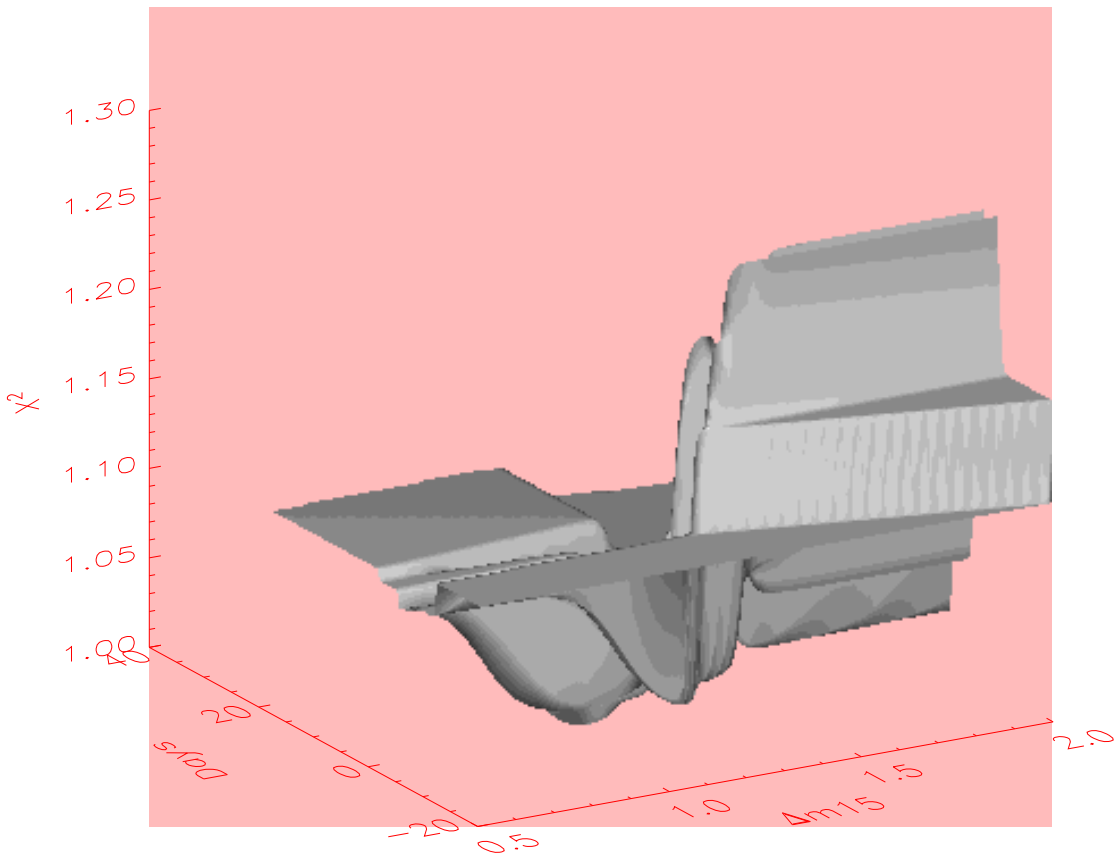

sn1994d.m05.dat.rect, z = 0.69000000
SuF02-007_IR_spec.fits Observed − Galaxy
Template Spectrum Av = 0.0000000
Galaxy: No Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
6
4
2
0
−2
5000
6000
7000
8000
9000
10000


sn1994d.m09.dat.rect, z = 0.95999998
SuF02-007_IR_spec.fits Observed – Galaxy
Template Spectrum Av = 0.0000000
Galaxy: No Galaxy
SN/Gal = Inf
Mg II
[O II]
Ca II
[O III]
6
4
2
0
−2
5000
6000
7000
8000
9000
10000

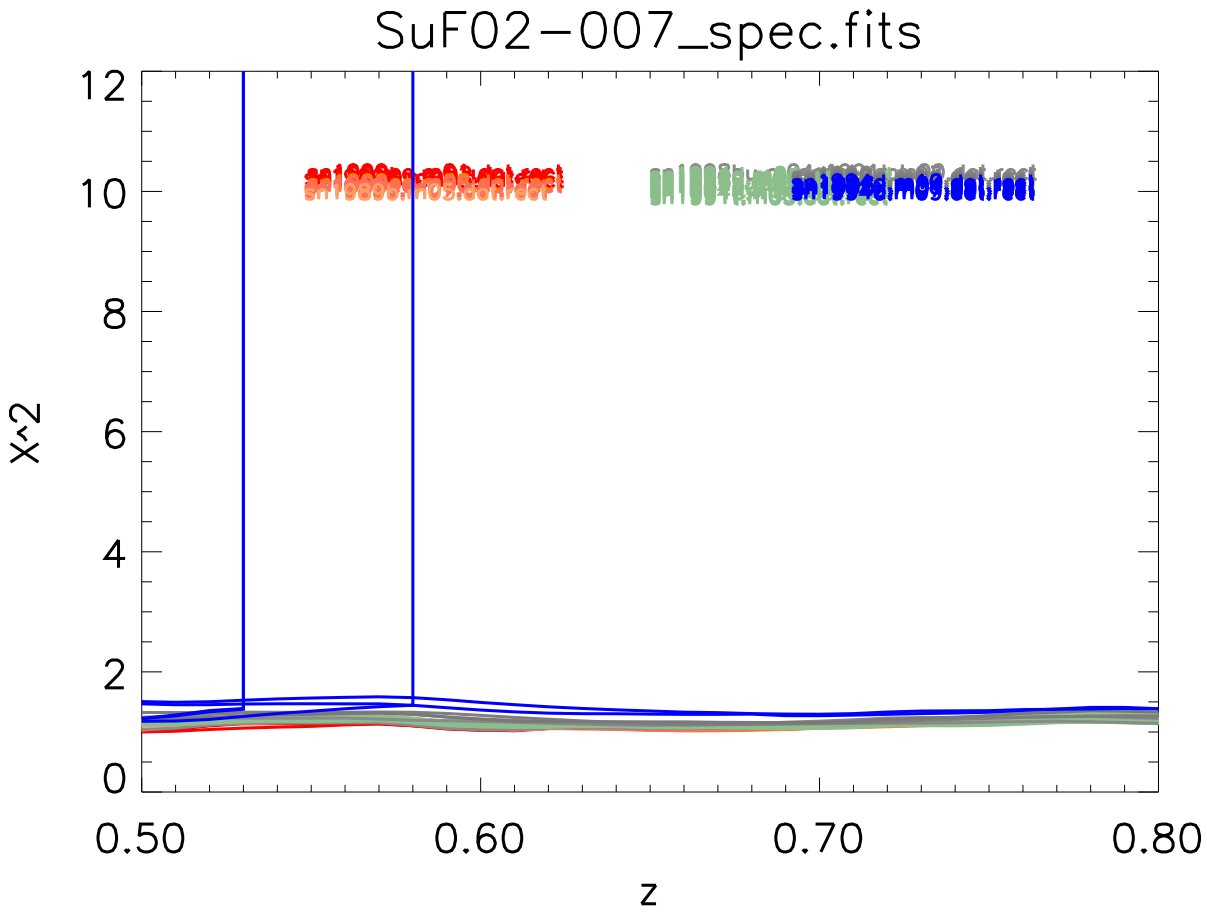

sn1994d.m07.dat.rect, z = 0.90999997
SuF02-007_IR_spec.fits Observed – G
Template Spectrum Av = 0.0000000
Galaxy: No Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
6
4
2
0
−2
5000
6000
7000
8000
9000
10000

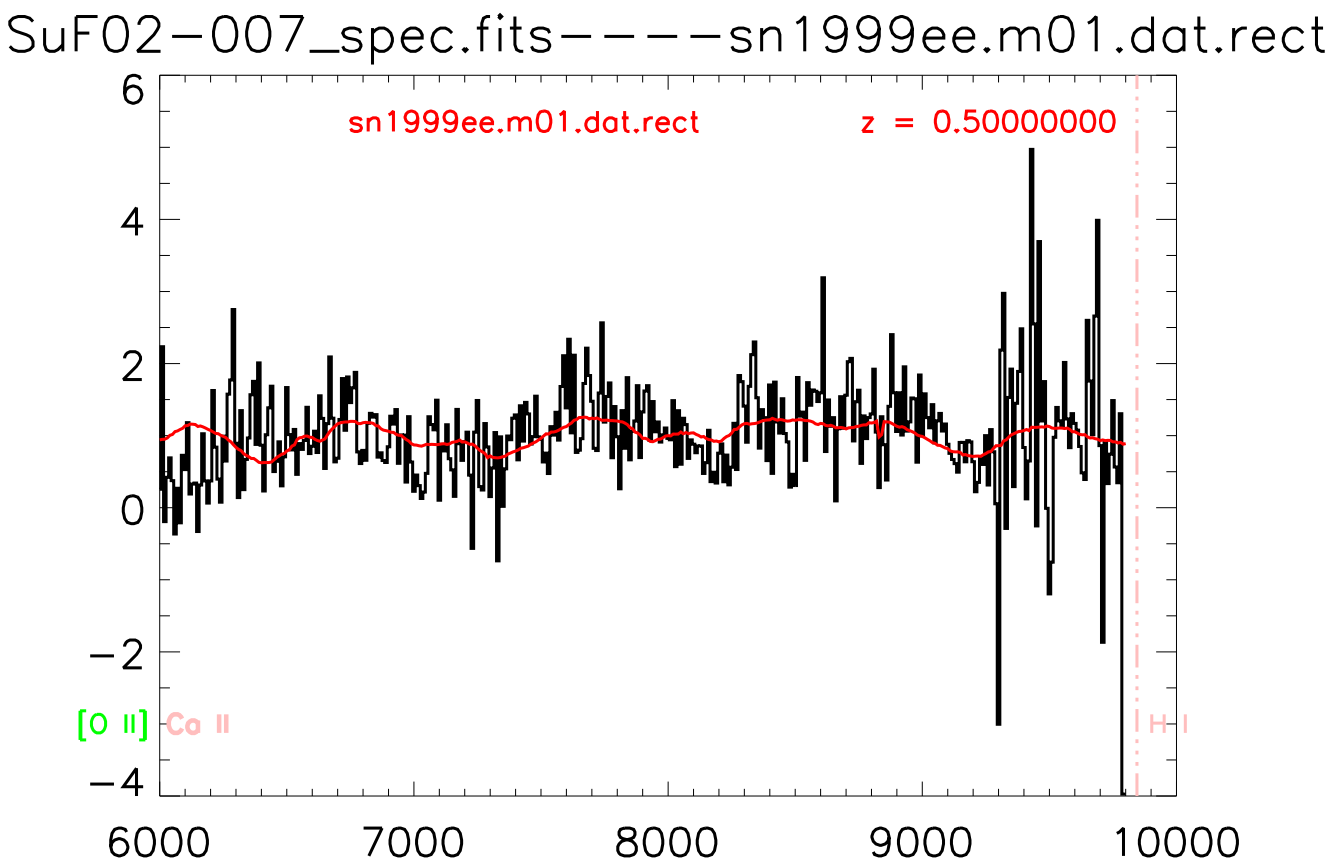

sn1994d.m08.dat.rect, z = 0.88000000
SuF02-007_IR_spec.fits Observed - G
Template Spectrum Av = 0.0000000
Galaxy: No Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
6
4
2
0
−2
5000
6000
7000
8000
9000
10000

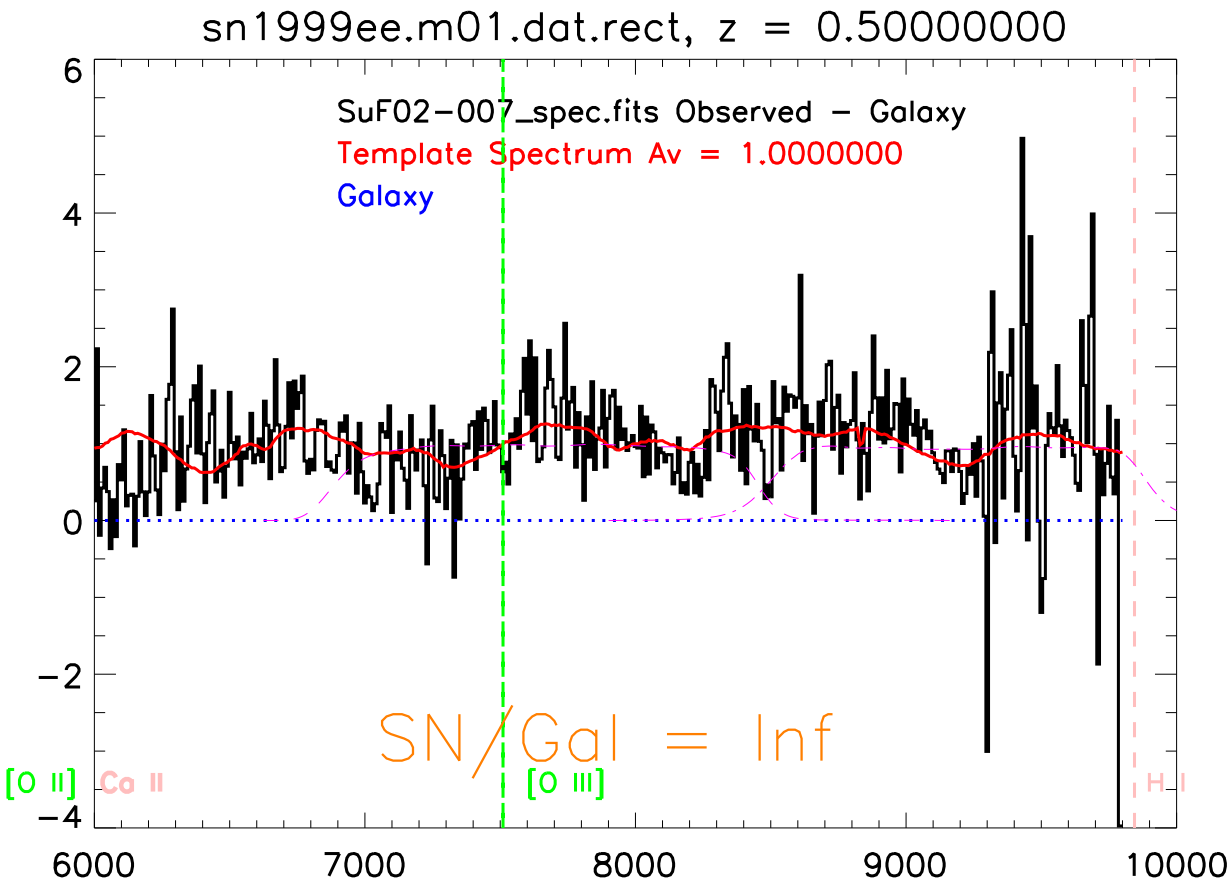


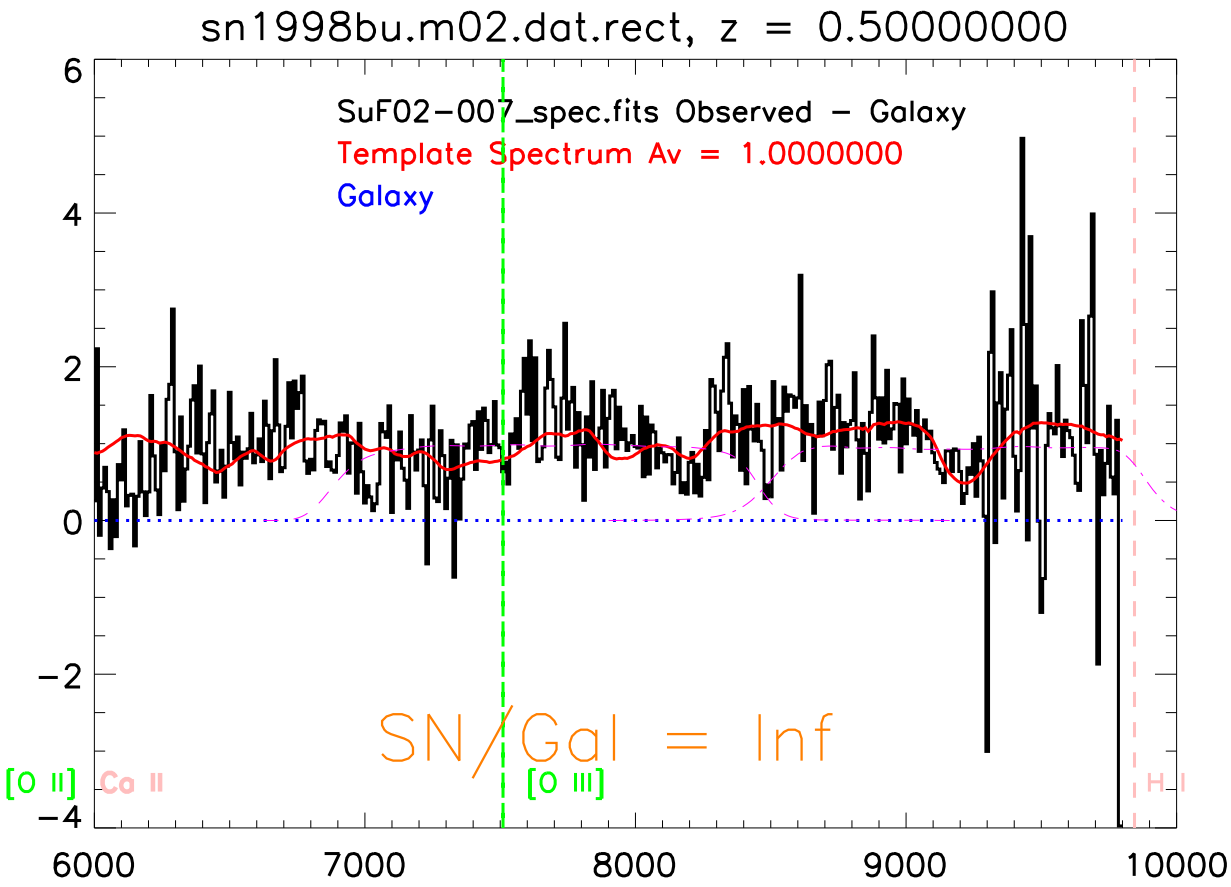


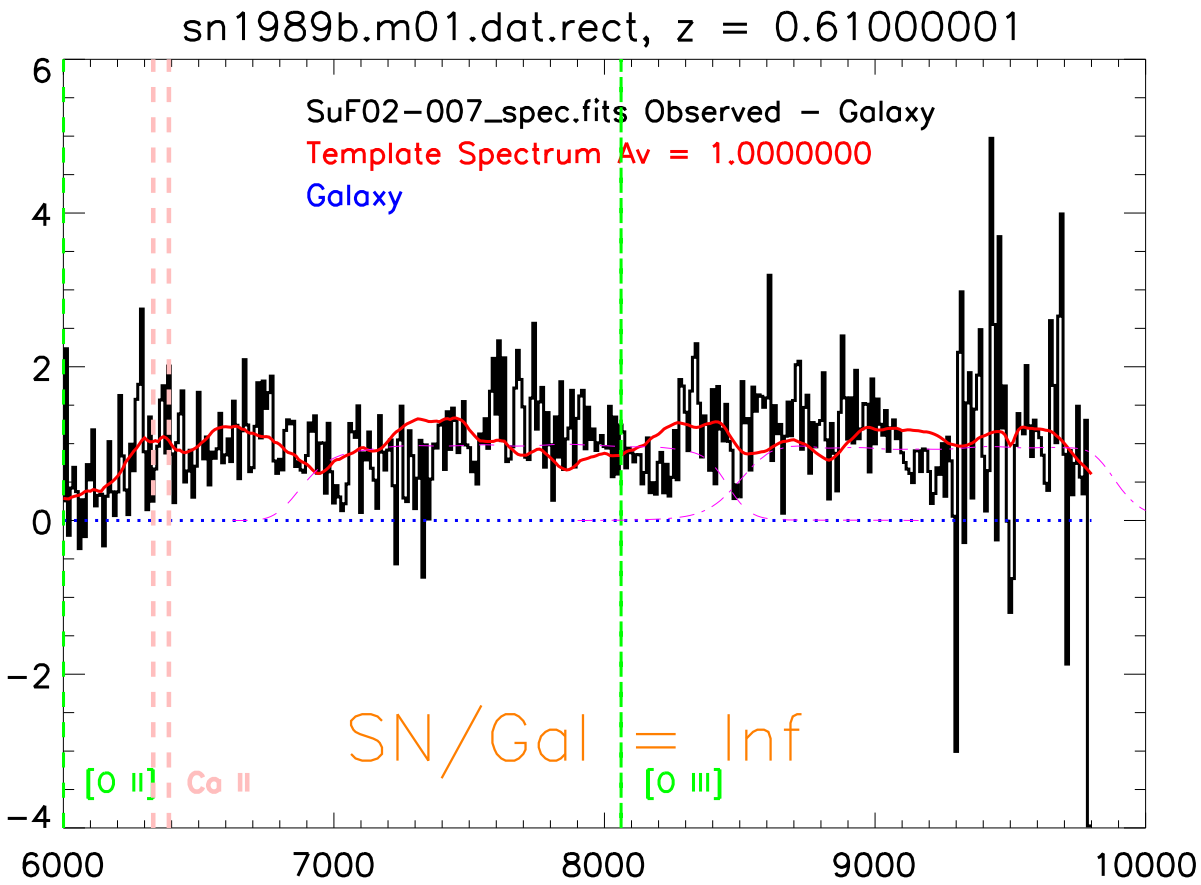
1.30
1.25
1.20
1.15
1.10
1.05
1.00
χ^2
40
20
0
−20
Days
0.5
1.0
1.5
2.0
Δm15

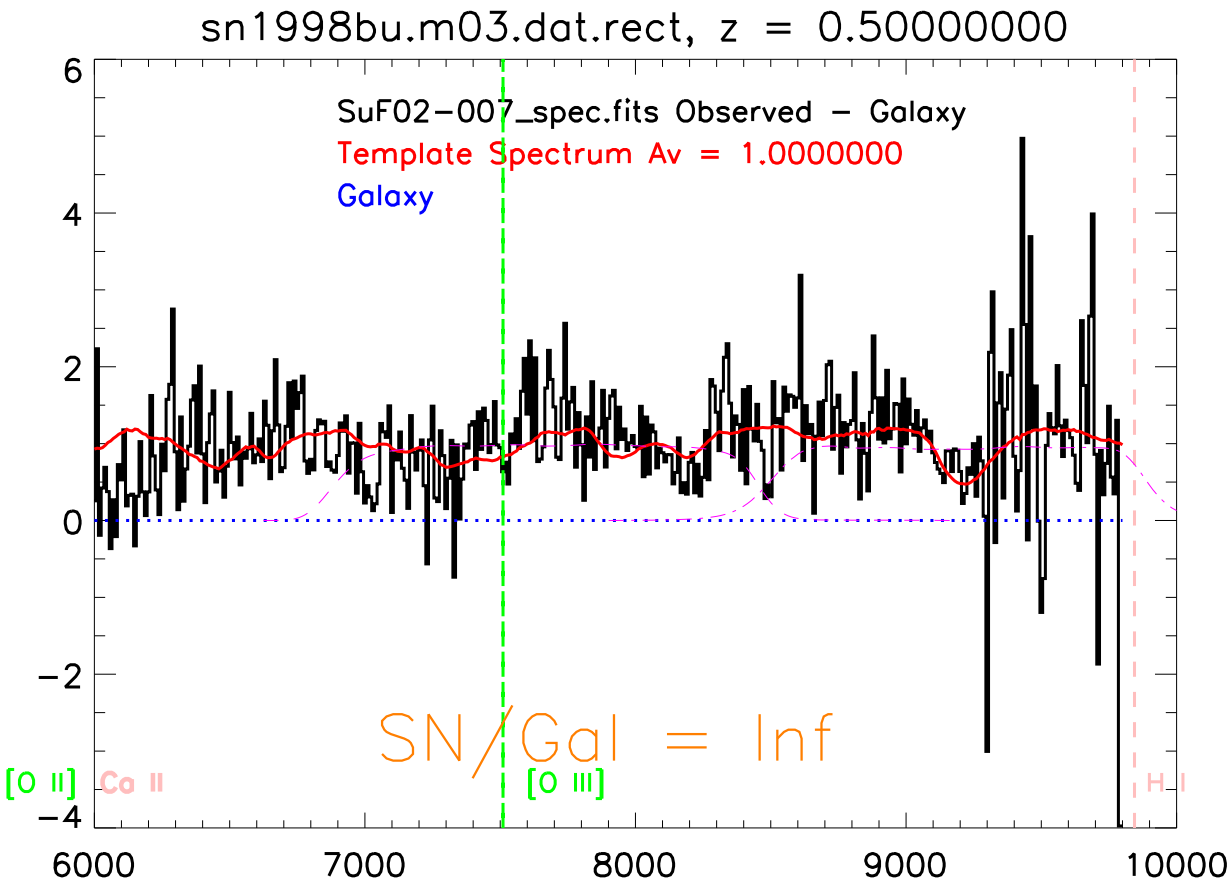

SuF02−007_spec.fits
12
10
8
6
4
2
0
X^2
0.50
0.60
0.70
0.80
z

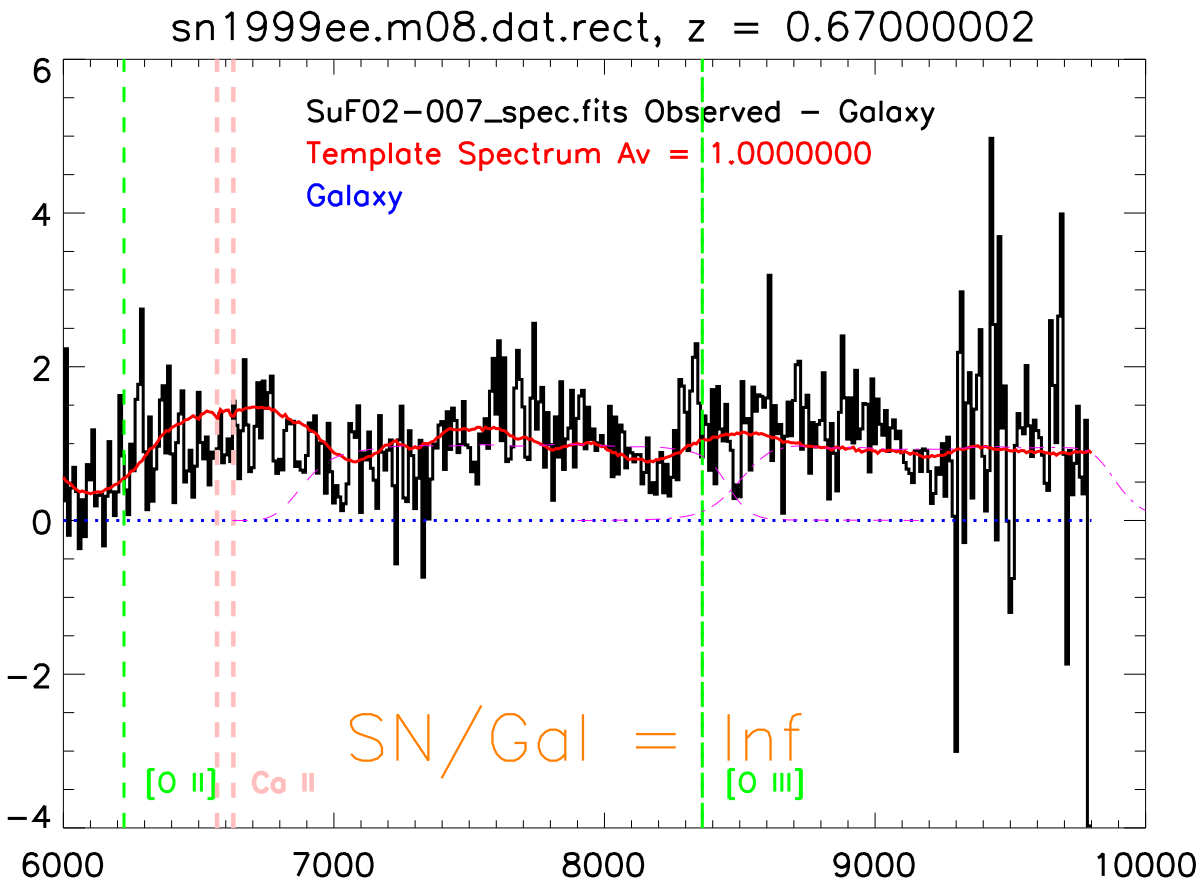

SuF02−007_spec.fits−−−−sn1999ee.m01.dat.rect
sn1999ee.m01.dat.rect
z = 0.50000000
6
4
2
0
−2
−4
[O II]
Ca II
H I
6000
7000
8000
9000
10000


sn1999ee.m01.dat.rect, z = 0.50000000
SuF02-007_spec.fits Observed - Galaxy
Template Spectrum Av = 1.0000000
Galaxy
SN/Gal = Inf
[O II]
Ca II
[O III]
H I
6
4
2
0
−2
−4
6000
7000
8000
9000
10000

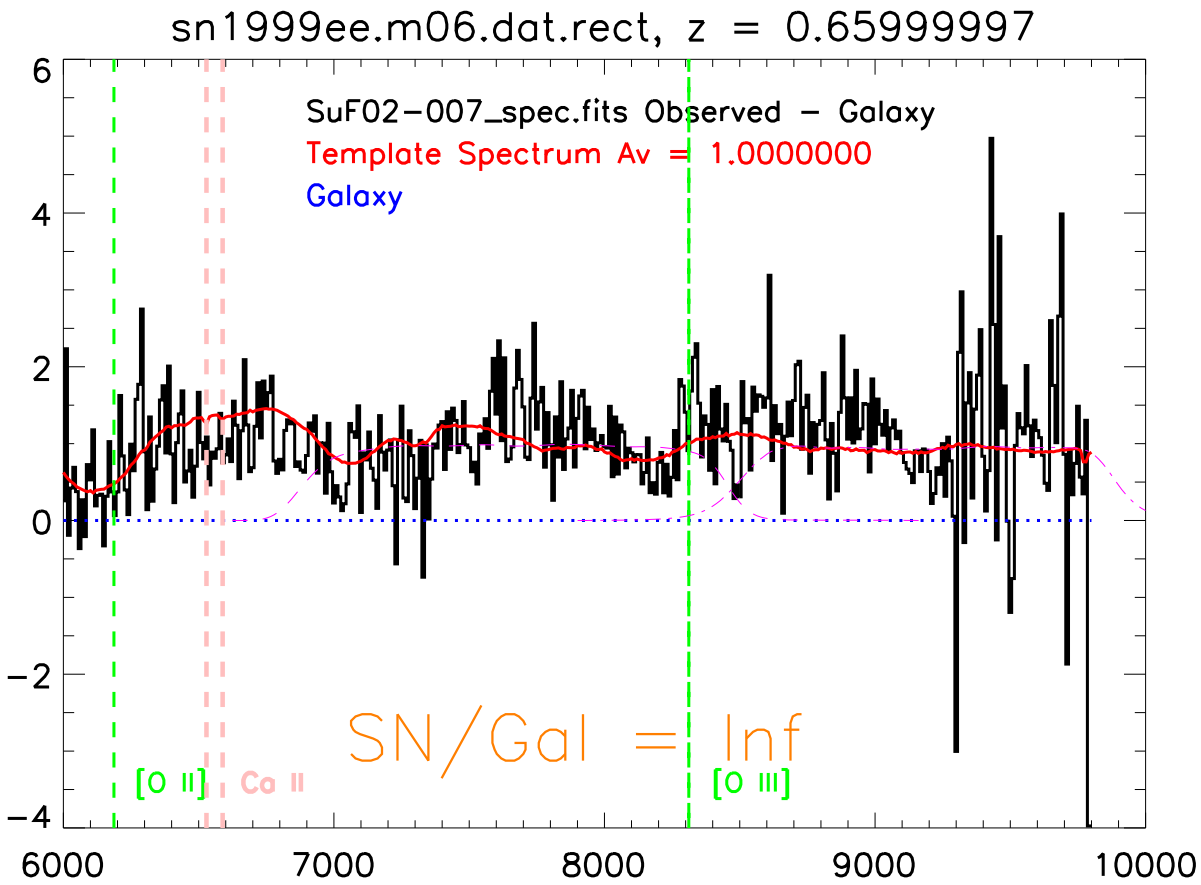

sn1998bu.m02.dat.rect, z = 0.50000000
SuF02-007_spec.fits Observed − Galaxy
Template Spectrum Av = 1.0000000
Galaxy
SN/Gal = Inf
[O II]
Ca II
[O III]
H I
6
4
2
0
−2
−4
6000
7000
8000
9000
10000


sn1989b.m01.dat.rect, z = 0.61000001
SuF02-007_spec.fits Observed - Galaxy
Template Spectrum Av = 1.0000000
Galaxy
SN/Gal = Inf
[O II]
Ca II
[O III]
6
4
2
0
−2
−4
6000
7000
8000
9000
10000

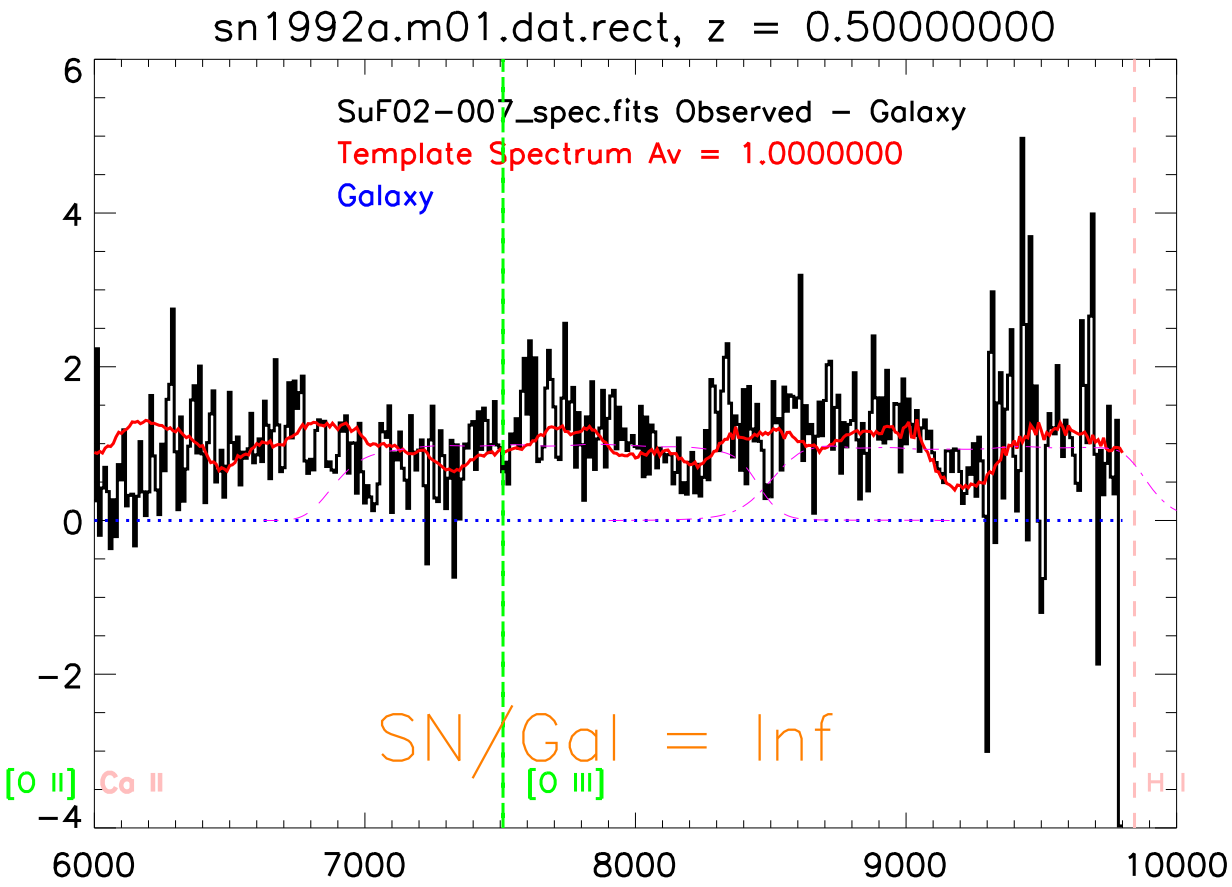

sn1998bu.m03.dat.rect, z = 0.50000000
SuF02-007_spec.fits Observed - Galaxy
Template Spectrum Av = 1.0000000
Galaxy
SN/Gal = Inf
[O II]
Ca II
[O III]
H I
6
4
2
0
−2
−4
6000
7000
8000
9000
10000

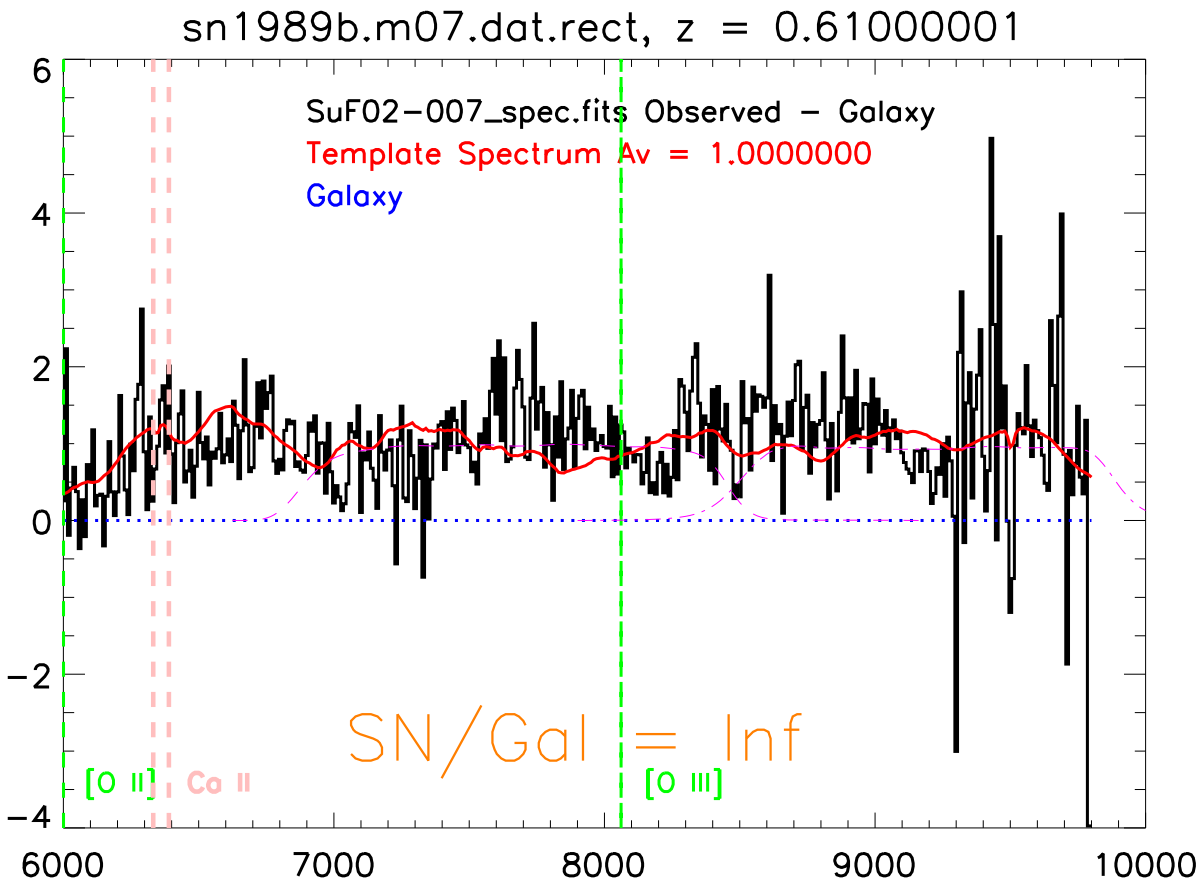

sn1999ee.m08.dat.rect, z = 0.67000002
SuF02−007_spec.fits Observed − Galaxy
Template Spectrum Av = 1.0000000
Galaxy
SN/Gal = Inf
[O II]
Ca II
[O III]
6
4
2
0
−2
−4
6000
7000
8000
9000
10000

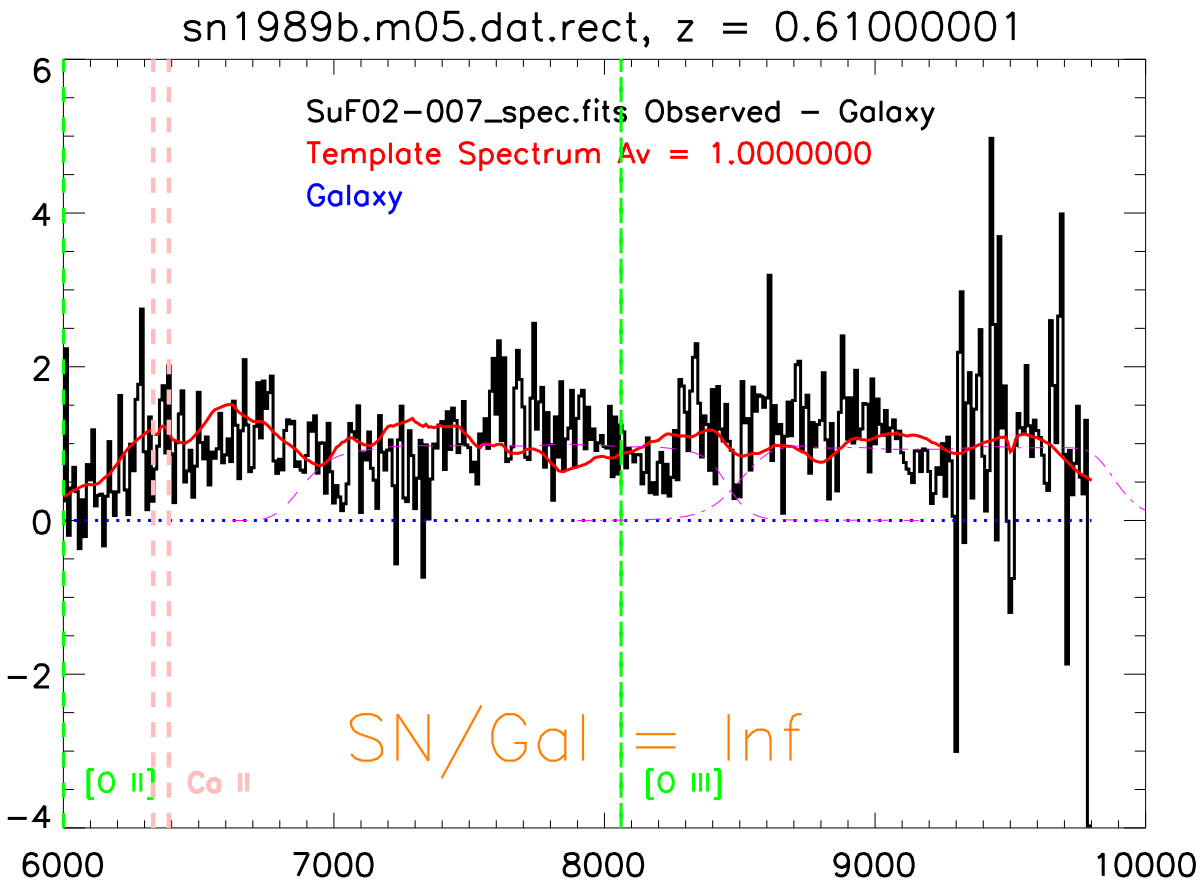
Mg II, I

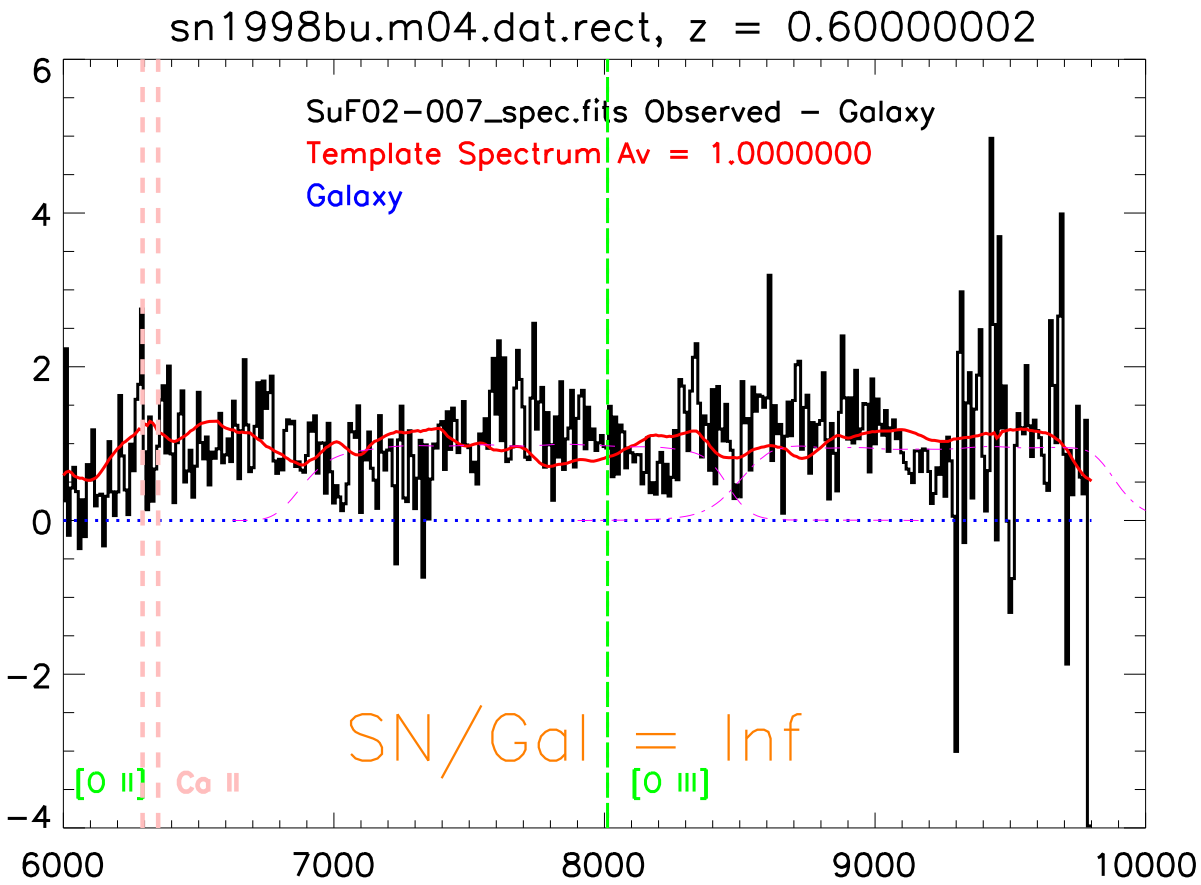

sn1999ee.m06.dat.rect, z = 0.65999997
SuF02-007_spec.fits Observed - Galaxy
Template Spectrum Av = 1.0000000
Galaxy
SN/Gal = Inf
[O II]
Ca II
[O III]
6
4
2
0
−2
−4
6000
7000
8000
9000
10000

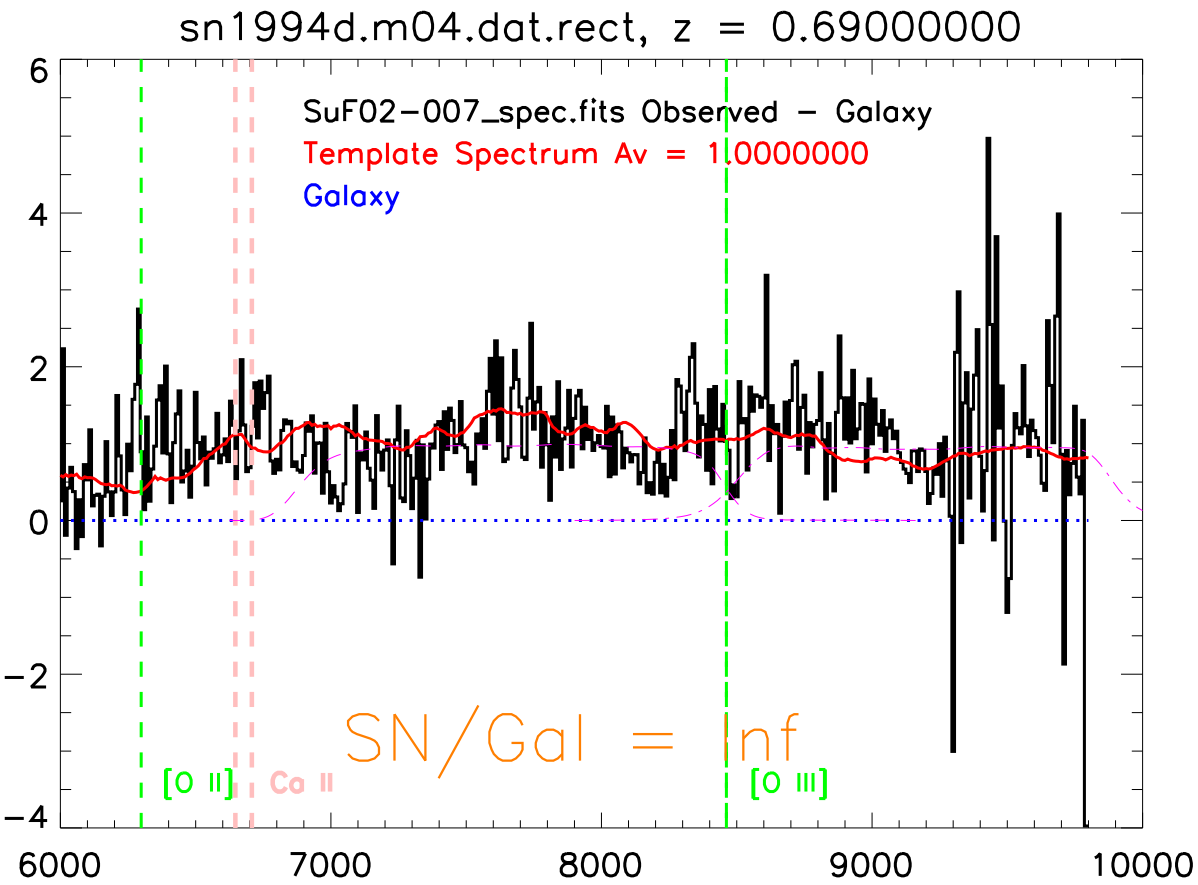
Mg II, I


sn1992a.m01.dat.rect, z = 0.50000000
SuF02-007_spec.fits Observed - Galaxy
Template Spectrum Av = 1.0000000
Galaxy
SN/Gal = Inf
[O II]
Ca II
[O III]
H I
6
4
2
0
-2
-4
6000
7000
8000
9000
10000

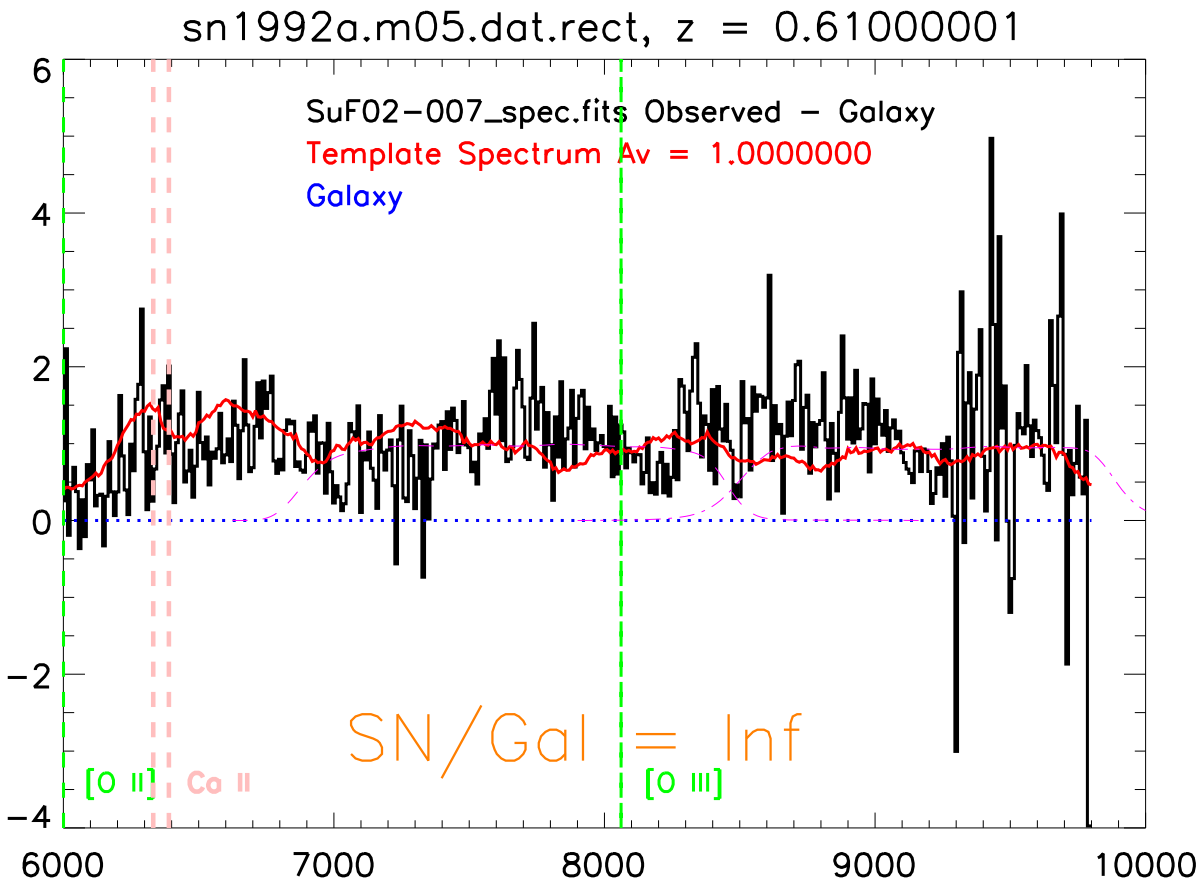

sn1989b.m07.dat.rect, z = 0.61000001
SuF02-007_spec.fits Observed − Galaxy
Template Spectrum Av = 1.0000000
Galaxy
SN/Gal = Inf
[O II]
Ca II
[O III]
6
4
2
0
−2
−4
6000
7000
8000
9000
10000

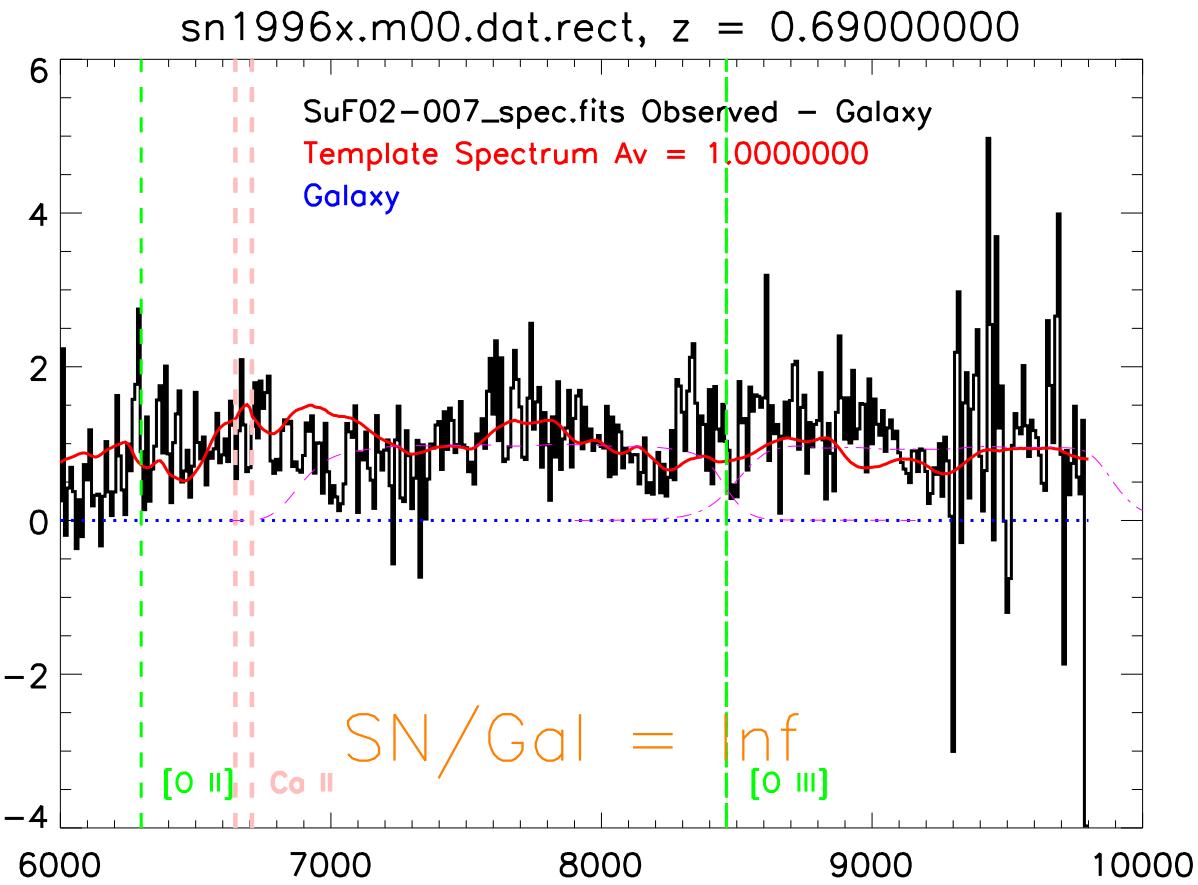

sn1989b.m05.dat.rect, z = 0.61000001
SuF02-007_spec.fits Observed - Galaxy
Template Spectrum Av = 1.0000000
Galaxy
SN/Gal = Inf
[O II]
Ca II
[O III]
6
4
2
0
−2
−4
6000
7000
8000
9000
10000


sn1998bu.m04.dat.rect, z = 0.60000002
SuF02-007_spec.fits Observed - Galaxy
Template Spectrum Av = 1.0000000
Galaxy
SN/Gal = Inf
[O II]
Ca II
[O III]
6
4
2
0
−2
−4
6000
7000
8000
9000
10000

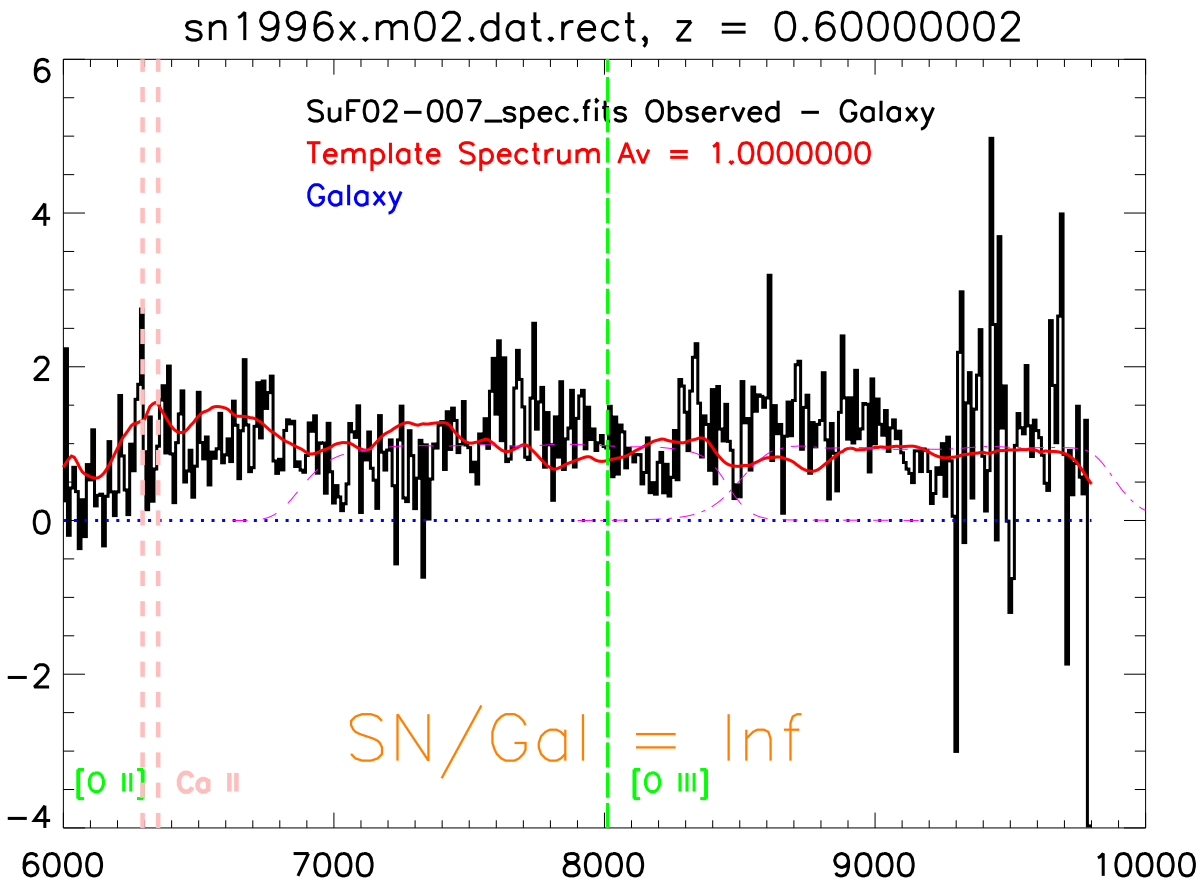

sn1994d.m04.dat.rect, z = 0.69000000
SuF02-007_spec.fits Observed - Galaxy
Template Spectrum Av = 1.0000000
Galaxy
SN/Gal = Inf
[O II]
Ca II
[O III]
6
4
2
0
−2
−4
6000
7000
8000
9000
10000

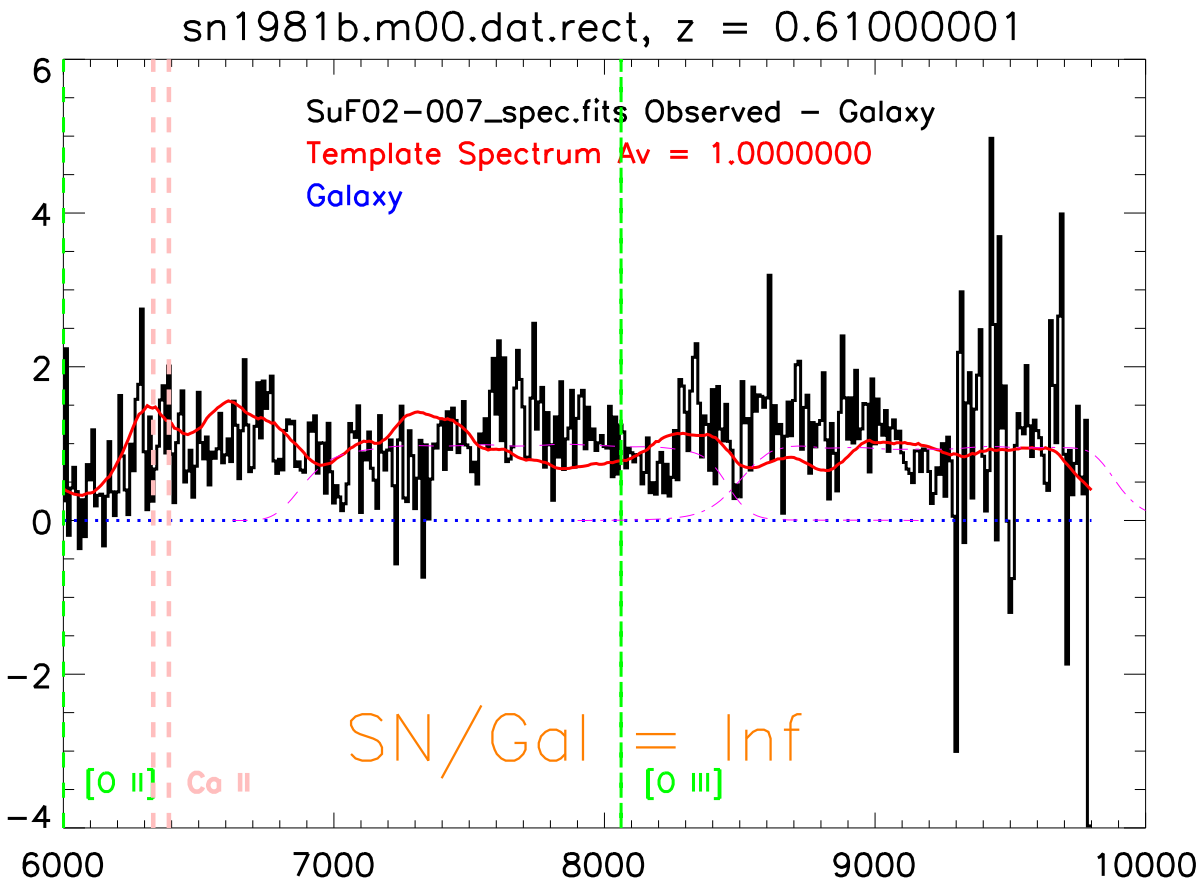
Mg II, I

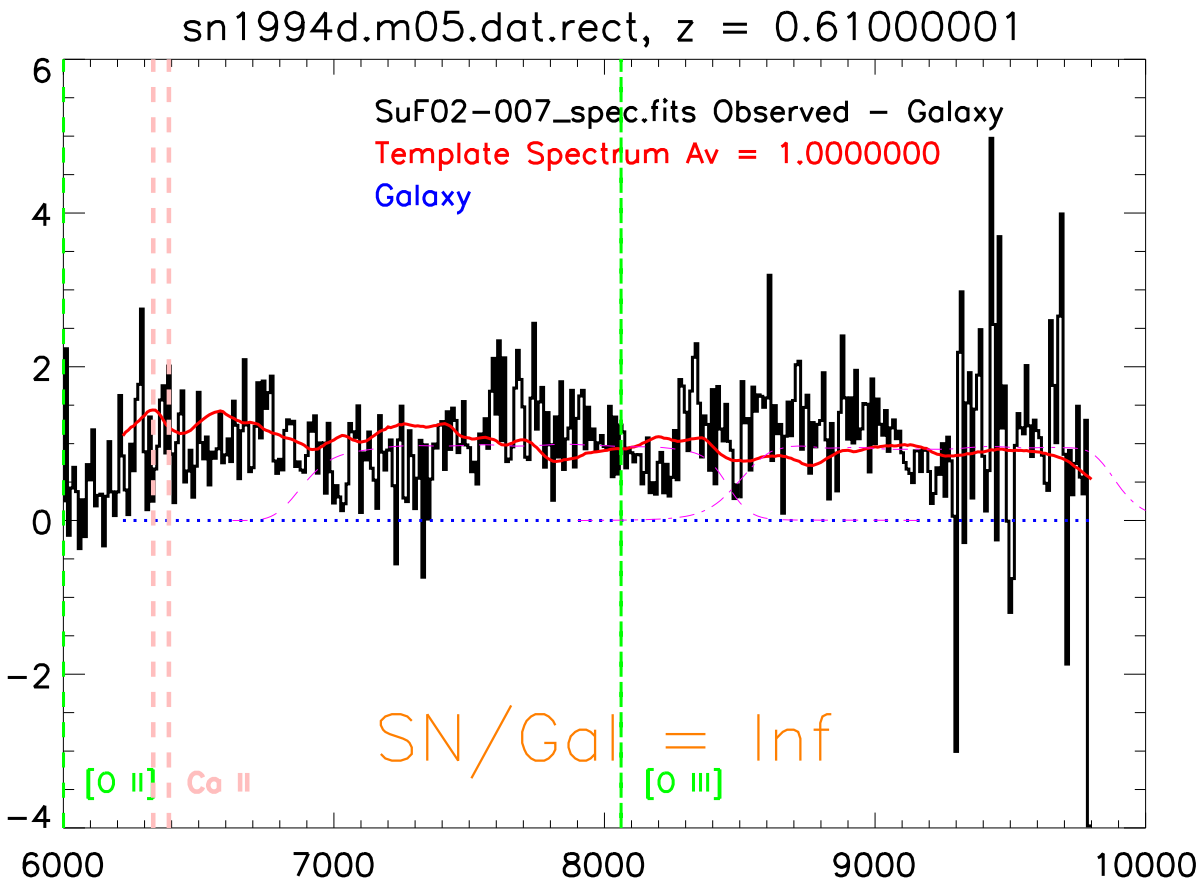

sn1992a.m05.dat.rect, z = 0.61000001
SuF02-007_spec.fits Observed - Galaxy
Template Spectrum Av = 1.0000000
Galaxy
SN/Gal = Inf
[O II]
Ca II
[O III]
6
4
2
0
−2
−4
6000
7000
8000
9000
10000

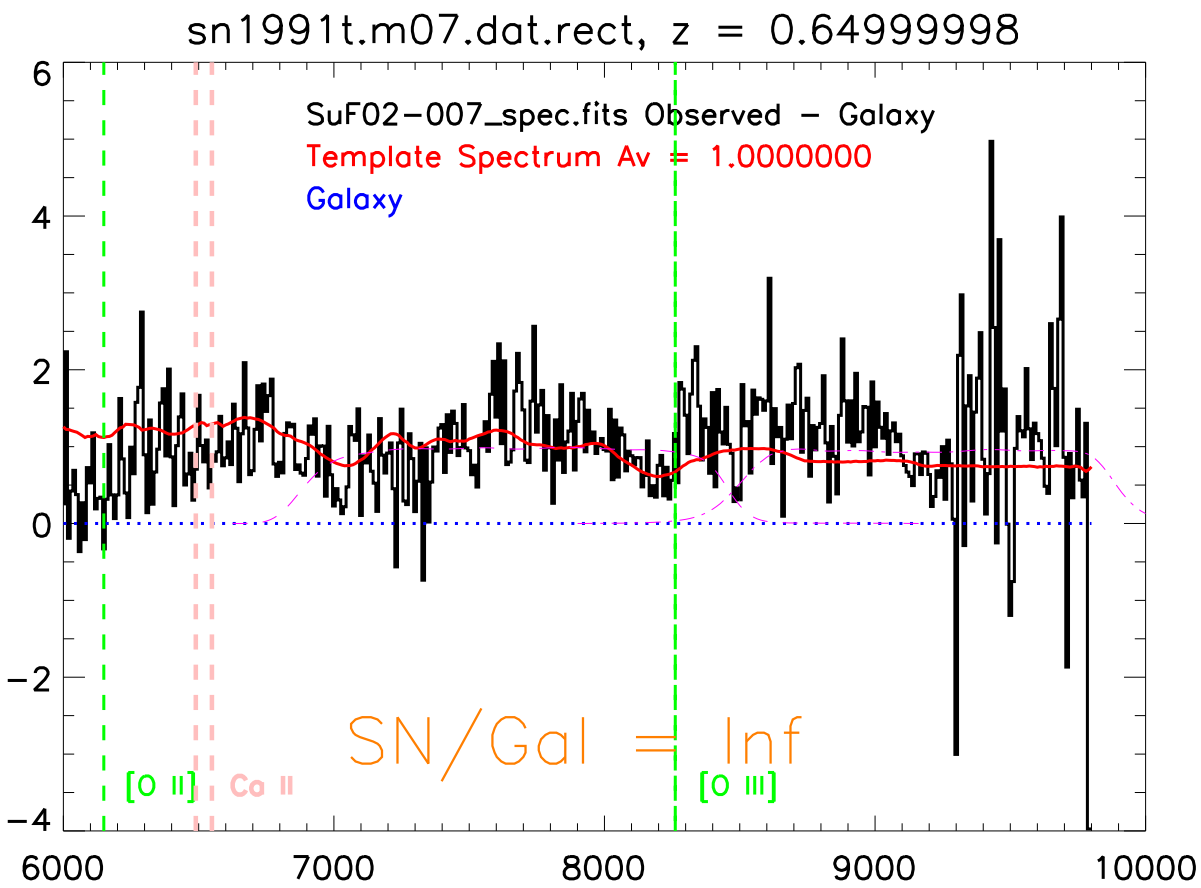

sn1996x.m00.dat.rect, z = 0.69000000
SuF02-007_spec.fits Observed − Galaxy
Template Spectrum Av = 1.0000000
Galaxy
SN/Gal = Inf
[O II]
Ca II
[O III]
6
4
2
0
−2
−4
6000
7000
8000
9000
10000

Mg II, I

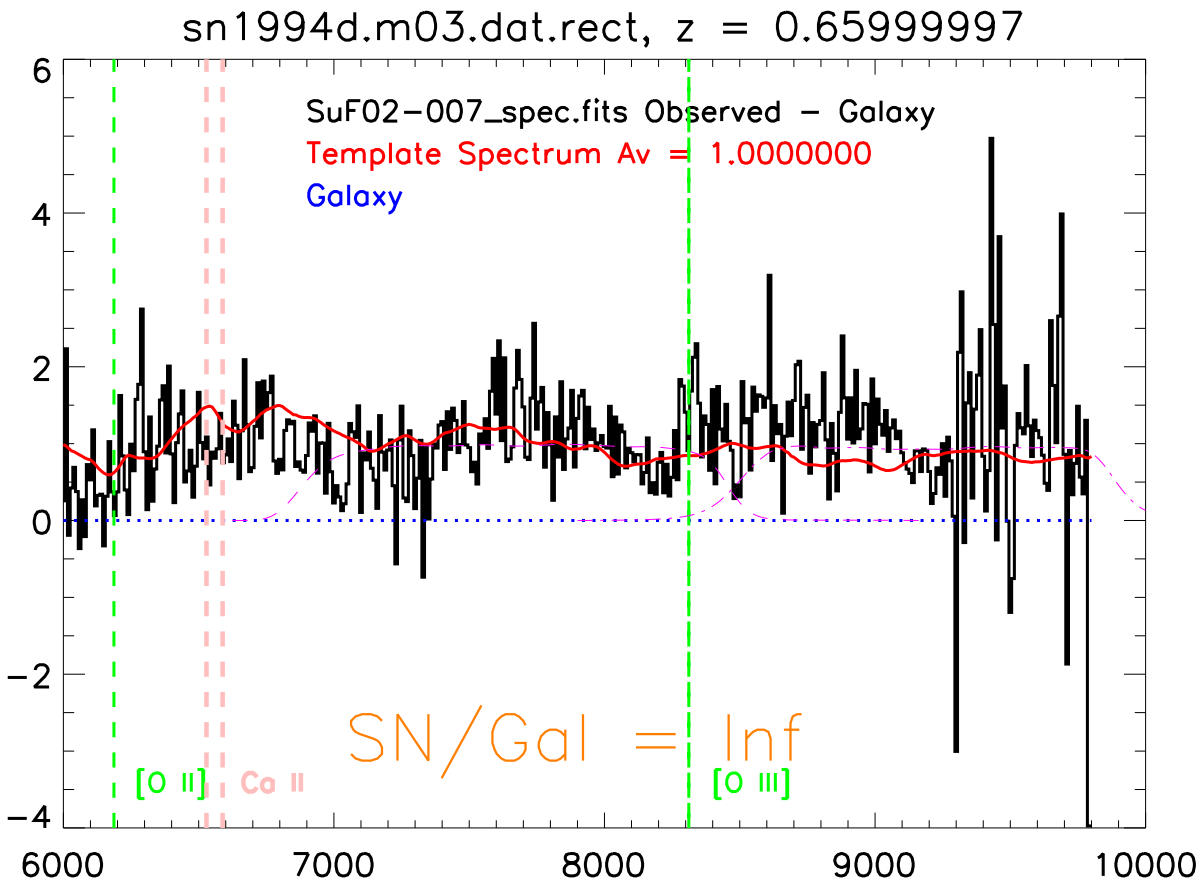

sn1996x.m02.dat.rect, z = 0.60000002
SuF02-007_spec.fits Observed − Galaxy
Template Spectrum Av = 1.0000000
Galaxy
SN/Gal = Inf
[O II]
Ca II
[O III]
6
4
2
0
−2
−4
6000
7000
8000
9000
10000


sn1981b.m00.dat.rect, z = 0.61000001
SuF02-007_spec.fits Observed - Galaxy
Template Spectrum Av = 1.0000000
Galaxy
SN/Gal = Inf
[O II]
Ca II
[O III]
6
4
2
0
−2
−4
6000
7000
8000
9000
10000

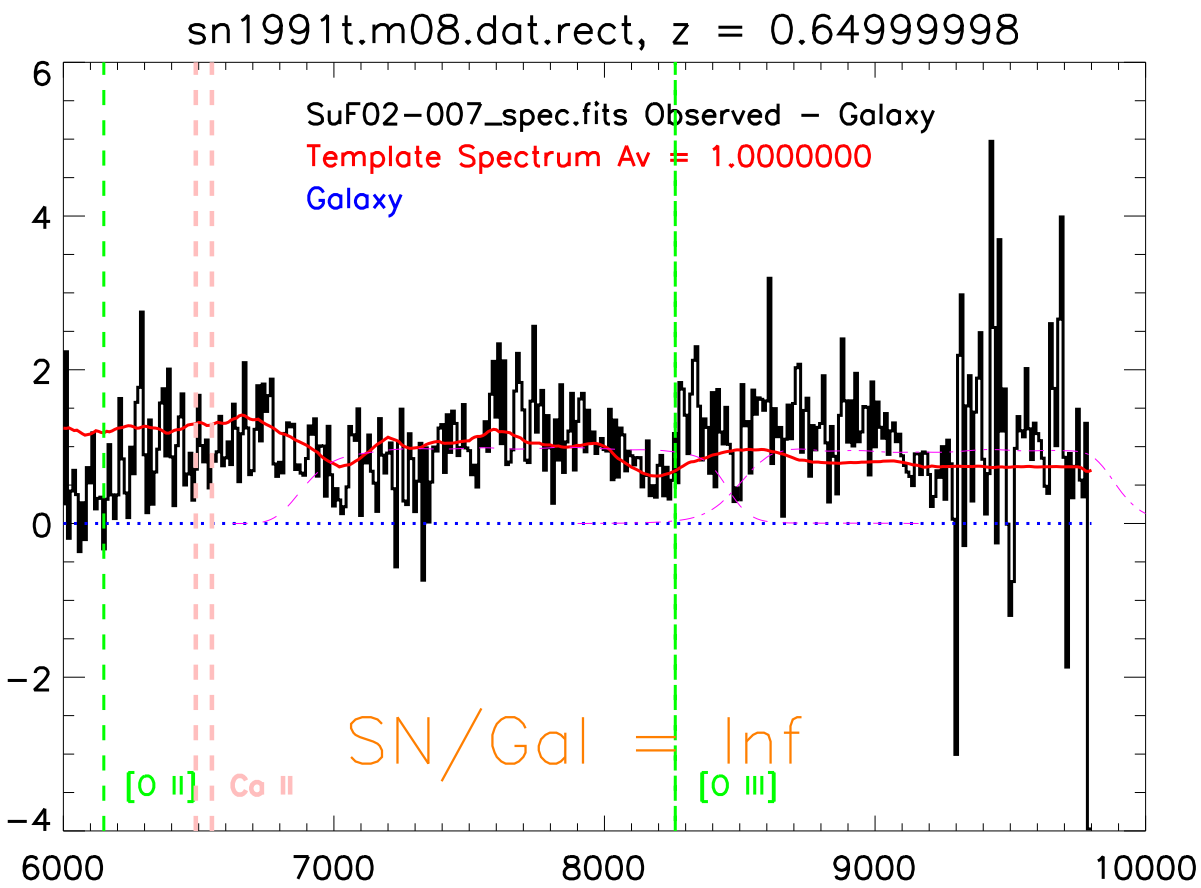

sn1994d.m05.dat.rect, z = 0.61000001
SuF02−007_spec.fits Observed − Galaxy
Template Spectrum Av = 1.0000000
Galaxy
SN/Gal = Inf
[O II]
Ca II
[O III]
6
4
2
0
−2
−4
6000
7000
8000
9000
10000


sn1991t.m07.dat.rect, z = 0.64999998
SuF02-007_spec.fits Observed - Galaxy
Template Spectrum Av = 1.0000000
Galaxy
SN/Gal = Inf
[O II]
Ca II
[O III]
6
4
2
0
−2
−4
6000
7000
8000
9000
10000

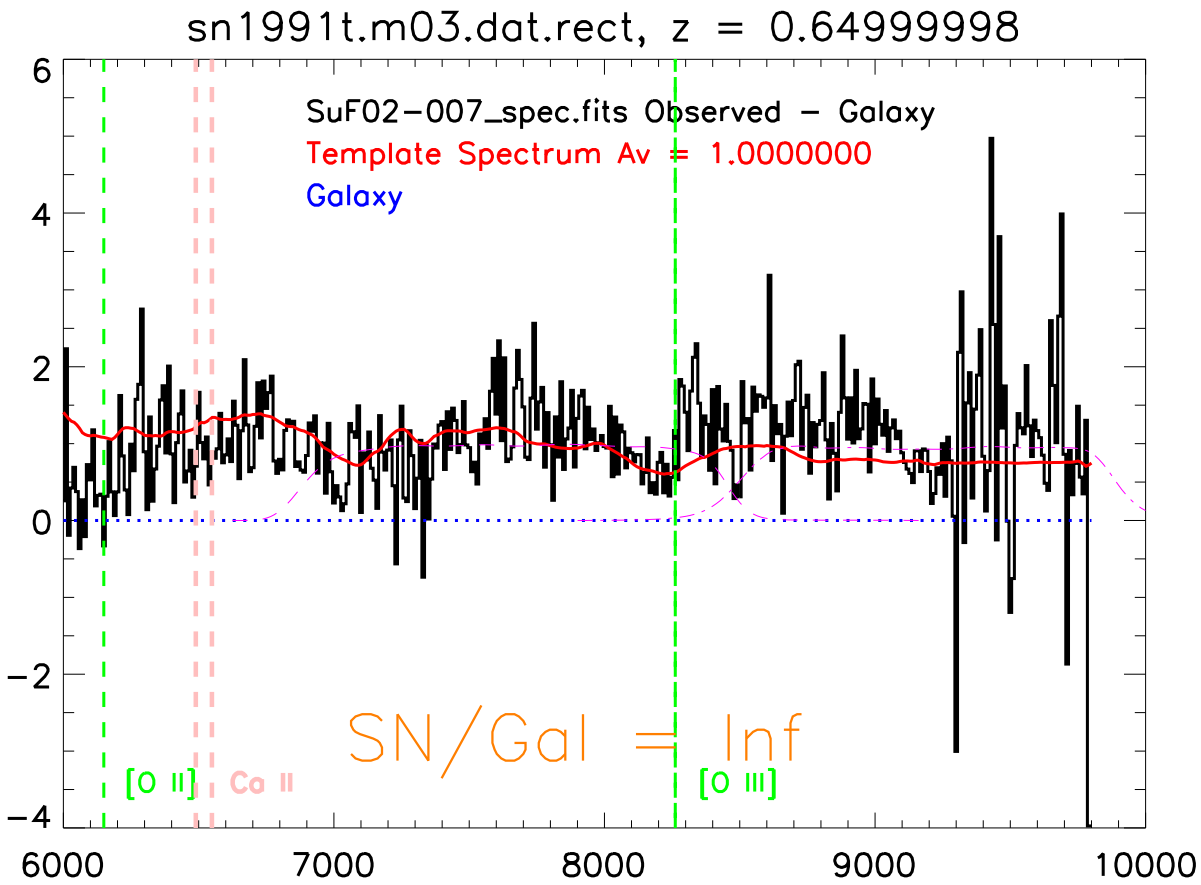
Mg II, I


sn1994d.m03.dat.rect, z = 0.65999997
SuF02-007_spec.fits Observed - Galaxy
Template Spectrum Av = 1.0000000
Galaxy
SN/Gal = Inf
[O II]
Ca II
[O III]
6
4
2
0
−2
−4
6000
7000
8000
9000
10000

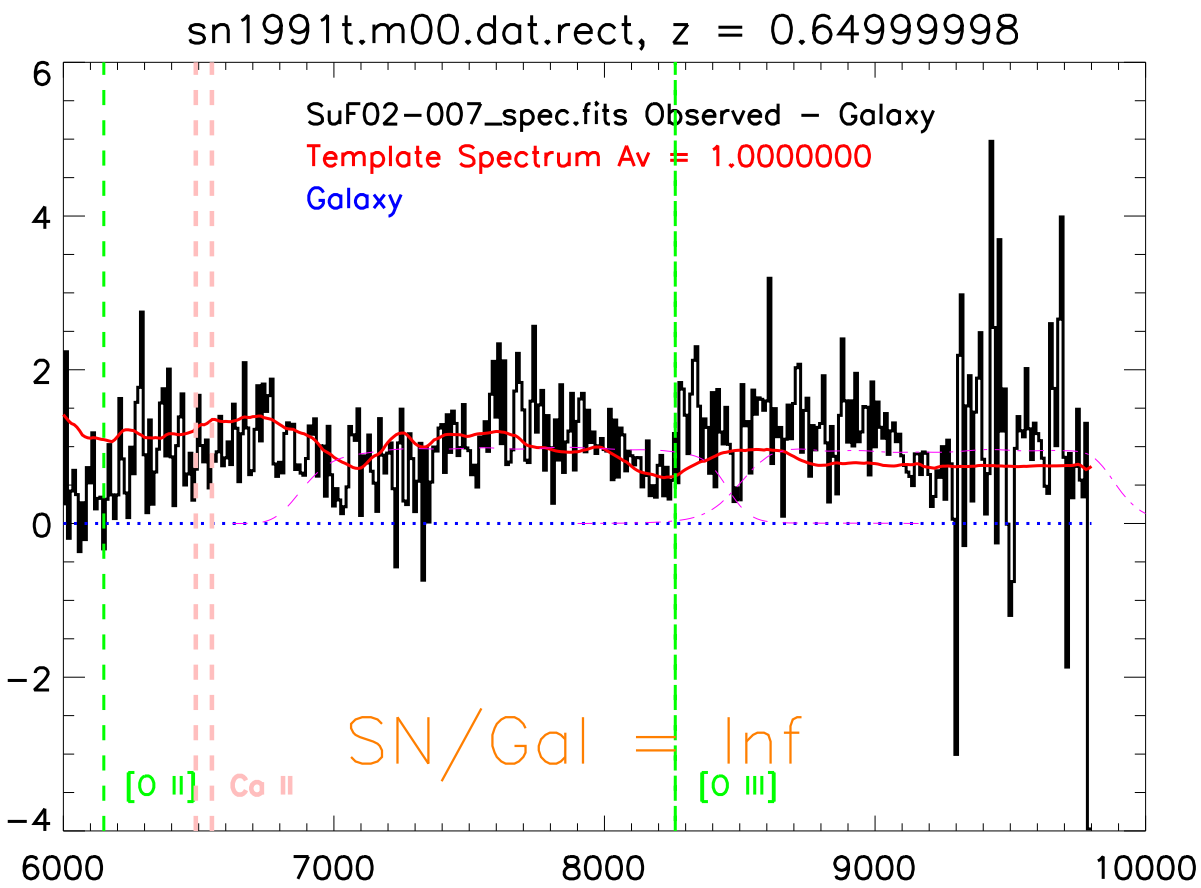
Mg II, I


sn1991t.m08.dat.rect, z = 0.64999998
SuF02-007_spec.fits Observed - Galaxy
Template Spectrum Av = 1.0000000
Galaxy
SN/Gal = Inf
[O II]
Ca II
[O III]
6
4
2
0
−2
−4
6000
7000
8000
9000
10000

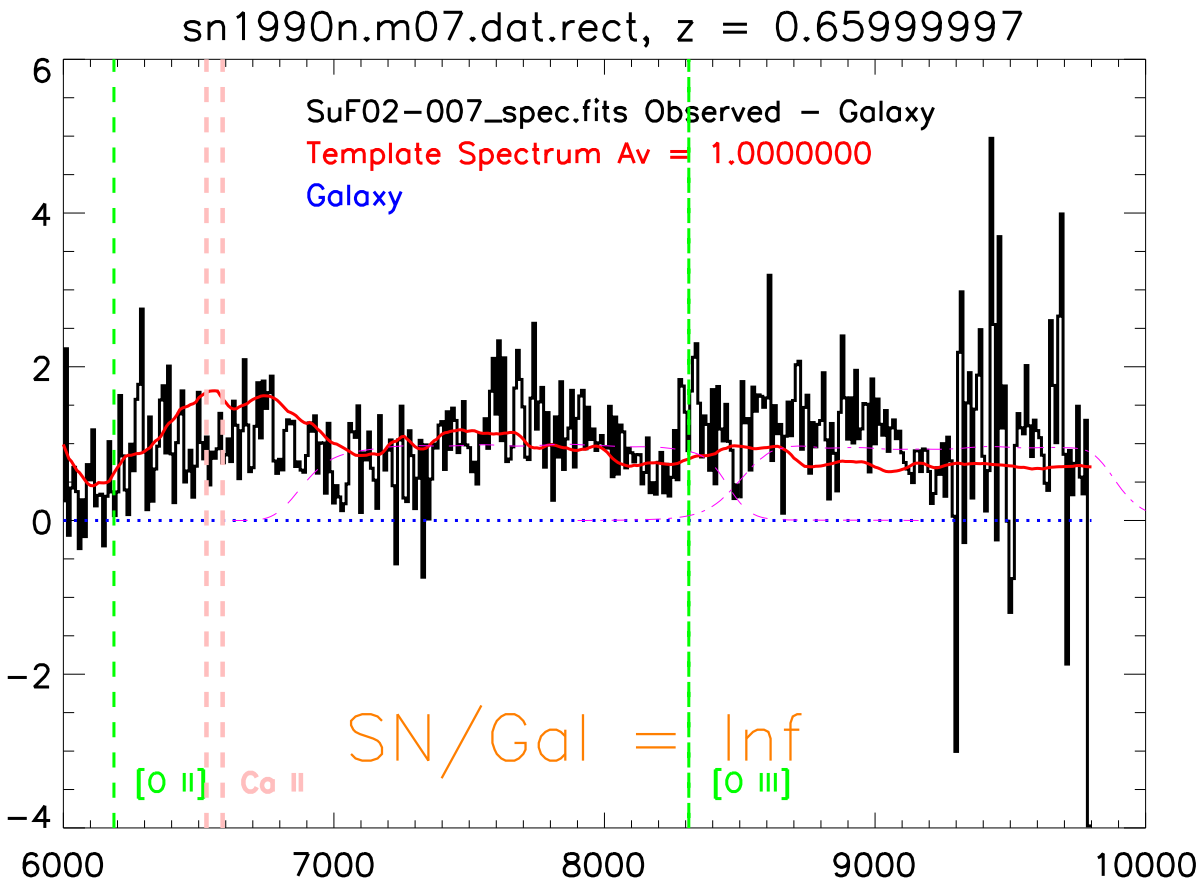
Mg II, I


sn1991t.m03.dat.rect, z = 0.64999998
SuF02-007_spec.fits Observed - Galaxy
Template Spectrum Av = 1.0000000
Galaxy
SN/Gal = Inf
[O II]
Ca II
[O III]
6
4
2
0
−2
−4
6000
7000
8000
9000
10000

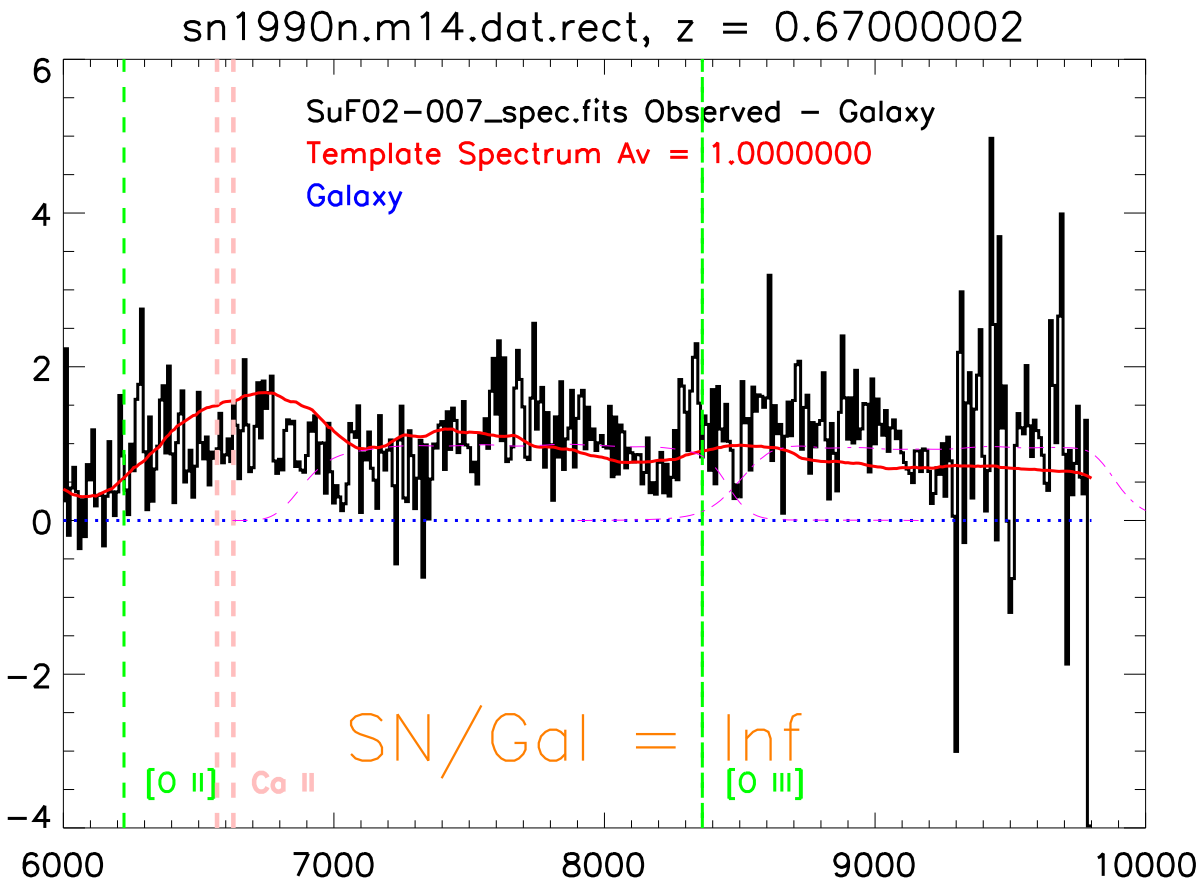
Mg II, I


sn1991t.m00.dat.rect, z = 0.64999998
SuF02-007_spec.fits Observed - Galaxy
Template Spectrum Av = 1.0000000
Galaxy
SN/Gal = Inf
[O II]
Ca II
[O III]
6
4
2
0
−2
−4
6000
7000
8000
9000
10000

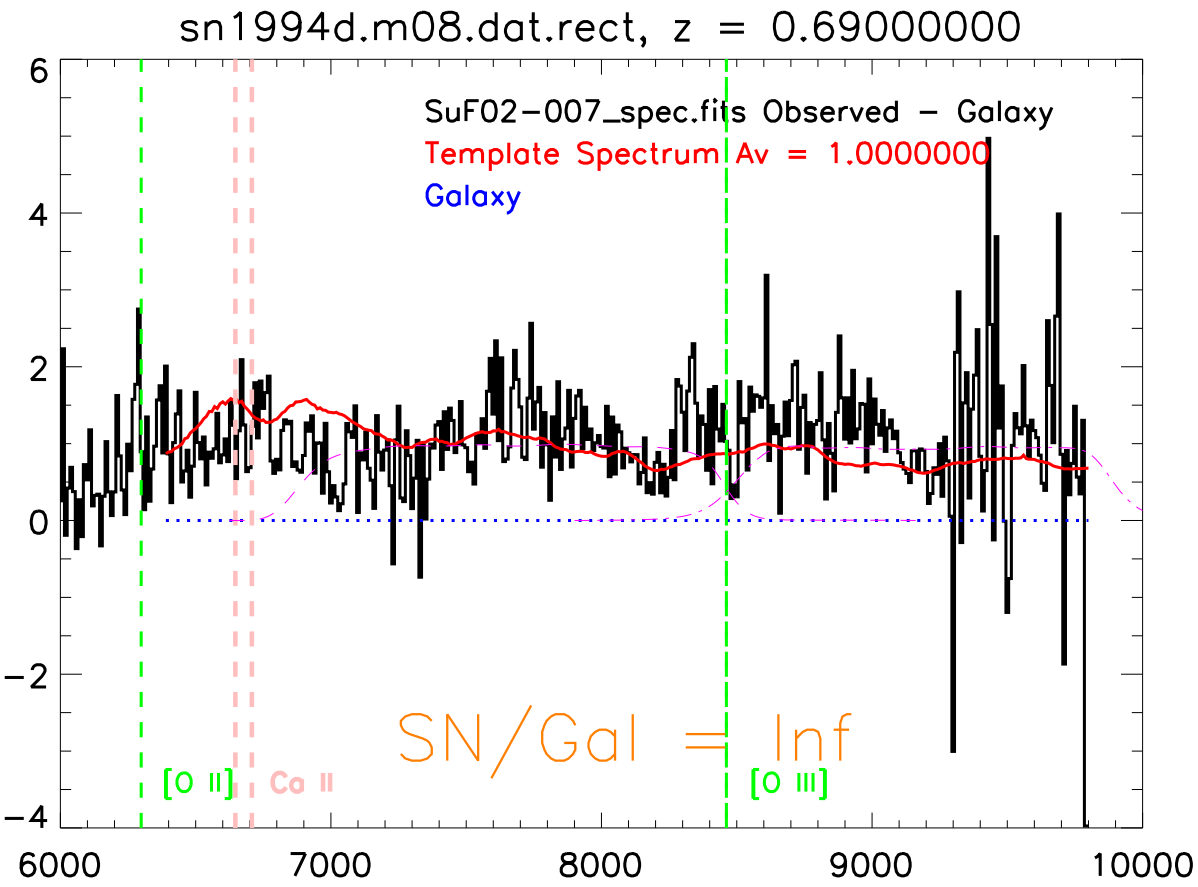
Mg II, I


sn1990n.m07.dat.rect, z = 0.65999997
SuF02-007_spec.fits Observed - Galaxy
Template Spectrum Av = 1.0000000
Galaxy
SN/Gal = Inf
[O II]
Ca II
[O III]
6
4
2
0
−2
−4
6000
7000
8000
9000
10000

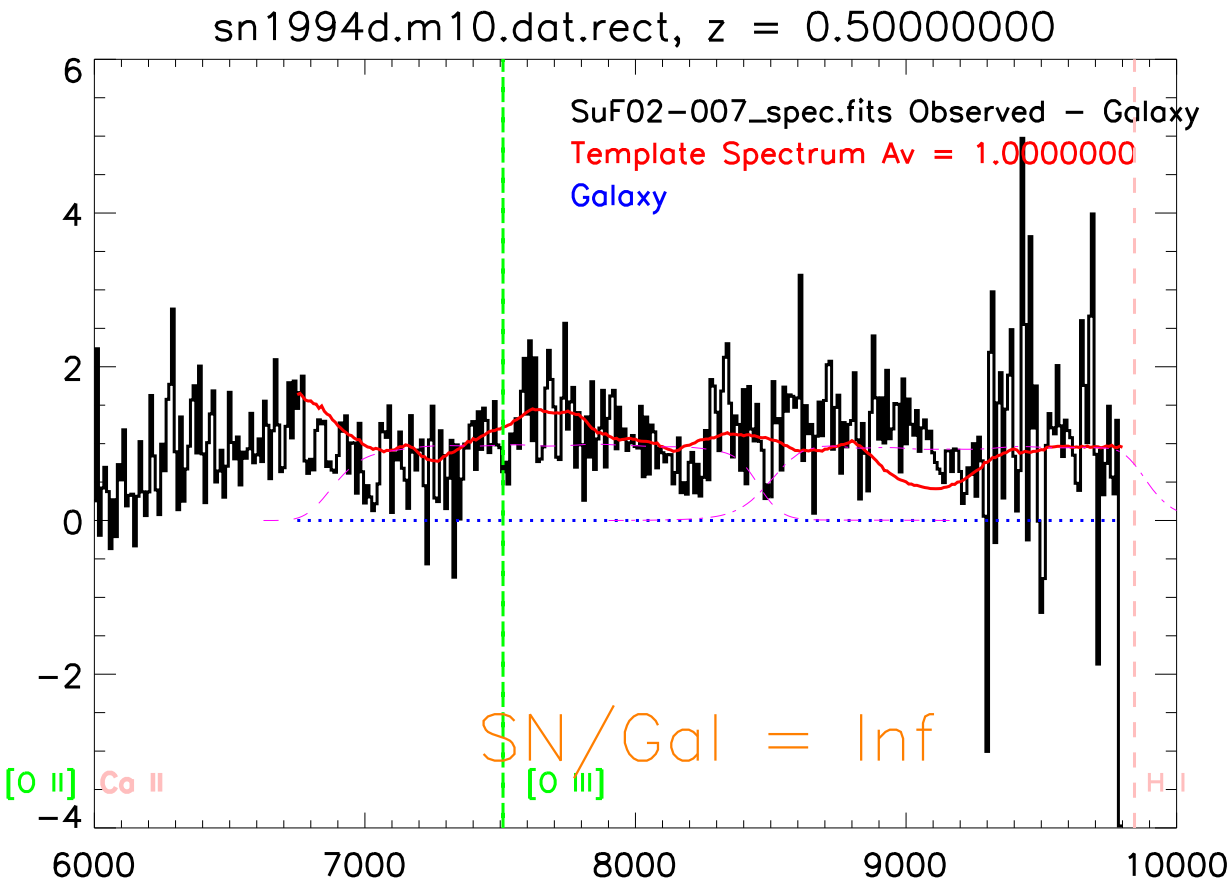
Mg II, I

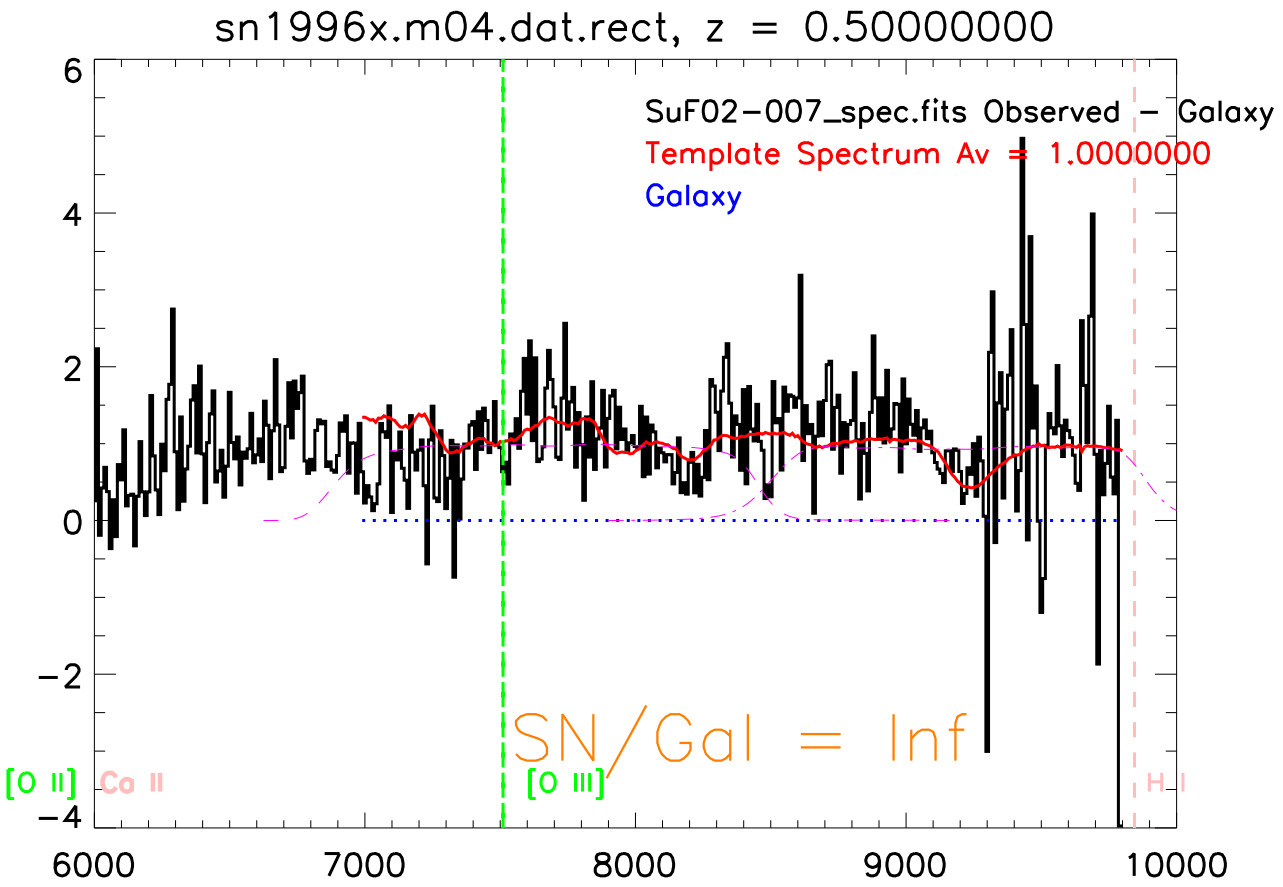

sn1990n.m14.dat.rect, z = 0.67000002
SuF02-007_spec.fits Observed − Galaxy
Template Spectrum Av = 1.0000000
Galaxy
SN/Gal = Inf
[O II]
Ca II
[O III]
6
4
2
0
−2
−4
6000
7000
8000
9000
10000

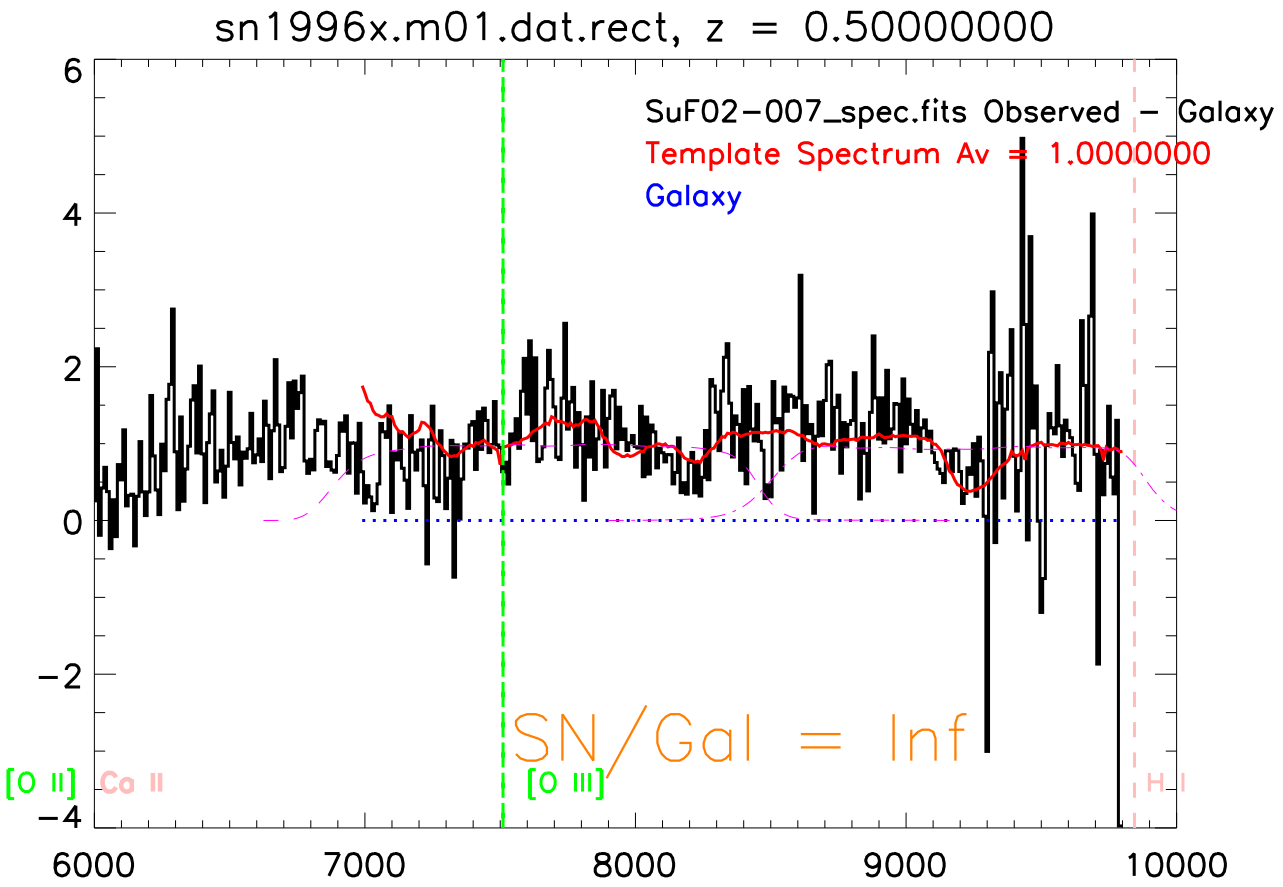
Mg II, I

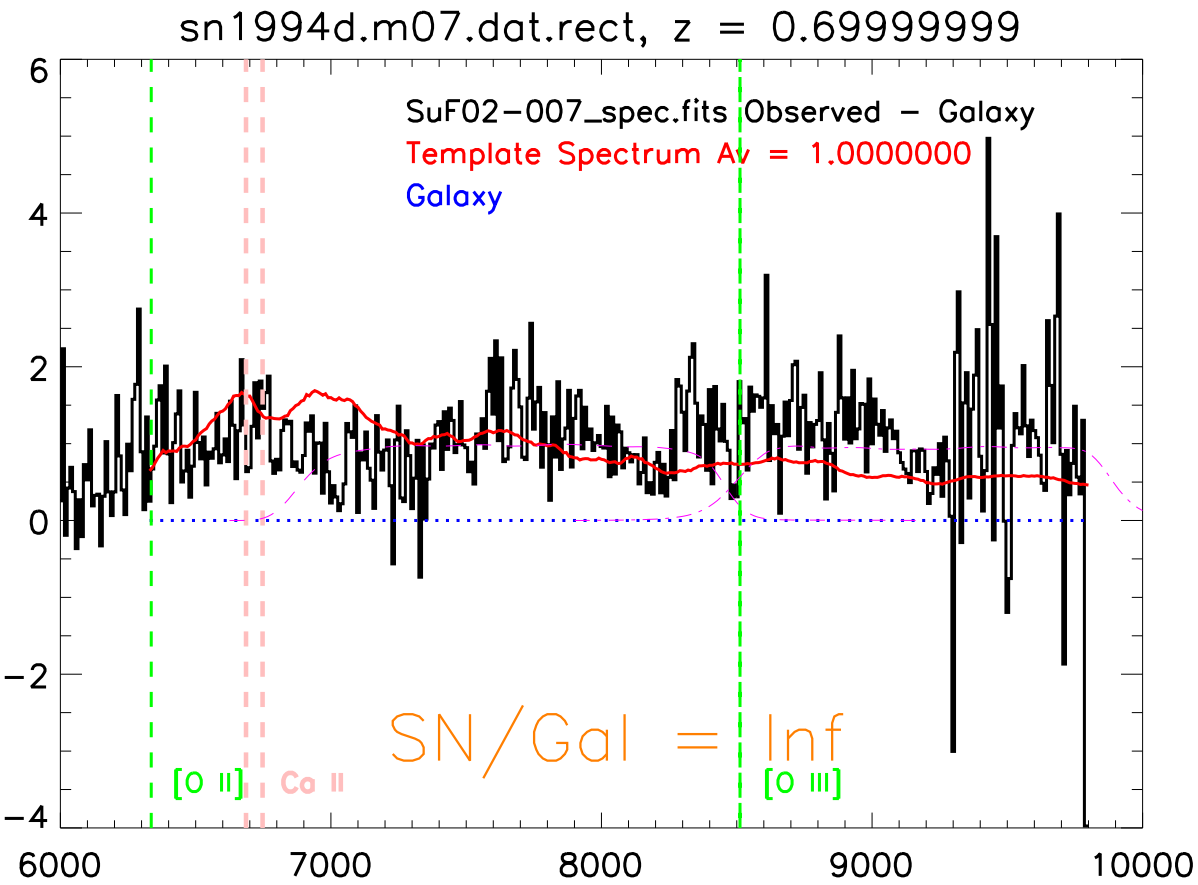

sn1994d.m08.dat.rect, z = 0.69000000
SuF02-007_spec.fits Observed - Galaxy
Template Spectrum Av = 1.0000000
Galaxy
SN/Gal = Inf
[O II]
Ca II
[O III]
6
4
2
0
-2
-4
6000
7000
8000
9000
10000

Mg II, I

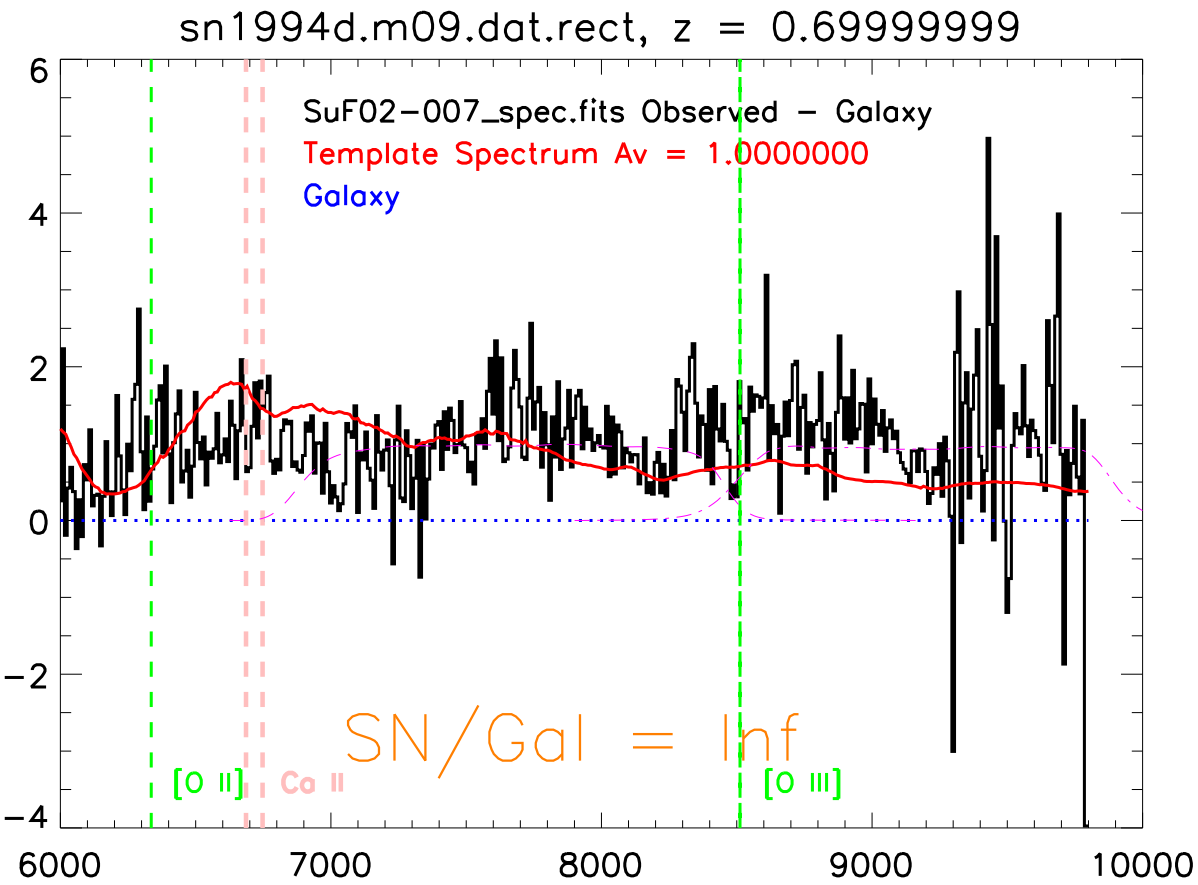

sn1994d.m10.dat.rect, z = 0.50000000
SuF02-007_spec.fits Observed - Galaxy
Template Spectrum Av = 1.0000000
Galaxy
S/N Gal = Inf
[O II]
Ca II
[O III]
H I
6
4
2
0
-2
-4
6000
7000
8000
9000
10000


sn1996x.m04.dat.rect, z = 0.50000000
SuF02-007_spec.fits Observed − Galaxy
Template Spectrum Av = 1.0000000
Galaxy
SN/Gal = Inf
[O II]
Ca II
[O III]
H I
6
4
2
0
−2
−4
6000
7000
8000
9000
10000

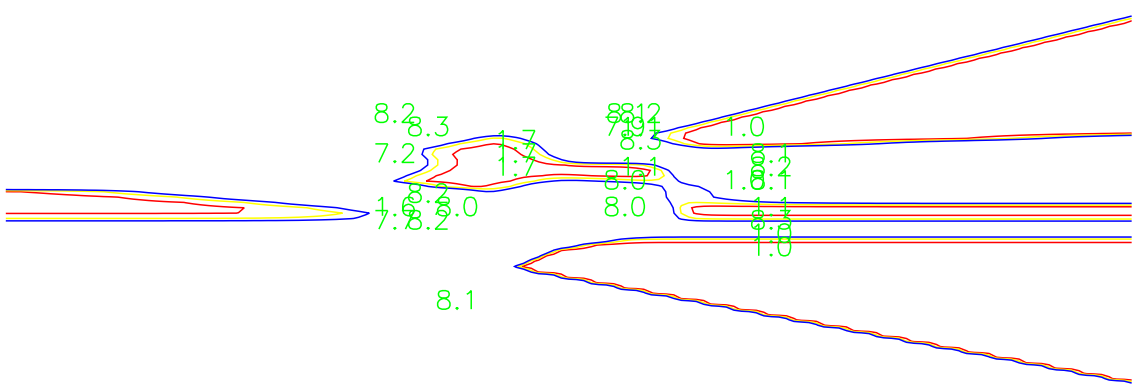

sn1996x.m01.dat.rect, z = 0.50000000
SuF02-007_spec.fits Observed − Galaxy
Template Spectrum Av = 1.0000000
Galaxy
SN/Gal = Inf
[O II]
Ca II
[O III]
H I
6
4
2
0
−2
−4
6000
7000
8000
9000
10000

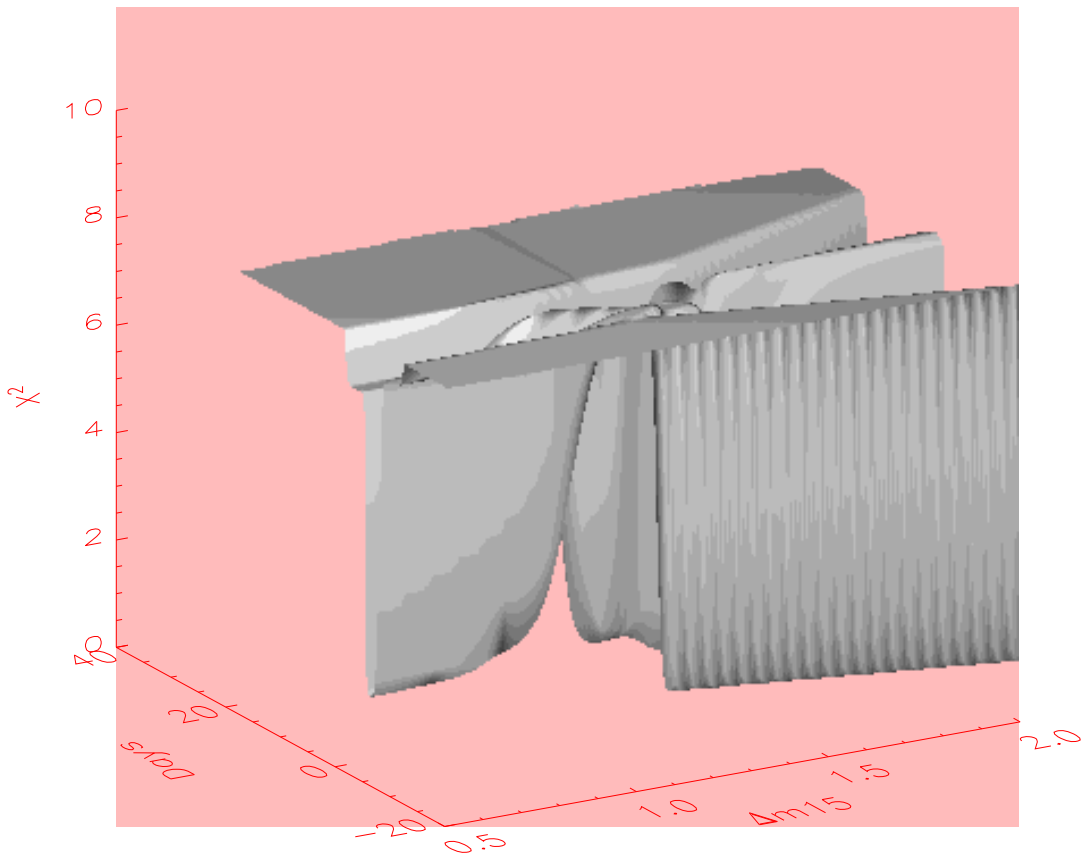

sn1994d.m07.dat.rect, z = 0.69999999
SuF02-007_spec.fits Observed − Galaxy
Template Spectrum Av = 1.0000000
Galaxy
SN/Gal = Inf
[O II]
Ca II
[O III]
6
4
2
0
−2
−4
6000
7000
8000
9000
10000

Mg II, I

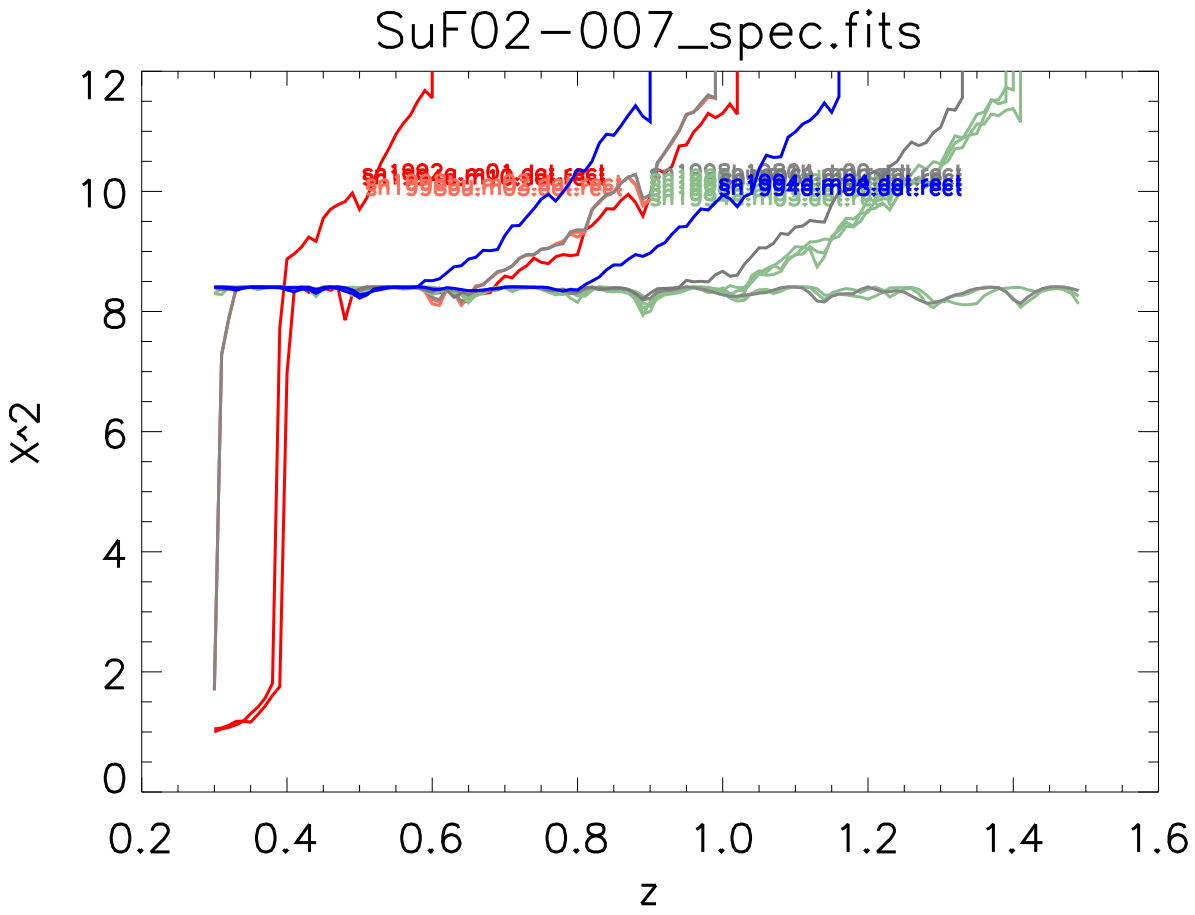

sn1994d.m09.dat.rect, z = 0.69999999
SuF02-007_spec.fits Observed − Galaxy
Template Spectrum Av = 1.0000000
Galaxy
SN/Gal = Inf
[O II]
Ca II
[O III]
6
4
2
0
−2
−4
6000
7000
8000
9000
10000

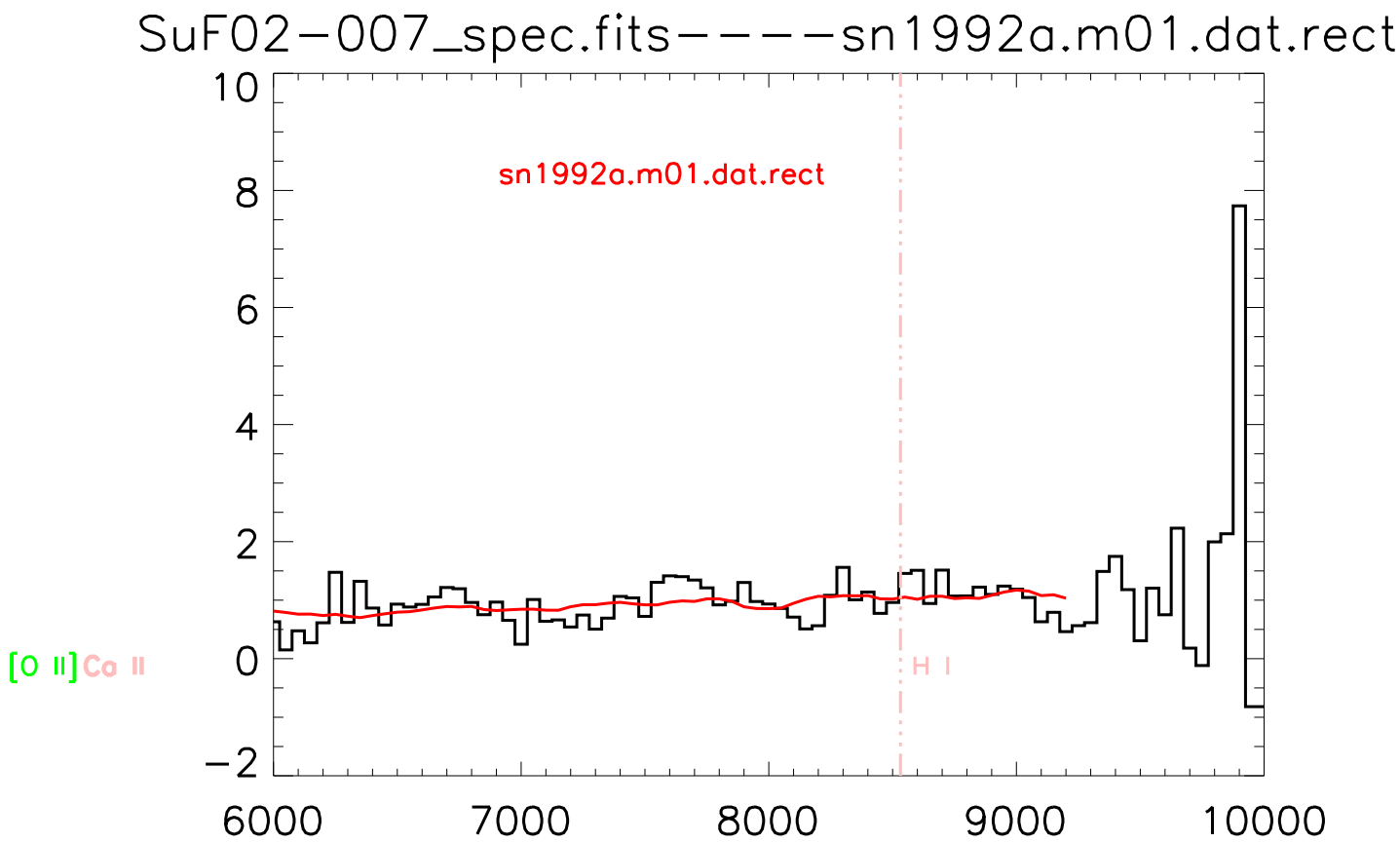
Mg II, I

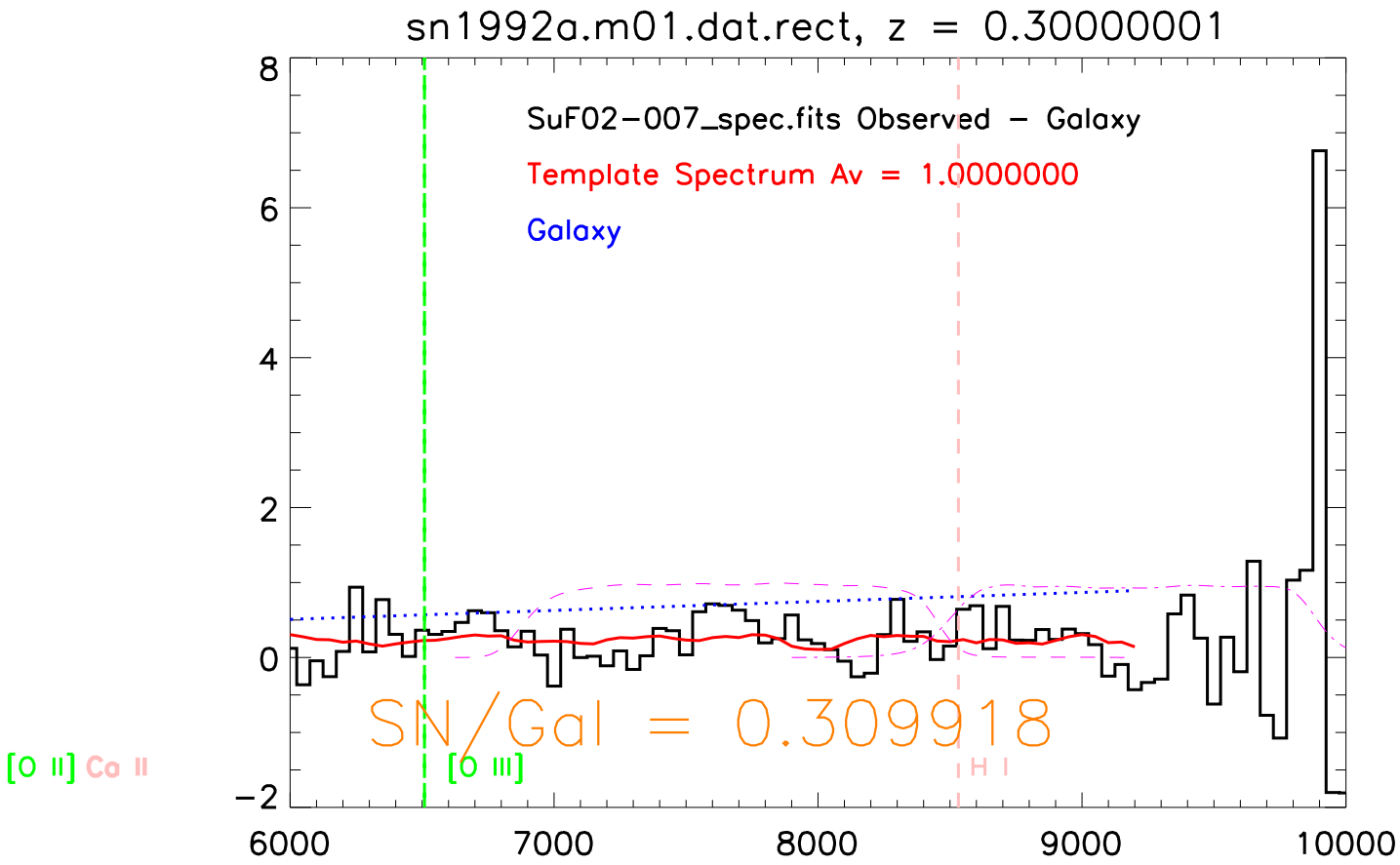

8.2
8.3
7.2
1.7
1.7
8.0
8.0
1.0
8.1
8.1
8.0
8.0
1.0
8.1

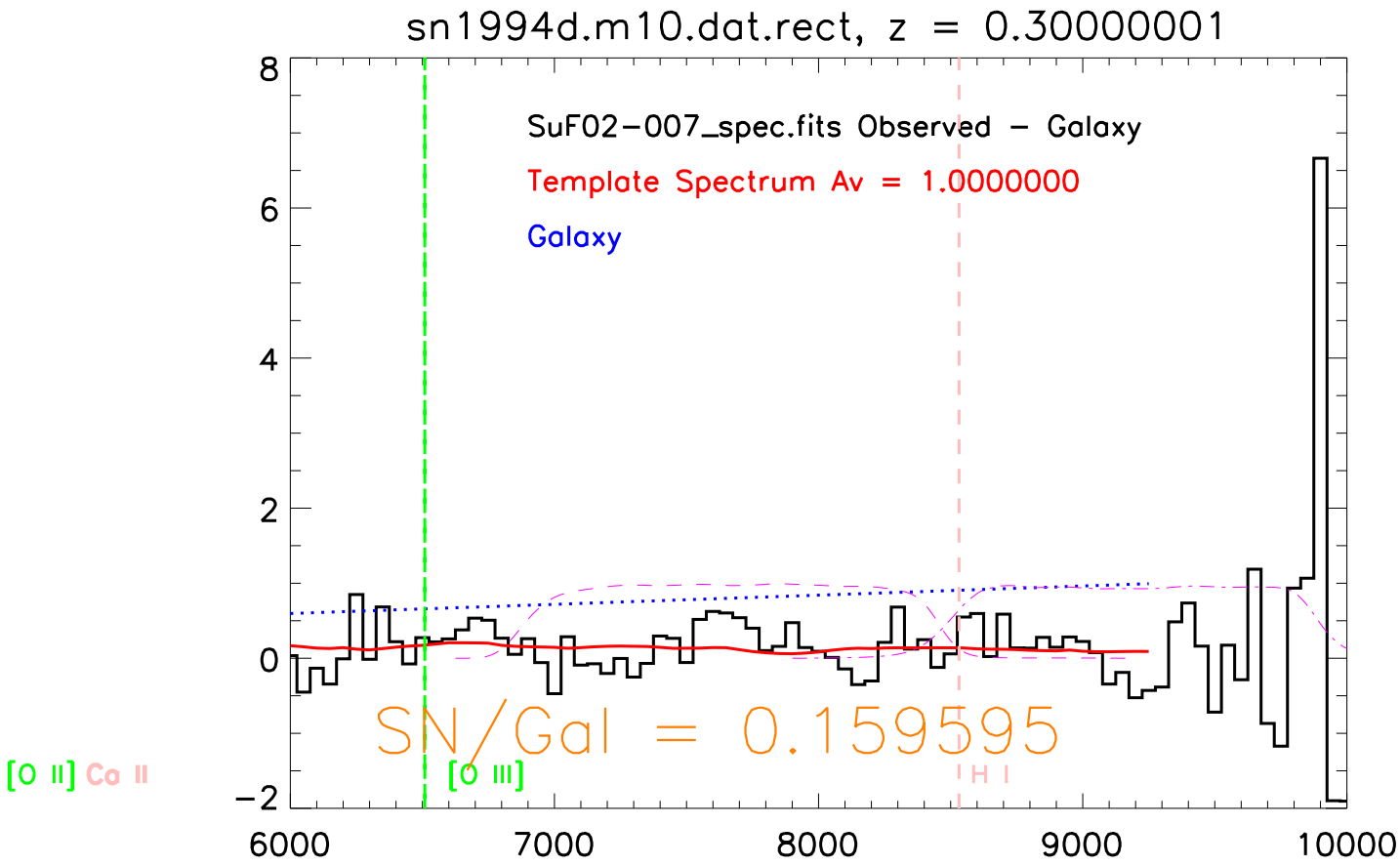


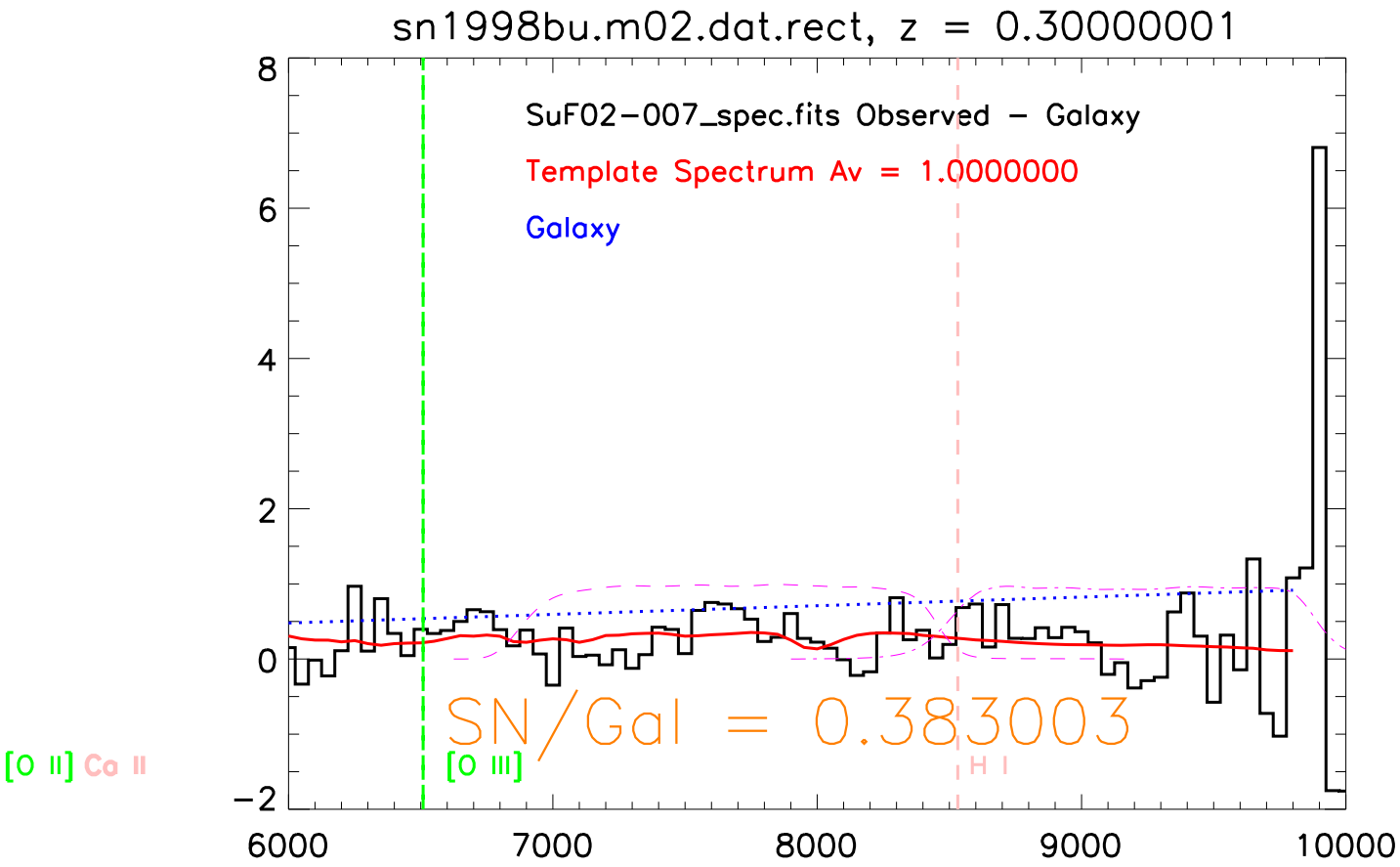
10
8
6
4
2
0
χ^2
40
20
0
−20
Days
0.5
1.0
1.5
2.0
Δm15

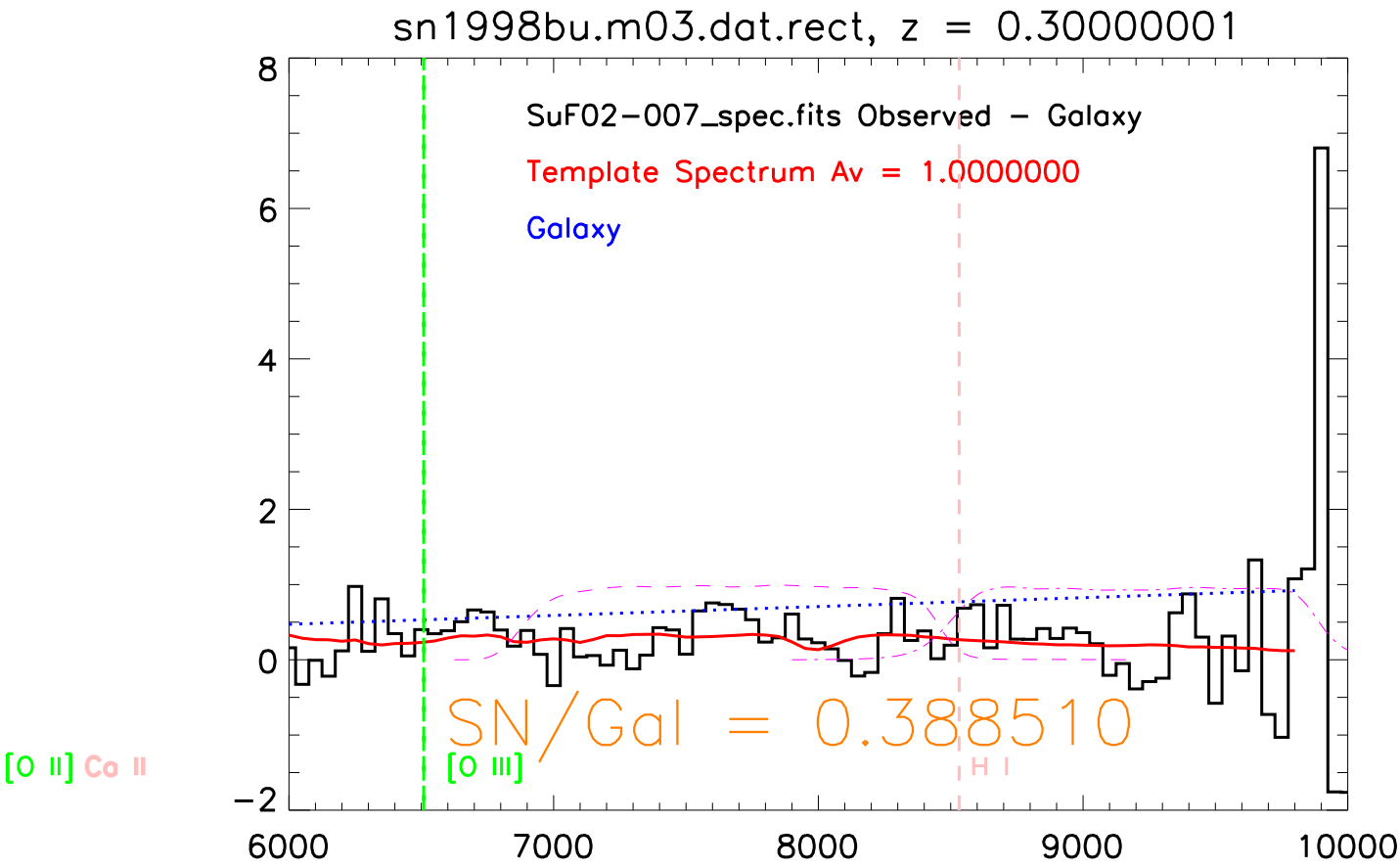

SuF02-007_spec.fits
sn1992a.m04.det.reet
sn1994d.m04.det.reet
X^2
z
0
2
4
6
8
10
12
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6

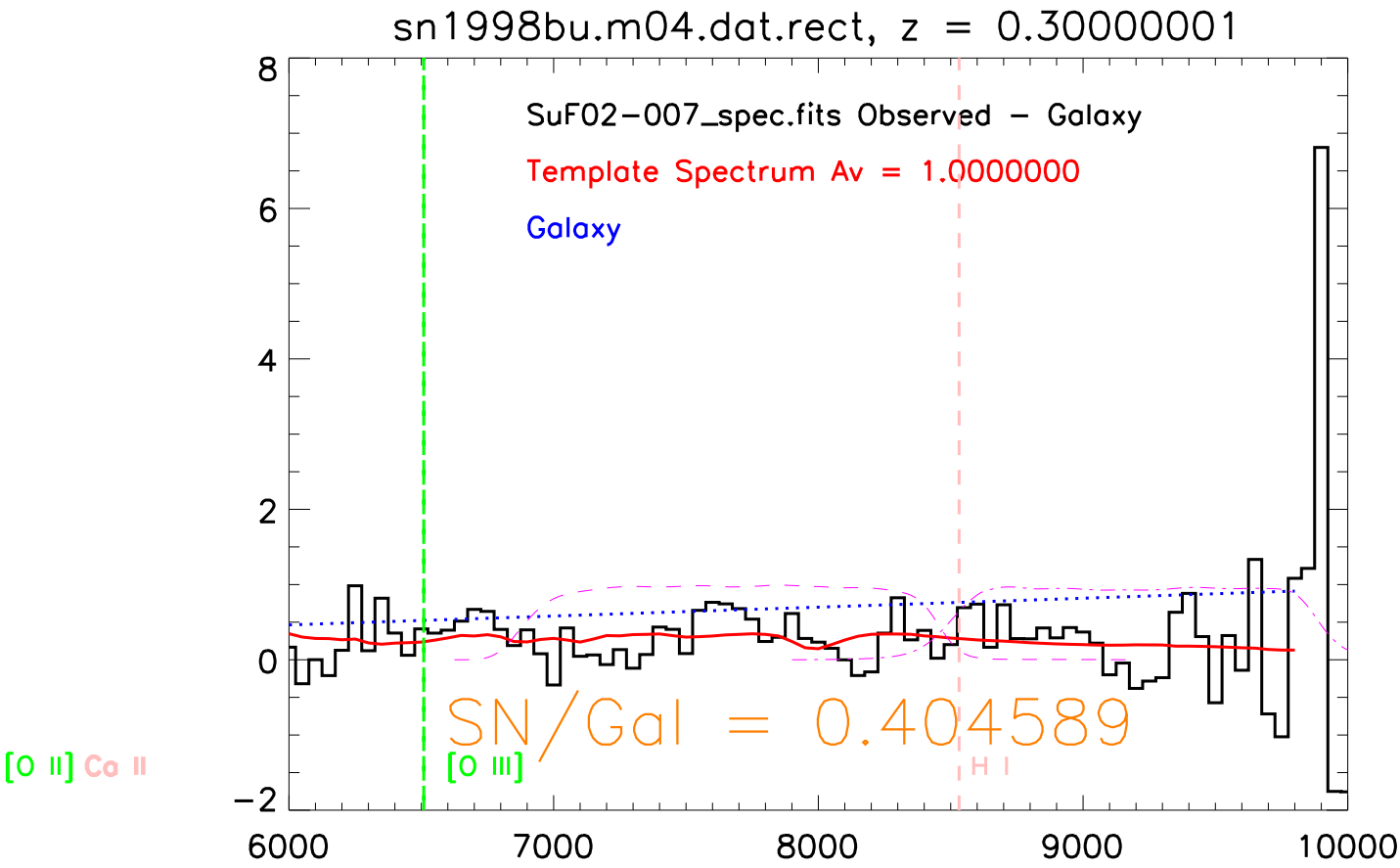

SuF02−007_spec.fits−−−−sn1992a.m01.dat.rect
sn1992a.m01.dat.rect
[O II]
Ca II
H I
10
8
6
4
2
0
−2
6000
7000
8000
9000
10000

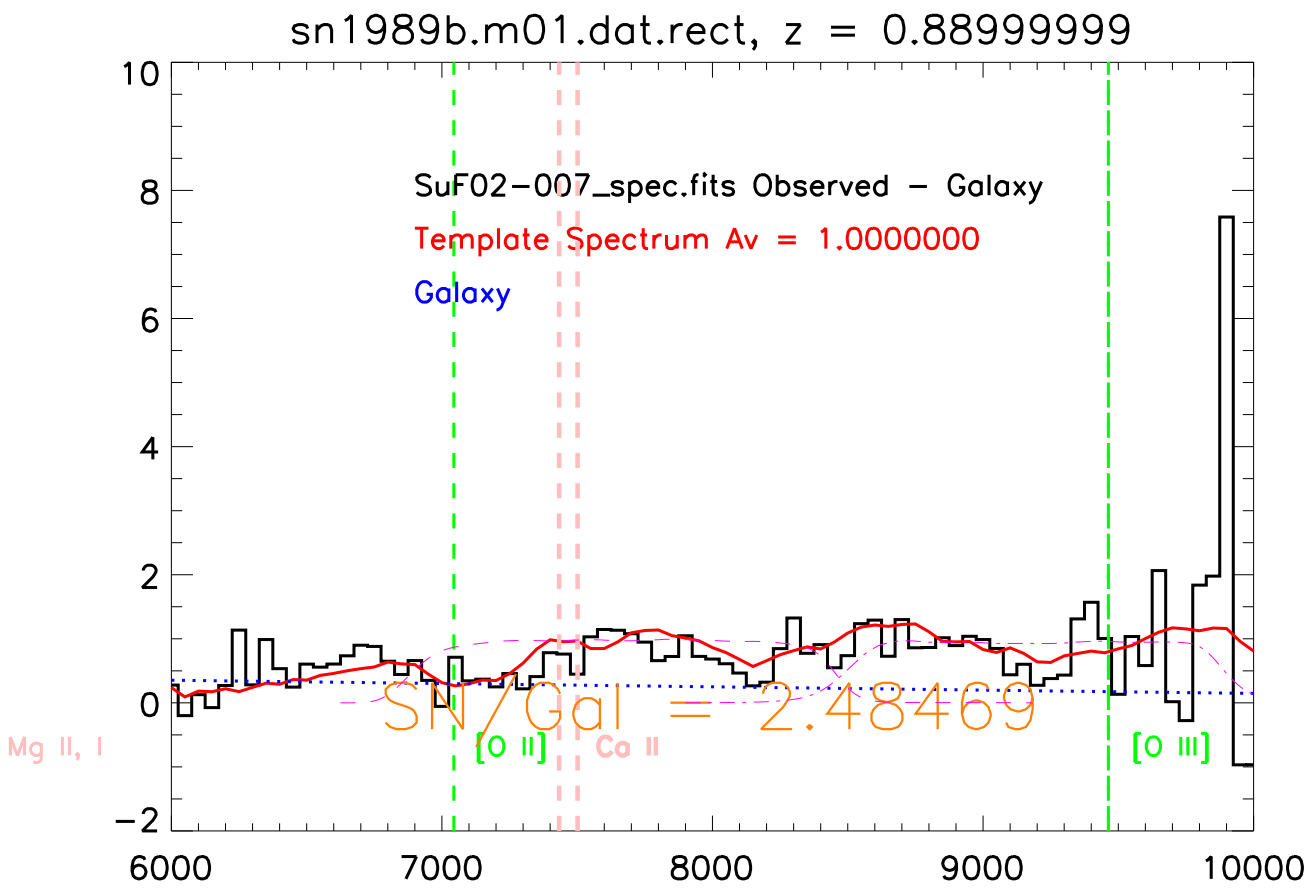

sn1992a.m01.dat.rect, z = 0.30000001
SuF02-007_spec.fits Observed - Galaxy
Template Spectrum Av = 1.0000000
Galaxy
SN/Gal = 0.309918
[O II] Ca II
[O III]
H I
8
6
4
2
0
-2
6000
7000
8000
9000
10000

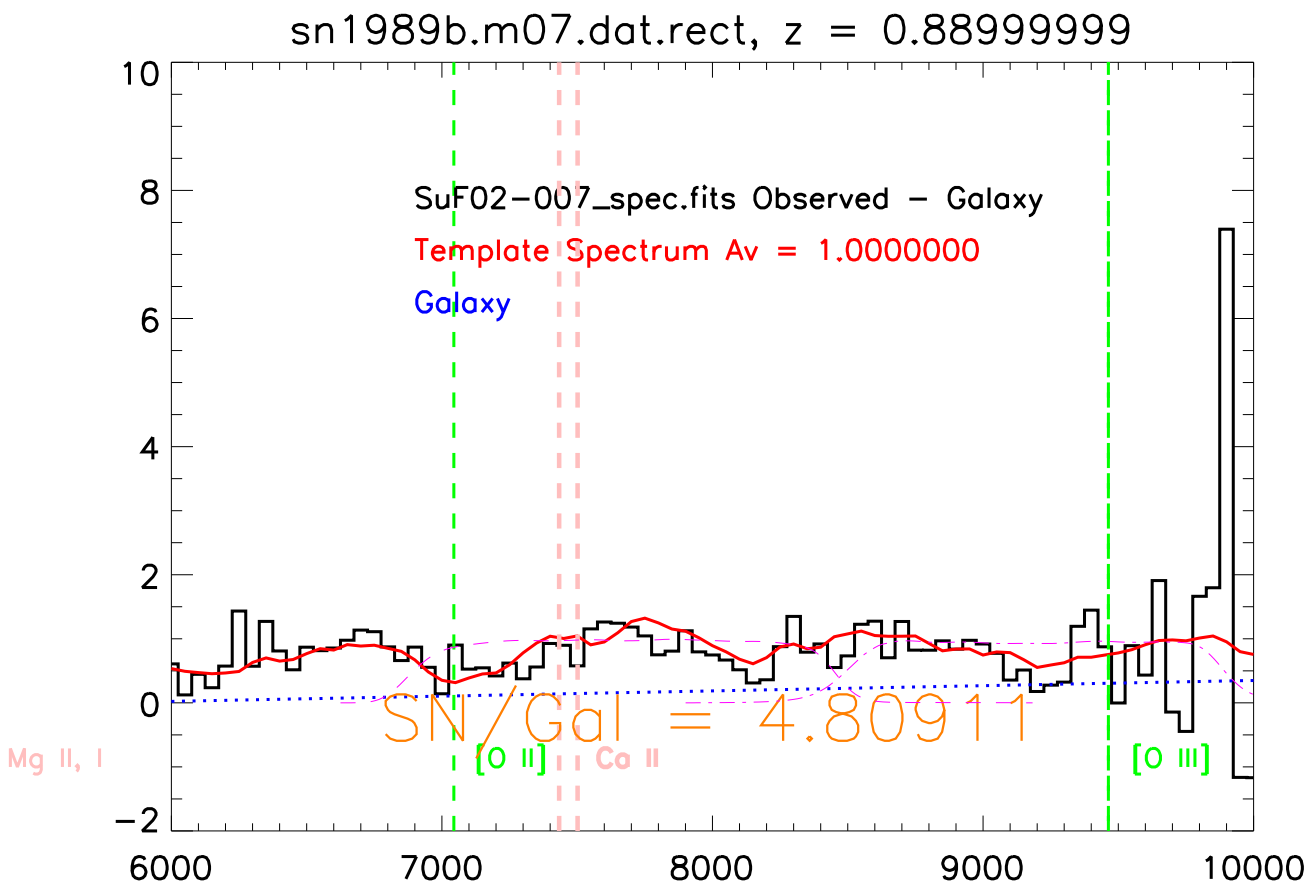

sn1994d.m10.dat.rect, z = 0.30000001
SuF02-007_spec.fits Observed - Galaxy
Template Spectrum Av = 1.0000000
Galaxy
SN/Gal = 0.159595
[O II]
Ca II
[O III]
H I
8
6
4
2
0
-2
6000
7000
8000
9000
10000

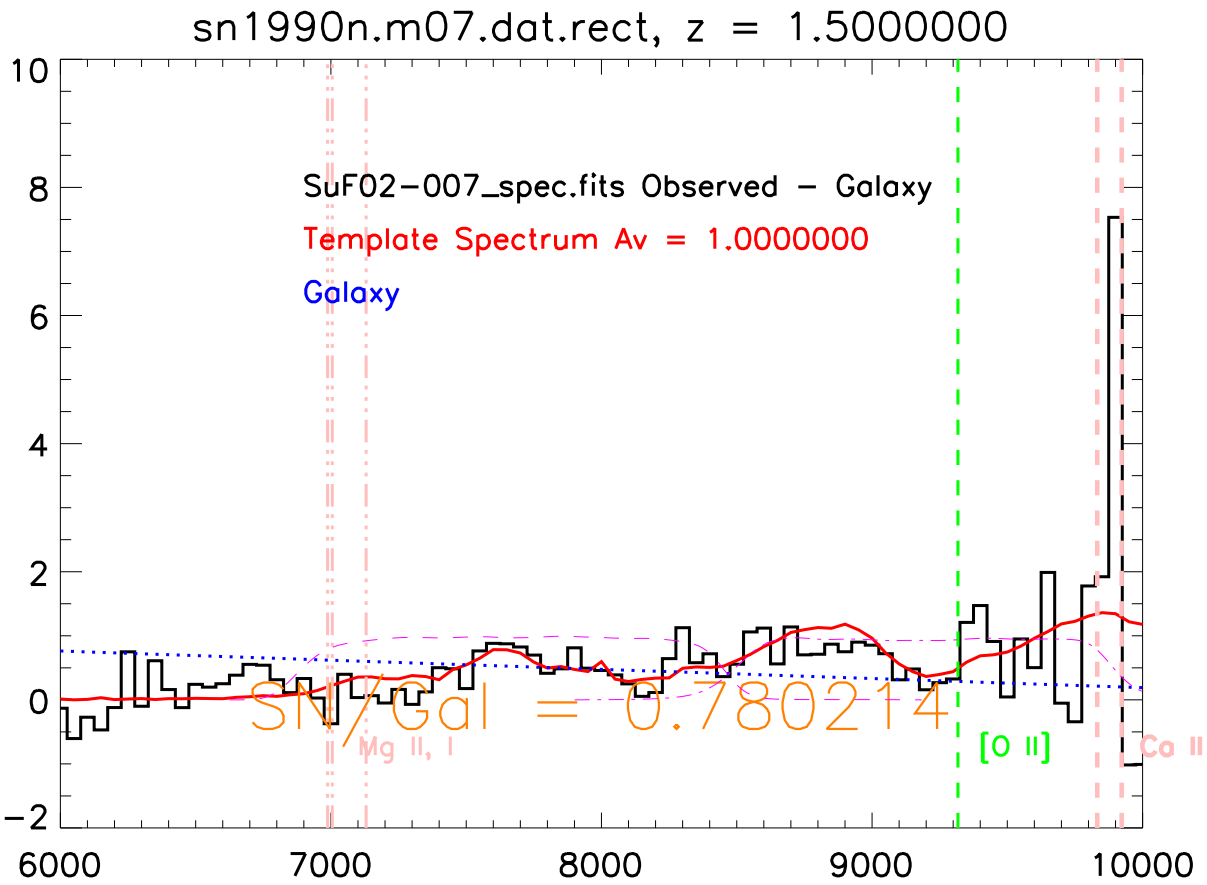

sn1998bu.m02.dat.rect, z = 0.30000001
SuF02-007_spec.fits Observed - Galaxy
Template Spectrum Av = 1.0000000
Galaxy
SN/Gal = 0.383003
[O II]
Ca II
[O III]
H I
8
6
4
2
0
-2
6000
7000
8000
9000
10000

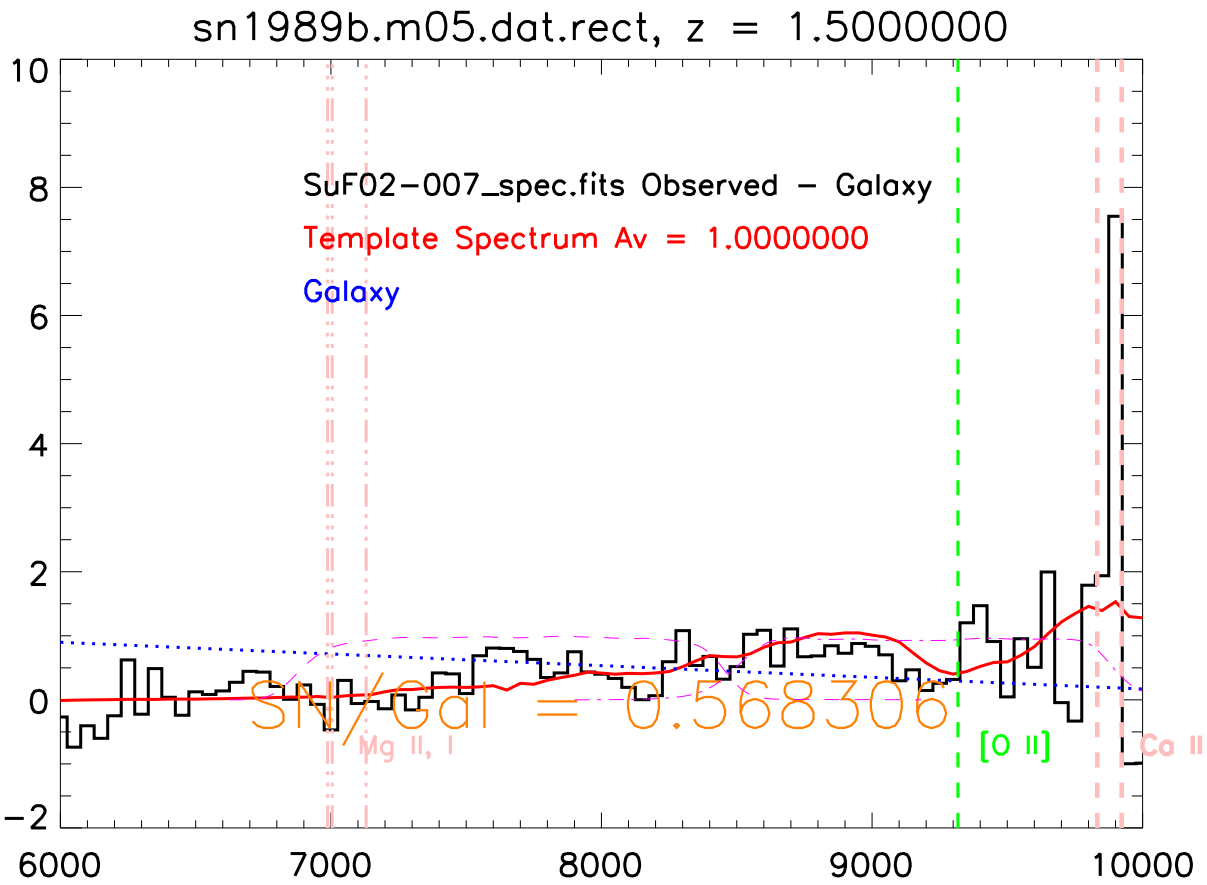

sn1998bu.m03.dat.rect, z = 0.30000001
SuF02-007_spec.fits Observed - Galaxy
Template Spectrum Av = 1.0000000
Galaxy
SN/Gal = 0.388510
[O II] Ca II
[O III]
H I
8
6
4
2
0
-2
6000
7000
8000
9000
10000

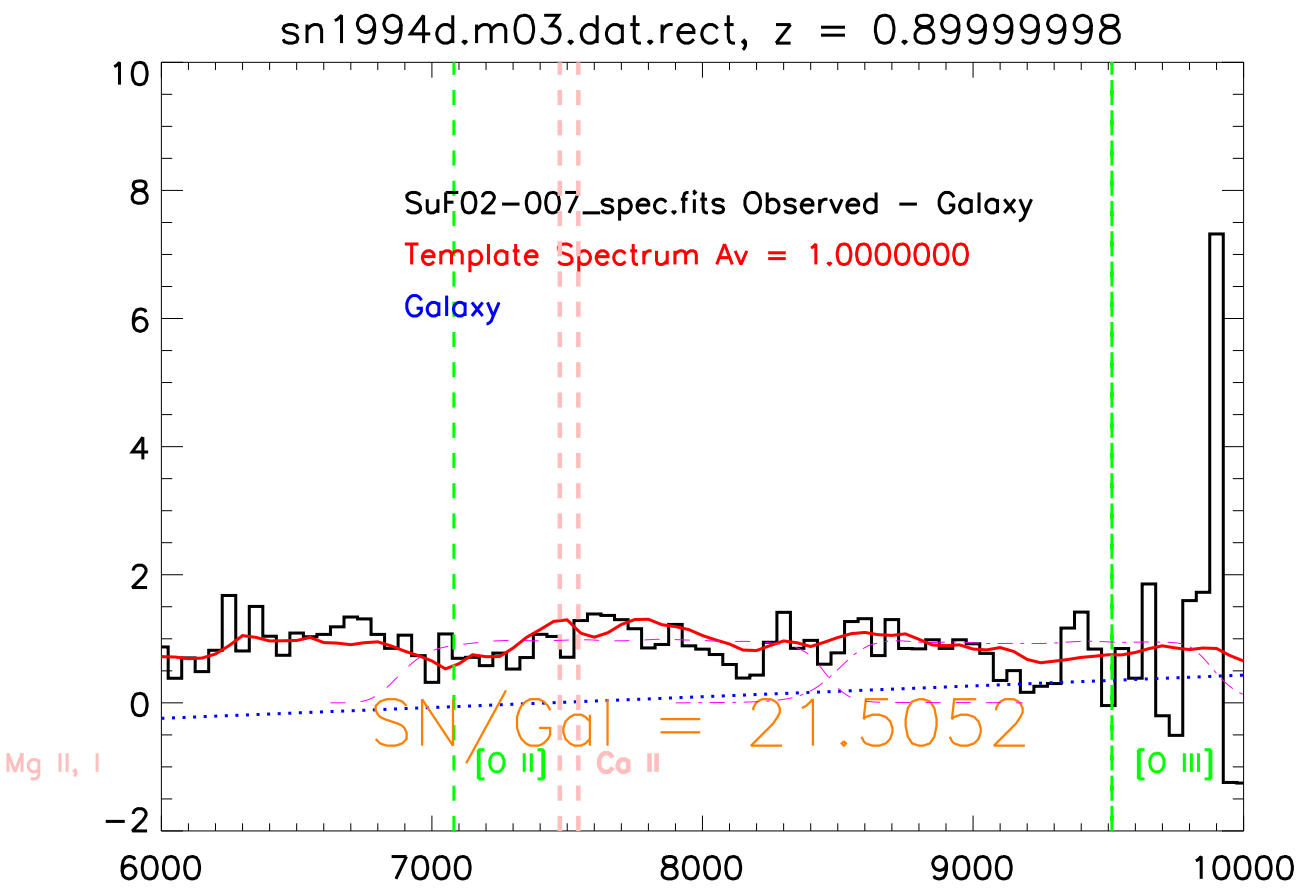

sn1998bu.m04.dat.rect, z = 0.30000001
SuF02-007_spec.fits Observed - Galaxy
Template Spectrum Av = 1.0000000
Galaxy
SN/Gal = 0.404589
[O II]
Ca II
[O III]
H I
8
6
4
2
0
-2
6000
7000
8000
9000
10000

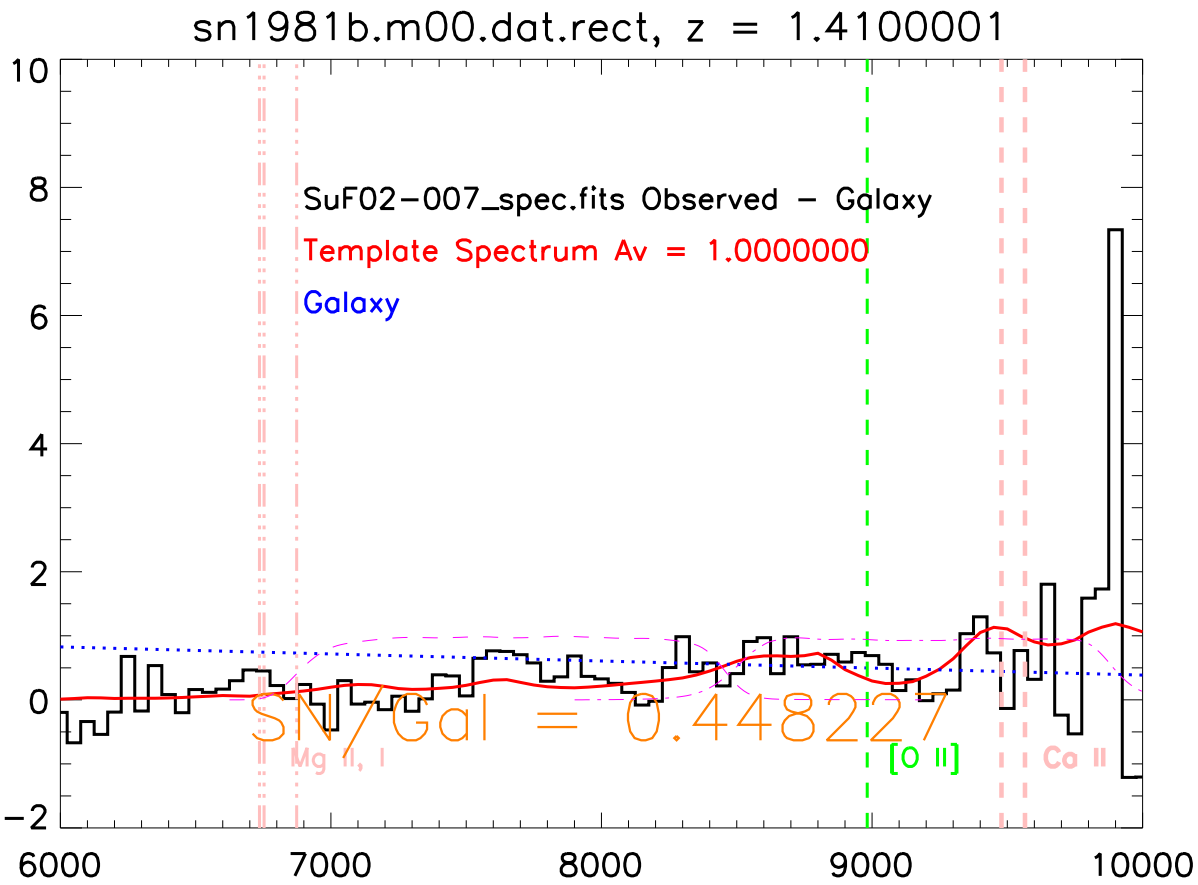

sn1989b.m01.dat.rect, z = 0.88999999
SuF02-007_spec.fits Observed − Galaxy
Template Spectrum Av = 1.0000000
Galaxy
SN/Gal = 2.48469
Mg II, I
[O II]
Ca II
[O III]
10
8
6
4
2
0
−2
6000
7000
8000
9000
10000

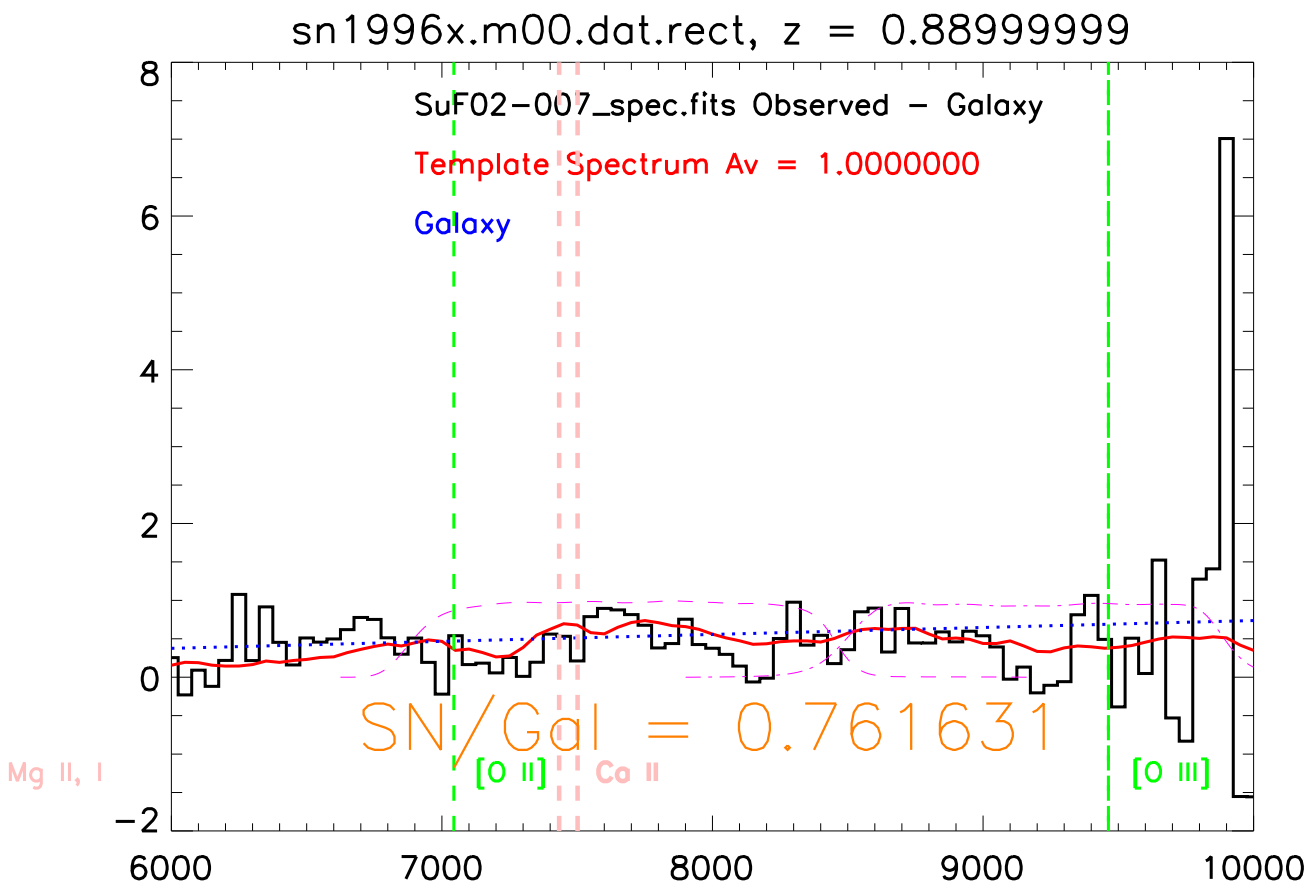

sn1989b.m07.dat.rect, z = 0.88999999
SuF02-007_spec.fits Observed − Galaxy
Template Spectrum Av = 1.0000000
Galaxy
SN/Gal = 4.80911
Mg II, I
[O II]
Ca II
[O III]
10
8
6
4
2
0
−2
6000
7000
8000
9000
10000

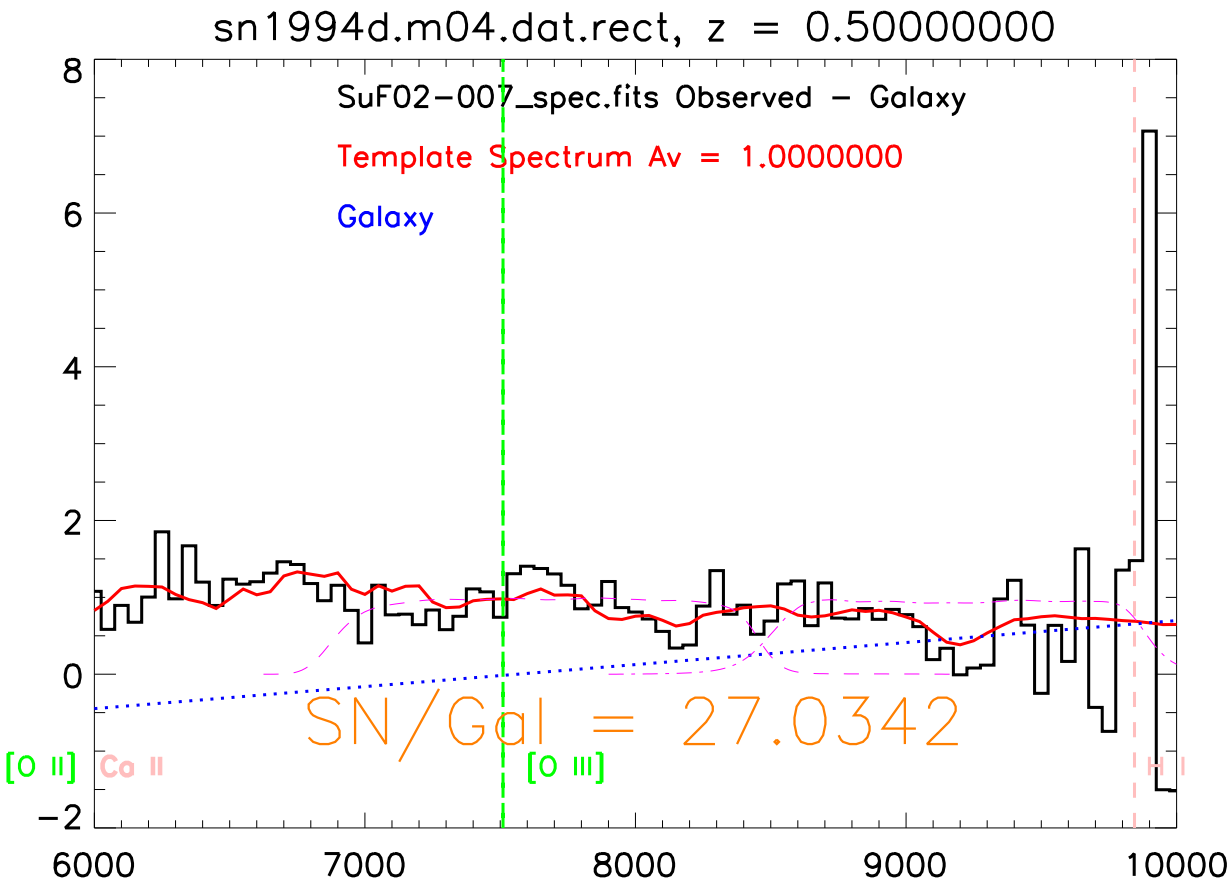

sn1990n.m07.dat.rect, z = 1.5000000
SuF02-007_spec.fits Observed − Galaxy
Template Spectrum Av = 1.0000000
Galaxy
S/N Gal = 0.780214
Mg II, I
[O II]
Ca II
10
8
6
4
2
0
−2
6000
7000
8000
9000
10000

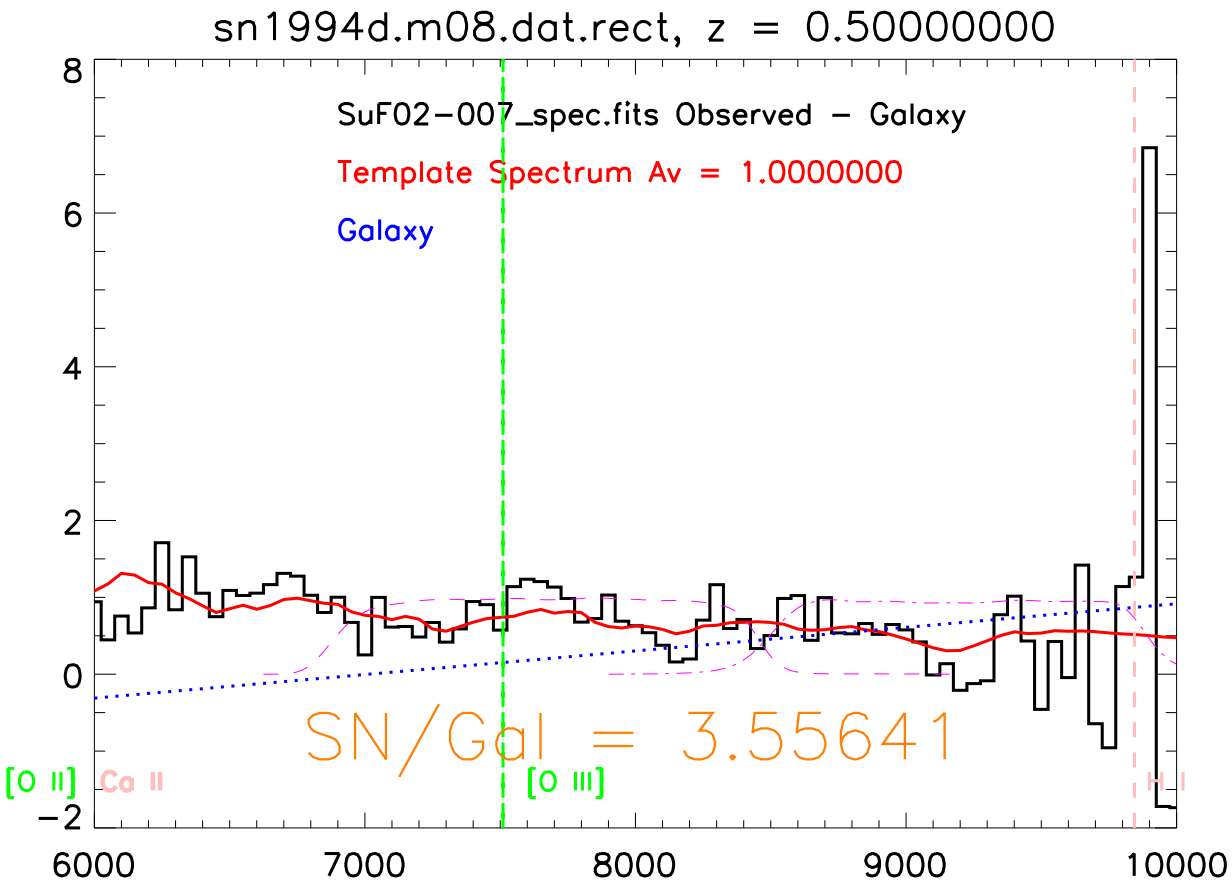

sn1989b.m05.dat.rect, z = 1.5000000
SuF02-007_spec.fits Observed - Galaxy
Template Spectrum Av = 1.0000000
Galaxy
S/N/Gal = 0.568306
Mg II, I
[O II]
Ca II
10
8
6
4
2
0
-2
6000
7000
8000
9000
10000

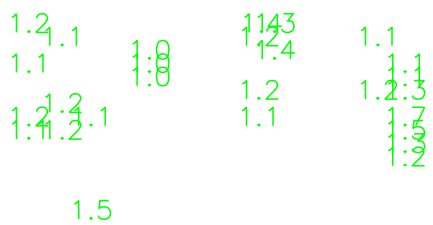

sn1994d.m03.dat.rect, z = 0.89999998
SuF02-007_spec.fits Observed − Galaxy
Template Spectrum Av = 1.0000000
Galaxy
SN/Gal = 21.5052
Mg II, I
[O II]
Ca II
[O III]
10
8
6
4
2
0
−2
6000
7000
8000
9000
10000

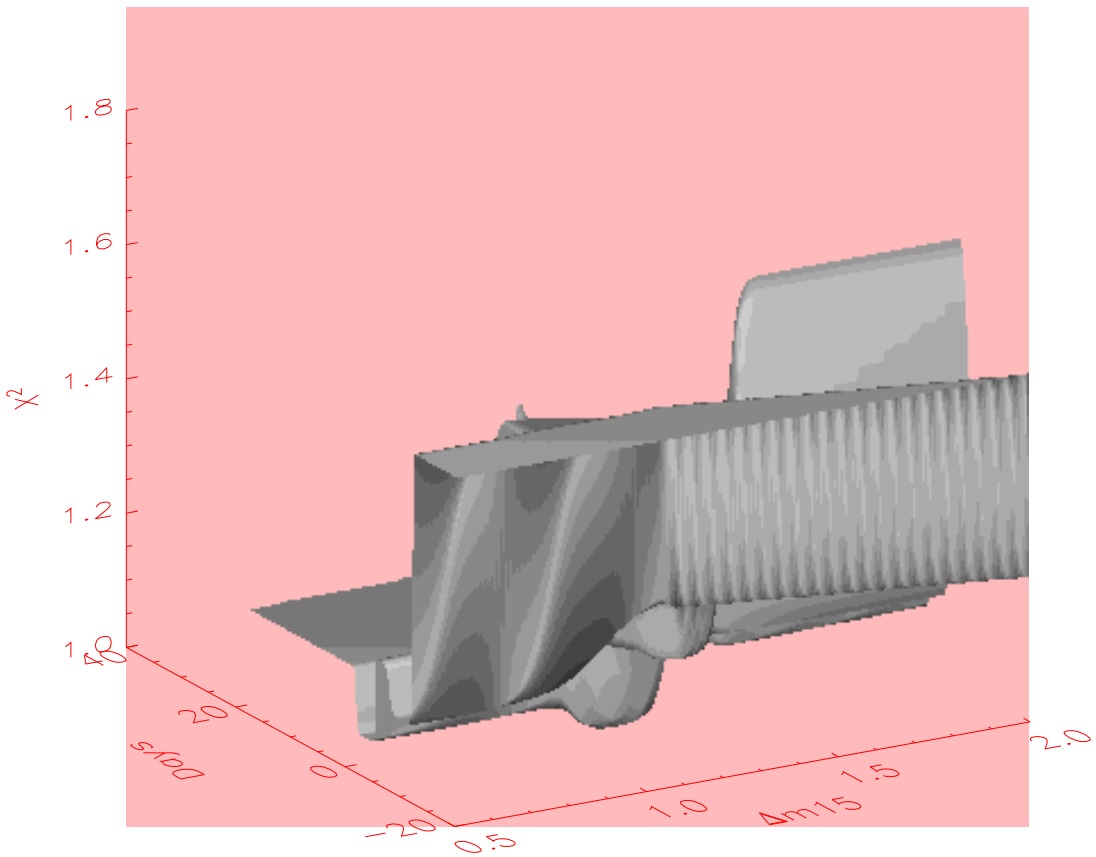

sn1981b.m00.dat.rect, z = 1.4100001
SuF02-007_spec.fits Observed - Galaxy
Template Spectrum Av = 1.0000000
Galaxy
SN/Gal = 0.448227
Mg II, I
[O II]
Ca II
10
8
6
4
2
0
−2
6000
7000
8000
9000
10000

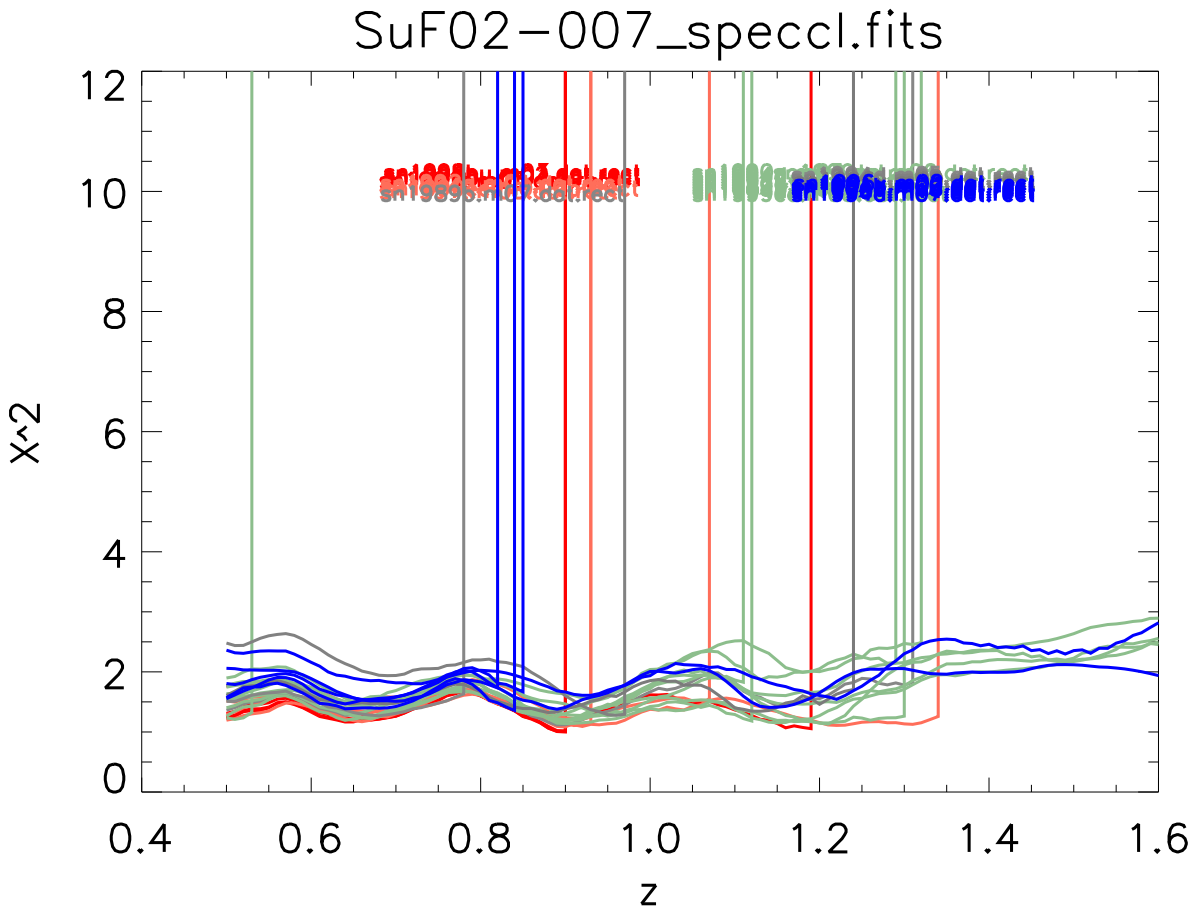

sn1996x.m00.dat.rect, z = 0.88999999
SuF02-007_spec.fits Observed - Galaxy
Template Spectrum Av = 1.0000000
Galaxy
SN/Gal = 0.761631
Mg II, I
[O II]
Ca II
[O III]
8
6
4
2
0
−2
6000
7000
8000
9000
10000

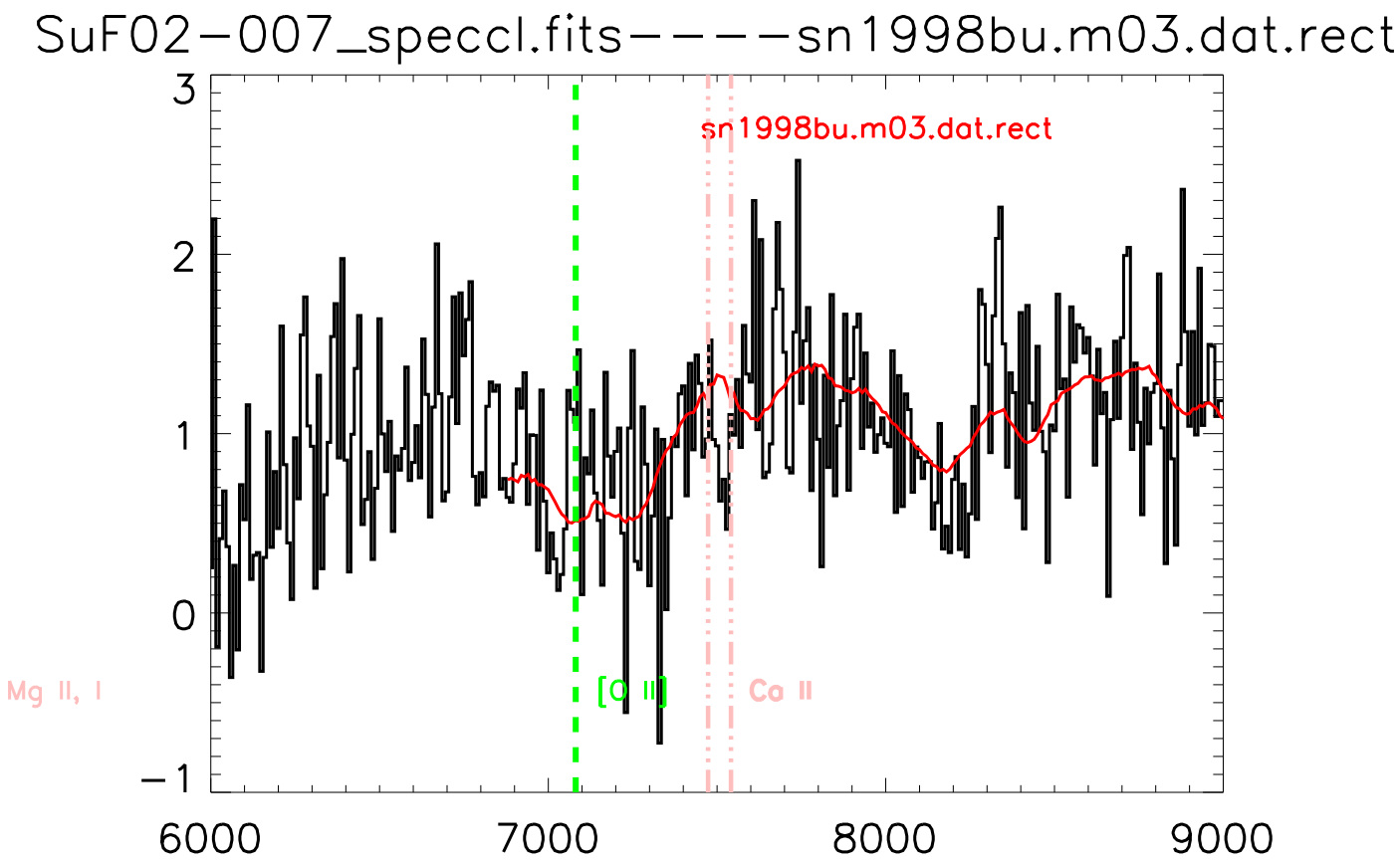

sn1994d.m04.dat.rect, z = 0.50000000
SuF02-007_spec.fits Observed − Galaxy
Template Spectrum Av = 1.0000000
Galaxy
SN/Gal = 27.0342
[O II]
Ca II
[O III]
8
6
4
2
0
−2
6000
7000
8000
9000
10000

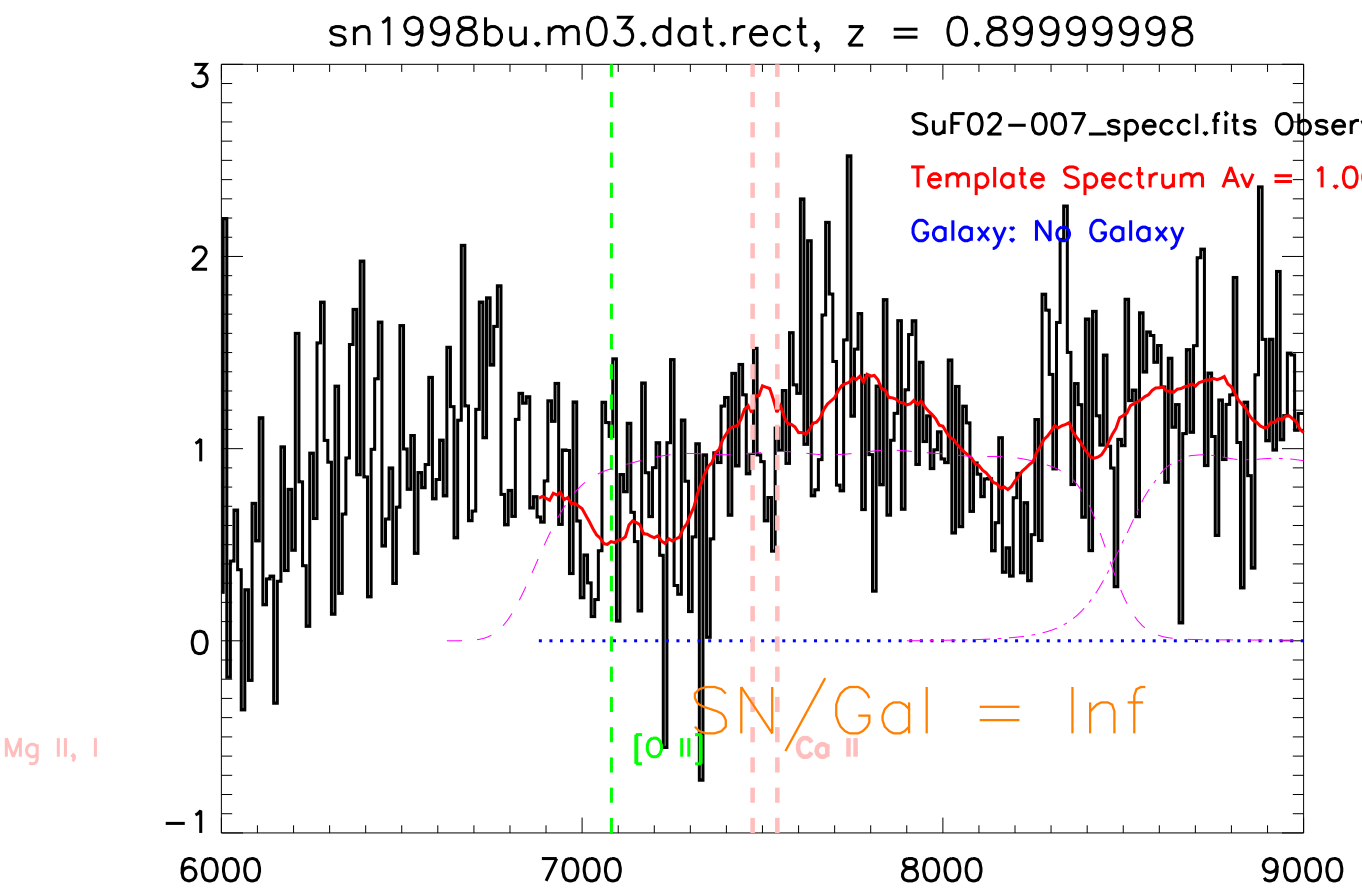

sn1994d.m08.dat.rect, z = 0.50000000
SuF02-007_spec.fits Observed - Galaxy
Template Spectrum Av = 1.0000000
Galaxy
SN/Gal = 3.55641
[O II]
Ca II
[O III]
H I
8
6
4
2
0
-2
6000
7000
8000
9000
10000

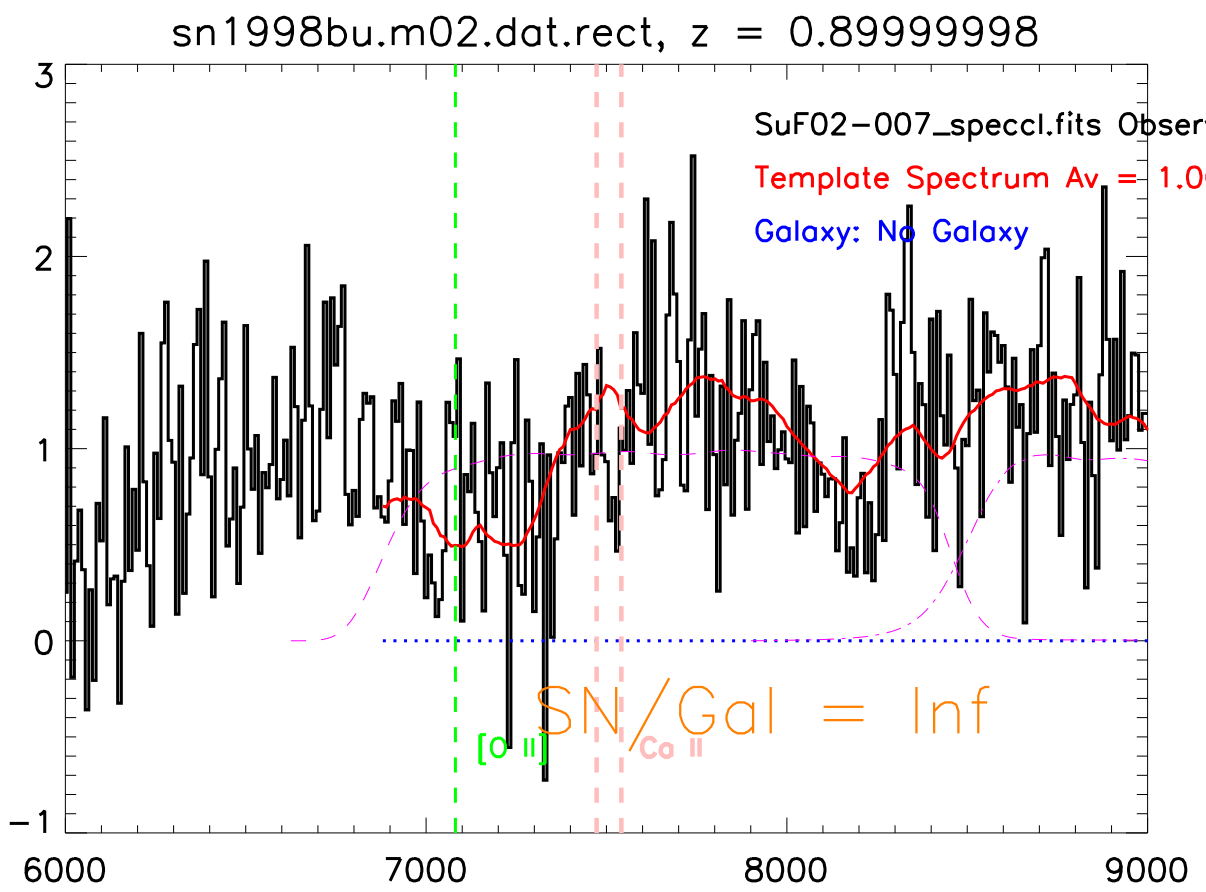


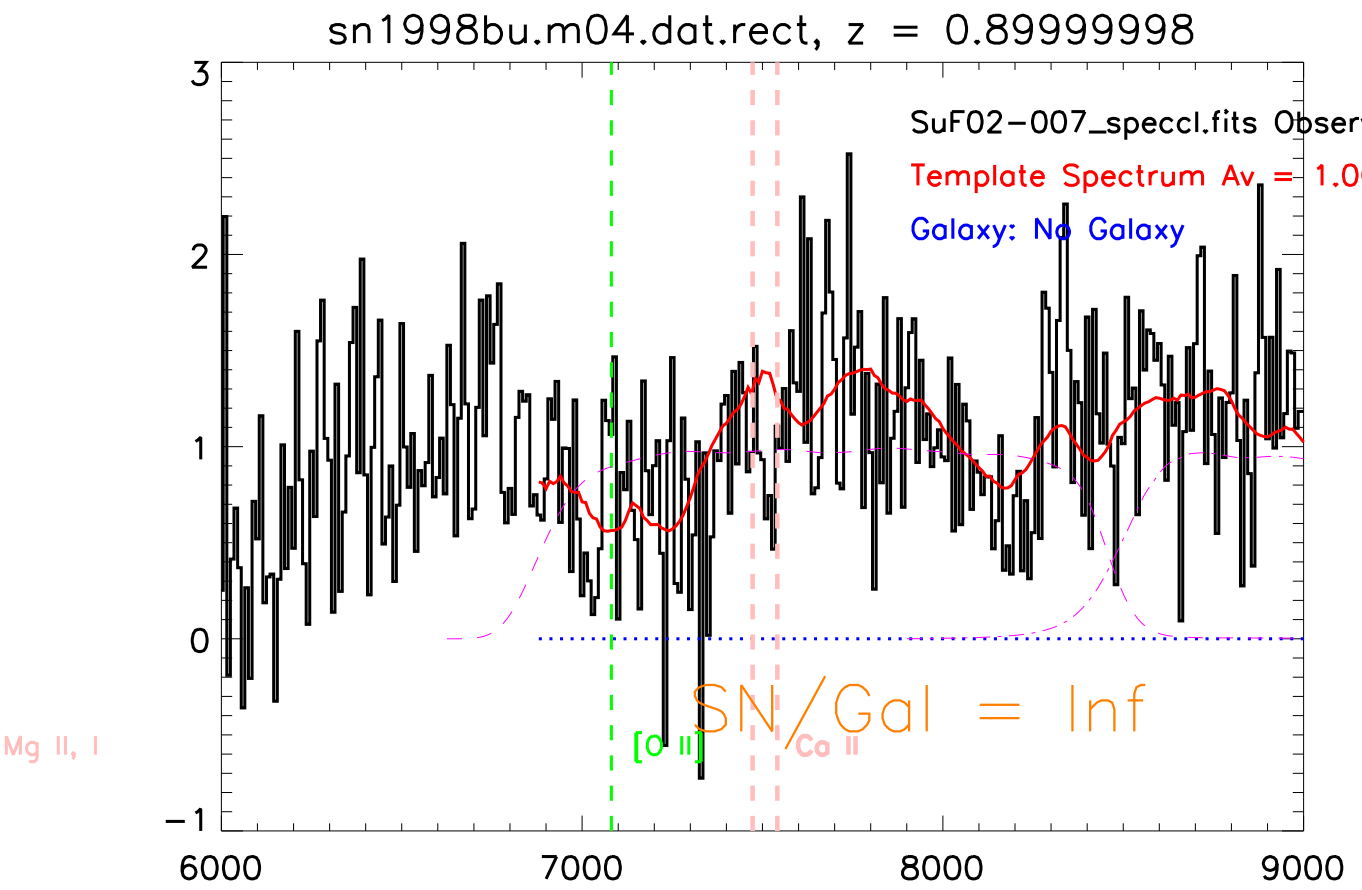

1.8
1.6
1.4
1.2
1.0
χ^2
40
20
0
−20
Dots
0.5
1.0
1.5
2.0
Δm15

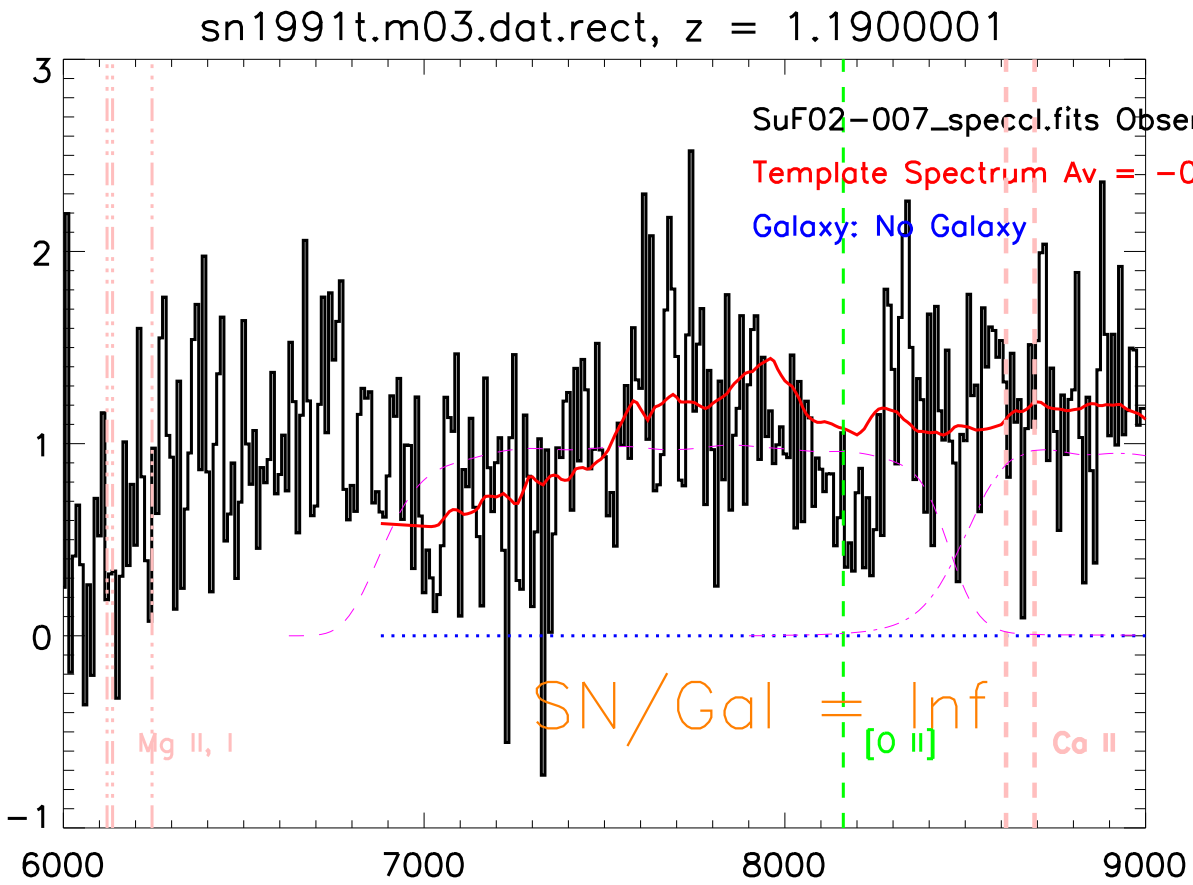

SuF02−007_speccl.fits
X^2
z
0
2
4
6
8
10
12
0.4
0.6
0.8
1.0
1.2
1.4
1.6

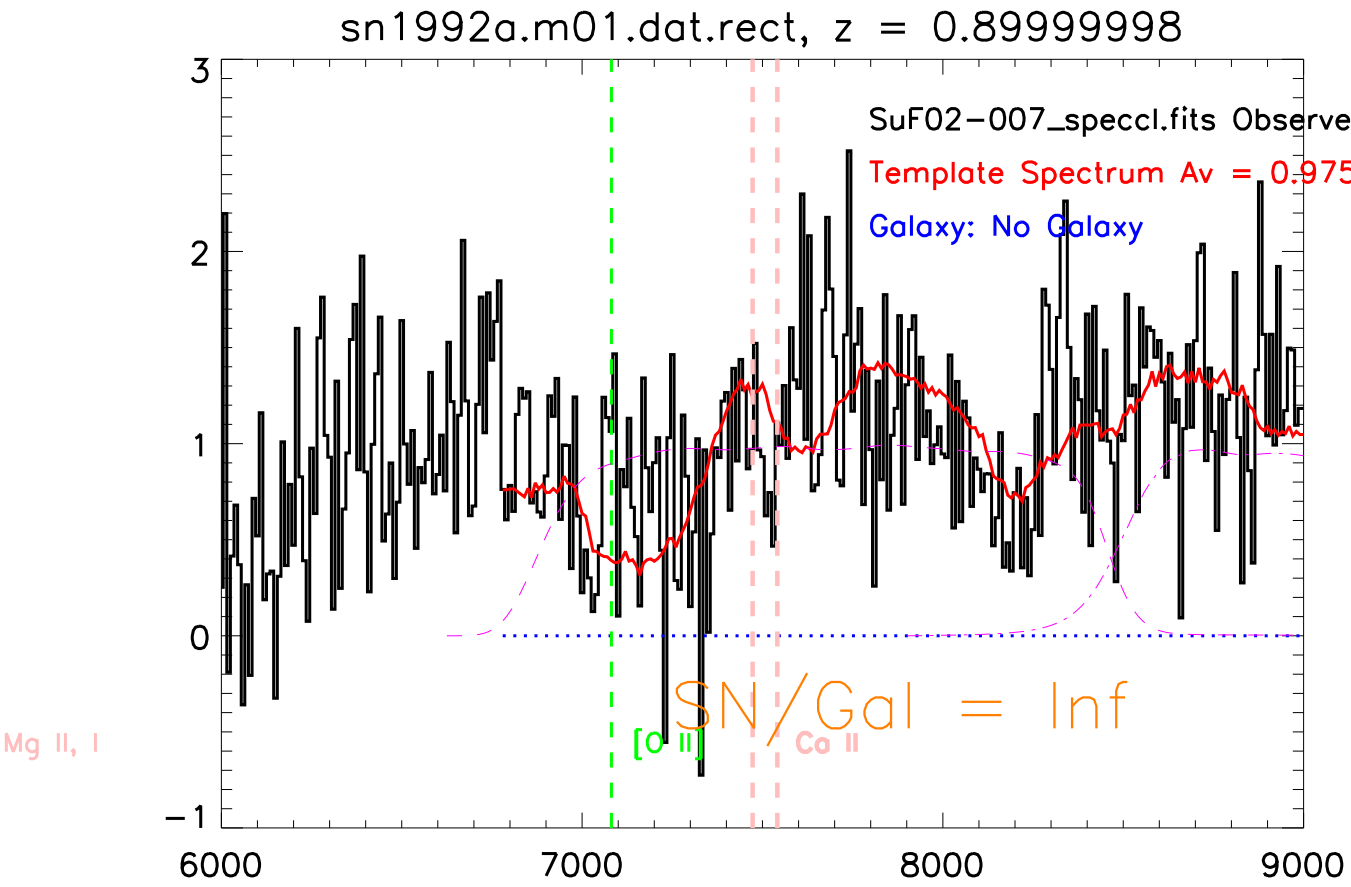

SuF02−007_speccl.fits−−−−sn1998bu.m03.dat.rect
sn1998bu.m03.dat.rect
Mg II, I
[O II]
Ca II
3
2
1
0
−1
6000
7000
8000
9000

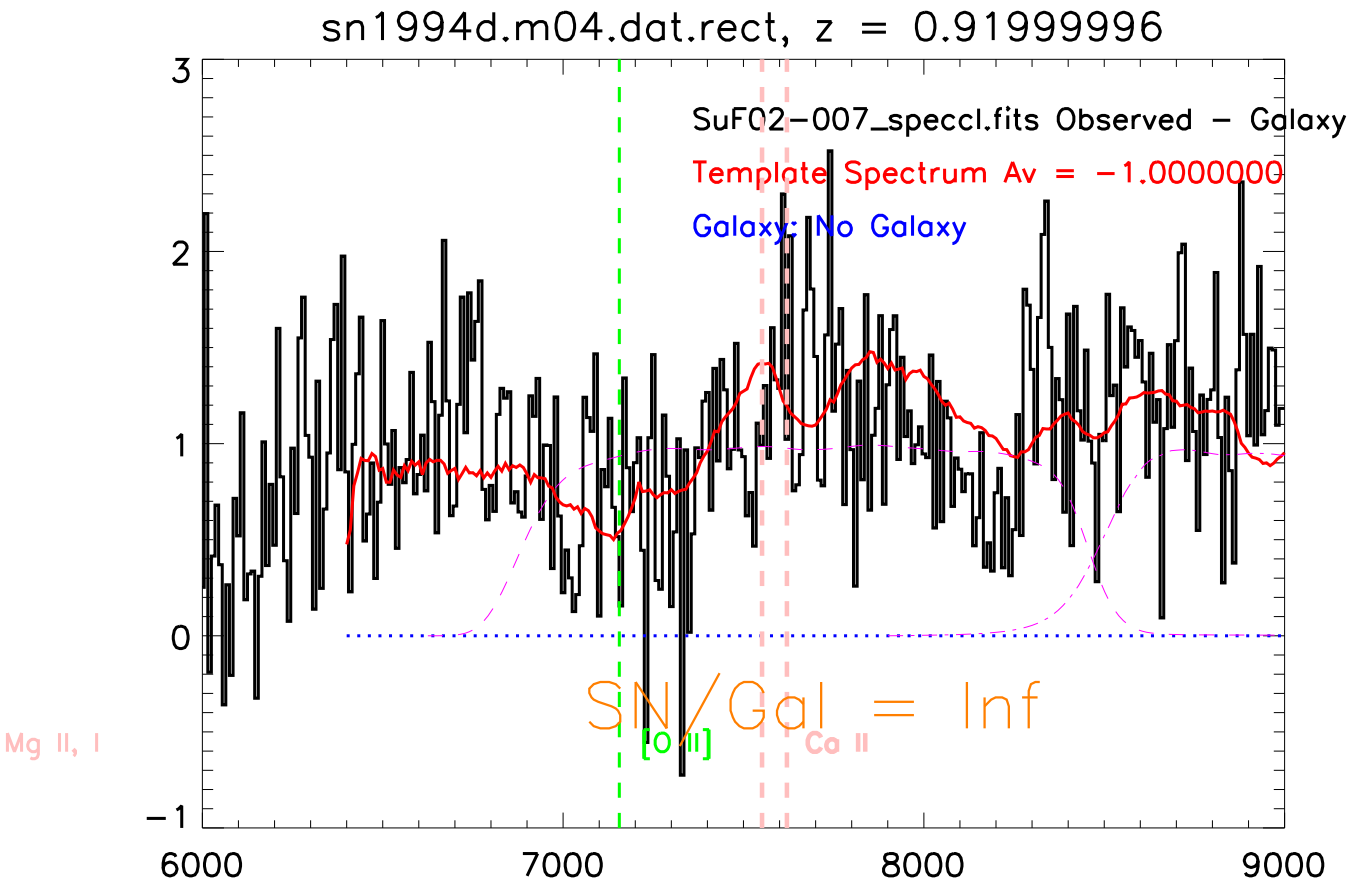

sn1998bu.m03.dat.rect, z = 0.89999998
SuF02-007_specc1.fits Observed - Ga
Template Spectrum Av. = 1.0000000
Galaxy: No Galaxy
SN/Gal = Inf
[O II]
Ca II
Mg II, I
3
2
1
0
−1
6000
7000
8000
9000

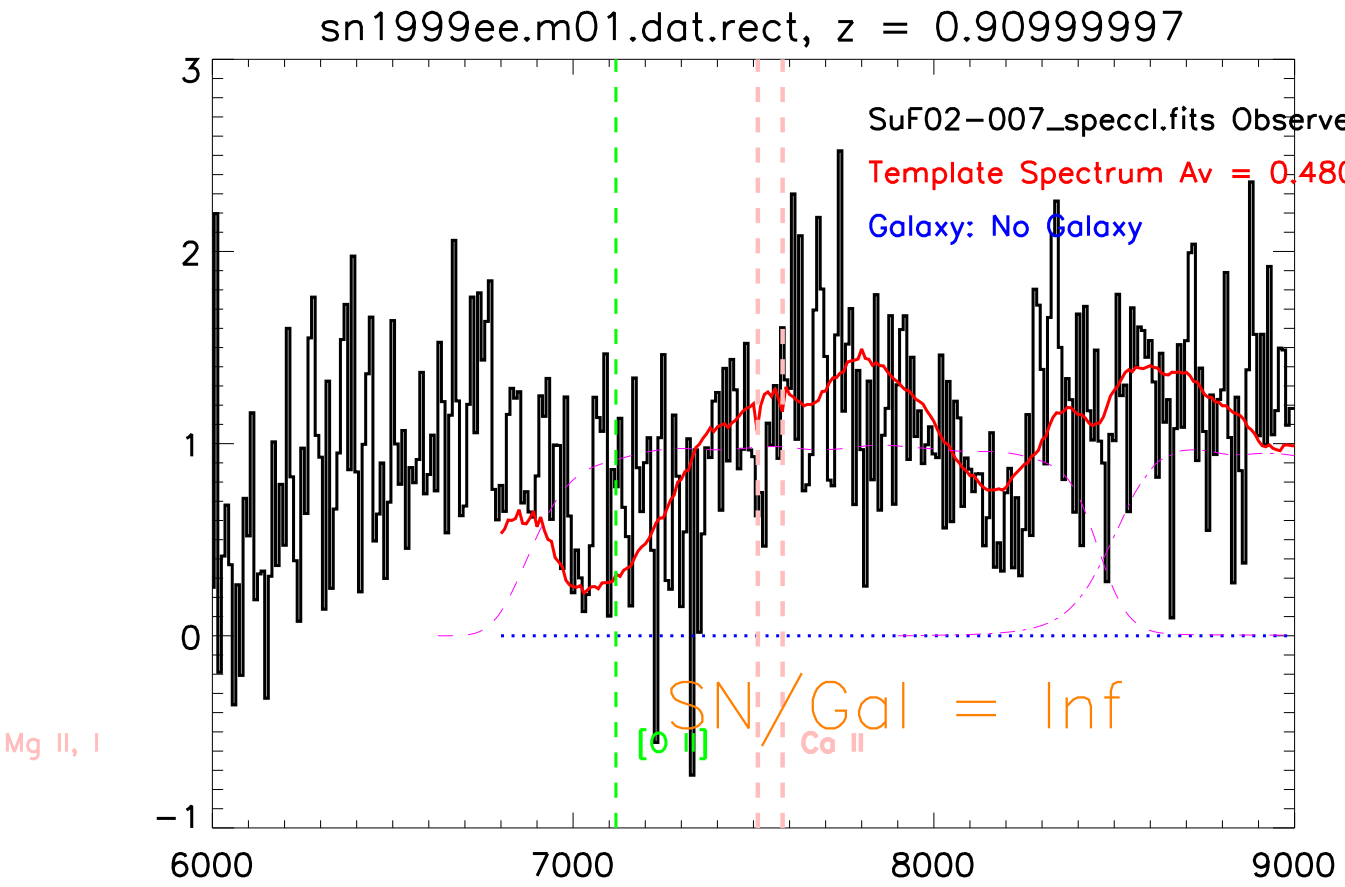

sn1998bu.m02.dat.rect, z = 0.89999998
SuF02-007_specc1.fits Observed - Ga
Template Spectrum Av = 1.0000000
Galaxy: No Galaxy
SN/Gal = Inf
[O II]
Ca II
Mg II, I
3
2
1
0
−1
6000
7000
8000
9000

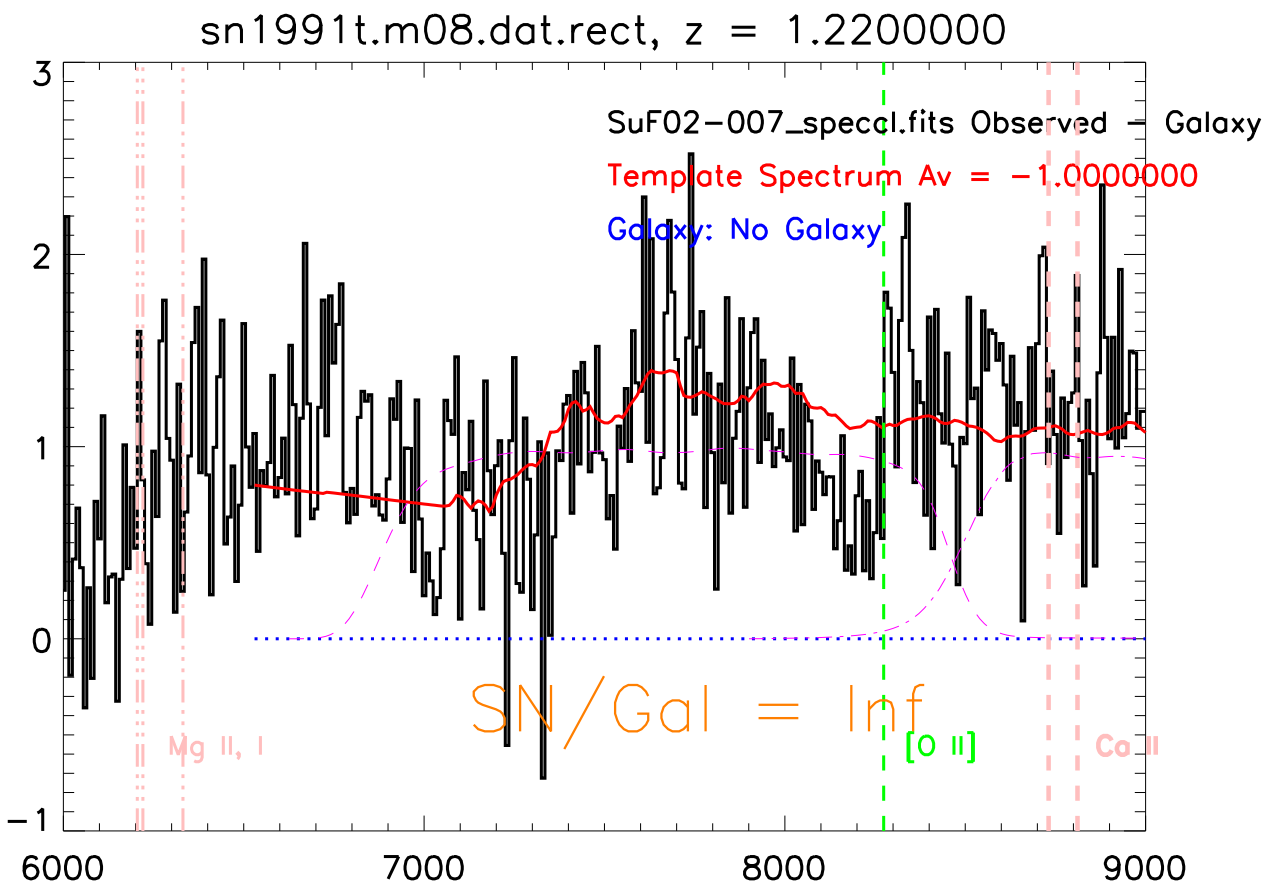

sn1998bu.m04.dat.rect, z = 0.89999998
SuF02-007_speccl.fits Observed - Ga
Template Spectrum Av. = 1.0000000
Galaxy: No Galaxy
SN/Gal = Inf
[O II]
Ca II
Mg II, I
3
2
1
0
−1
6000
7000
8000
9000

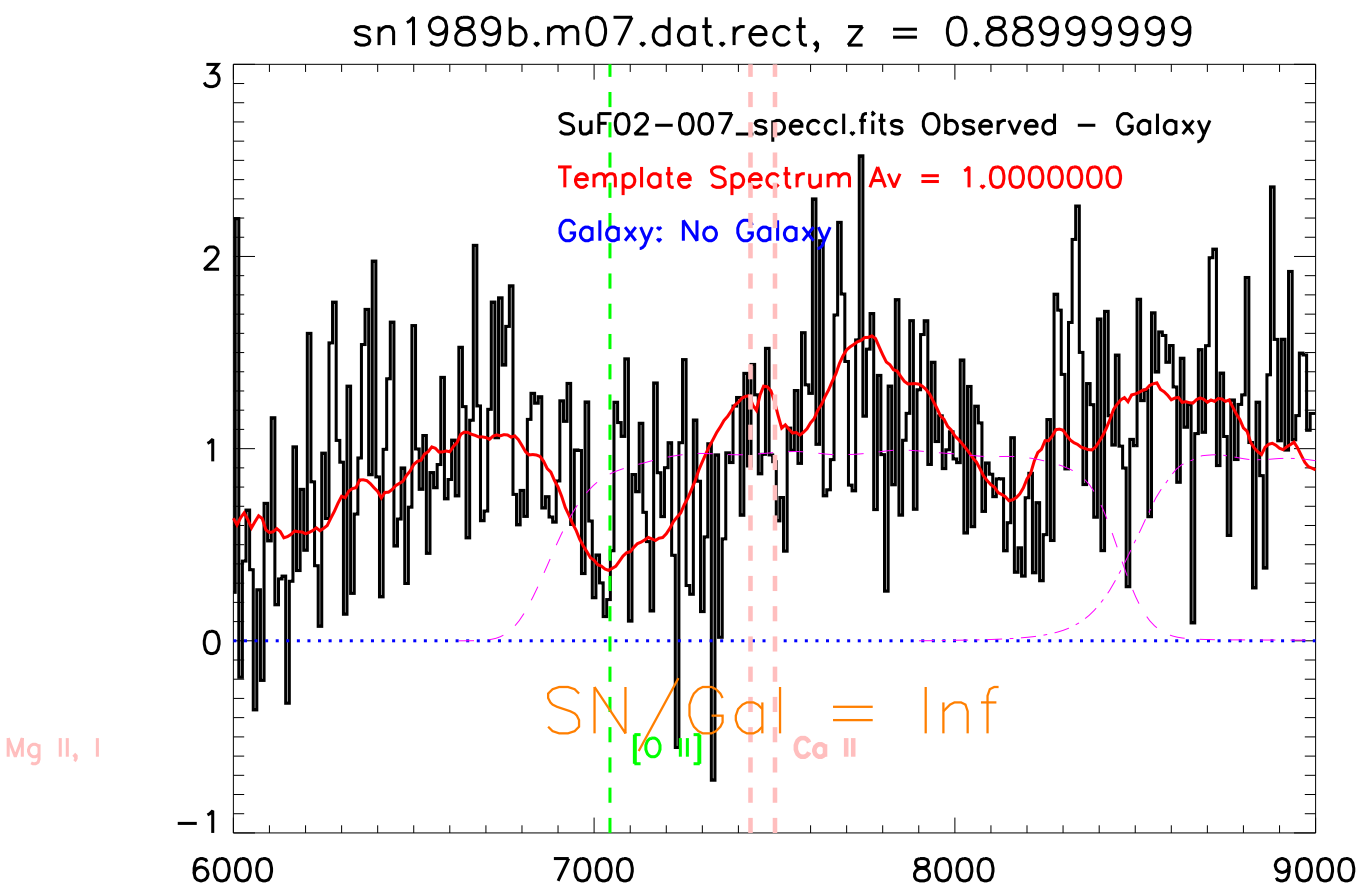

sn1991t.m03.dat.rect, z = 1.1900001
SuF02-007_specCl.fits Observed - Ga
Template Spectrum Av = -0.5573979
Galaxy: No Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
3
2
1
0
-1
6000
7000
8000
9000

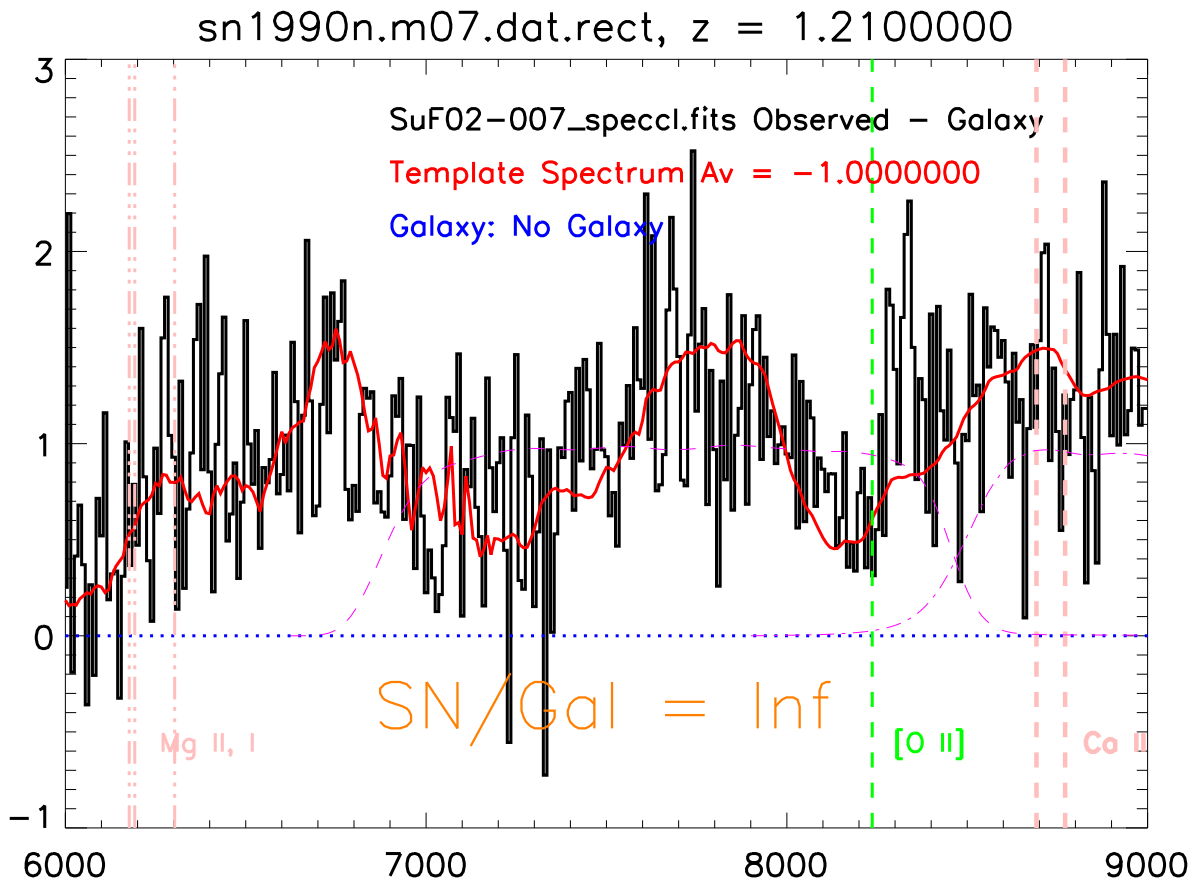

sn1992a.m01.dat.rect, z = 0.89999998
SuF02-007_speccl.fits Observed – Galax
Template Spectrum Av = 0.97576532
Galaxy: No Galaxy
SN/Gal = Inf
[O II]
Ca II
Mg II, I
3
2
1
0
−1
6000
7000
8000
9000

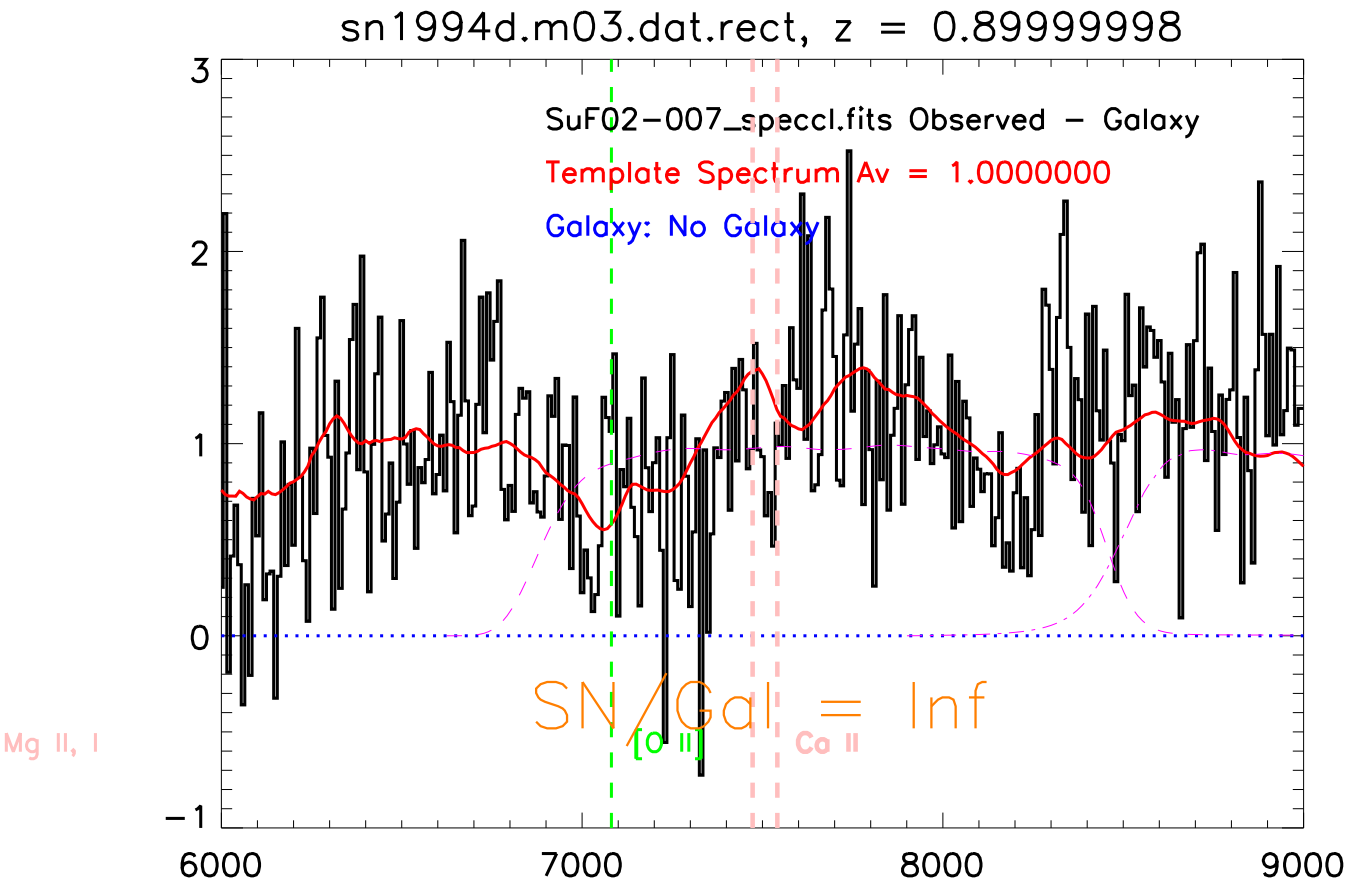

sn1994d.m04.dat.rect, z = 0.91999996
SuF02-007_specc1.fits Observed - Galaxy
Template Spectrum Av = -1.0000000
Galaxy: No Galaxy
SN/Gal = Inf
[O II]
Ca II
Mg II, I
3
2
1
0
-1
6000
7000
8000
9000

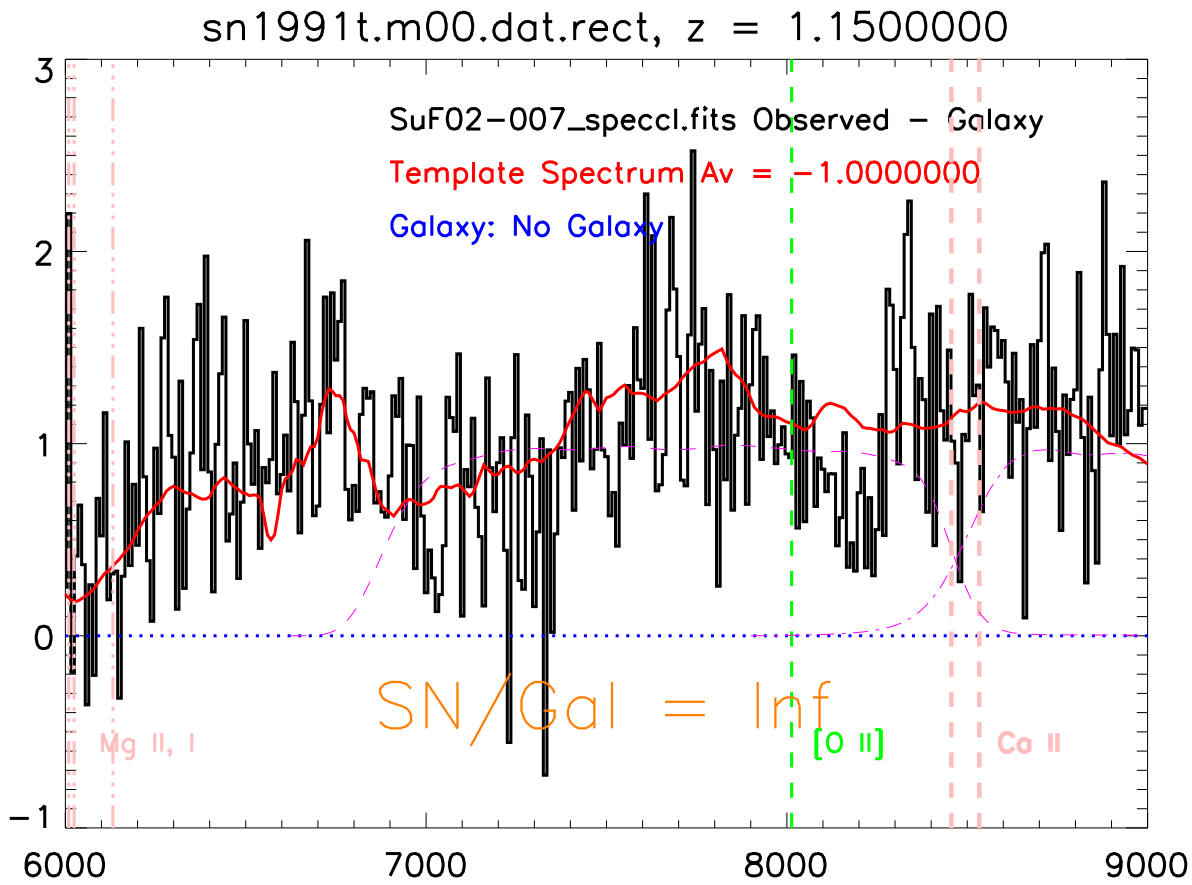

sn1999ee.m01.dat.rect, z = 0.90999997
SuF02−007_speccl.fits Observed − Galax
Template Spectrum Av = 0.48086736
Galaxy: No Galaxy
SN/Gal = Inf
[O II]
Ca II
Mg II, I
3
2
1
0
−1
6000
7000
8000
9000

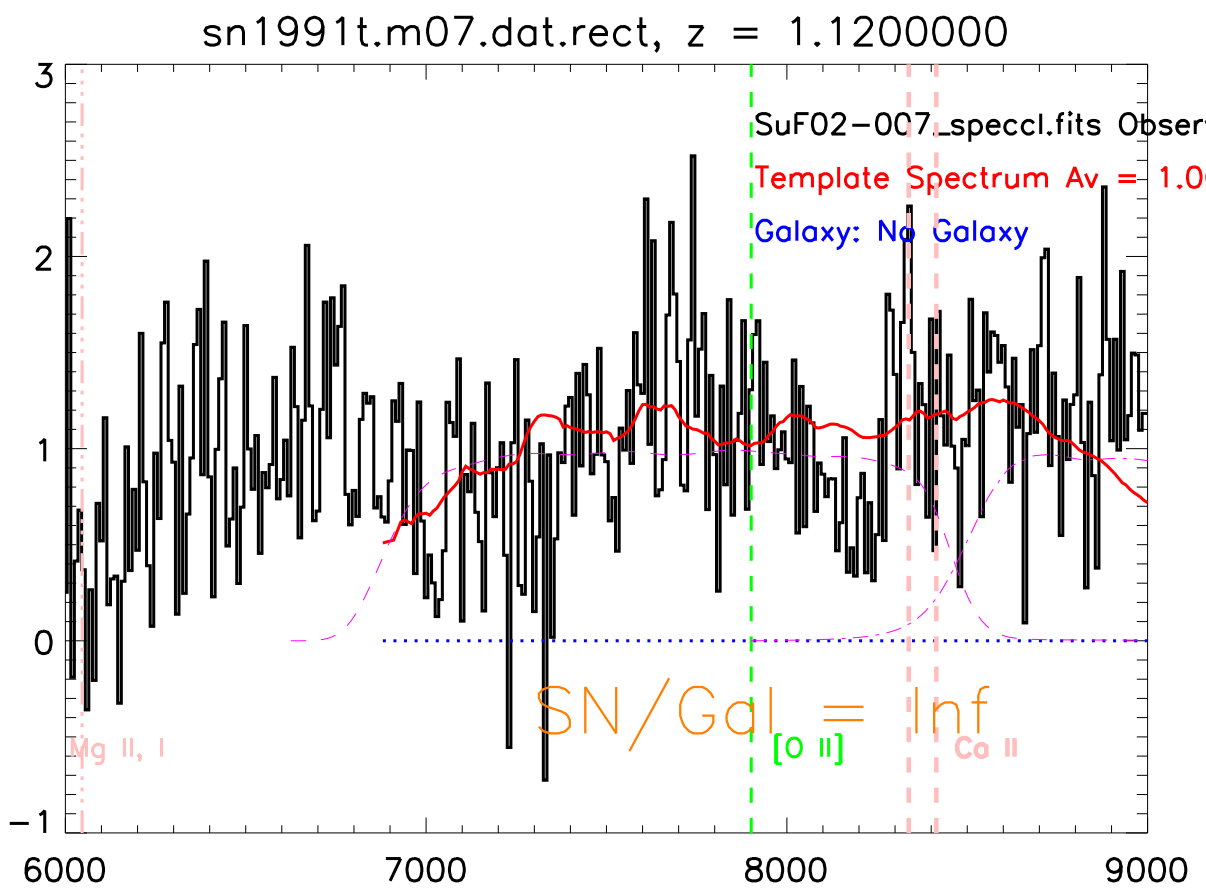

sn1991t.m08.dat.rect, z = 1.2200000
SuF02-007_specal.fits Observed – Galaxy
Template Spectrum Av = -1.0000000
Galaxy: No Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
3
2
1
0
-1
6000
7000
8000
9000

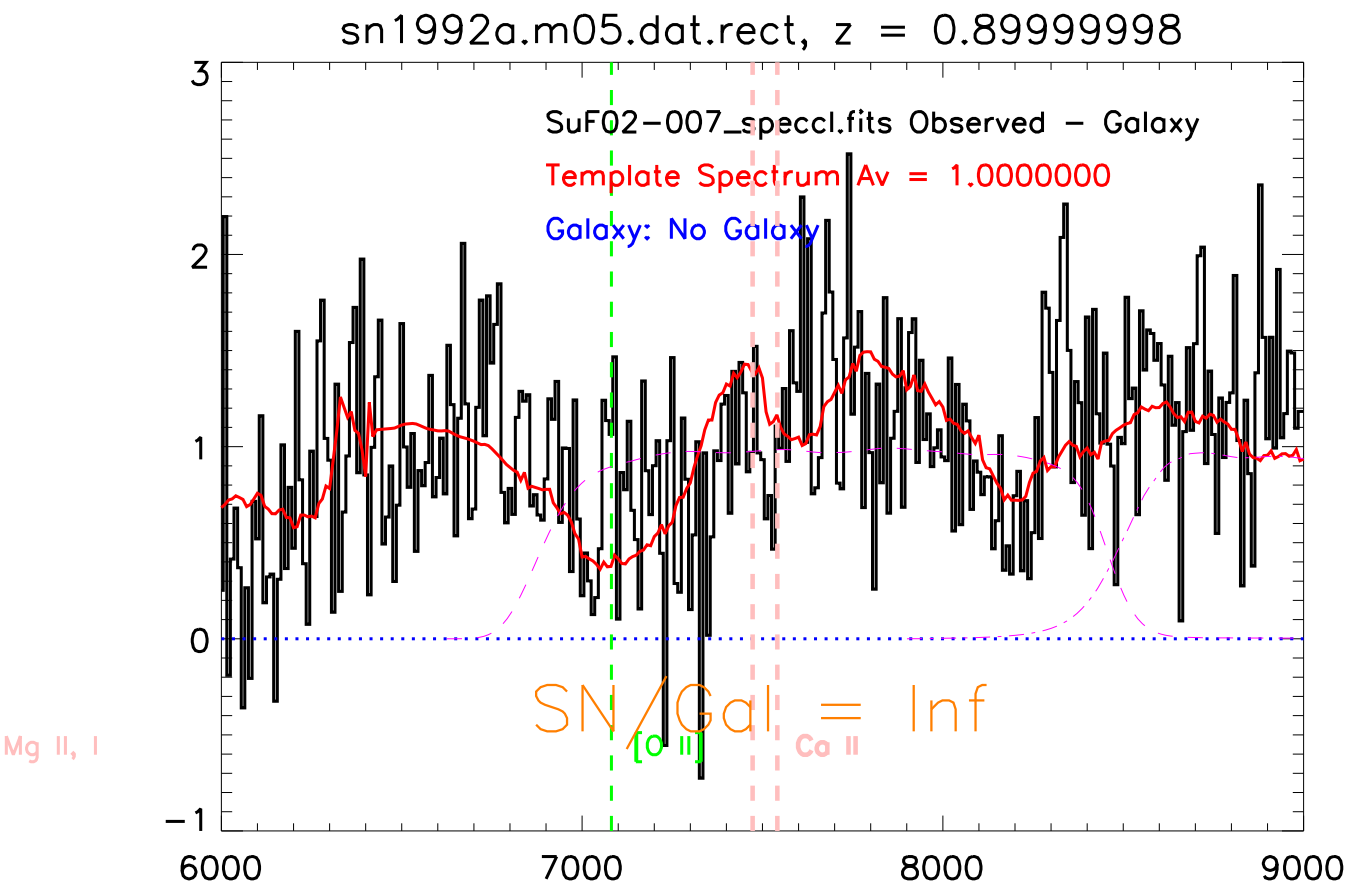

sn1989b.m07.dat.rect, z = 0.88999999
SuF02-007_speccl.fits Observed − Galaxy
Template Spectrum Av = 1.0000000
Galaxy: No Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
3
2
1
0
−1
6000
7000
8000
9000

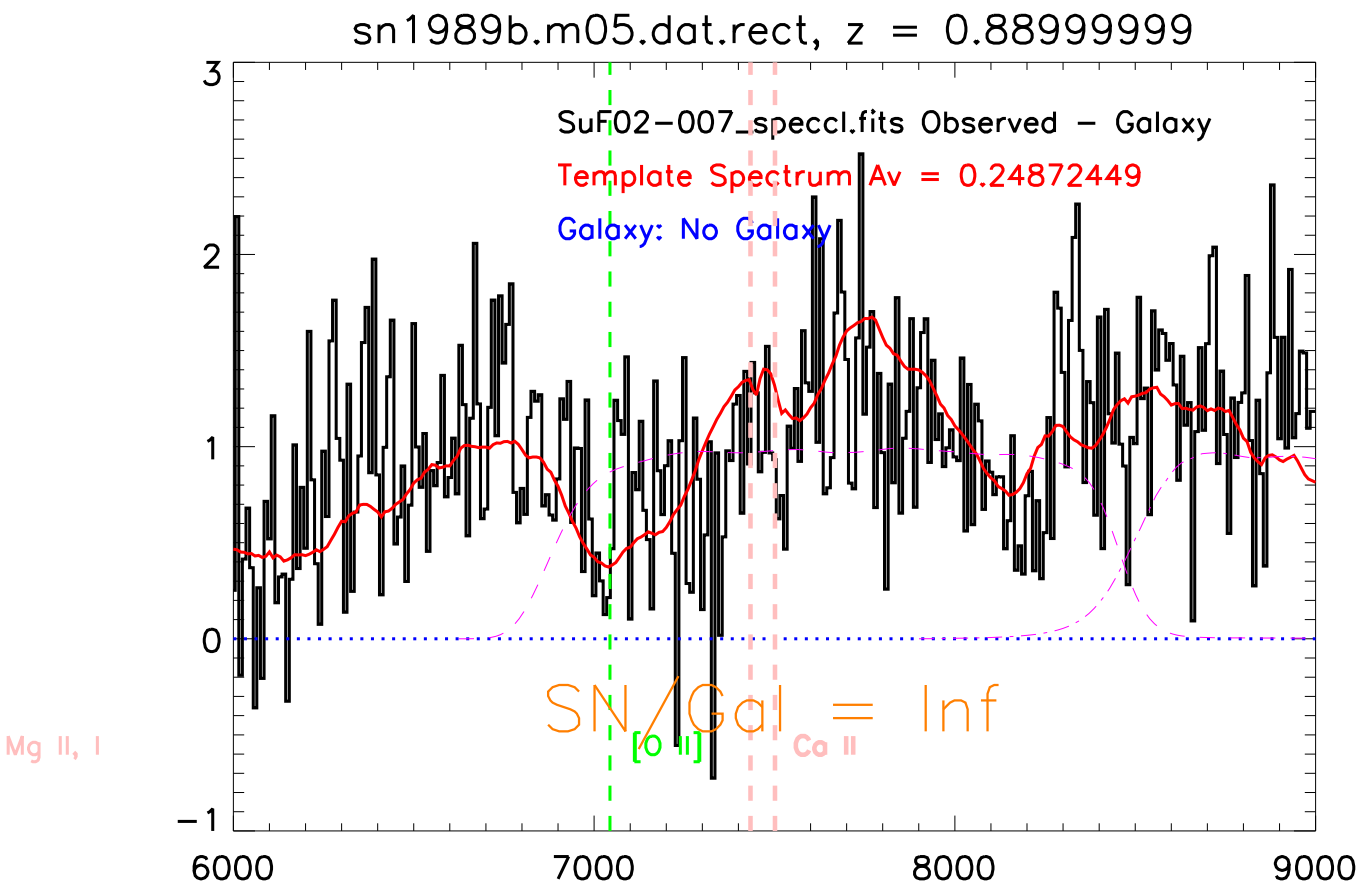

sn1990n.m07.dat.rect, z = 1.2100000
SuF02-007_speccl.fits Observed - Galaxy
Template Spectrum Av = -1.0000000
Galaxy: No Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
3
2
1
0
-1
6000
7000
8000
9000

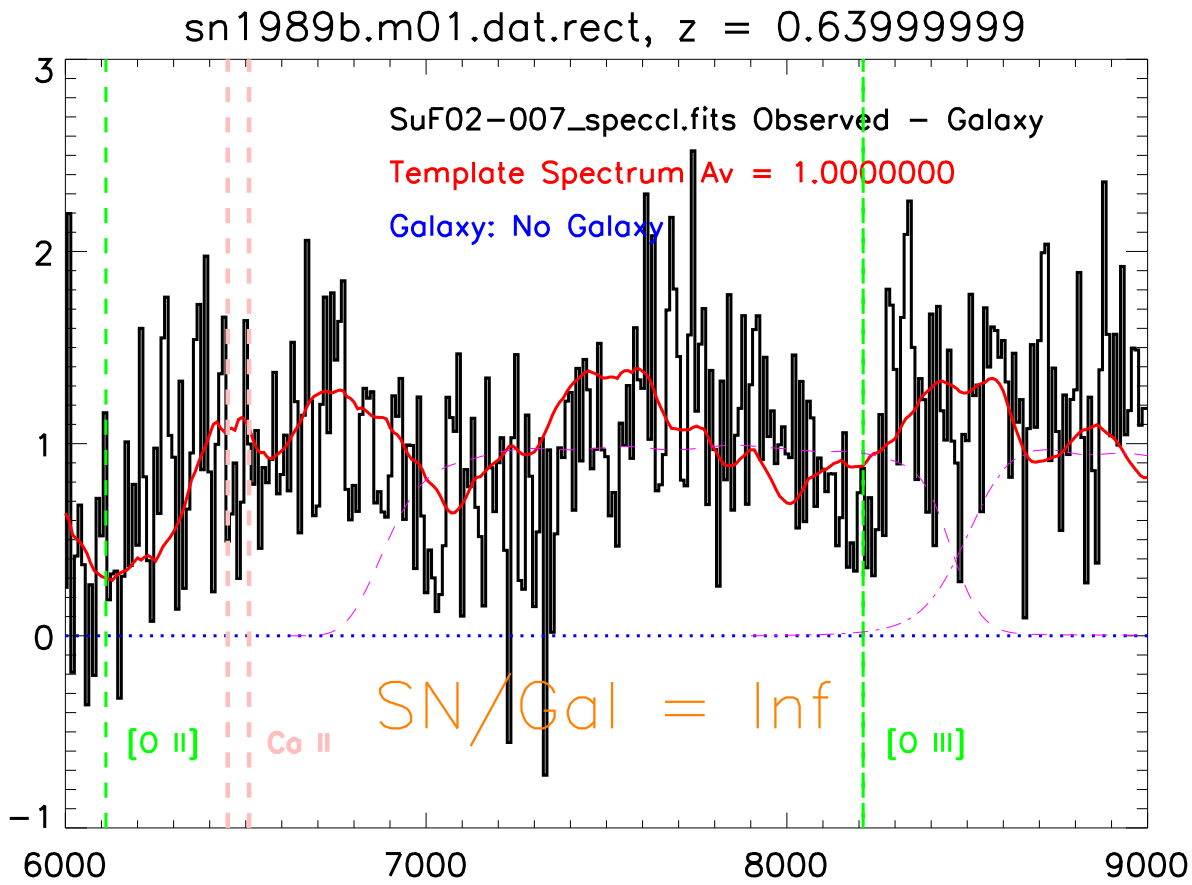

sn1994d.m03.dat.rect, z = 0.89999998
SuF02-007_speccl.fits Observed − Galaxy
Template Spectrum Av = 1.0000000
Galaxy: No Galaxy
SN/Gal = Inf
[O II]
Ca II
Mg II, I
3
2
1
0
−1
6000
7000
8000
9000

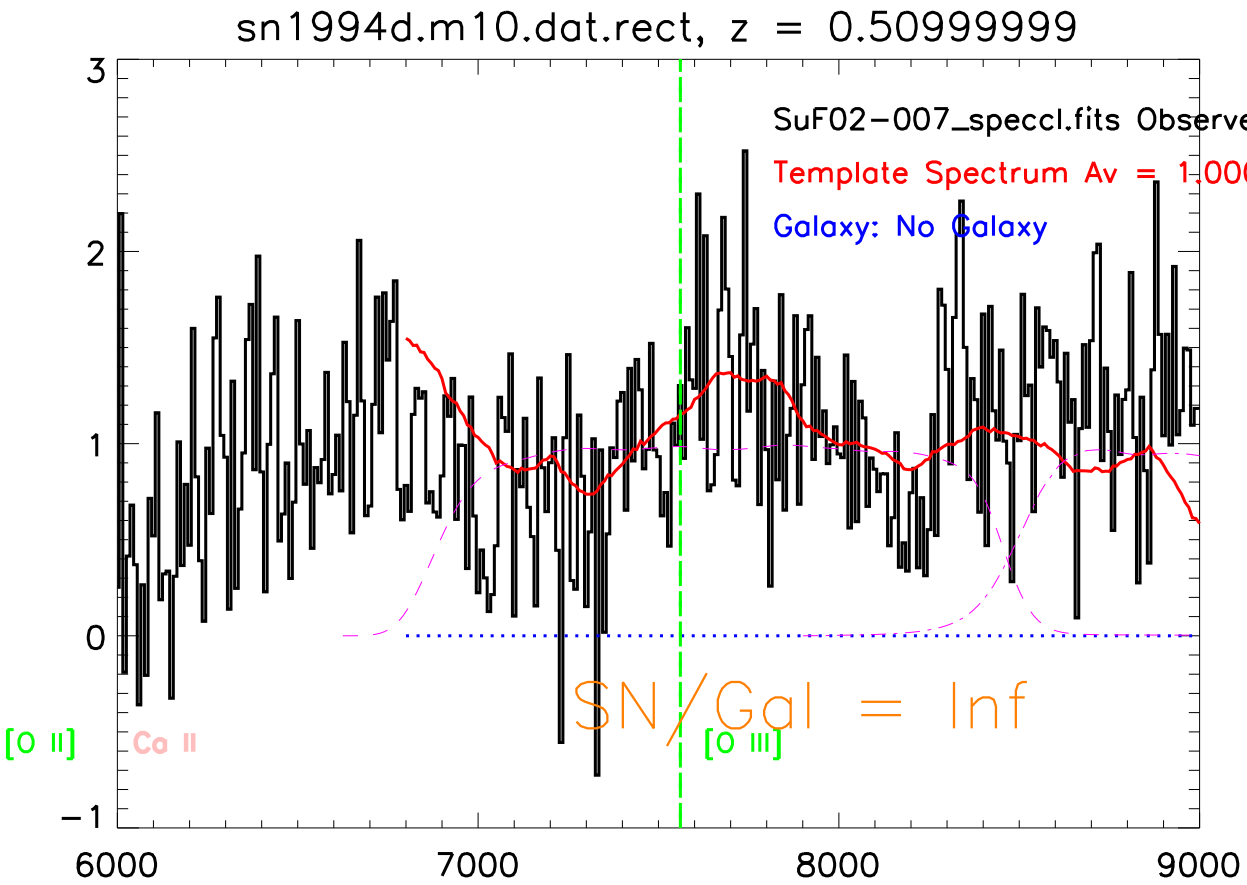

sn1991t.m00.dat.rect, z = 1.1500000
SuF02-007_specc1.fits Observed - Galaxy
Template Spectrum Av = -1.0000000
Galaxy: No Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
3
2
1
0
-1
6000
7000
8000
9000

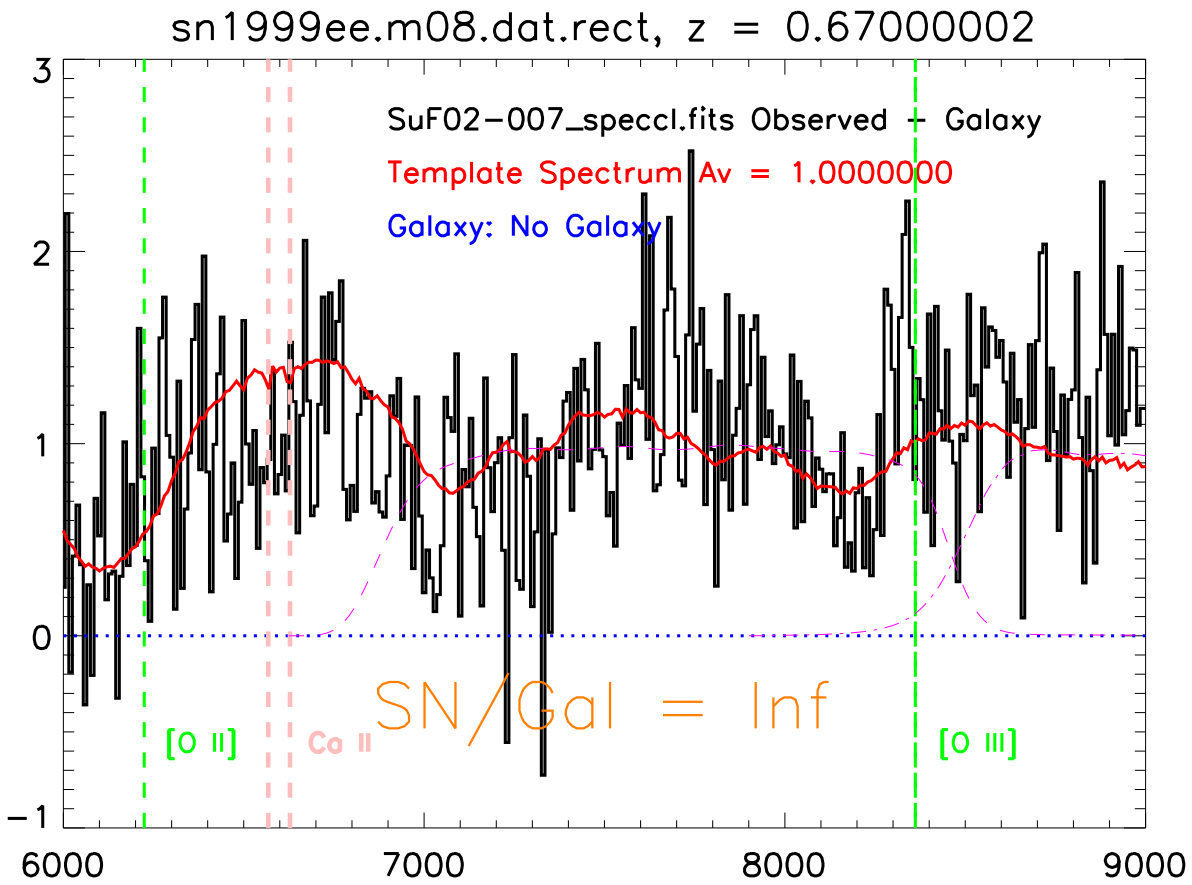

sn1991t.m07.dat.rect, z = 1.1200000
SuF02-007_speccl.fits Observed – Ga
Template Spectrum Av = 1.0000000
Galaxy: No Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
3
2
1
0
−1
6000
7000
8000
9000

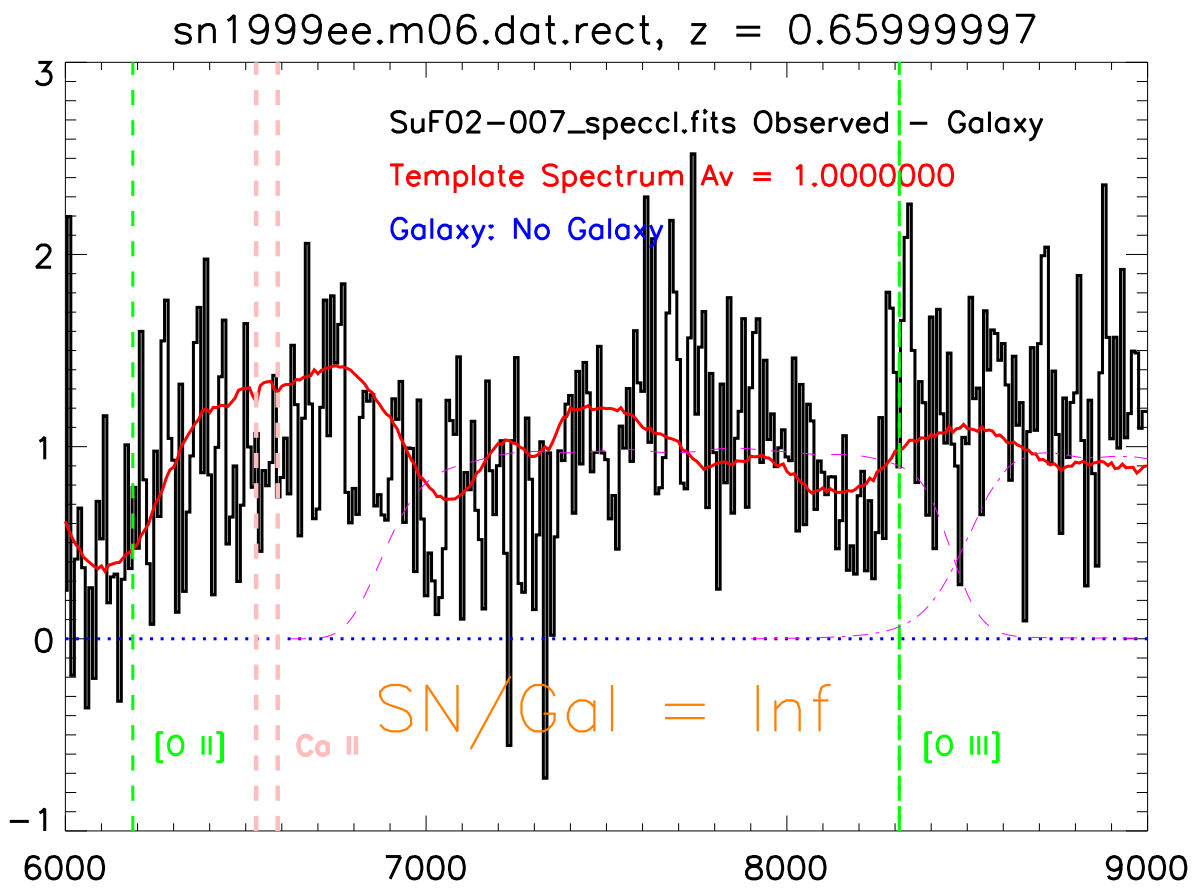

sn1992a.m05.dat.rect, z = 0.89999998
SuF02-007_speccl.fits Observed − Galaxy
Template Spectrum Av = 1.0000000
Galaxy: No Galaxy
SN/Gal = Inf
[O II]
Ca II
Mg II, I
3
2
1
0
−1
6000
7000
8000
9000

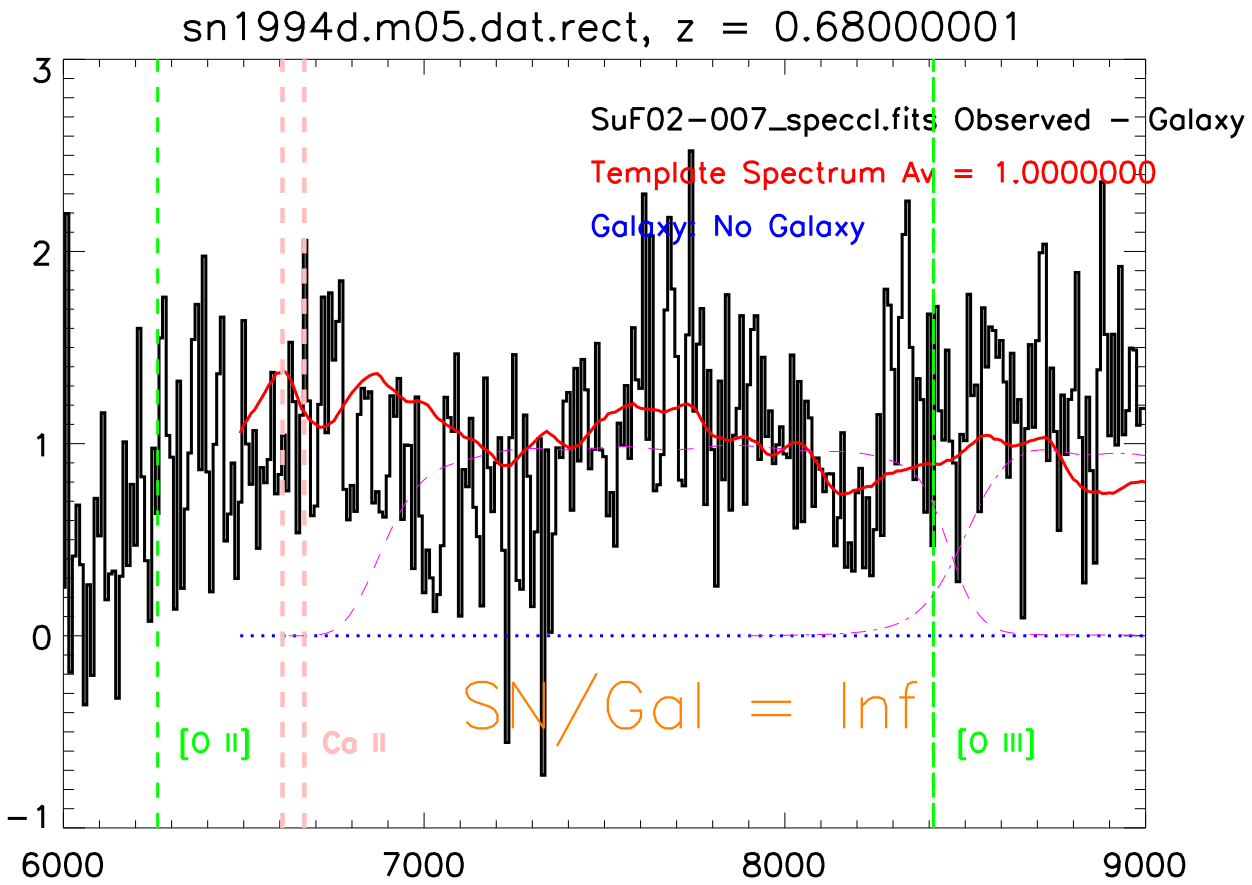

sn1989b.m05.dat.rect, z = 0.88999999
SuF02-007_speccl.fits Observed - Galaxy
Template Spectrum Av = 0.24872449
Galaxy: No Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
3
2
1
0
−1
6000
7000
8000
9000

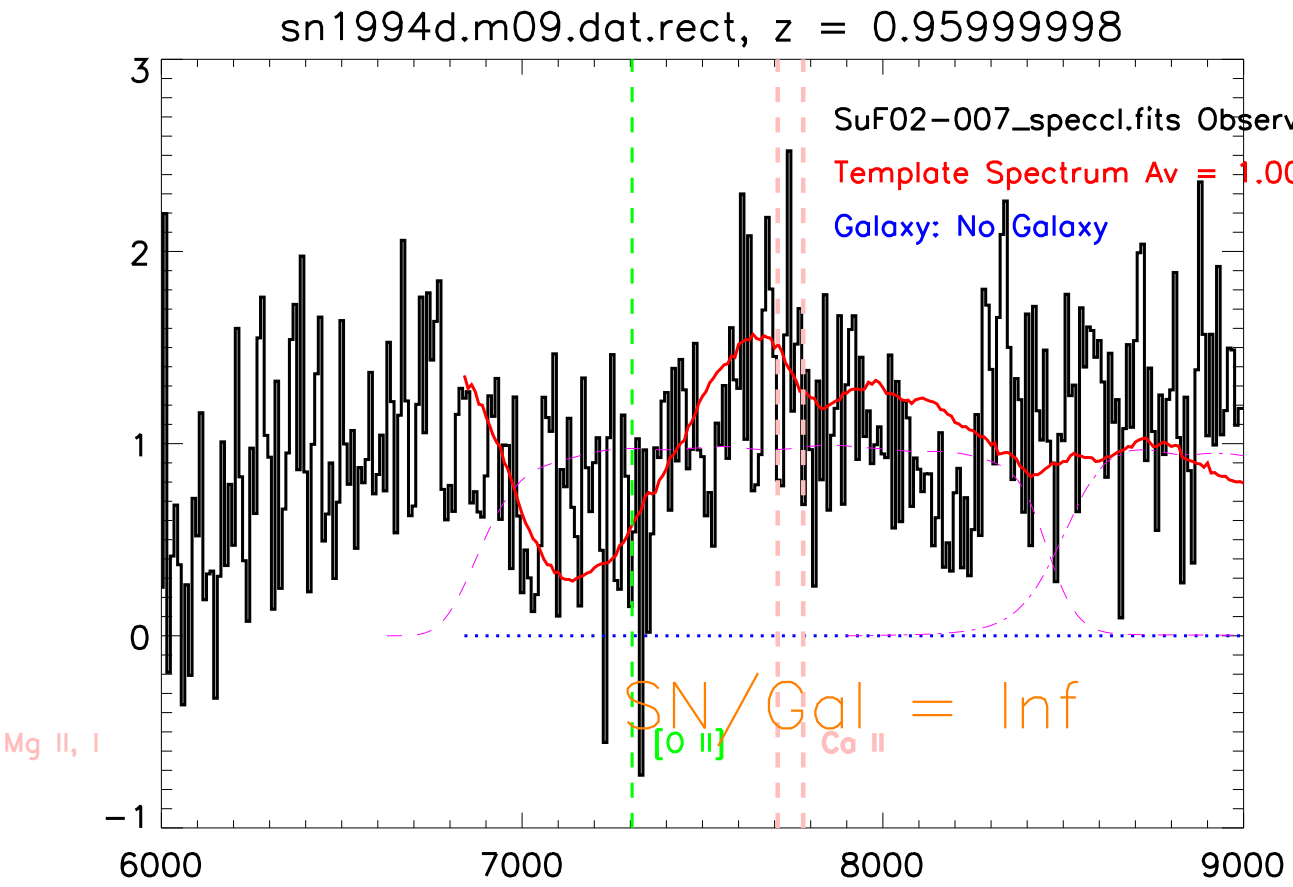

sn1989b.m01.dat.rect, z = 0.63999999
SuF02−007_speccl.fits Observed − Galaxy
Template Spectrum Av = 1.0000000
Galaxy: No Galaxy
SN/Gal = Inf
[O II]
Ca II
[O III]
3
2
1
0
−1
6000
7000
8000
9000

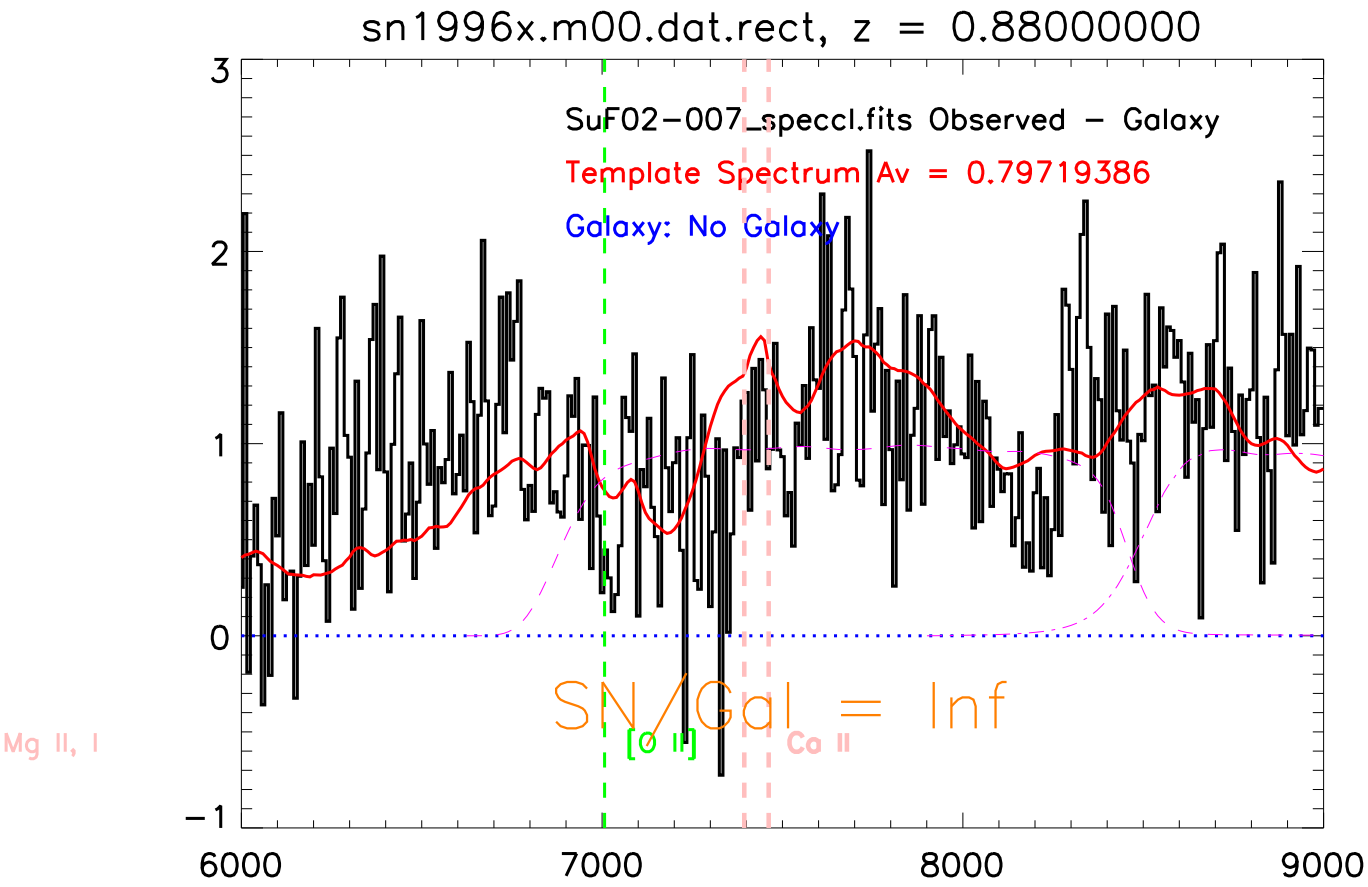

sn1994d.m10.dat.rect, z = 0.50999999
SuF02−007_speccl.fits Observed − Galax
Template Spectrum Av = 1.0000000
Galaxy: No Galaxy
SN/Gal = Inf
[O II]
Ca II
[O III]
3
2
1
0
−1
6000
7000
8000
9000

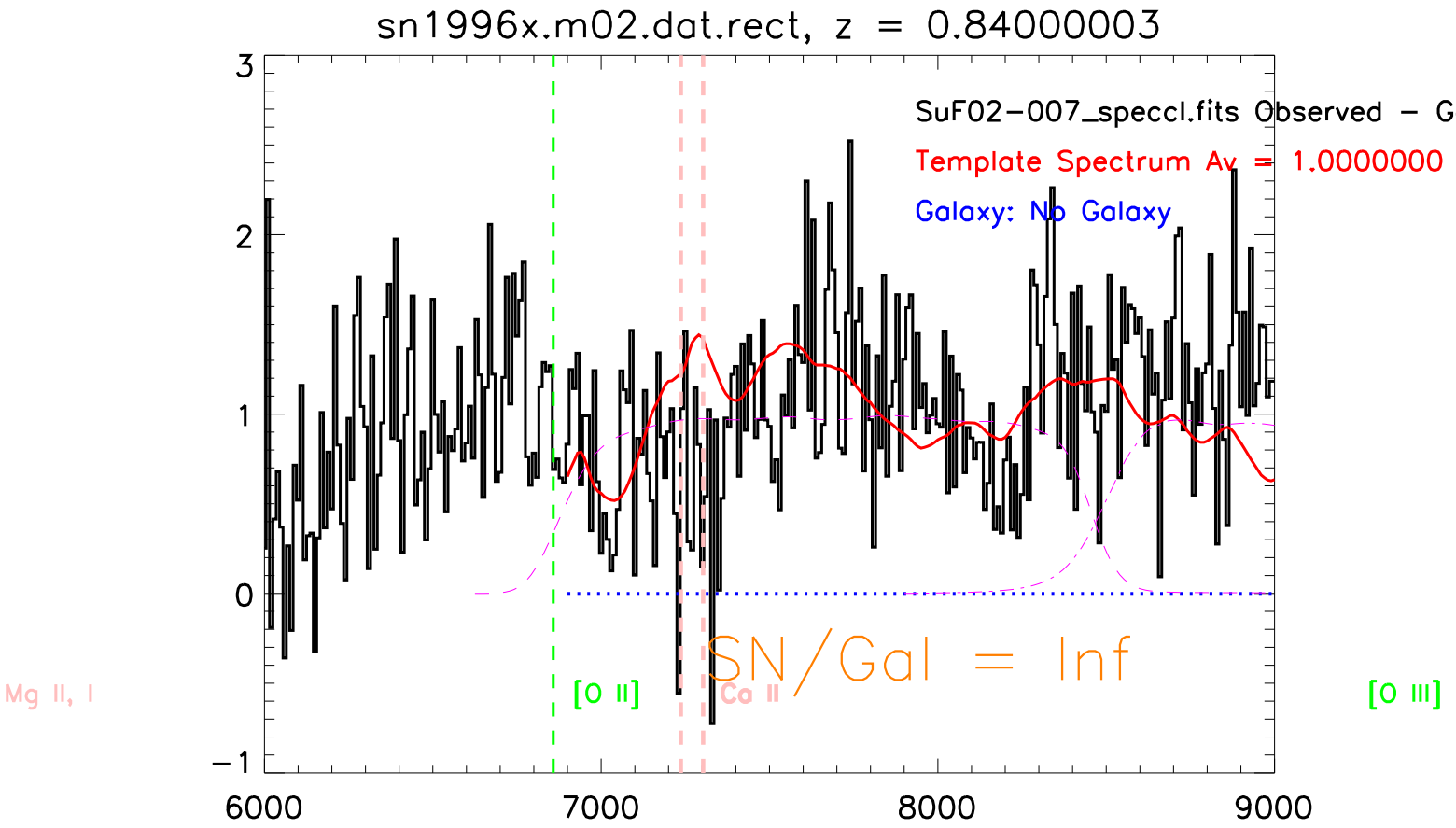

sn1999ee.m08.dat.rect, z = 0.67000002
SuF02−007_speccl.fits Observed + Galaxy
Template Spectrum Av = 1.0000000
Galaxy: No Galaxy
SN/Gal = Inf
[O II]
Ca II
[O III]
3
2
1
0
−1
6000
7000
8000
9000

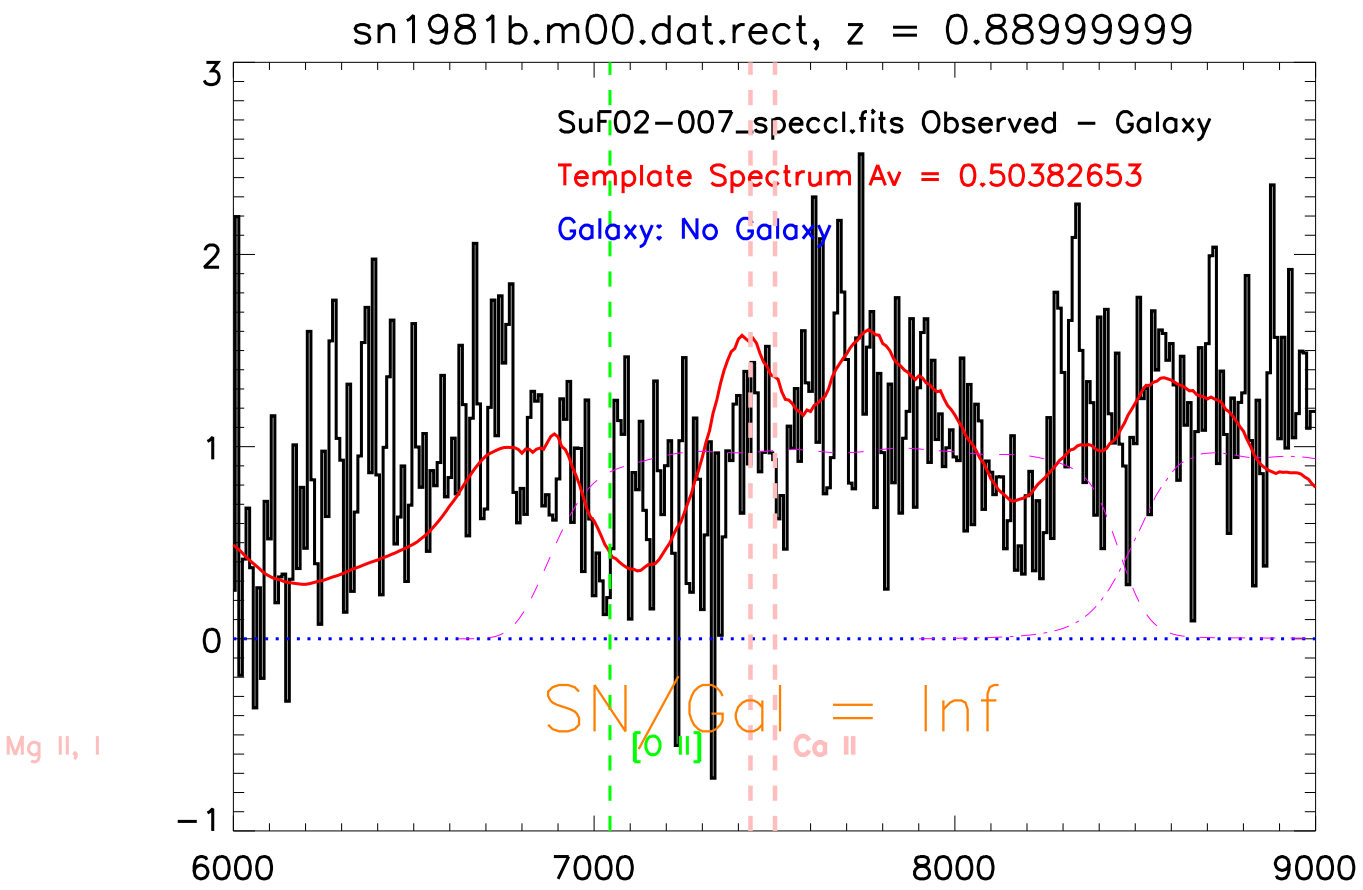

sn1999ee.m06.dat.rect, z = 0.65999997
SuF02−007_speccl.fits Observed − Galaxy
Template Spectrum Av = 1.0000000
Galaxy: No Galaxy
SN/Gal = Inf
[O II]
Ca II
[O III]
3
2
1
0
−1
6000
7000
8000
9000

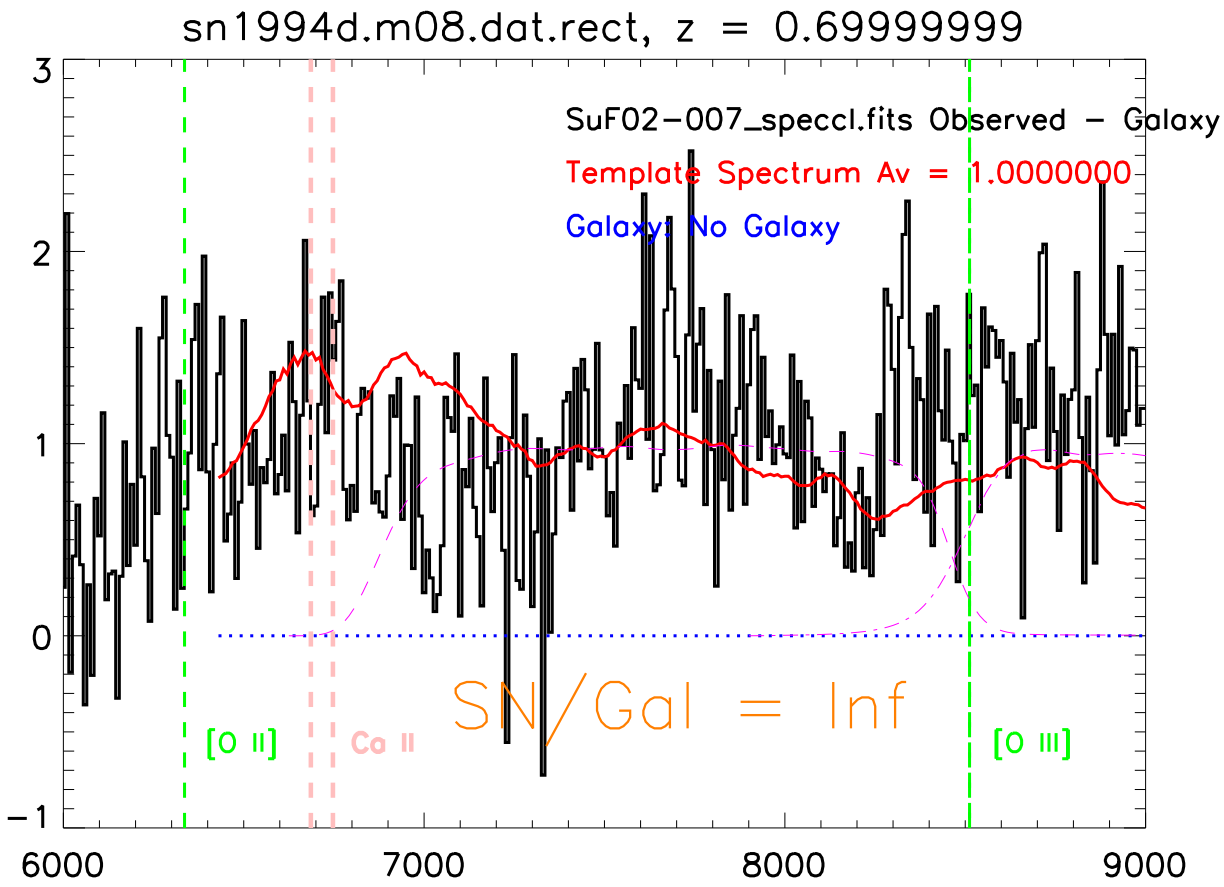

sn1994d.m05.dat.rect, z = 0.68000001
SuF02-007_specc1.fits Observed − Galaxy
Template Spectrum Av = 1.0000000
Galaxy: No Galaxy
SN/Gal = Inf
[O II]
Ca II
[O III]
3
2
1
0
−1
6000
7000
8000
9000

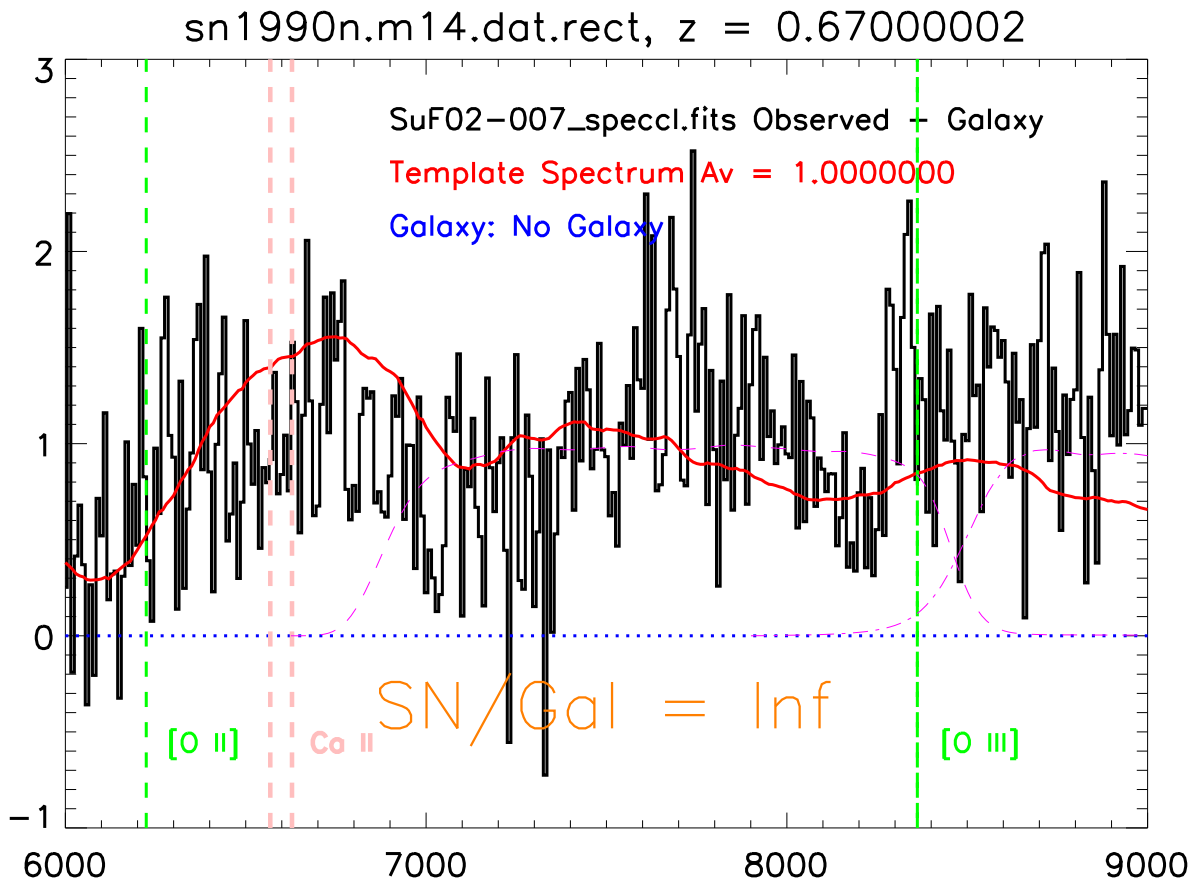

sn1994d.m09.dat.rect, z = 0.95999998
SuF02−007_speccl.fits Observed − Gala
Template Spectrum Av = 1.0000000
Galaxy: No Galaxy
SN/Gal = Inf
[O II]
Ca II
Mg II, I
3
2
1
0
−1
6000
7000
8000
9000

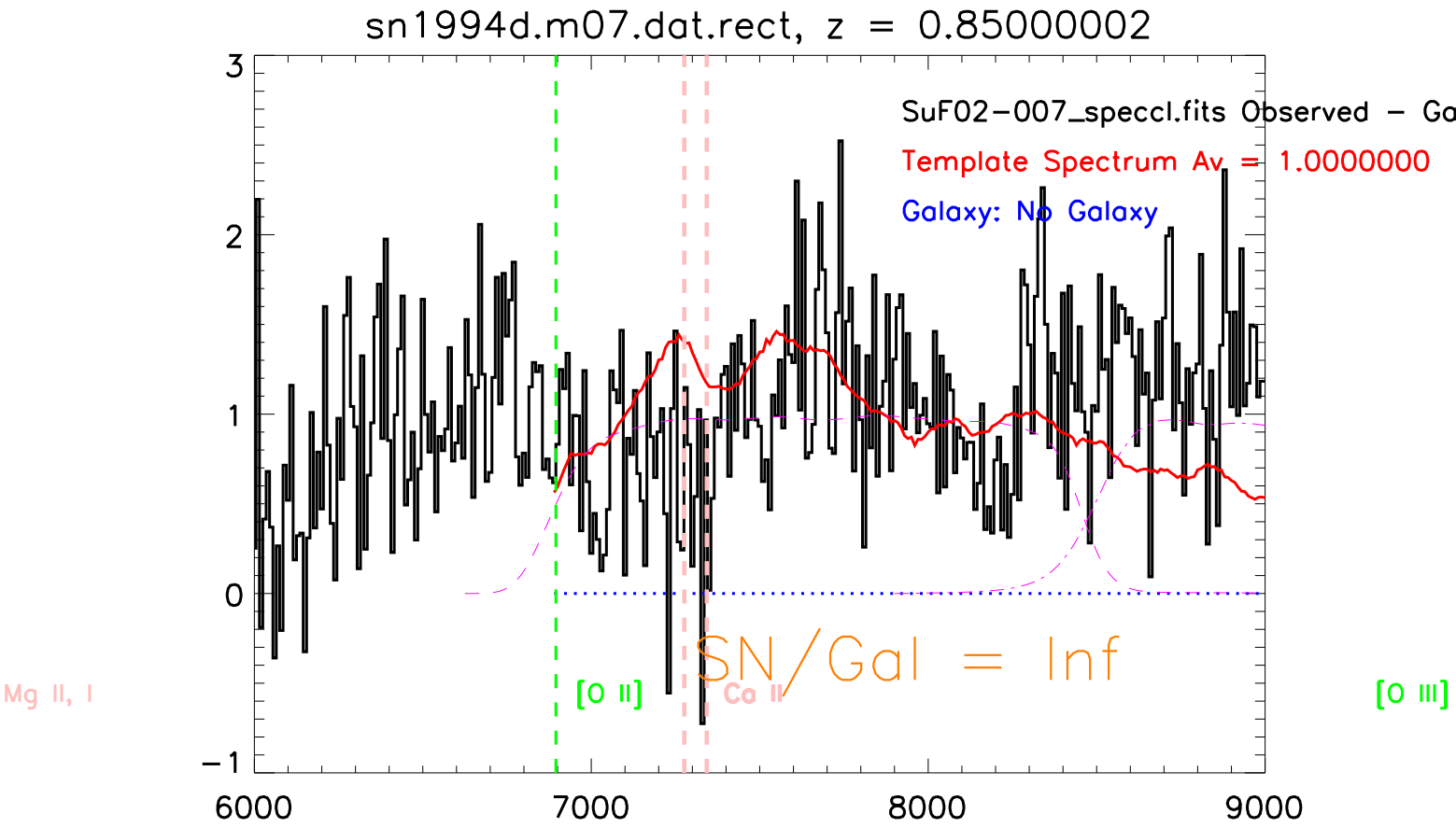

sn1996x.m00.dat.rect, z = 0.88000000
SuF02-007_speccl.fits Observed − Galaxy
Template Spectrum Av = 0.79719386
Galaxy: No Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O
3
2
1
0
−1
6000
7000
8000
9000

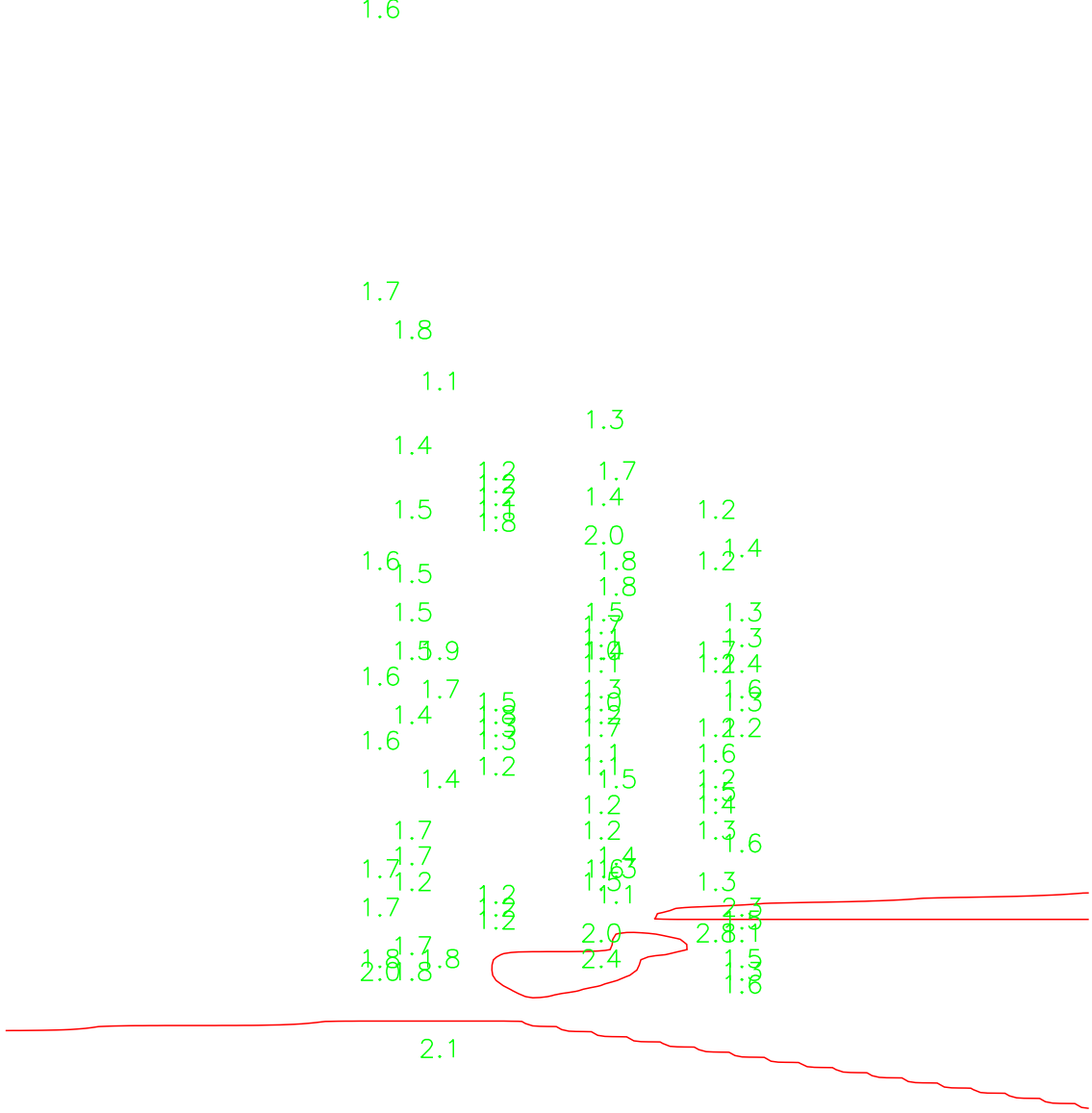

sn1996x.m02.dat.rect, z = 0.84000003
SuF02-007_specc1.fits Observed – Ga
Template Spectrum Av = 1.0000000
Galaxy: No Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
3
2
1
0
−1
6000
7000
8000
9000

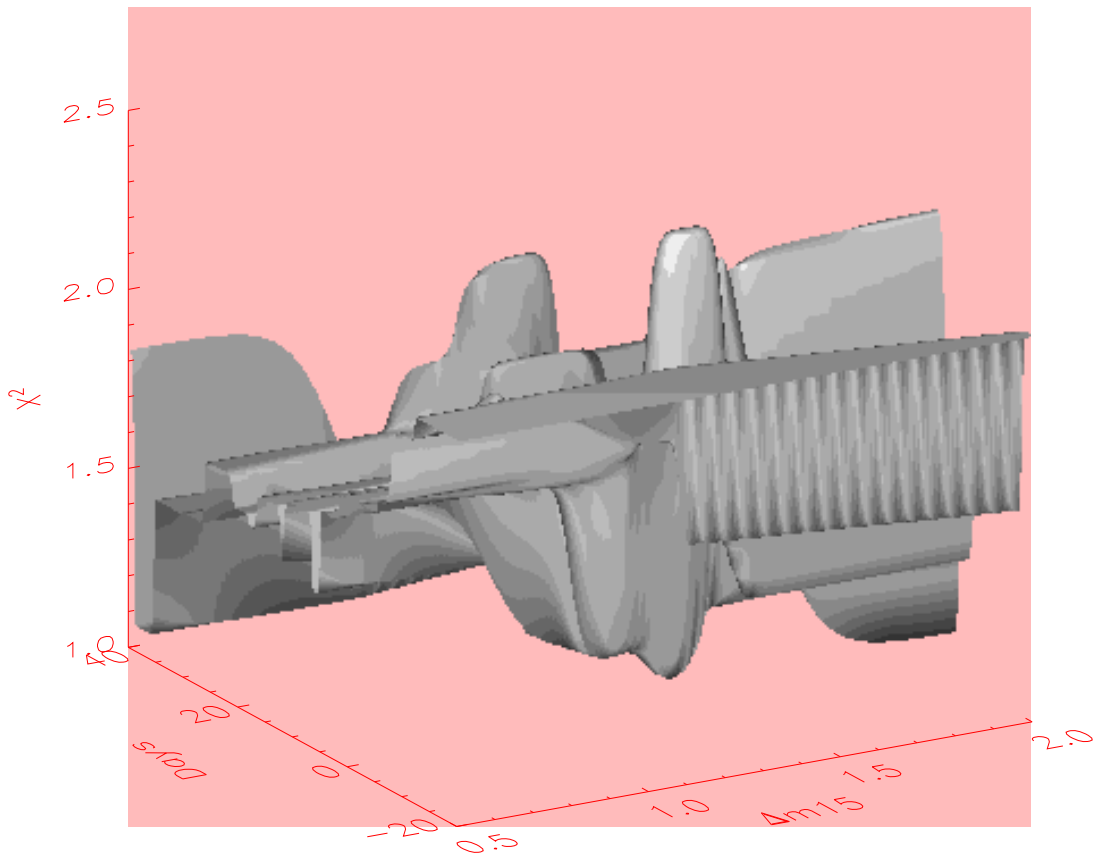

sn1981b.m00.dat.rect, z = 0.88999999
SuF02-007_speccl.fits Observed − Galaxy
Template Spectrum Av = 0.50382653
Galaxy: No Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
3
2
1
0
−1
6000
7000
8000
9000


sn1994d.m08.dat.rect, z = 0.69999999
SuF02-007_speccl.fits Observed - Galaxy
Template Spectrum Av = 1.0000000
Galaxy: No Galaxy
SN/Gal = Inf
[O II]
Ca II
[O III]
3
2
1
0
-1
6000
7000
8000
9000

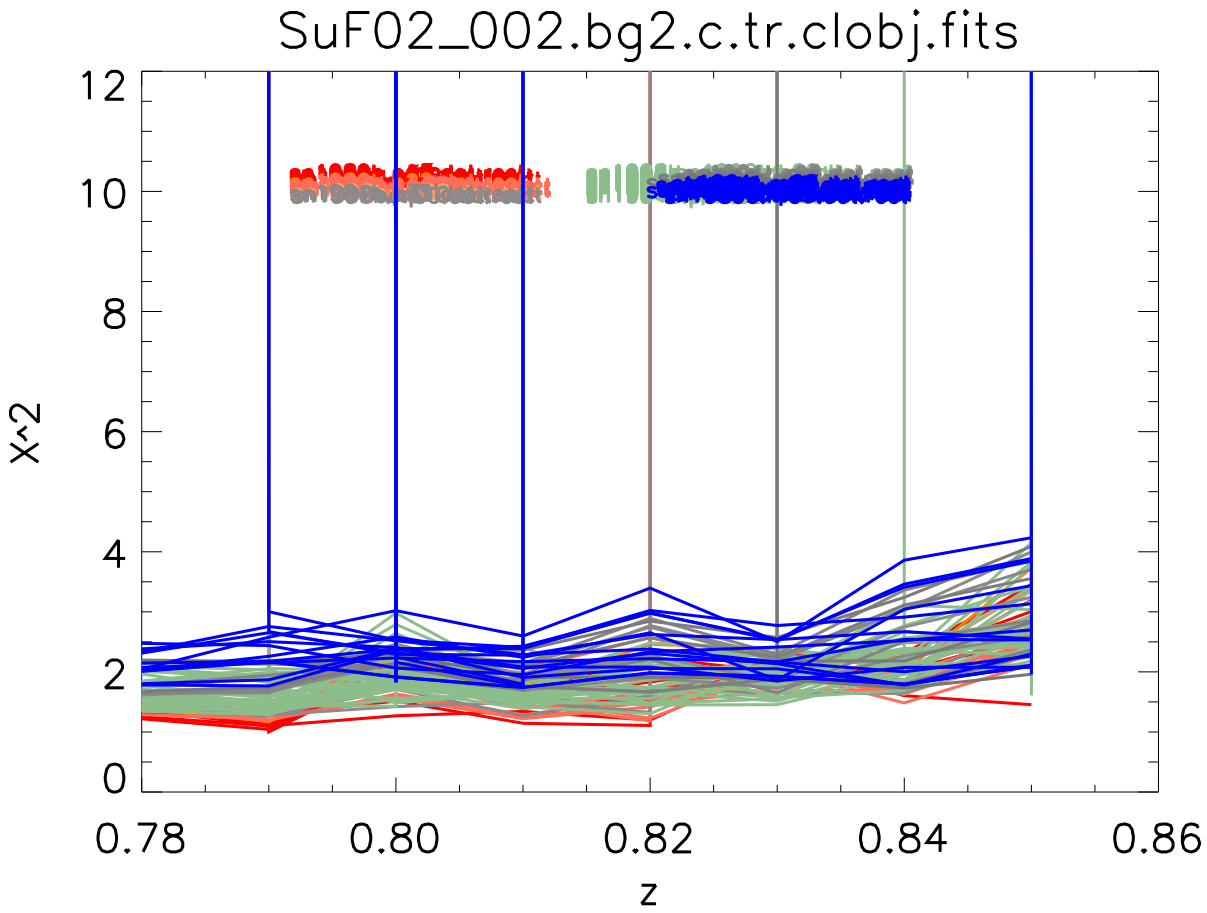

sn1990n.m14.dat.rect, z = 0.67000002
SuF02-007_speccl.fits Observed + Galaxy
Template Spectrum Av = 1.0000000
Galaxy: No Galaxy
SN/Gal = Inf
[O II]
Ca II
[O III]
3
2
1
0
−1
6000
7000
8000
9000

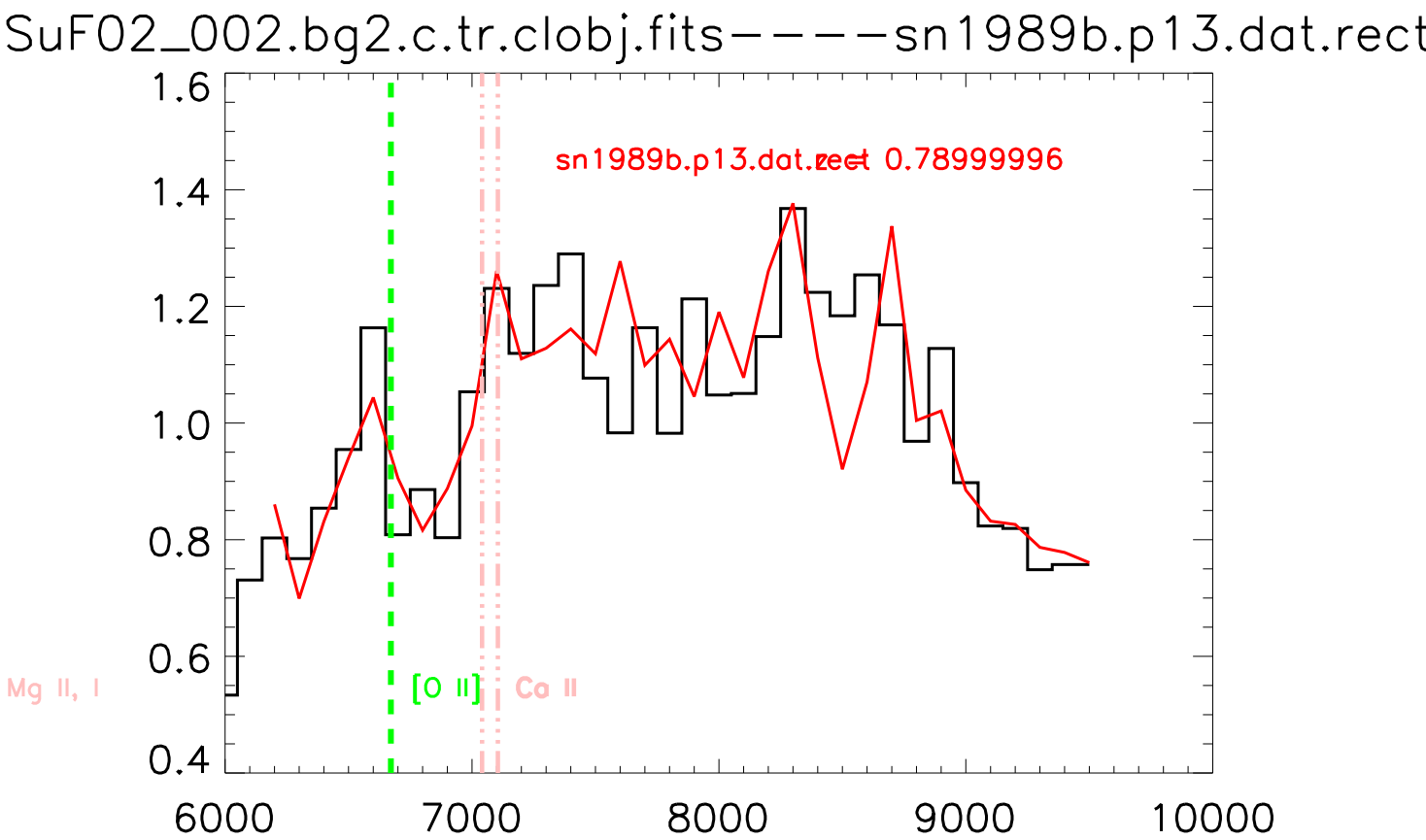

sn1994d.m07.dat.rect, z = 0.85000002
SuF02-007_specci.fits Observed – Ga
Template Spectrum Av = 1.0000000
Galaxy: No Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
3
2
1
0
−1
6000
7000
8000
9000

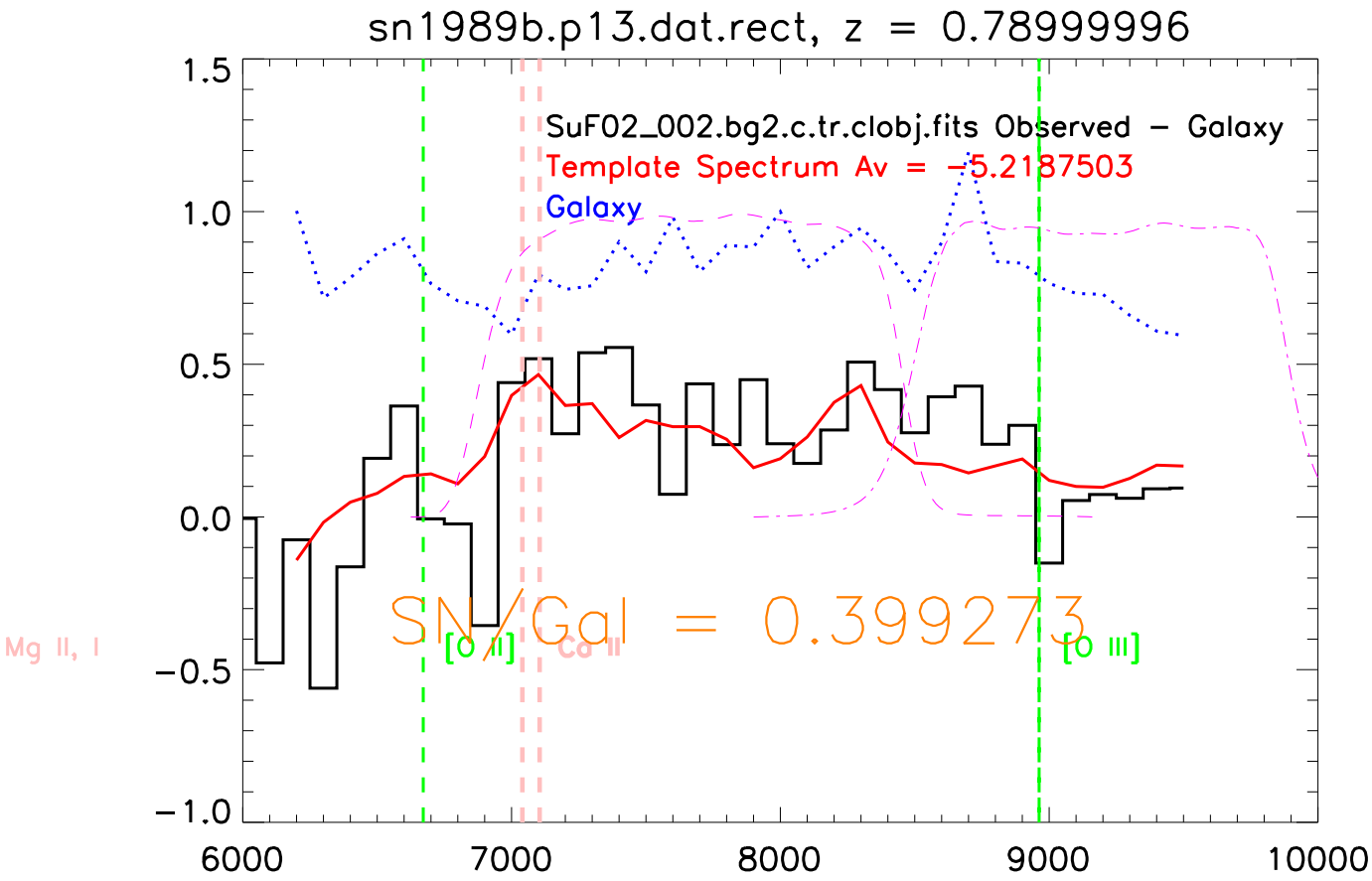

1.6
1.7
1.8
1.1
1.3
1.4
1.2
1.7
1.4
1.5
1.2
2.0
1.4
1.6
1.5
1.8
1.2
1.8
1.5
1.3
1.5
1.3
1.6
1.7
1.4
1.6
1.2
1.4
1.5
1.2
1.7
1.2
1.3
1.6
1.7
1.2
1.3
1.7
2.0
2.4
2.1

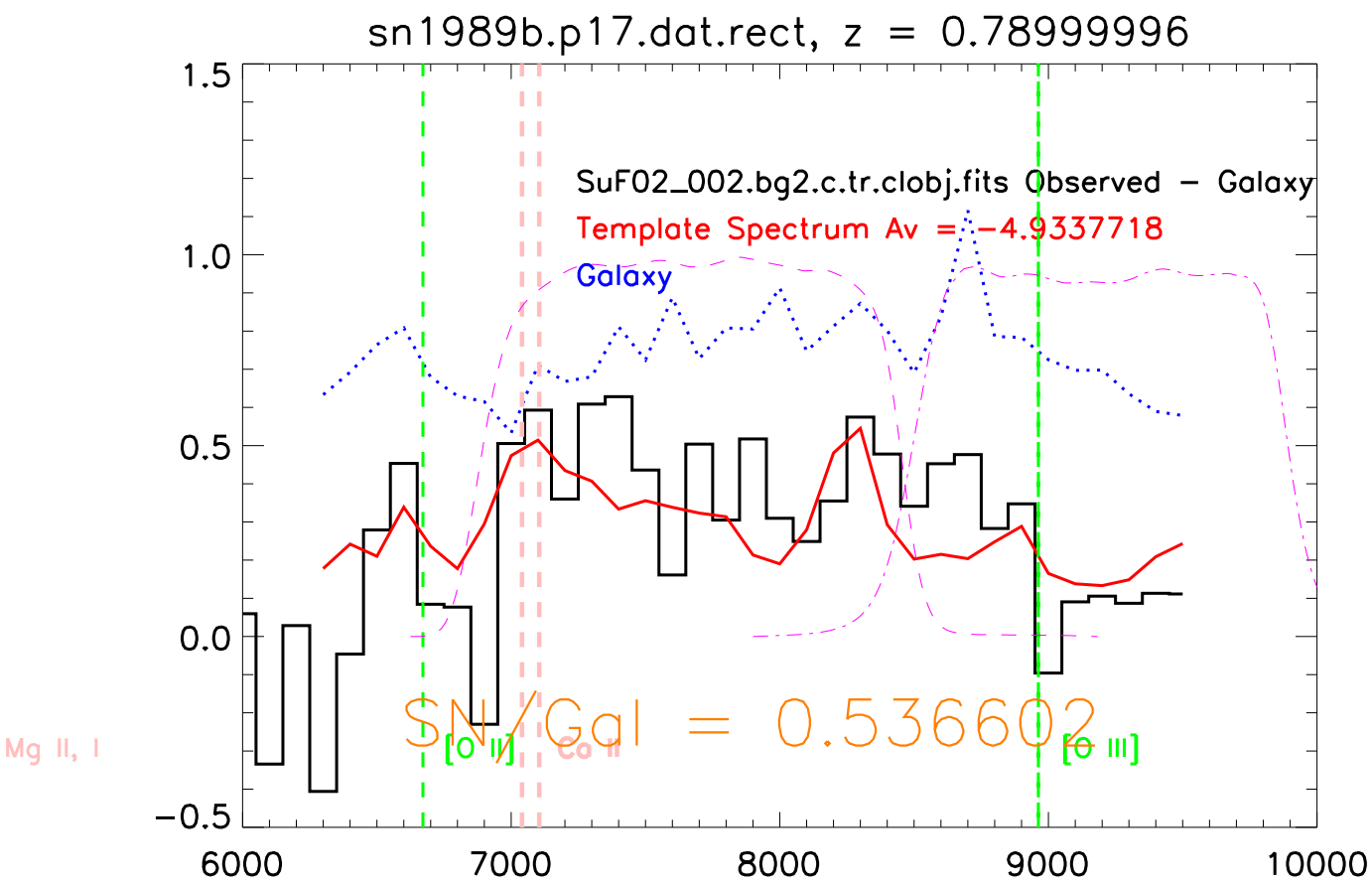


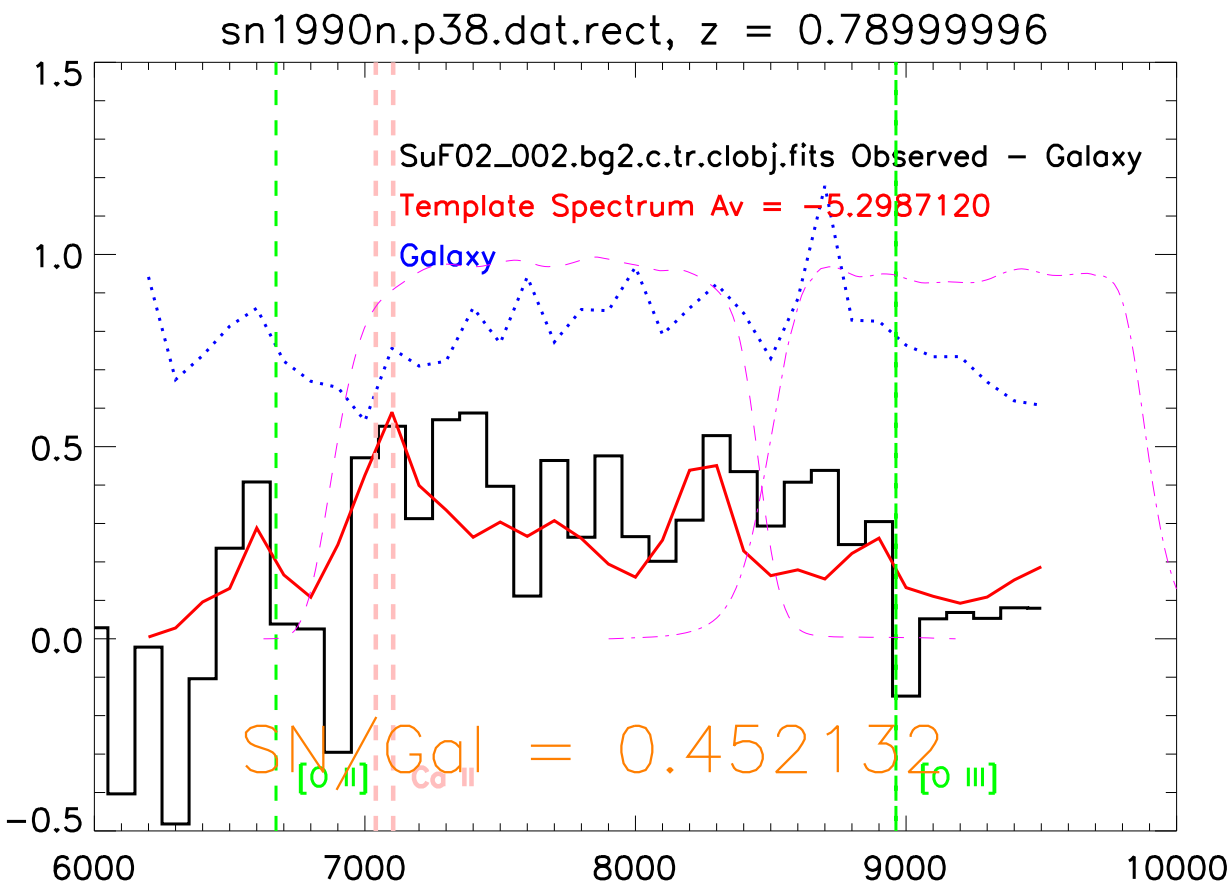
2.5
2.0
1.5
1.0
χ^2
40
20
0
−20
Days
0.5
1.0
1.5
2.0
Δm15

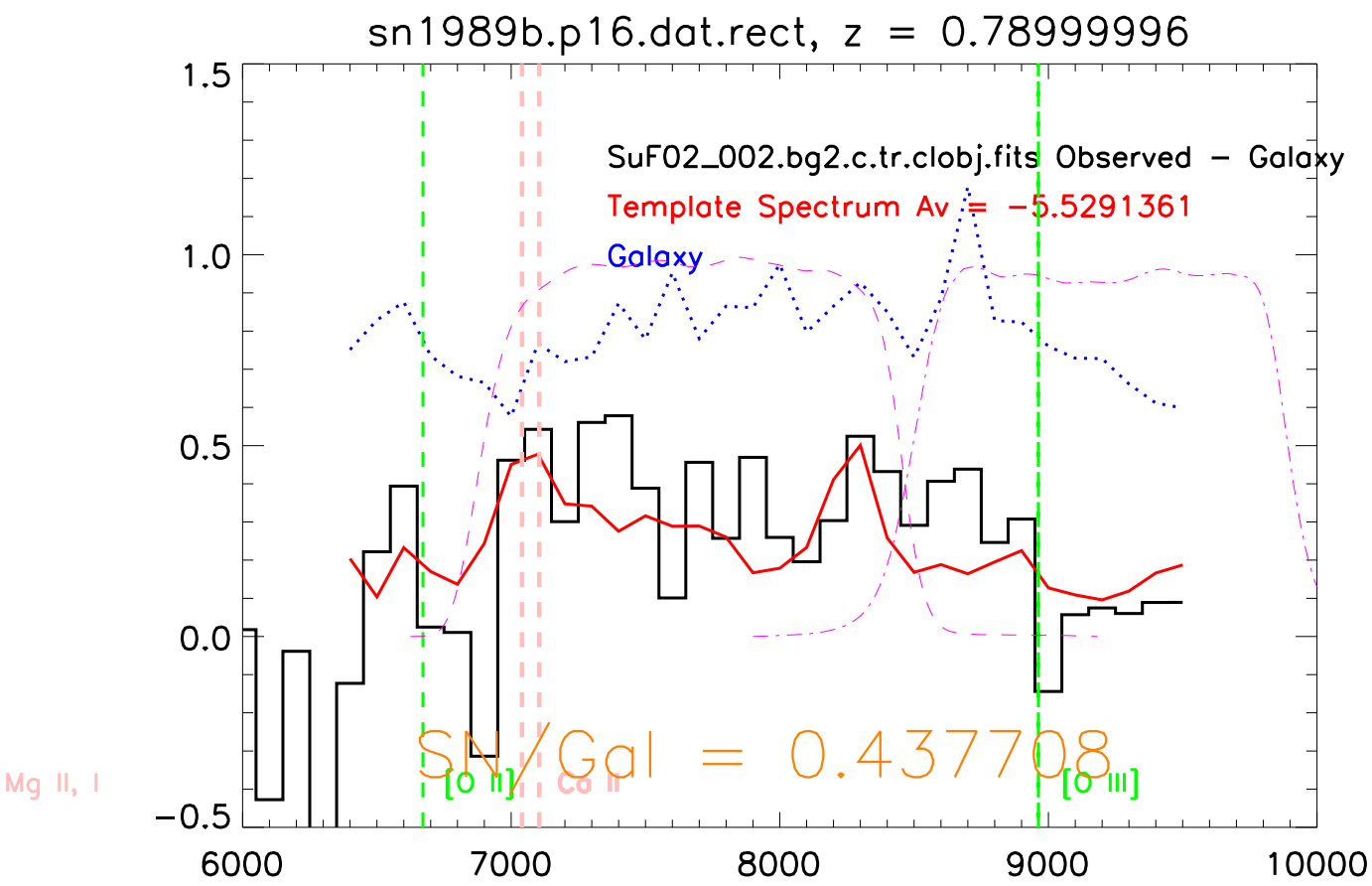

SuF02_002.bg2.c.tr.clobj.fits
X^2
z
0
2
4
6
8
10
12
0.78
0.80
0.82
0.84
0.86

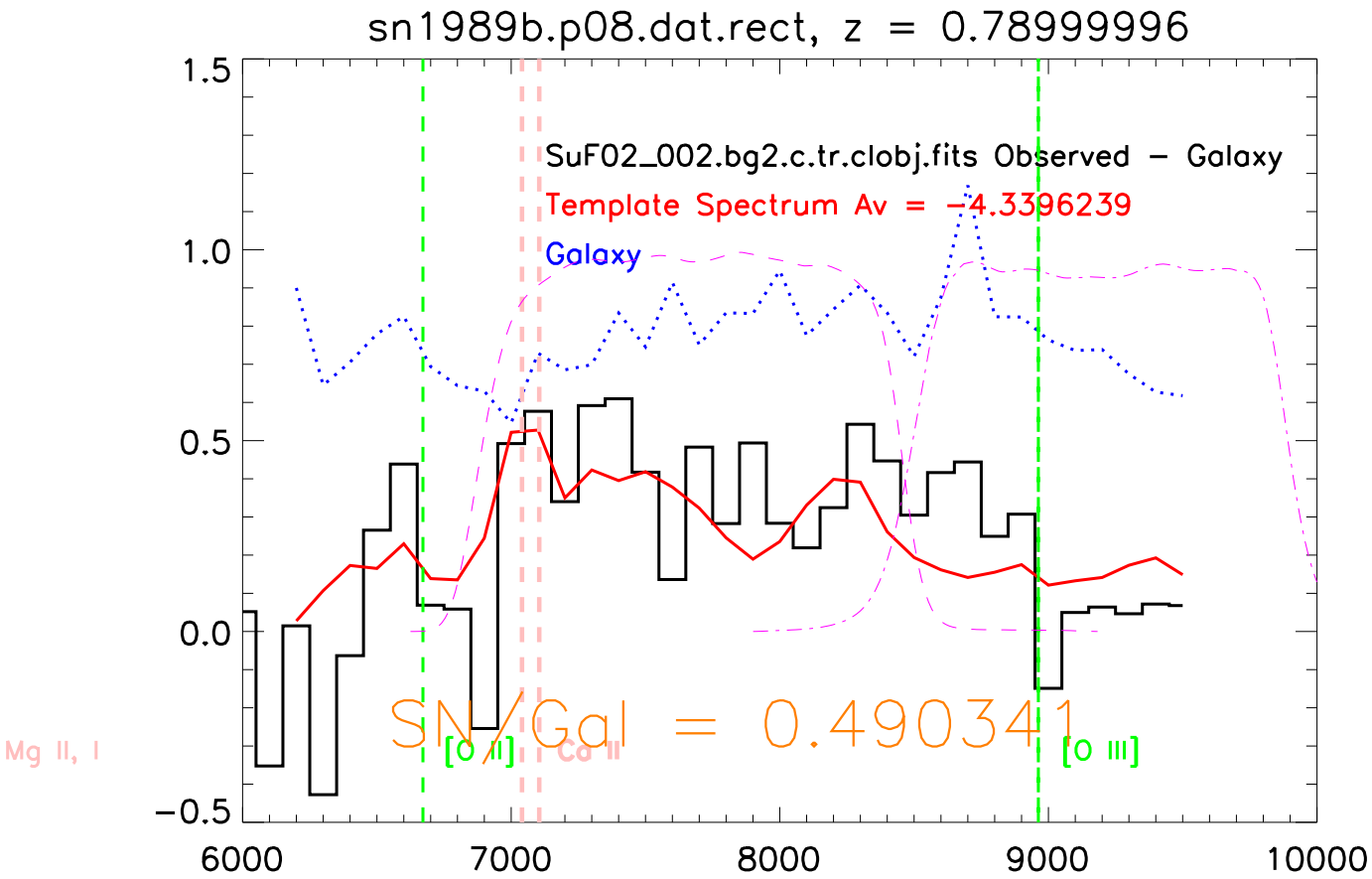

SuF02_002.bg2.c.tr.clobj.fits----sn1989b.p13.dat.rect
sn1989b.p13.dat.rect 0.78999996
Mg II, I
[O II]
Ca II
1.6
1.4
1.2
1.0
0.8
0.6
0.4
6000
7000
8000
9000
10000

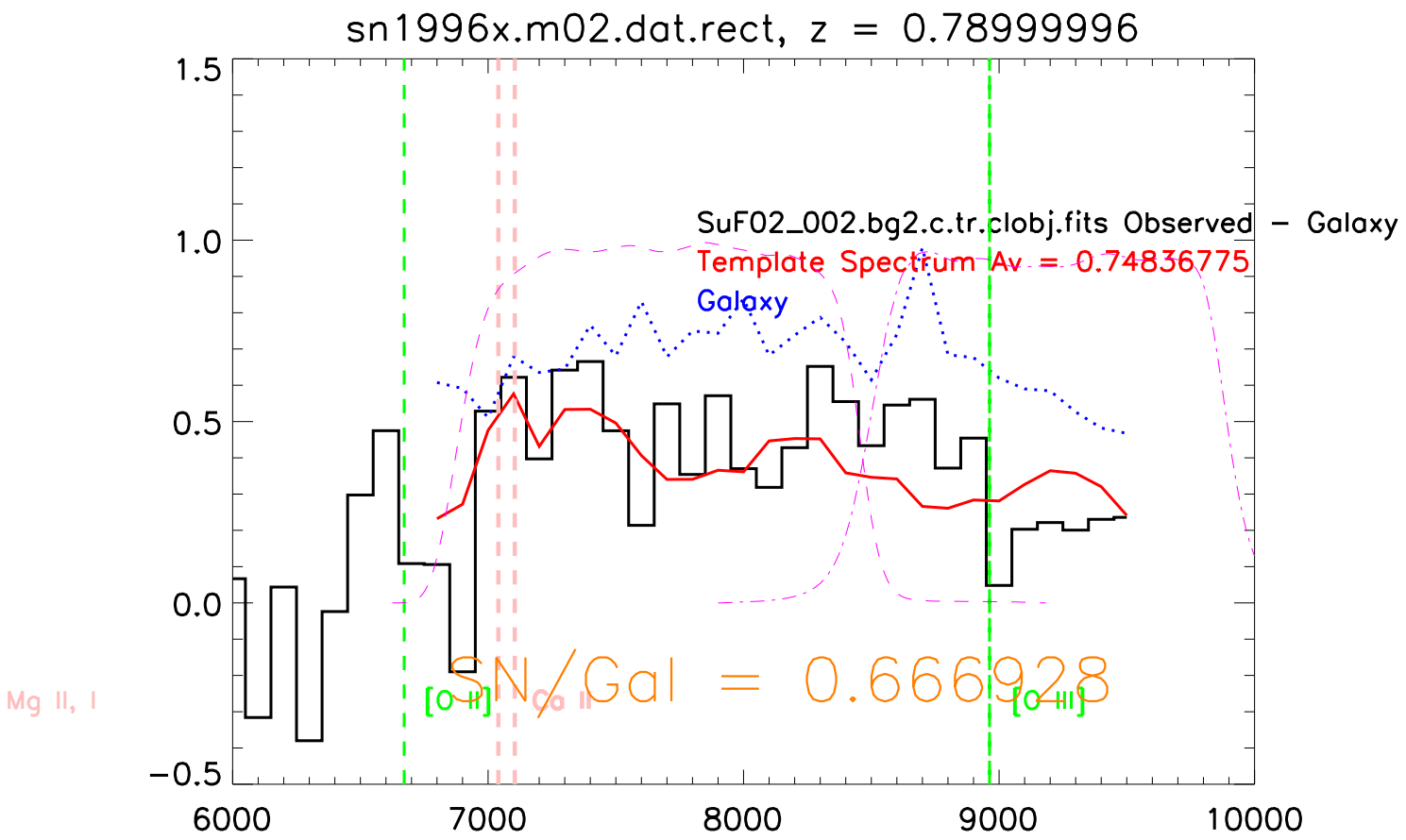

sn1989b.p13.dat.rect, z = 0.78999996
SuF02_002.bg2.c.tr.clobj.fits Observed − Galaxy
Template Spectrum Av = −5.2187503
Galaxy
SN/Gal = 0.399273
[O II]
Ca II
[O III]
Mg II, I
1.5
1.0
0.5
0.0
−0.5
−1.0
6000
7000
8000
9000
10000

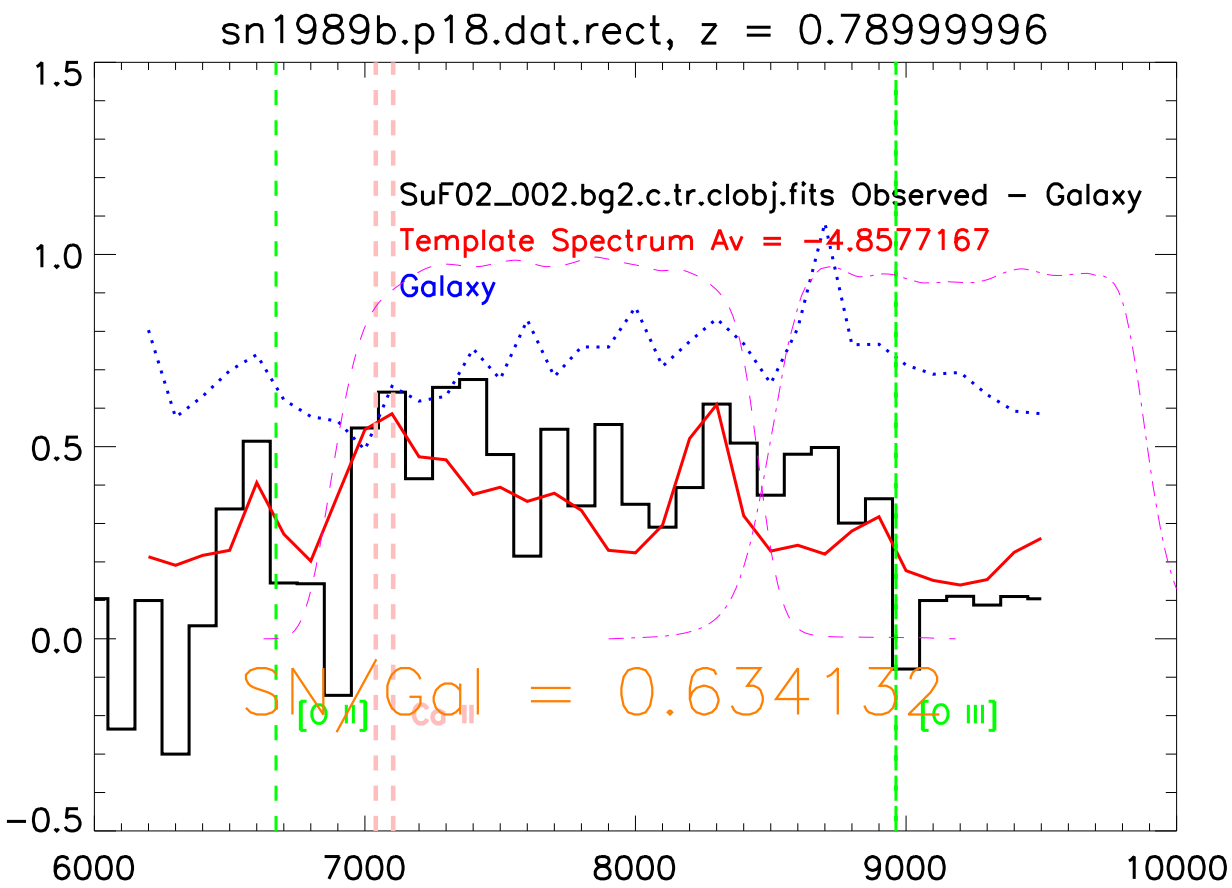

sn1989b.p17.dat.rect, z = 0.78999996
SuF02_002.bg2.c.tr.clobj.fits Observed – Galaxy
Template Spectrum Av = -4.9337718
Galaxy
S/N Gal = 0.536602
[O II]
Ca II
[O III]
Mg II, I
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

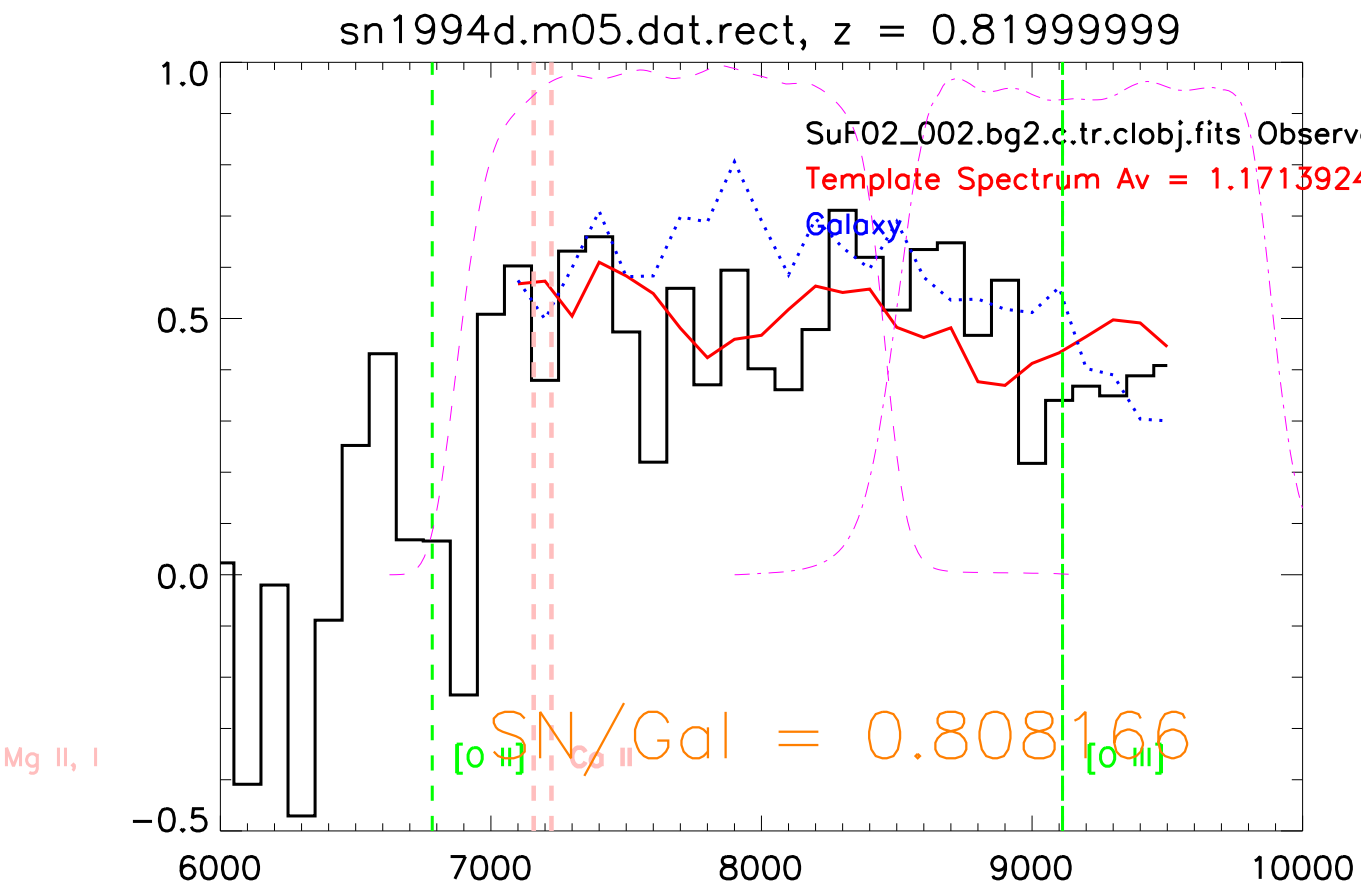

sn1990n.p38.dat.rect, z = 0.78999996
SuF02_002.bg2.c.tr.clobj.fits Observed − Galaxy
Template Spectrum Av = −5.2987120
Galaxy
SN/Gal = 0.452132
[O II]
Ca II
[O III]
Mg II, I
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000


sn1989b.p16.dat.rect, z = 0.78999996
SuF02_002.bg2.c.tr.clobj.fits Observed – Galaxy
Template Spectrum Av = −5.5291361
Galaxy
SN/Gal = 0.437708
[O II]
Ca II
[O III]
Mg II, I
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000


sn1989b.p08.dat.rect, z = 0.78999996
SuF02_002.bg2.c.tr.clobj.fits Observed − Galaxy
Template Spectrum Av = −4.3396239
Galaxy
SN/Gal = 0.490341
[O II]
Ca II
[O III]
Mg II, I
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000


sn1996x.m02.dat.rect, z = 0.78999996
SuF02_002.bg2.c.tr.clobj.fits Observed – Galaxy
Template Spectrum Av = 0.74836775
Galaxy
S/N Gal = 0.666928
Mg II, I
[O II]
Ca II
[O III]
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000


sn1989b.p18.dat.rect, z = 0.78999996
SuF02_002.bg2.c.tr.clobj.fits Observed − Galaxy
Template Spectrum Av = −4.8577167
Galaxy
SN/Gal = 0.634132
[O II]
Ca II
[O III]
Mg II, I
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000


sn1994d.m05.dat.rect, z = 0.81999999
SuF02_002.bg2.c.tr.clobj.fits Observed – Gala
Template Spectrum Av = 1.1713924
Galaxy
SN/Gal = 0.808166
Mg II, I
[O II]
Ca II
[O III]
1.0
0.5
0.0
−0.5
6000
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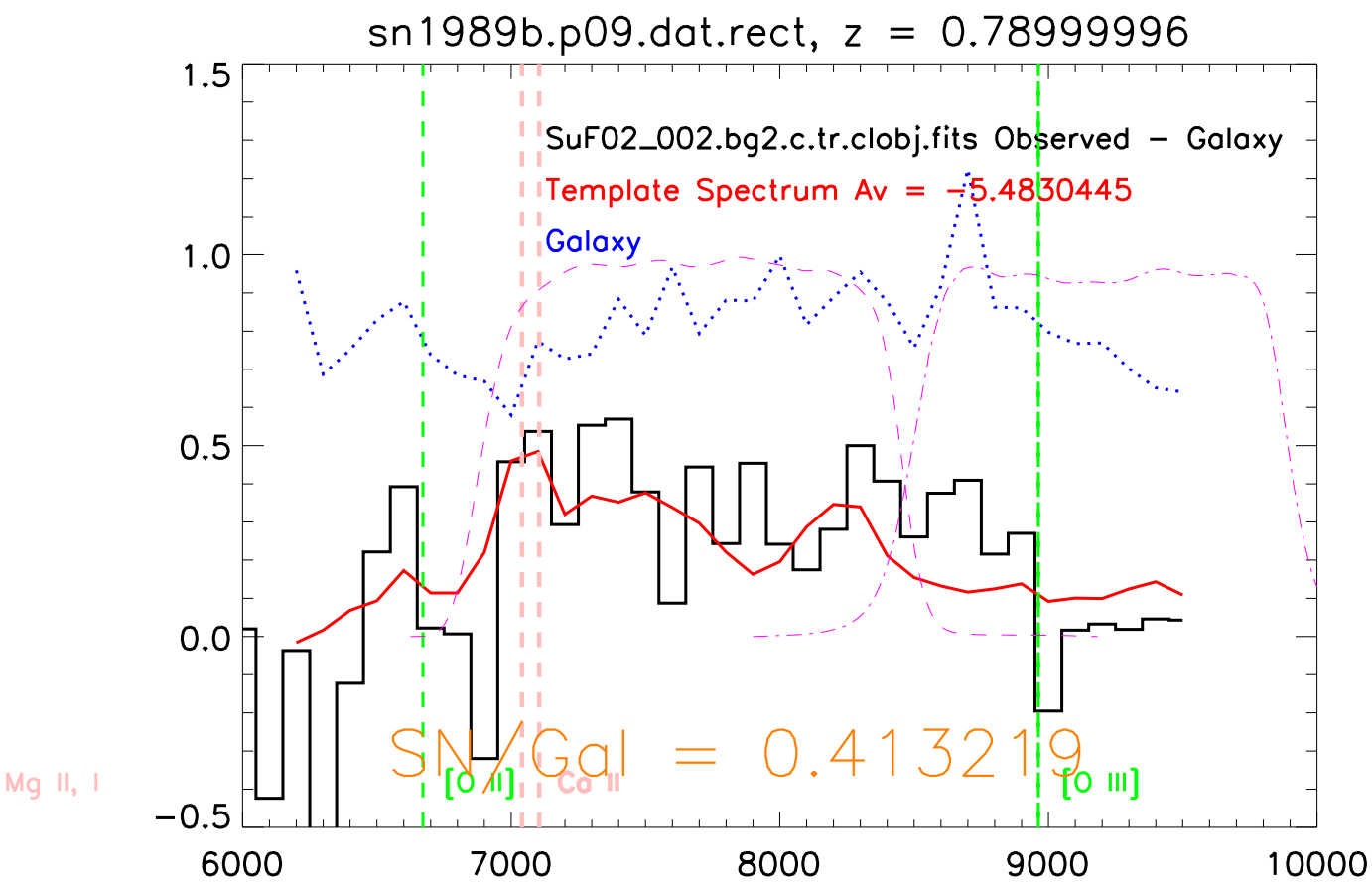
8000
9000
10000


sn1989b.p09.dat.rect, z = 0.78999996
SuF02_002.bg2.c.tr.clobj.fits Observed − Galaxy
Template Spectrum Av = −5.4830445
Galaxy
SN/Gal = 0.413219
[O II]
Ca II
[O III]
Mg II, I
1.5
1.0
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−0.5
6000
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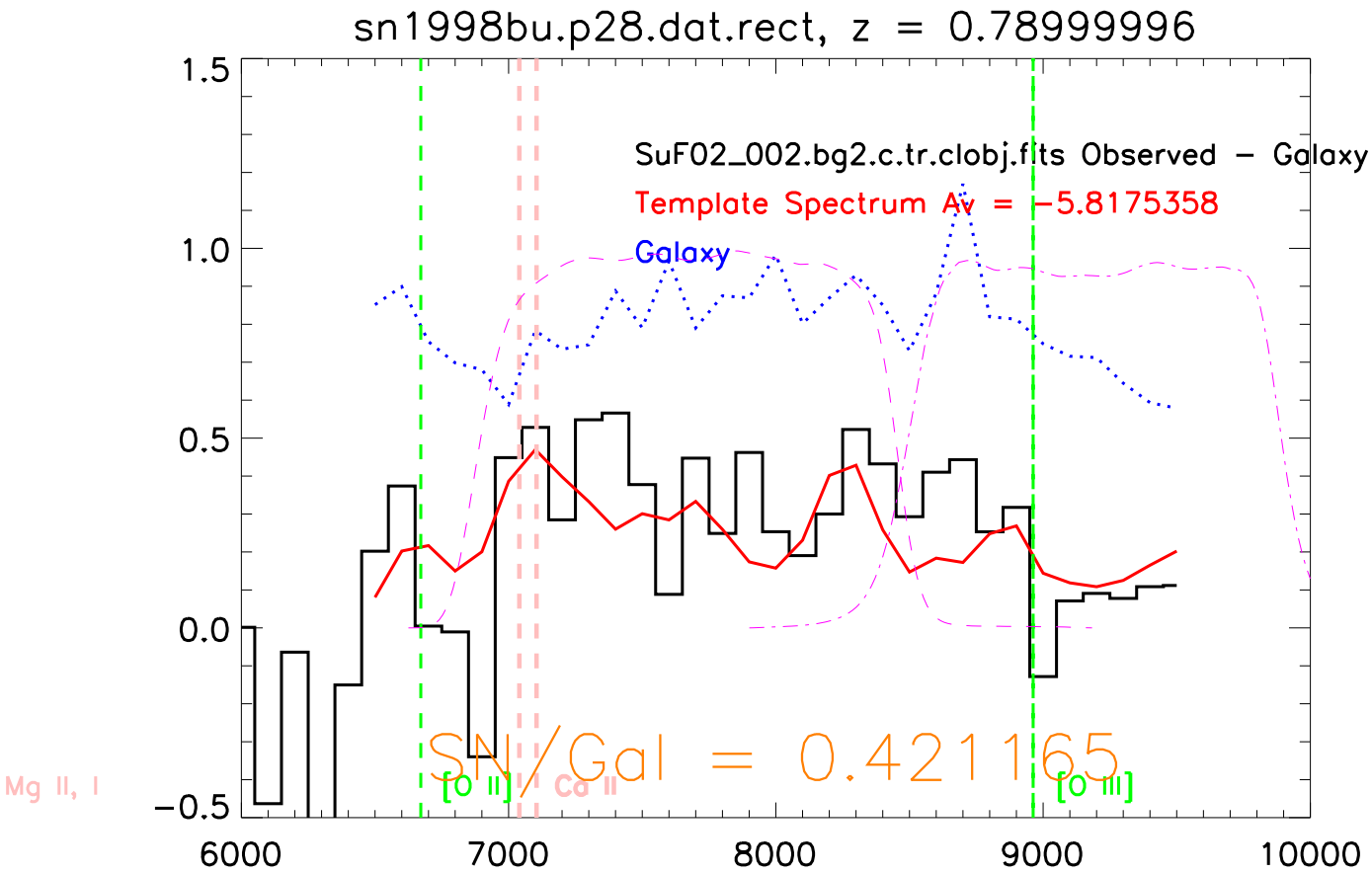
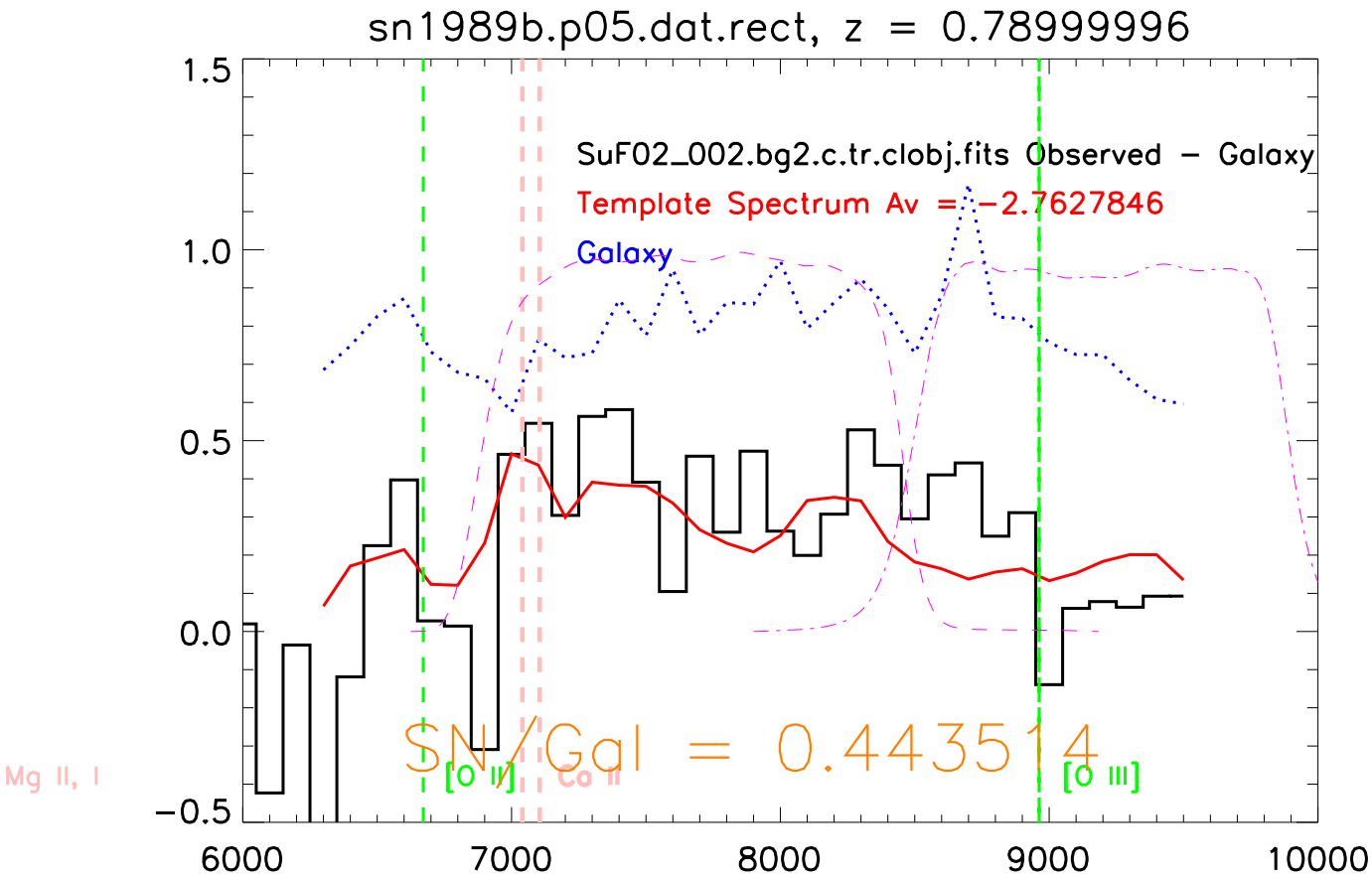
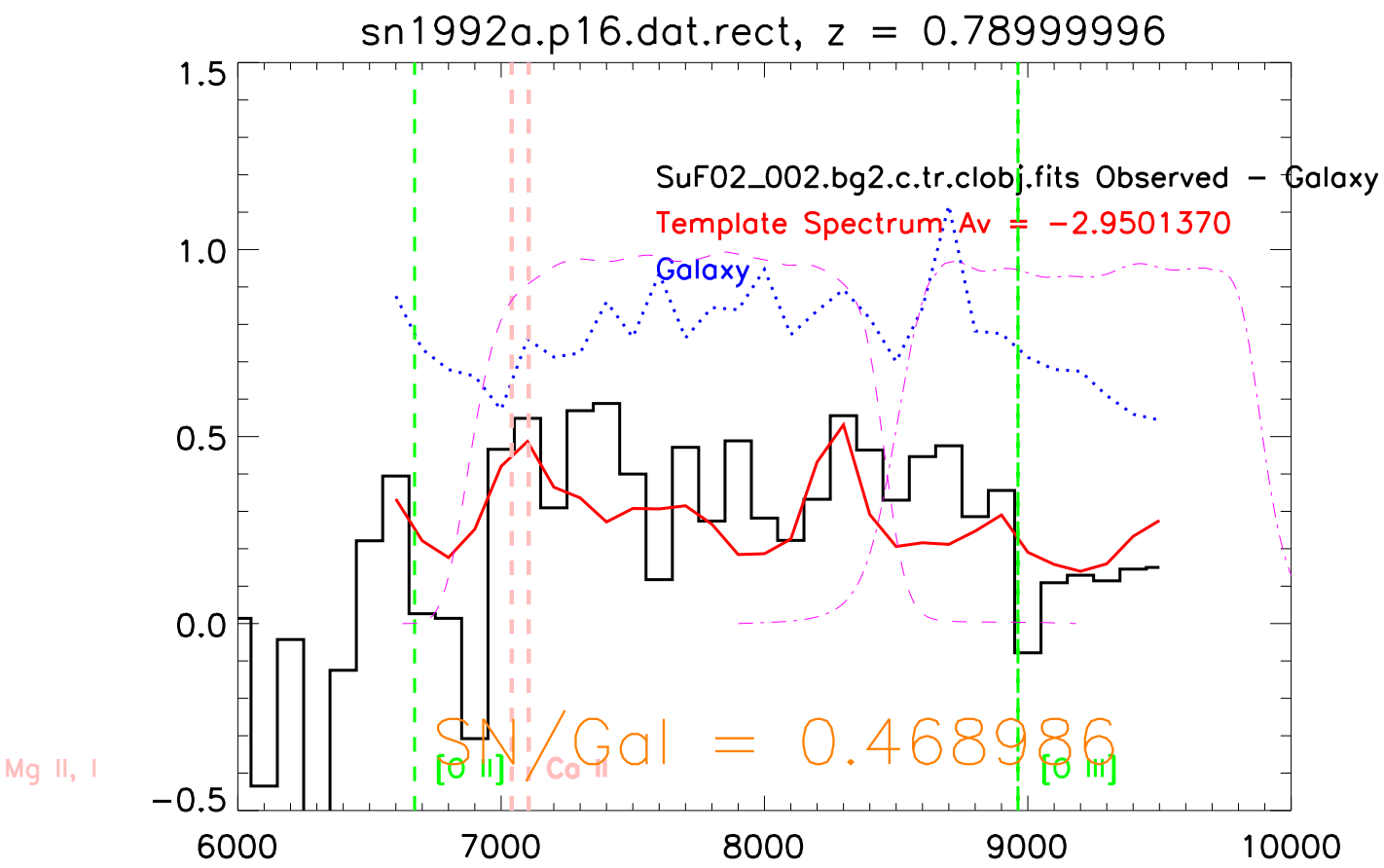
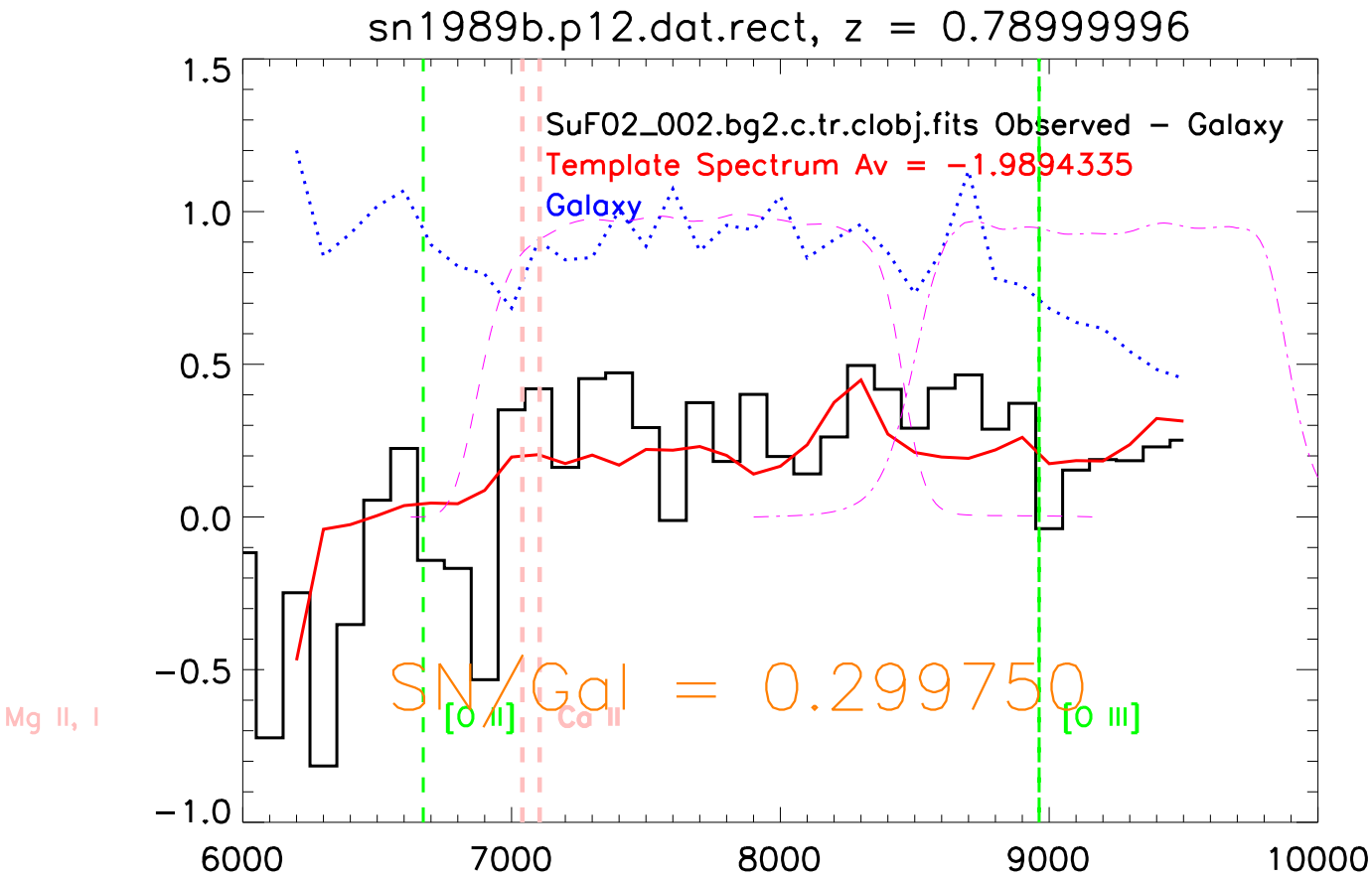
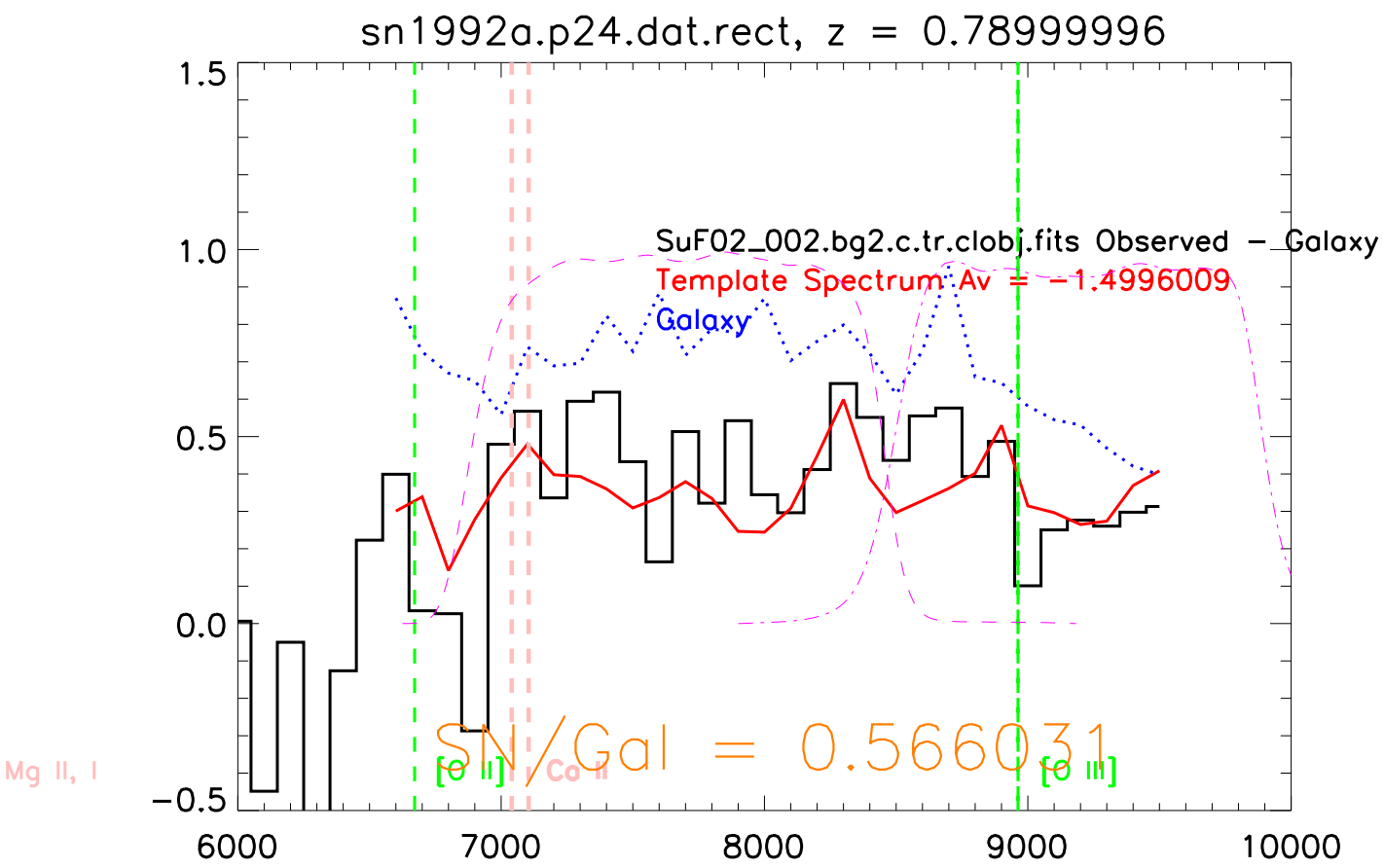
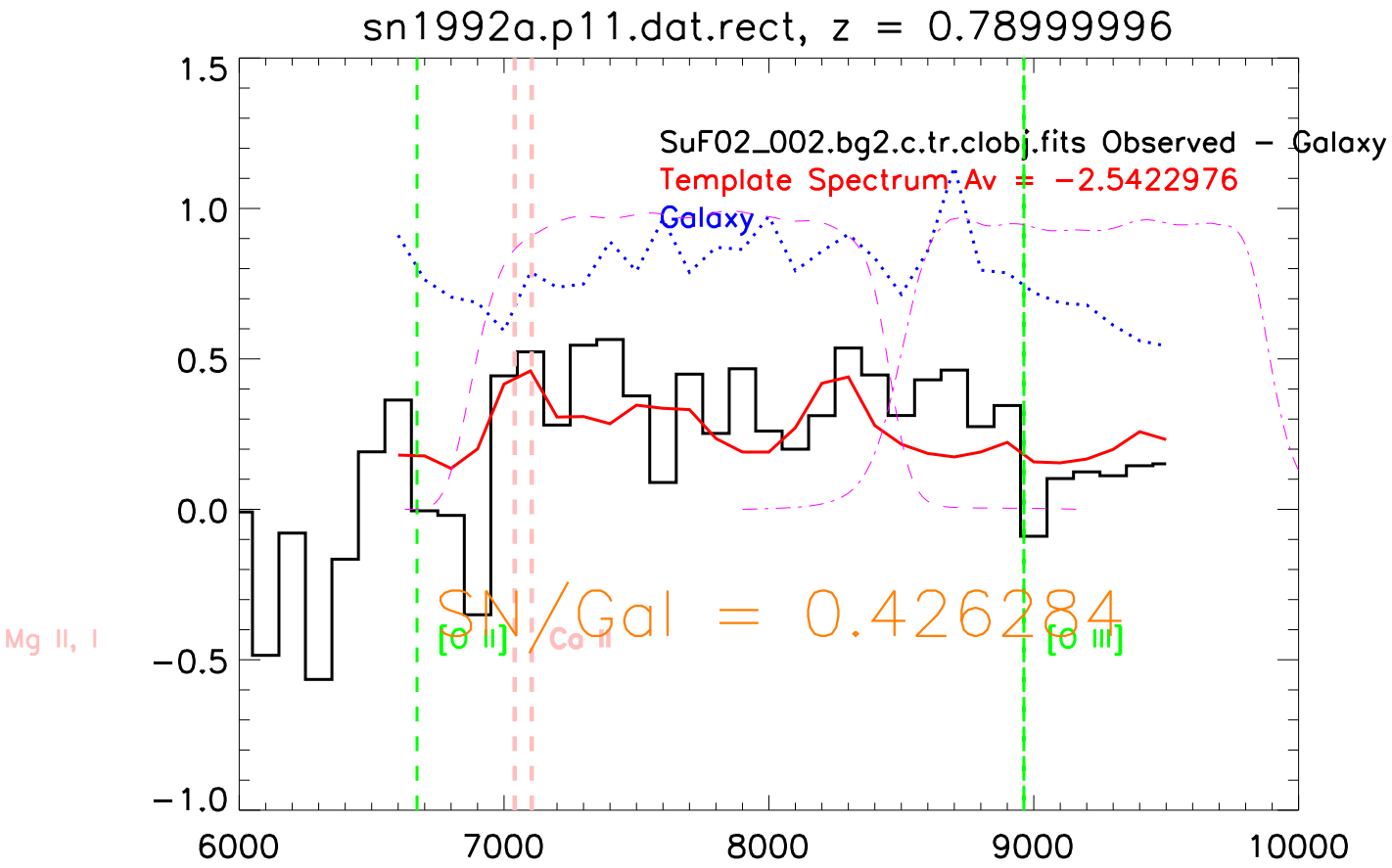

sn1998bu.p28.dat.rect, z = 0.78999996
SuF02_002.bg2.c.tr.clobj.fits Observed – Galaxy
Template Spectrum Av = -5.8175358
Galaxy
SN/Gal = 0.421165
[O II]
Ca II
[O III]
Mg II, I
1.5
1.0
0.5
0.0
-0.5
6000
7000
8000
9000
10000

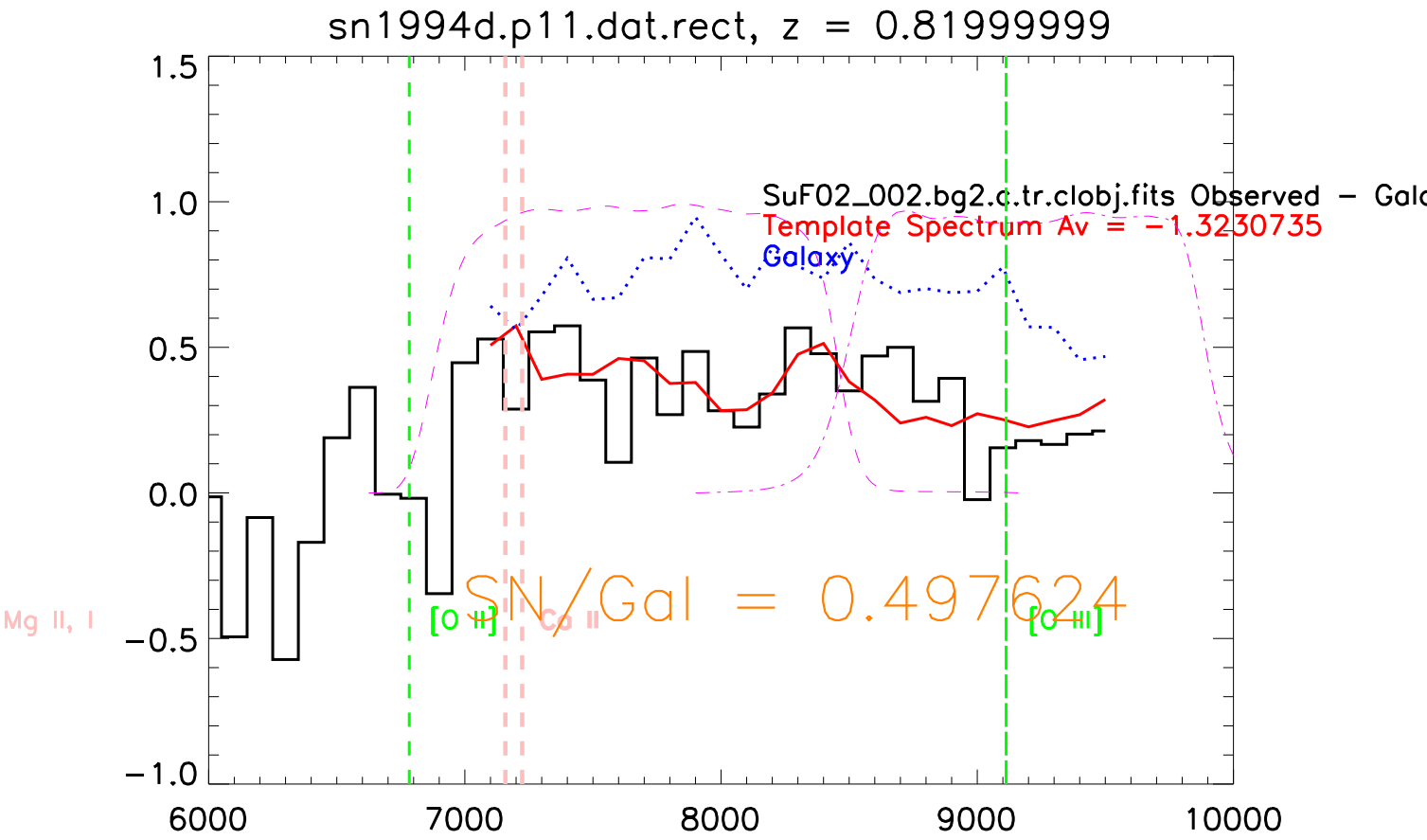

sn1989b.p05.dat.rect, z = 0.78999996
SuF02_002.bg2.c.tr.clobj.fits Observed − Galaxy
Template Spectrum Av = −2.7627846
Galaxy
S/N/Gal = 0.443514
[O II]
Ca II
[O III]
Mg II, I
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

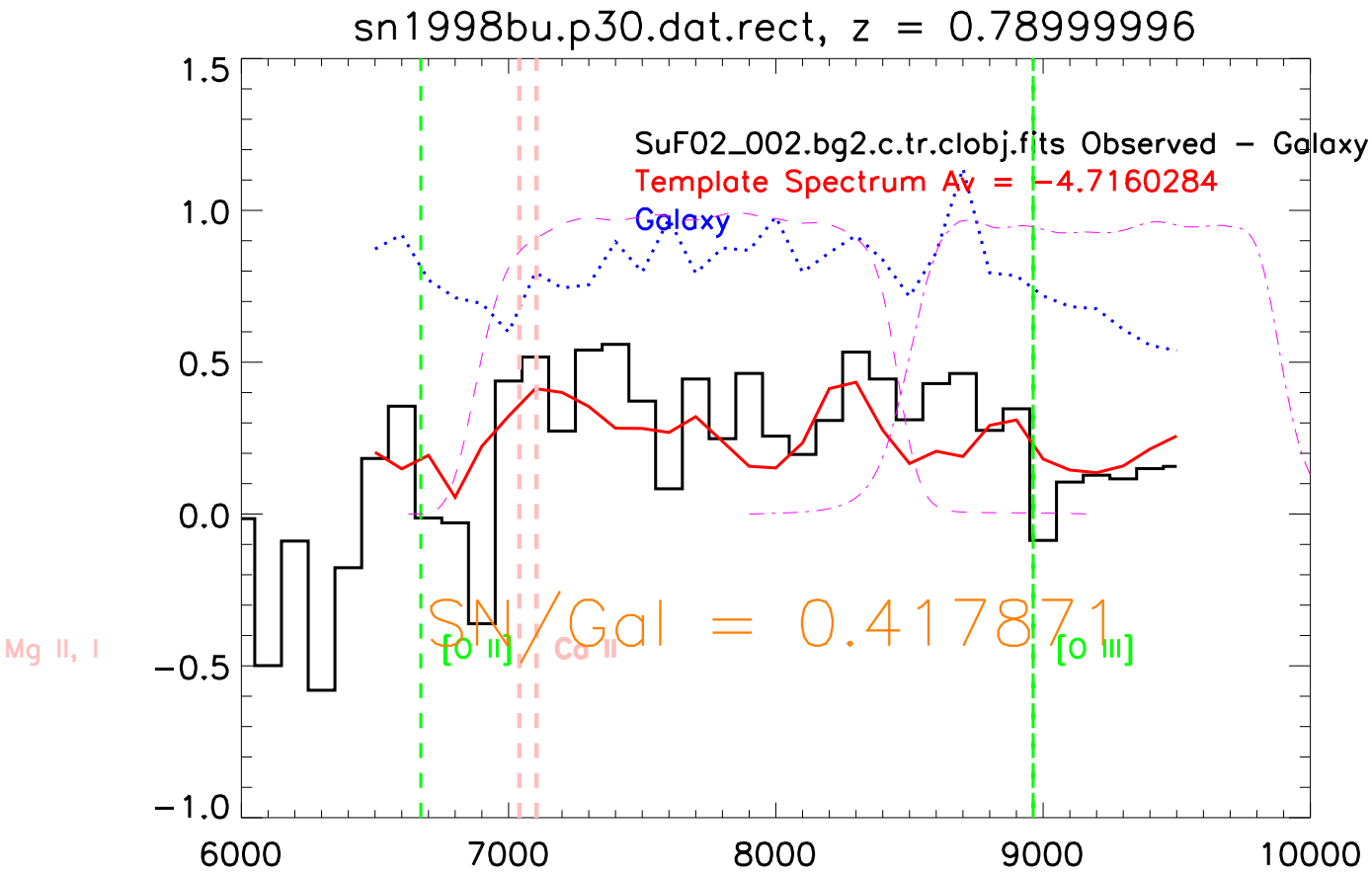

sn1992a.p16.dat.rect, z = 0.78999996
SuF02_002.bg2.c.tr.clobj.fits Observed − Galaxy
Template Spectrum Av = −2.9501370
Galaxy
SN/Gal = 0.468986
[O II]
Ca II
[O III]
Mg II, I
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

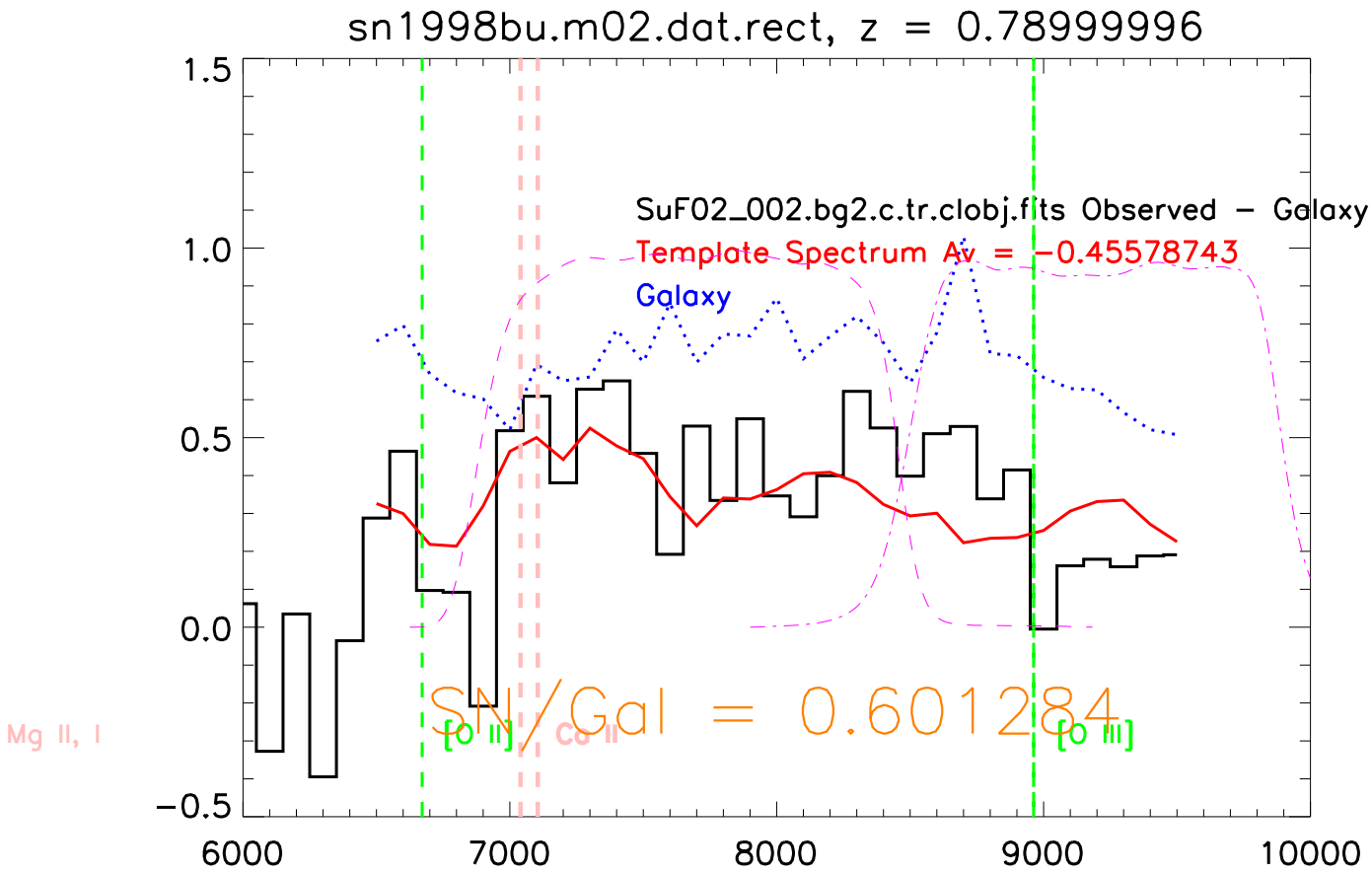

sn1989b.p12.dat.rect, z = 0.78999996
SuF02_002.bg2.c.tr.clobj.fits Observed − Galaxy
Template Spectrum Av = −1.9894335
Galaxy
SN/Gal = 0.299750
[O II]
Ca II
[O III]
Mg II, I
1.5
1.0
0.5
0.0
−0.5
−1.0
6000
7000
8000
9000
10000

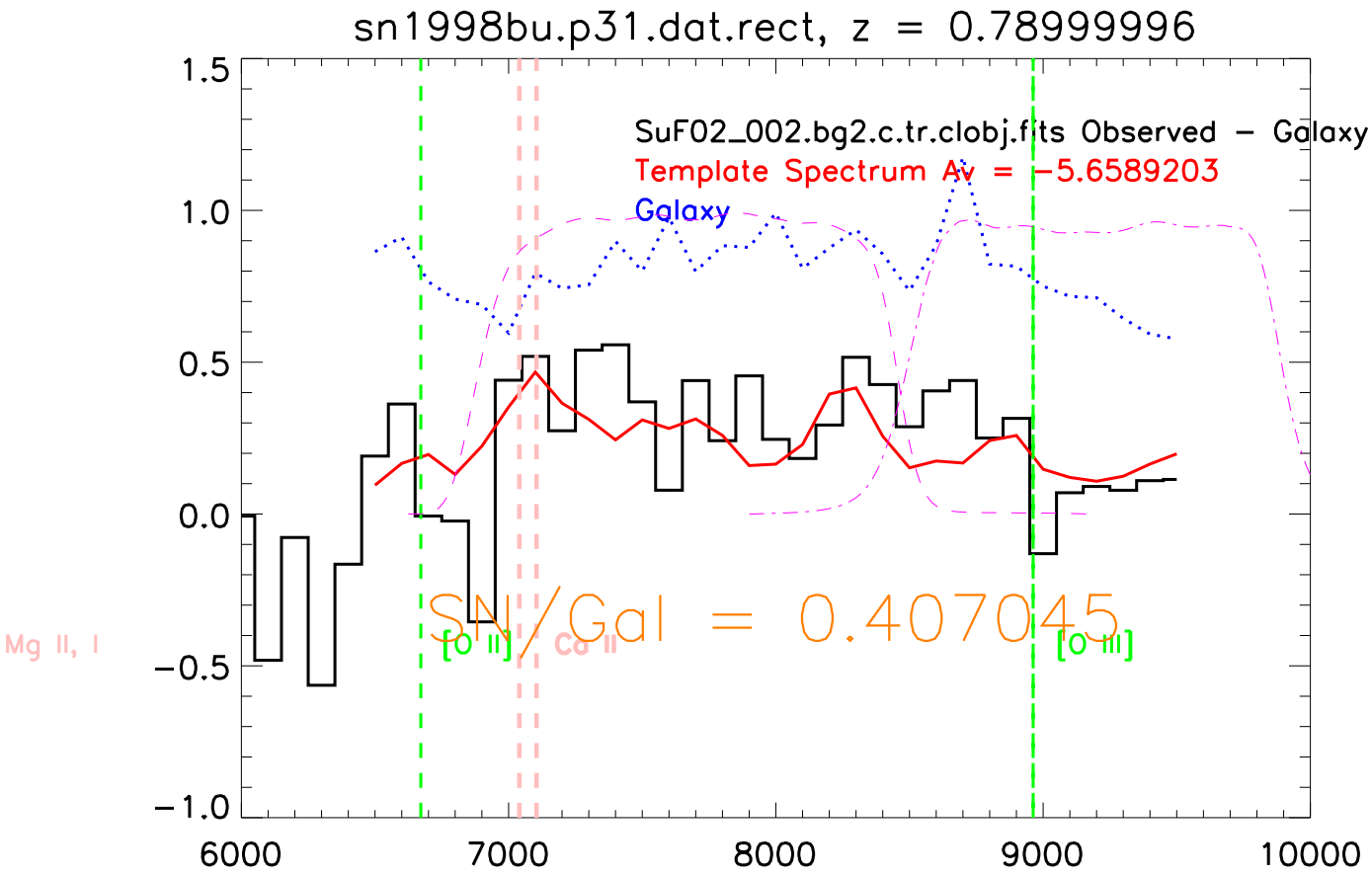

sn1992a.p24.dat.rect, z = 0.78999996
SuF02_002.bg2.c.tr.clobj.fits Observed – Galaxy
Template Spectrum Av = –1.4996009
Galaxy
SN/Gal = 0.566031
[O II]
Ca II
[O III]
Mg II, I
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

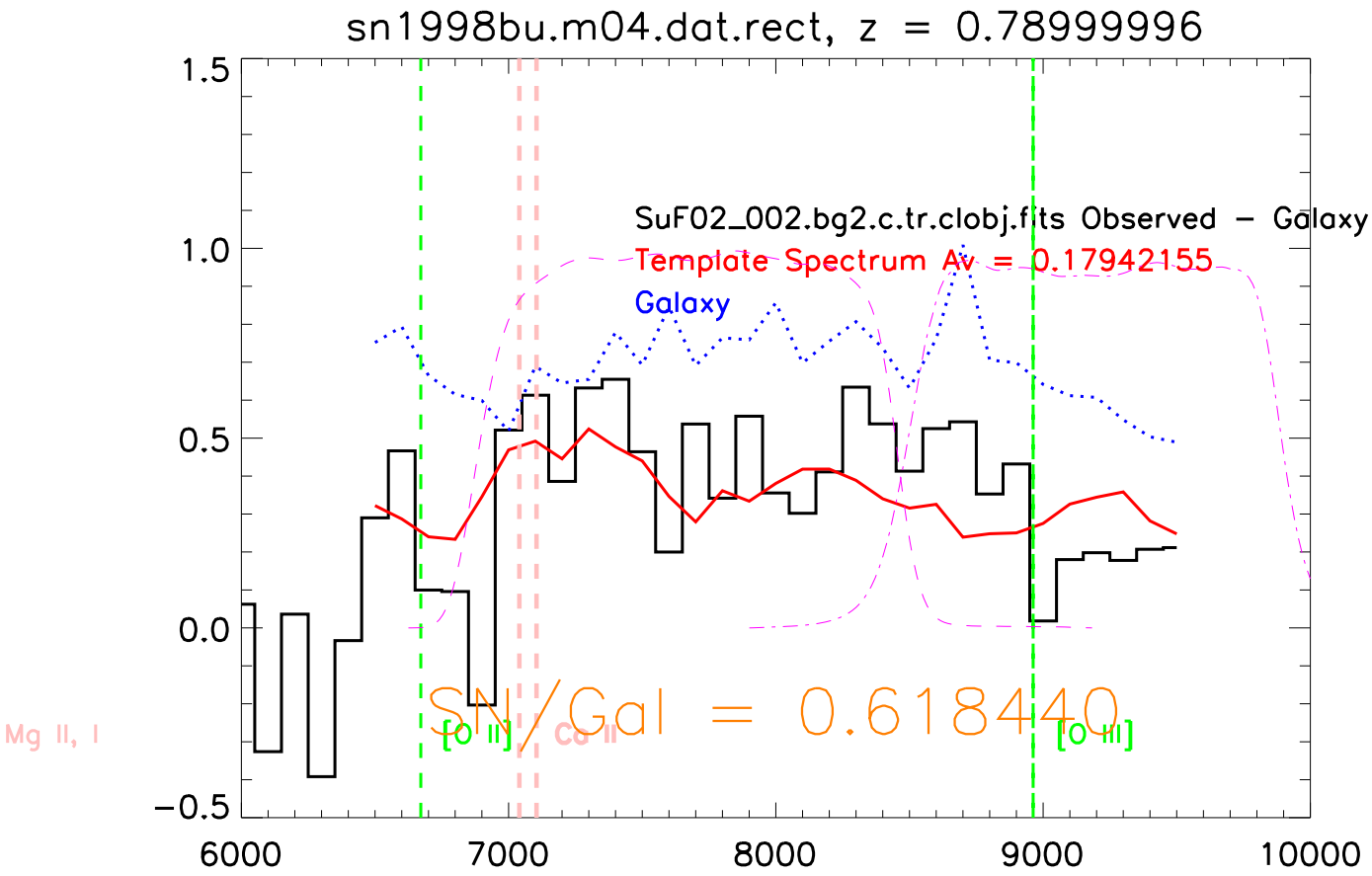

sn1992a.p11.dat.rect, z = 0.78999996
SuF02_002.bg2.c.tr.clobj.fits Observed − Galaxy
Template Spectrum: Av = −2.5422976
Galaxy
SN/Gal = 0.426284
[O II]
Ca II
[O III]
Mg II, I
1.5
1.0
0.5
0.0
−0.5
−1.0
6000
7000
8000
9000
10000

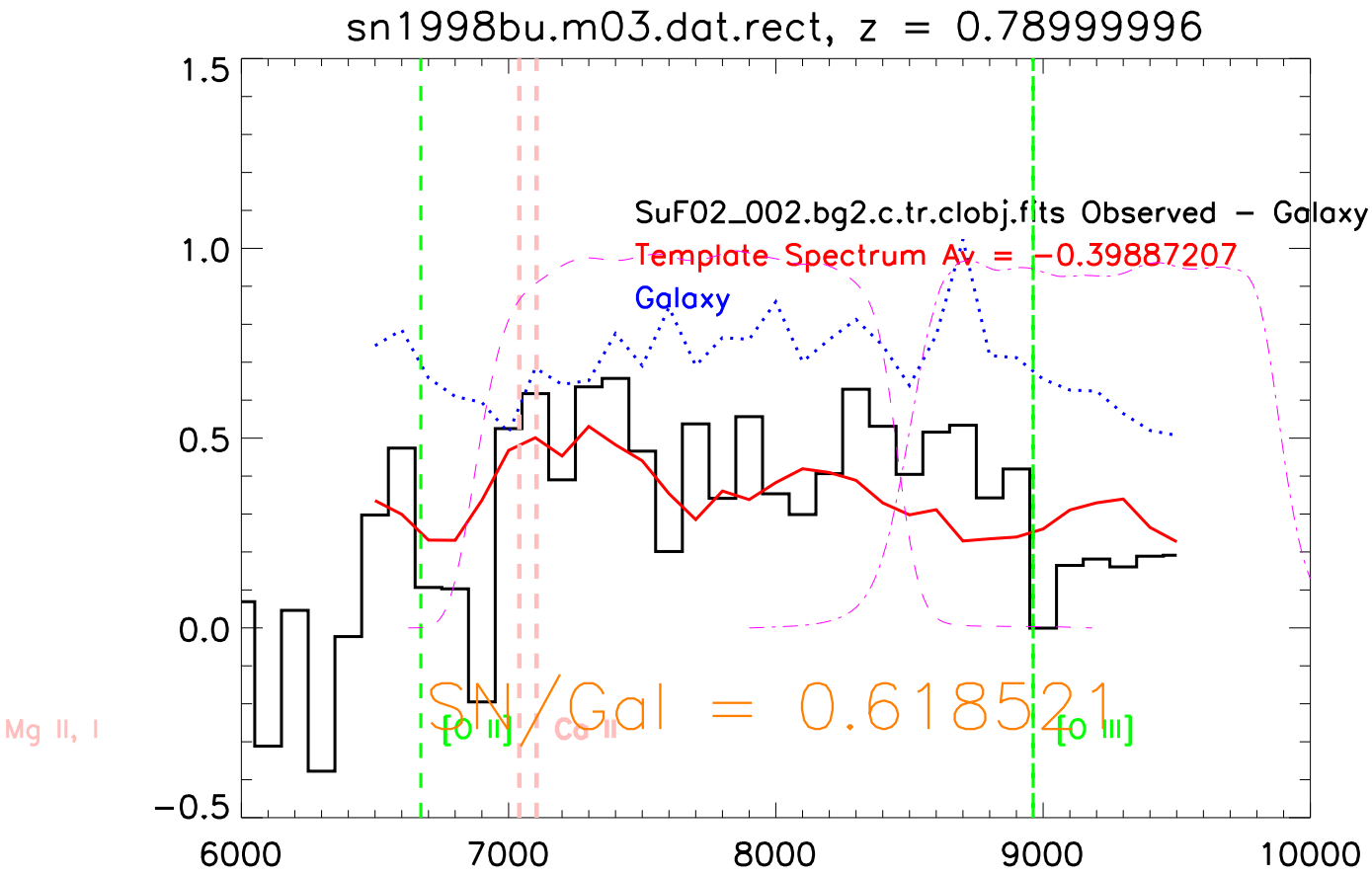

sn1994d.p11.dat.rect, z = 0.81999999
SuF02_002.bg2.c.tr.clobj.fits Observed – Gala
Template Spectrum Av = −1.3230735
Galaxy
SN/Gal = 0.497624
Mg II, I
[O II]
Ca II
[O III]
1.5
1.0
0.5
0.0
−0.5
−1.0
6000
7000
8000
9000
10000

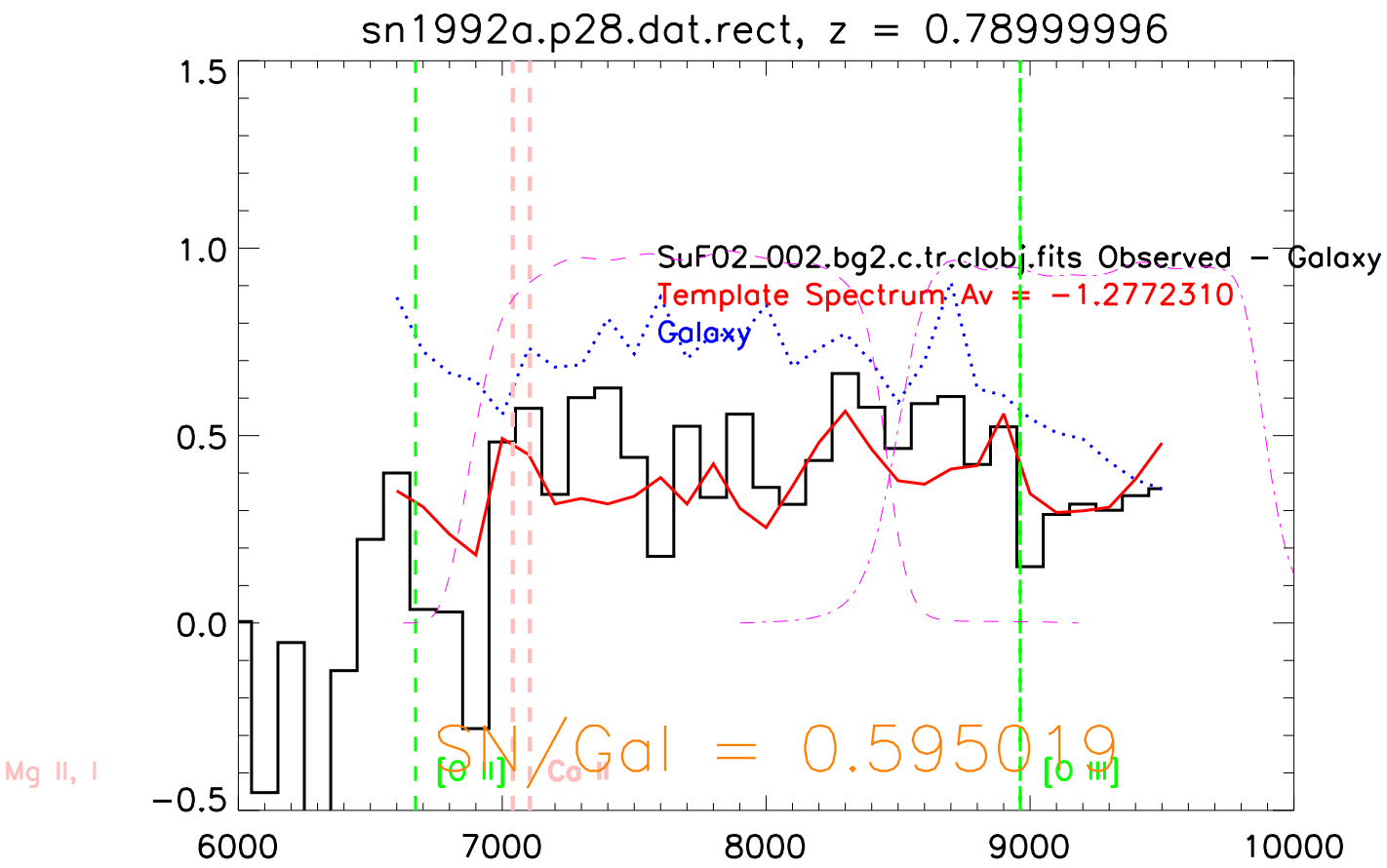

sn1998bu.p30.dat.rect, z = 0.78999996
SuF02_002.bg2.c.tr.clobj.fits Observed − Galaxy
Template Spectrum Av = −4.7160284
Galaxy
S/N/Gal = 0.417871
Mg II, I
[O II]
Ca II
[O III]
1.5
1.0
0.5
0.0
−0.5
−1.0
6000
7000
8000
9000
10000

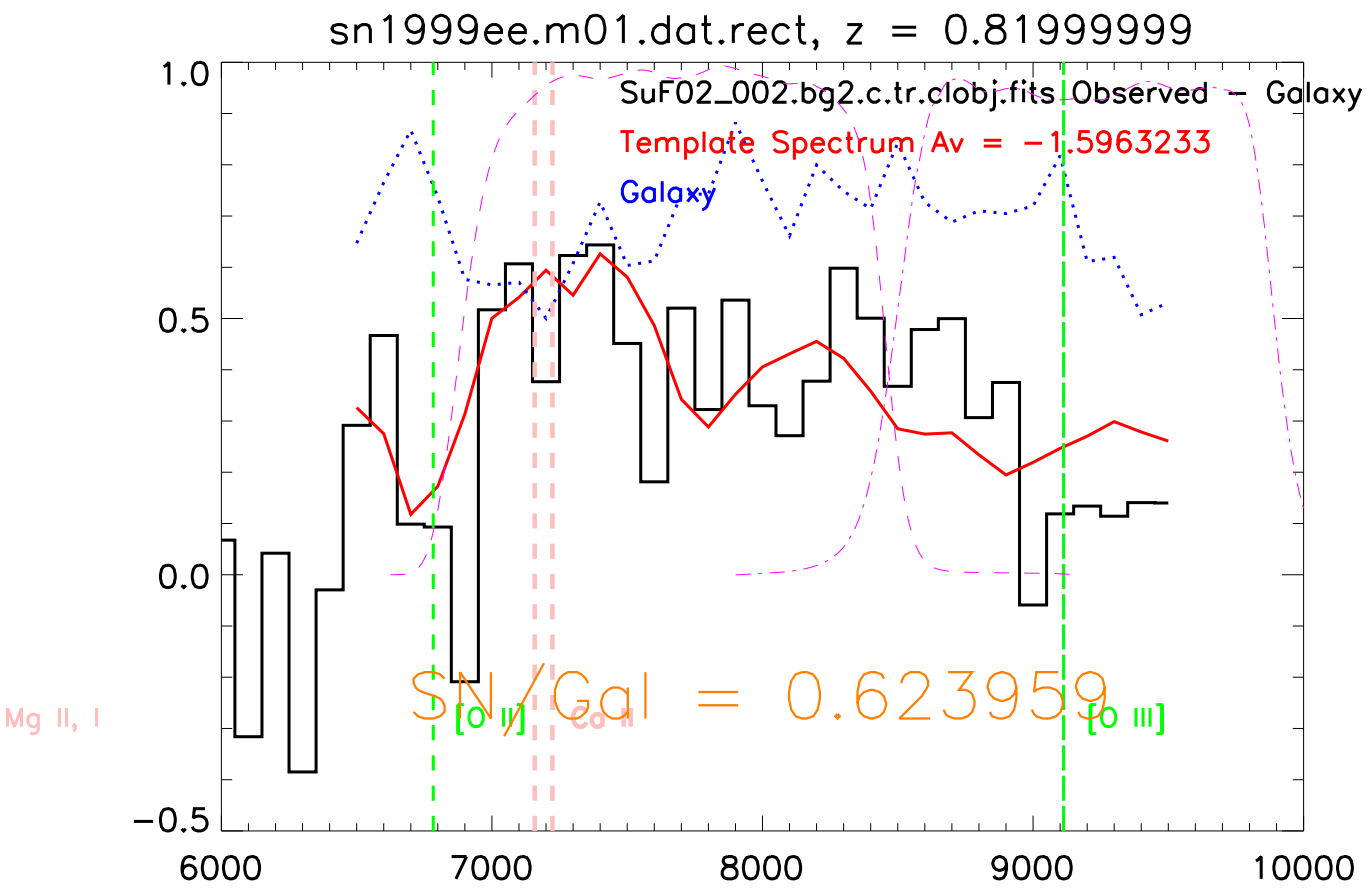

sn1998bu.m02.dat.rect, z = 0.78999996
SuF02_002.bg2.c.tr.clobj.fits Observed – Galaxy
Template Spectrum Av = −0.45578743
Galaxy
S/N/Gal = 0.601284
[O II]
[O III]
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

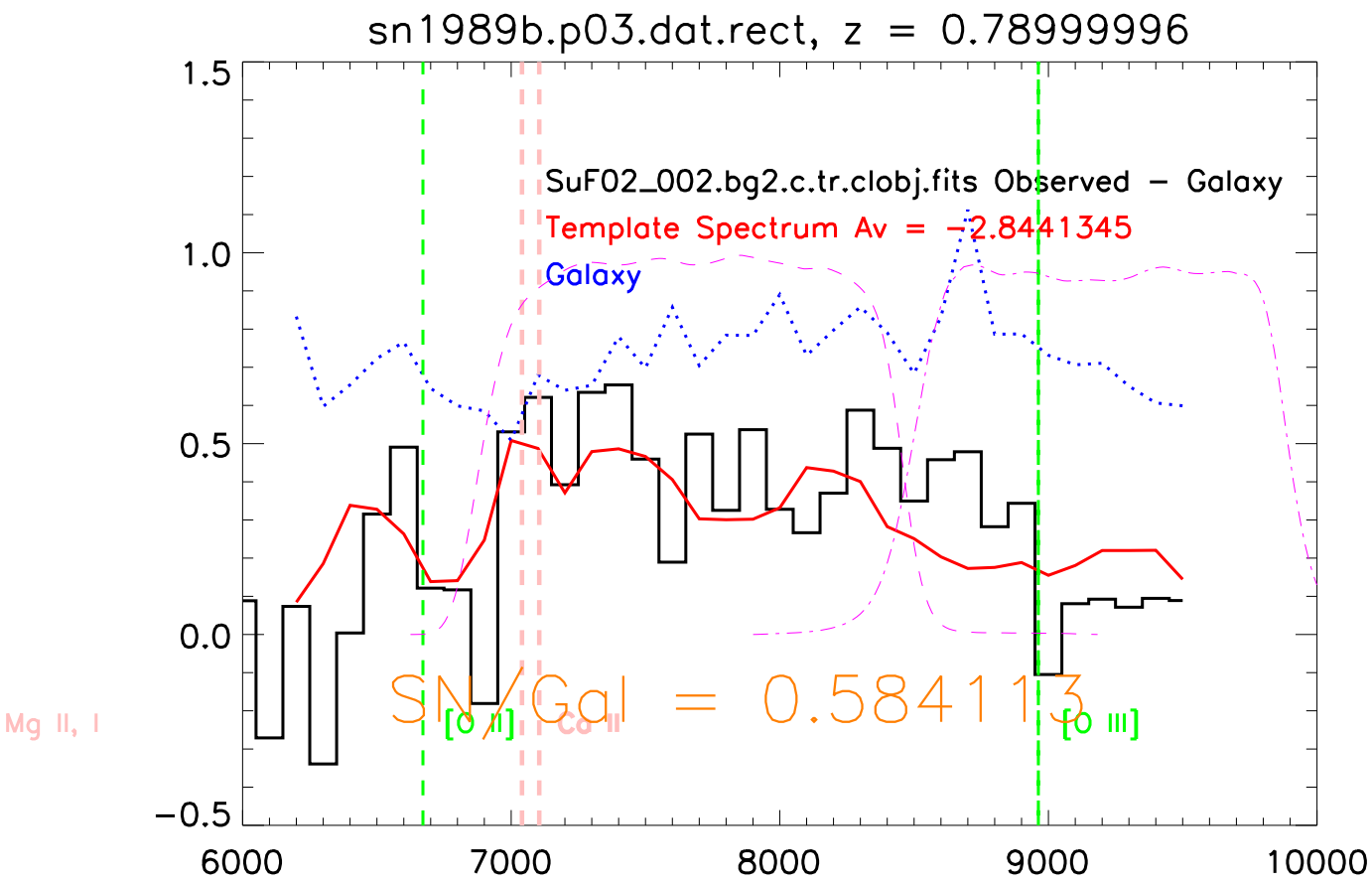

sn1998bu.p31.dat.rect, z = 0.78999996
SuF02_002.bg2.c.tr.clobj.fits Observed − Galaxy
Template Spectrum Av = −5.6589203
Galaxy
SN/Gal = 0.407045
[O II]
Ca II
[O III]
Mg II, I
1.5
1.0
0.5
0.0
−0.5
−1.0
6000
7000
8000
9000
10000

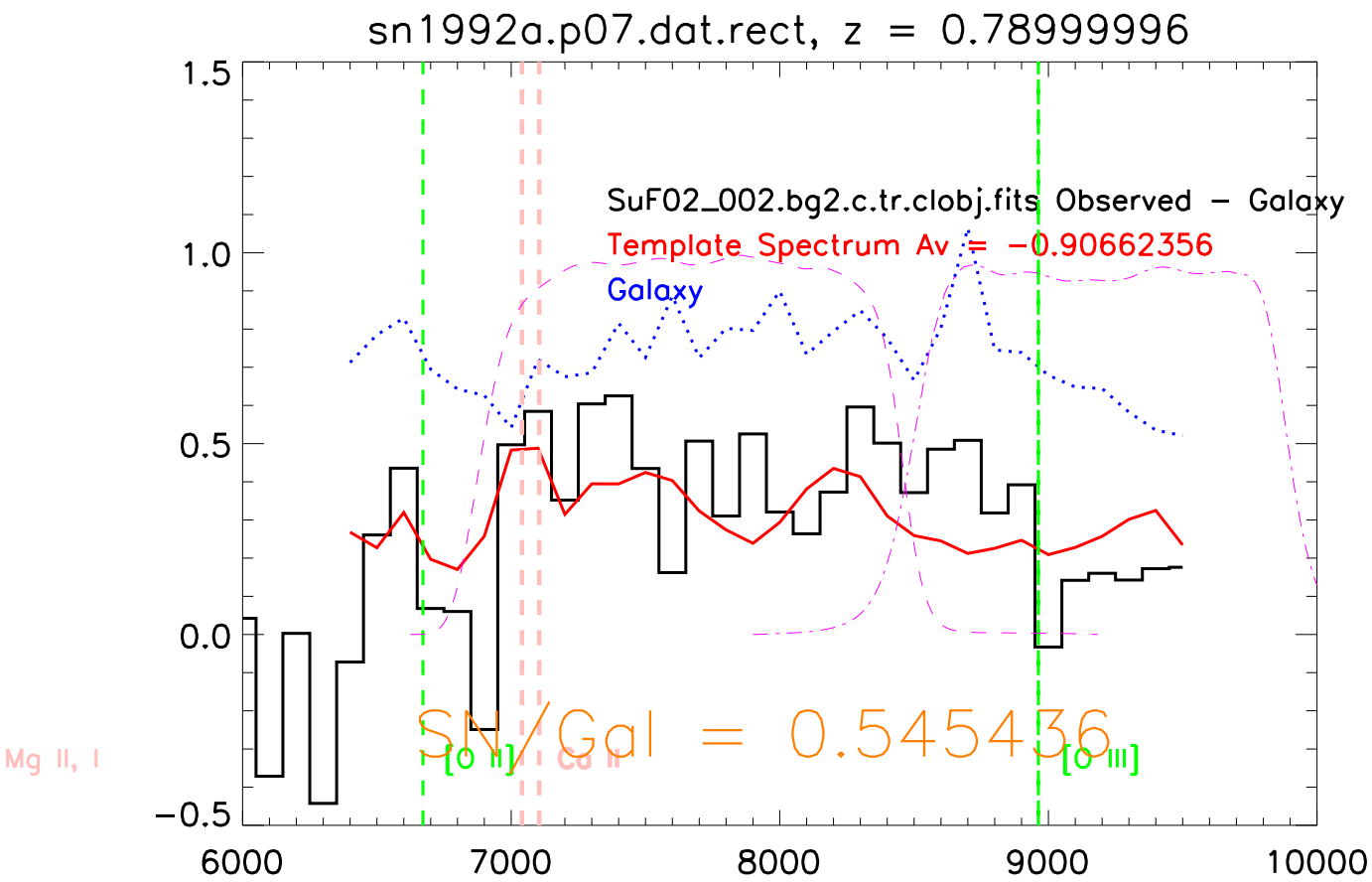

sn1998bu.m04.dat.rect, z = 0.78999996
SuF02_002.bg2.c.tr.clobj.fits Observed − Galaxy
Template Spectrum Av = 0.17942155
Galaxy
S/N Gal = 0.618440
[O II]
[O III]
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

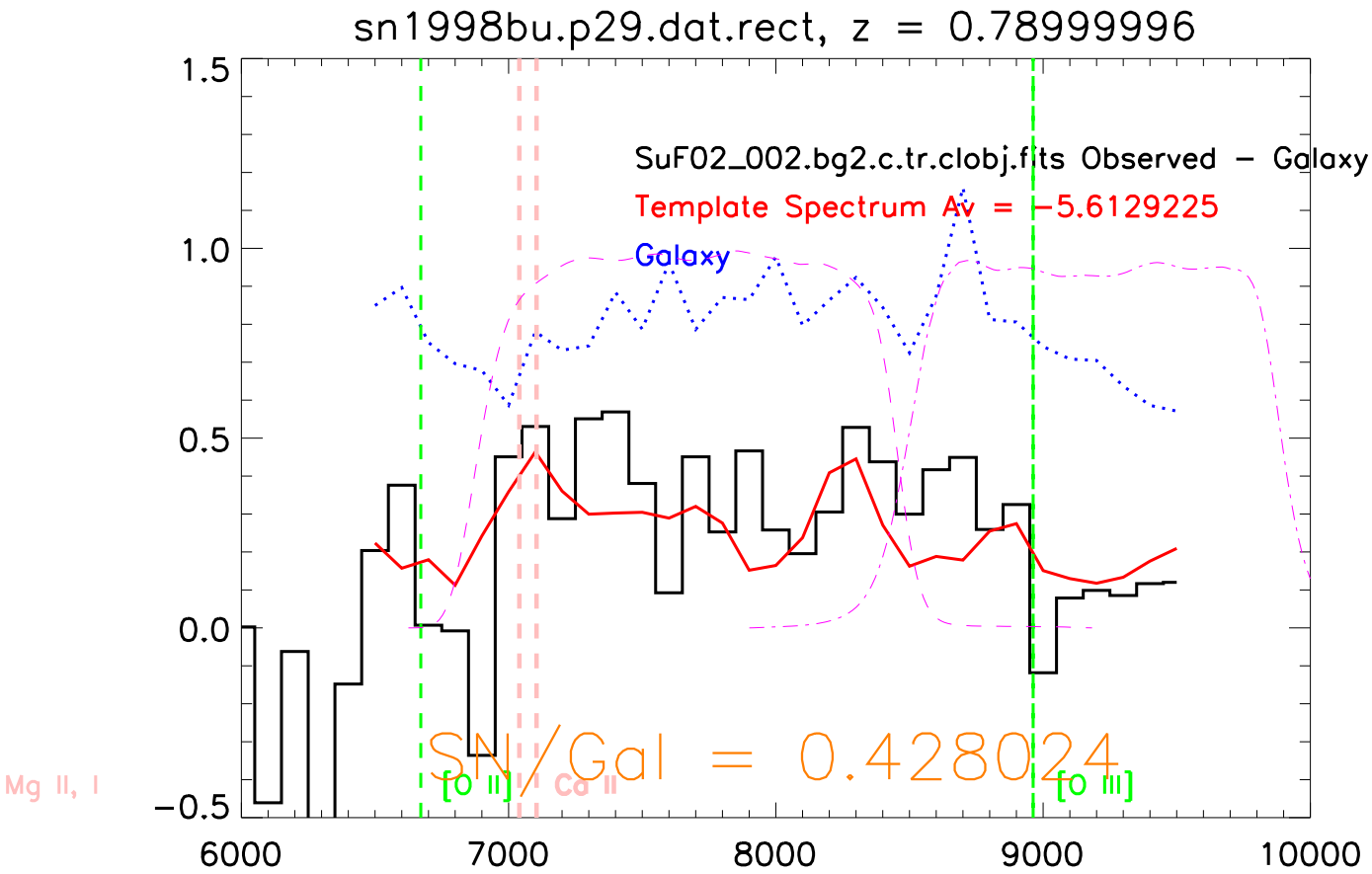

sn1998bu.m03.dat.rect, z = 0.78999996
SuF02_002.bg2.c.tr.clobj.fits Observed − Galaxy
Template Spectrum Av = −0.39887207
Galaxy
S/N/Gal = 0.618521
Mg II, I
[O II]
Ca II
[O III]
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

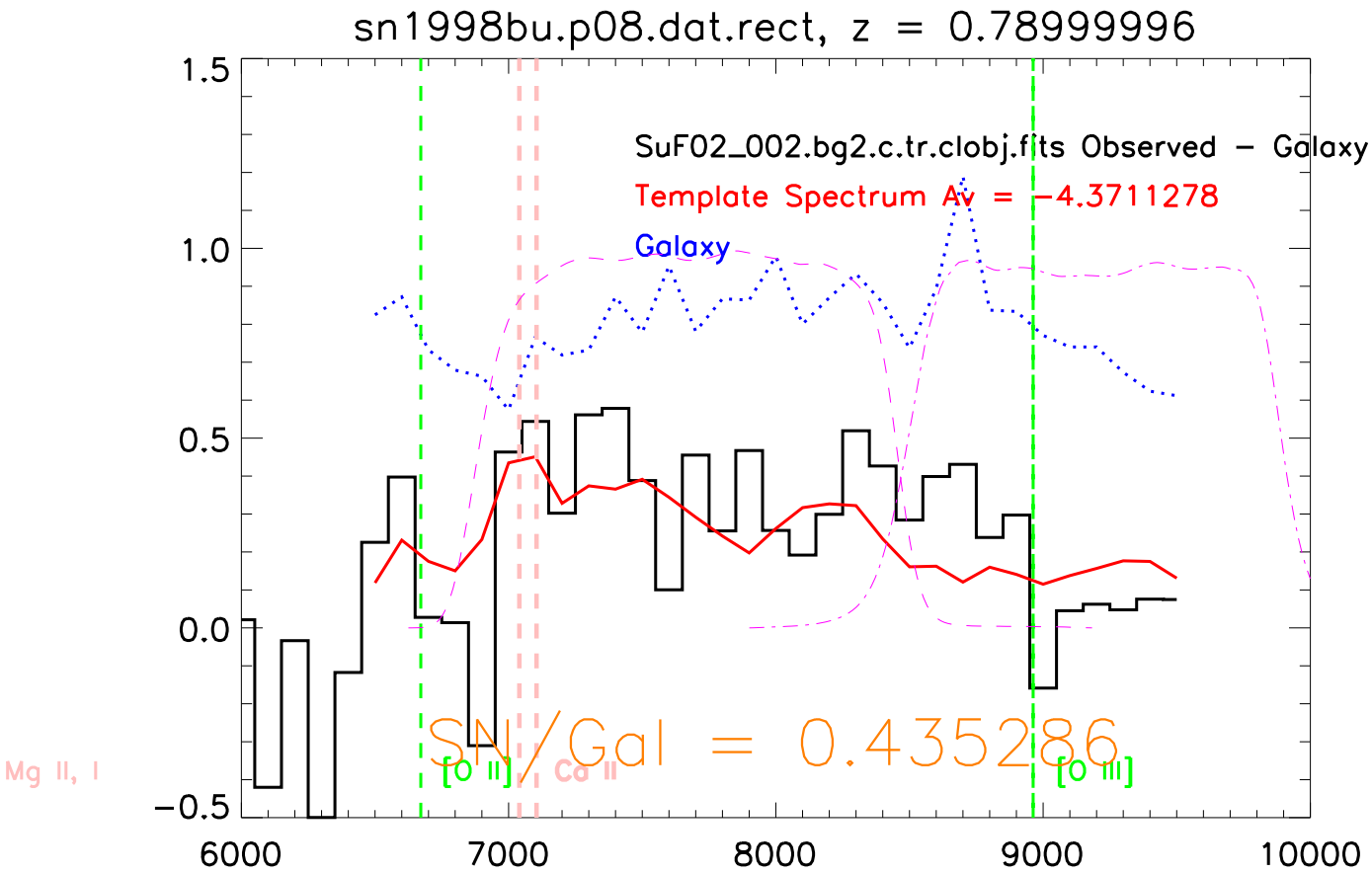

sn1992a.p28.dat.rect, z = 0.78999996
SuF02_002.bg2.c.tr.clobj.fits Observed − Galaxy
Template Spectrum Av = −1.2772310
Galaxy
SN/Gal = 0.595019
[O II]
Ca II
[O III]
Mg II, I
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

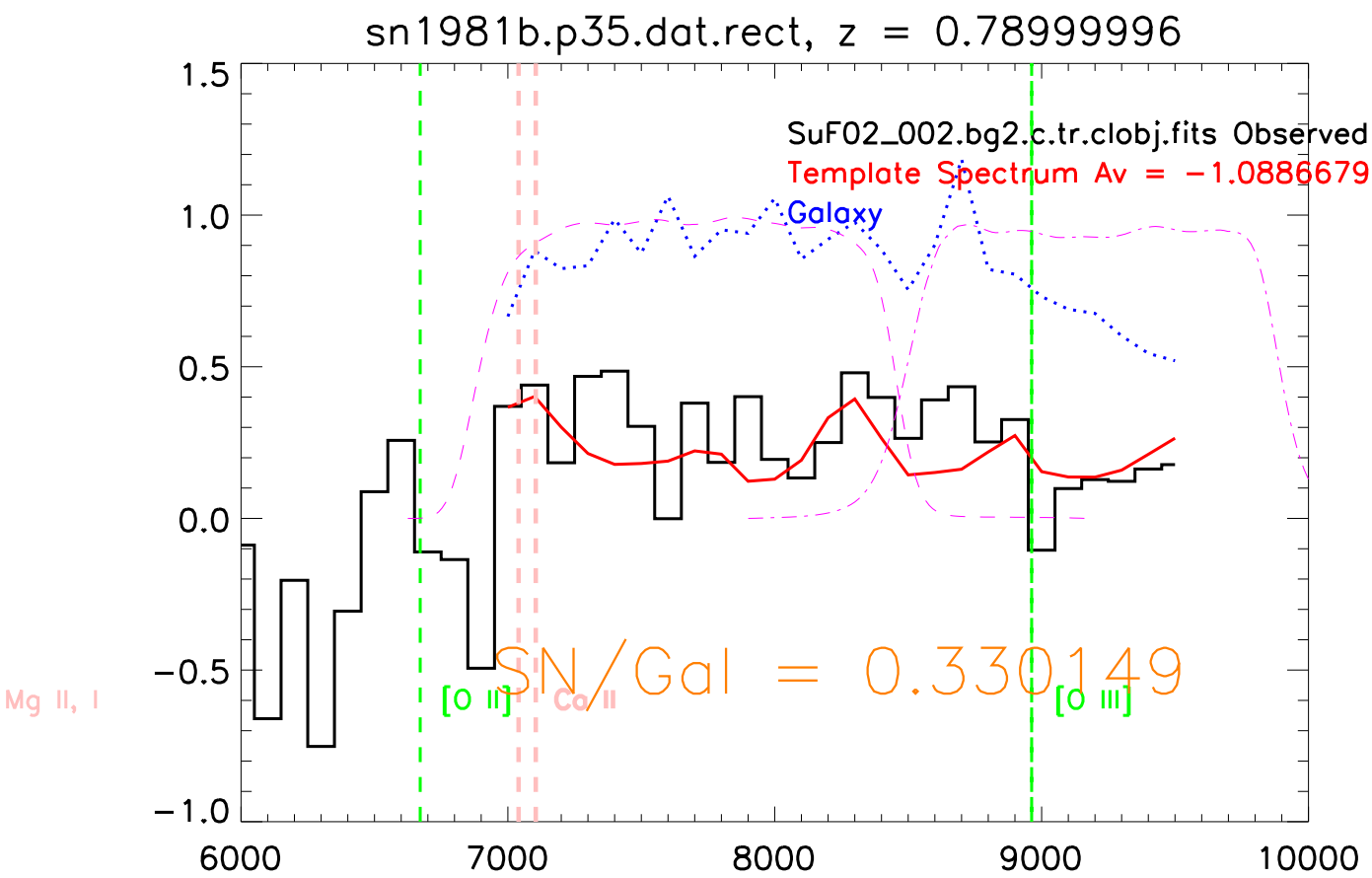

sn1999ee.m01.dat.rect, z = 0.81999999
SuF02_002.bg2.c.tr.clobj.fits Observed – Galaxy
Template Spectrum Av = −1.5963233
Galaxy
SN/Gal = 0.623959
Mg II, I
[O II]
Ca II
[O III]
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

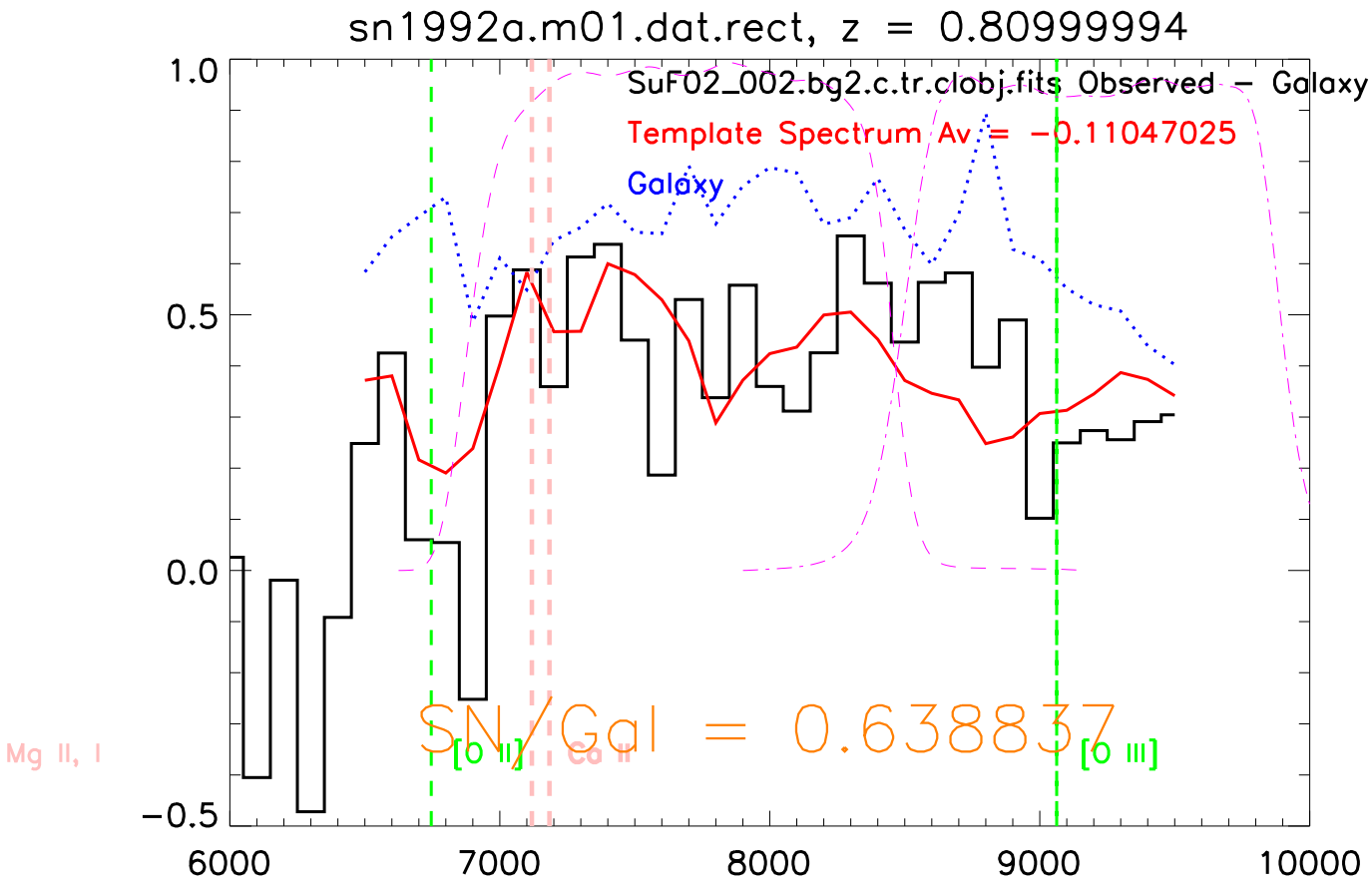

sn1989b.p03.dat.rect, z = 0.78999996
SuF02_002.bg2.c.tr.clobj.fits Observed − Galaxy
Template Spectrum Av = −2.8441345
Galaxy
SN/Gal = 0.584113
Mg II, I
[O II]
Ca II
[O III]
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

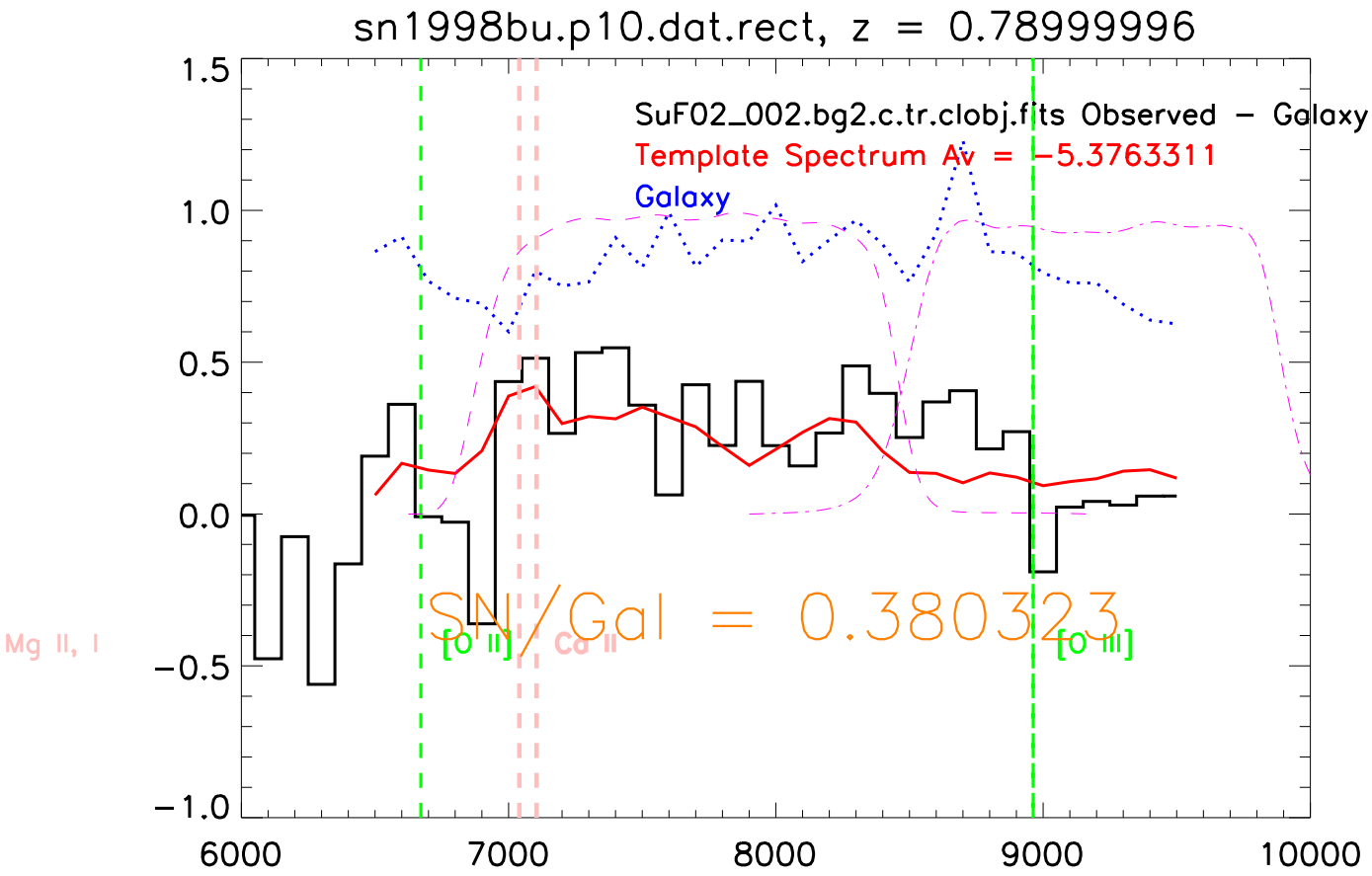

sn1992a.p07.dat.rect, z = 0.78999996
SuF02_002.bg2.c.tr.clobj.fits Observed – Galaxy
Template Spectrum Av = −0.90662356
Galaxy
S/N Gal = 0.545436
[O II]
Ca II
[O III]
Mg II, I
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

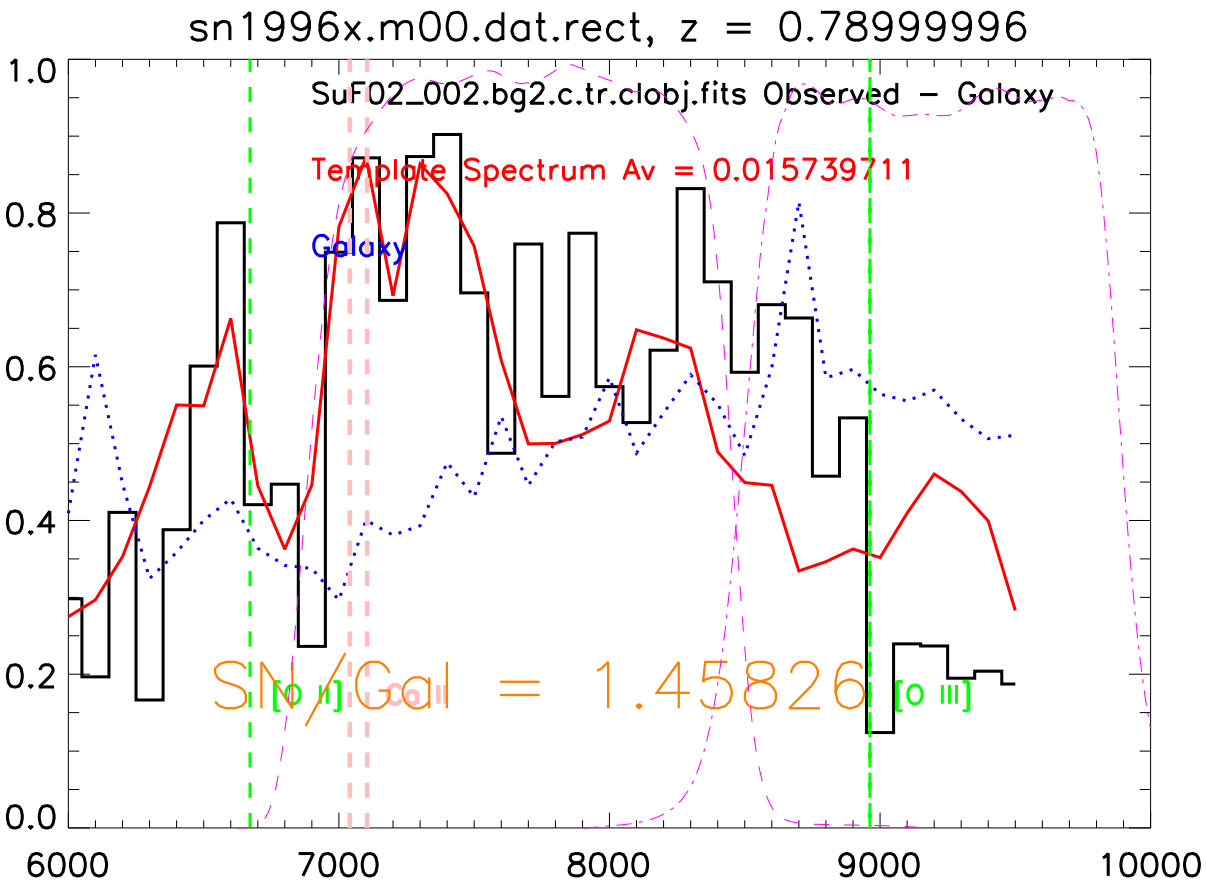

sn1998bu.p29.dat.rect, z = 0.78999996
SuF02_002.bg2.c.tr.clobj.fits Observed − Galaxy
Template Spectrum Av = −5.6129225
Galaxy
SN/Gal = 0.428024
[O II]
Ca II
[O III]
Mg II, I
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000


sn1998bu.p08.dat.rect, z = 0.78999996
SuF02_002.bg2.c.tr.clobj.fits Observed – Galaxy
Template Spectrum Av = −4.3711278
Galaxy
SN/Gal = 0.435286
[O II]
Ca II
[O III]
Mg II, I
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

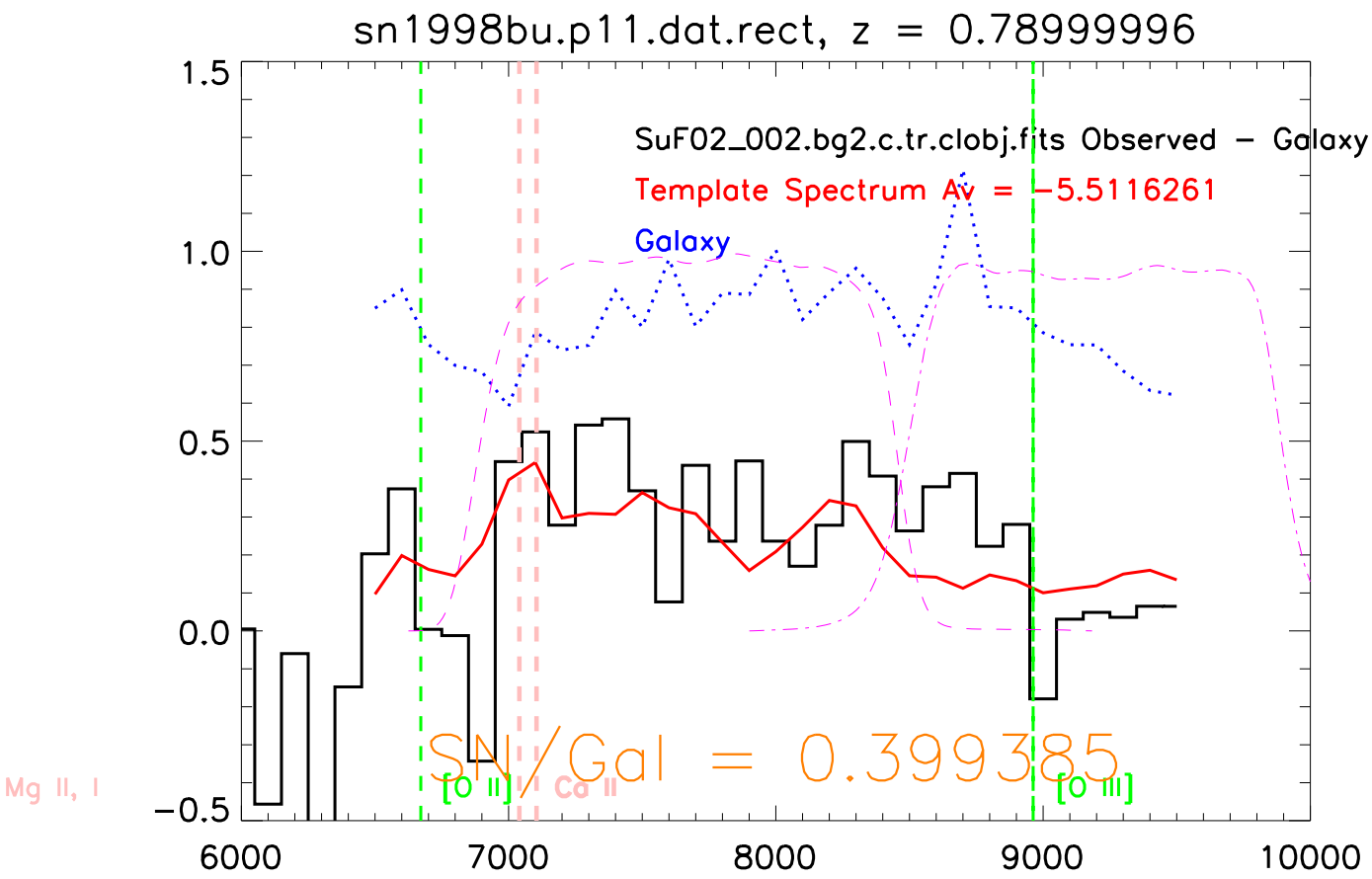

sn1981b.p35.dat.rect, z = 0.78999996
SuF02_002.bg2.c.tr.clobj.fits Observed − Galaxy
Template Spectrum Av = −1.0886679
Galaxy
SN/Gal = 0.330149
Mg II, I
[O II]
Ca II
[O III]
1.5
1.0
0.5
0.0
−0.5
−1.0
6000
7000
8000
9000
10000

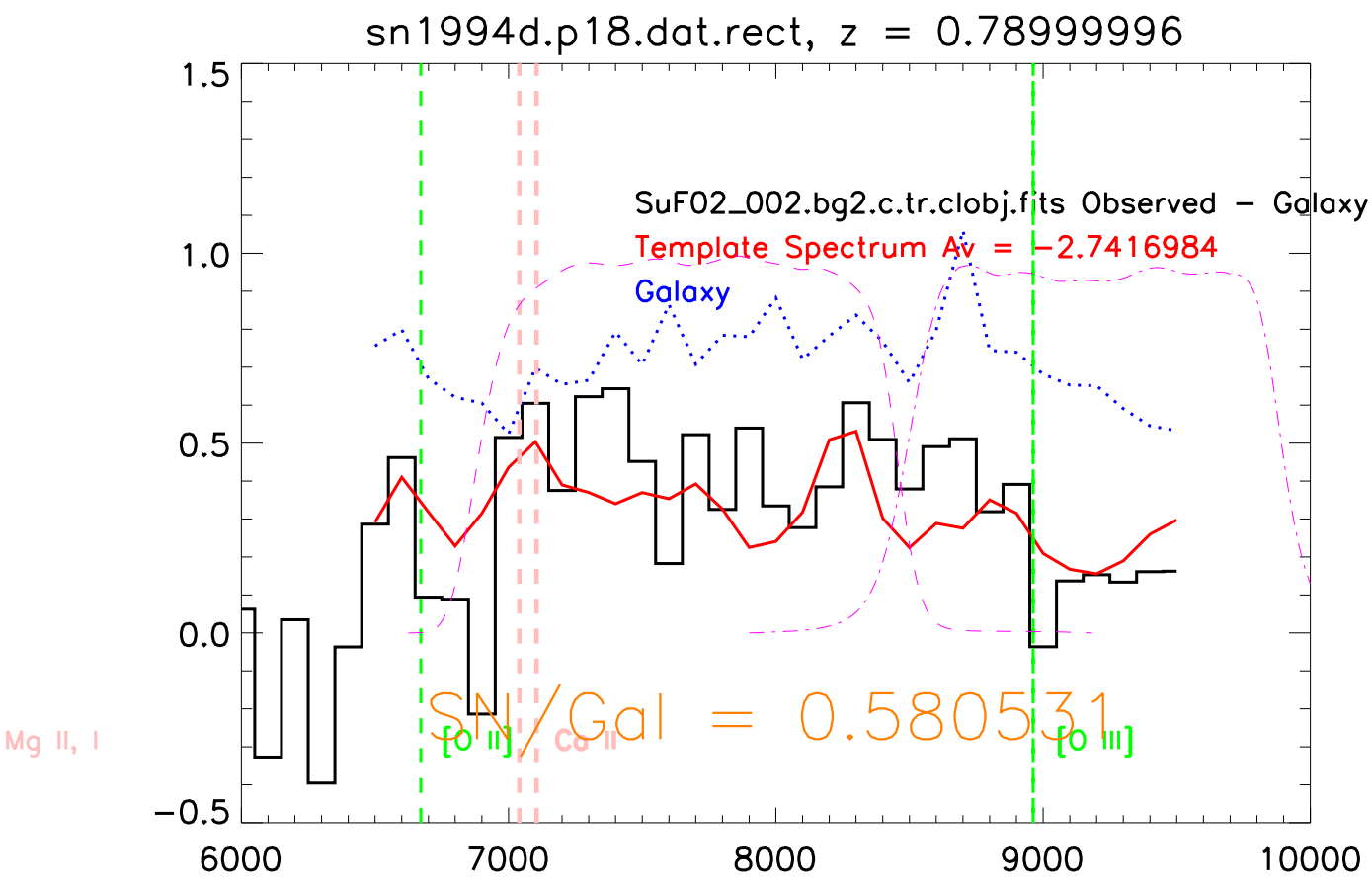

sn1992a.m01.dat.rect, z = 0.80999994
SuF02_002.bg2.c.tr.clobj.fits Observed – Galaxy
Template Spectrum Av = −0.11047025
Galaxy
SN/Gal = 0.638837
[O II]
Ca II
[O III]
Mg II, I
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

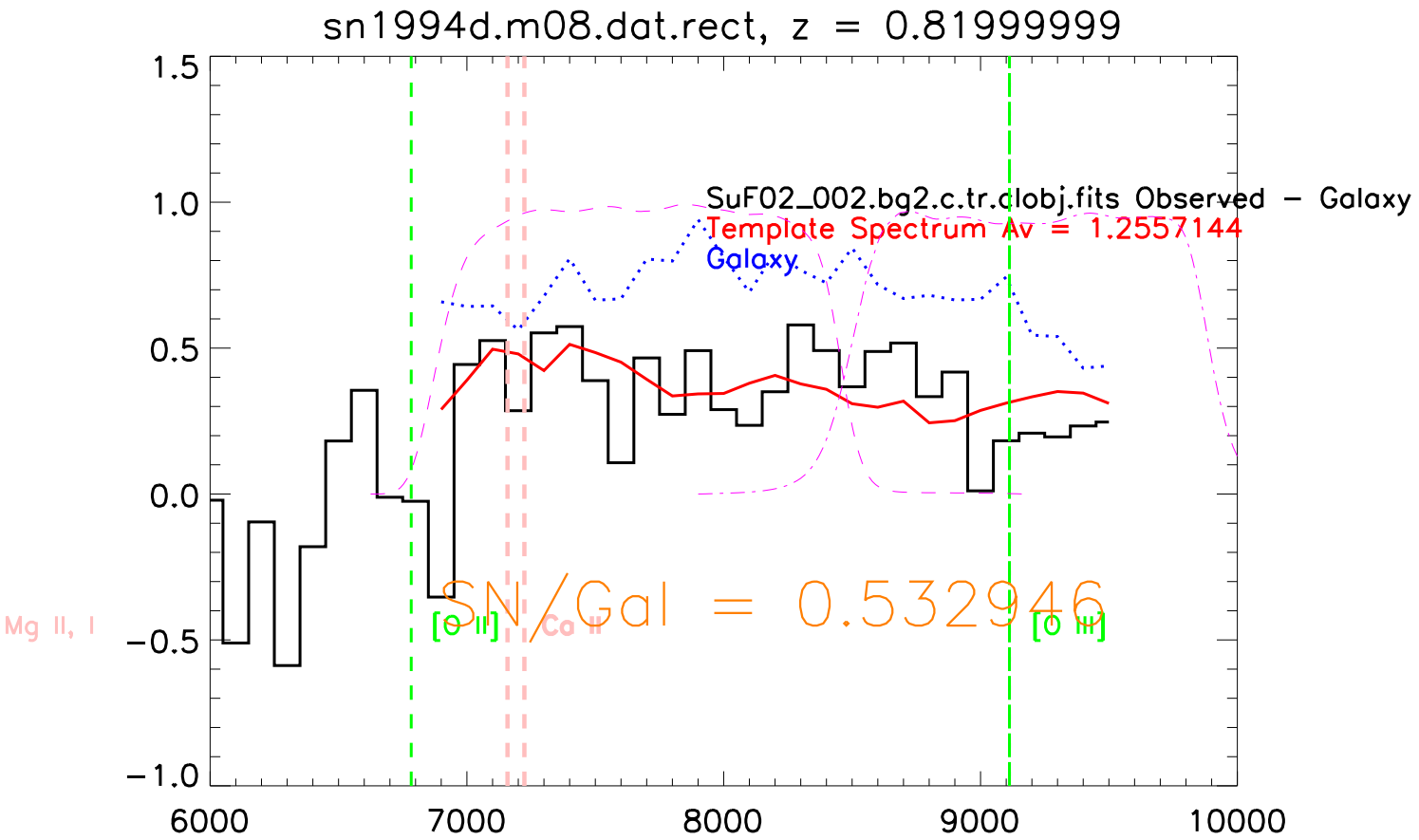

sn1998bu.p10.dat.rect, z = 0.78999996
SuF02_002.bg2.c.tr.clobj.fits Observed − Galaxy
Template Spectrum Av = −5.3763311
Galaxy
SN/Gal = 0.380323
Mg II, I
[O II]
Ca II
[O III]
1.5
1.0
0.5
0.0
−0.5
−1.0
6000
7000
8000
9000
10000

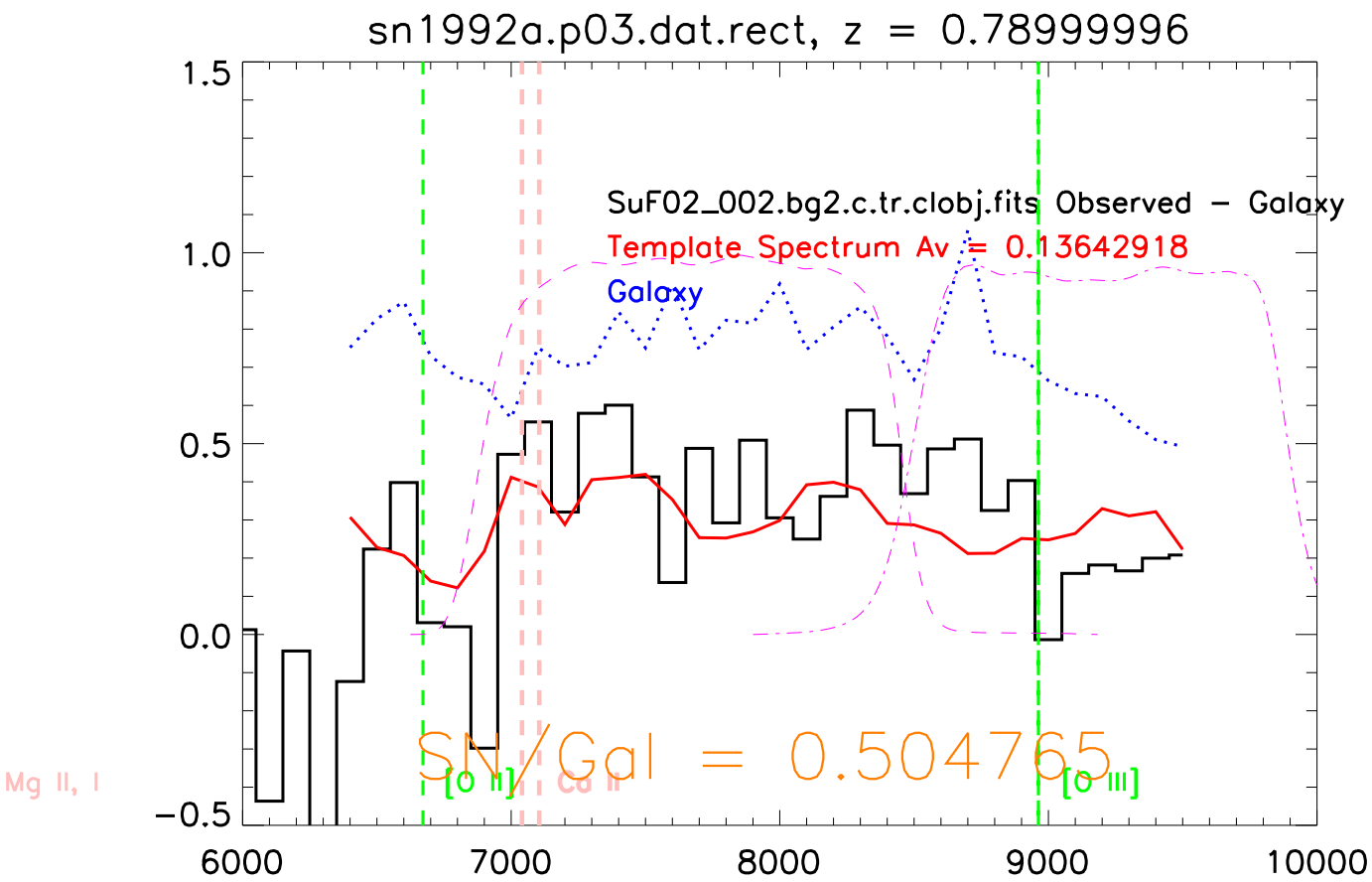

sn1996x.m00.dat.rect, z = 0.78999996
SuF02_002.bg2.c.tr.clobj.fits Observed – Galaxy
Template Spectrum Av = 0.015739711
Galaxy
SN/Gal = 1.45826
[O II]
[O III]
1.0
0.8
0.6
0.4
0.2
0.0
6000
7000
8000
9000
10000

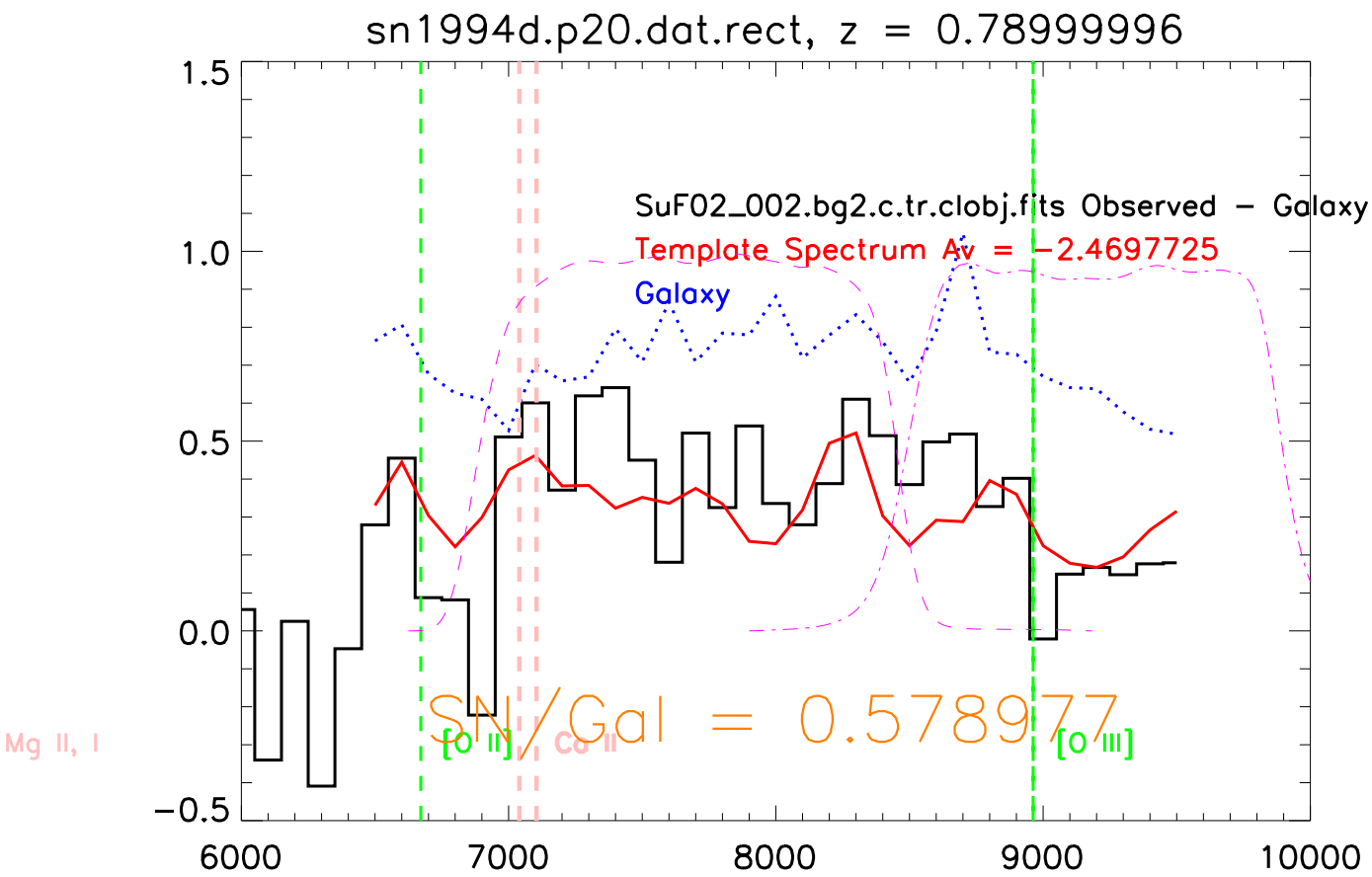
Mg II, I

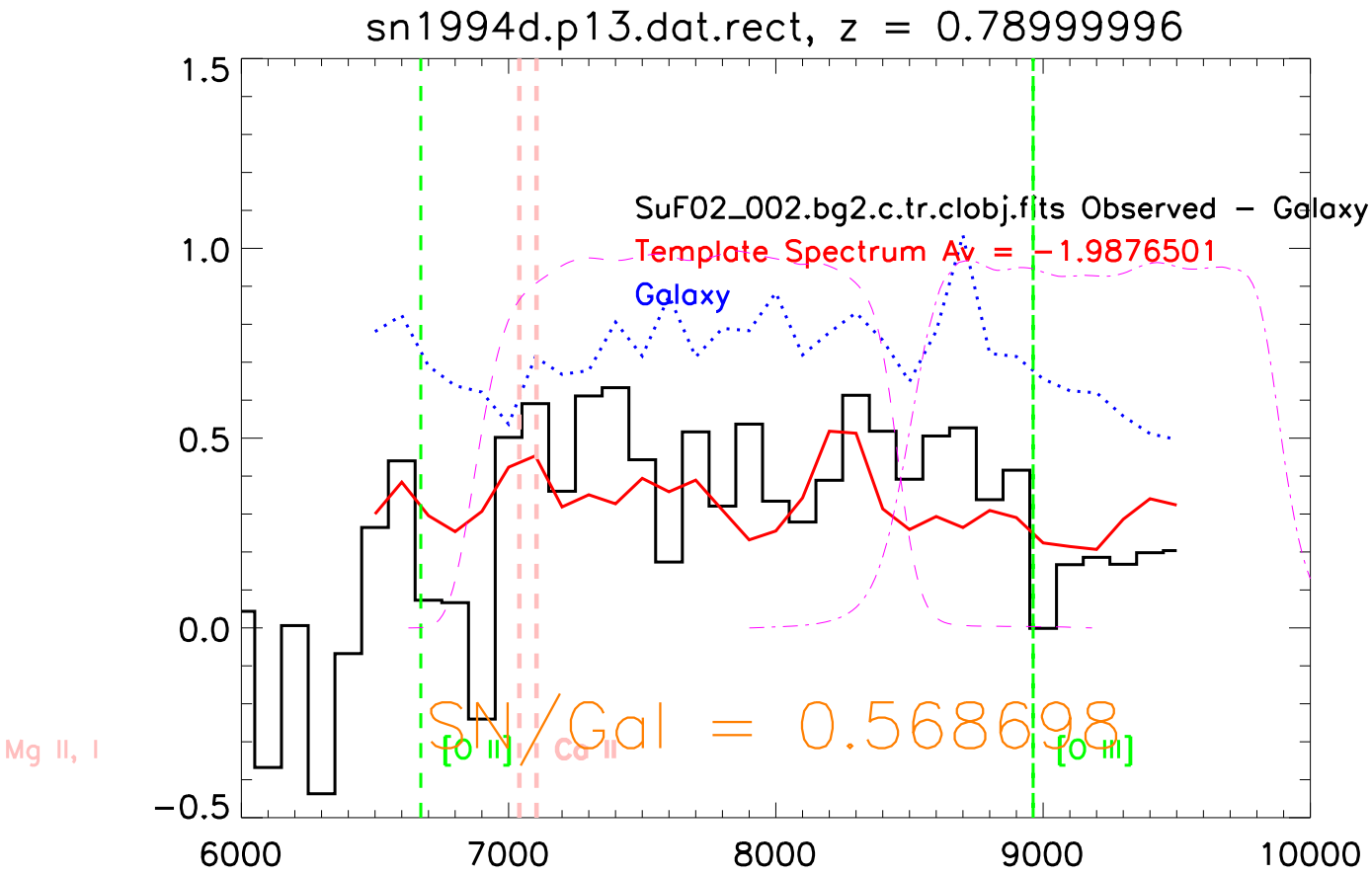

sn1998bu.p11.dat.rect, z = 0.78999996
SuF02_002.bg2.c.tr.clobj.fits Observed − Galaxy
Template Spectrum Av = −5.5116261
Galaxy
SN/Gal = 0.399385
[O II]
Ca II
[O III]
Mg II, I
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

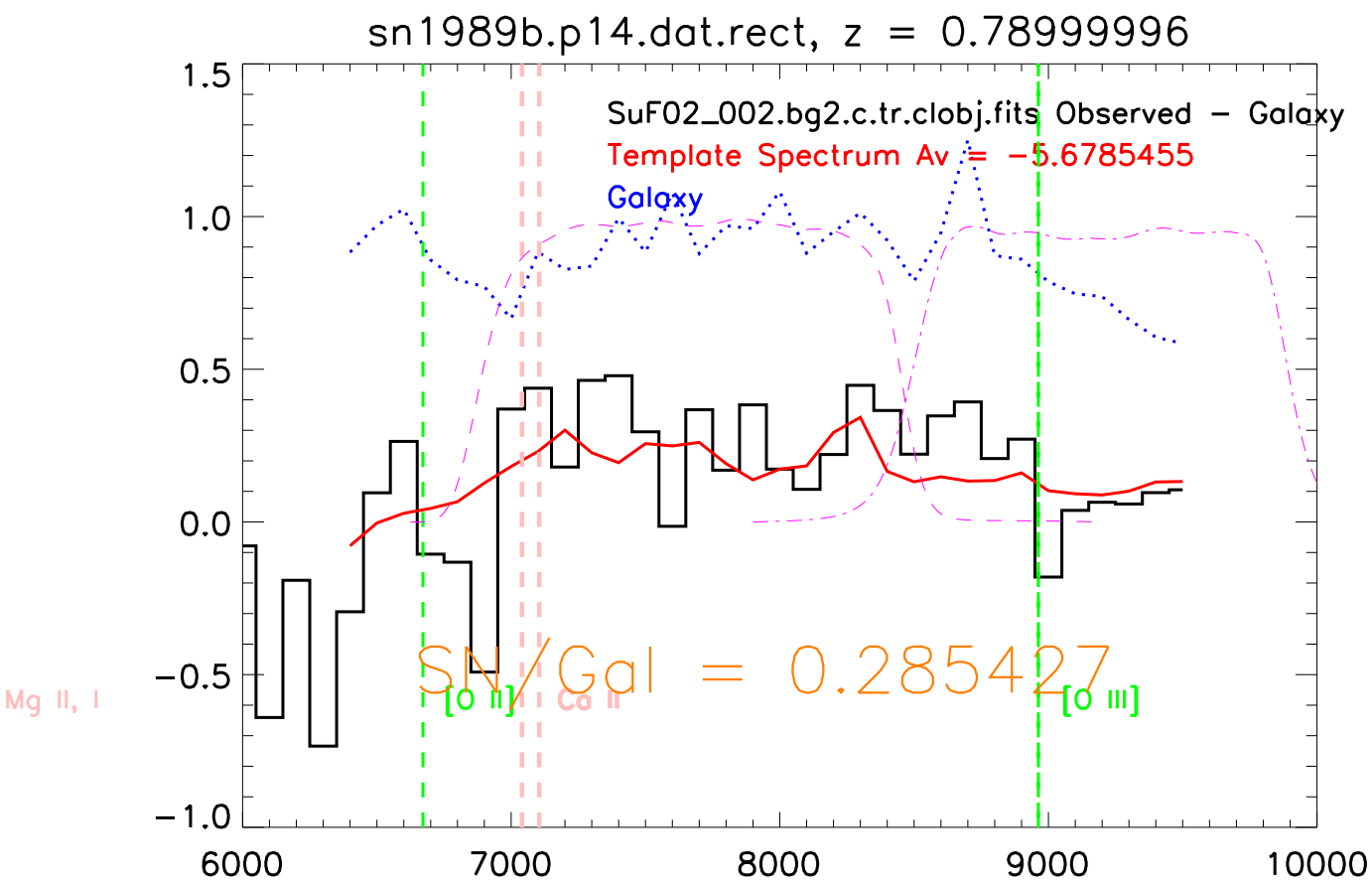

sn1994d.p18.dat.rect, z = 0.78999996
SuF02_002.bg2.c.tr.clobj.fits Observed − Galaxy
Template Spectrum Av = −2.7416984
Galaxy
SN/Gal = 0.580531
[O II]
Ca II
[O III]
Mg II, I
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

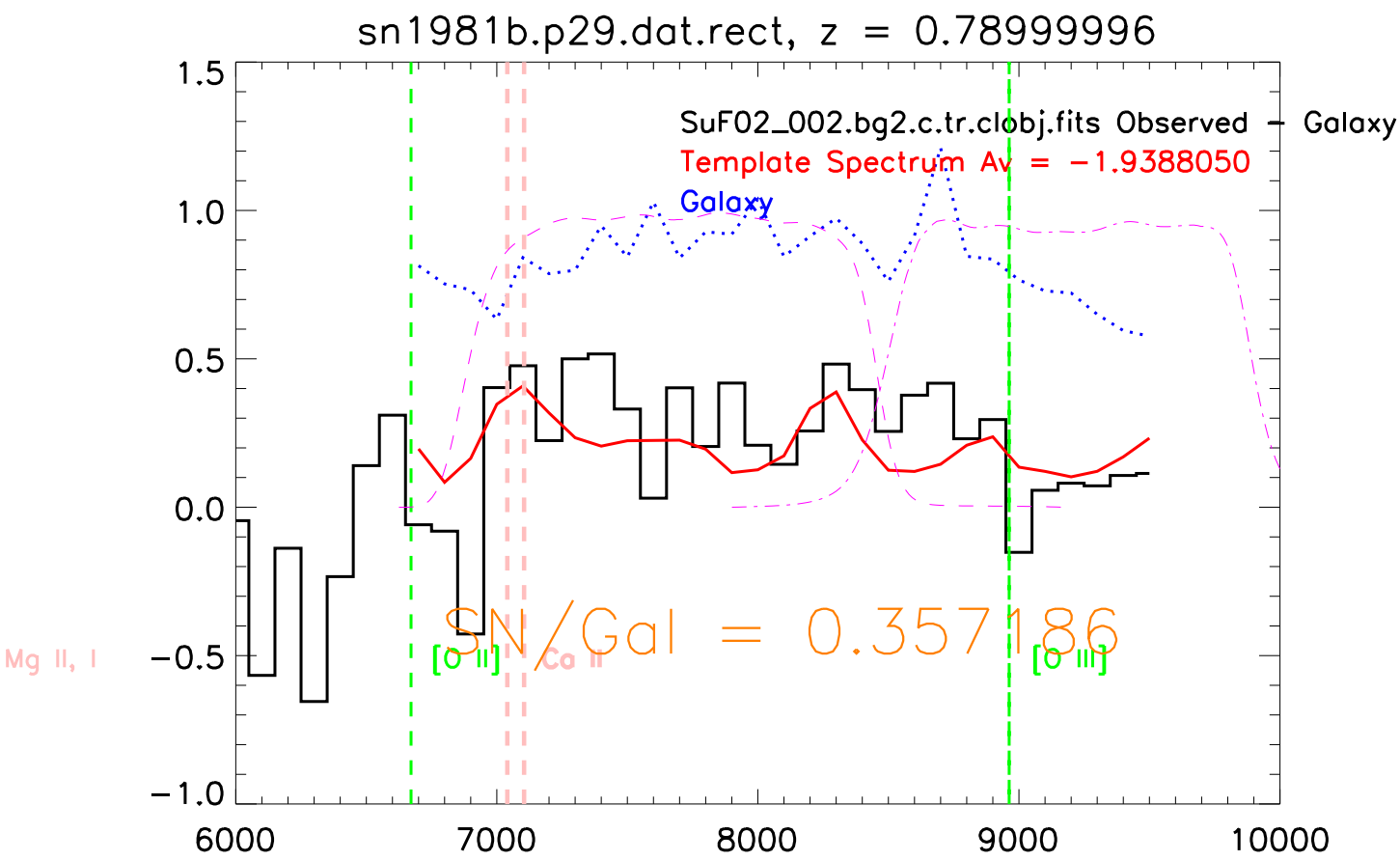

sn1994d.m08.dat.rect, z = 0.81999999
SuF02_002.bg2.c.tr.dlobj.fits Observed − Galaxy
Template Spectrum Av = 1.2557144
Galaxy
SN/Gal = 0.532946
Mg II, I
[O II]
Co II
[O III]
1.5
1.0
0.5
0.0
−0.5
−1.0
6000
7000
8000
9000
10000

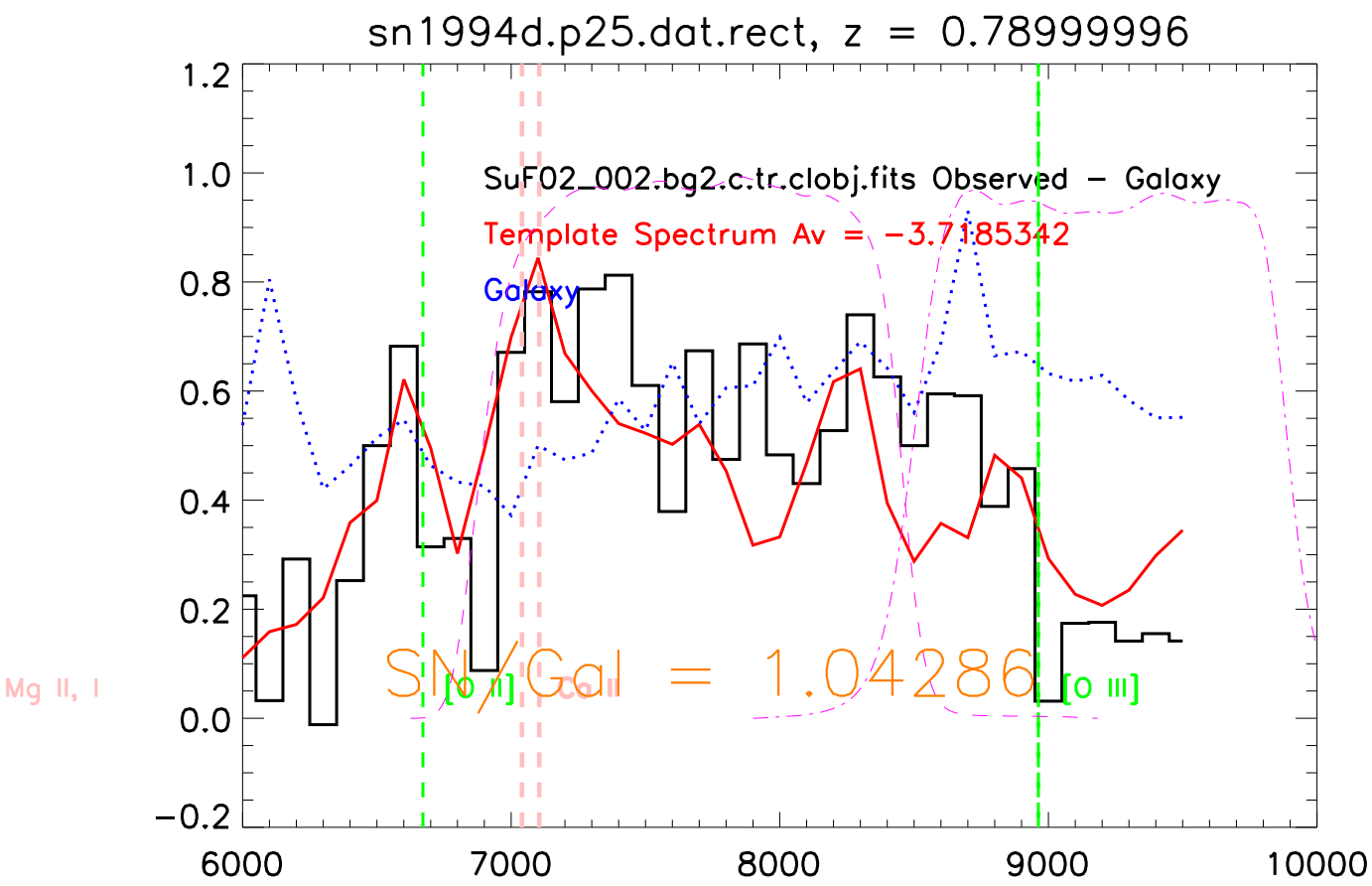

sn1992a.p03.dat.rect, z = 0.78999996
SuF02_002.bg2.c.tr.clobj.fits Observed − Galaxy
Template Spectrum Av = 0.13642918
Galaxy
SN/Gal = 0.504765
[O II]
Ca II
[O III]
Mg II, I
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

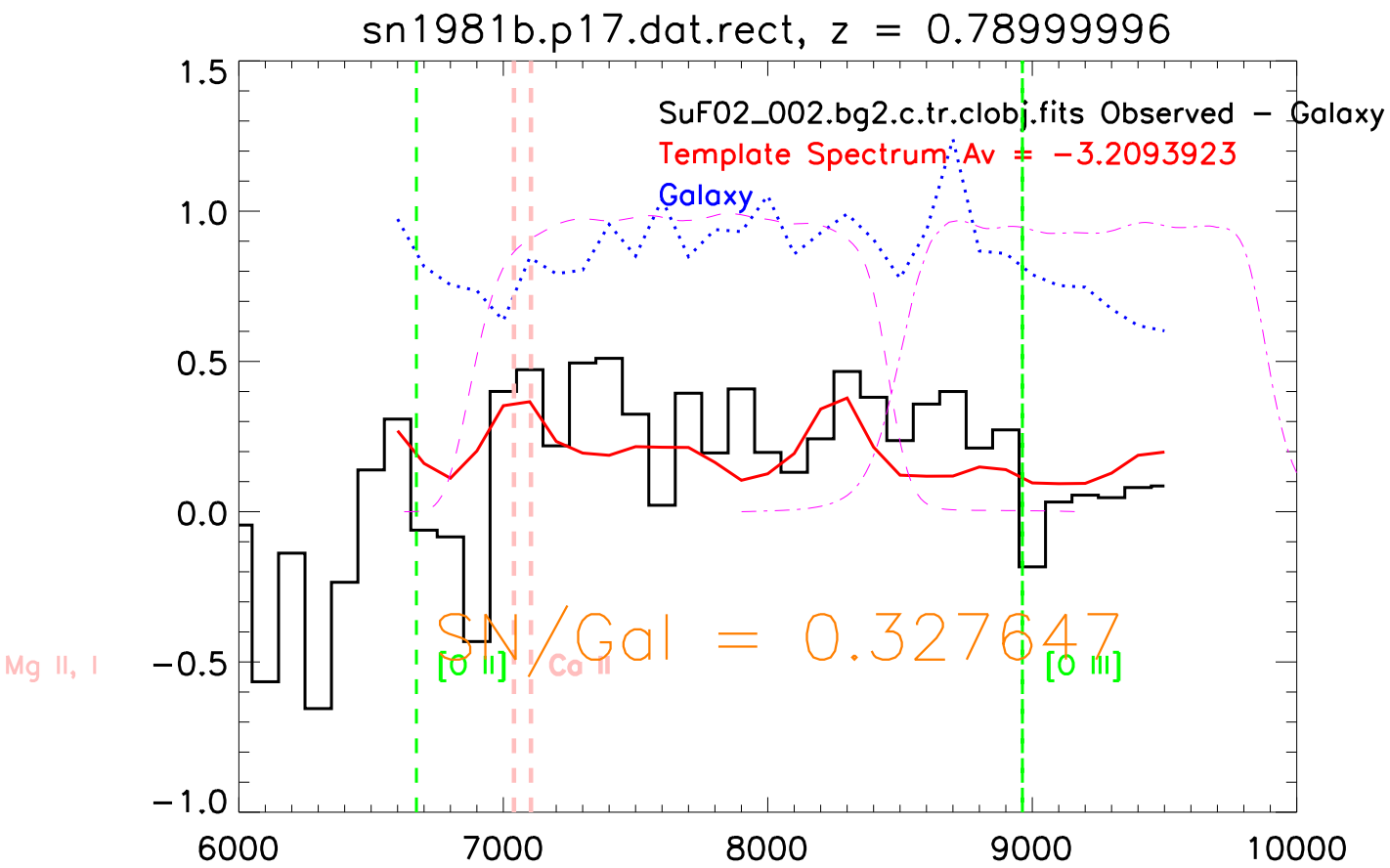

sn1994d.p20.dat.rect, z = 0.78999996
SuF02_002.bg2.c.tr.clobj.fits Observed – Galaxy
Template Spectrum Av = −2.4697725
Galaxy
SN/Gal = 0.578977
[O II]
Ca II
[O III]
Mg II, I
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

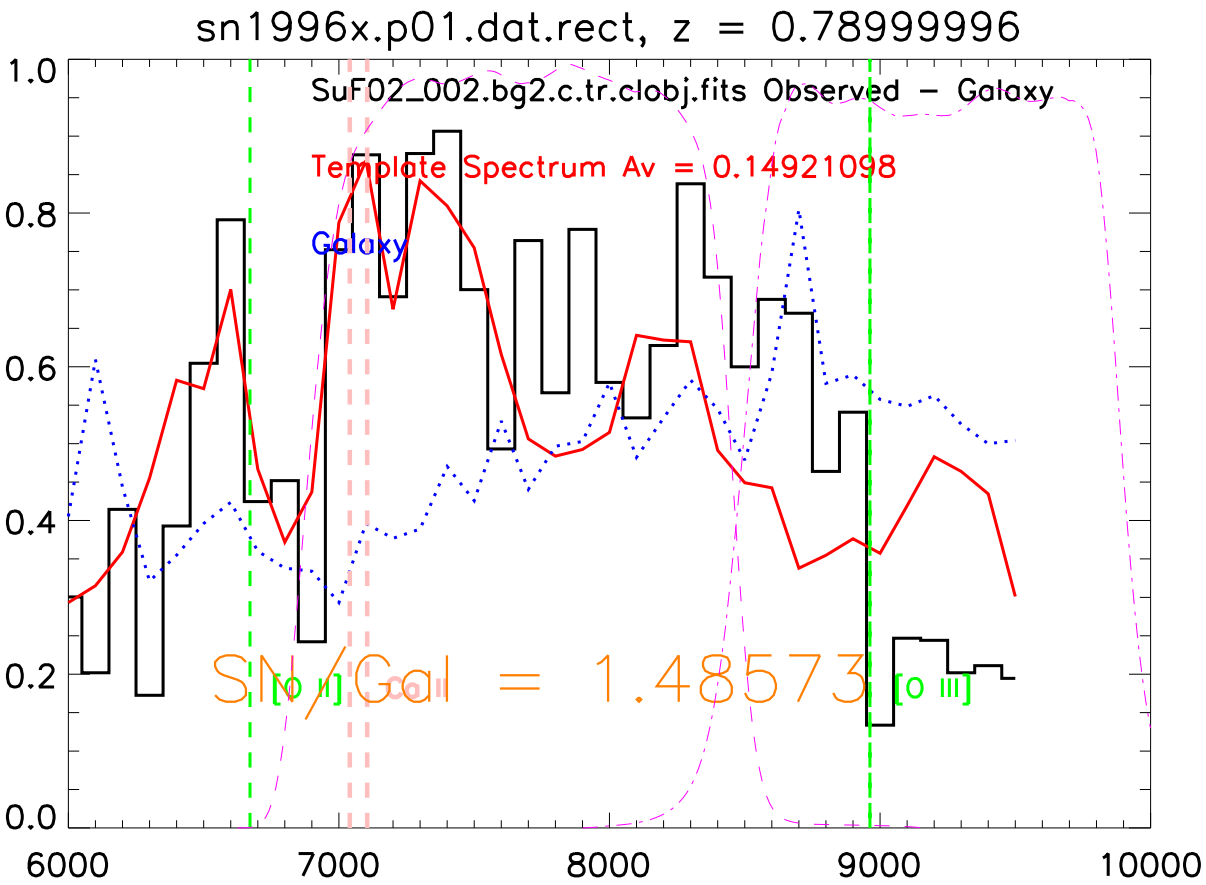

sn1994d.p13.dat.rect, z = 0.78999996
SuF02_002.bg2.c.tr.clobj.fits Observed − Galaxy
Template Spectrum Av = −1.9876501
Galaxy
S/N Gal = 0.568698
Mg II, I
[O II]
Ca II
[O III]
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

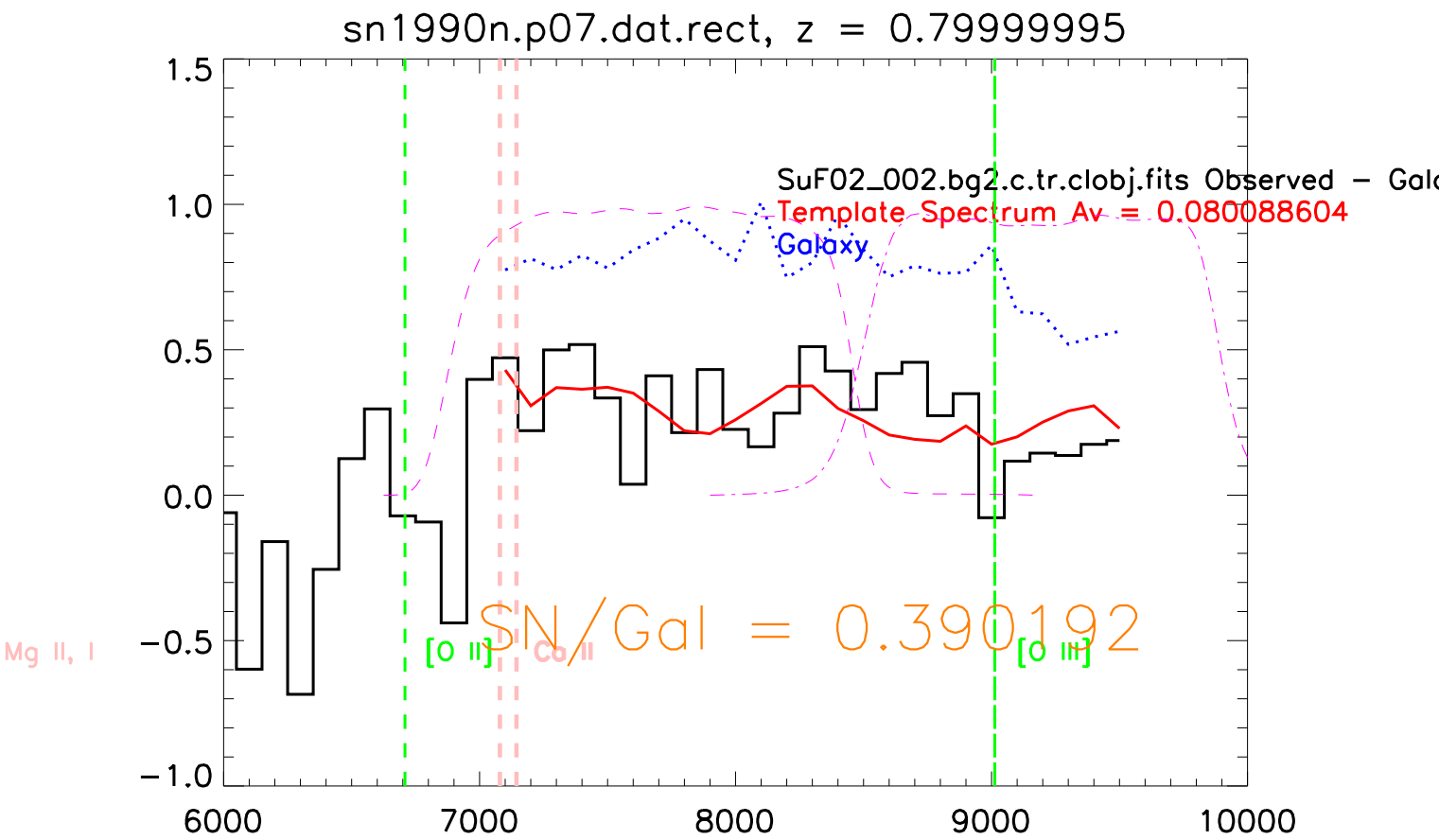

sn1989b.p14.dat.rect, z = 0.78999996
SuF02_002.bg2.c.tr.clobj.fits Observed − Galaxy
Template Spectrum Av = −5.6785455
Galaxy
SN/Gal = 0.285427
[O II]
Ca II
[O III]
Mg II, I
1.5
1.0
0.5
0.0
−0.5
−1.0
6000
7000
8000
9000
10000

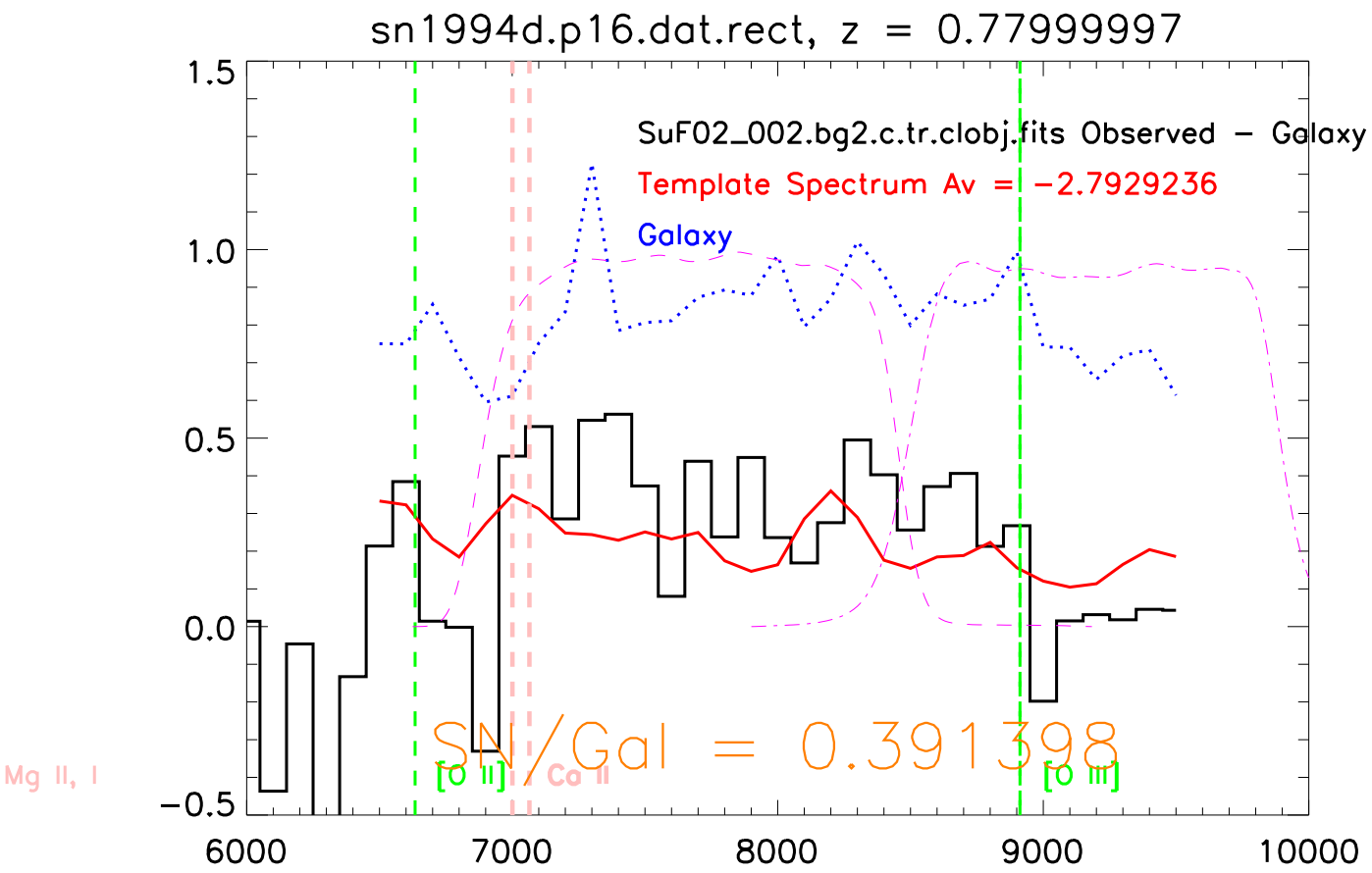

sn1981b.p29.dat.rect, z = 0.78999996
SuF02_002.bg2.c.tr.clobj.fits Observed
Galaxy
Template Spectrum Av = −1.9388050
Galaxy
SN/Gal = 0.357186
Mg II, I
[O II]
Ca II
[O III]
1.5
1.0
0.5
0.0
−0.5
−1.0
6000
7000
8000
9000
10000

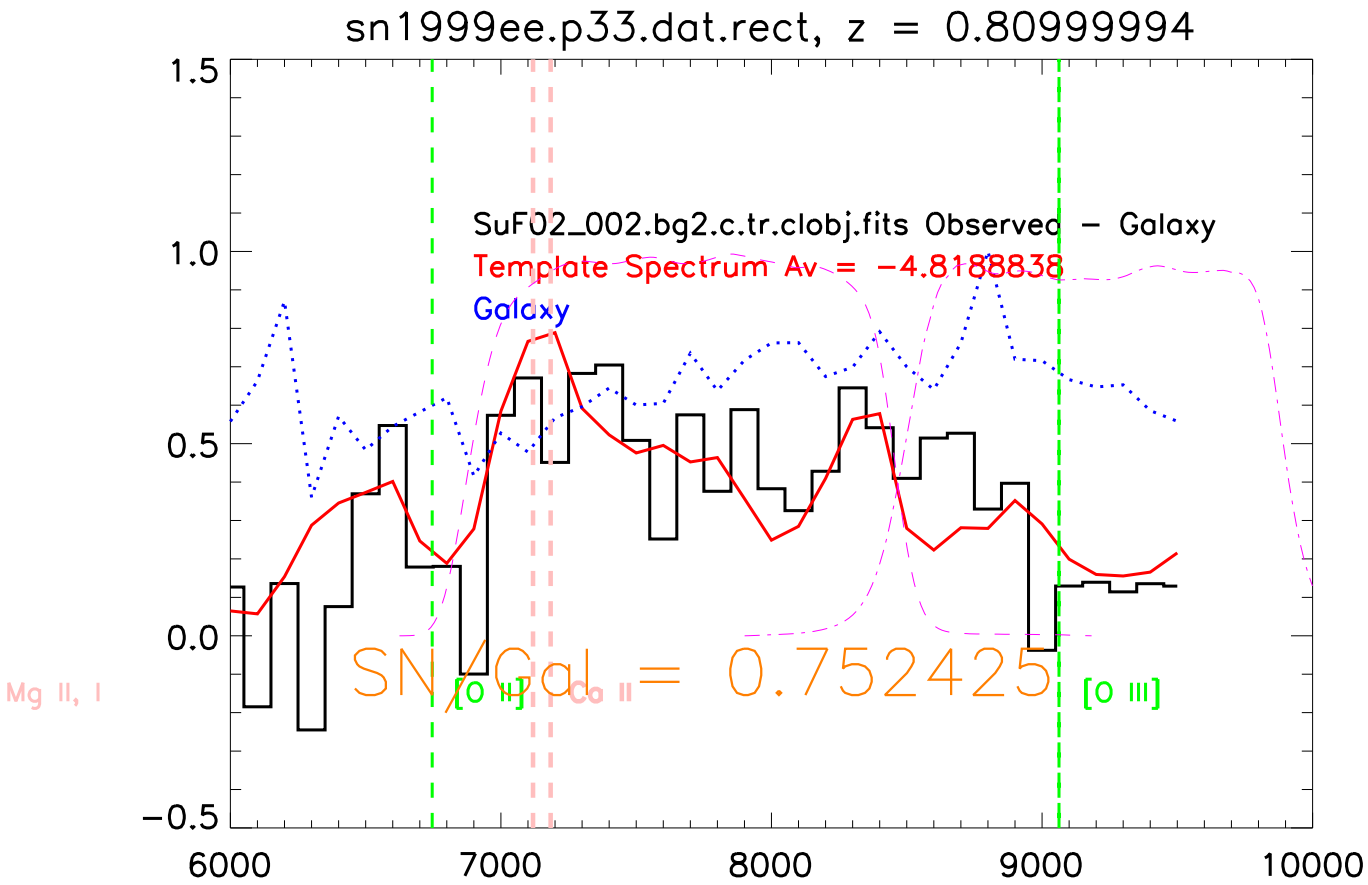

sn1994d.p25.dat.rect, z = 0.78999996
SuF02_002.bg2.c.tr.clobj.fits Observed – Galaxy
Template Spectrum Av = -3.7185342
Galaxy
SN/Gal = 1.04286
[O II]
[O III]
Mg II, I
1.2
1.0
0.8
0.6
0.4
0.2
0.0
-0.2
6000
7000
8000
9000
10000

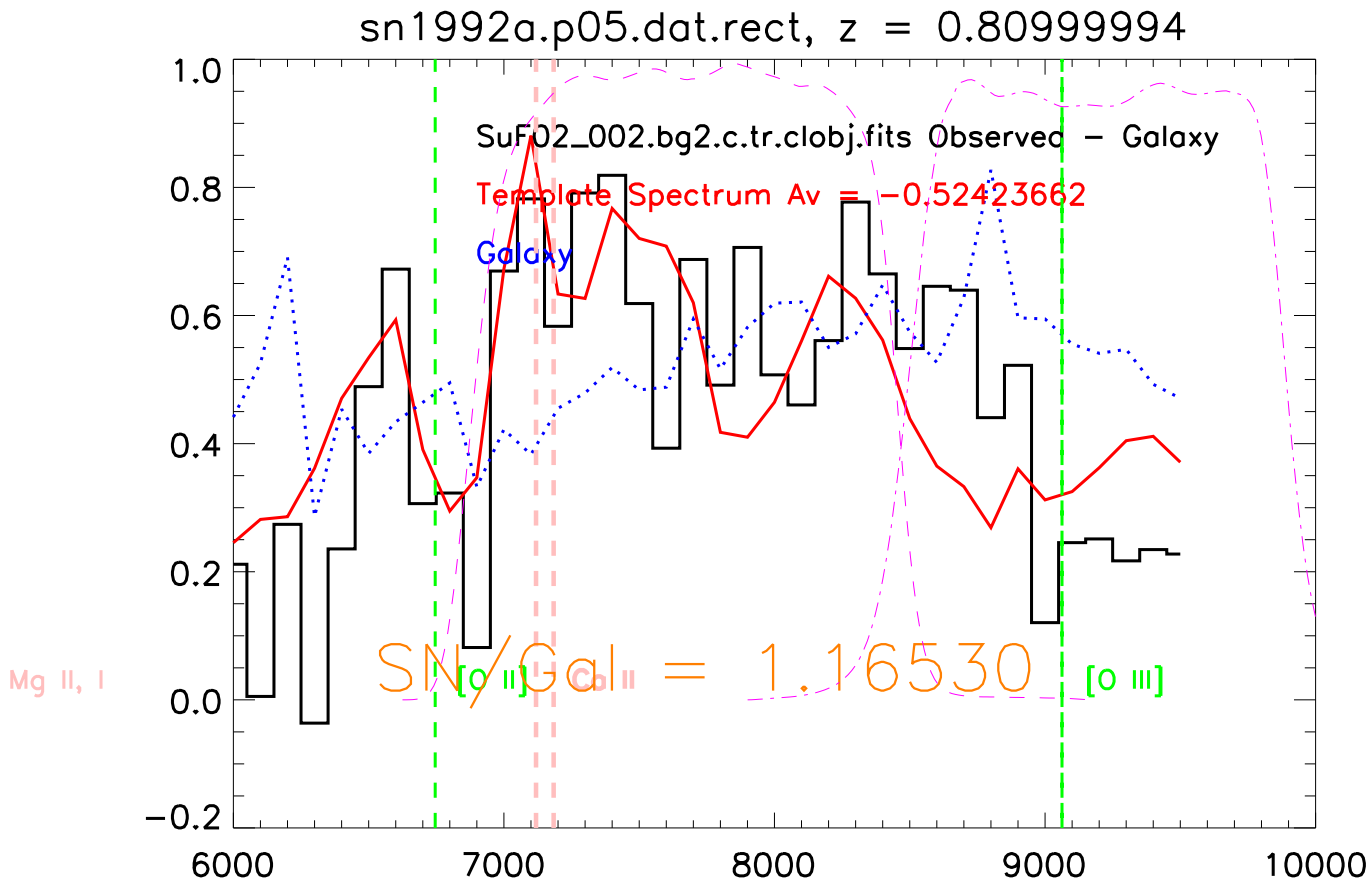

sn1981b.p17.dat.rect, z = 0.78999996
SuF02_002.bg2.c.tr.clobj.fits Observed − Galaxy
Template Spectrum Av = −3.2093923
Galaxy
SN/Gal = 0.327647
[O II]
Ca II
[O III]
Mg II, I
1.5
1.0
0.5
0.0
−0.5
−1.0
6000
7000
8000
9000
10000

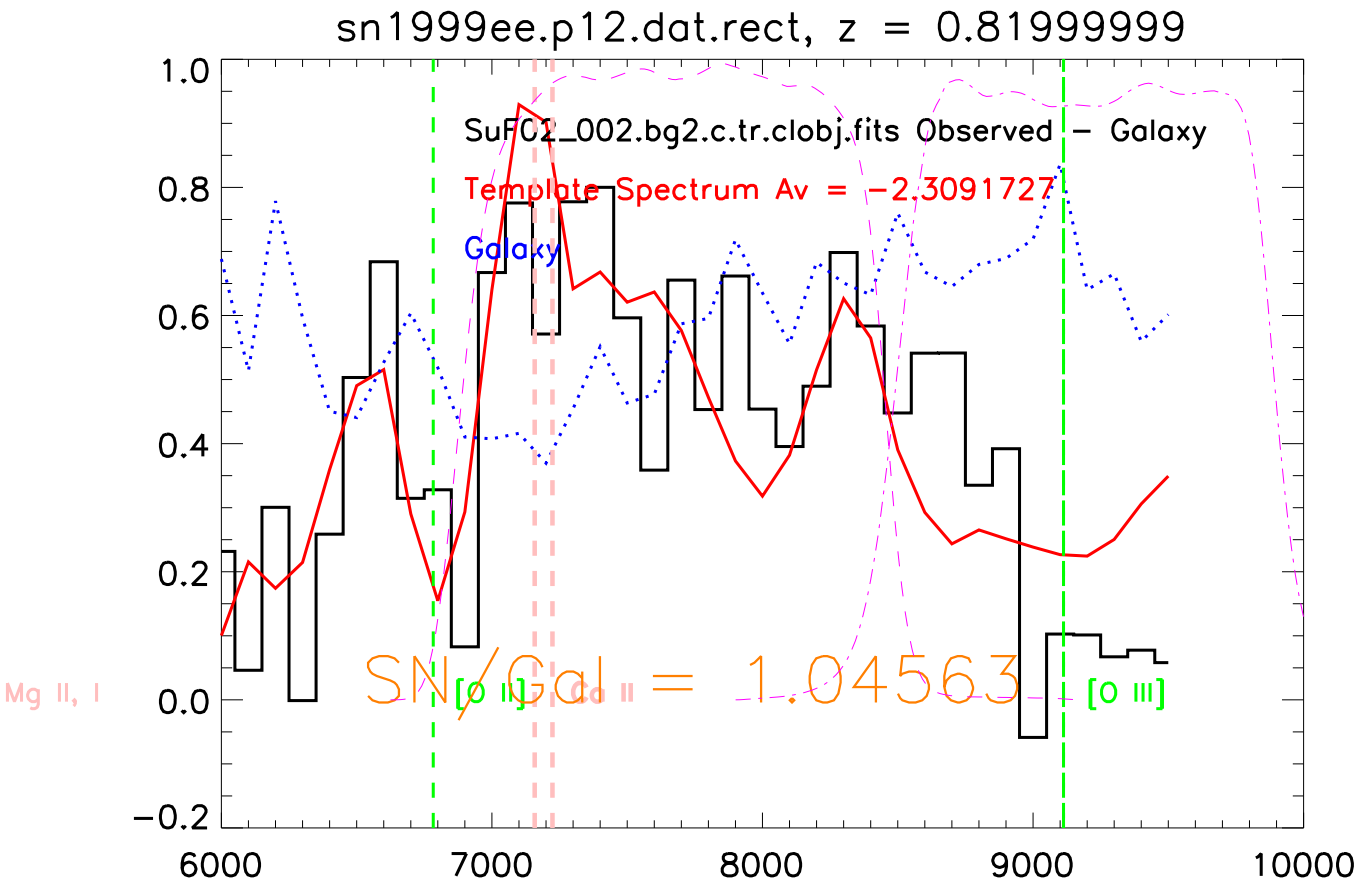

sn1996x.p01.dat.rect, z = 0.78999996
SuF02_002.bg2.c.tr.clobj.fits Observed – Galaxy
Template Spectrum Av = 0.14921098
Galaxy
SN/Gal = 1.48573
[O II]
Ca II
[O III]
Mg II, I
1.0
0.8
0.6
0.4
0.2
0.0
6000
7000
8000
9000
10000

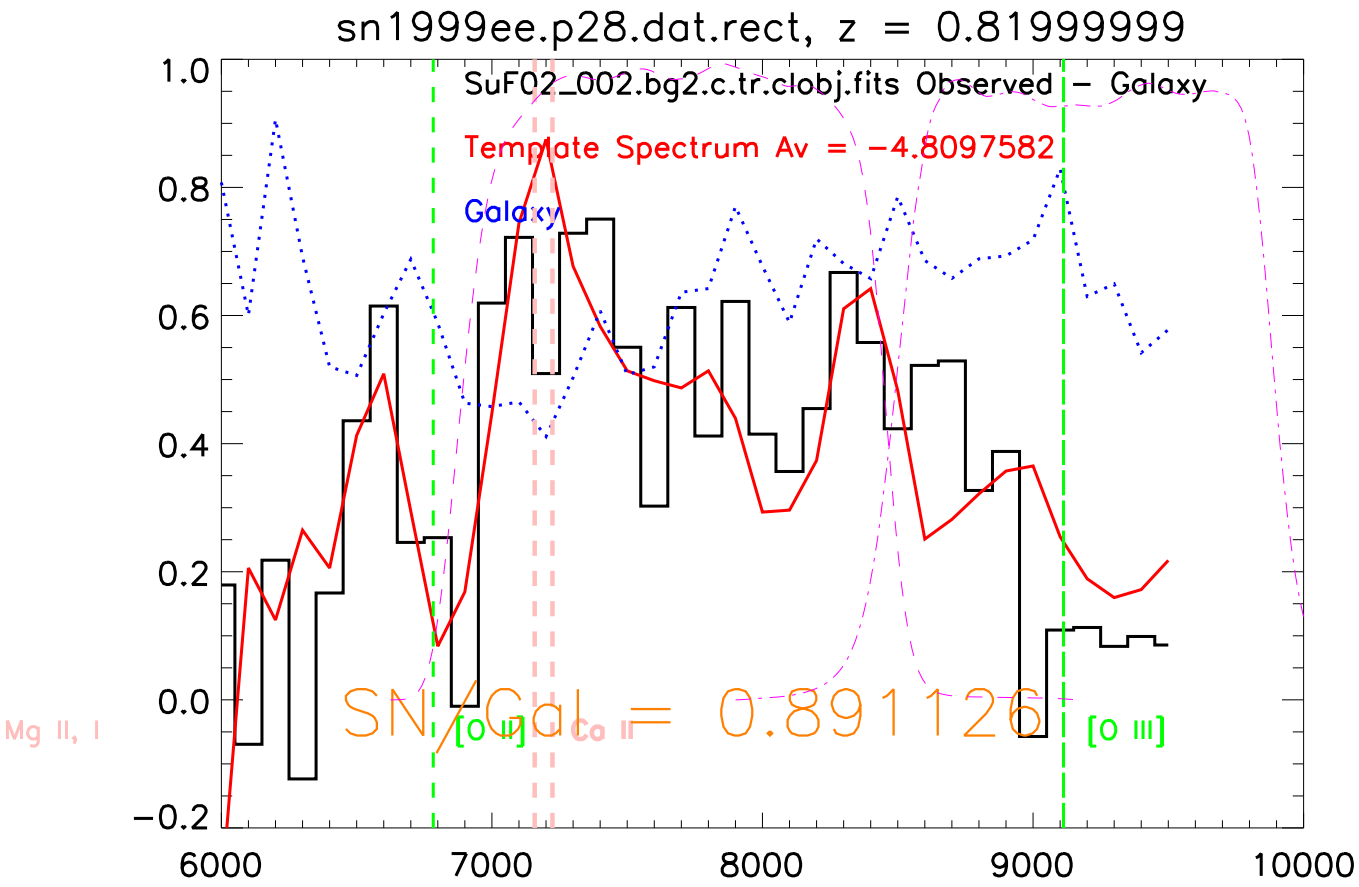

sn1990n.p07.dat.rect, z = 0.79999995
SuF02_002.bg2.c.tr.clobj.fits Observed – Gala
Template Spectrum Av = 0.080088604
Galaxy
SN/Gal = 0.390192
[O II]
Ca II
[O III]
Mg II, I
1.5
1.0
0.5
0.0
−0.5
−1.0
6000
7000
8000
9000
10000

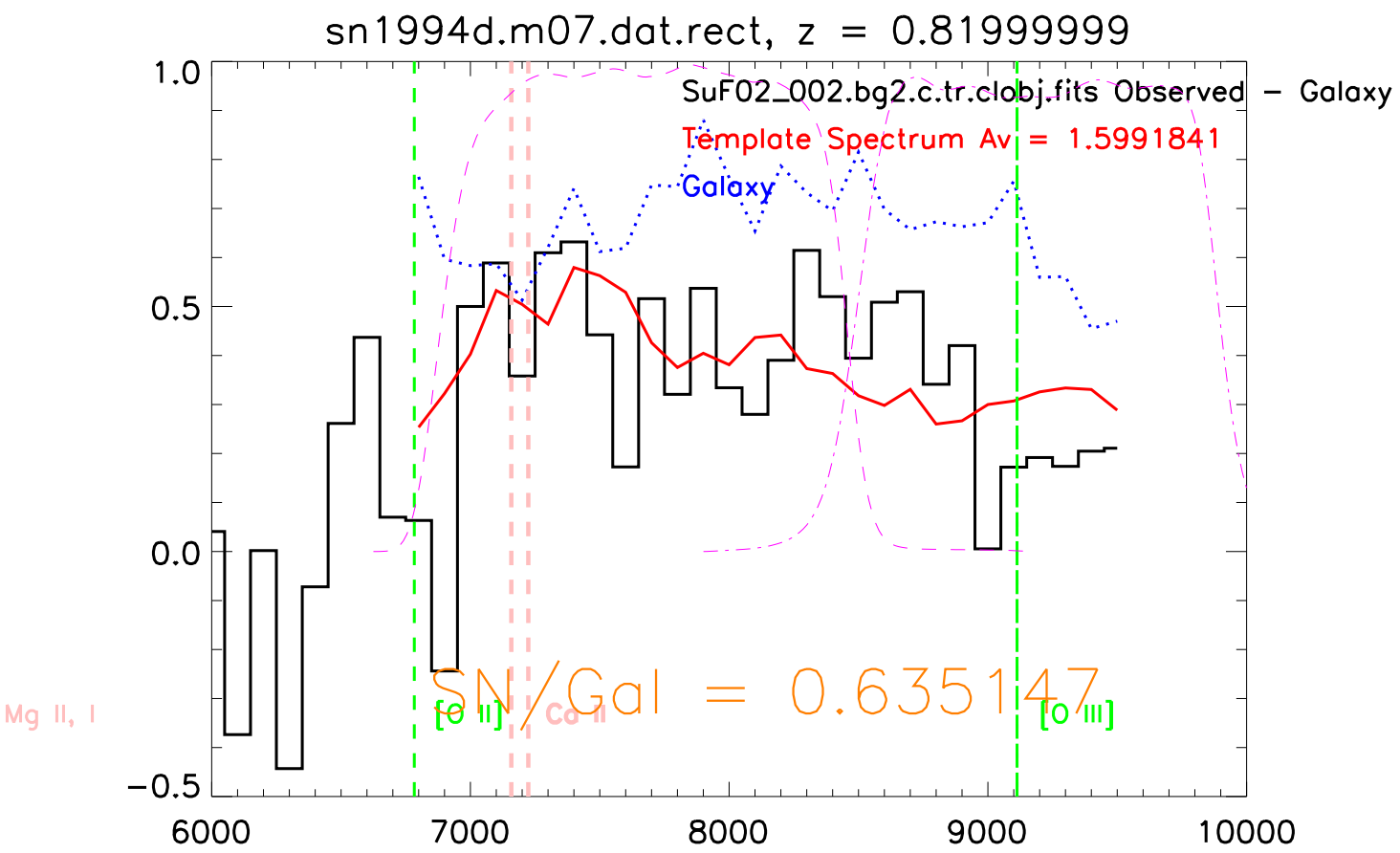

sn1994d.p16.dat.rect, z = 0.77999997
SuF02_002.bg2.c.tr.clobj.fits Observed − Galaxy
Template Spectrum Av = −2.7929236
Galaxy
SN/Gal = 0.391398
[O II]
Ca II
[O III]
Mg II, I
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

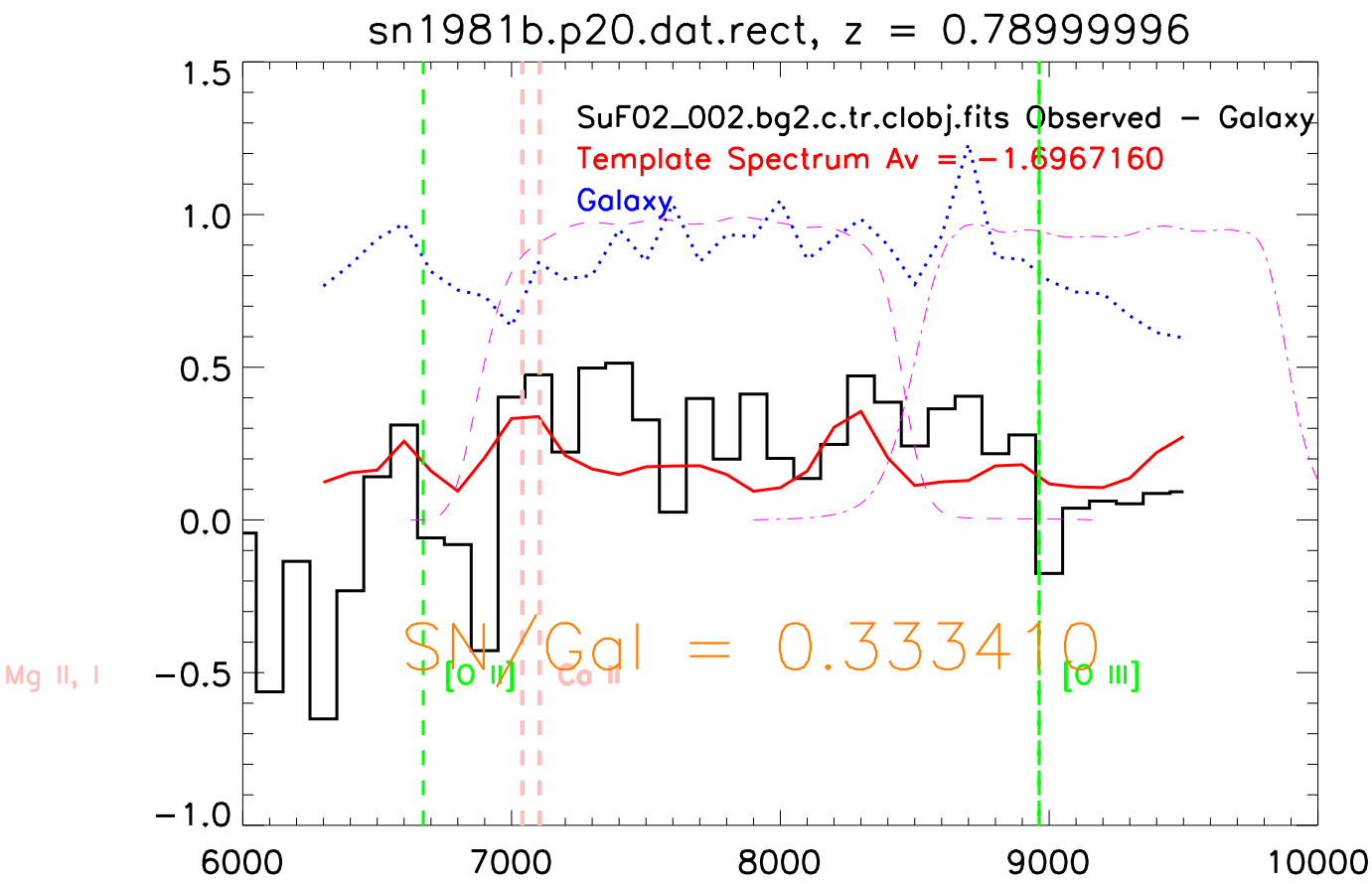

sn1999ee.p33.dat.rect, z = 0.80999994
SuF02_002.bg2.c.tr.clobj.fits Observed − Galaxy
Template Spectrum Av = −4.8188838
Galaxy
SN / Gal = 0.752425
Mg II, I
[O II]
Ca II
[O III]
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

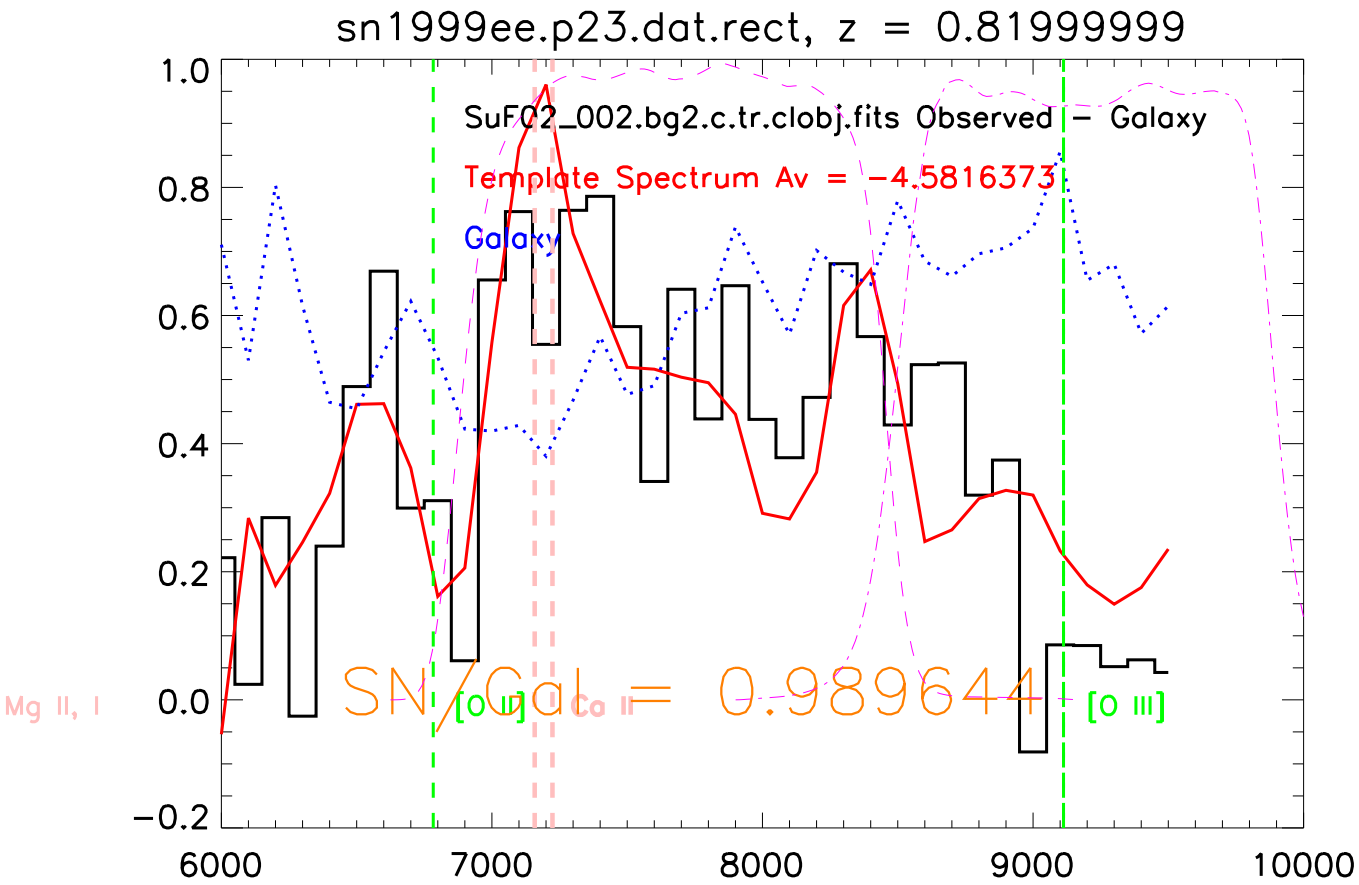

sn1992a.p05.dat.rect, z = 0.80999994
SuF02_002.bg2.c.tr.clobj.fits Observed – Galaxy
Template Spectrum Av = -0.52423662
Galaxy
SN/Gal = 1.16530
Mg II, I
[O II]
Ca II
[O III]
1.0
0.8
0.6
0.4
0.2
0.0
-0.2
6000
7000
8000
9000
10000

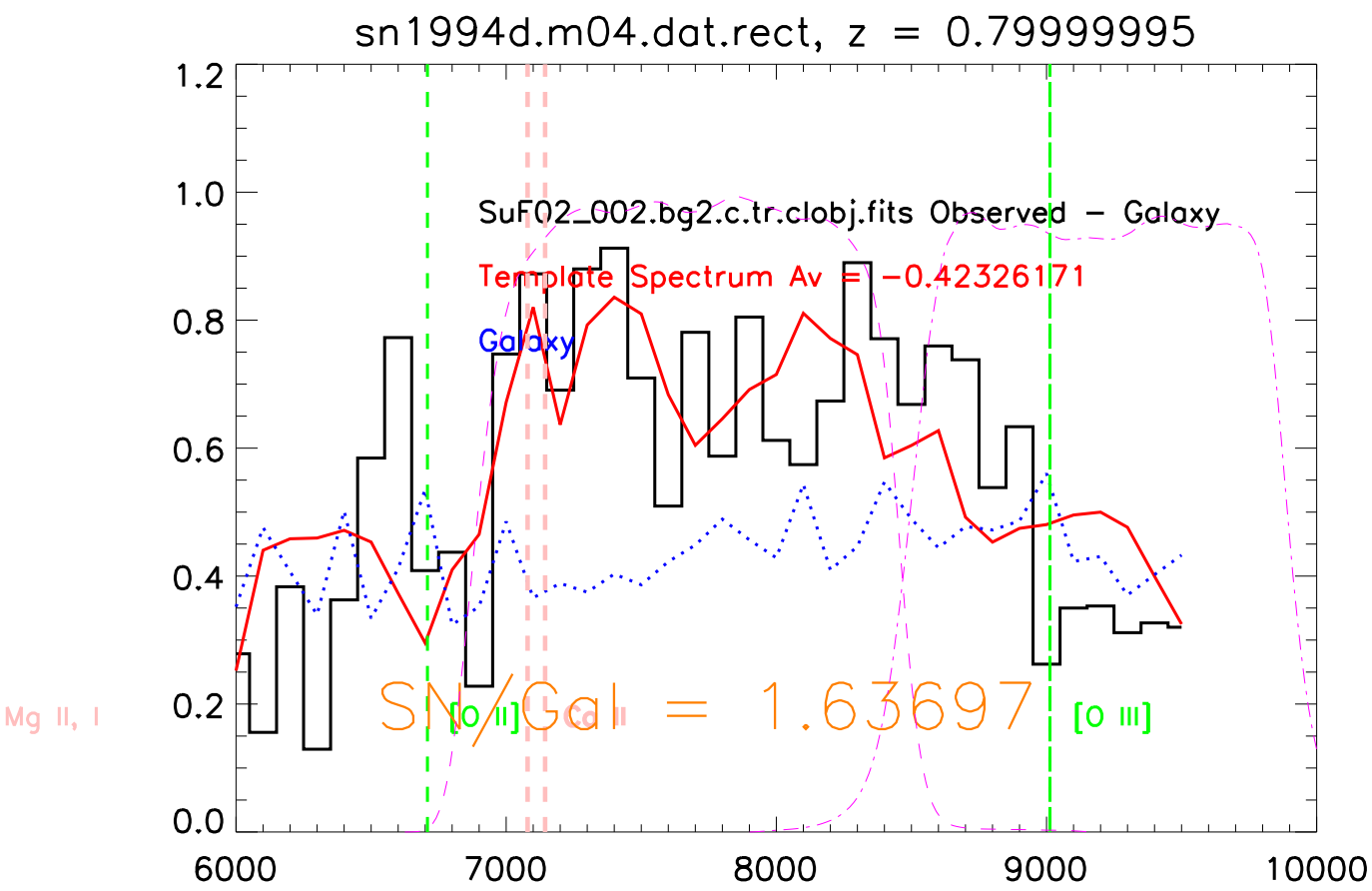

sn1999ee.p12.dat.rect, z = 0.81999999
SuFC2_002.bg2.c.tr.clobj.fits Observed – Galaxy
Template Spectrum Av = -2.3091727
Galaxy
SN/Gal = 1.04563
Mg II, I
[O II]
Ca II
[O III]
1.0
0.8
0.6
0.4
0.2
0.0
-0.2
6000
7000
8000
9000
10000

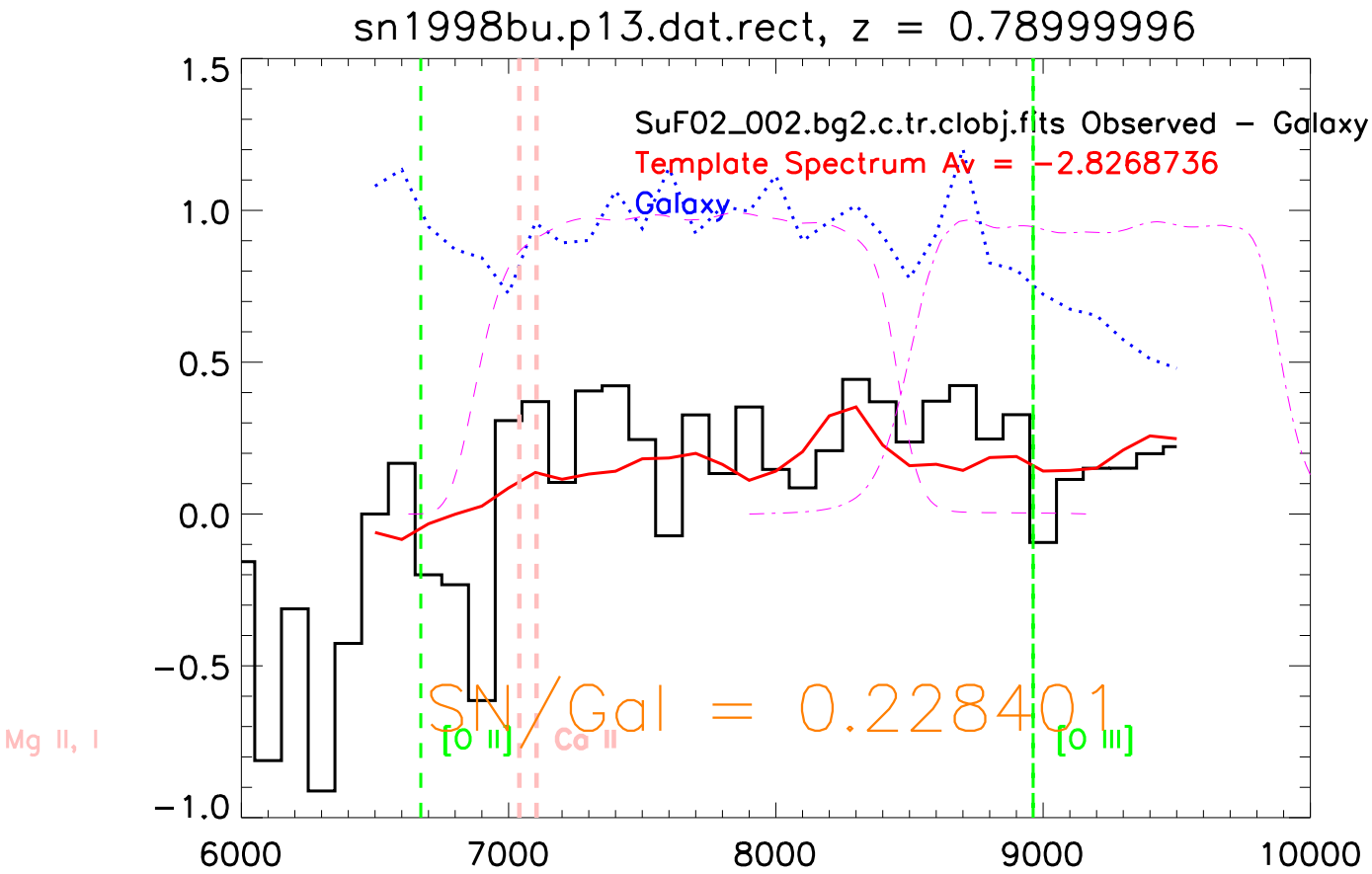

sn1999ee.p28.dat.rect, z = 0.81999999
SuF02_002.bg2.c.tr.clobj.fits Observed – Galaxy
Template Spectrum Av = −4.8097582
Galaxy
SN/Gal = 0.891126
Mg II, I
[O II]
Ca II
[O III]
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
6000
7000
8000
9000
10000

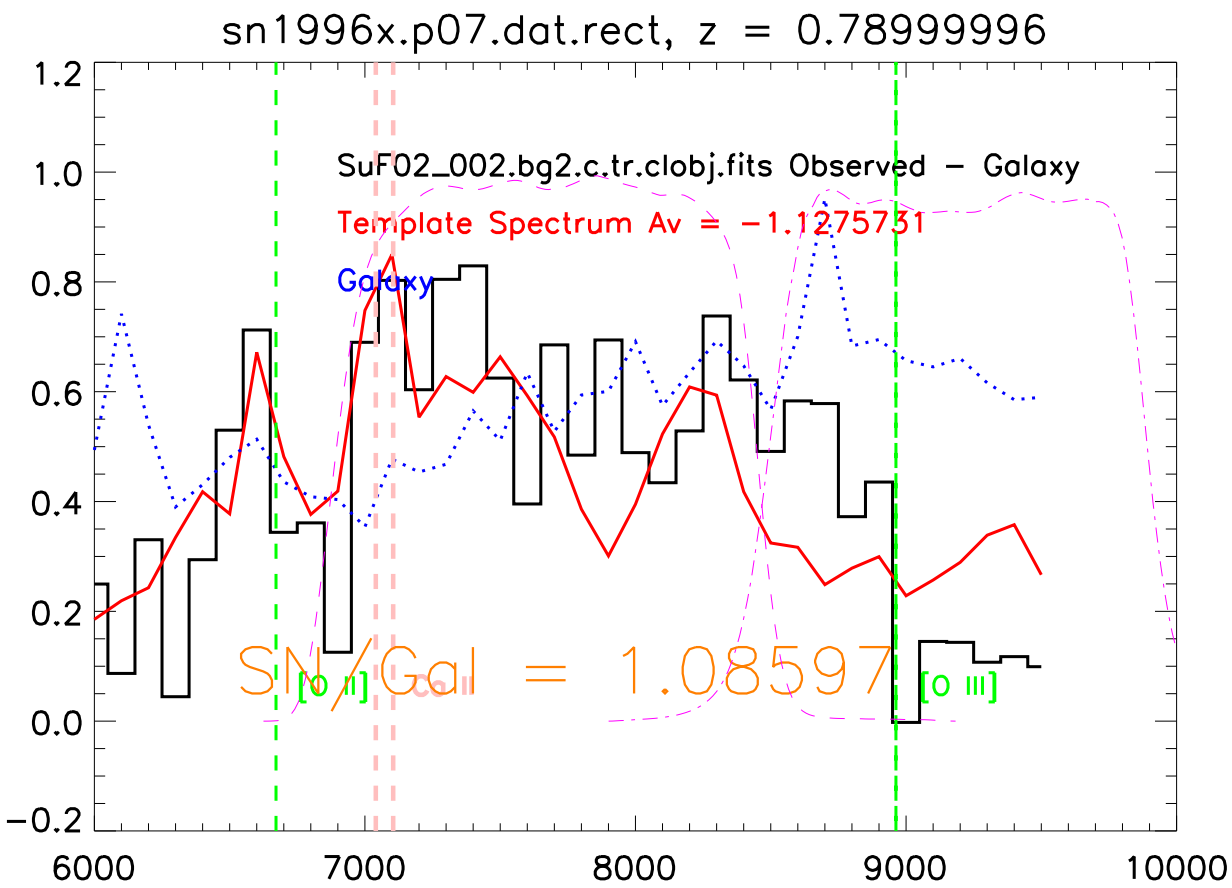

sn1994d.m07.dat.rect, z = 0.81999999
SuF02_002.bg2.c.tr.clobj.fits Observed – Galaxy
Template Spectrum Av = 1.5991841
Galaxy
SN/Gal = 0.635147
[O II]
Ca II
[O III]
Mg II, I
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000


sn1981b.p20.dat.rect, z = 0.78999996
SuF02_002.bg2.c.tr.clobj.fits Observed − Galaxy
Template Spectrum Av = −1.6967160
Galaxy
SN/Gal = 0.333410
[O II]
Ca II
[O III]
Mg II, I
1.5
1.0
0.5
0.0
−0.5
−1.0
6000
7000
8000
9000
10000

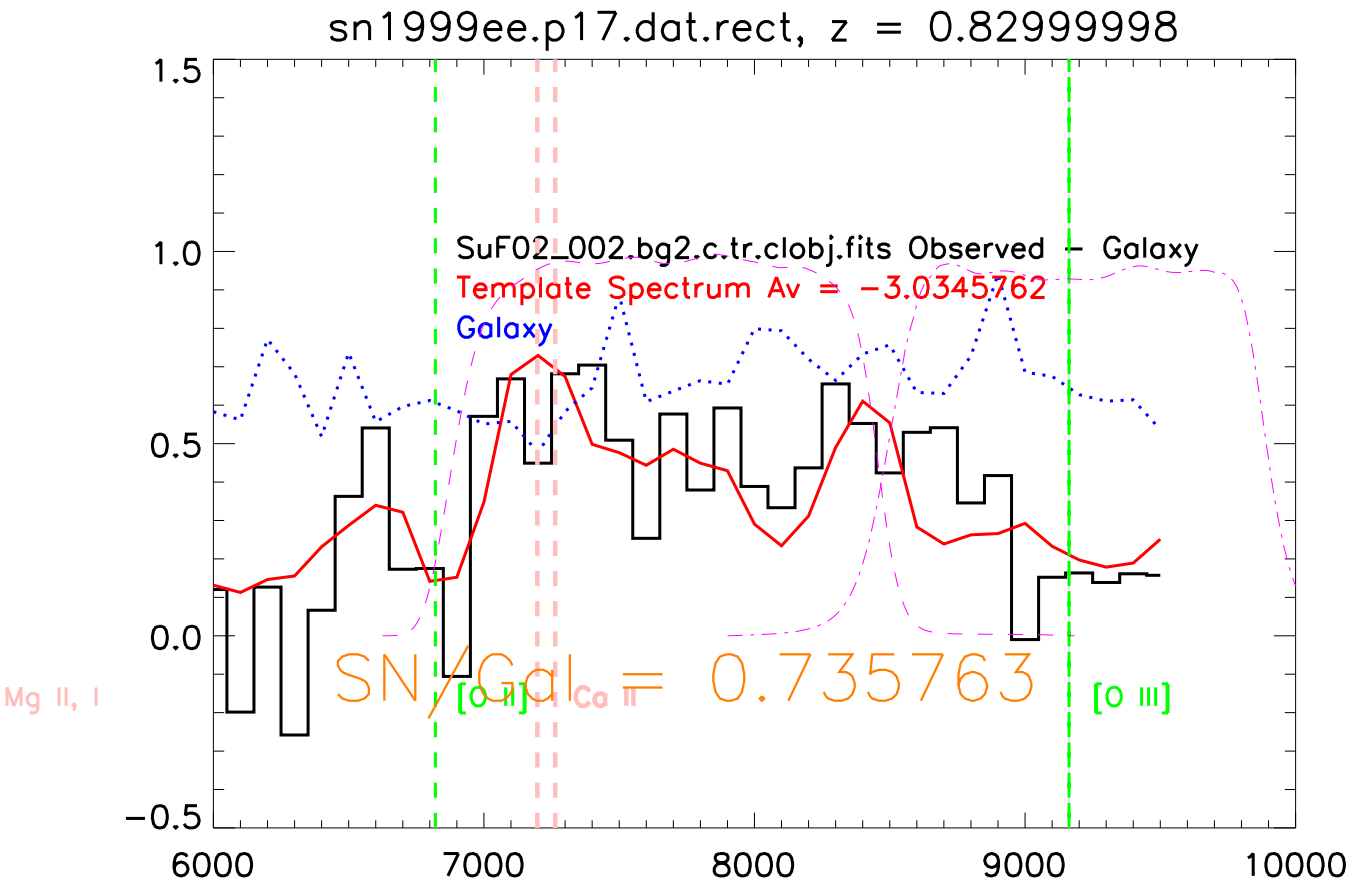

sn1999ee.p23.dat.rect, z = 0.81999999
SuF02_002.bg2.c.tr.clobj.fits Observed – Galaxy
Template Spectrum Av = -4.5816373
Galaxy
SN/Gal = 0.989644
Mg II, I
[O II]
Ca II
[O III]
1.0
0.8
0.6
0.4
0.2
0.0
-0.2
6000
7000
8000
9000
10000

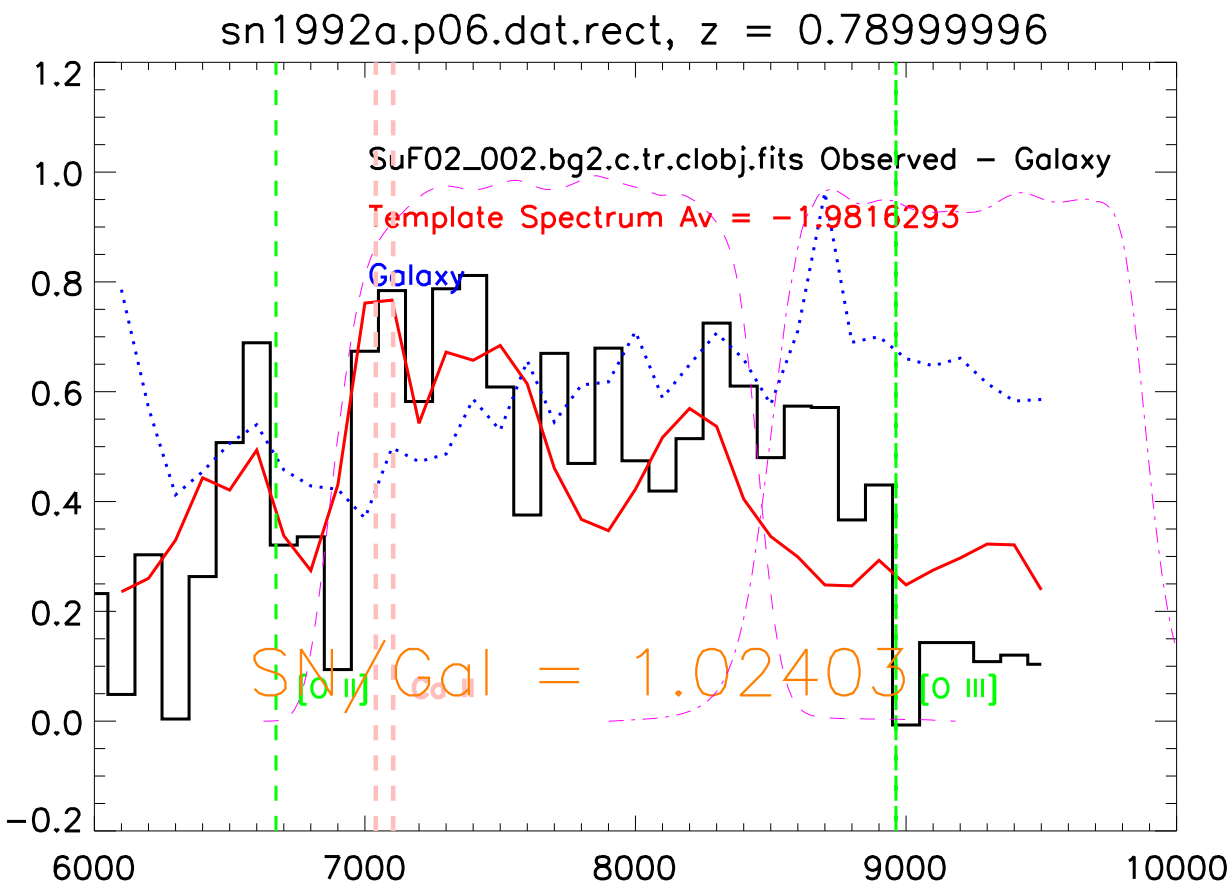

sn1994d.m04.dat.rect, z = 0.79999995
SuF02_002.bg2.c.tr.clobj.fits Observed – Galaxy
Template Spectrum Av = -0.42326171
Galaxy
SN/Gal = 1.63697
[O II]
[O III]
Mg II, I
1.2
1.0
0.8
0.6
0.4
0.2
0.0
6000
7000
8000
9000
10000

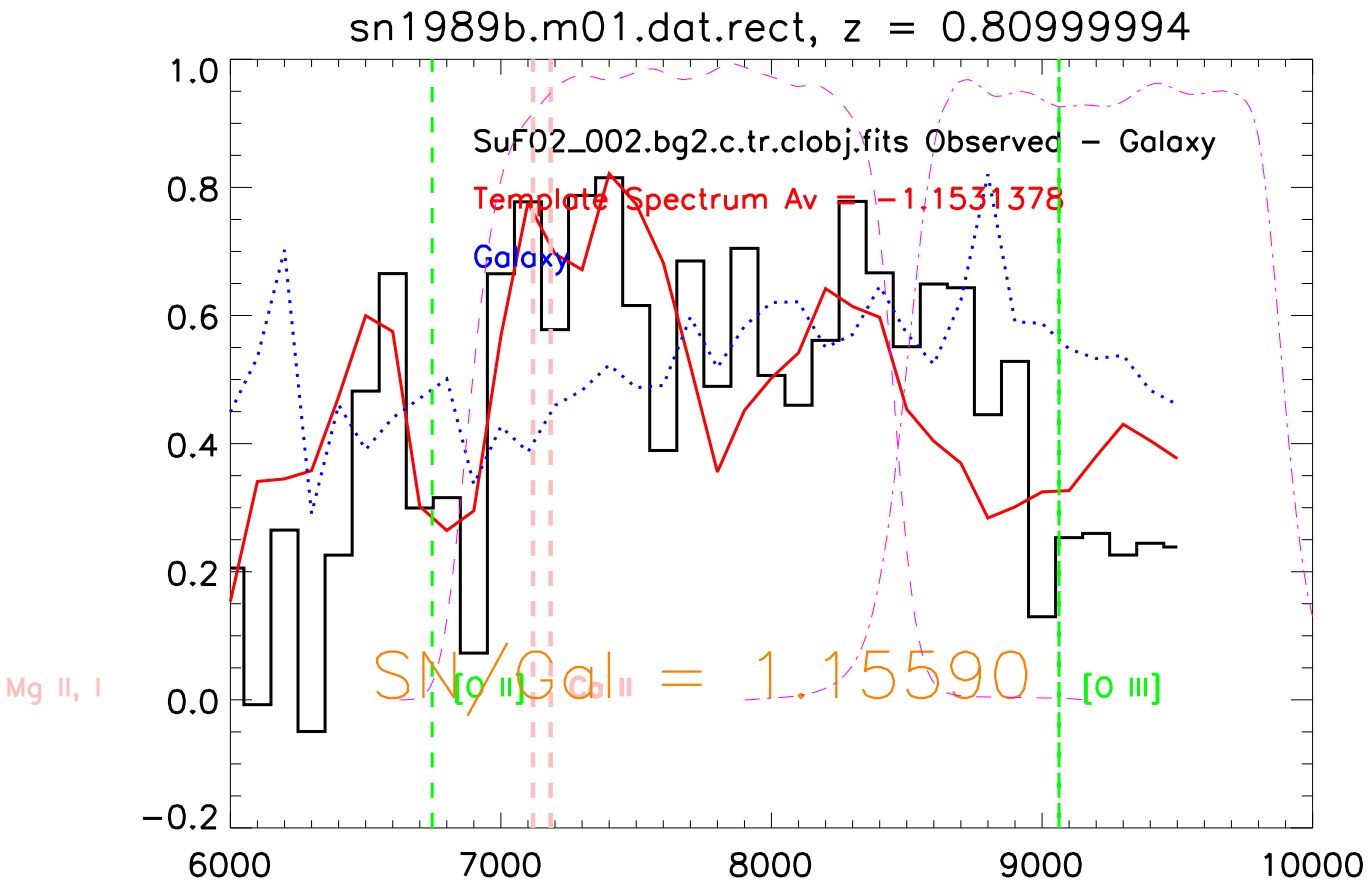

sn1998bu.p13.dat.rect, z = 0.78999996
SuF02_002.bg2.c.tr.clobj.fits Observed − Galaxy
Template Spectrum Av = −2.8268736
Galaxy
SN/Gal = 0.228401
[O II]
Ca II
[O III]
Mg II, I
1.5
1.0
0.5
0.0
−0.5
−1.0
6000
7000
8000
9000
10000

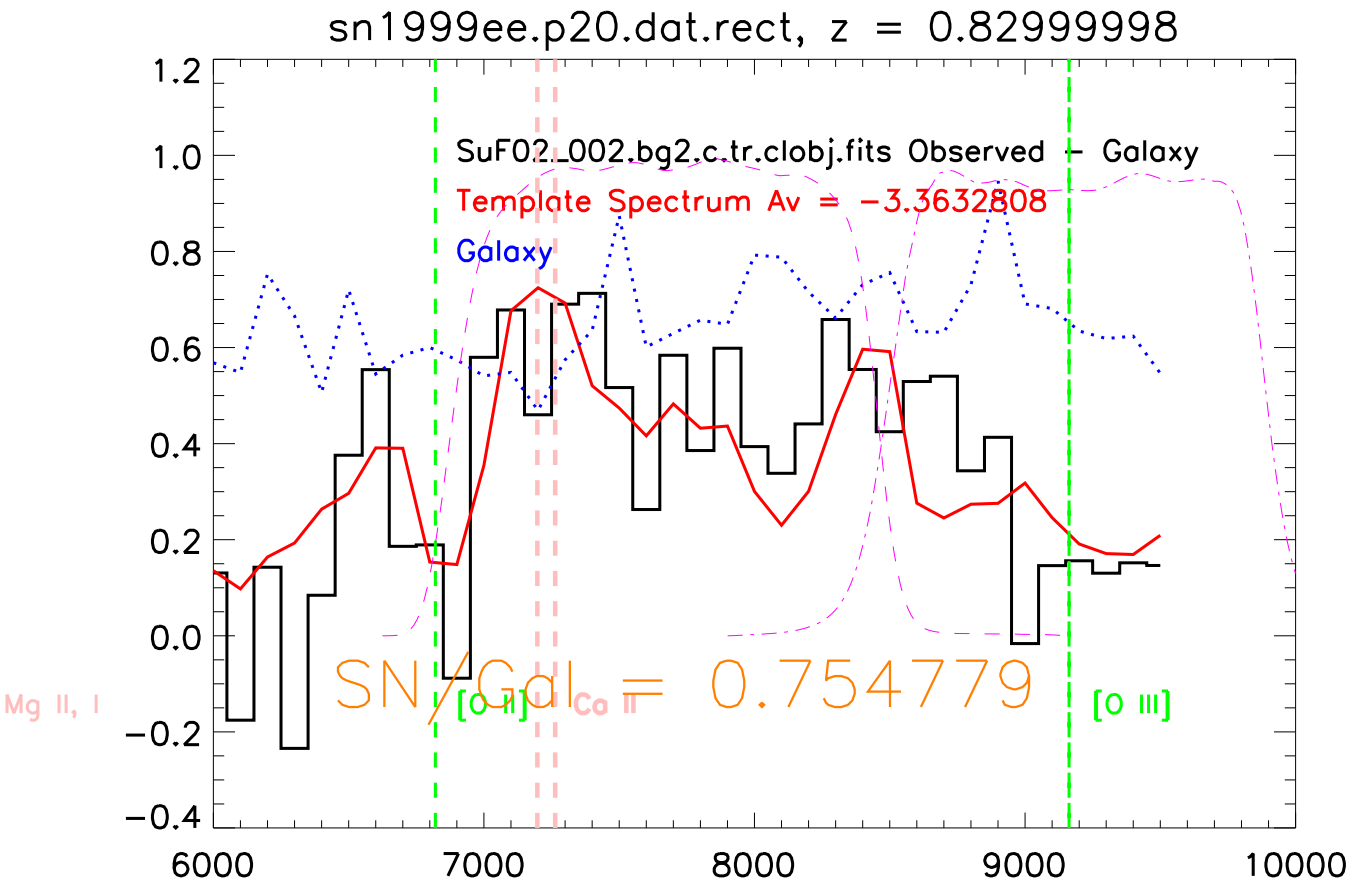

sn1996x.p07.dat.rect, z = 0.78999996
SuF02_002.bg2.c.tr.clobj.fits Observed − Galaxy
Template Spectrum Av = −1.1275731
Galaxy
SN/Gal = 1.08597
[O II]
[O III]
1.2
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
6000
7000
8000
9000
10000

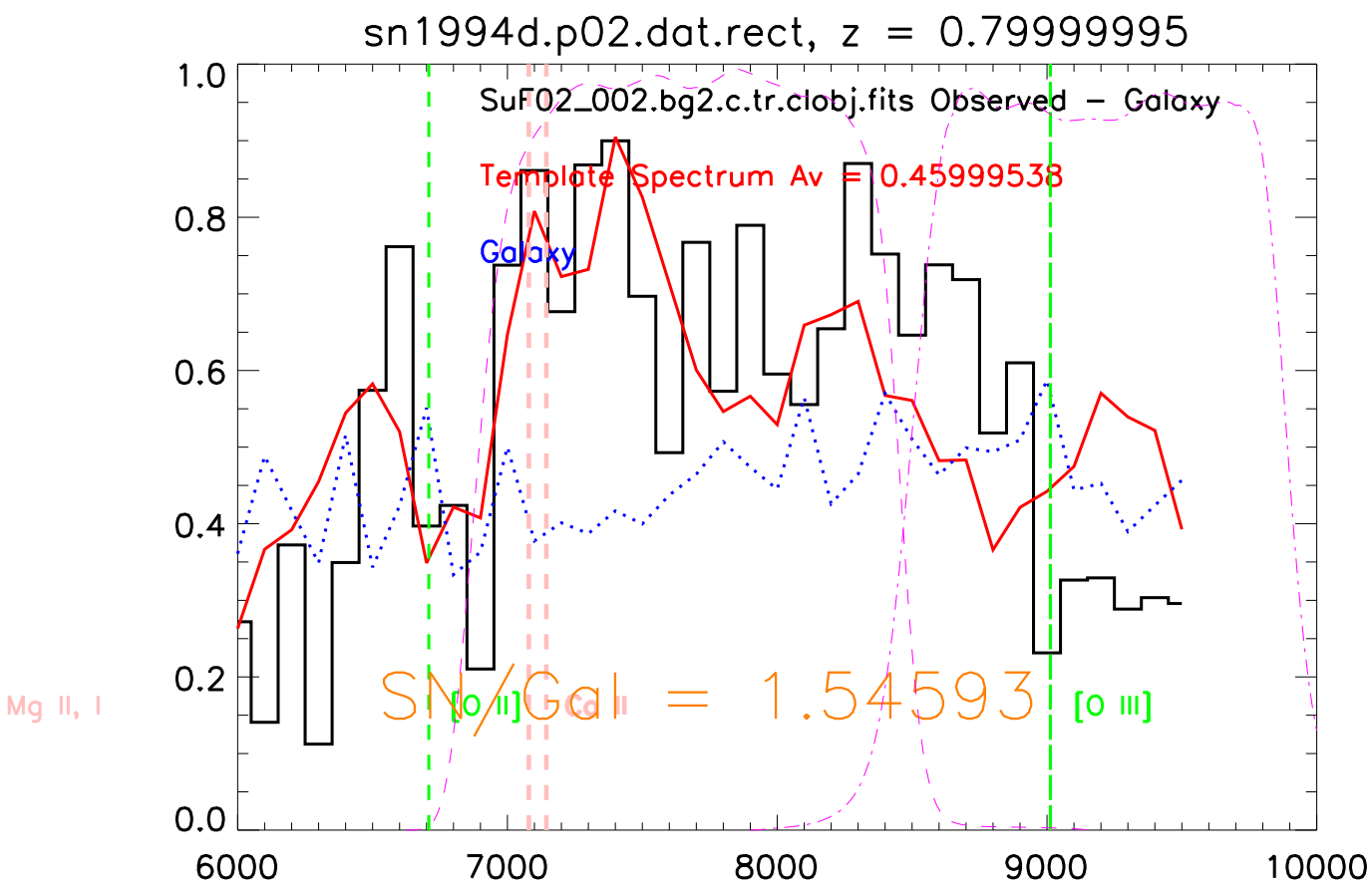
Mg II, I

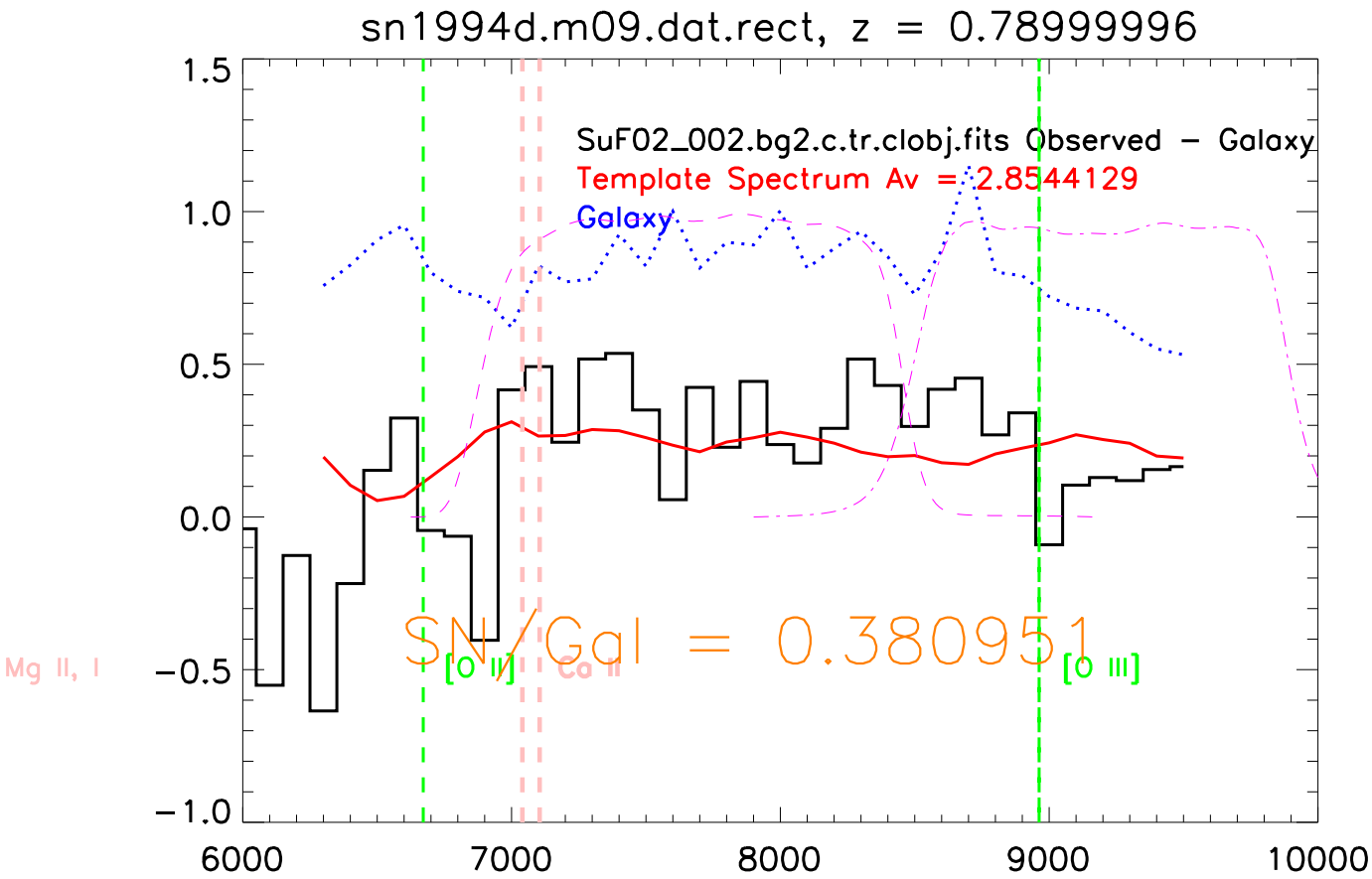

sn1999ee.p17.dat.rect, z = 0.82999998
SuF02_002.bg2.c.tr.clobj.fits Observed – Galaxy
Template Spectrum Av = −3.0345762
Galaxy
SN/Gal = 0.735763
Mg II, I
[O II]
Ca II
[O III]
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

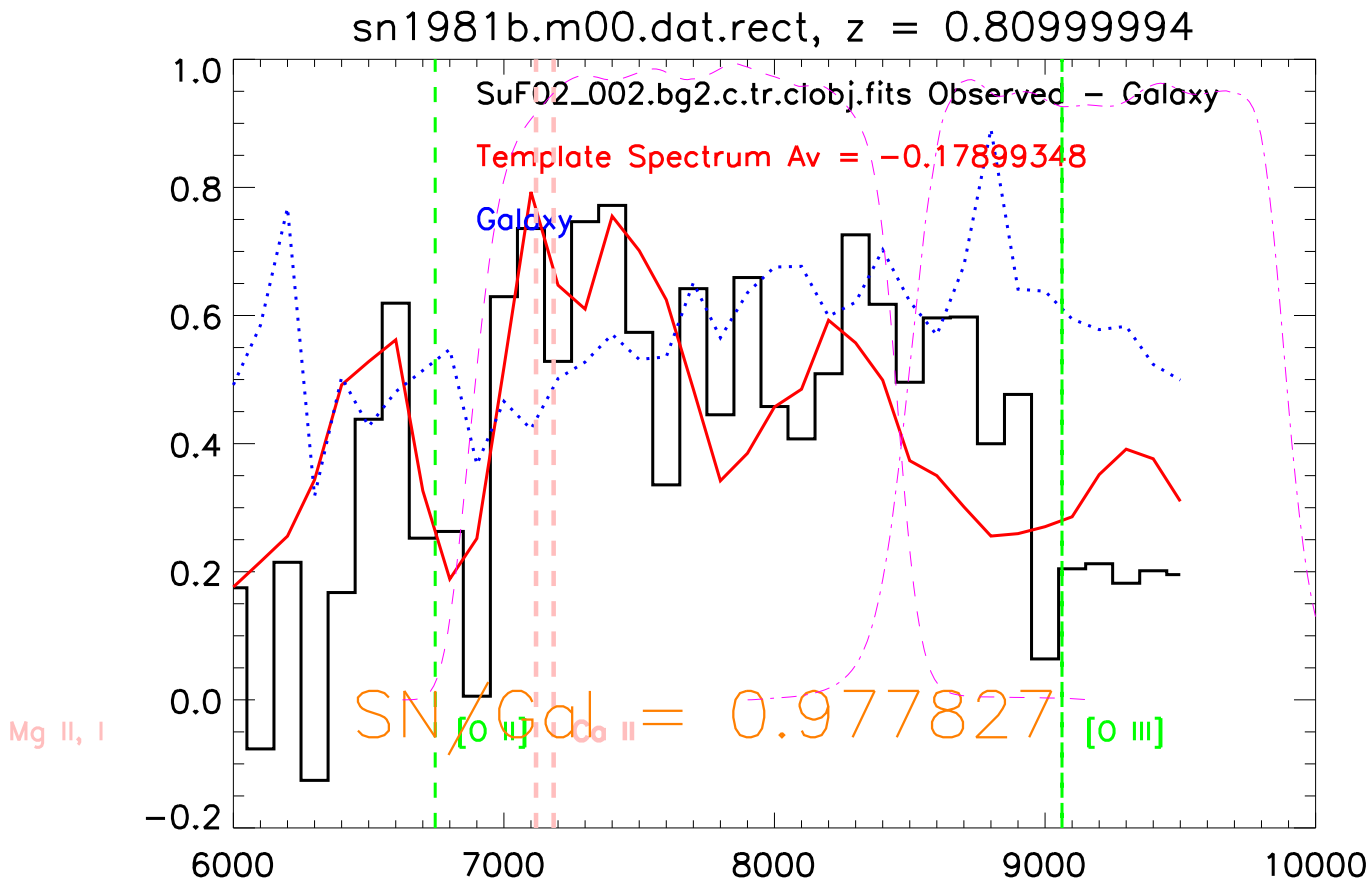

sn1992a.p06.dat.rect, z = 0.78999996
SuF02_002.bg2.c.tr.clobj.fits Observed − Galaxy
Template Spectrum Av = −1.9816293
Galaxy
SN/Gal = 1.02403
[O II]
[O III]
1.2
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
6000
7000
8000
9000
10000

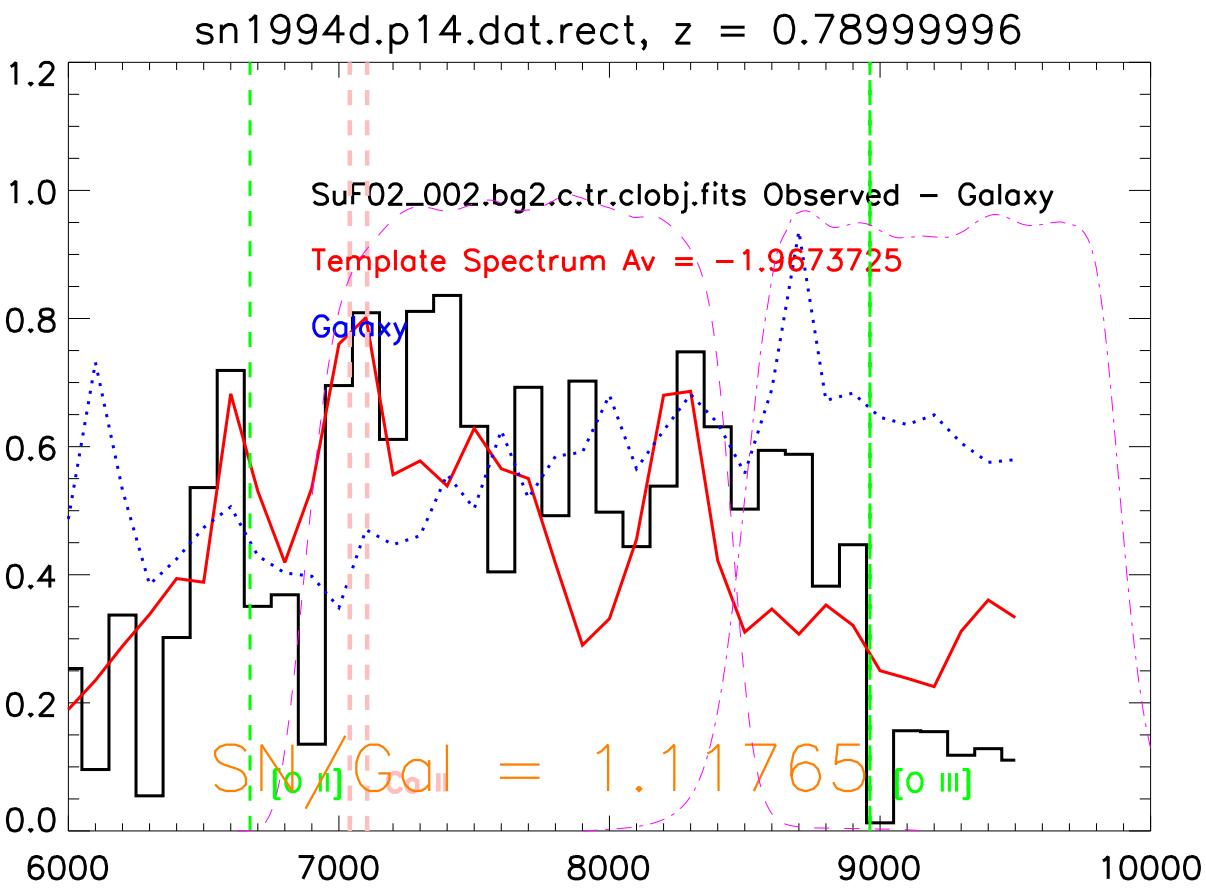

sn1989b.m01.dat.rect, z = 0.80999994
SuF02_002.bg2.c.tr.clobj.fits Observed − Galaxy
Template Spectrum Av = −1.1531378
Galaxy
SN/Gal = 1.15590
Mg II, I
[O II]
Ca II
[O III]
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
6000
7000
8000
9000
10000


sn1999ee.p20.dat.rect, z = 0.82999998
SuF02_002.bg2.c.tr.clobj.fits Observed – Galaxy
Template Spectrum Av = −3.3632808
Galaxy
SN/Gal = 0.754779
Mg II, I
[O II]
Ca II
[O III]
1.2
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
−0.4
6000
7000
8000
9000
10000

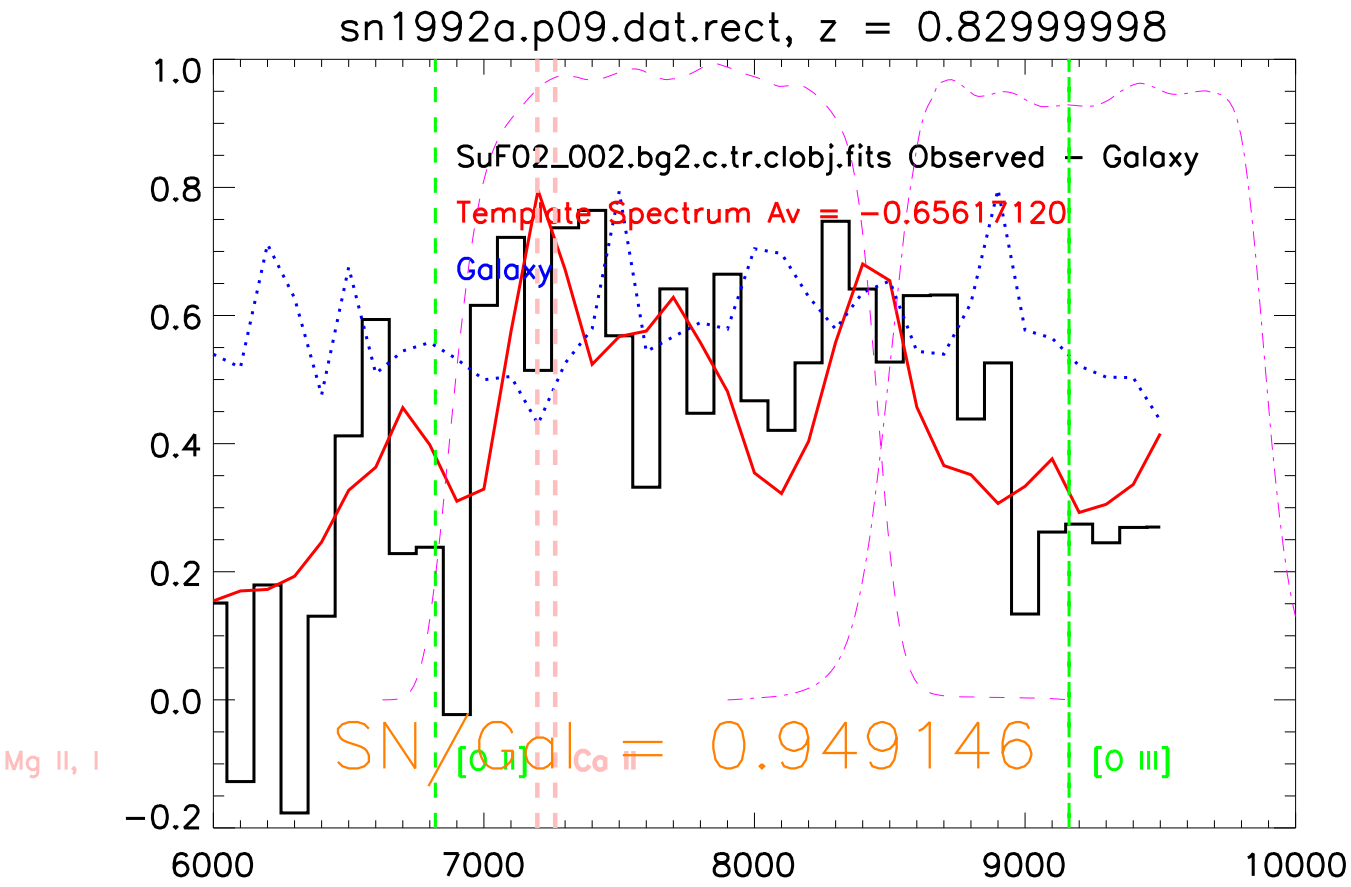

sn1994d.p02.dat.rect, z = 0.79999995
SuF02_002.bg2.c.tr.clobj.fits Observed – Galaxy
Template Spectrum Av = 0.45999538
Galaxy
SN/Gal = 1.54593
[O II]
[O III]
Mg II, I
1.0
0.8
0.6
0.4
0.2
0.0
6000
7000
8000
9000
10000


sn1994d.m09.dat.rect, z = 0.78999996
SuF02_002.bg2.c.tr.clobj.fits Observed − Galaxy
Template Spectrum Av = 2.8544129
Galaxy
SN/Gal = 0.380951
Mg II, I
[O II]
Ca II
[O III]
1.5
1.0
0.5
0.0
−0.5
−1.0
6000
7000
8000
9000
10000

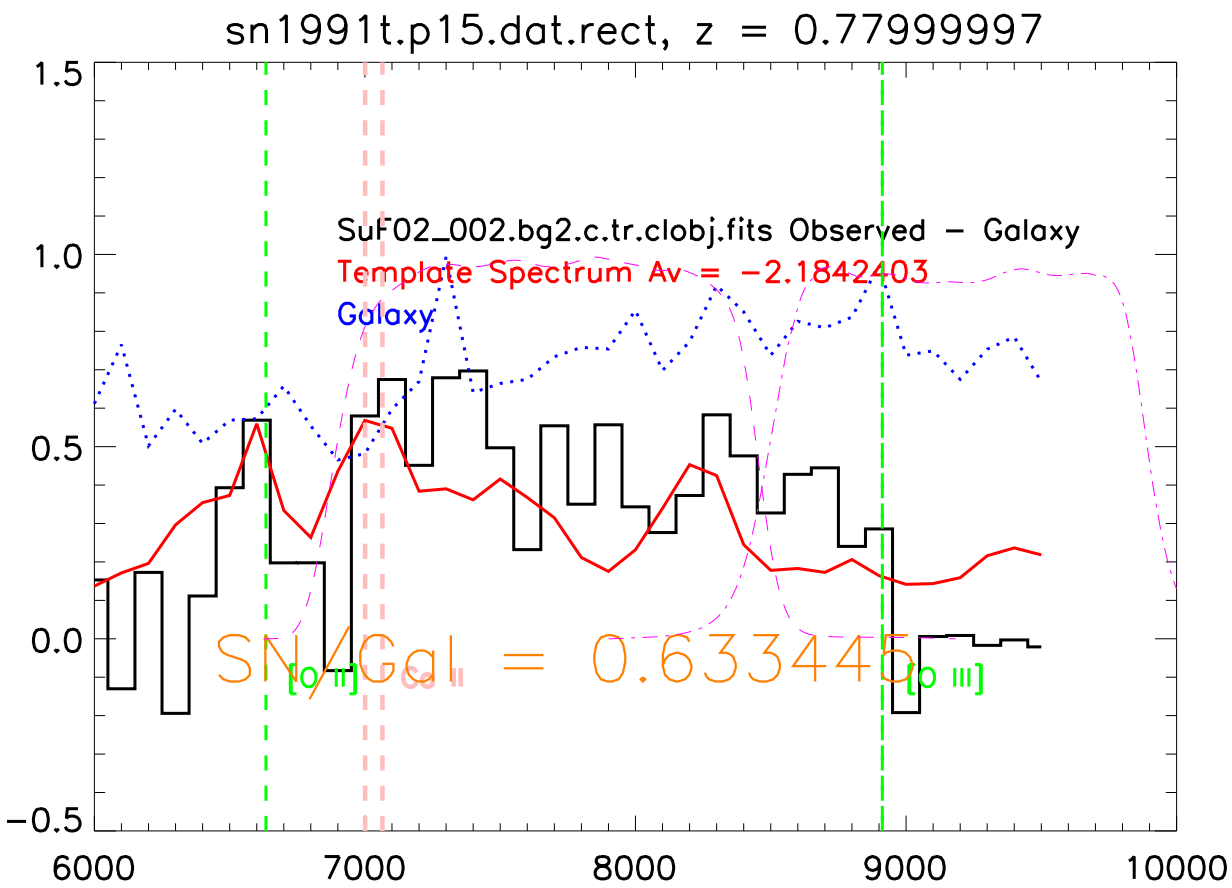

sn1981b.m00.dat.rect, z = 0.80999994
SuF02_002.bg2.c.tr.clobj.fits Observed – Galaxy
Template Spectrum Av = −0.17899348
Galaxy
SN/Gal = 0.977827
[O II]
Ca II
[O III]
Mg II, I
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
6000
7000
8000
9000
10000


sn1994d.p14.dat.rect, z = 0.78999996
SuF02_002.bg2.c.tr.clobj.fits Observed – Galaxy
Template Spectrum Av = −1.9673725
Galaxy
SN/Gal = 1.11765
[O II]
[O III]
1.2
1.0
0.8
0.6
0.4
0.2
0.0
6000
7000
8000
9000
10000

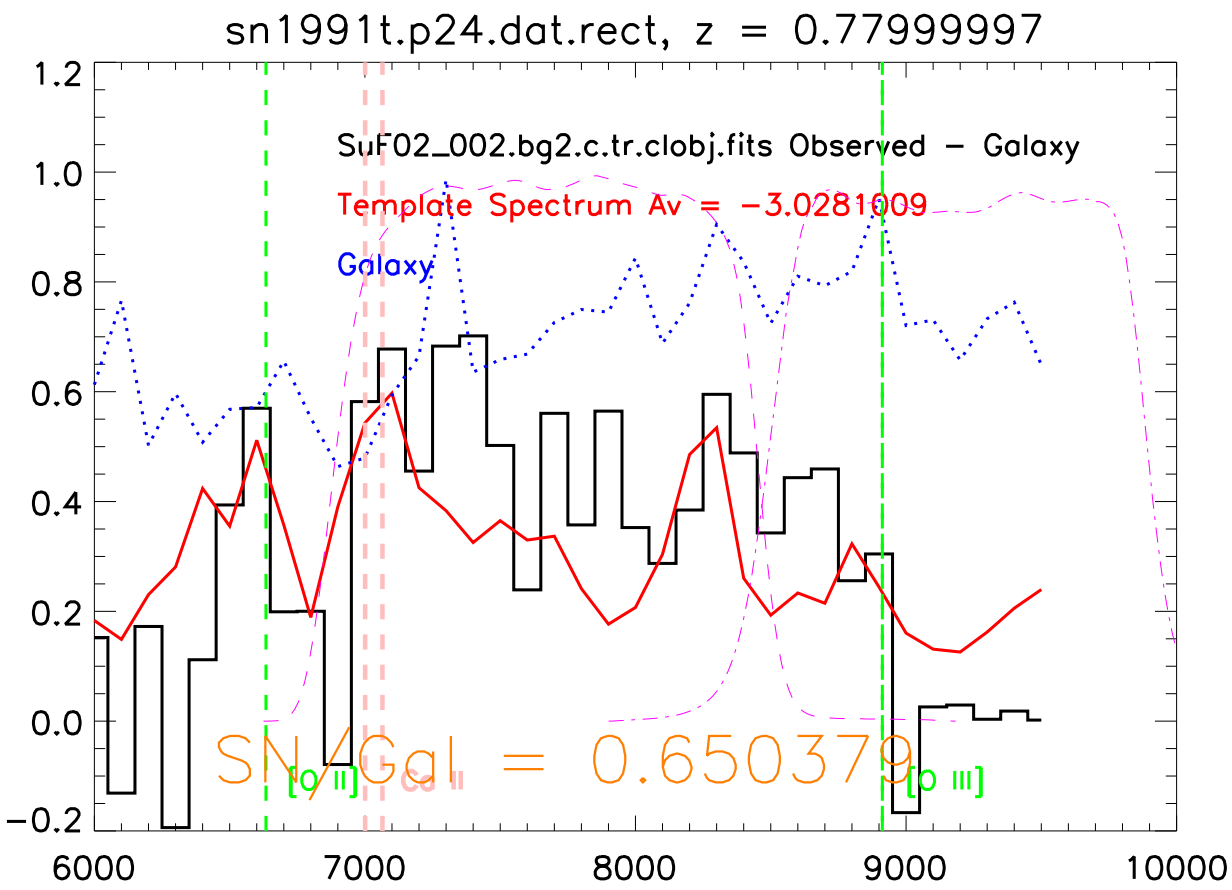
Mg II, I

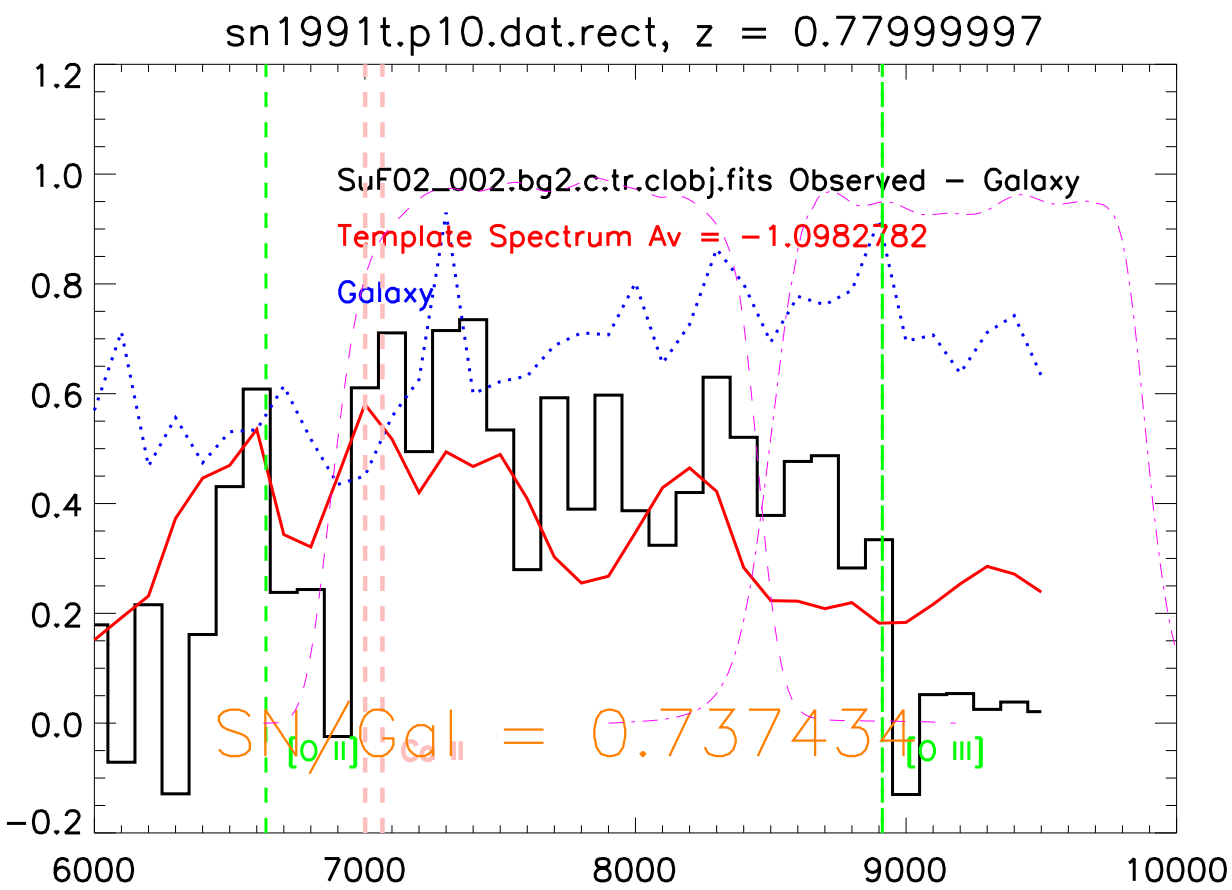


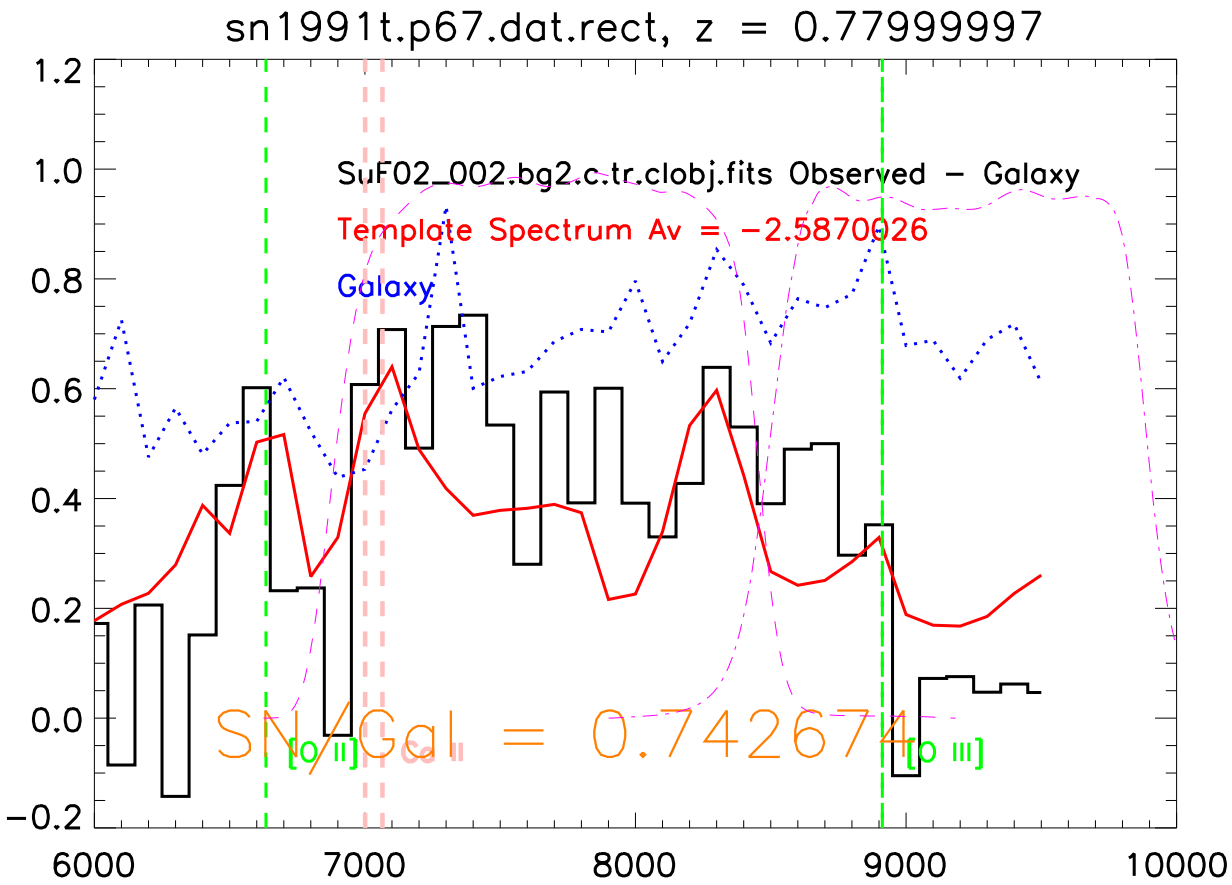
sn1992a.p09.dat.rect, z = 0.82999998
SuF02_002.bg2.c.tr.clobj.fits Observed - Galaxy
Template Spectrum Av = -0.65617120
Galaxy
SN/Gal = 0.949146
Mg II, I
[O II]
Ca II
[O III]
1.0
0.8
0.6
0.4
0.2
0.0
-0.2
6000
7000
8000
9000
10000

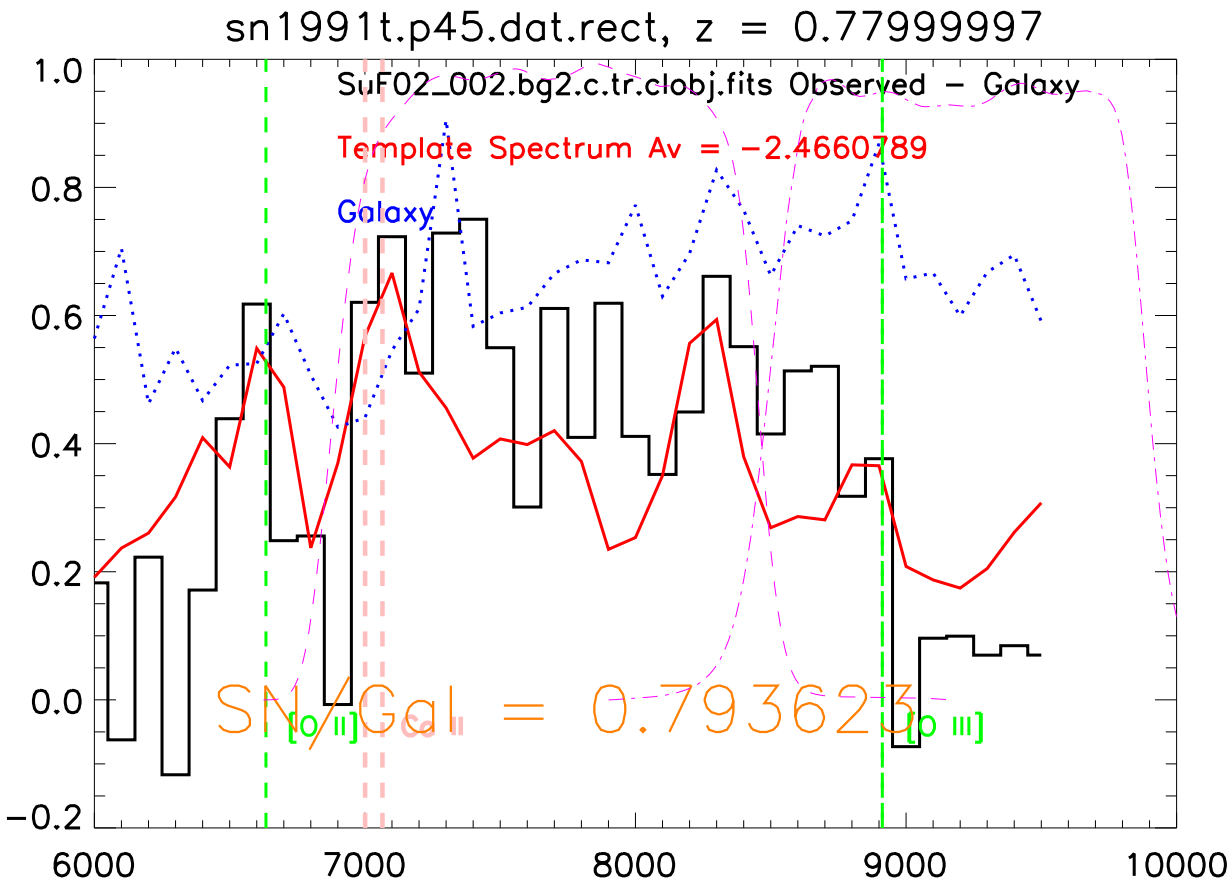

sn1991t.p15.dat.rect, z = 0.77999997
SuF02_002.bg2.c.tr.clobj.fits Observed − Galaxy
Template Spectrum Av = −2.1842403
Galaxy
SN/Gal = 0.633445
[O II]
[O III]
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

Mg II, I Ca II

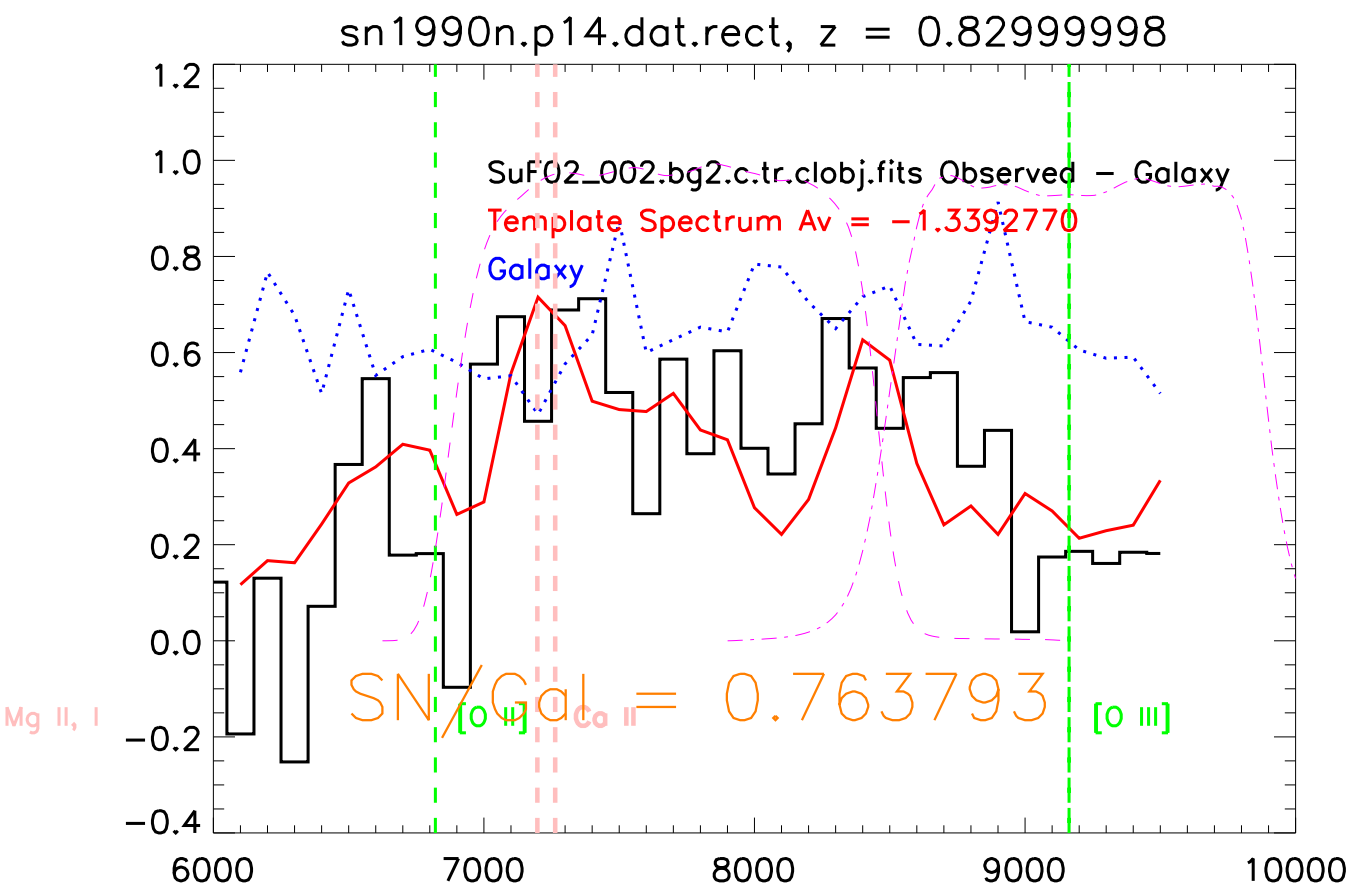

sn1991t.p24.dat.rect, z = 0.77999997
SuF02_002.bg2.c.tr.clobj.fits Observed – Galaxy
Template Spectrum Av = −3.0281009
Galaxy
SN/Gal = 0.650379
[O II]
Ca II
[O III]
Mg II, I
1.2
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
6000
7000
8000
9000
10000

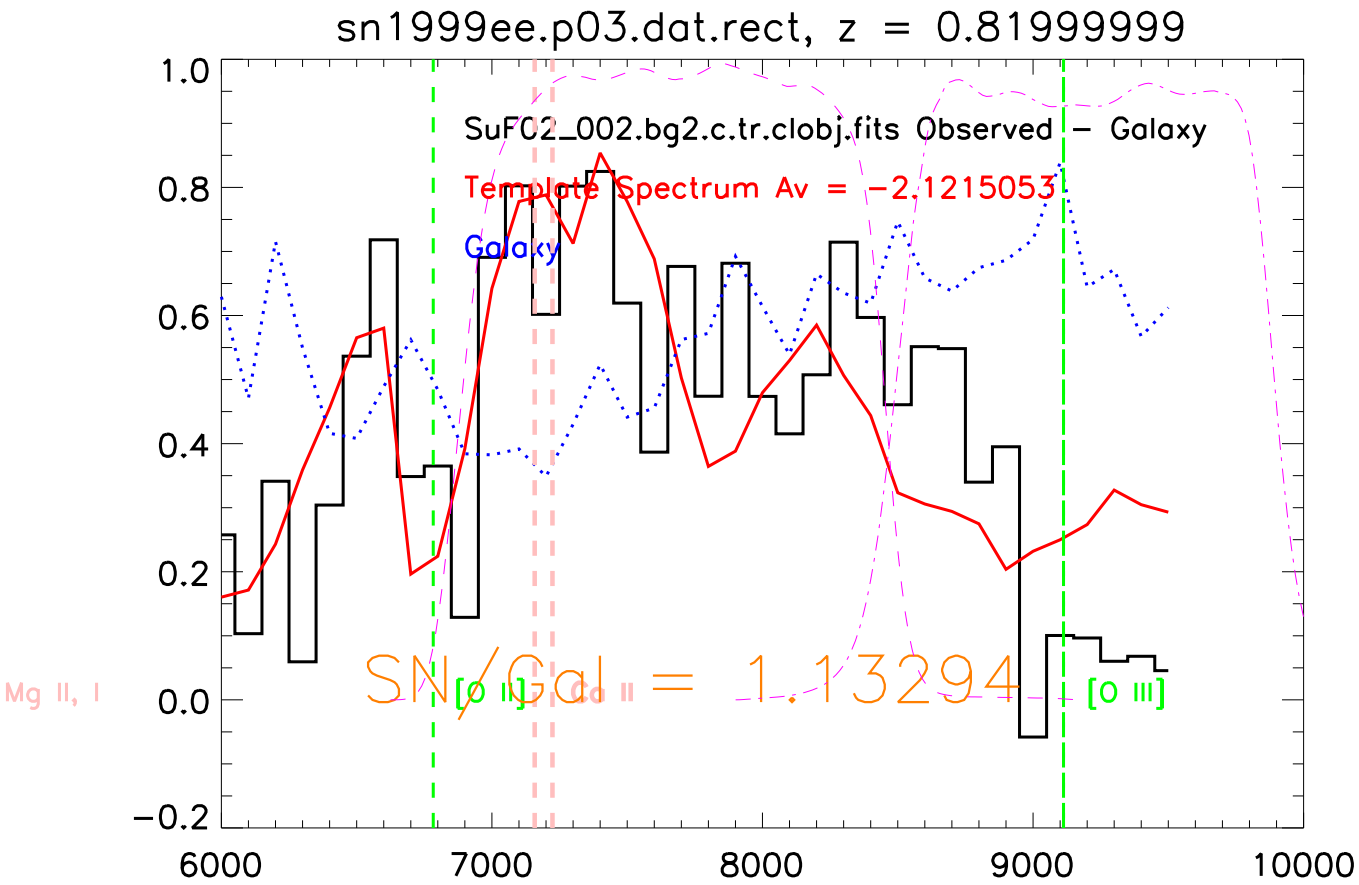

sn1991t.p10.dat.rect, z = 0.77999997
SuF02_002.bg2.c.tr.clobj.fits Observed − Galaxy
Template Spectrum Av = −1.0982782
Galaxy
SN/Gal = 0.737434
[O II]
[O III]
1.2
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
6000
7000
8000
9000
10000

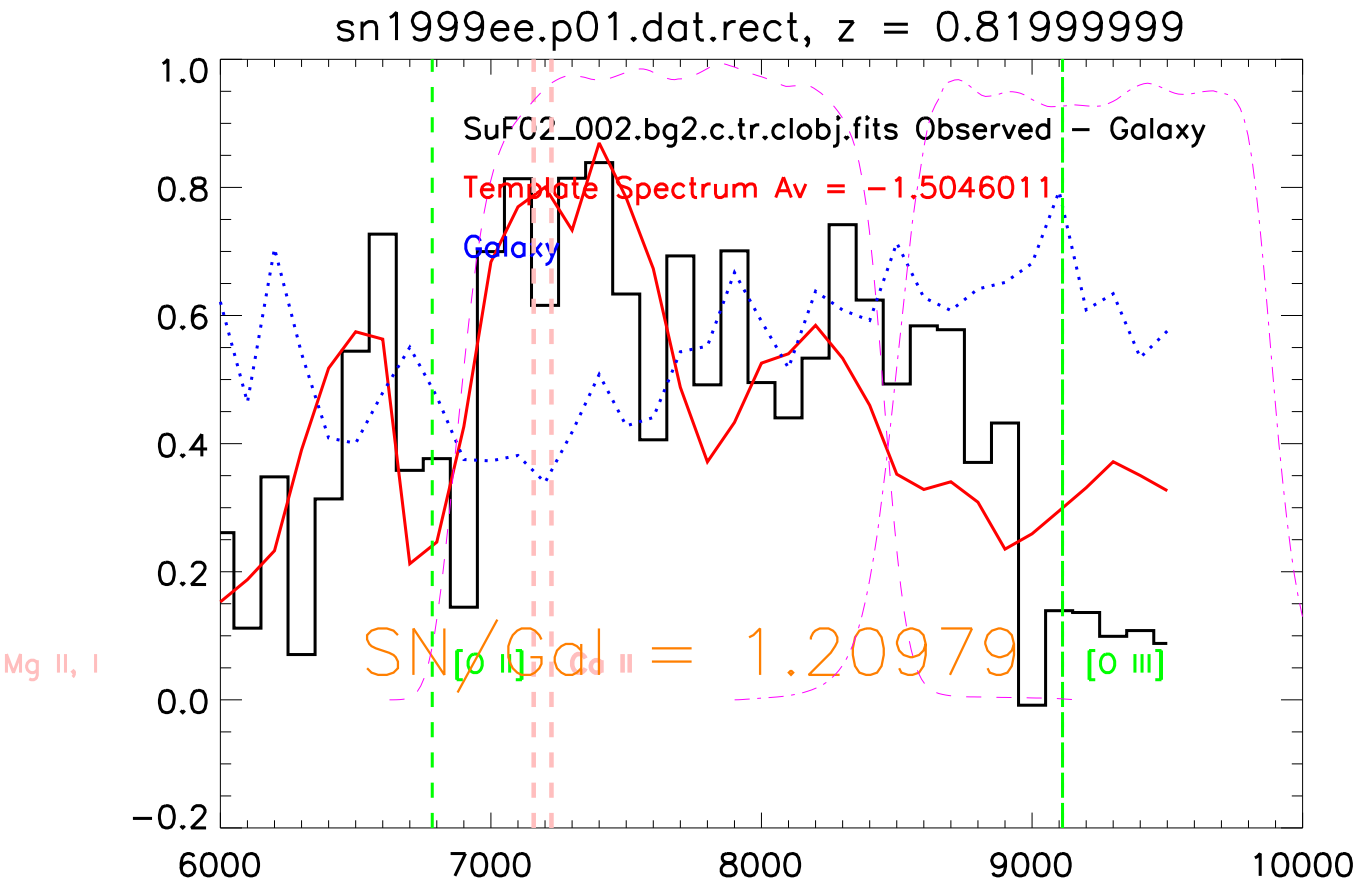

sn1991t.p67.dat.rect, z = 0.77999997
SuF02_002.bg2.c.tr.clobj.fits Observed − Galaxy
Template Spectrum Av = −2.5870026
Galaxy
S/N Gal = 0.742674
[O II]
Ca II
[O III]
Mg II, I
1.2
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
6000
7000
8000
9000
10000

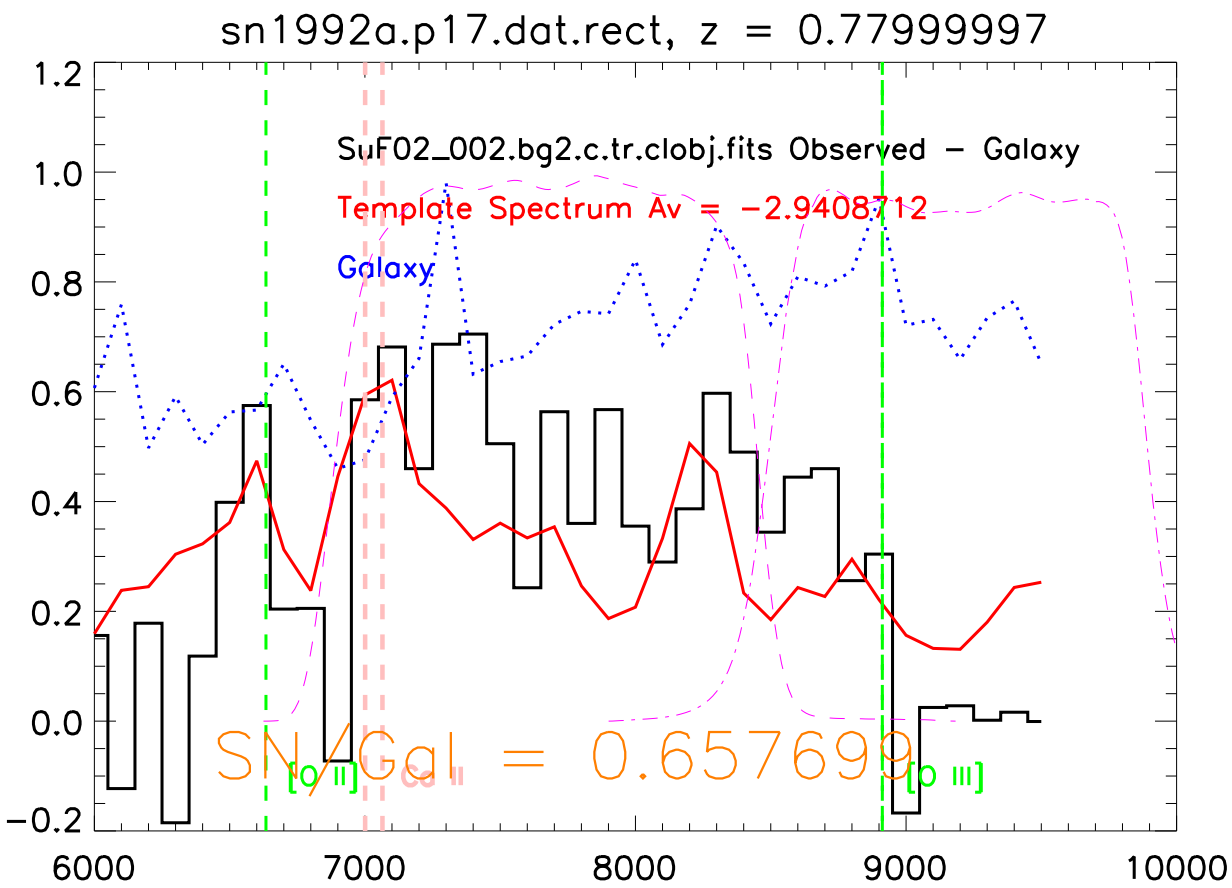

sn1991t.p45.dat.rect, z = 0.77999997
SuF02_002.bg2.c.tr.clobj.fits Observed − Galaxy
Template Spectrum Av = −2.4660789
Galaxy
SN/Gal = 0.793623
[O II]
Ca II
[O III]
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
6000
7000
8000
9000
10000

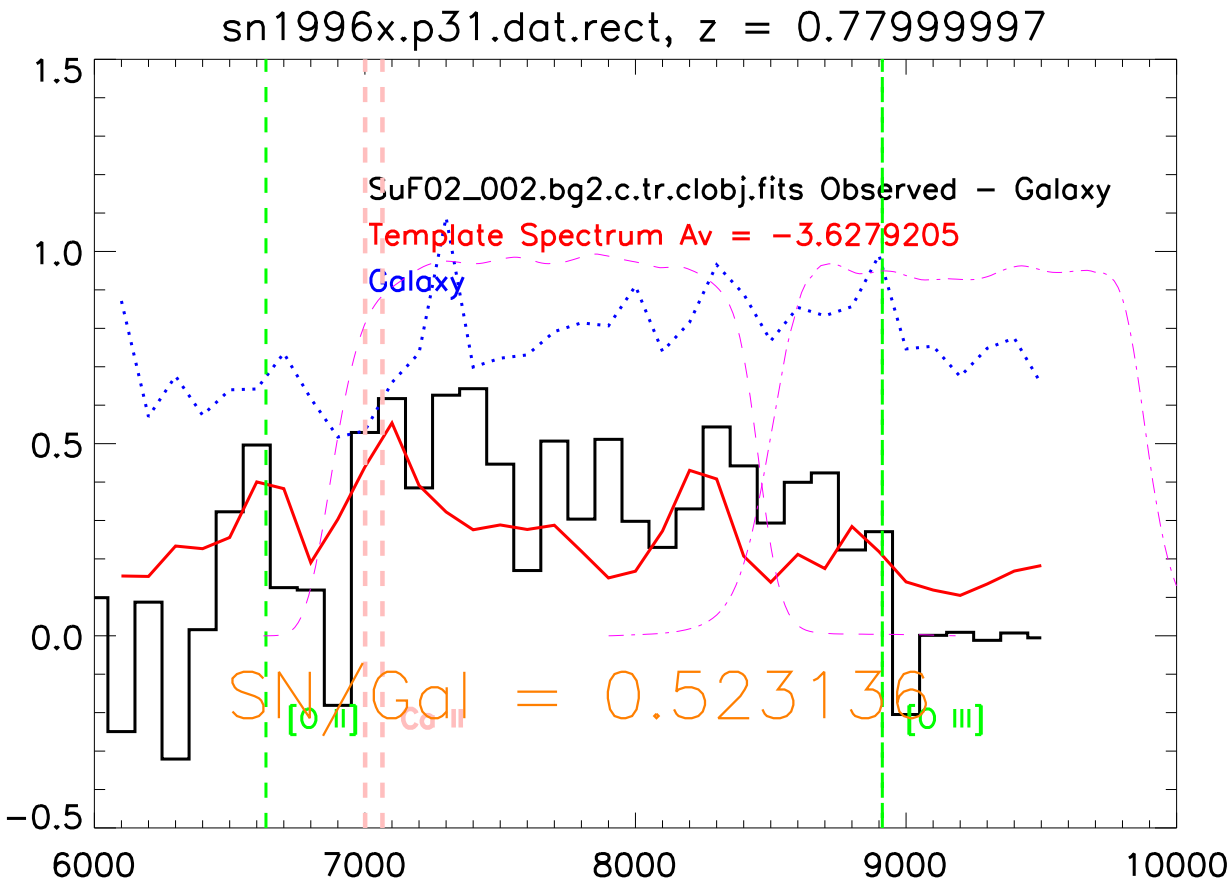
Mg II, I


sn1990n.p14.dat.rect, z = 0.82999998
SuF02_002.bg2.c.tr.clobj.fits Observed − Galaxy
Template Spectrum Av = −1.3392770
Galaxy
SN/Gal = 0.763793
Mg II, I
[O II]
Ca II
[O III]
1.2
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
−0.4
6000
7000
8000
9000
10000

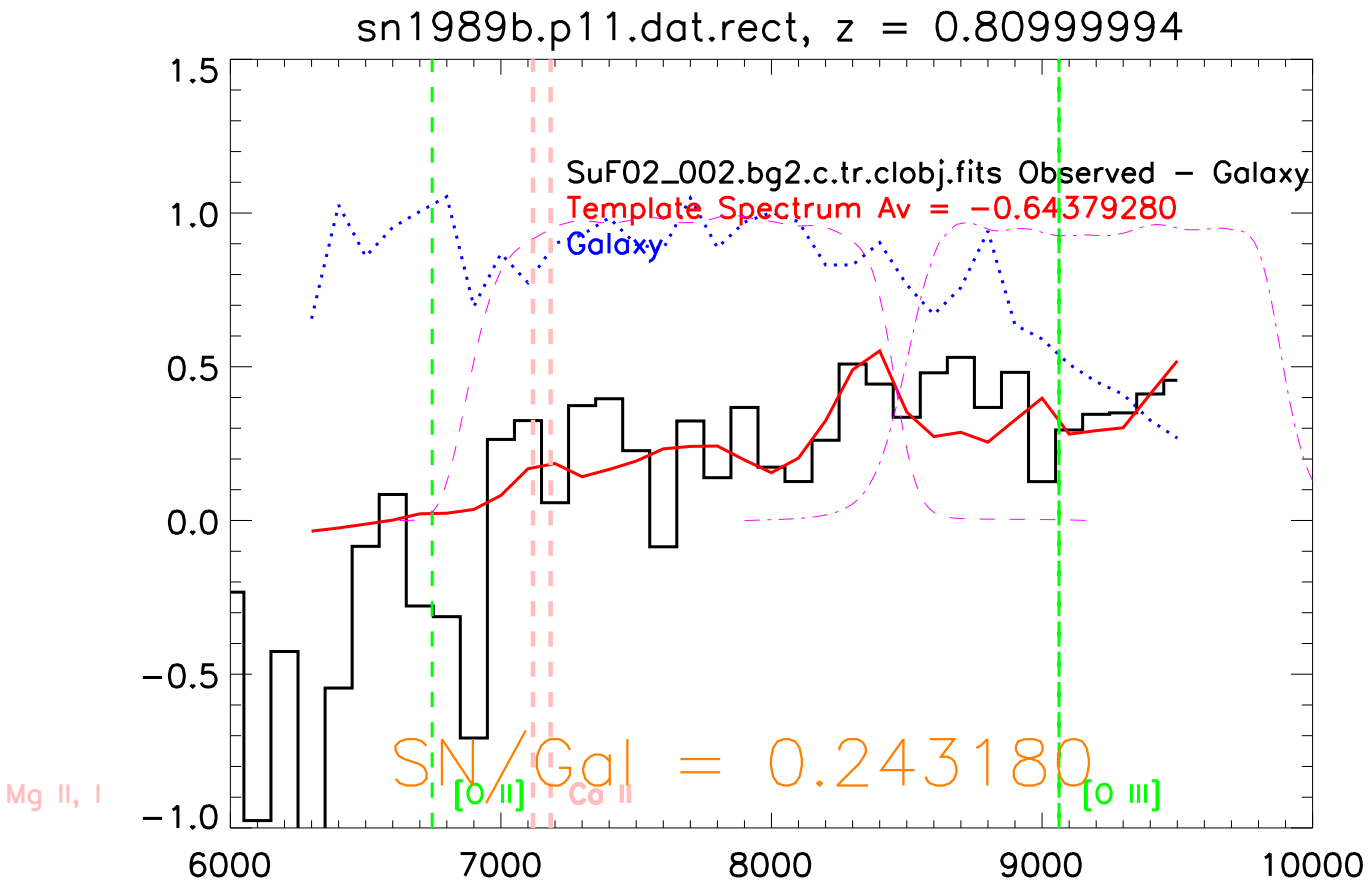

sn1999ee.p03.dat.rect, z = 0.81999999
SuFC2_002.bg2.c.tr.clobj.fits Observed – Galaxy
Template Spectrum Av = -2.1215053
Galaxy
SN/Gal = 1.13294
Mg II, I
[O II]
Ca II
[O III]
1.0
0.8
0.6
0.4
0.2
0.0
-0.2
6000
7000
8000
9000
10000

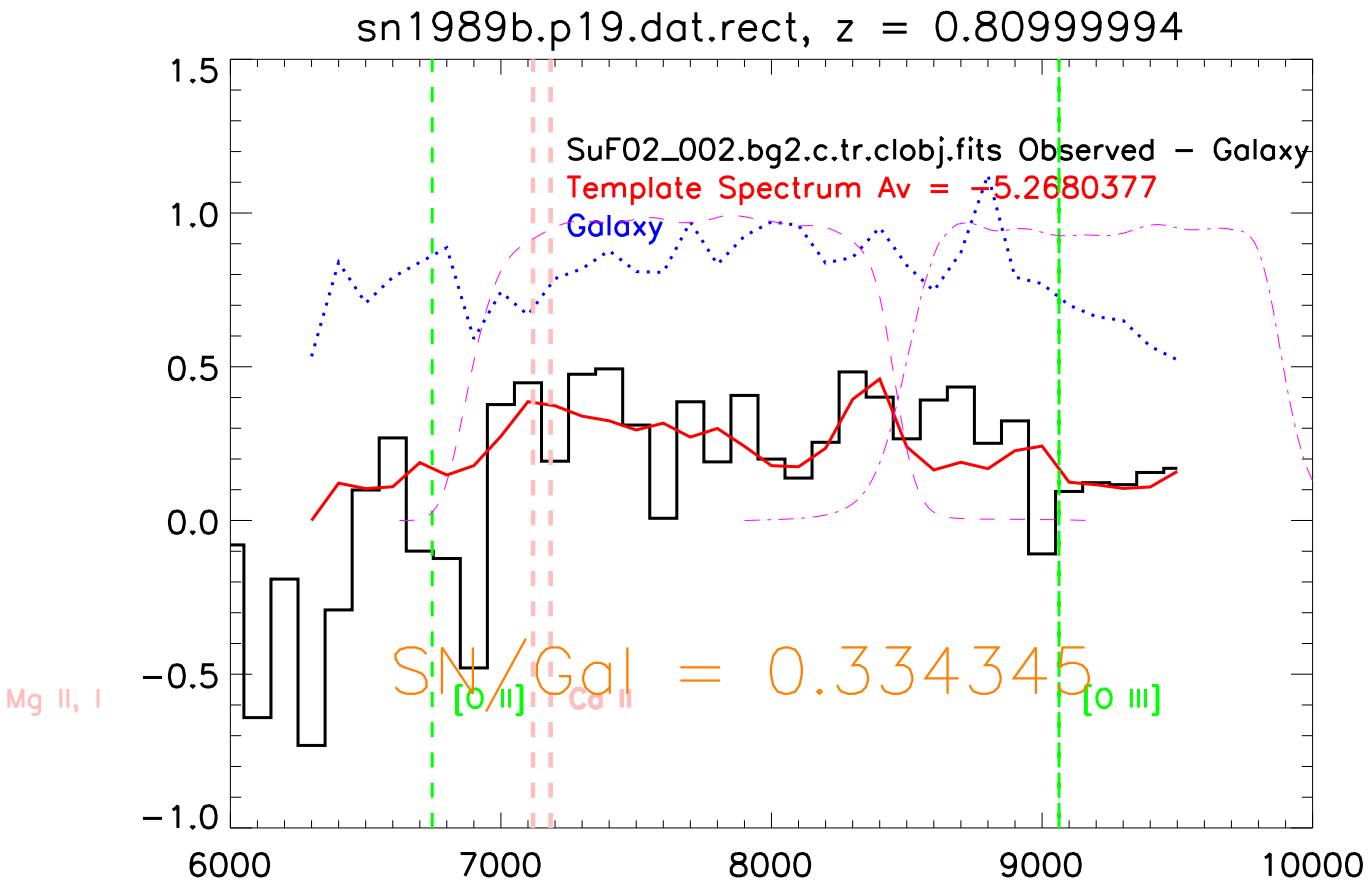

sn1999ee.p01.dat.rect, z = 0.81999999
SuFC2_002.bg2.c.tr.clobj.fits Observed – Galaxy
Template Spectrum Av = −1.5046011
Galaxy
SN/Gal = 1.20979
Mg II, I
[O II]
Ca II
[O III]
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
6000
7000
8000
9000
10000

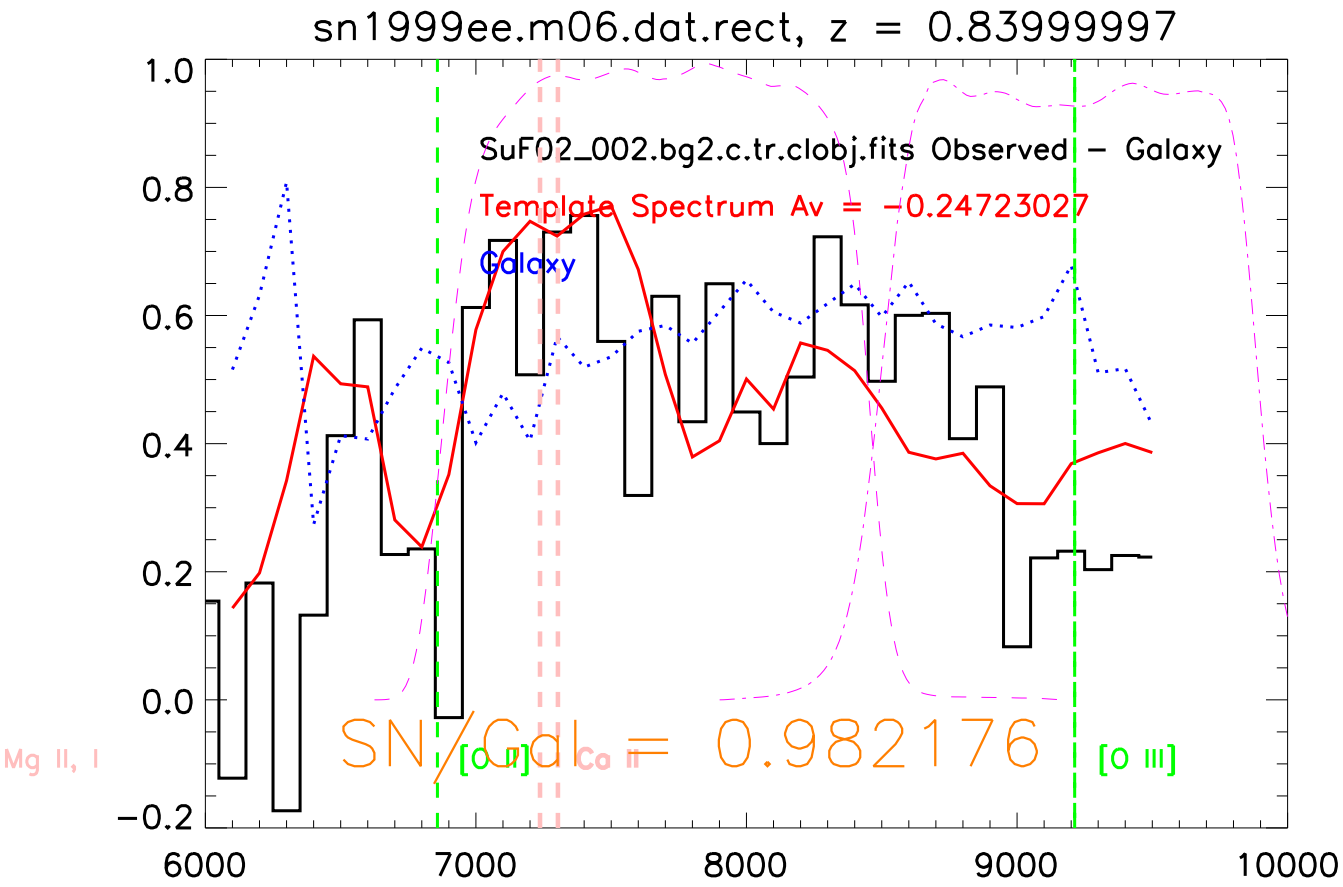

sn1992a.p17.dat.rect, z = 0.77999997
SuF02_002.bg2.c.tr.clobj.fits Observed − Galaxy
Template Spectrum Av = −2.9408712
Galaxy
SN/Gal = 0.657699
[O II]
[O III]
1.2
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
6000
7000
8000
9000
10000

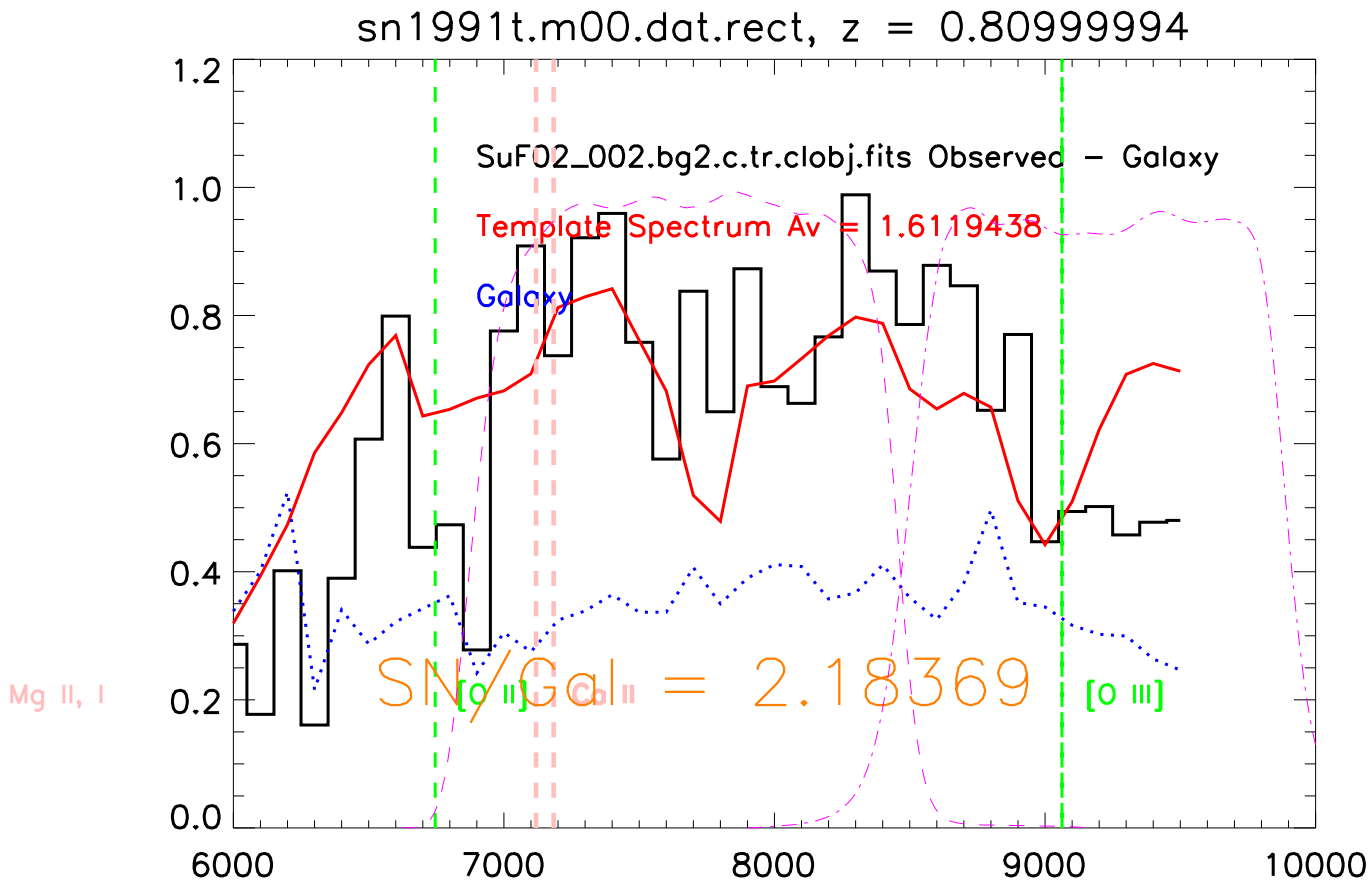

sn1996x.p31.dat.rect, z = 0.77999997
SuF02_002.bg2.c.tr.clobj.fits Observed − Galaxy
Template Spectrum Av = −3.6279205
Galaxy
SN/Gal = 0.523136
[O II]
Ca II
[O III]
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

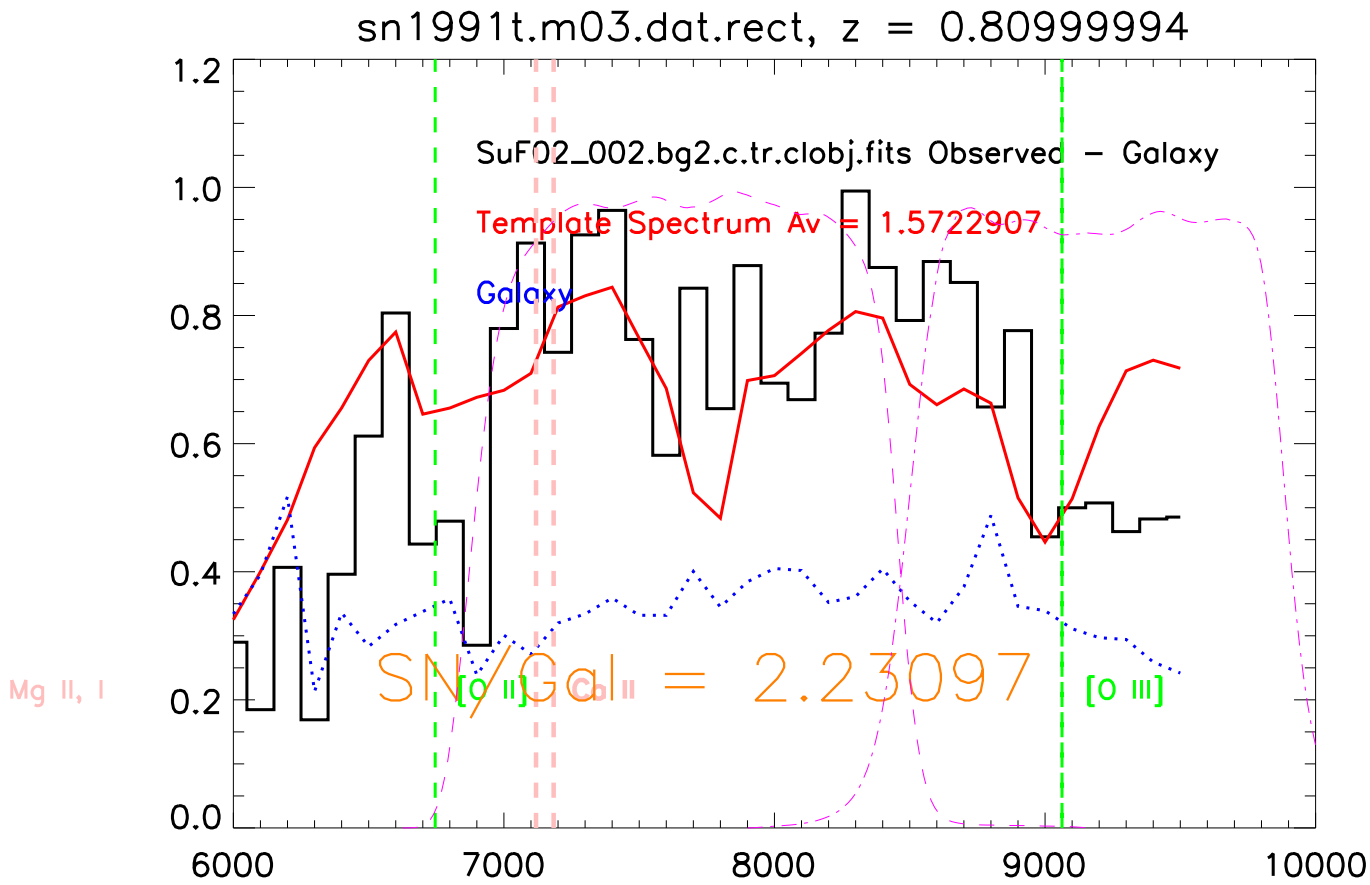
Mg II, I

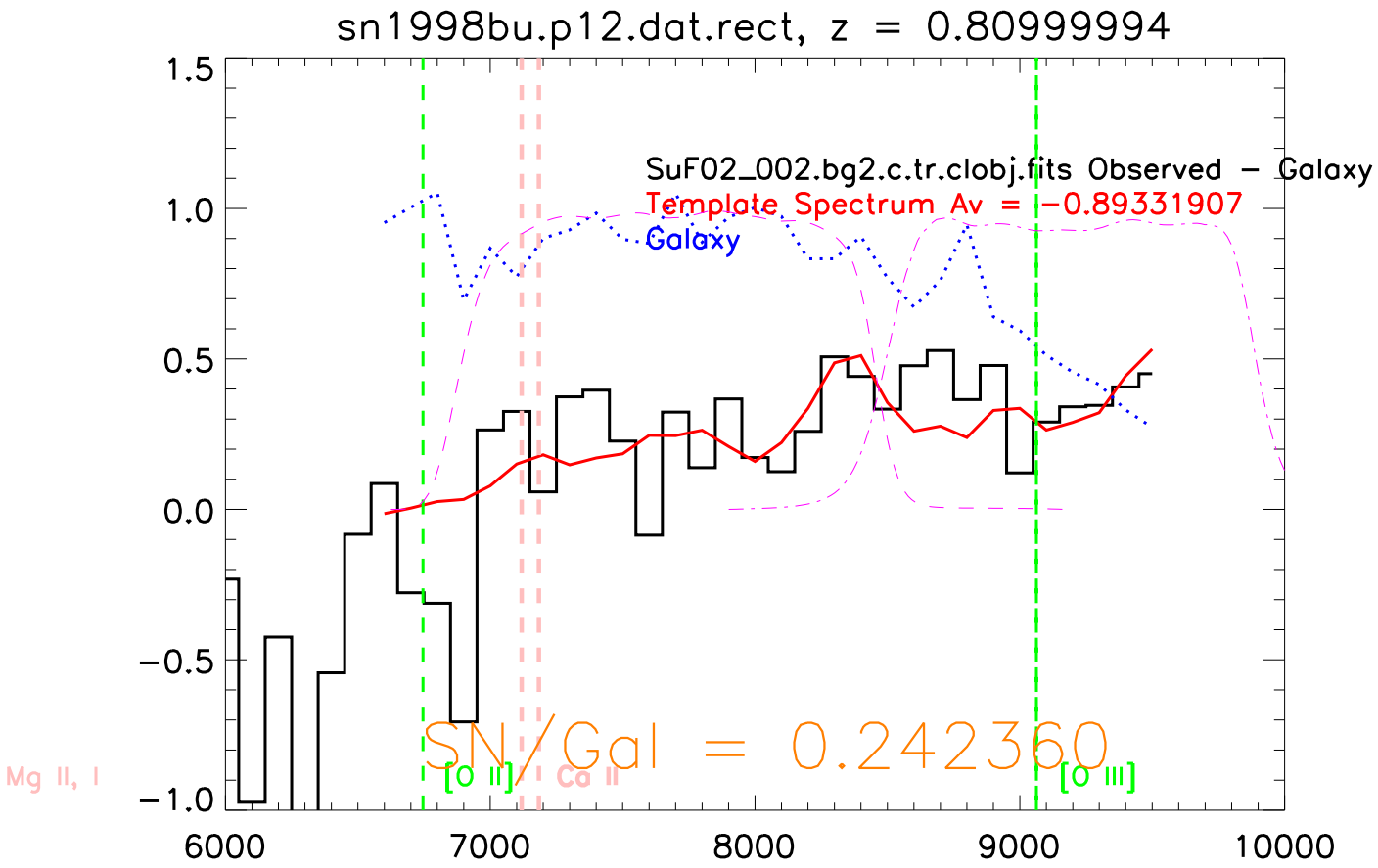

sn1989b.p11.dat.rect, z = 0.80999994
SuF02_002.bg2.c.tr.clobj.fits Observed − Galaxy
Template Spectrum Av = −0.64379280
Galaxy
SN/Gal = 0.243180
Mg II, I
[O II]
Ca II
[O III]
1.5
1.0
0.5
0.0
−0.5
−1.0
6000
7000
8000
9000
10000

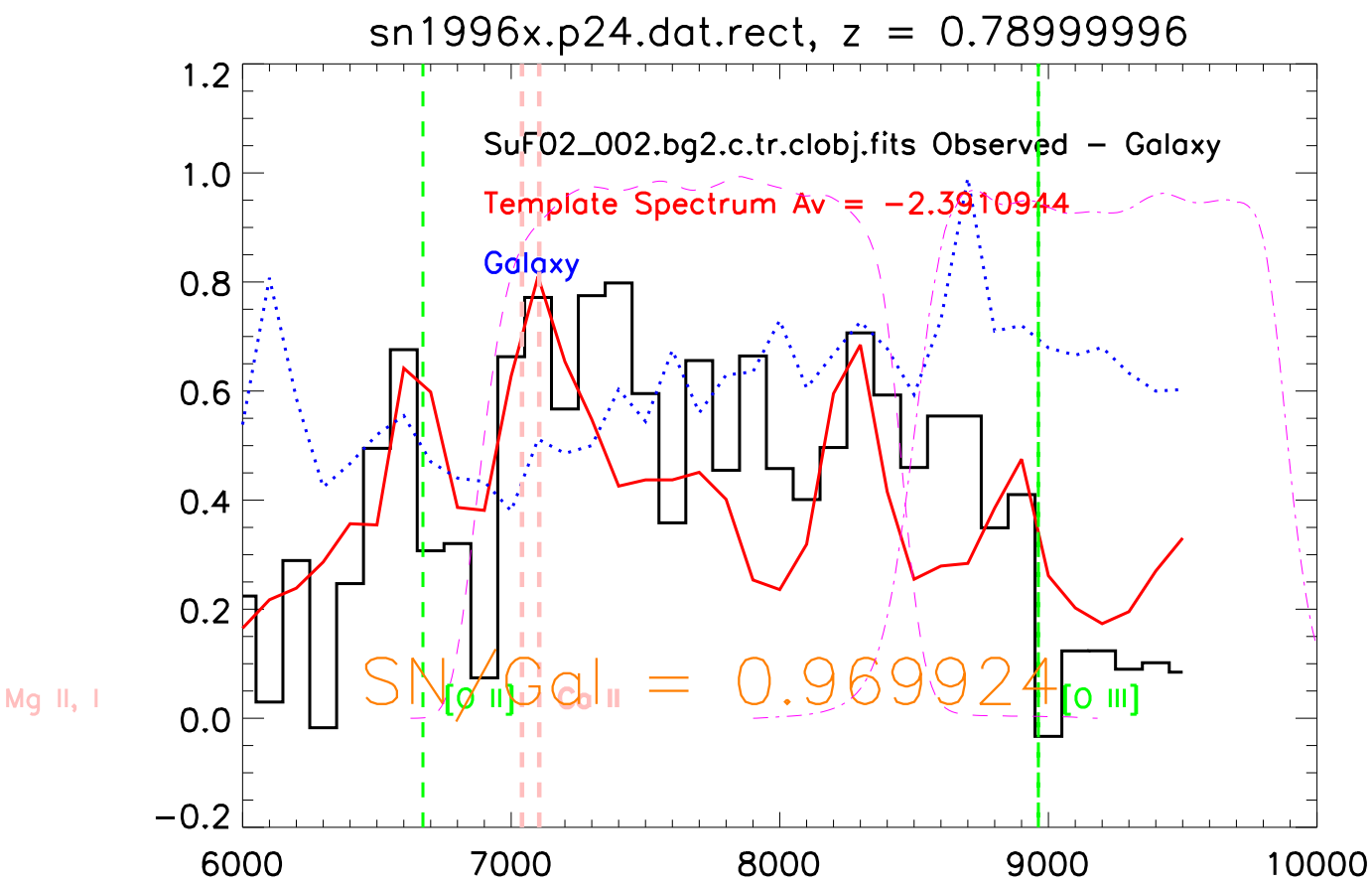

sn1989b.p19.dat.rect, z = 0.80999994
SuF02_002.bg2.c.tr.clobj.fits Observed − Galaxy
Template Spectrum Av = −5.2680377
Galaxy
SN/Gal = 0.334345
Mg II, I
[O II]
Ca II
[O III]
1.5
1.0
0.5
0.0
−0.5
−1.0
6000
7000
8000
9000
10000

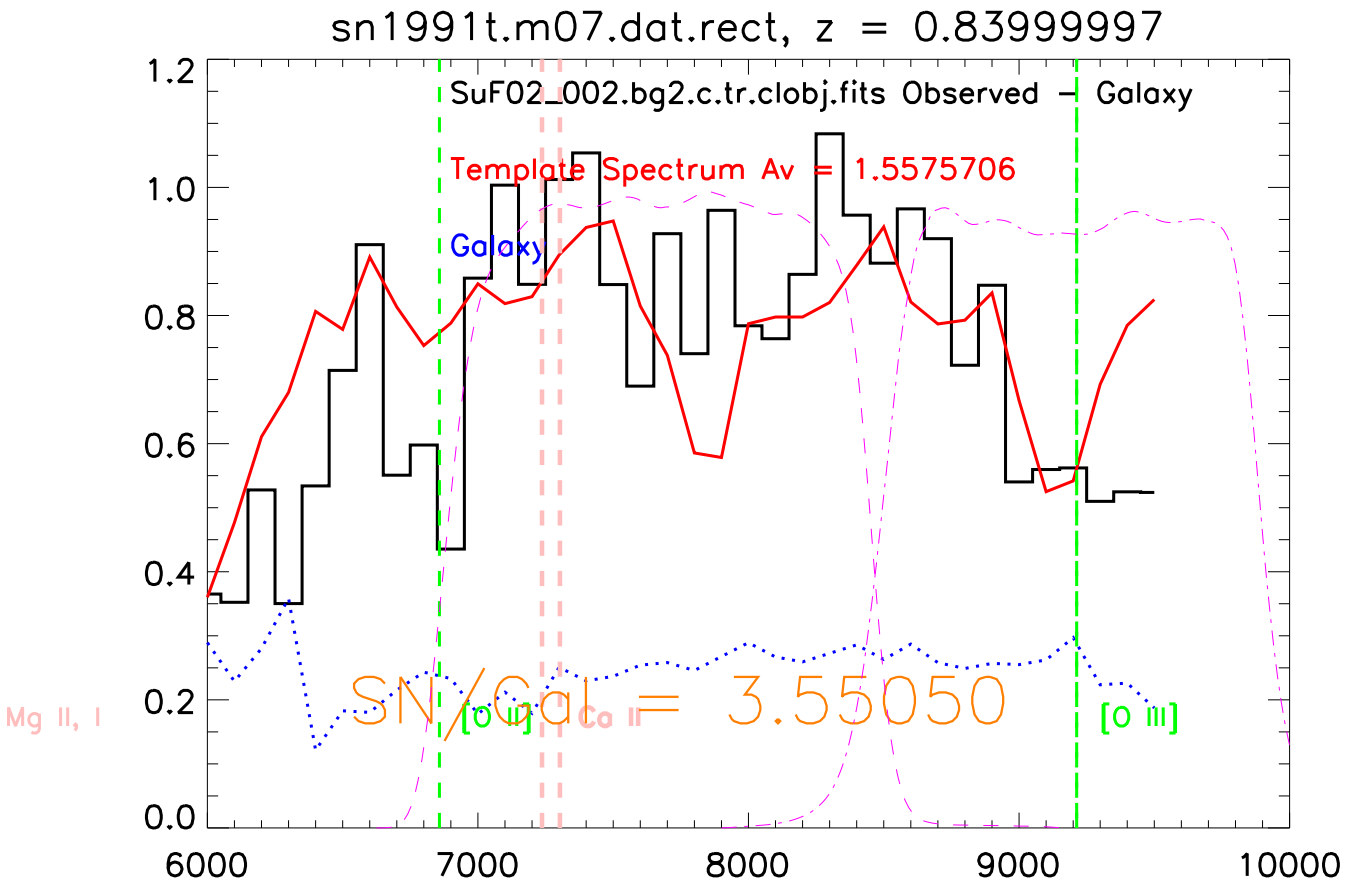

sn1999ee.m06.dat.rect, z = 0.83999997
SuF02_002.bg2.c.tr.clobj.fits Observed − Galaxy
Template Spectrum Av = −0.24723027
Galaxy
SN/Gal = 0.982176
Mg II, I
[O II]
Ca II
[O III]
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
6000
7000
8000
9000
10000

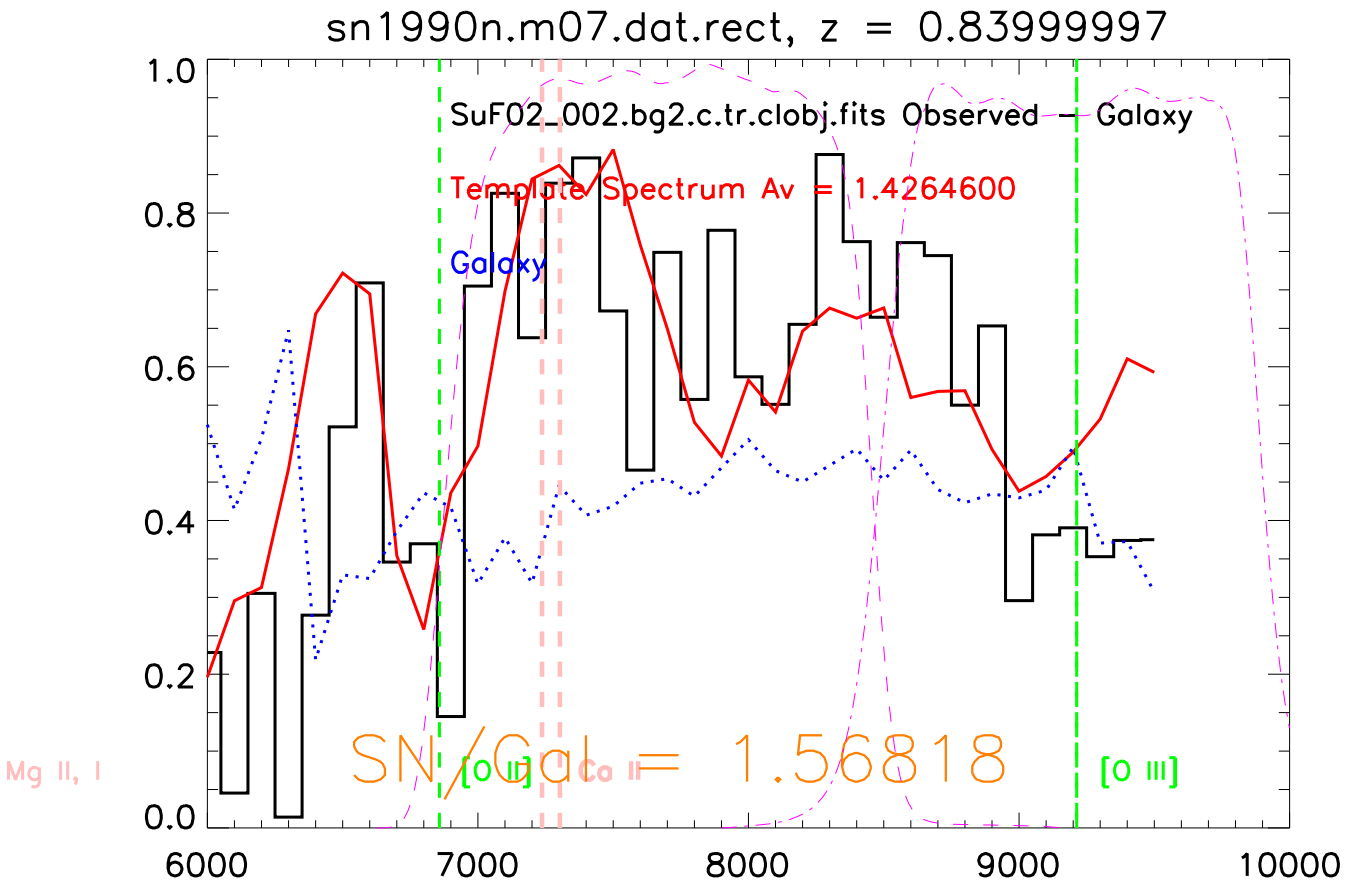

sn1991t.m00.dat.rect, z = 0.80999994
SuF02_002.bg2.c.tr.clobj.fits Observed – Galaxy
Template Spectrum Av = 1.6119438
Galaxy
SN/Gal = 2.18369
[O II]
[O III]
Mg II, I
1.2
1.0
0.8
0.6
0.4
0.2
0.0
6000
7000
8000
9000
10000

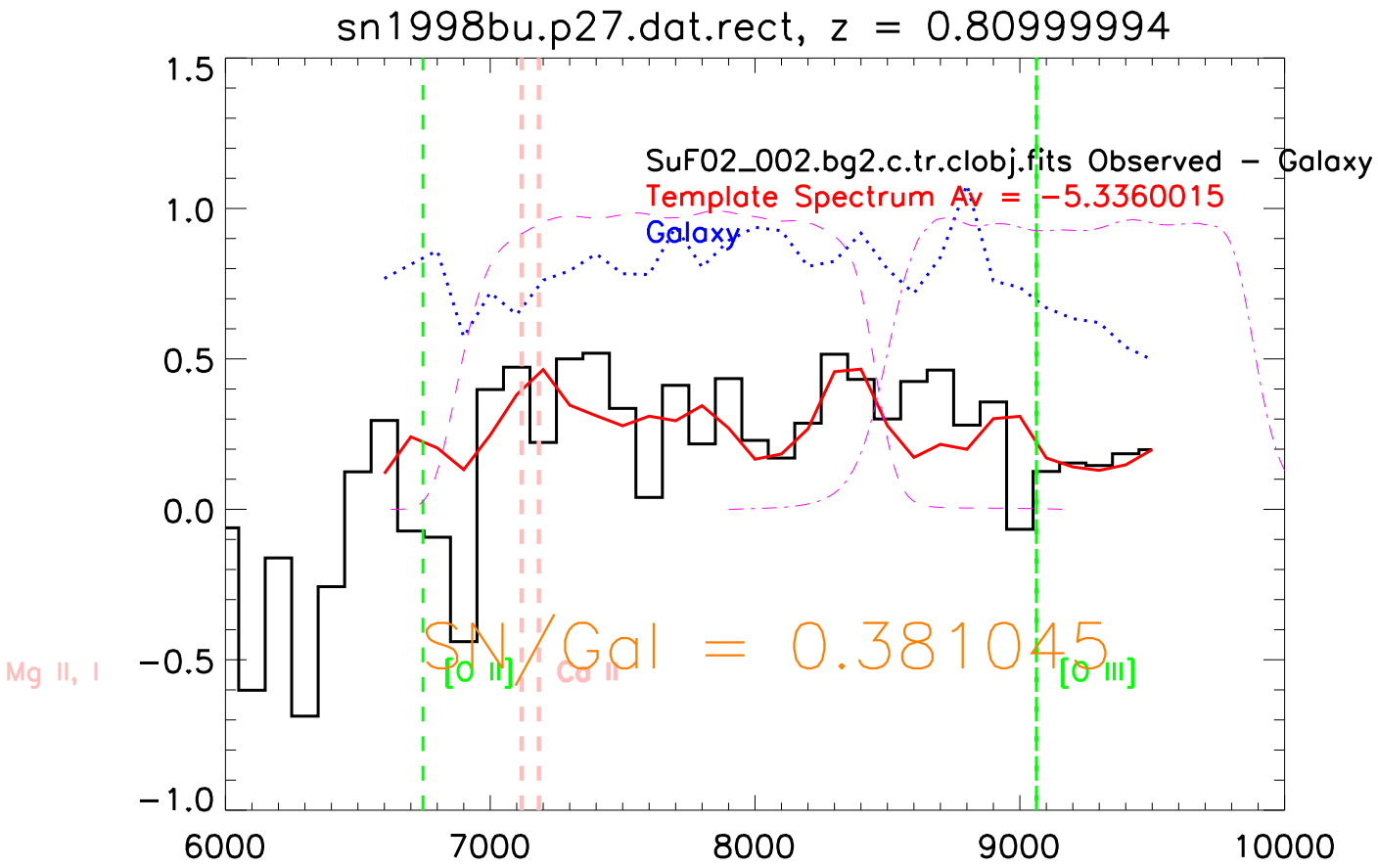

sn1991t.m03.dat.rect, z = 0.80999994
SuF02_002.bg2.c.tr.clobj.fits Observed – Galaxy
Template Spectrum Av = 1.5722907
Galaxy
SN/Gal = 2.23097
Mg II, I
[O II]
Ca II
[O III]
1.2
1.0
0.8
0.6
0.4
0.2
0.0
6000
7000
8000
9000
10000

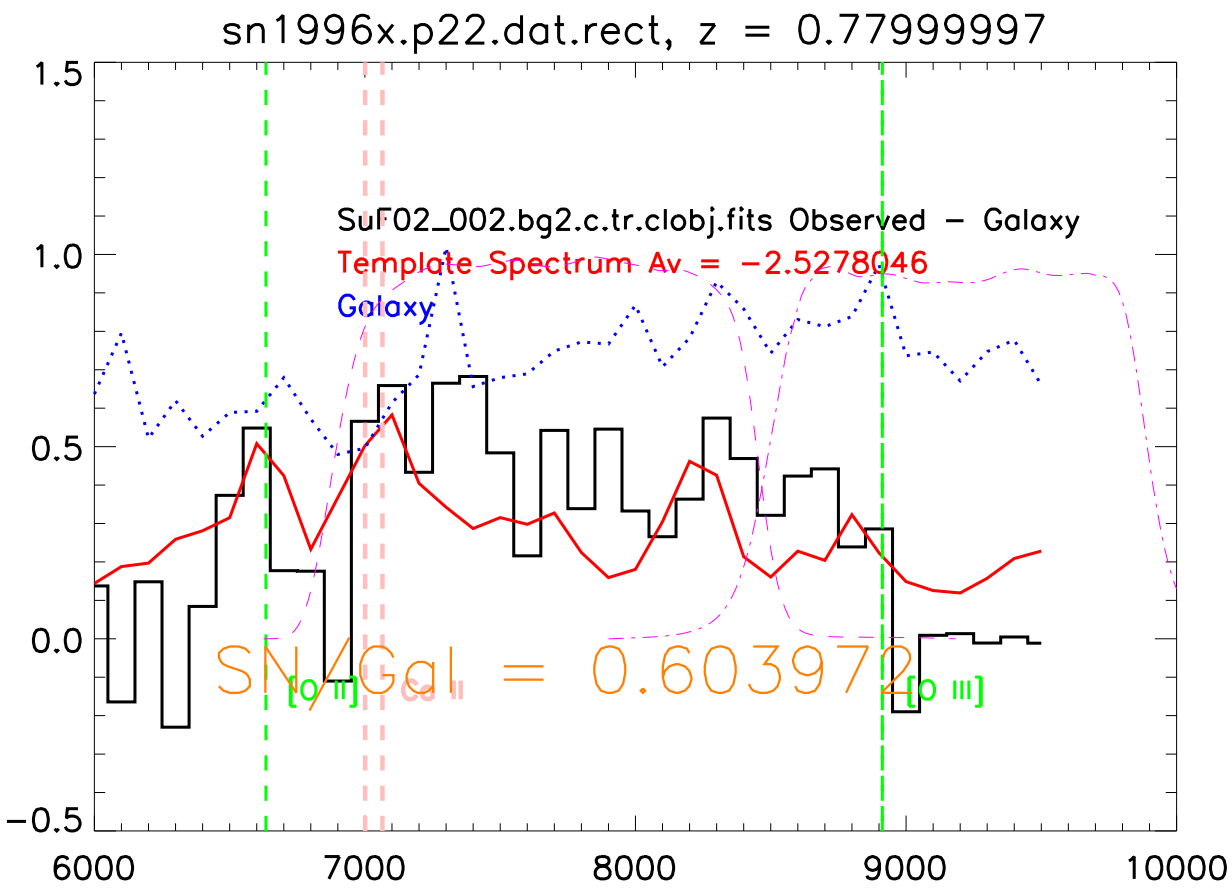

sn1998bu.p12.dat.rect, z = 0.80999994
SuF02_002.bg2.c.tr.clobj.fits Observed − Galaxy
Template Spectrum Av = −0.89331907
Galaxy
SN/Gal = 0.242360
Mg II, I
[O II]
Ca II
[O III]
1.5
1.0
0.5
0.0
−0.5
−1.0
6000
7000
8000
9000
10000

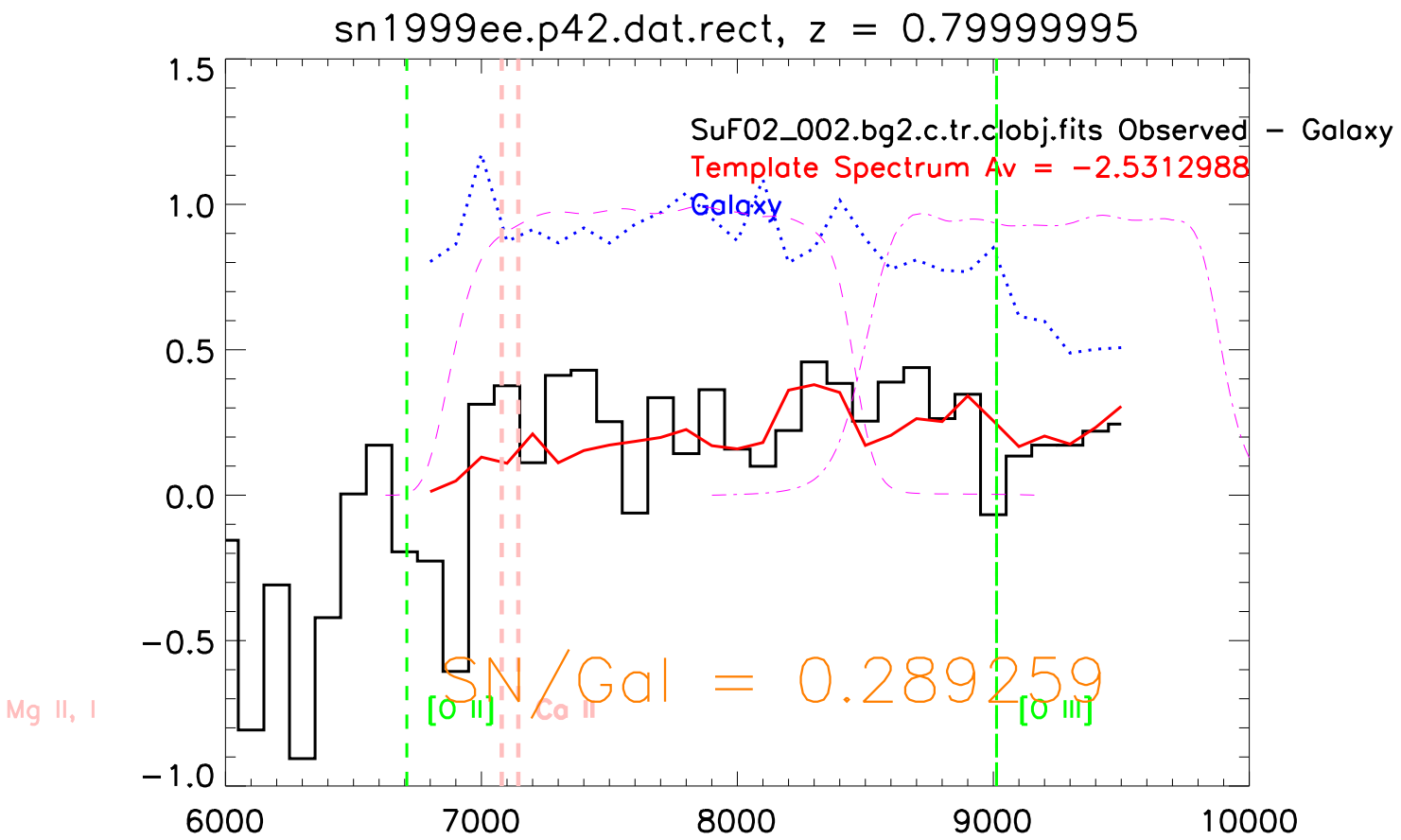

sn1996x.p24.dat.rect, z = 0.78999996
SuF02_002.bg2.c.tr.clobj.fits Observed – Galaxy
Template Spectrum Av = −2.3910944
Galaxy
SN/Gal = 0.969924
[O II]
Ca II
[O III]
Mg II, I
1.2
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
6000
7000
8000
9000
10000

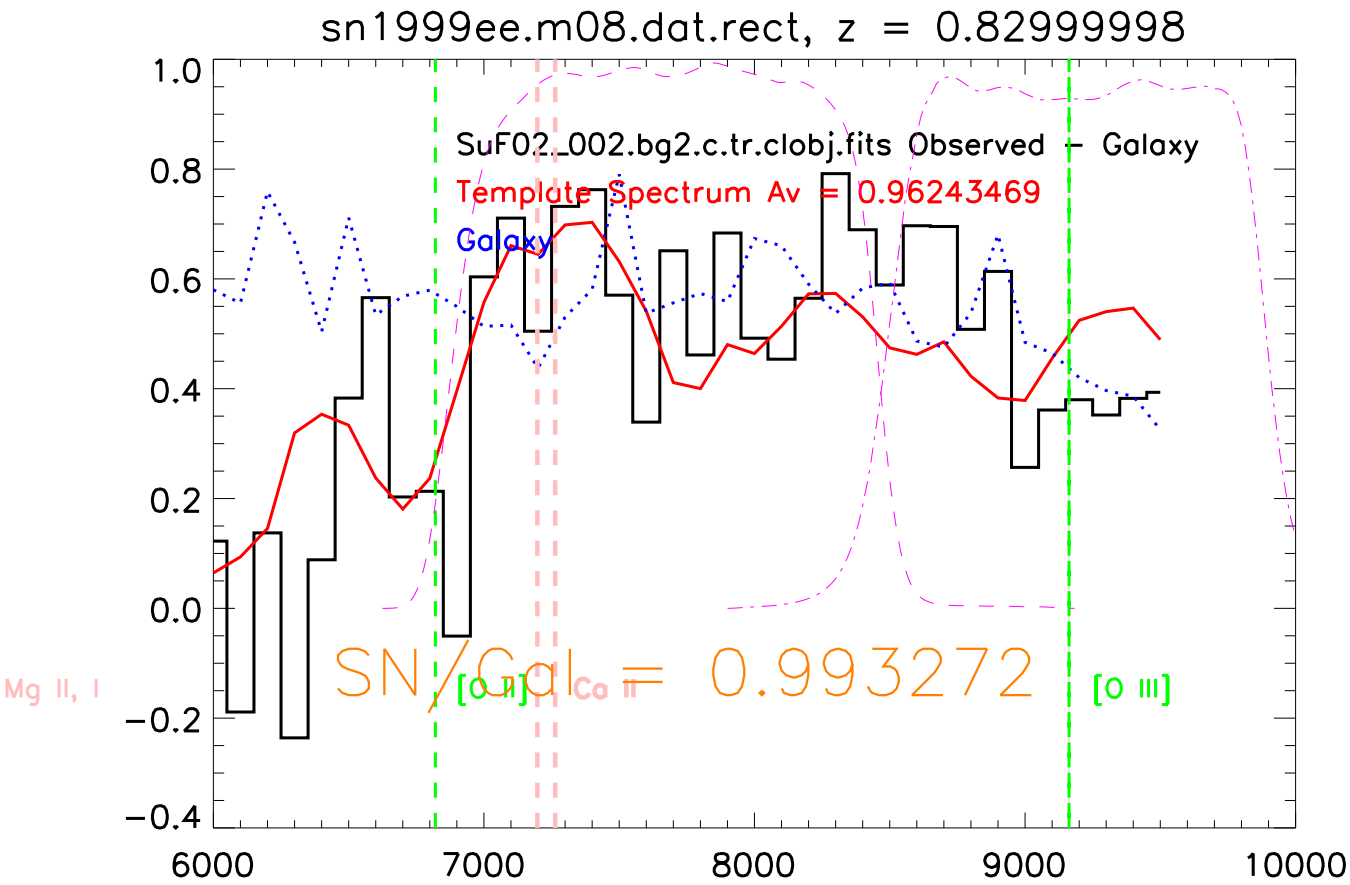

sn1991t.m07.dat.rect, z = 0.83999997
SuF02_002.bg2.c.tr.clobj.fits Observed – Galaxy
Template Spectrum Av = 1.5575706
Galaxy
SN/Gal = 3.55050
Mg II, I
[O II]
Ca II
[O III]
1.2
1.0
0.8
0.6
0.4
0.2
0.0
6000
7000
8000
9000
10000

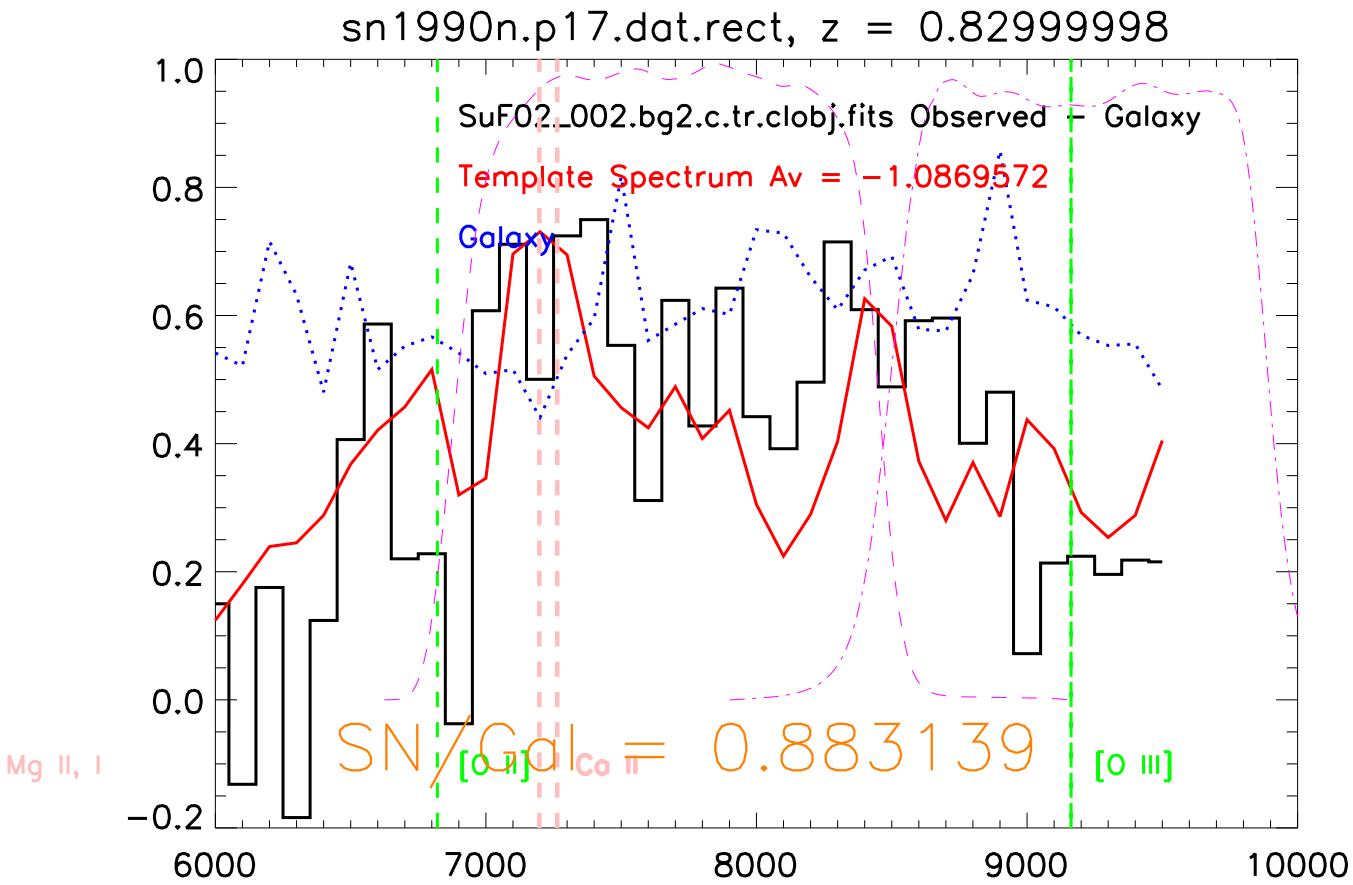

sn1990n.m07.dat.rect, z = 0.83999997
SuF02_002.bg2.c.tr.clobj.fits Observed
Galaxy
Template Spectrum Av = 1.4264600
Galaxy
SN/Gal = 1.56818
Mg II, I
[O II]
Ca II
[O III]
1.0
0.8
0.6
0.4
0.2
0.0
6000
7000
8000
9000
10000

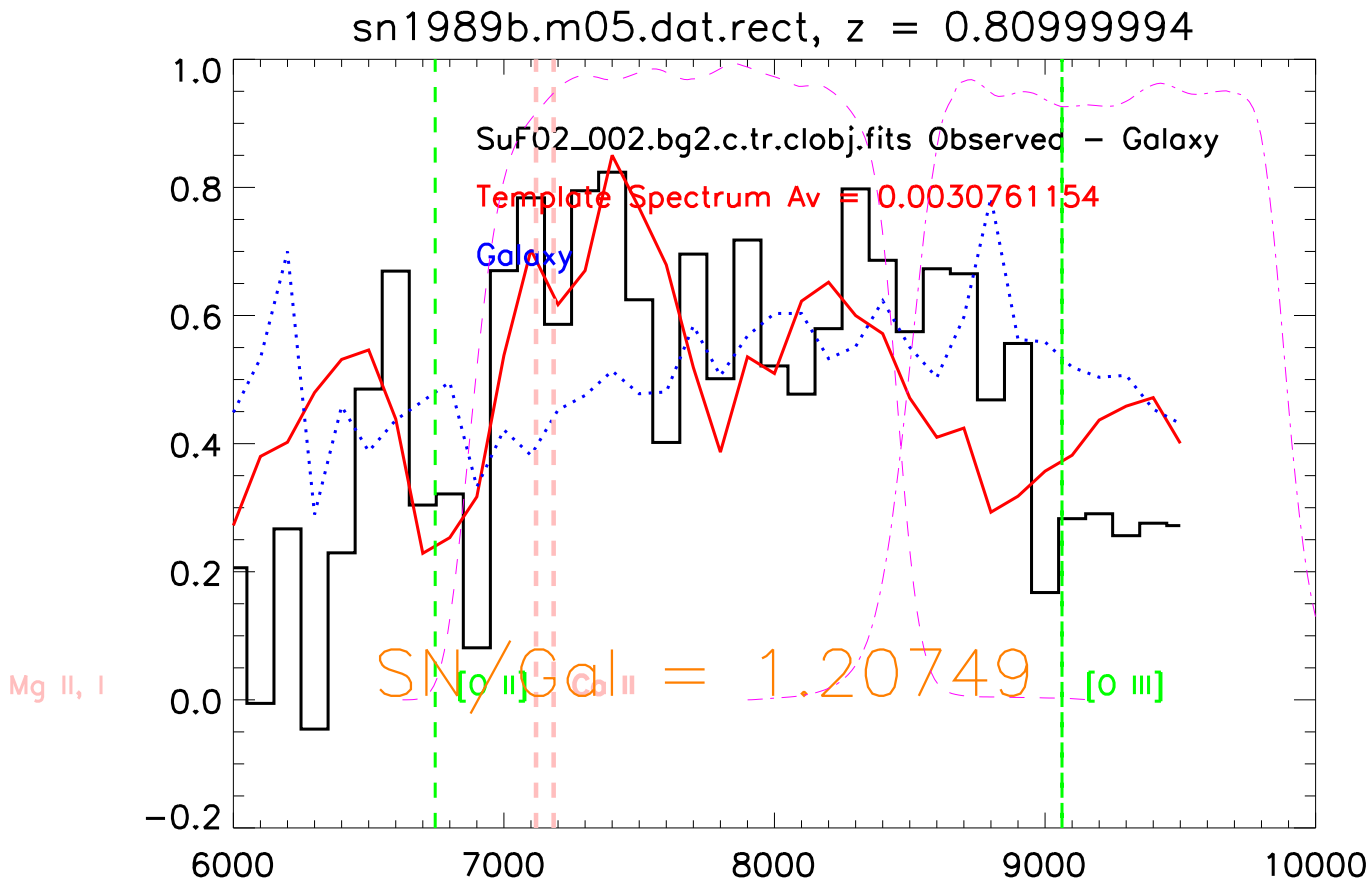

sn1998bu.p27.dat.rect, z = 0.80999994
SuF02_002.bg2.c.tr.clobj.fits Observed − Galaxy
Template Spectrum Av = −5.3360015
Galaxy
SN/Gal = 0.381045
Mg II, I
[O II]
Ca II
[O III]
1.5
1.0
0.5
0.0
−0.5
−1.0
6000
7000
8000
9000
10000

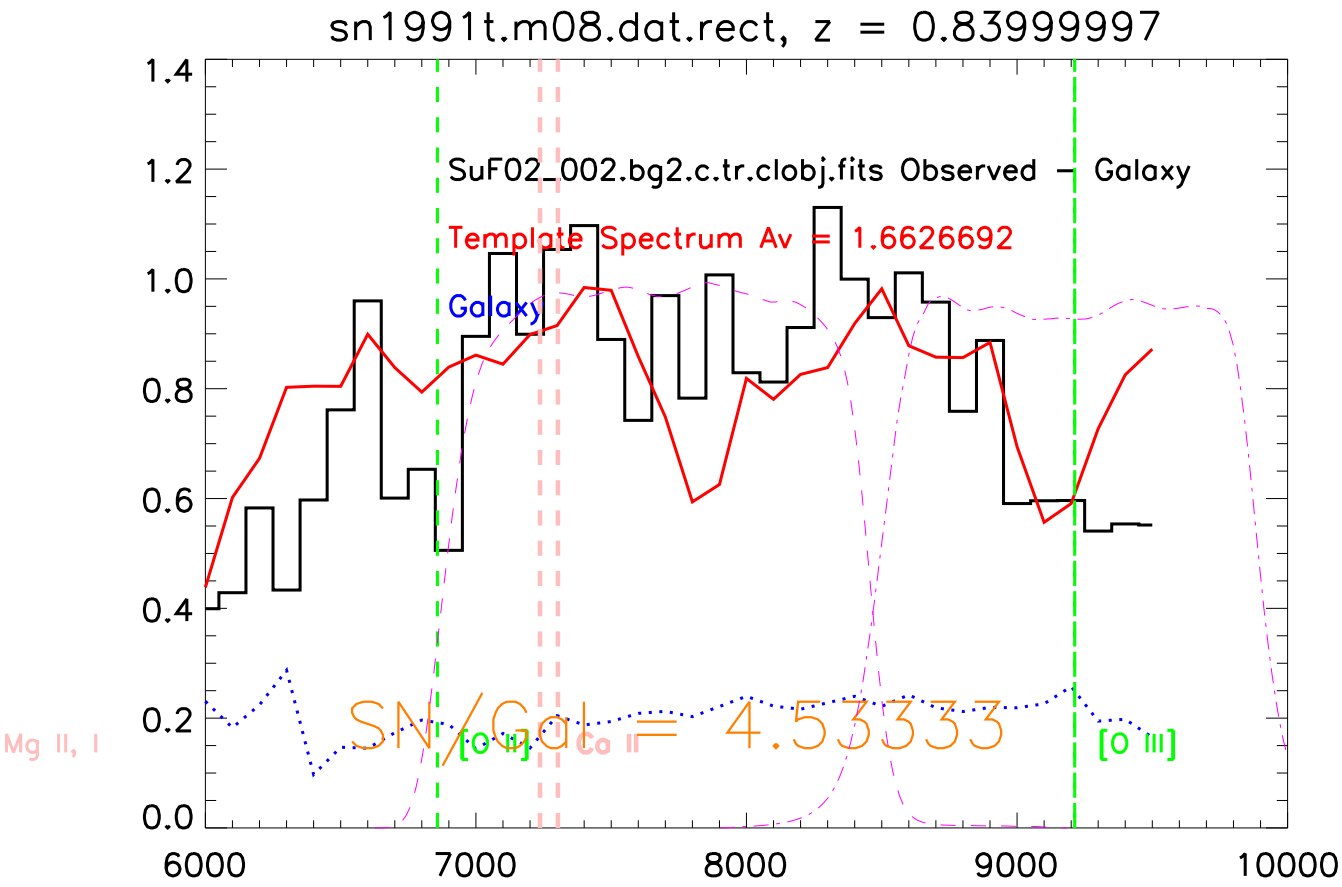

sn1996x.p22.dat.rect, z = 0.77999997
SuF02_002.bg2.c.tr.clobj.fits Observed − Galaxy
Template Spectrum Av = −2.5278046
Galaxy
SN/Gal = 0.603972
Mg II, I
[O II]
Ca II
[O III]
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

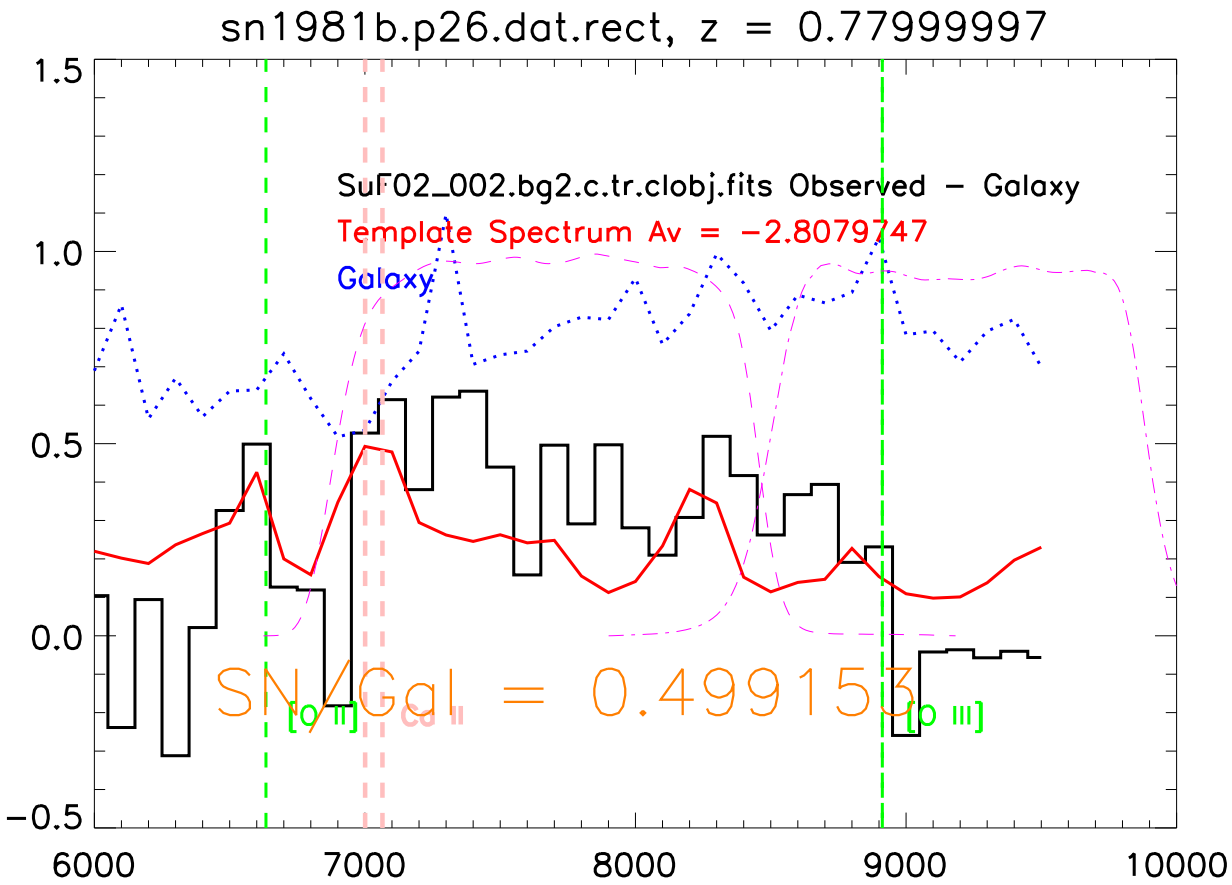

sn1999ee.p42.dat.rect, z = 0.79999995
SuF02_002.bg2.c.tr.clobj.fits Observed − Galaxy
Template Spectrum Av = −2.5312988
Galaxy
SN/Gal = 0.289259
Mg II, I
[O II]
Ca II
[O III]
1.5
1.0
0.5
0.0
−0.5
−1.0
6000
7000
8000
9000
10000

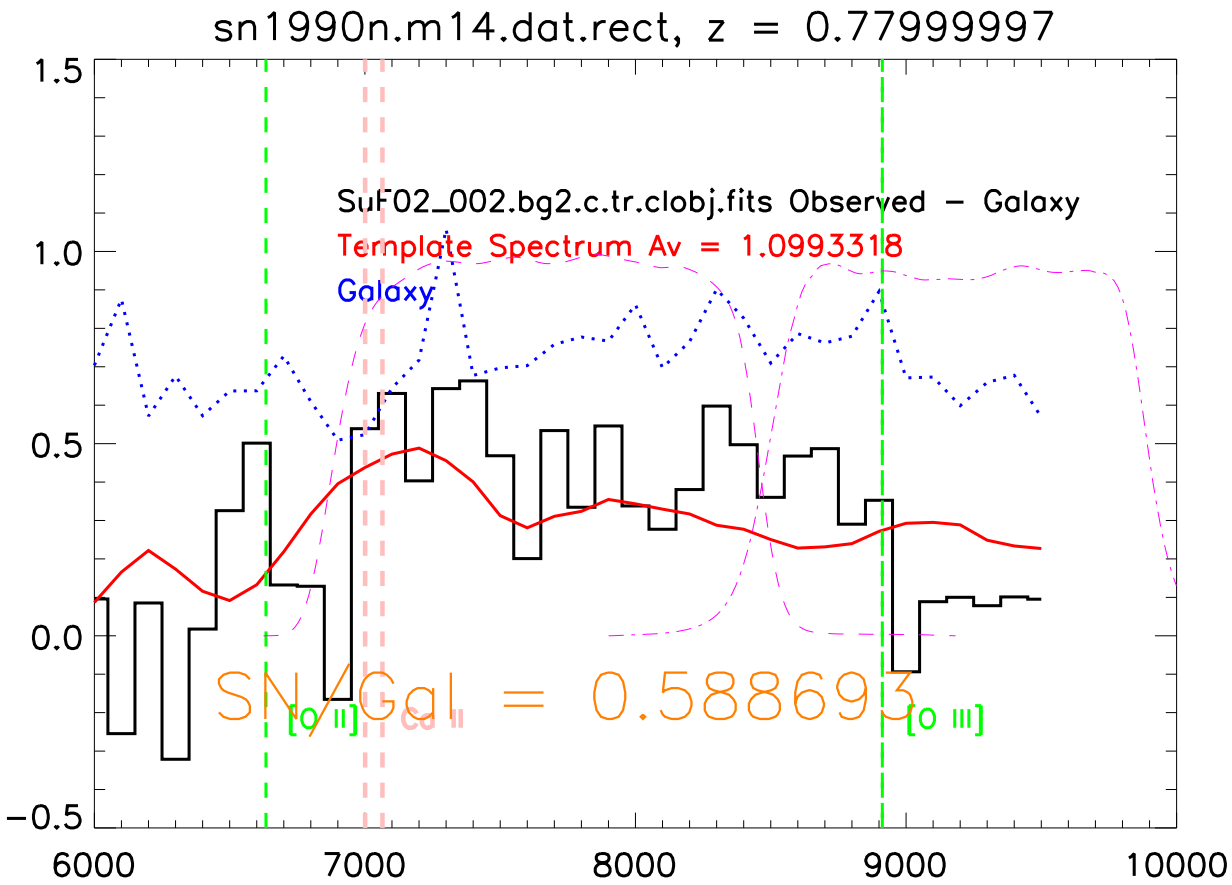

sn1999ee.m08.dat.rect, z = 0.82999998
SuF02_002.bg2.c.tr.clobj.fits Observed
Galaxy
Template Spectrum Av = 0.96243469
Galaxy
SN/Gal = 0.993272
Mg II, I
[O II]
Ca II
[O III]
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
−0.4
6000
7000
8000
9000
10000

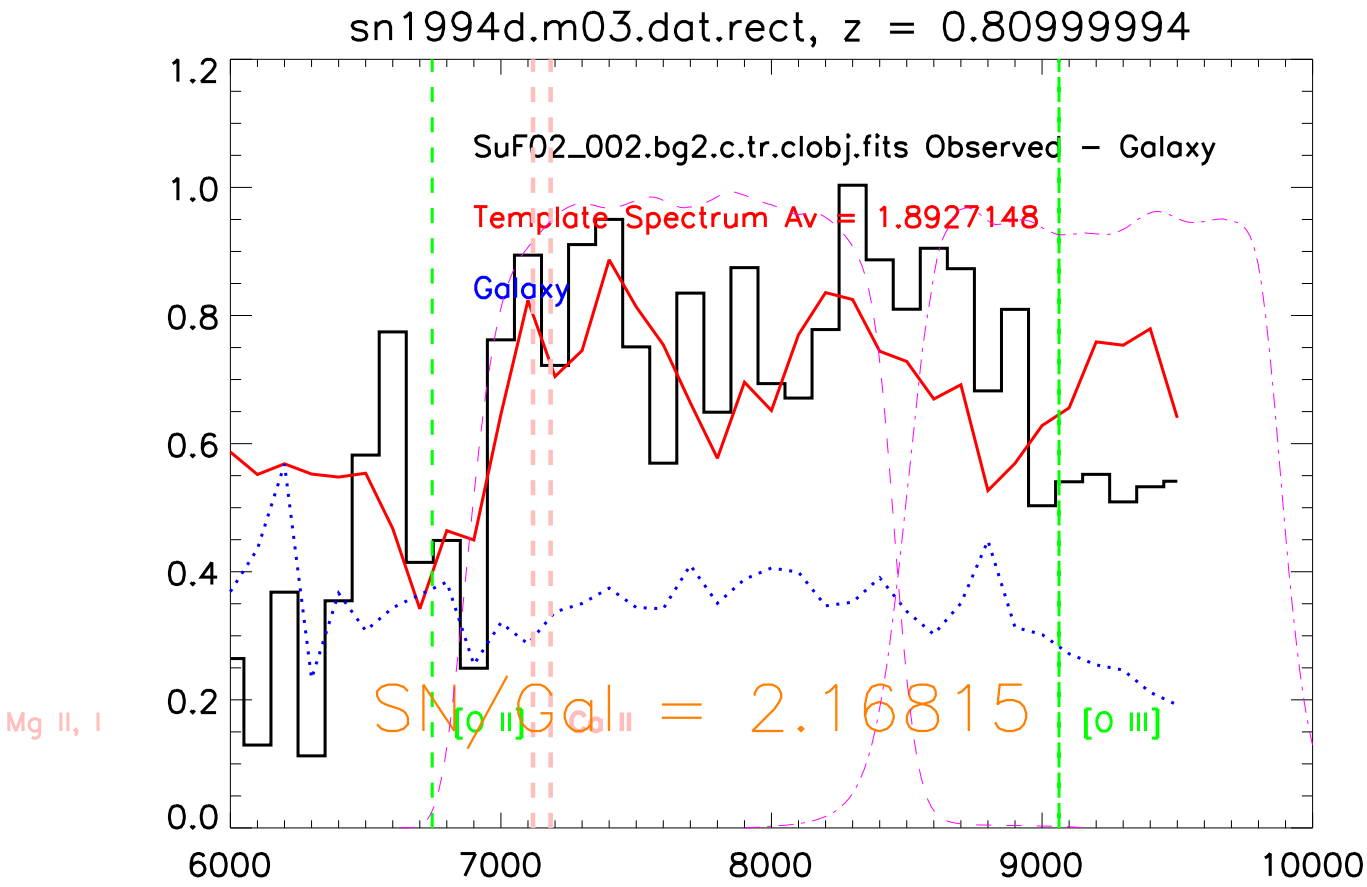

sn1990n.p17.dat.rect, z = 0.82999998
SuF02_002.bg2.c.tr.clobj.fits Observed – Galaxy
Template Spectrum Av = −1.0869572
Galaxy
SN/Gal = 0.883139
[O II]
Ca II
[O III]
Mg II, I
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
6000
7000
8000
9000
10000

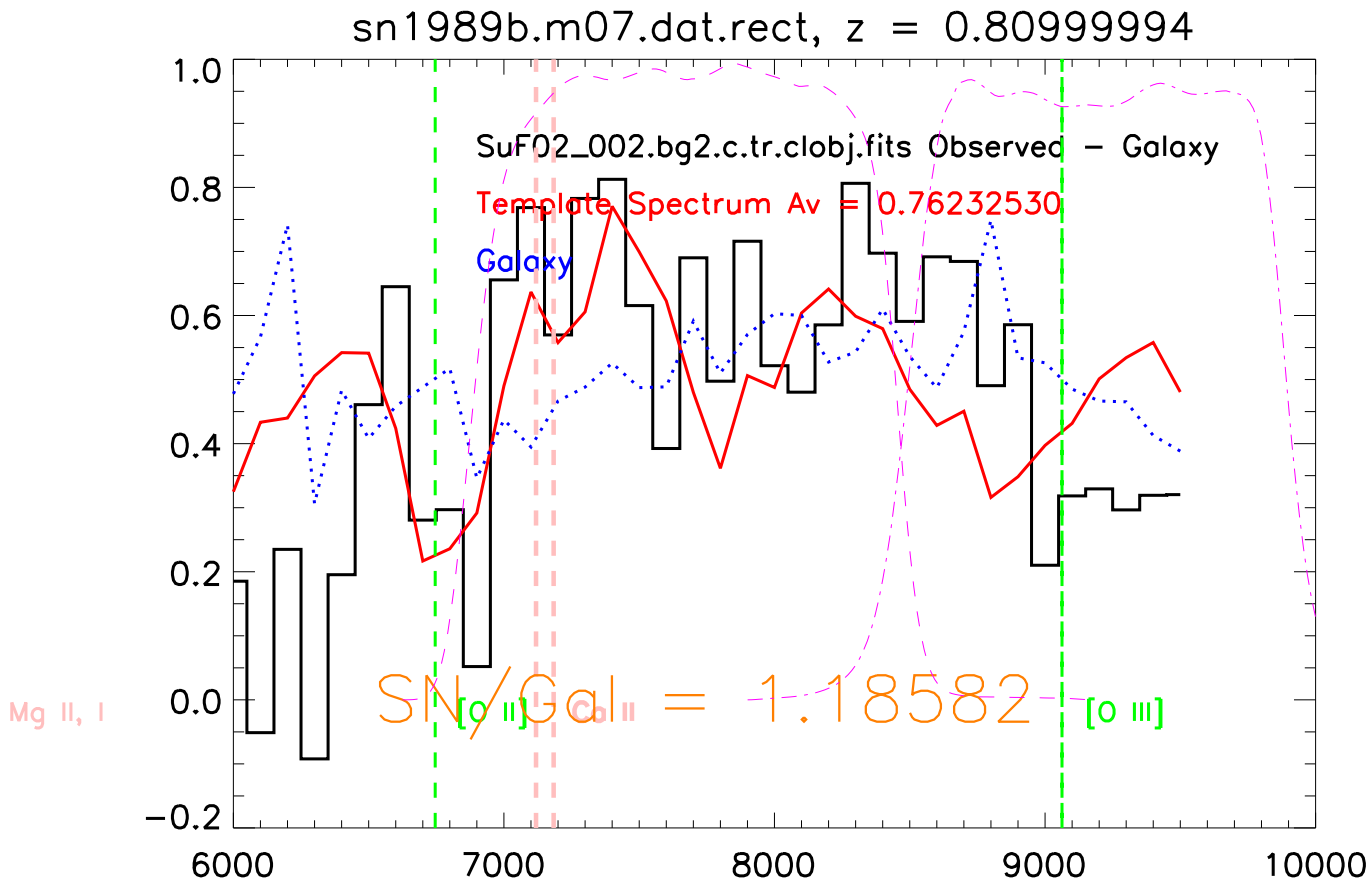

sn1989b.m05.dat.rect, z = 0.80999994
SuF02_002.bg2.c.tr.clobj.fits Observed − Galaxy
Template Spectrum Av = 0.0030761154
Galaxy
SN/Gal = 1.20749
Mg II, I
[O II]
Ca II
[O III]
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
6000
7000
8000
9000
10000


sn1991t.m08.dat.rect, z = 0.83999997
SuF02_002.bg2.c.tr.clobj.fits Observed – Galaxy
Template Spectrum Av = 1.6626692
Galaxy
SN/Gal = 4.53333
Mg II, I
[O II]
Ca II
[O III]
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
6000
7000
8000
9000
10000


sn1981b.p26.dat.rect, z = 0.77999997
SuF02_002.bg2.c.tr.clobj.fits Observed − Galaxy
Template Spectrum Av = −2.8079747
Galaxy
SN/Gal = 0.499153
[O II]
Ca II
[O III]
Mg II, I
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000


sn1990n.m14.dat.rect, z = 0.77999997
SuF02_002.bg2.c.tr.clobj.fits Observed − Galaxy
Template Spectrum Av = 1.0993318
Galaxy
SN/Gal = 0.588693
[O II]
Ca II
[O III]
Mg II, I
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000


sn1994d.m03.dat.rect, z = 0.80999994
SuF02_002.bg2.c.tr.clobj.fits Observed – Galaxy
Template Spectrum Av = 1.8927148
Galaxy
SN/Gal = 2.16815
[O II]
[O III]
1.2
1.0
0.8
0.6
0.4
0.2
0.0
6000
7000
8000
9000
10000


sn1989b.m07.dat.rect, z = 0.80999994
SuF02_002.bg2.c.tr.clobj.fits Observed – Galaxy
Template Spectrum Av = 0.76232530
Galaxy
SN/Gal = 1.18582
Mg II, I
[O II]
Ca II
[O III]
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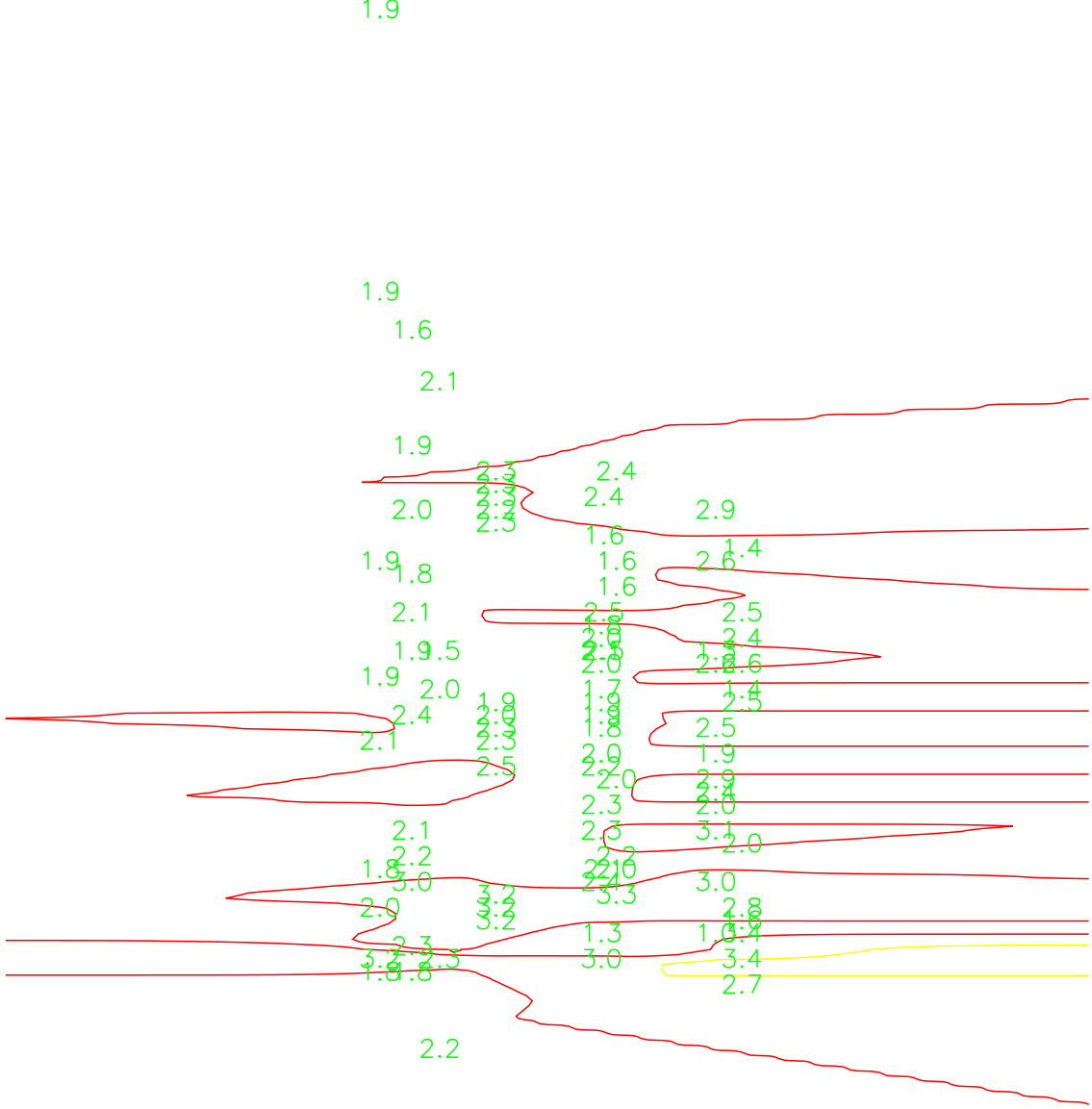
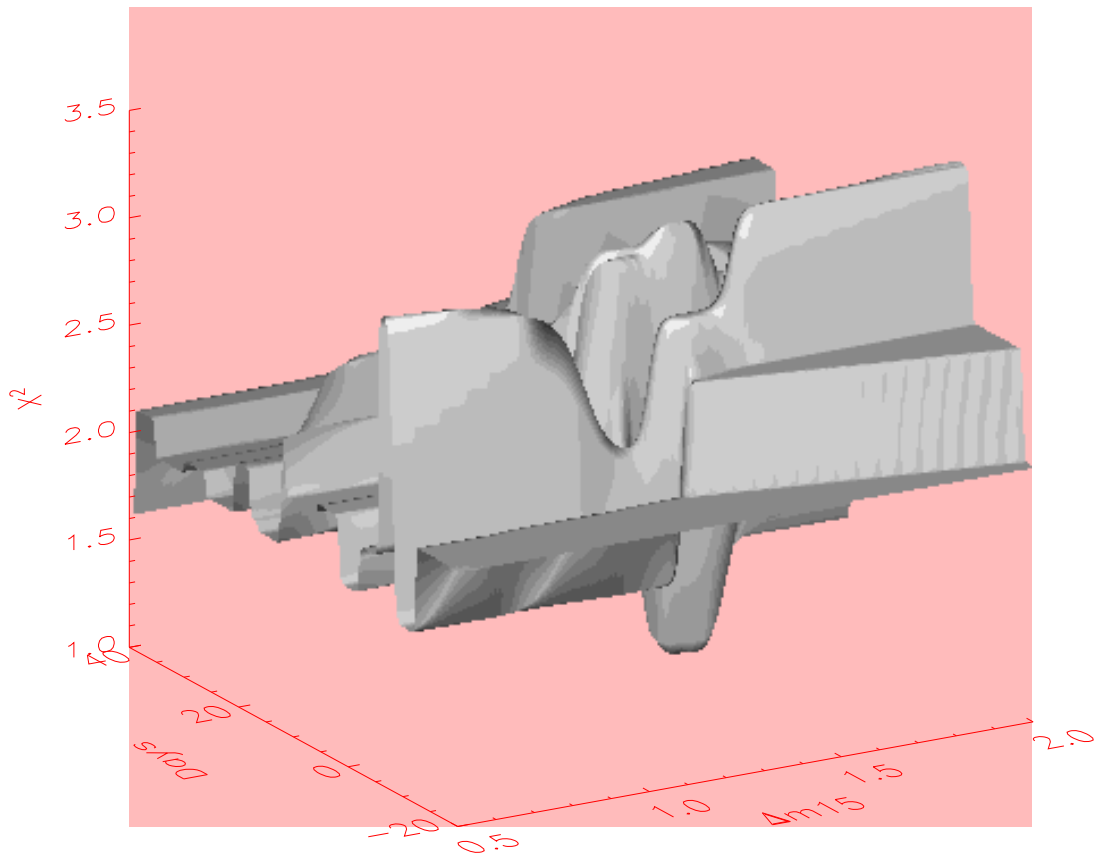
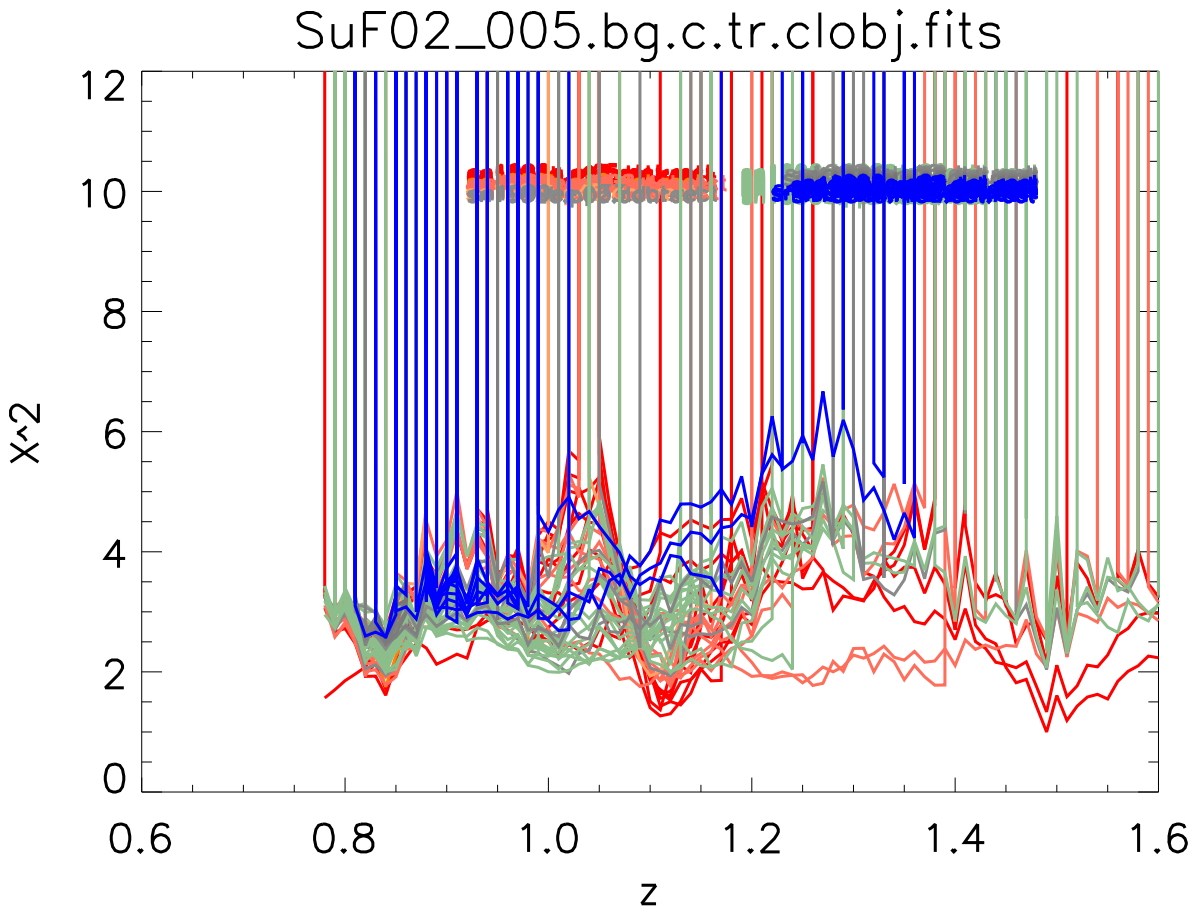
0.8
0.6
0.4
0.2
0.0
−0.2
6000
7000
8000
9000
10000




3.5
3.0
2.5
2.0
1.5
1.0
χ²
40
20
0
−20
Δm15
0.5
1.0
1.5
2.0


SuF02_005.bg.c.tr.clobj.fits
X^2
z
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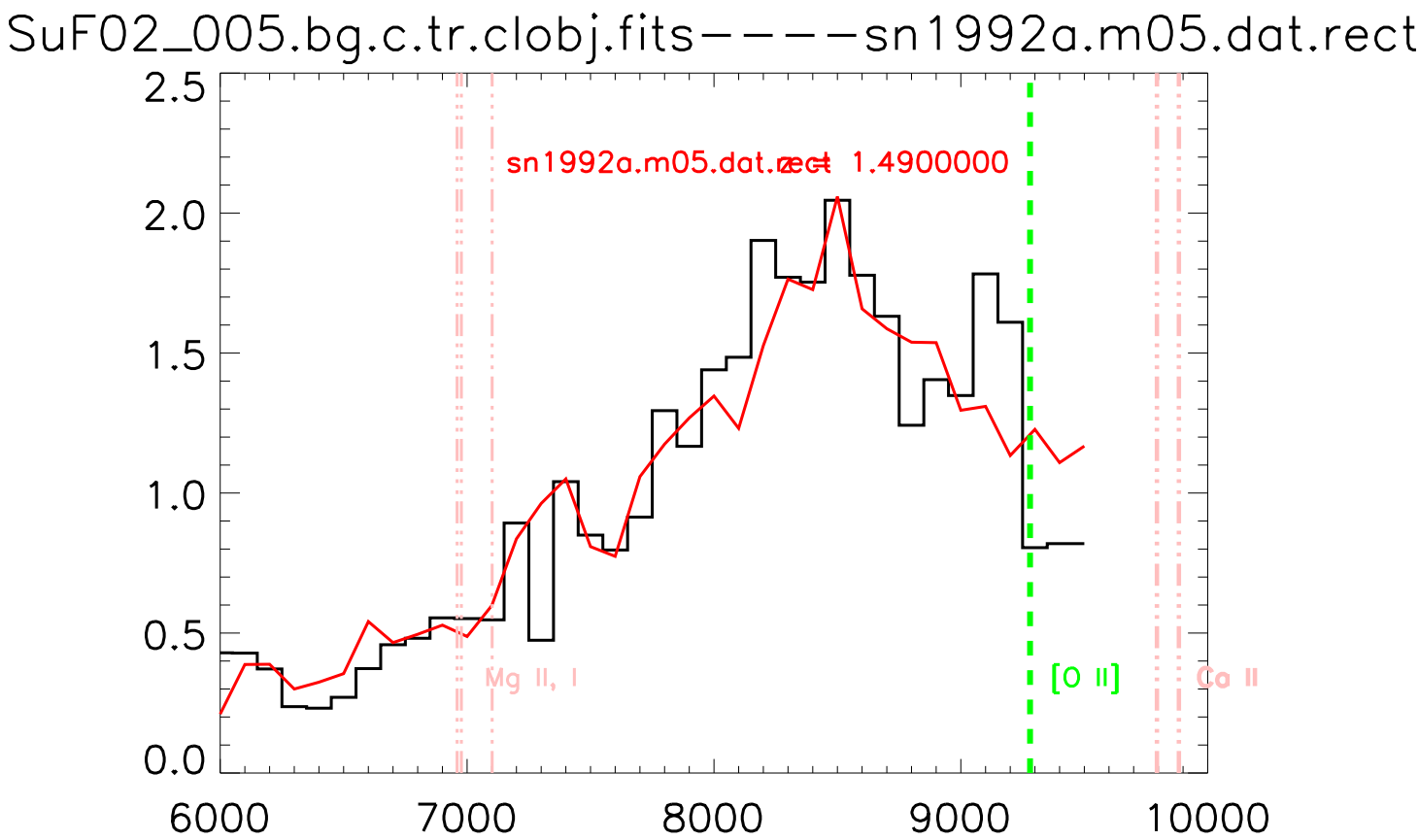
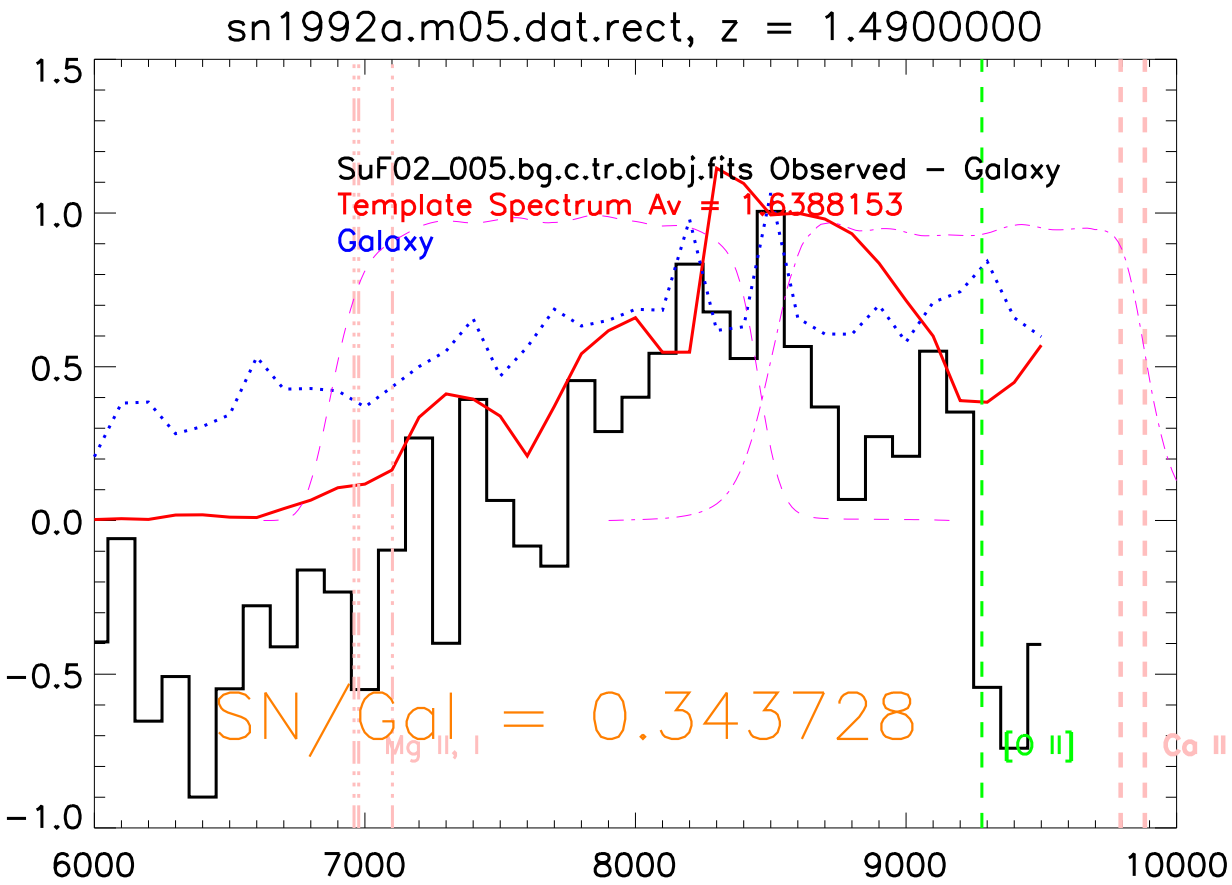
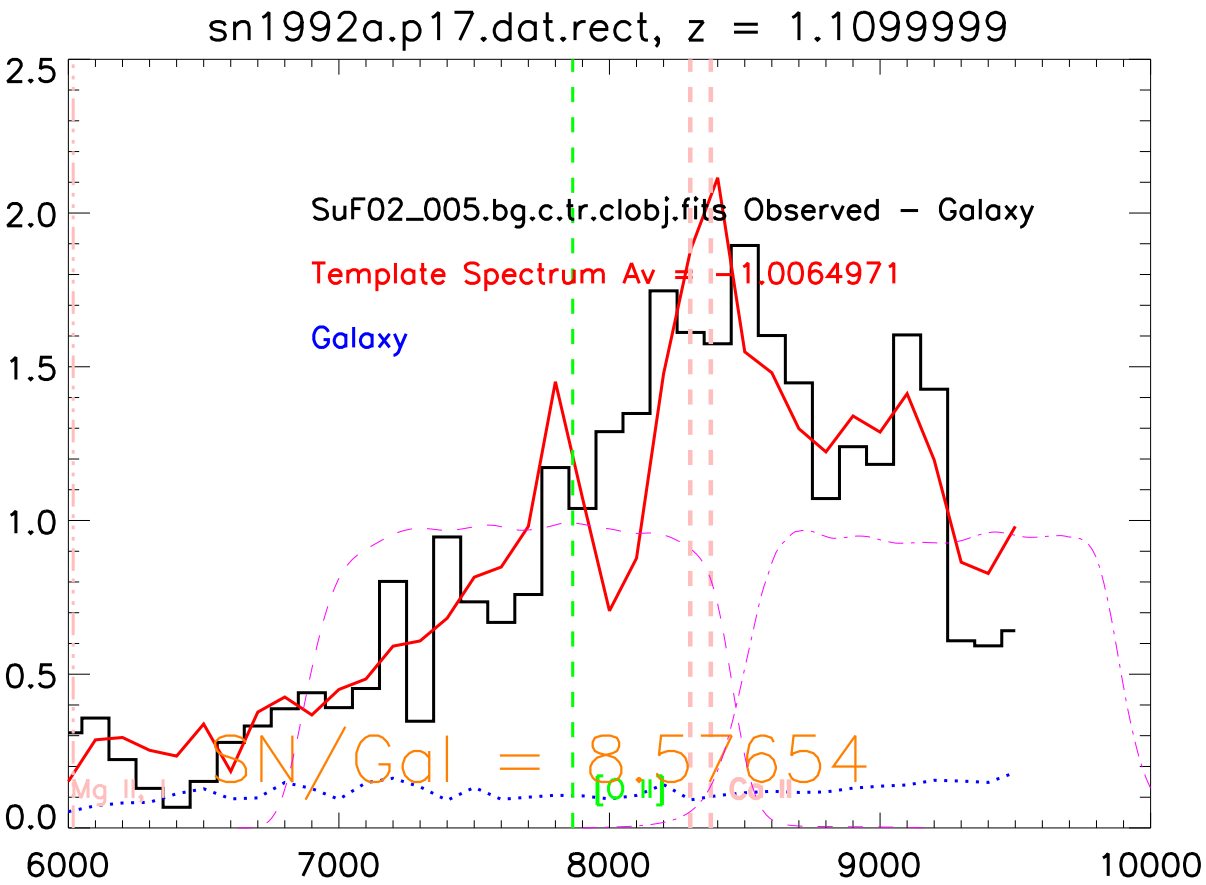
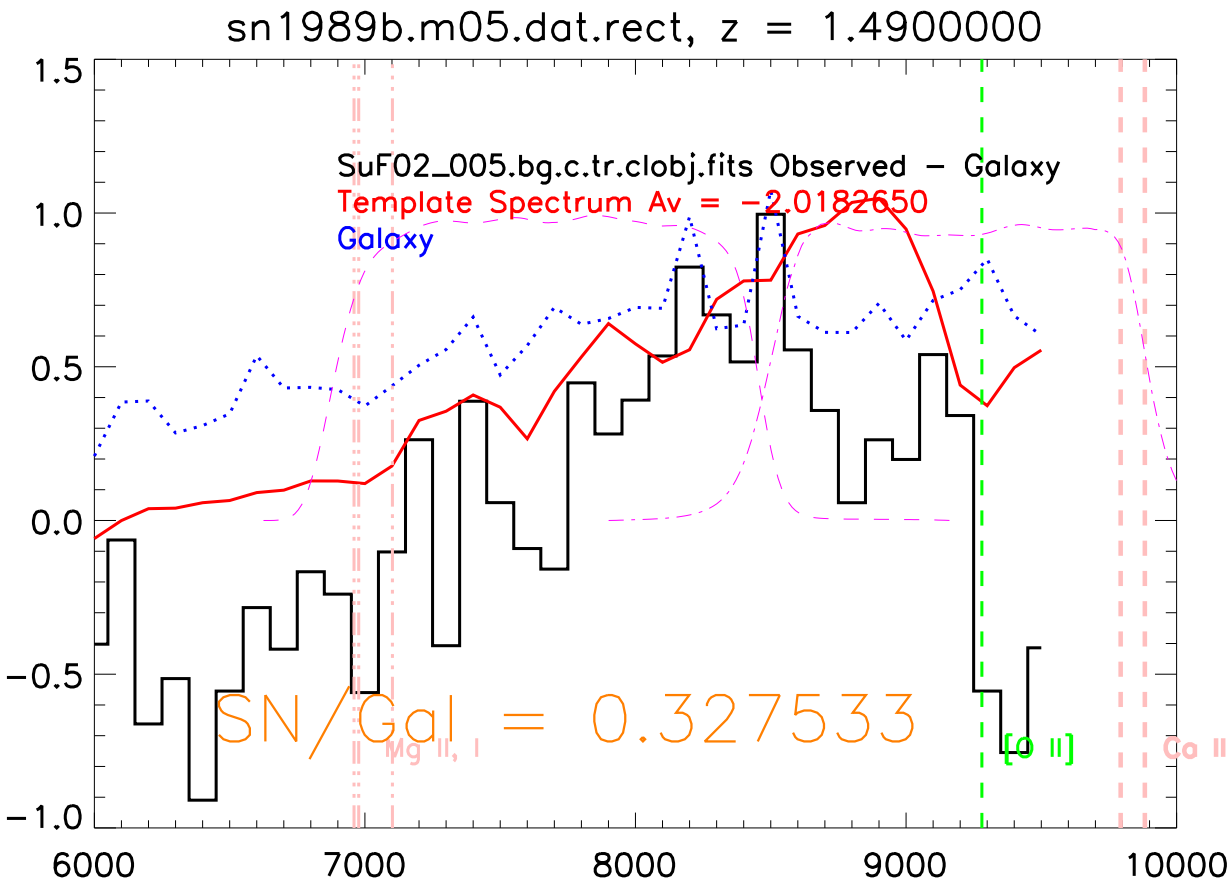
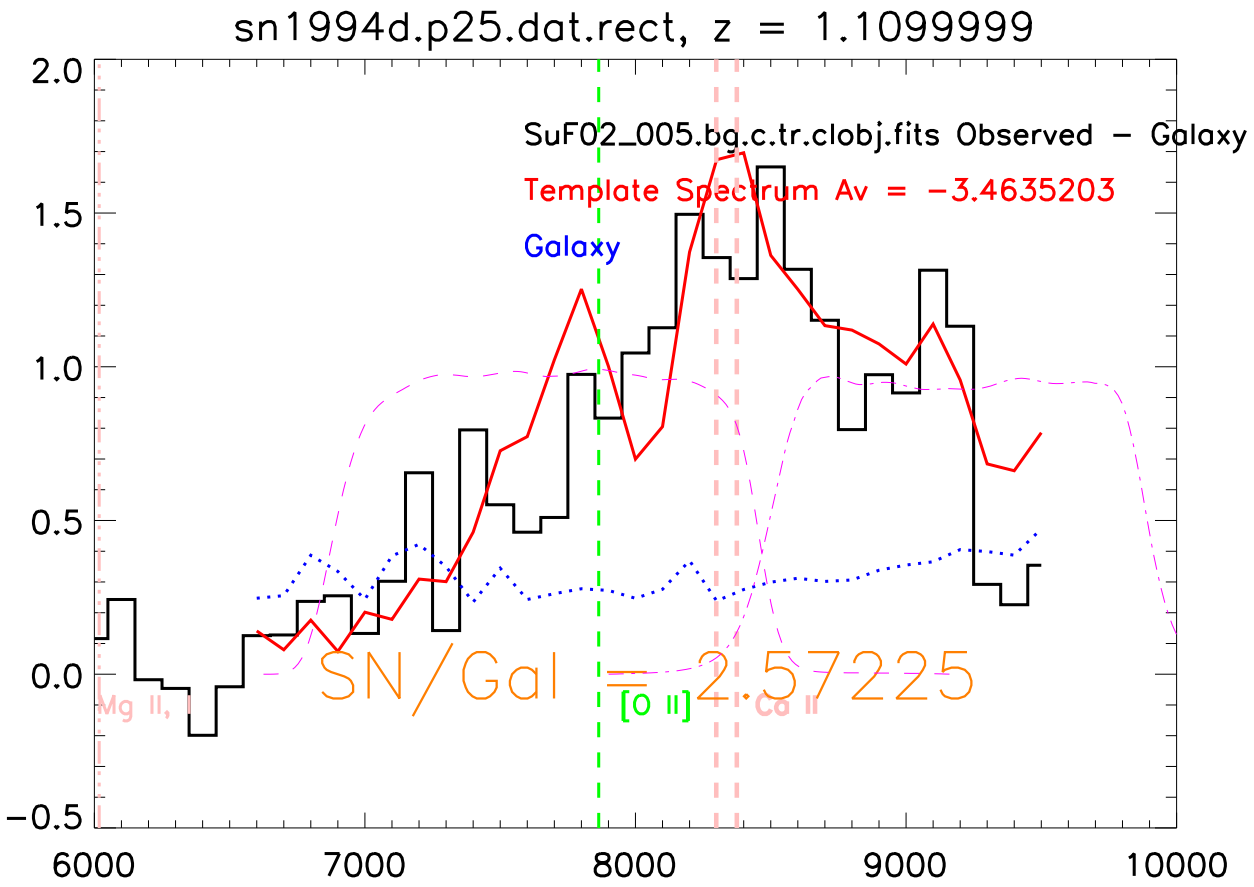
2
4
6
8
10
12
0.6
0.8
1.0
1.2
1.4
1.6

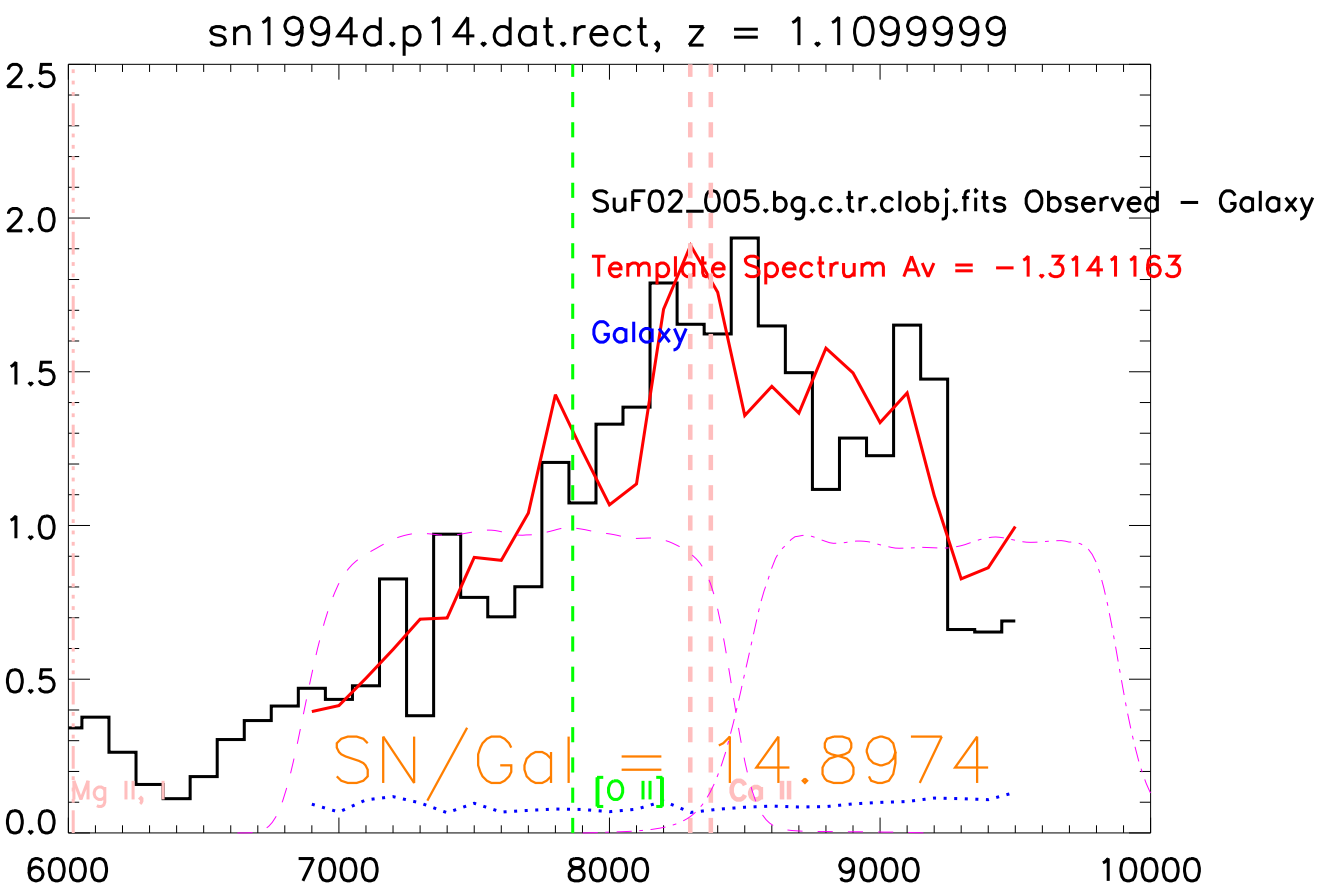

SuF02_005.bg.c.tr.clobj.fits----sn1992a.m05.dat.rect
sn1992a.m05.dat.rect 1.4900000
Mg II, I
[O II]
Ca II
2.5
2.0
1.5
1.0
0.5
0.0
6000
7000
8000
9000
10000

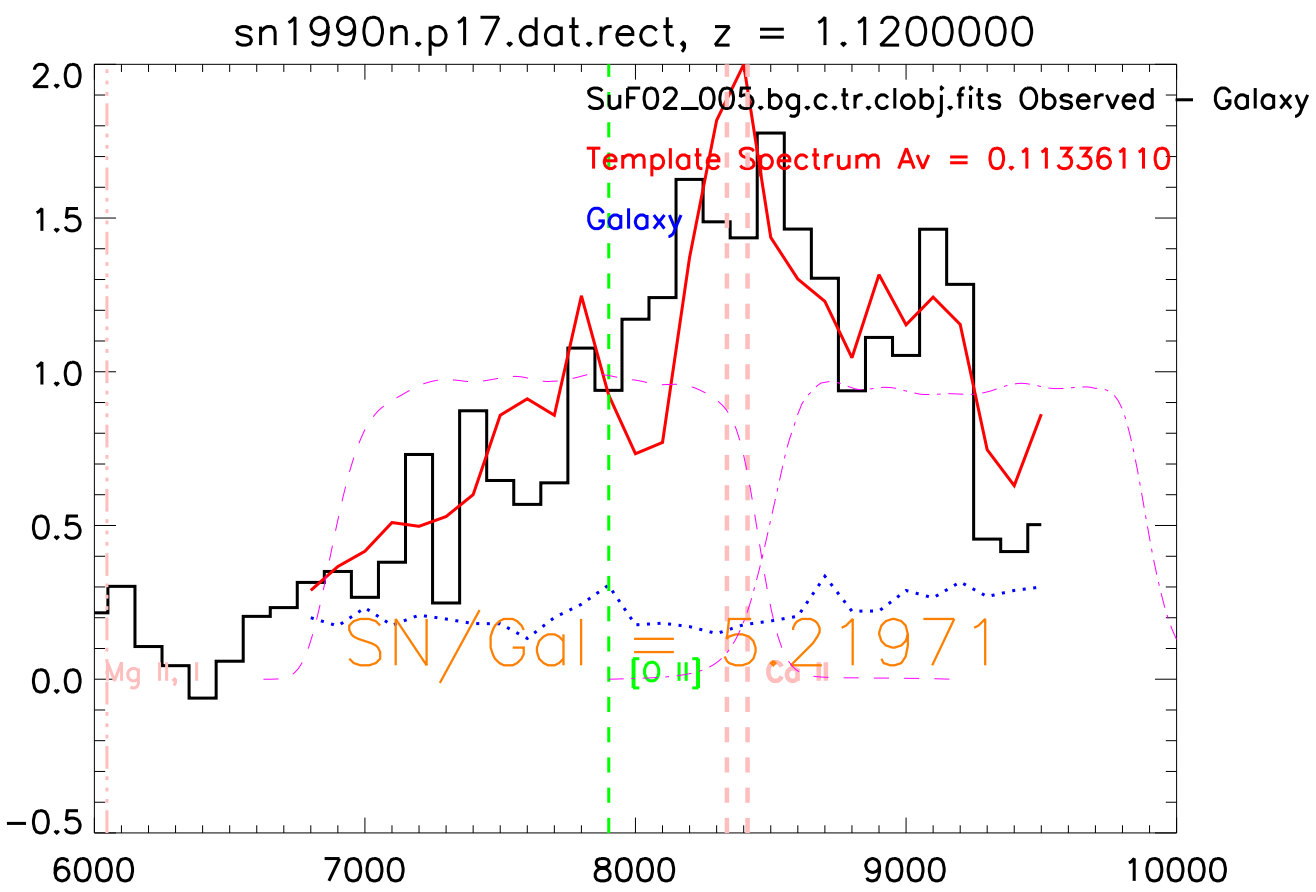

sn1992a.m05.dat.rect, z = 1.4900000
SuF02_005.bg.c.tr.clobj.fits Observed − Galaxy
Template Spectrum Av = 1.6388153
Galaxy
SN/Gal = 0.343728
Mg II, I
[O II]
Ca II
1.5
1.0
0.5
0.0
−0.5
−1.0
6000
7000
8000
9000
10000

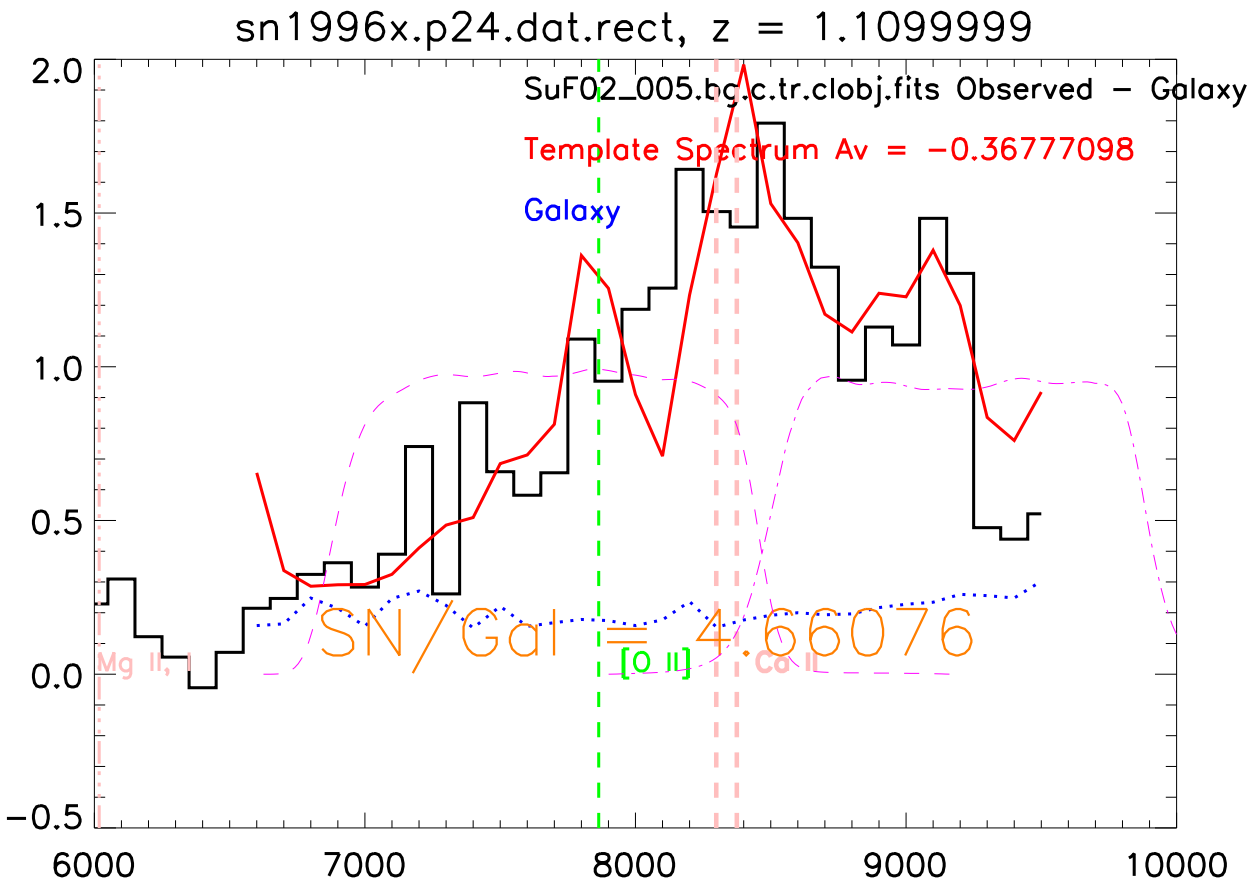

sn1992a.p17.dat.rect, z = 1.1099999
SuF02_005.bg.c.tr.clobj.fits Observed – Galaxy
Template Spectrum Av = -1.0064971
Galaxy
SN/Gal = 8.57654
Mg II
[O II]
Ca II
2.5
2.0
1.5
1.0
0.5
0.0
6000
7000
8000
9000
10000

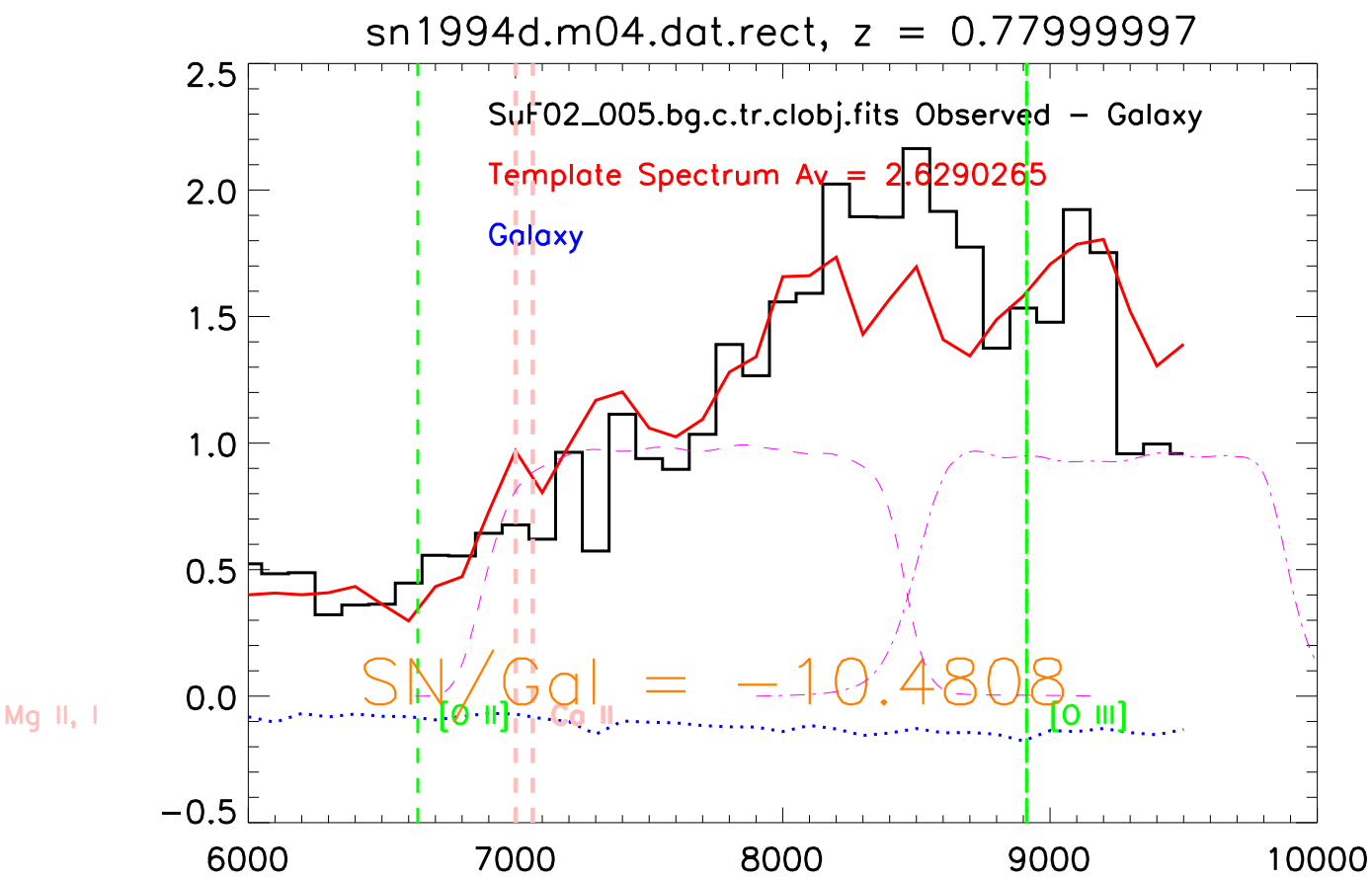

sn1989b.m05.dat.rect, z = 1.4900000
SuF02_005.bg.c.tr.clobj.fits Observed − Galaxy
Template Spectrum Av = −2.0182650
Galaxy
SN/Gal = 0.327533
Mg II, I
[O II]
Ca II
1.5
1.0
0.5
0.0
−0.5
−1.0
6000
7000
8000
9000
10000

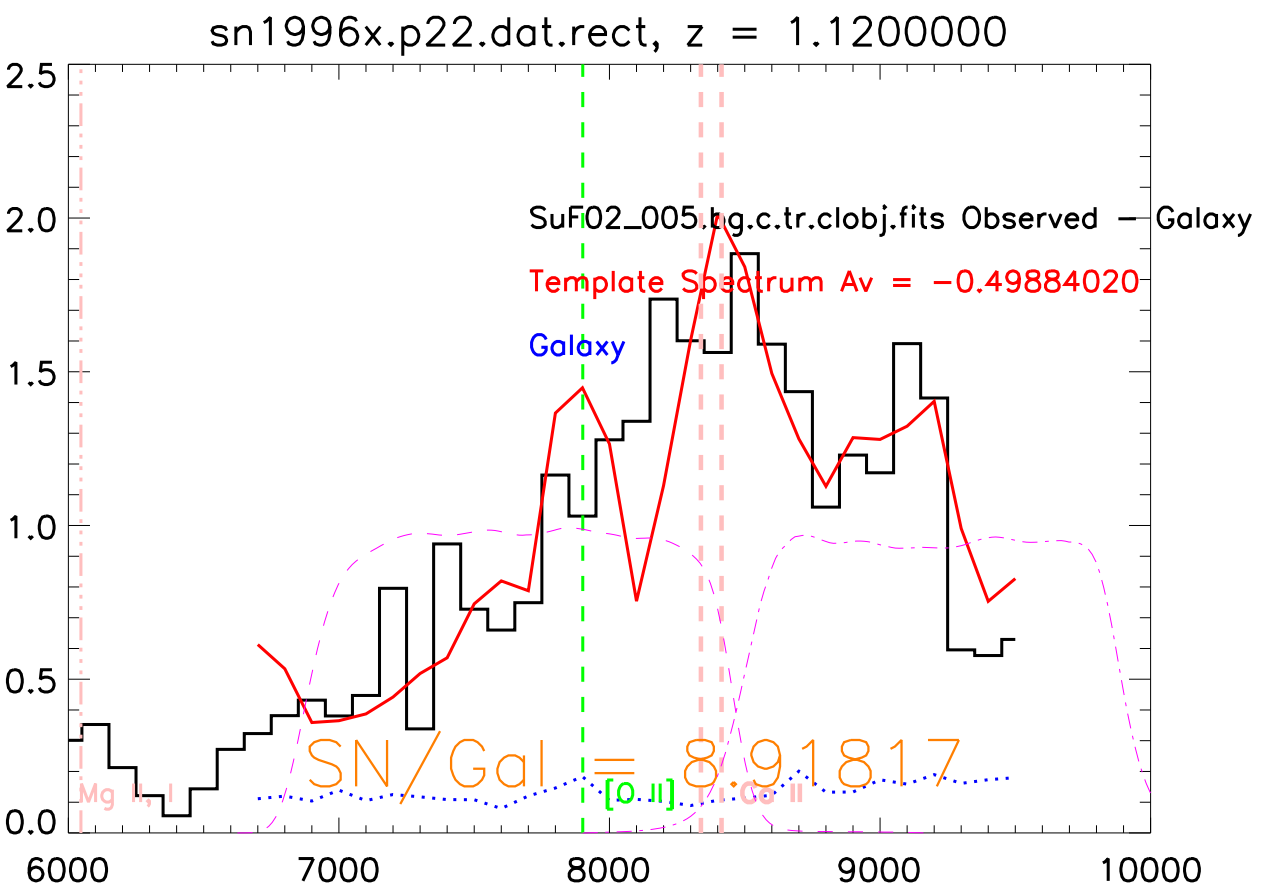

sn1994d.p25.dat.rect, z = 1.1099999
SuF02_005.bg.c.tr.clobj.fits Observed − Galaxy
Template Spectrum Av = −3.4635203
Galaxy
SN/Gal = 2.57225
Mg II, I
[O II]
Ca II
2.0
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

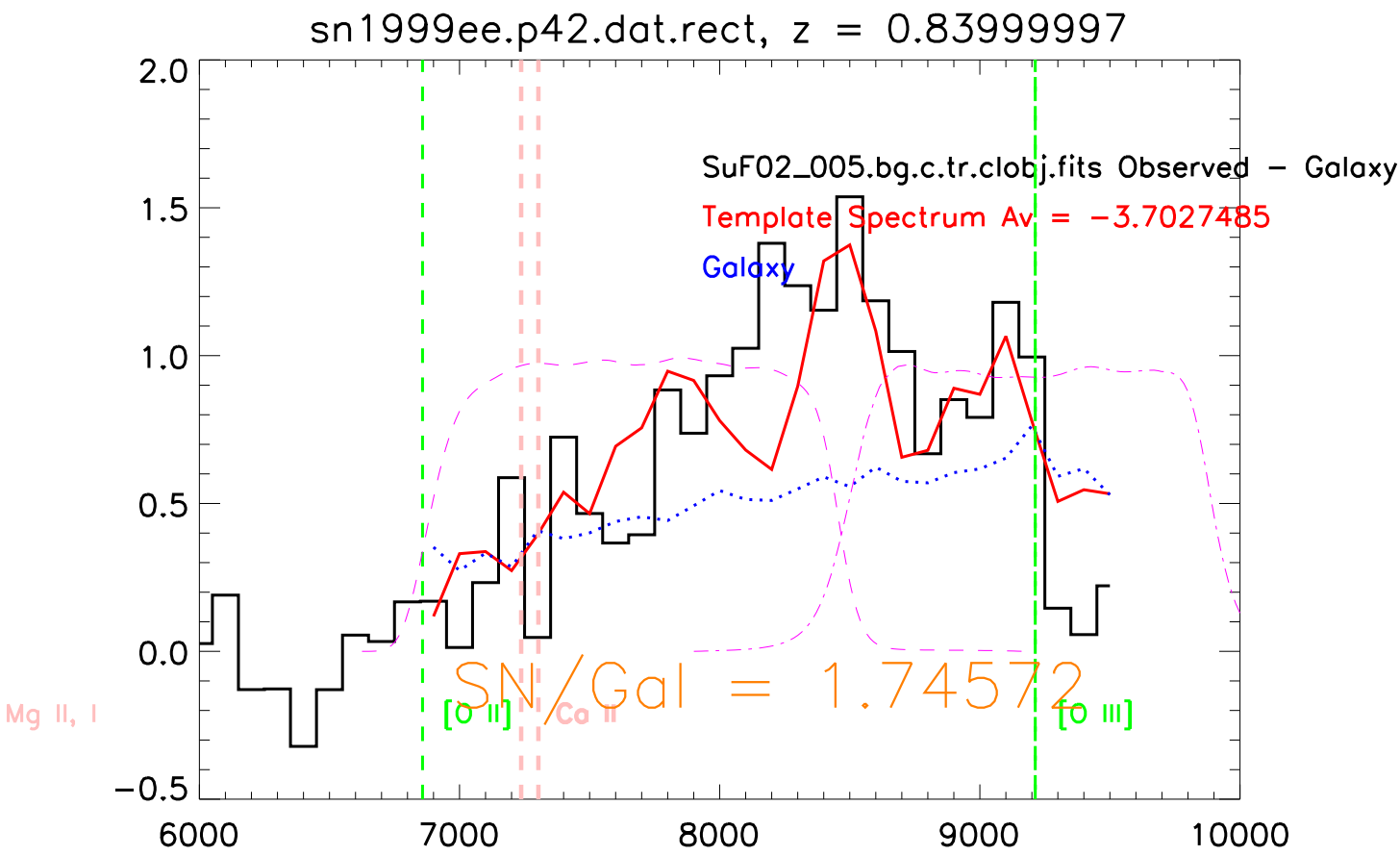

sn1994d.p14.dat.rect, z = 1.1099999
SuF02_005.bg.c.tr.clobj.fits Observed − Galaxy
Template Spectrum Av = −1.3141163
Galaxy
SN/Gal = 14.8974
[O II]
Ca II
2.5
2.0
1.5
1.0
0.5
0.0
6000
7000
8000
9000
10000

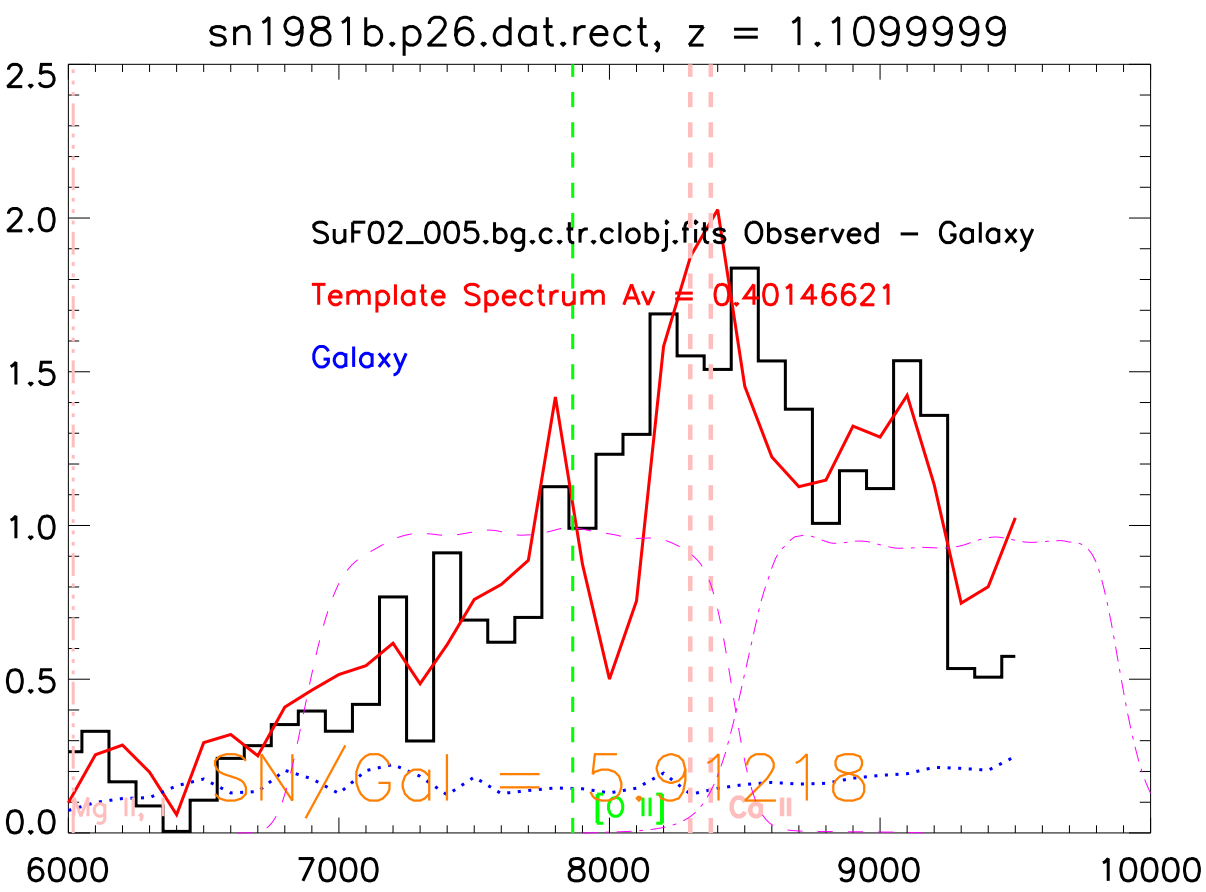

sn1990n.p17.dat.rect, z = 1.1200000
SuF02_005.bg.c.tr.clobj.fits Observed
Galaxy
Template Spectrum Av = 0.11336110
Galaxy
SN/Gal = 5.21971
Mg II, 1
[O II]
Ca II
2.0
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

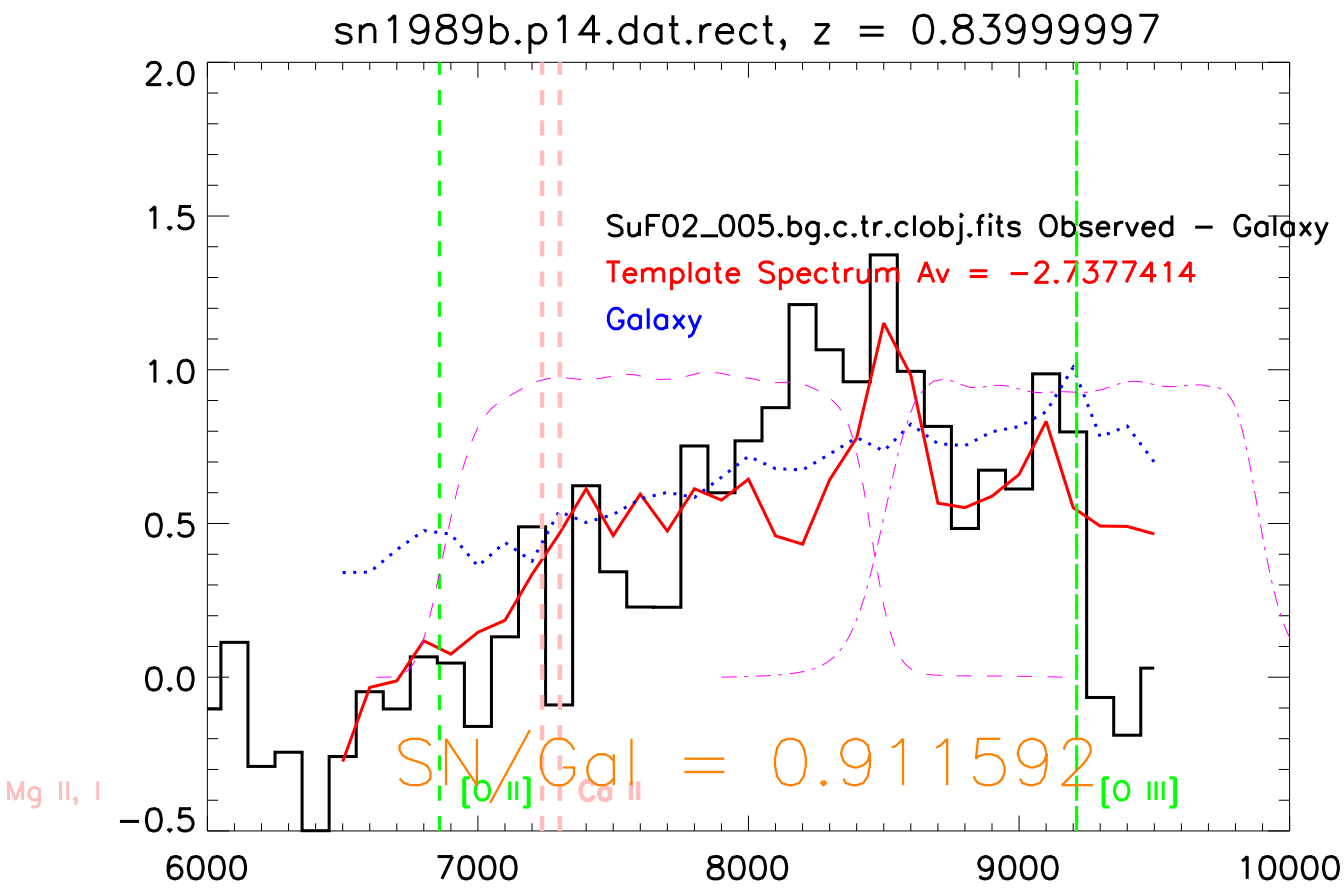

sn1996x.p24.dat.rect, z = 1.1099999
SuF02_005.bc.c.tr.clobj.fits Observed – Galaxy
Template Spectrum Av = −0.36777098
Galaxy
SN/Gal = 4.66076
Mg II
[O II]
Ca II
2.0
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

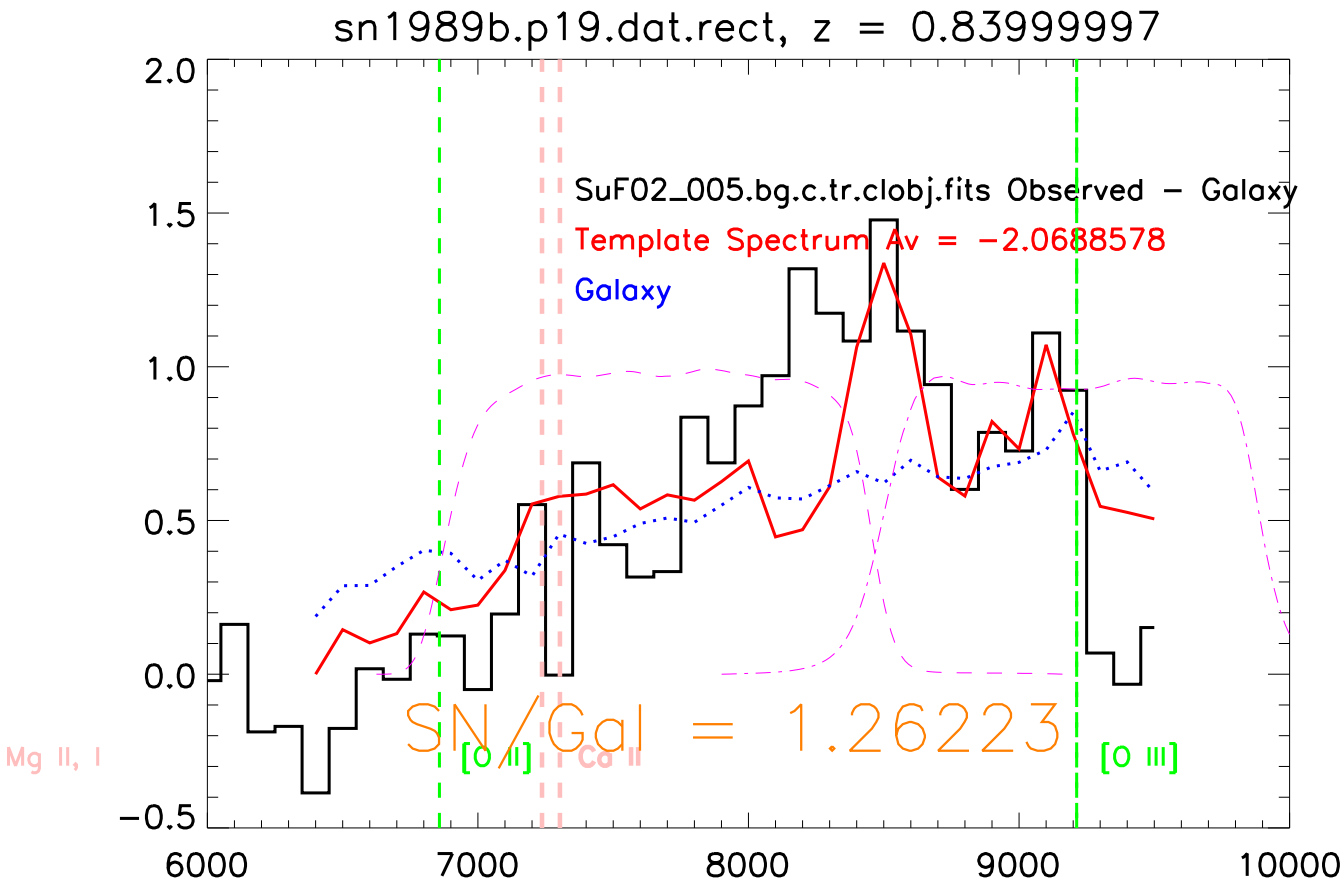

sn1994d.m04.dat.rect, z = 0.77999997
SuF02_005.bg.c.tr.clobj.fits Observed − Galaxy
Template Spectrum Av = 2.6290265
Galaxy
SN/Gal = −10.4808
[O II]
Ca II
[O III]
Mg II, I
2.5
2.0
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

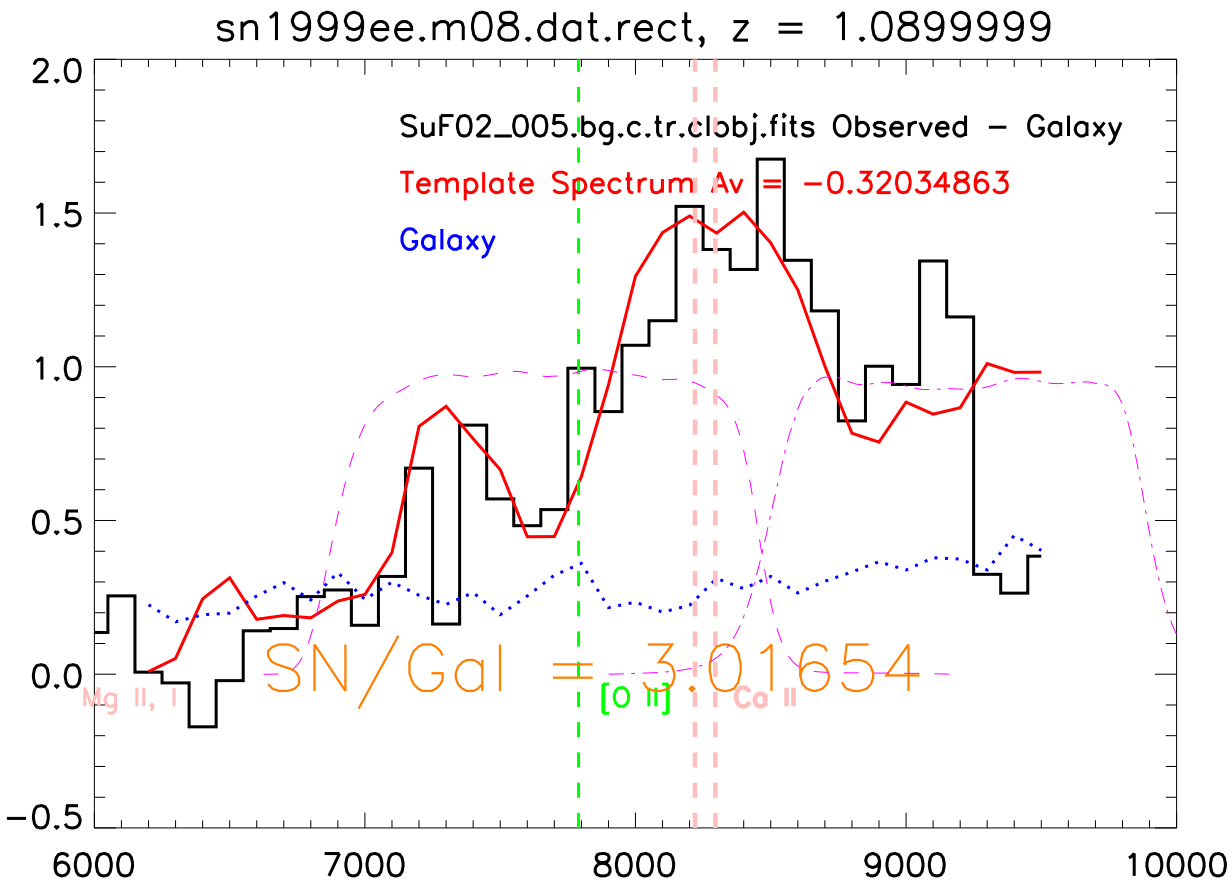

sn1996x.p22.dat.rect, z = 1.1200000
SuF02_005.tg.c.tr.clobj.fits Observed
Galaxy
Template Spectrum Av = -0.49884020
Galaxy
SN/Gal = 8.91817
[O II]
Ca II
2.5
2.0
1.5
1.0
0.5
0.0
6000
7000
8000
9000
10000

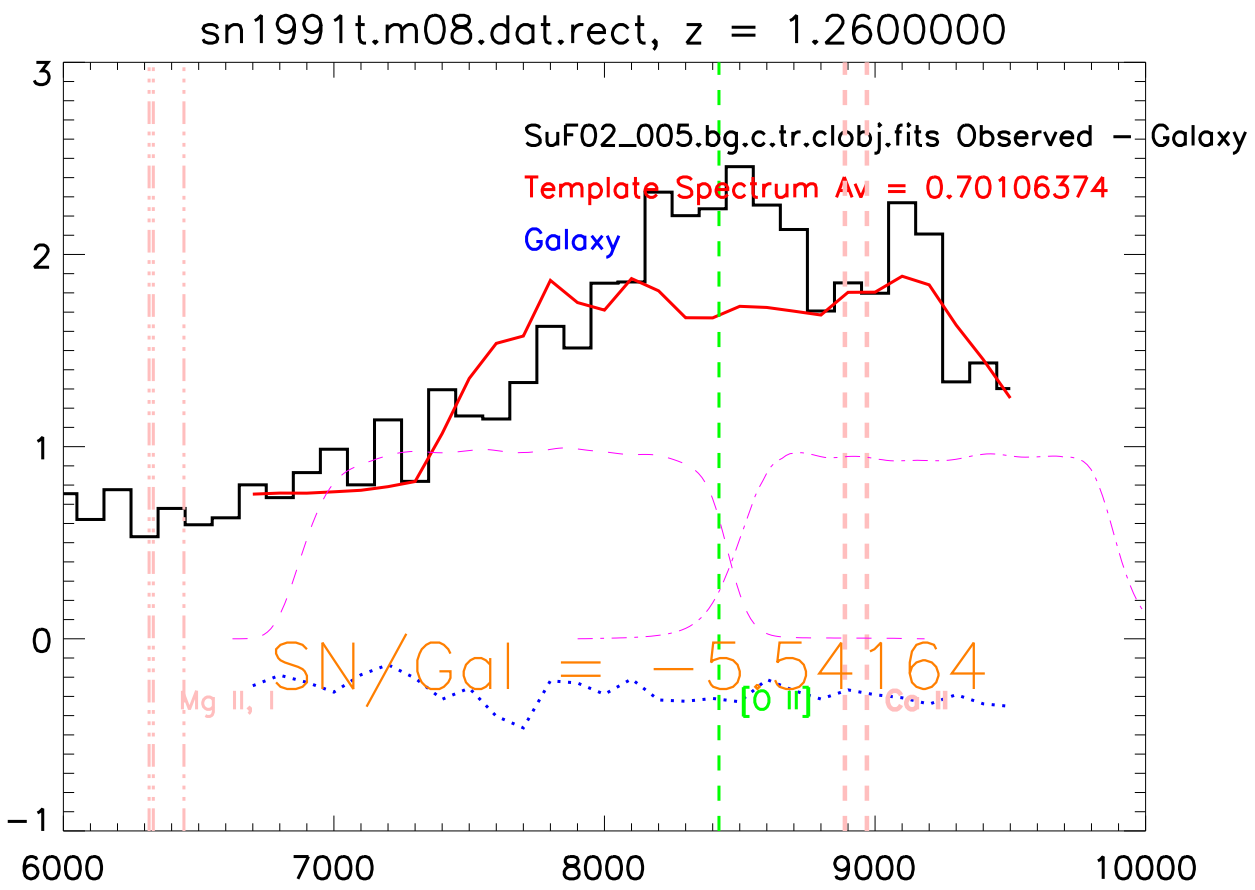

sn1999ee.p42.dat.rect, z = 0.83999997
SuF02_005.bg.c.tr.clobj.fits Observed − Galaxy
Template Spectrum Av = −3.7027485
Galaxy
SN/Gal = 1.74572
Mg II, I
[O II]
Ca II
[O III]
2.0
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

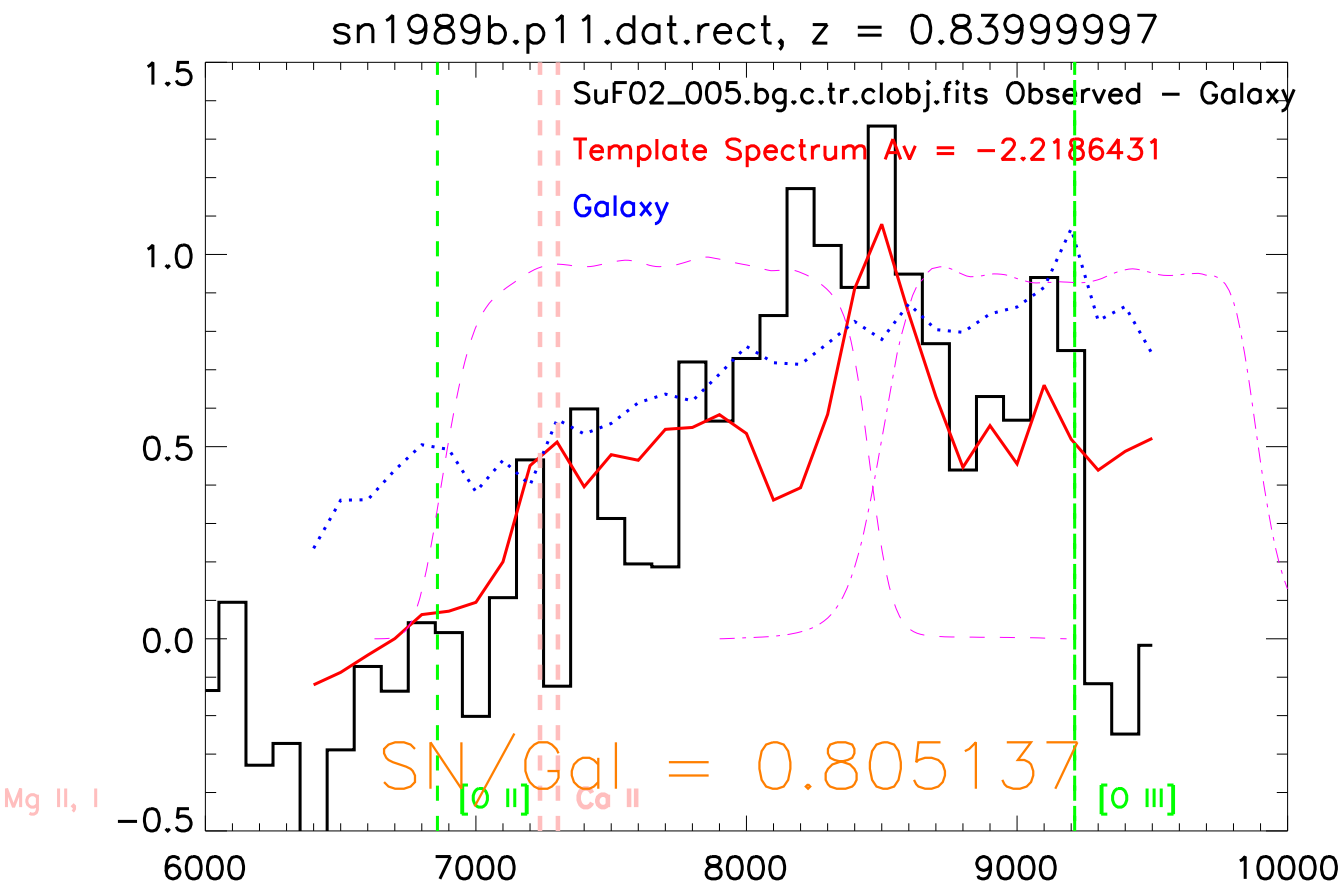

sn1981b.p26.dat.rect, z = 1.1099999
SuF02_005.bg.c.tr.clobj.fits Observed – Galaxy
Template Spectrum Av = 0.40146621
Galaxy
SN/Gal = 5.91218
[O II]
Ca II
2.5
2.0
1.5
1.0
0.5
0.0
6000
7000
8000
9000
10000

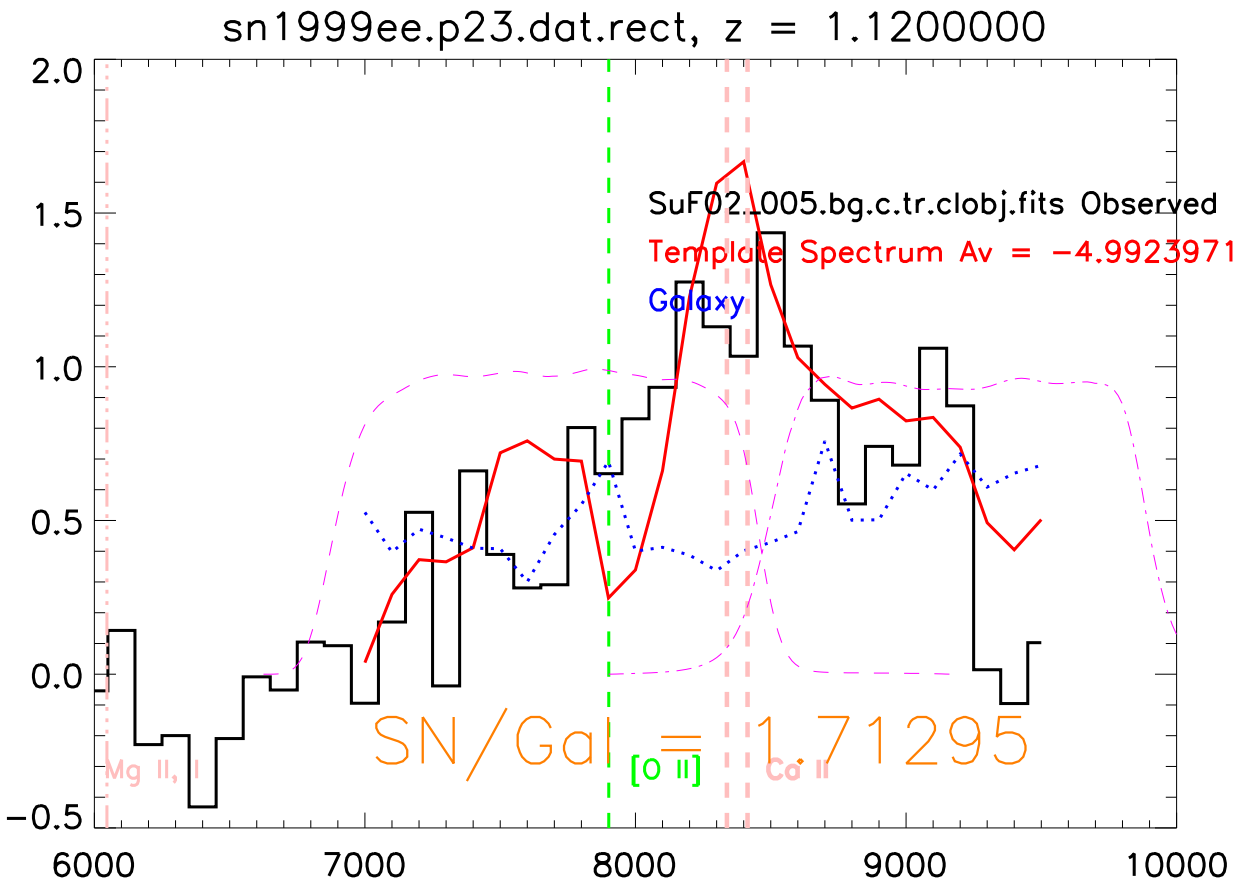

sn1989b.p14.dat.rect, z = 0.83999997
SuF02_005.bg.c.tr.clobj.fits Observed – Galaxy
Template Spectrum Av = -2.7377414
Galaxy
S/N Gal = 0.911592
Mg II, I
[O II]
Ca II
[O III]
2.0
1.5
1.0
0.5
0.0
-0.5
6000
7000
8000
9000
10000

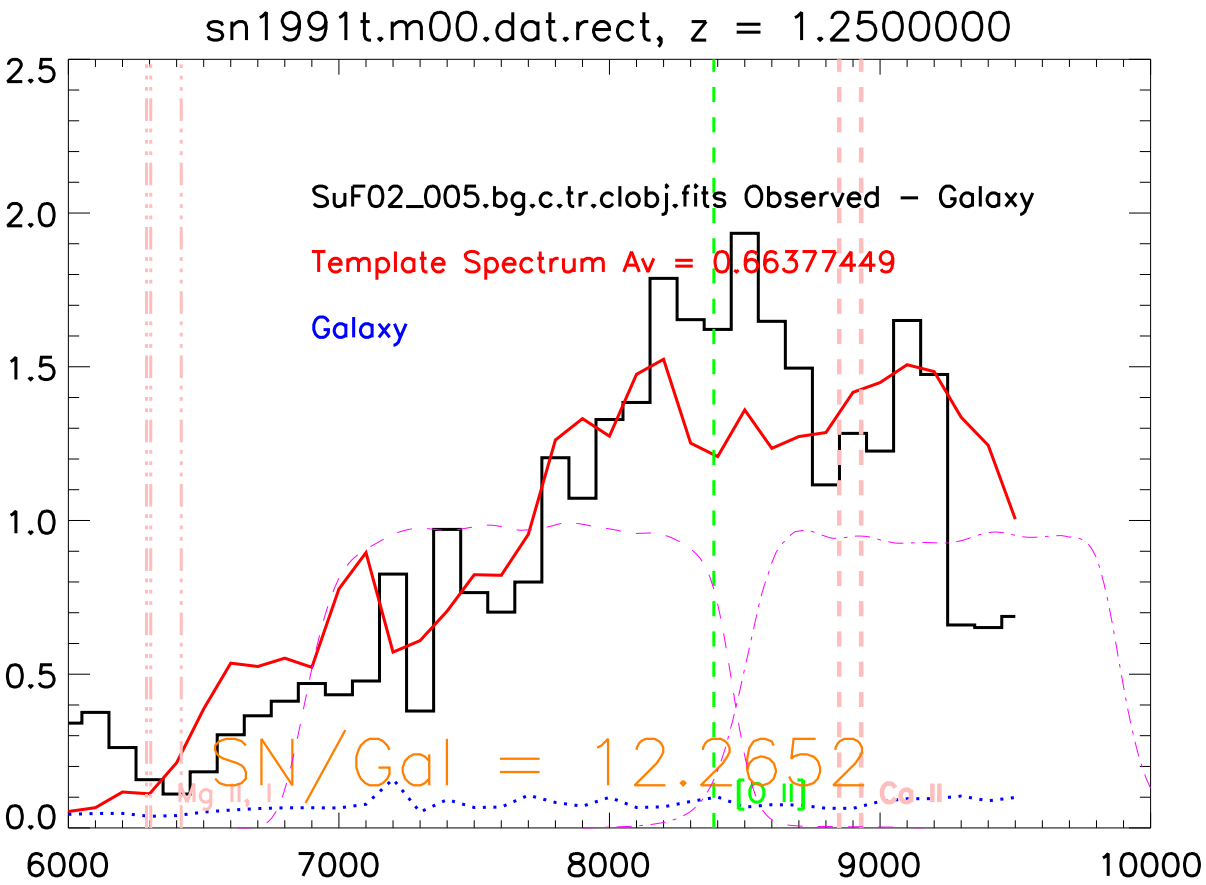

sn1989b.p19.dat.rect, z = 0.83999997
SuF02_005.bg.c.tr.clobj.fits Observed − Galaxy
Template Spectrum Av = −2.0688578
Galaxy
SN/Gal = 1.26223
[O II]
Ca II
[O III]
Mg II, I
2.0
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

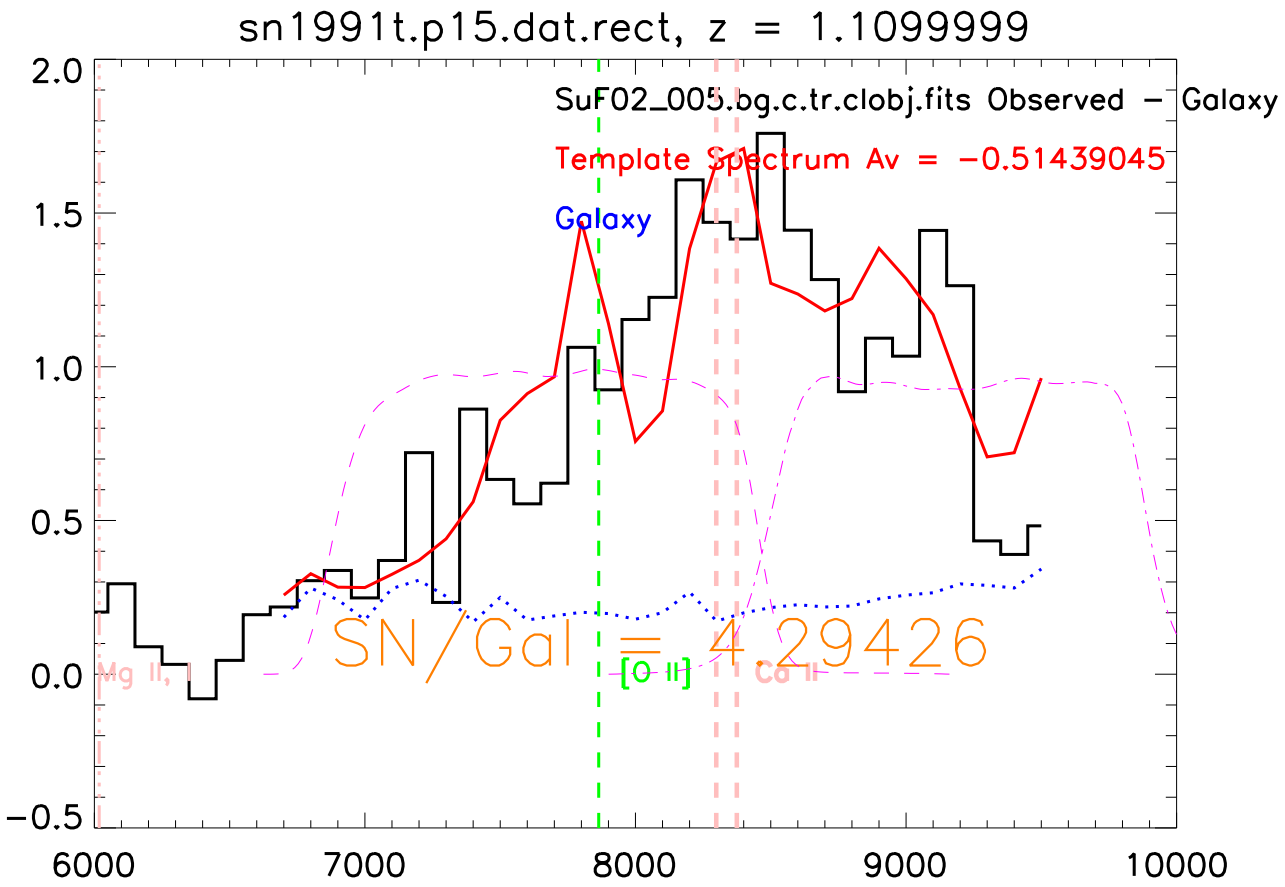

sn1999ee.m08.dat.rect, z = 1.0899999
SuF02_005.bg.c.tr.clobj.fits Observed − Galaxy
Template Spectrum Av = −0.32034863
Galaxy
SN/Gal = 3.01654
[O II]
Ca II
2.0
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

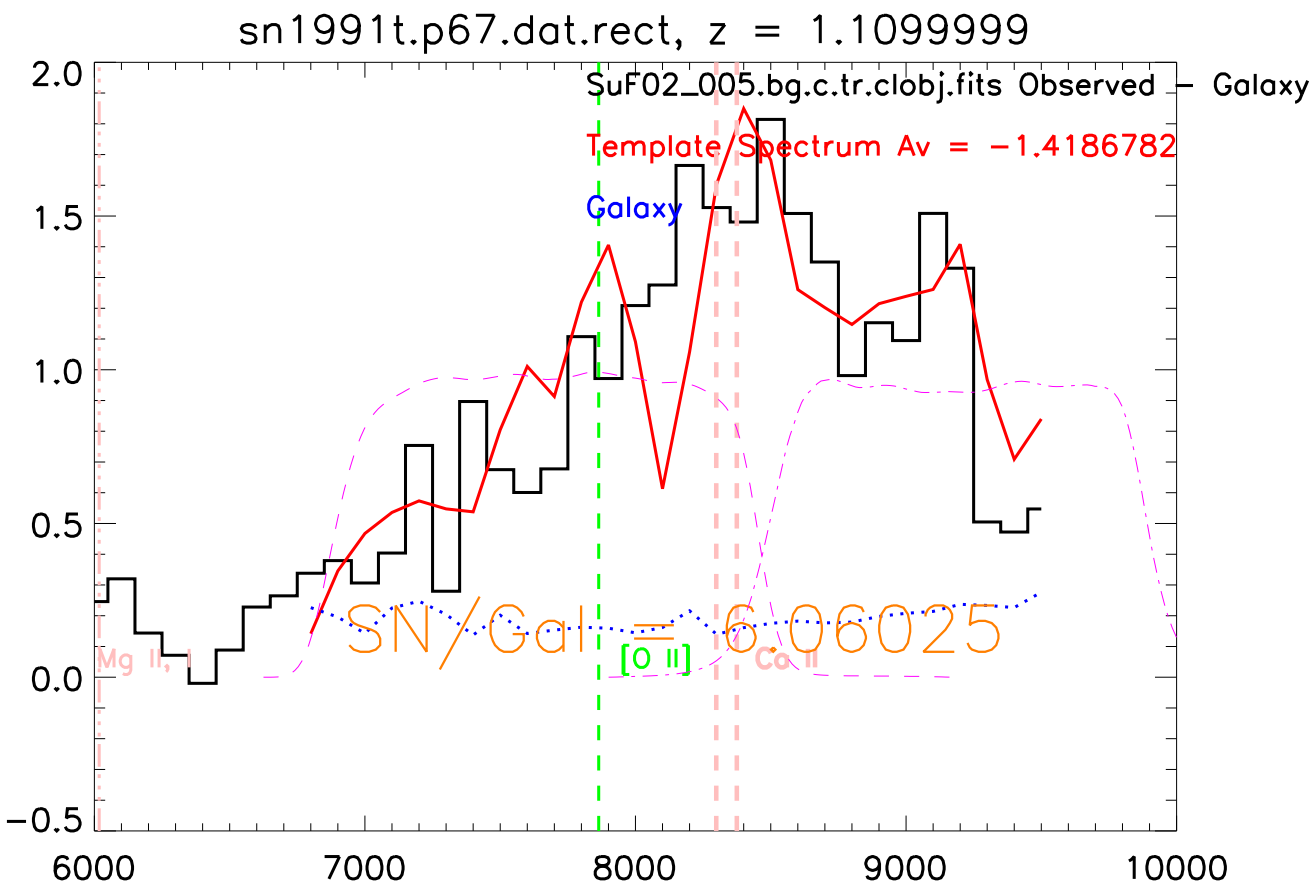

sn1991t.m08.dat.rect, z = 1.2600000
SuF02_005.bg.c.tr.clobj.fits Observed
Galaxy
Template Spectrum Av = 0.70106374
Galaxy
SN/Gal = −5.54164
Mg II, I
[O II]
Ca II
3
2
1
0
−1
6000
7000
8000
9000
10000

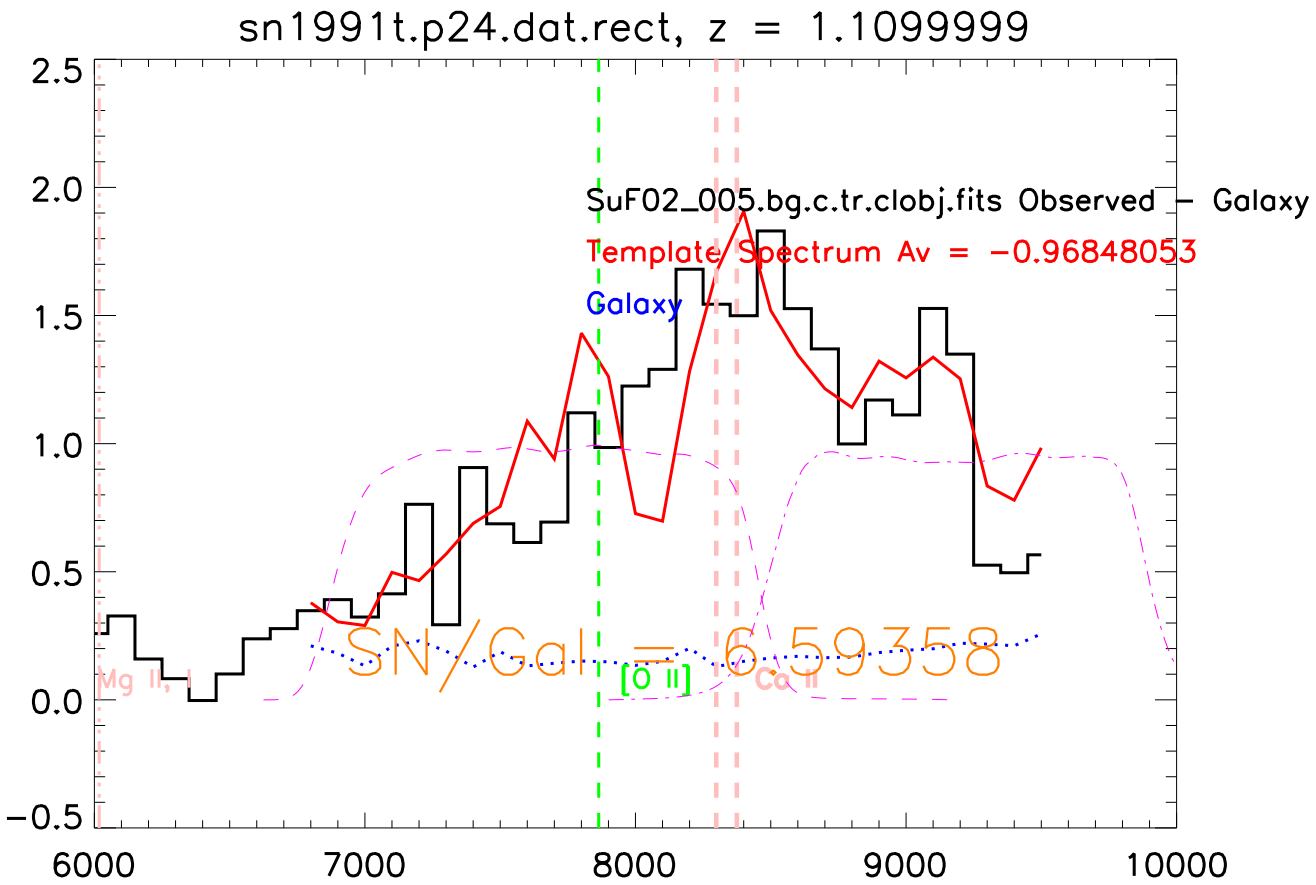

sn1989b.p11.dat.rect, z = 0.83999997
SuF02_005.bg.c.tr.clobj.fits Observed − Galaxy
Template Spectrum Av = −2.2186431
Galaxy
SN/Gal = 0.805137
Mg II, I
[O II]
Ca II
[O III]
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

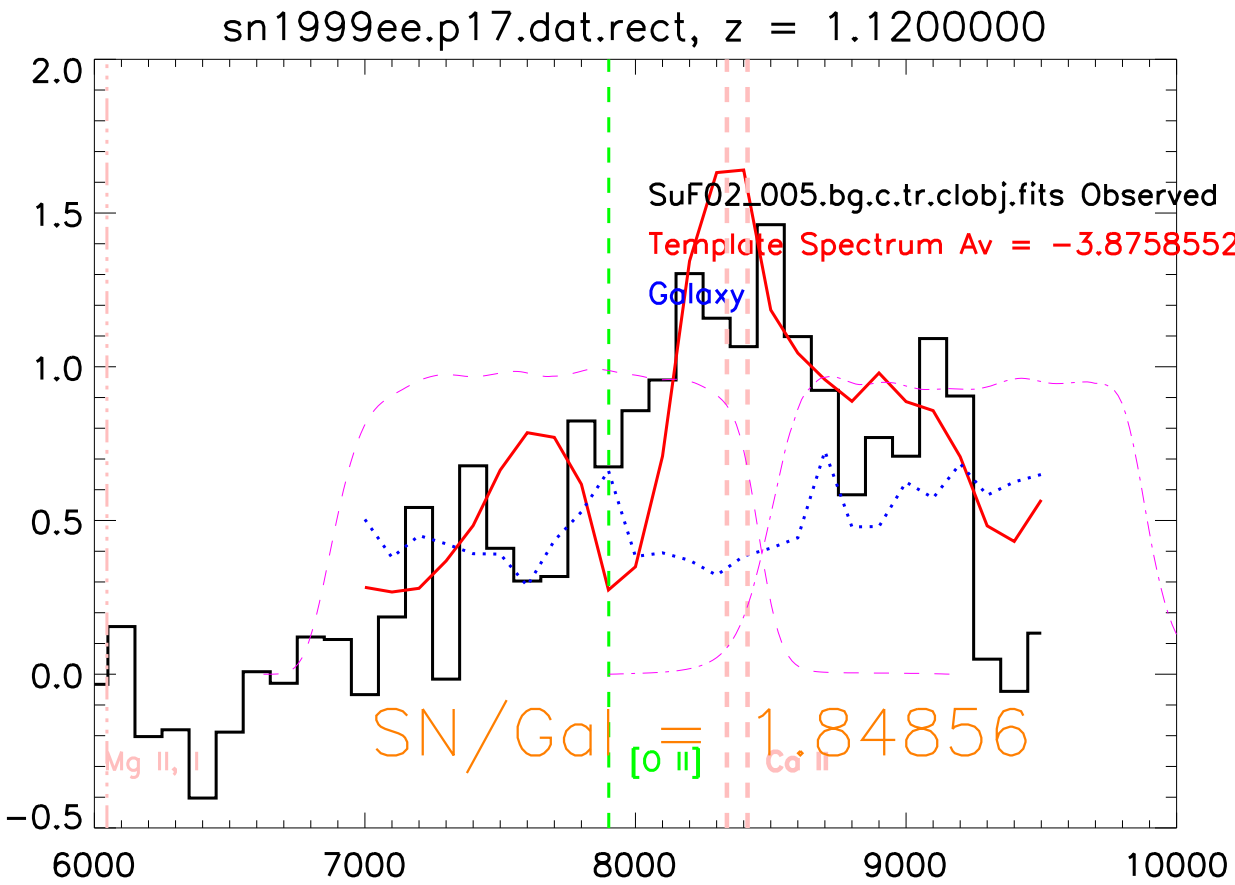

sn1999ee.p23.dat.rect, z = 1.1200000
SuF02_005.bg.c.tr.clobj.fits Observed – Galaxy
Template Spectrum Av = −4.9923971
Galaxy
SN/Gal = 1.71295
Mg II, I
[O II]
Ca II
2.0
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

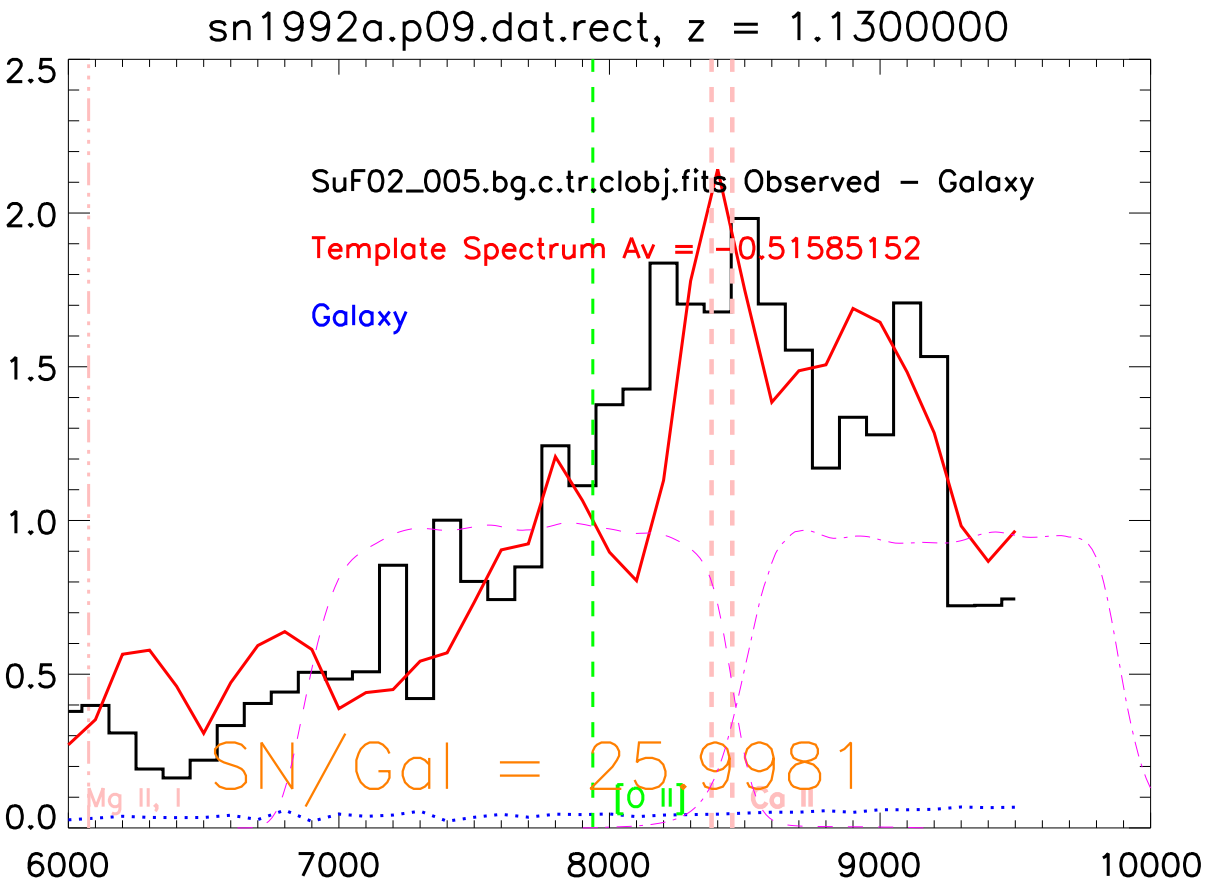

sn1991t.m00.dat.rect, z = 1.2500000
SuF02_005.bg.c.tr.clobj.fits Observed – Galaxy
Template Spectrum Av = 0.66377449
Galaxy
SN/Gal = 12.2652
Mg II, I
[O II]
Ca II
2.5
2.0
1.5
1.0
0.5
0.0
6000
7000
8000
9000
10000

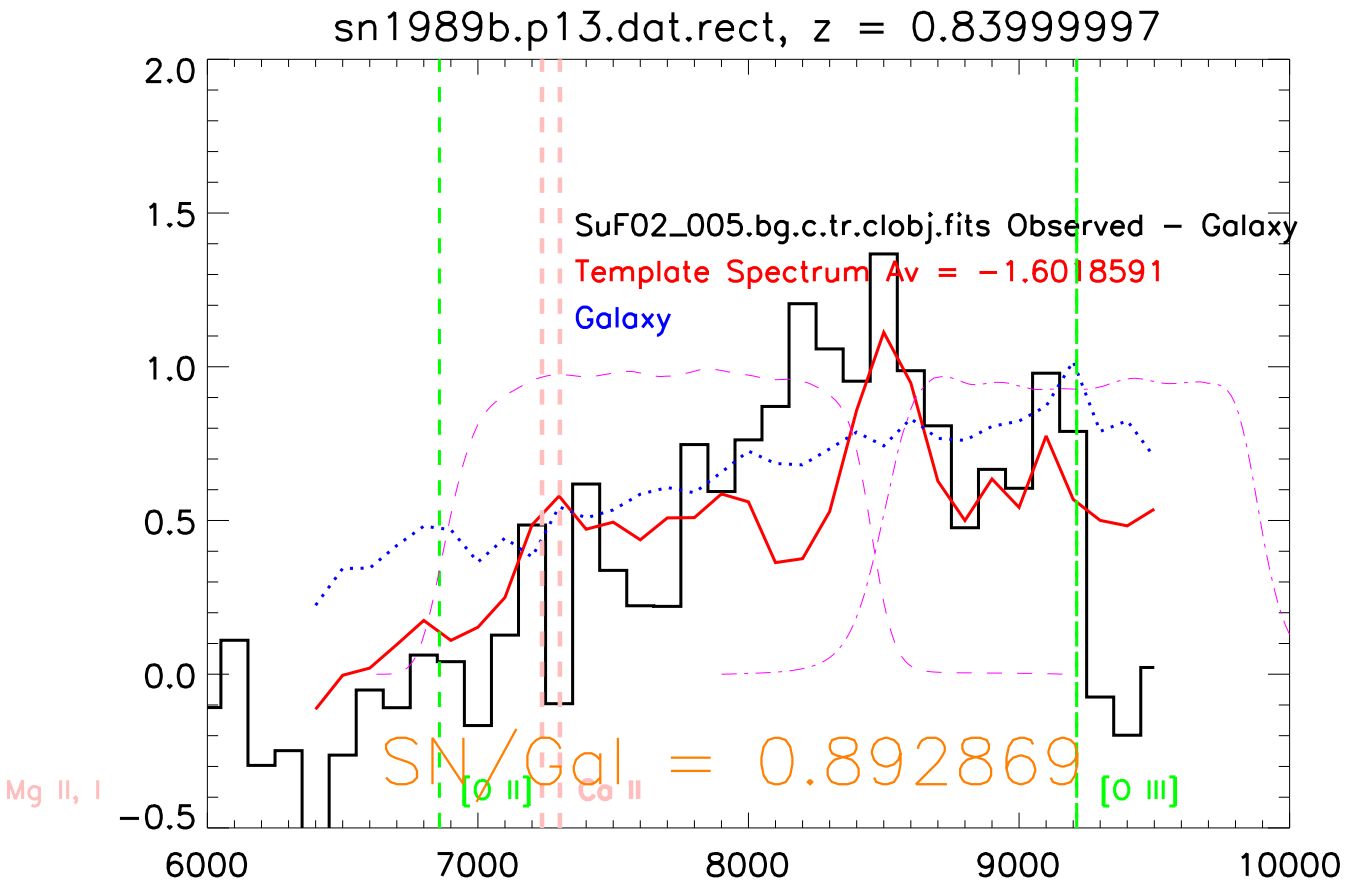

sn1991t.p15.dat.rect, z = 1.1099999
SuF02_005.bg.c.tr.clobj.fits Observed – Galaxy
Template Spectrum Av = −0.51439045
Galaxy
SN/Gal = 4.29426
[O II]
Ca II
2.0
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

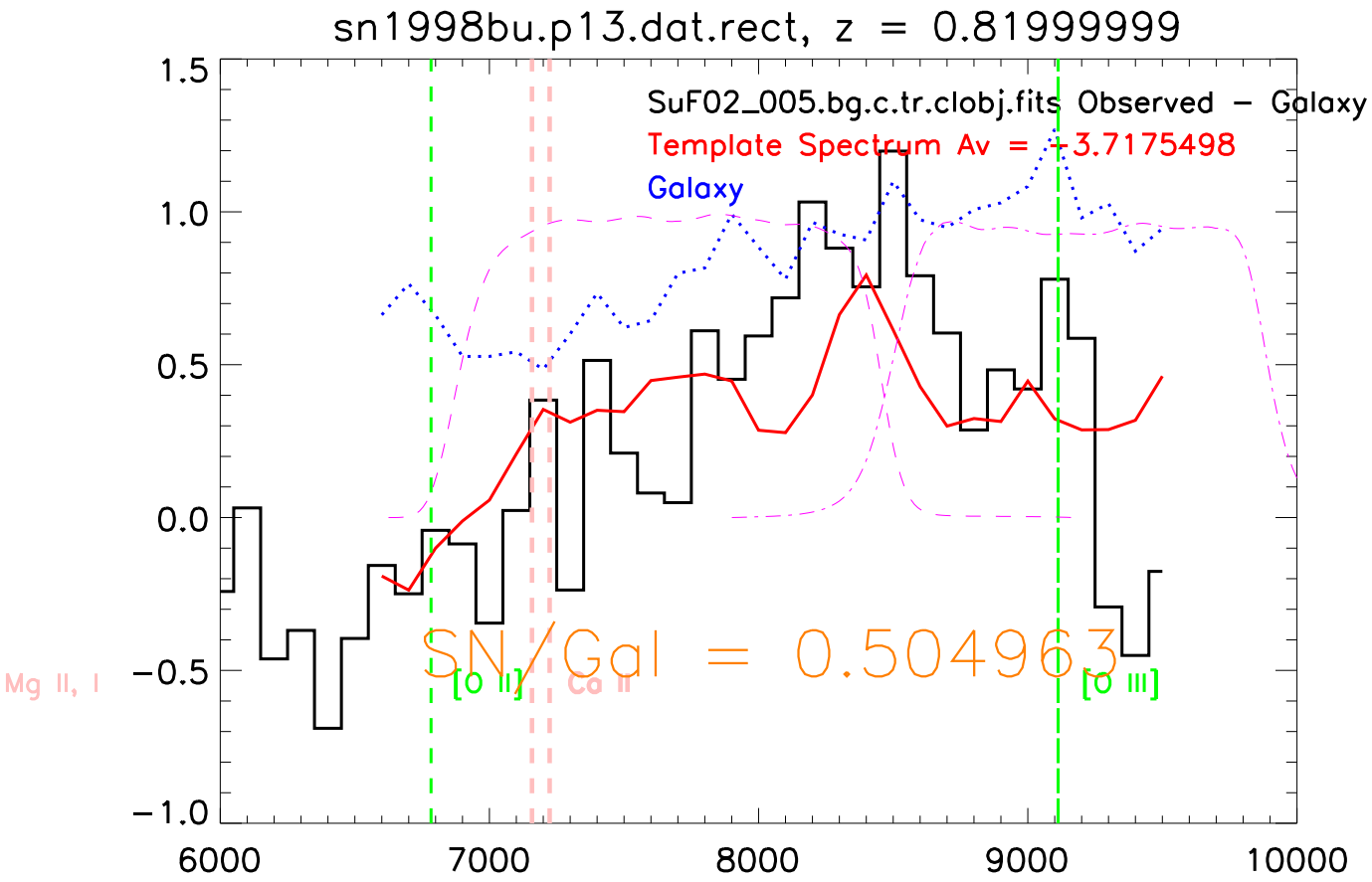

sn1991t.p67.dat.rect, z = 1.1099999
SuF02_005.bg.c.tr.clobj.fits Observed
Galaxy
Template Spectrum Av = -1.4186782
Galaxy
SN/Gal = 6.06025
Mg II
[O II]
Ca II
[O
2.0
1.5
1.0
0.5
0.0
-0.5
6000
7000
8000
9000
10000

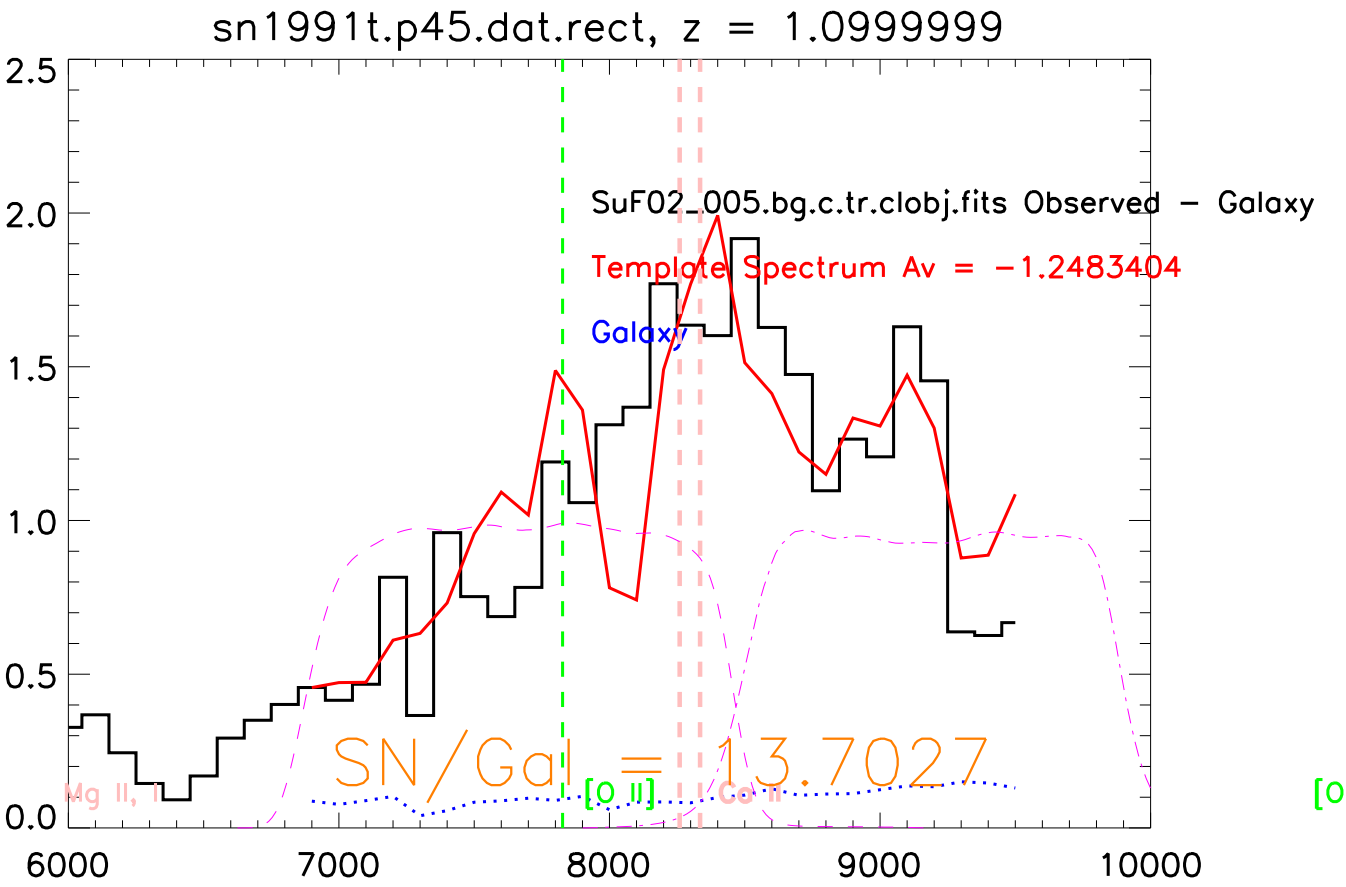

sn1991t.p24.dat.rect, z = 1.1099999
SuF02_005.bg.c.tr.clobj.fits Observed
Galaxy
Template Spectrum Av = -0.96848053
Galaxy
SN/Gal = 6.59358
Mg II
[O II]
Ca II
[O
2.5
2.0
1.5
1.0
0.5
0.0
-0.5
6000
7000
8000
9000
10000

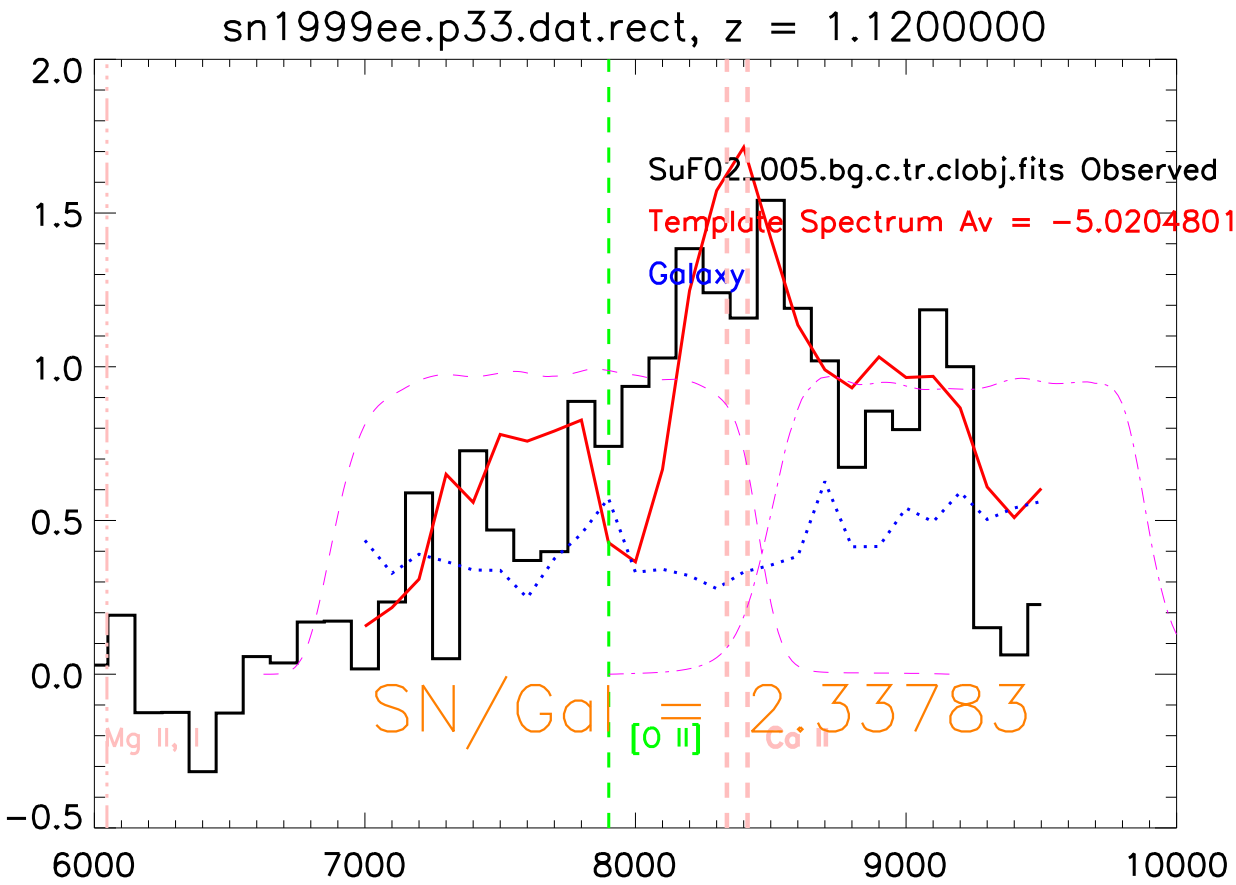

sn1999ee.p17.dat.rect, z = 1.1200000
SuF02_005.bg.c.tr.clobj.fits Observed – Galaxy
Template Spectrum Av = −3.8758552
Galaxy
SN/Gal = 1.84856
Mg II, I
[O II]
Ca II
2.0
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

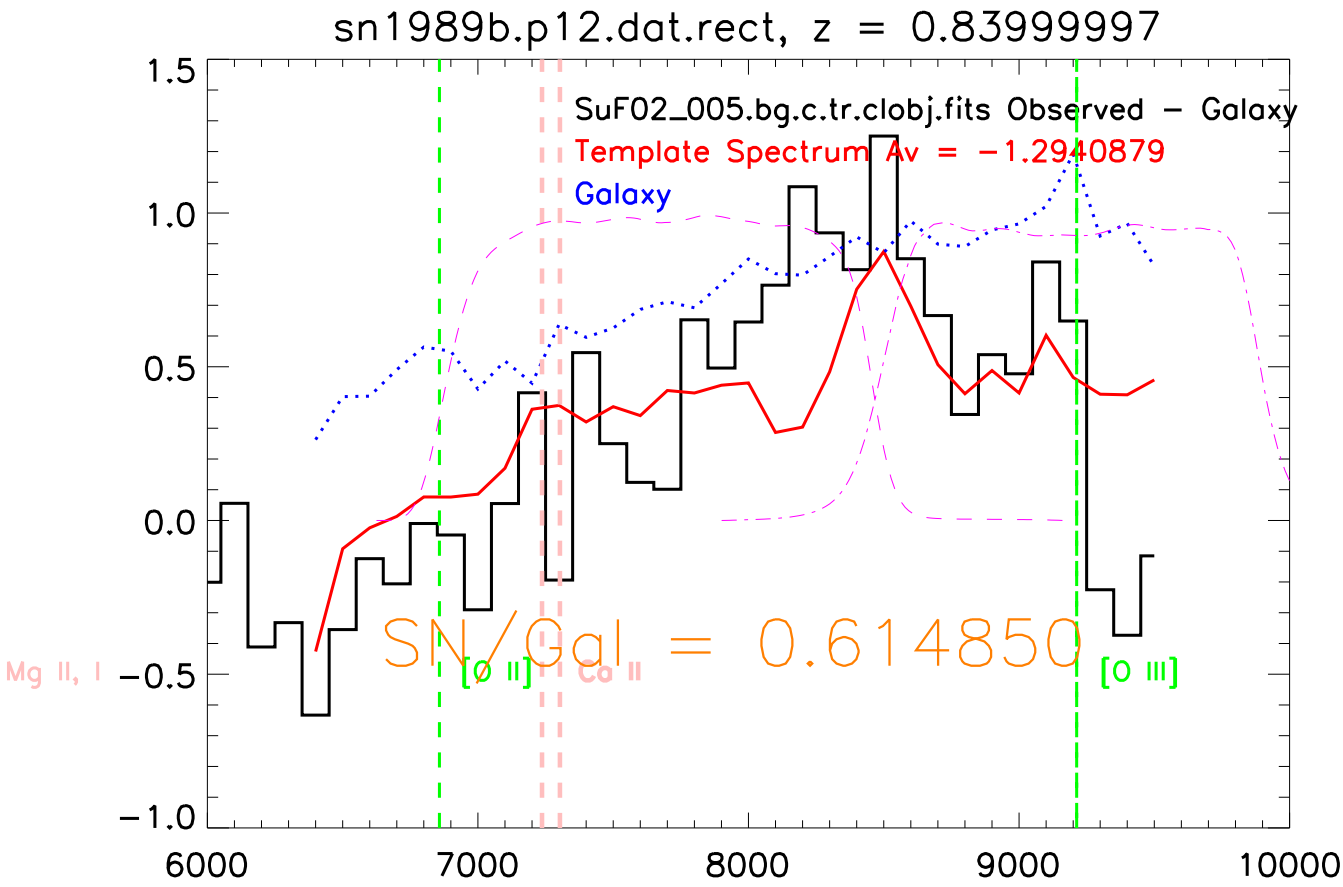

sn1992a.p09.dat.rect, z = 1.1300000
SuF02_005.bg.c.tr.clobj.fits Observed − Galaxy
Template Spectrum Av = −0.51585152
Galaxy
SN/Gal = 25.9981
Mg II, I
[O II]
Ca II
2.5
2.0
1.5
1.0
0.5
0.0
6000
7000
8000
9000
10000

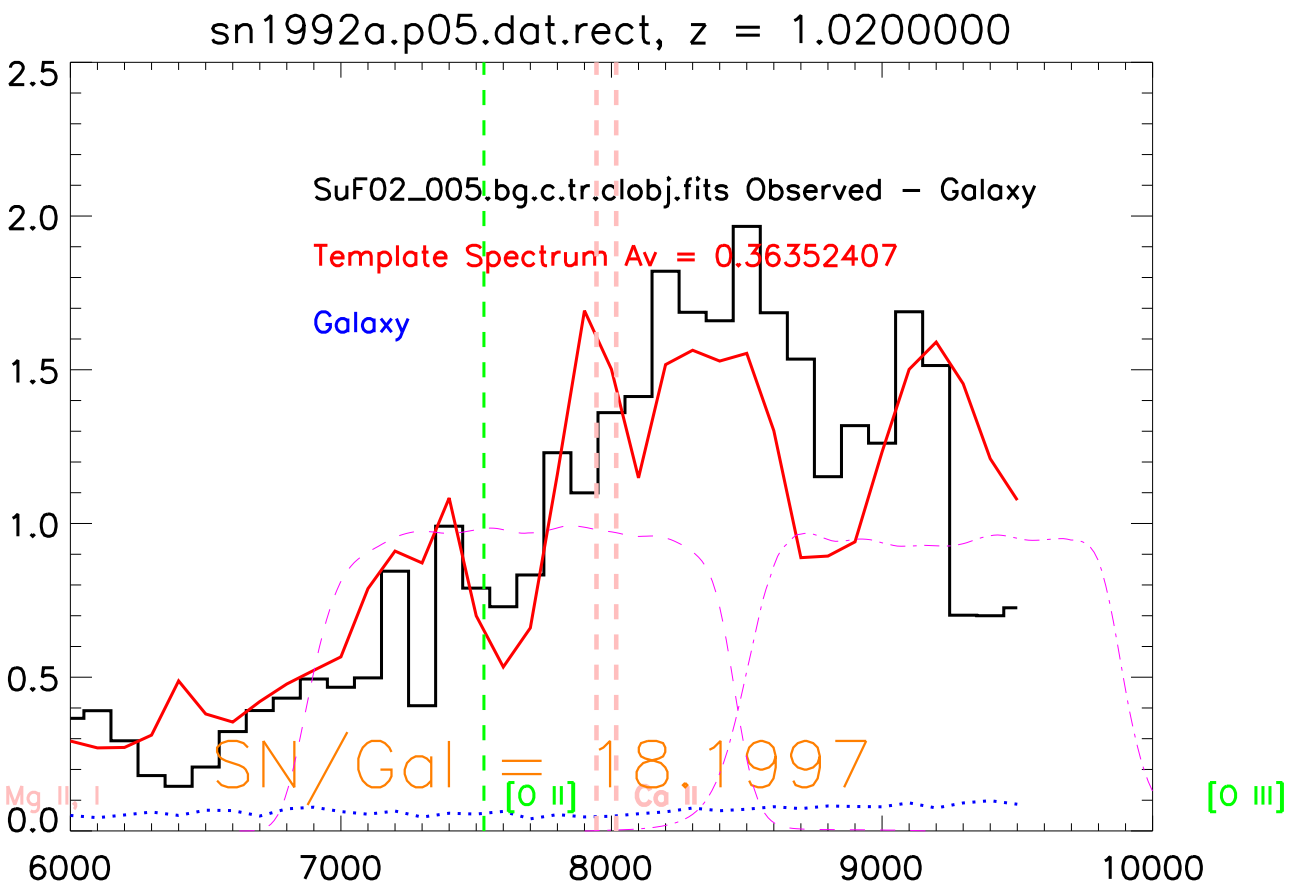

sn1989b.p13.dat.rect, z = 0.83999997
SuF02_005.bg.c.tr.clobj.fits Observed − Galaxy
Template Spectrum Av = −1.6018591
Galaxy
SN/Gal = 0.892869
[O II]
Ca II
[O III]
Mg II, I
2.0
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

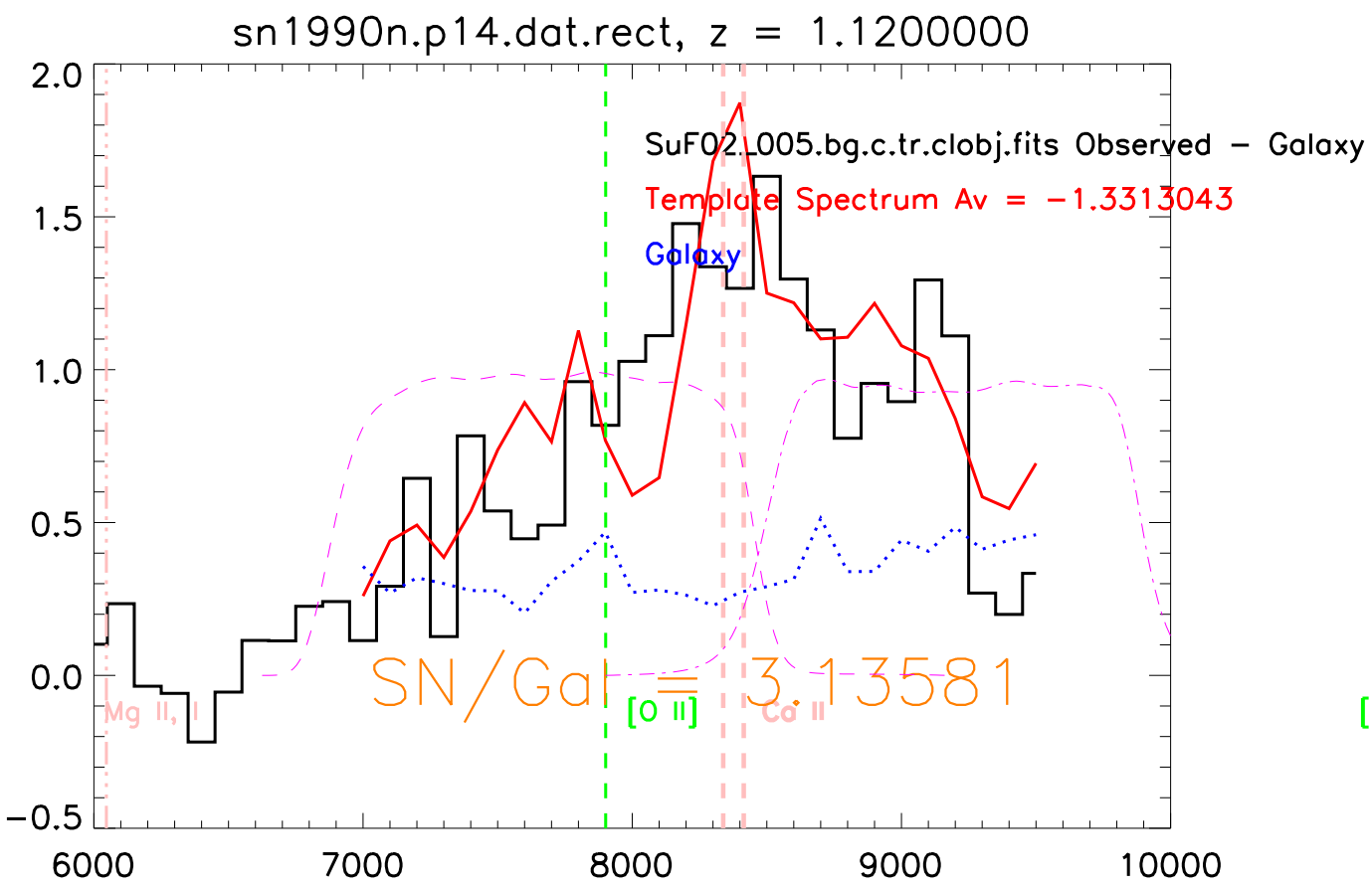

sn1998bu.p13.dat.rect, z = 0.81999999
SuF02_005.bg.c.tr.clobj.fits Observed − Galaxy
Template Spectrum Av = 3.7175498
Galaxy
SN/Gal = 0.504963
Mg II, I
[O II]
Ca II
[O III]
1.5
1.0
0.5
0.0
−0.5
−1.0
6000
7000
8000
9000
10000

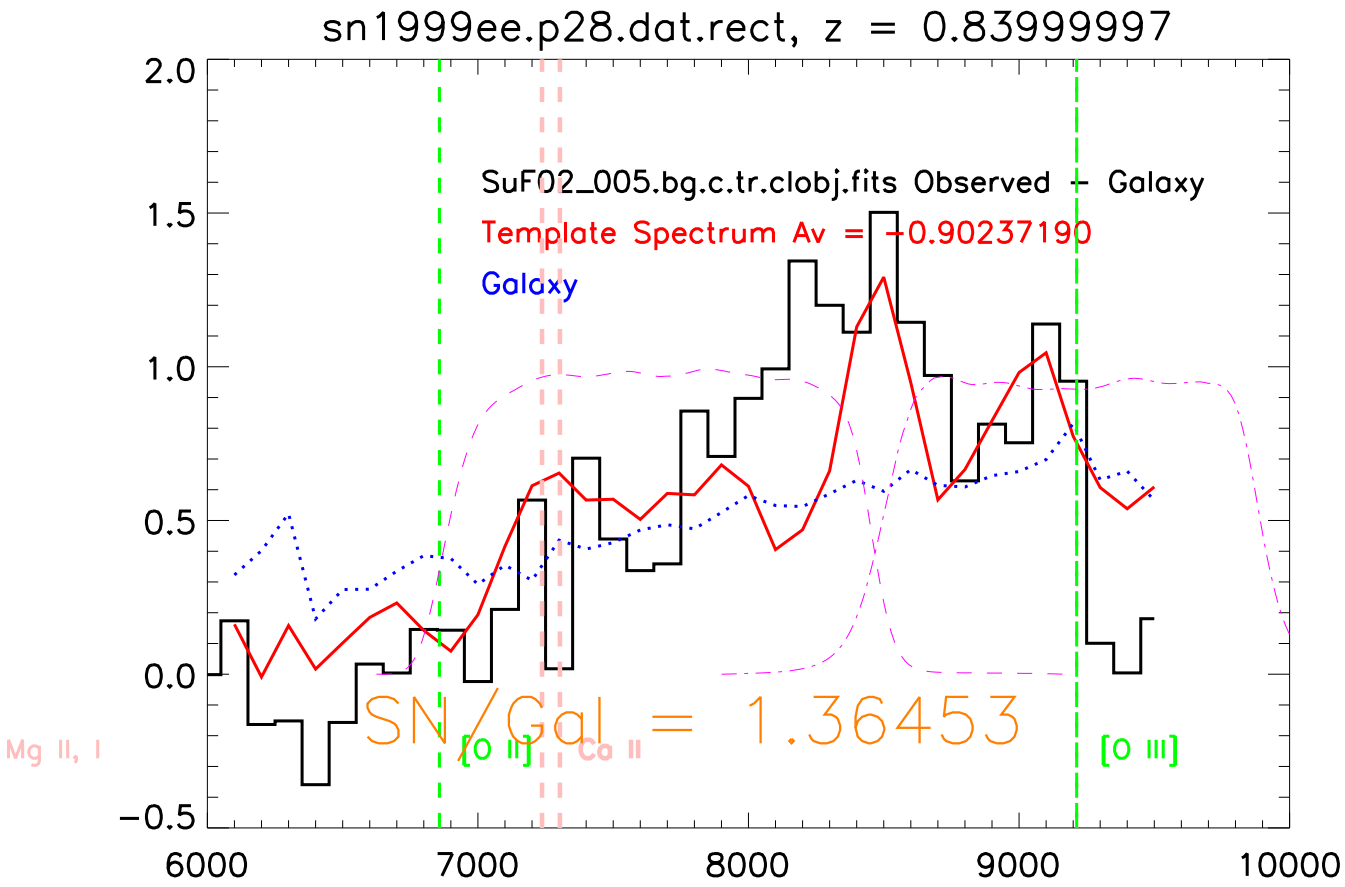

sn1991t.p45.dat.rect, z = 1.0999999
SuF02_005.bg.c.tr.clobj.fits Observed − Galaxy
Template Spectrum Av = −1.2483404
Galaxy
SN/Gal = 13.7027
[O II]
2.5
2.0
1.5
1.0
0.5
0.0
6000
7000
8000
9000
10000

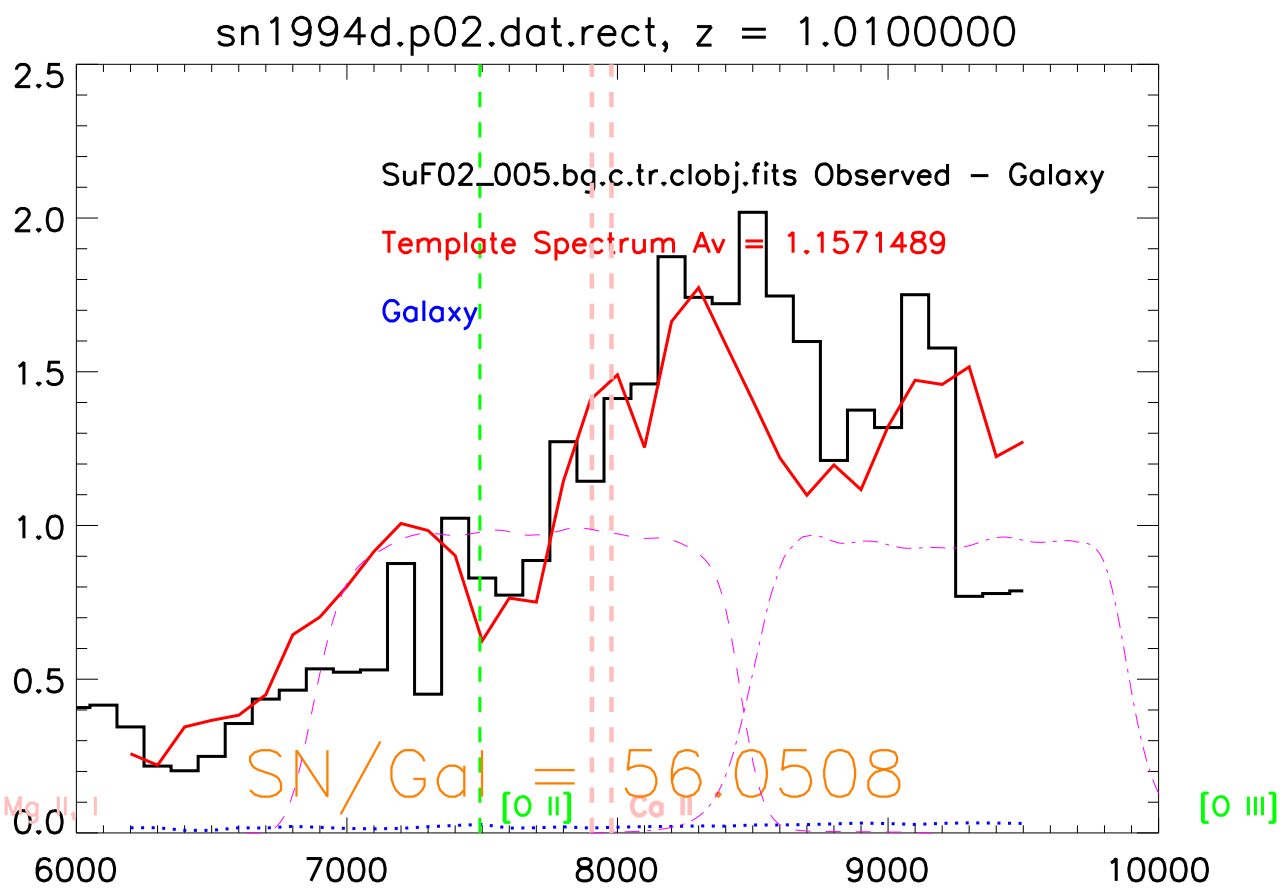

sn1999ee.p33.dat.rect, z = 1.1200000
SuF02_005.bg.c.tr.clobj.fits Observed − Galaxy
Template Spectrum Av = −5.0204801
Galaxy
SN/Gal = 2.33783
Mg II, I
[O II]
Ca II
2.0
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

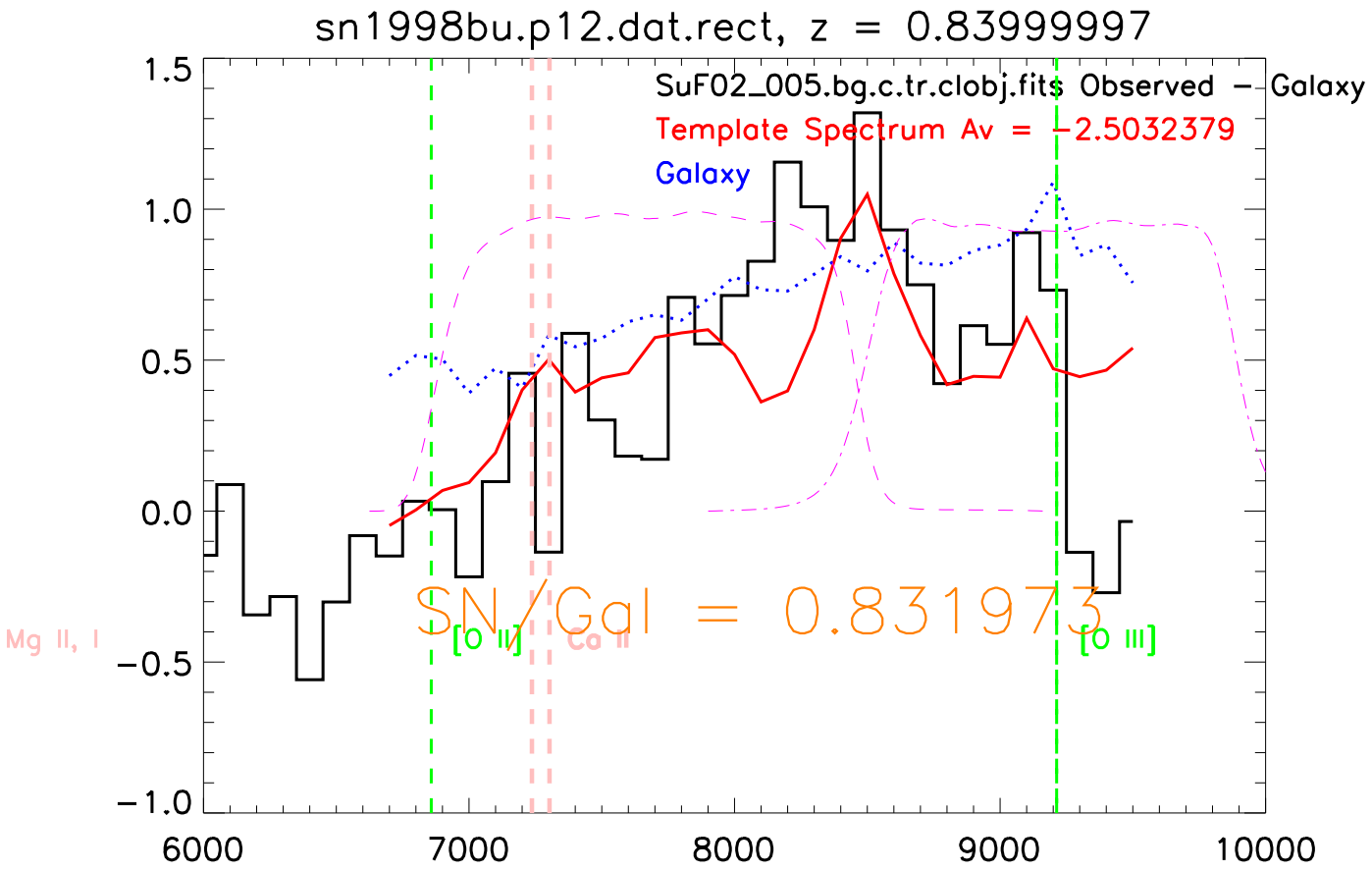

sn1989b.p12.dat.rect, z = 0.83999997
SuF02_005.bg.c.tr.clobj.fits Observed − Galaxy
Template Spectrum Av = −1.2940879
Galaxy
SN/Gal = 0.614850
[O II]
Ca II
[O III]
Mg II, I
1.5
1.0
0.5
0.0
−0.5
−1.0
6000
7000
8000
9000
10000

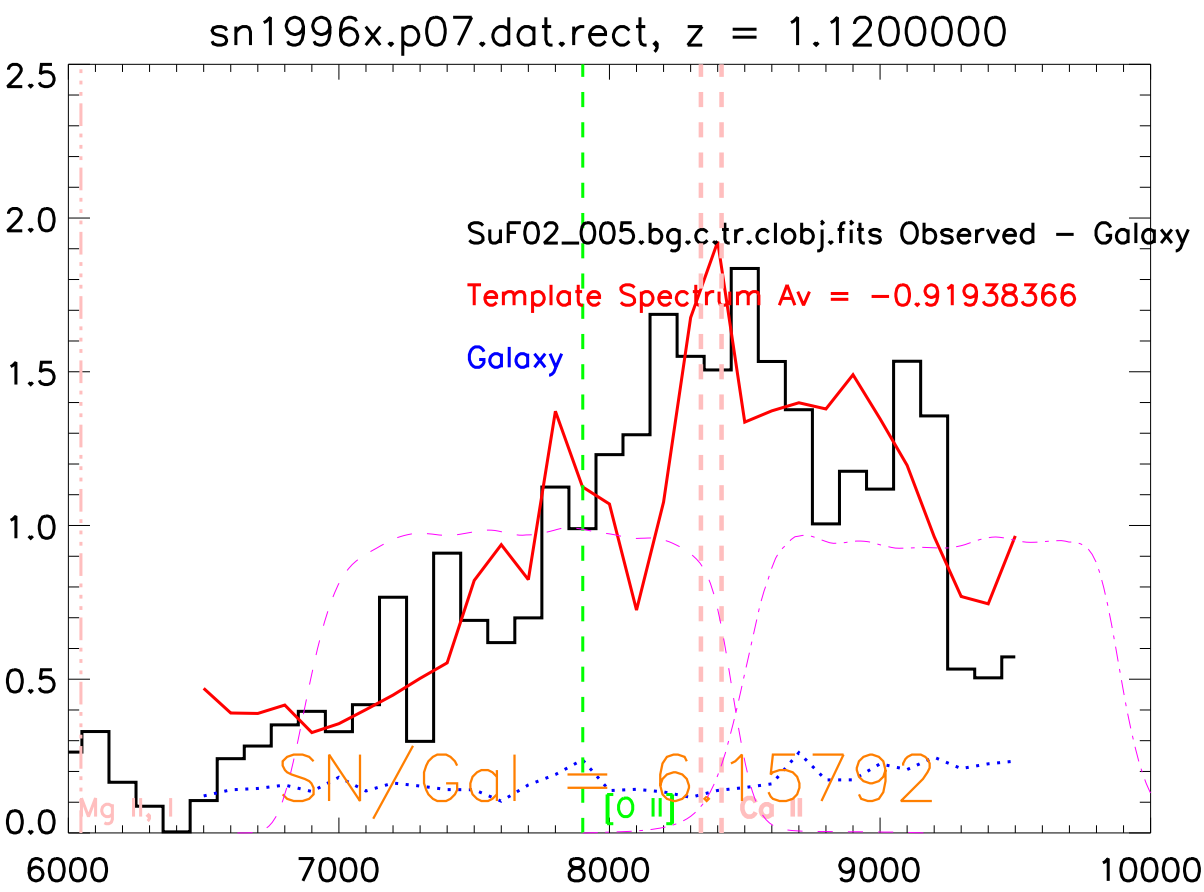

sn1992a.p05.dat.rect, z = 1.0200000
SuF02_005.bg.c.tr.clobj.fits Observed − Galaxy
Template Spectrum Av = 0.36352407
Galaxy
SN/Gal = 18.1997
[O II]
Ca II
[O III]
2.5
2.0
1.5
1.0
0.5
0.0
6000
7000
8000
9000
10000

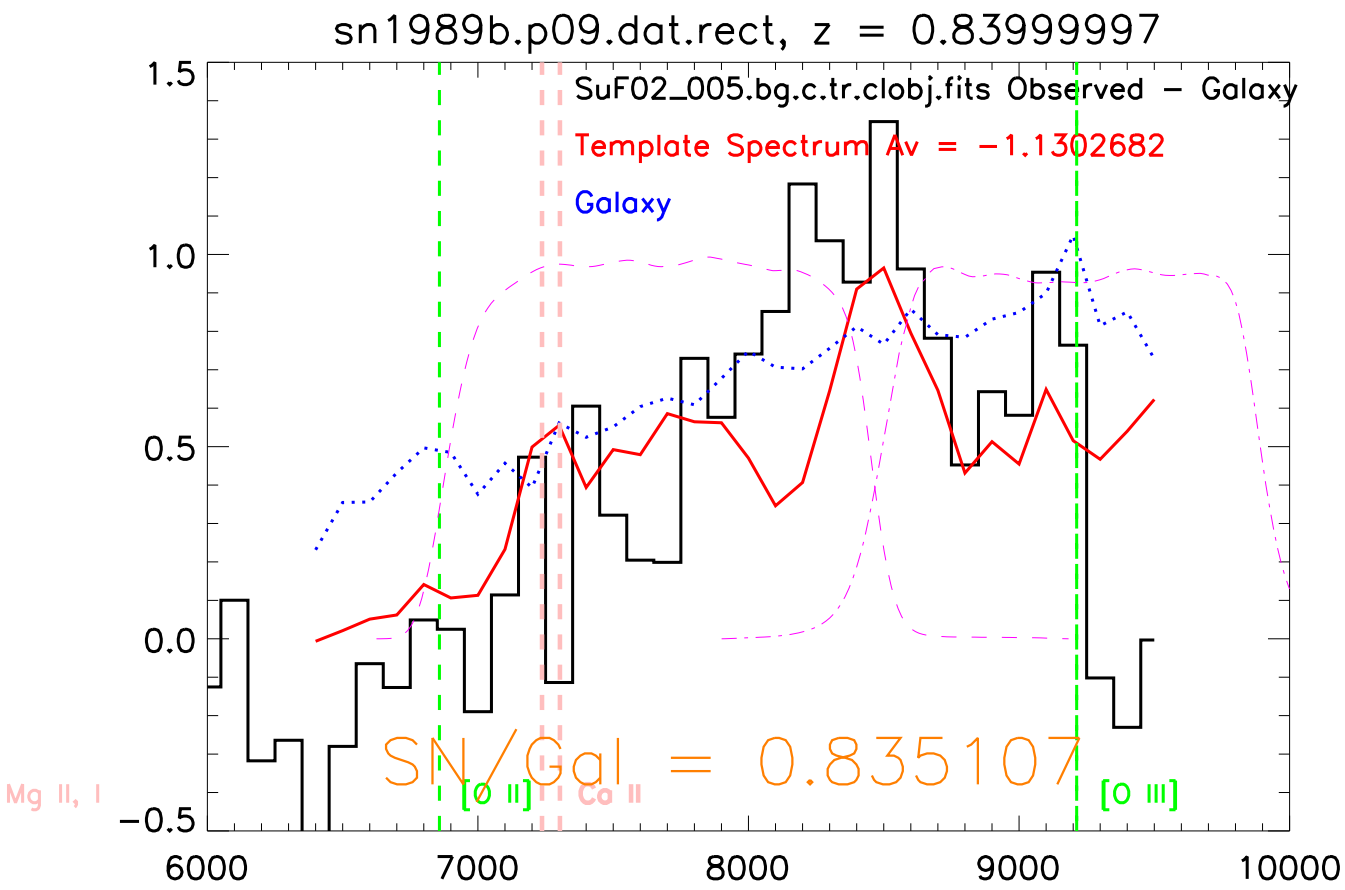

sn1990n.p14.dat.rect, z = 1.1200000
SuF02_005.bg.c.tr.clobj.fits Observed − Galaxy
Template Spectrum Av = −1.3313043
Galaxy
SN/Gal = 3.13581
[O II]
Ca II
Mg II, I
2.0
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

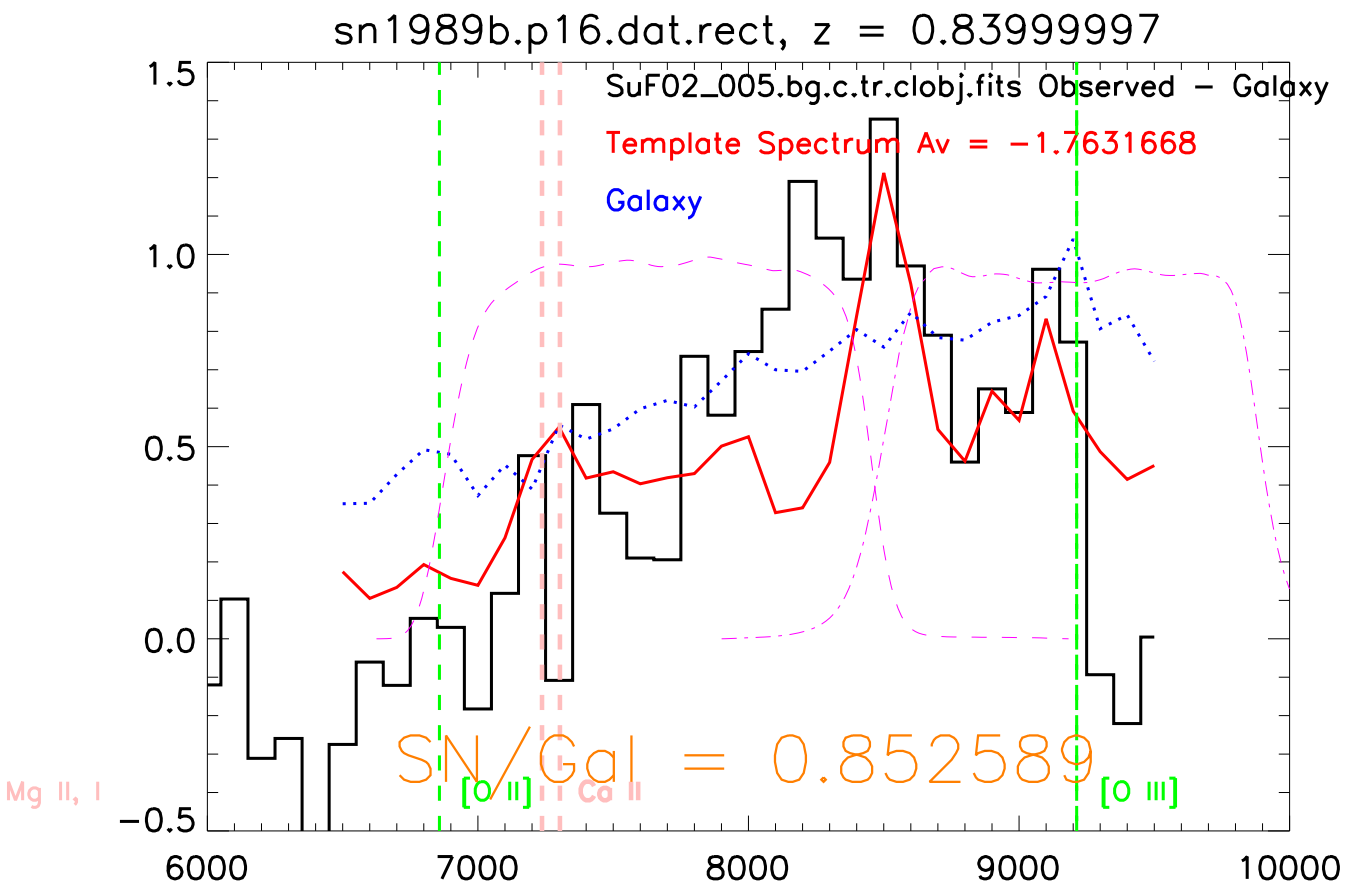

sn1999ee.p28.dat.rect, z = 0.83999997
SuF02_005.bg.c.tr.clobj.fits Observed + Galaxy
Template Spectrum Av = +0.90237190
Galaxy
SN/Gal = 1.36453
Mg II, I
[O II]
Ca II
[O III]
2.0
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

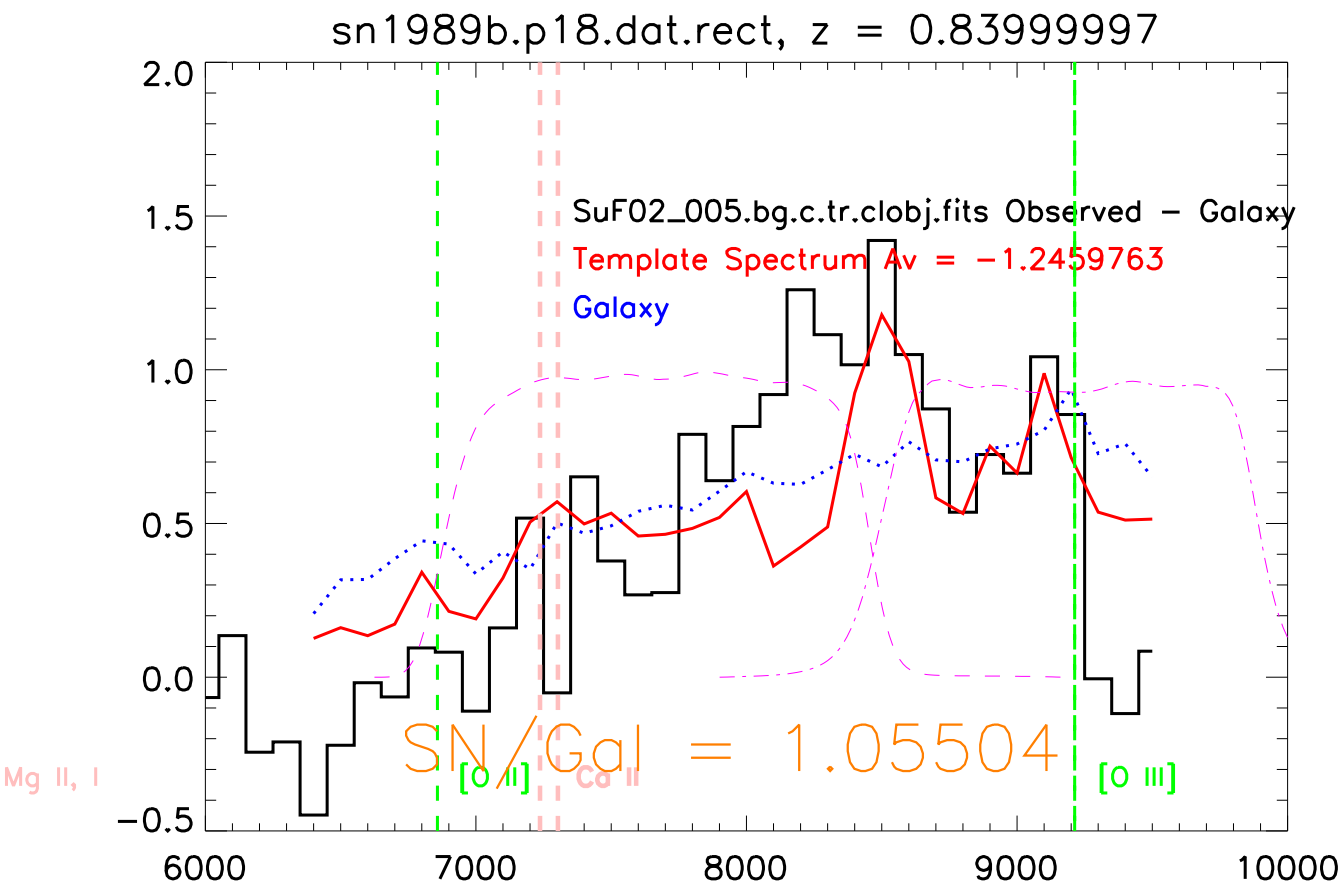

sn1994d.p02.dat.rect, z = 1.0100000
SuF02_005.bg.c.tr.clobj.fits Observed – Galaxy
Template Spectrum Av = 1.1571489
Galaxy
SN/Gal = 56.0508
[O II]
Ca II
[O III]
2.5
2.0
1.5
1.0
0.5
0.0
6000
7000
8000
9000
10000

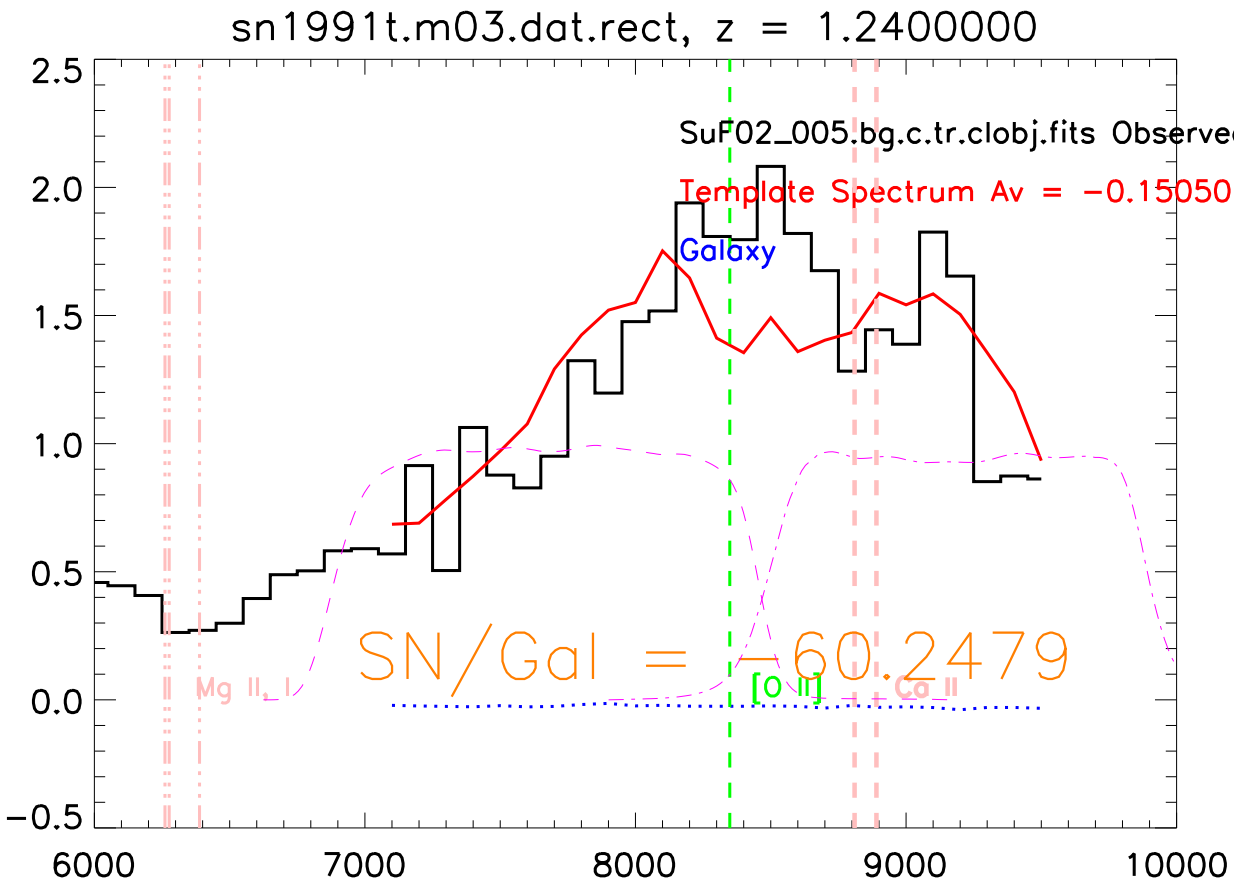

sn1998bu.p12.dat.rect, z = 0.83999997
SuF02_005.bg.c.tr.clobj.fits Observed
Galaxy
Template Spectrum Av = 2.5032379
Galaxy
SN/Gal = 0.831973
[O II]
Co II
[O III]
Mg II, I
1.5
1.0
0.5
0.0
−0.5
−1.0
6000
7000
8000
9000
10000

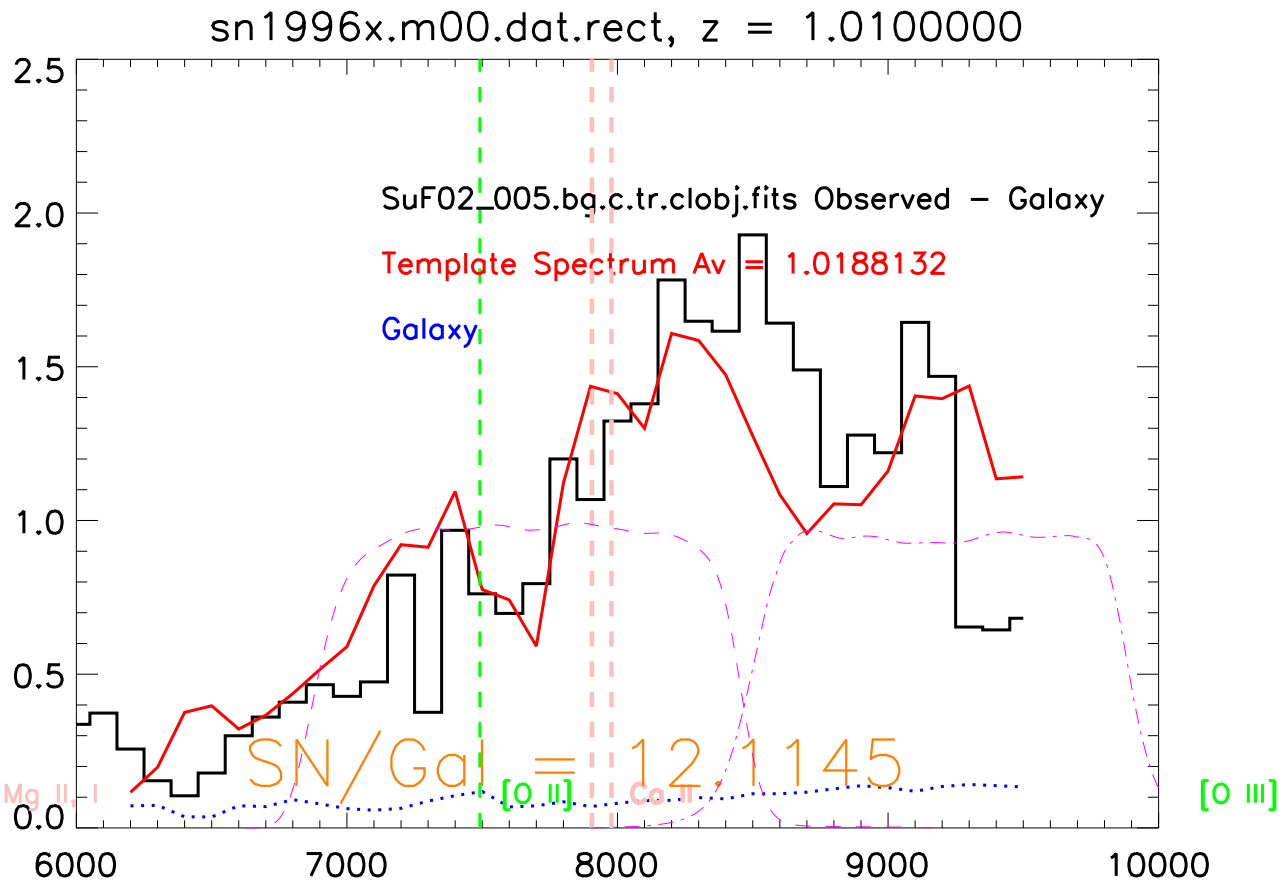

sn1996x.p07.dat.rect, z = 1.1200000
SuF02_005.bg.c.tr.clobj.fits Observed − Galaxy
Template Spectrum Av = −0.91938366
Galaxy
SN/Gal = 6.15792
[O II]
Ca II
2.5
2.0
1.5
1.0
0.5
0.0
6000
7000
8000
9000
10000

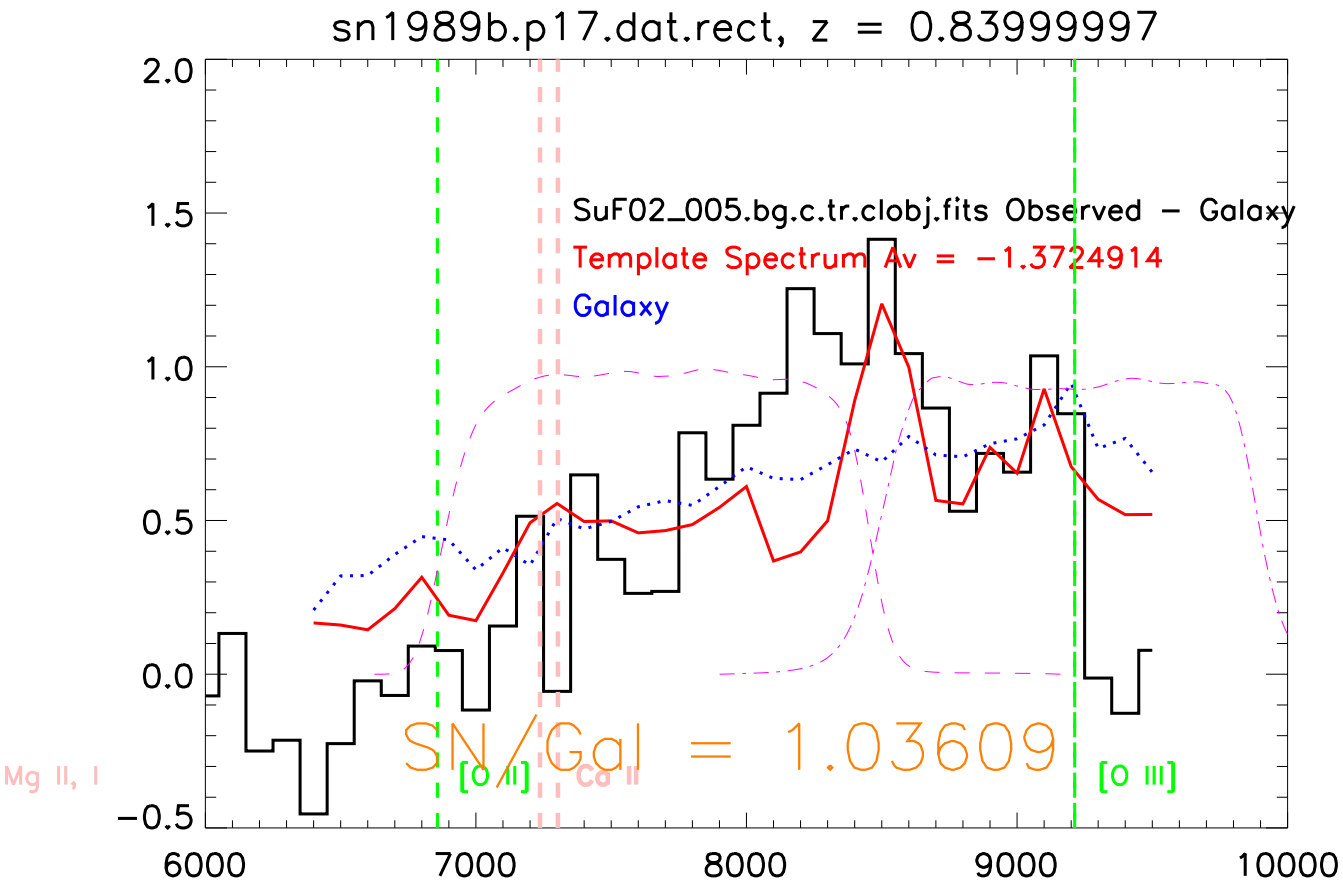

sn1989b.p09.dat.rect, z = 0.83999997
SuF02_005.bg.c.tr.clobj.fits Observed − Galaxy
Template Spectrum Av = −1.1302682
Galaxy
SN/Gal = 0.835107
Mg II, I
[O II]
Ca II
[O III]
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

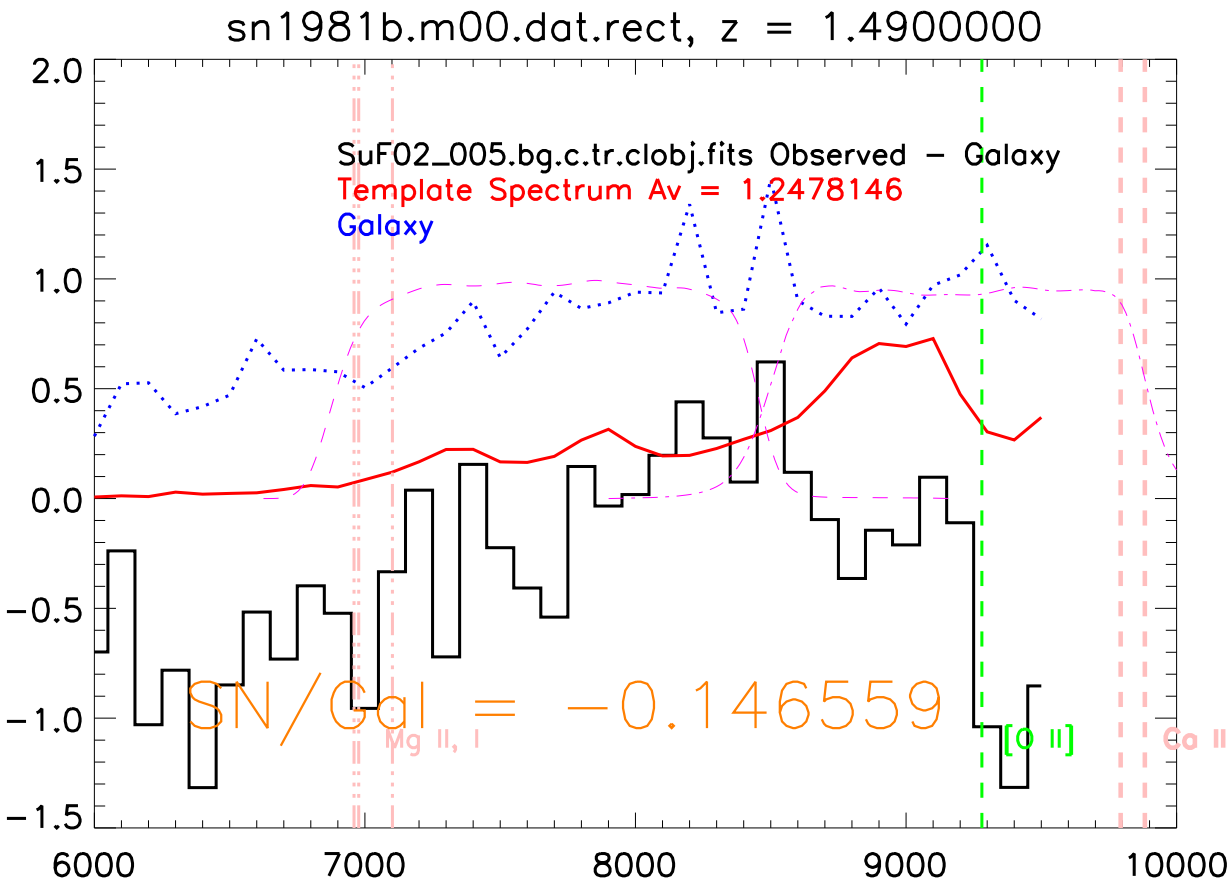

sn1989b.p16.dat.rect, z = 0.83999997
SuF02_005.bg.c.tr.clobj.fits Observed − Galaxy
Template Spectrum Av = −1.7631668
Galaxy
SN/Gal = 0.852589
[O II]
Ca II
[O III]
Mg II, I
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

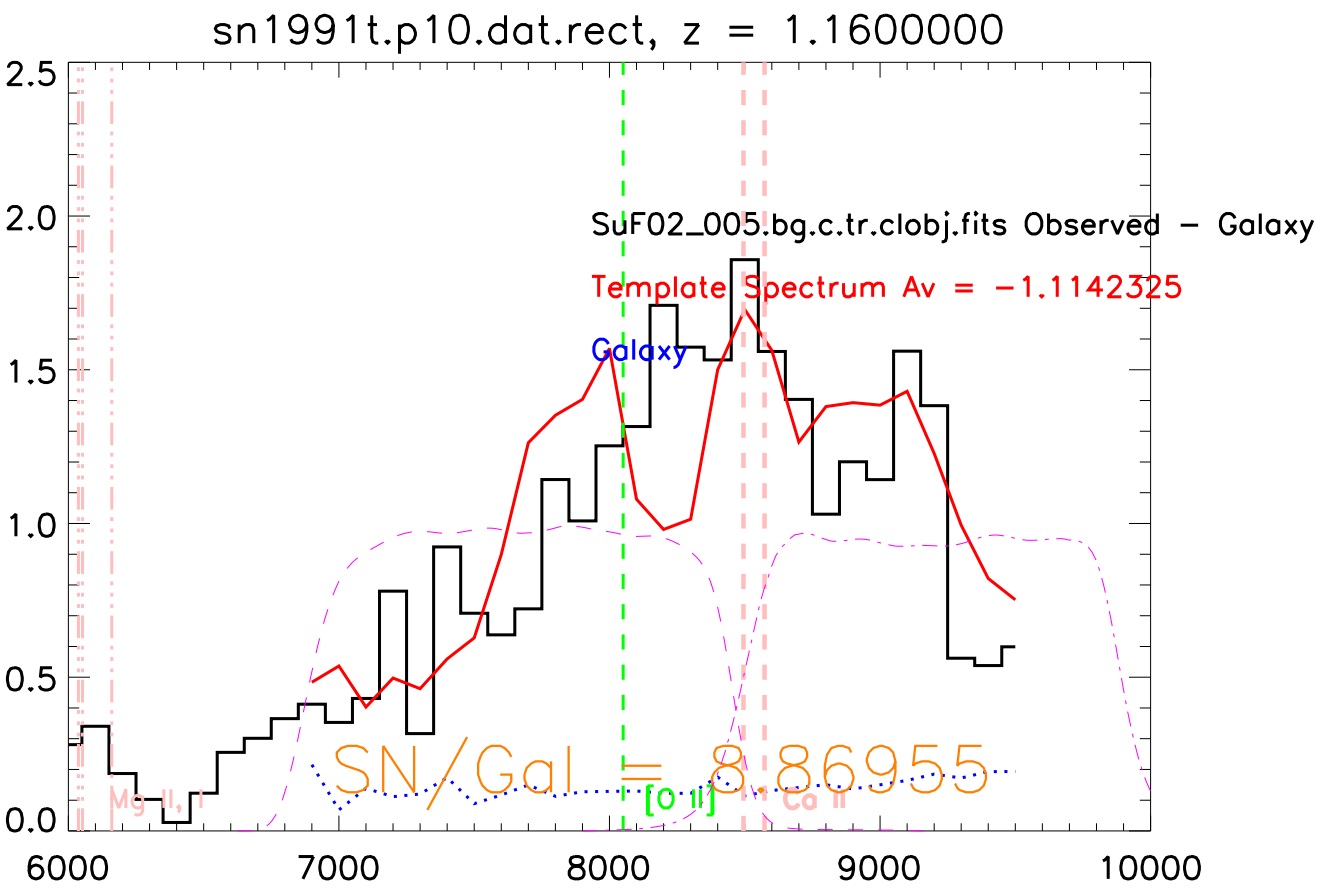

sn1989b.p18.dat.rect, z = 0.83999997
SuF02_005.bg.c.tr.clobj.fits Observed − Galaxy
Template Spectrum Av = −1.2459763
Galaxy
SN/Gal = 1.05504
Mg II, I
[O II]
Ca II
[O III]
2.0
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

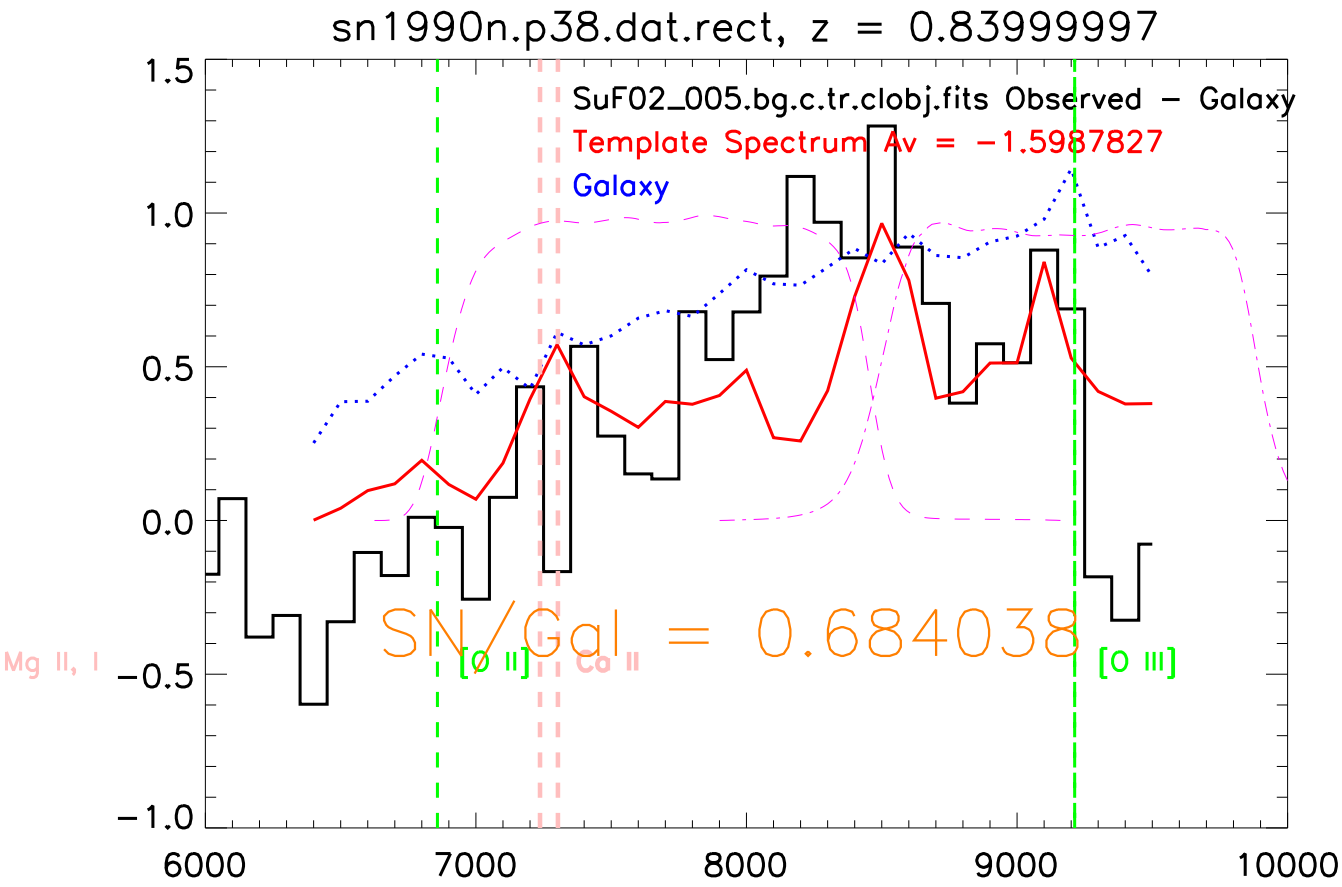

sn1991t.m03.dat.rect, z = 1.2400000
SuF02_005.bg.c.tr.clobj.fits Observed – Galax
Template Spectrum Av = −0.15050610
Galaxy
SN/Gal = 60.2479
Mg II, I
[O II]
Ca II
2.5
2.0
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

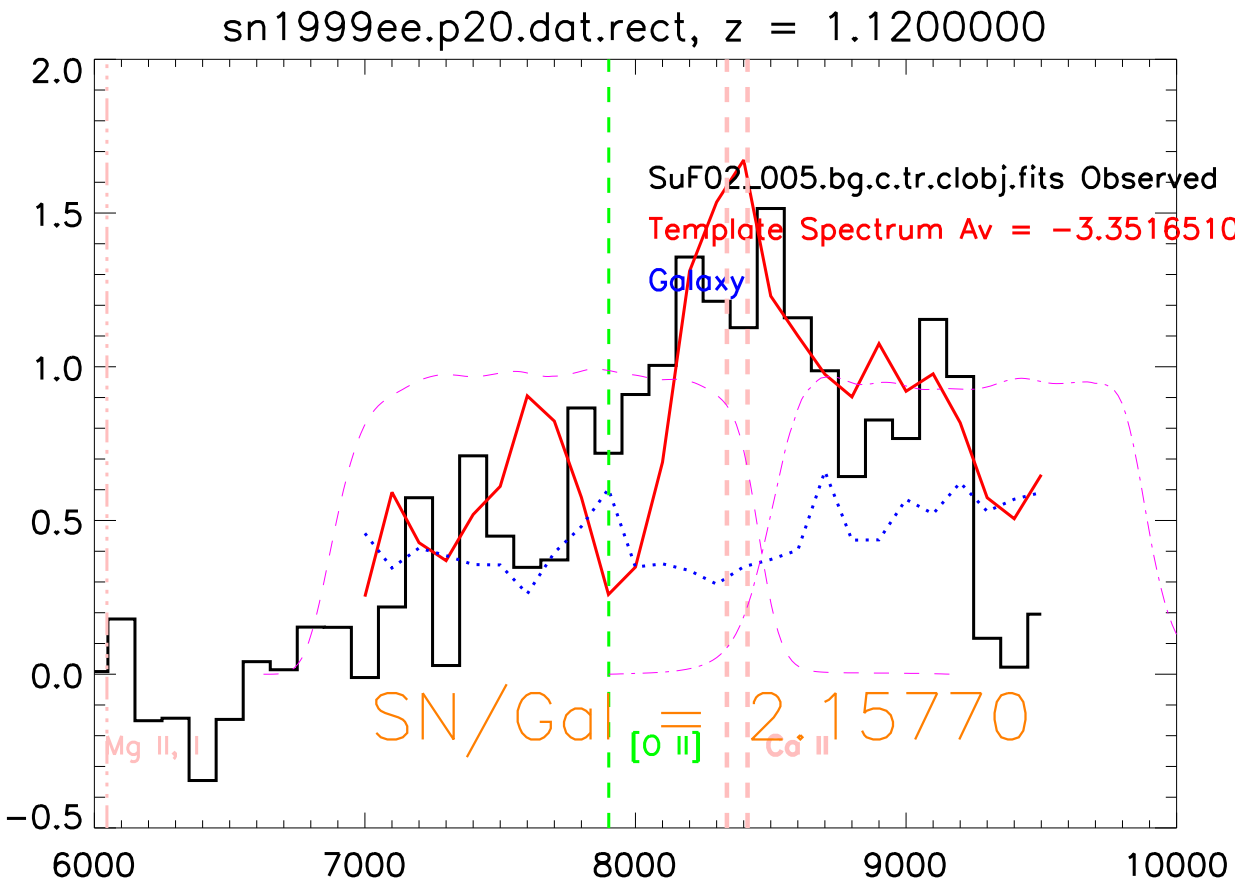

sn1996x.m00.dat.rect, z = 1.0100000
SuF02_005.bg.c.tr.clobj.fits Observed – Galaxy
Template Spectrum Av = 1.0188132
Galaxy
SN/Gal = 12.1145
Mg II
[O II]
Ca II
[O III]
2.5
2.0
1.5
1.0
0.5
0.0
6000
7000
8000
9000
10000

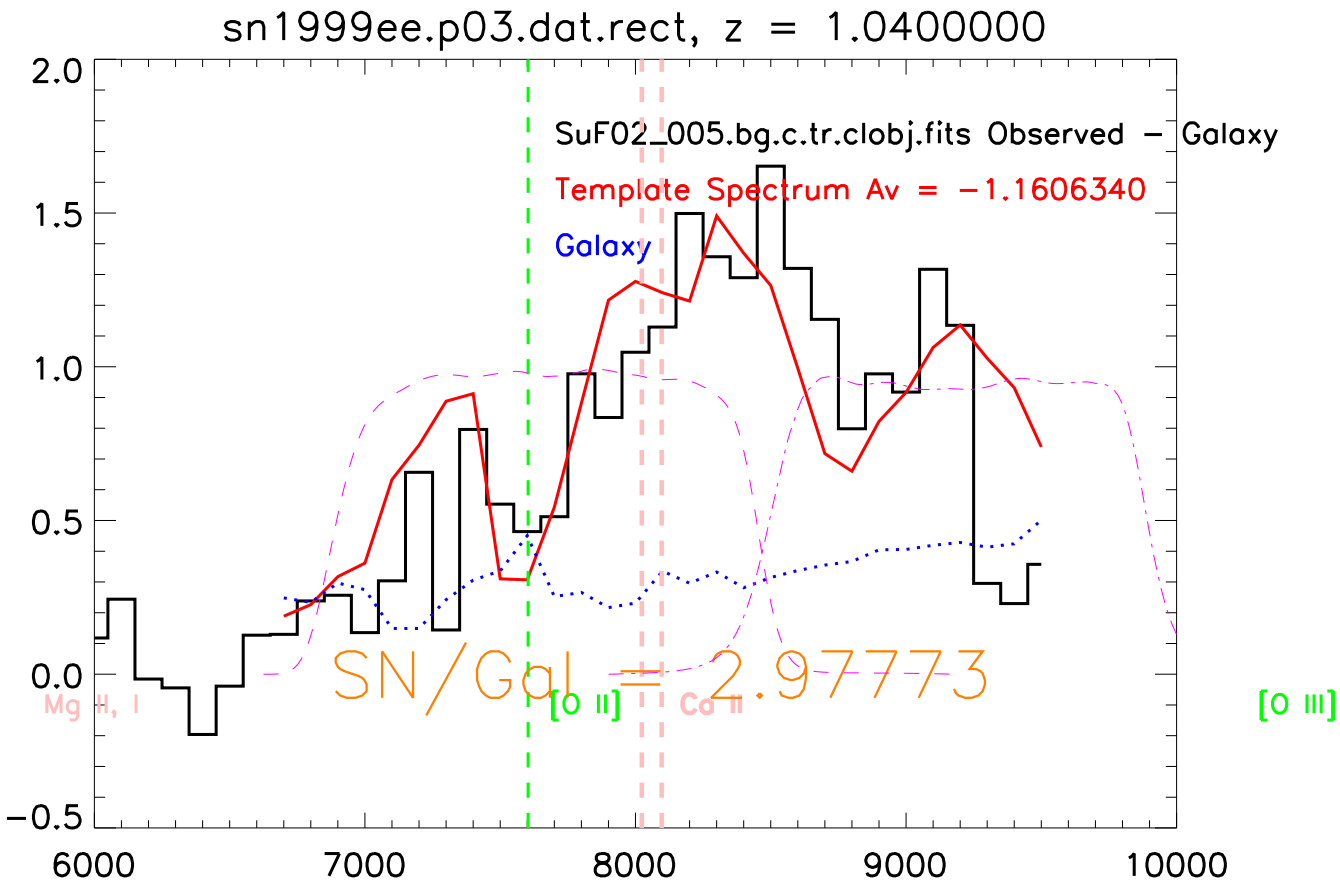

sn1989b.p17.dat.rect, z = 0.83999997
SuF02_005.bg.c.tr.clobj.fits Observed − Galaxy
Template Spectrum Av = −1.3724914
Galaxy
SN/Gal = 1.03609
[O II]
Ca II
[O III]
Mg II, I
2.0
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

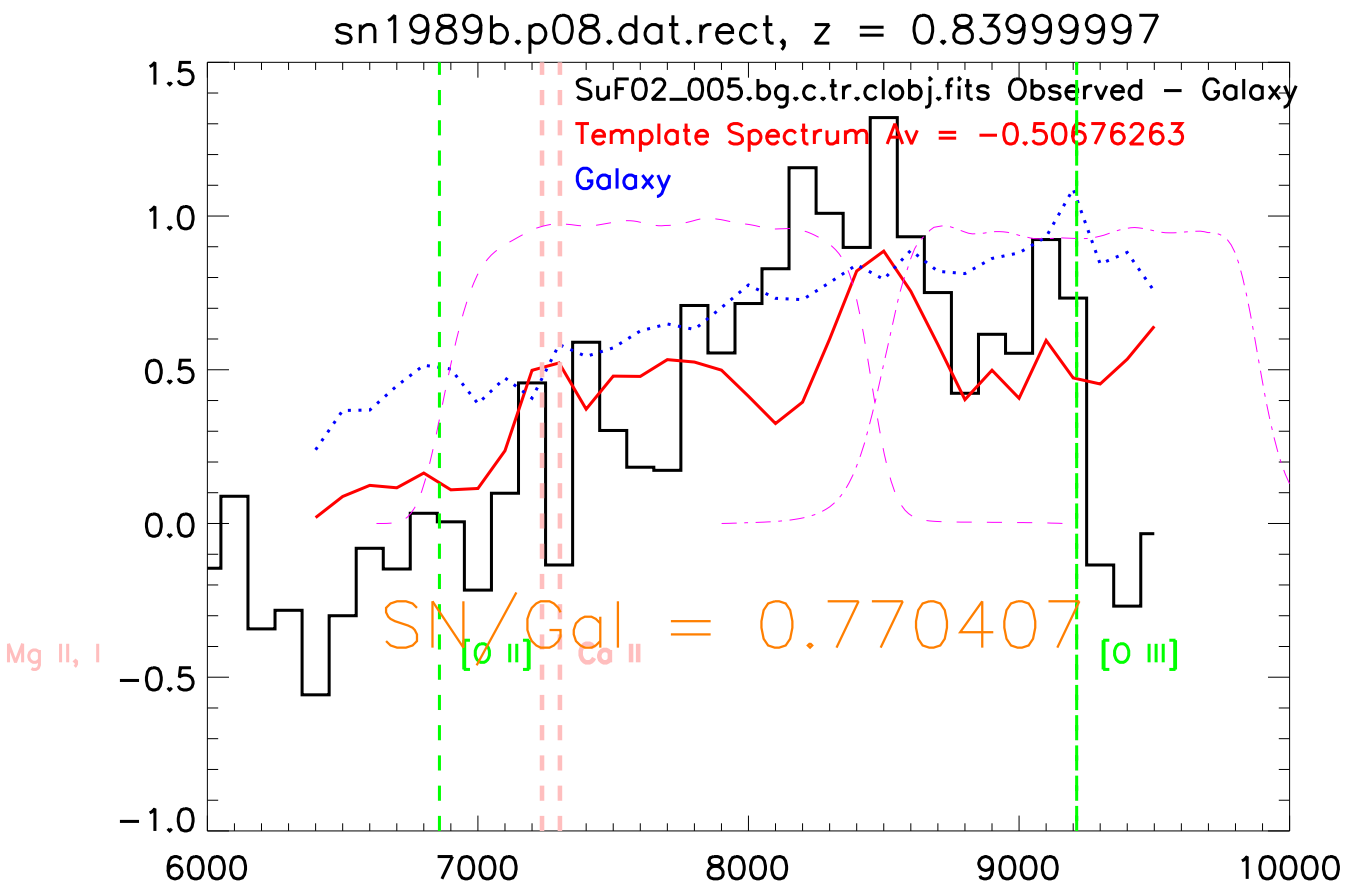

sn1981b.m00.dat.rect, z = 1.4900000
SuF02_005.bg.c.tr.clobj.fits Observed − Galaxy
Template Spectrum Av = 1.2478146
Galaxy
SN/Gal = −0.146559
Mg II, I
[O II]
Ca II
2.0
1.5
1.0
0.5
0.0
−0.5
−1.0
−1.5
6000
7000
8000
9000
10000

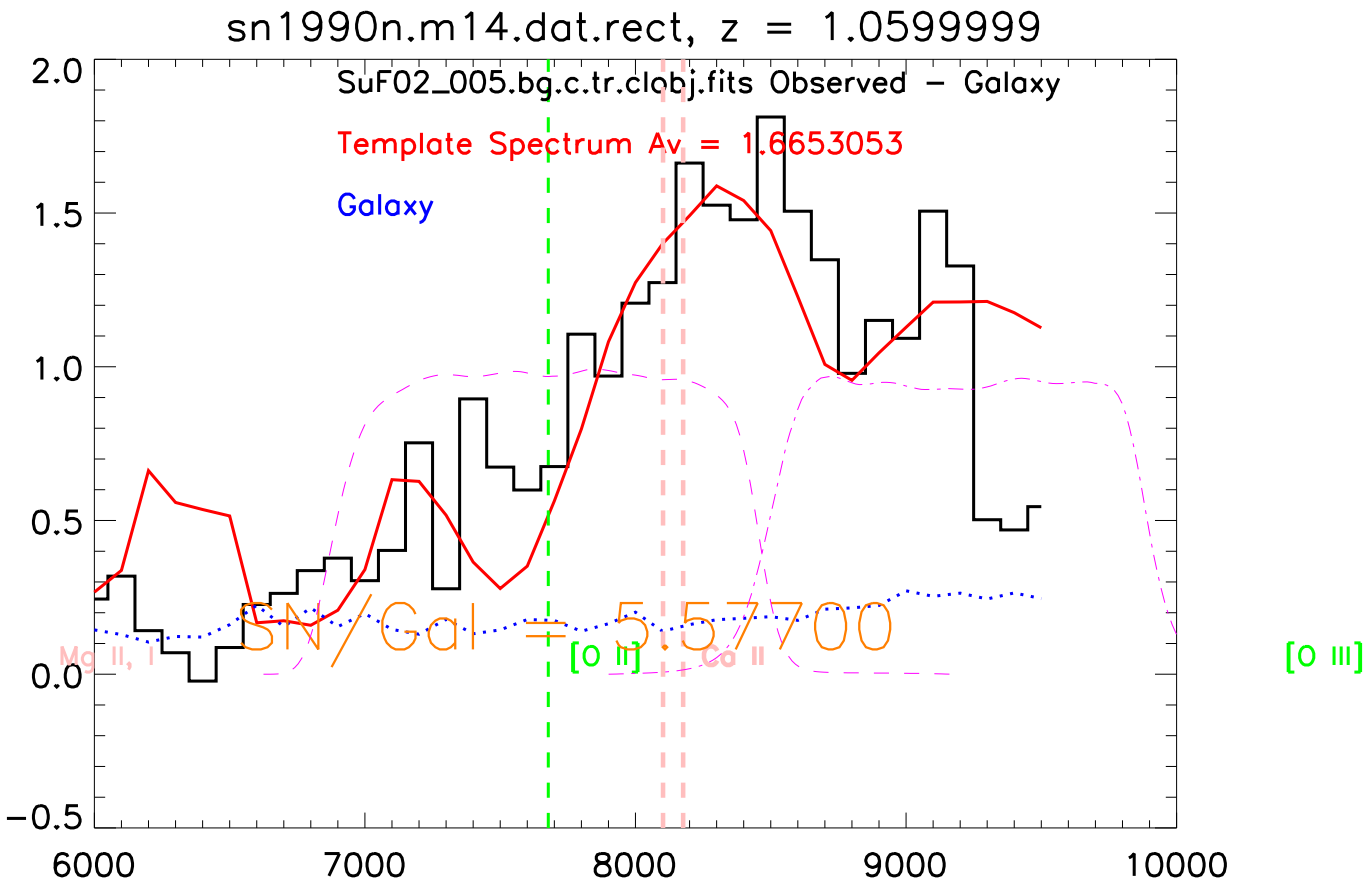

sn1991t.p10.dat.rect, z = 1.1600000
SuF02_005.bg.c.tr.clobj.fits Observed – Galaxy
Template Spectrum Av = -1.1142325
Galaxy
SN/Gal = 8.86955
[O II]
Ca II
Mg II, I
2.5
2.0
1.5
1.0
0.5
0.0
6000
7000
8000
9000
10000

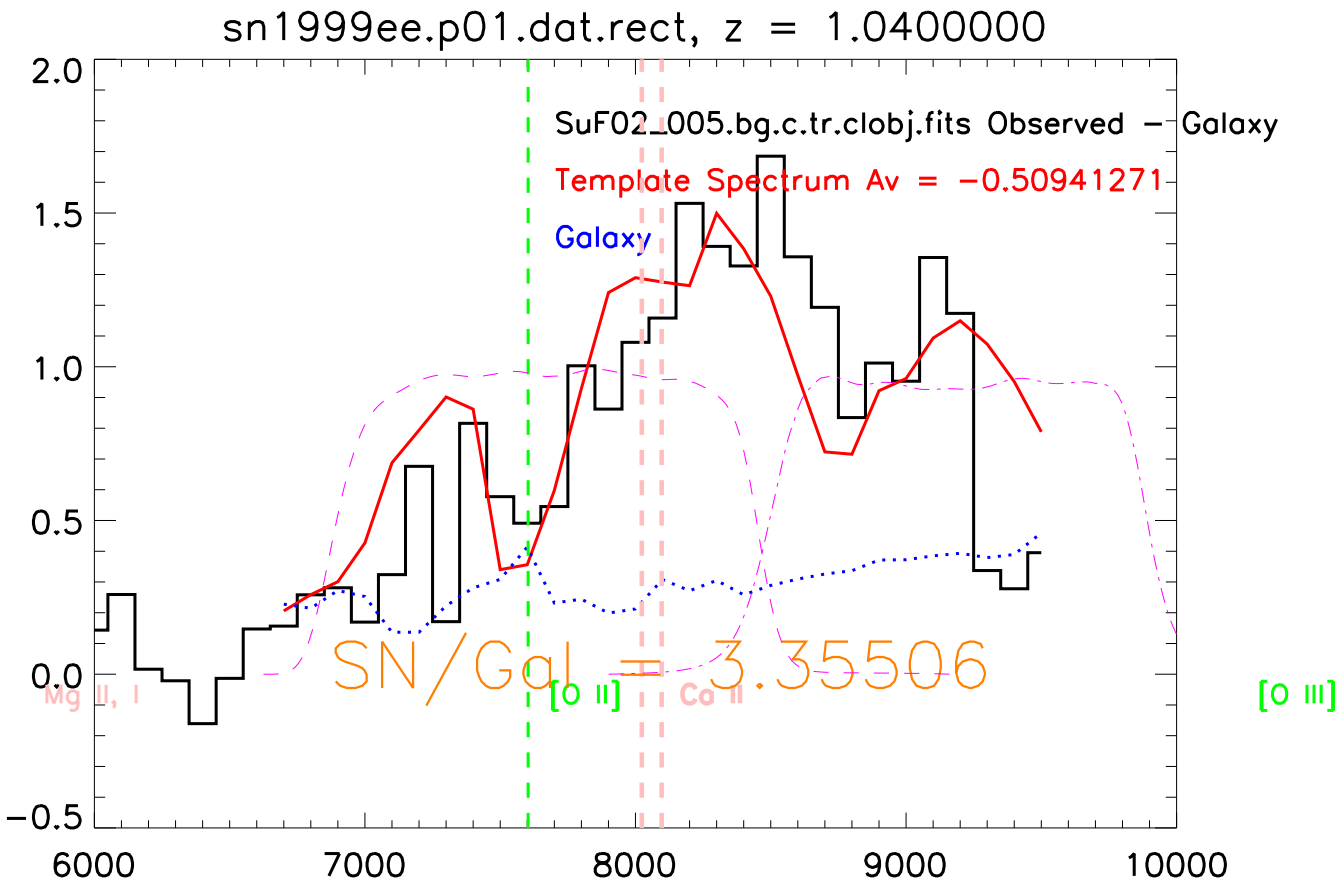

sn1990n.p38.dat.rect, z = 0.83999997
SuF02_005.bg.c.tr.clobj.fits Observed − Galaxy
Template Spectrum Av = −1.5987827
Galaxy
SN/Gal = 0.684038
Mg II, I
[O II]
Ca II
[O III]
1.5
1.0
0.5
0.0
−0.5
−1.0
6000
7000
8000
9000
10000

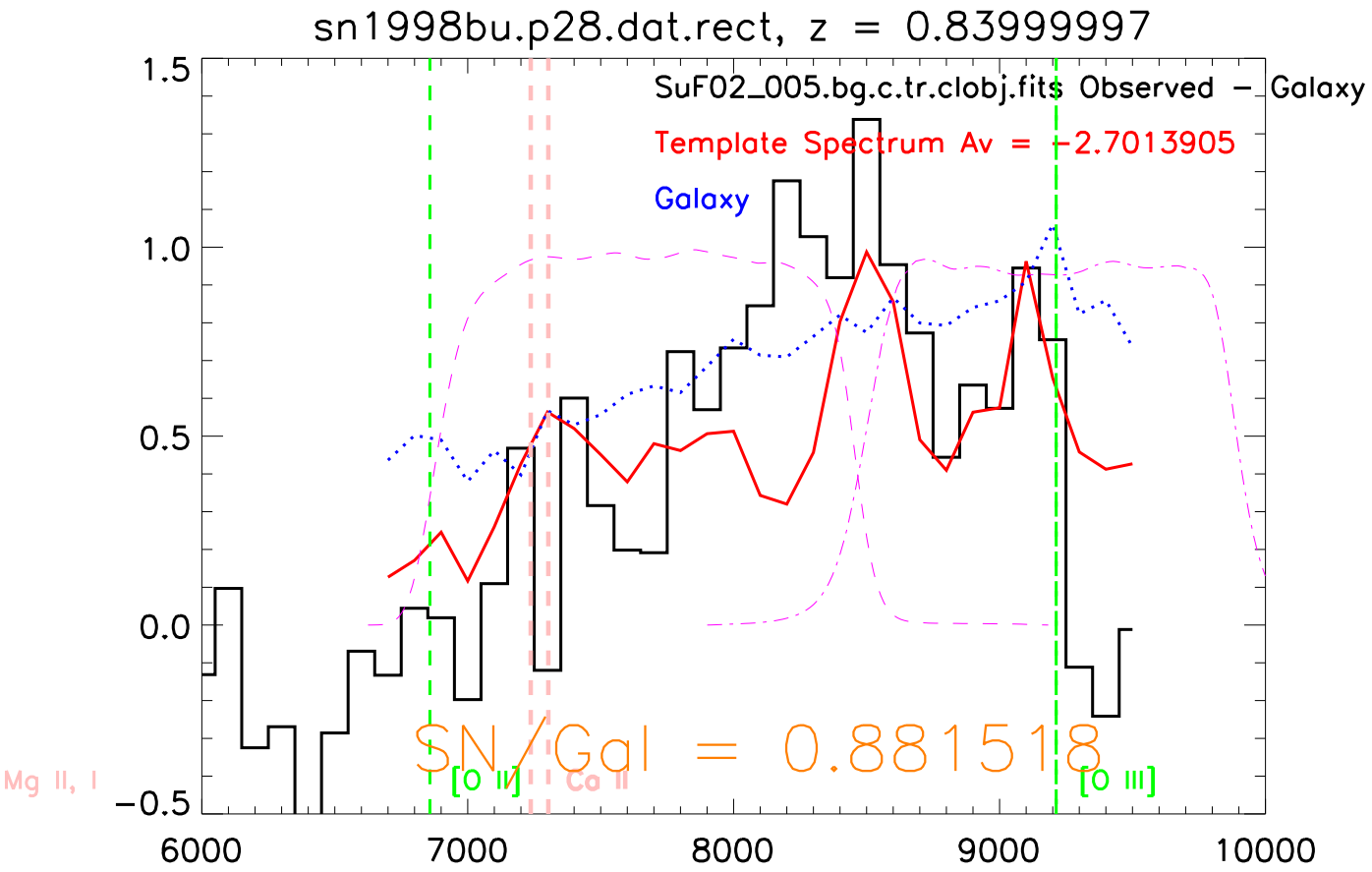

sn1999ee.p20.dat.rect, z = 1.1200000
SuF02_005.bg.c.tr.clobj.fits Observed – Galaxy
Template Spectrum Av = −3.3516510
Galaxy
SN/Gal = 2.15770
Mg II, I
[O II]
Ca II
2.0
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

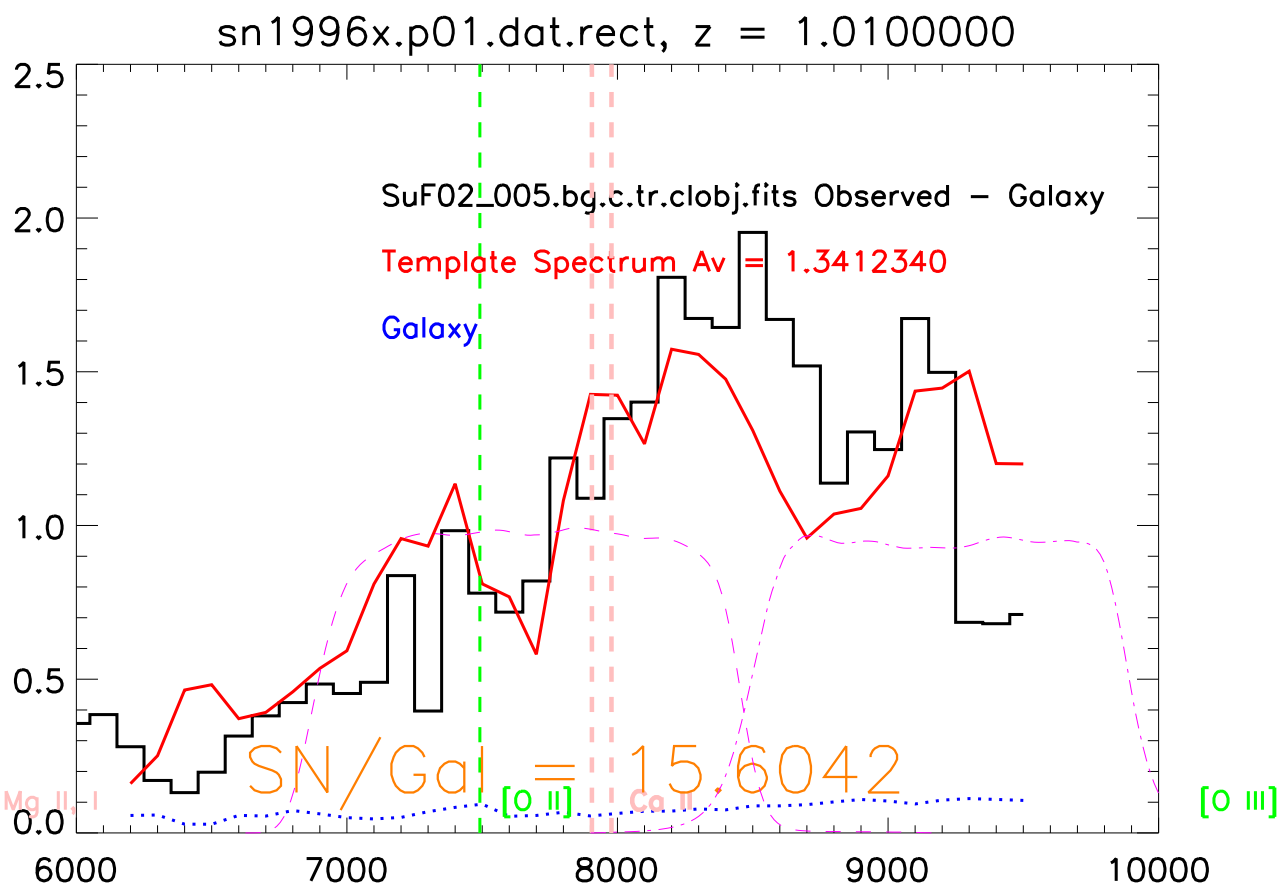

sn1999ee.p03.dat.rect, z = 1.0400000
SuF02_005.bg.c.tr.clobj.fits Observed – Galaxy
Template Spectrum Av = −1.1606340
Galaxy
SN/Gal = 2.97773
Mg II, I
[O II]
Ca II
[O III]
2.0
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

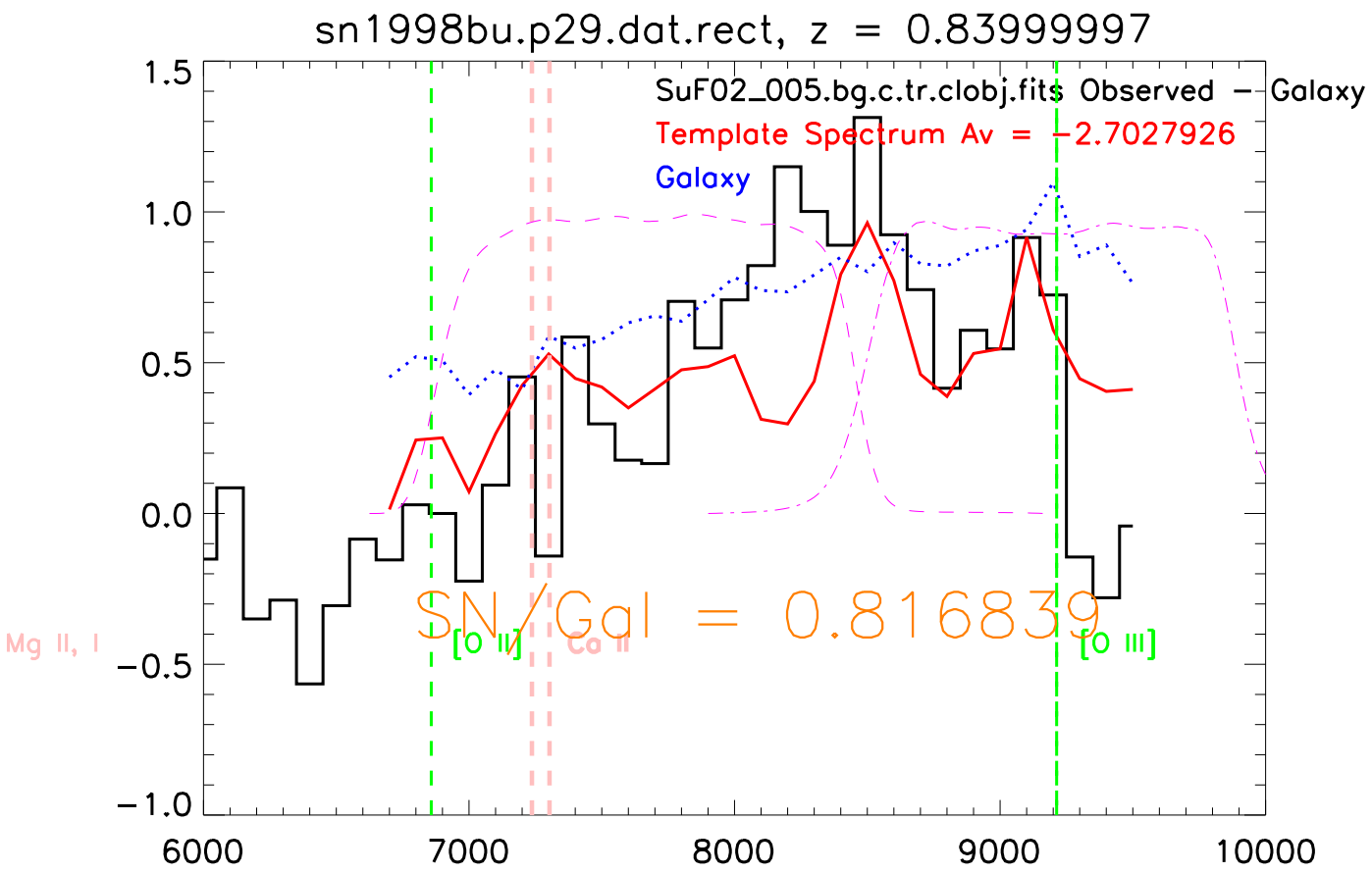

sn1989b.p08.dat.rect, z = 0.83999997
SuF02_005.bg.c.tr.clobj.fits Observed − Galaxy
Template Spectrum Av = −0.50676263
Galaxy
SN/Gal = 0.770407
Mg II, I
[O II]
Ca II
[O III]
1.5
1.0
0.5
0.0
−0.5
−1.0
6000
7000
8000
9000
10000

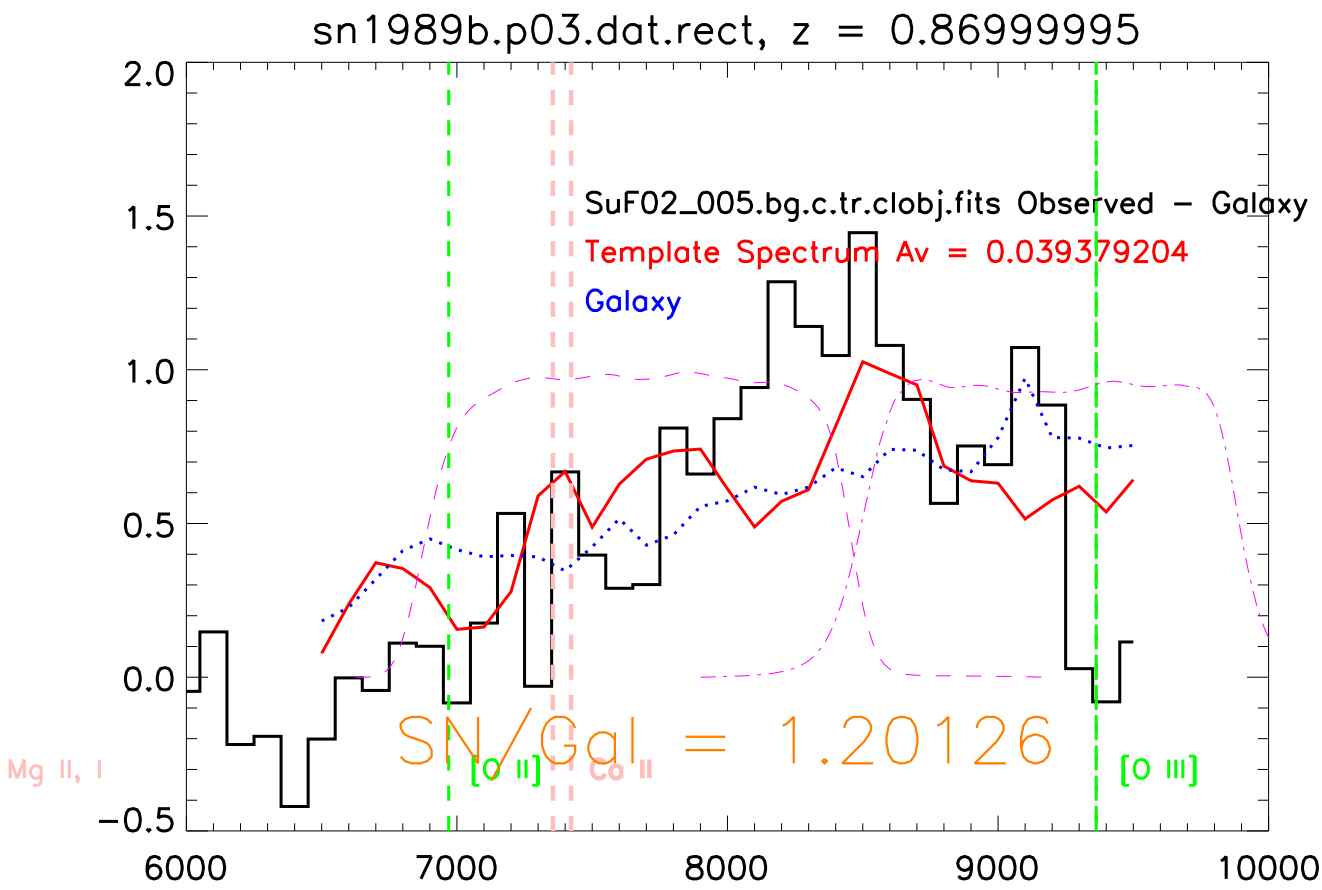

sn1990n.m14.dat.rect, z = 1.0599999
SuF02_005.bg.c.tr.clobj.fits Observed − Galaxy
Template Spectrum Av = 1.6653053
Galaxy
SN/Gal = 5.57700
Mg II, I
[O II]
Ca II
[O III]
2.0
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

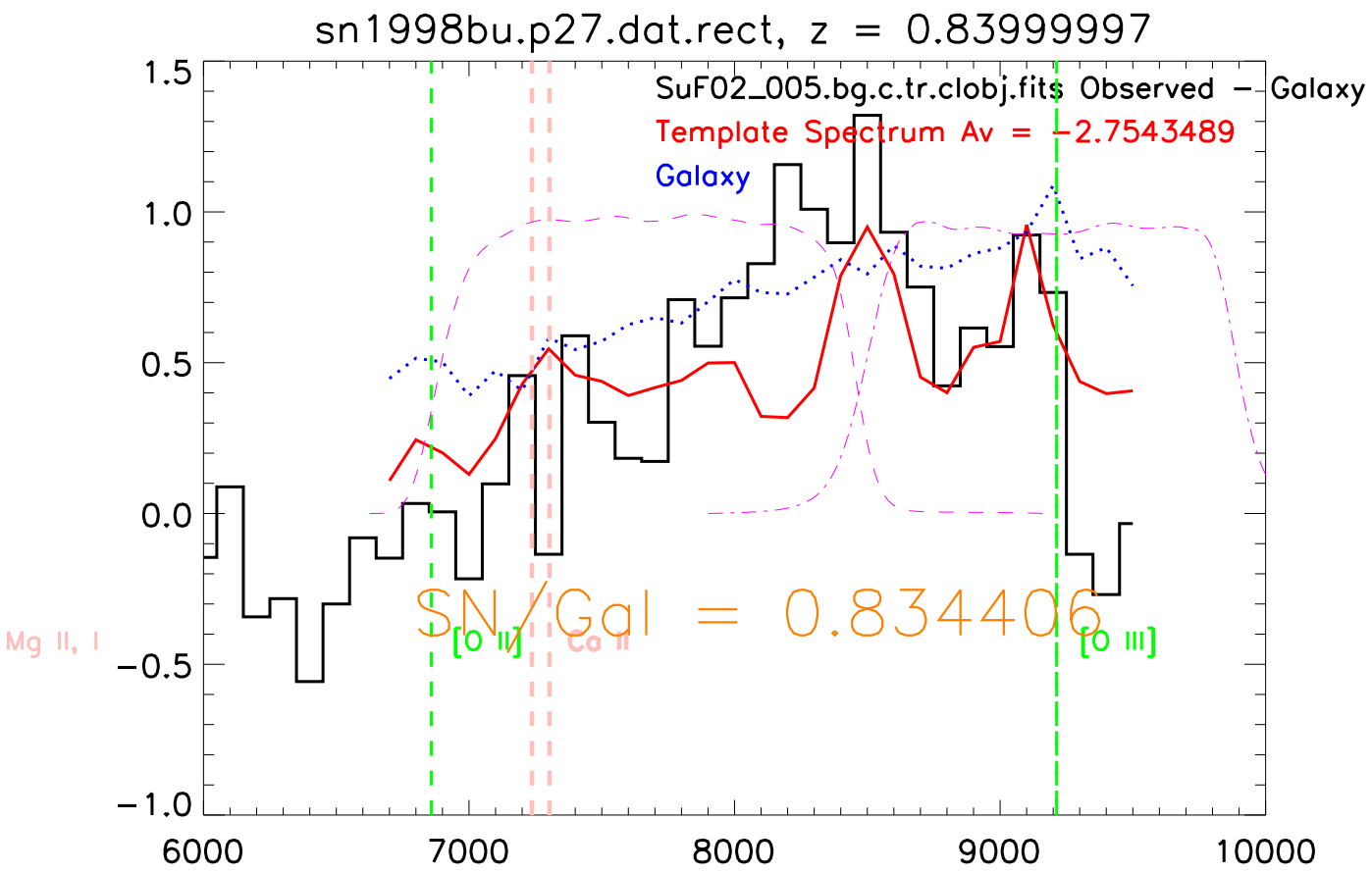

sn1999ee.p01.dat.rect, z = 1.0400000
SuF02_005.bg.c.tr.clobj.fits Observed – Galaxy
Template Spectrum Av = −0.50941271
Galaxy
SN/Gal = 3.35506
Mg II, I
[O II]
Ca II
[O III]
2.0
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

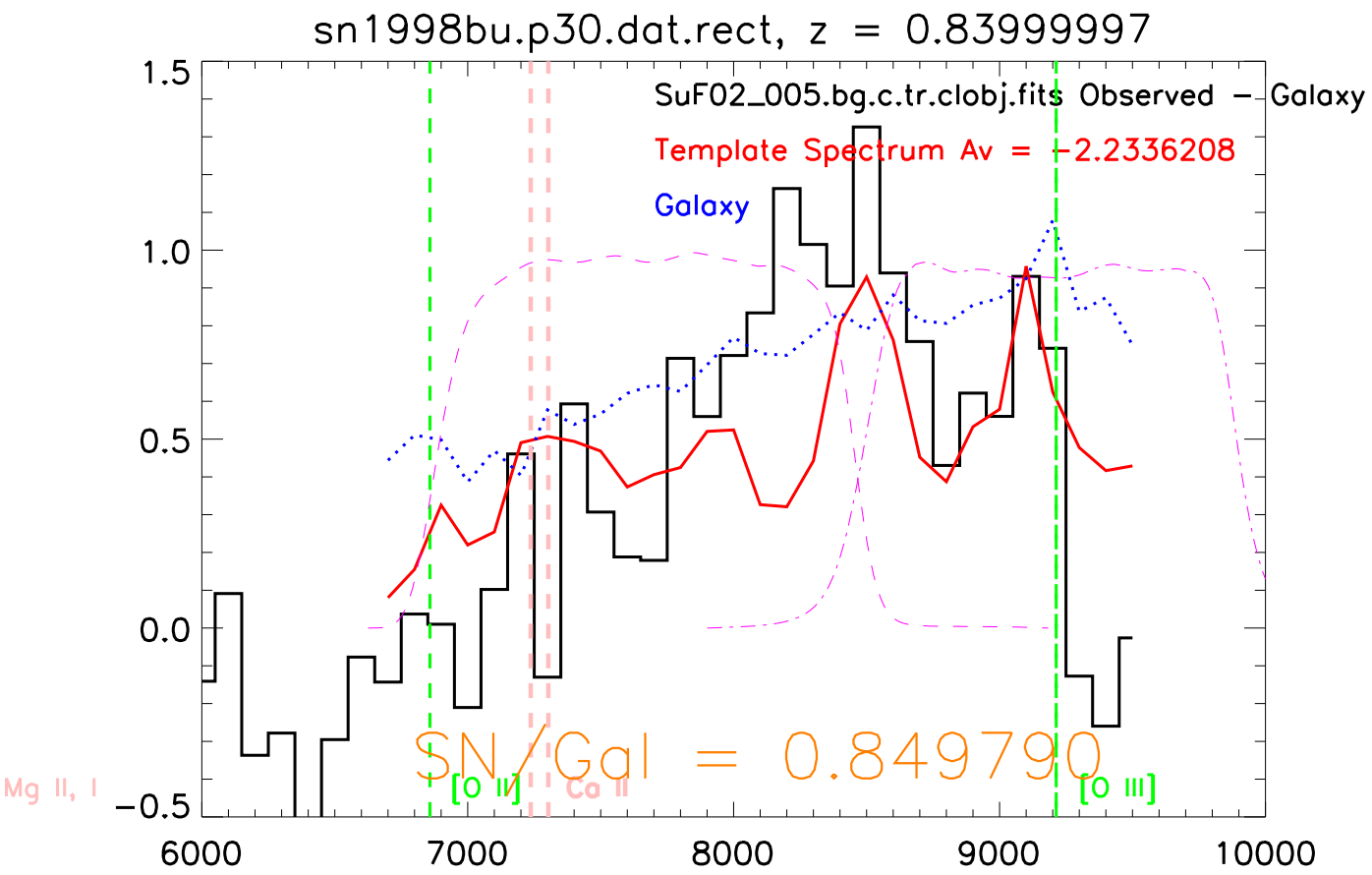

sn1998bu.p28.dat.rect, z = 0.83999997
SuF02_005.bg.c.tr.clobj.fits Observed − Galaxy
Template Spectrum Av = 2.7013905
Galaxy
SN/Gal = 0.881518
Mg II, I
[O II]
Ca II
[O III]
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

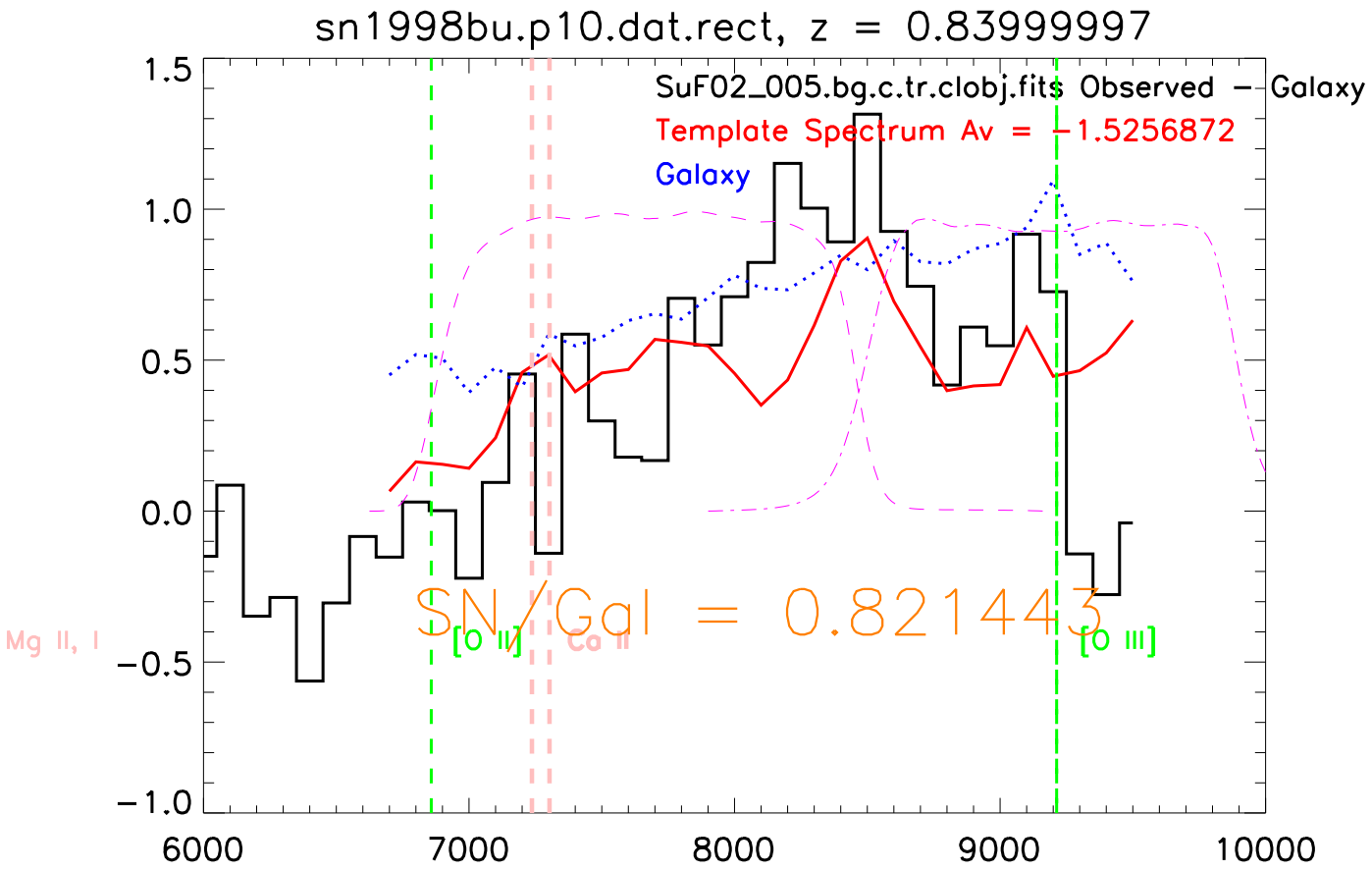

sn1996x.p01.dat.rect, z = 1.0100000
SuF02_005.bg.c.tr.clobj.fits Observed – Galaxy
Template Spectrum Av = 1.3412340
Galaxy
SN/Gal = 15.6042
Mg II
[O II]
Ca II
[O III]
2.5
2.0
1.5
1.0
0.5
0.0
6000
7000
8000
9000
10000

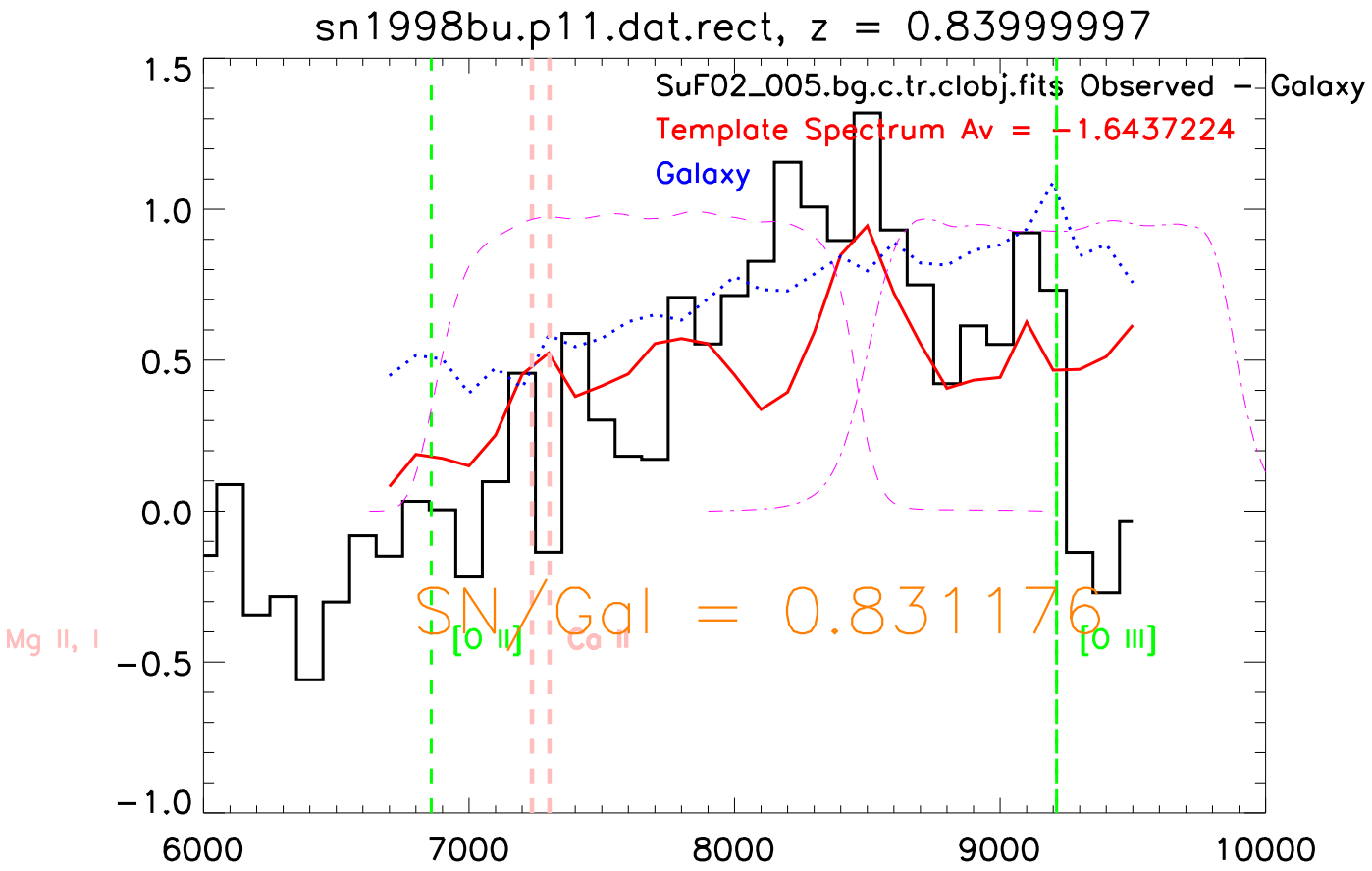

sn1998bu.p29.dat.rect, z = 0.83999997
SuF02_005.bg.c.tr.clobj.fits Observed
Galaxy
Template Spectrum Av = 2.7027926
Galaxy
SN/Gal = 0.816839
[O II]
Ca II
[O III]
Mg II, I
1.5
1.0
0.5
0.0
−0.5
−1.0
6000
7000
8000
9000
10000

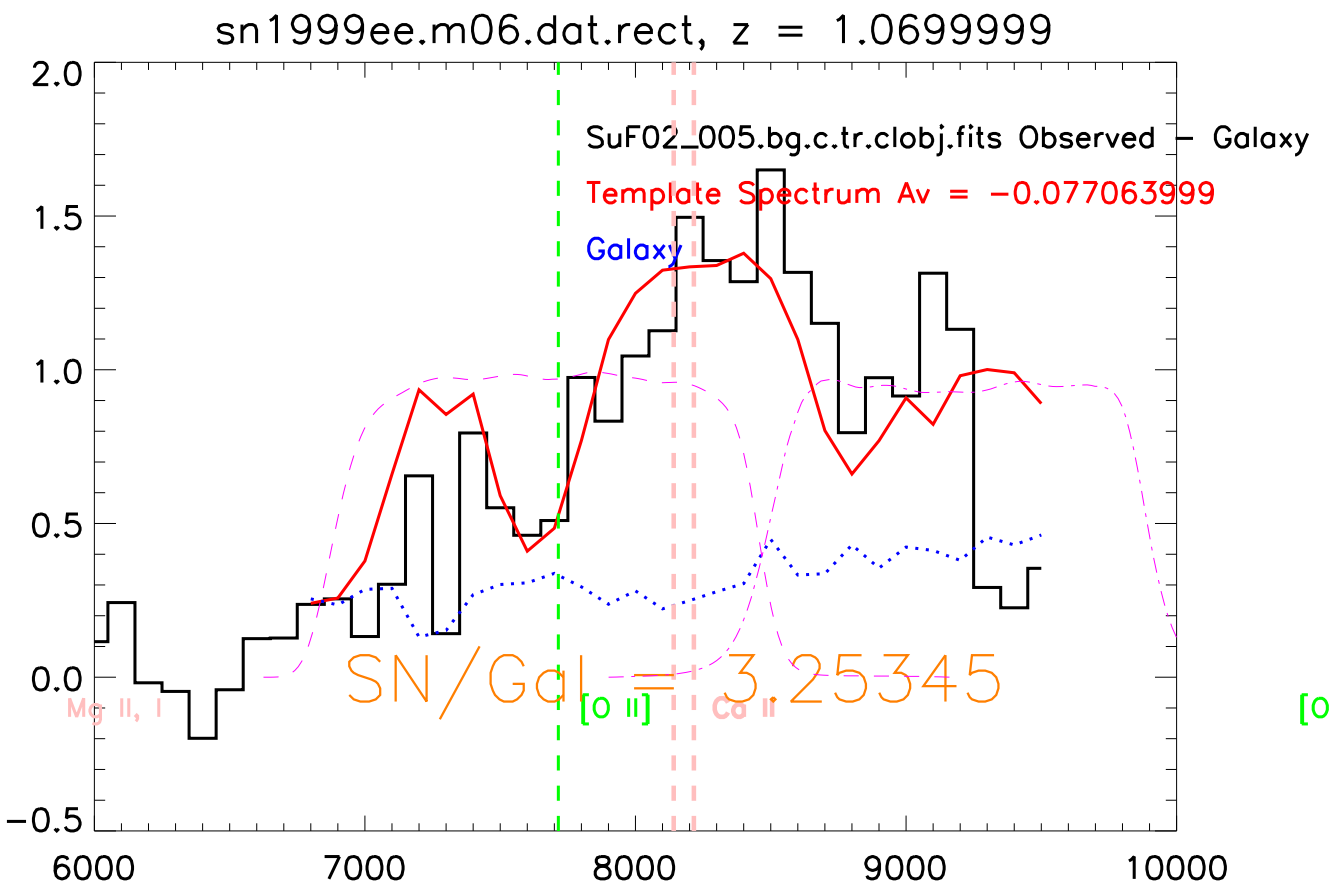

sn1989b.p03.dat.rect, z = 0.86999995
SuF02_005.bg.c.tr.clobj.fits Observed − Galaxy
Template Spectrum Av = 0.039379204
Galaxy
SN/Gal = 1.20126
Mg II, I
[O II]
Ca II
[O III]
2.0
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

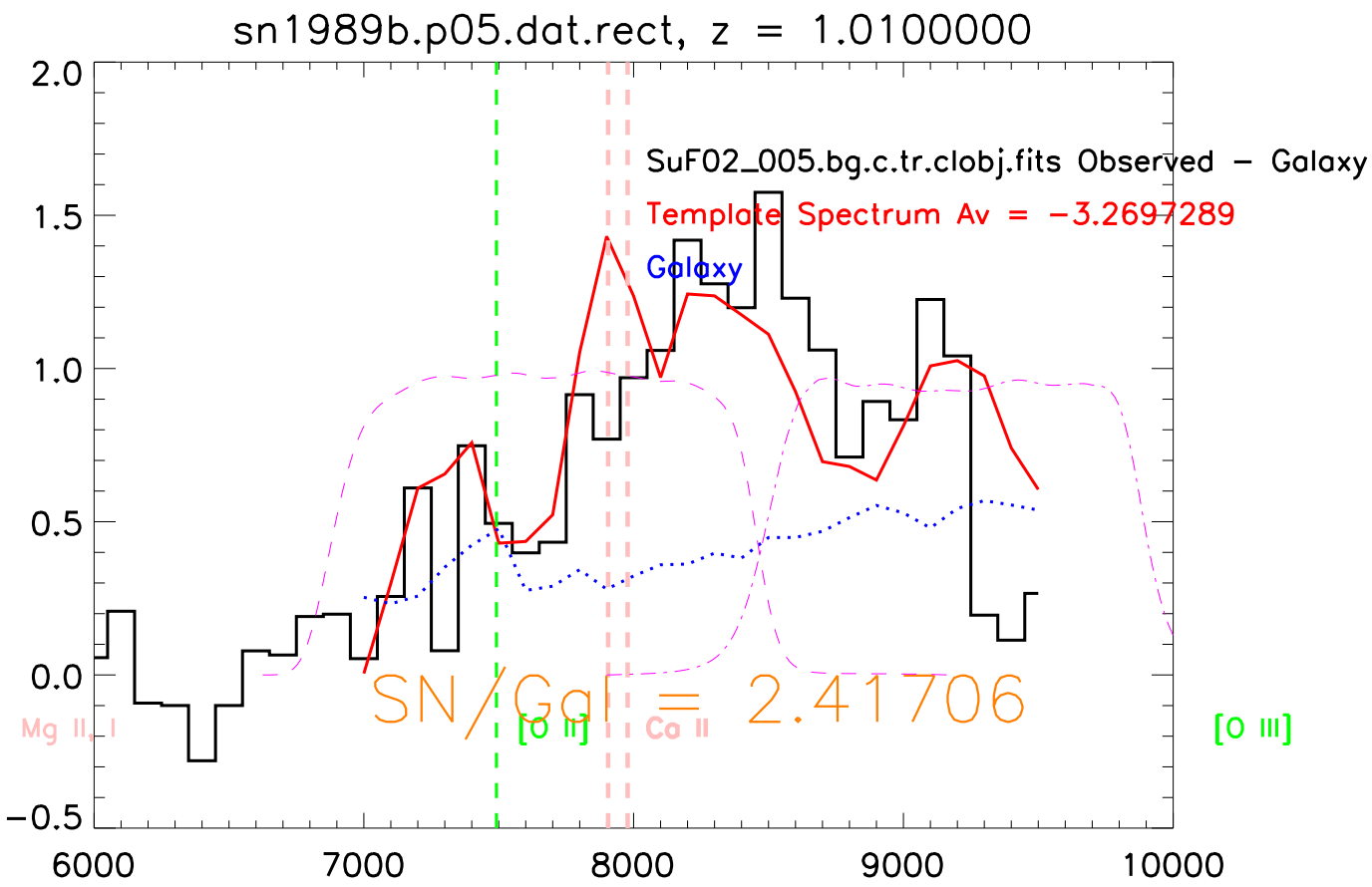

sn1998bu.p27.dat.rect, z = 0.83999997
SuF02_005.bg.c.tr.clobj.fits Observed
Galaxy
Template Spectrum Av = 2.7543489
Galaxy
SN/Gal = 0.834406
[O II]
Ca II
[O III]
Mg II, I
1.5
1.0
0.5
0.0
−0.5
−1.0
6000
7000
8000
9000
10000

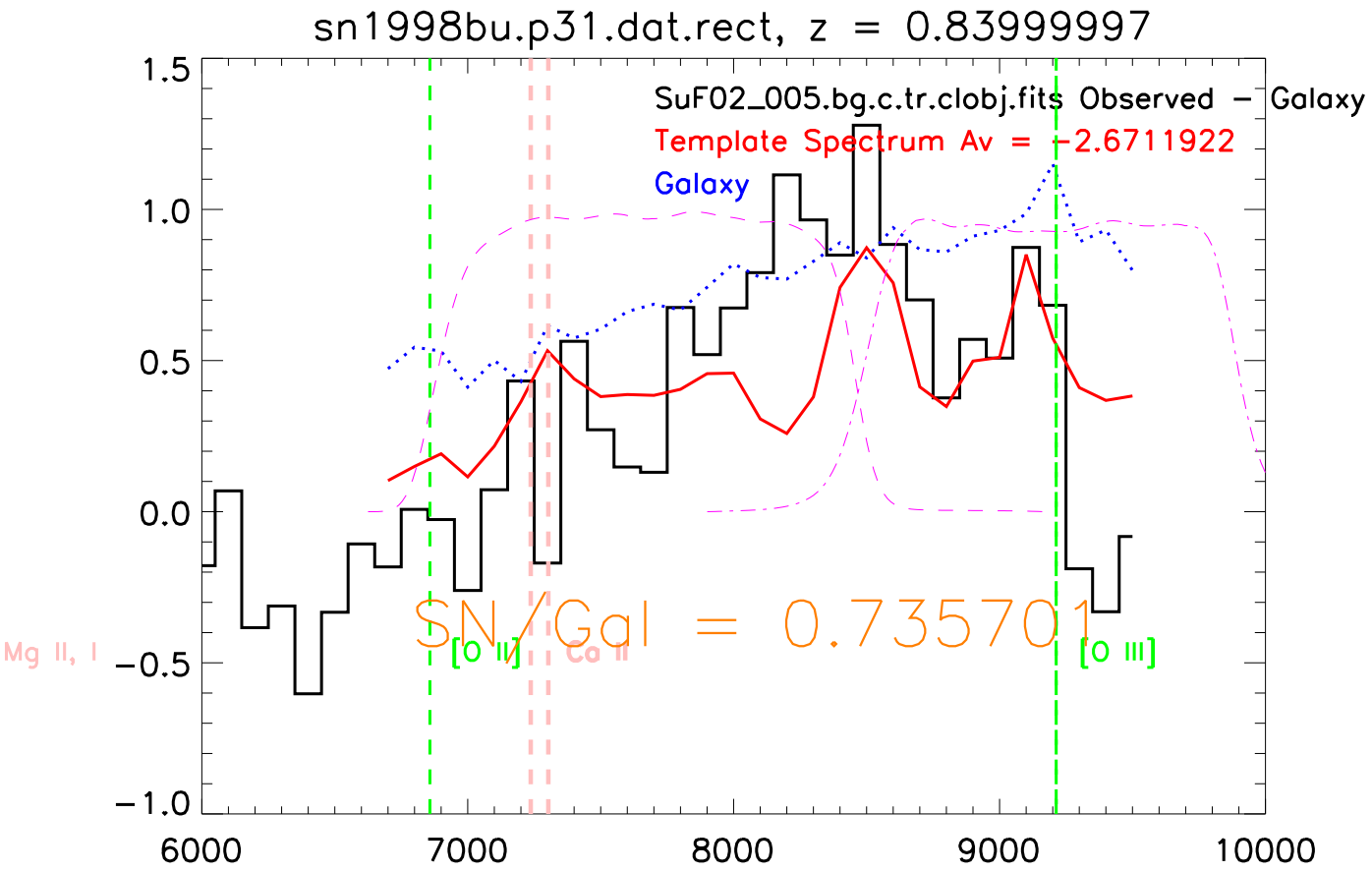

sn1998bu.p30.dat.rect, z = 0.83999997
SuF02_005.bg.c.tr.clobj.fits Observed
Galaxy
Template Spectrum Av = 2.2336208
Galaxy
SN/Gal = 0.849790
Mg II, I
[O II]
Ca II
[O III]
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

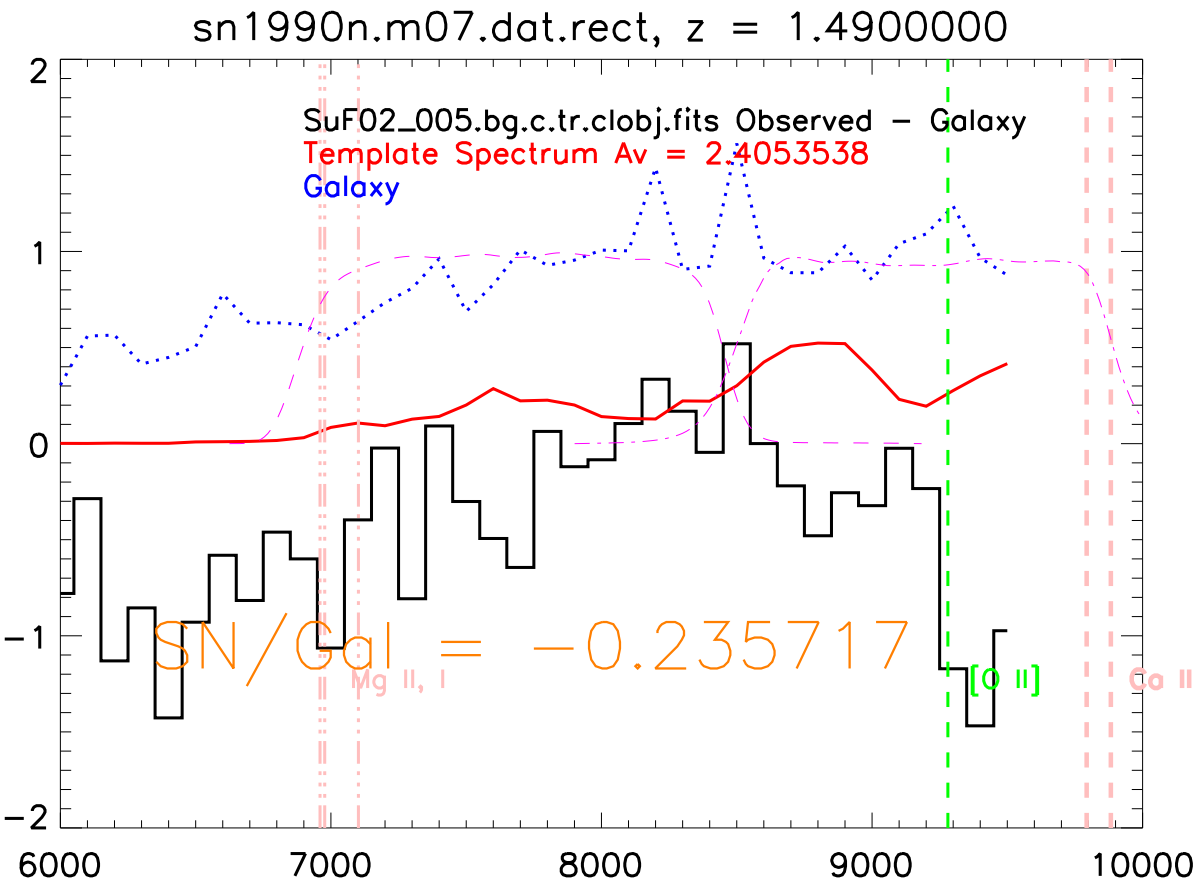

sn1998bu.p10.dat.rect, z = 0.83999997
SuF02_005.bg.c.tr.clobj.fits Observed
Galaxy
Template Spectrum Av = 1.5256872
Galaxy
SN/Gal = 0.821443
[O II]
Ca II
[O III]
Mg II, I
1.5
1.0
0.5
0.0
−0.5
−1.0
6000
7000
8000
9000
10000

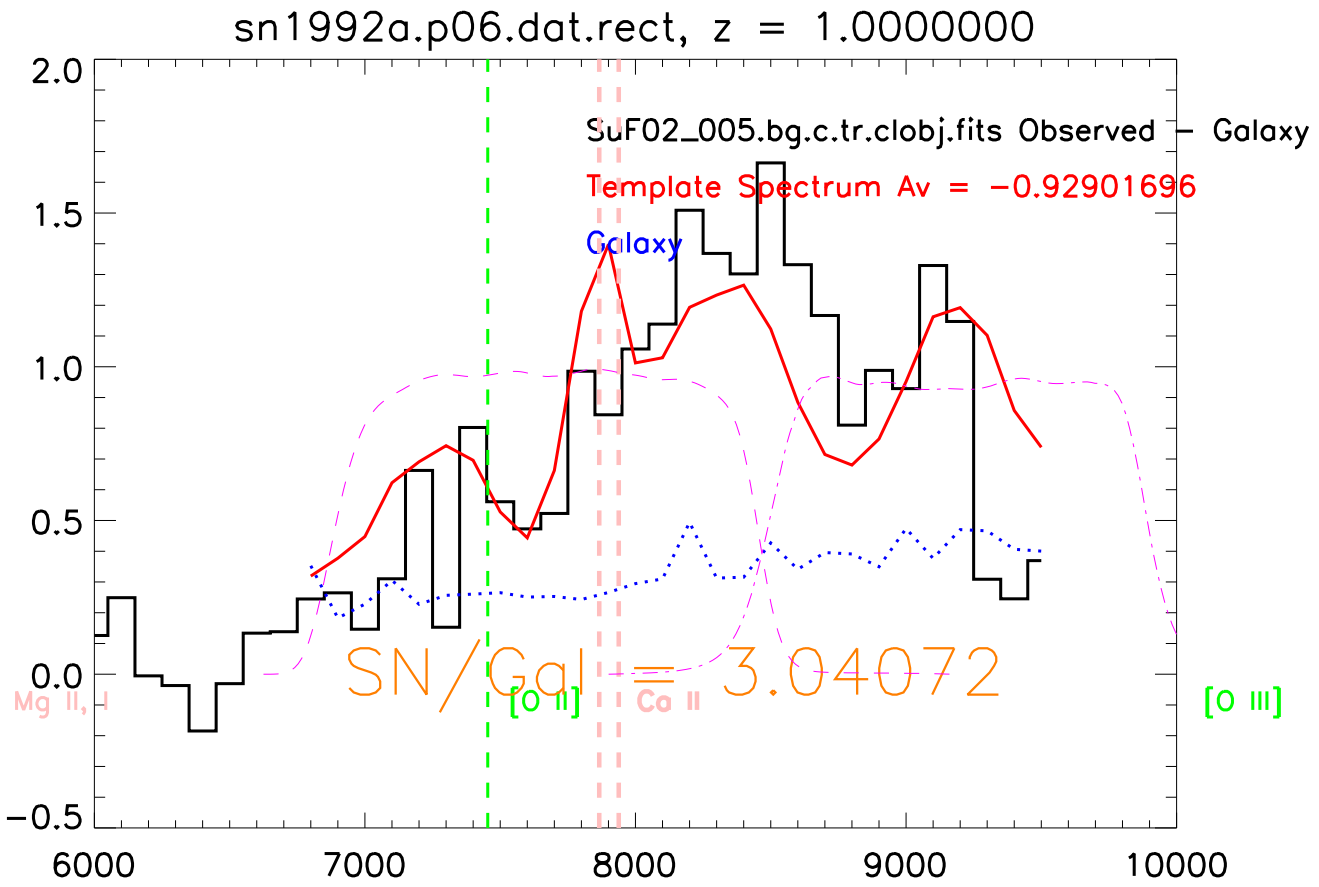

sn1998bu.p11.dat.rect, z = 0.83999997
SuF02_005.bg.c.tr.clobj.fits Observed
Galaxy
Template Spectrum Av = 1.6437224
Galaxy
SN/Gal = 0.831176
Mg II, I
[O II]
Ca II
[O III]
1.5
1.0
0.5
0.0
−0.5
−1.0
6000
7000
8000
9000
10000

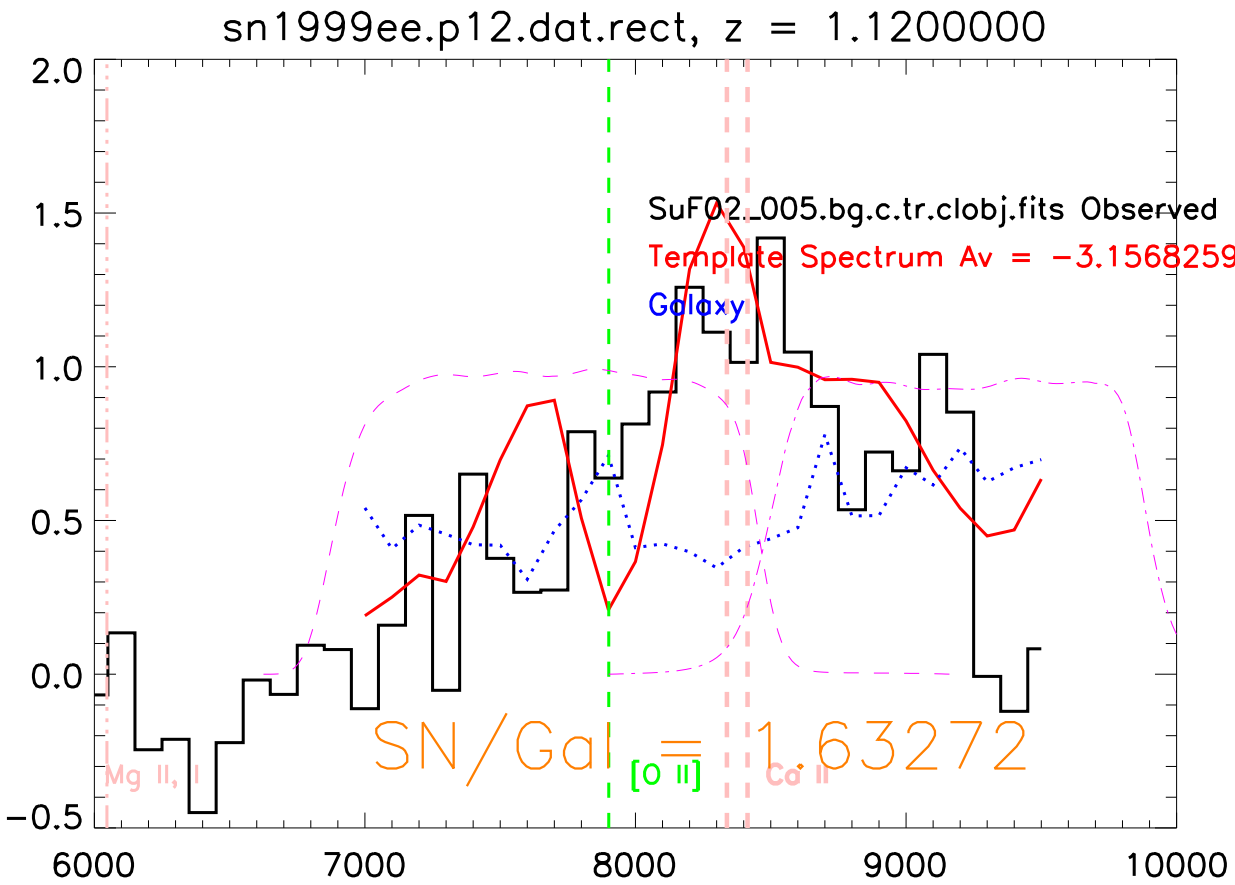

sn1999ee.m06.dat.rect, z = 1.0699999
SuF02_005.bg.c.tr.clobj.fits Observed – Galaxy
Template Spectrum Av = −0.077063999
Galaxy
SN/Gal = 3.25345
Mg II, I
[O II]
Ca II
[O III]
2.0
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

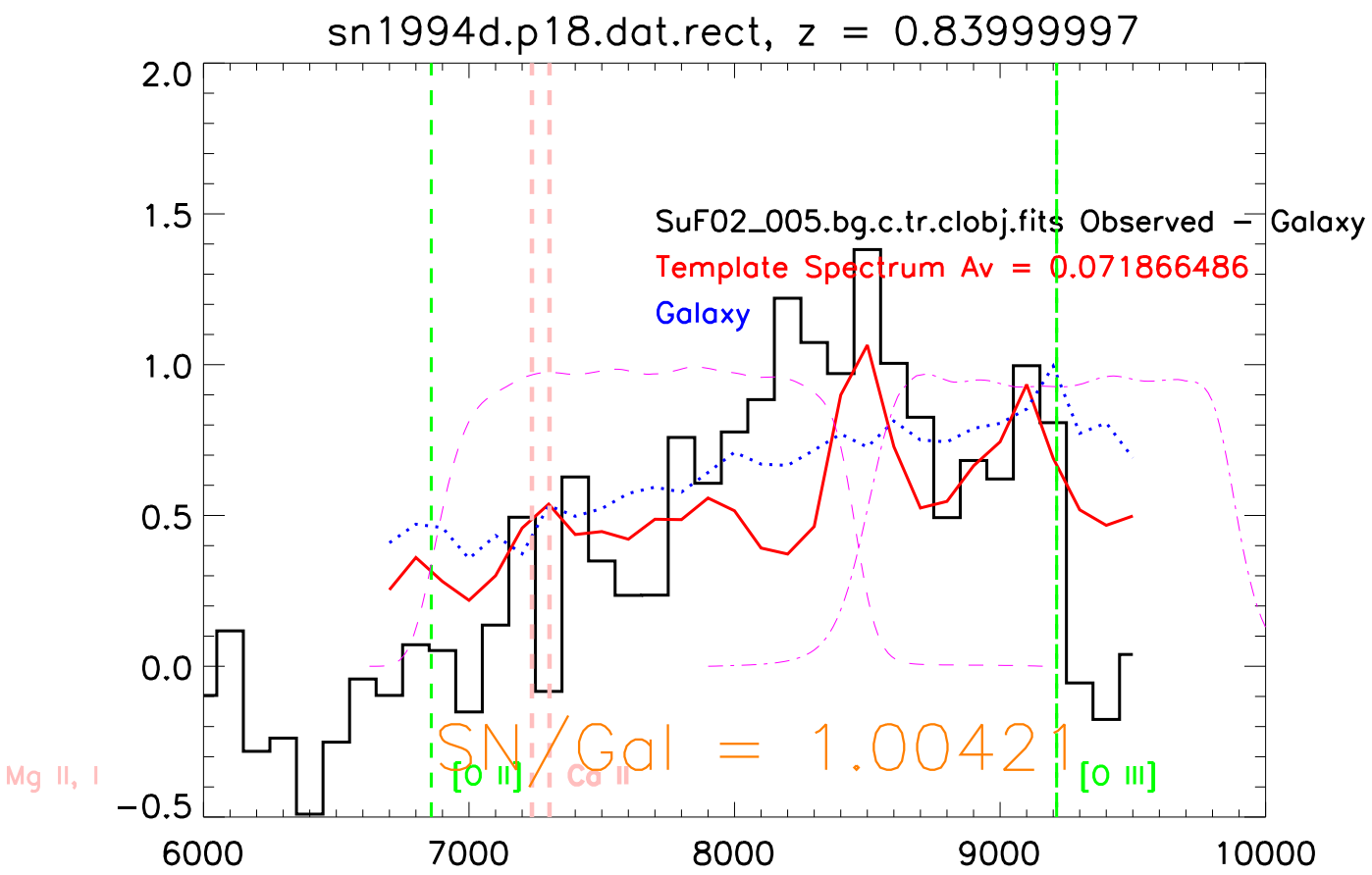

sn1989b.p05.dat.rect, z = 1.0100000
SuF02_005.bg.c.tr.clobj.fits Observed – Galaxy
Template Spectrum Av = −3.2697289
Galaxy
SN/Gal = 2.41706
Mg II, I
[O II]
Ca II
[O III]
2.0
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

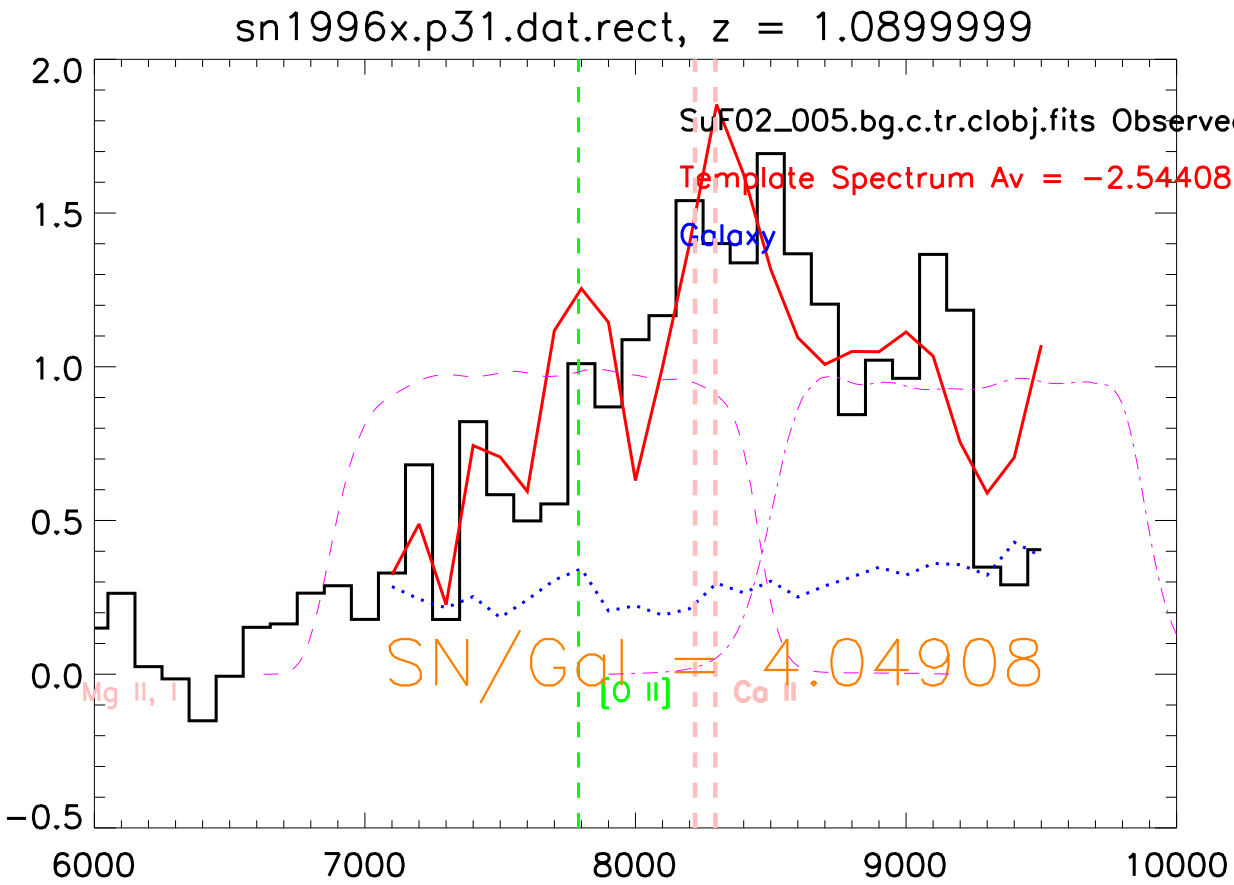

sn1998bu.p31.dat.rect, z = 0.83999997
SuF02_005.bg.c.tr.clobj.fits Observed – Galaxy
Template Spectrum Av = 2.6711922
Galaxy
SN/Gal = 0.735701
Mg II, I
[O II]
Ca II
[O III]
1.5
1.0
0.5
0.0
−0.5
−1.0
6000
7000
8000
9000
10000

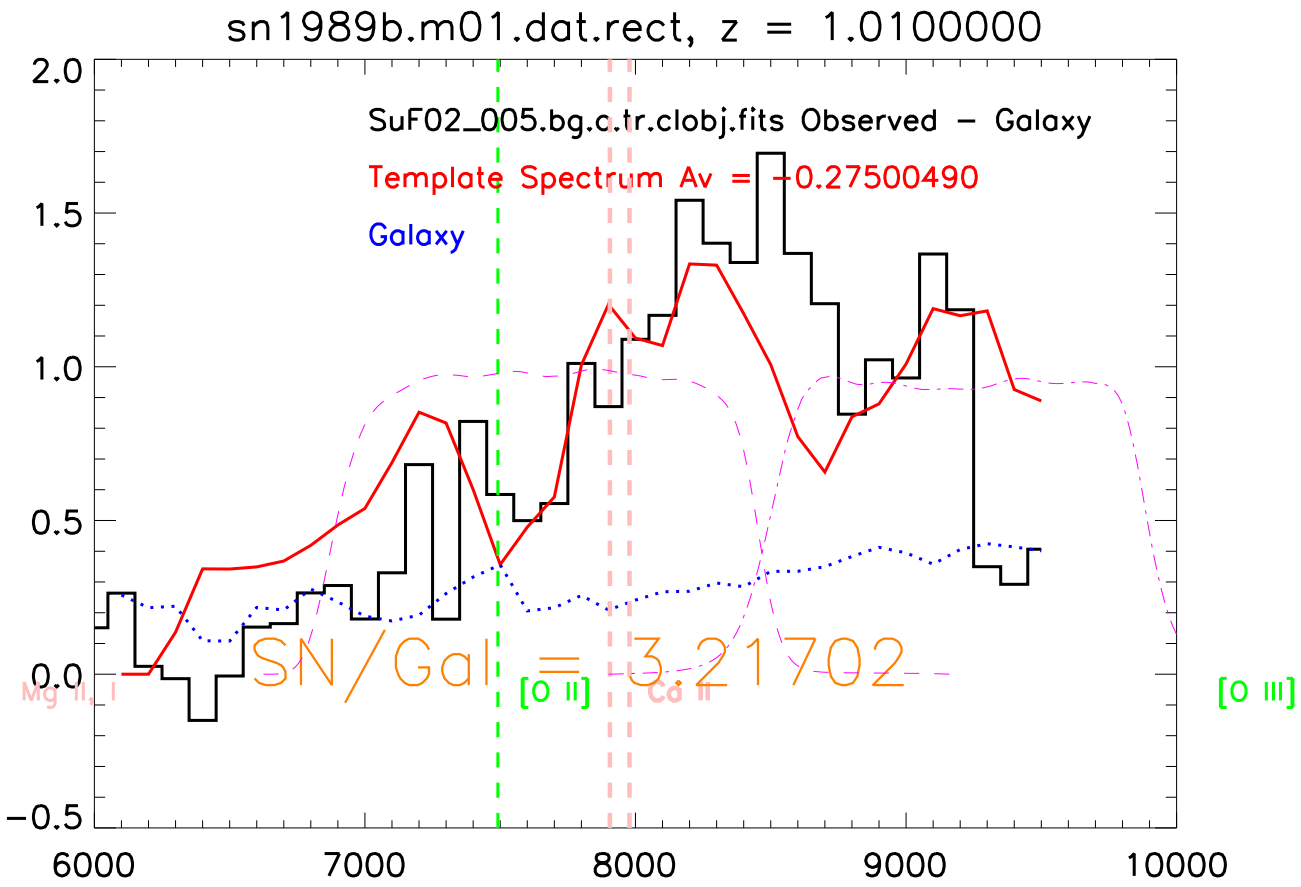

sn1990n.m07.dat.rect, z = 1.4900000
SuF02_005.bg.c.tr.clobj.fits Observed − Galaxy
Template Spectrum Av = 2.4053538
Galaxy
SN/Gal = −0.235717
Mg II, I
[O II]
Ca II
2
1
0
−1
−2
6000
7000
8000
9000
10000

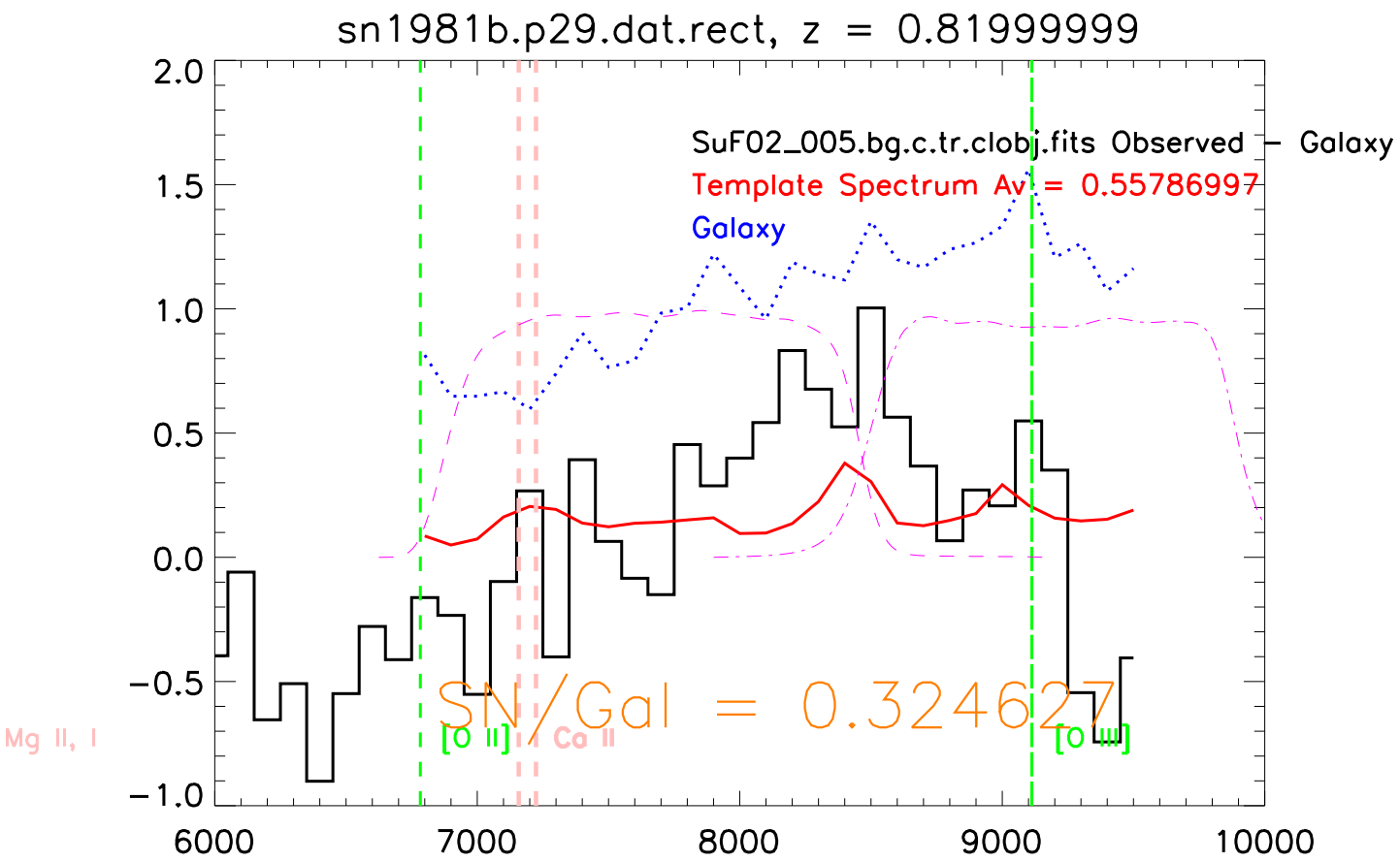

sn1992a.p06.dat.rect, z = 1.0000000
SuF02_005.bg.c.tr.clobj.fits Observed
Galaxy
Template Spectrum Av = −0.92901696
Galaxy
SN/Gal = 3.04072
Mg II, I
[O II]
Ca II
[O III]
2.0
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

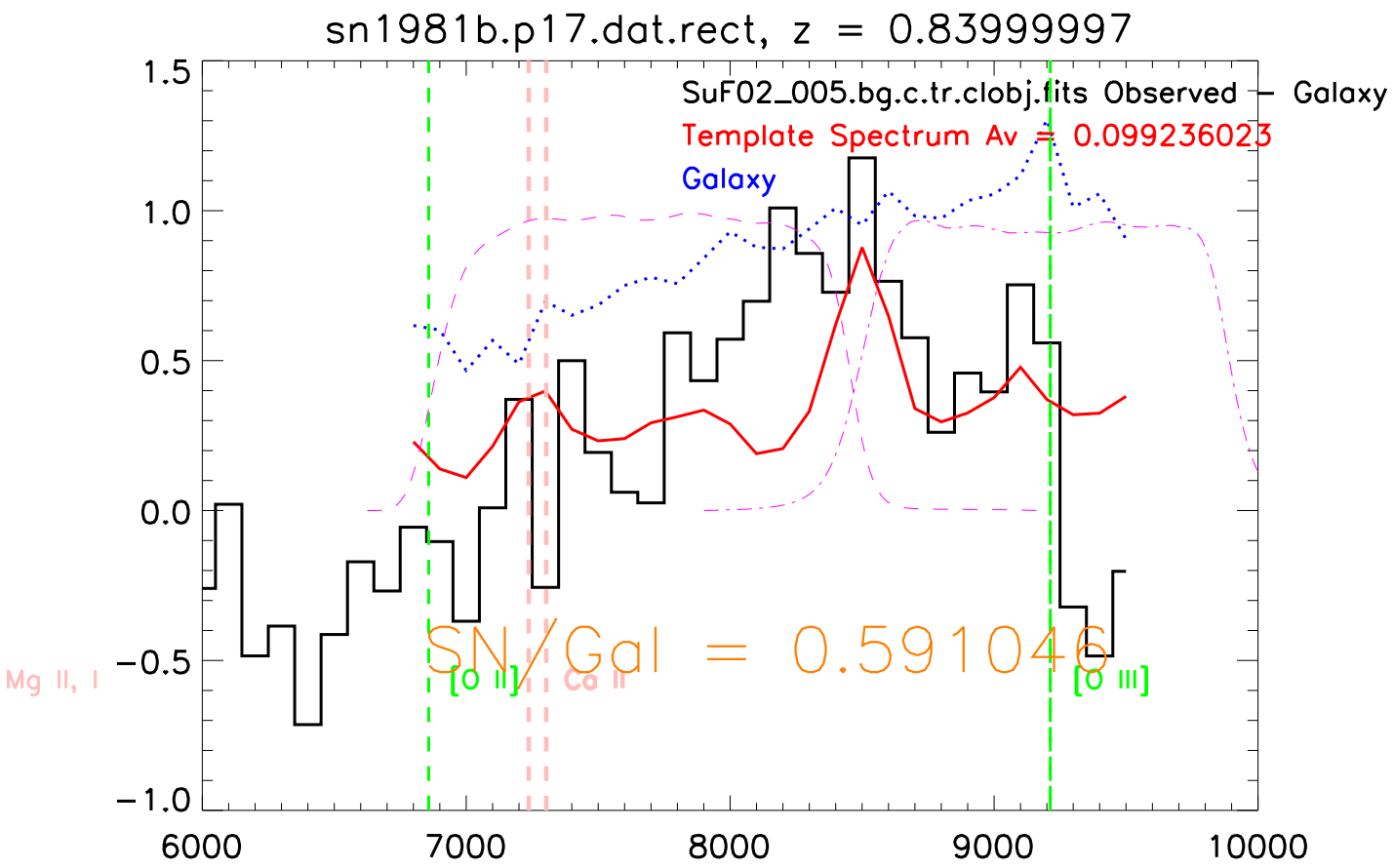

sn1999ee.p12.dat.rect, z = 1.1200000
SuF02_005.bg.c.tr.clobj.fits Observed − Galaxy
Template Spectrum Av = −3.1568259
Galaxy
SN/Gal = 1.63272
Mg II, I
[O II]
Ca II
2.0
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

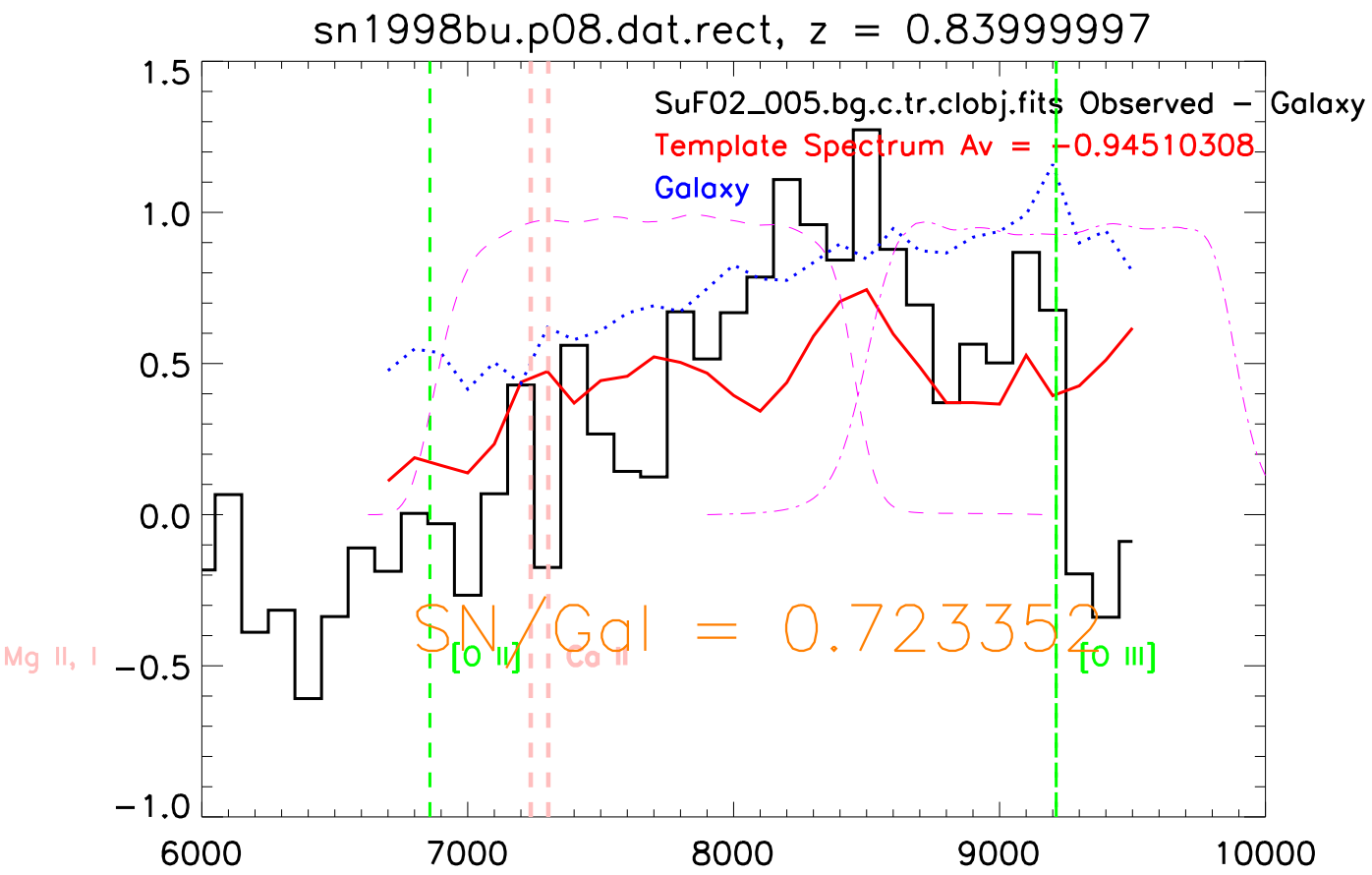

sn1994d.p18.dat.rect, z = 0.83999997
SuF02_005.bg.c.tr.clobj.fits Observed – Galaxy
Template Spectrum Av = 0.071866486
Galaxy
SN/Gal = 1.00421
[O II]
Ca II
[O III]
Mg II, I
2.0
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

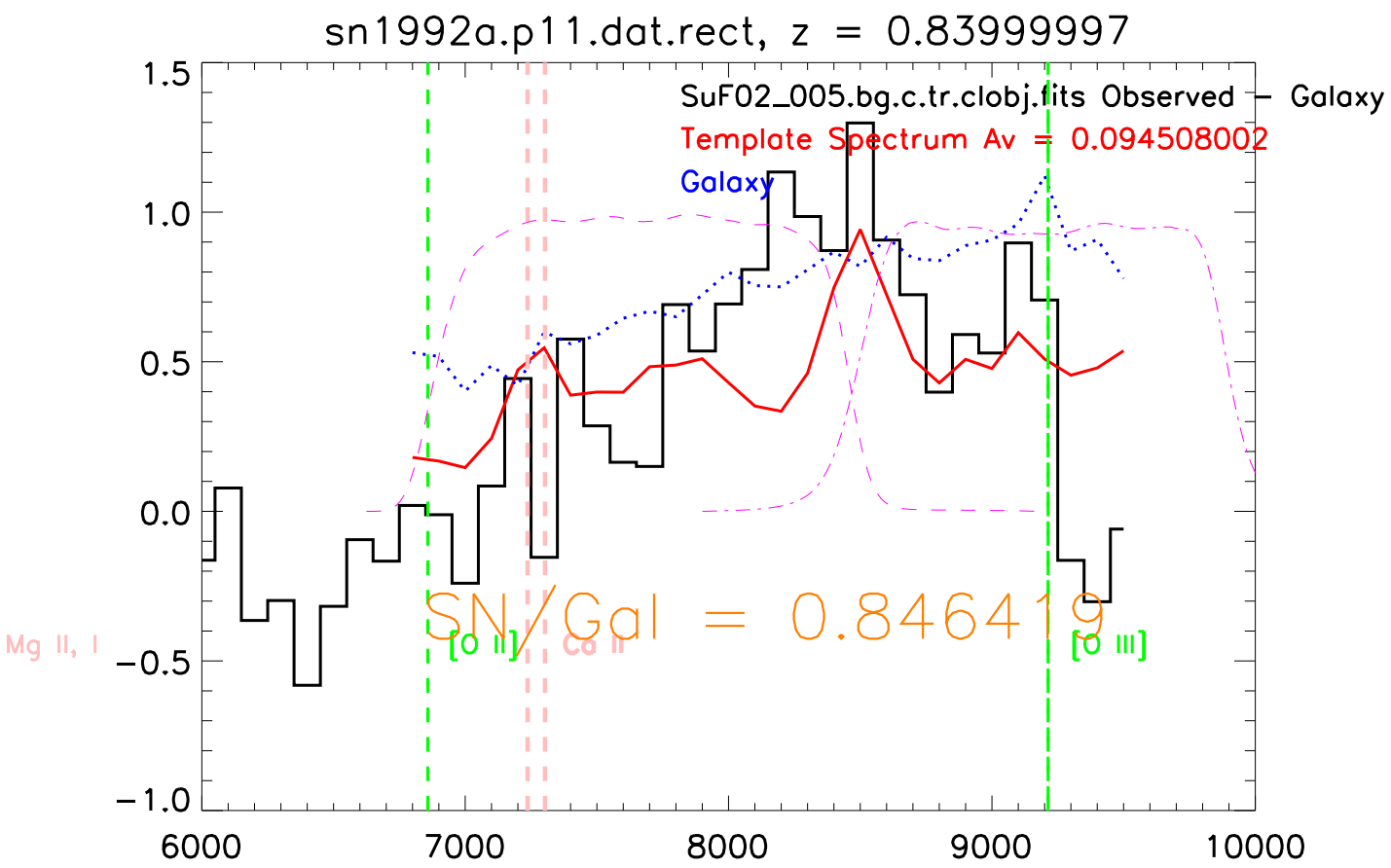

sn1996x.p31.dat.rect, z = 1.0899999
SuF02_005.bg.c.tr.clobj.fits Observed – Galax
Template Spectrum Av = −2.5440810
Galaxy
SN/Gal = 4.04908
[O II]
Ca II
2.0
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

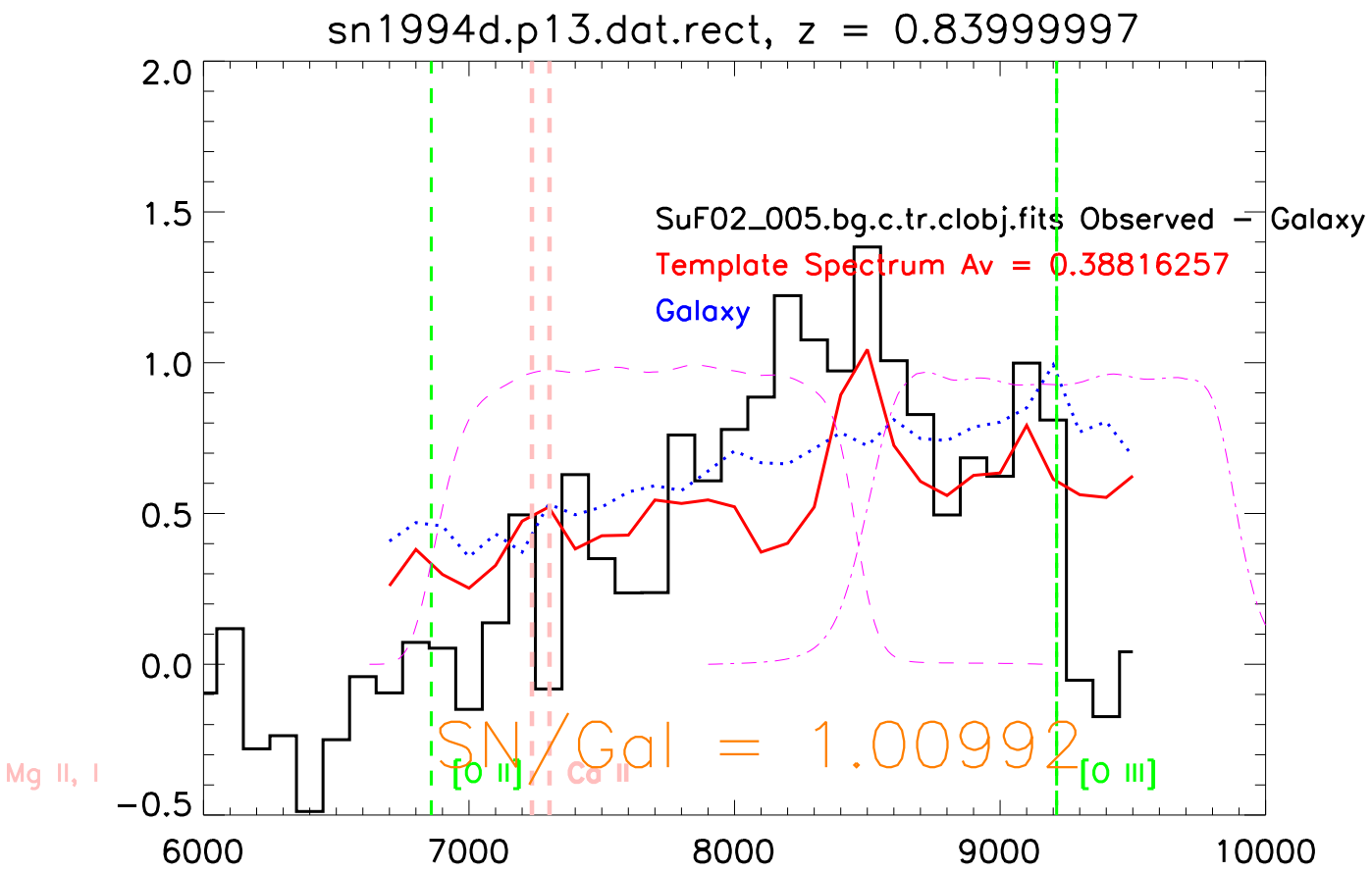

sn1989b.m01.dat.rect, z = 1.0100000
SuF02_005.bg.c.tr.clobj.fits Observed − Galaxy
Template Spectrum Av = −0.27500490
Galaxy
SN/Gal = 3.21702
Mg II, I
[O II]
Ca II
[O III]
2.0
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

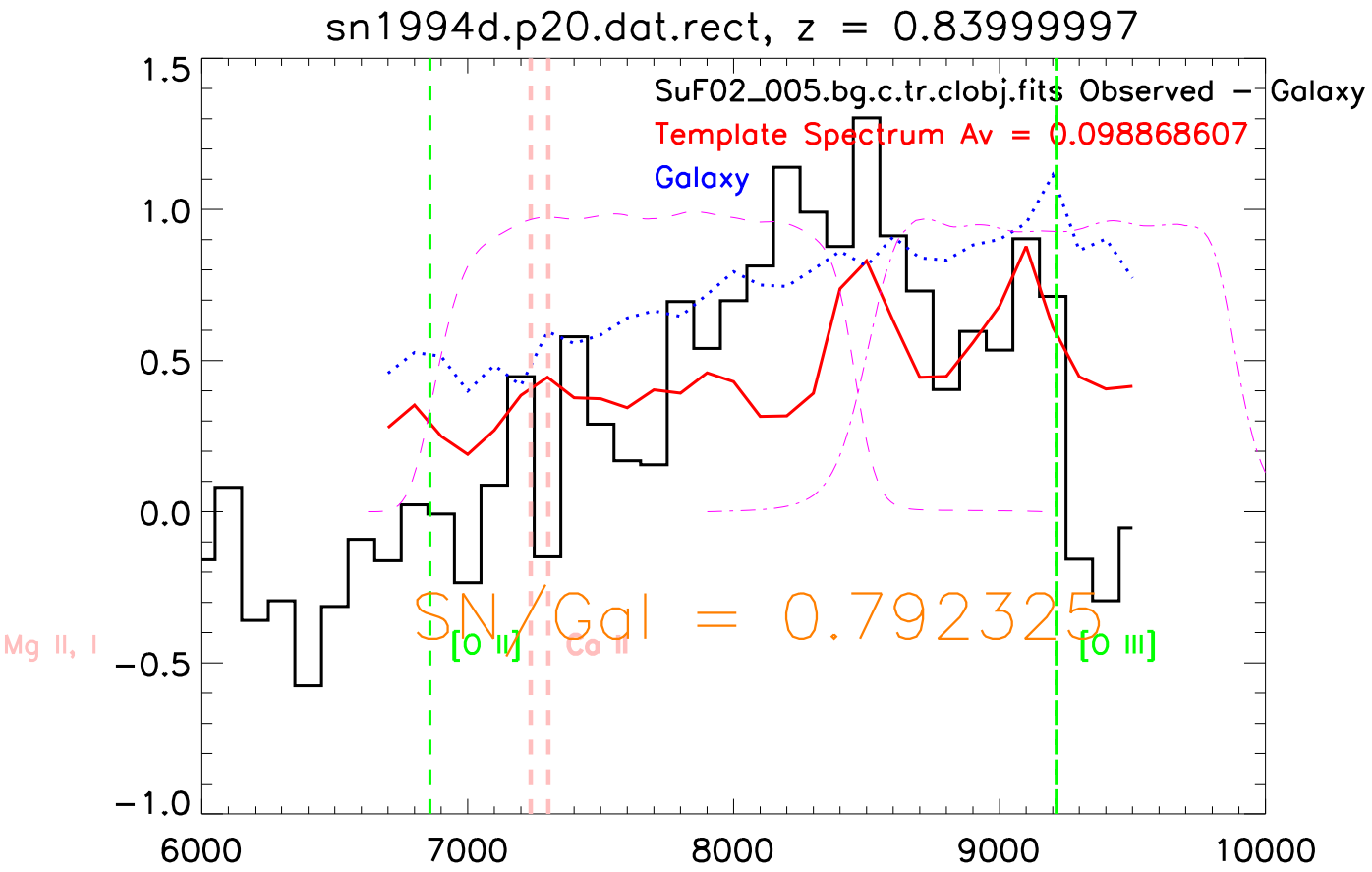

sn1981b.p29.dat.rect, z = 0.81999999
SuF02_005.bg.c.tr.clobj.fits Observed
Galaxy
Template Spectrum Av = 0.55786997
Galaxy
SN/Gal = 0.324627
Mg II, I
[O II]
Ca II
[O III]
2.0
1.5
1.0
0.5
0.0
−0.5
−1.0
6000
7000
8000
9000
10000

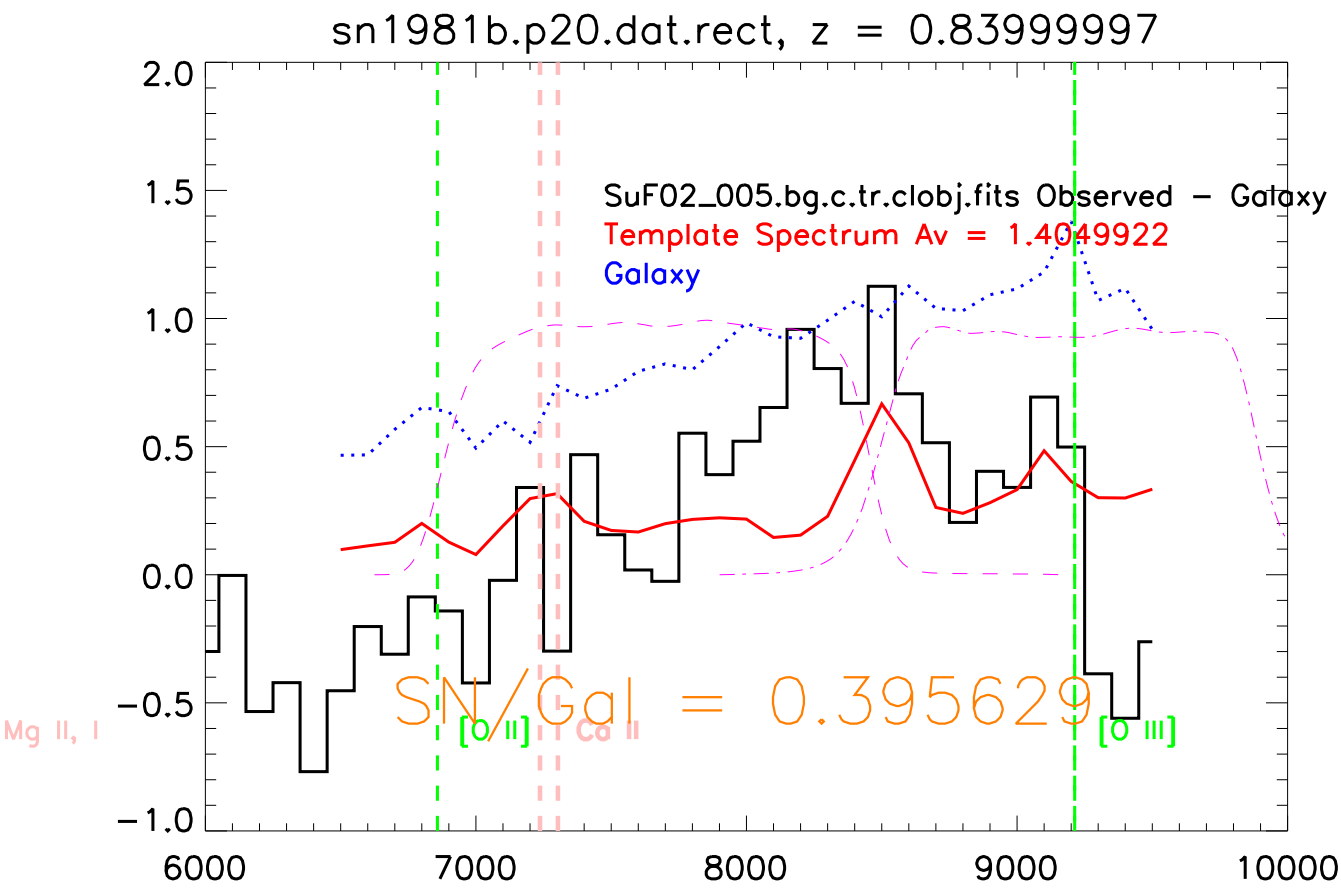

sn1981b.p17.dat.rect, z = 0.83999997
SuF02_005.bg.c.tr.clobj.fits Observed
Galaxy
Template Spectrum Av = 0.099236023
Galaxy
SN/Gal = 0.591046
[O II]
Ca II
[O III]
Mg II, I
1.5
1.0
0.5
0.0
−0.5
−1.0
6000
7000
8000
9000
10000

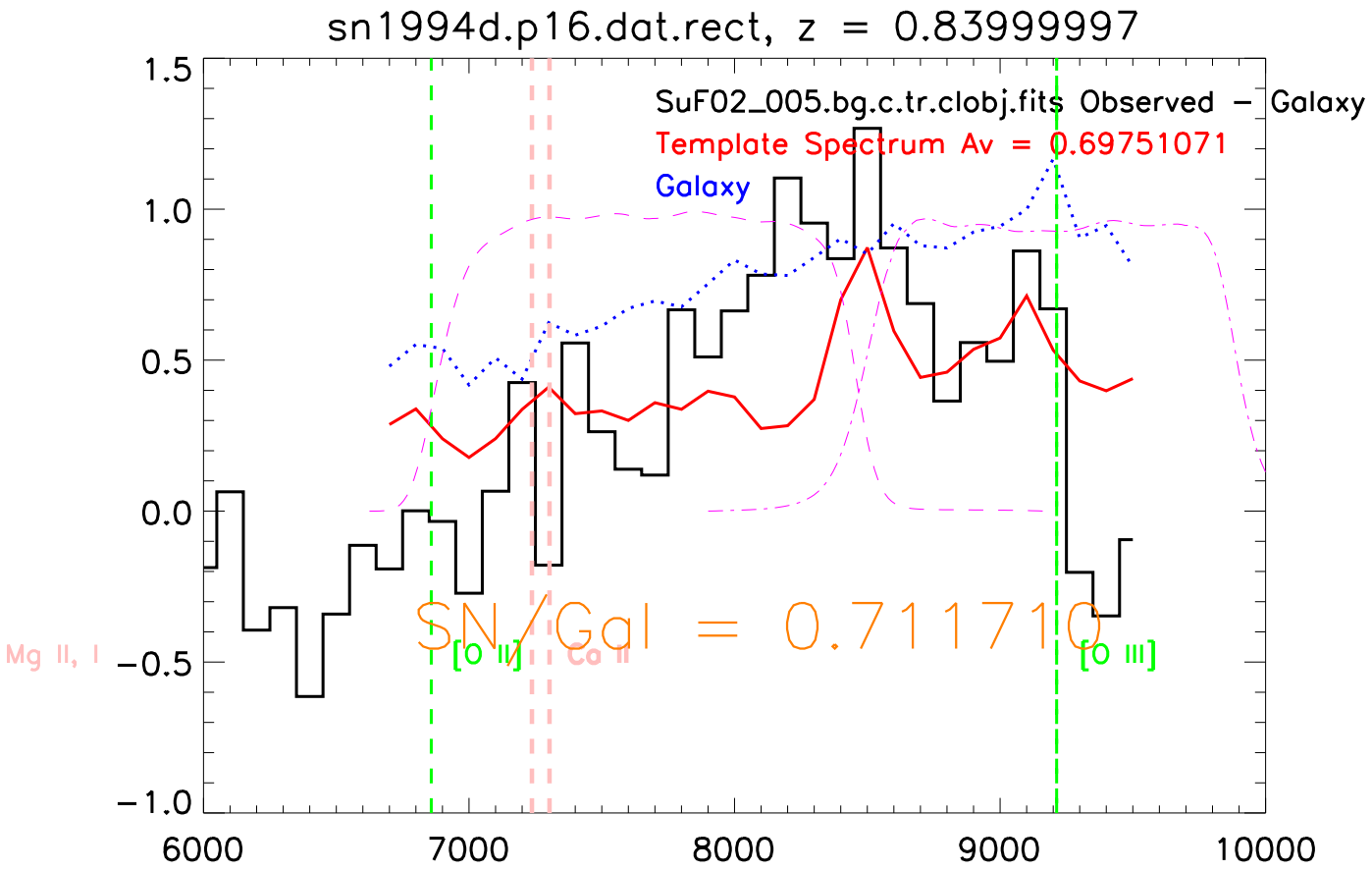

sn1998bu.p08.dat.rect, z = 0.83999997
SuF02_005.bg.c.tr.clobj.fits Observed – Galaxy
Template Spectrum Av = 0.94510308
Galaxy
SN/Gal = 0.723352
[O II]
Ca II
[O III]
Mg II, I
1.5
1.0
0.5
0.0
−0.5
−1.0
6000
7000
8000
9000
10000

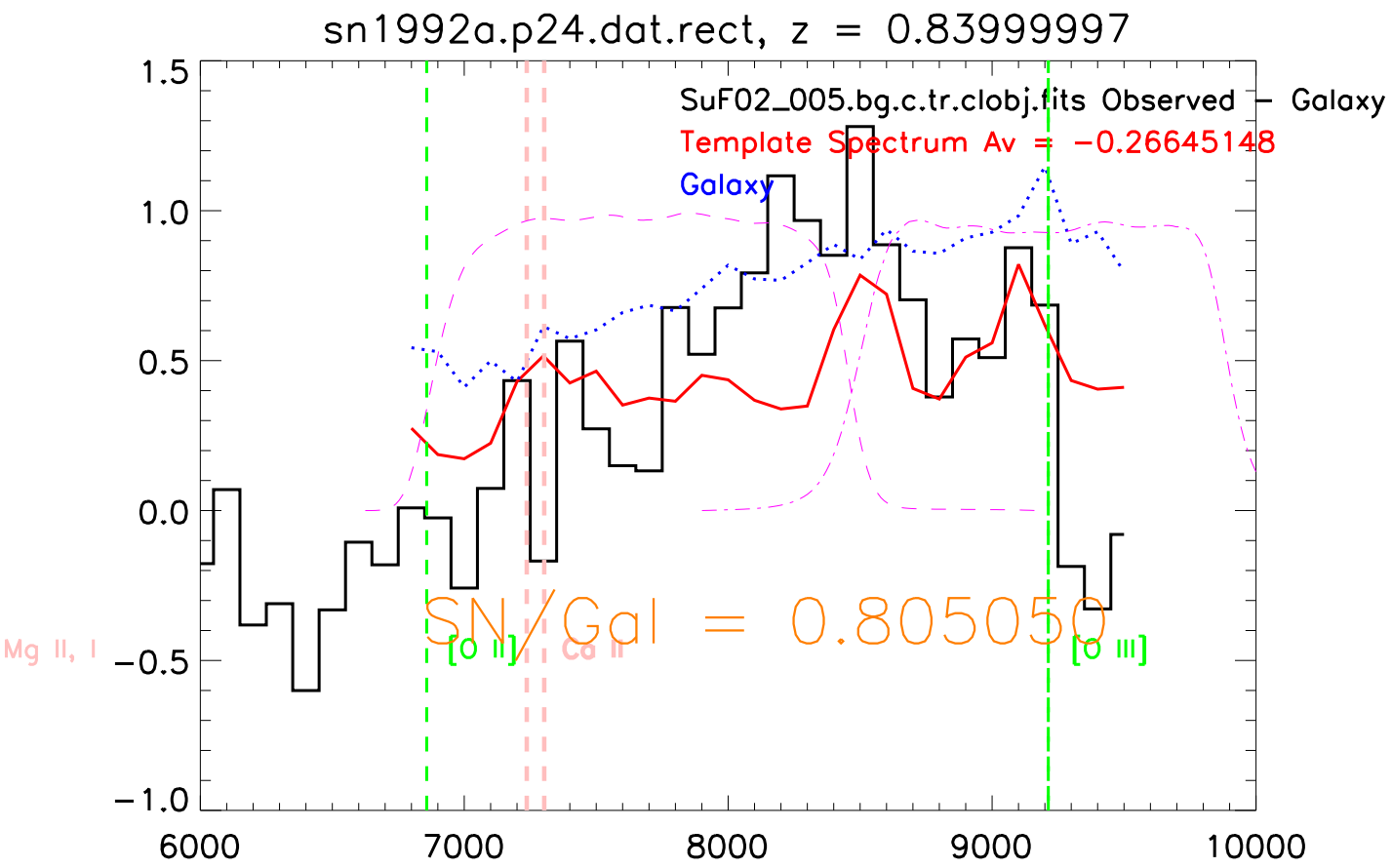

sn1992a.p11.dat.rect, z = 0.83999997
SuF02_005.bg.c.tr.clobj.fits Observed
Galaxy
Template Spectrum Av = 0.094508002
Galaxy
SN/Gal = 0.846419
Mg II, I
[O II]
Ca II
[O III]
1.5
1.0
0.5
0.0
−0.5
−1.0
6000
7000
8000
9000
10000

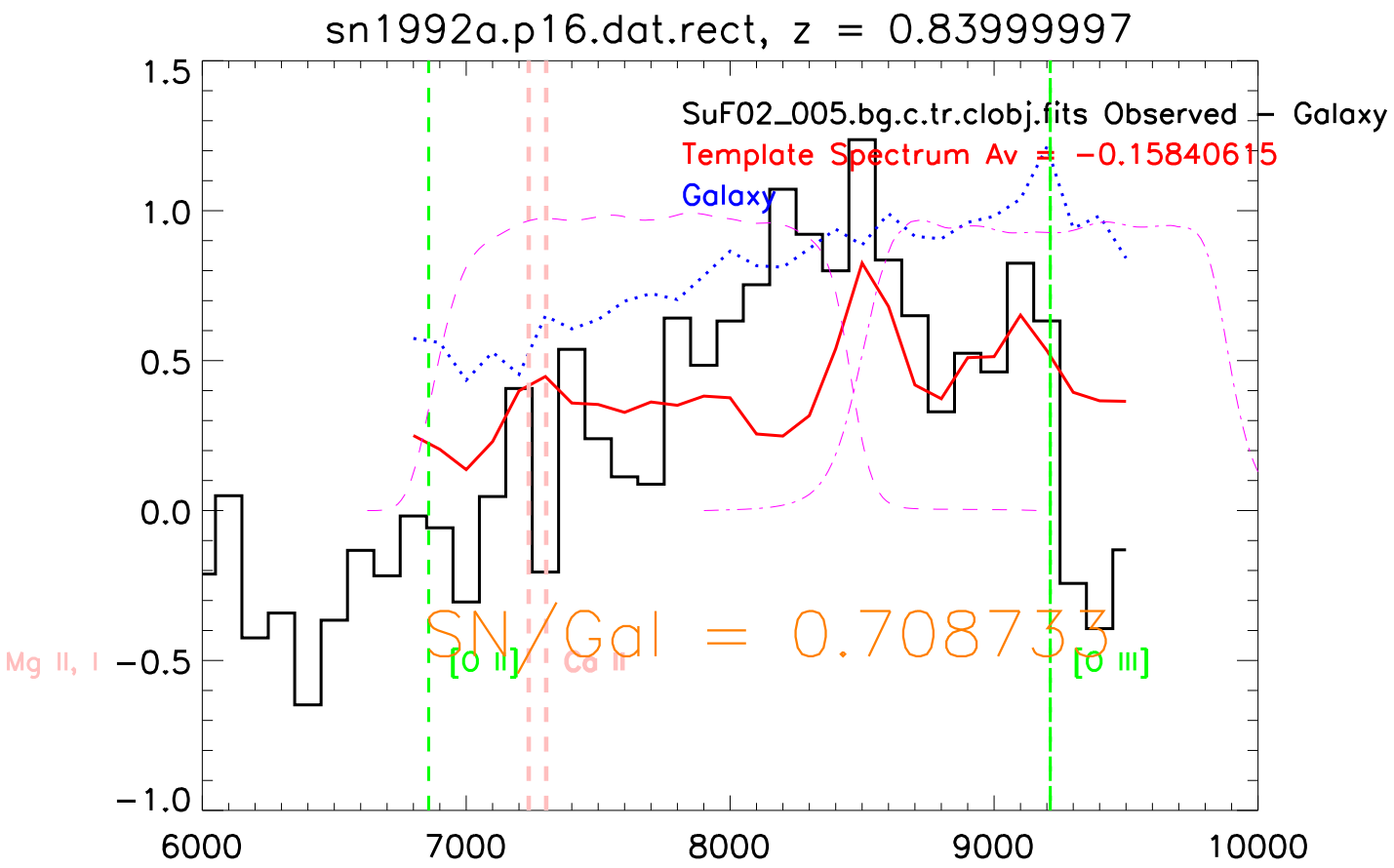

sn1994d.p13.dat.rect, z = 0.83999997
SuF02_005.bg.c.tr.clobj.fits Observed
Galaxy
Template Spectrum Av = 0.38816257
Galaxy
SN/Gal = 1.00992
Mg II, I
[O II]
Ca II
[O III]
2.0
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

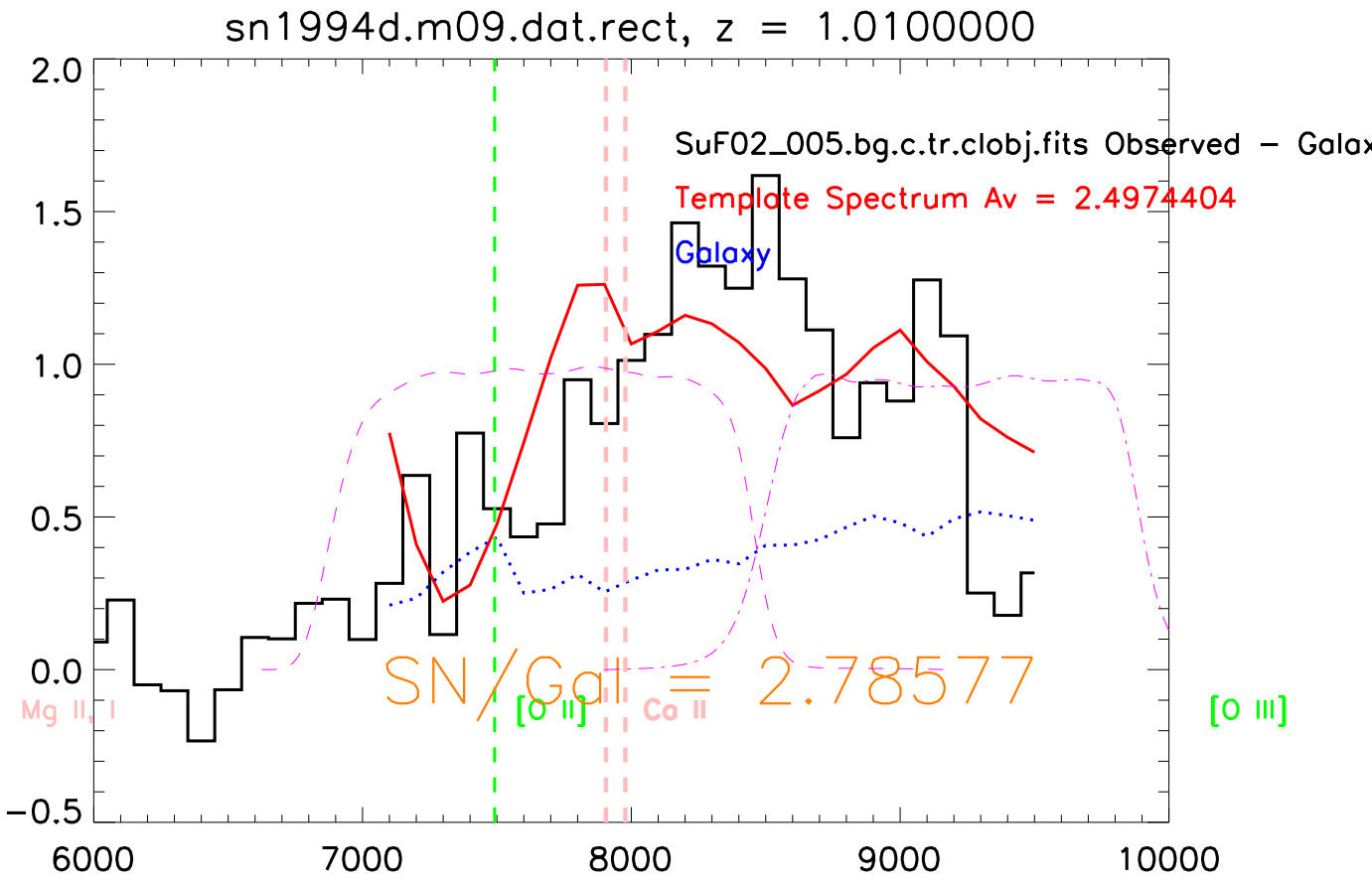

sn1994d.p20.dat.rect, z = 0.83999997
SuF02_005.bg.c.tr.clobj.fits Observed
Galaxy
Template Spectrum Av = 0.098868607
Galaxy
SN/Gal = 0.792325
[O II]
Ca II
[O III]
Mg II, I
1.5
1.0
0.5
0.0
−0.5
−1.0
6000
7000
8000
9000
10000

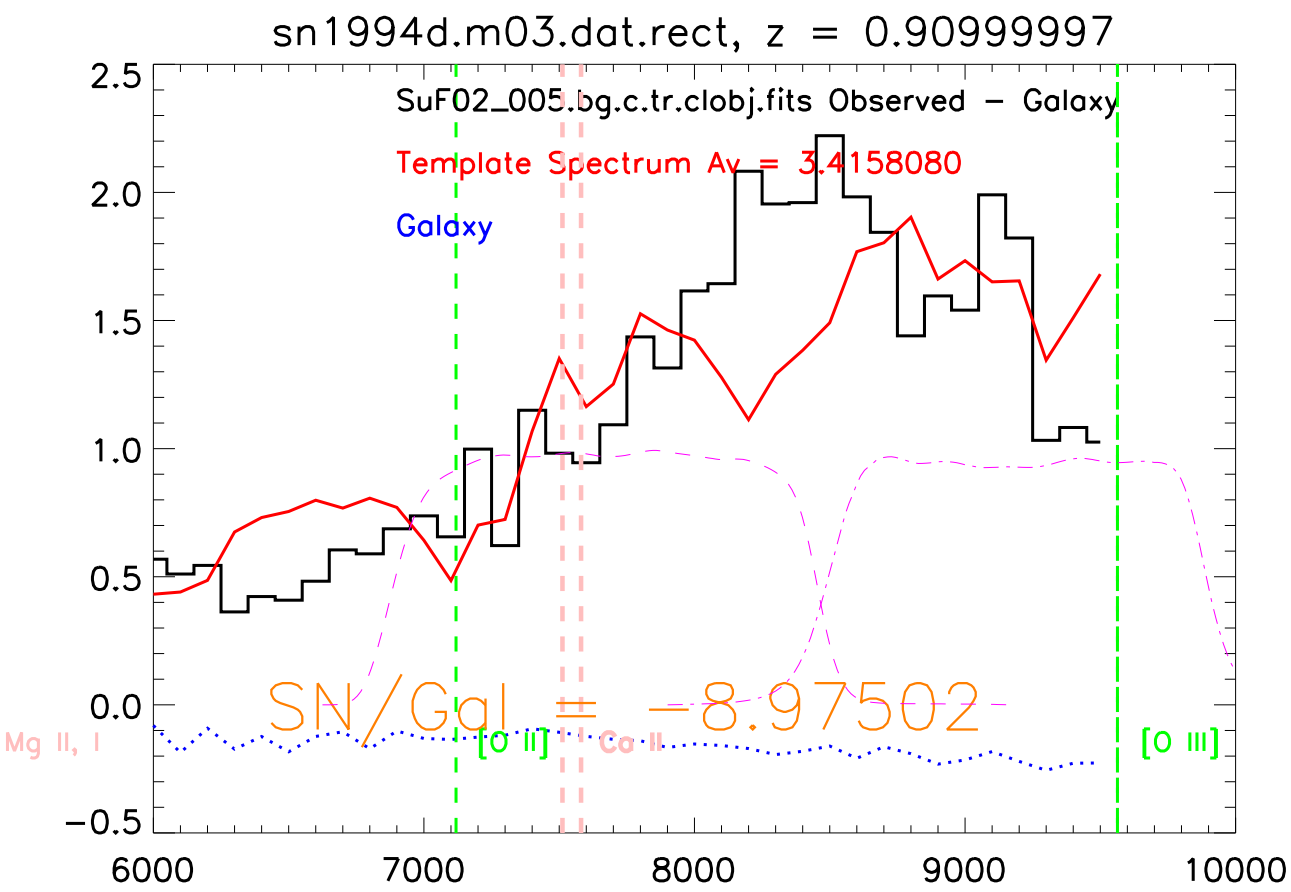

sn1981b.p20.dat.rect, z = 0.83999997
SuF02_005.bg.c.tr.clobj.fits Observed – Galaxy
Template Spectrum Av = 1.4049922
Galaxy
SN/Gal = 0.395629
Mg II, I
[O II]
Ca II
[O III]
2.0
1.5
1.0
0.5
0.0
−0.5
−1.0
6000
7000
8000
9000
10000

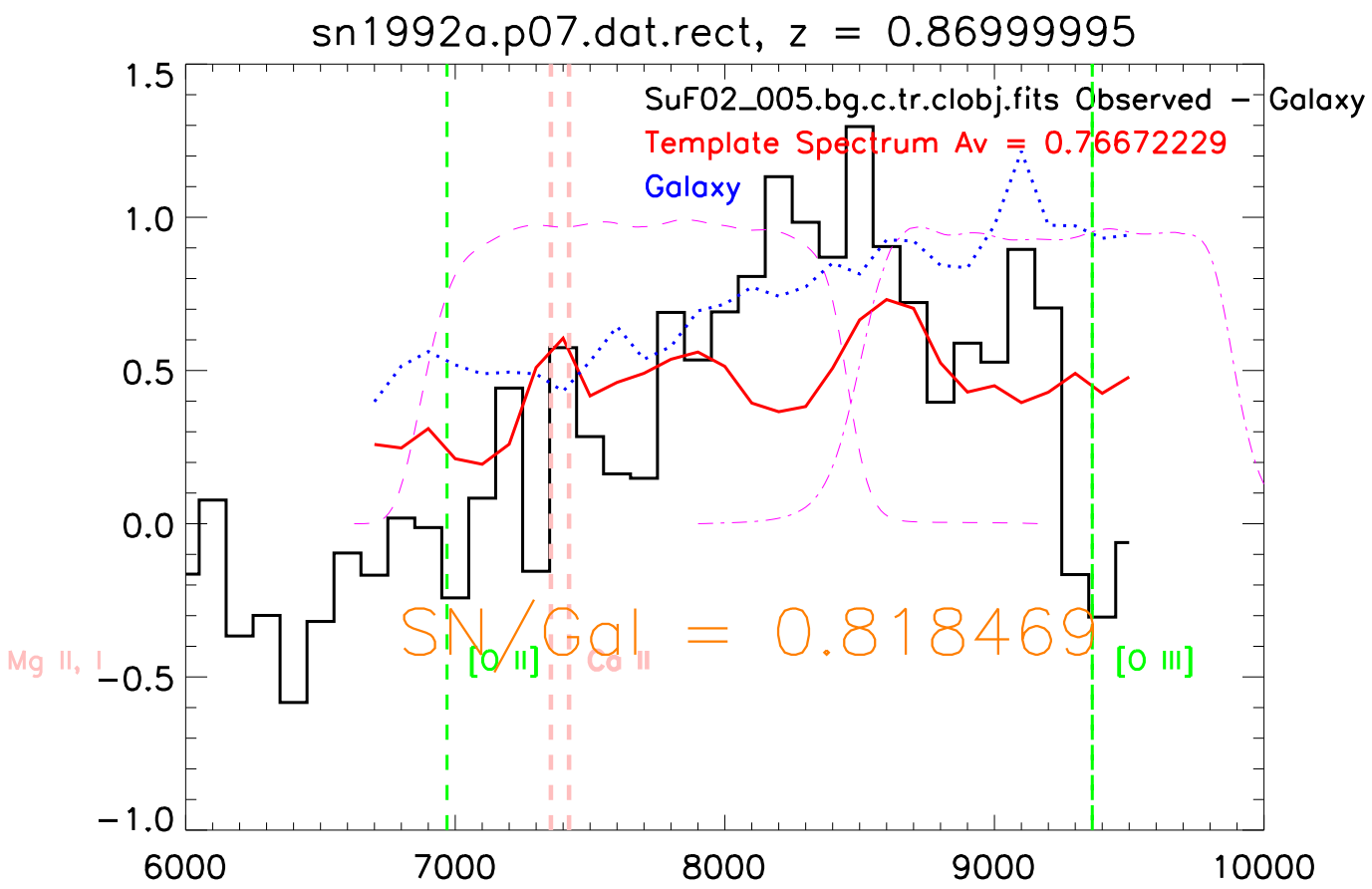

sn1994d.p16.dat.rect, z = 0.83999997
SuF02_005.bg.c.tr.clobj.fits Observed – Galaxy
Template Spectrum Av = 0.69751071
Galaxy
SN/Gal = 0.711710
Mg II, I
[O II]
Ca II
[O III]
1.5
1.0
0.5
0.0
−0.5
−1.0
6000
7000
8000
9000
10000

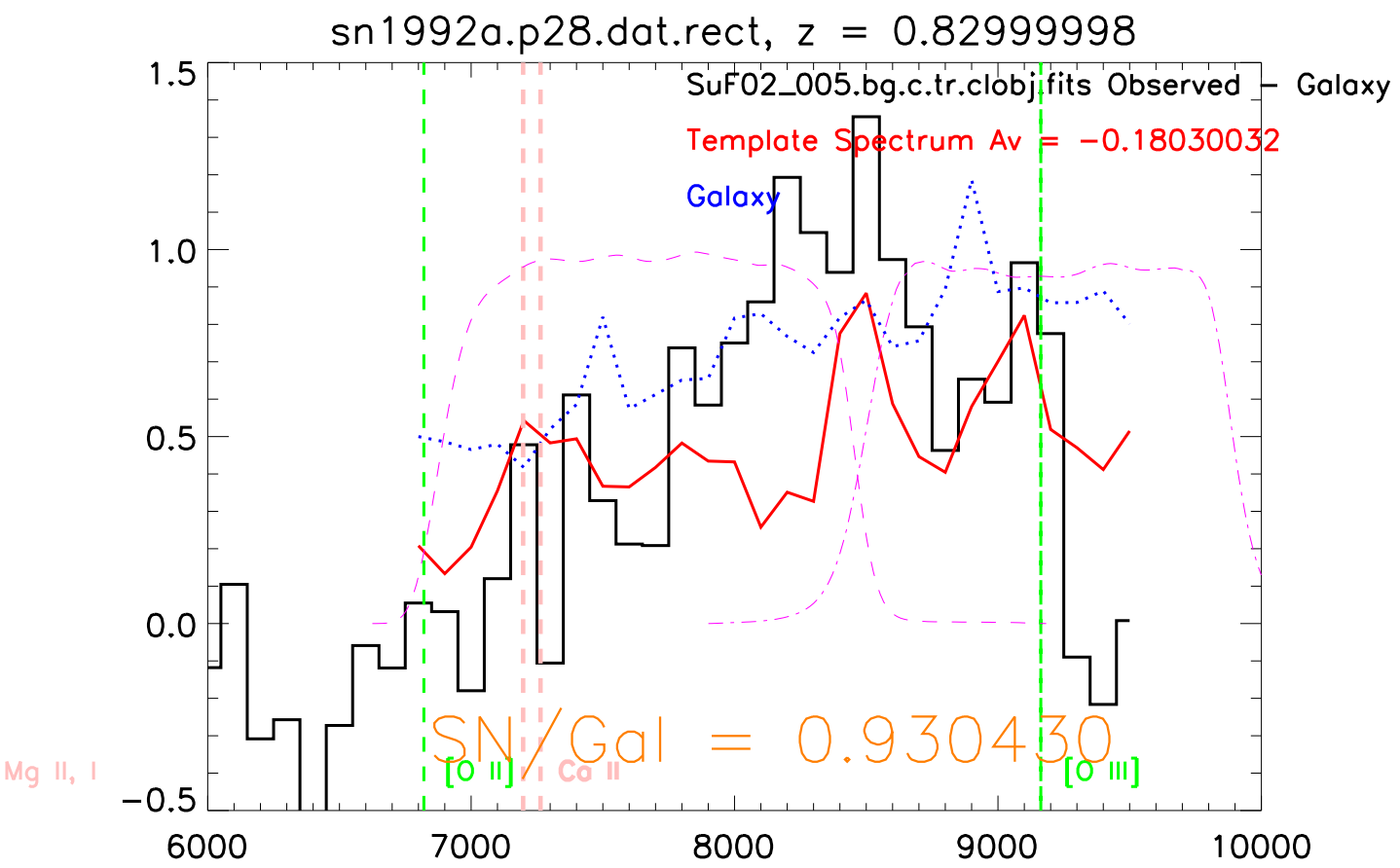

sn1992a.p24.dat.rect, z = 0.83999997
SuF02_005.bg.c.tr.clobj.fits Observed – Galaxy
Template Spectrum Av = −0.26645148
Galaxy
SN/Gal = 0.805050
Mg II, I
[O II]
Ca II
[O III]
1.5
1.0
0.5
0.0
−0.5
−1.0
6000
7000
8000
9000
10000

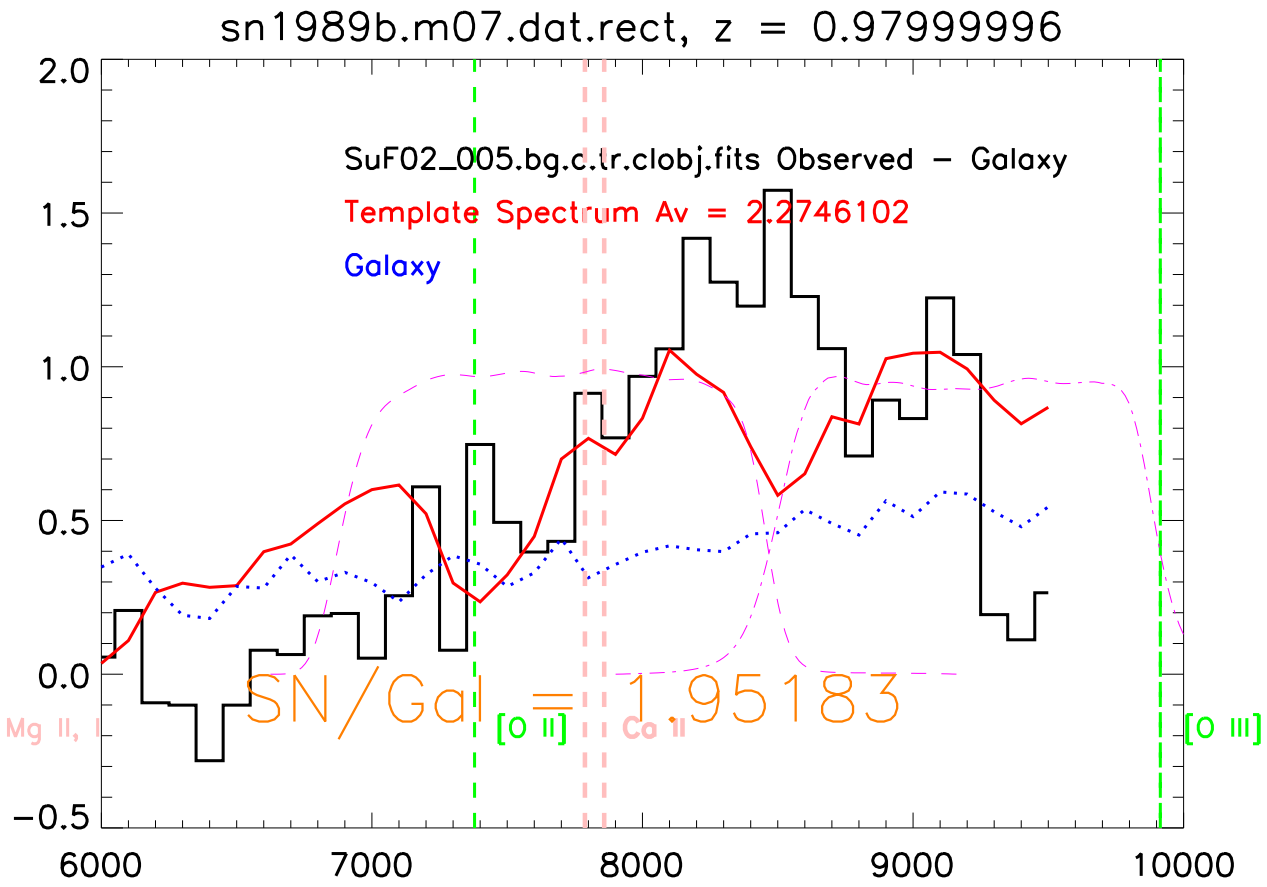

sn1992a.p16.dat.rect, z = 0.83999997
SuF02_005.bg.c.tr.clobj.fits Observed
Galaxy
Template Spectrum Av = -0.15840615
Galaxy
SN/Gal = 0.708735
[O II]
Ca II
[O III]
Mg II, I
1.5
1.0
0.5
0.0
-0.5
-1.0
6000
7000
8000
9000
10000

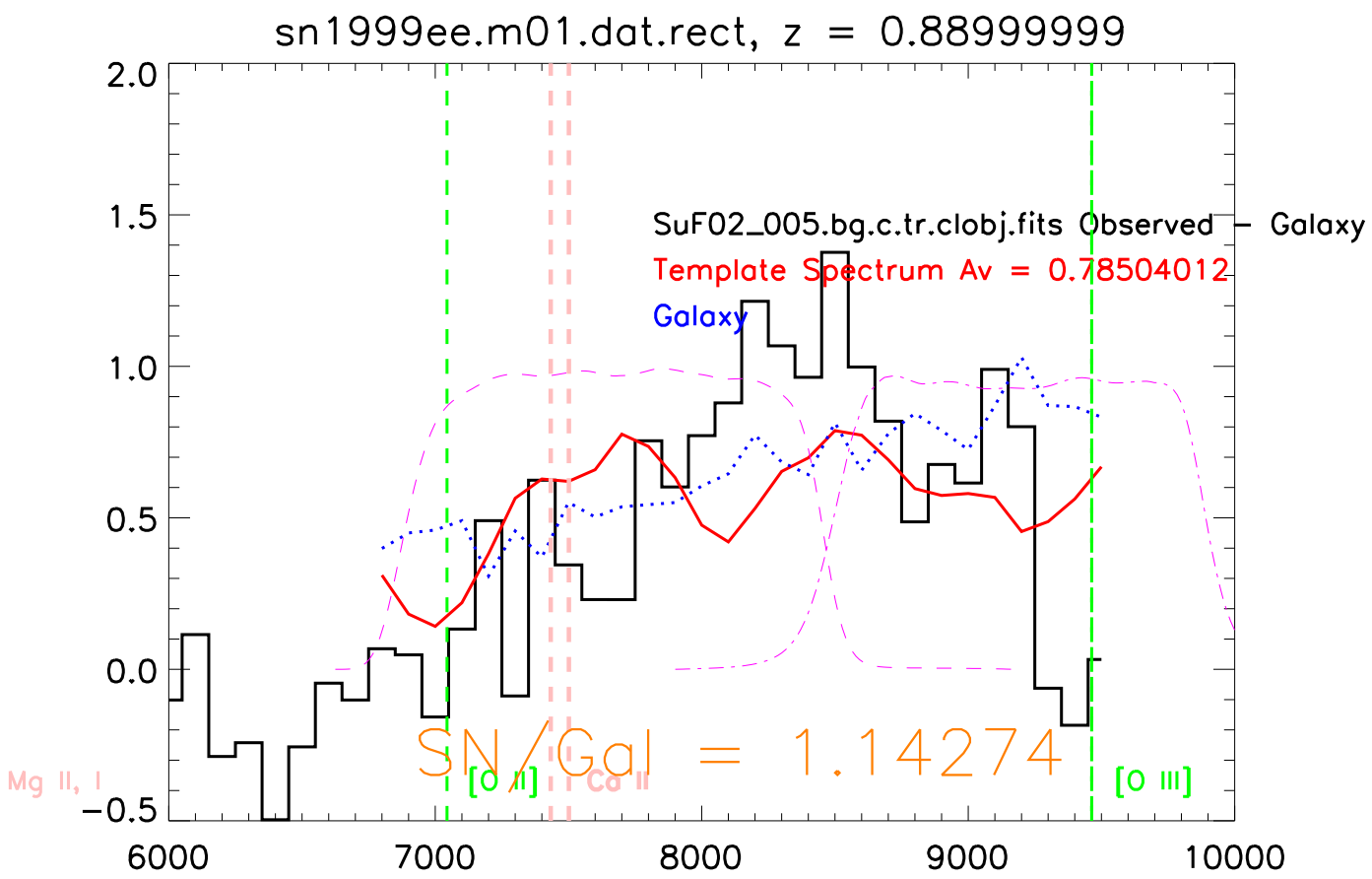

sn1994d.m09.dat.rect, z = 1.0100000
SuF02_005.bg.c.tr.clobj.fits Observed – Galax
Template Spectrum Av = 2.4974404
Galaxy
SN/Gal = 2.78577
Mg II, I
[O II]
Ca II
[O III]
2.0
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

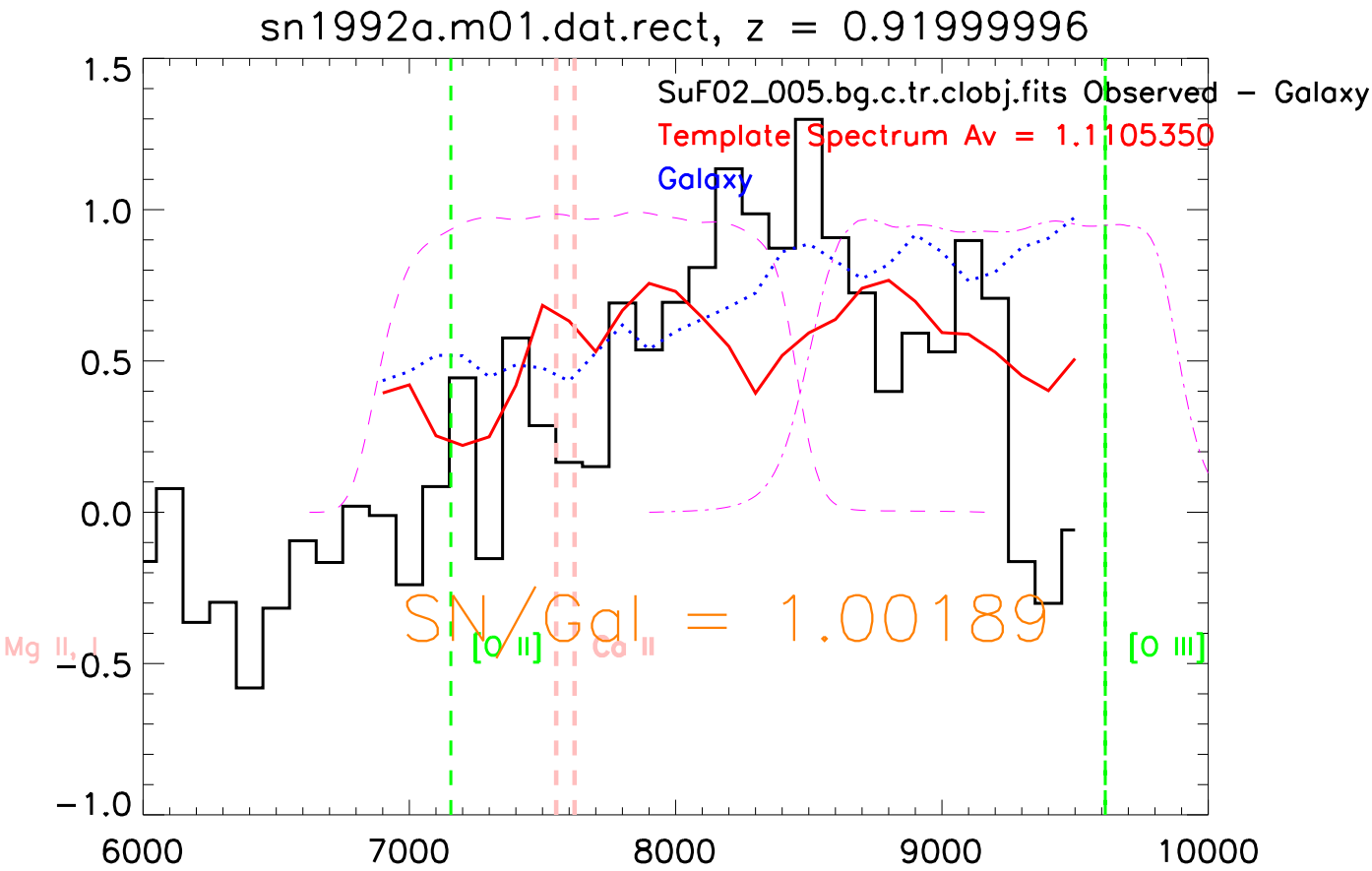

sn1994d.m03.dat.rect, z = 0.90999997
SuF02_005.bg.c.tr.clobj.fits Observed − Galaxy
Template Spectrum Av = 3.4158080
Galaxy
SN/Gal = −8.97502
Mg II, I
[O II]
Ca II
[O III]
2.5
2.0
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

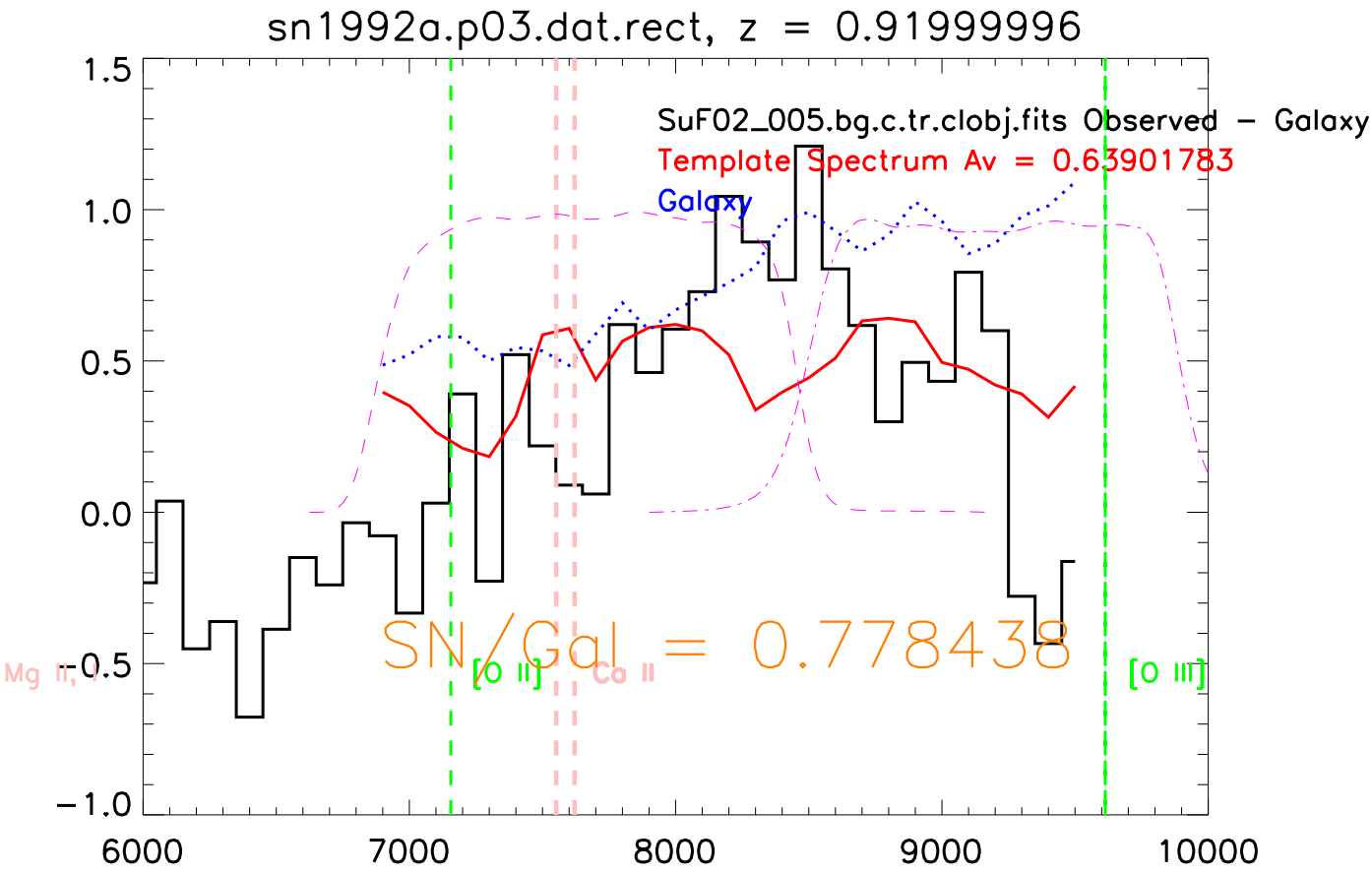

sn1992a.p07.dat.rect, z = 0.86999995
SuF02_005.bg.c.tr.clobj.fits Observed – Galaxy
Template Spectrum Av = 0.76672229
Galaxy
S/N/Gal = 0.818469
Mg II, I
[O II]
Ca II
[O III]
1.5
1.0
0.5
0.0
−0.5
−1.0
6000
7000
8000
9000
10000

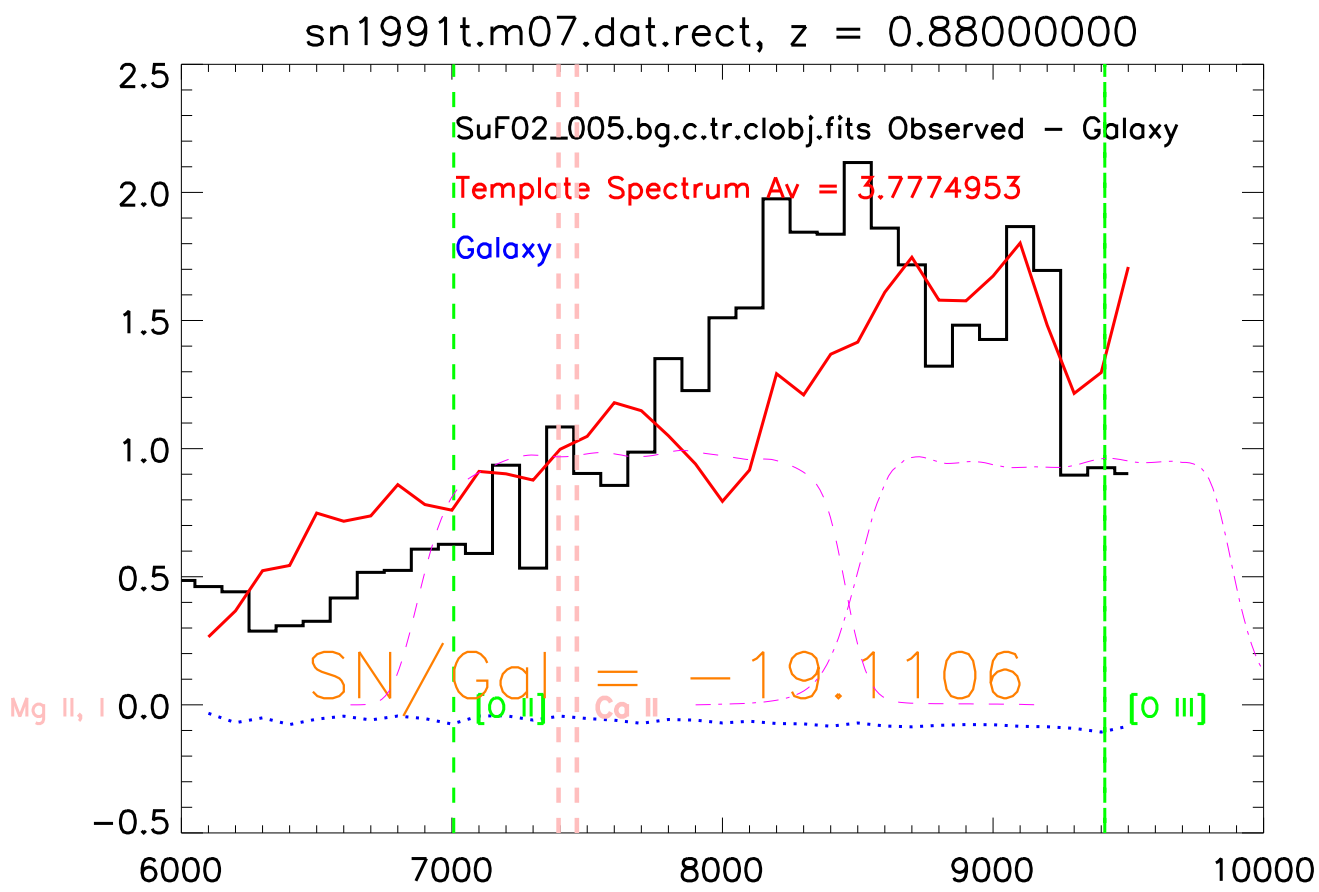

sn1992a.p28.dat.rect, z = 0.82999998
SuF02_005.bg.c.tr.clobj.fits Observed – Galaxy
Template Spectrum Av = −0.18030032
Galaxy
SN/Gal = 0.930430
[O II]
Ca II
[O III]
Mg II, I
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

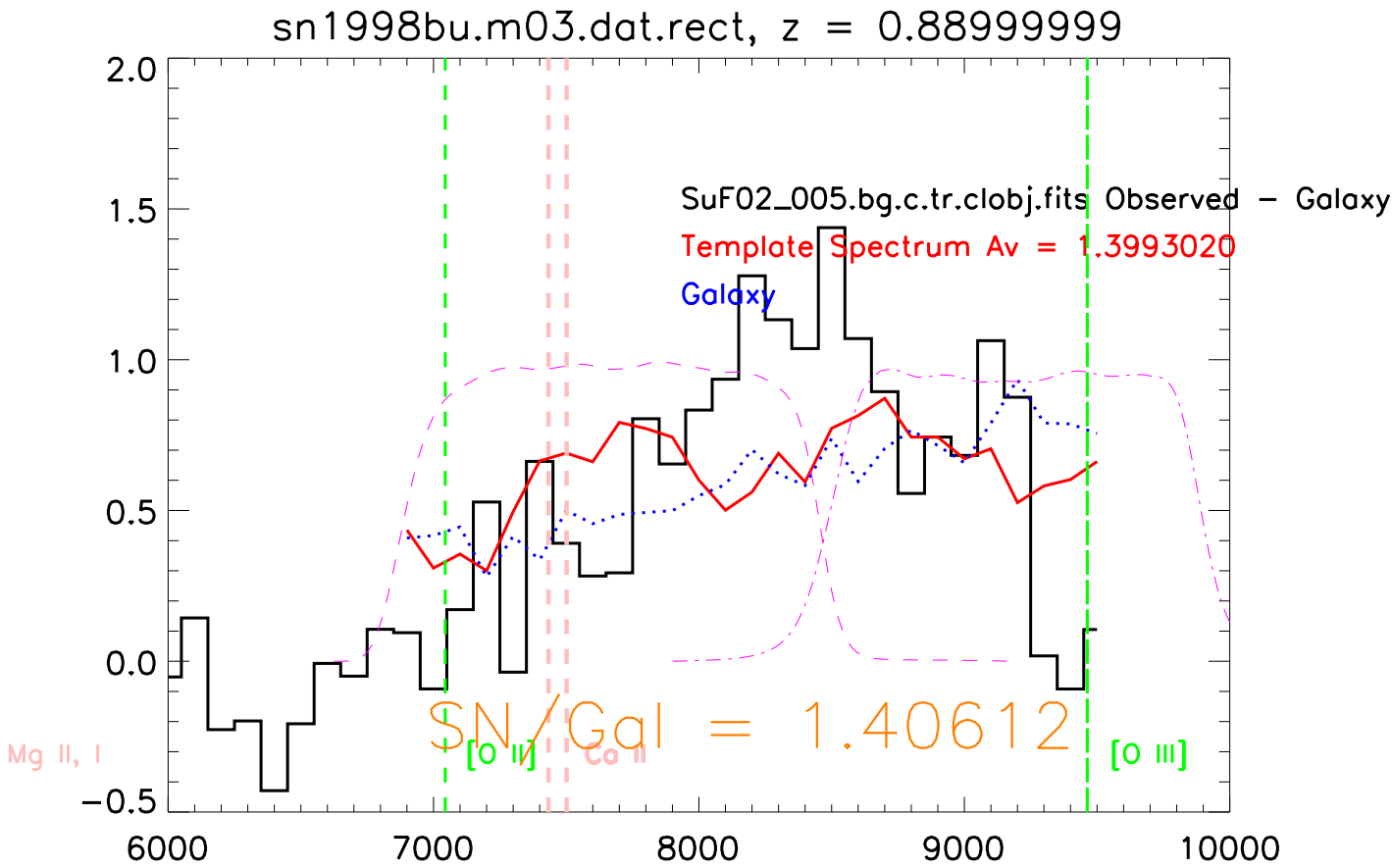

sn1989b.m07.dat.rect, z = 0.97999996
SuF02_005.bg.c.tr.clobj.fits Observed − Galaxy
Template Spectrum Av = 2.2746102
Galaxy
SN/Gal = 1.95183
[O II]
Ca II
[O III]
2.0
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

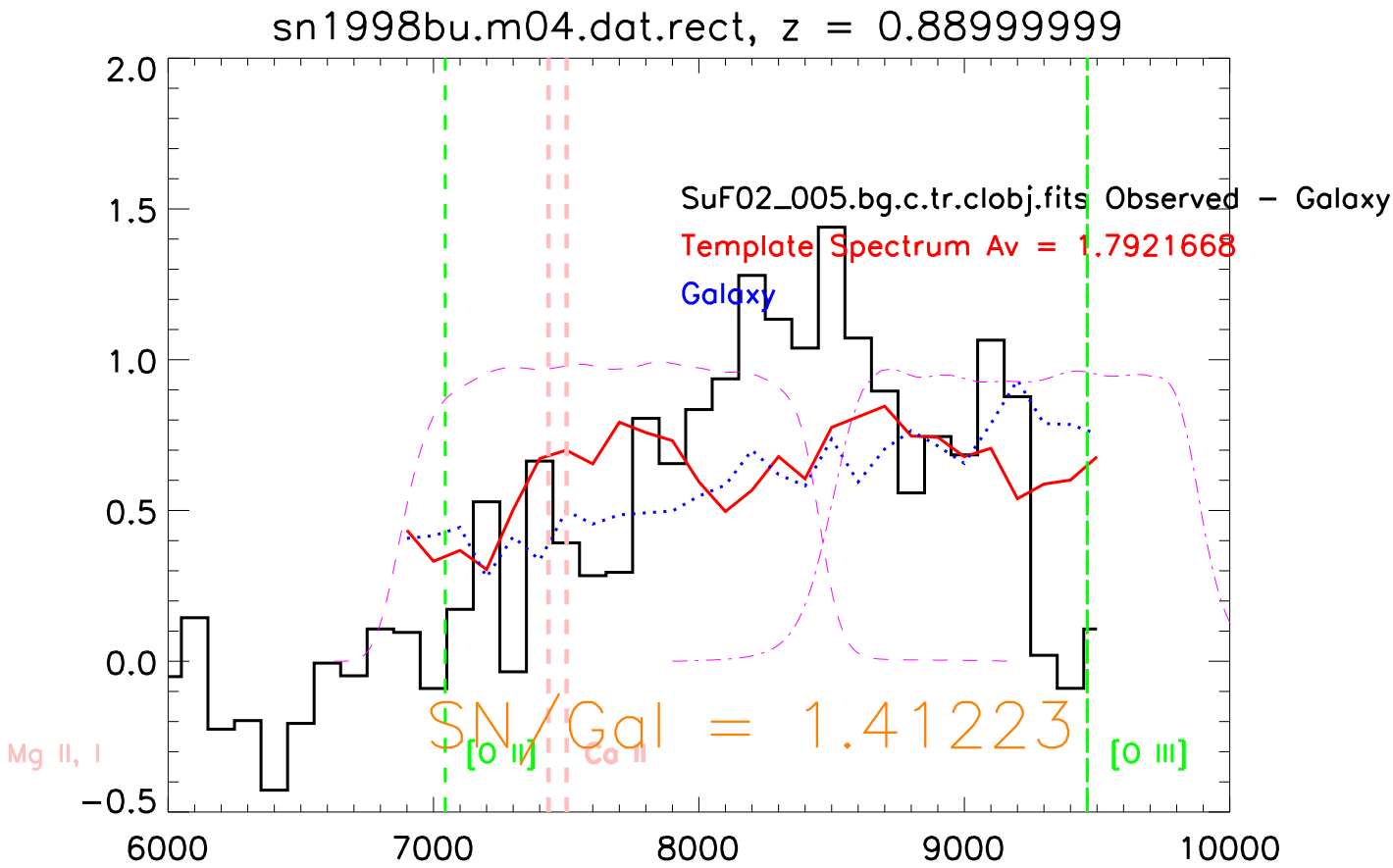

sn1999ee.m01.dat.rect, z = 0.88999999
SuF02_005.bg.c.tr.clobj.fits Observed – Galaxy
Template Spectrum Av = 0.78504012
Galaxy
SN/Gal = 1.14274
Mg II, I
[O II]
Ca II
[O III]
2.0
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

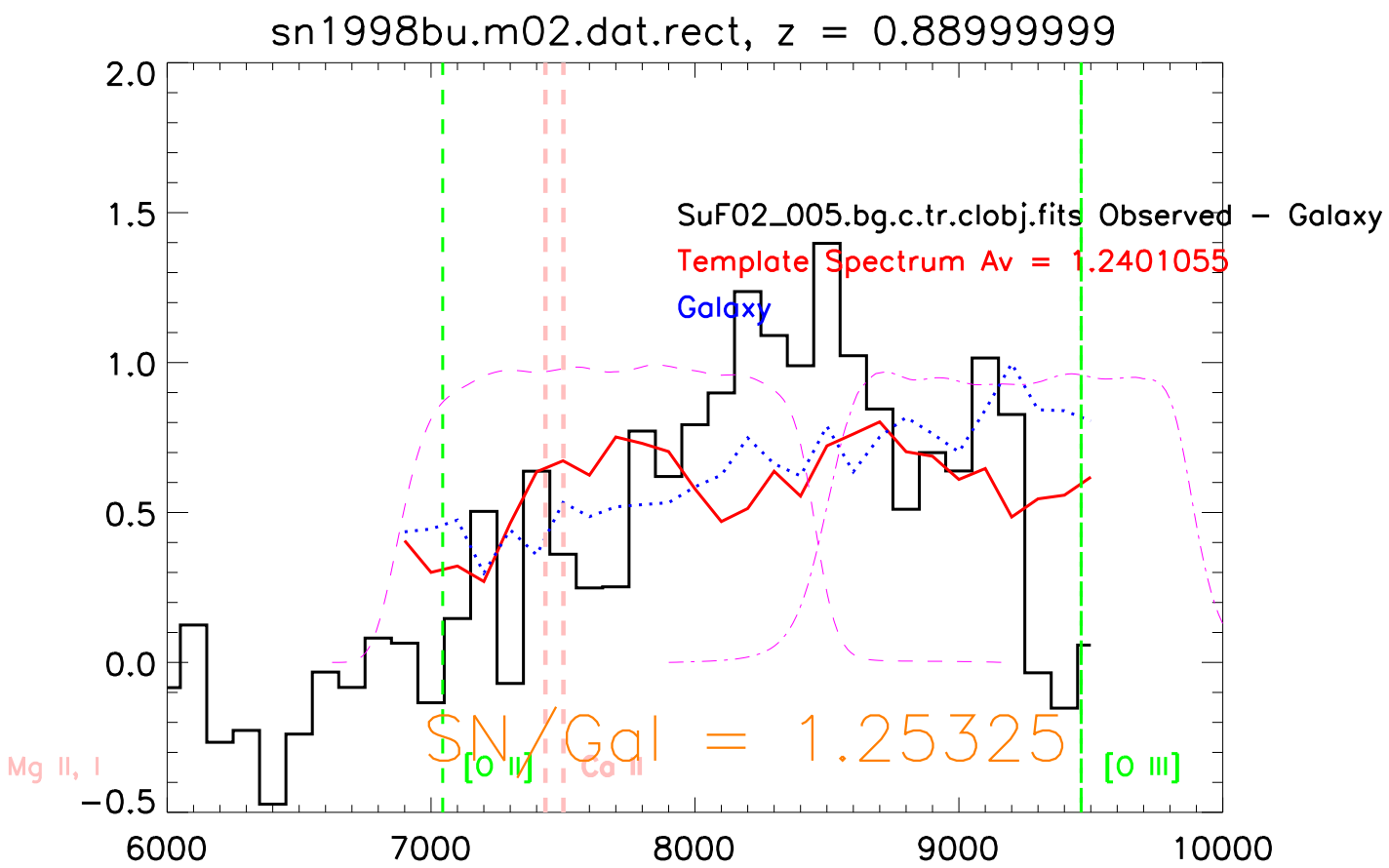

sn1992a.m01.dat.rect, z = 0.91999996
SuF02_005.bg.c.tr.clobj.fits Observed – Galaxy
Template Spectrum Av = 1.1105350
Galaxy
SN/Gal = 1.00189
Mg II, I
[O II]
Ca II
[O III]
1.5
1.0
0.5
0.0
−0.5
−1.0
6000
7000
8000
9000
10000

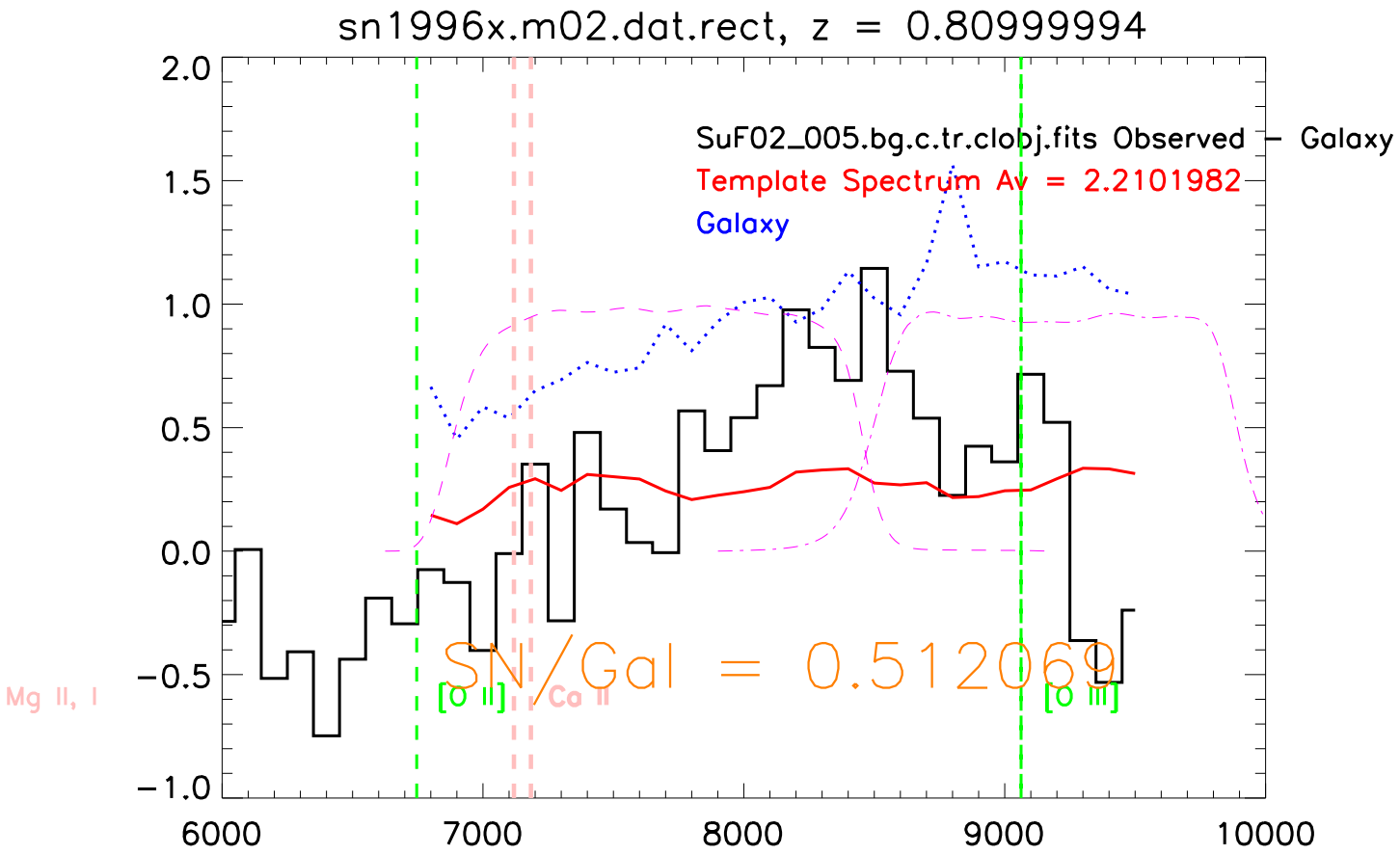

sn1992a.p03.dat.rect, z = 0.91999996
SuF02_005.bg.c.tr.clobj.fits Observed − Galaxy
Template Spectrum Av = 0.63901783
Galaxy
SN/Gal = 0.778438
[O II]
Ca II
[O III]
1.5
1.0
0.5
0.0
−0.5
−1.0
6000
7000
8000
9000
10000

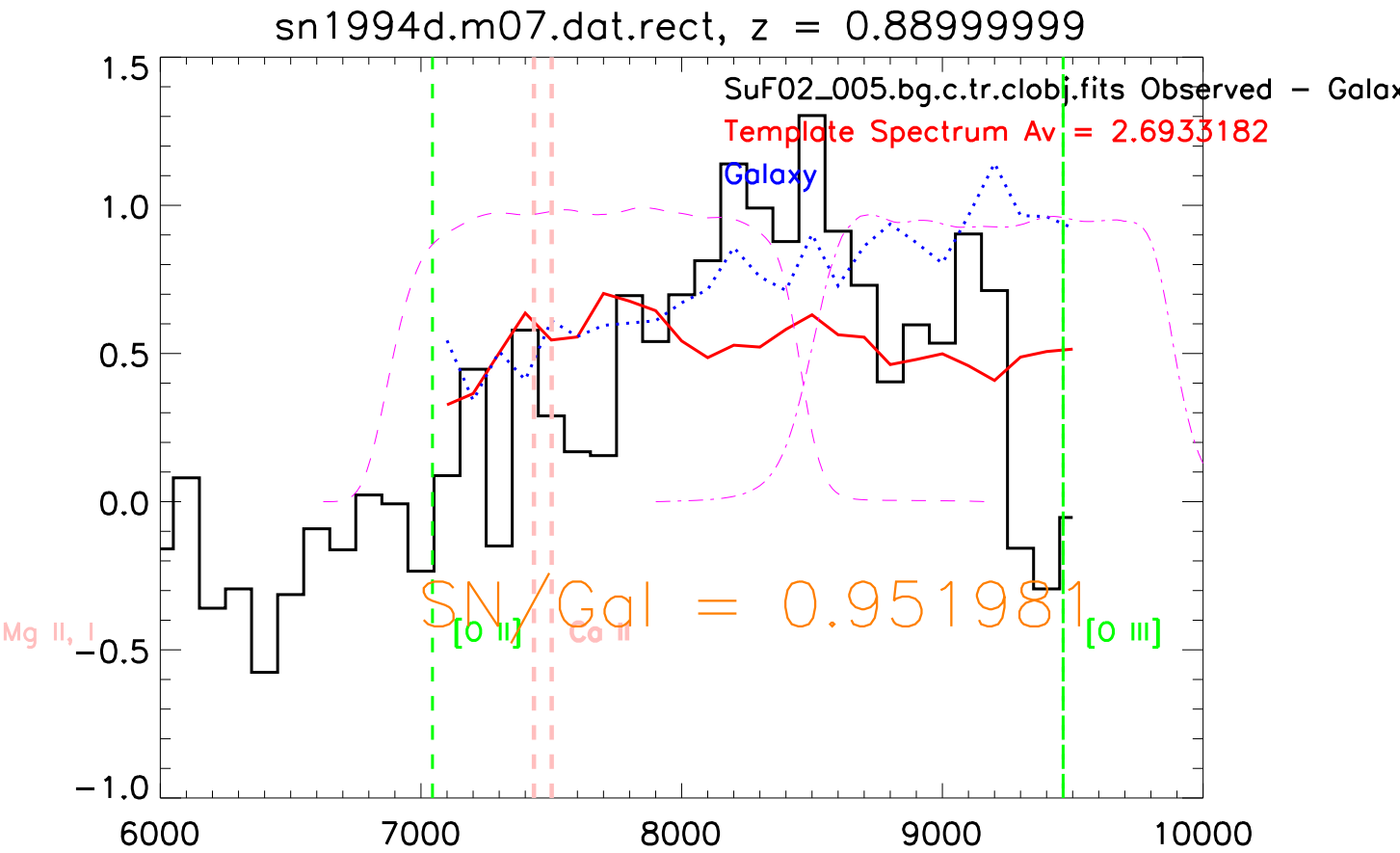

sn1991t.m07.dat.rect, z = 0.88000000
SuF02_005.bg.c.tr.clobj.fits Observed − Galaxy
Template Spectrum Av = 3.7774953
Galaxy
SN/Gal = −19.1106
Mg II, I
[O II]
Ca II
[O III]
2.5
2.0
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

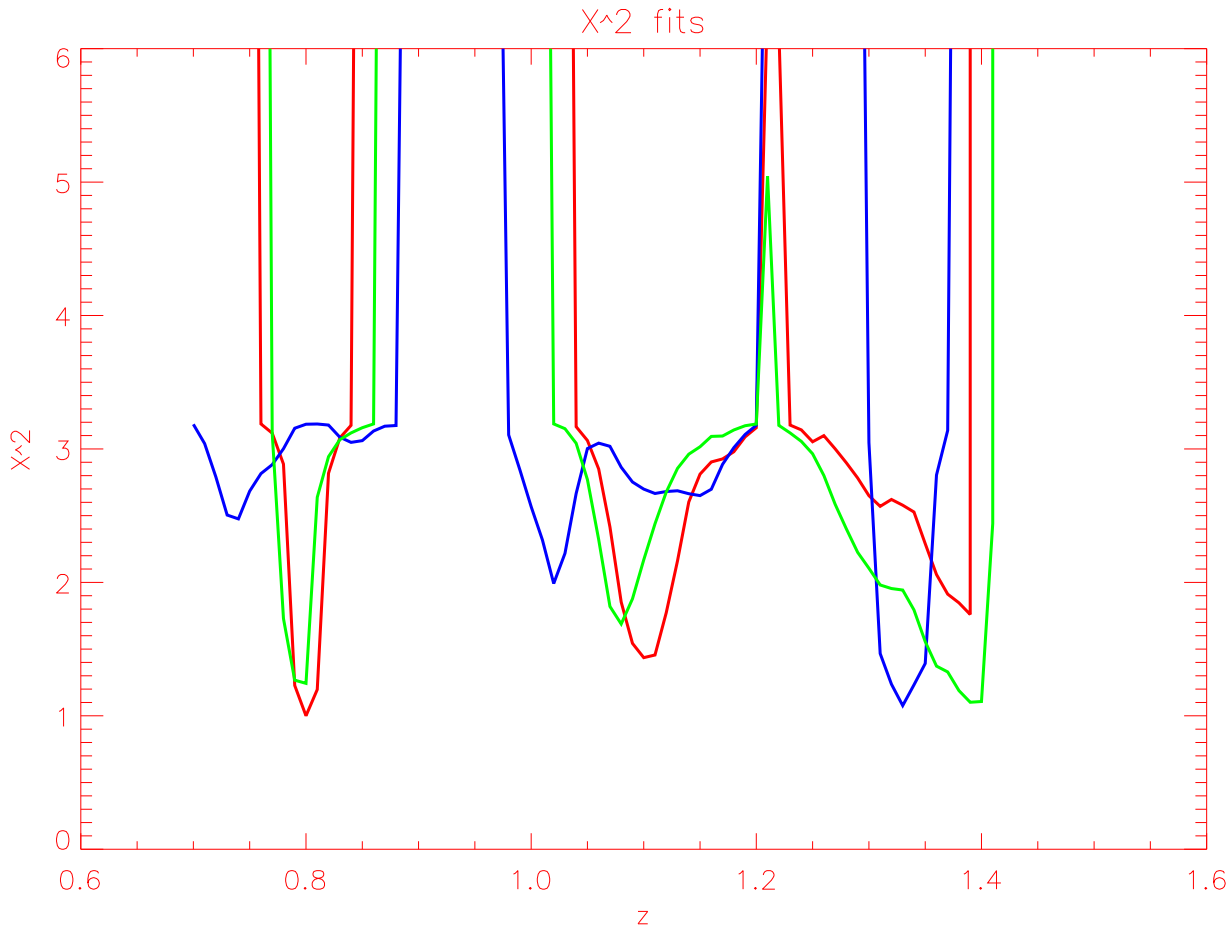

sn1998bu.m03.dat.rect, z = 0.88999999
SuF02_005.bg.c.tr.clobj.fits Observed − Galaxy
Template Spectrum Av = 1.3993020
Galaxy
SN/Gal = 1.40612
Mg II, I
[O II]
Ca II
[O III]
2.0
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

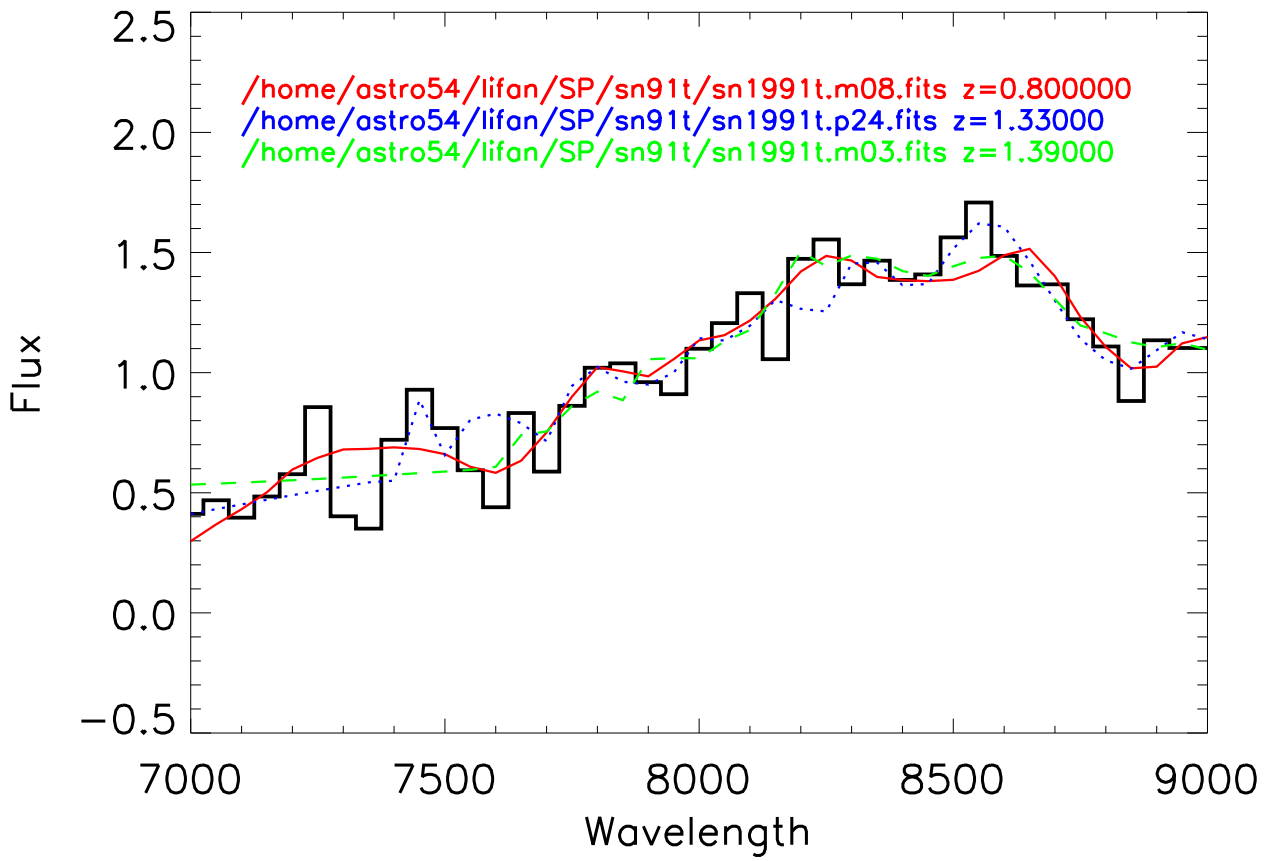

sn1998bu.m04.dat.rect, z = 0.88999999
SuF02_005.bg.c.tr.clobj.fits Observed − Galaxy
Template Spectrum Av = 1.7921668
Galaxy
SN/Gal = 1.41223
Mg II, I
[O II]
Ca II
[O III]
2.0
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

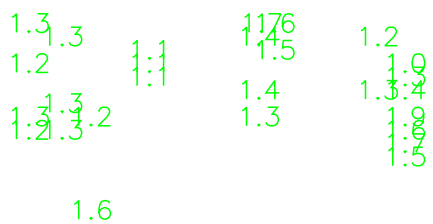

sn1998bu.m02.dat.rect, z = 0.88999999
SuF02_005.bg.c.tr.clobj.fits Observed – Galaxy
Template Spectrum Av = 1.2401055
Galaxy
S/N/Gal = 1.25325
Mg II, I
[O II]
Ca II
[O III]
2.0
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

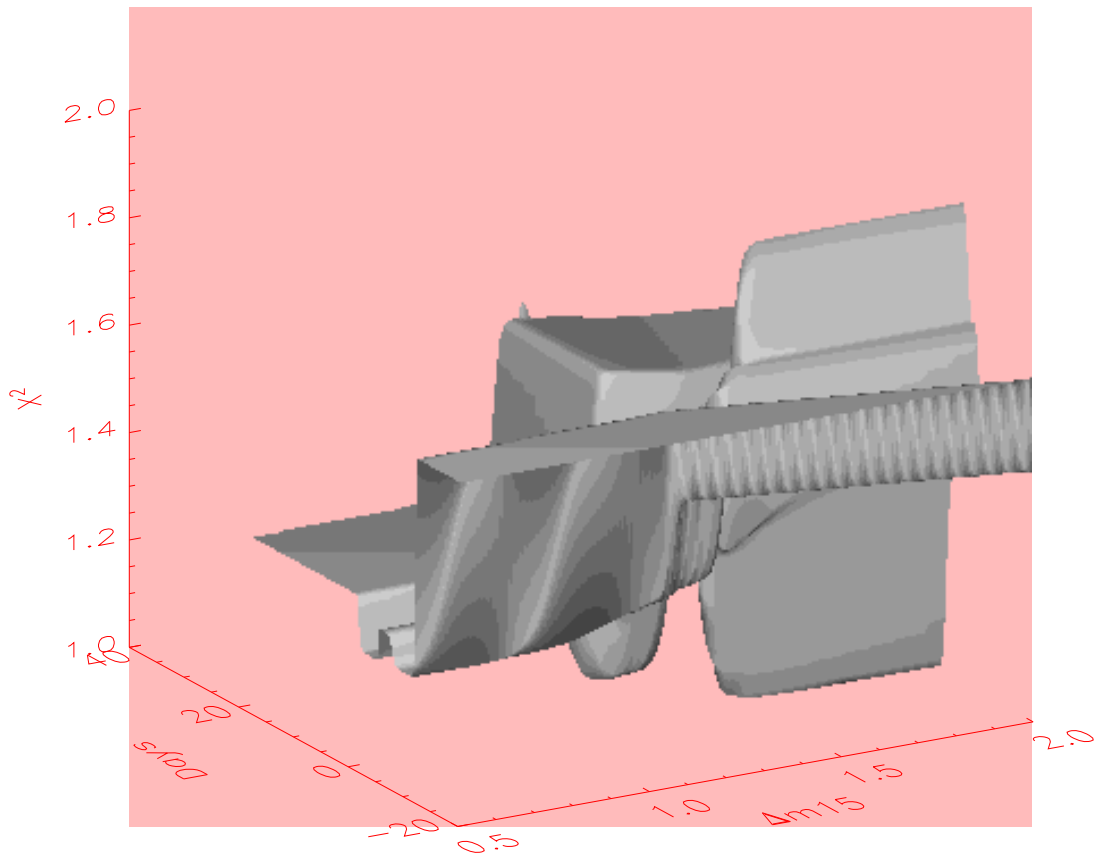

sn1996x.m02.dat.rect, z = 0.80999994
SuF02_005.bg.c.tr.clobj.fits Observed
Galaxy
Template Spectrum Av = 2.2101982
Galaxy
SN/Gal = 0.512069
Mg II, I
[O II]
Ca II
[O III]
2.0
1.5
1.0
0.5
0.0
−0.5
−1.0
6000
7000
8000
9000
10000


sn1994d.m07.dat.rect, z = 0.88999999
SuF02_005.bg.c.tr.clobj.fits Observed – Galax
Template Spectrum Av = 2.6933182
Galaxy
SN/Gal = 0.951981
Mg II, I
[O II]
Ca II
[O III]
1.5
1.0
0.5
0.0
−0.5
−1.0
6000
7000
8000
9000
10000

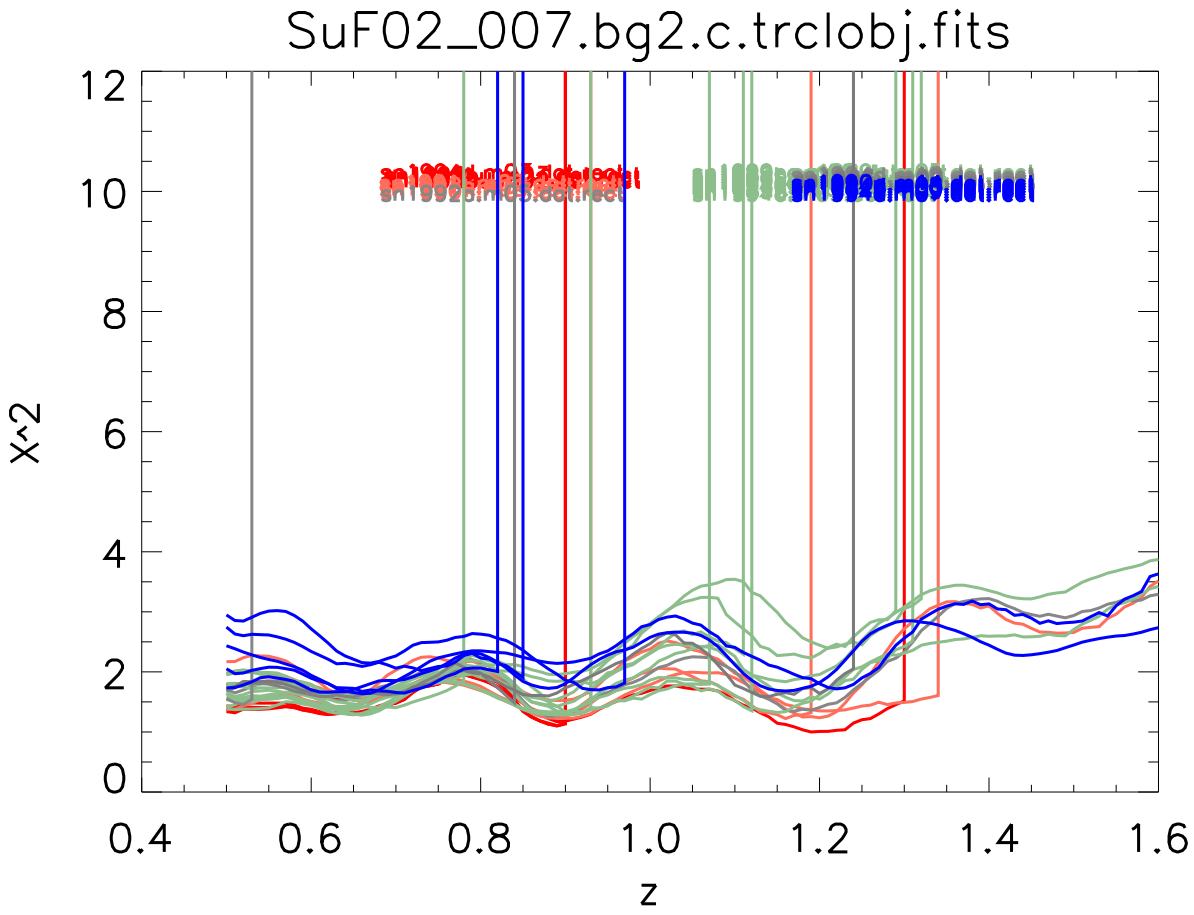

X^2 fits
X^2
z
0
1
2
3
4
5
6
0.6
0.8
1.0
1.2
1.4
1.6

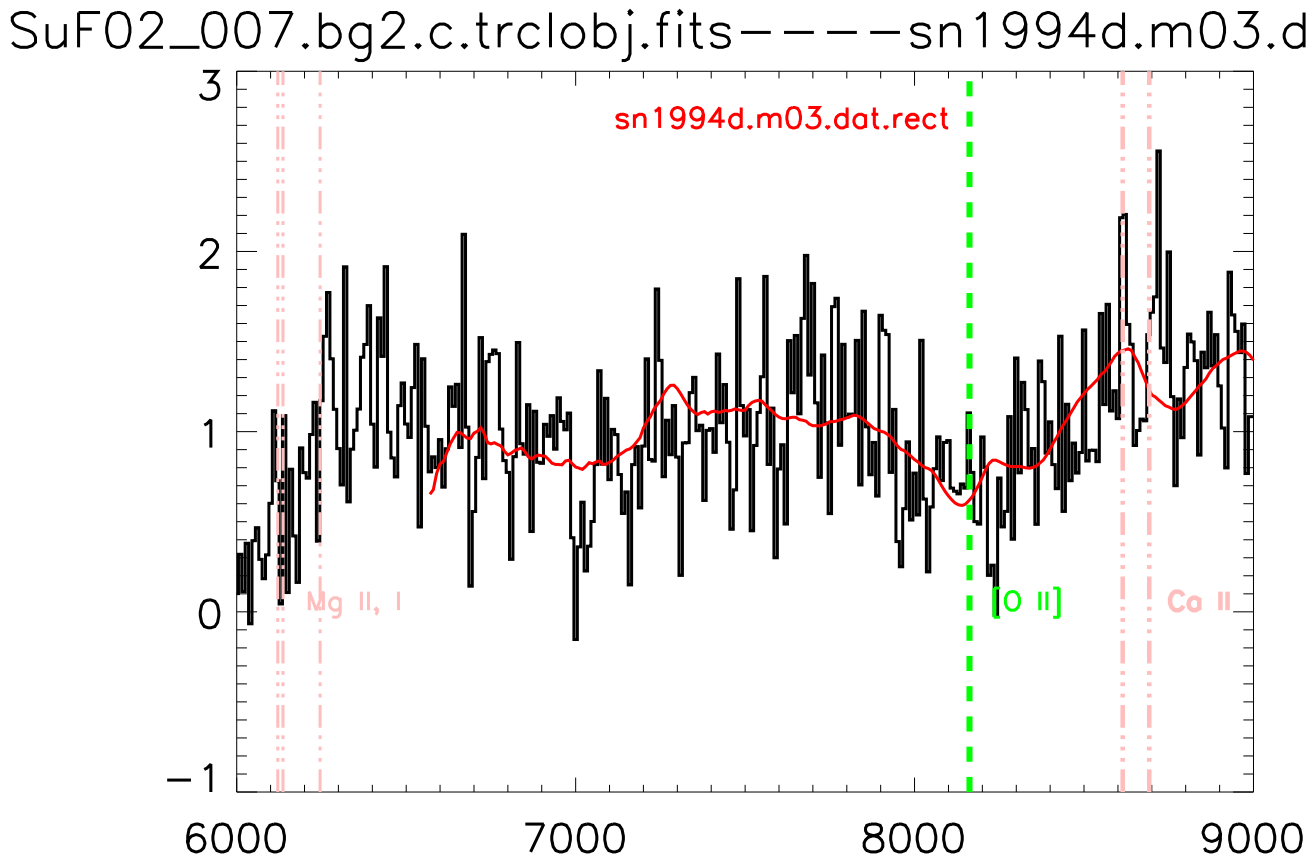

/home/astro54/lifan/SP/sn91t/sn1991t.m08.fits z=0.800000
/home/astro54/lifan/SP/sn91t/sn1991t.p24.fits z=1.33000
/home/astro54/lifan/SP/sn91t/sn1991t.m03.fits z=1.39000
Flux
Wavelength
2.5
2.0
1.5
1.0
0.5
0.0
−0.5
7000
7500
8000
8500
9000

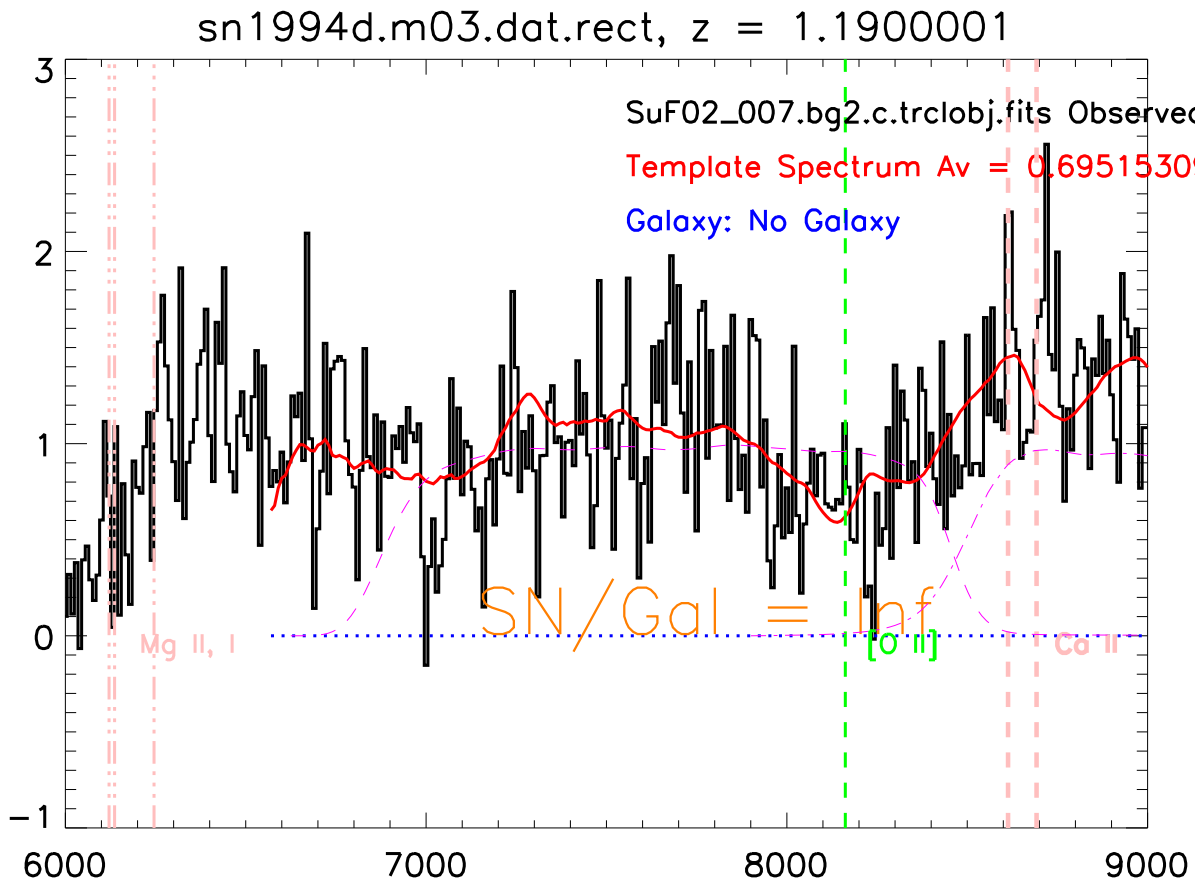


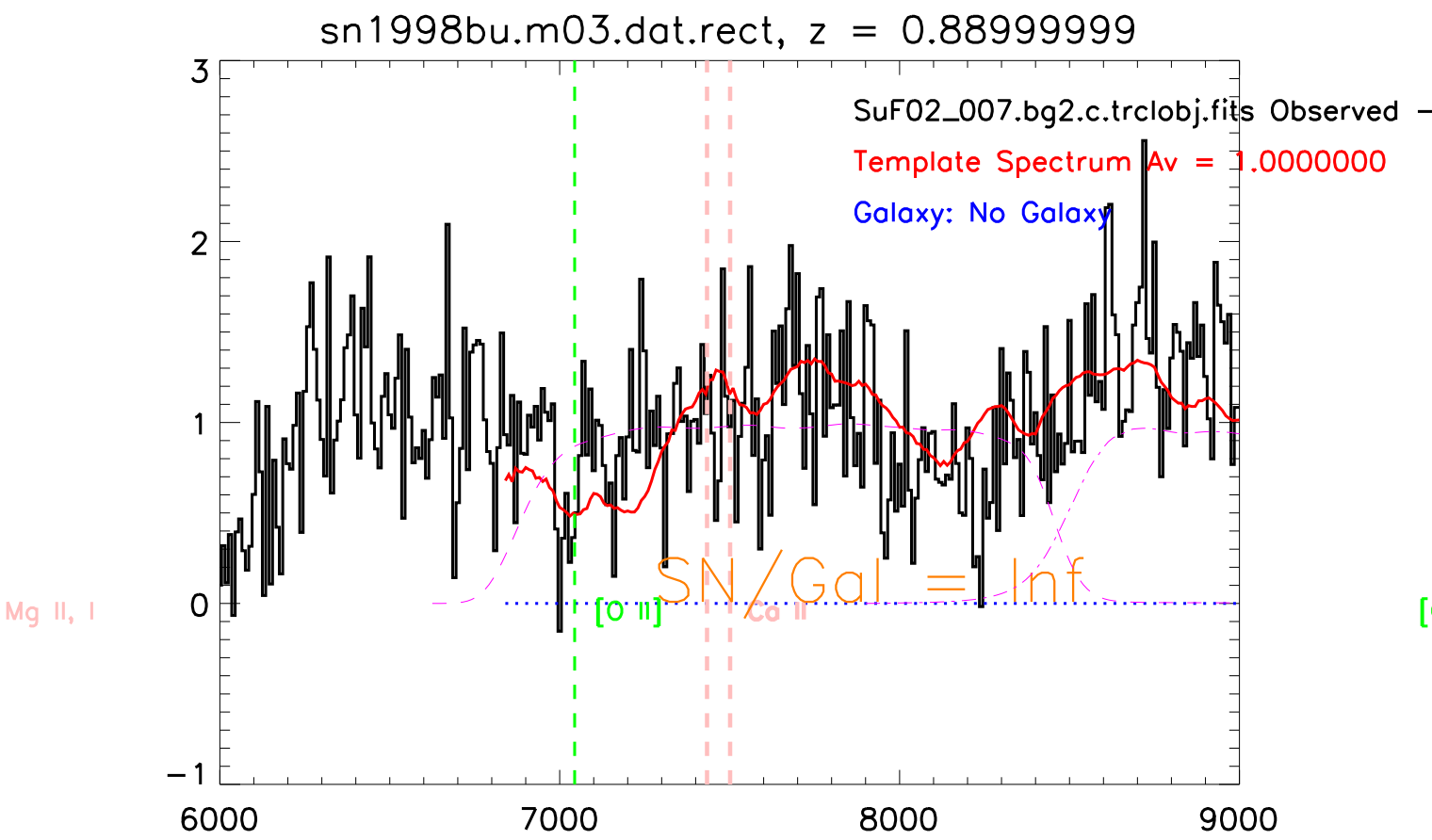


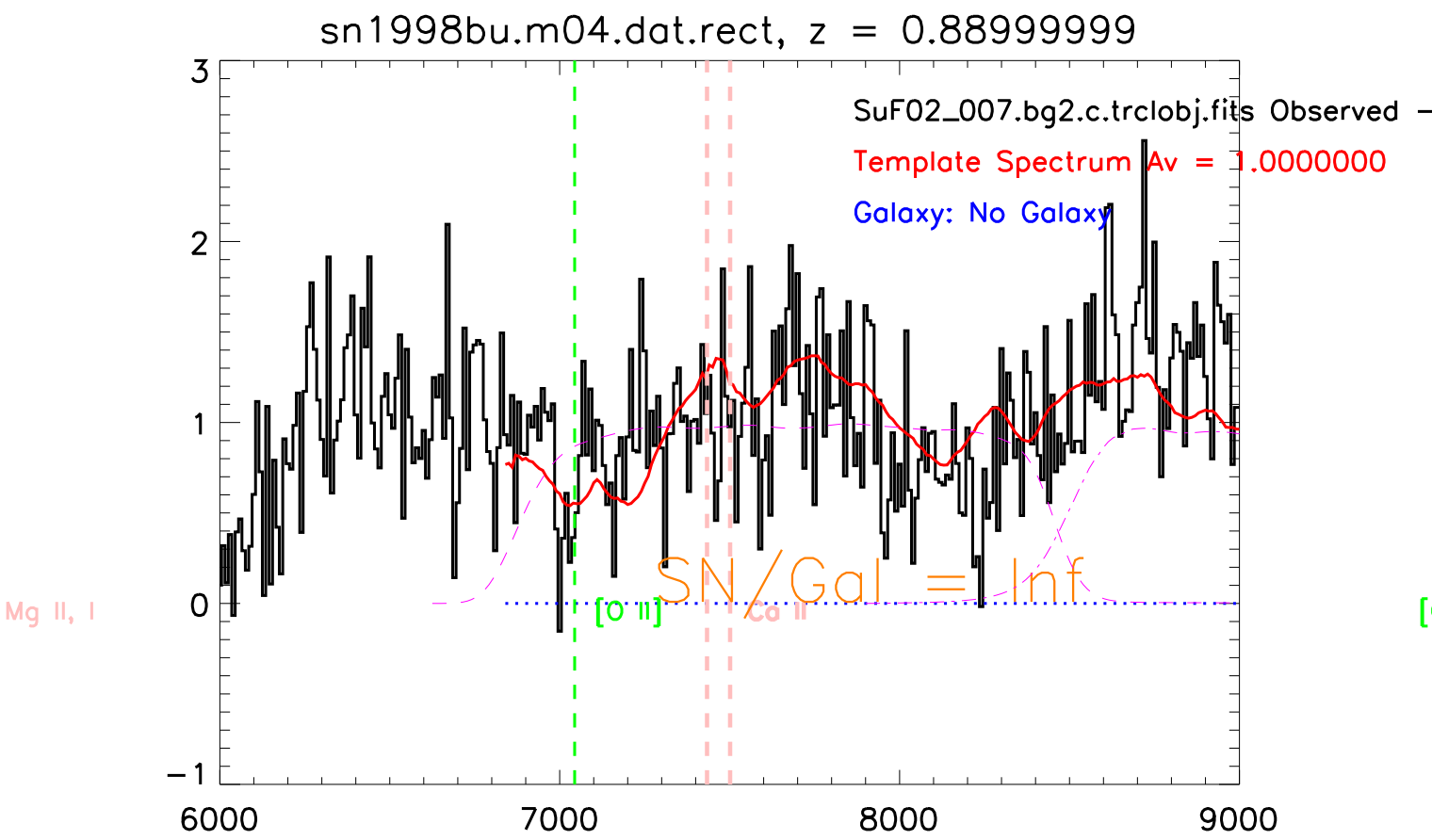
2.0
1.8
1.6
1.4
1.2
1.0
χ^2
40
20
0
−20
Days
0.5
1.0
1.5
2.0
Δm15

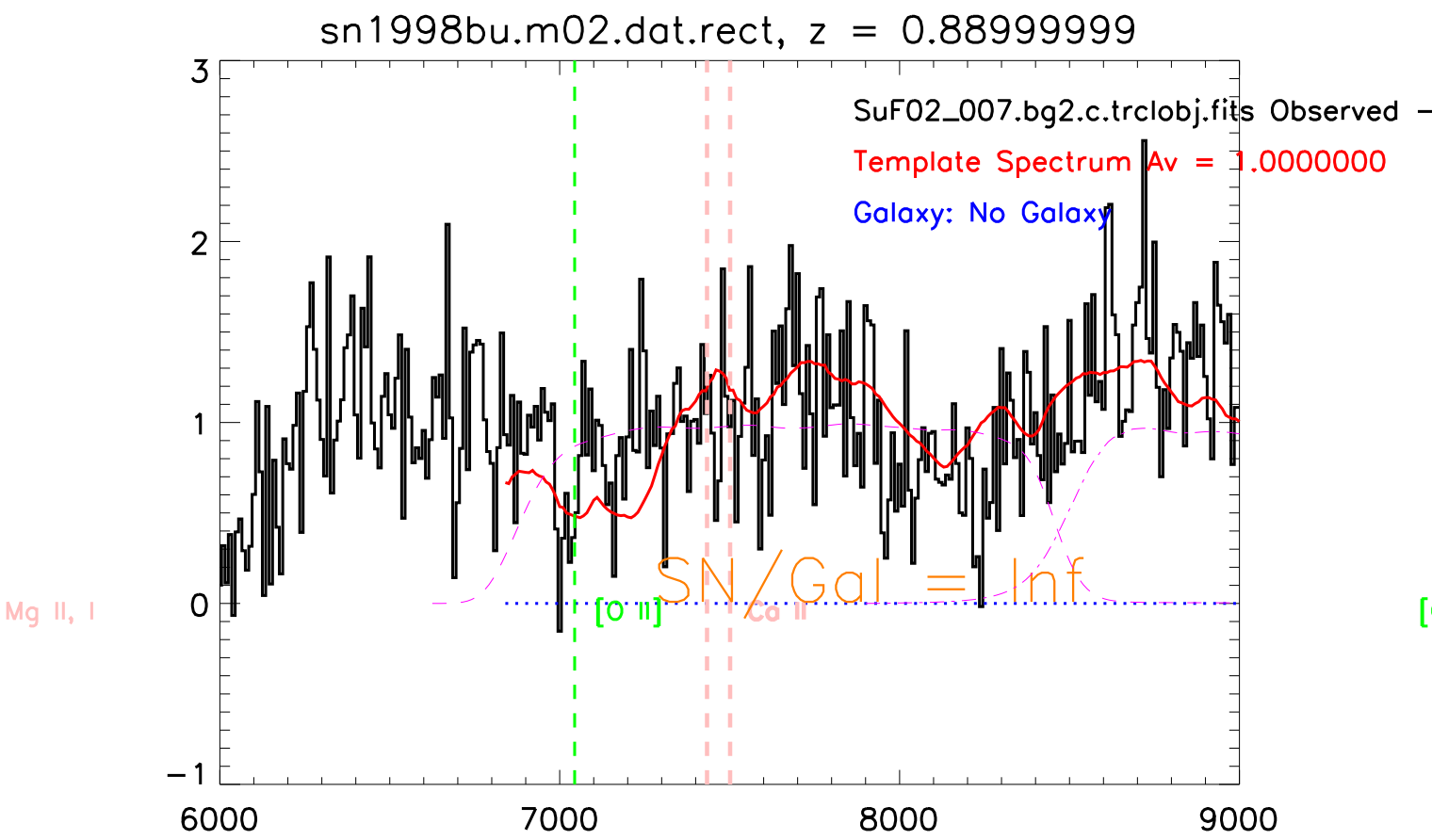

SuF02_007.bg2.c.trclobj.fits
12
10
8
6
4
2
0
X^2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
z

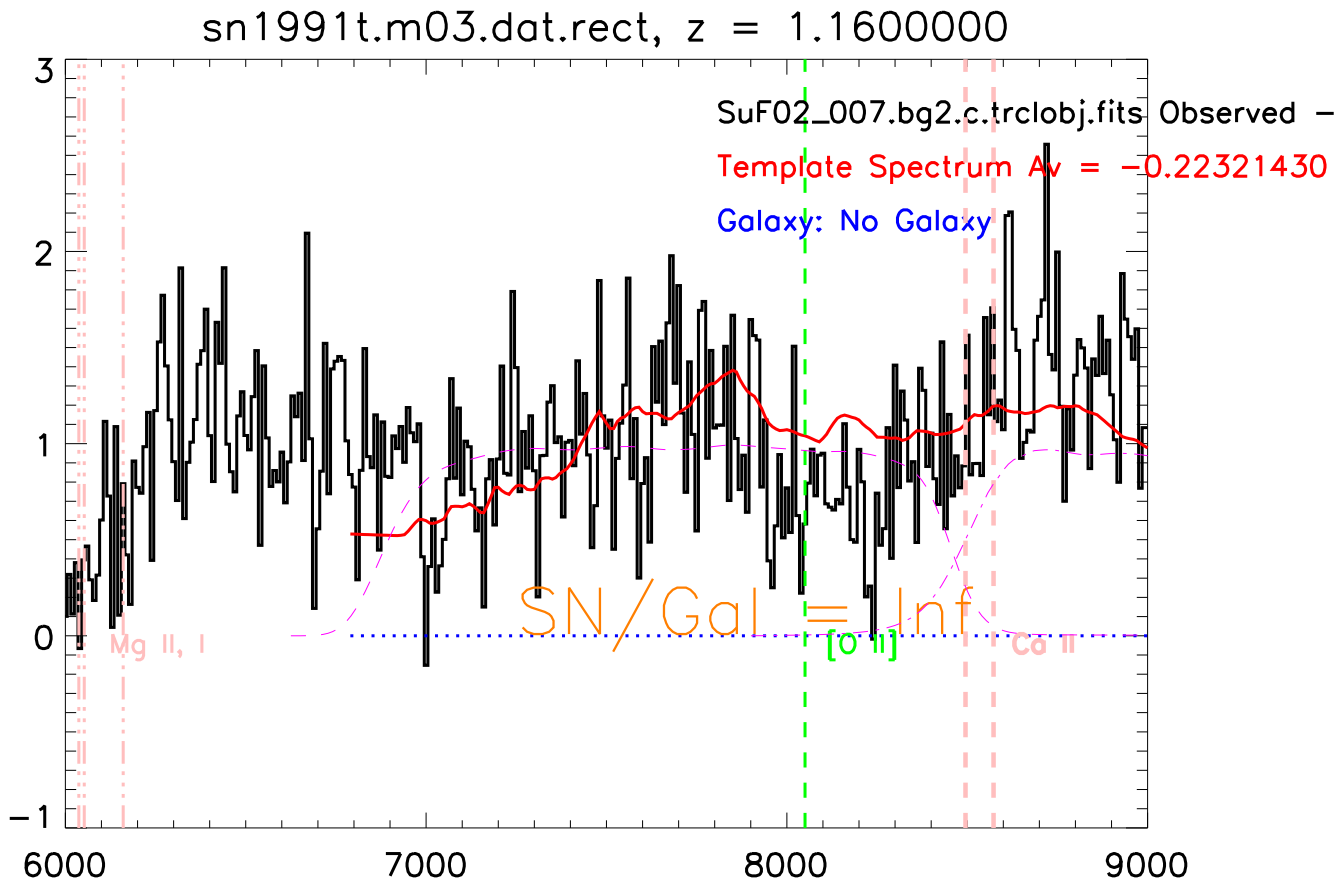

SuF02_007.bg2.c.trclobj.fits----sn1994d.m03.dat.rect
sn1994d.m03.dat.rect
Mg II, I
[O II]
Ca II
3
2
1
0
−1
6000
7000
8000
9000

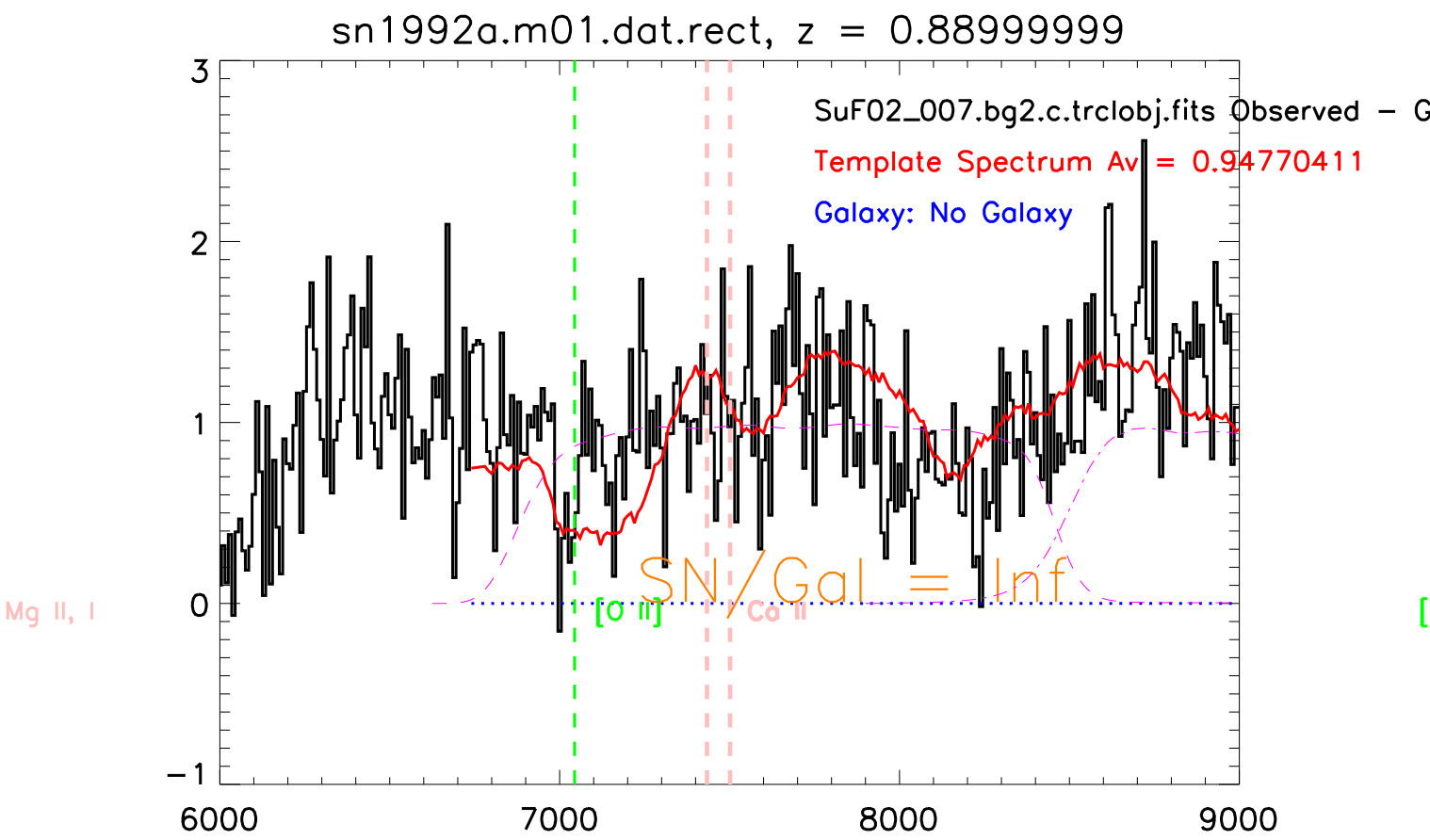

sn1994d.m03.dat.rect, z = 1.1900001
SuF02_007.bg2.c.trclobj.fits Observed – Galaxy
Template Spectrum Av = 0.69515309
Galaxy: No Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
3
2
1
0
−1
6000
7000
8000
9000

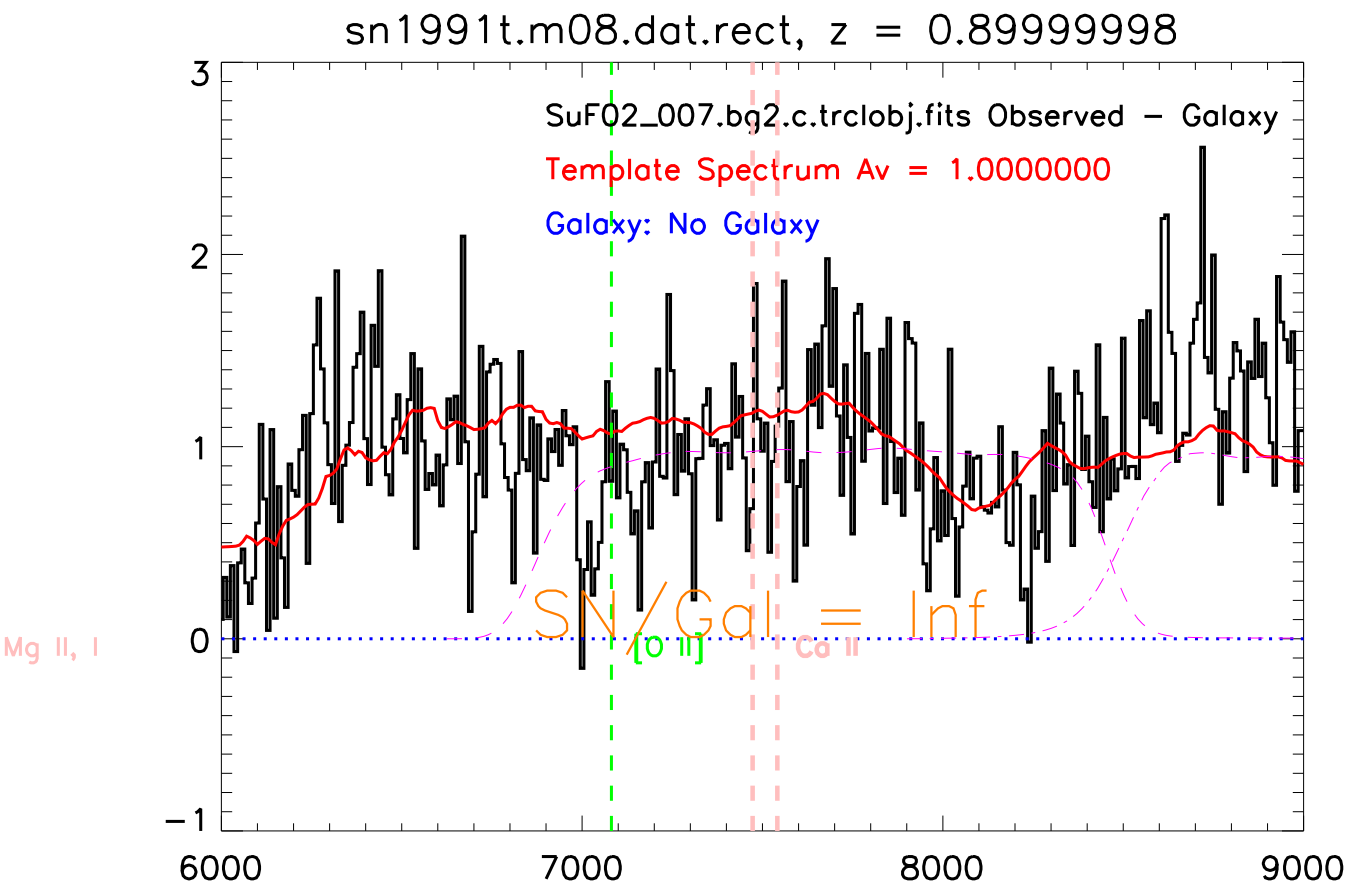

sn1998bu.m03.dat.rect, z = 0.88999999
SuF02_007.bg2.c.trclobj.fits Observed –
Template Spectrum Av = 1.0000000
Galaxy: No Galaxy
SN/Gal = Inf
[O II]
Ca II
Mg II, I
3
2
1
0
−1
6000
7000
8000
9000

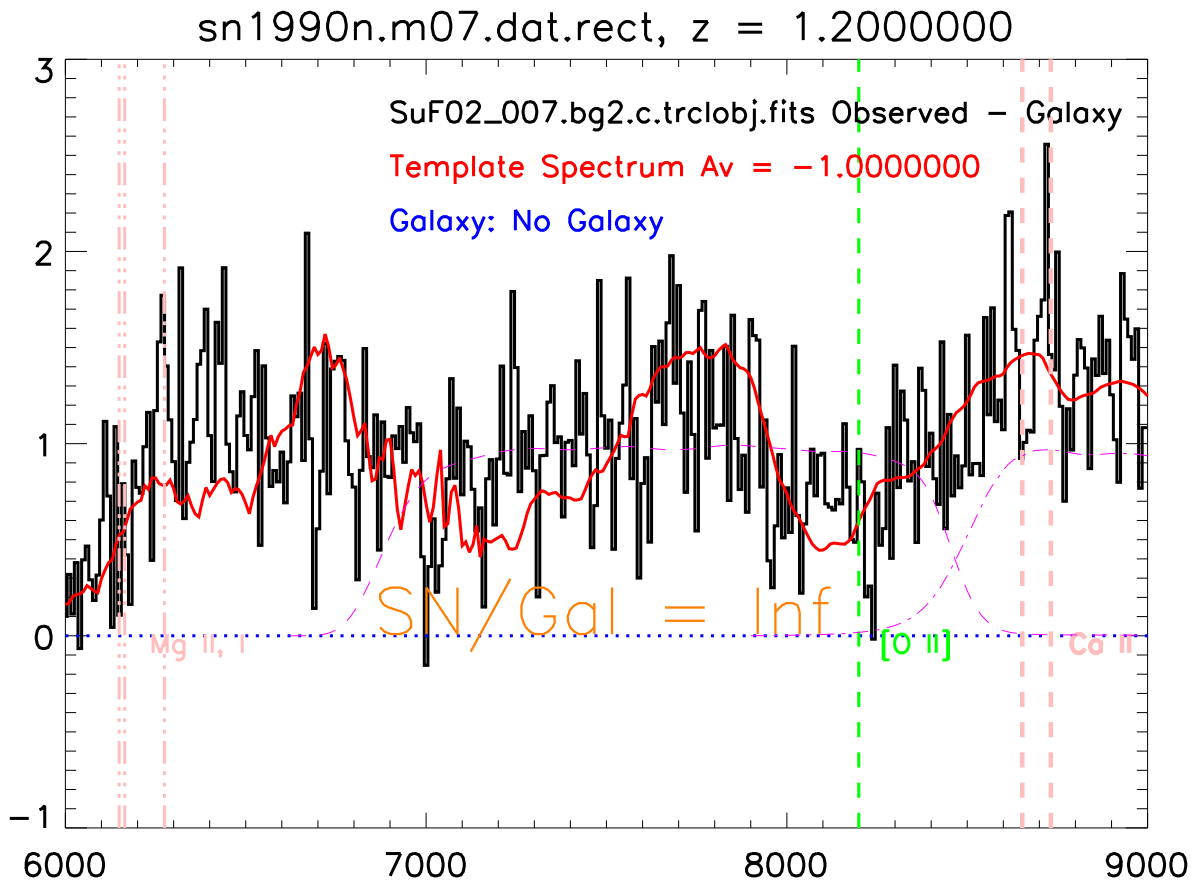

sn1998bu.m04.dat.rect, z = 0.88999999
SuF02_007.bg2.c.trclobj.fits Observed –
Template Spectrum Av = 1.0000000
Galaxy: No Galaxy
SN/Gal = Inf
[O II]
Ca II
Mg II, I
3
2
1
0
−1
6000
7000
8000
9000

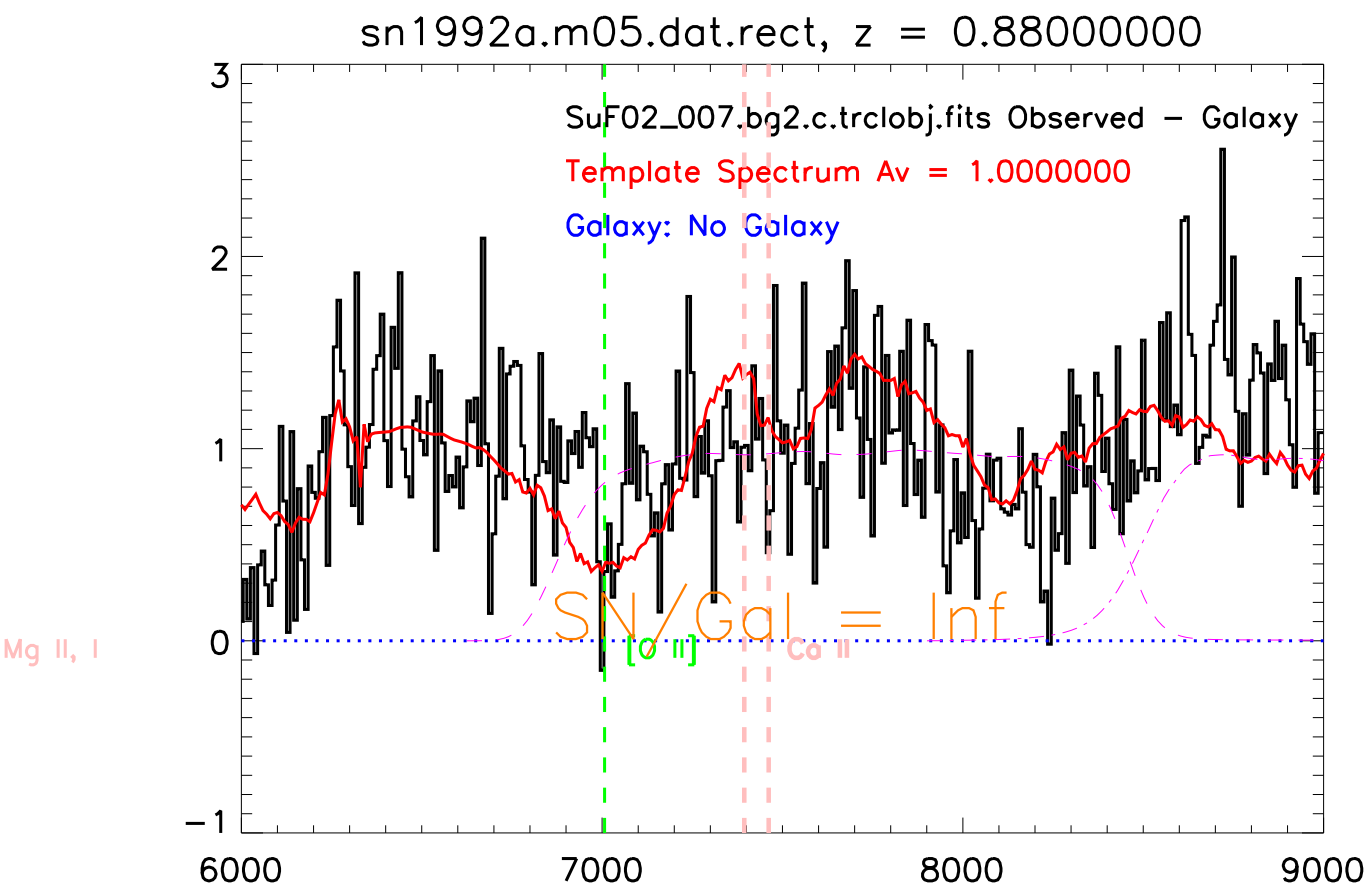

sn1998bu.m02.dat.rect, z = 0.88999999
SuF02_007.bg2.c.trclobj.fits Observed –
Template Spectrum Av = 1.0000000
Galaxy: No Galaxy
SN/Gal = Inf
[O II]
Ca II
Mg II, I
3
2
1
0
−1
6000
7000
8000
9000

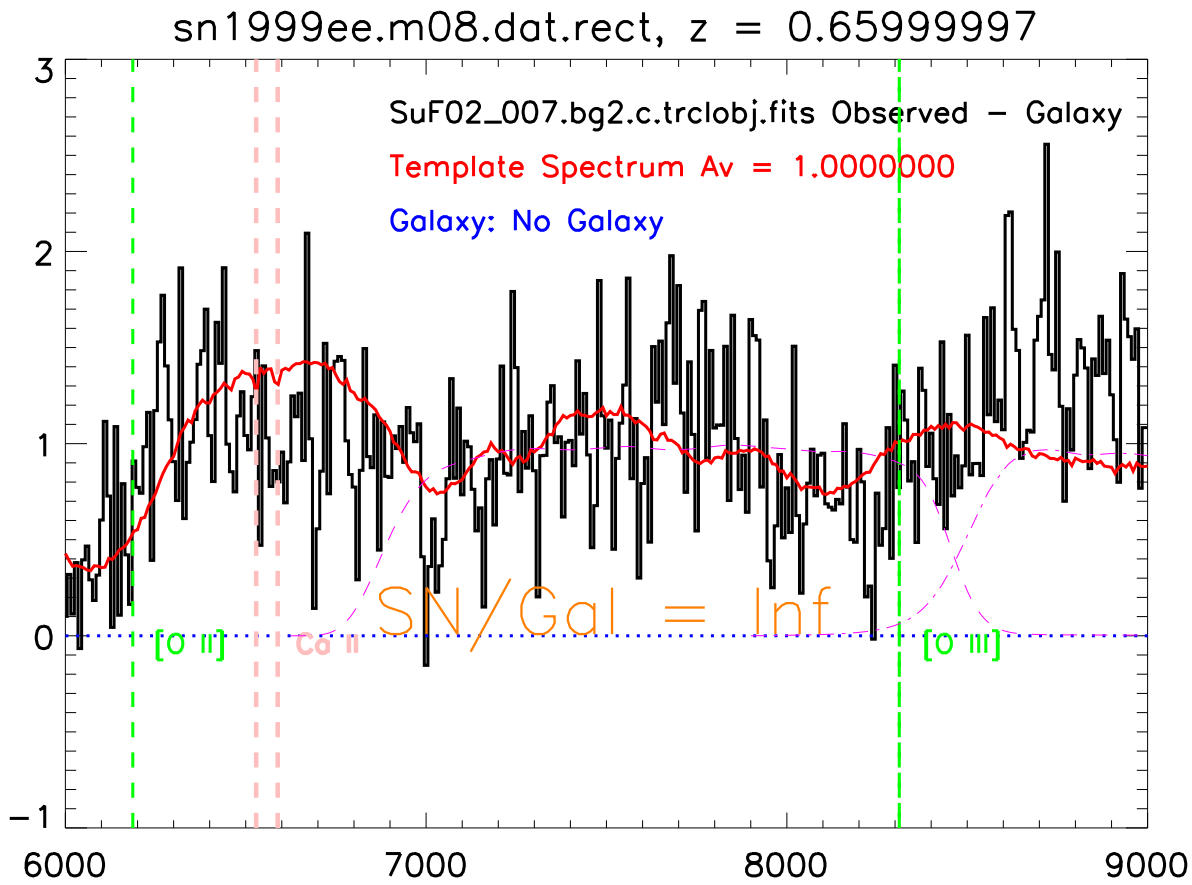

sn1991t.m03.dat.rect, z = 1.1600000
SuF02_007.bg2.c.trclobj.fits Observed –
Template Spectrum Av = –0.22321430
Galaxy: No Galaxy
SN/Gal = Inf
[O II]
Mg II, I
Ca II
3
2
1
0
–1
6000
7000
8000
9000

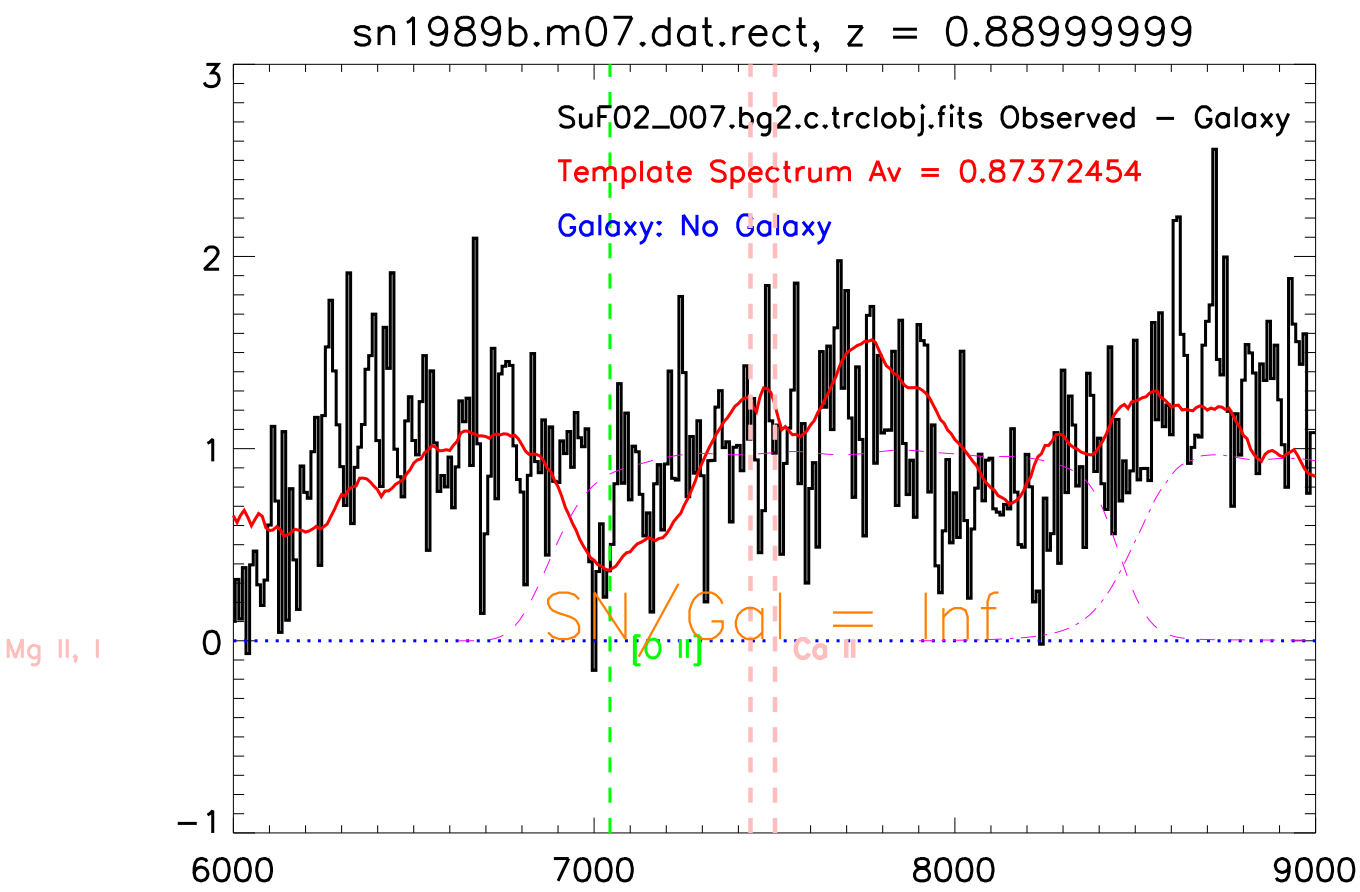

sn1992a.m01.dat.rect, z = 0.88999999
SuF02_007.bg2.c.trclobj.fits Observed – G
Template Spectrum Av = 0.94770411
Galaxy: No Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
3
2
1
0
−1
6000
7000
8000
9000

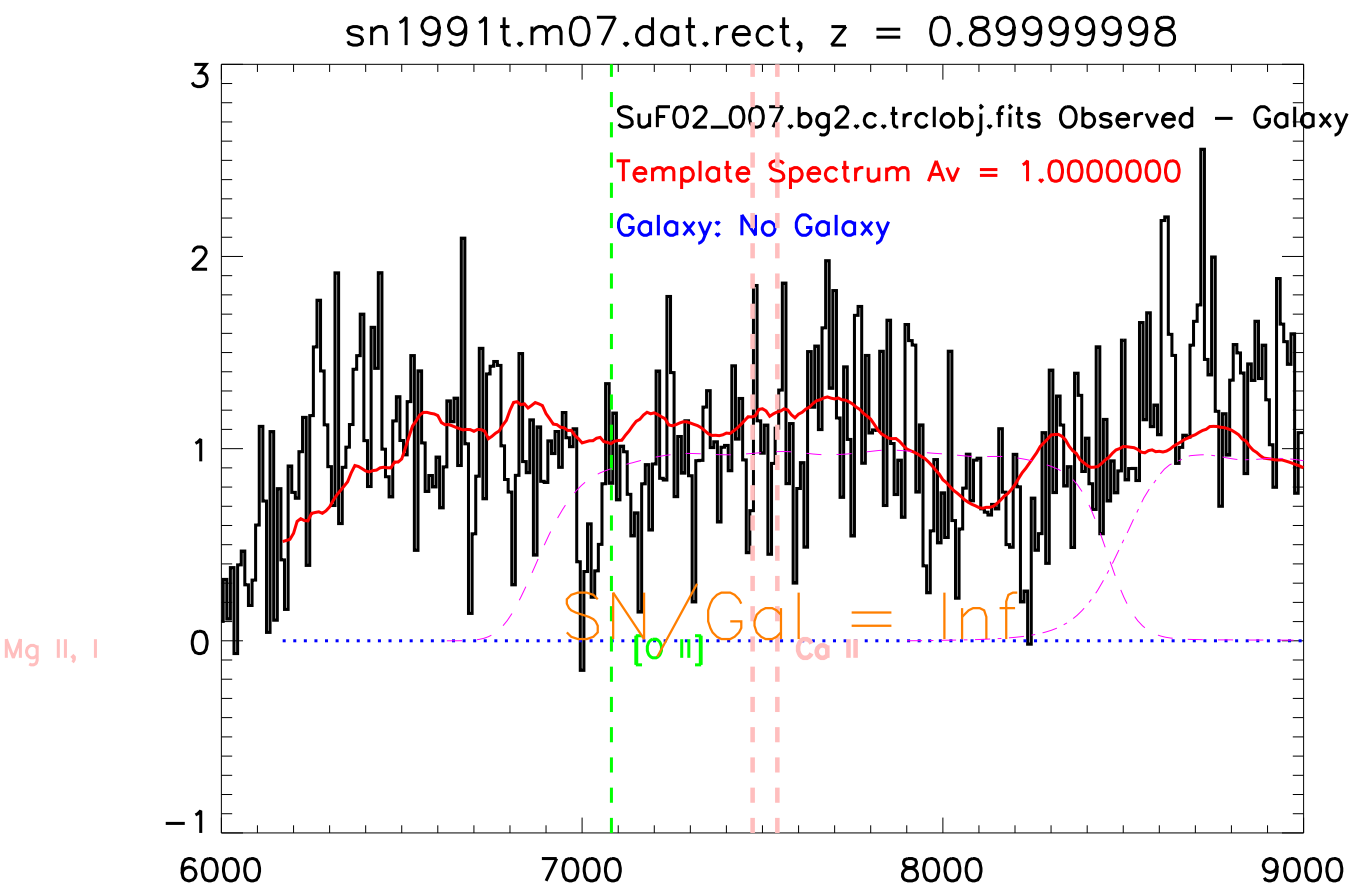

sn1991t.m08.dat.rect, z = 0.89999998
SuF02_007.bg2.c.trclobj.fits Observed − Galaxy
Template Spectrum Av = 1.0000000
Galaxy: No Galaxy
SN/Gal = Inf
[O II]
Ca II
Mg II, I
3
2
1
0
−1
6000
7000
8000
9000

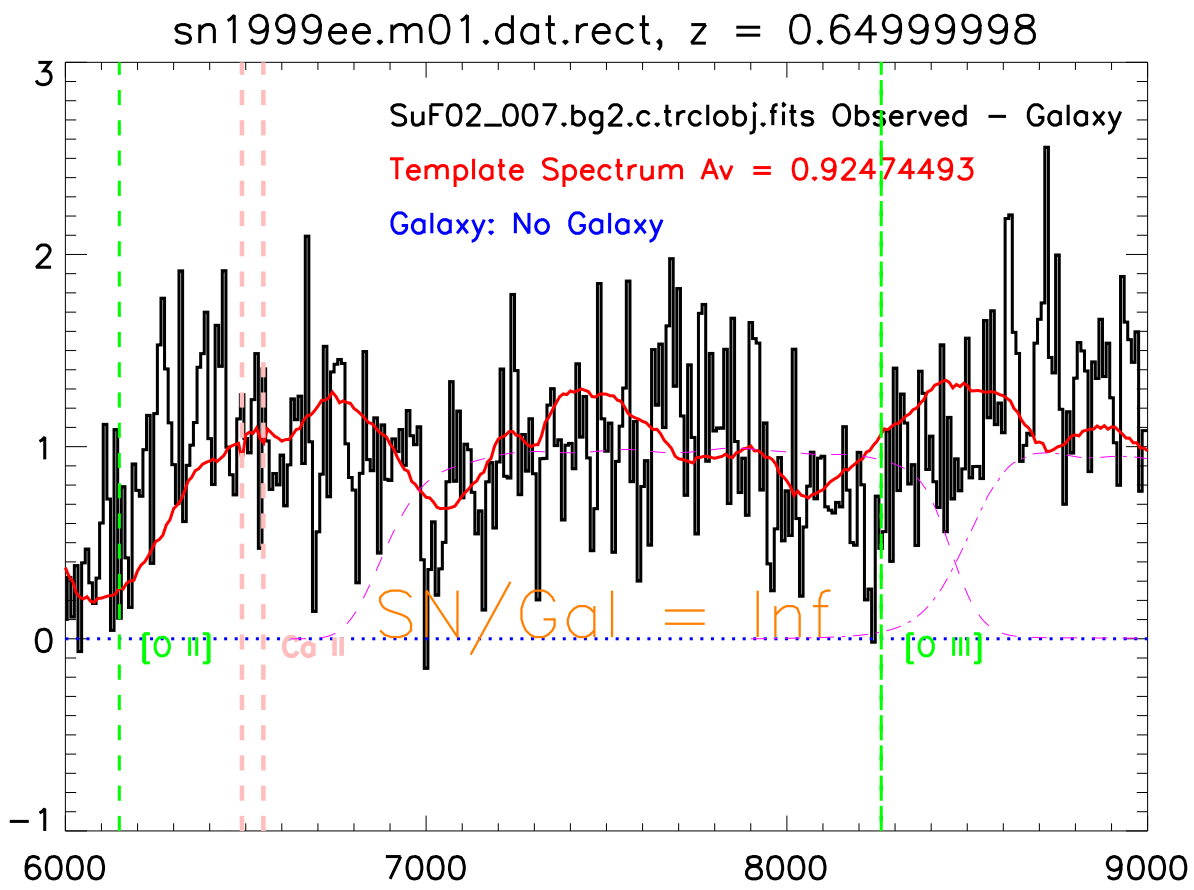

sn1990n.m07.dat.rect, z = 1.2000000
SuF02_007.bg2.c.trclobj.fits Observed – Galaxy
Template Spectrum Av = −1.0000000
Galaxy: No Galaxy
SN/Gal = Inf
[O II]
Ca II
3
2
1
0
−1
6000
7000
8000
9000

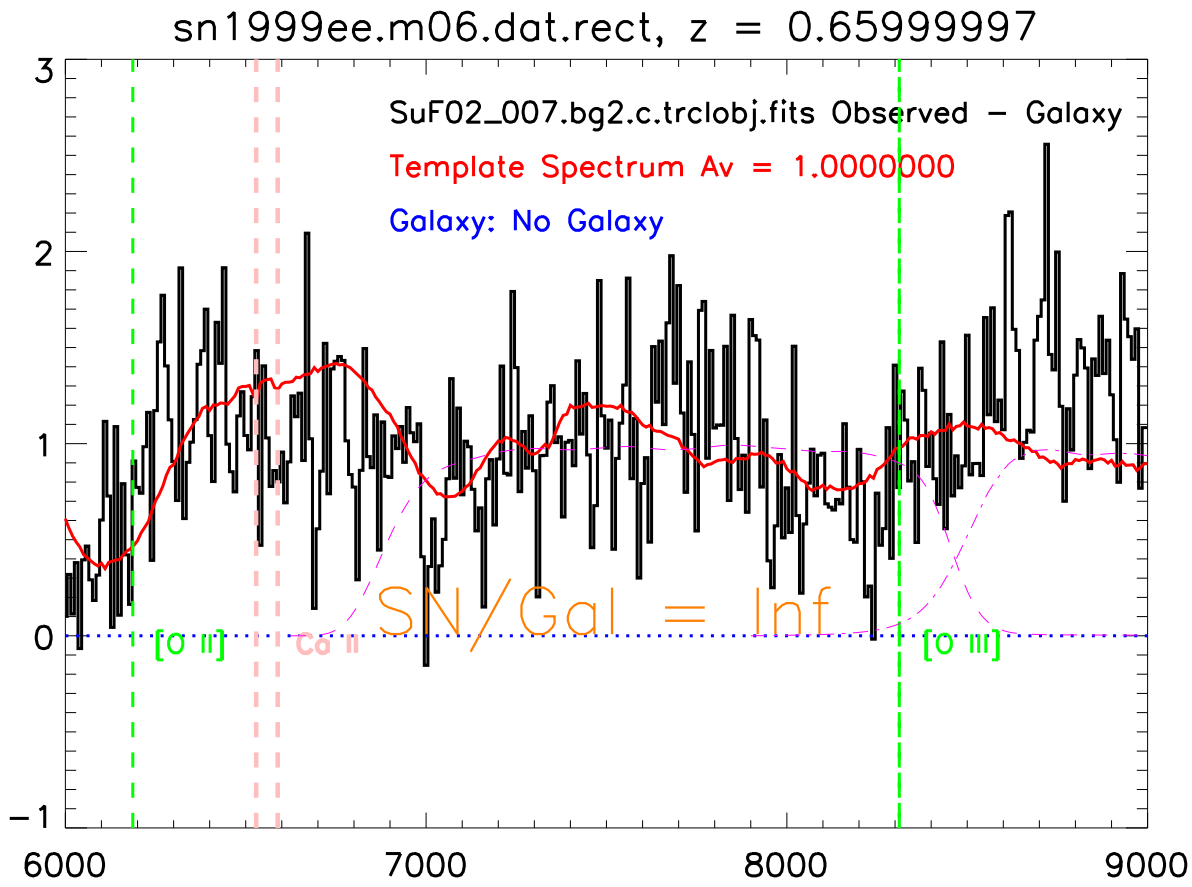

sn1992a.m05.dat.rect, z = 0.88000000
SuF02_007.bg2.c.trclobj.fits Observed – Galaxy
Template Spectrum Av = 1.0000000
Galaxy: No Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O
3
2
1
0
−1
6000
7000
8000
9000

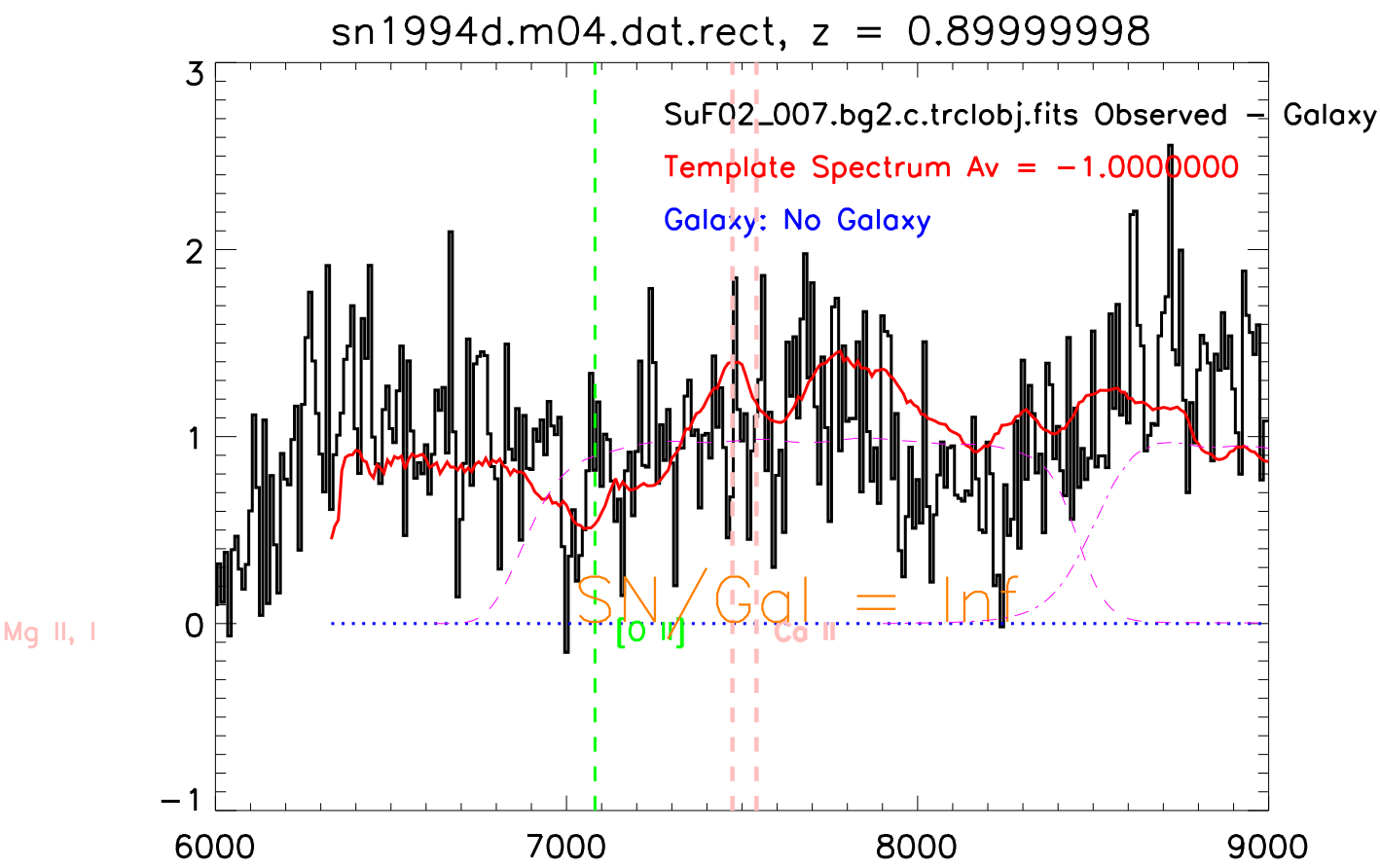

sn1999ee.m08.dat.rect, z = 0.65999997
SuF02_007.bg2.c.trclobj.fits Observed − Galaxy
Template Spectrum Av = 1.0000000
Galaxy: No Galaxy
SN/Gal = Inf
[O II]
Ca II
[O III]
3
2
1
0
−1
6000
7000
8000
9000

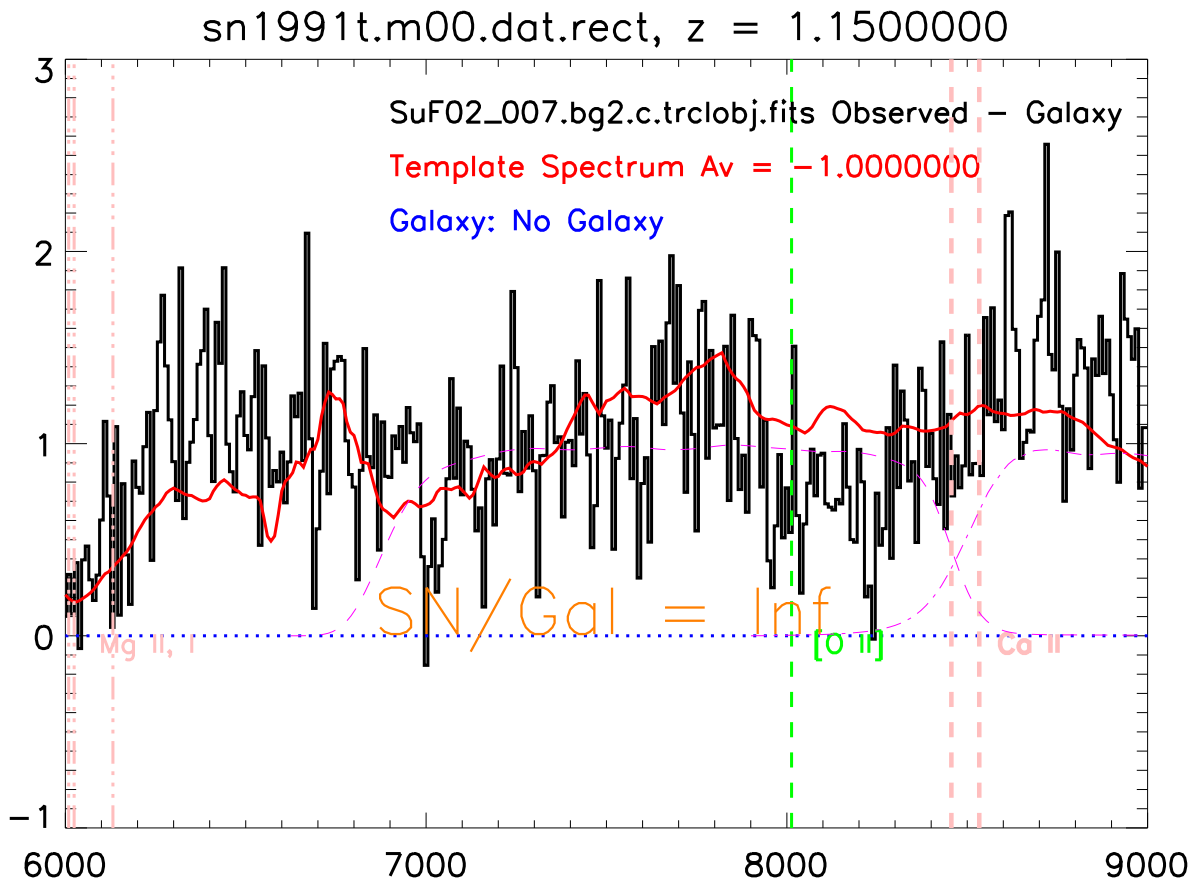

sn1989b.m07.dat.rect, z = 0.88999999
SuF02_007.bg2.c.trclobj.fits Observed − Galaxy
Template Spectrum Av = 0.87372454
Galaxy: No Galaxy
SN/Gal = Inf
[O II]
Ca II
Mg II, I
3
2
1
0
−1
6000
7000
8000
9000

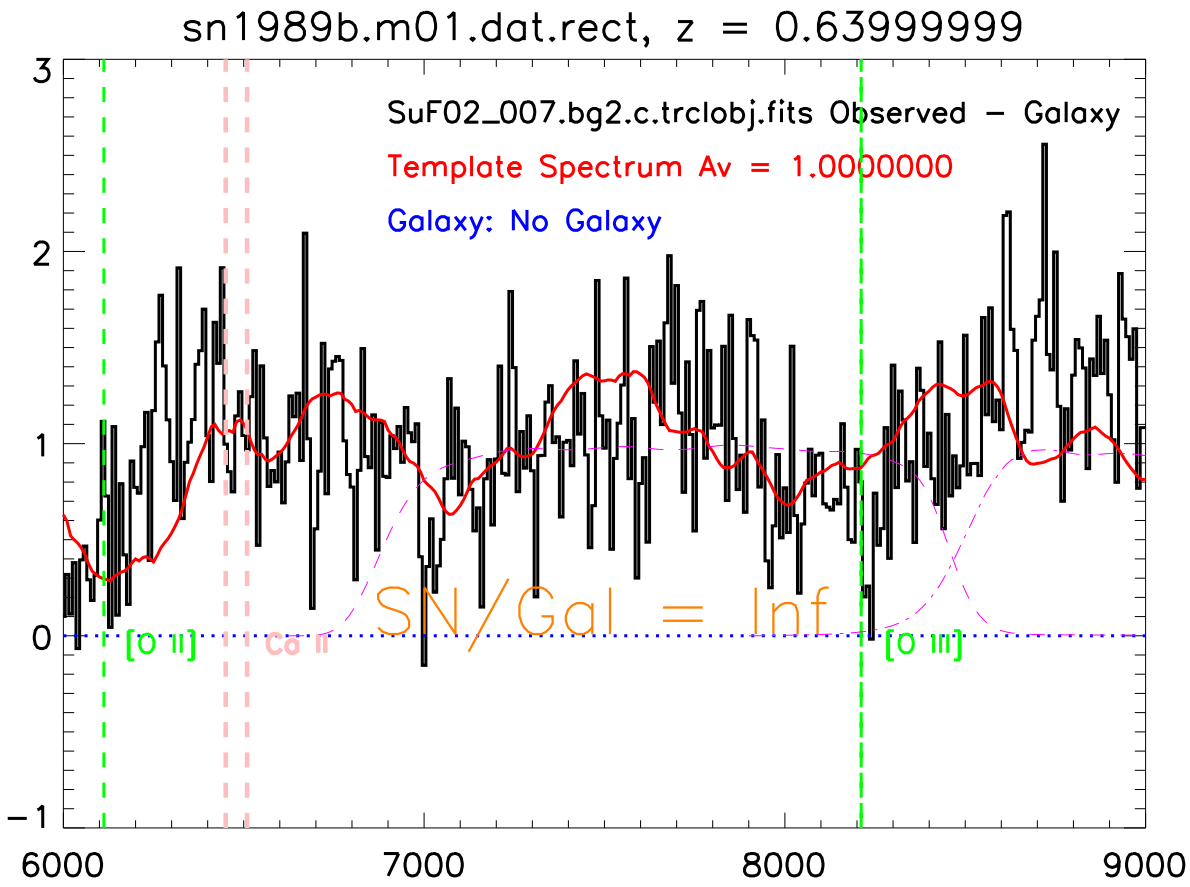

sn1991t.m07.dat.rect, z = 0.89999998
SuF02_007.bg2.c.trclobj.fits Observed – Galaxy
Template Spectrum Av = 1.0000000
Galaxy: No Galaxy
S/N/Gal = Inf
[O II]
Ca II
Mg II, I
3
2
1
0
−1
6000
7000
8000
9000

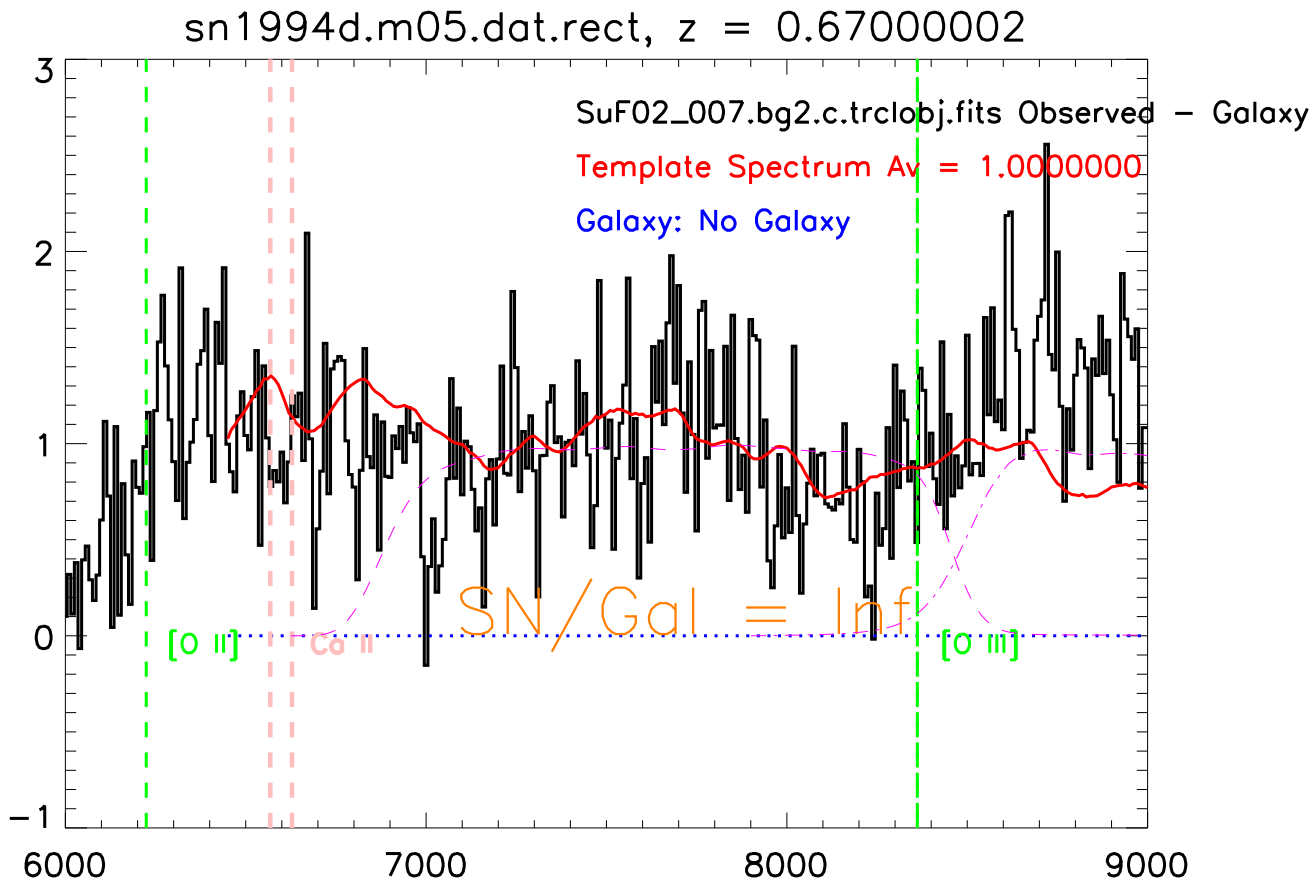

sn1999ee.m01.dat.rect, z = 0.64999998
SuF02_007.bg2.c.trclobj.fits Observed − Galaxy
Template Spectrum Av = 0.92474493
Galaxy: No Galaxy
SN/Gal = Inf
[O II]
Ca II
[O III]
3
2
1
0
−1
6000
7000
8000
9000

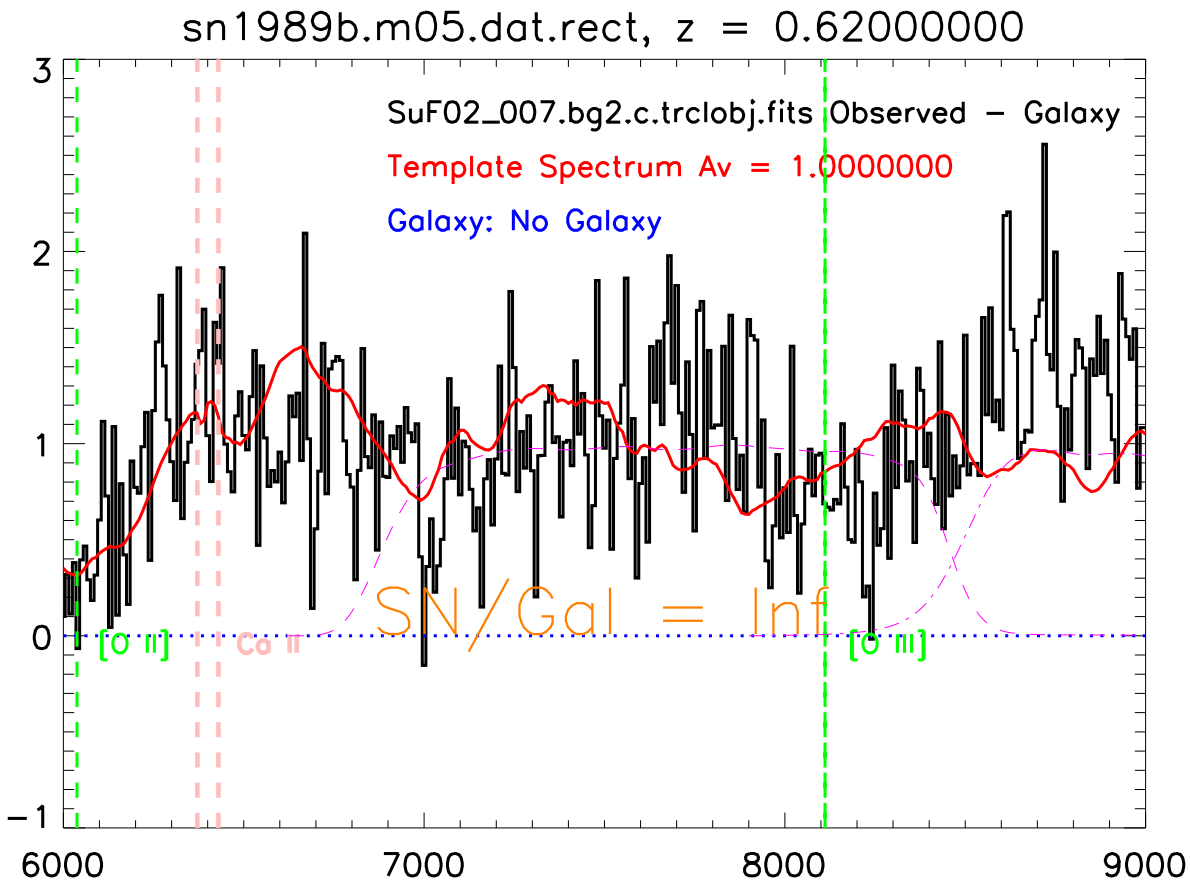

sn1999ee.m06.dat.rect, z = 0.65999997
SuF02_007.bg2.c.trclobj.fits Observed − Galaxy
Template Spectrum Av = 1.0000000
Galaxy: No Galaxy
SN/Gal = Inf
[O II]
Ca II
[O III]
3
2
1
0
−1
6000
7000
8000
9000

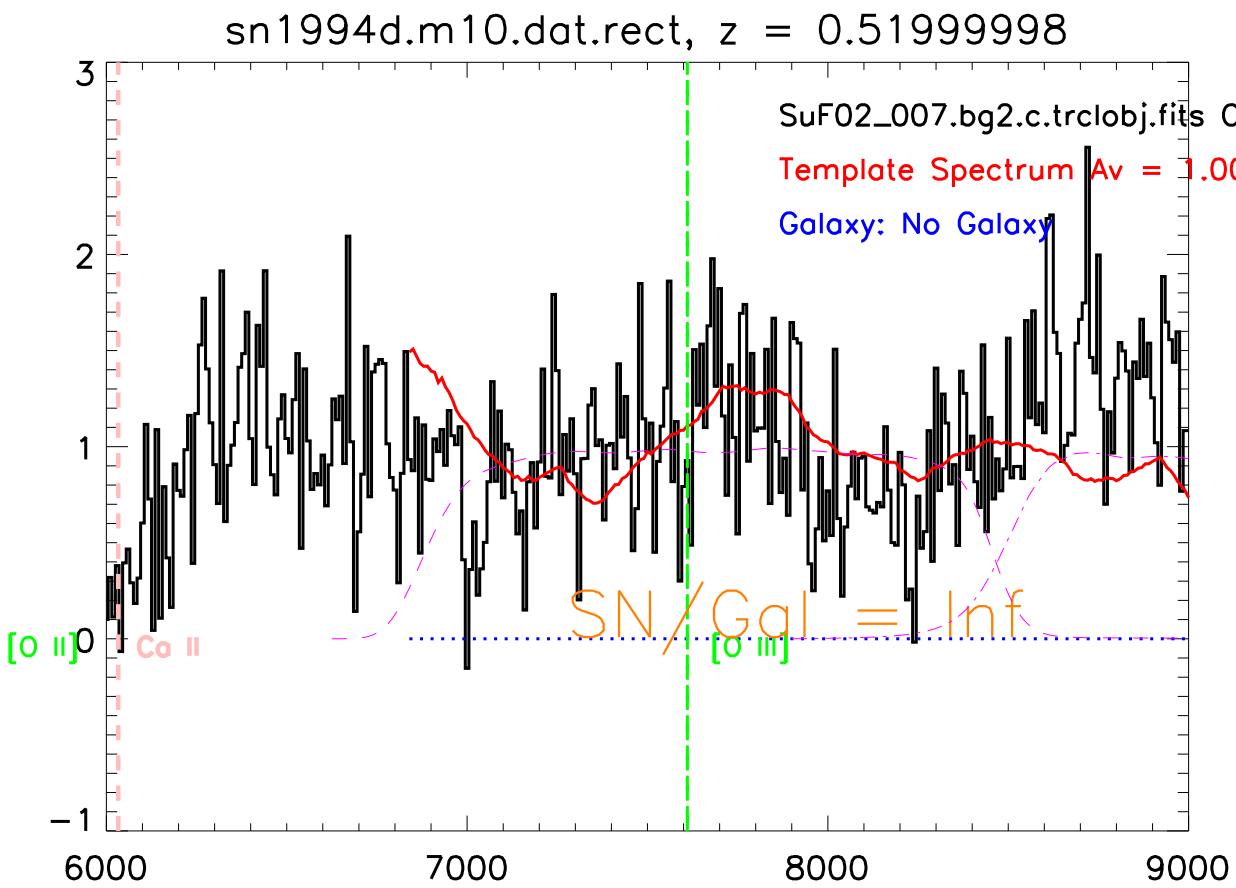

sn1994d.m04.dat.rect, z = 0.89999998
SuF02_007.bg2.c.trclobj.fits Observed
Galaxy
Template Spectrum Av = −1.0000000
Galaxy: No Galaxy
SN/Gal = Inf
[O II]
Ca II
Mg II, I
3
2
1
0
−1
6000
7000
8000
9000

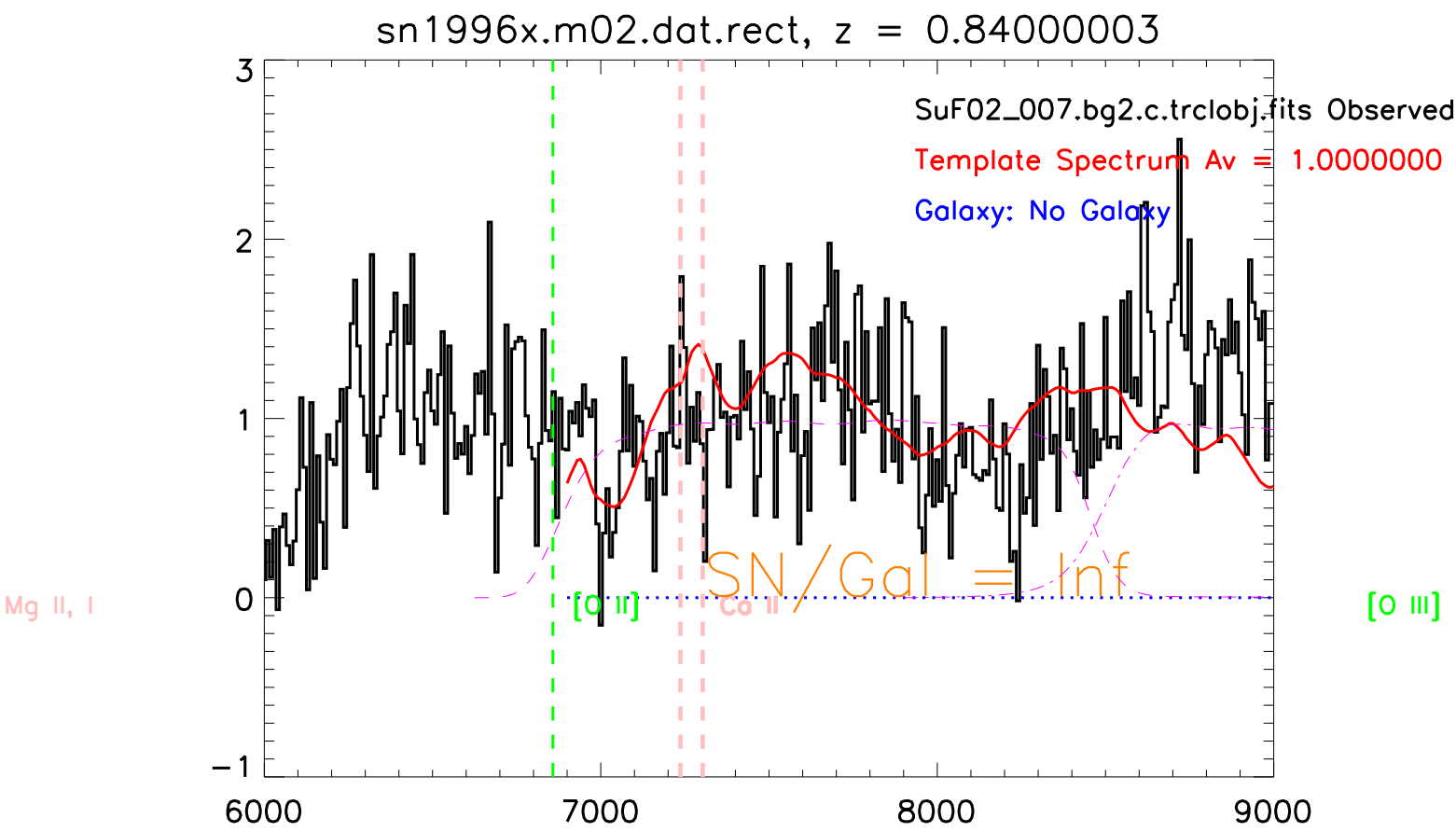

sn1991t.m00.dat.rect, z = 1.1500000
SuF02_007.bg2.c.trclobj.fits Observed − Galaxy
Template Spectrum Av = −1.0000000
Galaxy: No Galaxy
SN/Gal = Inf
[O II]
Ca II
3
2
1
0
−1
6000
7000
8000
9000

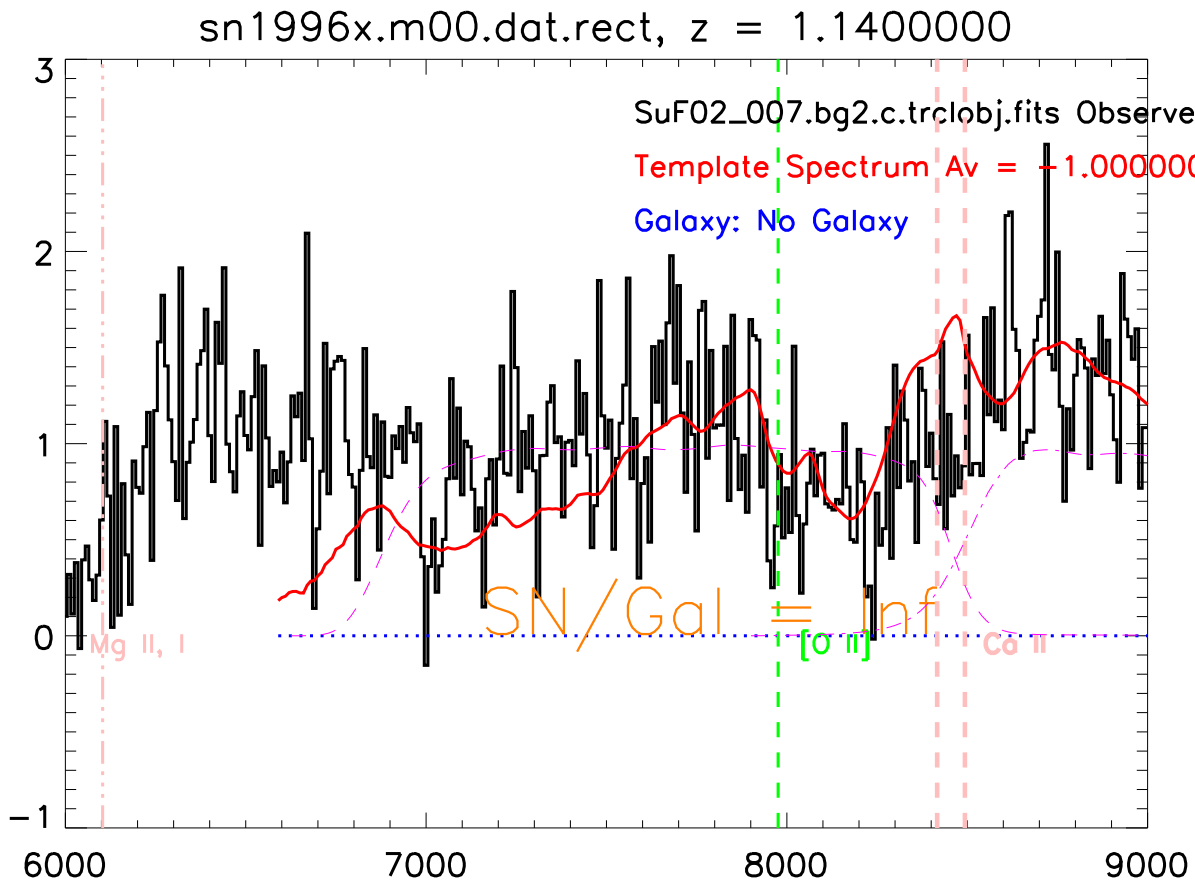

sn1989b.m01.dat.rect, z = 0.63999999
SuF02_007.bg2.c.trclobj.fits Observed − Galaxy
Template Spectrum Av = 1.0000000
Galaxy: No Galaxy
SN/Gal = Inf
[O II]
Ca II
[O III]
3
2
1
0
−1
6000
7000
8000
9000

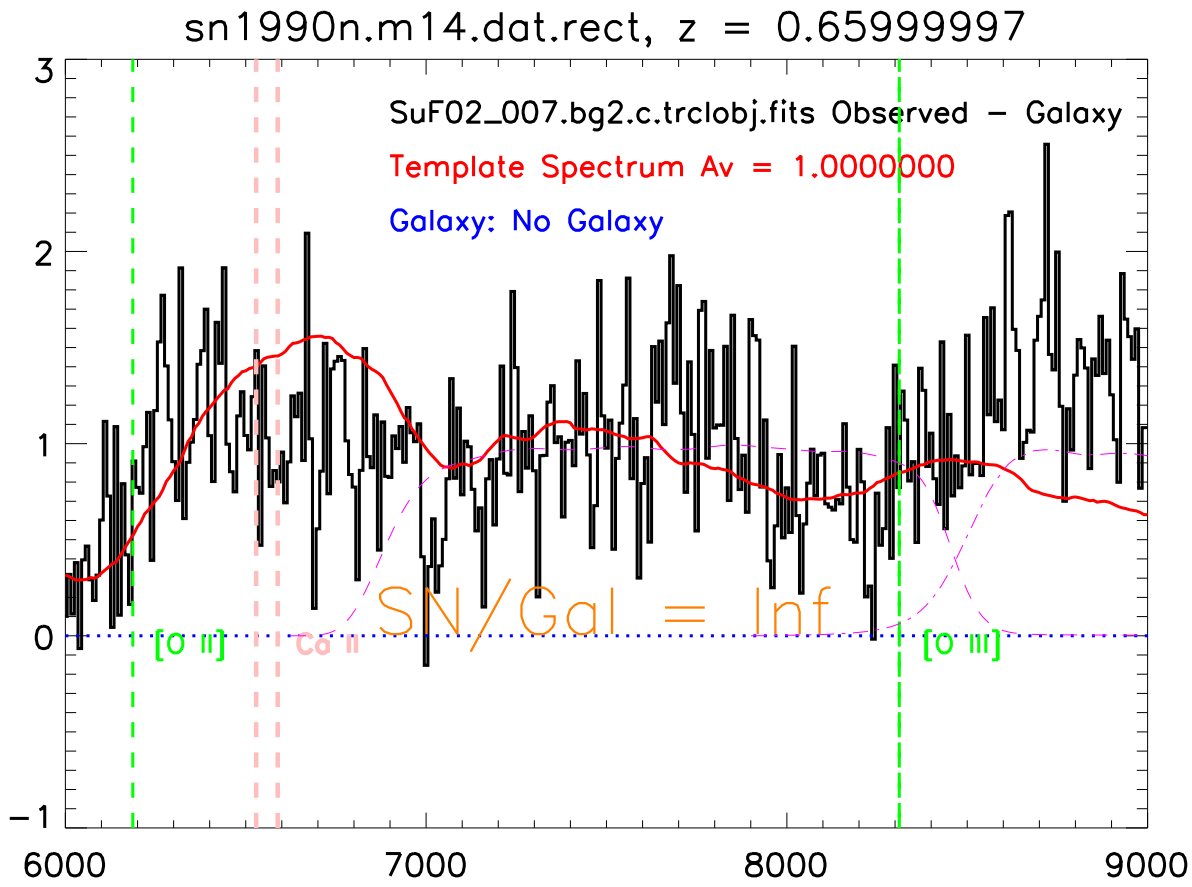

sn1994d.m05.dat.rect, z = 0.67000002
SuF02_007.bg2.c.trclobj.fits Observed − Galaxy
Template Spectrum Av = 1.0000000
Galaxy: No Galaxy
SN/Gal = Inf
[O II]
Ca II
[O III]
3
2
1
0
−1
6000
7000
8000
9000

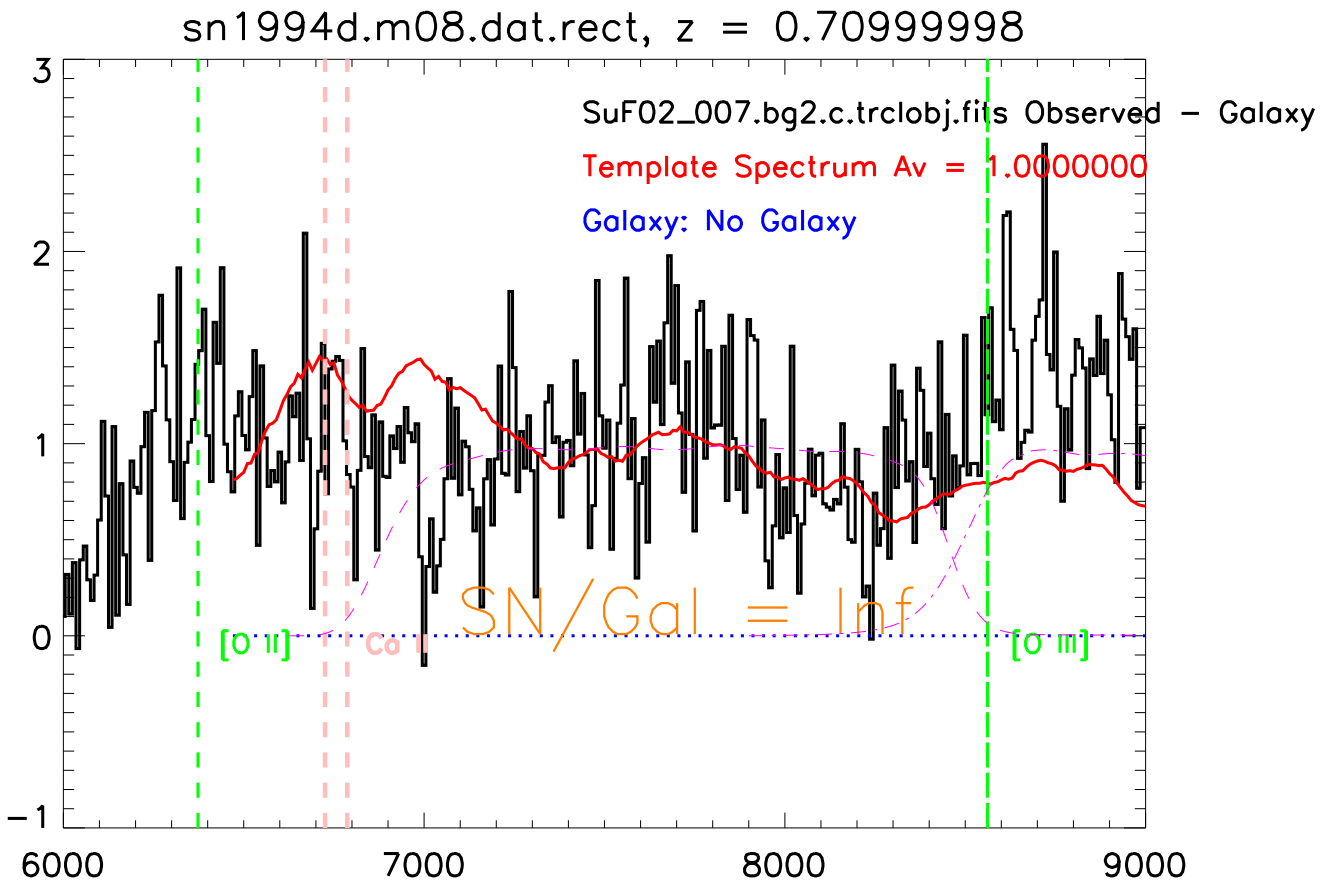

sn1989b.m05.dat.rect, z = 0.62000000
SuF02_007.bg2.c.trclobj.fits Observed − Galaxy
Template Spectrum Av = 1.0000000
Galaxy: No Galaxy
SN/Gal = Inf
[O II]
Ca II
[O III]
3
2
1
0
−1
6000
7000
8000
9000

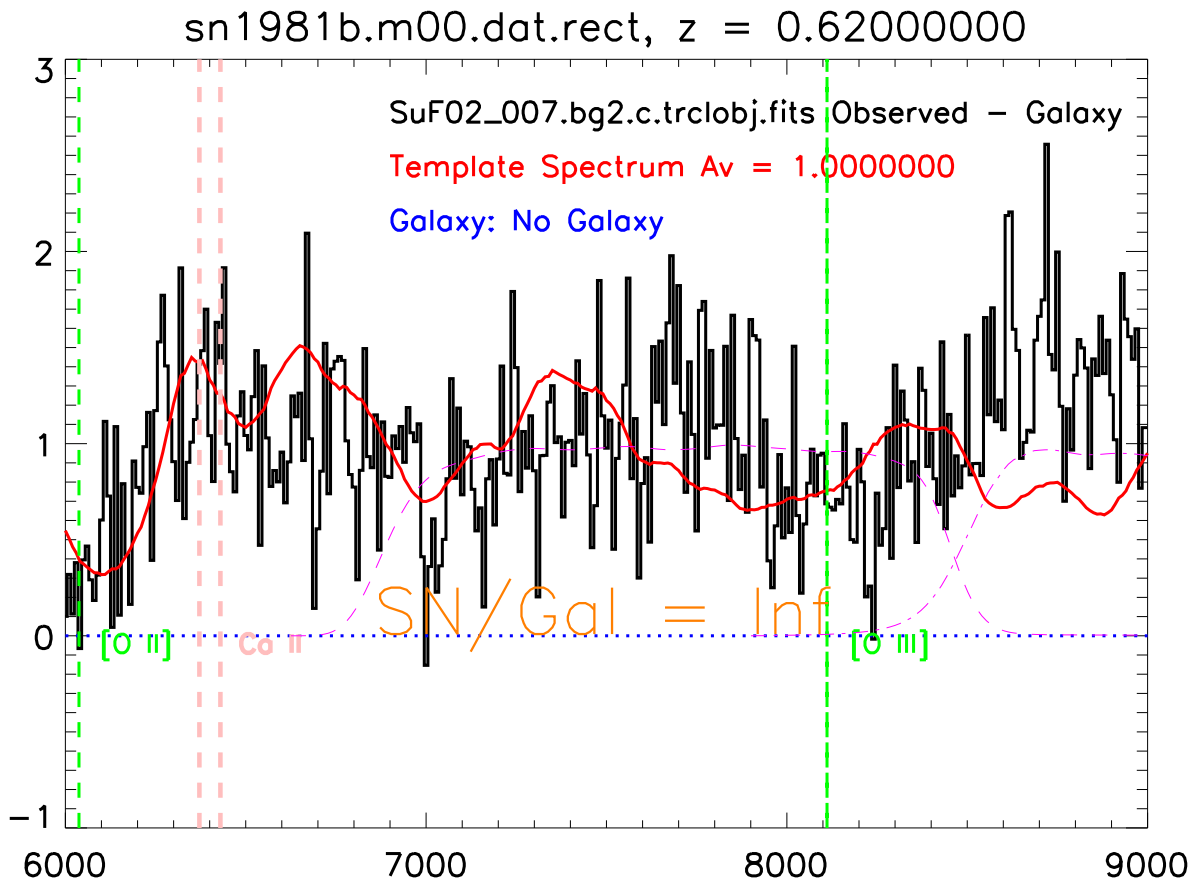

sn1994d.m10.dat.rect, z = 0.51999998
SuF02_007.bg2.c.trclobj.fits Observed –
Template Spectrum Av = 1.0000000
Galaxy: No Galaxy
SN/Gal = Inf
[O II]
Ca II
[O III]
3
2
1
0
−1
6000
7000
8000
9000

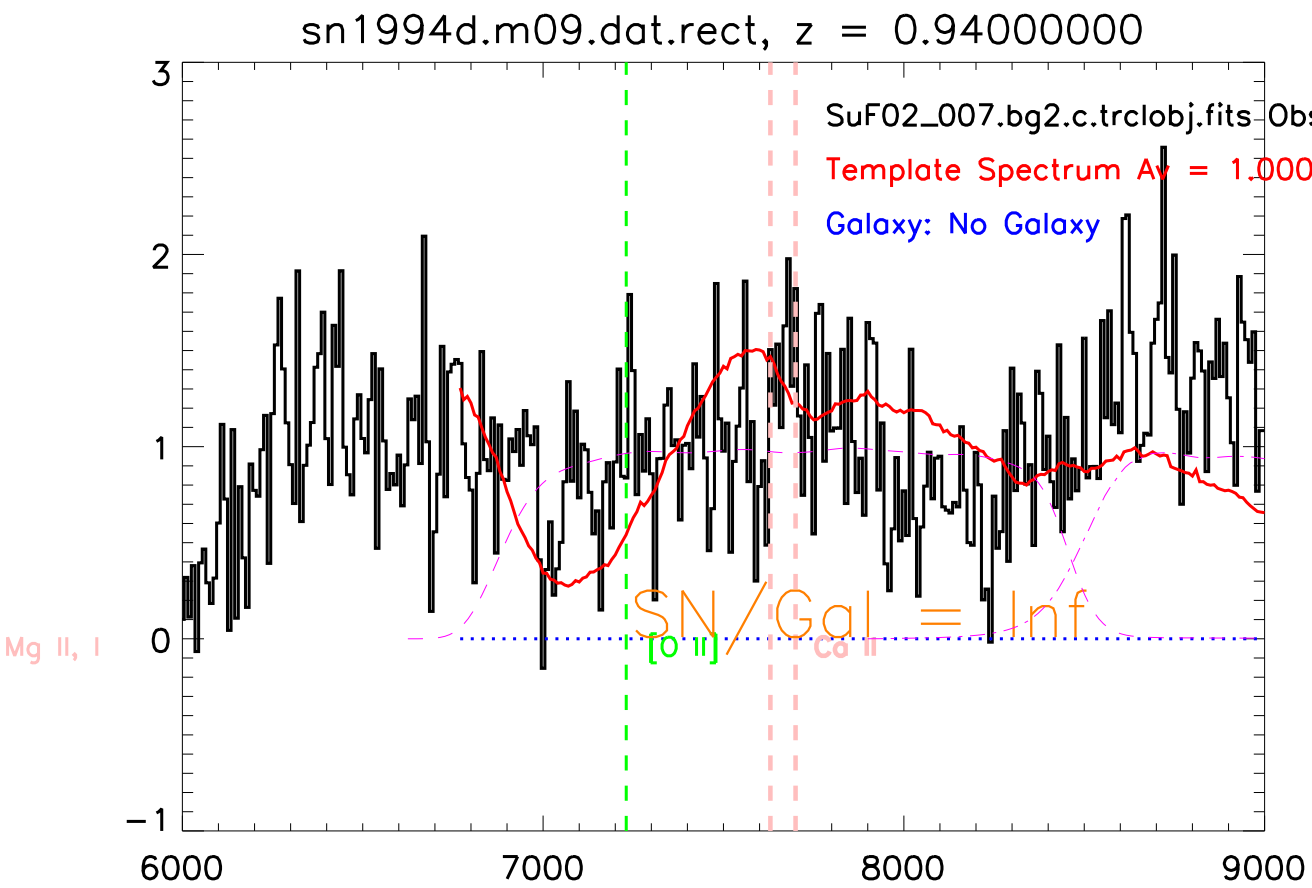

sn1996x.m02.dat.rect, z = 0.84000003
SuF02_007.bg2.c.trclobj.fits Observed
Template Spectrum Av = 1.0000000
Galaxy: No Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
3
2
1
0
−1
6000
7000
8000
9000

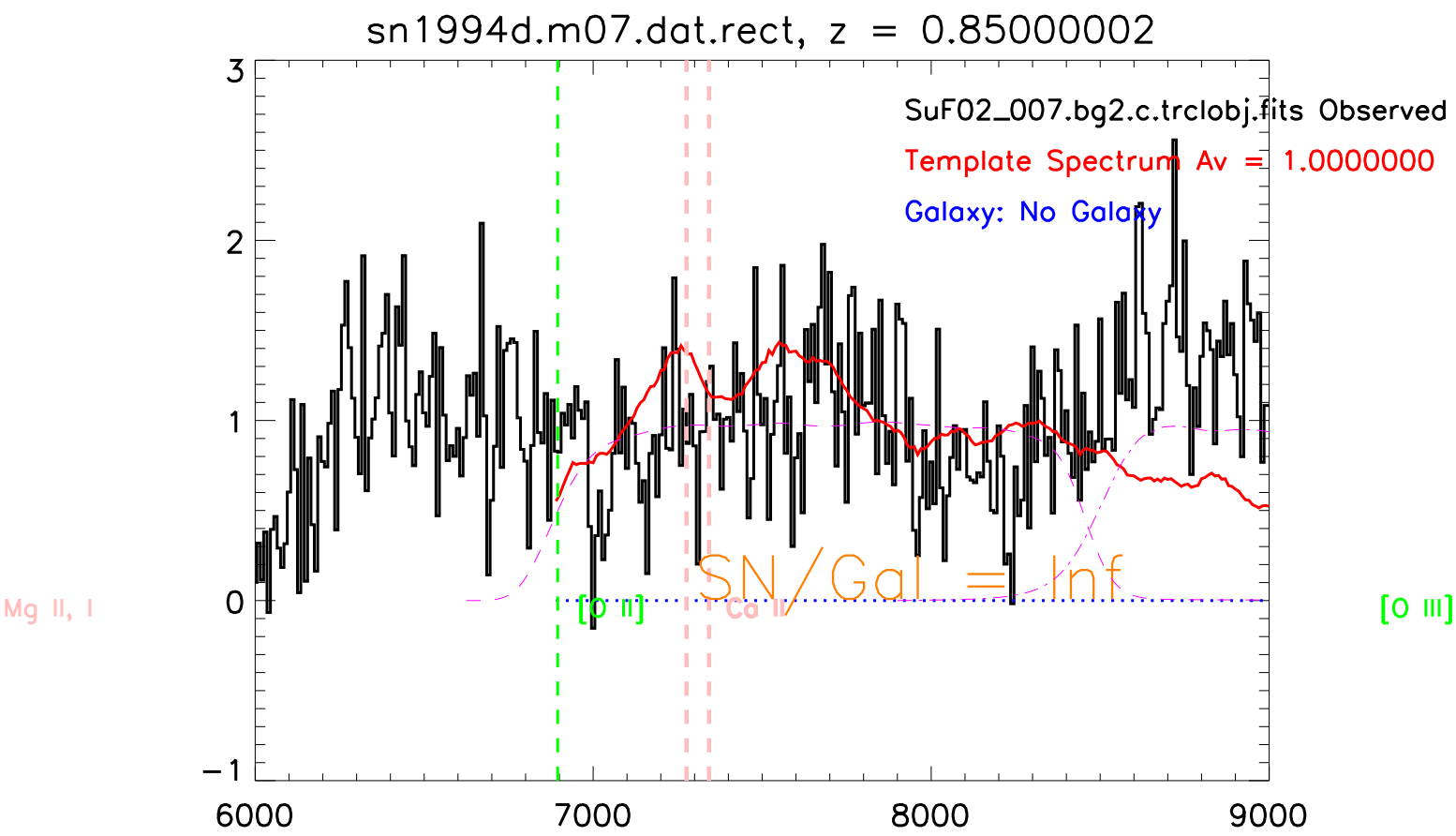

sn1996x.m00.dat.rect, z = 1.1400000
SuF02_007.bg2.c.trclobj.fits Observed – Galax
Template Spectrum Av = 1.0000000
Galaxy: No Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
3
2
1
0
−1
6000
7000
8000
9000

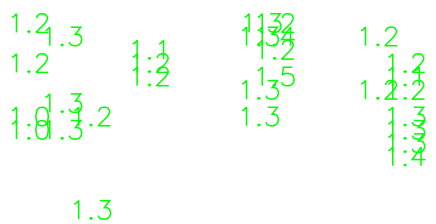

sn1990n.m14.dat.rect, z = 0.65999997
SuF02_007.bg2.c.trclobj.fits Observed − Galaxy
Template Spectrum Av = 1.0000000
Galaxy: No Galaxy
SN/Gal = Inf
[O II]
Ca II
[O III]
3
2
1
0
−1
6000
7000
8000
9000

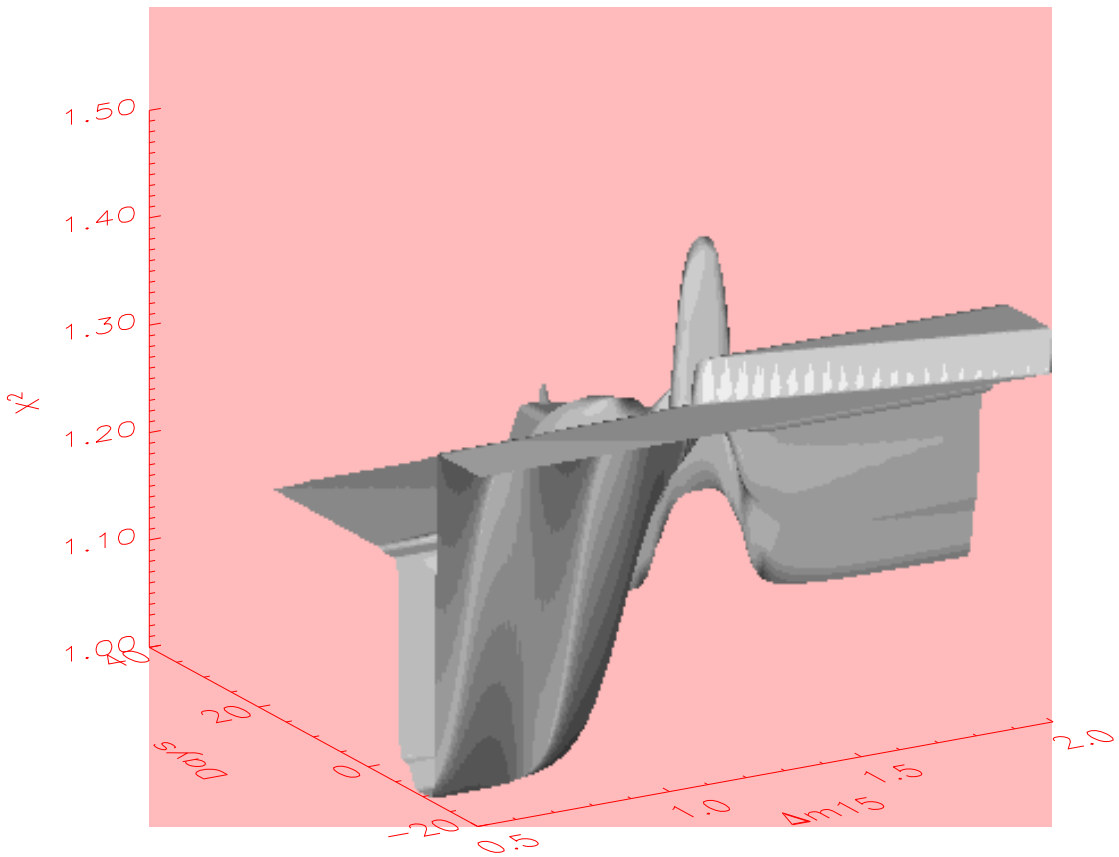

sn1994d.m08.dat.rect, z = 0.70999998
SuF02_007.bg2.c.trclobj.fits Observed − Galaxy
Template Spectrum Av = 1.0000000
Galaxy: No Galaxy
SN/Gal = Inf
[O II]
Ca II
[O III]
3
2
1
0
−1
6000
7000
8000
9000


sn1981b.m00.dat.rect, z = 0.62000000
SuF02_007.bg2.c.trclobj.fits Observed − Galaxy
Template Spectrum Av = 1.0000000
Galaxy: No Galaxy
SN/Gal = Inf
[O II]
Ca II
[O III]
3
2
1
0
−1
6000
7000
8000
9000

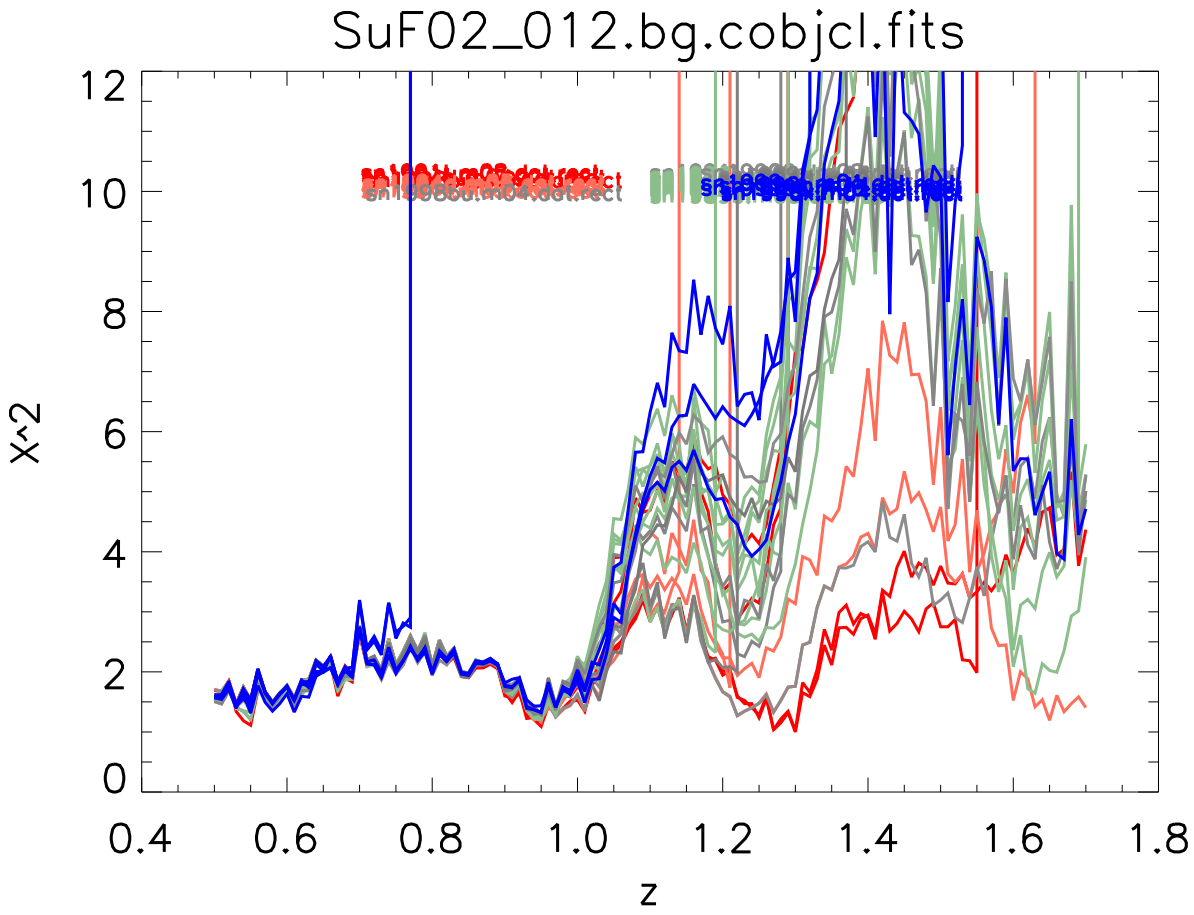

sn1994d.m09.dat.rect, z = 0.94000000
SuF02_007.bg2.c.trclobj.fits Observed – C
Template Spectrum Av = 1.0000000
Galaxy: No Galaxy
SN/Gal = Inf
[O II]
Ca II
Mg II, I
3
2
1
0
−1
6000
7000
8000
9000

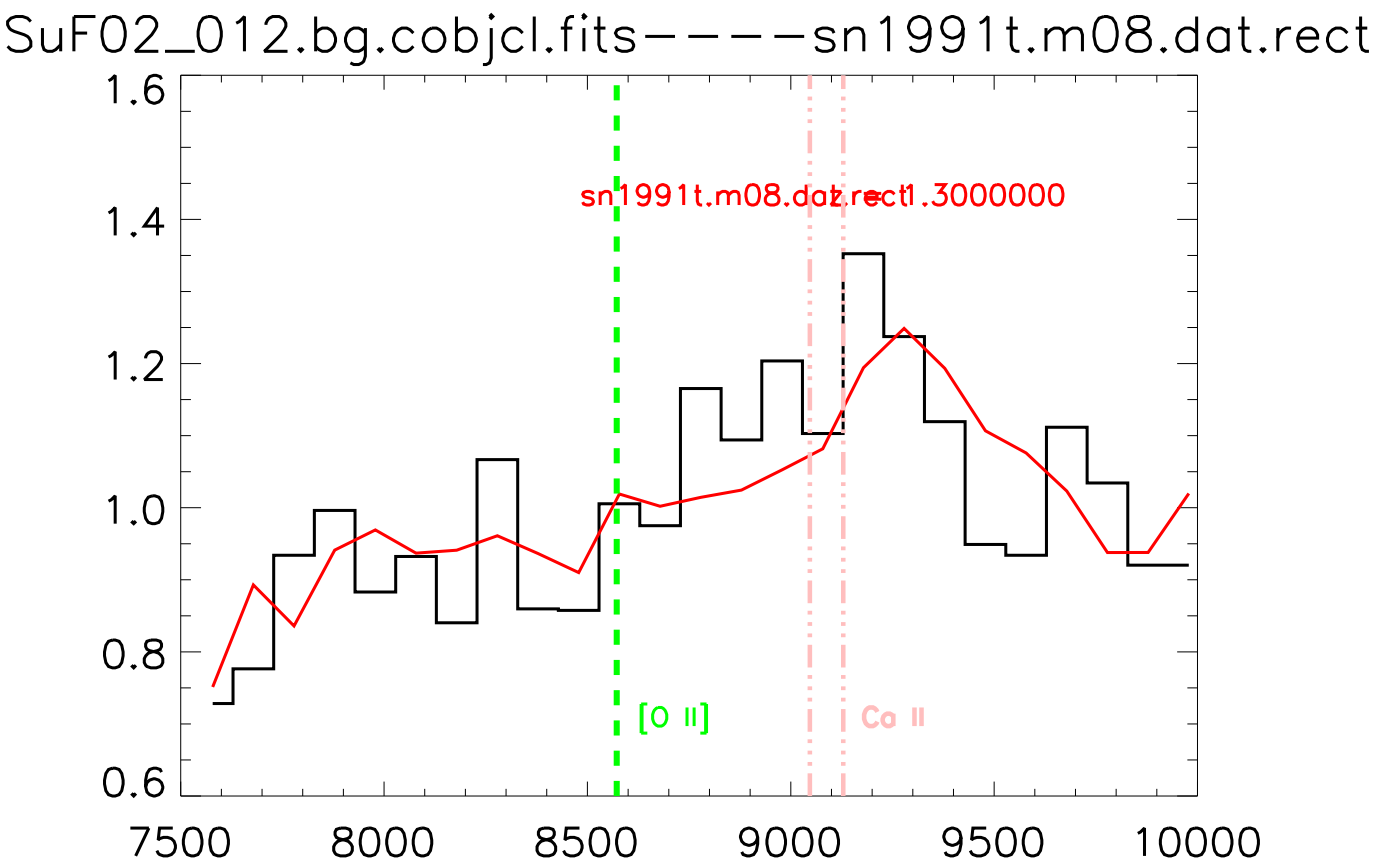

sn1994d.m07.dat.rect, z = 0.85000002
SuF02_007.bg2.c.trclobj.fits Observed
Template Spectrum Av = 1.0000000
Galaxy: No Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
[O III]
3
2
1
0
−1
6000
7000
8000
9000



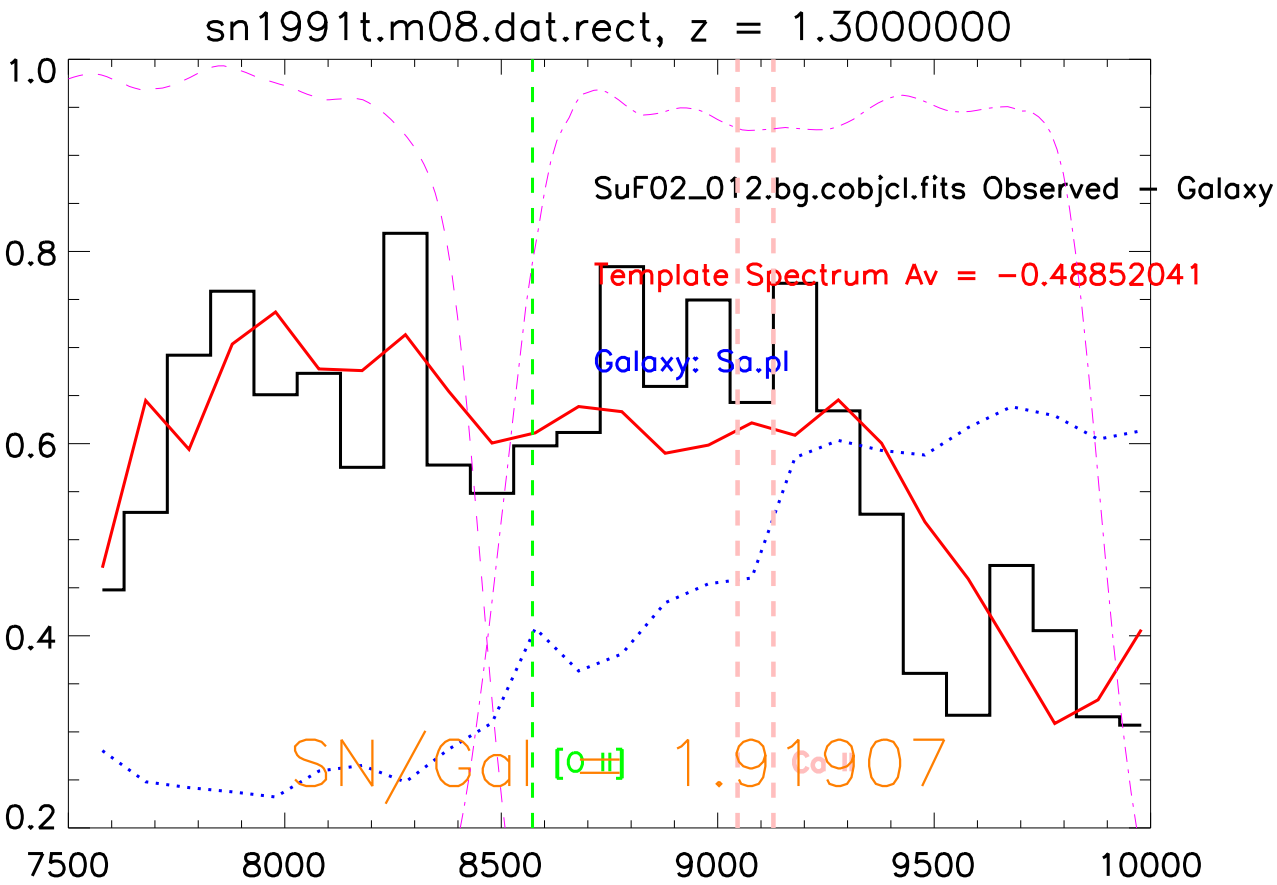


1.50
1.40
1.30
1.20
1.10
1.00
χ^2
40
20
0
−20
Days
0.5
1.0
1.5
2.0
Δm15


SuF02_012.bg.cobjcl.fits
X^2
z
0
2
4
6
8
10
12
0.4
0.6
0.8
1.0
1.2
1.4
1.6
1.8


SuF02_012.bg.cobjcl.fits----sn1991t.m08.dat.rect
1.6
1.4
1.2
1.0
0.8
0.6
7500
8000
8500
9000
9500
10000
sn1991t.m08.dat.rect1.3000000
[O II]
Ca II

Mg II, I


sn1991t.m08.dat.rect, z = 1.3000000
SuF02_012.bg.cobjcl.fits Observed – Galaxy
Template Spectrum Av = −0.48852041
Galaxy: Sa.pl
SN/Gal
[O II]
1.91907
1.0
0.8
0.6
0.4
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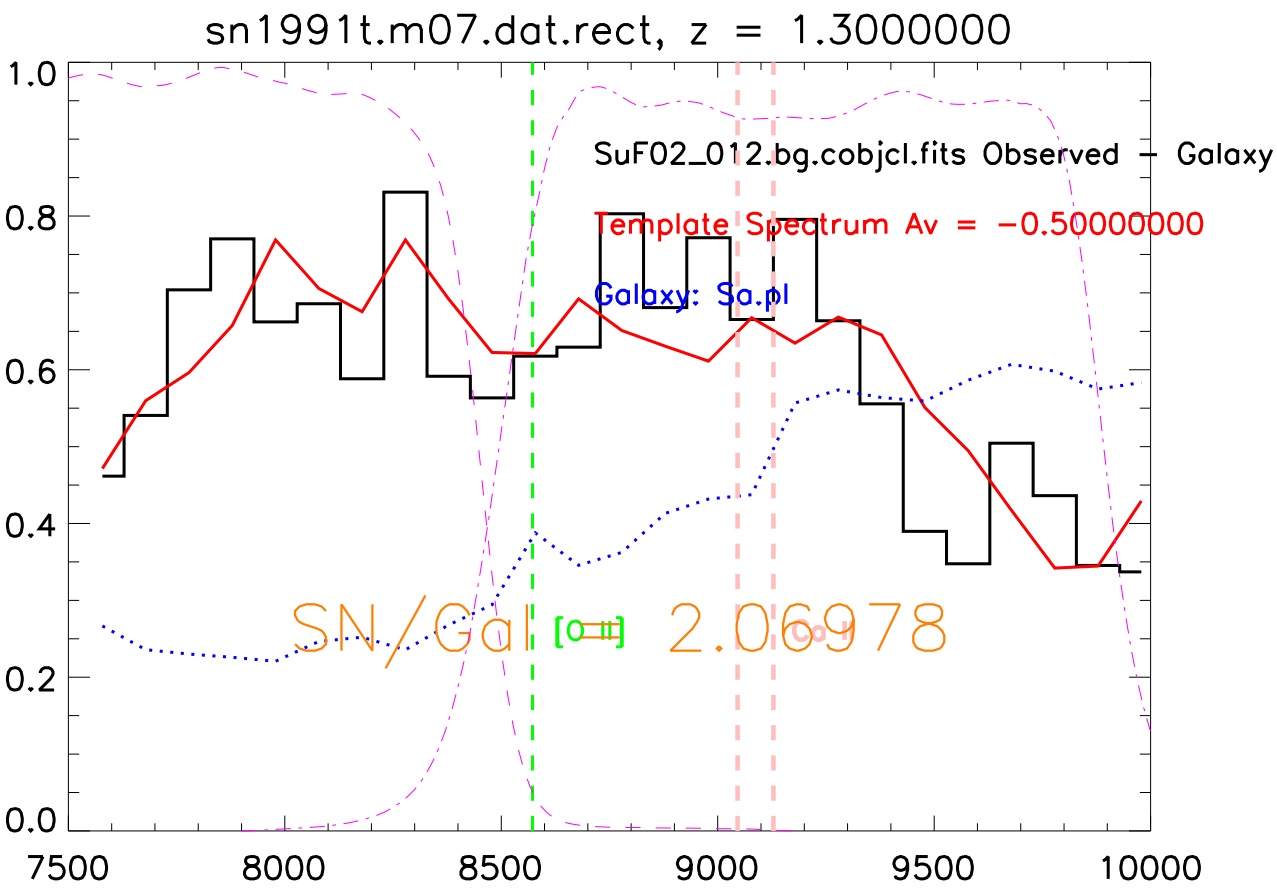
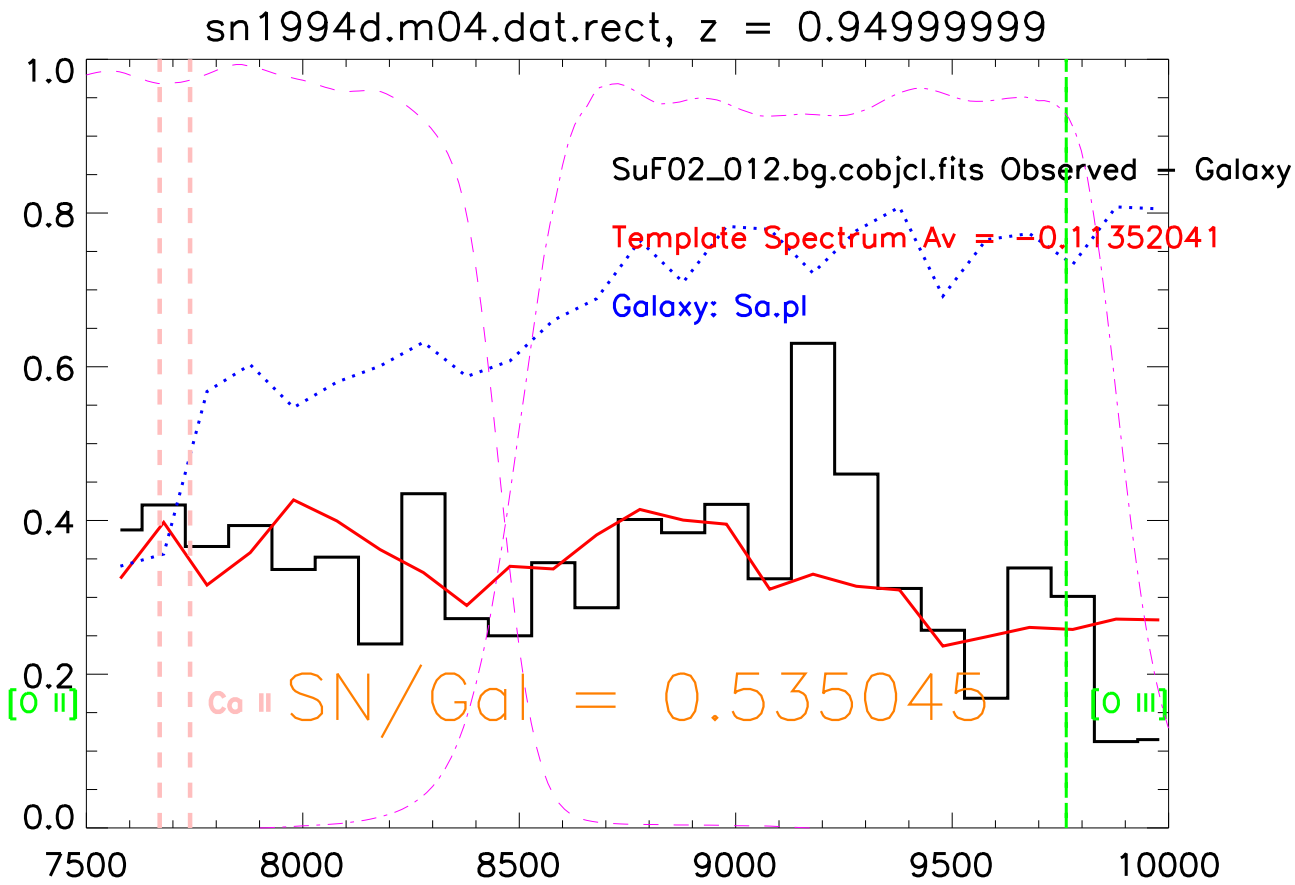
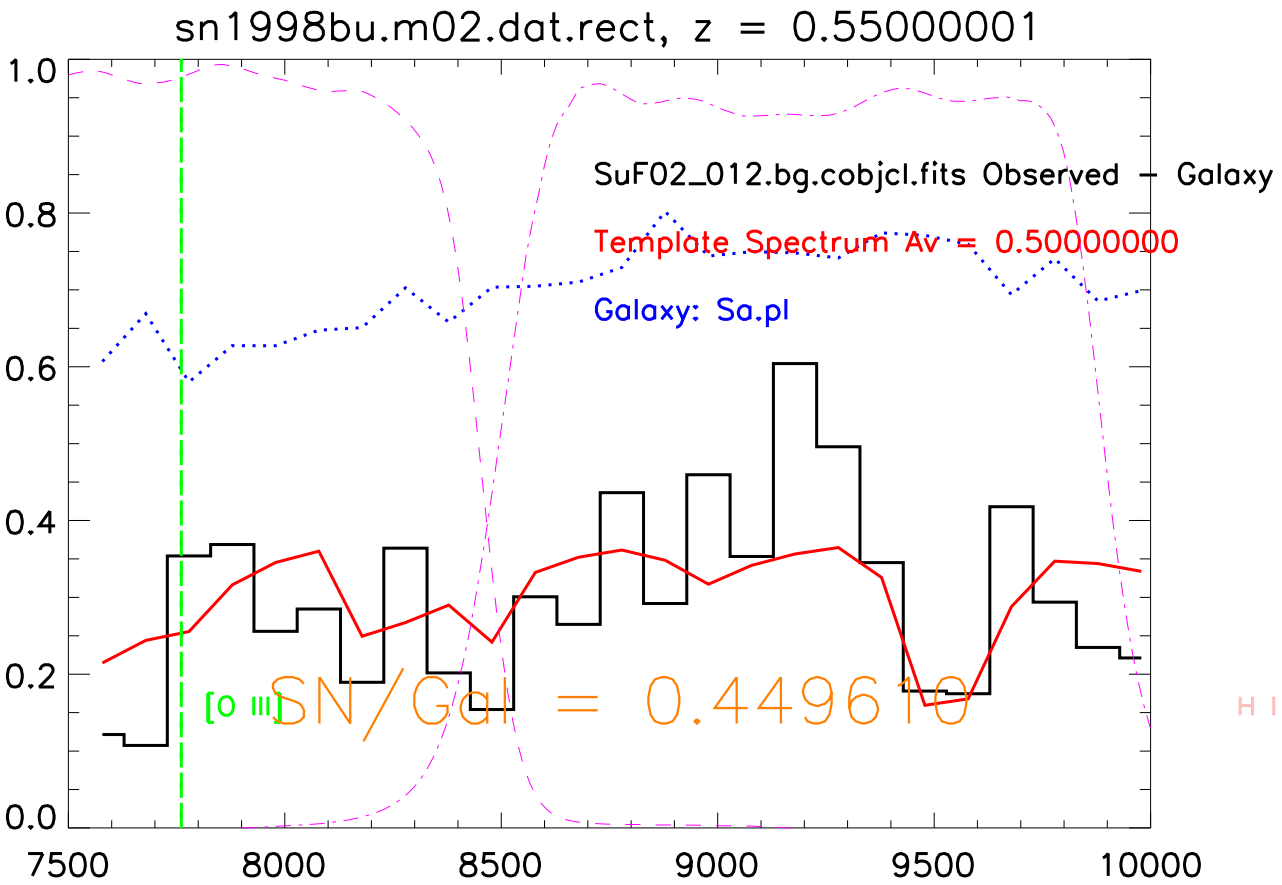
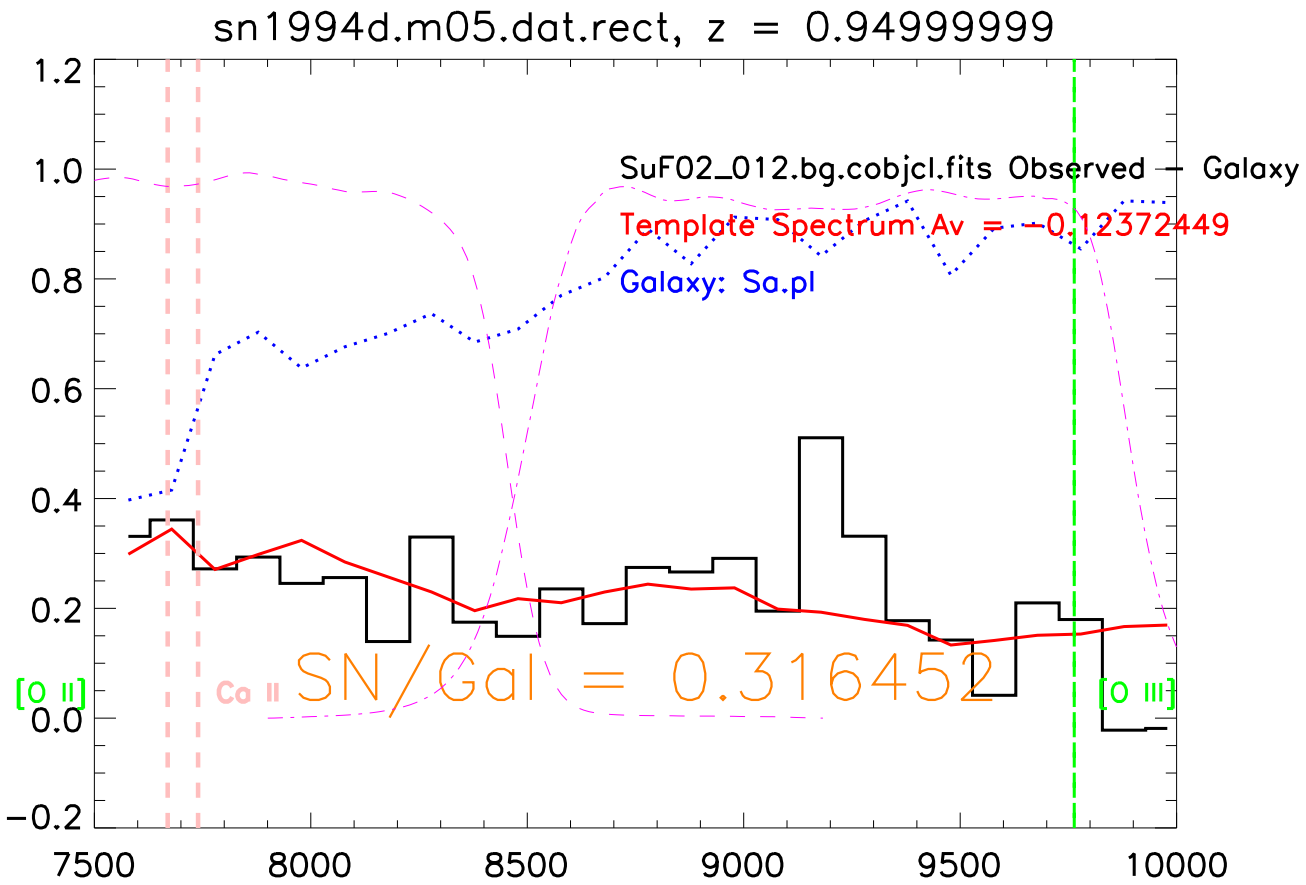
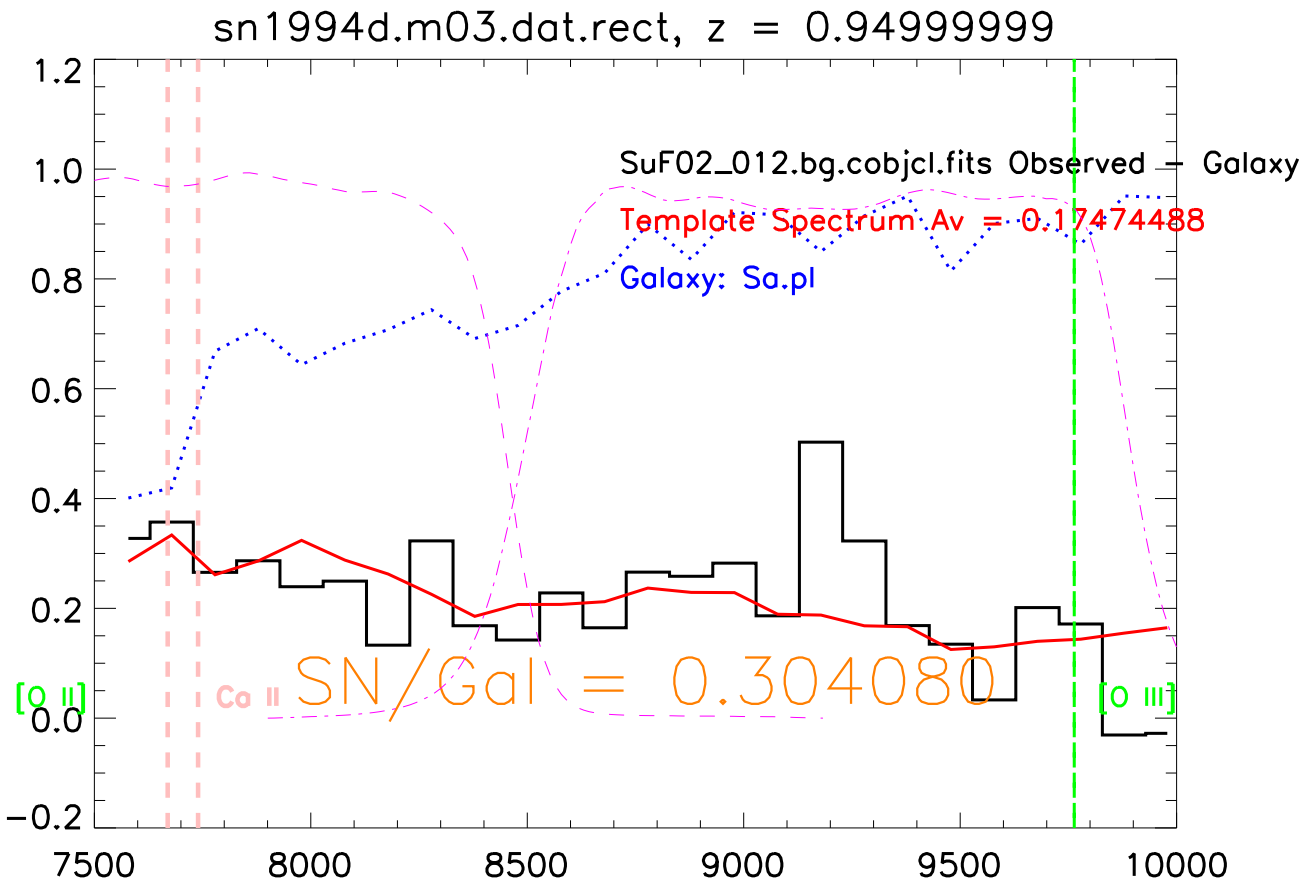
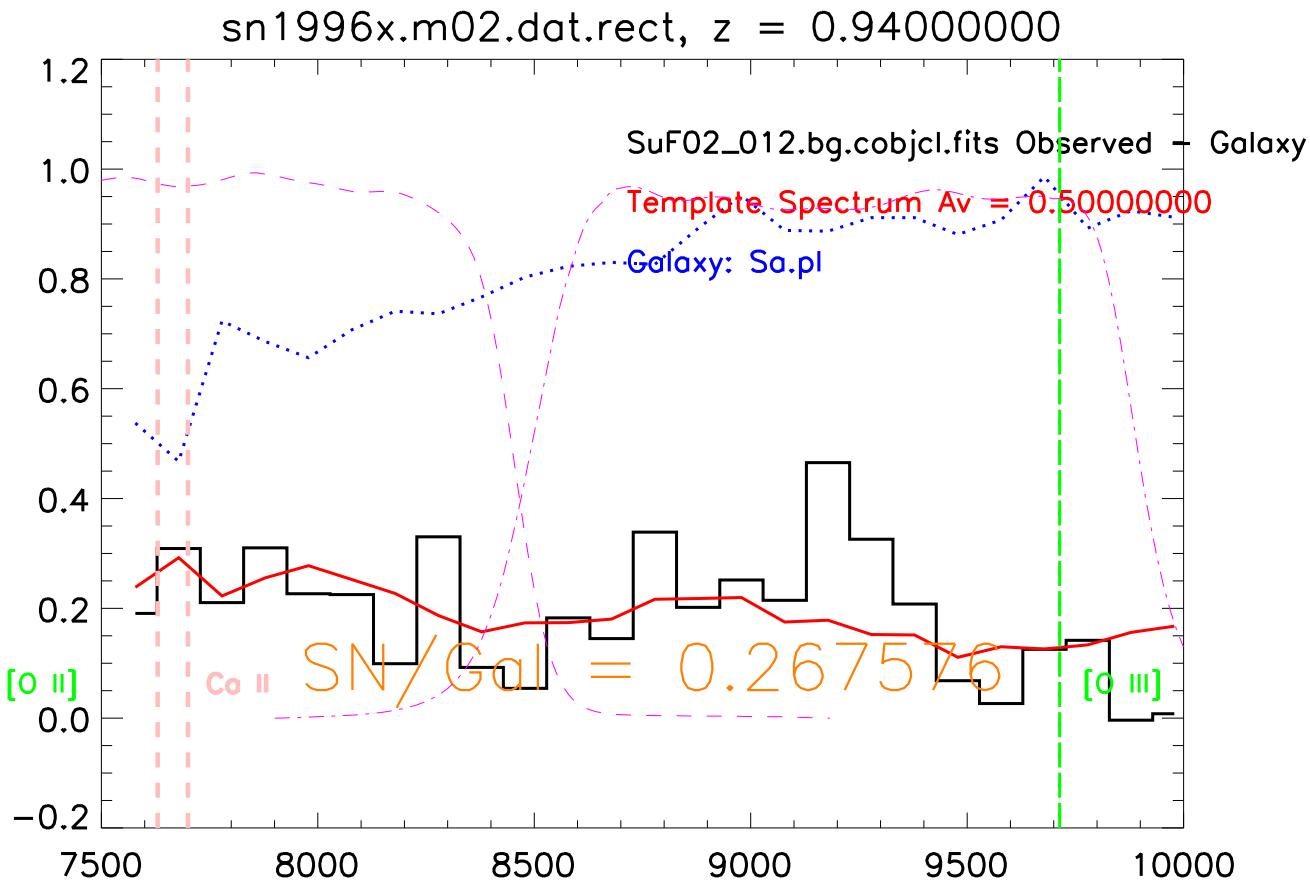

sn1991t.m07.dat.rect, z = 1.3000000
SuF02_012.bg.cobjcl.fits Observed – Galaxy
Template Spectrum Av = −0.50000000
Galaxy: Sa.pl
SN/Gal [O II] 2.06978
1.0
0.8
0.6
0.4
0.2
0.0
7500
8000
8500
9000
9500
10000

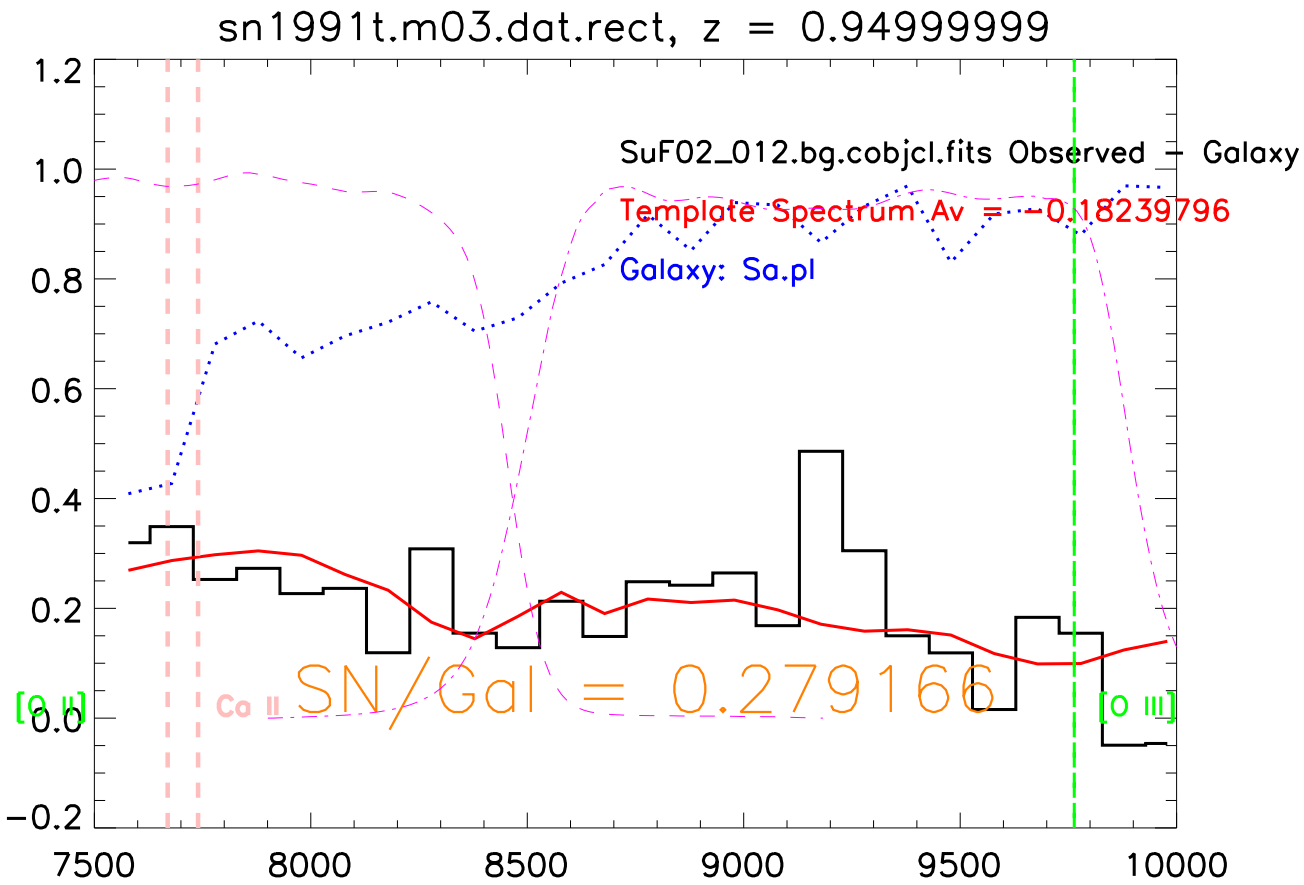

sn1994d.m04.dat.rect, z = 0.94999999
SuF02_012.bg.cobjcl.fits Observed + Galaxy
Template Spectrum Av = 0.11352041
Galaxy: Sa.pl
SN/Gal = 0.535045
[O II]
Ca II
[O III]
1.0
0.8
0.6
0.4
0.2
0.0
7500
8000
8500
9000
9500
10000

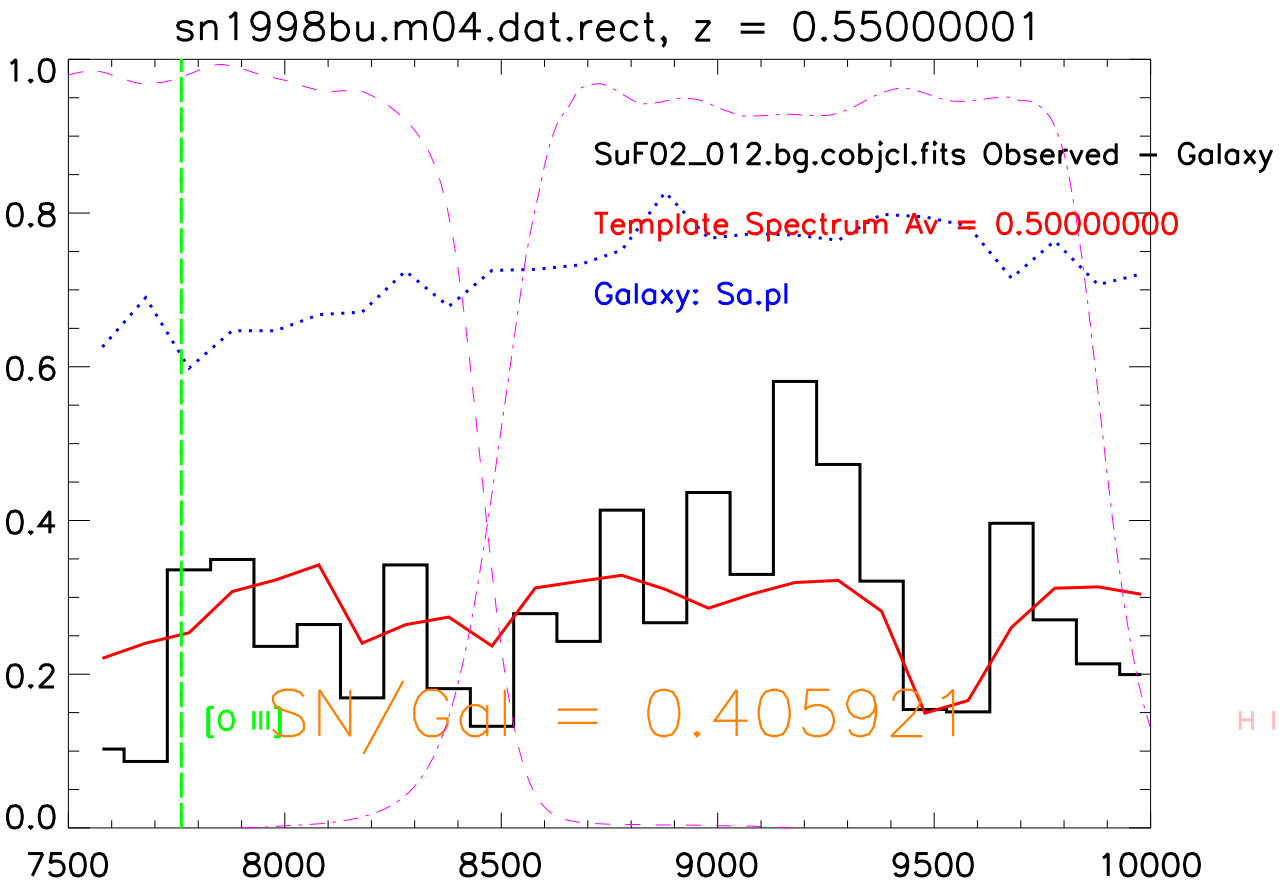

sn1998bu.m02.dat.rect, z = 0.55000001
SuF02_012.bg.cobjcl.fits Observed – Galaxy
Template Spectrum Av = 0.50000000
Galaxy: Sa.pl
[O III]
SN/Gal = 0.449610
H I
1.0
0.8
0.6
0.4
0.2
0.0
7500
8000
8500
9000
9500
10000


sn1994d.m05.dat.rect, z = 0.94999999
SuF02_012.bg.cobjcl.fits Observed
Galaxy
Template Spectrum Av = -0.12372449
Galaxy: Sa.pl
SN/Gal = 0.316452
[O II]
Ca II
[O III]
1.2
1.0
0.8
0.6
0.4
0.2
0.0
-0.2
7500
8000
8500
9000
9500
10000


sn1994d.m03.dat.rect, z = 0.94999999
SuF02_012.bg.cobjcl.fits Observed – Galaxy
Template Spectrum Av = 0.17474488
Galaxy: Sa.pl
SN/Gal = 0.304080
[O II]
Ca II
[O III]
1.2
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
7500
8000
8500
9000
9500
10000


sn1996x.m02.dat.rect, z = 0.94000000
SuF02_012.bg.cobjcl.fits Observed - Galaxy
Template Spectrum Av = 0.50000000
Galaxy: Sa.pl
SN/Gal = 0.267576
[O II]
Ca II
[O III]
1.2
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
7500
8000
8500
9000
9500
10000


sn1991t.m03.dat.rect, z = 0.94999999
SuF02_012.bg.cobjcl.fits Observed − Galaxy
Template Spectrum Av = −0.18239796
Galaxy: Sa.pl
SN/Gal = 0.279166
[O II]
Ca II
[O III]
1.2
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
7500
8000
8500
9000
9500
10000


sn1998bu.m04.dat.rect, z = 0.55000001
SuF02_012.bg.cobjcl.fits Observed - Galaxy
Template Spectrum Av = 0.50000000
Galaxy: Sa.pl
[O III]
SN/Gal = 0.405921
H I
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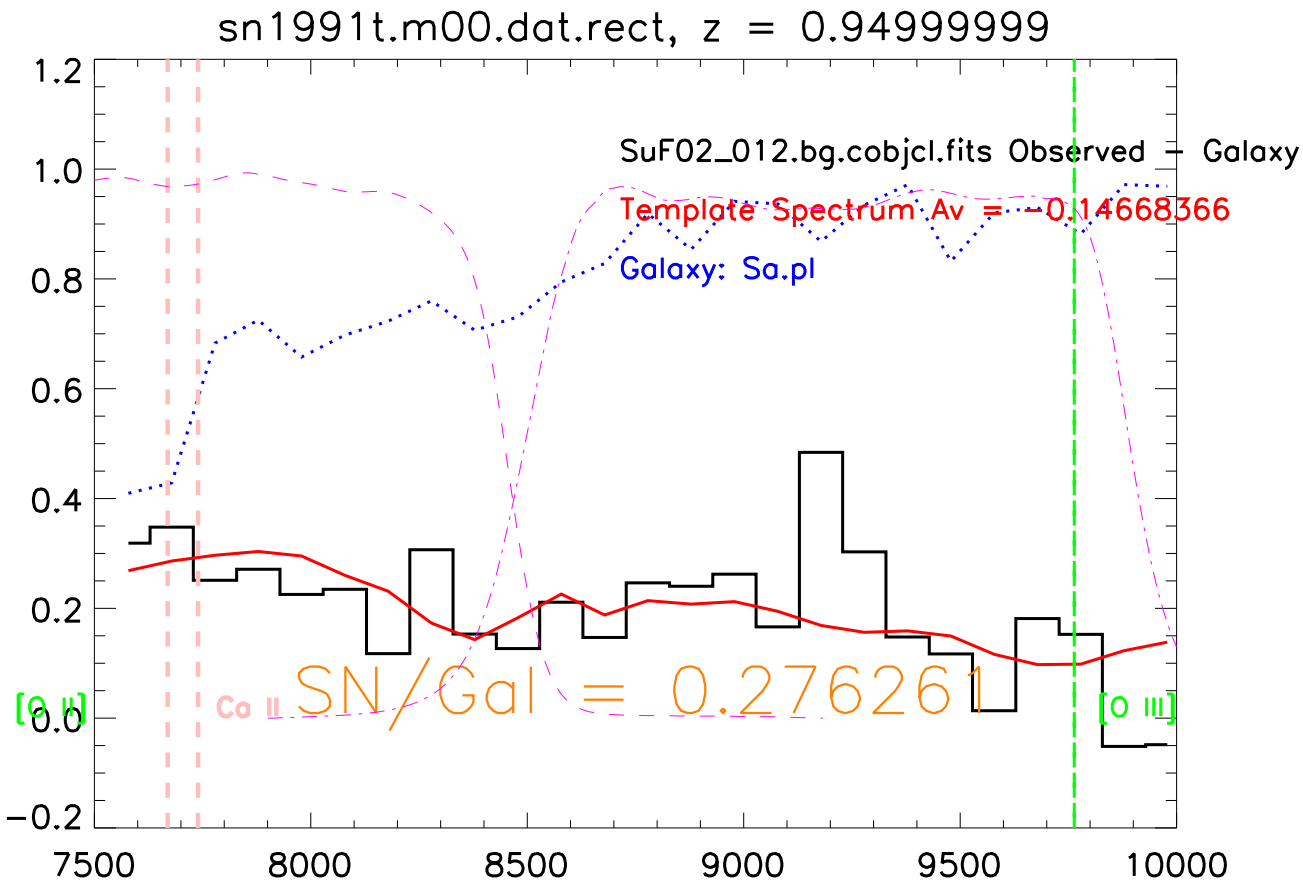
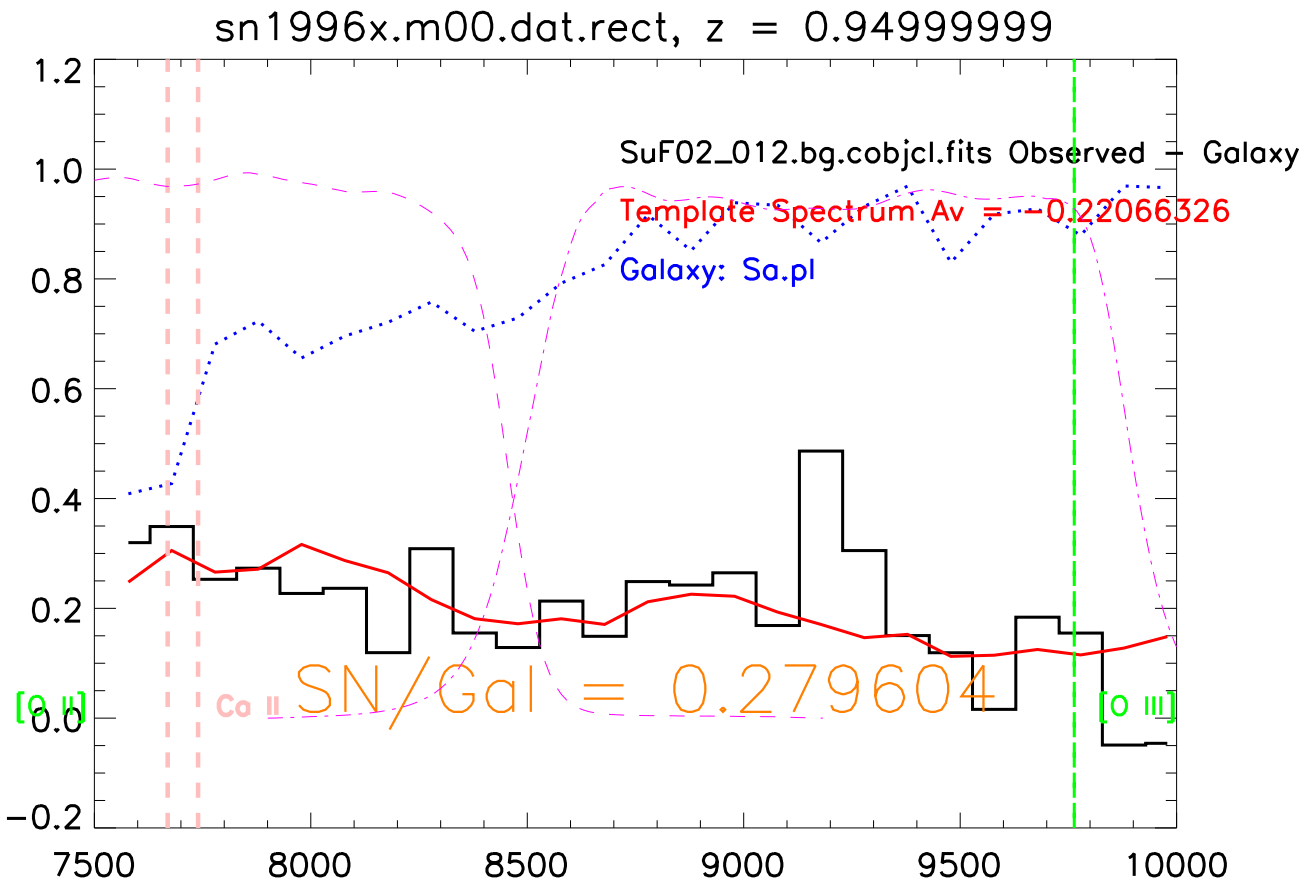
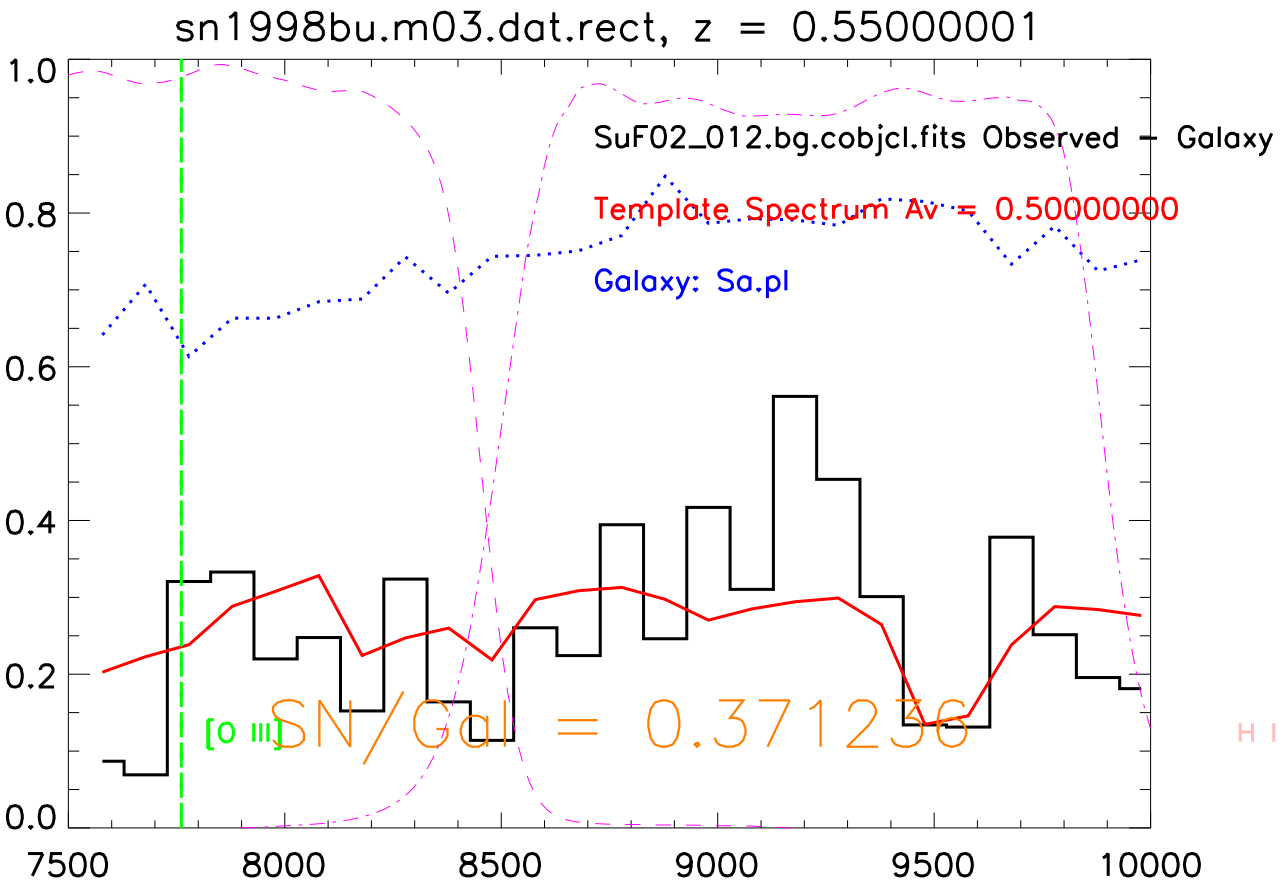
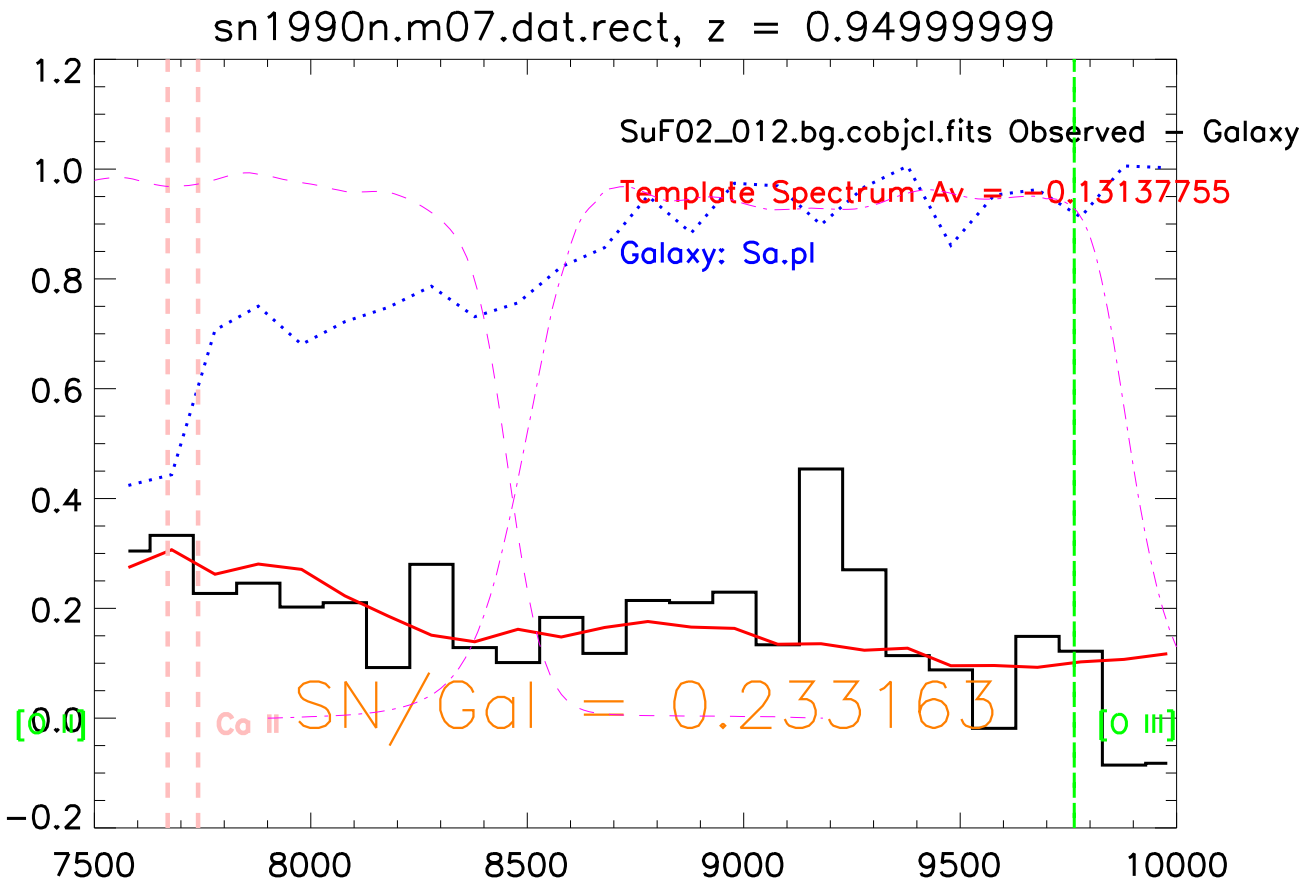
0.8
0.6
0.4
0.2
0.0
7500
8000
8500
9000
9500
10000


sn1991t.m00.dat.rect, z = 0.94999999
SuF02_012.bg.cobjcl.fits Observed − Galaxy
Template Spectrum Av = −0.14668366
Galaxy: Sa.pl
SN/Gal = 0.276261
[O II]
Co II
[O III]
1.2
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
7500
8000
8500
9000
9500
10000


sn1996x.m00.dat.rect, z = 0.94999999
SuF02_012.bg.cobjcl.fits Observed − Galaxy
Template Spectrum Av = −0.22066326
Galaxy: Sa.pl
SN/Gal = 0.279604
[O II]
Ca II
[O III]
1.2
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
7500
8000
8500
9000
9500
10000


sn1998bu.m03.dat.rect, z = 0.55000001
SuF02_012.bg.cobjcl.fits Observed
Galaxy
Template Spectrum Av = 0.50000000
Galaxy: Sa.pl
SN/Gal = 0.371236
[O III]
H I
1.0
0.8
0.6
0.4
0.2
0.0
7500
8000
8500
9000
9500
10000


sn1990n.m07.dat.rect, z = 0.94999999
SuF02_012.bg.cobjcl.fits Observed – Galaxy
Template Spectrum Av = -0.13137755
Galaxy: Sa.pl
SN/Gal = 0.233163
Ca II
[O II]
[O II]
1.2
1.0
0.8
0.6
0.4
0.2
0.0
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8000
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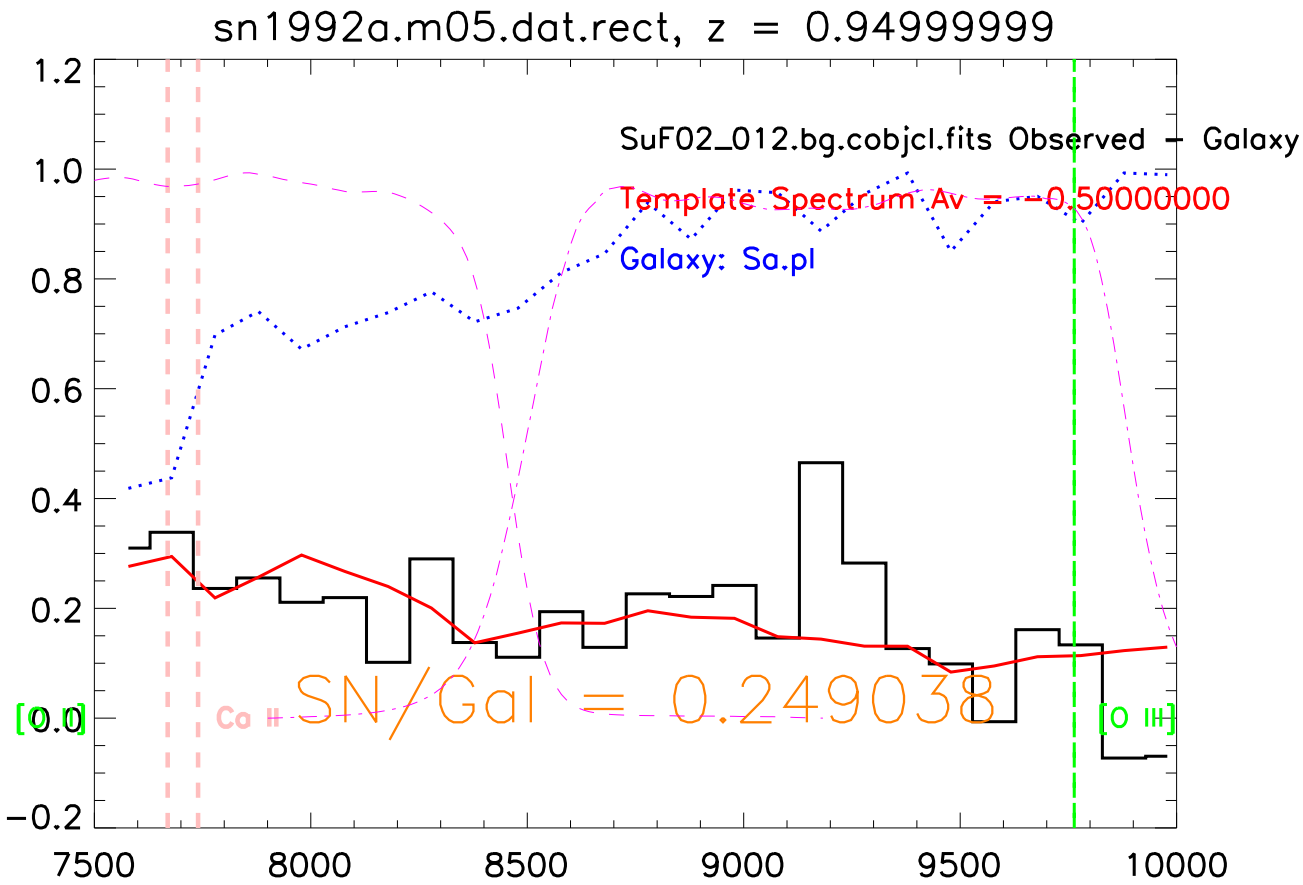
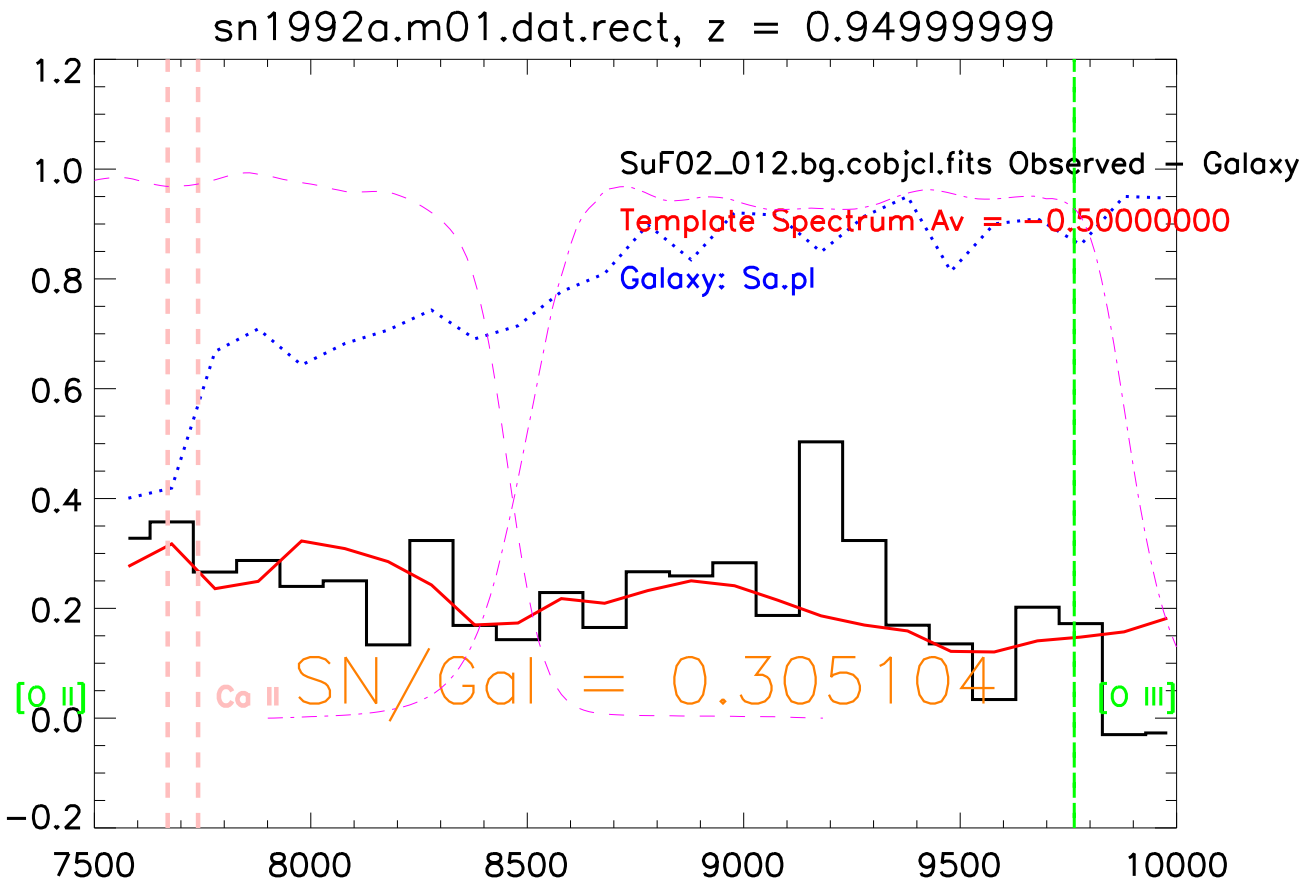
9000
9500
10000


sn1992a.m05.dat.rect, z = 0.94999999
SuF02_012.bg.cobjcl.fits Observed – Galaxy
Template Spectrum Av = 0.50000000
Galaxy: Sa.pl
SN/Gal = 0.249038
Ca II
[O II]
1.2
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
7500
8000
8500
9000
9500
10000


sn1992a.m01.dat.rect, z = 0.94999999
SuF02_012.bg.cobjcl.fits Observed – Galaxy
Template Spectrum Av = 0.50000000
Galaxy: Sa.pl
SN/Gal = 0.305104
[O II]
Ca II
[O III]
1.2
1.0
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0.6
0.4
0.2
0.0
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7500
8000
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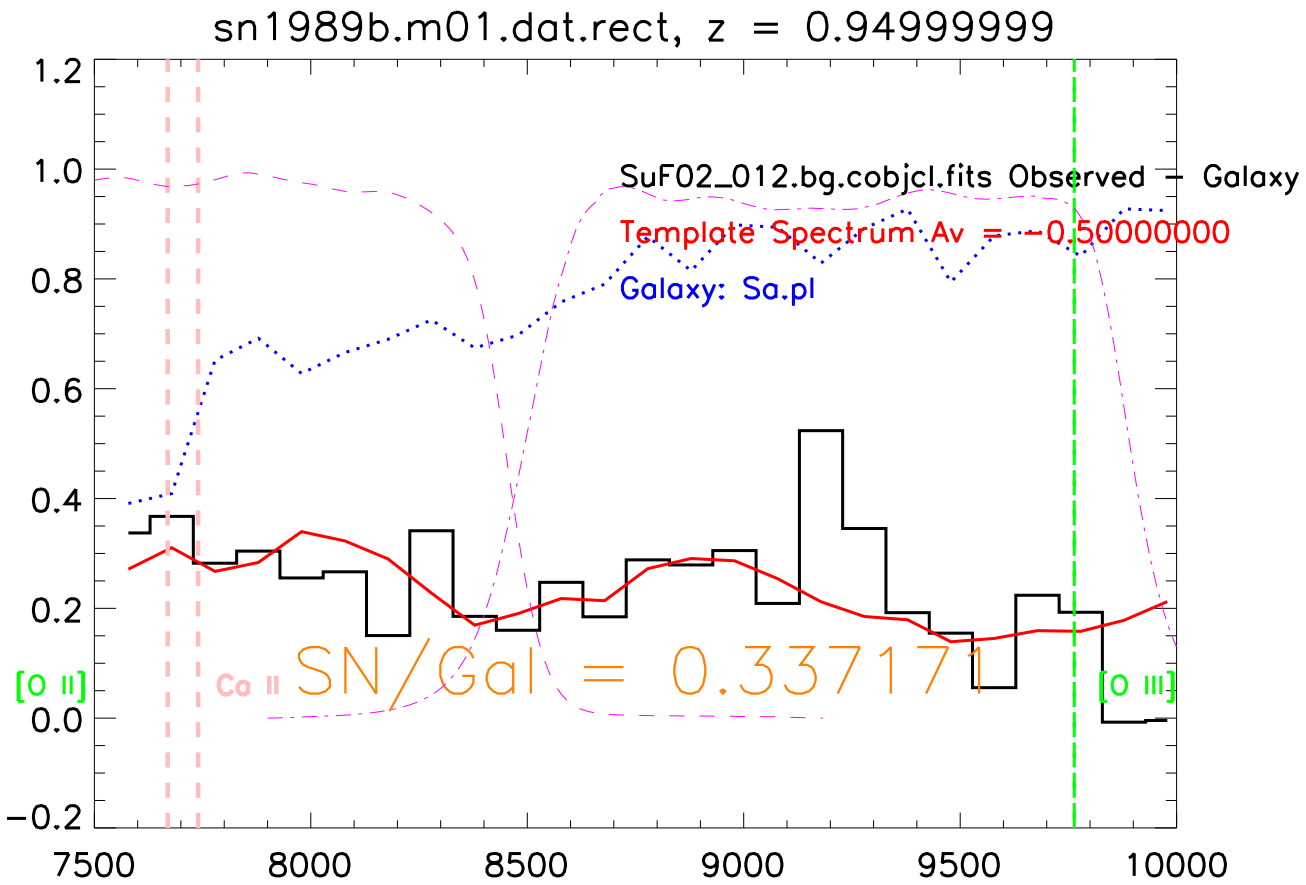
9000
9500
10000


sn1989b.m01.dat.rect, z = 0.94999999
SuF02_012.bg.cobjcl.fits Observed − Galaxy
Template Spectrum Av = −0.50000000
Galaxy: Sa.pl
SN/Gal = 0.337171
[O II]
Ca II
[O III]
1.2
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
7500
8000
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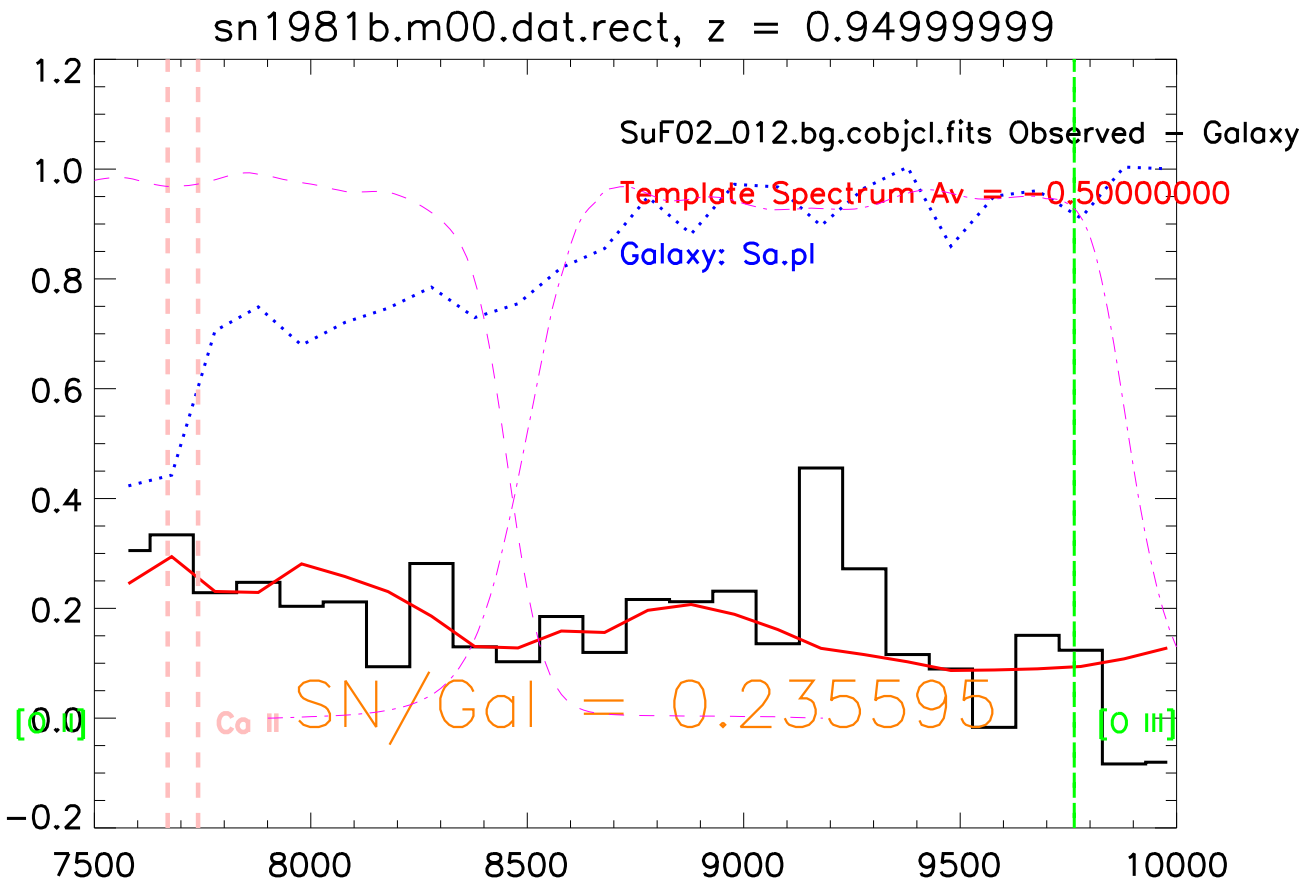
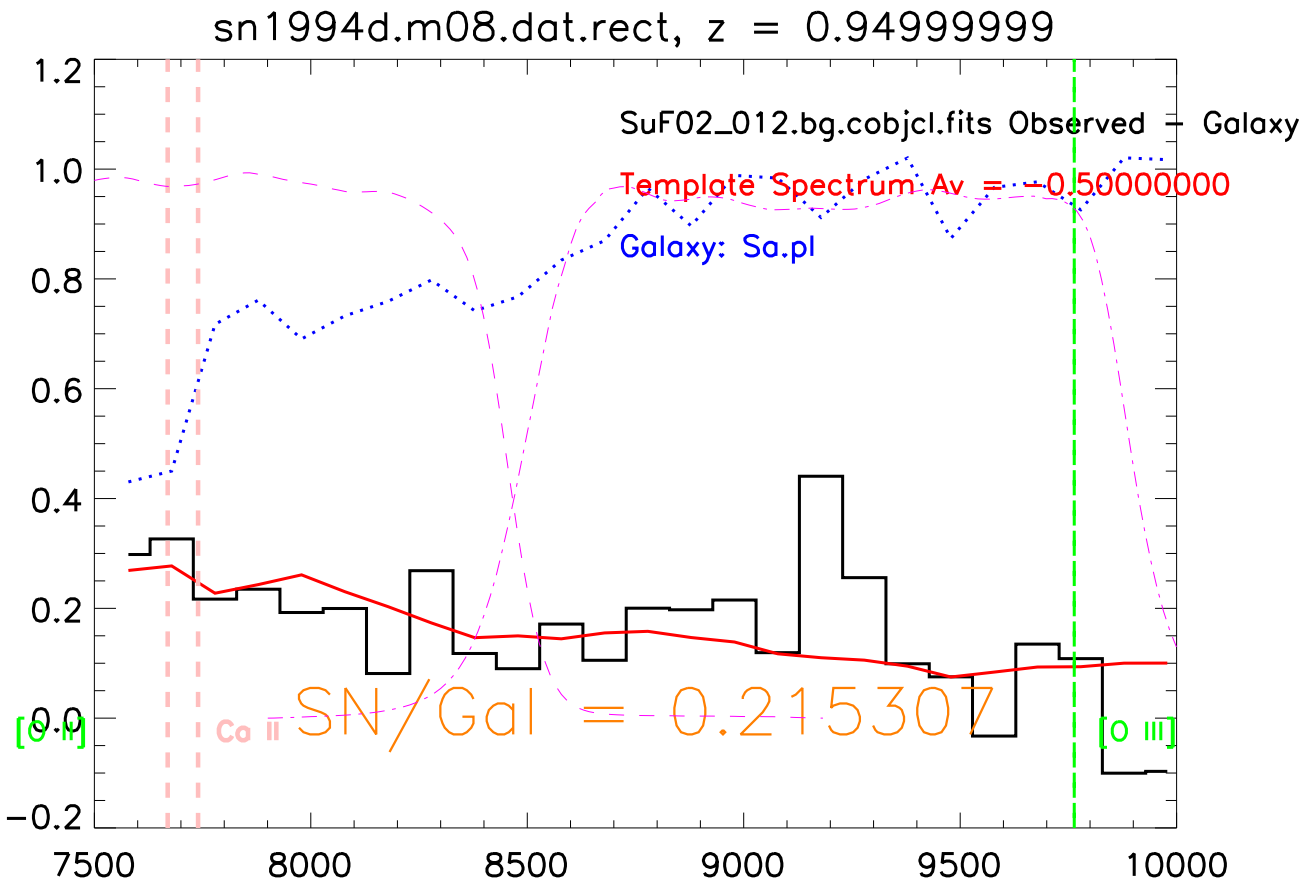
9000
9500
10000


sn1981b.m00.dat.rect, z = 0.94999999
SuF02_012.bg.cobjcl.fits Observed – Galaxy
Template Spectrum Av = 0.50000000
Galaxy: Sa.pl
SN/Gal = 0.235595
[O II]
Ca II
[O II]
1.2
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
7500
8000
8500
9000
9500
10000


sn1994d.m08.dat.rect, z = 0.94999999
SuF02_012.bg.cobjcl.fits Observed − Galaxy
Template Spectrum Av = −0.50000000
Galaxy: Sa.pl
SN/Gal = 0.215307
[O II]
Ca II
[O III]
1.2
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
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8000
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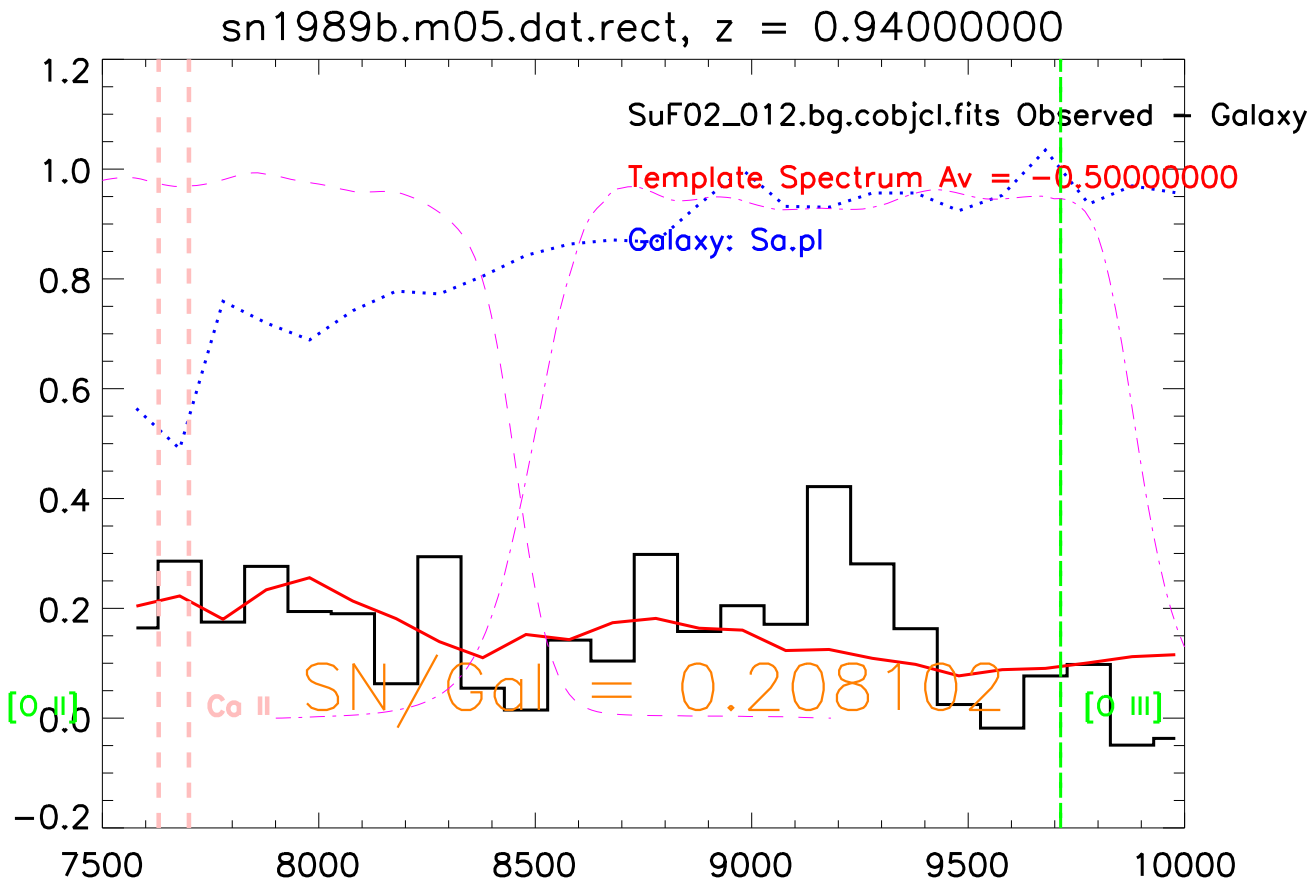
9000
9500
10000


sn1989b.m05.dat.rect, z = 0.94000000
SuF02_012.bg.cobjcl.fits Observed - Galaxy
Template Spectrum Av = -0.50000000
Galaxy: Sa.pl
SN/Gal = 0.208102
[O II]
Ca II
[O III]
1.2
1.0
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0.6
0.4
0.2
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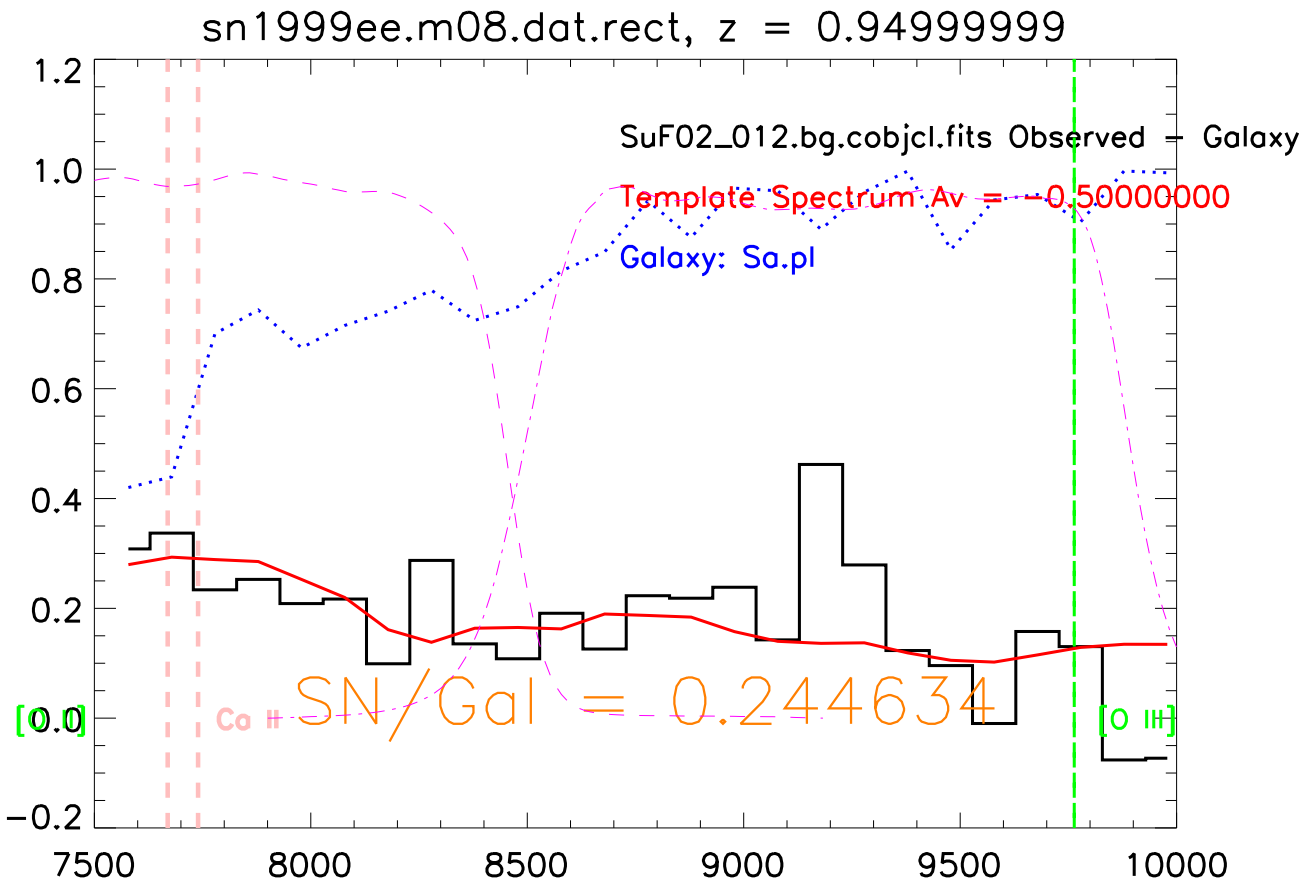
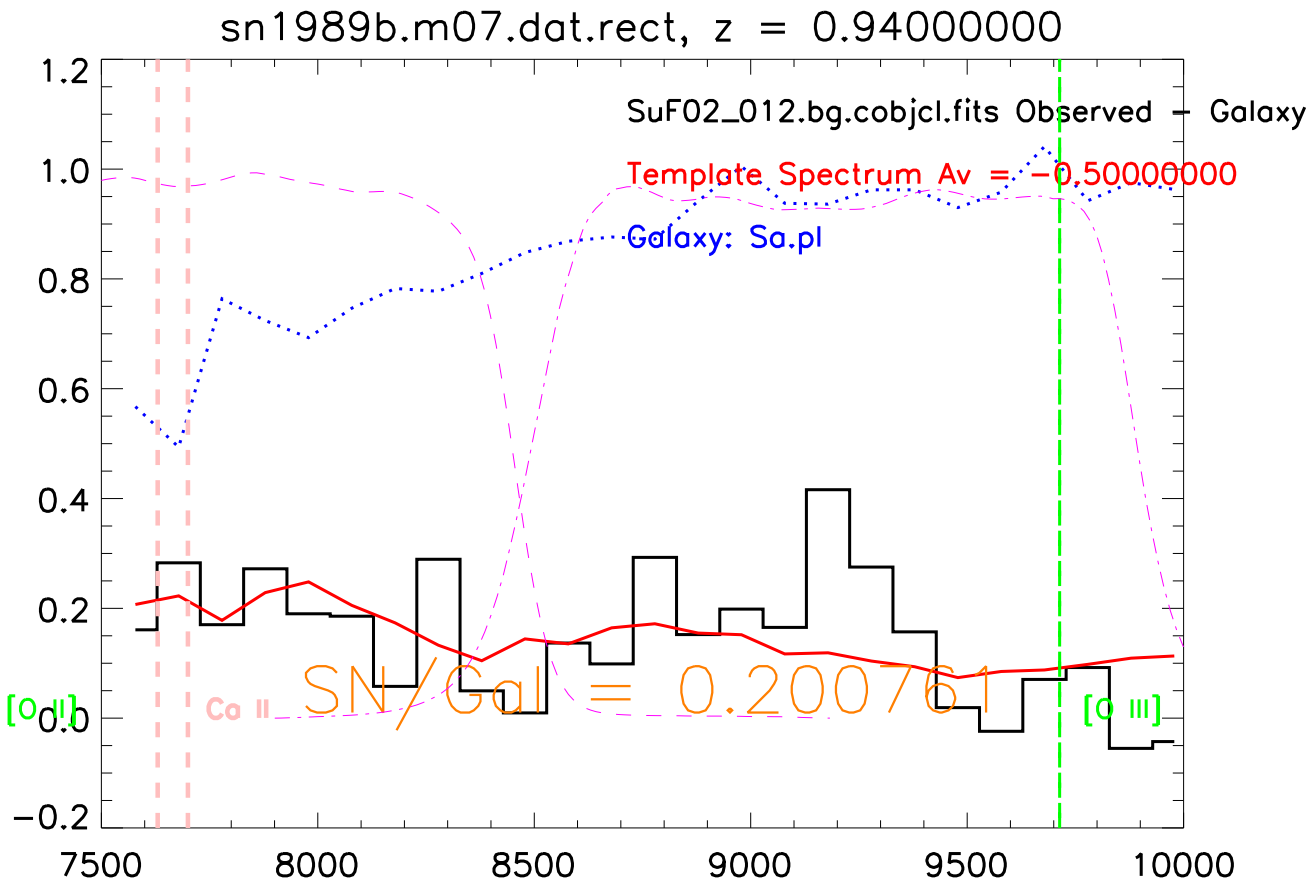

sn1999ee.m08.dat.rect, z = 0.94999999
SuF02_012.bg.cobjcl.fits Observed + Galaxy
Template Spectrum Av = 0.50000000
Galaxy: Sa.pl
SN/Gal = 0.244634
[O II]
Ca II
[O II]
1.2
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
7500
8000
8500
9000
9500
10000


sn1989b.m07.dat.rect, z = 0.94000000
SuF02_012.bg.cobjcl.fits Observed – Galaxy
Template Spectrum Av = −0.50000000
Galaxy: Sa.pl
SN/Gal = 0.200761
[O II]
Ca II
[O III]
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0.6
0.4
0.2
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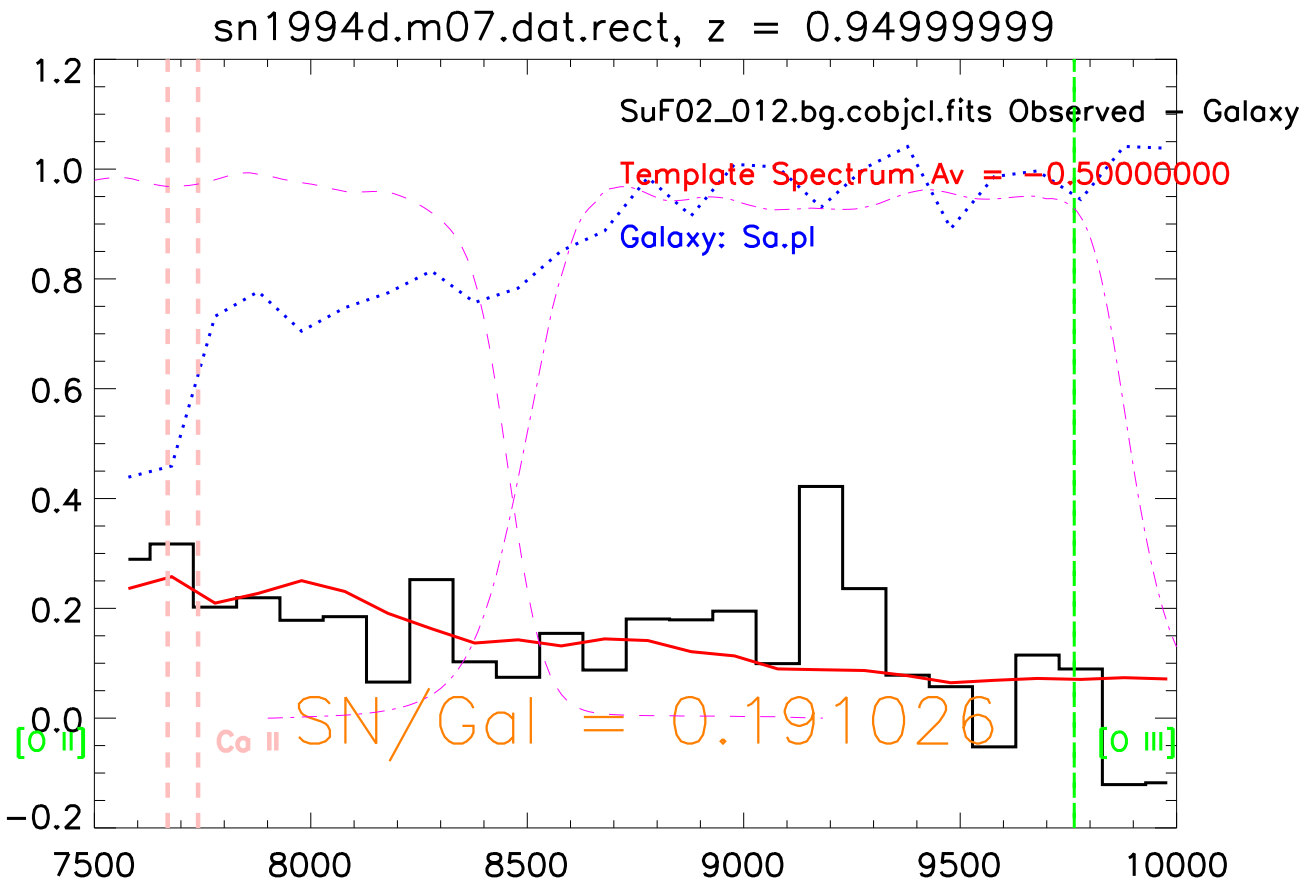
9000
9500
10000


sn1994d.m07.dat.rect, z = 0.94999999
SuF02_012.bg.cobjcl.fits Observed – Galaxy
Template Spectrum Av = 0.50000000
Galaxy: Sa.pl
SN/Gal = 0.191026
[O II]
Ca II
[O III]
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0.6
0.4
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9500
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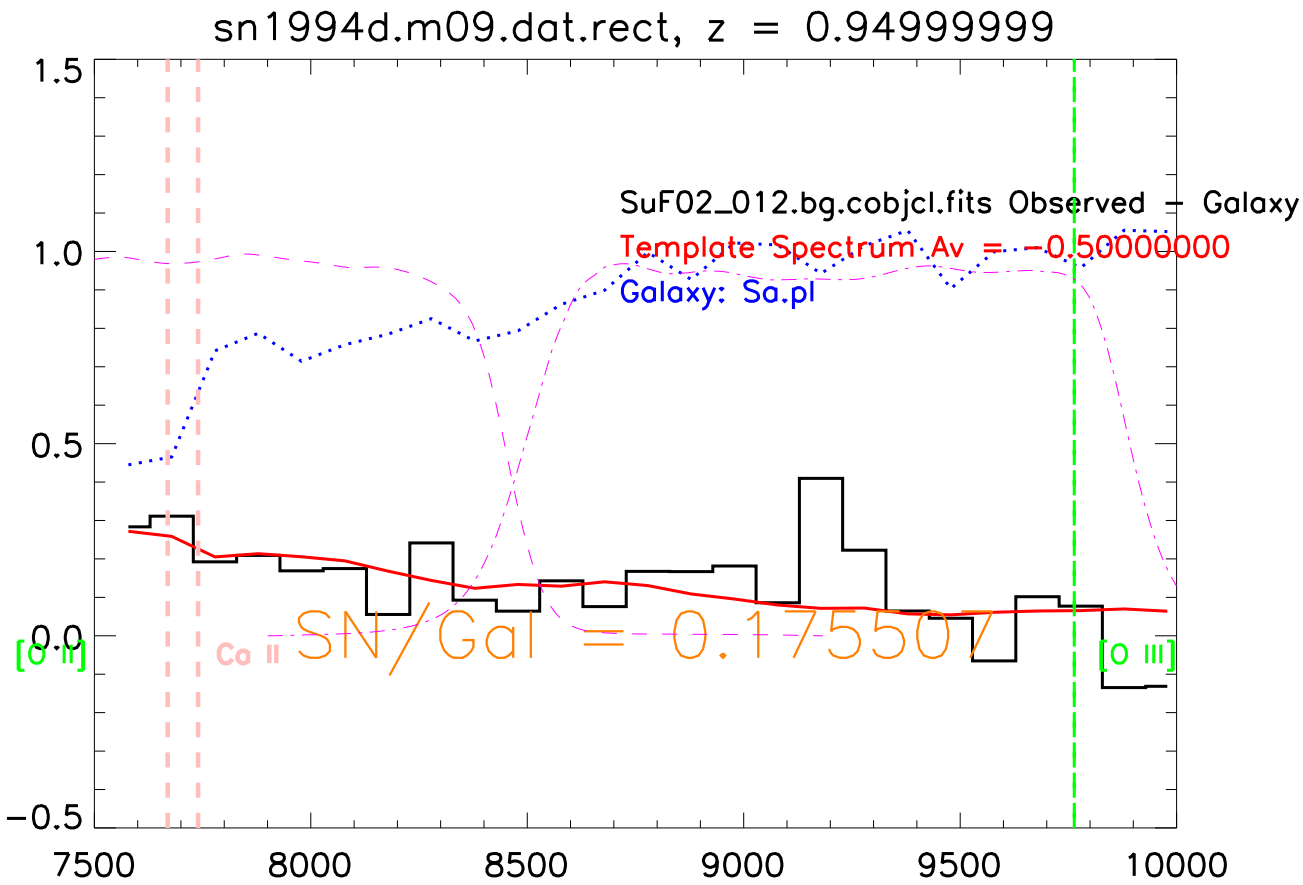
sn1994d.m09.dat.rect, z = 0.94999999
SuF02_012.bg.cobjcl.fits Observed – Galaxy
Template Spectrum Av = -0.50000000
Galaxy: Sa.pl
SN/Gal = 0.17550
[O II]
Ca II
[O III]
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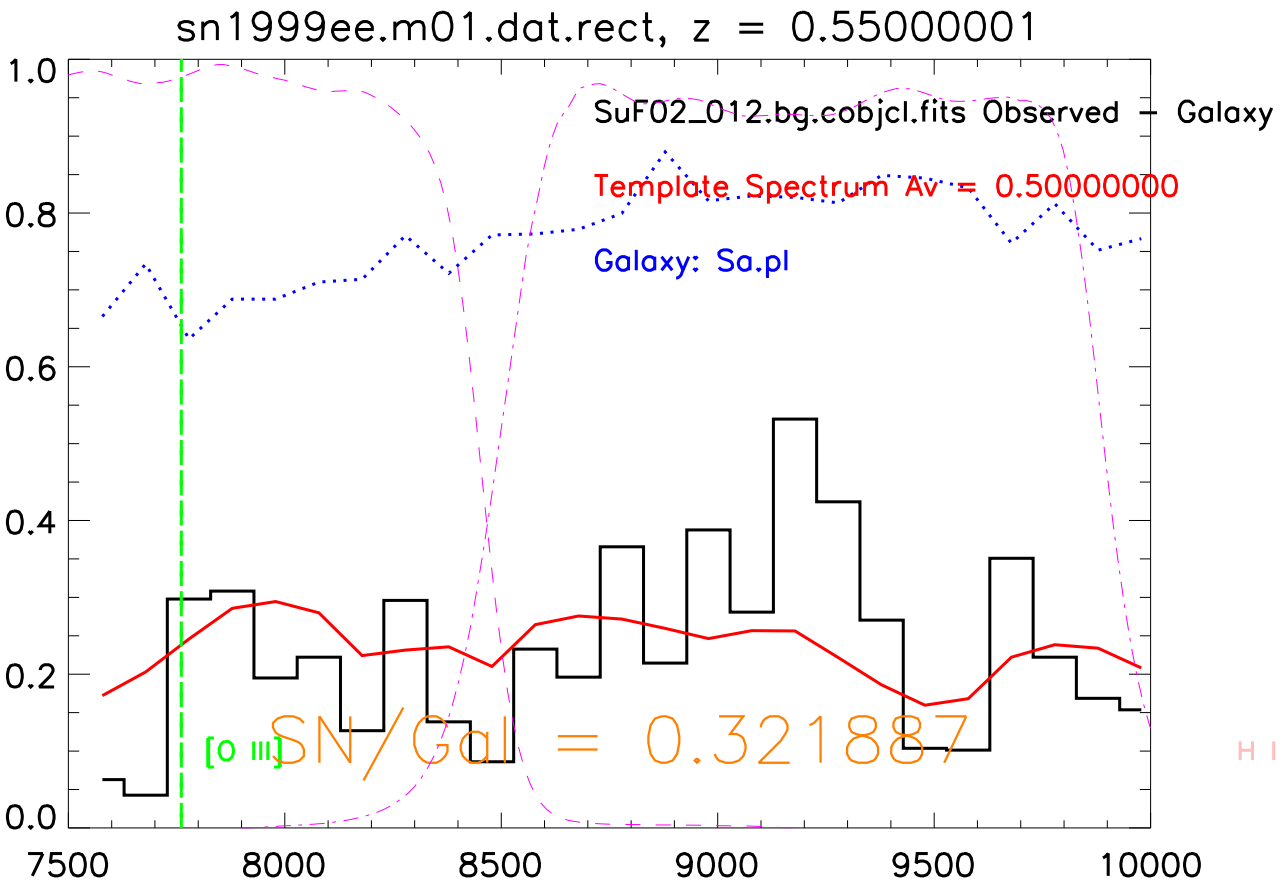
9500
10000


sn1999ee.m01.dat.rect, z = 0.55000001
SuF02_012.bg.cobjcl.fits Observed – Galaxy
Template Spectrum Av = 0.50000000
Galaxy: Sa.pl
SN/Gal = 0.321887
[O III]
H I
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0.8
0.6
0.4
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8000
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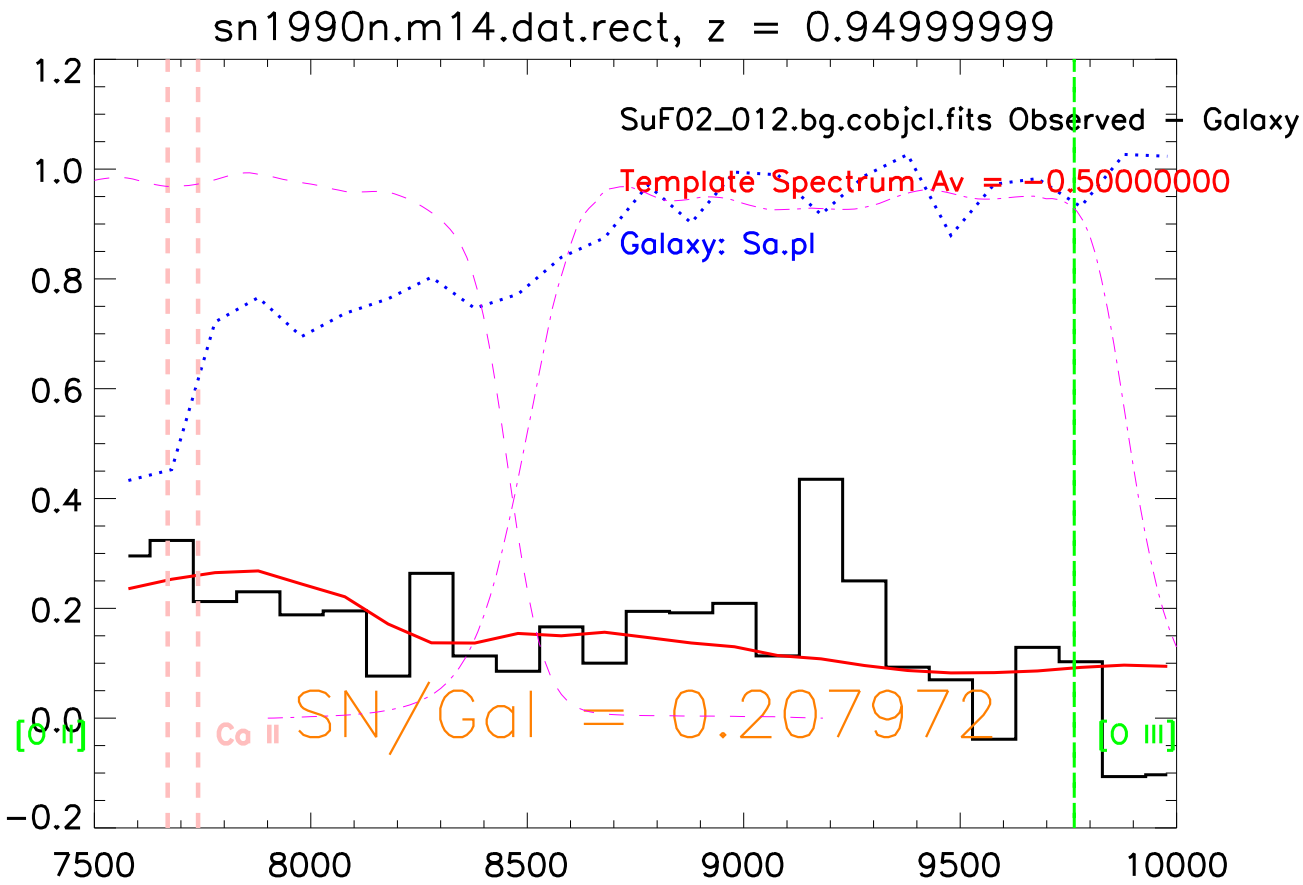
9000
9500
10000


sn1990n.m14.dat.rect, z = 0.94999999
SuF02_012.bg.cobjcl.fits Observed + Galaxy
Template Spectrum Av = -0.50000000
Galaxy: Sa.pl
SN/Gal = 0.207972
[O II]
Ca II
[O III]
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0.6
0.4
0.2
0.0
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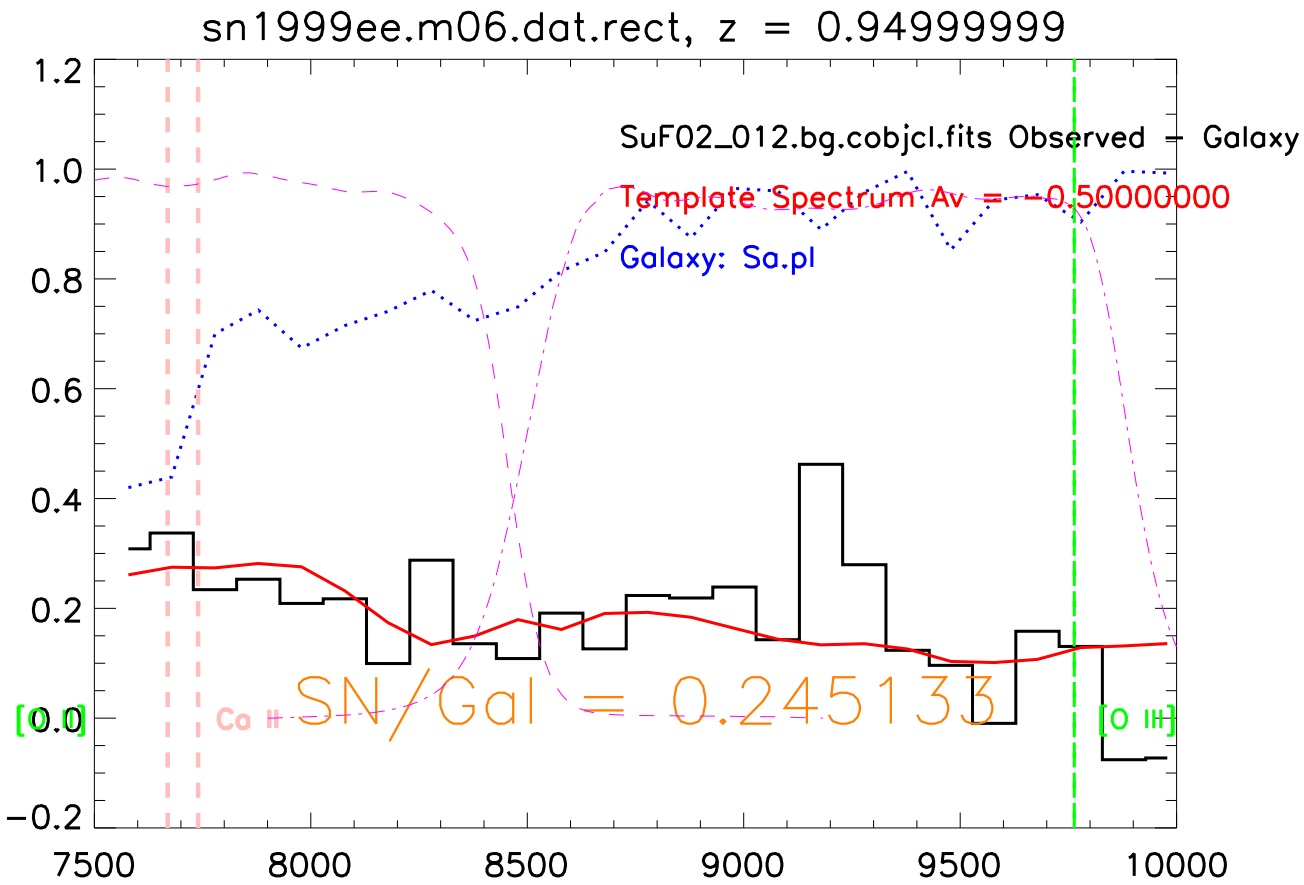
7500
8000
8500
9000
9500
10000


sn1999ee.m06.dat.rect, z = 0.94999999
SuF02_012.bg.cobjcl.fits Observed - Galaxy
Template Spectrum Av = -0.50000000
Galaxy: Sa.pl
SN/Gal = 0.245133
Ca II
[O II]
[O II]
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0.6
0.4
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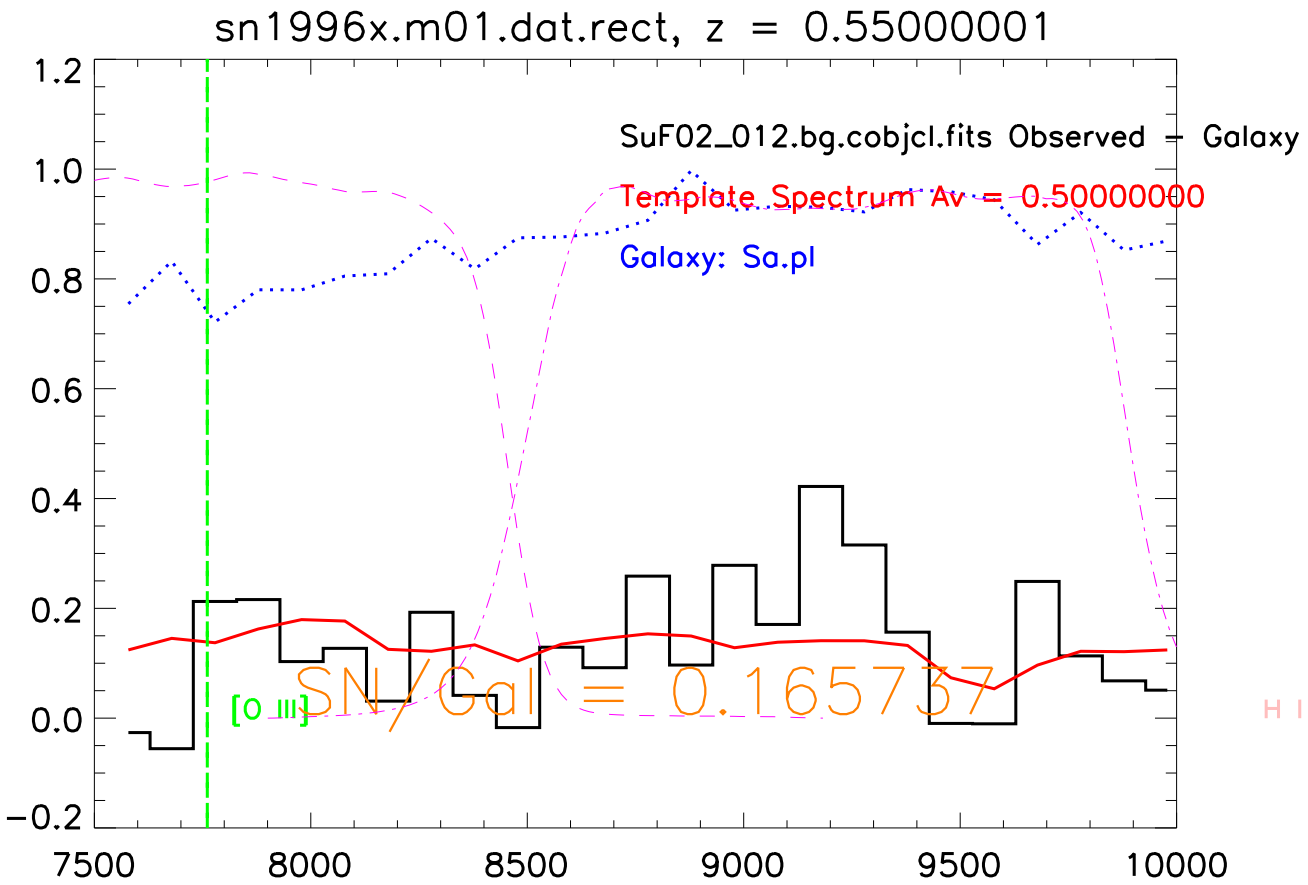
9000
9500
10000


sn1996x.m01.dat.rect, z = 0.55000001
SuF02_012.bg.cobjcl.fits Observed - Galaxy
Template Spectrum Av = 0.50000000
Galaxy: Sa.pl
SN/Gal = 0.165737
[O III]
H I
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0.6
0.4
0.2
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9500
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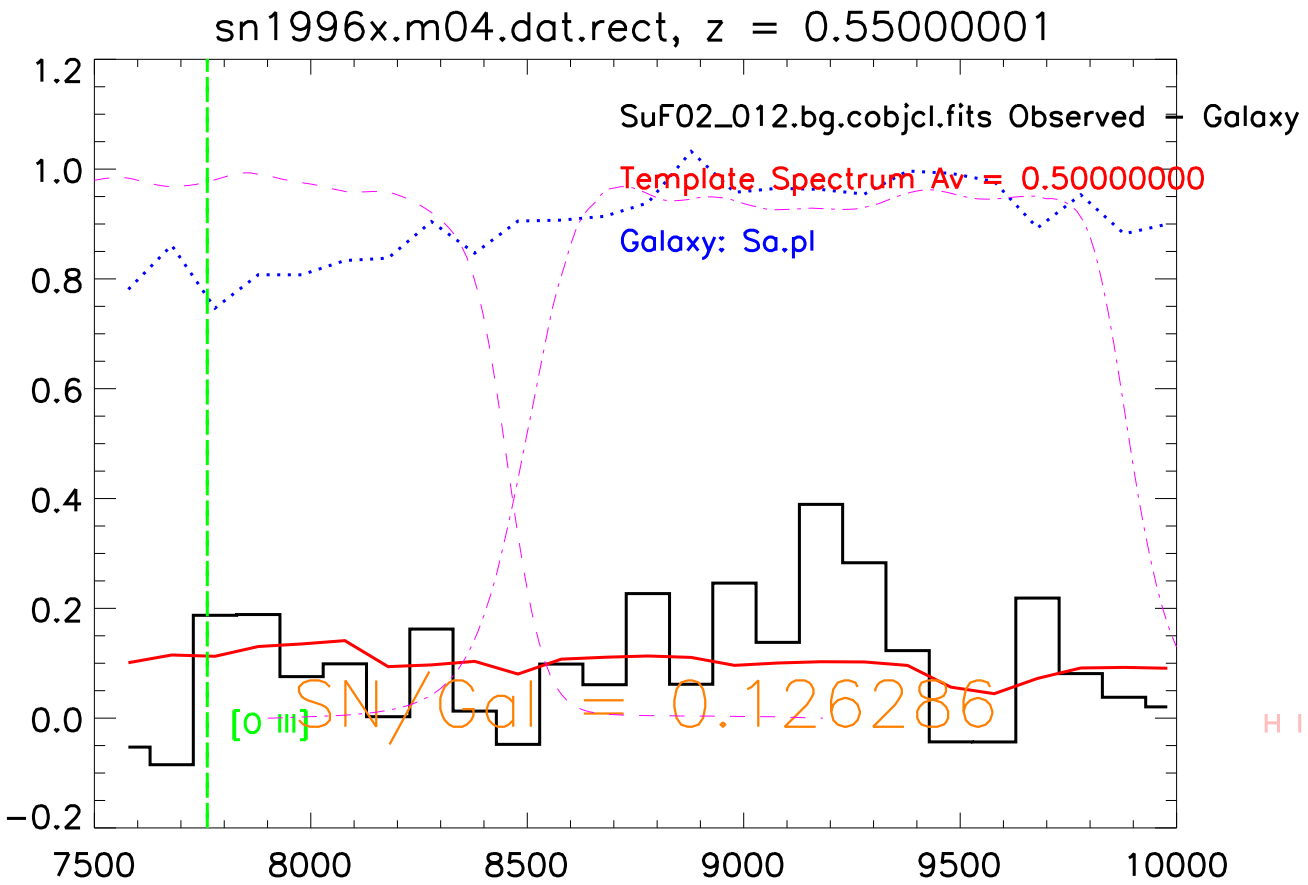
sn1996x.m04.dat.rect, z = 0.55000001
SuF02_012.bg.cobjcl.fits Observed - Galaxy
Template Spectrum Av = 0.50000000
Galaxy: Sa.pl
SN/Gal = 0.126286
[O III]
H I
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0.6
0.4
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9500
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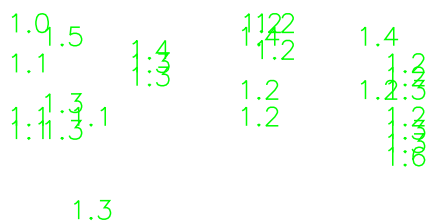
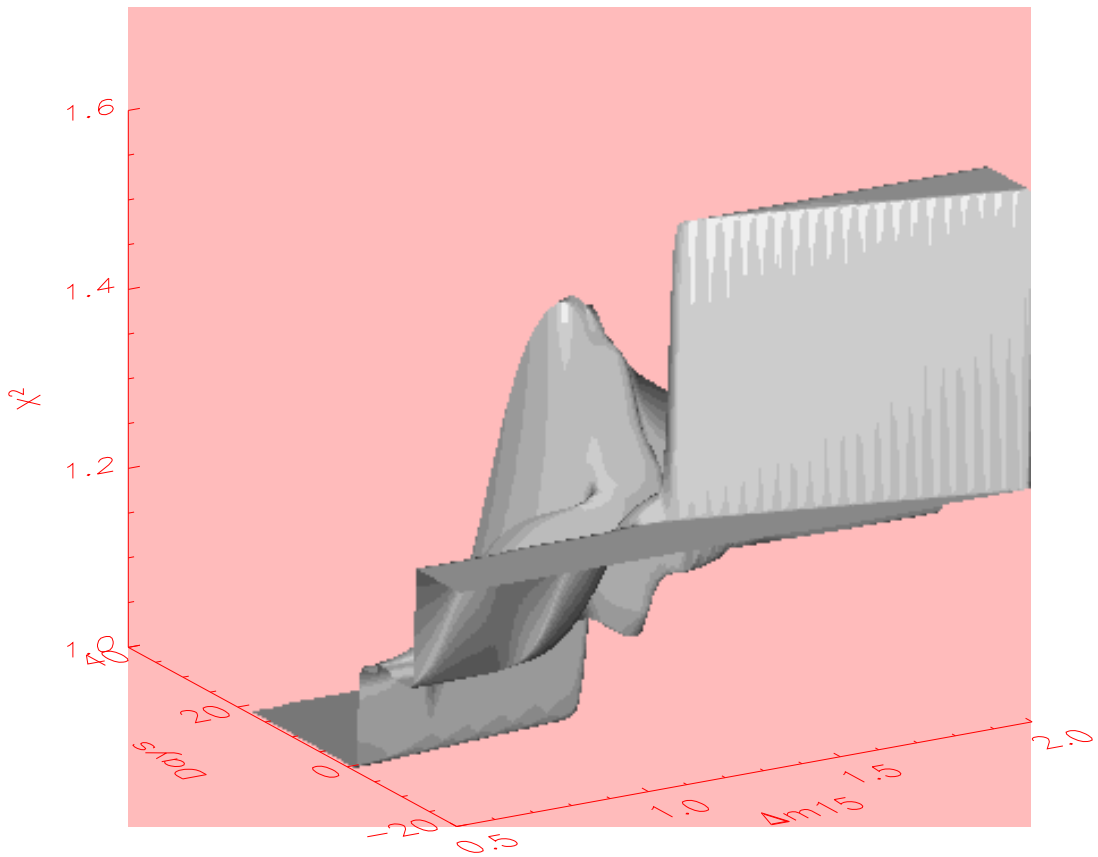
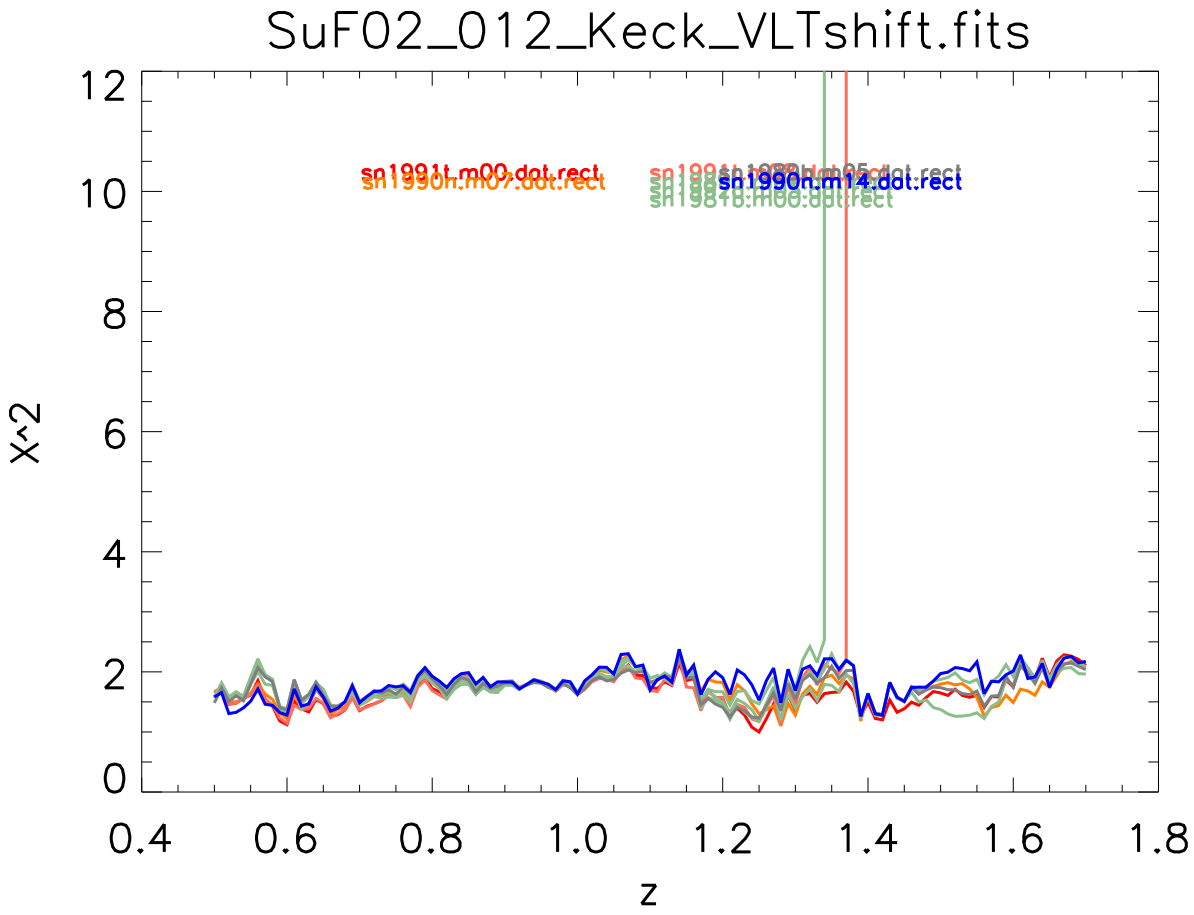
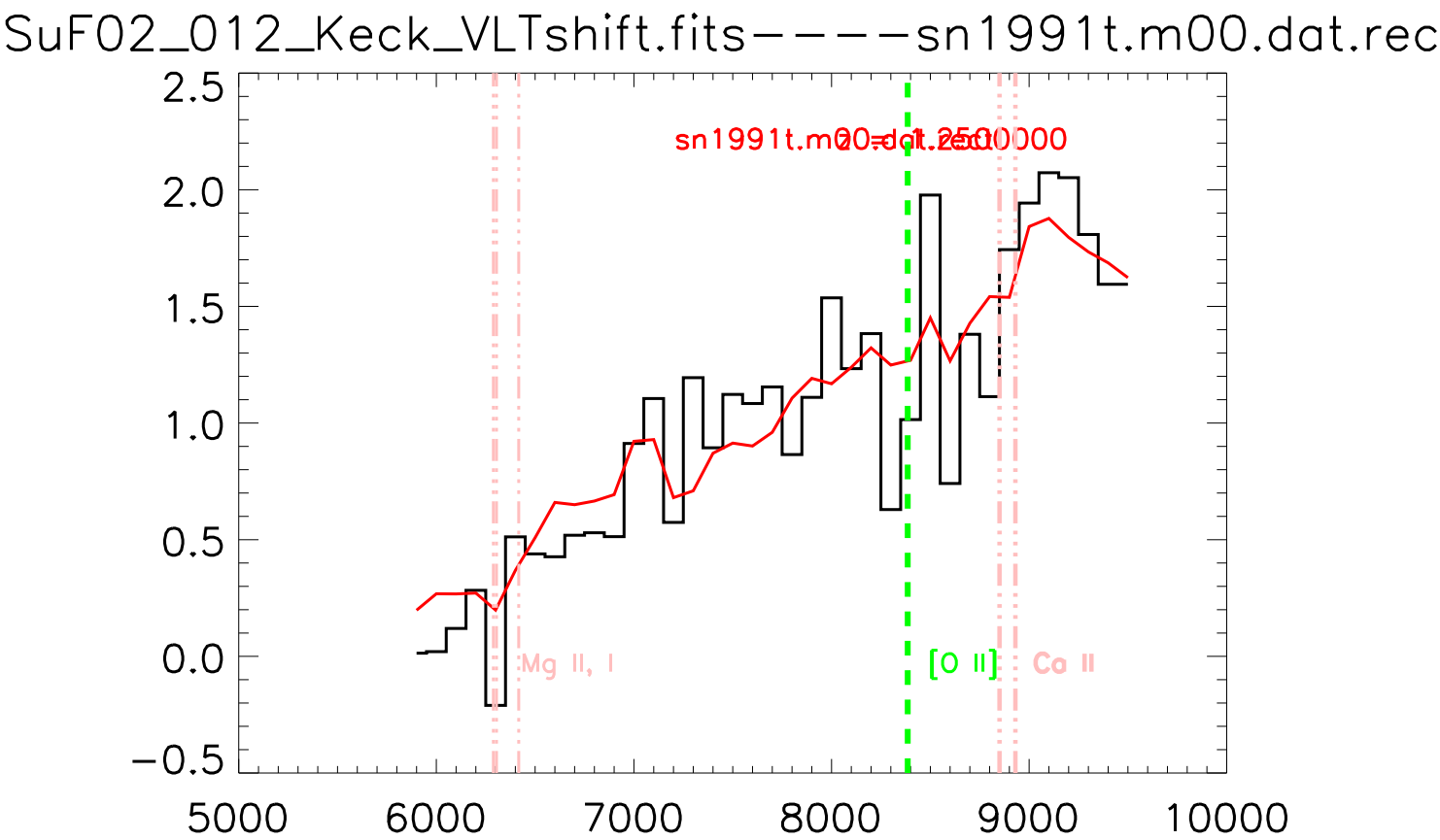
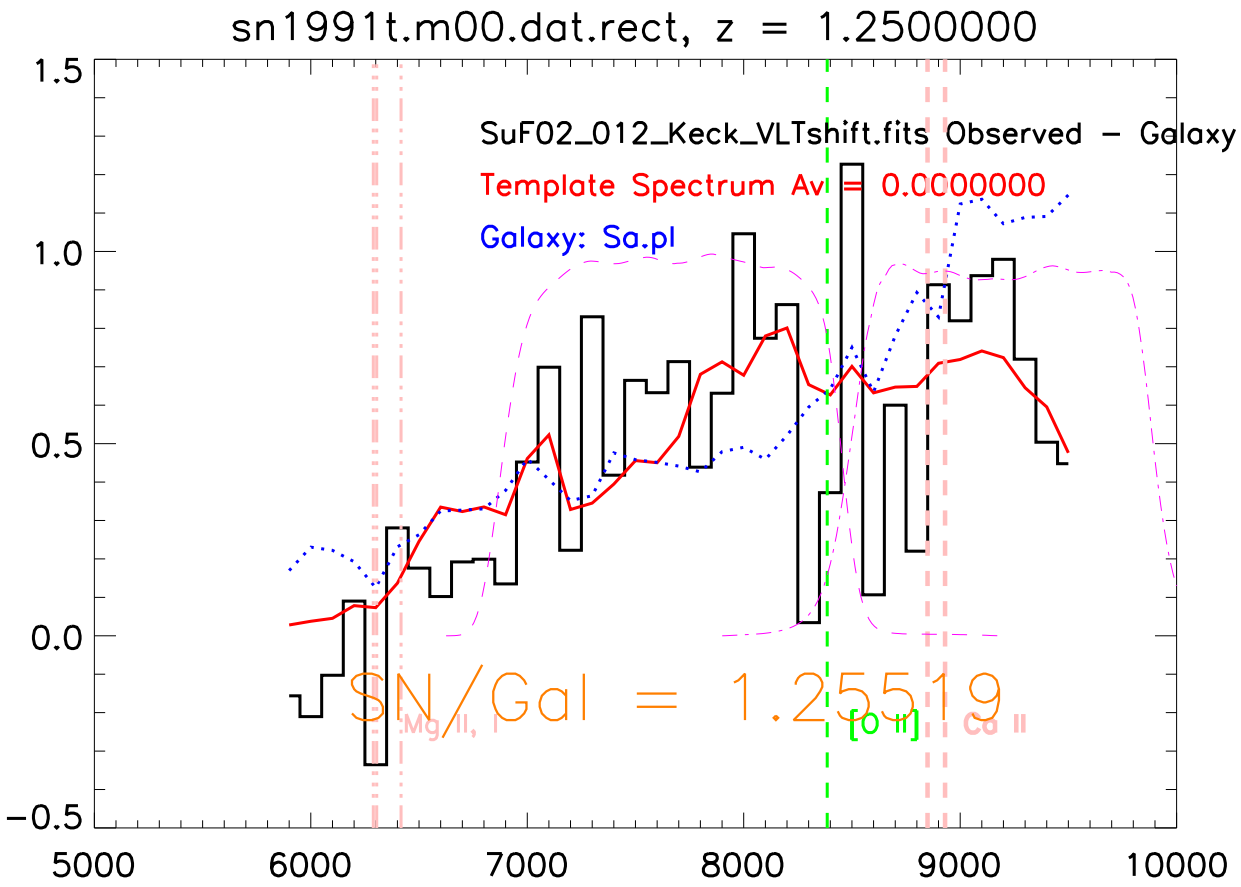


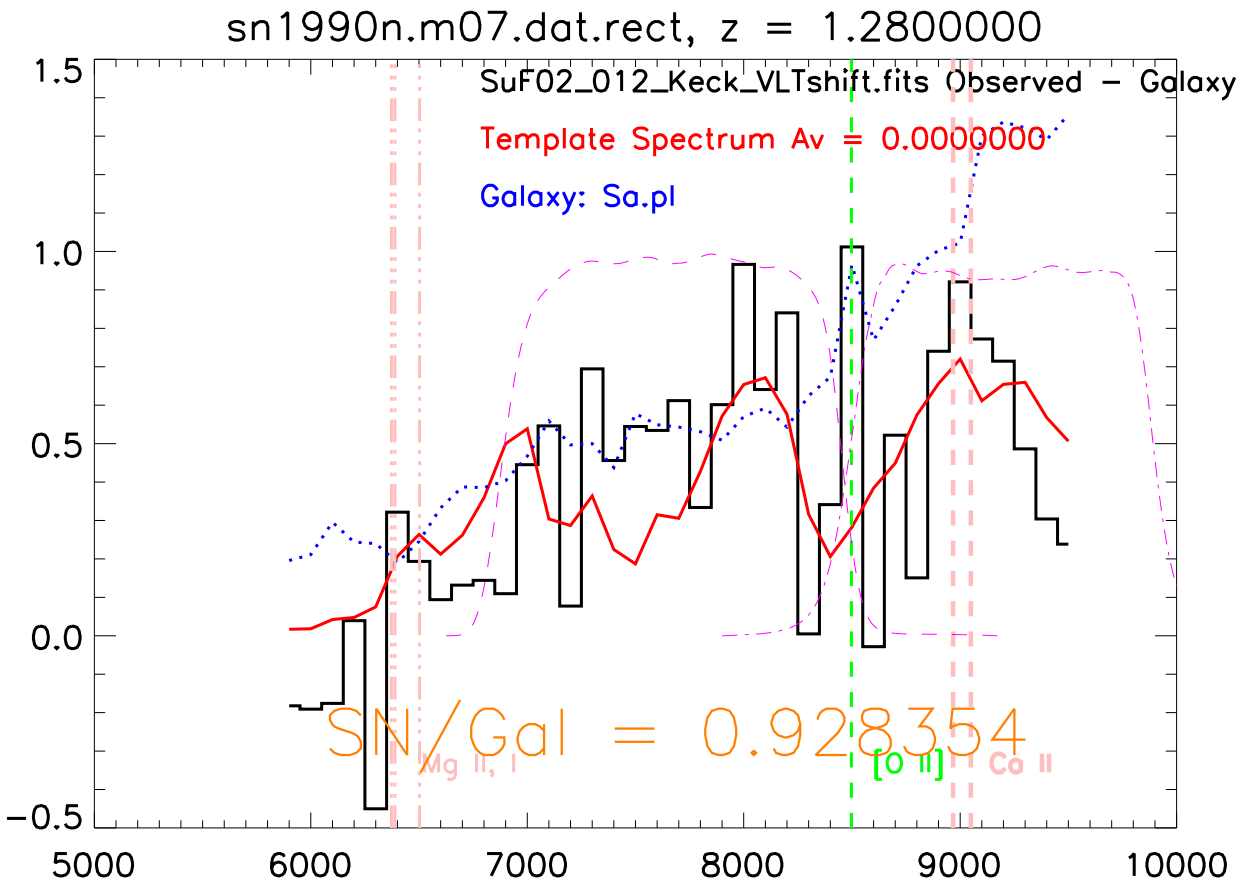


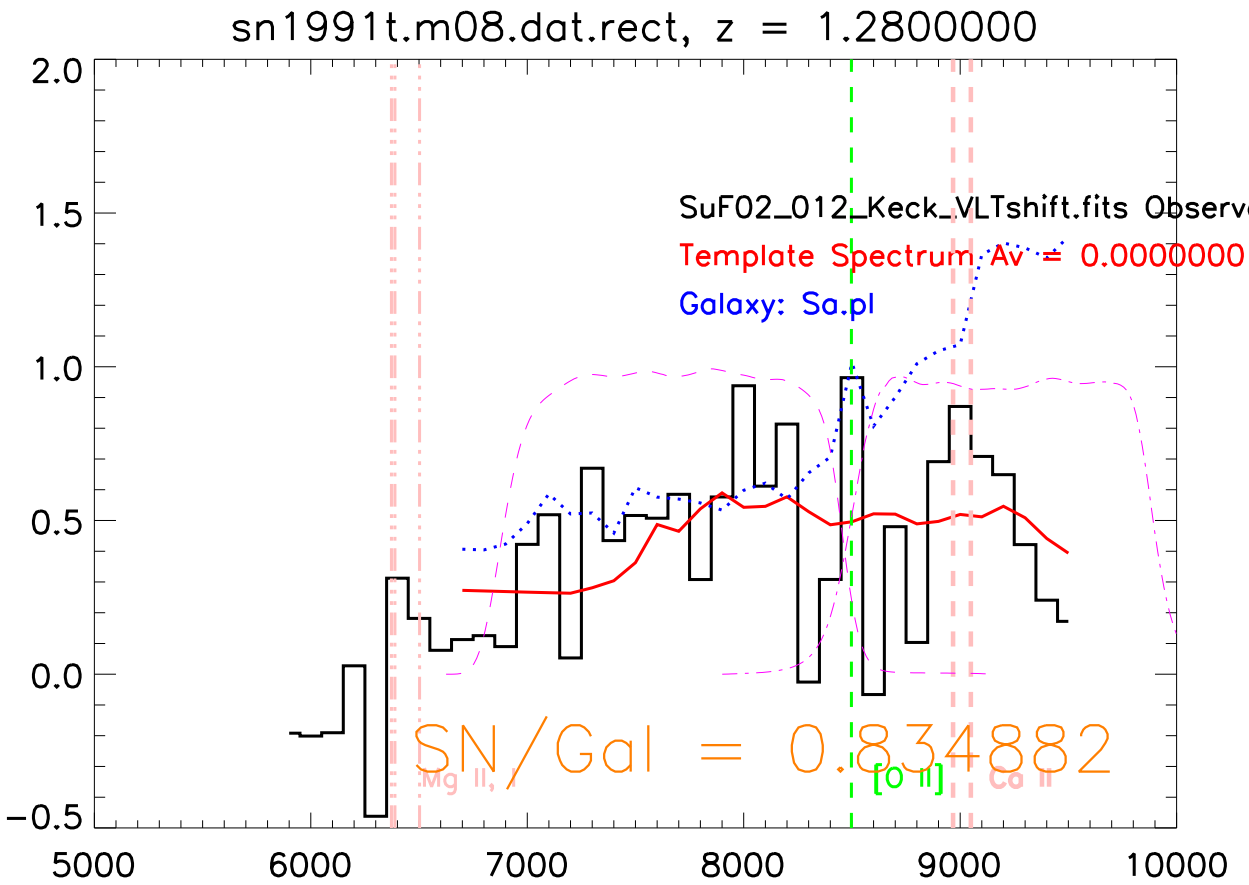
1.6
1.4
1.2
1.0
χ^2
40
20
0
−20
Days
0.5
1.0
1.5
2.0
Δm15

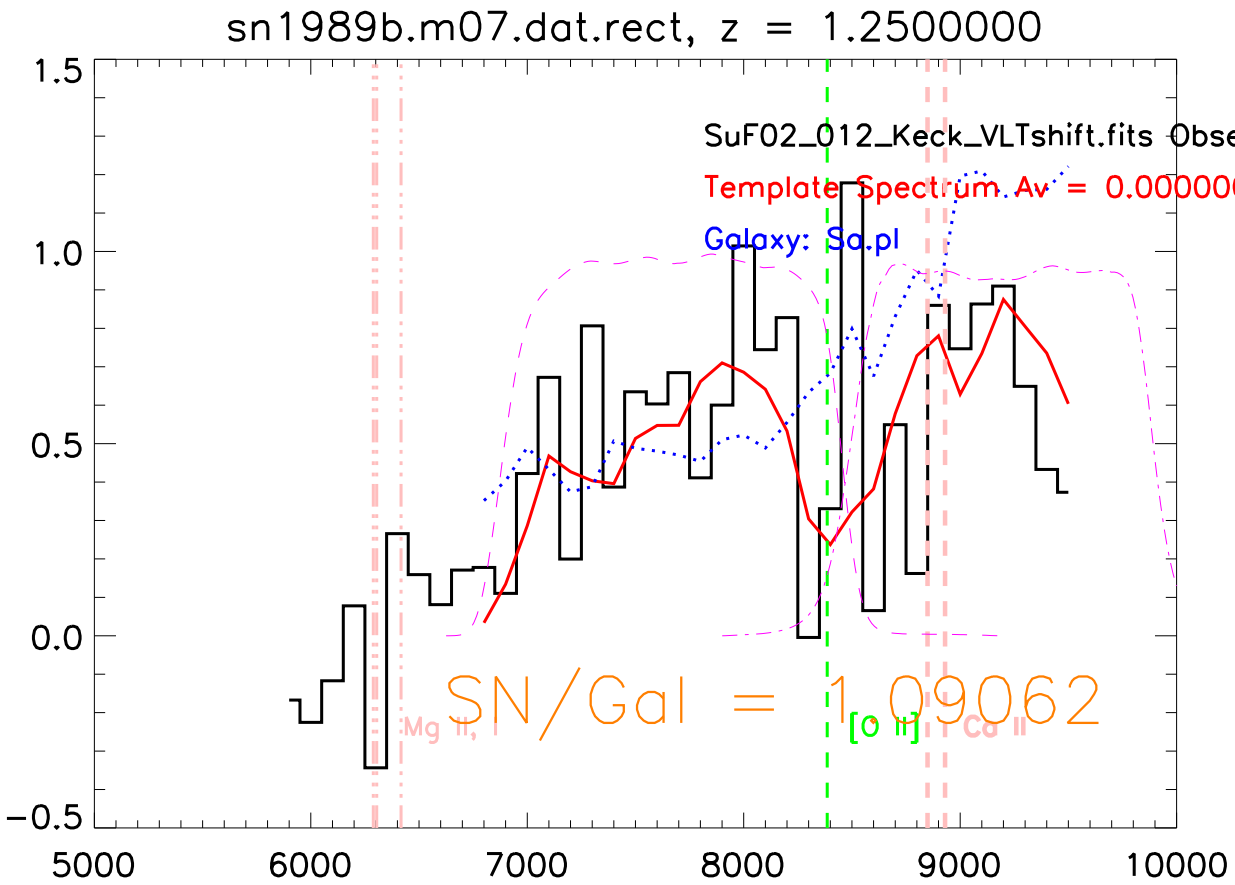

SuF02_012_Keck_VLTshift.fits
sn1991t:m00:dat:rect
sn1990n:m14:dat:rect
X^2
z
0
2
4
6
8
10
12
0.4
0.6
0.8
1.0
1.2
1.4
1.6
1.8

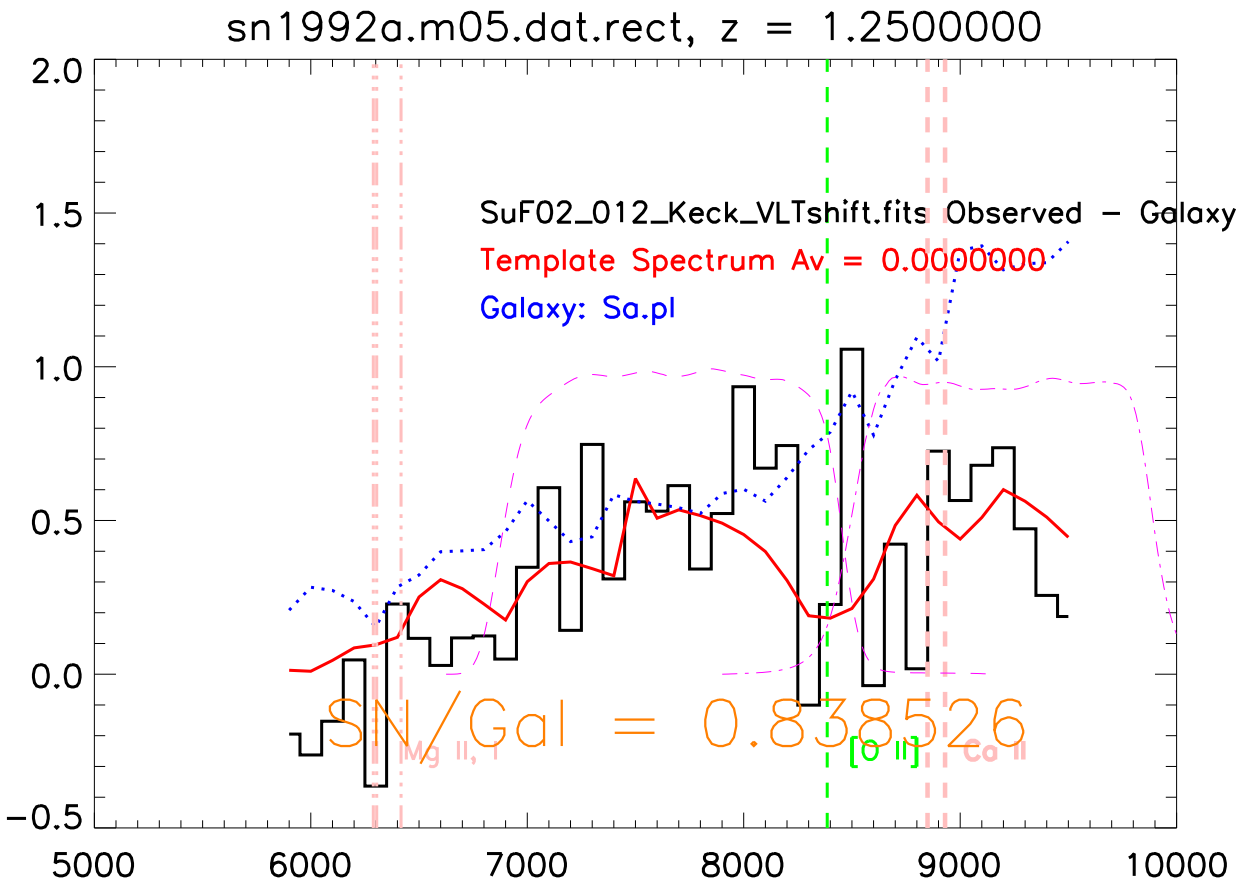

SuF02_012_Keck_VLTshift.fits----sn1991t.m00.dat.rec
sn1991t.m00.dat.red
2.5
2.0
1.5
1.0
0.5
0.0
−0.5
5000
6000
7000
8000
9000
10000
Mg II, I
[O II]
Ca II

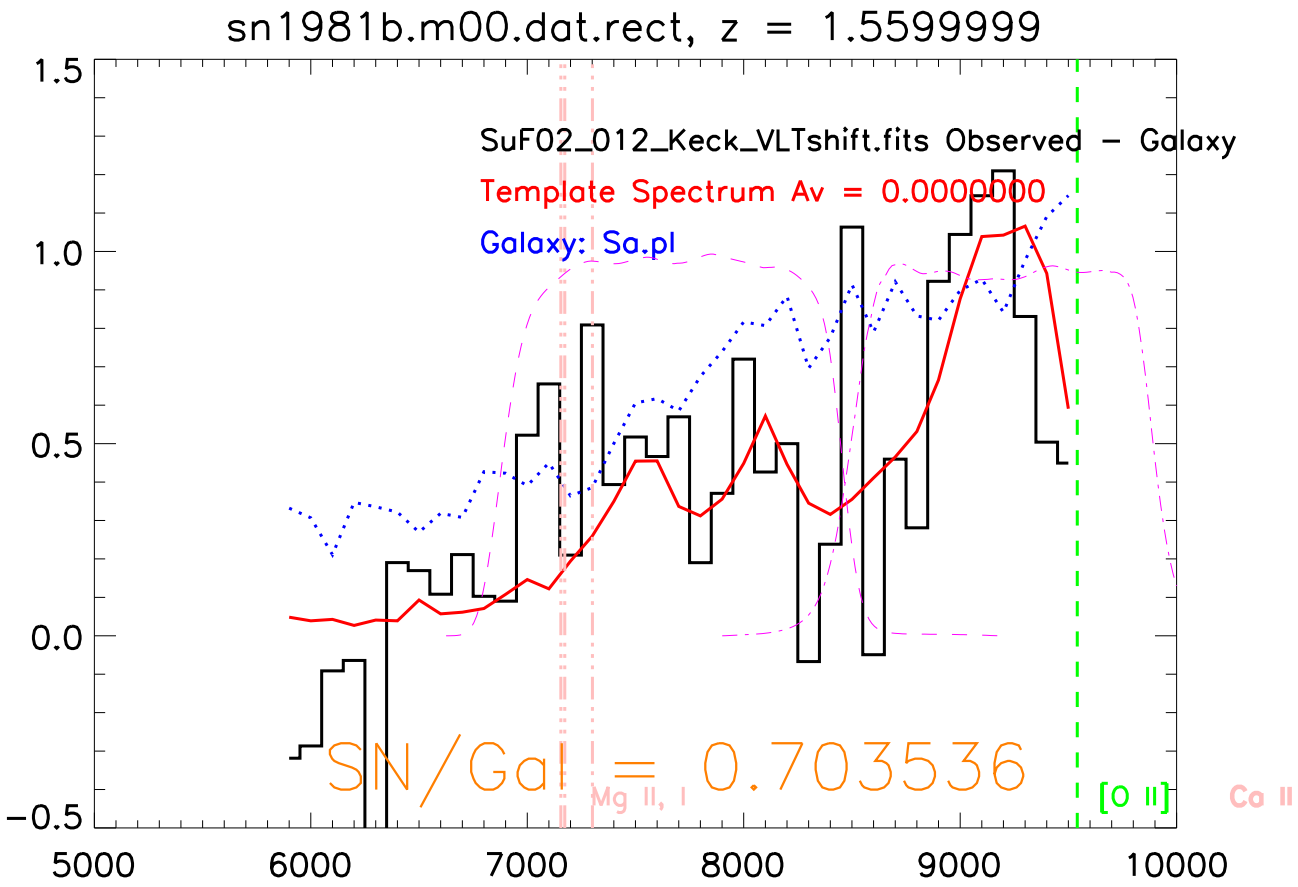

sn1991t.m00.dat.rect, z = 1.2500000
SuF02_012_Keck_VLTshift.fits Observed – Galaxy
Template Spectrum Av = 0.0000000
Galaxy: Sa.pl
SN/Gal = 1.25519
[O II]
1.5
1.0
0.5
0.0
−0.5
5000
6000
7000
8000
9000
10000

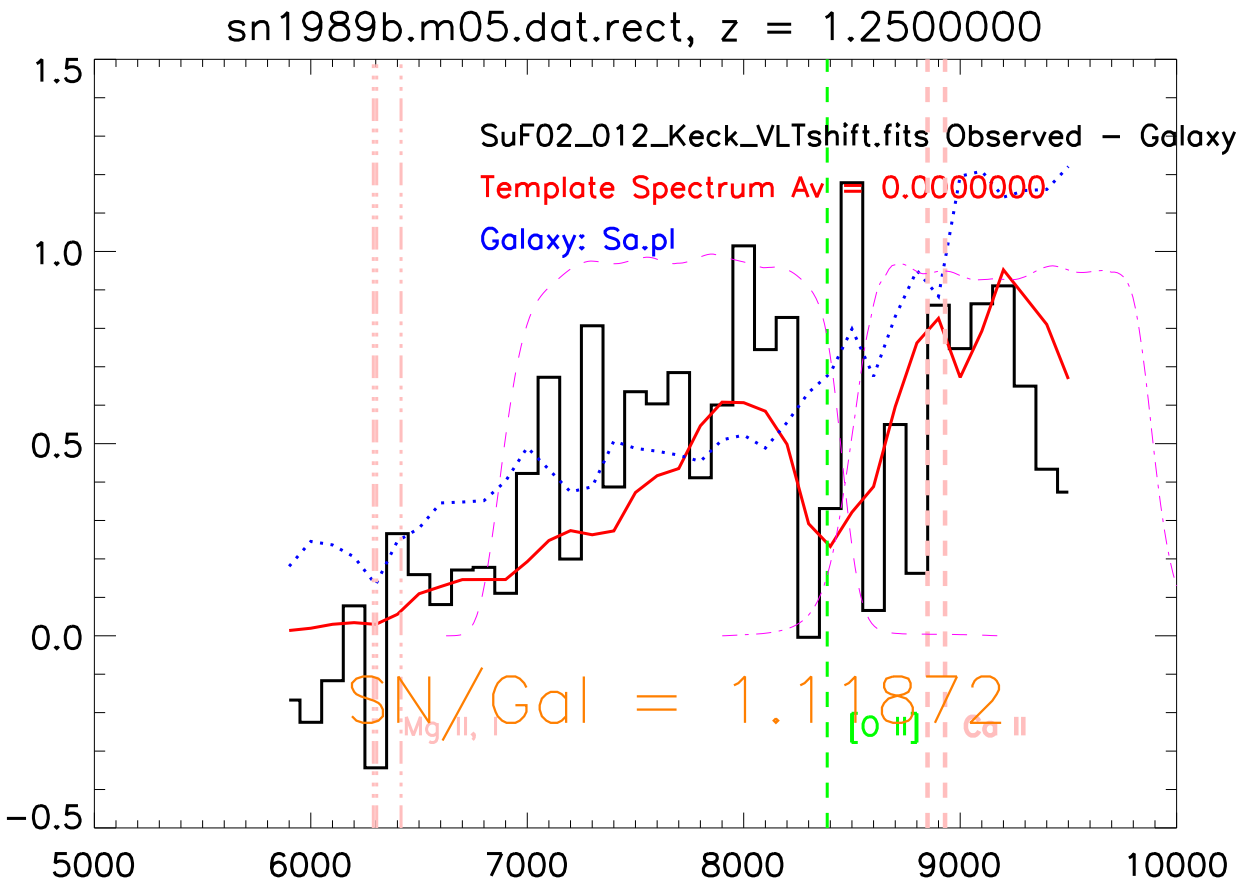

sn1990n.m07.dat.rect, z = 1.2800000
SuF02_012_Keck_VLTshift.fits Observed – Galaxy
Template Spectrum Av = 0.0000000
Galaxy: Sa.pl
SN/Gal = 0.928354
Mg II, I
[O II]
Ca II
1.5
1.0
0.5
0.0
−0.5
5000
6000
7000
8000
9000
10000

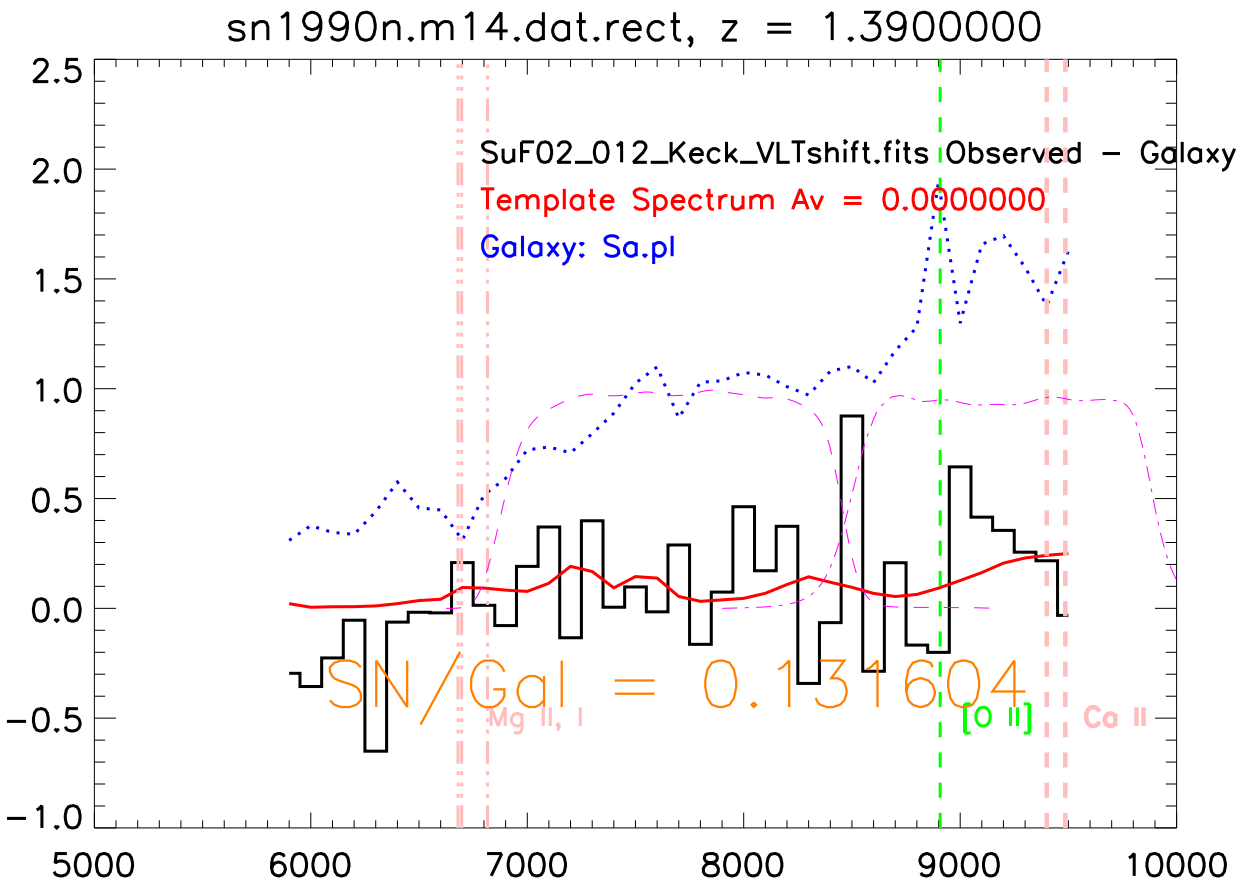

sn1991t.m08.dat.rect, z = 1.2800000
SuF02_012_Keck_VLTshift.fits Observed – Gal
Template Spectrum Av = 0.0000000
Galaxy: Sa.pl
SN/Gal = 0.834882
[O II]
Ca II
2.0
1.5
1.0
0.5
0.0
−0.5
5000
6000
7000
8000
9000
10000

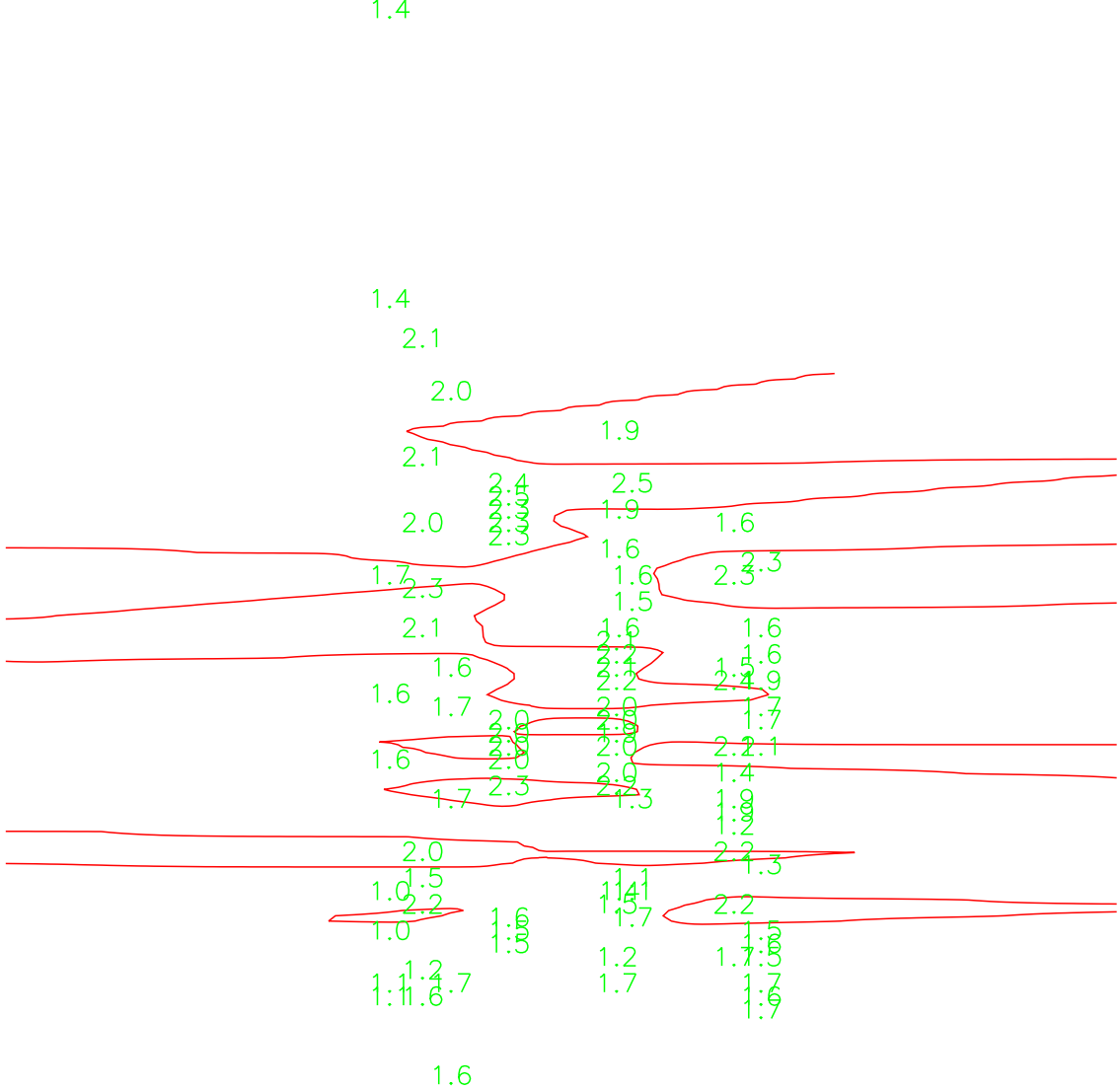

sn1989b.m07.dat.rect, z = 1.2500000
SuF02_012_Keck_VLTshift.fits Observed – G
Template Spectrum Av = 0.0000000
Galaxy: Sa.pl
SN/Gal = 1.09062
Mg II,
[O II]
Ca II
1.5
1.0
0.5
0.0
−0.5
5000
6000
7000
8000
9000
10000

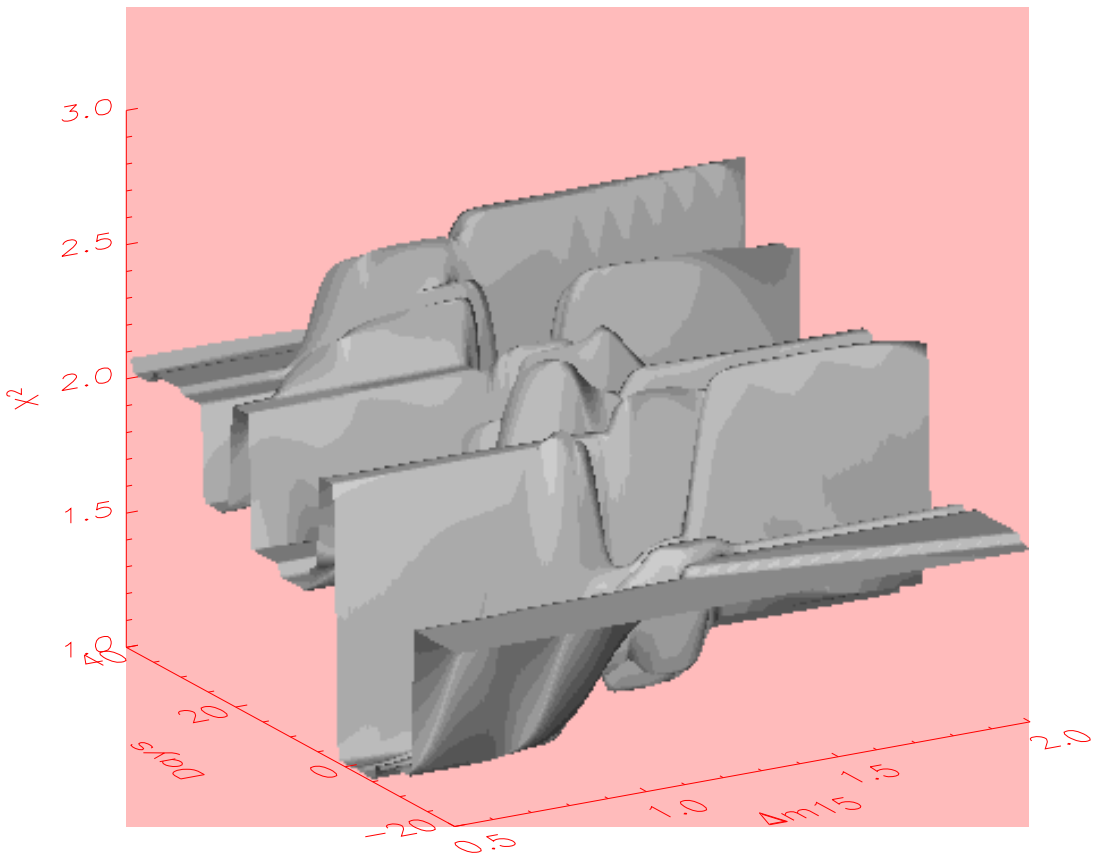

sn1992a.m05.dat.rect, z = 1.2500000
SuF02_012_Keck_VLTshift.fits Observed − Galaxy
Template Spectrum Av = 0.0000000
Galaxy: Sa.pl
SN/Gal = 0.838526
Mg II, 1
[O II]
Ca II
2.0
1.5
1.0
0.5
0.0
−0.5
5000
6000
7000
8000
9000
10000


sn1981b.m00.dat.rect, z = 1.5599999
SuF02_012_Keck_VLTshift.fits Observed − Galaxy
Template Spectrum Av = 0.0000000
Galaxy: Sa.pl
SN/Gal = 0.703536
Mg II, I
[O II]
Ca II
1.5
1.0
0.5
0.0
−0.5
5000
6000
7000
8000
9000
10000

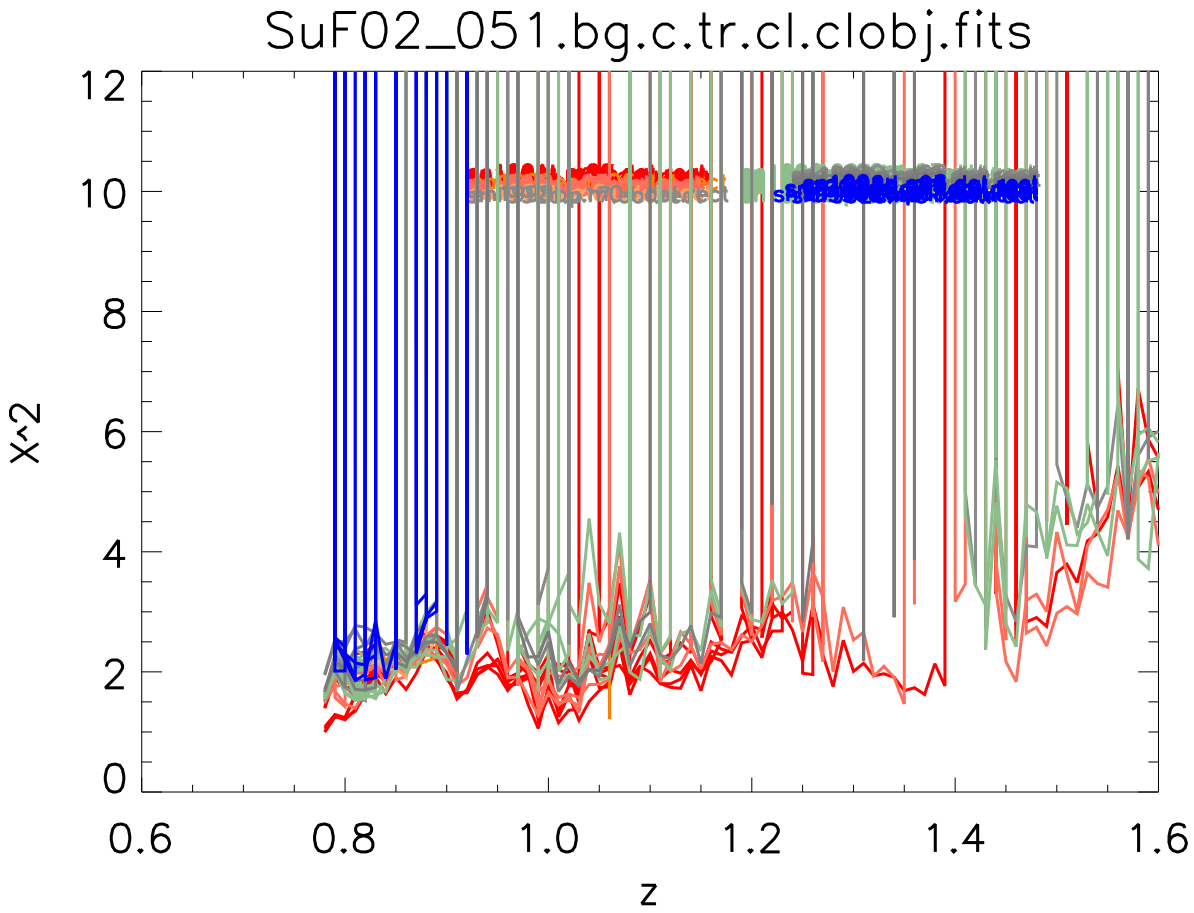

sn1989b.m05.dat.rect, z = 1.2500000
SuF02_012_Keck_VLTshift.fits Observed – Galaxy
Template Spectrum Av = 0.0000000
Galaxy: Sa.pl
SN/Gal = 1.11872
[O II]
1.5
1.0
0.5
0.0
−0.5
5000
6000
7000
8000
9000
10000

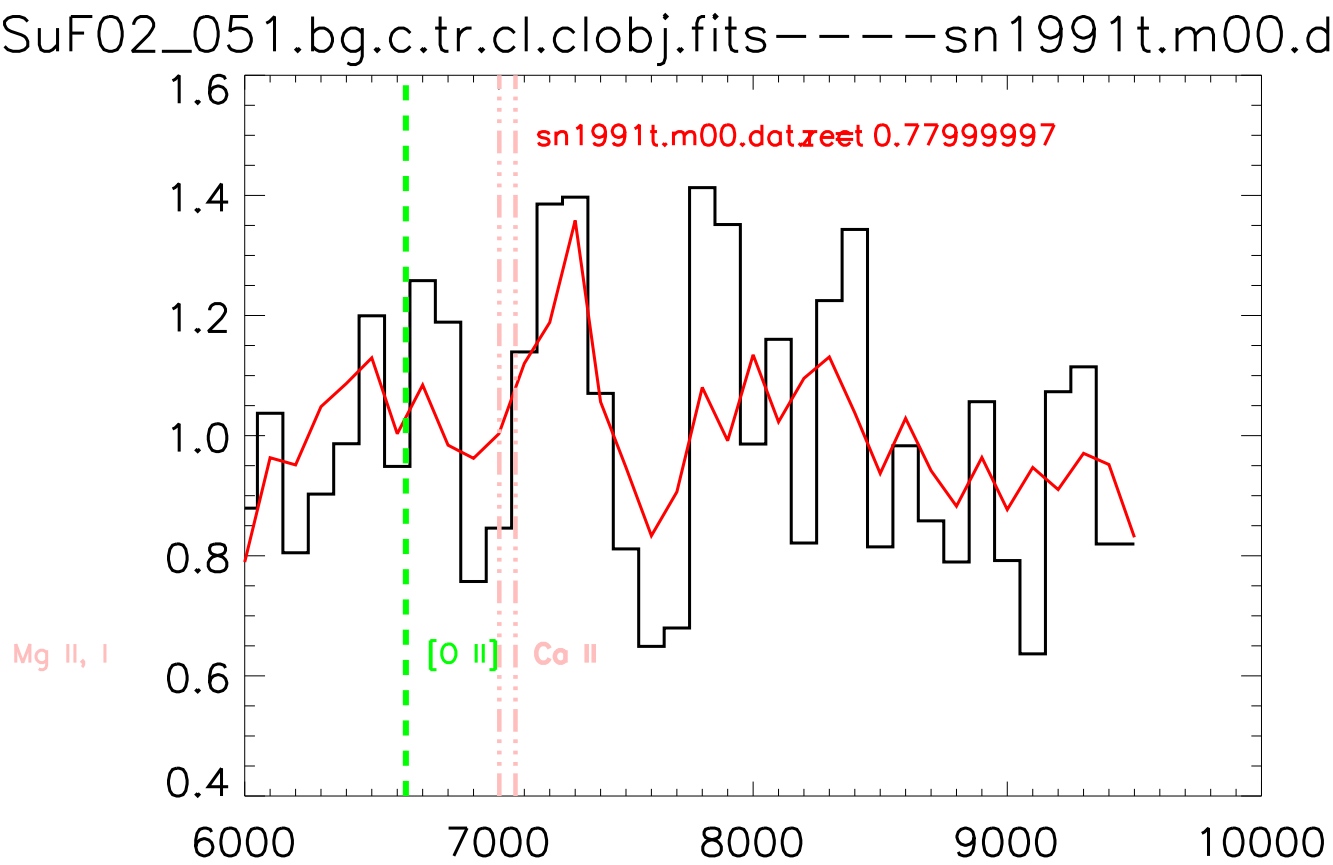

sn1990n.m14.dat.rect, z = 1.3900000
SuF02_012_Keck_VLTshift.fits Observed − Galaxy
Template Spectrum Av = 0.0000000
Galaxy: Sa.pl
SN/Gal = 0.131604
Mg II, I
[O II]
Ca II
2.5
2.0
1.5
1.0
0.5
0.0
−0.5
−1.0
5000
6000
7000
8000
9000
10000

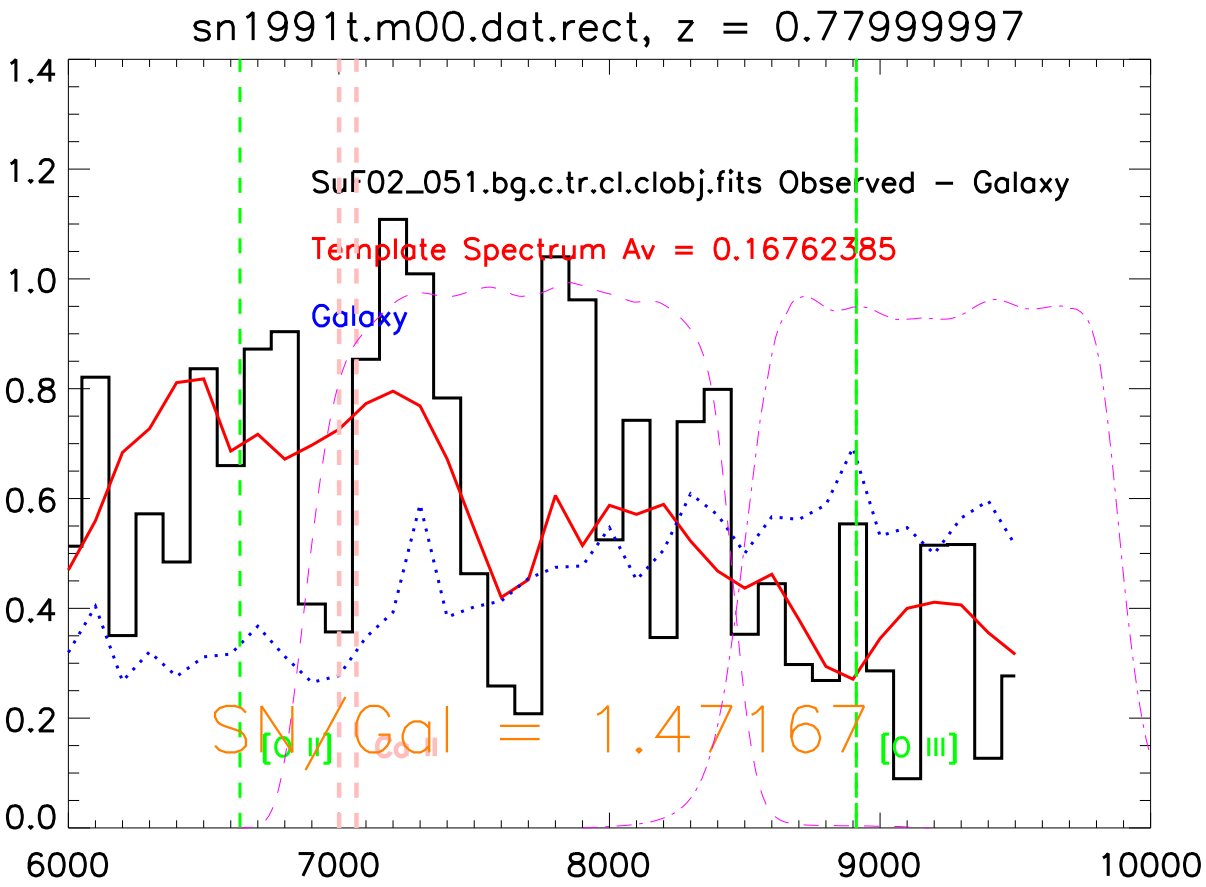




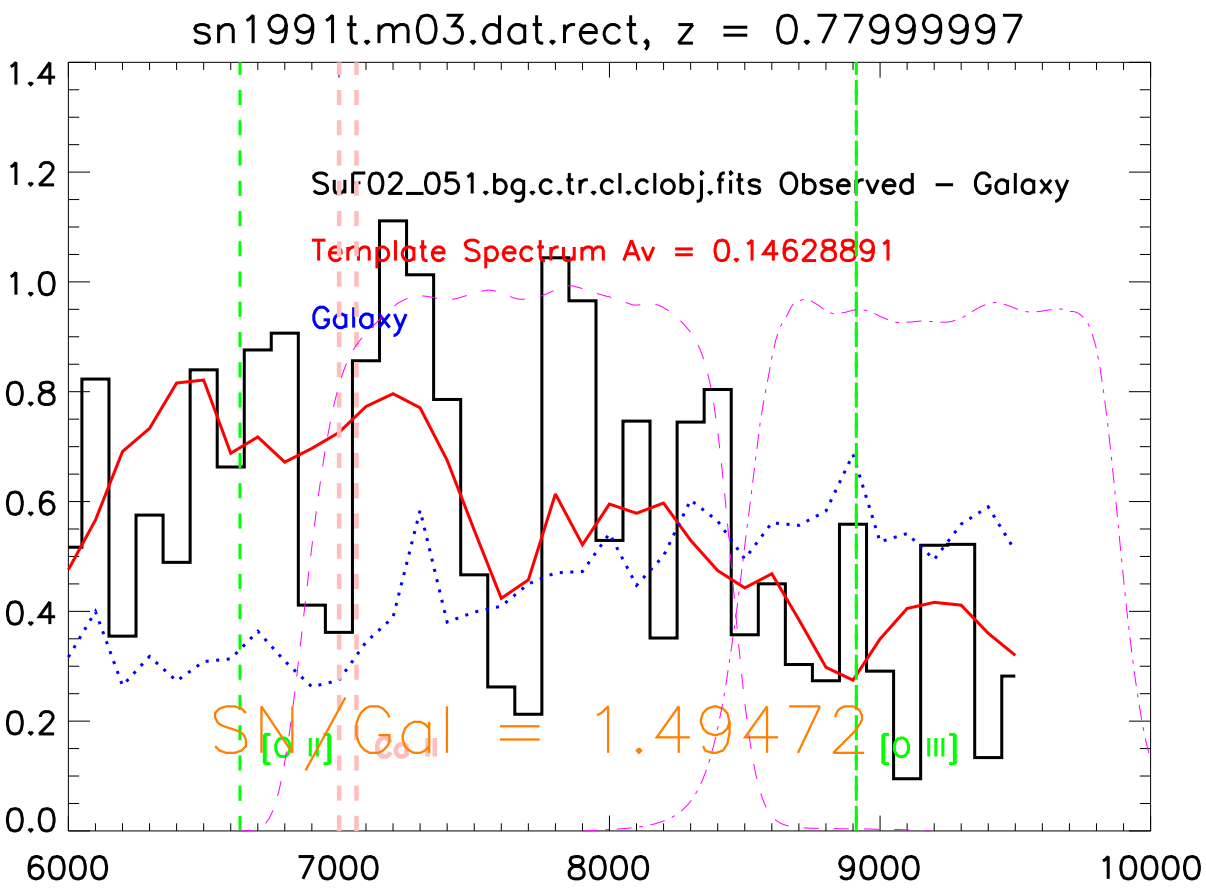
3.0
2.5
2.0
1.5
1.0
χ^2
40
20
0
−20
Days
0.5
1.0
1.5
2.0
Δm15


SuF02_051.bg.c.tr.cl.clobj.fits
X^2
z
0
2
4
6
8
10
12
0.6
0.8
1.0
1.2
1.4
1.6

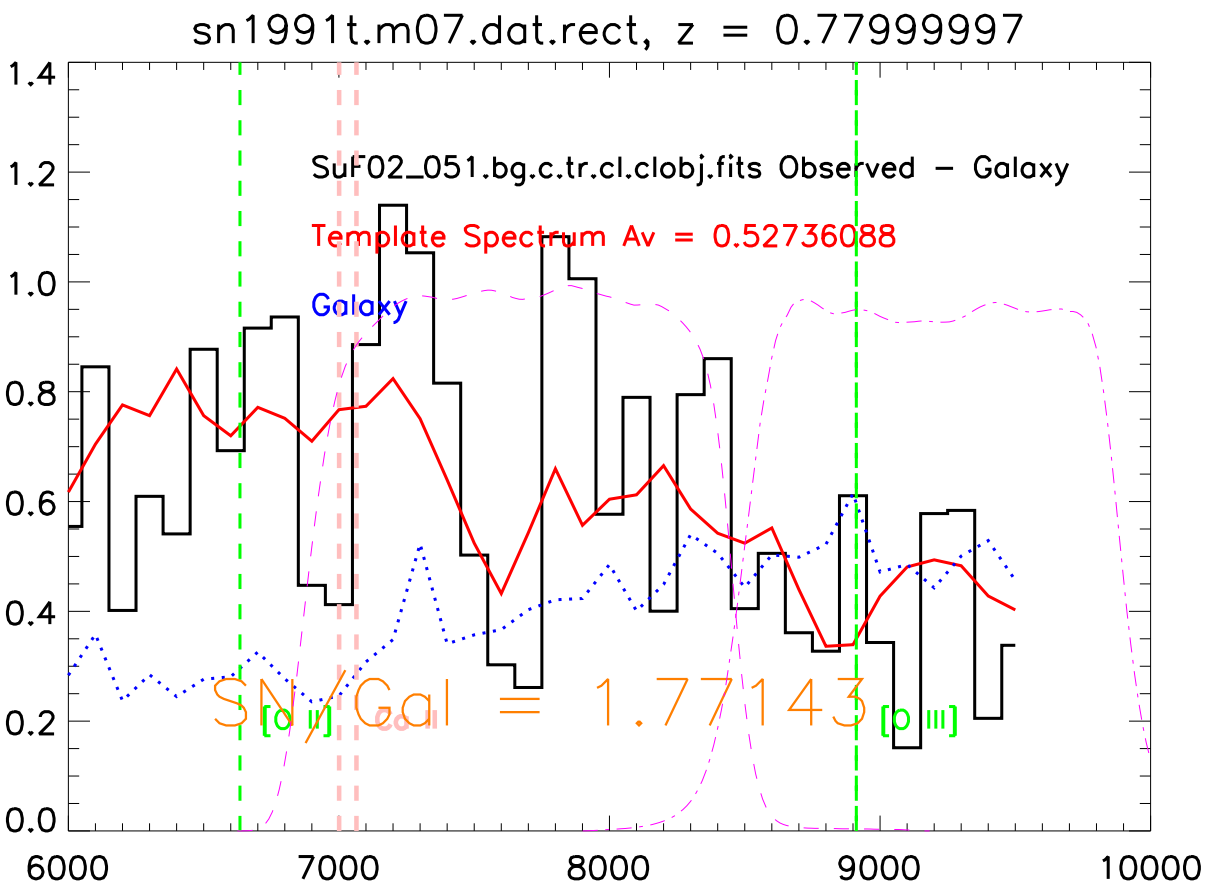

SuF02_051.bg.c.tr.cl.clobj.fits----sn1991t.m00.dat.rec
sn1991t.m00.dat.rec z= 0.77999997
Mg II, I
[O II]
Ca II
1.6
1.4
1.2
1.0
0.8
0.6
0.4
6000
7000
8000
9000
10000


sn1991t.m00.dat.rect, z = 0.77999997
SuF02_051.bg.c.tr.cl.clobj.fits Observed – Galaxy
Template Spectrum Av = 0.16762385
Galaxy
SN/Gal = 1.47167
[O II]
[O III]
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
6000
7000
8000
9000
10000

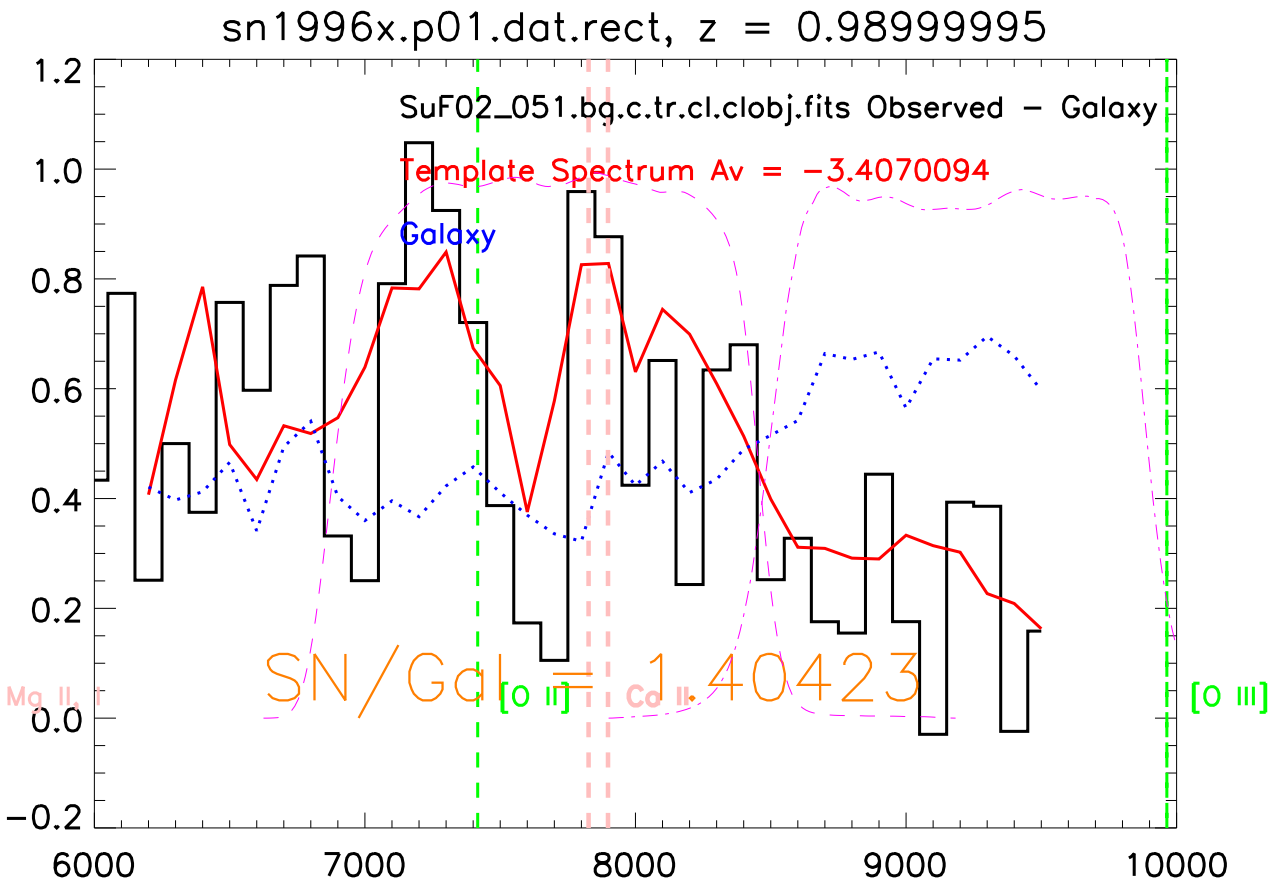
Mg II, I

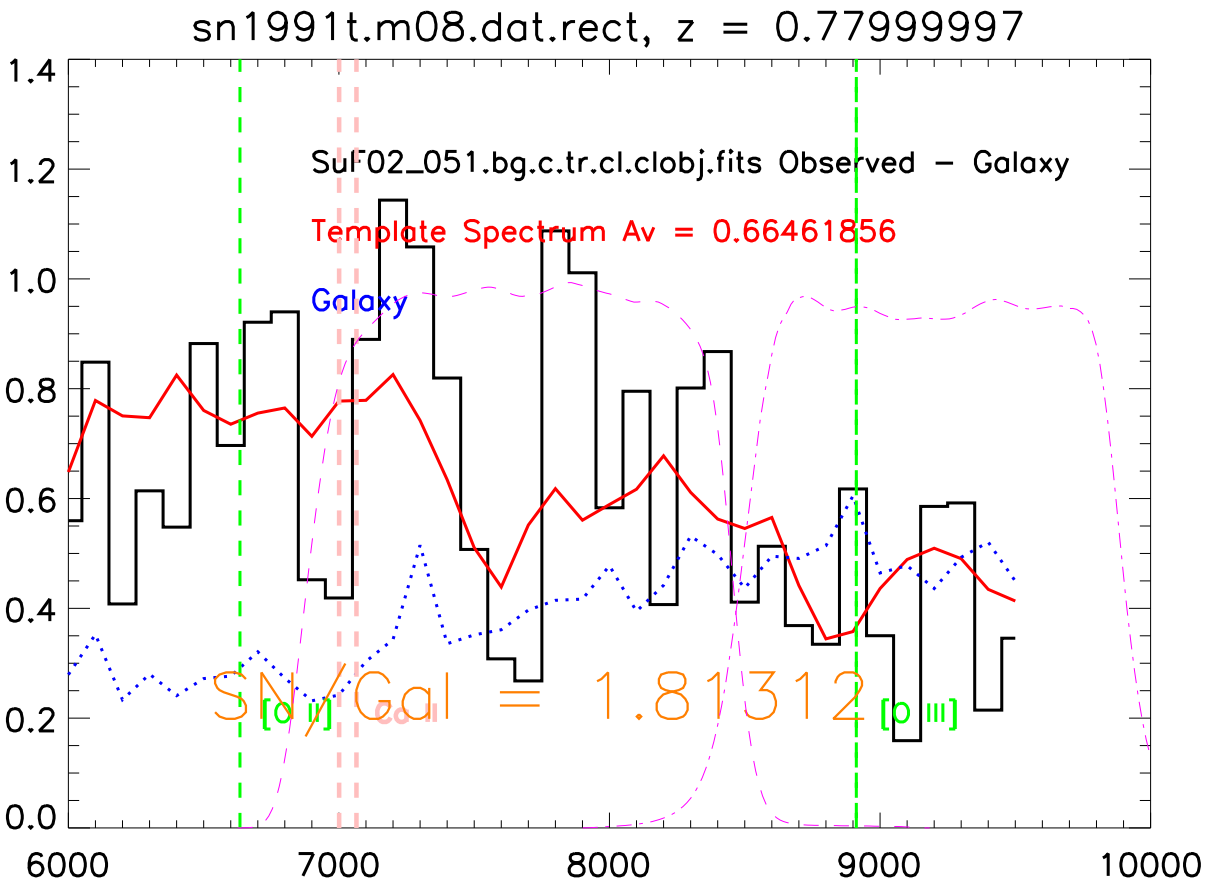

sn1991t.m03.dat.rect, z = 0.77999997
SuF02_051.bg.c.tr.cl.clobj.fits Observed – Galaxy
Template Spectrum Av = 0.14628891
Galaxy
SN/Gal = 1.49472
[O II]
[O III]
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
6000
7000
8000
9000
10000

Mg II, I

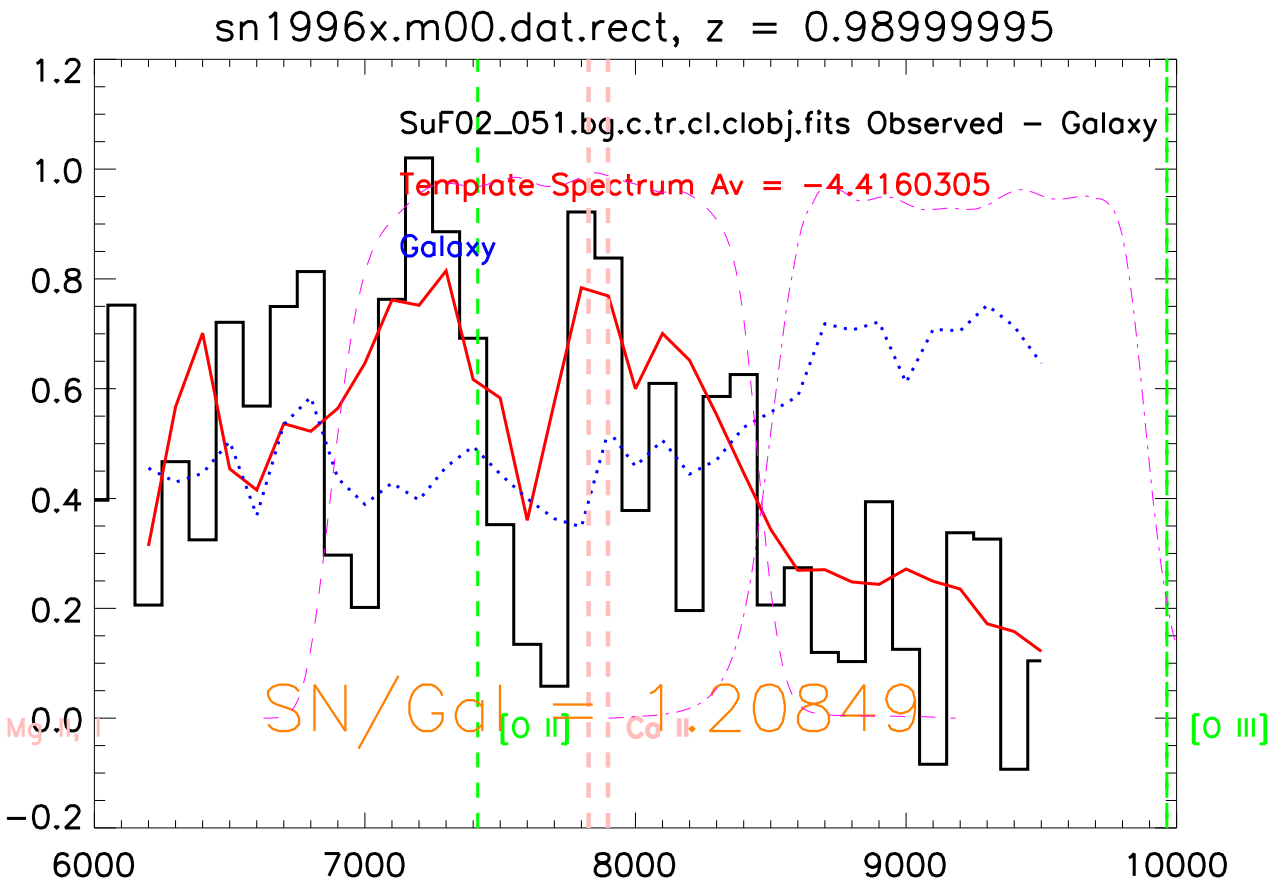

sn1991t.m07.dat.rect, z = 0.77999997
SuF02_051.bg.c.tr.cl.clobj.fits Observed – Galaxy
Template Spectrum Av = 0.52736088
Galaxy
SN/Gal = 1.77143
[O II]
[O III]
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
6000
7000
8000
9000
10000

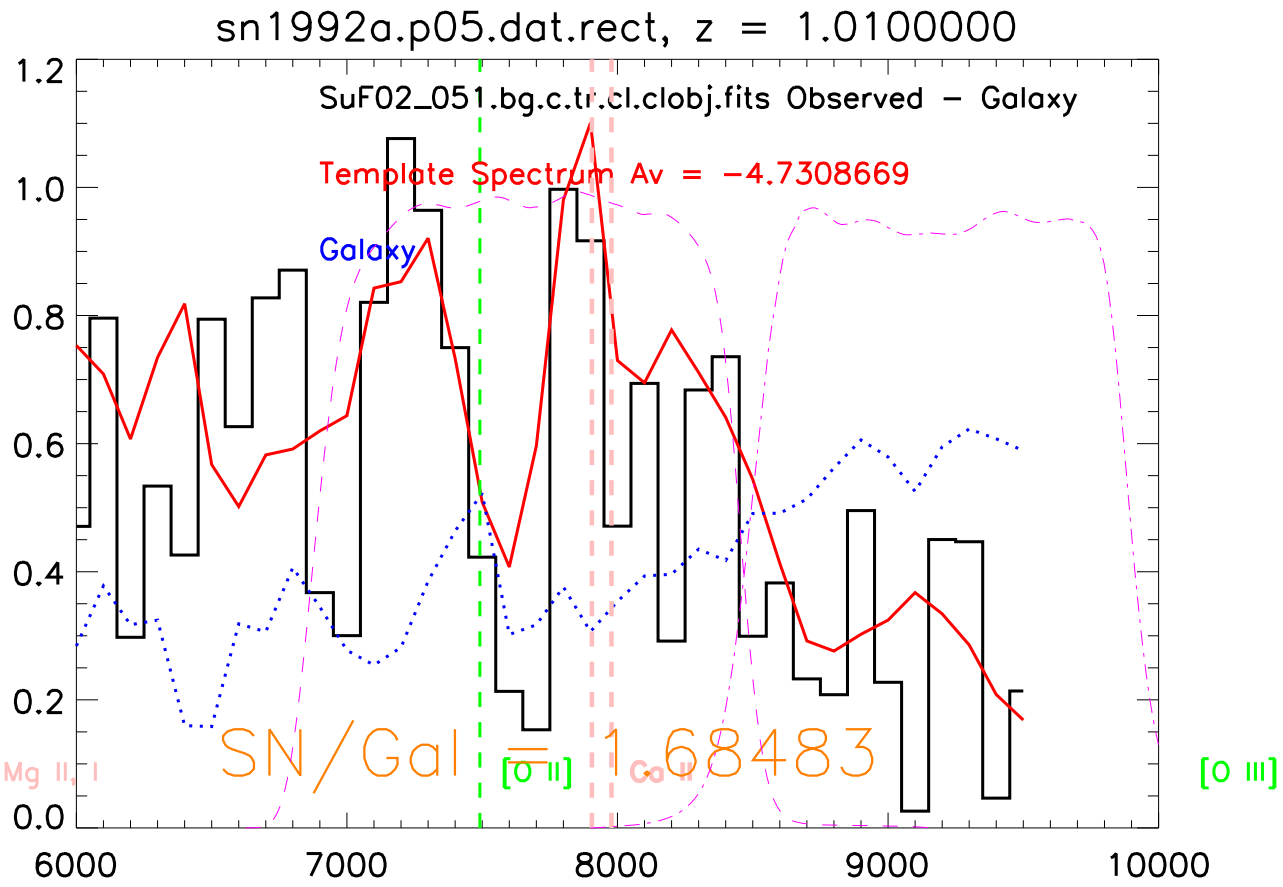
Mg II, I

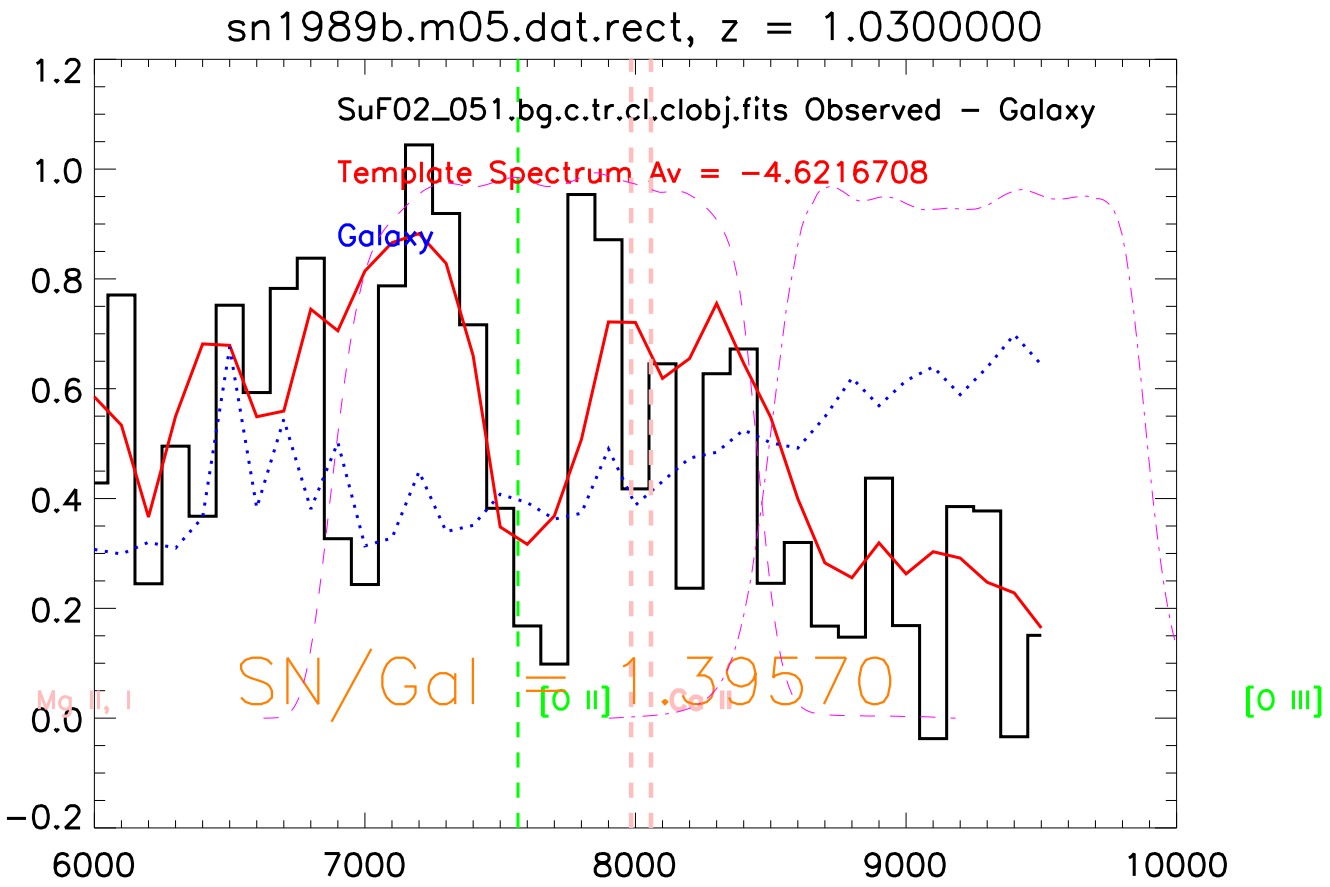

sn1996x.p01.dat.rect, z = 0.98999995
SuF02_051.bg.c.tr.cl.clobj.fits Observed − Galaxy
Template Spectrum Av = −3.4070094
Galaxy
SN/Gal = 1.40423
Mg II, T
[O II]
Ca II
[O III]
1.2
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
6000
7000
8000
9000
10000

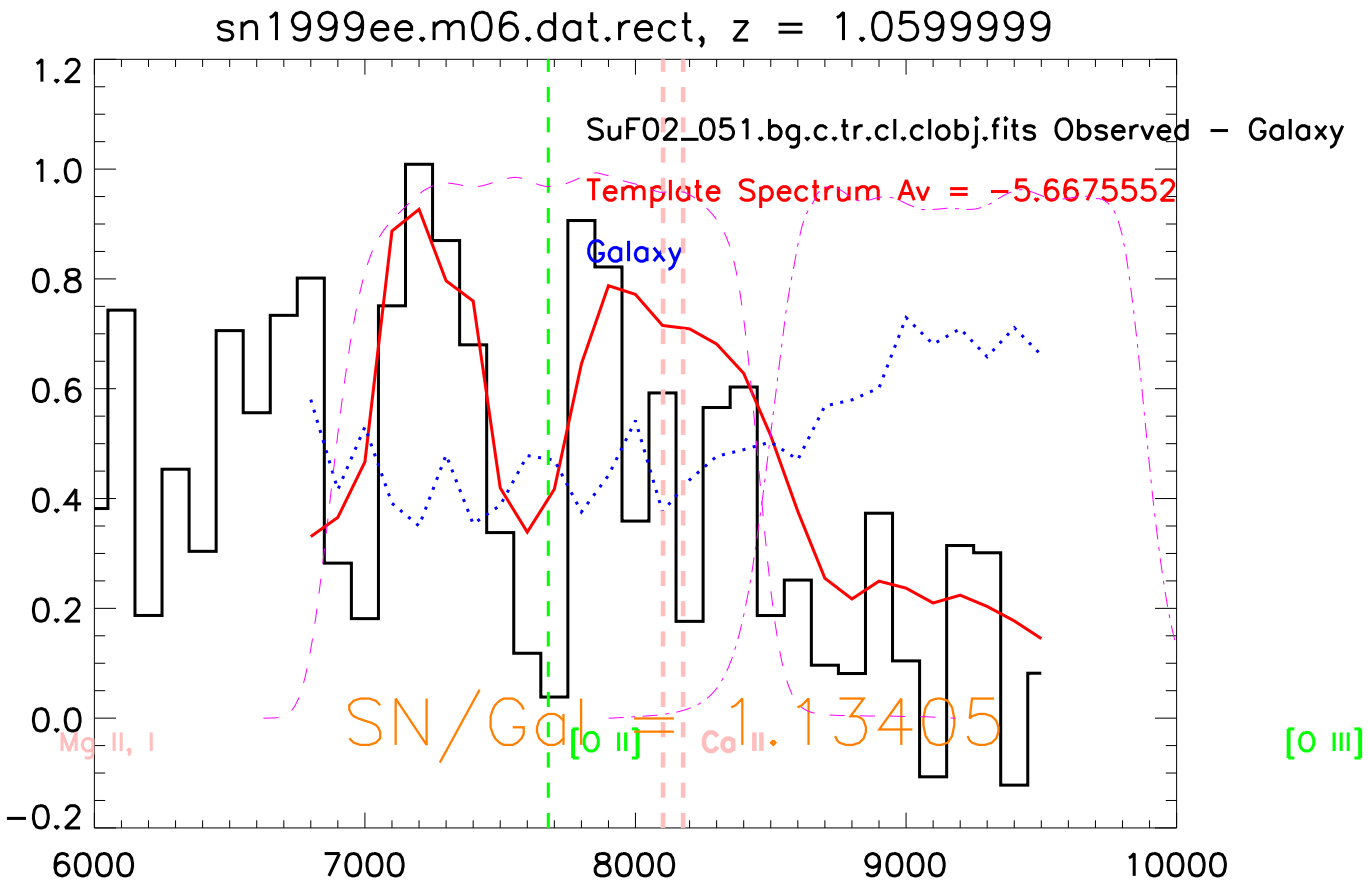

sn1991t.m08.dat.rect, z = 0.77999997
SuF02_051.bg.c.tr.cl.clobj.fits Observed – Galaxy
Template Spectrum Av = 0.66461856
Galaxy
SN/Gal = 1.81312
[O II]
Ca II
[O III]
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
6000
7000
8000
9000
10000

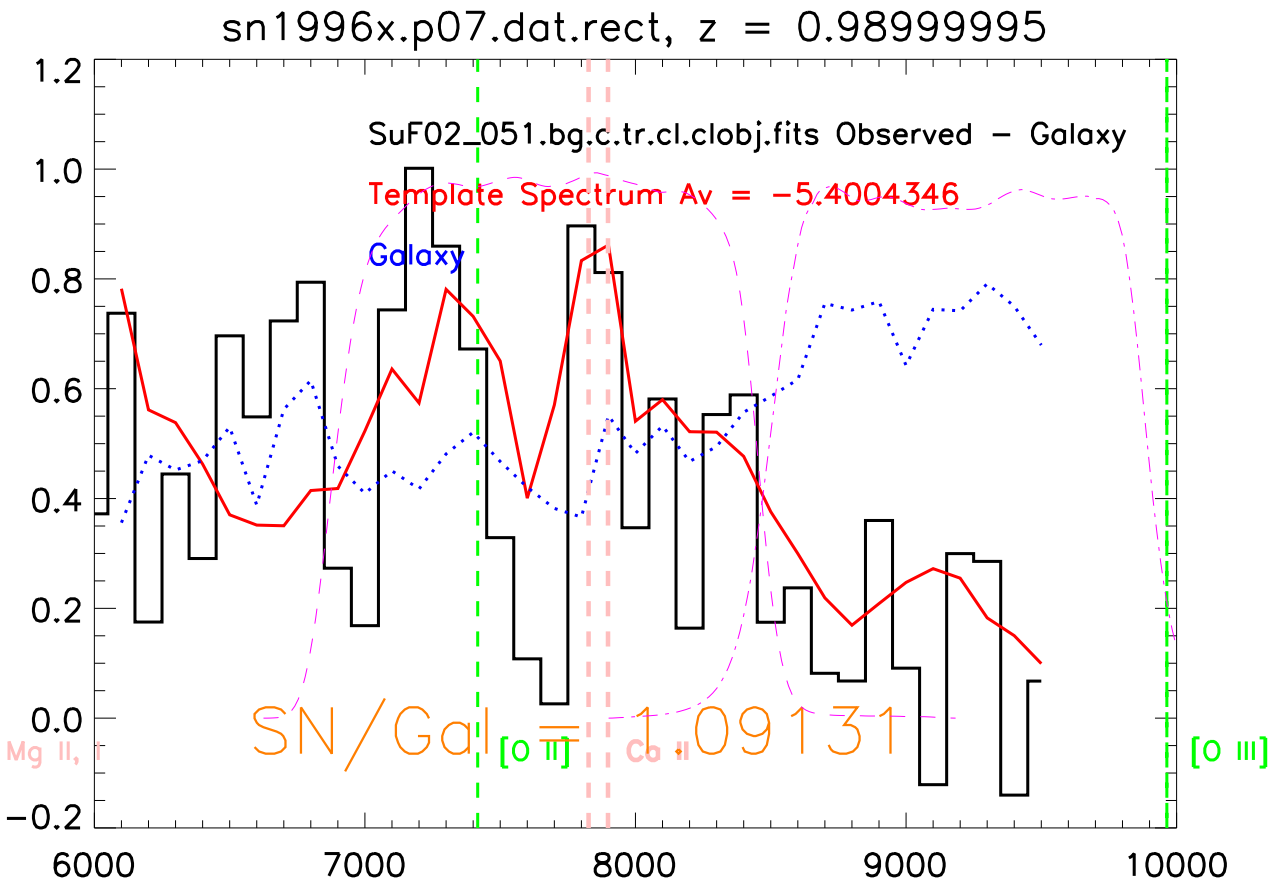
Mg II, I

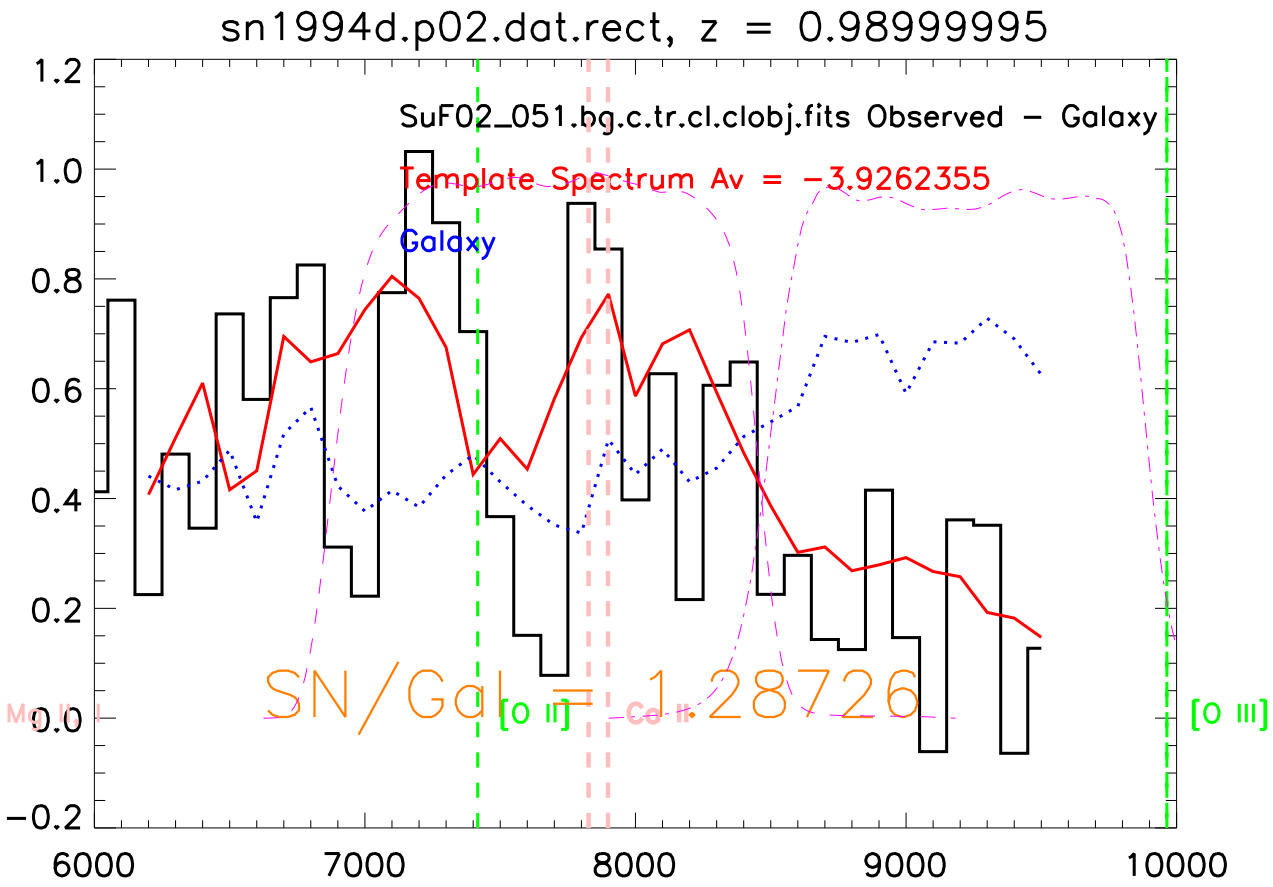

sn1996x.m00.dat.rect, z = 0.98999995
SuF02_051.bg.c.tr.cl.clobj.fits Observed − Galaxy
Template Spectrum Av = −4.4160305
Galaxy
SN/Gal = 1.20849
[O II]
Ca II
[O III]
1.2
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
6000
7000
8000
9000
10000

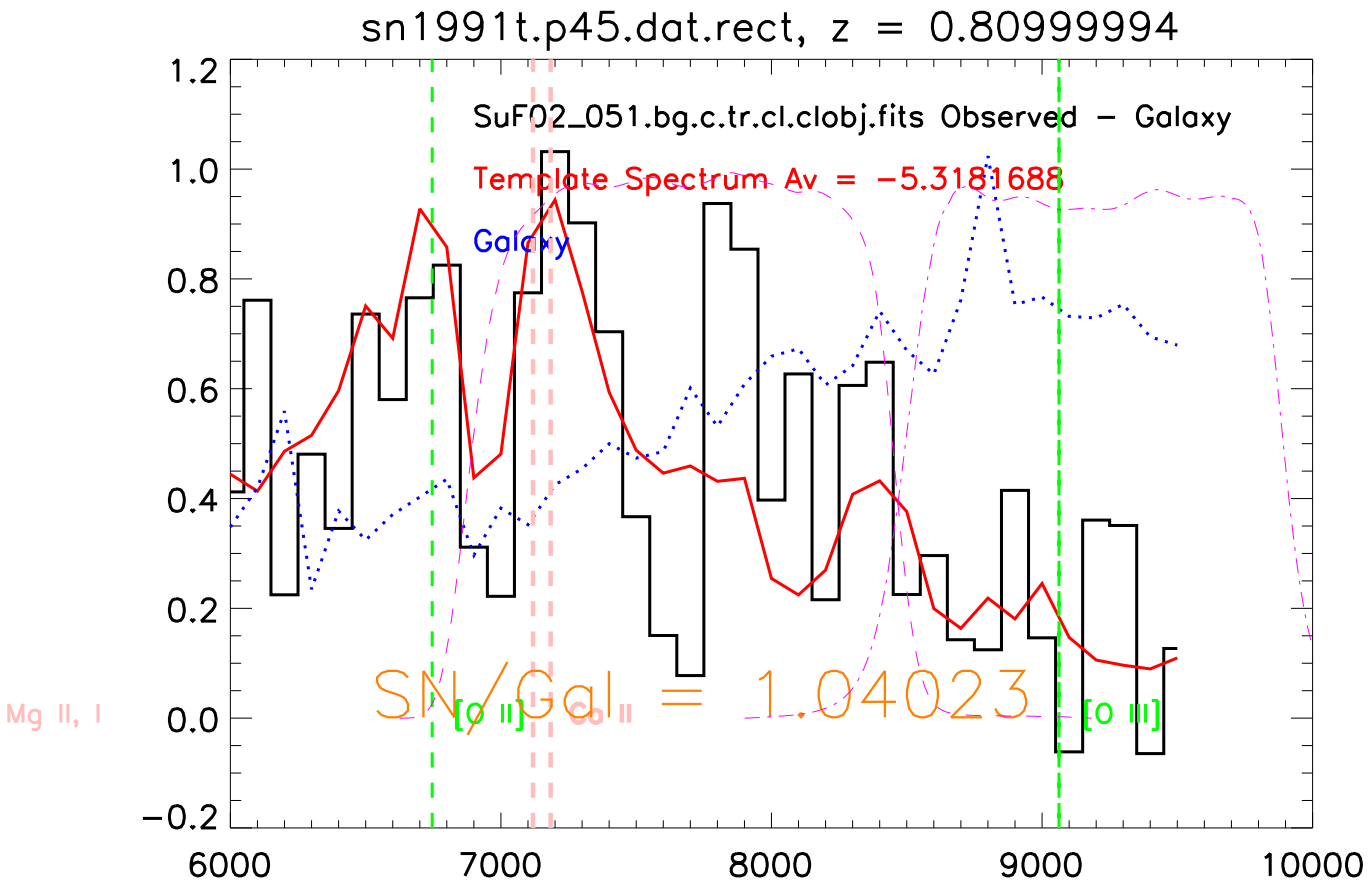

sn1992a.p05.dat.rect, z = 1.0100000
SuF02_051.bg.c.tr.cl.clobj.fits Observed − Galaxy
Template Spectrum Av = −4.7308669
Galaxy
SN/Gal = 1.68483
Mg II, I
[O II]
Ca II
[O III]
1.2
1.0
0.8
0.6
0.4
0.2
0.0
6000
7000
8000
9000
10000

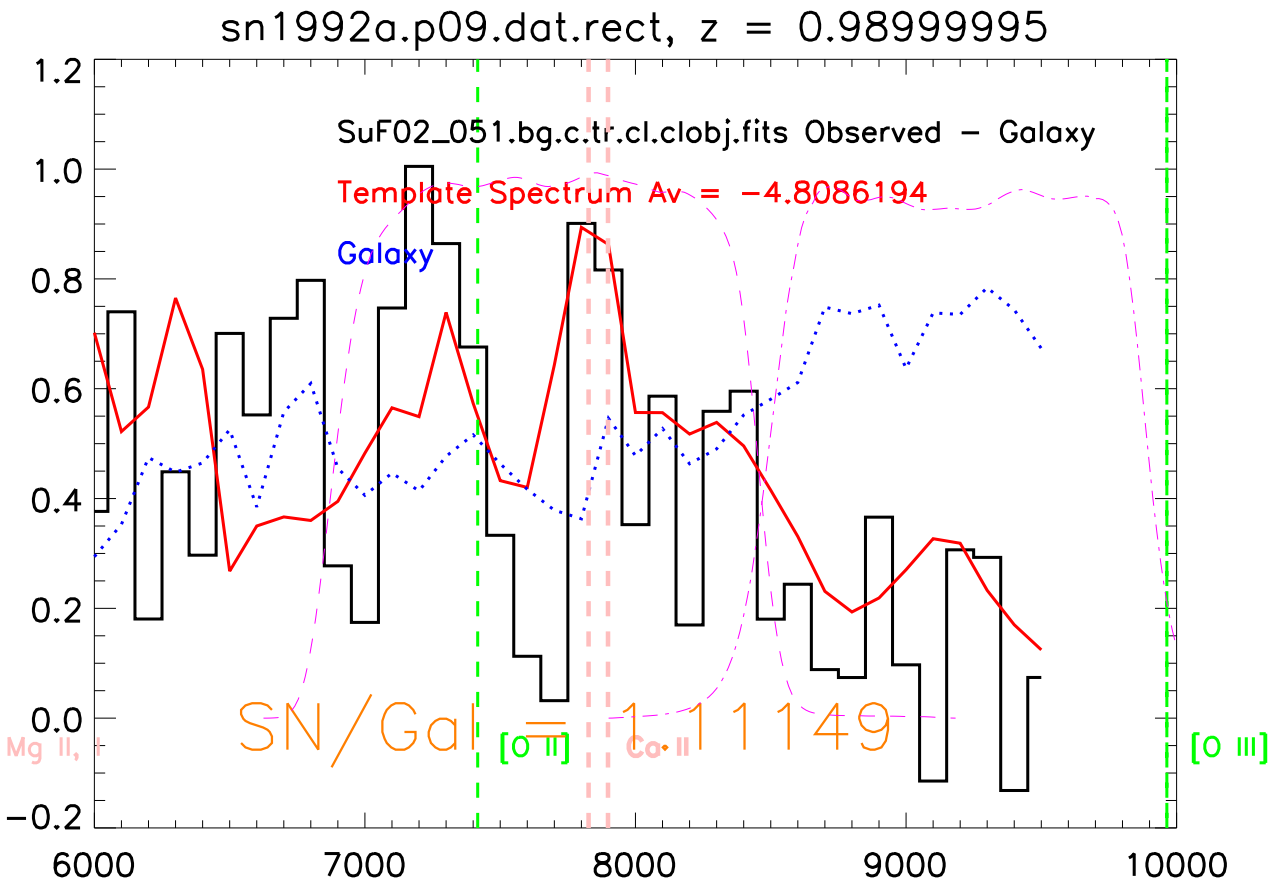

sn1989b.m05.dat.rect, z = 1.0300000
SuF02_051.bg.c.tr.cl.clobj.fits Observed – Galaxy
Template Spectrum Av = -4.6216708
Galaxy
SN/Gal = 1.39570
[O II]
[O III]
1.2
1.0
0.8
0.6
0.4
0.2
0.0
-0.2
6000
7000
8000
9000
10000

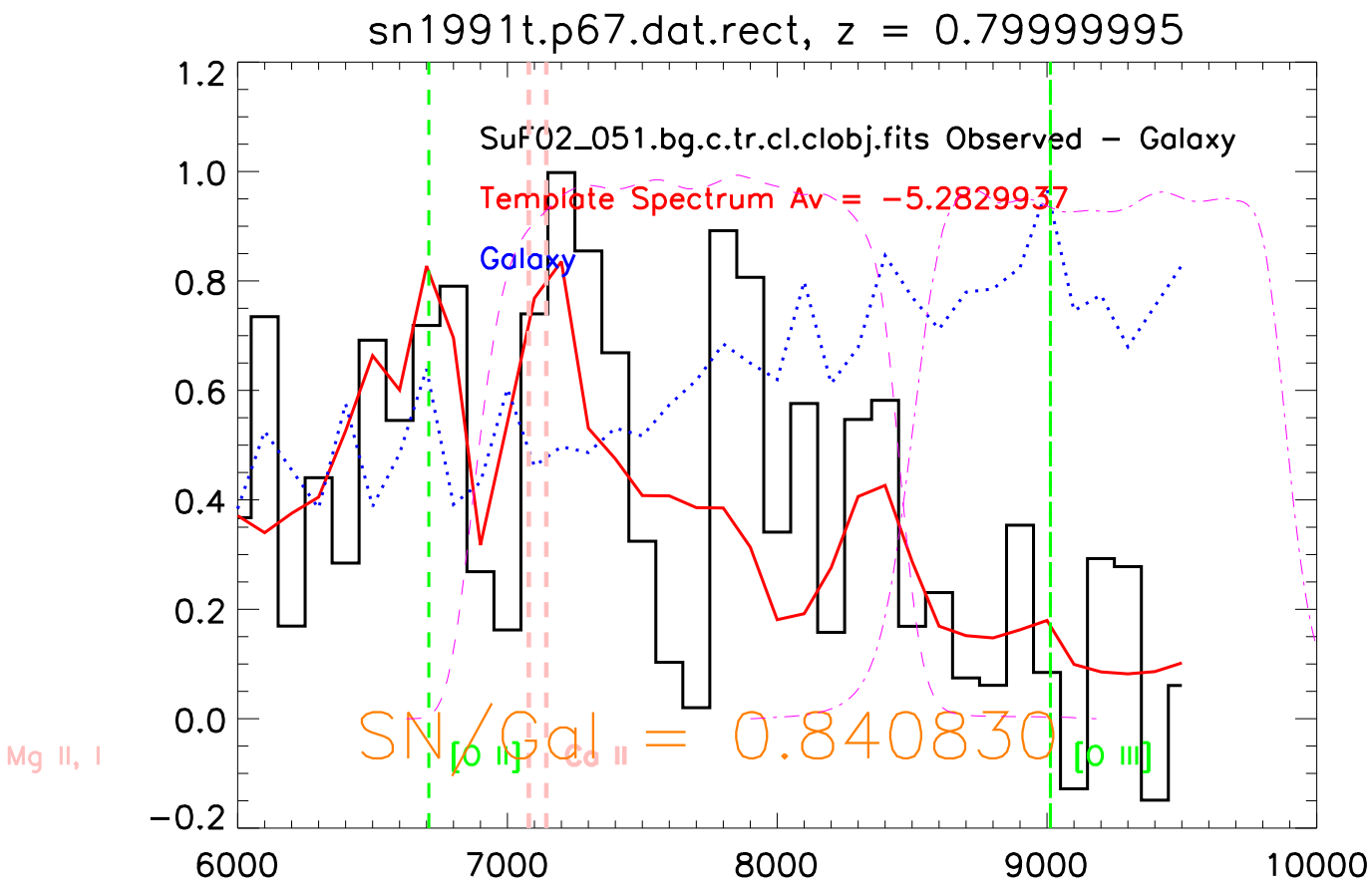

sn1999ee.m06.dat.rect, z = 1.0599999
SuF02_051.bg.c.tr.cl.clobj.fits Observed − Galaxy
Template Spectrum Av = −5.6675552
Galaxy
SN/Gal = 1.13405
Mg II, I
[O II]
Ca II
[O III]
1.2
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
6000
7000
8000
9000
10000

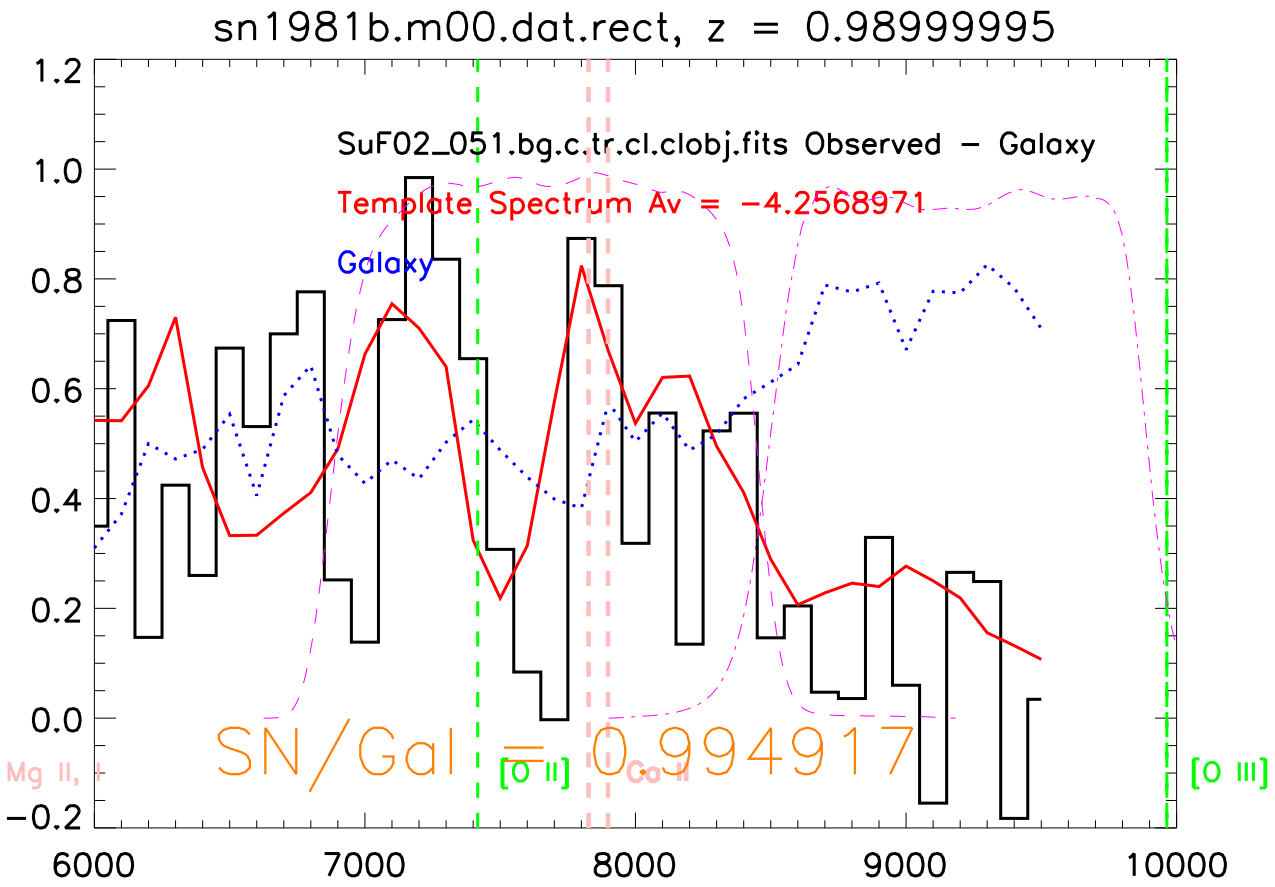

sn1996x.p07.dat.rect, z = 0.98999995
SuF02_051.bg.c.tr.cl.clobj.fits Observed − Galaxy
Template Spectrum Av = −5.4004346
Galaxy
SN/Gal = 1.09131
Mg II, f
[O II]
Ca II
[O III]
1.2
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
6000
7000
8000
9000
10000

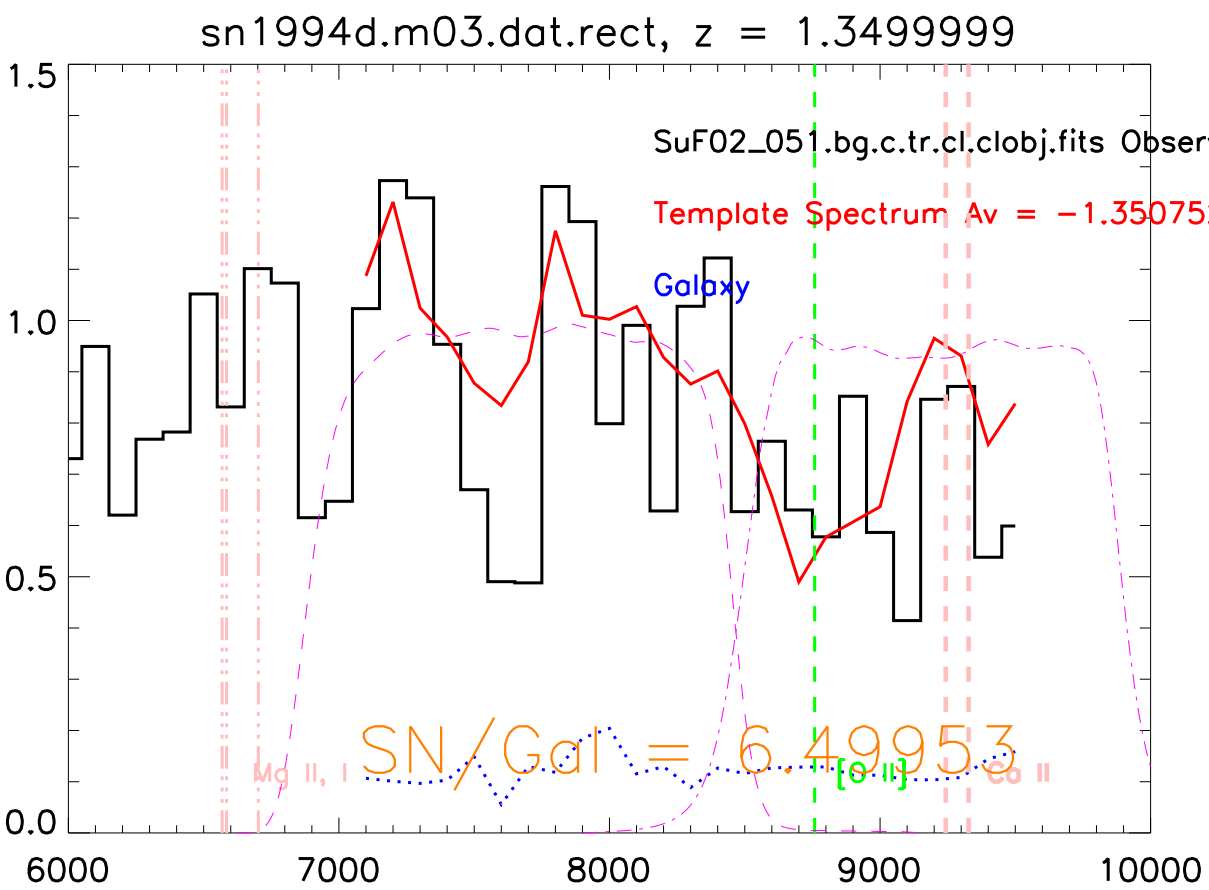

sn1994d.p02.dat.rect, z = 0.98999995
SuF02_051.bg.c.tr.cl.clobj.fits Observed − Galaxy
Template Spectrum Av = −3.9262355
Galaxy
SN/Gal = 1.28726
[O II]
[O III]
1.2
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
6000
7000
8000
9000
10000

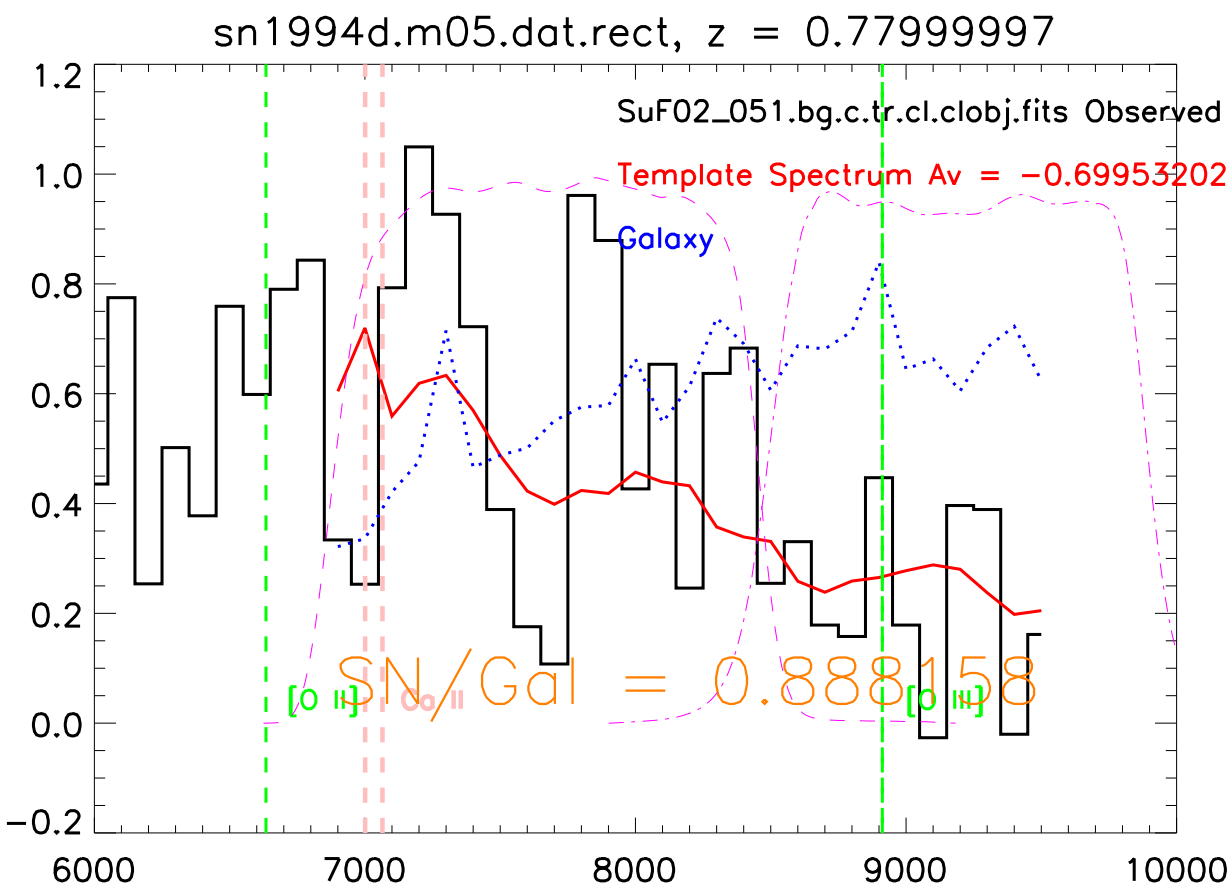

sn1991t.p45.dat.rect, z = 0.80999994
SuF02_051.bg.c.tr.cl.clobj.fits Observed − Galaxy
Template Spectrum Av = −5.3181688
Galaxy
SN/Gal = 1.04023
Mg II, I
[O II]
Ca II
[O III]
1.2
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
6000
7000
8000
9000
10000

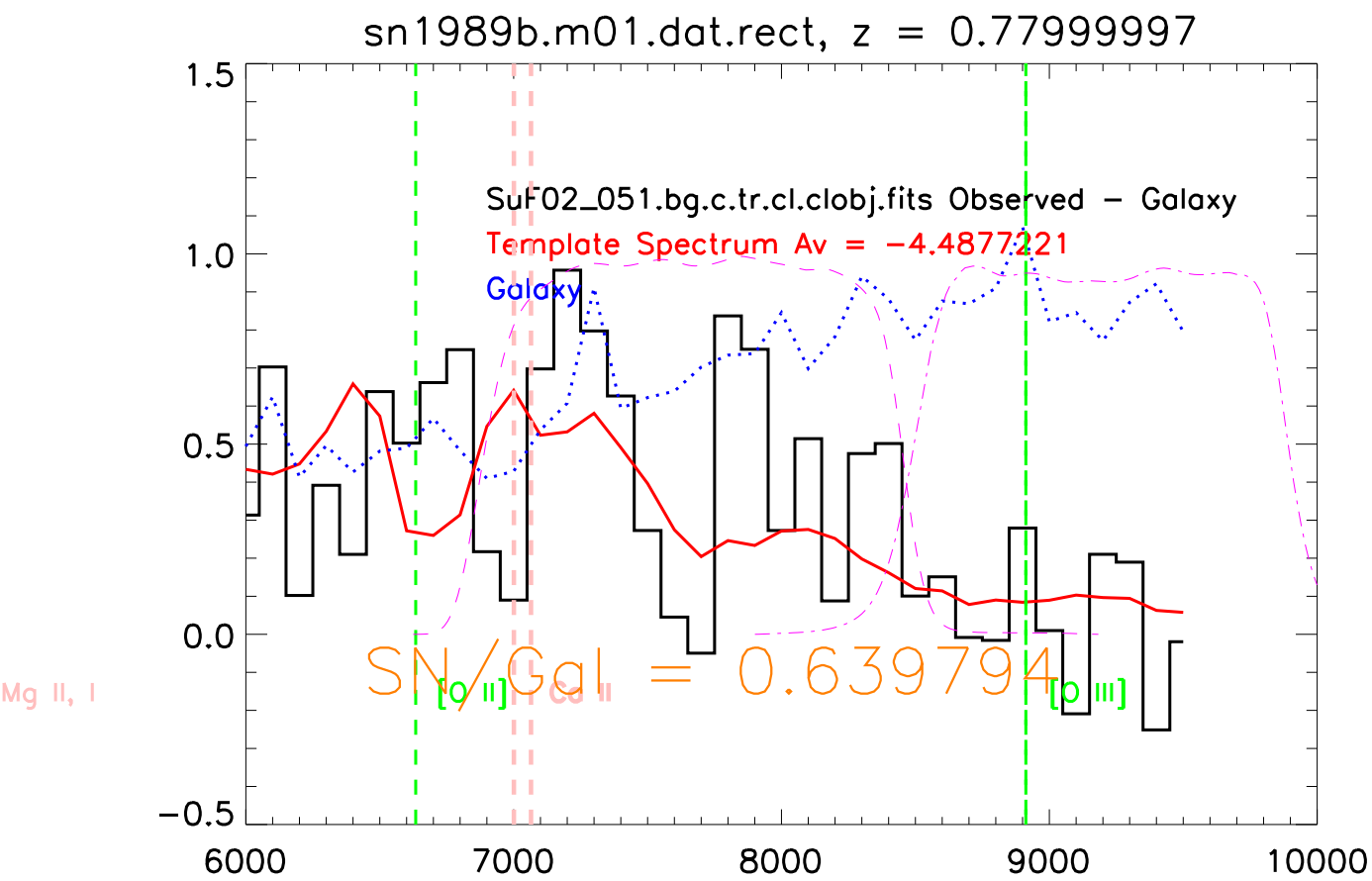

sn1992a.p09.dat.rect, z = 0.98999995
SuF02_051.bg.c.tr.cl.clobj.fits Observed − Galaxy
Template Spectrum Av = −4.8086194
Galaxy
SN/Gal = 1.11149
[O II]
Co II
[O III]
Mg II,
1.2
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
6000
7000
8000
9000
10000

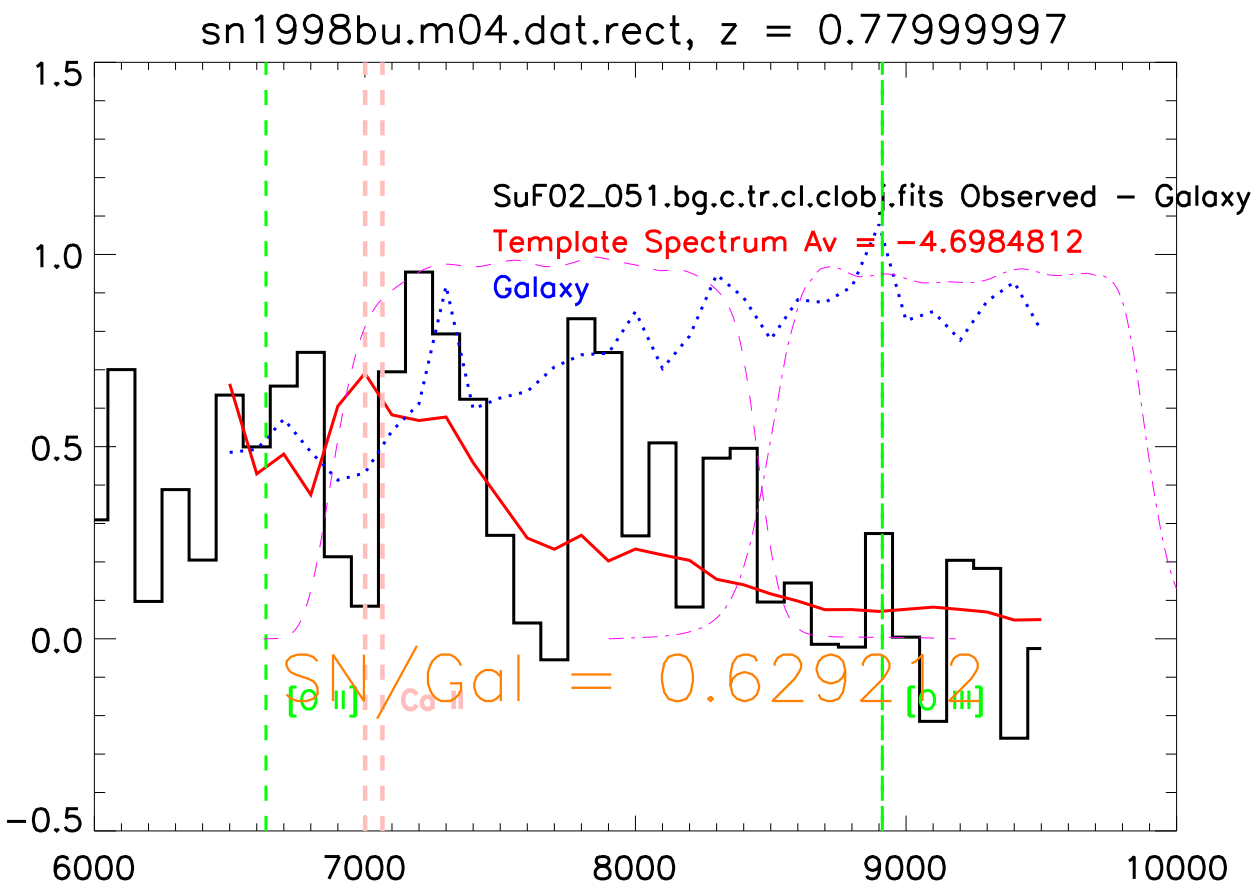

sn1991t.p67.dat.rect, z = 0.79999995
SuF02_051.bg.c.tr.cl.clobj.fits Observed − Galaxy
Template Spectrum Av = −5.2829937
Galaxy
SN/Gal = 0.840830
[O II]
Ca II
[O III]
Mg II, I
1.2
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
6000
7000
8000
9000
10000

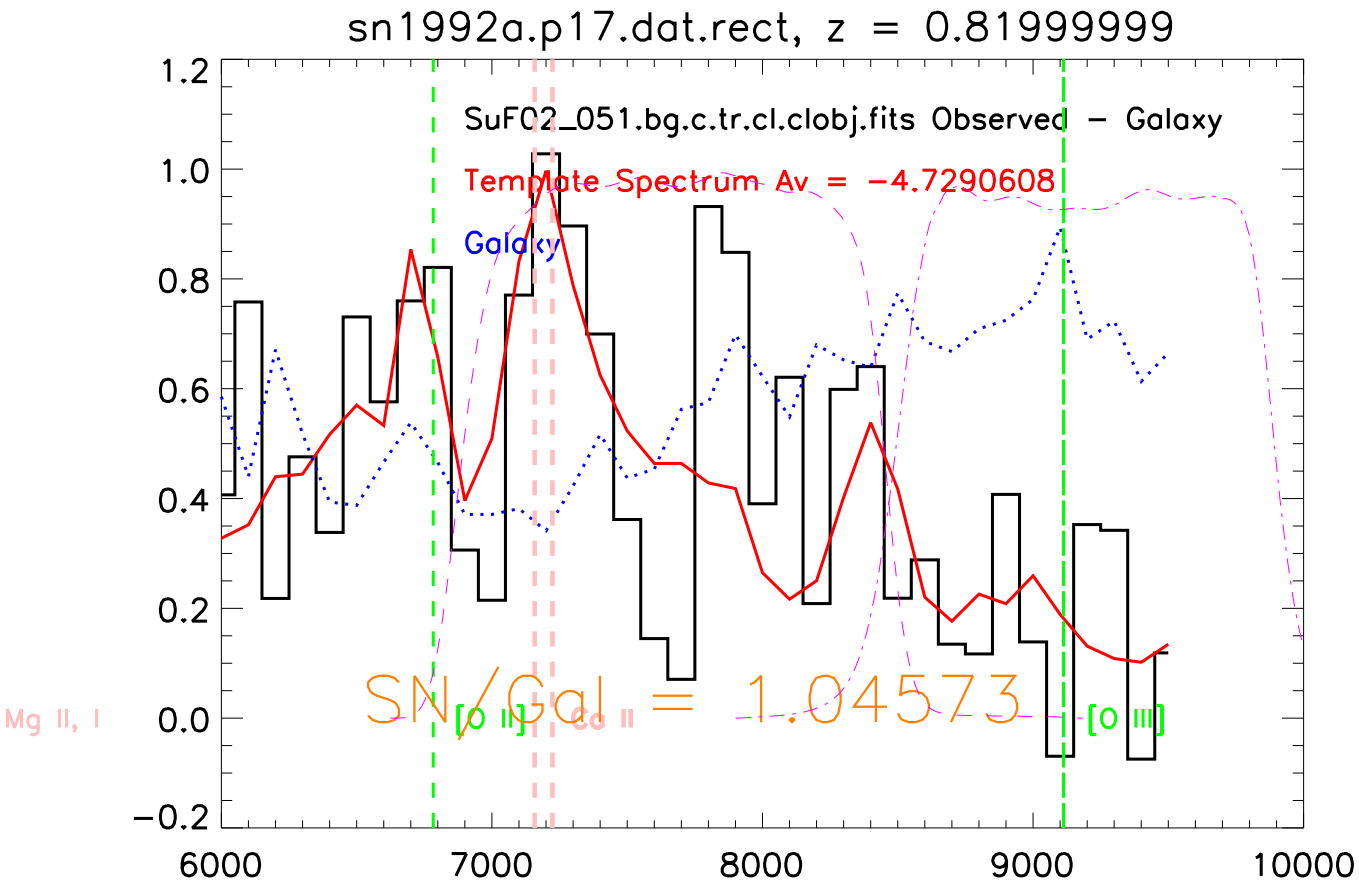

sn1981b.m00.dat.rect, z = 0.98999995
SuF02_051.bg.c.tr.cl.clobj.fits Observed − Galaxy
Template Spectrum Av = −4.2568971
Galaxy
SN/Gal = 0.994917
Mg II, +
[O II]
Ca II
[O III]
1.2
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
6000
7000
8000
9000
10000

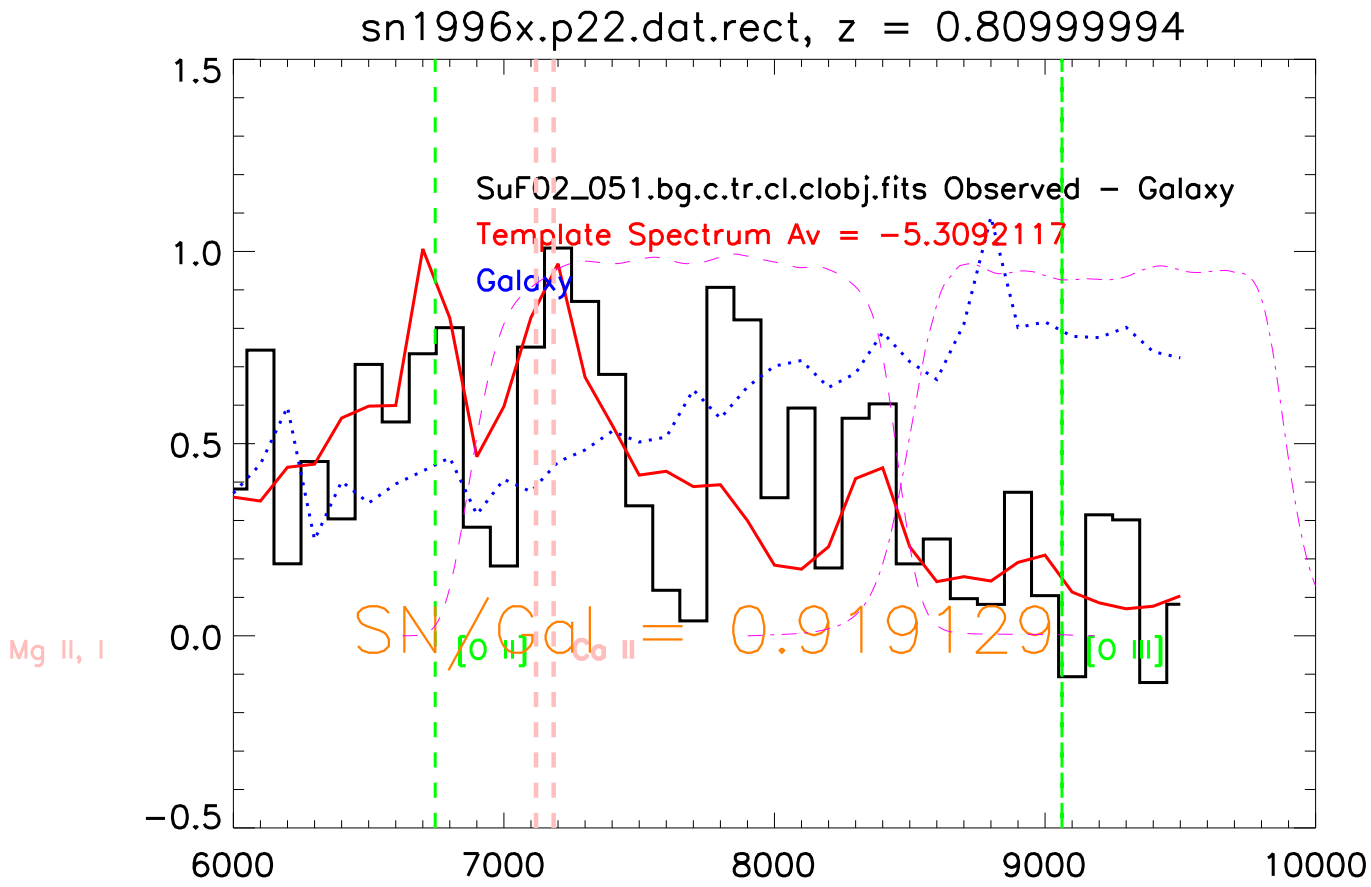

sn1994d.m03.dat.rect, z = 1.3499999
SuF02_051.bg.c.tr.cl.clobj.fits Observed – Ga
Template Spectrum Av = −1.3507523
Galaxy
SN/Gal = 6.49953
[O II]
1.5
1.0
0.5
0.0
6000
7000
8000
9000
10000

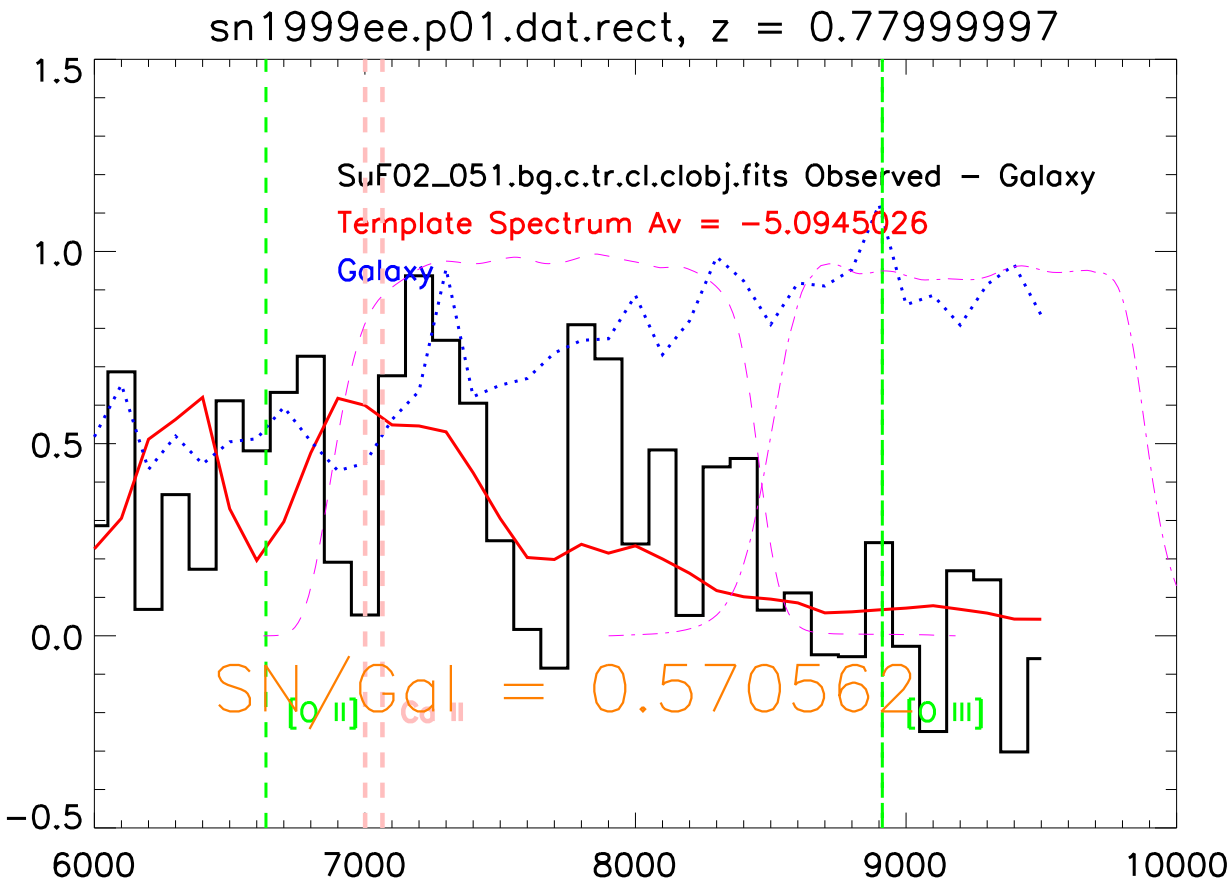

sn1994d.m05.dat.rect, z = 0.77999997
SuF02_051.bg.c.tr.cl.clobj.fits Observed − Galaxy
Template Spectrum Av = −0.69953202
Galaxy
SN/Gal = 0.888158
[O II]
Ca II
[O III]
Mg II, I
1.2
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
6000
7000
8000
9000
10000

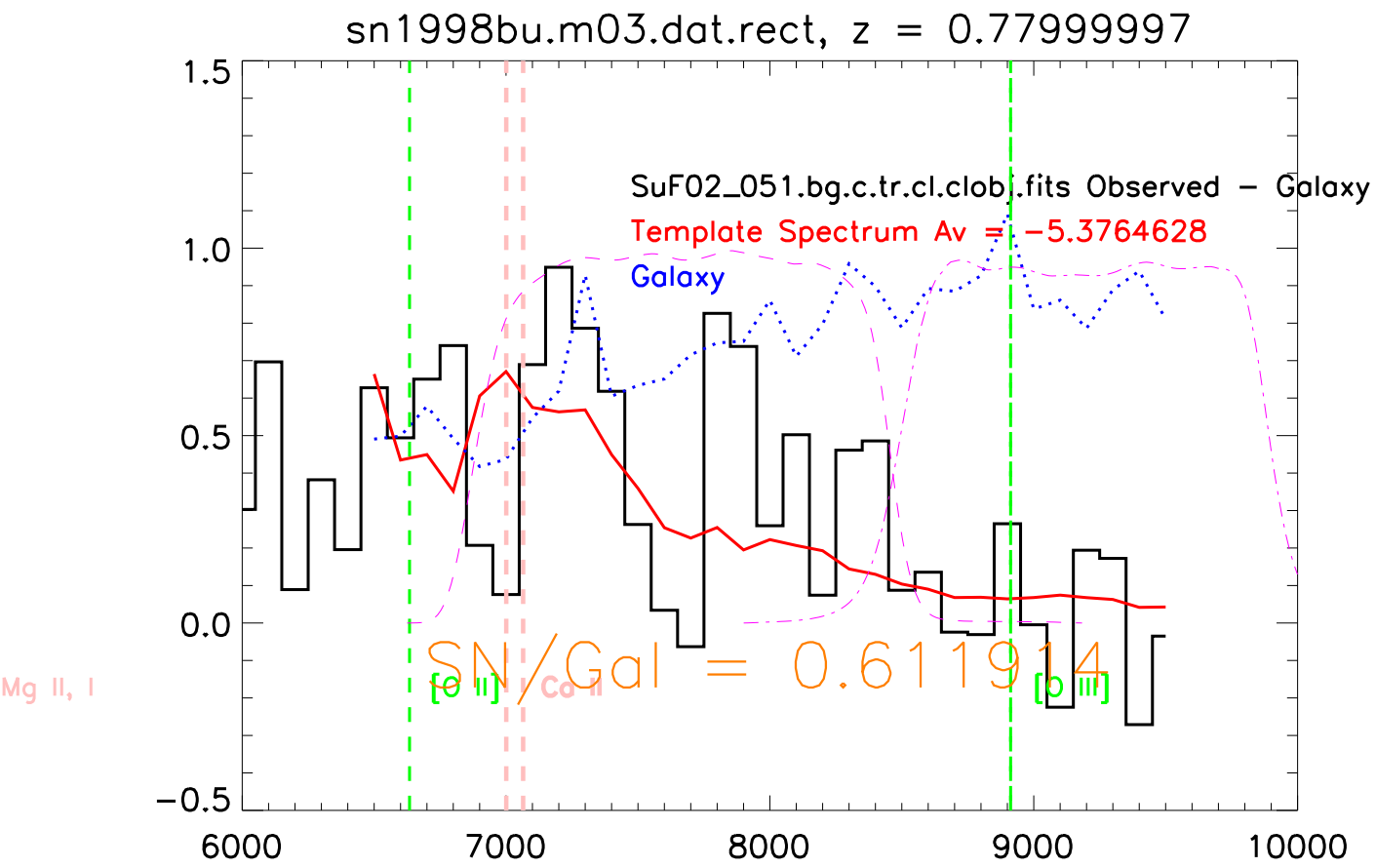

sn1989b.m01.dat.rect, z = 0.77999997
SuF02_051.bg.c.tr.cl.clobj.fits Observed – Galaxy
Template Spectrum Av = −4.4877221
Galaxy
SN/Gal = 0.639794
[O II]
Ca II
[O III]
Mg II, I
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

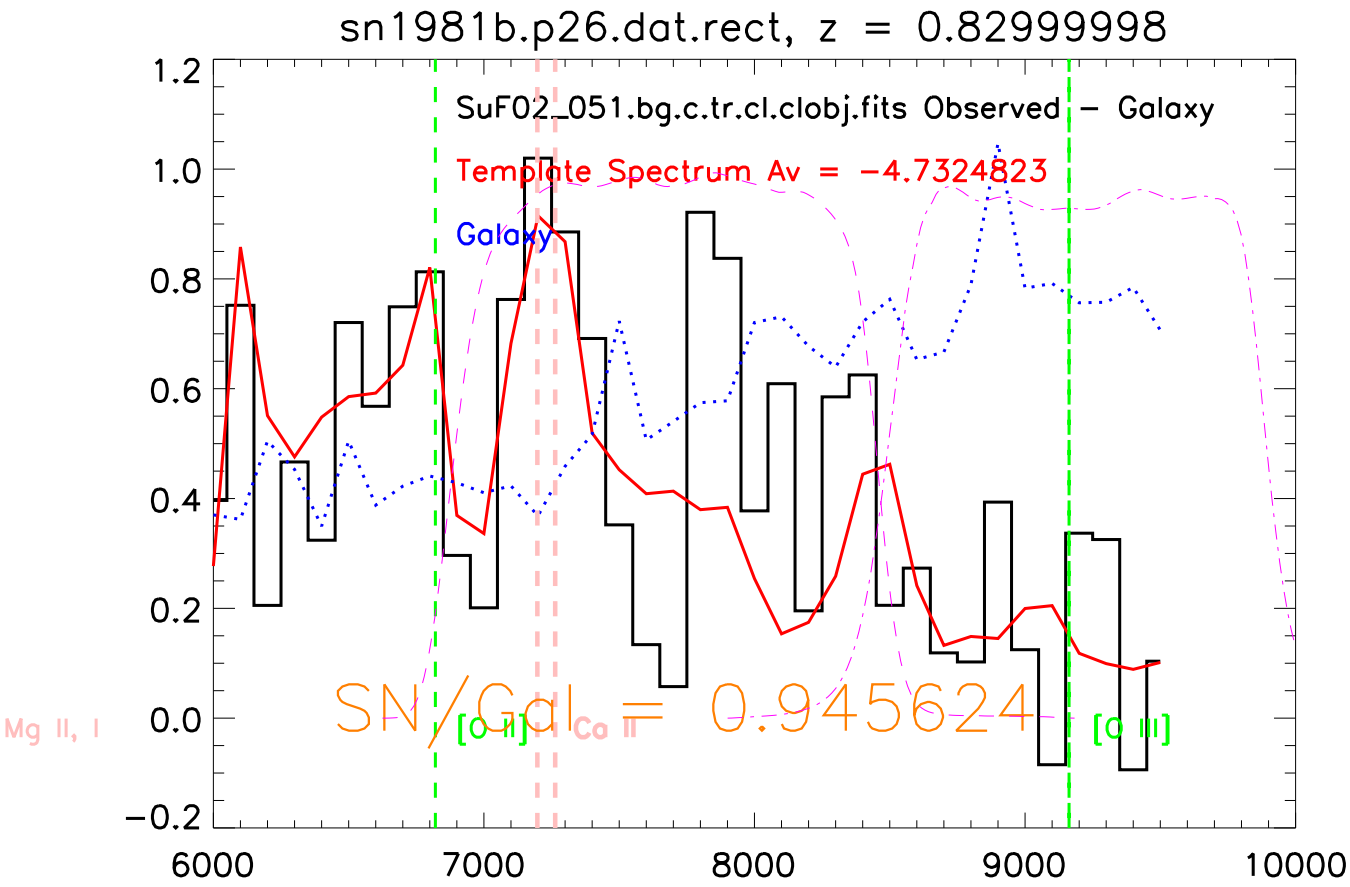

sn1998bu.m04.dat.rect, z = 0.77999997
SuF02_051.bg.c.tr.cl.clob.fits Observed – Galaxy
Template Spectrum Av = −4.6984812
Galaxy
SN/Gal = 0.629212
[O II]
Ca II
[O III]
Mg II, I
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

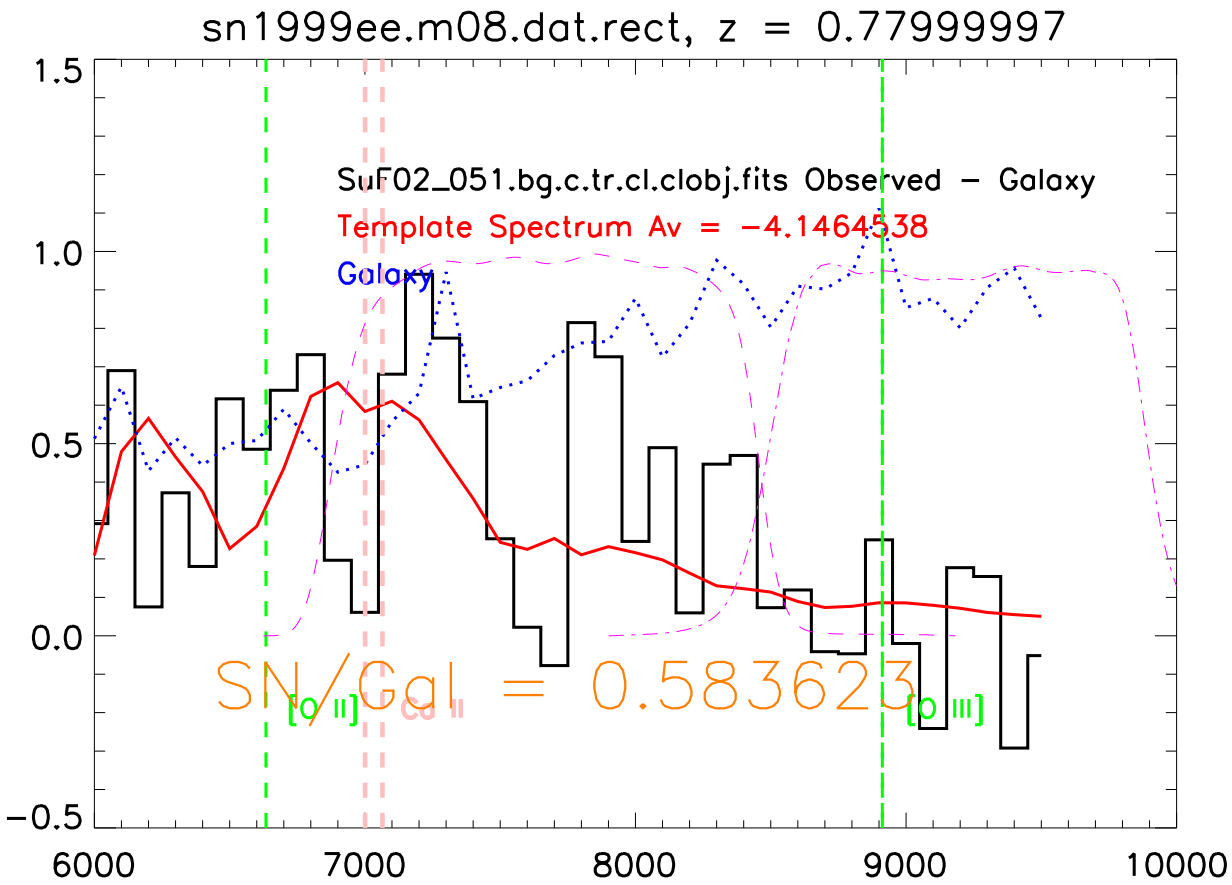

sn1992a.p17.dat.rect, z = 0.81999999
SuFC2_051.bg.c.tr.cl.clobj.fits Observed – Galaxy
Template Spectrum Av = −4.7290608
Galaxy
SN/Gal = 1.04573
Mg II, I
[O II]
Ca II
[O III]
1.2
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
6000
7000
8000
9000
10000

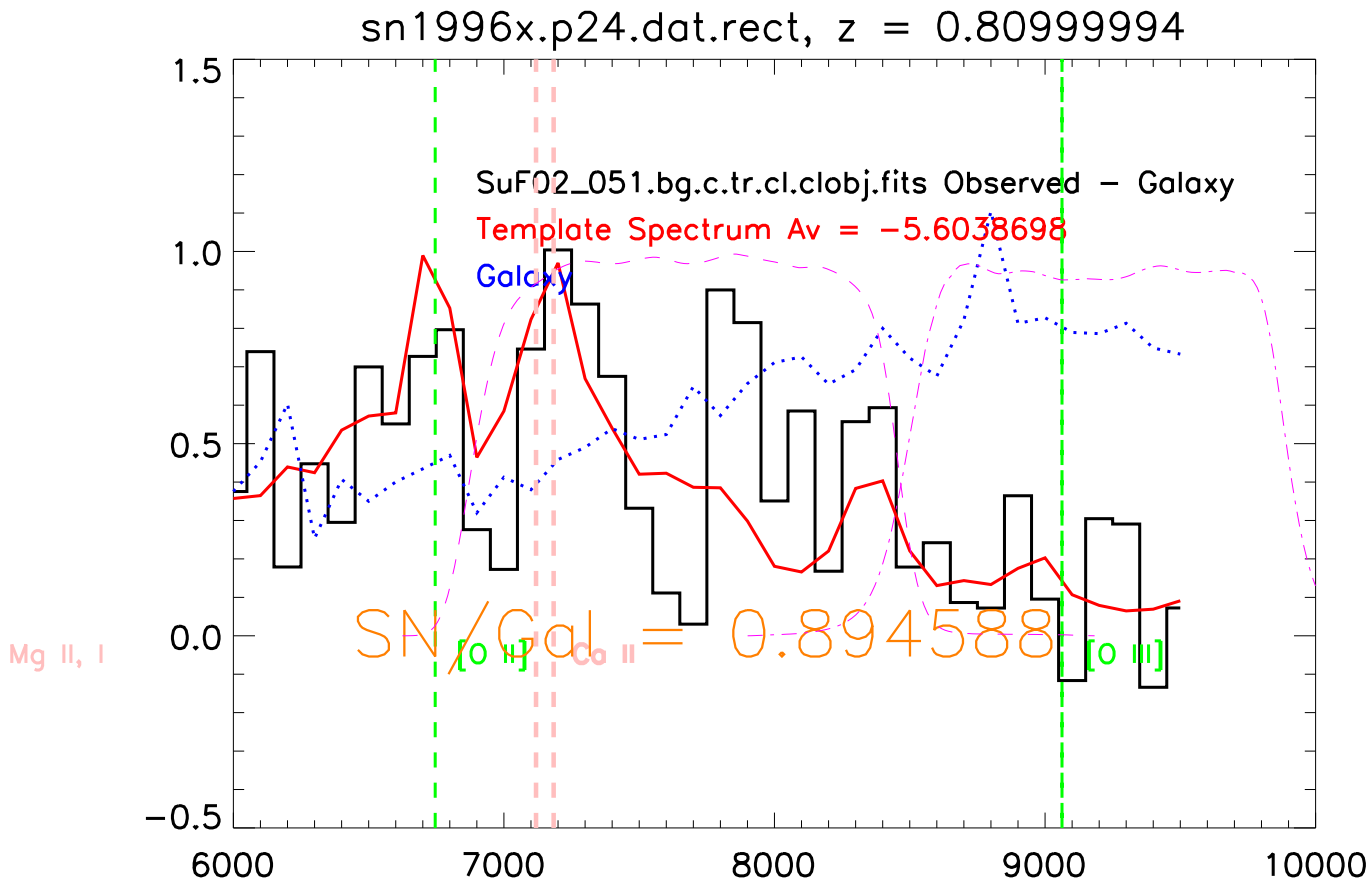

sn1996x.p22.dat.rect, z = 0.80999994
SuF02_051.bg.c.tr.cl.clobj.fits Observed − Galaxy
Template Spectrum Av = −5.3092117
Galaxy
SN/Gal = 0.919129
[O II]
Ca II
[O III]
Mg II, I
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

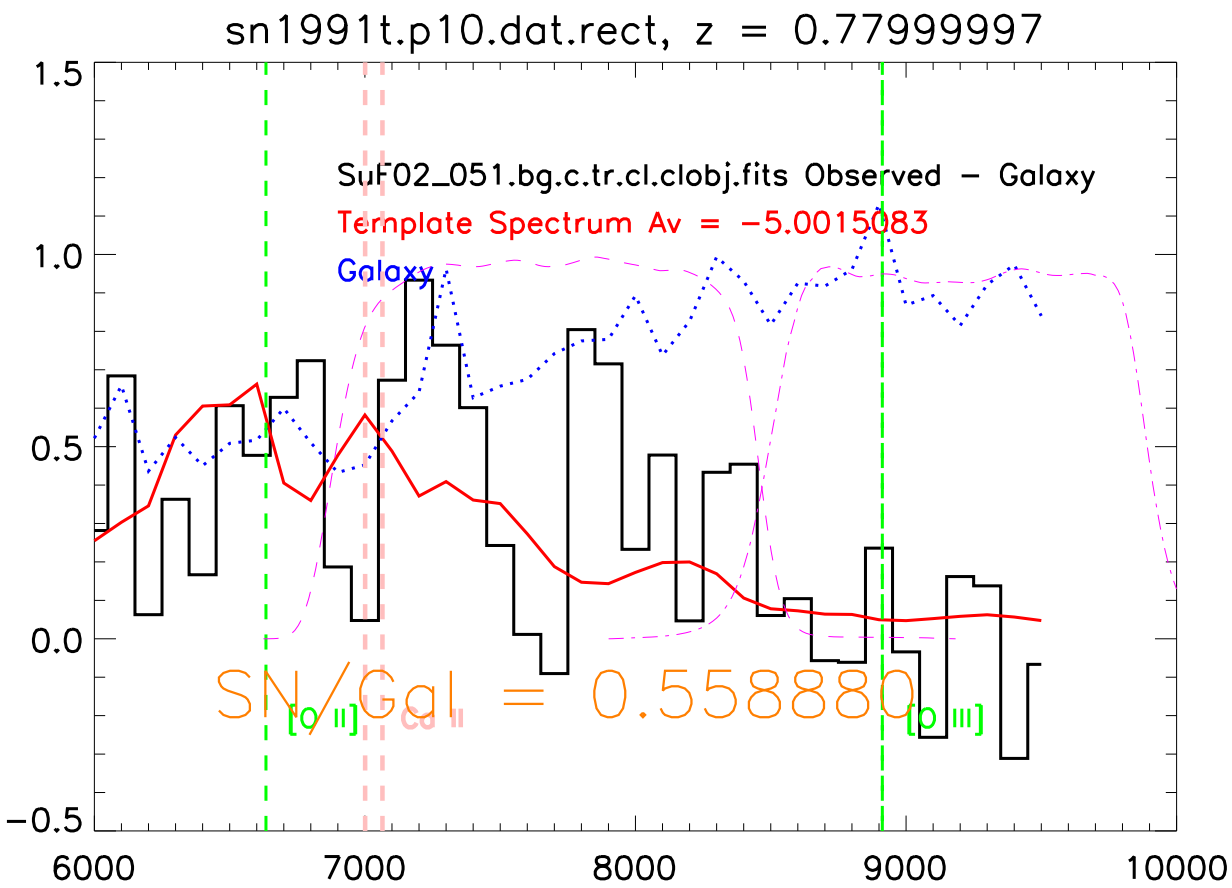

sn1999ee.p01.dat.rect, z = 0.77999997
SuF02_051.bg.c.tr.cl.clobj.fits Observed – Galaxy
Template Spectrum Av = −5.0945026
Galaxy
SN/Gal = 0.570562
[O II]
Ca II
[O III]
Mg II, I
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

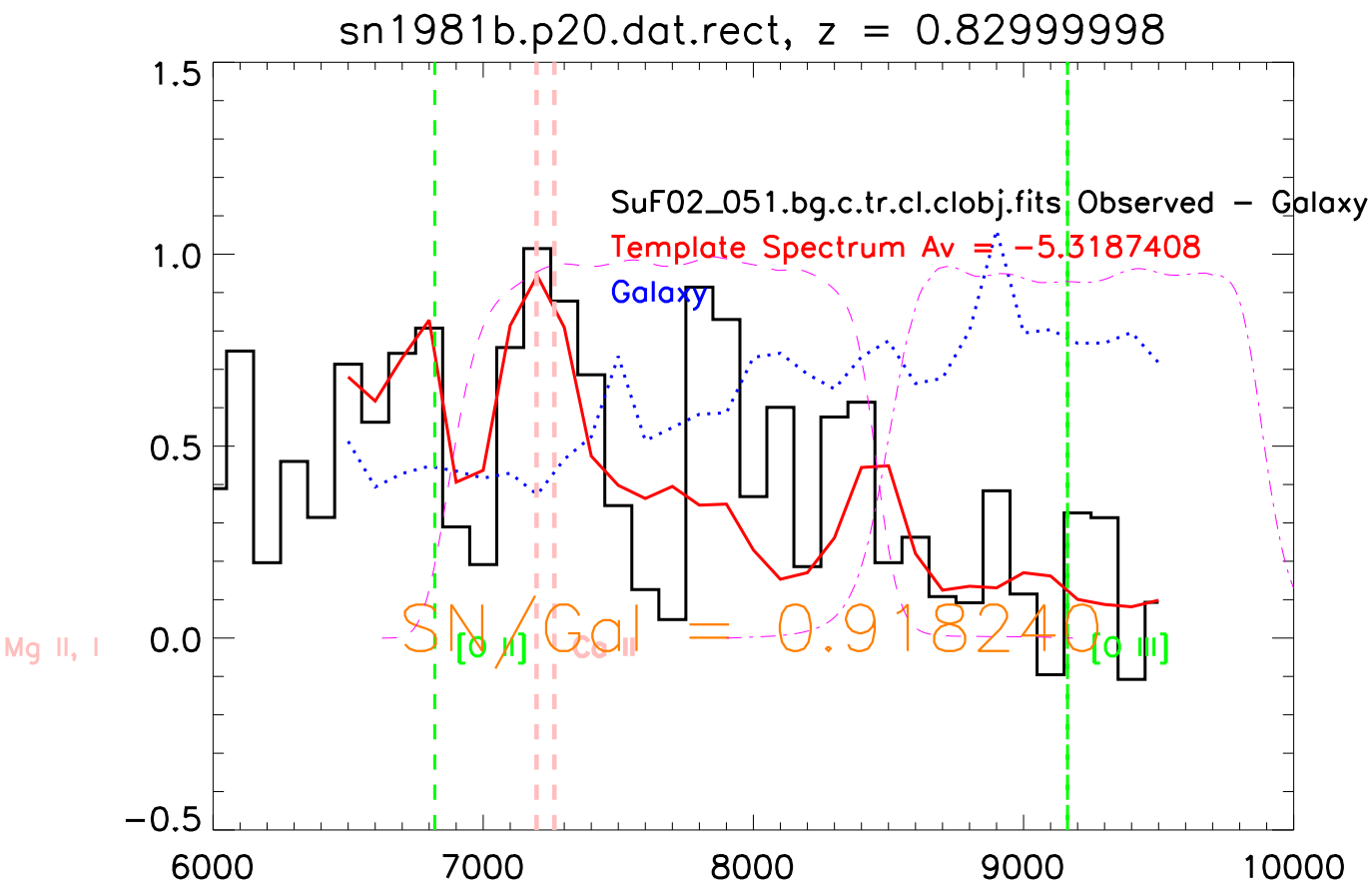

sn1998bu.m03.dat.rect, z = 0.77999997
SuF02_051.bg.c.tr.cl.clobj.fits Observed − Galaxy
Template Spectrum Av = −5.3764628
Galaxy
SN/Gal = 0.611914
[O II]
Ca II
[O III]
Mg II, I
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

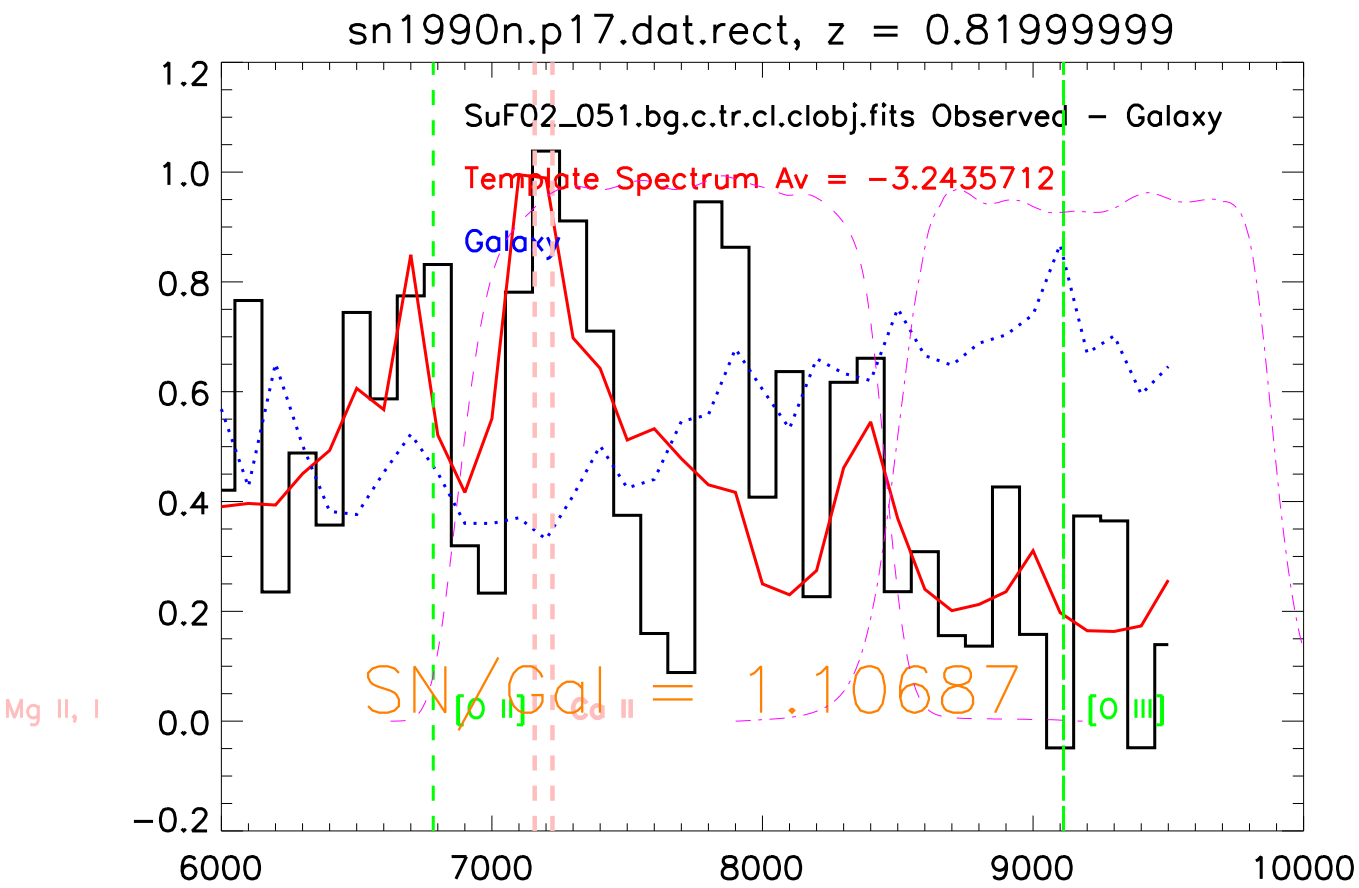

sn1981b.p26.dat.rect, z = 0.82999998
SuF02_051.bg.c.tr.cl.clobj.fits Observed – Galaxy
Template Spectrum Av = -4.7324823
Galaxy
SN/Gal = 0.945624
[O II]
Ca II
[O III]
Mg II, I
1.2
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
6000
7000
8000
9000
10000

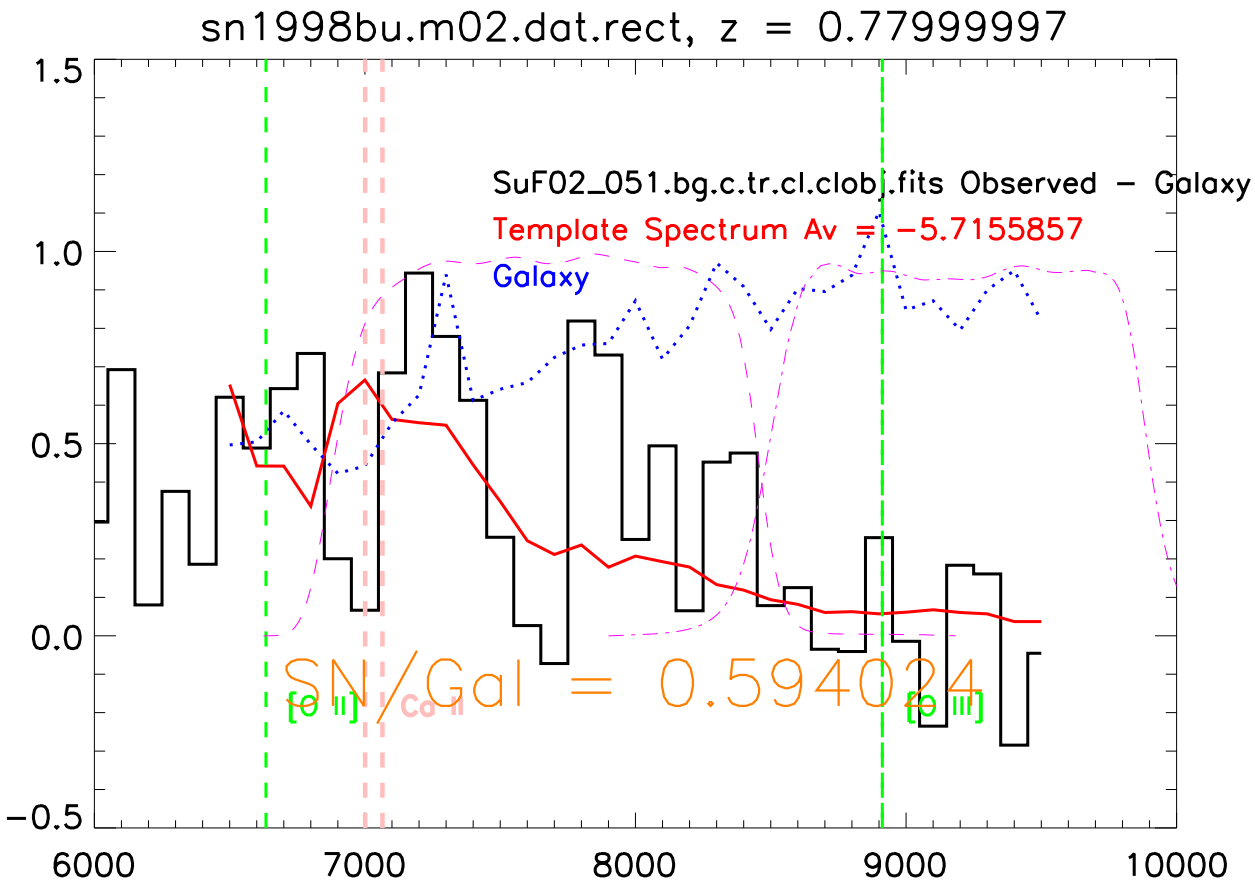

sn1999ee.m08.dat.rect, z = 0.77999997
SuF02_051.bg.c.tr.cl.clobj.fits Observed – Galaxy
Template Spectrum Av = −4.1464538
Galaxy
SN/Gal = 0.583623
[O II]
Ca II
[O III]
Mg II, I
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

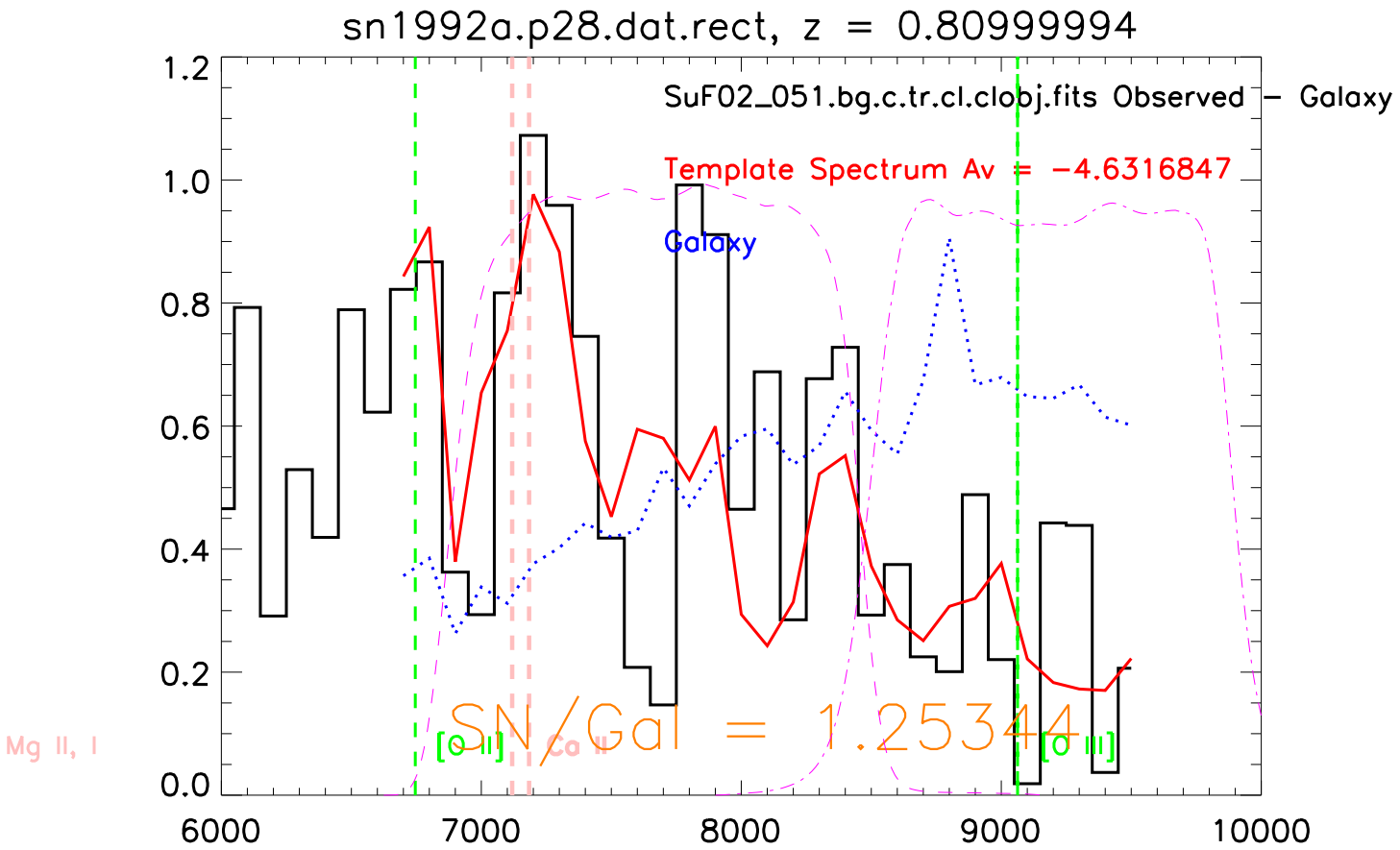

sn1996x.p24.dat.rect, z = 0.80999994
SuF02_051.bg.c.tr.cl.clobj.fits Observed – Galaxy
Template Spectrum Av = -5.6038698
Galaxy
SN/Gal = 0.894588
Mg II, I
[O II]
Ca II
[O III]
1.5
1.0
0.5
0.0
-0.5
6000
7000
8000
9000
10000

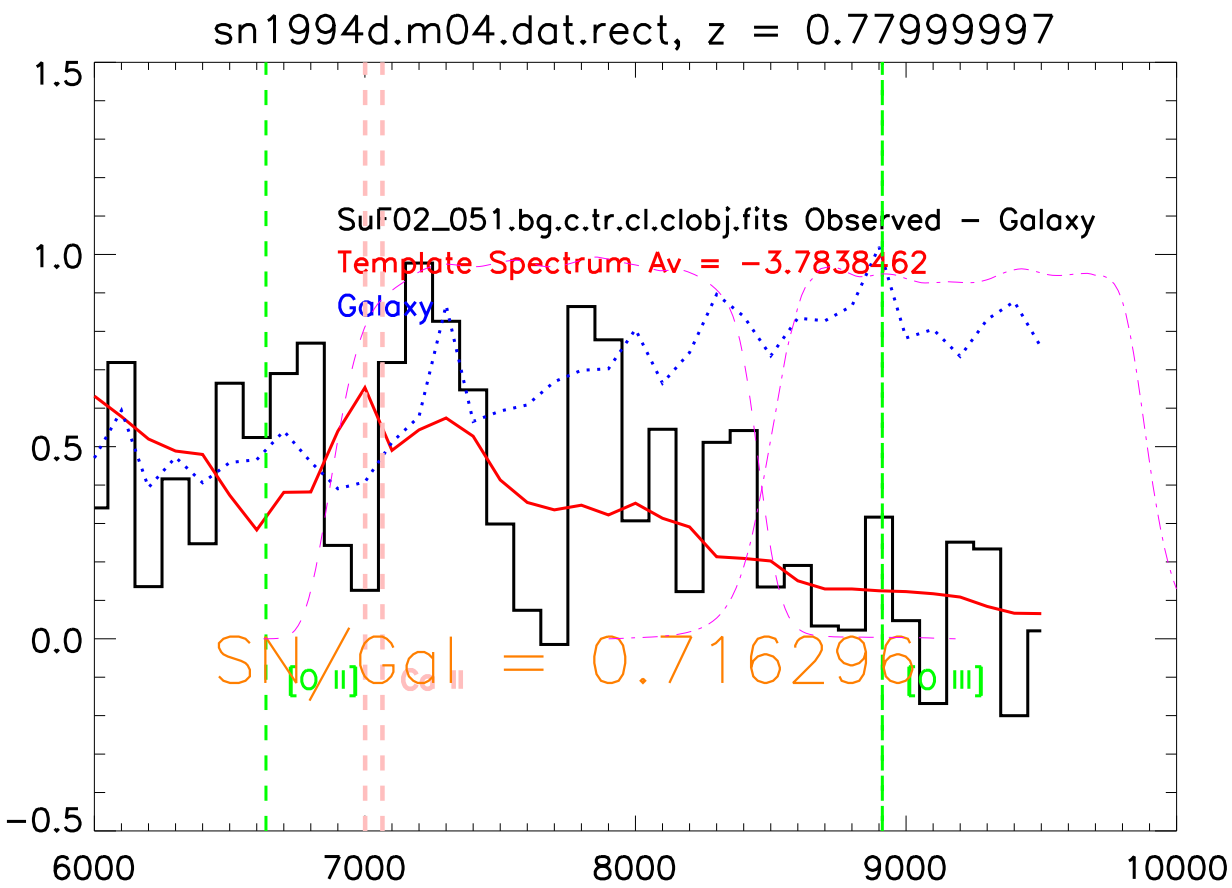

sn1991t.p10.dat.rect, z = 0.77999997
SuF02_051.bg.c.tr.cl.clobj.fits Observed – Galaxy
Template Spectrum Av = −5.0015083
Galaxy
SN/Gal = 0.558880
[O II]
Ca II
[O III]
Mg II, I
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000


sn1981b.p20.dat.rect, z = 0.82999998
SuF02_051.bg.c.tr.cl.clobj.fits Observed − Galaxy
Template Spectrum Av = −5.3187408
Galaxy
SN/Gal = 0.918240
[O II]
Ca II
[O III]
Mg II, I
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

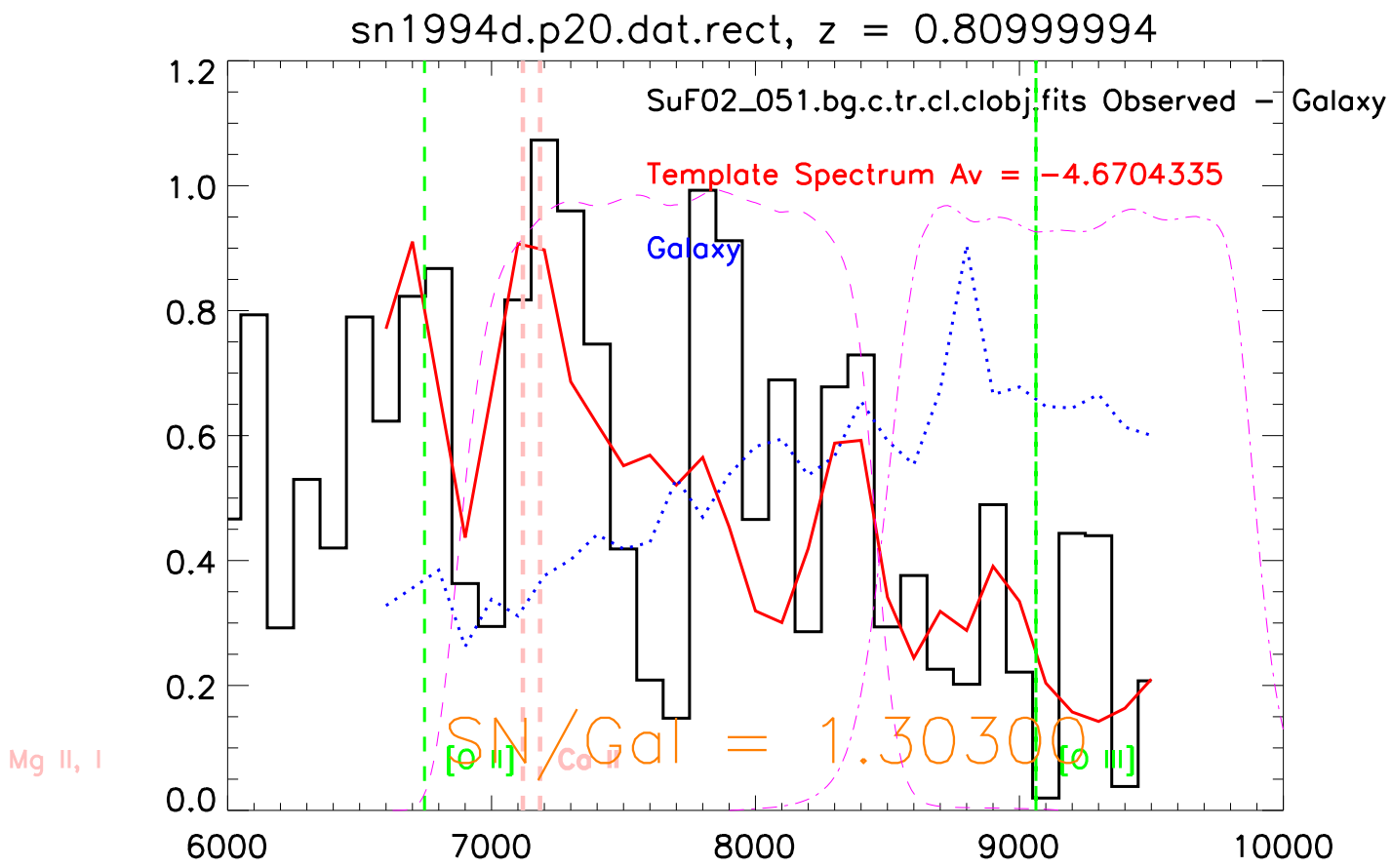

sn1990n.p17.dat.rect, z = 0.81999999
SuF02_051.bg.c.tr.cl.clobj.fits Observed − Galaxy
Template Spectrum Av = −3.2435712
Galaxy
SN/Gal = 1.10687
Mg II, I
[O II]
Ca II
[O III]
1.2
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
6000
7000
8000
9000
10000

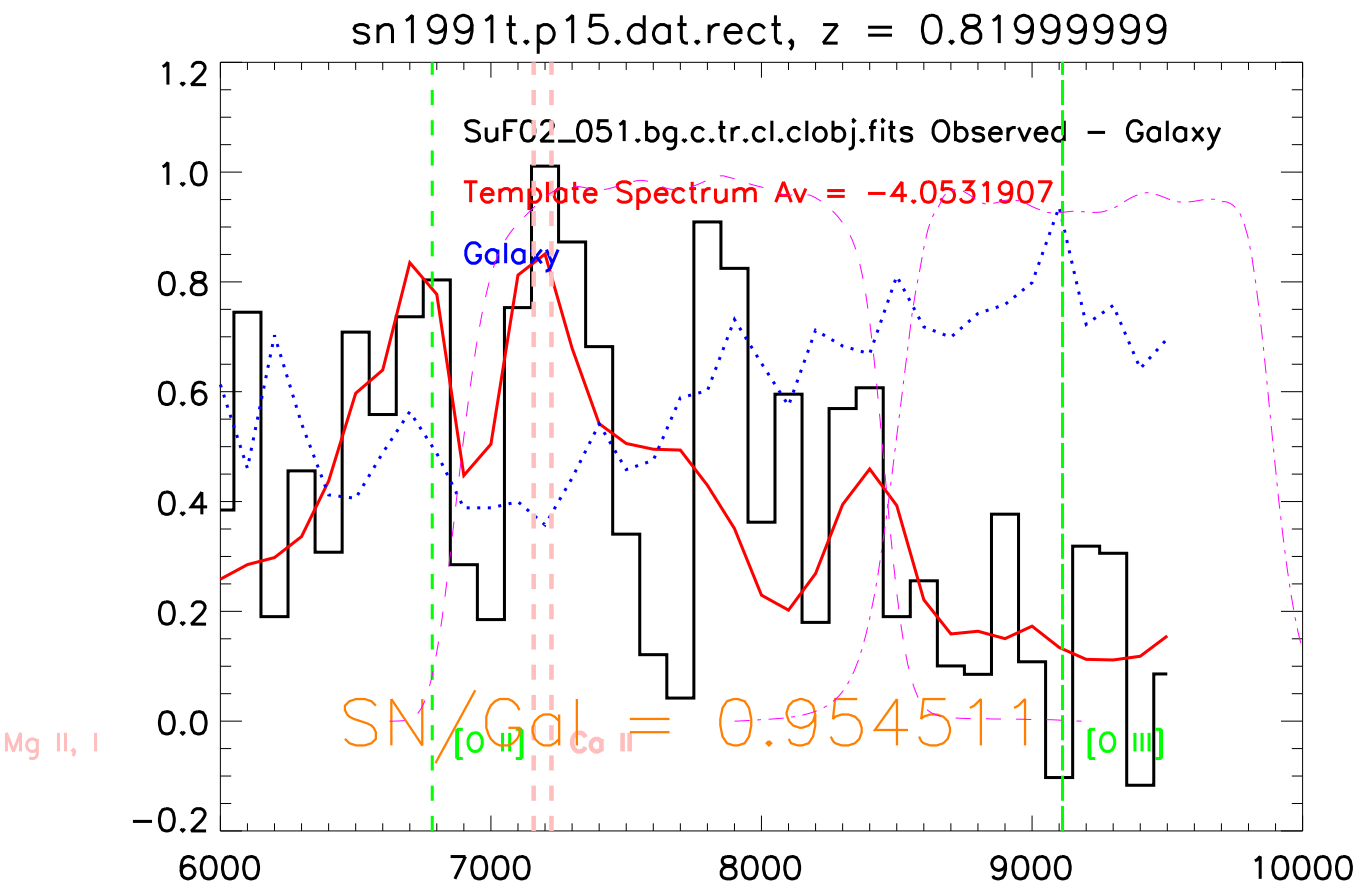

sn1998bu.m02.dat.rect, z = 0.77999997
SuF02_051.bg.c.tr.cl.clob.fits Observed − Galaxy
Template Spectrum Av = −5.7155857
Galaxy
SN/Gal = 0.594024
[O II]
Ca II
[O III]
Mg II, I
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

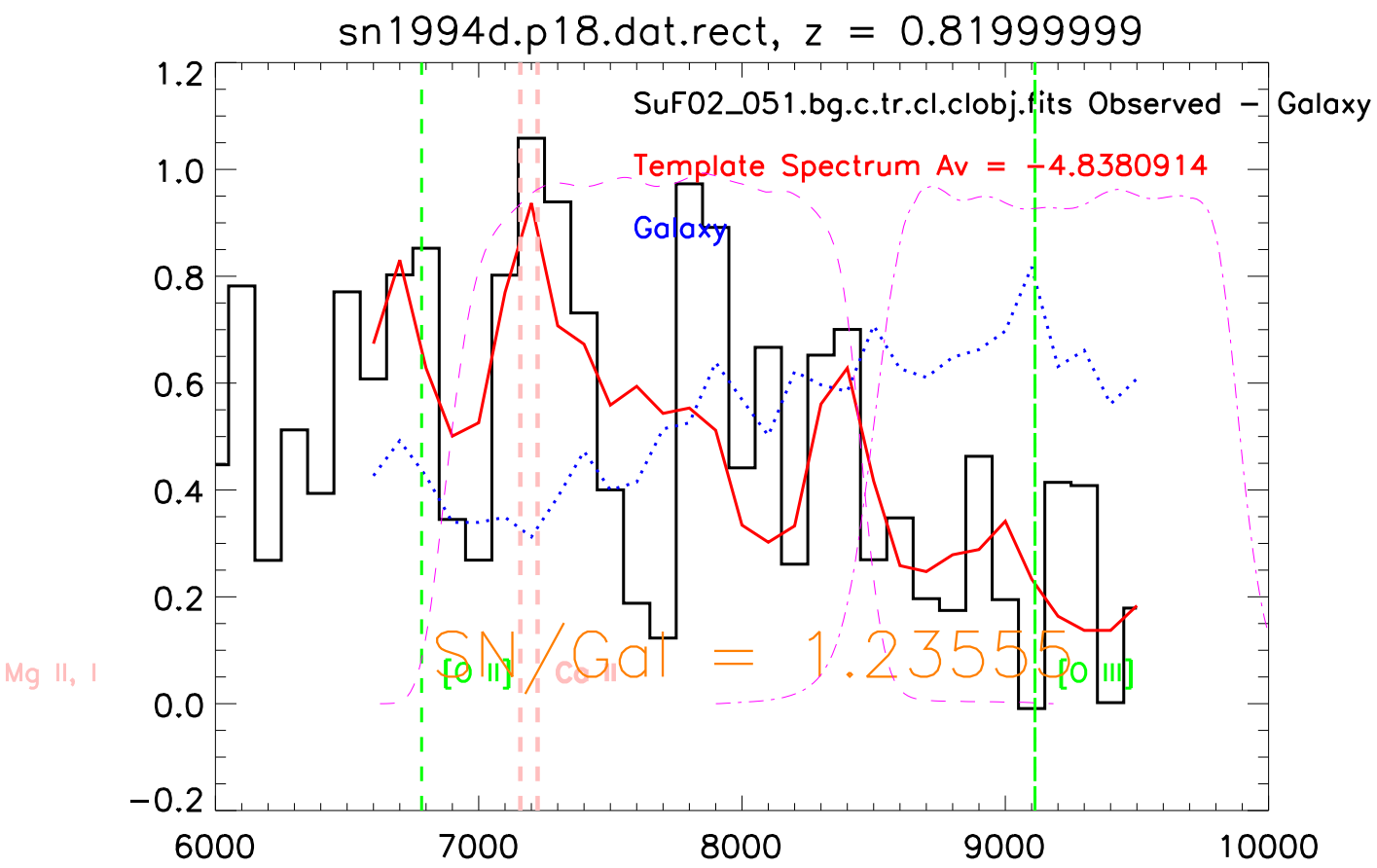

sn1992a.p28.dat.rect, z = 0.80999994
SuF02_051.bg.c.tr.cl.clobj.fits Observed – Galaxy
Template Spectrum Av = -4.6316847
Galaxy
SN/Gal = 1.25344
[O II]
Ca II
[O III]
Mg II, I
1.2
1.0
0.8
0.6
0.4
0.2
0.0
6000
7000
8000
9000
10000

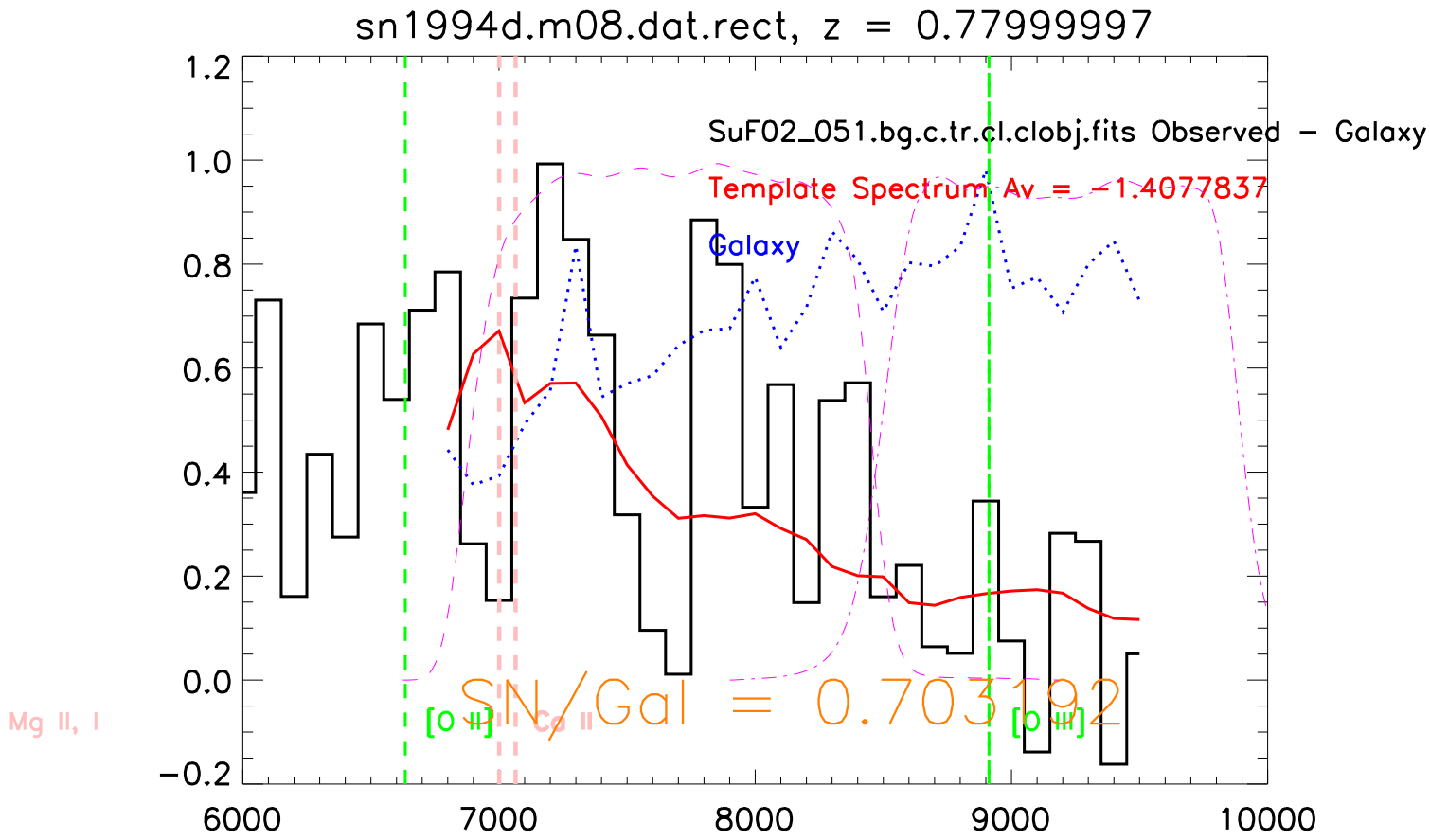

sn1994d.m04.dat.rect, z = 0.77999997
SuF02_051.bg.c.tr.cl.clobj.fits Observed − Galaxy
Template Spectrum Av = −3.7838462
Galaxy
SN/Gal = 0.716296
[O II]
[O III]
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

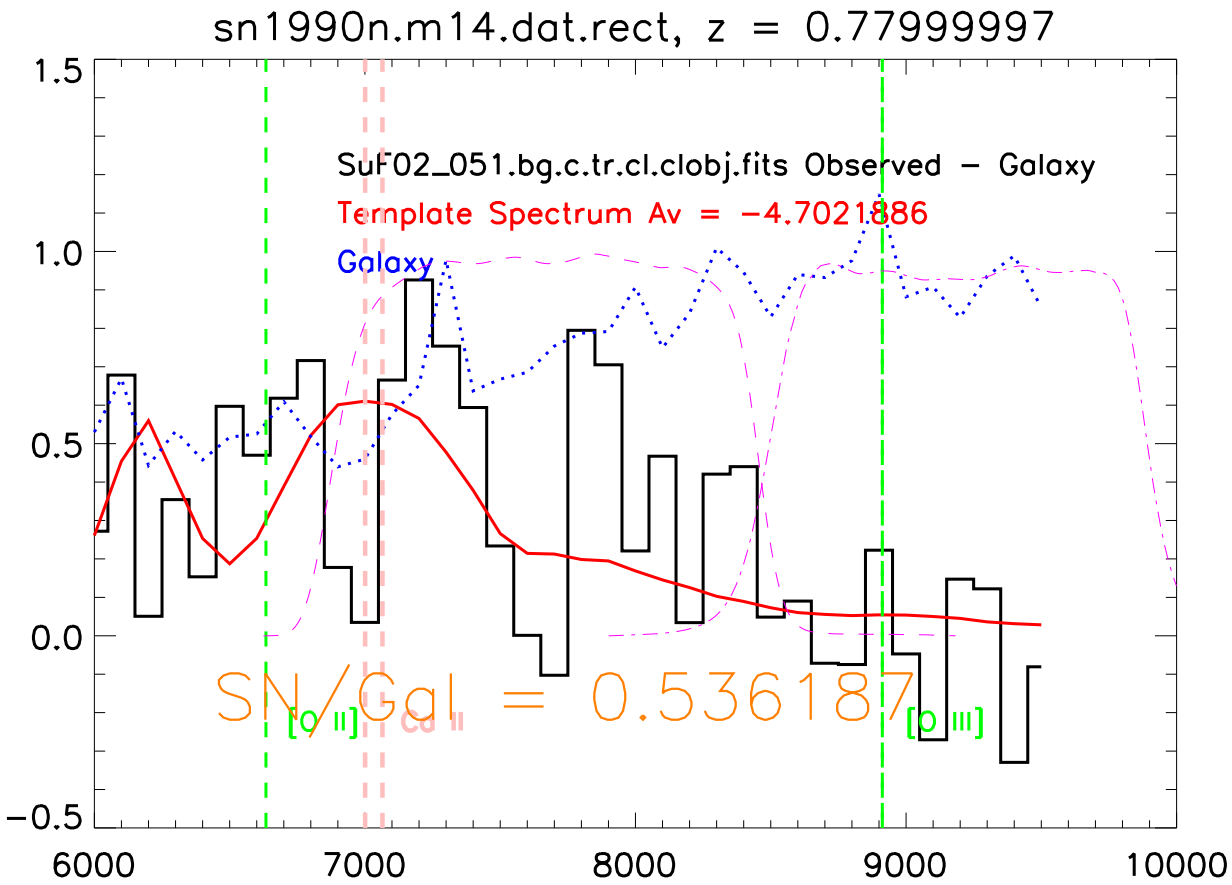
Mg II, I

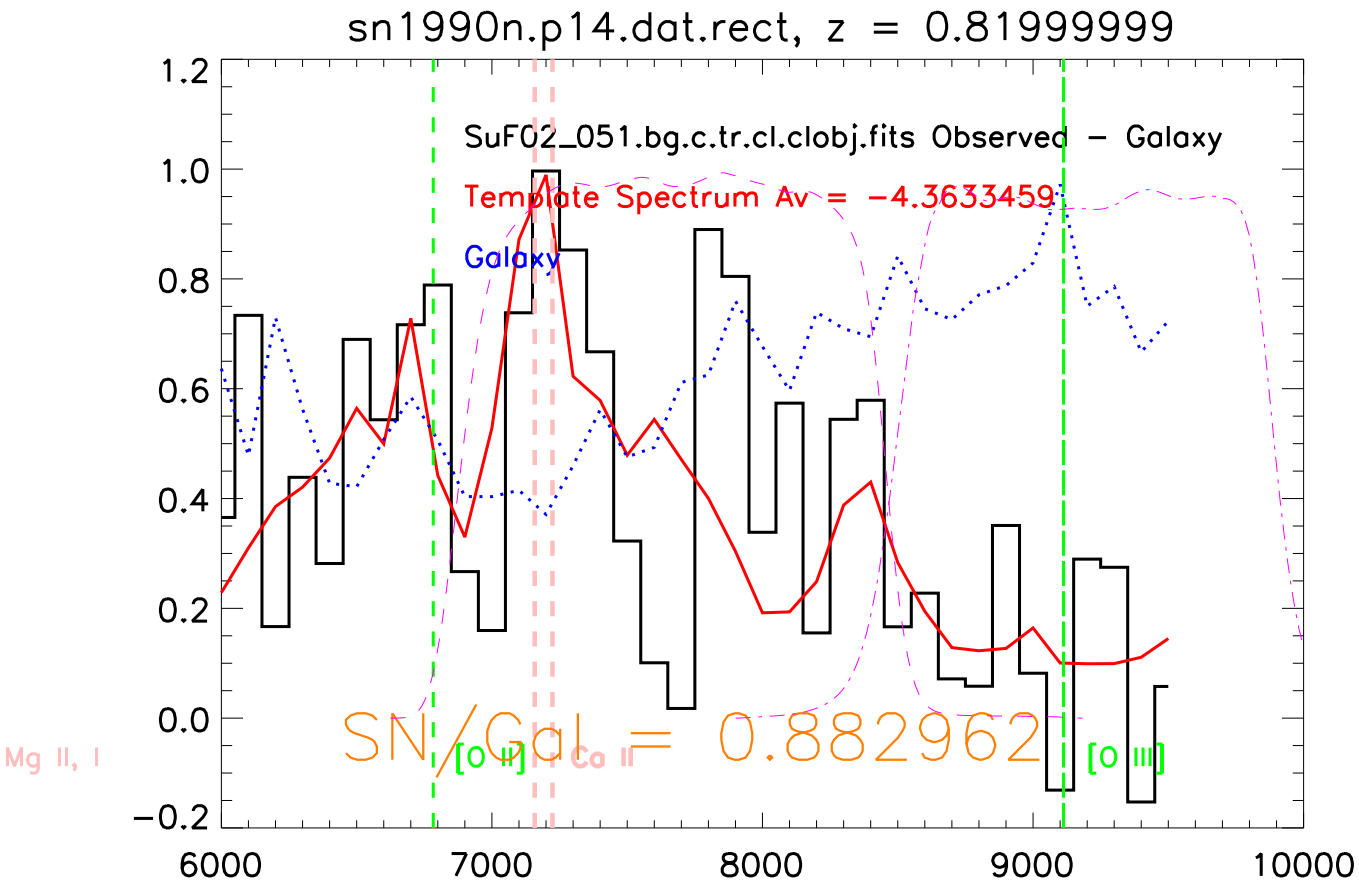

sn1994d.p20.dat.rect, z = 0.80999994
SuF02_051.bg.c.tr.cl.clobj.fits Observed
Galaxy
Template Spectrum Av = -4.6704335
Galaxy
SN/Gal = 1.30300
[O II]
Ca II
[O III]
Mg II, I
1.2
1.0
0.8
0.6
0.4
0.2
0.0
6000
7000
8000
9000
10000

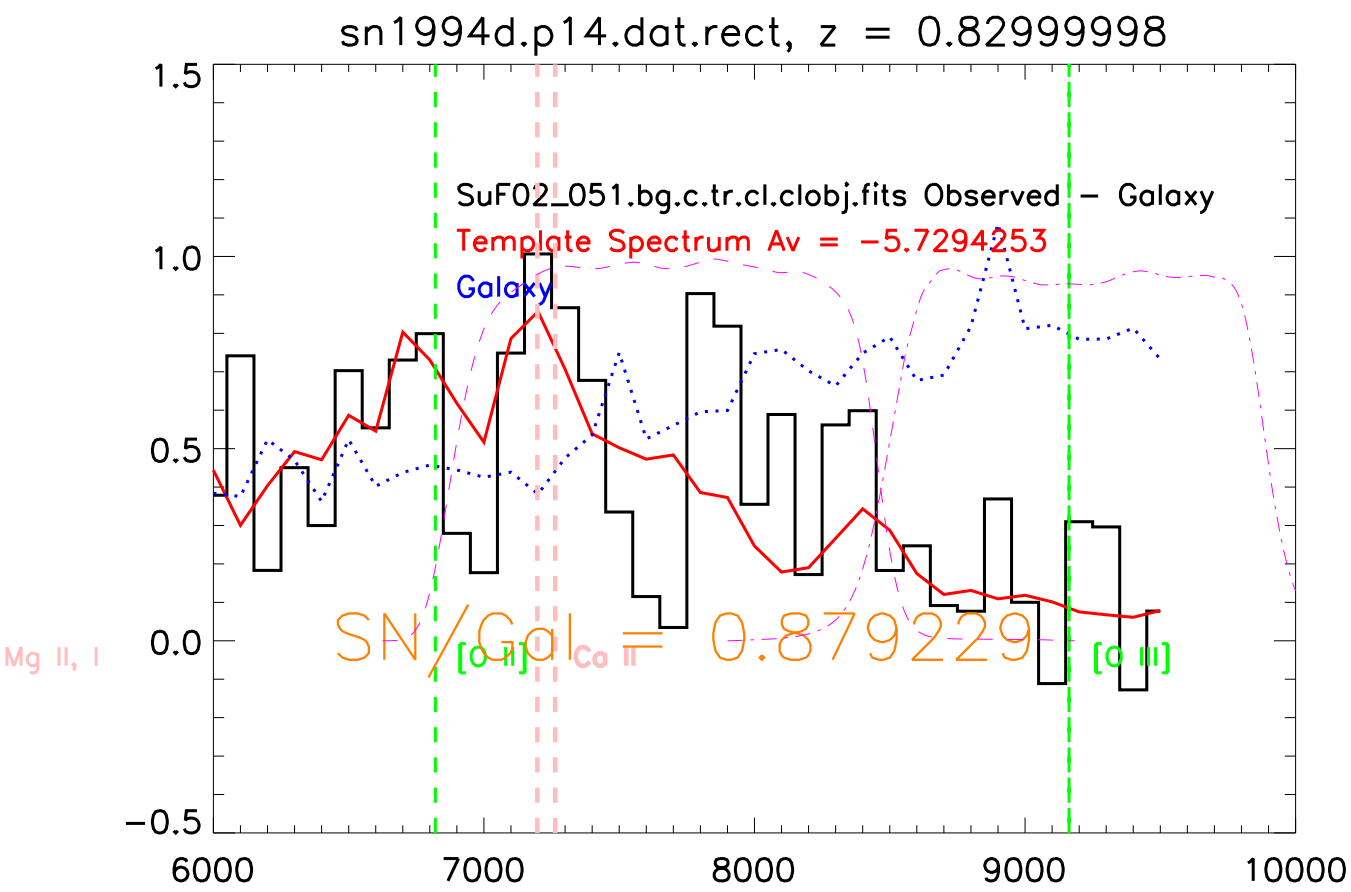

sn1991t.p15.dat.rect, z = 0.81999999
SuFC2_051.bg.c.tr.cl.clobj.fits Observed – Galaxy
Template Spectrum Av = −4.0531907
Galaxy
SN/Gal = 0.954511
[O II]
Ca II
[O III]
Mg II, I
1.2
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
6000
7000
8000
9000
10000

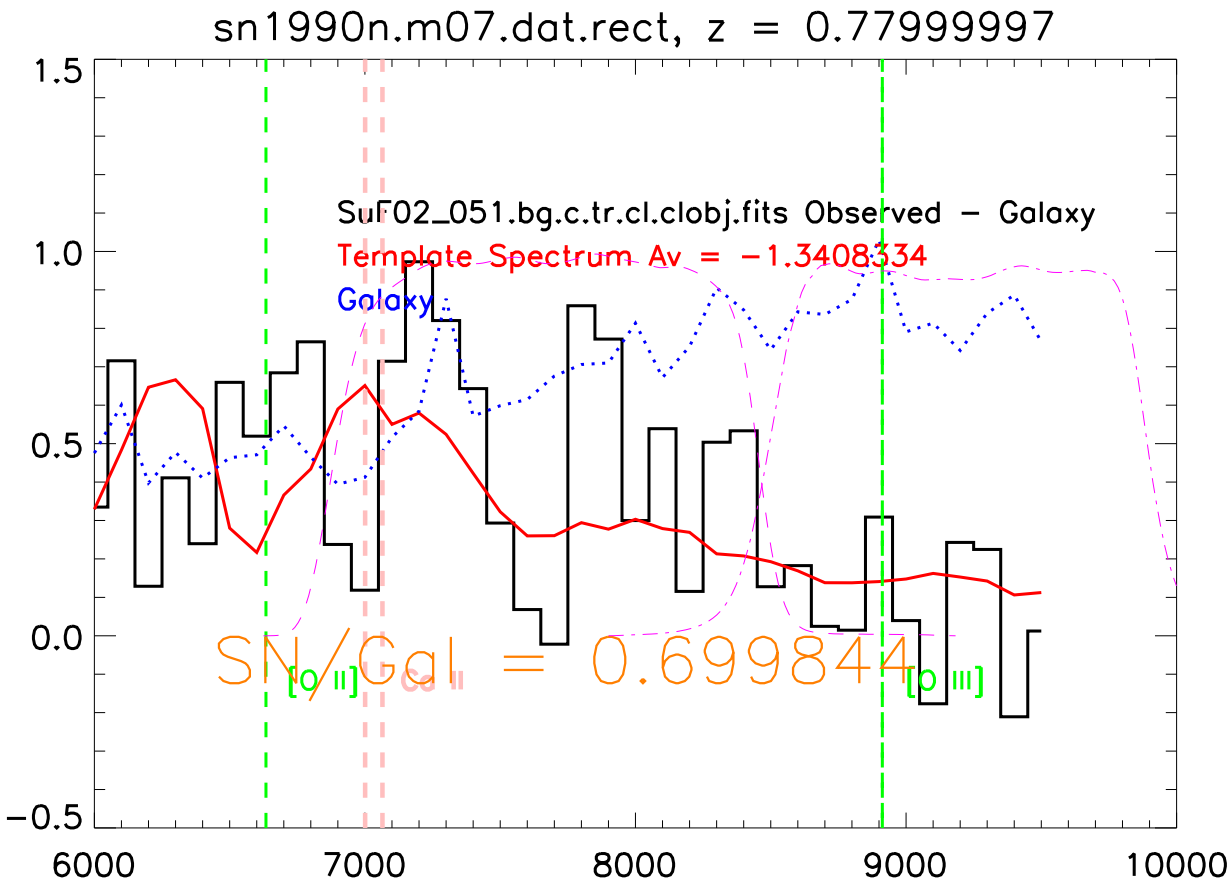

sn1994d.p18.dat.rect, z = 0.81999999
SuF02_051.bg.c.tr.cl.clobj.fits Observed
Galaxy
Template Spectrum Av = 4.8380914
Galaxy
SN/Gal = 1.23555
[O II]
[O III]
Mg II, I
1.2
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
6000
7000
8000
9000
10000

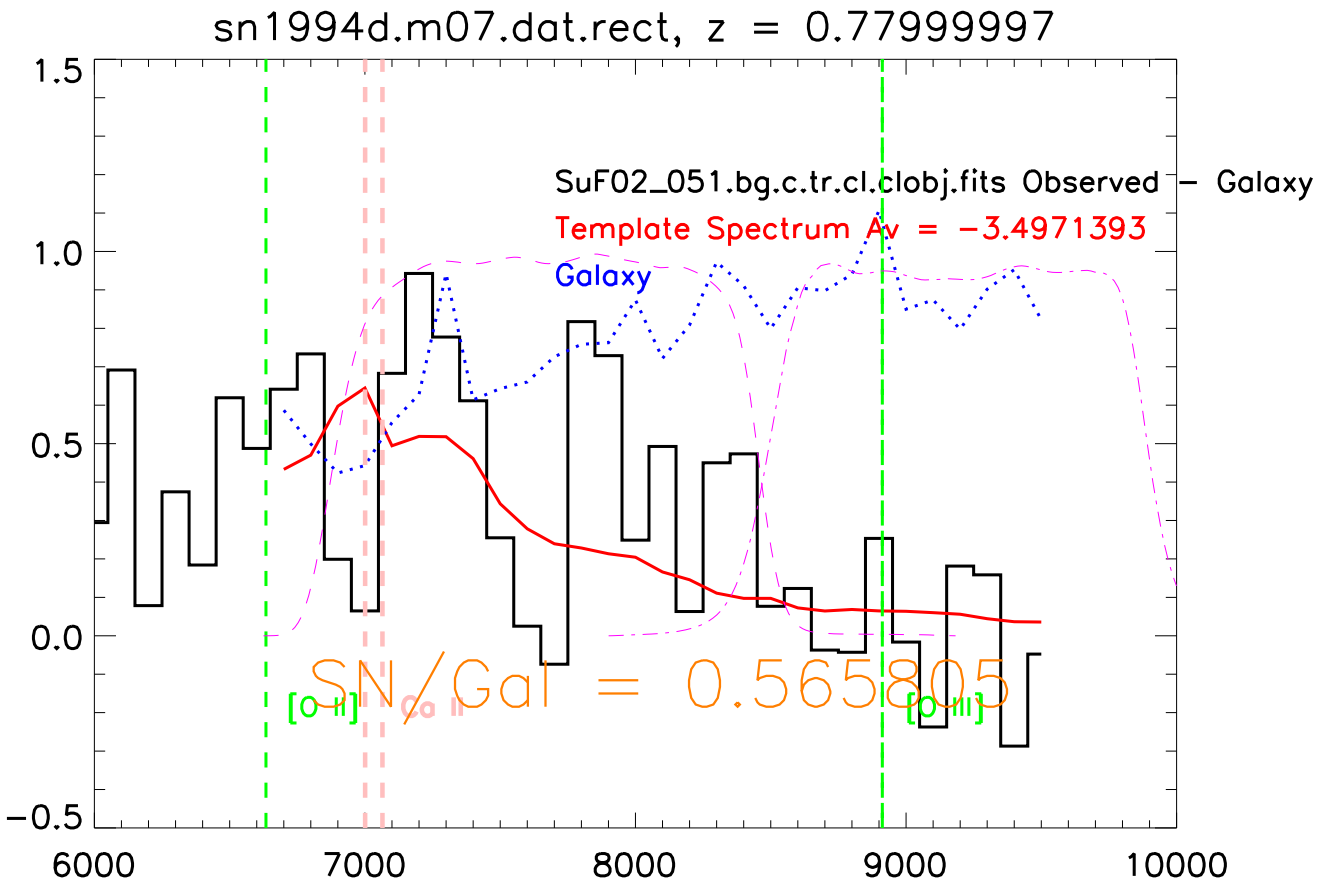

sn1994d.m08.dat.rect, z = 0.77999997
SuF02_051.bg.c.tr.cl.clobj.fits Observed − Galaxy
Template Spectrum Av = −1.4077837
Galaxy
S/N Gal = 0.703192
[O II]
Ca II
[O III]
Mg II, I
1.2
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
6000
7000
8000
9000
10000

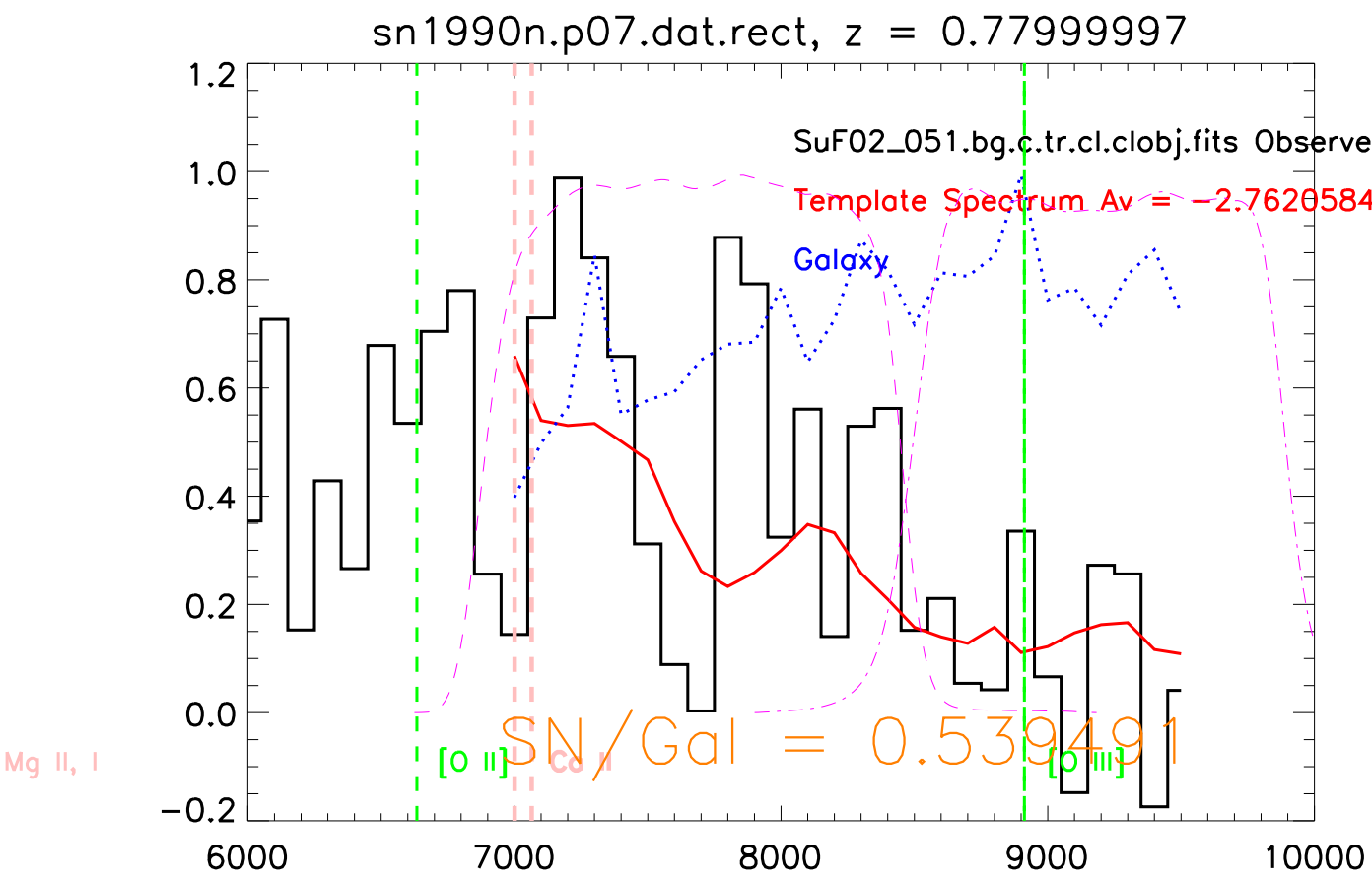

sn1990n.m14.dat.rect, z = 0.77999997
SuF02_051.bg.c.tr.cl.clobj.fits Observed − Galaxy
Template Spectrum Av = −4.7021886
Galaxy
SN/Gal = 0.536187
[O II]
Ca II
[O III]
Mg II, I
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

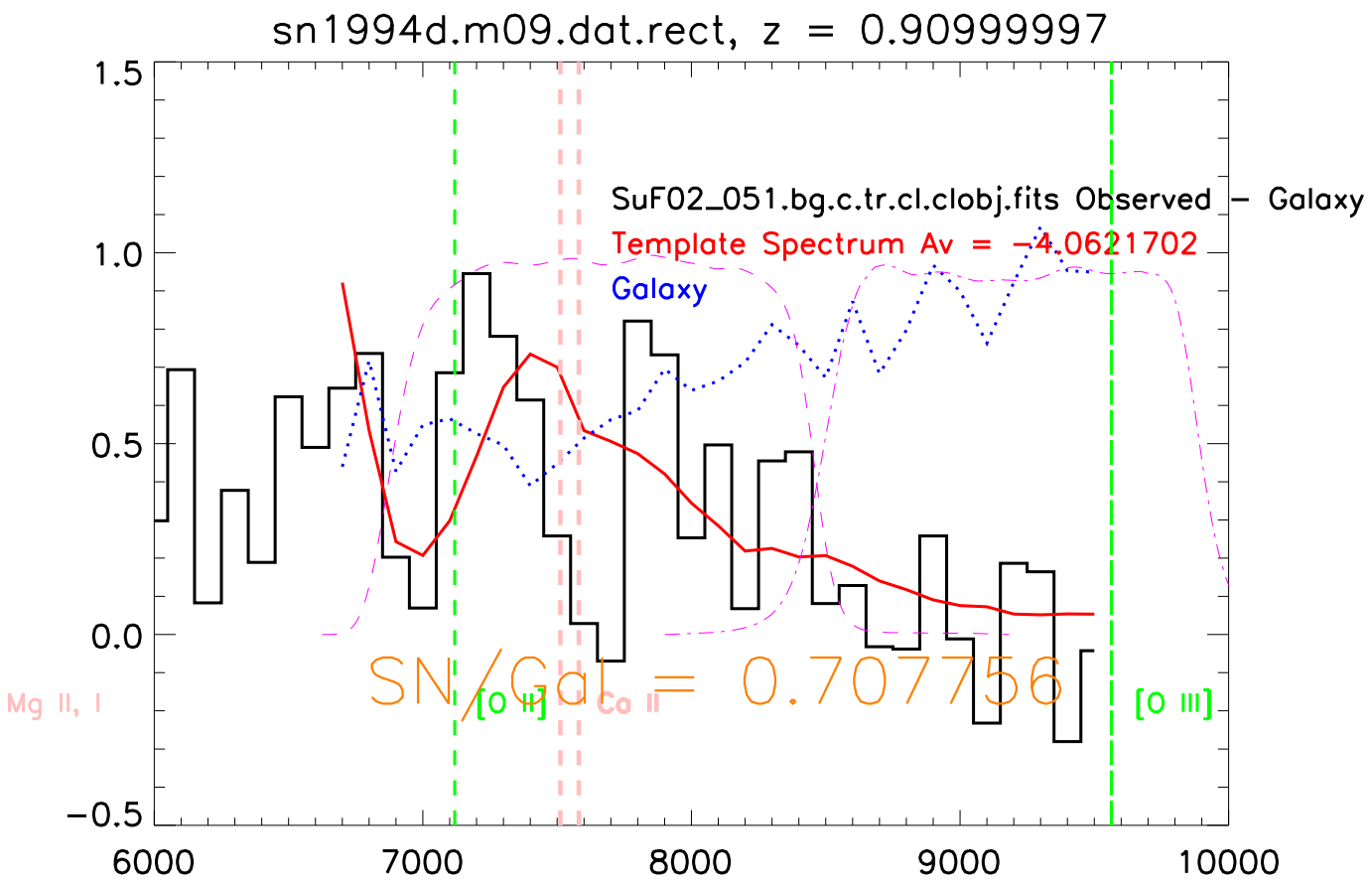

sn1990n.p14.dat.rect, z = 0.81999999
SuF02_051.bg.c.tr.cl.clobj.fits Observed − Galaxy
Template Spectrum Av = −4.3633459
Galaxy
SN/Gal = 0.882962
Mg II, I
[O II]
Ca II
[O III]
1.2
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
6000
7000
8000
9000
10000

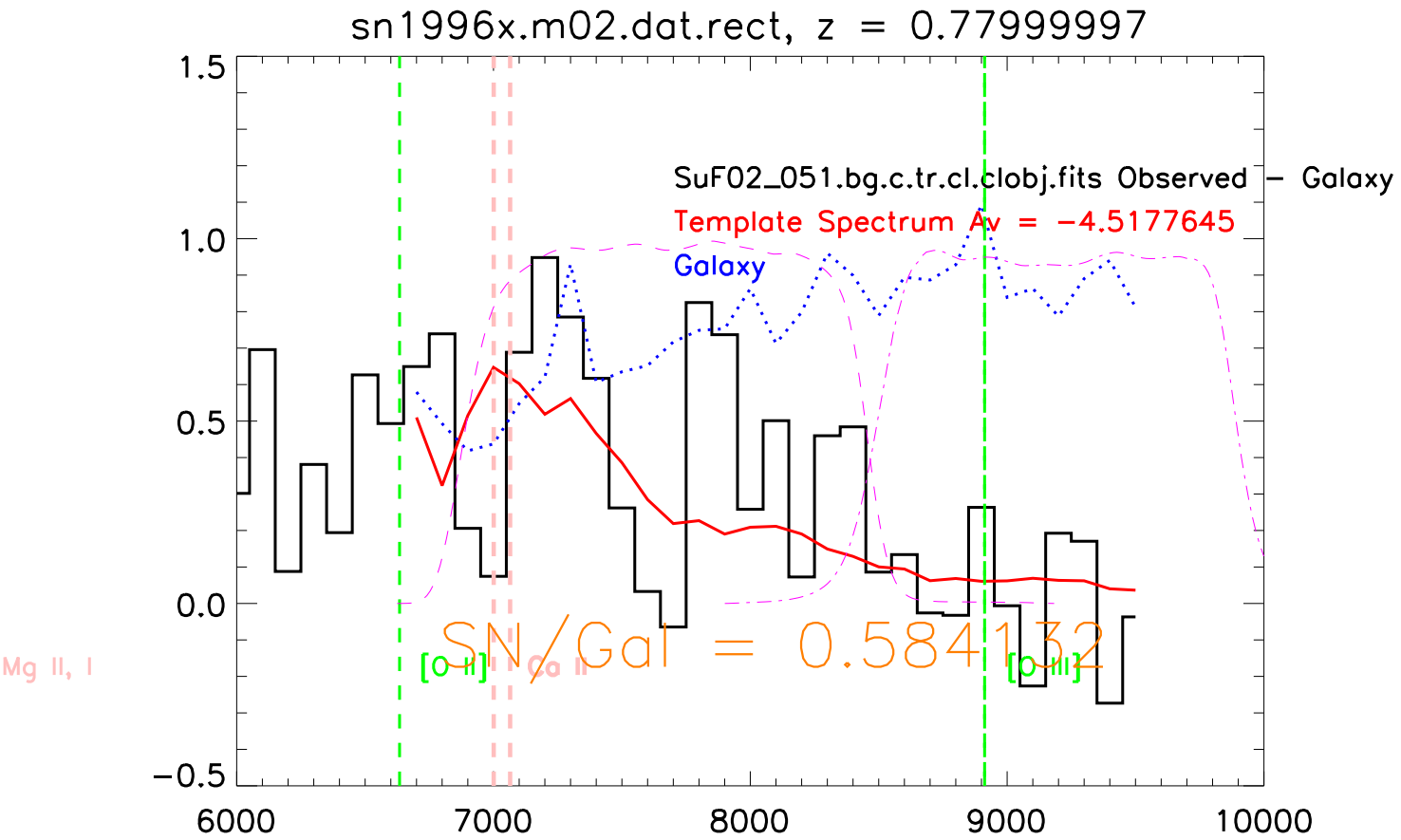

sn1994d.p14.dat.rect, z = 0.82999998
SuF02_051.bg.c.tr.cl.clobj.fits Observed – Galaxy
Template Spectrum Av = −5.7294253
Galaxy
SN/Gal = 0.879229
Mg II, I
[O II]
Ca II
[O III]
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

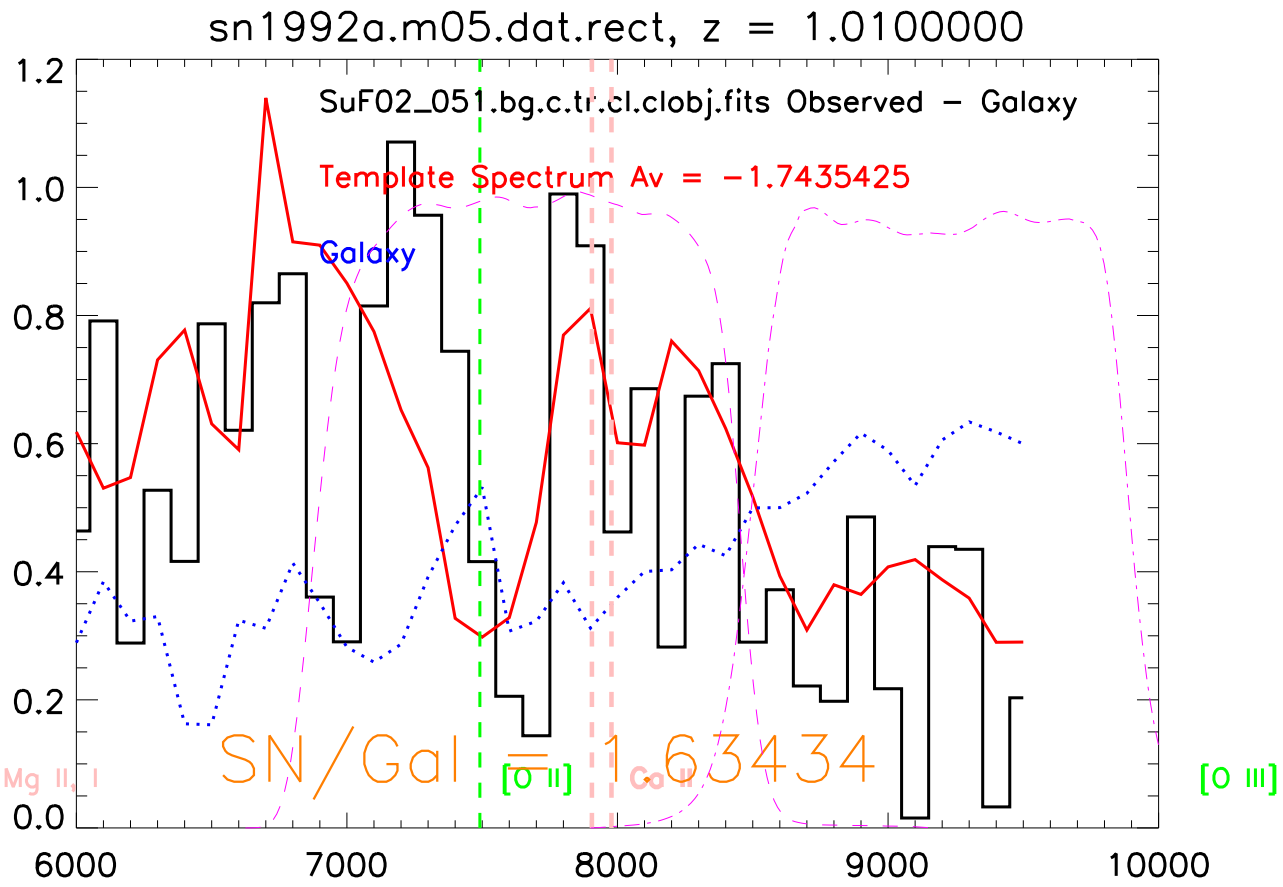

sn1990n.m07.dat.rect, z = 0.77999997
SuF02_051.bg.c.tr.cl.clobj.fits Observed − Galaxy
Template Spectrum Av = −1.3408334
Galaxy
SN/Gal = 0.699844
[O II]
Ca II
[O III]
Mg II, I
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

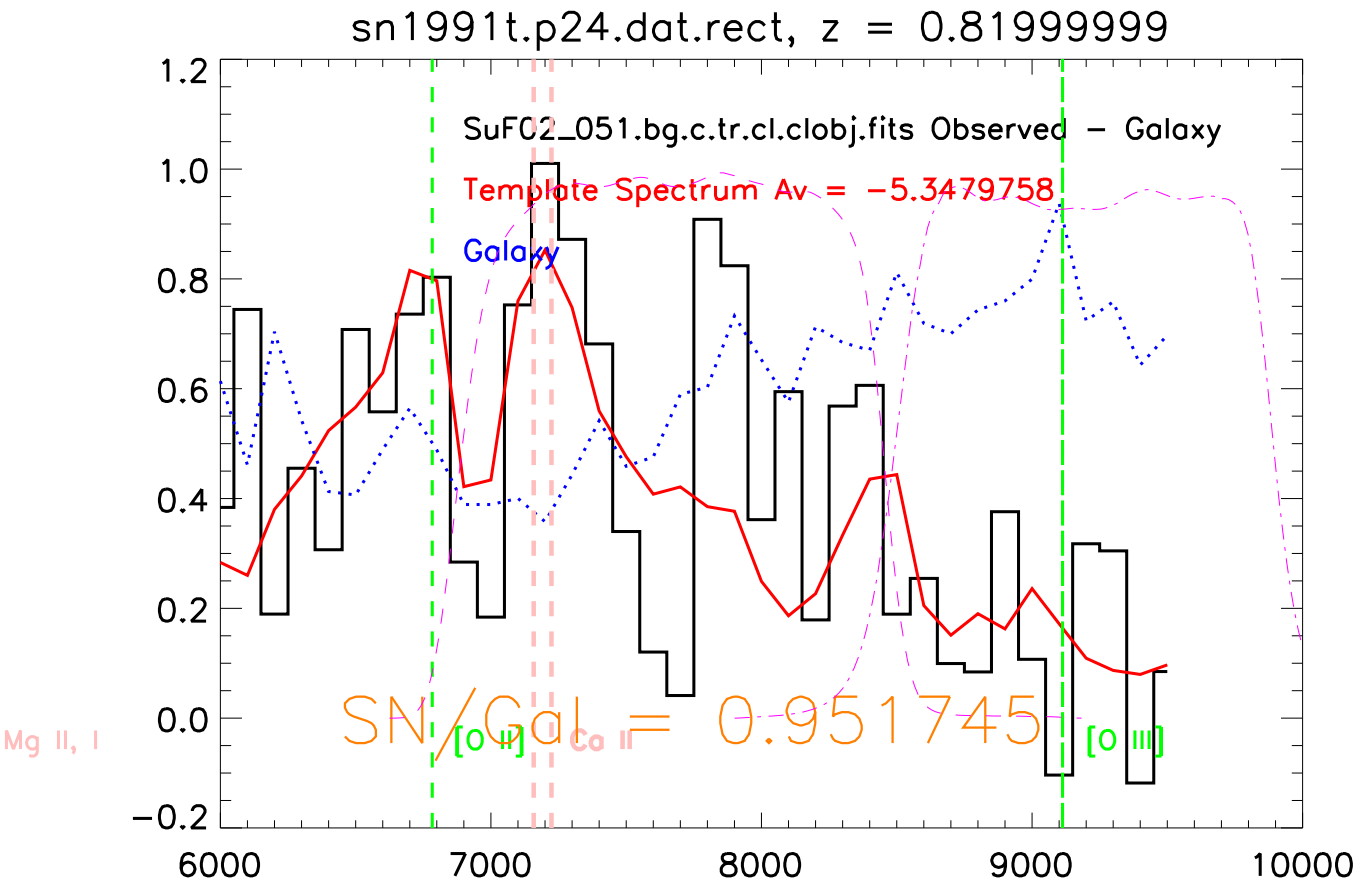

sn1994d.m07.dat.rect, z = 0.77999997
SuF02_051.bg.c.tr.cl.clobj.fits Observed − Galaxy
Template Spectrum Av = −3.4971393
Galaxy
SN/Gal = 0.565805
[O II]
Ca II
[O III]
Mg II, I
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

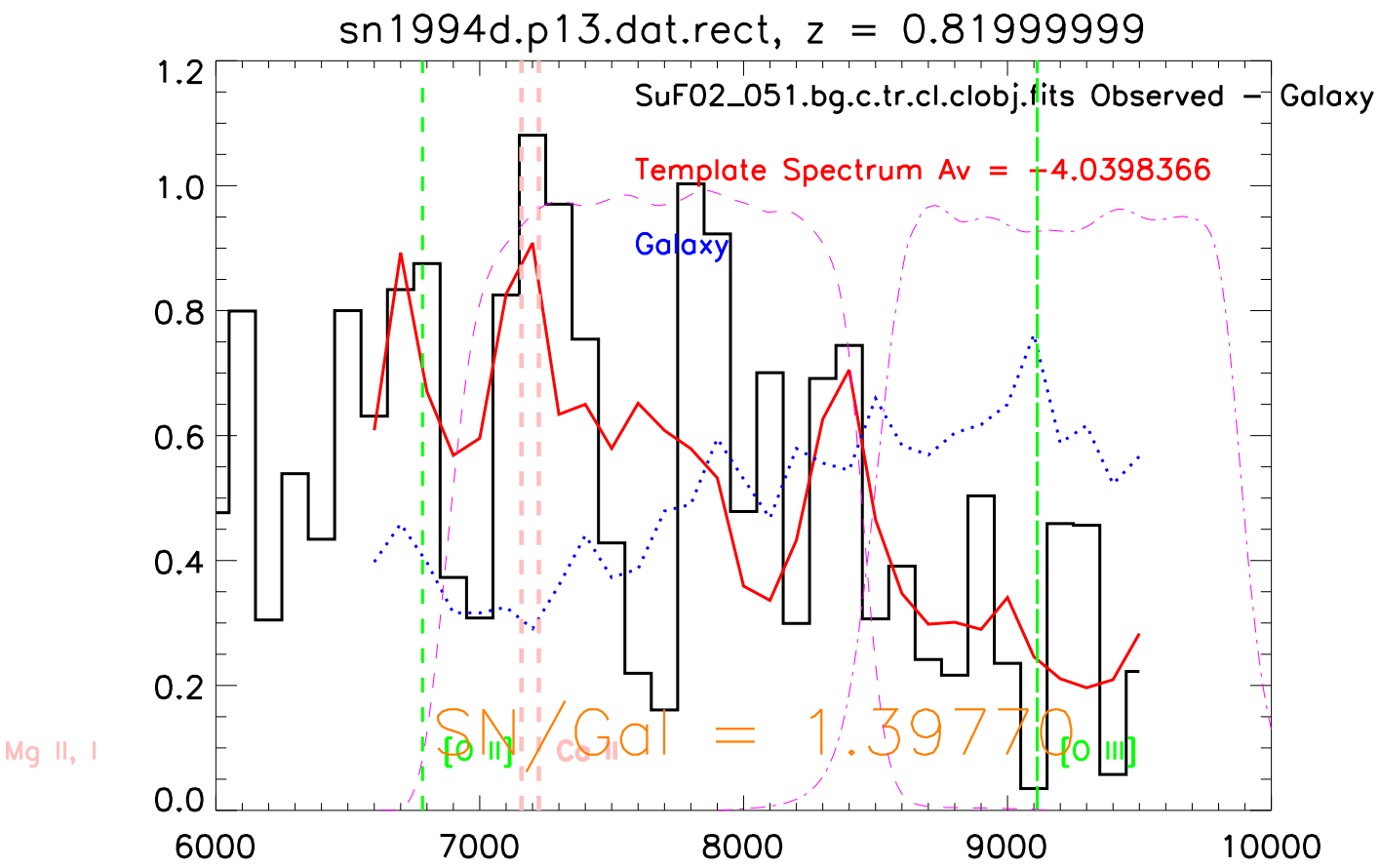

sn1990n.p07.dat.rect, z = 0.77999997
SuF02_051.bg.c.tr.cl.clobj.fits Observed – Galax
Template Spectrum Av = –2.7620584
Galaxy
SN/Gal = 0.539491
[O II]
[O III]
Mg II, I
1.2
1.0
0.8
0.6
0.4
0.2
0.0
–0.2
6000
7000
8000
9000
10000

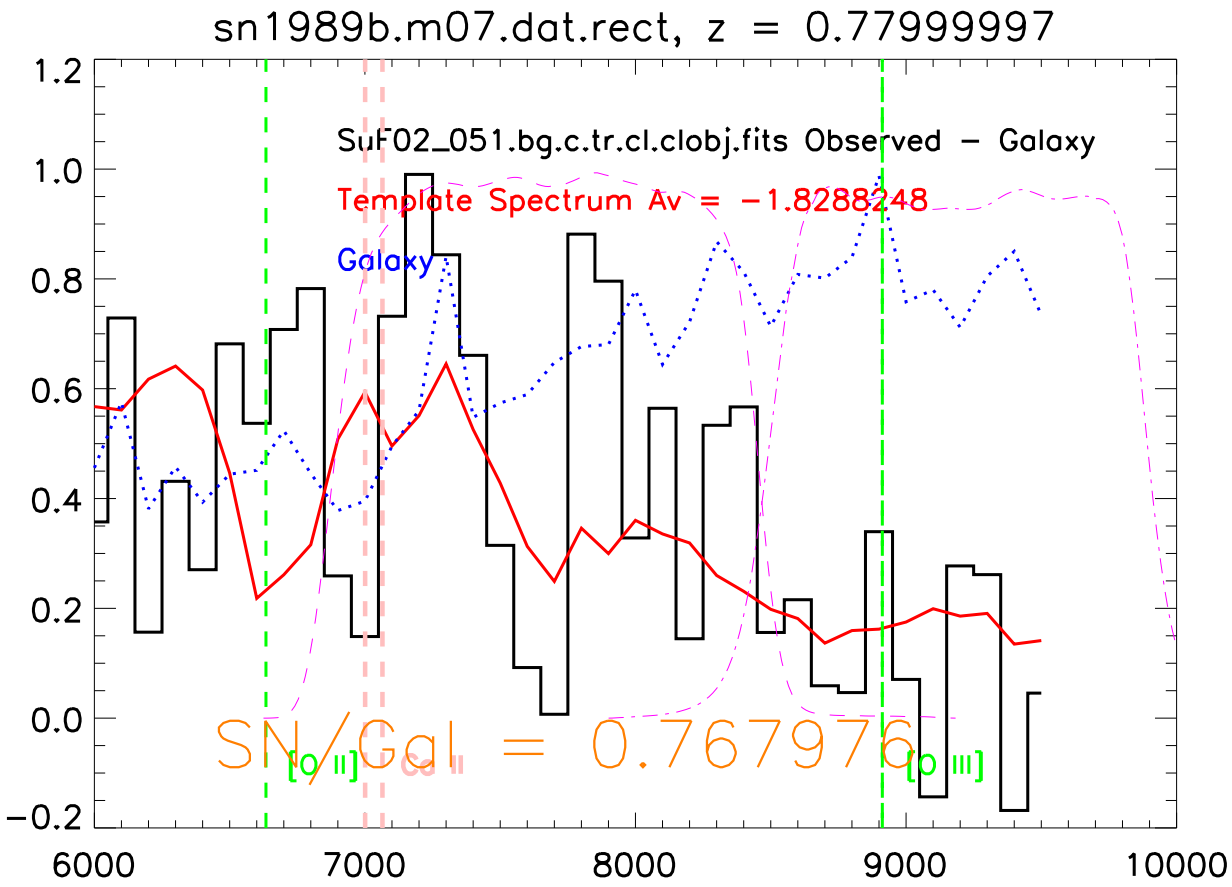

sn1994d.m09.dat.rect, z = 0.90999997
SuF02_051.bg.c.tr.cl.clobj.fits Observed − Galaxy
Template Spectrum Av = −4.0621702
Galaxy
SN/Gal = 0.707756
Mg II, I
[O II]
Co II
[O III]
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

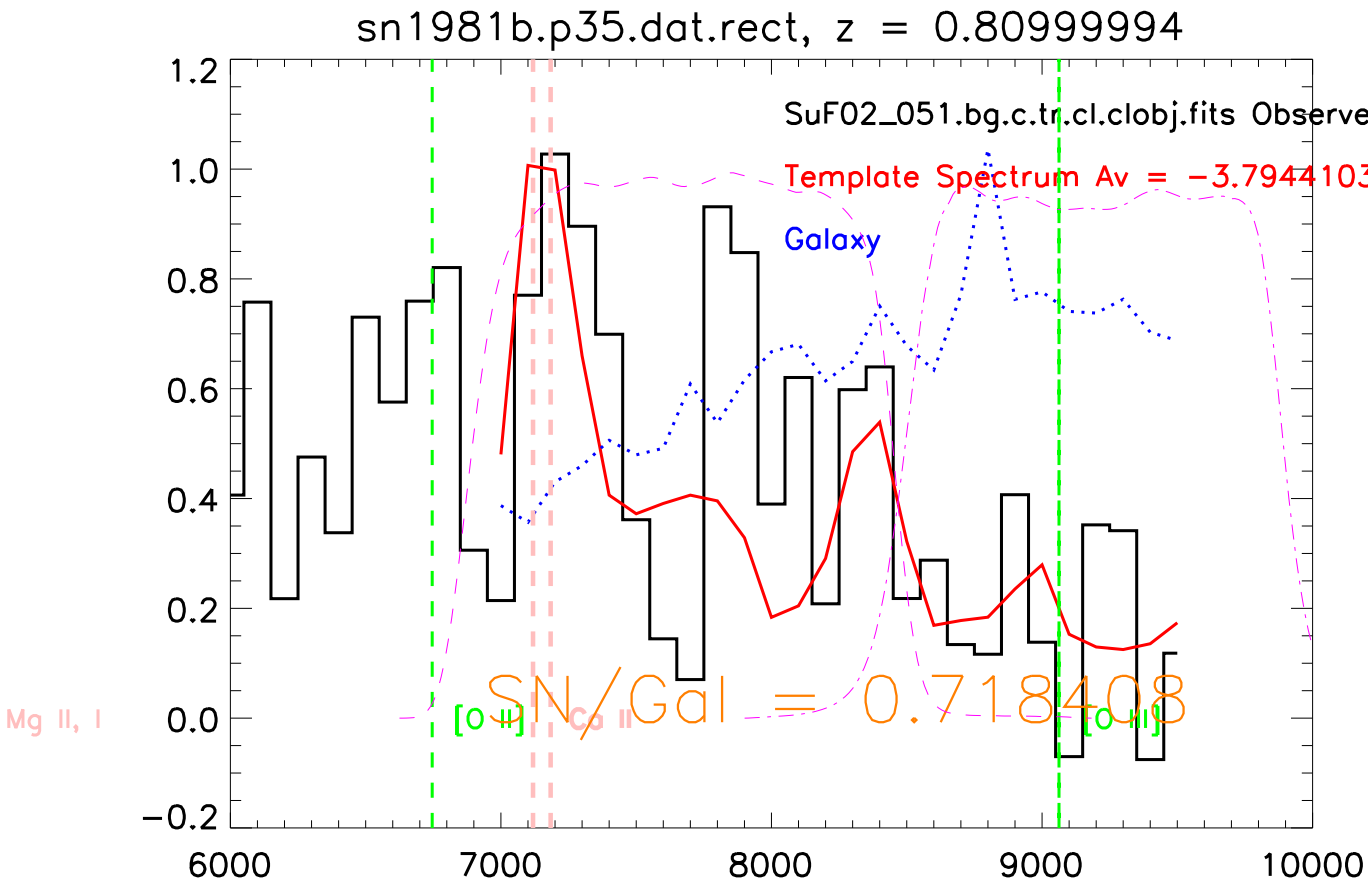

sn1996x.m02.dat.rect, z = 0.77999997
SuF02_051.bg.c.tr.cl.clobj.fits Observed
Galaxy
Template Spectrum Av = -4.5177645
Galaxy
SN/Gal = 0.584132
[O II]
Ca II
[O III]
Mg II, I
1.5
1.0
0.5
0.0
-0.5
6000
7000
8000
9000
10000

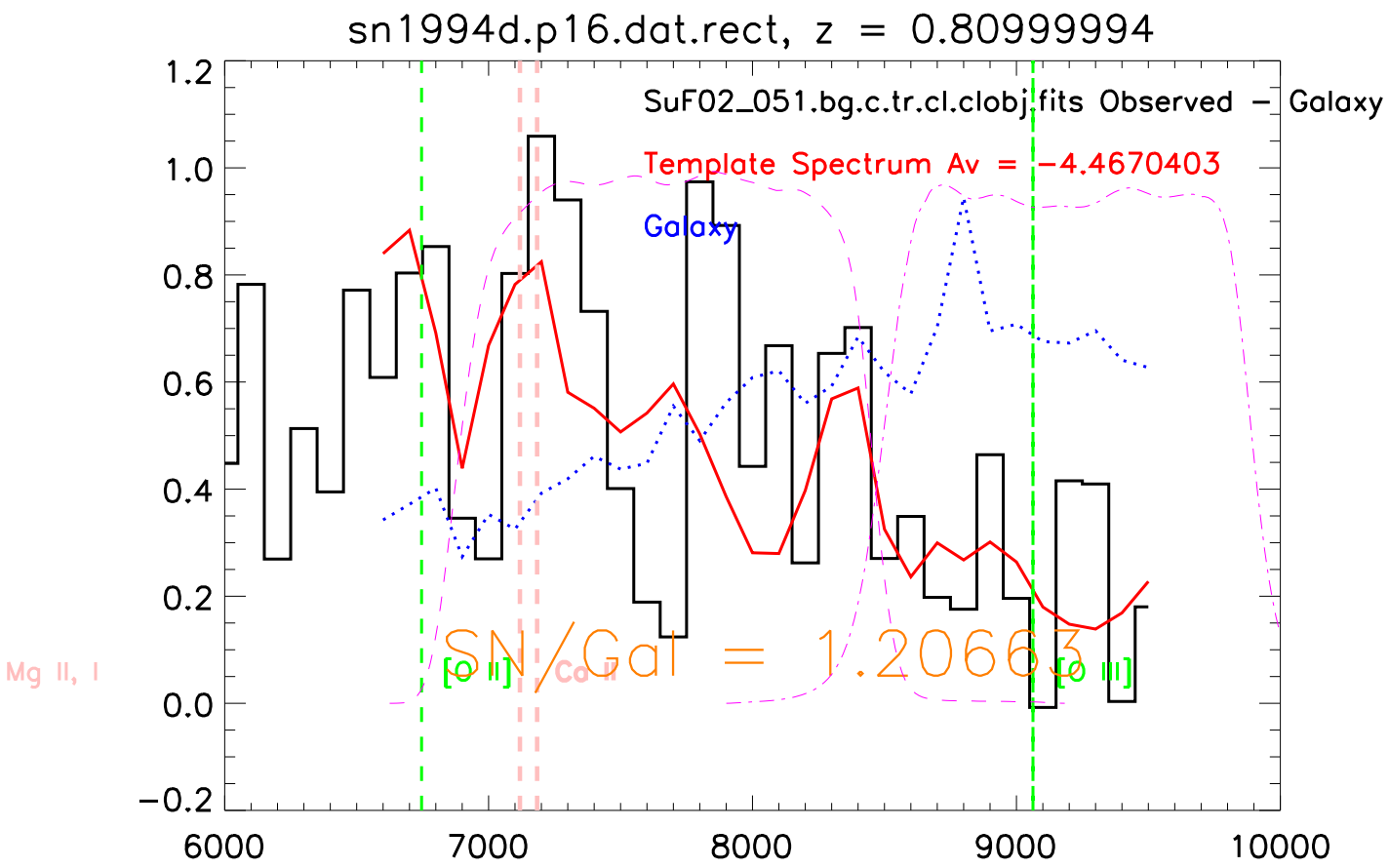

sn1992a.m05.dat.rect, z = 1.0100000
SuF02_051.bg.c.tr.cl.clobj.fits Observed – Galaxy
Template Spectrum Av = −1.7435425
Galaxy
SN/Gal = 1.63434
Mg II, I
[O II]
Ca II
[O III]
1.2
1.0
0.8
0.6
0.4
0.2
0.0
6000
7000
8000
9000
10000

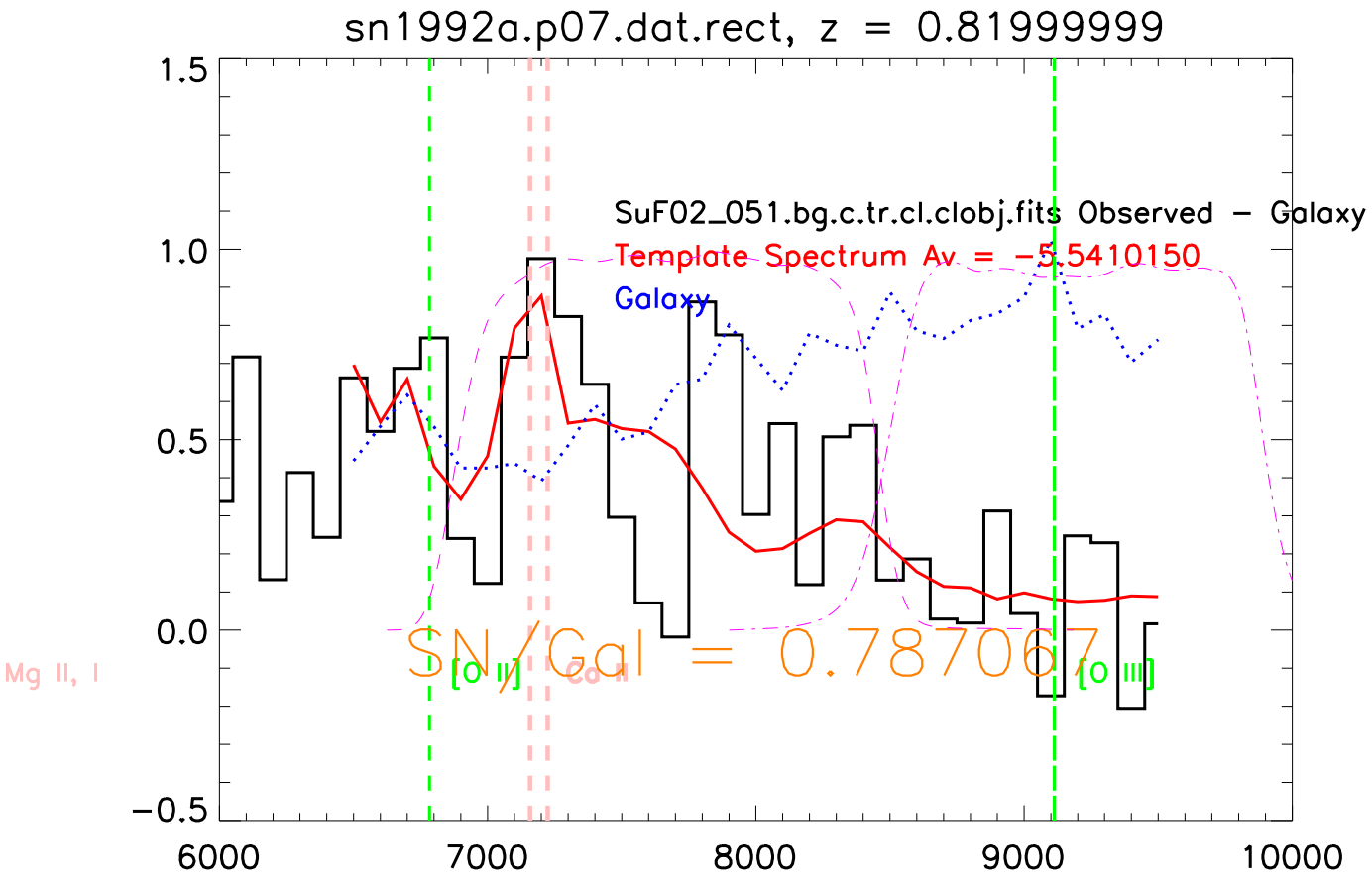

sn1991t.p24.dat.rect, z = 0.81999999
SuFC2_051.bg.c.tr.cl.clobj.fits Observed – Galaxy
Template Spectrum Av = -5.3479758
Galaxy
SN/Gal = 0.951745
[O II]
Ca II
[O III]
Mg II, I
1.2
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
6000
7000
8000
9000
10000

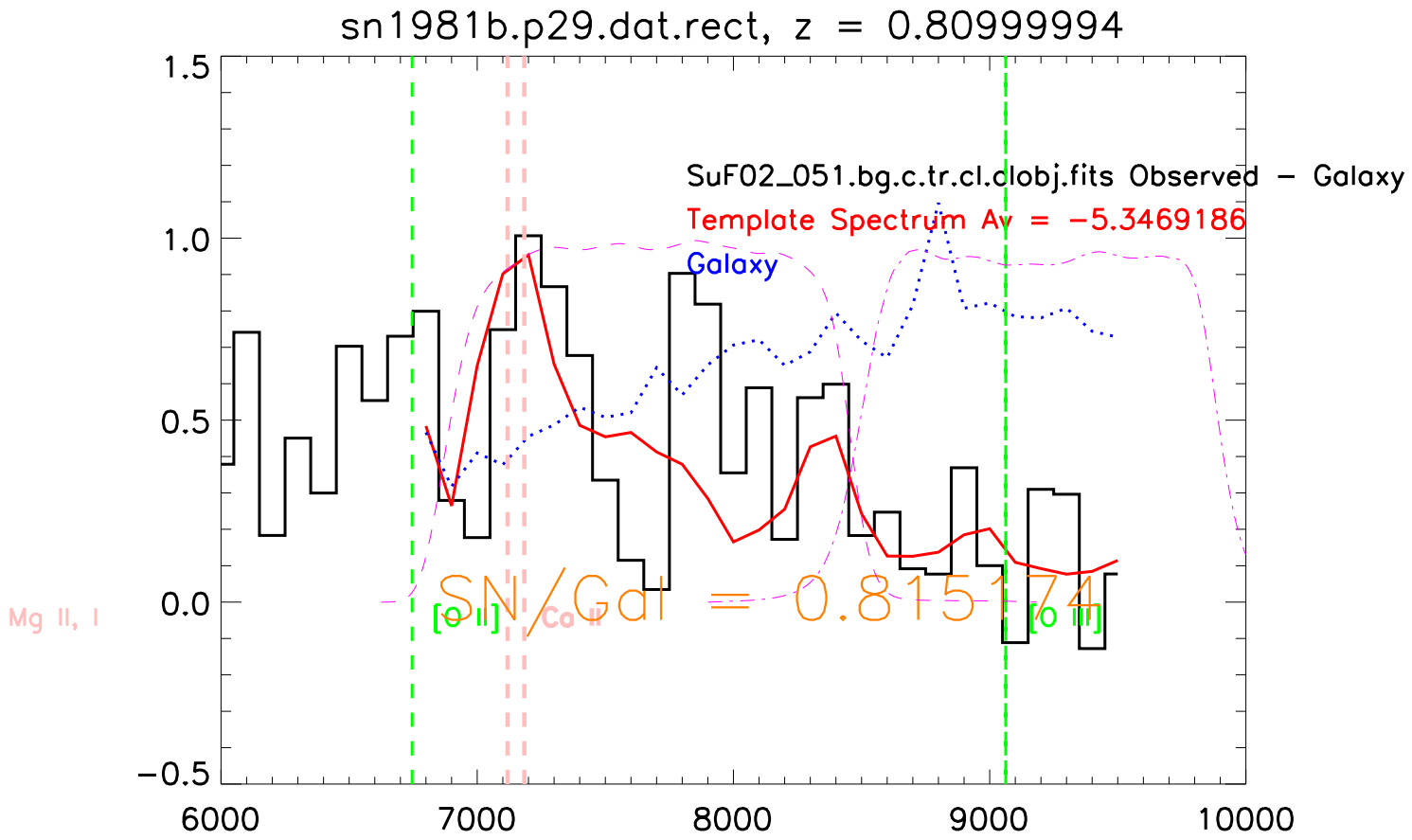

sn1994d.p13.dat.rect, z = 0.81999999
SuF02_051.bg.c.tr.cl.clobj.fits Observed
Galaxy
Template Spectrum Av = 4.0398366
Galaxy
SN/Gal = 1.39770
[O II]
[O III]
1.2
1.0
0.8
0.6
0.4
0.2
0.0
6000
7000
8000
9000
10000

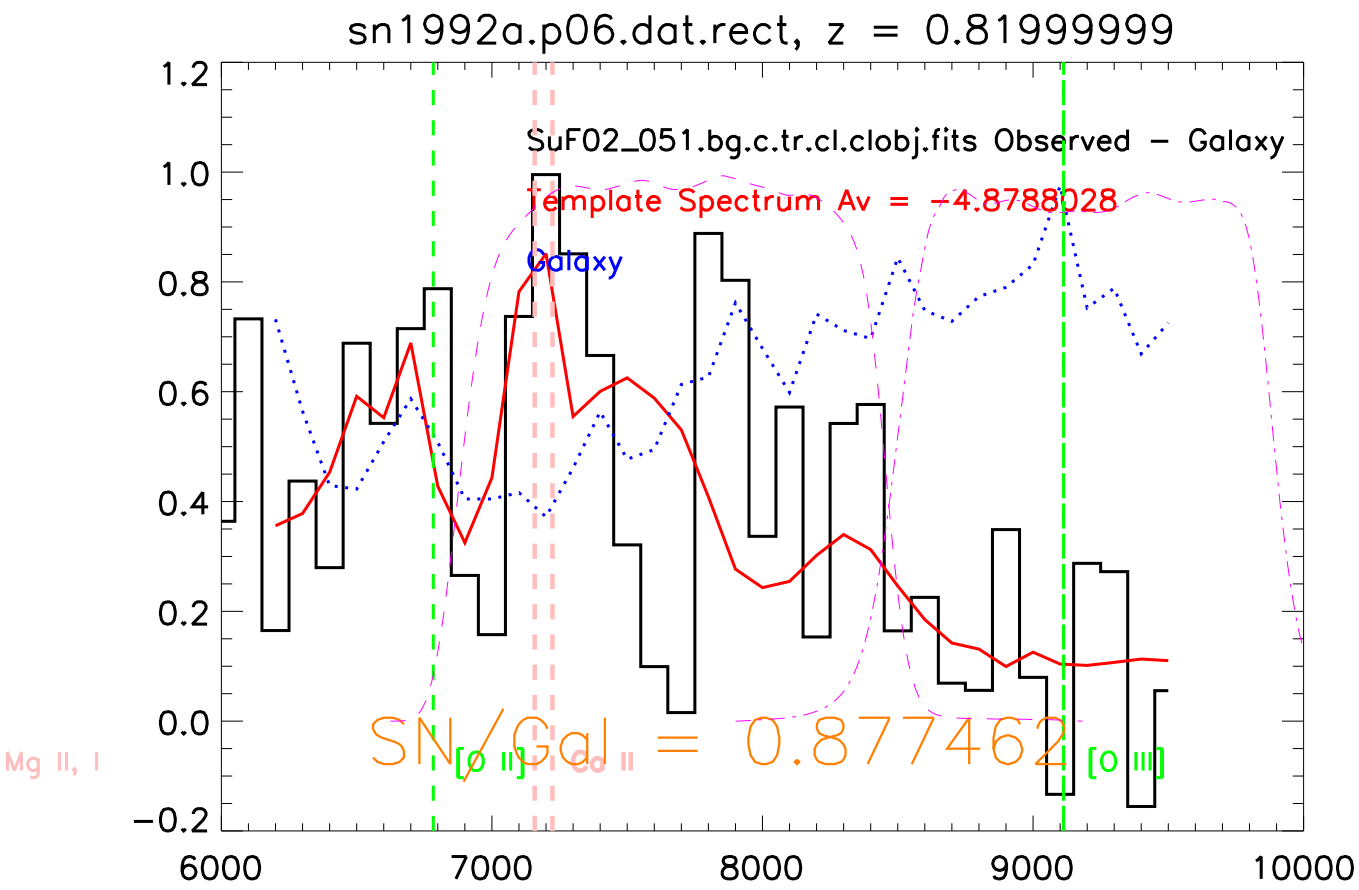

sn1989b.m07.dat.rect, z = 0.77999997
SuF02_051.bg.c.tr.cl.clobj.fits Observed − Galaxy
Template Spectrum Av = −1.8288248
Galaxy
SN/Gal = 0.767976
[O II]
Ca II
[O III]
Mg II, I
1.2
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
6000
7000
8000
9000
10000

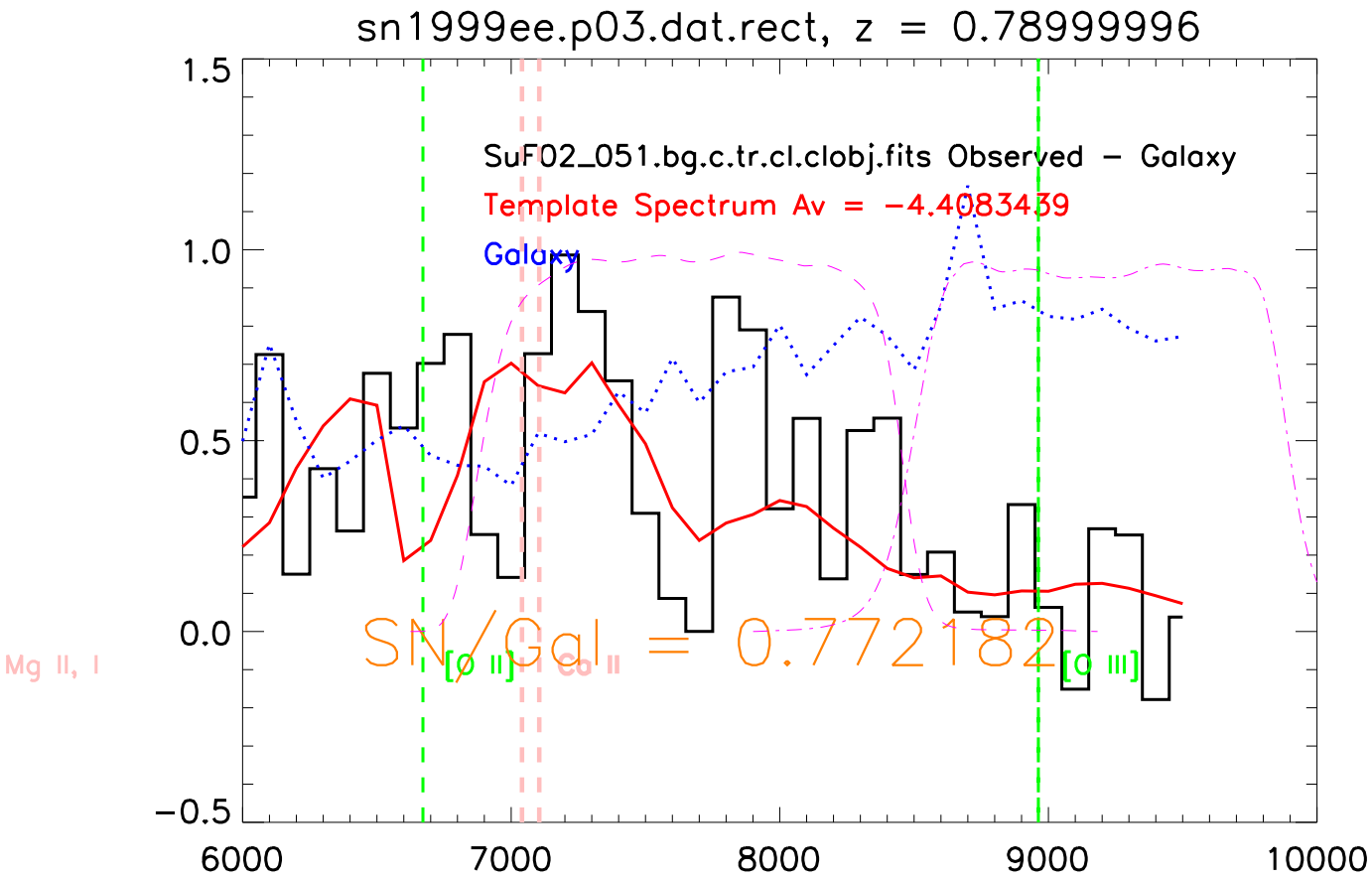

sn1981b.p35.dat.rect, z = 0.80999994
SuF02_051.bg.c.tr.cl.clobj.fits Observed – Galax
Template Spectrum Av = −3.7944103
Galaxy
SN/Gal = 0.718408
Mg II, I
[O II]
Ca II
[O III]
1.2
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
6000
7000
8000
9000
10000

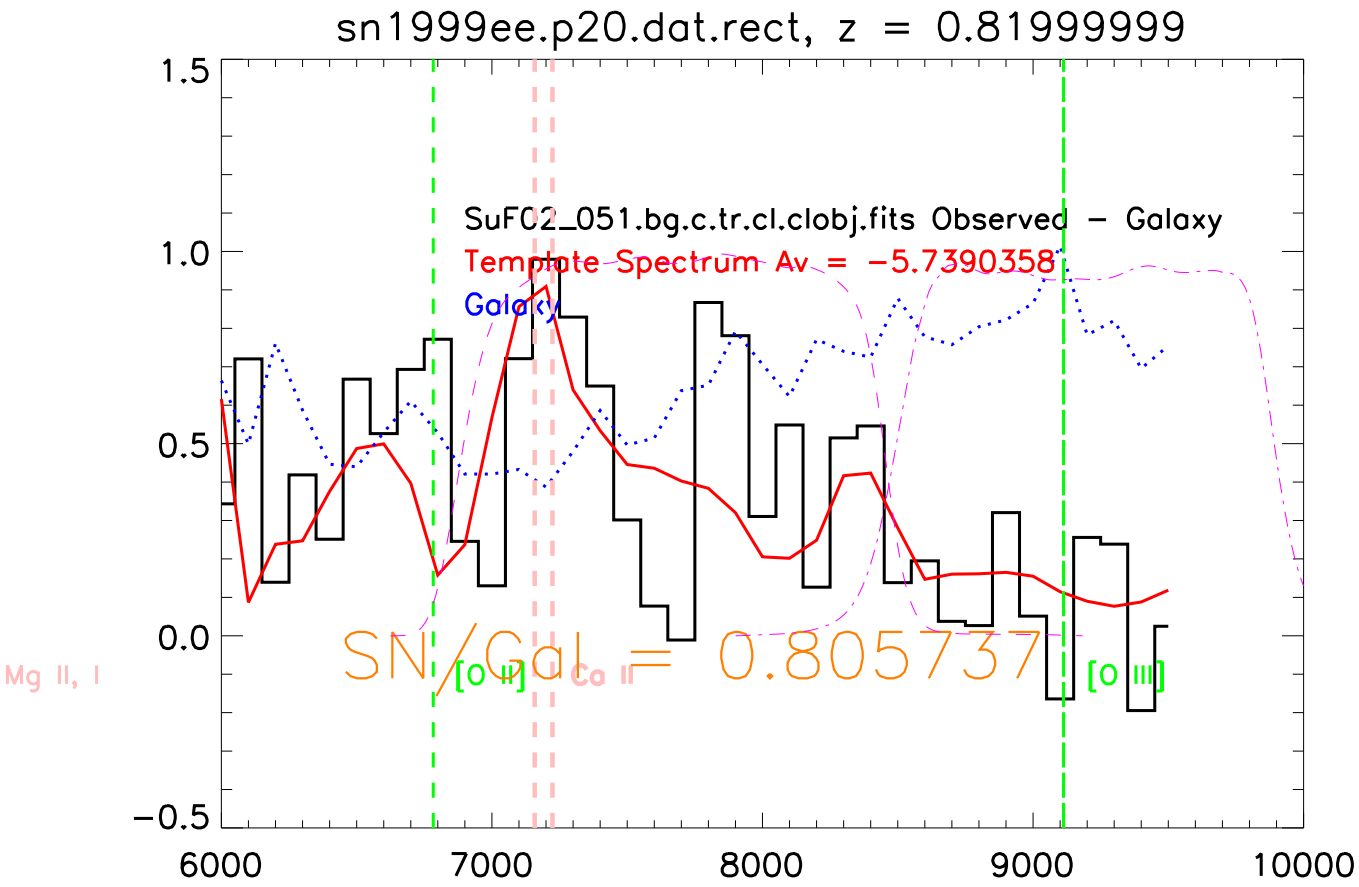

sn1994d.p16.dat.rect, z = 0.80999994
SuF02_051.bg.c.tr.cl.clobj.fits Observed
Galaxy
Template Spectrum Av = -4.4670403
Galaxy
SN/Gal = 1.20663
Mg II, I
[O II]
Ca II
[O III]
1.2
1.0
0.8
0.6
0.4
0.2
0.0
-0.2
6000
7000
8000
9000
10000

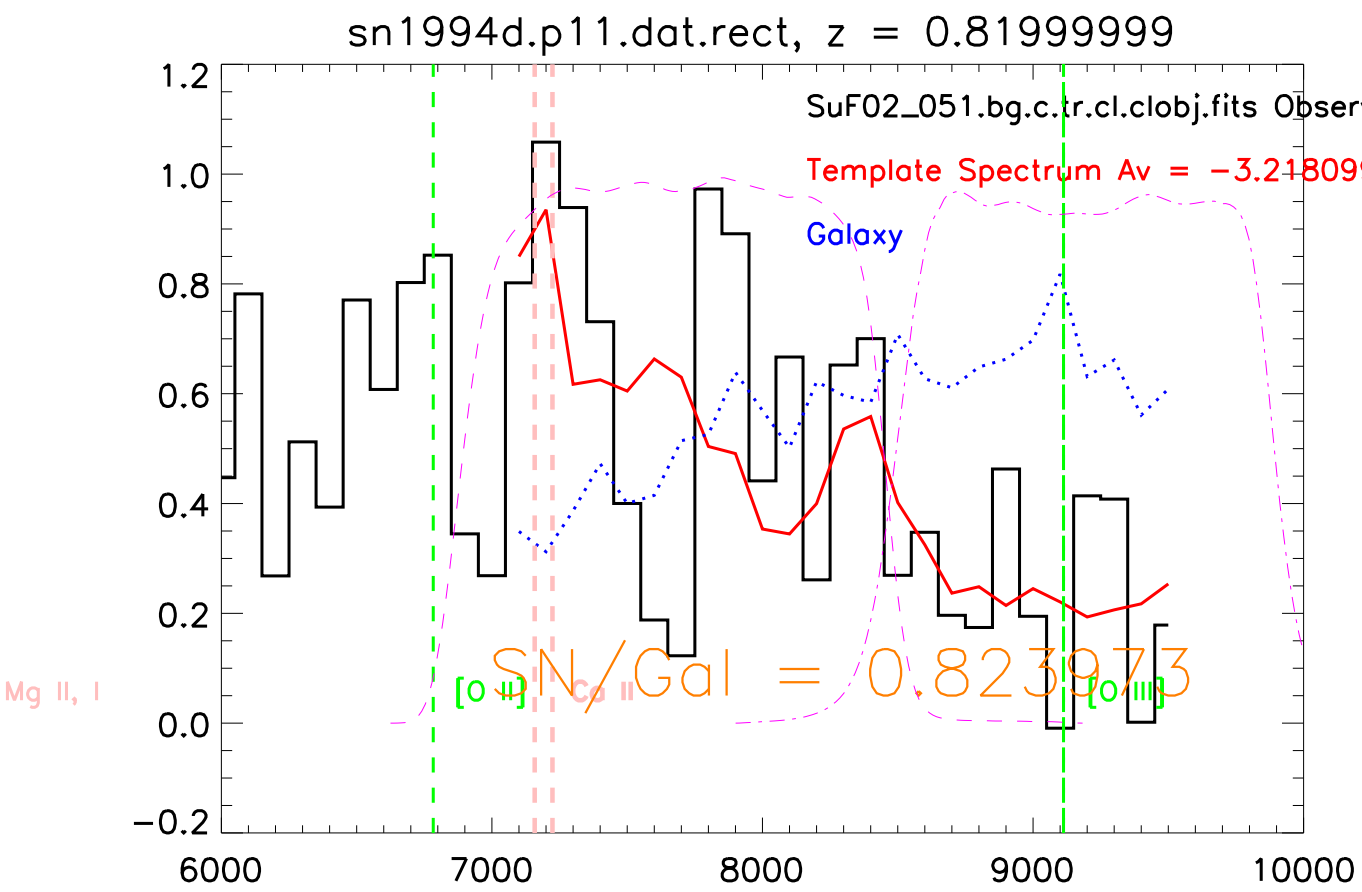

sn1992a.p07.dat.rect, z = 0.81999999
SuF02_051.bg.c.tr.cl.clobj.fits Observed – Galaxy
Template Spectrum Av = −5.5410150
Galaxy
SN/Gal = 0.787067
Mg II, I
[O II]
Ca II
[O III]
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

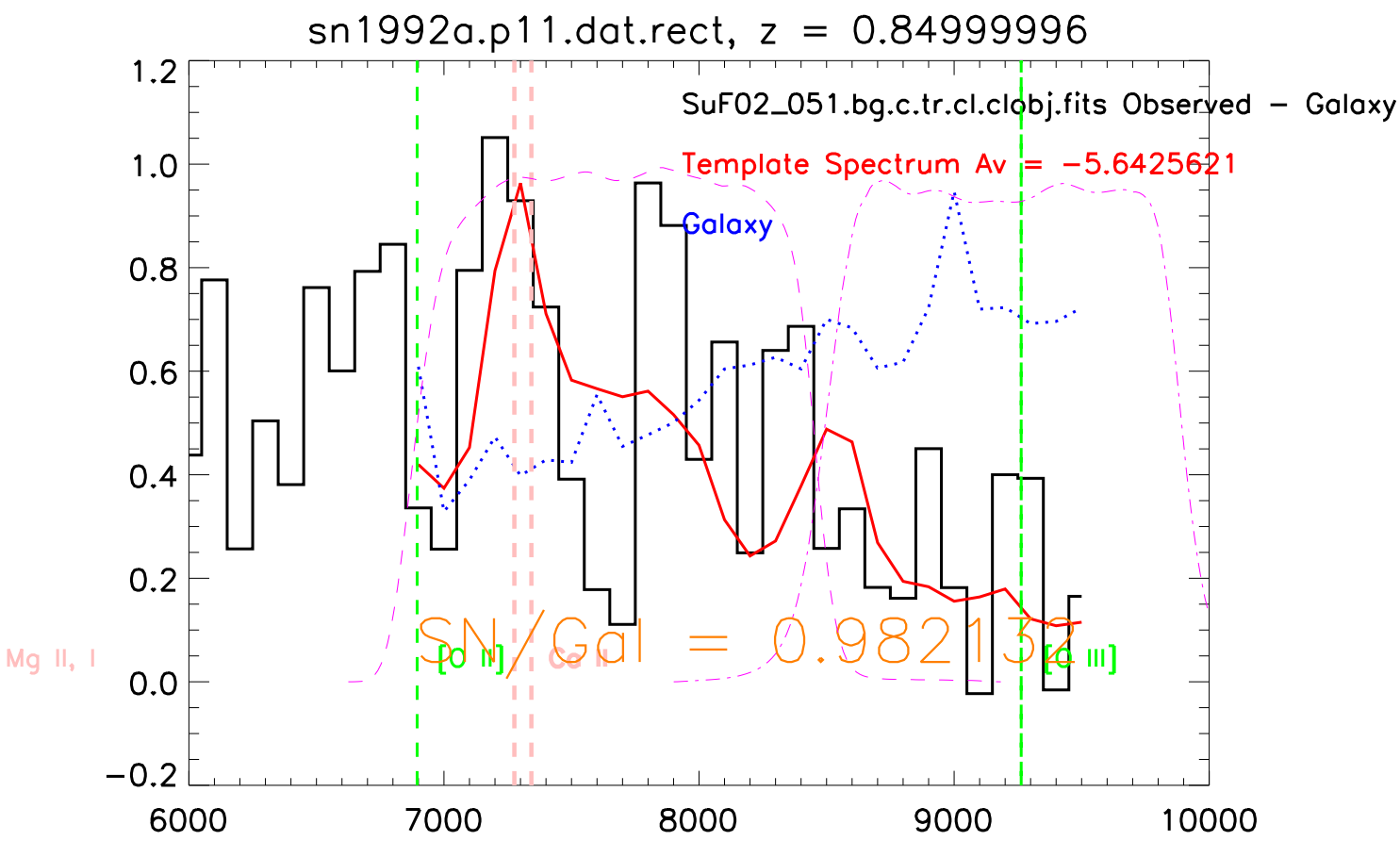

sn1981b.p29.dat.rect, z = 0.80999994
SuF02_051.bg.c.tr.cl.dlobj.fits Observed – Galaxy
Template Spectrum Av = −5.3469186
Galaxy
SN/Gal = 0.8151174
Mg II, I
[O II]
Ca II
[O III]
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

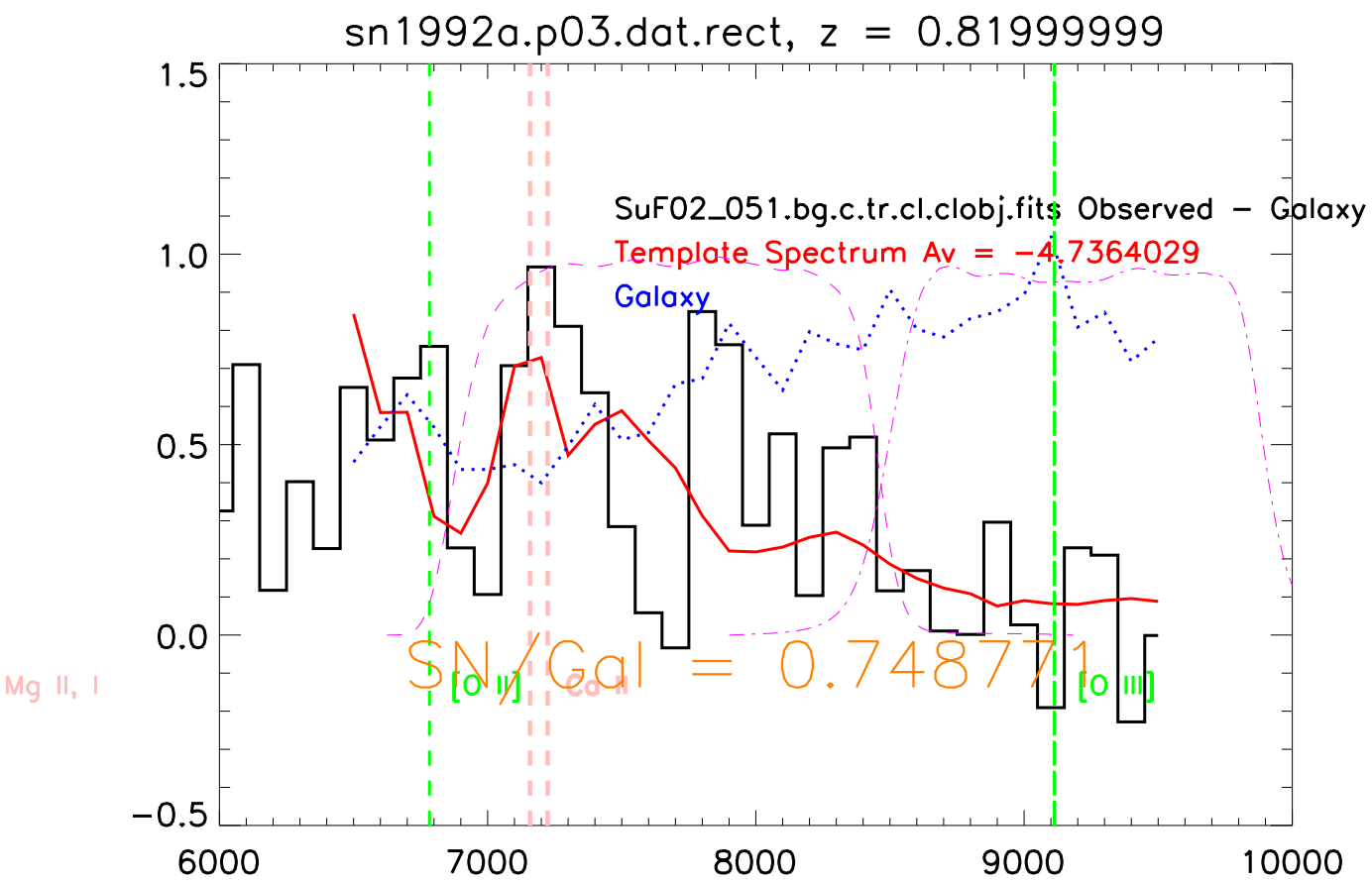

sn1992a.p06.dat.rect, z = 0.81999999
SuF02_051.bg.c.tr.cl.clobj.fits Observed − Galaxy
Template Spectrum Av = −4.8788028
Galaxy
SN/Gal = 0.877462
[O II]
Ca II
[O III]
Mg II, I
1.2
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
6000
7000
8000
9000
10000

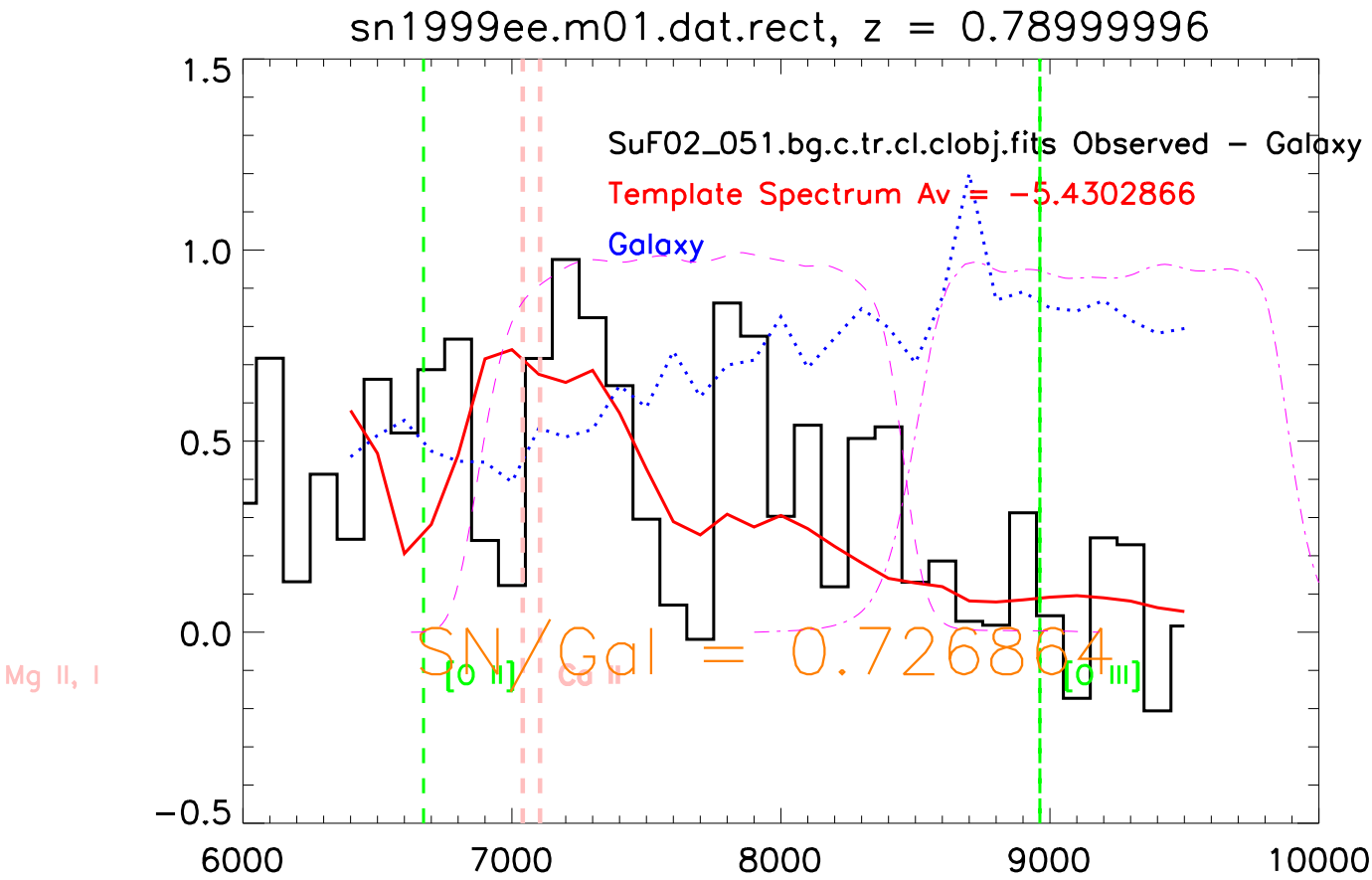

sn1999ee.p03.dat.rect, z = 0.78999996
SuF02_051.bg.c.tr.cl.clobj.fits Observed − Galaxy
Template Spectrum Av = −4.4083439
Galaxy
SN/Gal = 0.772182
[O II]
Ca II
[O III]
Mg II, I
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

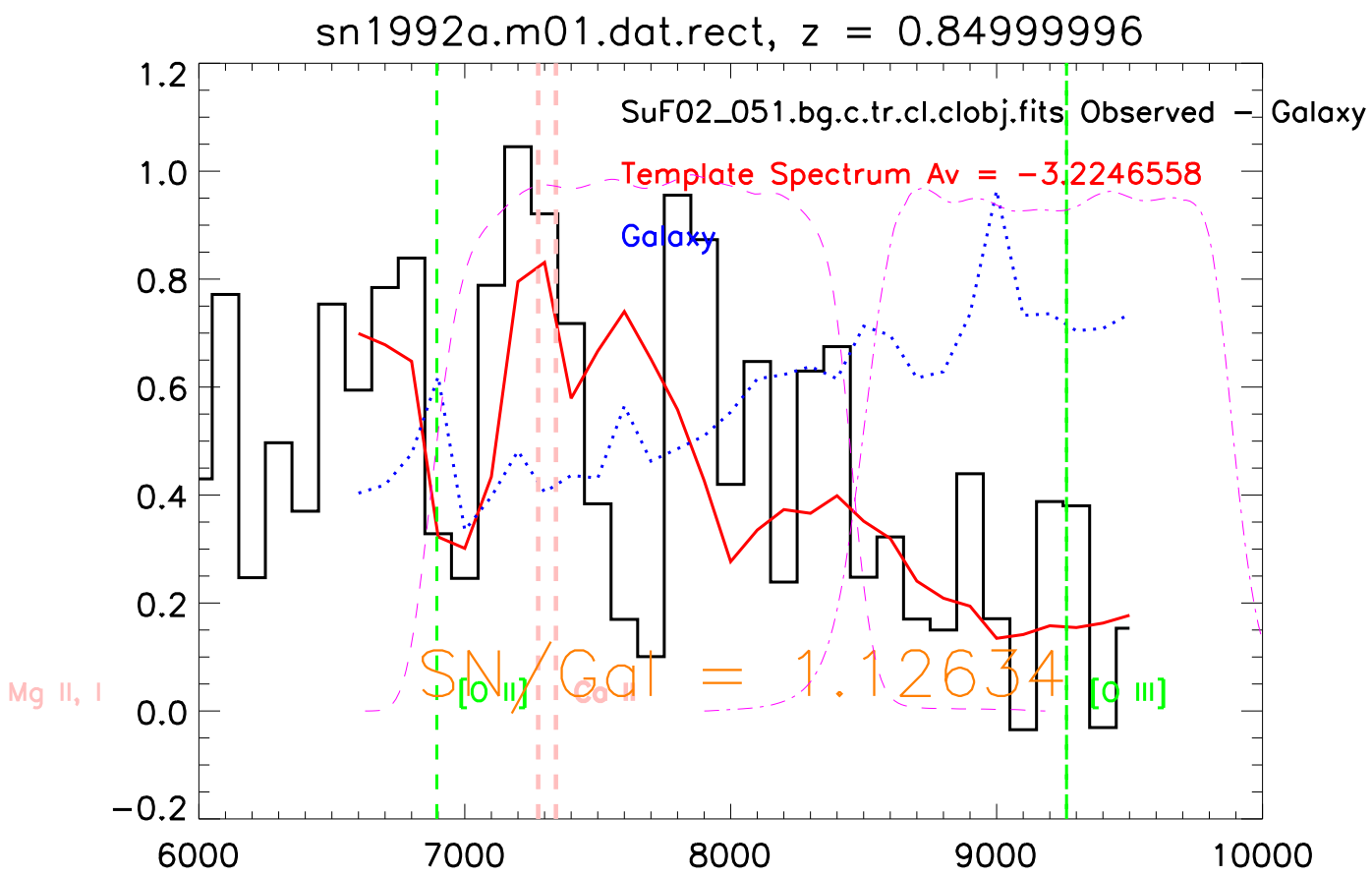

sn1999ee.p20.dat.rect, z = 0.81999999
SuFC2_051.bg.c.tr.cl.clobj.fits Observed − Galaxy
Template Spectrum Av = −5.7390358
Galaxy
SN/Gal = 0.805737
Mg II, I
[O II]
Ca II
[O III]
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

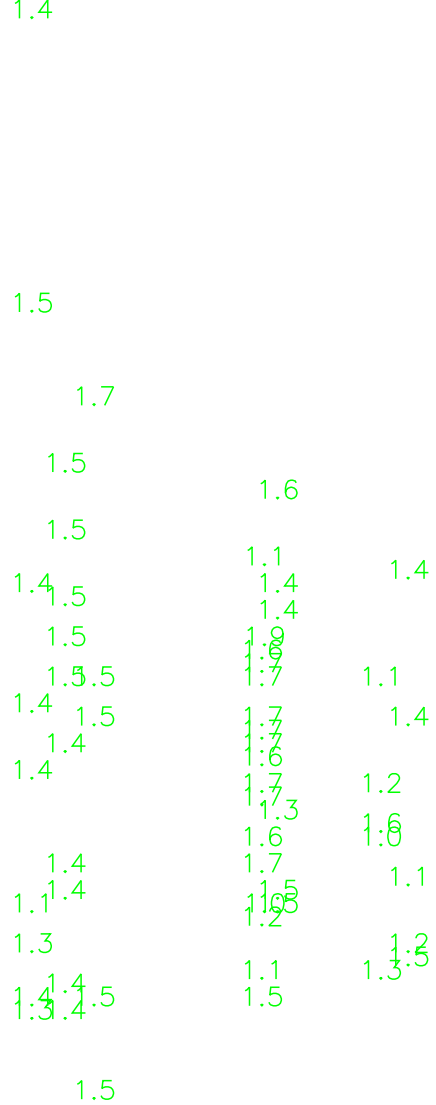

sn1994d.p11.dat.rect, z = 0.81999999
SuF02_051.bg.c.tr.cl.clobj.fits Observed – Ga
Template Spectrum Av = −3.2180995
Galaxy
SN/Gal = 0.8239773
Mg II, I
[O II]
Ca II
[O III]
1.2
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
6000
7000
8000
9000
10000


sn1992a.p11.dat.rect, z = 0.84999996
SuF02_051.bg.c.tr.cl.clobj.fits Observed – Galaxy
Template Spectrum Av = −5.6425621
Galaxy
SN/Gal = 0.982132
Mg II, I
[O II]
Ca II
[O III]
1.2
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
6000
7000
8000
9000
10000


sn1992a.p03.dat.rect, z = 0.81999999
SuF02_051.bg.c.tr.cl.clobj.fits Observed − Galaxy
Template Spectrum Av = −4.7364029
Galaxy
S/N/Gal = 0.748771
Mg II, I
[O II]
Ca II
[O III]
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000


sn1999ee.m01.dat.rect, z = 0.78999996
SuF02_051.bg.c.tr.cl.clobj.fits Observed − Galaxy
Template Spectrum Av = −5.4302866
Galaxy
SN/Gal = 0.726864
[O II]
Ca II
[O III]
Mg II, I
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000


sn1992a.m01.dat.rect, z = 0.84999996
SuF02_051.bg.c.tr.cl.clobj.fits Observed
Galaxy
Template Spectrum Av = -3.2246558
Galaxy
SN/Gal = 1.12634
[O II]
[O III]
Mg II, I
1.2
1.0
0.8
0.6
0.4
0.2
0.0
-0.2
6000
7000
8000
9000
10000


1.4
1.5
1.7
1.5
1.6
1.5
1.1
1.4
1.4
1.5
1.4
1.5
1.9
1.6
1.7
1.5
1.5
1.7
1.1
1.4
1.5
1.7
1.4
1.7
1.4
1.6
1.4
1.7
1.2
1.7
1.3
1.6
1.6
1.0
1.4
1.7
1.1
1.4
1.5
1.1
1.6
1.2
1.3
1.2
1.5
1.1
1.3
1.4
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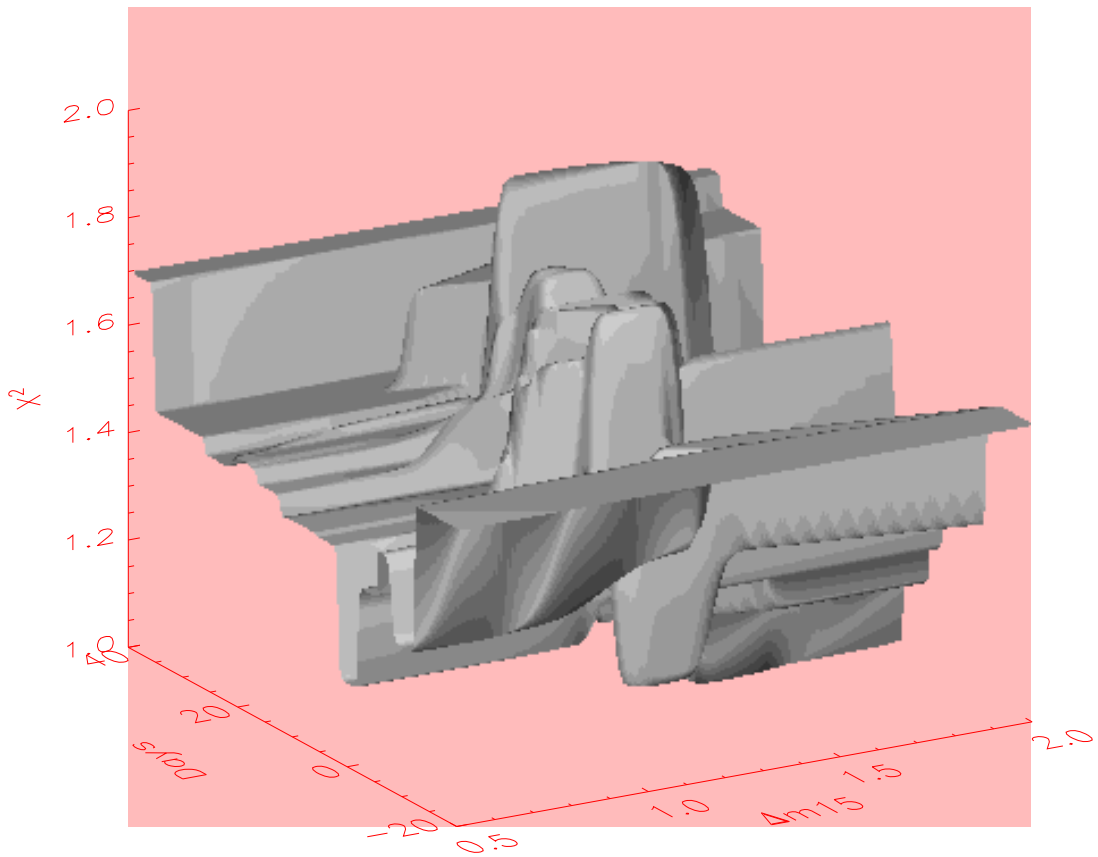
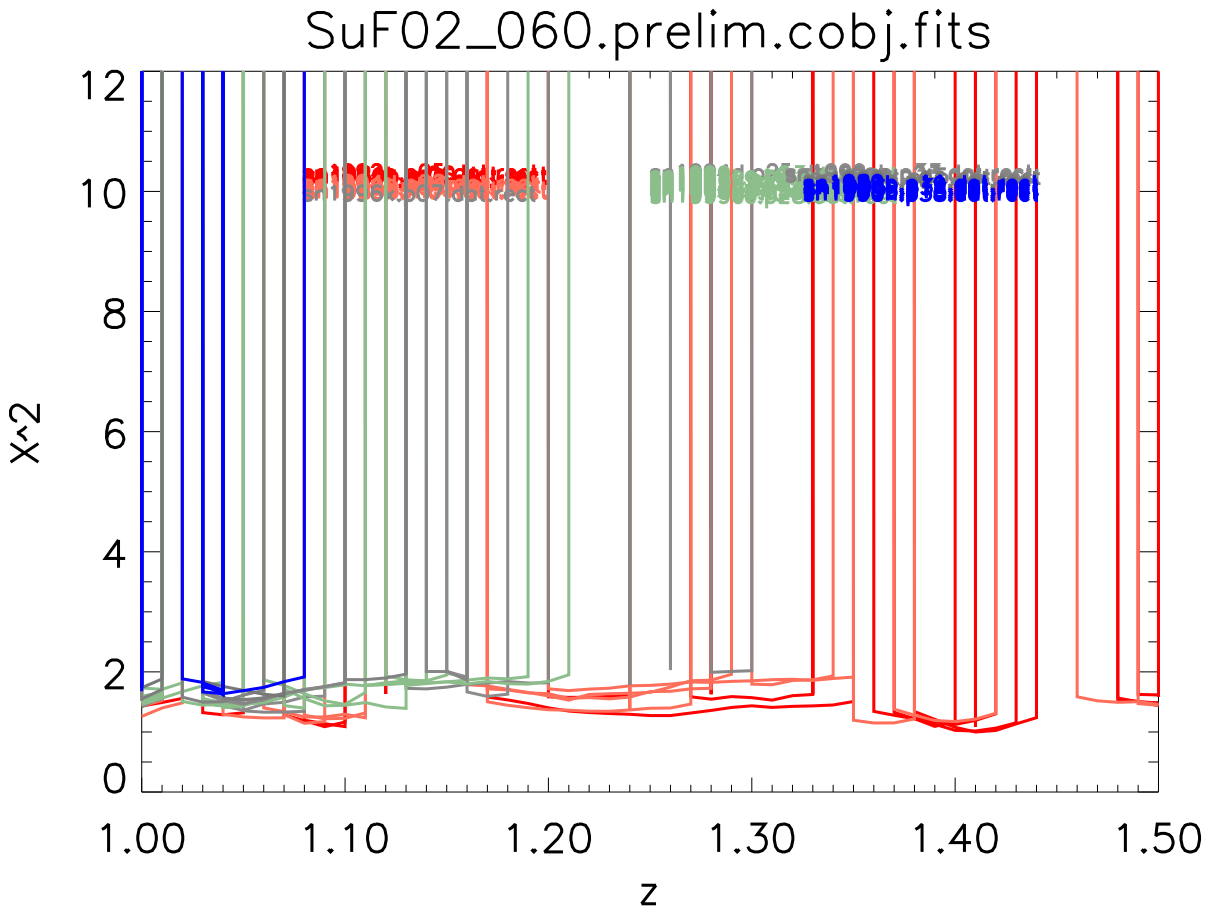
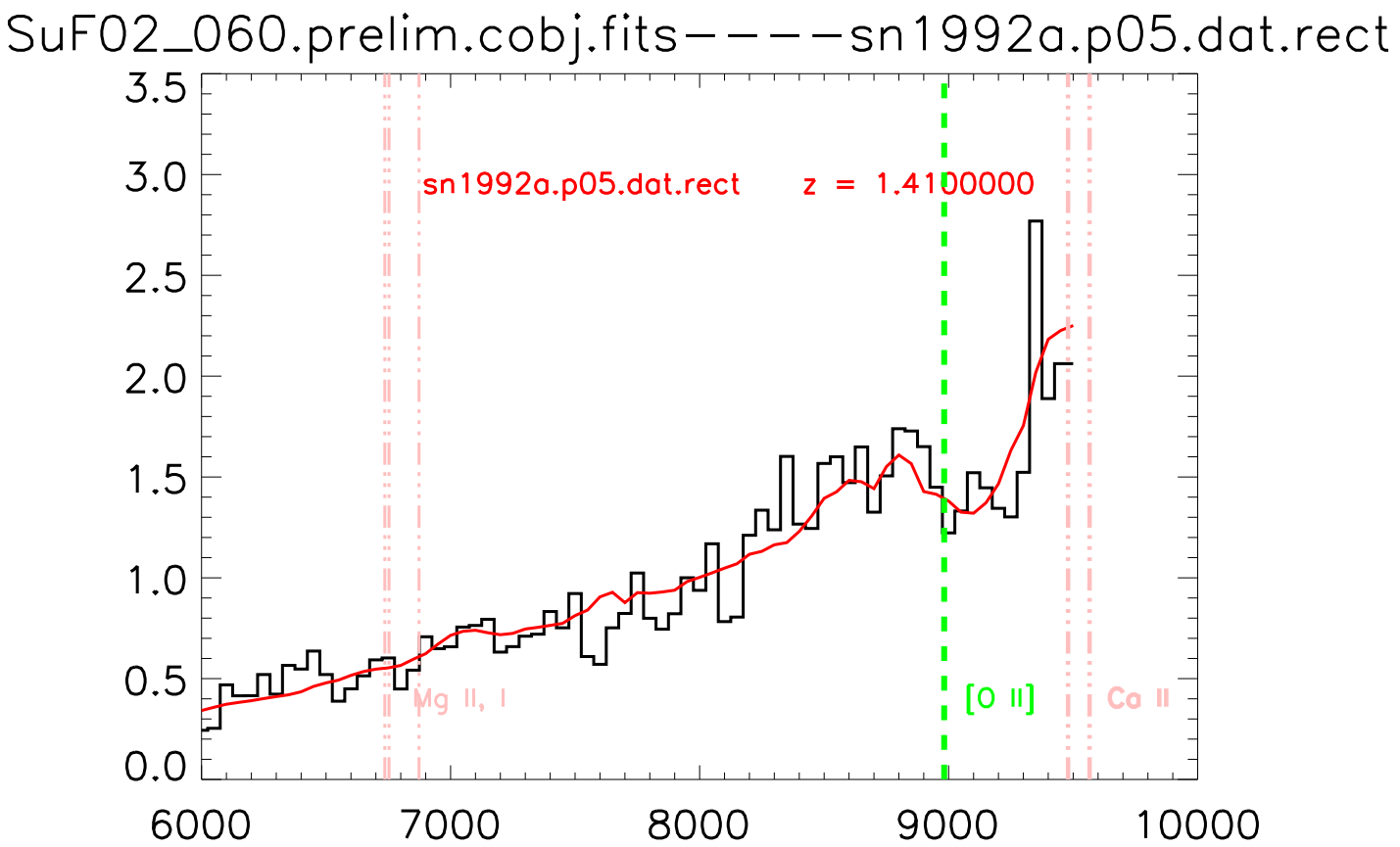
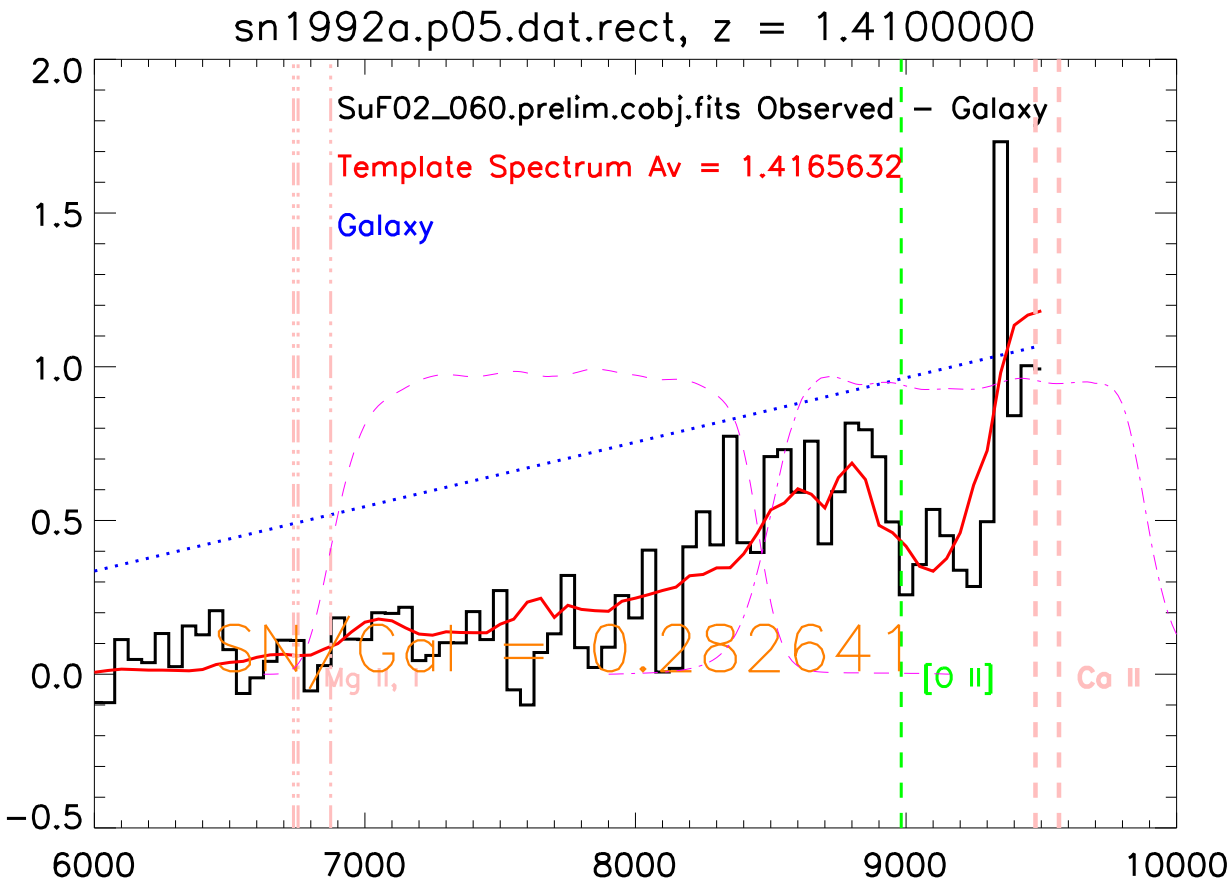
1.3
1.4
1.5

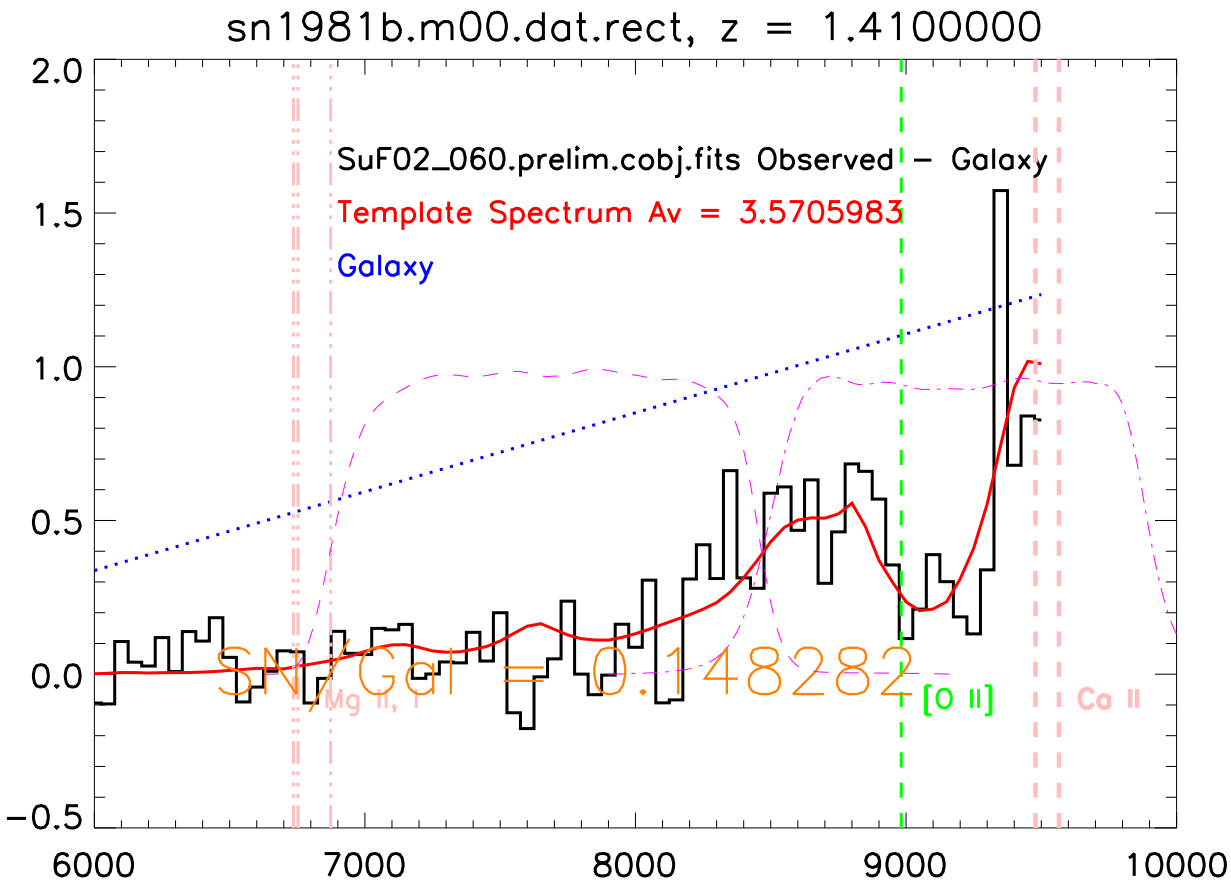


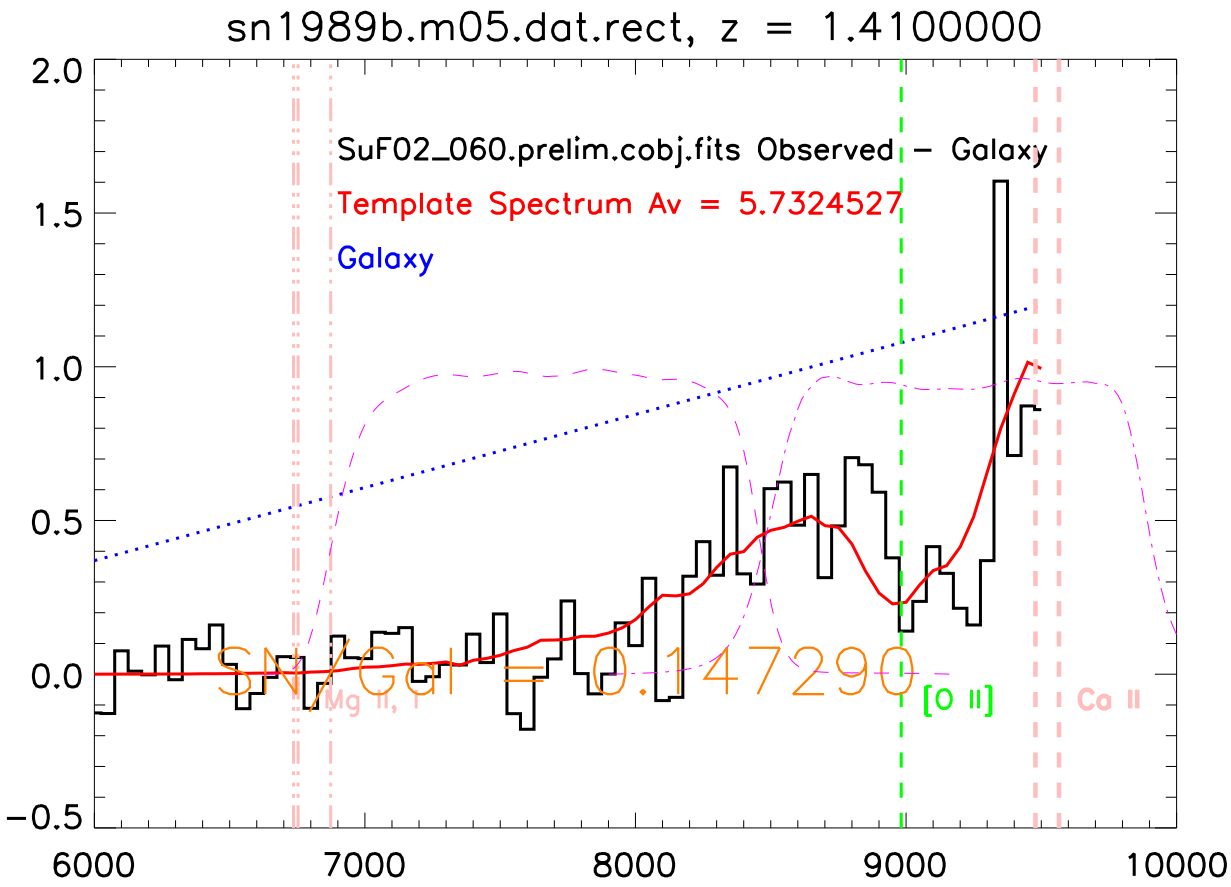
2.0
1.8
1.6
1.4
1.2
1.0
χ^2
40
20
0
−20
Days
0.5
1.0
1.5
2.0
Δm15

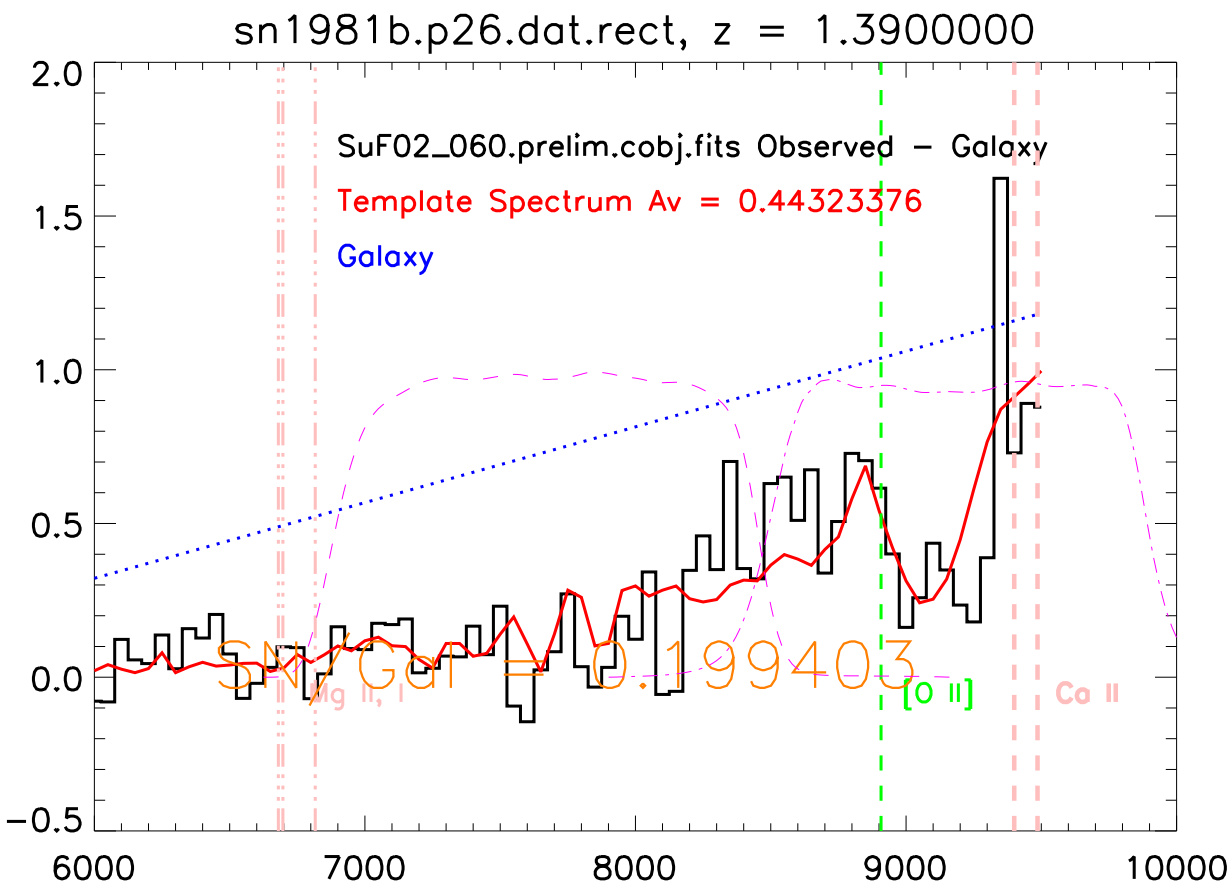

SuF02_060.prelim.cobj.fits
X^2
z
0
2
4
6
8
10
12
1.00
1.10
1.20
1.30
1.40
1.50

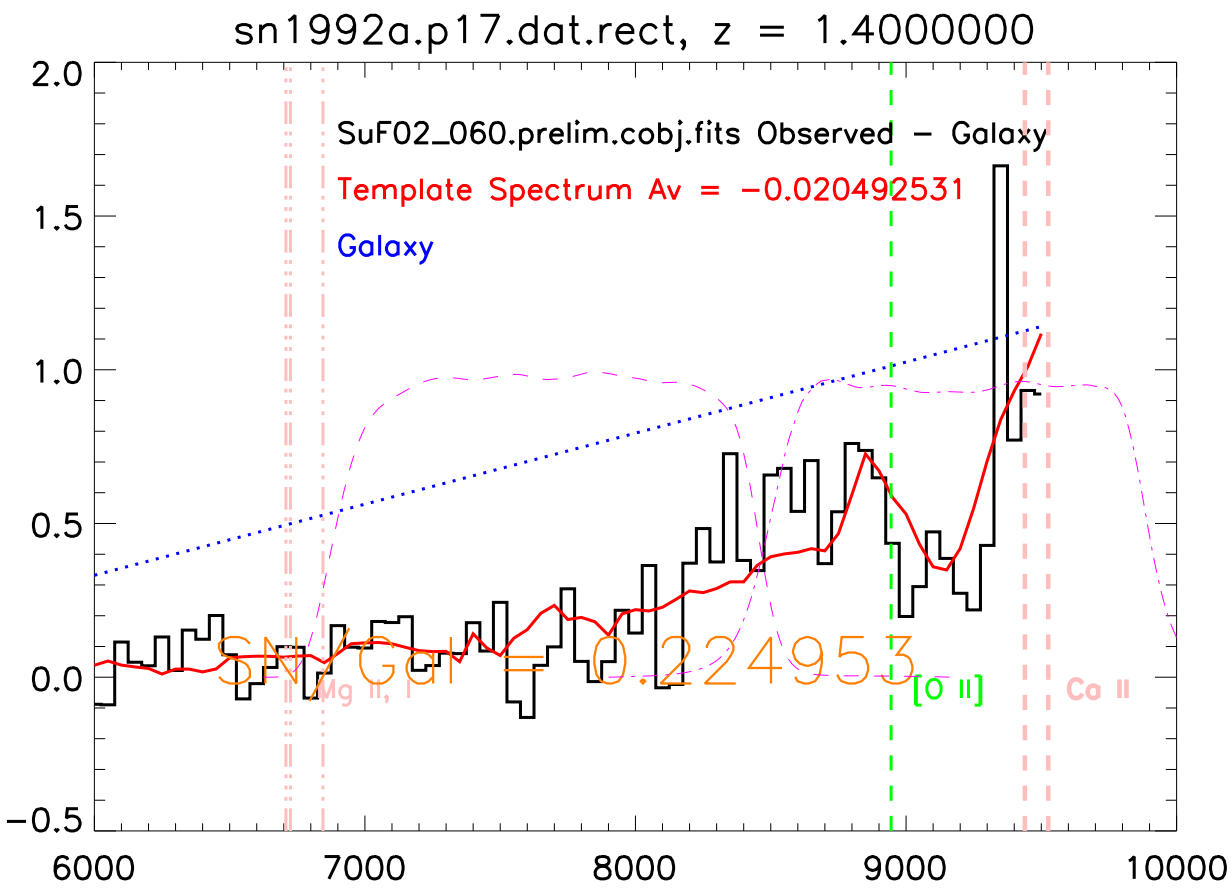

SuF02_060.prelim.cobj.fits----sn1992a.p05.dat.rect
sn1992a.p05.dat.rect
z = 1.4100000
Mg II, I
[O II]
Ca II
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
6000
7000
8000
9000
10000

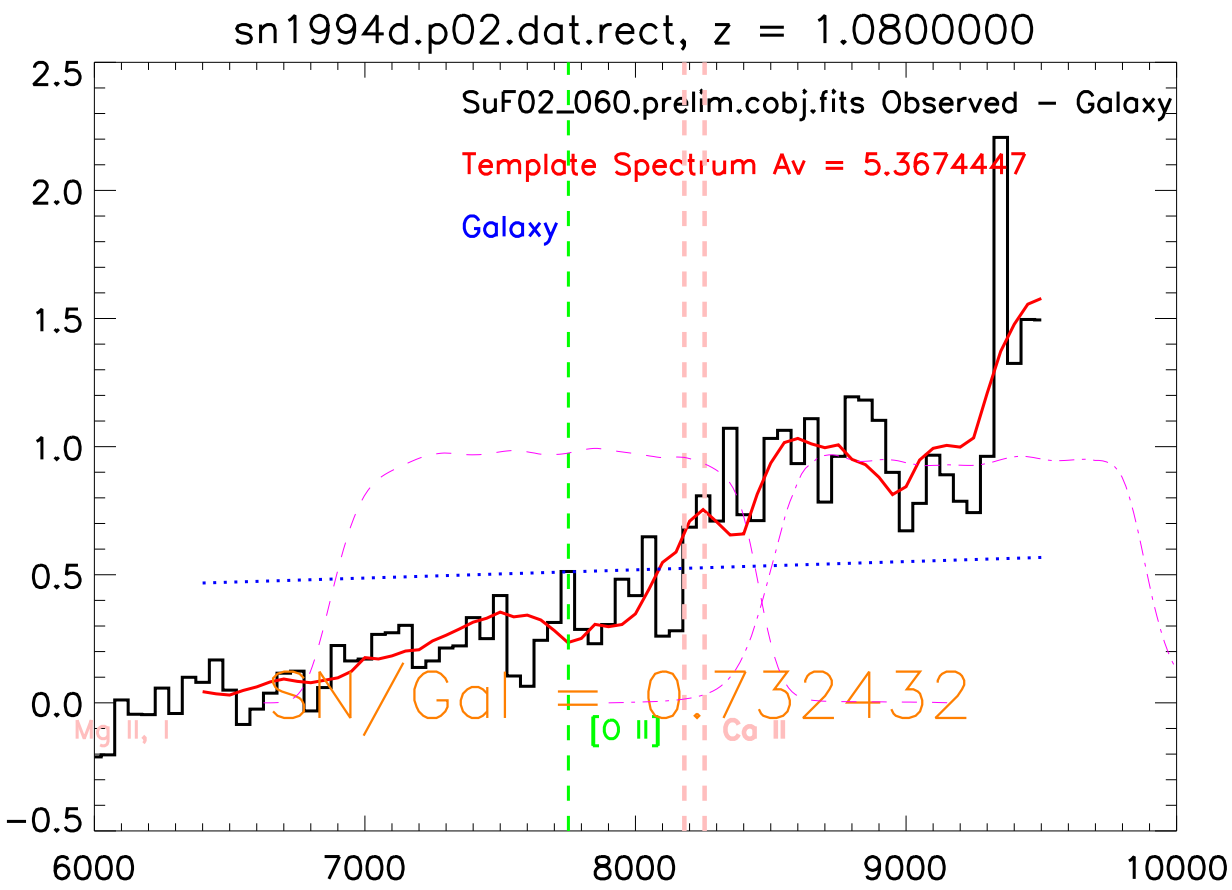

sn1992a.p05.dat.rect, z = 1.4100000
SuF02_060.prelim.cobj.fits Observed − Galaxy
Template Spectrum Av = 1.4165632
Galaxy
SN/Gal = 0.282641
Mg II, f
[O II]
Ca II
2.0
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

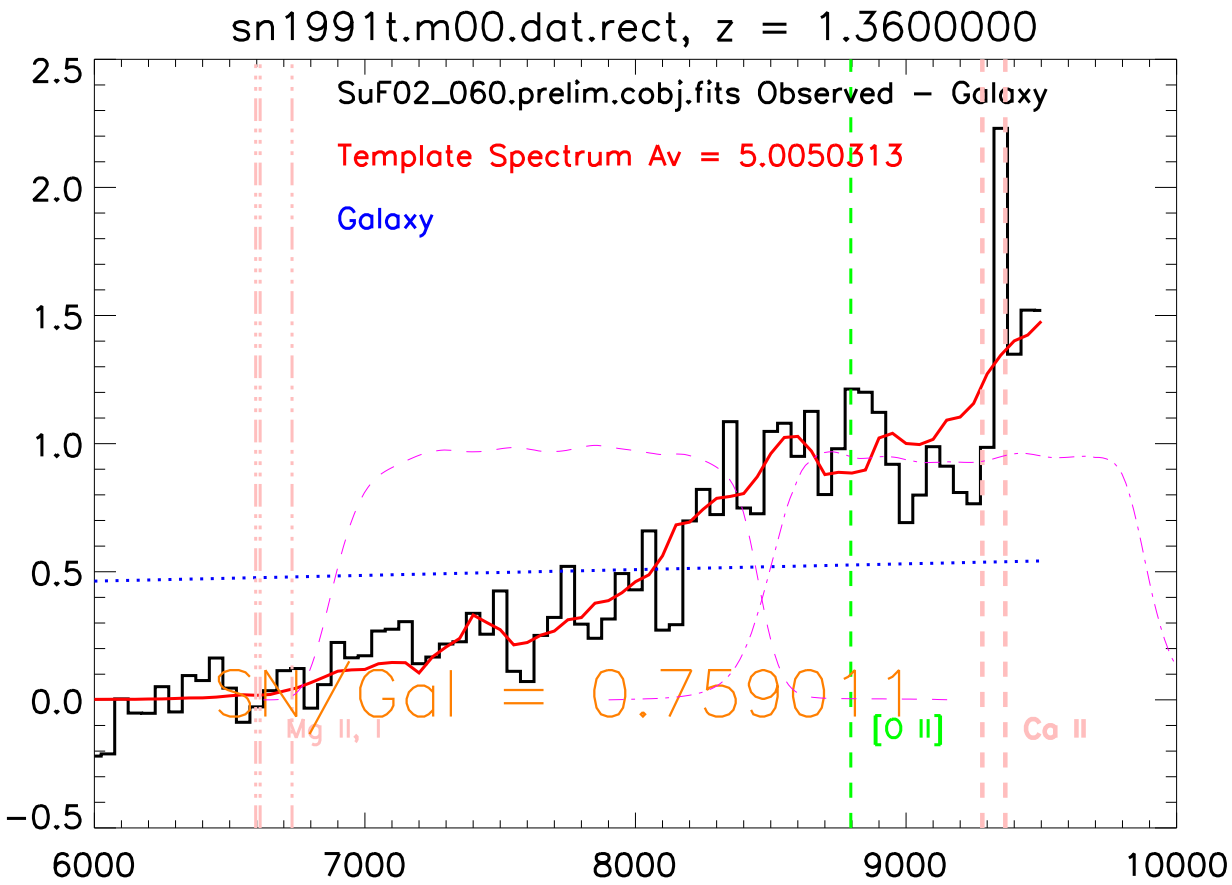

sn1981b.m00.dat.rect, z = 1.4100000
SuF02_060.prelim.cobj.fits Observed − Galaxy
Template Spectrum Av = 3.5705983
Galaxy
SN/Gal = 0.148282
Mg II, ?
[O II]
Ca II
2.0
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

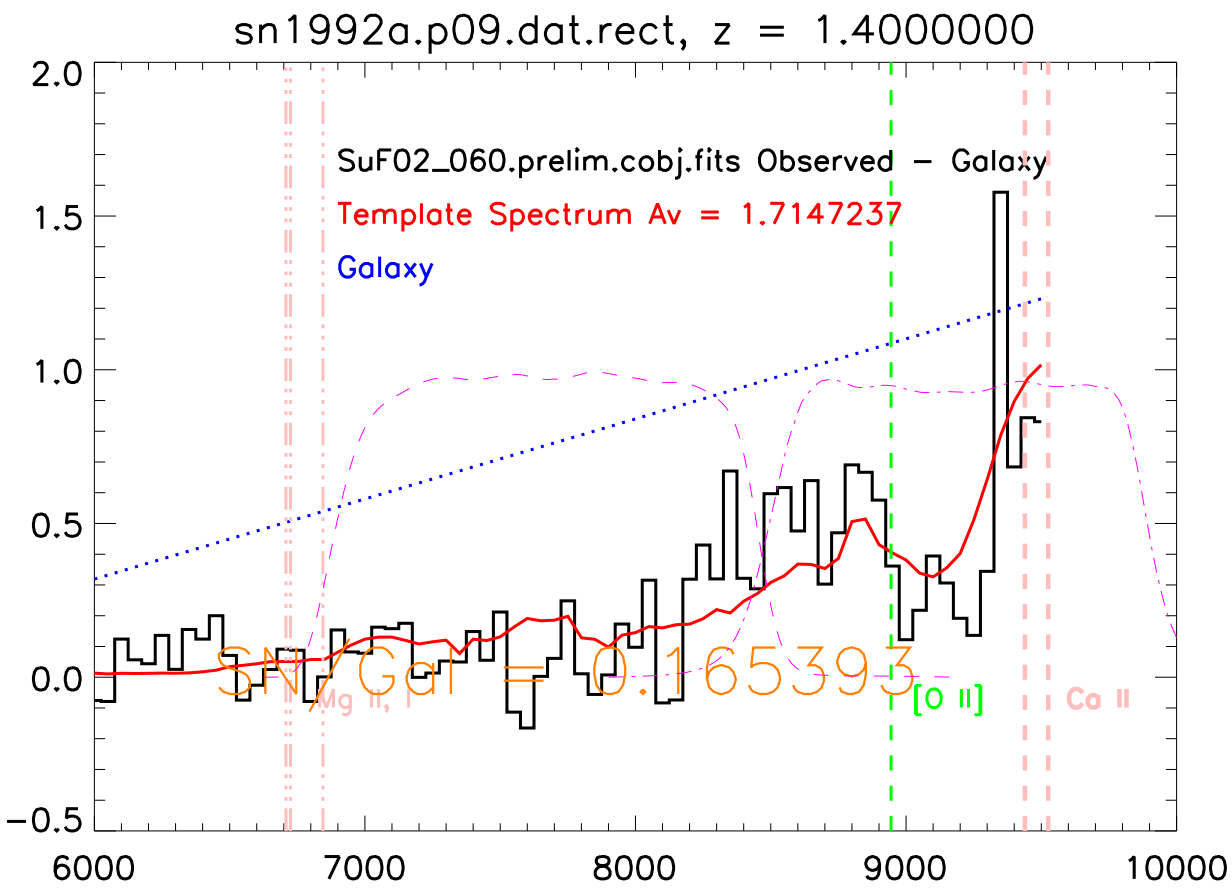

sn1989b.m05.dat.rect, z = 1.4100000
SuF02_060.prelim.cobj.fits Observed – Galaxy
Template Spectrum Av = 5.7324527
Galaxy
SN/Gal = 0.147290
[O II]
Ca II
2.0
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

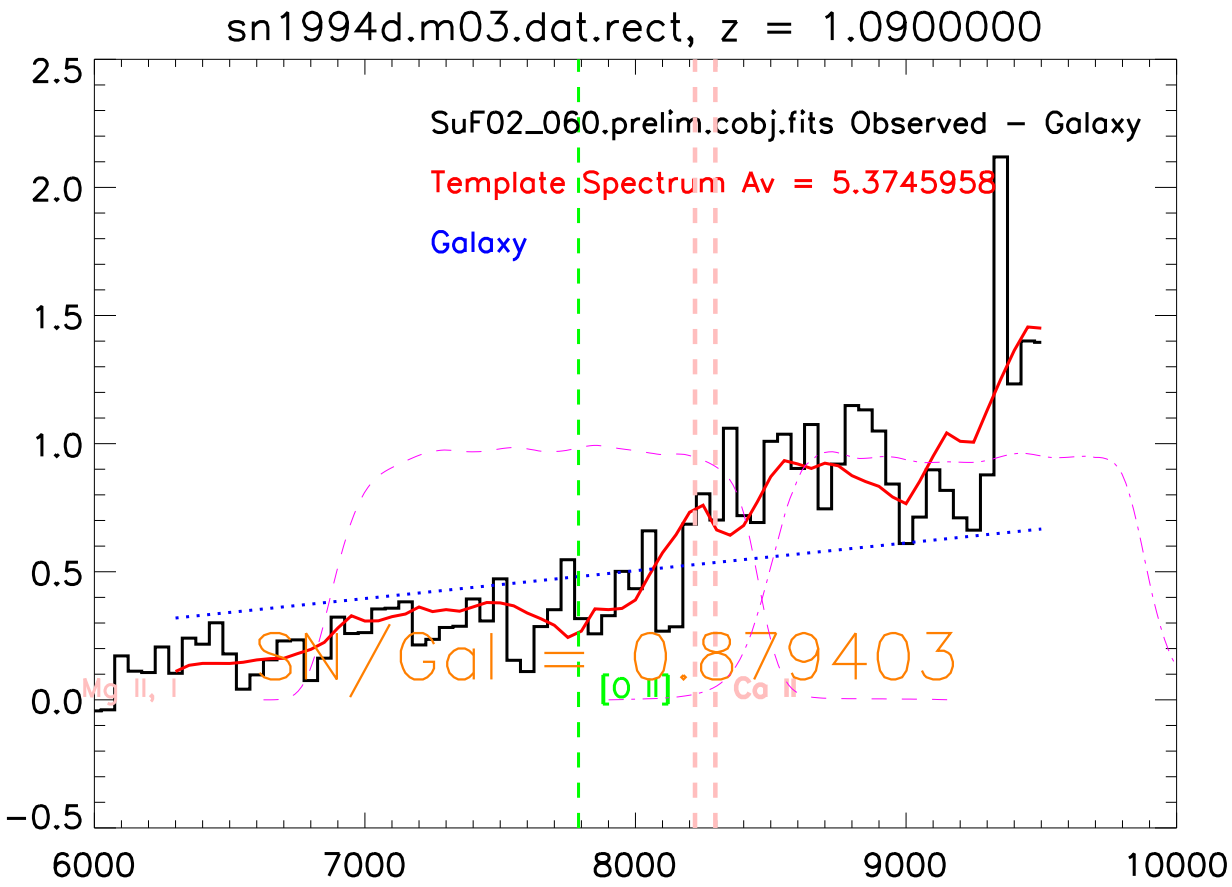

sn1981b.p26.dat.rect, z = 1.3900000
SuF02_060.prelim.cobj.fits Observed − Galaxy
Template Spectrum Av = 0.44323376
Galaxy
SN/Gal = 0.199403
Mg II, I
[O II]
Ca II
2.0
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

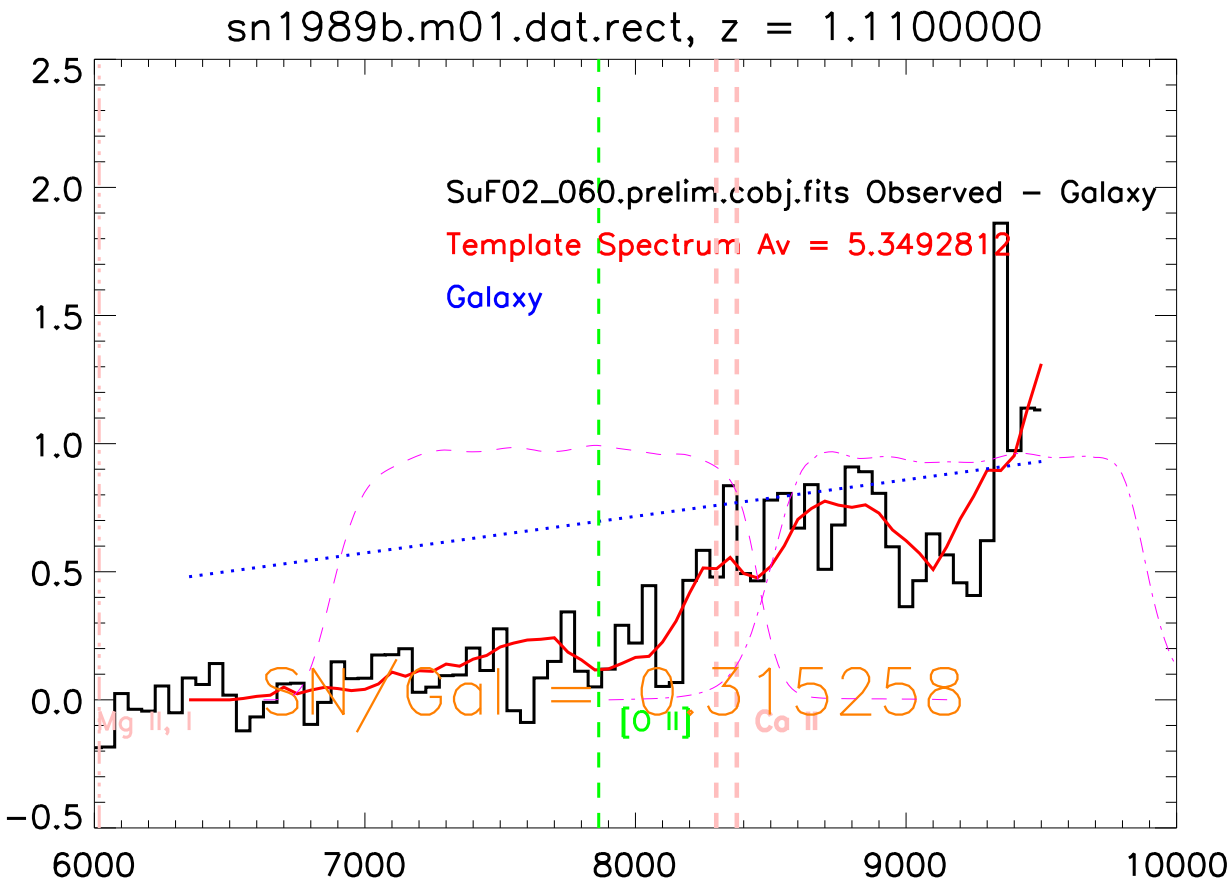

sn1992a.p17.dat.rect, z = 1.4000000
SuF02_060.prelim.cobj.fits Observed − Galaxy
Template Spectrum Av = −0.020492531
Galaxy
SN/Gal = 0.224953
Mg II, I
[O II]
Ca II
2.0
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

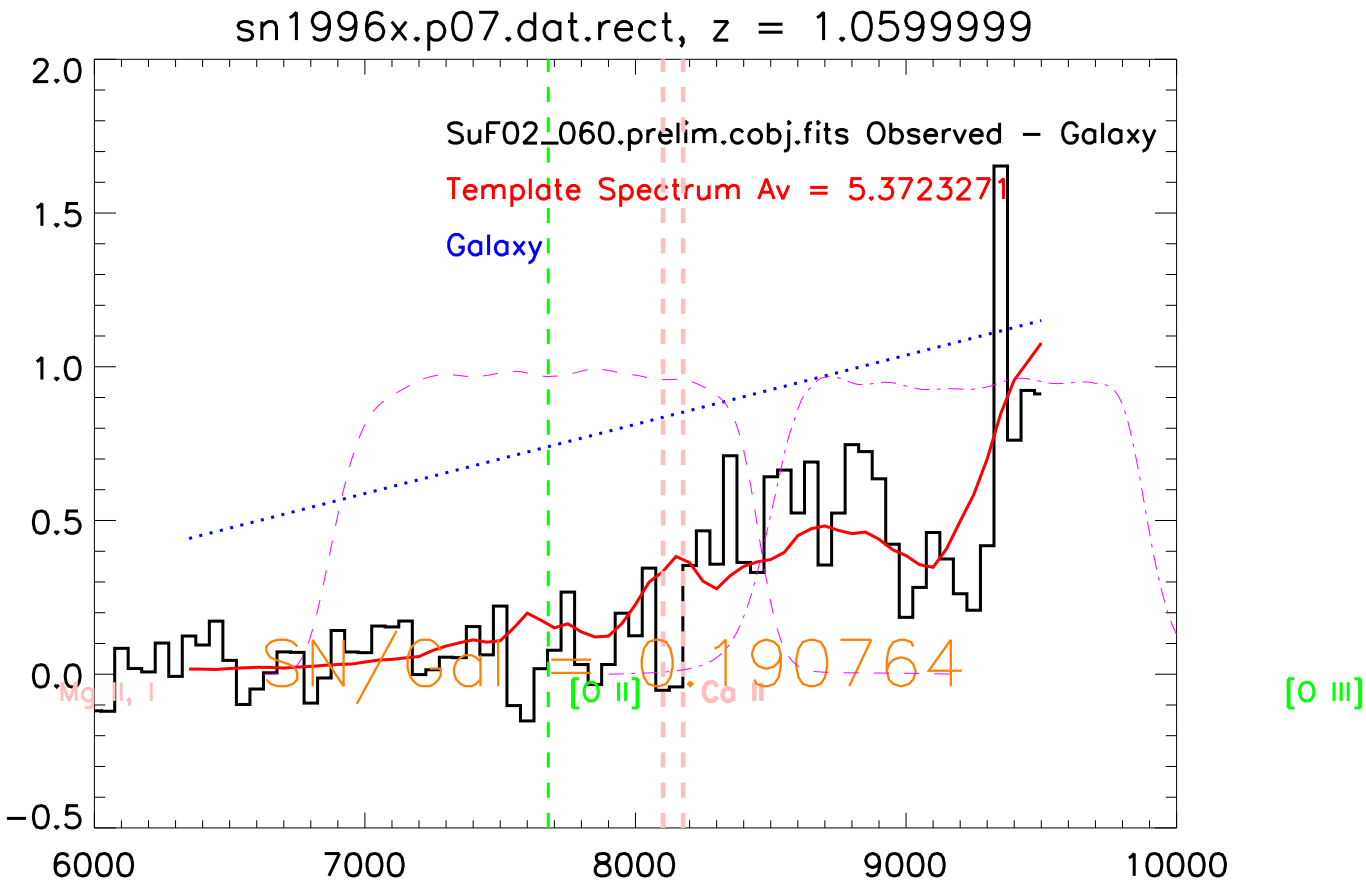

sn1994d.p02.dat.rect, z = 1.0800000
SuF02_060.prelim.cobj.fits Observed − Galaxy
Template Spectrum Av = 5.3674447
Galaxy
S/N/Gal = 0.732432
Mg II, I
[O II]
Ca II
[O III
2.5
2.0
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

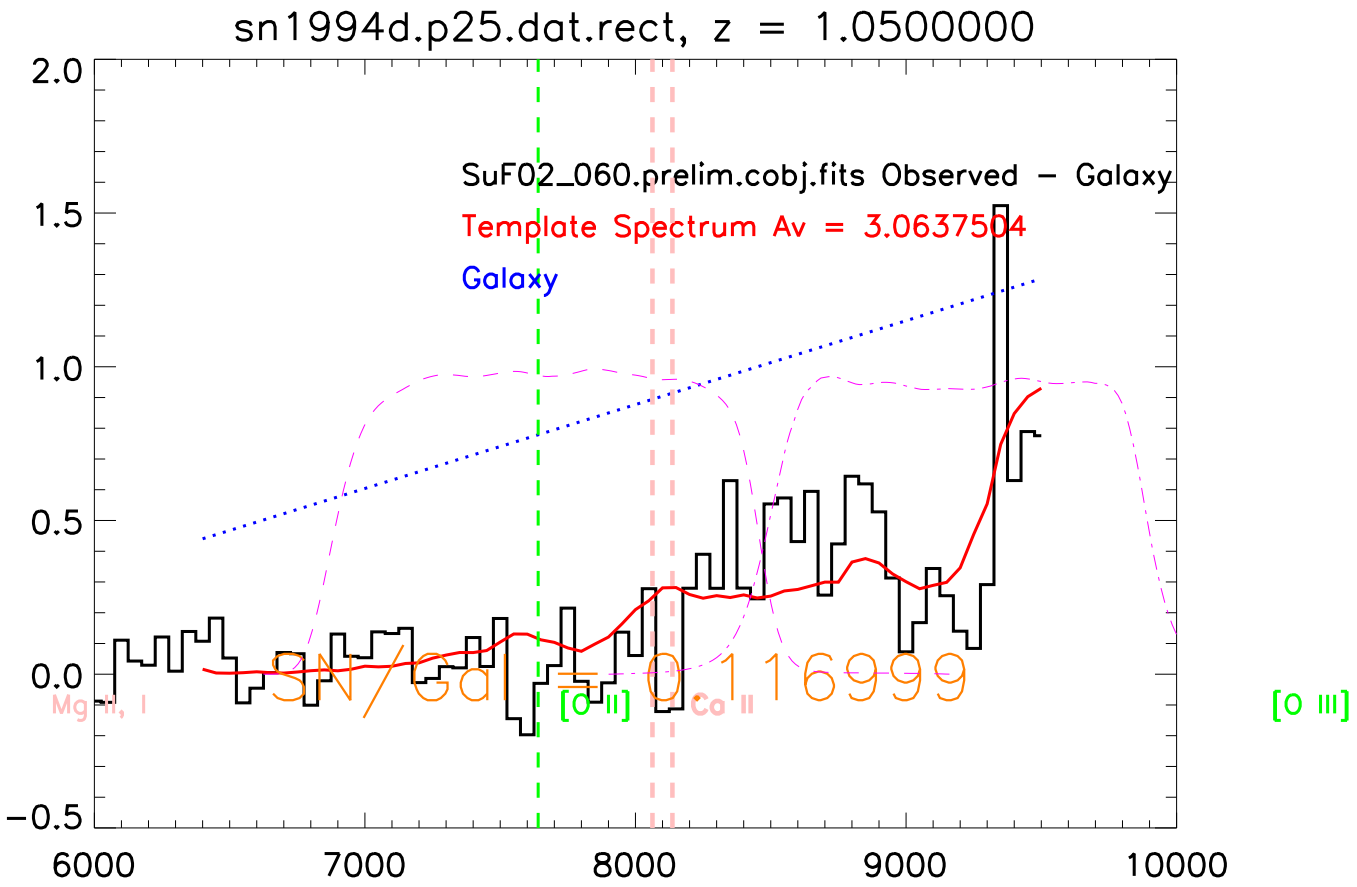

sn1991t.m00.dat.rect, z = 1.3600000
SuF02_060.prelim.cobj.fits Observed − Galaxy
Template Spectrum Av = 5.0050313
Galaxy
S/N Gal = 0.759011
Mg II, I
[O II]
Ca II
2.5
2.0
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

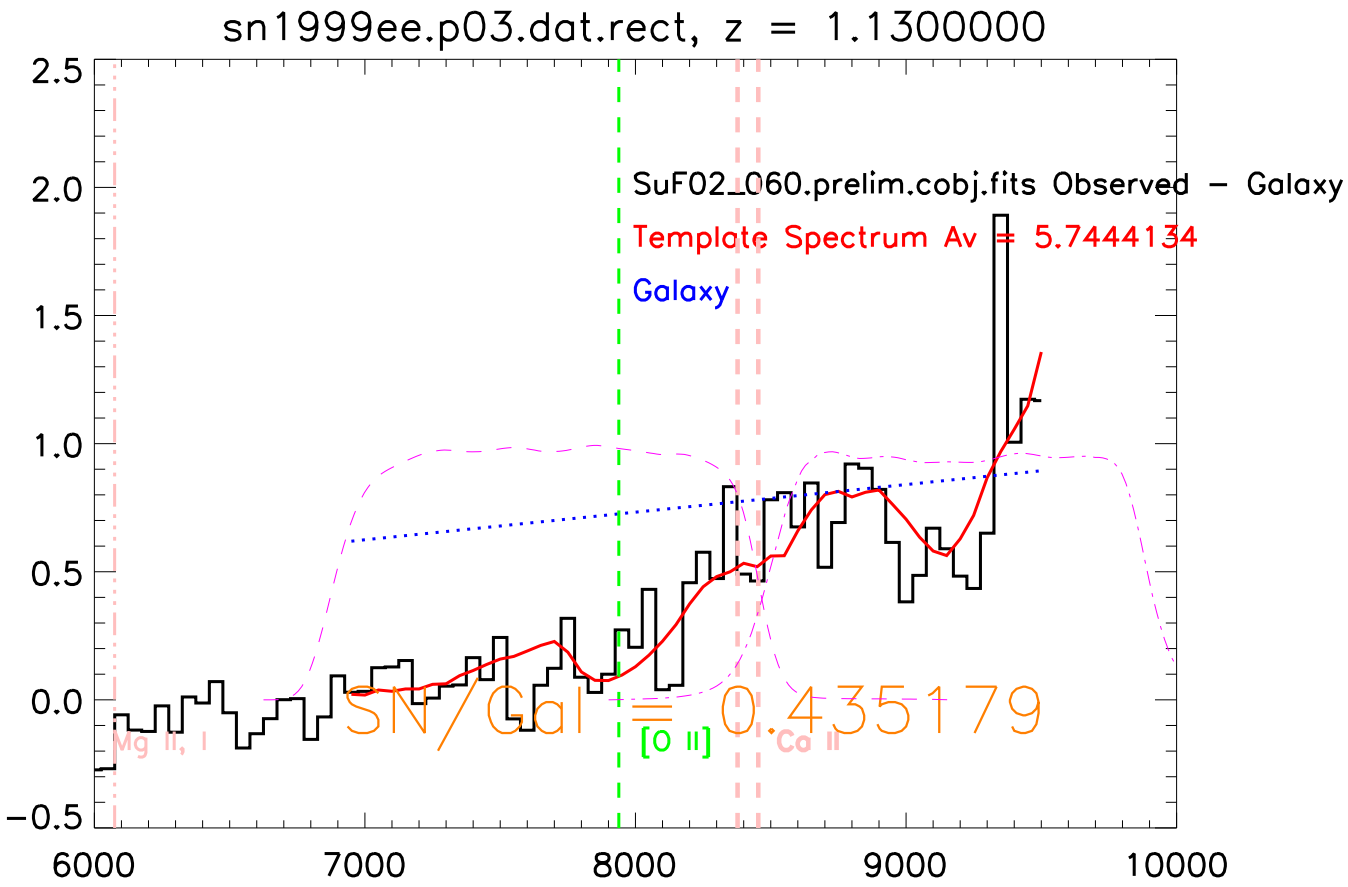

sn1992a.p09.dat.rect, z = 1.4000000
SuF02_060.prelim.cobj.fits Observed − Galaxy
Template Spectrum Av = 1.7147237
Galaxy
SN/Gal = 0.165393
Mg II, I
[O II]
Ca II
2.0
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

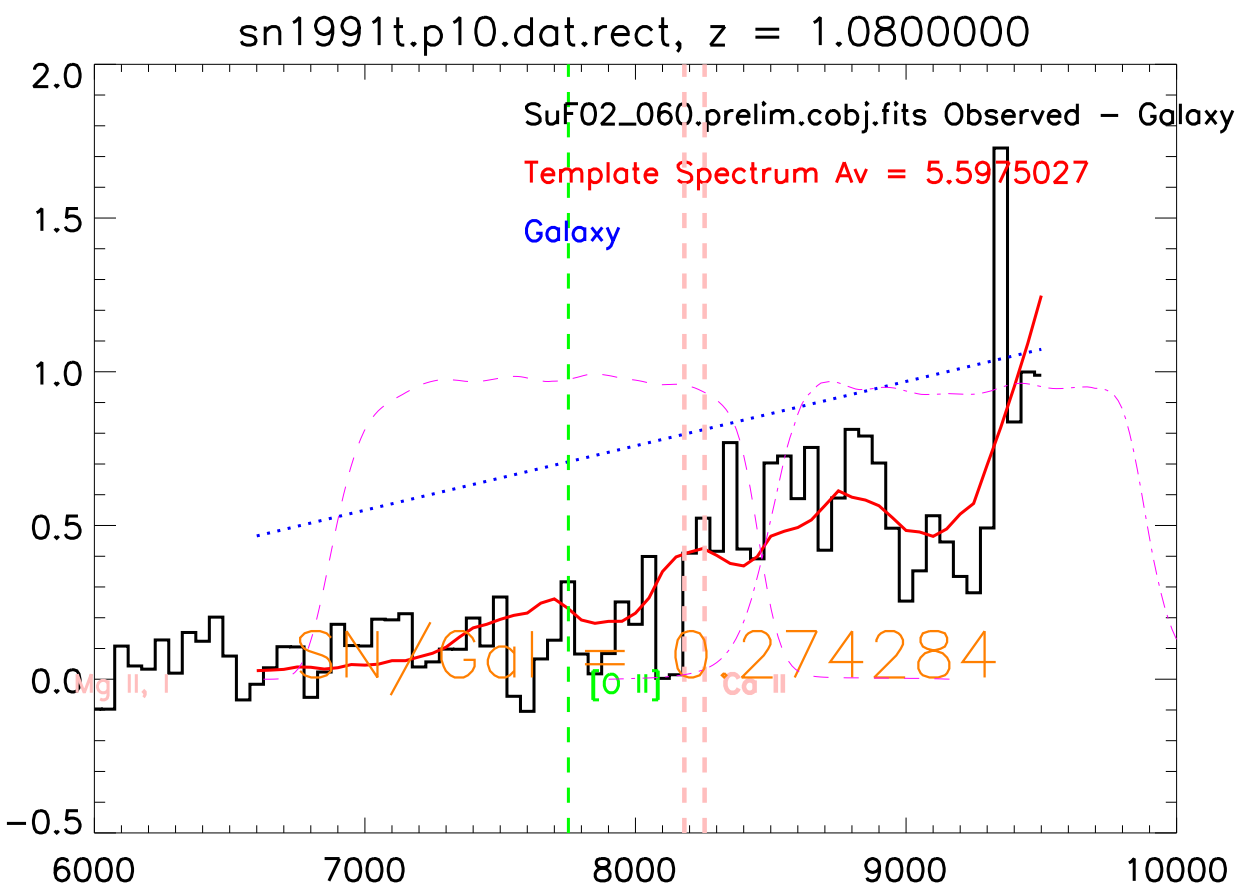

sn1994d.m03.dat.rect, z = 1.0900000
SuF02_060.prelim.cobj.fits Observed − Galaxy
Template Spectrum Av = 5.3745958
Galaxy
SN/Gal = 0.879403
Mg II, I
[O II]
Ca II
2.5
2.0
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

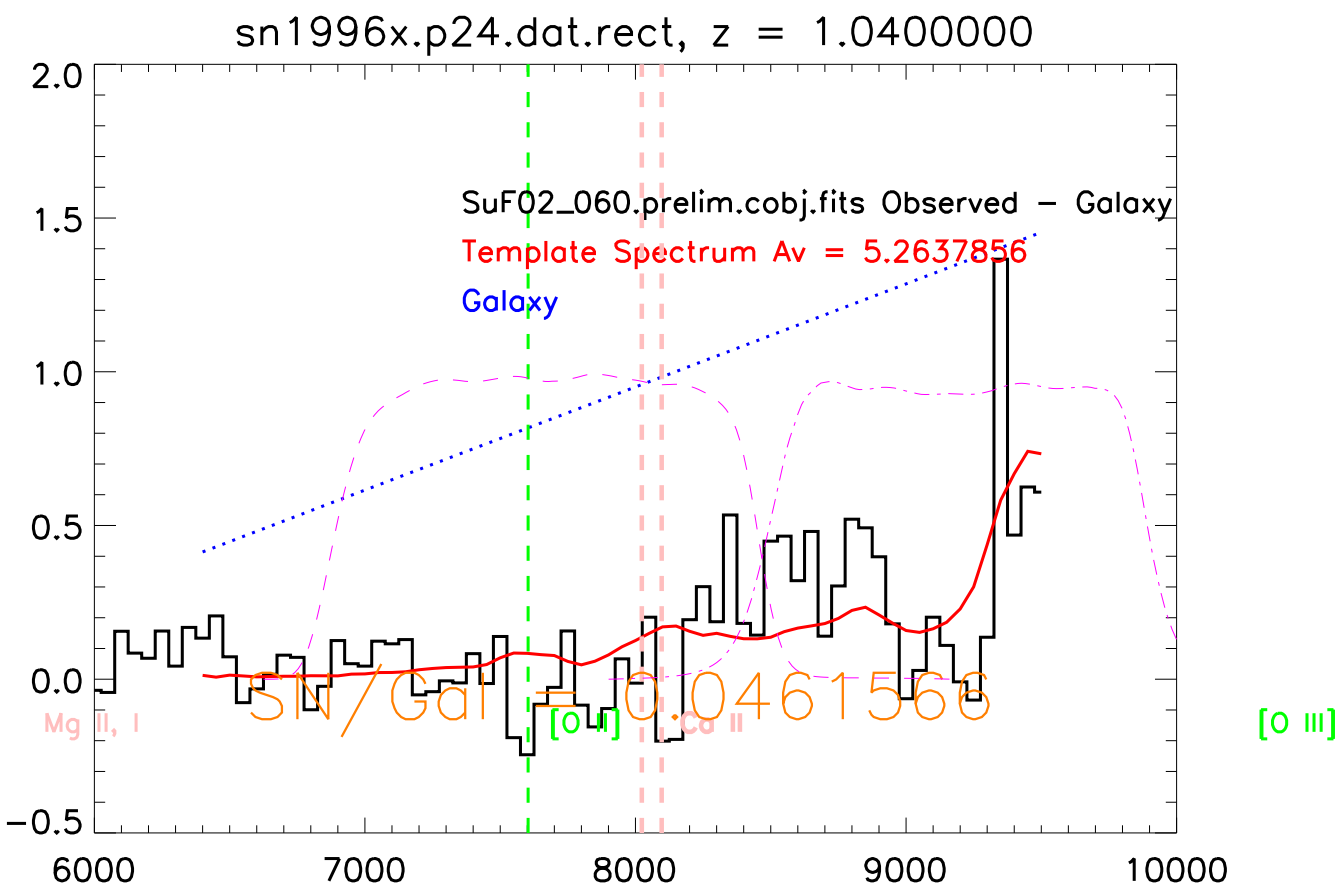

sn1989b.m01.dat.rect, z = 1.1100000
SuF02_060.prelim.cobj.fits Observed − Galaxy
Template Spectrum Av = 5.3492812
Galaxy
SN/Gal = 0.315258
Mg II, I
[O II]
Ca II
2.5
2.0
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

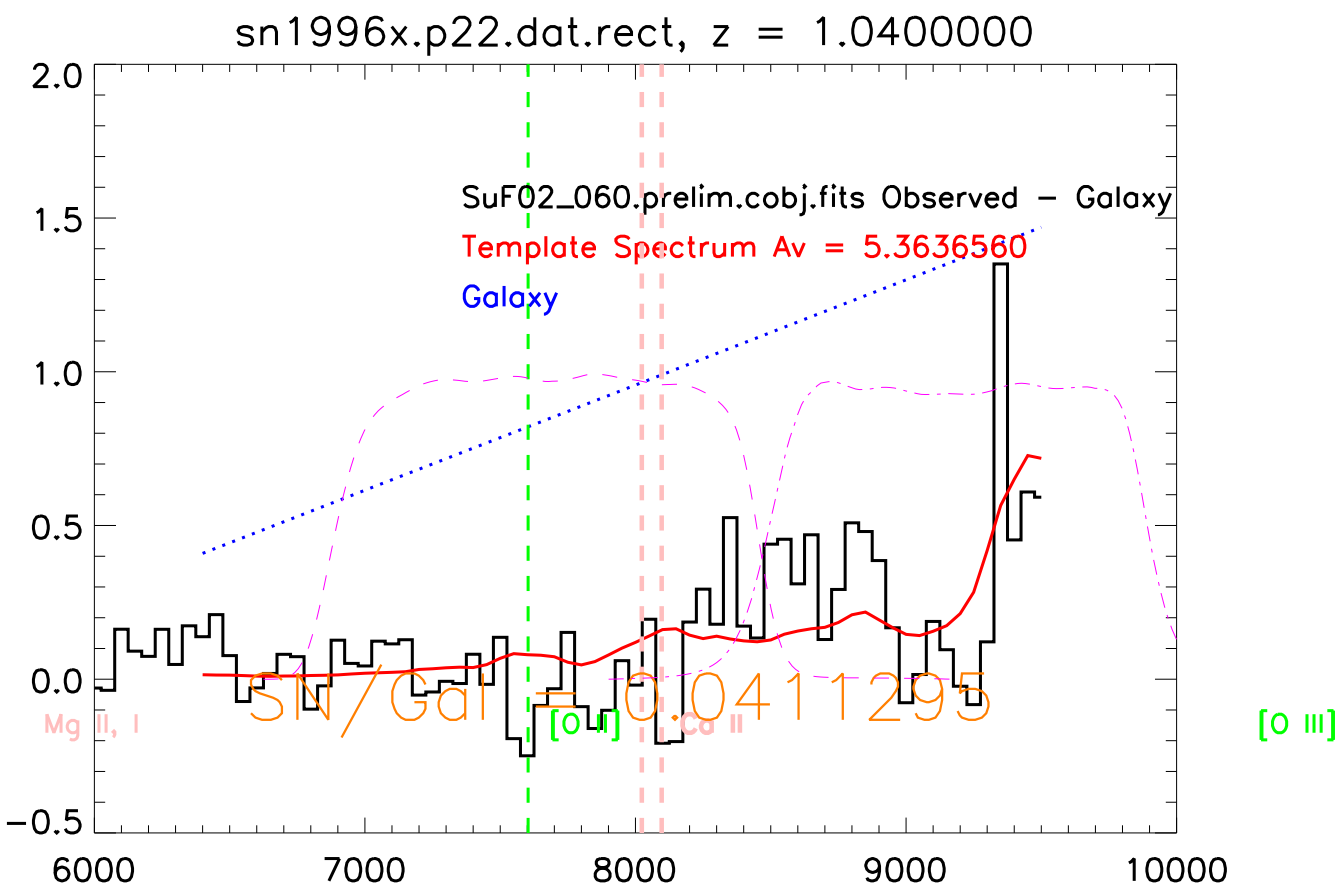

sn1996x.p07.dat.rect, z = 1.0599999
SuF02_060.prelim.cobj.fits Observed − Galaxy
Template Spectrum Av = 5.3723271
Galaxy
SN/Gal = 0.190764
Mg II, I
[O II]
Ca II
[O III]
2.0
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

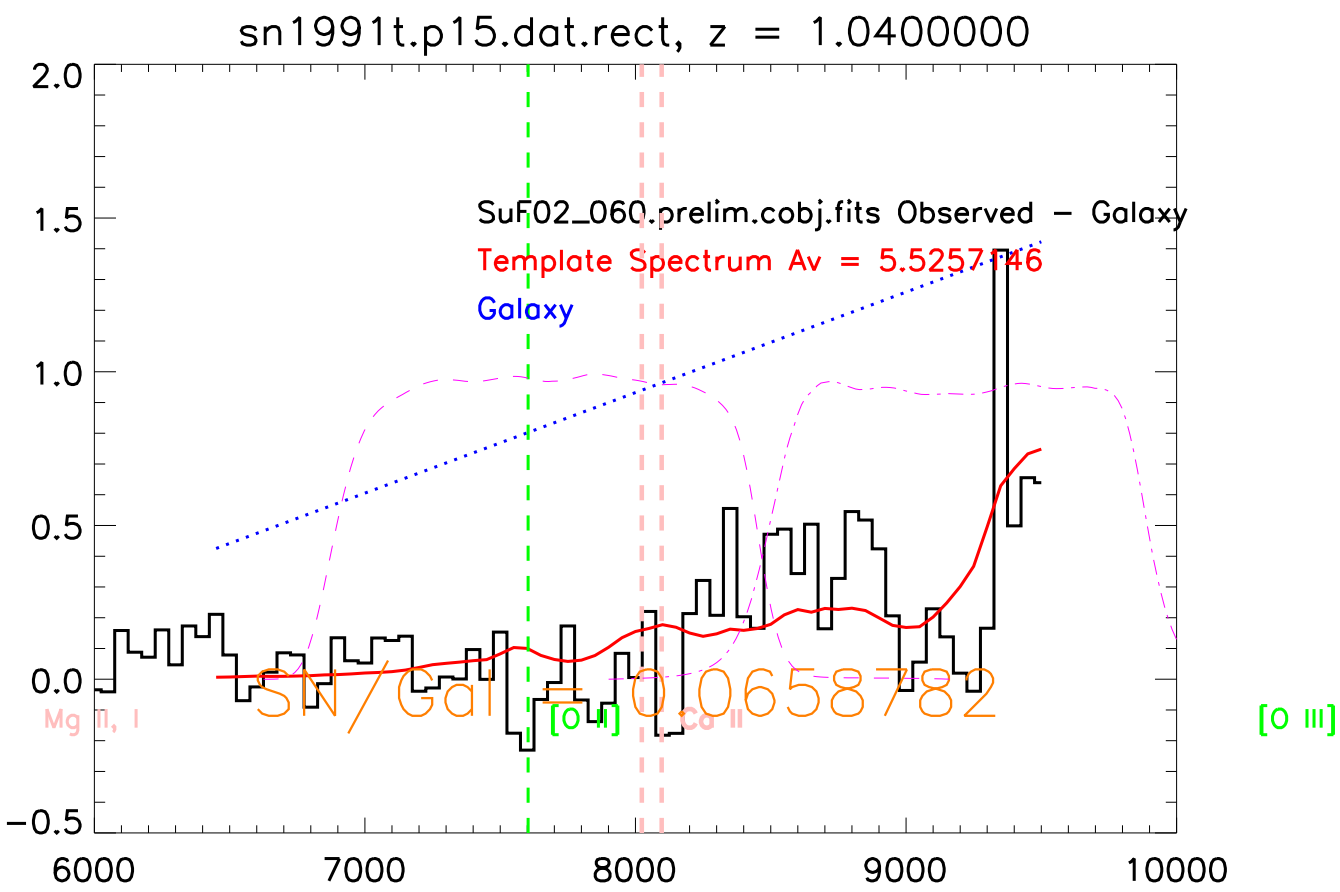

sn1994d.p25.dat.rect, z = 1.0500000
SuF02_060.prelim.cobj.fits Observed − Galaxy
Template Spectrum Av = 3.0637504
Galaxy
SN/Gal = 0.116999
Mg II, I
[O II]
Ca II
[O III]
2.0
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

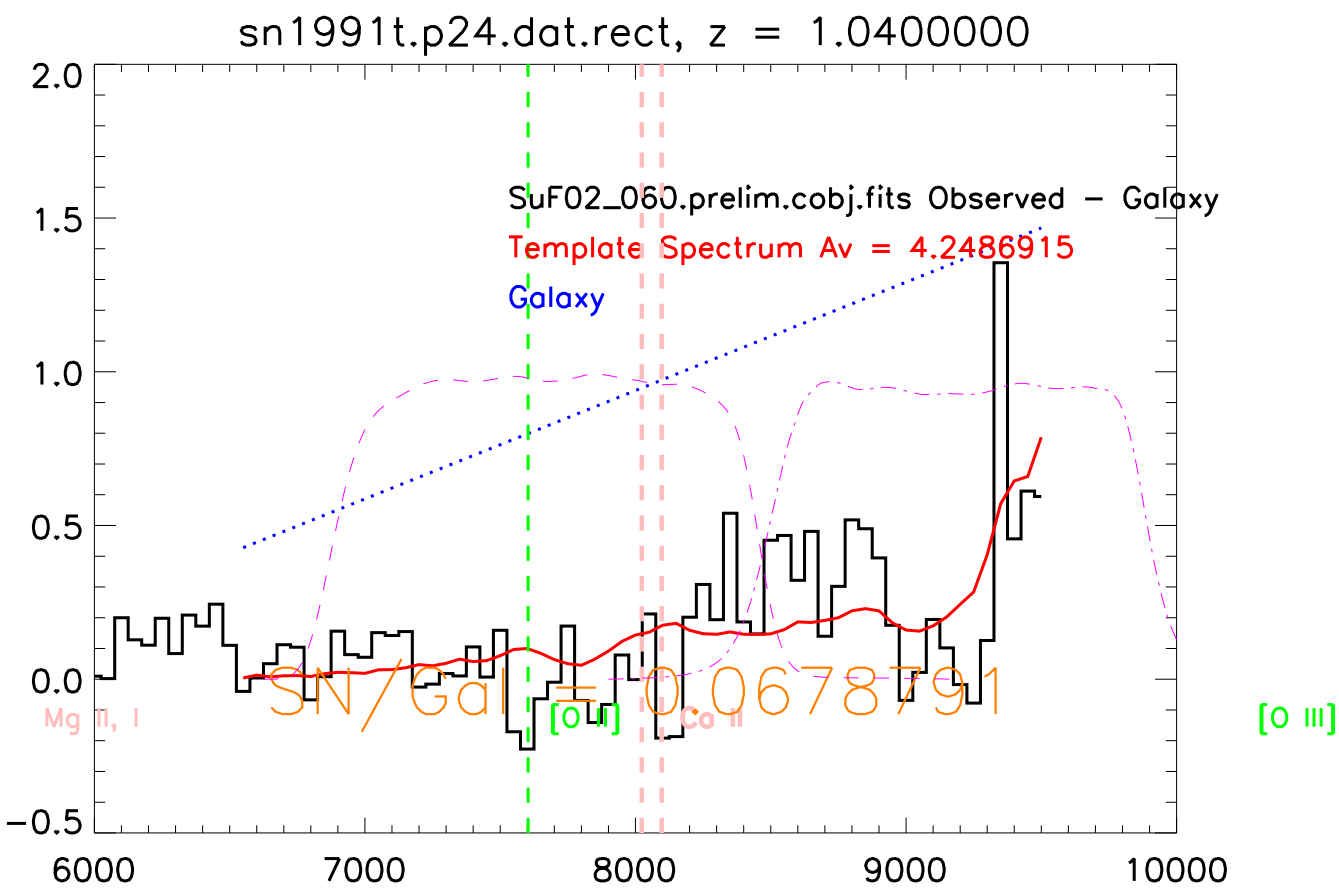

sn1999ee.p03.dat.rect, z = 1.1300000
SuF02_060.prelim.cobj.fits Observed − Galaxy
Template Spectrum Av = 5.7444134
Galaxy
SN/Gal = 0.435179
Mg II, I
[O II]
Ca II
2.5
2.0
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

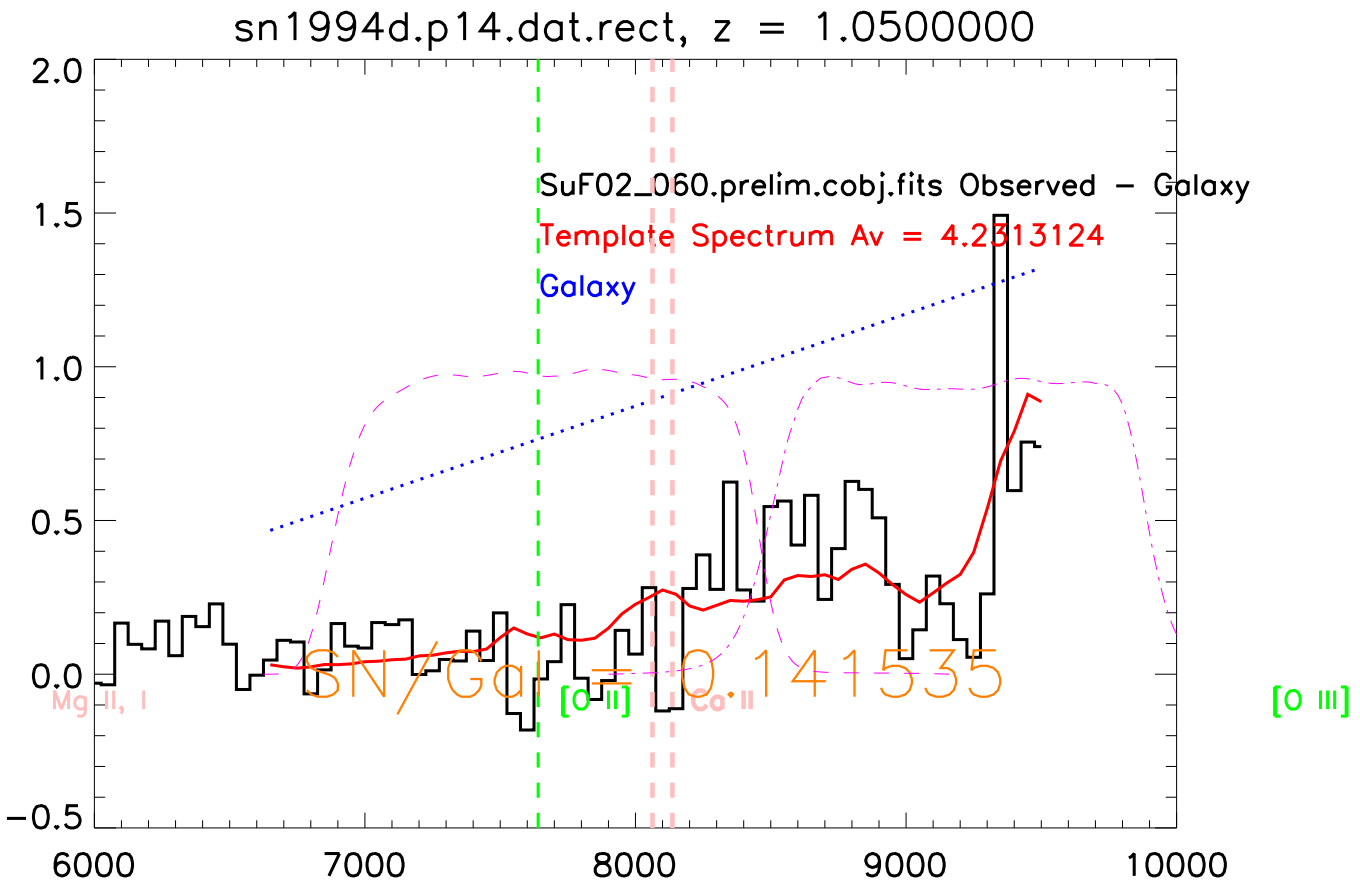

sn1991t.p10.dat.rect, z = 1.0800000
SuF02_060.prelim.cobj.fits Observed − Galaxy
Template Spectrum Av = 5.5975027
Galaxy
SN/Gal F 0.274284
[O II]
[O III
2.0
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

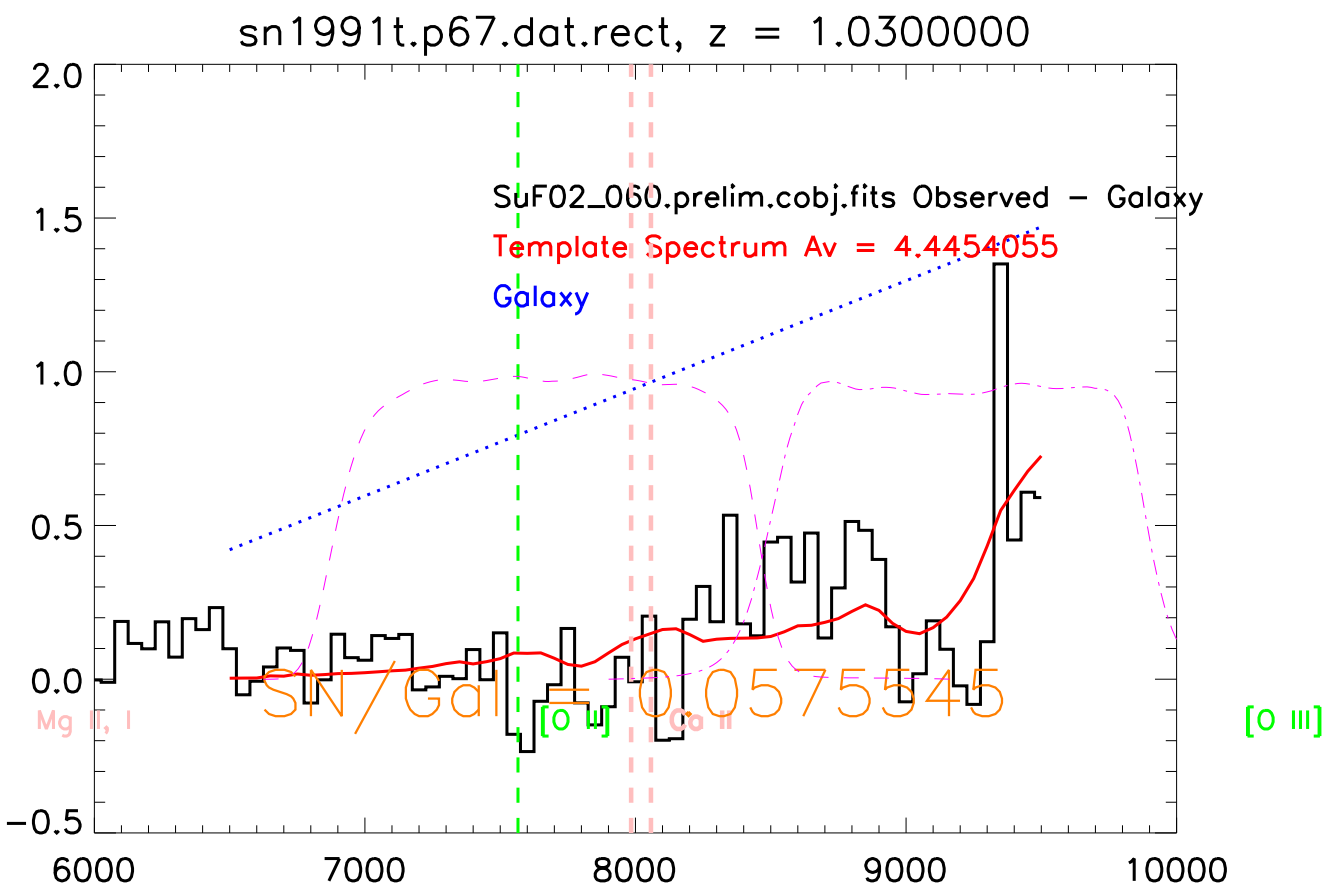

sn1996x.p24.dat.rect, z = 1.0400000
SuF02_060.prelim.cobj.fits Observed − Galaxy
Template Spectrum Av = 5.2637856
Galaxy
SN/Gal F=0.0461566
Mg II, I
[O II]
Ca II
[O III]
2.0
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

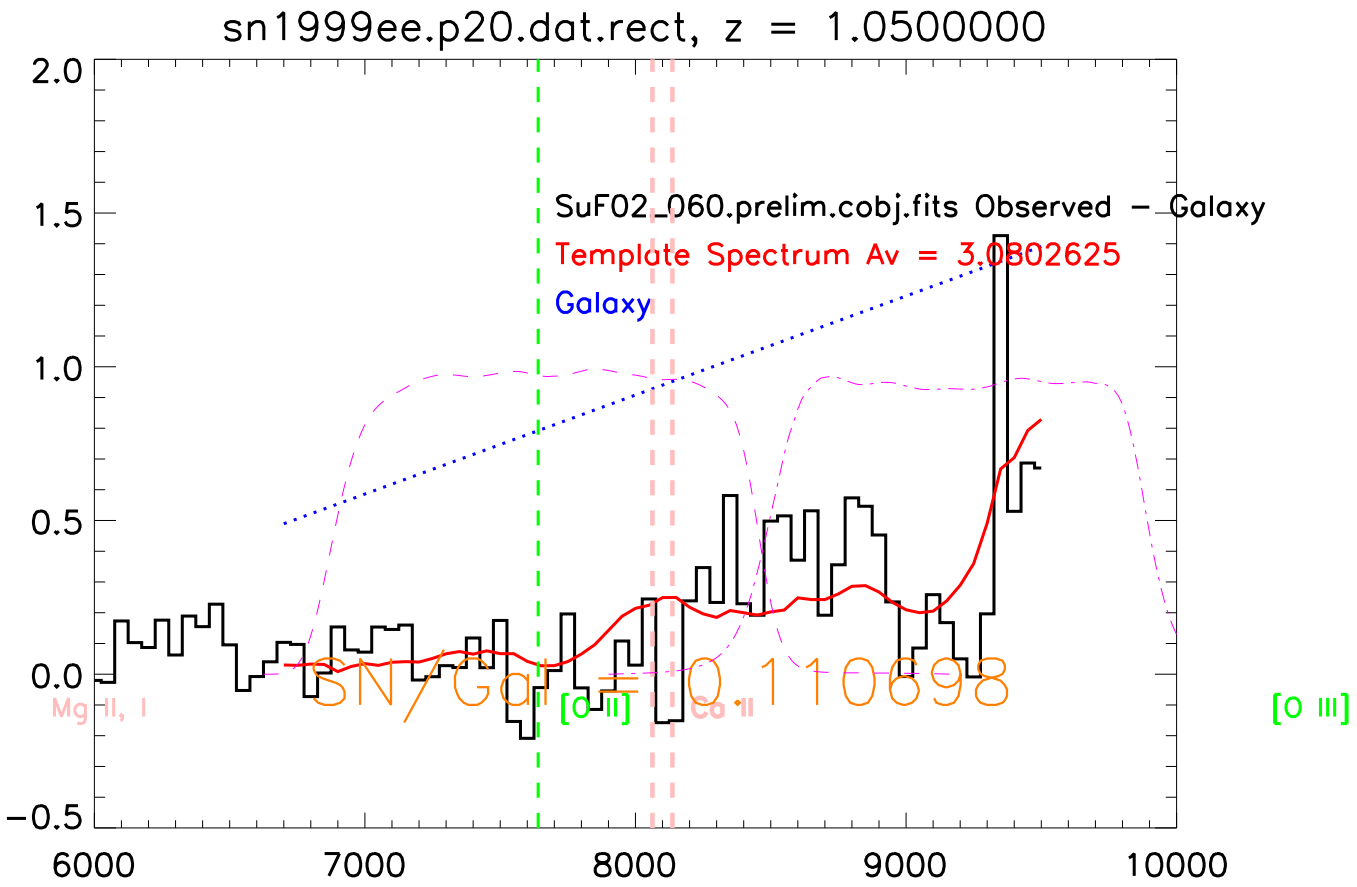

sn1996x.p22.dat.rect, z = 1.0400000
SuF02_060.prelim.cobj.fits Observed − Galaxy
Template Spectrum Av = 5.3636560
Galaxy
SN/Gal F=0.041129
Mg II, I
[O II]
Ca II
[O III]
2.0
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

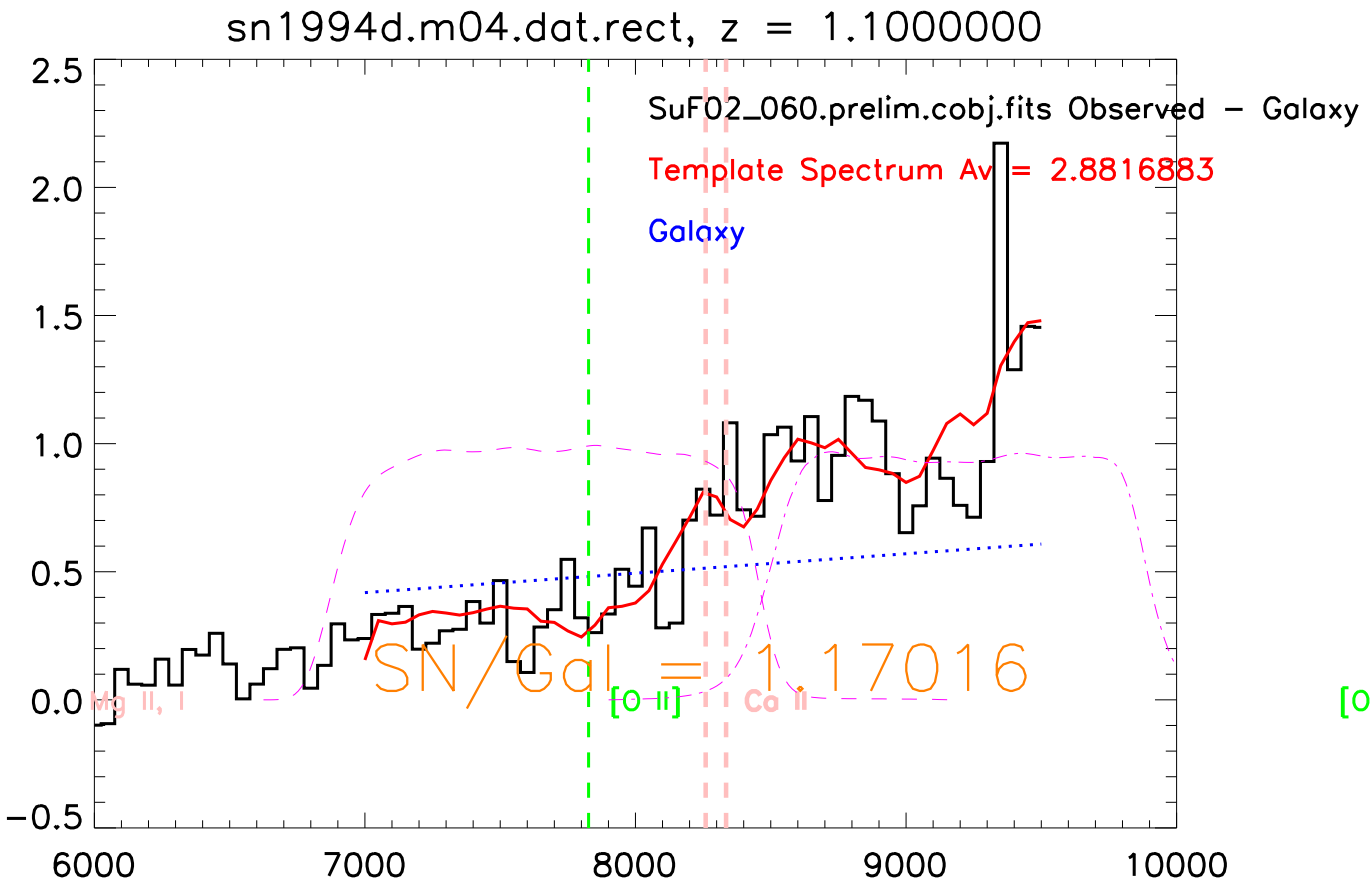

sn1991t.p15.dat.rect, z = 1.0400000
SuF02_060.prelim.cobj.fits Observed − Galaxy
Template Spectrum Av = 5.5257746
Galaxy
SN/Gal F: 0.0658782
Mg II, I
[O II]
Ca II
[O III]
2.0
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

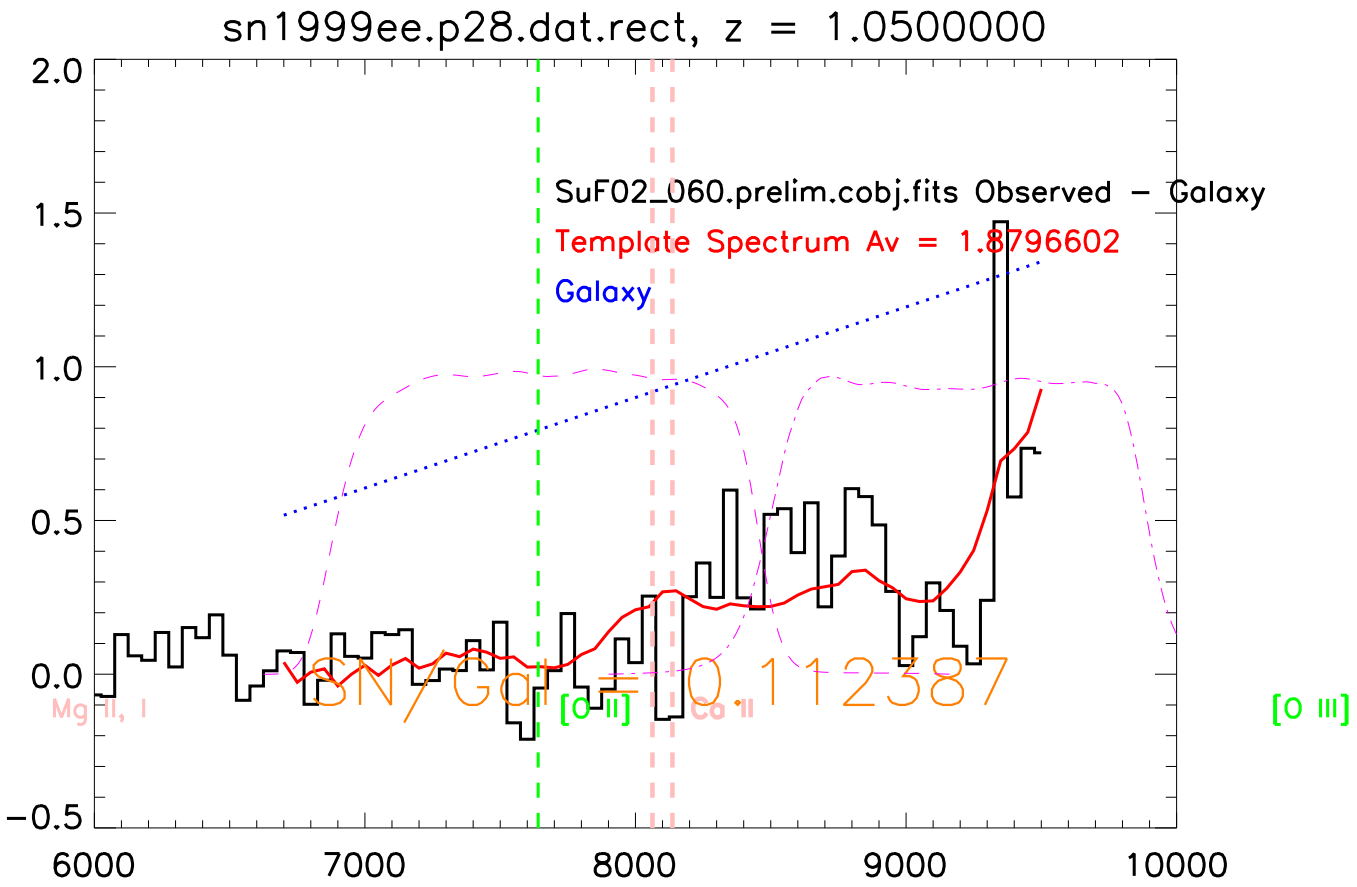

sn1991t.p24.dat.rect, z = 1.0400000
SuF02_060.prelim.cobj.fits Observed − Galaxy
Template Spectrum Av = 4.2486915
Galaxy
SN/Gal=+0.0678791
Mg II, I
[O II]
Ca II
[O III]
2.0
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

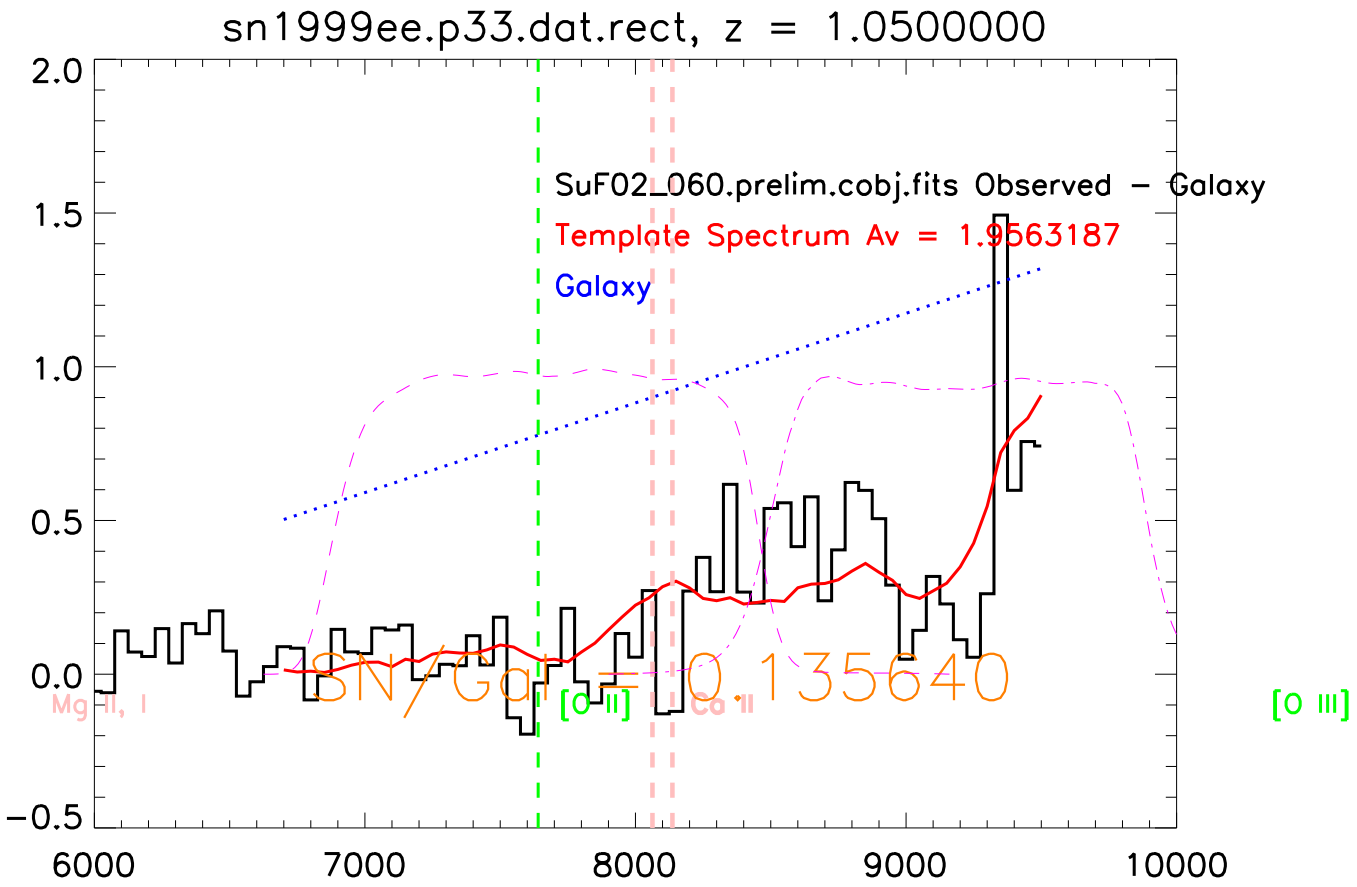

sn1994d.p14.dat.rect, z = 1.0500000
SuF02_060.prelim.cobj.fits Observed − Galaxy
Template Spectrum Av = 4.2313124
Galaxy
SN/Gal = 0.141535
Mg II, I
[O II]
Co II
[O III]
2.0
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

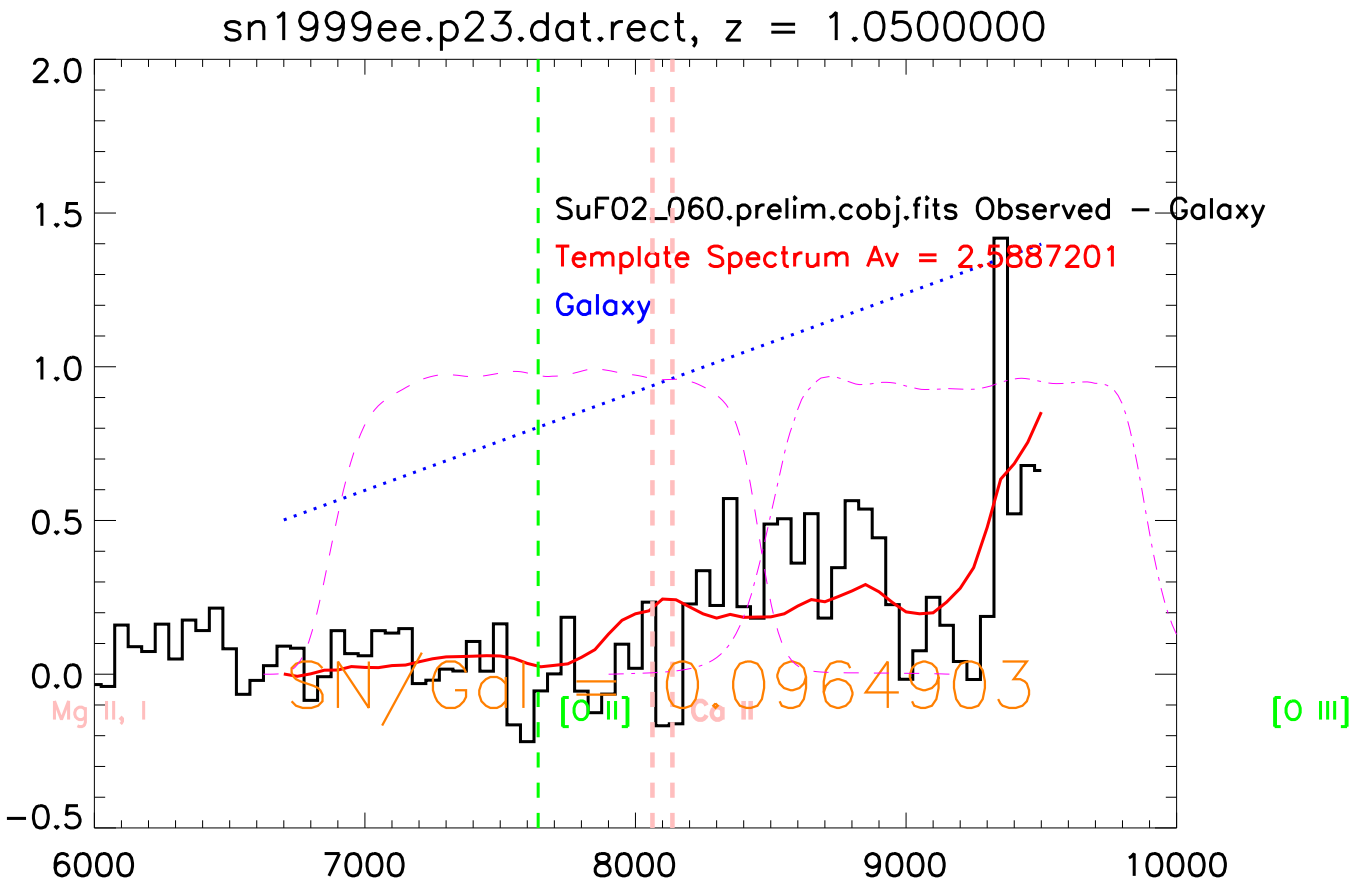

sn1991t.p67.dat.rect, z = 1.0300000
SuF02_060.prelim.cobj.fits Observed − Galaxy
Template Spectrum Av = 4.4454055
Galaxy
SN/Gal = 0.05755545
Mg II, I
[O II]
Ca II
[O III]
2.0
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

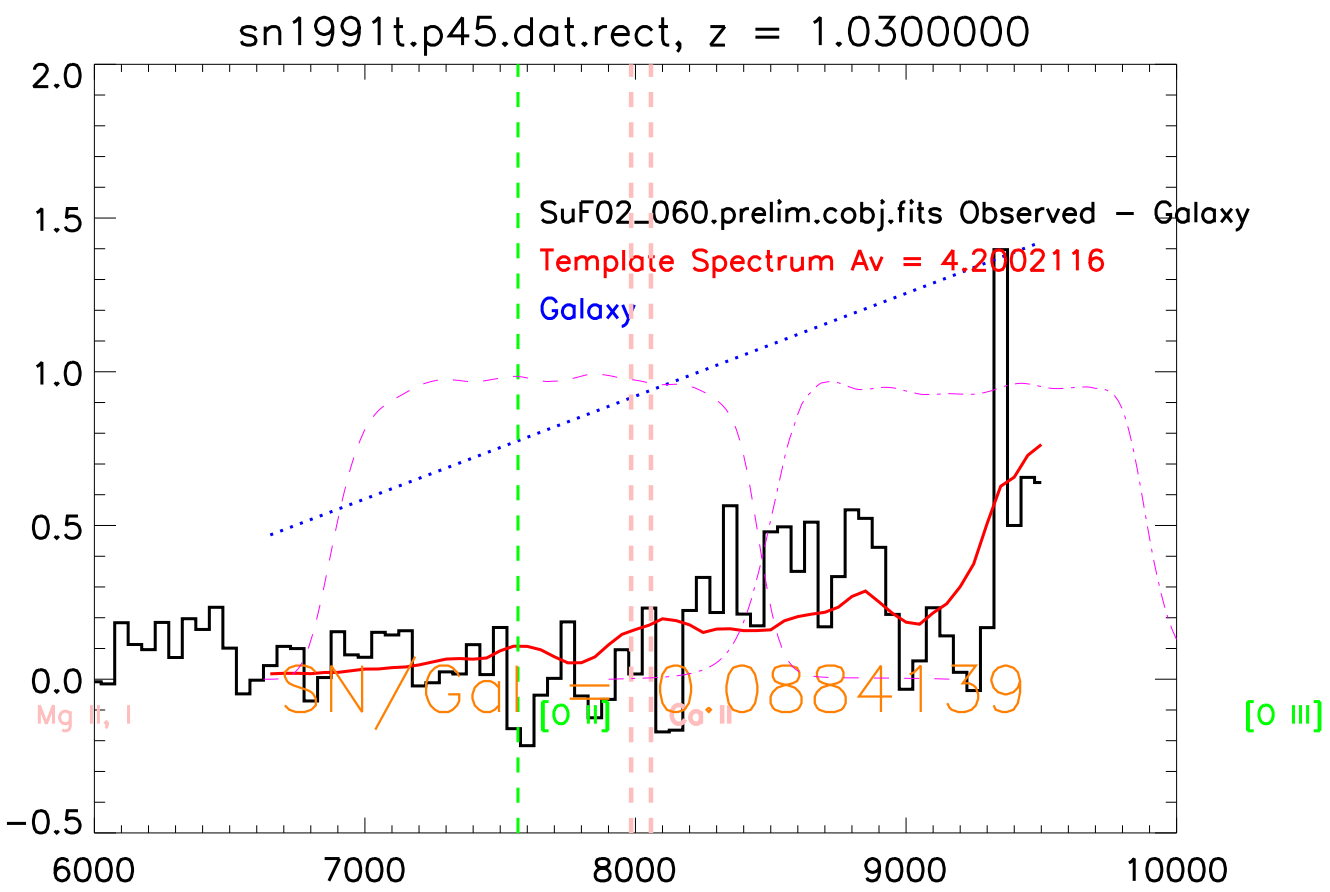

sn1999ee.p20.dat.rect, z = 1.0500000
SuF02_060.prelim.cobj.fits Observed − Galaxy
Template Spectrum Av = 3.0802625
Galaxy
SN/Gal = 0.110698
Mg II, I
[O III]
Ca II
[O III]
2.0
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

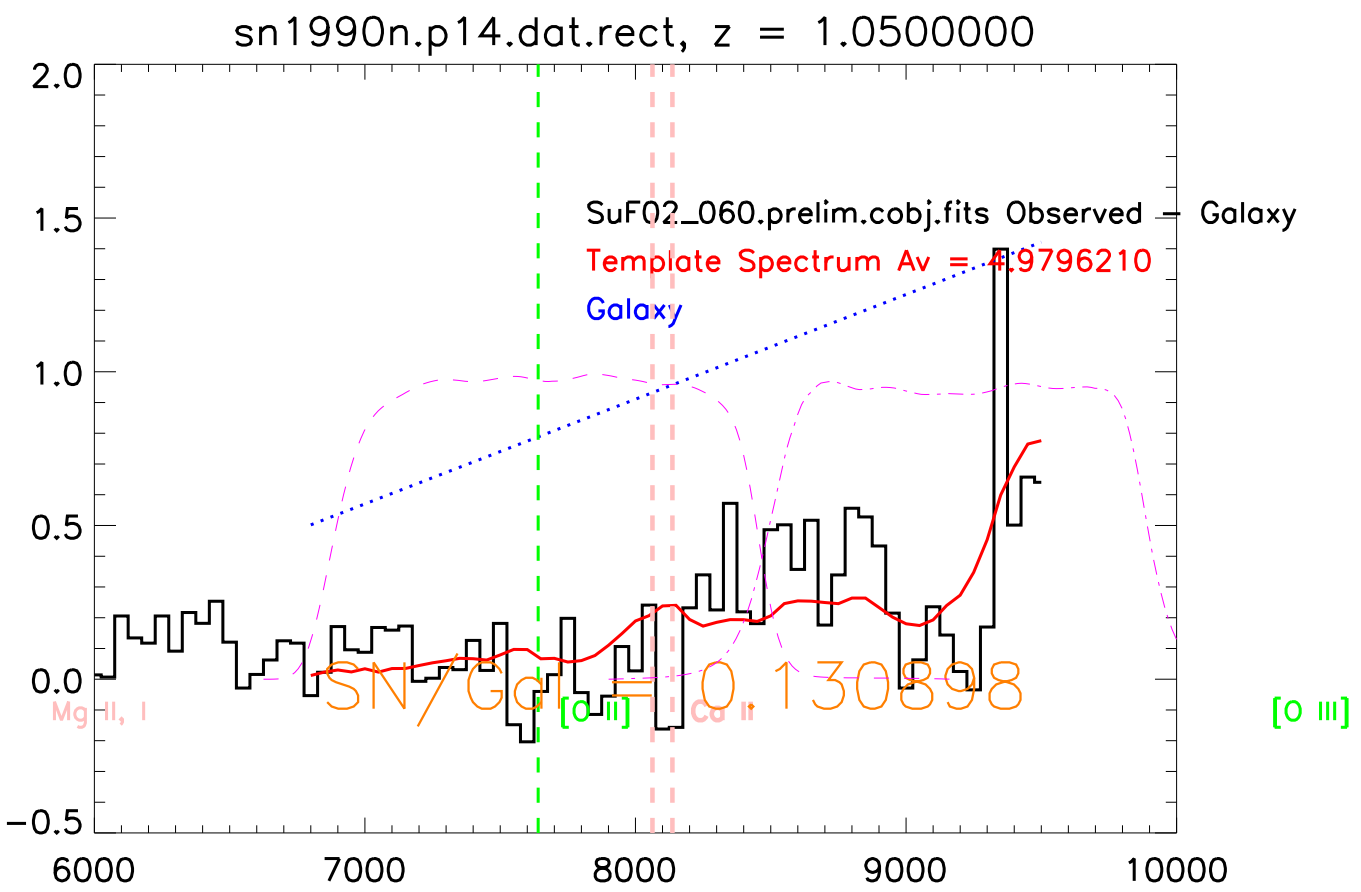

sn1994d.m04.dat.rect, z = 1.1000000
SuF02_060.prelim.cobj.fits Observed − Galaxy
Template Spectrum Av = 2.8816883
Galaxy
SN/Gal = 1.17016
Mg II, I
[O II]
Ca II
[O
2.5
2.0
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

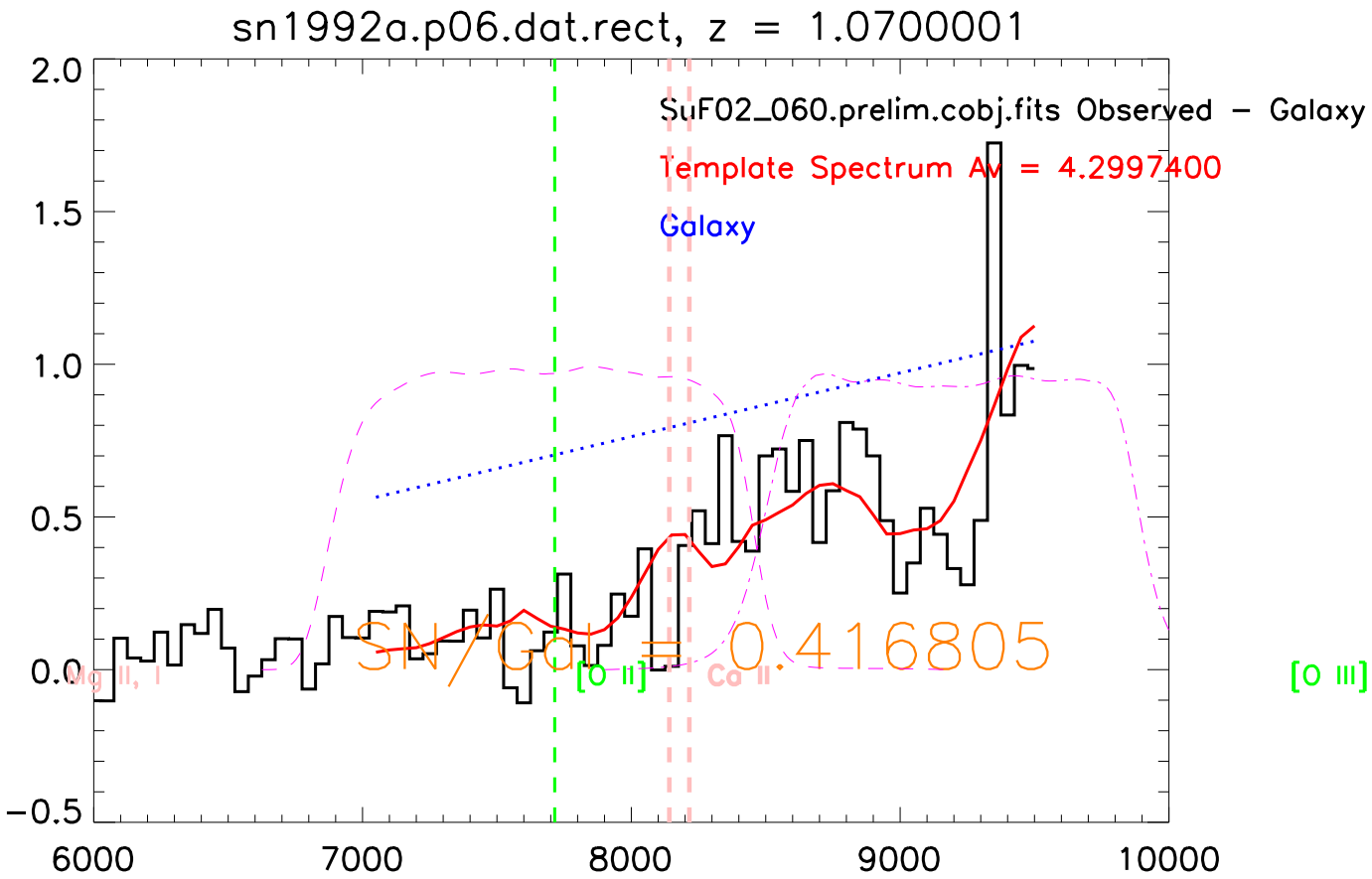

sn1999ee.p28.dat.rect, z = 1.0500000
SuF02_060.prelim.cobj.fits Observed – Galaxy
Template Spectrum Av = 1.8796602
Galaxy
vSN/Gal = 0.112387
Mg II, I
[O II]
Ca II
[O III]
2.0
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

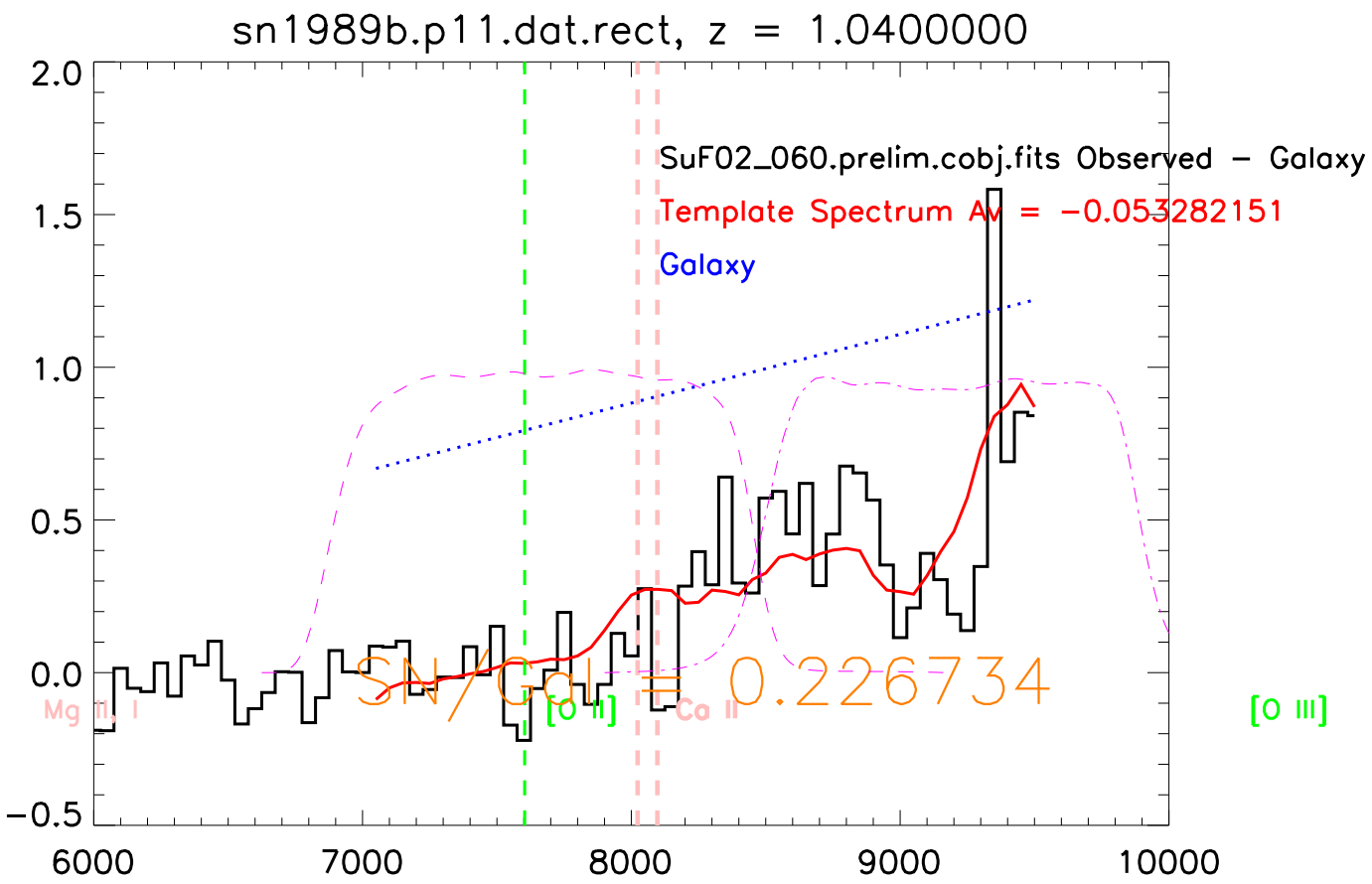

sn1999ee.p33.dat.rect, z = 1.0500000
SuF02_060.prelim.cobj.fits Observed − Galaxy
Template Spectrum Av = 1.9563187
Galaxy
SN/Gal = 0.135640
Mg II, I
[O II]
Ca II
[O III]
2.0
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

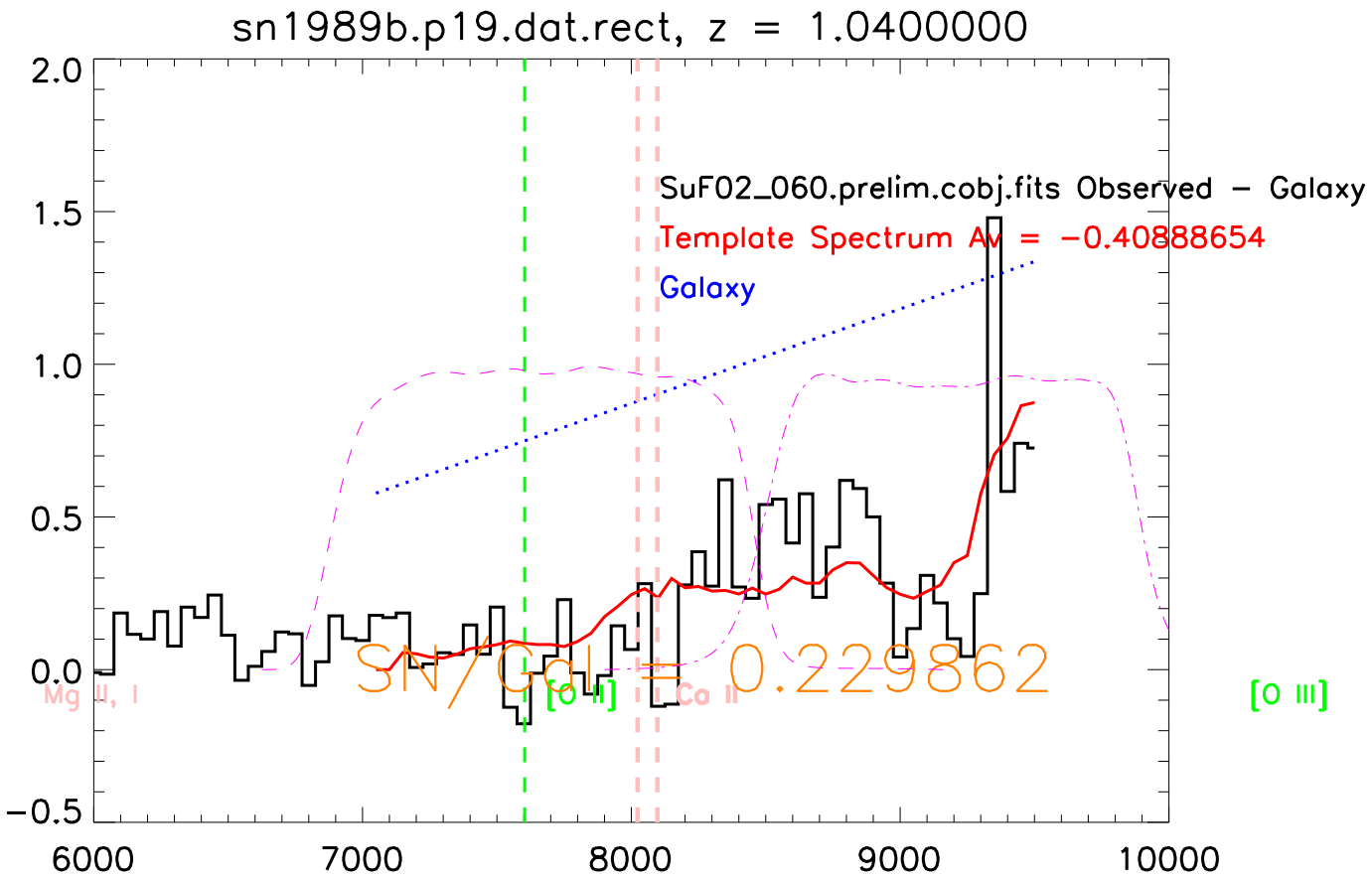

sn1999ee.p23.dat.rect, z = 1.0500000
SuF02_060.prelim.cobj.fits Observed – Galaxy
Template Spectrum Av = 2.5887201
Galaxy
SN/Gal = 0.0964903
Mg II, I
[O II]
Ca II
[O III]
2.0
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

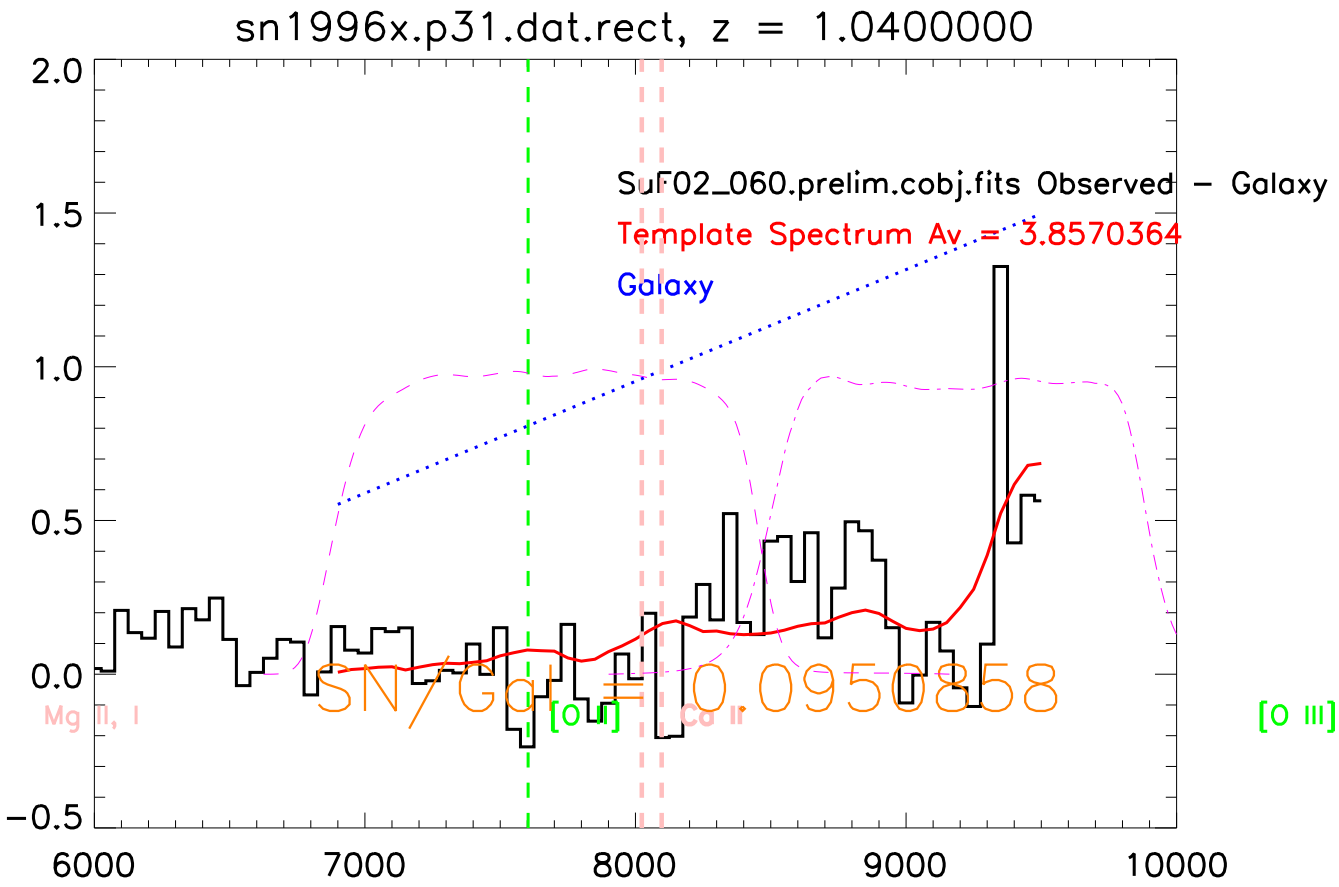

sn1991t.p45.dat.rect, z = 1.0300000
SuF02_060.prelim.cobj.fits Observed − Galaxy
Template Spectrum Av = 4.2002116
Galaxy
SN/Gal = 0.0884139
Mg II, I
[O II]
Ca II
[O III]
2.0
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

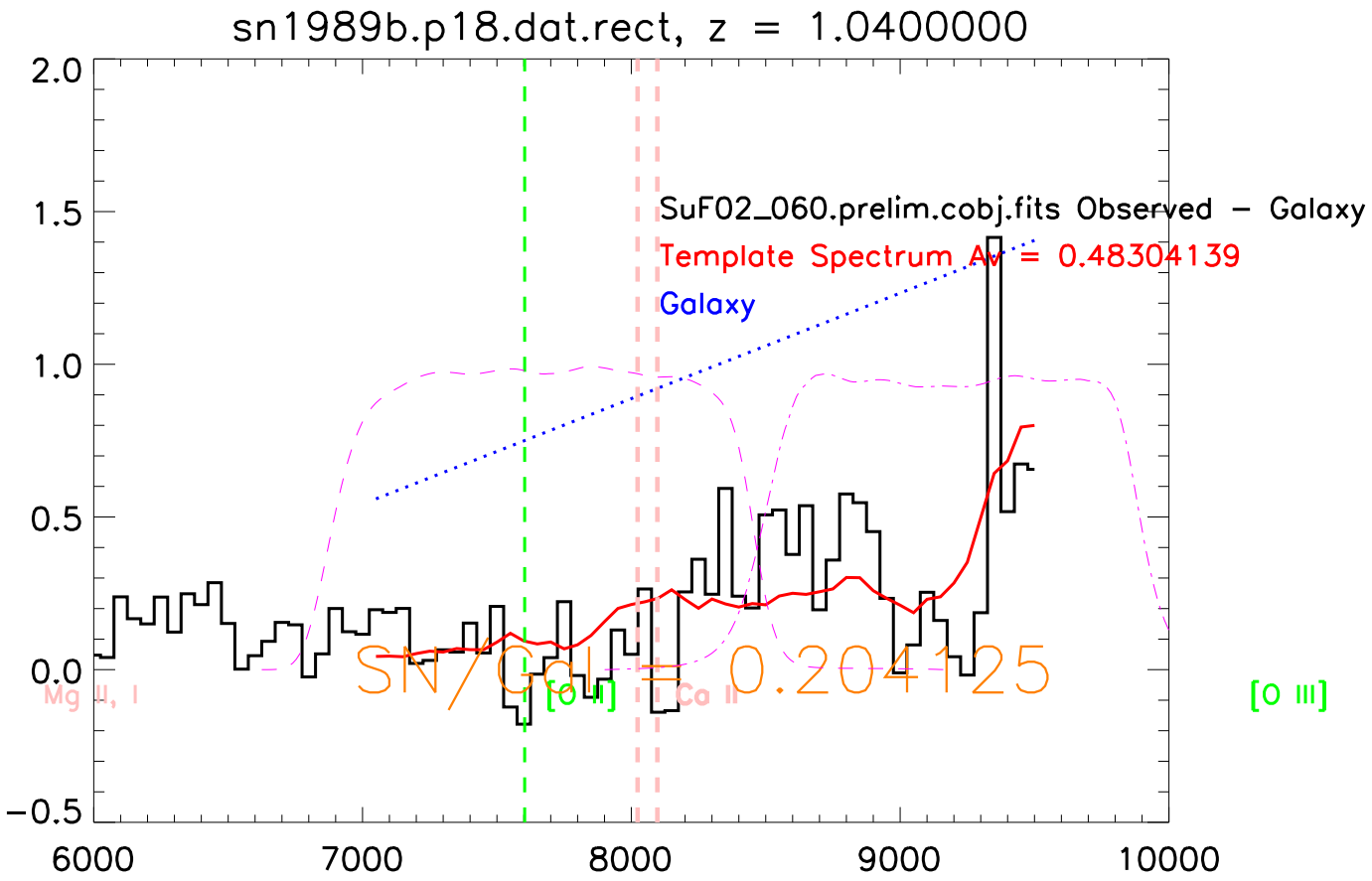

sn1990n.p14.dat.rect, z = 1.0500000
SuF02_060.prelim.cobj.fits Observed – Galaxy
Template Spectrum Av = 4.9796210
Galaxy
SN/Gal=0.130898
Mg II, I
[O II]
Ca II
[O III]
2.0
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

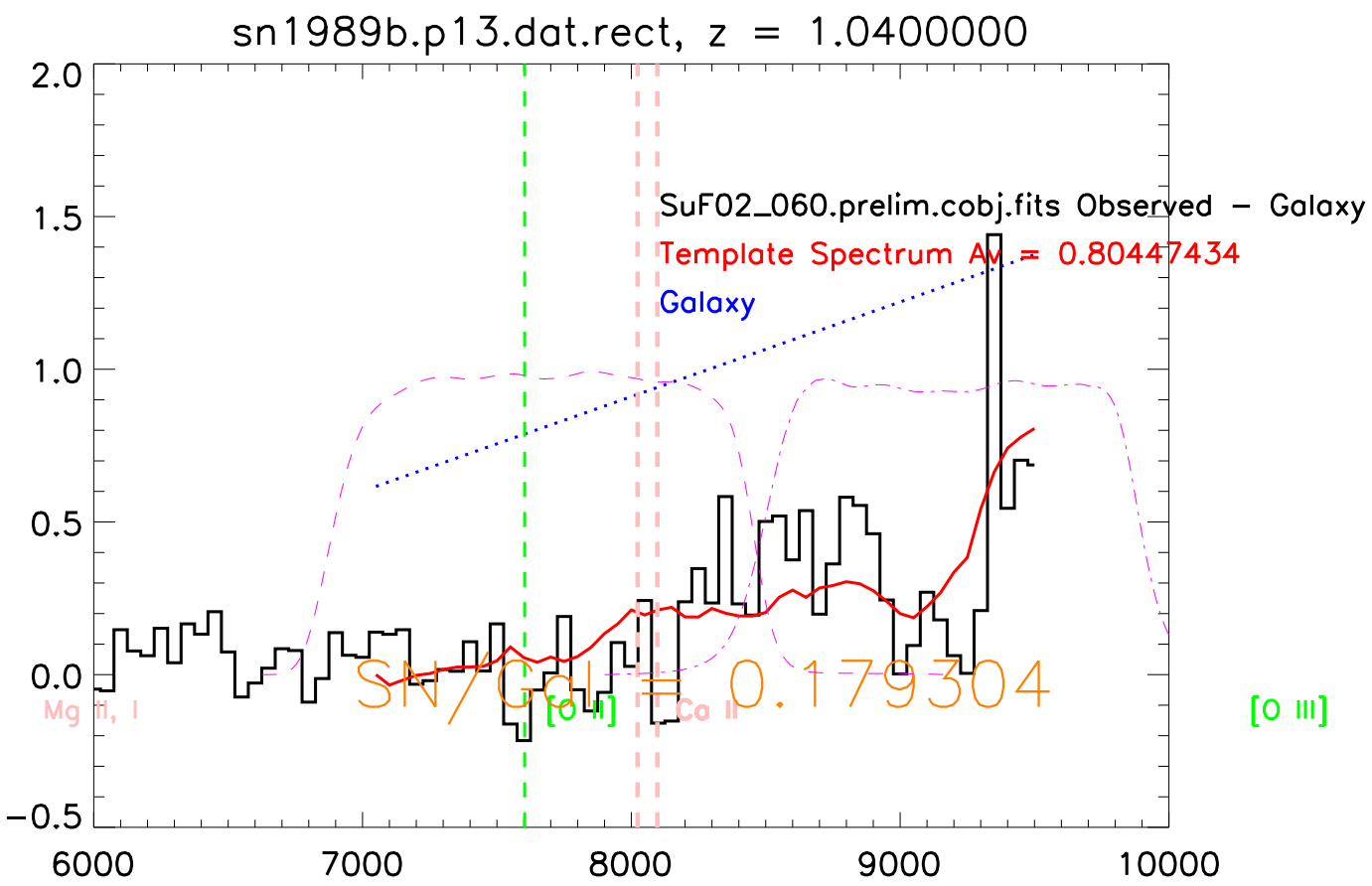

sn1992a.p06.dat.rect, z = 1.0700001
SuF02_060.prelim.cobj.fits Observed − Galaxy
Template Spectrum Av = 4.2997400
Galaxy
S/N(Gal) = 0.416805
Mg II, I
[O II]
Ca II
[O III]
2.0
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

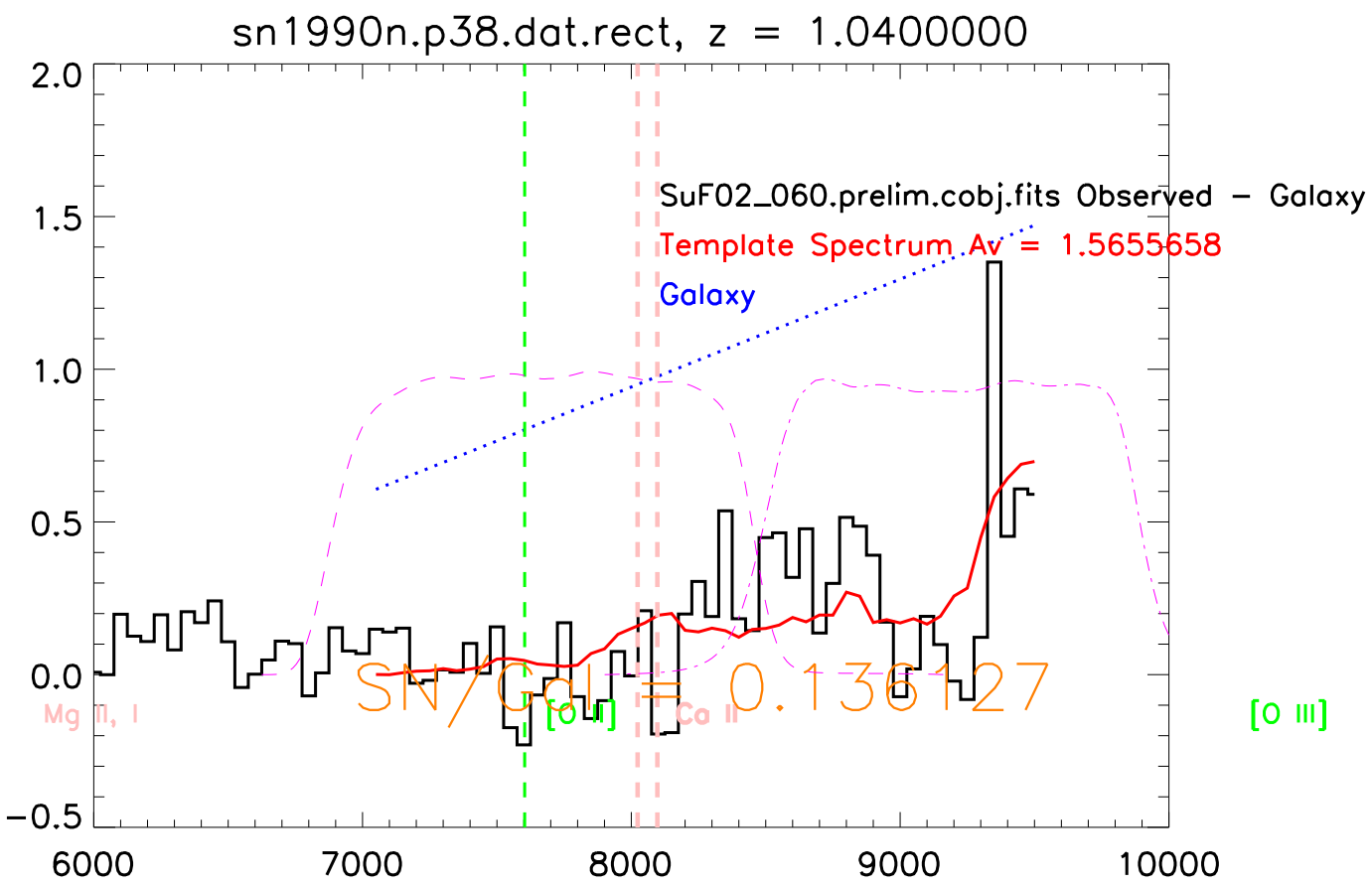

sn1989b.p11.dat.rect, z = 1.0400000
SuF02_060.prelim.cobj.fits Observed − Galaxy
Template Spectrum AV = −0.053282151
Galaxy
S/N/GOL = 0.226734
Mg II, I
[O II]
Ca II
[O III]
2.0
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000


sn1989b.p19.dat.rect, z = 1.0400000
SuF02_060.prelim.cobj.fits Observed − Galaxy
Template Spectrum Av = −0.40888654
Galaxy
SN/Gal = 0.229862
Mg II, I
[O II]
Ca II
[O III]
2.0
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000


sn1996x.p31.dat.rect, z = 1.0400000
SuF02_060.prelim.cobj.fits Observed − Galaxy
Template Spectrum Av = 3.8570364
Galaxy
SN/Gal = 0.09508858
Mg II, I
[O II]
Ca II
[O III]
2.0
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000


sn1989b.p18.dat.rect, z = 1.0400000
SuF02_060.prelim.cobj.fits Observed − Galaxy
Template Spectrum Av = 0.48304139
Galaxy
SN/Gal = 0.204125
Mg II, I
[O II]
Ca II
[O III]
2.0
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000


sn1989b.p13.dat.rect, z = 1.0400000
SuF02_060.prelim.cobj.fits Observed − Galaxy
Template Spectrum AV = 0.80447434
Galaxy
SN/GAL = 0.179304
Mg II, I
[O II]
Ca II
[O III]
2.0
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

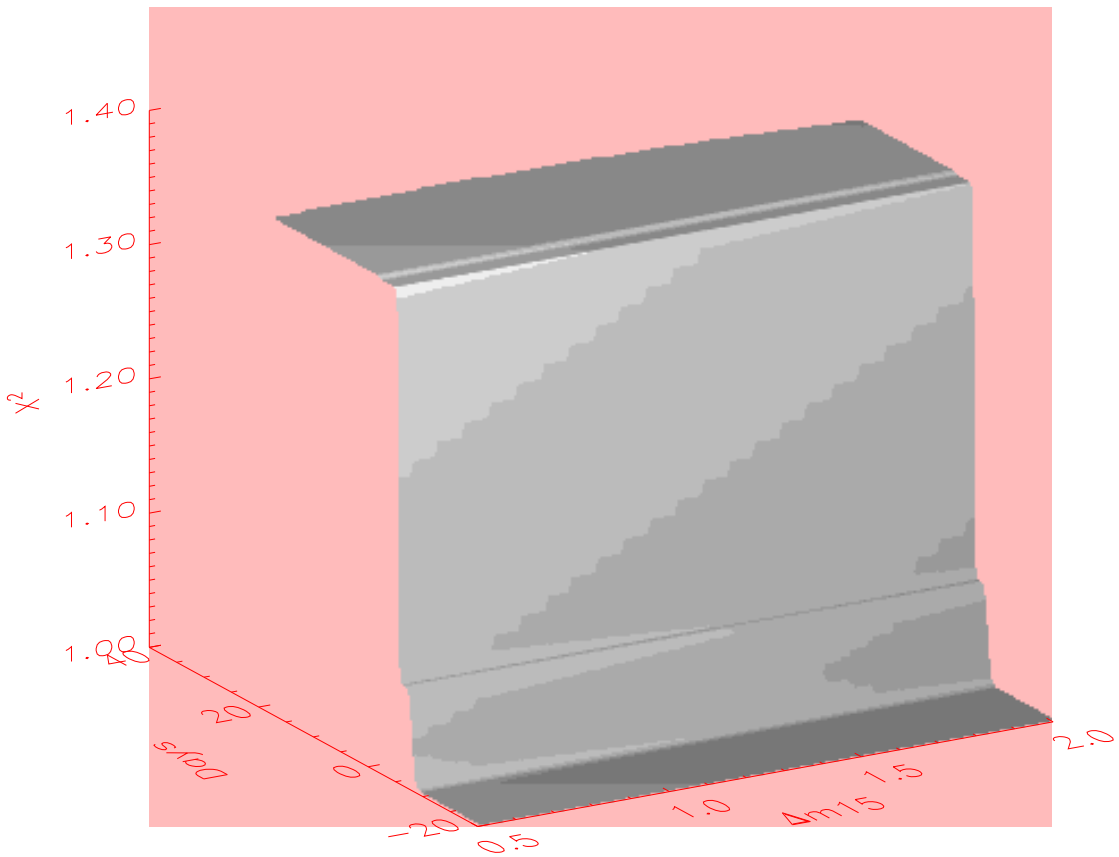

sn1990n.p38.dat.rect, z = 1.0400000
SuF02_060.prelim.cobj.fits Observed − Galaxy
Template Spectrum Av = 1.5655658
Galaxy
SN/Gal = 0.136127
Mg II, I
[O II]
Ca II
[O III]
2.0
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

1.4

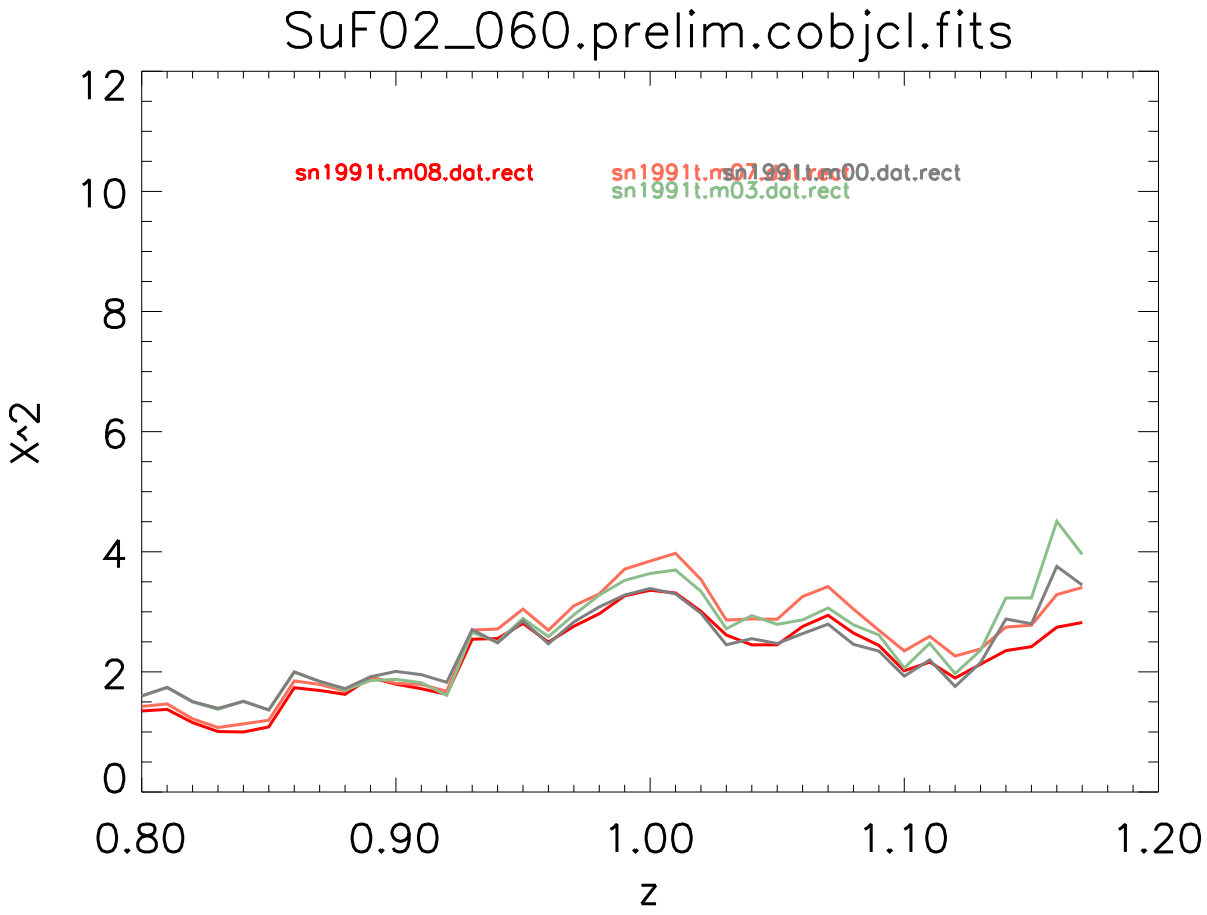
1.4

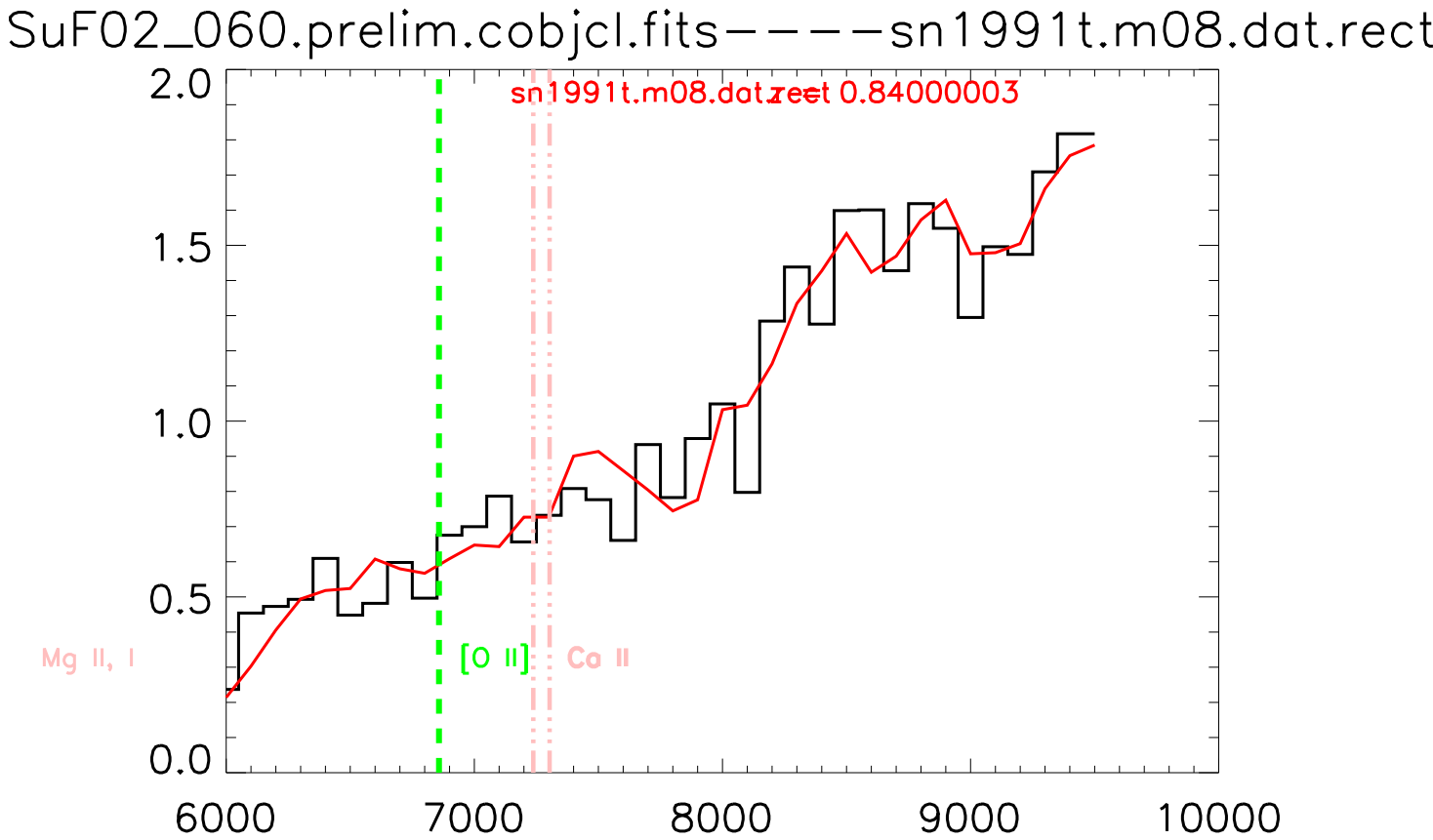
1.1

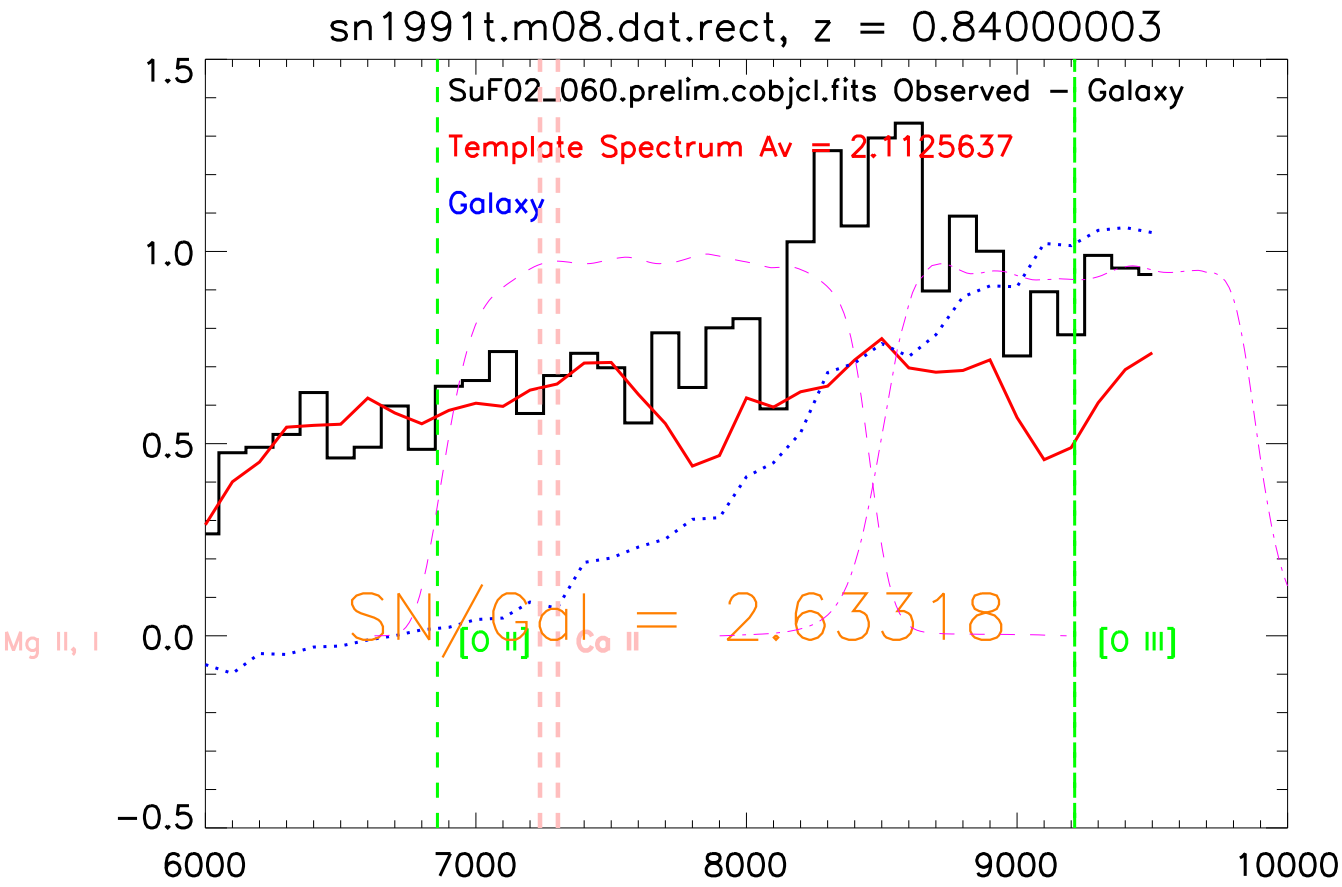
1.0

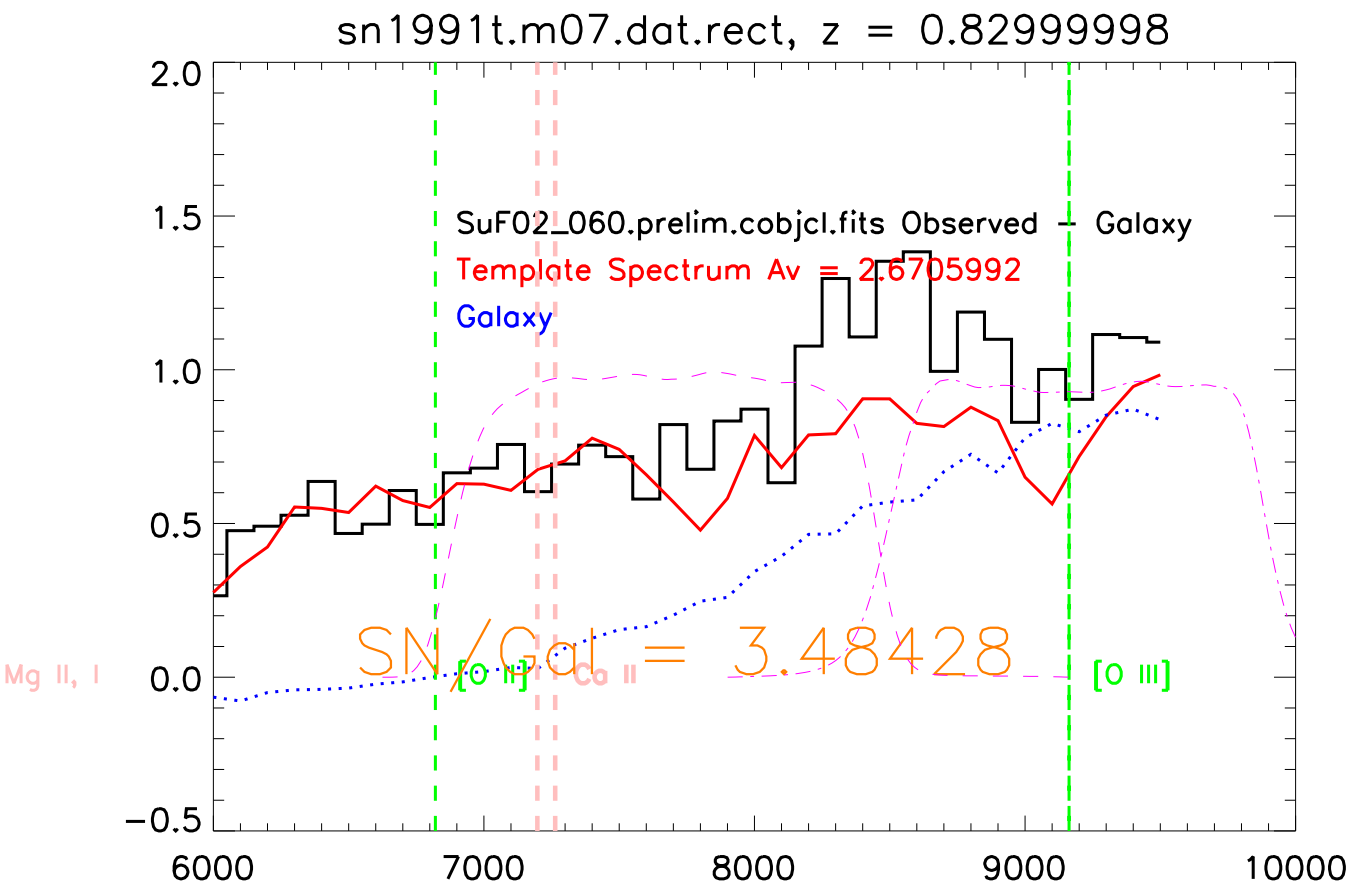


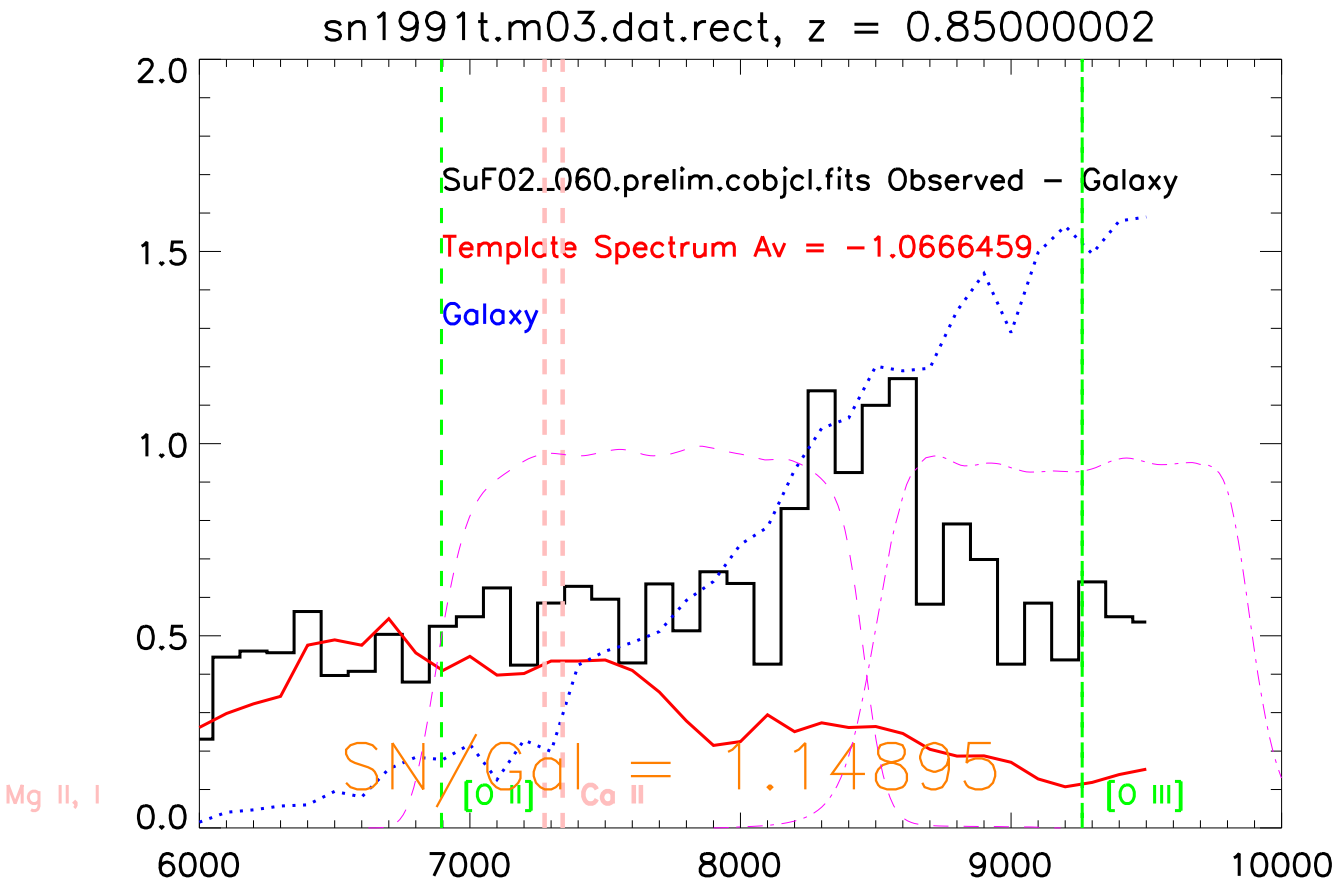
1.40
1.30
1.20
1.10
1.00
χ^2
40
20
0
−20
Days
0.5
1.0
1.5
2.0
Δm15

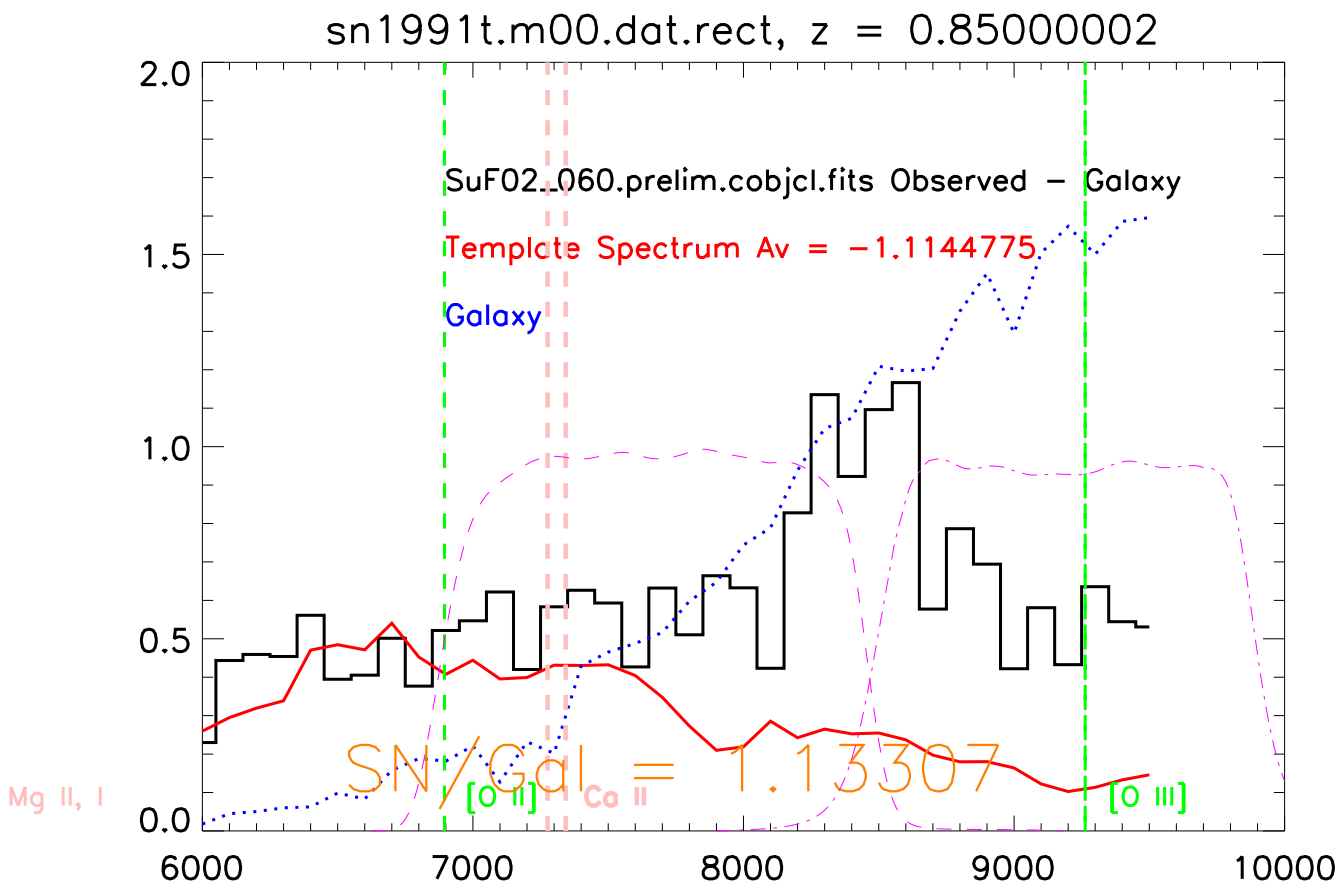

SuF02_060.prelim.cobjcl.fits
sn1991t.m08.dot.rect
sn1991t.m03.dot.rect
X^2
z
0
2
4
6
8
10
12
0.80
0.90
1.00
1.10
1.20

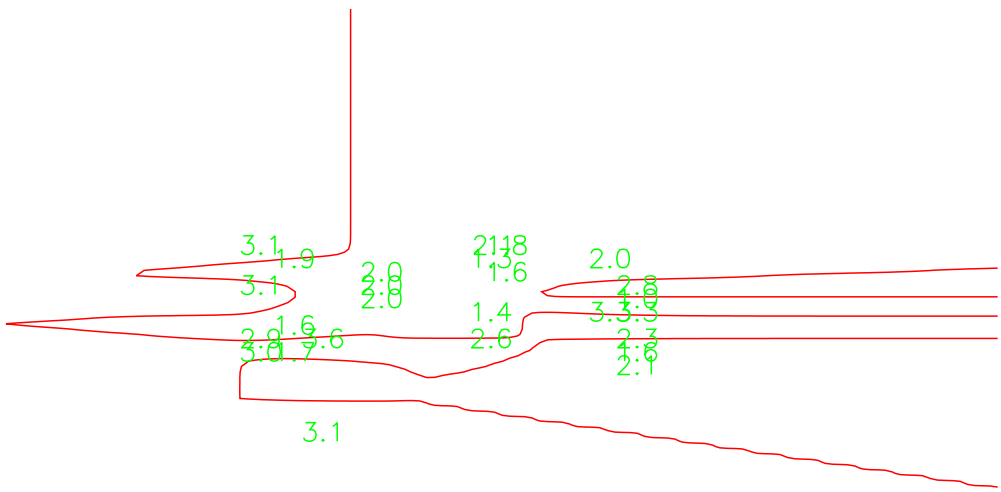

SuF02_060.prelim.cobjcl.fits----sn1991t.m08.dat.rect
sn1991t.m08.dat.rect 0.84000003
2.0
1.5
1.0
0.5
0.0
6000
7000
8000
9000
10000
Mg II, I
[O II]
Ca II

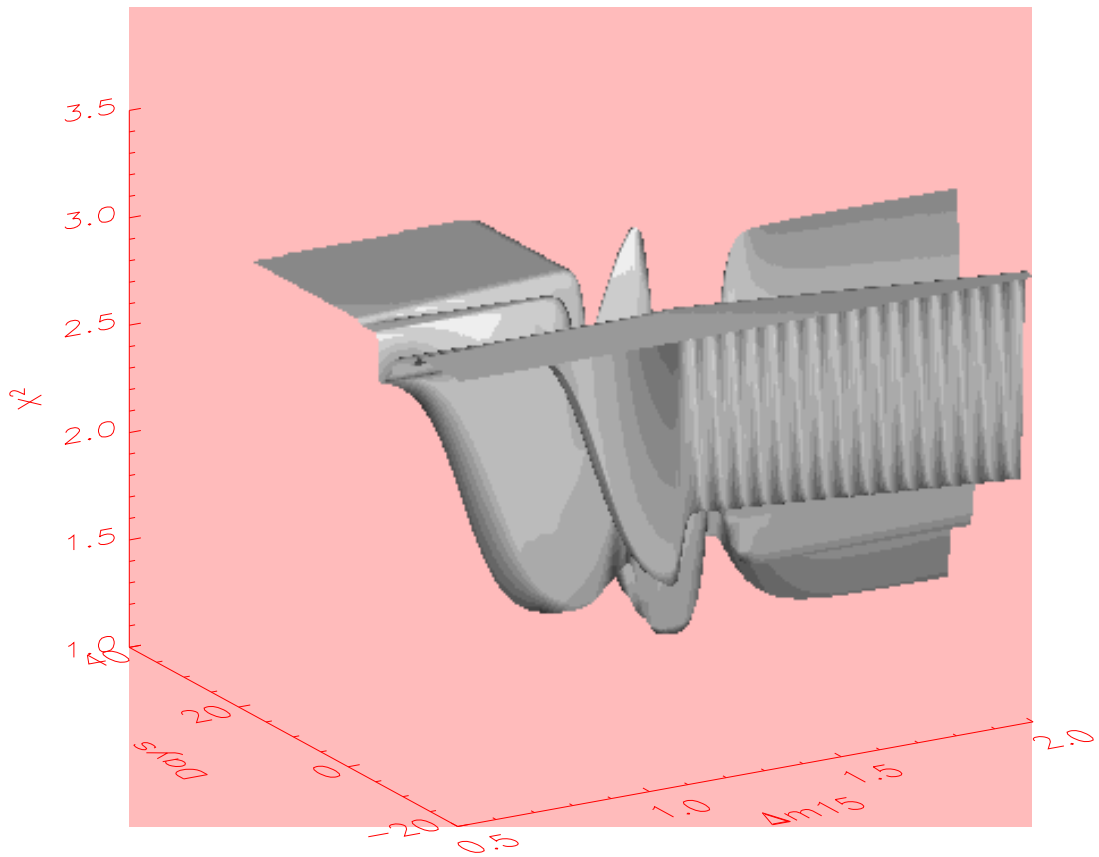

sn1991t.m08.dat.rect, z = 0.84000003
SuF02_060.prelim.cobjcl.fits Observed – Galaxy
Template Spectrum Av = 2.1125637
Galaxy
SN/Gal = 2.63318
Mg II, I
[O II]
Ca II
[O III]
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000


sn1991t.m07.dat.rect, z = 0.82999998
SuF02_060.prelim.cobjcl.fits Observed – Galaxy
Template Spectrum Av = 2.6705992
Galaxy
SN/Gal = 3.48428
Mg II, I
[O II]
Ca II
[O III]
2.0
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

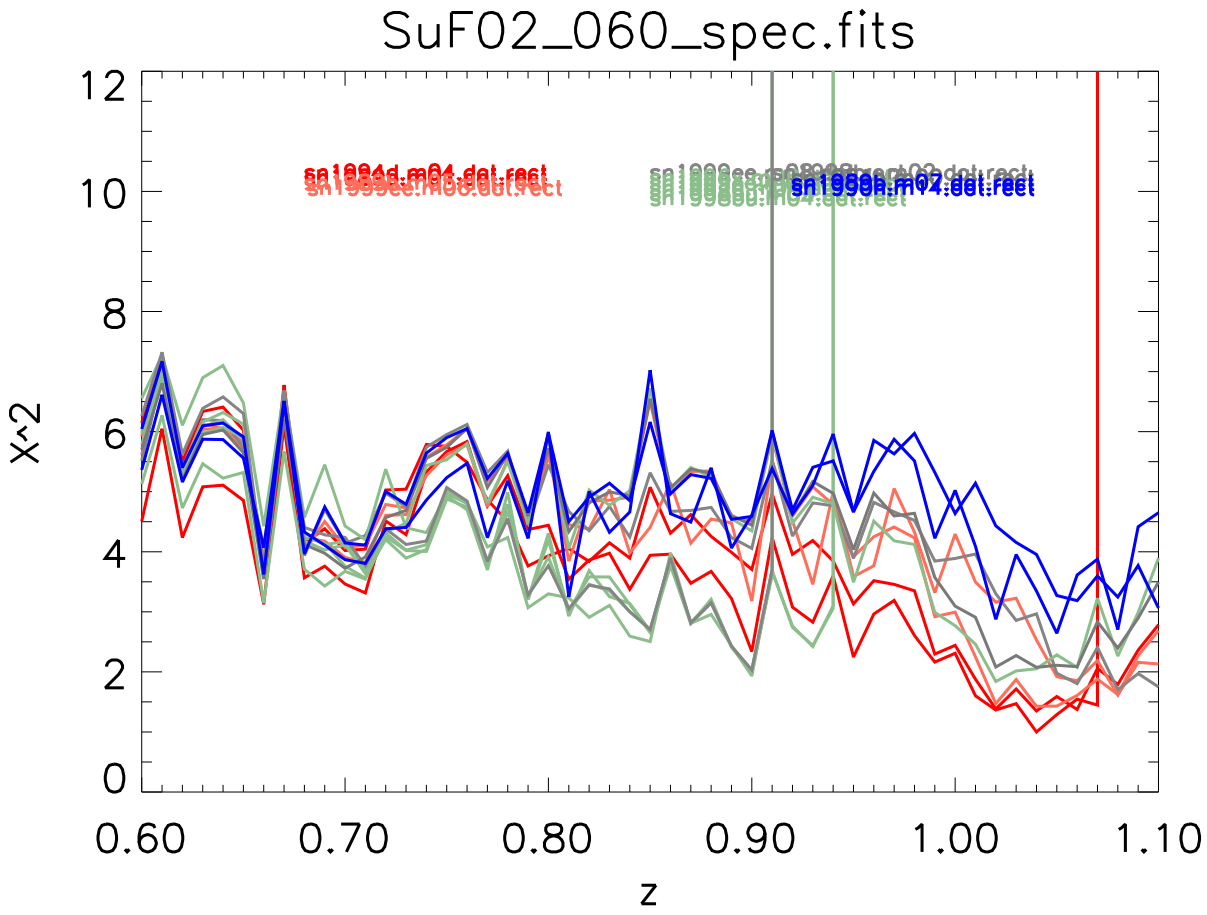

sn1991t.m03.dat.rect, z = 0.85000002
SuF02_060.prelim.cobjcl.fits Observed − Galaxy
Template Spectrum Av = −1.0666459
Galaxy
SN/Gal = 1.14895
[O II]
Ca II
[O III]
Mg II, I
2.0
1.5
1.0
0.5
0.0
6000
7000
8000
9000
10000

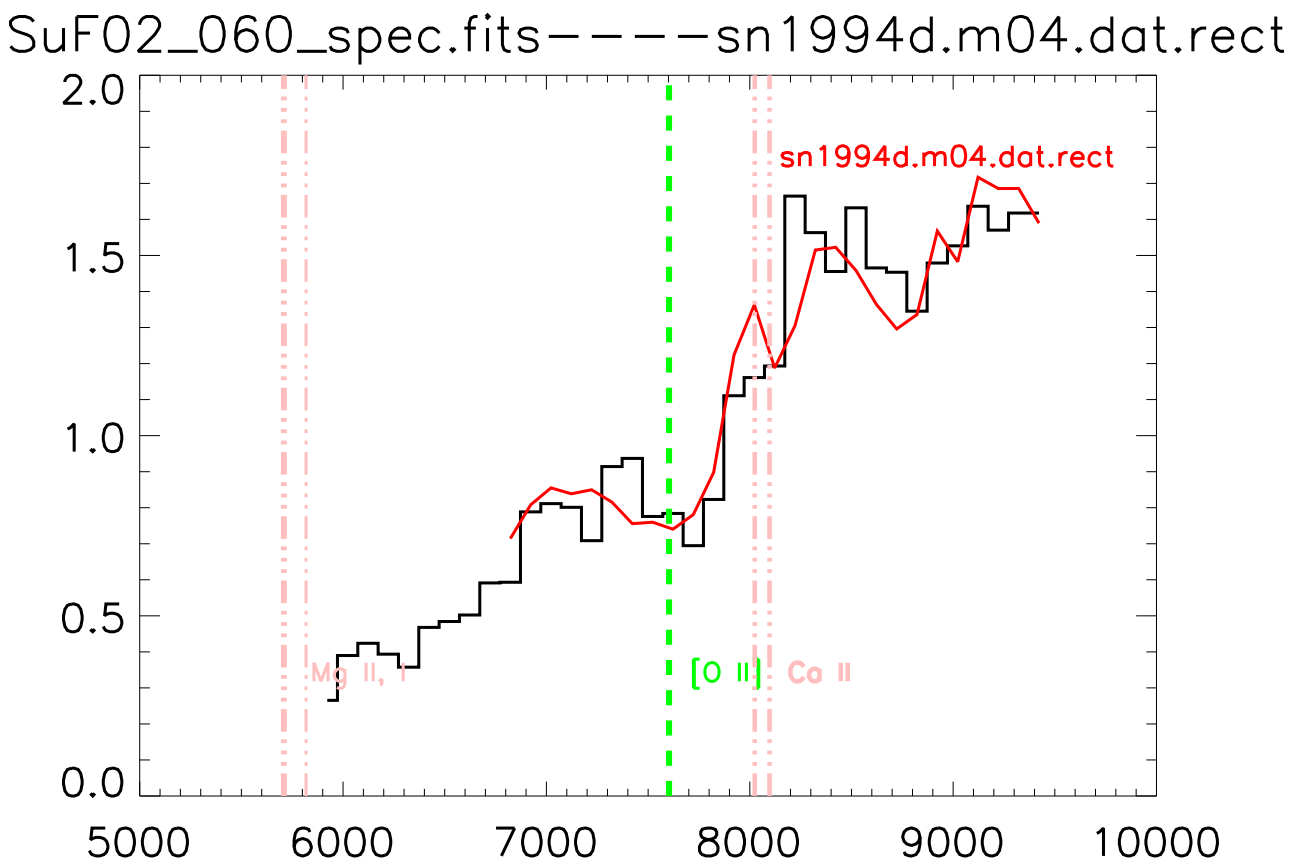

sn1991t.m00.dat.rect, z = 0.85000002
SuF02_060.prelim.cobjcl.fits Observed − Galaxy
Template Spectrum Av = −1.1144775
Galaxy
SN/Gal = 1.13307
Mg II, I
[O II]
Ca II
[O III]
2.0
1.5
1.0
0.5
0.0
6000
7000
8000
9000
10000

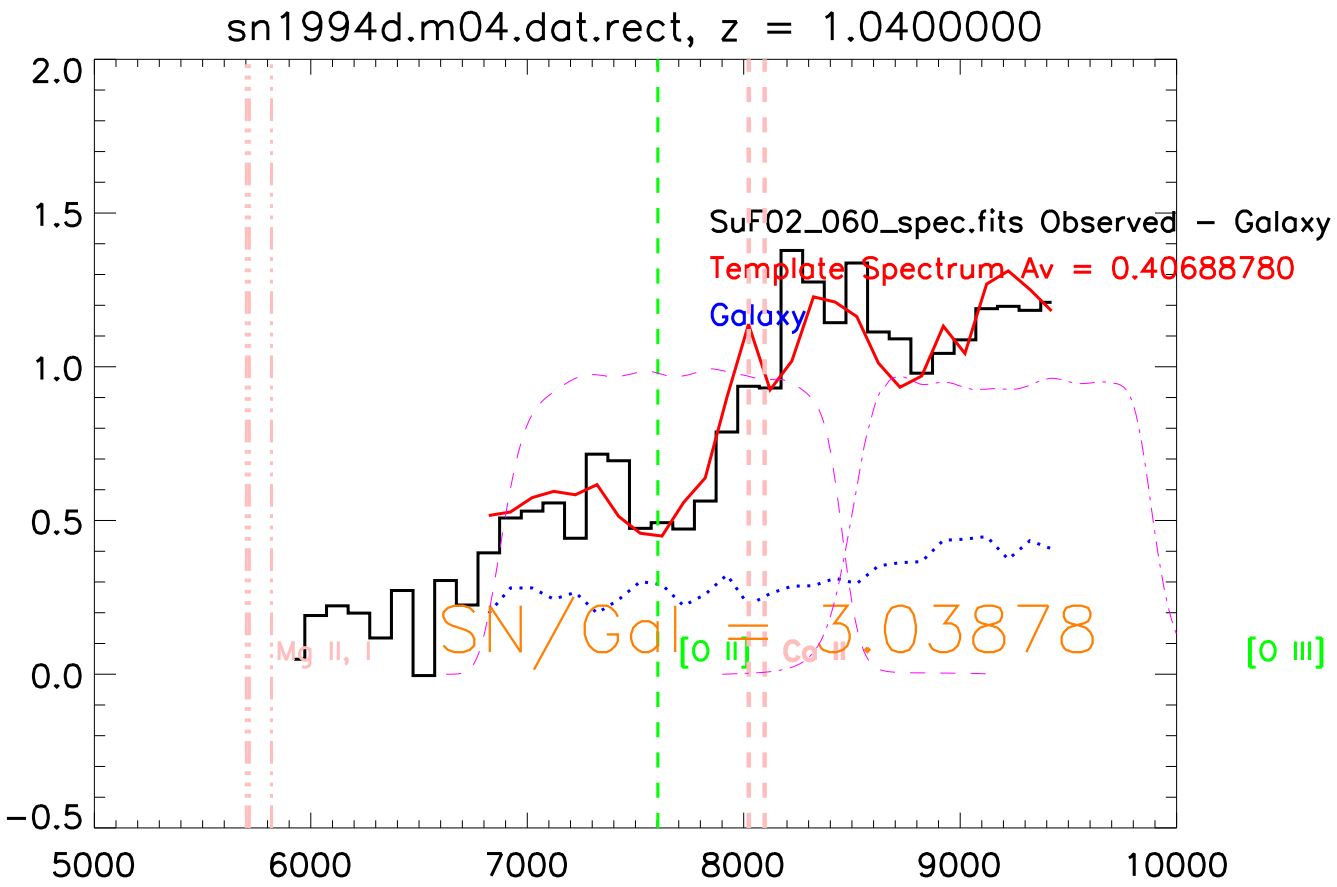

3.1
1.9
3.1
2.0
2.0
2.0
1.6
1.6
2.0
1.4
2.6
2.0
2.1
3.1

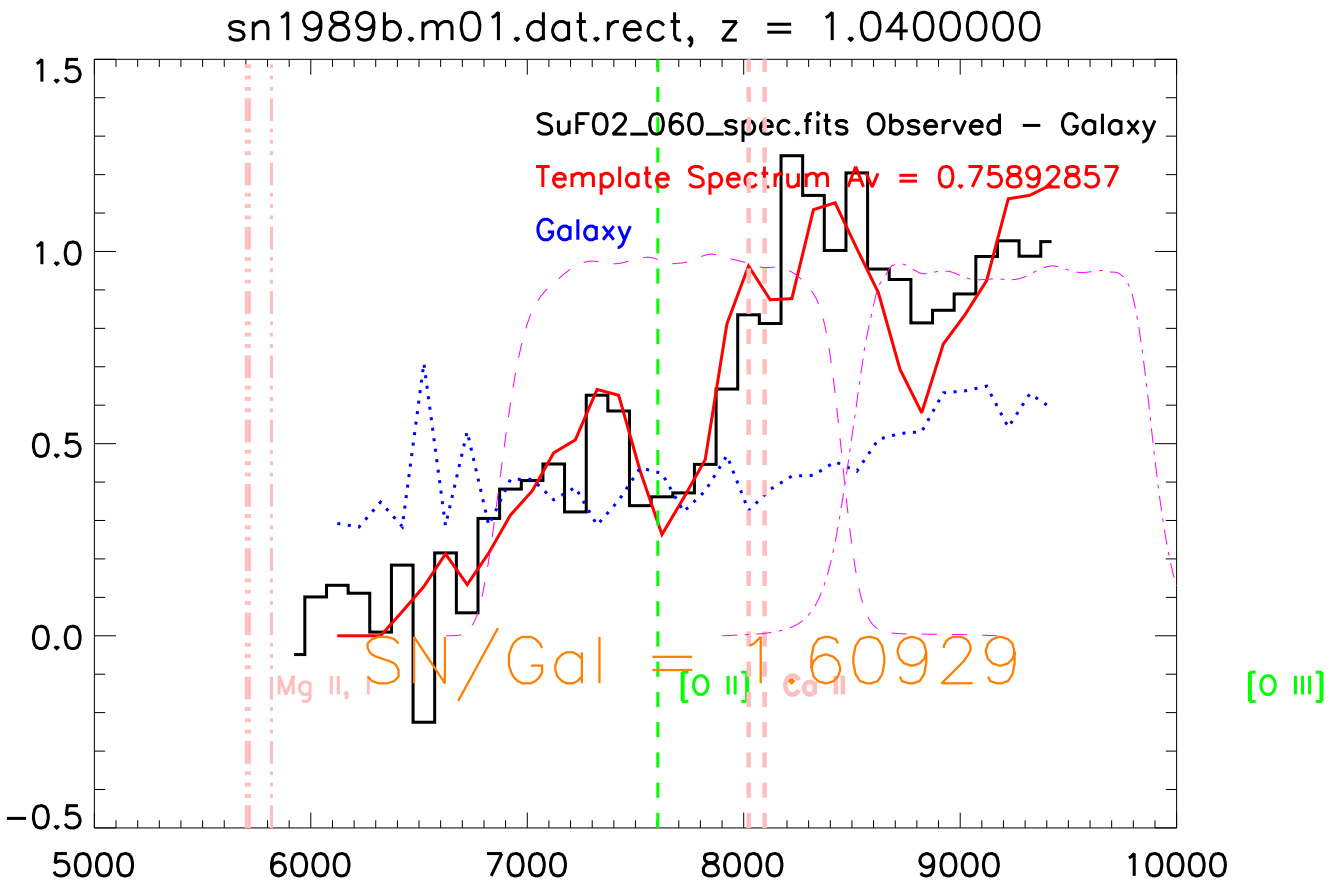


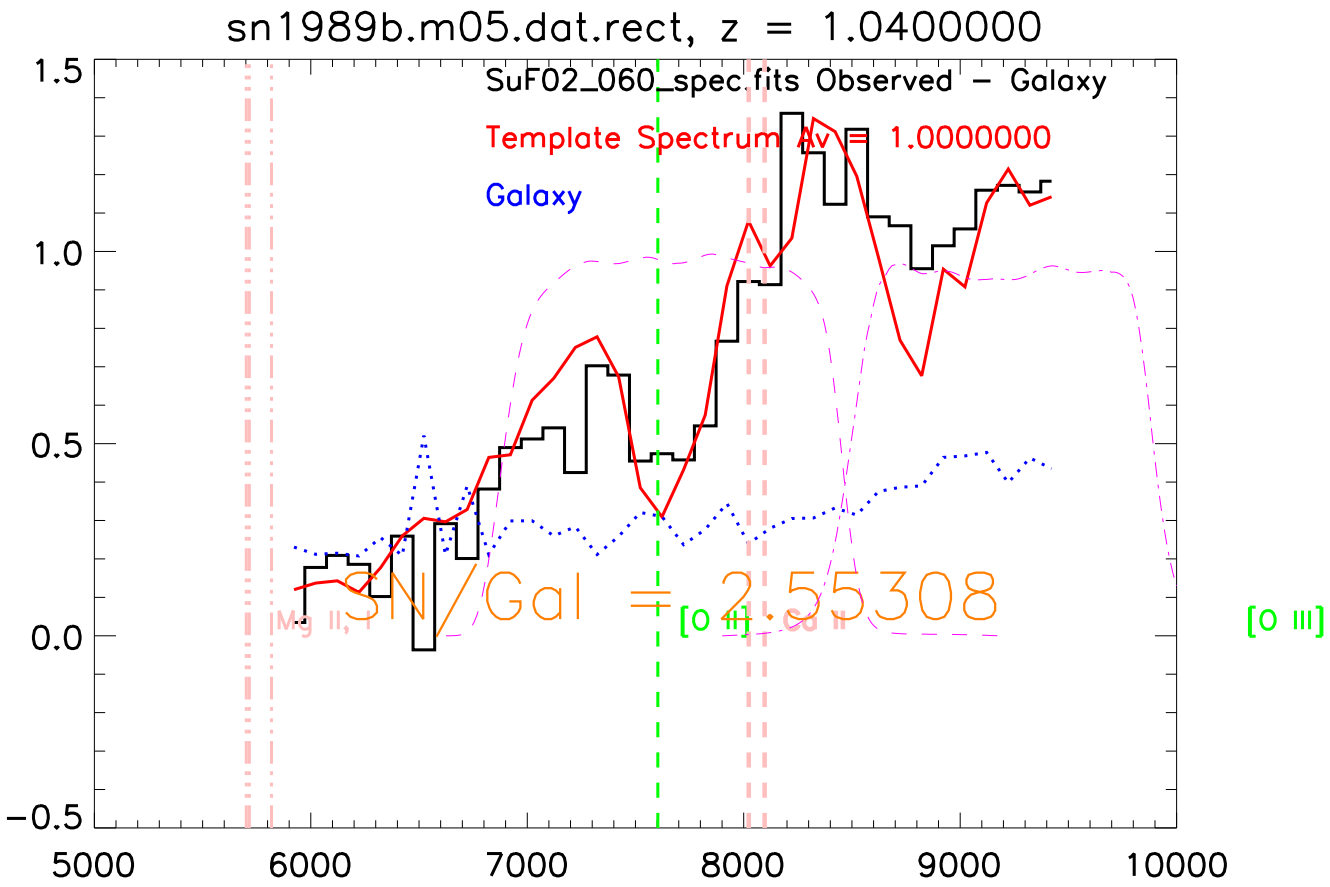
3.5
3.0
2.5
2.0
1.5
1.0
χ^2
40
20
0
−20
Days
0.5
1.0
1.5
2.0
Δm15

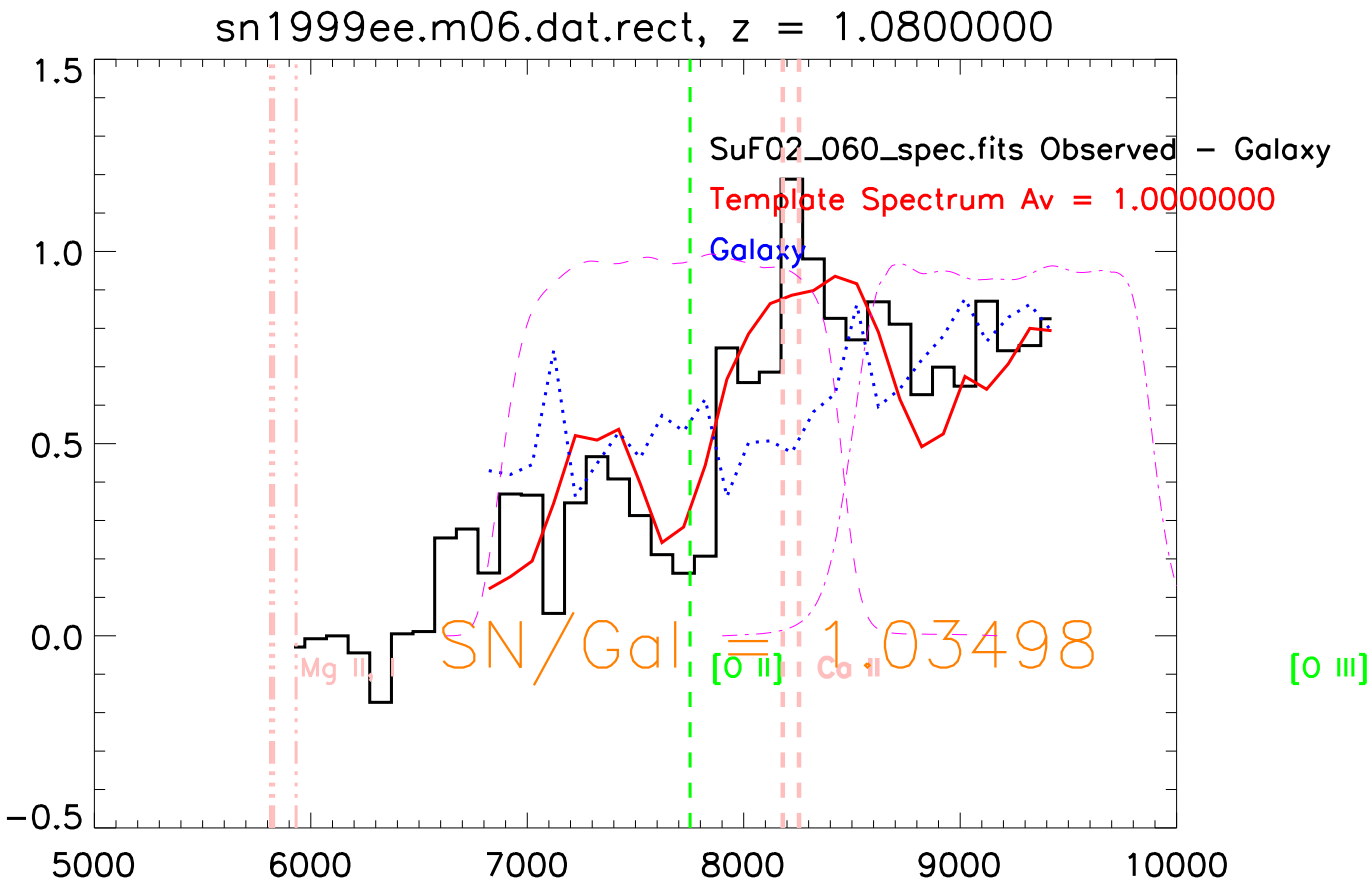

SuF02_060_spec.fits
sn1994d.m04.del.rect
sn1998a.m04.del.reet
X^2
z
0
2
4
6
8
10
12
0.60
0.70
0.80
0.90
1.00
1.10

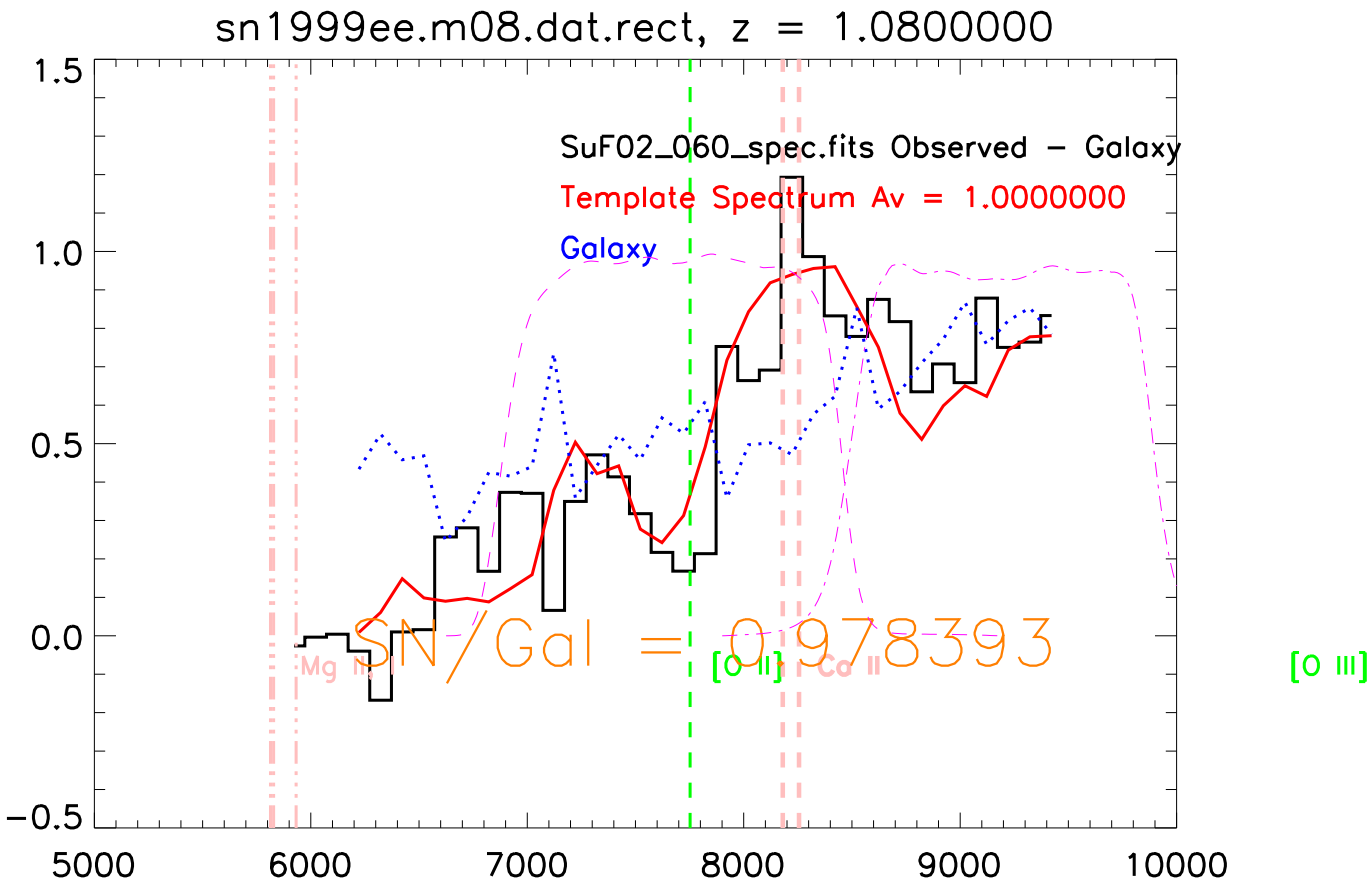

SuF02_060_spec.fits----sn1994d.m04.dat.rect
sn1994d.m04.dat.rect
Mg II, I
[O II]
Co II
2.0
1.5
1.0
0.5
0.0
5000
6000
7000
8000
9000
10000

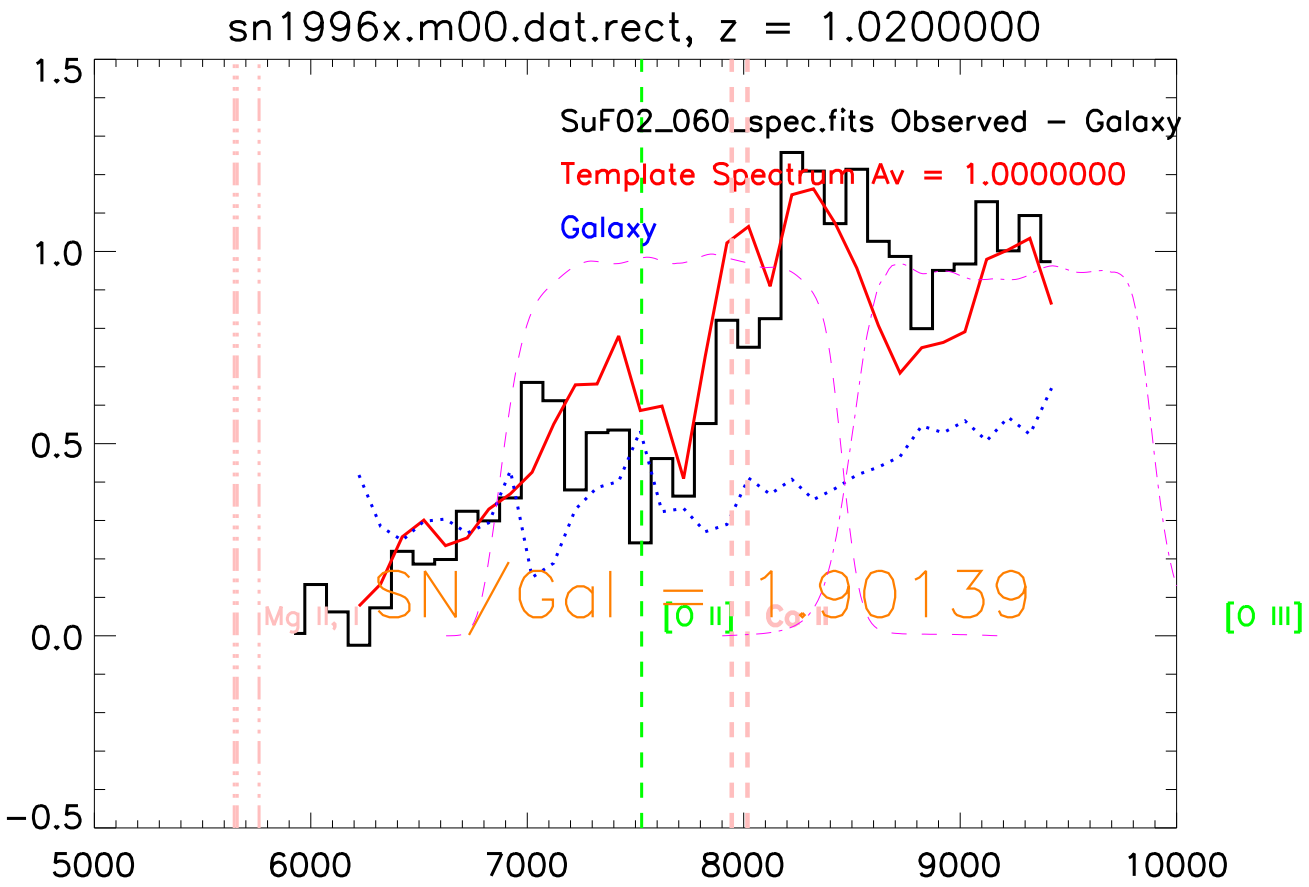

sn1994d.m04.dat.rect, z = 1.0400000
SuF02_060_spec.fits Observed − Galaxy
Template Spectrum Av = 0.40688780
Galaxy
SN/Gal = 3.03878
Mg II, I
[O II]
Ca II
[O III]
2.0
1.5
1.0
0.5
0.0
−0.5
5000
6000
7000
8000
9000
10000

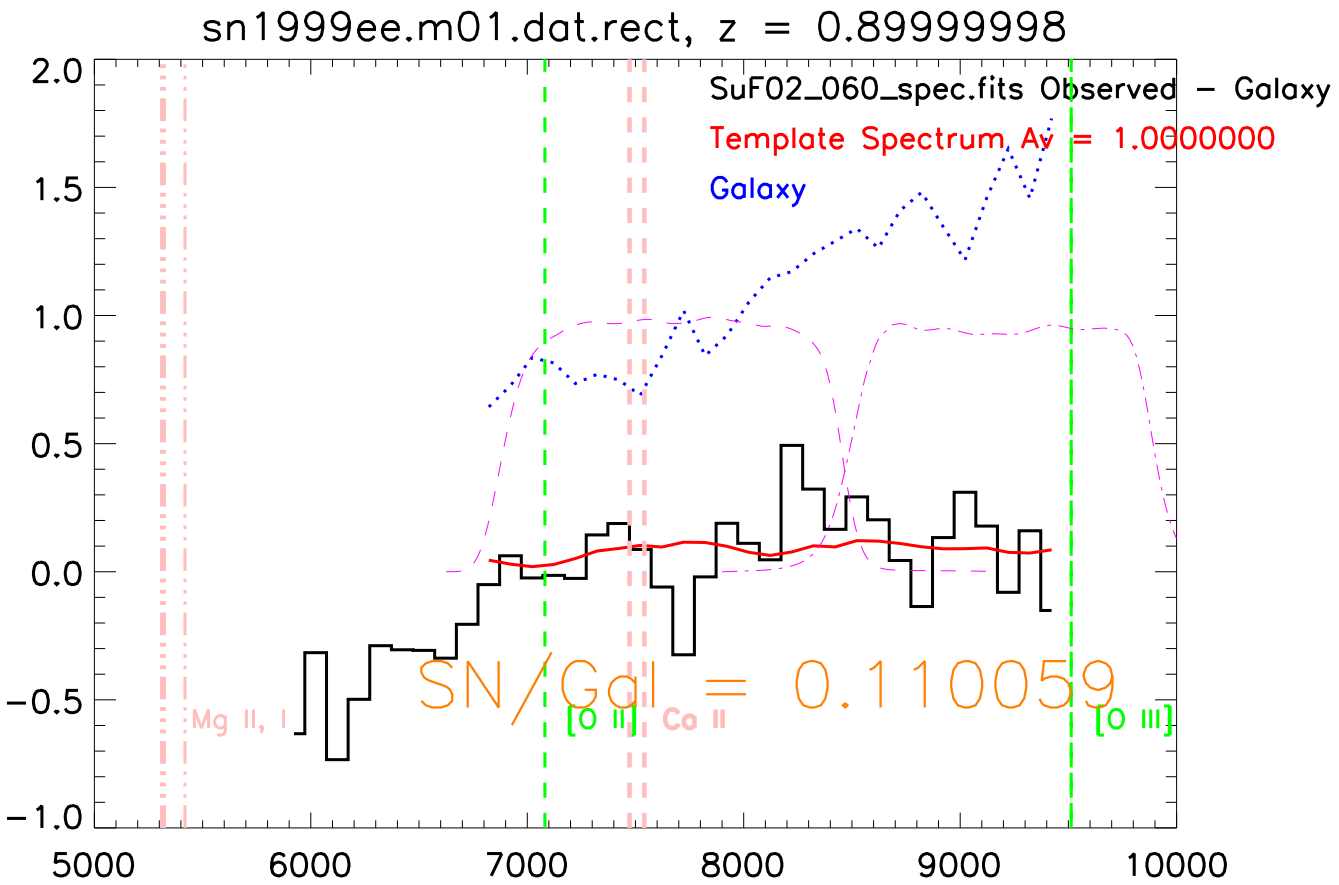

sn1989b.m01.dat.rect, z = 1.0400000
SuF02_060_spec.fits Observed − Galaxy
Template Spectrum Av = 0.75892857
Galaxy
SN/Gal = 1.60929
[O II]
[O III]
1.5
1.0
0.5
0.0
−0.5
5000
6000
7000
8000
9000
10000

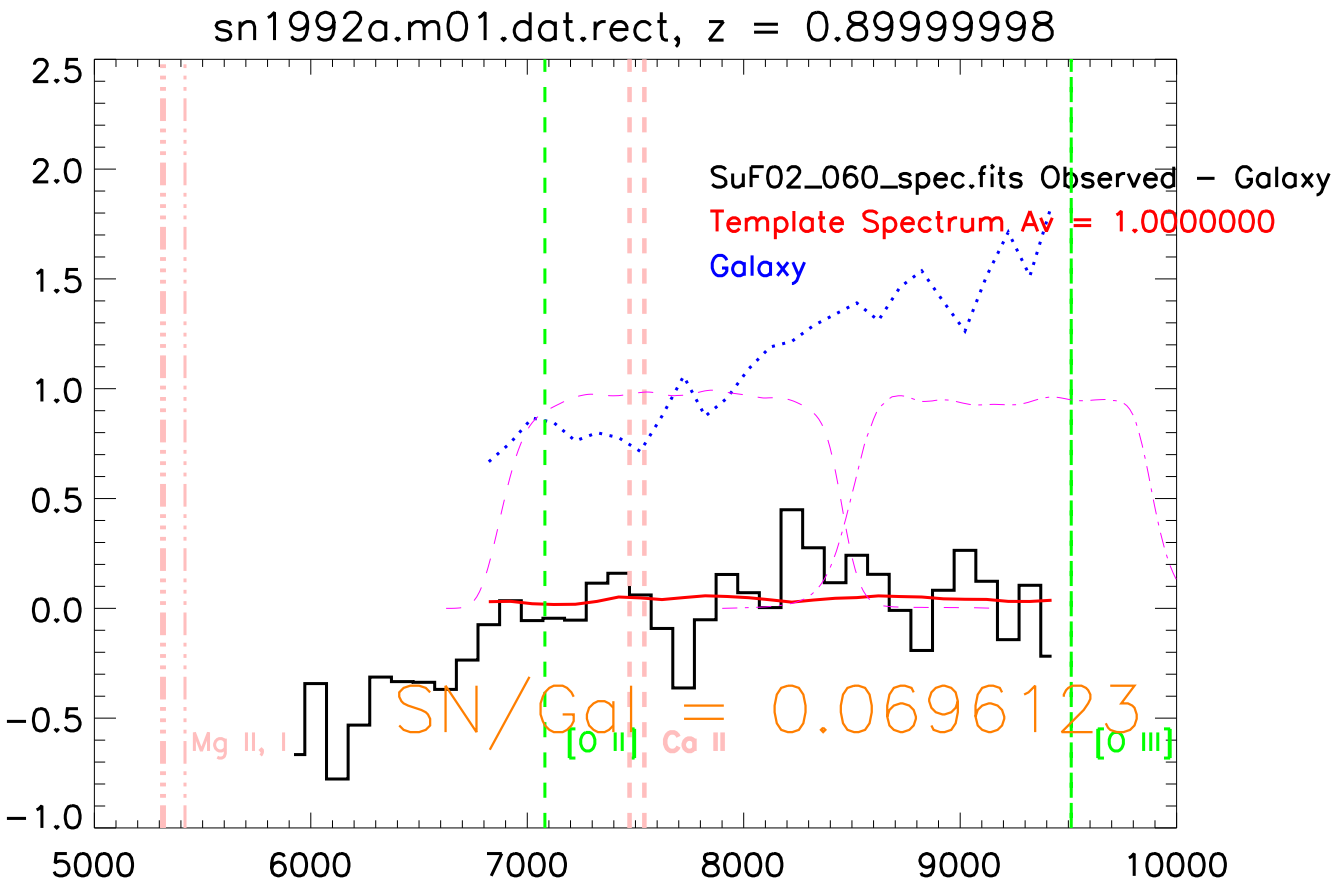

sn1989b.m05.dat.rect, z = 1.0400000
SuF02_060_spec.fits Observed − Galaxy
Template Spectrum Av = 1.0000000
Galaxy
S/N Gal = 2.55308
[O II]
[O III]
1.5
1.0
0.5
0.0
−0.5
5000
6000
7000
8000
9000
10000

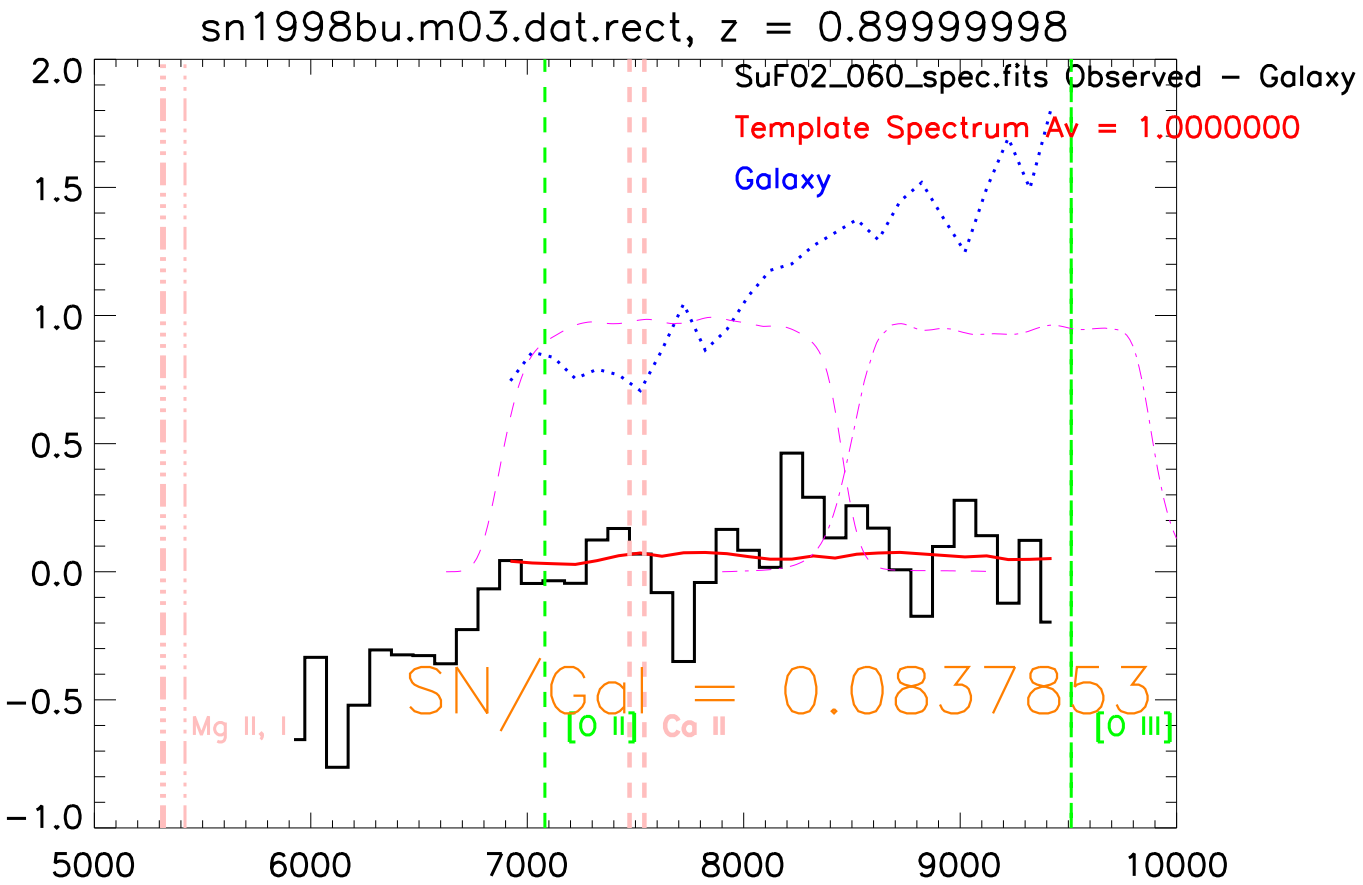

sn1999ee.m06.dat.rect, z = 1.0800000
SuF02_060_spec.fits Observed − Galaxy
Template Spectrum Av = 1.0000000
Galaxy
SN/Gal = 1.03498
Mg II]
[O II]
Ca II
[O III]
1.5
1.0
0.5
0.0
−0.5
5000
6000
7000
8000
9000
10000

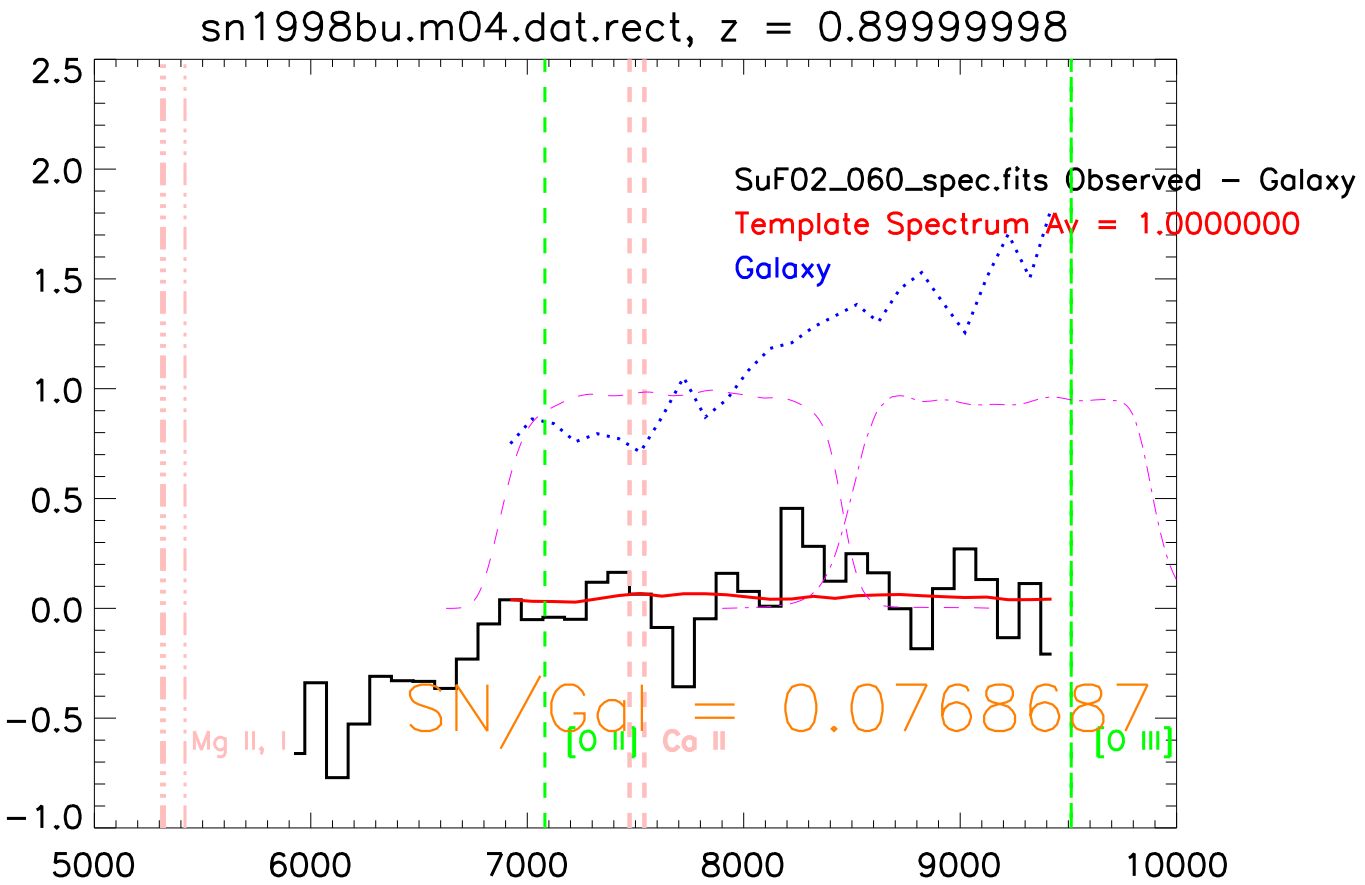

sn1999ee.m08.dat.rect, z = 1.0800000
SuF02_060_spec.fits Observed − Galaxy
Template Spectrum Av = 1.0000000
Galaxy
SN/Gal = 0.978393
Mg II
[O II]
Ca II
[O III]
1.5
1.0
0.5
0.0
−0.5
5000
6000
7000
8000
9000
10000

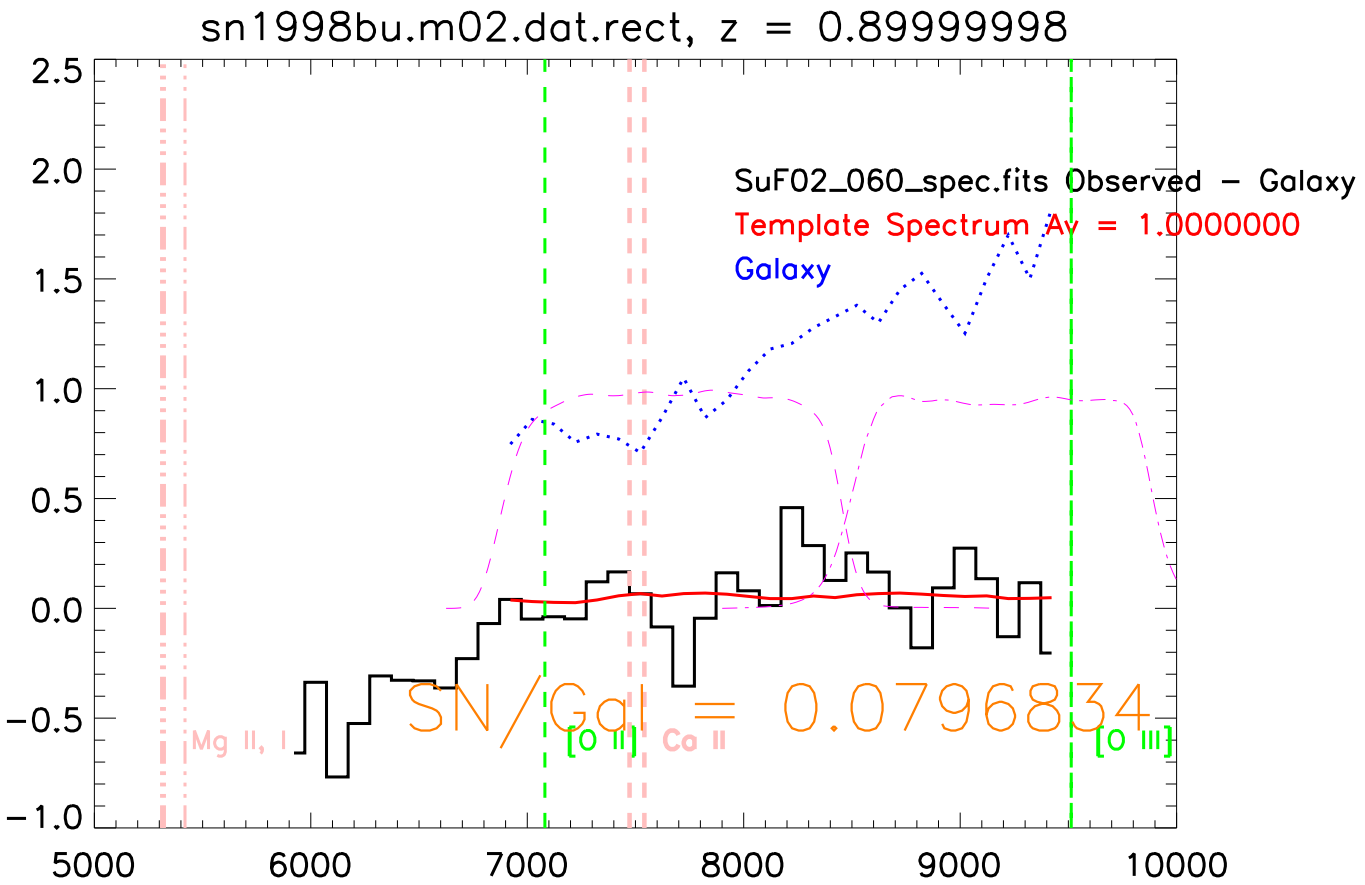

sn1996x.m00.dat.rect, z = 1.0200000
SuF02_060_spec.fits Observed − Galaxy
Template Spectrum Av = 1.0000000
Galaxy
SN/Gal = 1.90139
[O II]
[O III]
1.5
1.0
0.5
0.0
−0.5
5000
6000
7000
8000
9000
10000

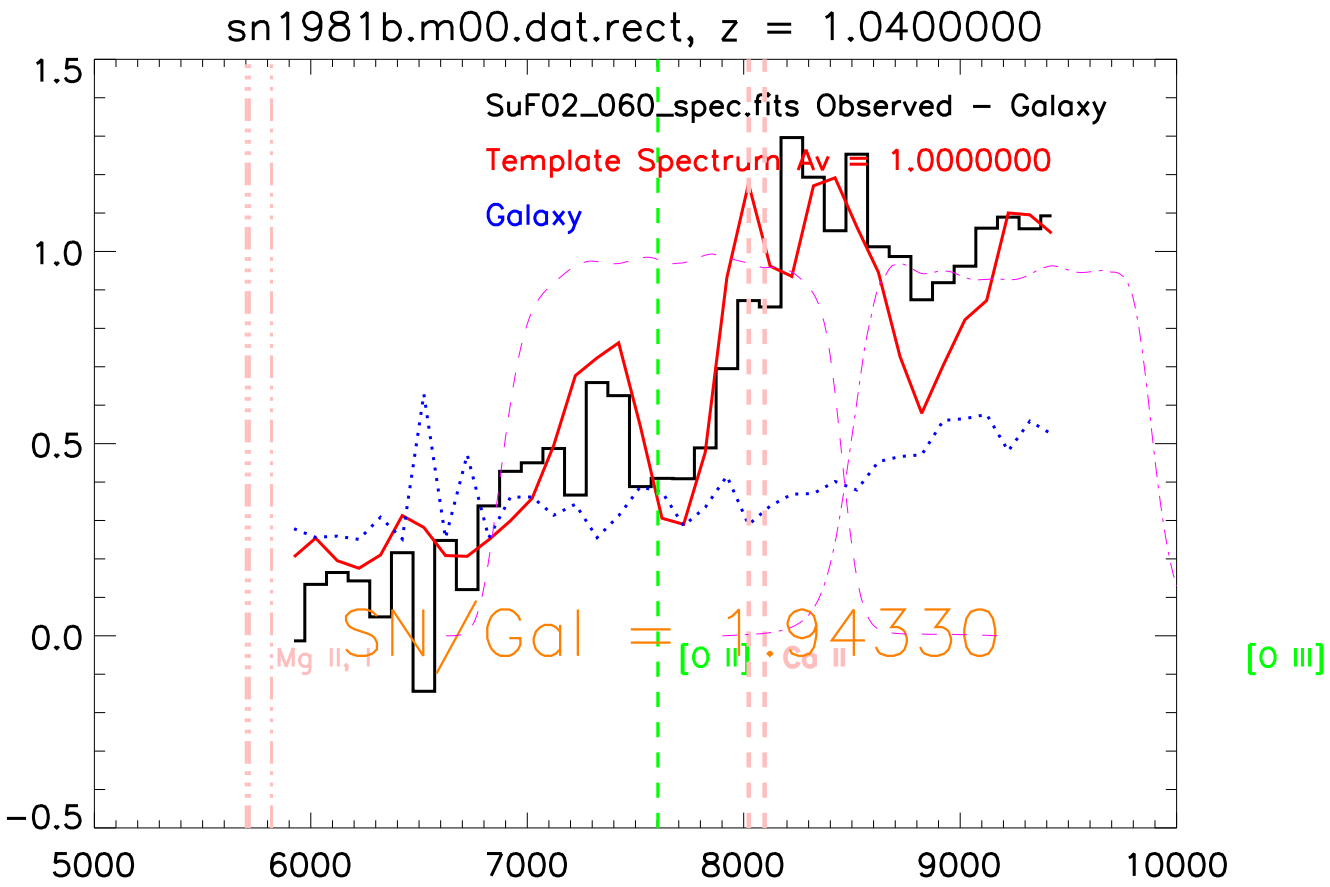

sn1999ee.m01.dat.rect, z = 0.89999998
SuF02_060_spec.fits Observed − Galaxy
Template Spectrum Av = 1.0000000
Galaxy
SN/Gal = 0.110059
Mg II, I
[O II]
Ca II
[O III]
2.0
1.5
1.0
0.5
0.0
−0.5
−1.0
5000
6000
7000
8000
9000
10000

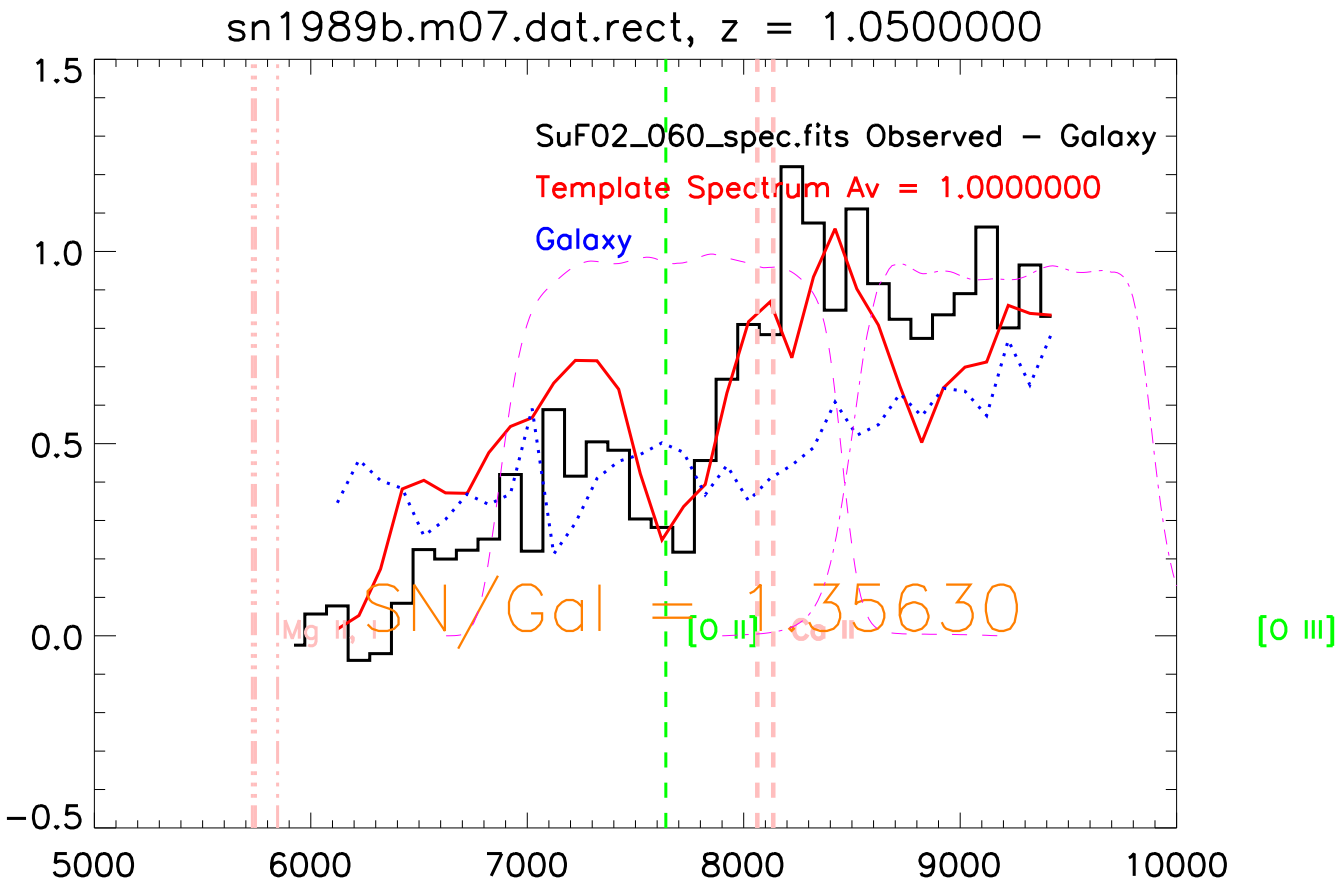

sn1992a.m01.dat.rect, z = 0.89999998
SuF02_060_spec.fits Observed − Galaxy
Template Spectrum, Av = 1.0000000
Galaxy
SN/Gal = 0.0696123
Mg II, I
[O II]
Ca II
[O III]
2.5
2.0
1.5
1.0
0.5
0.0
−0.5
−1.0
5000
6000
7000
8000
9000
10000

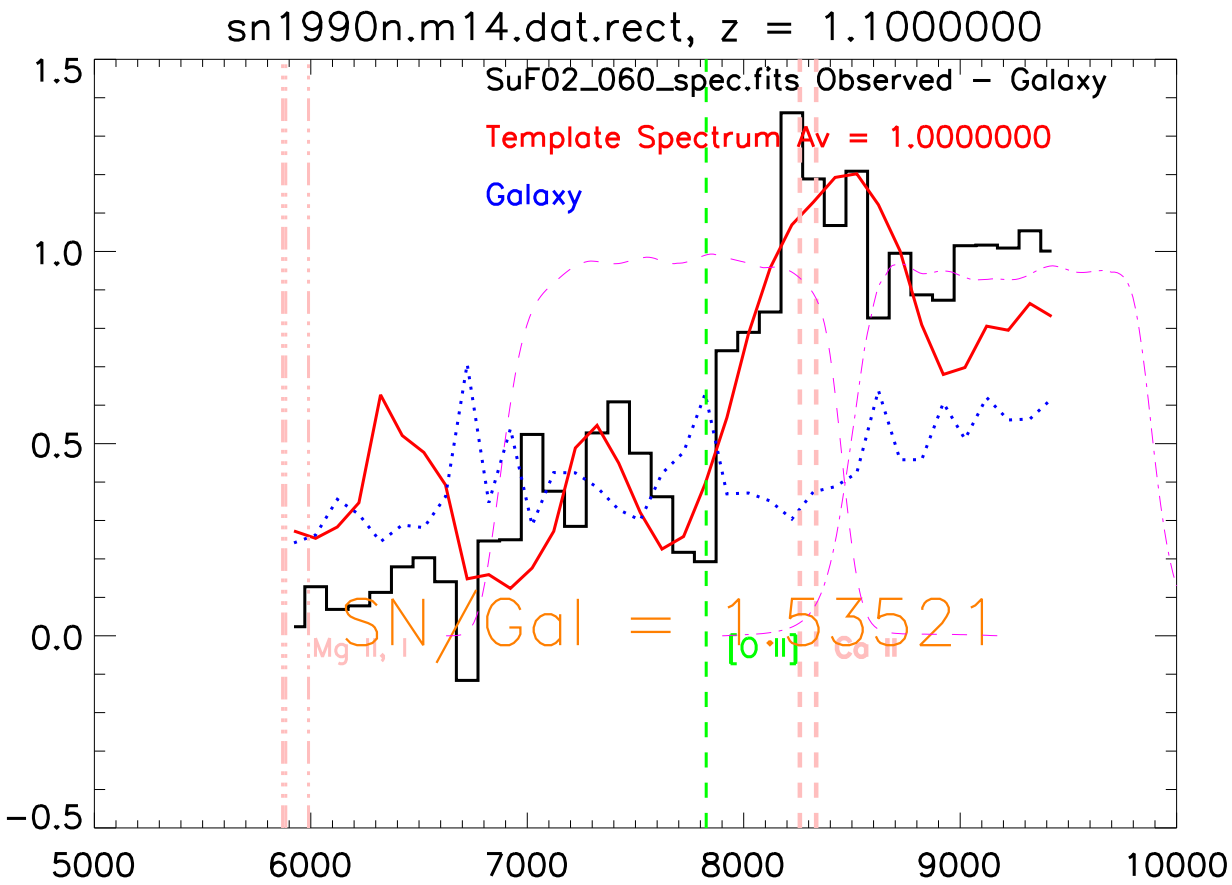

sn1998bu.m03.dat.rect, z = 0.89999998
SuF02_060_spec.fits Observed − Galaxy
Template Spectrum Av = 1.0000000
Galaxy
SN/Gal = 0.0837853
Mg II, I
[O II]
Ca II
[O III]
2.0
1.5
1.0
0.5
0.0
−0.5
−1.0
5000
6000
7000
8000
9000
10000

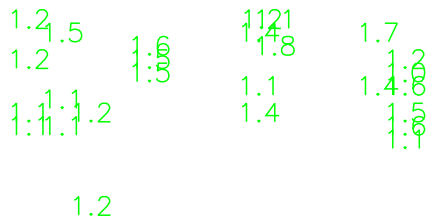

sn1998bu.m04.dat.rect, z = 0.89999998
SuF02_060_spec.fits Observed − Galaxy
Template Spectrum Av = 1.0000000
Galaxy
SN/Gal = 0.0768687
Mg II, I
[O II]
Ca II
[O III]
2.5
2.0
1.5
1.0
0.5
0.0
−0.5
−1.0
5000
6000
7000
8000
9000
10000

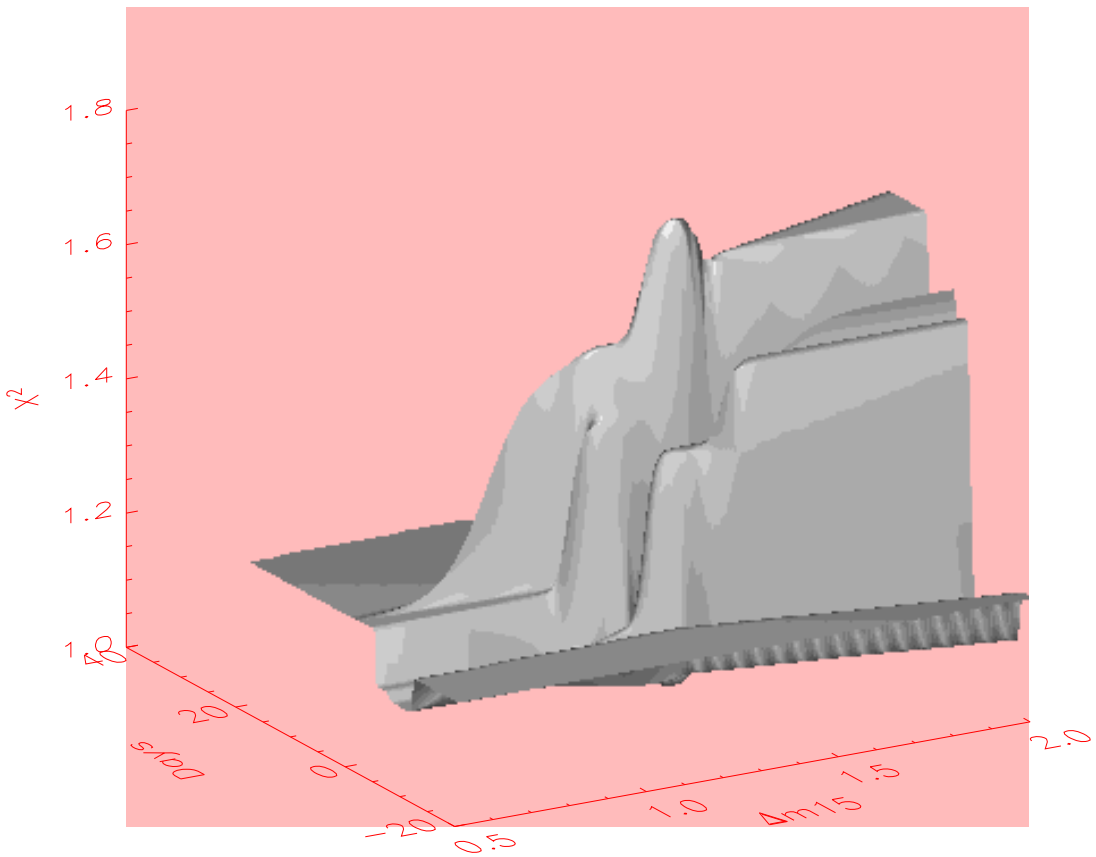

sn1998bu.m02.dat.rect, z = 0.89999998
SuF02_060_spec.fits Observed − Galaxy
Template Spectrum Av = 1.0000000
Galaxy
SN/Gal = 0.0796834
Mg II, I
[O II]
Ca II
[O III]
2.5
2.0
1.5
1.0
0.5
0.0
−0.5
−1.0
5000
6000
7000
8000
9000
10000


sn1981b.m00.dat.rect, z = 1.0400000
SuF02_060_spec.fits Observed − Galaxy
Template Spectrum Av = 1.0000000
Galaxy
SN/Gal = 1.94330
Mg II,
[O II]
Ca II
[O III]
1.5
1.0
0.5
0.0
−0.5
5000
6000
7000
8000
9000
10000

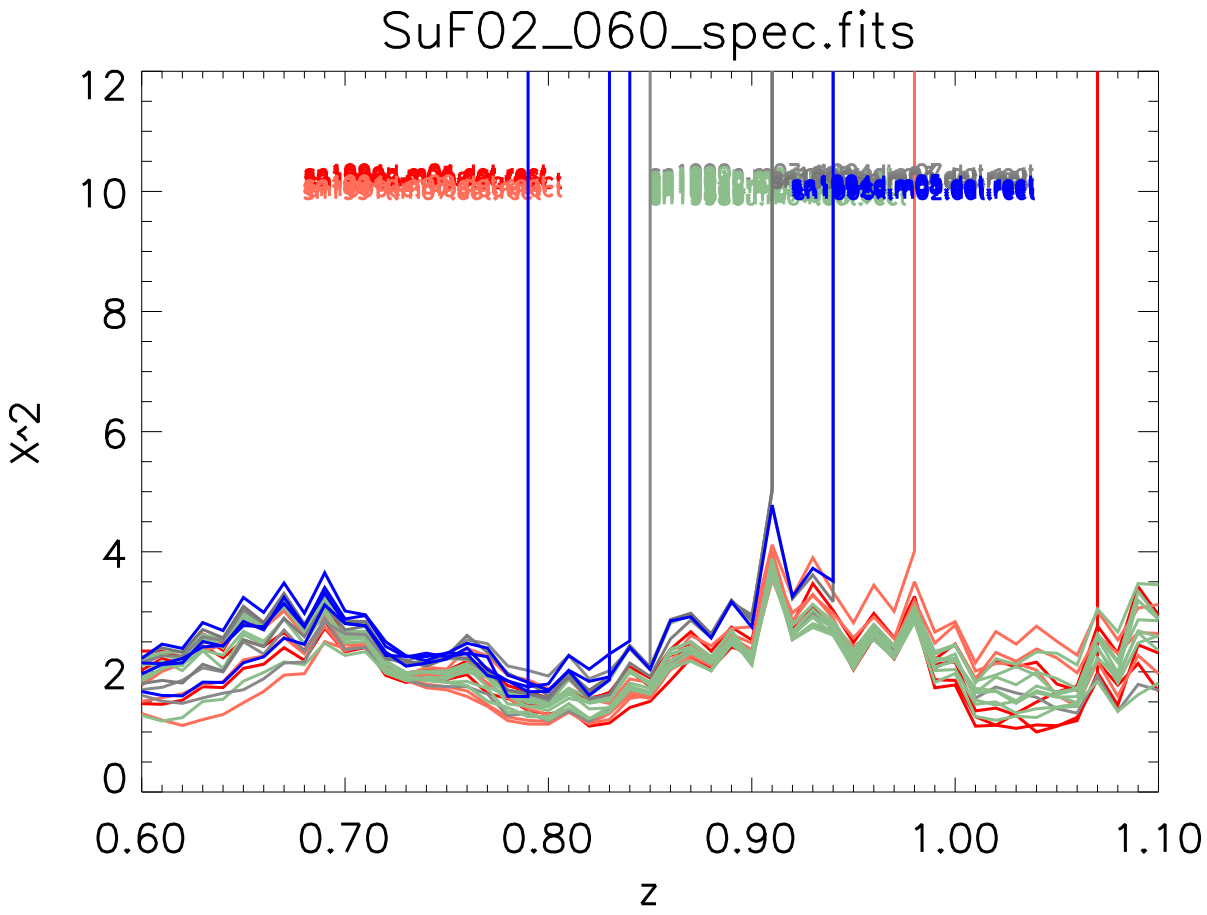

sn1989b.m07.dat.rect, z = 1.0500000
SuF02_060_spec.fits Observed − Galaxy
Template Spectrum Av = 1.0000000
Galaxy
SN/Gal = 1.35630
[O II]
[O III]
1.5
1.0
0.5
0.0
−0.5
5000
6000
7000
8000
9000
10000

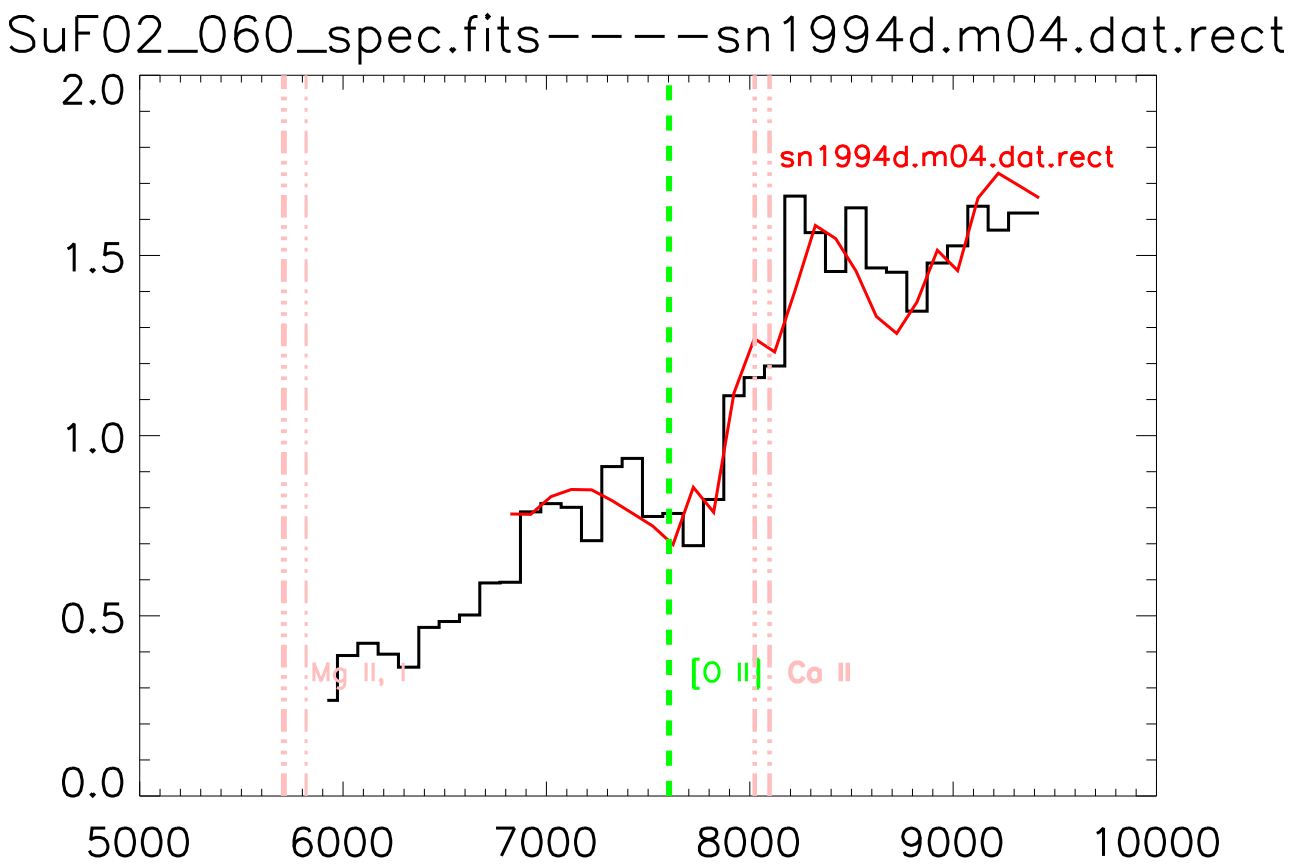

sn1990n.m14.dat.rect, z = 1.1000000
SuF02_060_spec.fits Observed − Galaxy
Template Spectrum Av = 1.0000000
Galaxy
SN/Gal = 1.53521
Mg II, I
[O II]
Ca II
[O III]
1.5
1.0
0.5
0.0
−0.5
5000
6000
7000
8000
9000
10000

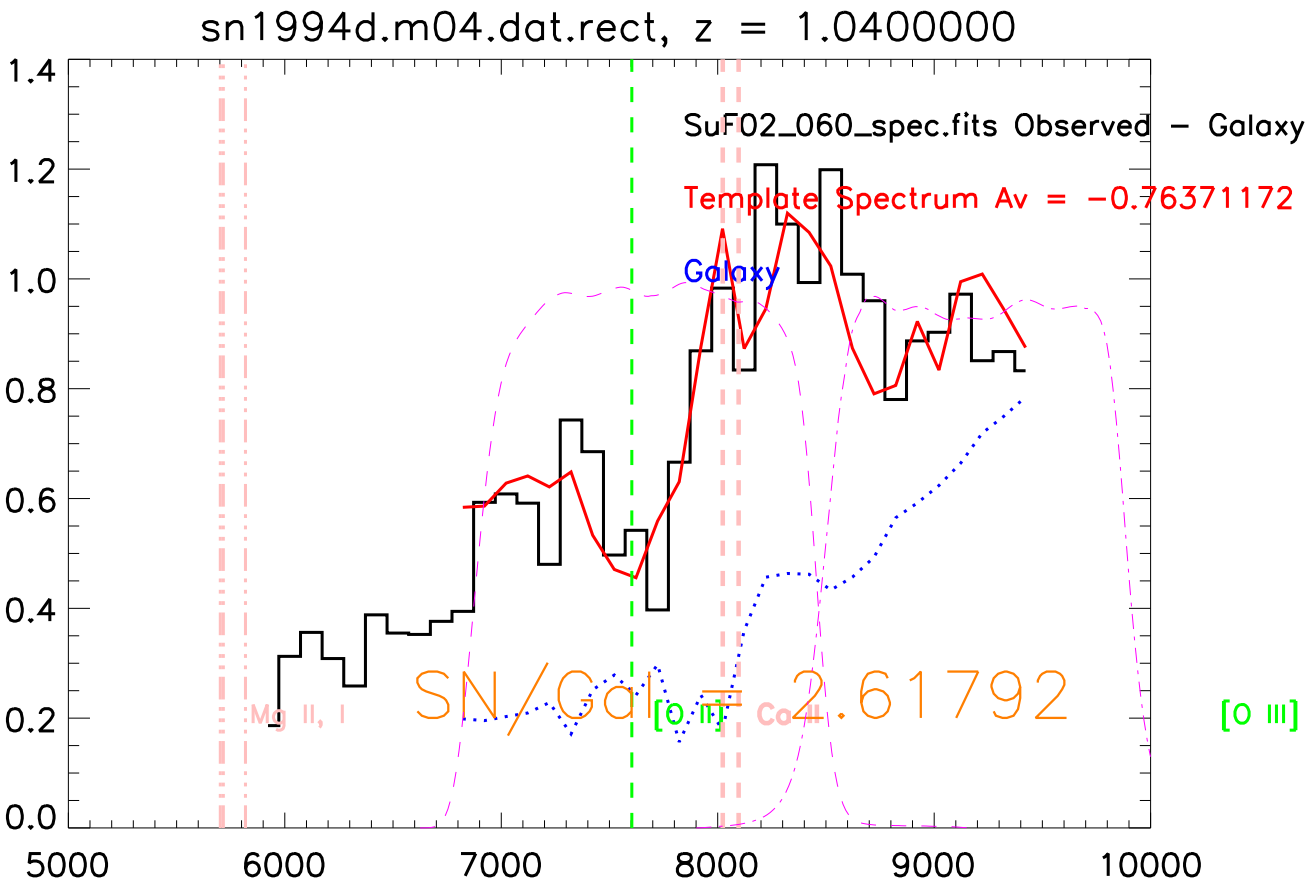


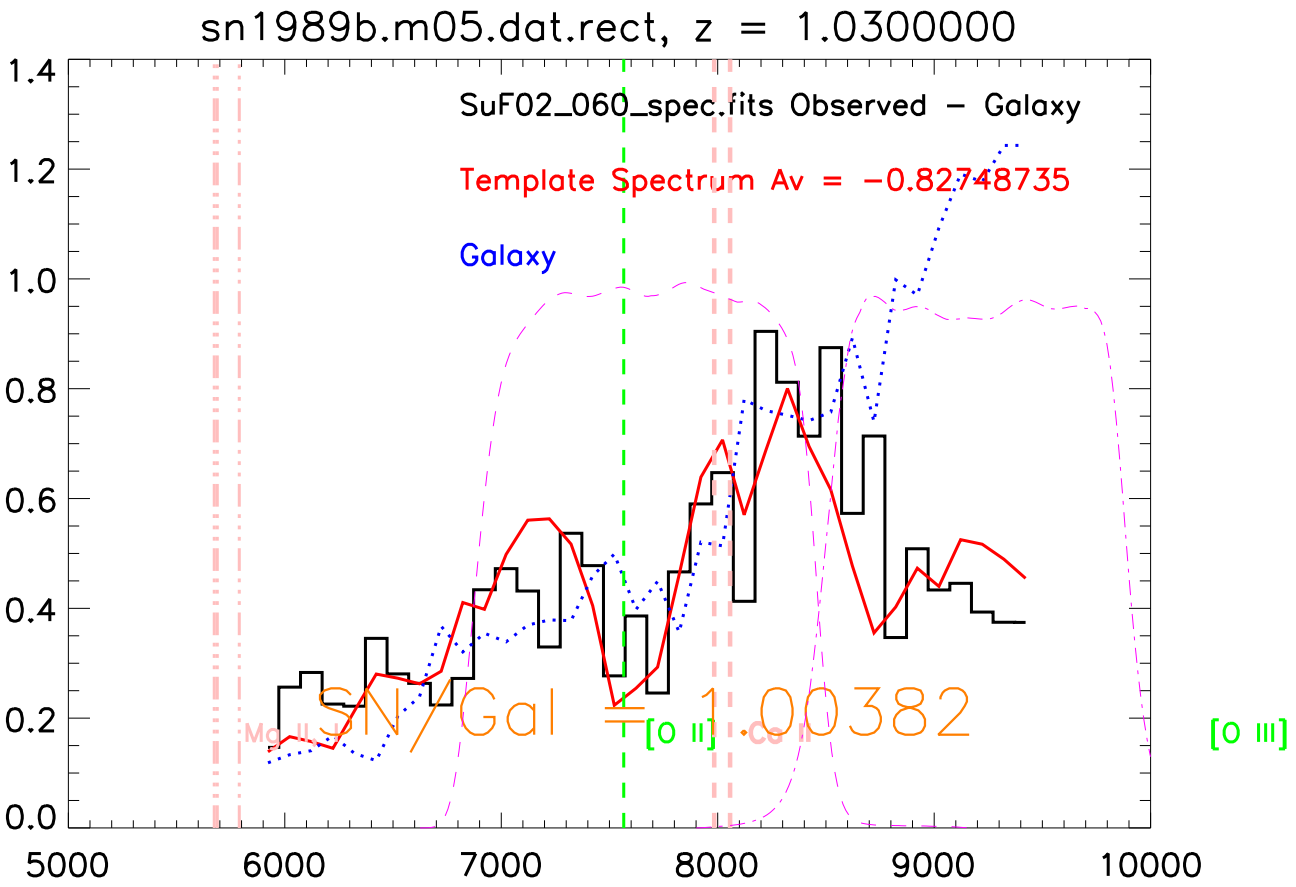


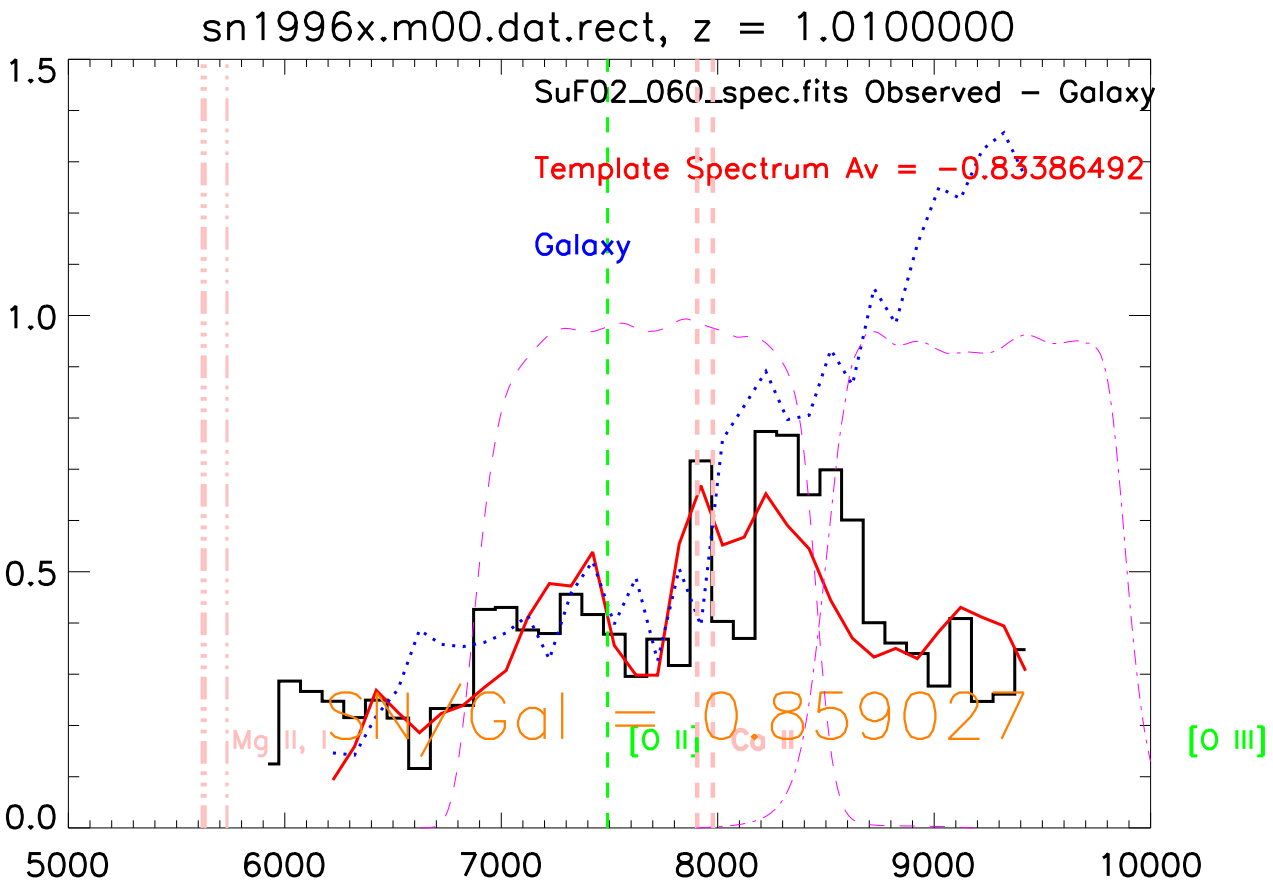
1.8
1.6
1.4
1.2
1.0
χ^2
40
20
0
−20
Days
0.5
1.0
1.5
2.0
Δm15

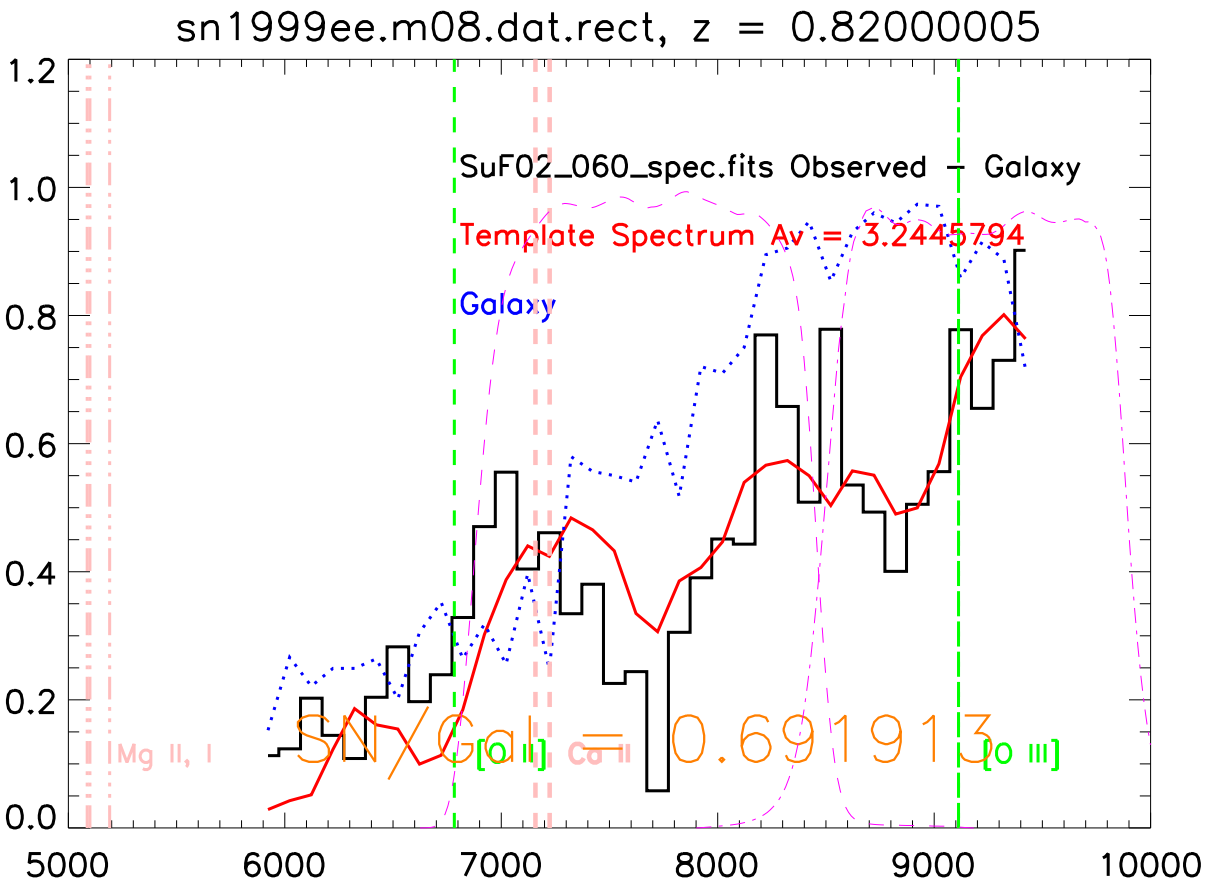

SuF02_060_spec.fits
12
10
8
6
4
2
0
X^2
0.60
0.70
0.80
0.90
1.00
1.10
z

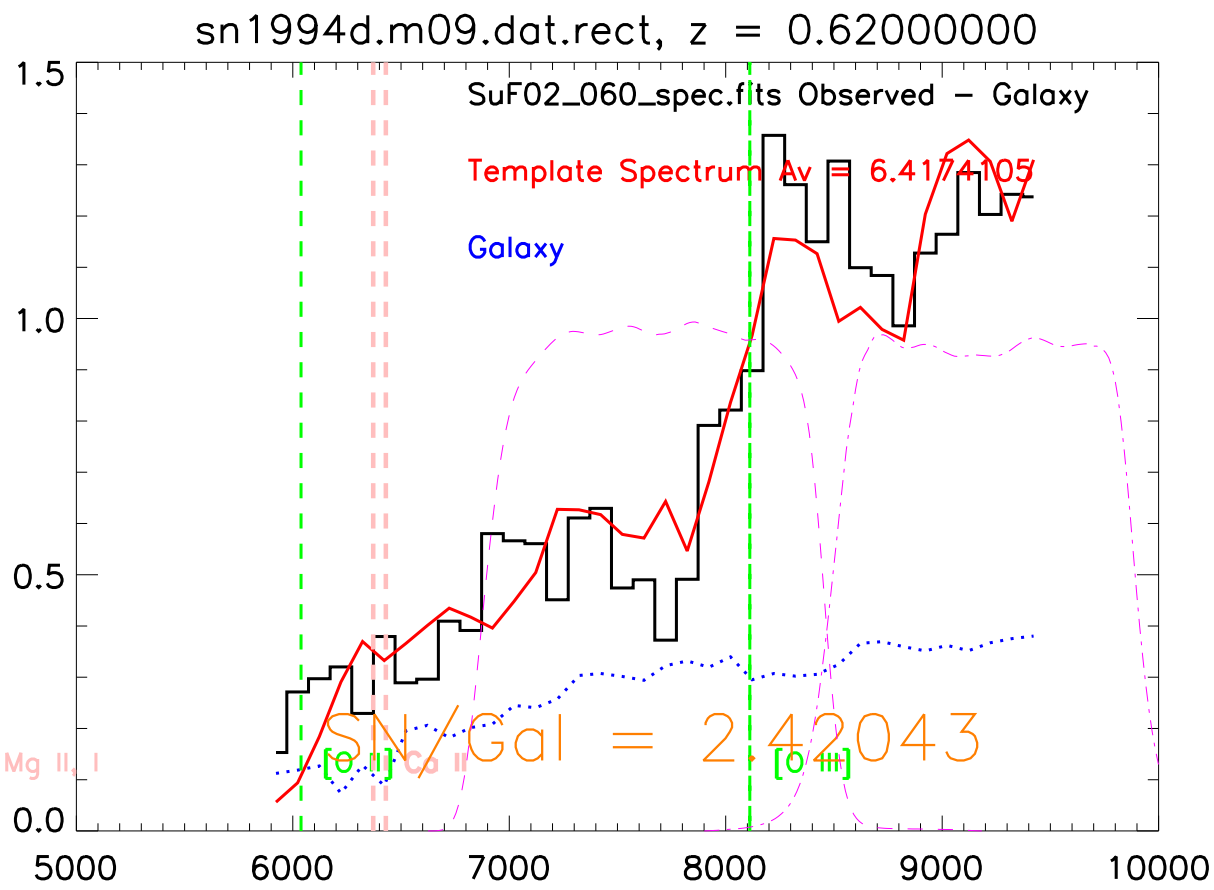

SuF02_060_spec.fits----sn1994d.m04.dat.rect
sn1994d.m04.dat.rect
Mg II, I
[O II]
Ca II
2.0
1.5
1.0
0.5
0.0
5000
6000
7000
8000
9000
10000

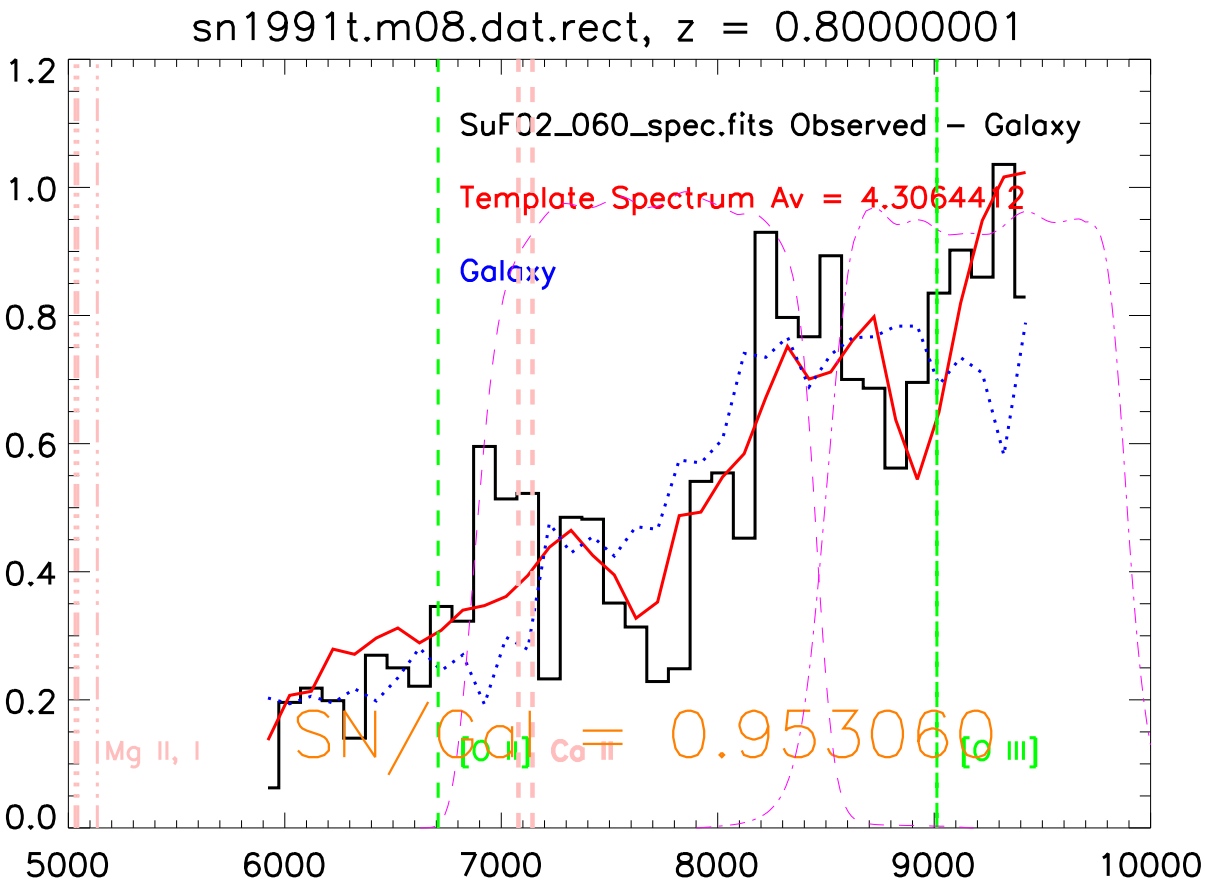

sn1994d.m04.dat.rect, z = 1.0400000
SuF02_060_spec.fits Observed − Galaxy
Template Spectrum Av = −0.76371172
Galaxy
SN/Gal = 2.61792
Mg II, I
[O II]
Ca II
[O III]
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
5000
6000
7000
8000
9000
10000

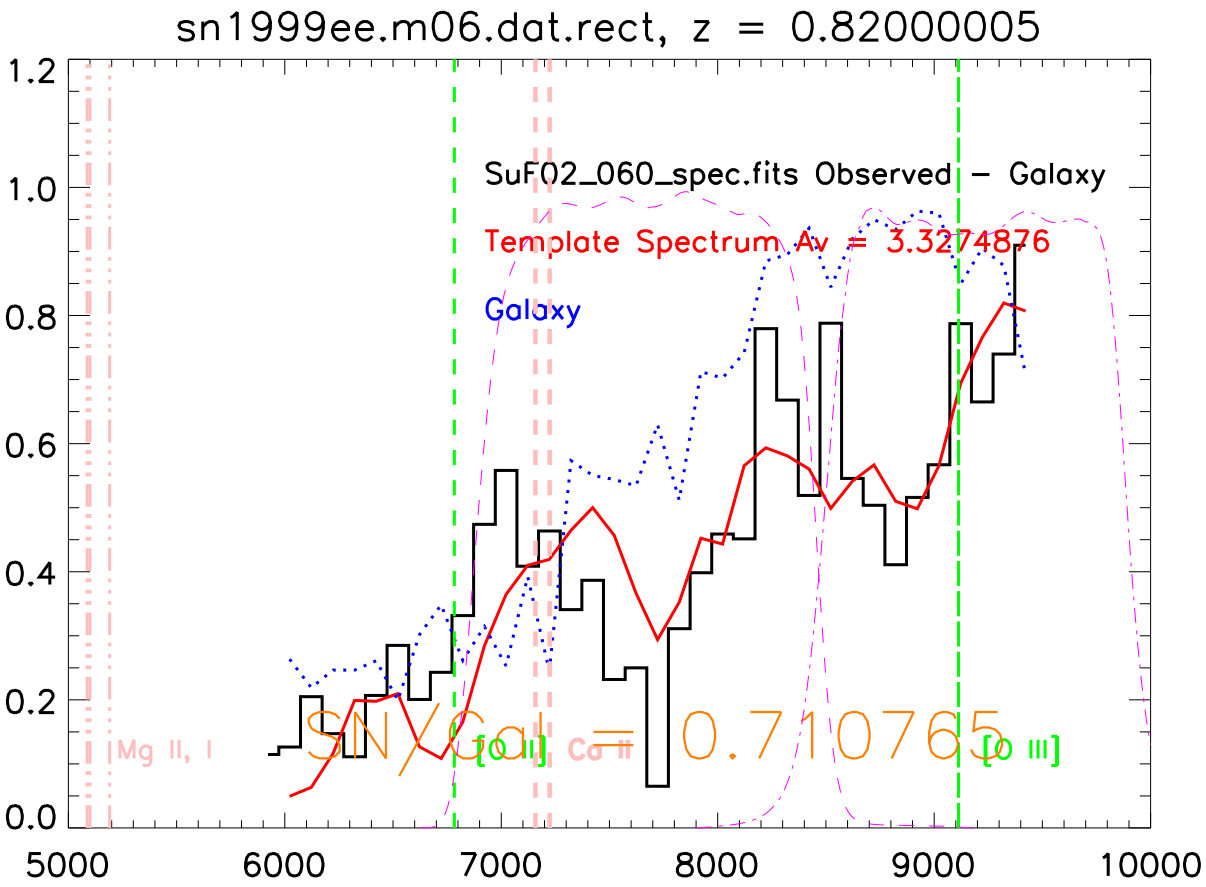

sn1989b.m05.dat.rect, z = 1.0300000
SuF02_060_spec.fits Observed − Galaxy
Template Spectrum Av = −0.82748735
Galaxy
S/N Gal = 1.00382
[O II]
[O III]
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
5000
6000
7000
8000
9000
10000

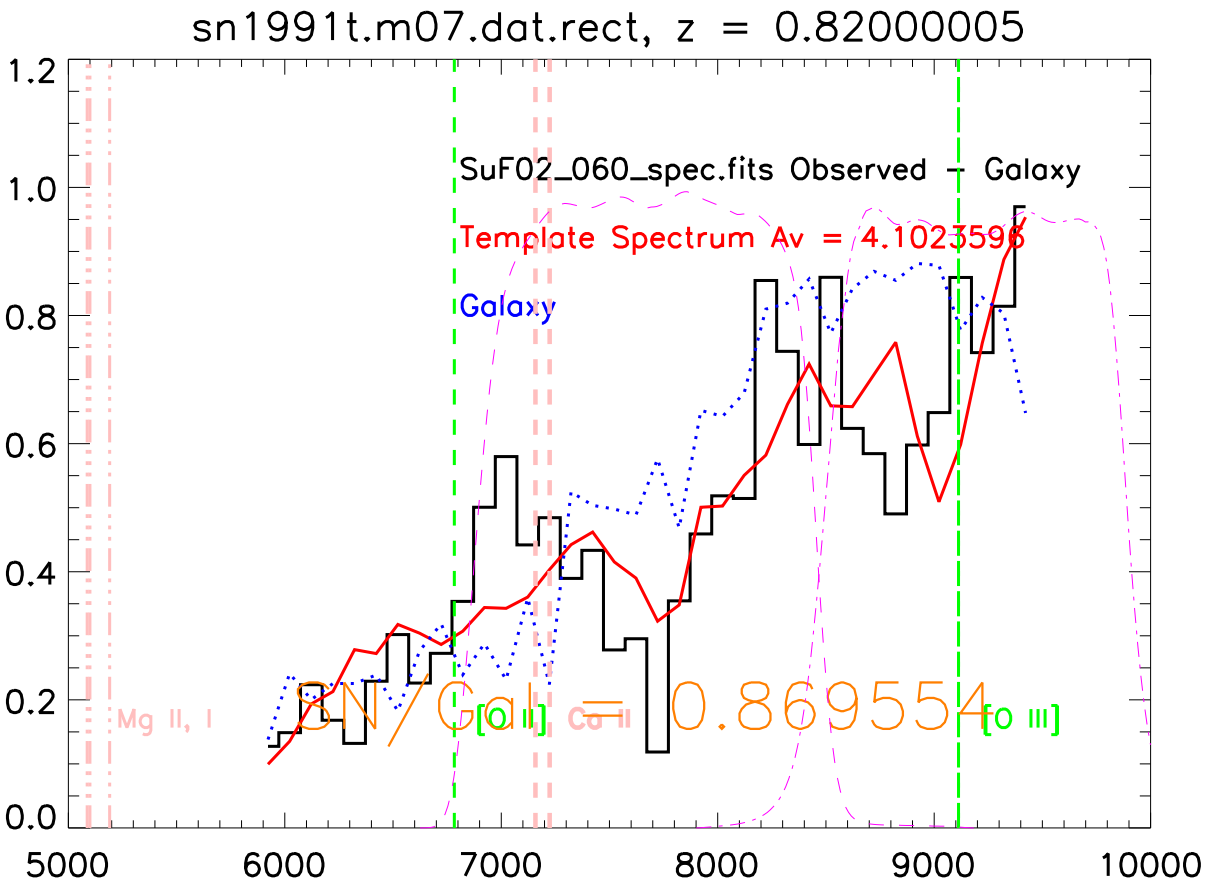

sn1996x.m00.dat.rect, z = 1.0100000
SuF02_060_spec.fits Observed − Galaxy
Template Spectrum Av = −0.83386492
Galaxy
SN/Gal = 0.859027
Mg II, I
[O II]
Ca II
[O III]
1.5
1.0
0.5
0.0
5000
6000
7000
8000
9000
10000

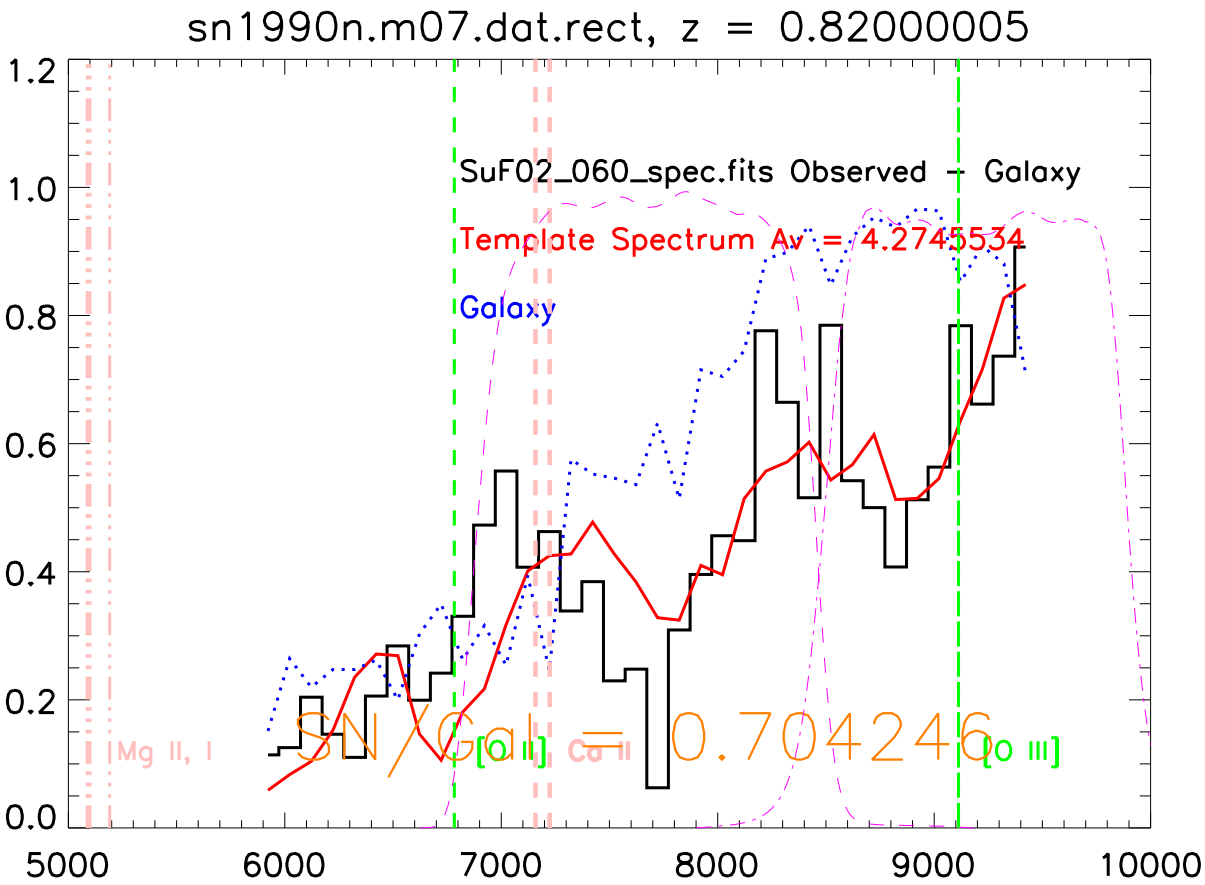

sn1999ee.m08.dat.rect, z = 0.82000005
SuF02_060_spec.fits Observed – Galaxy
Template Spectrum Av = 3.2445794
Galaxy
SN/Gal = 0.691913
Mg II, I
[O II]
Ca II
[O III]
1.2
1.0
0.8
0.6
0.4
0.2
0.0
5000
6000
7000
8000
9000
10000

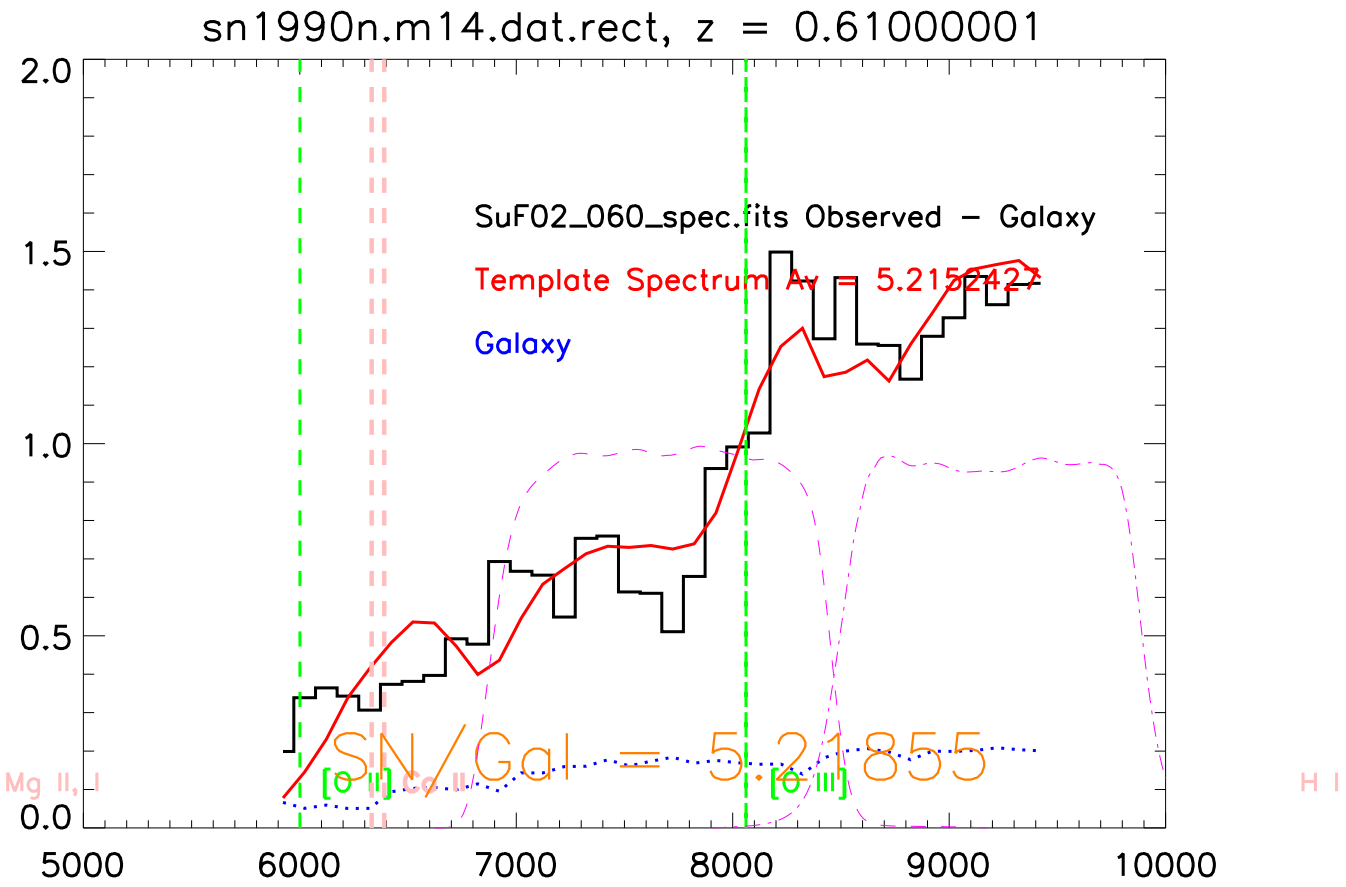

sn1994d.m09.dat.rect, z = 0.62000000
SuF02_060_spec.fits Observed − Galaxy
Template Spectrum Av = 6.41774105
Galaxy
SN/Gal = 2.42043
Mg II, I
[O II]
Ca II
[O III]
H I
1.5
1.0
0.5
0.0
5000
6000
7000
8000
9000
10000

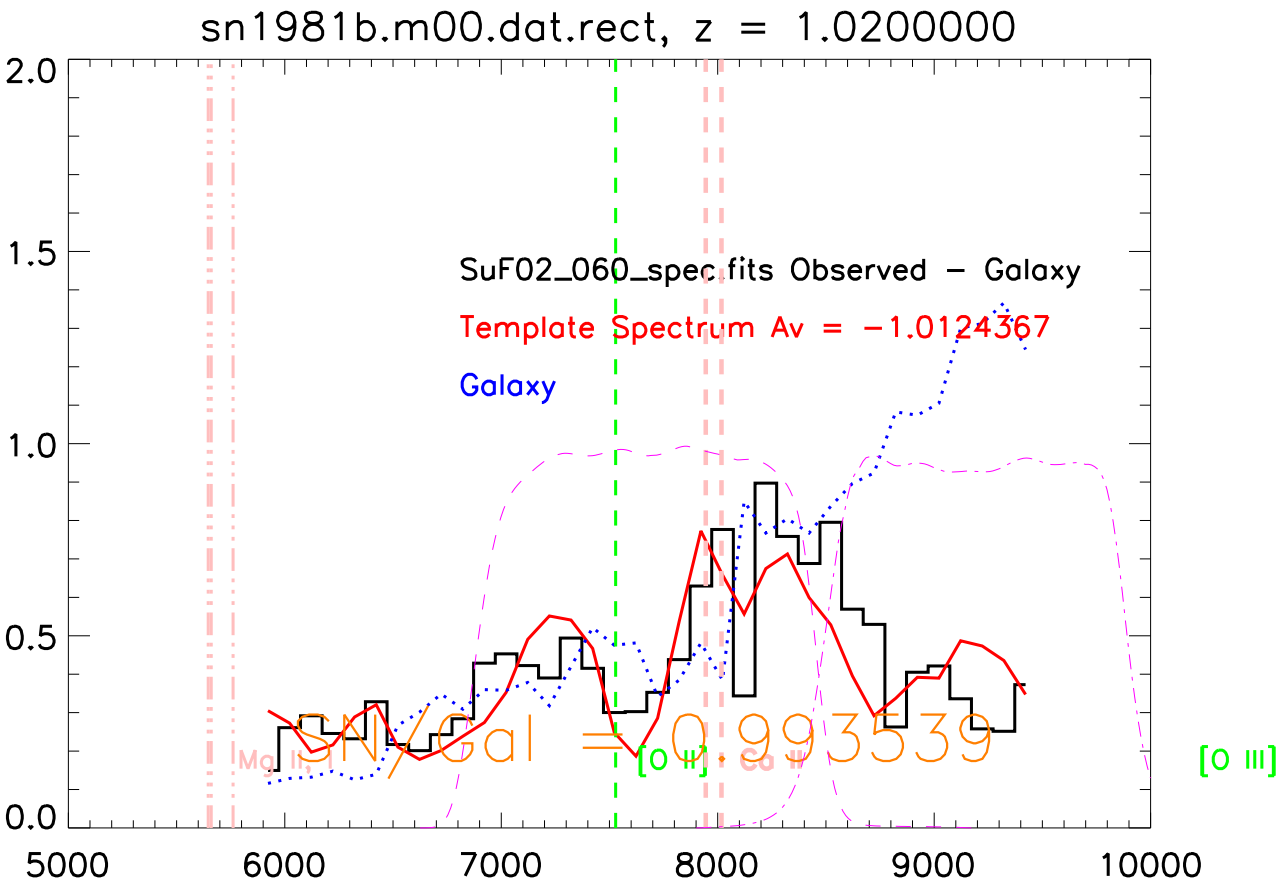

sn1991t.m08.dat.rect, z = 0.80000001
SuF02_060_spec.fits Observed − Galaxy
Template Spectrum Av = 4.3064412
Galaxy
SN/Gal = 0.953060
Mg II, I
[O II]
Ca II
[O III]
1.2
1.0
0.8
0.6
0.4
0.2
0.0
5000
6000
7000
8000
9000
10000

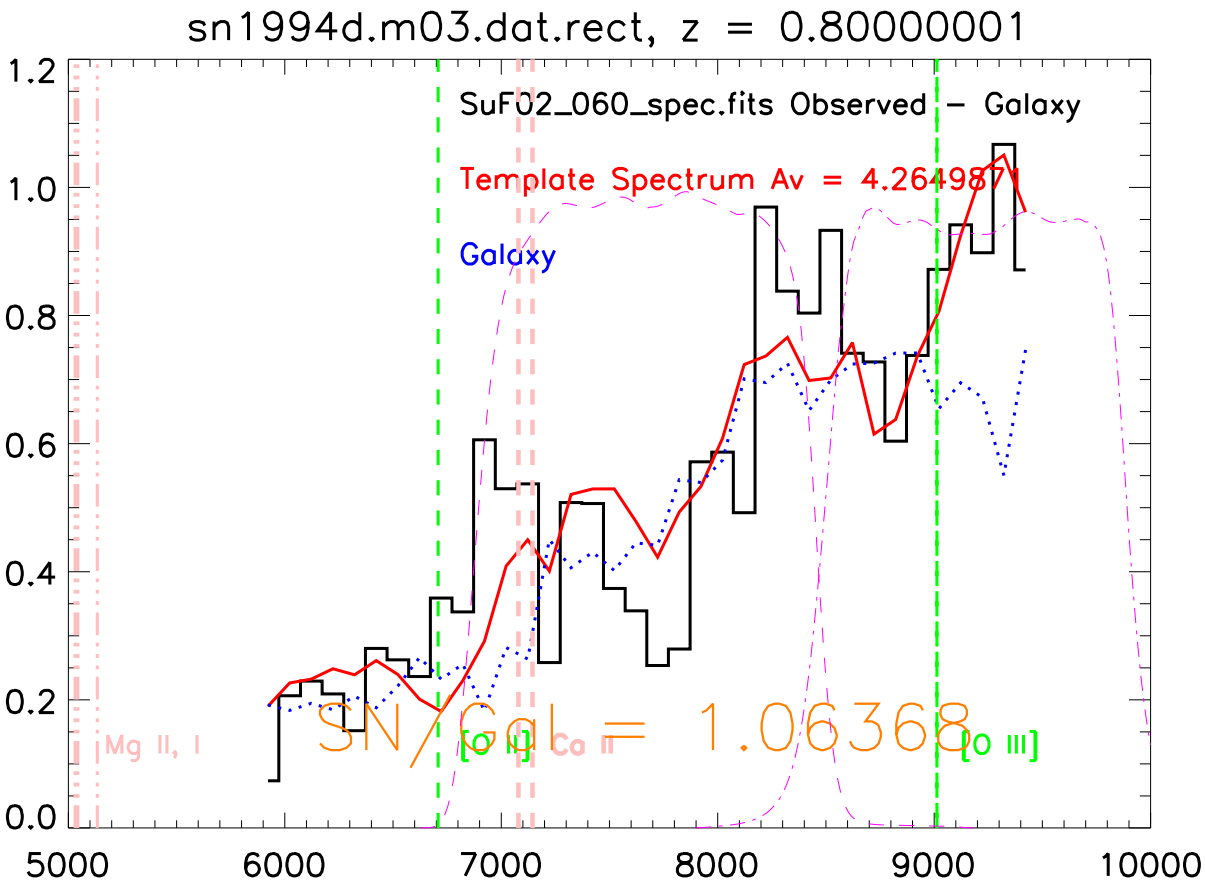

sn1999ee.m06.dat.rect, z = 0.82000005
SuF02_060_spec.fits Observed – Galaxy
Template Spectrum Av = 3.3274876
Galaxy
SNXCorr = 0.710765
Mg II, I
[O II]
Ca II
[O III]
1.2
1.0
0.8
0.6
0.4
0.2
0.0
5000
6000
7000
8000
9000
10000

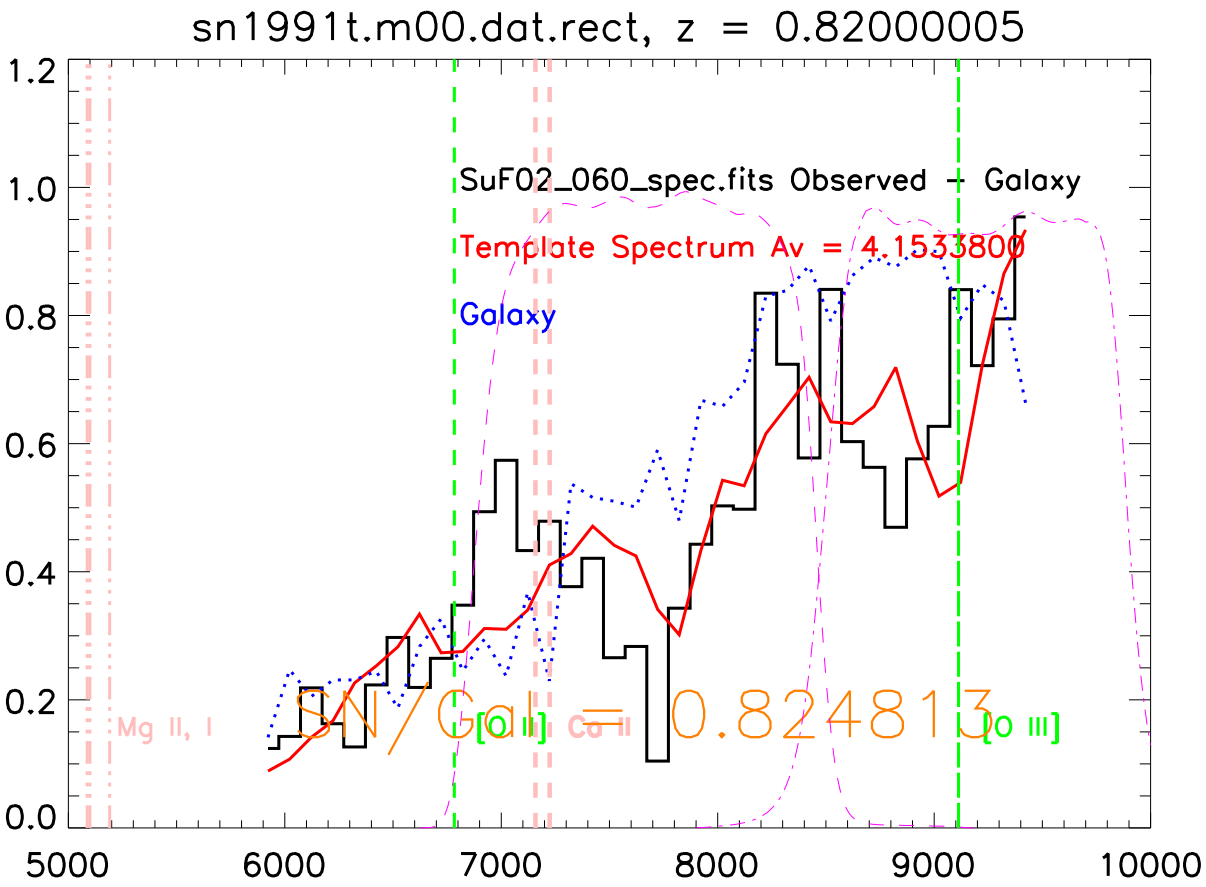

sn1991t.m07.dat.rect, z = 0.82000005
SuF02_060_spec.fits Observed - Galaxy
Template Spectrum Av = 4.1023596
Galaxy
SN/Gal = 0.869554
Mg II, I
[O II]
Ca II
[O III]
1.2
1.0
0.8
0.6
0.4
0.2
0.0
5000
6000
7000
8000
9000
10000

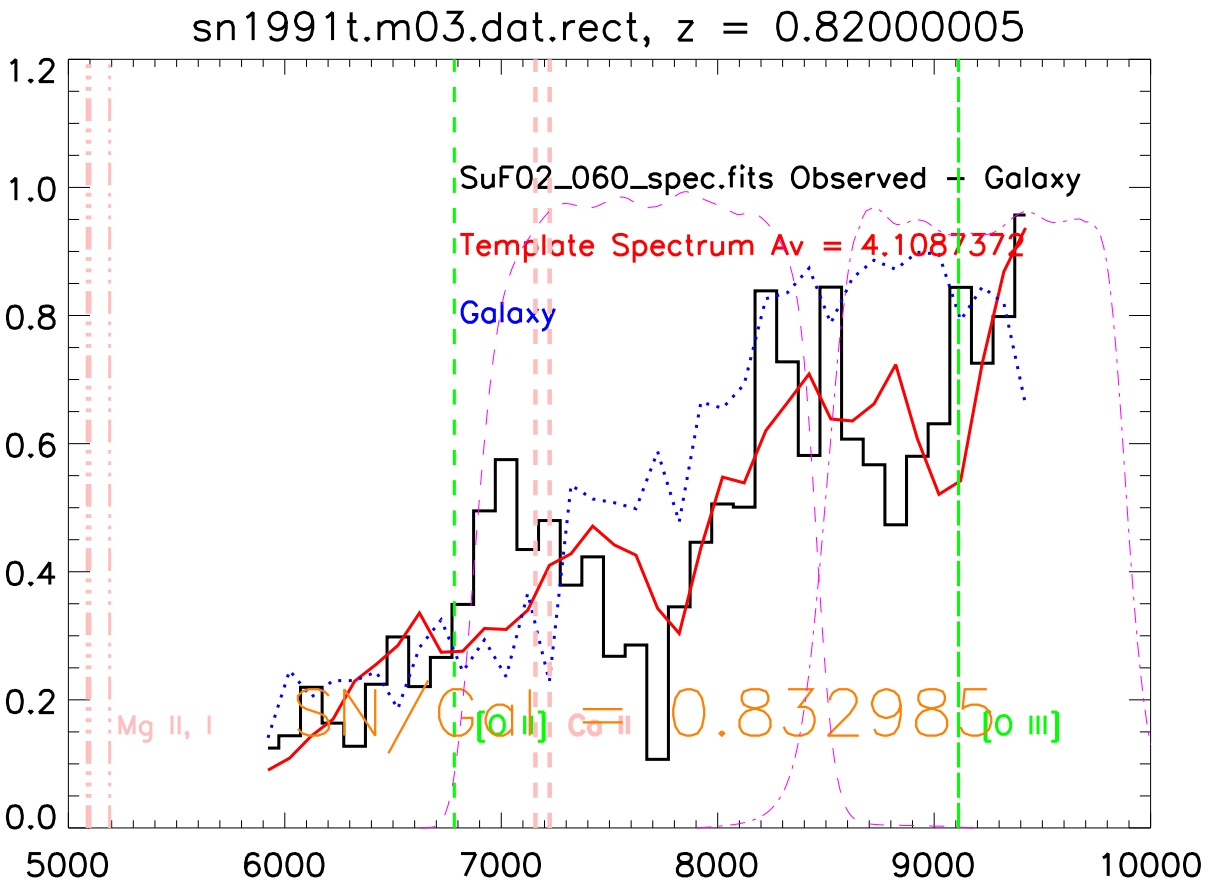

sn1990n.m07.dat.rect, z = 0.82000005
SuF02_060_spec.fits Observed - Galaxy
Template Spectrum Av = 4.2745534
Galaxy
SN/Gal = 0.704246
Mg II, I
[O II]
Ca II
[O III]
1.2
1.0
0.8
0.6
0.4
0.2
0.0
5000
6000
7000
8000
9000
10000


sn1990n.m14.dat.rect, z = 0.61000001
SuF02_060_spec.fits Observed − Galaxy
Template Spectrum Av = 5.21524427
Galaxy
SN/Gal = 5.21855
Mg II, I
[O II]
Ca II
[O III]
H I
2.0
1.5
1.0
0.5
0.0
5000
6000
7000
8000
9000
10000


sn1981b.m00.dat.rect, z = 1.0200000
SuF02_060_spec.fits Observed − Galaxy
Template Spectrum Av = −1.0124367
Galaxy
S/N/Gal = 0.993539
[O II]
[O III]
2.0
1.5
1.0
0.5
0.0
5000
6000
7000
8000
9000
10000


sn1994d.m03.dat.rect, z = 0.80000001
SuF02_060_spec.fits Observed – Galaxy
Template Spectrum Av = 4.2649871
Galaxy
SN/Gal = 1.06368
Mg II, I
[O II]
Ca II
[O III]
1.2
1.0
0.8
0.6
0.4
0.2
0.0
5000
6000
7000
8000
9000
10000


sn1991t.m00.dat.rect, z = 0.82000005
SuF02_060_spec.fits Observed + Galaxy
Template Spectrum Av = 4.1533800
Galaxy
SN/Gal = 0.824813
Mg II, I
[O II]
Ca II
[O III]
1.2
1.0
0.8
0.6
0.4
0.2
0.0
5000
6000
7000
8000
9000
10000


sn1991t.m03.dat.rect, z = 0.82000005
SuF02_060_spec.fits Observed + Galaxy
Template Spectrum Av = 4.1087372
Galaxy
SN/Gal = 0.832985
Mg II, I
[O II]
Ca II
[O III]
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1.0
0.8
0.6
0.4
0.2
0.0
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6000
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8000
9000
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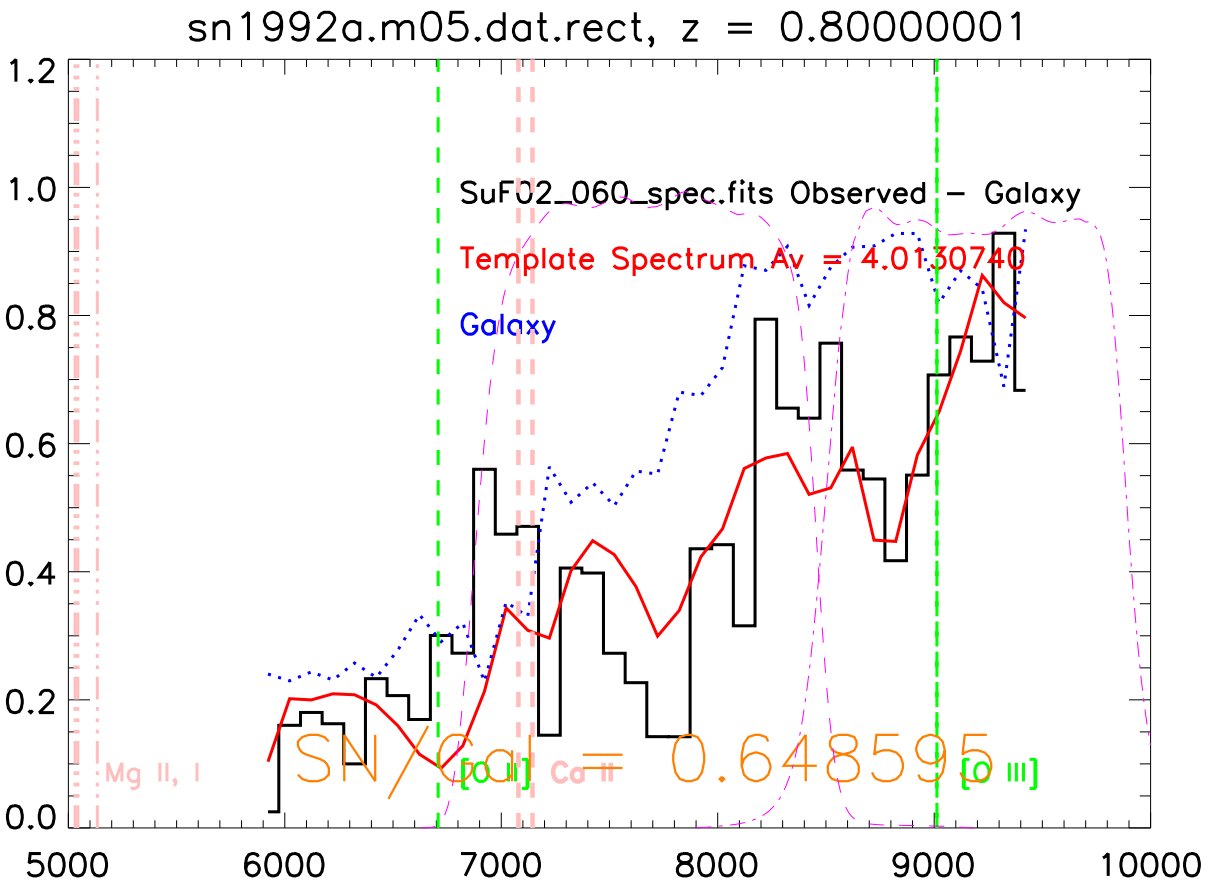
sn1992a.m05.dat.rect, z = 0.80000001
SuF02_060_spec.fits Observed − Galaxy
Template Spectrum Av = 4.0130740
Galaxy
SN/Gal = 0.648595
Mg II, I
[O II]
Ca II
[O III]
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1.0
0.8
0.6
0.4
0.2
0.0
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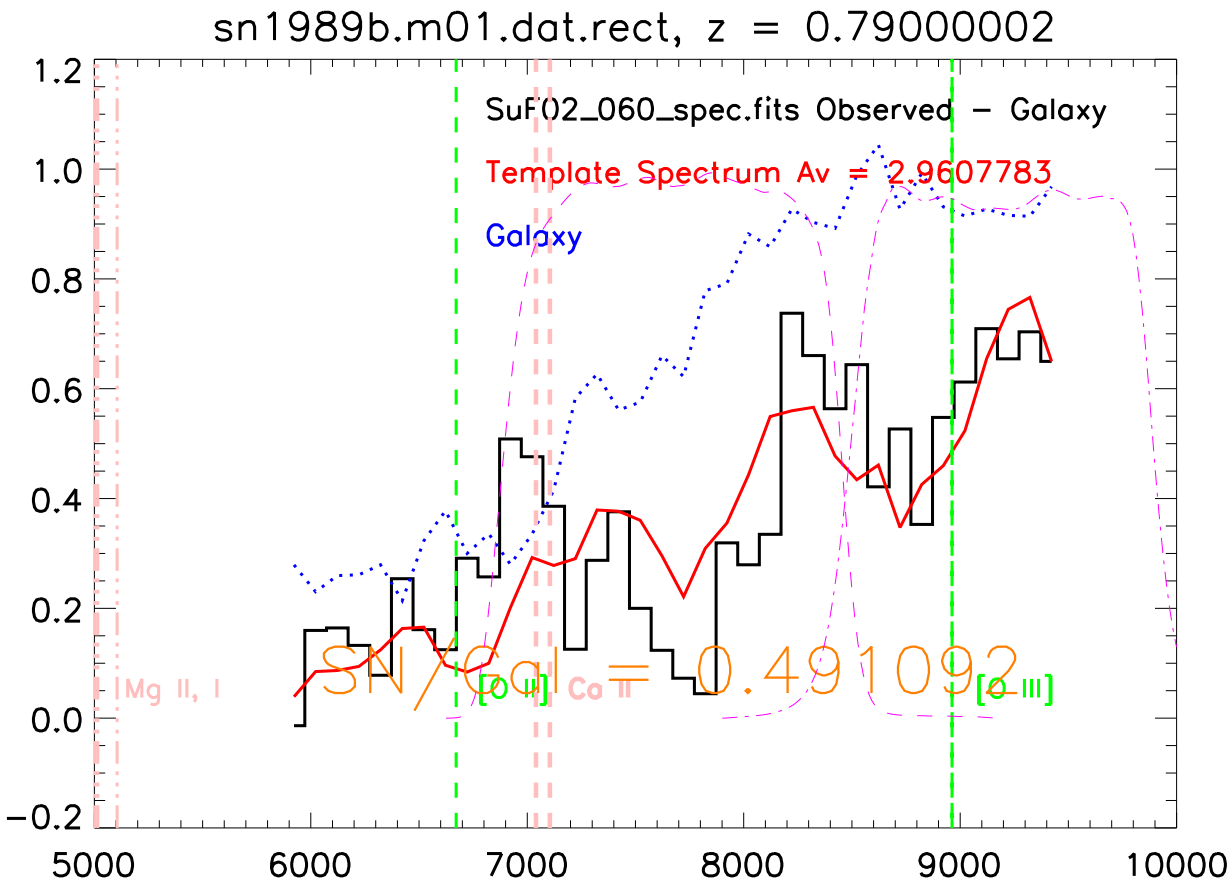
7000
8000
9000
10000


sn1989b.m01.dat.rect, z = 0.79000002
SuF02_060_spec.fits Observed − Galaxy
Template Spectrum Av = 2.9607783
Galaxy
SN/Gal = 0.491092
Mg II, I
[O II]
Ca II
[O III]
1.2
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
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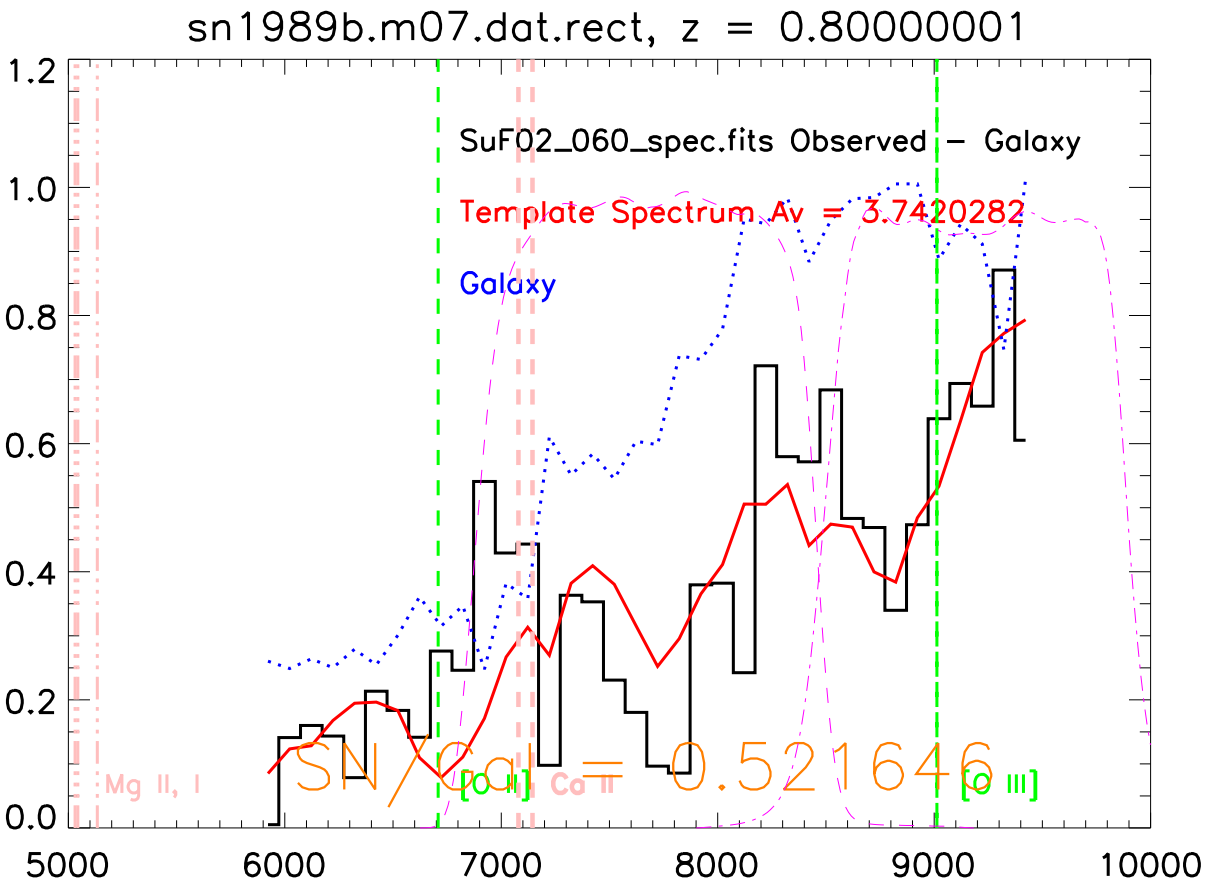
6000
7000
8000
9000
10000


sn1989b.m07.dat.rect, z = 0.80000001
SuF02_060_spec.fits Observed – Galaxy
Template Spectrum Av = 3.7420282
Galaxy
SN/Gal = 0.521646
Mg II, I
[O II]
Ca II
[O III]
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1.0
0.8
0.6
0.4
0.2
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8000
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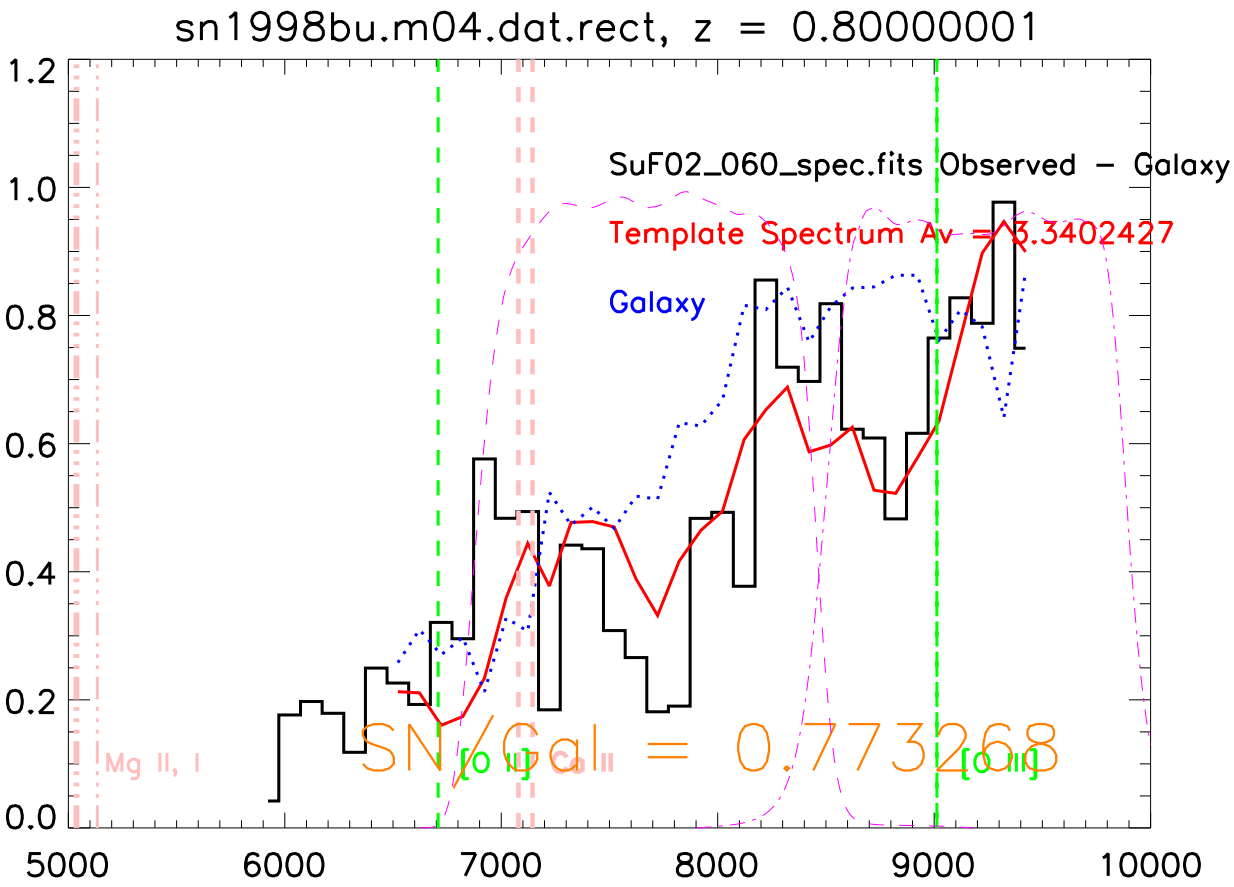
sn1998bu.m04.dat.rect, z = 0.80000001
SuF02_060_spec.fits Observed − Galaxy
Template Spectrum Av = 3.3402427
Galaxy
SN/Gal = 0.773268
Mg II, I
[O II]
Ca II
[O III]
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1.0
0.8
0.6
0.4
0.2
0.0
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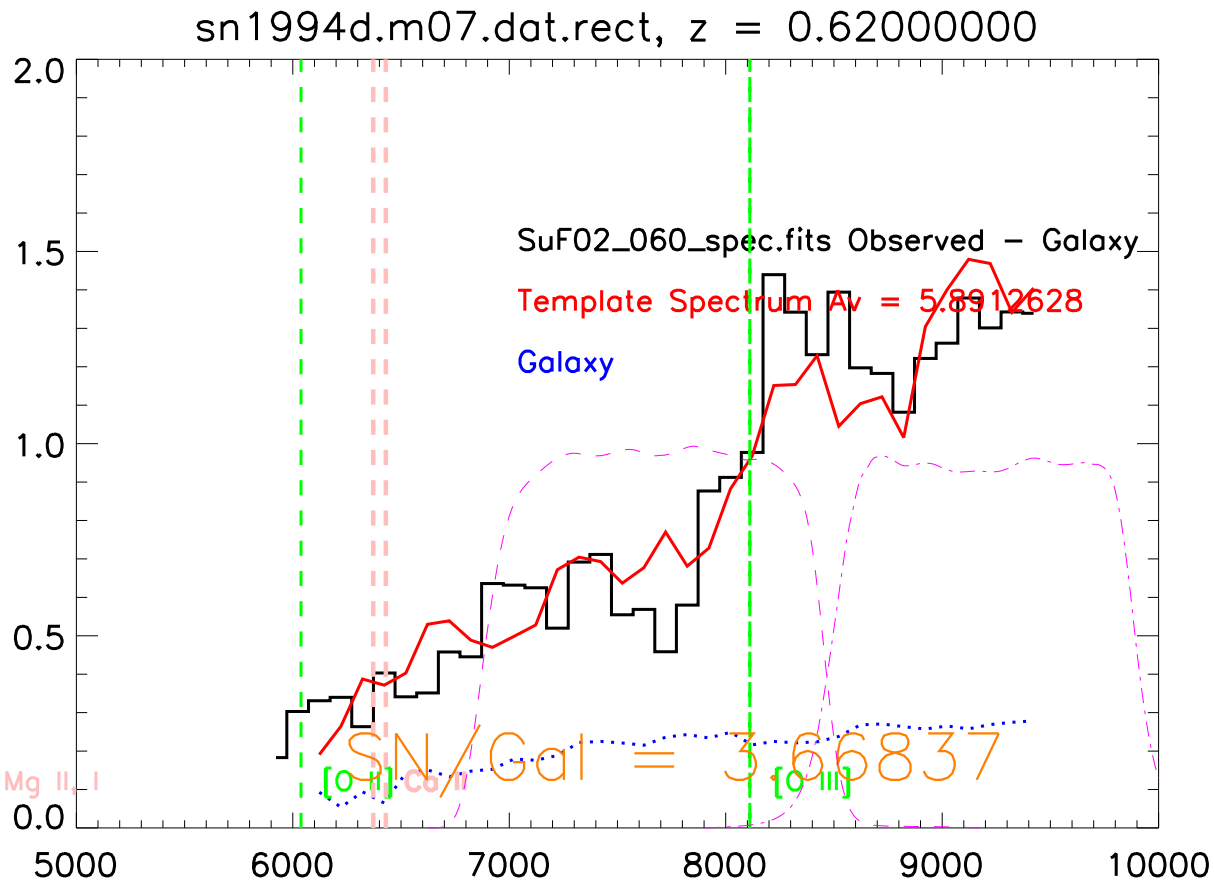
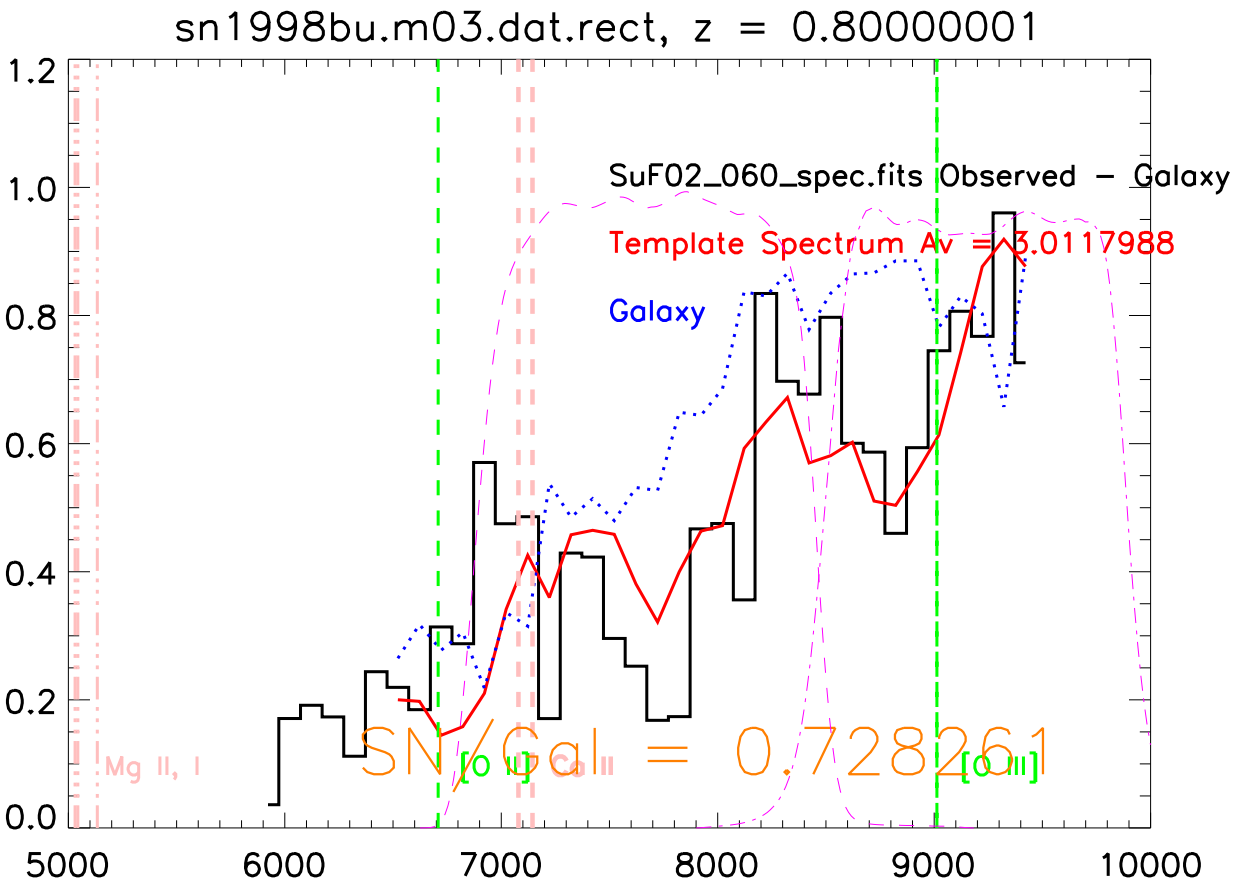
6000
7000
8000
9000
10000


sn1994d.m07.dat.rect, z = 0.62000000
SuF02_060_spec.fits Observed − Galaxy
Template Spectrum Av = 5.8912628
Galaxy
SN/Gal = 3.66837
Mg II
[O II]
Ca II
[O III]
H I
2.0
1.5
1.0
0.5
0.0
5000
6000
7000
8000
9000
10000


sn1998bu.m03.dat.rect, z = 0.80000001
SuF02_060_spec.fits Observed − Galaxy
Template Spectrum Av = 3.0117988
Galaxy
SN/Gal = 0.728261
Mg II, I
[O II]
Ca II
[O III]
1.2
1.0
0.8
0.6
0.4
0.2
0.0
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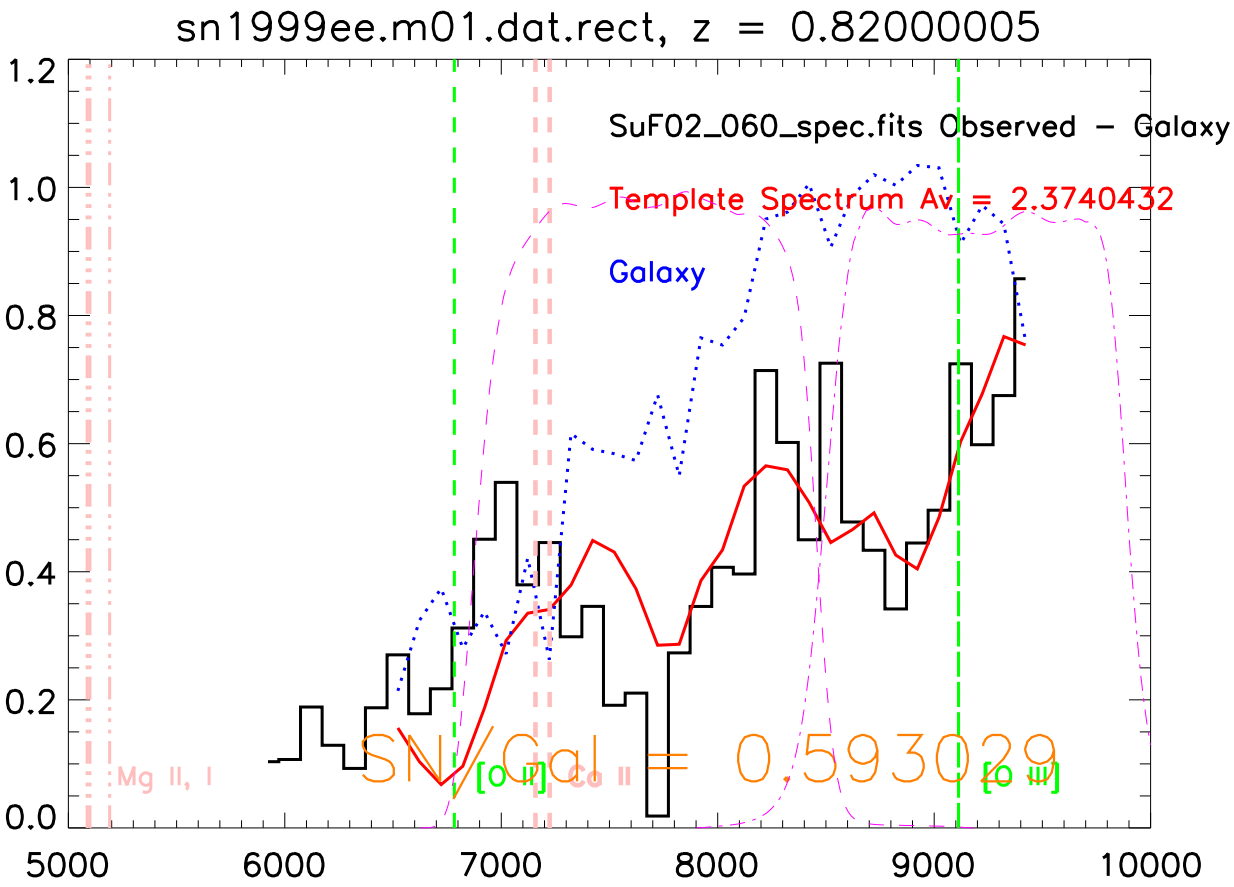
6000
7000
8000
9000
10000


sn1999ee.m01.dat.rect, z = 0.82000005
SuF02_060_spec.fits Observed − Galaxy
Template Spectrum Av = 2.3740432
Galaxy
SN/Gal = 0.593029
Mg II, I
[O II]
Ca II
[O III]
1.2
1.0
0.8
0.6
0.4
0.2
0.0
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6000
7000
8000
9000
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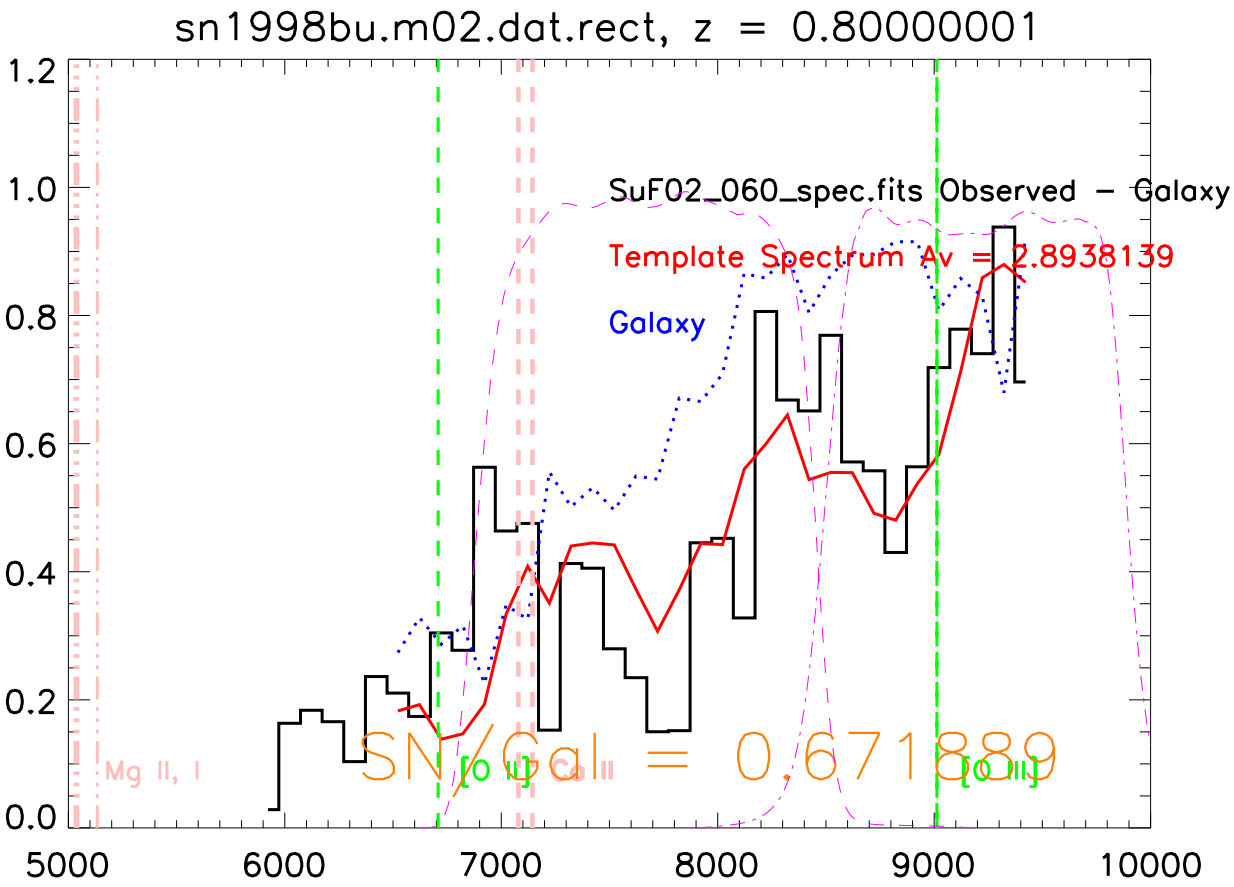
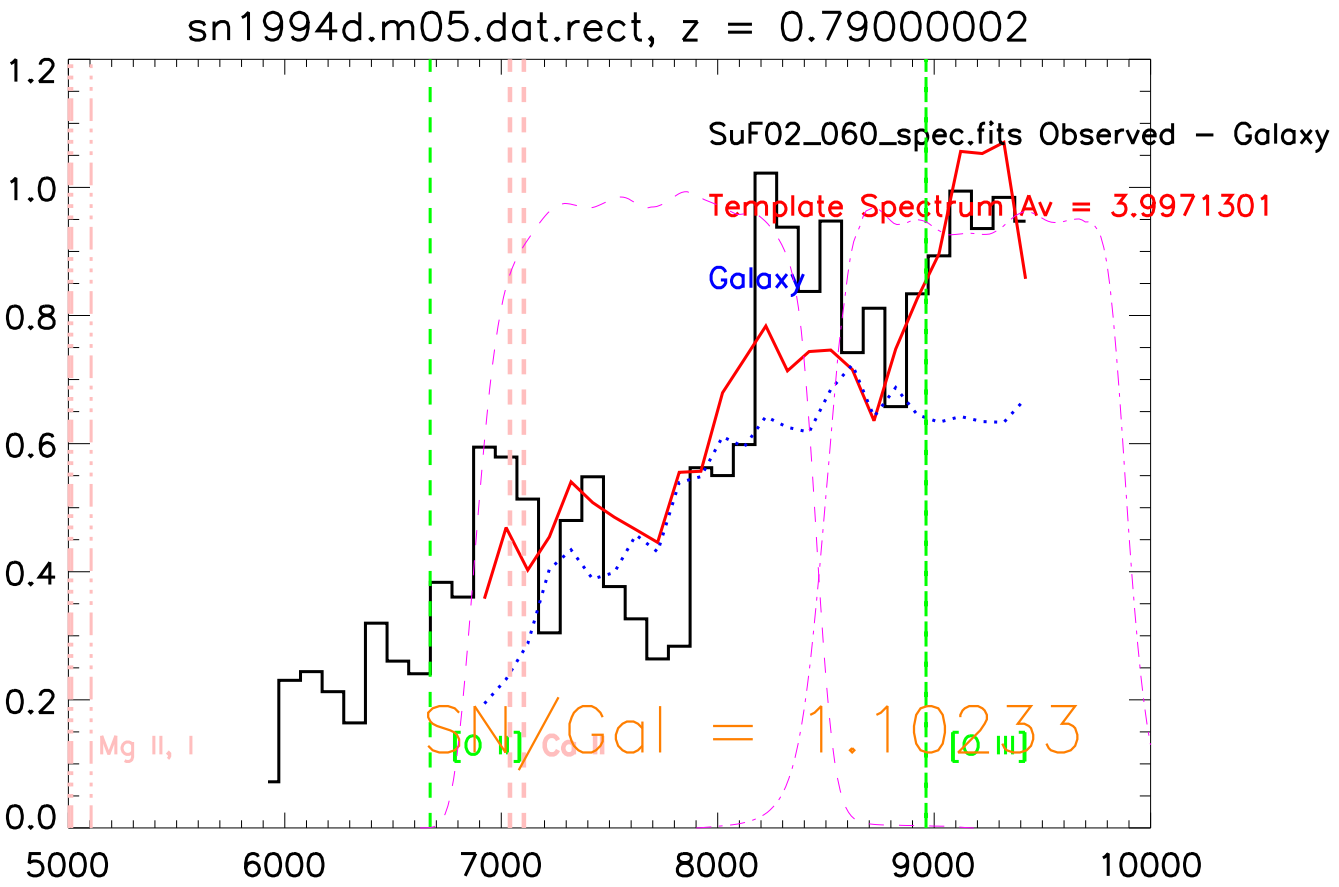
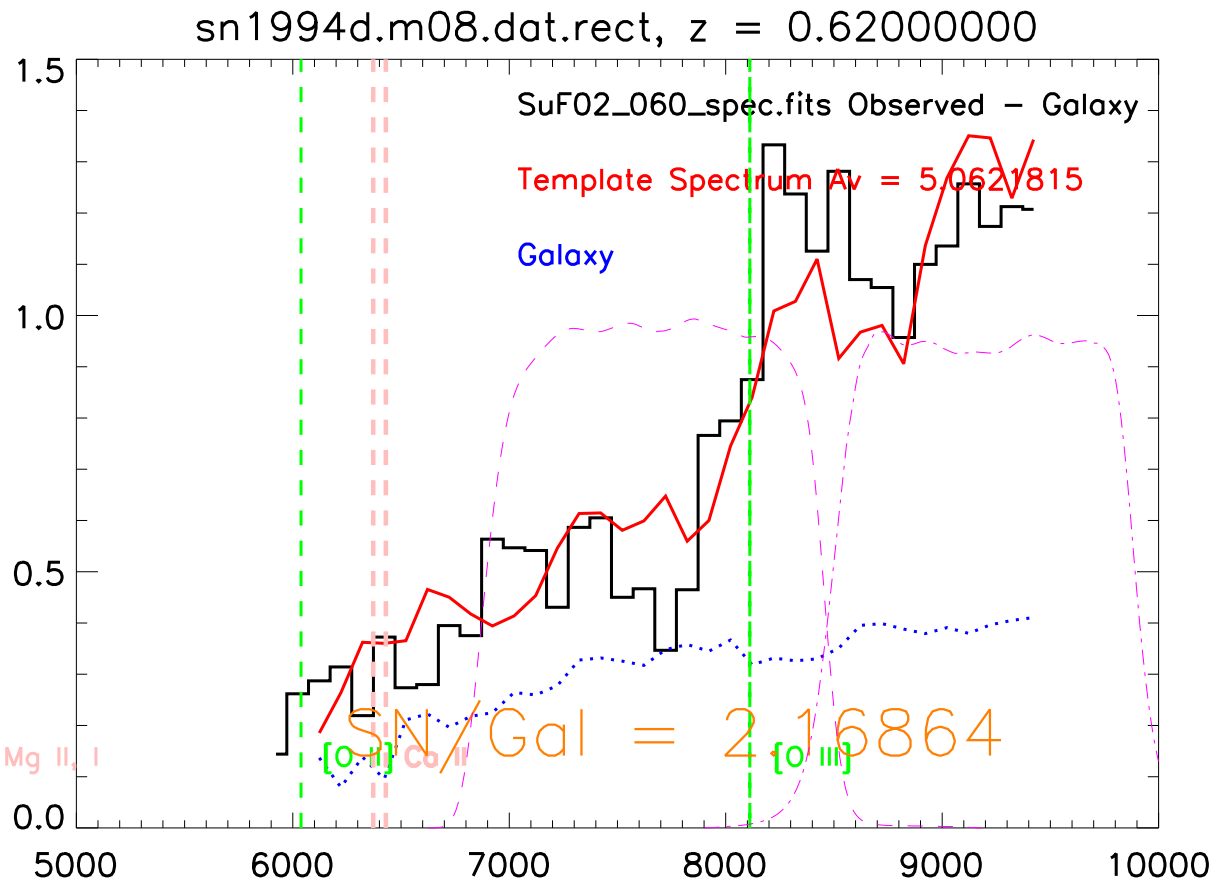

sn1998bu.m02.dat.rect, z = 0.80000001
SuF02_060_spec.fits Observed − Galaxy
Template Spectrum Av = 2.8938139
Galaxy
SN/Gal = 0.671889
Mg II, I
[O II]
Ca II
[O III]
1.2
1.0
0.8
0.6
0.4
0.2
0.0
5000
6000
7000
8000
9000
10000


sn1994d.m05.dat.rect, z = 0.79000002
SuF02_060_spec.fits Observed − Galaxy
Template Spectrum, Av = 3.9971301
Galaxy
SN/Gal = 1.10233
Mg II, I
[O II]
Ca I
[O III]
1.2
1.0
0.8
0.6
0.4
0.2
0.0
5000
6000
7000
8000
9000
10000


sn1994d.m08.dat.rect, z = 0.62000000
SuF02_060_spec.fits Observed − Galaxy
Template Spectrum Av = 5.0621815
Galaxy
S/N Gal = 2.16864
[O II]
[O III]
Mg II
Ca II
H I
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1.0
0.5
0.0
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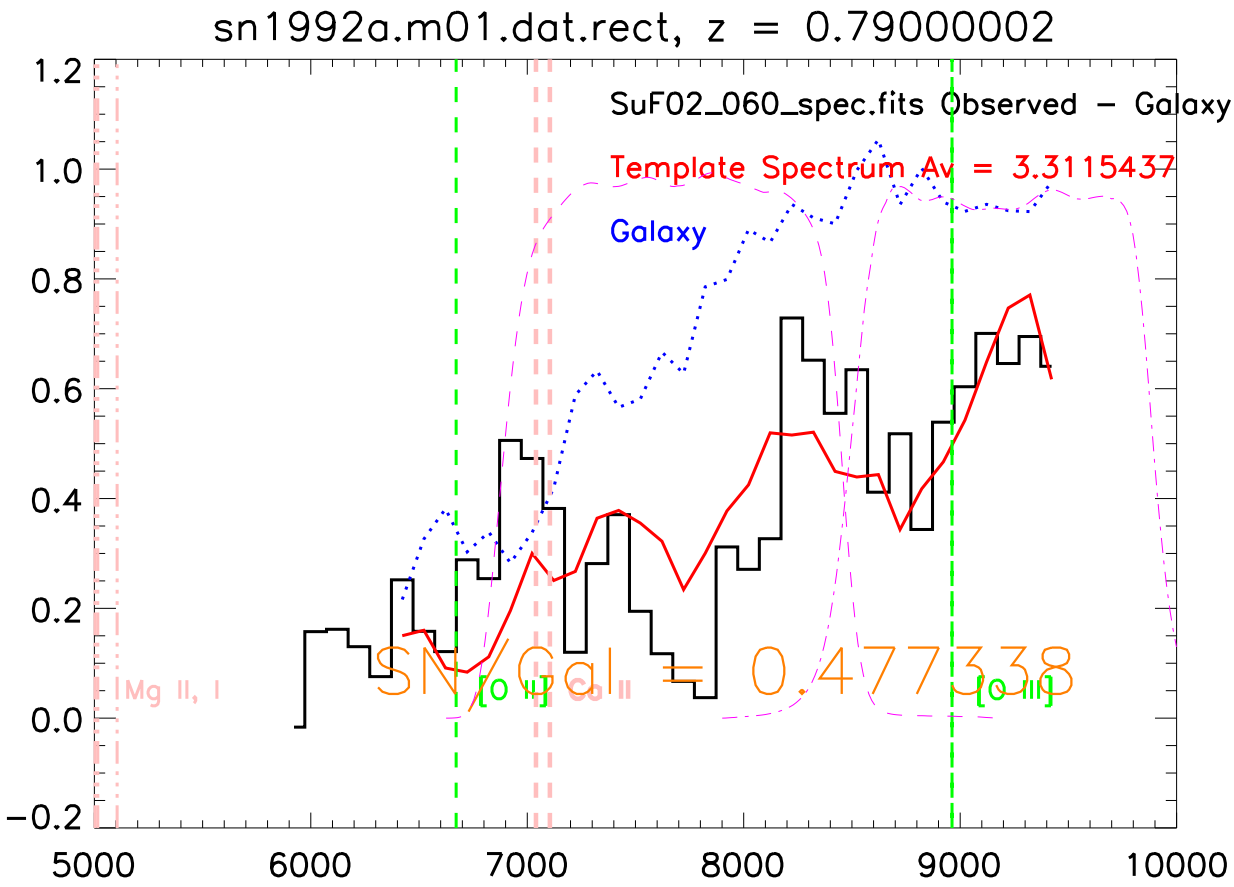
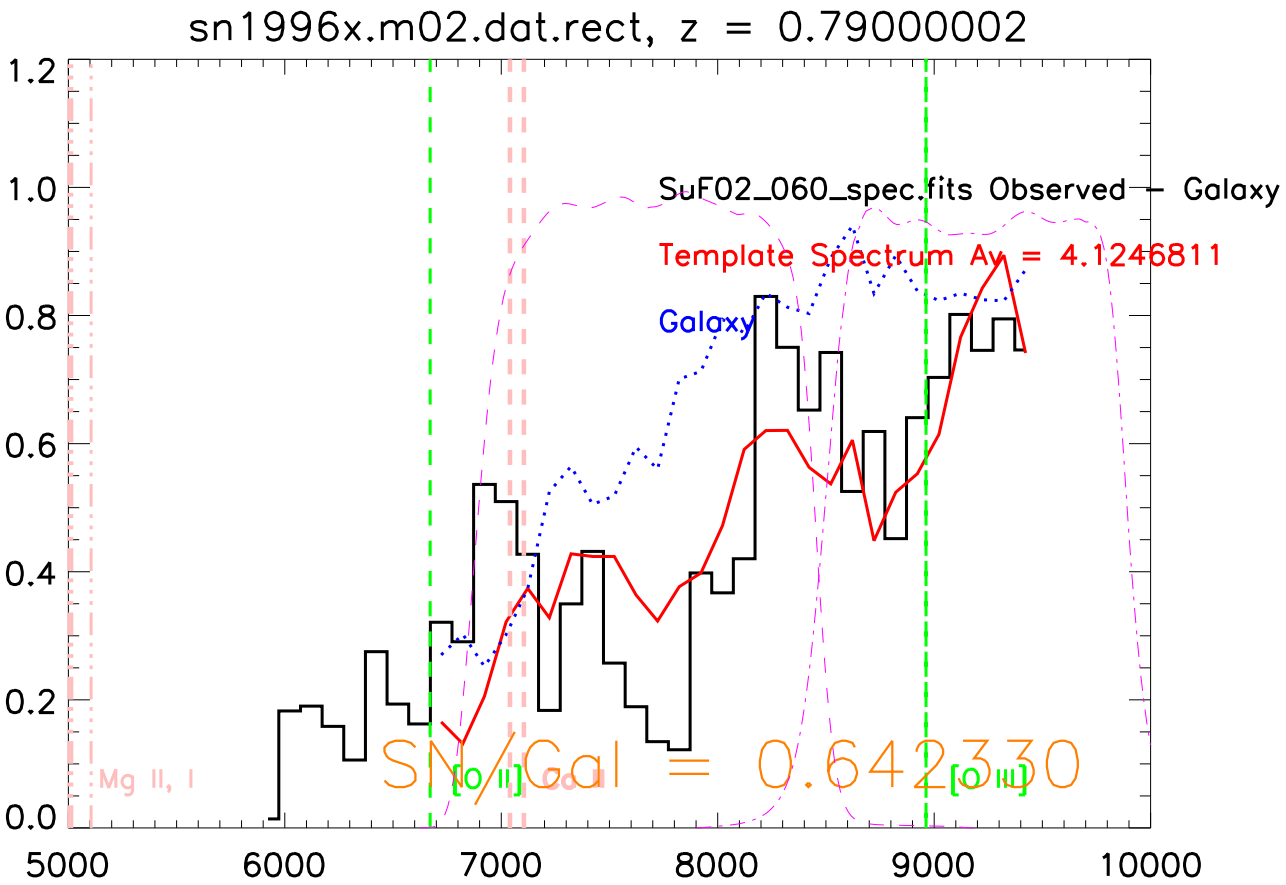
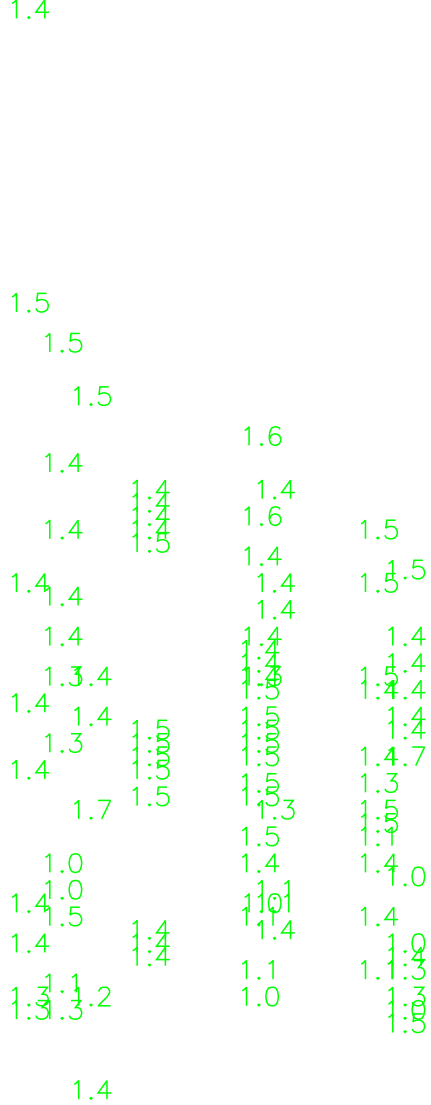
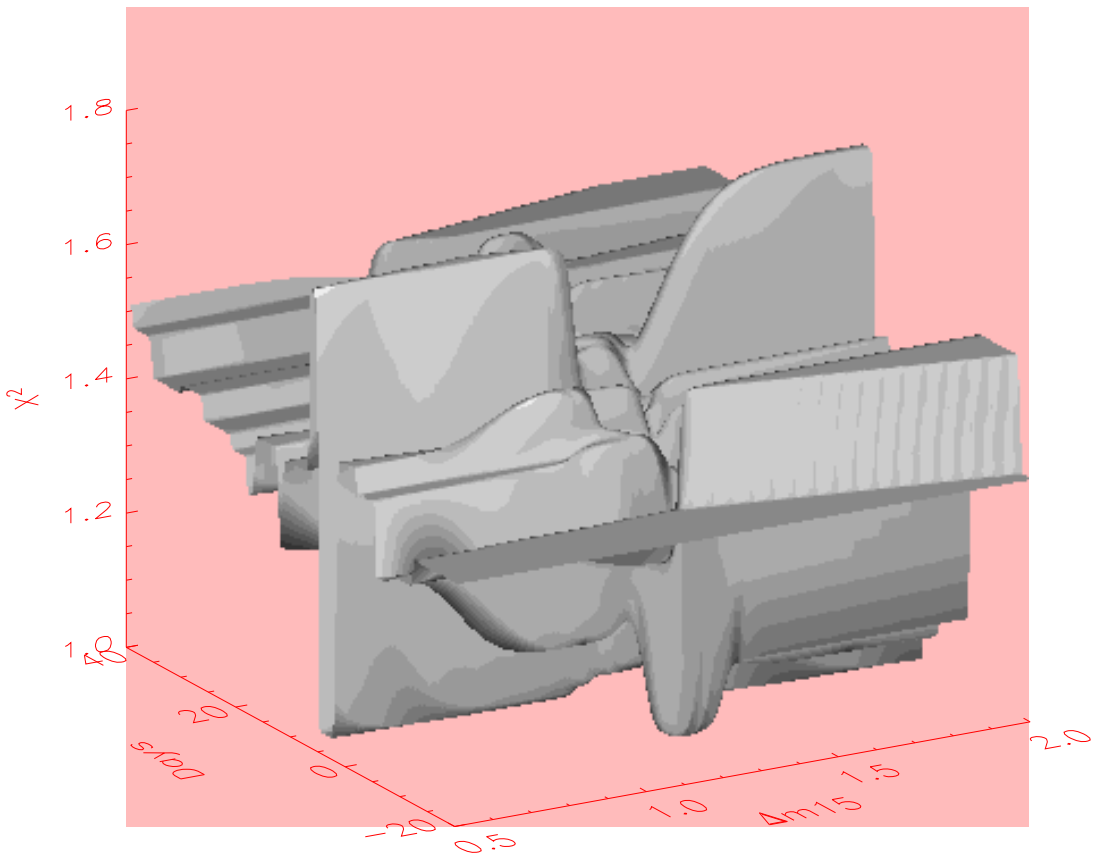
6000
7000
8000
9000
10000

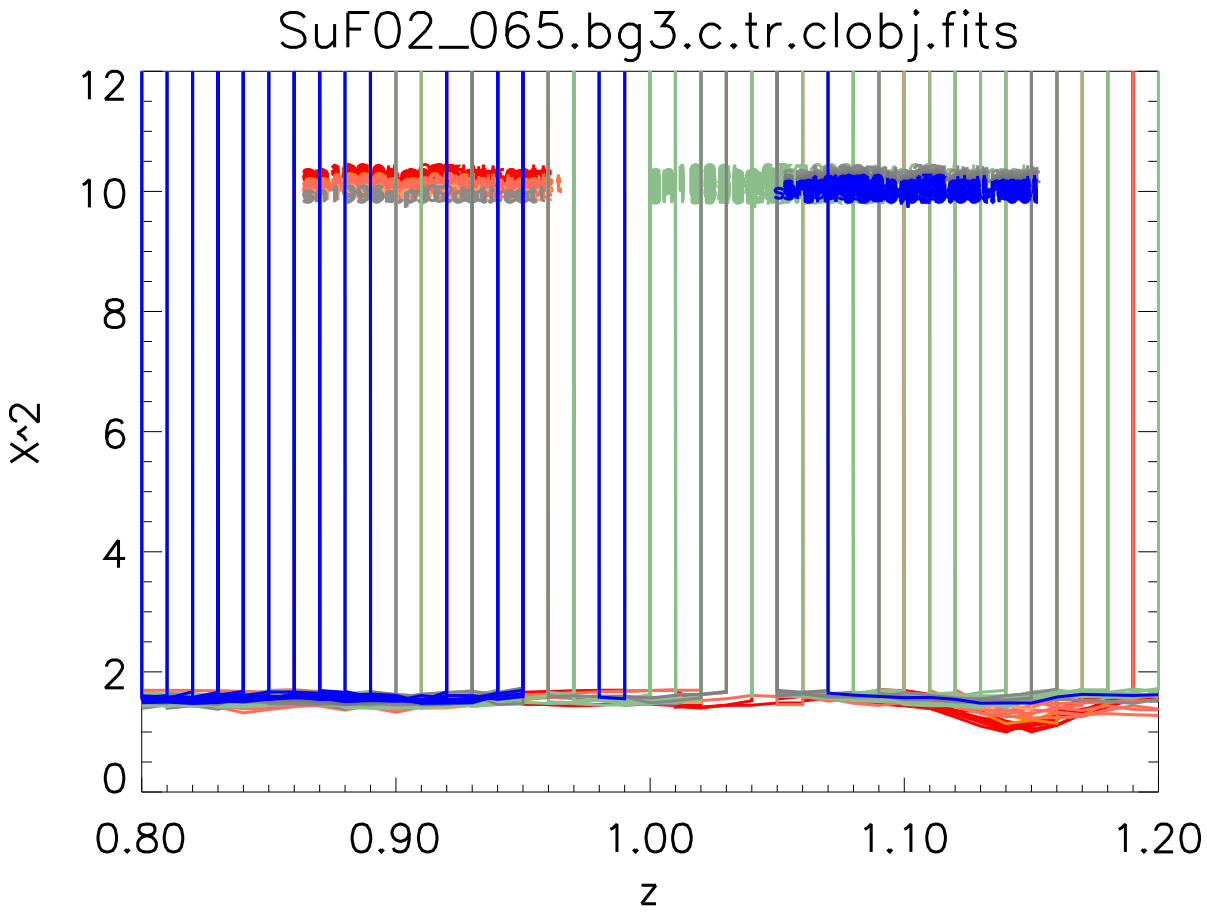

sn1992a.m01.dat.rect, z = 0.79000002
SuF02_060_spec.fits Observed − Galaxy
Template Spectrum Av = 3.3115437
Galaxy
SN/Gal = 0.477338
Mg II, I
[O II]
Ca II
[O III]
1.2
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
5000
6000
7000
8000
9000
10000


sn1996x.m02.dat.rect, z = 0.79000002
SuF02_060_spec.fits Observed
Galaxy
Template Spectrum Av = 4.1246811
Galaxy
SN/Gal = 0.642330
Mg II, I
[O II]
Ca II
[O III]
1.2
1.0
0.8
0.6
0.4
0.2
0.0
5000
6000
7000
8000
9000
10000





1.8
1.6
1.4
1.2
1.0
χ^2
40
20
0
−20
Days
0.5
1.0
1.5
2.0
Δm15


SuF02_065.bg3.c.tr.clobj.fits
X^2
z
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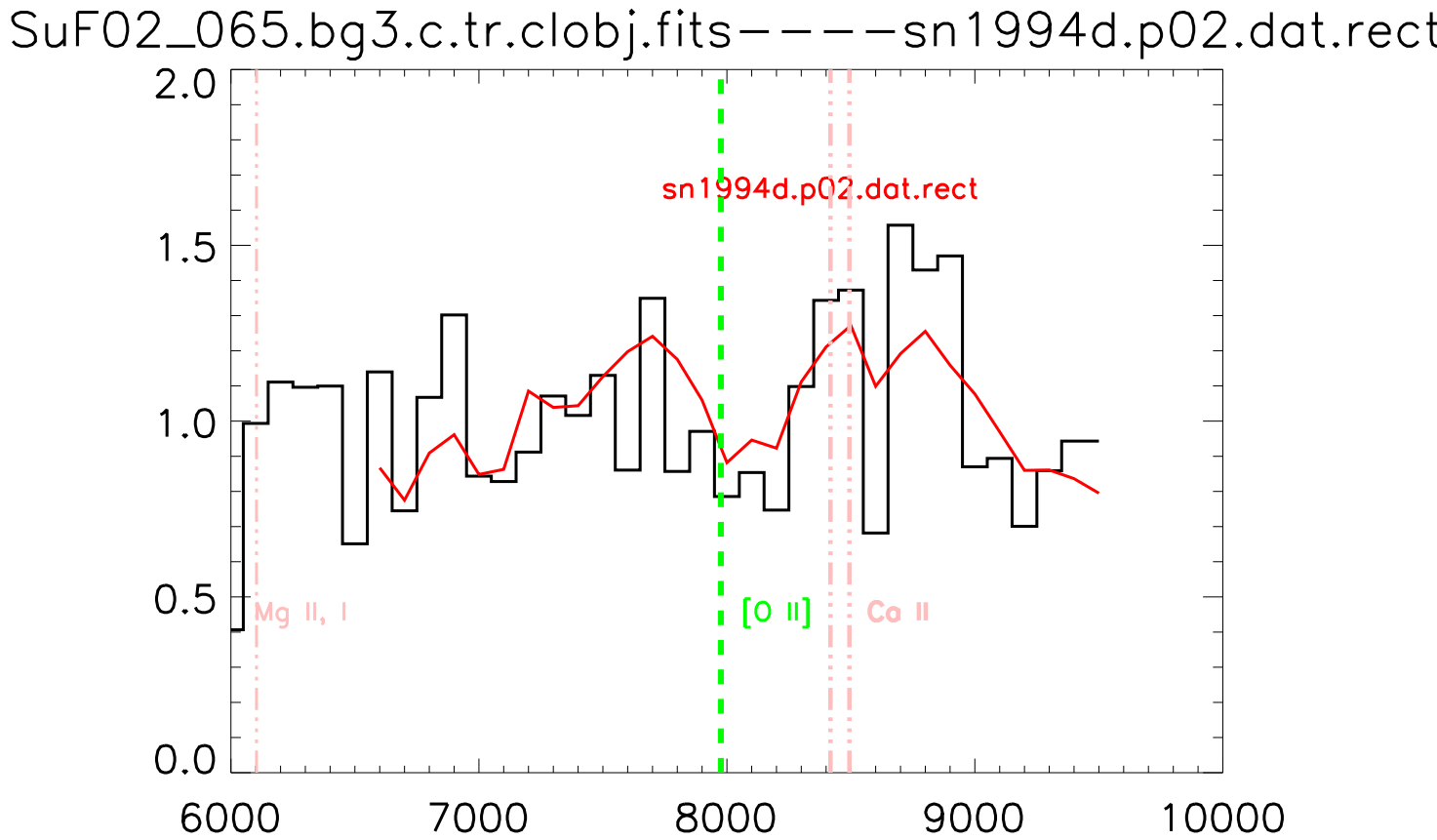
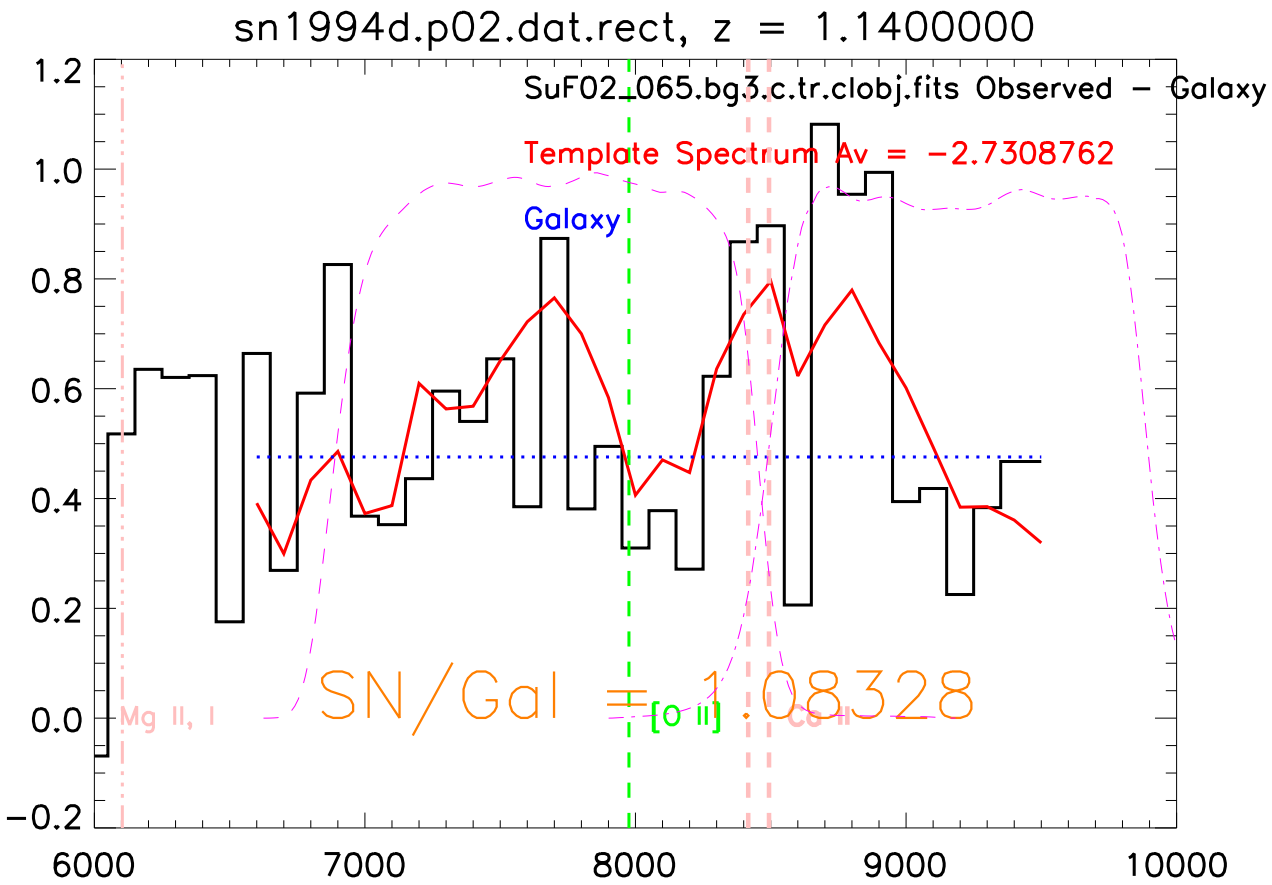
2
4
6
8
10
12
0.80
0.90
1.00
1.10
1.20


SuF02_065.bg3.c.tr.clobj.fits----sn1994d.p02.dat.rect
sn1994d.p02.dat.rect
Mg II, I
[O II]
Ca II
2.0
1.5
1.0
0.5
0.0
6000
7000
8000
9000
10000


sn1994d.p02.dat.rect, z = 1.1400000
SuF02_065.bg3.c.tr.clobj.fits Observed − Galaxy
Template Spectrum Av = −2.7308762
Galaxy
SN/Gal = 1.08328
Mg II, I
[O II]
Ca II
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0.8
0.6
0.4
0.2
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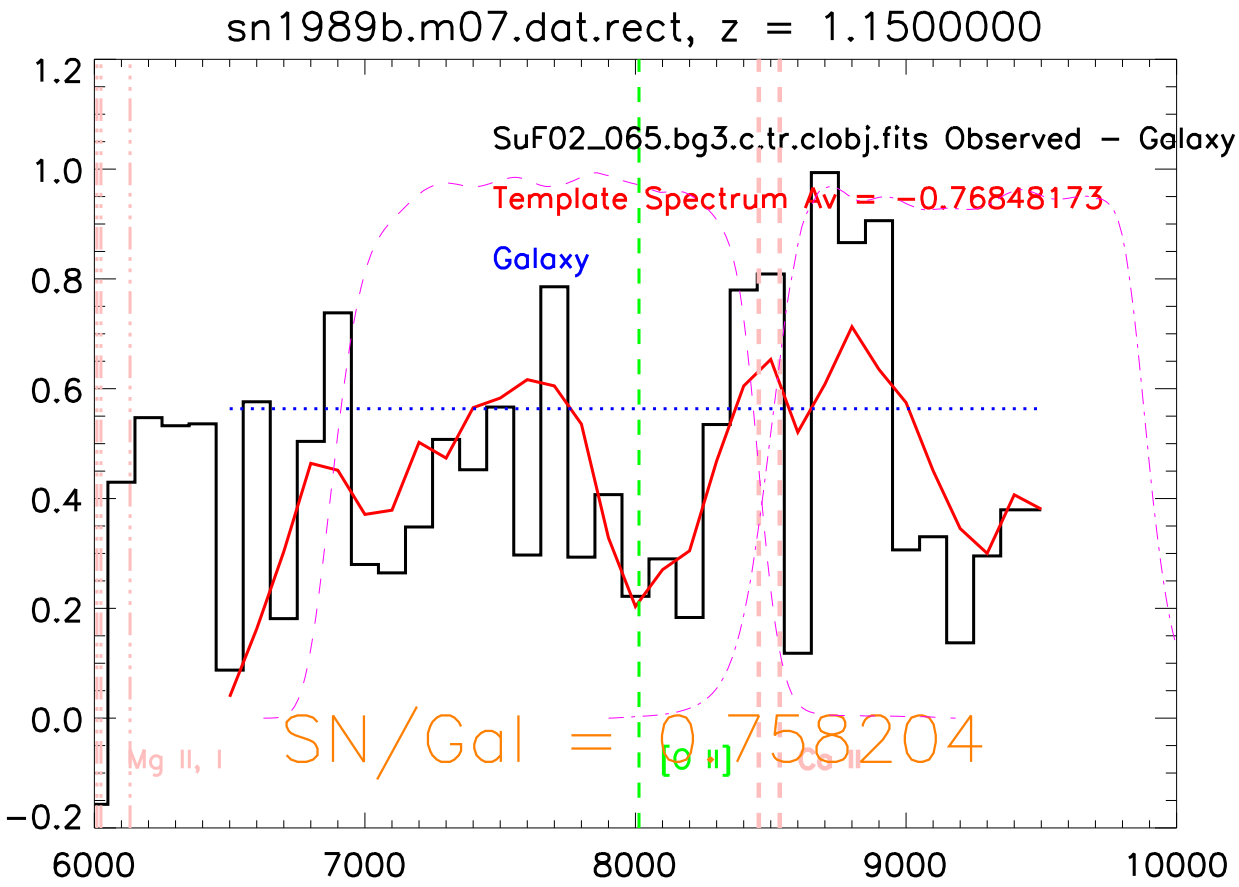
−0.2
6000
7000
8000
9000
10000


sn1989b.m07.dat.rect, z = 1.1500000
SuF02_065.bg3.c.tr.clobj.fits Observed – Galaxy
Template Spectrum Av = -0.76848173
Galaxy
SN/Gal = 0.758204
Mg II, I
[O II]
Ca II
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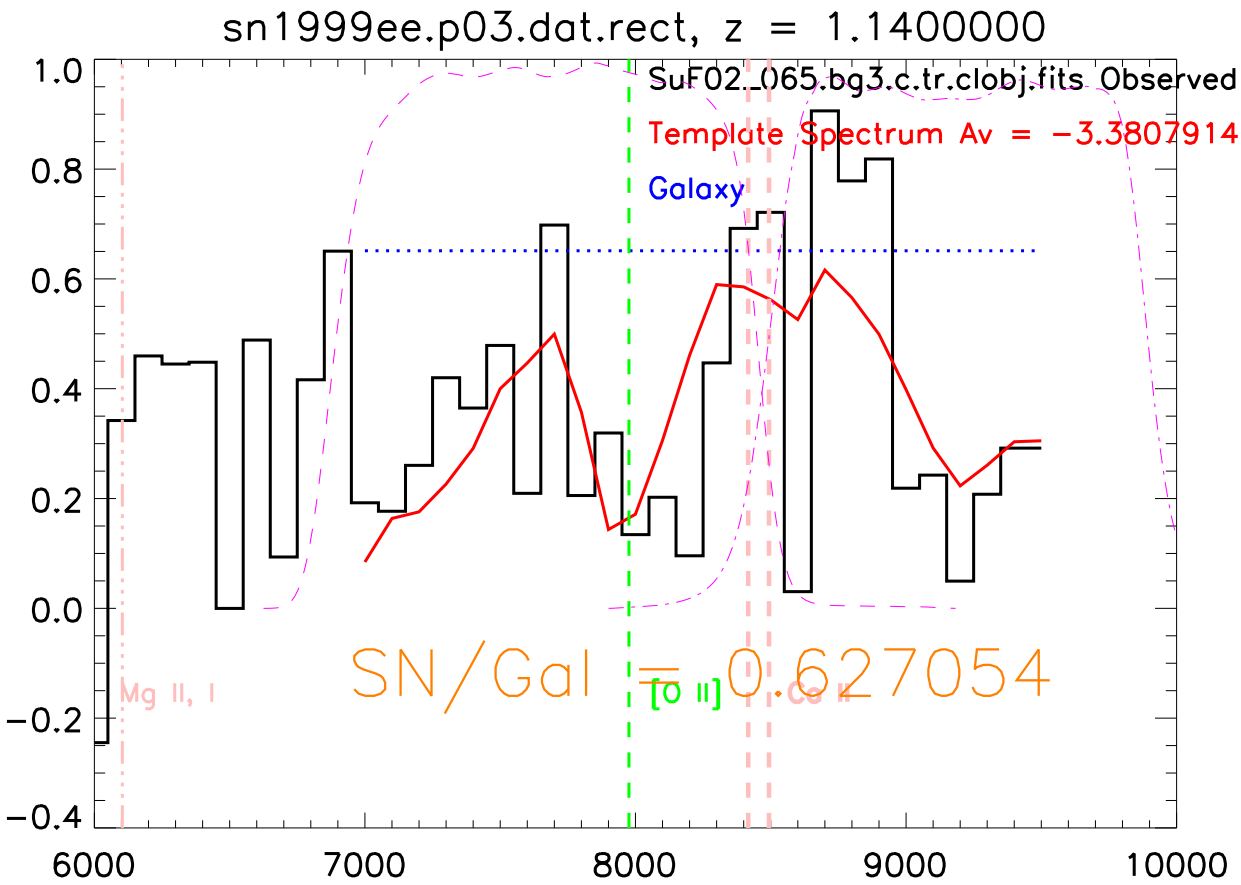
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
6000
7000
8000
9000
10000


sn1999ee.p03.dat.rect, z = 1.1400000
SuF02_065.bg3.c.tr.clobj.fits Observed – Galaxy
Template Spectrum Av = −3.3807914
Galaxy
SN/Gal = 0.627054
Mg II, I
[O II]
Ca II
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0.6
0.4
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−0.4
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8000
9000
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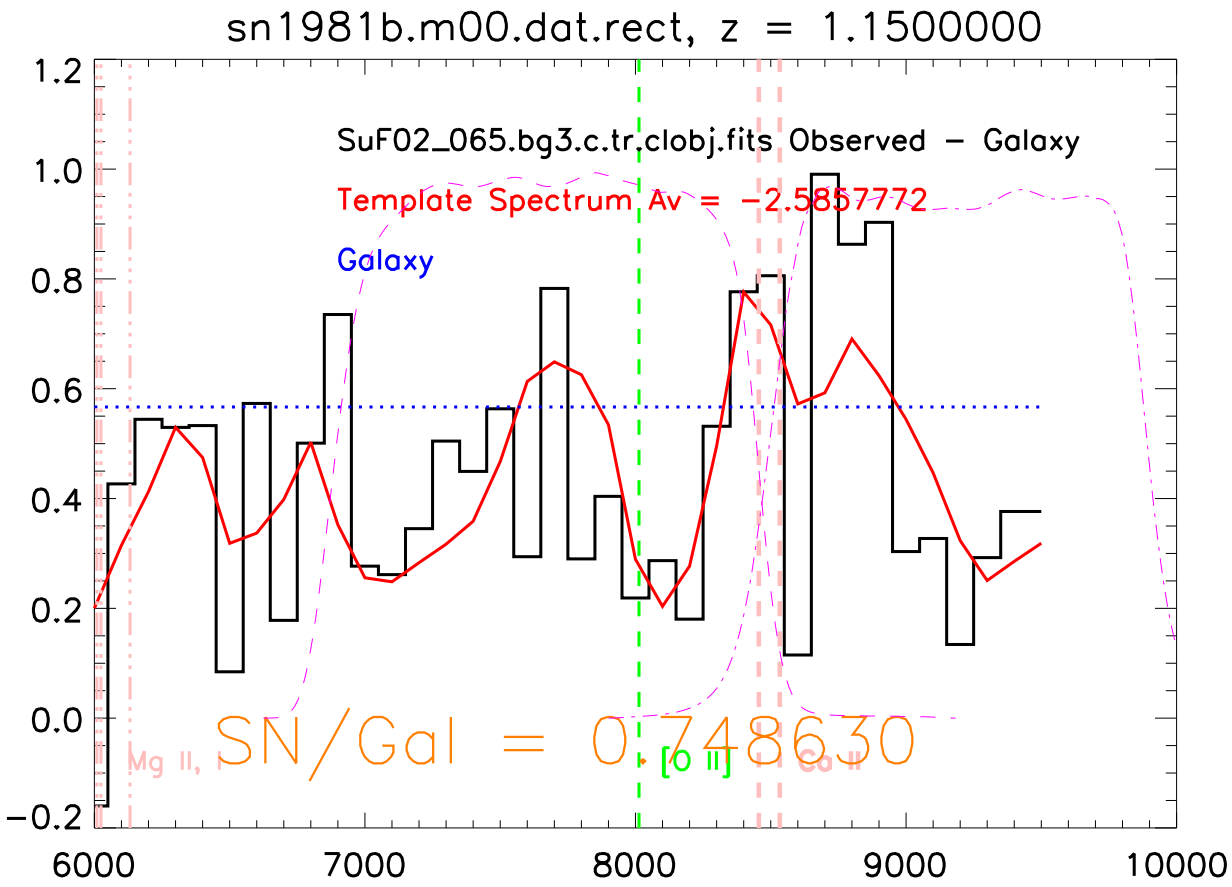
sn1981b.m00.dat.rect, z = 1.1500000
SuF02_065.bg3.c.tr.clobj.fits Observed − Galaxy
Template Spectrum, Av = −2.5857772
Galaxy
SN/Gal = 0.748630
[O II]
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0.8
0.6
0.4
0.2
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−0.2
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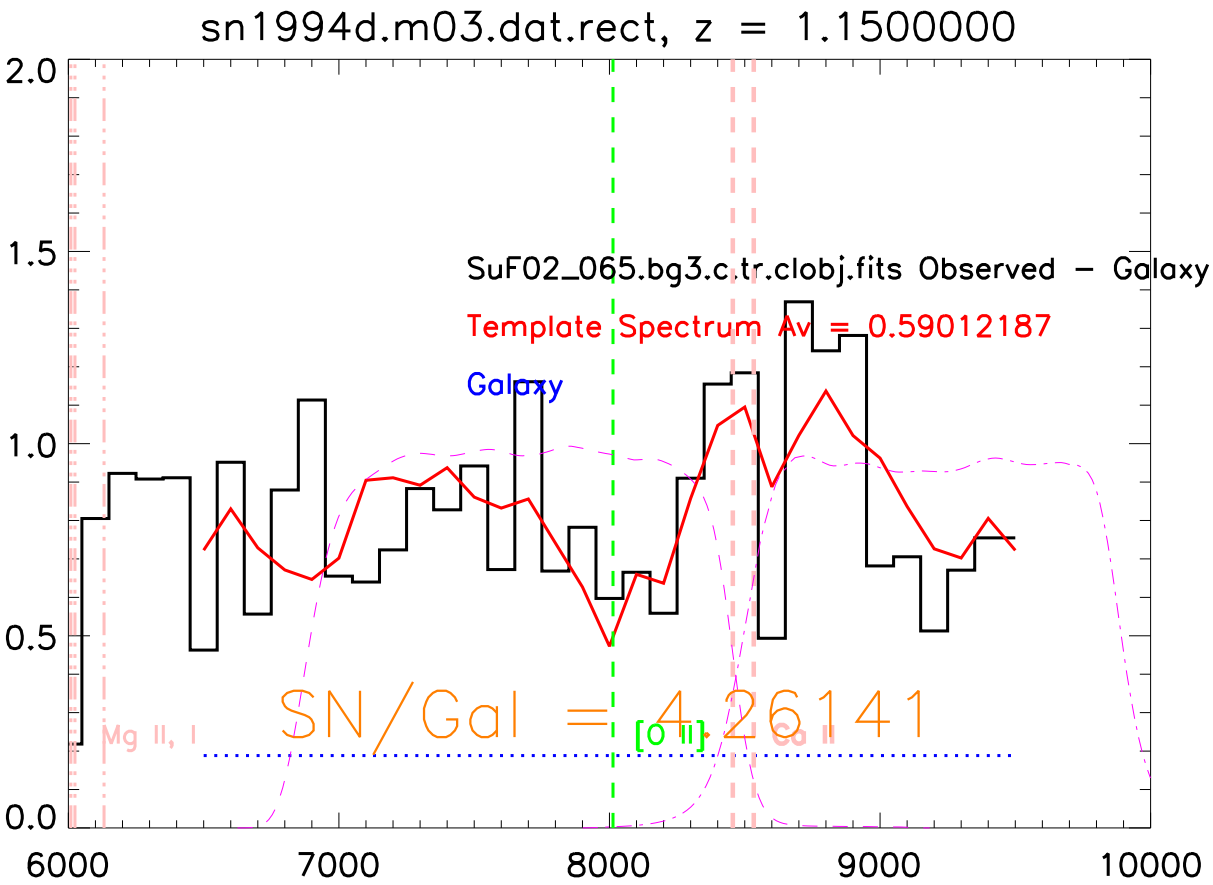
8000
9000
10000


sn1994d.m03.dat.rect, z = 1.1500000
SuF02_065.bg3.c.tr.clobj.fits Observed – Galaxy
Template Spectrum Av = 0.59012187
Galaxy
SN/Gal = 4.26141
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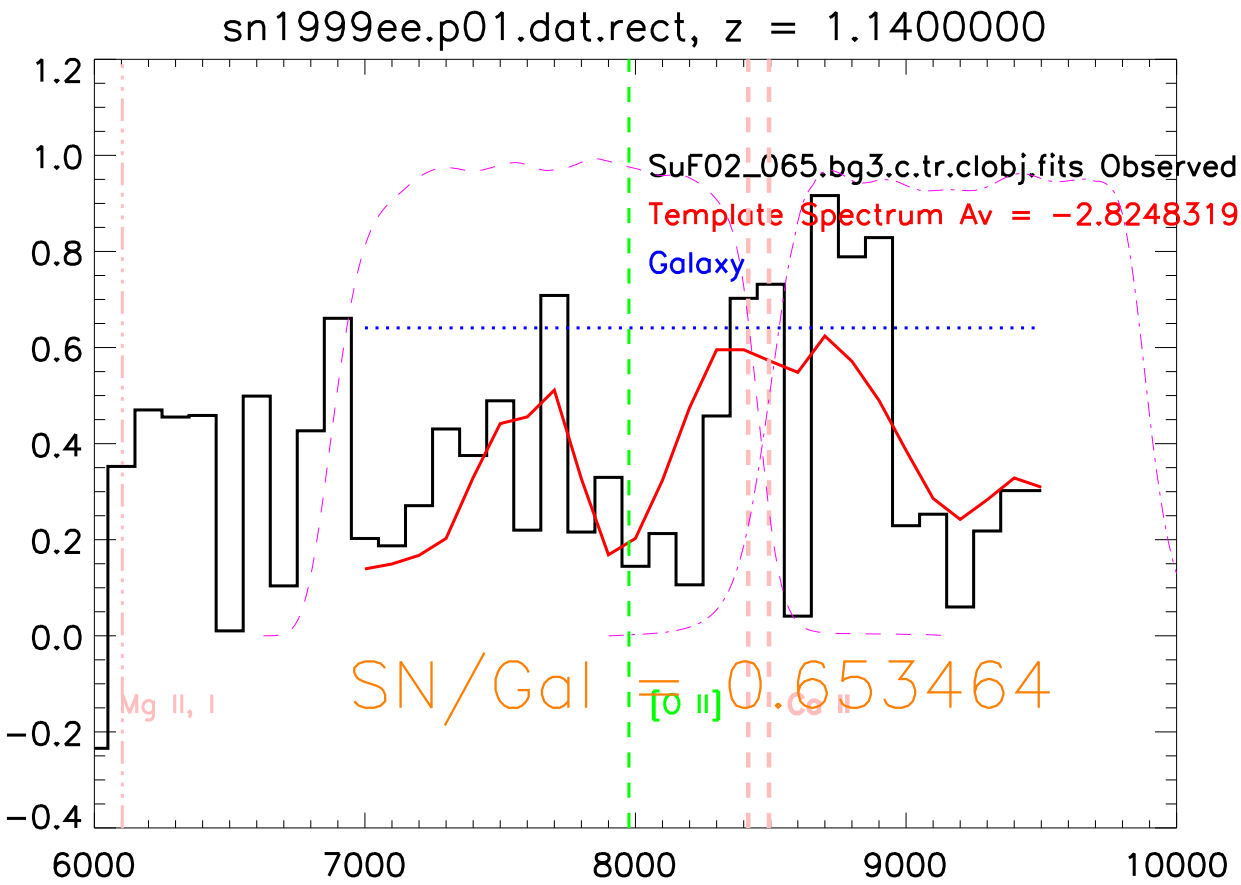
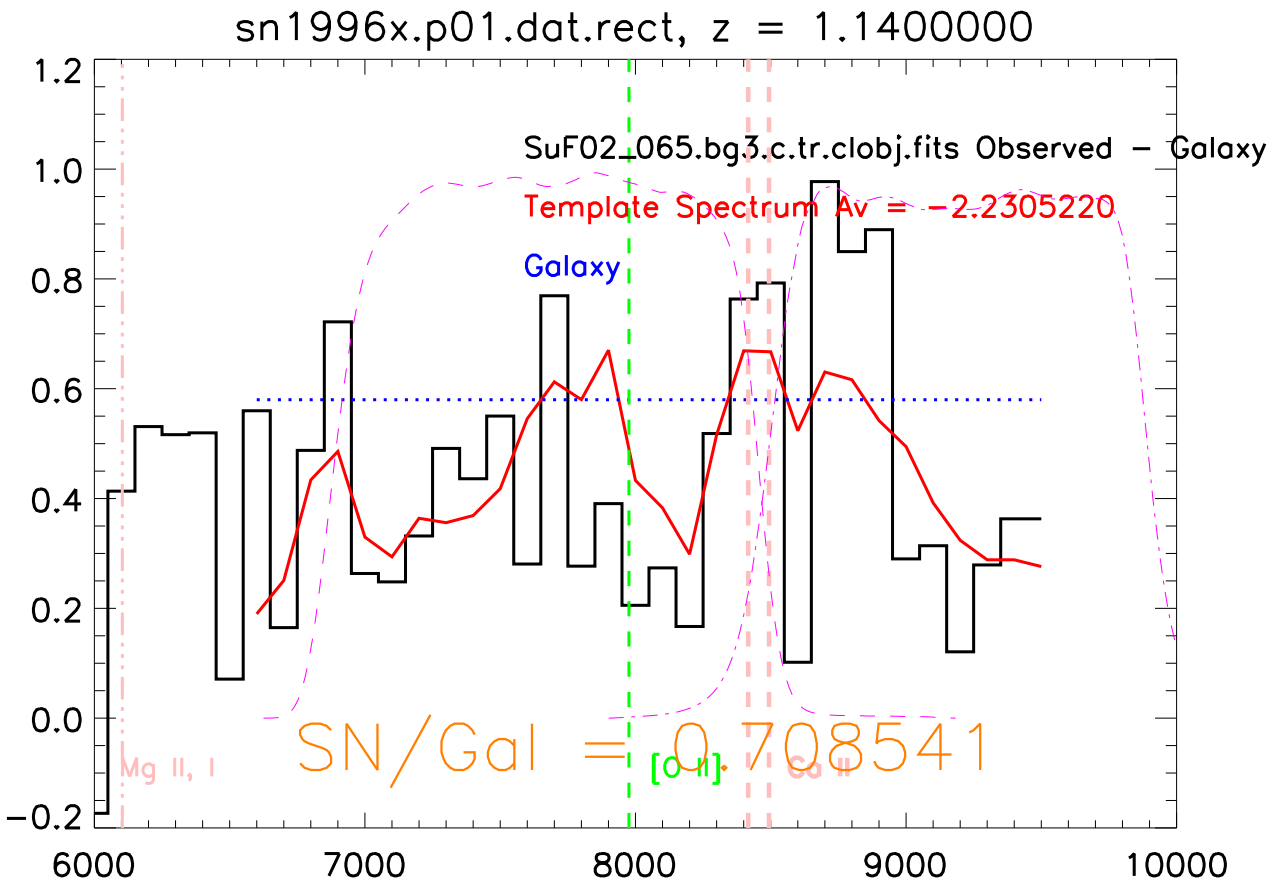
[O II]
Ca II
2.0
1.5
1.0
0.5
0.0
6000
7000
8000
9000
10000


sn1999ee.p01.dat.rect, z = 1.1400000
SuF02_065.bg3.c.tr.clobj.fits Observed – Galaxy
Template Spectrum Av = −2.8248319
Galaxy
SN/Gal = 0.653464
Mg II, I
[O II]
Ca II
1.2
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
−0.4
6000
7000
8000
9000
10000


sn1996x.p01.dat.rect, z = 1.1400000
SuF02_065.bg3.c.tr.clobj.fits Observed − Galaxy
Template Spectrum Av = −2.2305220
Galaxy
SN/Gal = 0.708541
Mg II, I
[O II]
Ca II
1.2
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0.8
0.6
0.4
0.2
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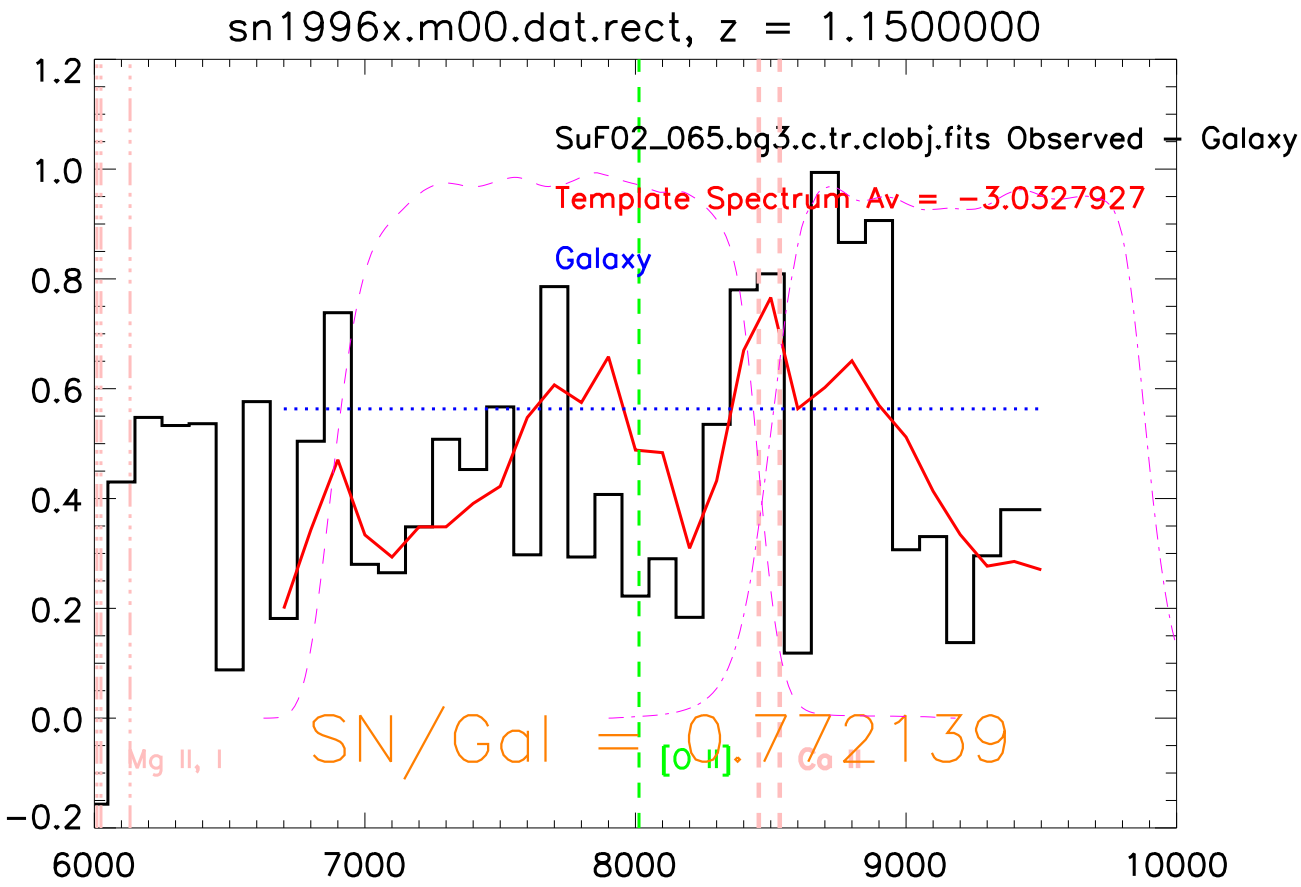
−0.2
6000
7000
8000
9000
10000


sn1996x.m00.dat.rect, z = 1.1500000
SuF02_065.bg3.c.tr.clobj.fits Observed – Galaxy
Template Spectrum Av = −3.0327927
Galaxy
SN/Gal = 0.772139
Mg II, I
[O II]
Ca II
1.2
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
6000
7000
8000
9000
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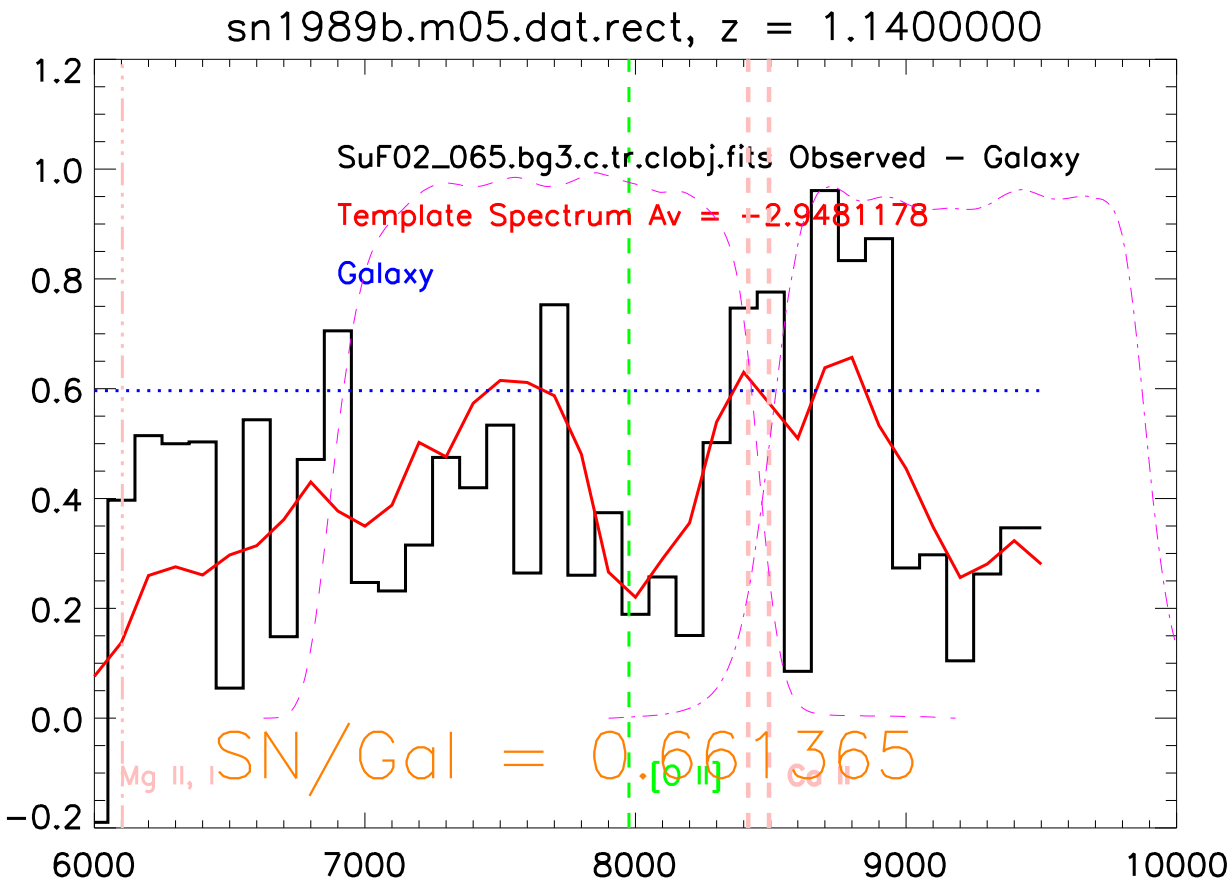
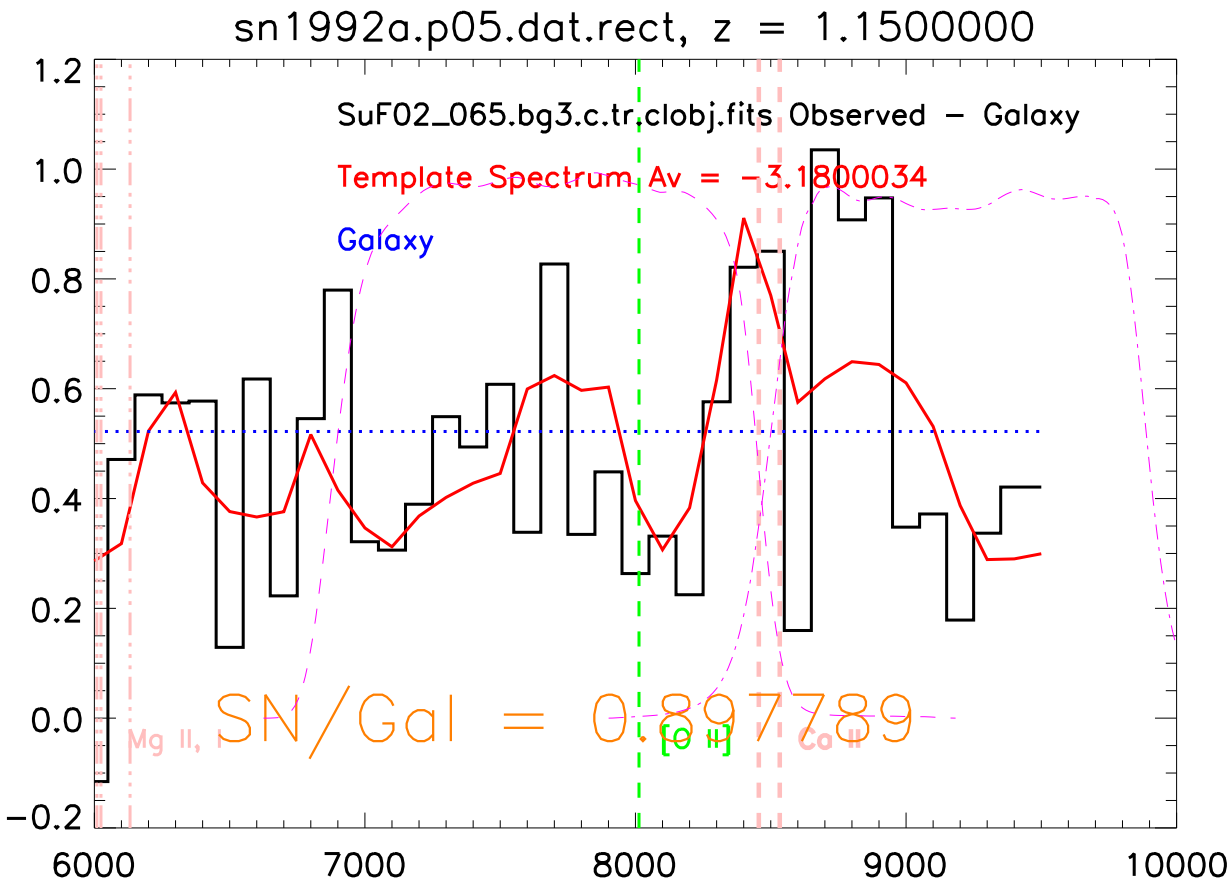

sn1989b.m05.dat.rect, z = 1.1400000
SuF02_065.bg3.c.tr.clobj.fits Observed − Galaxy
Template Spectrum Av = -2.9481178
Galaxy
SN/Gal = 0.661365
Mg II, I
[O II]
Ca II
1.2
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
6000
7000
8000
9000
10000


sn1992a.p05.dat.rect, z = 1.1500000
SuF02_065.bg3.c.tr.clobj.fits Observed − Galaxy
Template Spectrum, Av = −3.1800034
Galaxy
SN/Gal = 0.897789
[O II]
Ca II
1.2
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0.8
0.6
0.4
0.2
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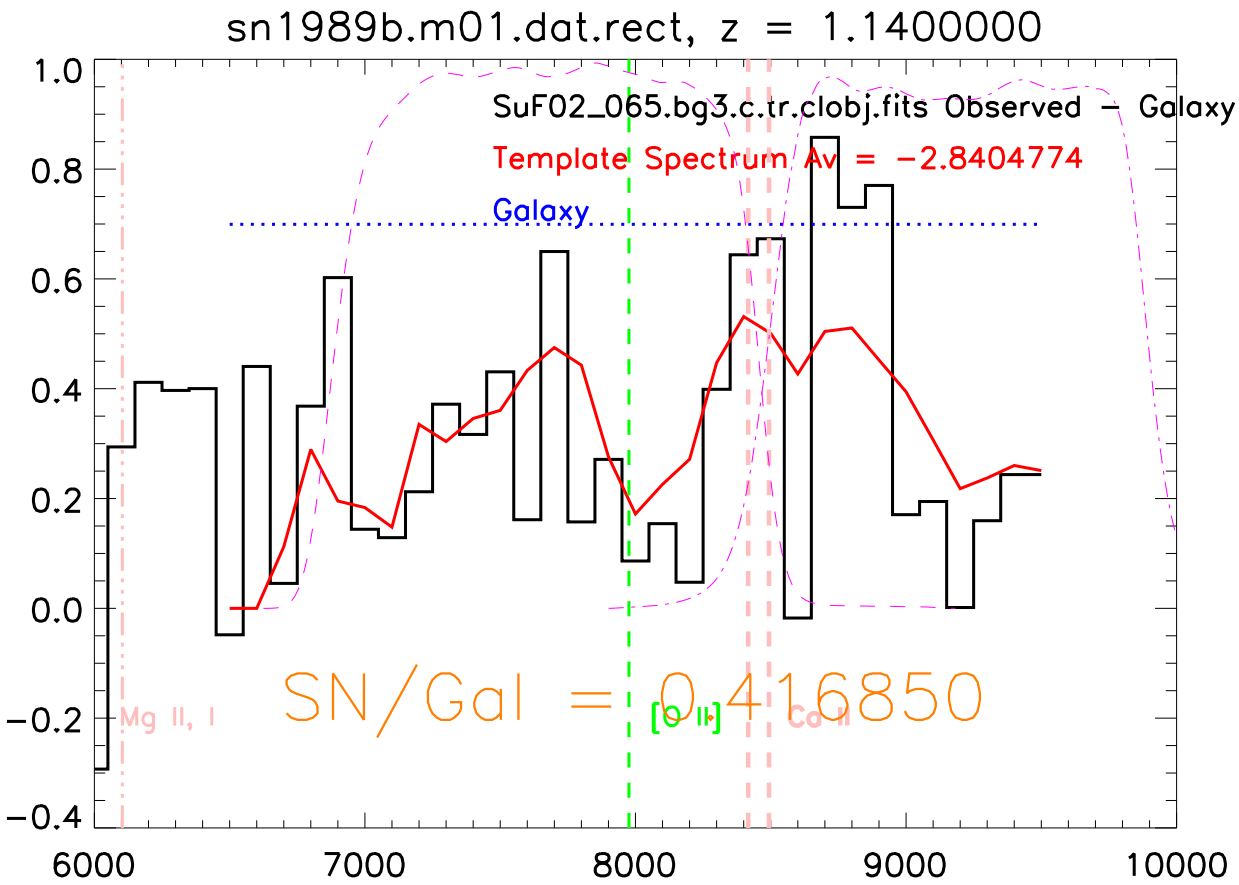
−0.2
6000
7000
8000
9000
10000


sn1989b.m01.dat.rect, z = 1.1400000
SuF02_065.bg3.c.tr.clobj.fits Observed – Galaxy
Template Spectrum Av = −2.8404774
Galaxy
SN/Gal = 0.416850
Mg II, I
[O II]
Ca II
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0.6
0.4
0.2
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−0.4
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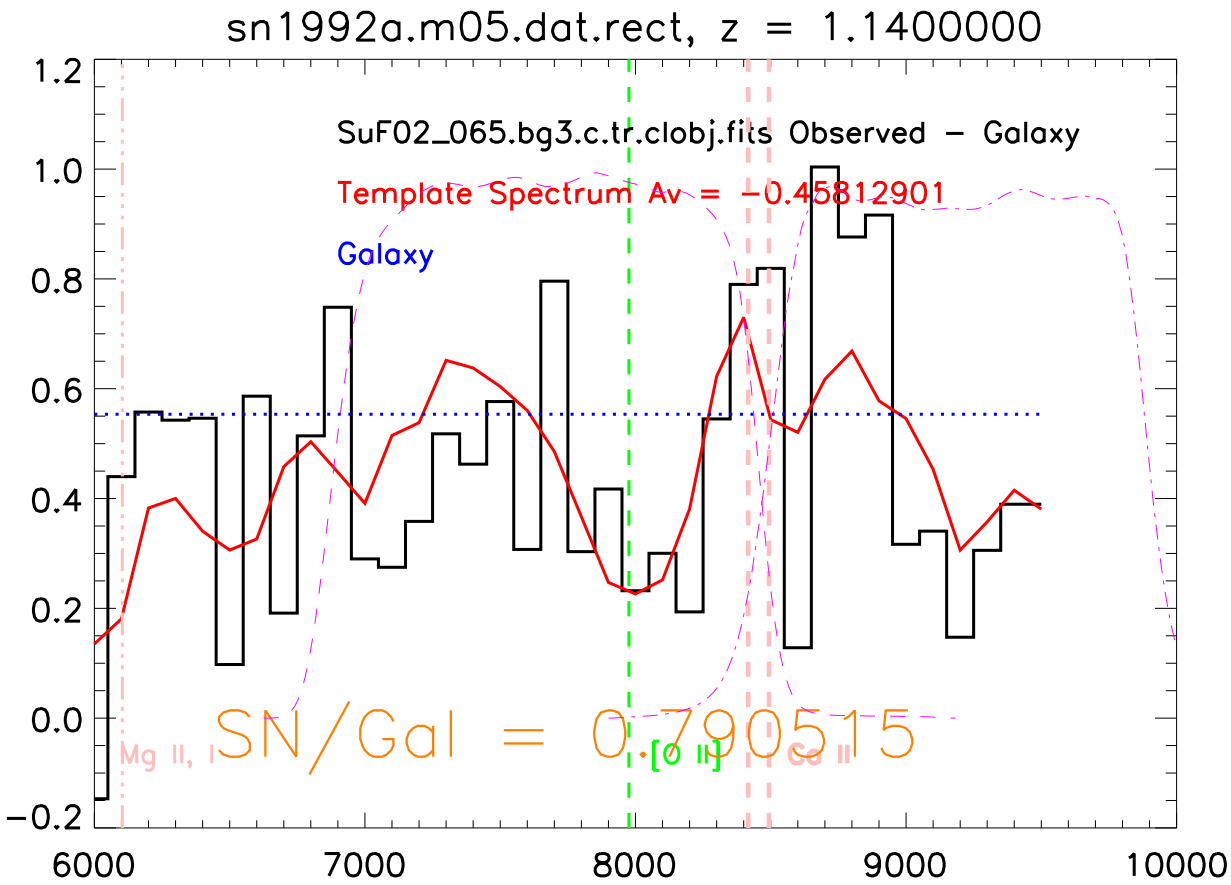
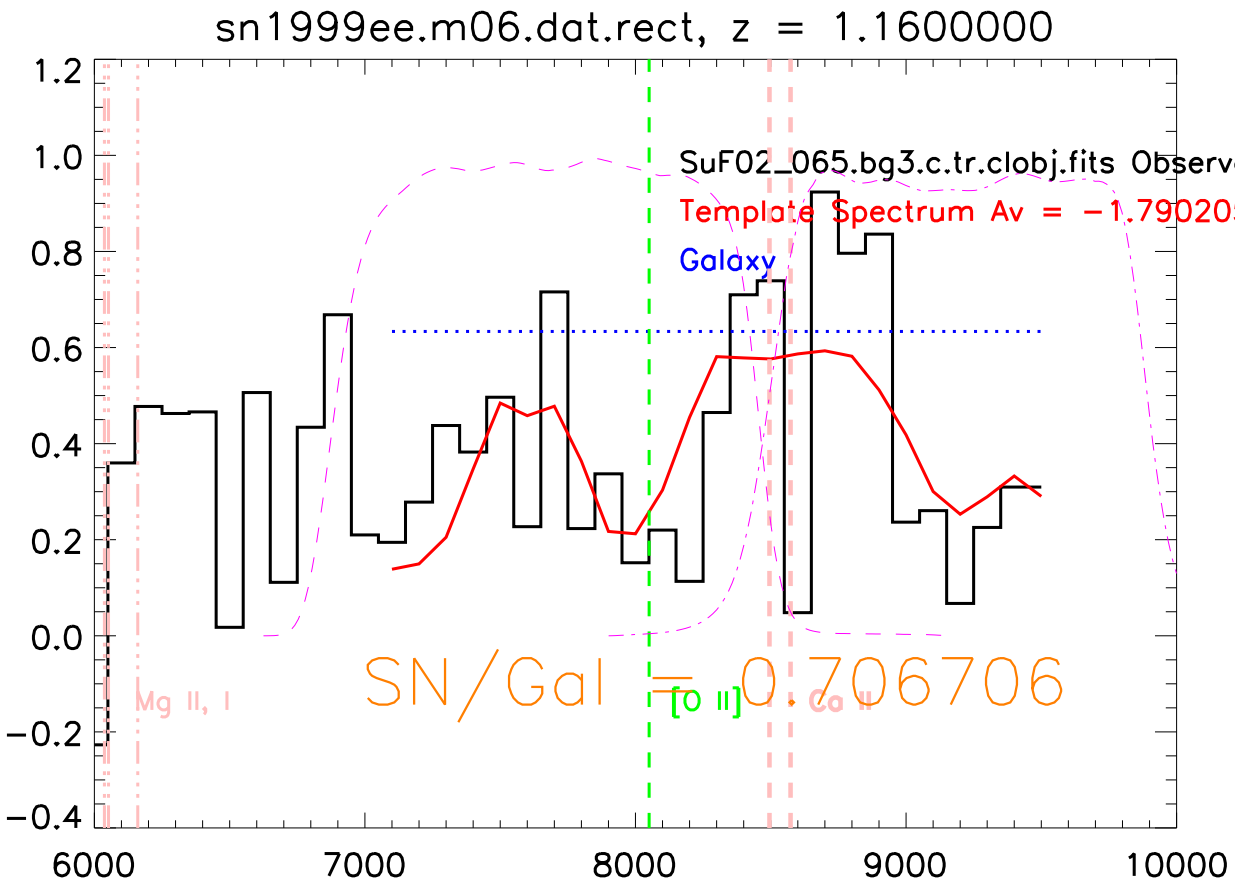
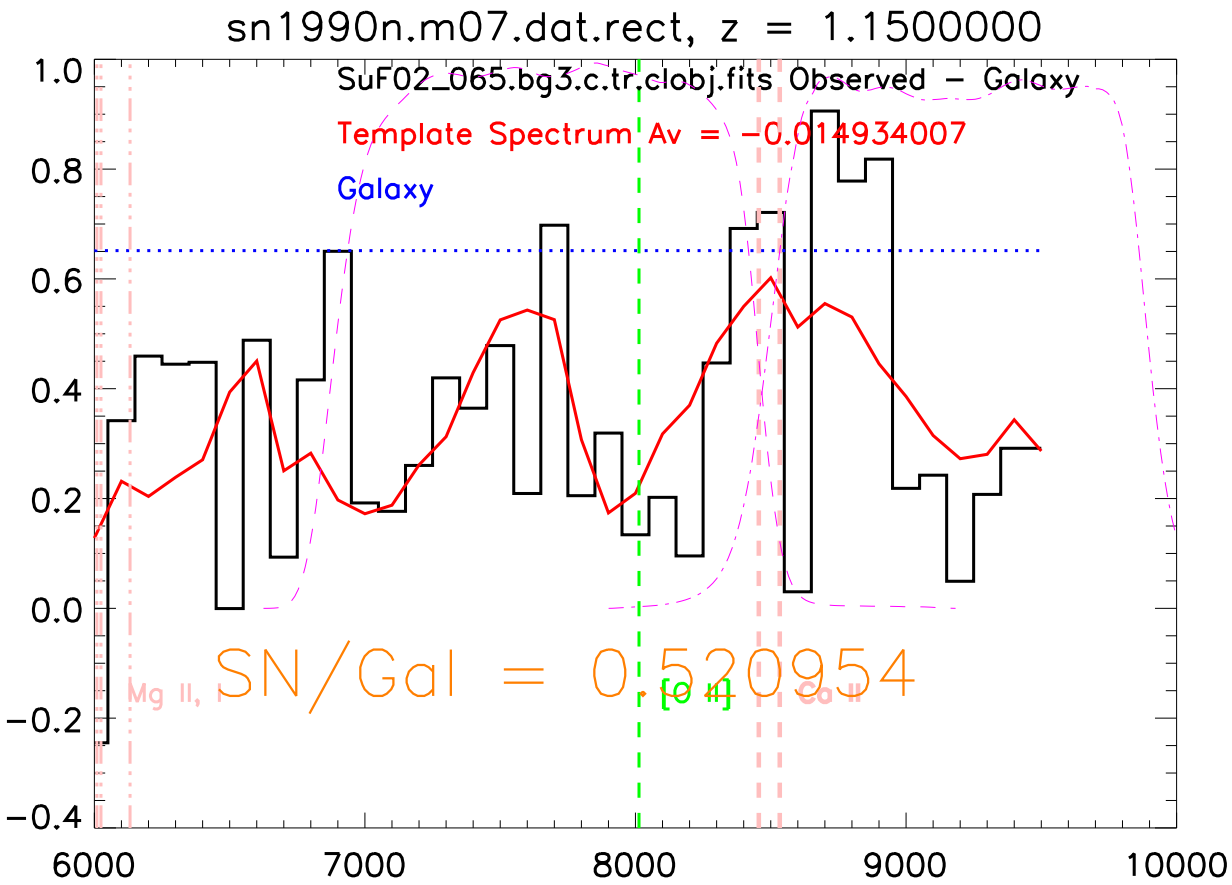
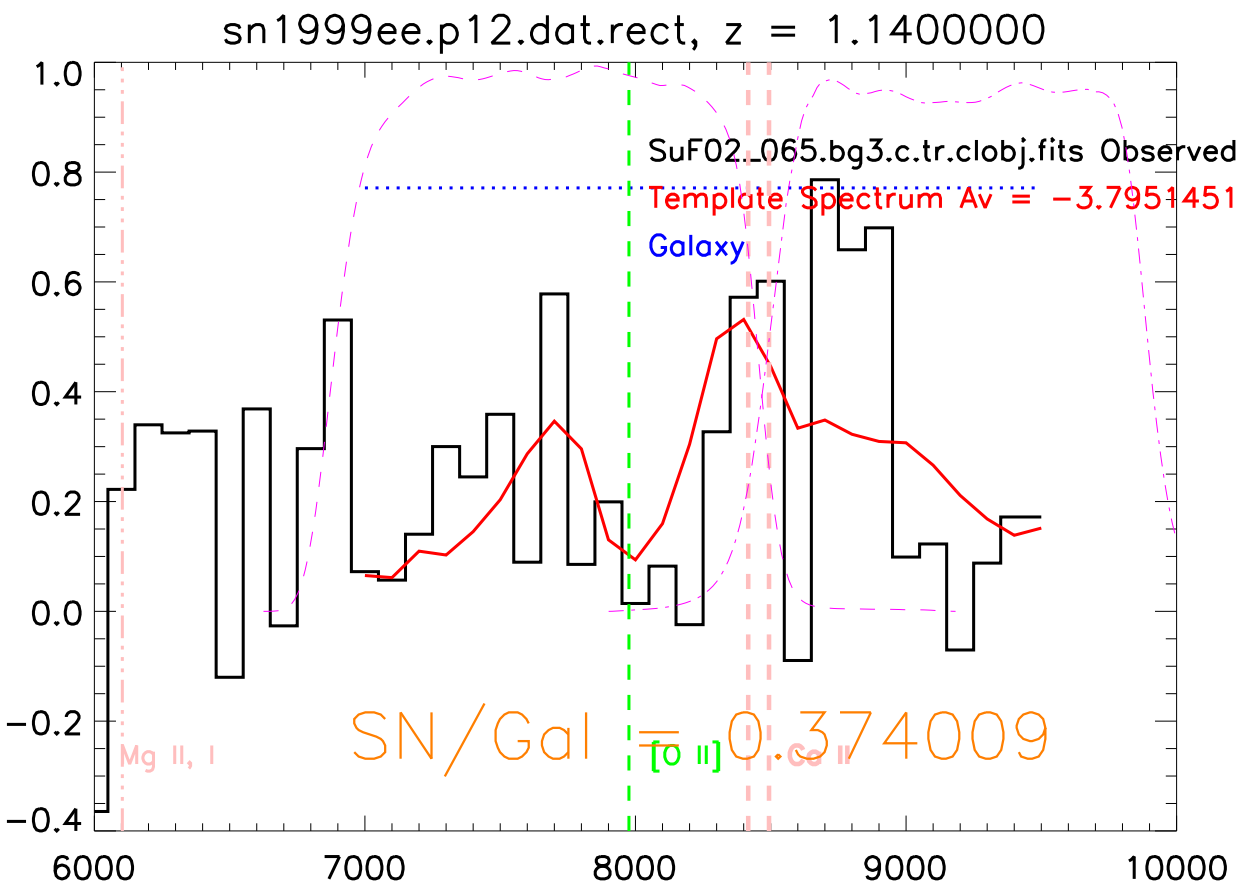
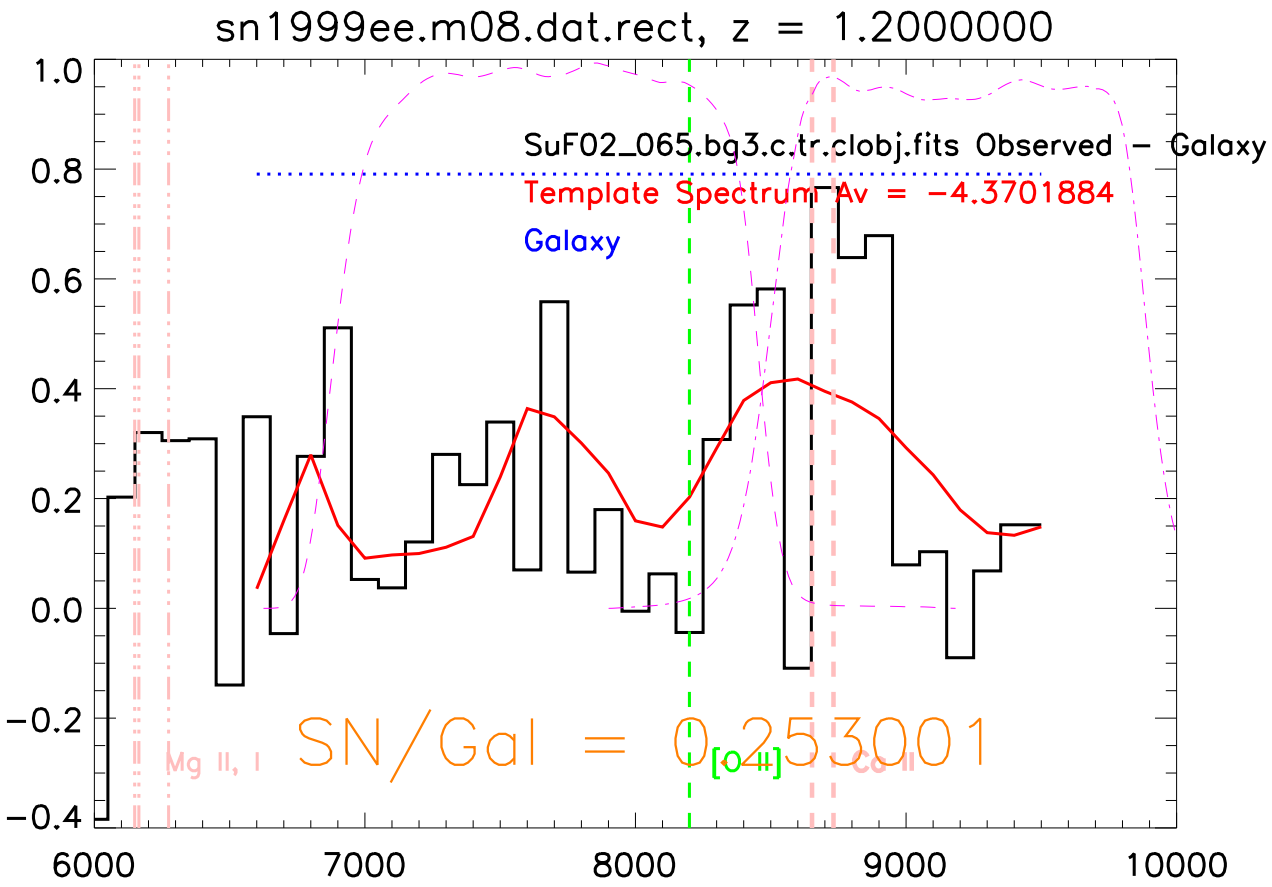
7000
8000
9000
10000

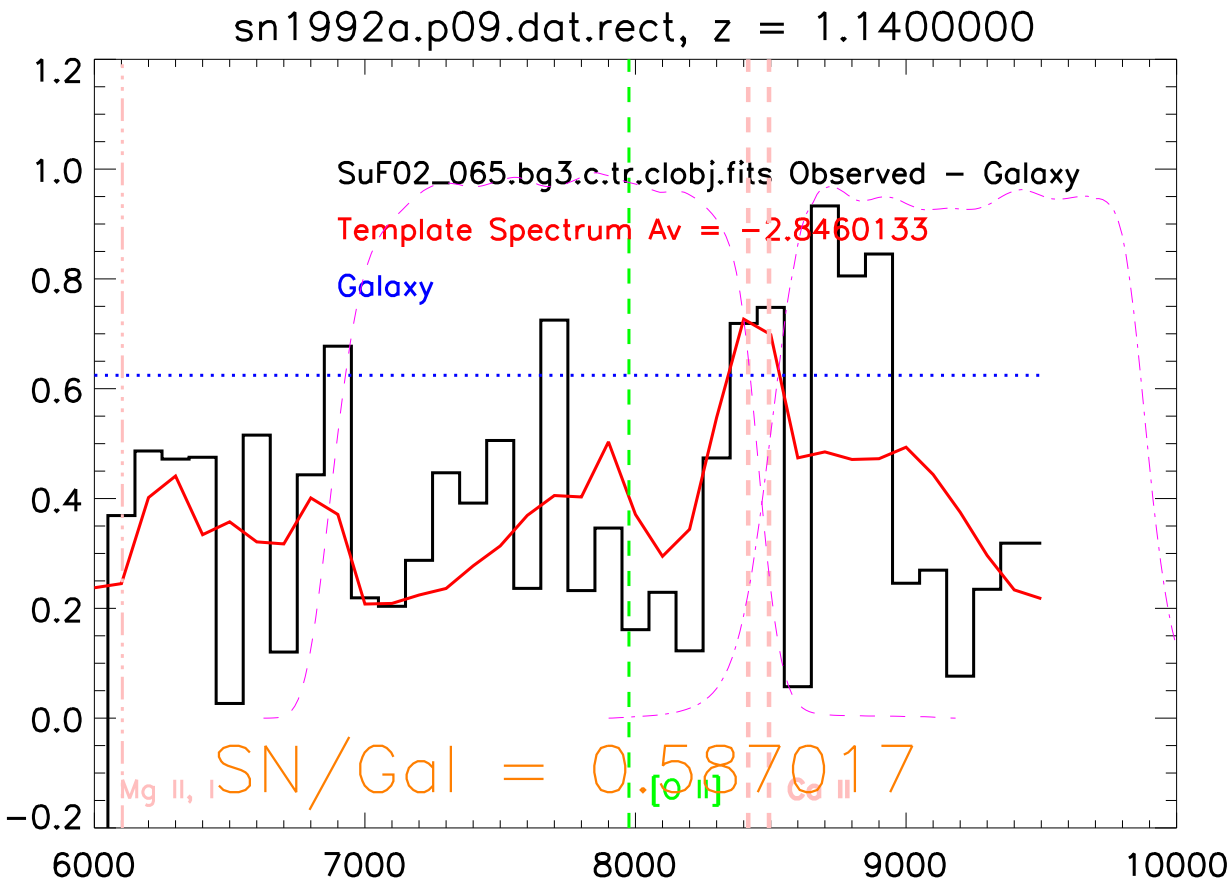

sn1992a.m05.dat.rect, z = 1.1400000
SuF02_065.bg3.c.tr.clobj.fits Observed − Galaxy
Template Spectrum Av = −0.45812901
Galaxy
SN/Gal = 0.790515
Mg II, I
[O II]
Ca II
1.2
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
6000
7000
8000
9000
10000

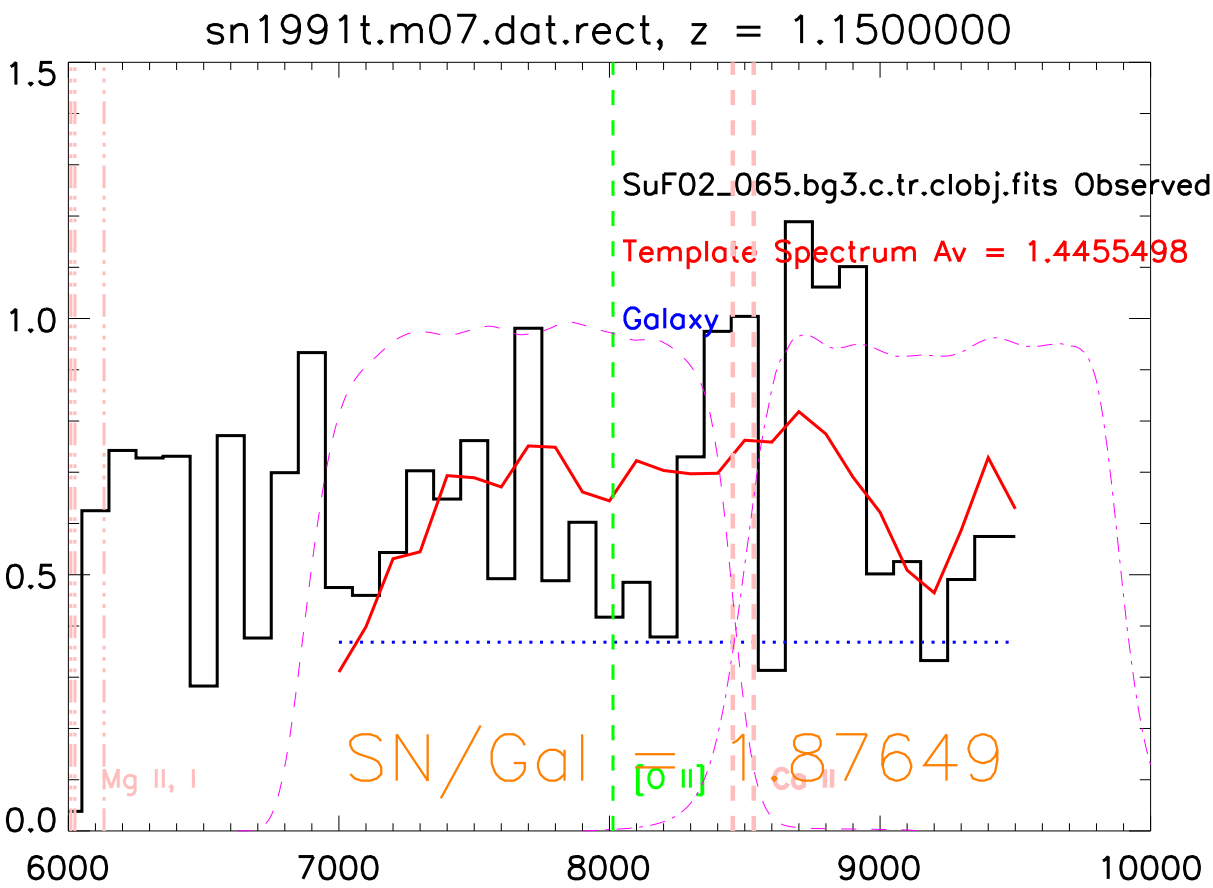

sn1999ee.m06.dat.rect, z = 1.1600000
SuF02_065.bg3.c.tr.clobj.fits Observed – Gala
Template Spectrum Av = −1.7902057
Galaxy
SN/Gal = 0.706706
Mg II, I
[O II]
Ca II
1.2
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
−0.4
6000
7000
8000
9000
10000

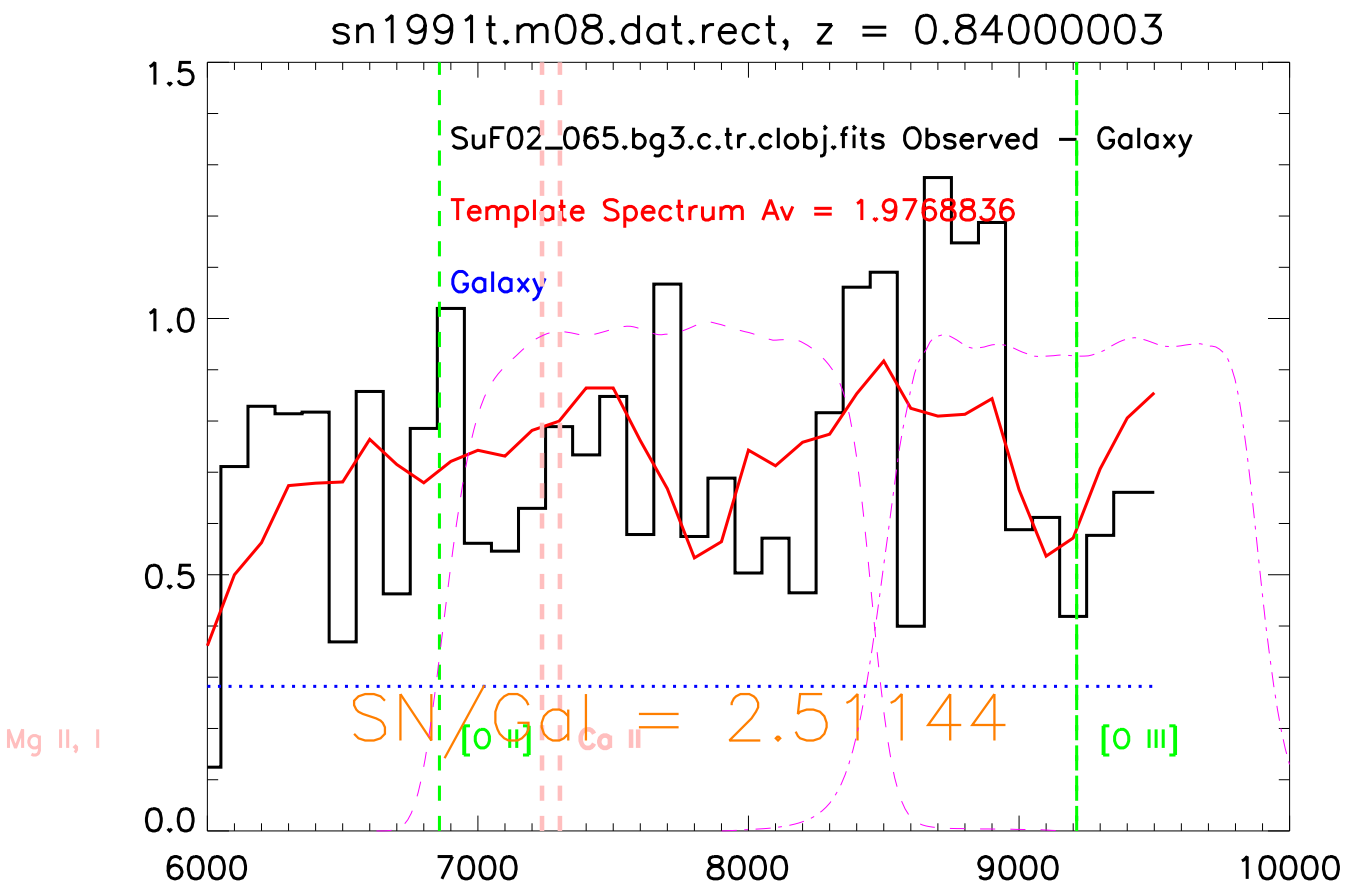

sn1990n.m07.dat.rect, z = 1.1500000
SuF02_065.bg3.c.tr.clobj.fits Observed − Galaxy
Template Spectrum Av = −0.014934007
Galaxy
SN/Gal = 0.520954
[O II]
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
−0.4
6000
7000
8000
9000
10000

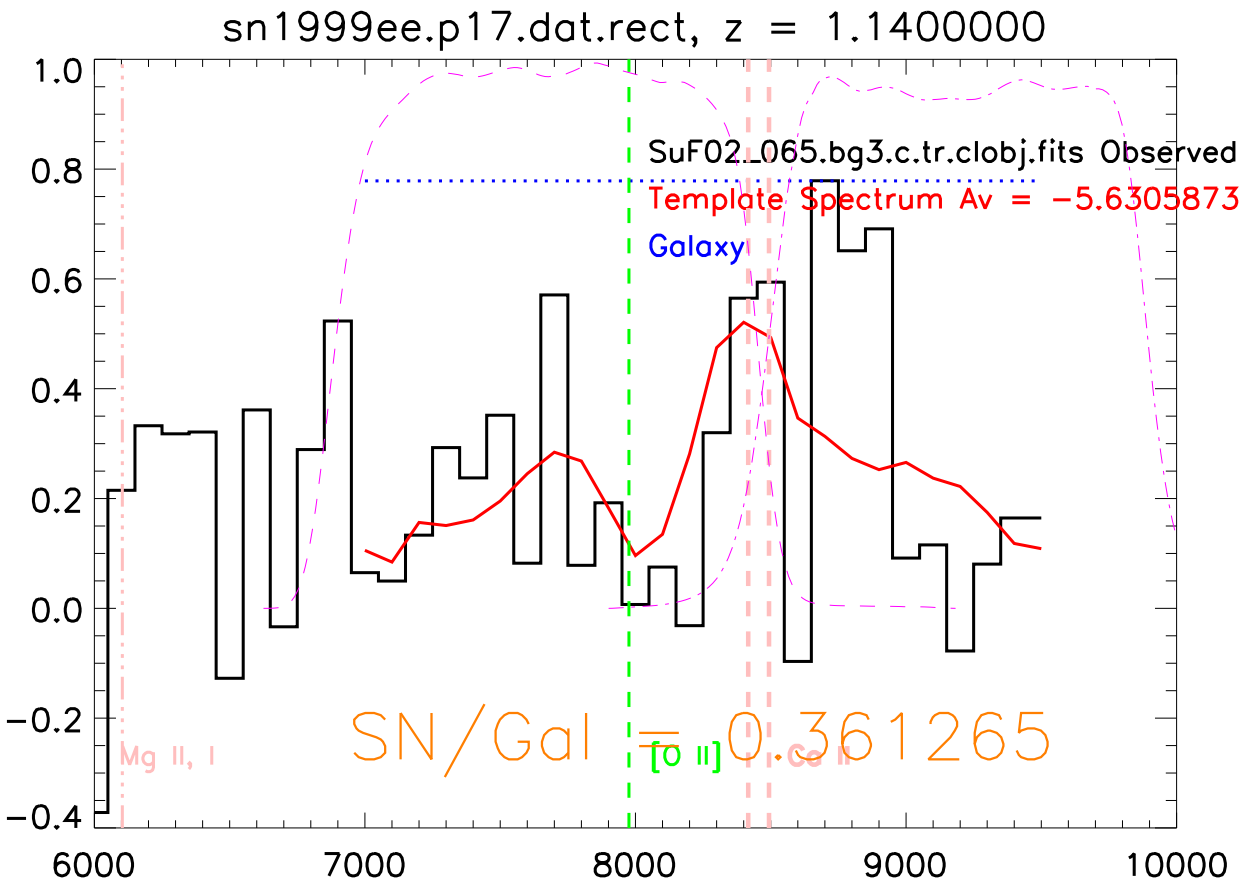

sn1999ee.p12.dat.rect, z = 1.1400000
SuF02_065.bg3.c.tr.clobj.fits Observed – Galaxy
Template Spectrum Av = −3.7951451
Galaxy
SN/Gal = 0.374009
Mg II, I
[O II]
Ca II
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
−0.4
6000
7000
8000
9000
10000

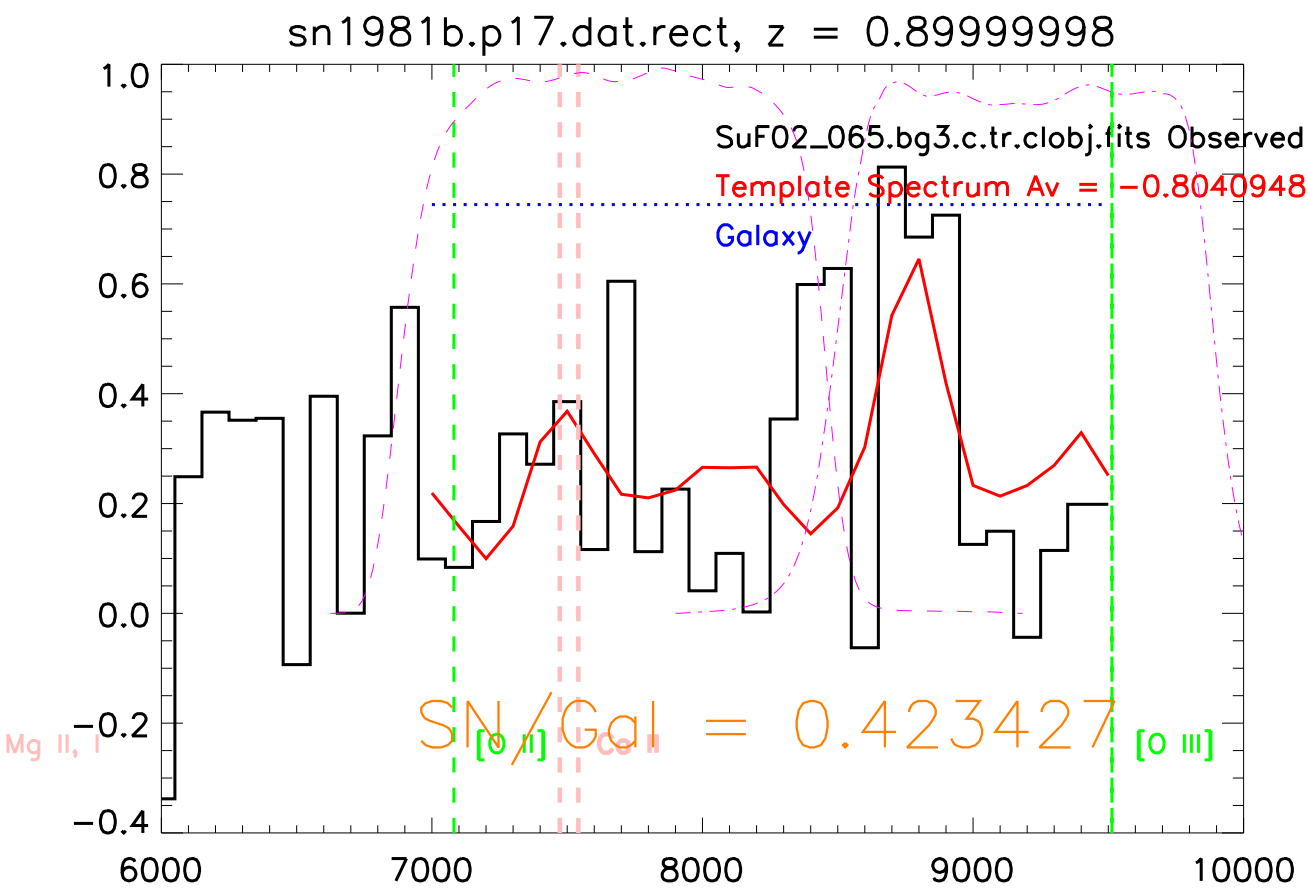

sn1999ee.m08.dat.rect, z = 1.2000000
SuF02_065.bg3.c.tr.clobj.fits Observed – Galaxy
Template Spectrum Av = −4.3701884
Galaxy
SN/Gal = 0.253001
Mg II, I
[O II]
Ca II
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
−0.4
6000
7000
8000
9000
10000

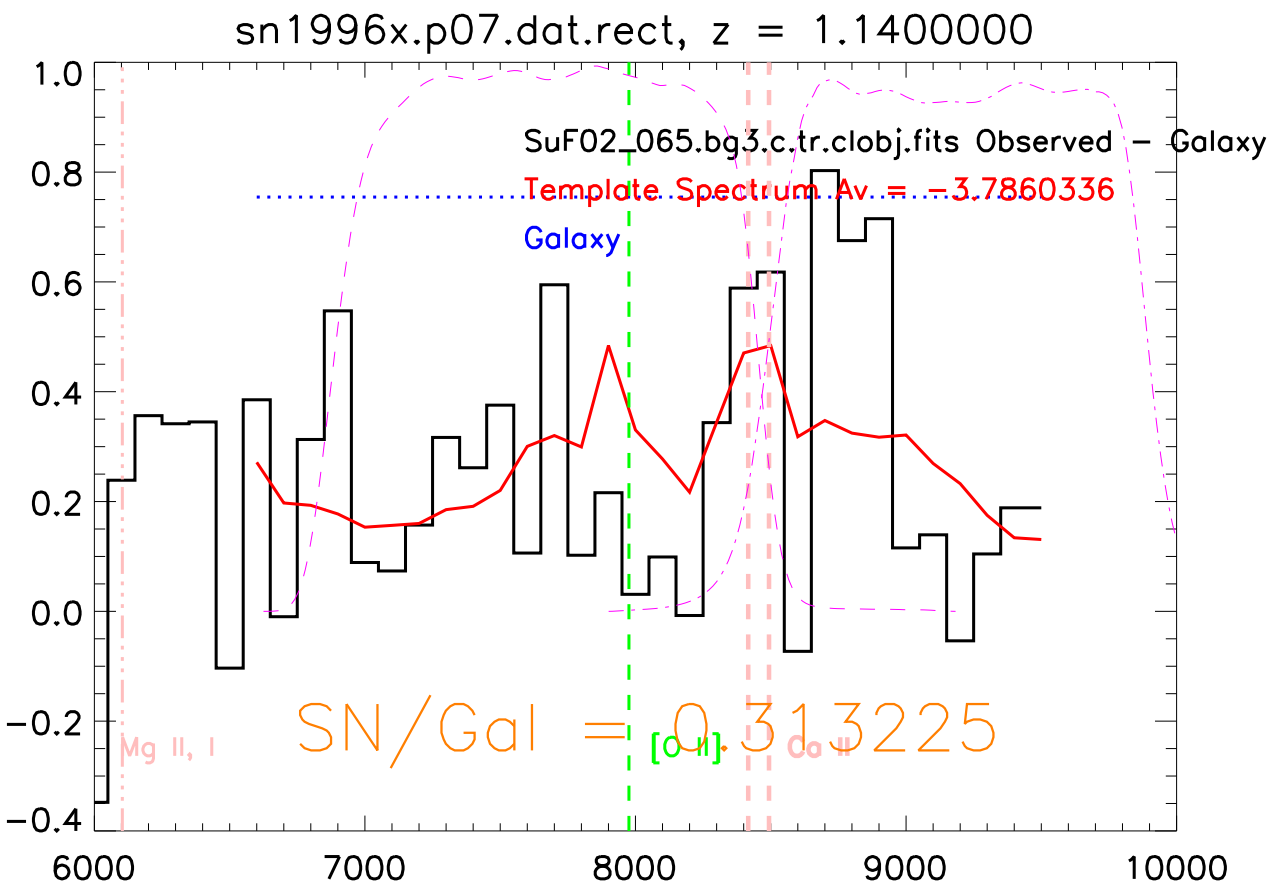

sn1992a.p09.dat.rect, z = 1.1400000
SuF02_065.bg3.c.tr.clobj.fits Observed − Galaxy
Template Spectrum Av = −2.8460133
Galaxy
SN/Gal = 0.587017
Mg II, I
[O II]
Ca II
1.2
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
6000
7000
8000
9000
10000

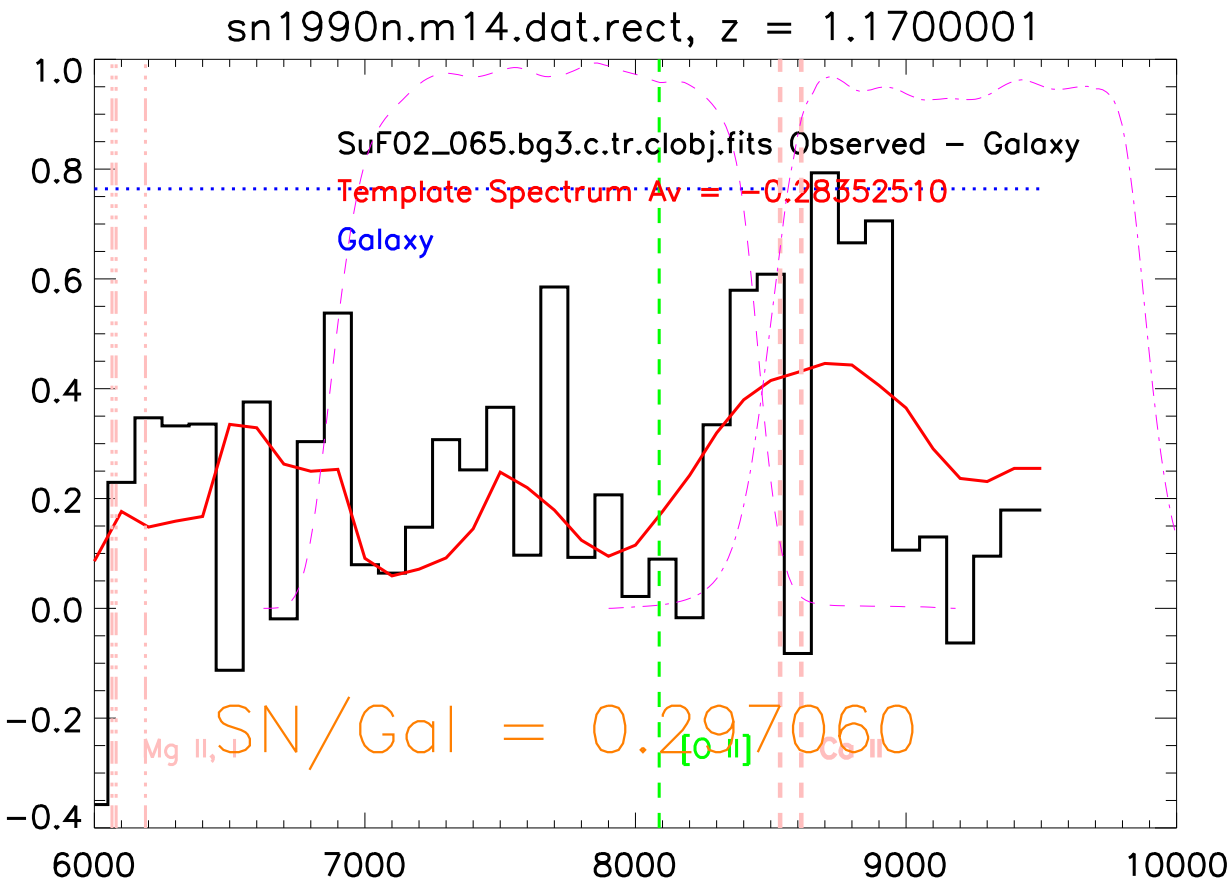

sn1991t.m07.dat.rect, z = 1.1500000
SuF02_065.bg3.c.tr.clobj.fits Observed – Galaxy
Template Spectrum Av = 1.4455498
Galaxy
SN/Gal = 1.87649
Mg II, I
[O II]
Ca II
1.5
1.0
0.5
0.0
6000
7000
8000
9000
10000

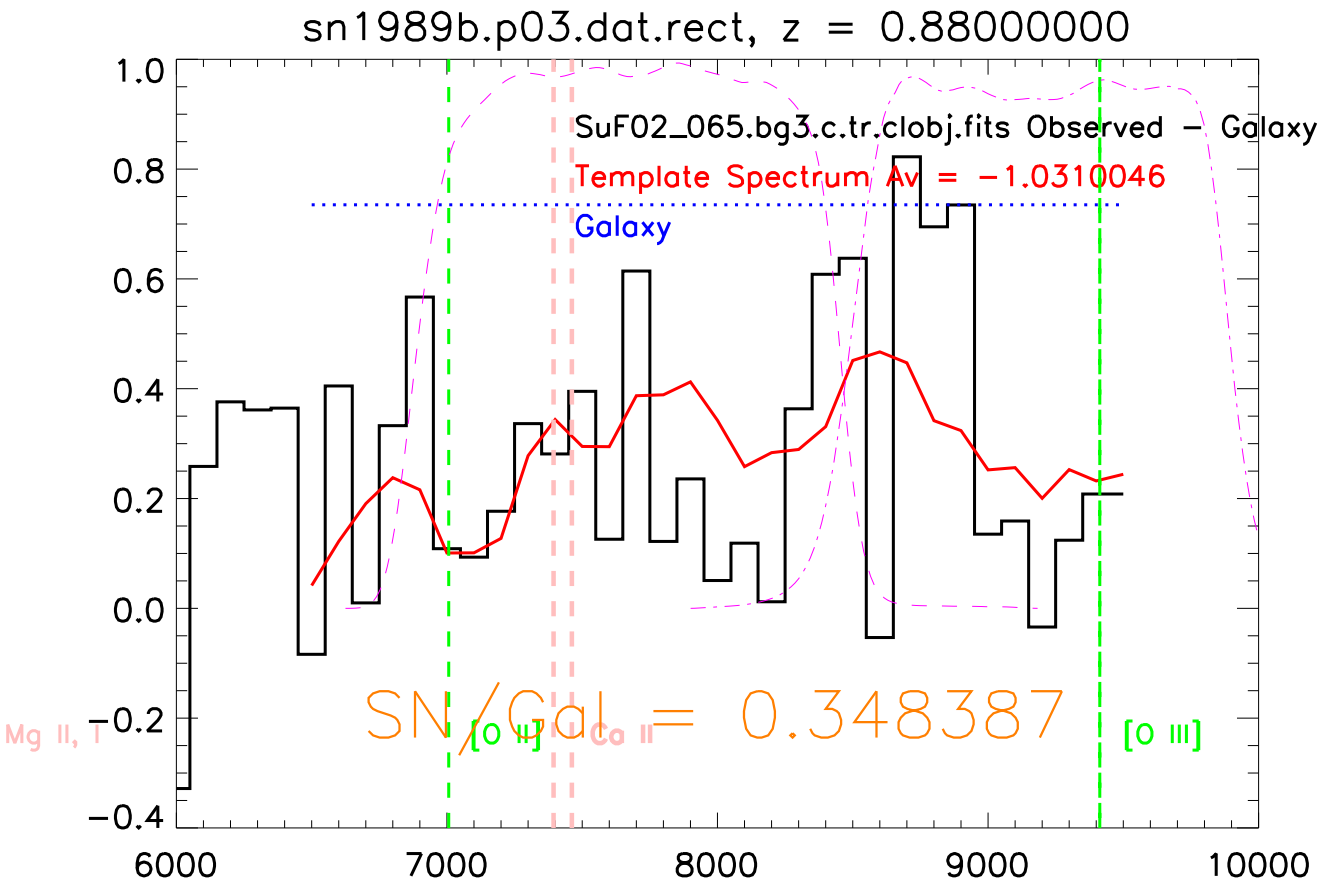

sn1991t.m08.dat.rect, z = 0.84000003
SuF02_065.bg3.c.tr.clobj.fits Observed – Galaxy
Template Spectrum Av = 1.9768836
Galaxy
SN/Gal = 2.51144
[O II]
Ca II
[O III]
Mg II, I
1.5
1.0
0.5
0.0
6000
7000
8000
9000
10000

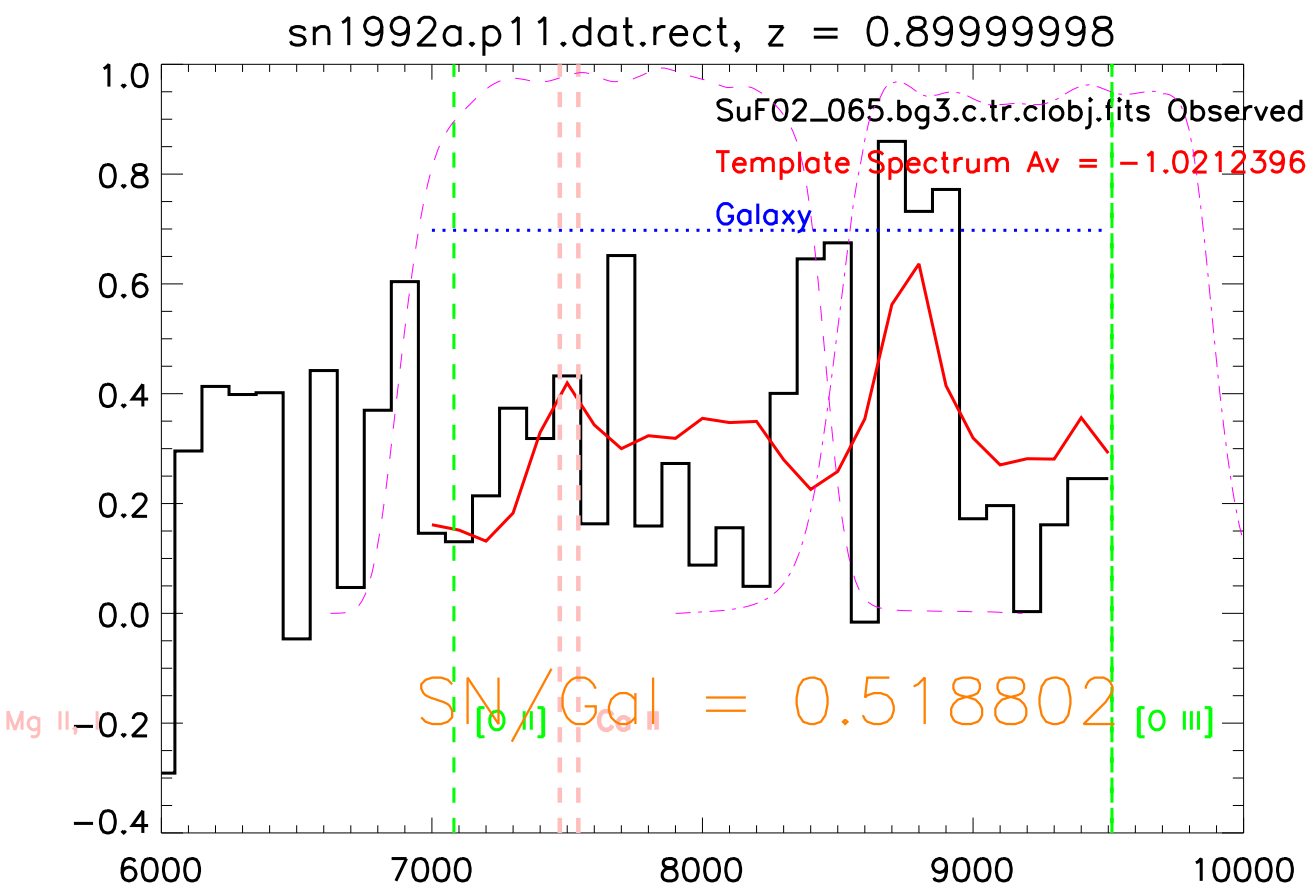

sn1999ee.p17.dat.rect, z = 1.1400000
SuF02_065.bg3.c.tr.clobj.fits Observed – Galaxy
Template Spectrum Av = −5.6305873
Galaxy
SN/Gal = 0.361265
Mg II, I
[O II]
Ca II
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
−0.4
6000
7000
8000
9000
10000

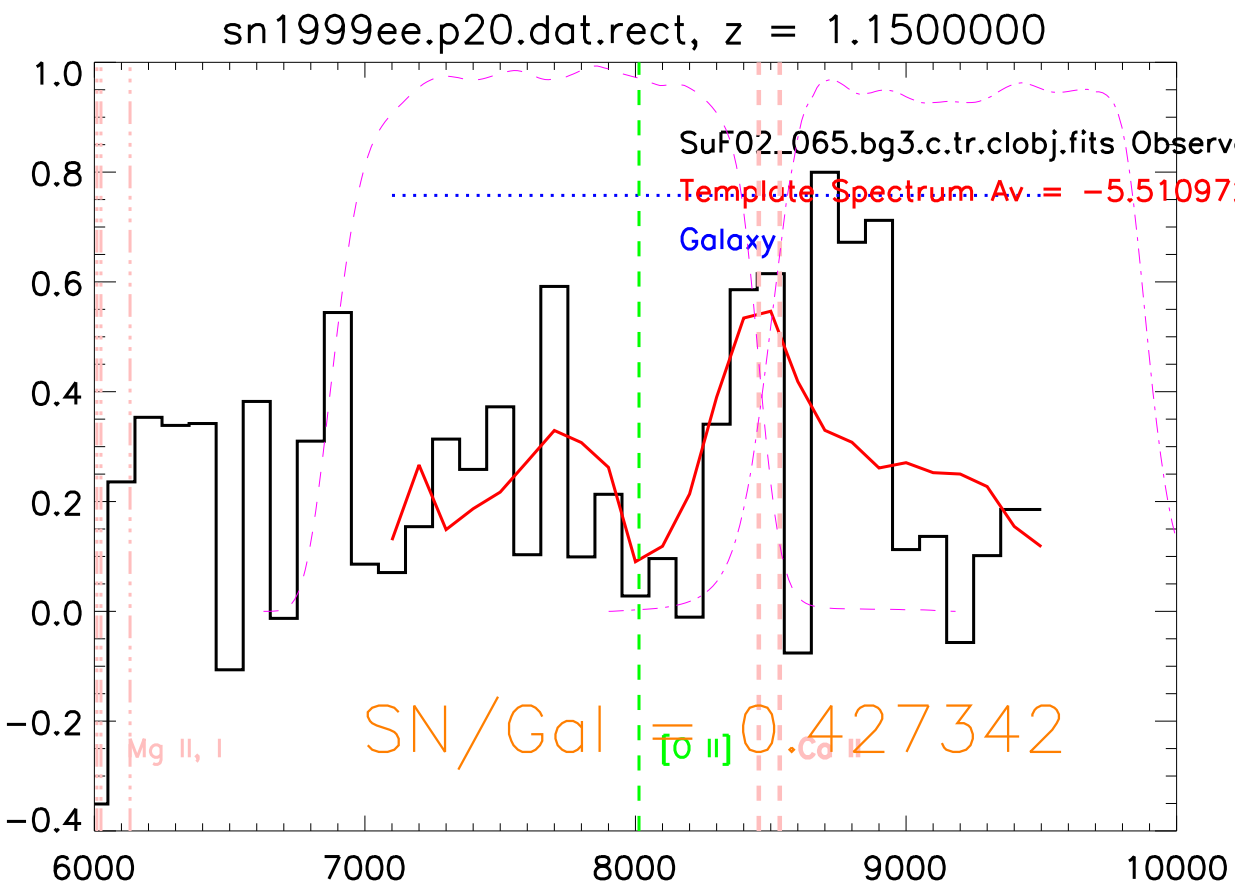

sn1981b.p17.dat.rect, z = 0.89999998
SuF02_065.bg3.c.tr.clobj.fits Observed – Galaxy
Template Spectrum Av = −0.80409480
Galaxy
SN/Gal = 0.423427
Mg II, I
[O II]
Ca II
[O III]
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
−0.4
6000
7000
8000
9000
10000

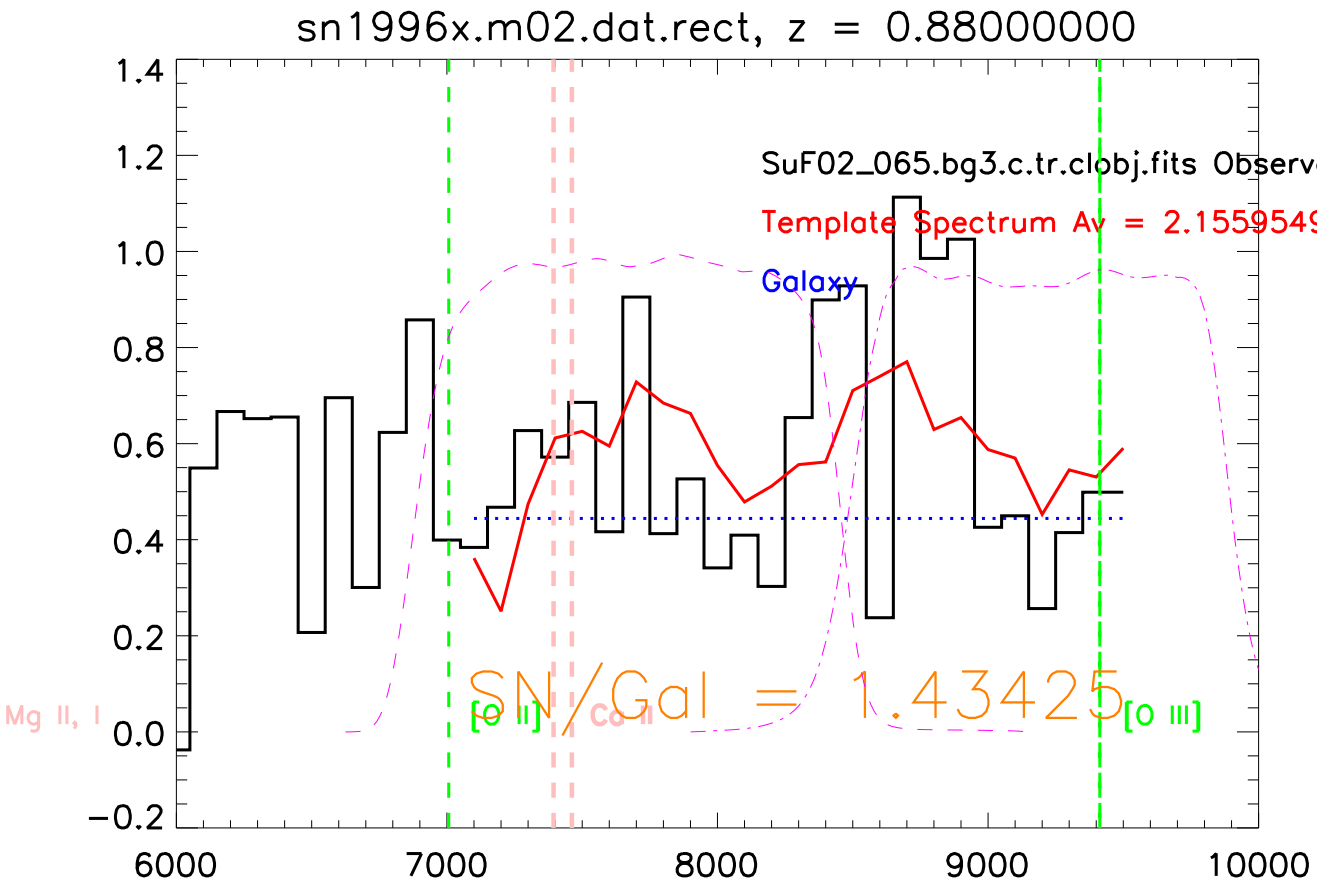

sn1996x.p07.dat.rect, z = 1.1400000
SuF02_065.bg3.c.tr.clobj.fits Observed − Galaxy
Template Spectrum Av. = −3.7860336
Galaxy
SN/Gal = 0.313225
Mg II, I
[O II]
Ca II
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
−0.4
6000
7000
8000
9000
10000

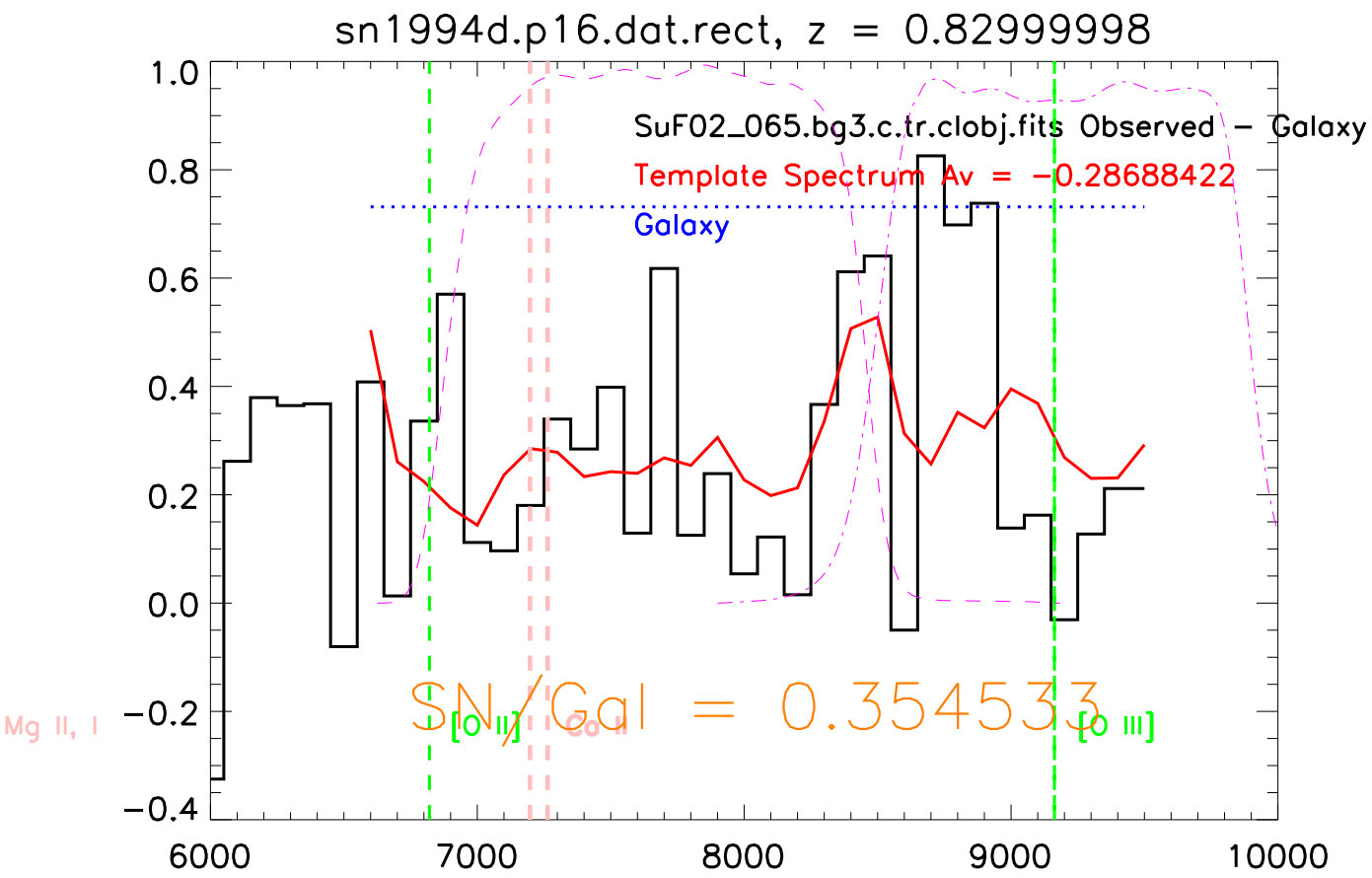

sn1990n.m14.dat.rect, z = 1.1700001
SuF02_065.bg3.c.tr.clobj.fits Observed – Galaxy
Template Spectrum Av = -0.283525 10
Galaxy
SN/Gal = 0.297060
Mg II,
[O II]
Ca II
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
−0.4
6000
7000
8000
9000
10000

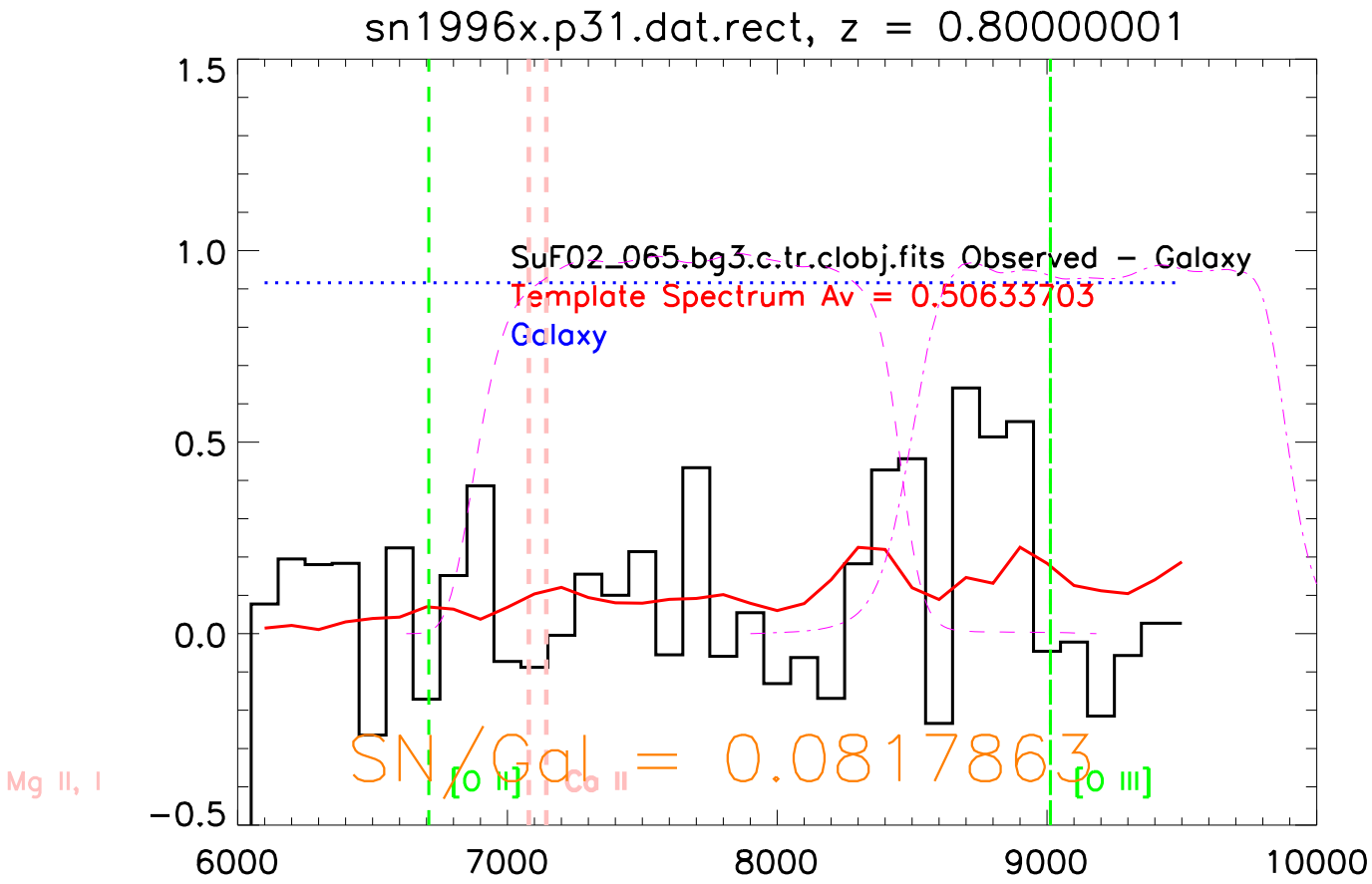

sn1989b.p03.dat.rect, z = 0.88000000
SuF02_065.bg3.c.tr.clobj.fits Observed – Galaxy
Template Spectrum Av = −1.0310046
Galaxy
SN/Gal = 0.348387
[O II]
Ca II
[O III]
Mg II, T
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
−0.4
6000
7000
8000
9000
10000

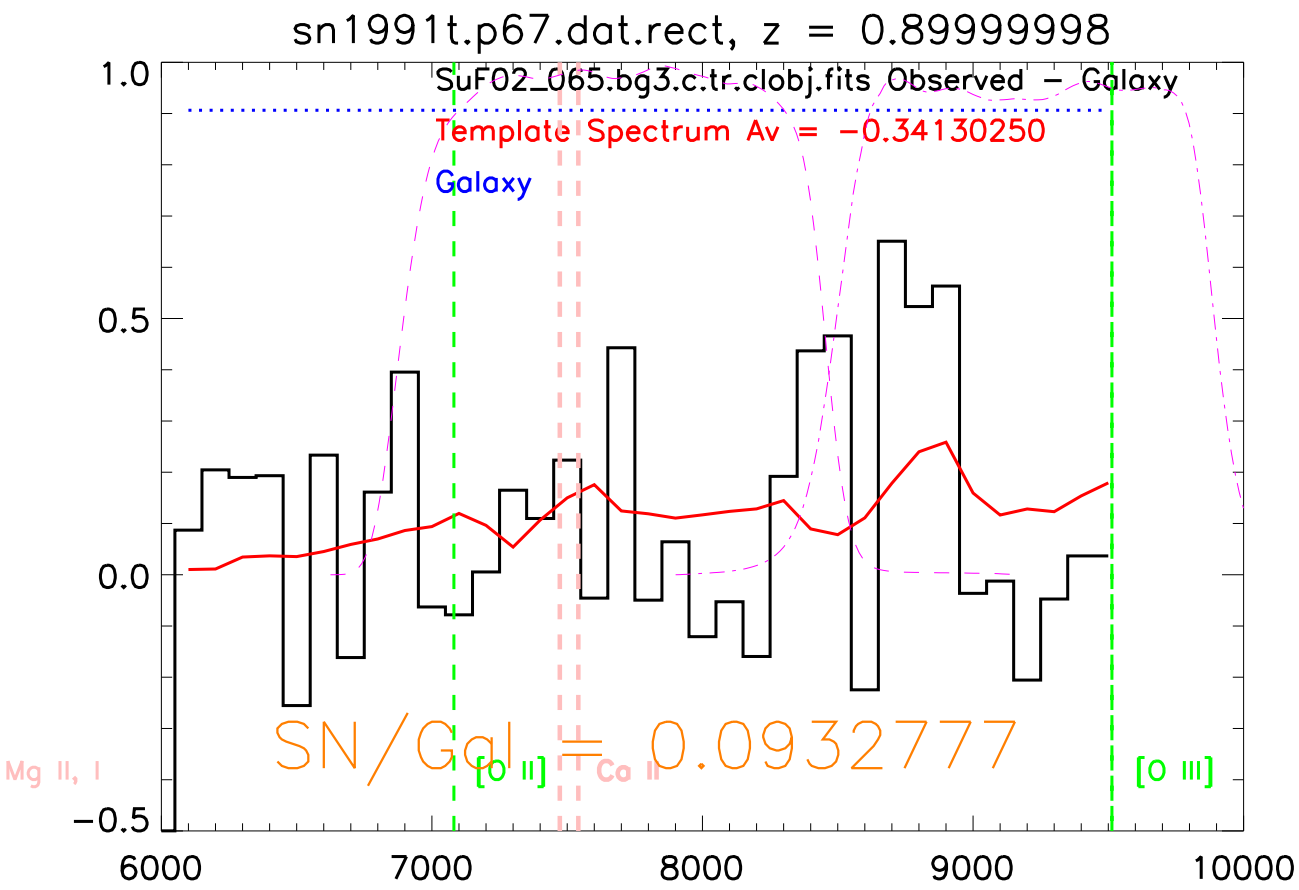

sn1992a.p11.dat.rect, z = 0.89999998
SuF02_065.bg3.c.tr.clobj.fits Observed – Galaxy
Template Spectrum Av = −1.0212396
Galaxy
SN/Gal = 0.518802
Mg II
[O II]
Ca II
[O III]
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
−0.4
6000
7000
8000
9000
10000

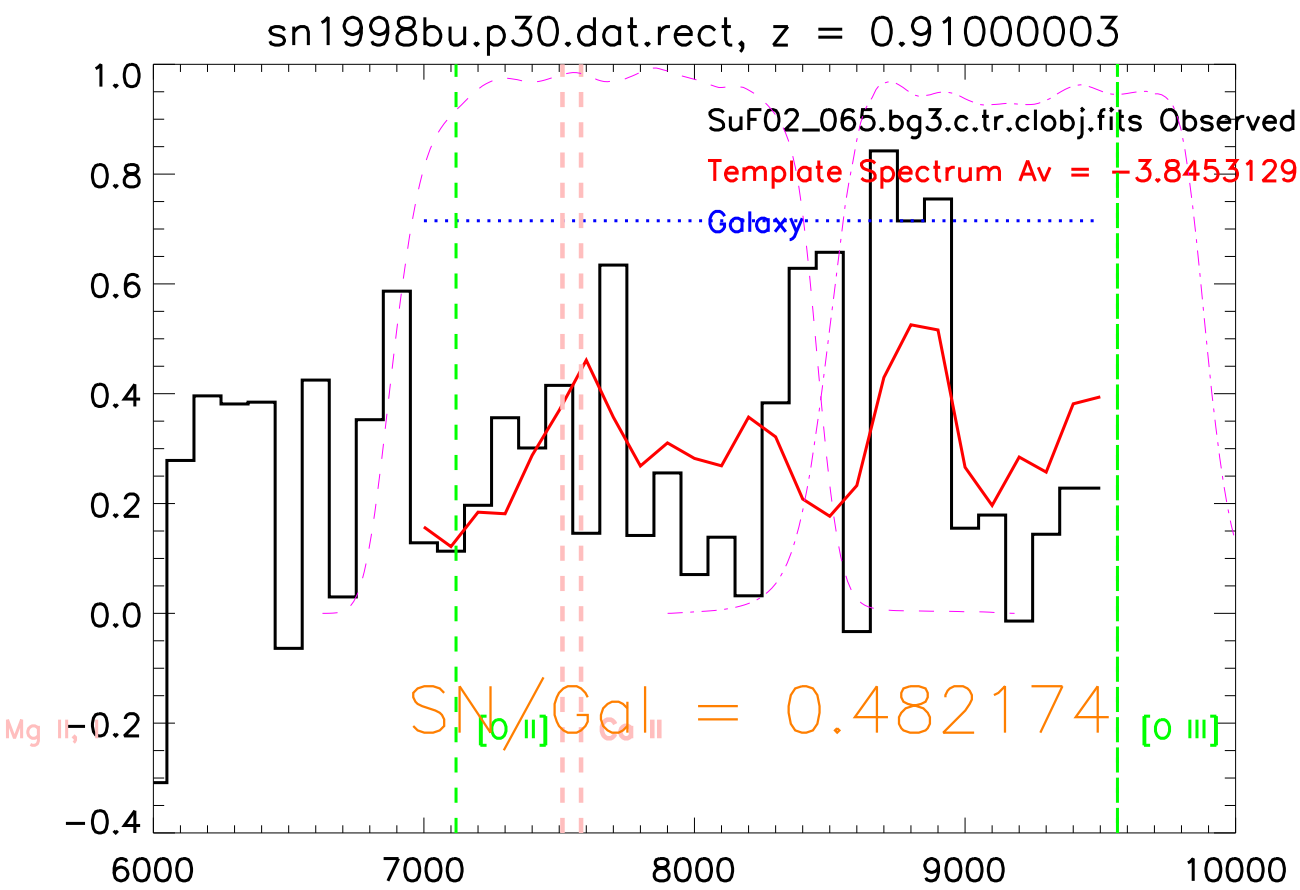

sn1999ee.p20.dat.rect, z = 1.1500000
SuF02_065.bg3.c.tr.clobj.fits Observed – Gala
Template Spectrum Av = −5.5109727
Galaxy
SN/Gal = 0.427342
Mg II, I
[O II]
Ca II
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
−0.4
6000
7000
8000
9000
10000

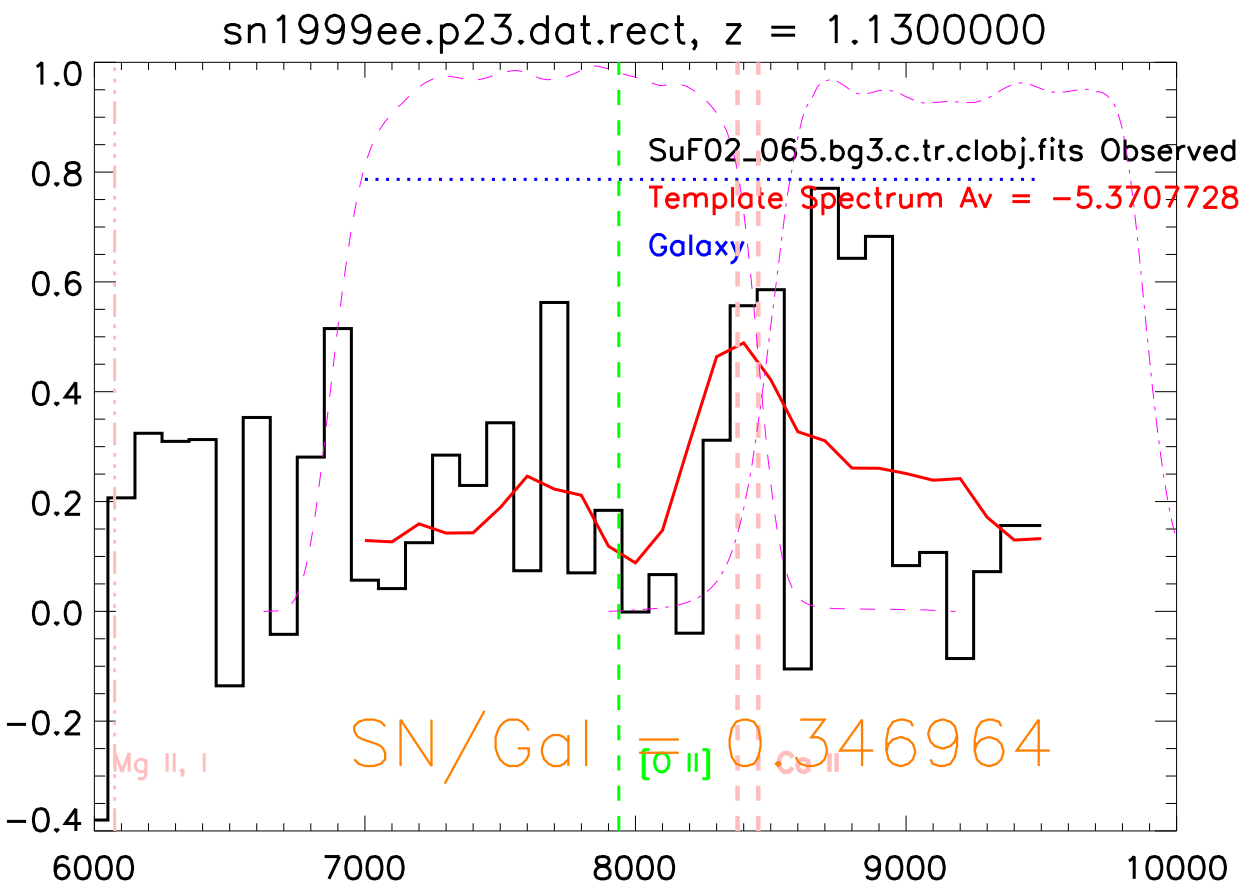

sn1996x.m02.dat.rect, z = 0.88000000
SuF02_065.bg3.c.tr.clobj.fits Observed – Gala
Template Spectrum Av = 2.1559549
Galaxy
SN/Gal = 1.43425
Mg II, I
[O II]
Ca II
[O III]
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
6000
7000
8000
9000
10000

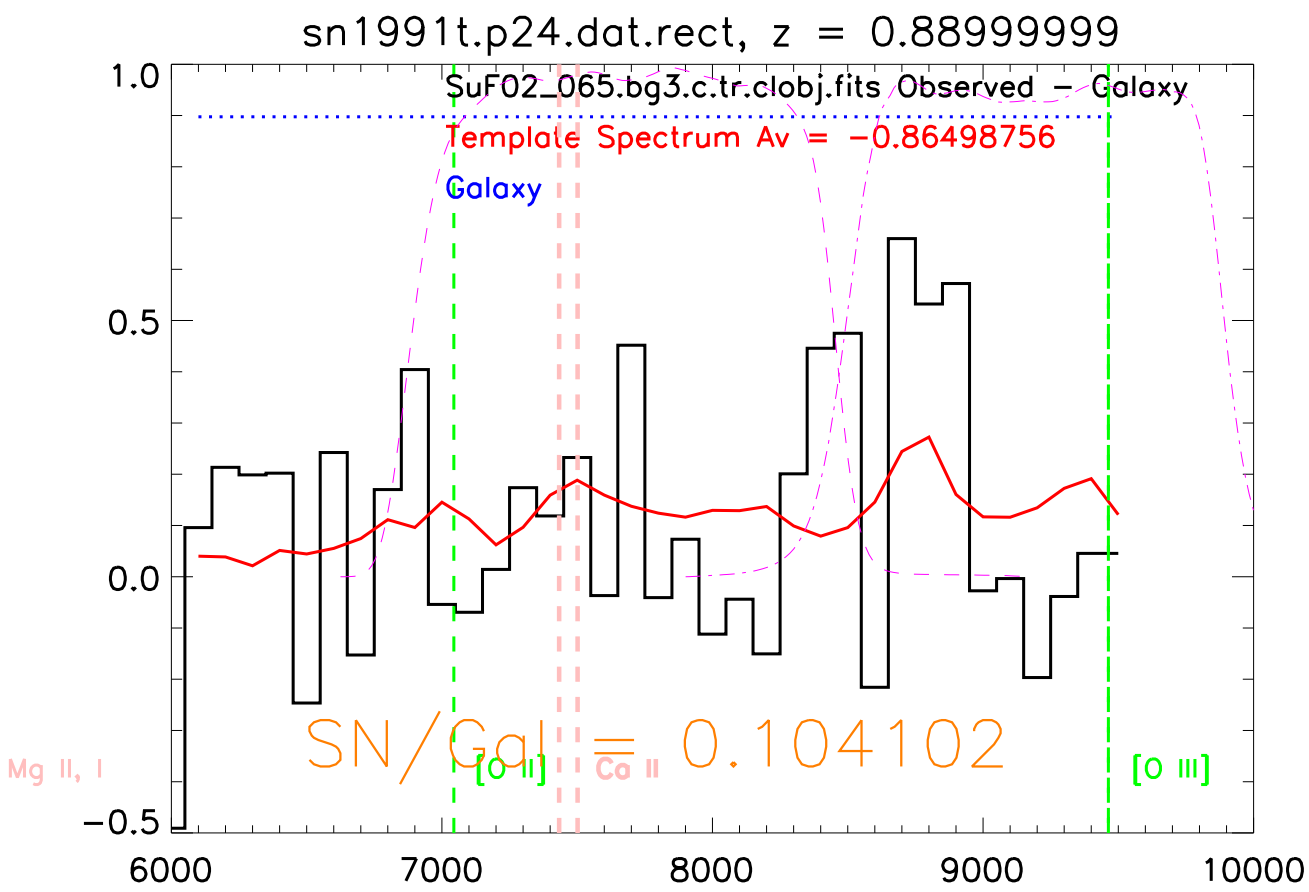

sn1994d.p16.dat.rect, z = 0.82999998
SuF02_065.bg3.c.tr.clobj.fits Observed − Galaxy
Template Spectrum Av = −0.28688422
Galaxy
SN/Gal = 0.354533
[O II]
[O III]
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
−0.4
6000
7000
8000
9000
10000

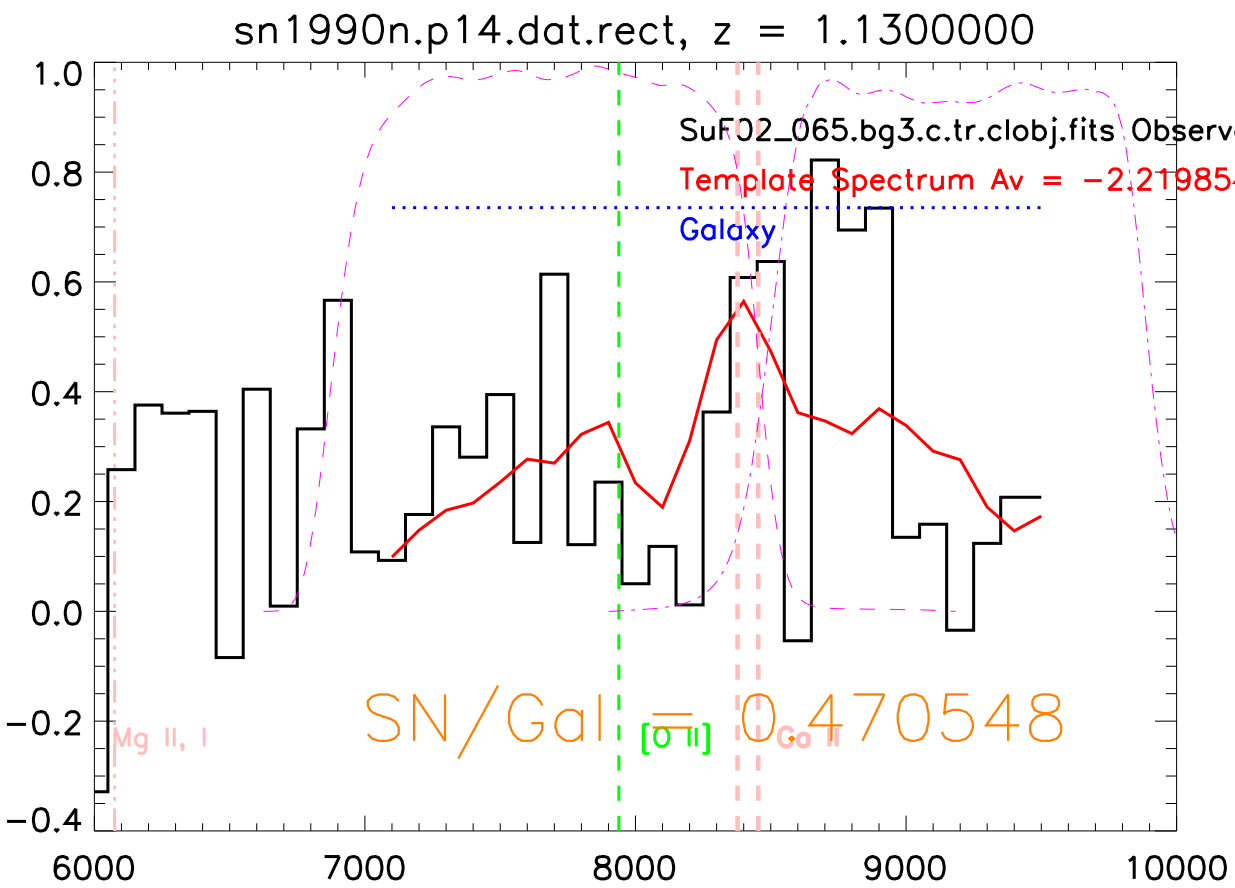

sn1996x.p31.dat.rect, z = 0.80000001
SuF02_065.bg3.c.tr.clobj.fits Observed − Galaxy
Template Spectrum Av = 0.50633703
Galaxy
SN/Gal = 0.0817863
[O II]
Ca II
[O III]
Mg II, I
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

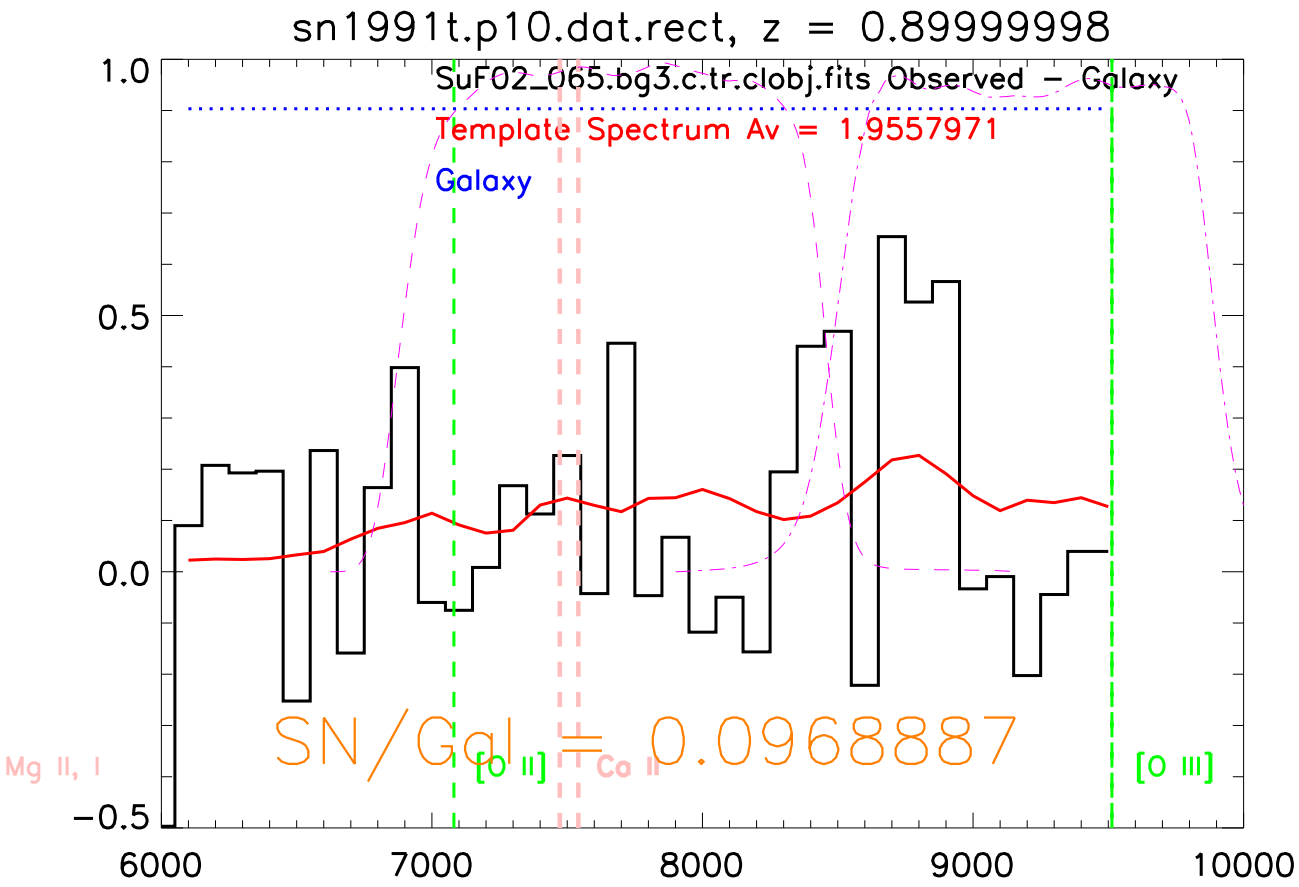

sn1991t.p67.dat.rect, z = 0.89999998
SuF02_065.bg3.c.tr.clobj.fits Observed − Galaxy
Template Spectrum Av = −0.34130250
Galaxy
SN/Gal = 0.0932777
Mg II, I
[O II]
Ca II
[O III]
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

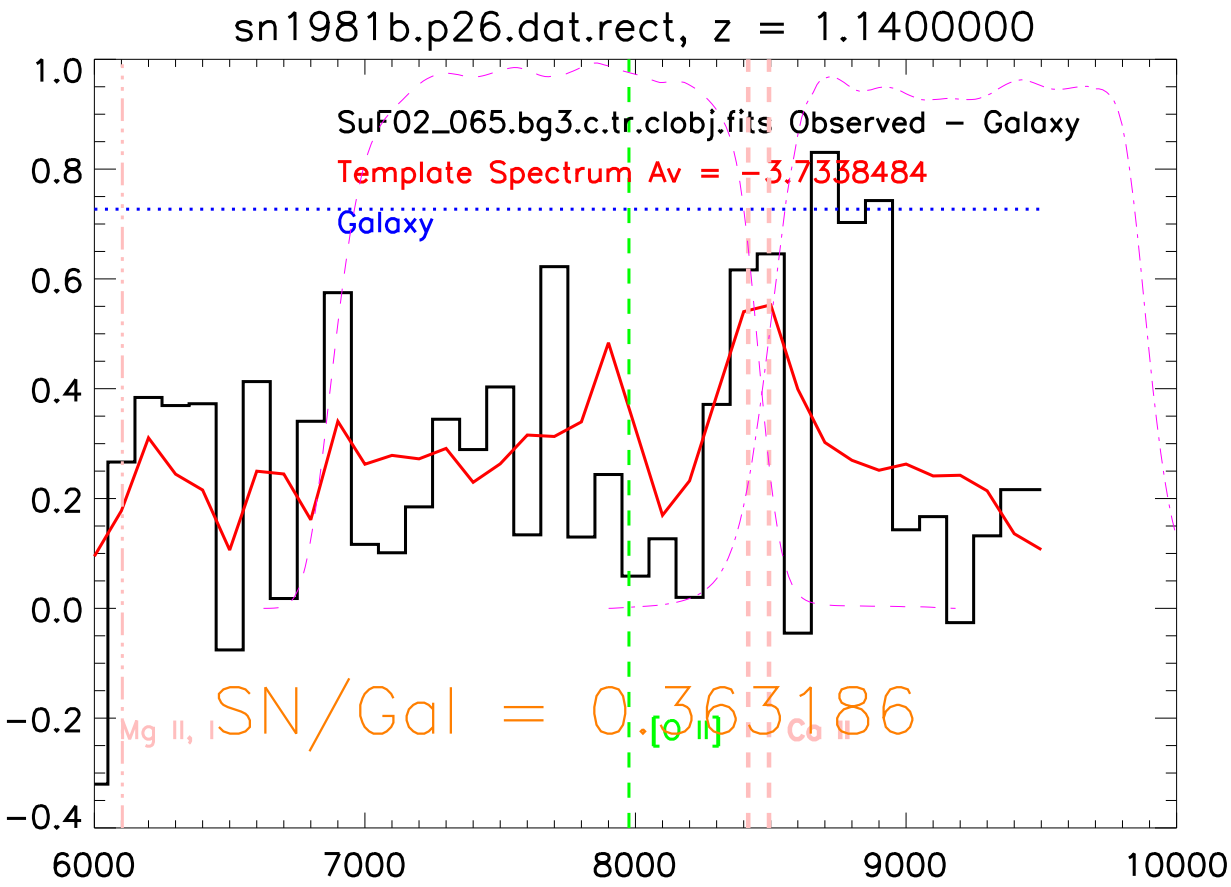

sn1998bu.p30.dat.rect, z = 0.91000003
SuF02_065.bg3.c.tr.clobj.fits Observed – Galaxy
Template Spectrum Av = 3.8453129
Galaxy
SN/Gal = 0.482174
[O II]
[O III]
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
−0.4
6000
7000
8000
9000
10000

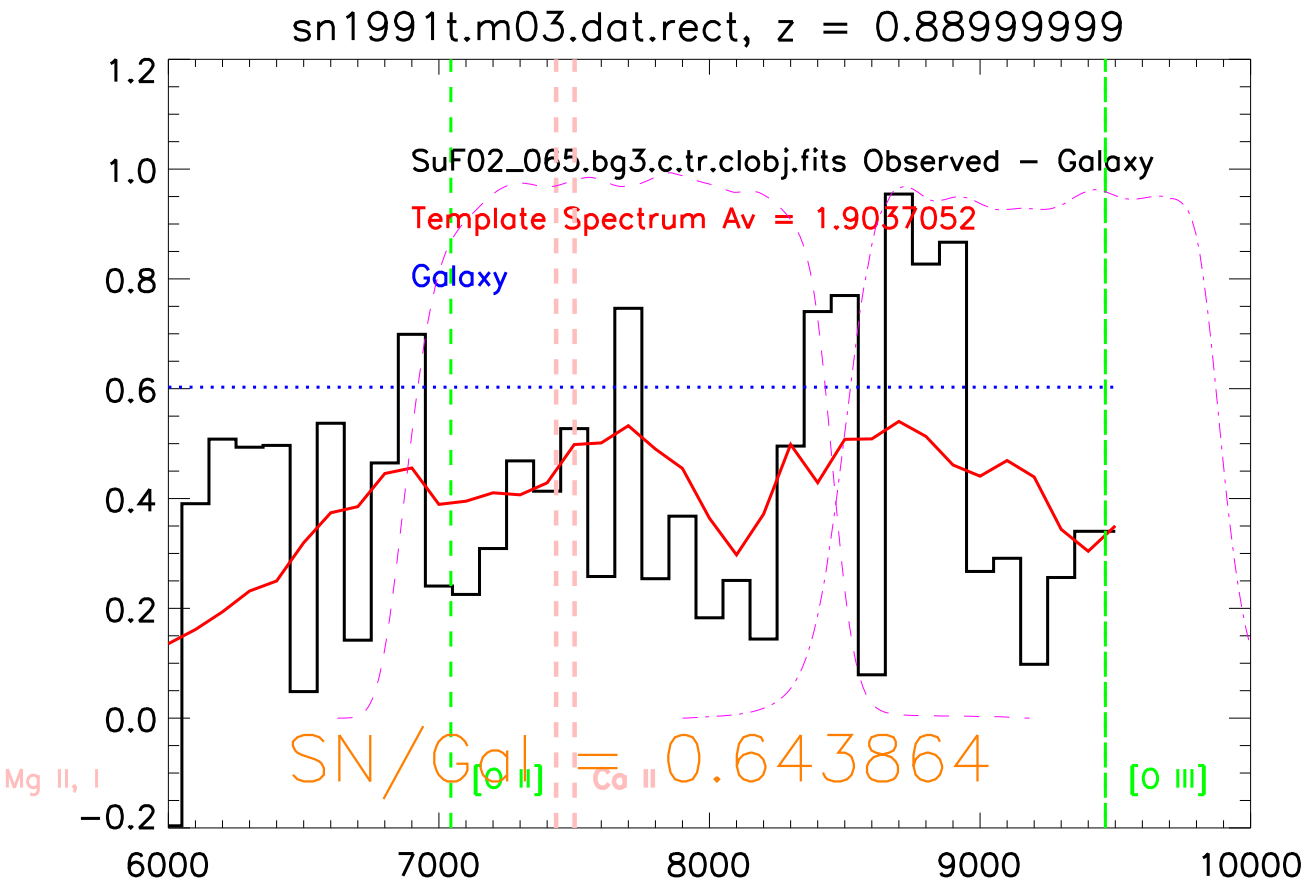

sn1999ee.p23.dat.rect, z = 1.1300000
SuF02_065.bg3.c.tr.clobj.fits Observed – Galaxy
Template Spectrum Av = −5.3707728
Galaxy
SN/Gal = 0.346964
Mg II, I
[O II]
Ca II
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
−0.4
6000
7000
8000
9000
10000

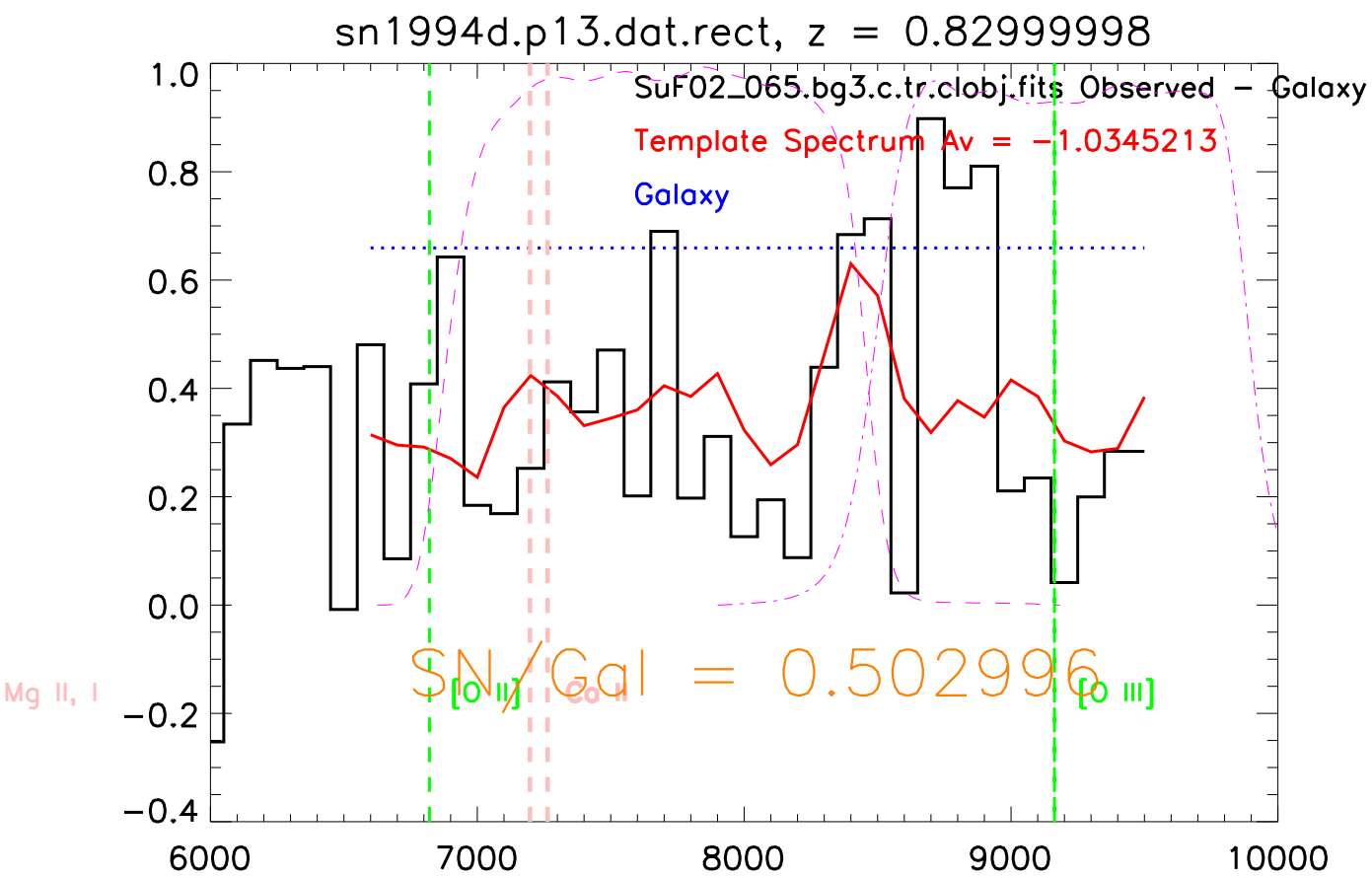

sn1991t.p24.dat.rect, z = 0.88999999
SuF02_065.bg3.c.tr.clobj.fits Observed − Galaxy
Template Spectrum Av = −0.86498756
Galaxy
SN/Gal = 0.104102
Mg II, I
[O II]
Ca II
[O III]
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

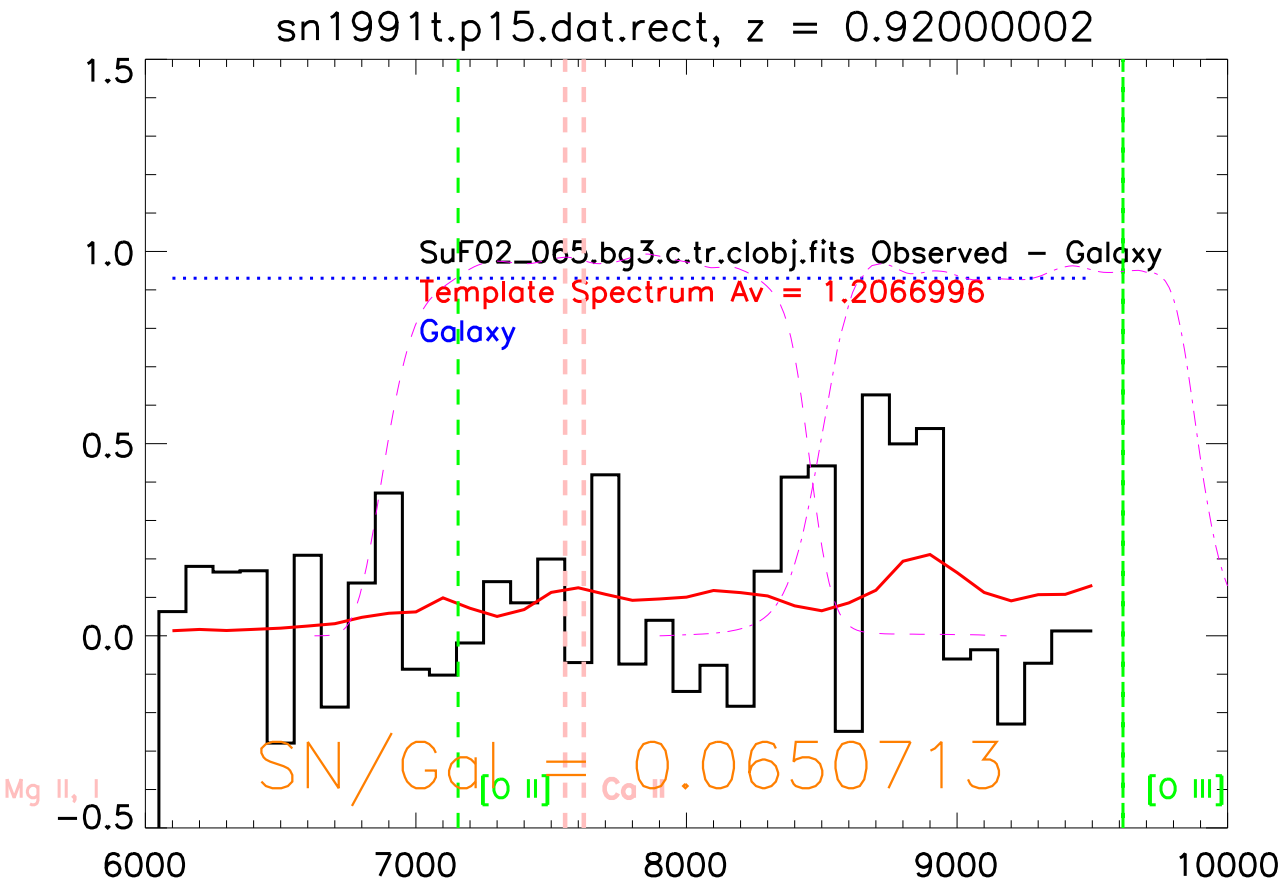

sn1990n.p14.dat.rect, z = 1.1300000
SuF02_065.bg3.c.tr.clobj.fits Observed – Gala
Template Spectrum Av = −2.2198545
Galaxy
SN/Gal = 0.470548
Mg II, I
[O II]
Ca II
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
−0.4
6000
7000
8000
9000
10000

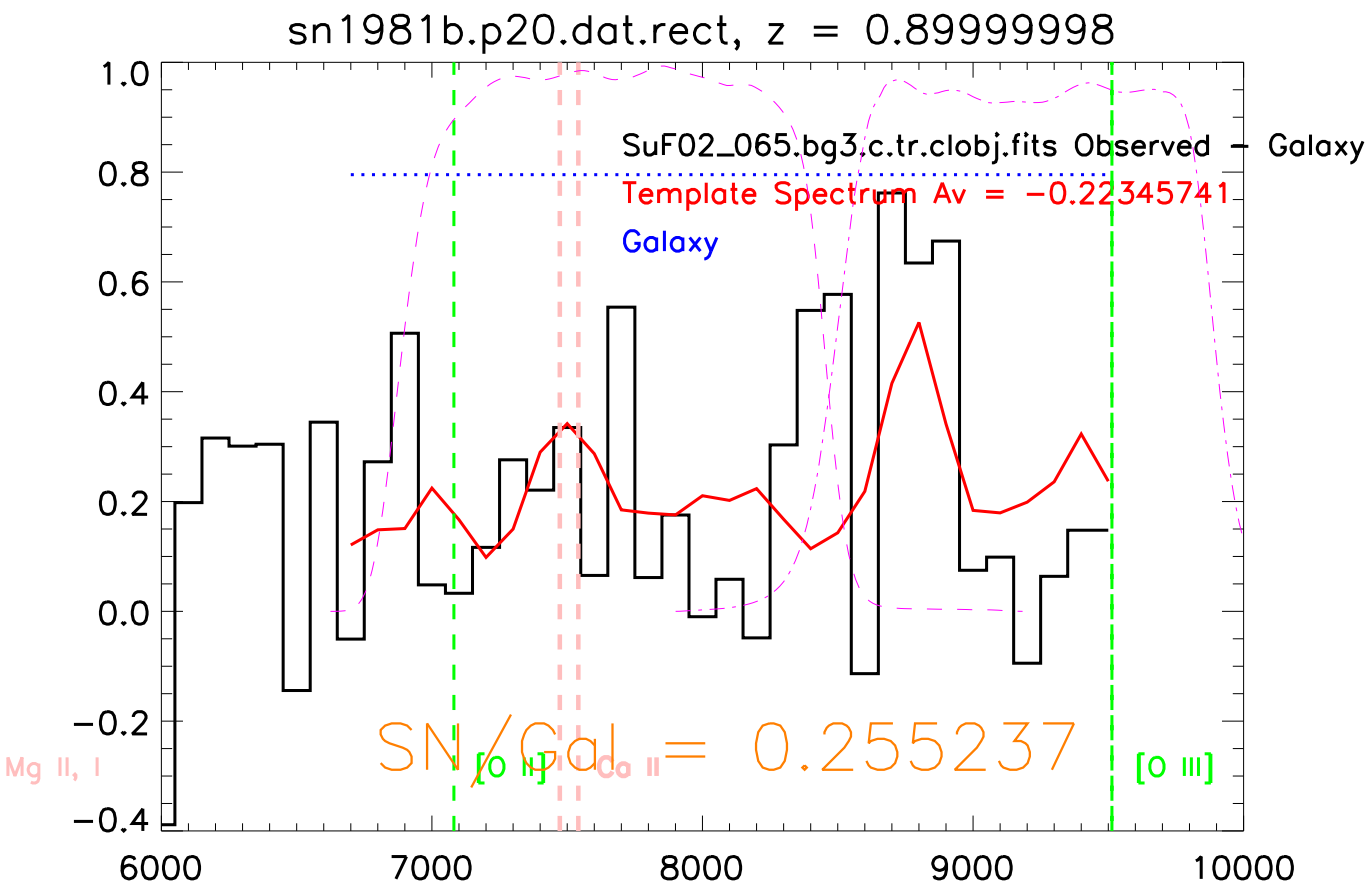

sn1991t.p10.dat.rect, z = 0.89999998
SuF02_065.bg3.c.tr.clobj.fits Observed − Galaxy
Template Spectrum Av = 1.9557971
Galaxy
SN/Gal = 0.0968887
Mg II, I
[O II]
Ca II
[O III]
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

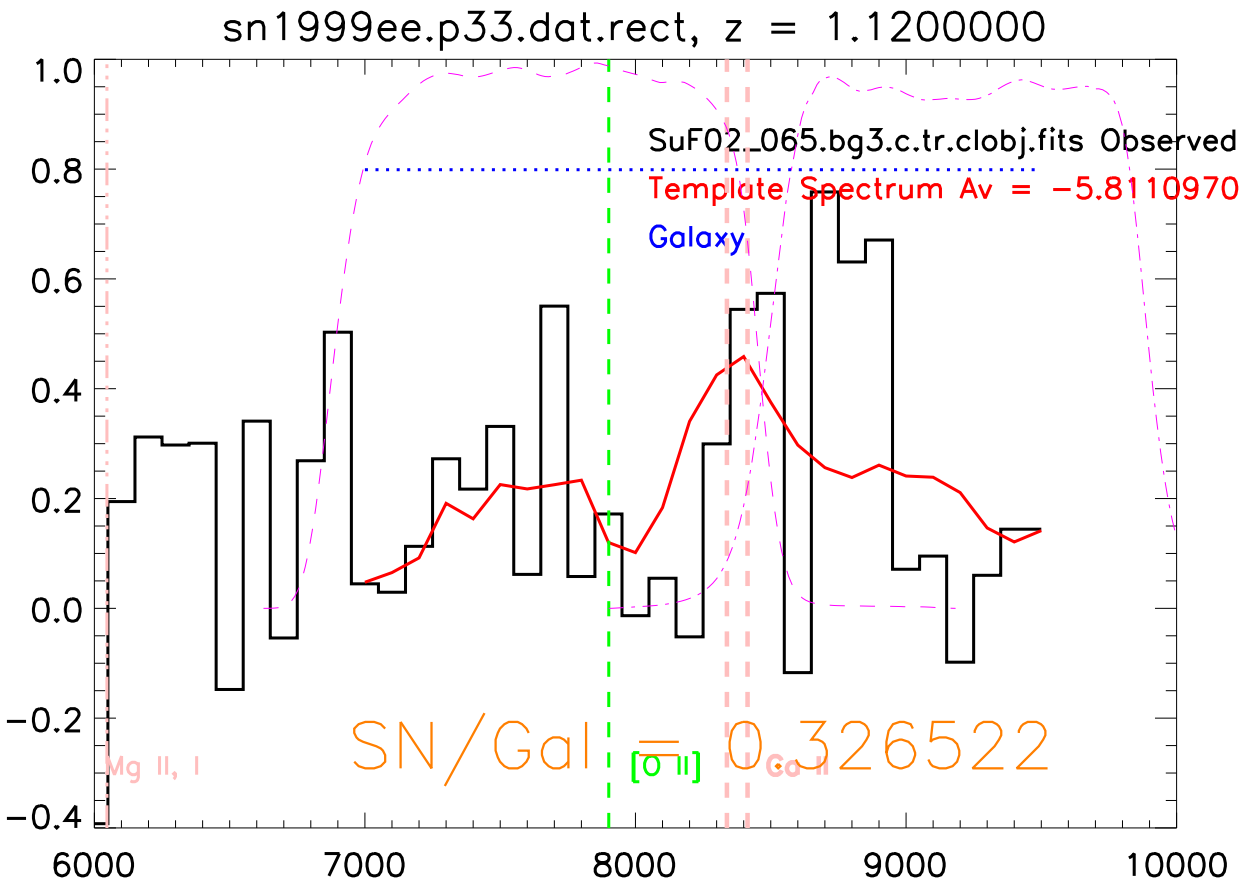

sn1981b.p26.dat.rect, z = 1.1400000
SuF02_065.bg3.c.tr.clobj.fits Observed − Galaxy
Template Spectrum Av = −3.7338484
Galaxy
SN/Gal = 0.363186
Mg II, I
[O II]
Ca II
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
−0.4
6000
7000
8000
9000
10000

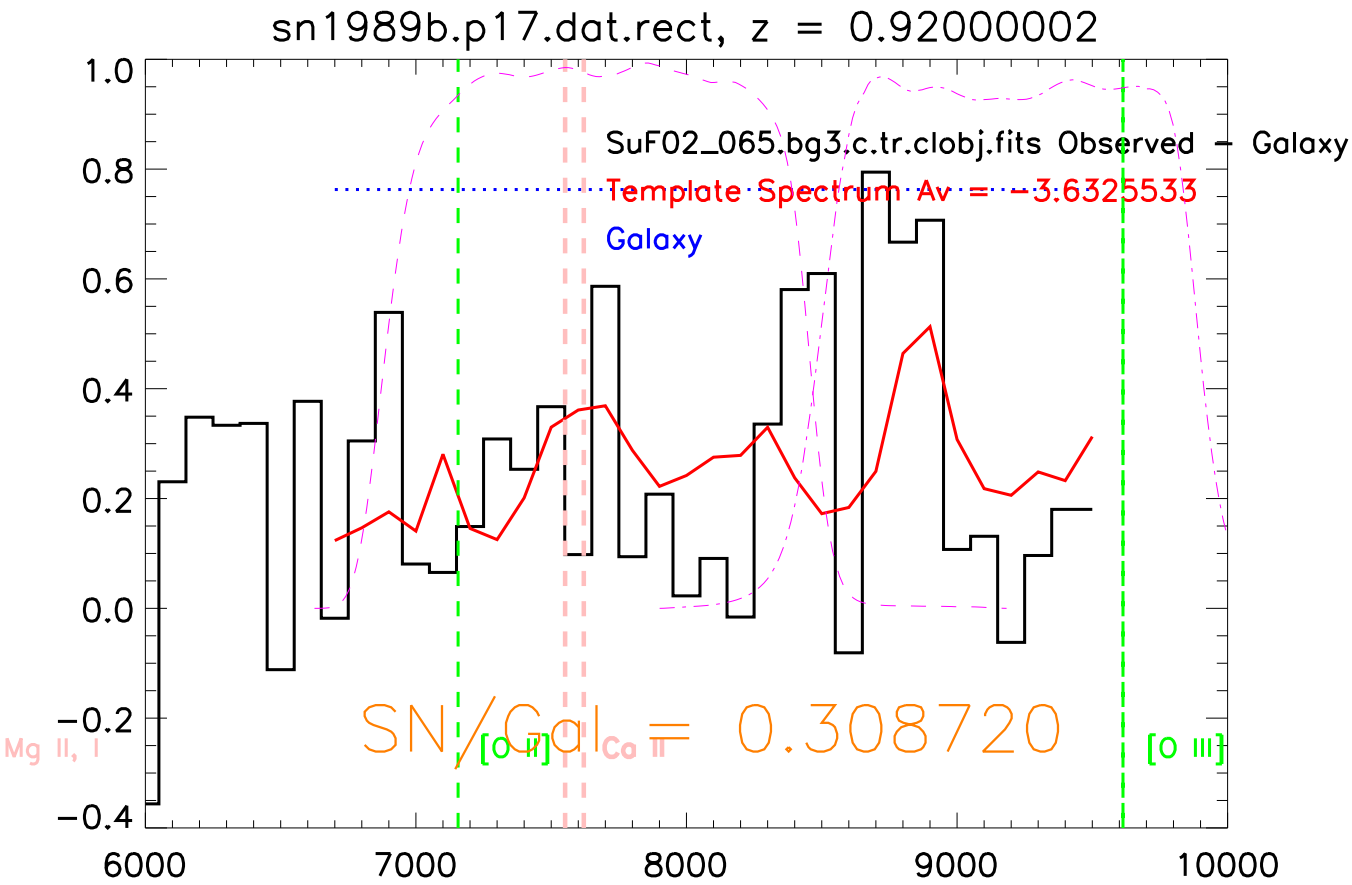

sn1991t.m03.dat.rect, z = 0.88999999
SuF02_065.bg3.c.tr.clobj.fits Observed − Galaxy
Template Spectrum Av = 1.9037052
Galaxy
SN/Gal = 0.643864
Mg II, I
[O II]
Ca II
[O III]
1.2
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
6000
7000
8000
9000
10000

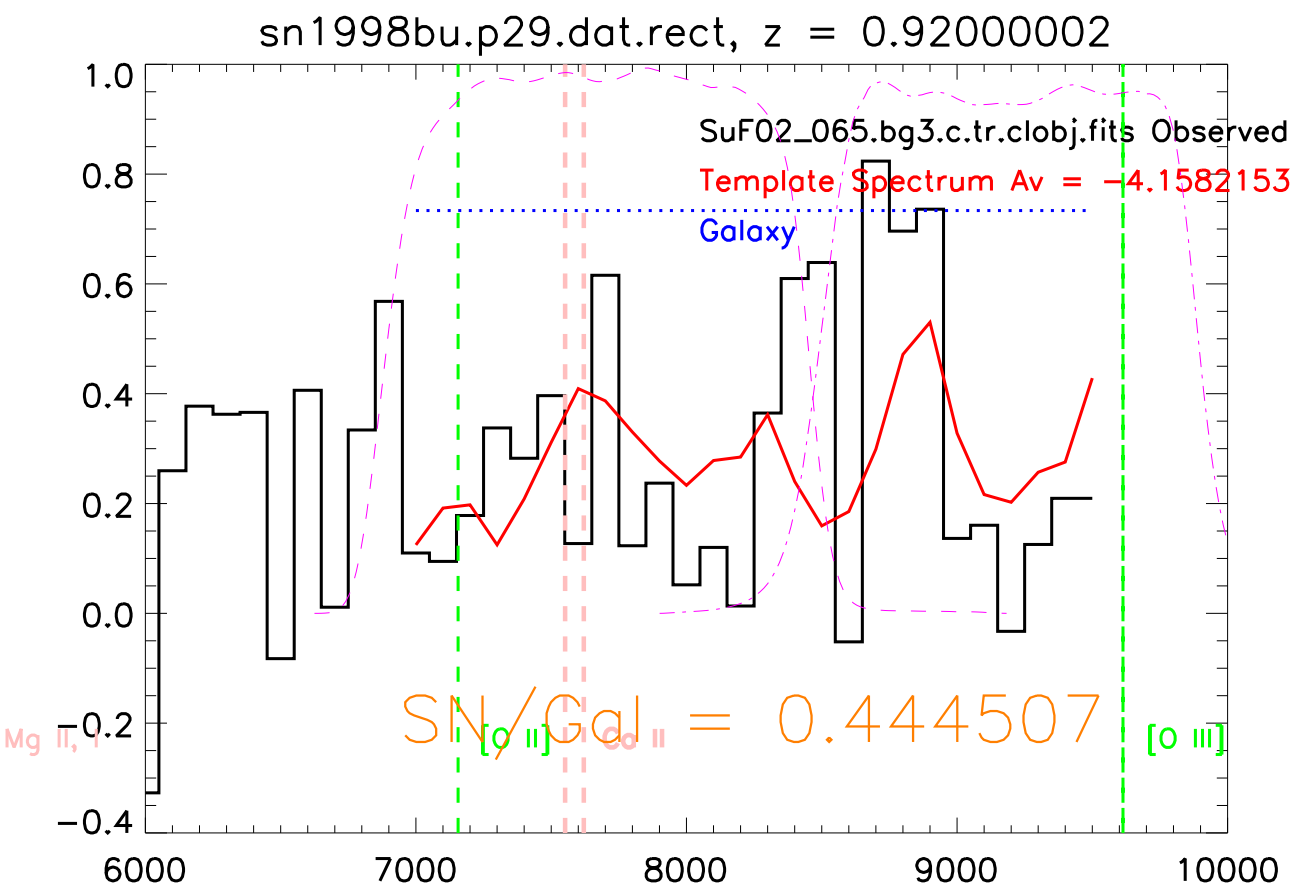

sn1994d.p13.dat.rect, z = 0.82999998
SuF02_065.bg3.c.tr.clobj.fits Observed − Galaxy
Template Spectrum Av = −1.0345213
Galaxy
SN/Gal = 0.502996
Mg II, I
[O II]
Ca I
[O III]
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
−0.4
6000
7000
8000
9000
10000

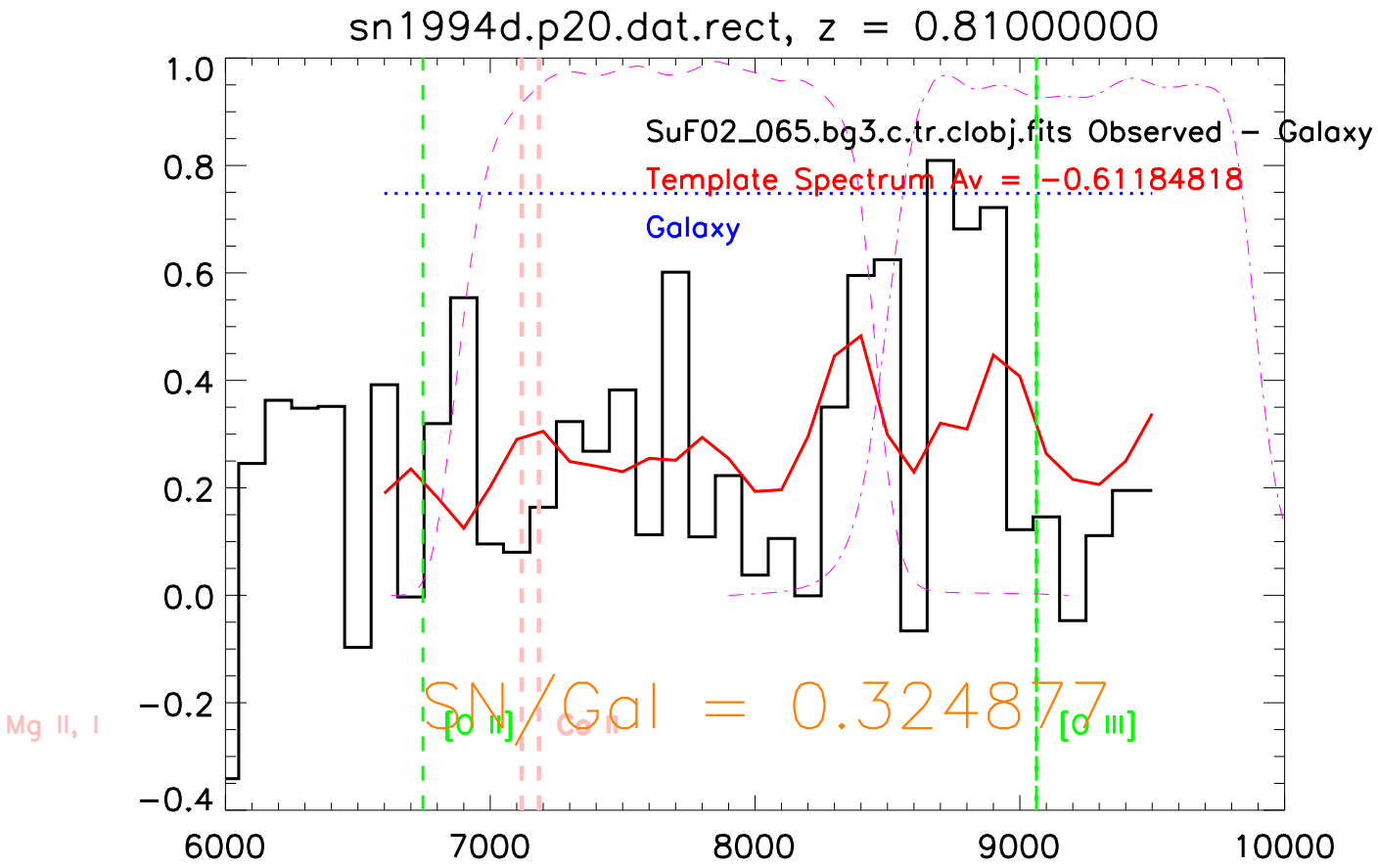

sn1991t.p15.dat.rect, z = 0.92000002
SuF02_065.bg3.c.tr.clobj.fits Observed − Galaxy
Template Spectrum Av = 1.2066996
Galaxy
SN/Gal = 0.0650713
Mg II, I
[O II]
Ca II
[O III]
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

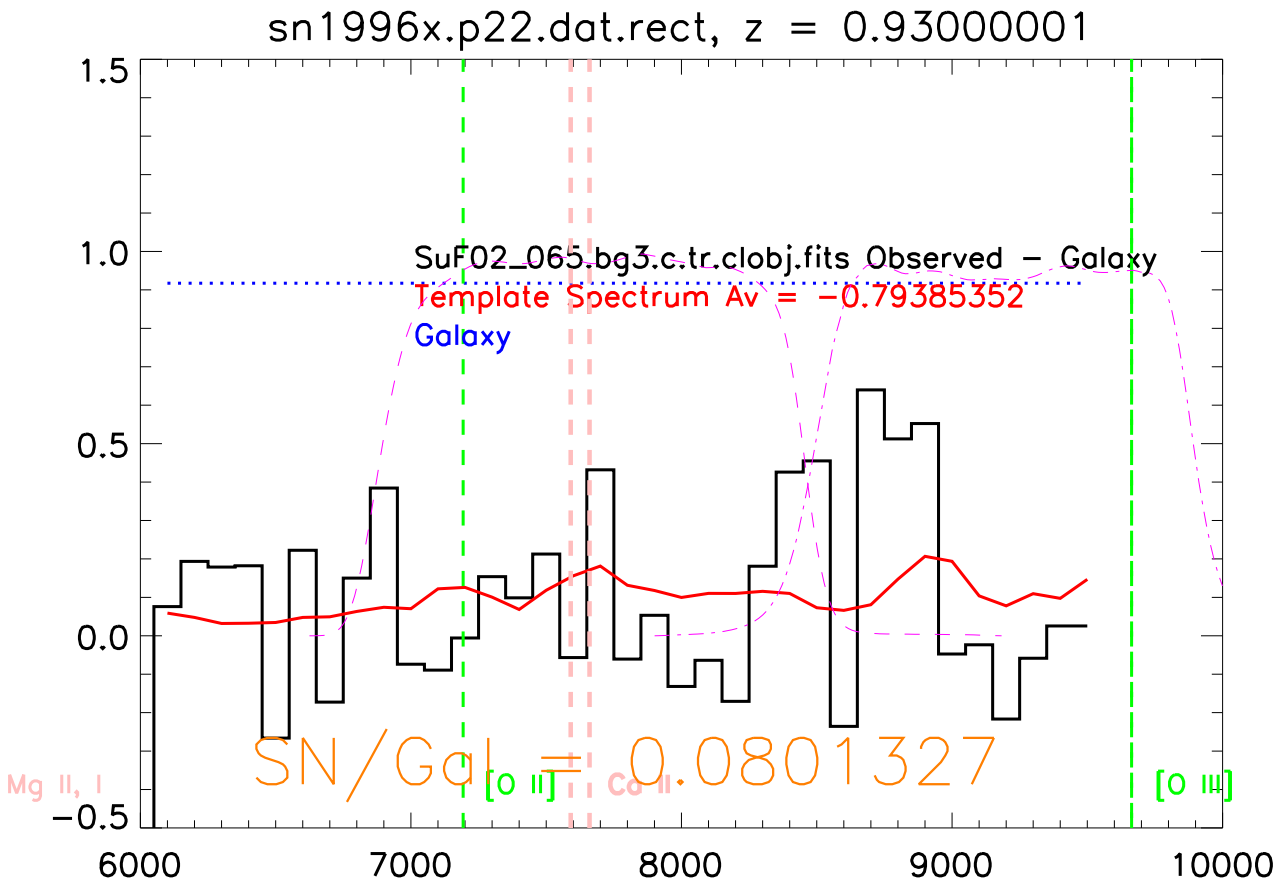

sn1981b.p20.dat.rect, z = 0.89999998
SuF02_065.bg3.c.tr.clobj.fits Observed – Galaxy
Template Spectrum Av = −0.22345741
Galaxy
SN/Gal = 0.255237
Mg II, I
[O II]
Ca II
[O III]
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
−0.4
6000
7000
8000
9000
10000

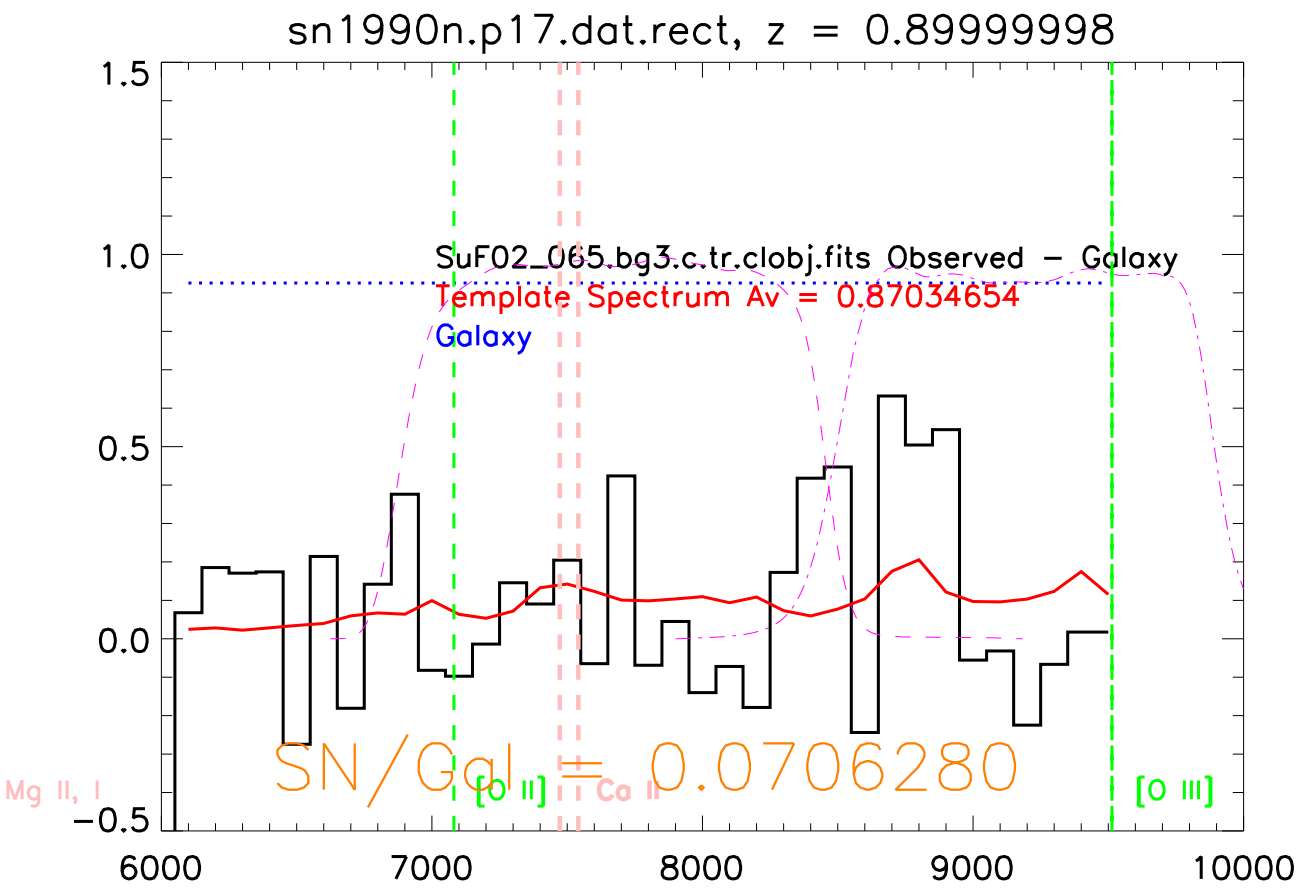

sn1999ee.p33.dat.rect, z = 1.1200000
SuF02_065.bg3.c.tr.clobj.fits Observed – Galaxy
Template Spectrum Av = −5.8110970
Galaxy
SN/Gal = 0.326522
Mg II, I
[O II]
Ca II
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
−0.4
6000
7000
8000
9000
10000

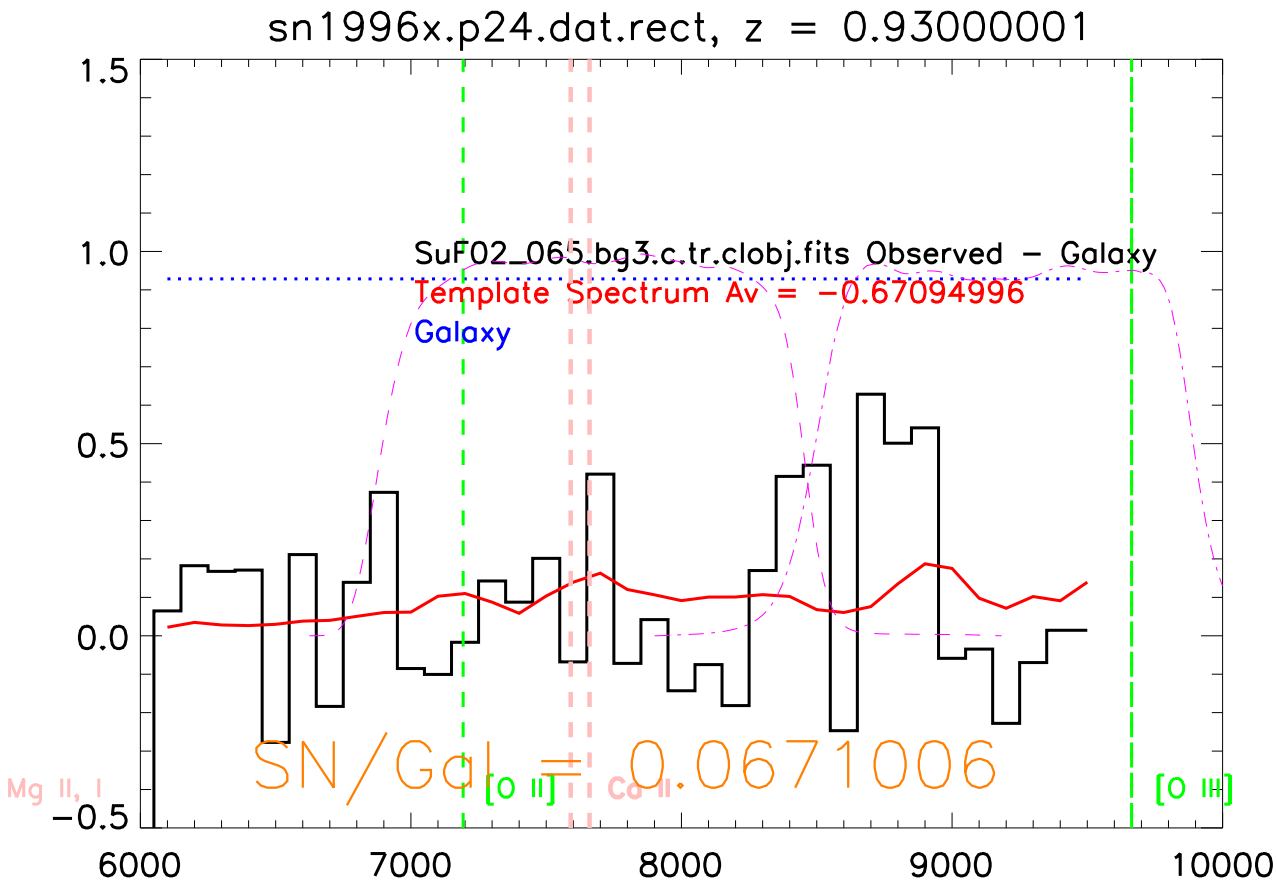

sn1989b.p17.dat.rect, z = 0.92000002
SuF02_065.bg3.c.tr.clobj.fits Observed – Galaxy
Template Spectrum Av = -3.6325533
Galaxy
SN/Gal = 0.308720
Mg II, I
[O II]
Ca II
[O III]
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
−0.4
6000
7000
8000
9000
10000

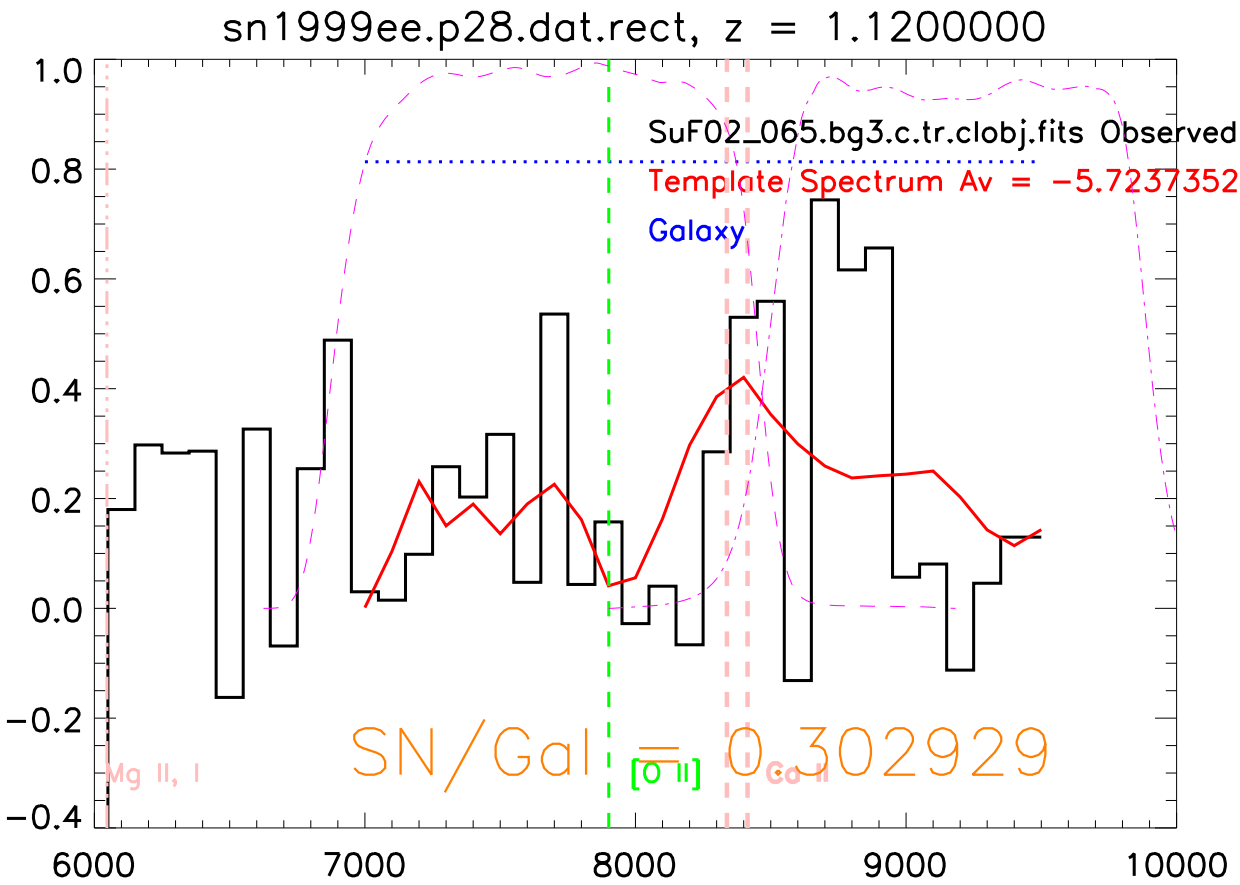

sn1998bu.p29.dat.rect, z = 0.92000002
SuF02_065.bg3.c.tr.clobj.fits Observed − Galaxy
Template Spectrum Av = −4.1582153
Galaxy
SN/Gal = 0.444507
[O II]
[O III]
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
−0.4
6000
7000
8000
9000
10000

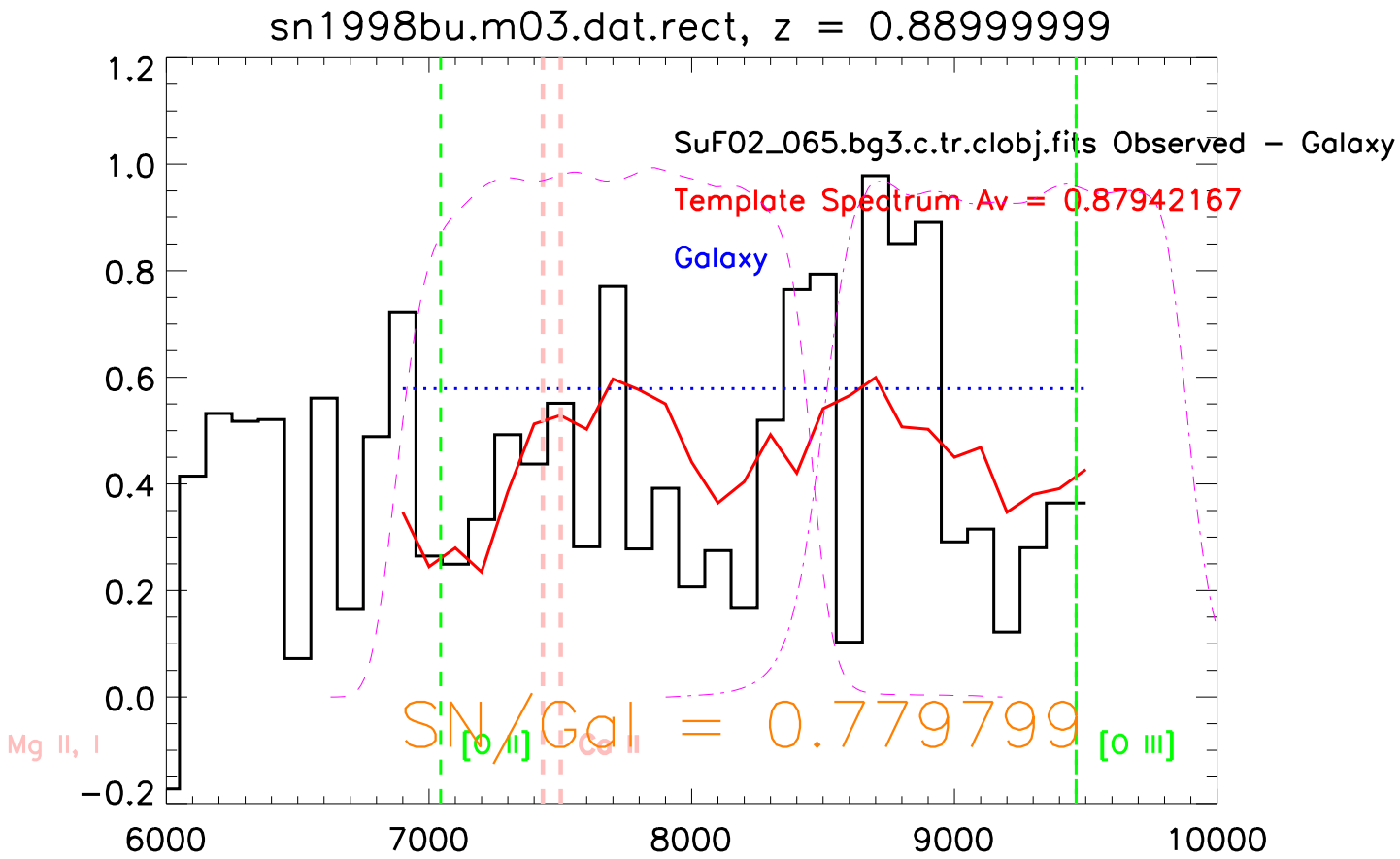

sn1994d.p20.dat.rect, z = 0.81000000
SuF02_065.bg3.c.tr.clobj.fits Observed − Galaxy
Template Spectrum Av = −0.61184818
Galaxy
SN/Gal = 0.324877
[O II]
[O III]
Mg II, I
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
−0.4
6000
7000
8000
9000
10000

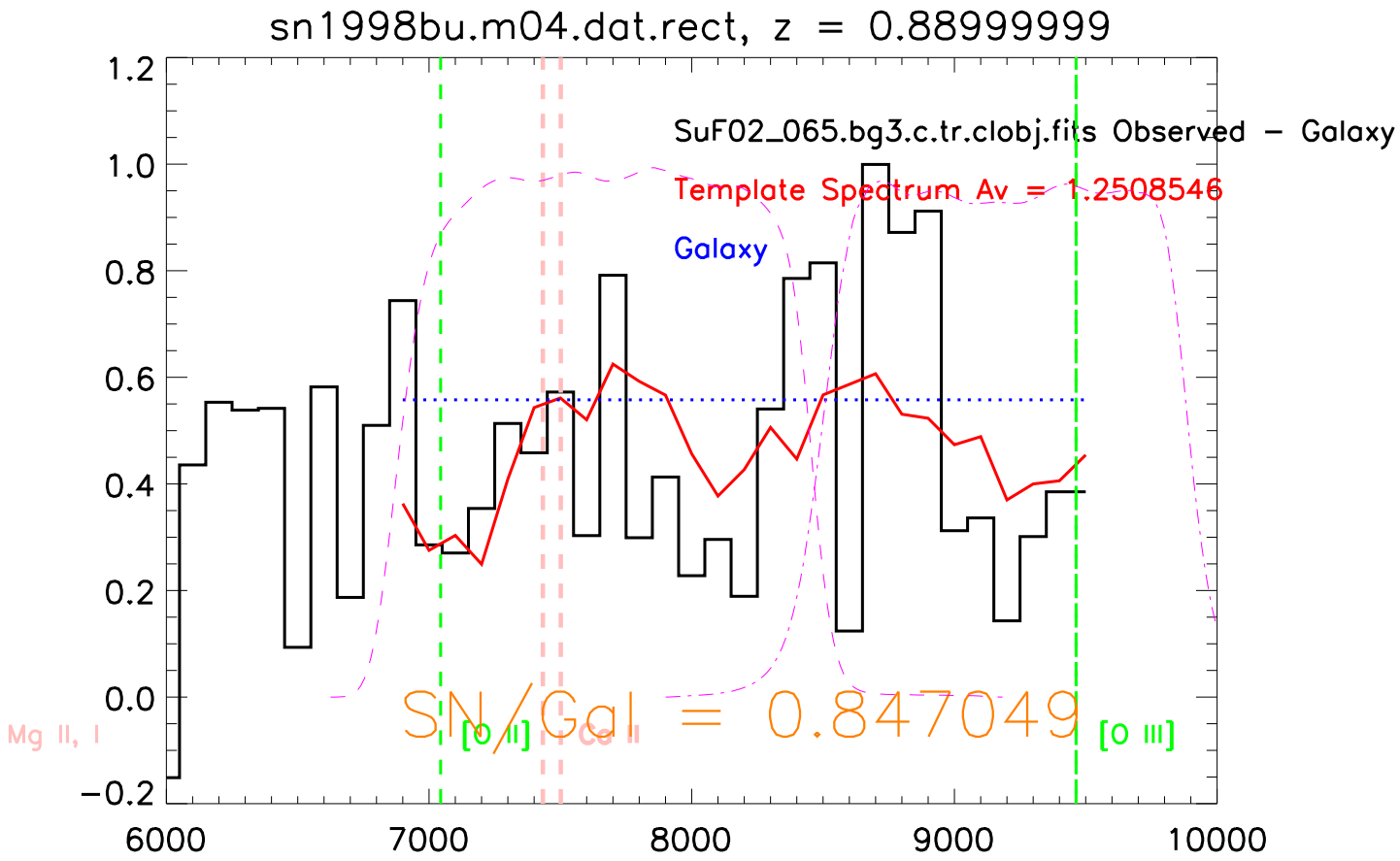

sn1996x.p22.dat.rect, z = 0.93000001
SuF02_065.bg3.c.tr.clobj.fits Observed − Galaxy
Template Spectrum Av = −0.79385352
Galaxy
SN/Gal = 0.0801327
Mg II, I
[O II]
Ca II
[O III]
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

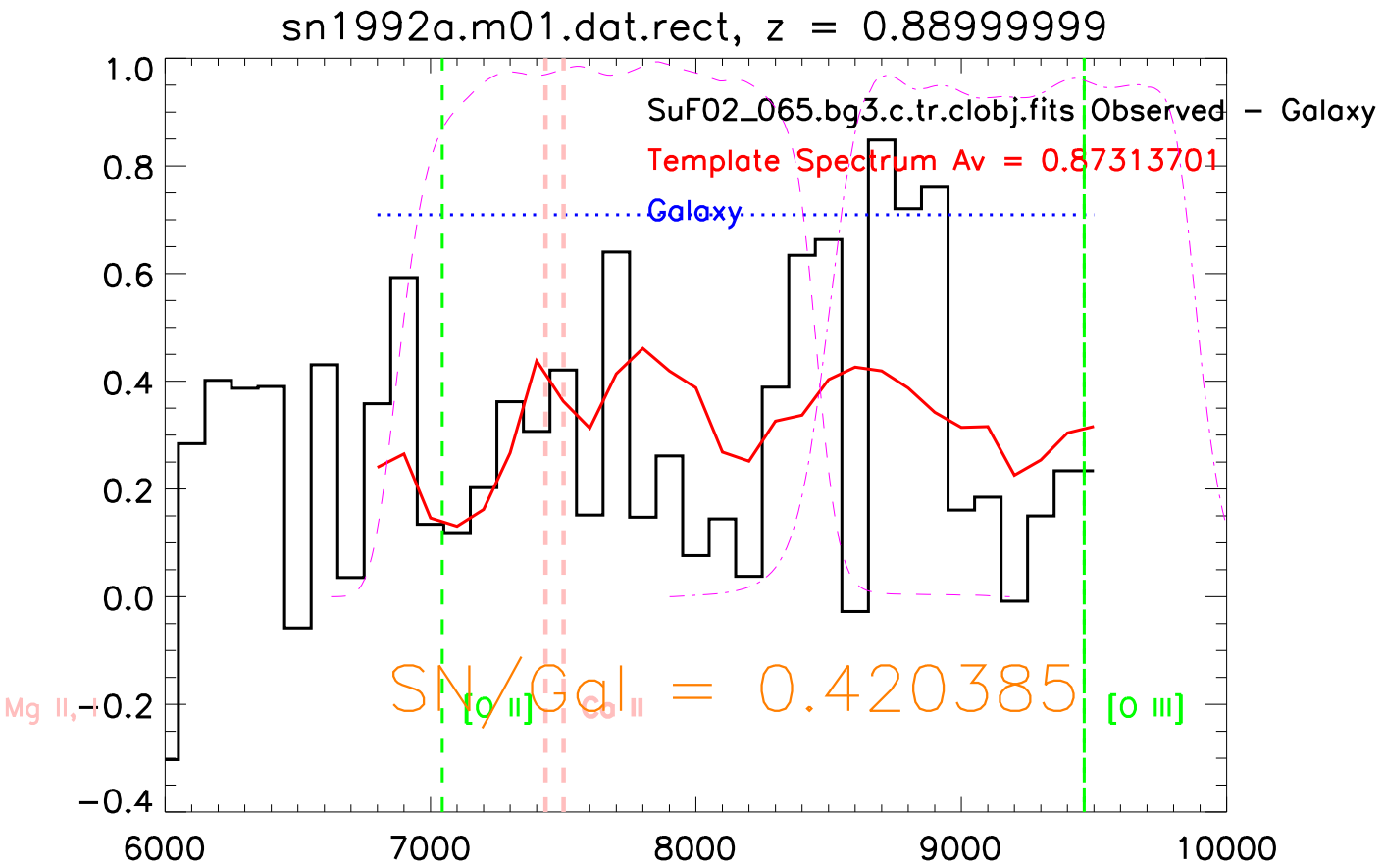

sn1990n.p17.dat.rect, z = 0.89999998
SuF02_065.bg3.c.tr.clobj.fits Observed – Galaxy
Template Spectrum Av = 0.87034654
Galaxy
SN/Gal = 0.0706280
Mg II, I
[O II]
Ca II
[O III]
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

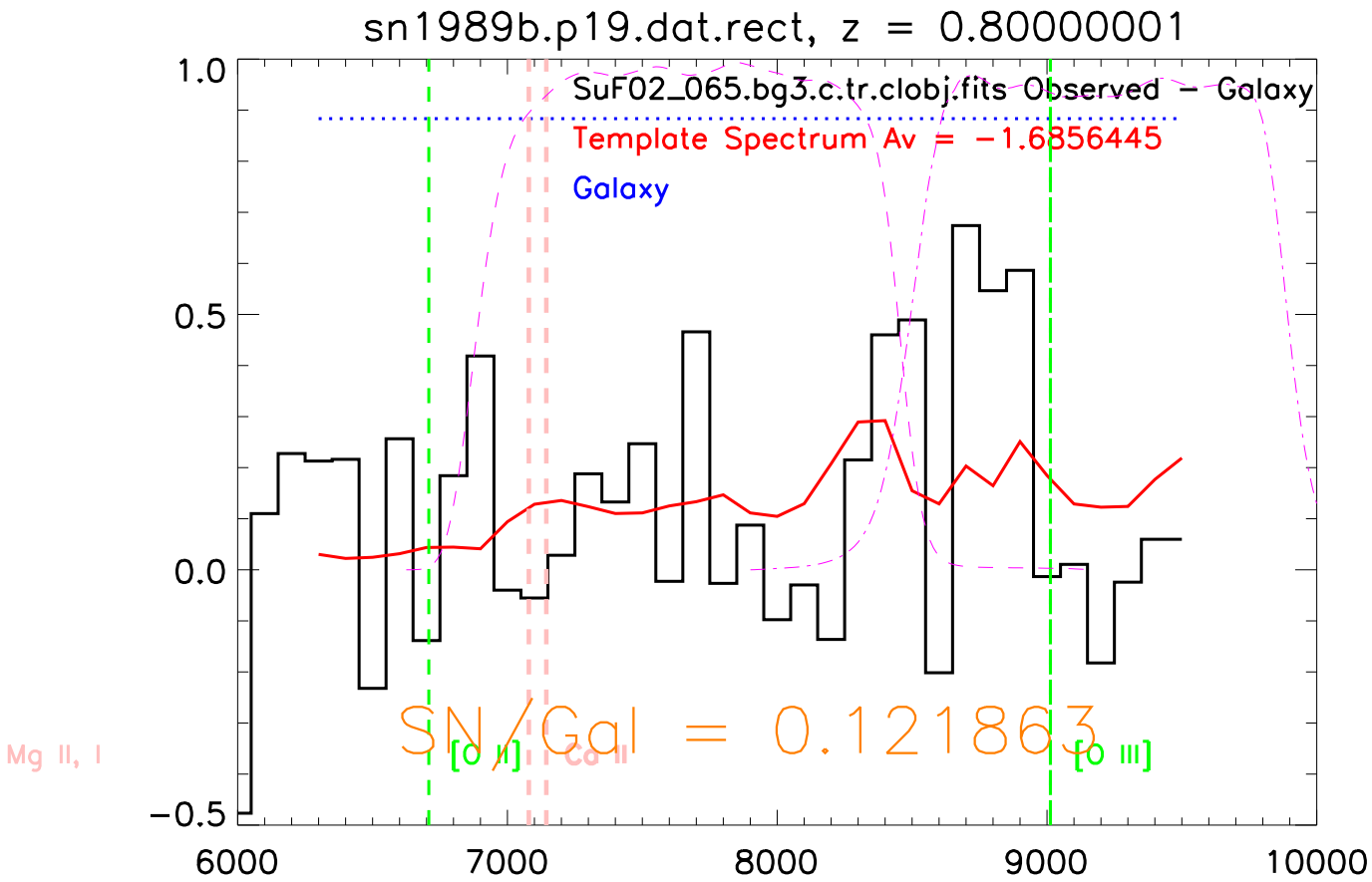

sn1996x.p24.dat.rect, z = 0.93000001
SuF02_065.bg3.c.tr.clobj.fits Observed − Galaxy
Template Spectrum Av = −0.67094996
Galaxy
SN/Gal = 0.0671006
Mg II, I
[O II]
Ca II
[O III]
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

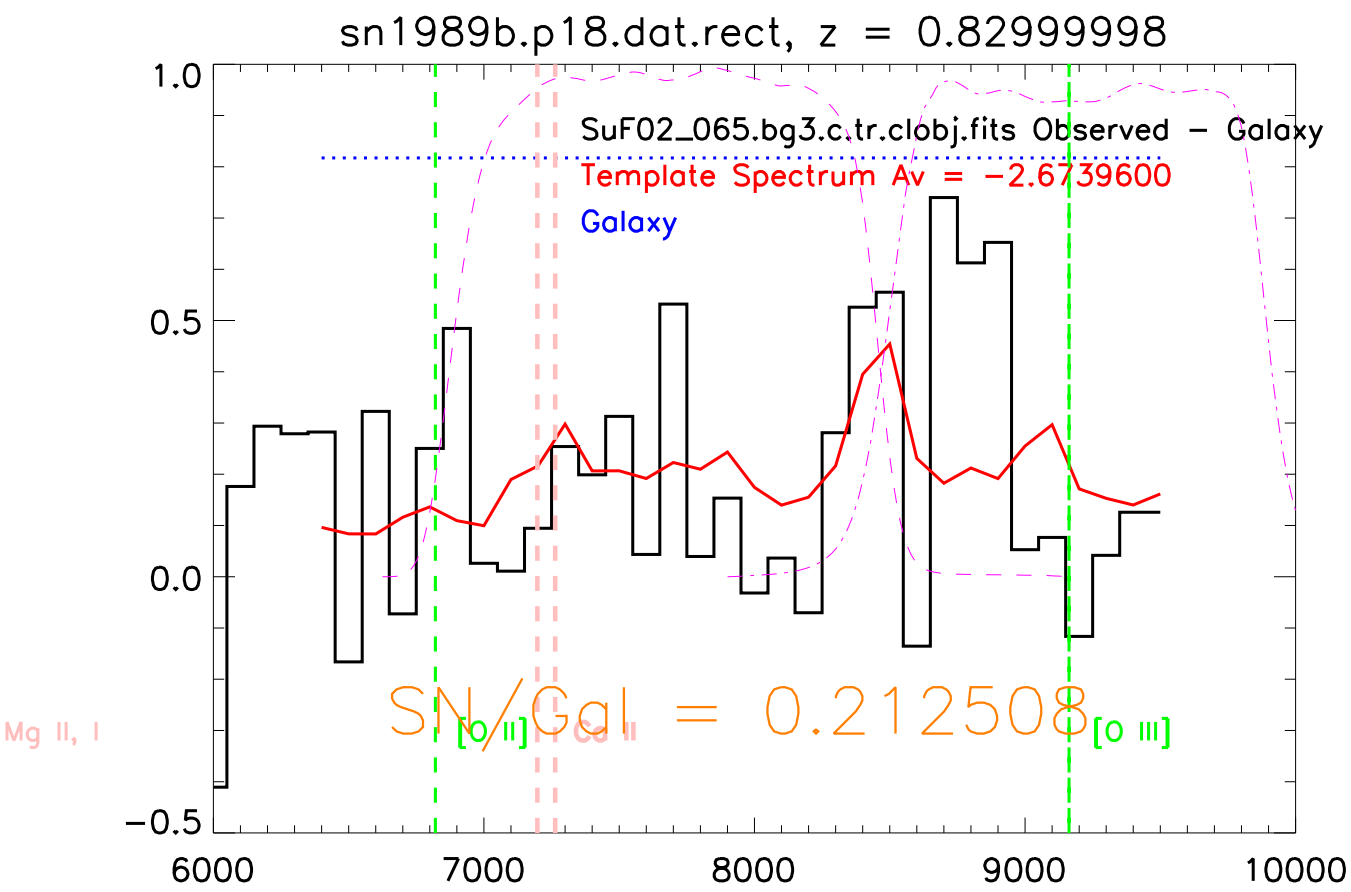

sn1999ee.p28.dat.rect, z = 1.1200000
SuF02_065.bg3.c.tr.clobj.fits Observed – Galaxy
Template Spectrum Av = −5.7237352
Galaxy
SN/Gal = 0.302929
Mg II, I
[O II]
Ca II
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
−0.4
6000
7000
8000
9000
10000

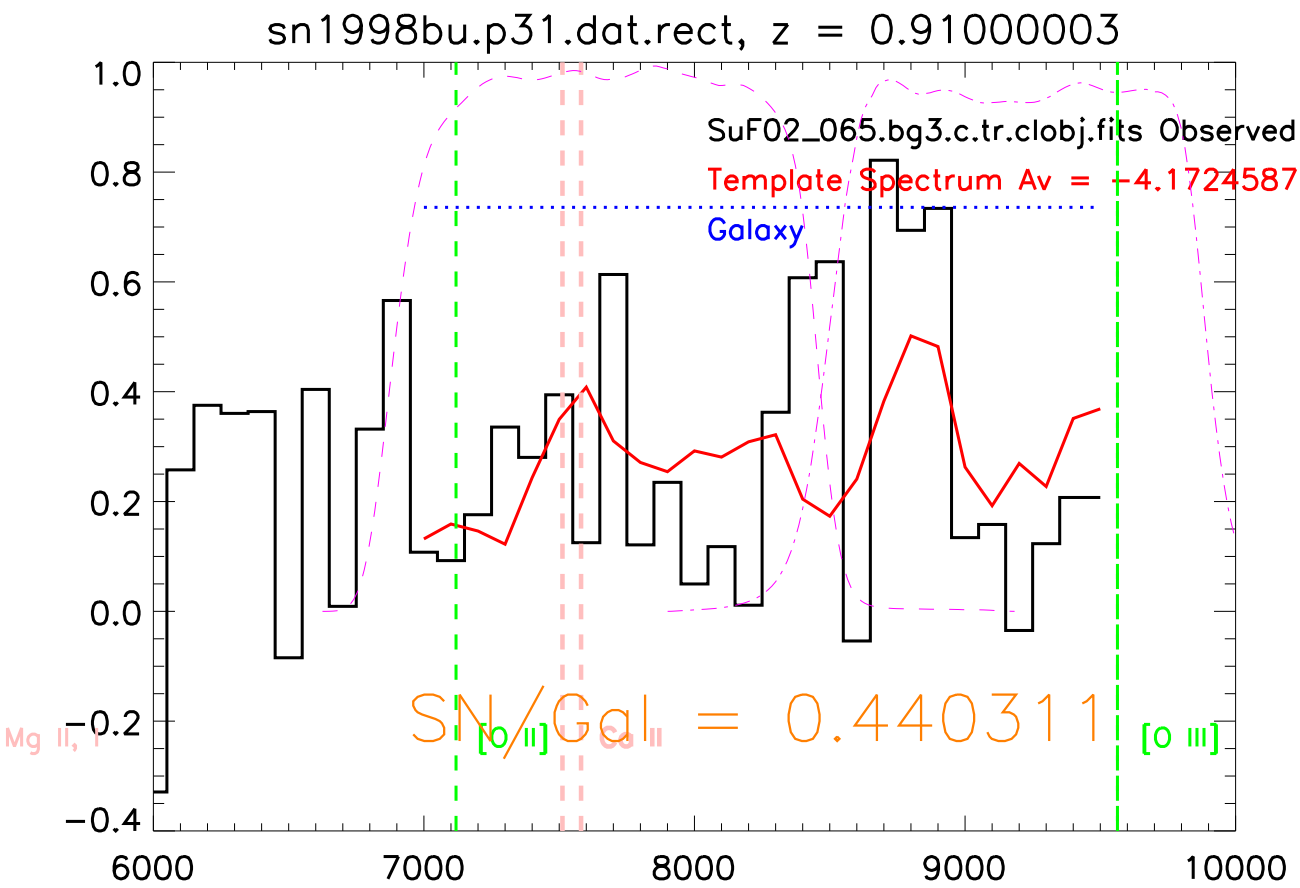

sn1998bu.m03.dat.rect, z = 0.88999999
SuF02_065.bg3.c.tr.clobj.fits Observed – Galaxy
Template Spectrum Av = 0.87942167
Galaxy
S/N/Gal = 0.779799
Mg II, I
[O II]
Ca II
[O III]
1.2
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
6000
7000
8000
9000
10000

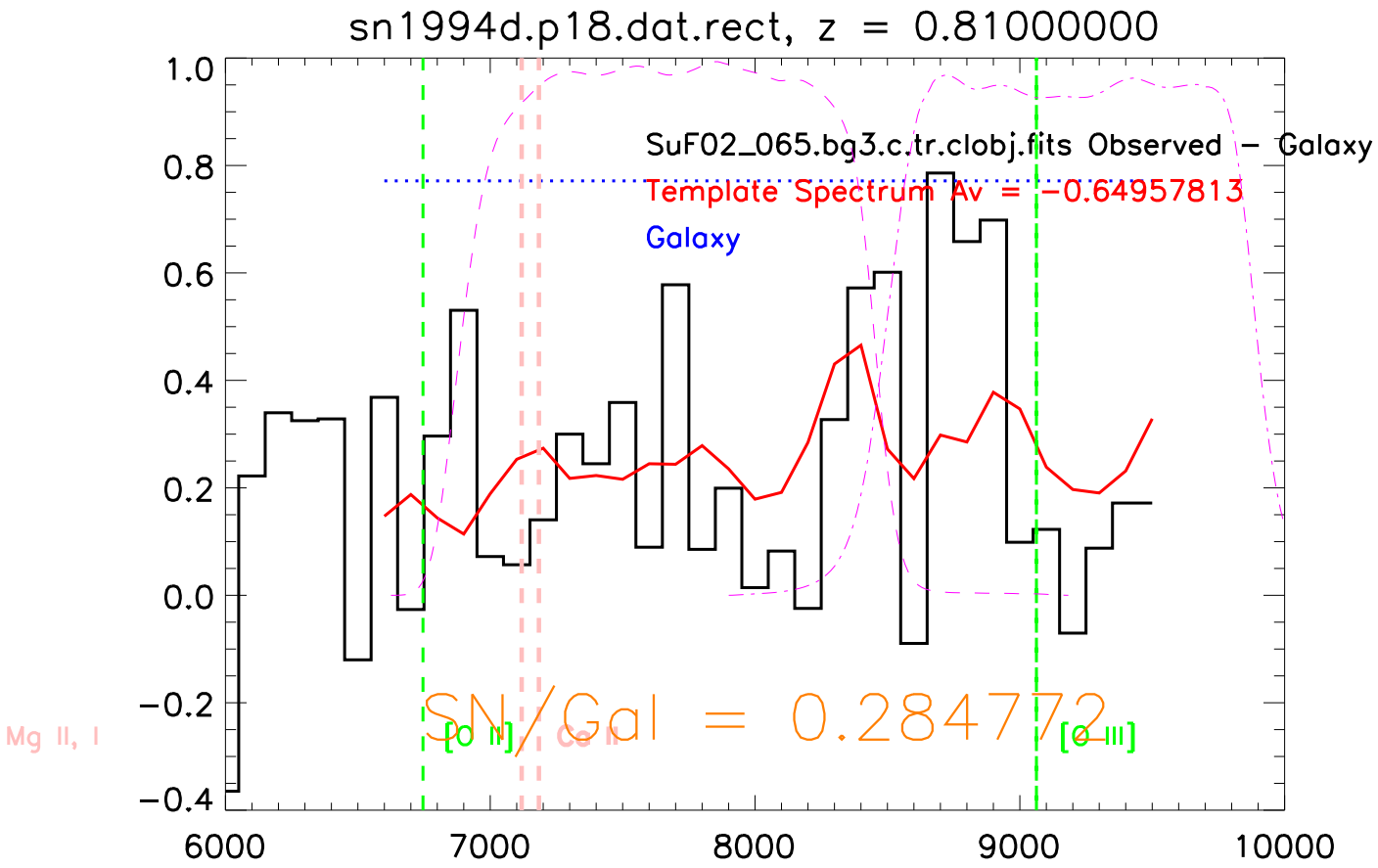

sn1998bu.m04.dat.rect, z = 0.88999999
SuF02_065.bg3.c.tr.clobj.fits Observed – Galaxy
Template Spectrum Av = 1.2508546
Galaxy
SN/Gal = 0.847049
Mg II, I
[O II]
Ca II
[O III]
1.2
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
6000
7000
8000
9000
10000

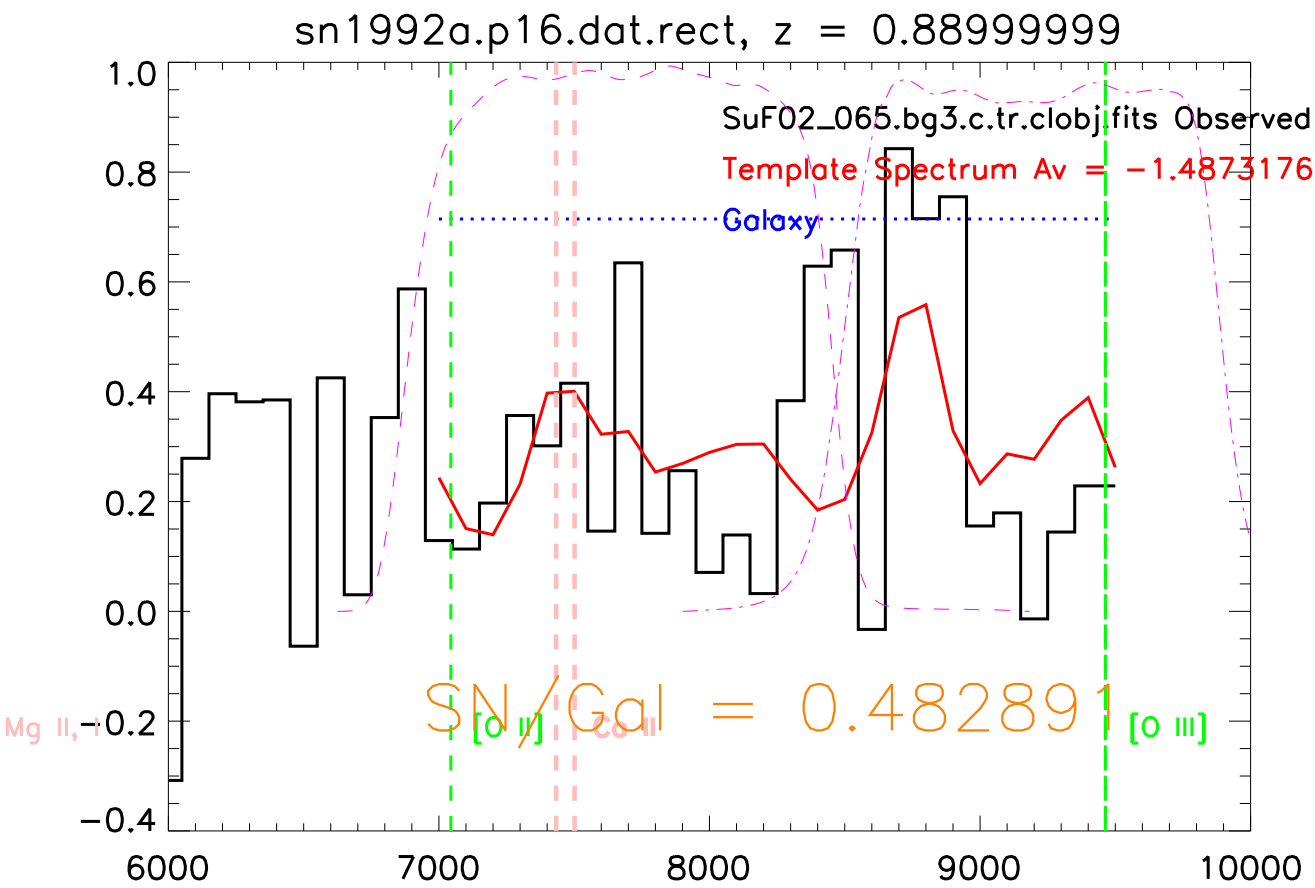

sn1992a.m01.dat.rect, z = 0.88999999
SuF02_065.bg3.c.tr.clobj.fits Observed − Galaxy
Template Spectrum Av = 0.87313701
Galaxy
SN/Gal = 0.420385
[O II]
[O III]
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
−0.4
6000
7000
8000
9000
10000

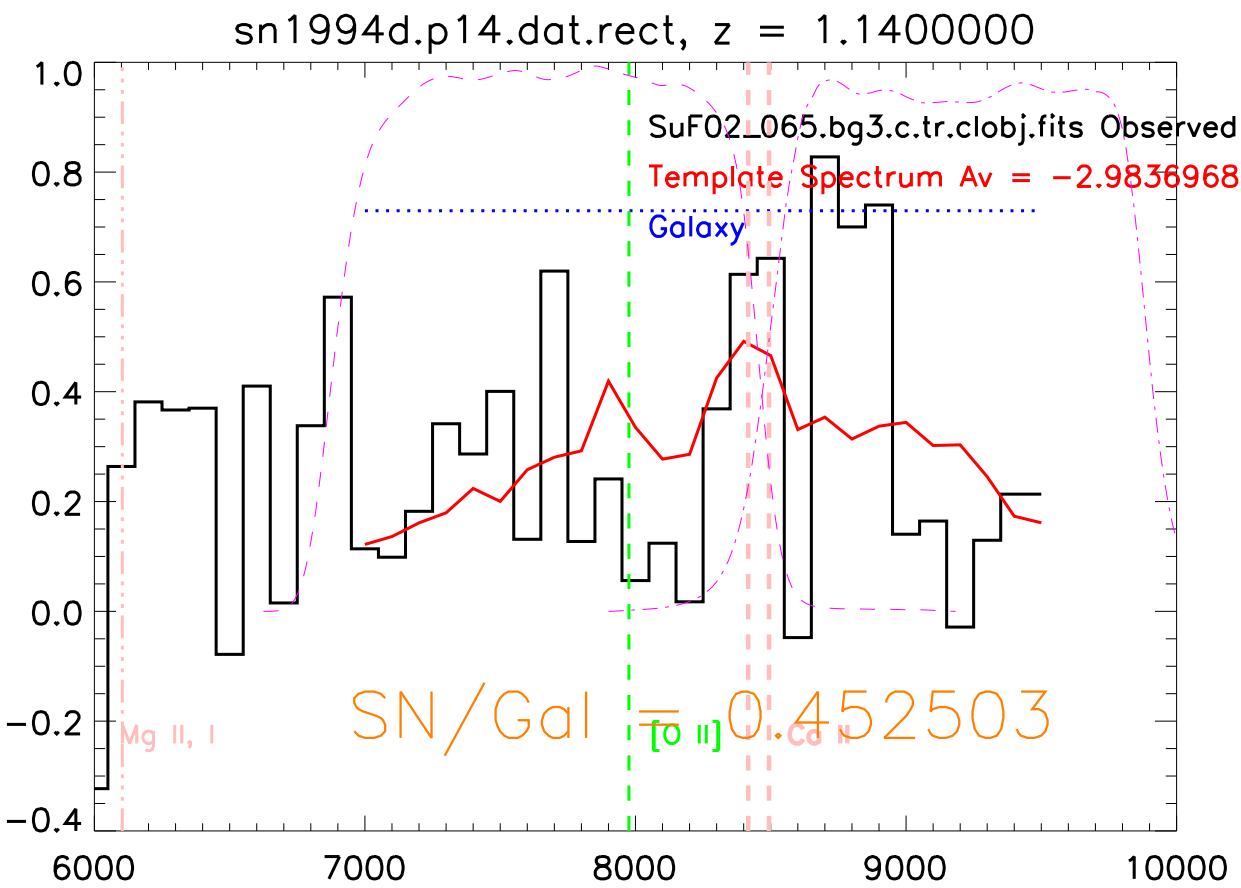

sn1989b.p19.dat.rect, z = 0.80000001
SuF02_065.bg3.c.tr.clobj.fits Observed − Galaxy
Template Spectrum Av = −1.6856445
Galaxy
SN/Gal = 0.121863
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000
Mg II, I
[O II]
Ca II
[O III]

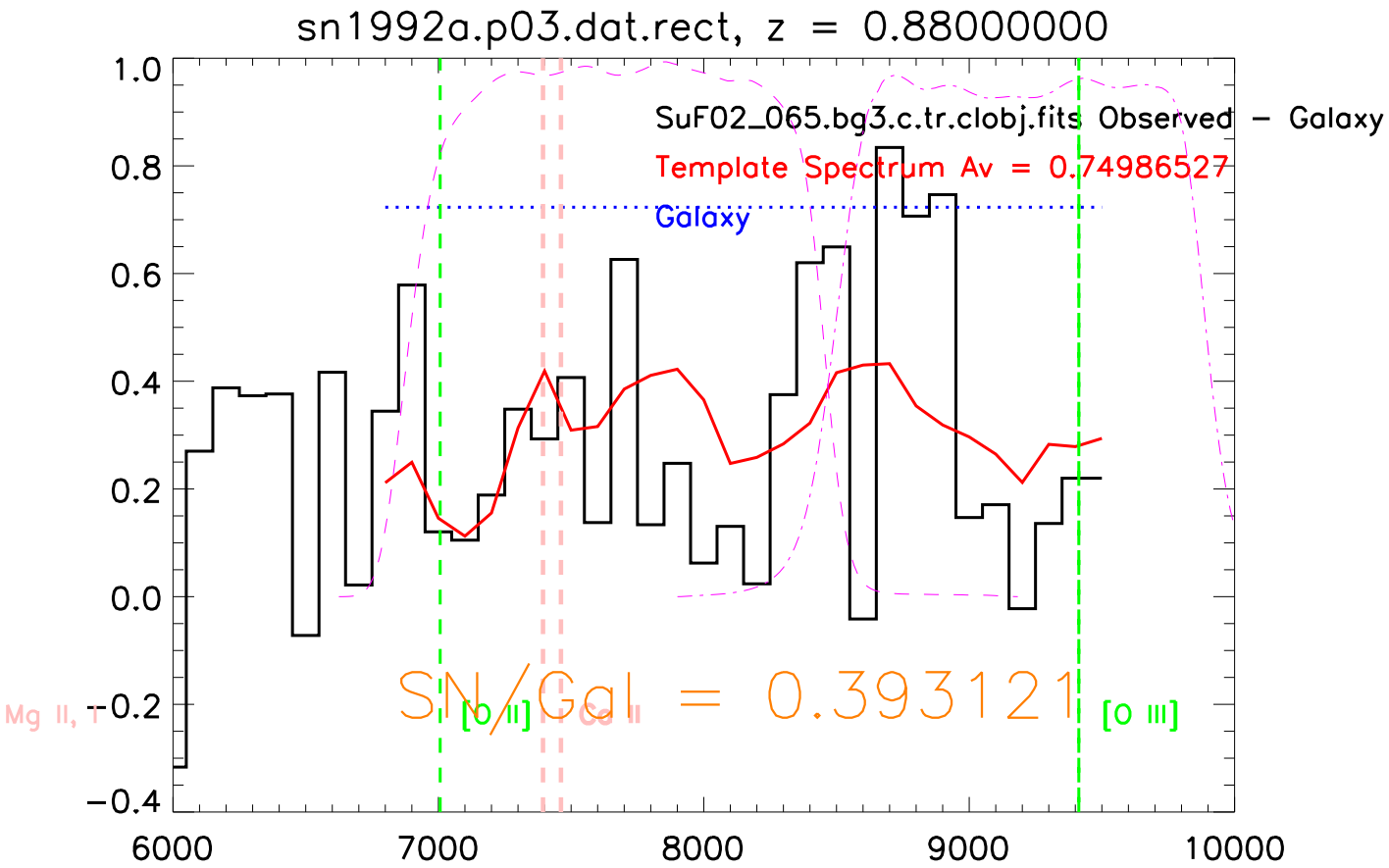

sn1989b.p18.dat.rect, z = 0.82999998
SuF02_065.bg3.c.tr.clobj.fits Observed − Galaxy
Template Spectrum Av = −2.6739600
Galaxy
SN/Gal = 0.212508
[O II]
[O III]
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

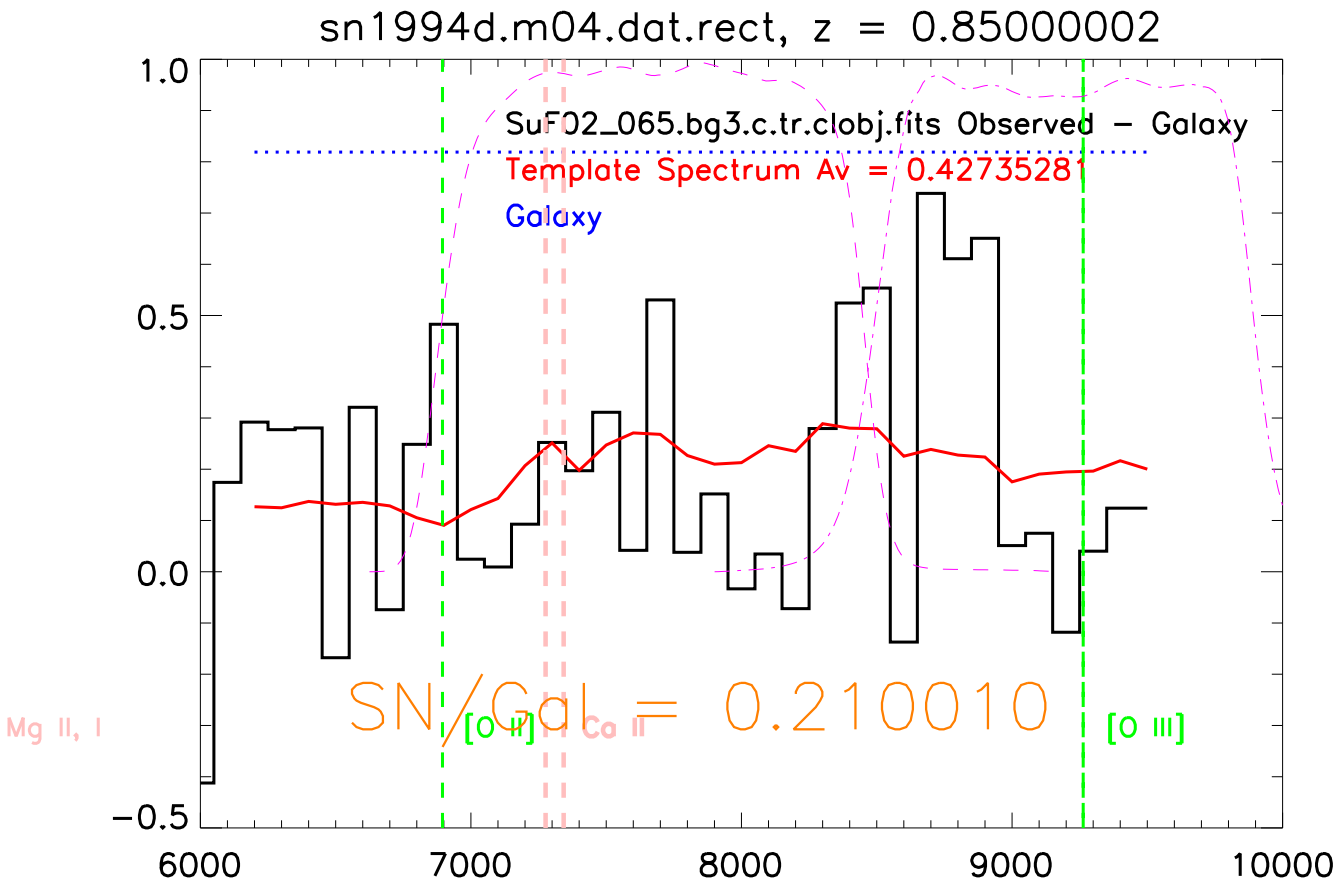

sn1998bu.p31.dat.rect, z = 0.91000003
SuF02_065.bg3.c.tr.clobj.fits Observed – Galaxy
Template Spectrum Av = 4.1724587
Galaxy
SN/Gal = 0.440311
[O II]
[O III]
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
−0.4
6000
7000
8000
9000
10000

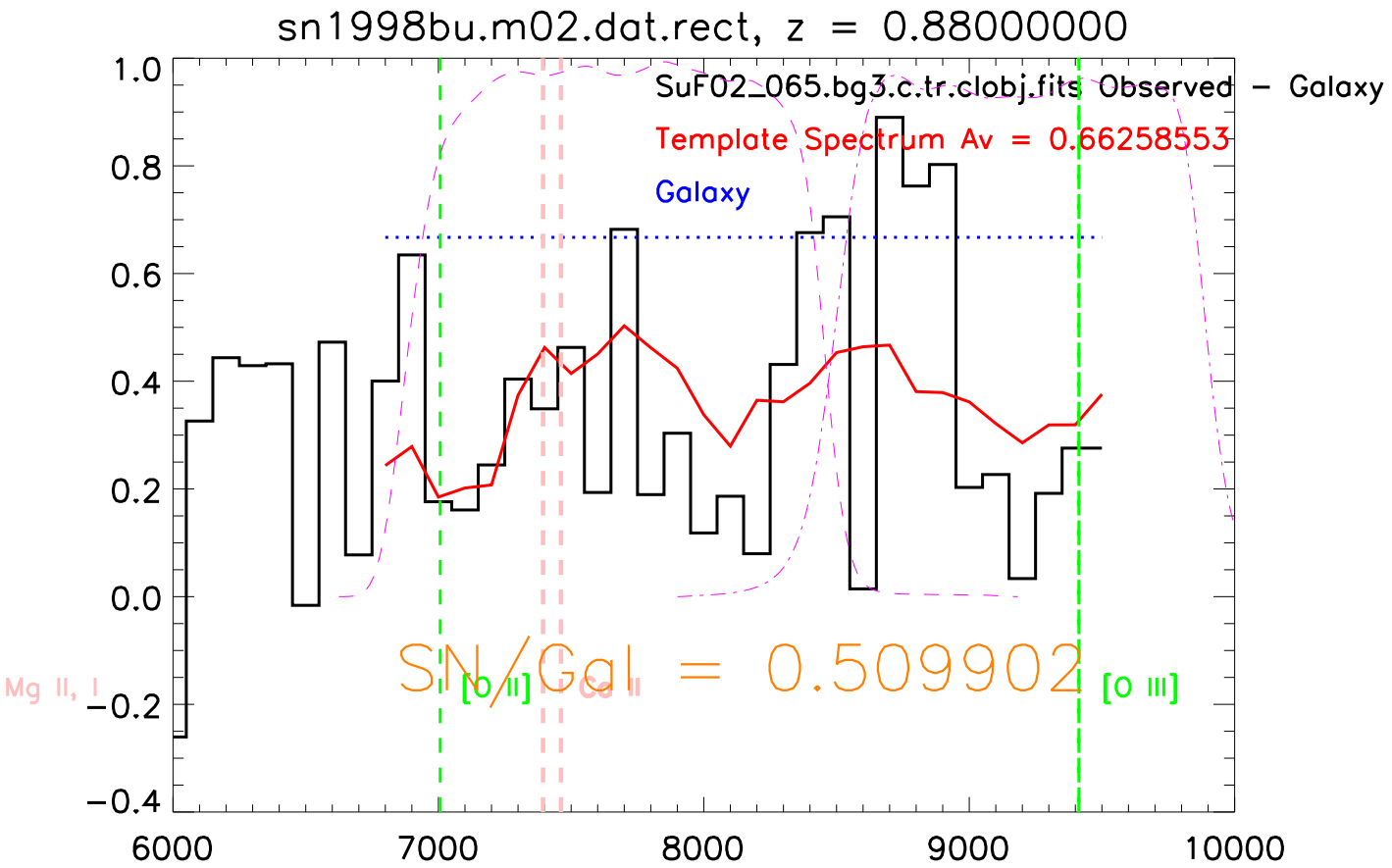

sn1994d.p18.dat.rect, z = 0.81000000
SuF02_065.bg3.c.tr.clobj.fits Observed – Galaxy
Template Spectrum Av = -0.64957813
Galaxy
SN/Gal = 0.284772
[O II]
[O III]
Mg II, I
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
−0.4
6000
7000
8000
9000
10000

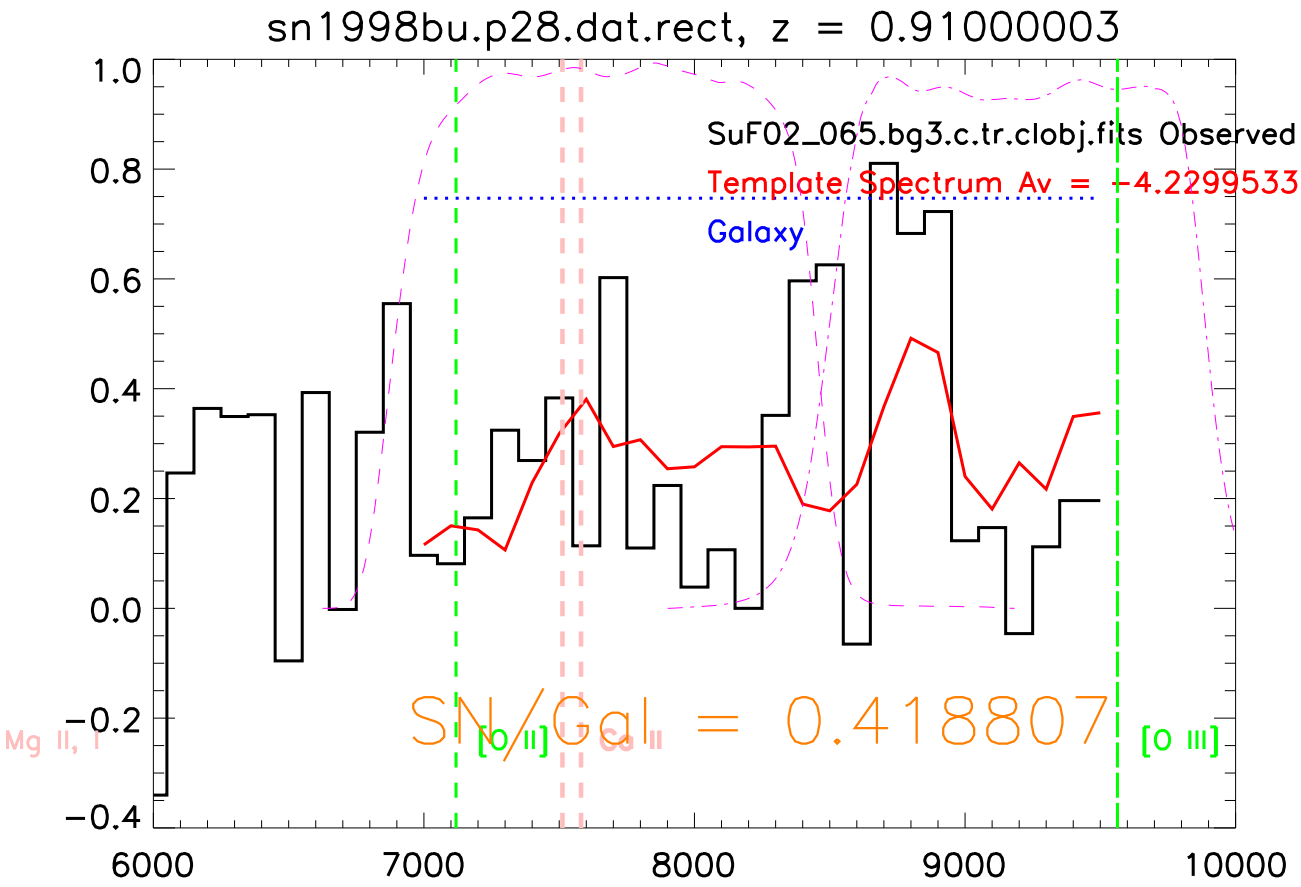

sn1992a.p16.dat.rect, z = 0.88999999
SuF02_065.bg3.c.tr.clobj.fits Observed – Galaxy
Template Spectrum Av = −1.4873176
Galaxy
SN/Gal = 0.482891
[O II]
[O III]
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
−0.4
6000
7000
8000
9000
10000

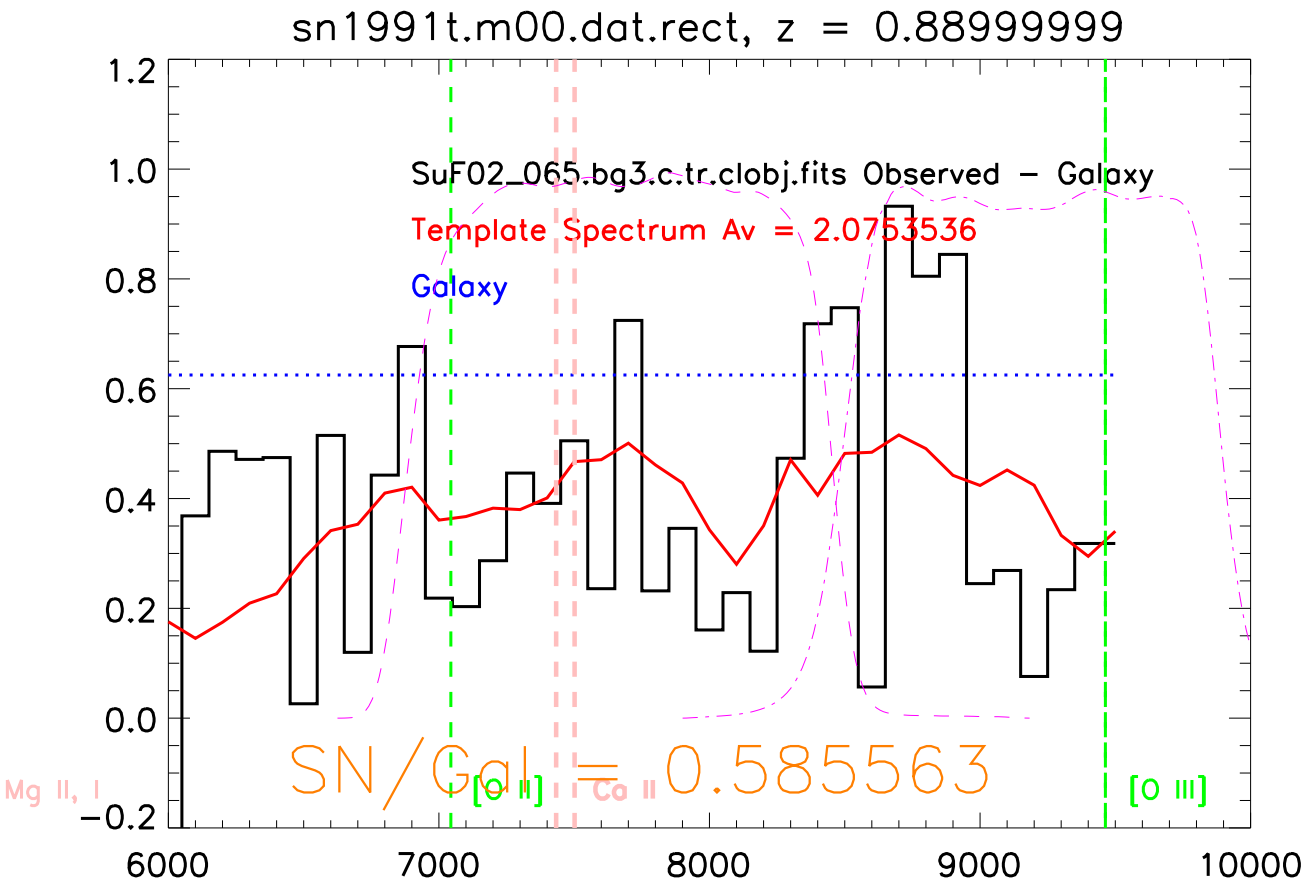

sn1994d.p14.dat.rect, z = 1.1400000
SuF02_065.bg3.c.tr.clobj.fits Observed – Galaxy
Template Spectrum Av = −2.9836968
Galaxy
SN/Gal = 0.452503
Mg II, I
[O II]
Ca II
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
−0.4
6000
7000
8000
9000
10000

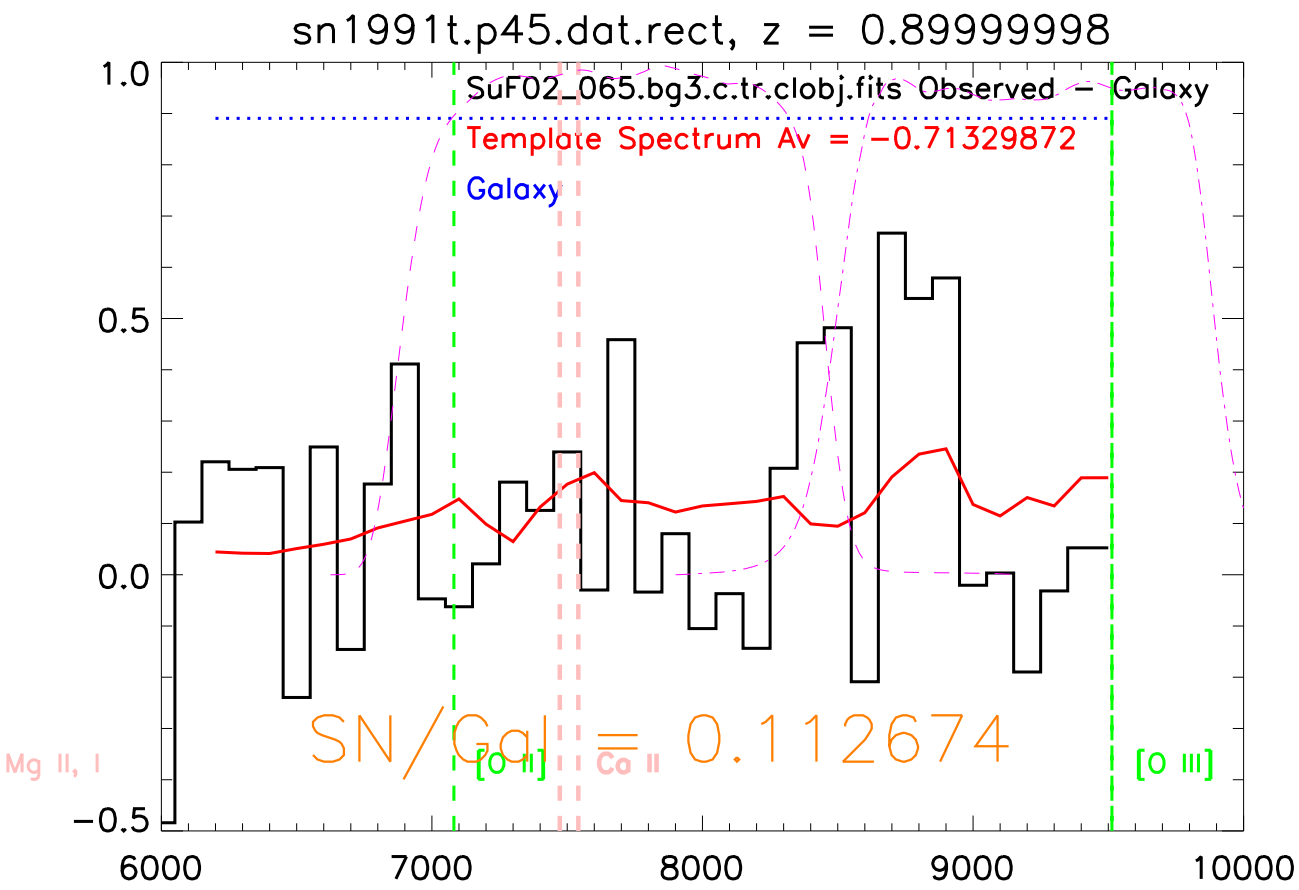

sn1992a.p03.dat.rect, z = 0.88000000
SuF02_065.bg3.c.tr.clobj.fits Observed − Galaxy
Template Spectrum Av = 0.74986527
Galaxy
S/N/Gal = 0.393121
[O II]
[O III]
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
−0.4
6000
7000
8000
9000
10000

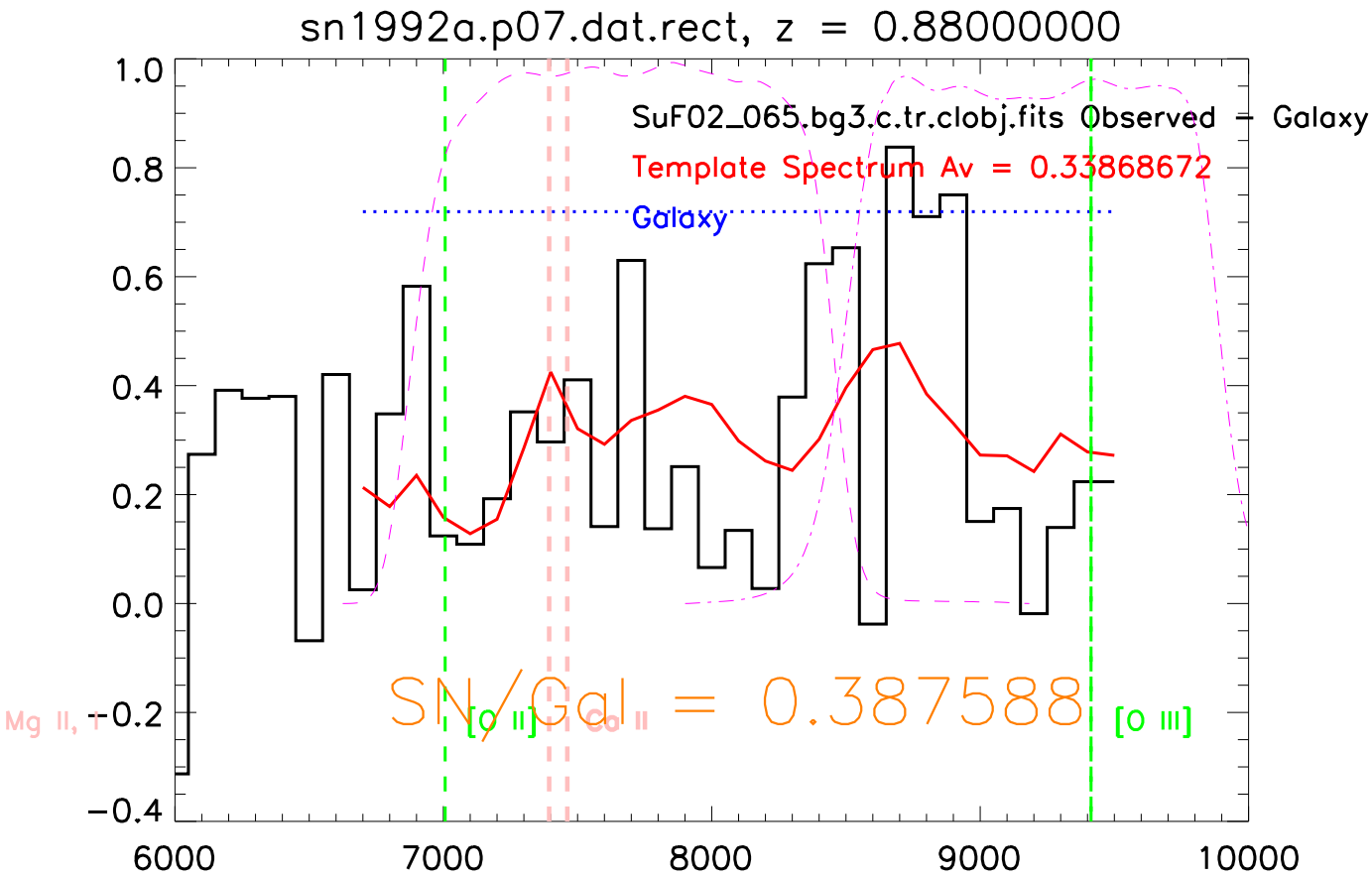

sn1994d.m04.dat.rect, z = 0.85000002
SuF02_065.bg3.c.tr.clobj.fits Observed − Galaxy
Template Spectrum Av = 0.42735281
Galaxy
SN/Gal = 0.210010
[O II]
Ca II
[O III]
Mg II, I
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

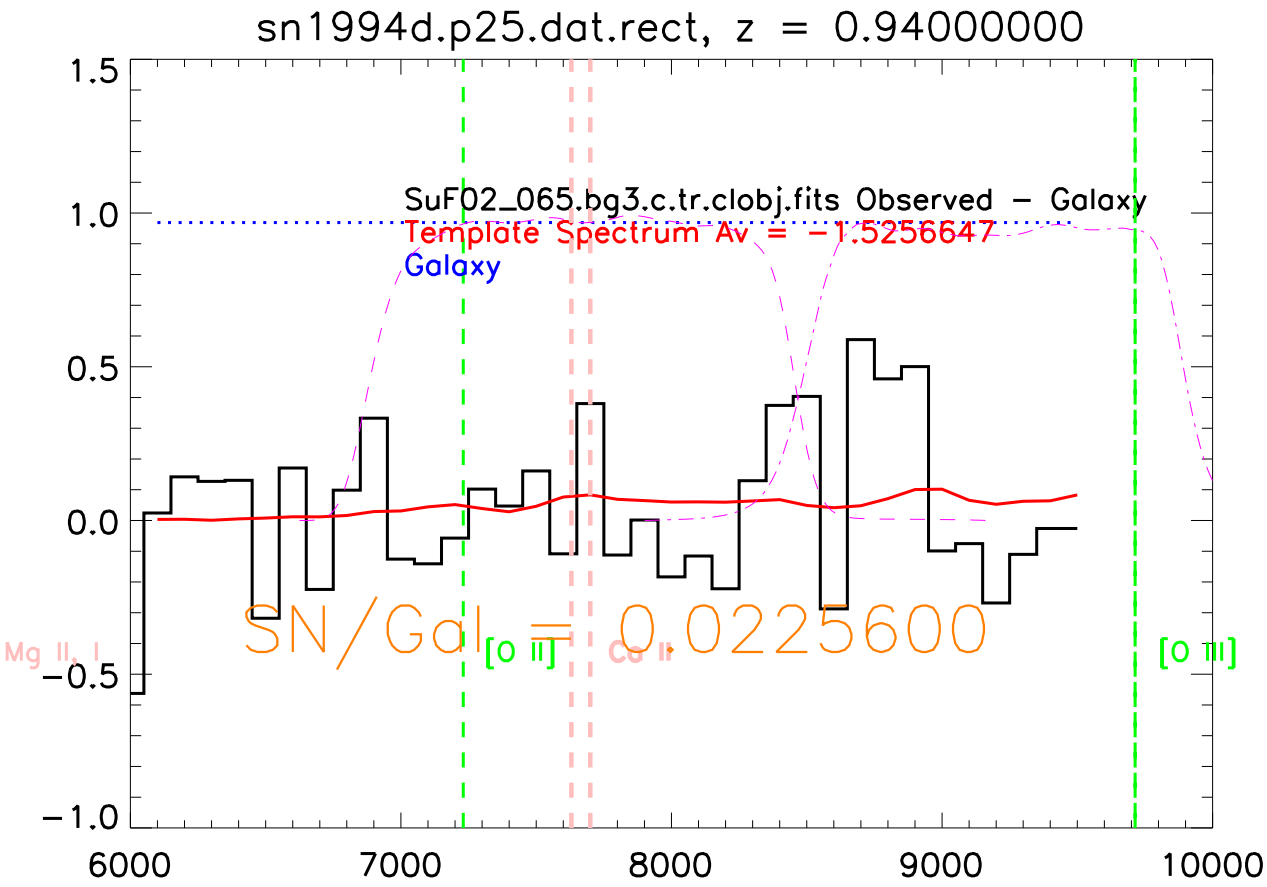

sn1998bu.m02.dat.rect, z = 0.88000000
SuF02_065.bg3.c.tr.clobj.fits Observed − Galaxy
Template Spectrum Av = 0.66258553
Galaxy
SN/Gal = 0.509902
Mg II, I
[O II]
Ca II
[O III]
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
−0.4
6000
7000
8000
9000
10000

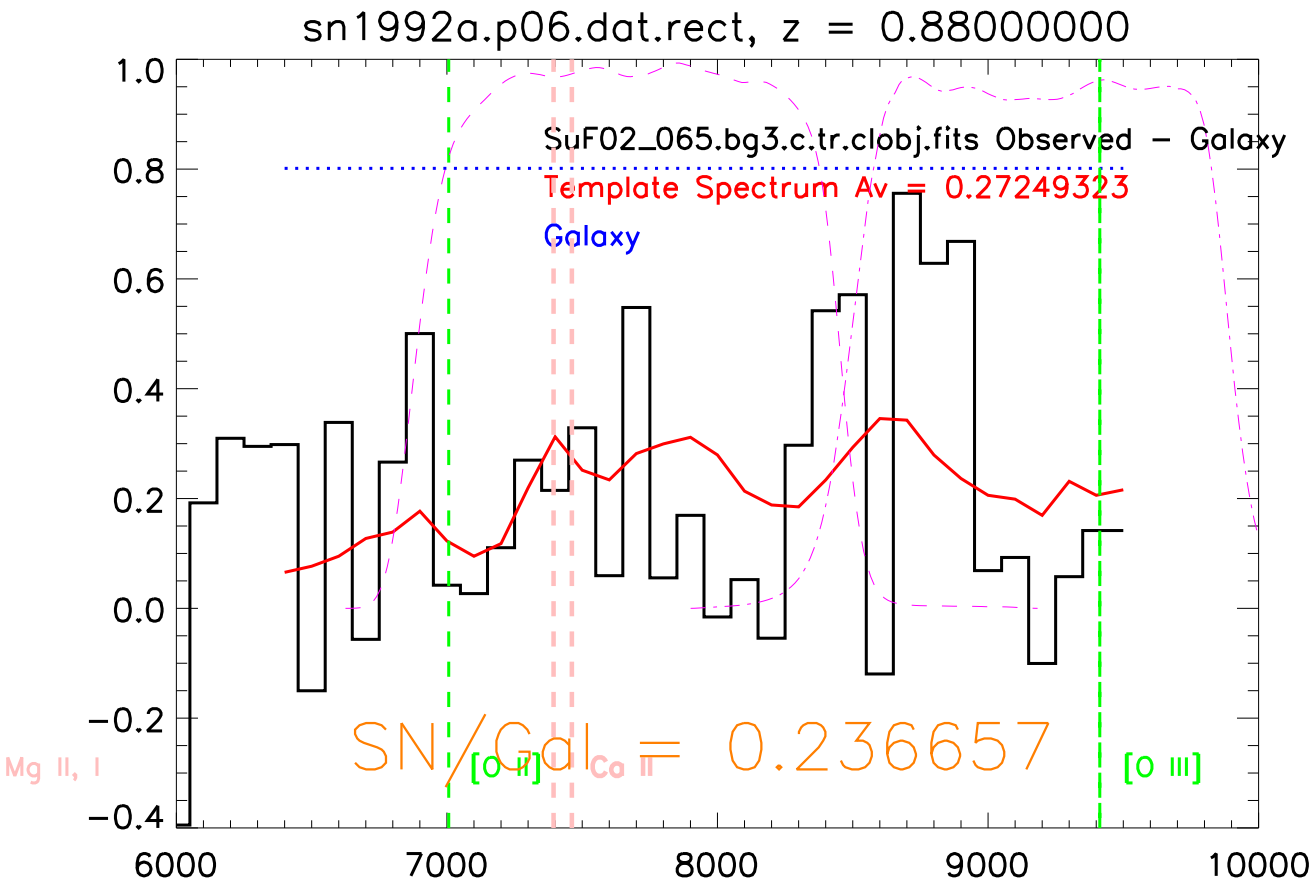

sn1998bu.p28.dat.rect, z = 0.91000003
SuF02_065.bg3.c.tr.clobj.fits Observed – Galaxy
Template Spectrum Av = -4.2299533
Galaxy
S/N/Gal = 0.418807
[O II]
[O III]
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
−0.4
6000
7000
8000
9000
10000

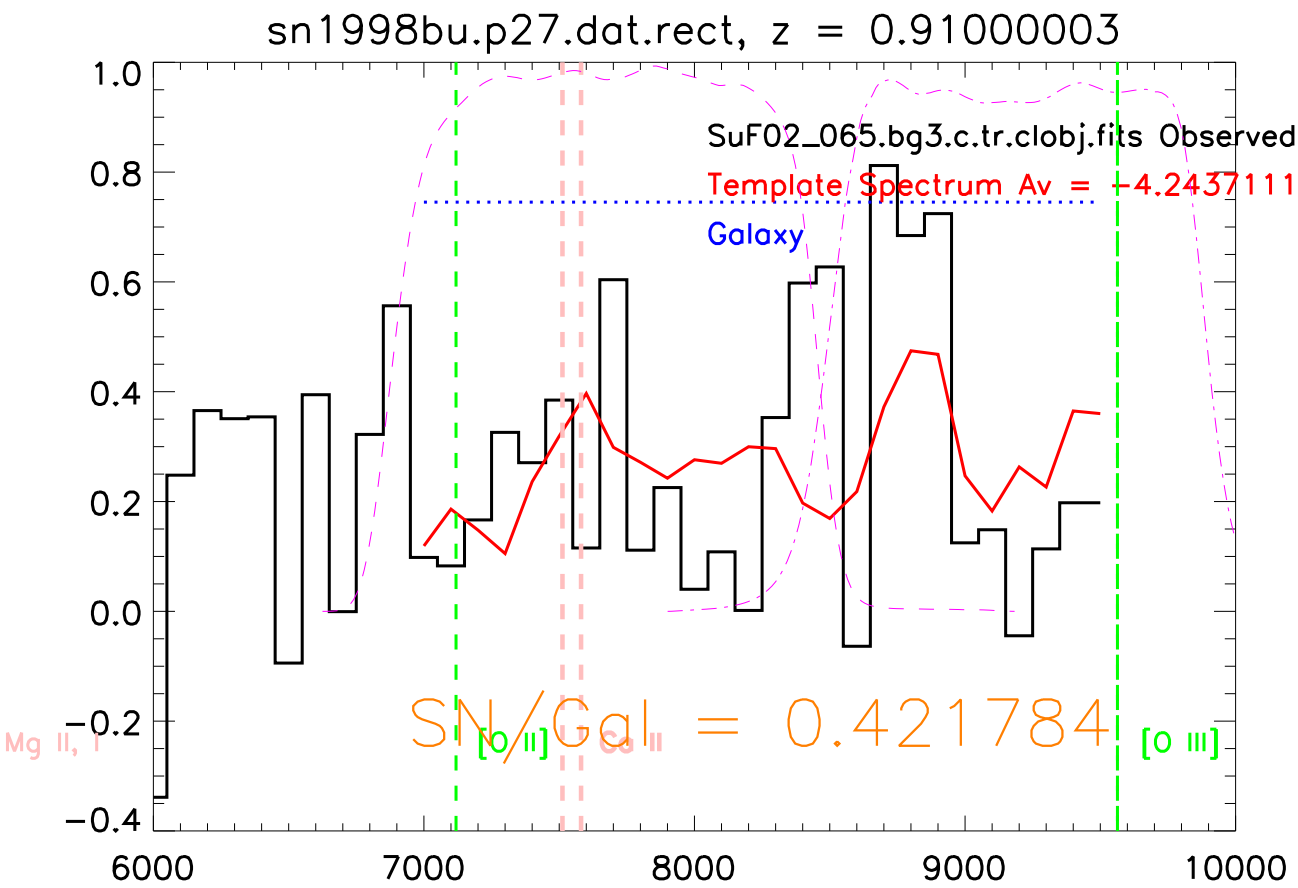

sn1991t.m00.dat.rect, z = 0.88999999
SuF02_065.bg3.c.tr.clobj.fits Observed − Galaxy
Template Spectrum Av = 2.0753536
Galaxy
SN/Gal = 0.585563
Mg II, I
[O II]
Ca II
[O III]
1.2
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
6000
7000
8000
9000
10000

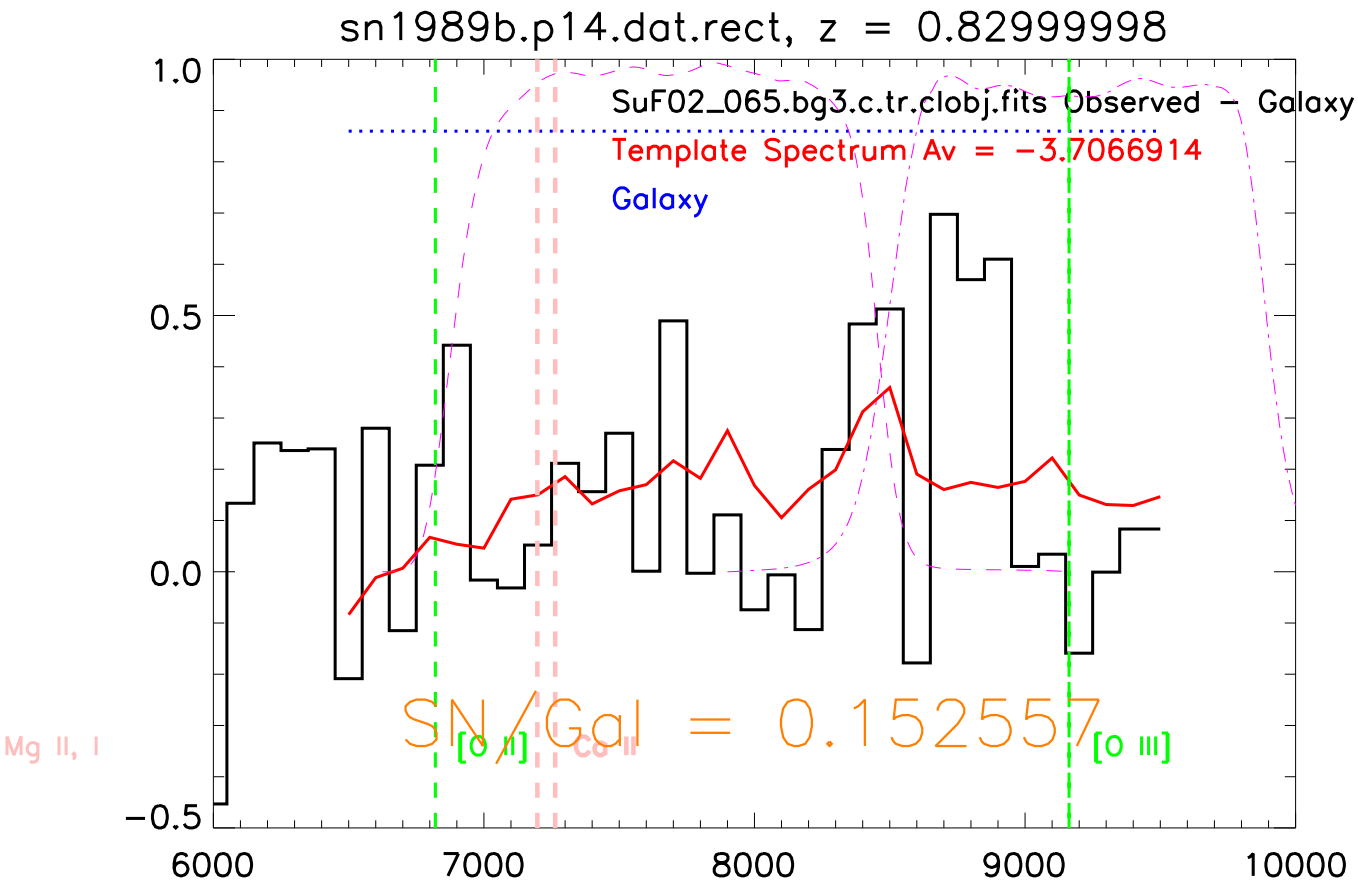

sn1991t.p45.dat.rect, z = 0.89999998
SuF02_065.bg3.c.tr.clobj.fits Observed – Galaxy
Template Spectrum Av = −0.71329872
Galaxy
SN/Gal = 0.112674
Mg II, I
[O II]
Ca II
[O III]
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

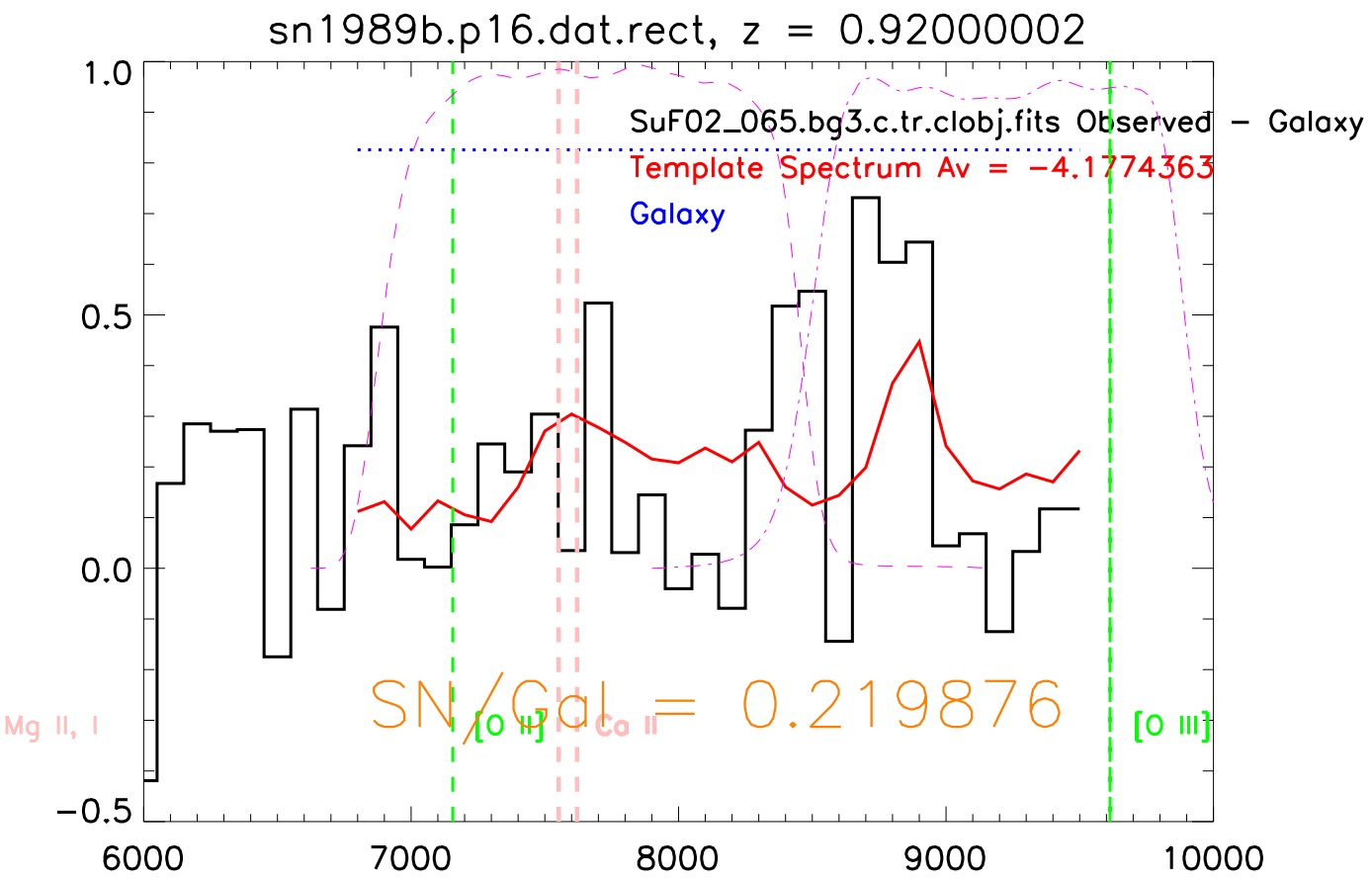

sn1992a.p07.dat.rect, z = 0.88000000
SuF02_065.bg3.c.tr.clobj.fits Observed = Galaxy
Template Spectrum Av = 0.33868672
Galaxy
SN/Gal = 0.387588
[O II]
Ca II
[O III]
Mg II,
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
−0.4
6000
7000
8000
9000
10000

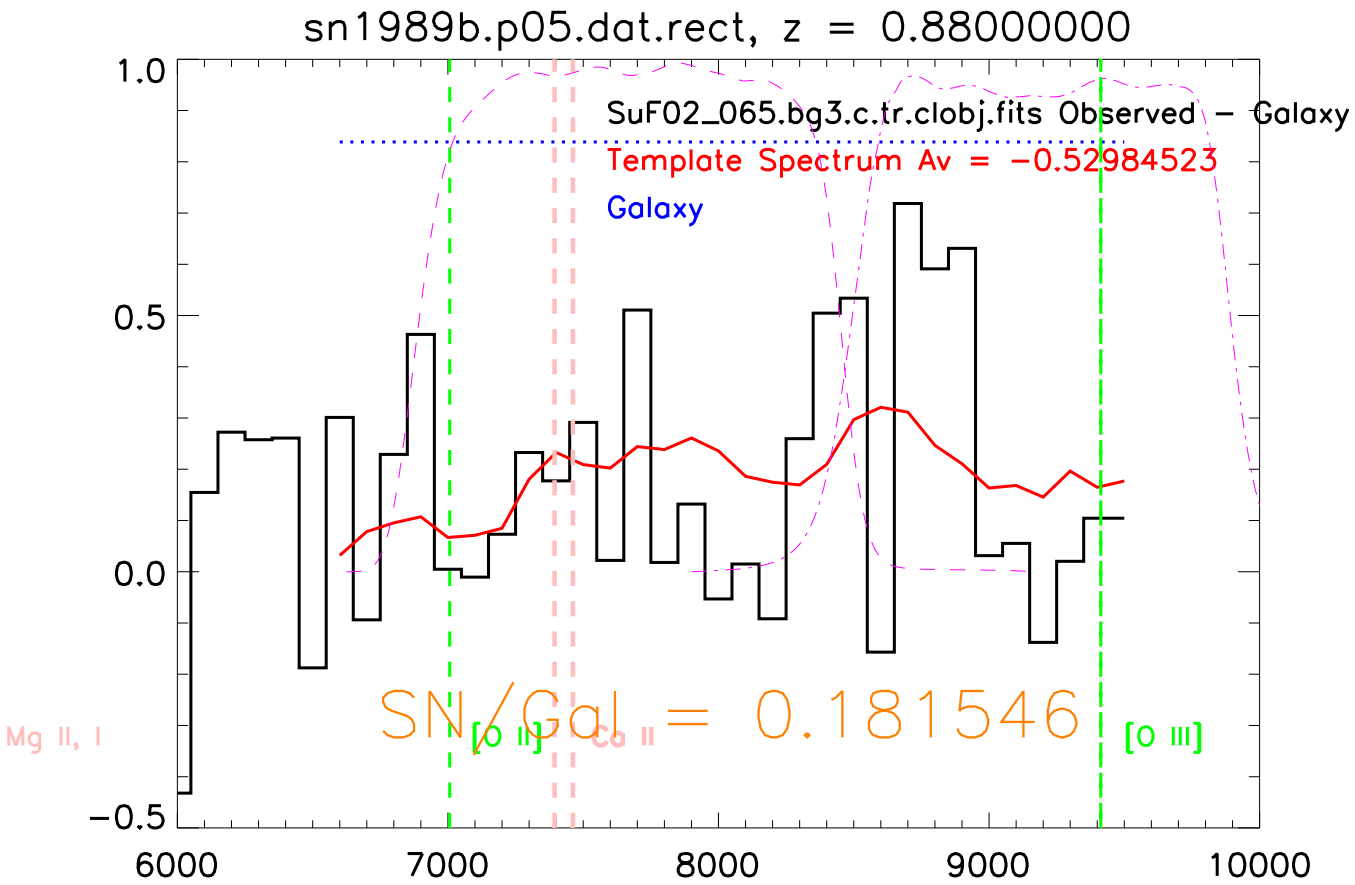

sn1994d.p25.dat.rect, z = 0.94000000
SuF02_065.bg3.c.tr.clobj.fits Observed − Galaxy
Template Spectrum Av = −1.5256647
Galaxy
SN/Gal = 0.0225600
Mg II, I
[O II]
Ca II
[O III]
1.5
1.0
0.5
0.0
−0.5
−1.0
6000
7000
8000
9000
10000

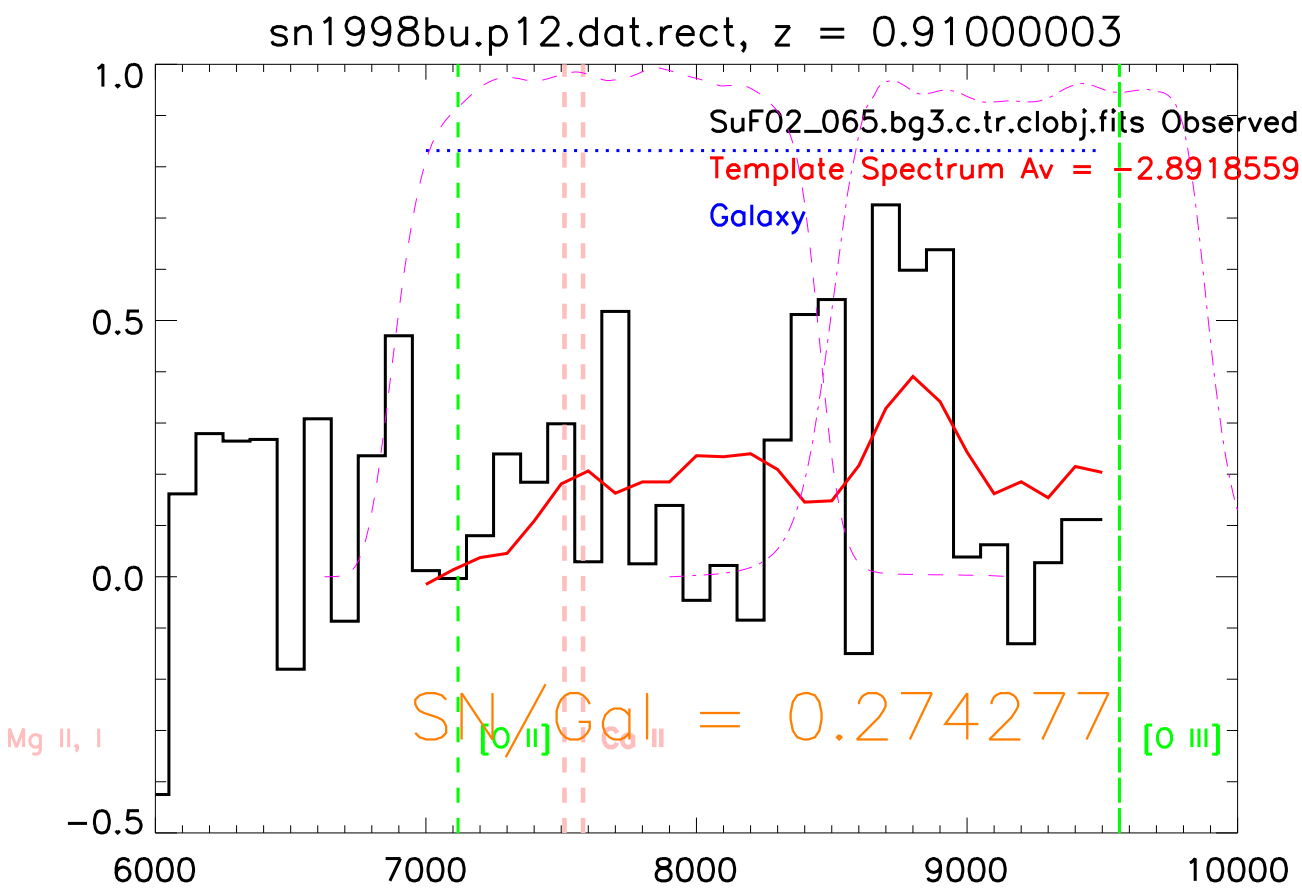

sn1992a.p06.dat.rect, z = 0.88000000
SuF02_065.bg3.c.tr.clobj.fits Observed – Galaxy
Template Spectrum Av = 0.27249323
Galaxy
SN/Gdl = 0.236657
Mg II, I
[O II]
Ca II
[O III]
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
−0.4
6000
7000
8000
9000
10000

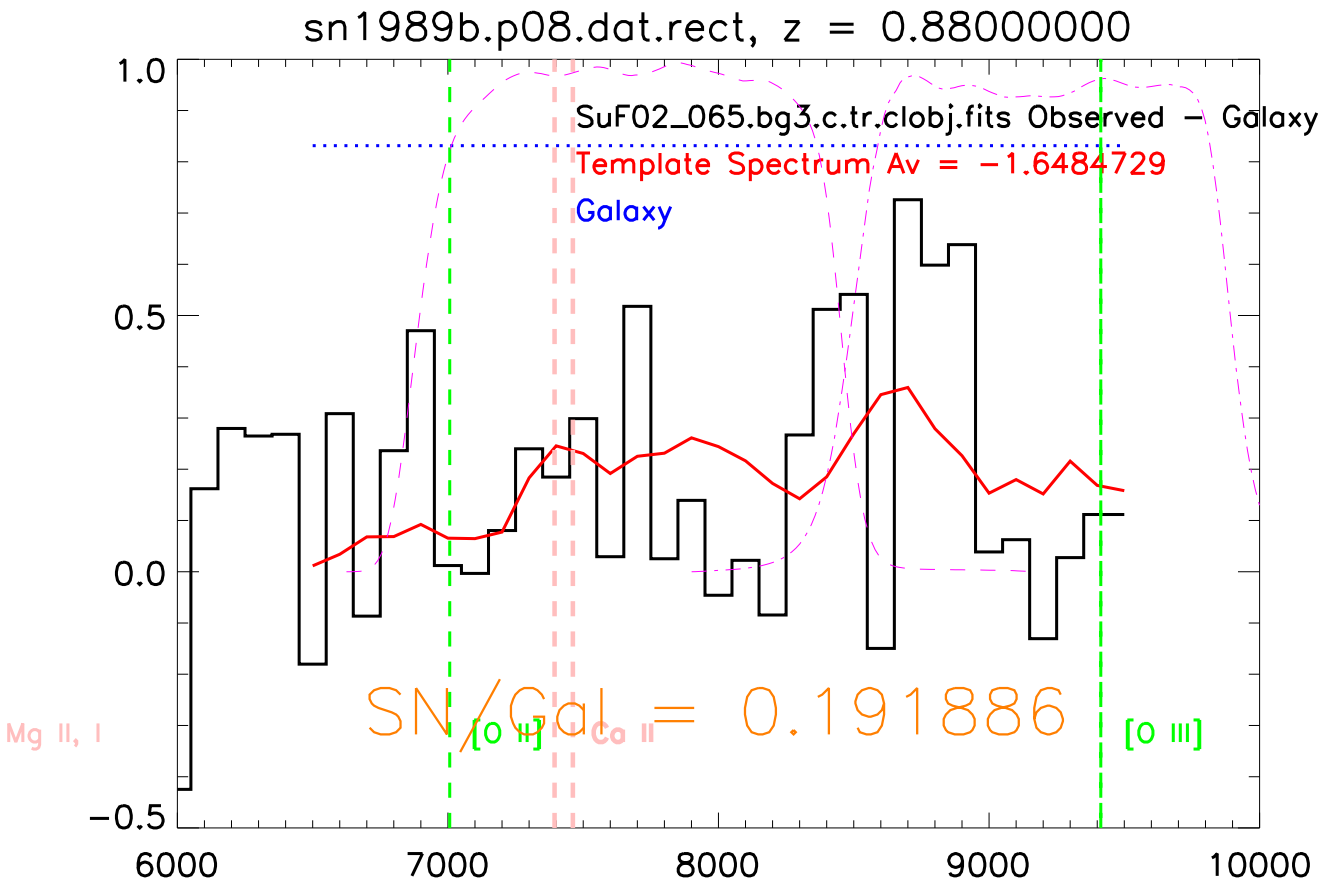

sn1998bu.p27.dat.rect, z = 0.91000003
SuF02_065.bg3.c.tr.clobj.fits Observed – Galaxy
Template Spectrum Av = -4.2437111
Galaxy
S/N/Gal = 0.421784
Mg II, I
[O II]
Ca II
[O III]
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
−0.4
6000
7000
8000
9000
10000

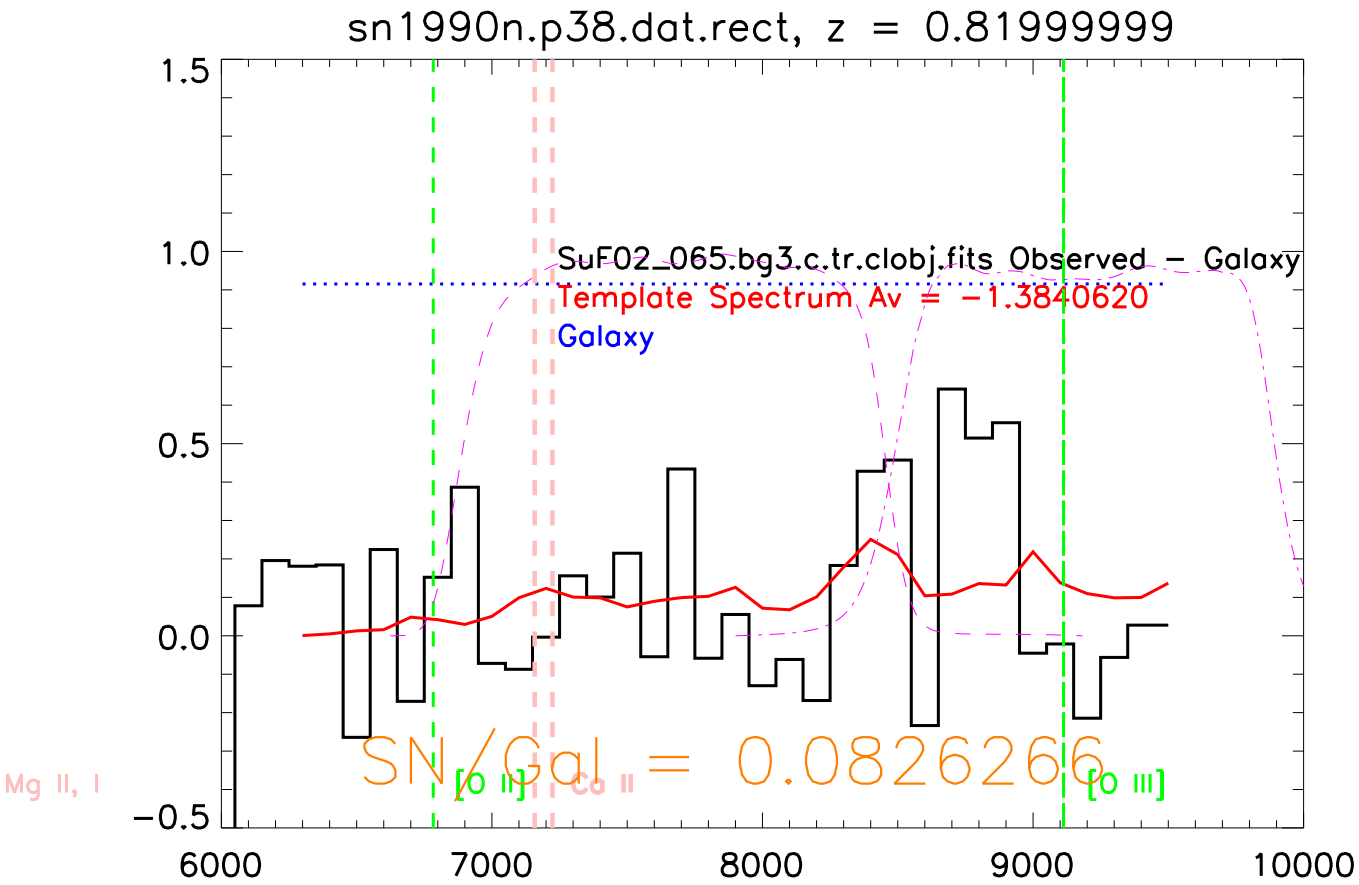

sn1989b.p14.dat.rect, z = 0.82999998
SuF02_065.bg3.c.tr.clobj.fits Observed – Galaxy
Template Spectrum Av = −3.7066914
Galaxy
SN/Gal = 0.152557
[O II]
Ca II
[O III]
Mg II, I
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

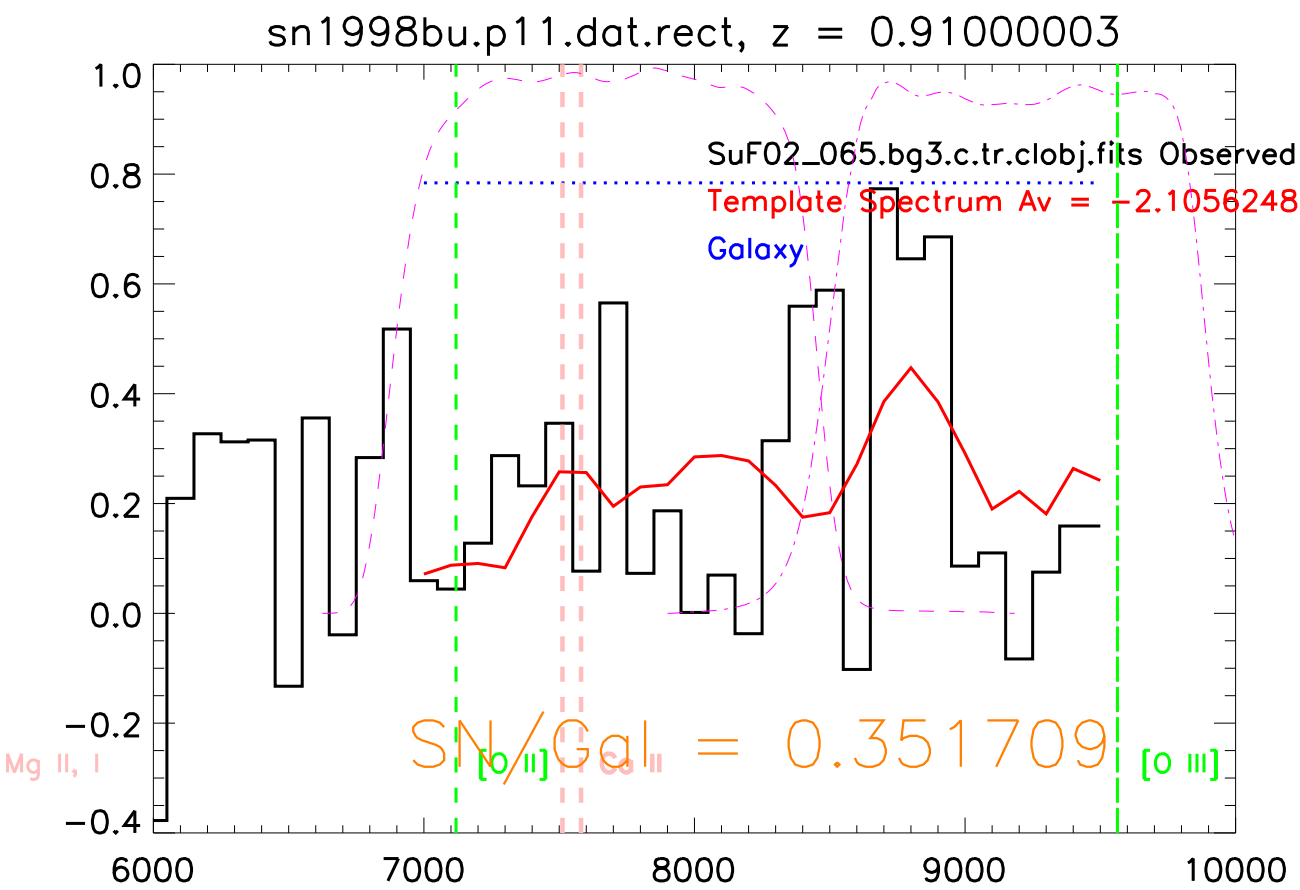

sn1989b.p16.dat.rect, z = 0.92000002
SuF02_065.bg3.c.tr.clobj.fits Observed − Galaxy
Template Spectrum Av = −4.1774363
Galaxy
SN/Gal = 0.219876
Mg II, I
[O II]
Ca II
[O III]
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

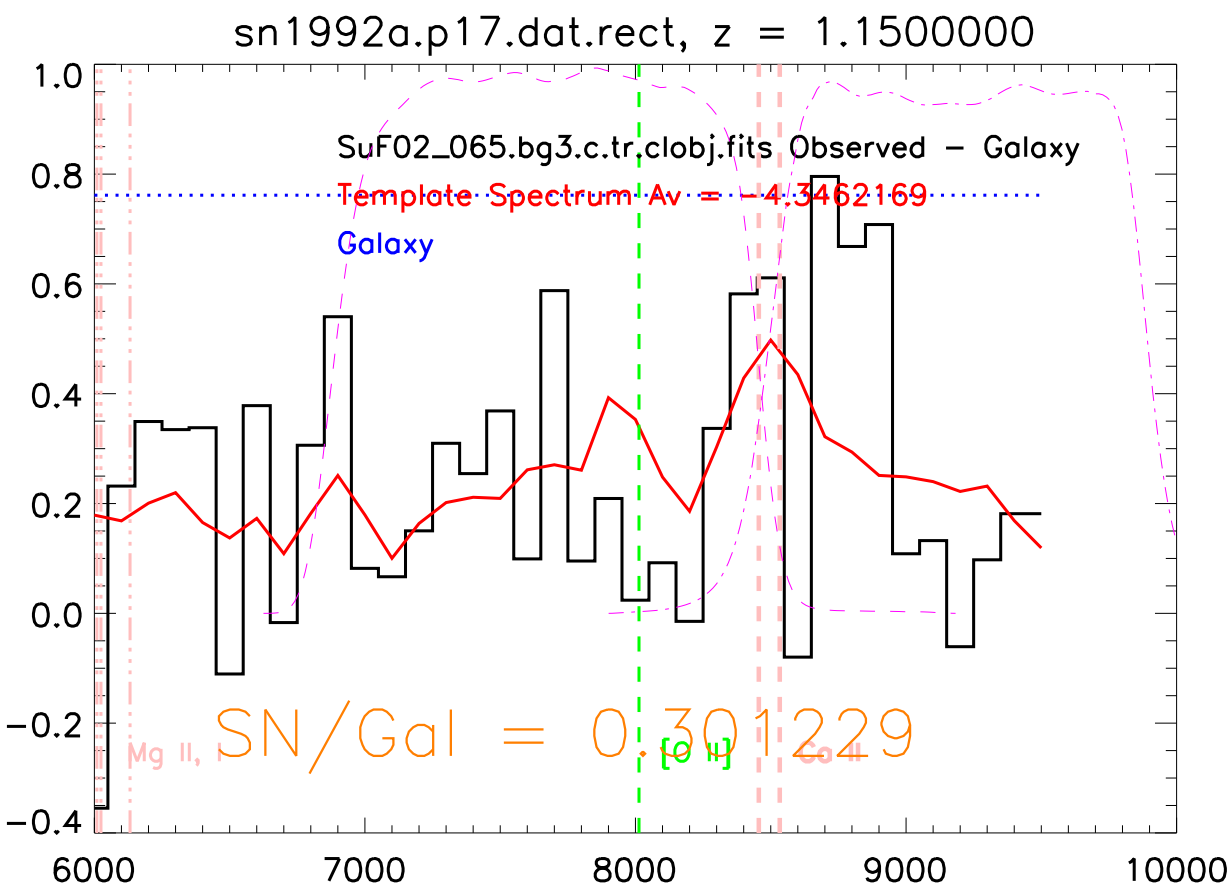

sn1989b.p05.dat.rect, z = 0.88000000
SuF02_065.bg3.c.tr.clobj.fits Observed − Galaxy
Template Spectrum Av = −0.52984523
Galaxy
SN/Gal = 0.181546
Mg II, I
[O II]
Ca II
[O III]
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

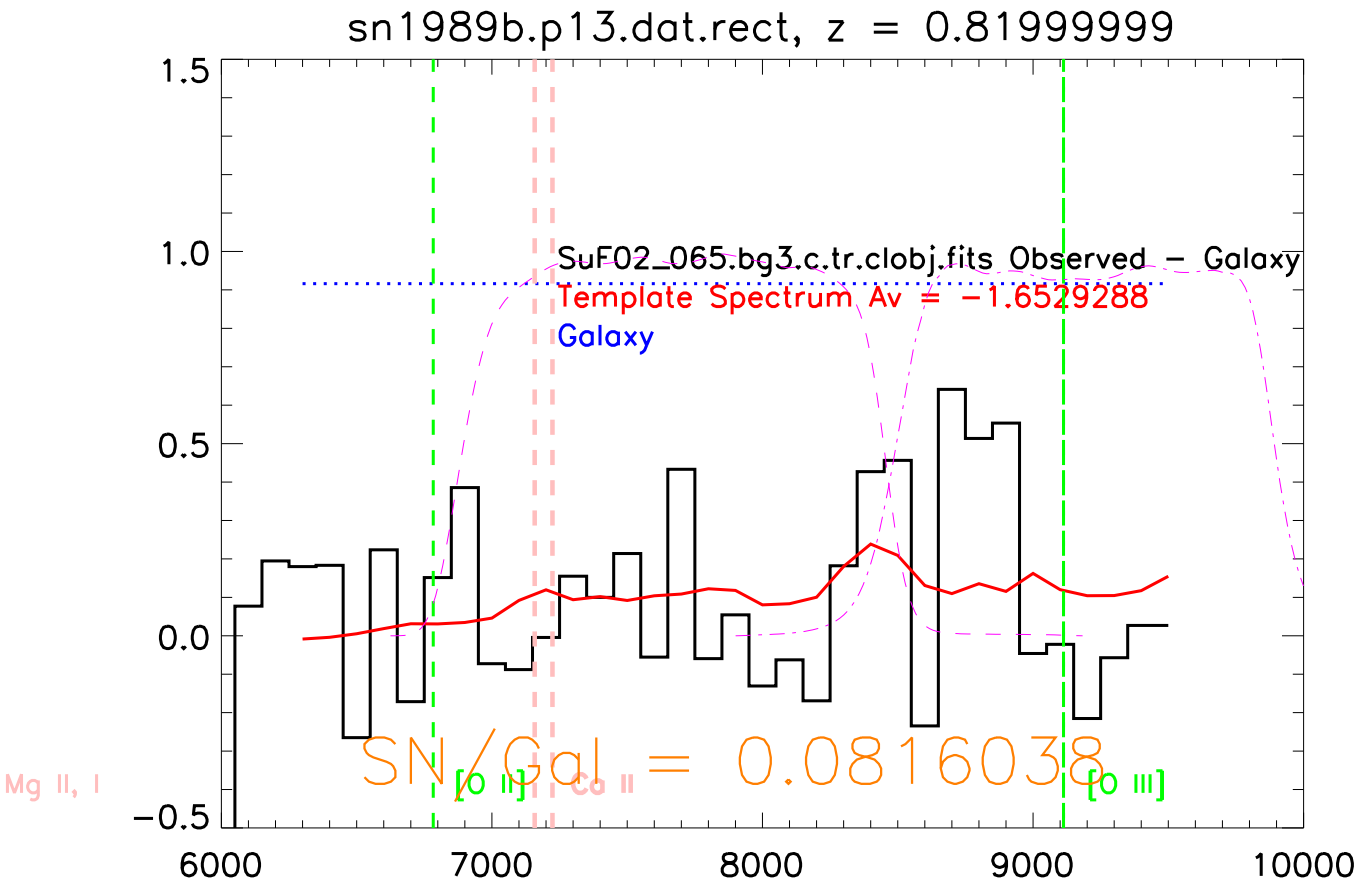

sn1998bu.p12.dat.rect, z = 0.91000003
SuF02_065.bg3.c.tr.clobj.fits Observed – Galaxy
Template Spectrum Av = −2.8918559
Galaxy
SN/Gal = 0.274277
Mg II, I
[O II]
Ca II
[O III]
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

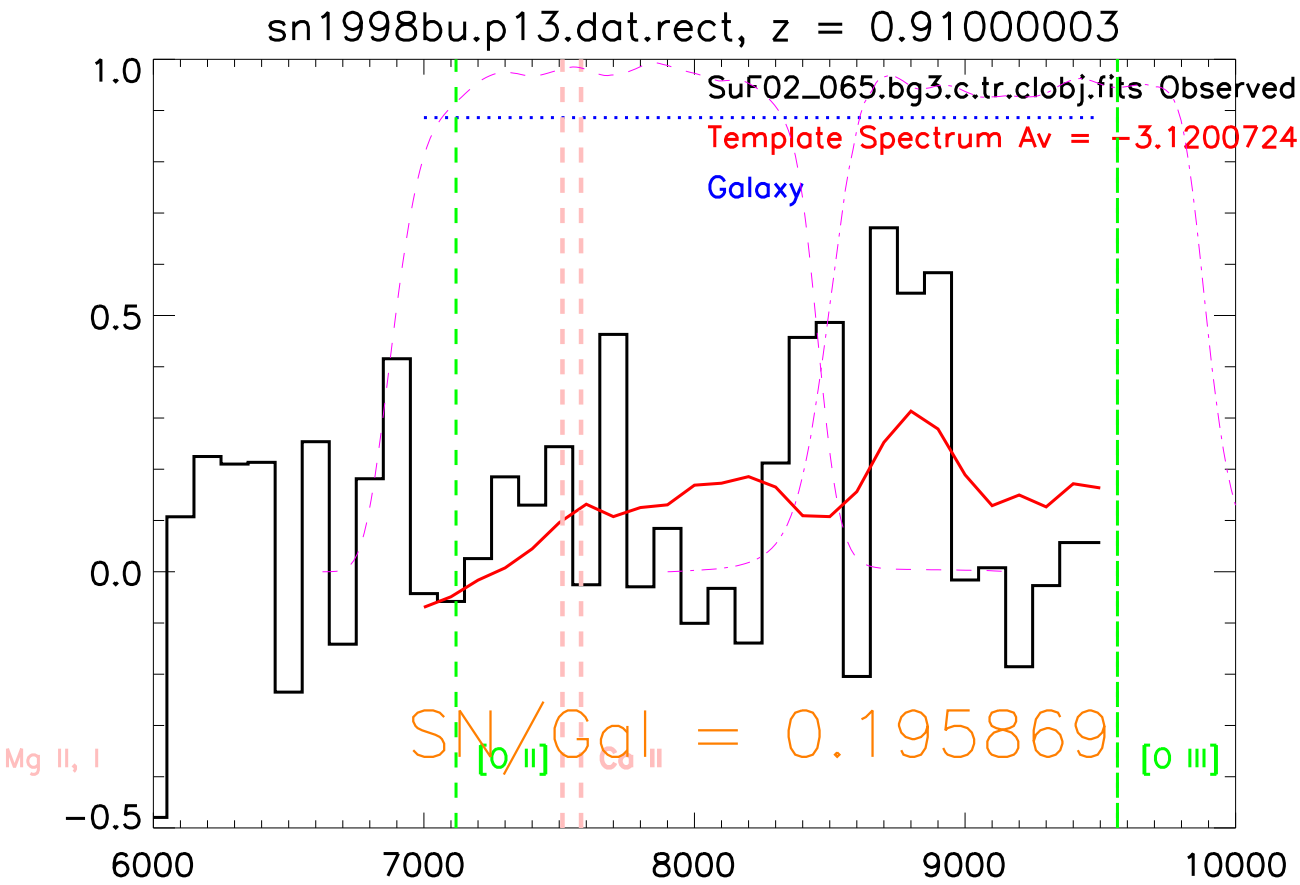

sn1989b.p08.dat.rect, z = 0.88000000
SuF02_065.bg3.c.tr.clobj.fits Observed – Galaxy
Template Spectrum Av = −1.6484729
Galaxy
SN/Gal = 0.191886
Mg II, I
[O II]
Ca II
[O III]
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

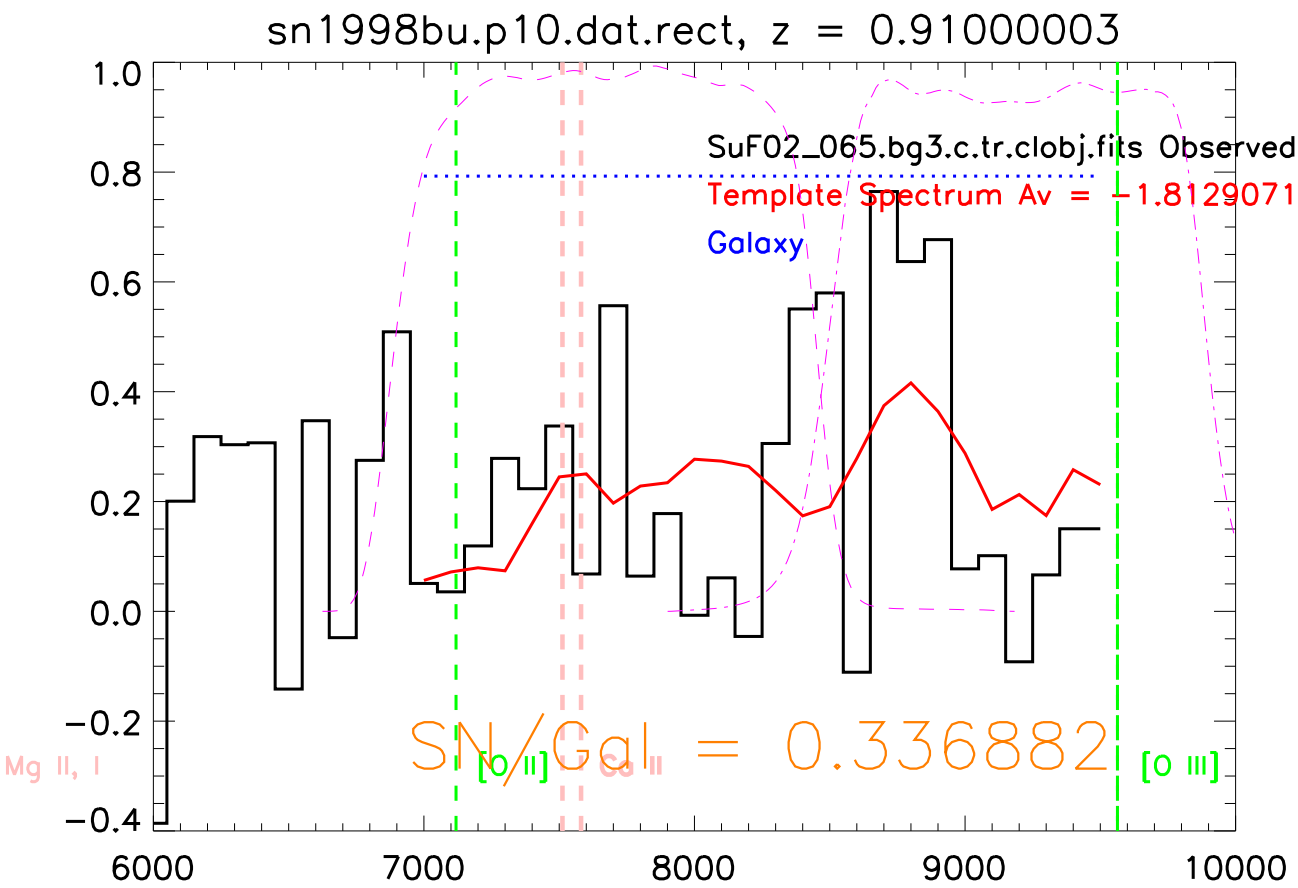

sn1990n.p38.dat.rect, z = 0.81999999
SuF02_065.bg3.c.tr.clobj.fits Observed − Galaxy
Template Spectrum Av = −1.3840620
Galaxy
SN/Gal = 0.0826266
Mg II, I
[O II]
Ca II
[O III]
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

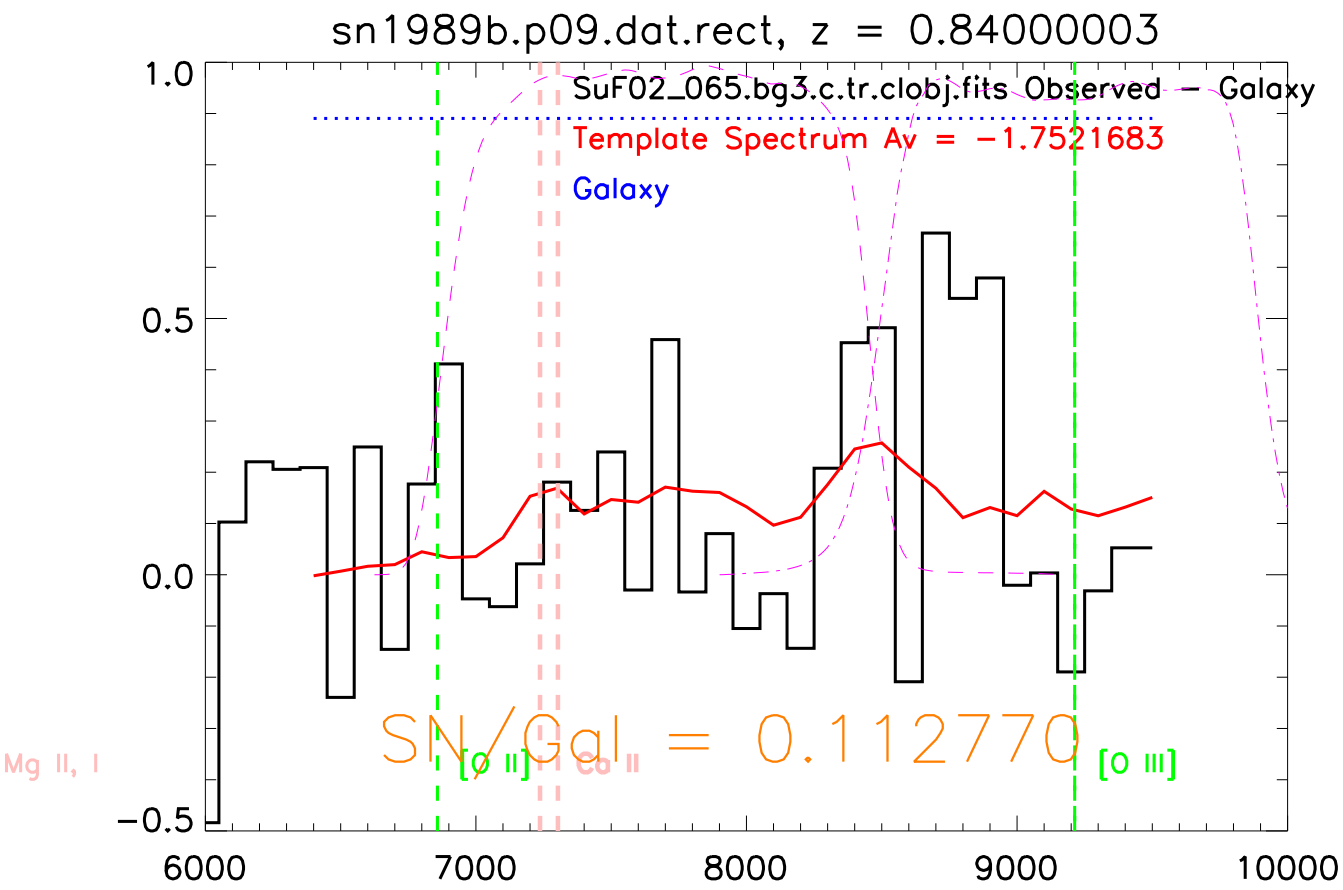

sn1998bu.p11.dat.rect, z = 0.91000003
SuF02_065.bg3.c.tr.clobj.fits Observed – Galaxy
Template Spectrum Av = −2.1056248
Galaxy
S/N/Gal = 0.351709
Mg II, I
[O II]
Ca II
[O III]
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
−0.4
6000
7000
8000
9000
10000

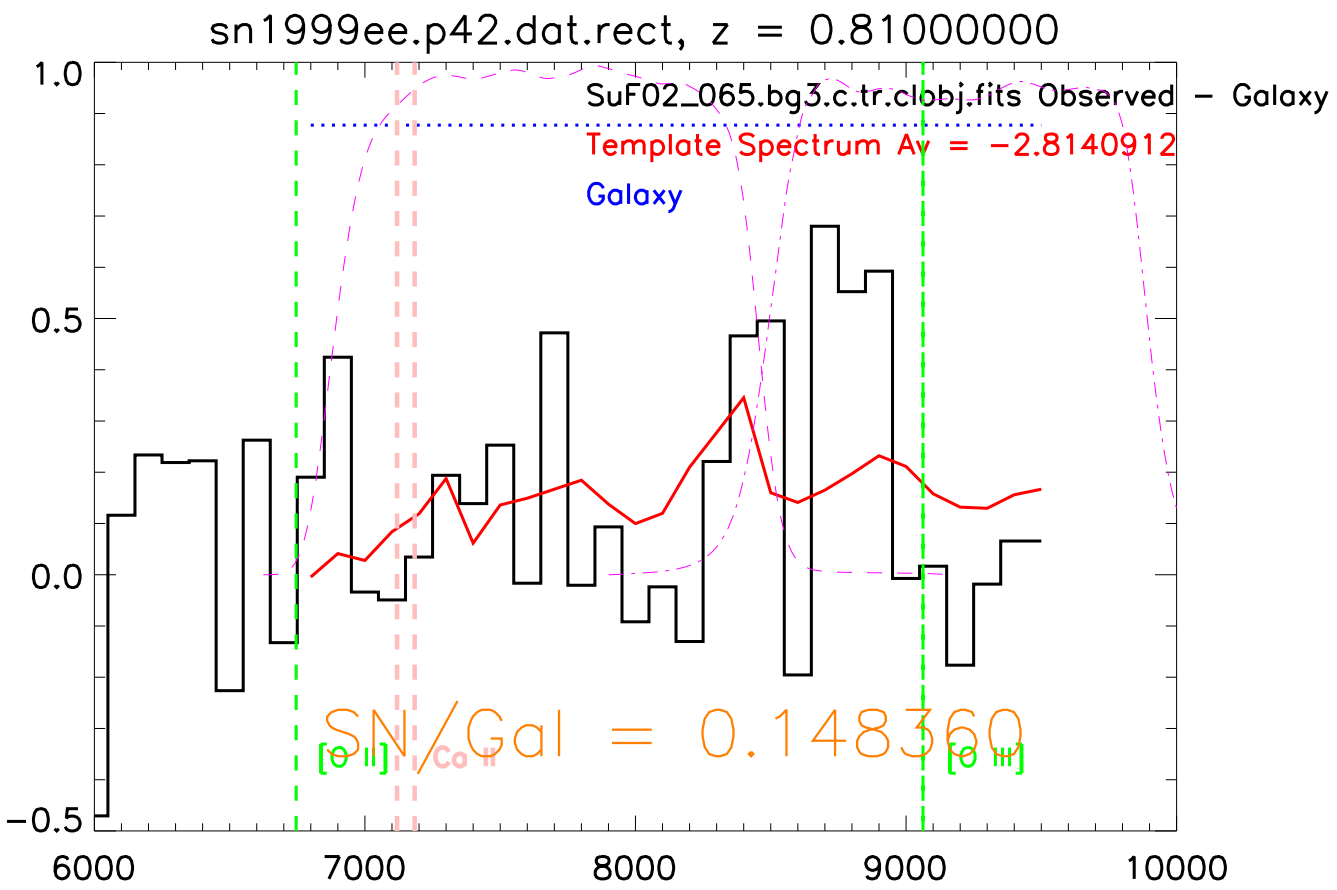

sn1992a.p17.dat.rect, z = 1.1500000
SuF02_065.bg3.c.tr.clobj.fits Observed − Galaxy
Template Spectrum Av = −4.3462169
Galaxy
SN/Gal = 0.301229
Mg II, I
[O II]
Ca II
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
−0.4
6000
7000
8000
9000
10000

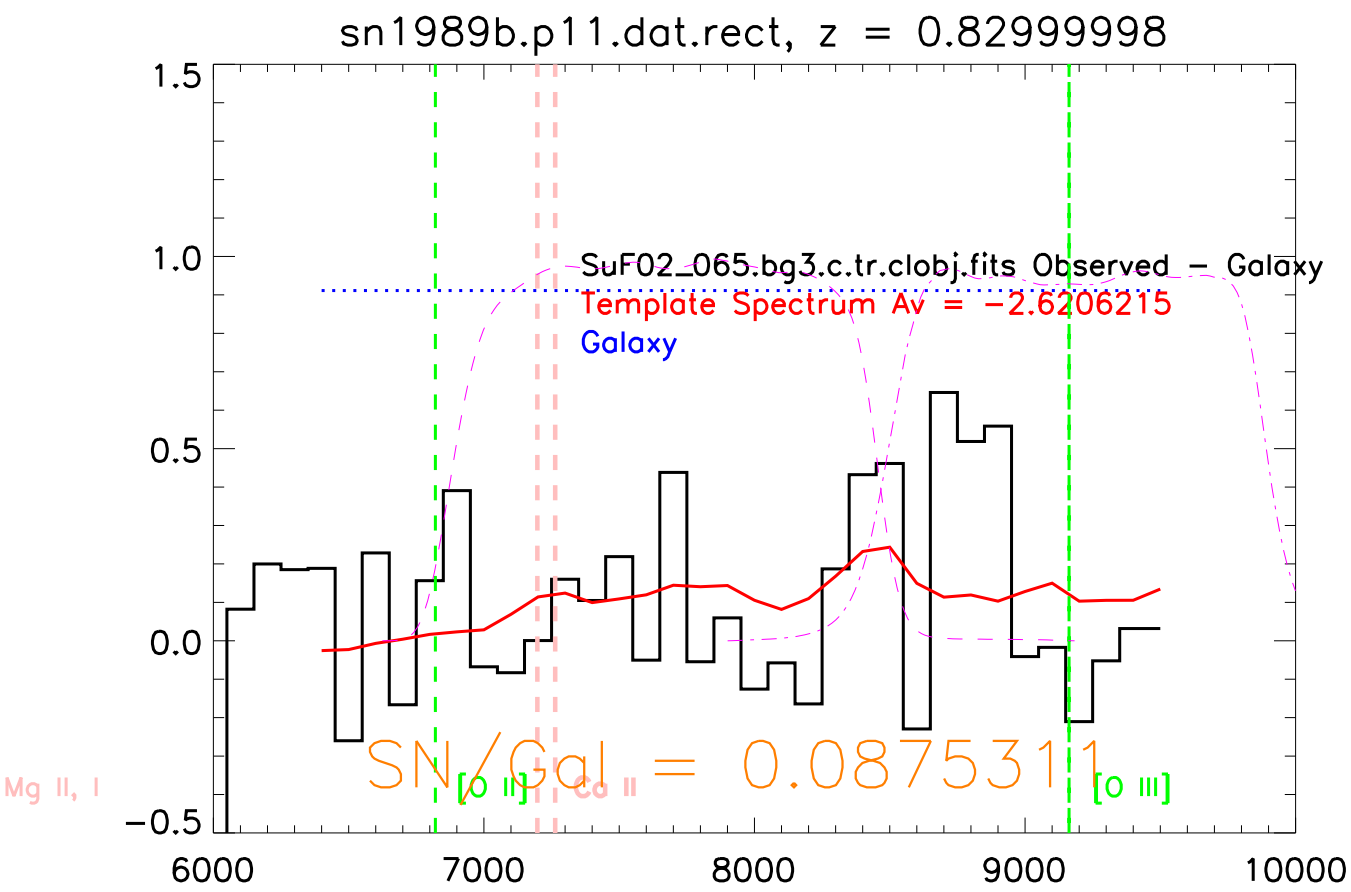

sn1989b.p13.dat.rect, z = 0.81999999
SuF02_065.bg3.c.tr.clobj.fits Observed − Galaxy
Template Spectrum Av = −1.6529288
Galaxy
SN/Gal = 0.0816038
Mg II, I
[O II]
Ca II
[O III]
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

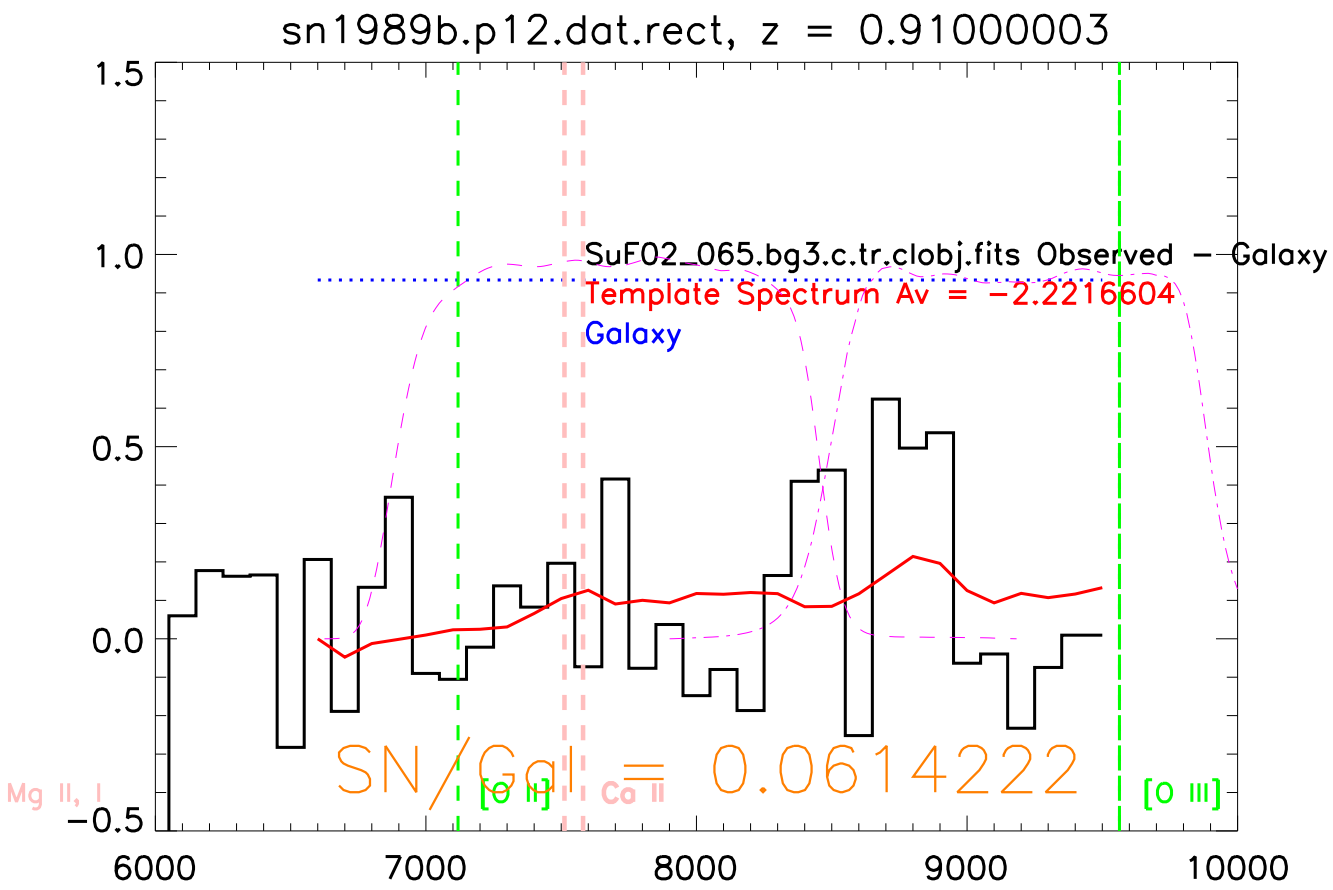

sn1998bu.p13.dat.rect, z = 0.91000003
SuF02_065.bg3.c.tr.clobj.fits Observed − Galaxy
Template Spectrum Av = 3.1200724
Galaxy
SN/Gal = 0.195869
Mg II, I
[O II]
Ca II
[O III]
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

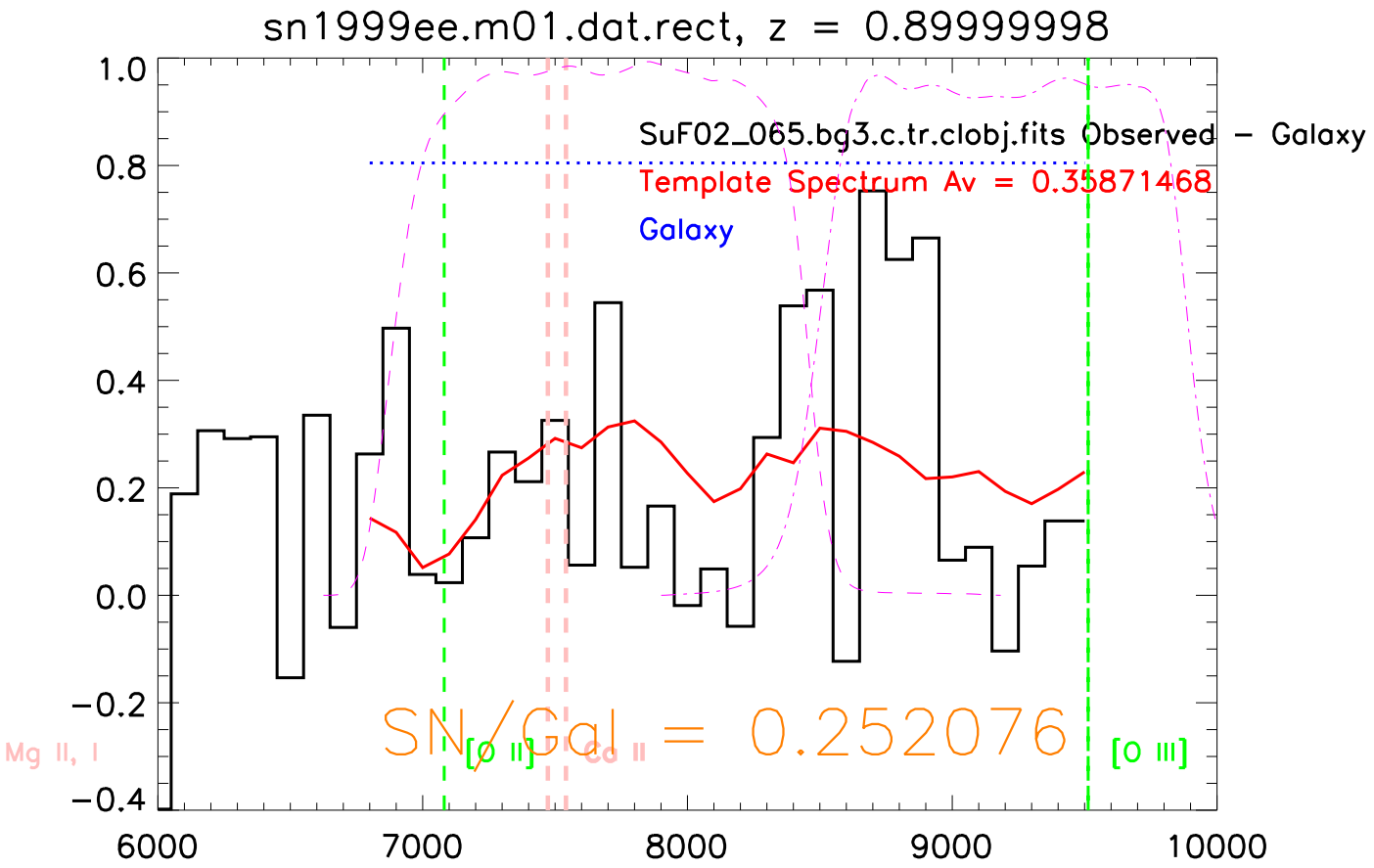

sn1998bu.p10.dat.rect, z = 0.91000003
SuF02_065.bg3.c.tr.clobj.fits Observed – Galaxy
Template Spectrum Av = -1.8129071
Galaxy
SN/Gal = 0.336882
Mg II, I
[O II]
Ca II
[O III]
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
−0.4
6000
7000
8000
9000
10000

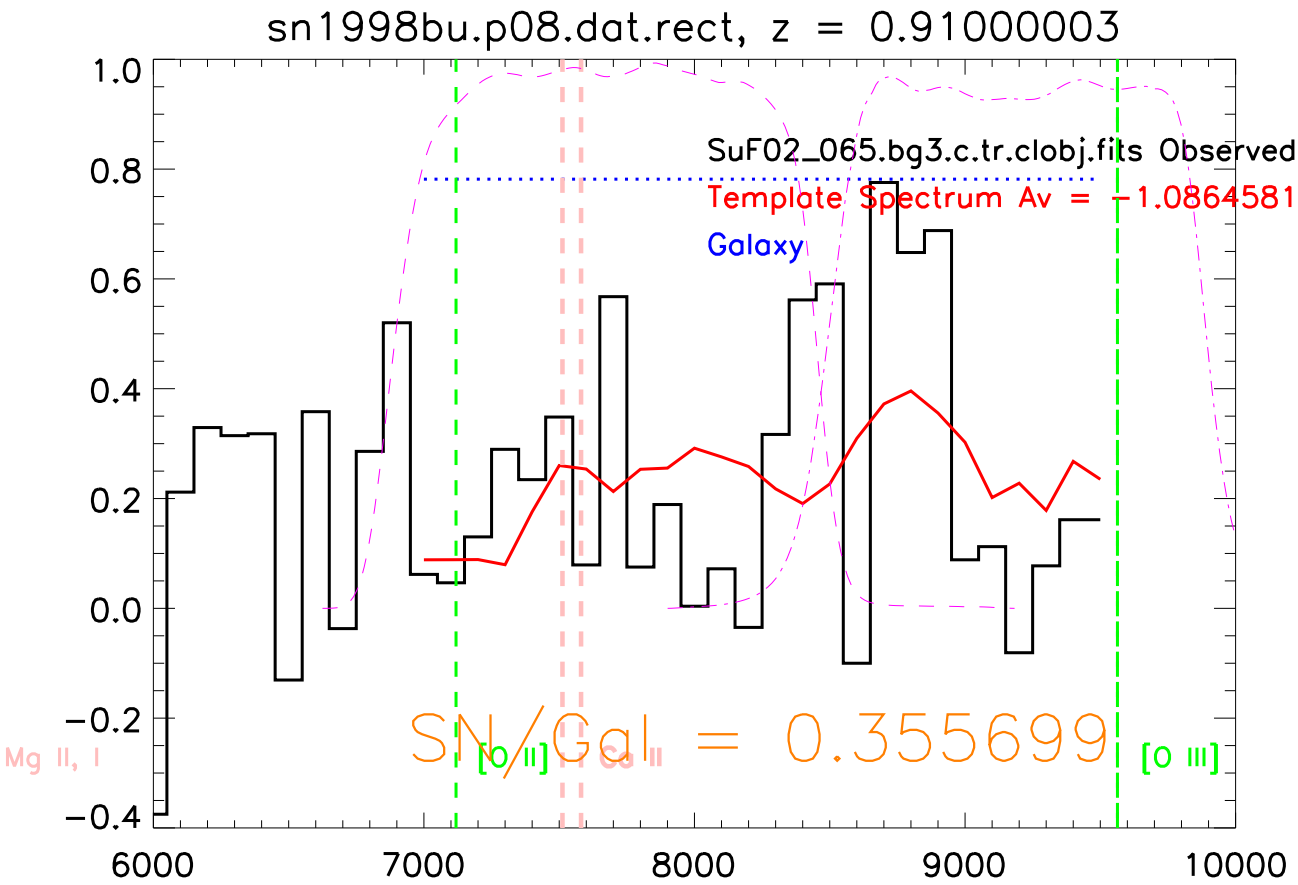

sn1989b.p09.dat.rect, z = 0.84000003
SuF02_065.bg3.c.tr.clobj.fits Observed − Galaxy
Template Spectrum Av = −1.7521683
Galaxy
SN/Gal = 0.112770
[O II]
Ca II
[O III]
Mg II, I
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

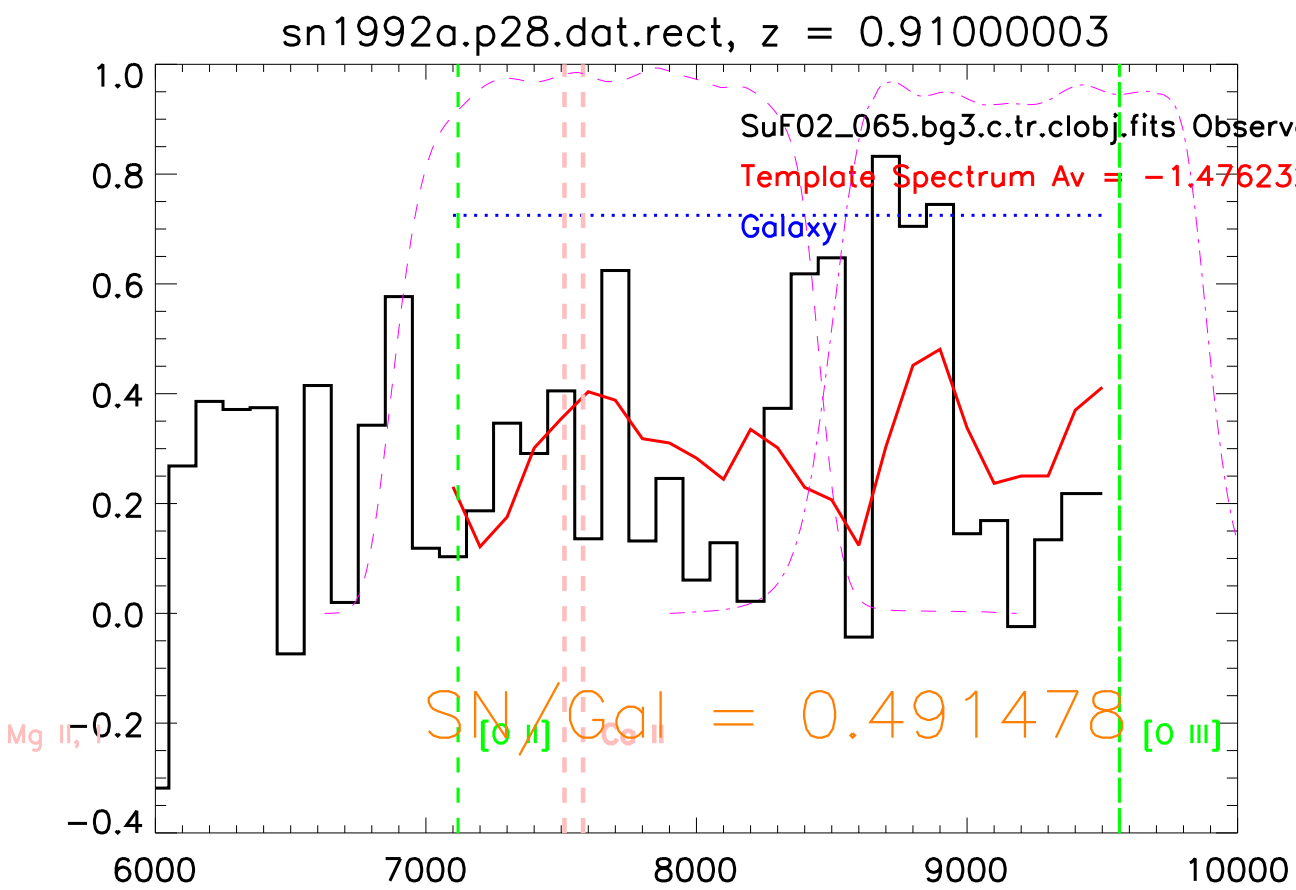

sn1999ee.p42.dat.rect, z = 0.81000000
SuF02_065.bg3.c.tr.clobj.fits Observed − Galaxy
Template Spectrum Av = −2.8140912
Galaxy
SN/Gal = 0.148360
[O II]
Ca II
[O III]
Mg II, I
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

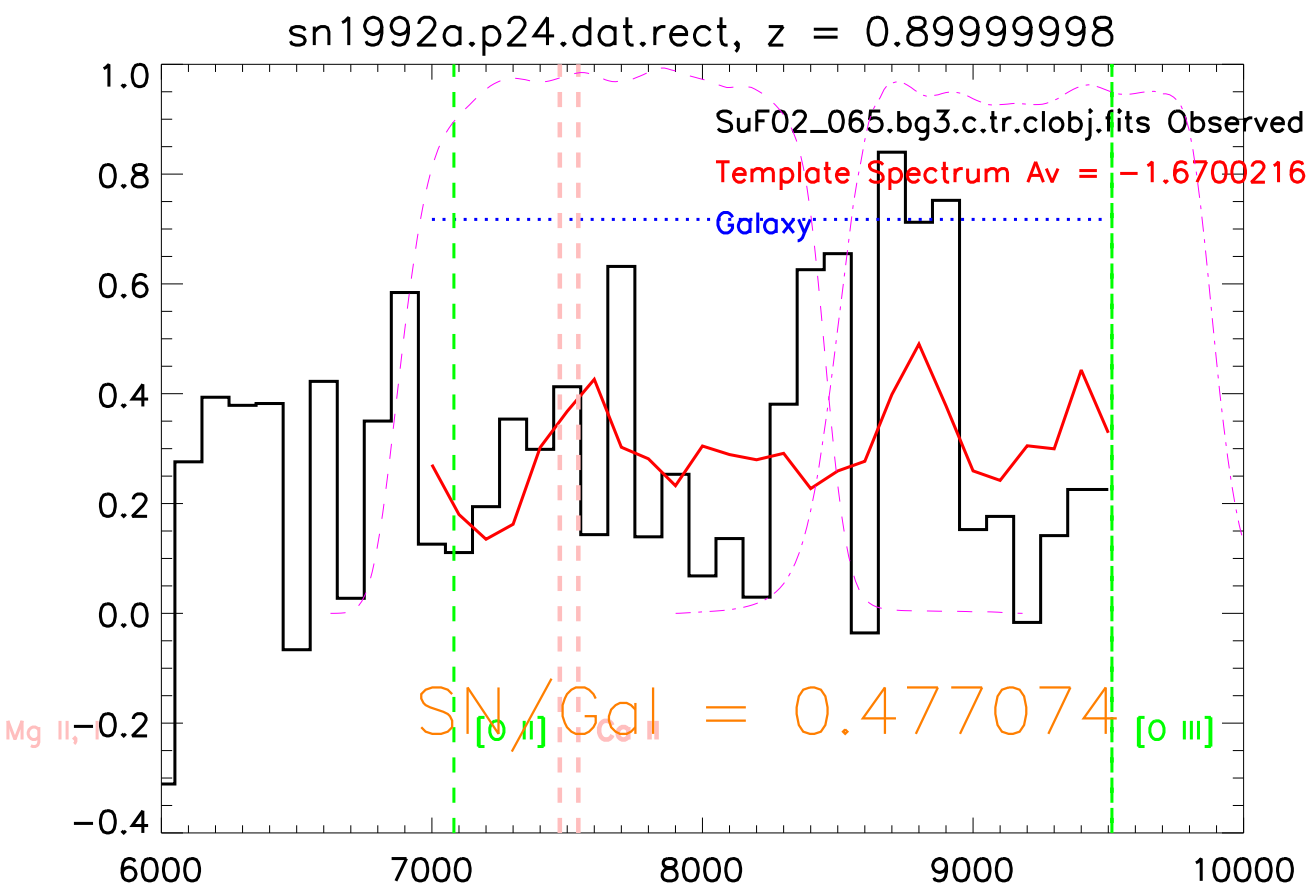

sn1989b.p11.dat.rect, z = 0.82999998
SuF02_065.bg3.c.tr.clobj.fits Observed – Galaxy
Template Spectrum Av = -2.6206215
Galaxy
SN/Gal = 0.0875311
Mg II, I
[O II]
Ca II
[O III]
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

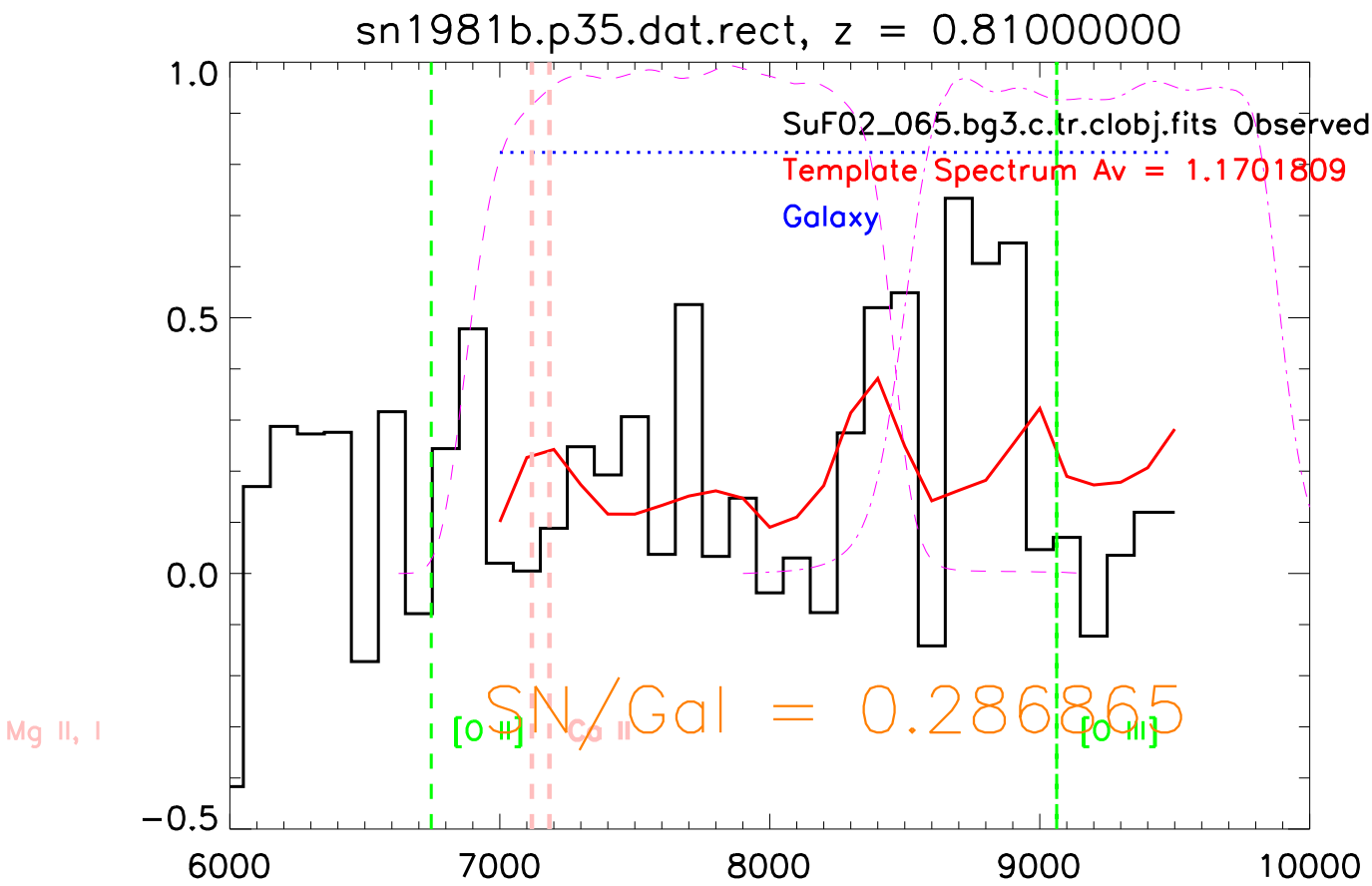

sn1989b.p12.dat.rect, z = 0.91000003
SuF02_065.bg3.c.tr.clobj.fits Observed
Galaxy
Template Spectrum Av = -2.2216604
Galaxy
SN/Gal = 0.0614222
Mg II, I
[O II]
Ca II
[O III]
1.5
1.0
0.5
0.0
-0.5
6000
7000
8000
9000
10000

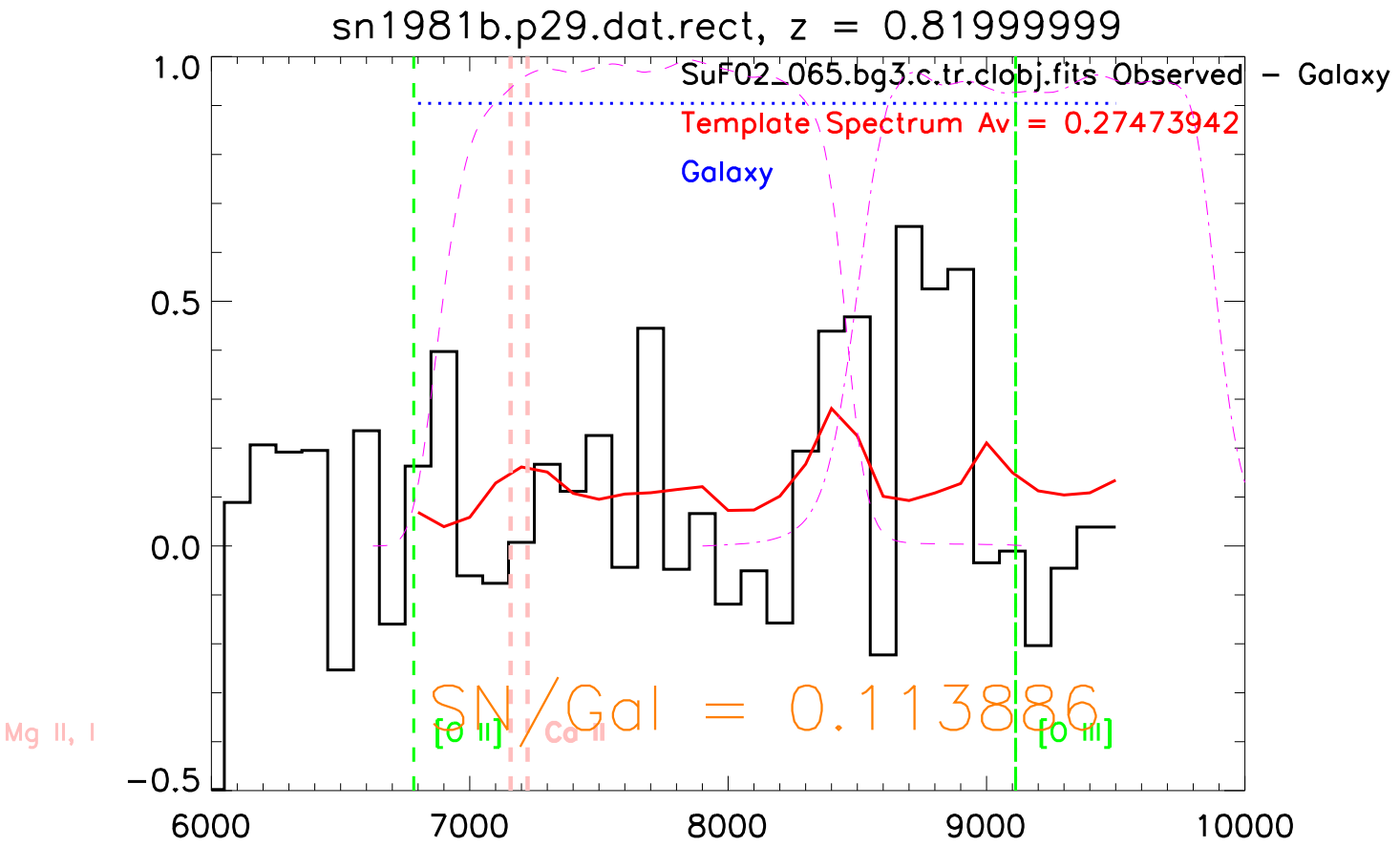

sn1999ee.m01.dat.rect, z = 0.89999998
SuF02_065.bg3.c.tr.clobj.fits Observed − Galaxy
Template Spectrum Av = 0.35871468
Galaxy
SN/Gal = 0.252076
Mg II, I
[O II]
Ca II
[O III]
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
−0.4
6000
7000
8000
9000
10000

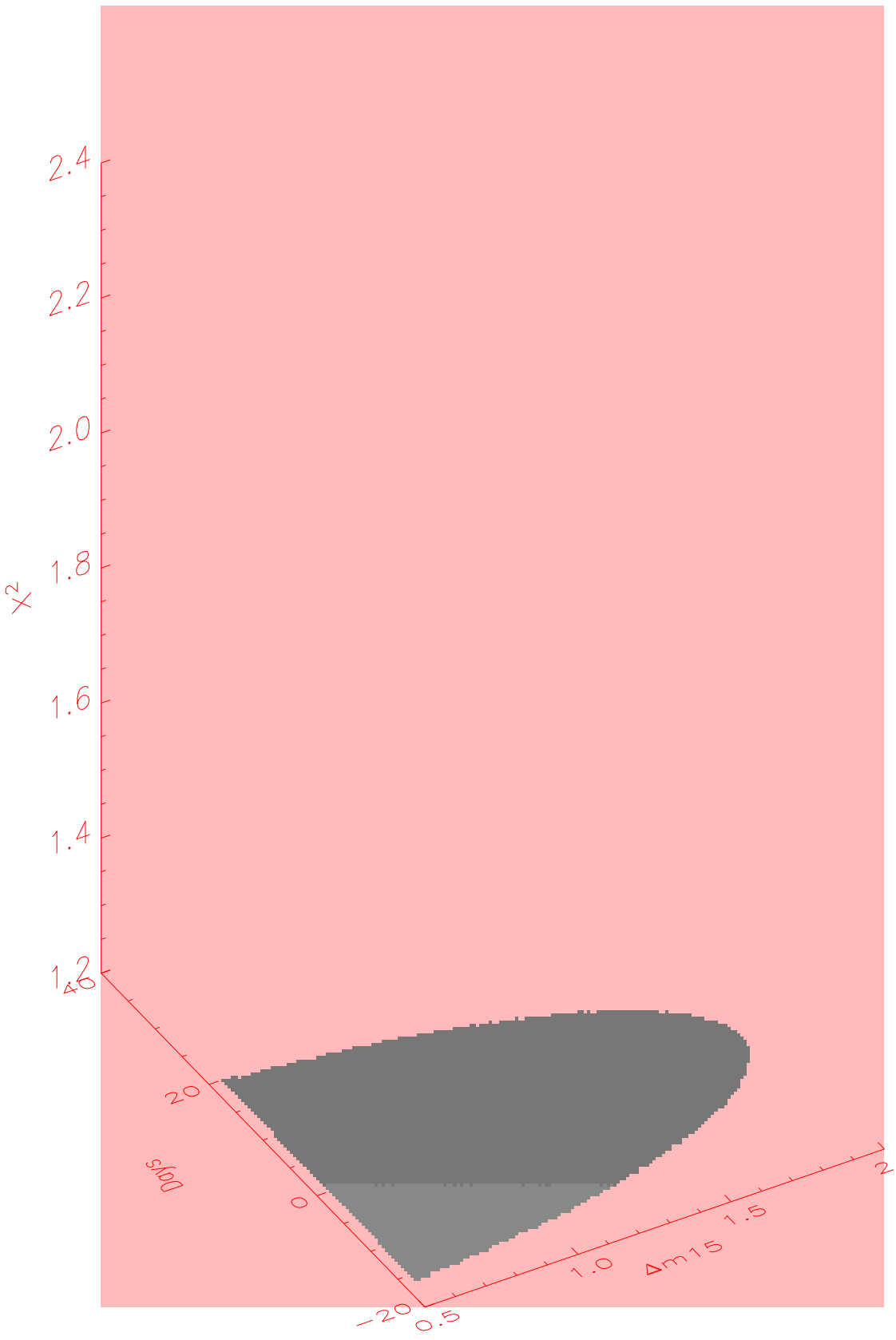

sn1998bu.p08.dat.rect, z = 0.91000003
SuF02_065.bg3.c.tr.clobj.fits Observed – Galaxy
Template Spectrum Av = –1.0864581
Galaxy
S/N/Gal = 0.355699
Mg II, I
[O II]
Ca II
[O III]
1.0
0.8
0.6
0.4
0.2
0.0
–0.2
–0.4
6000
7000
8000
9000
10000


sn1992a.p28.dat.rect, z = 0.91000003
SuF02_065.bg3.c.tr.clobj.fits Observed – Gala
Template Spectrum Av = −1.4762320
Galaxy
SN/Gal = 0.491478
[O II]
[O III]
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
−0.4
6000
7000
8000
9000
10000

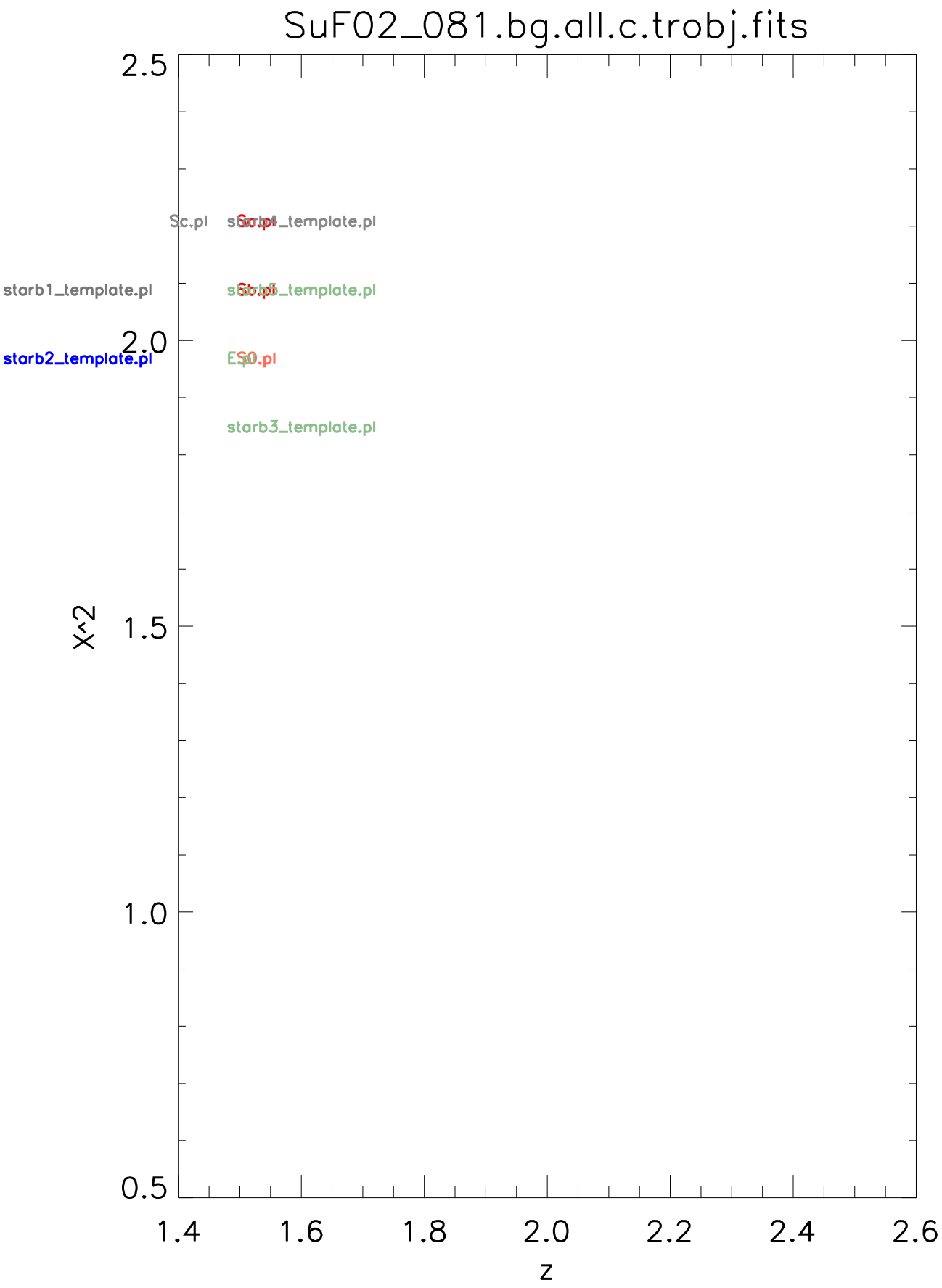

sn1992a.p24.dat.rect, z = 0.89999998
SuF02_065.bg3.c.tr.clobj.fits Observed – Galaxy
Template Spectrum Av = −1.6700216
Galaxy
SN/Gal = 0.477074
[O II]
[O III]
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
−0.4
6000
7000
8000
9000
10000

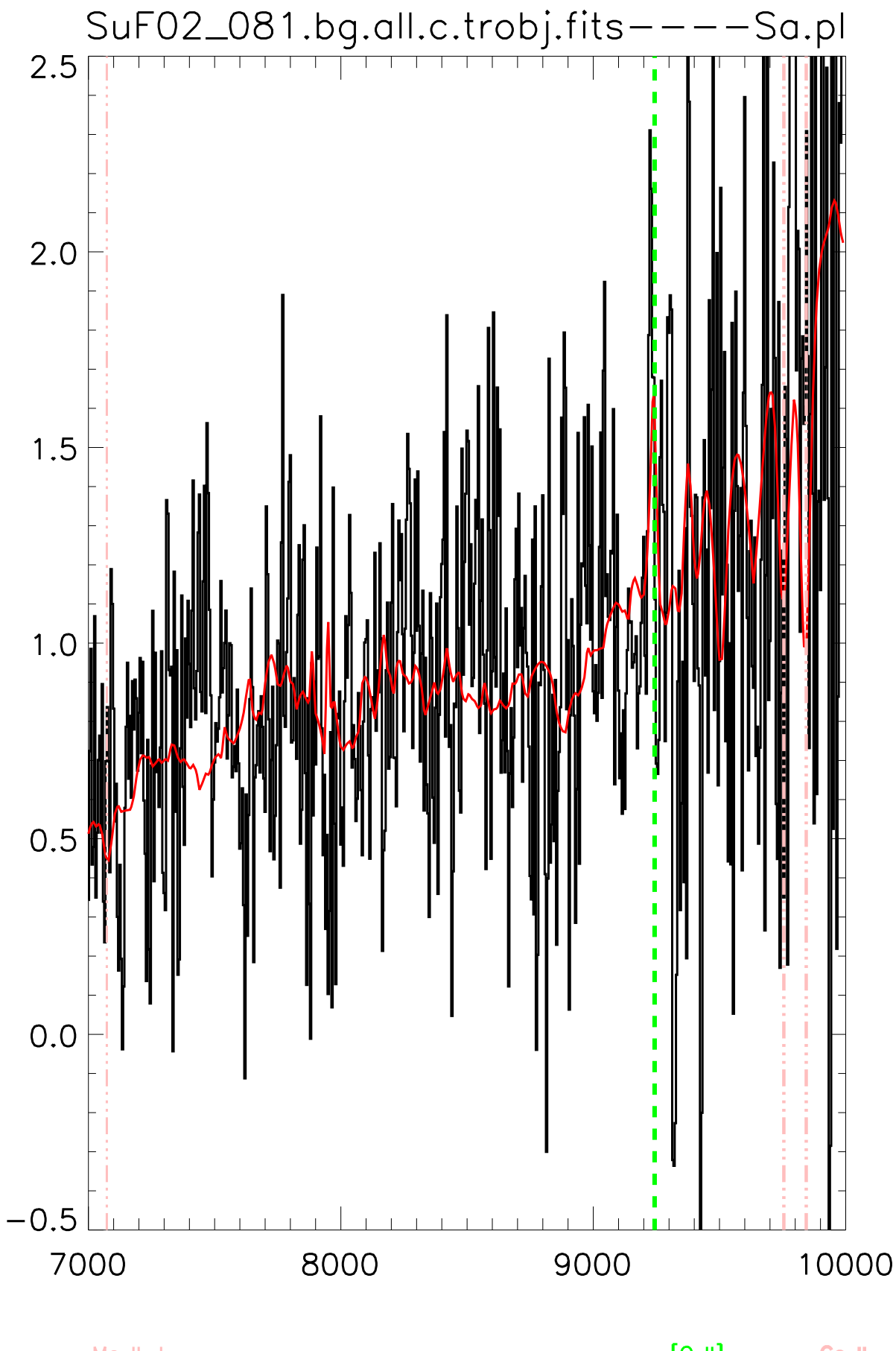

sn1981b.p35.dat.rect, z = 0.81000000
SuF02_065.bg3.c.tr.clobj.fits Observed – Galaxy
Template Spectrum Av = 1.1701809
Galaxy
SN/Gal = 0.286865
Mg II, I
[O II]
Ca II
[O III]
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

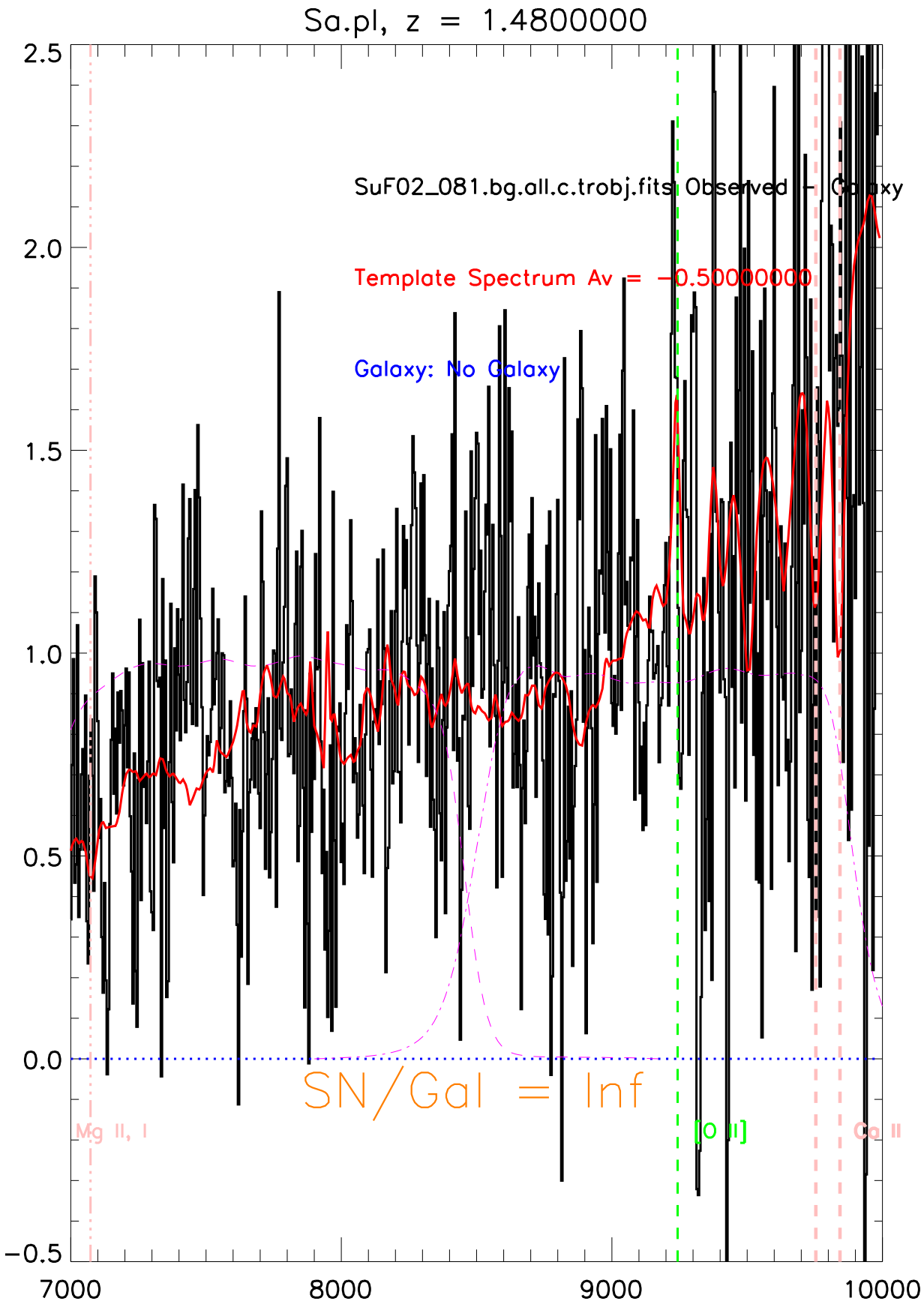

sn1981b.p29.dat.rect, z = 0.81999999
SuF02_065.bg3.c.tr.clobj.fits Observed – Galaxy
Template Spectrum Av = 0.27473942
Galaxy
SN/Gal = 0.113886
[O II]
Ca II
[O III]
Mg II, I
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

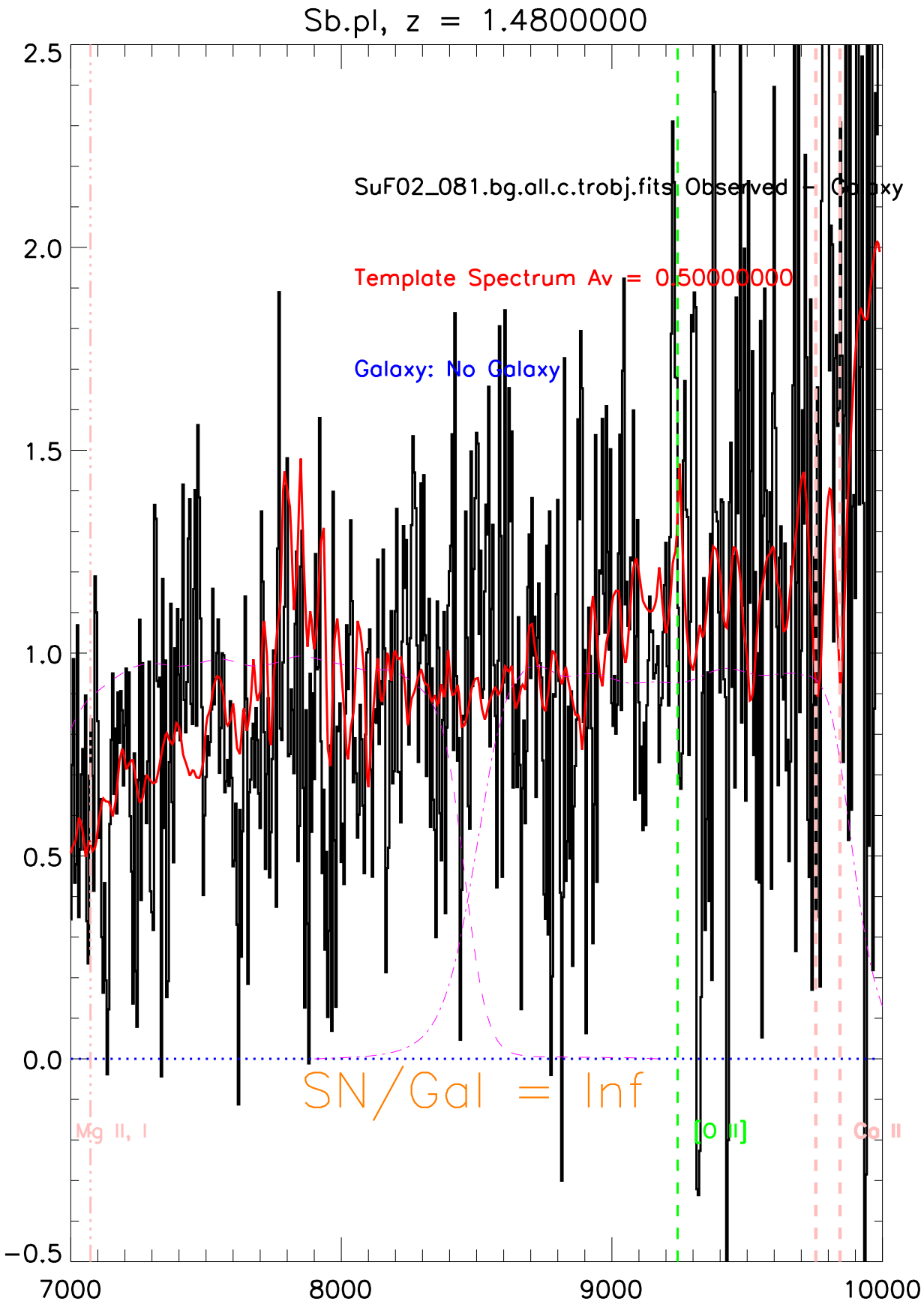


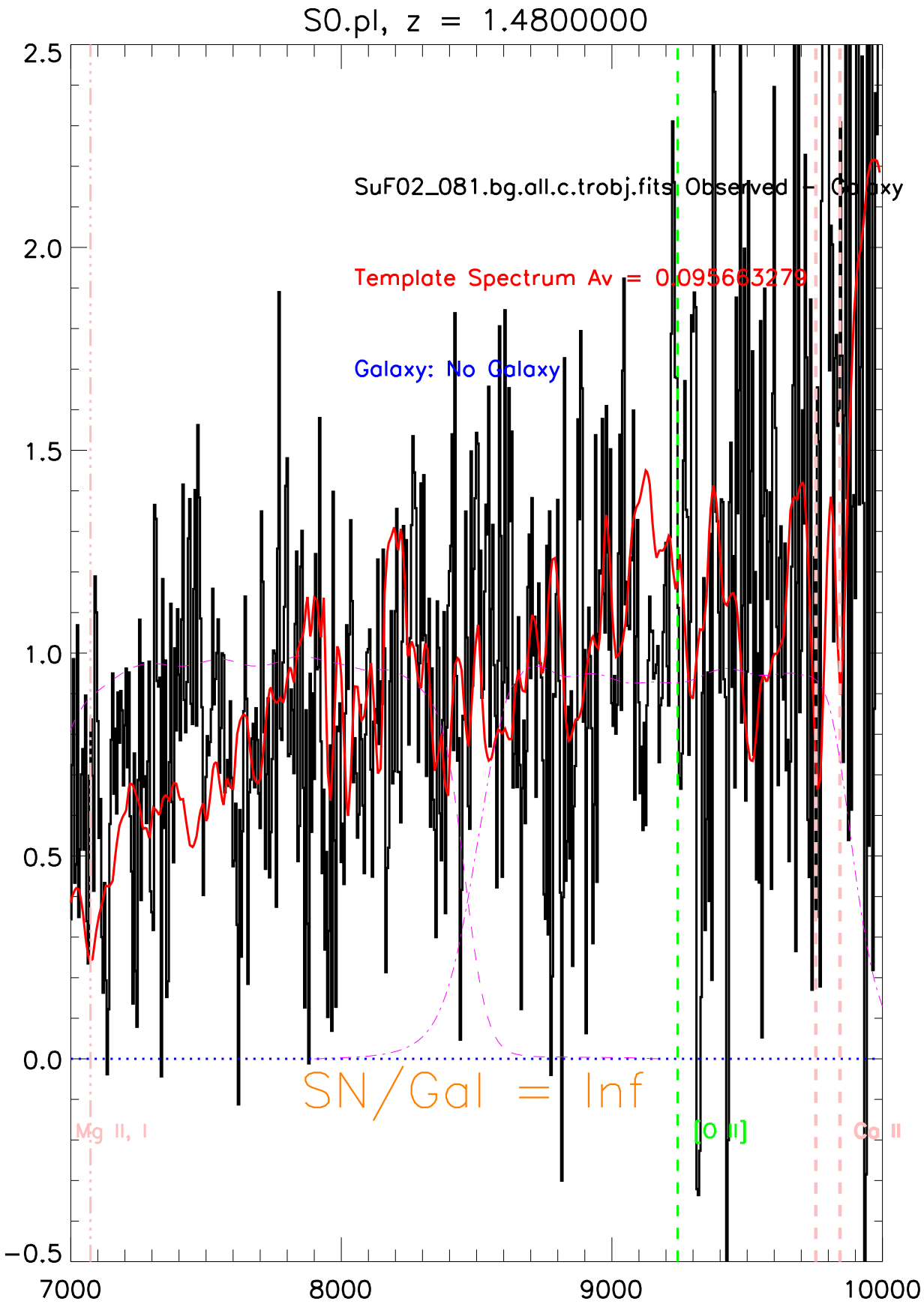
2.4
2.2
2.0
1.8
1.6
1.4
1.2
χ^2
40
20
0
−20
Days
0.5
1.0
1.5
2.0
Δm15

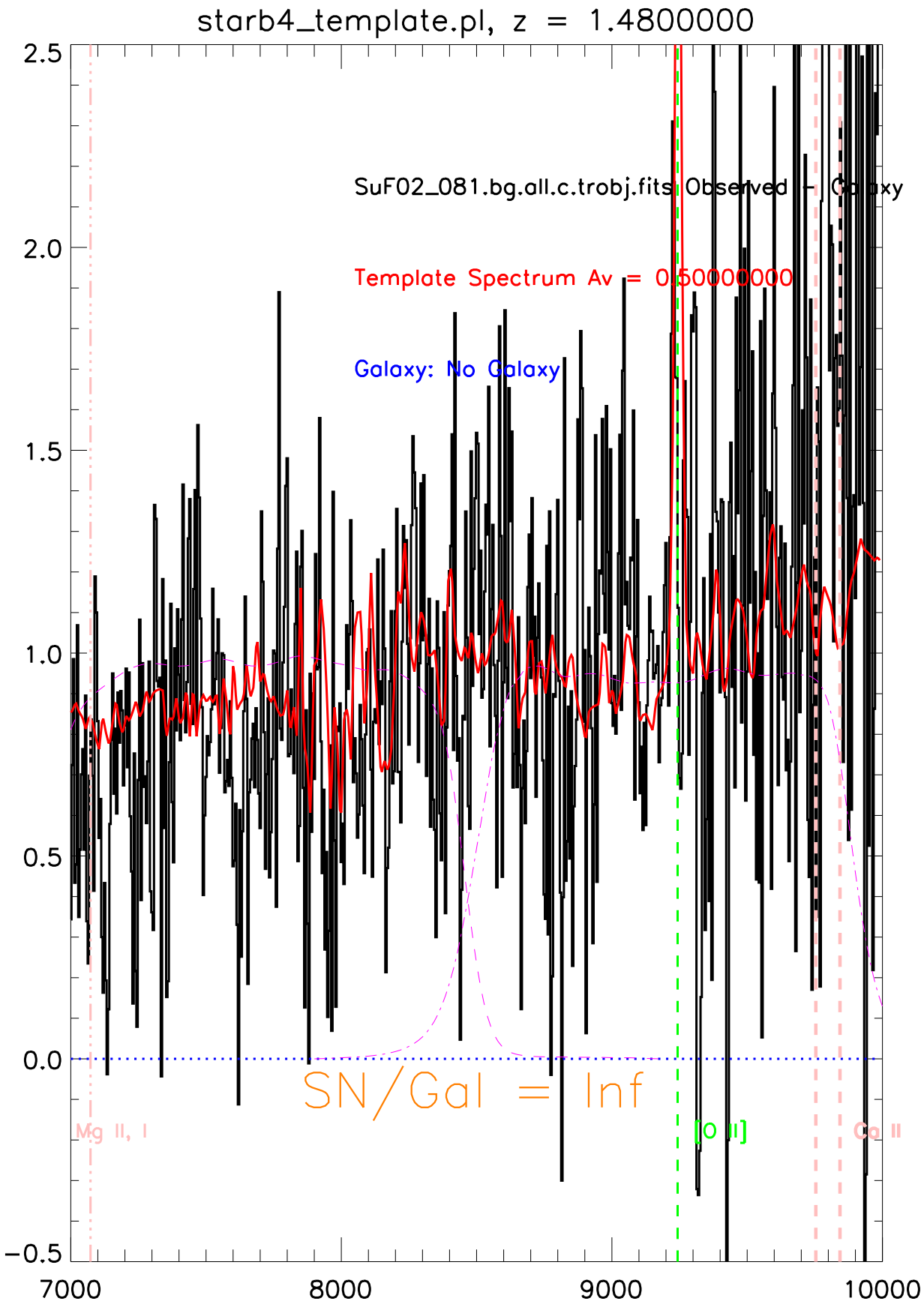

SuF02_081.bg.all.c.trobj.fits
2.5
2.0
1.5
1.0
0.5
X^2
1.4
1.6
1.8
2.0
2.2
2.4
2.6
z
Sc.pl
starb4_template.pl
starb1_template.pl
starb2_template.pl
starb3_template.pl
E.pl
starb3_template.pl

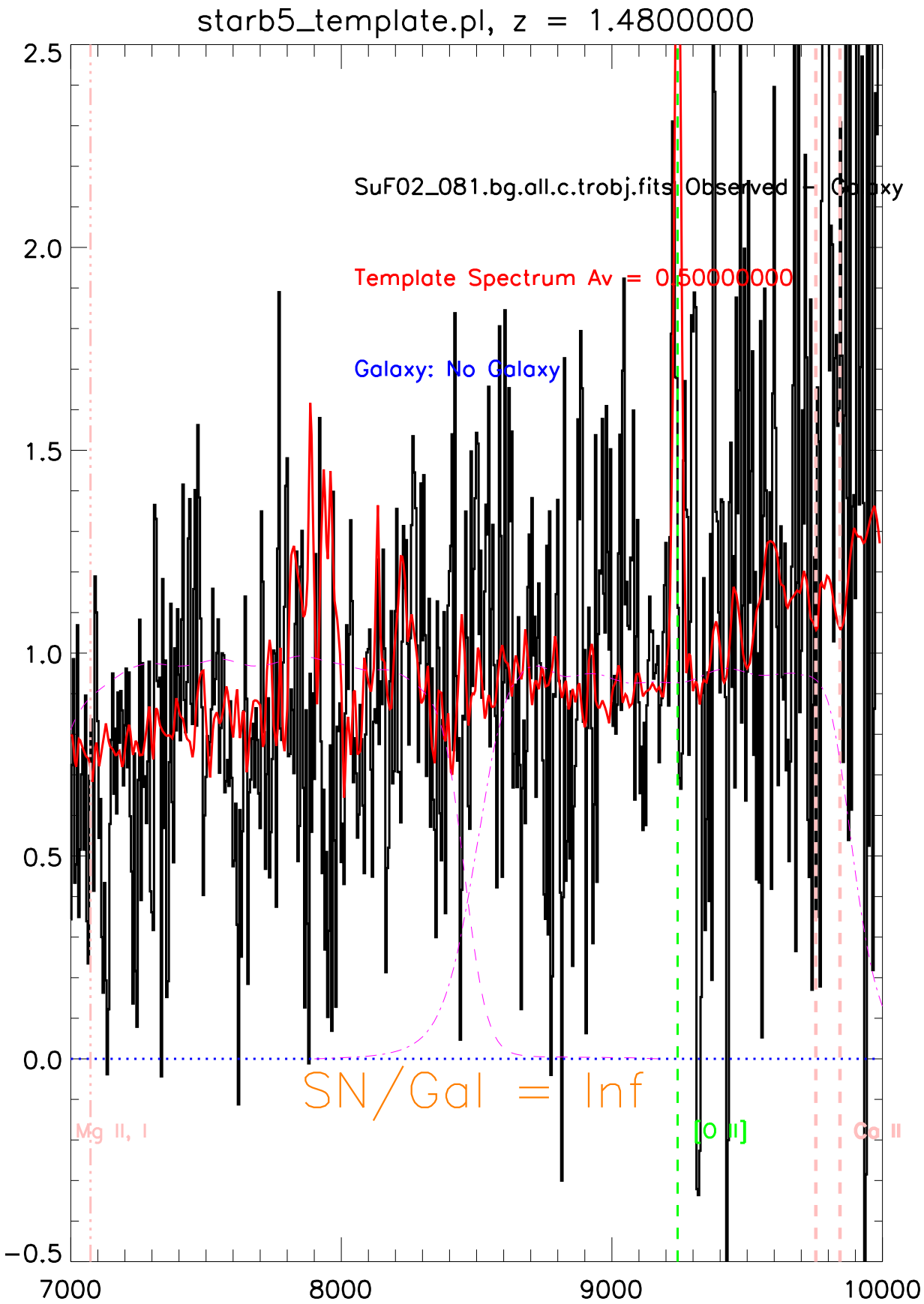

SuF02_081.bg.all.c.trobj.fits----Sa.pl
2.5
2.0
1.5
1.0
0.5
0.0
−0.5
7000
8000
9000
10000
Mg II, I
[O II]
Ca II

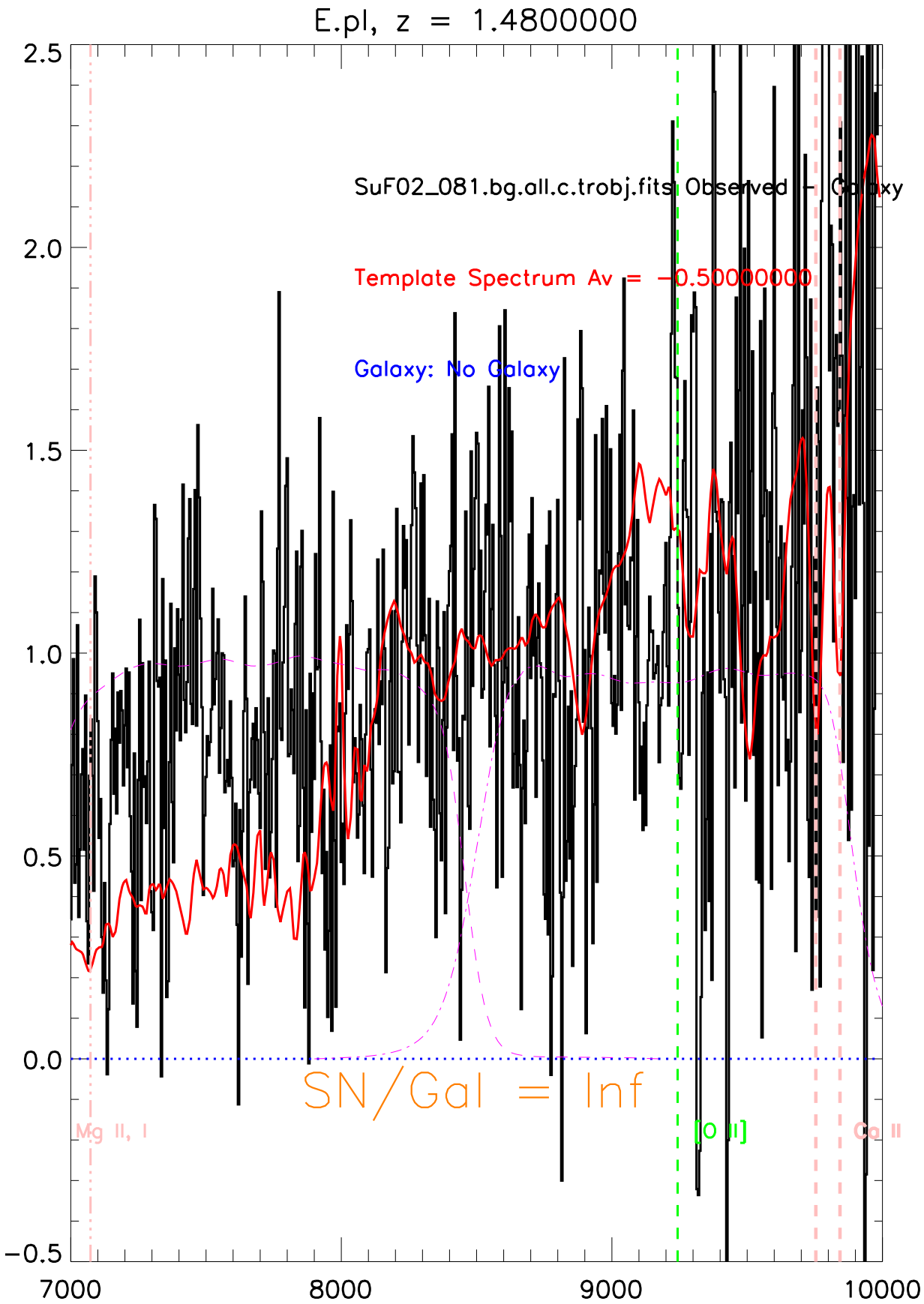

Sa.pl, z = 1.4800000
SuF02_081.bg.all.c.trobj.fits Observed - Galaxy
Template Spectrum Av = -0.50000000
Galaxy: No Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
2.5
2.0
1.5
1.0
0.5
0.0
-0.5
7000
8000
9000
10000

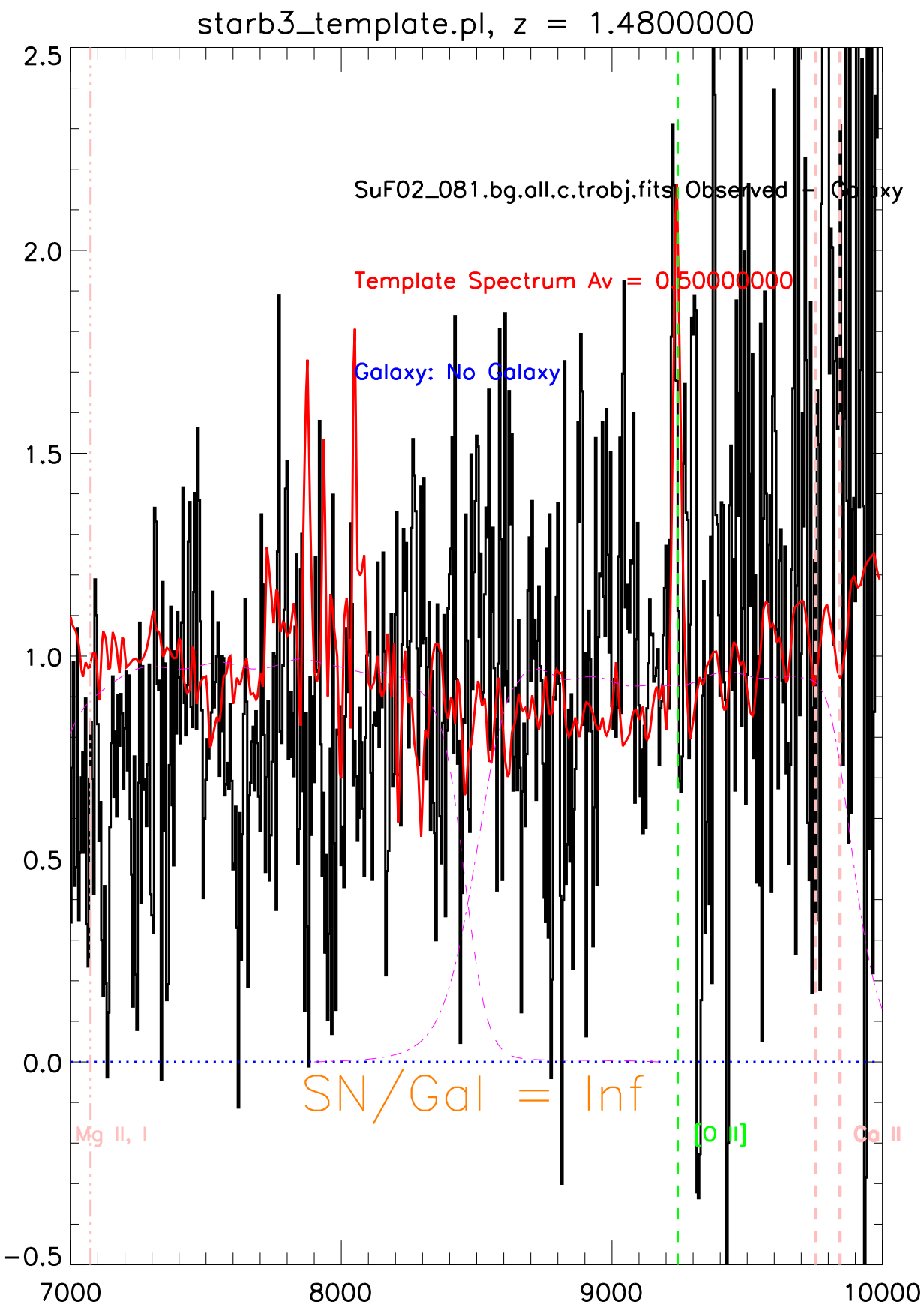

Sb.pl, z = 1.4800000
SuF02_081.bg.all.c.trobj.fits Observed - Galaxy
Template Spectrum Av = 0.50000000
Galaxy: No Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
2.5
2.0
1.5
1.0
0.5
0.0
−0.5
7000
8000
9000
10000

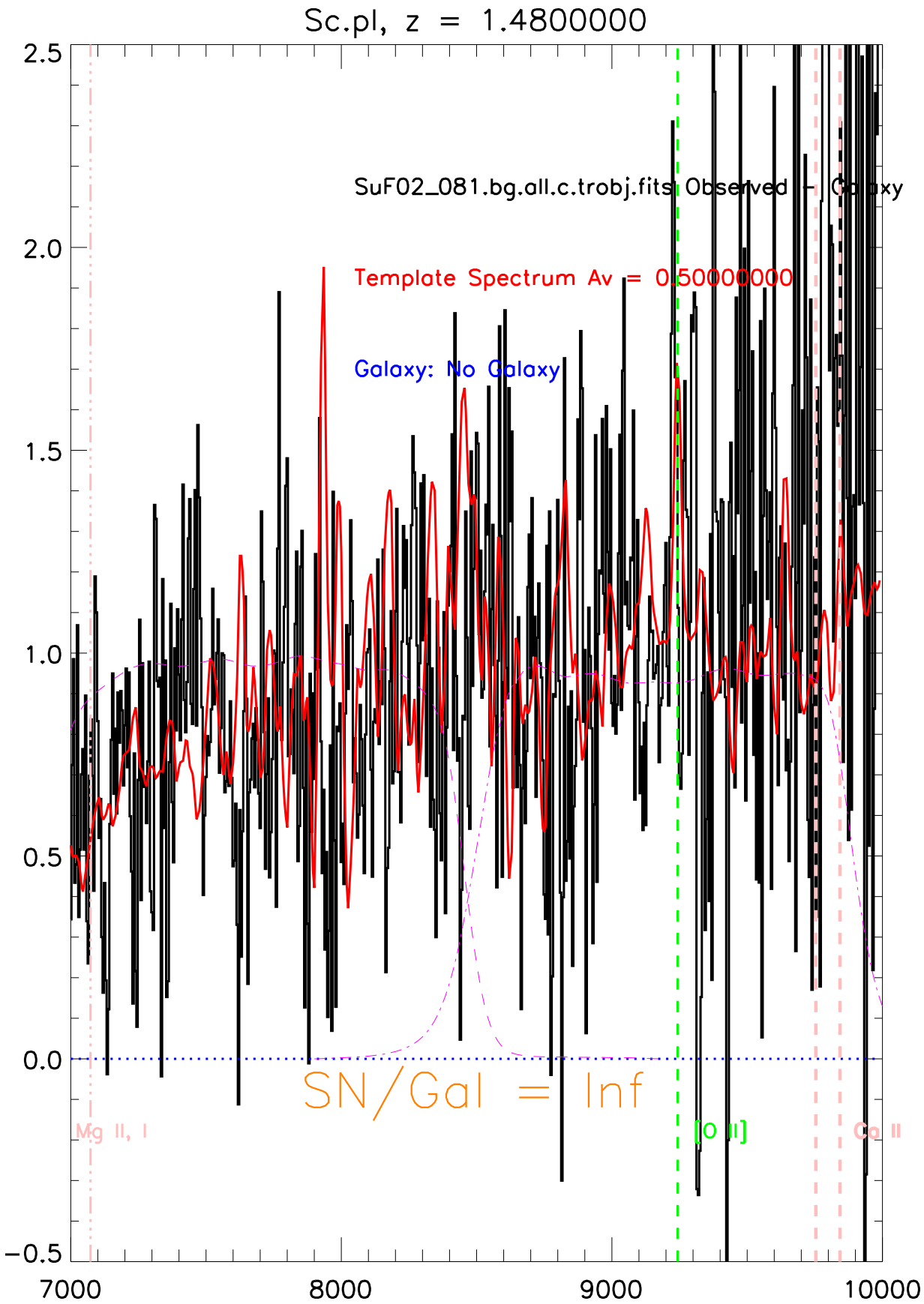

S0.pl, z = 1.4800000
SuF02_081.bg.all.c.trobj.fits Observed - Galaxy
Template Spectrum Av = 0.095663279
Galaxy: No Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
2.5
2.0
1.5
1.0
0.5
0.0
−0.5
7000
8000
9000
10000

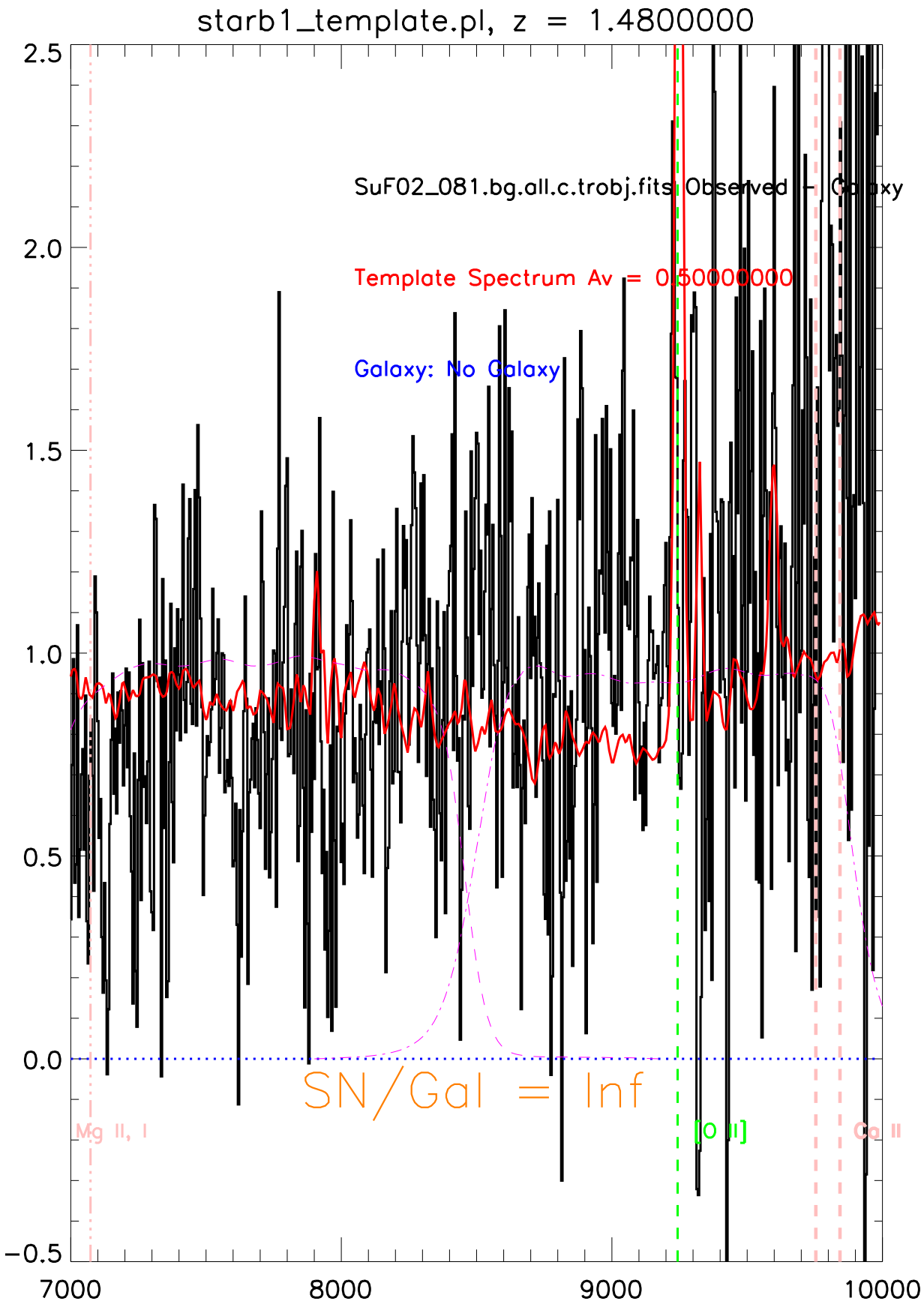

starb4_template.pl, z = 1.4800000
SuF02_081.bg.all.c.trobj.fits: Observed - Galaxy
Template Spectrum Av = 0.50000000
Galaxy: No Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
2.5
2.0
1.5
1.0
0.5
0.0
−0.5
7000
8000
9000
10000

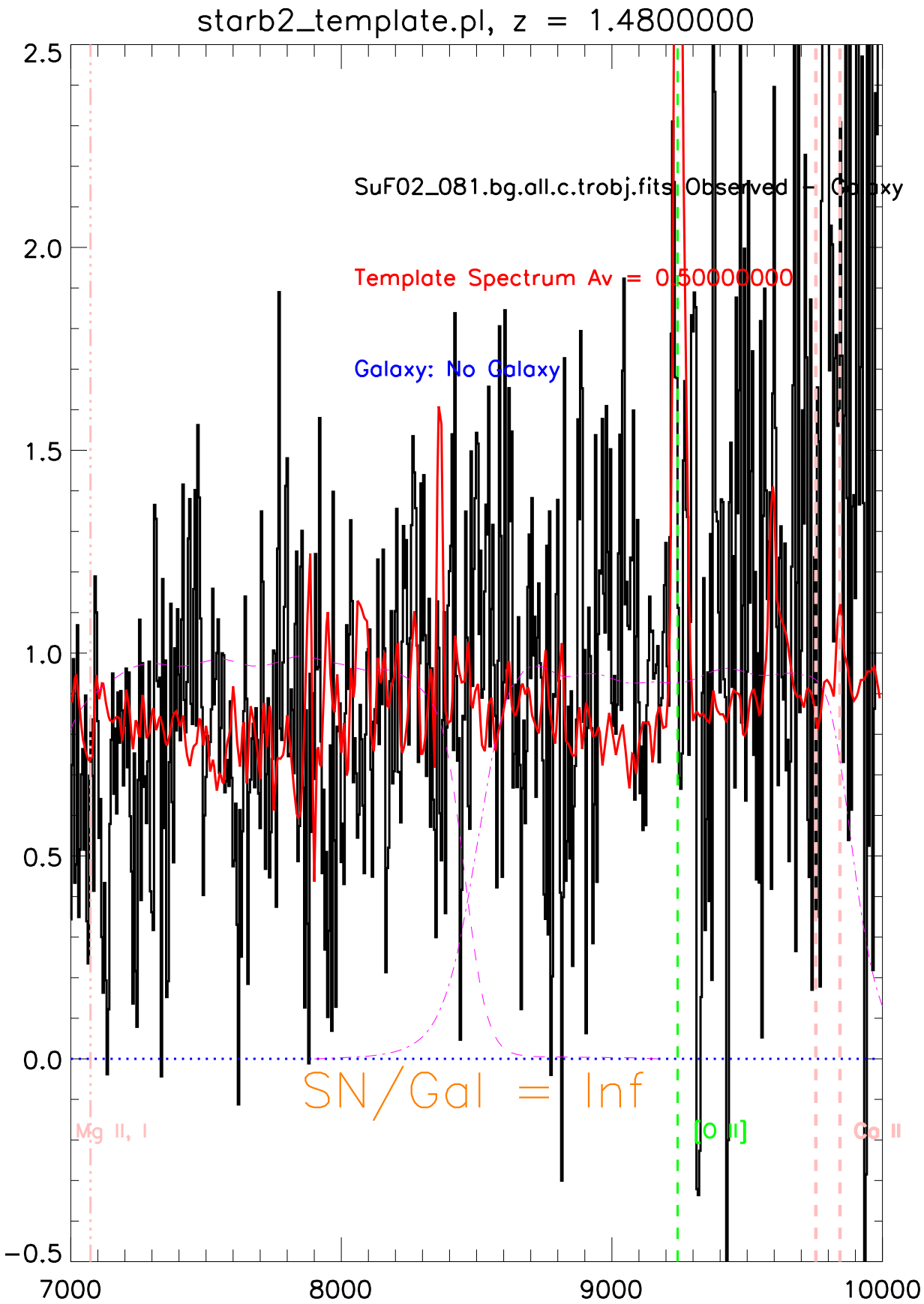

starb5_template.pl, z = 1.4800000
SuF02_081.bg.all.c.trobj.fits: Observed - Galaxy
Template Spectrum Av = 0.50000000
Galaxy: No Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
2.5
2.0
1.5
1.0
0.5
0.0
−0.5
7000
8000
9000
10000


E.pl, z = 1.4800000
SuF02_081.bg.all.c.trobj.fits Observed - Galaxy
Template Spectrum Av = −0.50000000
Galaxy: No Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
2.5
2.0
1.5
1.0
0.5
0.0
−0.5
7000
8000
9000
10000


starb3_template.pl, z = 1.4800000
SuF02_081.bg.all.c.trobj.fits: Observed - Galaxy
Template Spectrum Av = 0.50000000
Galaxy: No Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
2.5
2.0
1.5
1.0
0.5
0.0
−0.5
7000
8000
9000
10000


Sc.pl, z = 1.4800000
SuF02_081.bg.all.c.trobj.fits Observed - Galaxy
Template Spectrum Av = 0.50000000
Galaxy: No Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
2.5
2.0
1.5
1.0
0.5
0.0
−0.5
7000
8000
9000
10000


starb1_template.pl, z = 1.4800000
SuF02_081.bg.all.c.trobj.fits: Observed - Galaxy
Template Spectrum Av = 0.50000000
Galaxy: No Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
2.5
2.0
1.5
1.0
0.5
0.0
−0.5
7000
8000
9000
10000


starb2_template.pl, z = 1.4800000
SuF02_081.bg.all.c.trobj.fits Observed - Galaxy
Template Spectrum Av = 0.50000000
Galaxy: No Galaxy
SN/Gal = Inf
Mg II, I
[O II]
Ca II
2.5
2.0
1.5
1.0
0.5
0.0
−0.5
7000
8000
9000
10000

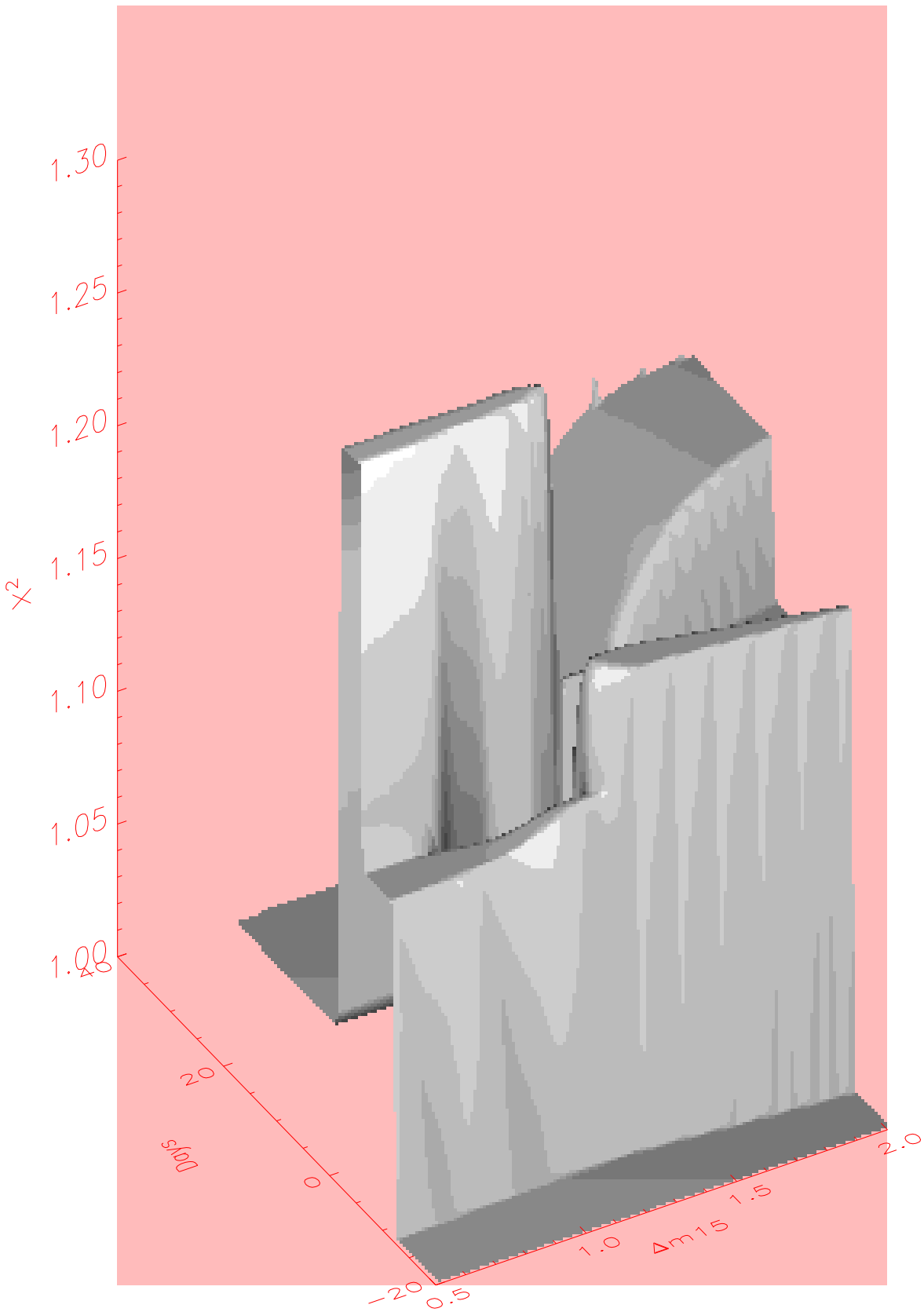
1.1 1112
1.2

1.3 1.2

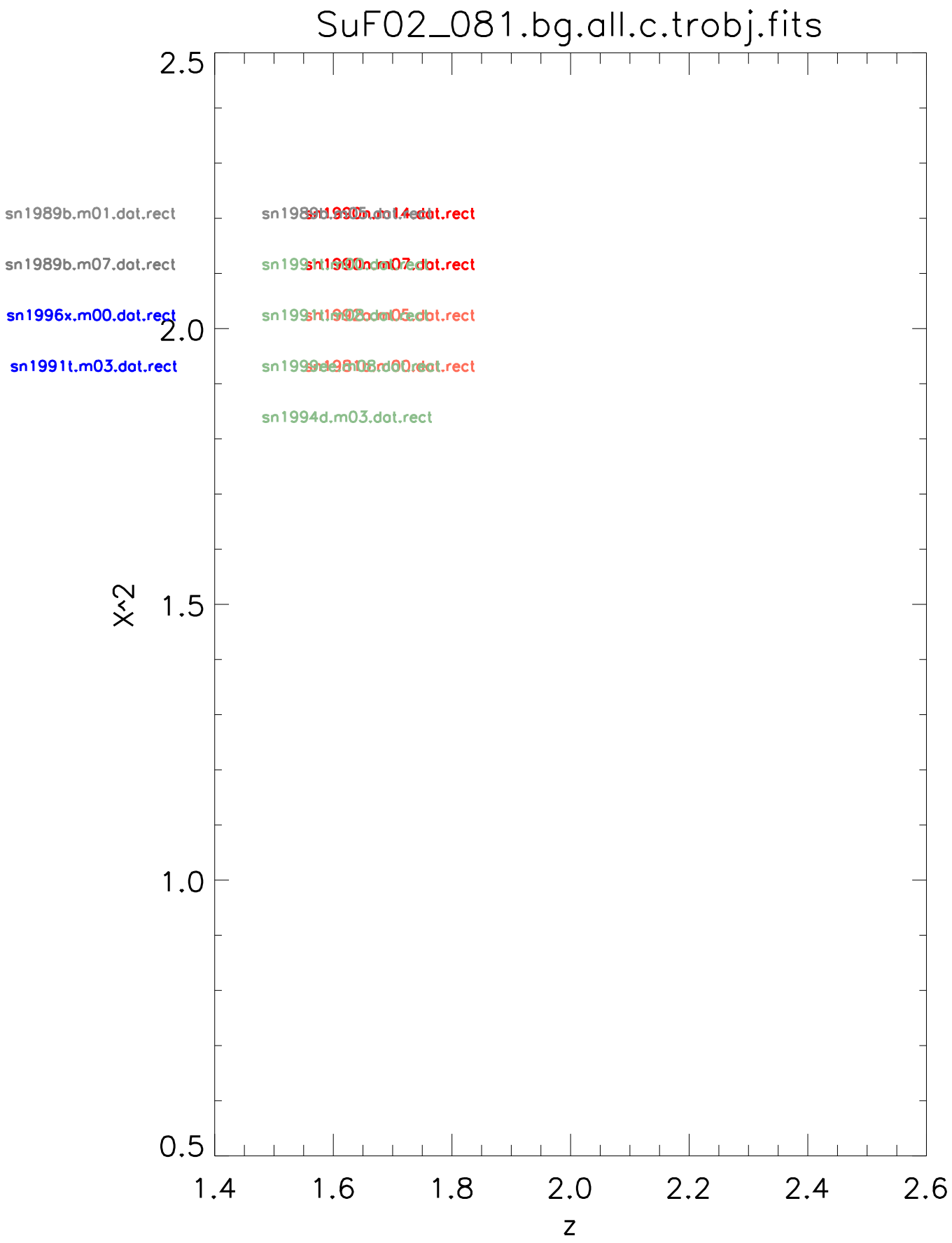
1.1 1.1

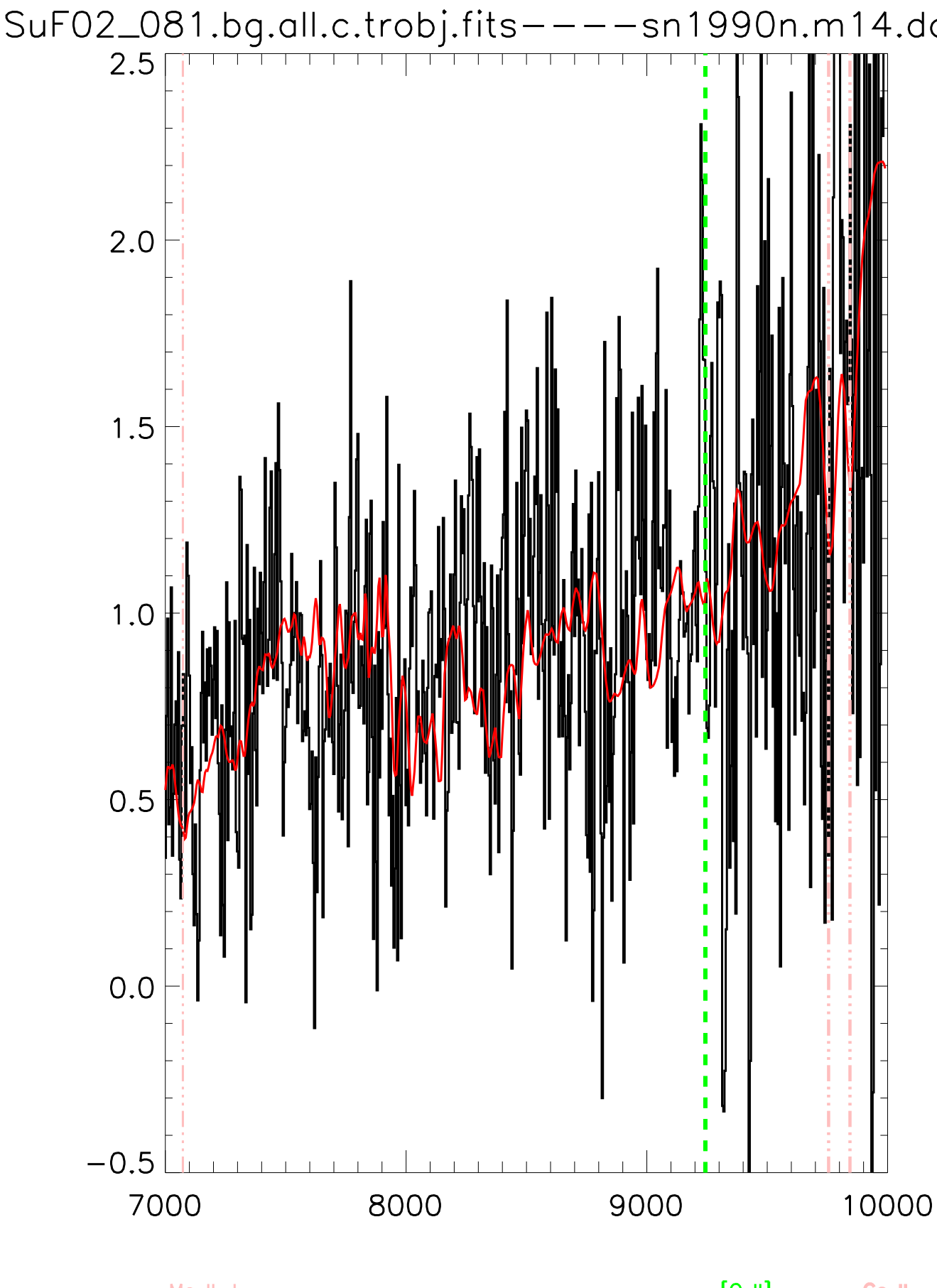
1.0 1.2
1.11.1

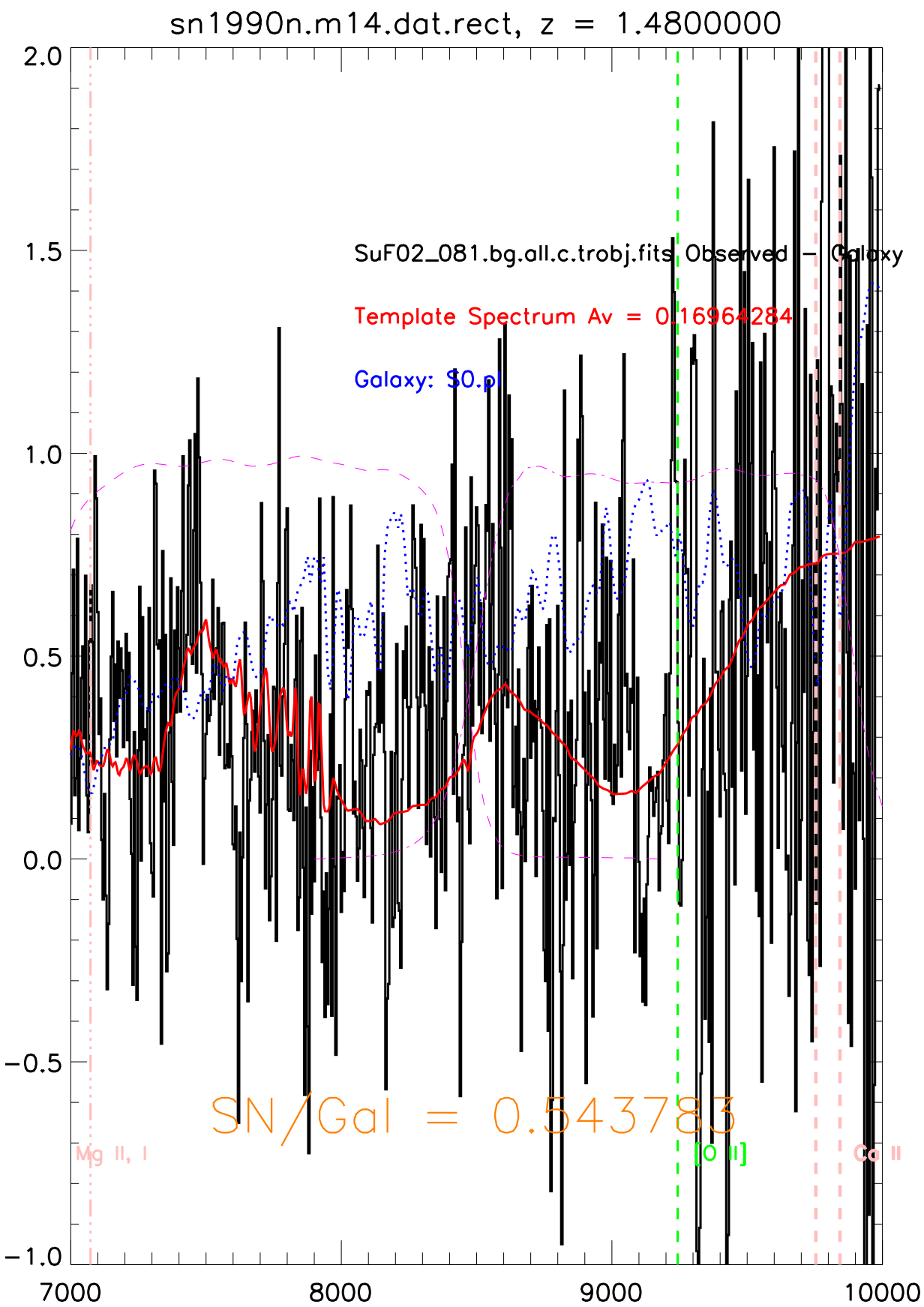
1.0

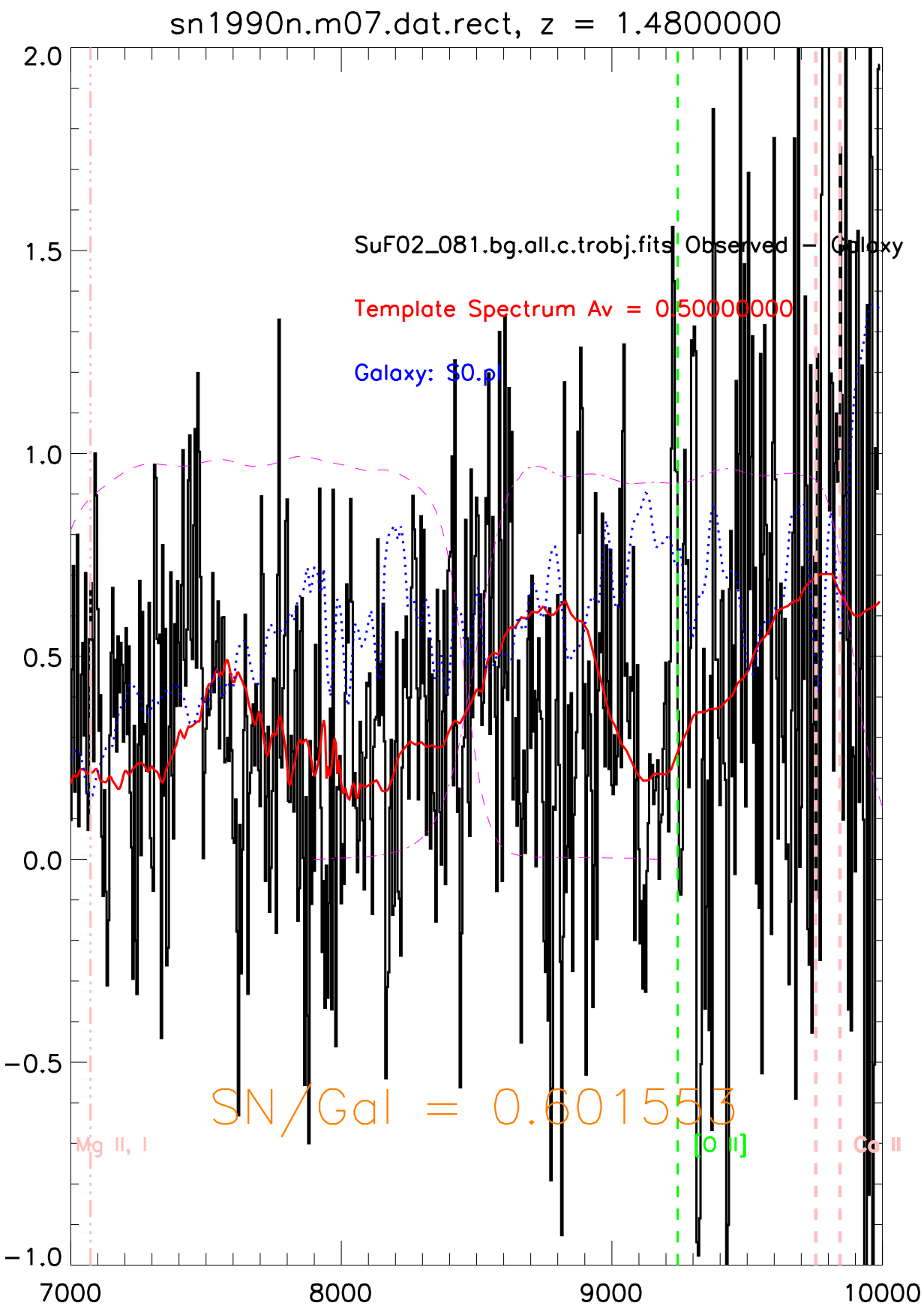


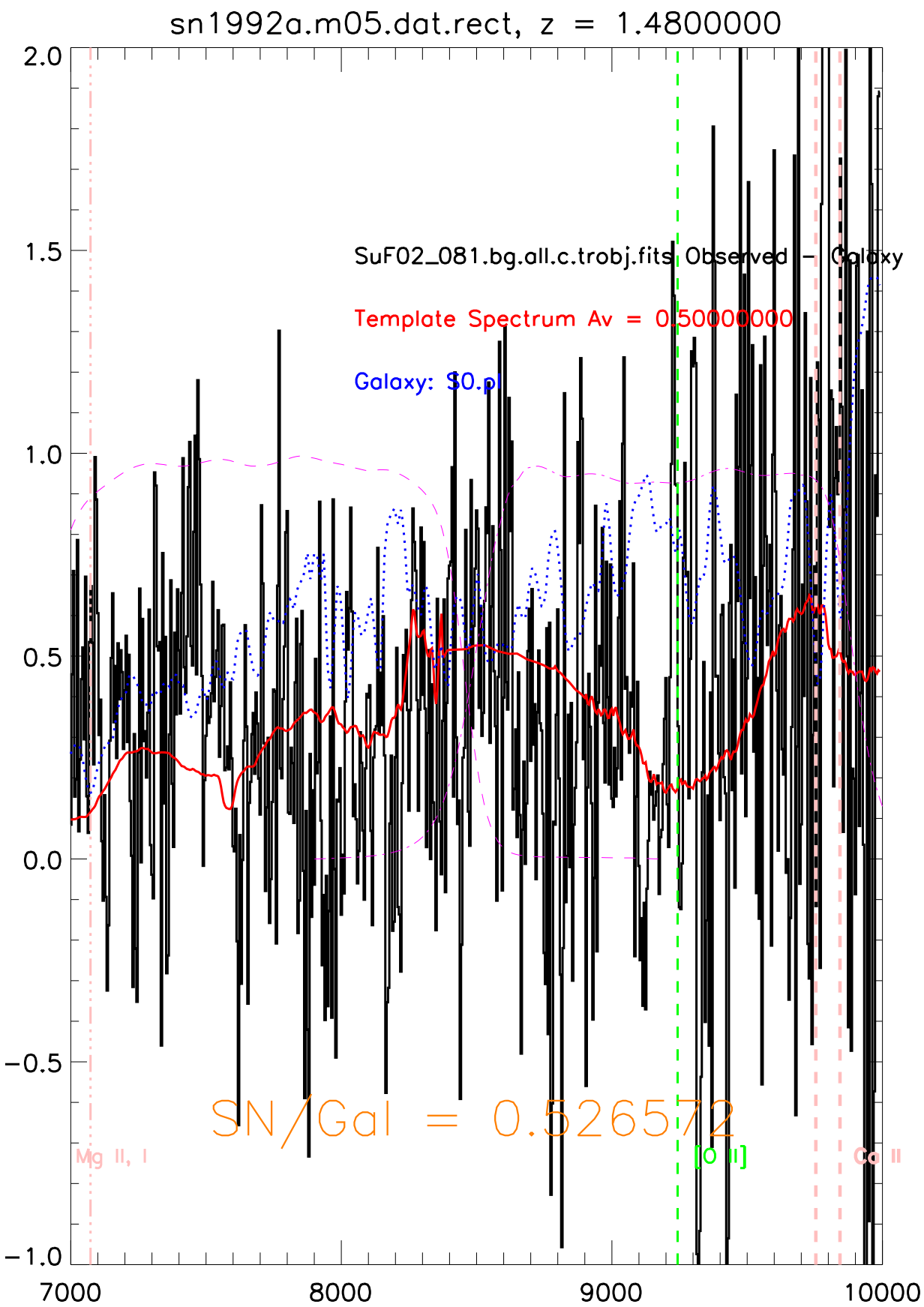
1.30
1.25
1.20
1.15
1.10
1.05
1.00
χ^2
40
20
0
−20
Days
0.5
1.0
1.5
2.0
Δm15

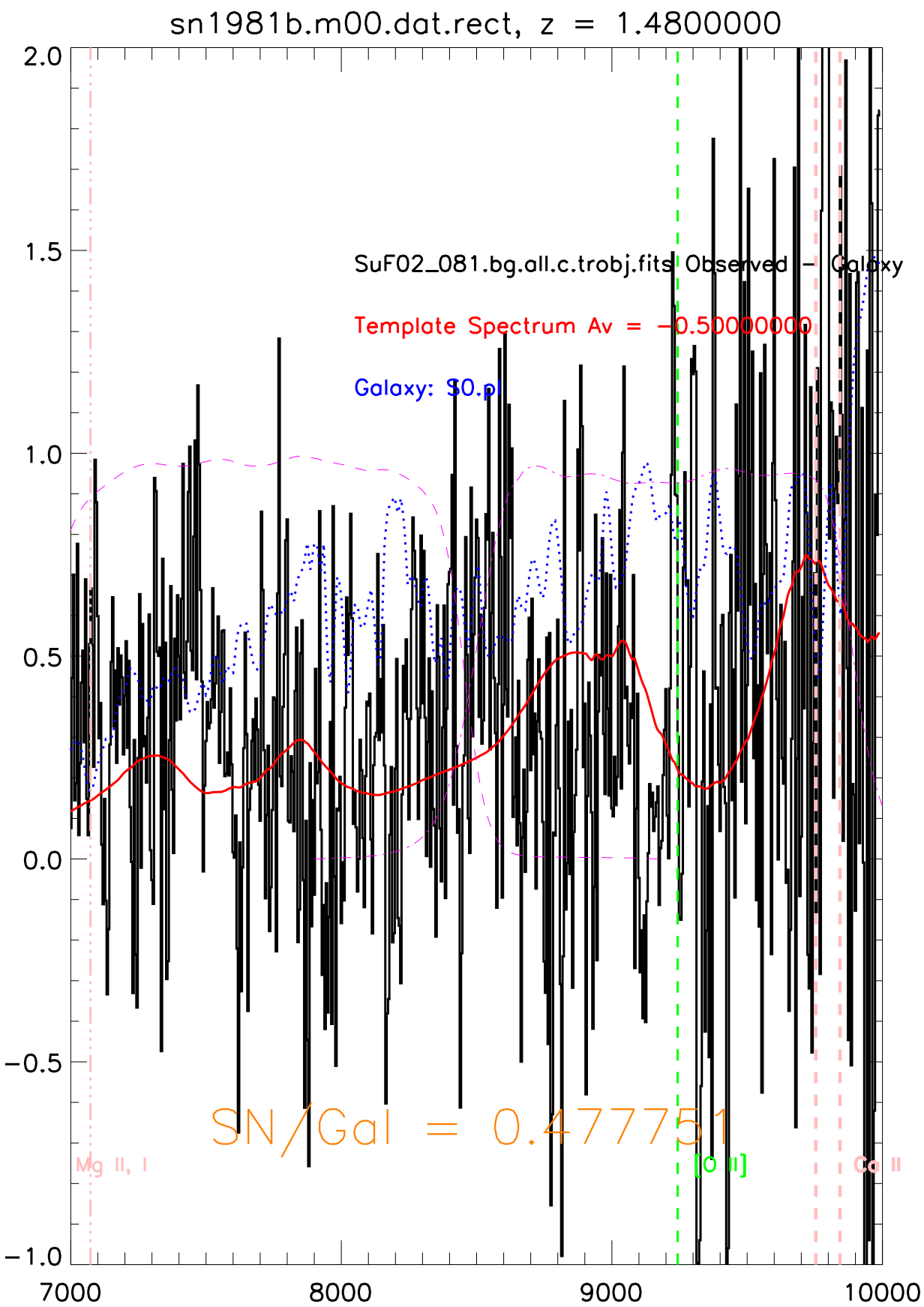

SuF02_081.bg.all.c.trobj.fits
sn1989b.m01.dat.rect
sn1989b.m07.dat.rect
sn1996x.m00.dat.rect
sn1991t.m03.dat.rect
sn1994d.m03.dat.rect
X^2
z
2.5
2.0
1.5
1.0
0.5
1.4
1.6
1.8
2.0
2.2
2.4
2.6

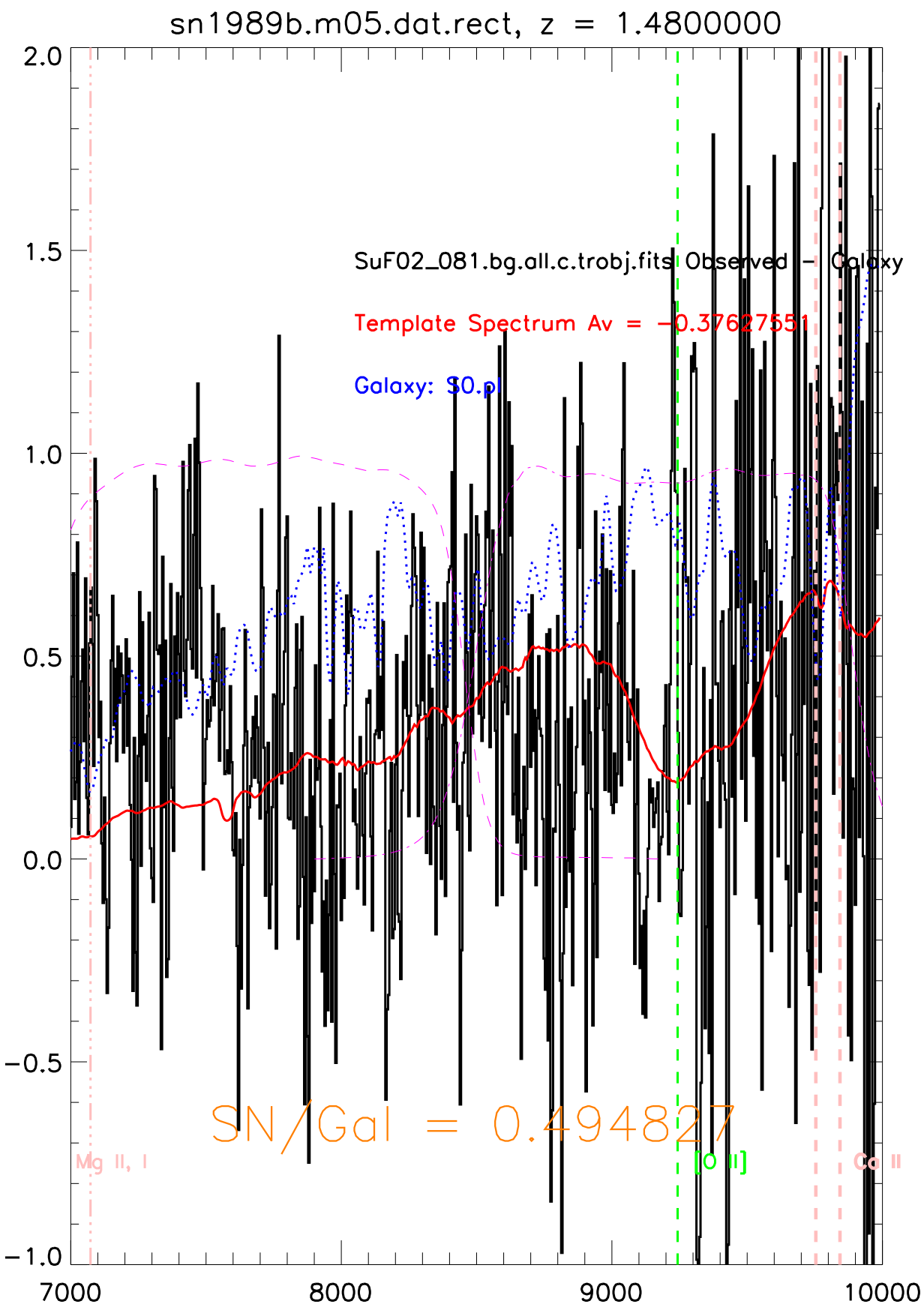

SuF02_081.bg.all.c.trobj.fits----sn1990n.m14.dat.rect
2.5
2.0
1.5
1.0
0.5
0.0
−0.5
7000
8000
9000
10000
Mg II, I
[O II]
Ca II

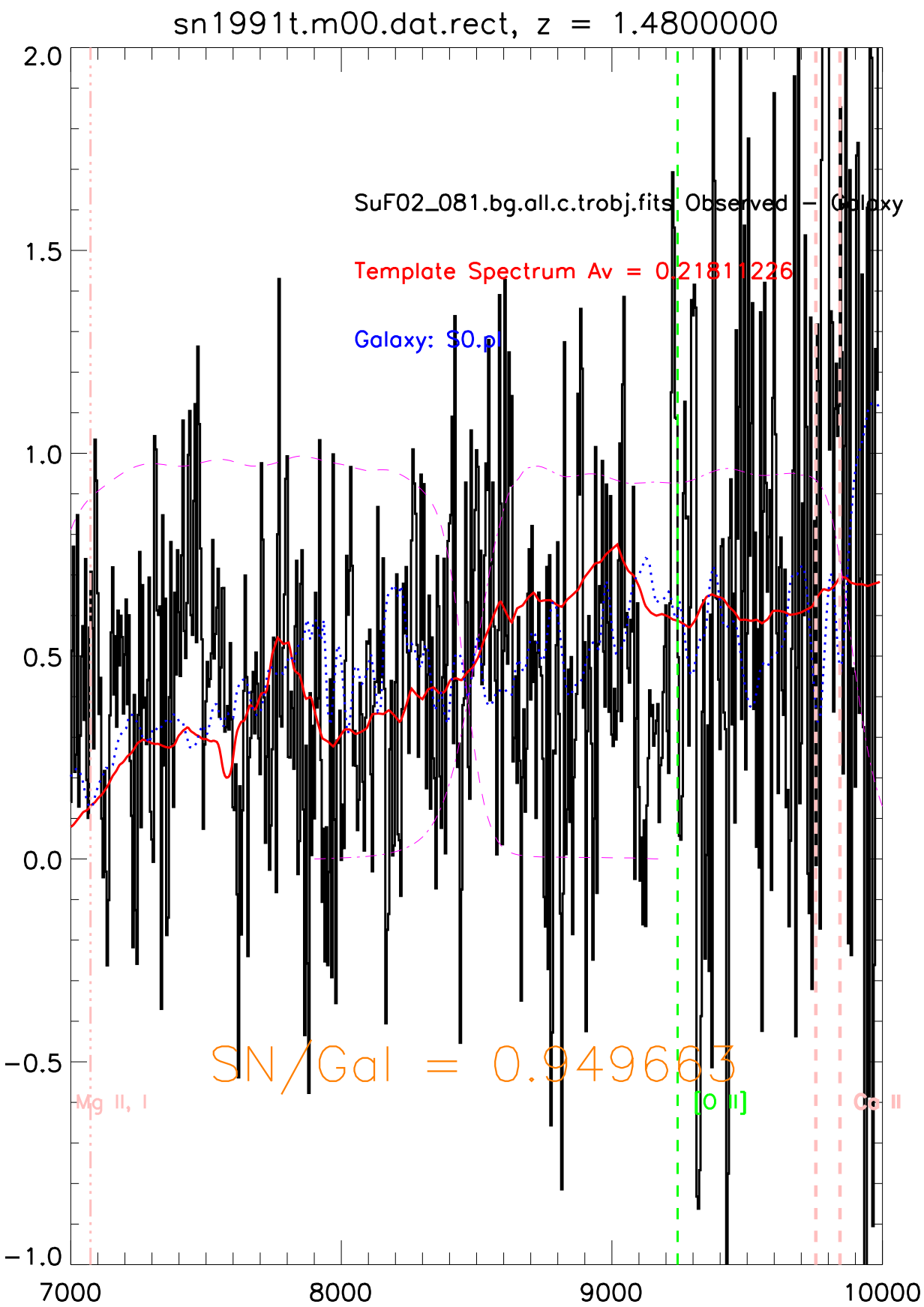

sn1990n.m14.dat.rect, z = 1.4800000
SuF02_081.bg.all.c.trobj.fits Observed − Galaxy
Template Spectrum Av = 0.16964284
Galaxy: S0.pl
SN/Gal = 0.543783
Mg II, I
[O II]
Ca II
2.0
1.5
1.0
0.5
0.0
−0.5
−1.0
7000
8000
9000
10000

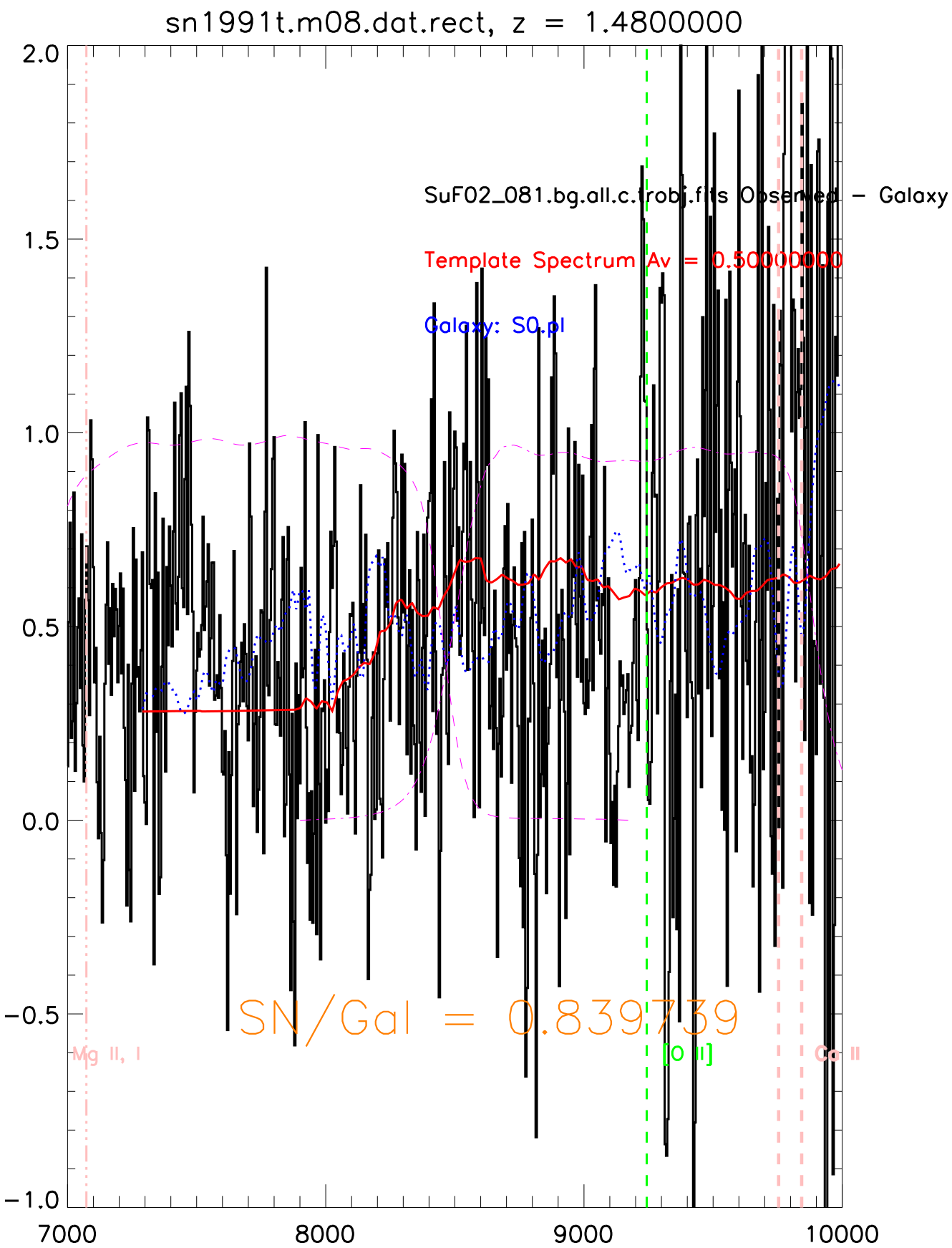

sn1990n.m07.dat.rect, z = 1.4800000
SuF02_081.bg.all.c.trobj.fits Observed – Galaxy
Template Spectrum Av = 0.50000000
Galaxy: S0.pl
SN/Gal = 0.601553
Mg II, I
[O III]
Ca II
2.0
1.5
1.0
0.5
0.0
−0.5
−1.0
7000
8000
9000
10000

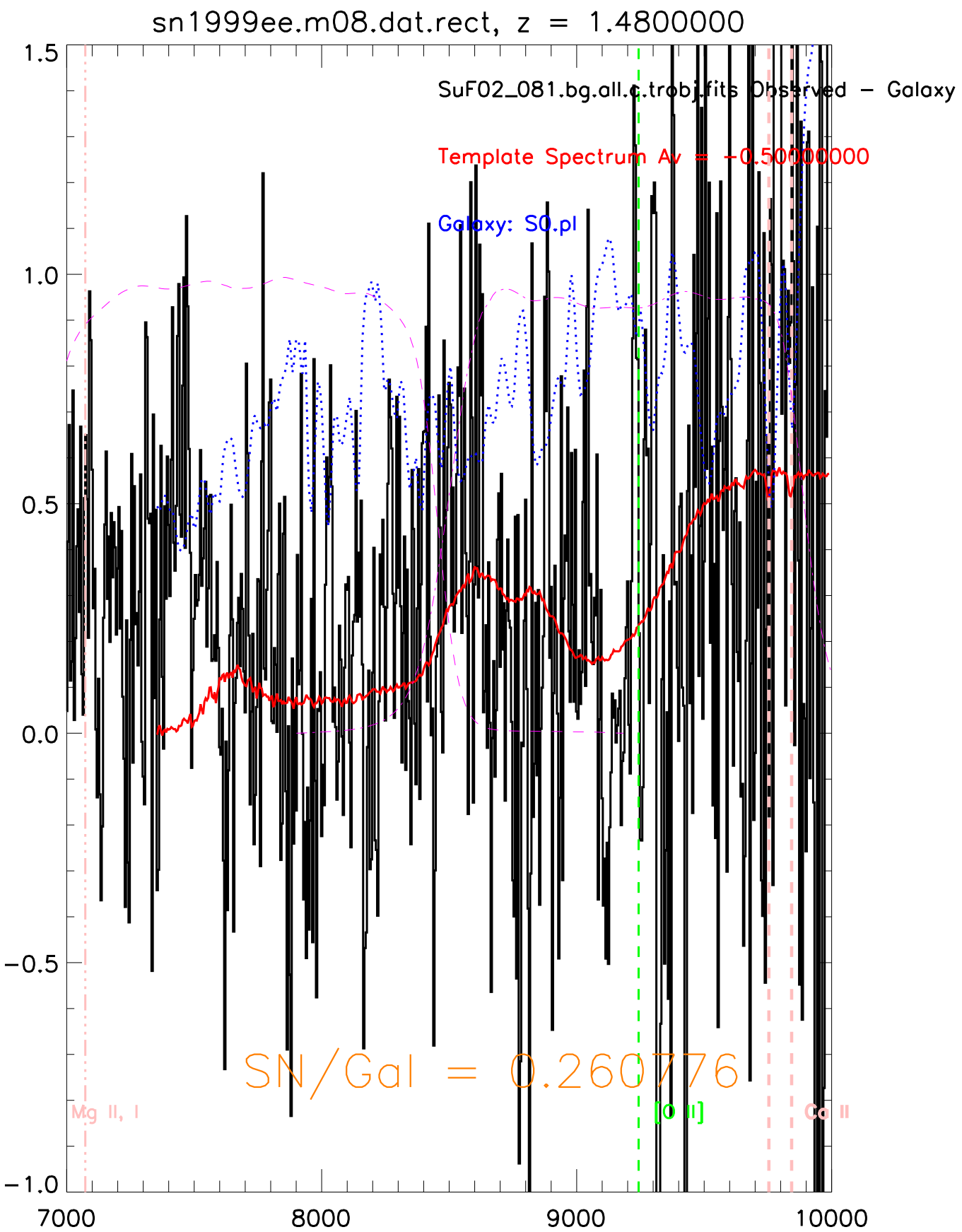

sn1992a.m05.dat.rect, z = 1.4800000
SuF02_081.bg.all.c.trobj.fits Observed – Galaxy
Template Spectrum Av = 0.50000000
Galaxy: S0.pl
SN/Gal = 0.526572
Mg II, I
[O II]
Ca II
2.0
1.5
1.0
0.5
0.0
−0.5
−1.0
7000
8000
9000
10000

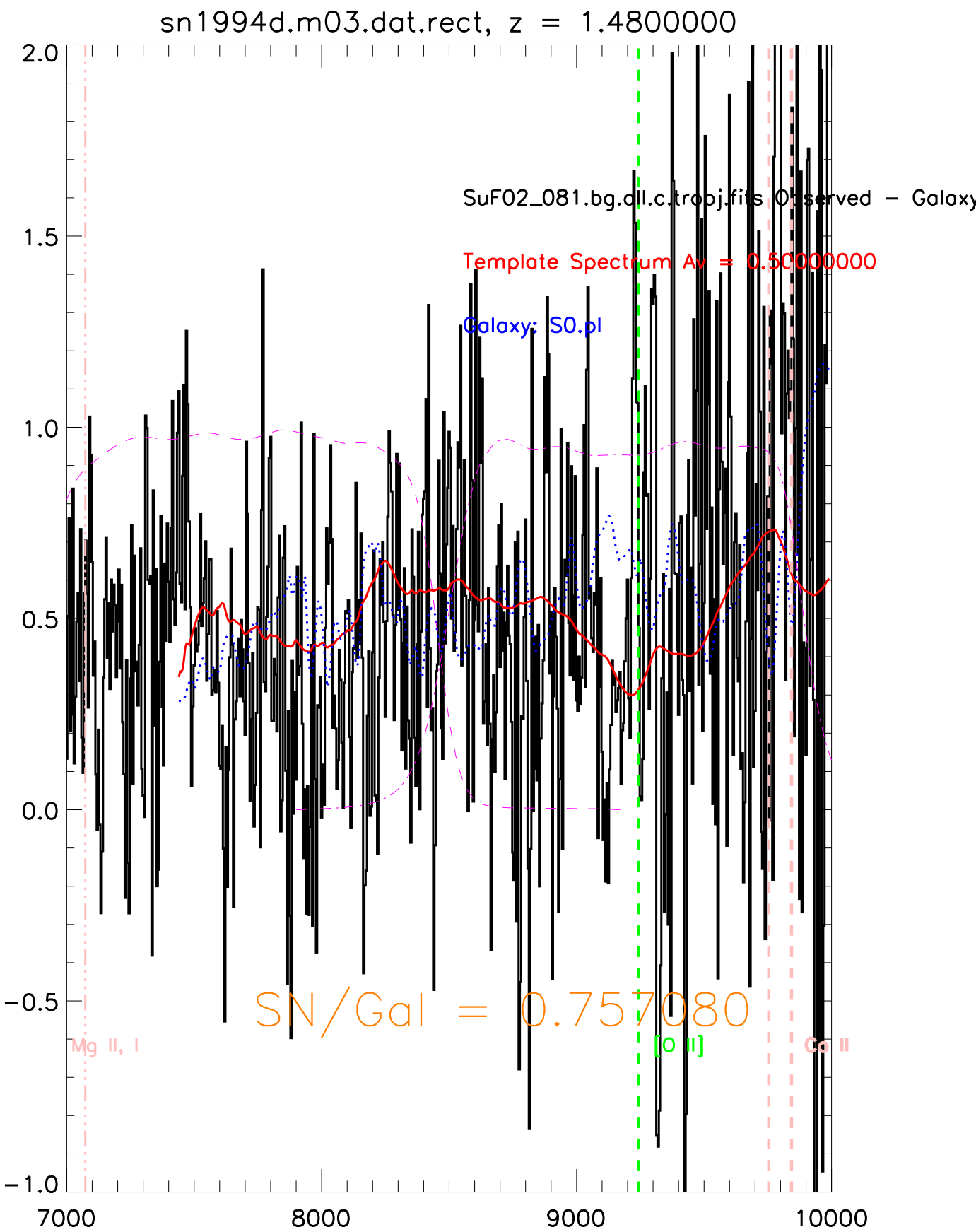

sn1981b.m00.dat.rect, z = 1.4800000
SuF02_081.bg.all.c.trobj.fits Observed - Galaxy
Template Spectrum Av = -0.500000000
Galaxy: S0.pl
SN/Gal = 0.477751
Mg II, I
[O III]
Ca II
2.0
1.5
1.0
0.5
0.0
-0.5
-1.0
7000
8000
9000
10000

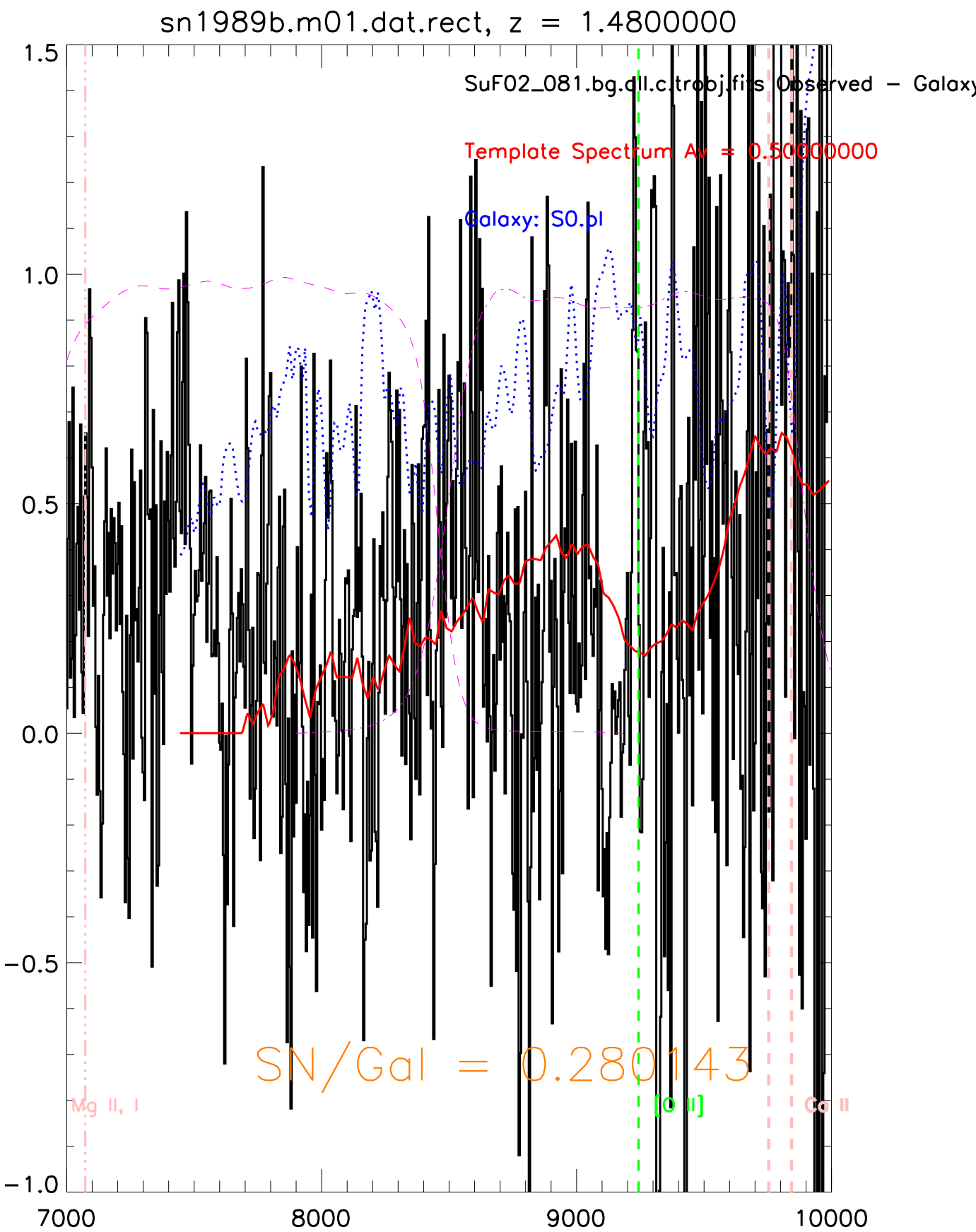

sn1989b.m05.dat.rect, z = 1.4800000
SuF02_081.bg.all.c.trobj.fits Observed − Galaxy
Template Spectrum Av = −0.37627551
Galaxy: S0.pl
SN/Gal = 0.494827
Mg II, I
[O II]
Ca II
2.0
1.5
1.0
0.5
0.0
−0.5
−1.0
7000
8000
9000
10000

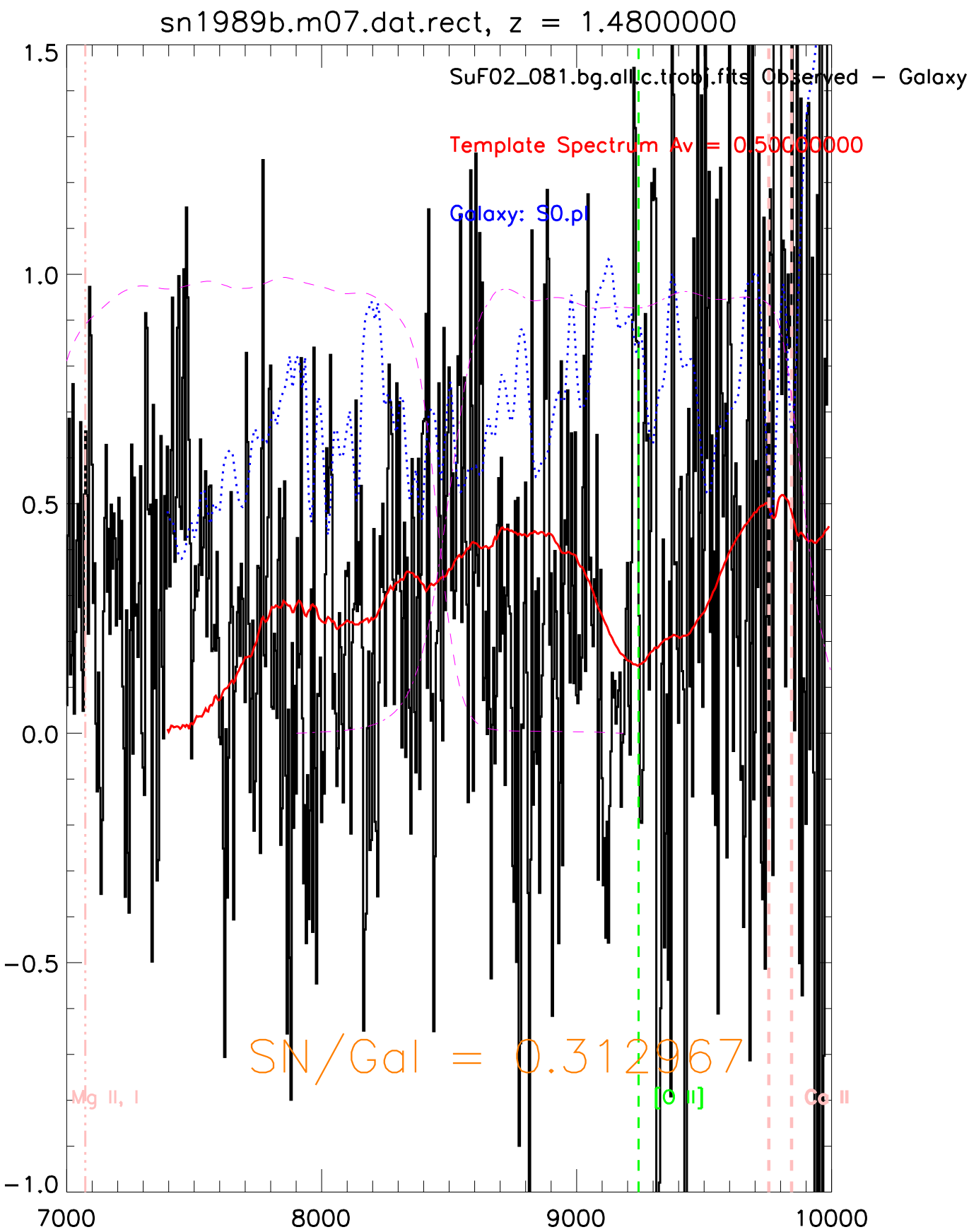

sn1991t.m00.dat.rect, z = 1.4800000
SuF02_081.bg.all.c.trobj.fits Observed − Galaxy
Template Spectrum Av = 0.21811226
Galaxy: S0.pl
SN/Gal = 0.949663
Mg II, I
[O II]
Ca II
2.0
1.5
1.0
0.5
0.0
−0.5
−1.0
7000
8000
9000
10000

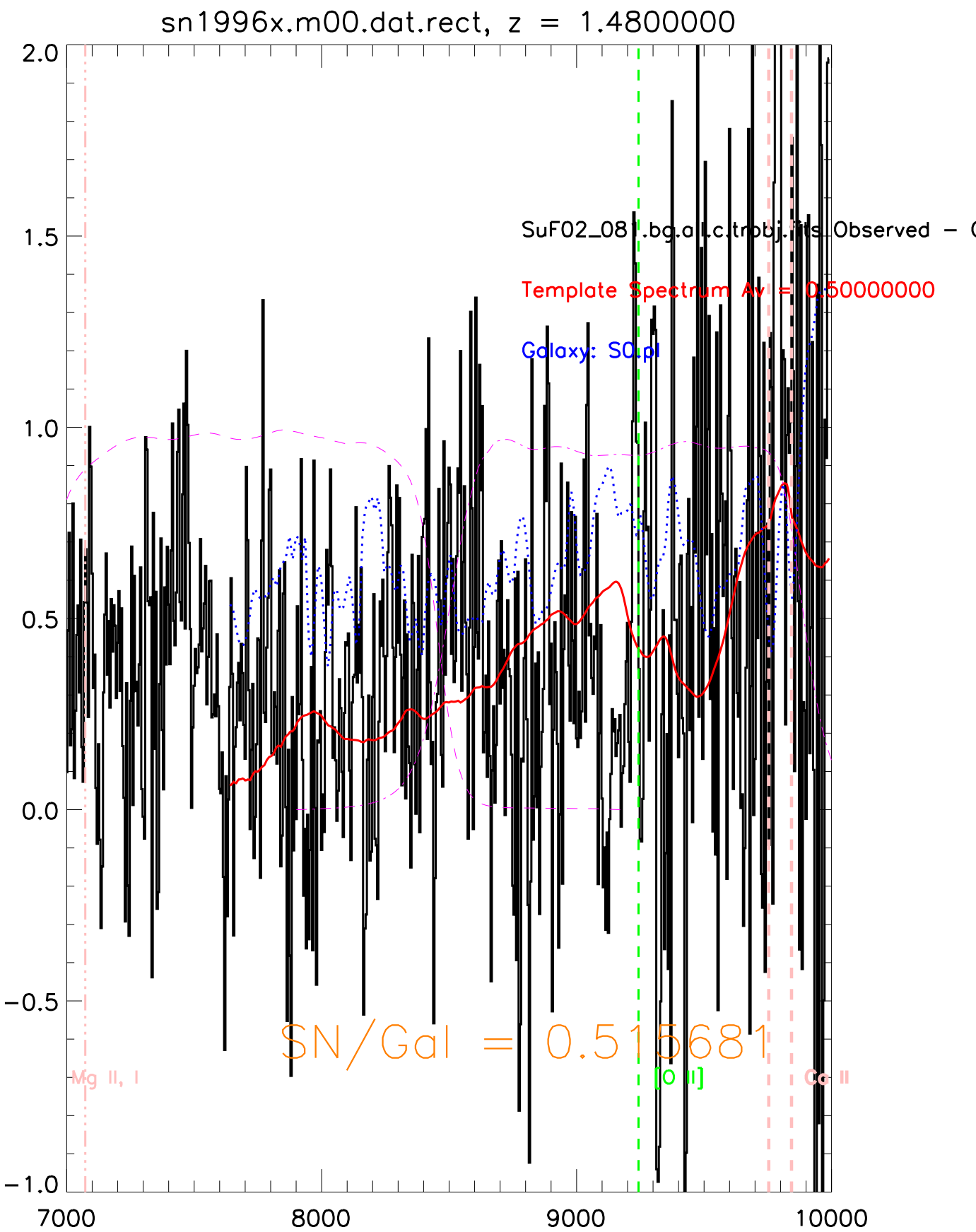

sn1991t.m08.dat.rect, z = 1.4800000
SuF02_081.bg.all.c.frobj.fits Observed − Galaxy
Template Spectrum Av = 0.50000000
Galaxy: S0.pl
SN/Gal = 0.839739
Mg II, I
[O II]
Ca II
2.0
1.5
1.0
0.5
0.0
−0.5
−1.0
7000
8000
9000
10000

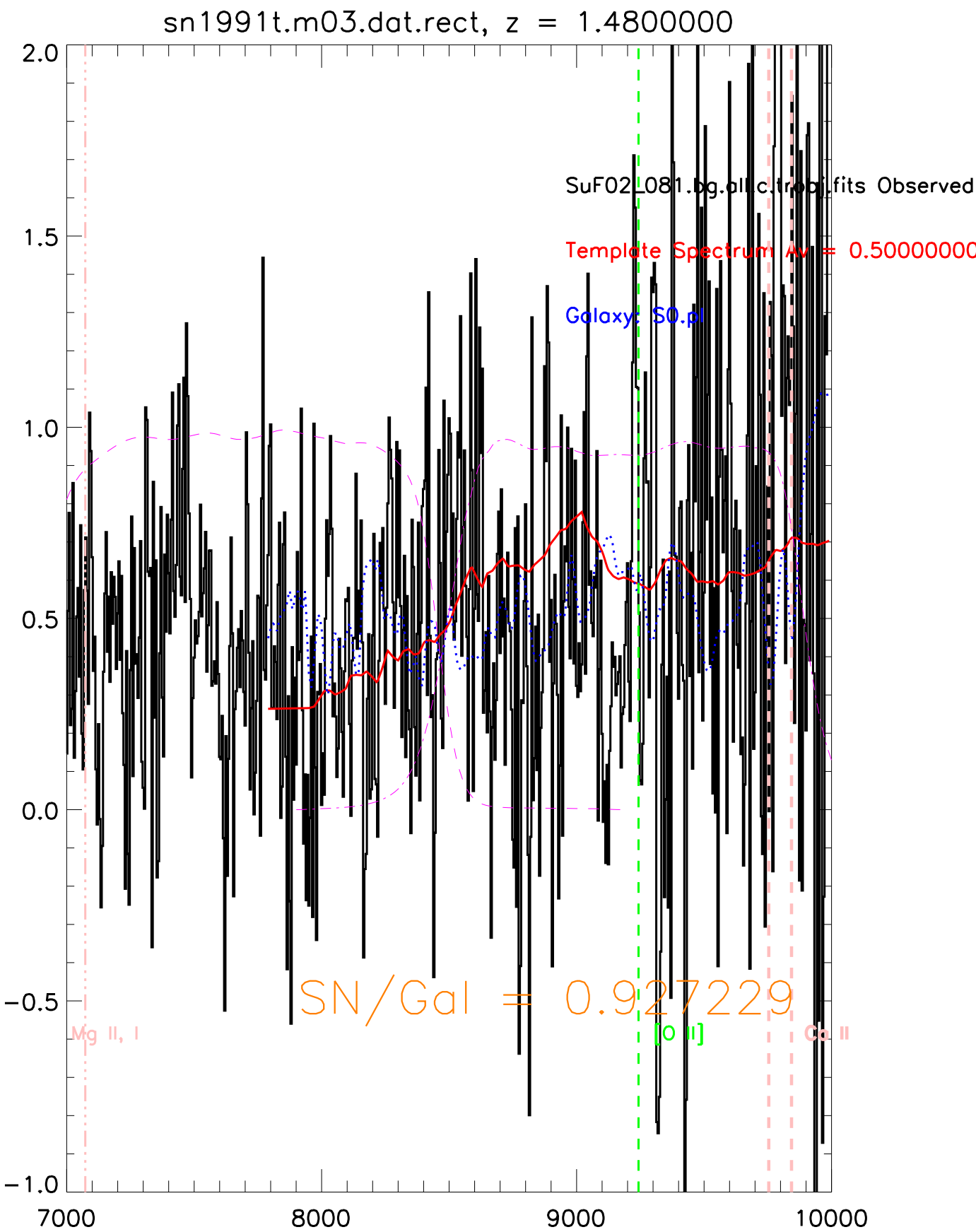

sn1999ee.m08.dat.rect, z = 1.4800000
SuF02_081.bg.all.c.trobj.fits Observed − Galaxy
Template Spectrum Av = −0.50000000
Galaxy: S0.pl
SN/Gal = 0.260776
Mg II, I
[O II]
Ca II
1.5
1.0
0.5
0.0
−0.5
−1.0
7000
8000
9000
10000

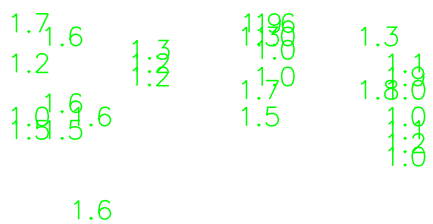

sn1994d.m03.dat.rect, z = 1.4800000
SuF02_081.bg.dll.c.trobj.fits Observed − Galaxy
Template Spectrum Av = 0.50000000
Galaxy: S0.pl
SN/Gal = 0.757080
Mg II, I
[O II]
Ca II
2.0
1.5
1.0
0.5
0.0
−0.5
−1.0
7000
8000
9000
10000

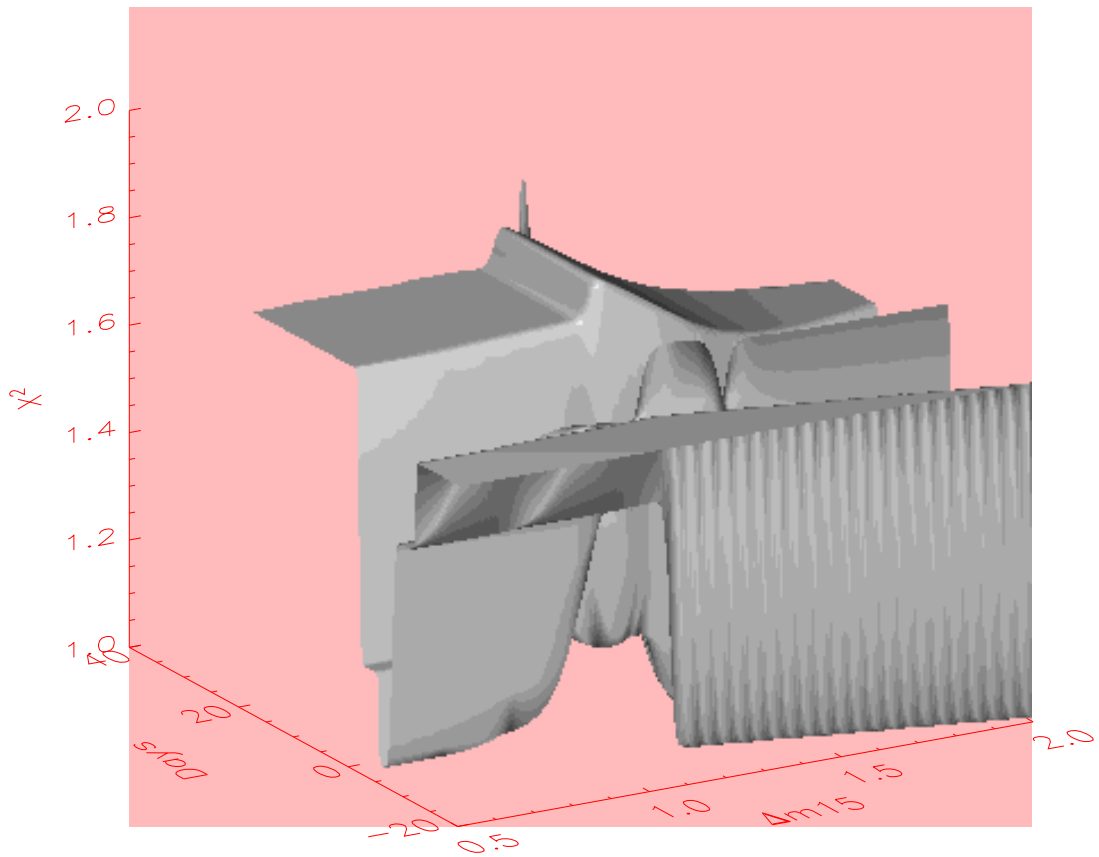

sn1989b.m01.dat.rect, z = 1.4800000
SuF02_081.bg.dll.c.trobj.fits Observed − Galaxy
Template Spectrum Av = 0.50000000
Galaxy: S0.pl
SN/Gal = 0.280143
Mg II, I
[O II]
Ca II
1.5
1.0
0.5
0.0
−0.5
−1.0
7000
8000
9000
10000

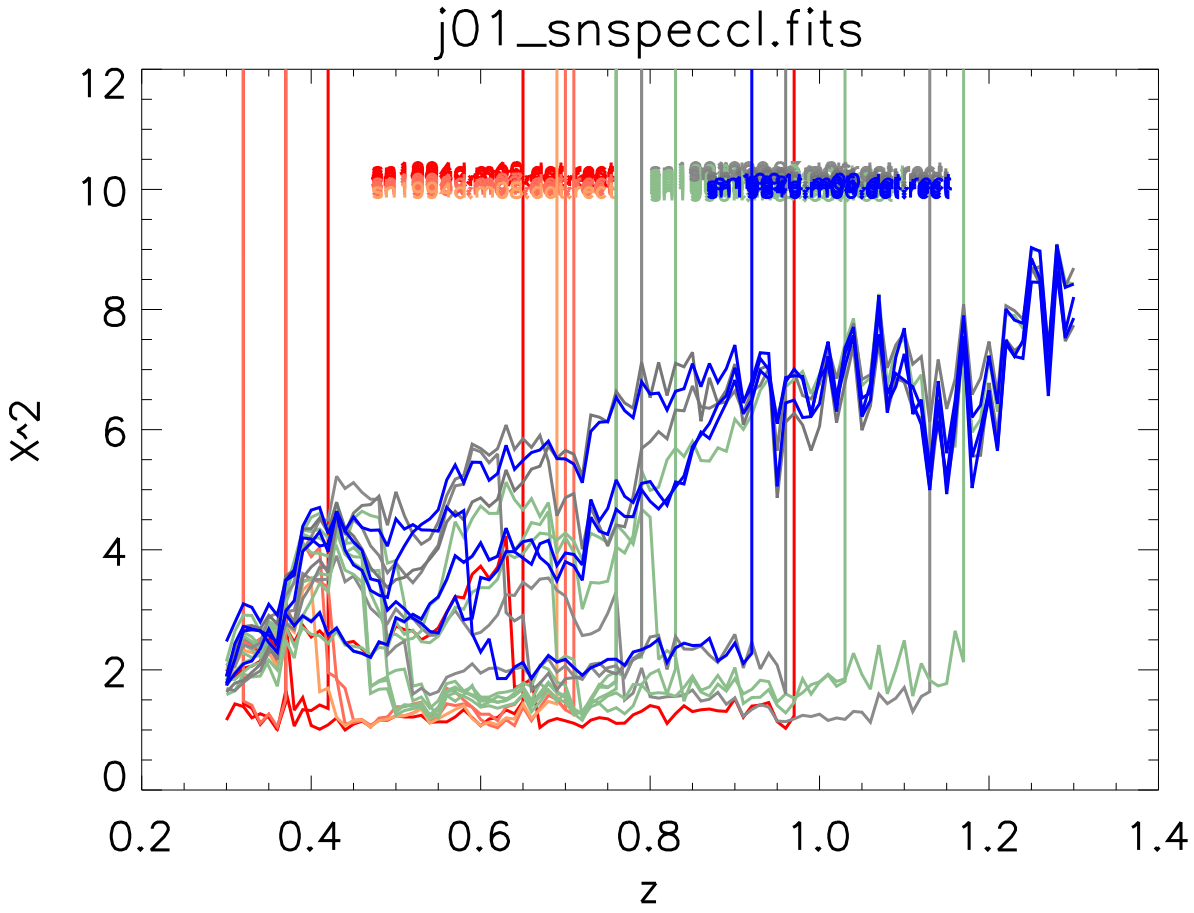

sn1989b.m07.dat.rect, z = 1.4800000
SuF02_081.bg.allc.trobj.fits Observed − Galaxy
Template Spectrum Av = 0.50000000
Galaxy: S0.pl
SN/Gal = 0.312967
Mg II, I
[O II]
Ca II
1.5
1.0
0.5
0.0
−0.5
−1.0
7000
8000
9000
10000

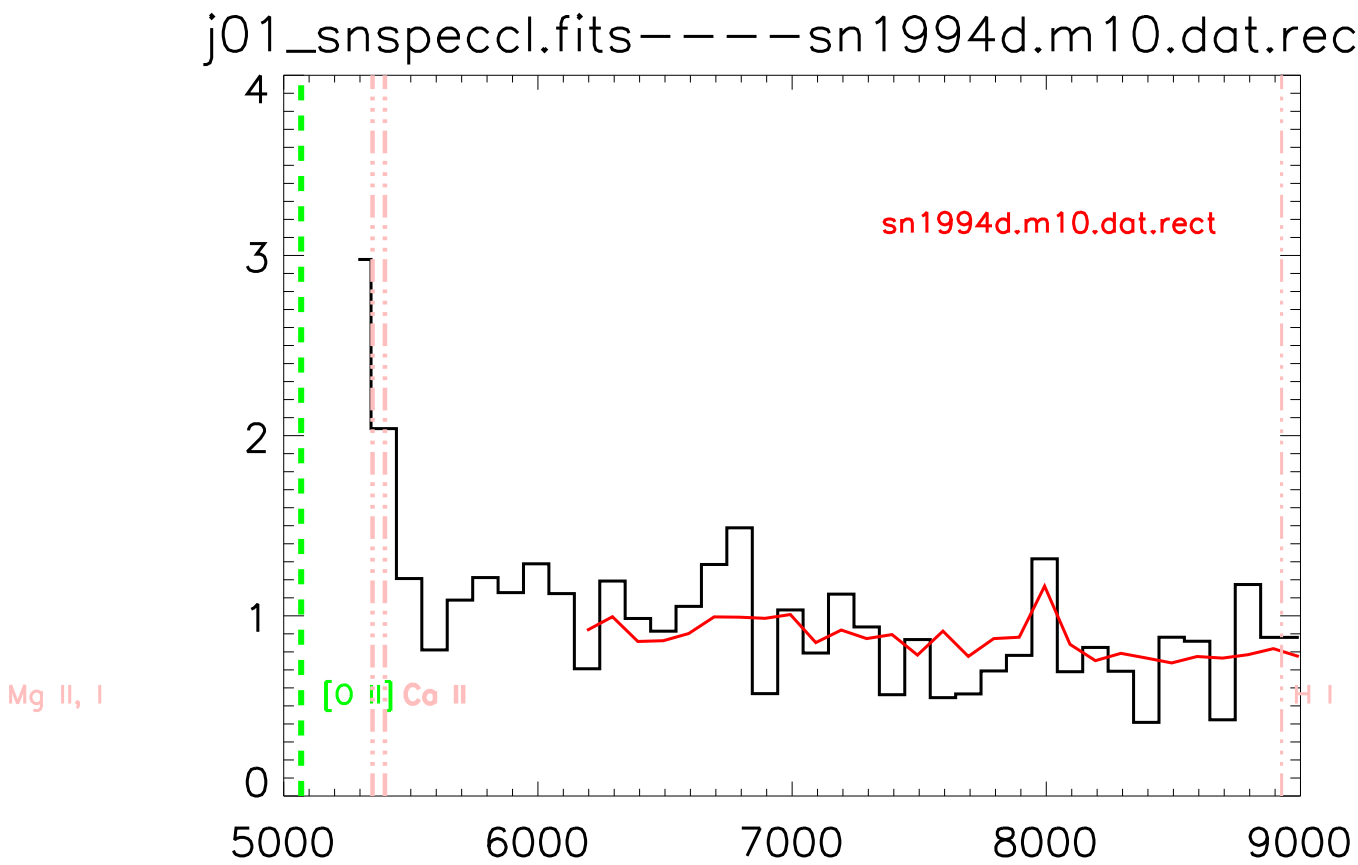

sn1996x.m00.dat.rect, z = 1.4800000
SuF02_08
.bg.all.c.trobj.fits Observed –
Template Spectrum Av = 0.50000000
Galaxy: S0.pl
SN/Gal = 0.515681
Mg II, I
[O II]
Ca II
2.0
1.5
1.0
0.5
0.0
−0.5
−1.0
7000
8000
9000
10000

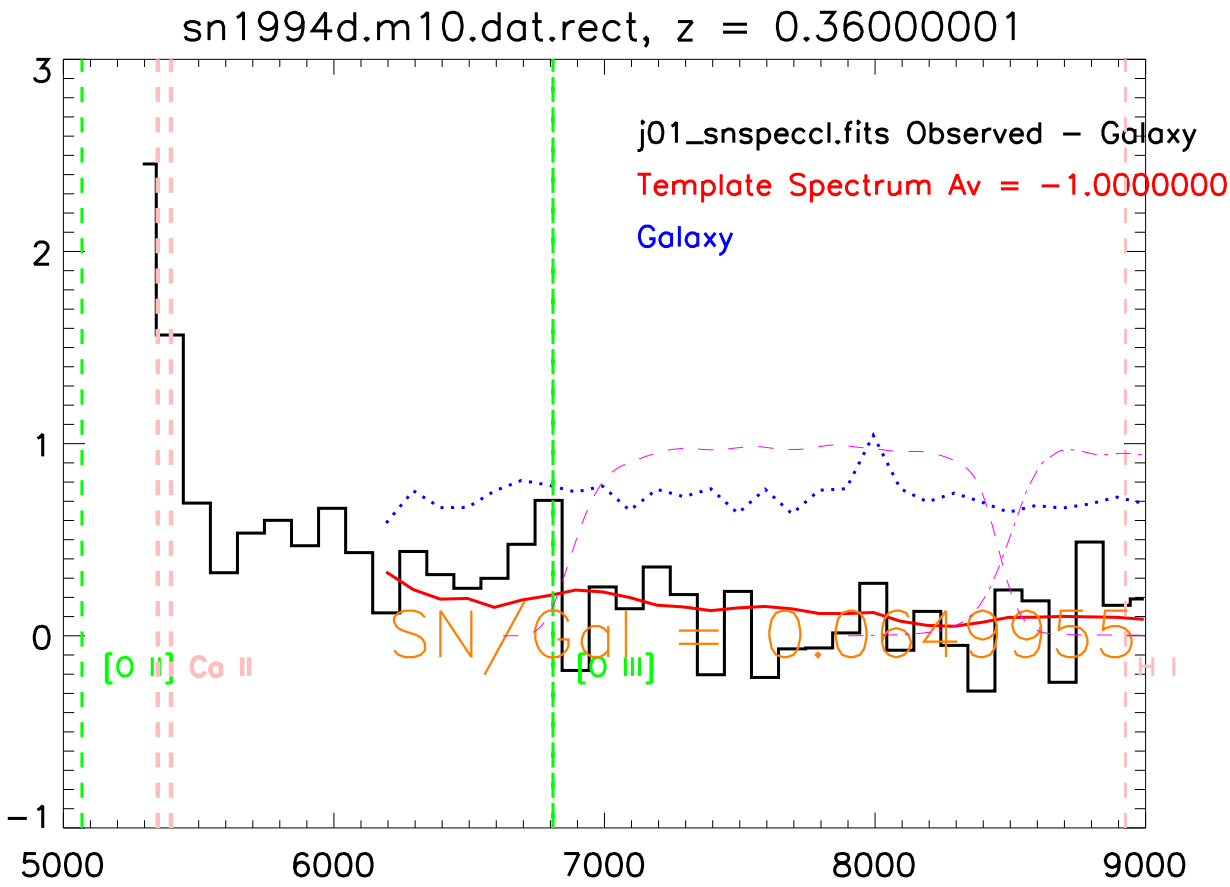

sn1991t.m03.dat.rect, z = 1.4800000
SuF02_L081.bg.all.c.trobj.fits Observed
Template Spectrum Av = 0.5000000
Galaxy: S0.pl
SN/Gal = 0.927229
Mg II, I
[O II]
Ca II
2.0
1.5
1.0
0.5
0.0
−0.5
−1.0
7000
8000
9000
10000

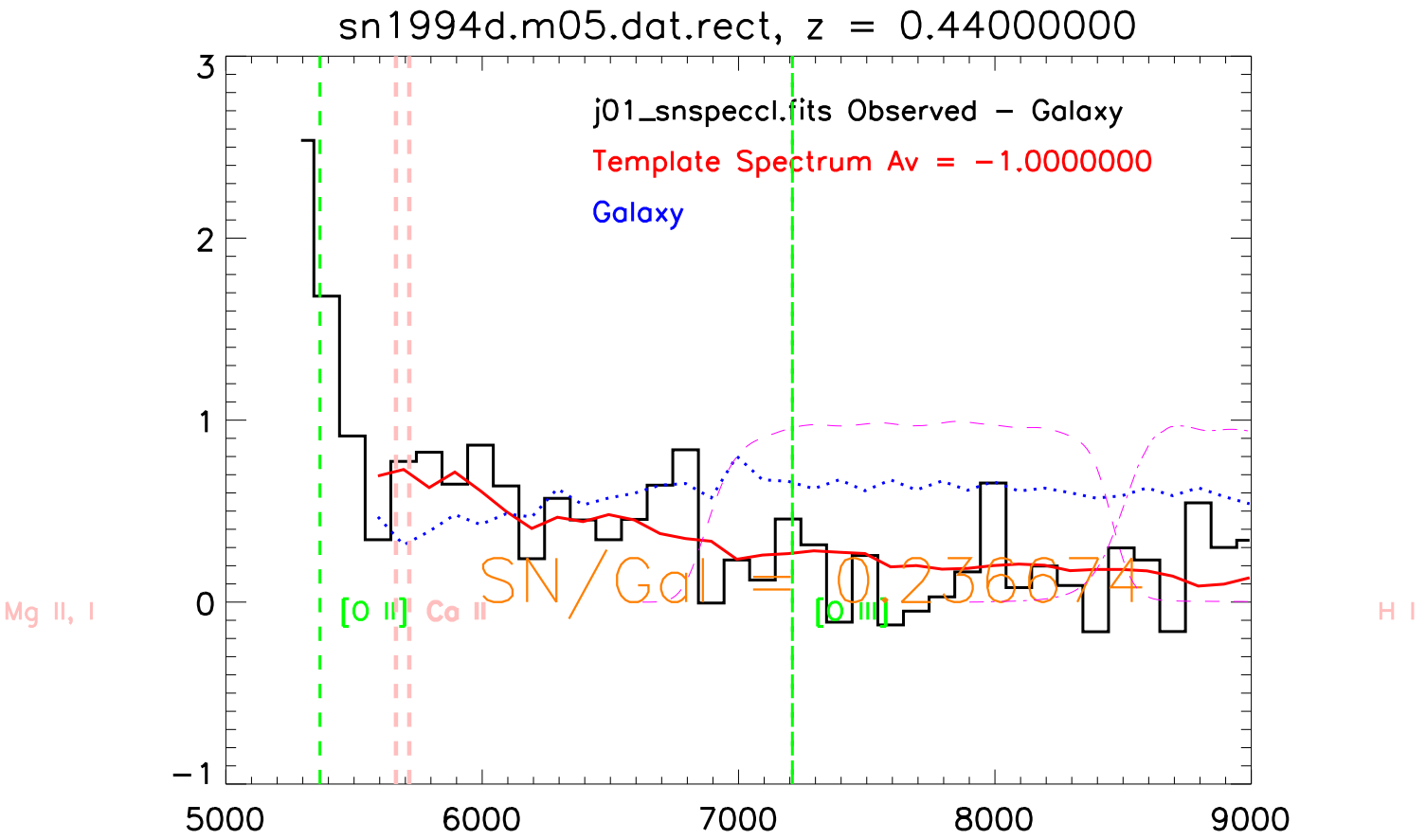


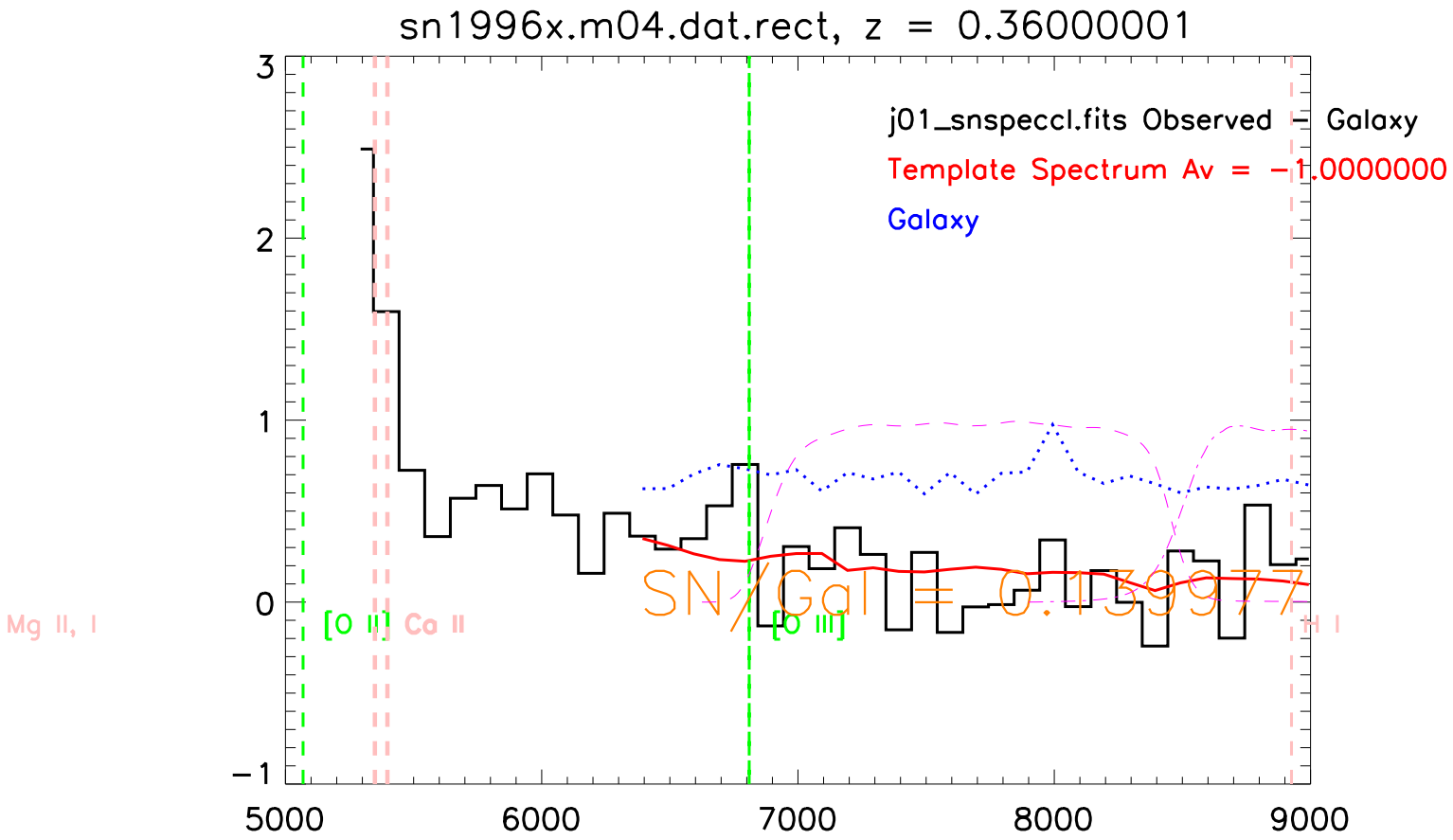

2.0
1.8
1.6
1.4
1.2
1.0
χ²
40
20
0
−20
Dφ/s
0.5
1.0
1.5
2.0
Δm15

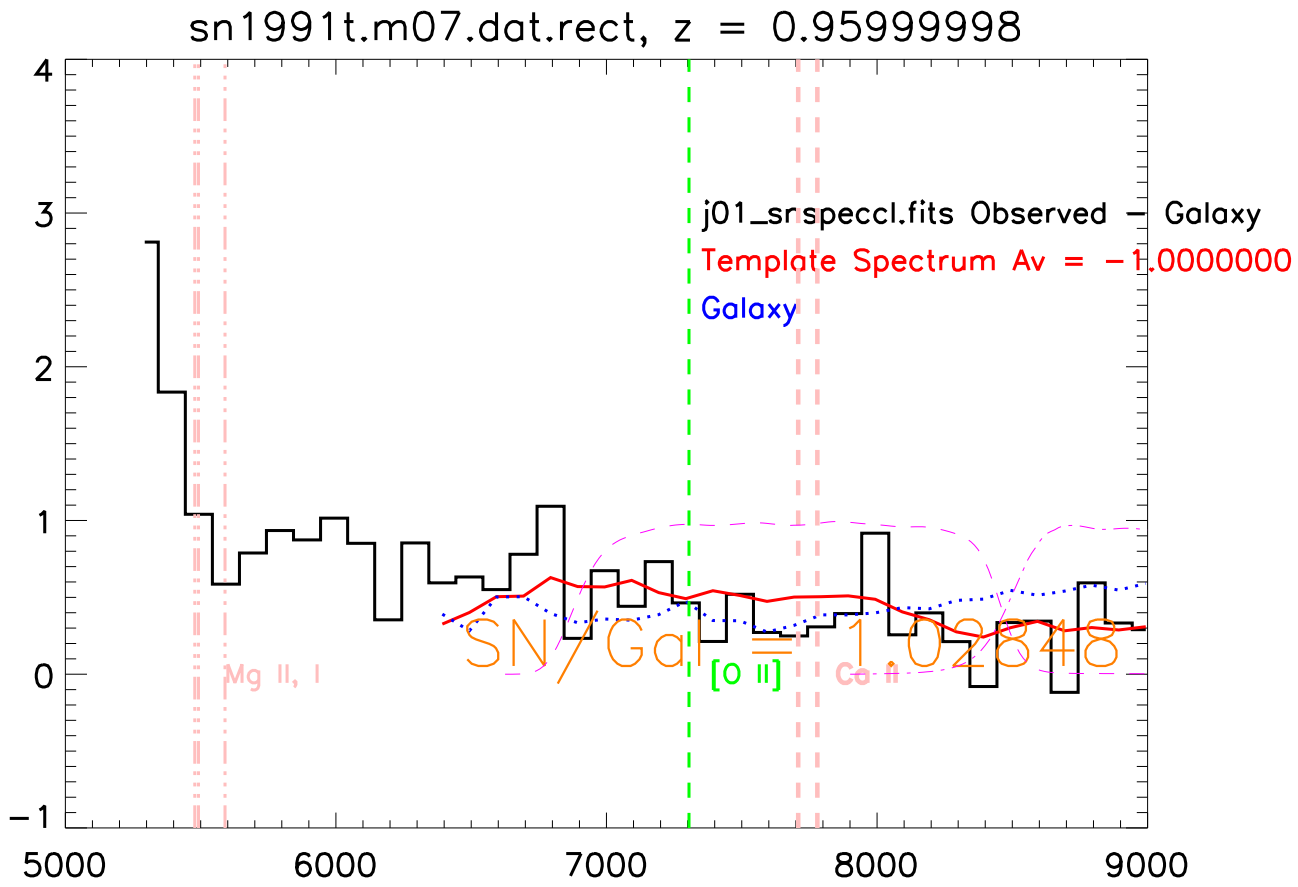

j01_snspeccl.fits
X^2
z
0
2
4
6
8
10
12
0.2
0.4
0.6
0.8
1.0
1.2
1.4


j01_snspeccl.fits----sn1994d.m10.dat.rect
sn1994d.m10.dat.rect
Mg II, I
[O II]
Ca II
H I
0
1
2
3
4
5000
6000
7000
8000
9000

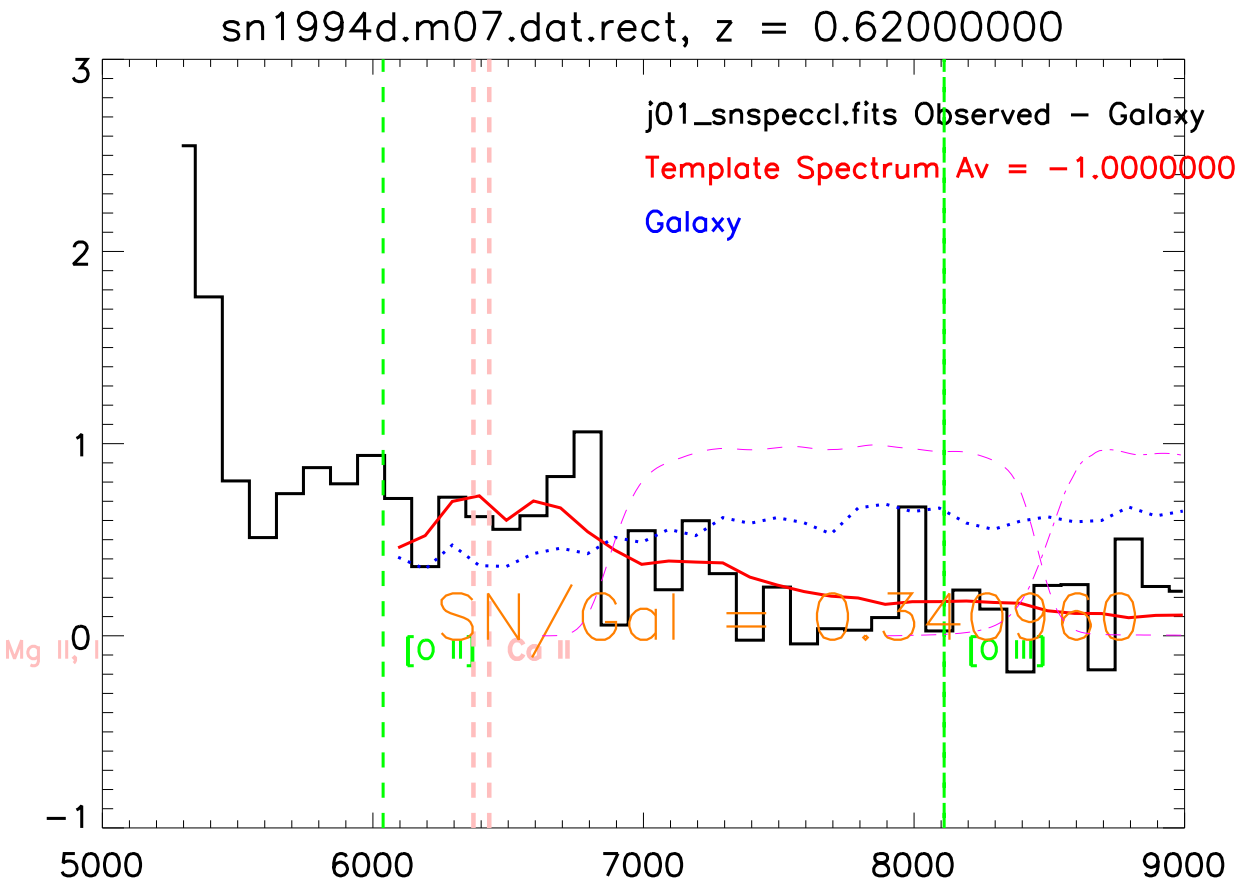

sn1994d.m10.dat.rect, z = 0.36000001
j01_snspeccl.fits Observed − Galaxy
Template Spectrum Av = −1.0000000
Galaxy
SN/Gal = 0.0649955
Mg II, I
[O II]
Ca II
[O III]
H I
3
2
1
0
−1
5000
6000
7000
8000
9000

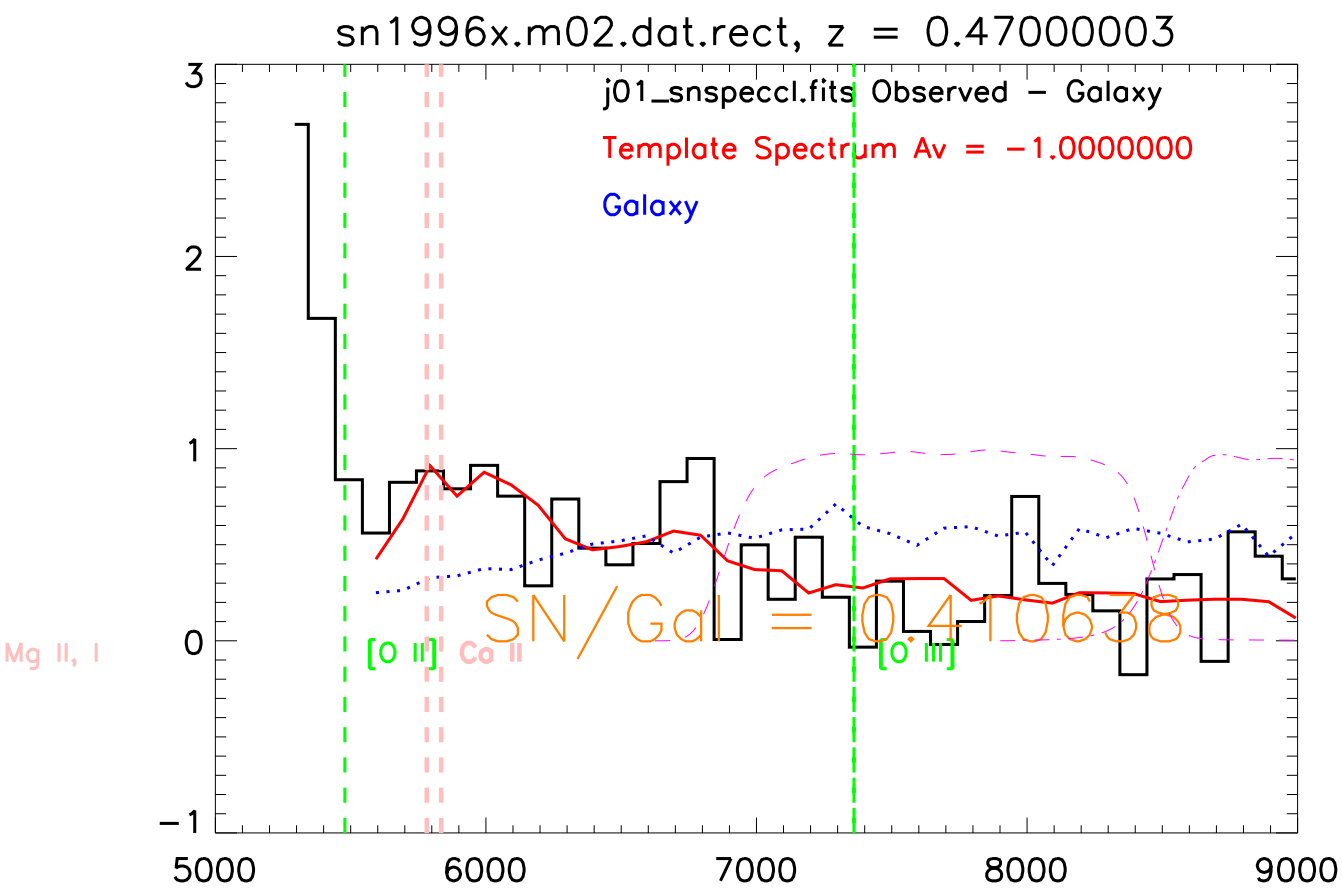

sn1994d.m05.dat.rect, z = 0.44000000
j01_snspeccl.fits Observed − Galaxy
Template Spectrum Av = −1.0000000
Galaxy
SN/Gal = 0.23666674
Mg II, I
[O II]
Ca II
[O III]
H I
3
2
1
0
−1
5000
6000
7000
8000
9000

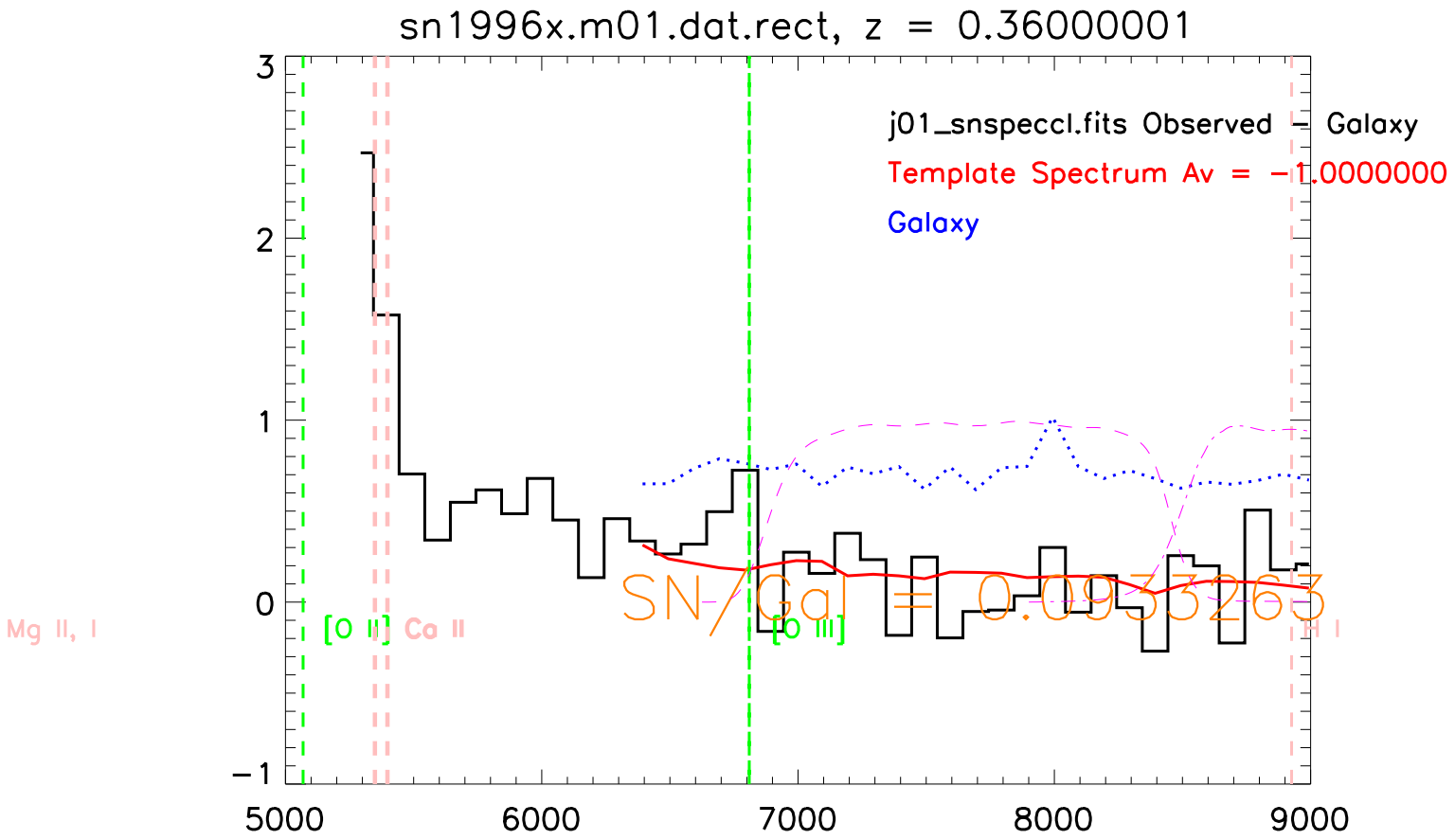

sn1996x.m04.dat.rect, z = 0.36000001
j01_snspeccl.fits Observed
Galaxy
Template Spectrum Av = -1.0000000
Galaxy
SN/Gal = 0.113997
Mg II, I
[O II]
Ca II
[O III]
H I
3
2
1
0
-1
5000
6000
7000
8000
9000

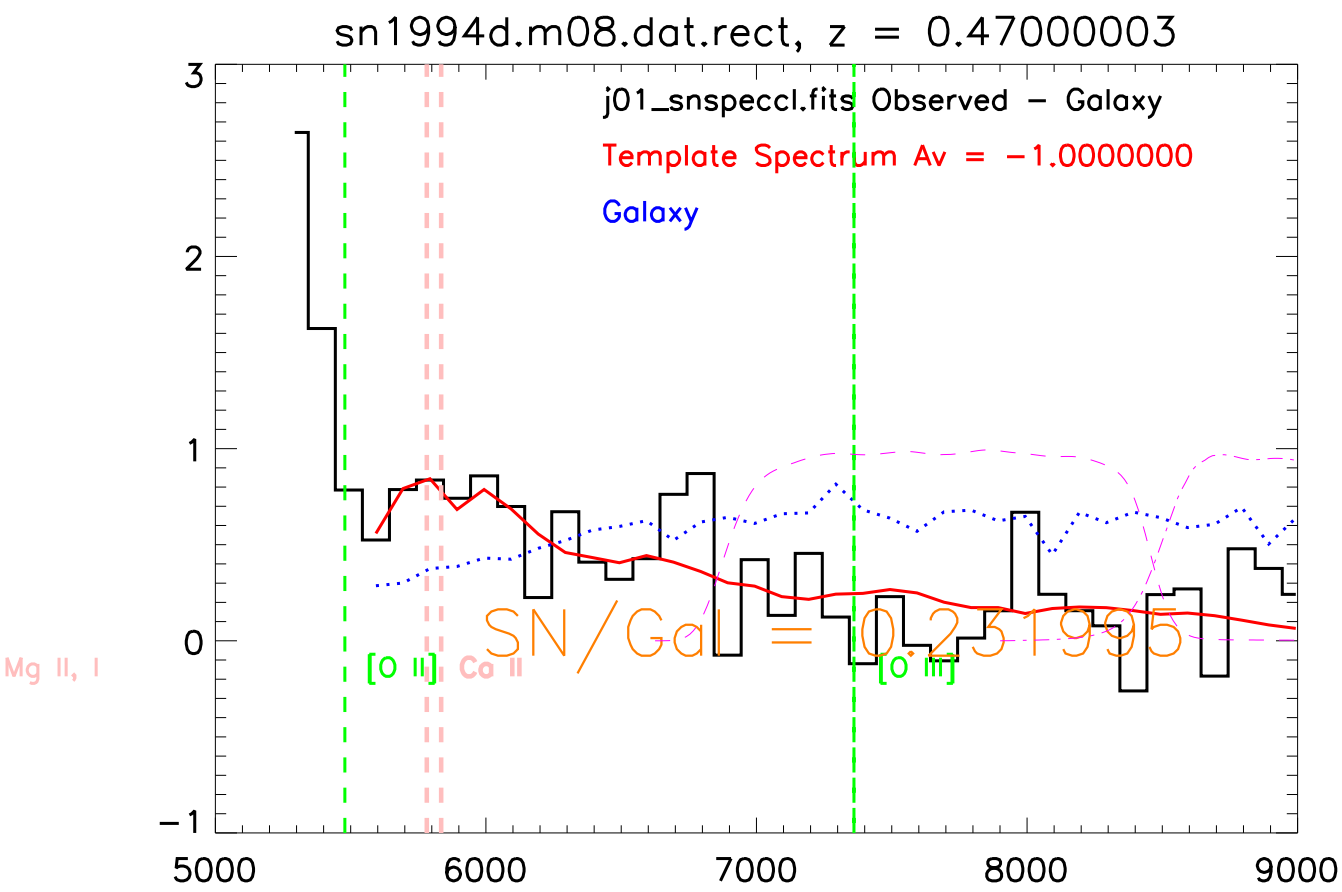


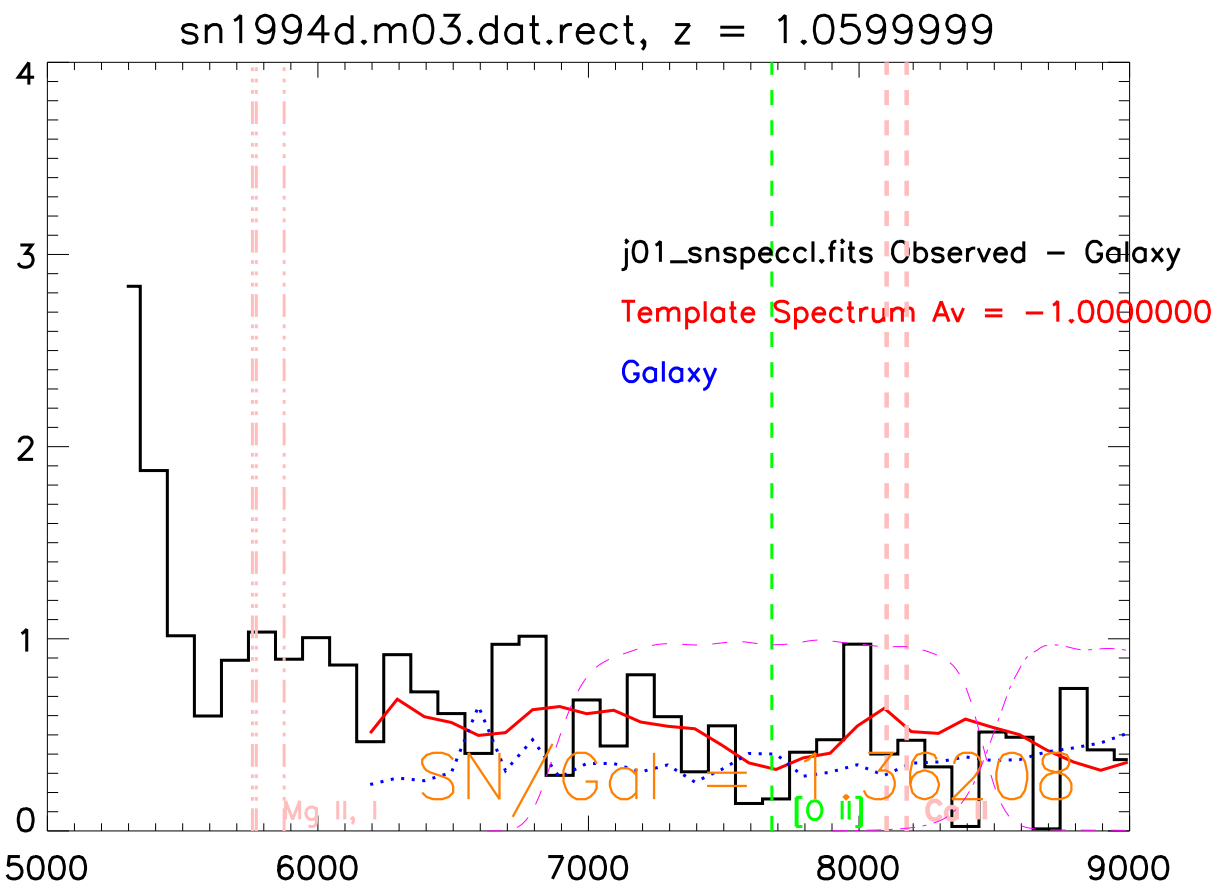
sn1991t.m07.dat.rect, z = 0.95999998
j01_snspeccl.fits Observed – Galaxy
Template Spectrum Av = −1.0000000
Galaxy
SN/Gal = 1.02848
Mg II, I
[O II]
Ca II
4
3
2
1
0
−1
5000
6000
7000
8000
9000

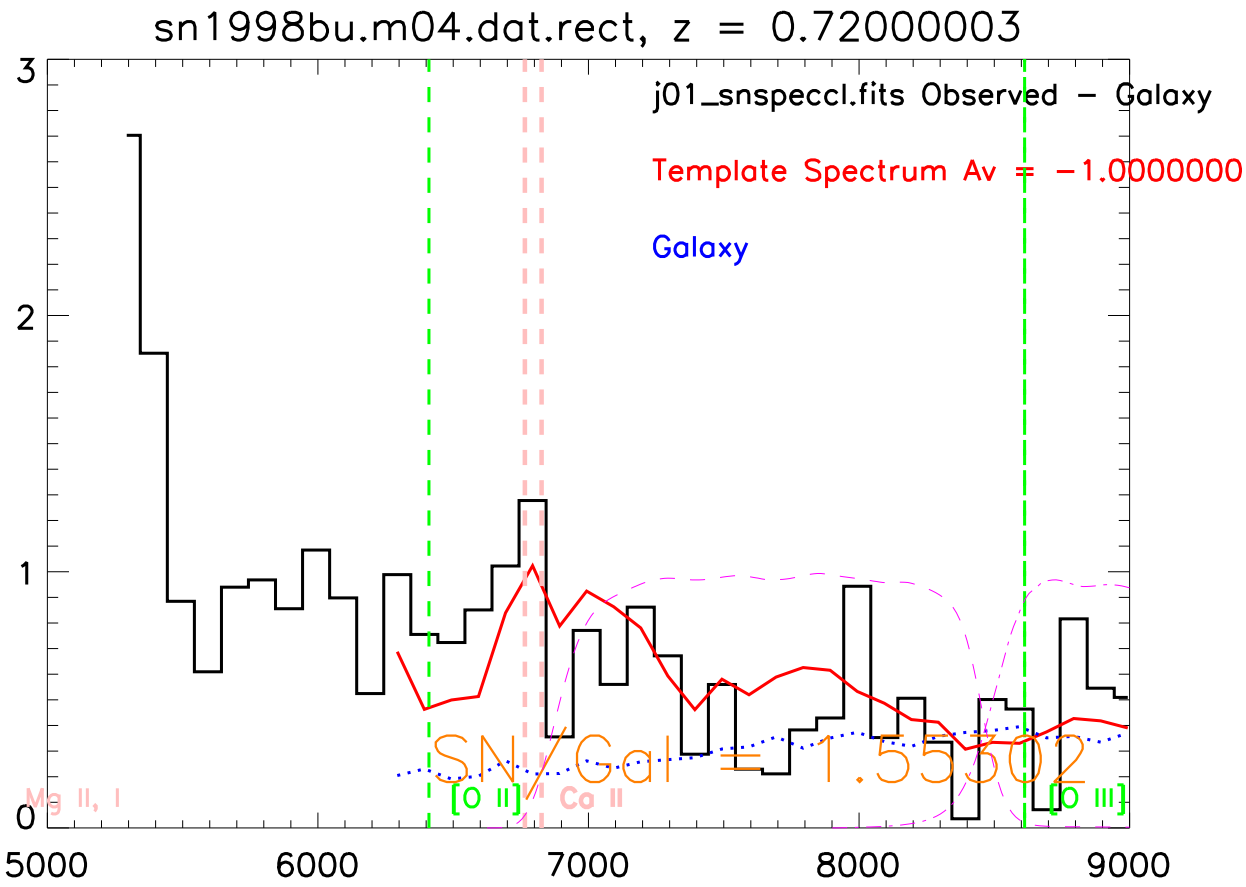

sn1994d.m07.dat.rect, z = 0.62000000
j01_snspeccl.fits Observed − Galaxy
Template Spectrum Av = −1.0000000
Galaxy
SN/Gal = 0.340960
[O II]
Ca II
[O III]
Mg II, I
3
2
1
0
−1
5000
6000
7000
8000
9000

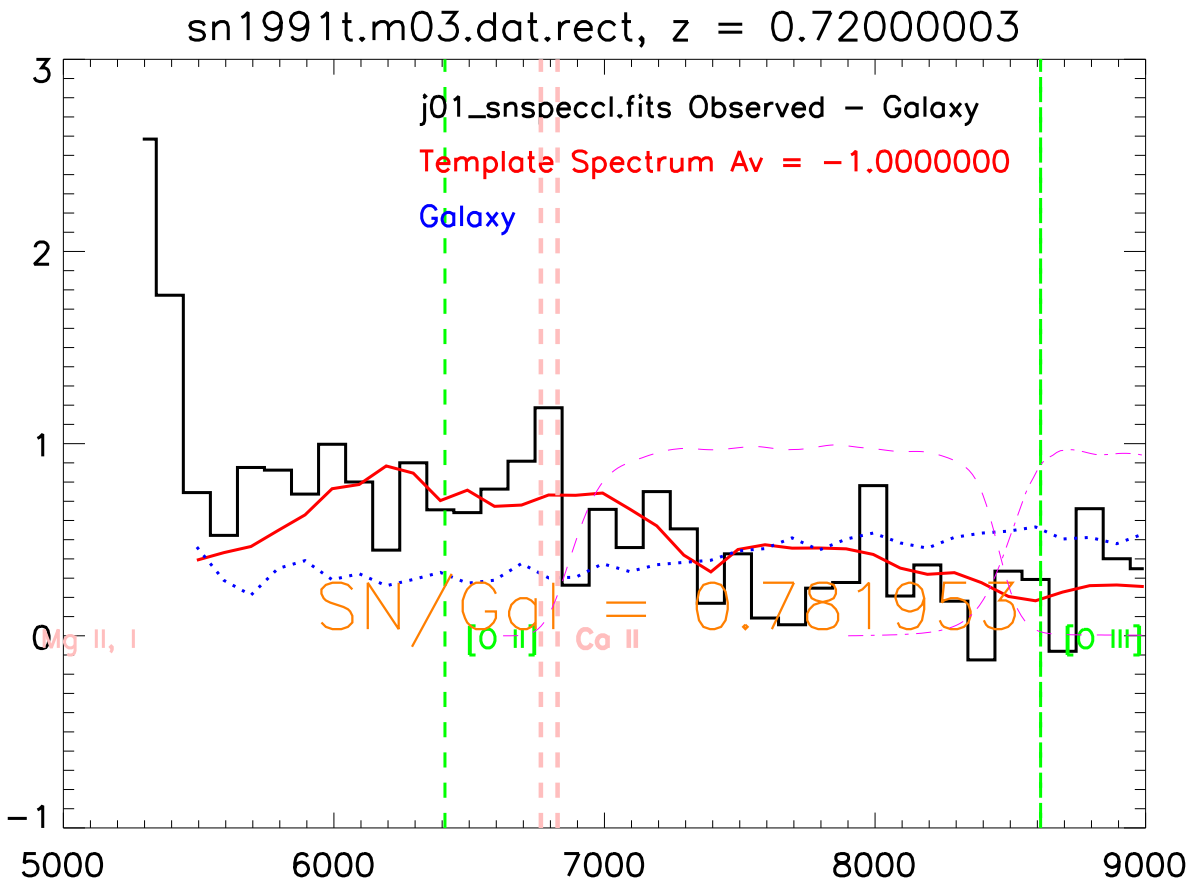

sn1996x.m02.dat.rect, z = 0.47000003
j01_snspeccl.fits Observed − Galaxy
Template Spectrum Av = −1.0000000
Galaxy
SN/Gal = 014106538
Mg II, I
[O II]
Ca II
[O III]
H
3
2
1
0
−1
5000
6000
7000
8000
9000

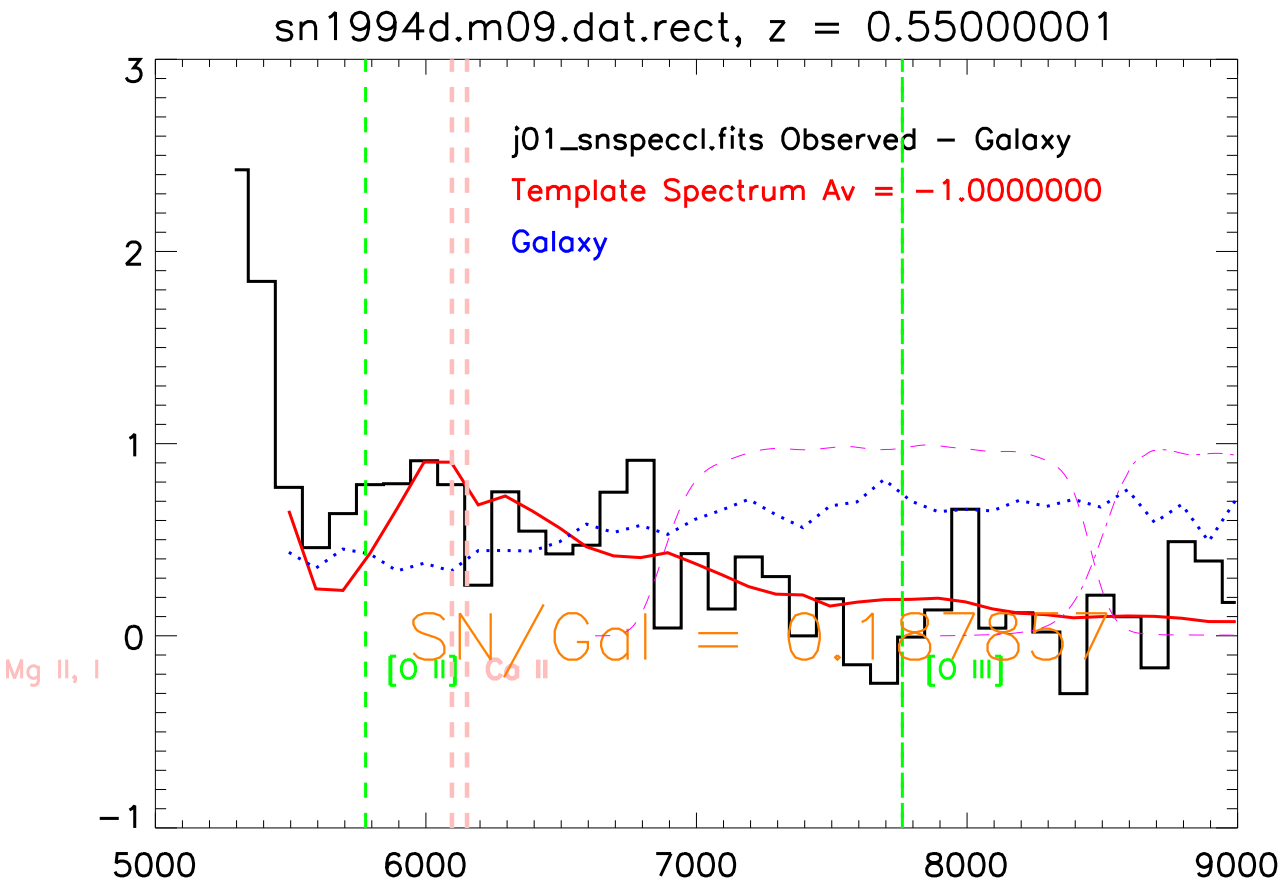

sn1996x.m01.dat.rect, z = 0.36000001
j01_snspeccl.fits Observed
Galaxy
Template Spectrum Av = −1.0000000
Galaxy
SN/Gal = 0.09333263
Mg II, I
[O II]
Ca II
[O III]
H I
3
2
1
0
−1
5000
6000
7000
8000
9000

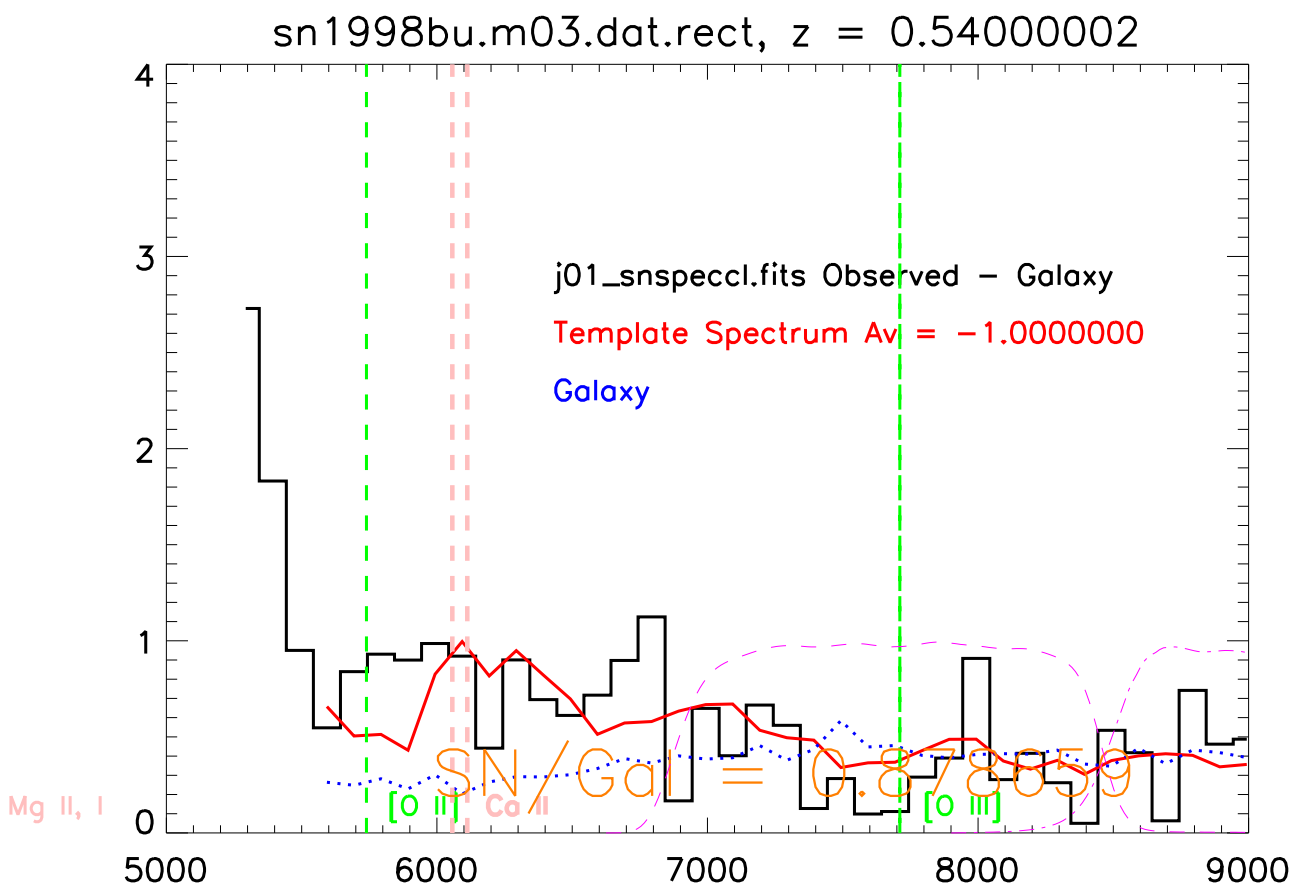

sn1994d.m08.dat.rect, z = 0.47000003
j01_snspeccl.fits Observed − Galaxy
Template Spectrum Av = −1.0000000
Galaxy
SN/Gal = 0.231995
[O II]
Ca II
[O III]
Mg II, I
H
3
2
1
0
−1
5000
6000
7000
8000
9000

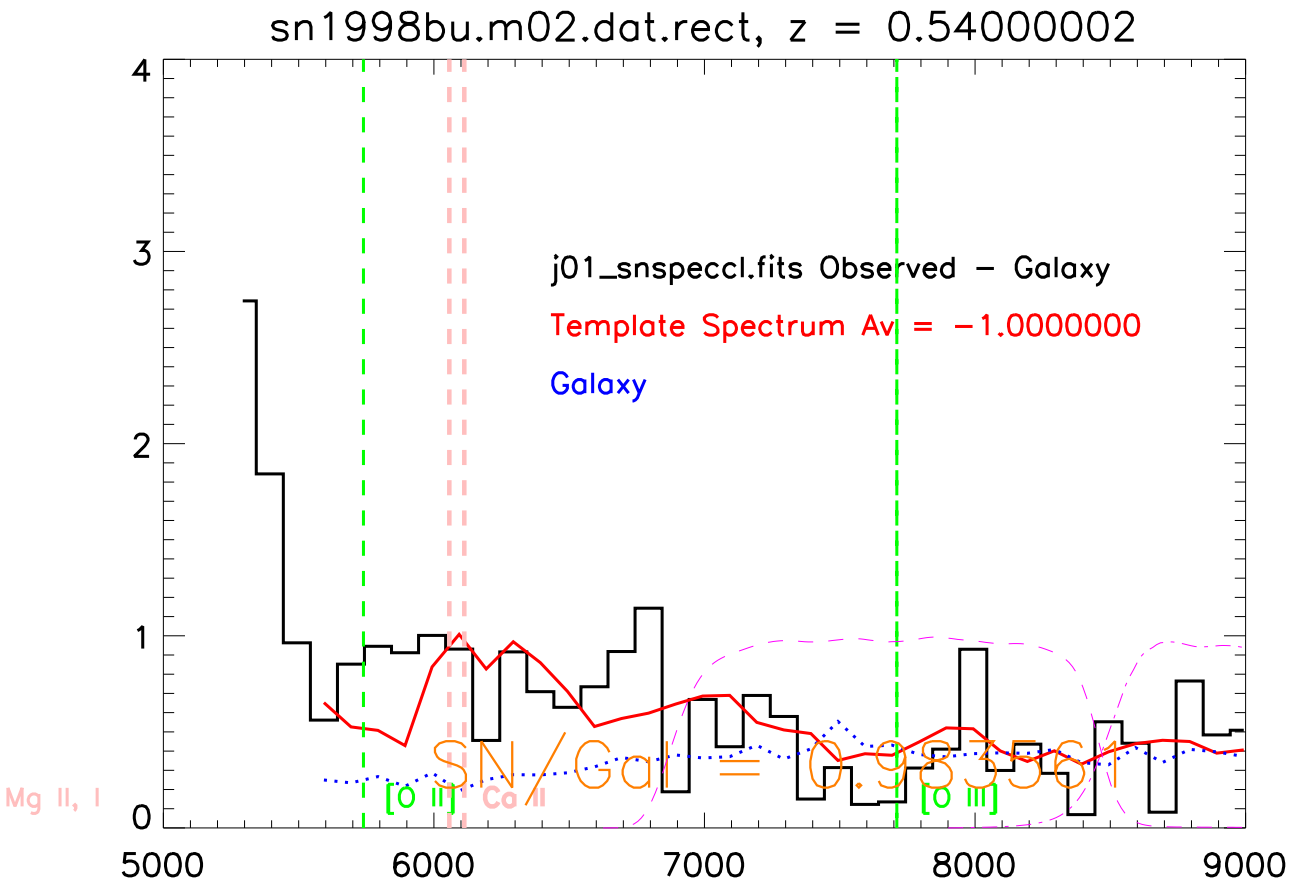

sn1994d.m03.dat.rect, z = 1.0599999
j01_snspeccl.fits Observed − Galaxy
Template Spectrum Av = −1.0000000
Galaxy
SN/Gal = 1.36208
Mg II, I
[O II]
Ca II
0
1
2
3
4
5000
6000
7000
8000
9000

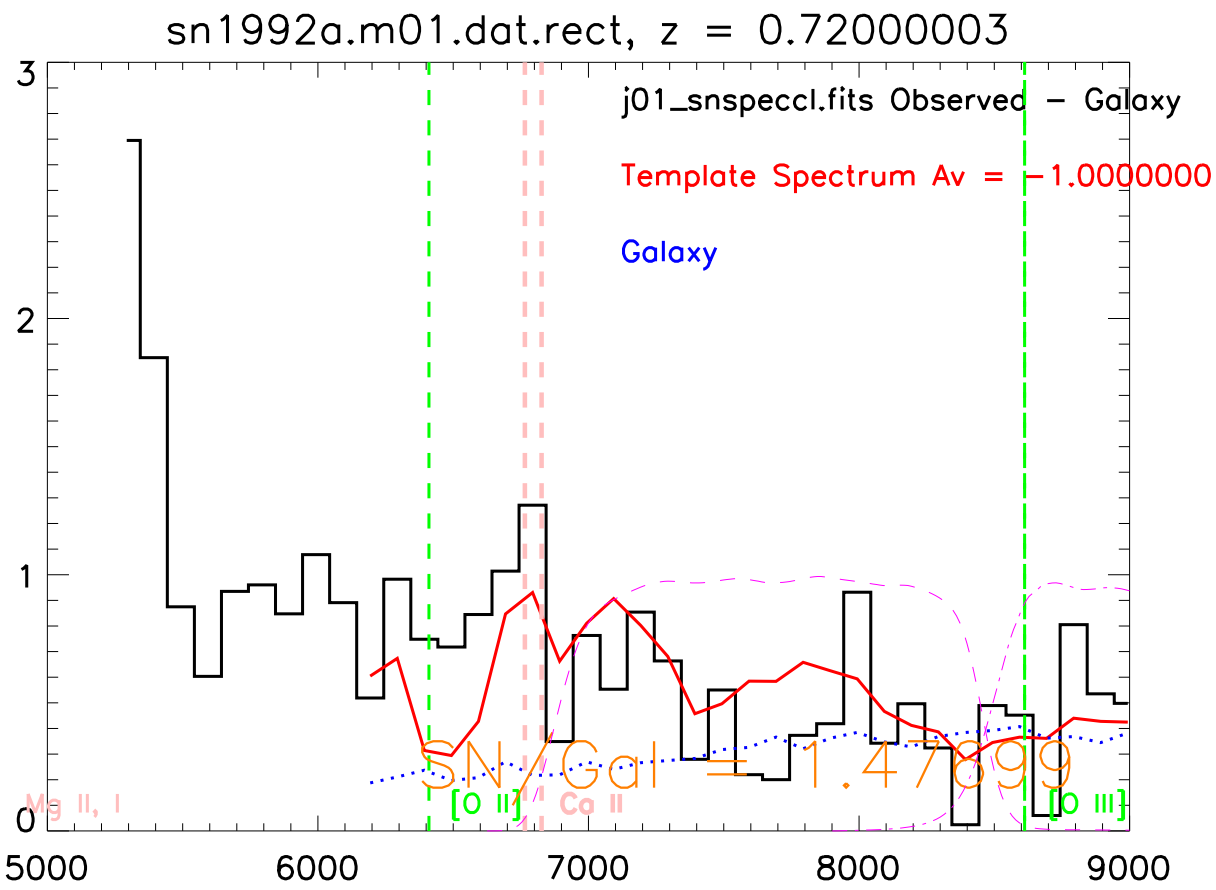

sn1998bu.m04.dat.rect, z = 0.72000003
j01_snspeccl.fits Observed − Galaxy
Template Spectrum Av = −1.0000000
Galaxy
SN/Gal = 1.55302
Mg II, I
[O II]
Ca II
[O III]
3
2
1
0
5000
6000
7000
8000
9000

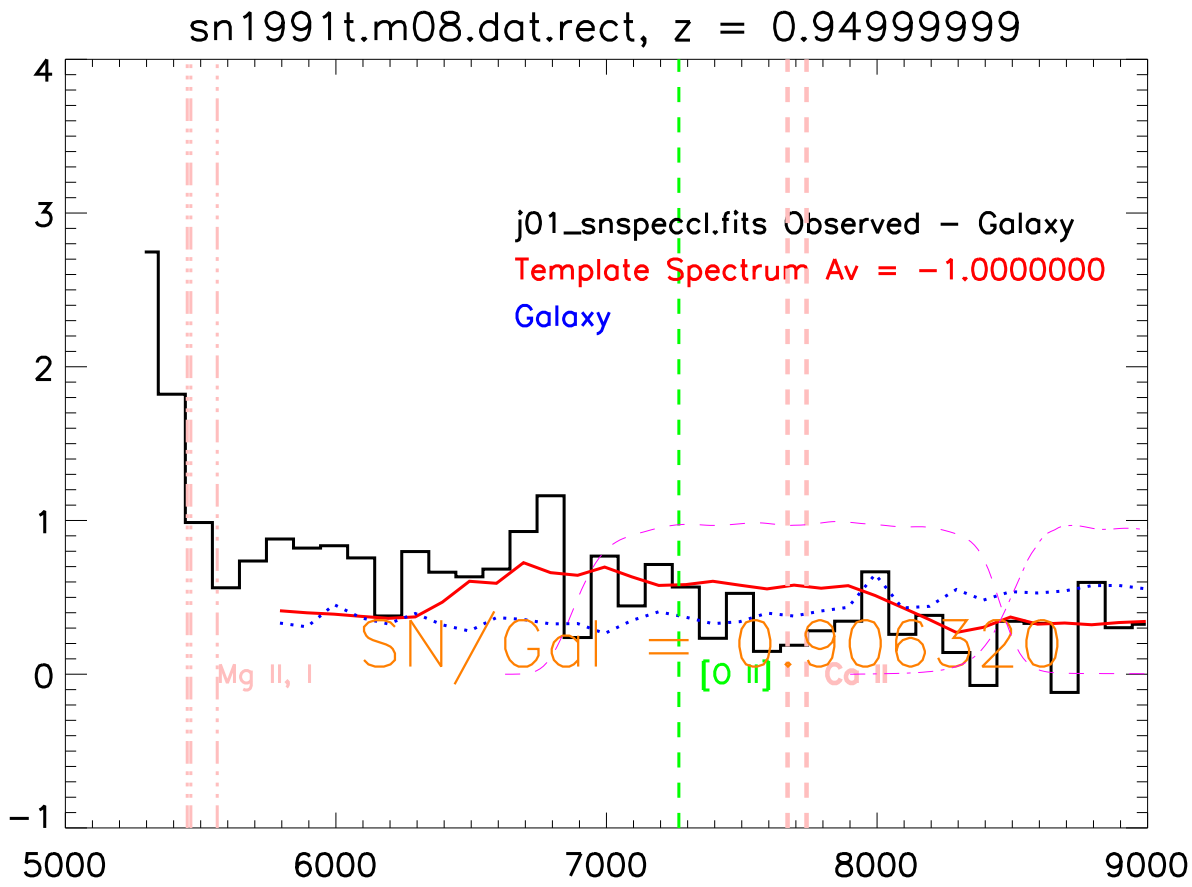

sn1991t.m03.dat.rect, z = 0.72000003
j01_snspeccl.fits Observed − Galaxy
Template Spectrum Av = −1.0000000
Galaxy
SN/Gal = 0.7819553
Mg II, I
[O II]
Ca II
[O III]
3
2
1
0
−1
5000
6000
7000
8000
9000

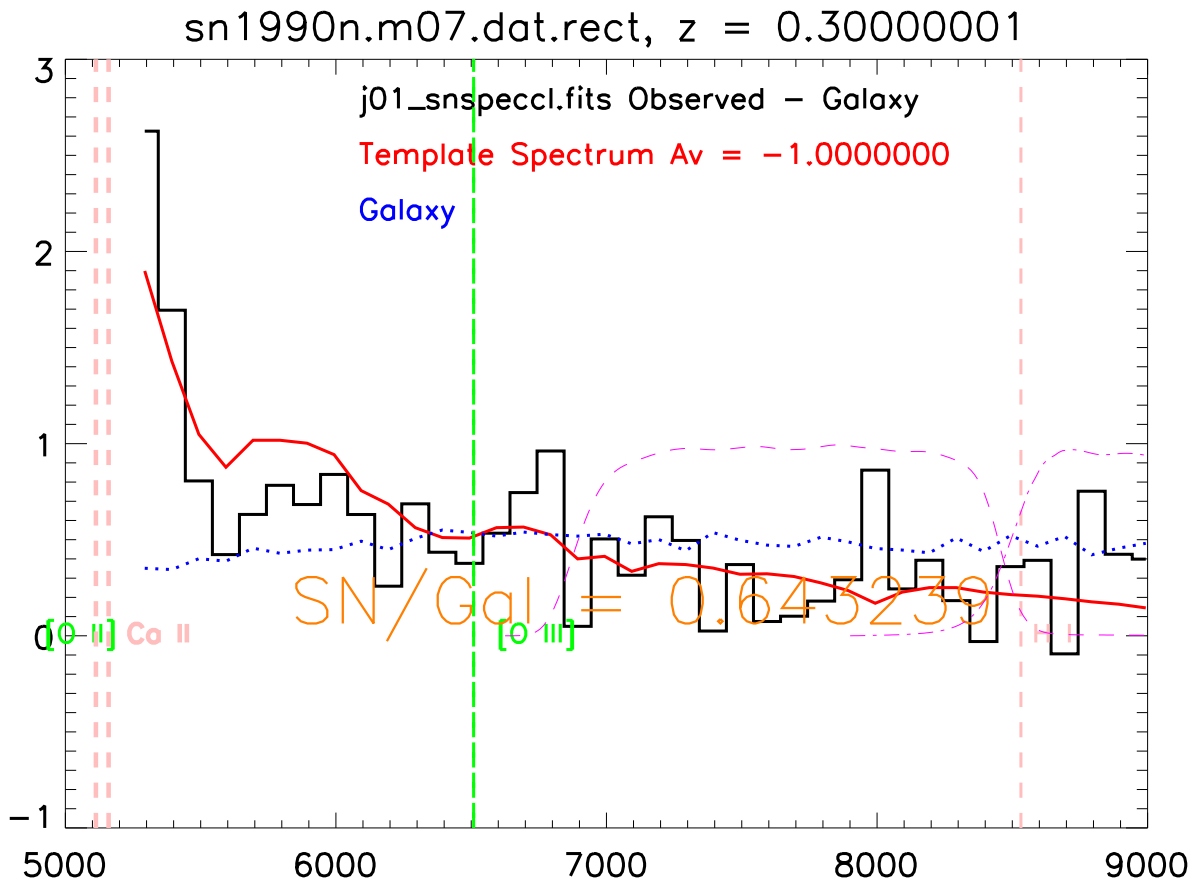

sn1994d.m09.dat.rect, z = 0.55000001
j01_snspeccl.fits Observed − Galaxy
Template Spectrum Av = −1.0000000
Galaxy
SN/Gal = 0.1187857
Mg II, I
[O II]
Ca II
[O III]
3
2
1
0
−1
5000
6000
7000
8000
9000


sn1998bu.m03.dat.rect, z = 0.54000002
j01_snspeccl.fits Observed − Galaxy
Template Spectrum Av = −1.0000000
Galaxy
SN/Gal = 0.878859
[O II]
Ca II
[O III]
Mg II, I
0
1
2
3
4
5000
6000
7000
8000
9000

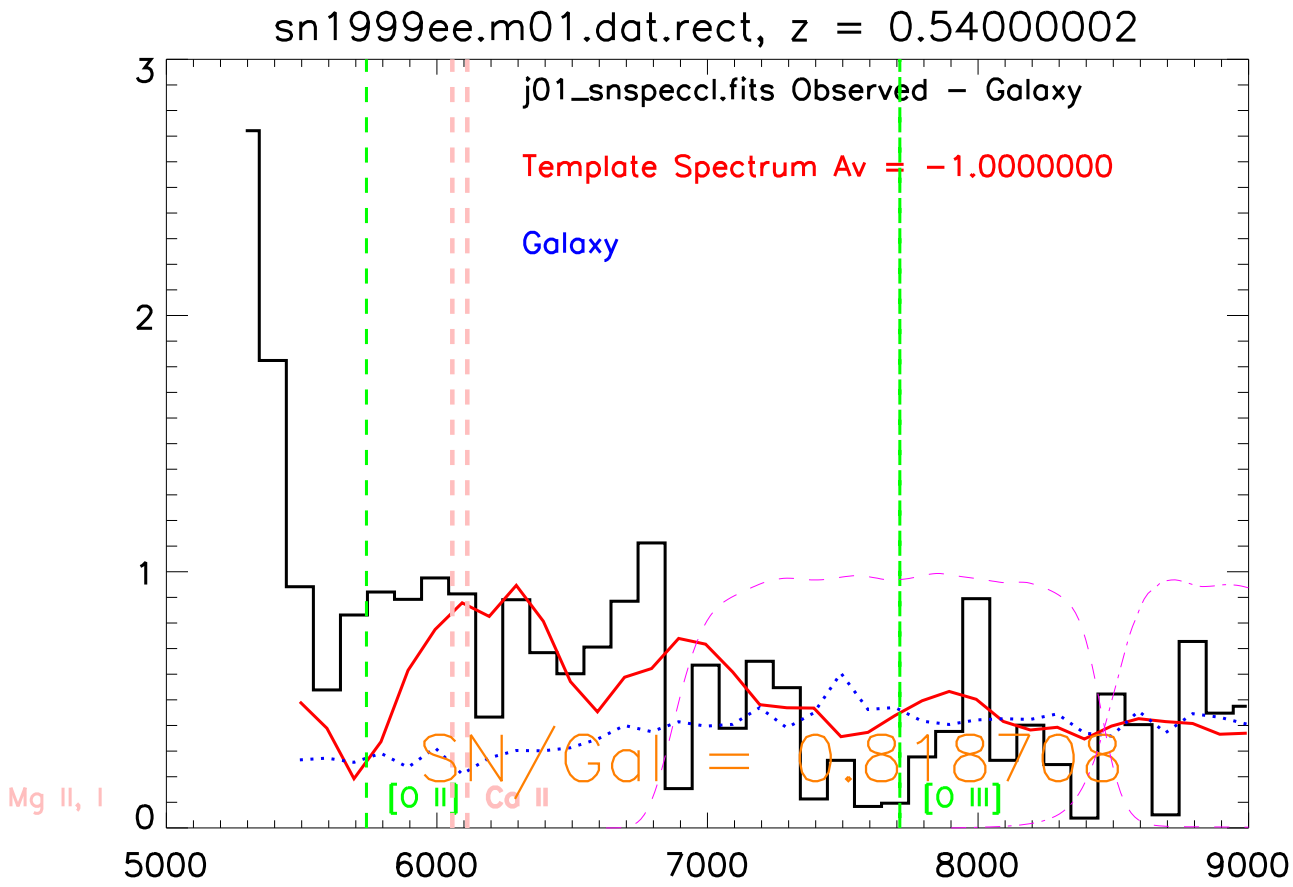

sn1998bu.m02.dat.rect, z = 0.54000002
j01_snspeccl.fits Observed − Galaxy
Template Spectrum Av = −1.0000000
Galaxy
SN/Gal = 0.933561
[O II]
Ca II
[O III]
Mg II, I
0
1
2
3
4
5000
6000
7000
8000
9000

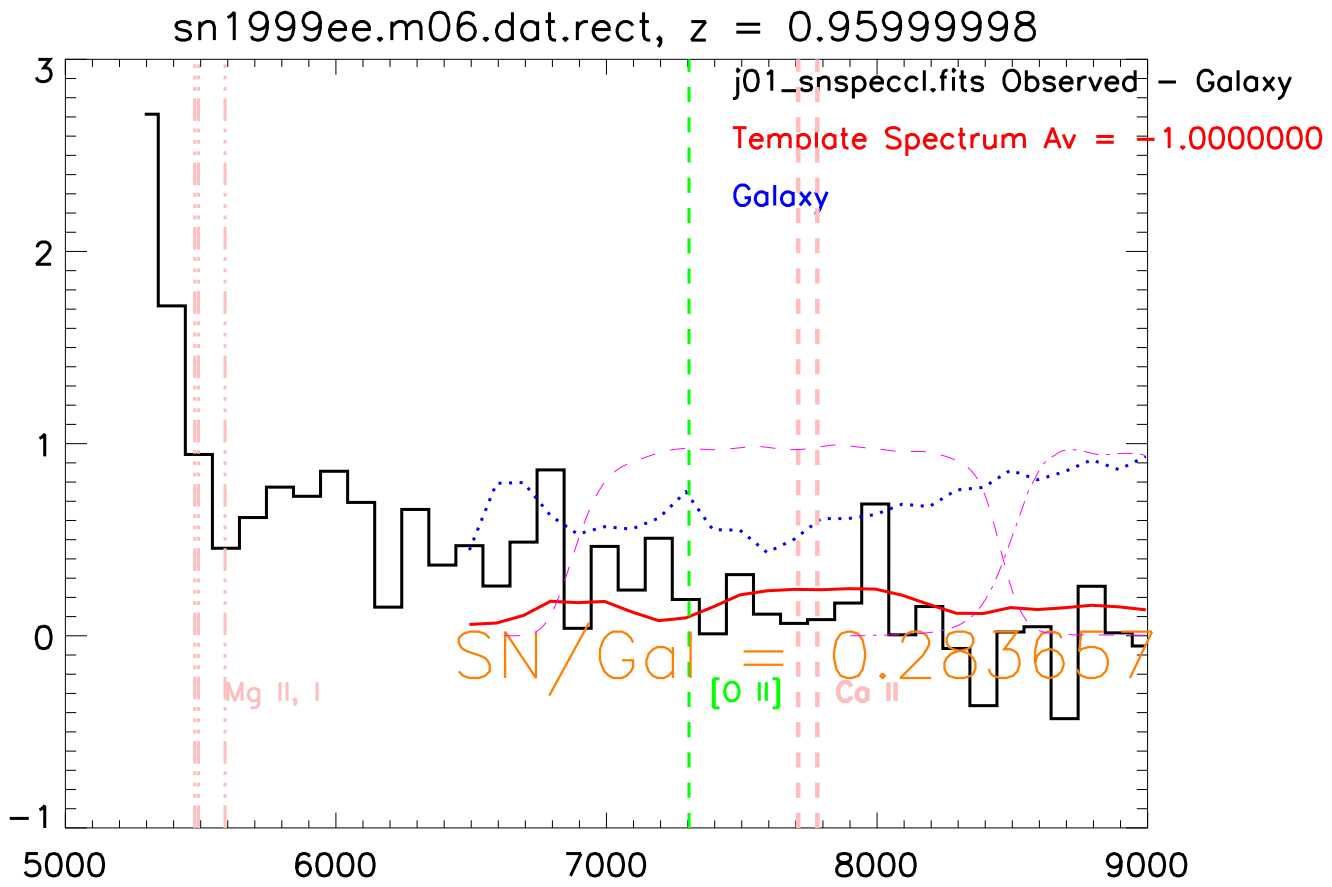

sn1992a.m01.dat.rect, z = 0.72000003
j01_snspeccl.fits Observed − Galaxy
Template Spectrum Av = −1.0000000
Galaxy
SN/Gal = 1.47899
Mg II, I
[O II]
Ca II
[O III]
0
1
2
3
5000
6000
7000
8000
9000

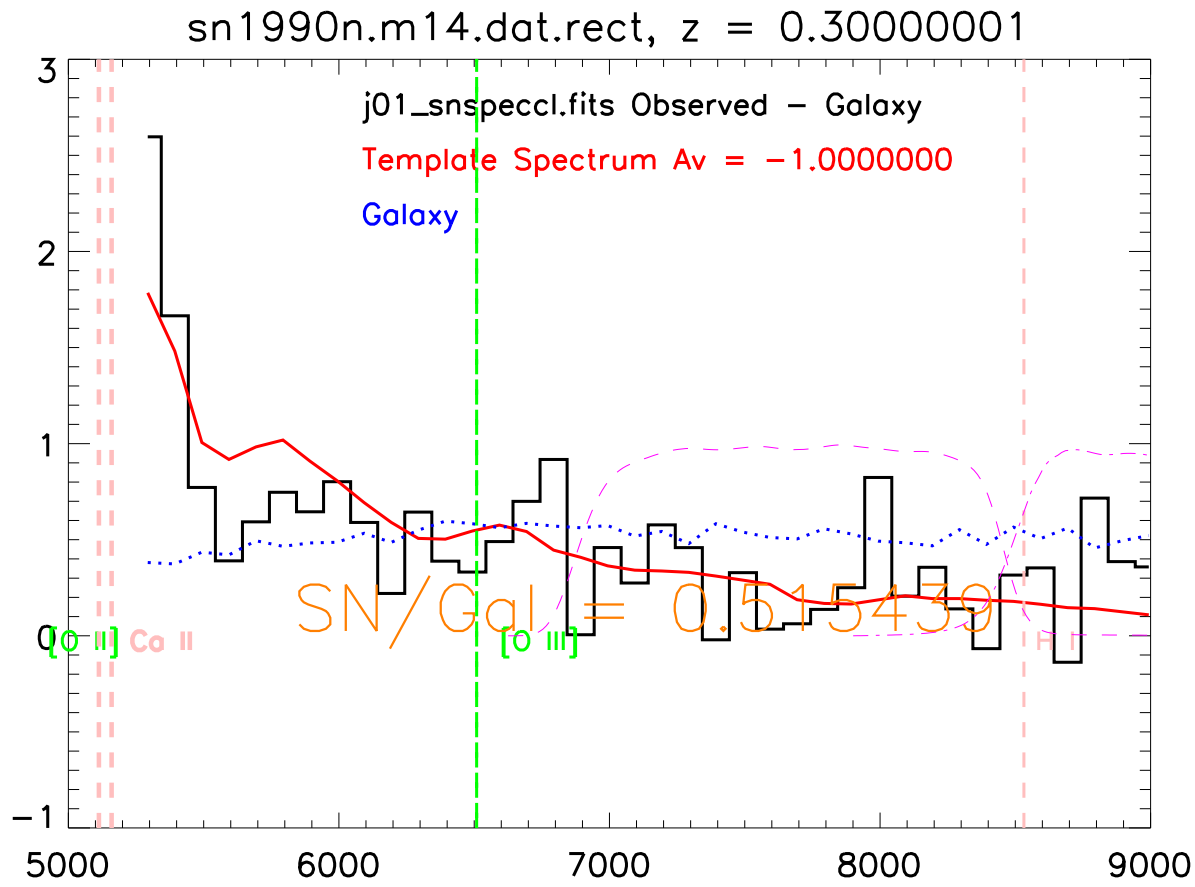

sn1991t.m08.dat.rect, z = 0.94999999
j01_snspeccl.fits Observed − Galaxy
Template Spectrum Av = −1.0000000
Galaxy
SN/Gal = 0.906320
Mg II, I
[O II]
Ca II
4
3
2
1
0
−1
5000
6000
7000
8000
9000


sn1990n.m07.dat.rect, z = 0.30000001
j01_snspeccl.fits Observed − Galaxy
Template Spectrum Av = −1.0000000
Galaxy
SN/Gal = 0.6453239
[O II]
Ca II
[O III]
H ε
3
2
1
0
−1
5000
6000
7000
8000
9000

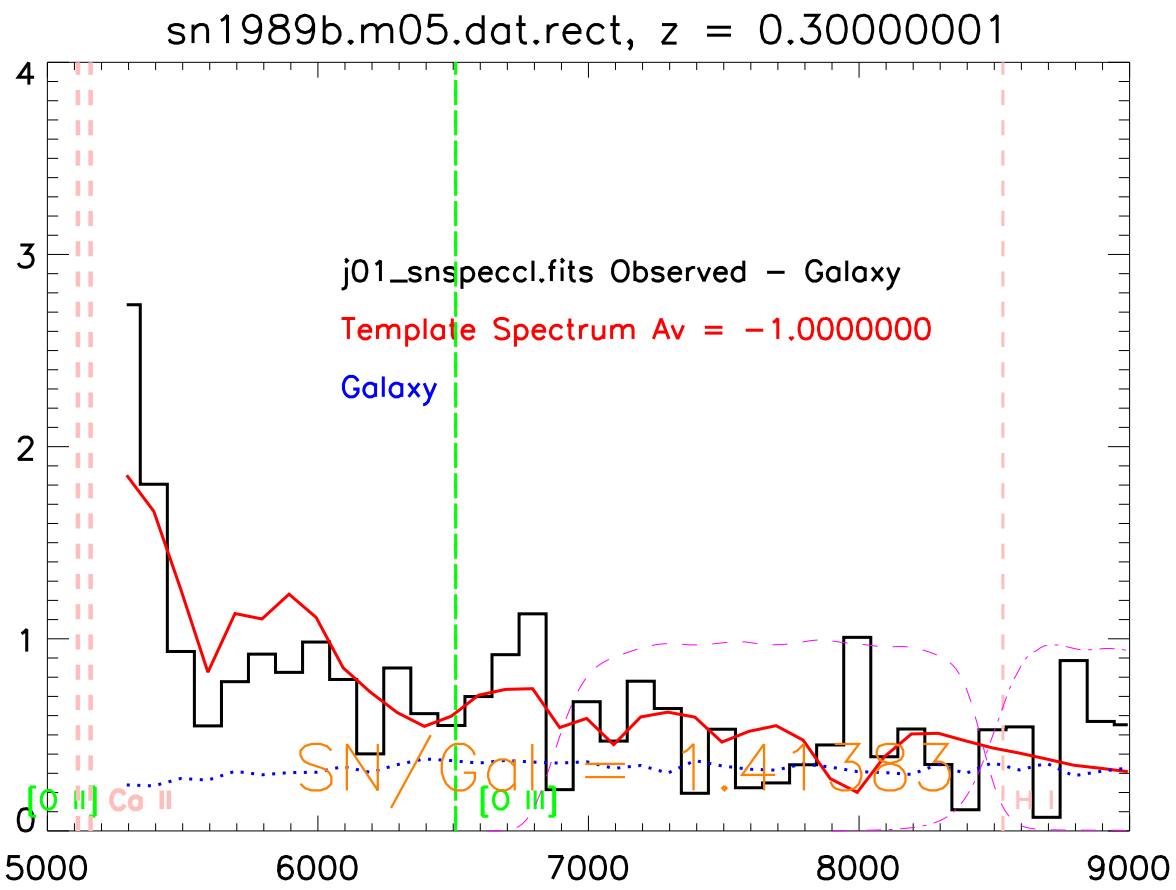
Mg II, I

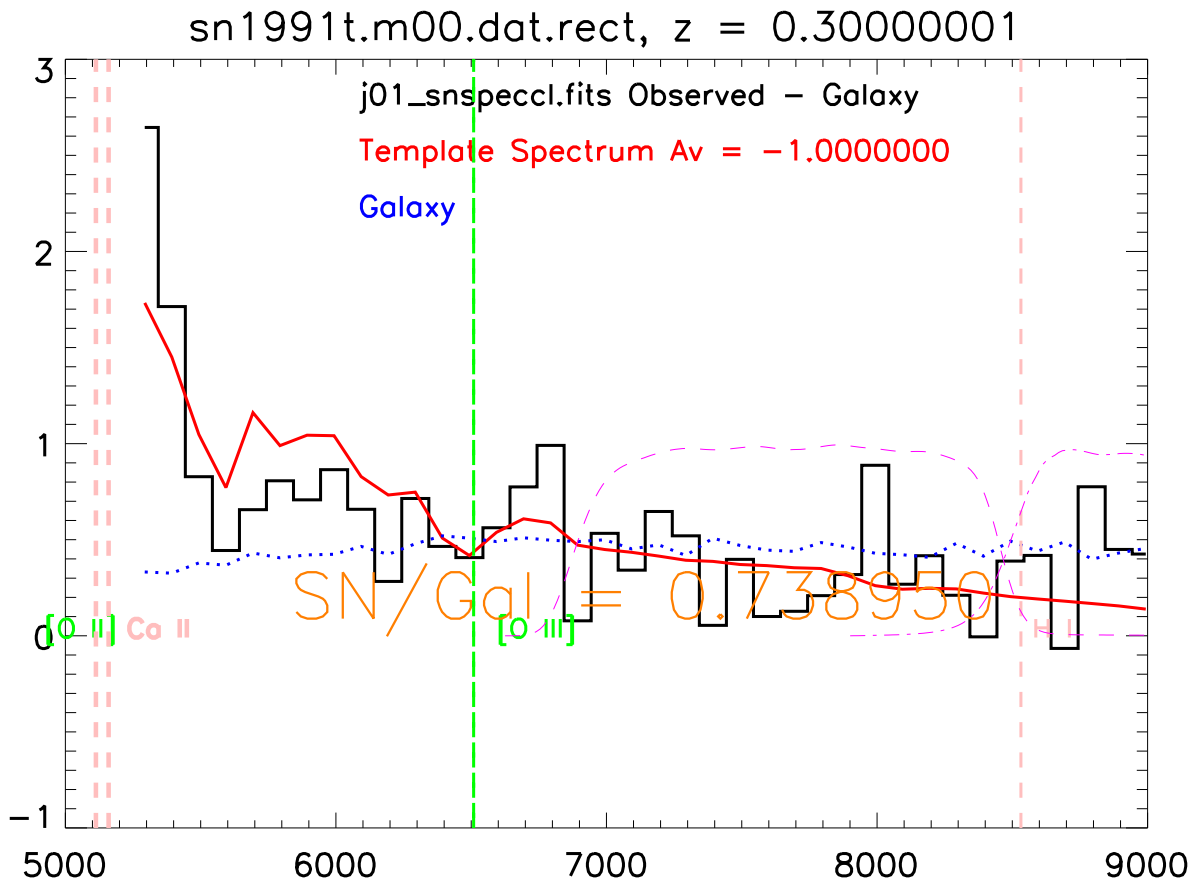

sn1999ee.m01.dat.rect, z = 0.54000002
j01_snspeccl.fits Observed − Galaxy
Template Spectrum Av = −1.0000000
Galaxy
SN/Gal = 0.818798
[O II]
Ca II
[O III]
Mg II, I
3
2
1
0
5000
6000
7000
8000
9000


sn1999ee.m06.dat.rect, z = 0.95999998
j01_snspeccl.fits Observed – Galaxy
Template Spectrum Av = 1.0000000
Galaxy
SN/Gal = 0.2836567
Mg II, I
[O II]
Ca II
3
2
1
0
−1
5000
6000
7000
8000
9000

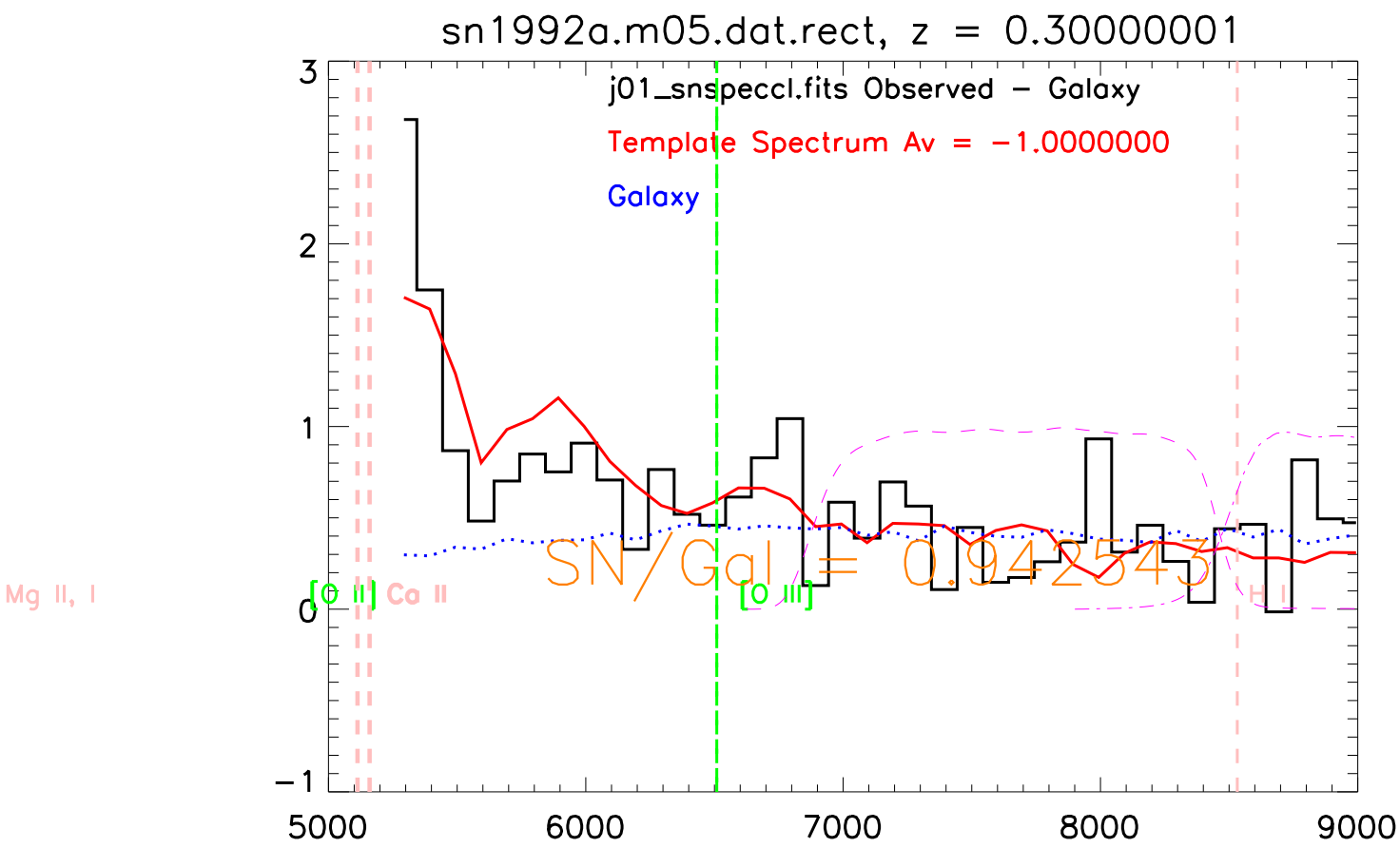

sn1990n.m14.dat.rect, z = 0.30000001
j01_snspeccl.fits Observed − Galaxy
Template Spectrum Av = −1.0000000
Galaxy
SN/Gal = 0.5154539
[O II]
Ca II
[O III]
3
2
1
0
−1
5000
6000
7000
8000
9000

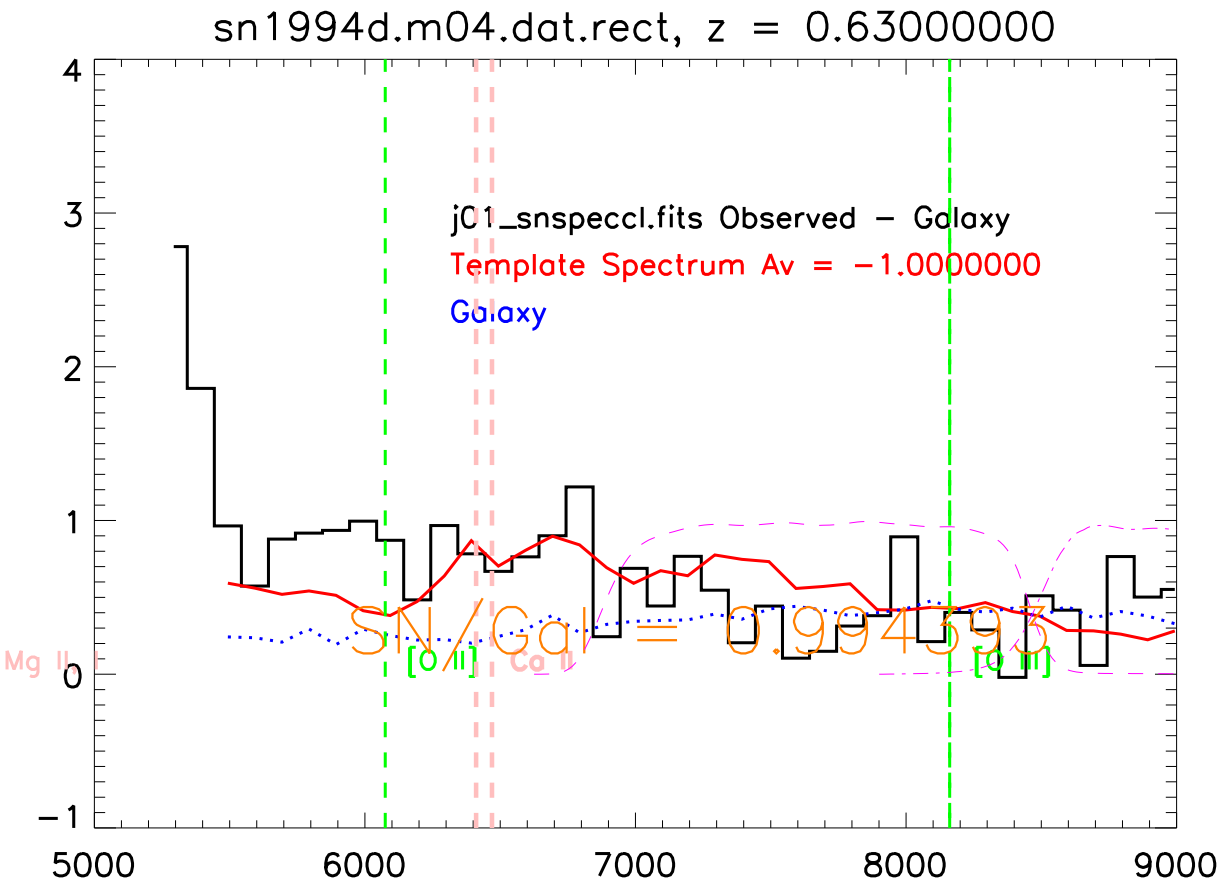
Mg II, I

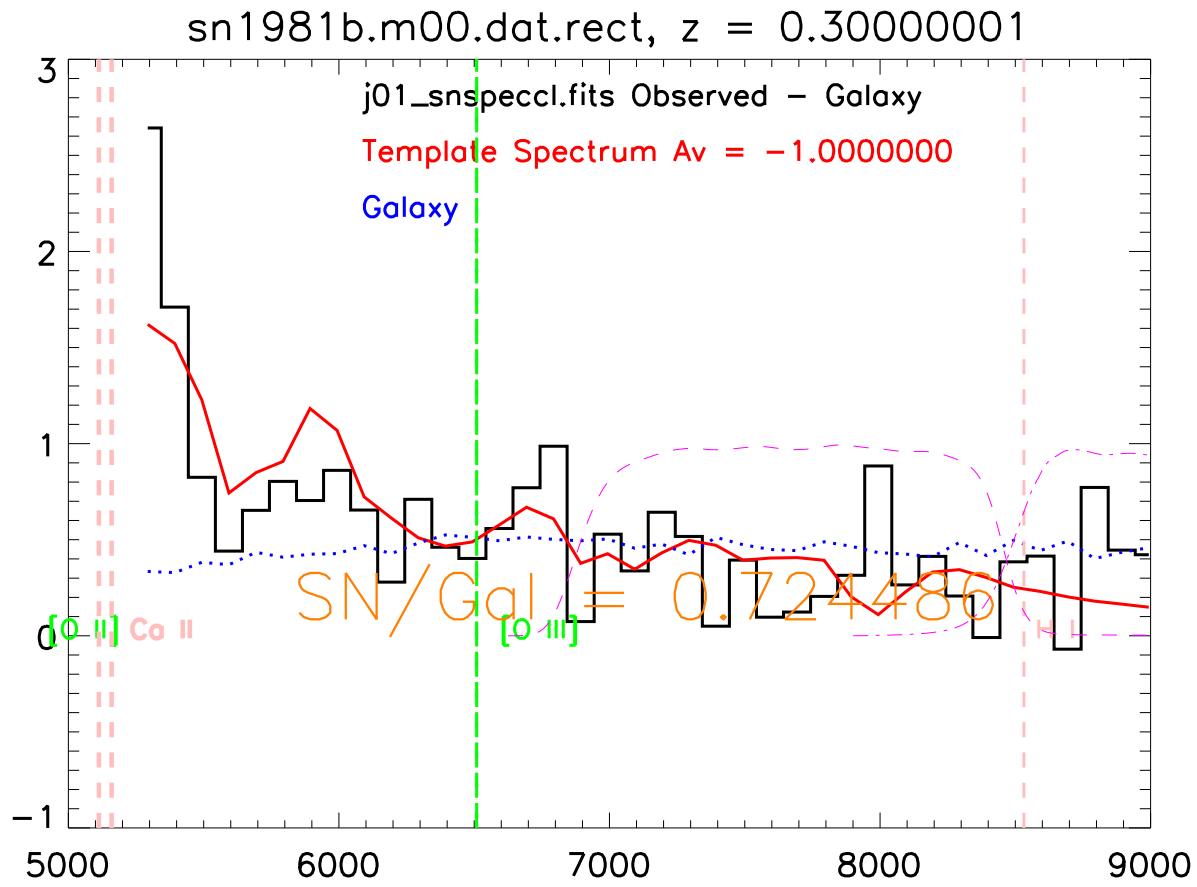

sn1989b.m05.dat.rect, z = 0.30000001
j01_snspeccl.fits Observed – Galaxy
Template Spectrum Av = –1.0000000
Galaxy
SN/Gal= 1.413383
[O II]
Ca II
[O III]
H I
Mg II, I
0
1
2
3
4
5000
6000
7000
8000
9000


sn1991t.m00.dat.rect, z = 0.30000001
j01_snspeccl.fits Observed − Galaxy
Template Spectrum Av = −1.0000000
Galaxy
SN/Gal = 0.7738950
[O II]
Ca II
[O III]
3
2
1
0
−1
5000
6000
7000
8000
9000

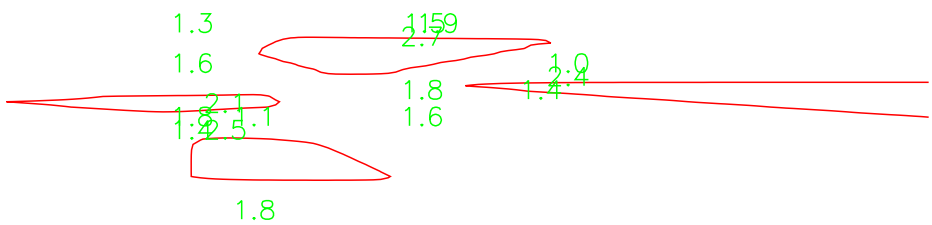
Mg II, I

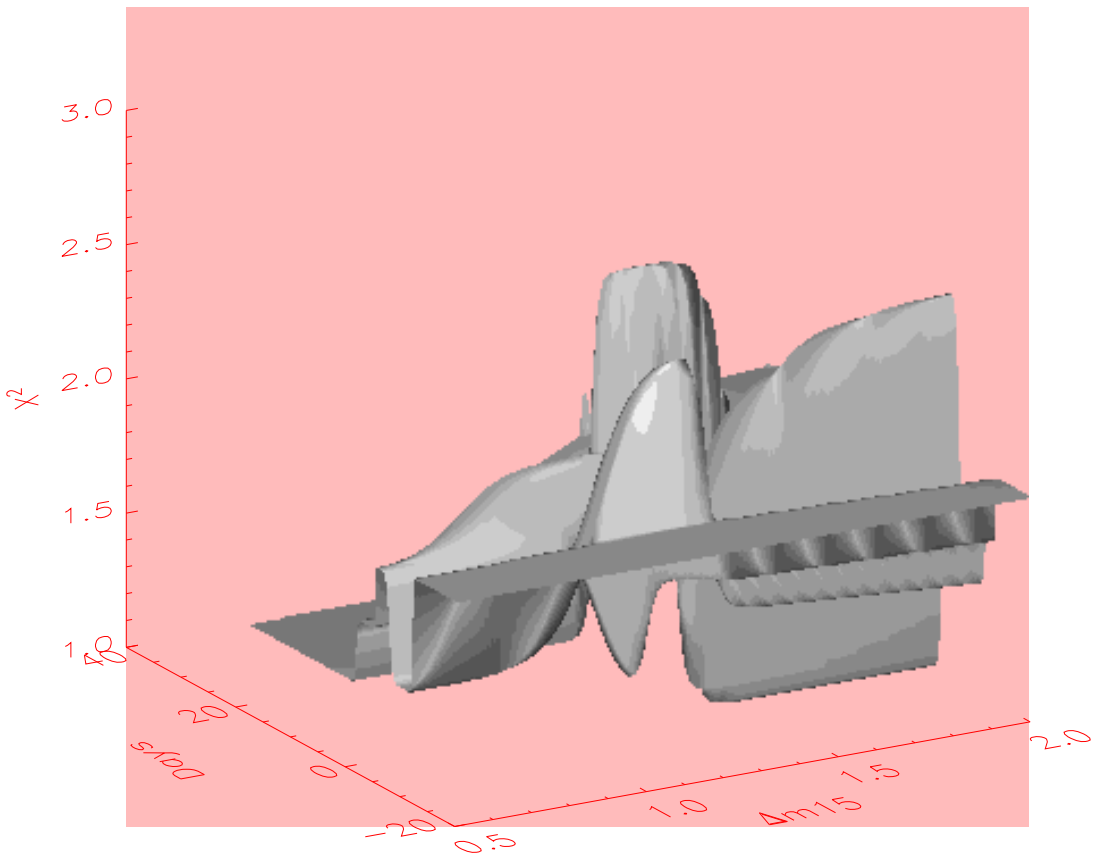

sn1992a.m05.dat.rect, z = 0.30000001
j01_snspeccl.fits Observed − Galaxy
Template Spectrum Av = −1.0000000
Galaxy
SN/Gal = 0.942545
Mg II, I
[O II]
Ca II
[O III]
H I
3
2
1
0
−1
5000
6000
7000
8000
9000


sn1994d.m04.dat.rect, z = 0.63000000
j01_snspeccl.fits Observed − Galaxy
Template Spectrum Av = −1.0000000
Galaxy
SN/Gal = 0.99945935
[O II]
Ca II
[O III]
Mg II
4
3
2
1
0
−1
5000
6000
7000
8000
9000

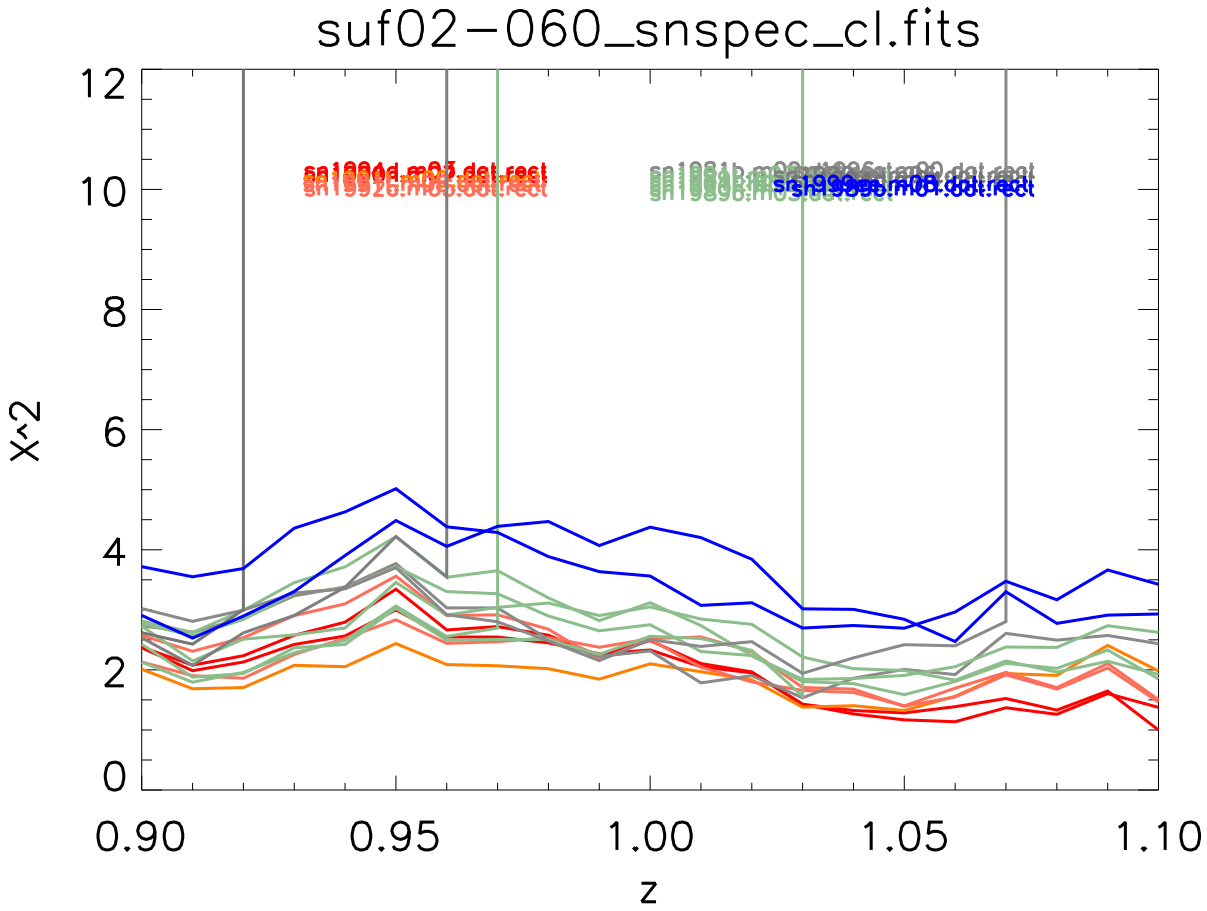

sn1981b.m00.dat.rect, z = 0.30000001
j01_snspeccl.fits Observed − Galaxy
Template Spectrum Av = −1.0000000
Galaxy
SN/Gal = 0.724486
[O II]
Ca II
[O III]
H L
3
2
1
0
−1
5000
6000
7000
8000
9000

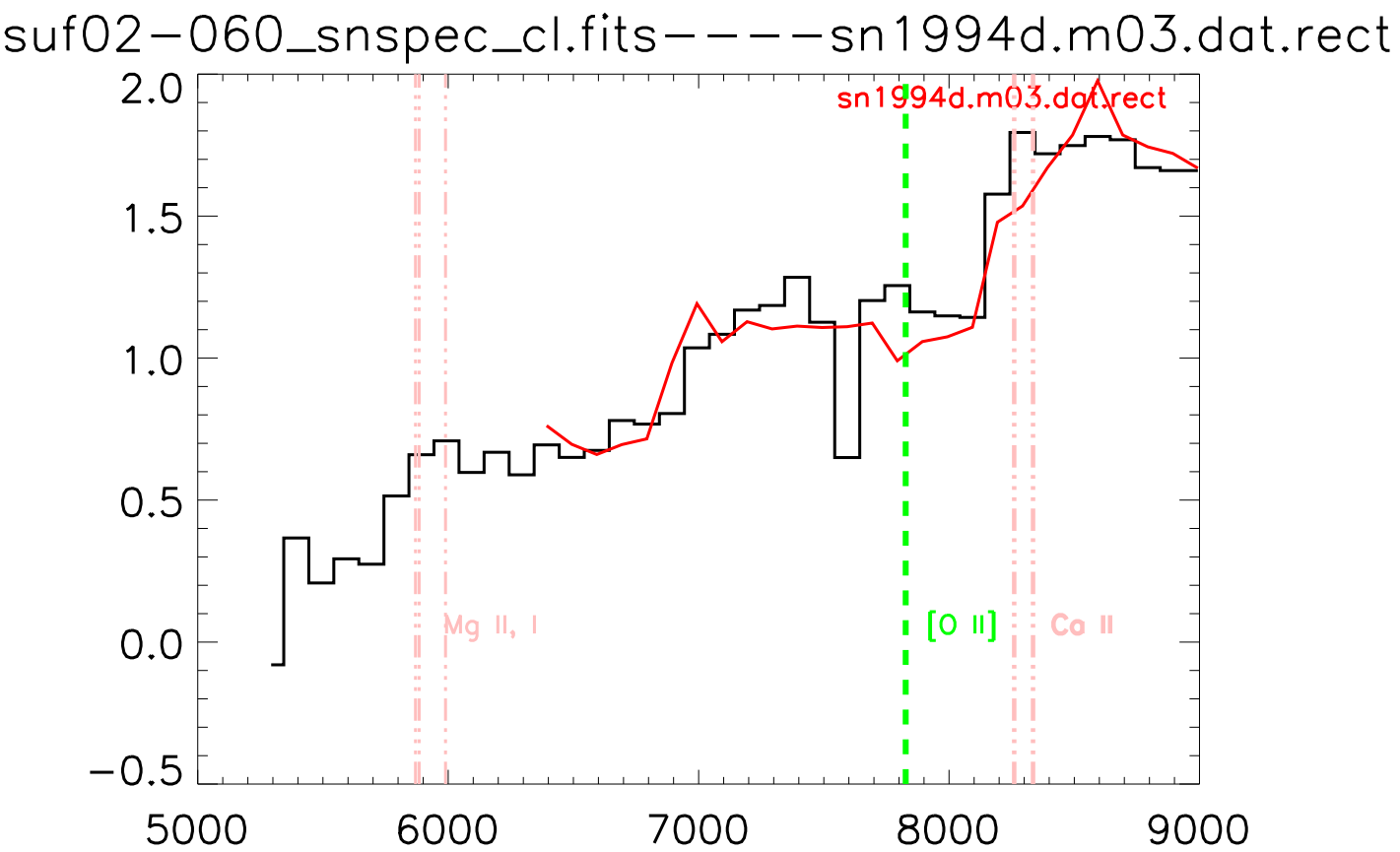
Mg II, I

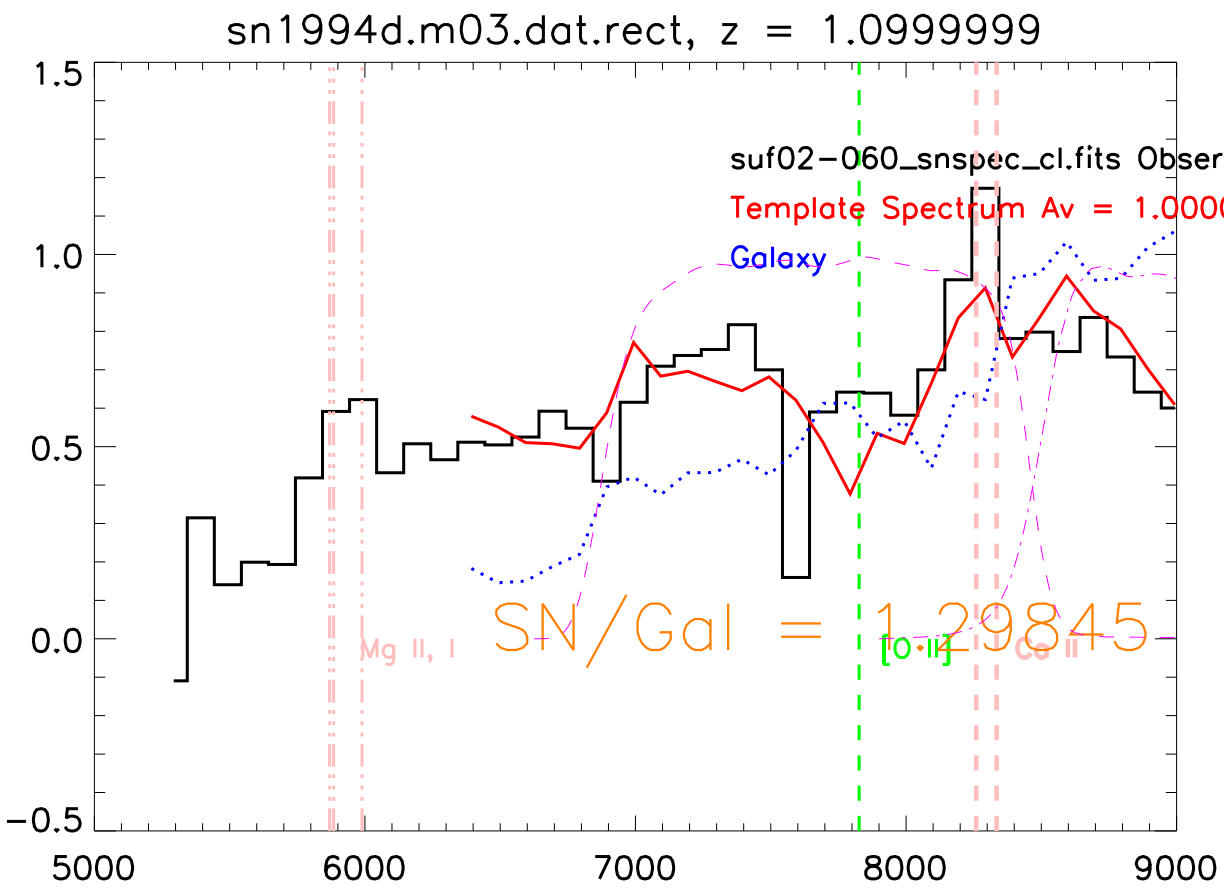

1.3
1.6
1.8
1.6
1.8

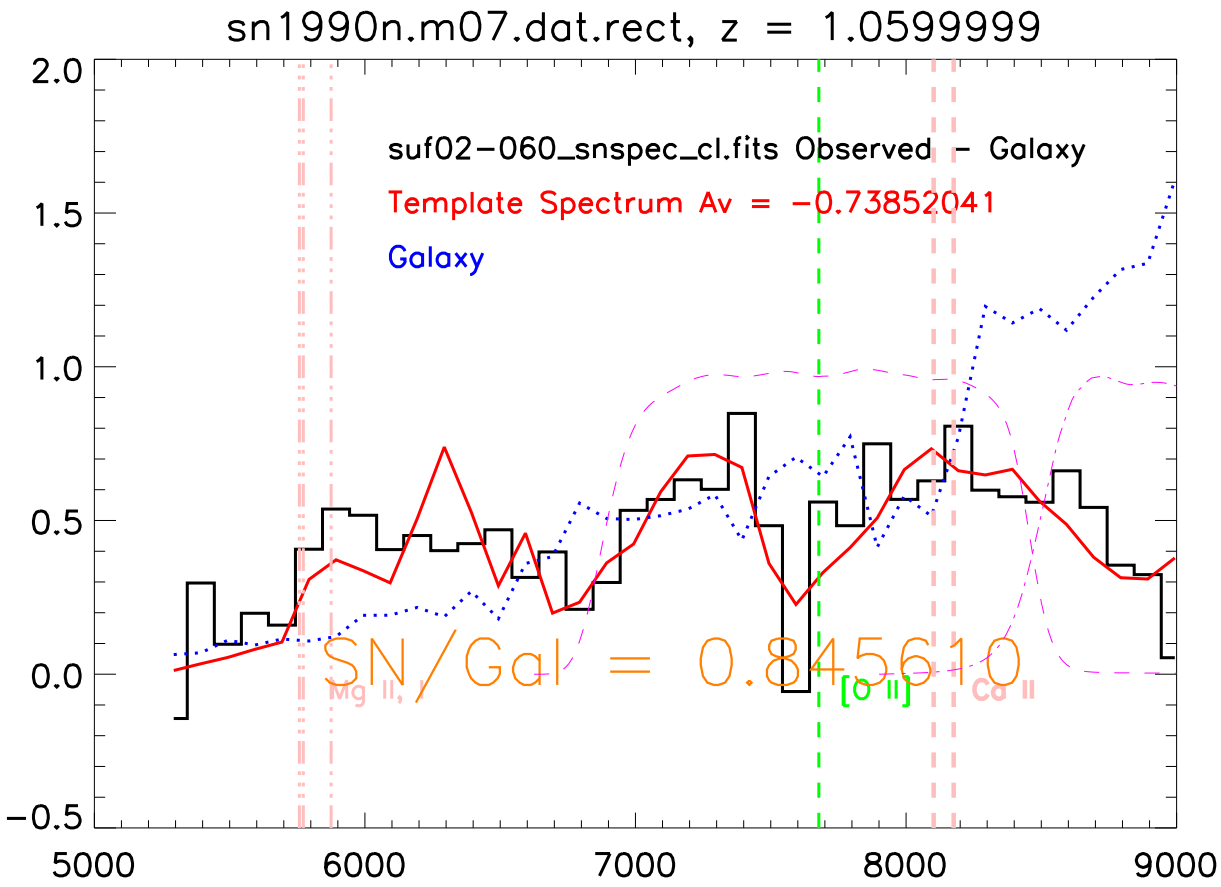


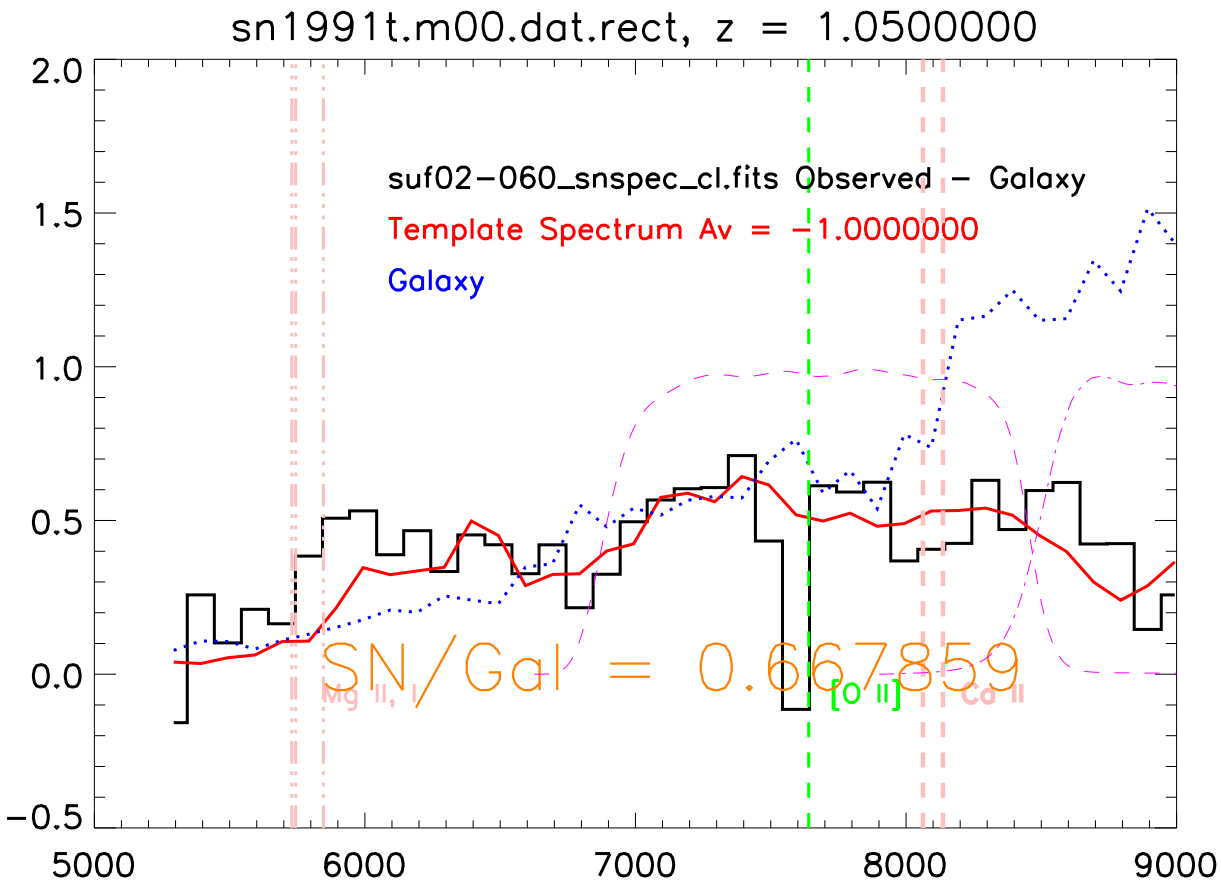
3.0
2.5
2.0
1.5
1.0
χ^2
40
20
0
−20
Days
0.5
1.0
1.5
2.0
Δm15

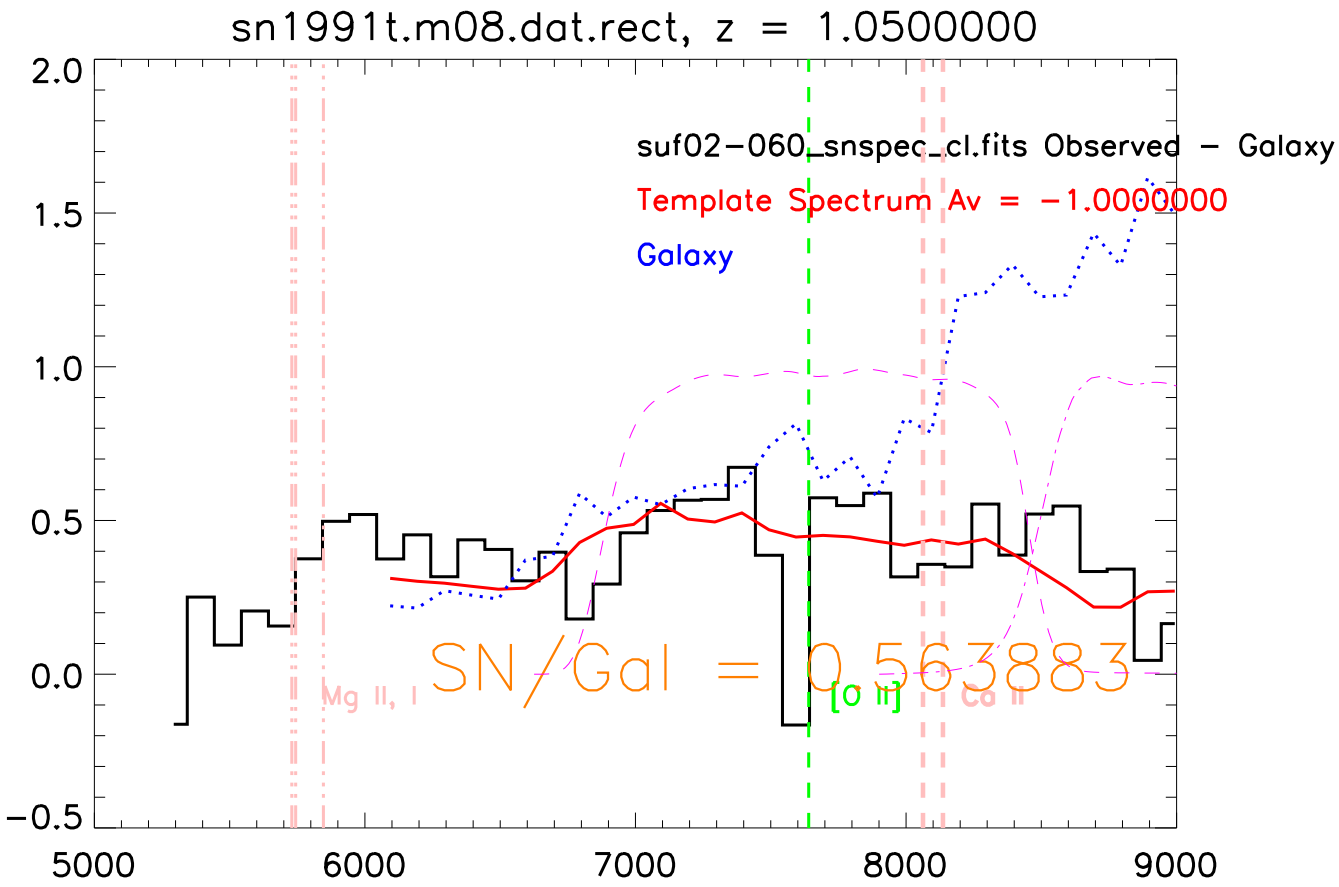

suf02−060_snspec_cl.fits
X^2
z
0
2
4
6
8
10
12
0.90
0.95
1.00
1.05
1.10

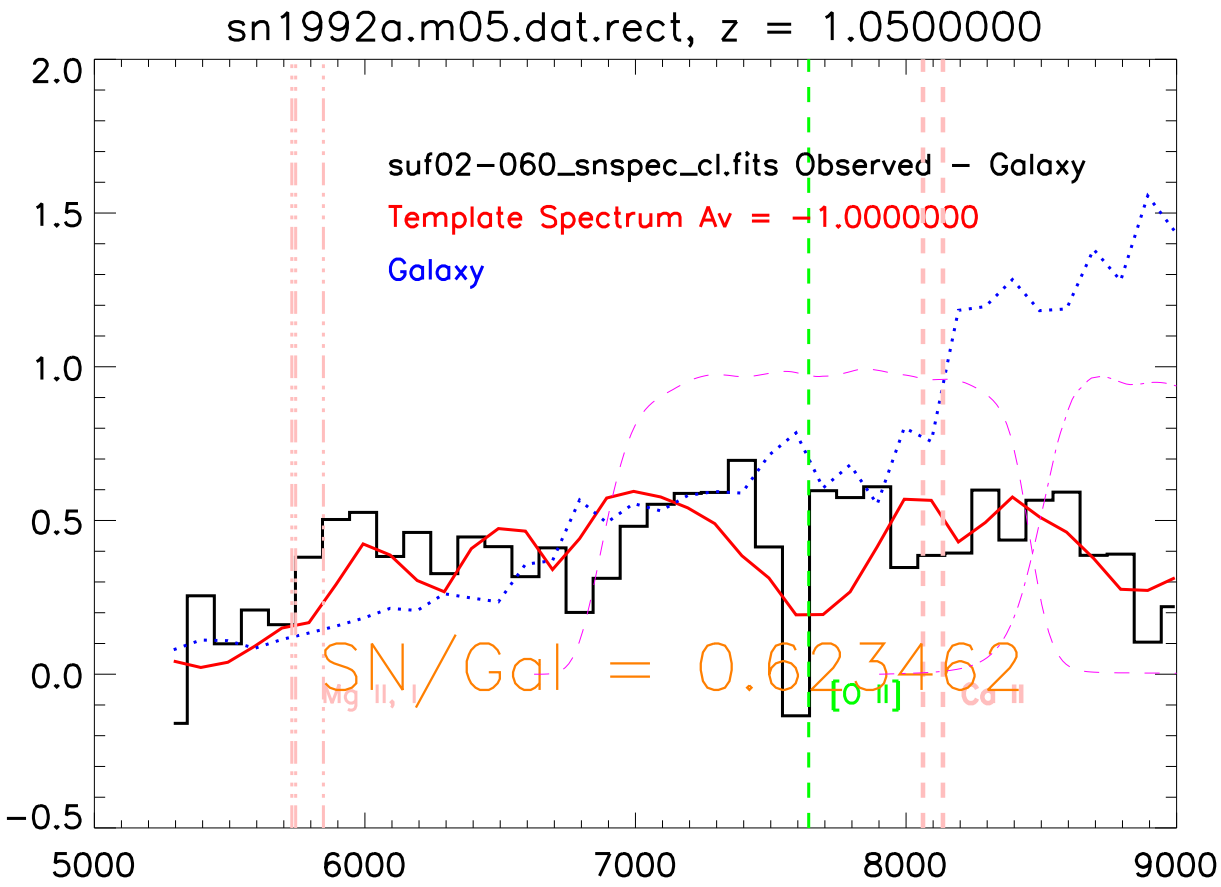

suf02−060_snspec_cl.fits−−−−sn1994d.m03.dat.rect
sn1994d.m03.dat.rect
Mg II, I
[O II]
Ca II
2.0
1.5
1.0
0.5
0.0
−0.5
5000
6000
7000
8000
9000

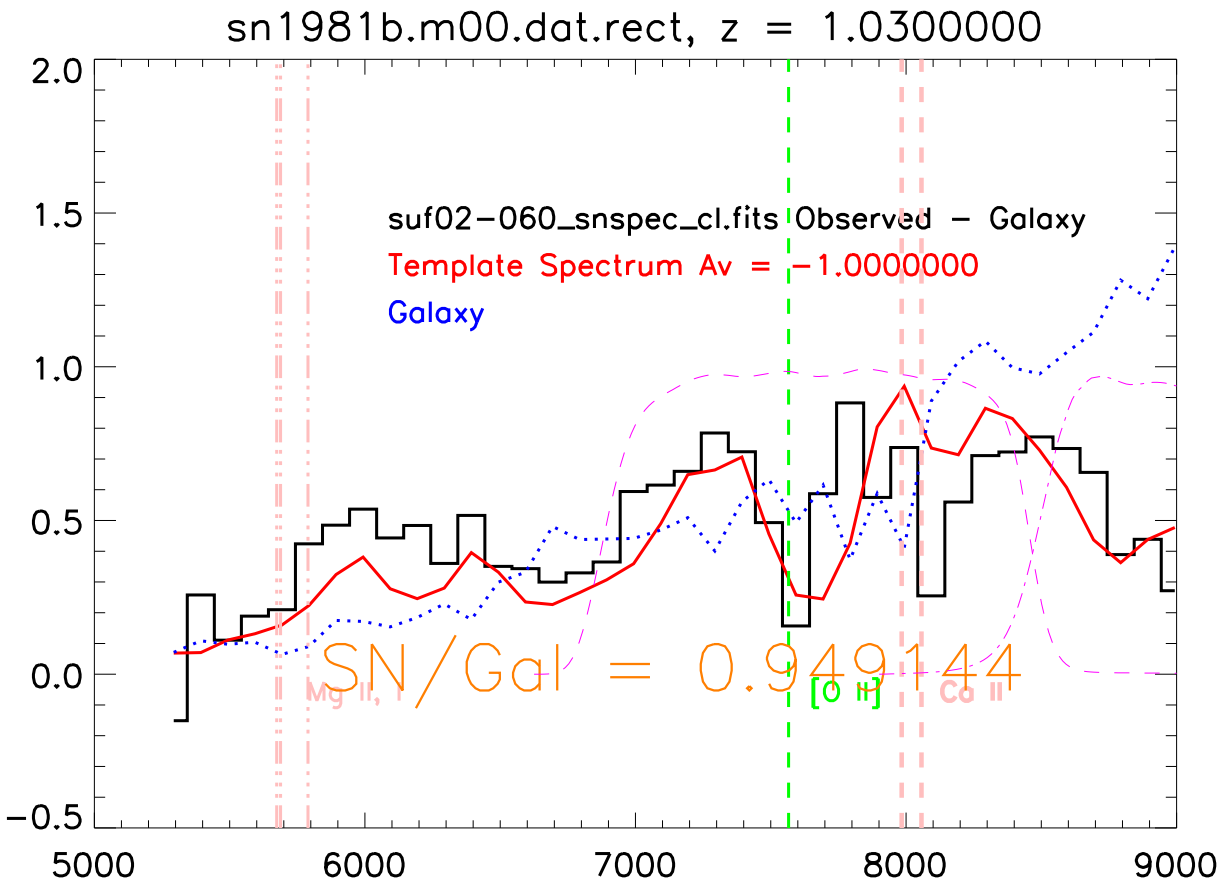

sn1994d.m03.dat.rect, z = 1.0999999
suf02-060_snspec_cl.fits Observed - Gal
Template Spectrum Av = 1.0000000
Galaxy
SN/Gal = 1.29845
Mg II, I
[O II]
Ca II
1.5
1.0
0.5
0.0
-0.5
5000
6000
7000
8000
9000

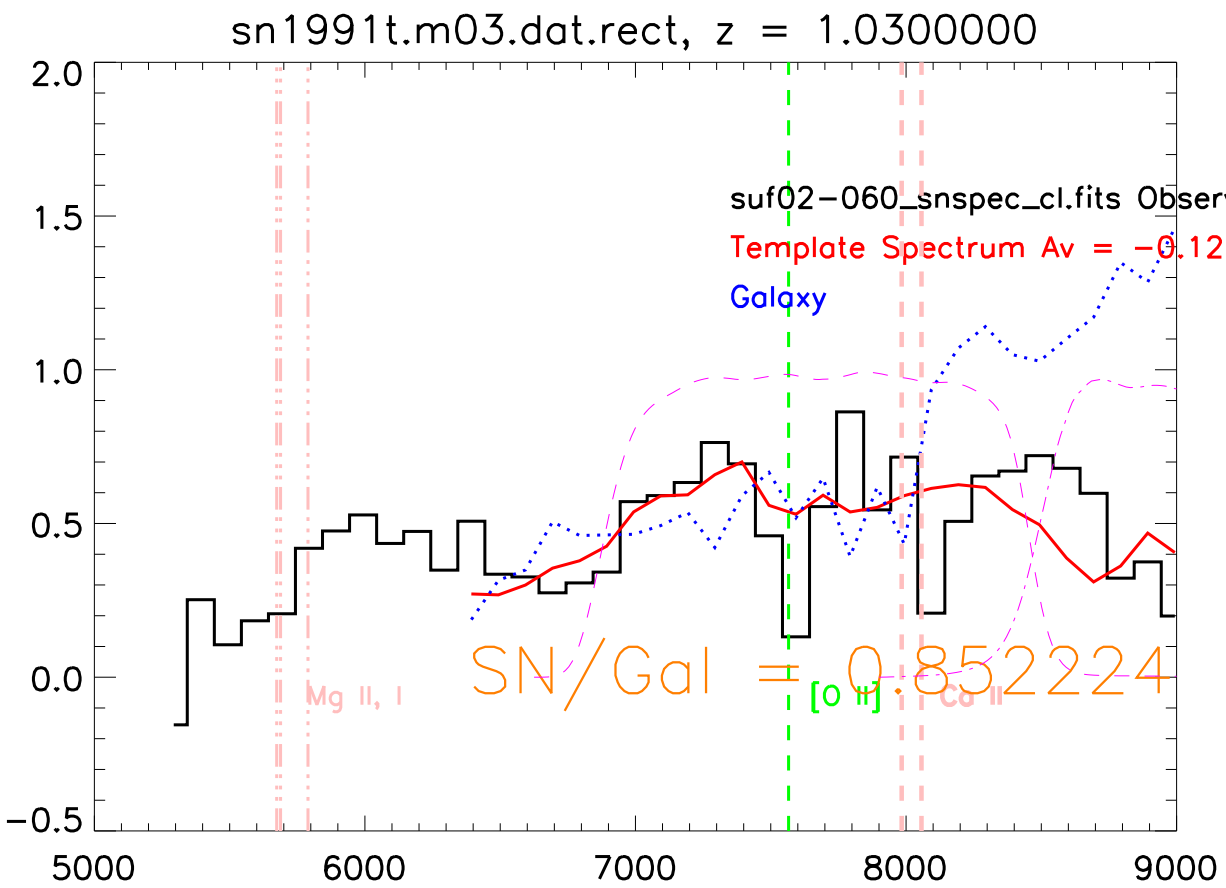

sn1990n.m07.dat.rect, z = 1.0599999
suf02-060_snspec_cl.fits Observed - Galaxy
Template Spectrum Av = -0.73852041
Galaxy
SN/Gal = 0.845610
Mg II, I
[O II]
Ca II
2.0
1.5
1.0
0.5
0.0
-0.5
5000
6000
7000
8000
9000

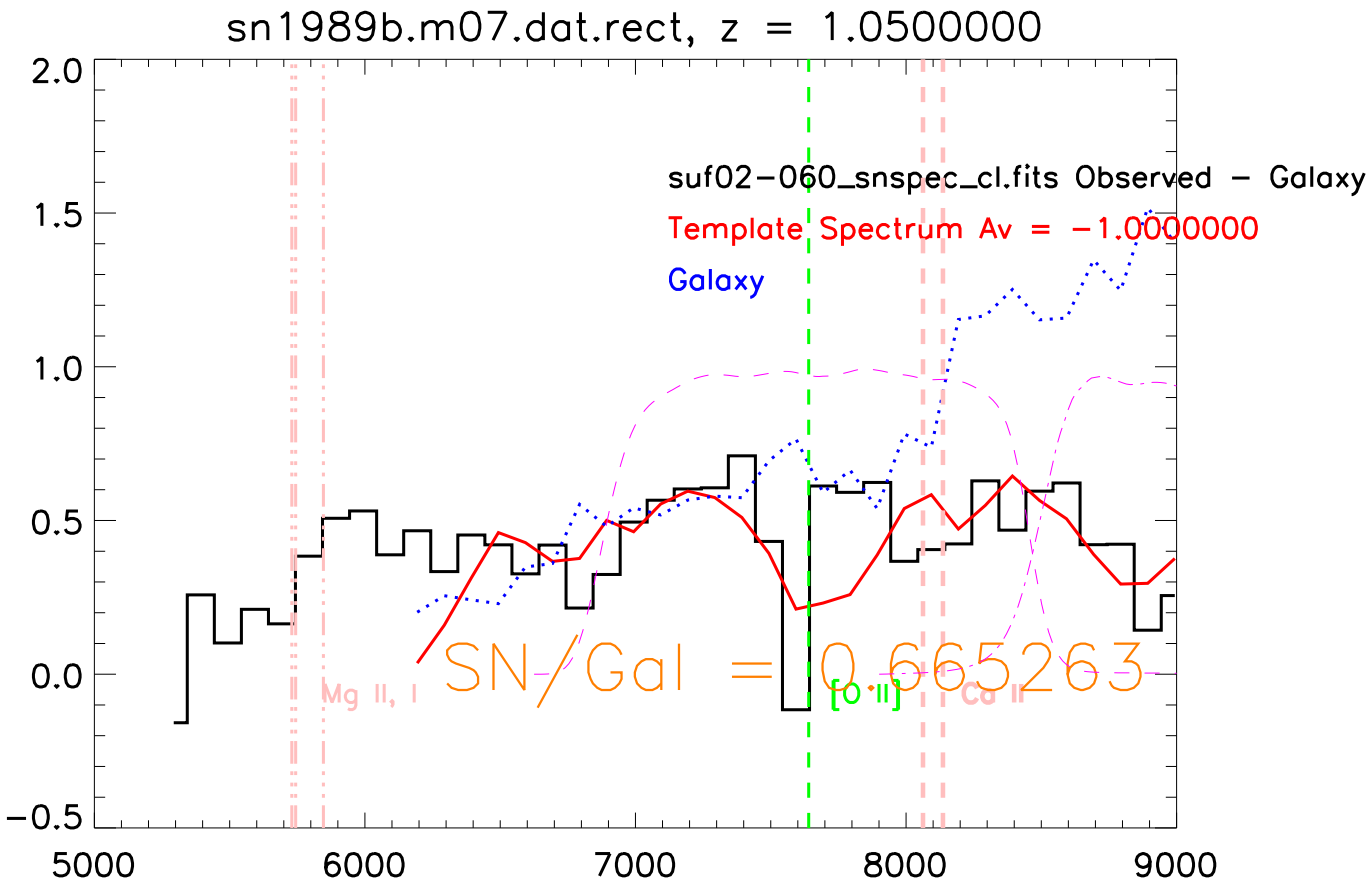

sn1991t.m00.dat.rect, z = 1.0500000
suf02-060_snspec_cl.fits Observed - Galaxy
Template Spectrum Av = 1.0000000
Galaxy
SN/Gal = 0.667859
Mg II, I
[O II]
Ca II
2.0
1.5
1.0
0.5
0.0
-0.5
5000
6000
7000
8000
9000

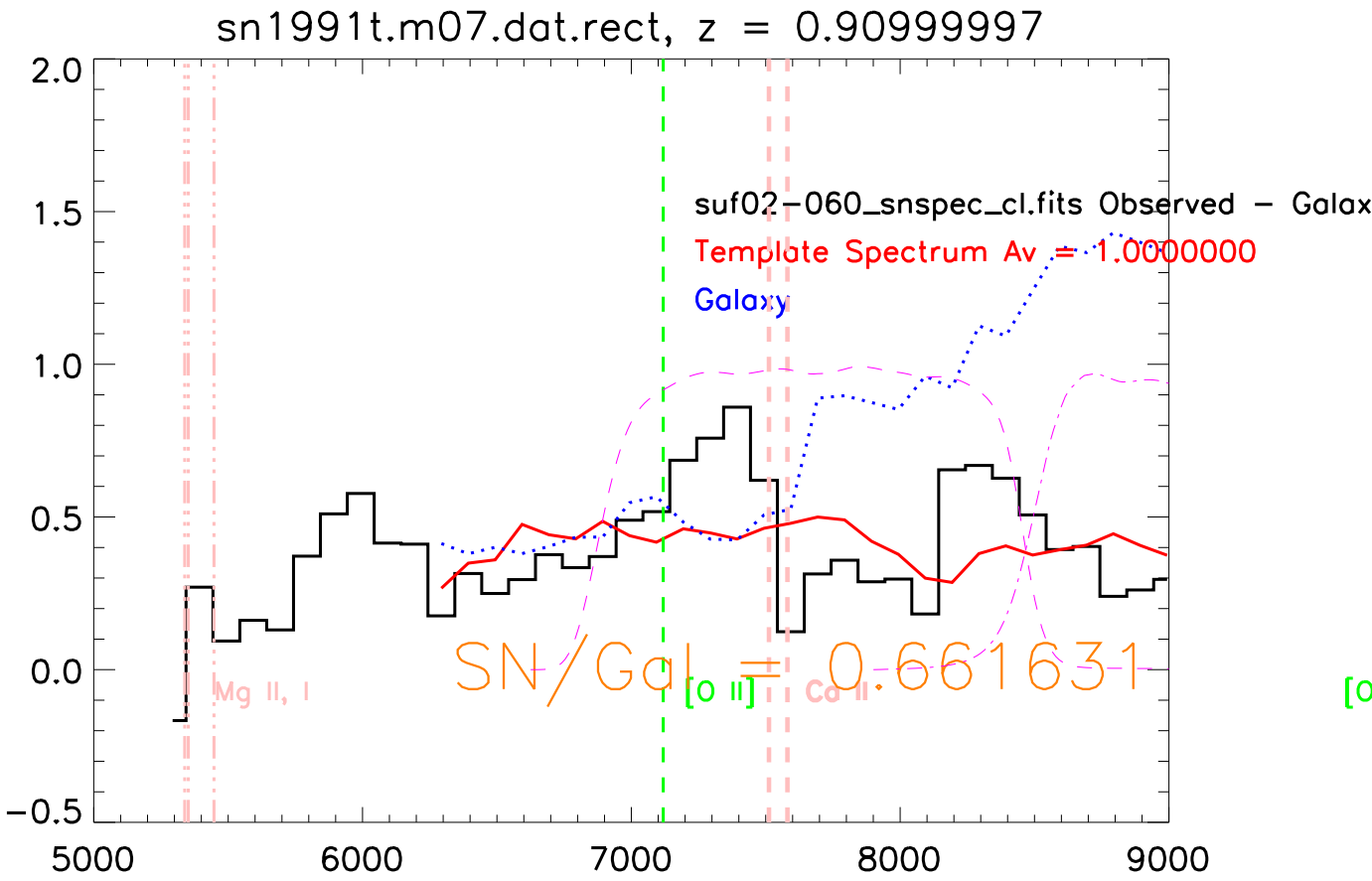

sn1991t.m08.dat.rect, z = 1.0500000
suf02-060_snspec_cl.fits Observed − Galaxy
Template Spectrum Av = −1.0000000
Galaxy
SN/Gal = 0.563883
Mg II, I
[O II]
Ca II
2.0
1.5
1.0
0.5
0.0
−0.5
5000
6000
7000
8000
9000

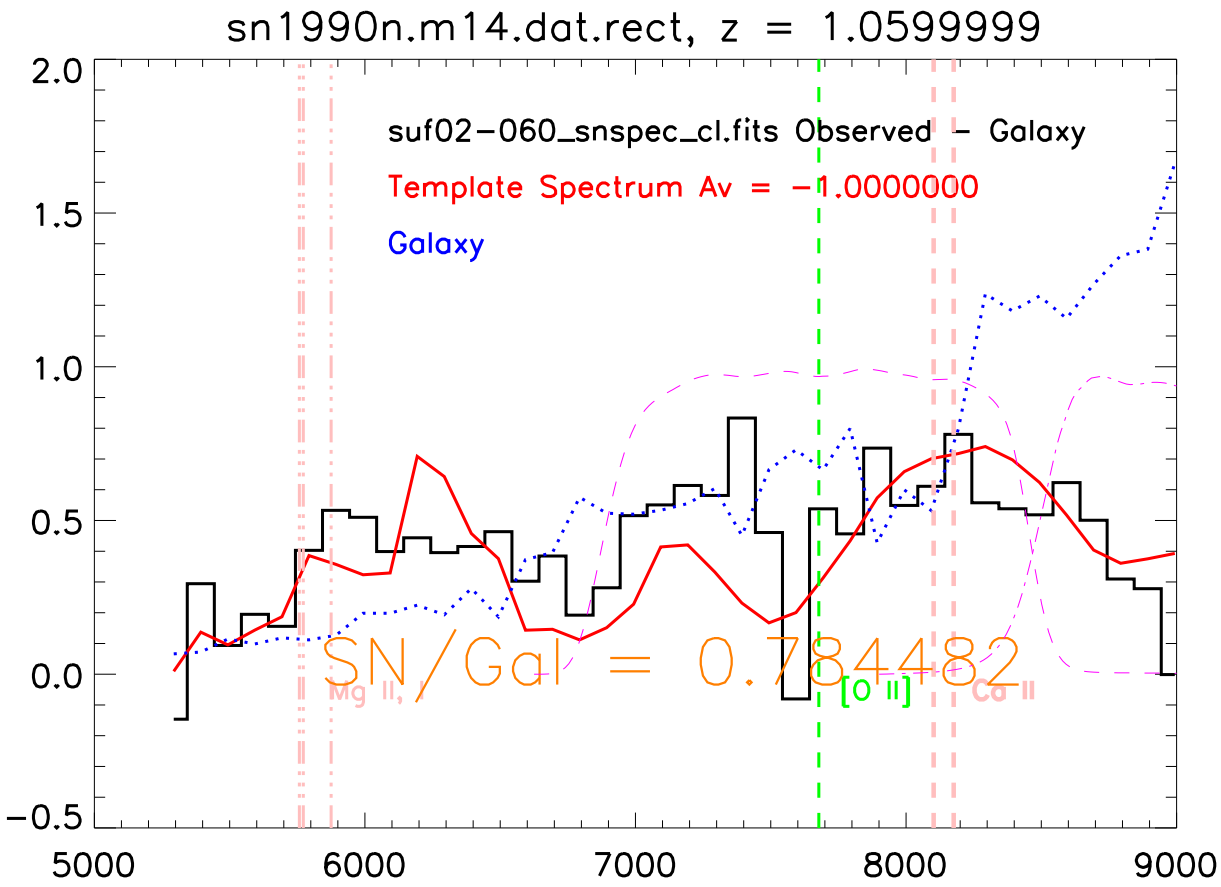

sn1992a.m05.dat.rect, z = 1.0500000
suf02-060_snspec_cl.fits Observed - Galaxy
Template Spectrum Av = 1.0000000
Galaxy
SN/Gal = 0.623462
Mg II, I
[O II]
Ca II
2.0
1.5
1.0
0.5
0.0
-0.5
5000
6000
7000
8000
9000

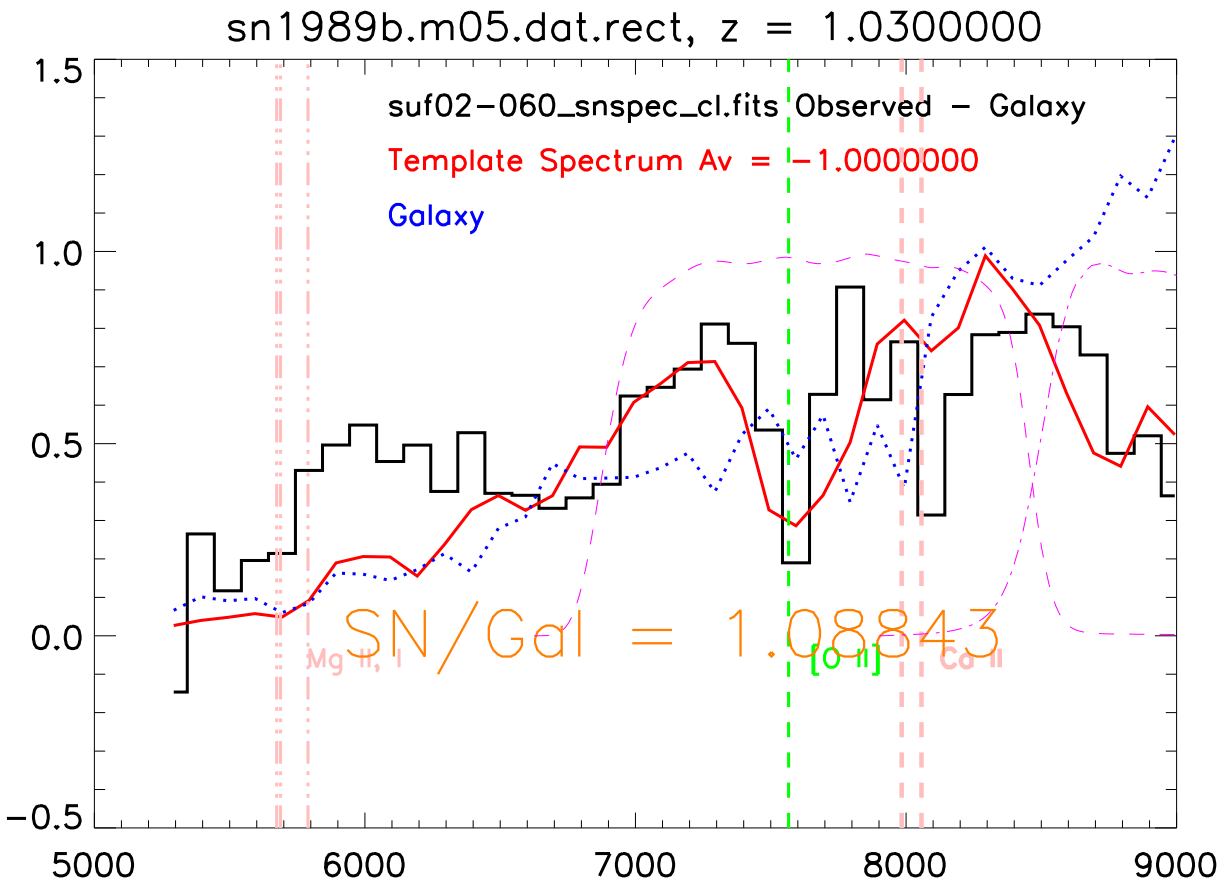

sn1981b.m00.dat.rect, z = 1.0300000
suf02-060_snspec_cl.fits Observed - Galaxy
Template Spectrum Av = -1.0000000
Galaxy
SN/Gal = 0.949144
Mg II, ?
[O II]
Ca II
2.0
1.5
1.0
0.5
0.0
-0.5
5000
6000
7000
8000
9000

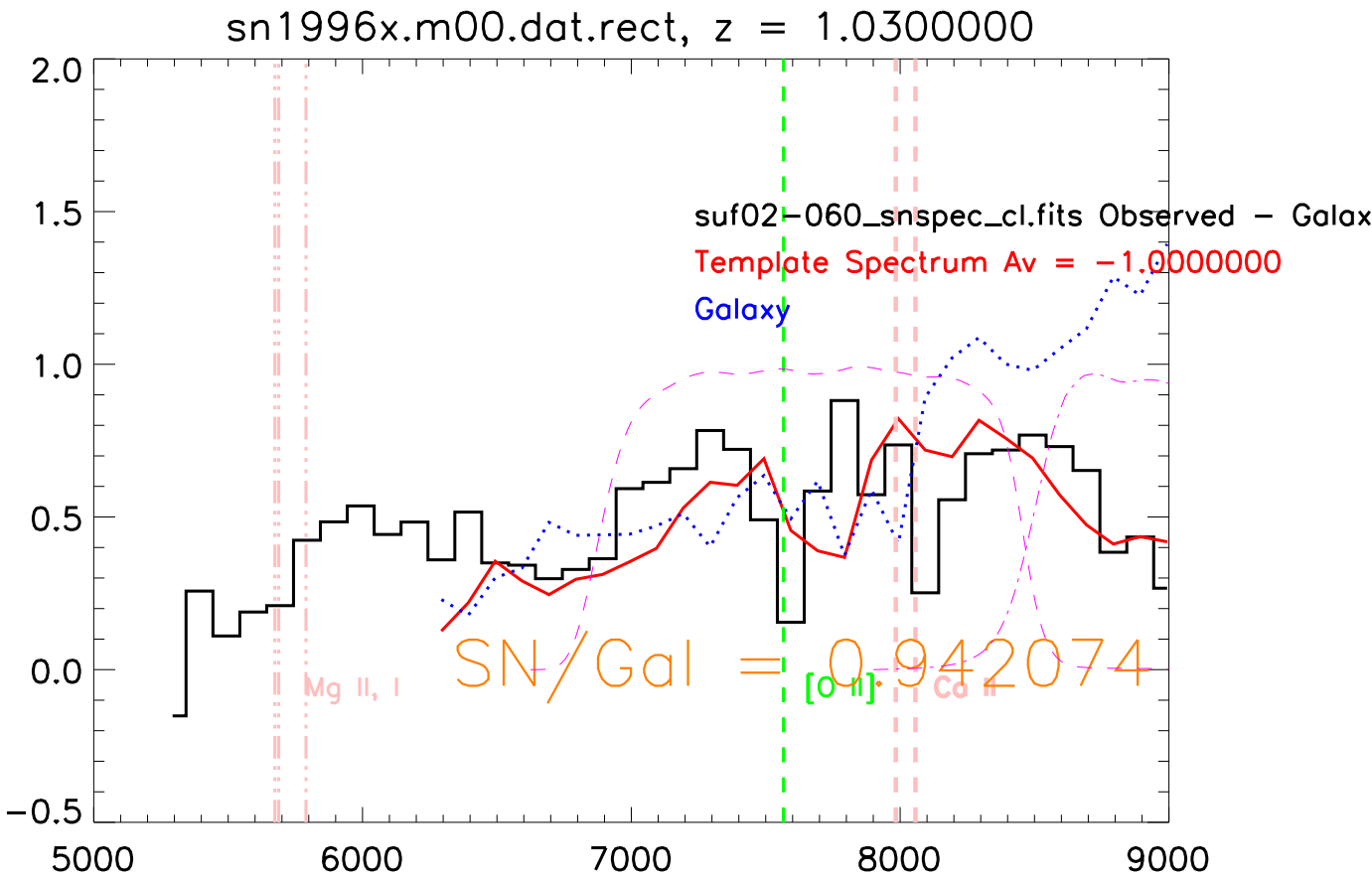

sn1991t.m03.dat.rect, z = 1.0300000
suf02-060_snspec_cl.fits Observed – Gal
Template Spectrum Av = -0.12372449
Galaxy
SN/Gal = 0.852224
Mg II, I
[O II]
Ca II
2.0
1.5
1.0
0.5
0.0
-0.5
5000
6000
7000
8000
9000

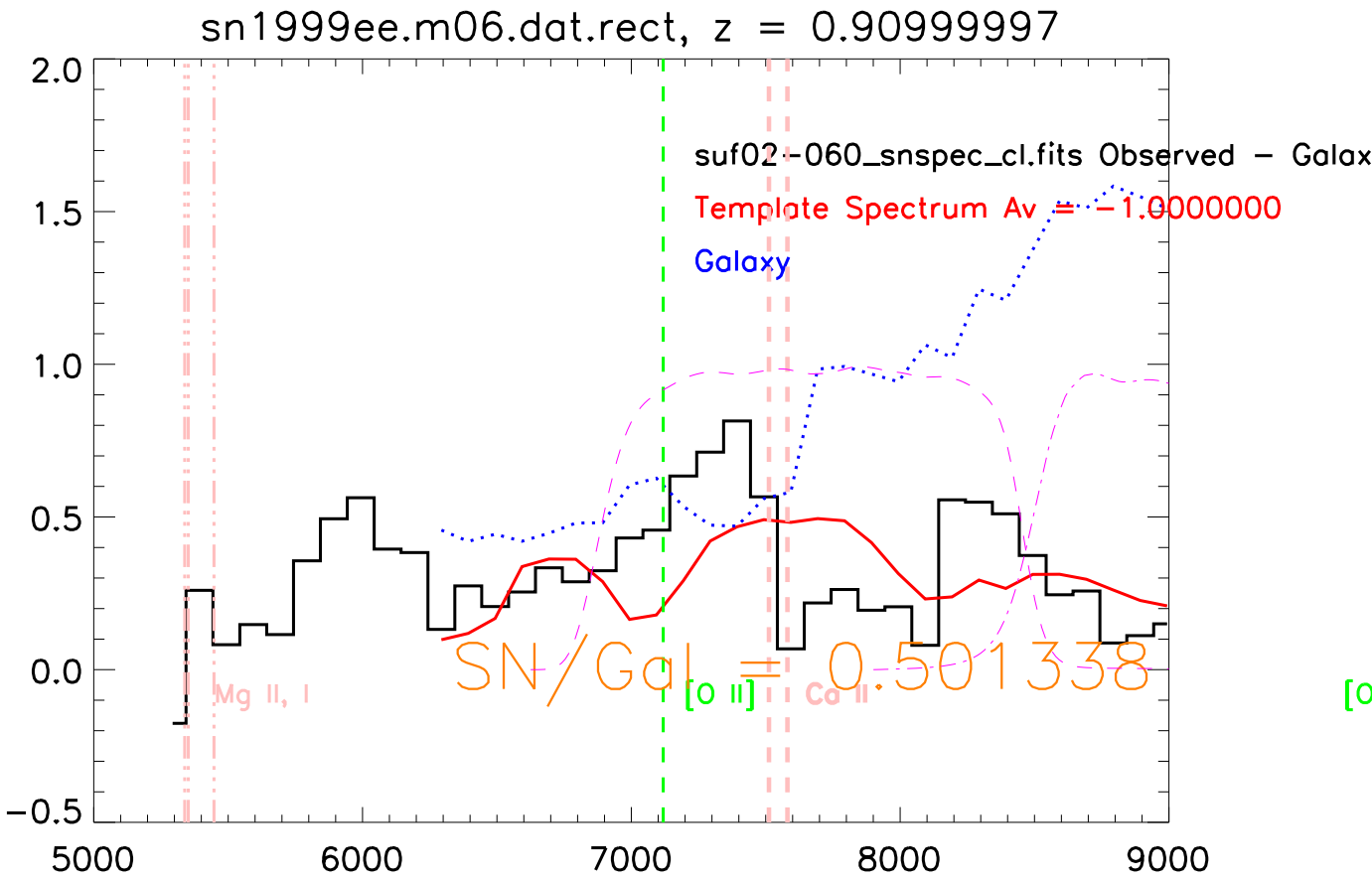

sn1989b.m07.dat.rect, z = 1.0500000
suf02-060_snspec_cl.fits Observed - Galaxy
Template Spectrum Av = -1.0000000
Galaxy
SN/Gal = 0.665263
Mg II, I
[O II]
Ca II
2.0
1.5
1.0
0.5
0.0
-0.5
5000
6000
7000
8000
9000

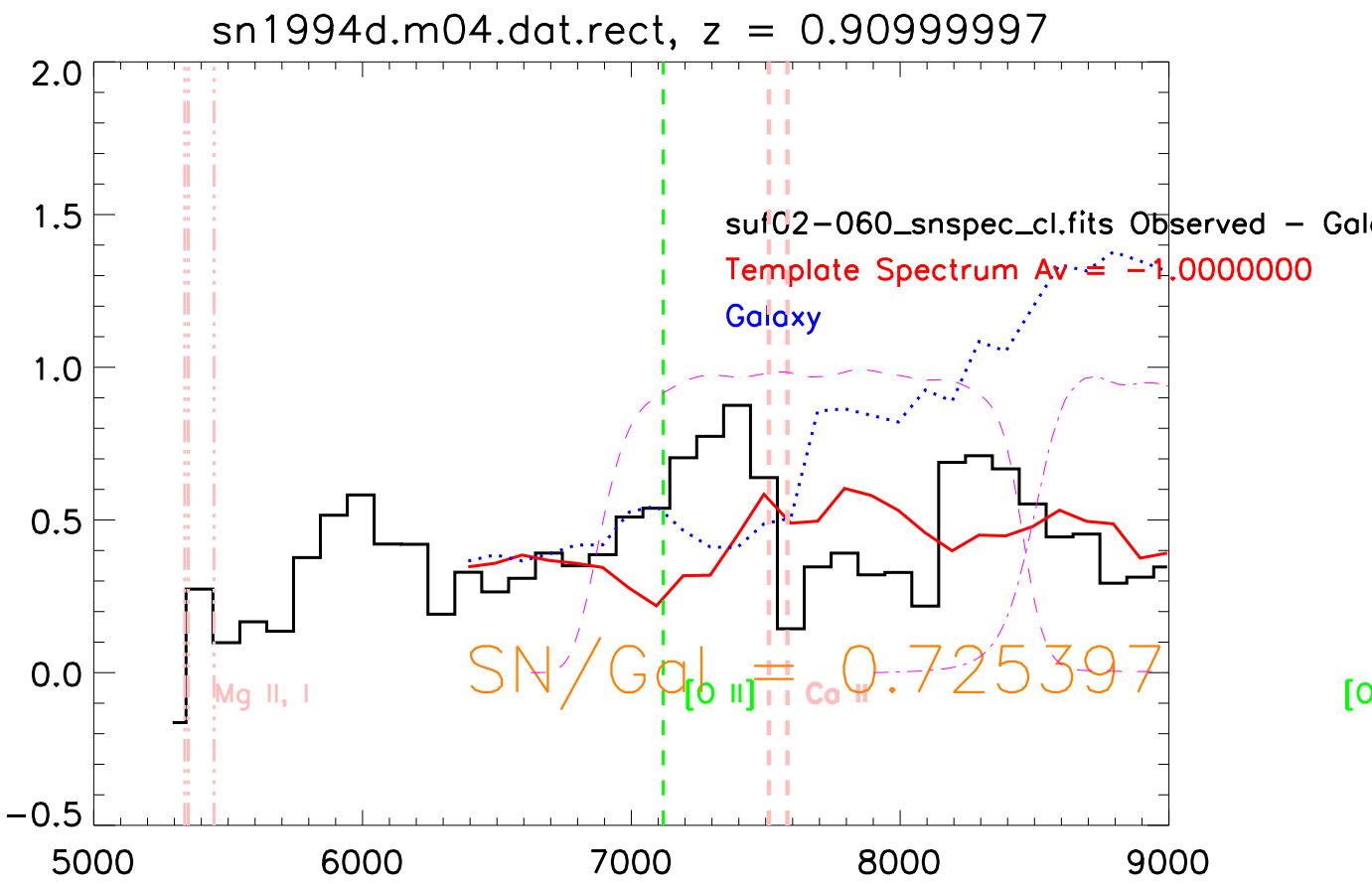

sn1991t.m07.dat.rect, z = 0.90999997
suf02-060_snspec_cl.fits Observed – Galax
Template Spectrum Av = 1.0000000
Galaxy
SN/Gal = 0.661631
Mg II, I
[O II]
Ca II
2.0
1.5
1.0
0.5
0.0
−0.5
5000
6000
7000
8000
9000

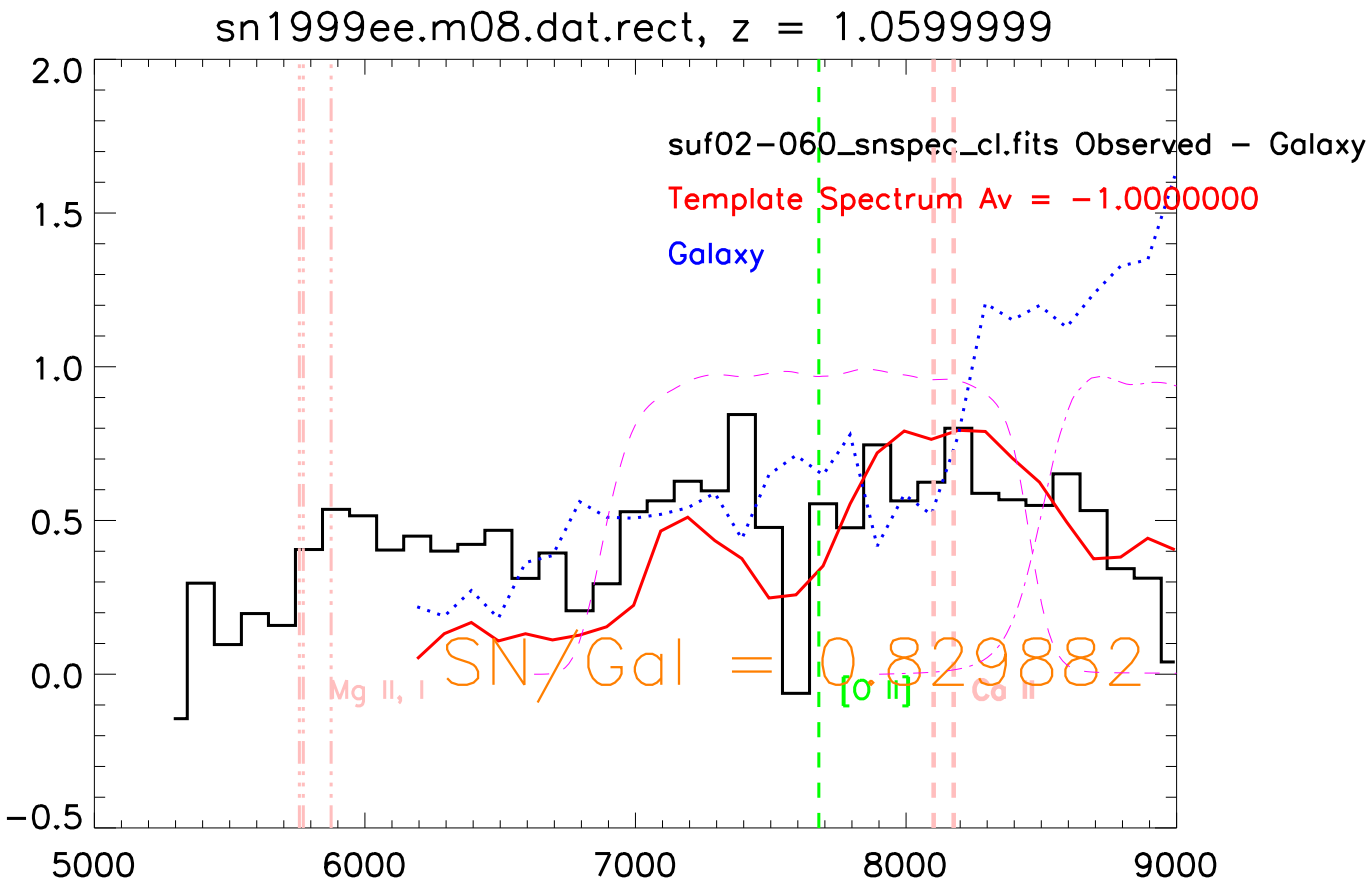

sn1990n.m14.dat.rect, z = 1.0599999
suf02-060_snspec_cl.fits Observed - Galaxy
Template Spectrum Av = -1.0000000
Galaxy
SN/Gal = 0.784482
[O II]
2.0
1.5
1.0
0.5
0.0
-0.5
5000
6000
7000
8000
9000

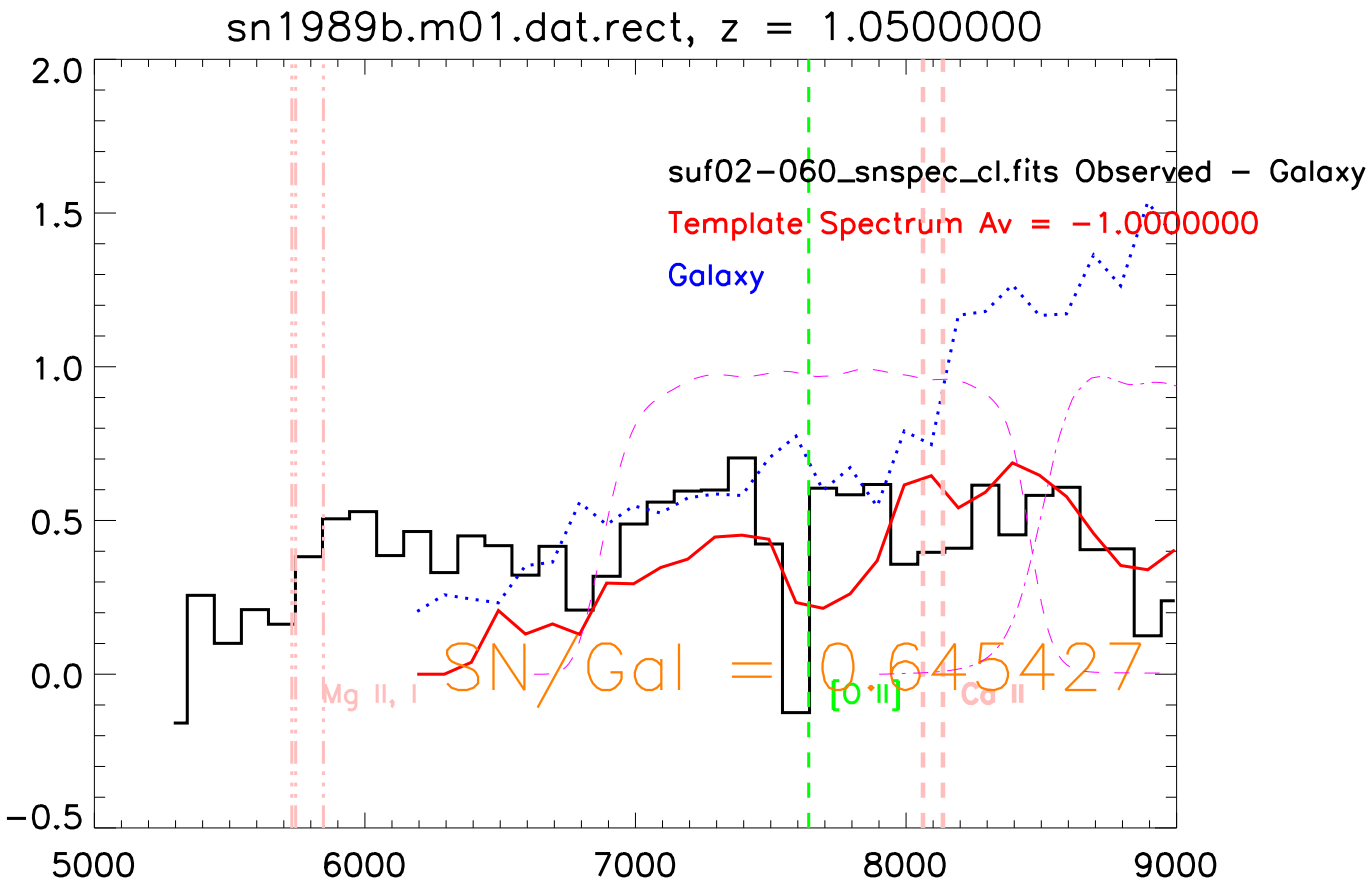

sn1989b.m05.dat.rect, z = 1.0300000
suf02-060_snspec_cl.fits Observed - Galaxy
Template Spectrum Av = -1.0000000
Galaxy
SN/Gal = 1.08843
Mg II, I
[O II]
Ca II
1.5
1.0
0.5
0.0
-0.5
5000
6000
7000
8000
9000

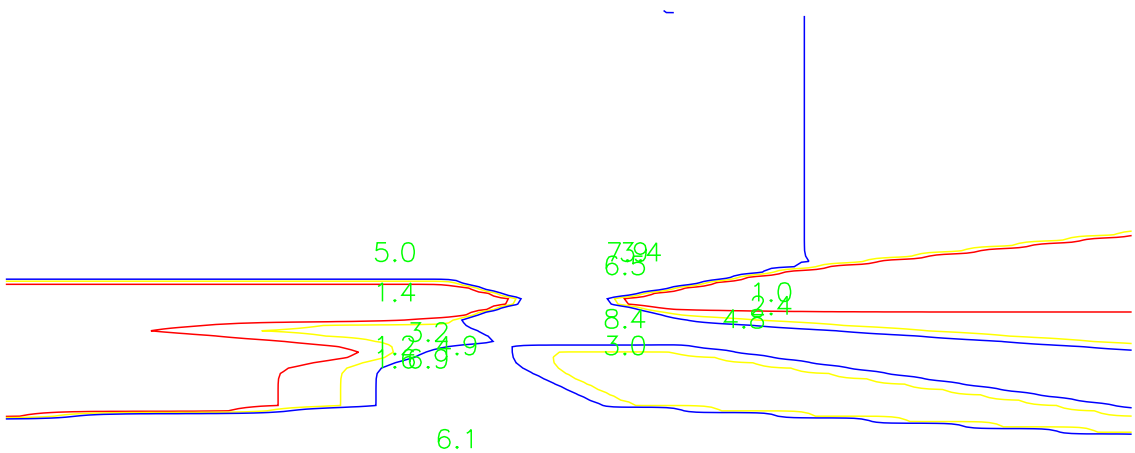

sn1996x.m00.dat.rect, z = 1.0300000
suf02-060_snspec_cl.fits Observed - Galax
Template Spectrum Av = -1.0000000
Galaxy
SN/Gal = 0.942074
Mg II, I
[O II]
Ca II
2.0
1.5
1.0
0.5
0.0
-0.5
5000
6000
7000
8000
9000

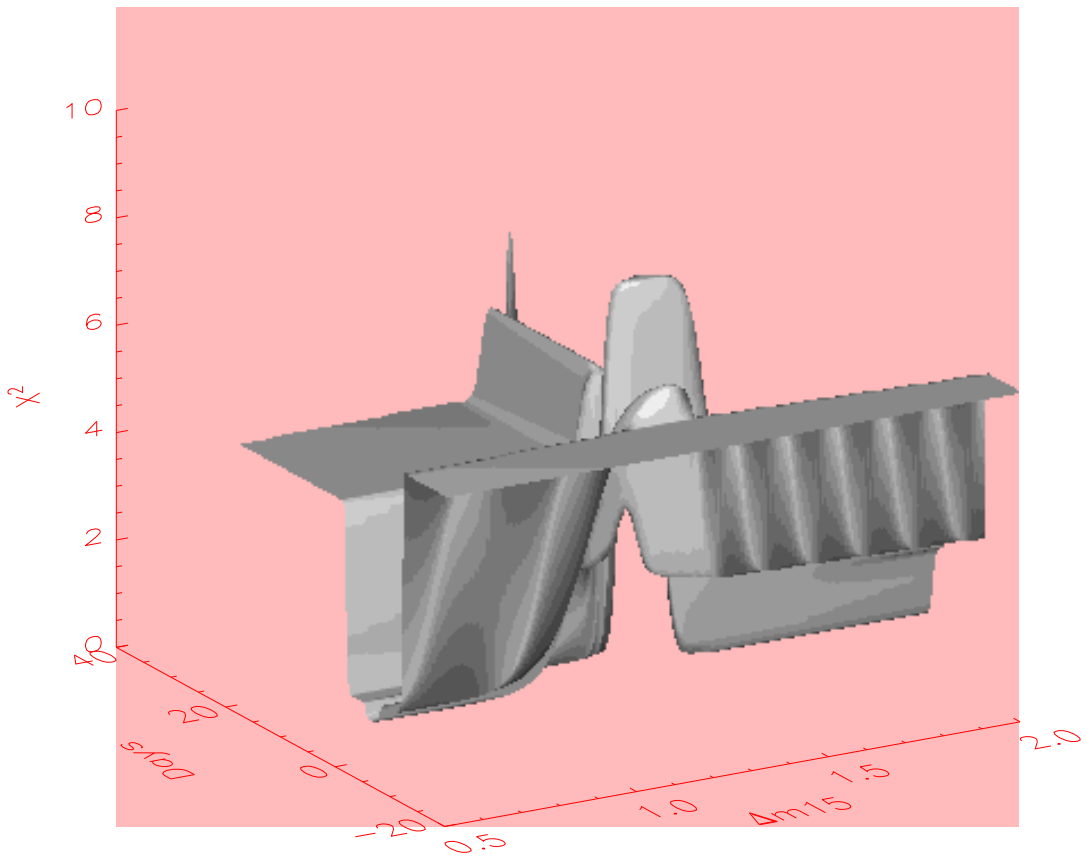

sn1999ee.m06.dat.rect, z = 0.90999997
suf02-060_snspec_cl.fits Observed – Galax
Template Spectrum Av = 1.0000000
Galaxy
SN/Gal = 0.501338
Mg II, I
[O II]
Ca II
[O
2.0
1.5
1.0
0.5
0.0
−0.5
5000
6000
7000
8000
9000


sn1994d.m04.dat.rect, z = 0.90999997
2.0
1.5
1.0
0.5
0.0
−0.5
5000
6000
7000
8000
9000
sufC2−060_snspec_cl.fits Observed − Gal
Template Spectrum Av = −1.0000000
Galaxy
SN/Gal = 0.725397
Mg II, I
[O II]
Ca II
[O

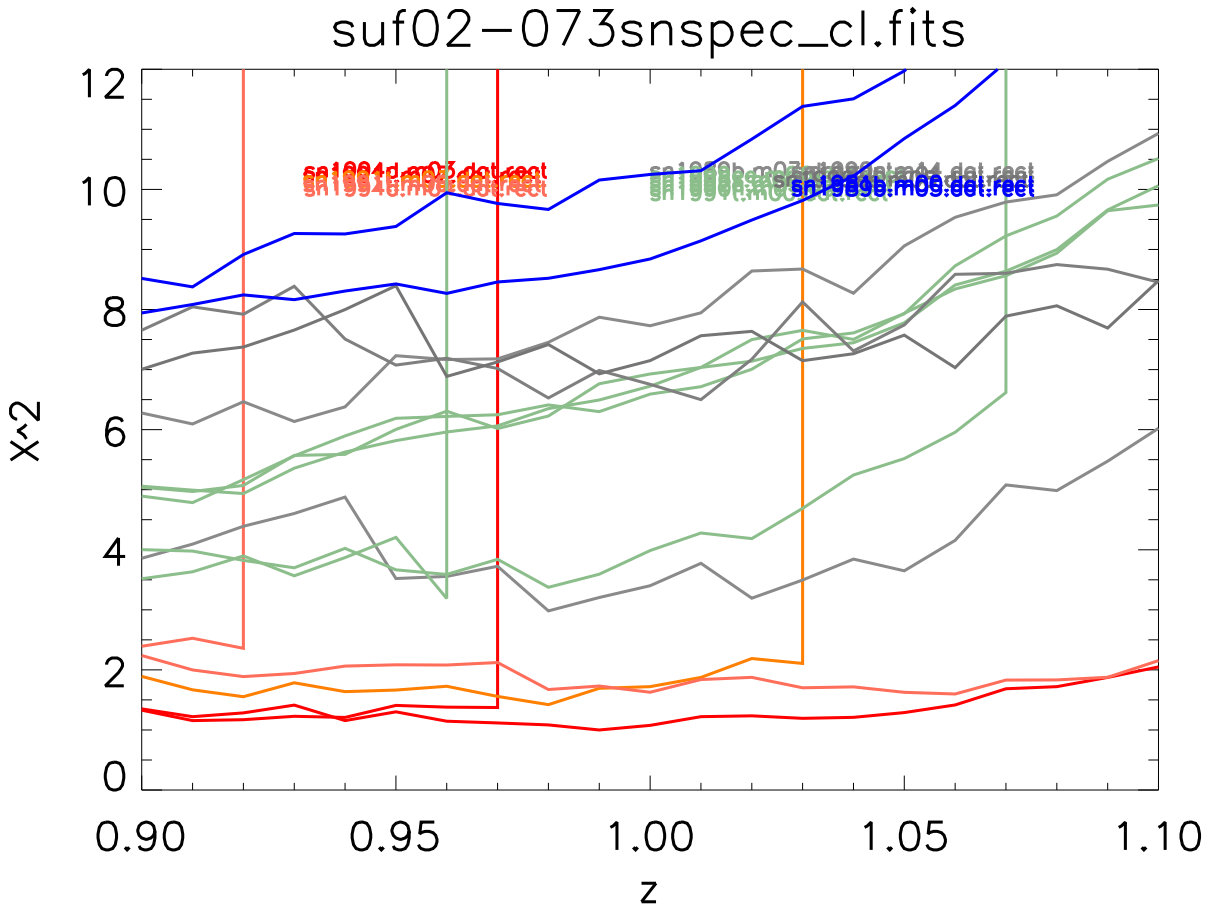

sn1999ee.m08.dat.rect, z = 1.0599999
suf02-060_snspec_cl.fits Observed - Galaxy
Template Spectrum Av = -1.0000000
Galaxy
SN/Gal = 0.829882
Mg II, I
[O II]
Ca II
2.0
1.5
1.0
0.5
0.0
-0.5
5000
6000
7000
8000
9000

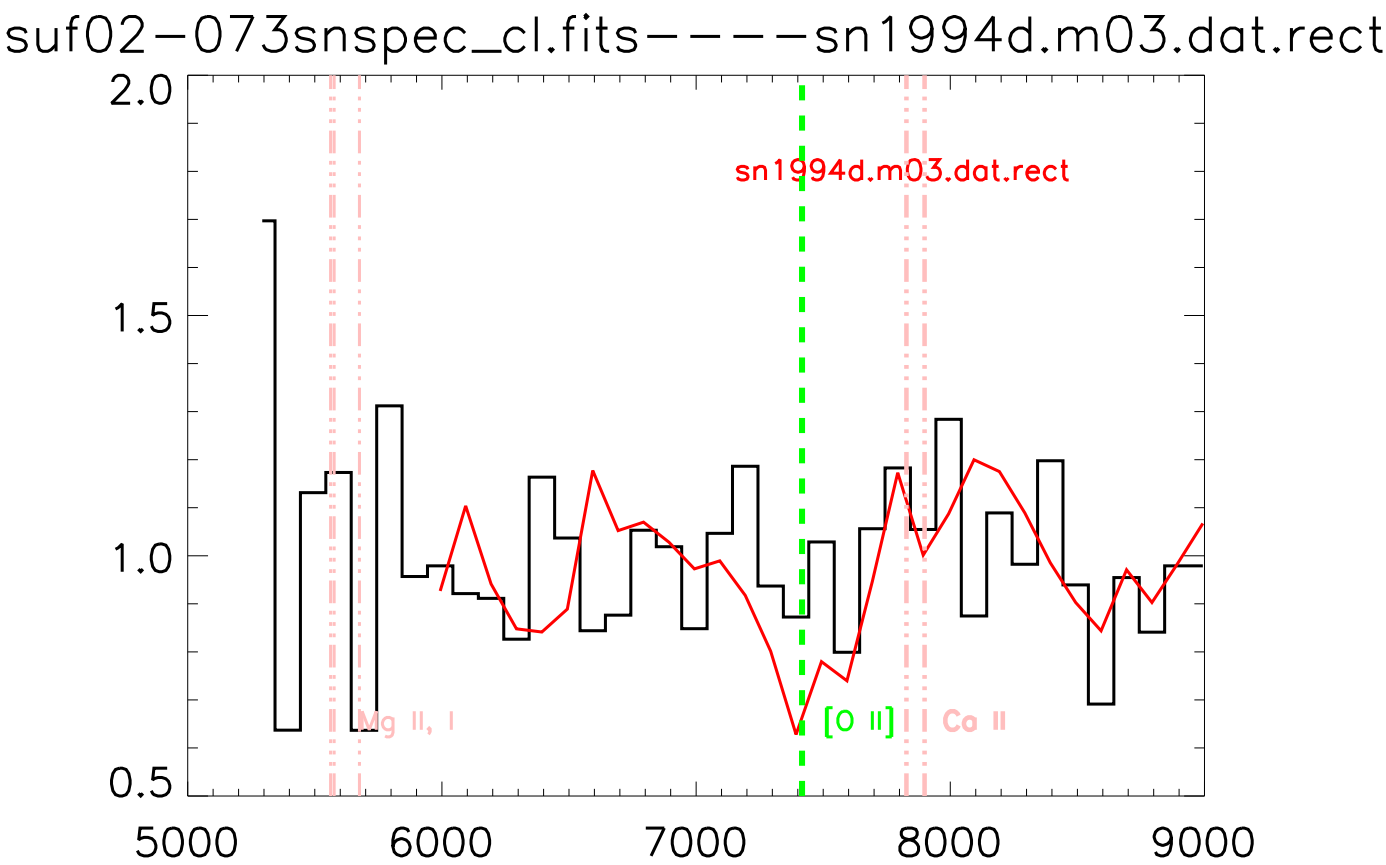

sn1989b.m01.dat.rect, z = 1.0500000
suf02-060_snspec_cl.fits Observed - Galaxy
Template Spectrum Av = -1.0000000
Galaxy
SN/Gal = 0.645427
Mg II, I
[O II]
Ca II
2.0
1.5
1.0
0.5
0.0
-0.5
5000
6000
7000
8000
9000

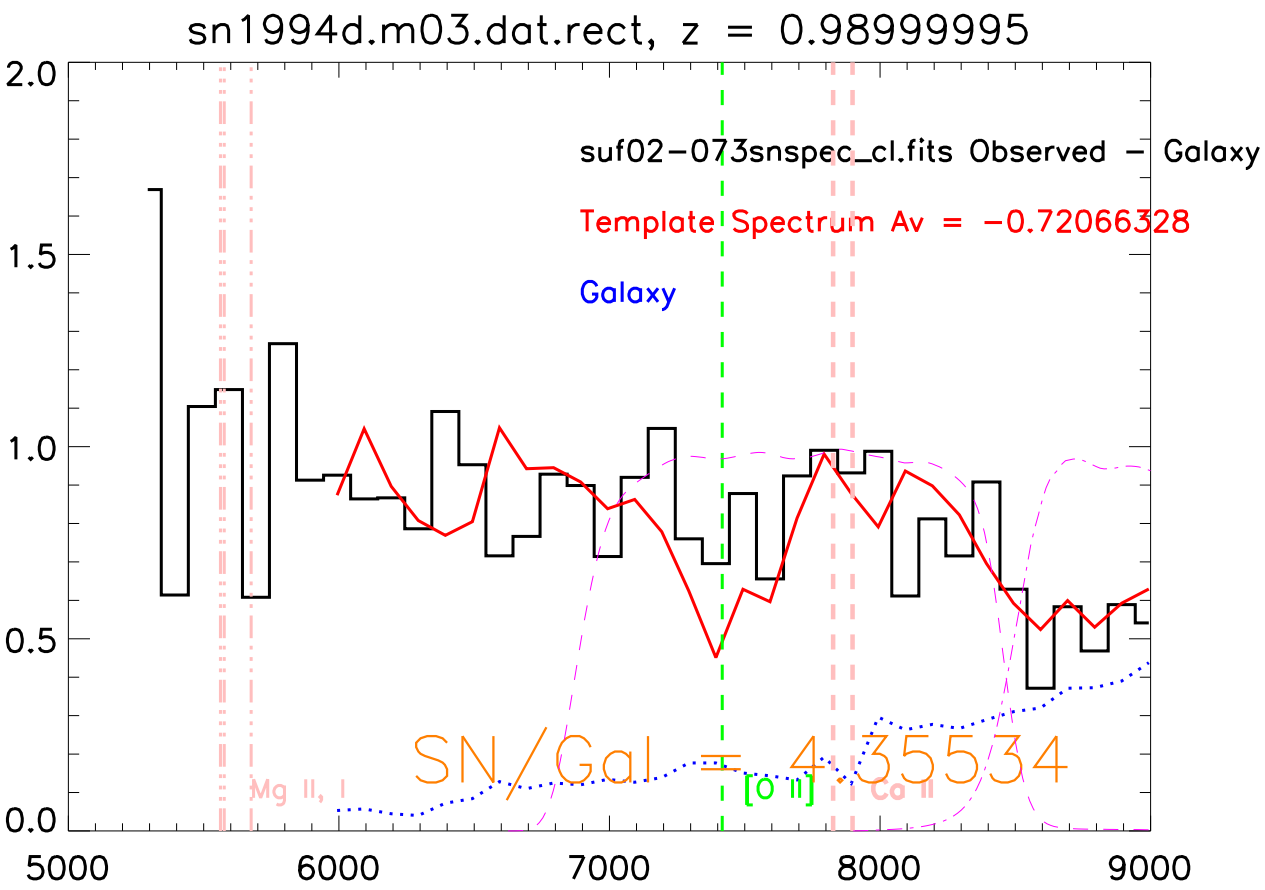

5.0
1.4
3.2
6.1
6.5
8.4
3.0
1.0
4.8

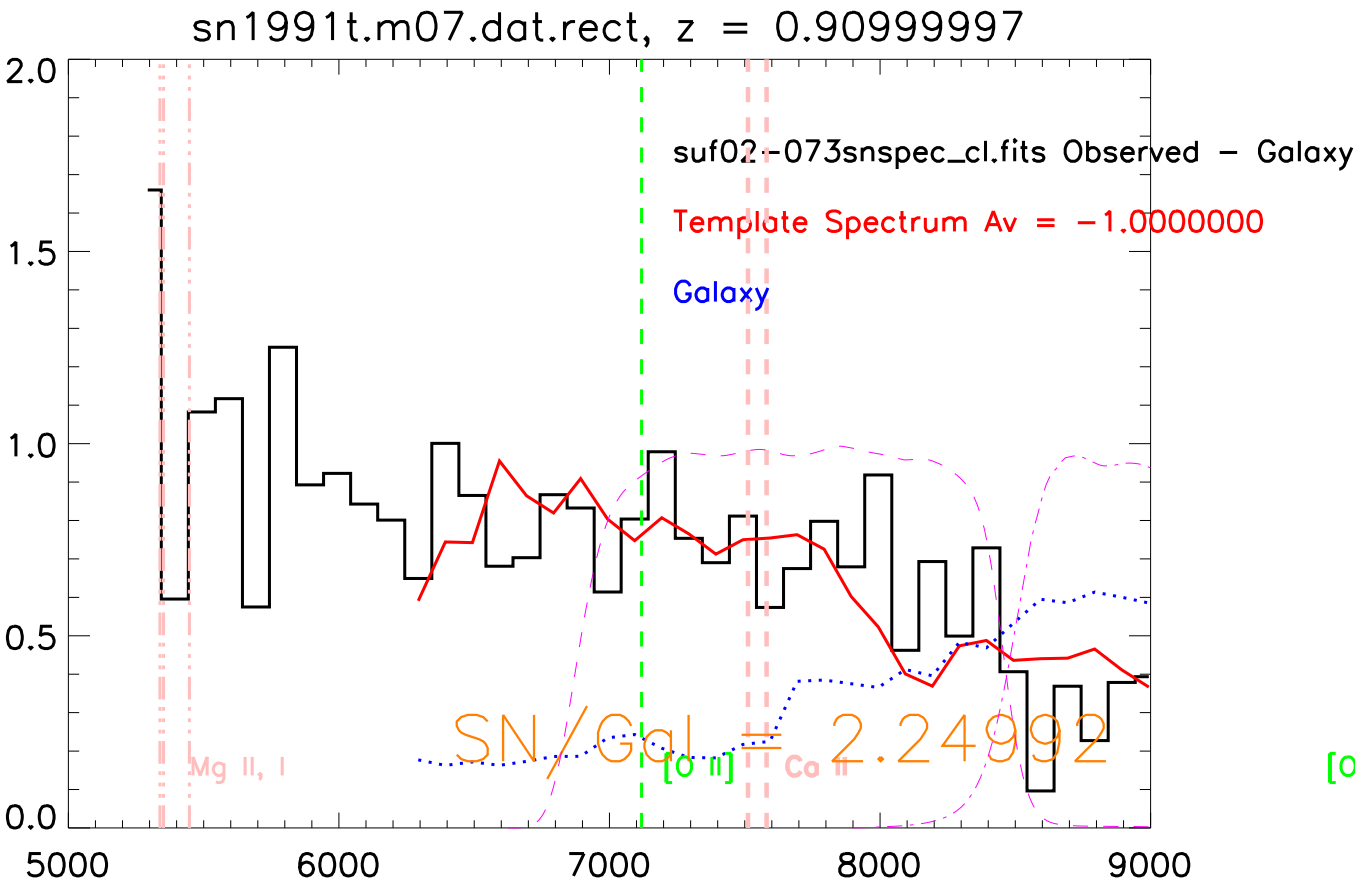


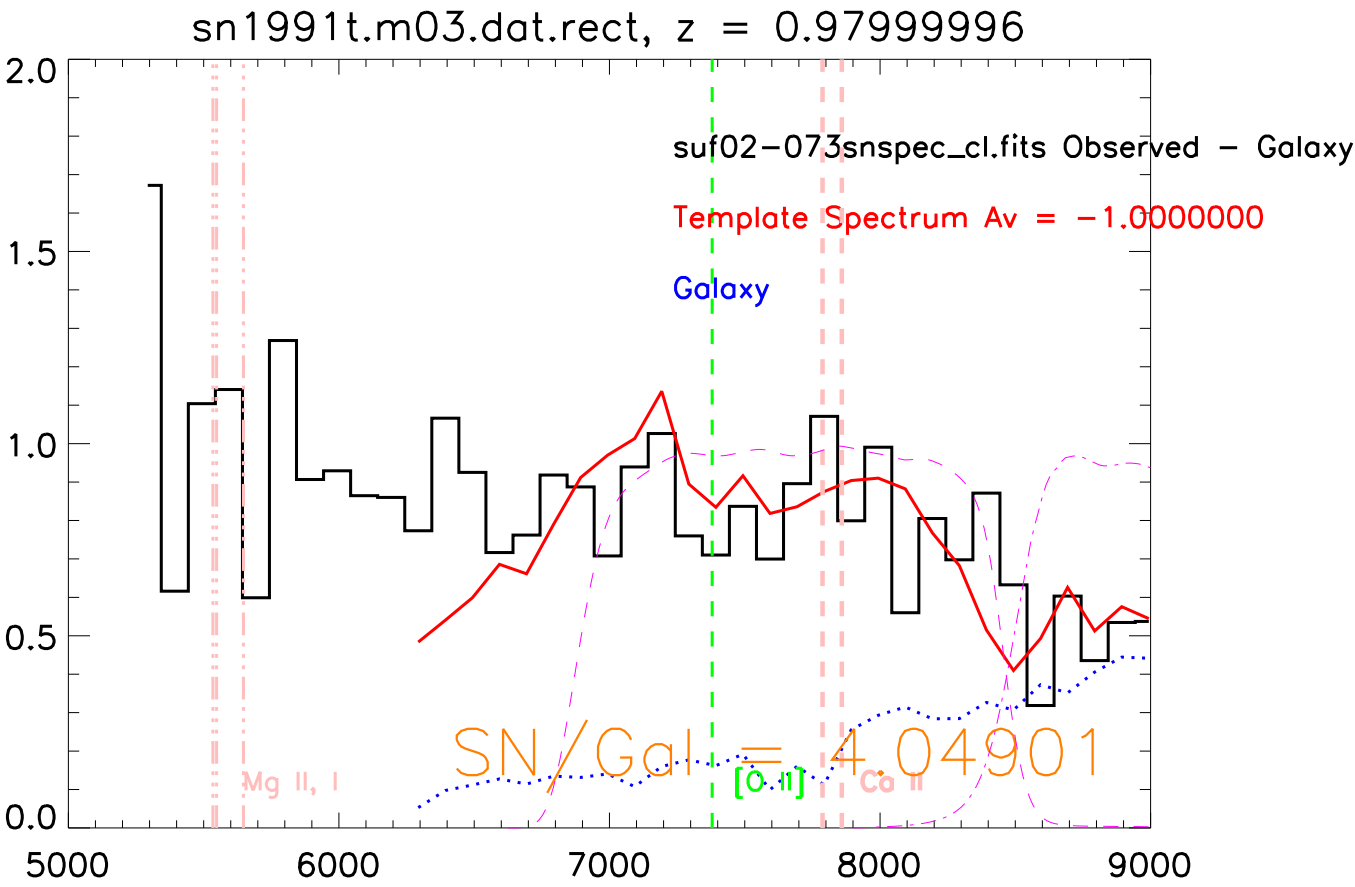
10
8
6
4
2
0
χ^2
40
20
0
−20
Days
0.5
1.0
1.5
2.0
Δm15

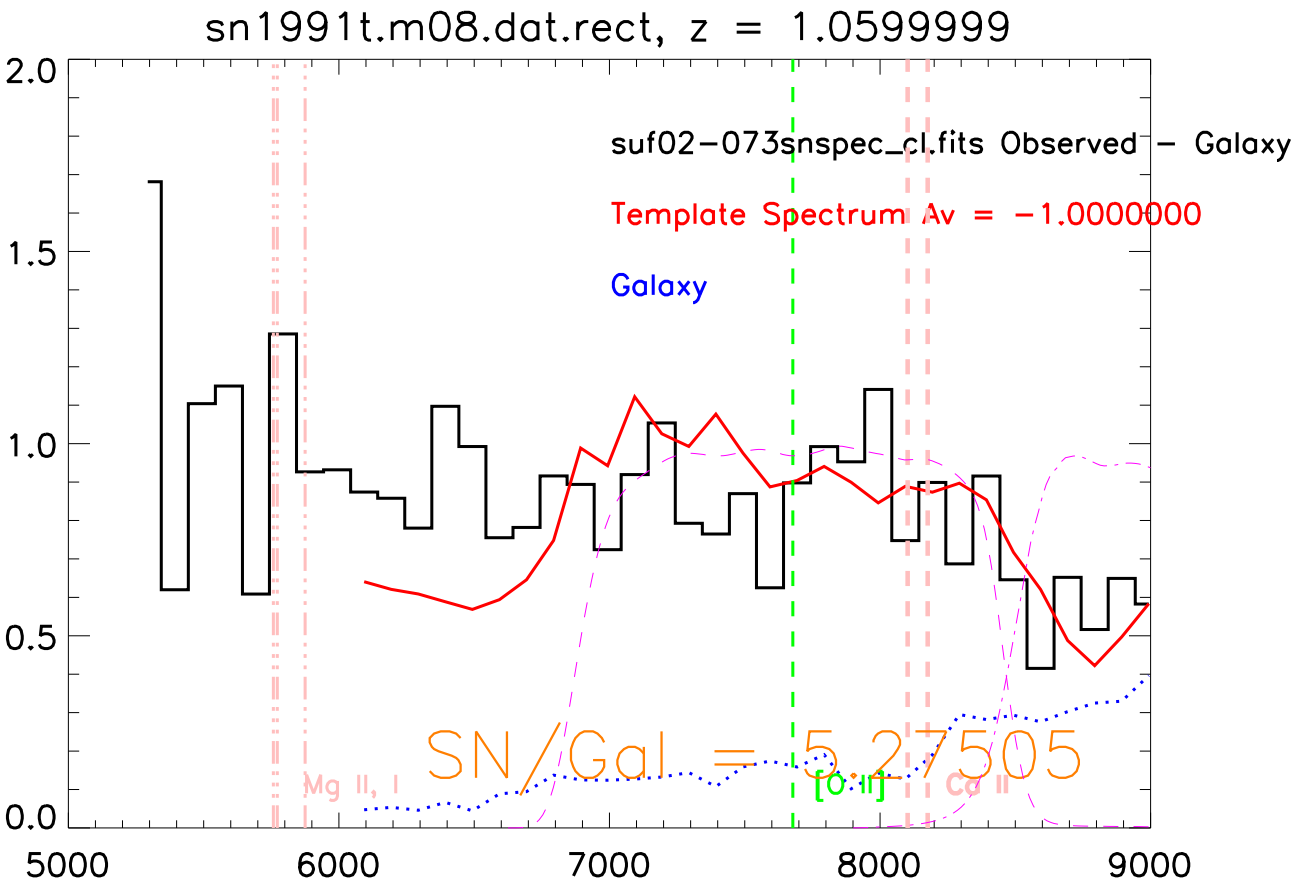

suf02−073snspec_cl.fits
X^2
z
0
2
4
6
8
10
12
0.90
0.95
1.00
1.05
1.10
sn1998b.m09.det.reet

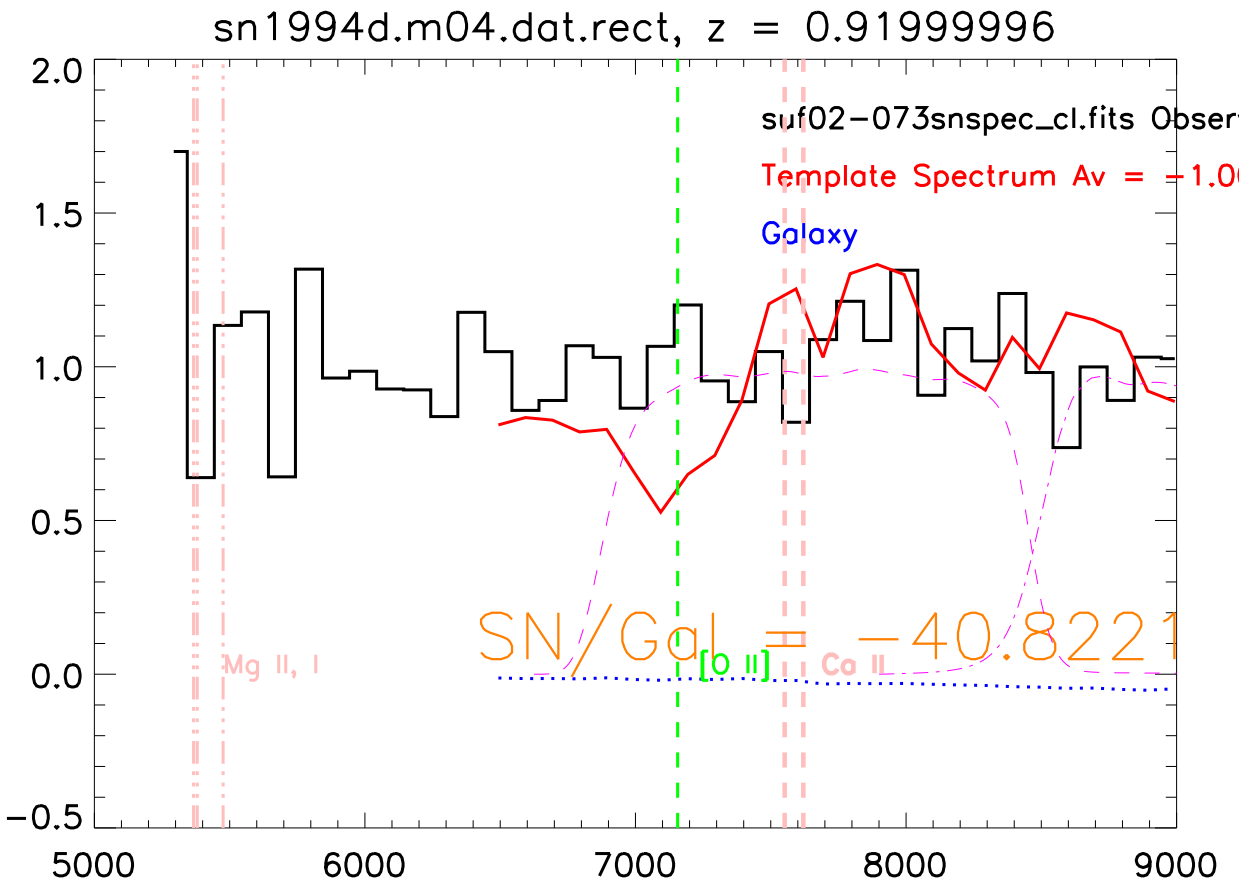

suf02−073snspec_cl.fits−−−−sn1994d.m03.dat.rect
sn1994d.m03.dat.rect
Mg II, I
[O II]
Ca II
2.0
1.5
1.0
0.5
5000
6000
7000
8000
9000

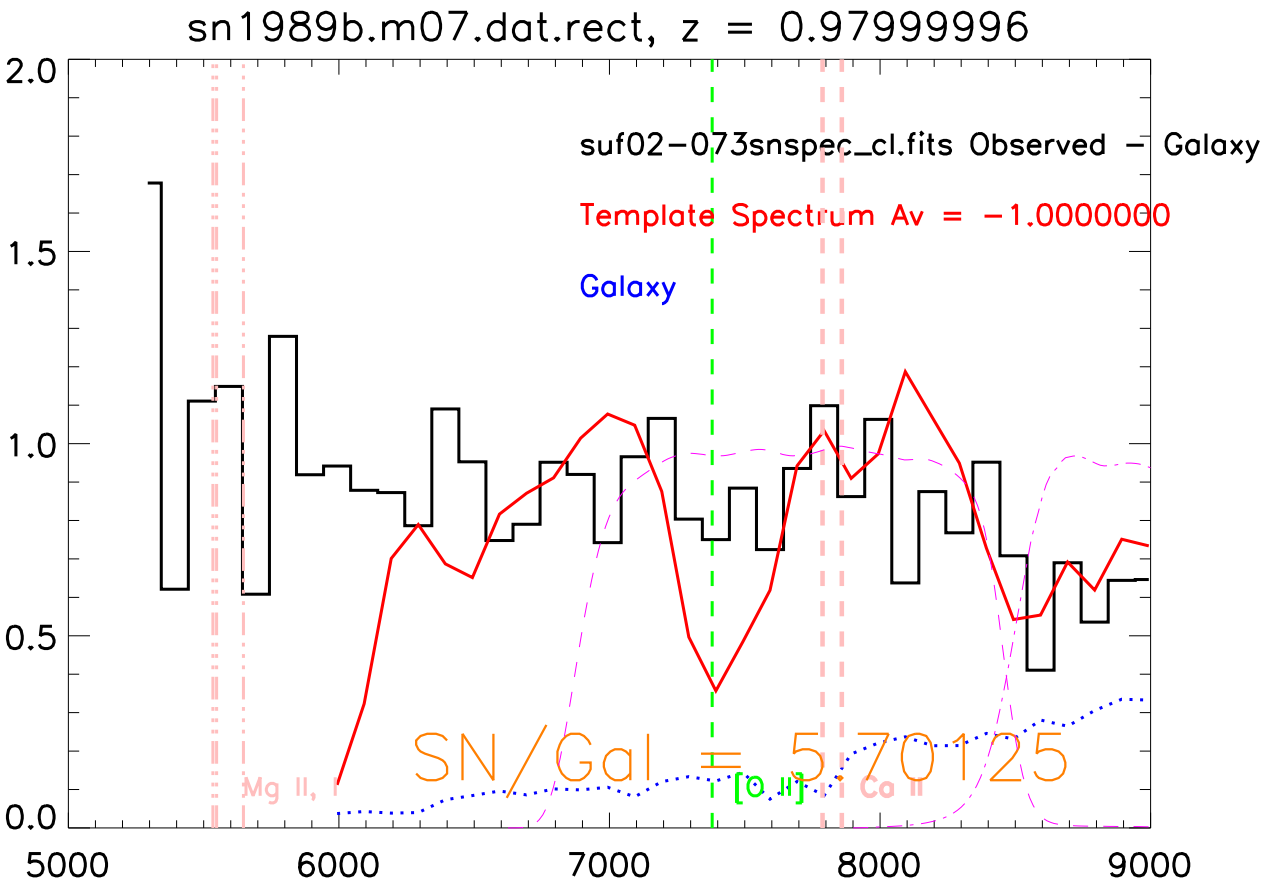

sn1994d.m03.dat.rect, z = 0.98999995
suf02-073snspec_cl.fits Observed – Galaxy
Template Spectrum Av = -0.72066328
Galaxy
SN/Gal = 4.35534
Mg II, I
[O II]
Ca II
2.0
1.5
1.0
0.5
0.0
5000
6000
7000
8000
9000

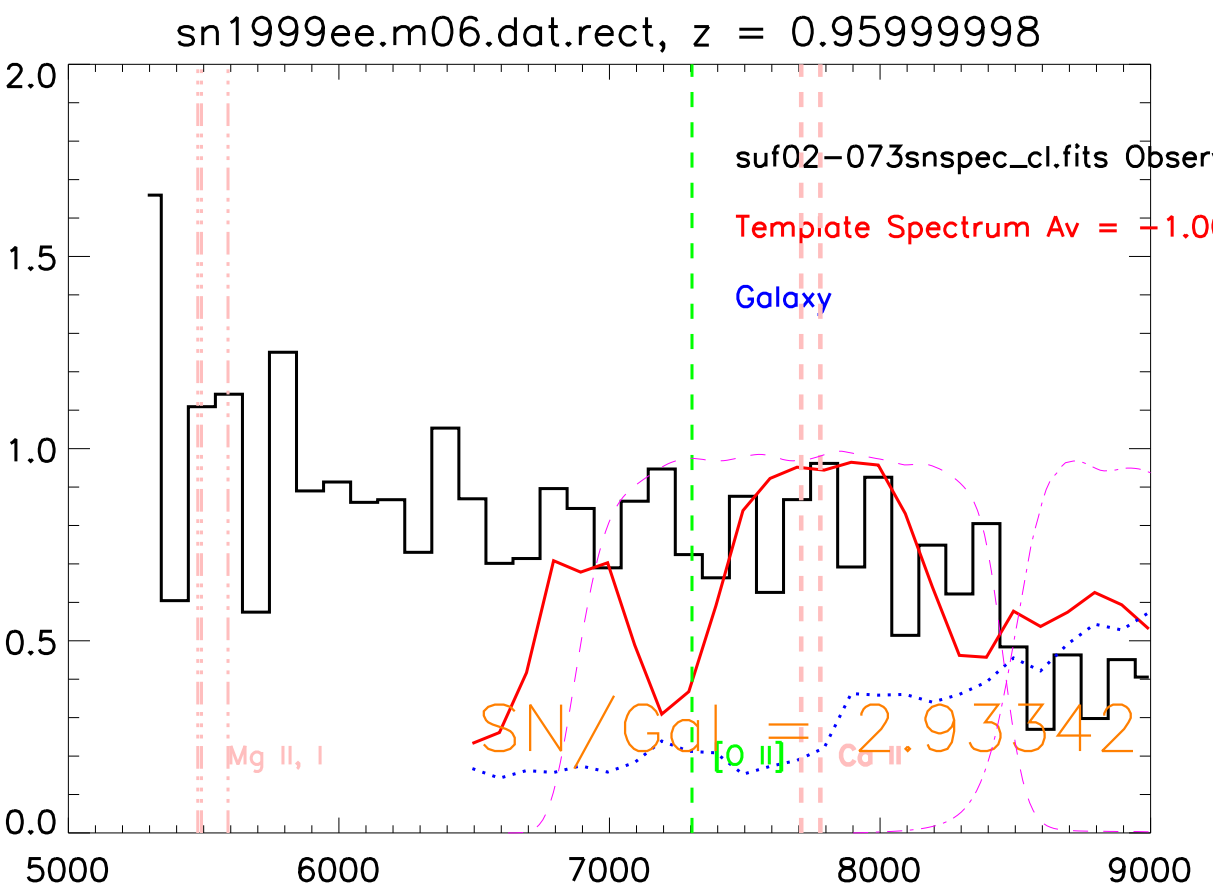

sn1991t.m07.dat.rect, z = 0.90999997
suf02--073snspec_cl.fits Observed – Galaxy
Template Spectrum Av = –1.0000000
Galaxy
SN/Gal = 2.24992
Mg II, I
[O II]
Ca II
[O
2.0
1.5
1.0
0.5
0.0
5000
6000
7000
8000
9000

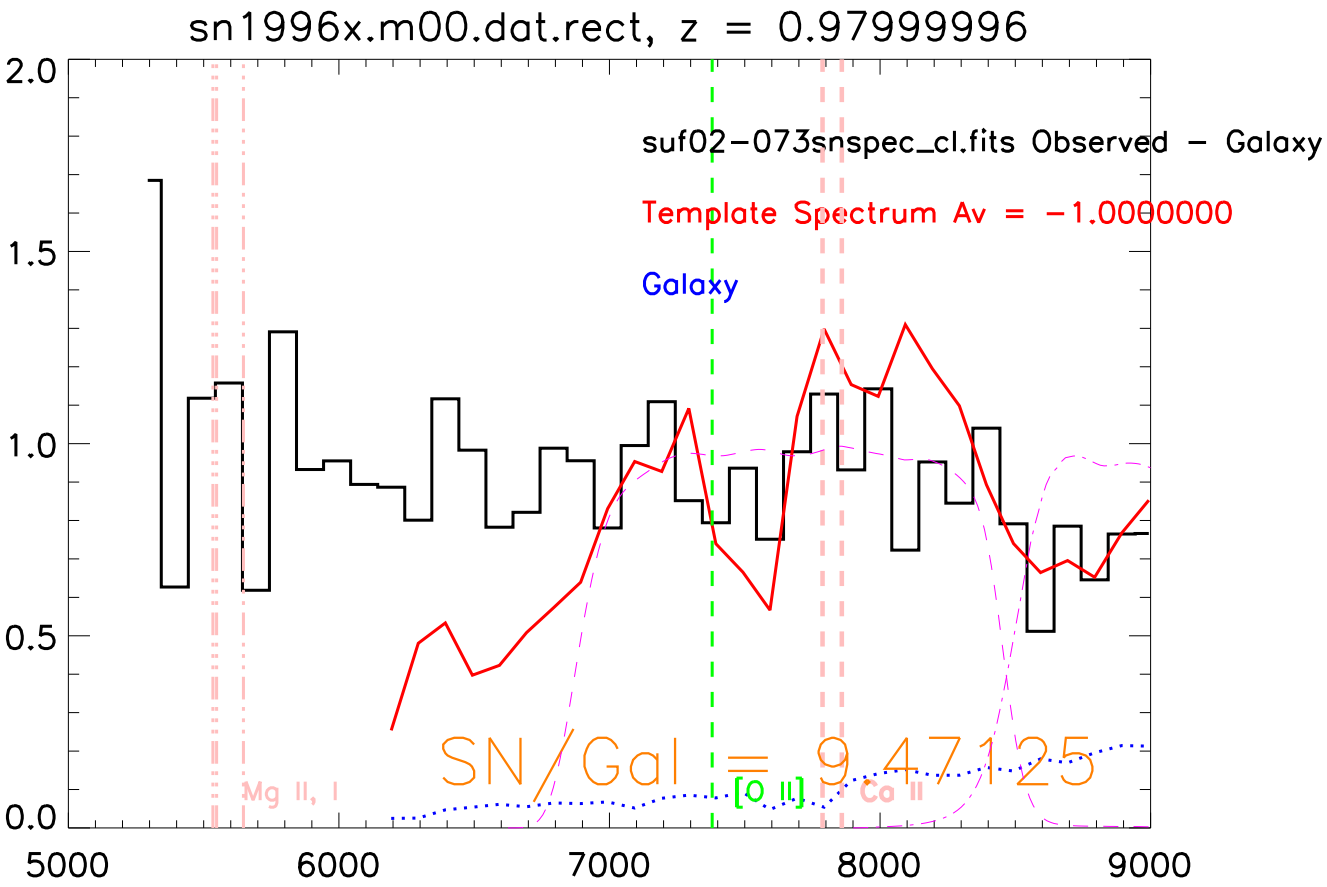

sn1991t.m03.dat.rect, z = 0.97999996
suf02-073snspec_cl.fits Observed - Galaxy
Template Spectrum Av = -1.0000000
Galaxy
SN/Gal = 4.04901
Mg II, I
[O II]
Ca II
2.0
1.5
1.0
0.5
0.0
5000
6000
7000
8000
9000

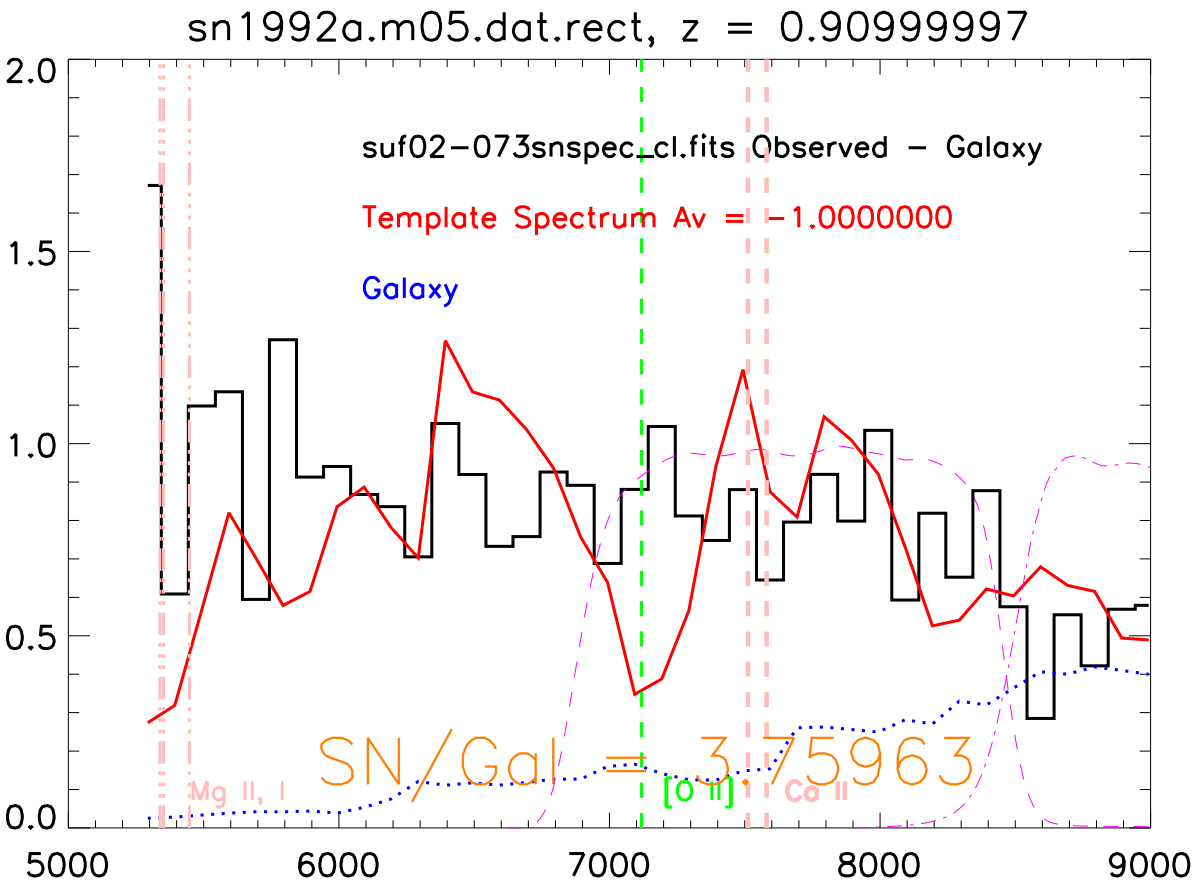

sn1991t.m08.dat.rect, z = 1.0599999
suf02-073snspec_cl.fits Observed - Galaxy
Template Spectrum Av = -1.0000000
Galaxy
SN/Gal = 5.27505
Mg II, I
[O II]
Ca II
2.0
1.5
1.0
0.5
0.0
5000
6000
7000
8000
9000

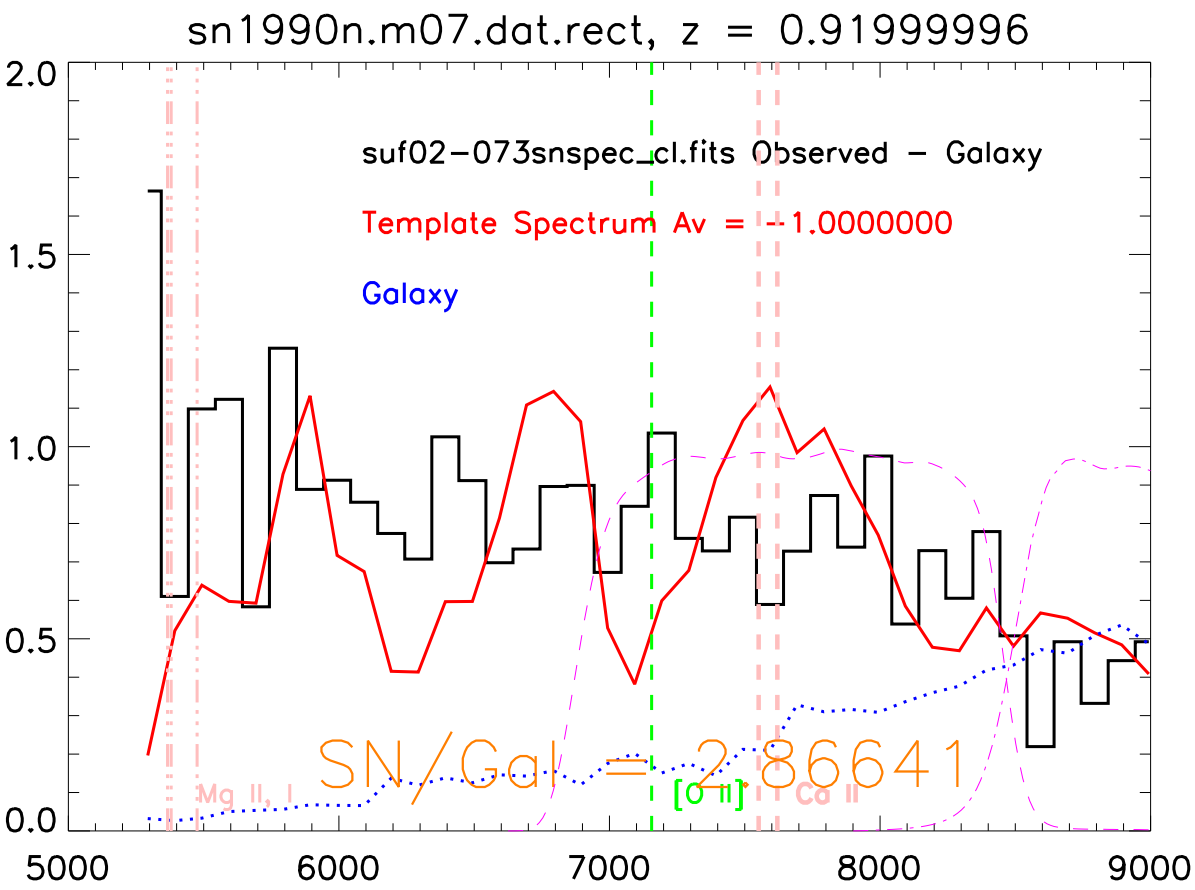

sn1994d.m04.dat.rect, z = 0.91999996
suf02-073snspec_cl.fits Observed – Ga
Template Spectrum Av = 1.0000000
Galaxy
SN/Gal = −40.8221
Mg II, I
[O II]
Ca II
2.0
1.5
1.0
0.5
0.0
−0.5
5000
6000
7000
8000
9000

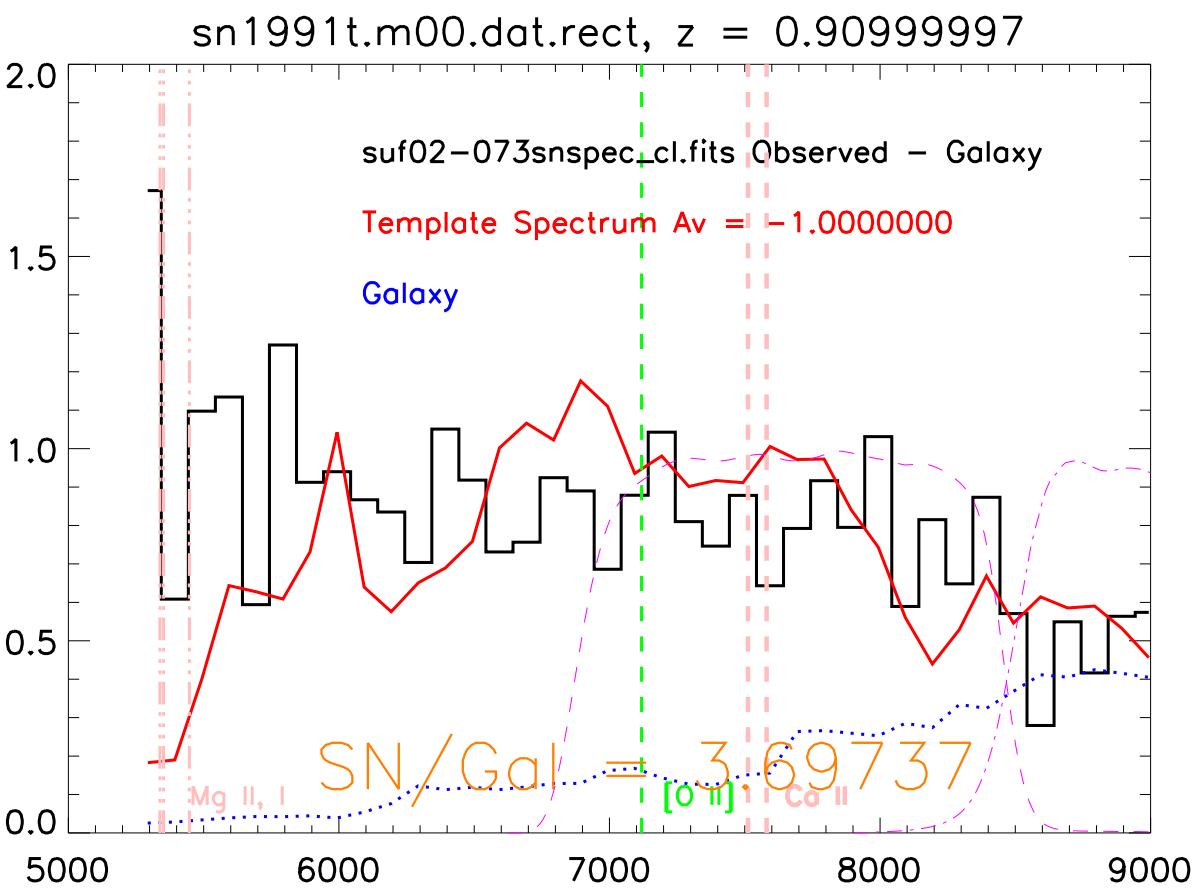

sn1989b.m07.dat.rect, z = 0.97999996
suf02-073snspec_cl.fits Observed – Galaxy
Template Spectrum Av = -1.0000000
Galaxy
SN/Gal = 5.70125
Mg II, ?
[O II]
Ca II
2.0
1.5
1.0
0.5
0.0
5000
6000
7000
8000
9000

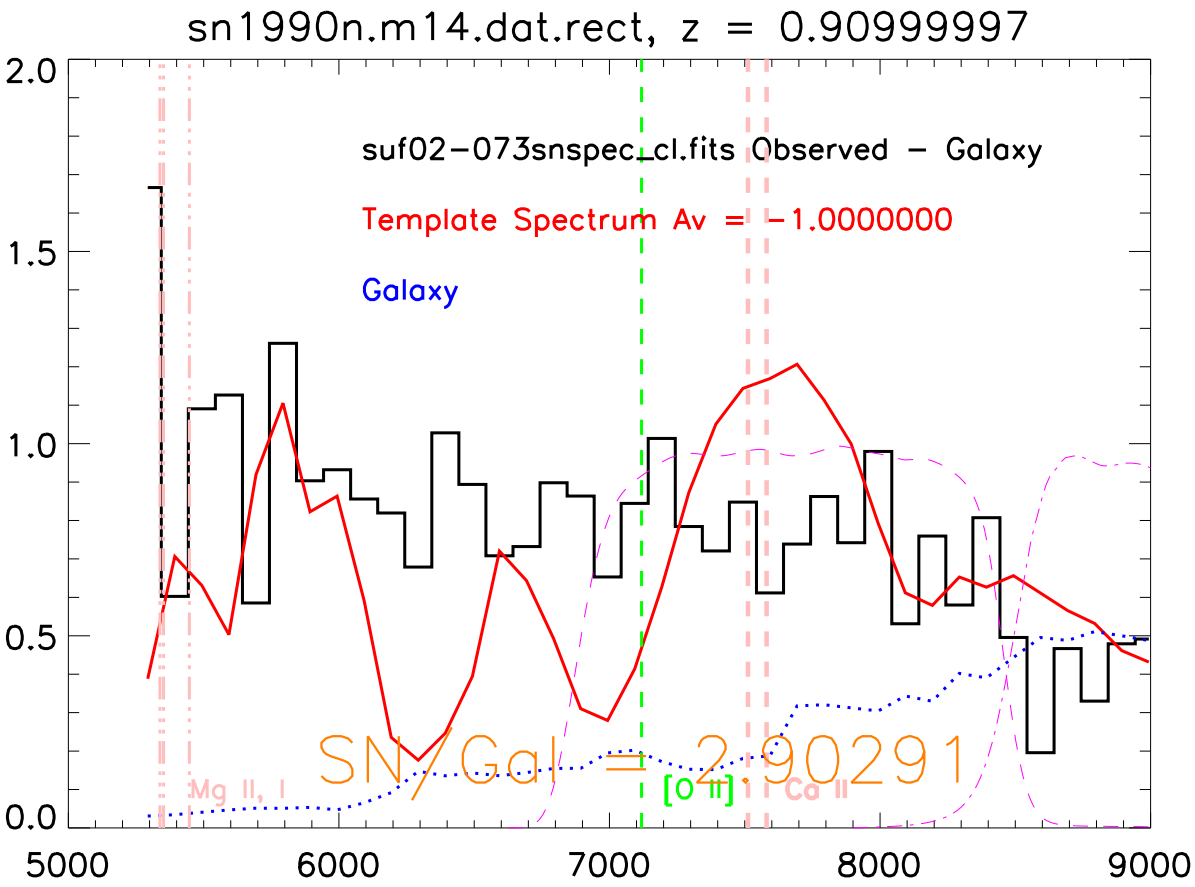

sn1999ee.m06.dat.rect, z = 0.95999998
suf02-073snspec_cl.fits Observed – Ga
Template Spectrum Av = 1.0000000
Galaxy
SN/Gal = 2.93342
Mg II, I
[O II]
Ca II
2.0
1.5
1.0
0.5
0.0
5000
6000
7000
8000
9000

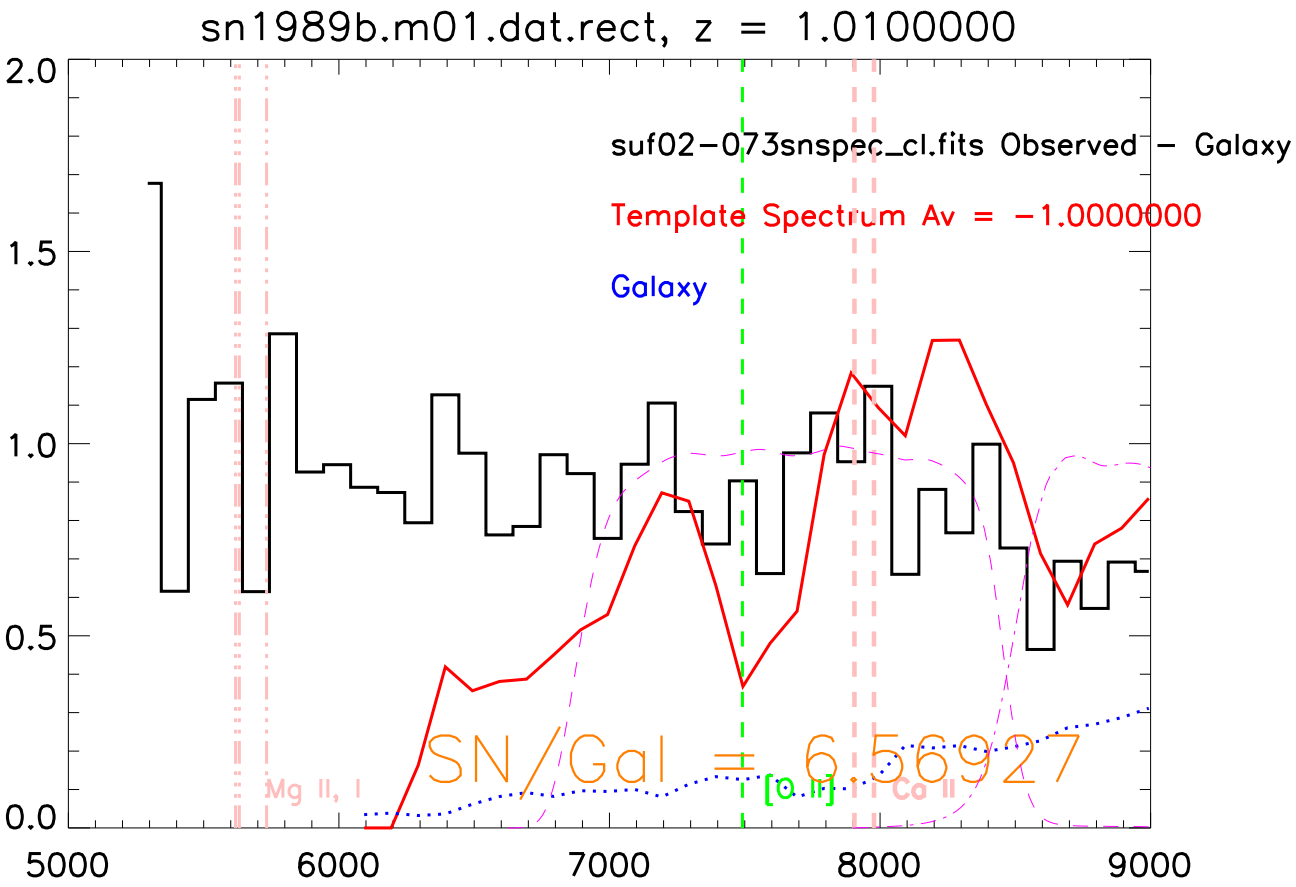

sn1996x.m00.dat.rect, z = 0.97999996
suf02-073snspec_cl.fits Observed - Galaxy
Template Spectrum Av = -1.0000000
Galaxy
SN/Gal = 9.47125
Mg II, I
[O II]
Ca II
2.0
1.5
1.0
0.5
0.0
5000
6000
7000
8000
9000

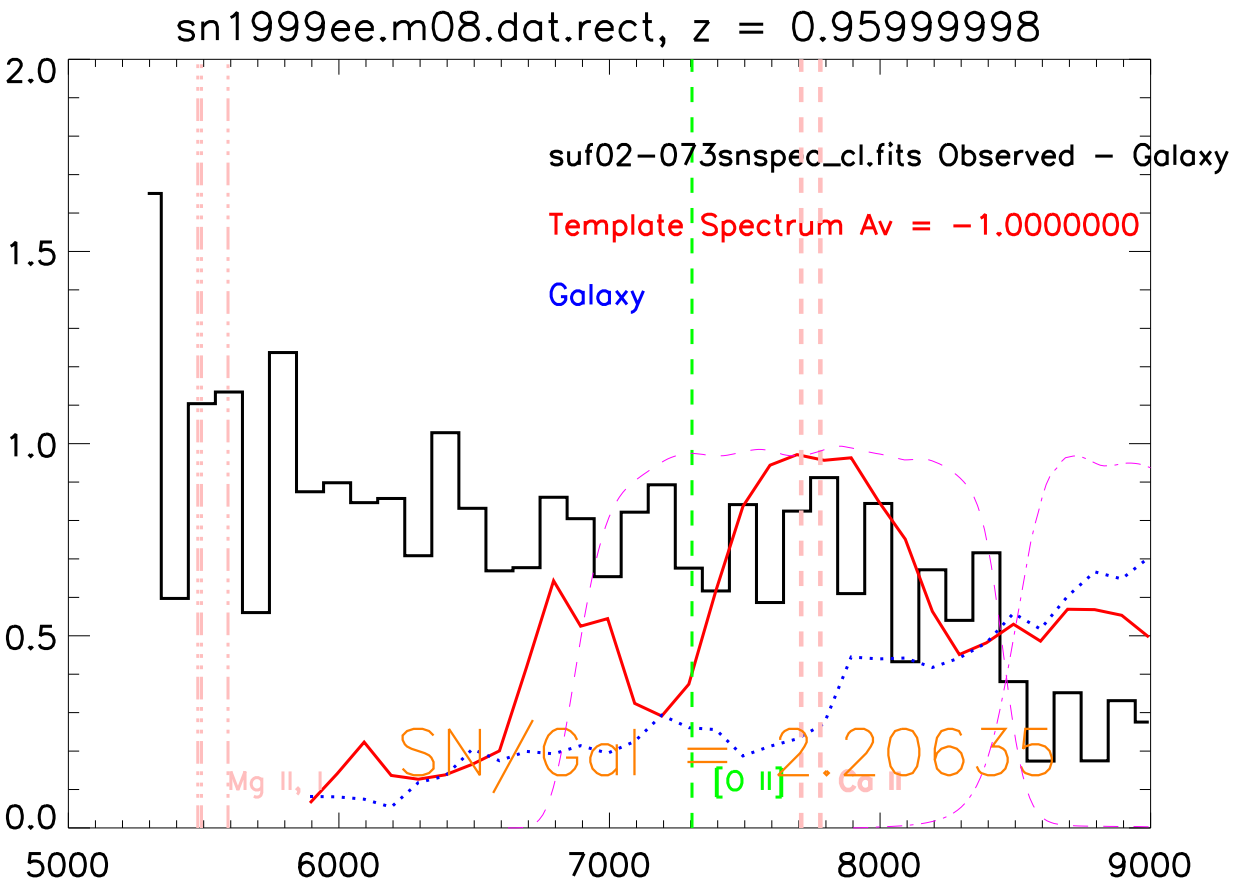

sn1992a.m05.dat.rect, z = 0.90999997
suf02-073snspec_cl.fits Observed - Galaxy
Template Spectrum Av = -1.0000000
Galaxy
SN/Gal = 3.75963
Mg II, I
[O II]
Ca II
2.0
1.5
1.0
0.5
0.0
5000
6000
7000
8000
9000

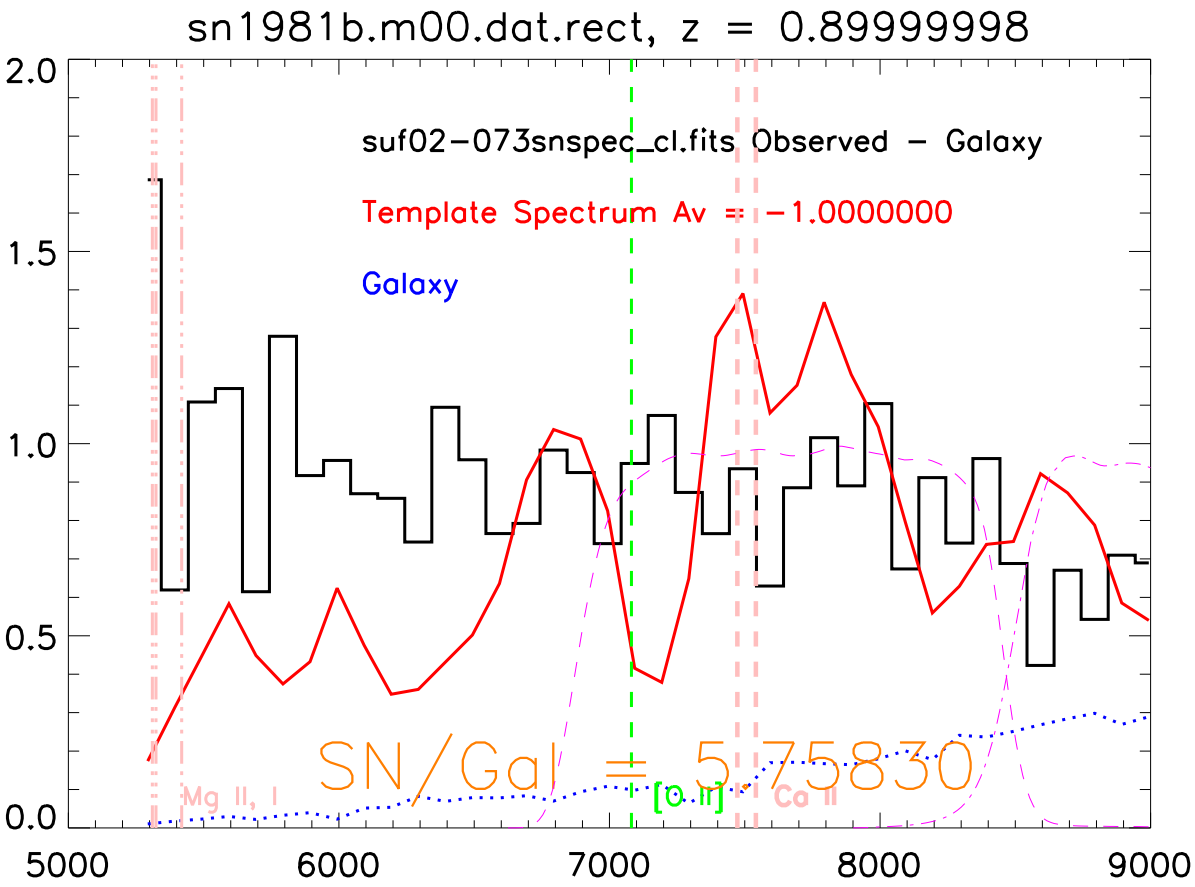

sn1990n.m07.dat.rect, z = 0.91999996
suf02-073snspec_cl.fits Observed - Galaxy
Template Spectrum Av = 1.0000000
Galaxy
SN/Gal = 2.86641
Mg II, I
[O II]
Ca II
2.0
1.5
1.0
0.5
0.0
5000
6000
7000
8000
9000

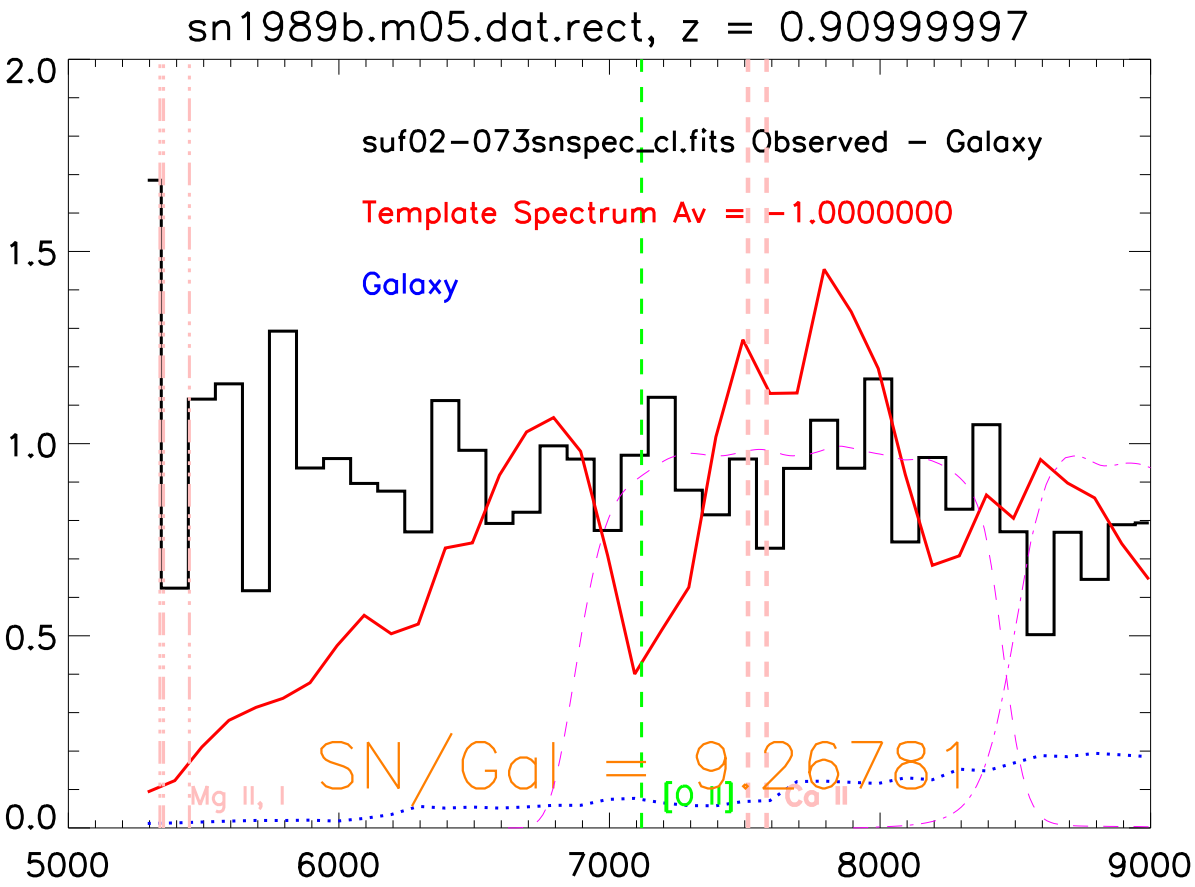

sn1991t.m00.dat.rect, z = 0.90999997
suf02-073snspec_cl.fits Observed - Galaxy
Template Spectrum Av = -1.0000000
Galaxy
SN/Gal = 3.69737
Mg II, I
[O II]
Ca II
2.0
1.5
1.0
0.5
0.0
5000
6000
7000
8000
9000

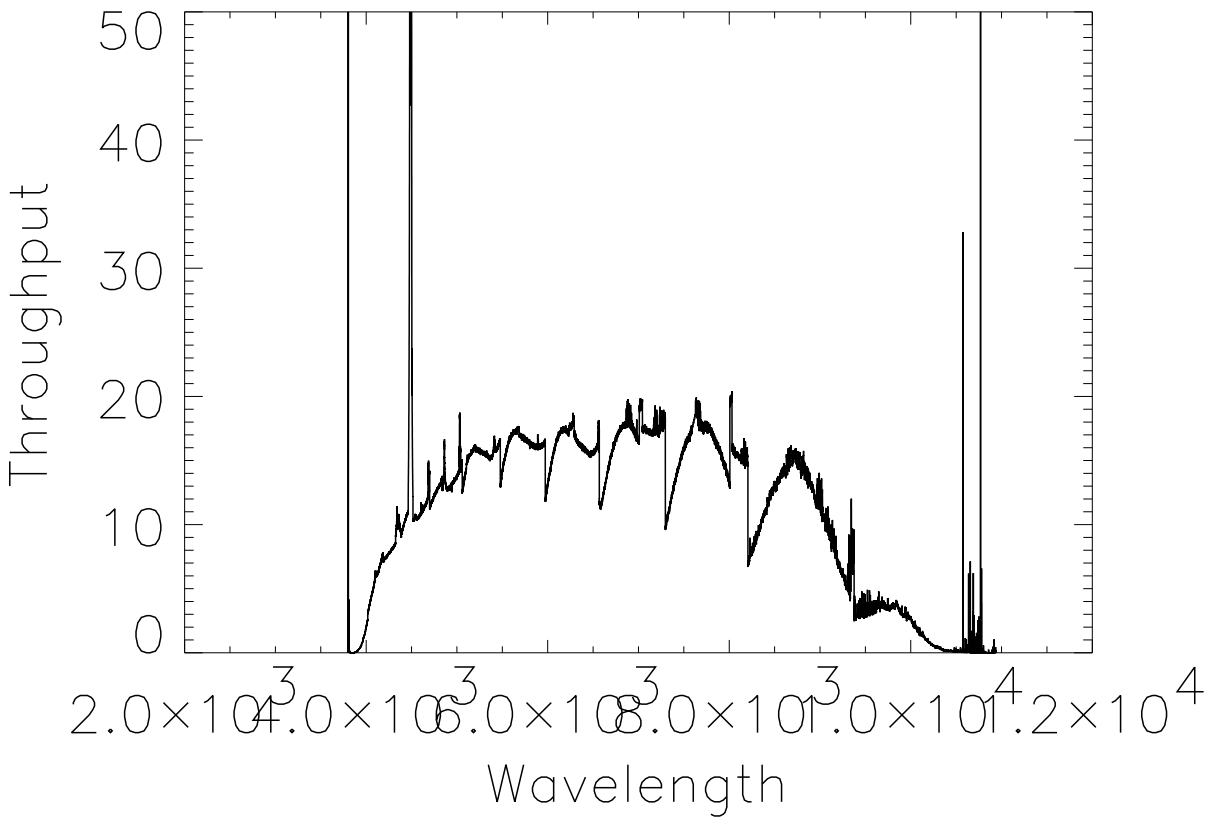

sn1990n.m14.dat.rect, z = 0.90999997
suf02-073snspec_cl.fits Observed - Galaxy
Template Spectrum Av = -1.0000000
Galaxy
SN/Gal = 2.90291
Mg II, I
[O II]
Ca II
2.0
1.5
1.0
0.5
0.0
5000
6000
7000
8000
9000


sn1989b.m01.dat.rect, z = 1.0100000
suf02-073snspec_cl.fits Observed – Galaxy
Template Spectrum Av = -1.0000000
Galaxy
SN/Gal = 6.56927
Mg II, I
[O II]
Ca II
2.0
1.5
1.0
0.5
0.0
5000
6000
7000
8000
9000


sn1999ee.m08.dat.rect, z = 0.95999998
suf02-073snspec_cl.fits Observed - Galaxy
Template Spectrum Av = -1.0000000
Galaxy
SN/Gal = 2.20635
Mg II, I
[O II]
Ca II
2.0
1.5
1.0
0.5
0.0
5000
6000
7000
8000
9000


sn1981b.m00.dat.rect, z = 0.89999998
suf02-073snspec_cl.fits Observed - Galaxy
Template Spectrum Av = -1.0000000
Galaxy
SN/Gal = 5.75830
Mg II, I
[O II]
Ca II
[O
2.0
1.5
1.0
0.5
0.0
5000
6000
7000
8000
9000


sn1989b.m05.dat.rect, z = 0.90999997
suf02-073snspec_cl.fits Observed - Galaxy
Template Spectrum Av = -1.0000000
Galaxy
SN/Gal = 9.26781
Mg II, I
[O II]
Ca II
2.0
1.5
1.0
0.5
0.0
5000
6000
7000
8000
9000


Throughput
50
40
30
20
10
0
2.0×10^3
4.0×10^3
6.0×10^3
8.0×10^3
1.0×10^4
1.2×10^4
Wavelength