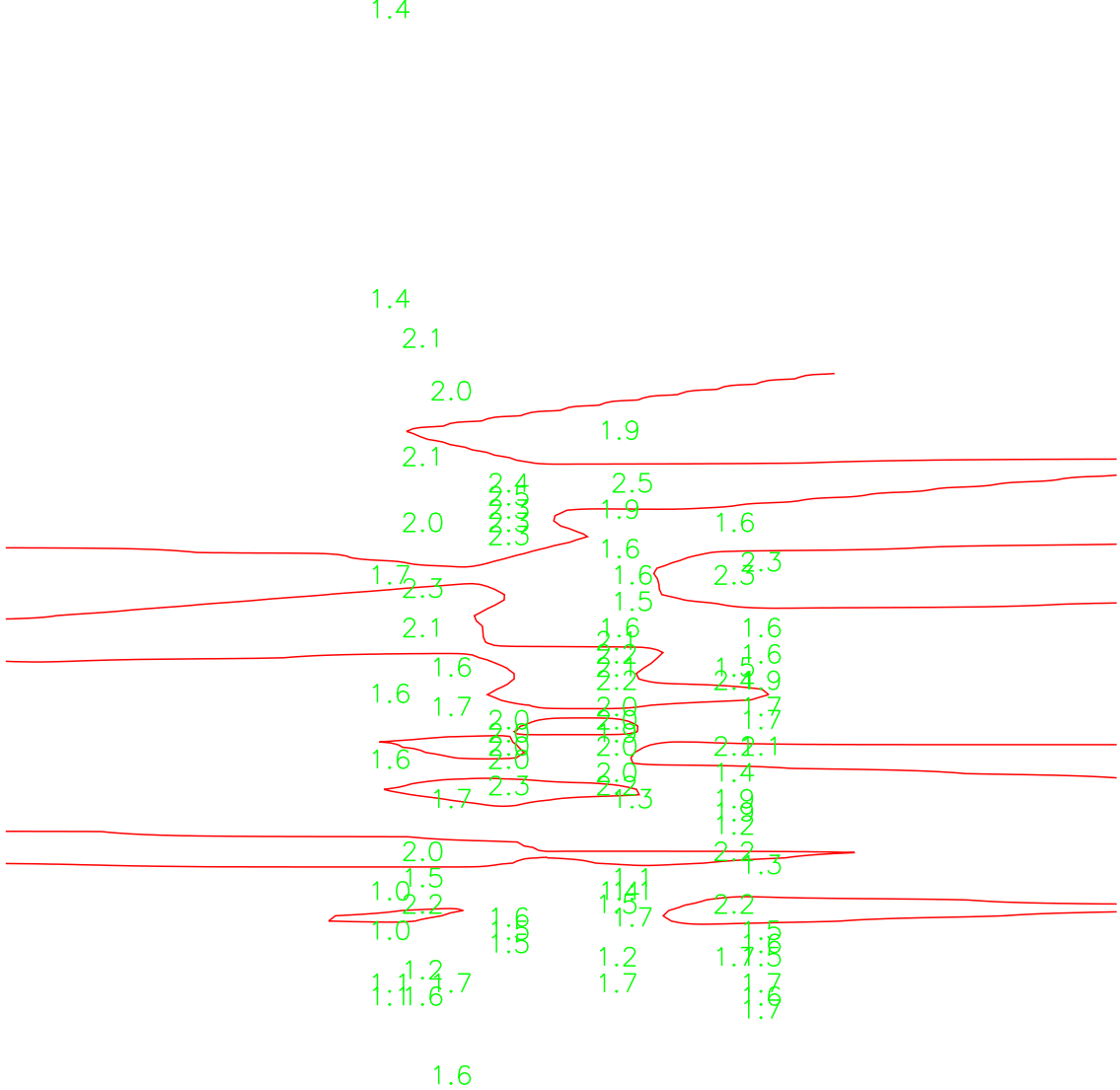

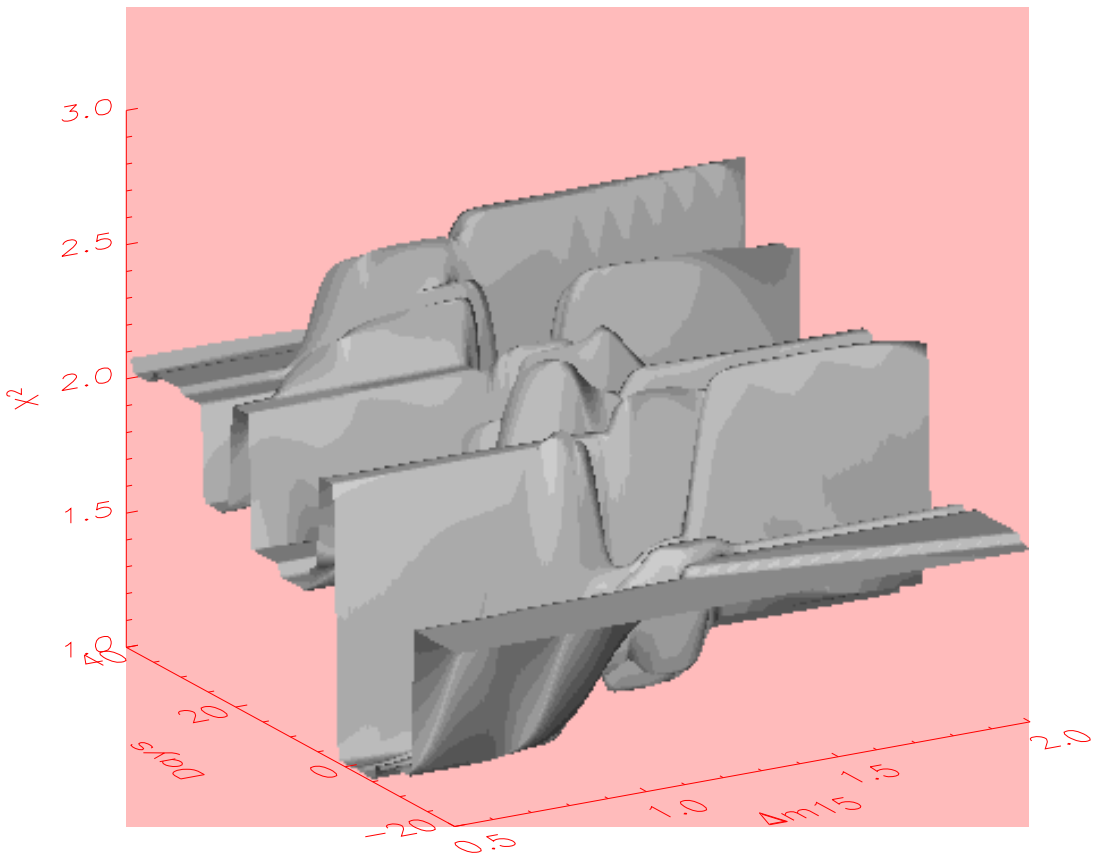

3.0
2.5
2.0
1.5
1.0
χ^2
40
20
0
−20
Days
0.5
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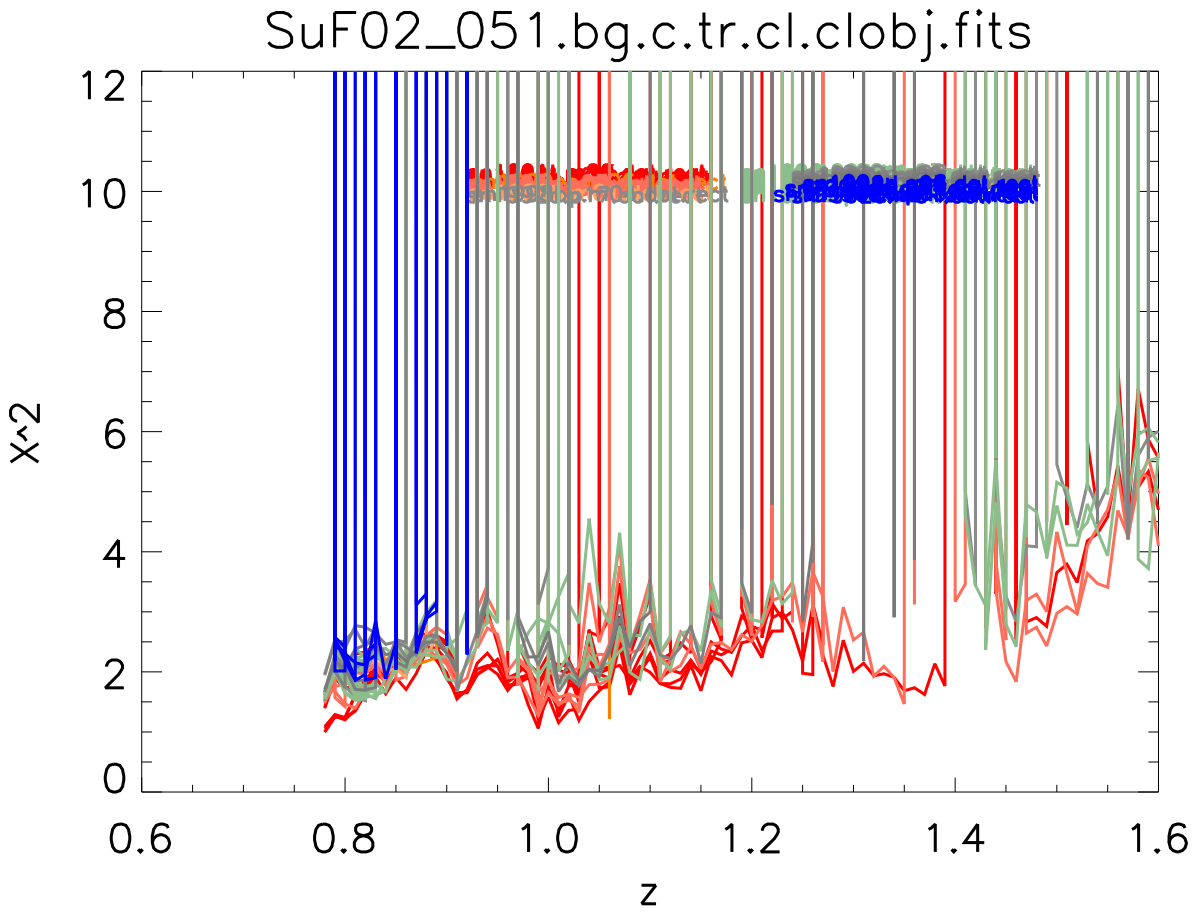
2.0
Δm15


SuF02_051.bg.c.tr.cl.clobj.fits
X^2
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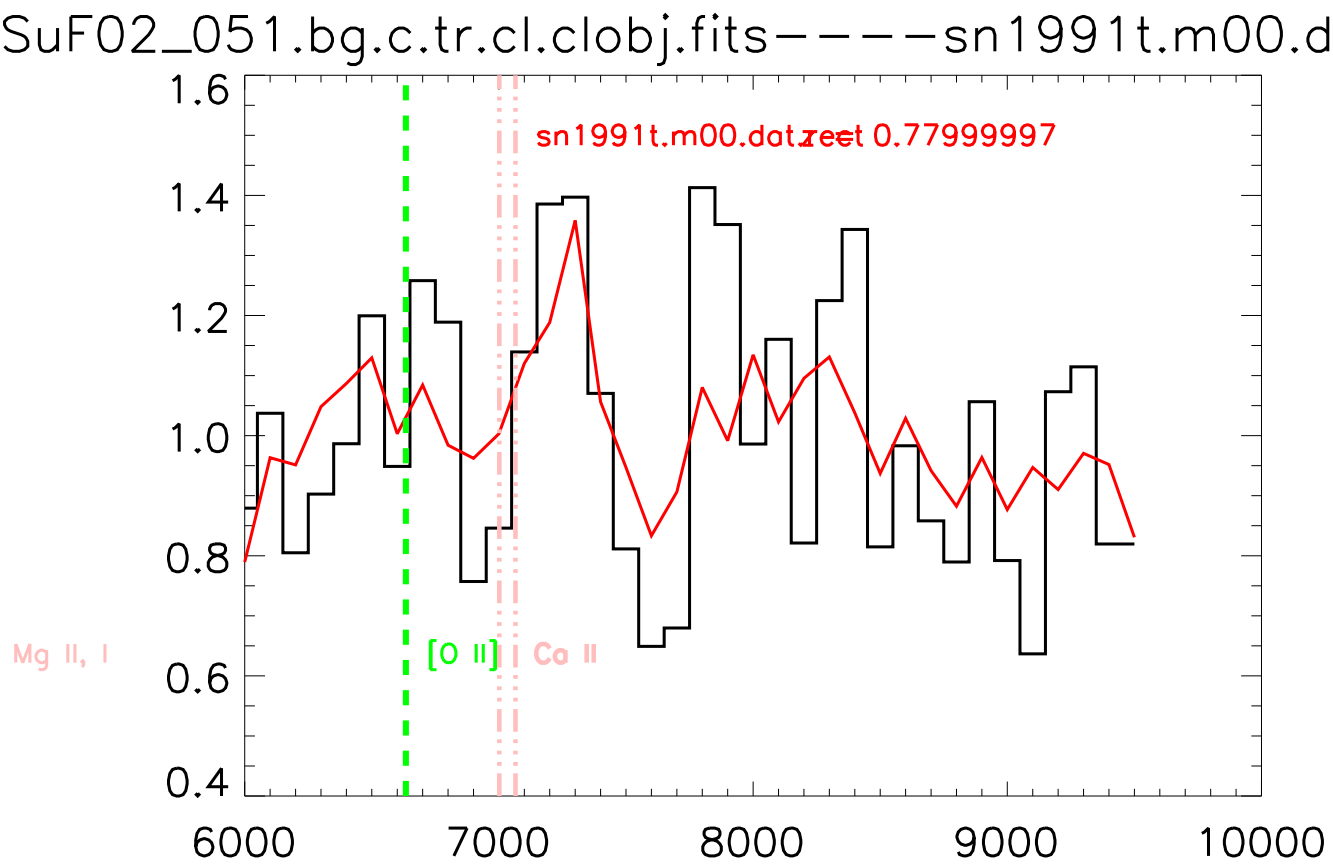
2
4
6
8
10
12
0.6
0.8
1.0
1.2
1.4
1.6


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
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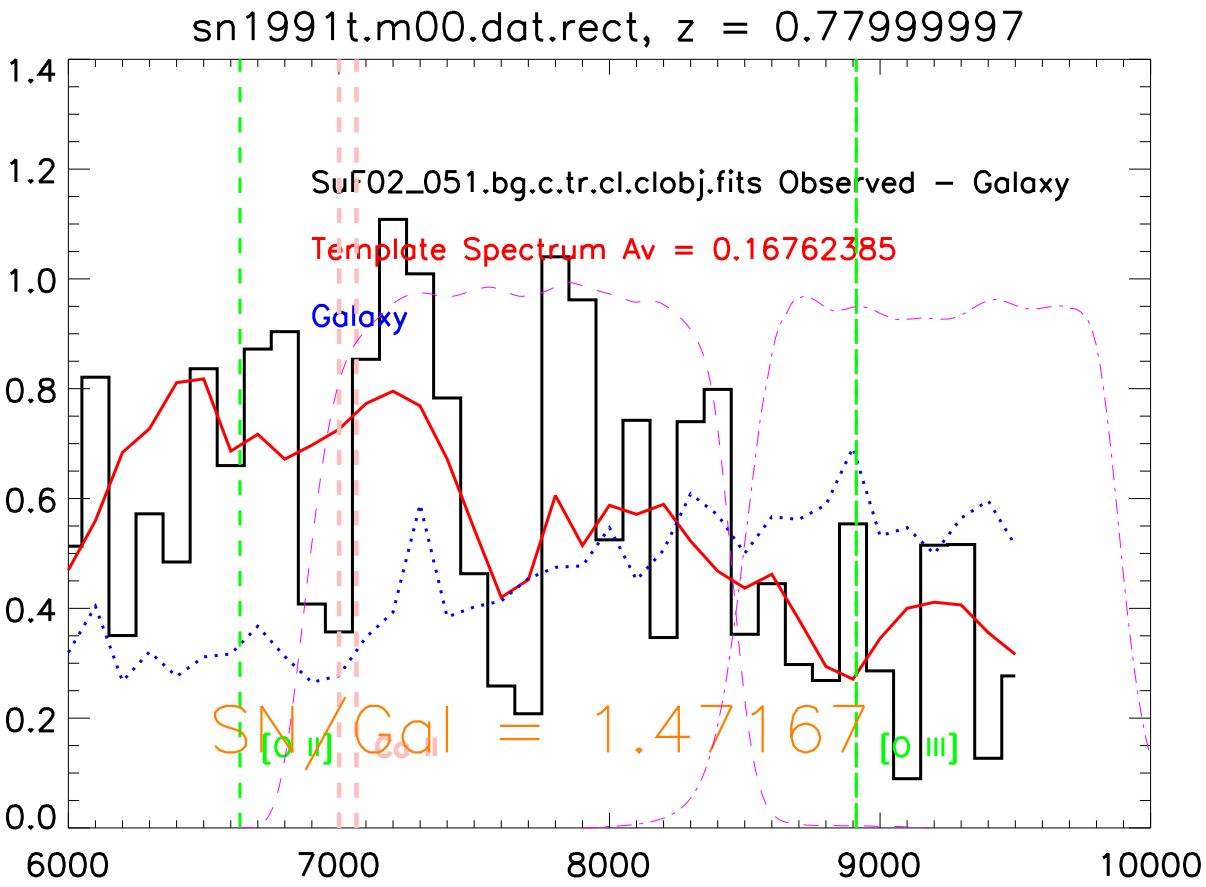
1.4
1.2
1.0
0.8
0.6
0.4
6000
7000
8000
9000
10000


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
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0.8
0.6
0.4
0.2
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6000
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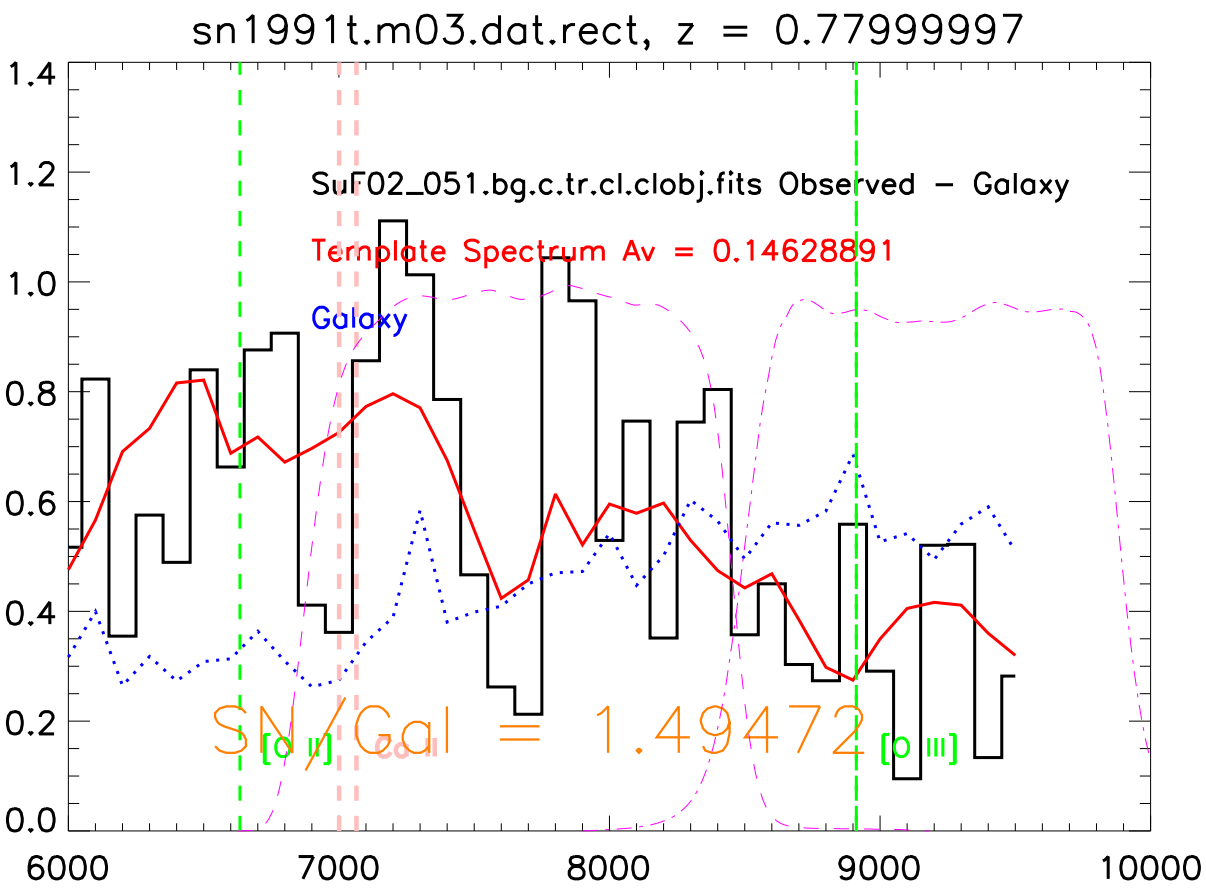
8000
9000
10000

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
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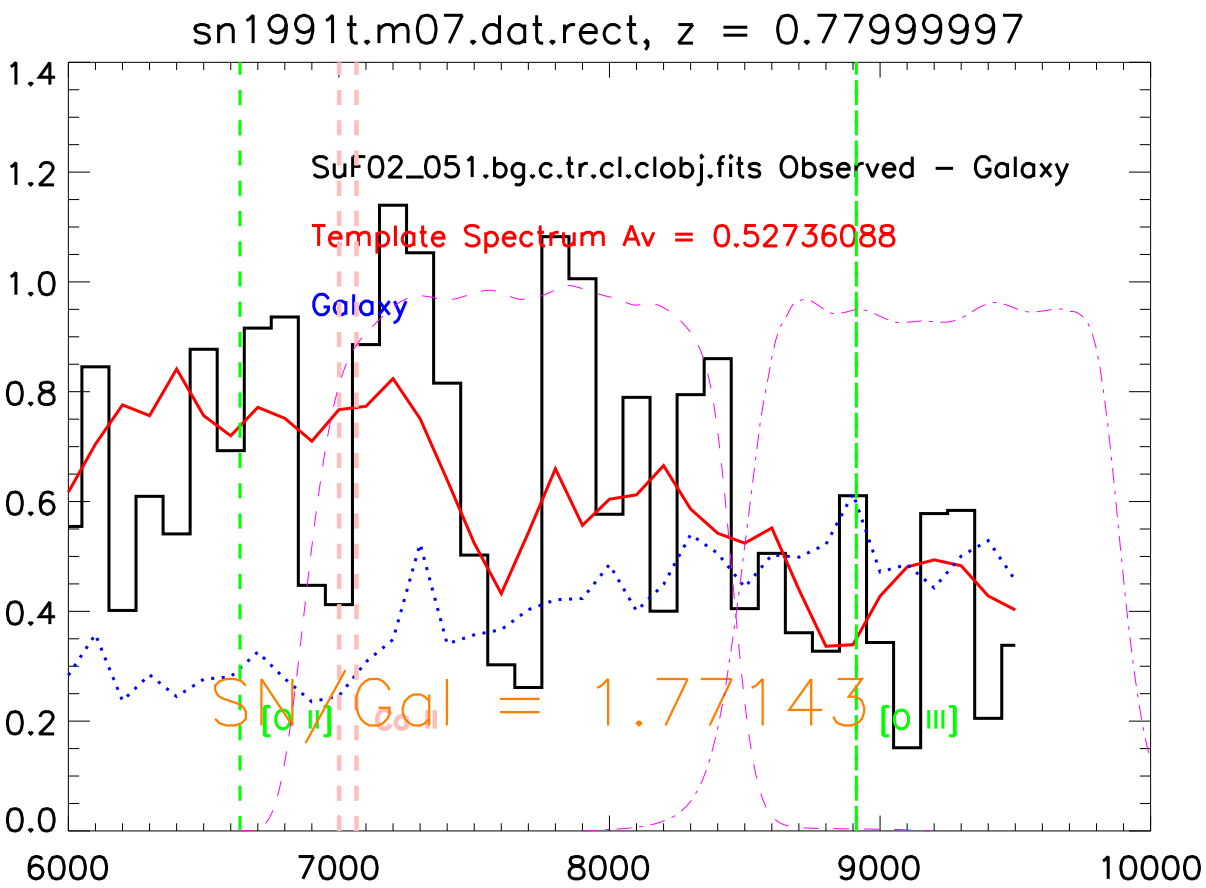
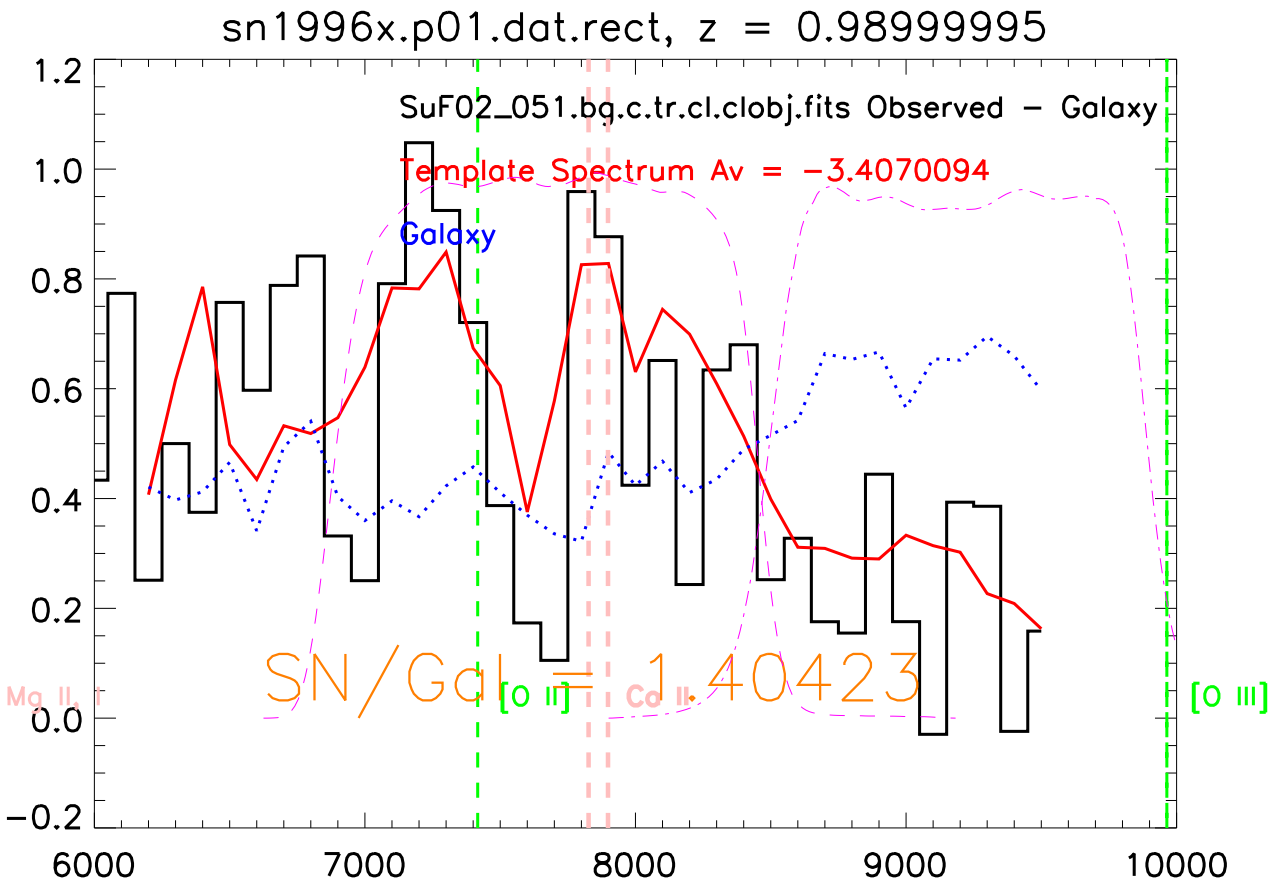
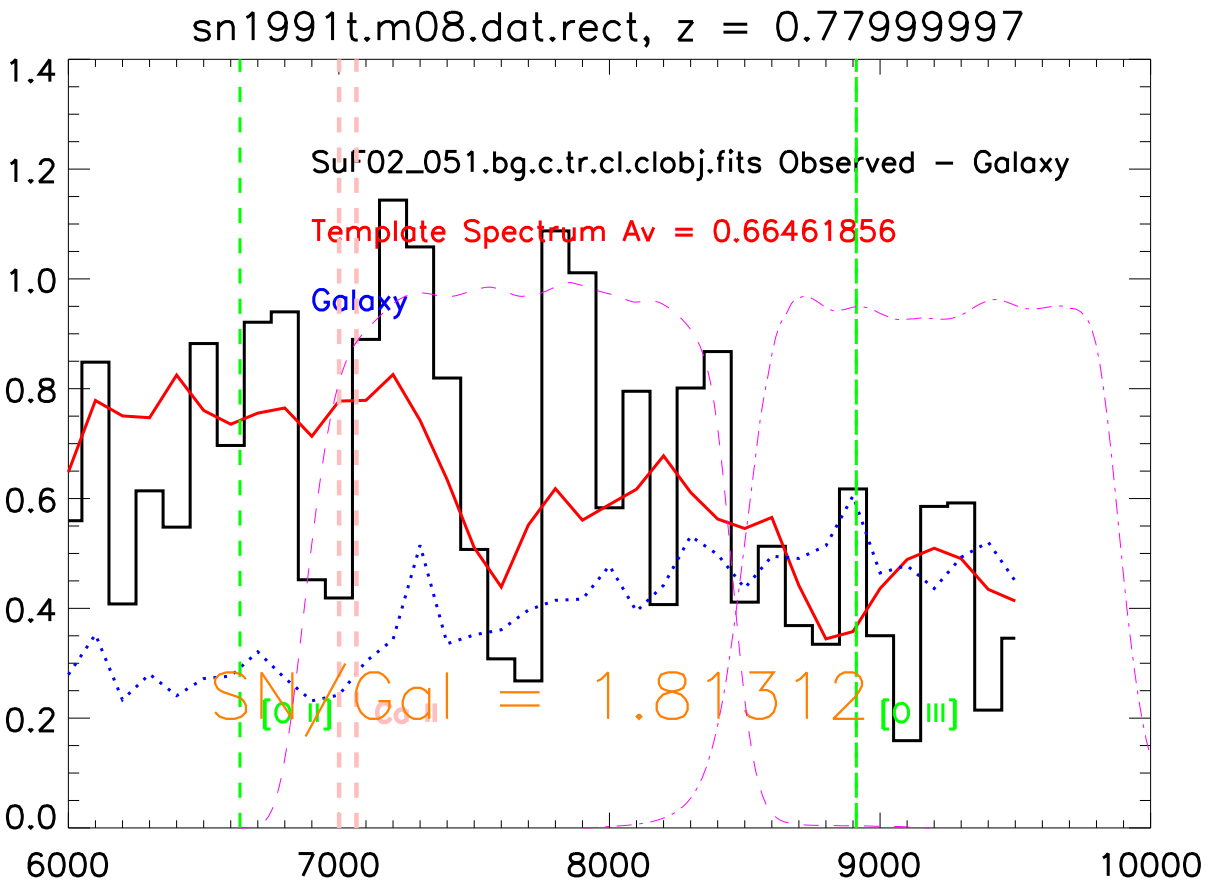
6000
7000
8000
9000
10000

Mg II, I

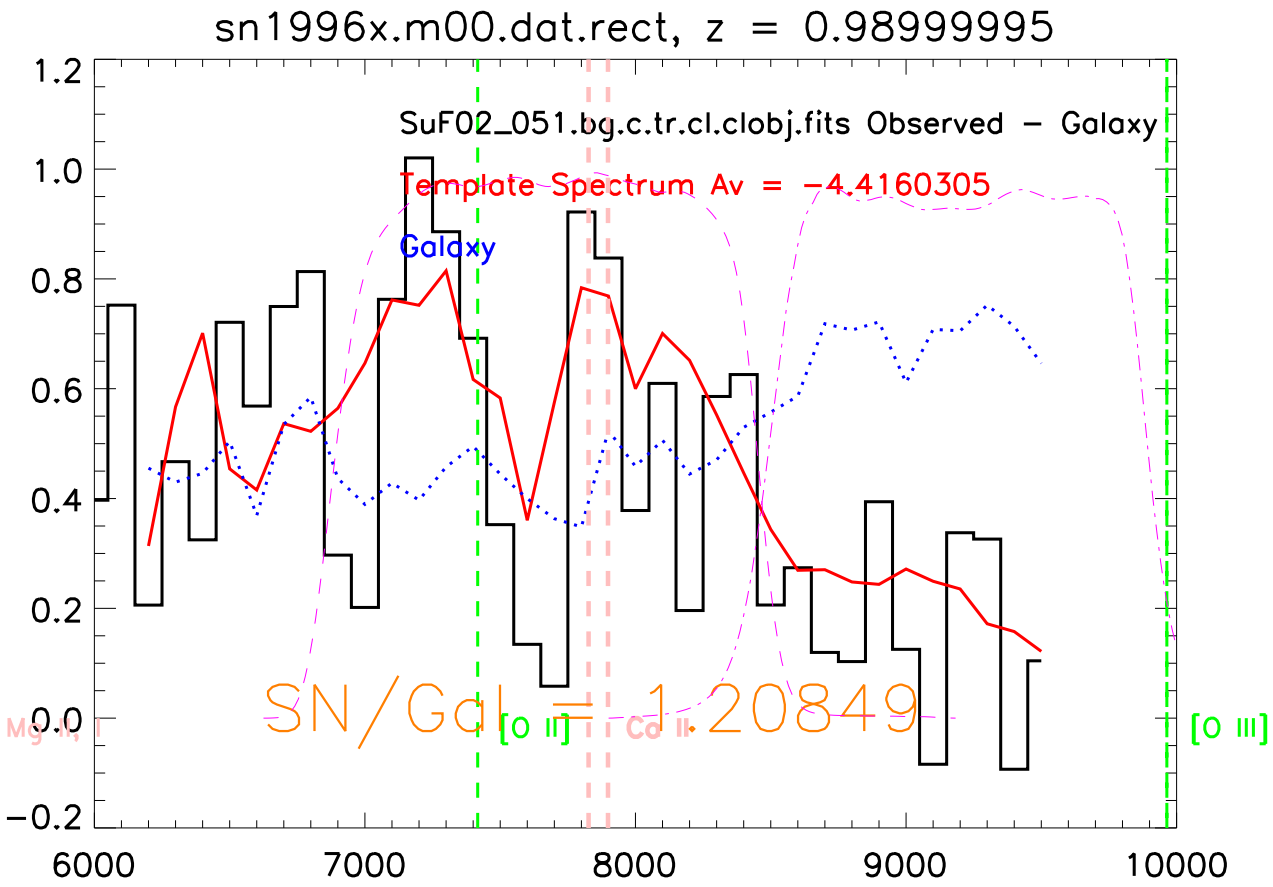

sn1991t.m07.dat.rect, z = 0.77999997
SuF02_051.bg.c.tr.cl.clobj.fits Observed – Galaxy
Template Spectrum Av = 0.52736088
Galaxy
SN/Gal = 1.77143
[O II]
[O III]
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
6000
7000
8000
9000
10000

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
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8000
9000
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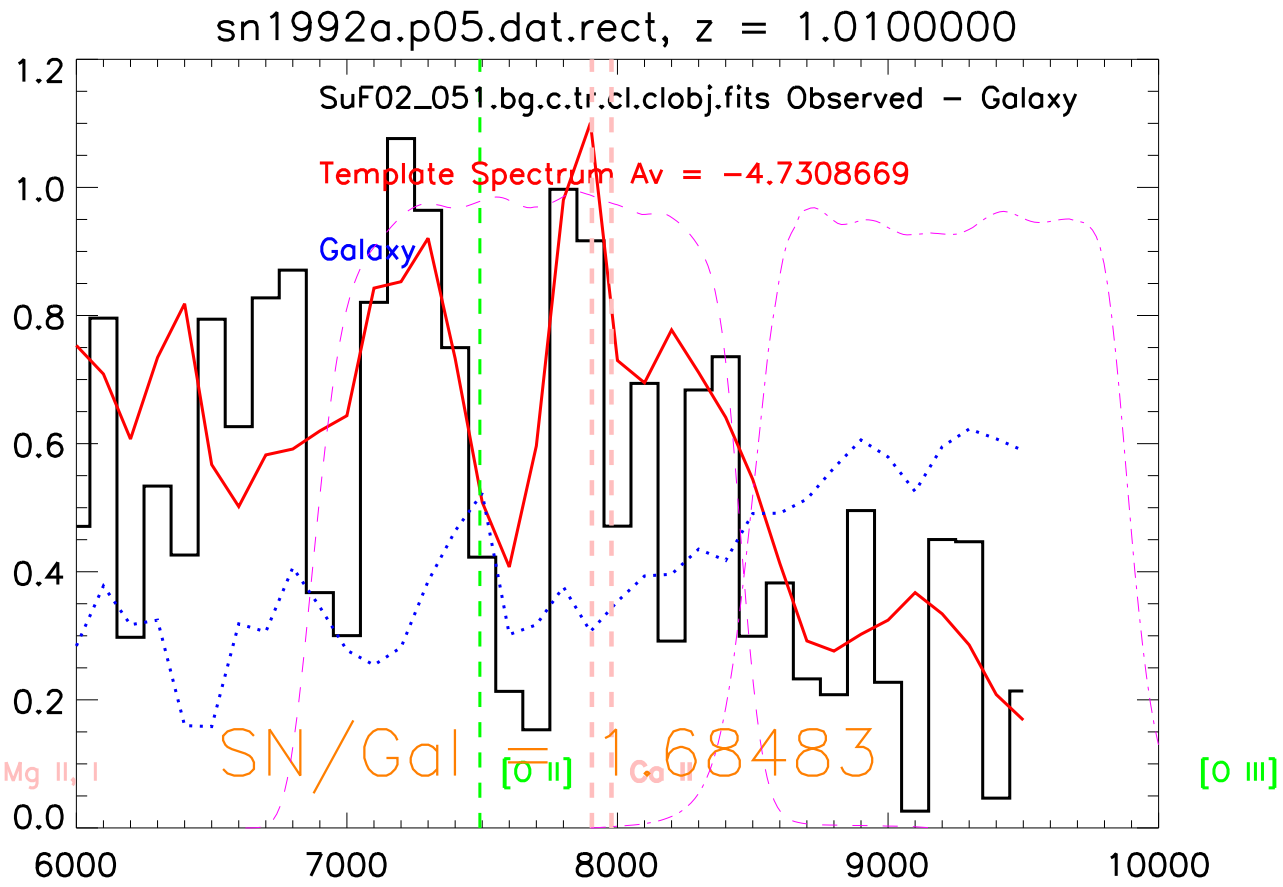
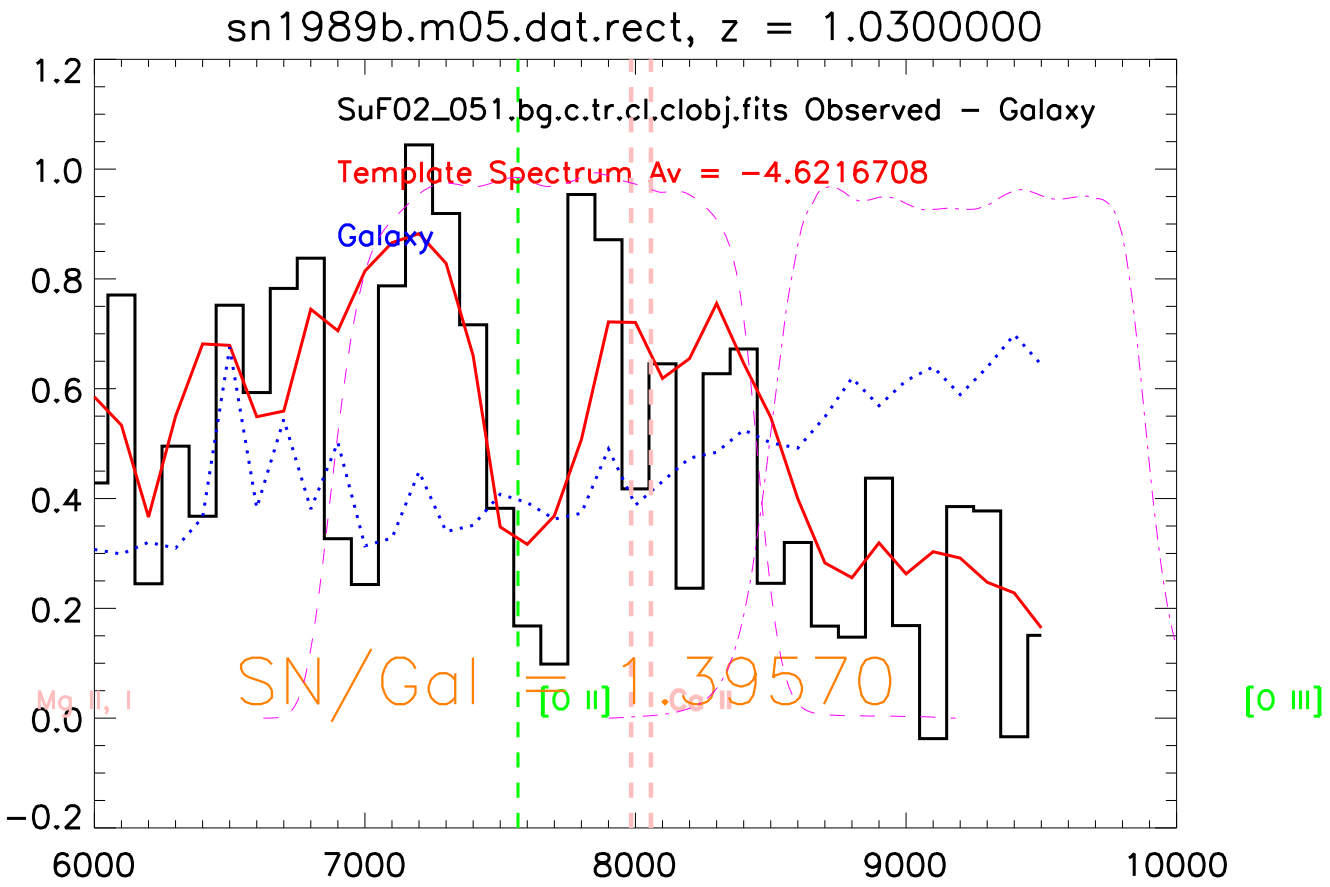
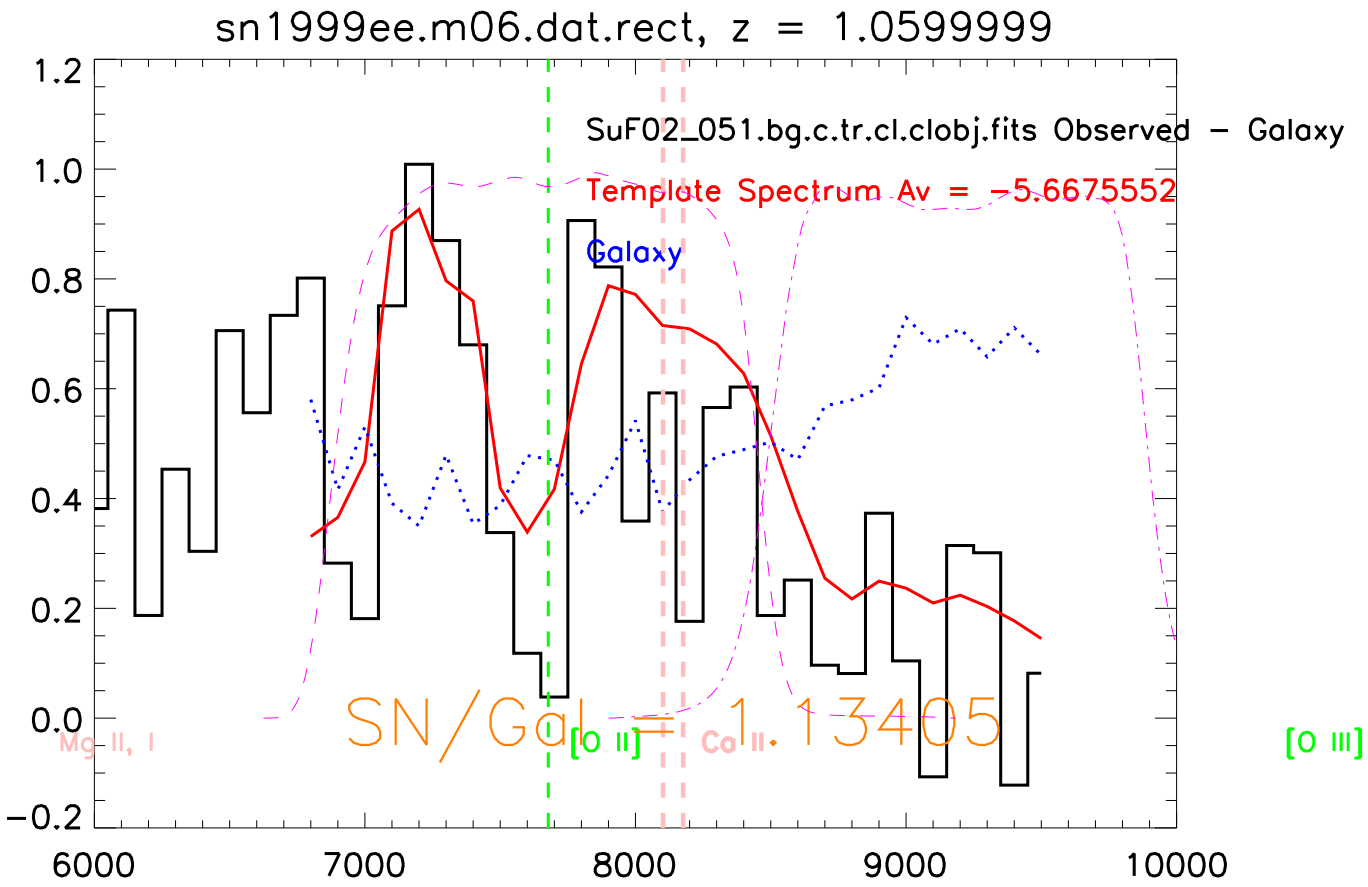
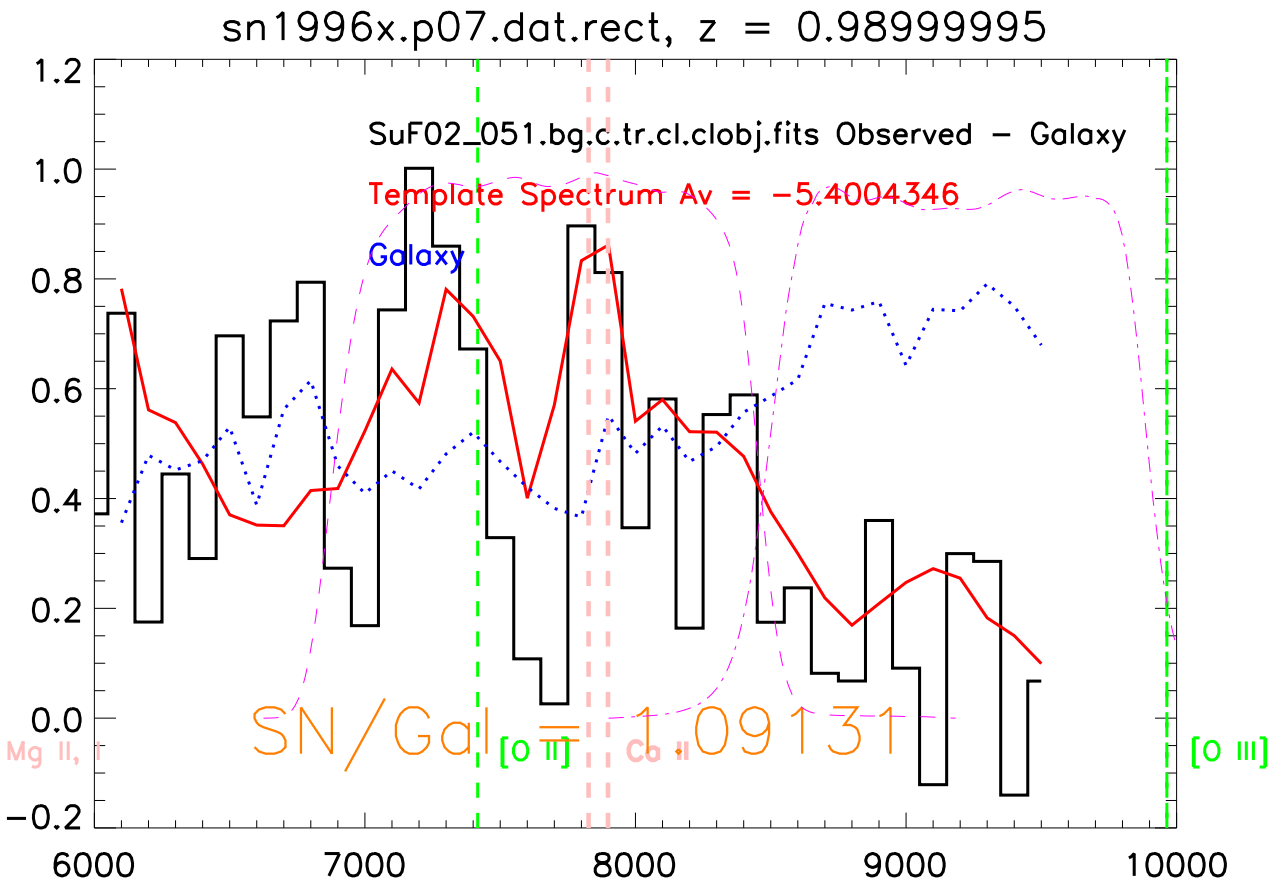
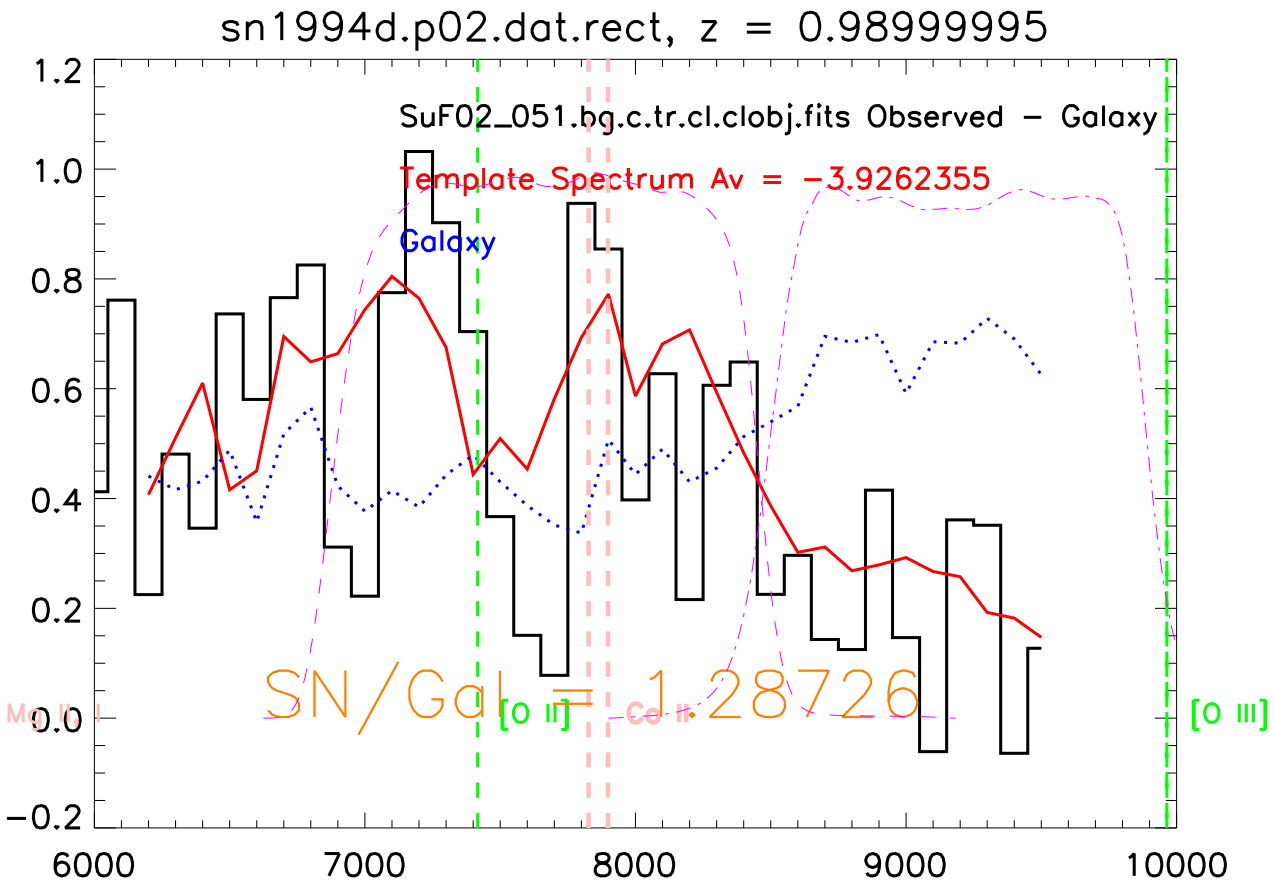

sn1992a.p05.dat.rect, z = 1.0100000
SuF02_051.bg.c.tr.cl.clobj.fits Observed − Galaxy
Template Spectrum Av = −4.7308669
Galaxy
SN/Gal = 1.68483
Mg II, I
[O II]
Ca II
[O III]
1.2
1.0
0.8
0.6
0.4
0.2
0.0
6000
7000
8000
9000
10000


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
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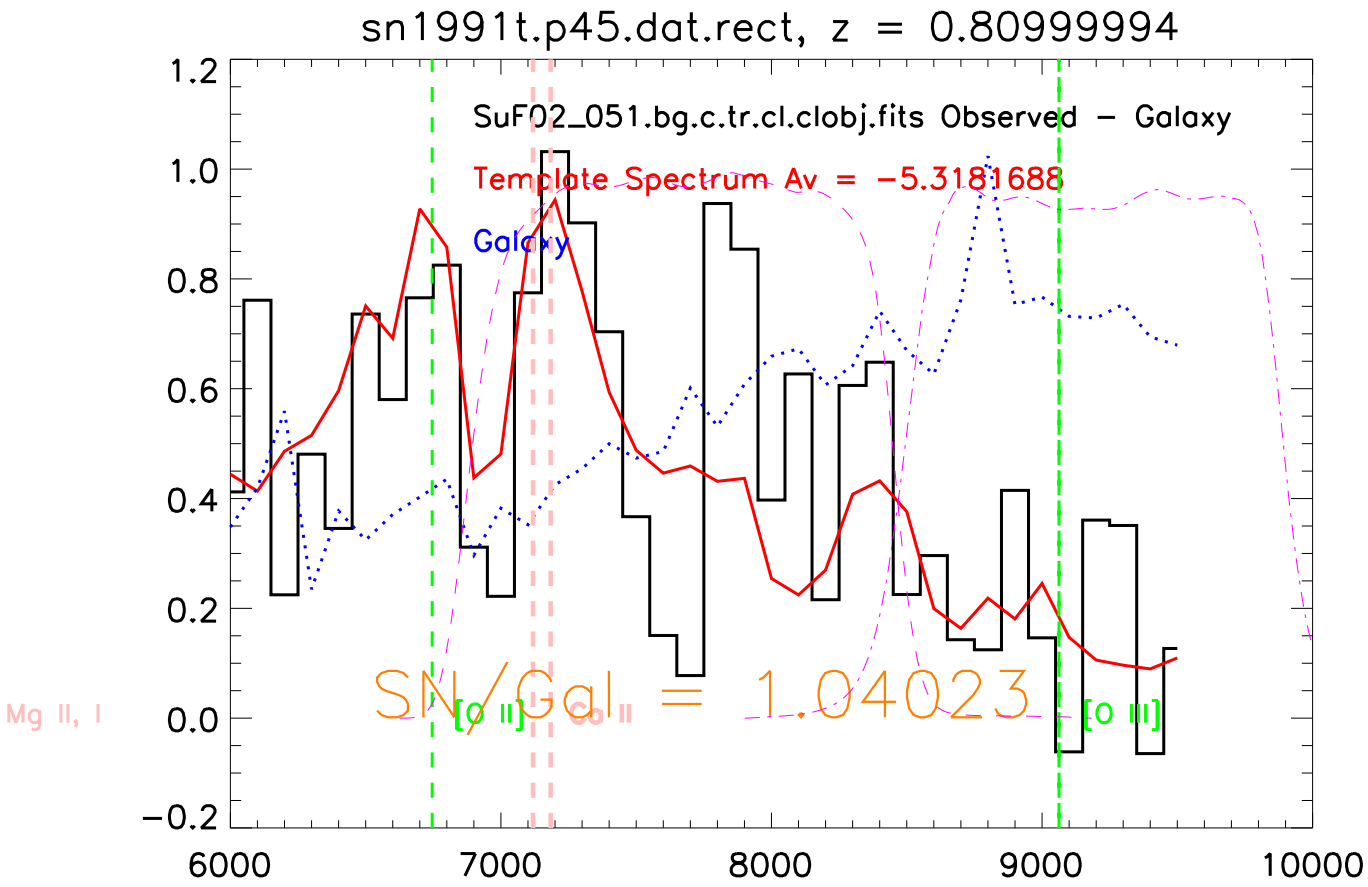
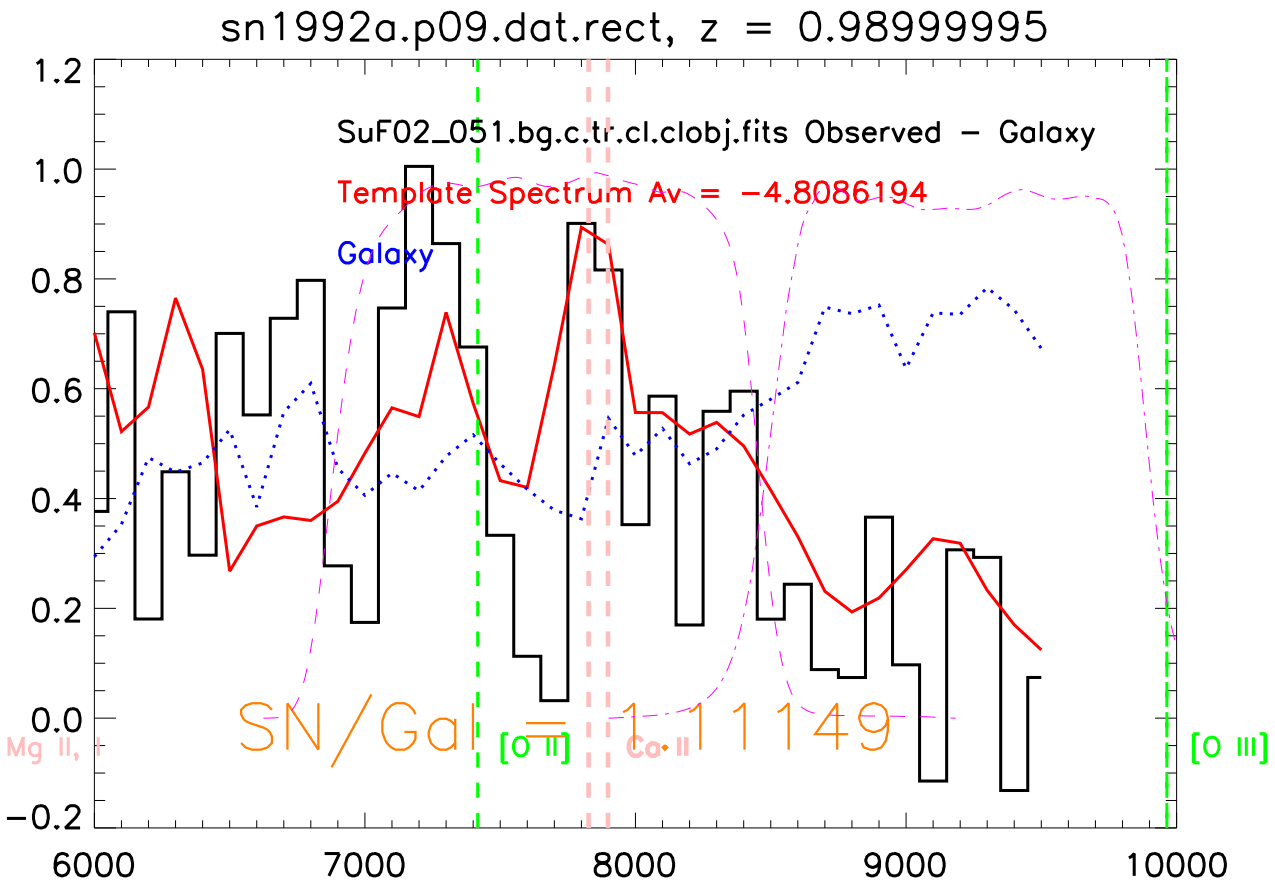
0.8
0.6
0.4
0.2
0.0
−0.2
6000
7000
8000
9000
10000


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
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0.8
0.6
0.4
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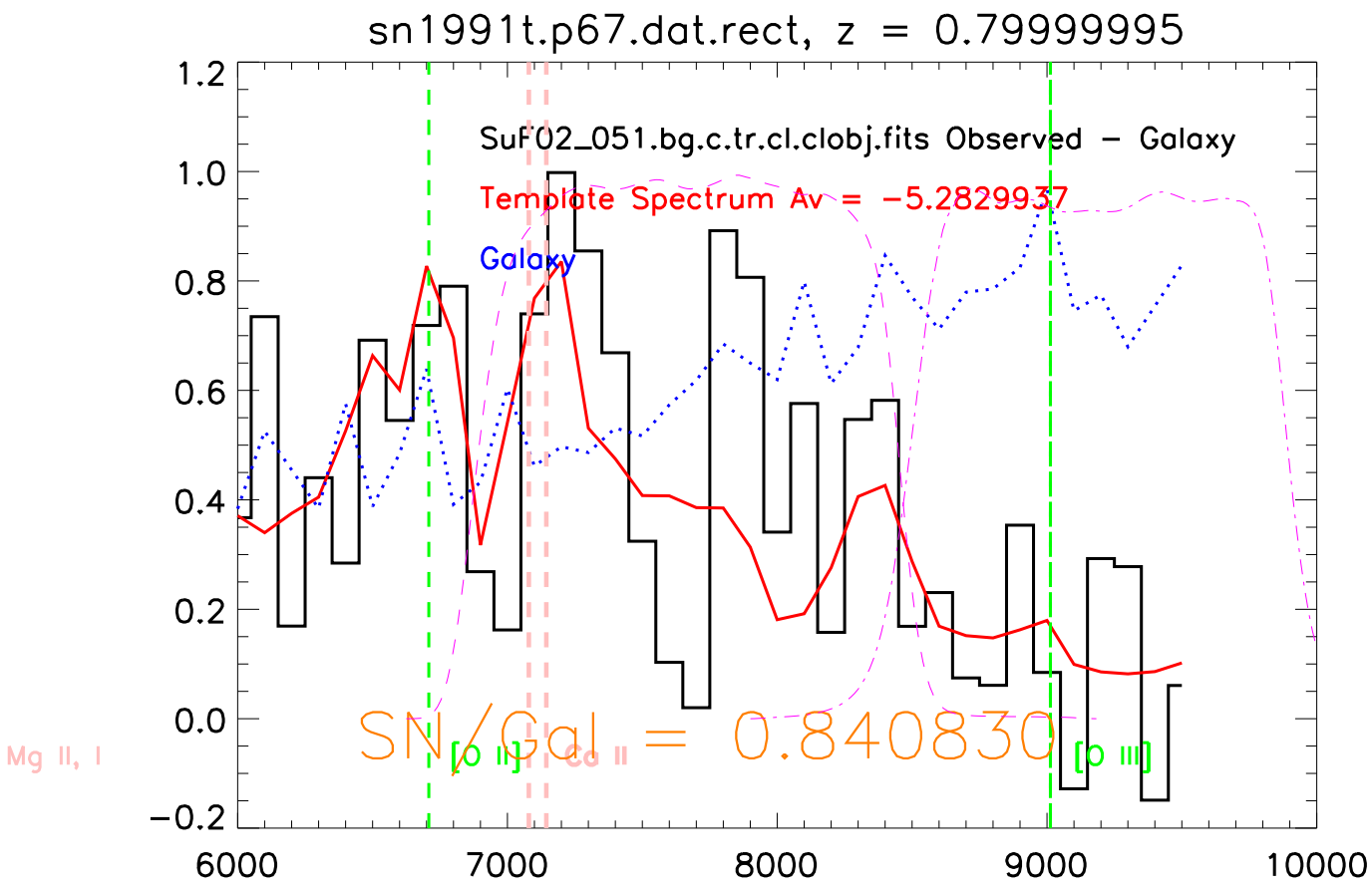
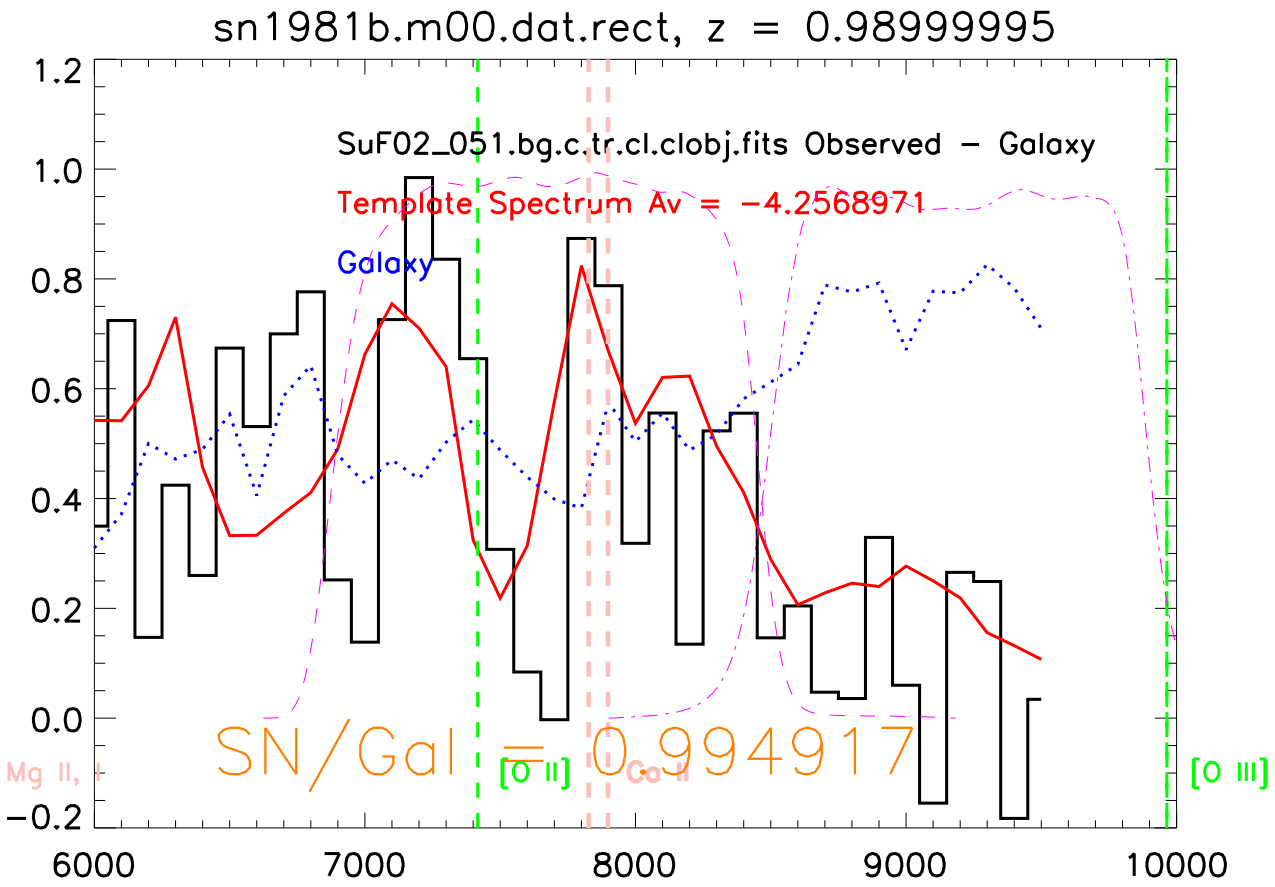
0.0
−0.2
6000
7000
8000
9000
10000


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
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0.8
0.6
0.4
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0.0
−0.2
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8000
9000
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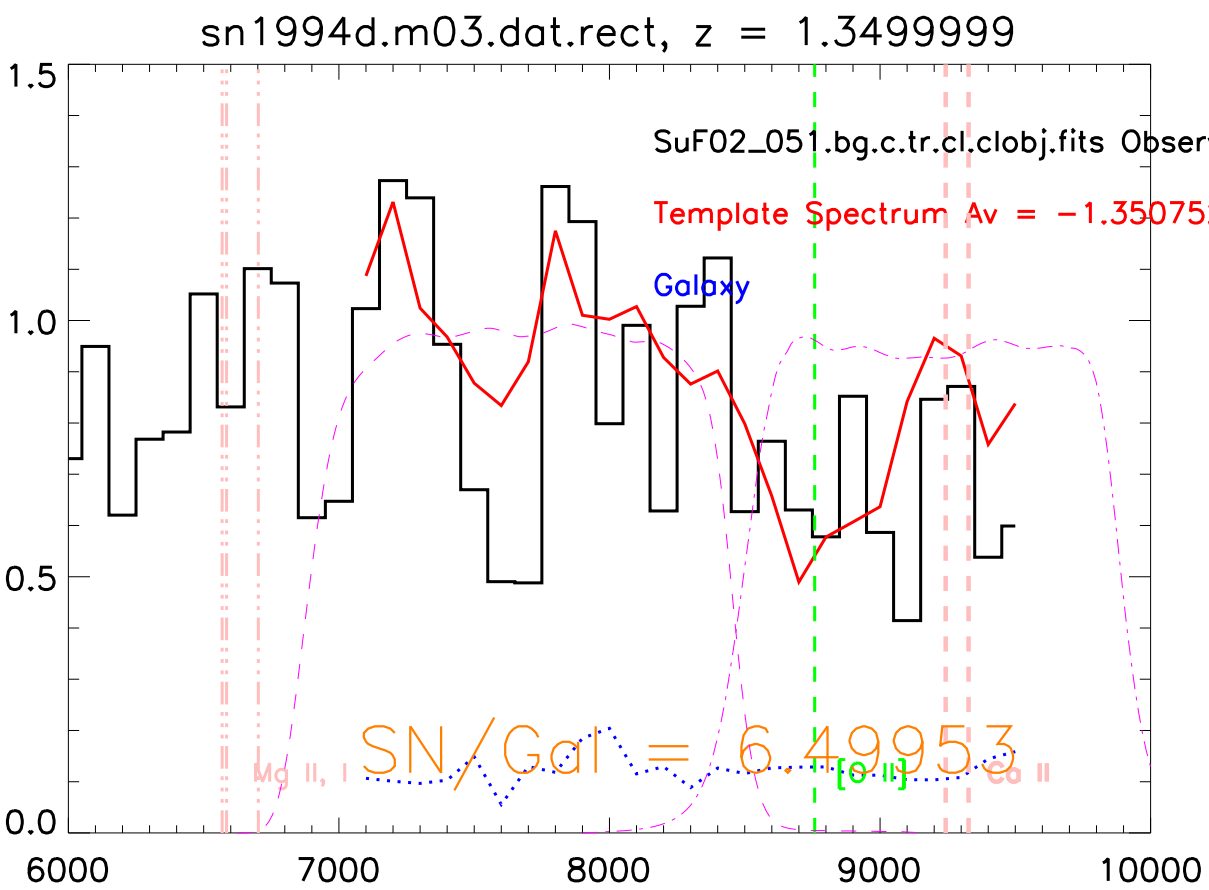
sn1994d.m03.dat.rect, z = 1.3499999
SuF02_051.bg.c.tr.cl.clobj.fits Observed – Ga
Template Spectrum Av = −1.3507523
Galaxy
SN/Gal = 6.49953
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9000
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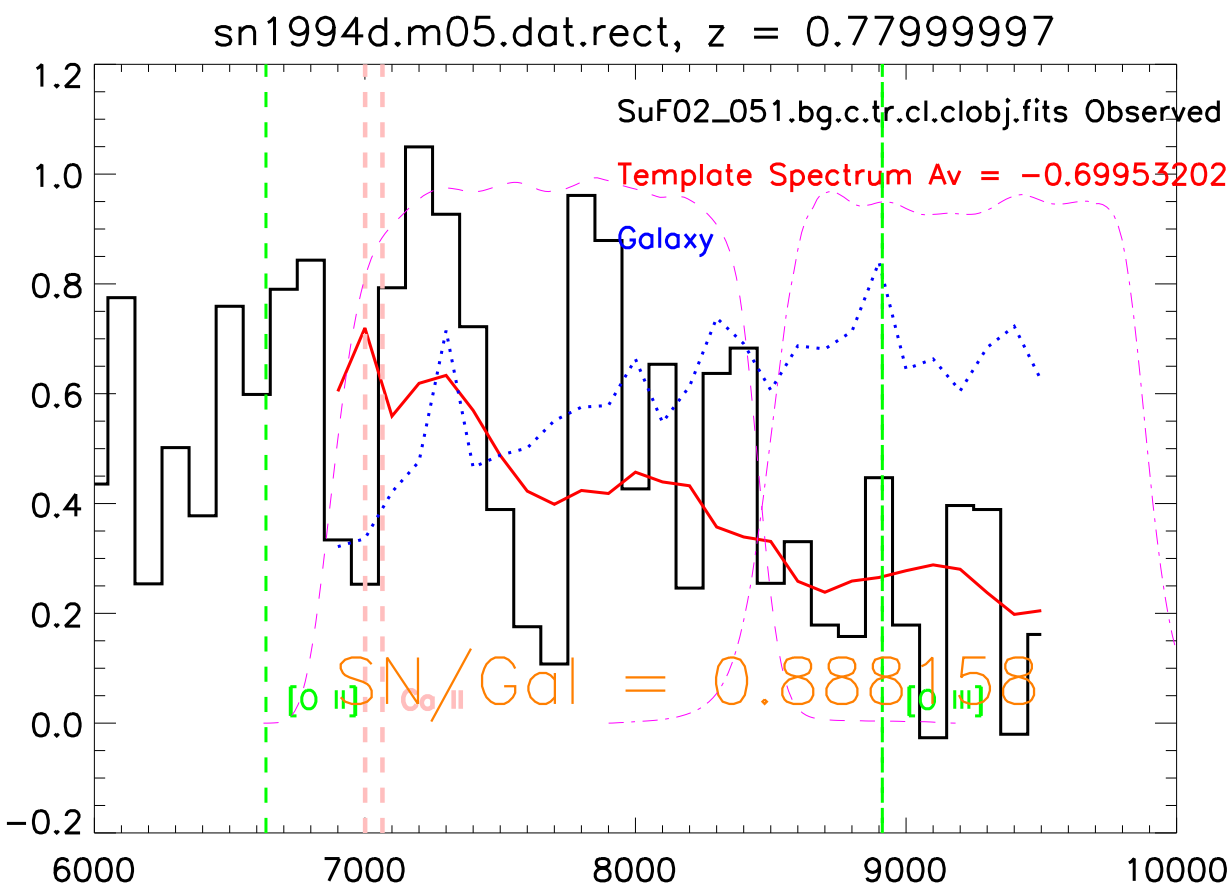
sn1994d.m05.dat.rect, z = 0.77999997
SuF02_051.bg.c.tr.cl.clobj.fits Observed − Galaxy
Template Spectrum Av = −0.69953202
Galaxy
SN/Gal = 0.888158
[O II]
Ca II
[O III]
Mg II, I
1.2
1.0
0.8
0.6
0.4
0.2
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9000
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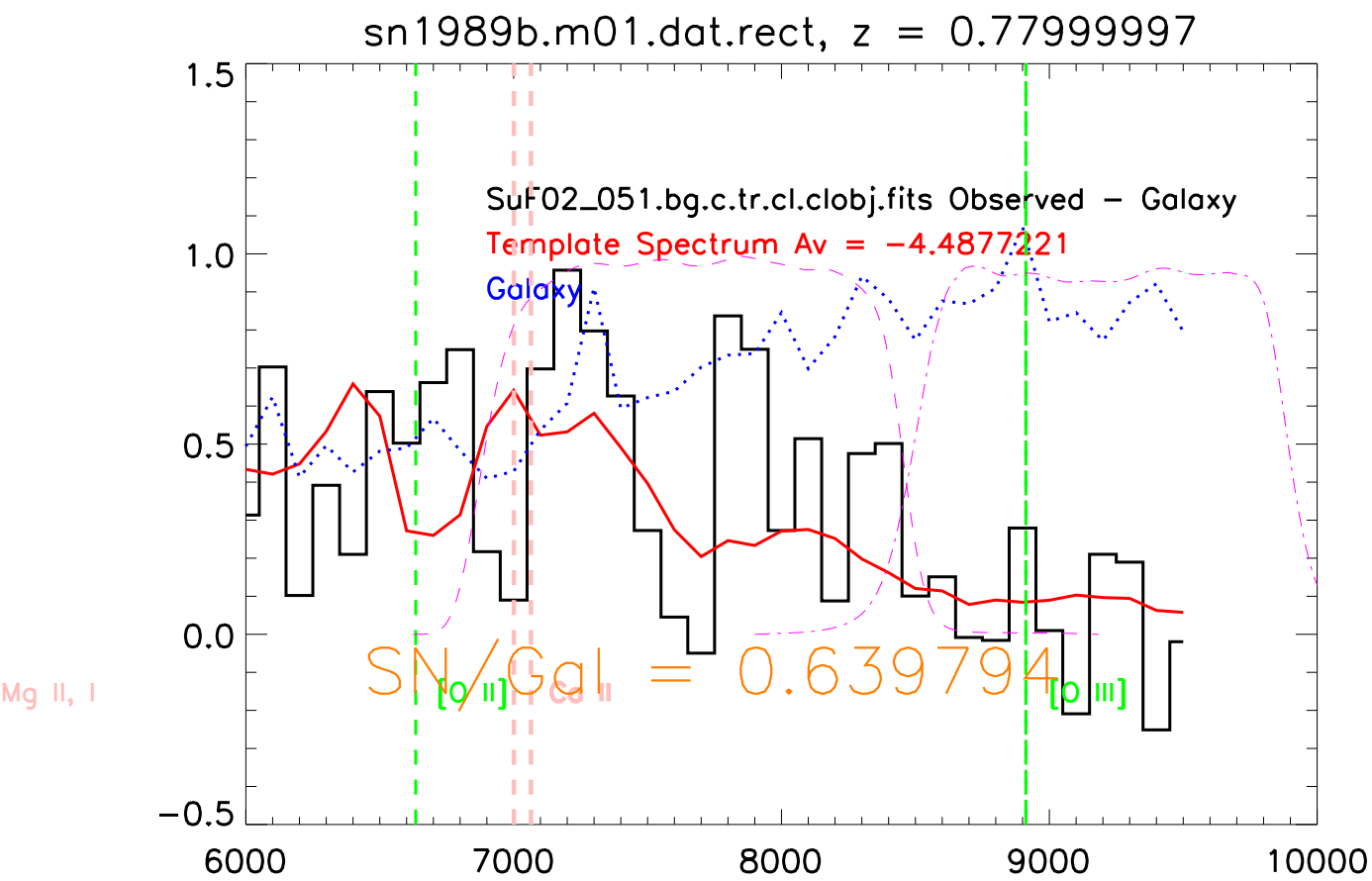
sn1989b.m01.dat.rect, z = 0.77999997
SuF02_051.bg.c.tr.cl.clobj.fits Observed – Galaxy
Template Spectrum Av = −4.4877221
Galaxy
SN/Gal = 0.639794
[O II]
Ca II
[O III]
Mg II, I
1.5
1.0
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8000
9000
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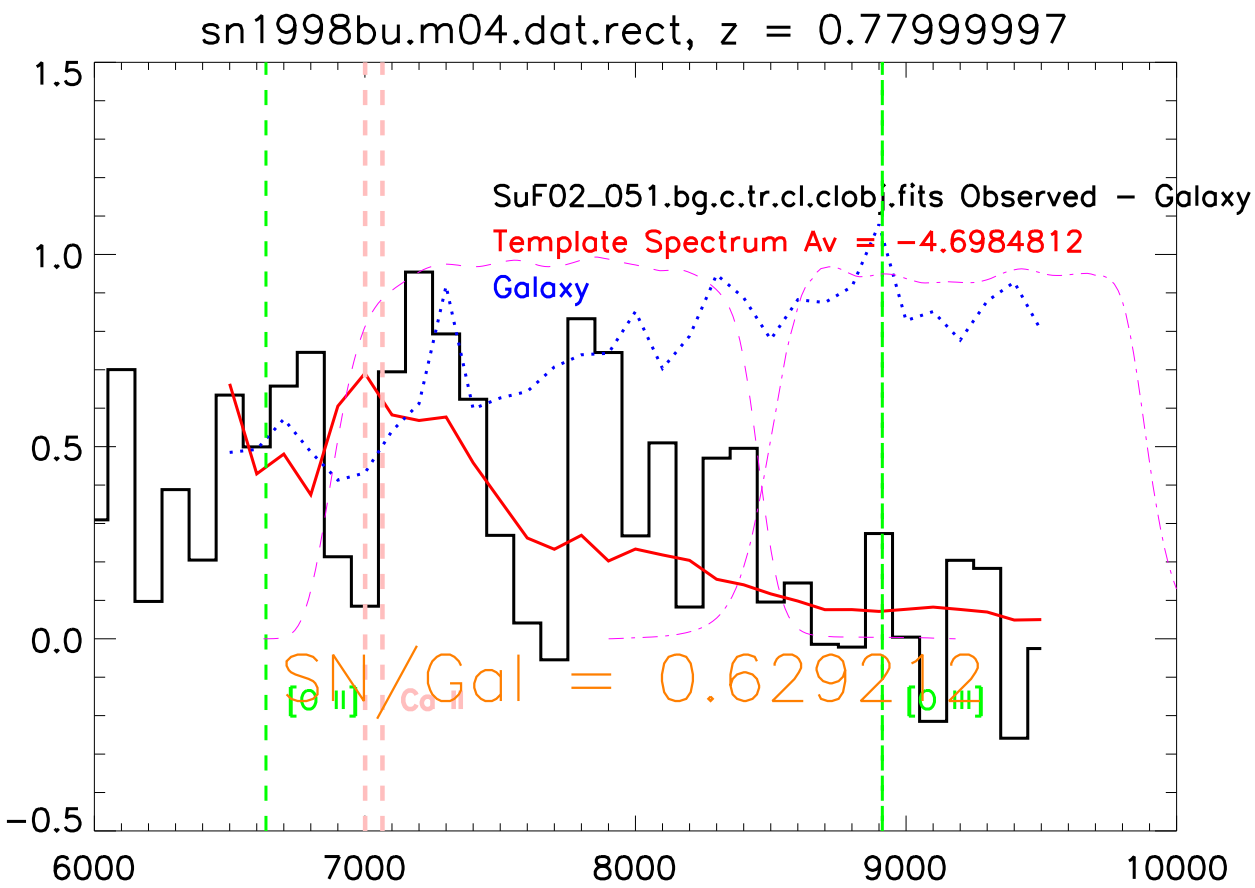
sn1998bu.m04.dat.rect, z = 0.77999997
SuF02_051.bg.c.tr.cl.clob.fits Observed – Galaxy
Template Spectrum Av = −4.6984812
Galaxy
SN/Gal = 0.629212
[O II]
Ca II
[O III]
Mg II, I
1.5
1.0
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−0.5
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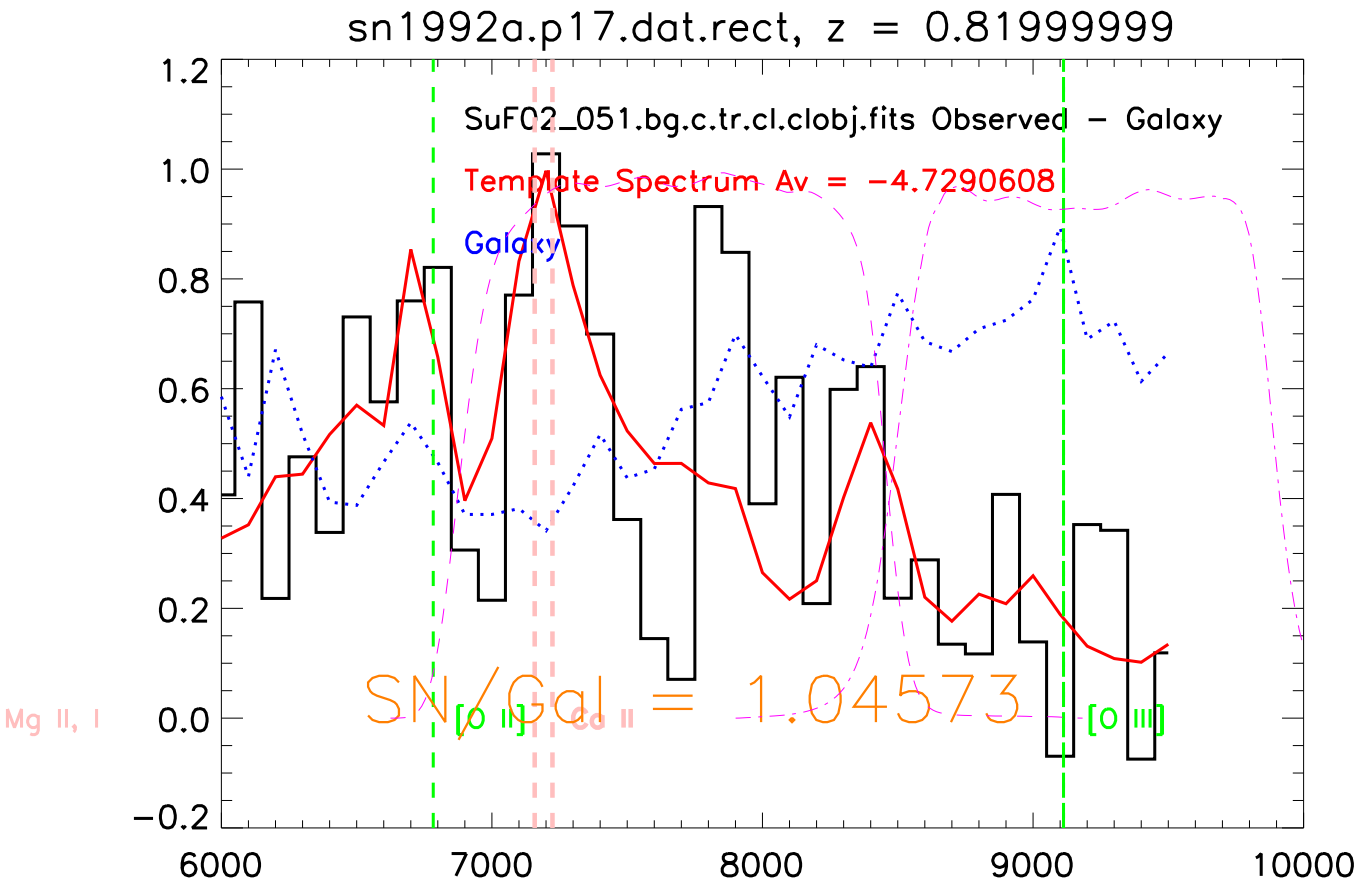
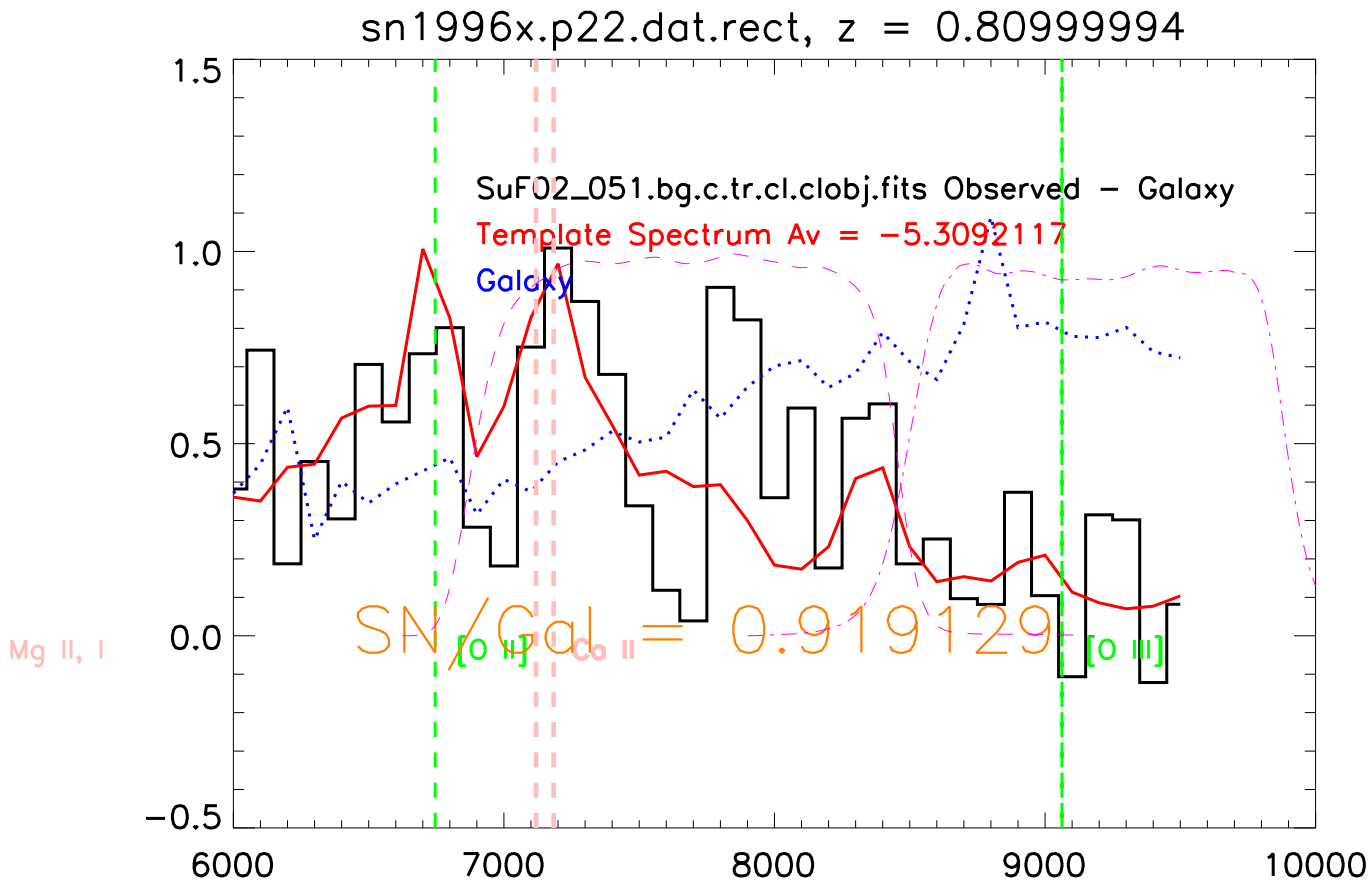
7000
8000
9000
10000


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
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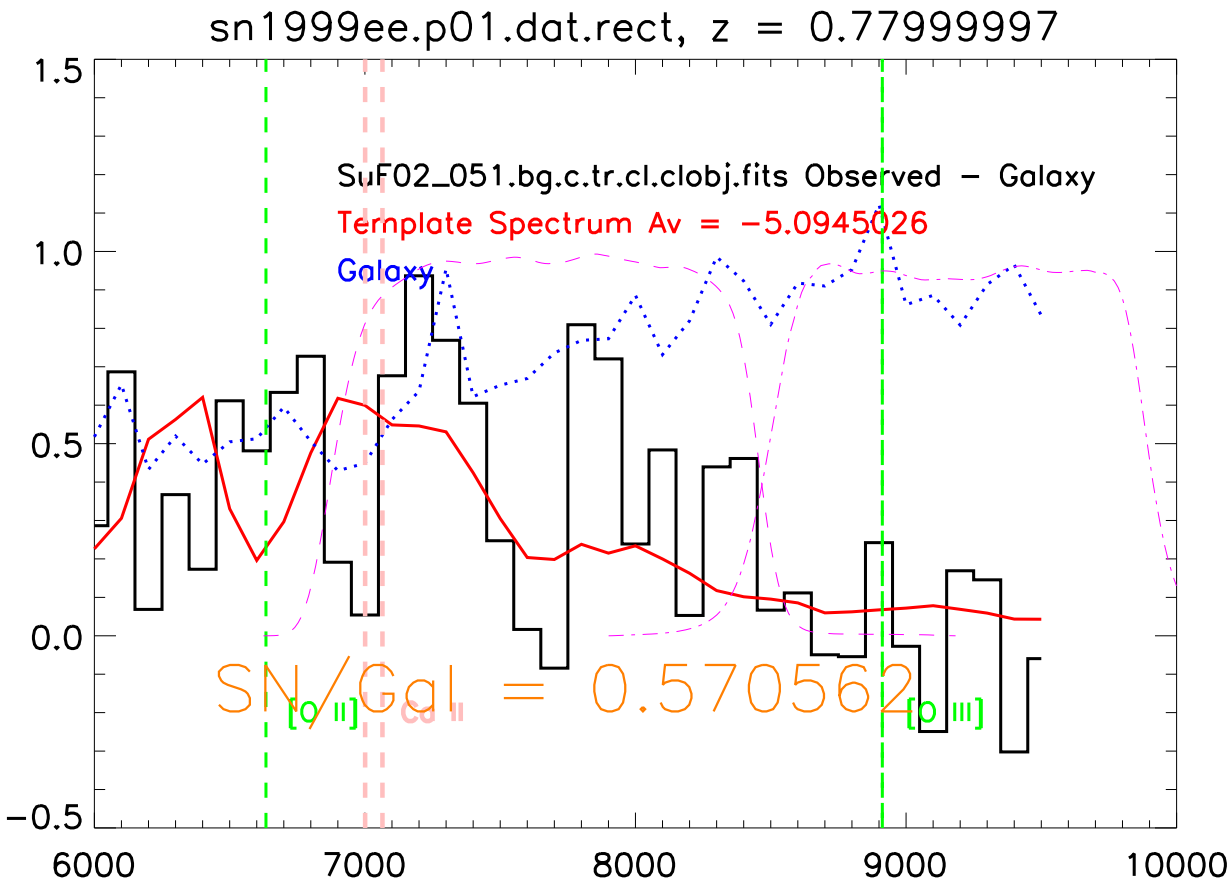
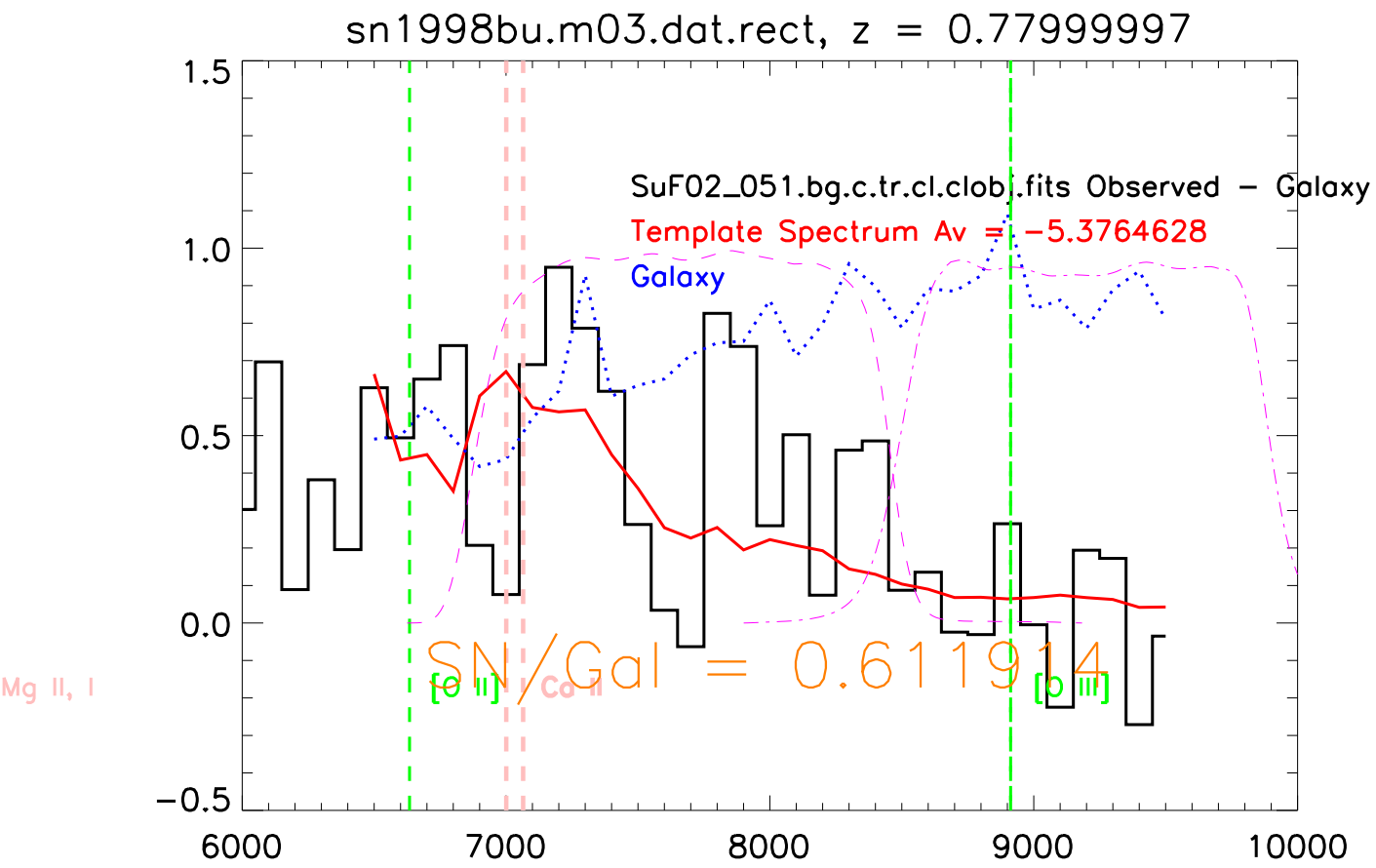
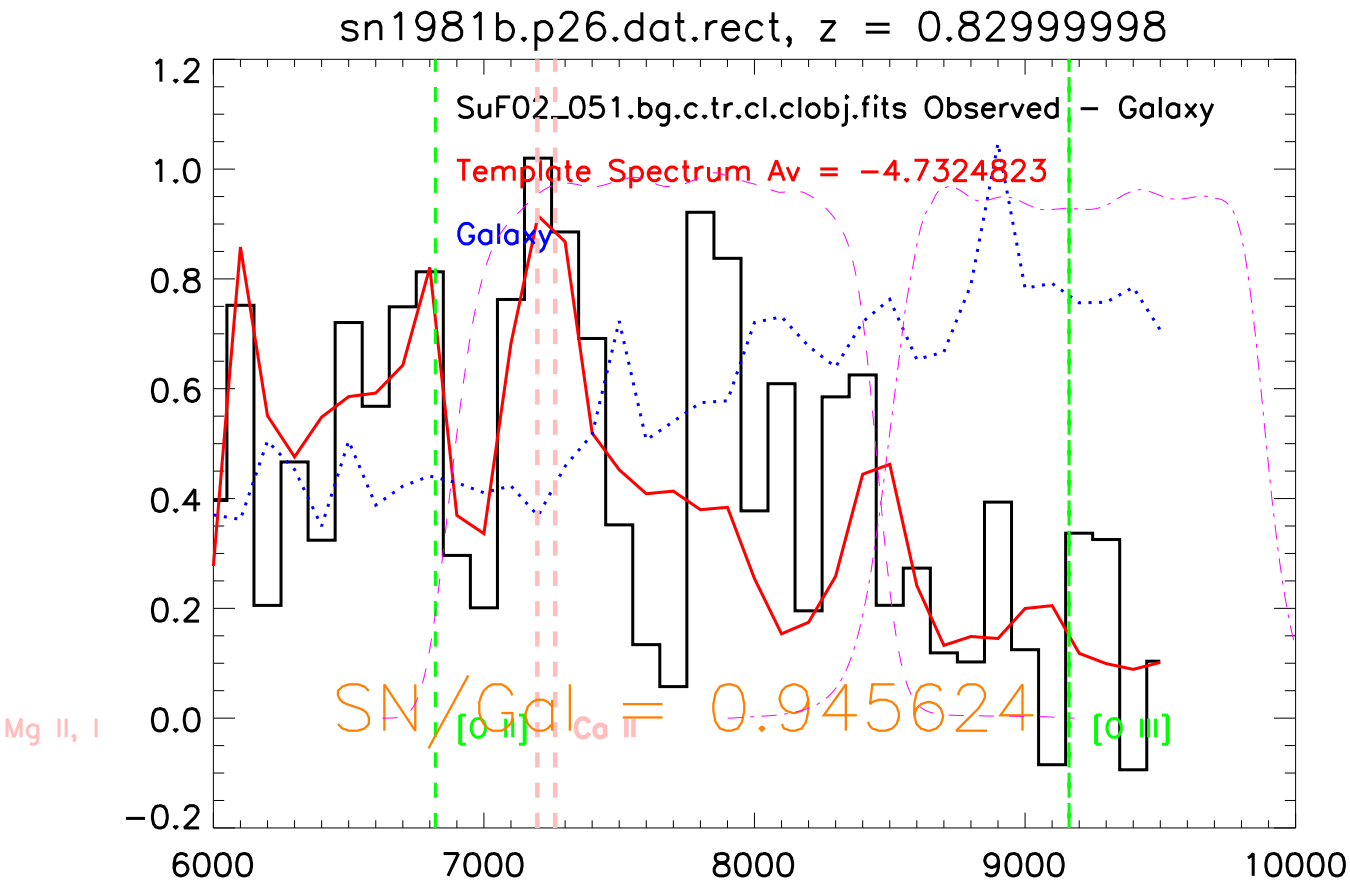
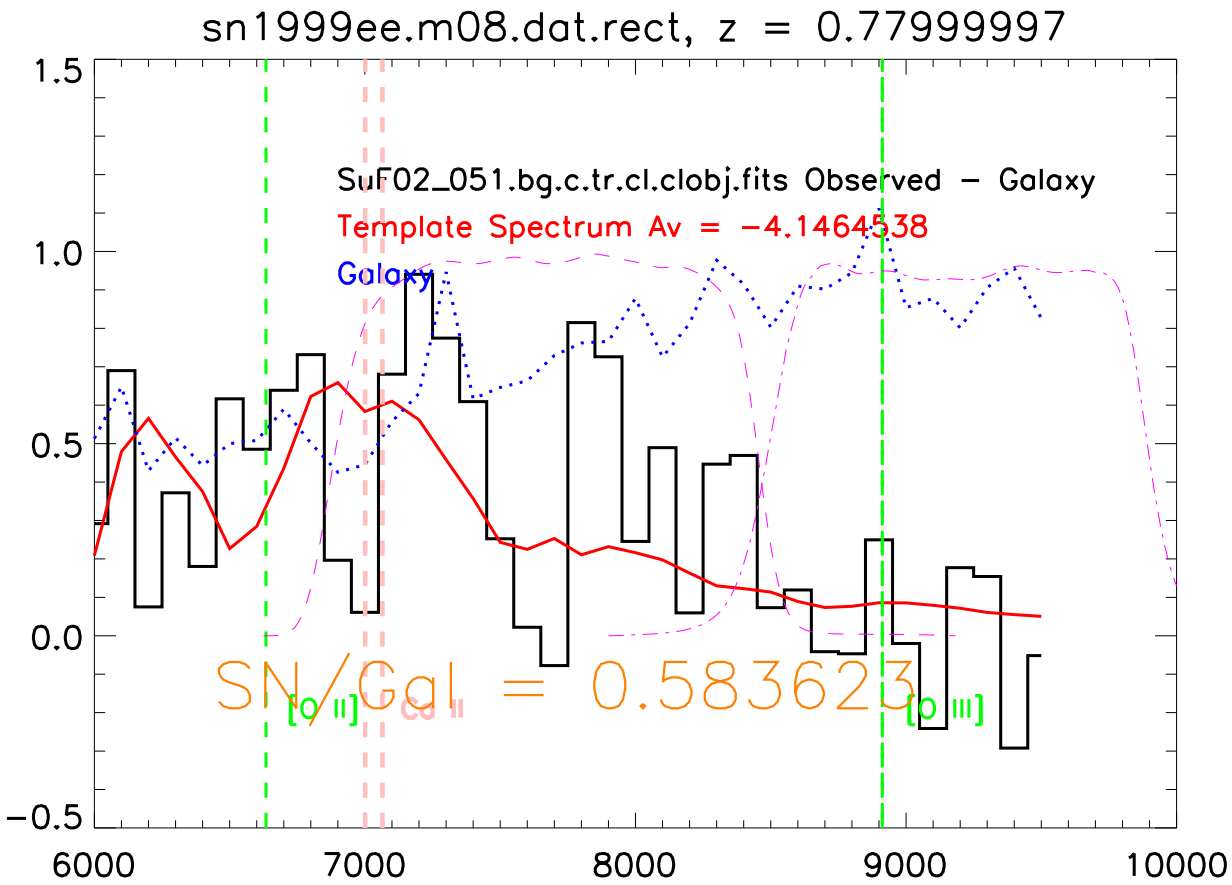
7000
8000
9000
10000


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
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−0.5
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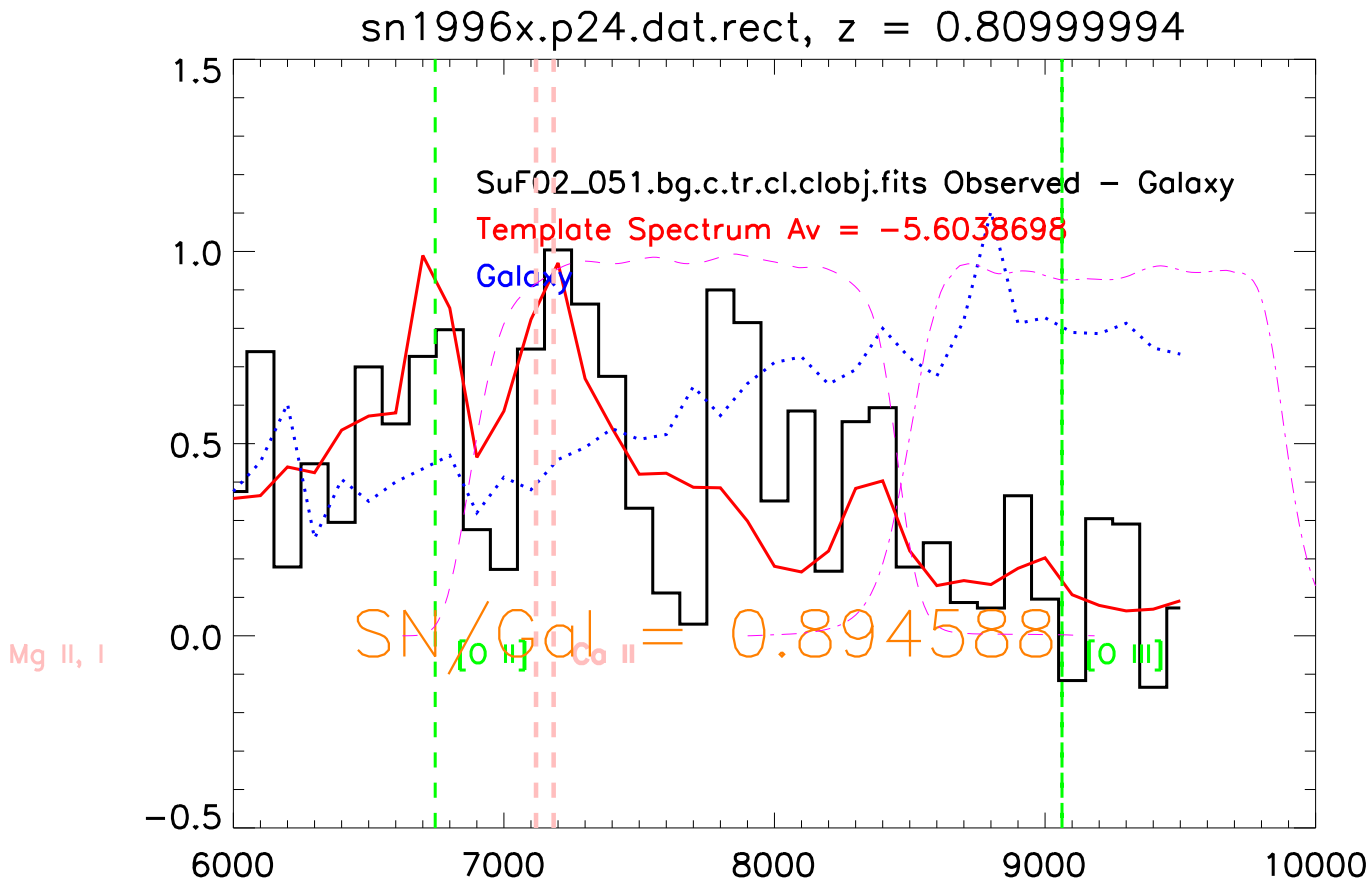
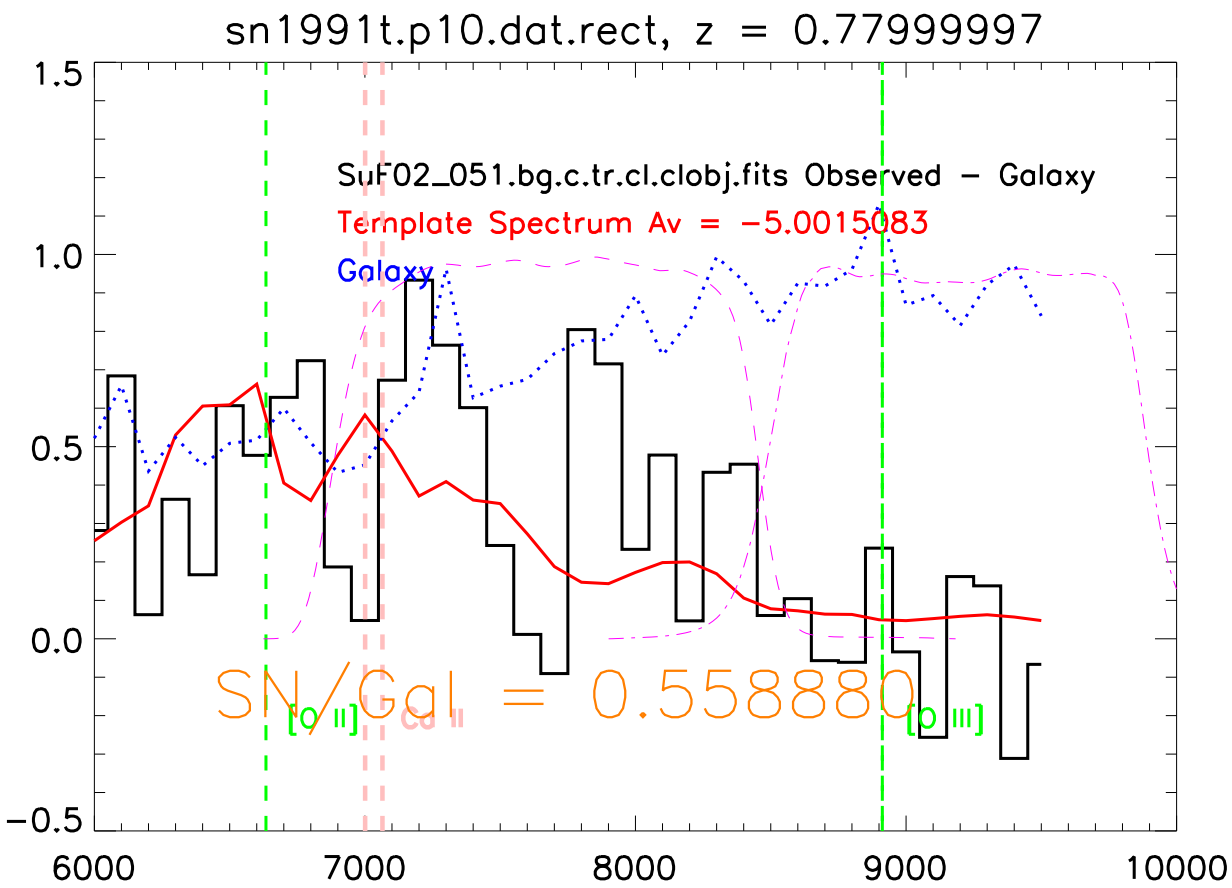
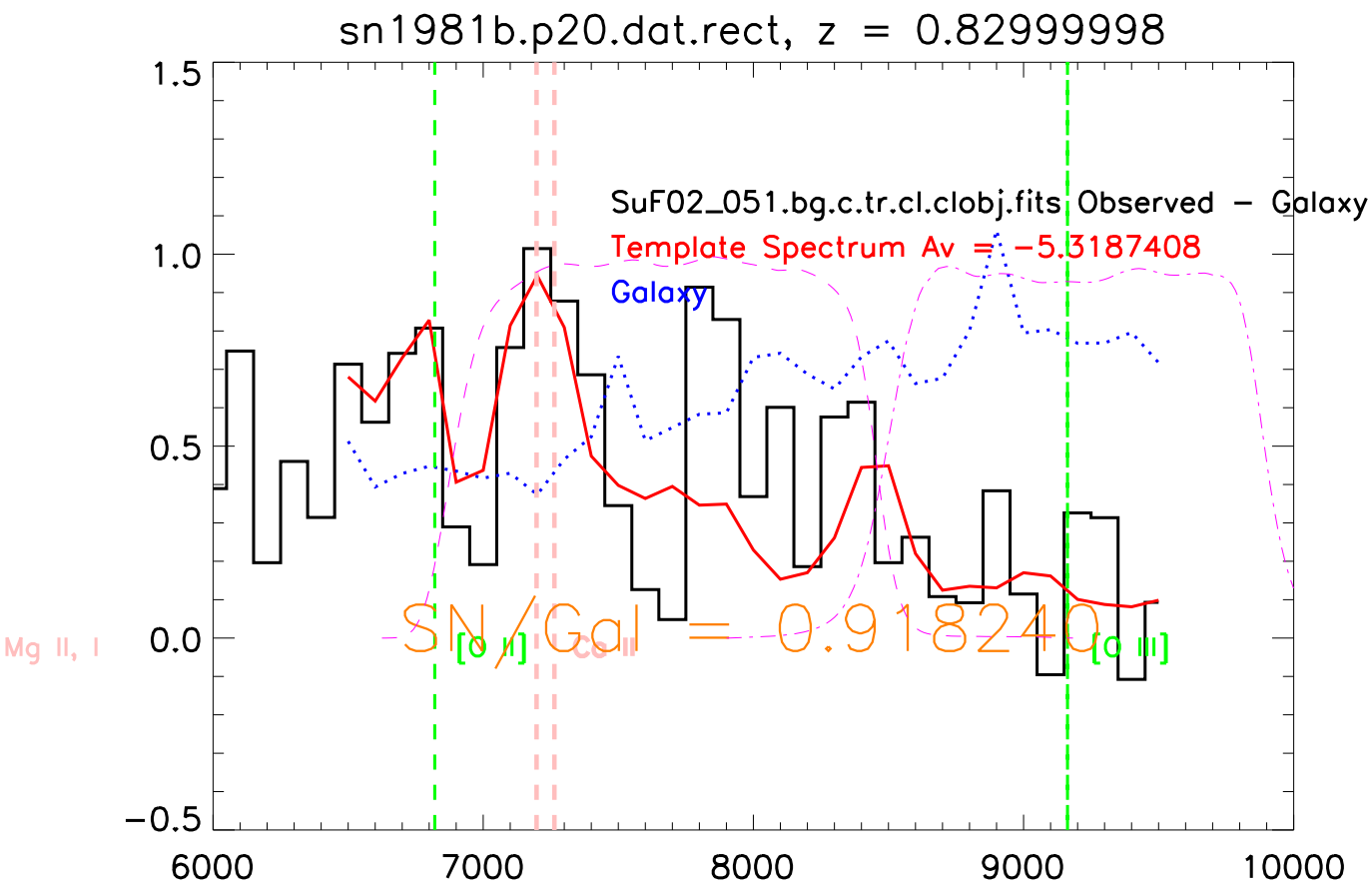
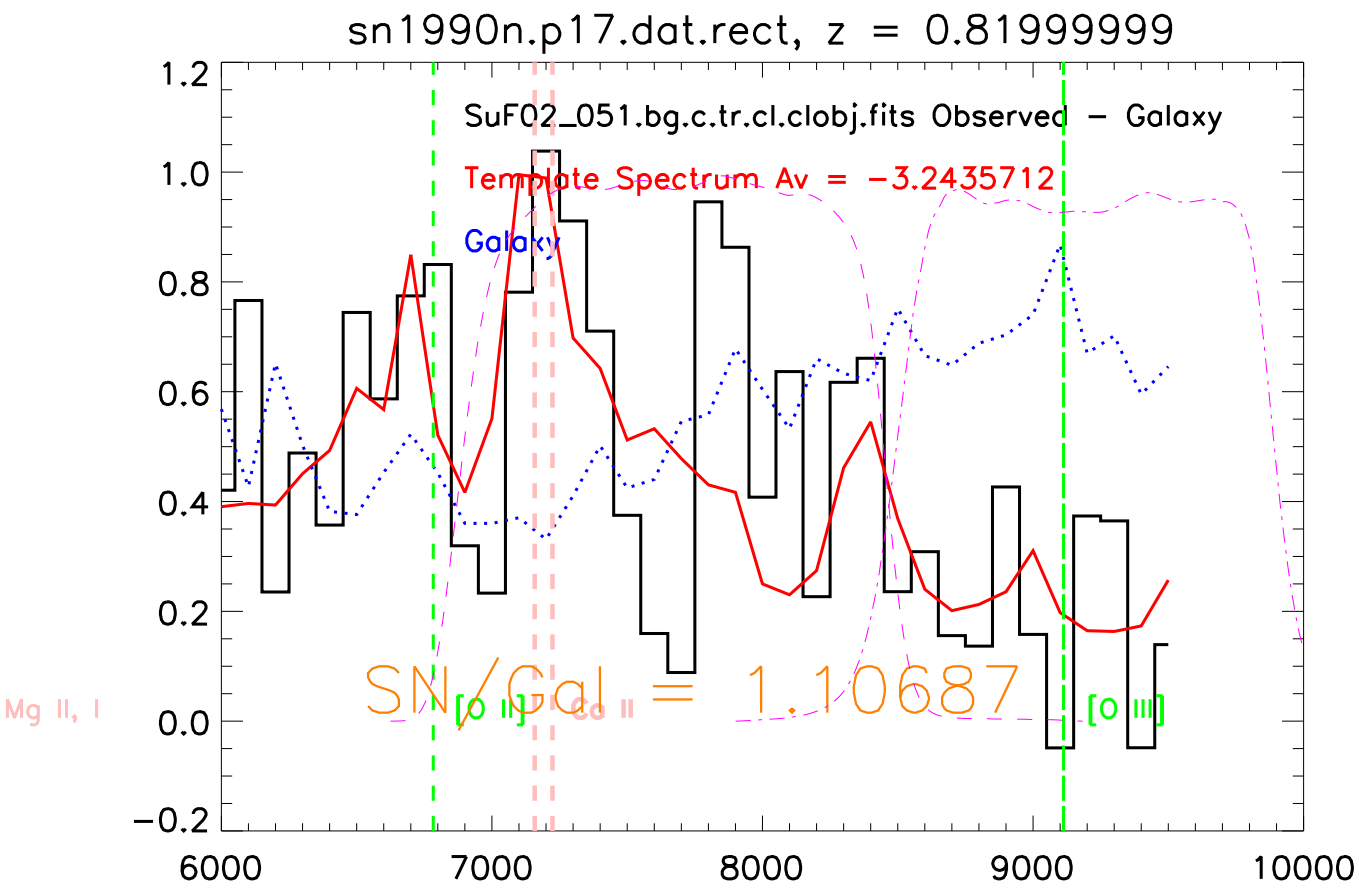
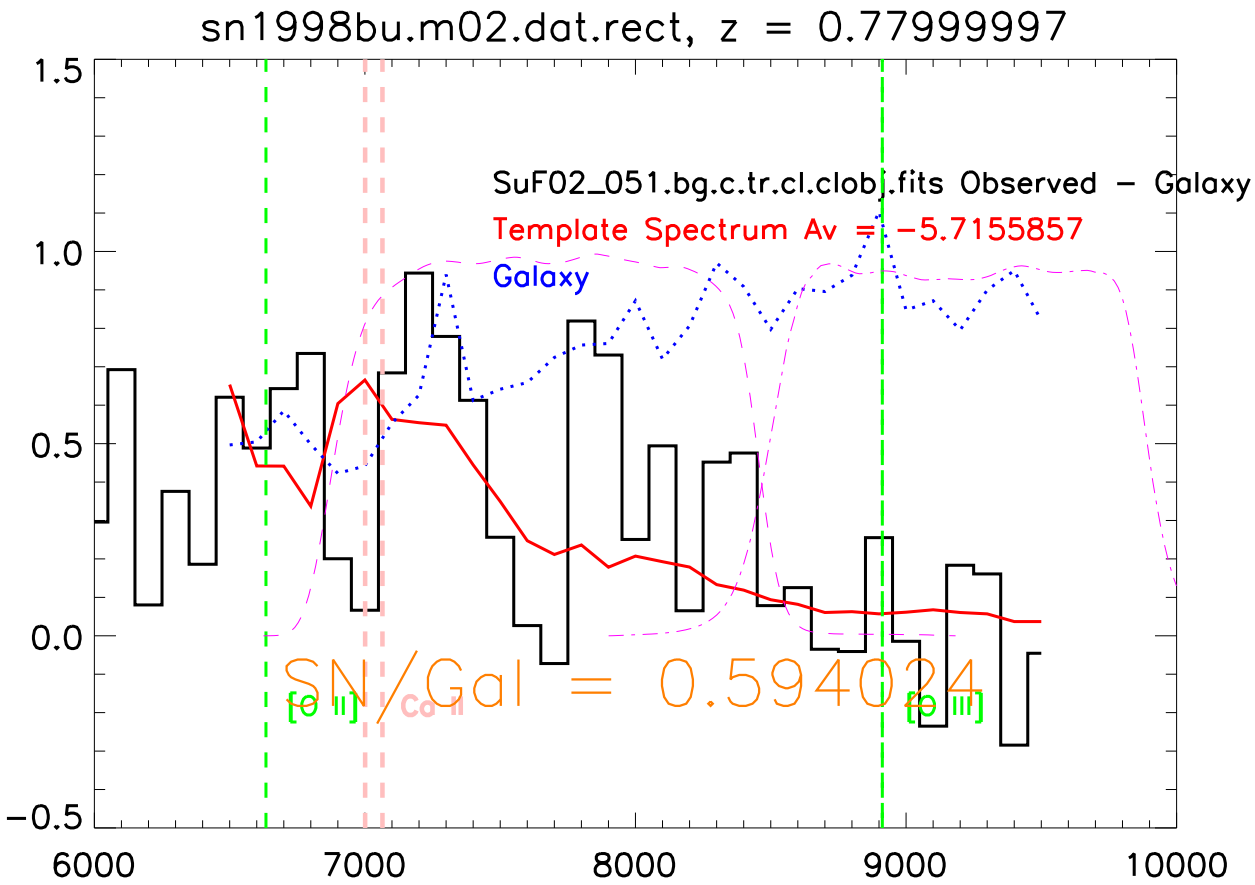
7000
8000
9000
10000

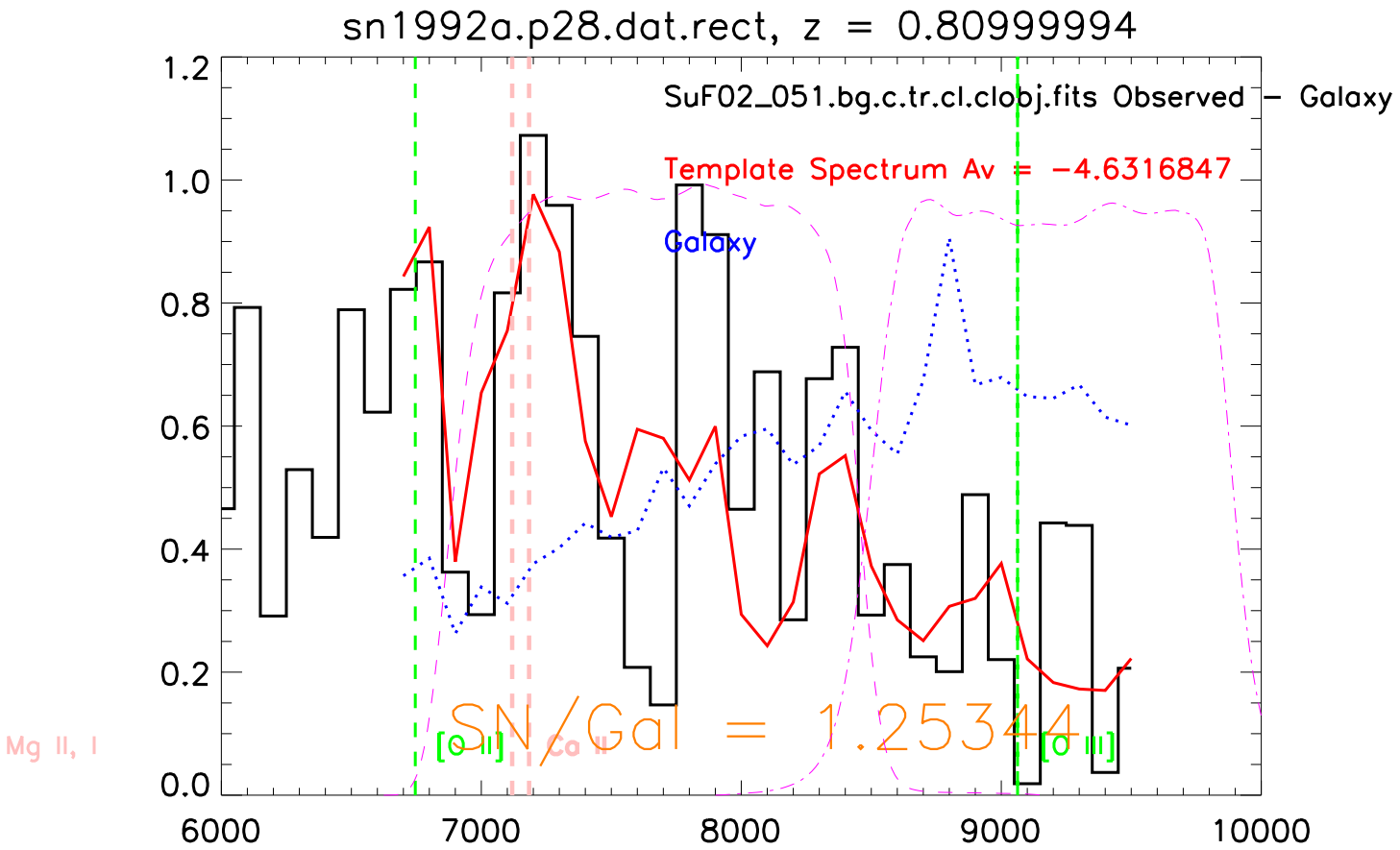

sn1996x.p24.dat.rect, z = 0.80999994
SuF02_051.bg.c.tr.cl.clobj.fits Observed – Galaxy
Template Spectrum Av = -5.6038698
Galaxy
SN/Gal = 0.894588
Mg II, I
[O II]
Ca II
[O III]
1.5
1.0
0.5
0.0
-0.5
6000
7000
8000
9000
10000

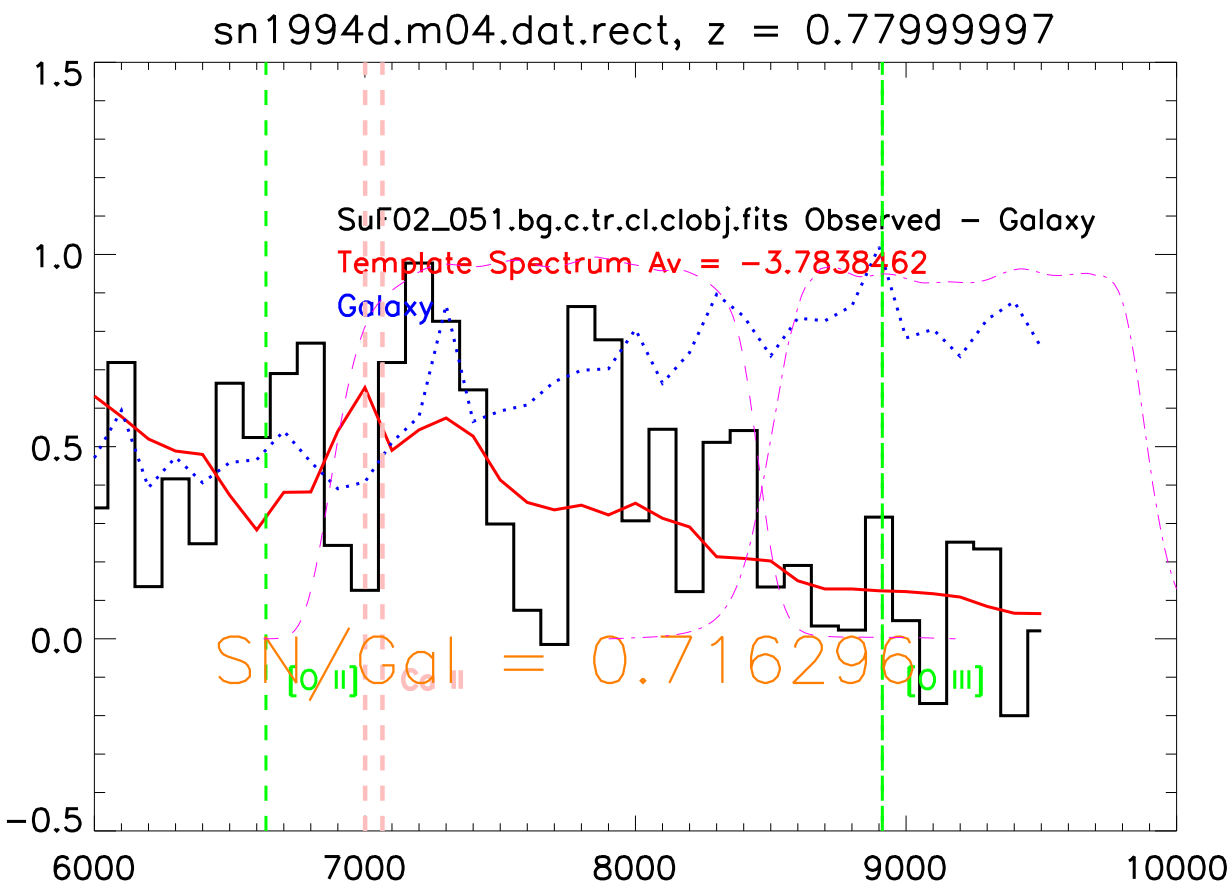

sn1991t.p10.dat.rect, z = 0.77999997
SuF02_051.bg.c.tr.cl.clobj.fits Observed – Galaxy
Template Spectrum Av = −5.0015083
Galaxy
SN/Gal = 0.558880
[O II]
Ca II
[O III]
Mg II, I
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000


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

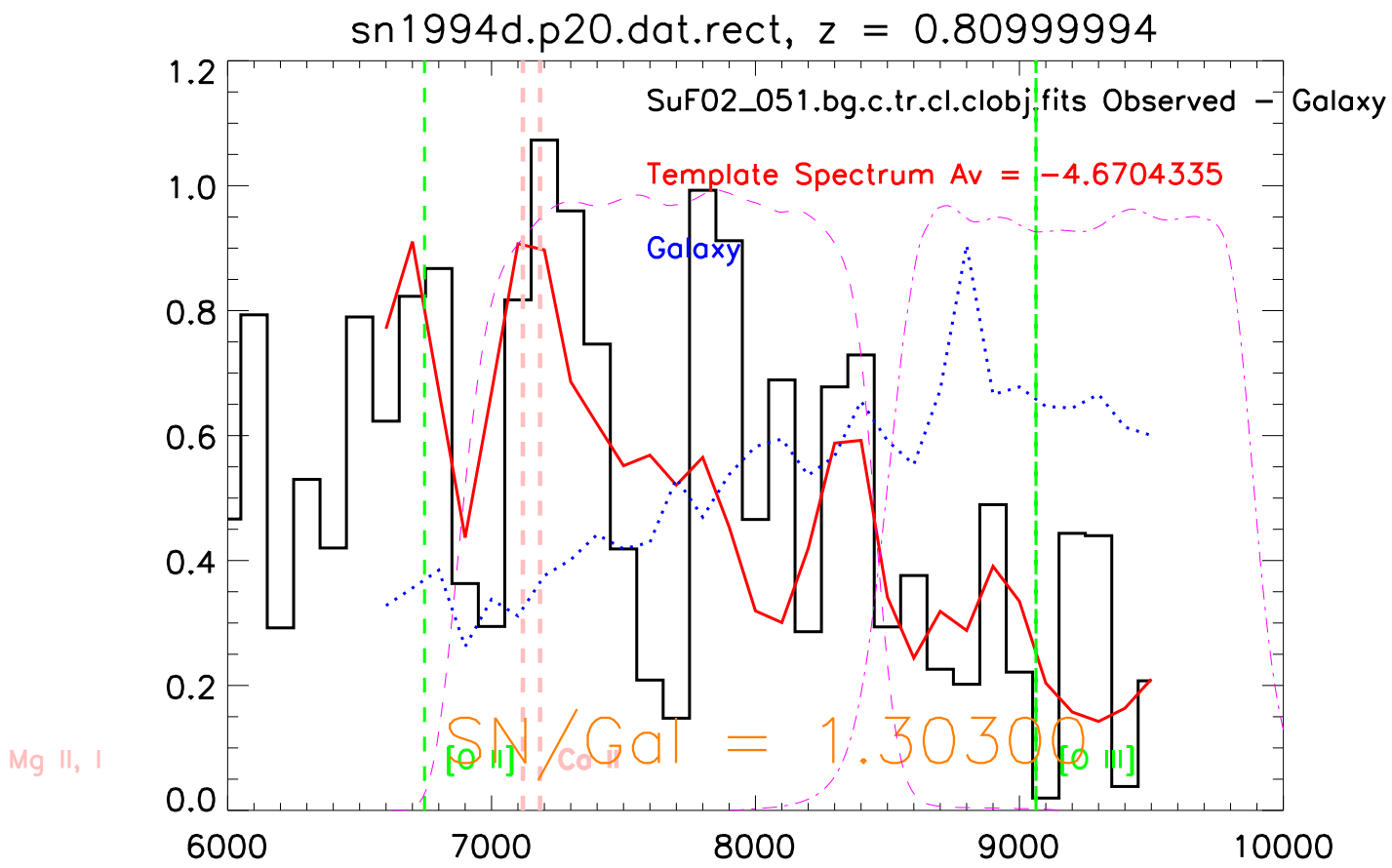

sn1990n.p17.dat.rect, z = 0.81999999
SuF02_051.bg.c.tr.cl.clobj.fits Observed − Galaxy
Template Spectrum Av = −3.2435712
Galaxy
SN/Gal = 1.10687
Mg II, I
[O II]
Ca II
[O III]
1.2
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
6000
7000
8000
9000
10000

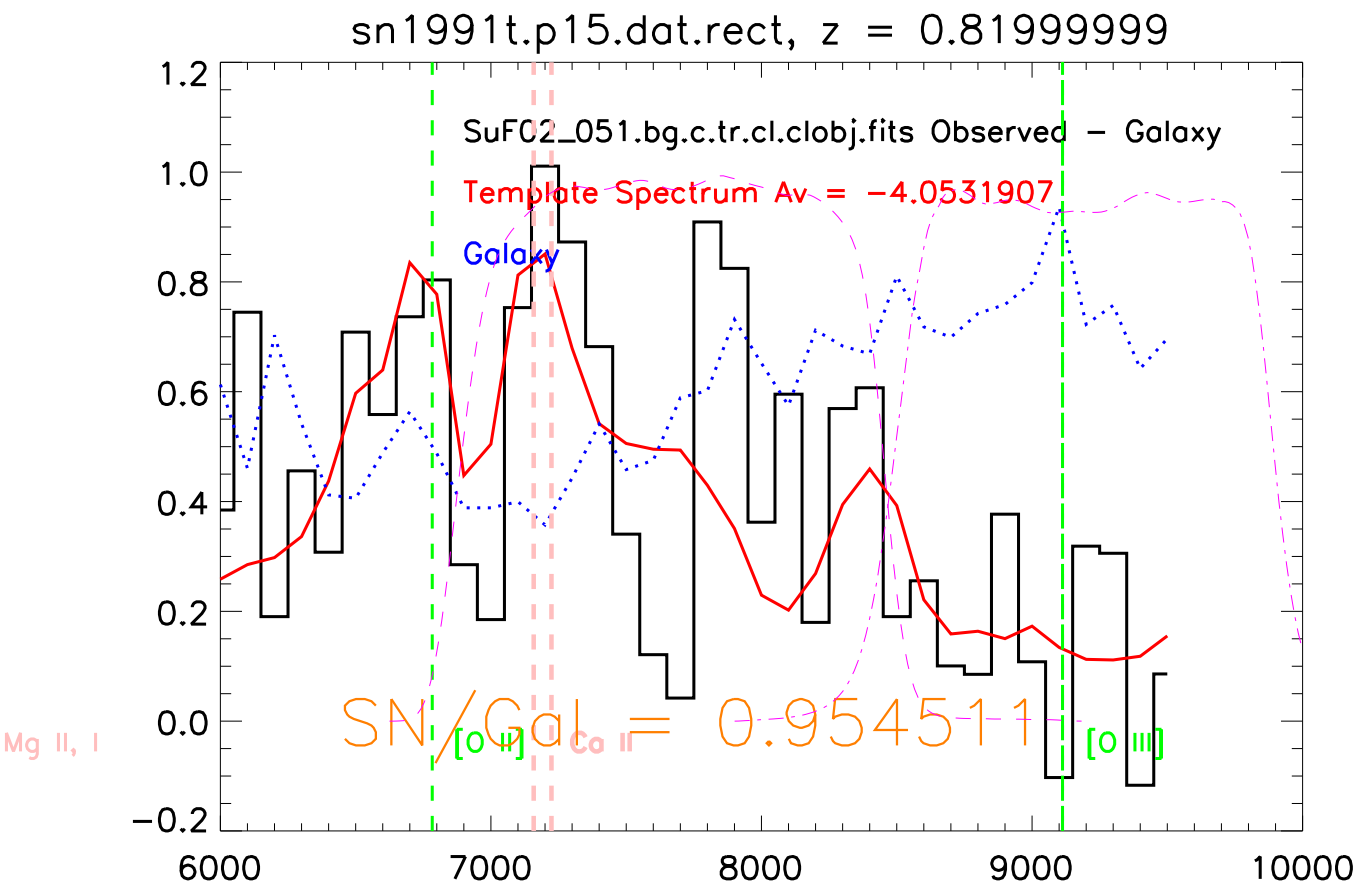

sn1998bu.m02.dat.rect, z = 0.77999997
SuF02_051.bg.c.tr.cl.clob.fits Observed − Galaxy
Template Spectrum Av = −5.7155857
Galaxy
SN/Gal = 0.594024
[O II]
Ca II
[O III]
Mg II, I
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

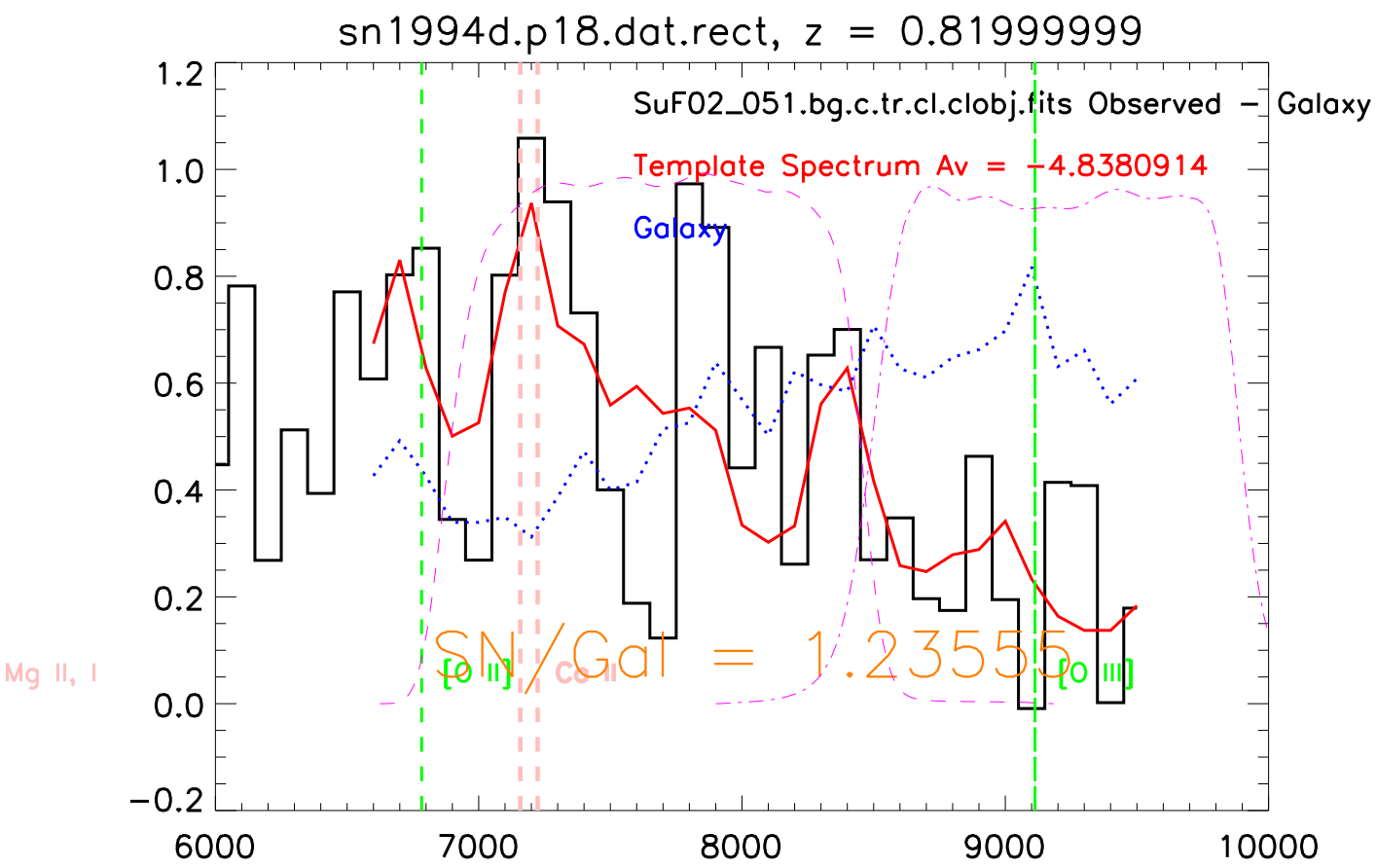

sn1992a.p28.dat.rect, z = 0.80999994
SuF02_051.bg.c.tr.cl.clobj.fits Observed – Galaxy
Template Spectrum Av = -4.6316847
Galaxy
SN/Gal = 1.25344
[O II]
Ca II
[O III]
Mg II, I
1.2
1.0
0.8
0.6
0.4
0.2
0.0
6000
7000
8000
9000
10000

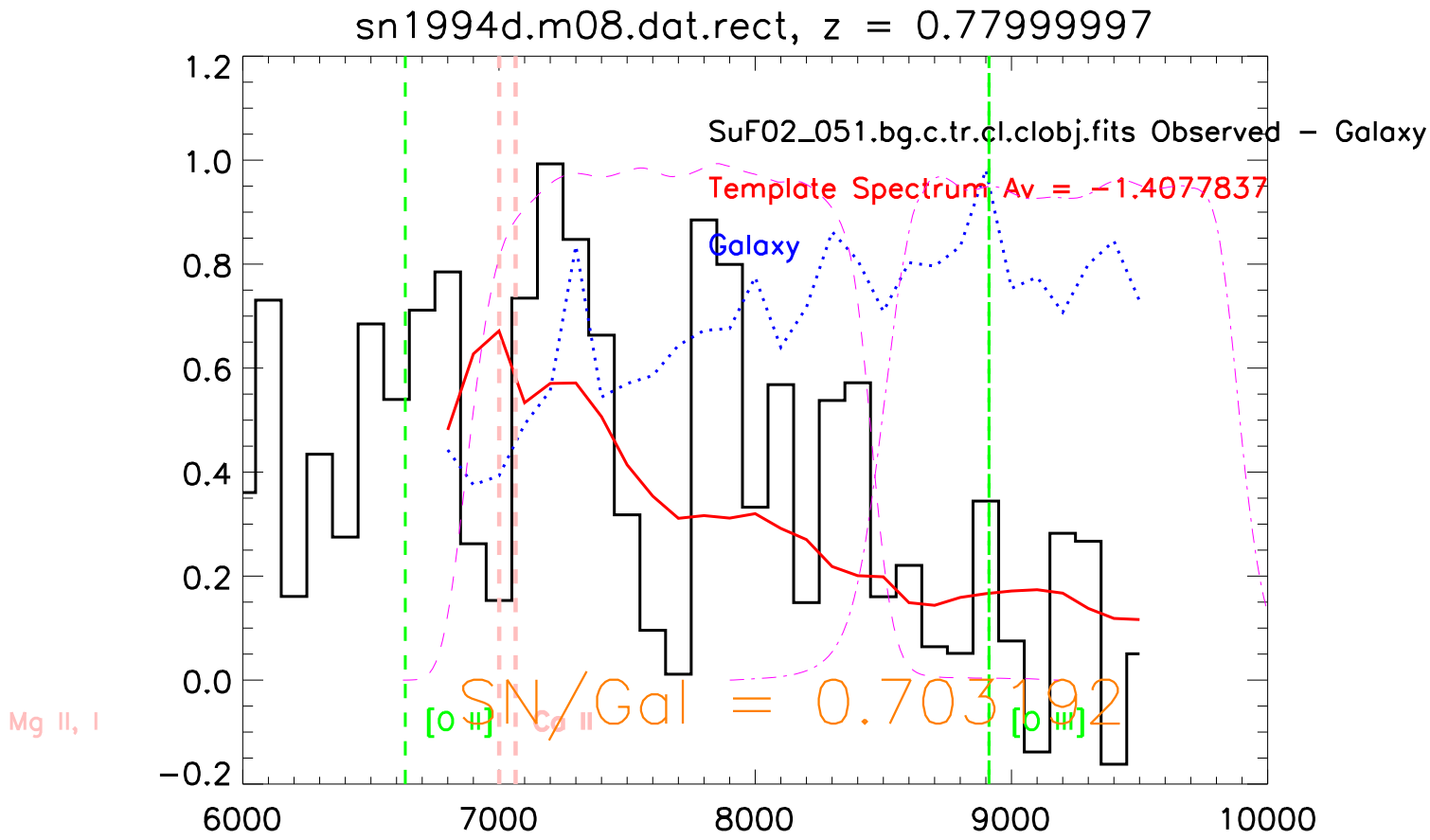

sn1994d.m04.dat.rect, z = 0.77999997
SuF02_051.bg.c.tr.cl.clobj.fits Observed − Galaxy
Template Spectrum Av = −3.7838462
Galaxy
SN/Gal = 0.716296
[O II]
[O III]
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

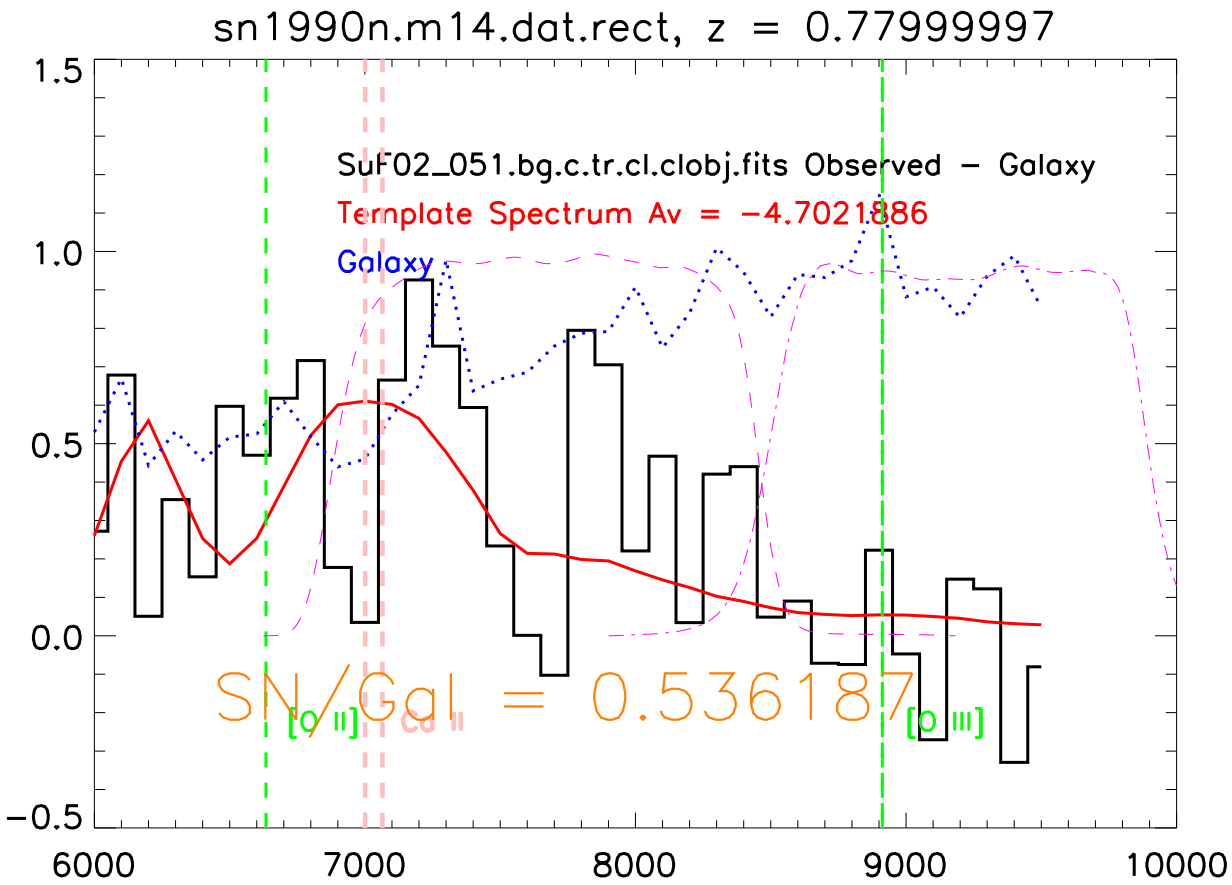
Mg II, I

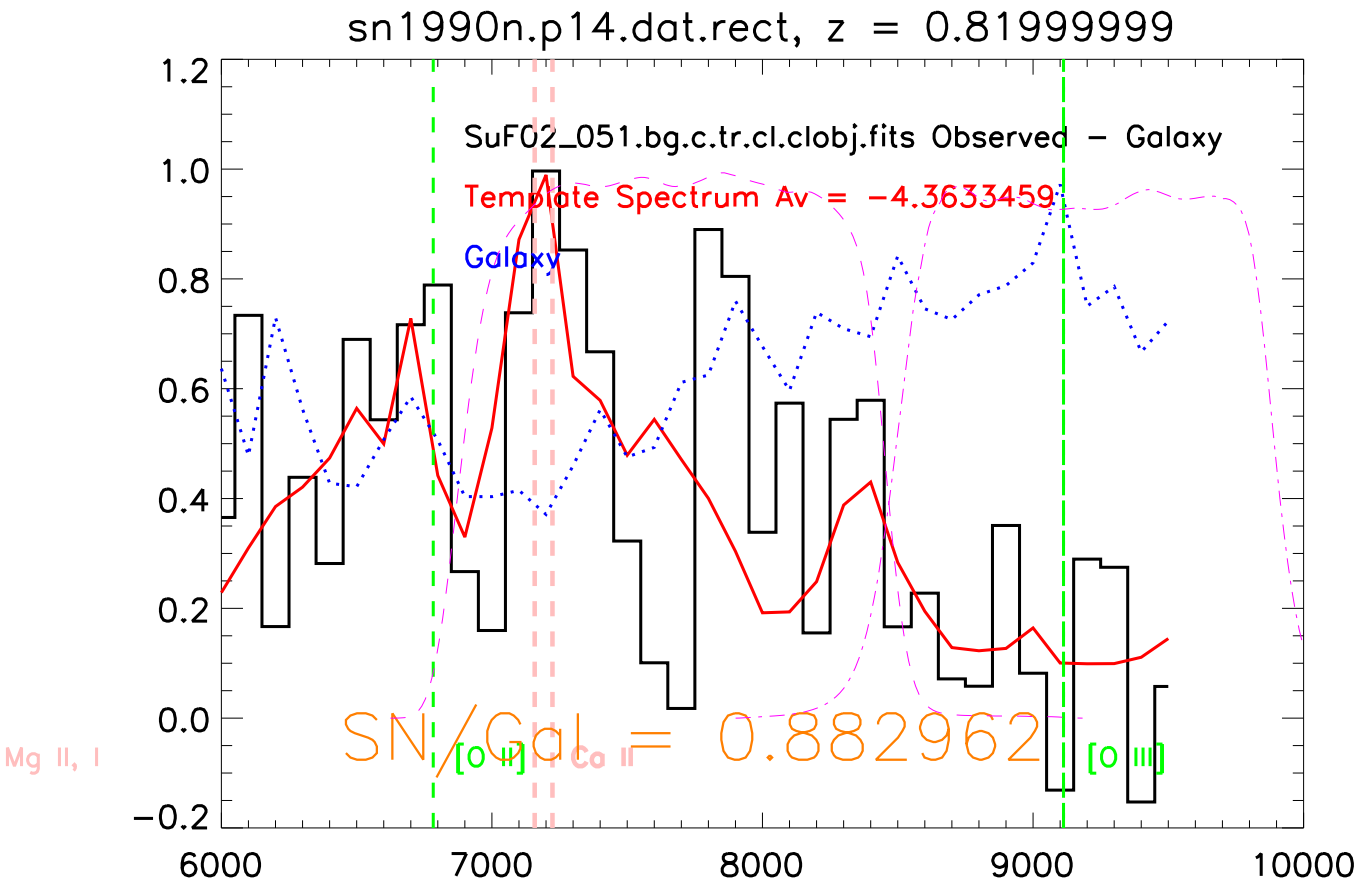

sn1994d.p20.dat.rect, z = 0.80999994
SuF02_051.bg.c.tr.cl.clobj.fits Observed
Galaxy
Template Spectrum Av = -4.6704335
Galaxy
SN/Gal = 1.30300
[O II]
Ca II
[O III]
Mg II, I
1.2
1.0
0.8
0.6
0.4
0.2
0.0
6000
7000
8000
9000
10000

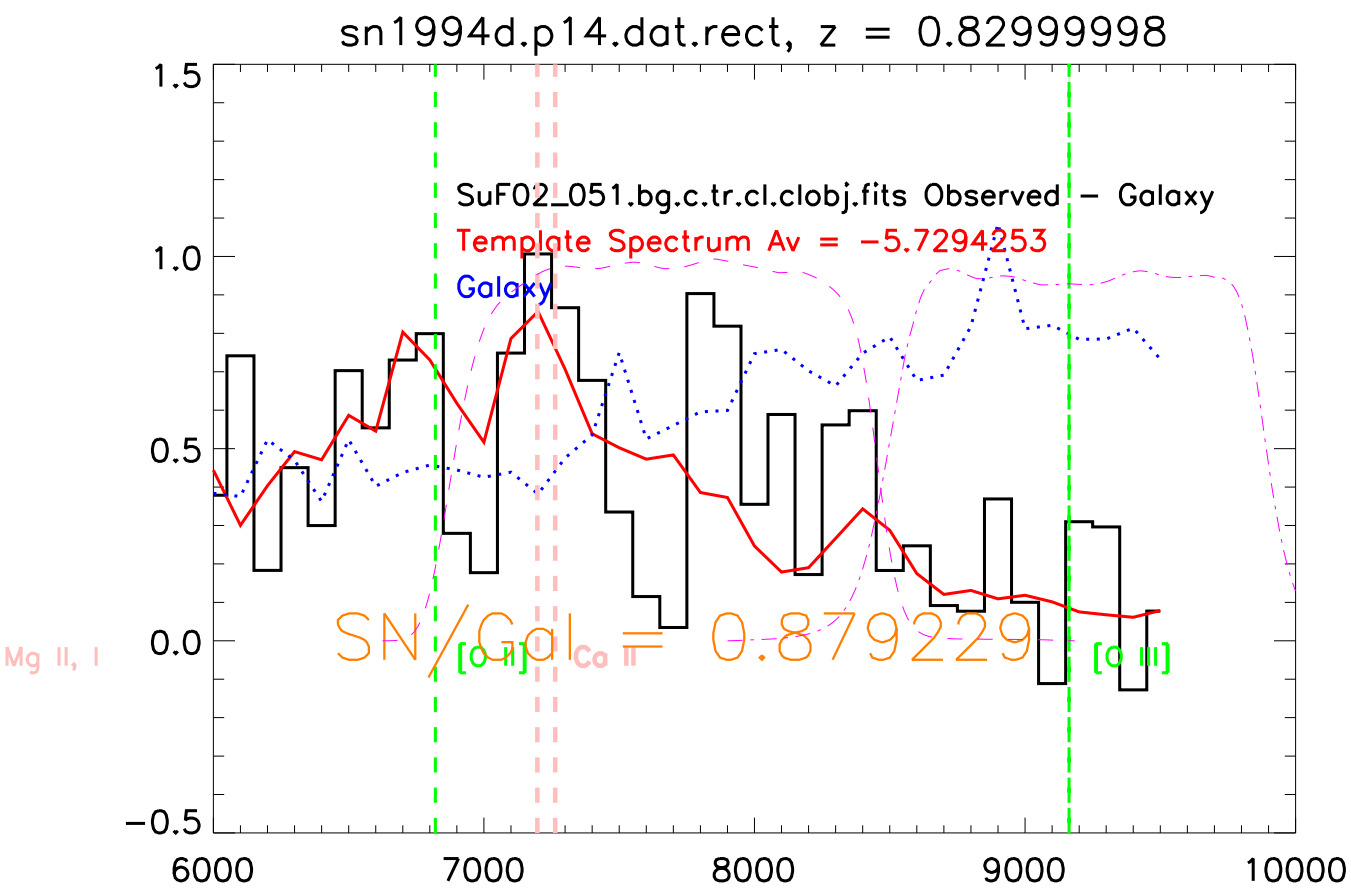

sn1991t.p15.dat.rect, z = 0.81999999
SuFC2_051.bg.c.tr.cl.clobj.fits Observed – Galaxy
Template Spectrum Av = −4.0531907
Galaxy
SN/Gal = 0.954511
[O II]
Ca II
[O III]
Mg II, I
1.2
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
6000
7000
8000
9000
10000

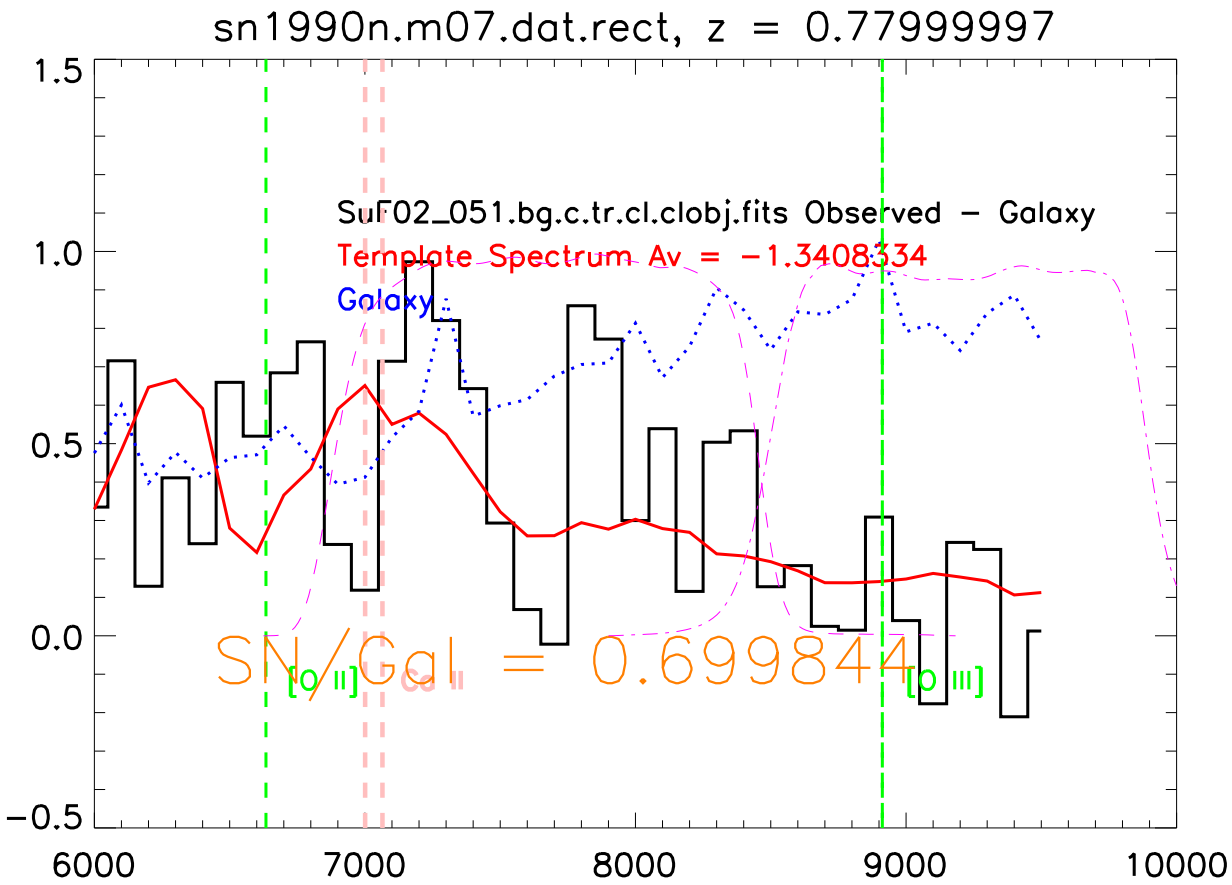

sn1994d.p18.dat.rect, z = 0.81999999
SuF02_051.bg.c.tr.cl.clobj.fits Observed
Galaxy
Template Spectrum Av = 4.8380914
Galaxy
SN/Gal = 1.23555
[O II]
[O III]
Mg II, I
1.2
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
6000
7000
8000
9000
10000

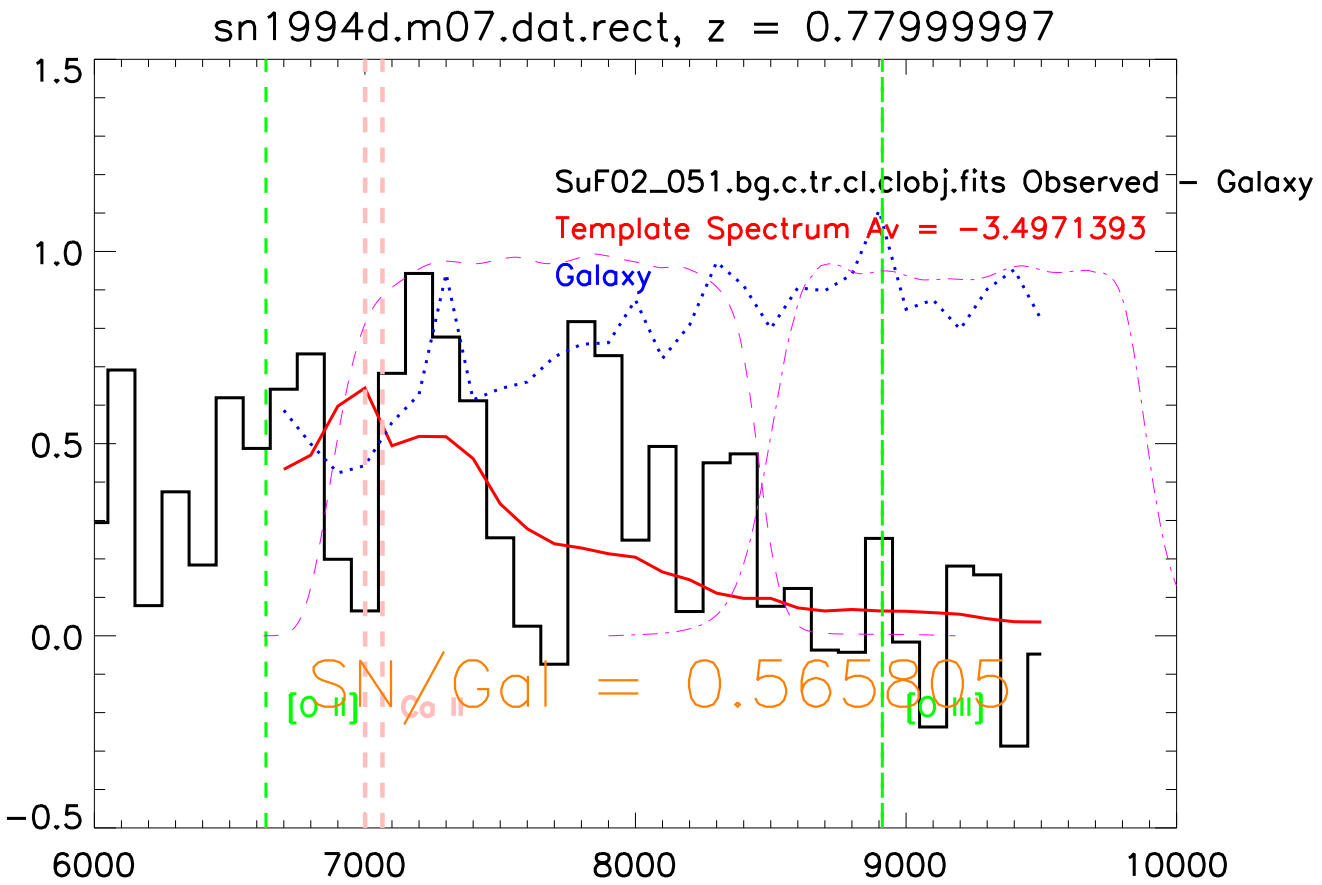

sn1994d.m08.dat.rect, z = 0.77999997
SuF02_051.bg.c.tr.cl.clobj.fits Observed − Galaxy
Template Spectrum Av = −1.4077837
Galaxy
S/N Gal = 0.703192
[O II]
Ca II
[O III]
Mg II, I
1.2
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
6000
7000
8000
9000
10000

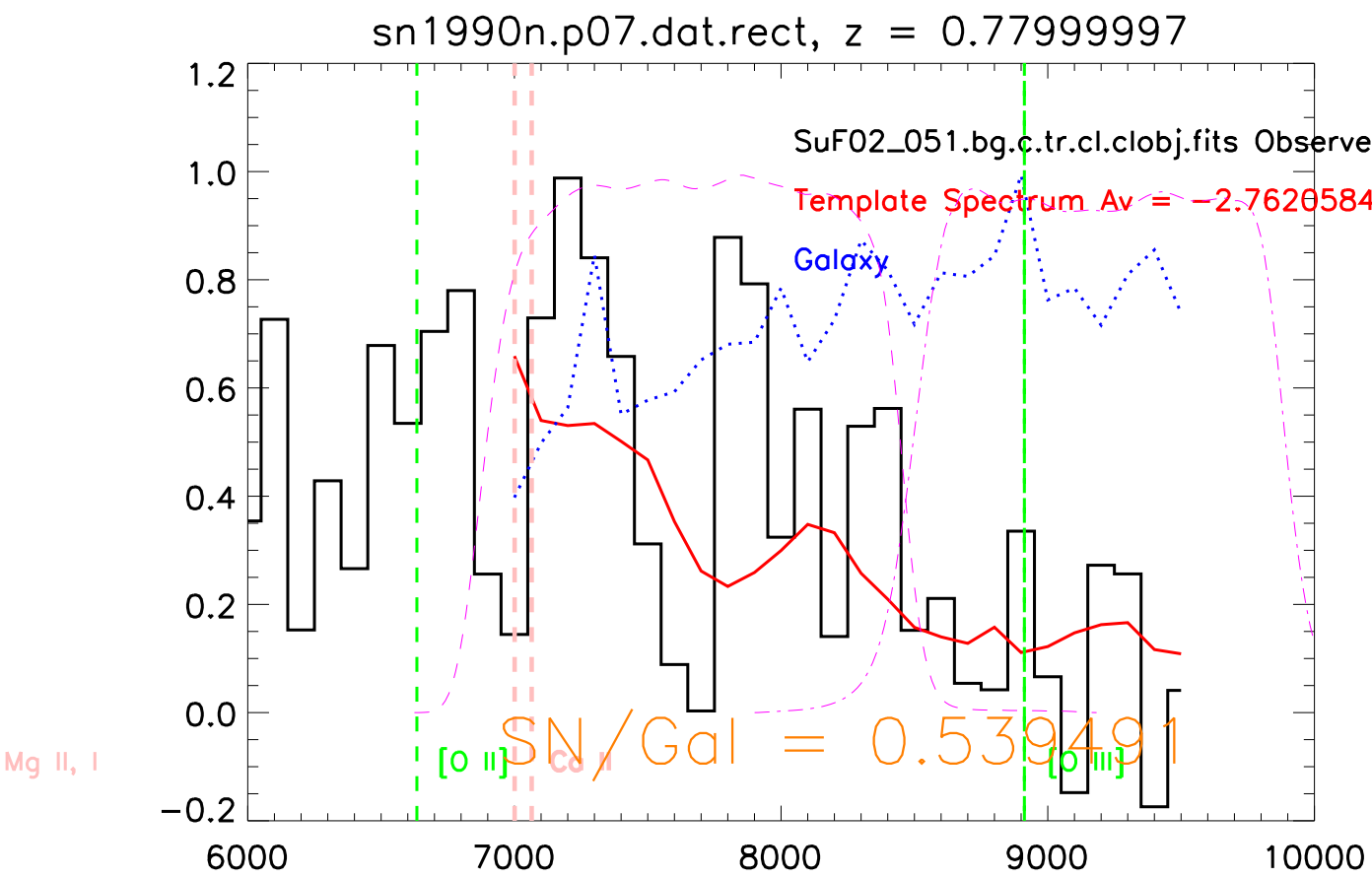

sn1990n.m14.dat.rect, z = 0.77999997
SuF02_051.bg.c.tr.cl.clobj.fits Observed − Galaxy
Template Spectrum Av = −4.7021886
Galaxy
SN/Gal = 0.536187
[O II]
Ca II
[O III]
Mg II, I
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

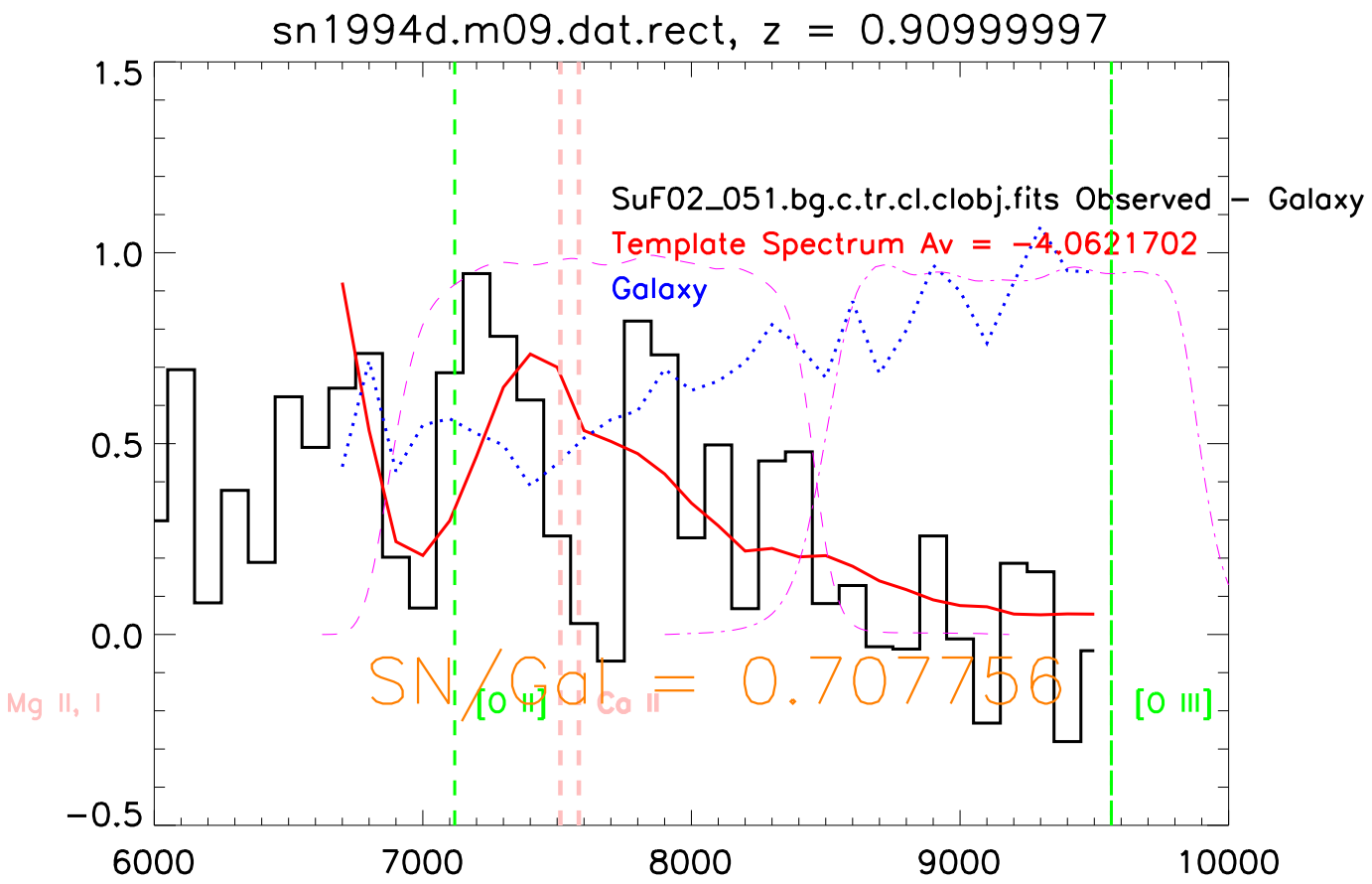

sn1990n.p14.dat.rect, z = 0.81999999
SuF02_051.bg.c.tr.cl.clobj.fits Observed − Galaxy
Template Spectrum Av = −4.3633459
Galaxy
SN/Gal = 0.882962
Mg II, I
[O II]
Ca II
[O III]
1.2
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
6000
7000
8000
9000
10000

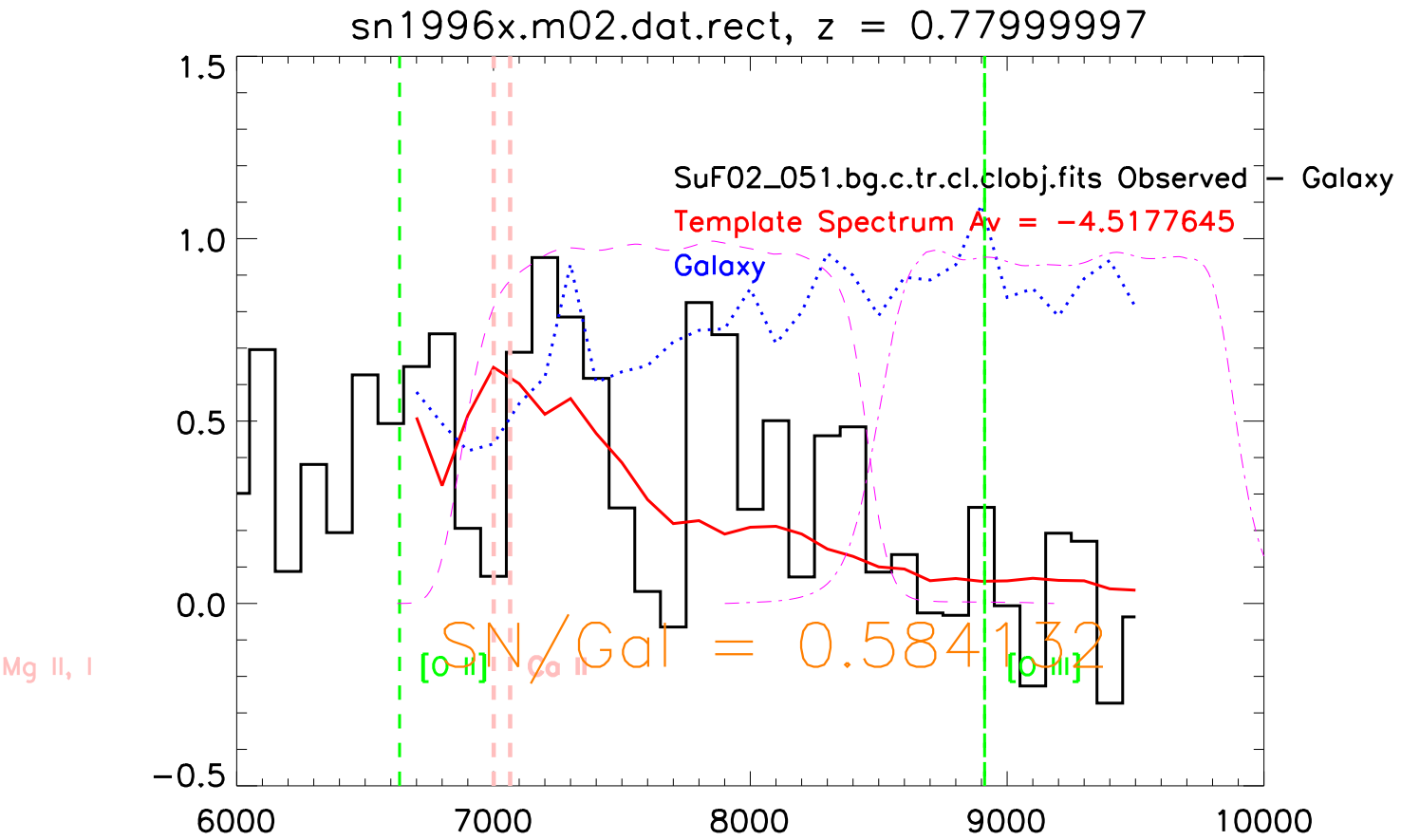

sn1994d.p14.dat.rect, z = 0.82999998
SuF02_051.bg.c.tr.cl.clobj.fits Observed – Galaxy
Template Spectrum Av = −5.7294253
Galaxy
SN/Gal = 0.879229
Mg II, I
[O II]
Ca II
[O III]
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

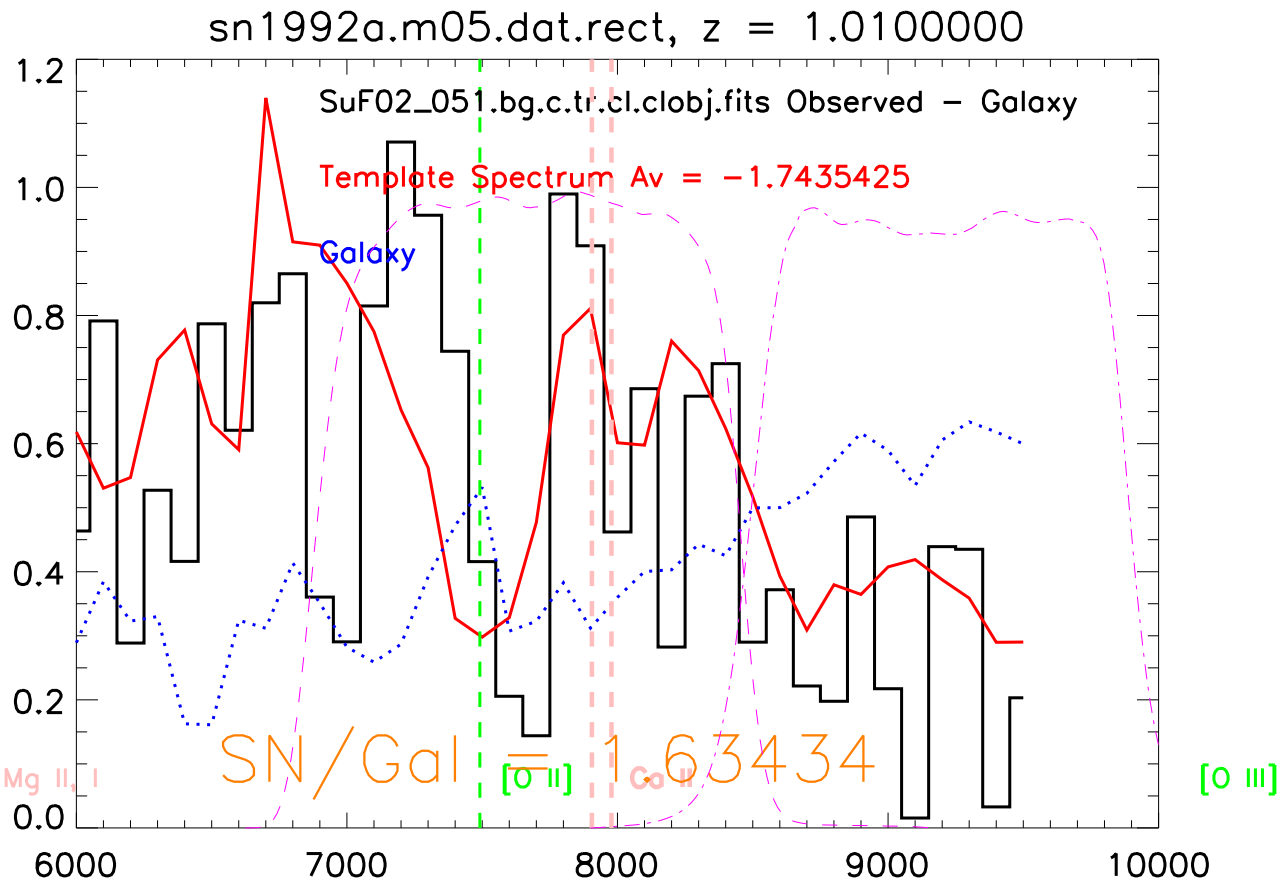

sn1990n.m07.dat.rect, z = 0.77999997
SuF02_051.bg.c.tr.cl.clobj.fits Observed − Galaxy
Template Spectrum Av = −1.3408334
Galaxy
SN/Gal = 0.699844
[O II]
Ca II
[O III]
Mg II, I
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

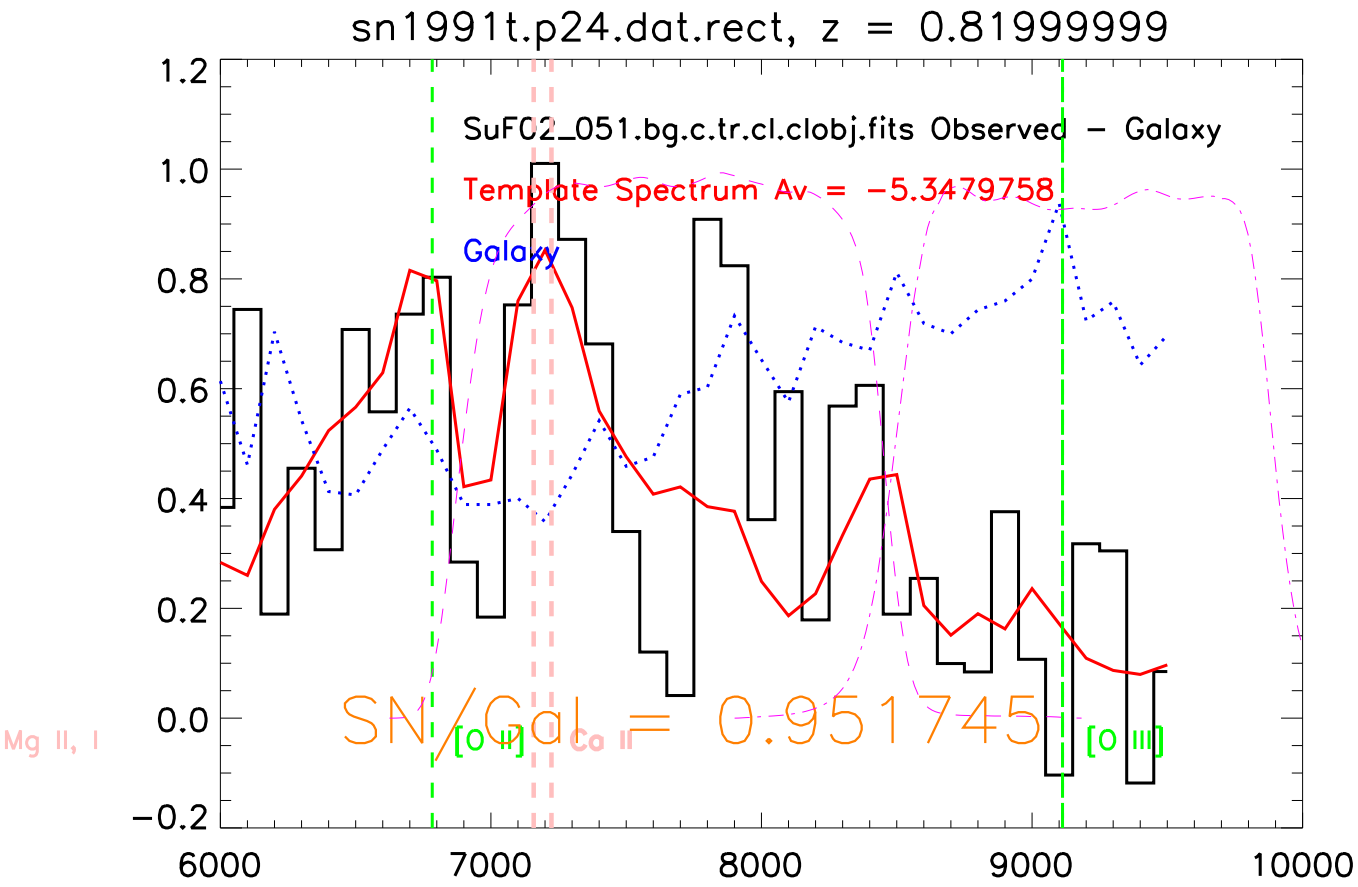

sn1994d.m07.dat.rect, z = 0.77999997
SuF02_051.bg.c.tr.cl.clobj.fits Observed − Galaxy
Template Spectrum Av = −3.4971393
Galaxy
SN/Gal = 0.565805
[O II]
Ca II
[O III]
Mg II, I
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

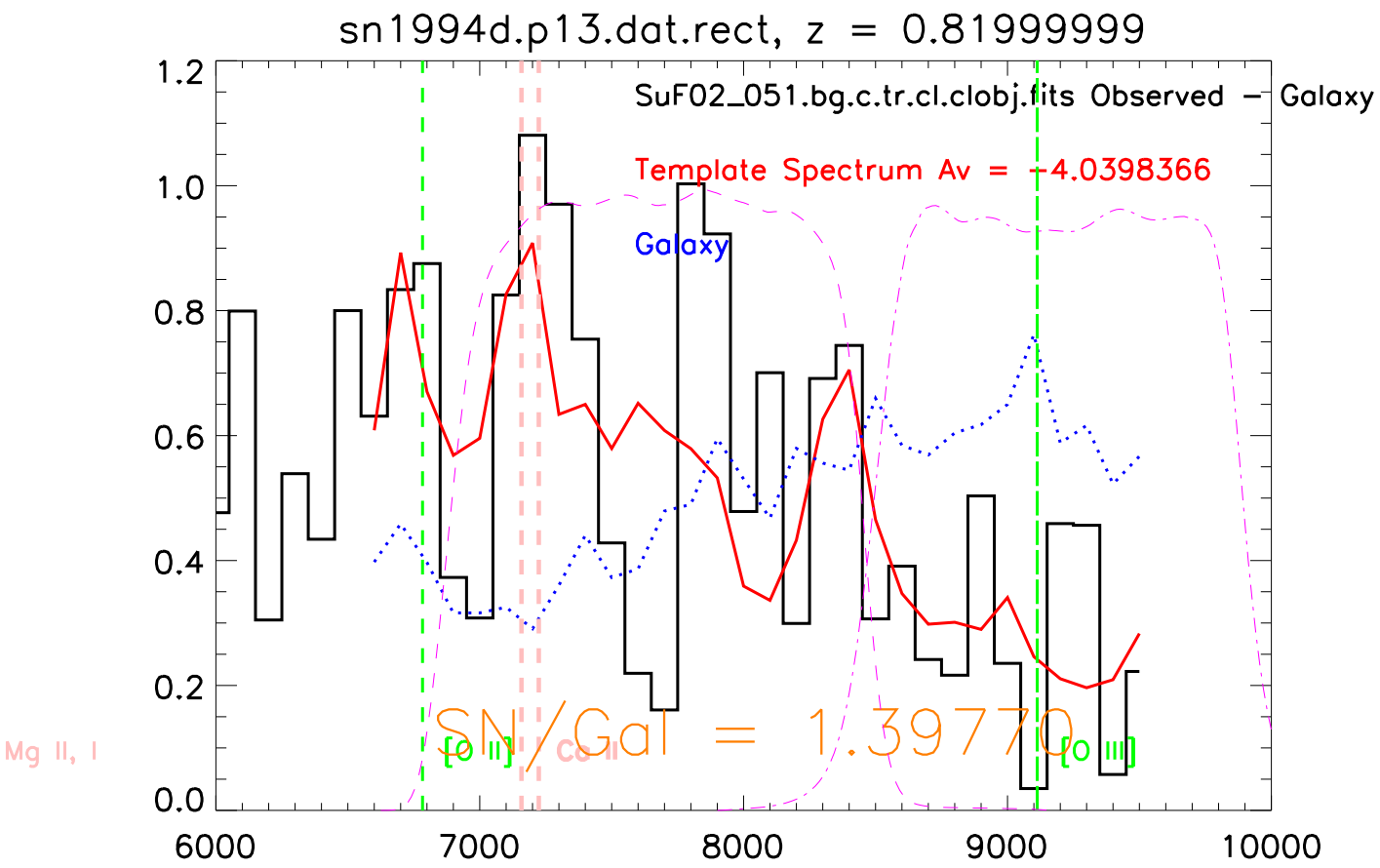

sn1990n.p07.dat.rect, z = 0.77999997
SuF02_051.bg.c.tr.cl.clobj.fits Observed – Galax
Template Spectrum Av = –2.7620584
Galaxy
SN/Gal = 0.539491
[O II]
[O III]
Mg II, I
1.2
1.0
0.8
0.6
0.4
0.2
0.0
–0.2
6000
7000
8000
9000
10000

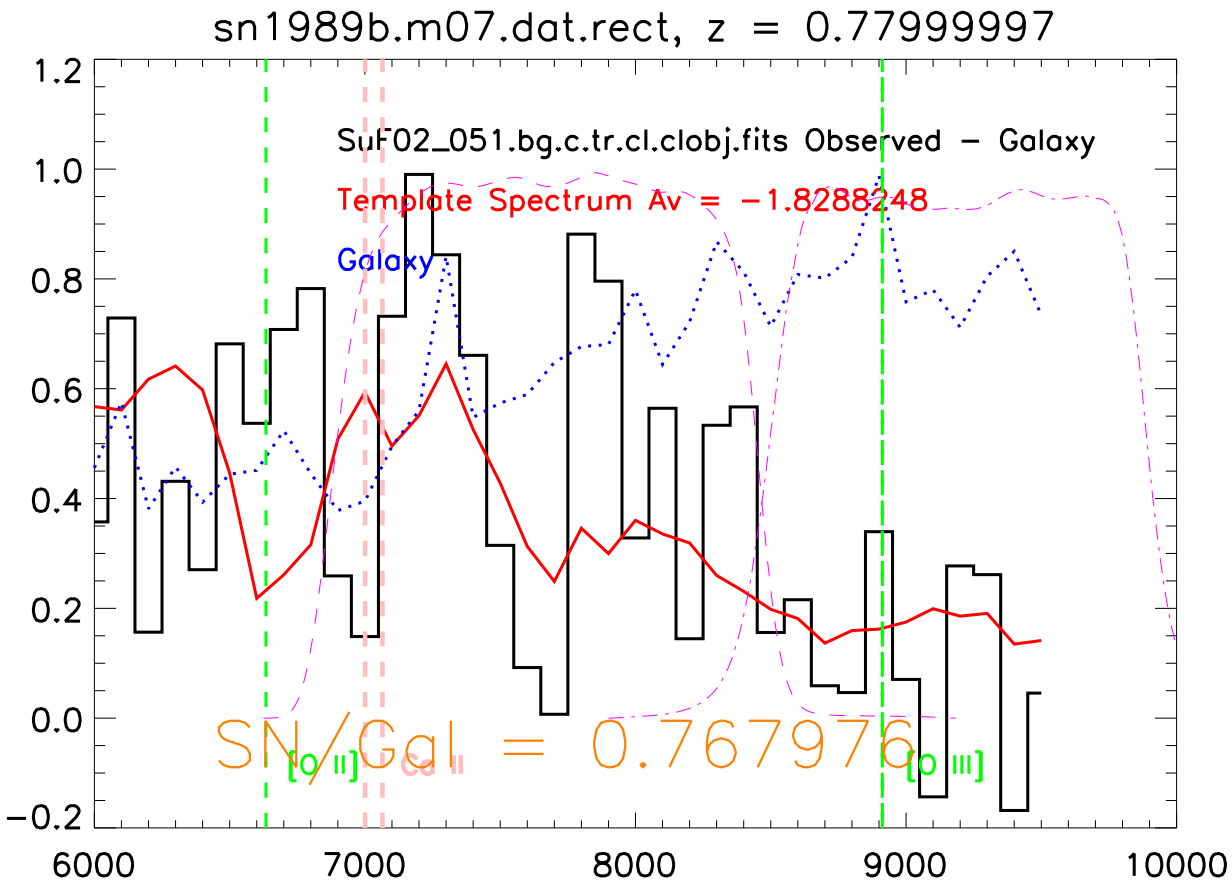

sn1994d.m09.dat.rect, z = 0.90999997
SuF02_051.bg.c.tr.cl.clobj.fits Observed − Galaxy
Template Spectrum Av = −4.0621702
Galaxy
SN/Gal = 0.707756
Mg II, I
[O II]
Co II
[O III]
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

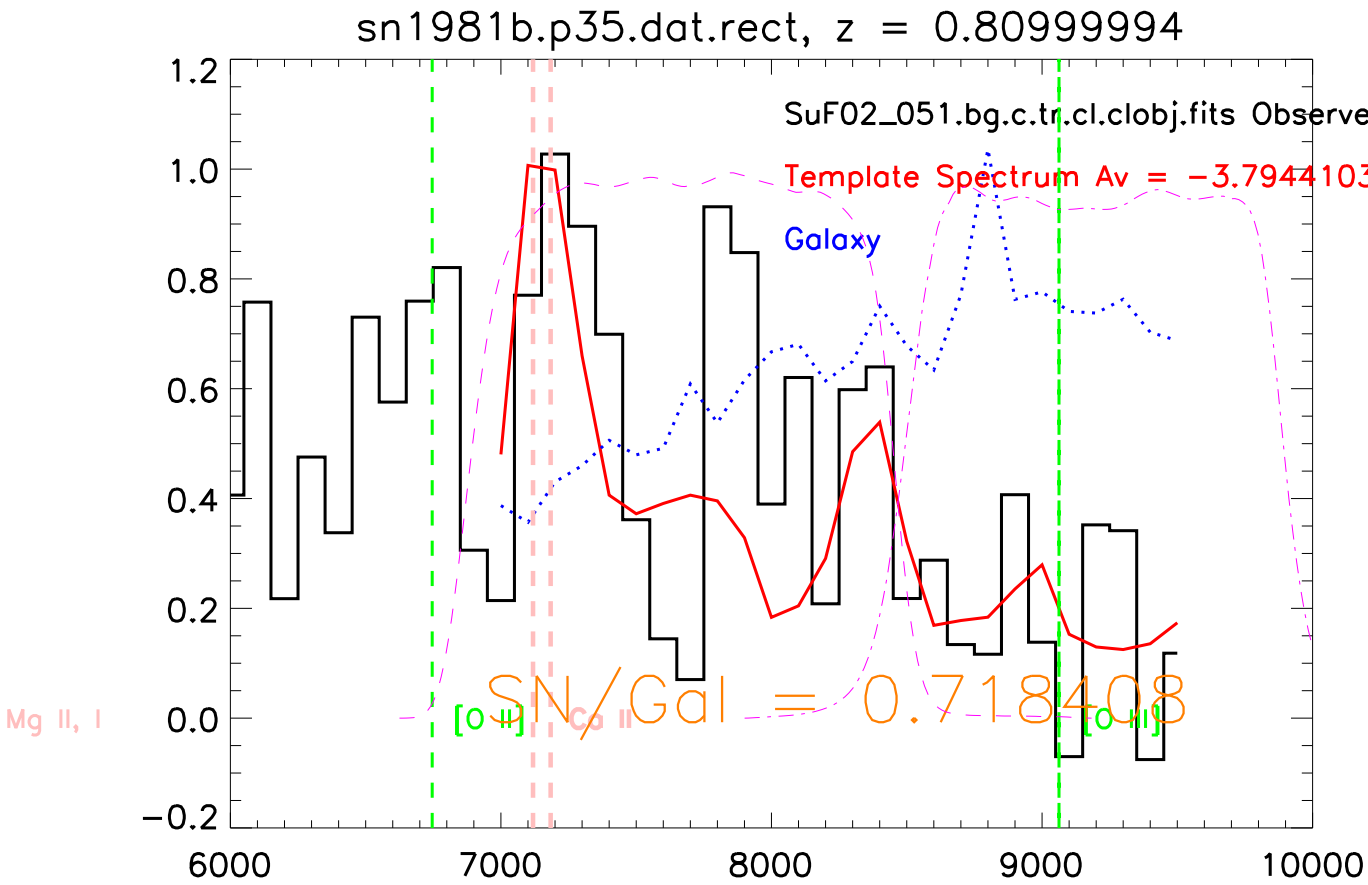

sn1996x.m02.dat.rect, z = 0.77999997
SuF02_051.bg.c.tr.cl.clobj.fits Observed
Galaxy
Template Spectrum Av = -4.5177645
Galaxy
SN/Gal = 0.584132
[O II]
Ca II
[O III]
Mg II, I
1.5
1.0
0.5
0.0
-0.5
6000
7000
8000
9000
10000

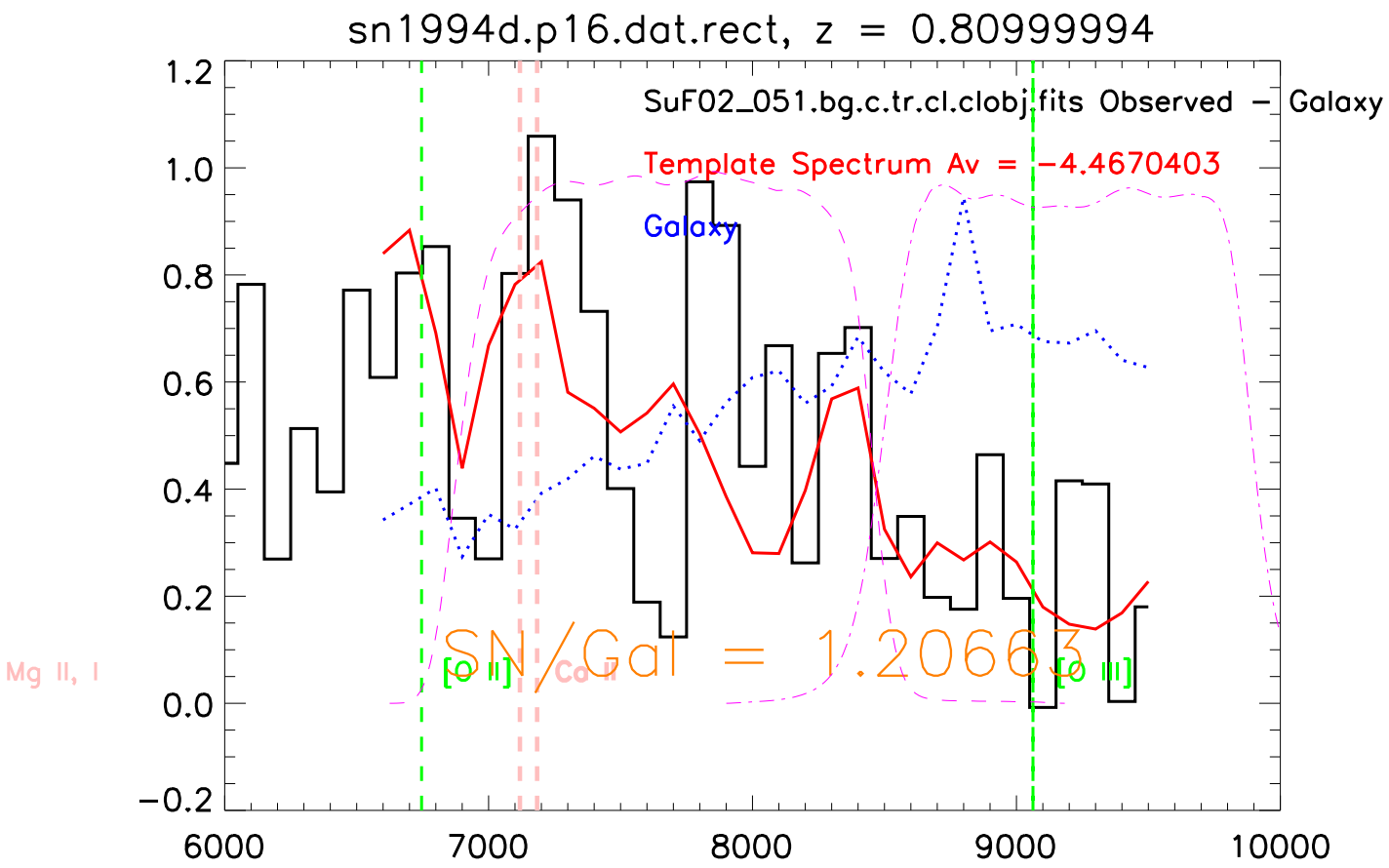

sn1992a.m05.dat.rect, z = 1.0100000
SuF02_051.bg.c.tr.cl.clobj.fits Observed – Galaxy
Template Spectrum Av = −1.7435425
Galaxy
SN/Gal = 1.63434
Mg II, I
[O II]
Ca II
[O III]
1.2
1.0
0.8
0.6
0.4
0.2
0.0
6000
7000
8000
9000
10000

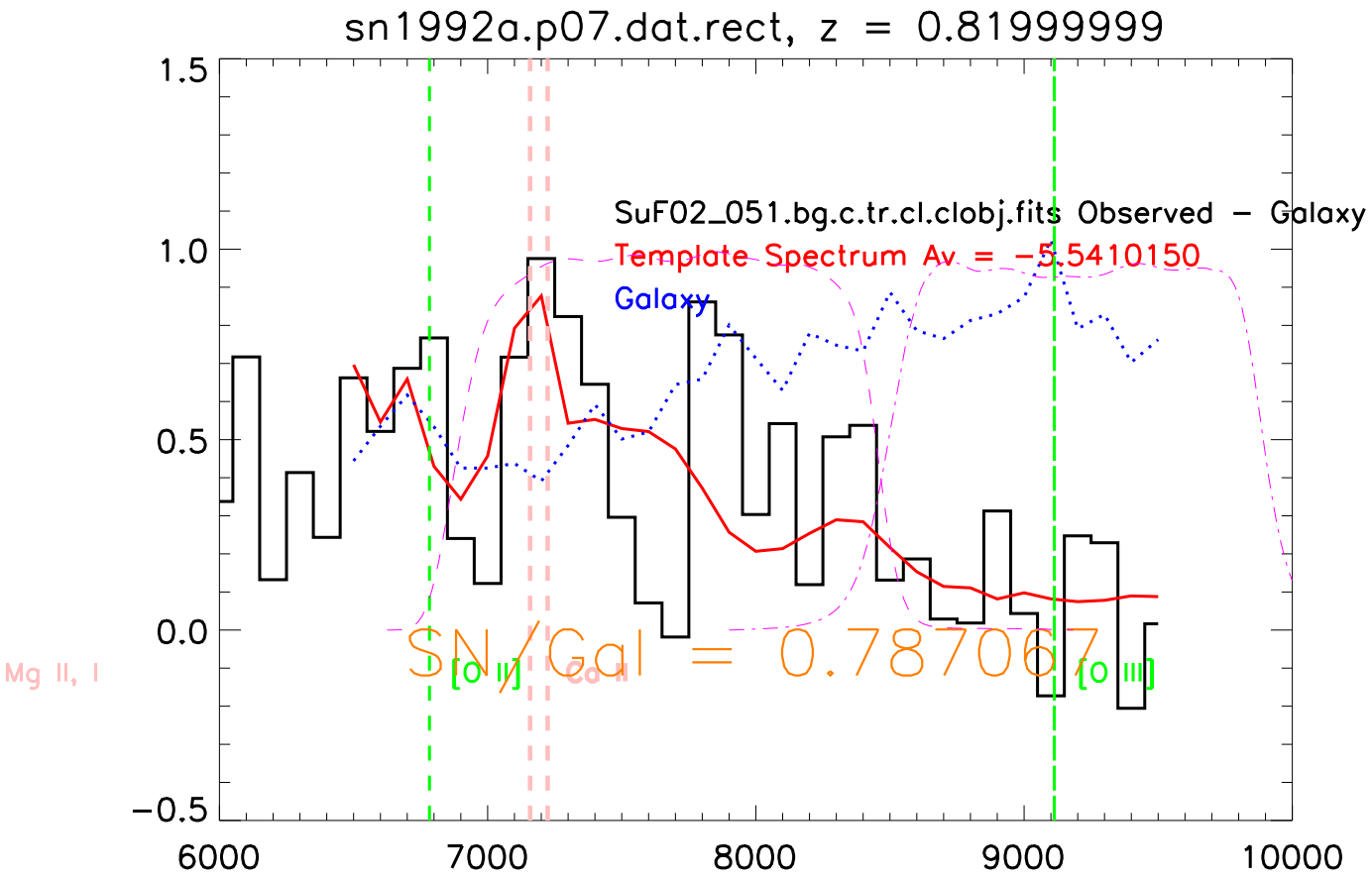

sn1991t.p24.dat.rect, z = 0.81999999
SuFC2_051.bg.c.tr.cl.clobj.fits Observed – Galaxy
Template Spectrum Av = -5.3479758
Galaxy
SN/Gal = 0.951745
[O II]
Ca II
[O III]
Mg II, I
1.2
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
6000
7000
8000
9000
10000

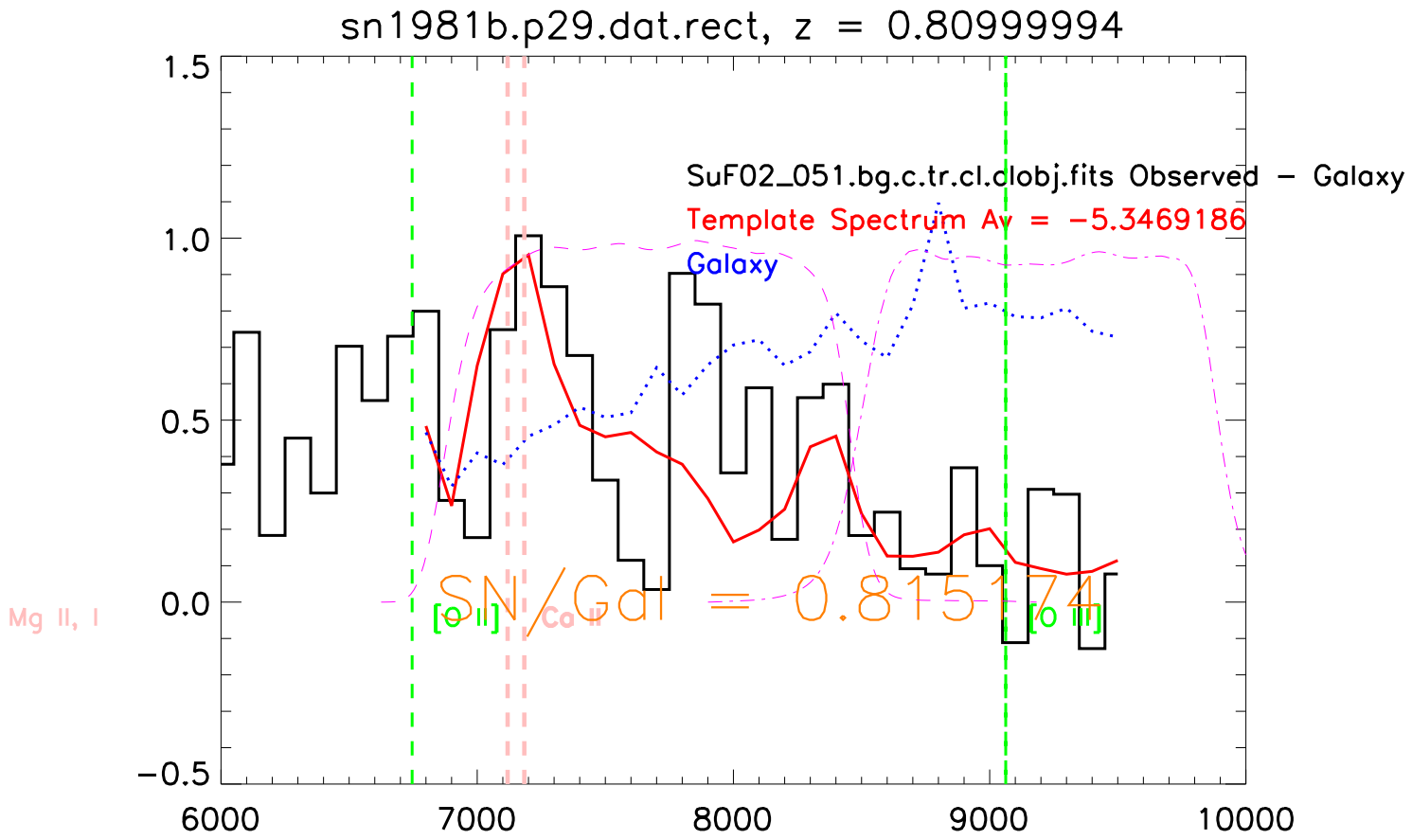

sn1994d.p13.dat.rect, z = 0.81999999
SuF02_051.bg.c.tr.cl.clobj.fits Observed
Galaxy
Template Spectrum Av = 4.0398366
Galaxy
SN/Gal = 1.39770
[O II]
[O III]
1.2
1.0
0.8
0.6
0.4
0.2
0.0
6000
7000
8000
9000
10000

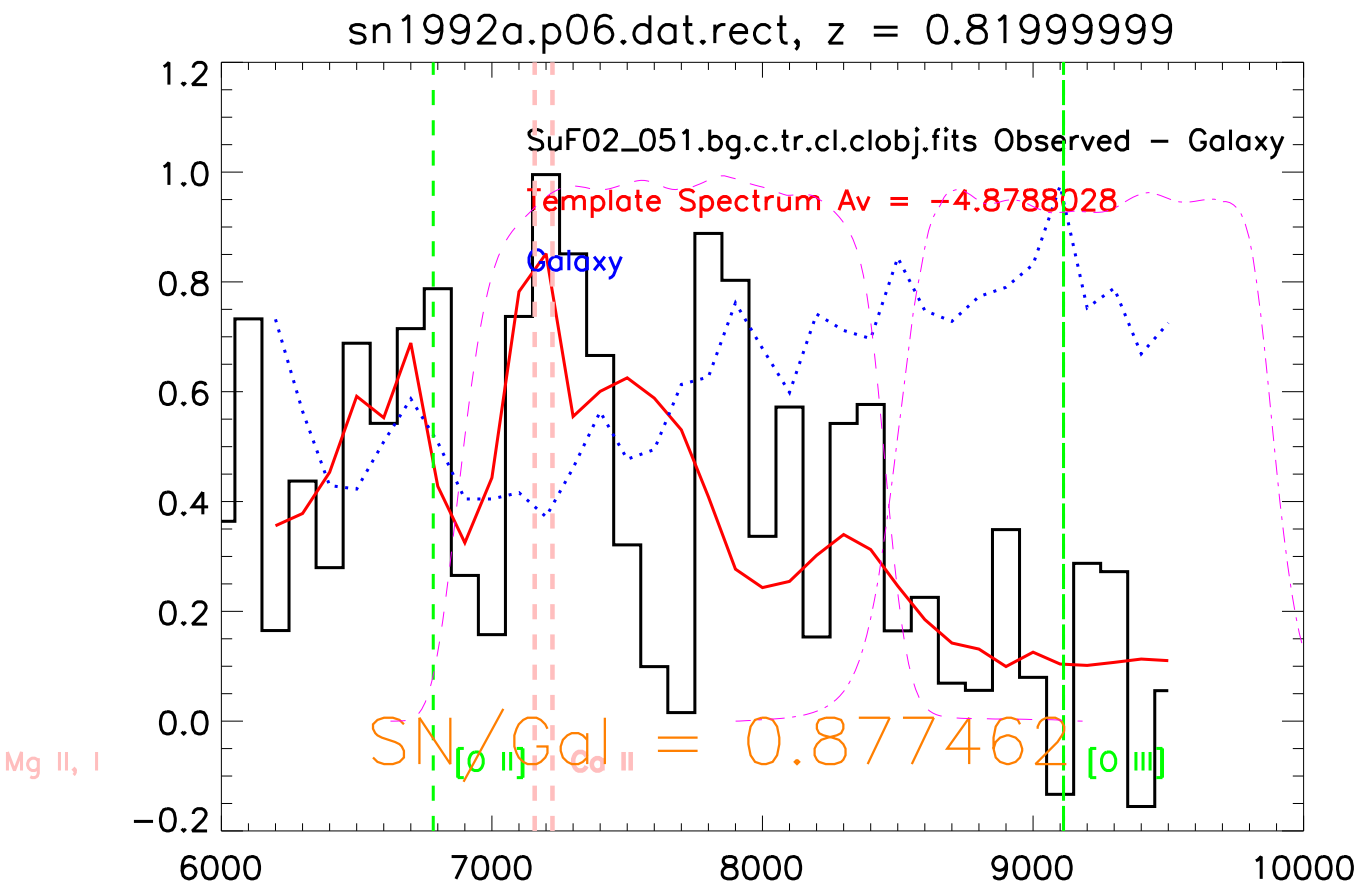

sn1989b.m07.dat.rect, z = 0.77999997
SuF02_051.bg.c.tr.cl.clobj.fits Observed − Galaxy
Template Spectrum Av = −1.8288248
Galaxy
SN/Gal = 0.767976
[O II]
Ca II
[O III]
Mg II, I
1.2
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
6000
7000
8000
9000
10000

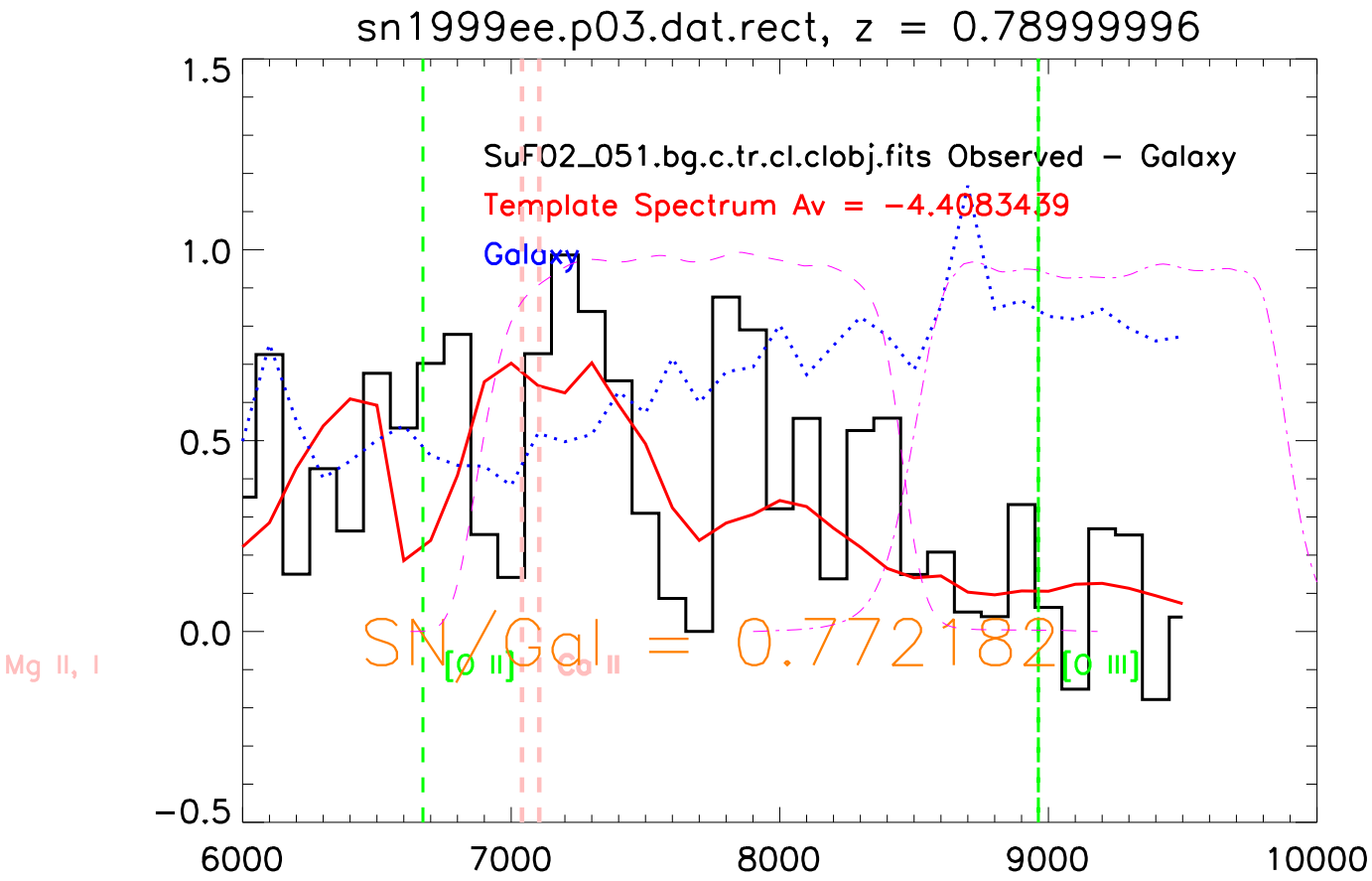

sn1981b.p35.dat.rect, z = 0.80999994
SuF02_051.bg.c.tr.cl.clobj.fits Observed – Galax
Template Spectrum Av = −3.7944103
Galaxy
SN/Gal = 0.718408
Mg II, I
[O II]
Ca II
[O III]
1.2
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
6000
7000
8000
9000
10000

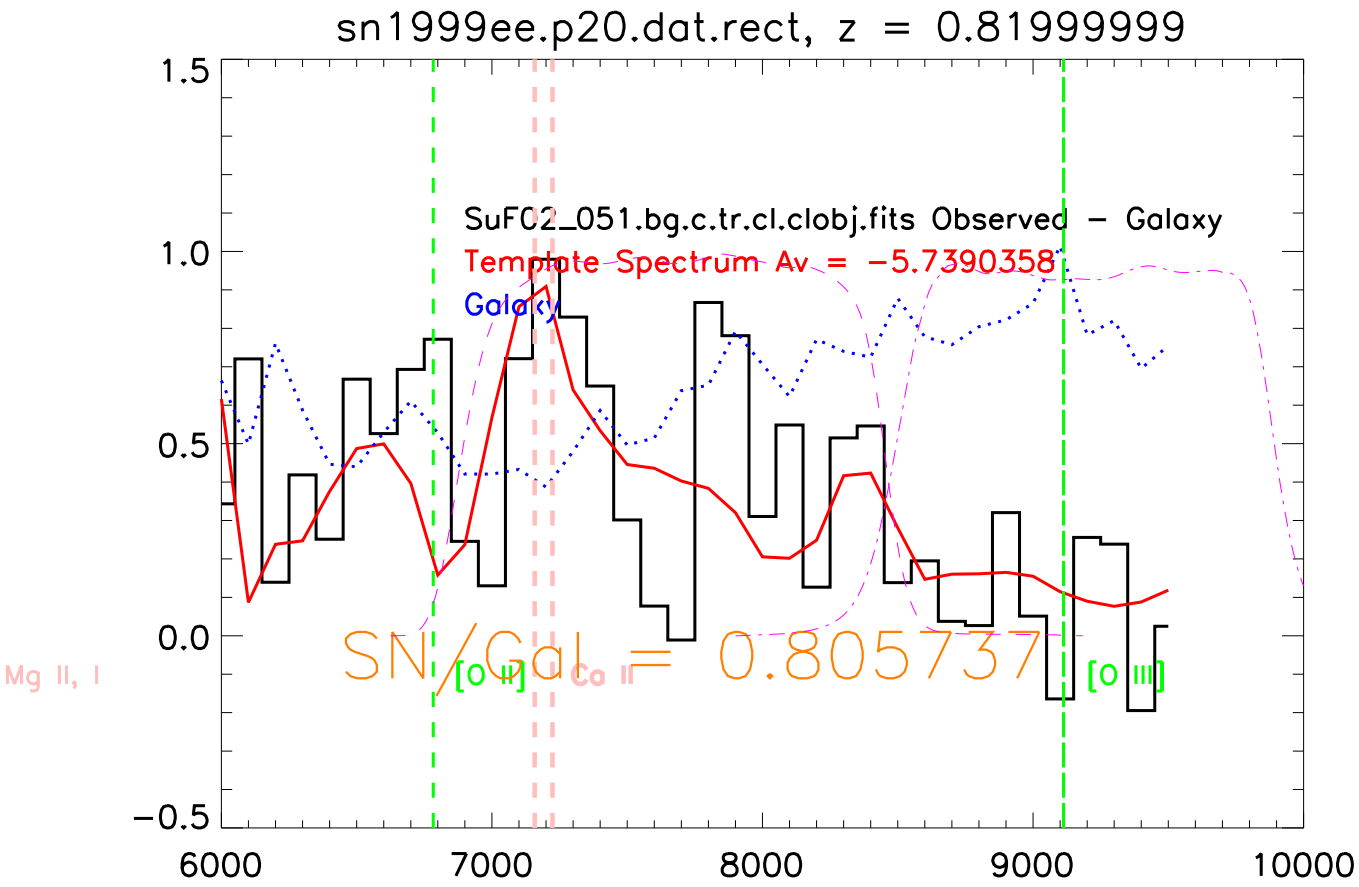

sn1994d.p16.dat.rect, z = 0.80999994
SuF02_051.bg.c.tr.cl.clobj.fits Observed
Galaxy
Template Spectrum Av = -4.4670403
Galaxy
SN/Gal = 1.20663
Mg II, I
[O II]
Ca II
[O III]
1.2
1.0
0.8
0.6
0.4
0.2
0.0
-0.2
6000
7000
8000
9000
10000

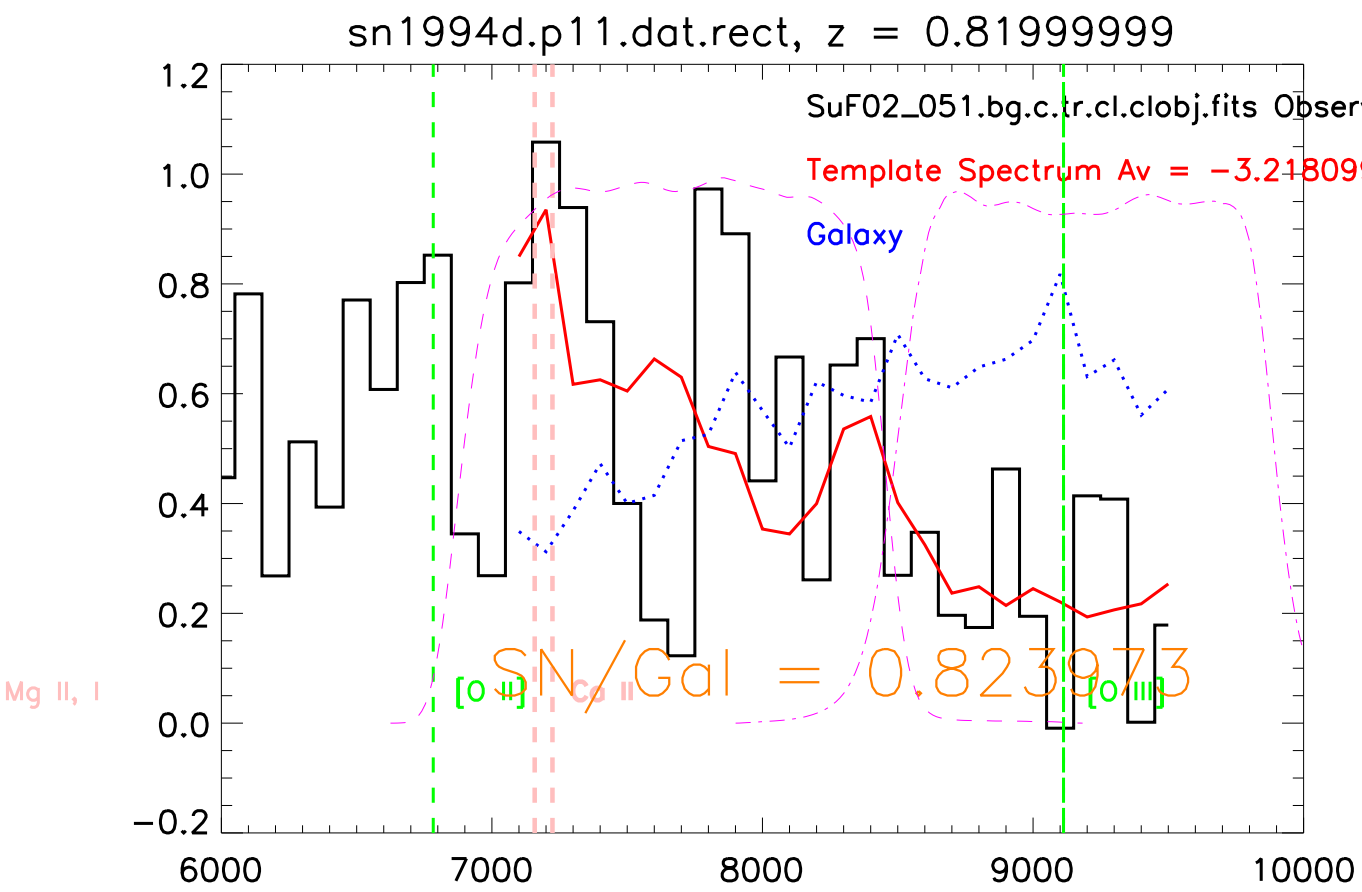

sn1992a.p07.dat.rect, z = 0.81999999
SuF02_051.bg.c.tr.cl.clobj.fits Observed – Galaxy
Template Spectrum Av = −5.5410150
Galaxy
SN/Gal = 0.787067
Mg II, I
[O II]
Ca II
[O III]
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

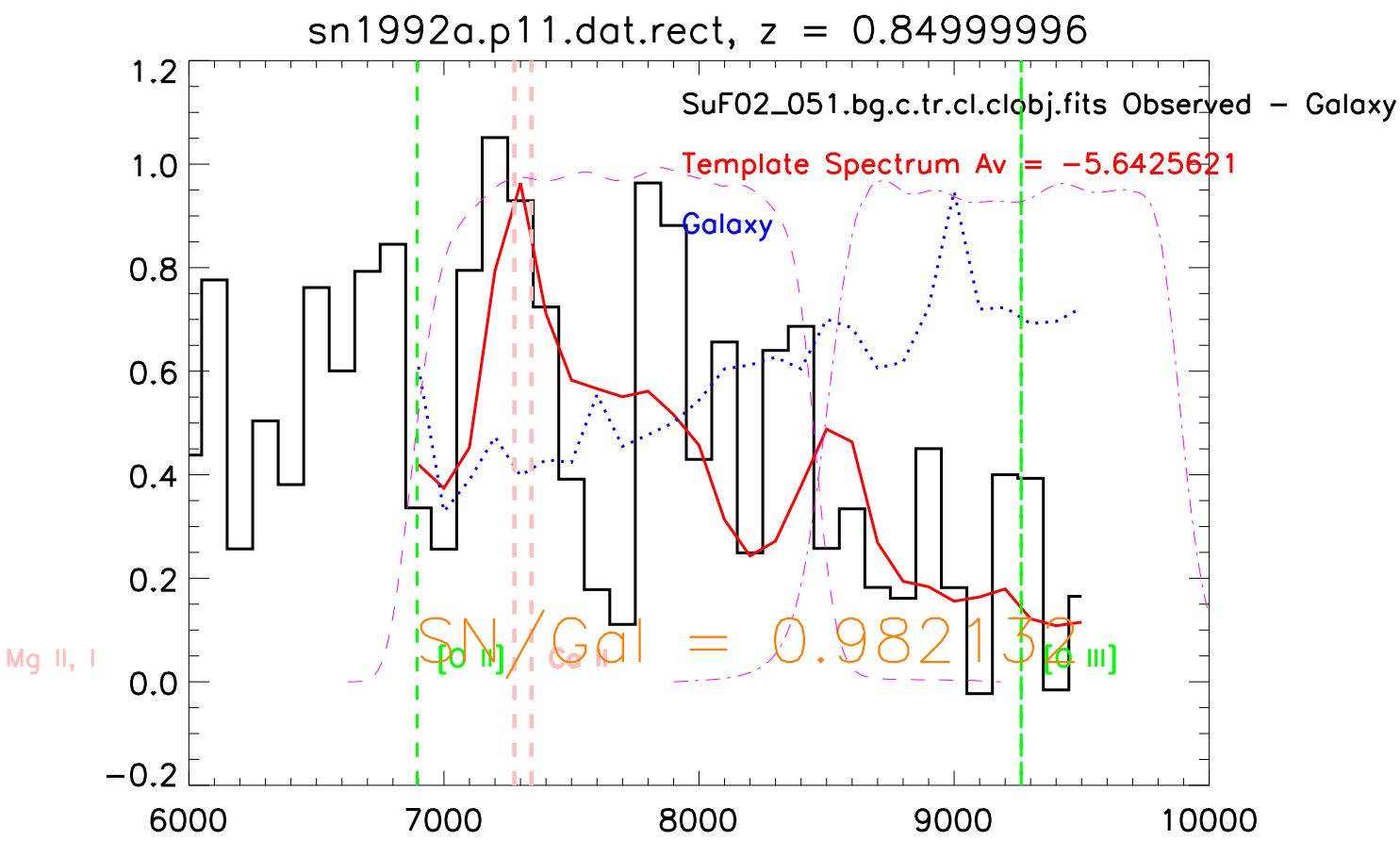

sn1981b.p29.dat.rect, z = 0.80999994
SuF02_051.bg.c.tr.cl.dlobj.fits Observed – Galaxy
Template Spectrum Av = −5.3469186
Galaxy
SN/Gal = 0.8151174
Mg II, I
[O II]
Ca II
[O III]
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

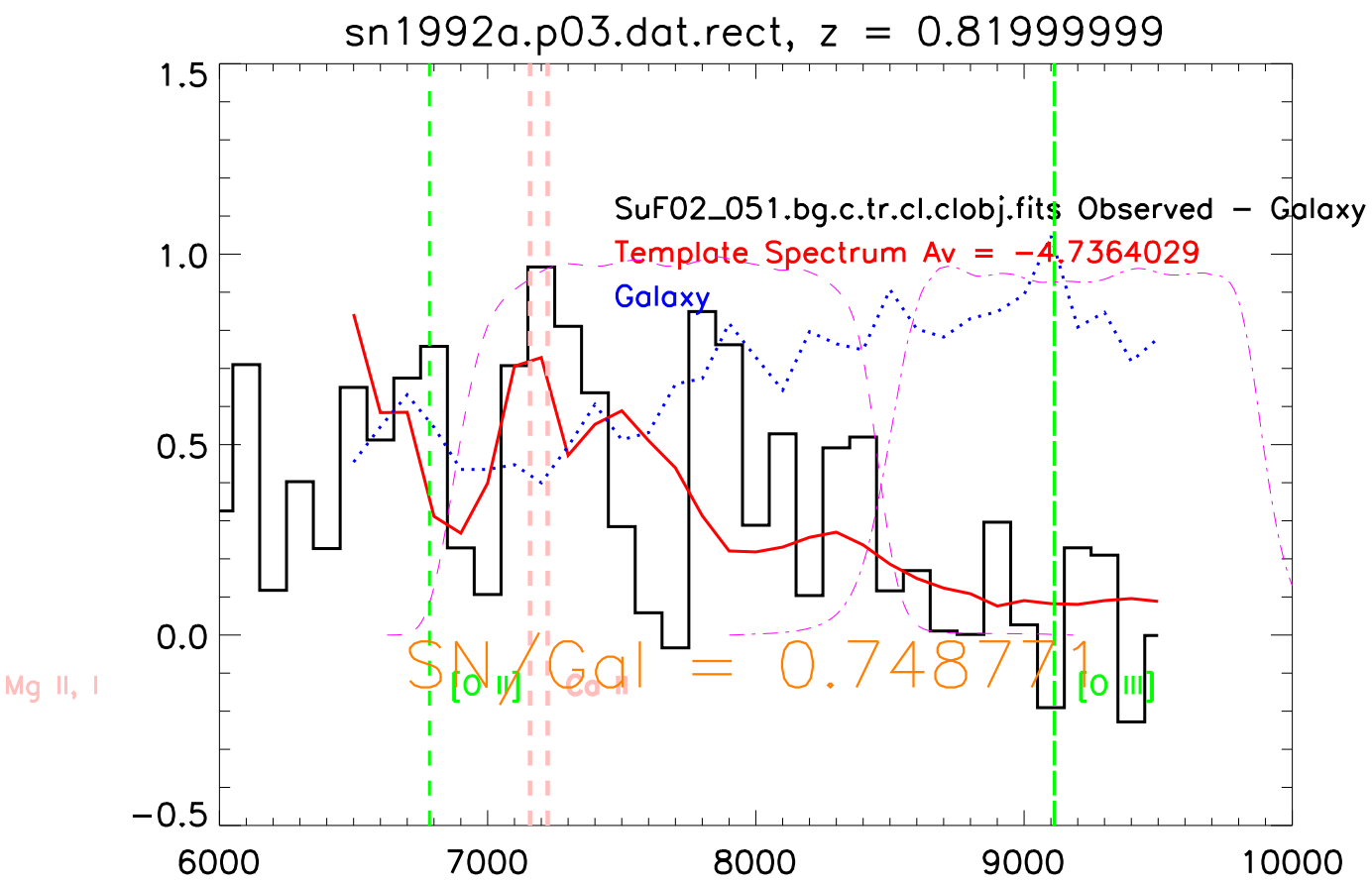

sn1992a.p06.dat.rect, z = 0.81999999
SuF02_051.bg.c.tr.cl.clobj.fits Observed − Galaxy
Template Spectrum Av = −4.8788028
Galaxy
SN/Gal = 0.877462
[O II]
Ca II
[O III]
Mg II, I
1.2
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
6000
7000
8000
9000
10000

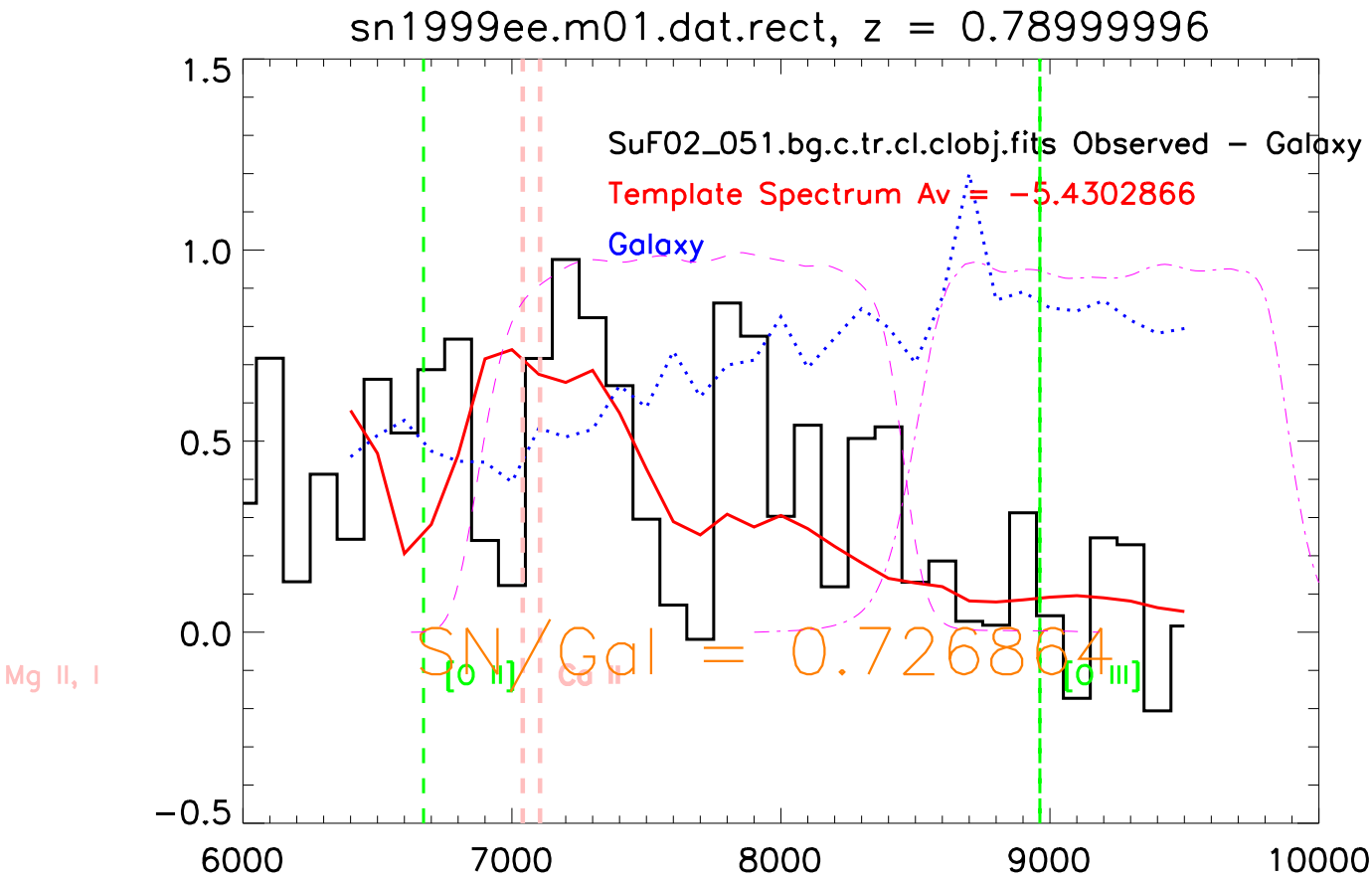

sn1999ee.p03.dat.rect, z = 0.78999996
SuF02_051.bg.c.tr.cl.clobj.fits Observed − Galaxy
Template Spectrum Av = −4.4083439
Galaxy
SN/Gal = 0.772182
[O II]
Ca II
[O III]
Mg II, I
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

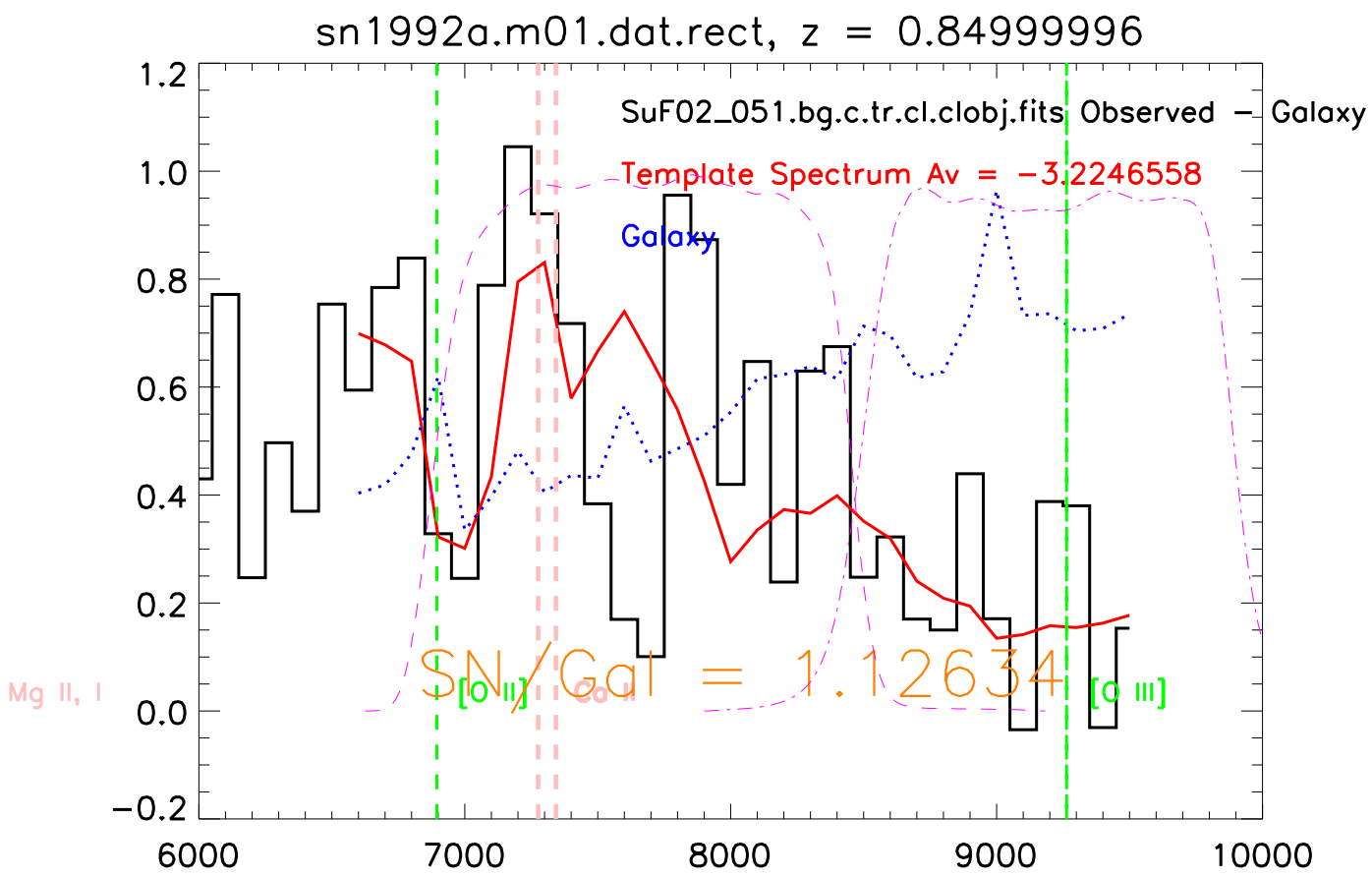

sn1999ee.p20.dat.rect, z = 0.81999999
SuFC2_051.bg.c.tr.cl.clobj.fits Observed − Galaxy
Template Spectrum Av = −5.7390358
Galaxy
SN/Gal = 0.805737
Mg II, I
[O II]
Ca II
[O III]
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000


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