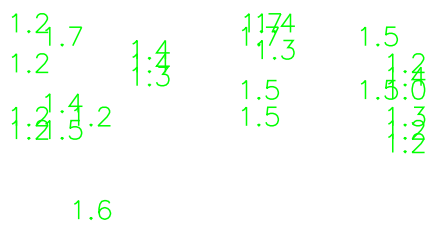
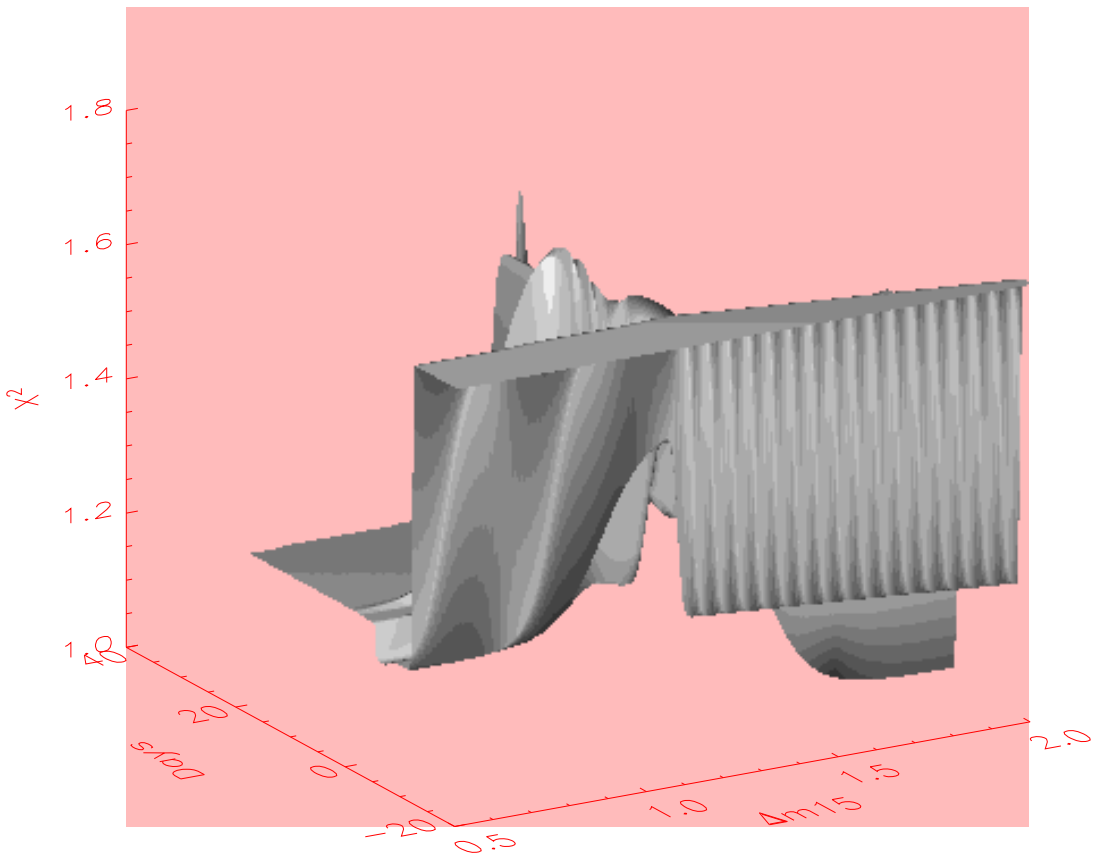
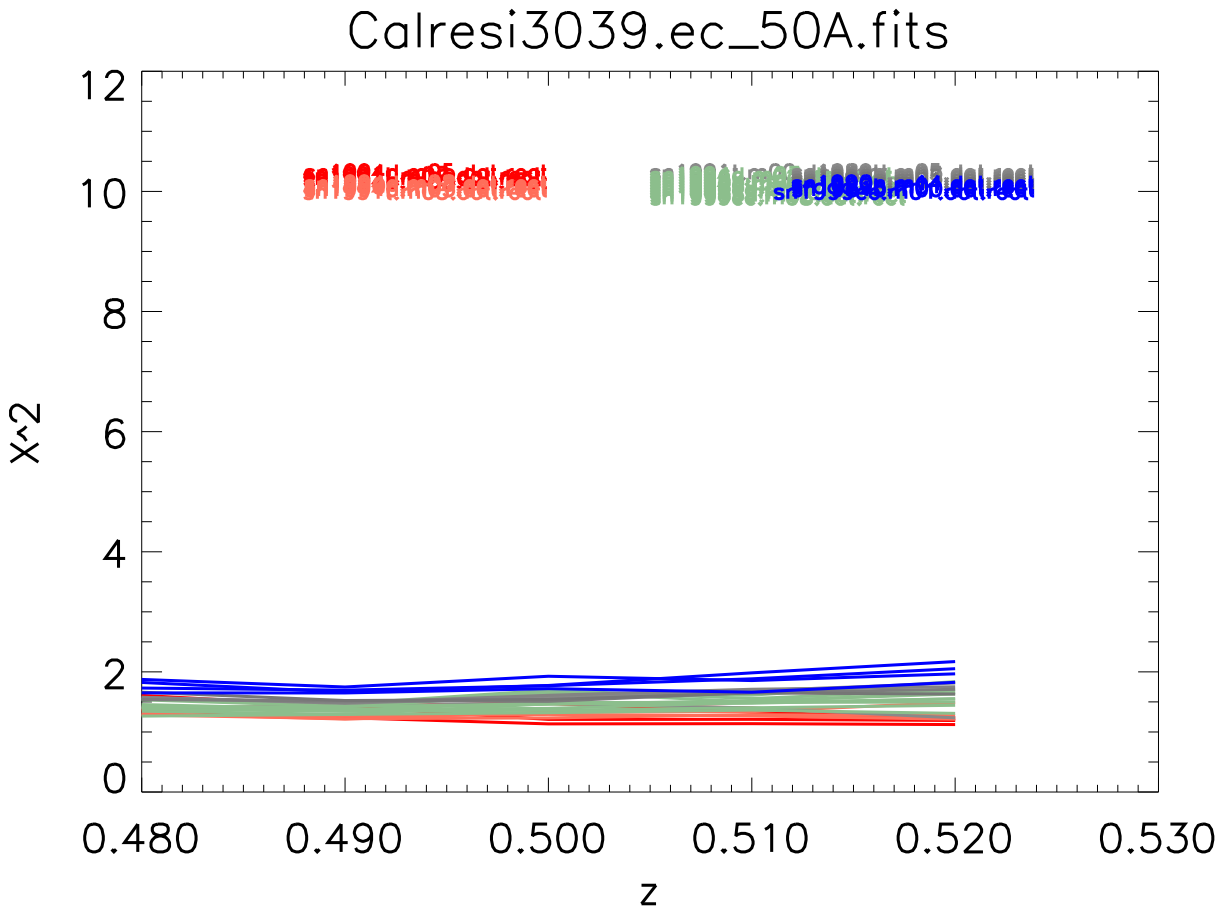
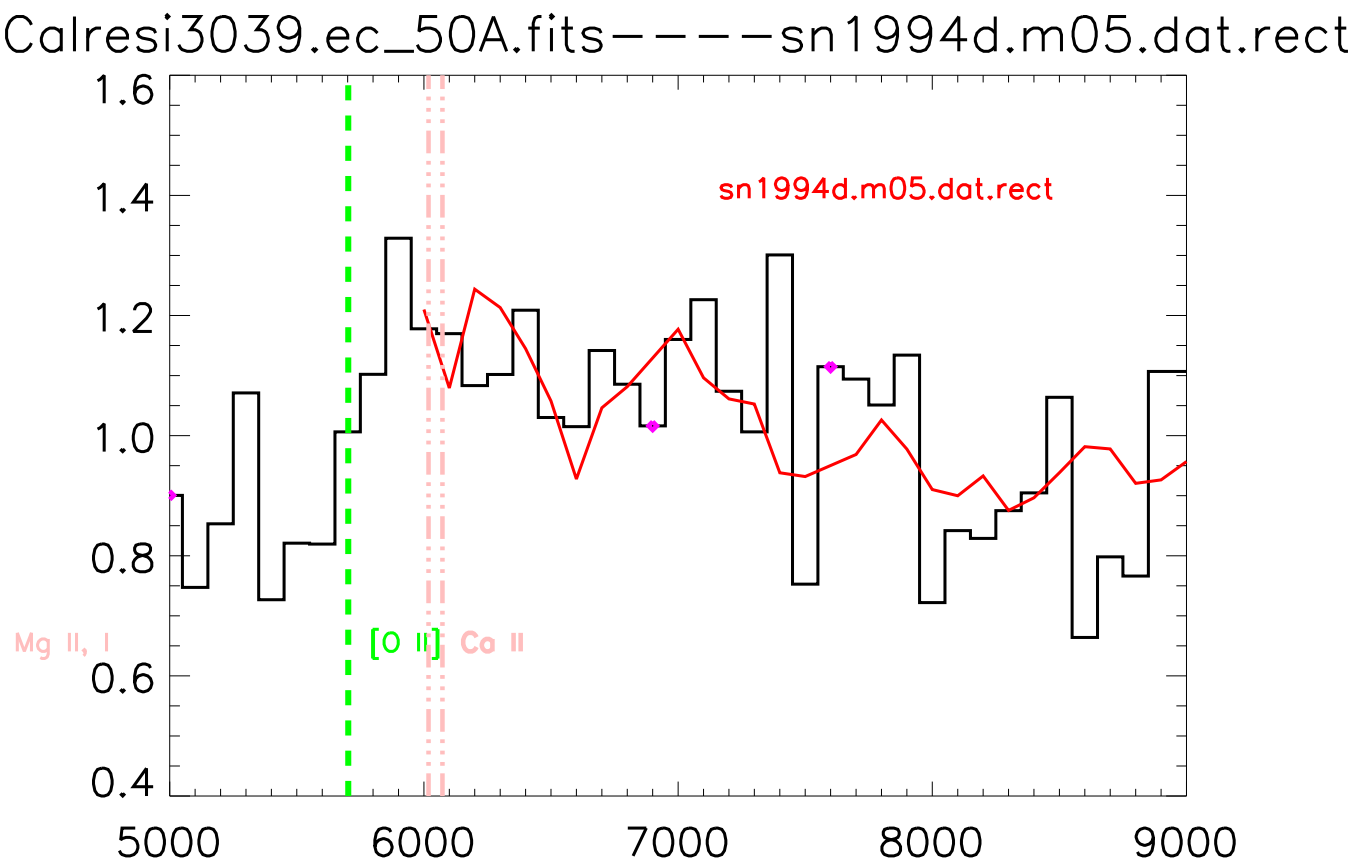

1.2
1.7
1.2
1.4
1.3
1.4
1.2
1.5
1.6
1.5
1.3
1.5
1.5
1.5
1.2



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
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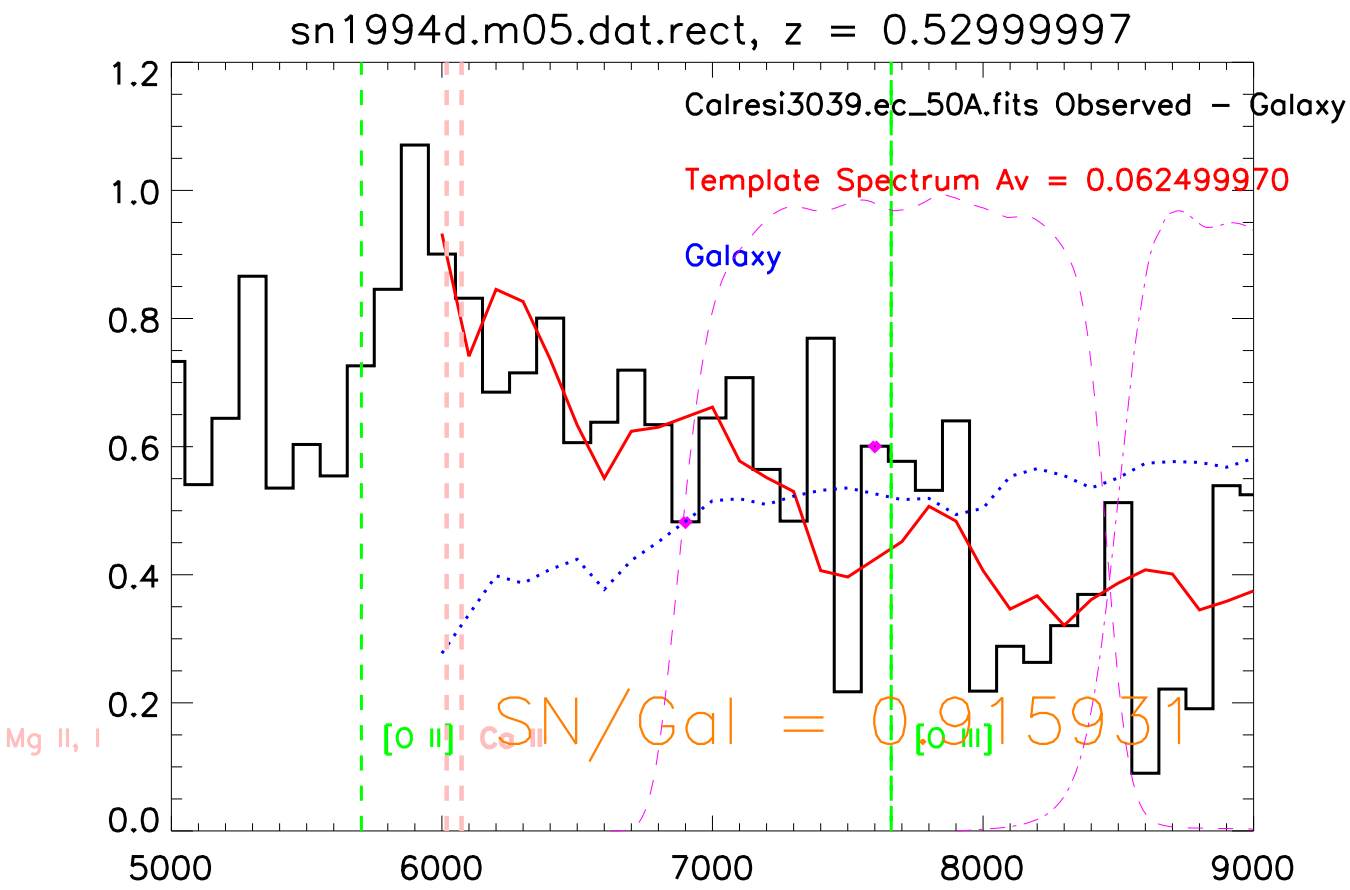
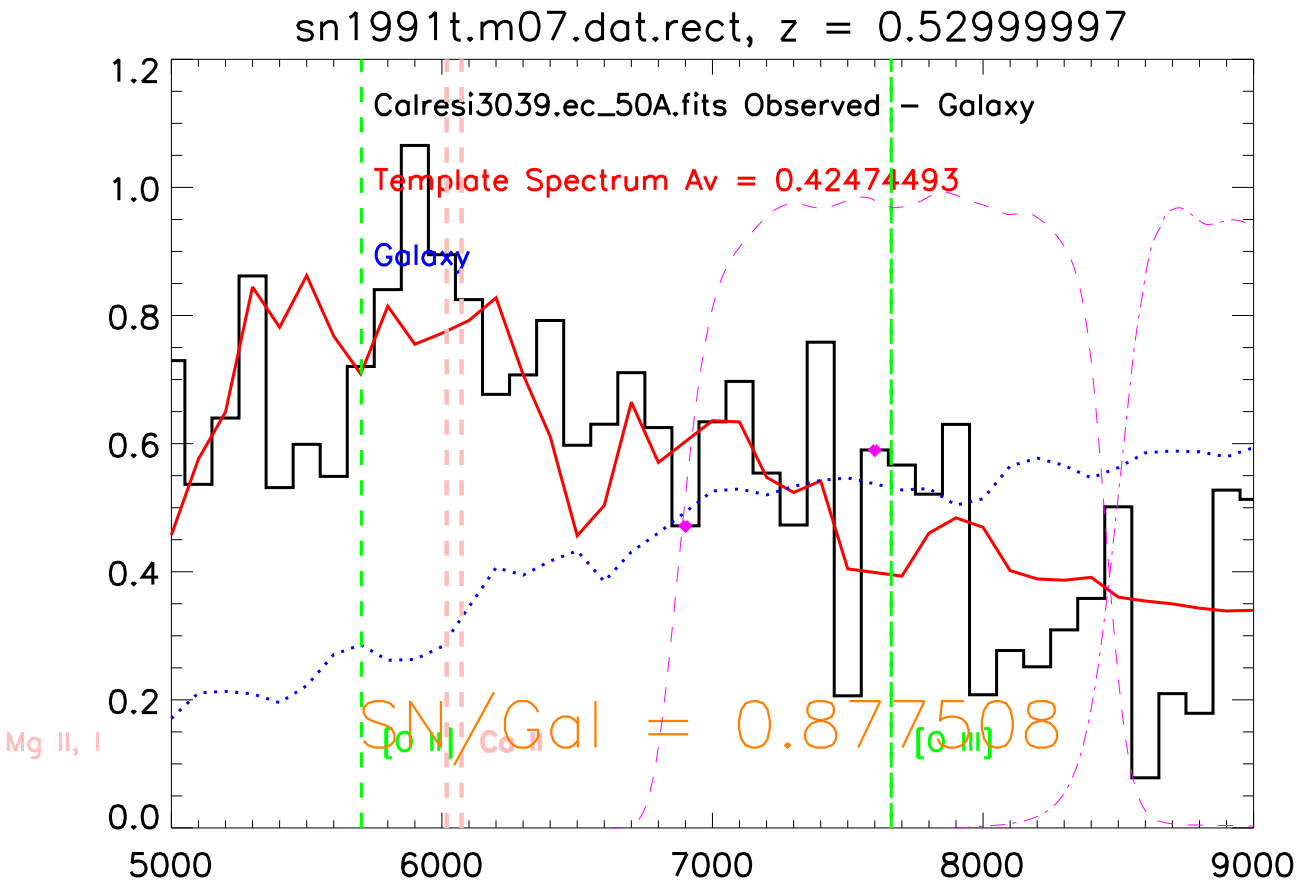
0.4
5000
6000
7000
8000
9000


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
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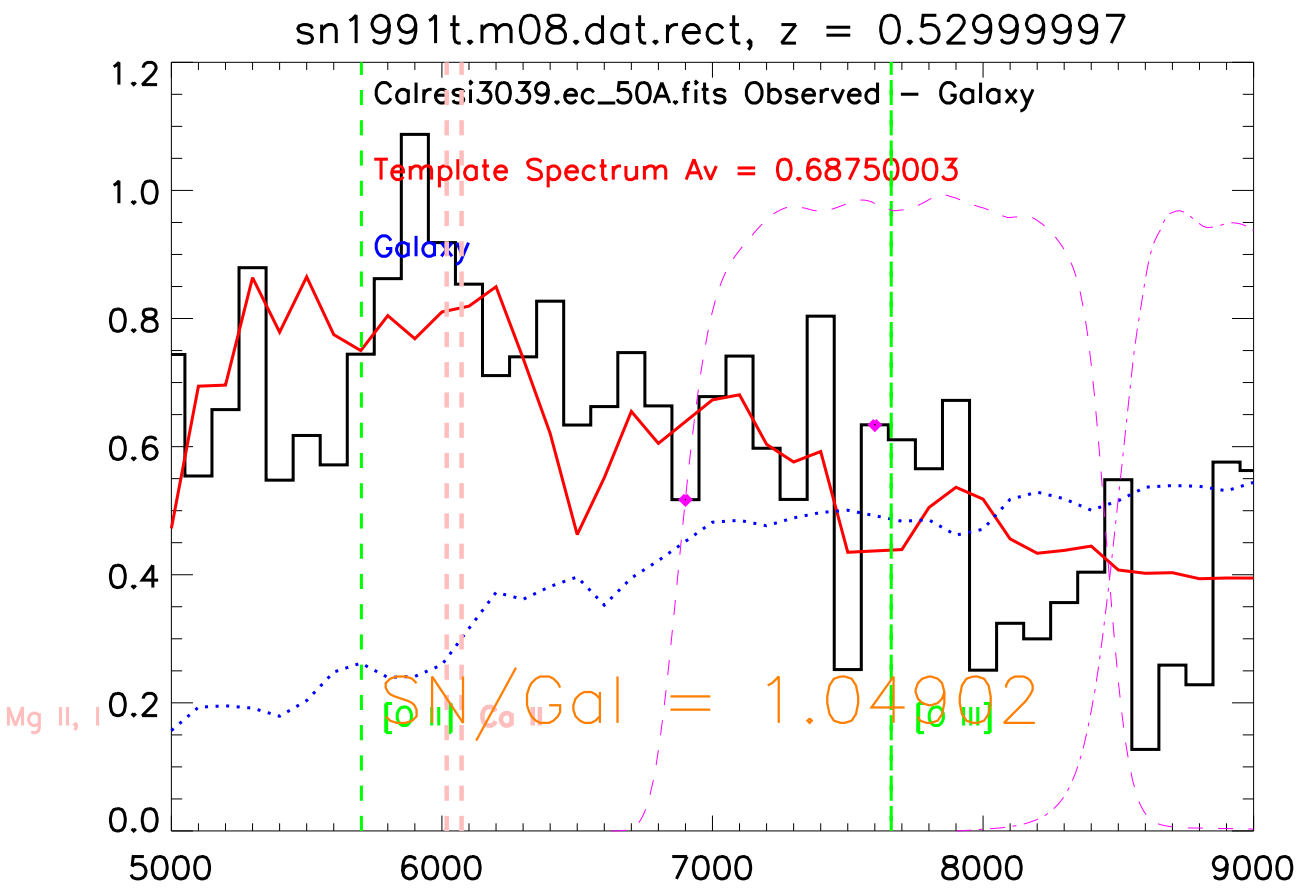
7000
8000
9000


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
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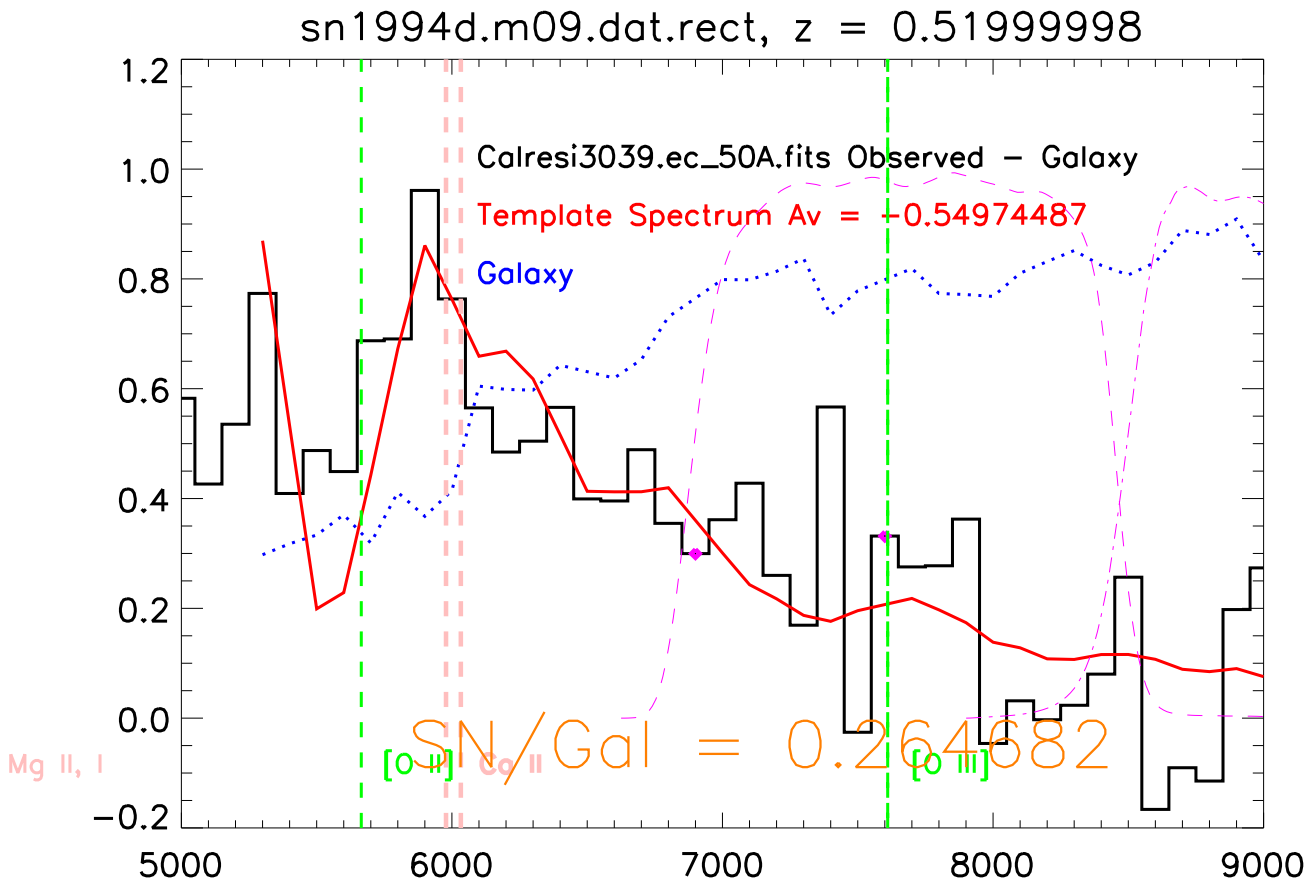
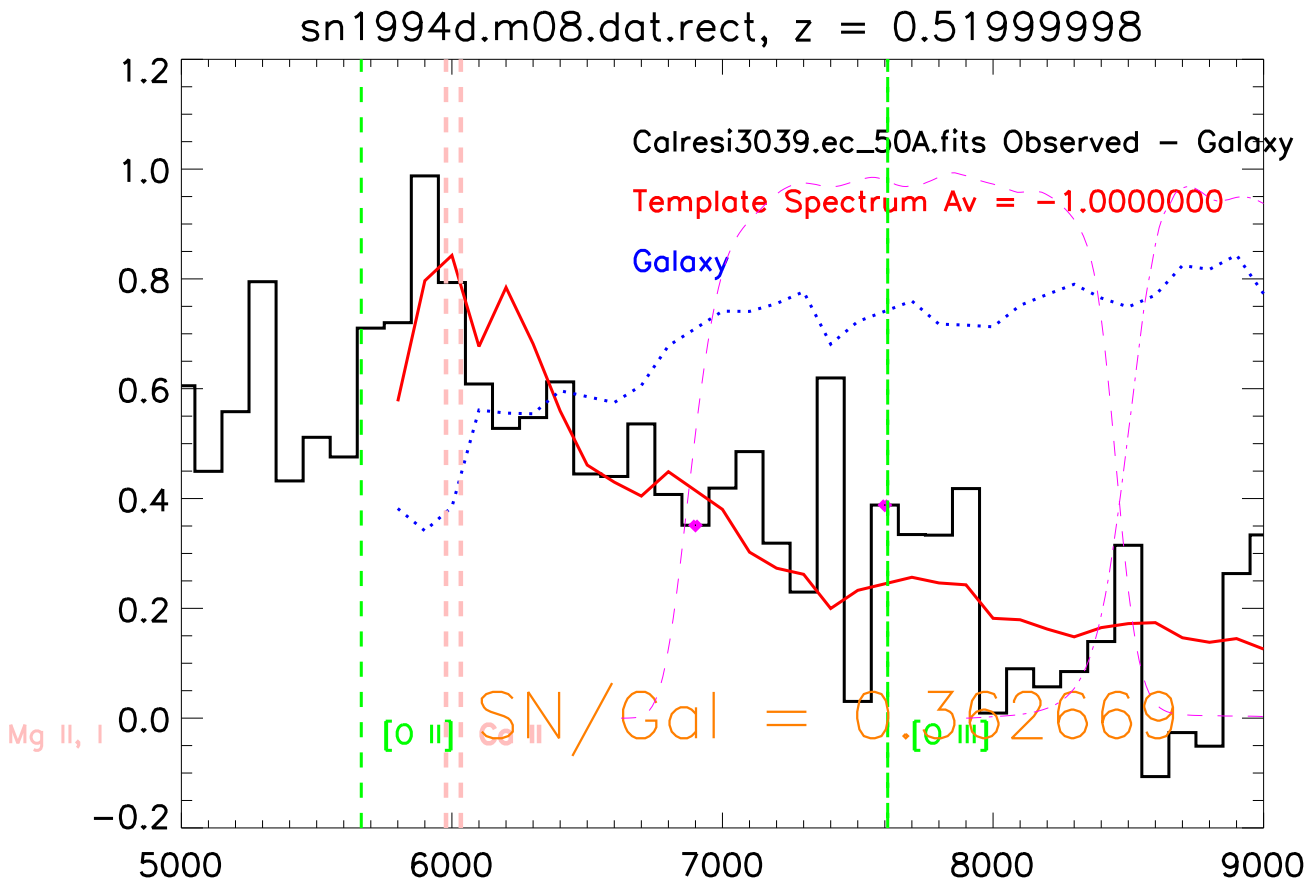
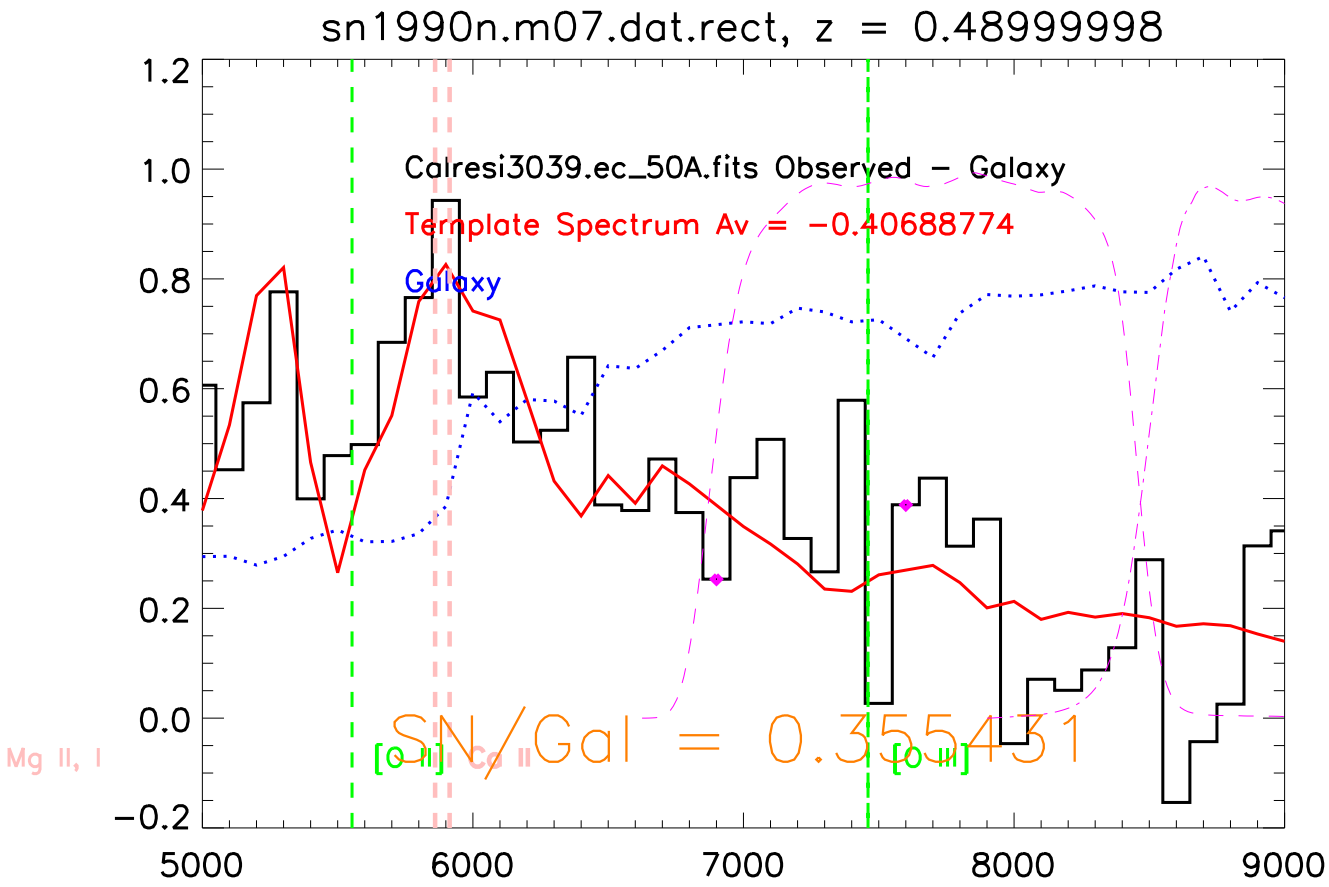
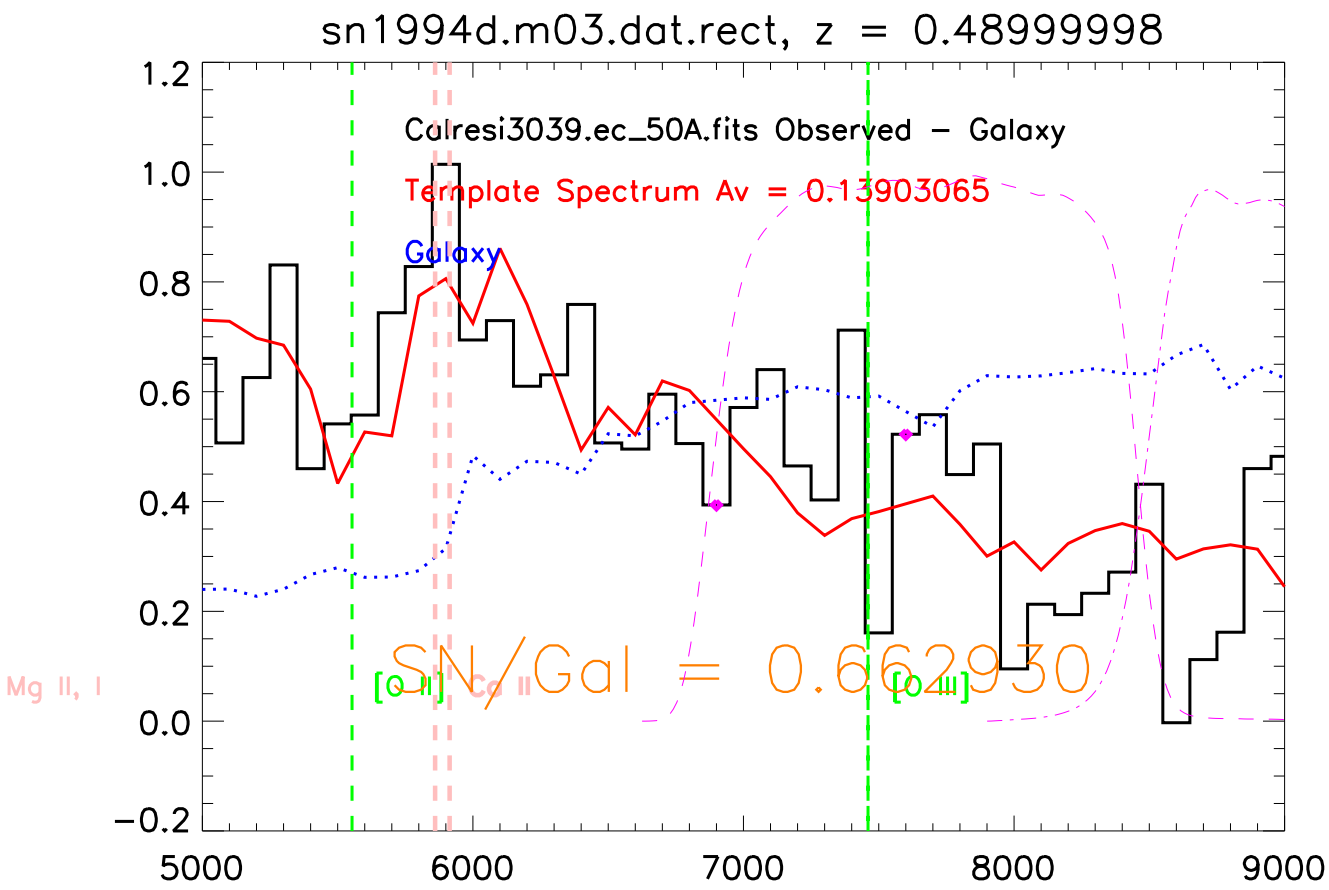
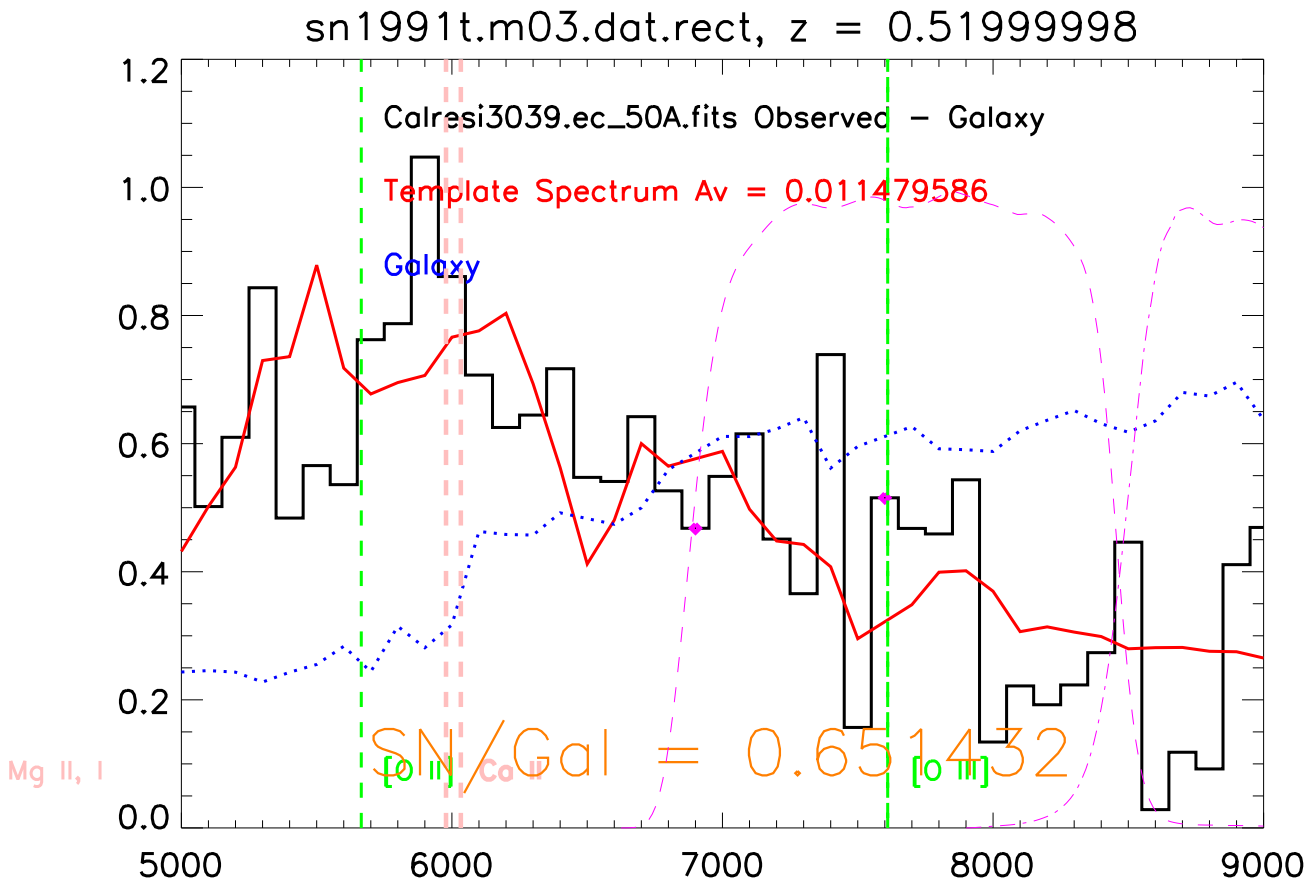
6000
7000
8000
9000

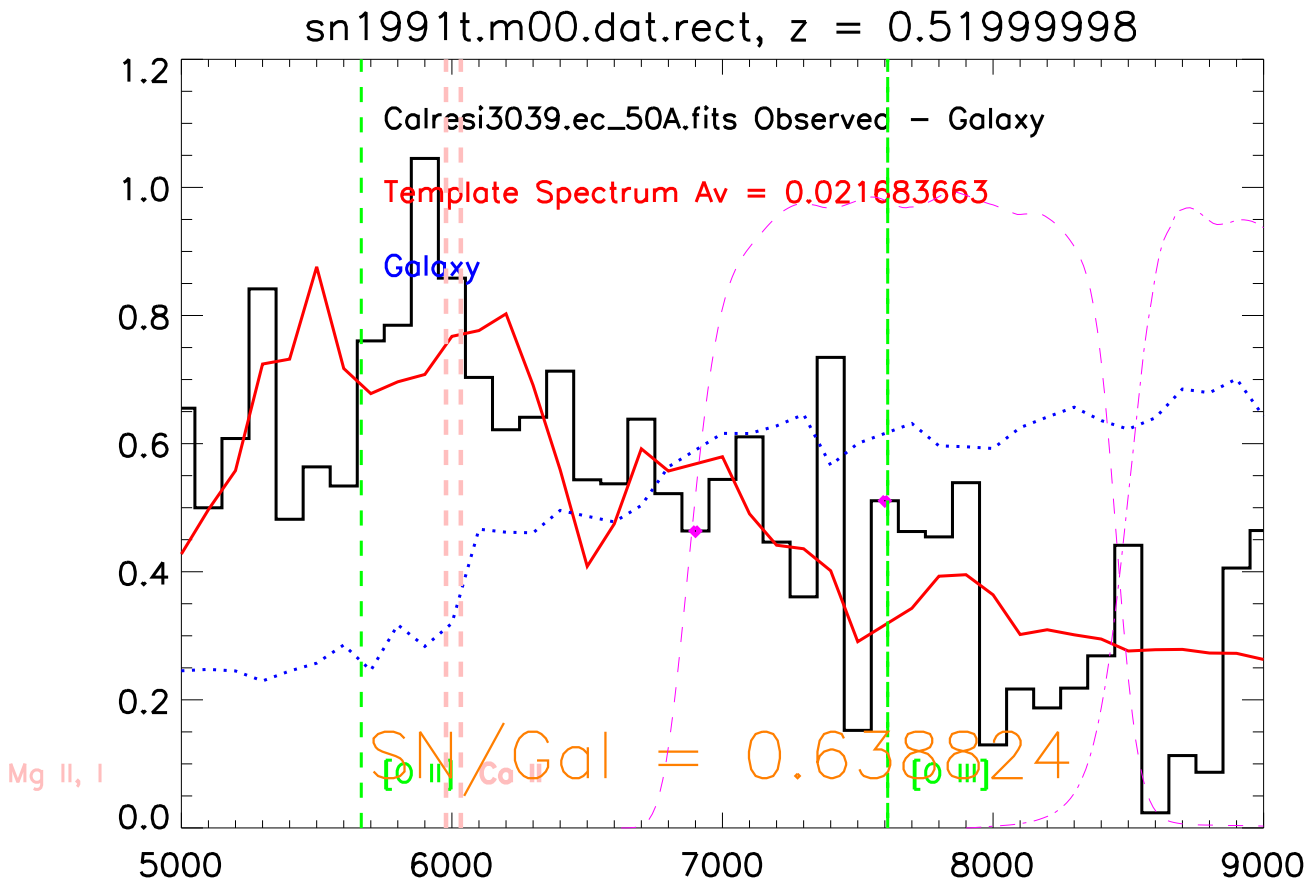

sn1994d.m09.dat.rect, z = 0.51999998
Calresi3039.ec_50A.fits Observed − Galaxy
Template Spectrum Av = 0.54974487
Galaxy
SN/Gal = 0.264682
Mg II, I
[O II]
Ca II
[O III]
1.2
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
5000
6000
7000
8000
9000

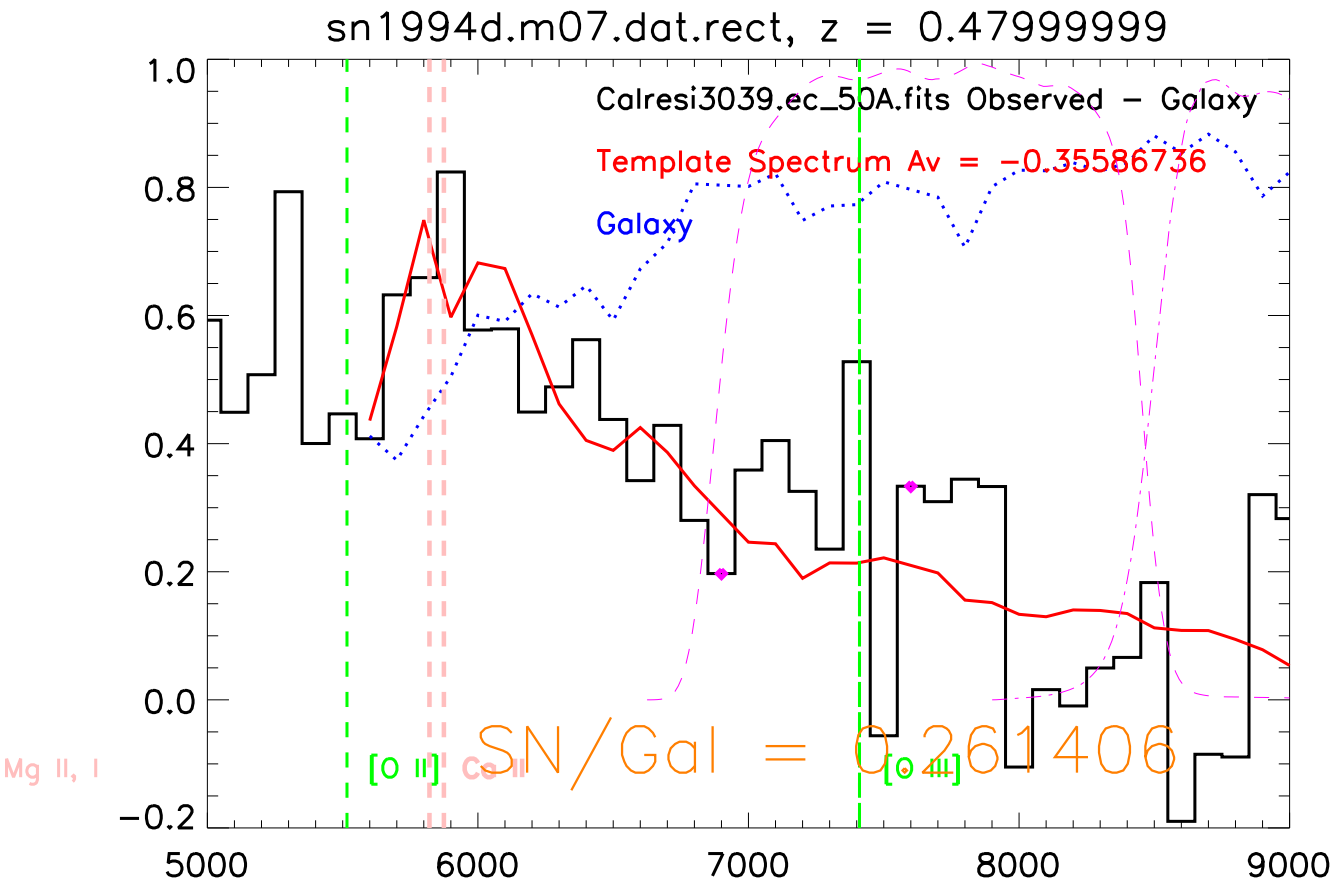

sn1994d.m08.dat.rect, z = 0.51999998
Calresi3039.ec_50A.fits Observed − Galaxy
Template Spectrum Av = −1.0000000
Galaxy
SN/Gal = 0.362669
Mg II, I
[O II]
Ca II
[O III]
1.2
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
5000
6000
7000
8000
9000

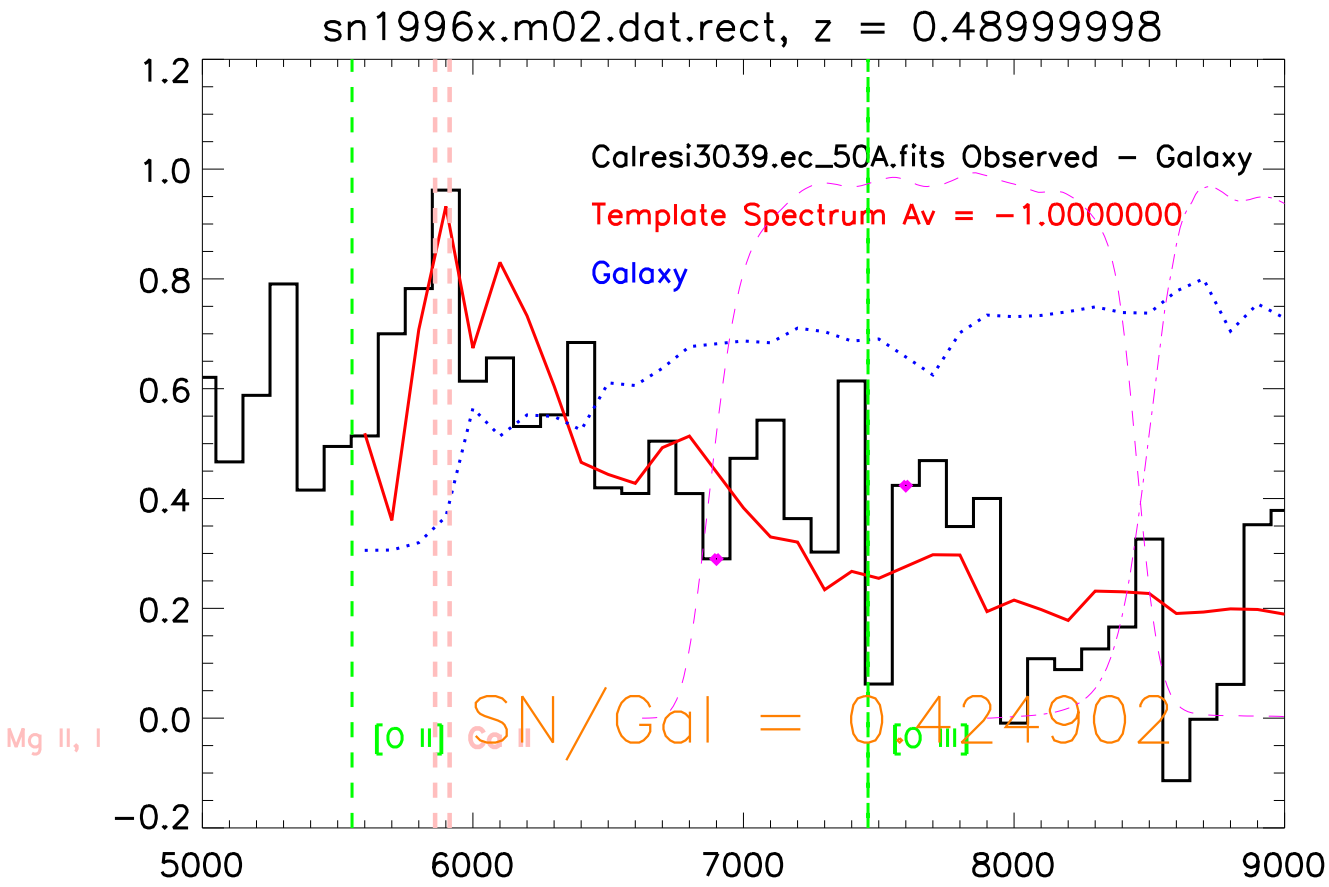

sn1990n.m07.dat.rect, z = 0.48999998
Calresi3039.ec_50A.fits Observed − Galaxy
Template Spectrum Av = −0.40688774
Galaxy
SN/Gal = 0.355431
Mg II, I
[O II]
Ca II
[O III]
1.2
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
5000
6000
7000
8000
9000

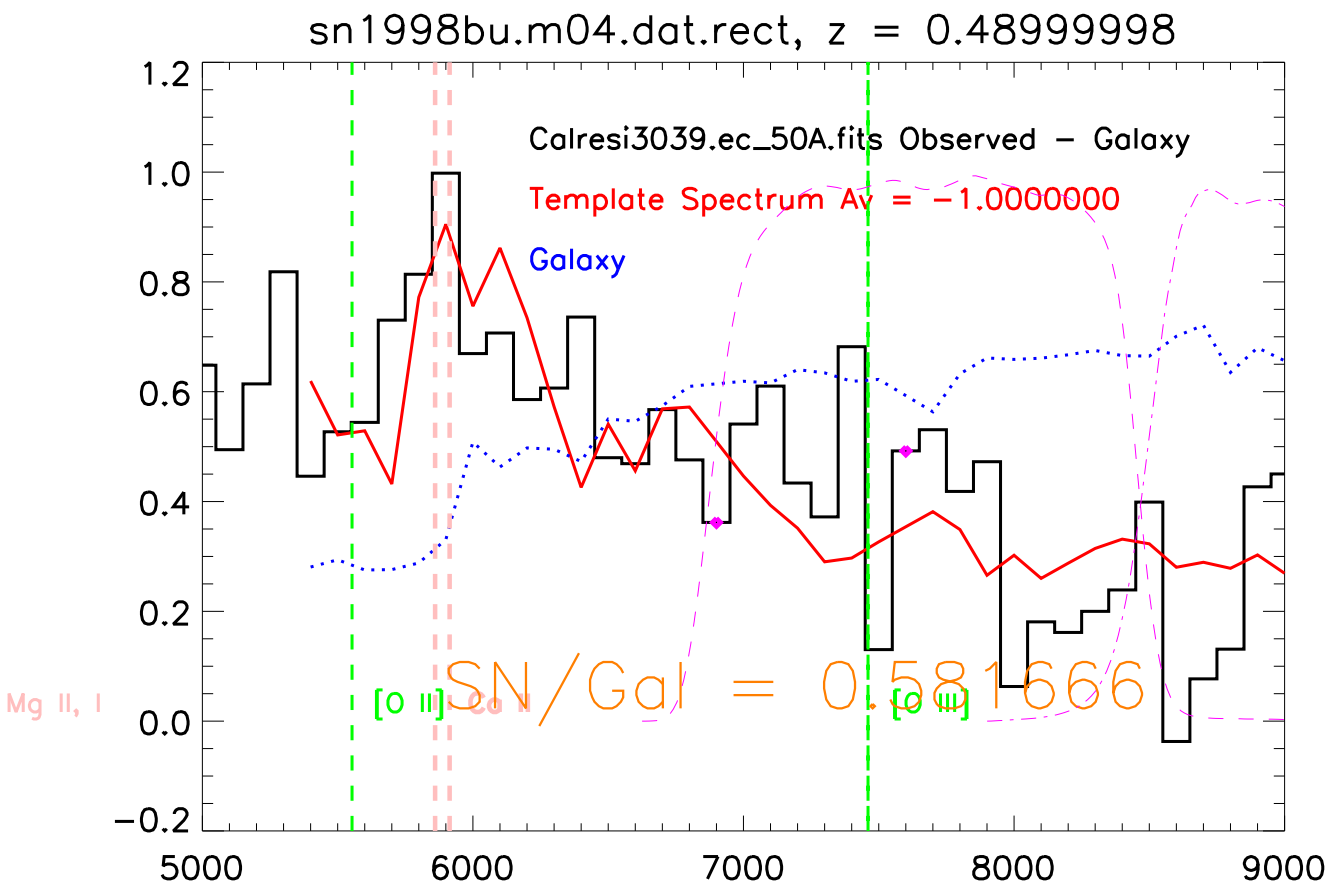

sn1994d.m03.dat.rect, z = 0.48999998
Calresi3039.ec_50A.fits Observed − Galaxy
Template Spectrum Av = 0.13903065
Galaxy
SN/Gal = 0.662930
Mg II, I
[O II]
Ca II
[O III]
1.2
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
5000
6000
7000
8000
9000

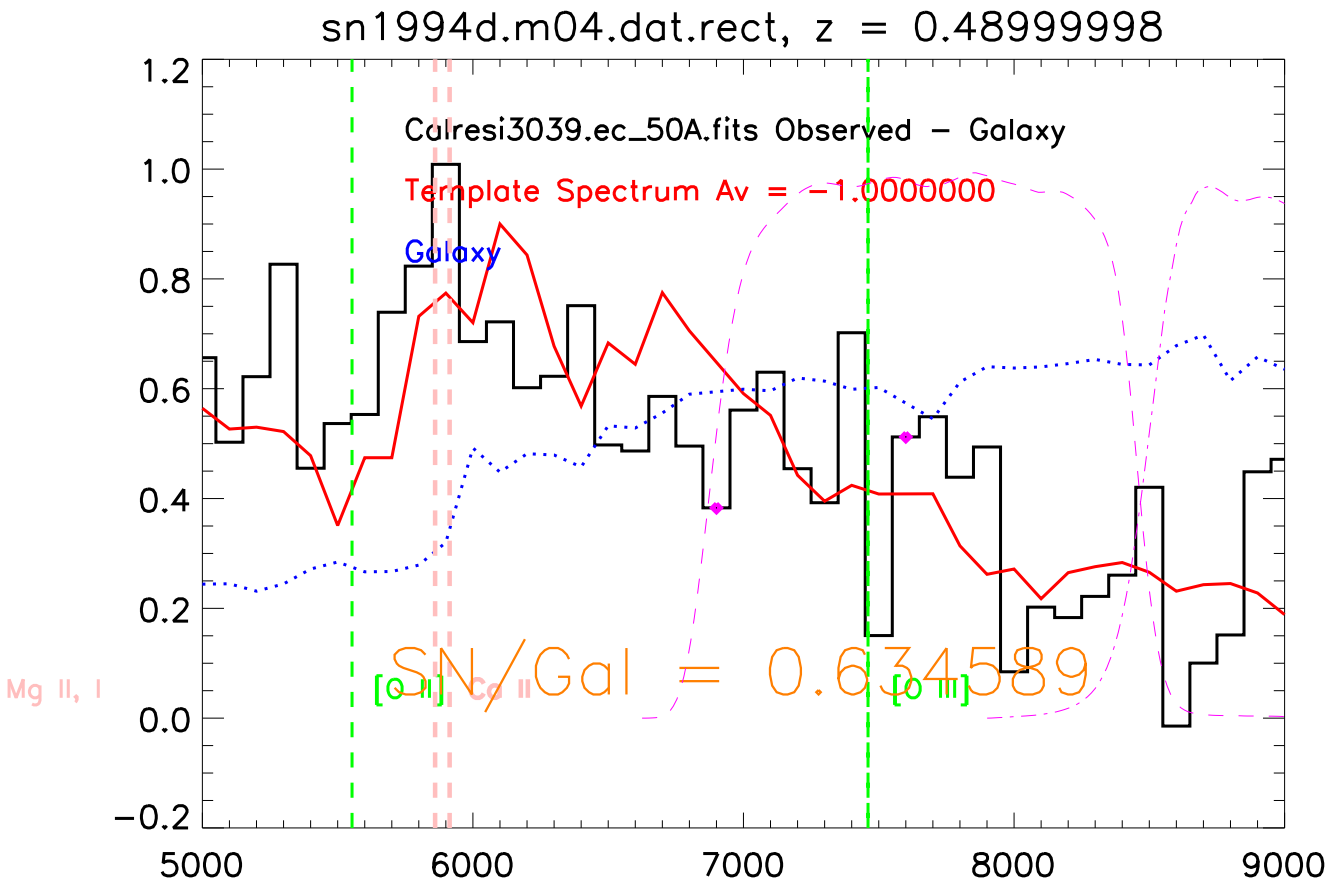

sn1991t.m03.dat.rect, z = 0.51999998
Calresi3039.ec_50A.fits Observed − Galaxy
Template Spectrum Av = 0.011479586
Galaxy
SN/Gal = 0.651432
Mg II, I
[O II]
Ca II
[O III]
1.2
1.0
0.8
0.6
0.4
0.2
0.0
5000
6000
7000
8000
9000

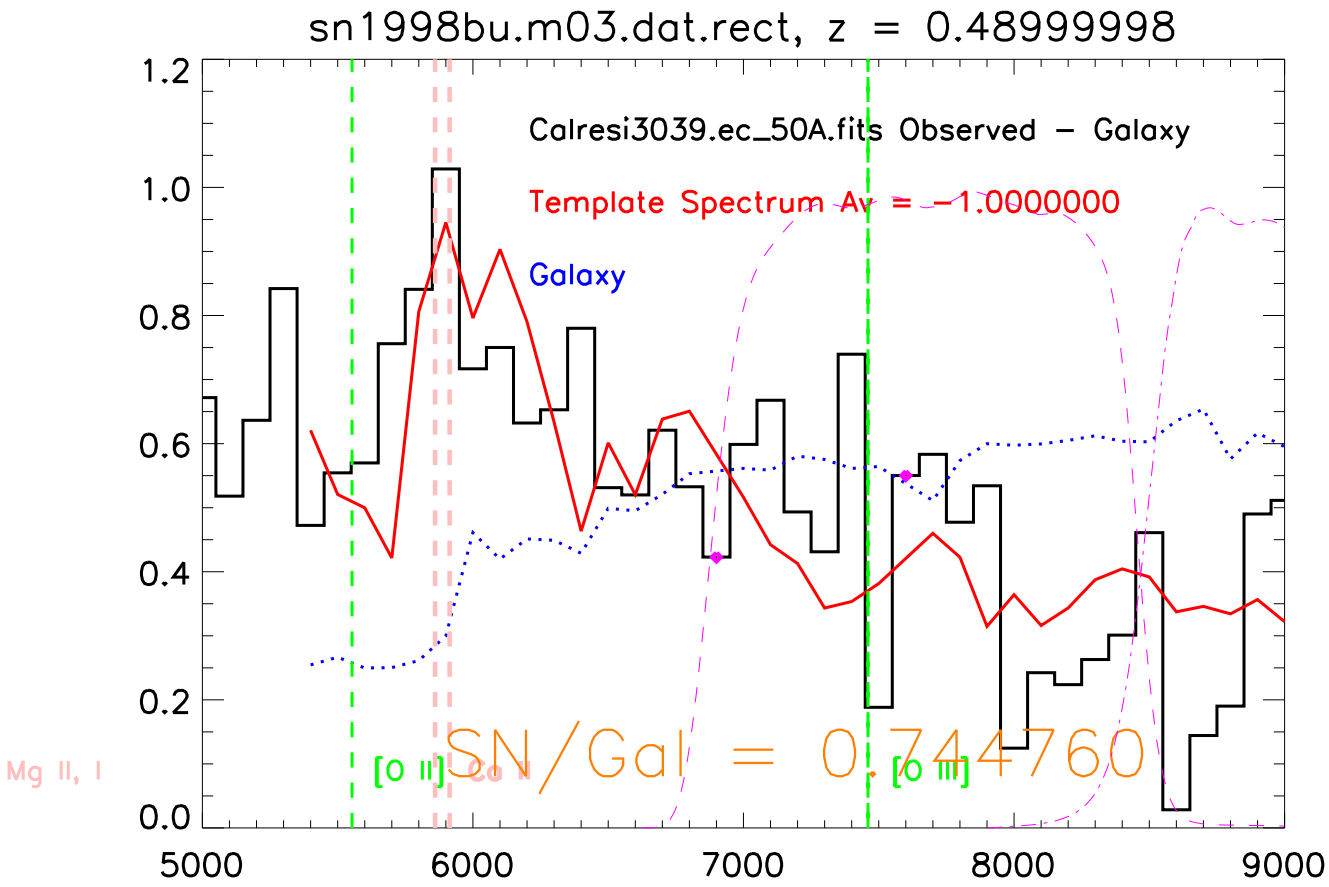

sn1991t.m00.dat.rect, z = 0.51999998
Calresi3039.ec_50A.fits Observed – Galaxy
Template Spectrum Av = 0.021683663
Galaxy
SN/Gal = 0.638824
Mg II, I
[O II]
Ca II
[O III]
1.2
1.0
0.8
0.6
0.4
0.2
0.0
5000
6000
7000
8000
9000

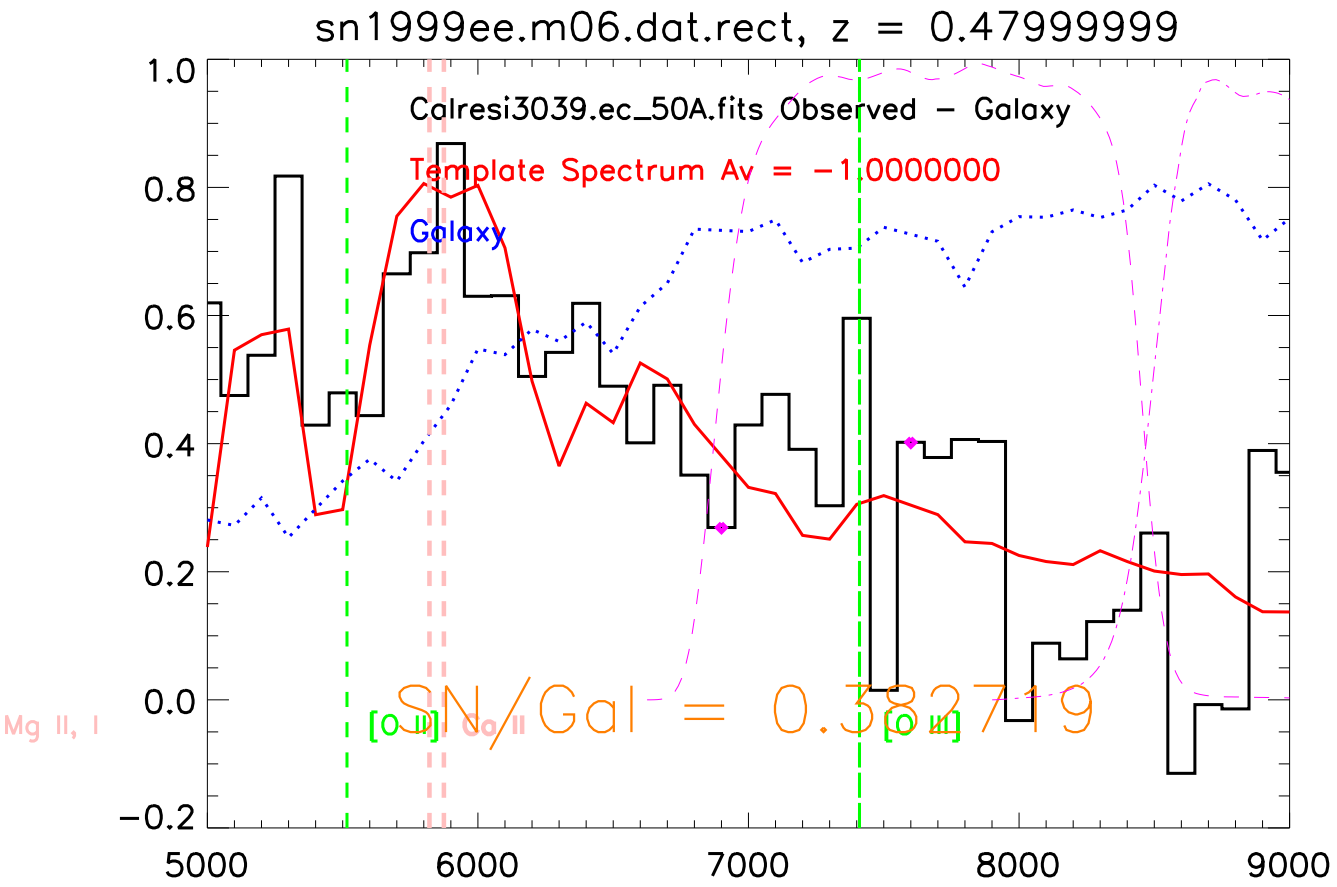

sn1994d.m07.dat.rect, z = 0.47999999
Calresi3039.ec_50A.fits Observed – Galaxy
Template Spectrum Av = –0.35586736
Galaxy
SN/Gal = 0.261406
Mg II, I
[O II]
Ca II
[O III]
1.0
0.8
0.6
0.4
0.2
0.0
–0.2
5000
6000
7000
8000
9000

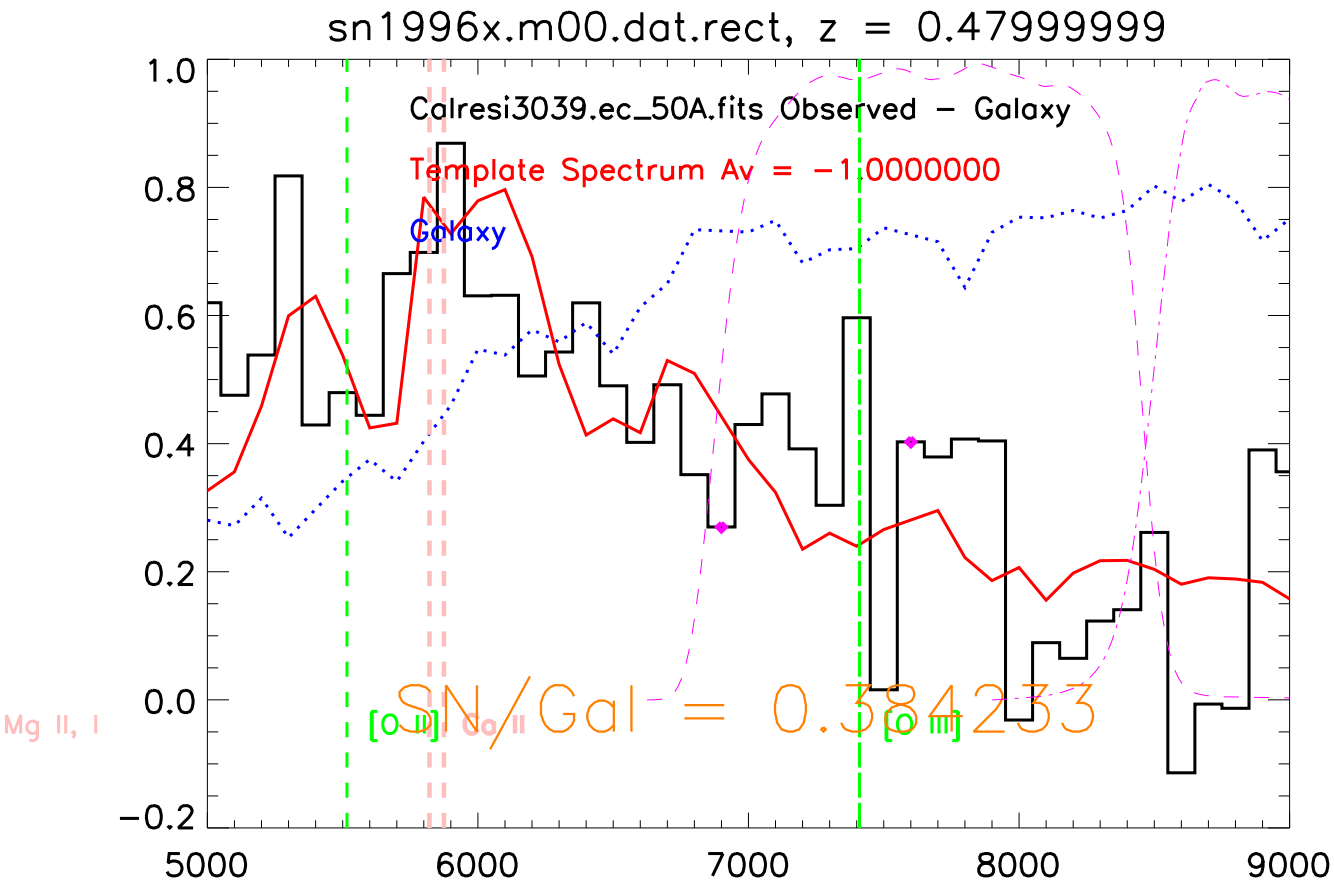

sn1996x.m02.dat.rect, z = 0.48999998
Calresi3039.ec_50A.fits Observed − Galaxy
Template Spectrum Av = −1.0000000
Galaxy
SN/Gal = 0.424902
Mg II, I
[O II]
Ca II
[O III]
1.2
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
5000
6000
7000
8000
9000

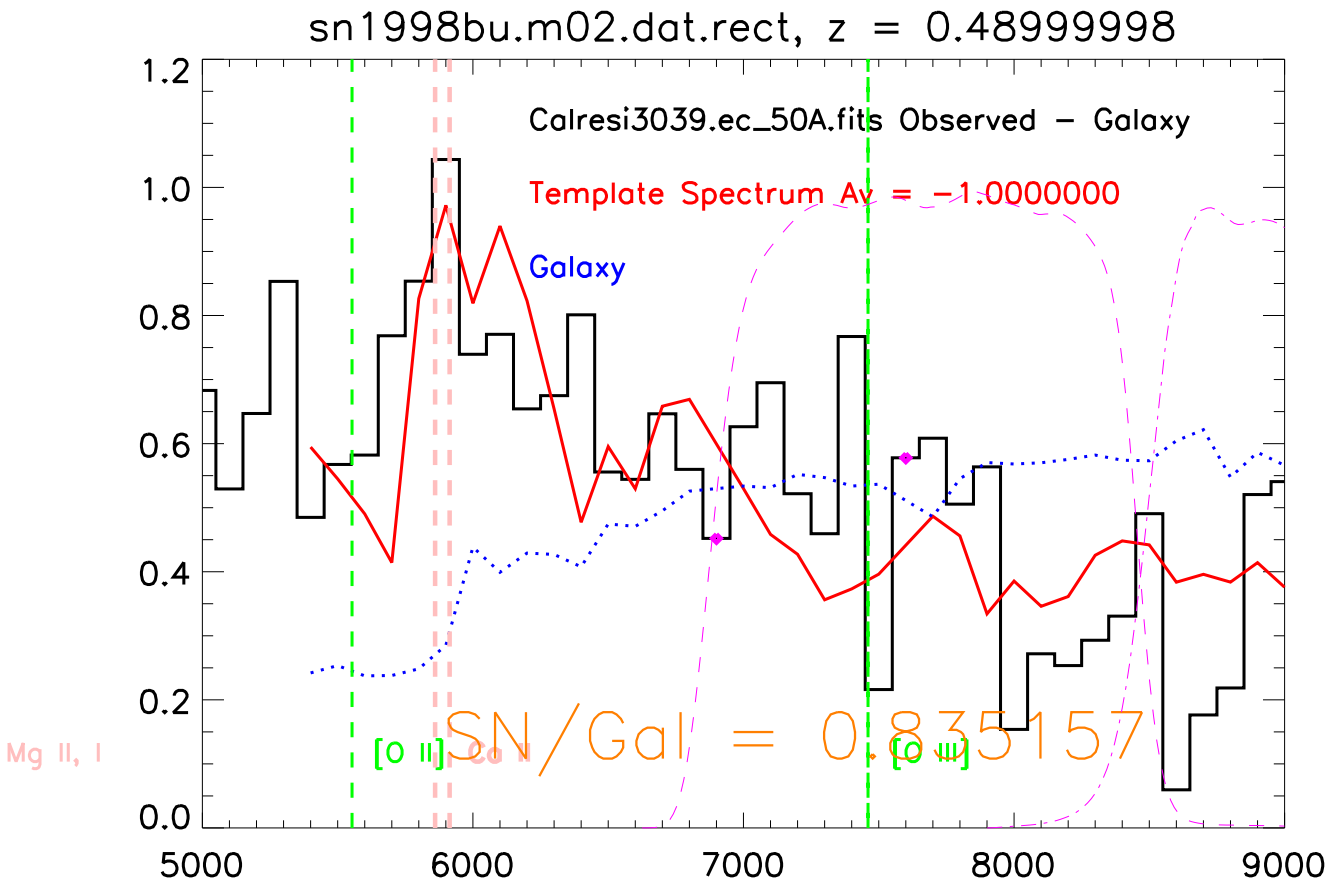

sn1998bu.m04.dat.rect, z = 0.48999998
Calresi3039.ec_50A.fits Observed − Galaxy
Template Spectrum Av = −1.0000000
Galaxy
SN/Gal = 0.581666
Mg II, I
[O II]
Ca II
[O III]
1.2
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
5000
6000
7000
8000
9000

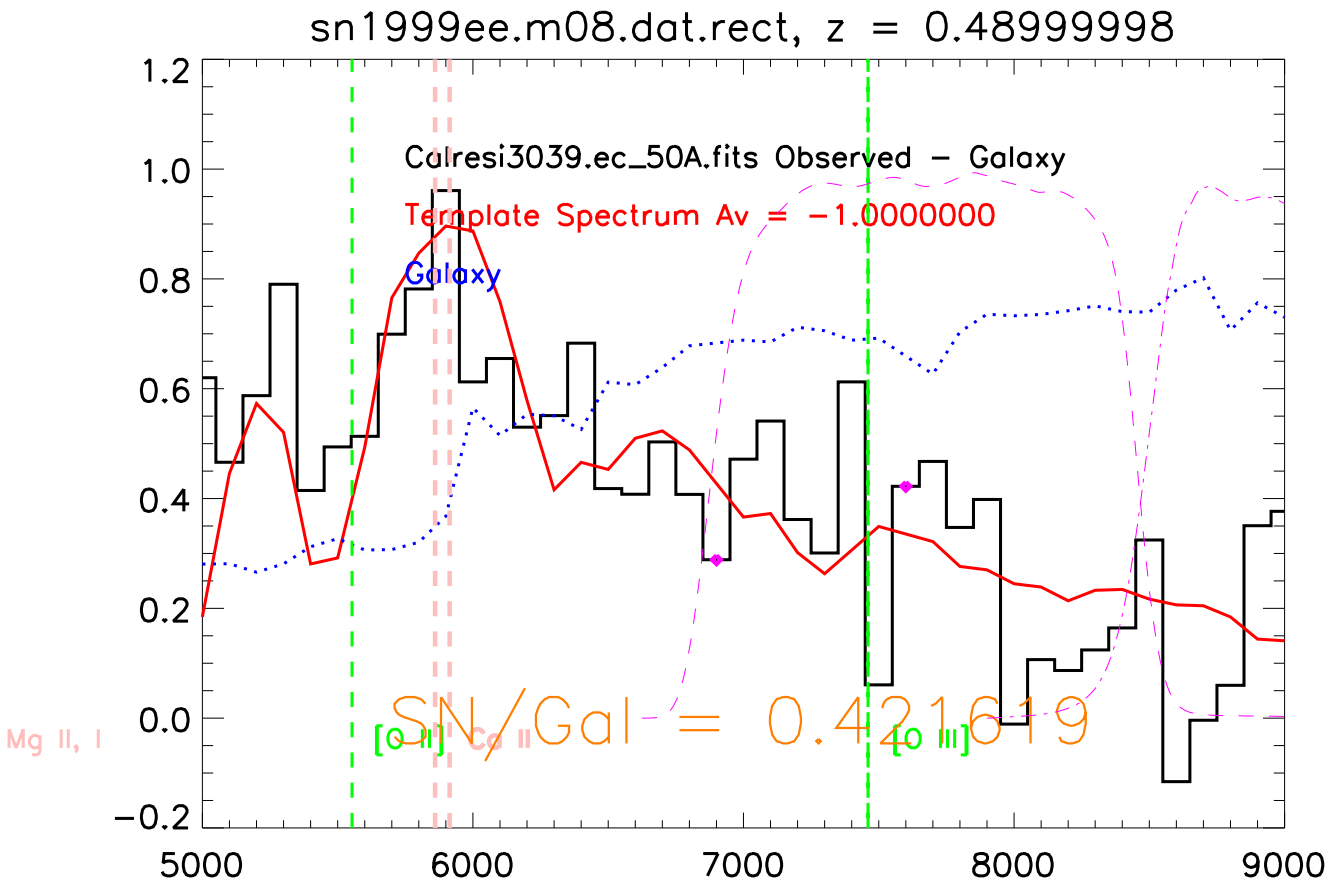

sn1994d.m04.dat.rect, z = 0.48999998
Calresi3039.ec_50A.fits Observed − Galaxy
Template Spectrum Av = −1.0000000
Galaxy
SN/Gal = 0.634589
Mg II, I
[O II]
Ca II
[O III]
1.2
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
5000
6000
7000
8000
9000

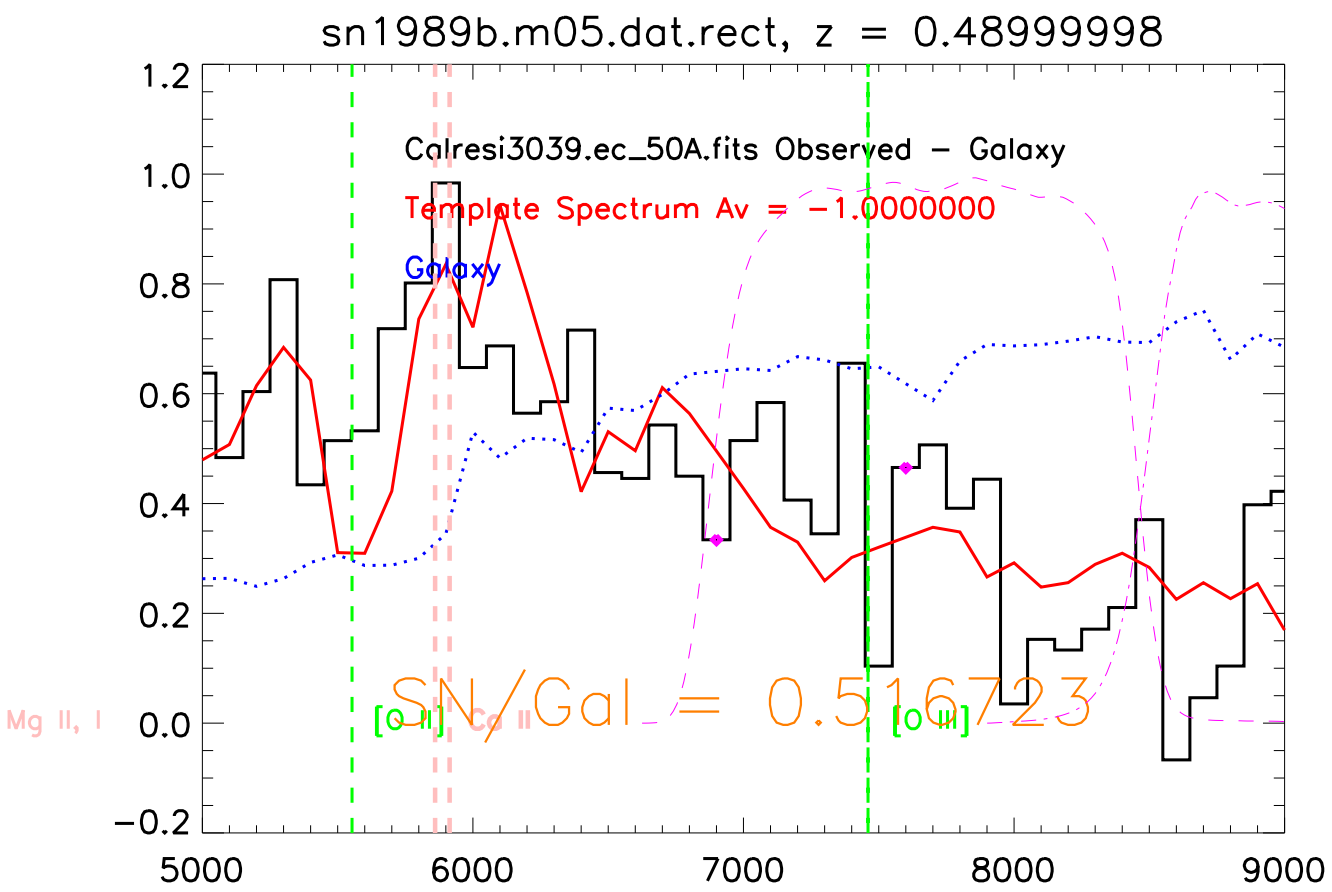

sn1998bu.m03.dat.rect, z = 0.48999998
Calresi3039.ec_50A.fits Observed − Galaxy
Template Spectrum Av = −1.0000000
Galaxy
SN/Gal = 0.744760
[O II]
[O III]
Mg II, I
1.2
1.0
0.8
0.6
0.4
0.2
0.0
5000
6000
7000
8000
9000

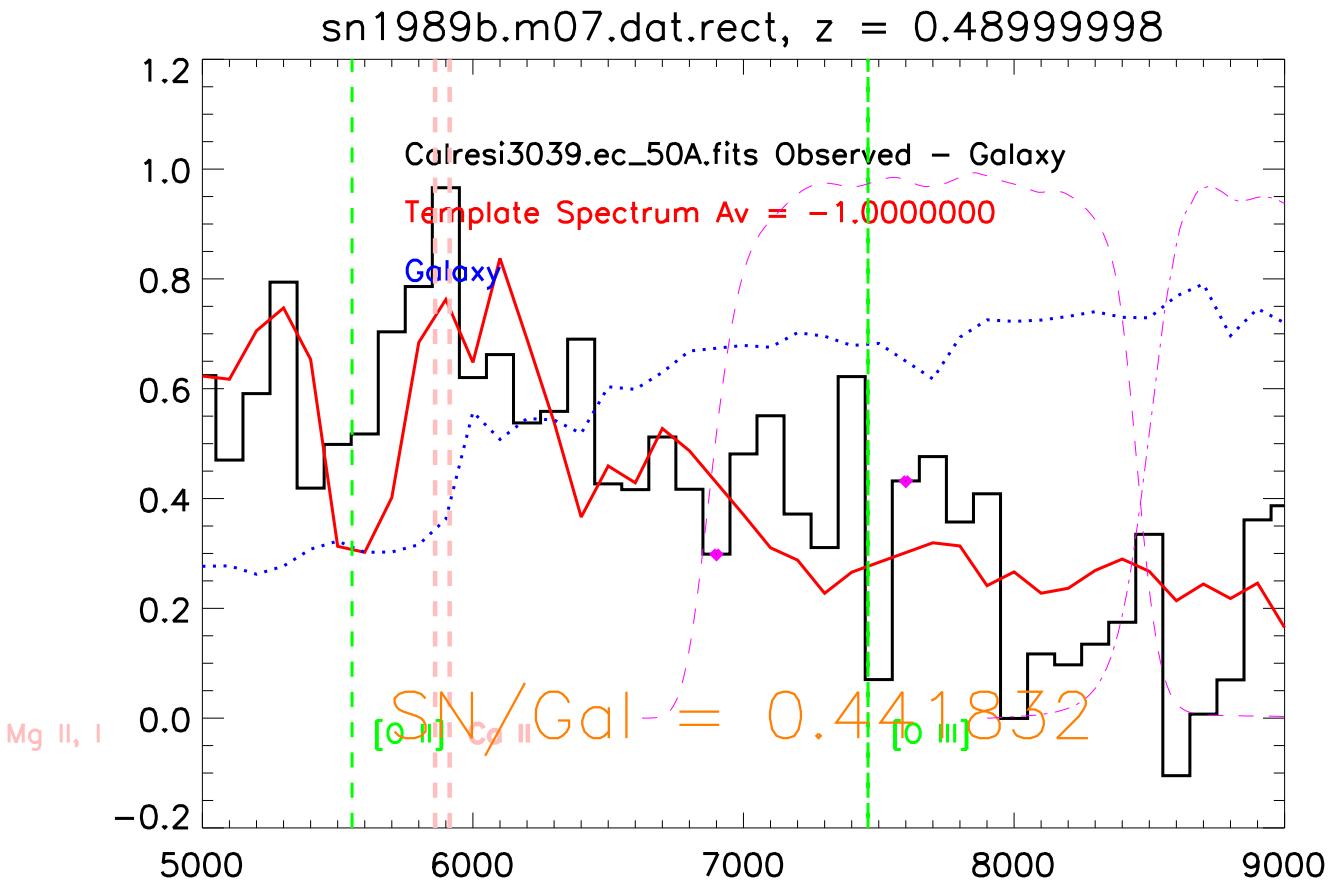

sn1999ee.m06.dat.rect, z = 0.47999999
Calresi3039.ec_50A.fits Observed − Galaxy
Template Spectrum Av = −1.0000000
Galaxy
SN/Gal = 0.382719
Mg II, I
[O II]
Ca II
[O III]
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
5000
6000
7000
8000
9000

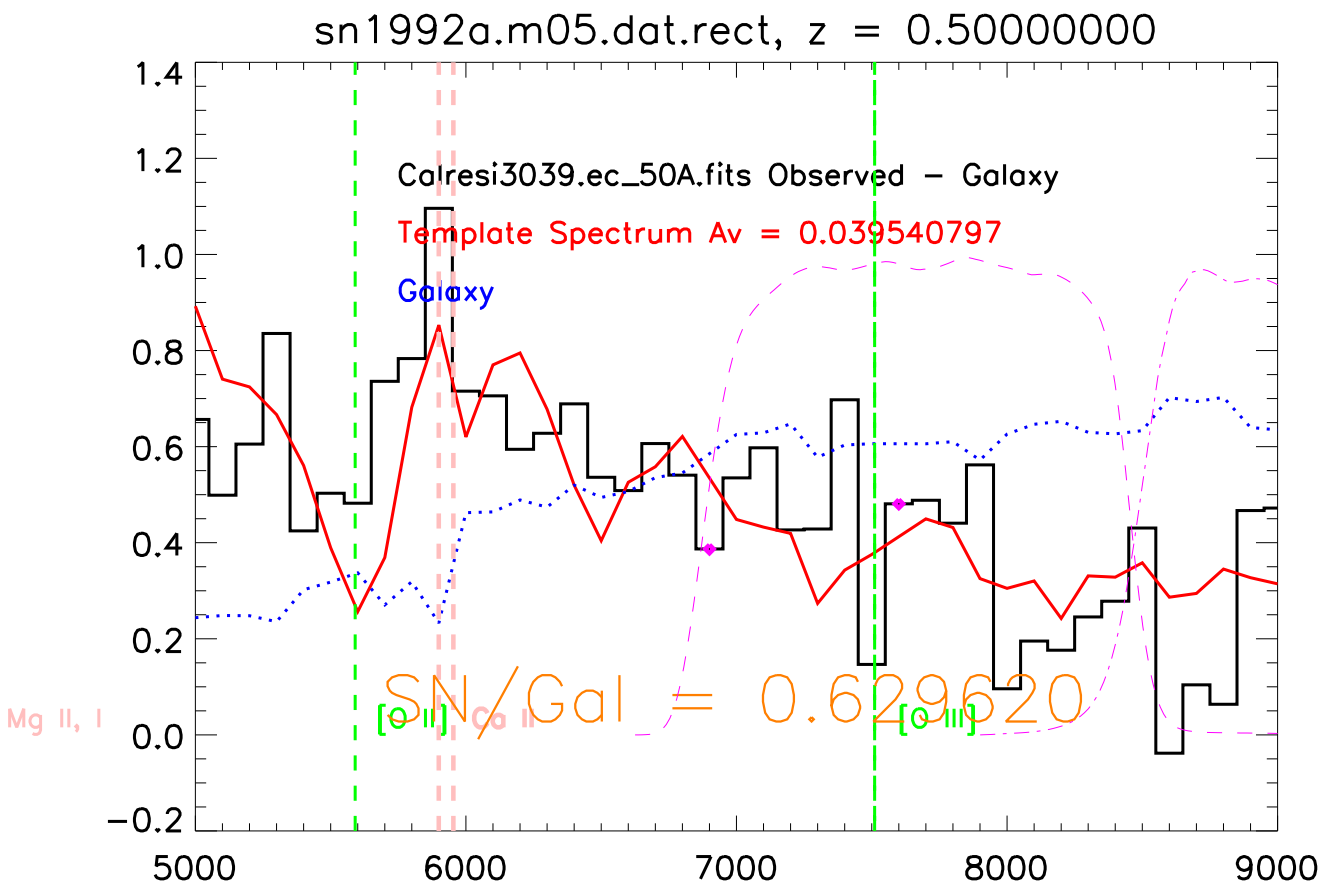

sn1996x.m00.dat.rect, z = 0.47999999
Calresi3039.ec_50A.fits Observed − Galaxy
Template Spectrum Av = −1.0000000
Galaxy
SN/Gal = 0.384233
Mg II, I
[O II]
Ca II
[O III]
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
5000
6000
7000
8000
9000

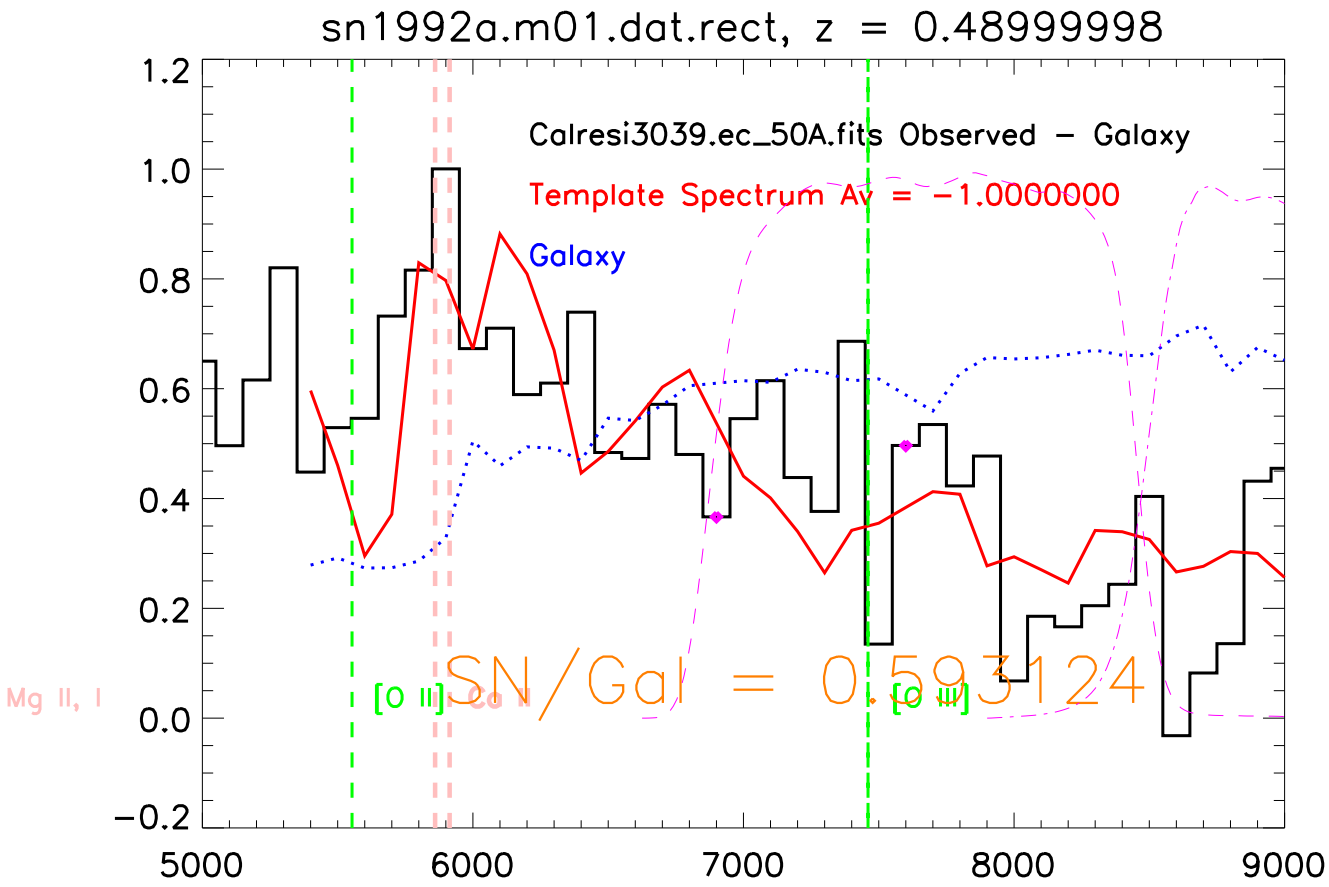

sn1998bu.m02.dat.rect, z = 0.48999998
Calresi3039.ec_50A.fits Observed − Galaxy
Template Spectrum Av = −1.0000000
Galaxy
SN/Gal = 0.835157
Mg II, I
[O II]
Ca II
[O III]
1.2
1.0
0.8
0.6
0.4
0.2
0.0
5000
6000
7000
8000
9000

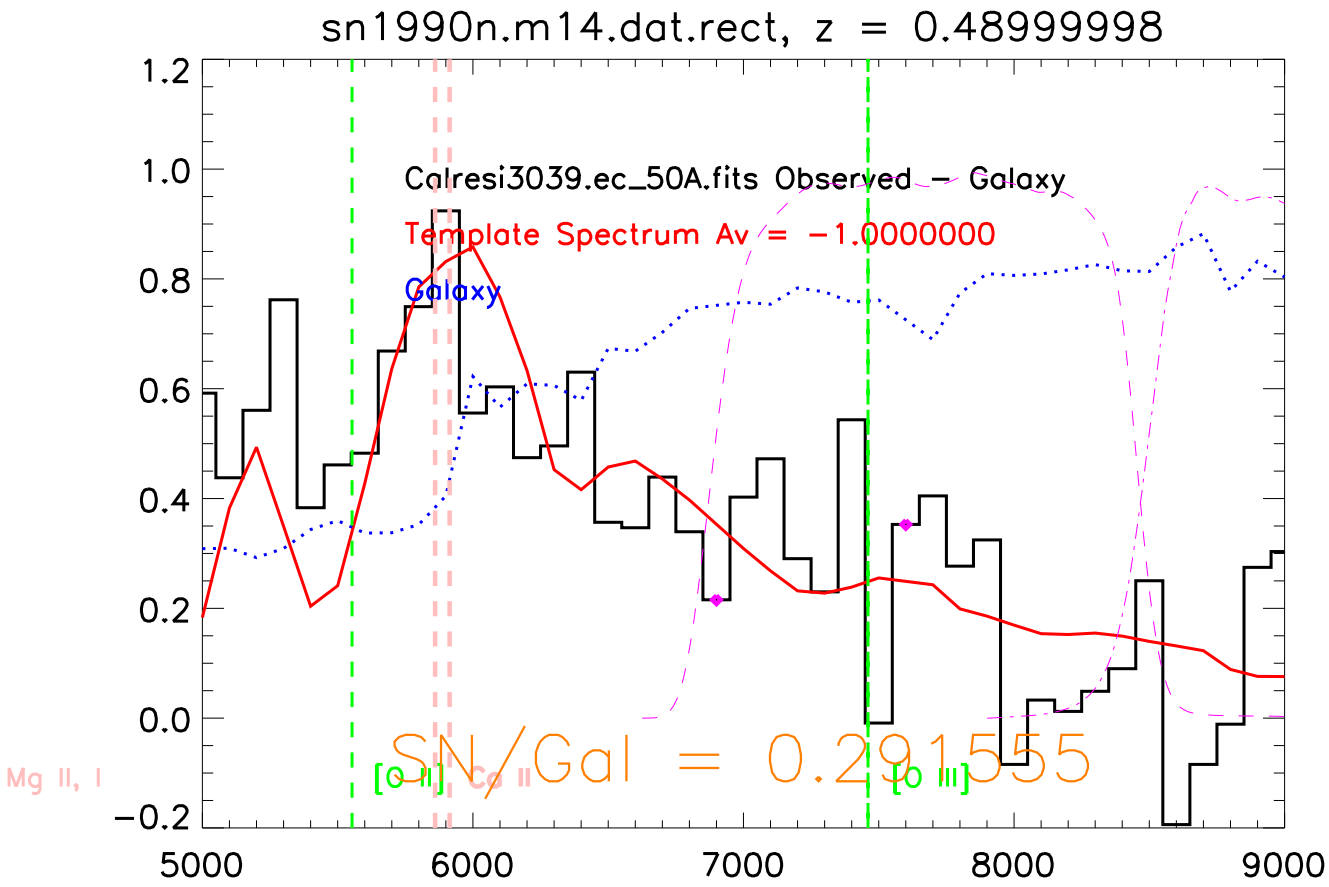

sn1999ee.m08.dat.rect, z = 0.48999998
Calresi3039.ec_50A.fits Observed − Galaxy
Template Spectrum Av = −1.0000000
Galaxy
SN/Gal = 0.421619
Mg II, I
[O II]
Ca II
[O III]
1.2
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
5000
6000
7000
8000
9000

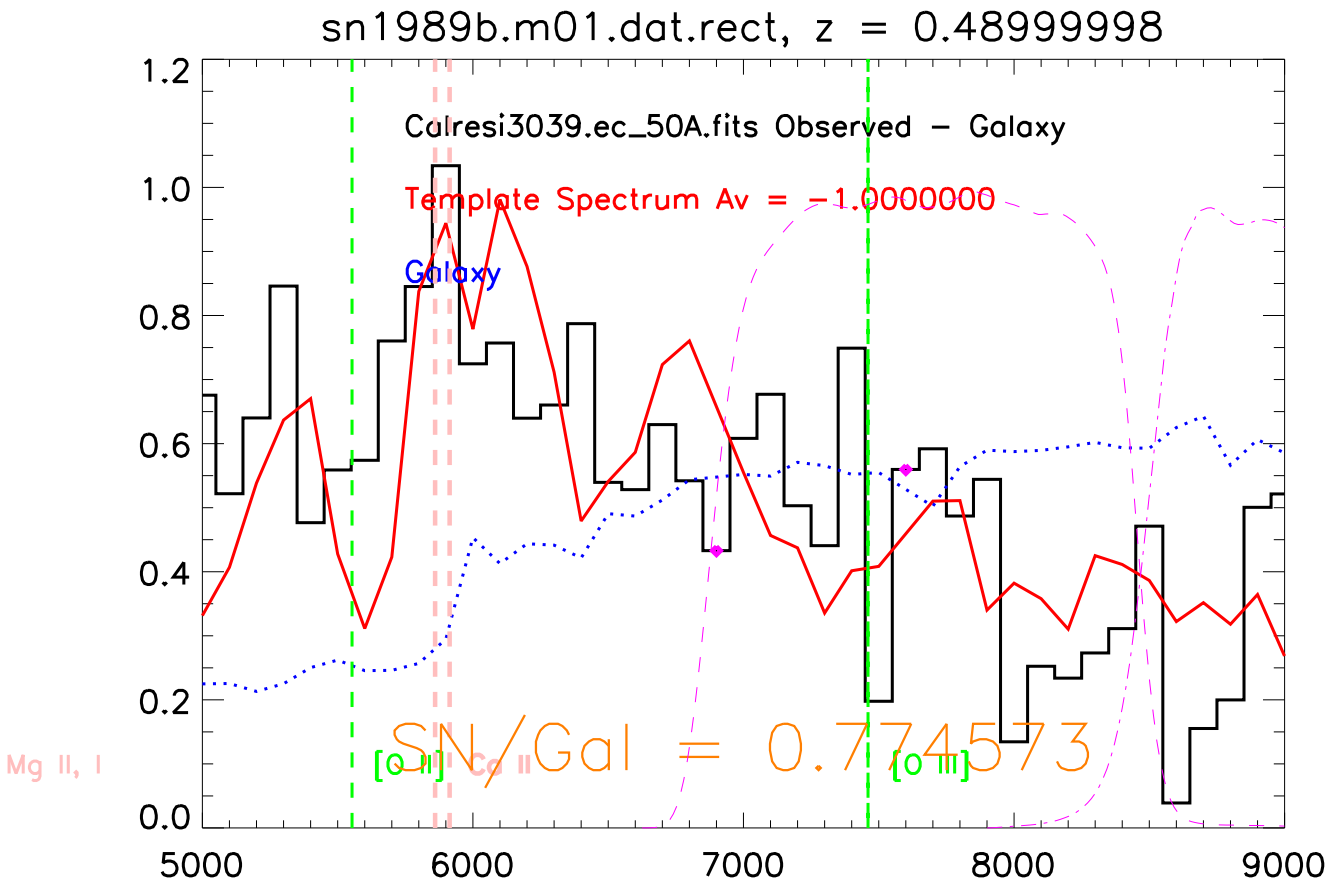

sn1989b.m05.dat.rect, z = 0.48999998
Calresi3039.ec_50A.fits Observed − Galaxy
Template Spectrum Av = −1.0000000
Galaxy
SN/Gal = 0.516723
Mg II, I
[O II]
Ca II
[O III]
1.2
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
5000
6000
7000
8000
9000

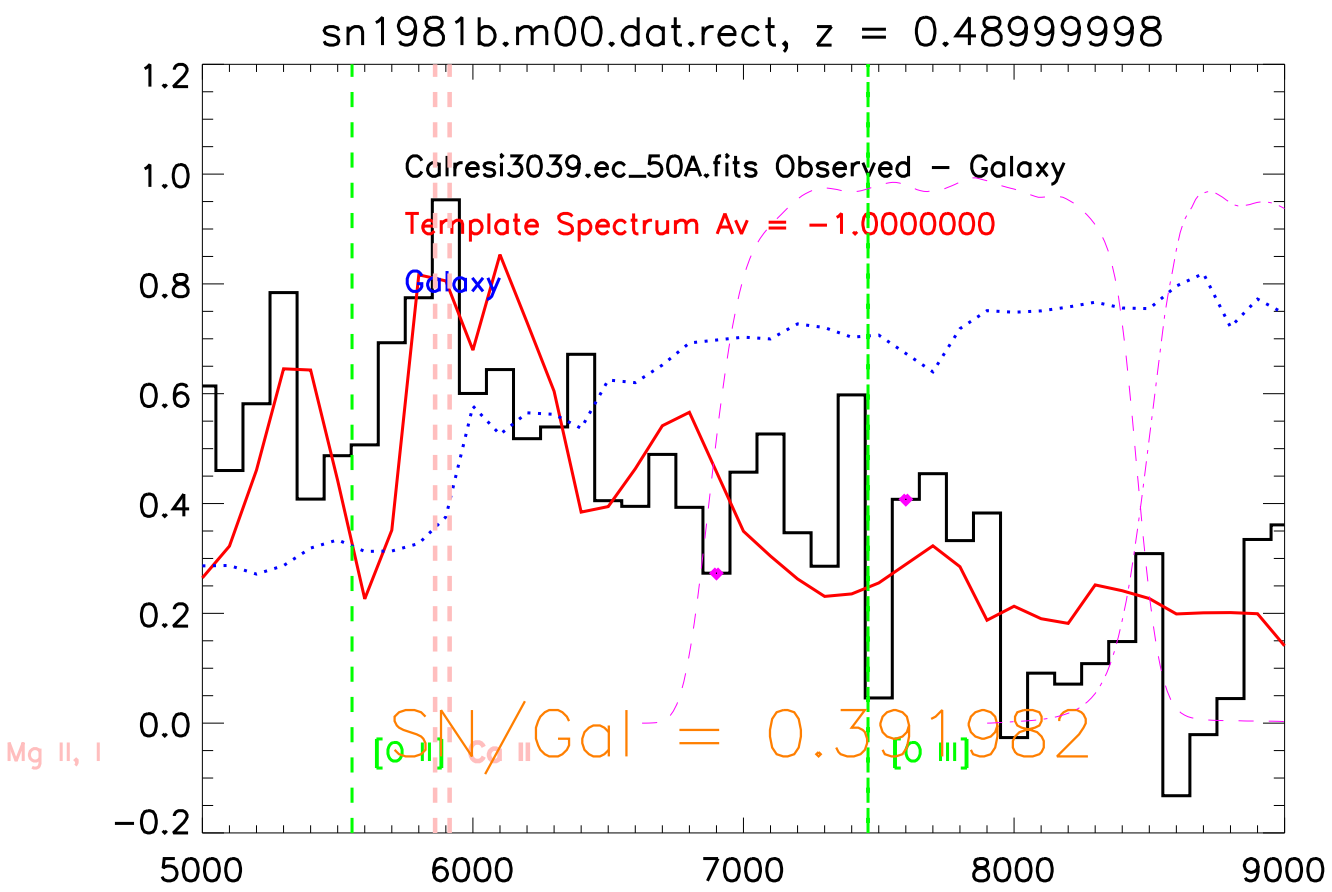

sn1989b.m07.dat.rect, z = 0.48999998
Calresi3039.ec_50A.fits Observed − Galaxy
Template Spectrum Av = −1.0000000
Galaxy
SN/Gal = 0.441832
Mg II, I
[O II]
Ca II
[O III]
1.2
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
5000
6000
7000
8000
9000

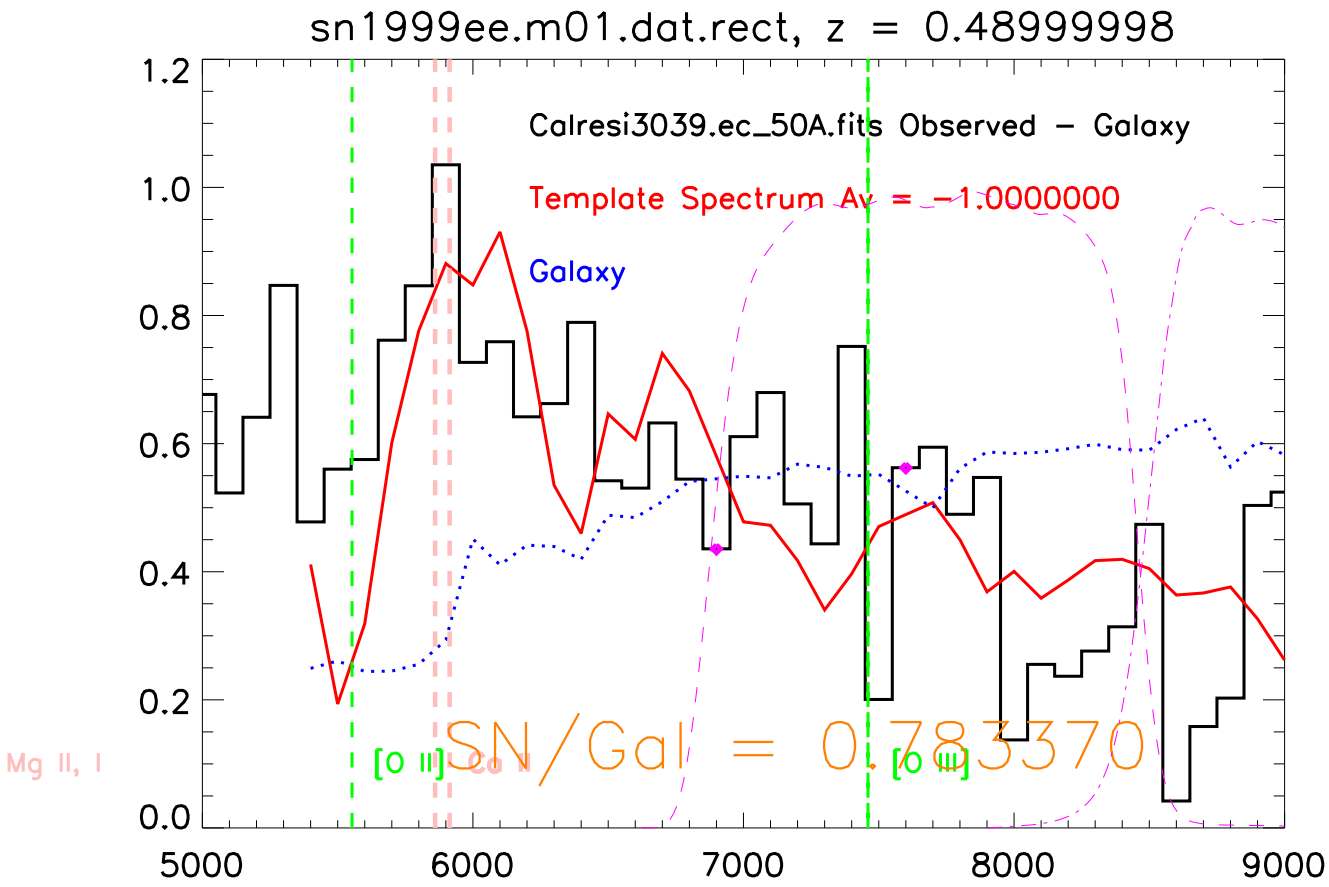

sn1992a.m05.dat.rect, z = 0.50000000
Calresi3039.ec_50A.fits Observed − Galaxy
Template Spectrum Av = 0.039540797
Galaxy
SN/Gal = 0.629620
Mg II, I
[O II]
Ca II
[O III]
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
5000
6000
7000
8000
9000


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