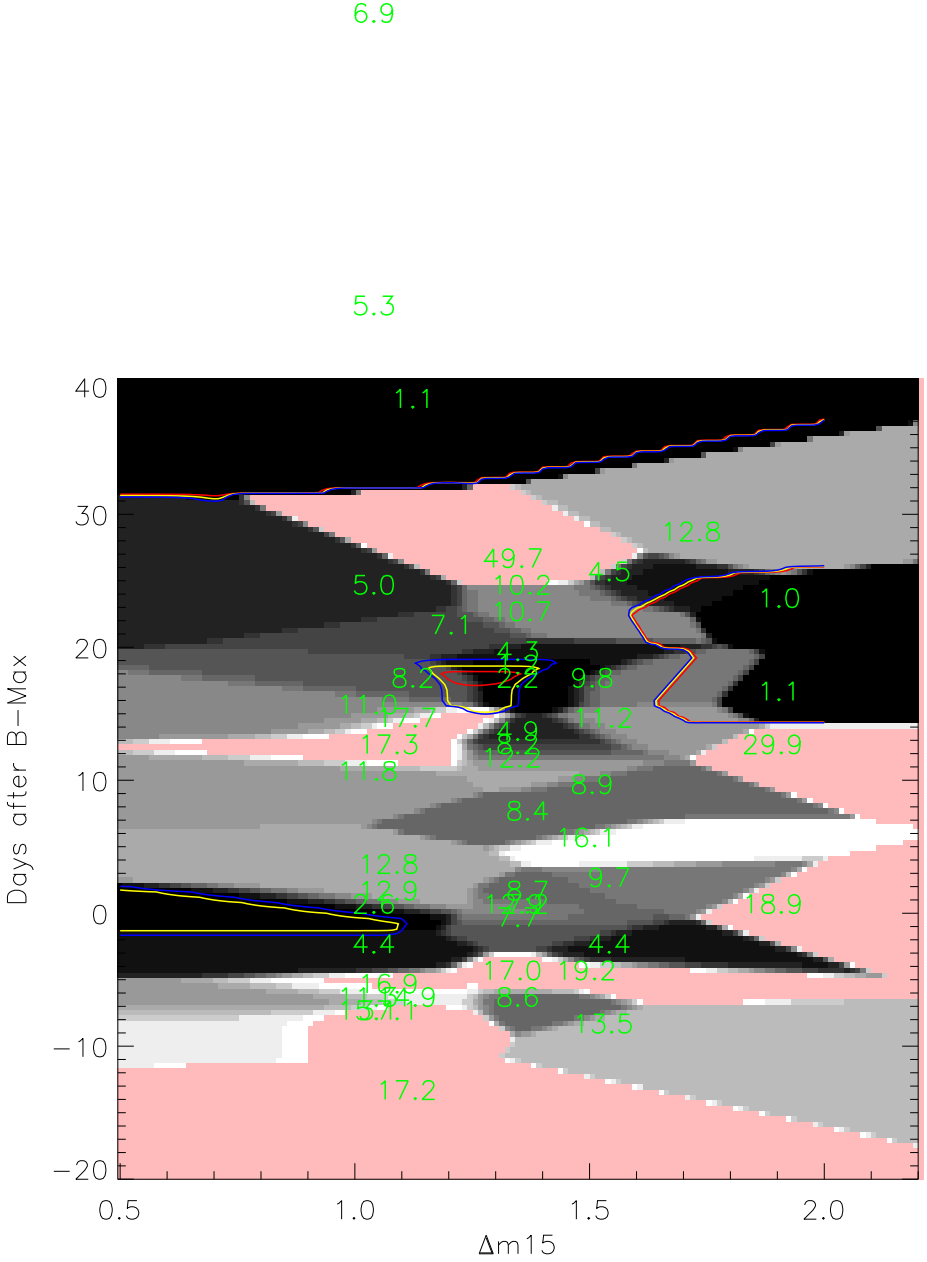
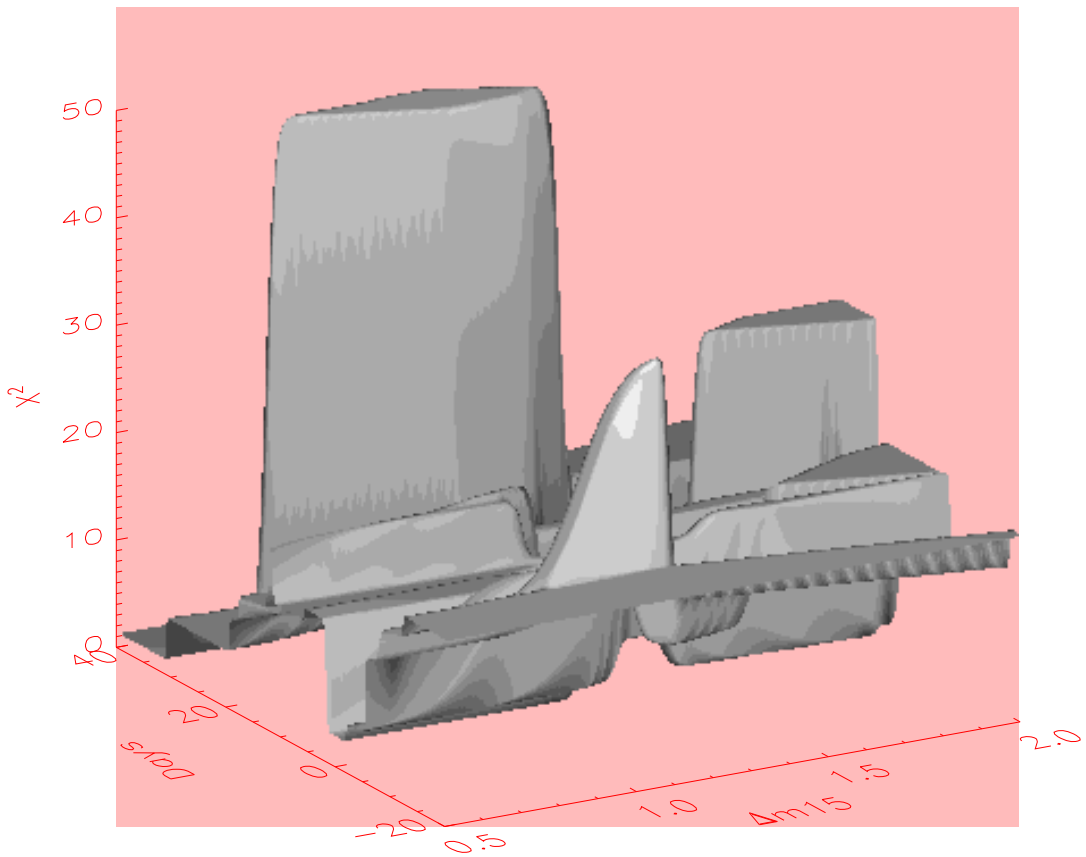
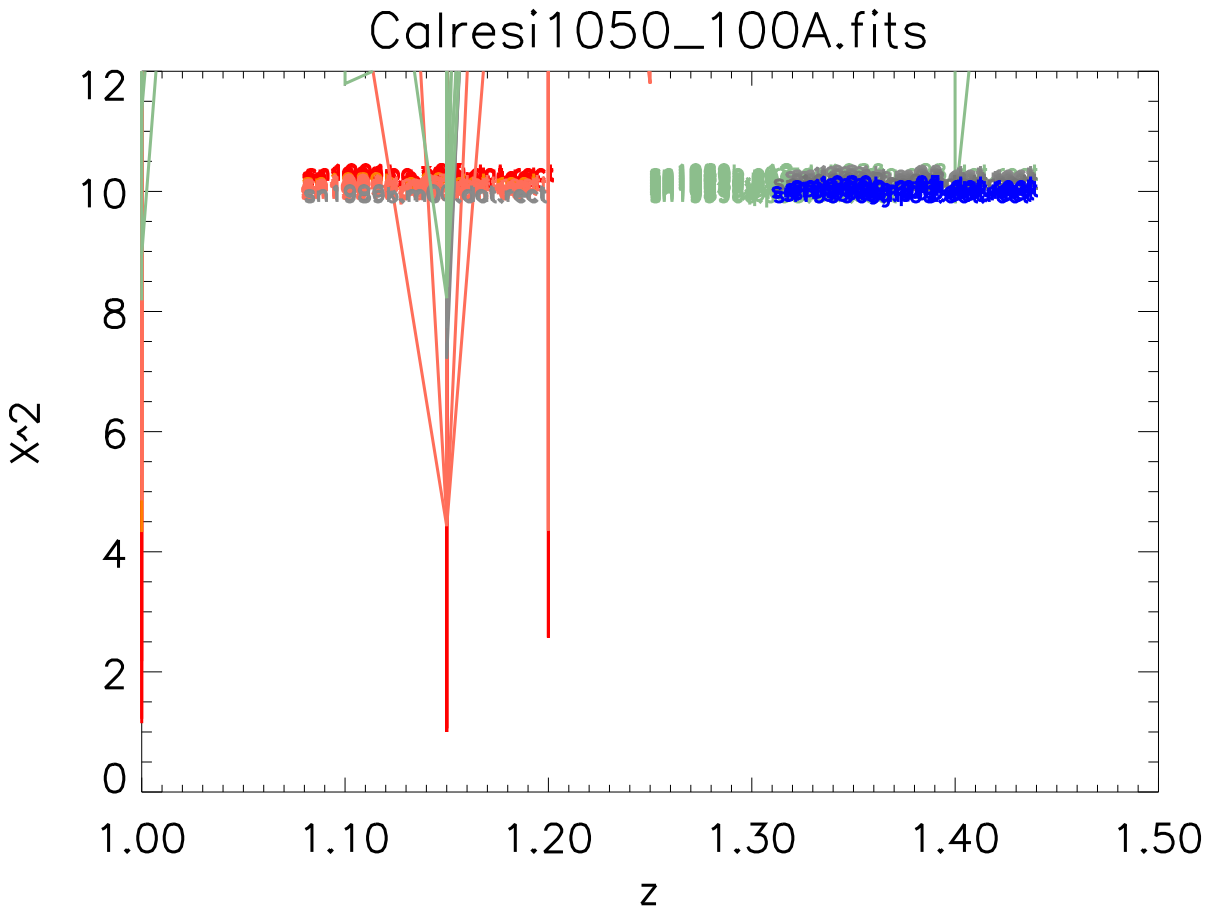
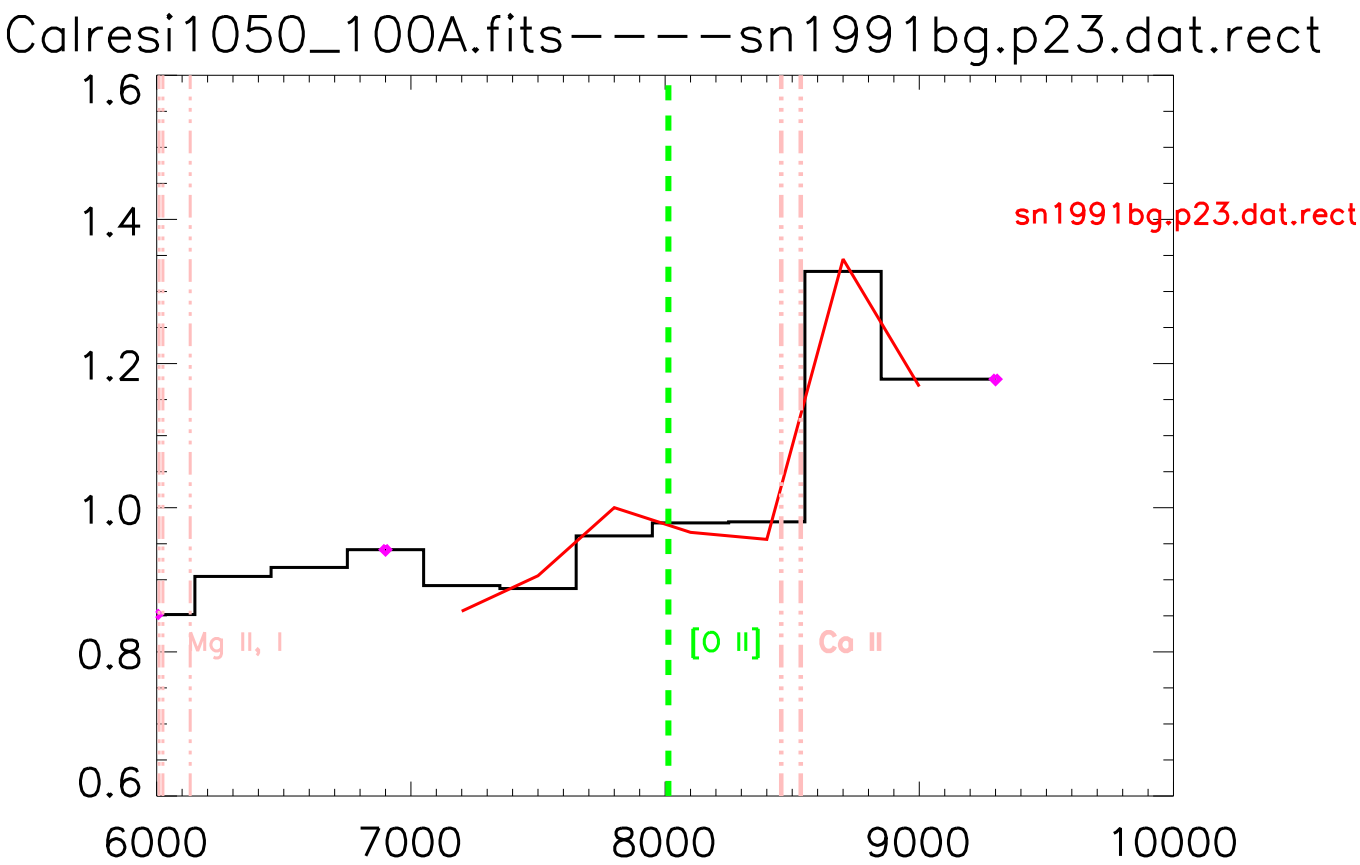
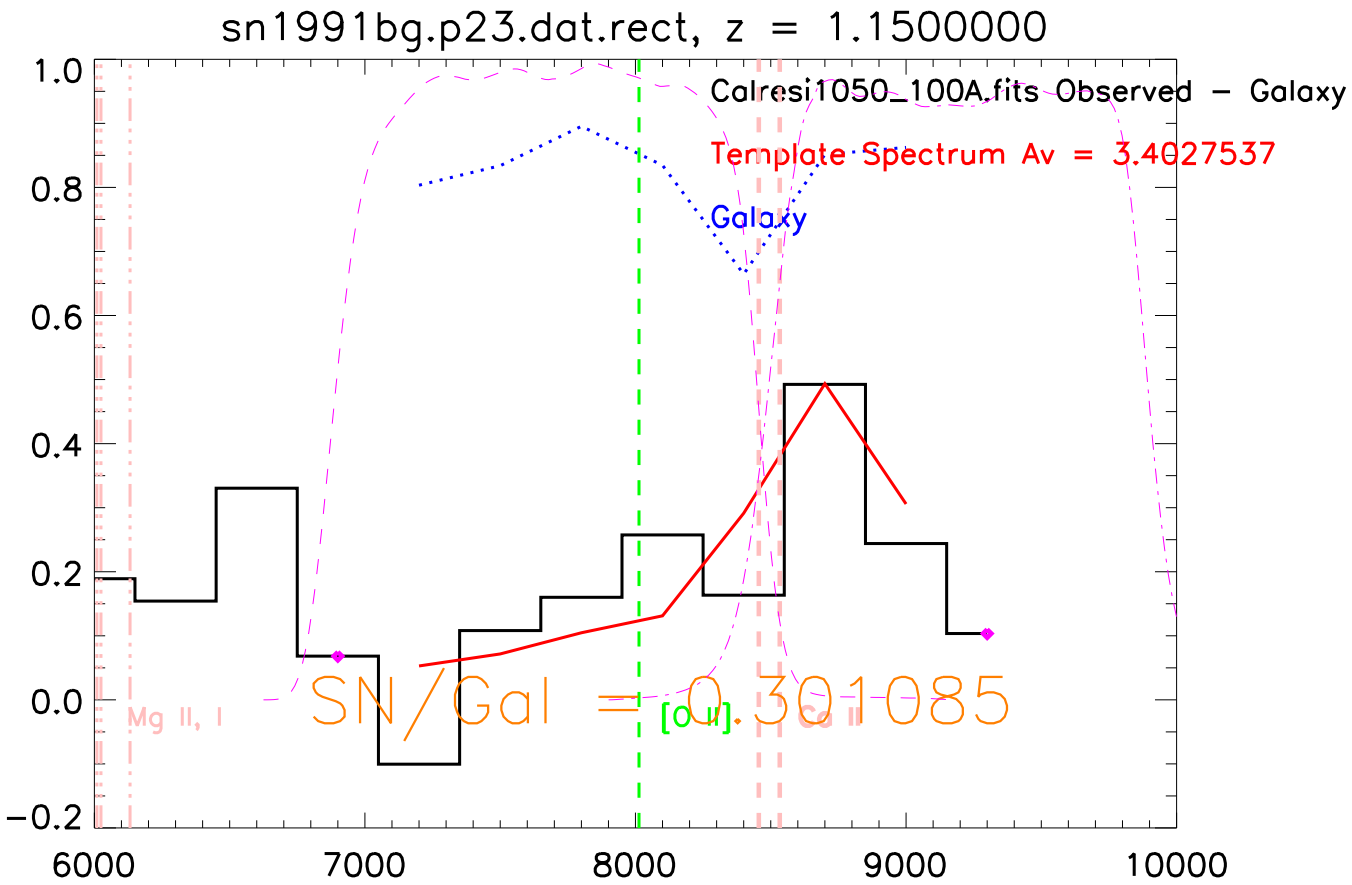

6.9
5.3
1.1
12.8
49.7
4.5
5.0
10.2
1.0
10.7
7.1
4.3
8.2
9.8
1.1
11.2
17.3
29.9
11.8
8.9
8.4
16.1
12.8
9.7
18.9
4.4
4.4
17.0
19.2
8.6
13.5
17.2
40
30
20
10
0
−10
−20
0.5
1.0
1.5
2.0
Days after B−Max
Δm15

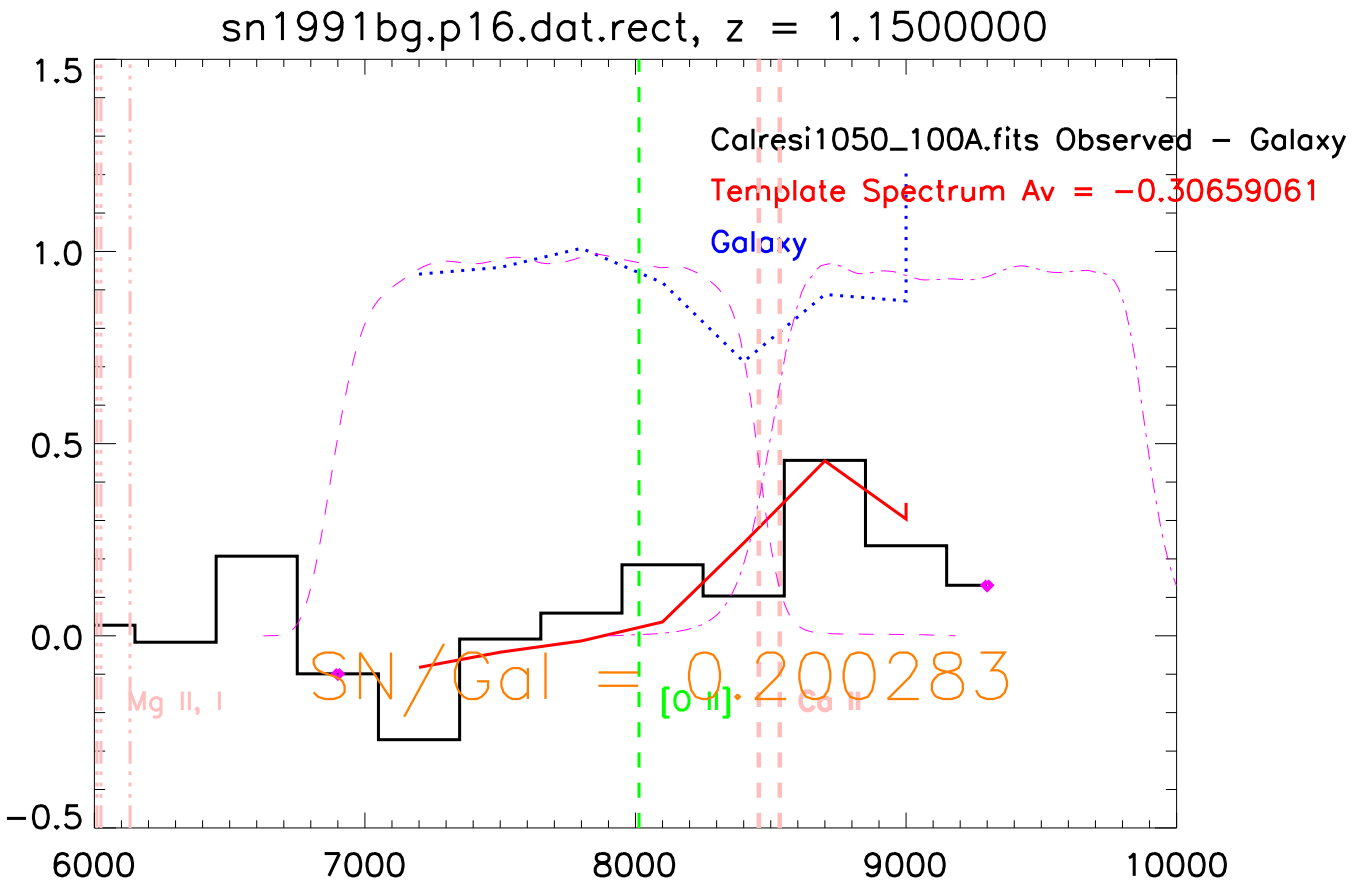


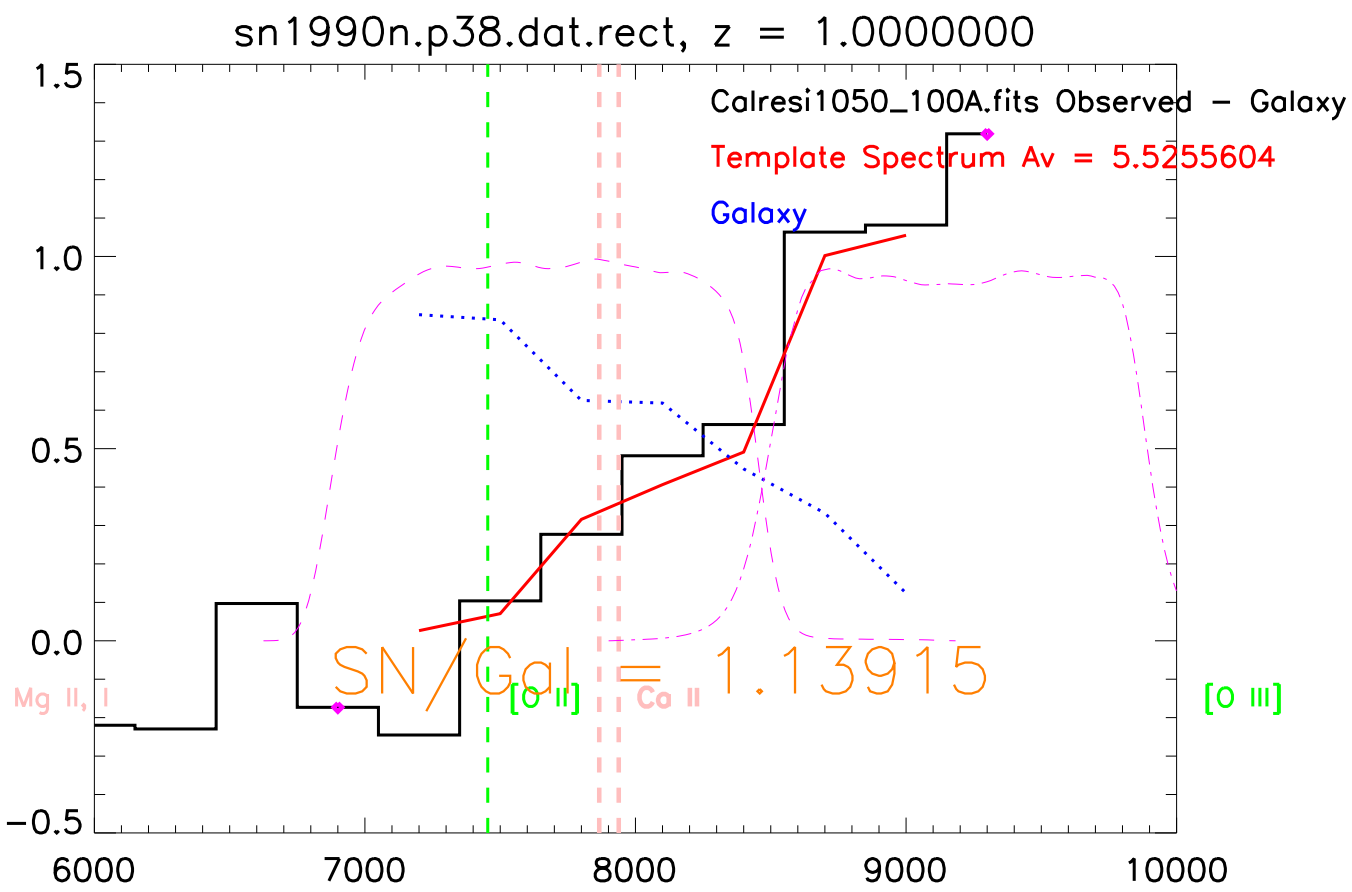
50
40
30
20
10
0
χ^2
40
20
0
−20
Days
0.5
1.0
1.5
2.0
Δm15

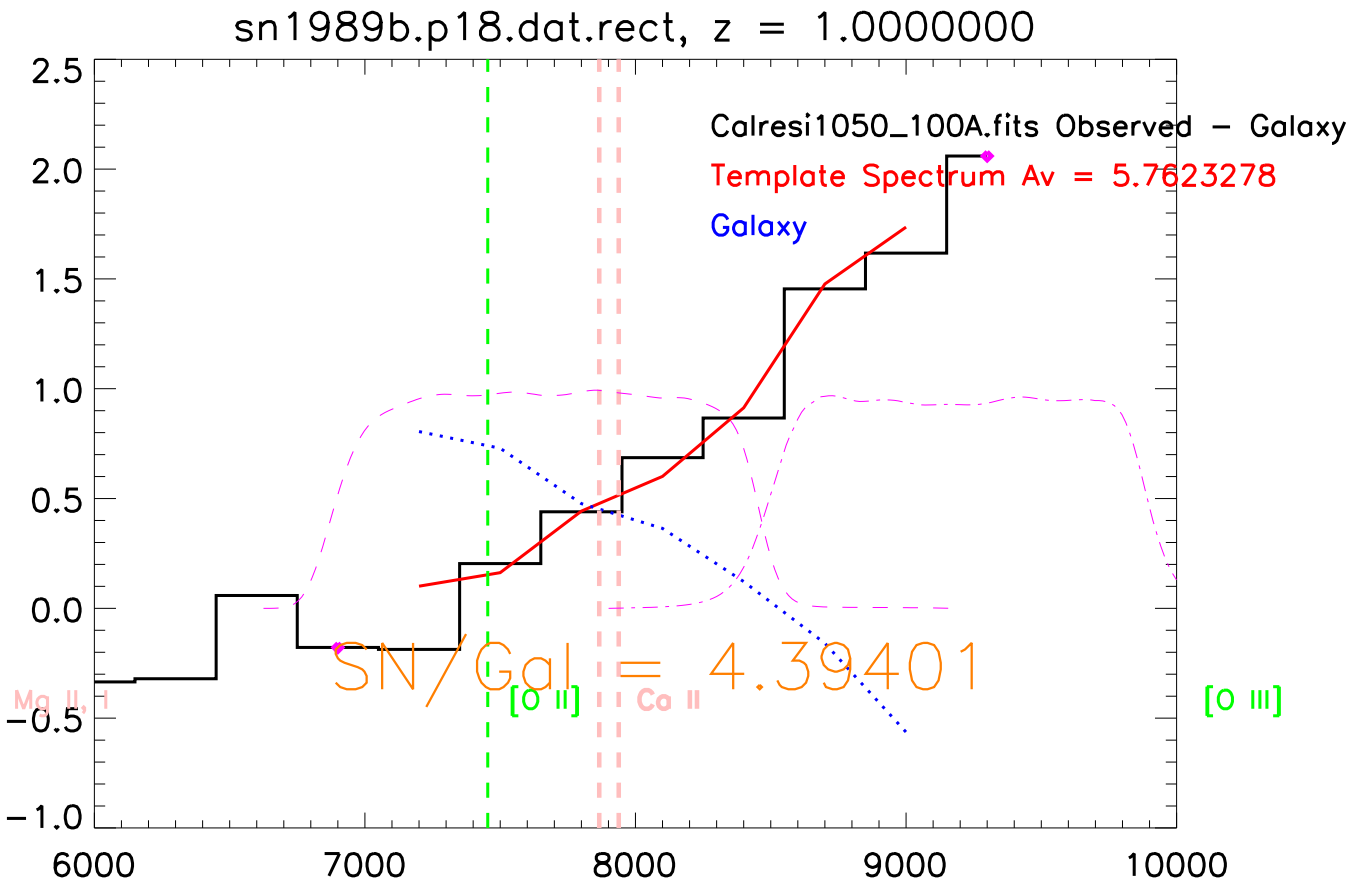

Calresi1050_100A.fits
X^2
z
0
2
4
6
8
10
12
1.00
1.10
1.20
1.30
1.40
1.50

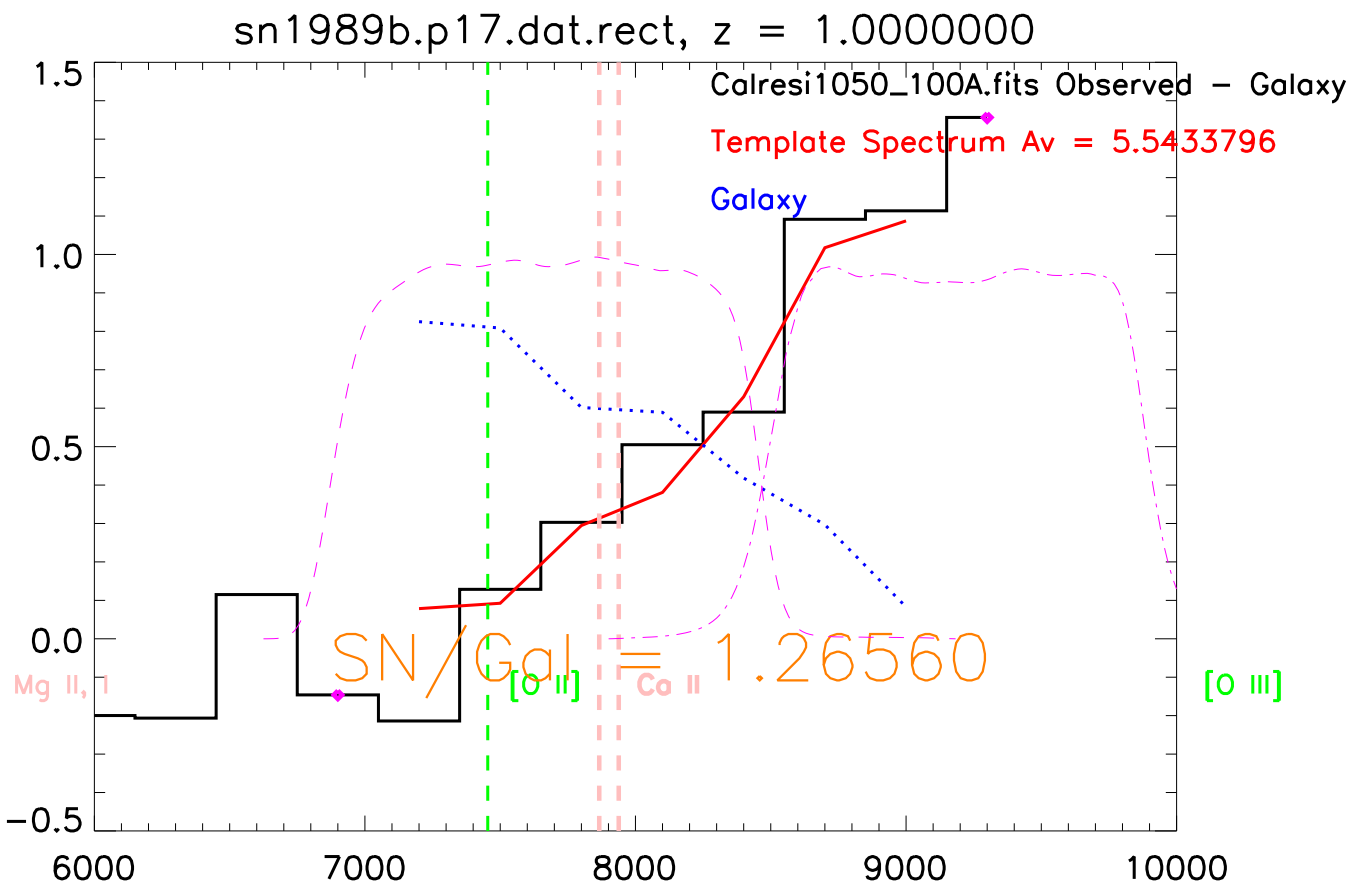

Calresi1050_100A.fits----sn1991bg.p23.dat.rect
sn1991bg.p23.dat.rect
Mg II, I
[O II]
Ca II
1.6
1.4
1.2
1.0
0.8
0.6
6000
7000
8000
9000
10000

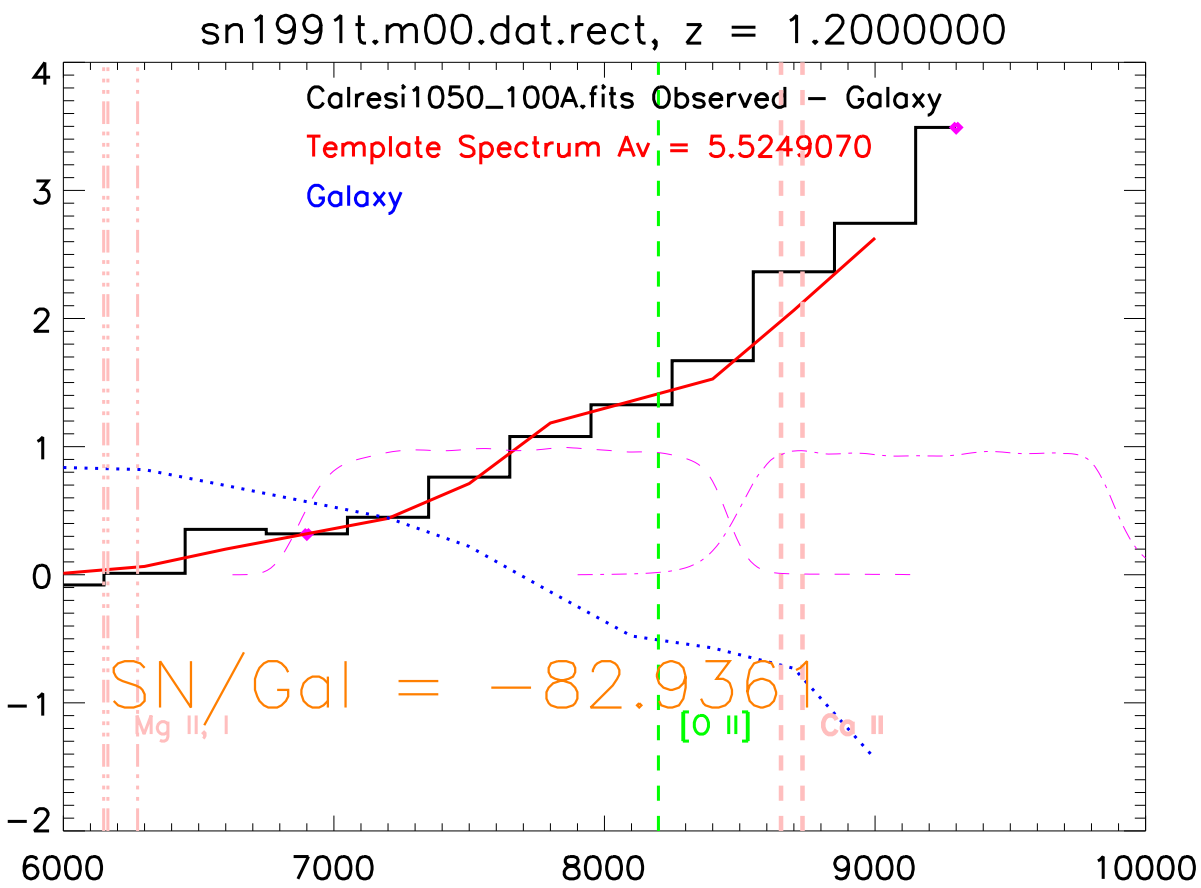

sn1991bg.p23.dat.rect, z = 1.1500000
Calresi1050_100A.fits Observed − Galaxy
Template Spectrum Av = 3.4027537
Galaxy
SN/Gal = 0.301085
Mg II, I
[O II]
Ca II
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
6000
7000
8000
9000
10000

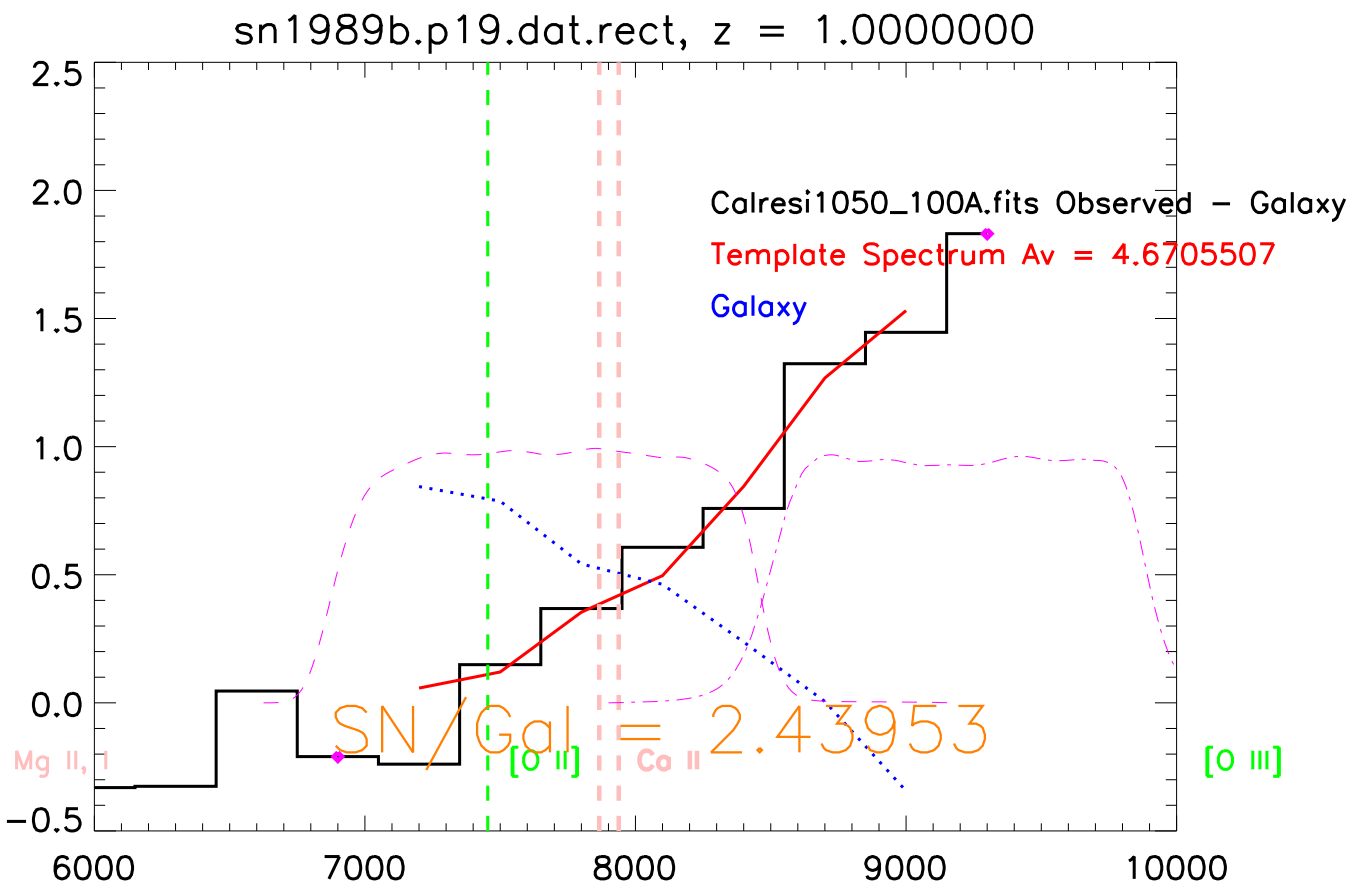

sn1991bg.p16.dat.rect, z = 1.1500000
Calresi1050_100A.fits Observed − Galaxy
Template Spectrum Av = −0.30659061
Galaxy
SN/Gal = 0.200283
Mg II, I
[O II]
Ca II
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

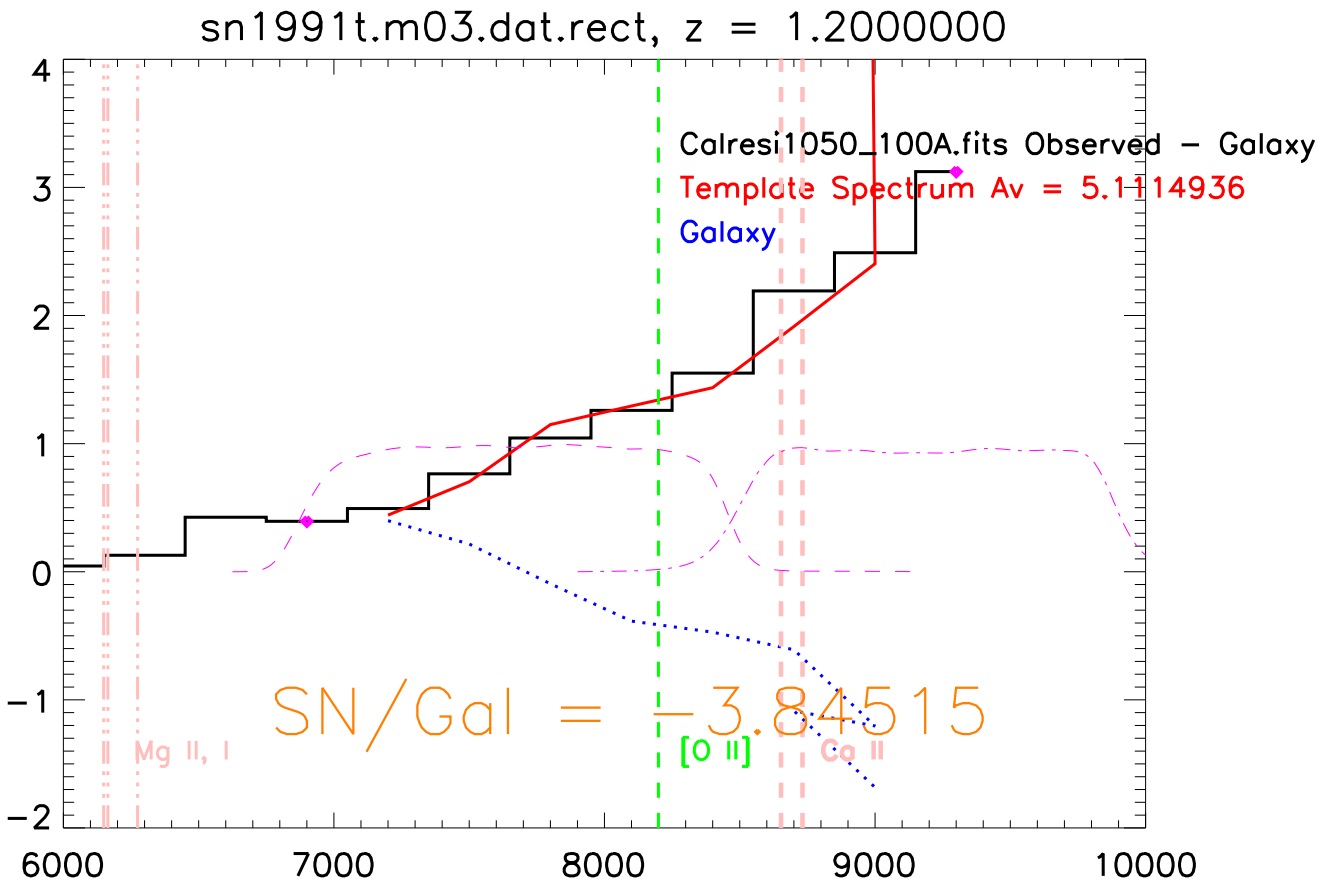

sn1990n.p38.dat.rect, z = 1.0000000
Calresi1050_100A.fits Observed − Galaxy
Template Spectrum Av = 5.5255604
Galaxy
SN/Gal = 1.13915
Mg II, I
[O II]
Ca II
[O III]
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

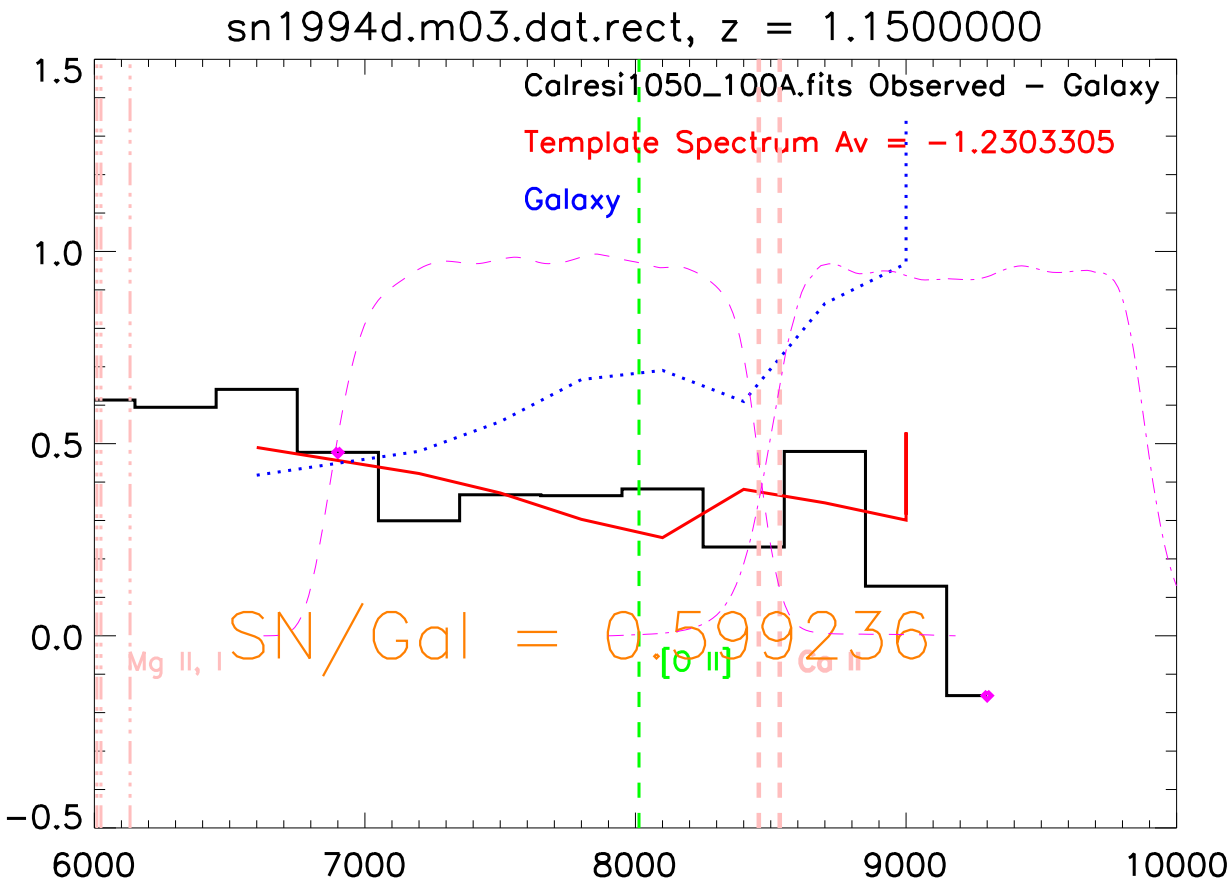

sn1989b.p18.dat.rect, z = 1.0000000
Calresi1050_100A.fits Observed − Galaxy
Template Spectrum Av = 5.7623278
Galaxy
SN/Gal = 4.39401
Mg II
[O II]
Ca II
[O III]
2.5
2.0
1.5
1.0
0.5
0.0
−0.5
−1.0
6000
7000
8000
9000
10000

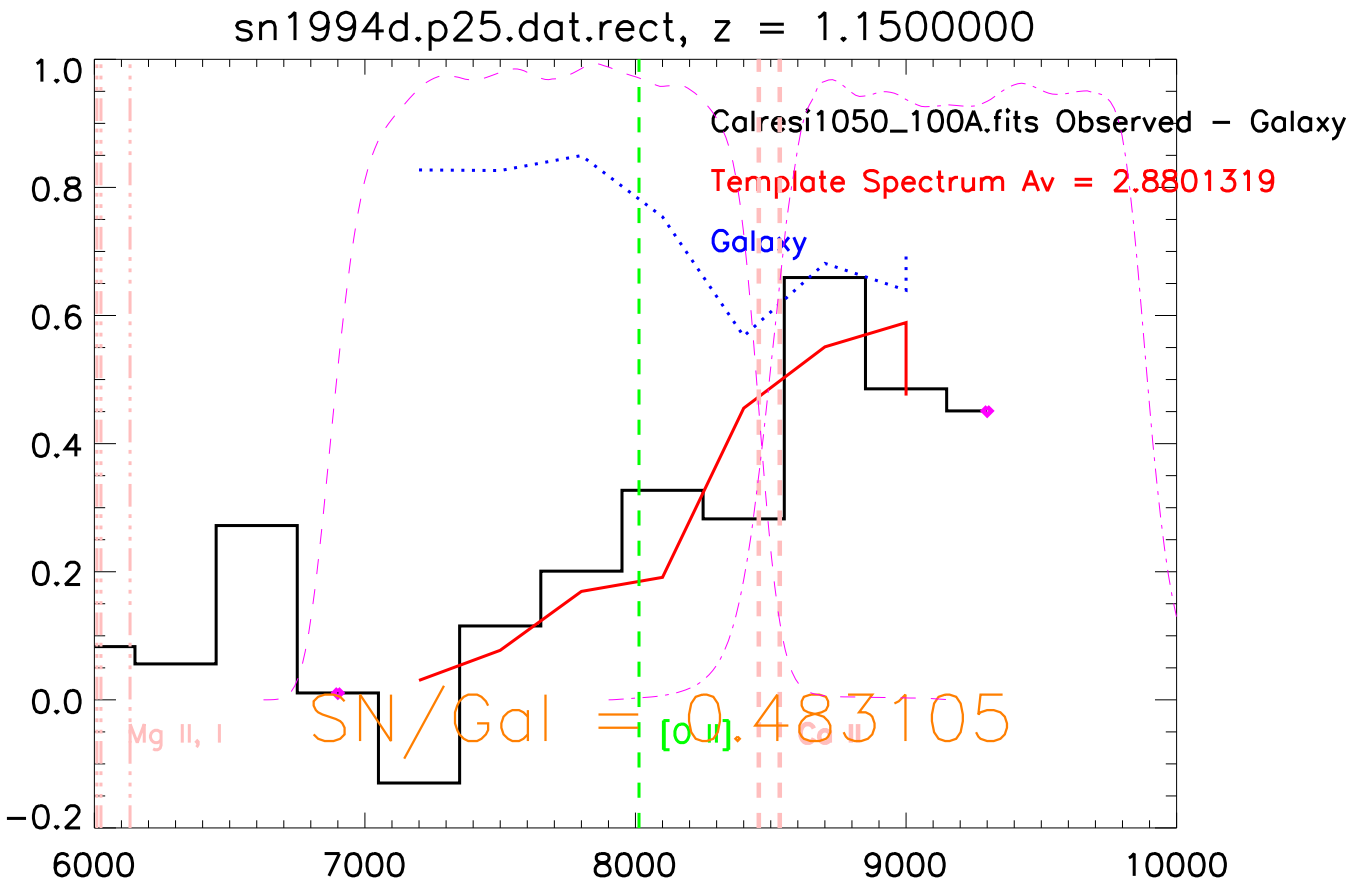

sn1989b.p17.dat.rect, z = 1.0000000
Calresi1050_100A.fits Observed − Galaxy
Template Spectrum Av = 5.5433796
Galaxy
SN/Gal = 1.26560
Mg II, 1
[O II]
Ca II
[O III]
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

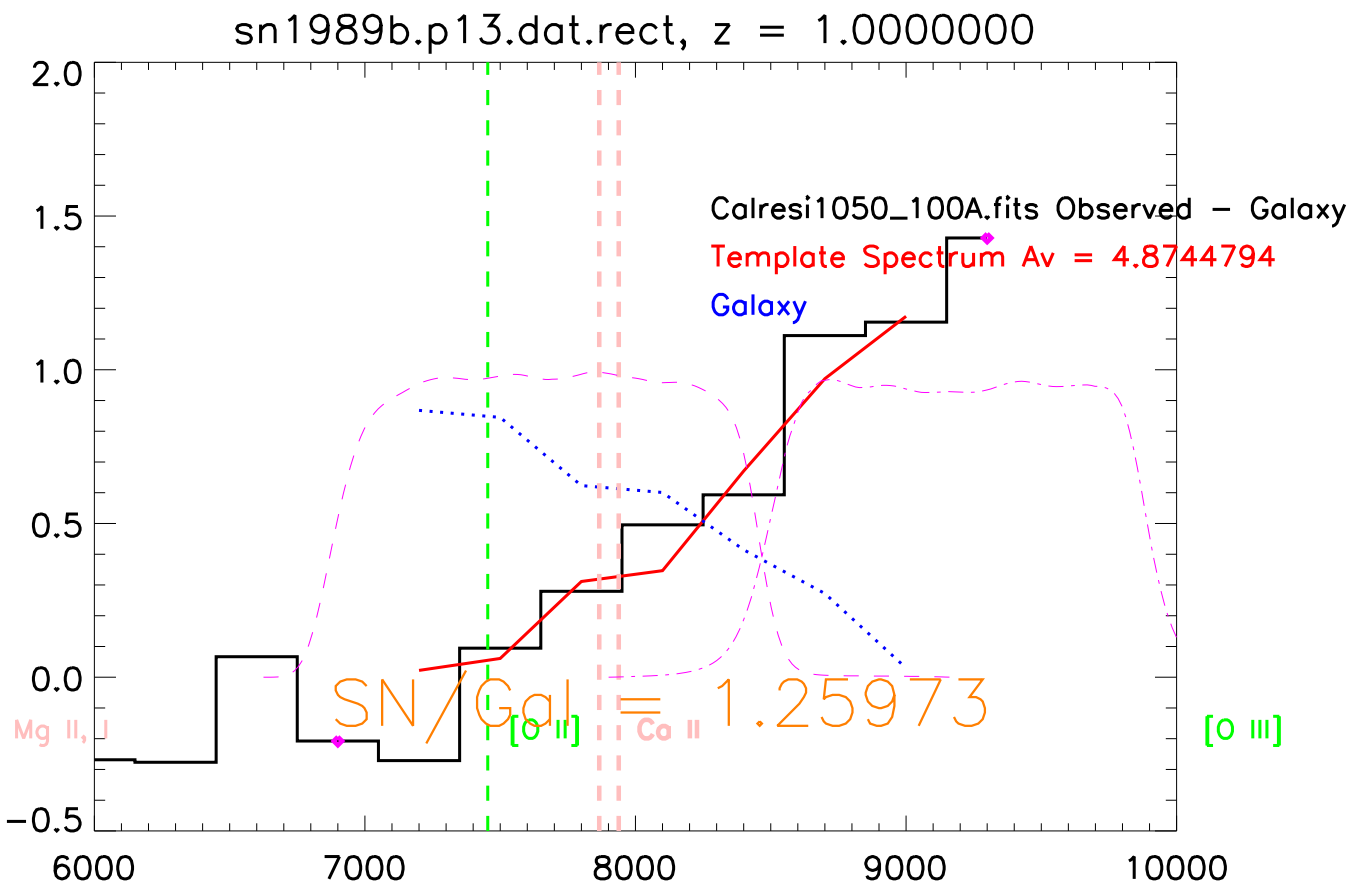

sn1991t.m00.dat.rect, z = 1.2000000
Calresi1050_100A.fits Observed − Galaxy
Template Spectrum Av = 5.5249070
Galaxy
SN/Gal = −82.9361
Mg II, I
[O II]
Ca II
4
3
2
1
0
−1
−2
6000
7000
8000
9000
10000

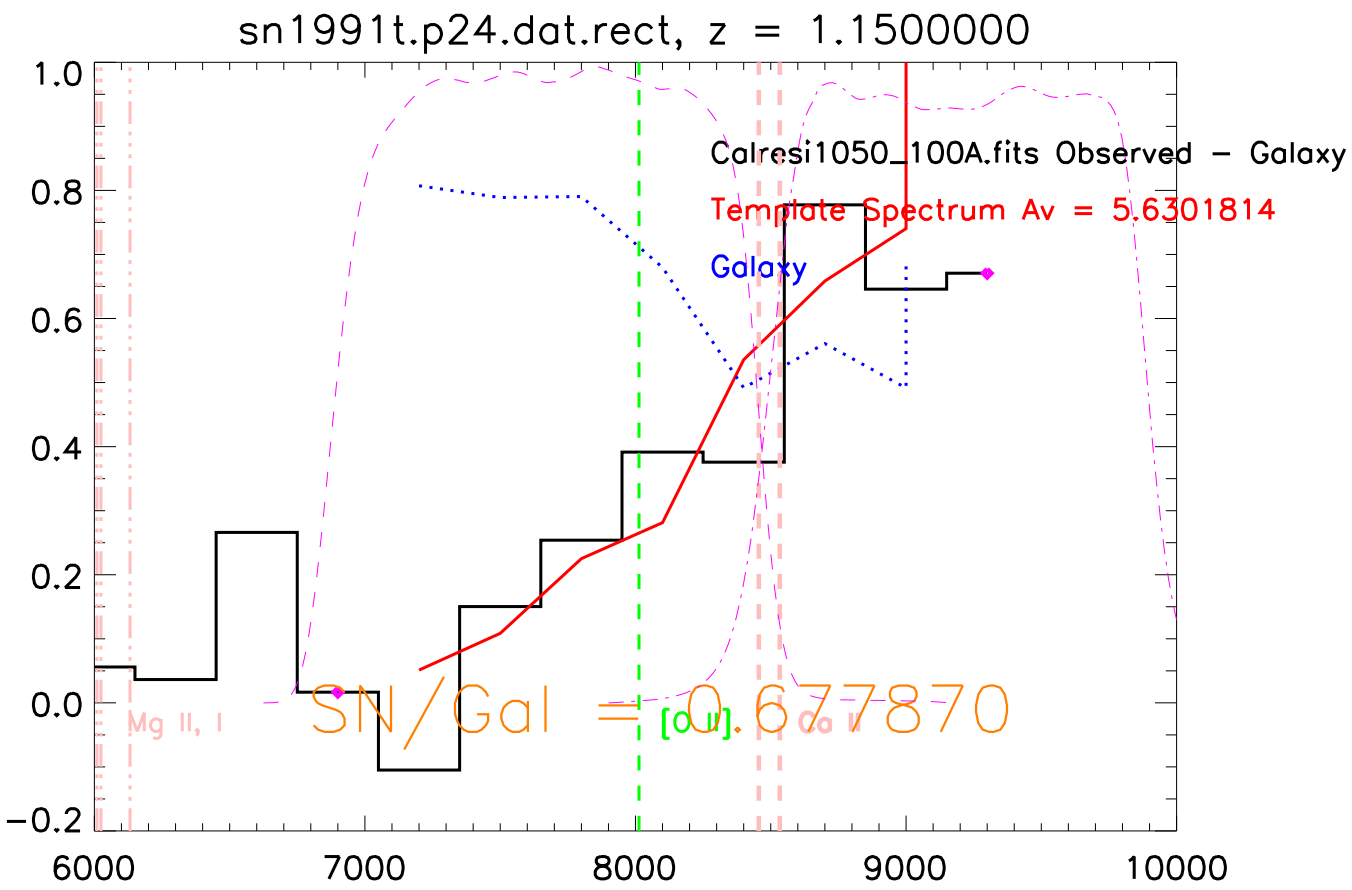

sn1989b.p19.dat.rect, z = 1.0000000
Calresi1050_100A.fits Observed – Galaxy
Template Spectrum Av = 4.6705507
Galaxy
SN/Gal = 2.43953
Mg II,]
[O II]
Ca II
[O III]
2.5
2.0
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

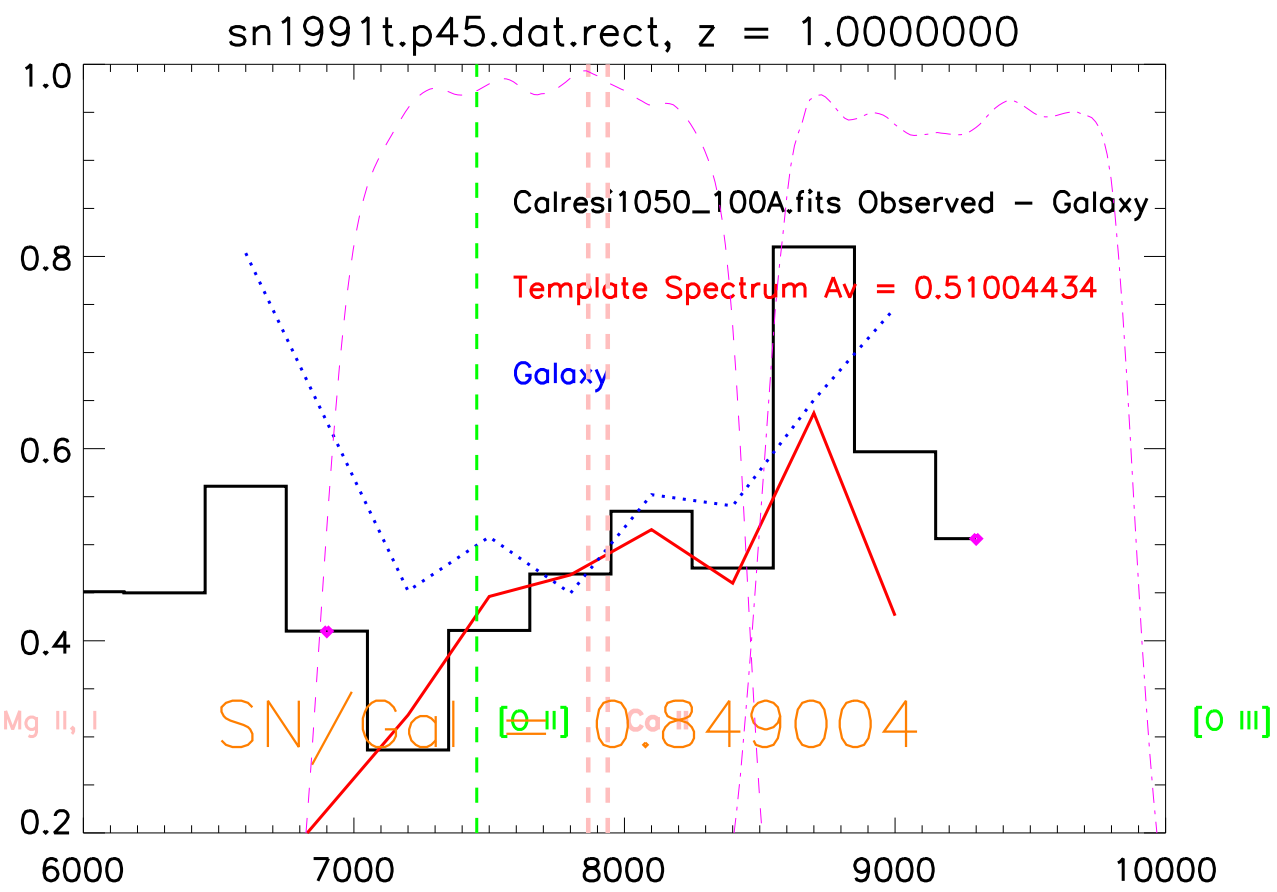

sn1991t.m03.dat.rect, z = 1.2000000
Calresi1050_100A.fits Observed − Galaxy
Template Spectrum Av = 5.1114936
Galaxy
SN/Gal = −3.84515
Mg II, I
[O II]
Ca II
4
3
2
1
0
−1
−2
6000
7000
8000
9000
10000

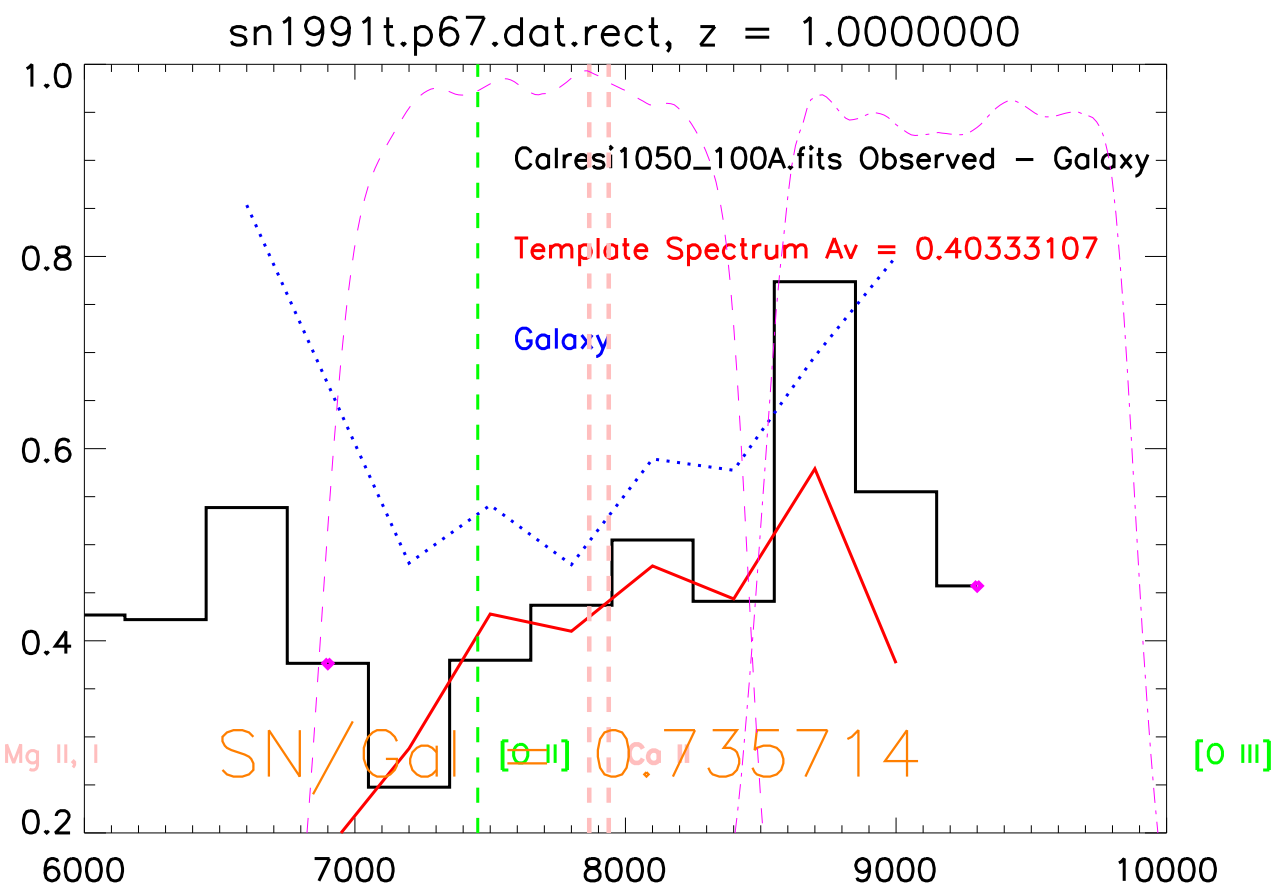

sn1994d.m03.dat.rect, z = 1.1500000
Calresi1050_100A.fits Observed − Galaxy
Template Spectrum Av = −1.2303305
Galaxy
SN/Gal = 0.599236
Mg II, I
[O II]
Ca II
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

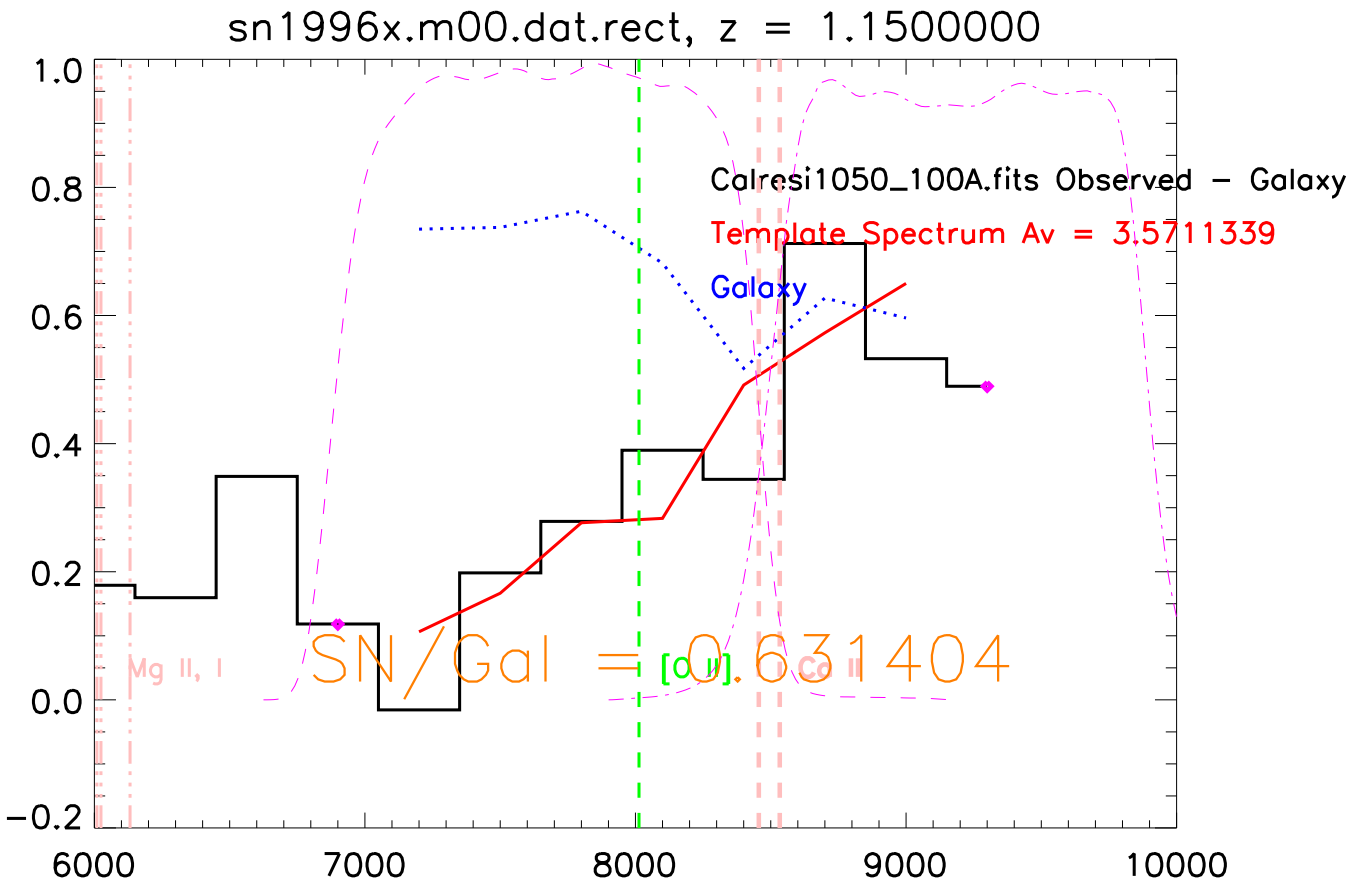

sn1994d.p25.dat.rect, z = 1.1500000
Calresi1050_100A.fits Observed – Galaxy
Template Spectrum Av = 2.8801319
Galaxy
SN/Gal = 0.483105
Mg II, I
[O II]
Ca II
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
6000
7000
8000
9000
10000

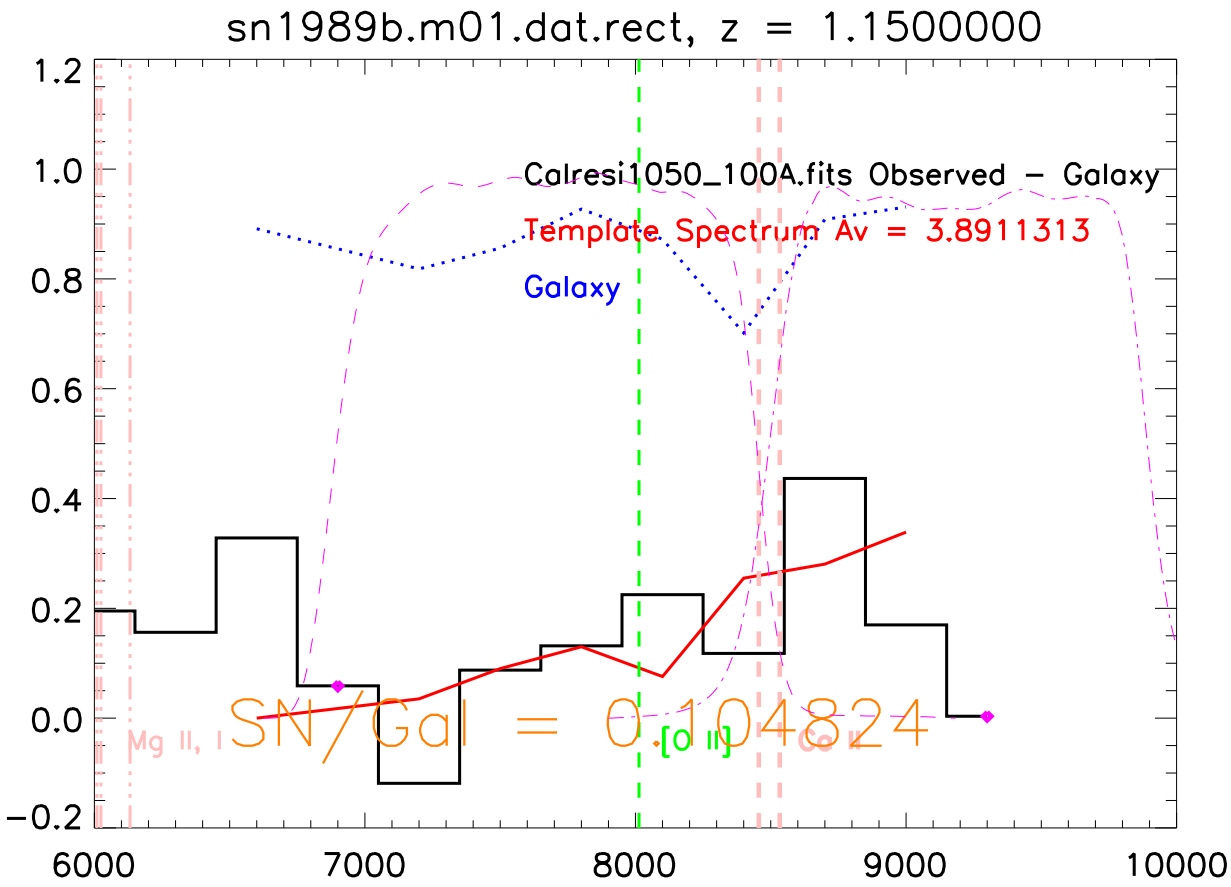

sn1989b.p13.dat.rect, z = 1.0000000
Calresi1050_100A.fits Observed − Galaxy
Template Spectrum Av = 4.8744794
Galaxy
SN/Gal = 1.25973
Mg II, I
[O II]
Ca II
[O III]
2.0
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

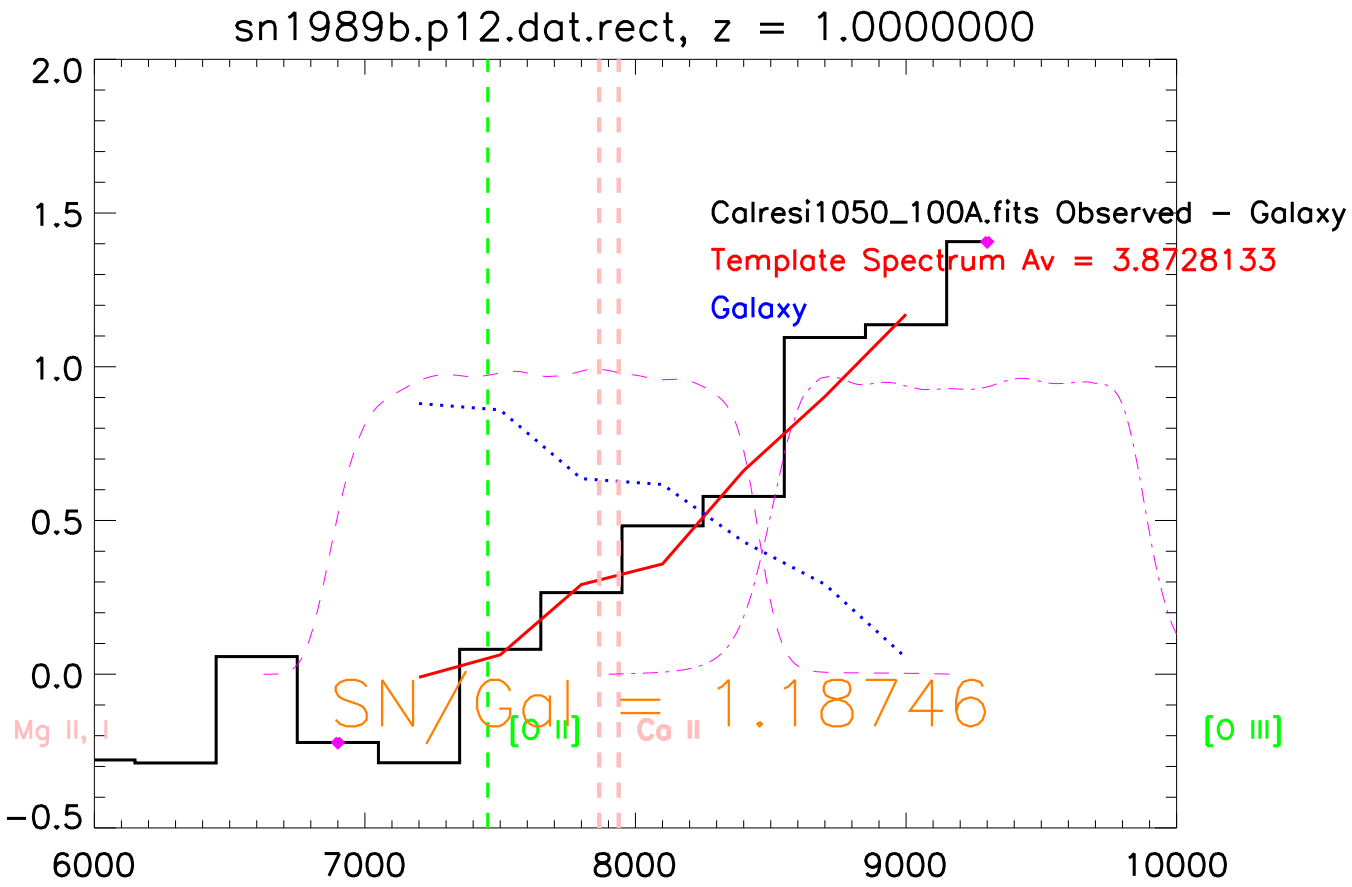

sn1991t.p24.dat.rect, z = 1.1500000
Calresi1050_100A.fits Observed − Galaxy
Template Spectrum Av = 5.6301814
Galaxy
SN/Gal = 0.677870
Mg II, I
[O II].
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
6000
7000
8000
9000
10000

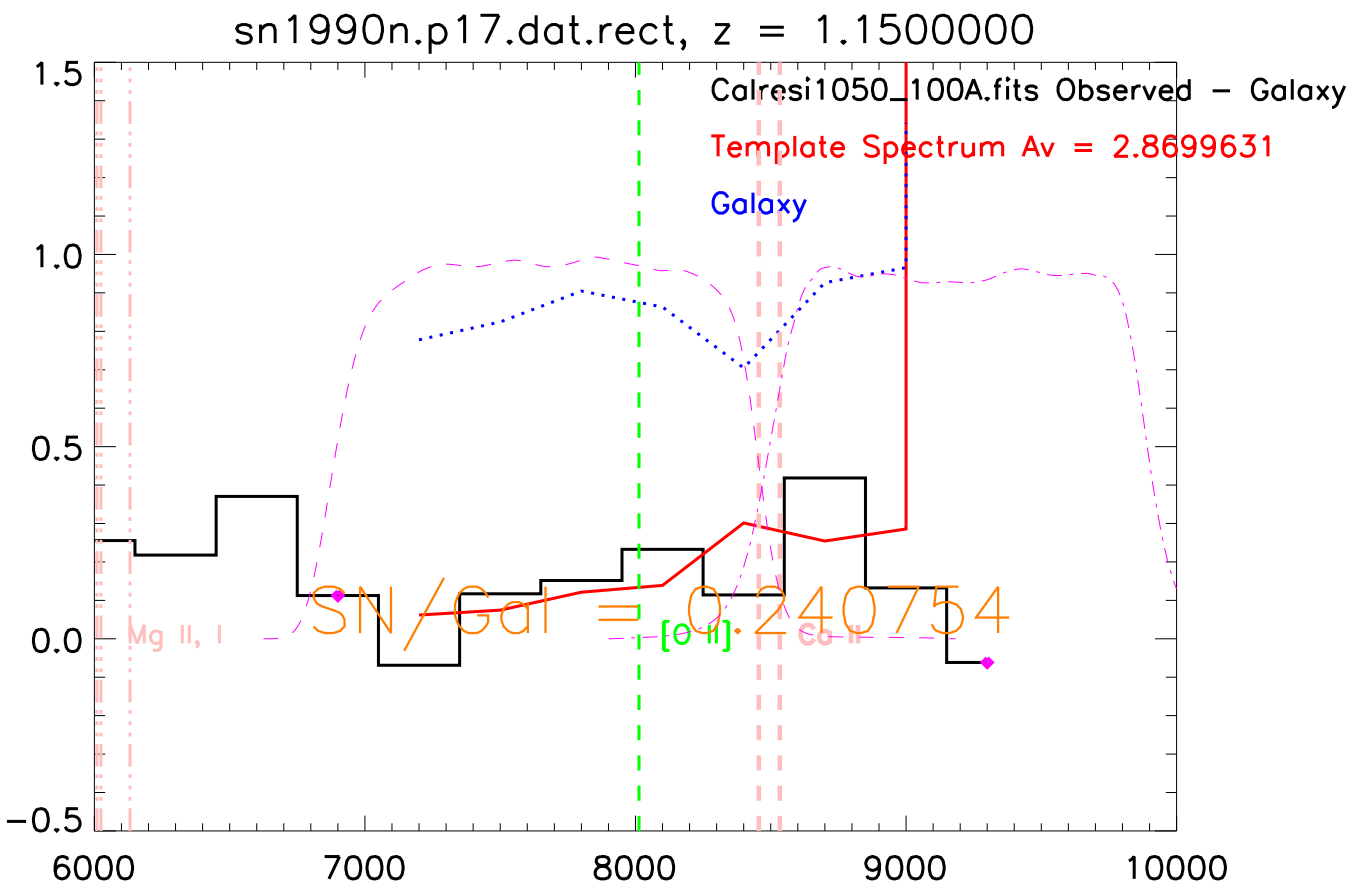

sn1991t.p45.dat.rect, z = 1.0000000
Calresi1050_100A.fits Observed – Galaxy
Template Spectrum Av = 0.51004434
Galaxy
SN/Gal = 0.849004
Mg II, I
[O II]
Ca II
[O III]
1.0
0.8
0.6
0.4
0.2
6000
7000
8000
9000
10000

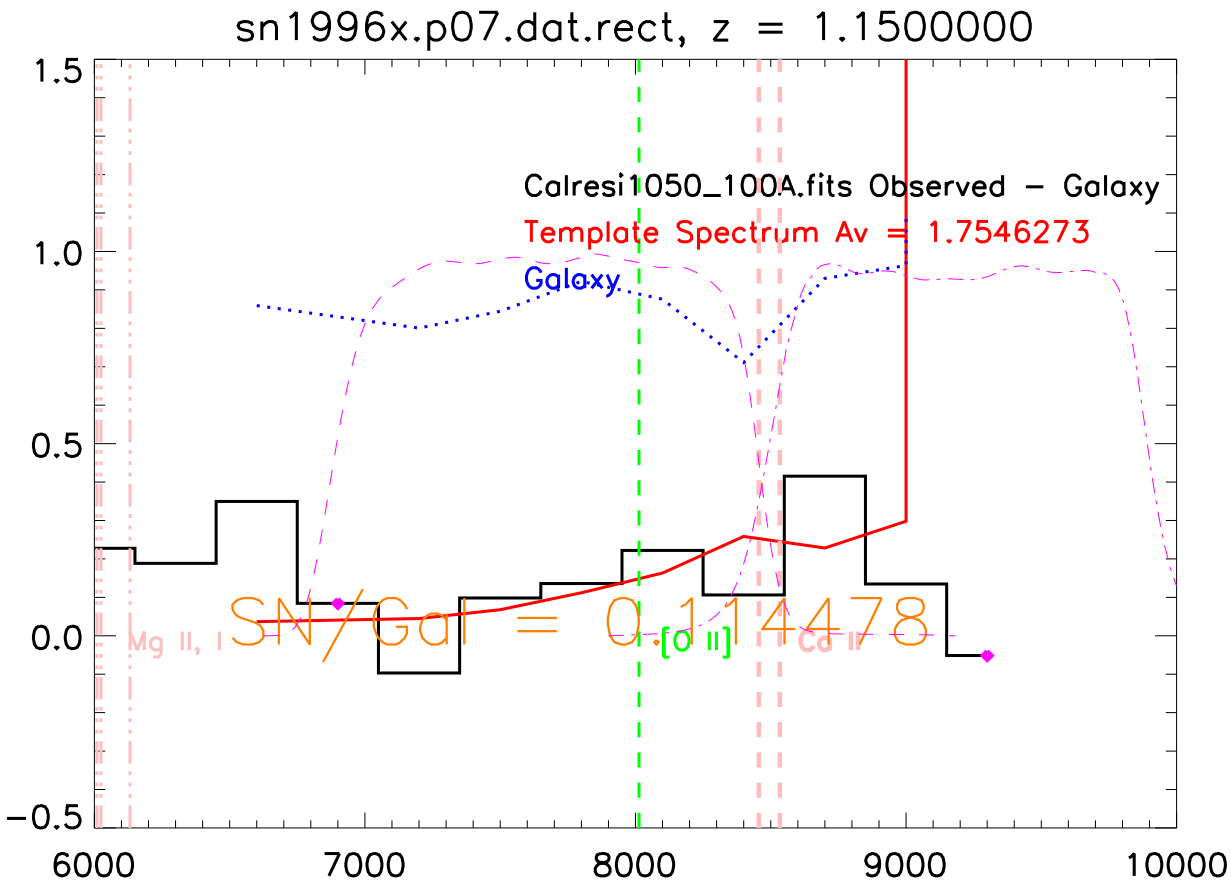

sn1991t.p67.dat.rect, z = 1.0000000
Calresi1050_100A.fits Observed – Galaxy
Template Spectrum Av = 0.40333107
Galaxy
SN/Gal = 0.735714
Mg II, I
[O II]
Ca I
[O III]
1.0
0.8
0.6
0.4
0.2
6000
7000
8000
9000
10000

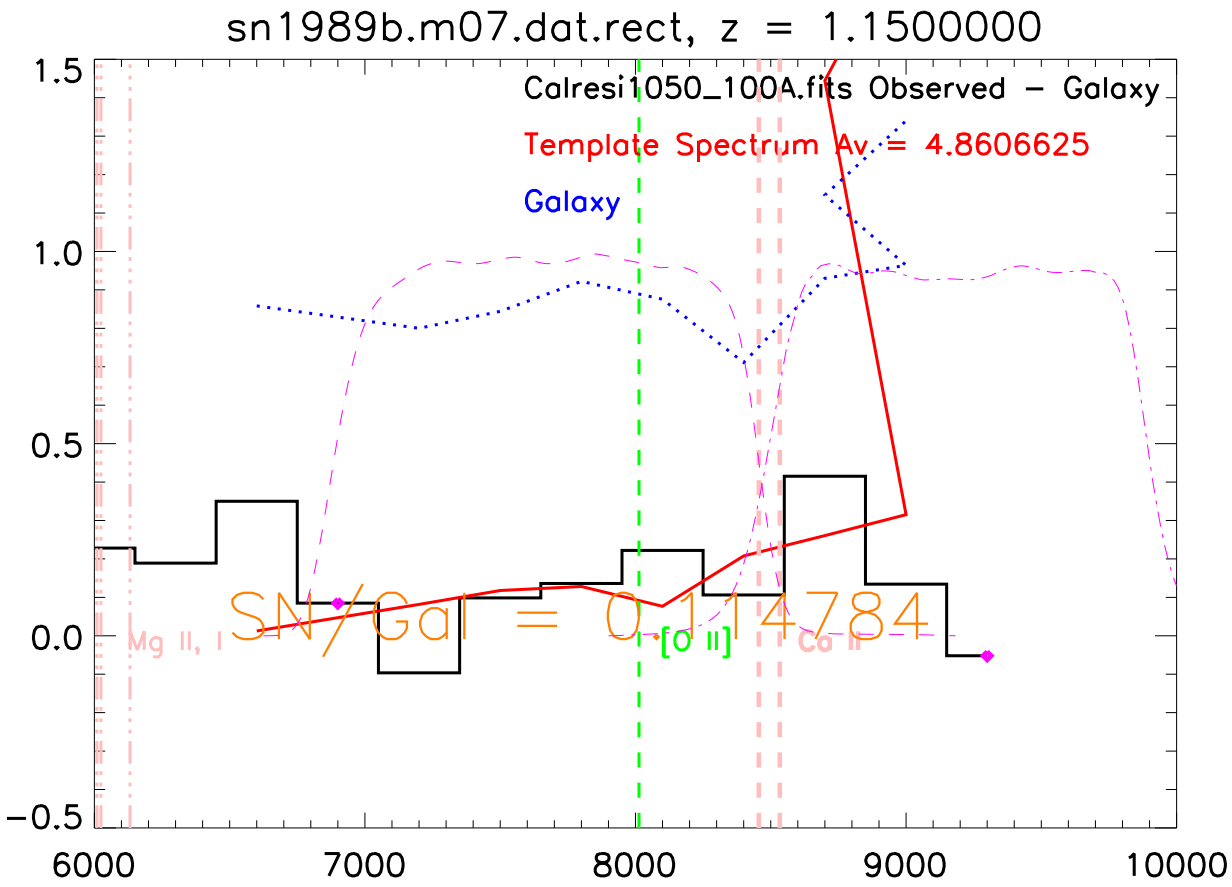

sn1996x.m00.dat.rect, z = 1.1500000
Calresi1050_100A.fits Observed − Galaxy
Template Spectrum Av = 3.5711339
Galaxy
SN/Gal = 0.631404
Mg II, I
[O II]
Ca II
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
6000
7000
8000
9000
10000

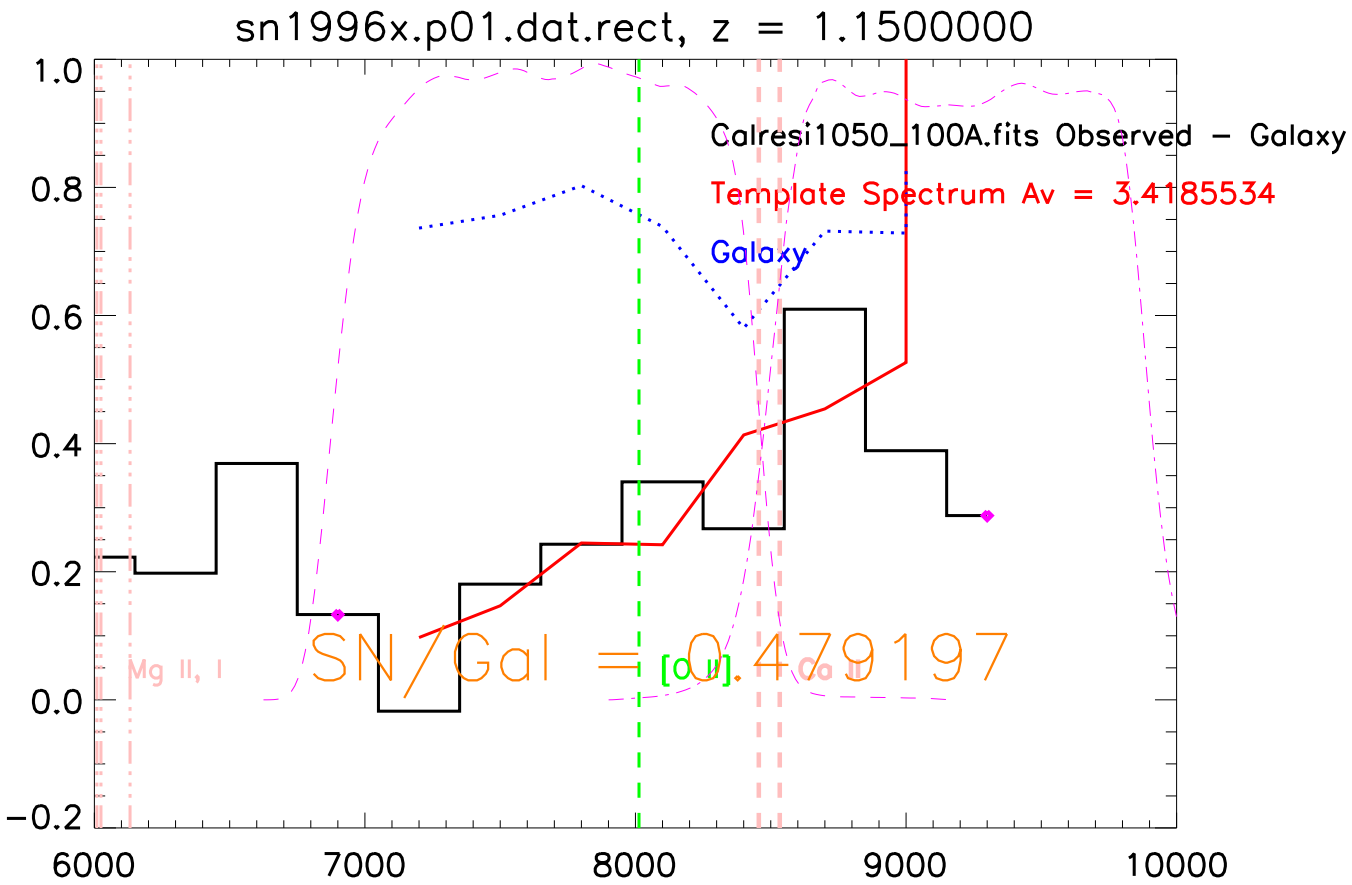

sn1989b.m01.dat.rect, z = 1.1500000
Calresi1050_100A.fits Observed − Galaxy
Template Spectrum Av = 3.8911313
Galaxy
SN/Gal = 0.104824
[O II]
1.2
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
6000
7000
8000
9000
10000

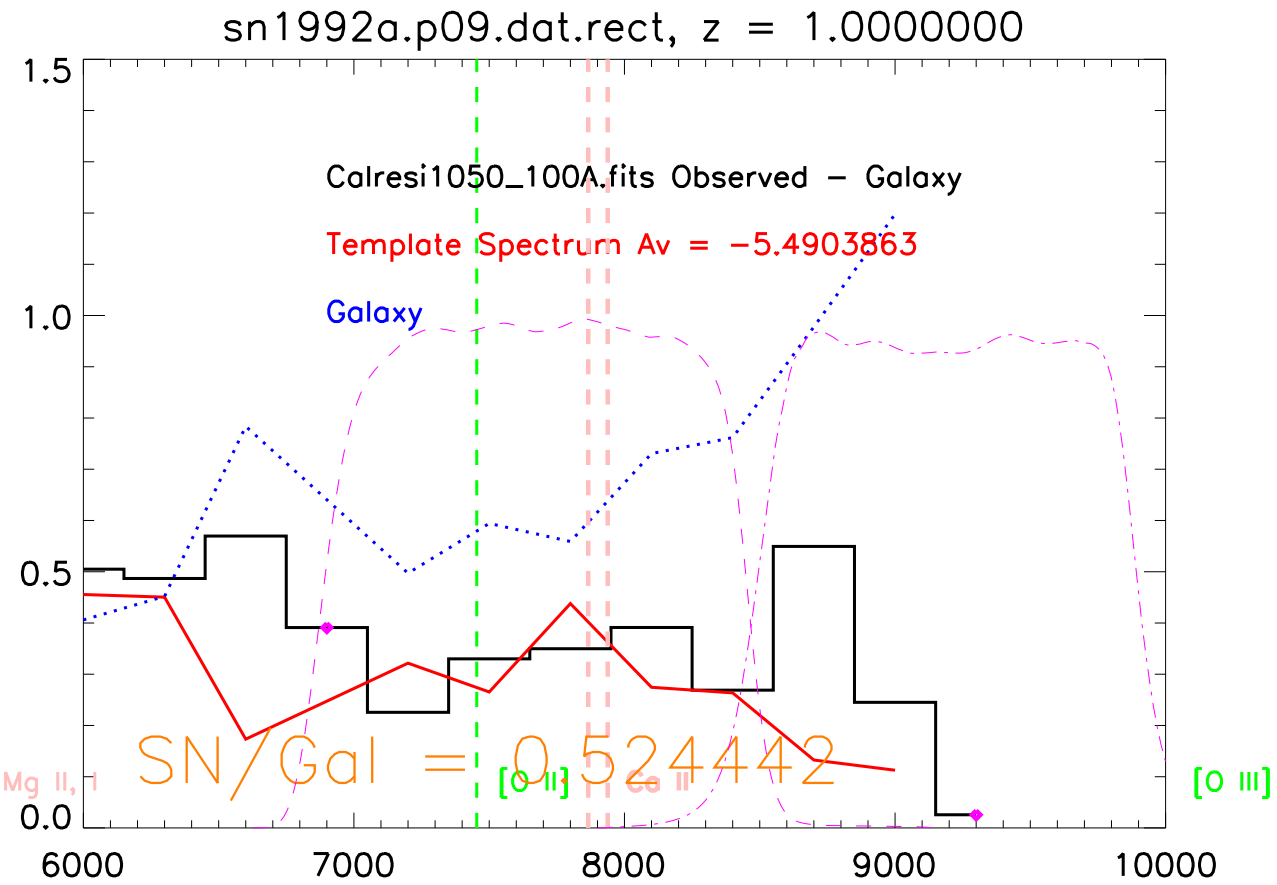

sn1989b.p12.dat.rect, z = 1.0000000
Calresi1050_100A.fits Observed − Galaxy
Template Spectrum Av = 3.8728133
Galaxy
SN/Gal = 1.18746
Mg II, I
[O II]
Ca II
[O III]
2.0
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

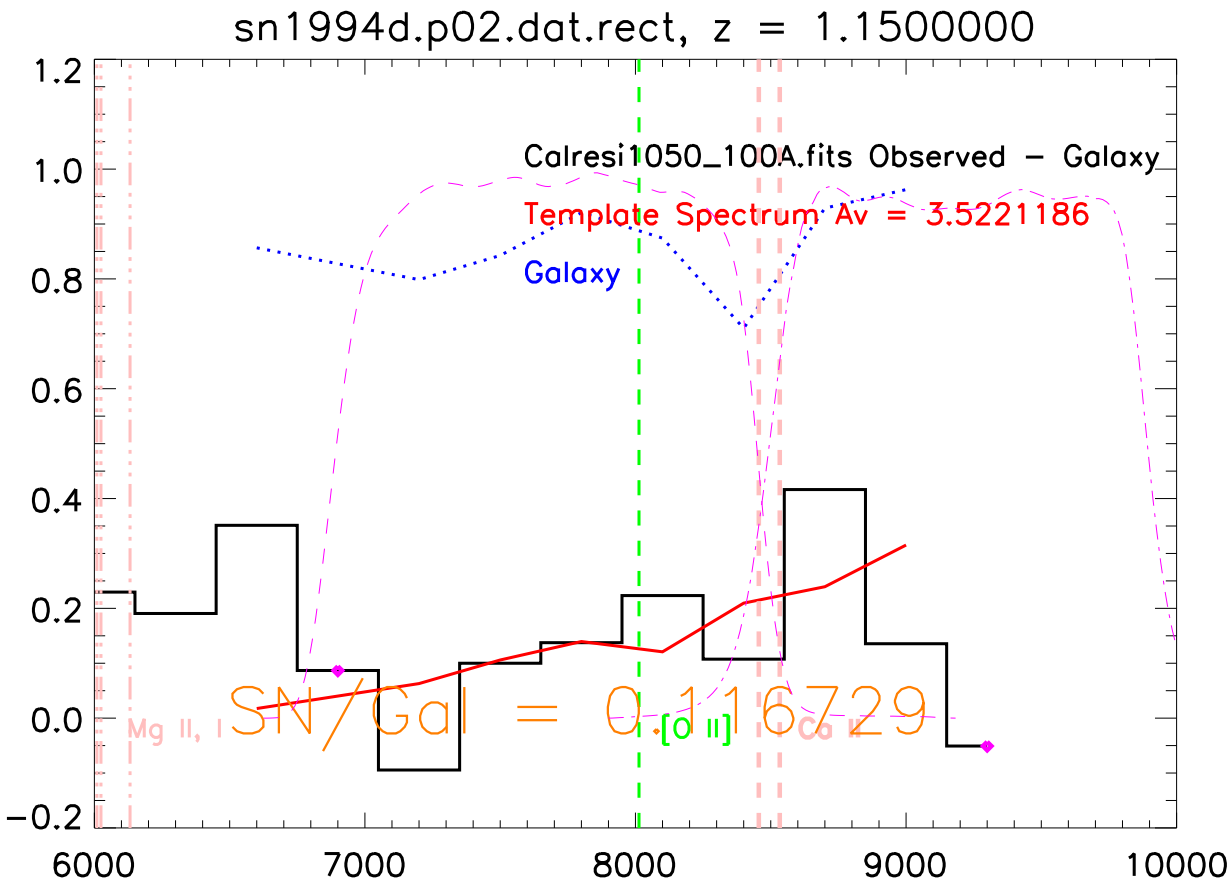

sn1990n.p17.dat.rect, z = 1.1500000
Calresi1050_100A.fits Observed − Galaxy
Template Spectrum Av = 2.8699631
Galaxy
SN/Gal = 0.240754
Mg II, I
[O II]
Ca II
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

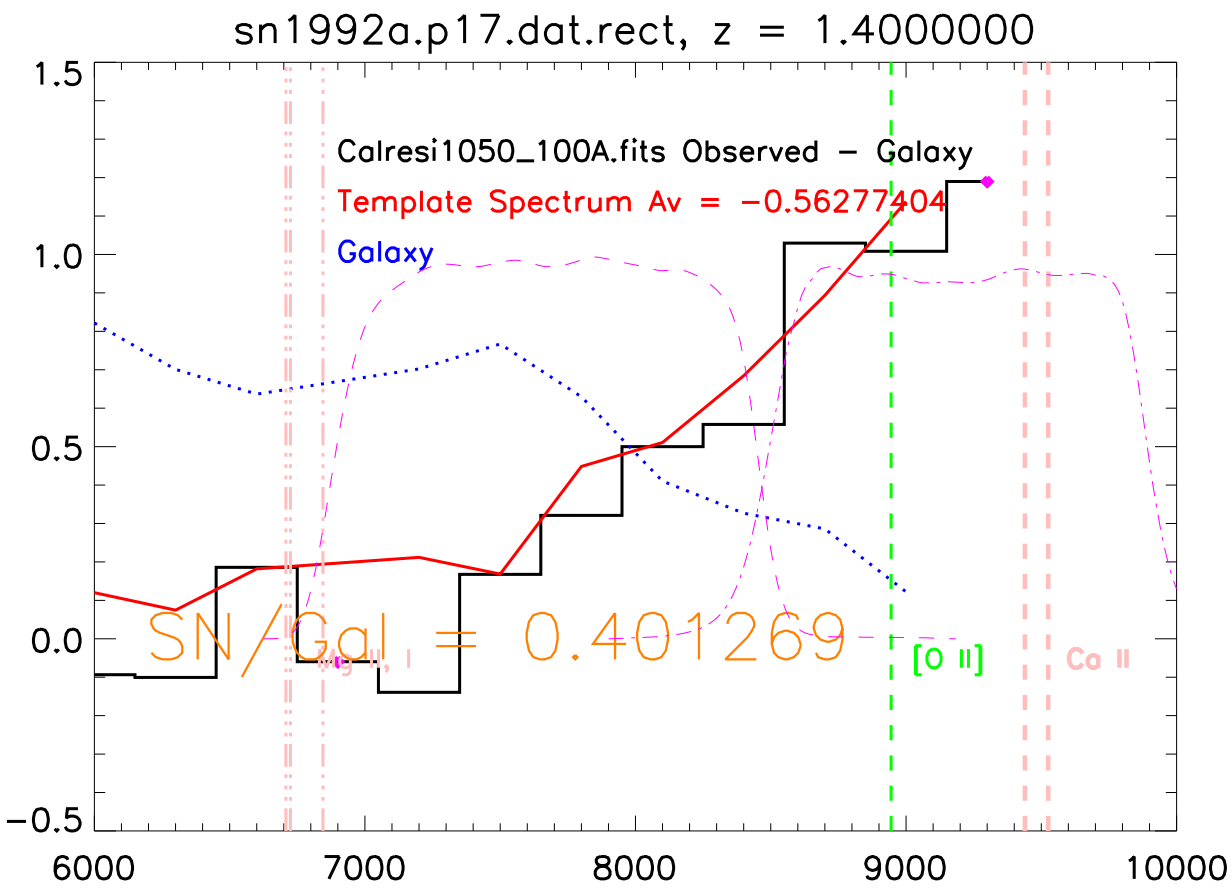

sn1996x.p07.dat.rect, z = 1.1500000
Calresi1050_100A.fits Observed − Galaxy
Template Spectrum Av = 1.7546273
Galaxy
S/N/Gal = 0.114478
Mg II, I
[O II]
Ca II
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

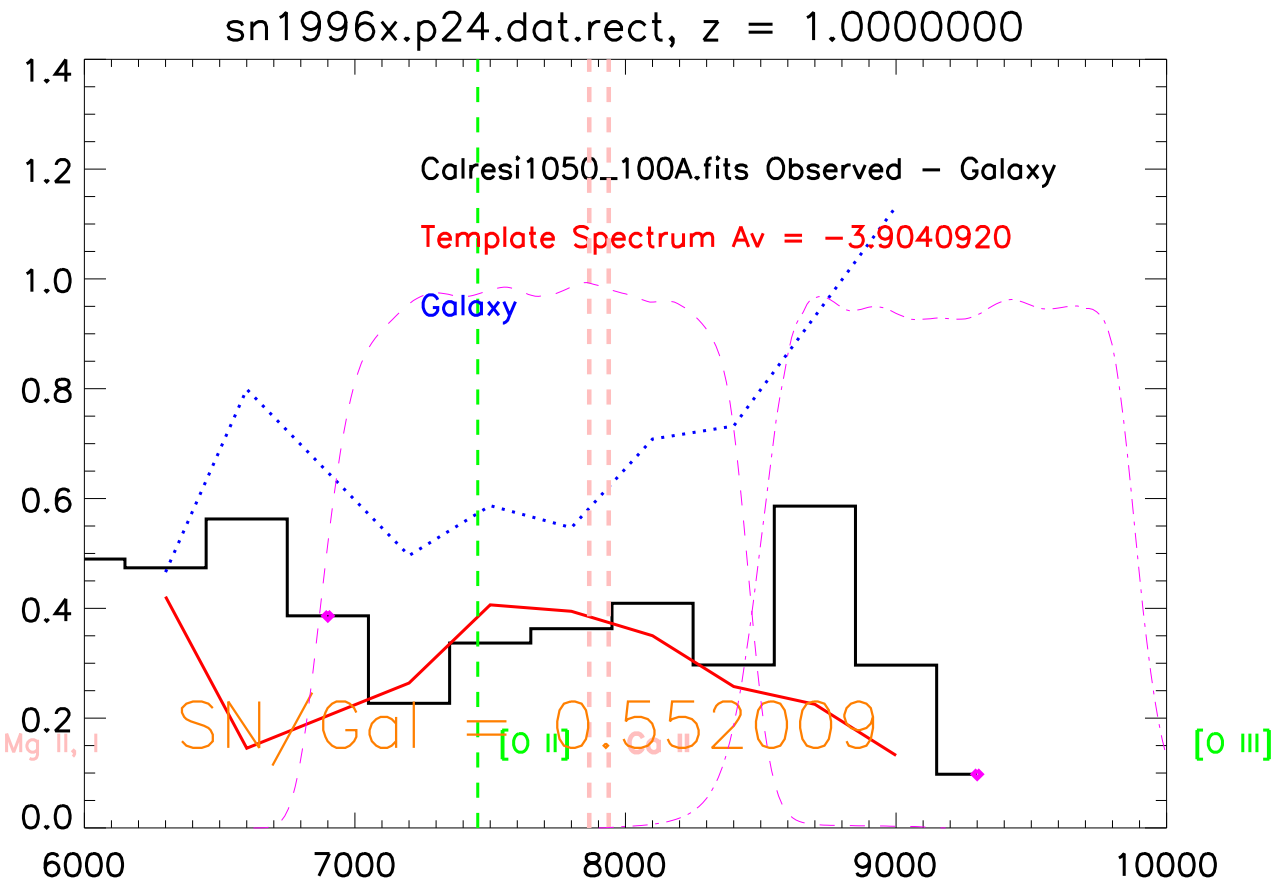

sn1989b.m07.dat.rect, z = 1.1500000
Calresi1050_100A.fits Observed − Galaxy
Template Spectrum Av = 4.8606625
Galaxy
SN/Gal = 0.114784
Mg II, I
[O II]
Ca II
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

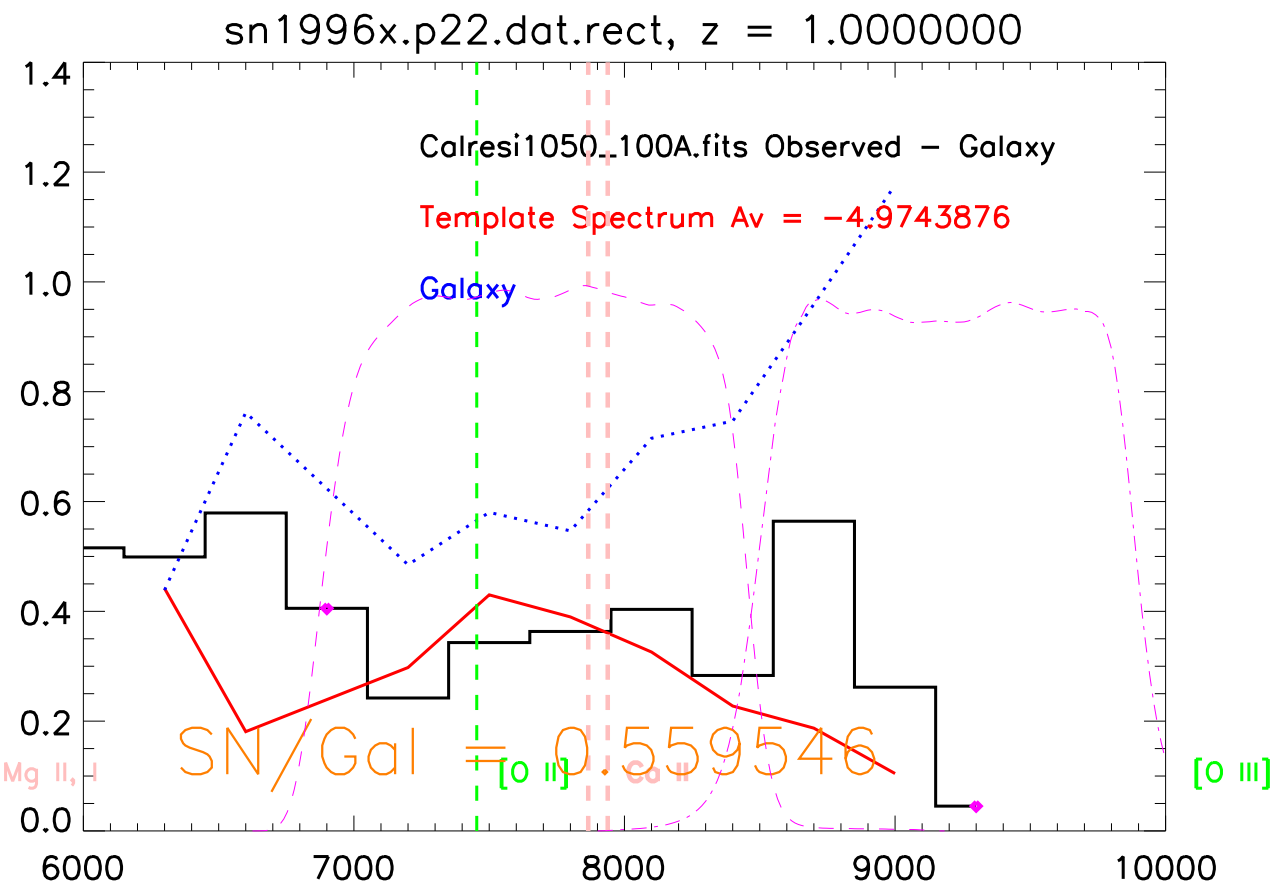

sn1996x.p01.dat.rect, z = 1.1500000
Calresi1050_100A.fits Observed − Galaxy
Template Spectrum Av = 3.4185534
Galaxy
SN/Gal = 0.479197
Mg II, I
[O II]
Ca II
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
6000
7000
8000
9000
10000

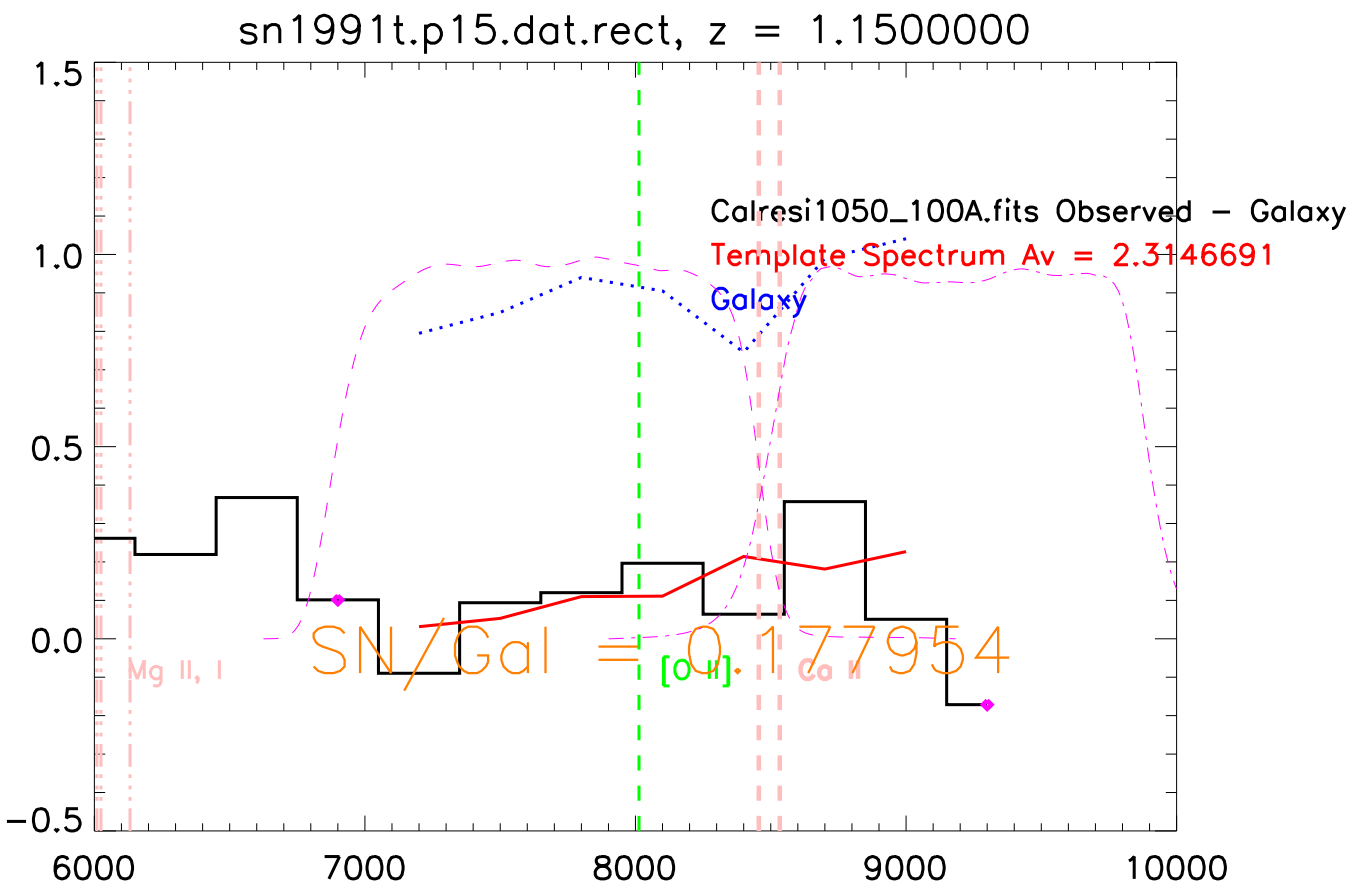

sn1992a.p09.dat.rect, z = 1.0000000
Calresi1050_100A.fits Observed − Galaxy
Template Spectrum Av = −5.4903863
Galaxy
SN/Gal = 0.524442
[O II]
[O III]
1.5
1.0
0.5
0.0
6000
7000
8000
9000
10000

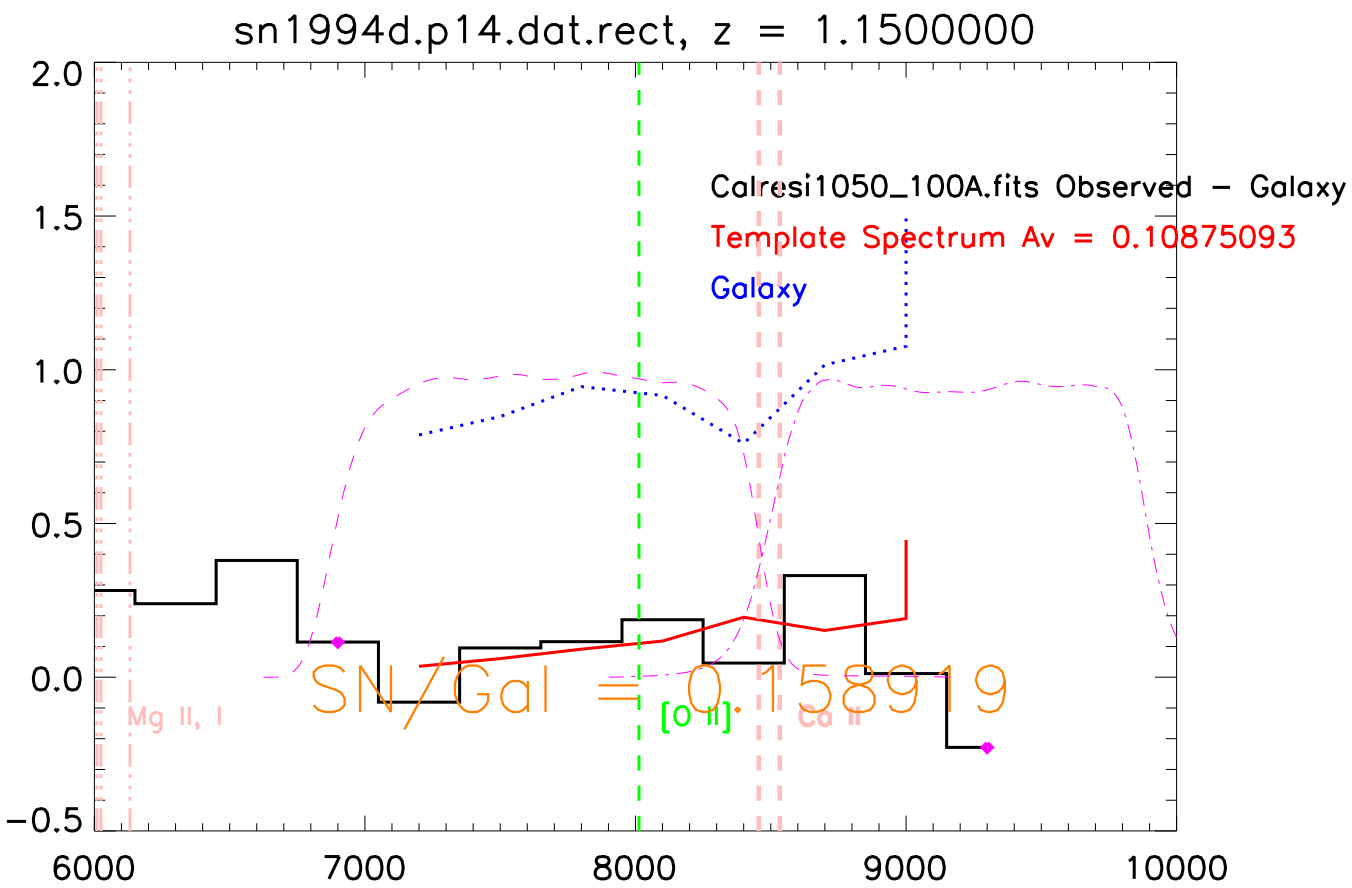

sn1994d.p02.dat.rect, z = 1.1500000
Calresi1050_100A.fits Observed − Galaxy
Template Spectrum Av = 3.5221186
Galaxy
SN/Gal = 0.116729
Mg II, I
[O II]
Ca II
1.2
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
6000
7000
8000
9000
10000

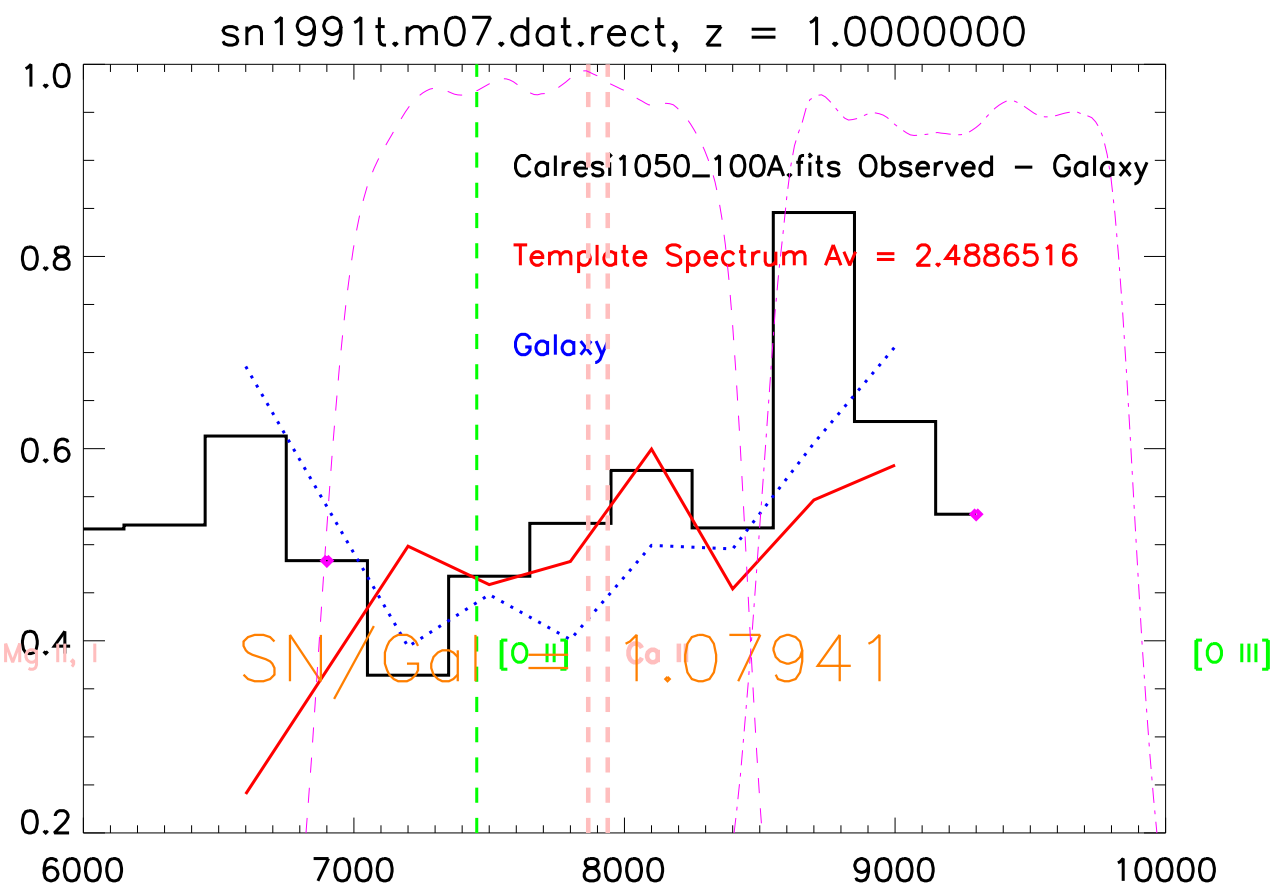

sn1992a.p17.dat.rect, z = 1.4000000
Calresi1050_100A.fits Observed − Galaxy
Template Spectrum Av = −0.56277404
Galaxy
SN/Gal = 0.401269
[O II]
Ca II
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

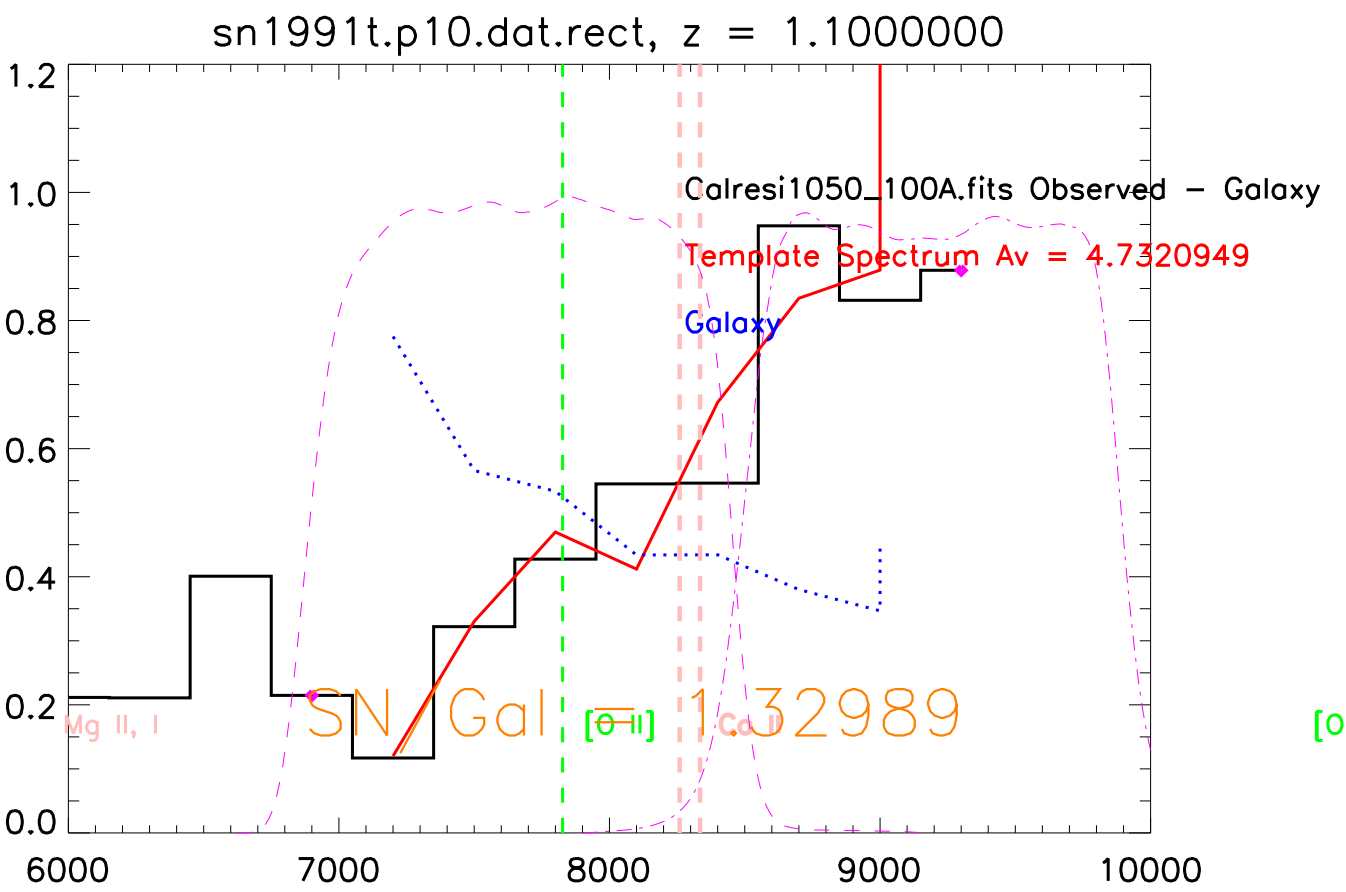

sn1996x.p24.dat.rect, z = 1.0000000
Calresi1050_100A.fits Observed − Galaxy
Template Spectrum Av = −3.9040920
Galaxy
SN/Gal = 0.552009
Mg II, I
[O II]
Ca II
[O III]
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
6000
7000
8000
9000
10000

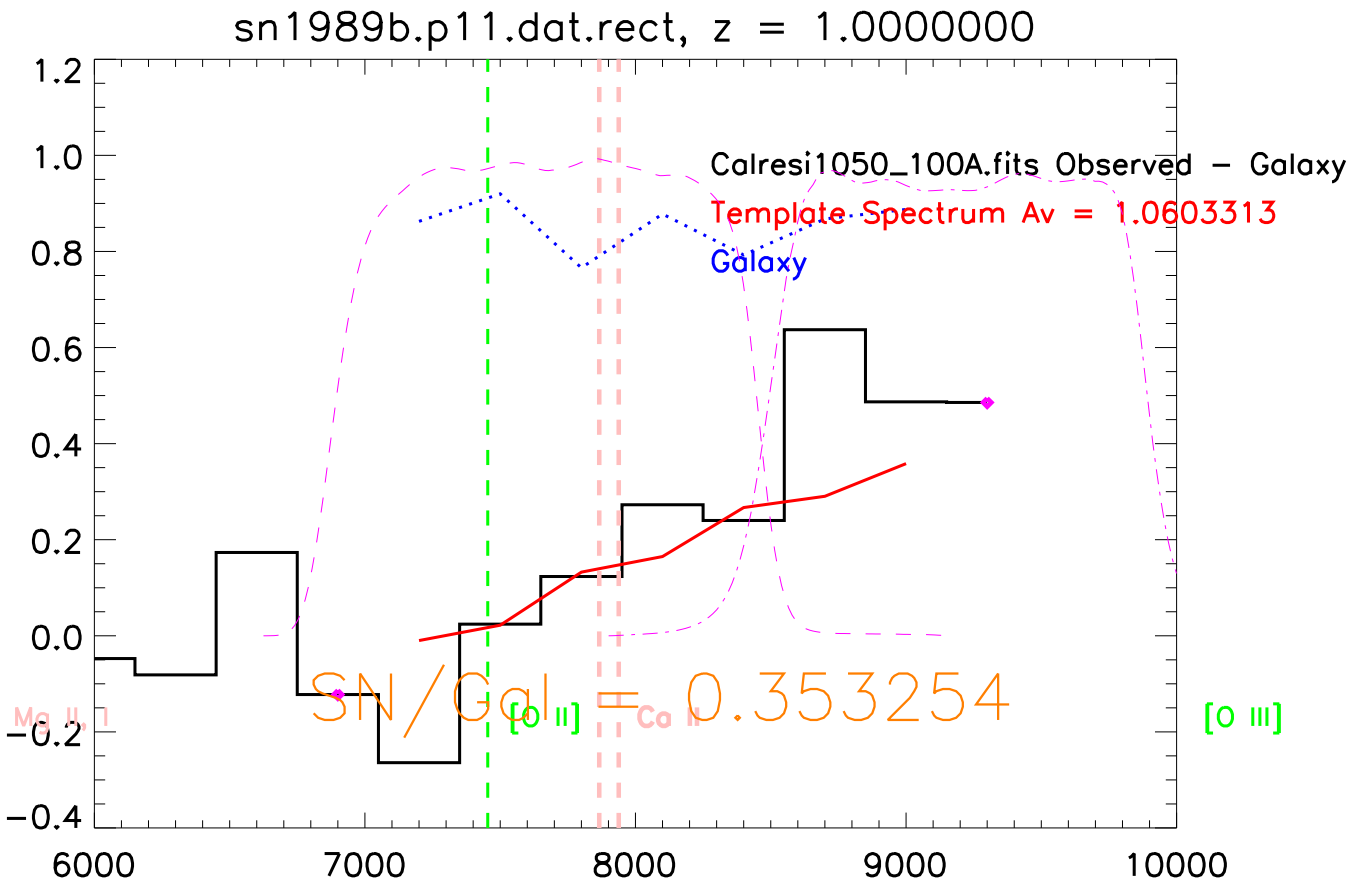

sn1996x.p22.dat.rect, z = 1.0000000
Calresi1050_100A.fits Observed − Galaxy
Template Spectrum Av = −4.9743876
Galaxy
SN/Gal = 0.559546
[O II]
[O III]
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
6000
7000
8000
9000
10000

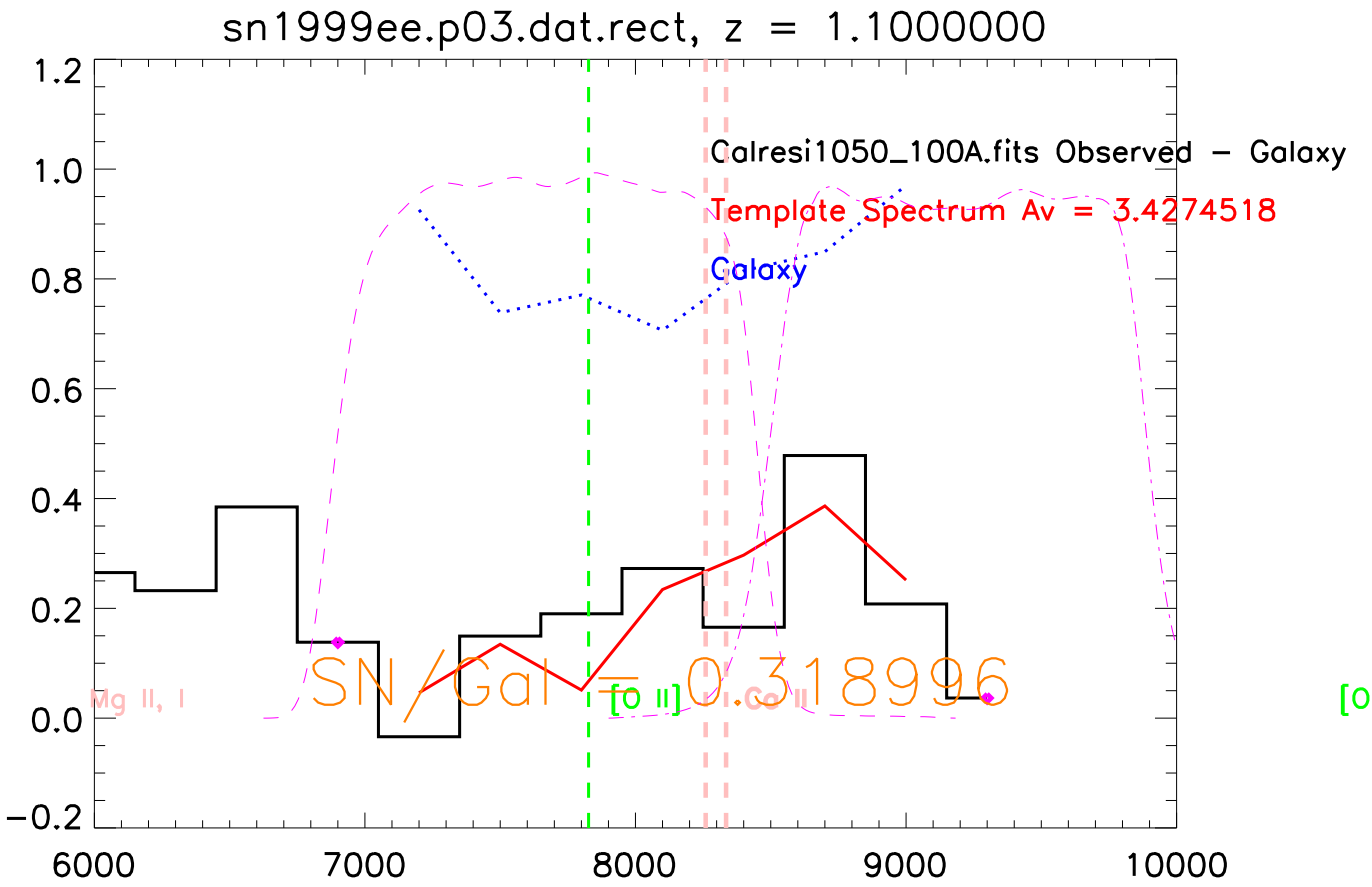

sn1991t.p15.dat.rect, z = 1.1500000
Calresi1050_100A.fits Observed − Galaxy
Template Spectrum Av = 2.3146691
Galaxy
SN/Gal = 0.177954
Mg II, I
[O II]
Ca II
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

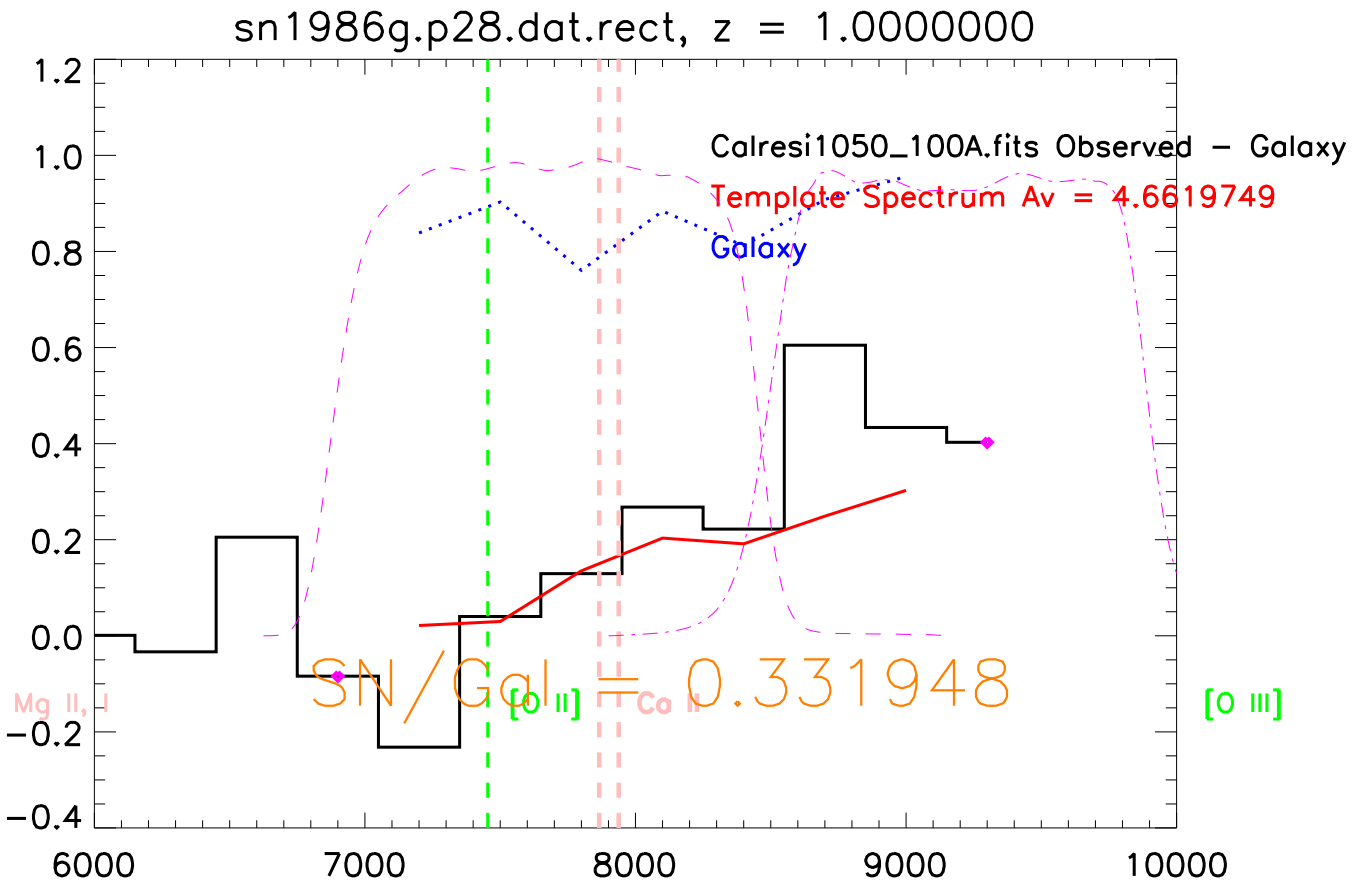

sn1994d.p14.dat.rect, z = 1.1500000
Calresi1050_100A.fits Observed − Galaxy
Template Spectrum Av = 0.10875093
Galaxy
SN/Gal = 0.158919
Mg II, I
[O II]
Ca II
2.0
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

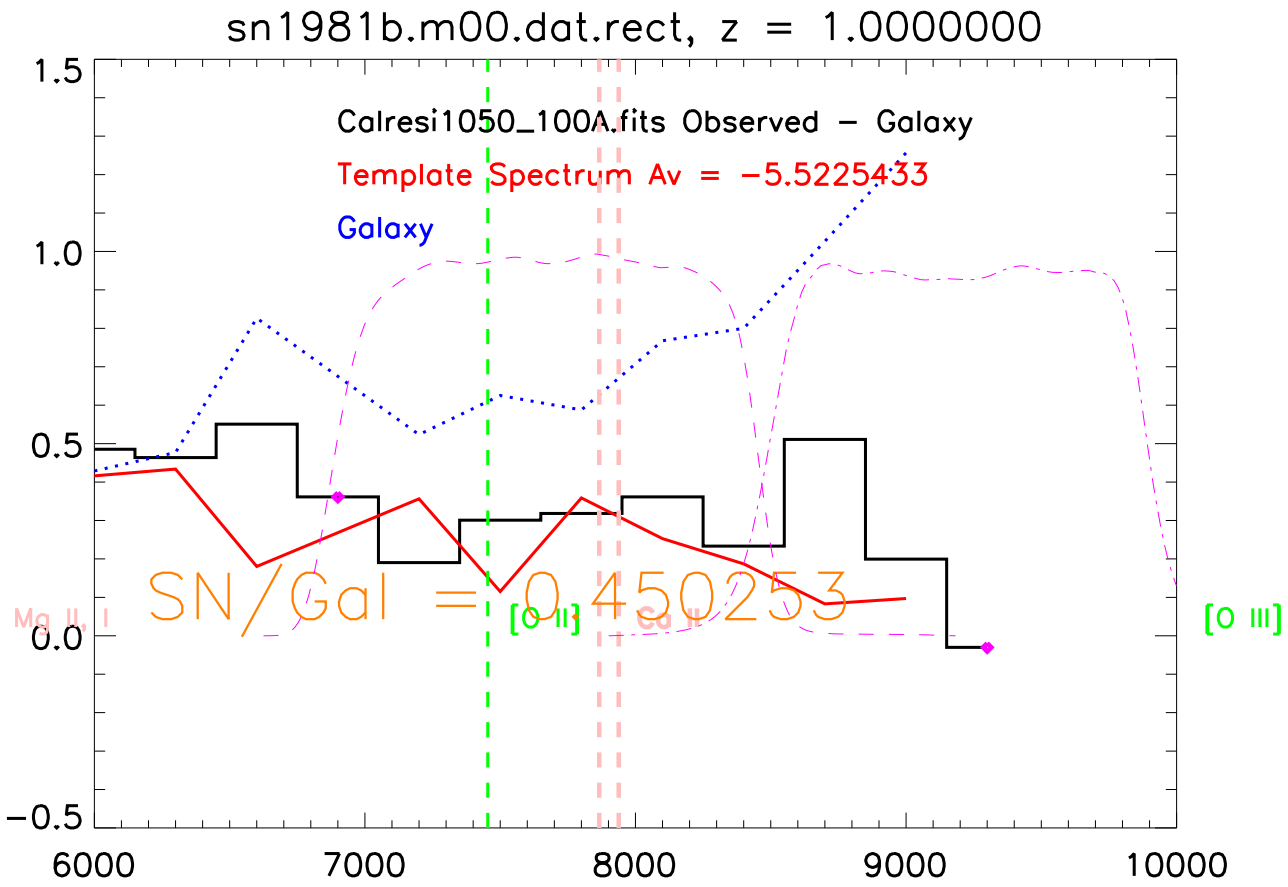

sn1991t.m07.dat.rect, z = 1.0000000
Calresi1050_100A.fits Observed − Galaxy
Template Spectrum Av = 2.4886516
Galaxy
SN/Gal = 1.07941
[O III]
[O III]
1.0
0.8
0.6
0.4
0.2
6000
7000
8000
9000
10000

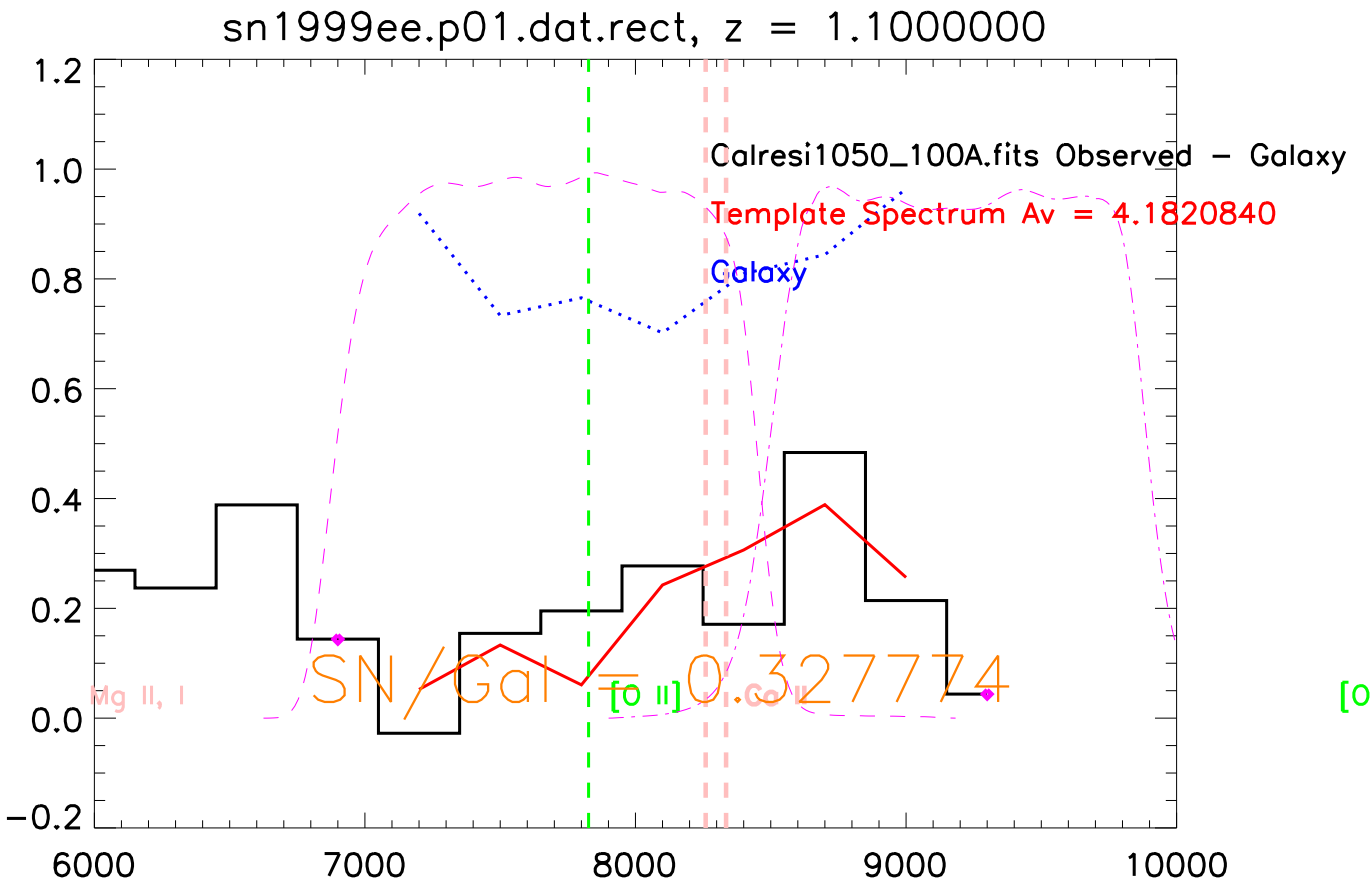

sn1991t.p10.dat.rect, z = 1.1000000
Calresi1050_100A.fits Observed – Galaxy
Template Spectrum Av = 4.7320949
Galaxy
SN / Gal = 1.32989
Mg II, I
[O II]
Ca II
[O
1.2
1.0
0.8
0.6
0.4
0.2
0.0
6000
7000
8000
9000
10000

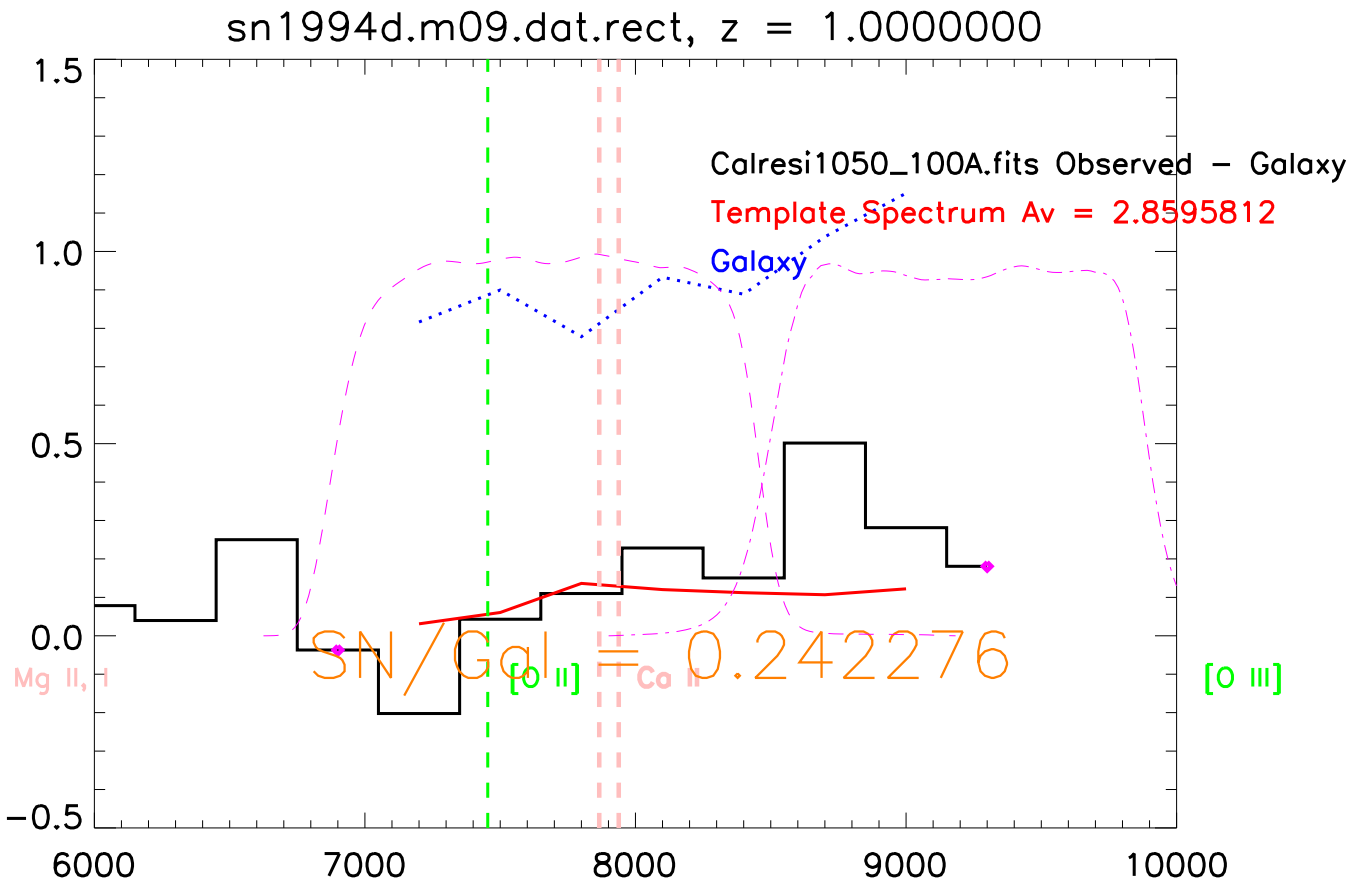

sn1989b.p11.dat.rect, z = 1.0000000
Calresi1050_100A.fits Observed − Galaxy
Template Spectrum Av = 1.0603313
Galaxy
SN/Gal = 0.353254
Mg II, I
[O II]
Ca II
[O III]
1.2
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
−0.4
6000
7000
8000
9000
10000

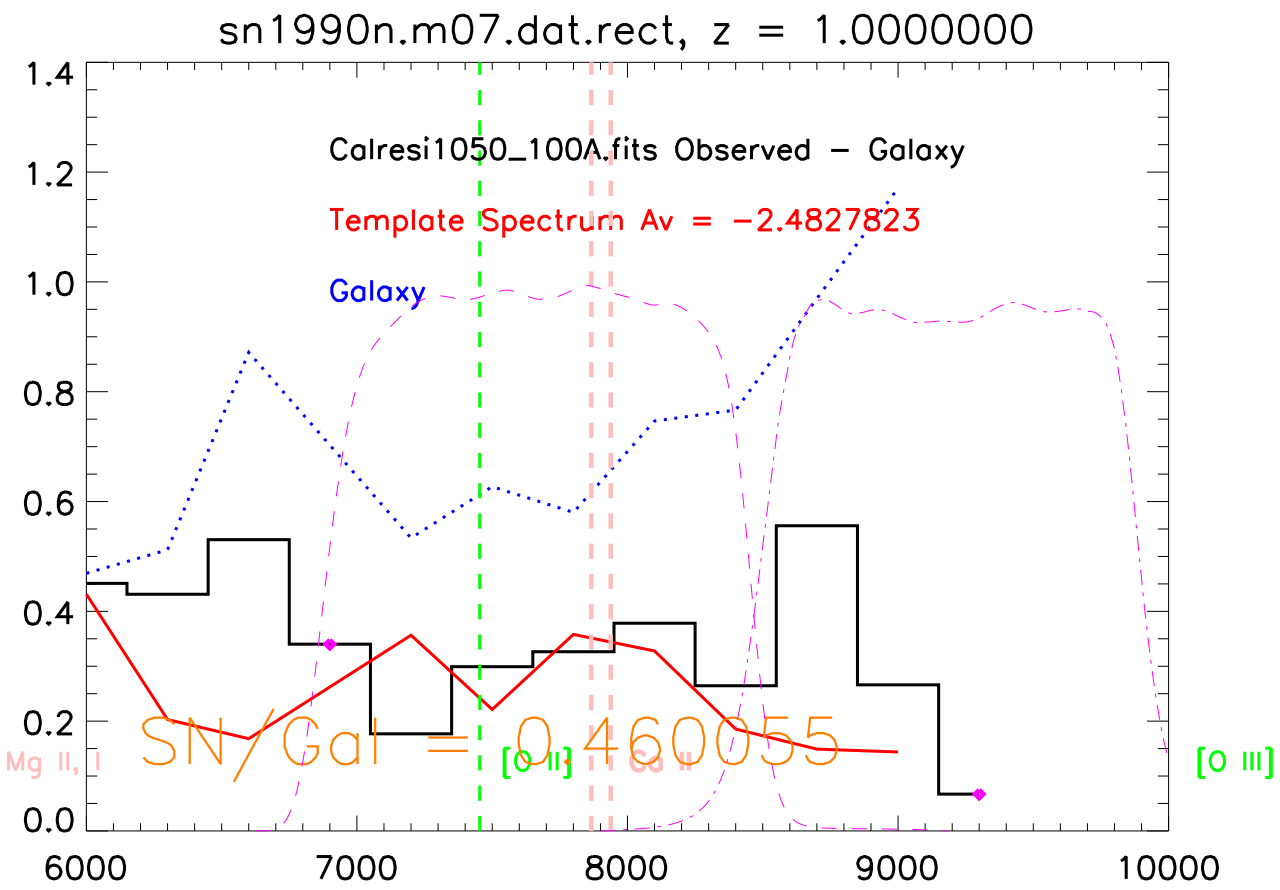

sn1999ee.p03.dat.rect, z = 1.1000000
Calresi1050_100A.fits Observed − Galaxy
Template Spectrum Av = 3.4274518
Galaxy
SN/Gal = 0.318996
Mg II, I
[O II]
Ca II
[O
1.2
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
6000
7000
8000
9000
10000

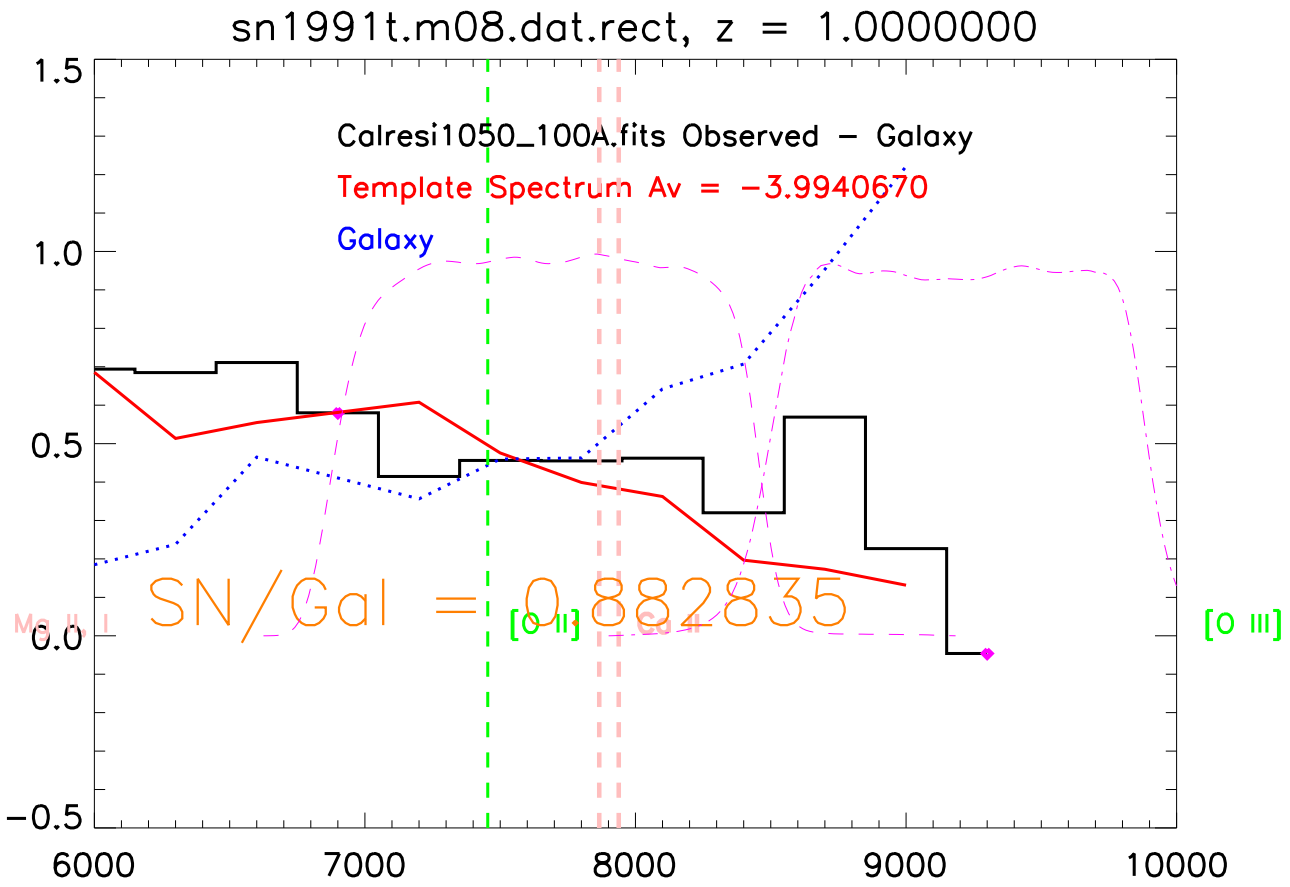

sn1986g.p28.dat.rect, z = 1.0000000
Calresi1050_100A.fits Observed − Galaxy
Template Spectrum Av = 4.6619749
Galaxy
SN/Gal = 0.331948
Mg II, I
[O II]
Ca II
[O III]
1.2
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
−0.4
6000
7000
8000
9000
10000

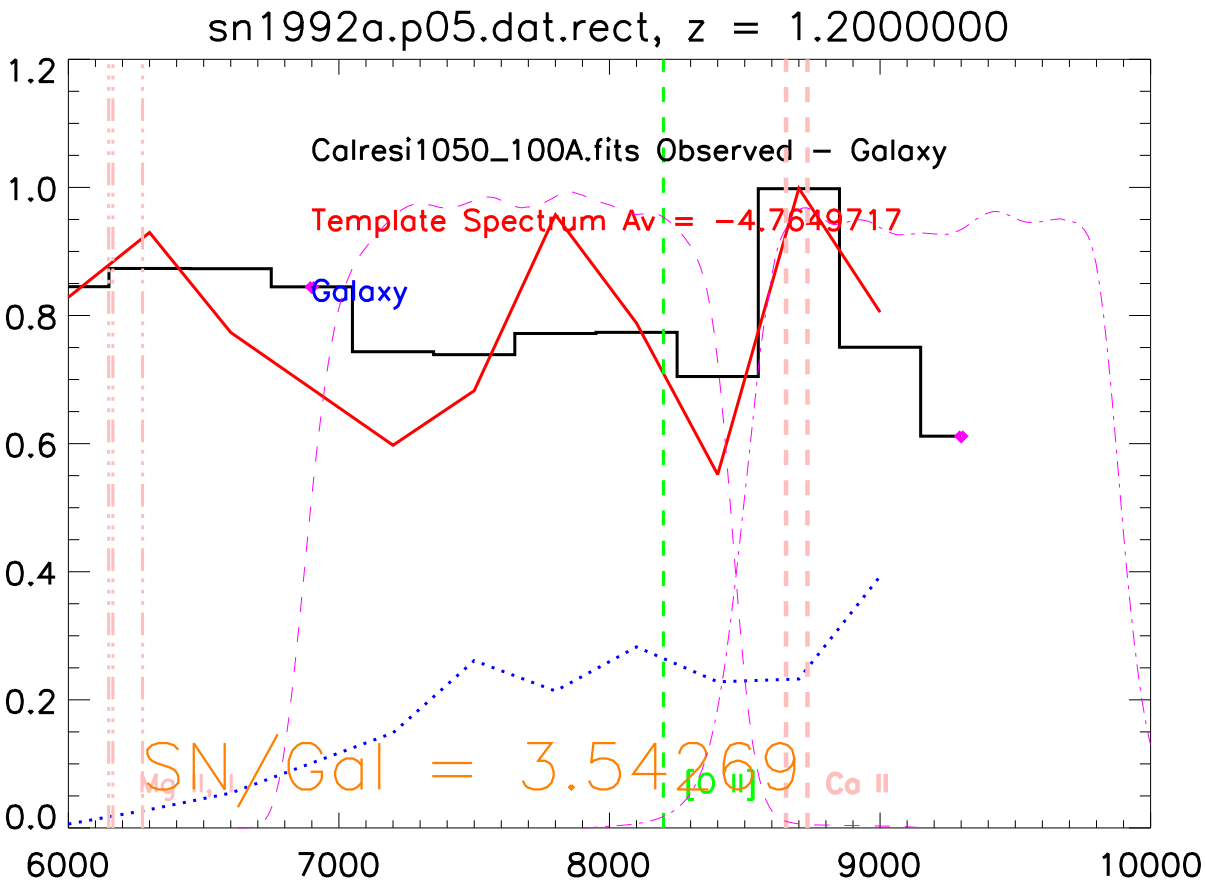

sn1981b.m00.dat.rect, z = 1.0000000
Calresi1050_100A.fits Observed − Galaxy
Template Spectrum Av = −5.5225433
Galaxy
SN/Gal = 0.450253
Mg II
[O II]
Ca II
[O III]
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

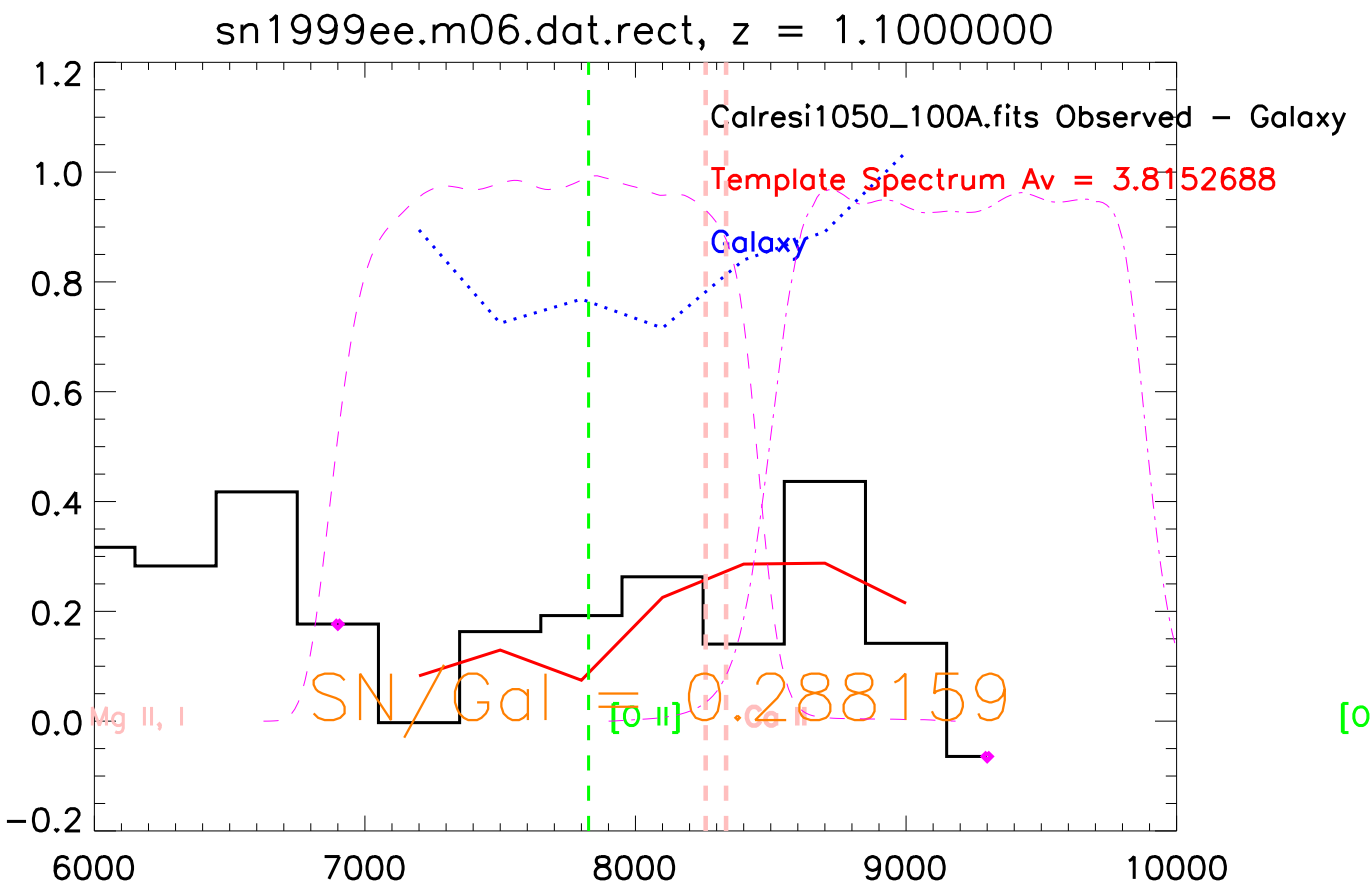

sn1999ee.p01.dat.rect, z = 1.1000000
Calresi1050_100A.fits Observed − Galaxy
Template Spectrum Av = 4.1820840
Galaxy
SN/Gal = 0.327774
Mg II, I
[O II]
Ca II
[O
1.2
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
6000
7000
8000
9000
10000

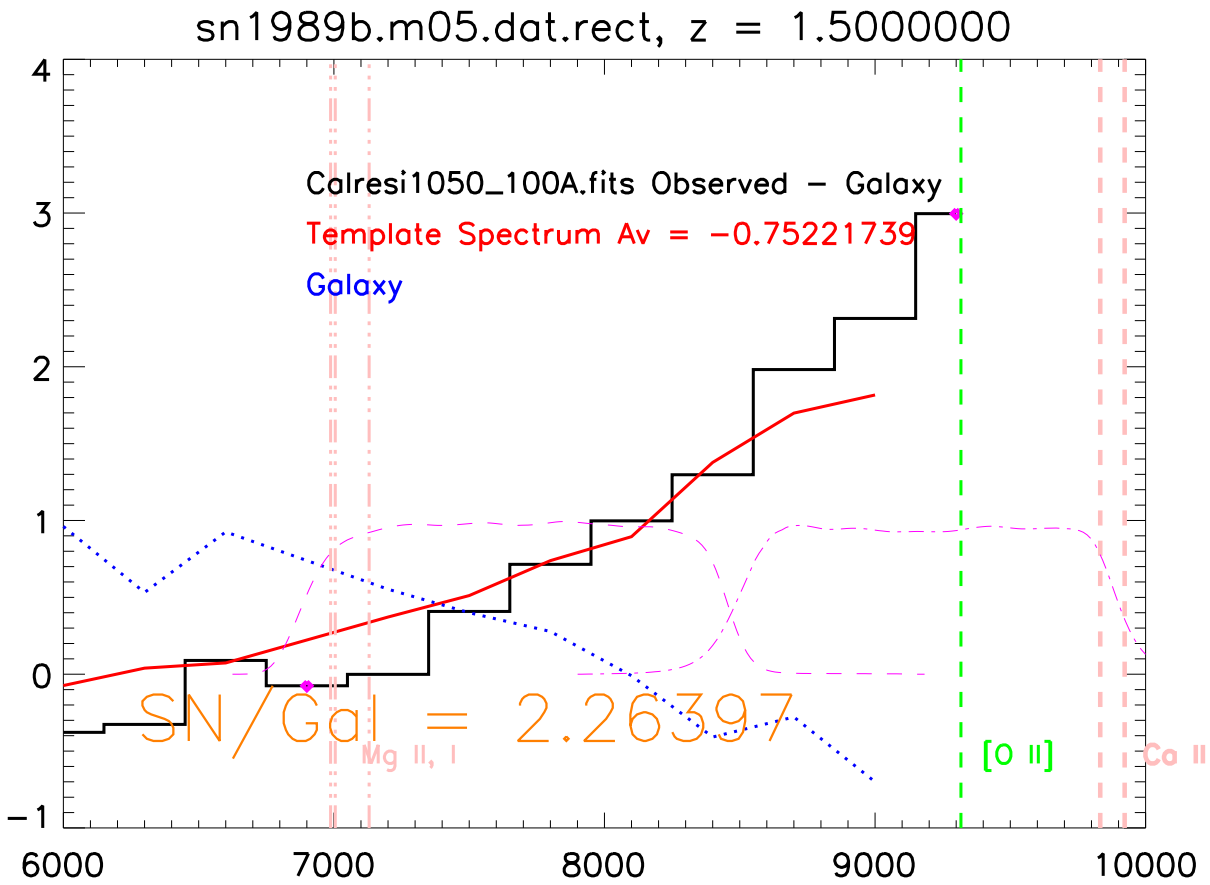

sn1994d.m09.dat.rect, z = 1.0000000
Calresi1050_100A.fits Observed − Galaxy
Template Spectrum Av = 2.8595812
Galaxy
SN/Gal = 0.242276
Mg II, I
[O II]
Ca II
[O III]
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

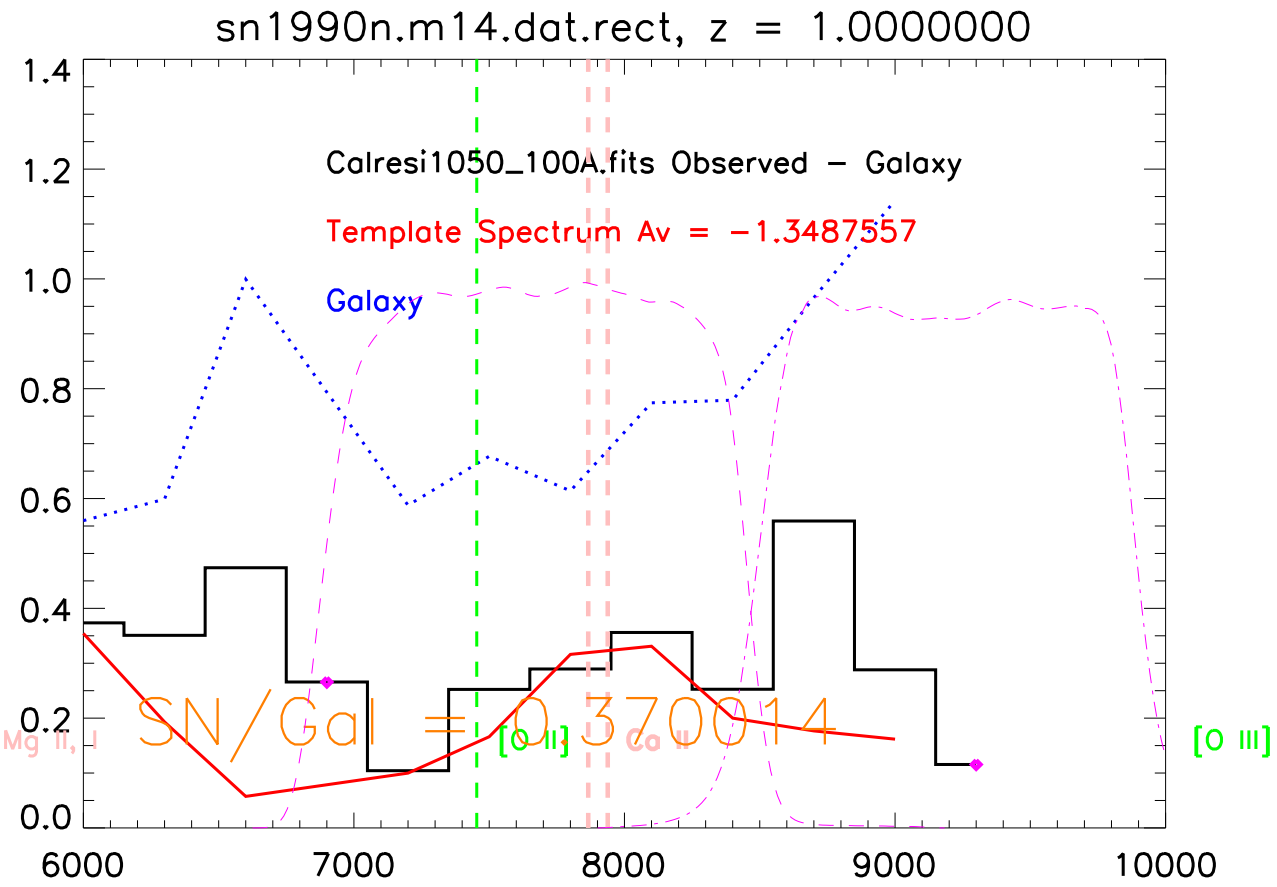

sn1990n.m07.dat.rect, z = 1.0000000
Calresi1050_100A.fits Observed − Galaxy
Template Spectrum Av = −2.4827823
Galaxy
SN/Gal = 0.460055
Mg II, I
[O II]
Ca II
[O III]
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
6000
7000
8000
9000
10000

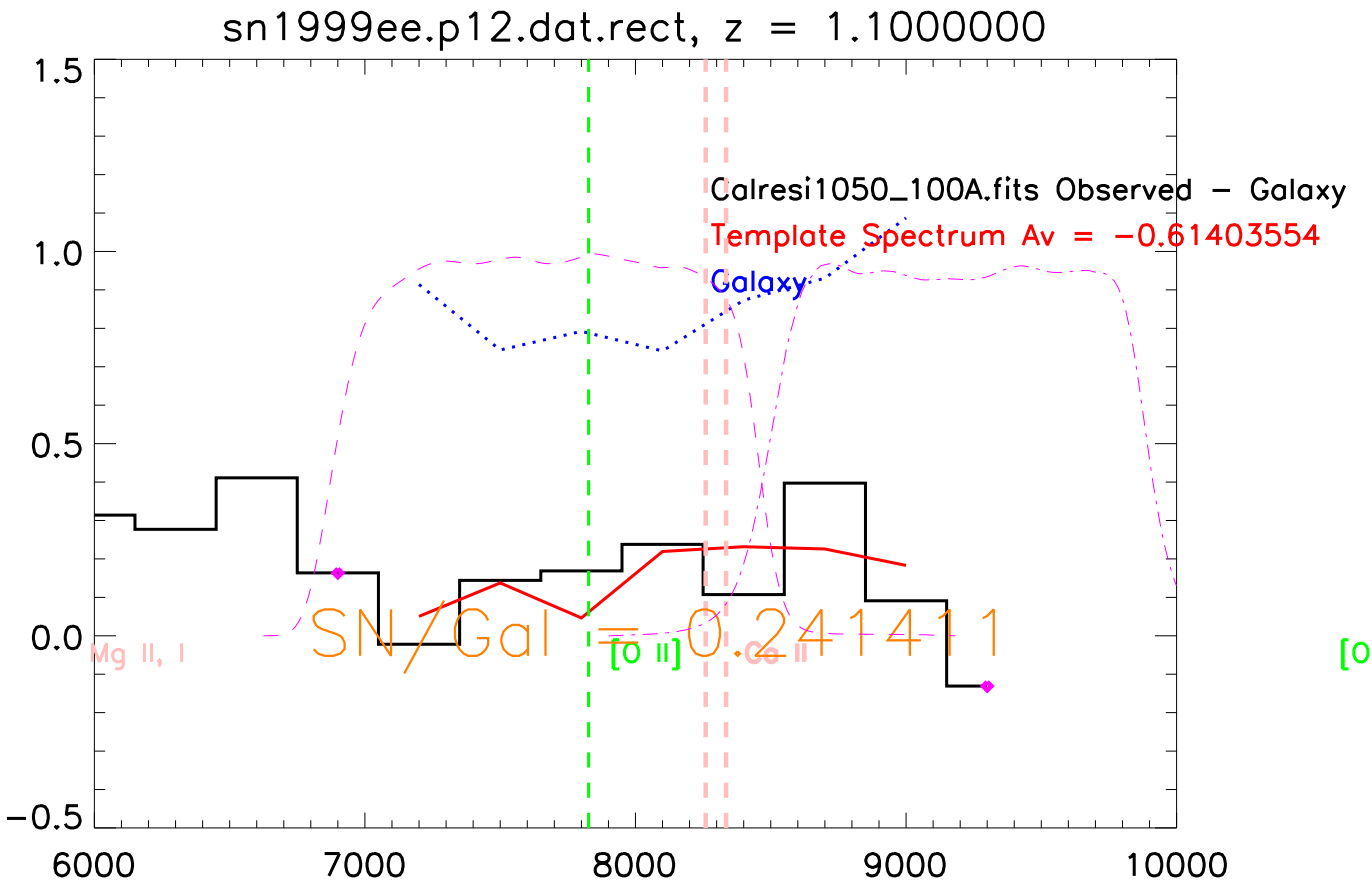

sn1991t.m08.dat.rect, z = 1.0000000
Calresi1050_100A.fits Observed − Galaxy
Template Spectrum Av = −3.9940670
Galaxy
SN/Gal = 0.882835
[O II]
[O III]
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000

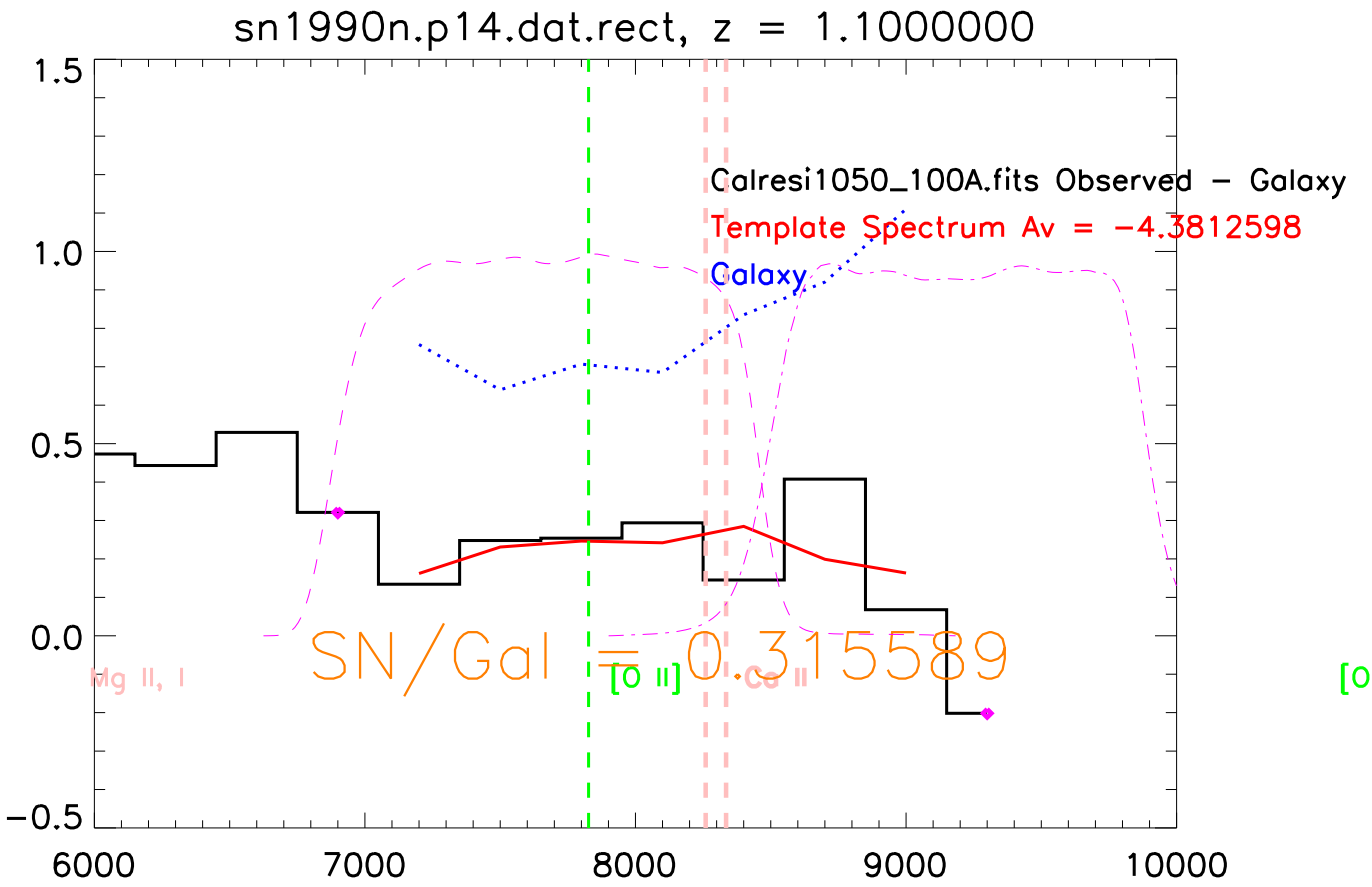

sn1992a.p05.dat.rect, z = 1.2000000
Calresi1050_100A.fits Observed – Galaxy
Template Spectrum Av = -4.7649717
Galaxy
SN/Gal = 3.54269
Mg II
[O II]
Ca II
1.2
1.0
0.8
0.6
0.4
0.2
0.0
6000
7000
8000
9000
10000

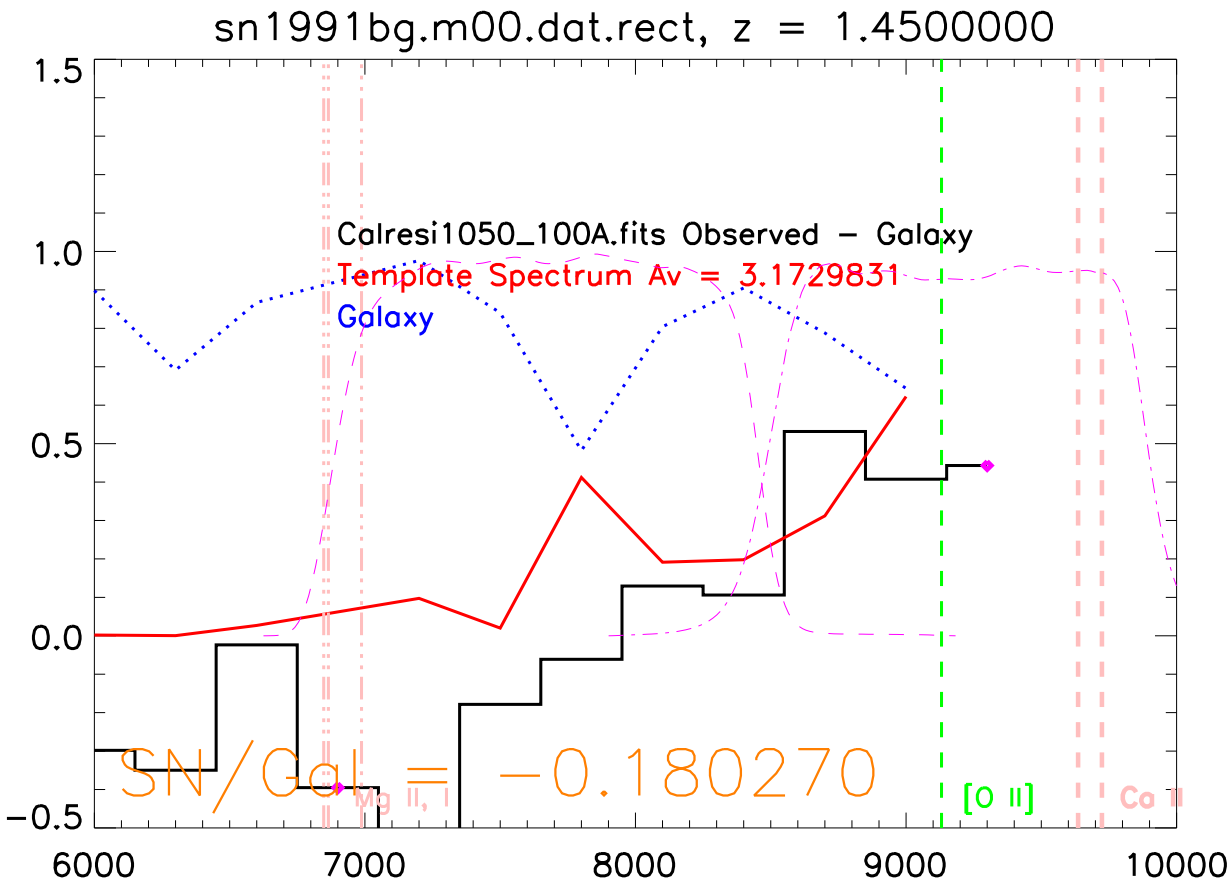

sn1999ee.m06.dat.rect, z = 1.1000000
Calresi1050_100A.fits Observed − Galaxy
Template Spectrum Av = 3.8152688
Galaxy
SN/Gal = 0.288159
[O II]
1.2
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
6000
7000
8000
9000
10000

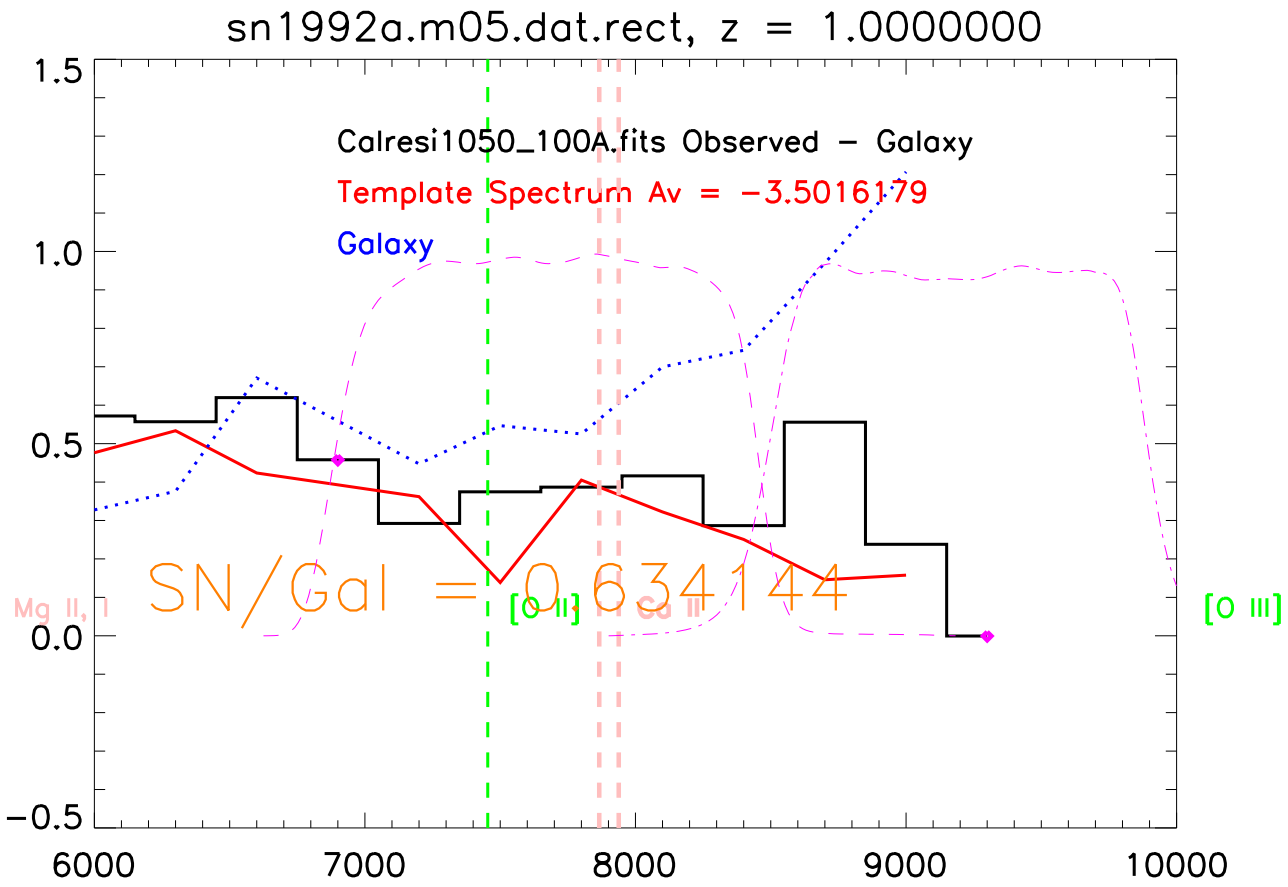

sn1989b.m05.dat.rect, z = 1.5000000
Calresi1050_100A.fits Observed − Galaxy
Template Spectrum Av = −0.75221739
Galaxy
SN/Gal = 2.26397
Mg II, I
[O II]
Ca II
4
3
2
1
0
−1
6000
7000
8000
9000
10000

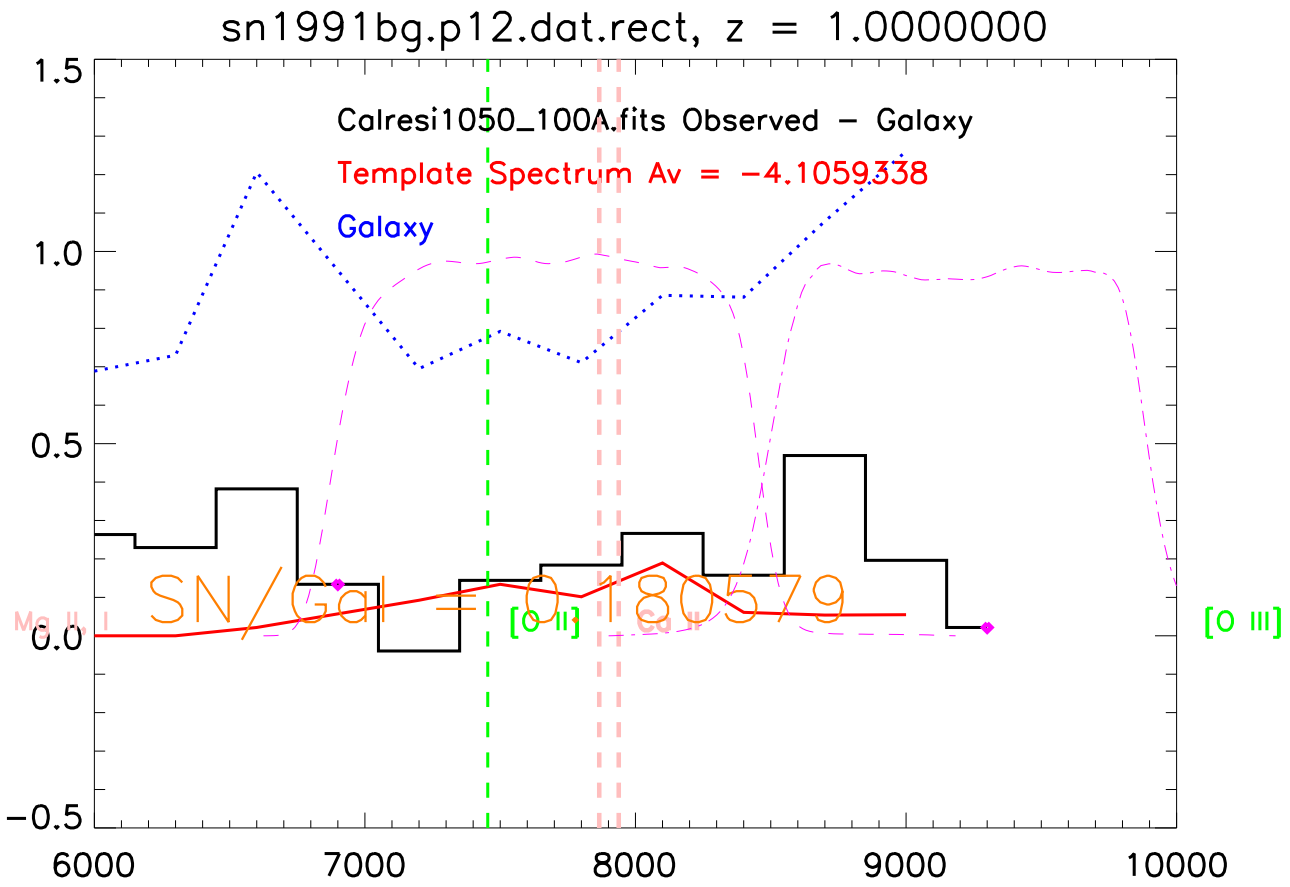

sn1990n.m14.dat.rect, z = 1.0000000
Calresi1050_100A.fits Observed − Galaxy
Template Spectrum Av = −1.3487557
Galaxy
SN/Gal = 0.370014
Mg II, I
[O II]
Ca II
[O III]
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
6000
7000
8000
9000
10000

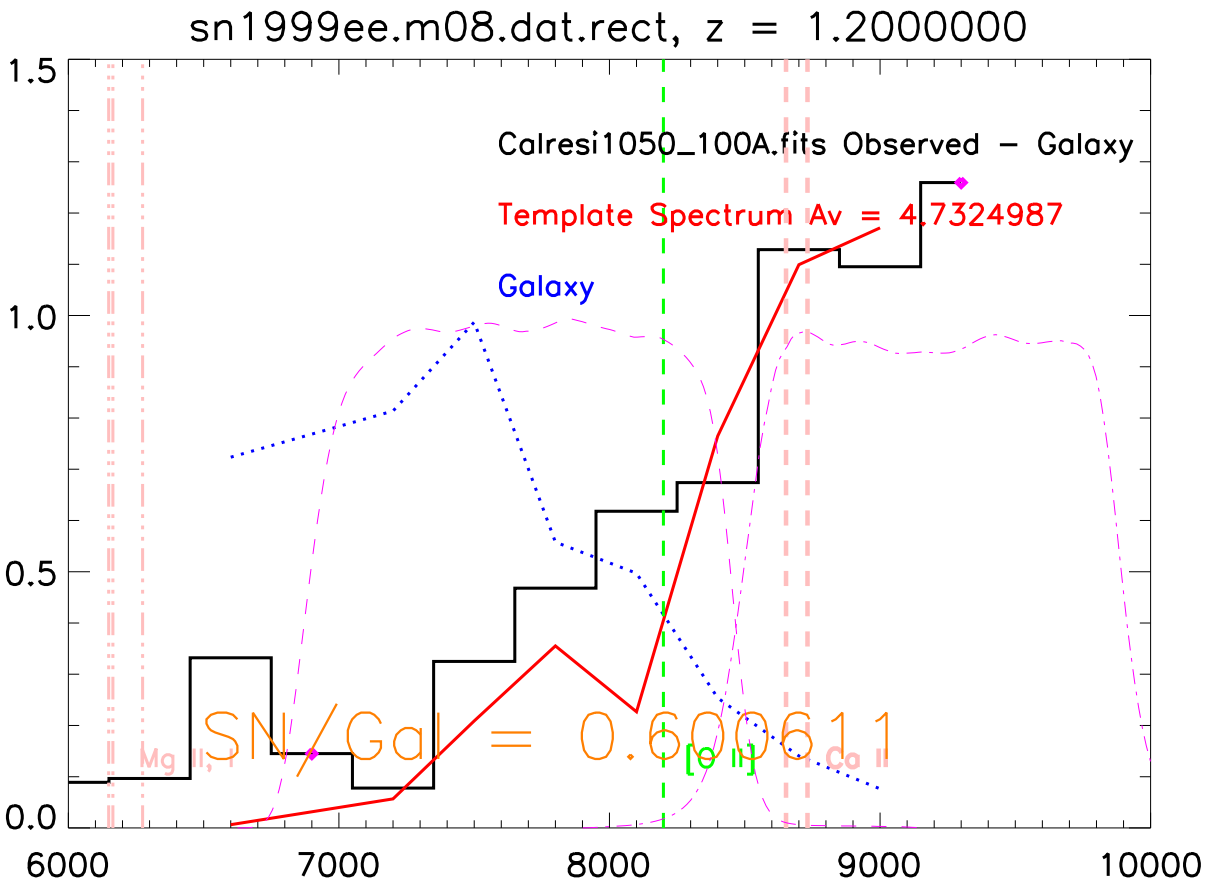

sn1999ee.p12.dat.rect, z = 1.1000000
Calresi1050_100A.fits Observed − Galaxy
Template Spectrum Av = −0.61403554
Galaxy
SN/Gal = 0.241411
Mg II, I
[O II]
Ca II
[O
1.5
1.0
0.5
0.0
−0.5
6000
7000
8000
9000
10000


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