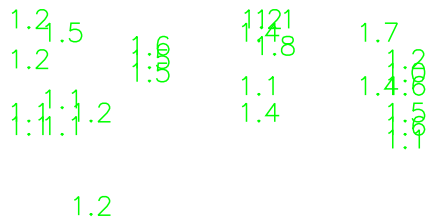
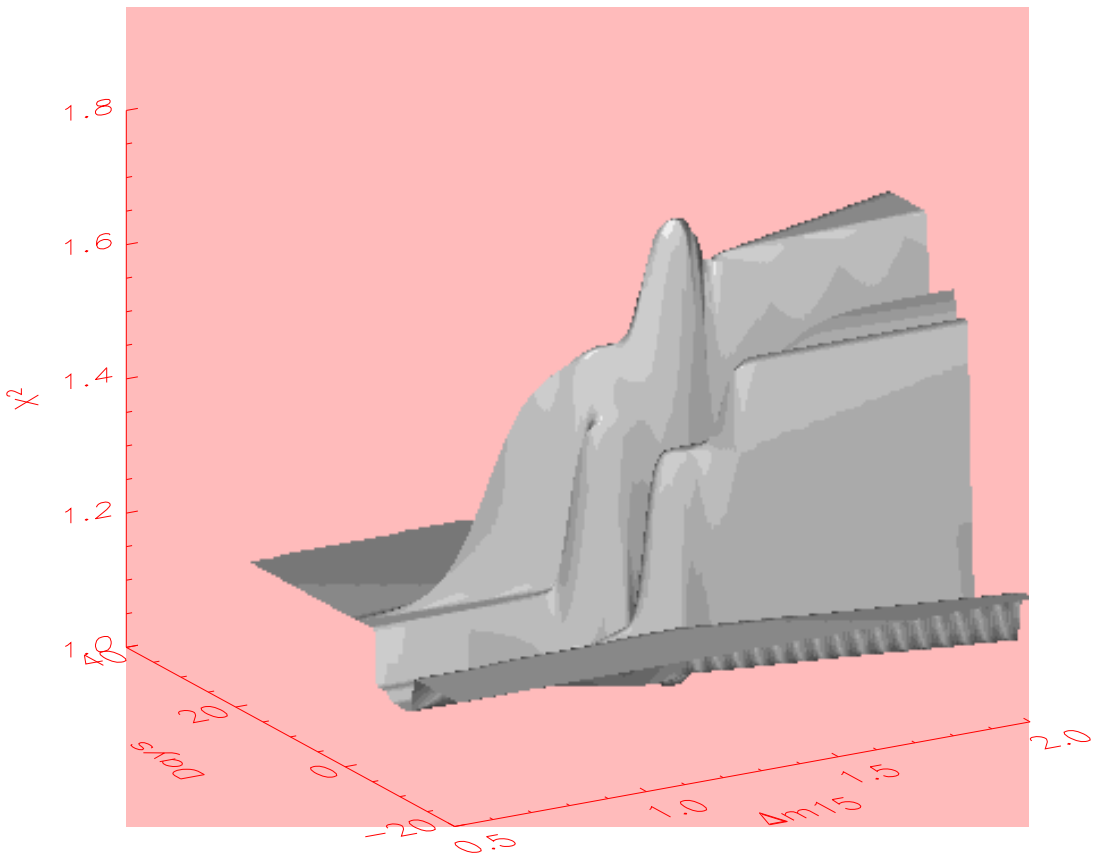
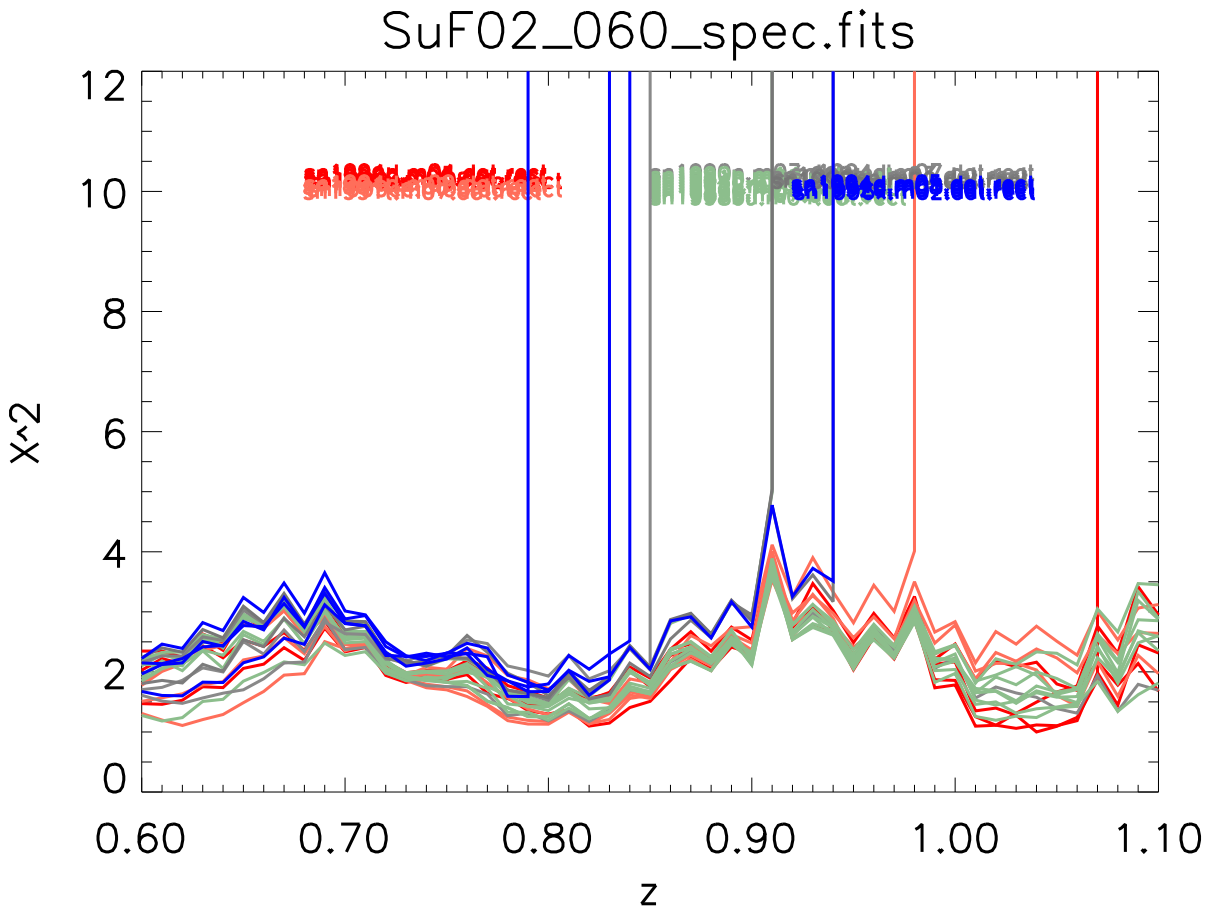
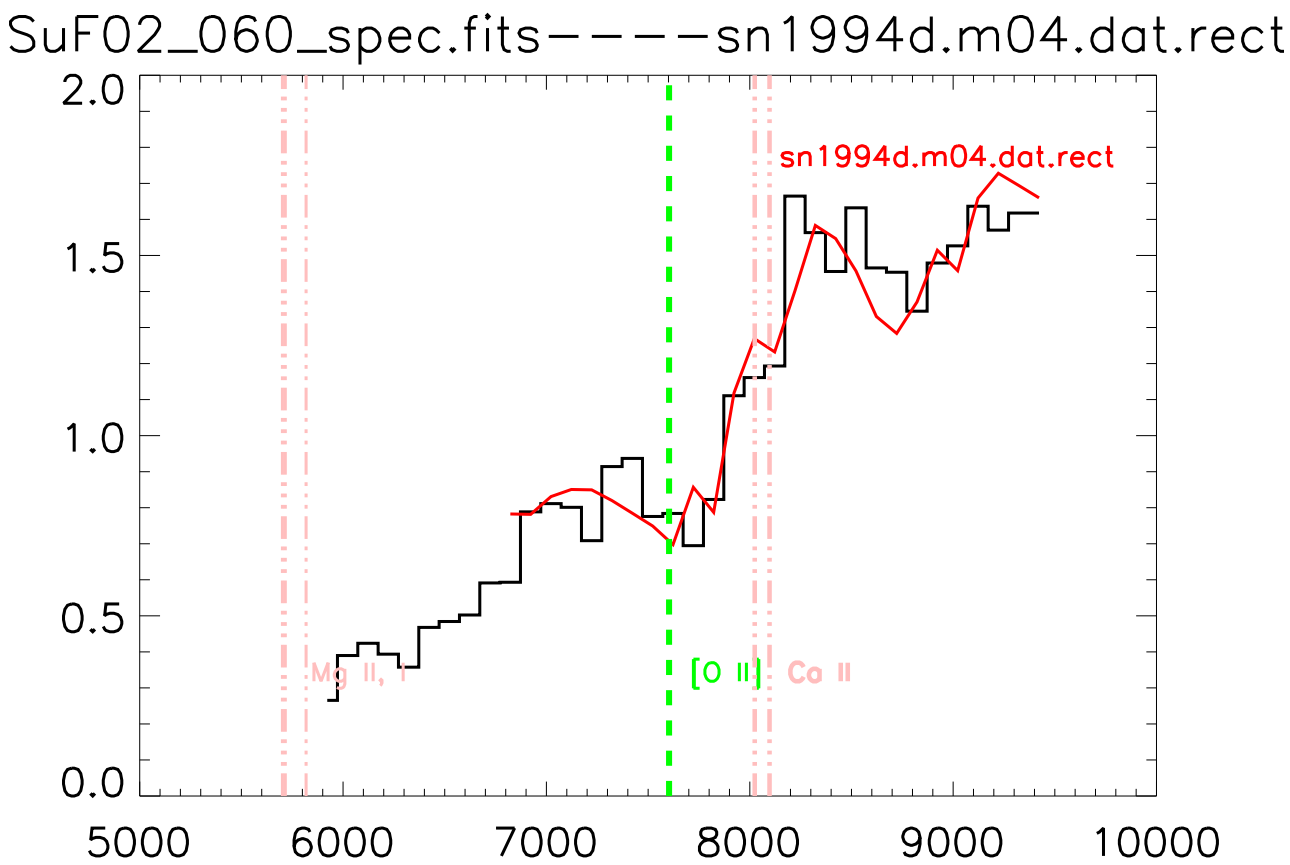
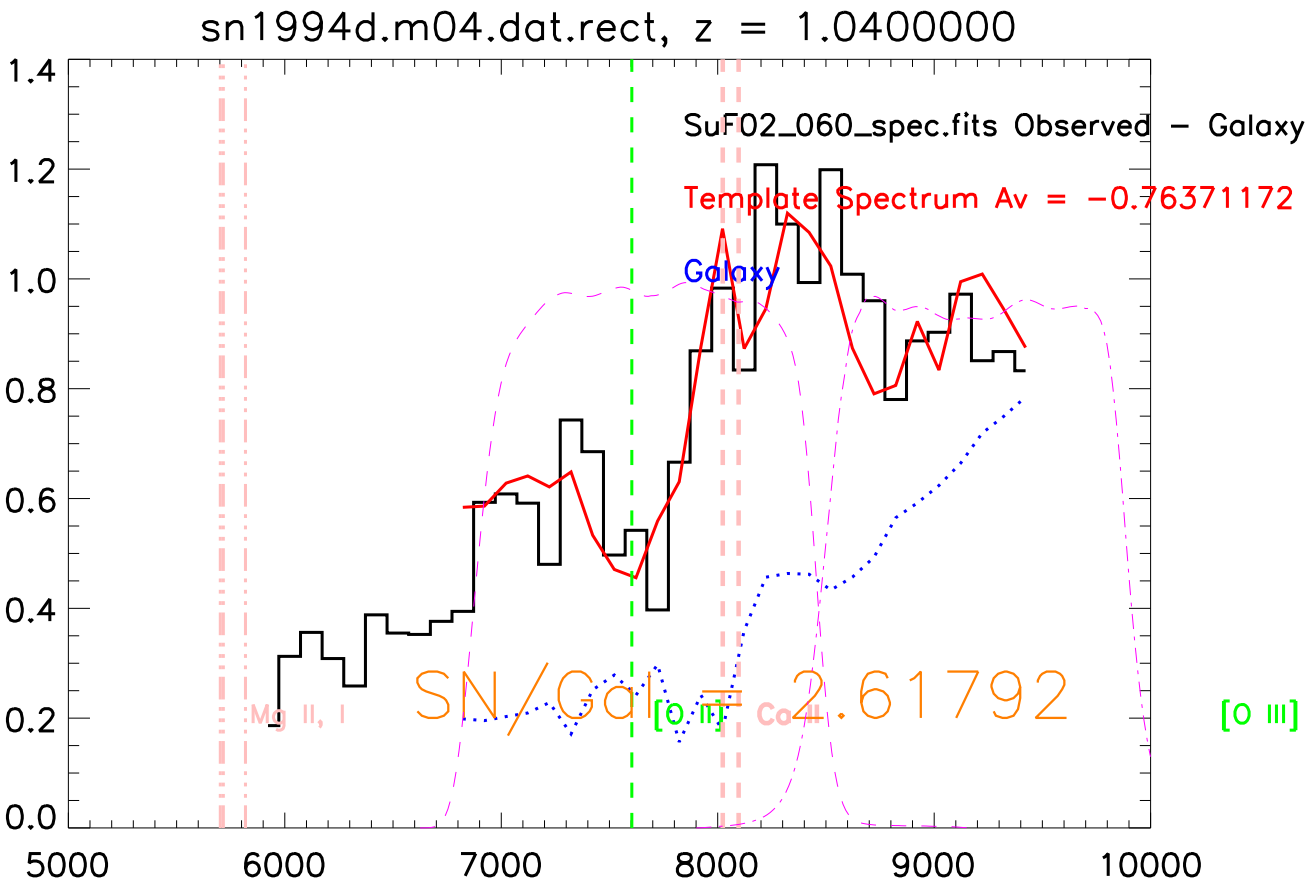


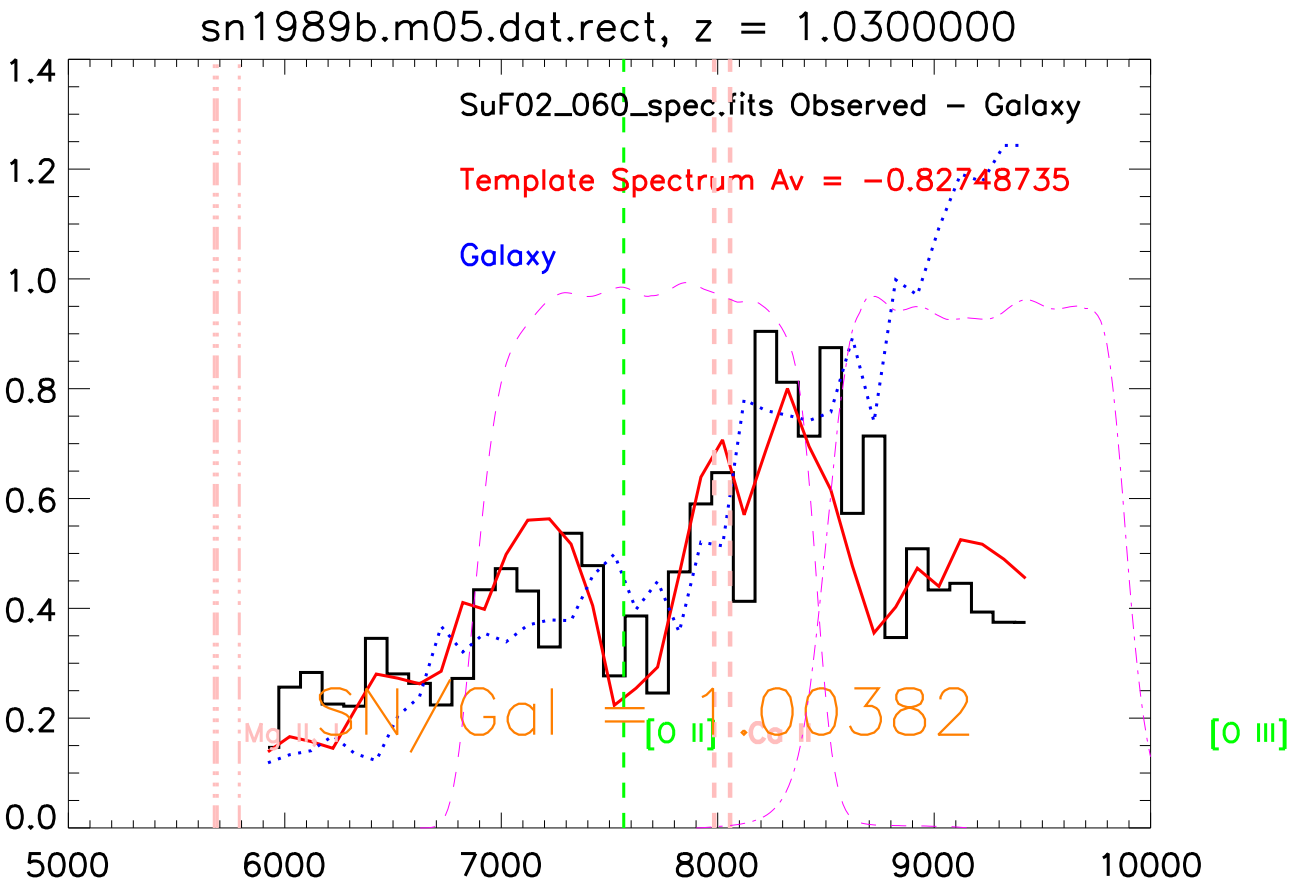


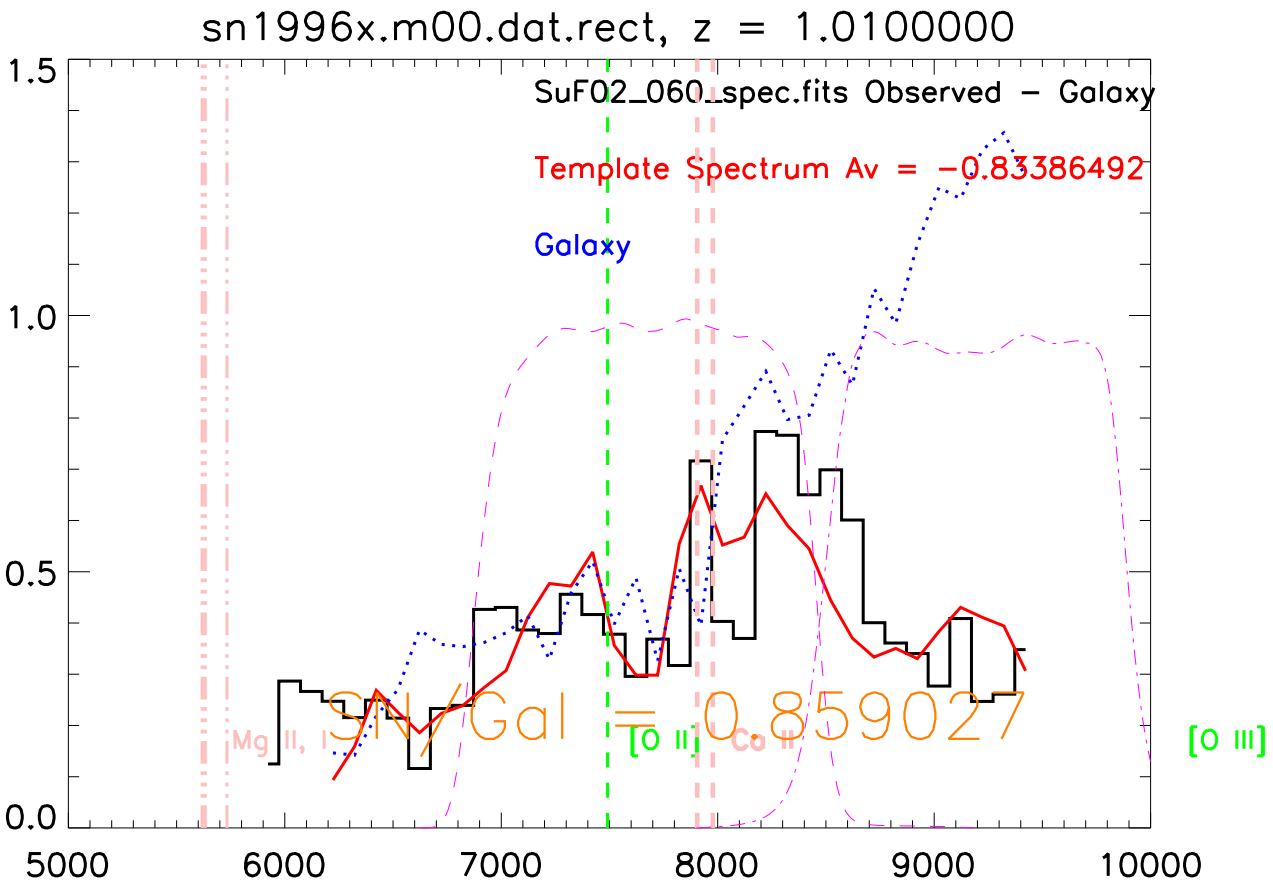
1.8
1.6
1.4
1.2
1.0
$\chi^2$
40
20
0
−20
Days
0.5
1.0
1.5
2.0
Δm15

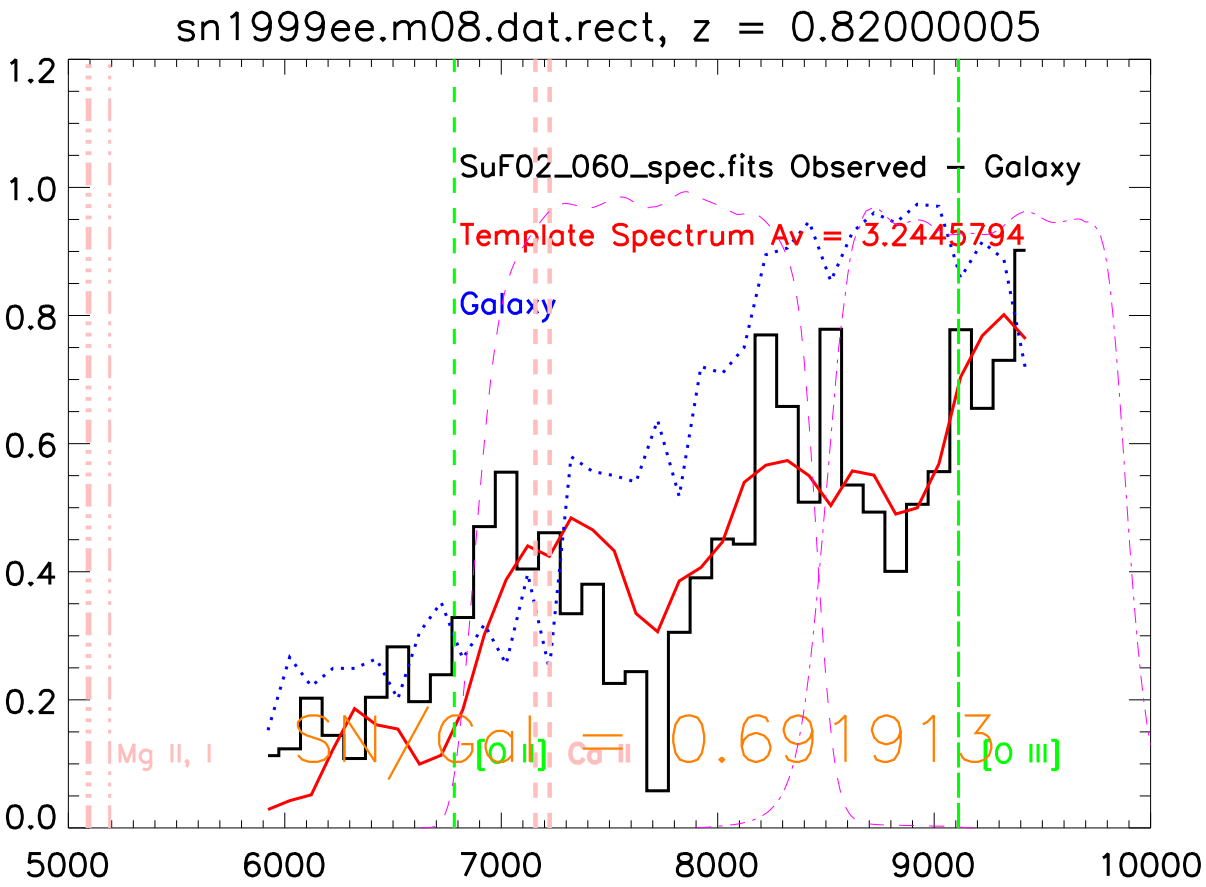

SuF02_060_spec.fits
12
10
8
6
4
2
0
X^2
0.60
0.70
0.80
0.90
1.00
1.10
z

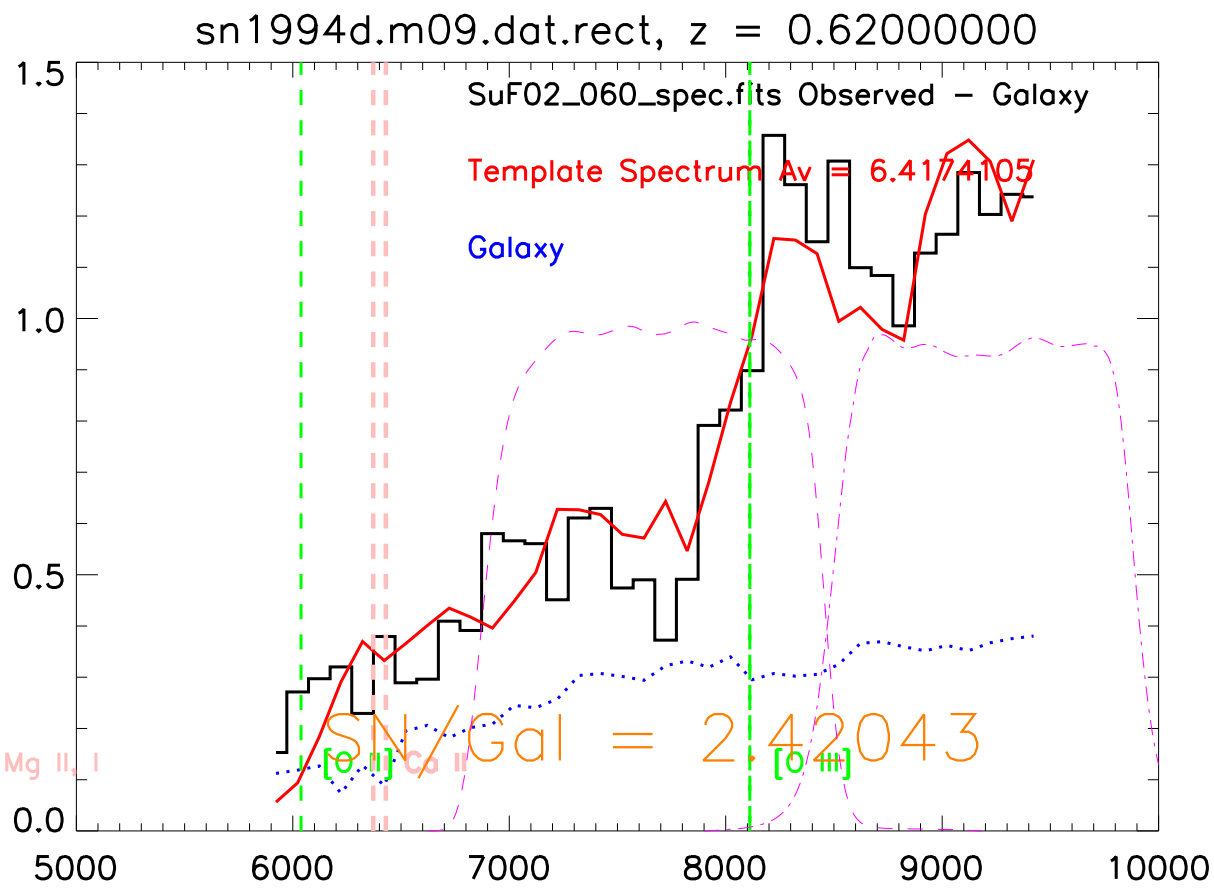

SuF02_060_spec.fits----sn1994d.m04.dat.rect
sn1994d.m04.dat.rect
Mg II, I
[O II]
Ca II
2.0
1.5
1.0
0.5
0.0
5000
6000
7000
8000
9000
10000

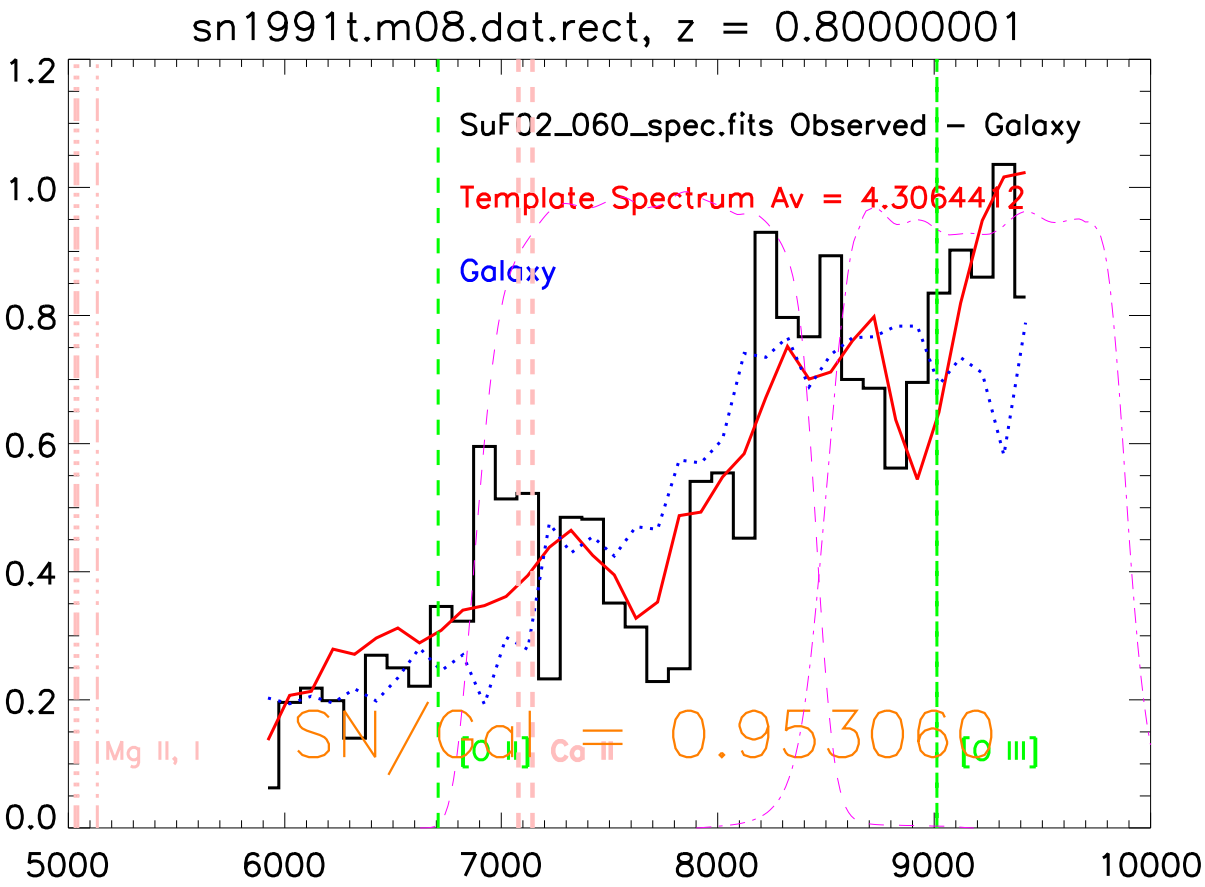

sn1994d.m04.dat.rect, z = 1.0400000
SuF02_060_spec.fits Observed − Galaxy
Template Spectrum Av = −0.76371172
Galaxy
SN/Gal = 2.61792
Mg II, I
[O II]
Ca II
[O III]
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
5000
6000
7000
8000
9000
10000

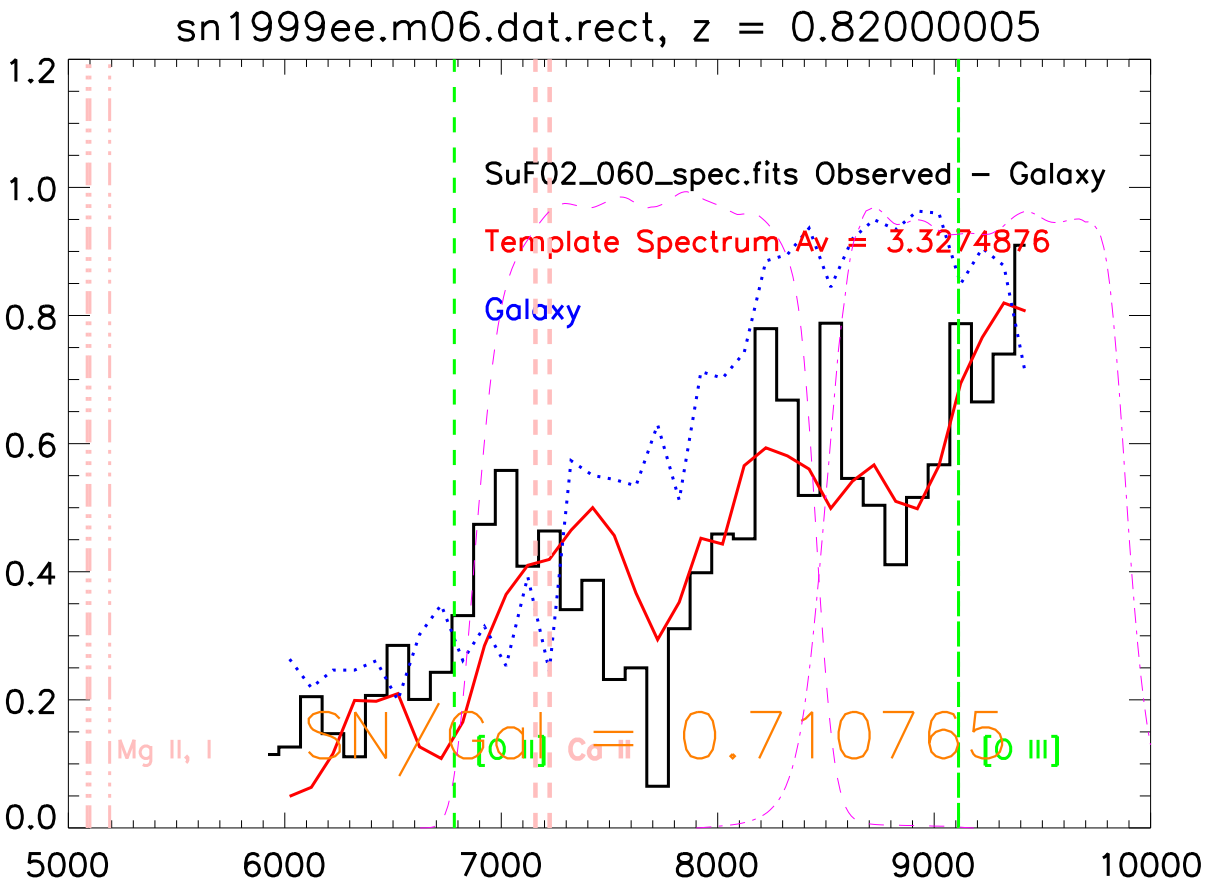

sn1989b.m05.dat.rect, z = 1.0300000
SuF02_060_spec.fits Observed − Galaxy
Template Spectrum Av = −0.82748735
Galaxy
S/N Gal = 1.00382
[O II]
[O III]
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
5000
6000
7000
8000
9000
10000

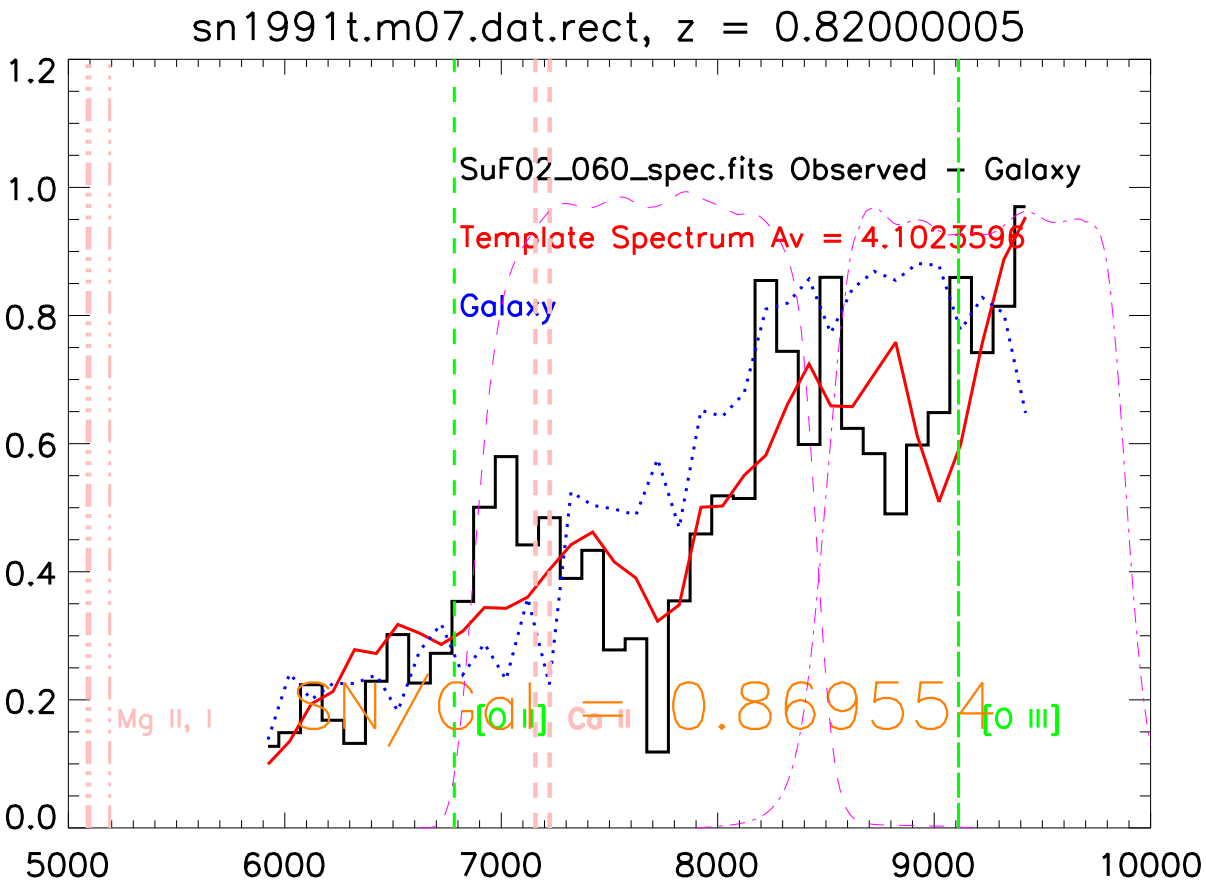

sn1996x.m00.dat.rect, z = 1.0100000
SuF02_060_spec.fits Observed − Galaxy
Template Spectrum Av = −0.83386492
Galaxy
SN/Gal = 0.859027
Mg II, I
[O II]
Ca II
[O III]
1.5
1.0
0.5
0.0
5000
6000
7000
8000
9000
10000

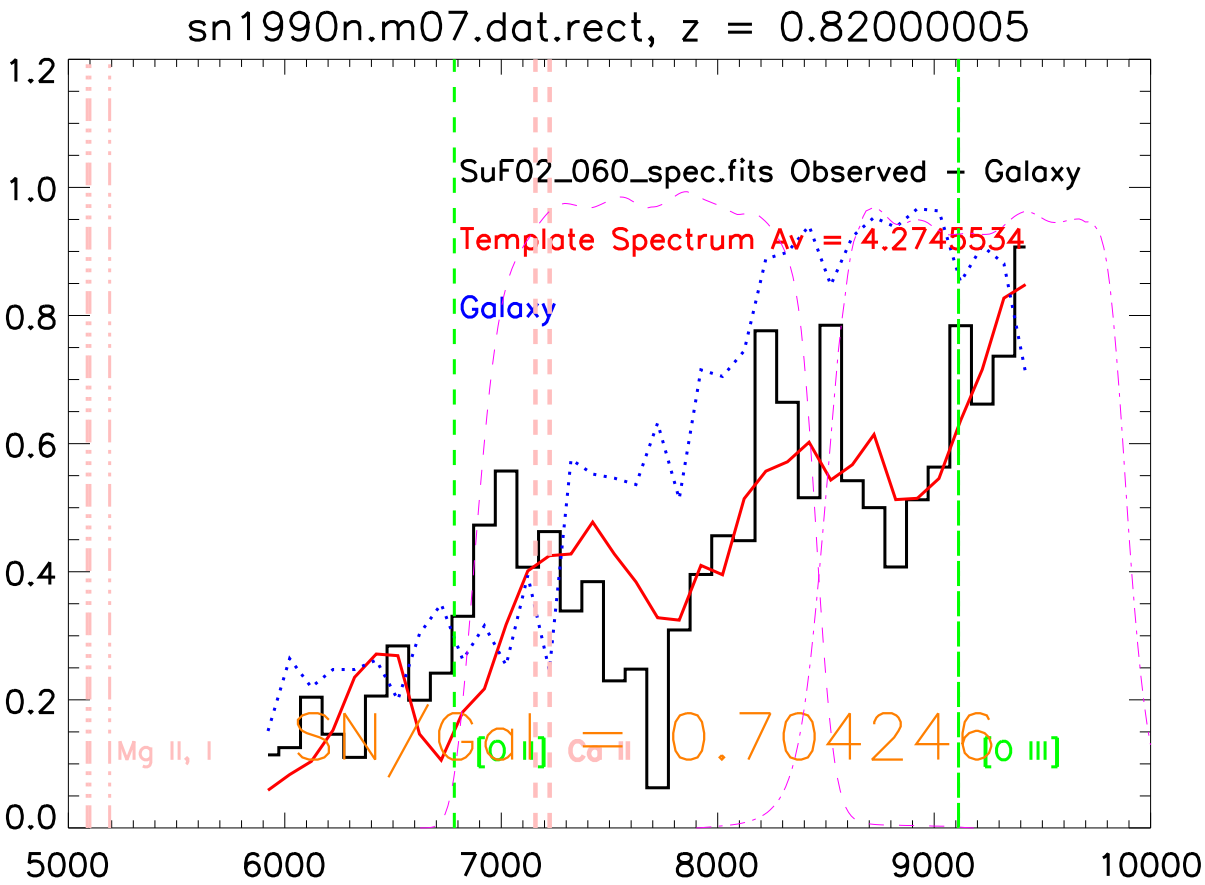

sn1999ee.m08.dat.rect, z = 0.82000005
SuF02_060_spec.fits Observed – Galaxy
Template Spectrum Av = 3.2445794
Galaxy
SN/Gal = 0.691913
Mg II, I
[O II]
Ca II
[O III]
1.2
1.0
0.8
0.6
0.4
0.2
0.0
5000
6000
7000
8000
9000
10000

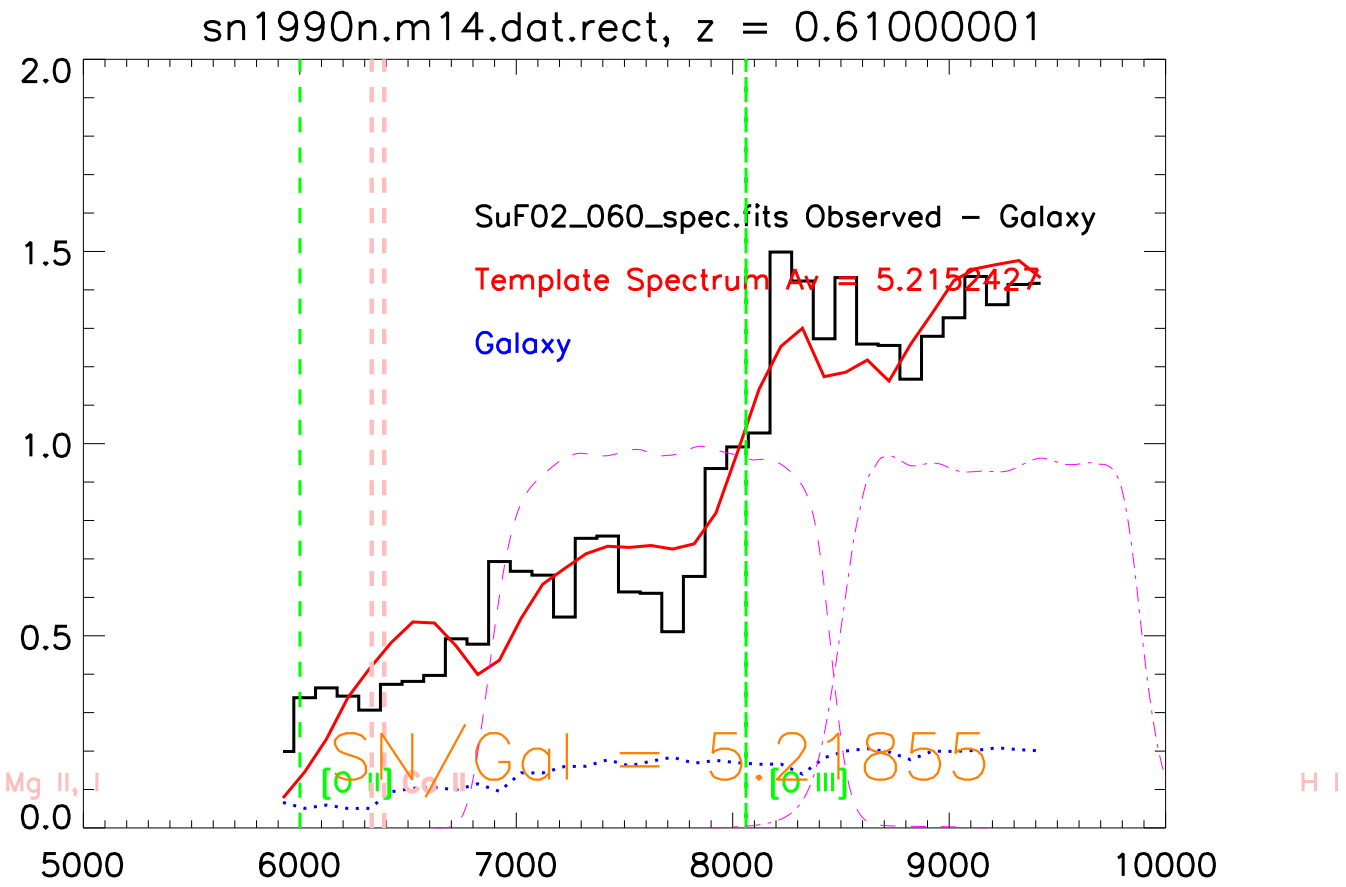

sn1994d.m09.dat.rect, z = 0.62000000
SuF02_060_spec.fits Observed − Galaxy
Template Spectrum Av = 6.41774105
Galaxy
SN/Gal = 2.42043
Mg II, I
[O II]
Ca II
[O III]
H I
1.5
1.0
0.5
0.0
5000
6000
7000
8000
9000
10000

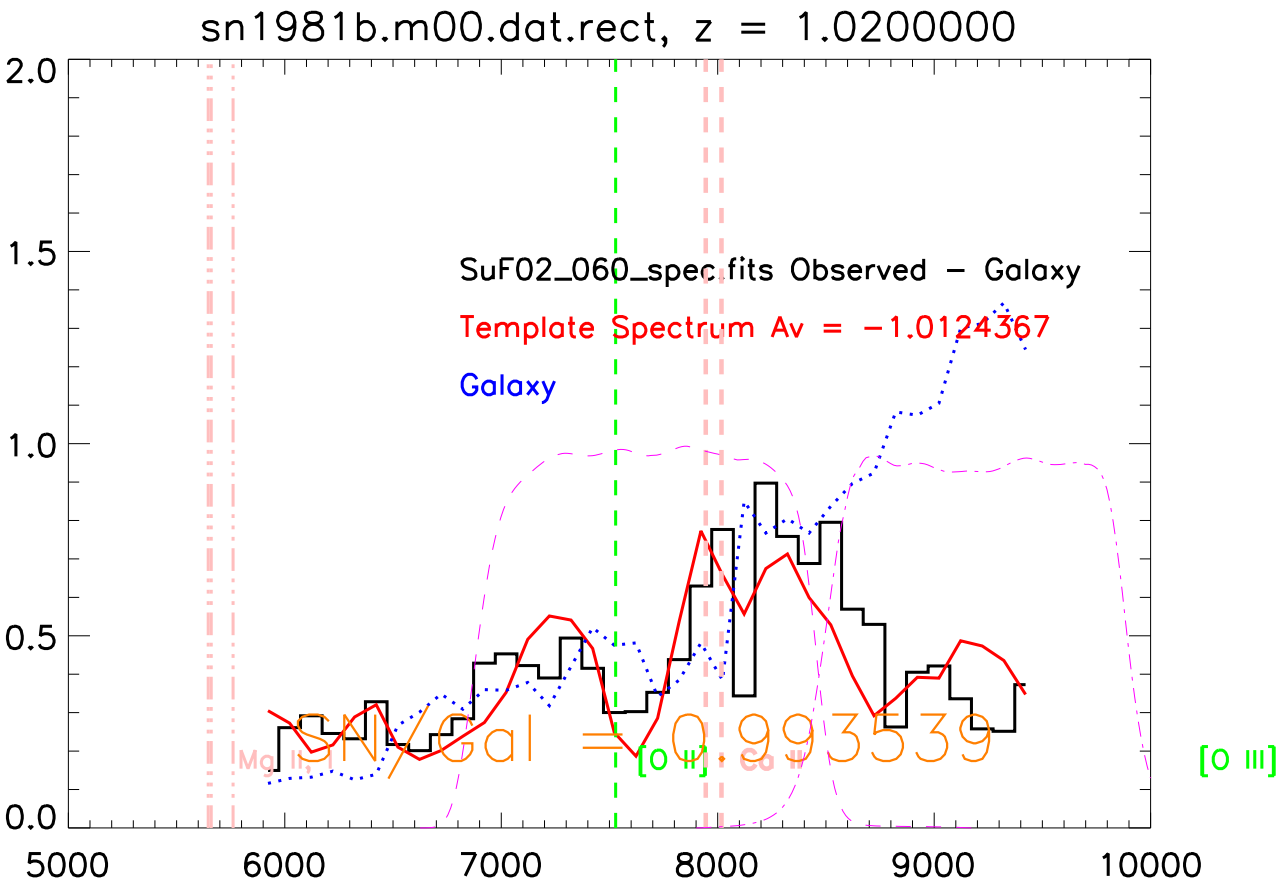

sn1991t.m08.dat.rect, z = 0.80000001
SuF02_060_spec.fits Observed − Galaxy
Template Spectrum Av = 4.3064412
Galaxy
SN/Gal = 0.953060
Mg II, I
[O II]
Ca II
[O III]
1.2
1.0
0.8
0.6
0.4
0.2
0.0
5000
6000
7000
8000
9000
10000

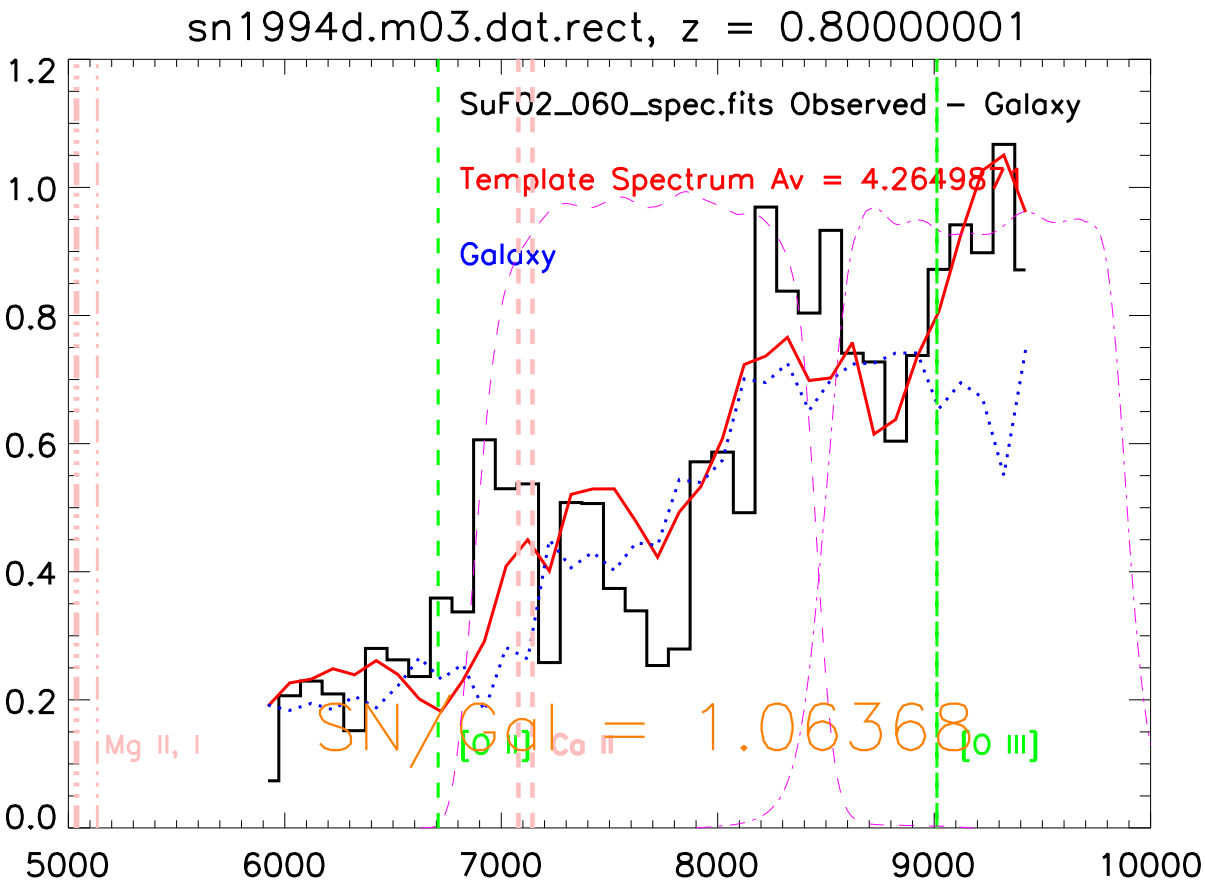

sn1999ee.m06.dat.rect, z = 0.82000005
SuF02_060_spec.fits Observed – Galaxy
Template Spectrum Av = 3.3274876
Galaxy
SNXCorr = 0.710765
Mg II, I
[O II]
Ca II
[O III]
1.2
1.0
0.8
0.6
0.4
0.2
0.0
5000
6000
7000
8000
9000
10000

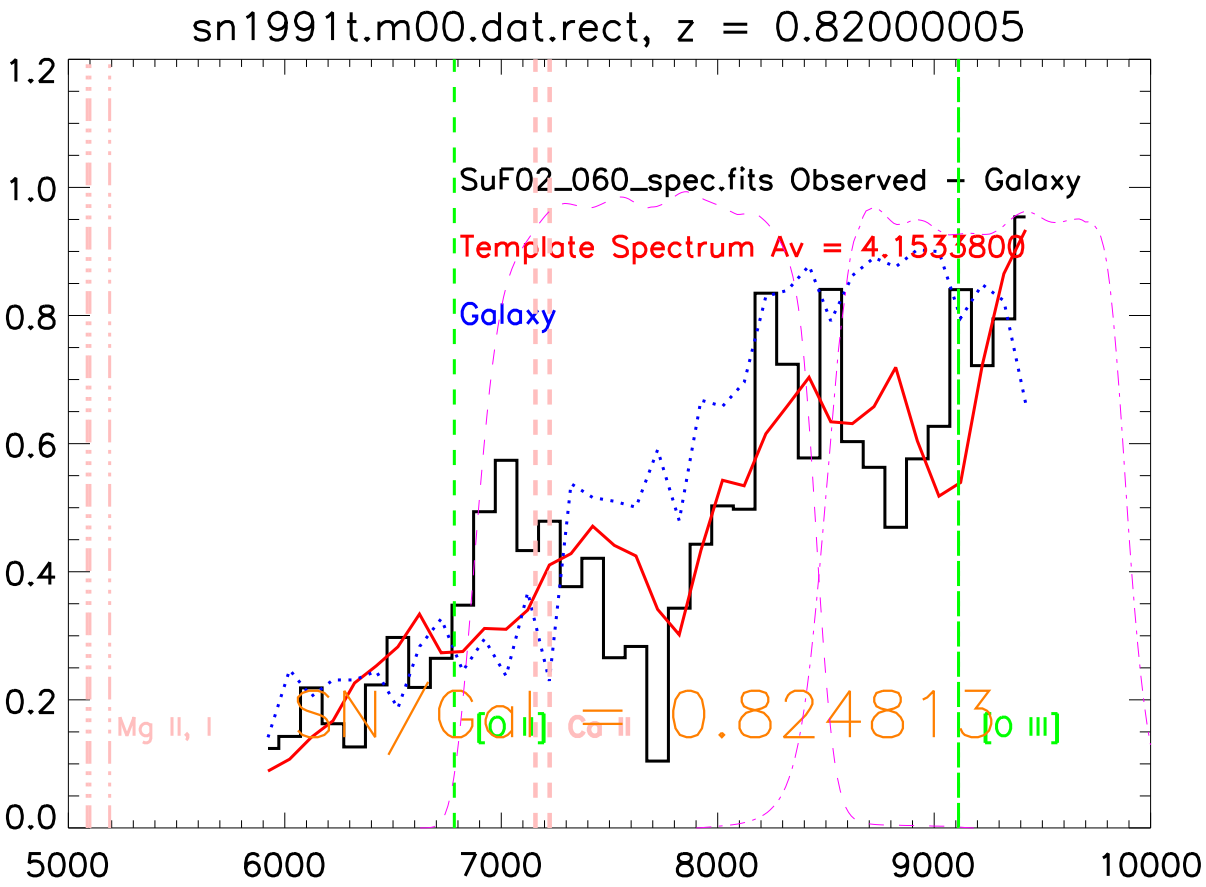

sn1991t.m07.dat.rect, z = 0.82000005
SuF02_060_spec.fits Observed - Galaxy
Template Spectrum Av = 4.1023596
Galaxy
SN/Gal = 0.869554
Mg II, I
[O II]
Ca II
[O III]
1.2
1.0
0.8
0.6
0.4
0.2
0.0
5000
6000
7000
8000
9000
10000

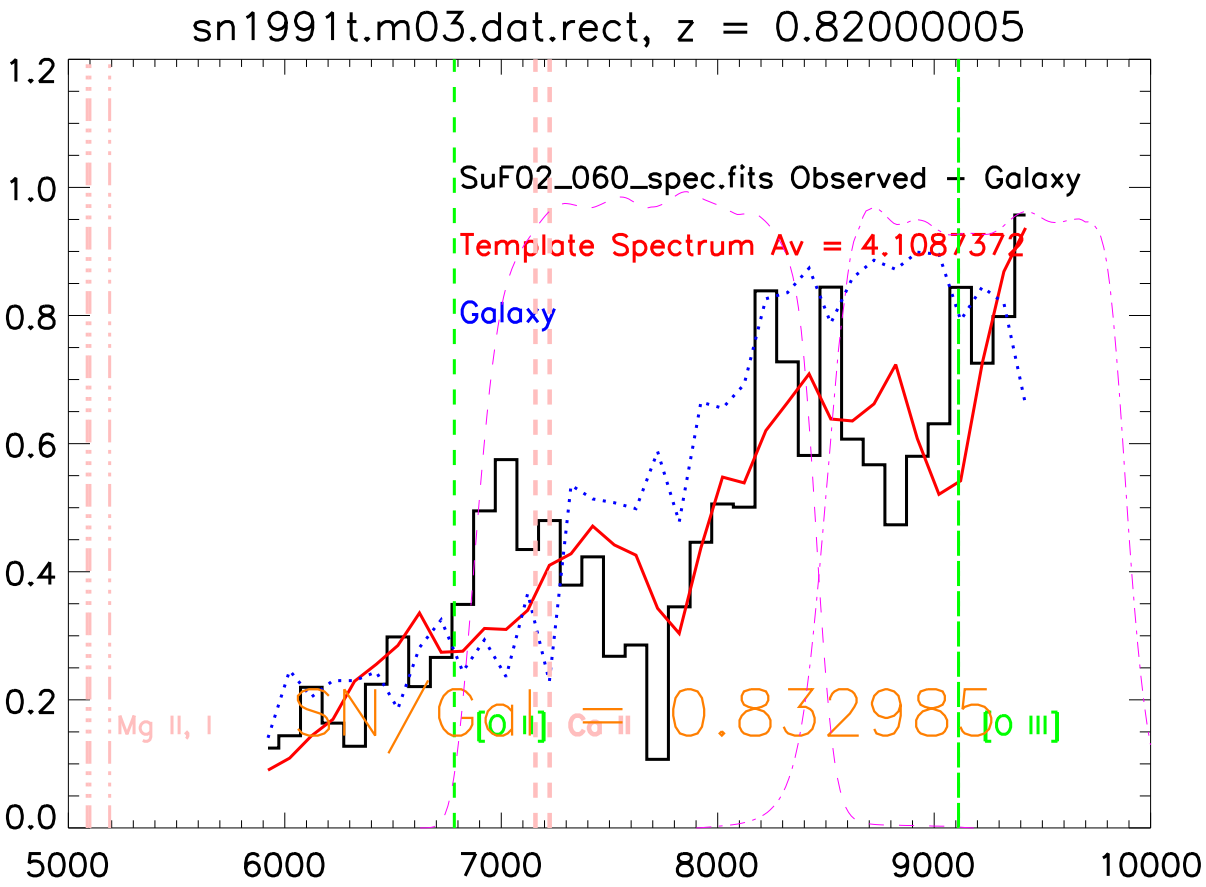

sn1990n.m07.dat.rect, z = 0.82000005
SuF02_060_spec.fits Observed - Galaxy
Template Spectrum Av = 4.2745534
Galaxy
SN/Gal = 0.704246
Mg II, I
[O II]
Ca II
[O III]
1.2
1.0
0.8
0.6
0.4
0.2
0.0
5000
6000
7000
8000
9000
10000

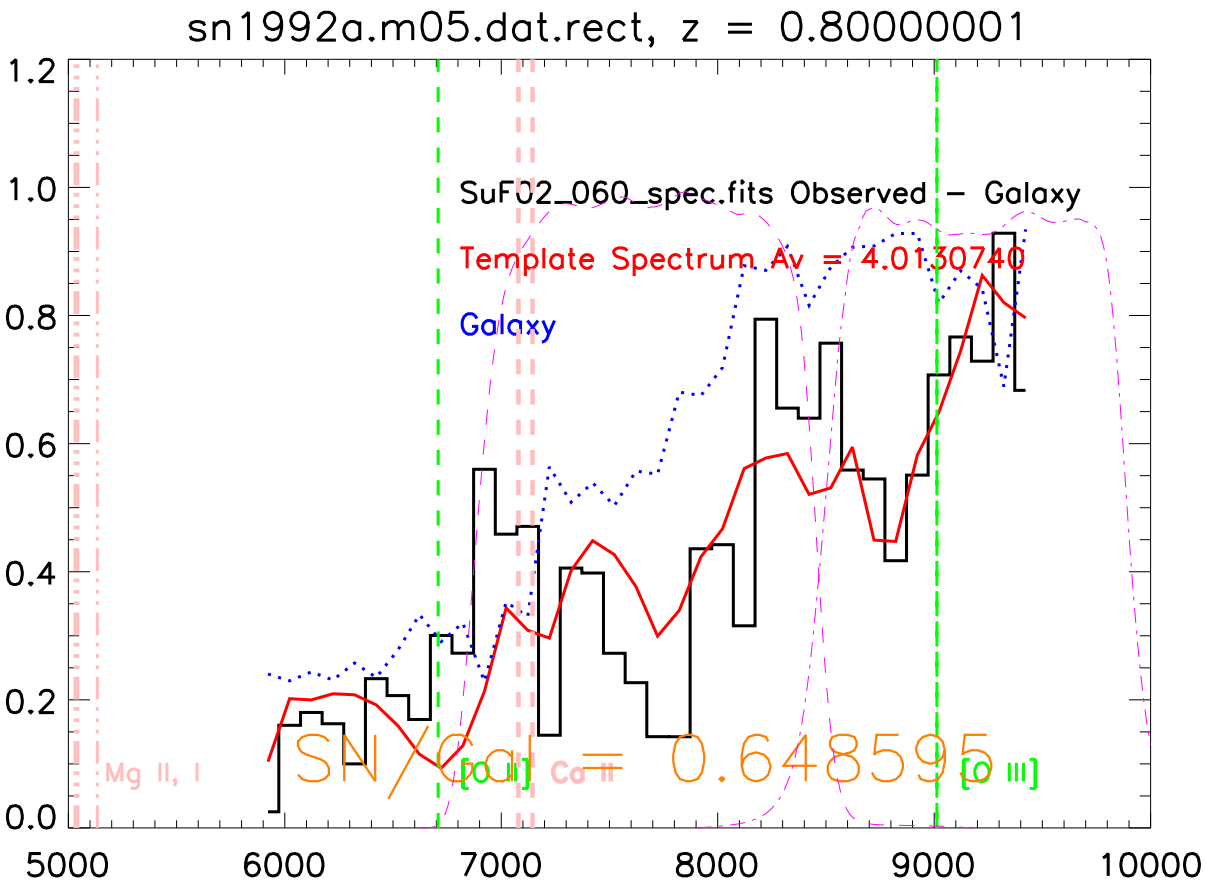

sn1990n.m14.dat.rect, z = 0.61000001
SuF02_060_spec.fits Observed − Galaxy
Template Spectrum Av = 5.21524427
Galaxy
SN/Gal = 5.21855
Mg II, I
[O II]
Ca II
[O III]
H I
2.0
1.5
1.0
0.5
0.0
5000
6000
7000
8000
9000
10000

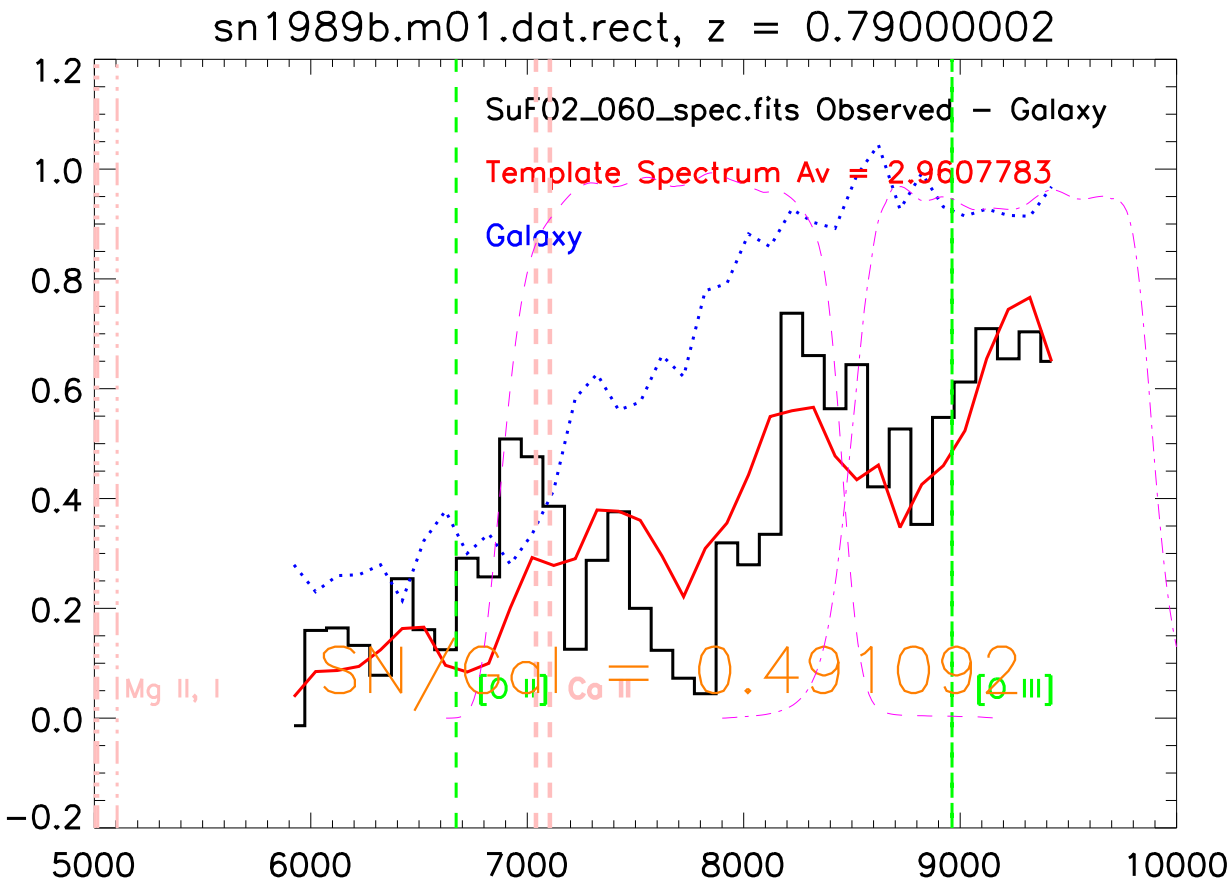

sn1981b.m00.dat.rect, z = 1.0200000
SuF02_060_spec.fits Observed − Galaxy
Template Spectrum Av = −1.0124367
Galaxy
S/N/Gal = 0.993539
[O II]
[O III]
2.0
1.5
1.0
0.5
0.0
5000
6000
7000
8000
9000
10000

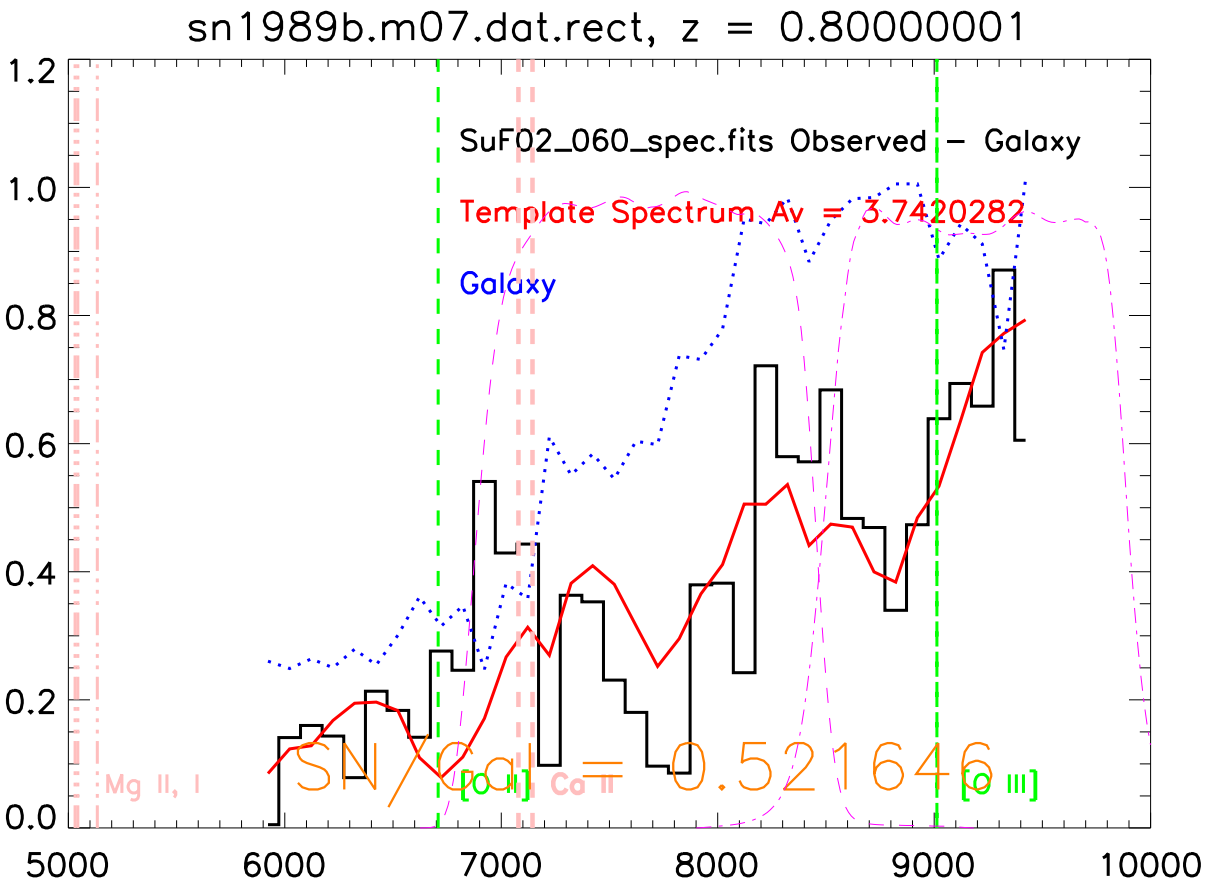

sn1994d.m03.dat.rect, z = 0.80000001
SuF02_060_spec.fits Observed – Galaxy
Template Spectrum Av = 4.2649871
Galaxy
SN/Gal = 1.06368
Mg II, I
[O II]
Ca II
[O III]
1.2
1.0
0.8
0.6
0.4
0.2
0.0
5000
6000
7000
8000
9000
10000

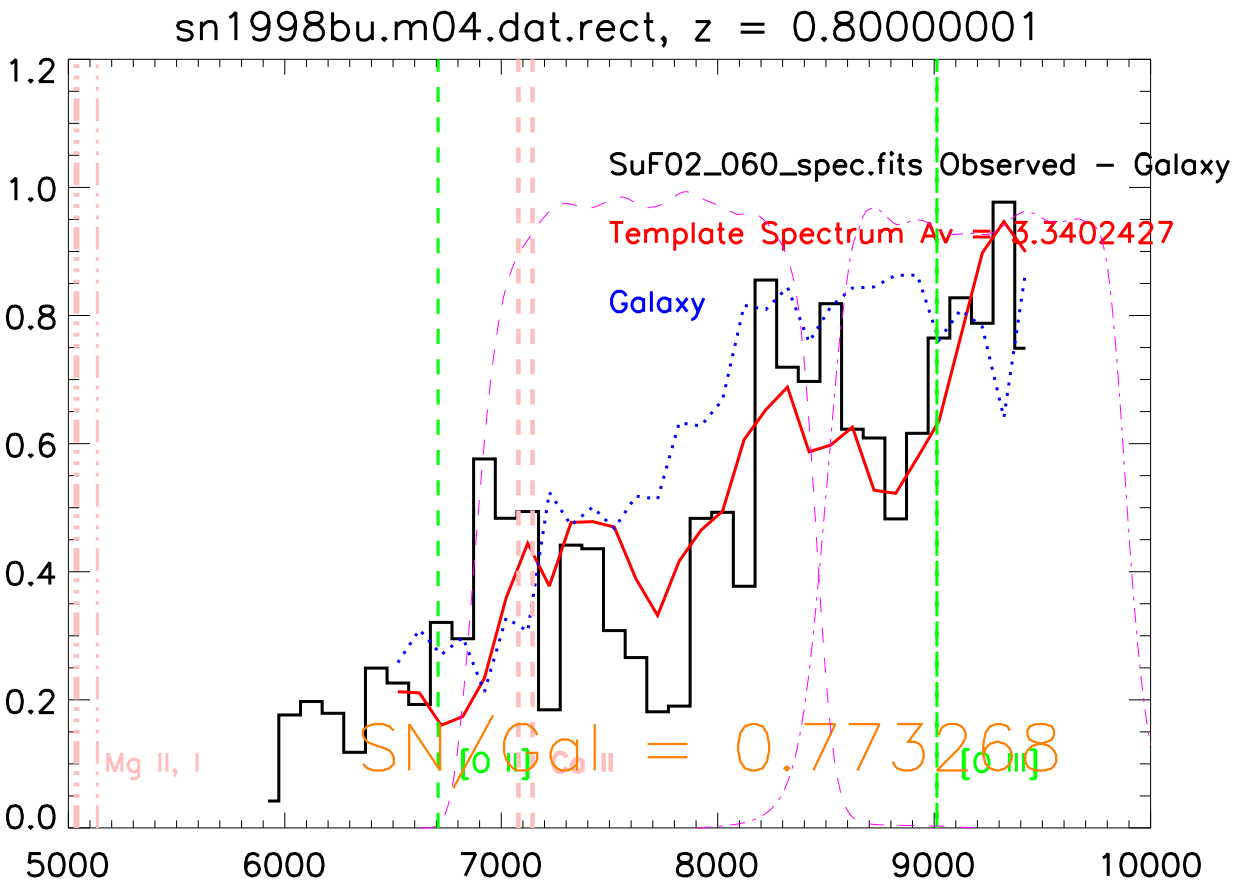

sn1991t.m00.dat.rect, z = 0.82000005
SuF02_060_spec.fits Observed + Galaxy
Template Spectrum Av = 4.1533800
Galaxy
SN/Gal = 0.824813
Mg II, I
[O II]
Ca II
[O III]
1.2
1.0
0.8
0.6
0.4
0.2
0.0
5000
6000
7000
8000
9000
10000

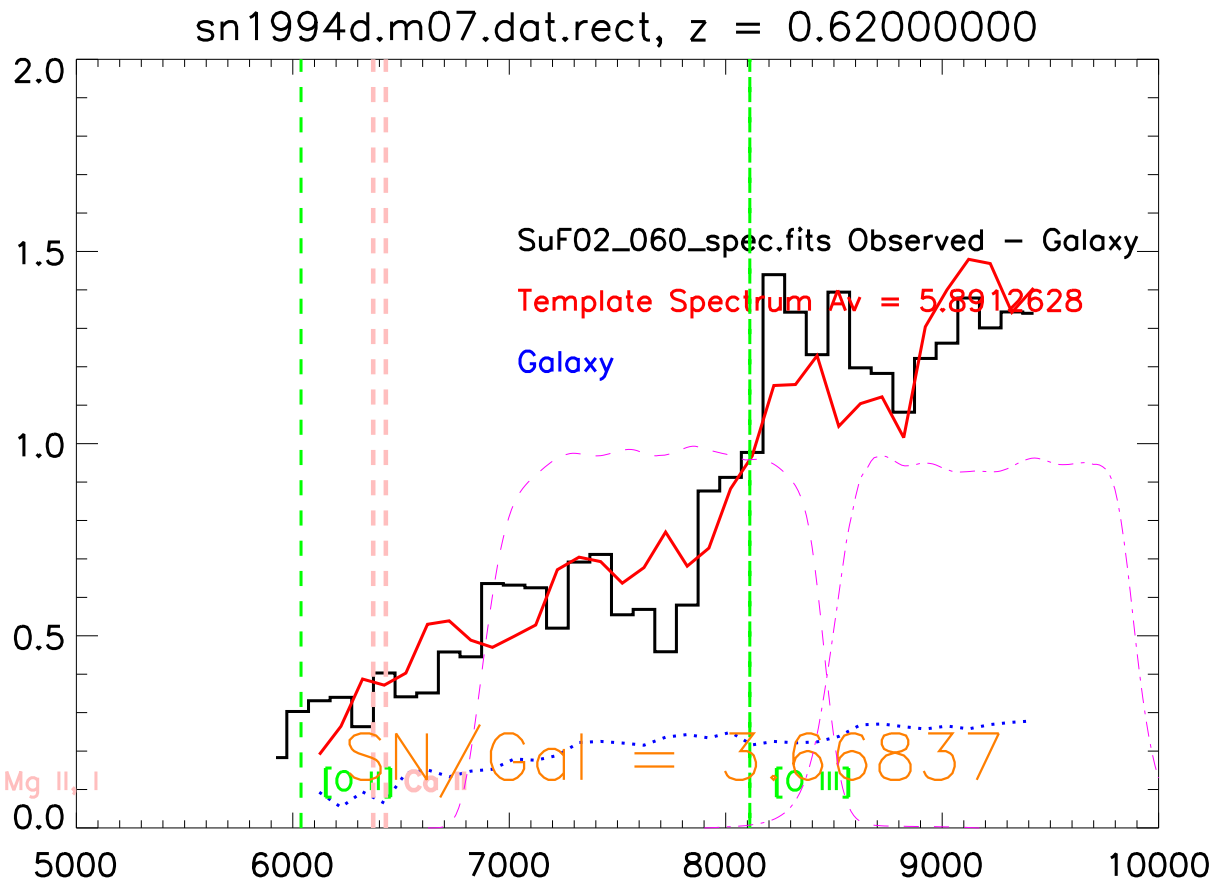

sn1991t.m03.dat.rect, z = 0.82000005
SuF02_060_spec.fits Observed + Galaxy
Template Spectrum Av = 4.1087372
Galaxy
SN/Gal = 0.832985
Mg II, I
[O II]
Ca II
[O III]
1.2
1.0
0.8
0.6
0.4
0.2
0.0
5000
6000
7000
8000
9000
10000

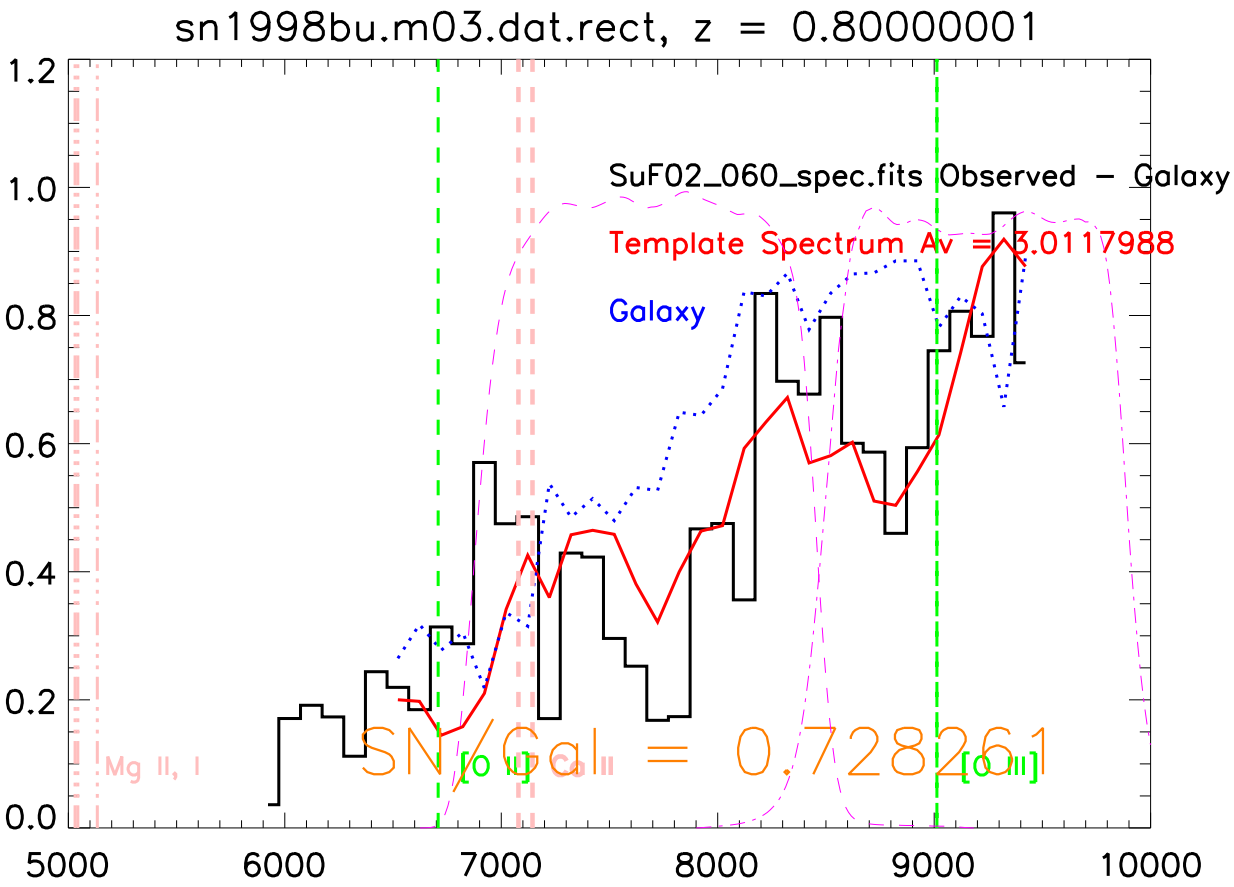

sn1992a.m05.dat.rect, z = 0.80000001
SuF02_060_spec.fits Observed − Galaxy
Template Spectrum Av = 4.0130740
Galaxy
SN/Gal = 0.648595
Mg II, I
[O II]
Ca II
[O III]
1.2
1.0
0.8
0.6
0.4
0.2
0.0
5000
6000
7000
8000
9000
10000

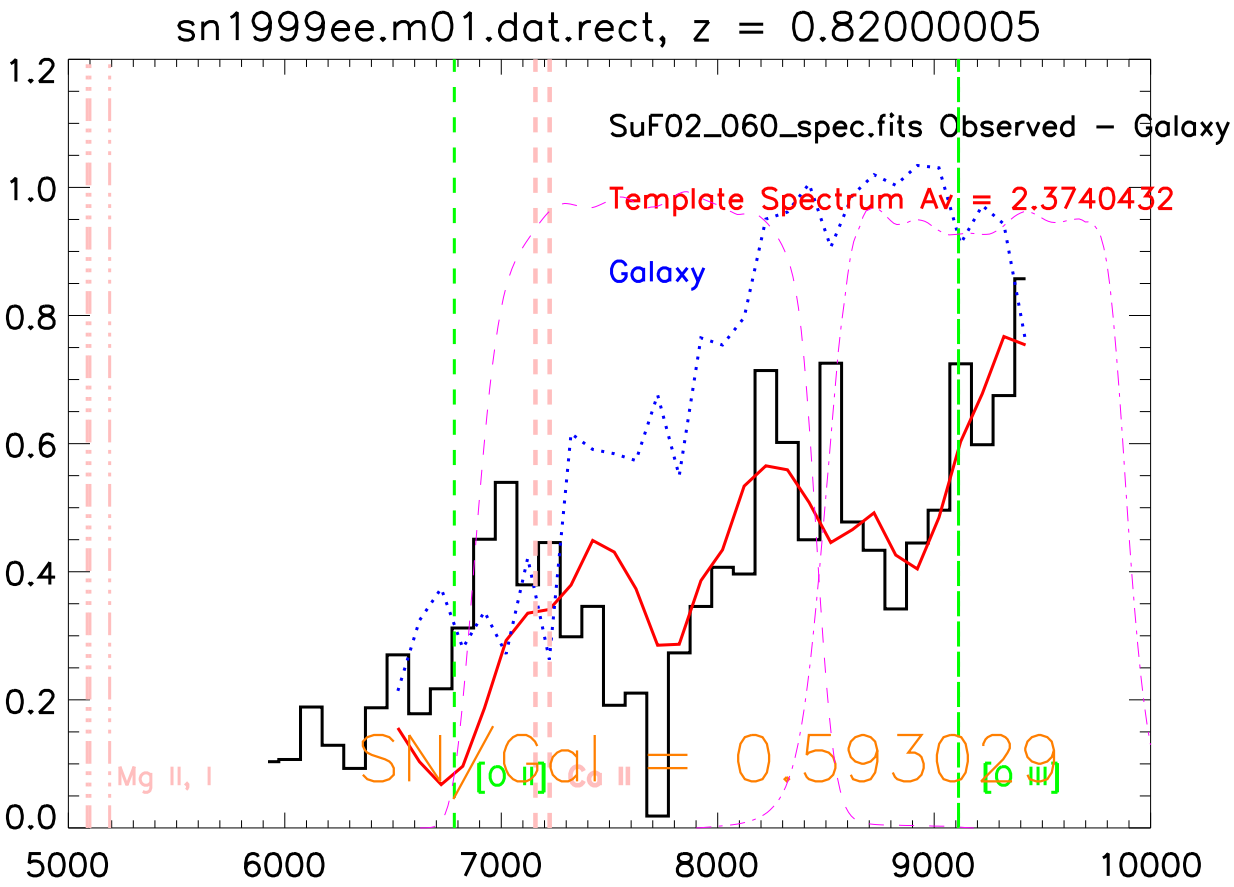

sn1989b.m01.dat.rect, z = 0.79000002
SuF02_060_spec.fits Observed − Galaxy
Template Spectrum Av = 2.9607783
Galaxy
SN/Gal = 0.491092
Mg II, I
[O II]
Ca II
[O III]
1.2
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
5000
6000
7000
8000
9000
10000

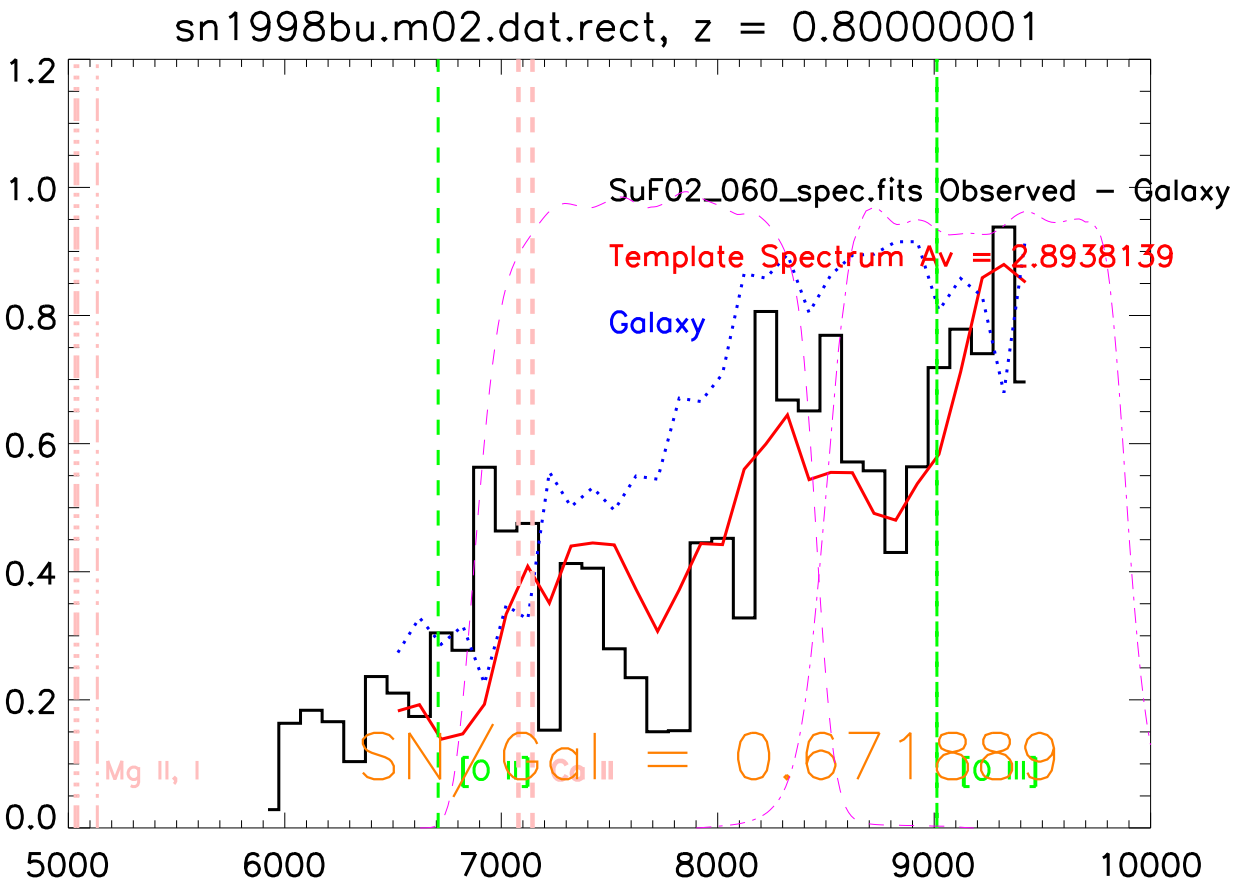

sn1989b.m07.dat.rect, z = 0.80000001
SuF02_060_spec.fits Observed – Galaxy
Template Spectrum Av = 3.7420282
Galaxy
SN/Gal = 0.521646
Mg II, I
[O II]
Ca II
[O III]
1.2
1.0
0.8
0.6
0.4
0.2
0.0
5000
6000
7000
8000
9000
10000

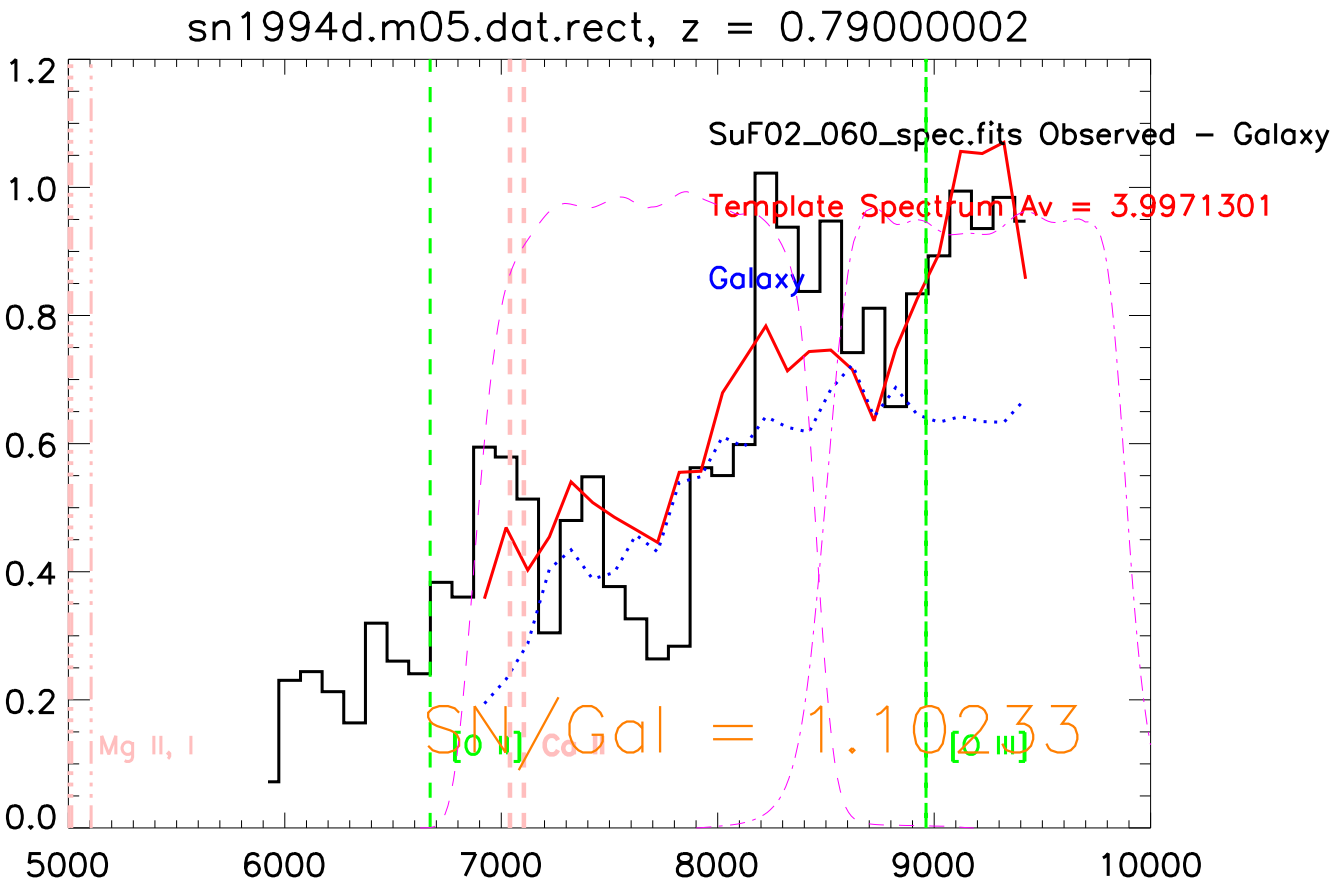

sn1998bu.m04.dat.rect, z = 0.80000001
SuF02_060_spec.fits Observed − Galaxy
Template Spectrum Av = 3.3402427
Galaxy
SN/Gal = 0.773268
Mg II, I
[O II]
Ca II
[O III]
1.2
1.0
0.8
0.6
0.4
0.2
0.0
5000
6000
7000
8000
9000
10000

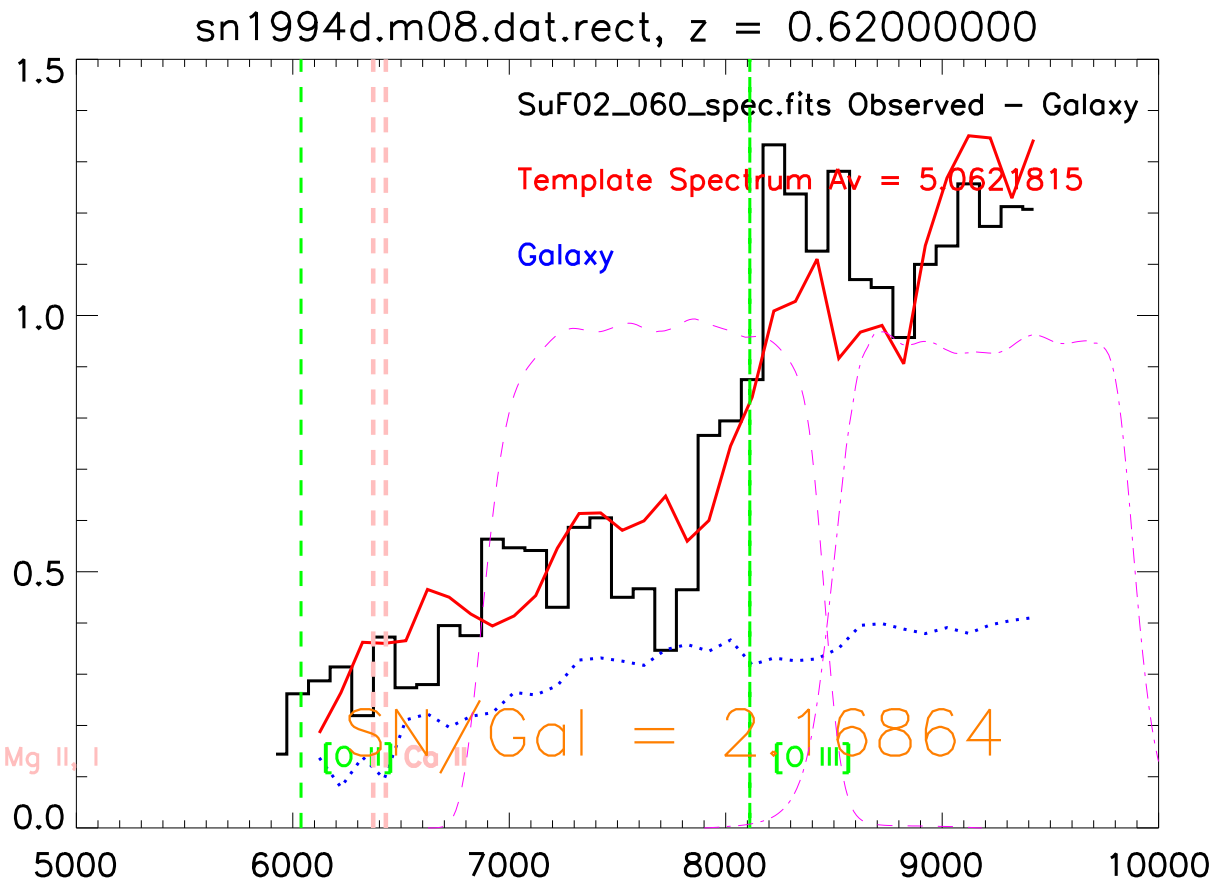

sn1994d.m07.dat.rect, z = 0.62000000
SuF02_060_spec.fits Observed − Galaxy
Template Spectrum Av = 5.8912628
Galaxy
SN/Gal = 3.66837
Mg II
[O II]
Ca II
[O III]
H I
2.0
1.5
1.0
0.5
0.0
5000
6000
7000
8000
9000
10000

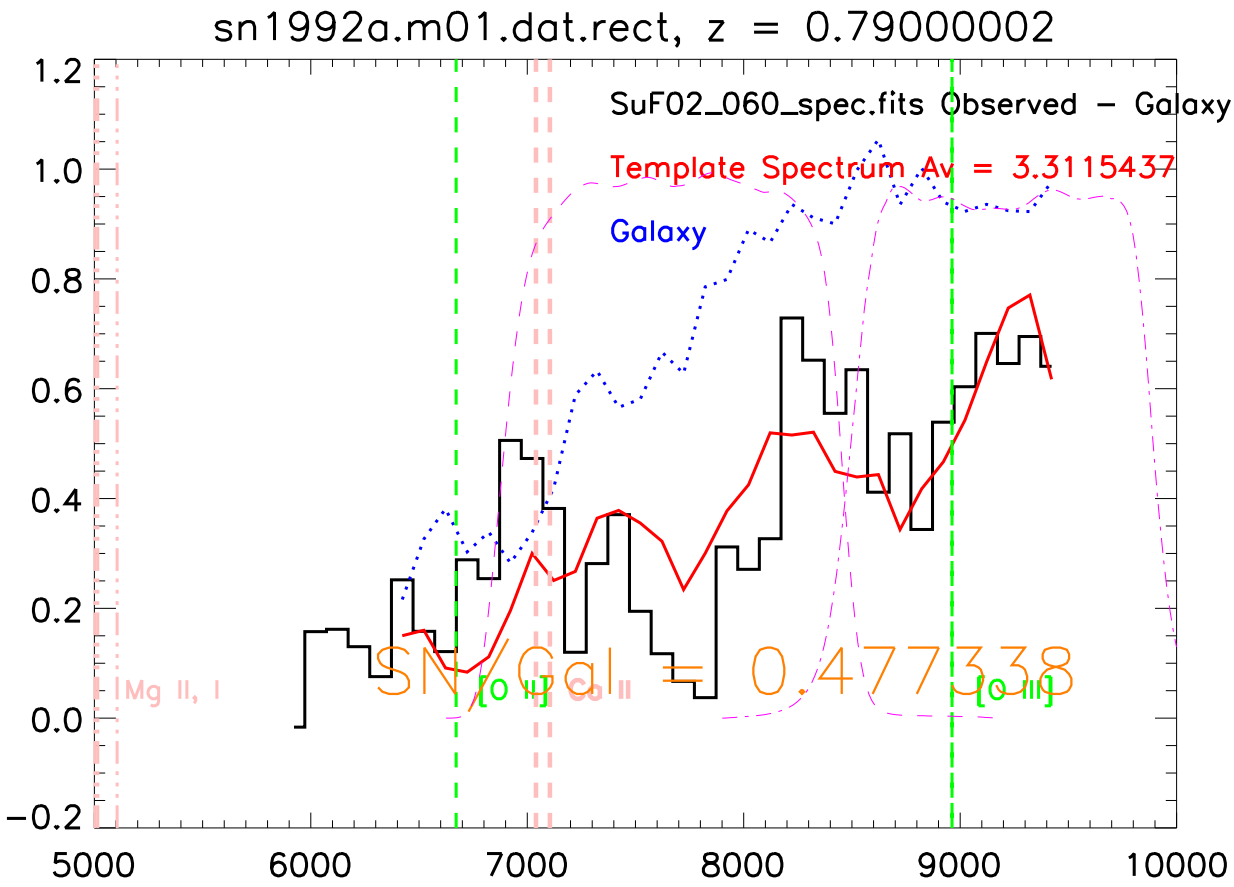

sn1998bu.m03.dat.rect, z = 0.80000001
SuF02_060_spec.fits Observed − Galaxy
Template Spectrum Av = 3.0117988
Galaxy
SN/Gal = 0.728261
Mg II, I
[O II]
Ca II
[O III]
1.2
1.0
0.8
0.6
0.4
0.2
0.0
5000
6000
7000
8000
9000
10000

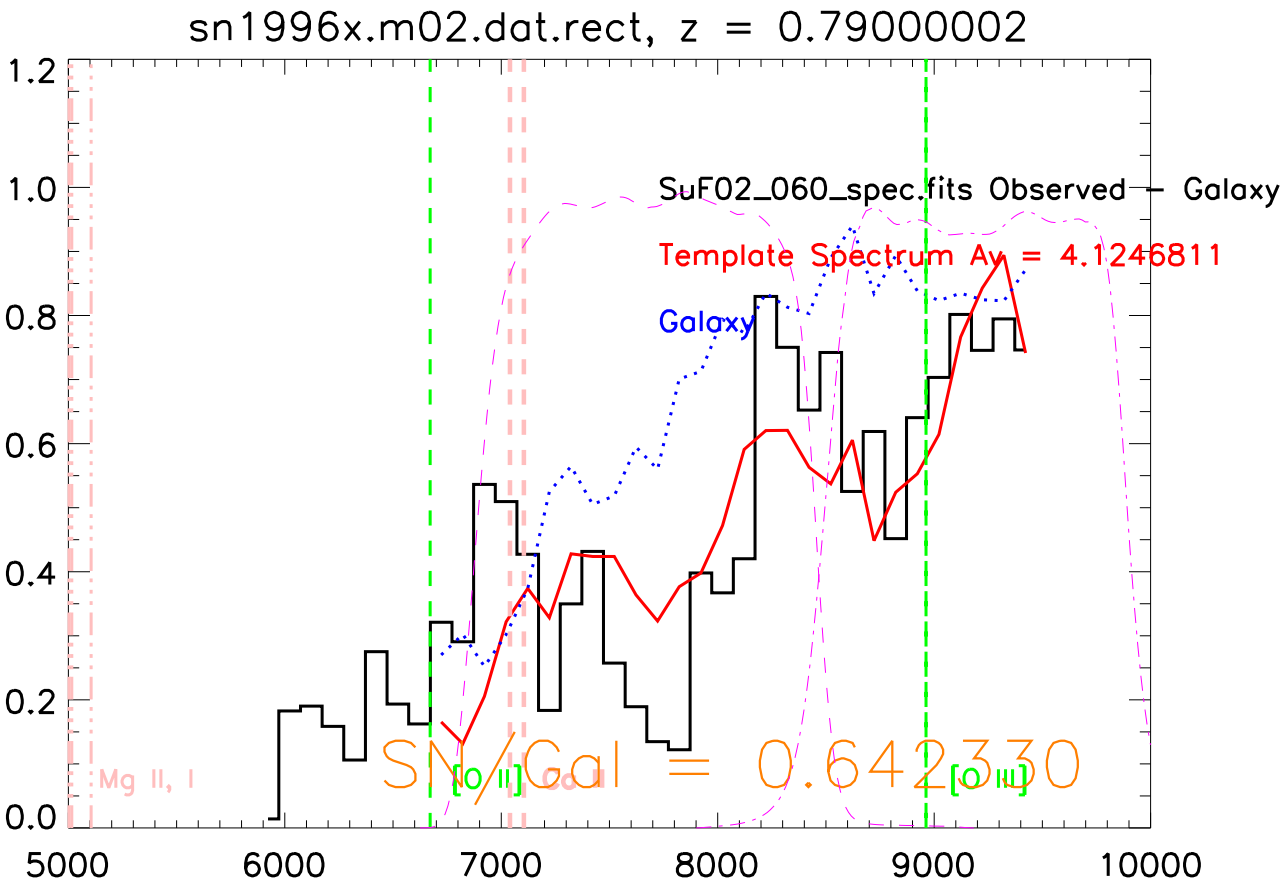

sn1999ee.m01.dat.rect, z = 0.82000005
SuF02_060_spec.fits Observed − Galaxy
Template Spectrum Av = 2.3740432
Galaxy
SN/Gal = 0.593029
Mg II, I
[O II]
Ca II
[O III]
1.2
1.0
0.8
0.6
0.4
0.2
0.0
5000
6000
7000
8000
9000
10000


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
1.5
1.0
0.5
0.0
5000
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