



FOCUSING BLUE/RED CHANNEL USING 'SPECFOCUS'

The following is a brief tutorial on focusing the MMT Blue and Red Channel spectrographs using the IRAF 'specfocus' routine.

1) From the IRAF cl load the ccdacq package:

```
ecl> ccdacq
```

2) Edit the lampfocuses parameters. The typical best focus value for Blue Channel with no filters is 2.15.

```
ccdacq> eparam lampfocuses
```

```

                I R A F
            Image Reduction and Analysis Facility
PACKAGE = ccdacq
  TASK = lampfocuses

nexpo =          11 Number of exposures
fstart =         1.8 Starting focus value
fdelta =         0.1 Focus increment
exptime =        30. Exposure time (seconds)
complamp=        HeAr/Ne Comparision lamp
objectti=        focus Object title
(verbose=         yes)
(mode =          ql)

```

3) Make sure the toggle switch on the lower right side of the paddle is set to "SCCS CONTROL".

4) Run lampfocuses

```
ccdacq> lampfocuses
```

Number of exposures (1:) (11):
 Starting focus value (1.8):
 Focus increment (0.1):
 Exposure time (seconds) (0.:16000.) (30.):
 Comparison lamp (HeAr/Ne):
 Object title (focus):
 image `focus0003' will be written to disk
 ...

5) Edit the parameters for specfocus which is in the noao, obsutil package:

ecl> ?

```

apropos  dataio.  gmisc.  lists.  proto.  system.
ared.    dbms.   guiapps. mscred. rvsao.  tables.
ccdacq.  dimsum.  images.  mxtools. softtools. utilities.
color.   finder.  imcnv.  noao.   spectime. vol.
crutil.  fitsutil.  immatchx. obsolete. sptools. xccdred.
ctio.    gemini.  language. plot.   stsdas.  xdimsum.

```

ecl> noao

```

artdata.  digiphot.  nobsolete. onedspec.
astcat.   focas.   nproto.   rv.
astrometry. imred.  observatory surfphot.
astutil.  mtlocal.  obsutil.  twodspect.

```

noao> obsutil

```

bitcount  cgiparse  kpno.    psfmeasure  specfocus  sptime
ccdtime   findgain  pairmass  shutcor    specpars@  starfocus

```

obsutil> eparam specfocus

Since the focus values are saved in the image header you can use the header keyword INSFOCUS for the focus values. You can limit which images to use by using wildcards, e.g.:

```
focus*! [4-8].fits
```

You can also use the IRAF @filename convention where filename contains a list of images to process.

```

      I R A F
    Image Reduction and Analysis Facility
PACKAGE = obsutil
TASK    = specfocus

```

```

images =      focus*.fits List of images
(focus =      INSFOCUS) Focus values
(corwidth=    20) Correlation width
(level =      0.5) Percent or fraction of peak for width measurement
(shifts =     yes) Compute shifts across the dispersion?

(dispxi=      1) Dispersion axis (long slit only)
(nspectr=     1) Number of spectral samples (long slit only)
(ndisp =      1) Number of dispersion samples
(slit1 =      INDEF) Lower slit edge
(slit2 =      INDEF) Upper slit edge

(logfile=     logfile) Logfile
(mode =       ql)

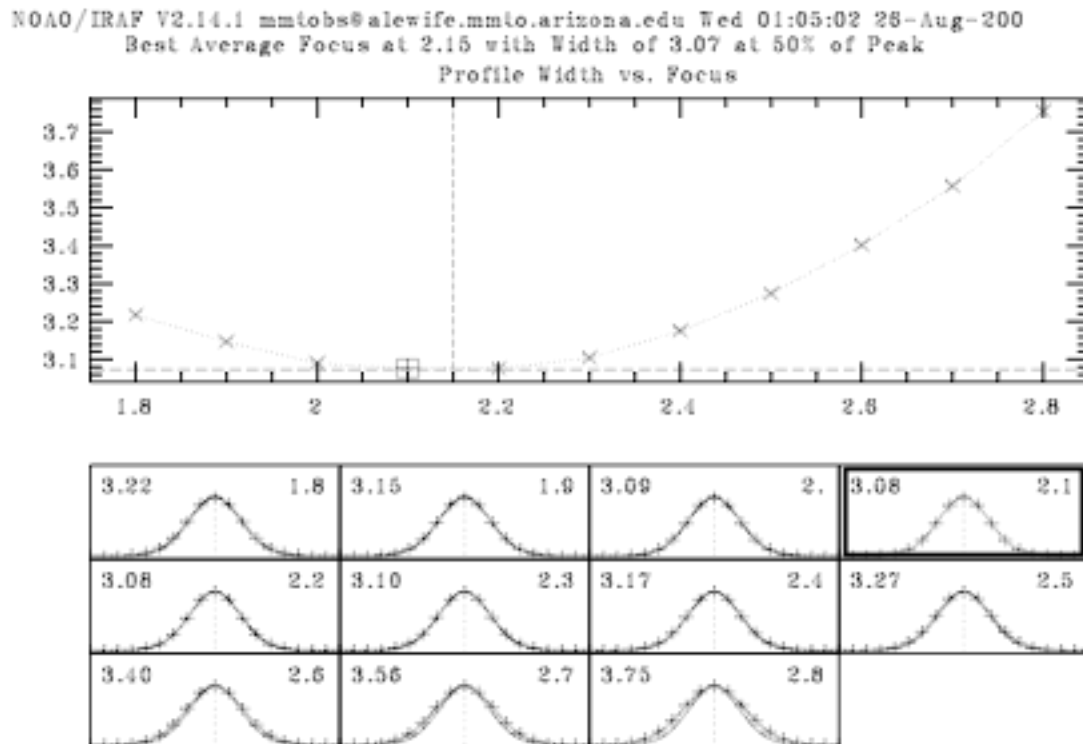
```

7. Run specfocus:

obsutil> specfocus

List of images (focus*.fits):

The result is the plot shown below:



SPECFOCUS: NOAO/IRAF V2.14.1 mmtobs@alewife.mmt.arizona.edu Wed 01:09:04
26-Aug-2009

Best average focus at 2.15 with average width of 3.07 at 50% of peak

-- Average Over All Samples

Image	Focus	Width
focus0014.fits	1.8	3.22
focus0015.fits	1.9	3.15
focus0016.fits	2.	3.09
focus0017.fits	2.1	3.08
focus0018.fits	2.2	3.08
focus0019.fits	2.3	3.10
focus0020.fits	2.4	3.17
focus0021.fits	2.5	3.27
focus0022.fits	2.6	3.40
focus0023.fits	2.7	3.56
focus0024.fits	2.8	3.75

-- Image focus0017.fits at Focus 2.1 --