

The note below is kindly provided by Christopher Willmer.

90Prime allows obtaining dithered exposures through scripts, which is absolutely critical in the case of exposures in R, I, SDSS r, i and z (e.g. Cool, 2007, ApJS, 169,21) where fringing is a problem. As an example, R. Cool combined from 12 to 42 z band exposures obtained during the course of each night to create a "fringing" correction master. By scripting much of the book-keeping is reduced.

In the case described here, a series of "N" dithers, each separated by 60" is calculated using a circular pattern. The total amplitude in Ra and Dec is 2 arc minutes, about 10% of the areal coverage of a single 90Prime CCD (area 23 arc min x 23 arc min).

1) The observing scripts were generated using a Fortran programme (dither.f), for which a central coordinate, image type, object name and list of filters are given. In the code I use 10 dithers for SDSS u and g and 20 for SDSS r, i and z. The programme generates an output file "pg_z_dither_script" which is then fed into a perl script (dither_to_dos.pl) that will translate the LINUX/UNIX carriage return control into DOS carriage return + linefeed. For each file it does:

```
perl -p -e 's/\n/\r\n/' < unixfile.txt > winfile.txt
```

2) The scripts then need to arrive at the 90prime bokccd computer somehow. I copied the files to bok:

```
scp *scr*.txt primefocus@bok.as.arizona.edu:/data/primefocus/cnaw/
```

and then on bokccd fired cygwin and

```
scp primefocus@bok.as.arizona.edu:/data/primefocus/cnaw/*scr*.txt .
```

(not the most straightforward way but works, a USB port is also available)

These must then be copied using windows into directory:

```
c:\AzCam\System\90Prime\ObservingScripts
```

The final scripts MUST have the .txt suffix, otherwise the windows machine will not understand the file.

3) Running the script

When the script is run, the telescope is moved to the new position and it will wait until the "moving" flag from the telescope is turned off, and waits for an additional 0.1 sec to start the integration (M. Lesser, private Communication, 2012-01-15).

To carry out dithered exposures with 90 Prime one uses on AzCam the command

```
Run Observe scriptname #_of_times
```

where #_of_times will be the number of times this script should be run.

This is what a line in a script looks like:

```
obs 150.0 object 'T2900' 1 u 090348.00 +173427.0 2000.0
```

obs - is the script command 150 - exposure time object - image type (OBJECT, ZERO, FLAT) 'T2900' - object name; quotes REQUIRED !! 1 - number of exposures at this position u - filter 090348.00 - RA

(HMS) with ONLY two decimal digits!! +173427.0 - DEC (DMS) with 1 decimal digit precision 2000.0
- EPOCH

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