AY257 Fall 2015

Homework #2: Bias, Trim and Flat-fielding

There are a number of CCD FITS files at:

http://www.ucolick.org/~bolte/AY257/HMWK2_2015

1. Use the IRAF tasks **hselect**, **imhead** and **hedit** or their equivalents to verify that these are all obtained in the direct imaging observing mode with the B filter. Correct any inaccurate titles.

2. For each of the frames make a table of frame name, title, exposure time, telescope elevation, LRIS rotation angle and the mode of the number of counts (**imstat**).

3. Overscan correct and trim the frames. The frames were read out of two amplifiers on a single CCD. Think about it a little bit, then use the IRAF script I have for this task in that is also in the HMWK2 directory. The script is called lrisbt_2amp.cl. To use it in IRAF, the path to the file needs to be added to a file in your IRAF directory called loginuser.cl. There is an example in the HMWK2 directory.

4. There are flatfields from the dome, twilight and darksky in the mix. Do every check you can think of with these frames all leading to creating an appropriate flatfield frame. For example: divide domes into twilights, twilights into dark-sky frames, dusk twilights into dawn twilights, long-exposure-time frames into short-exposure-time frames. A handy trick for doing this is to use **imdivide** with the option set to scale the resultant to a mean of 1.0 -- this way you can read residuals right off the images in units of percentage differences. Based on these experiments, chose a subset of the flat-field frames and experiment with the most effective way to combine them to create a flat-field.

5. Test for residual stars and galaxies in the combined flat by dividing it into a dome flat. Test for overall ability of your combined flat to flatten dark-sky data by dividing it into the one of the Draco fields and looking for overall gradients and noise levels in the sky.