For the TI500 CCD used for all of our observations at Lick, there are hundreds to thousands of pixels with excessive dark current which increases with exposure time. These dark current pixels (or "hot pixels") produce on the order of thousands or more counts per minute. To compensate for this, dark (zero-light) images are taken during an observing run. Since the dark current tends to be non-linear and varies from image-to-image by amounts larger than what would be expected from counting statistics, several exposures are taken with exposure times corresponding to the times used for the actual QSO fields. After baseline and bias frame correction, median filtering is applied to the dark frames to eliminate radiation events and only pixels with dark currents above a certain level will be included in the long dark images.

The bias and long dark frames are added, and this image is subtracted from the object images with the corresponding exposure times.

6.1.3 : Flat-Fields

To compensate for the varying pixel-to-pixel and region-to-region response of the CCD imaging system, we take short exposure, high light exposures of uniform fields which most accurately simulate the sky background during object exposures. Prior to dawn during an observing run a blank field in the sky is chosen free of any bright stars. Ideally, 5 arc minute regions are chosen ahead of time using the Palomar Sky Survey. It is usually possible to find areas at high galactic latitude free of any stars brighter than about 17th magnitude.

We acquire several frames totaling at least 100,000 counts per pixel which is normally sufficient to make the random noise in the sum of the flat-fields negligible relative to the error in the final reductions.

The images are added and then normalized to one (in order to simplify the Poisson statistics error calculations). This average is divided into each object or standard star image.