

we should delete any QSOs by criteria similar to those used to delete bad comparison stars (see above). Considering all the QSOs, we found six which may have been affected by nearby sources. These include two non-BALQSOs: PG 1522+101 and PKS 1756+2343 and four BALQSOs: 0145+0416, 0903+1734, 1413+1143, and 2201–1834. 1413+1143, the “cloverleaf”, is a special case since it is a gravitationally lensed image, and therefore the PSF is slightly larger for the QSO than the comparison stars. Note that all the other QSOs are unresolved (*i.e.* effectively point sources).

We found that 33% (27/82) of the QSOs have $P < 0.001$, as compared to 3% (17/553) of the stars. For the corresponding analysis with the V2 images, the values are: 45% (18/40) of the QSOs and 1% (2/232) of the stars. Note that these data sets include the FOS target sample and thus a significant fraction of non-BALQSOs and radio-loud QSOs. Also, a larger fraction of the V2 band observations are from the FOS target sample. Using $P < 0.001$ as a crude criterion for variability, we can claim to have detected variability in roughly one third of the observed QSOs. How this breaks down by class (BALQSO, radio-loud, redshift, luminosity, etc.) will be discussed in the next chapter.

7.6 : Ways of Possibly Reducing the Errors in Future Observations

Clearly, our signal-to-noise is limited by the non-formal errors we have encountered (for objects with $V \lesssim 17.5$). One of the reasons we have enumerated these errors in the sections above is to attempt to reduce them in the future. Below we list notes on possible future improvements:

(1) The TI500 CCD has a large number of pixels with excessive dark current which must be corrected. A newer CCD with fewer of these “hot pixels” and other defects should reduce the errors.

(2) A larger CCD with a larger field will help by providing more comparison stars, which will mean better estimates of the scaling factors between images, better estimates of the true error distribution, and improved detection of bad data points (among the stars).