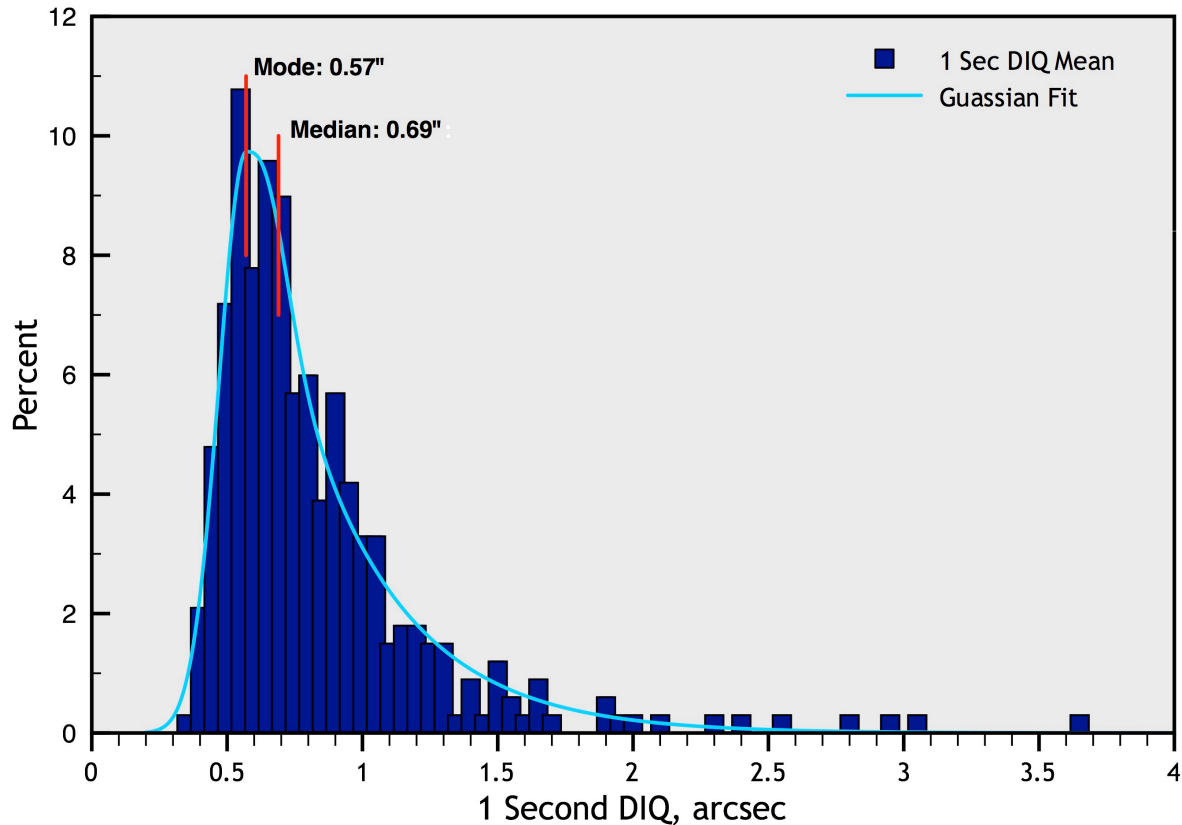


WIYN 3.5M

Delivered Image Quality

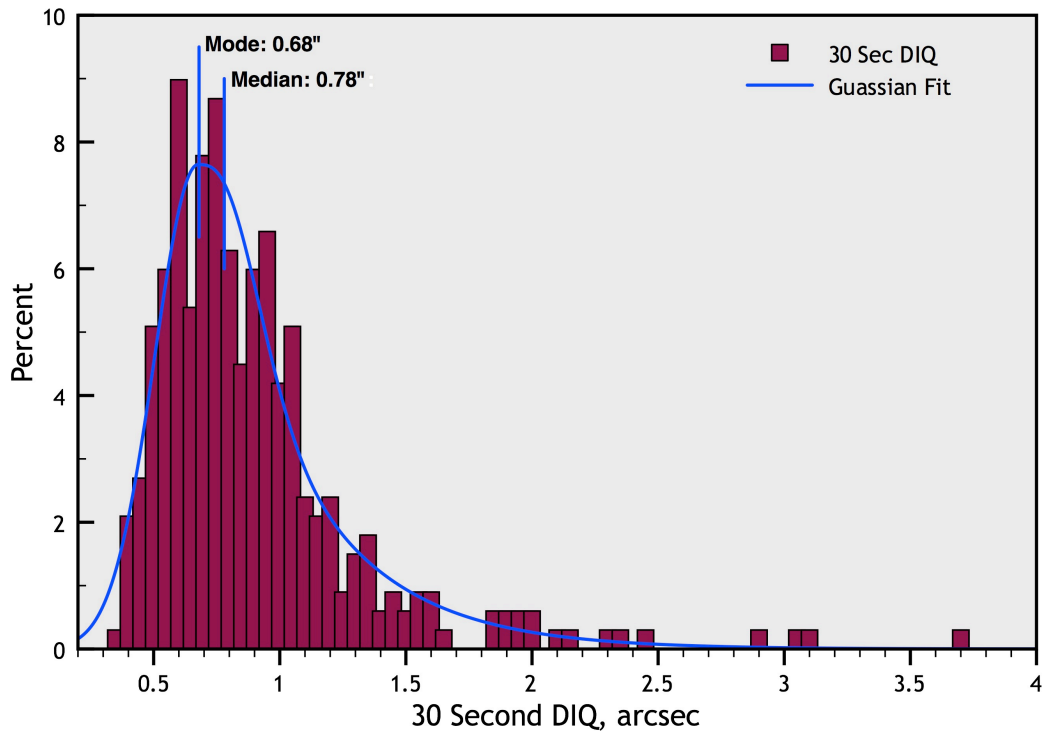
DIQ MEASUREMENT: Aug04 - Apr06



WIYN measures the DIQ by obtaining 30, 1sec exposures in the R-Band, 0.2arcsec pixels. The mean FWHM of the individual measurements is then reported as the DIQ. An equivalent 30sec FWHM is derived from the same data by stacking the unregistered images and measuring the FWHM. This is reported as the 30sec DIQ and is representative of what the observer might typically observe during his or her science exposures. An analysis of the measurements has been made for August of 2004 through April of 2006 with 334 data points obtained and are present here. Measurements typically a signal-to-noise of ~100. FWHM metric evaluated using IRAF's Imexam, v2.11.

As observing program's demands differ, the DIQ measurement is generally obtained just after wavefront curvature corrections to the primary and secondary mirrors, typically within the first hour of the observing night. The intent is not to constrain obser-

vations during the night. However, there is a subset of measurements obtained as opportunities arise, scattered randomly throughout the night, but is less than 20% of the total. The sample then constitutes a bias towards the first hour of the evening and

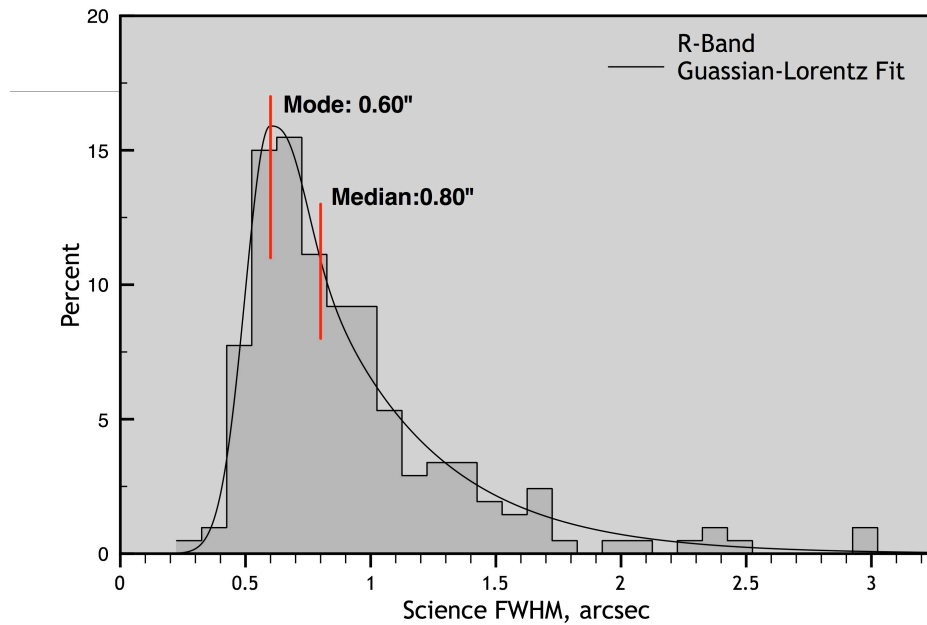


does not sample the variations in delivered image quality throughout the night.

Telescope Mount errors contribute to the spread in the 30sec DIQ histogram, but statistically, the mode and median do not appear to be different between those measurements obtained with mount errors (poor open-loop tracking) and when mount errors were removed (excellent open-loop tracking). Therefore, the difference in the two metrics for the 1sec and 30sec DIQ samples is best explained as differences in fast focus variations, atmospheric focus errors, and tip-tilt variations of the stellar centroid.

It should be noted that the DIQ measurement process relies upon a certain level of automation. This will result in some focus error where the measurement star is not optimally imaged. A large sample size should average out this effect.

Science FWHM



WIYN maintains an informal database of science FWHM for standard filters used with MiniMo and OPTIC (0.141 arcsec pixels). The database provides information as to the typical DIQ for science images. It is not a robust sampling of the image quality obtained. The following histograms show the databases for the R-band (198 samples) and I-band (106 data samples). Data was limited to airmass less than 1.8.

