

The photometric system of the Nanshan One-meter Wide field Telescope

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Abstract. A one-meter wide field astronomical telescope with Alt-Az mount, putting in work at prime focus with field corrector, is located at the Nanshan site of Xinjiang Astronomical Observatory. The Nanshan One meter Wide-field Telescope (hereafter NOWT) provides excellent optical quality, pointing accuracy and tracking accuracy. The main scientific goals of NOWT are supernovae, gamma-ray bursts, novae, variable stars, and active galactic nuclei. It is worthwhile to point out that the sky background at the Nanshan is a classic optical site.

Keywords. CCD photometer, telescopes

1. Observation system and Quality of Nanshan site

With a CCD photometer (E2V CCD203-82) the NOWT has tried to obtain high quality optical observations using a traditional UBVRI filters, which are made by the USA. For the NOWT, the main details can be described as follows: effective diameter(>960 mm), prime focal length(< 2200 mm), FOV at prime focus (1.3 degree×1.3 degree), pointing accuracy (better than 5''RMS for each axis after pointing model correction), tracking accuracy (20 degree < elevation < 75 degree, 0.2''RMS in 10 seconds, 1''RMS in 60 minutes; 75 degree < elevation < 85 degree, 0.4''RMS in 10 seconds, 3'' in 60 minutes), and so on. For the CCD camera, the information are as follows: active pixels (4096×4136), pixel size (12um×12um), peak charge storage(172500e/pixel), non-linearity (< 1%), dark signal (< 10e/pixel/hr), gain (0.89e/ADU for slow, 1.81e/ADU for medium, 0.91e/ADU for fast), readout noise (2.9e for slow, 4.1e for medium, 5.3e for fast).

We investigated 3 years of sky brightness and seeing data from Nanshan, and studied sky brightness, seeing FWHM, and Polaris brightness, as well as some statistics. We computed the total number of hours between the starting and ending dates. In our results, the sky was brighter than 18.38 for 25%, brighter than 20.65 for 50%, and brighter than 21.61 for 75% of the DARK time. A useful number to know is that the median seeing (as measured by the SBIG, whatever that means) was 1.62 arcsec. We have tagged as *Valid* those times when the seeing monitor is reporting valid data. Figure 2 displayed in the poster gives an example of seeing results from SBIG at Nanshan site. We do not yet have good statistics from other sites to which we might compare these numbers. These would clearly be valuable data to study. All in all, our results look very promising.

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