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TLS Participation in MPC's NEO Confirmation Program

Results and Prospects

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ABSTRACT

The Thueringer Landessternwarte (TLS) Tautenburg joined MPC's NEO confirmation program in 2010. Since then almost 7800 positions were reported of which about 4400 belong to NEAs. Thanks to ongoing improvements the observational output is still rising as indicated by the fact that about one third of these results were obtained in 2016. New features for the multi-pass image analysis were implemented in the data processing pipeline. After the target detection is performed on stacked frames, 1st pass single frame processing is carried out with nearby star identification. If required, a 2nd pass single frame processing is performed with field stars subtracted. The single frame processing includes the identification of outliers based on the residual statistics derived from orbit calculations which include all previous measurements. Thereby, mis-identifications and position glitches can be avoided.

The new prime-focus CCD camera TAUKAM, to be commissioned end of 2017, will drastically increase the imaging capabilities of TLS which is of major importance for

the NEO observations. TAUkam is manufactured by Spectral Instruments Inc. and features an e2v 6144 x 6160 pixel back-illuminated deep-depletion CCD. The pixel scale of 0.77 arcsec will improve the astrometric accuracy due to finer PSF sampling while, at the same time, the increased FOV of 1.73 square degrees permits to target objects with substantial position uncertainties. The fast readout of the four quadrants drastically reduces overheads, so full-frame imaging will become the default. By mid-2018 TAUkam shall be fully operational and supported by the NEO imaging data processing pipeline.
