

PERIOD DETERMINATION FOR NEA (162421) 2000 ET70

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Lightcurve analysis for (162421) 2000 ET70 was performed in collaboration with observers in Uruguay, Australia, and the United States from observations obtained during the asteroid's favorable opposition in 2012. The synodic rotation period was found to be 8.947 ± 0.001 h and the lightcurve amplitude was 0.60 ± 0.07 mag.

The Aten type near-Earth asteroid, (162421) 2000 ET70, with no previously reported lightcurve parameters, was selected from the potential lightcurve opportunities listed in the *Minor Planet Bulletin* (Warner *et al.* 2012) as a particularly favorable target for observation. At widely spaced locations, Alvarez, Oey and Han worked on this target independently from each other.

Unfiltered CCD photometric images of (162421) 2000 ET70 were taken by Alvarez at Observatorio Los Algarrobos, Salto, Uruguay (MPC I38), Oey at Kingsgrove Observatory, Australia (MPC E19) and Han and collaborators at Kitt Peak, USA (MPC 695) from 2012 February 19 to 24. Observing dates are summarized in Table I while technical specifications are described in Table II. Additional information about the instruments can be found on previous reports from Alvarez (2012) and Oey (2011).

All images were dark and flat field corrected and then measured using *MPO Canopus* v10 (Bdw Publishing), applying a differential photometry technique. The data were light-time corrected. Period analysis was also done with *MPO Canopus*, which incorporates the Fourier analysis algorithm developed by Harris (Harris *et al.* 1989).

Due to the asteroid's fast motion, all observations had to be broken into several "sessions", where a session was defined to be those data referenced against a given set of comparison stars in the same field as the asteroid. About 4,800 data points were obtained during 7 observing runs, resulting in a total of 65 sessions. Each observing run was longer than 5 hours, giving a total of more than 42 hours of observations. Over the span of observations, the phase angle varied from 40.7° to 45.4° . Analysis of the data found a rotation period for (162421) 2000 ET70 of $P = 8.947 \pm 0.001$ h along with a peak-to-peak amplitude of $A = 0.60 \pm 0.07$ mag.

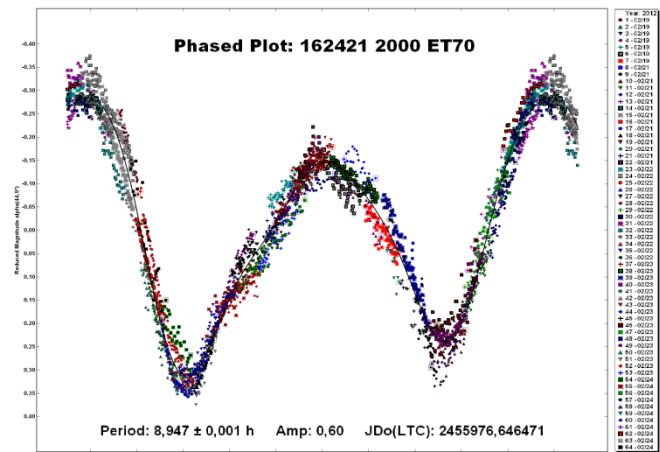
References

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Obs	Date	Obs 2012	Sess	Session numbers
Alvarez	02/19, 22, 23	19	1-7, 8-13, 22-27	
Oey	02/22, 23, 24	31	14-21, 28-39, 40-50	
Han	02/24	15	51-65	

Table I. Corresponding observing sessions by authors

Observer	Observatory (MPC)	Telescope	Image scale
	Location	Camera	Exposure
Alvarez	OLASU (I38)	0.30 m SCT	1.77 "/px
	Salto, Uruguay	QSI 516wsg	30 sec
Oey	Kingsgrove (E19)	0.25 m SCT	1.45 "/px
	NSW, Australia	SBIG ST-9XE	30 sec
Han	Kitt Peak (695)	0.90 m R-C	0.77 "/px
	Arizona, USA	Apogee Alta U6	20 sec

Table II. Equipment specifications