PERIOD DETERMINATION FOR THE SLOW ROTATOR 2546 LIBITINA

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(Received: 5 July)

Period and amplitude results for asteroid 2546 Libitina were determined from observations during 2013. The synodic rotation period was found to be 132.71 ± 0.07 h and the lightcurve amplitude was 0.35 ± 0.03 mag.

The main-belt asteroid 2546 Libitina was discovered in 1950 and named after the ancient Roman goddess of funerals and burial. It appeared on the CALL web site as an asteroid photometry opportunity due to reaching a favorable apparition and having no defined lightcurve parameters. CCD photometric images were taken at Observatorio Los Algarrobos, Salto, Uruguay (MPC Code I38) in 2013, April 9 to 23, using a 0.3-m Meade LX-200R reduced to f/6.9. The CCD imager was a QSI 516wsg NABG (non-antiblooming gate) with a 1536 x 1024 array of 9-micron pixels and 23 x 16 arcminute field-of-view. Exposures were 90 s working at –10C, unfiltered, binned 2x2, yielding an image scale of 1.77 arcseconds per pixel. The camera was off-axis guided by means of a SX Lodestar camera and *PHD Guiding* (Stark Labs) software. Image acquisition was done with *MaxIm DL5* (Diffraction Limited). All images were dark and flat-field corrected and then measured using *MPO Canopus* (Bdw Publishing) version 10.4.0.20 with a differential photometry technique. The data were light-time corrected. Night-to-night zero point calibration was accomplished by selecting up to five comp stars with near solar colors according to recommendations by Warner (2007) and Stephens (2008). Period analysis was also done with *MPO Canopus*, which incorporates the Fourier analysis algorithm developed by Harris (Harris *et al.*, 1989).

A total of 13 nights were exclusively devoted to observe this asteroid over a total span of 15 days. About 72 hours of effective observation and more than 2,600 data points were required in order to solve the lightcurve. Over the span of observations, the phase angle varied from 8.8º to 8.5º to 9.8º, the phase angle bisector ecliptic longitude from 203.9º to 204.9º, and the phase angle bisector ecliptic latitude from –13.7º to -14.1º. The rotational period was determined (for the first time) to be 132.71 ± 0.07 h along with a peak-to-peak amplitude of 0.35 ± 0.03 mag. Neither clear evidences of tumbling nor binary companion were seen in the lightcurve.

References

Collaborative Asteroid Lightcurve Link (CALL) Web Site at *http://www.minorplanet.info/PHP/call_OppLCDBQuery.php*

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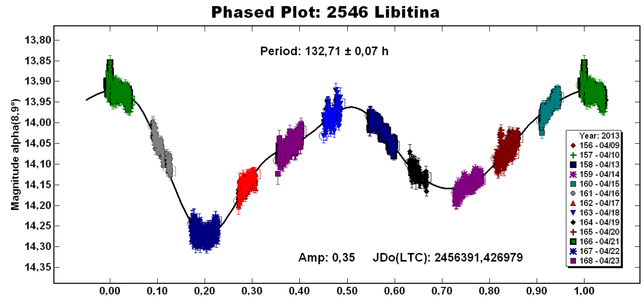

LIGHTCURVE OF 3422 REID USING STAR SUBTRACTION TECHNIQUES

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(Received: 26 June)

Lightcurves measurements obtained in June 2013 for asteroid 3422 Reid suggest 2.91 ± 0.02 h as an update to the rotation period. The observed amplitude was 0.52 ± 0.05 mag. A significant reduction in the point-to-point scatter within the lightcurve was achieved when star subtraction were employed to eliminate the contaminating effects of background stars.

3422 Reid was discovered on 1978 July 28 at Perth Observatory, in Perth, Australia, and given the designation 1978 OJ. Since its discovery, only one lightcurve had been measured (Krotz *et al.* 2010), but it did not cover a full rotation cycle and so it was possible that the reported period of 3.22 h was not precise. The purpose of the observations obtained at Isaac Aznar Observatory (IAO) was to find the rotation period as accurately as possible. Images were obtained using a Meade 0.35-m LX200 ACF *f*/6.4, an unfiltered Santa Barbara Instrument Group (SBIG) CCD ST9-XE working at –10°C, and SBIG A08 adaptive optics. The image scale was 1.86 arcseconds per pixel. Exposure time was 60 seconds. The observations were made on the night of 2013 June 22, when the asteroid was approximately mag 15.3. Image calibration was done using master twilight flats and darks. The calibration frames were created using *MaximDL* and *MPO Canopus* was used to measure the processed images.

Using a data set of 88 points, first analysis found a period of 2.99 ± 0.01 h with an amplitude of 0.48 ± 0.05 mag. This period was slightly shorter than the 3.22 h obtained by Krotz *et al.* (2010). Figure 1 shows the lightcurve from the first analysis. Because the asteroid was passing a dense field star at the time, the shape of the lightcurve changed abruptly around 0.30 to 0.55 rotation phase. This is a common problem in minor planet photometry, so it´s necessary to do a thorough review of the images in order to minimize background contamination effects on the curve shape and resulting the rotation period and amplitude.

Fortunately *MPO Canopus* V.10 has a star subtraction function that attempts to correct the increase in brightness when the asteroid