PHOTOMETRIC OBSERVATIONS OF MAIN-BELT ASTEROIDS 1968 MEHLTRETTER, 2681 OSTROVSKIJ & 3431 NAKANO

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(Received: 2018 Mar 26)

Lightcurves for three mid-belt asteroids were obtained from Flarestar Observatory (MPC171) and Znith Observatory in 2017 and 2018. These asteroids were selected from the Collaborative Asteroid Lightcurve Link (CALL) website. No reported observations were available to deduce their rotation periods prior to this research.

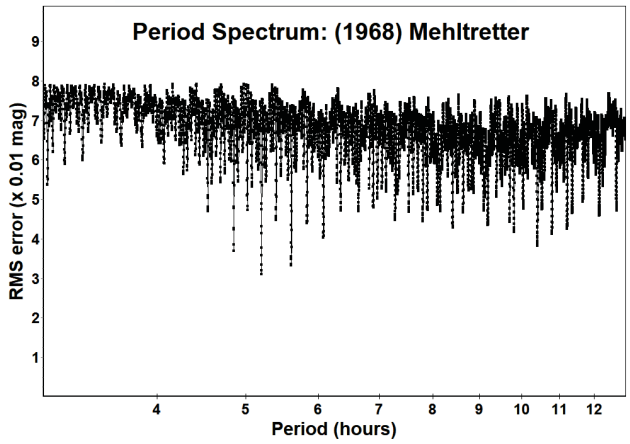
In between the months of October 2017 and March 2018, photometric observations of three main-belt asteroids were carried out from two observatories located in Malta (Europe). Observations of asteroids 1968 Mehltretter & 2681 Ostrovskij were obtained from Flarestar Observatory (MPC171). Observations of 3431 Nakano were obtained from Znith Observatory through a 0.20-m *f*/10 Schmidt-Cassegrain (SCT) equipped with a Moravian G2-1600 CCD camera. Flarestar Observatory utilized a Moravian G2-1600 camera at 1x1 binning mode with a resultant pixel scale of 0.99" per pixel while Znith operated at a pixel scale of 1.17" per pixel using the same binning mode. All cameras were operated at sensor temperature of -15°C and images were dark subtracted and flat-fielded.

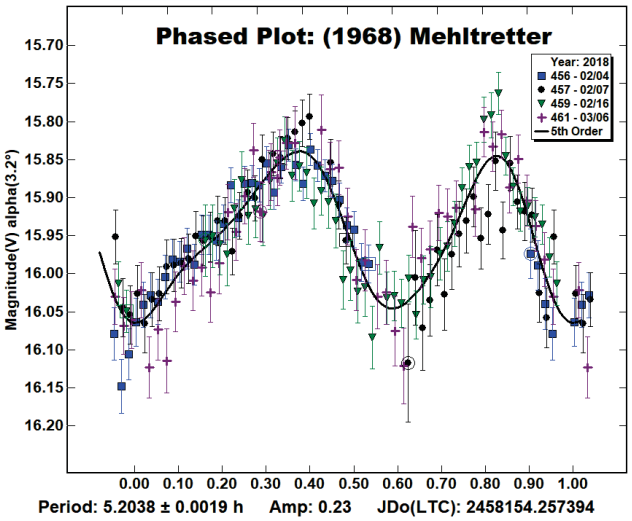
Both telescopes and cameras were controlled remotely from a nearby location via *Sequence Generator Pro* (Binary Star Software). Photometric reduction, lightcurve construction and analyses were derived through *MPO Canopus* software (Warner, 2017). Differential aperture photometry was utilised and photometric measurements were derived through the use of MPO Canopus. The Comparison Star Selector (CSS) that utilized comparison stars of near-solar color was used by the same software. All measurements were taken from the MPOSC3 Catalog that is based on the 2MASS catalog (*http://www.ipac.caltech.edu/2mass*) with magnitudes converted from J-K to BVRI (Warner, 2007).

The three asteroids for this research have been selected through the CALL website as maintained by Warner (2016).

1968 Mehlgretter. This main-belt asteroid that was discovered on 1932 January 29 by Reinmuth, K. at Heidelberg. The asteroid orbits the sun with a semi-major axis of 2.734 AU, eccentricity 0.112, and period of 4.53 years (JPL, 2018). The JPL Small-Bodies Database Browser lists the diameter of 1968 Mehltretter as 13.154 km ± 0.277 km based on an absolute magnitude H = 11.7.

Observations were conducted from Flarestar Observatory and were carried out on 4 nights from 2018 February 4 to March 6. Results indicate a synodic period of 5.2038 ± 0.0019 h and amplitude of 0.23 ± 0.05 mag There were no previous entries in the LCDB for this asteroid.



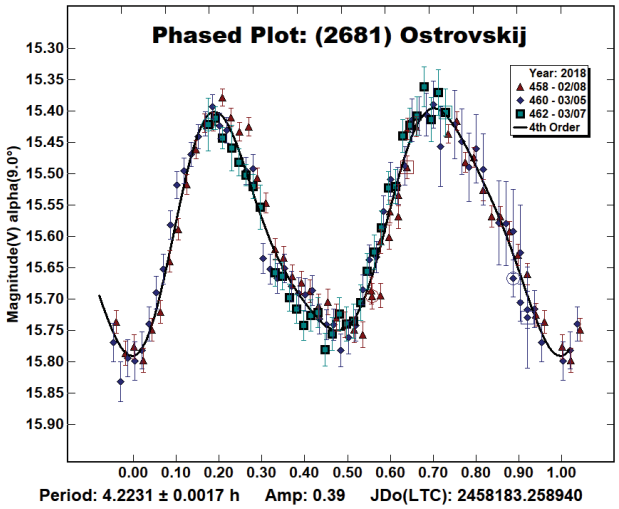


2681 Ostrovskij. This main-belt asteroid that was discovered on 1975 November 02 by Smironva, T. at Nauchnyj Russia. This 13.29 km asteroid has an absolute magnitude (H) of 12.3 and orbits the sun with a semi-major axis of 2.747 AU, eccentricity 0.1896, and period of 4.55 years (JPL, 2018).

Number	Name	yyyy /mm/ dd	Pts	Phase	L_{PAB}	B_{PAB}	Period(h)	P.E.	Amp	A.E.	Group
1968	Mehltretter	2018 02/04-03/06	189	2.9,14.1	130	05	5.2038	0.0019	0.23	0.05	MB-M
2681	Ostrovskij	2018 02/08-03/07	143	9.0,6.4	155	06	4.2231	0.0017	0.39	0.02	MB-M
3431	Nakano	2017 10/14-12/22	258	6.3,19.2	013	13	9.0563	0.0021	0.20	0.04	MB-M

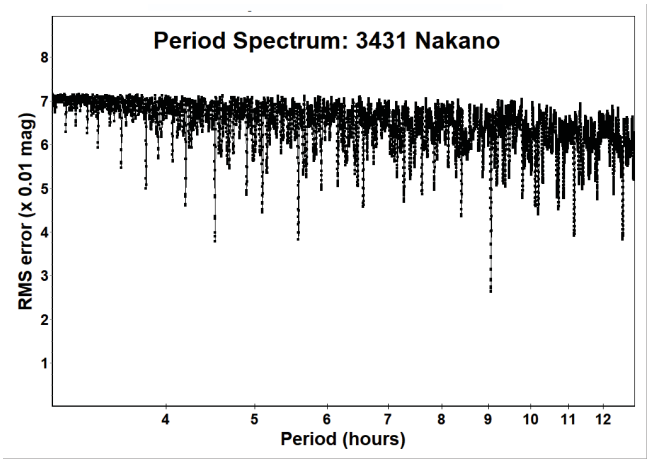
Table I. Observing circumstances and results. Pts is the number of data points. The phase angle is given for the first and last date. L_{PAB} and B_{PAB} are the approximate phase angle bisector longitude and latitude at mid-date range (see Harris *et al.*, 1984). Grp is the asteroid family/group (Warner *et al.*, 2009).

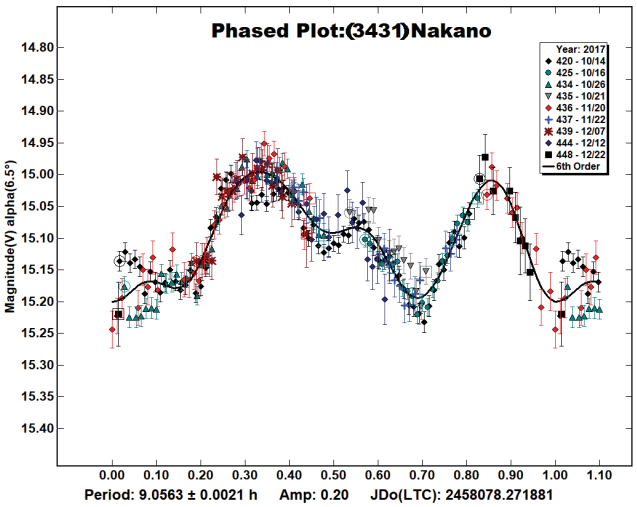
Observations were conducted from Flarestar Observatory on 3 nights from 2018 February 08 to March 07 10. The derived lightcurve indicates a synodic period of 4.2231 ± 0.0017 h and amplitude of 0.39 ± 0.02 mag. No previous entries in the LCDB database were found for this asteroid.



3431 Nakano. Nakano is a main-belt asteroid that was discovered on 1984 August 24 by Seki, T. at the at the Geisei Observatory in Kōchi, Japan. This asteroid was named was named after the Japanese astronomer Nakano Shuichi (1947-). 3431 Nakano orbits the sun with a semi-major axis of 3.095 AU, eccentricity 0.0472, and period of 5.45 years (JPL, 2018). The JPL Small-Bodies Database Browser (JPL, 2018) lists the diameter of 1637 Swings as 44.30 km ± 0.142 km based on an absolute magnitude H = 10.6.

3431 Nakano was observed from Znith Observatory on 9 nights starting on the night of 2017 October 14/15 at 19:16UT and ending on the night of 2017 December 22 at 21:11UT. Our results yielded a synodic period of 9.0563 ± 0.0021h and amplitude of 0.20 ± 0.04 mag. The Lightcurve Database did not contain any references of the synodic period of this asteroid.





Acknowledgements

We would like to thank Brian Warner his work in the development of *MPO Canopus* and for his efforts in maintaining the CALL website. This research has made use of the JPL's Small-Body Database.

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