

# THE MINOR PLANET BULLETIN

BULLETIN OF THE MINOR PLANETS SECTION OF THE  
ASSOCIATION OF LUNAR AND PLANETARY OBSERVERS

VOLUME 50, NUMBER 4, A.D. 2023 OCTOBER-DECEMBER

247.

## THE LIGHTCURVE AND ROTATION PERIOD FOR 268 ADOREA AND (16735) 1996 JJ

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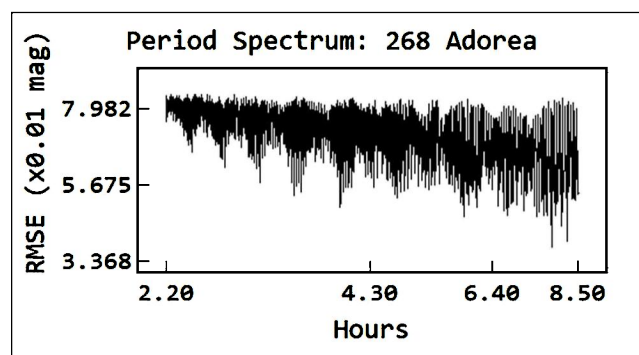
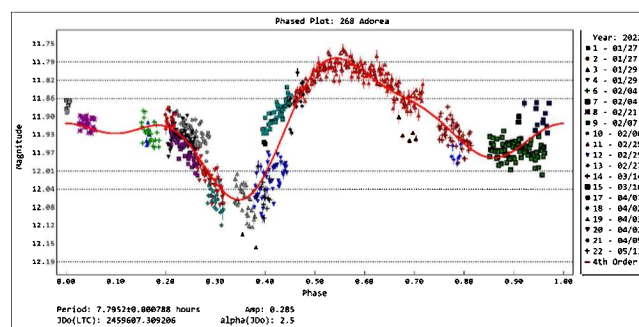
(Received: 2023 May 16)

Lightcurve period and amplitude results from Old Orchard Observatory are reported for 2022 January-May, 268 Adorea ( $7.7952 \pm 0.0008$  h and 0.285 mag). 2023 April-May, (16735) 1996 JJ ( $3.1796 \pm 0.0008$  h and 0.436 mag).

The author operates a single telescope at Old Orchard Observatory (MPC Code Z09) in Somerset, United Kingdom, a 10-inch Meade LX200 f/10 telescope on a fork mount coupled with a Starlight Xpress 694 Trius Pro mono CCD. The images were measured, and period analysis were done using *TychoTracker Pro* which uses differential aperture photometry to determine the results.

The results are summarized in the table below. Column 3 gives the dates over which the observations were made. Column 4 is the range of phase angles over the whole date range, if this is preceded by an asterisk this means the asteroid reached a minima during the period. Columns 5 and 6 give the range of values for the Phase Angle Bisector (PAB) longitude and latitude respectively. Column 7 gives the period and column 8 the error in hours. Columns 9 and 10 give the amplitude and error in magnitude.

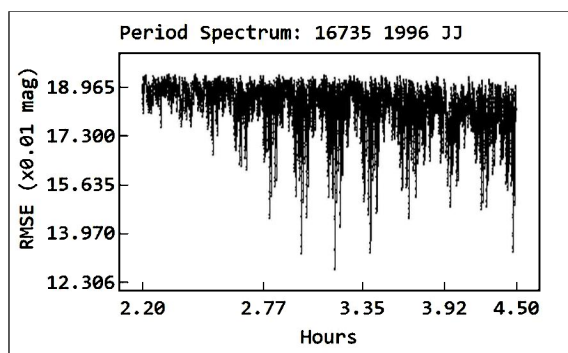
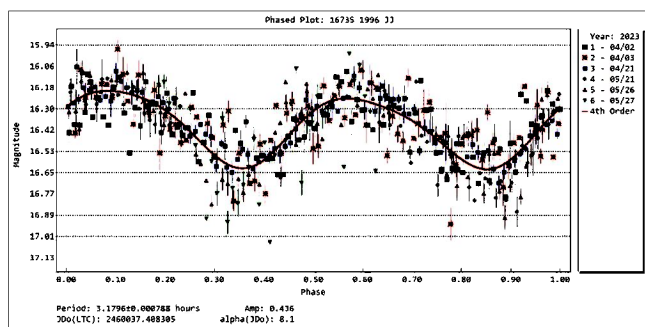
268 Adorea is a large main-belt asteroid, a member of the Themis group/family. Holliday (1995) previously reported a period of 9.44 hours while Tedesco (1979) reported a period of 6.1 hours. Behrend (2006web) reported a period of 15.595 h resulting in a four extrema light curve. Stephens (2006) reported a period of 7.8 hours. The 7.7952 hours is close to the preferred period listed on the known lightcurve periods maintained by Harris and Warner (Warner et al., 2009).



(16735) 1996 JJ an inner main-belt asteroid. Behrend (2003web) previously reported a rotation period of 3,1798 hours, this is in very close agreement with the figure reported here of 3.1796 hours.

| Number | Name    | yyyy mm/dd       | Phase    | L <sub>PAB</sub> | B <sub>PAB</sub> | Period(h) | P.E.   | Amp  | A.E. | Grp  |
|--------|---------|------------------|----------|------------------|------------------|-----------|--------|------|------|------|
| 268    | Adorea  | 2022 01/27-05/11 | 2.5,20.5 | 123              | 0                | 7.7952    | 0.0008 | 0.28 | 0.03 | THM  |
| 16735  | 1996 JJ | 2023 04/02-05/27 | 8.0,29.0 | 129              | 10               | 3.1796    | 0.0008 | 0.44 | 0.12 | 9104 |

Table I. Observing circumstances and results. The phase angle is given for the first and last date. If preceded by an asterisk, the phase angle reached an extrema during the period. LPAB and BPAB are the approximate phase angle bisector longitude/latitude at mid-date range (see Harris et al., 1984). Grp is the asteroid family/group (Warner et al., 2009).



### Acknowledgements

Thanks are given to Dr Richard Miles of the British Astronomical Association for all his support and encouragement and Daniel Parrott author of *TychoTracker Pro* for all his patience with my many questions.

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## ROTATION PERIOD DETERMINATION FOR ASTEROID 8861 JENSKANDLER

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(Received: 2023 June 13)

Photometric observations of the asteroid 8861 Jenskandler were conducted between 2023 April 14 and 2023 April 26 with the objective of estimating its rotation period. The preliminary rotation period was approximated at 2.9992  $\pm$  0.0019 hours. However, due to insufficient data, we were unable to ascertain the asteroid's lightcurve shape conclusively.

8861 Jenskandler is a main-belt asteroid first discovered on 1991 October 3. Named after astronomer Jens Kandler, who is credited with numerous asteroid discoveries at Drebach Observatory. This particular asteroid has a semi-major axis of 2.602 AU, an eccentricity of 0.206, inclination of 10.9577°, and an orbital period of 4.2 years. Its absolute magnitude is 13.2, and it has a diameter of approximately 14 km and a geometric albedo of 0.041 (JPL, 2016).

The University of Maryland authors observed asteroid 8861 Jenskandler on five nights between 2023 April 14 and 2023 April 26 from the Siding Springs Observatory located in Australia. We used a 0.43-m f/6.8 reflector telescope, a FLI ProLine PL4710 CCD camera with an array of 1024  $\times$  1024 pixels, and a clear filter. The pixel scale was 0.92 arcsec when binned at 1 $\times$ 1 pixels and the exposures were 300 seconds long (iTelescope Support Document).

Charles Galdies observed from Znith Observatory, Naxxar, Malta using Moravian CCD G2-1600 with 0.20m SCT, C filter and 1 $\times$ 1 binning on 2023 April 22 and 2023 April 26.

Data processing and analysis took place using *MPO Canopus*, and we used aperture photometry to find the differential magnitudes of the asteroid compared to the comparison stars (Warner, 2019). Phased lightcurves were obtained using the *MPO Canopus* Fourier fitting function and examining the fits with the lowest RMS value, varying the parameters in order to find the best lightcurve and rotation period. The resulting observation geometry is given in the table.

Before conducting our analysis, we checked the Asteroid Lightcurve Database (LCDB; Warner et al., 2009) and found that there were no previously-recorded rotation periods for this particular asteroid. Our analysis yielded two lightcurves. One fit the data with two maxima and minima, as is typical, with a period of 2.9992  $\pm$  0.0019 h. However, as seen from the figure, this lightcurve is quite noisy.