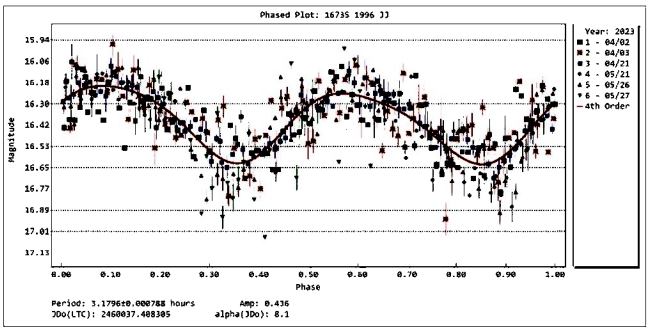

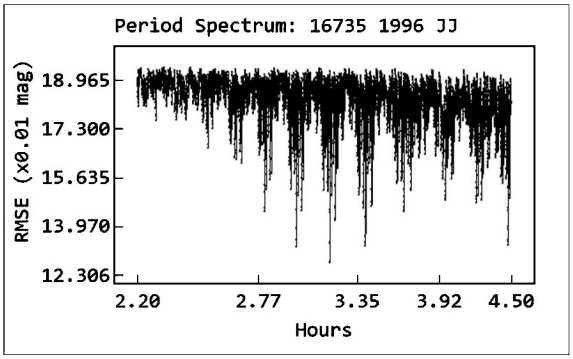

Acknowledgements

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 +/- 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 × 1024 pixels, and a clear filter. The pixel scale was 0.92 arcsec when binned at 1×1 pixels and the exposures were 300 seconds long (iTelescope Support Document).

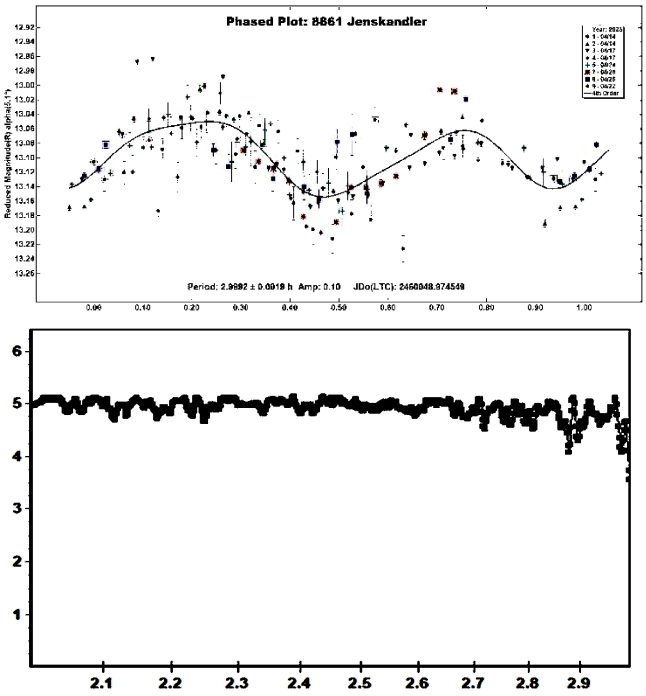
Charles Galdies observed from Znith Observatory, Naxxar, Malta using Moravian CCD G2-1600 with 0.20m SCT, C filter and 1×1 binning on 2023 April 22 and 2023 April 26.

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.

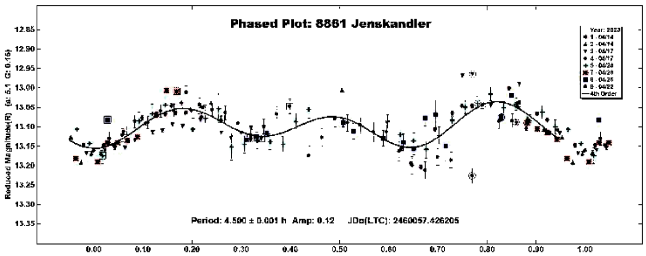
Before conducting our analysis, we checked the Asteroid Lightcurve Database (LCDB; Warner et al., 2009) and found that there were no previously-recorded rotation periods for this particular asteroid. Our analysis yielded two lightcurves. One fit the data with two maxima and minima, as is typical, with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

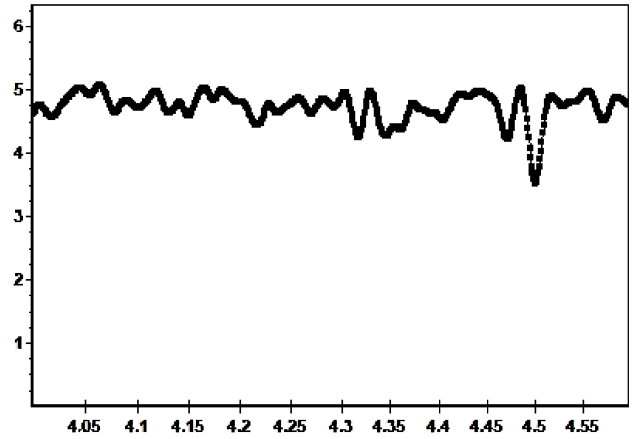
Number	Name	yyyy mm/dd	Phase	L_{PAB}	B_{PAB}	Period(h)	P.E.	Amp	A.E	Grp
8861	Jenskandler	2023 4/14-4/26	*4.8, 1.7	212.4	-1.6	2.9992	0.0019	0.10	0.05	MB-A

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).



The second fit presents an odd scenario having three maxima and minima, indicating a potential irregularity in the asteroid's shape. The period is 4.500 +/- 0.001 h, which is an alias of the prior period. However, this phased plot is noticeably less noisy. The RMS plot displays a more distinct minimum for this period compared to the RMS for the 2.99-h period. This anomaly is not without precedent: there have been other instances of oddly- shaped asteroids yielding similar phased lightcurves, such as 1580 Betulia (Tedesco et al., 1978). Nevertheless, we prefer the 2.99 h period due to its more typical lightcurve and suspect the ambiguity is due to a lack of high-quality data in our lightcurve.





Acknowledgements

Funding for iTelescope observations was provided by the University of Maryland department of Astronomy. The iTelescope data from Siding Springs Australia made this research possible, while *MPO Canopus* (Warner, 2019) and DS9 made finding phased lightcurves possible.

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