

ROTATION PERIOD DETERMINATION AND LIGHTCURVE ANALYSIS OF ASTEROID 3736 ROKOSKE

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Observations of the main-belt asteroid 3736 Rokoske were conducted over 8 nights between 2022 March 25 and 2022 April 23. Images were collected using three telescopes in the USA, Malta, and Italy. 3736 Rokoske has a diameter of 19.5 km and an absolute magnitude of 11.15. *MPO Canopus* was used for calibration and lightcurve analysis. The phased lightcurve resulted in a rotation period of 17.411 ± 0.004 h and 0.10 ± 0.02 mag amplitude.

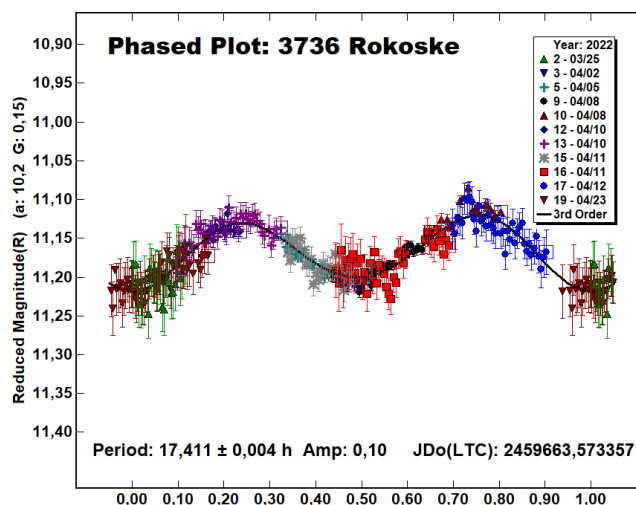
3736 Rokoske was first discovered in 1987 by Edward Bowell in Flagstaff, AZ (LCDB; Warner et al., 2009). It is a main-belt asteroid with a semi-major axis of 3.02 AU, eccentricity of 0.08, inclination of 11.30° , orbital period of 5.3 years, a diameter of 19.5 km, and an absolute magnitude of 11.15. Following a search through the Asteroid Lightcurve Database, we discovered the rotation period is currently unknown. The present lightcurve analysis can provide insight into a possible rotation period for the asteroid.

Images were collected during 8 nights between 2022 Mar 25 and Apr 23. The University of Maryland observers used the iTelescope 21 located in Mayhill, New Mexico (MPC Code: H06) on Apr 1, Apr 4, Apr 7, Apr 9, and Apr 23. The Planewave 17” CDK telescope has a focal length of 1940 mm, and an aperture of 431 mm. The FLI-PL6303E CCD camera used has a pixel size of $9 \mu\text{m}$ square, array of 3072×2048 pixels, and a resolution of 0.96 arcsec/pix. The luminance filter was used for all observations.

Galdies observed from the Znith Observatory in Malta on Mar 25 and Apr 23 using a 203-mm SCT telescope with a Moravian G2-1600 CCD camera at 1×1 binning and a luminance filter.

Marchini and Papini observed from the Astronomical Observatory of the University of Siena (MPC Code: K54). Observations were made on Apr 10, Apr 11, and Apr 12 with a 0.30-m f/5.6 Maksutov-Cassegrain telescope, SBIG STL-6303 NABG CCD camera, and Clear filter at 2×2 binning.

Lightcurve analysis was done with *MPO Canopus* (version 10.7.12.0; Warner 2019). Raw lightcurves were made for each night and, in the case of a meridian flip of the telescope, independent lightcurves were created for before and after the flip. Raw lightcurves were phased to numerous test periods with data from all three telescopes. Analysis of the resulting phased lightcurve shows that asteroid 3736 Rokoske has a typical lightcurve with two peaks and two troughs. The derived rotation period is 17.411 ± 0.004 h with an amplitude of 0.10 ± 0.02 mag.



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Number	Name	yyyy mm/dd	Phase	L _{PAB}	B _{PAB}	Period(h)	P.E.	Amp	A.E.	Grp
3736	Rokoske	2022 3/25-4/23	10.2, 5.3	208.7	12.3	17.411	0.004	0.10	0.02	MB

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. L_{PAB} and B_{PAB} 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).