

ROTATION PERIOD DETERMINATION FOR ASTEROID 849 ARA

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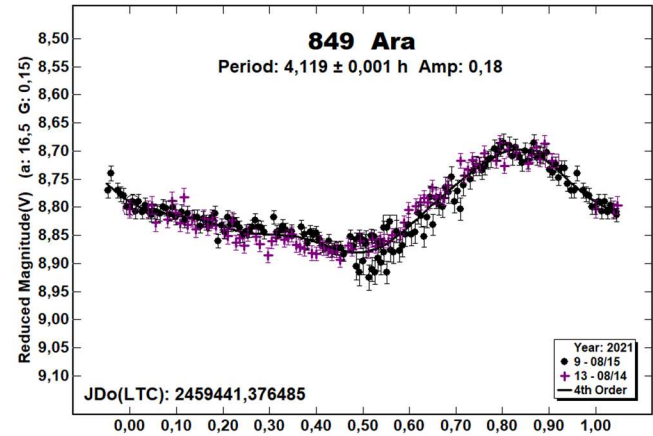
Photometric observations of the main-belt asteroid 849 Ara were conducted from the NOAK Observatory, in Greece in order to determine its synodic rotation periods. The results are: $P = 4.119 \pm 0.001$ h, $A = 0.18$ mag.

Asteroid 849 Ara (A915 UB) was discovered by Russian astronomer Sergey Belyavsky on February 09, 1912 at the Simeis Observatory on the Crimean Peninsula. It is an outer main-belt asteroid with a semi-major axis of 3.147 AU, eccentricity 0.201, inclination 19.523° and an orbital period of 5.58 years. Its absolute magnitude is $H = 8.2$ (MPO473773).

We report observations of 849 Ara performed at the NOAK Observatory, Ioannina Greece (MPC-International Astronomical Union code L02), using a 0.25m Newtonian Skywatcher optical tube operating at $f/4.7$. The optical tube is mounted on NEQ6 Skywatcher robotic mount and equipped with ATIK 460exm CCD camera. It is a high Quantum Efficiency CCD. No filters were used for better signal-to-noise. Exposure time for all images was 2 minutes. The images binned at 1×1 yielding an image scale of 0.78 arcsec/pixel and the field of view $35.77' \times 28.61'$. In these fields, the asteroid and five comparison stars were measured for differential photometry.

All images were reduced in the standard manner using nightly flatfield files as well as dark-current and bias images. Photometric measurements and lightcurve analysis were performed using *MPO Canopus* (version 10.8.1.1; Warner, 2019). The *Cartes Du Ciel* was used as the planetarium software with the most recent ephemerides downloaded from the Minor Planet Center and *Artemis Capture* was used for image capture.

The period analysis shows a solution for the rotational period of $P = 4.119 \pm 0.001$ h with an amplitude $A = 0.18 \pm 0.03$ mag, which is close to the previously published results in the asteroid lightcurve database 4.116 h (LCDB; Warner et al., 2009).



References

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Number	Name	yyyy mm/dd	Phase	L _{PAB}	B _{PAB}	Period(h)	P.E.	Amp	A.E.	Grp
849	Ara	2021 08/14-08/15	16.9,16.7	0.7	19.7	4.119	0.001	0.18	0.03	MB-O

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).