

LIGHTCURVES AND ROTATION PERIODS OF 209 DIDO, 268 ADOREA, 2732 WITT, AND 2836 SOBOLEV, WITH A NOTE ON 1402 ERI

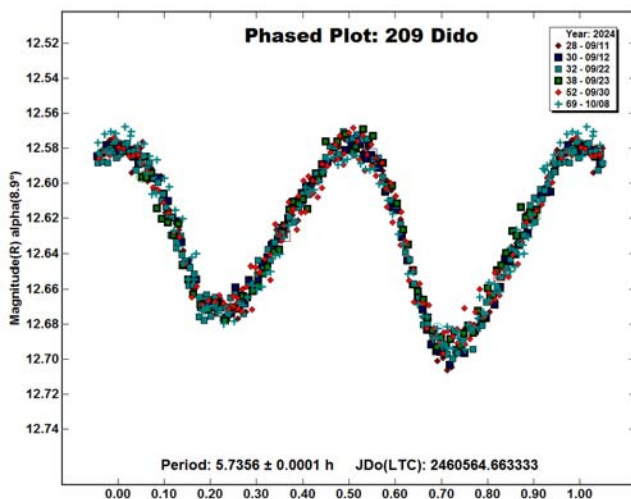
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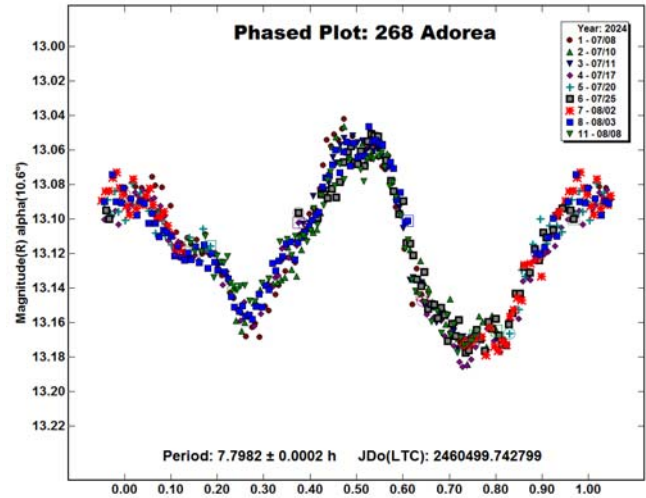
Synodic rotation periods and amplitudes are found for 209 Dido 5.7356 ± 0.0001 hours, 0.11 ± 0.01 magnitudes; 268 Adorea 7.7982 ± 0.0002 hours, 0.11 ± 0.01 magnitudes; 2732 Witt 12.6244 ± 0.0003 hours, 0.55 ± 0.03 magnitudes; and 2836 Sobolev 4.7548 ± 0.0001 hours, amplitude 0.75 ± 0.05 magnitudes. A 4-hour lightcurve of 1402 Eri showed no perceptible variation.

The new observations to produce the results reported in this paper were made at the Organ Mesa Observatory with a Meade 35-cm LX200 GPS Schmidt-Cassegrain, SBIG STL-1001E CCD, 60 second exposures for 209 Dido and 268 Adorea, and 120 second exposures for 1402 Eri, 2732 Witt, and 2836 Sobolev, unguided, clear filter. Image measurement and lightcurve construction were with *MPO Canopus* software with calibration star magnitudes for solar colored stars from the CMC15 catalog reduced to the Cousins R band. Zero-point adjustments of a few $\times 0.01$ magnitude were made for best fit. To reduce the number of data points on the lightcurves and make them easier to read, data points have been binned in sets of 3 with maximum time difference 5 minutes.

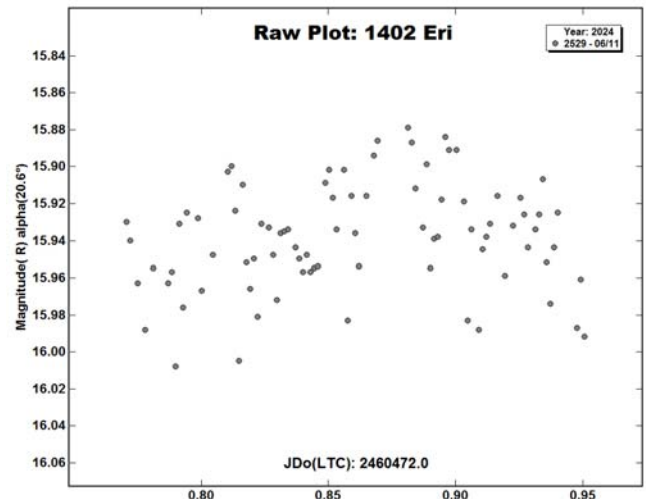
209 Dido. Eight previously published periods are listed in “The Asteroid Lightcurve Database” (Warner et al., 2009, updated 2023 October), seven of them in the range from 5.7351 hours to 5.745 hours. New observations on six nights 2024 Sept. 11 - Oct. 8 provide an excellent fit to an asymmetric bimodal lightcurve with period 5.7356 ± 0.0001 hours, amplitude 0.11 ± 0.01 magnitudes. The agreement with previously published periods is excellent.



268 Adorea. Previously published periods are by Tedesco (1979), 6.1 hours; Holliday (1995), 9.44 hours; Behrend (2005web), 15.595 hours; Stephens (2006), 7.8 hours; and Hawley (2023), 7.7952 hours. New observations on nine nights 2024 July 8 - Aug. 8 provide a good fit to an asymmetric bimodal lightcurve with period 7.7982 ± 0.0002 hours, amplitude 0.11 ± 0.01 magnitudes. This value is consistent with the periods published by Stephens (2006) and Hawley (2023). The earlier periods by Tedesco (1979), Holliday (1995) and Behrend (2005web) can now be rejected.



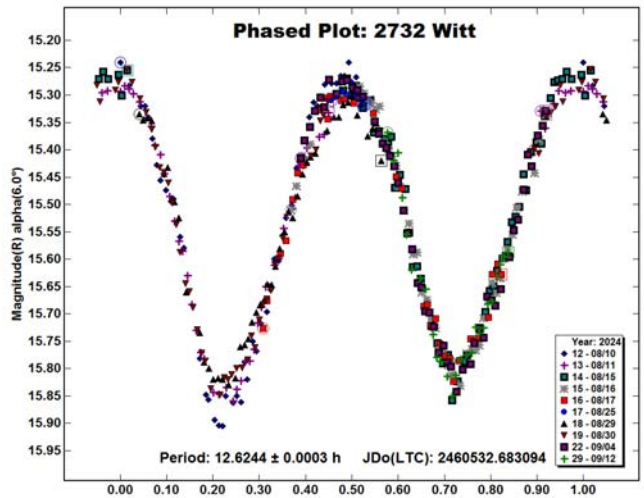
1402 Eri. This object is one of the faintest lower numbered minor planets, fainter than magnitude 17 at most oppositions. For this reason, no previous lightcurves have been published in the Lightcurve Database (Warner et al., 2009, updated 2023 October). At its 2024 opposition its magnitude brightened to 16. If the period had been short and the amplitude large, they could have been found with a 35-centimeter telescope. However, these parameters were not observed. A four-hour lightcurve on 2024 June 11 showed a 0.1 magnitude scatter of data points and variation of no more than 0.02 magnitudes. It was apparent that a reliable period could not be found with the available equipment, especially during the local cloudy/rainy season and at southerly declination. No more sessions were obtained.



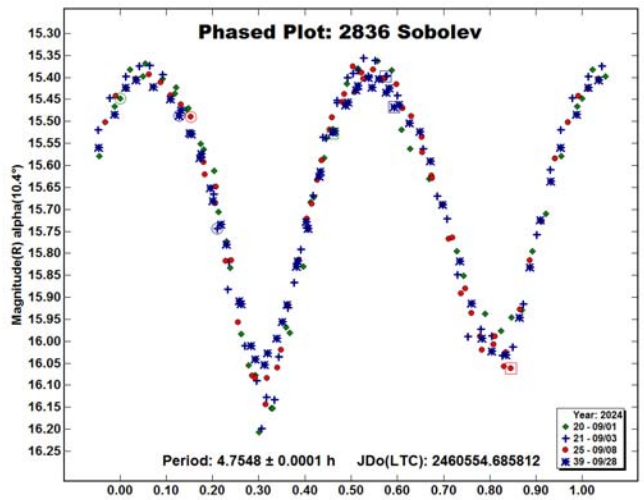
Number	Name	yyyy/mm/dd	Phase	LPAB	BPAB	Period(h)	P.E	Amp	A.E.
209	Dido	2024/09/11-2024/10/08	8.9 - 0.9	13	2	5.7356	0.0001	0.11	0.01
268	Adorea	2024/07/08-2024/08/08	10.5 - 0.5	317	-1	7.7982	0.0002	0.11	0.01
1402	Eri	2024/06/11-2024/06/11	20.6 - 20.5	302	8	---	---	---	---
2732	Witt	2024/08/10-2024/09/12	*6.0 - 7.9	331	-1	12.6244	0.0003	0.55	0.03
2836	Sobolev	2024/09/01-2024/09/28	10.4 - 1.6	4	3	4.7548	0.0001	0.70	0.05

Table I. Observing circumstances and results. The phase angle is given for the first and last date, unless a minimum (second value) was reached. LPAB and BPAB are the approximate phase angle bisector longitude and latitude at mid-date range (see Harris et al., 1984).

2732 Witt. The only previously published rotation period is by Behrend (2018web), 12.622 hours. New observations on ten nights 2024 Aug 10 - Sept. 12 provide a good fit to a period of 12.6244 ± 0.0003 hours, amplitude 0.55 ± 0.03 magnitudes. This value is in good agreement with Behrend (2018web).



2836 Sobolev. The Lightcurve Database (Warner et. al, 2009) lists no previously published lightcurves. However, Durech et al. (2016) present a sidereal period of 4.75483 hours based on lightcurve inversion of multiyear sparse data from the Lowell photometric database. New dense lightcurves on four nights 2024 Sept. 1-28 provide a good fit to a synodic period of 4.7548 ± 0.0001 hours, amplitude 0.75 ± 0.05 magnitudes. This value is in excellent agreement with Durech et al. (2016).



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