

ASTEROID LIGHTCURVE ANALYSIS AT THE VIA CAPOTE OBSERVATORY: 2ND QUARTER 2009

James W. Brinsfield
Via Capote Observatory
5180 Via Capote, Thousand Oaks CA 91320
jbrinsfi@gmail.com

(Received: 2009 Jun 28)

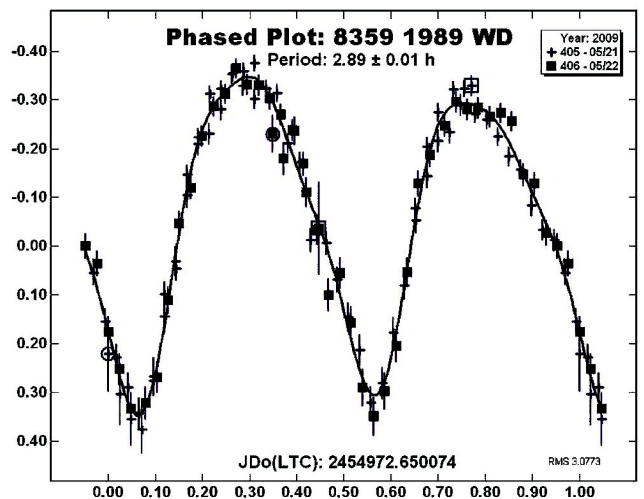
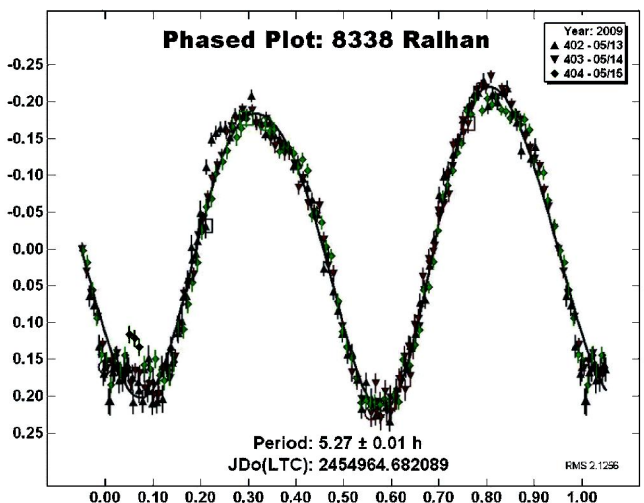
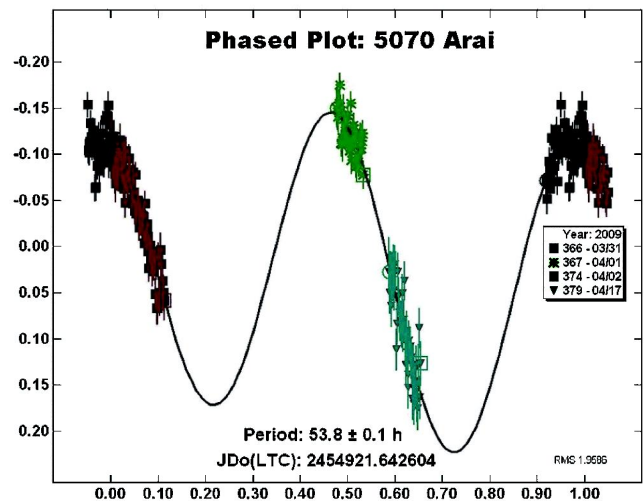
Three asteroids were observed and lightcurves were measured at the Via Capote Observatory from 2009 March through May. The resulting periods were: 5070 Arai (>48 h), 8338 Ralhan (5.27 h), and (8359) 1989 WD (2.89 h).

Observations of three minor planets were made using a Meade LX200 0.35-m Schmidt-Cassegrain (SCT) working at f/10. The CCD imager was an Alta U6 with a 1024x1024 array of 24-micron pixels. All observations were made unfiltered at 1x binning yielding an image scale of 1.44" per pixel and were dark and flat field corrected. Images were measured using *MPO Canopus* (Bdw Publishing) and differential photometry. The data were light-time corrected. Period analysis was also done with *Canopus*, incorporating the Fourier analysis algorithm developed by Harris (1989). Most target selections were made using the Collaborative Asteroid Lightcurve Link (CALL) web-site and "Lightcurve Opportunities" articles from the Minor Planet Bulletin. Priority was given to asteroids that did not have a published rotational period.

The results are summarized in the table below and include average phase angle information across the observational period. Where three numbers are indicated for phase angle, measurements of the target occurred over opposition. The middle value is the minimum phase angle observed and the two end values are the phase angles at the beginning and end of the observing campaign. Individual lightcurve plots along with additional comments, as required, are also presented. None of the three targets studied during the reporting period had published lightcurves. 5070 Arai was not fully characterized due to the limiting magnitude of the local sky conditions and hardware limitations. Phasing the data to the half period would suggest a period of greater than 48 hours and the data best fit a curve of 53.8 hours. The estimated magnitude of the curve exceeds 0.29.

References

Harris, A.W., Young, J.W., Bowell, E., Martin, L.J., Millis, R.L., Poutanen, M., Scaltriti, F., Zappala, V., Schober, H.J., Debehogne, H., and Zeigler, K.W. (1989). "Photoelectric Observations of Asteroids 3, 24, 60, 261, and 863." *Icarus* 77, 171-186.



#	Name	Date (mm/dd) 2009	Data Points	Phase	L _{PAB}	B _{PAB}	Per(h)	PE	Amp(m)	AE
5070	Arai	03/31-04/17	218	12	168	-2	> 48	0.1	>0.29	
8338	Ralhan	05/13-01/15	331	7	229	8	5.27	0.01	0.44	0.02
(8359)	1989 WD	05/21-05/22	107	16	212	4	2.89	0.01	0.7	0.02

THE LIGHTCURVES OF 1146 BIARMIA AND 5598 CARLMURRAY

Russell I. Durkee
Shed of Science Observatory
5213 Washburn Ave. S. Minneapolis, MN, USA
shedofscience@earthlink.net

(Received: 2009 Jul 7)

The lightcurves of asteroids 1146 Biarmia and 5598 Carlmurray were measured during the first half of 2009. 1146 Biarmia was found to have a synodic rotation period of 5.4700 ± 0.0002 h with an amplitude of 0.20 ± 0.02 mag. 5598 Carlmurray was found to have a synodic rotation period of 2.9226 ± 0.0002 h and an amplitude of 0.32 ± 0.03 mag.

Observations of asteroid 1146 Biarmia and 5598 Carlmurray were made in 2009 at the Shed of Science Observatory with a 0.35-m Schmidt-Cassegrain (SCT) operating at f/8.5 using an SBIG ST10XE and Celestron UHC light pollution filter. Images for 1146 Biarmia were binned 2x2, producing a scale of 0.94 arcsec/pixel. Images of 5598 Carlmurray were binned 3x3, resulting in an image scale of 1.41 arcsec/pixel.

1146 Biarmia. This asteroid was observed over seven nights in 2009 June. It was previously observed by Warner (2000), who reported a period of 11.514 h based on two night's data. Our data provided significantly more coverage. Initial measurements supported the longer period, but as double coverage of the lightcurve was obtained for its lower amplitude portions, the shorter solution of $P = 5.4700 \pm 0.0002$ h became dominant and was adopted. The period spectrum covering both periods is shown below. The solution is rated as $U = 3$ (see Warner et al., 2009, for the definition of the U rating).

5598 Carlmurray. This asteroid was initially selected for observation as part of the Photometric Survey for Asynchronous Binary Asteroids by Petr Pravec (Pravec et al., 2006). It was observed over three nights in 2009 January. The derived period of $P = 2.9226 \pm 0.0002$ h is unique and rated as $U = 3$ (Pravec, 2009).

Acknowledgements

Thanks to Brian Warner and Petr Pravec for their assistance in the analysis of 1146 Biarmia, and 5598 Carlmurray, respectively. Funding for observations at The Shed of Science is supported in part by a Gene Shoemaker NEO grant from the Planetary Society.

References

Pravec, P., Scheirich, P., Kušnirák, P., Šarounová, L., and 53 co-authors (2006). "Photometric Survey of Binary Near-Earth Asteroids." *Icarus* **181**, 63-93.

Pravec, P. (2009). "Prepublished Periods of Asteroids." <http://www.asu.cas.cz/~ppravec/newres.htm>

Warner, B.D. (2000). "Asteroid Photometry at the Palmer Divide Observatory." *Minor Planet Bul.* **27**, 4-6.

Warner, B.D., Harris, A.W., Pravec, P. (2009). "The asteroid lightcurve database." *Icarus* **202**, 134-146.

