

LIGHTCURVE ANALYSIS OF ASTEROIDS FROM KINGSGROVE AND OTHER COLLABORATING OBSERVATORIES IN THE FIRST HALF OF 2007

Julian Oey
Kingsgrove Observatory (E19)
23 Monaro Ave.
Kingsgrove, NSW 2208 AUSTRALIA
julianoey1@optusnet.com.au

Ric Krajewski
Dark Rosanne observatory
Middlefield, CT USA 06455

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Several asteroids were observed from Kingsgrove and other collaborating observatories during the first half of 2007. The synodic periods derived were: 162 Laurentia, 11.8686 ± 0.0004 h; 178 Belisana, 12.321 ± 0.002 h or 24.6510 ± 0.0003 h; 913 Otila, 4.8720 ± 0.0002 h; 1626 Sadeya, 3.4200 ± 0.0006 h; 2275 Cuitlahuac, 6.2892 ± 0.0002 h; and 2006 VV2, 2.43 ± 0.03 h;

The location and instruments used for both Kingsgrove and Leura observatories have been previously documented in Oey et al. (2007) and Oey (2007) respectively. Dark Rosanne observatory is located at Middlefield, CT, USA. The telescope used was a Schmidt-Newtonian 8" telescope mounted on a Meade equatorial platform. It was operating at f/4 when coupled with a Meade DSI Pro CCD camera. With its 9.6x7.5 micron pixel size, the camera provided a field of view of 20"x15" at 2.2"/pixel.

All images were taken with clear filter. Period analysis was done using MPO Canopus and all data was light time corrected. Targets 2275 Cuitlahuac and 2006 VV2 and were provided from the Photometric Survey of Asynchronous Binary Asteroids in Pravec (2006) whereas 162 Laurentia, 178 Belisana, 913 Otila, 1626 Sadeya and were selected from the list of Potential Lightcurve Targets in the CALL website managed by Warner (2007). Aspects of the minor planets are summarized in the table below. Additional comments if any are discussed separately. No previous photometric studies were done on 2275 Cuitlahuac or 2006 VV2.

162 Laurentia. The period was previously determined to be 11.87 ± 0.02 h by J. Piironen et al. (1994) who called for further observations to determine its spin axis. Recent observations done on this asteroid by Behrend et al. (2007) showed a period of

11.880 ± 0.004 h with an amplitude of about 0.33 mag. After posting a note on the CALL site, Oey was contacted by Krajewski who offered to collaborate in an effort to obtain an accurate period determination. Since the period was initially shown to be close to commensurate with 24 hr, observer from different longitudes can more quickly resolve any aliases by effectively extending runs made on the same day. This helps avoid half-period ambiguities if the curve happens to be nearly symmetrical. The synodic period was determined to be 11.8686 ± 0.0004 h with an amplitude of 0.40 ± 0.05 m, agreeing well with the previous results.

178 Belisana. The lightcurve data were collected over a time span of more than two months and showed a synodic period of 12.321 ± 0.002 h and amplitude of 0.10 ± 0.03 m, in perfect agreement with the previously published data by Harris et al. (1992). However there was also another possible solution of 24.6510 ± 0.0003 h. The uncertainty arose from the issue with aliases compounded with the relatively short lengths of each session. Collaboration with observers from another continent will be needed to resolve the ambiguity.

2006 VV2. The lightcurve for 2006 VV2 was obtained during its recent close approach. Data were taken over five hours and all segments were internally linked to a fixed reference. The zero-point was obtained in a photometric sky several nights later.

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#	Name	Obs	Date Range (mm/dd) 2007	Period (h)	Amp (mag)	Phase	LPAB	BPAB
162	Laurentia	1,3	03/22-04/21	11.8686 ± 0.0004	0.40 ± 0.05	2.3,13.0	181	4.0
178	Belisana	1	04/28-07/04	12.321 ± 0.002 or 24.6510 ± 0.0003	0.10 ± 0.03 or 0.13 ± 0.03	14.0,16.7	246	-0.5
913	Otila	1,2	04/20-05/30	4.8720 ± 0.0002	0.20 ± 0.03	19.2,4.8	240	5.0
1388	Aphrodite	1	04/28-06/23	11.9432 ± 0.0004	0.65 ± 0.10	7.7,13.2	237	-1.0
1626	Sadeya	1	01/26-01/30	3.4200 ± 0.0006	0.20 ± 0.04	15.1,14.5	136	-22.0
2275	Cuitlahuac	2	06/20-06/30	6.2892 ± 0.0002	1.05 ± 0.04	17.9,14.0	297	9.0
2006	VV2	1	04/04	2.43 ± 0.03	0.20 ± 0.04	36.8	186	-18.5

1. Julian Oey, Kingsgrove Observatory. 2. Julian Oey, Leura Observatory. 3. Ric Krajewski, Dark Rosanne Observatory.

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