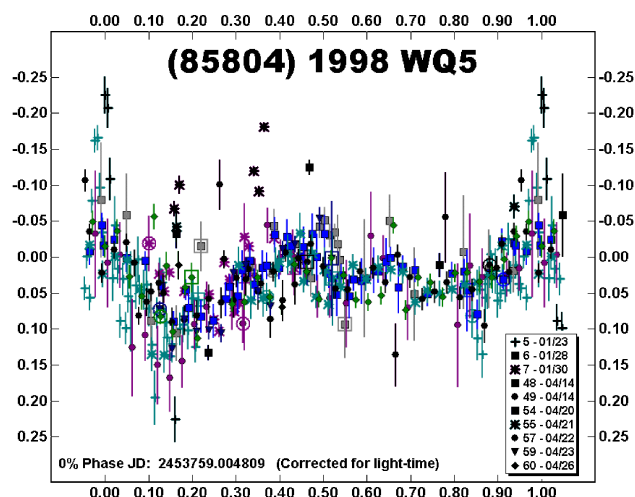




THE LIGHTCURVE OF HUNGARIA ASTEROID 6384 KERVIN

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Hungaria asteroid 6384 Kervin is found to have a synodic lightcurve period of 3.6203 ± 0.0003 hr and amplitude 0.10 ± 0.02 mag. The period and size are such that the asteroid was a binary candidate. No signs of mutual events were seen; however, initial runs showed slight, but eventually unsubstantiated, indications of a secondary period. Observations at other viewing aspects are encouraged to rule out a binary nature completely.

Initial observations of 6384 Kervin were made by Warner in late March and early April 2006. The data were somewhat noisy despite exposures of up to five minutes using a 0.5m telescope. Qualitatively, the asteroid was fainter than predicted by the H and G values listed in the MPCORB file (MPC 2006), possibly by up to a full magnitude. Calibrated images were not taken to establish an accurate estimate of the difference between observed and computed magnitudes.

The data from the earliest runs were sent to Pravec, who found indications of a secondary period, indicating the possibility of a binary nature with the second period representing the rotation of the satellite. No signs of mutual events, i.e., eclipses or occultations were seen. Additional observations after the full moon by both Warner and Pray almost certainly excluded any

secondary period. Checks were made to assure that the effects were not due to field stars and/or bad flat frames, so the cause of the deviations in the early data remain unexplained.

Table I shows the equipment used by Warner and Pray. The 0.35m at the PDO was used once, on March 31. Pray observed exclusively on April 27-30.

Observer	Scope / Camera
Warner	0.35m / ST-9E
	0.50m / FLI-1001E
Pray	0.36m / ST-10XME

Table I. Observer and equipment details.

Fourier analysis of the data found the synodic rotation period to be 3.6203 ± 0.0003 hr and a lightcurve amplitude of 0.10 ± 0.02 mag.

Date	Phase	L_{PAB}	B_{PAB}
2006 March 31	21.8	218.3	27.3
2006 April 30	15.4	219.4	24.4

Table II. The phase and Phase Angle Bisector values for the extreme dates of observations for 6384 Kervin.

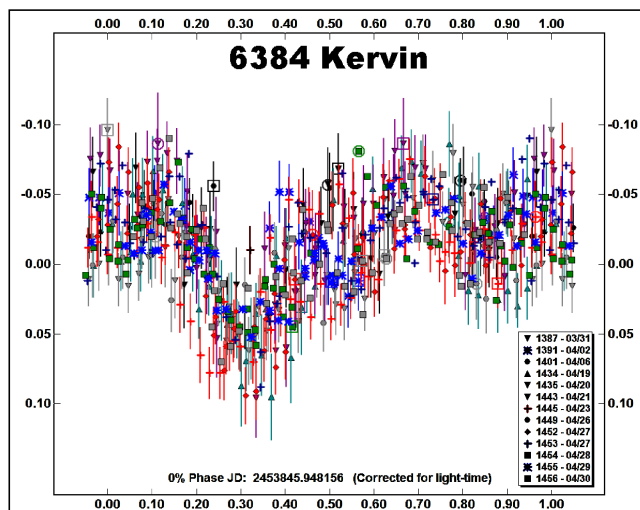


Figure 1. The lightcurve of 6384 Kervin phased to 3.6203hr.

Priority should be given to this asteroid around the next opposition, late December 2007, when the asteroid will be at mag 14.8 and $+36^\circ$ declination. At that time, the PAB longitude will differ by about 130° from the 2006 apparition.

Acknowledgements

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ASTEROID LIGHTCURVE PHOTOMETRY FROM SANTANA AND GMARS OBSERVATORIES – WINTER AND SPRING 2006

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Lightcurve period and amplitude results from Santana and GMARS Observatories are reported for 2006 January-June.

58 Concordia (9.895 ± 0.002 hr and 0.10 mag.),
268 Adorea (7.800 ± 0.002 hr and 0.16 mag.),
293 Brasilia (8.17 ± 0.01 hr and 0.20 mag.),
(6185) 1997 YD (21.05 ± 0.01 hr and 0.34 mag.),
(19204) 1992 ME (3.17 ± 0.01 hr and 0.04 mag.)

The author operates telescopes at two observatories. Santana Observatory (MPC Code 646) is located in Rancho Cucamonga, California at an elevation of 400 meters and contains a Meade 0.3m RCX400 telescope. GMARS (Goat Mountain Astronomical Research Station, MPC G79) is located at the Riverside Astronomical Society's observing site at an elevation of 879 meters and contains several observatories. The author's observatory contains a Celestron 0.35m mounted on a Paramount from Software Bisque. All observations were obtained with an SBIG ST1001 CCD camera. Further details of the equipment used can be found at the author's web site (<http://members.dslextrême.com/users/rstephens/>). The images were measured and period analysis were done using the software program MPO Canopus which uses differential aperture photometry to determine the values used for analysis.

Results

The results are summarized in the table below. Column 2 gives the dates over which the observations were made, Column 3 gives the number of actual runs made during that time span and column 4 gives the number of observations used. Column 5 is the range of phase angles over the full data range. If there are three values in the column, this means the phase angle reached a minimum with the middle valued being the minimum. Columns 6 and 7 give the range of values for the Phase Angle Bisector (PAB) longitude and latitude respectively. Column 8 gives the period and column 9 gives the error in hours. Columns 10 and 11 give the amplitude and error in magnitudes.

58 Concordia. This asteroid was previously observed by Gill-Hutton (Gill-Hutton 1993) who could not determine a period but

estimated it to be longer than 16 hours. X. Wang (Wang 2002) also reported a period of 9.90 hours, in good agreement with the current data.

268 Adorea. Holliday (1995) previously reported a period of 9.44 hours while Tedesco (1979) reported at period of 6.1 hours. Behrend (2006) reported a period of 15.595 hours resulting in a four extrema light curve. All of these periods were tested with the 2006 data and did not yield a reasonable fit. The 7.80 period is in agreement with the preferred period listed on the known lightcurve periods maintained by Harris and Warner (Harris 2006).

293 Brasilia. Observations were initially obtained with Santana's 0.3m telescope in suburban city skies. When adequate signal to noise could not be obtained, additional observations were acquired with the 0.35m telescope at GMARS under dark desert skies.

(6185) 1987 YD. This asteroid was selected as part of the Survey of Asynchronous Binary Asteroids (Pravec 2005). After four sessions it was apparent that the asteroid was not a binary candidate. Further observations could not be obtained due to the winter weather.

(19204) 1992 ME. This asteroid was also selected as part of the Survey of Asynchronous Binary Asteroids. Its amplitude was very low and it moved into crowded star fields. Observations were halted when it was felt that any potential binary nature could not be resolved. The period of 3.17 hours is a best fit, but the substantial noise and scatter reduces confidence in this solution.

Acknowledgements

Thanks are given to Dr. Alan Harris of the Space Science Institute, Boulder, CO, and Dr. Petr Pravec of the Astronomical Institute, Czech Republic, for their ongoing support of all amateur asteroid research. Also, thanks to Brian Warner for his continuing work and enhancements to the software program "Canopus" which makes it possible for amateur astronomers to analyze and collaborate on asteroid rotational period projects and for maintaining the CALL Web site which helps coordinate collaborative projects between amateur astronomers.

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Asteroid	Dates	Sess	Obs	Phase	L _{PAB}	B _{PAB}	Per (h)	PE	Amp	AE
58 Concordia	2006 02/04 - 13	4	916	1.7, 3.9	132.8	-3.0, -2.9	9.895	0.002	0.10	0.04
268 Adorea	2006 02/23 - 03/02	3	857	0.7, 3.3	153.6	1.6, 1.7	7.80	0.02	0.16	0.03
293 Brasilia	2006 04/18 - 05/01	5	704	8.7, 3.8	226.8	6.5, 5.6	8.17	0.01	0.20	0.03
(6185) 1997 YD	2006 01/21 - 23	4	273	7.9, 7.6	124.4	11.3, 11.4	21.05	0.01	0.34	0.02
(19204) 1992 ME	2006 05/20 - 06/04	4	392	25.2, 22.6	253.1	31.6, 29.4	3.17	0.01	0.04	0.03