

LIGHTCURVE ANALYSIS OF ASTEROIDS OBSERVED AT THE OAKLEY SOUTHERN SKY OBSERVATORY: 2015 DECEMBER – 2016 APRIL

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From 2015 December 12 to 2016 April 16, CCD images were taken with the goal of analyzing the photometric data on twenty-five asteroids: 507 Laodica, 1311 Knopfia, 1363 Herberta, 1454 Kalevala, 1480 Aunus, 1597 Laugier, 1714 Sy, 1791 Patsayev, 1911 Schubart, 2087 Kochera, 2179 Platzek, 2660 Wasserman, 2828 Iku-Turso, 2854 Rawson, 3228 Pire, 3606 Pohjola, 3669 Vertinskij, 3812 Lidaksum, 3829 Gunma, 3840 Mimistrobell, 4640 Hara, 7016 Conandoye, 8045 Kamiyama, (12551) 1998 QQ39, and (13388) 1999 AE6.

Lightcurve analysis was performed using images taken at the Oakley Southern Sky Observatory in New South Wales, Australia. The images were taken on the nights of 2015 December 12-19, 2016 February 05, 08-17, and 28-29, 2016 March 01-04 and 27-31, 2016 April 01-05, 06-07, and 09-16.

The telescope used to obtain the images was a 0.5-meter $f/6.71$ Planewave with a STX-16803 CCD camera, binned 3x3, using a luminance filter. The telescope operated at a plate scale of 1.63 arcseconds per pixel. The images were calibrated using *Maxim DL* software. *MPO Canopus* was used to measure the images, do Fourier analysis, and produce the lightcurves.

Table I lists the asteroids that were observed as well as the results of analysis, the number of data points in the analysis, and the exposure for each asteroid. If no result is given, the period could not be determined due to excessive noise or an insufficient data set.

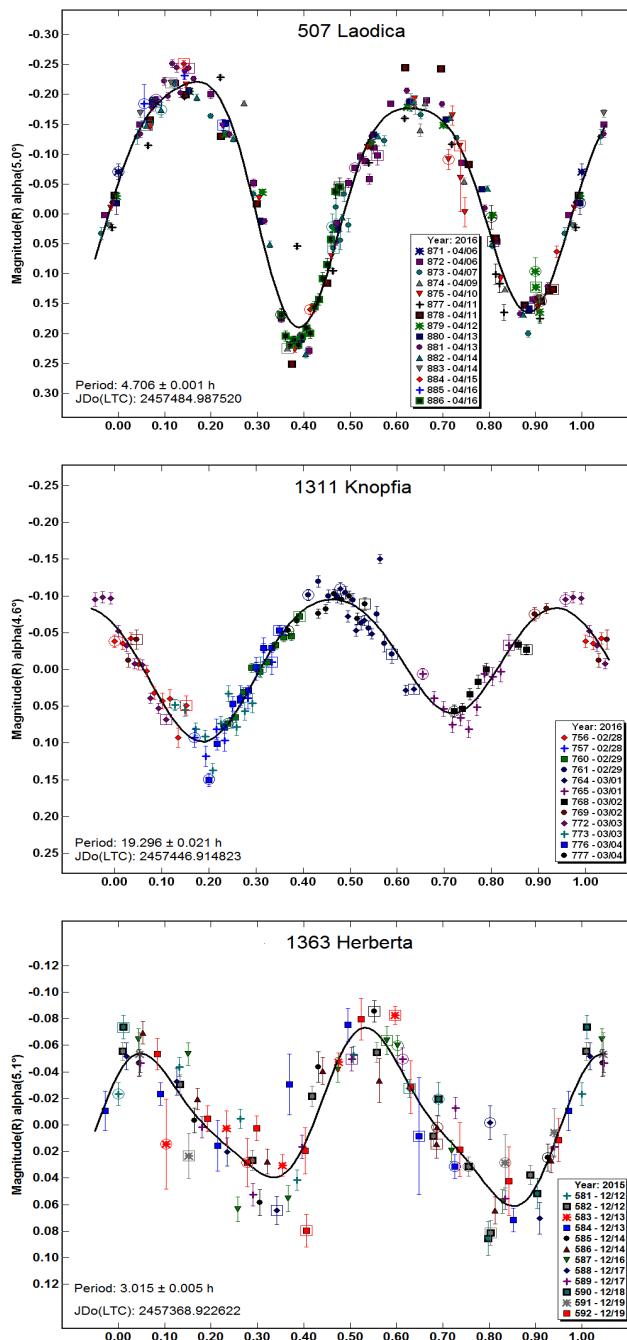
Our period of 4.706 ± 0.001 h for 507 Laodica differs from the previously reported 6.737 ± 0.001 h (Warner, 2011). When the previous period was used with the recent data, there was no recognizable pattern. Our period of 19.296 ± 0.021 h for 1311 Knopfia differs from the previously published period of 9.65 ± 0.09 h (Clark, 2010). When we tried to fit our data to 9.65 h, there was no recognizable pattern. It is important to note that the period found here is double the previously reported value. There were no entries in the asteroid lightcurve database (LCDB; Warner *et al.*, 2009) for the remaining asteroids reported here.

References

Clark, M. (2010). "Asteroid Lightcurves from the Chiro Observatory." *Minor Planet Bulletin* **37**, 89-92.

Warner, B.D., Harris, A.W., Pravec, P. (2009). "The Asteroid Lightcurve Database." *Icarus* **202**, 134-146. Updated 2016 Feb. <http://www.minorplanet.info/lightcurvedatabase.html>

Warner, B.D. (2011). "Upon Further Review: VI. An Examination of Previous Lightcurve Analysis from the Palmer Divide Observatory." *Minor Planet Bulletin* **38**, 96-101.



Number	Name	Dates (2016/MM/DD)	Period (h)	P.E. (h)	Amp (mag)	A. E. (mag)	Data Points	Exp (sec)
507	Laodica	04/6-7, 04/9-16	4.706	0.001	0.41	0.04	184	75
1311	Knopfia	02/28-29, 03/01-04	19.296	0.021	0.19	0.04	112	180
1363	Herberta	2015/12/12-19	3.015	0.005	0.12	0.02	86	210
1454	Kalevala	02/28-29, 03/01-04	—	—	0.37	0.02	96	120
1480	Aunus	2015/12/12-19	4.646	0.002	0.19	0.02	56	180
1597	Laugier	02/28-29, 03/01-04	8.020	0.005	0.68	0.04	124	180
1714	Sy	02/28-29, 03/01-04	—	—	0.03	0.03	143	180
1791	Patsayev	03/27-31, 04/1-5	19.809	0.013	0.28	0.03	202	150
1911	Schubart	04/6-7, 04/9-16	—	—	0.44	0.03	149	210
2087	Kochera	03/27-31, 04/1-5	6.109	0.002	0.37	0.04	165	210
2179	Platzeck	03/27-31, 04/1-5	5.995	0.002	0.24	0.04	137	180
2660	Wasserman	04/6-7, 04/9-16	—	—	0.08	0.08	109	210
2828	Iku-Turso	03/27-31, 04/1-5	—	—	0.60	0.02	159	210
2854	Rawson	02/05, 02/08-17	4.7755	0.0003	0.63	0.04	130	150
3228	Pire	02/05, 02/08-17	11.538	0.002	0.50	0.04	128	180
3606	Pohjola	2015/12/12-19	—	—	0.12	0.15	96	150
3669	Vertinskij	2015/12/12-19	—	—	0.86	0.04	93	210
3812	Lidaksum	02/05, 02/08-17	8.014	0.002	0.23	0.03	104	180
3829	Gunma	02/28-29, 03/01-04	4.720	0.002	0.22	0.05	142	120
3840	Mimistrobell	03/27-31, 04/1-5	—	—	0.05	0.03	141	150
4640	Hara	04/6-7, 04/9-16	3.534	0.002	0.18	0.05	128	210
7016	Conandoyle	02/05, 02/08-17	6.5427	0.0006	0.82	0.03	197	210
8045	Kamiyama	02/05, 02/08-17	—	—	0.07	0.02	147	180
12551	1998 QQ39	04/6-7, 04/9-16	11.202	0.002	0.95	0.05	139	210
13388	1999 AE6	2015/12/12-19	—	—	0.15	0.05	118	180

Table I. Observing dates and results for 25 asteroids.

