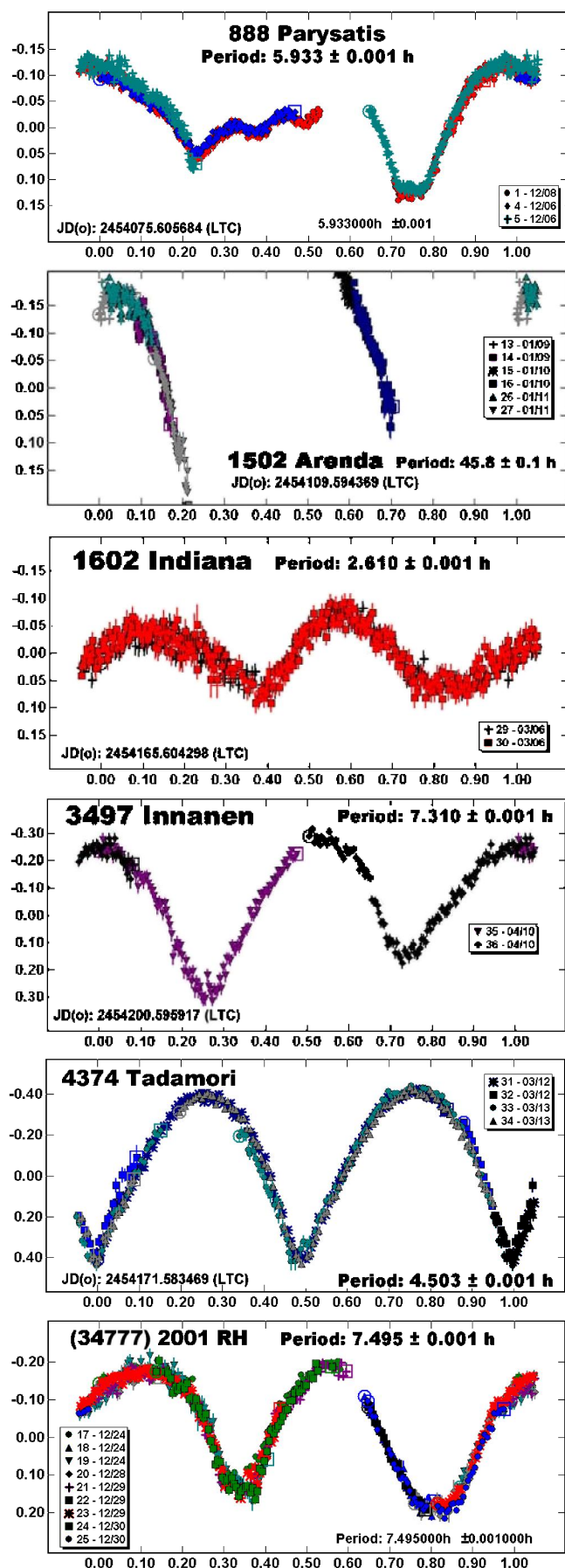




THE ROTATION PERIODS OF 242 KRIEMHILD AND 1094 SIBERIA

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Minor planet 242 Kriemhild was observed over nine nights in Jan and Feb 2007 and 1094 Siberia over eight nights in Dec 2006 and Jan 2007. The synodic period derived for the former was 4.5478 ± 0.0014 hr. The values for the latter were 21.15 ± 0.01 hr. The peak-to-peak amplitude of Kriemhild was 0.13 magnitudes, implying an axial ratio (a/b) of 1.13. For Siberia the magnitude variation was at least 0.45 implying a ratio (a/b) > 1.51 .

Minor planet 242 Kriemhild was discovered by J. Palisa at Vienna in 1884. This main-belt asteroid has a quoted diameter of 41.5 km and an albedo of 0.14 (Guide, 2002). Observations by Warner in 2004 yielded a rotation period of 4.543 ± 0.005 hr. (Warner, 2005). That lightcurve was somewhat noisy and in the latest rotational parameter list (Harris and Warner, 2006) it is assigned a quality value of only 2. Hence it was recently re-listed for observation (Warner et al, 2007).

Minor planet 1094 Siberia (1926 CB) was discovered in 1926 by S. Beljavskij. This inner main belt asteroid has a quoted diameter of 18.1 km and an albedo of 0.083 (Guide, 2002). The latest list of parameters (Harris & Warner, 2006) has no data for this asteroid.

Observations were conducted from four sites – three in Australia and one in New Zealand. All observations utilised unfiltered differential photometry and were light-time corrected. The aspect data (Tables I & 2) also shows the percentage of the lightcurves observed each night. Analysis was carried out using the “Peranso” software (Vanmunster, 2006), using various routines available including the “FALC” routine (based on Harris, et al, 1989).

242 Kriemhild: The final analysis determined a synodic period of 4.5478 ± 0.0014 hr, which was used to compile the composite lightcurve, with the arbitrary epoch of minimum at JD 2454120.078. The peak-to-peak variation in the lightcurve implies an axial ratio (a/b) of 1.13 if viewed at an equatorial aspect. Full phase coverage was achieved and this is considered a secure result. It confirms the result of Warner (2005). Kriemhild is thus a “fast rotator” for asteroids of this size (see Pravec et al, 2002).

1094 Siberia: Full phase coverage for this asteroid was not achieved and a period of 21.15 ± 0.01 hr was adopted as best fitting the available data. Other periods, including one close to 19 hr, cannot be entirely ruled out. The composite lightcurve has been compiled with an arbitrary epoch of maximum at JD 2454079.295. It appears that Siberia is a “slow rotator” for asteroids of this size (Pravec et al, 2002).

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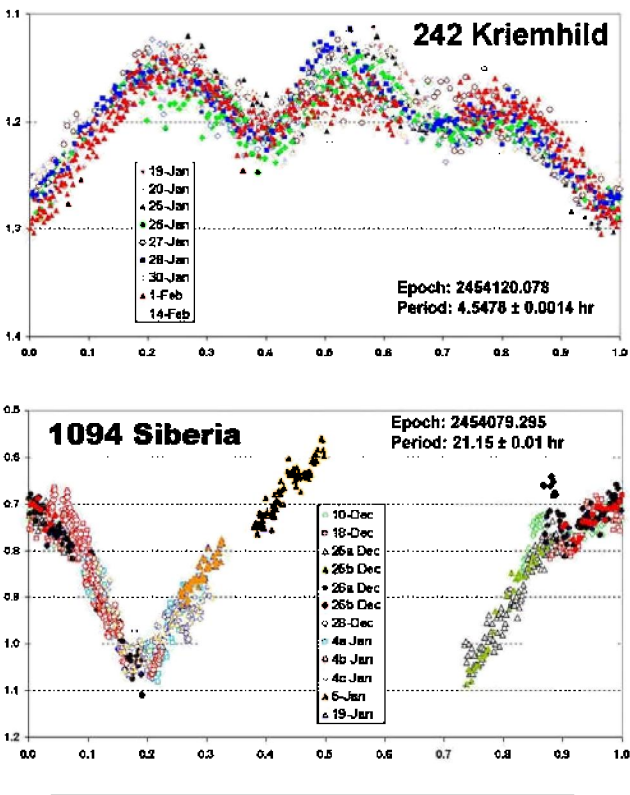
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Table I. Aspect data for Kriemhild in 2007.

UT Date	L _{PAB}	B _{PAB}	Phase Angle	%Phase Coverage
2007 Jan 19	136.2	-14.2	10.3	111
2007 Jan 20	136.3	-14.2	10.0	121
2007 Jan 25	136.4	-14.2	8.5	100
2007 Jan 26	136.4	-14.2	8.3	164
2007 Jan 27	136.5	-14.2	8.0	148
2007 Jan 28	136.5	-14.2	7.8	164
2007 Jan 30	136.5	-14.1	7.4	132
2007 Feb 01	136.6	-14.1	7.1	125
2007 Feb 14	136.8	-13.8	7.7	127

Table 2. Aspect data for Siberia in 2006/2007.

UT Date	L _{PAB}	B _{PAB}	Phase Angle	%Phase Coverage
2006 Dec 10	90.2	-17.2	11.5	22
2006 Dec 18	90.6	-16.9	9.7	27
2006 Dec 25	90.8	-16.5	9.4	29
2006 Dec 26	90.9	-16.5	9.4	29
2006 Dec 28	90.9	-16.3	9.7	10
2007 Jan 04	91.2	-15.8	11.1	28
2007 Jan 05	91.3	-15.7	11.4	25
2007 Jan 19	92.3	-14.3	15.9	16



LIGHTCURVES OF 25 PHOCEAE, 468 LINA, 482 PETRINA, 551 ORTRUD, 741 BOTOLPHIA, 834 BURNHAMIA, 2839 ANNETTE, AND 3411 DEBETENCOURT

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Lightcurves and synodic rotation period results for the following asteroids are presented: 25 Phocaea $P = 9.945 \pm 0.002$ hrs, $\Delta m \approx 0.03$ mag.; 468 Lina 16.33 ± 0.02 hrs, 0.15 mag; 482 Petrina 15.73 ± 0.02 hrs, 0.5 mag; 551 Ortrud 17.416 ± 0.002 hrs, 0.15 mag; 741 Botolphia 23.93 ± 0.02 hrs, $\Delta m \approx 0.15$ mag; 834 Burnhamia 13.875 ± 0.001 hrs, 0.2 mag; for 2839 Annette 10.4595 ± 0.0001 hrs, 0.65 mag; 3411 Debetencourt 9.93 ± 0.01 hrs, 0.35 mag. Slope parameters are also suggested for three of these asteroids.

Altimira Observatory is located in southern California, and is equipped with a 0.28-m Schmidt-Cassegrain telescope (Celestron NexStar-11 operating at F/6.3), and CCD imager (ST-8XE NABG, with Johnson-Cousins filters). Details of the equipment and instrument characterization are available at the author’s website (http://www.geocities.com/oca_bob).

Asteroid lightcurves were determined by differential photometry, generally using a two-color imaging sequence (e.g. VV-RR-etc.) throughout each night, although for the lightcurves in this paper,