

ASTEROID LIGHTCURVE PHOTOMETRY FROM SANTANA AND GMARS OBSERVATORIES – SEPTEMBER TO DECEMBER 2006

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Lightcurve period and amplitude results from Santana and GMARS Observatories are reported for 2006 September-December:

554 Peraga (13.71 ± 0.01 hr and 0.28 mag),
2215 Sichuan (3.975 ± 0.001 hr and 0.40 mag),
3279 Solon (8.10 ± 0.01 hr and 0.85 mag),
3773 Smithsonian (6.9804 ± 0.0001 hr and 1.04 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 observatories at GMARS contains a Celestron 0.35m mounted on a Paramount from Software Bisque and a Meade 0.35m RCX400 telescope. All observations were obtained with an SBIG ST1001 CCD camera with the image scale of approximately 2.2 arcseconds per pixel at Santana Observatory and 2.4 arcseconds per pixel at GMARS. Further details of the equipment used can be found at the author's web site:
<http://members.dslextrême.com/users/rstephens/>.

Unless otherwise noted, all observations were obtained from Santana Observatory. Most targets were chosen from the list of asteroid photometry opportunities published by Brian Warner and Alan Harris on the Collaborative Asteroid Lightcurve Link (CALL) website (Harris 2006). The images were measured and period analysis was done using the software program MPO Canopus which uses differential aperture photometry to determine the values used for analysis.

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 observations used. Column 4 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 5 and 6 give the range of values for the Phase Angle Bisector (PAB) longitude and latitude respectively. Column 7 gives the period and column 8 gives the error in hours. Columns 9 and 10 give the amplitude and error in magnitudes.

554 Peraga. This target was selected because of a request for lightcurve observations from Ellen Howell to support radar observations and IR spectroscopy. The results reported here are in agreement with those reported by Higgins et al. (2007).

3279 Solon. Observations were initially obtained with Santana's 0.3m telescope in suburban city skies. Shortly thereafter the target was added to the Binary Asteroid Survey. Additional observations were obtained from GMARS on November 25 and 26 using the Meade 0.35m RCX400.

3773 Smithsonian. Observations were initially obtained with Santana's 0.3m telescope in suburban city skies. Shortly thereafter the target was added to the Binary Asteroid Survey (Pravec 2005). Additional observations were obtained from GMARS on September 23 and 24 using the 0.35m Celestron.

Acknowledgements

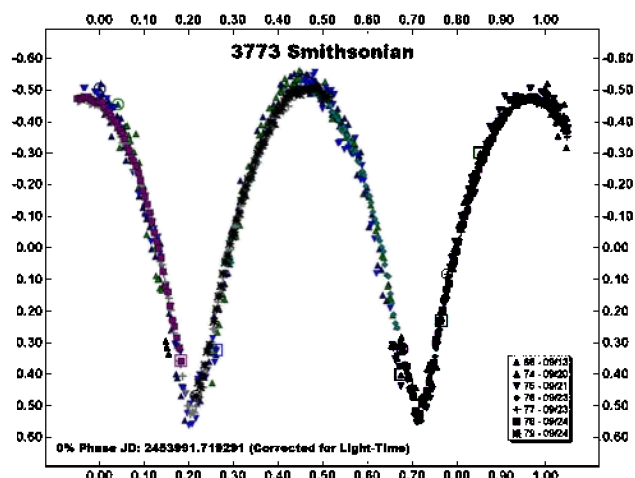
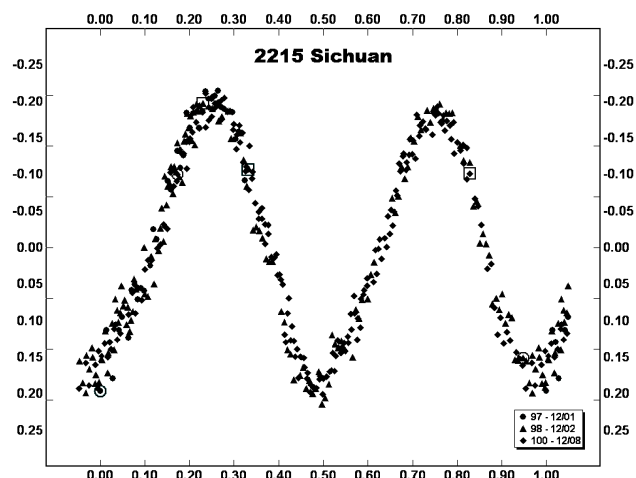
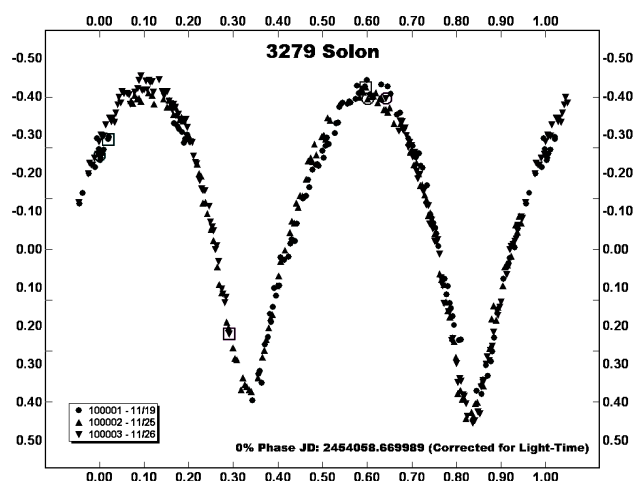
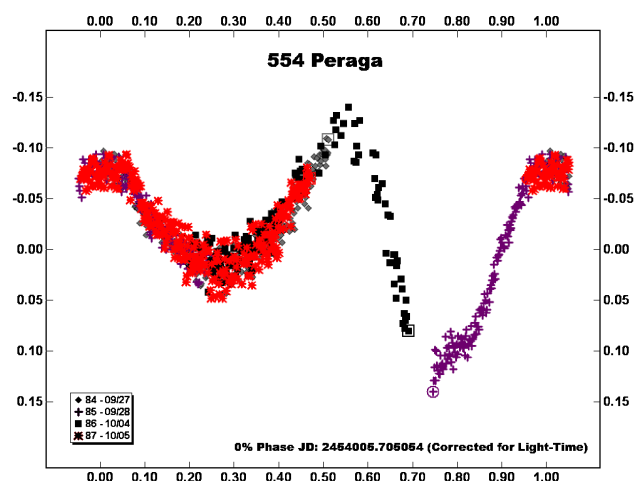
Thanks are given to Dr. Alan Harris of the Space Science Institute, Boulder, CO, and Dr. Petr Pravec of the Astronomical Institute, Czech Republic, for their ongoing support of all amateur asteroid. Also, thanks to Brian Warner for his continuing work and enhancements to the software program "Canopus" 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.

References

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Asteroid	Dates (2006)	Data Points	Phase	I_{PAB}	B_{PAB}	Per (h)	PE	Amp	AE
554 Peraga	09/27-10/05	1,005	13.4, 9.5	25.7, 26.4	4.1, 4.2	13.71	0.01	0.28	0.03
2215 Sichuan	12/01-08	395	1.4, 0.2, 2.6	71.1, 71.5	-0.2, 0.4	3.975	0.001	0.40	0.03
3279 Solon	11/19-26	398	2.2, 4.8	56.7, 57.1	-3.3, -3.4	8.10	0.01	0.85	0.03
3773 Smithsonian	09/13-24	1,112	10.2, 3.1	3.1, 4.4	-1.9	6.9804	0.0001	1.04	0.02

Table I: Observation Results



ASTEROID LIGHTCURVE ANALYSIS AT THE PALMER DIVIDE OBSERVATORY – SEPTEMBER-DECEMBER 2006

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Lightcurves for 25 asteroids were obtained at the Palmer Divide Observatory from late September through December 2006: 143 Adria, 469 Argentina, 595 Polixena, 880 Herba, 1515 Perrotin, 1756 Giacobini, 1920 Sarmiento, 2645 Daphne Plane, 2793 Valday, 4125 Lew Allen, 4142 Derzu-Uzala, 4690 Strasbourg, 4860 Gubbio, 6794 Masuisakura, (10171) 1995 EE8, 13025 Zurich, (15786) 1993 RS, 17681 Tweedledum, (24827) 1995 RA, (30019) 2000 DD, (31180) 1997 YX3, (31354) 1998 TR3, (32814) 1990 XZ, (34817) 2001 SE116, and 2006 WH1.

Observations of 25 asteroids were made at the Palmer Divide Observatory from June through September 2006. One of four

telescopes/camera combinations was used: 0.5m Ritchey-Chretien/FLI IMG-1001E, 0.35m SCT/FLI IMG-1001E, 0.35m SCT/ST-9E, or 0.35m SCT/STL-1001E. The scale for each was about 2.5 arcseconds/pixel. Exposure times were 60–240s. All but the 0.35m/FLI-1001E were guided. The operating temperature for the FLI and STL-1001E was -30°C . The ST-9E was run at -10°C .

All images were measured using MPO Canopus, which employs differential aperture photometry to determine the values used for analysis. Period analysis was also done with Canopus, incorporating the Fourier analysis algorithm developed by Harris (1989).

The results are summarized in the table below and individual plots are presented. The data and lightcurves are presented without comment except when warranted. Column 3 gives the full range of observation dates; column 4 gives the number of data points used in the analysis. Column 5 gives the range of phase angles. If there are three values in the column, the phase angle reached a minimum with the middle value being the minimum. Columns 6 and 7 give the range of values (or average if the range was relatively small) for the Phase Angle Bisector (PAB) longitude and latitude respectively. Columns 8 and 10 give the period and amplitude of the lightcurve while columns 9 and 11 give the respective errors in hour and magnitudes. An "(H)" follows the