

**ASTEROIDS OBSERVED FROM CS3:
2013 OCTOBER - DECEMBER**

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Results from CCD photometric observations are reported for eleven asteroids. These data were obtained from the Center for Solar System Studies (CS3) during 2013 October to December.

The Center for Solar System Studies (CS3, MPC U81) started operations in late 2012. Its participants have a history of studying asteroid families such as Jovian Trojans, Hungarias or NEOs. When program members of targeted families are not observable such as near the Full Moon, brighter alternative targets are selected to provide data for future shape model studies.

All images were made with a 0.4-m or 0.35-m SCT with a FLI-1001e or a SBIG STL-1001E CCD camera. They were unbinned with no filter and had Master flats and darks applied to the science frames prior to measurement. Measurements were made using MPO Canopus, which employs differential aperture photometry to produce the raw data. Period analysis was done using MPO Canopus, which incorporates the Fourier analysis algorithm (FALC) developed by Harris (1989). Night-to-night calibration of the data (generally $< \pm 0.05$ mag) was done using field stars converted to approximate Cousins R magnitudes based on 2MASS J-K colors (Warner 2007). The Comp Star Selector feature in MPO Canopus was used to limit the comparison stars to near solar color.

540 Rosamunde. This Flora-region asteroid has been well characterized over the years. Wisniewski (1997) observed Rosamunde on three nights in 1989 and obtained a period of 9.336 h. Behrend (2013) reported periods observed in 2005 and 2009 of 9.3495 h and 9.342 h. Kryszczyńska (2012) observed it over five apparitions reporting a synodic period of 9.351 h. Durech (2009) reported a shape model and a sidereal period of 9.34778 h. This synodic period of 9.351 h is in good agreement with those earlier findings.

567 Eleutheria. This asteroid has been observed a number of times. Pilcher (2010) observed it over five nights in April and May 2010 reporting a period of 7.718 h. Ruthroff (2010) also observed it on four nights in April 2010 reporting a period of 7.71 h. The results obtained on this opposition are in good agreement with those previously reported rotational periods.

607 Jenny. Brian Warner observed this asteroid in 2002 and 2007. His 2007 observations resulted in a rotational period of 8.524 h (Warner 2003). Upon re-measuring the 2002 images, he revised that rotational period to be 8.526 h (Warner 2011). Pierre Antonini (Behrend 2013) observed Jenny in 2007 finding a period of 8.5221 h. The period found this year is in good agreement with those results.

734 Benda. This asteroid was observed by Rene Roy for three nights in March 2004 (Behrend 2013) who reported the rotational period to be 7.11 h. Buchheim (2009) observed it on 10 nights in October 2007 reporting a period of 7.106 h. This result is in good agreement with those works.

804 Hispania. Hispania has been observed numerous times over the years. Harris and Young (Harris 1983) found a period of 14.851 h, Axel Martin (Behrend 2013) found a period of 14.844 h, and the author (Stephens 2004) found a period of 14.845 h. The rotational period found this year is in good agreement with those previous results.

989 Schwassmannia. Federico Manzini (Behrend 2013) observed this object on four nights in October 2004 reporting a period of 4.58 h. The scatter in the data was nearly the reported amplitude. At this opposition, each night of data was several hours long and showed no sign of an extrema. The asteroid could only be followed for a few nights, but the best fit of the data is to a period of 120.3 h. As a test, the half period was plotted which has a single modal period of 60.28 h.

1003 Lilofee. Rene Roy (Behrend 2013) observed Lilofee over three nights in February 2009 reporting a period of 8.255 h. This work is in good agreement with that finding.

1125 China. Menzies (2009) observed 1125 China for six nights in February 2009 reporting a period of 5.367 h. The lightcurve obtained at this opposition, although being for only a single night, is a close match to the previously reported period.

5489 Oberkochen. Caspari (2009) observed this asteroid over eight nights in August and September 2008 reporting a period of 5.6247 h. The period found at this opposition agrees with that result.

(6634) 1987 KB. Laurent Bernasconi (Behrend 2013) observed this asteroid on two nights in October 2002 reporting a period of 4.492 h. There was substantial scatter in the observations and the resulting phased lightcurve is asymmetric. The data observed at this opposition could not be phased to the 4.492 h period.

9950 ESA. Warner (2013) observed this Near Earth Object in August 2013 reporting a period of 6.712 h (private communication). In the 3 months between observational sets, the asteroid went from Phase Angle 56 to 6 and the L_{PAB} changed from 356 to 69. These two datasets are a good start towards an eventual

Number	Name	2013 (mm/dd)	Pts	Phase	L_{PAB}	B_{PAB}	Period	P.E.	Amp	A.E.
540	Rosamunde	09/21 - 09/27	358	21.4, 22.4	311	6	9.351	0.001	0.59	0.02
567	Eleutheria	11/16 - 11/17	539	6.4, 5.7	71	2	7.717	0.003	0.31	0.02
607	Jenny	12/12 - 12/15	506	4.4, 3.2	91	4	8.521	0.002	0.25	0.02
734	Benda	10/17 - 10/18	348	13.1, 12.8	58	5	7.110	0.003	0.32	0.02
804	Hispania	11/14 - 11/21	516	9.2, 8.1	64	19	14.899	0.002	0.08	0.02
989	Schwassmannia	09/19 - 09/27	776	18.1, 14.9	23	15	120.3	1	0.39	0.05
1003	Lilofee	10/16 - 10/18	433	10.5, 9.8	48	-2	8.250	0.001	0.54	0.02
1125	China	10/20 - 10/20	158	13.5	58	-2	5.45	0.02	0.62	0.03
5489	Oberkochen	12/12 - 12/15	456	5.4, 4	90	-5	5.628	0.002	0.51	0.02
6634	1987 KB	10/19 - 10/21	395	8.9, 9.4	18	11	5.333	0.003	0.23	0.02
9950	ESA	11/25 - 11/28	206	7.3, 4.4	69	4	6.707	0.002	0.44	0.02

shape model.

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