

A LIGHTCURVE OF 1090 SUMIDA

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We used the 0.36-m telescope of the Virtual Telescope Project to obtain three hours of photometry of the main-belt asteroid 1090 Sumida. The robotic telescope provided 120 sixty-second exposures.

Asteroid 1090 Sumida was discovered by Oikawa on 1928 Feb 20 and independently by Reinmouth four days earlier. Lightcurves were obtained by Behrend et al. (2004, 2015). Wisniewski (1991) determined a period of 2.70 h with amplitude of 0.22 magnitudes for Sumida. Behrend et al. (2004) obtained a rotation period of 2.7194 h and amplitude of 0.28 magnitudes. Warner and Megna (2012) obtained observations of Sumida from the Palmer Divide Observatory and the Center for Solar System Studies. The rapid spin period and 8 km size suggested Sumida could be a binary asteroid, but no secondary period was reported. The work of Warner and Megna (2012) suggested the possibility of discontinuities in the smoothly changing lightcurve of Sumida that could indicate a transit of a companion object and encouraged further observations of the object.

We selected Sumida for study because it was listed by Warner et al. (2015) as a good candidate for photometry in between January to March, 2015. Our major objective was to attempt a shape modeling of the object, and to obtain a very tightly spaced dataset with no observational gaps over the entire rotation period of the asteroid.

Our data were obtained on the night of 2015 Feb 18 with the Virtual Telescope operated by Gianluca Masi. The data consisted of 60-second exposures obtained over about 3 hours. The data were pre-processed using *IRAF* and the *IRAF Phot* package was used to measure instrumental magnitudes of Sumida and five comparison stars. We then took the average value of the magnitude difference between the asteroid and the comparison stars. The lightcurve of Sumida contributed for future modeling efforts for this object.

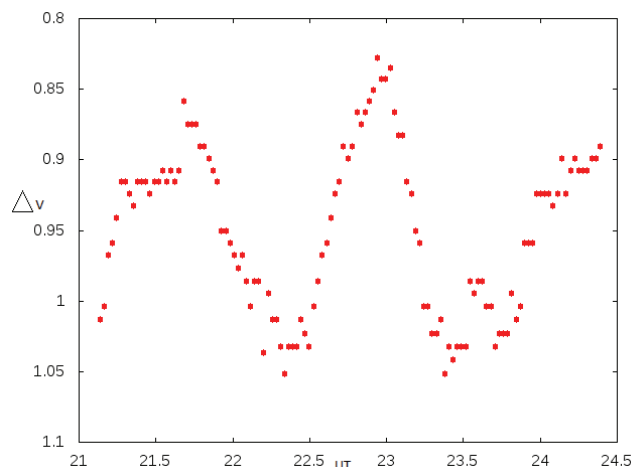
No formal period analysis was done. However, if assuming a bimodal lightcurve, the estimated period is 3.0 ± 0.3 h and the lightcurve amplitude 0.28 ± 0.03 mag.

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Number	Name	2015 mm/dd	Pts	Phase	L _{PAB}	B _{PAB}	Period (h)	P.E.	Amp	A.E.	Grp
1090	Sumida	02/18-02/18	120	7.4	158	4	3.0	0.3	0.28	0.03	PHO

Table I. Observing circumstances and results. Pts is the number of data points. The phase angle is given for the first and last date. L_{PAB} and B_{PAB} are the average phase angle bisector longitude and latitude (see Harris *et al.*, 1984). Grp is the asteroid family/group (Warner *et al.*, 2009). PHO: Phocaea.