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AN IMPROVED LIGHTCURVE AND ROTATION PERIOD OF 1178 IRMELA

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(Received: 2023 Feb 26)

A collaboration of observers from North America and Europe has produced a lightcurve of 1178 Irmela with synodic period 11.992 ± 0.001 hours, amplitude 0.29 ± 0.02 magnitudes, and full phase coverage.

Previously published period determinations for 1178 Irmela are reported by Binzel (1987), 19.17 hours; Stephens (2012), 11.989 hours; and Polakis (2019), 11.985 hours. The lightcurves published by Stephens (2012) and by Polakis (2019) were made from a single observatory and therefore show only about 2/3 phase coverage for an Earth-commensurate period. Stephens (2012) showed that the 19.17-hour period published by Binzel (1987), based upon sparse lightcurves widely spaced in time, is an 8/5 alias of a period near 11.99 hours.

The authors of this paper, widely spaced in longitude in North America and Europe, respectively, agreed to collaborate to obtain full phase coverage. An equipment list for all observers is provided in table II. Ten sessions 2023 Jan. 26 - Feb. 17 provide a very good fit to bimodal lightcurve with synodic period 11.992 ± 0.001 hours and amplitude 0.29 ± 0.02 magnitudes with full phase coverage. This result is very close to the periods published by Stephens (2012) and by Polakis (2019), and to 5/8 of the period by Binzel (1987).

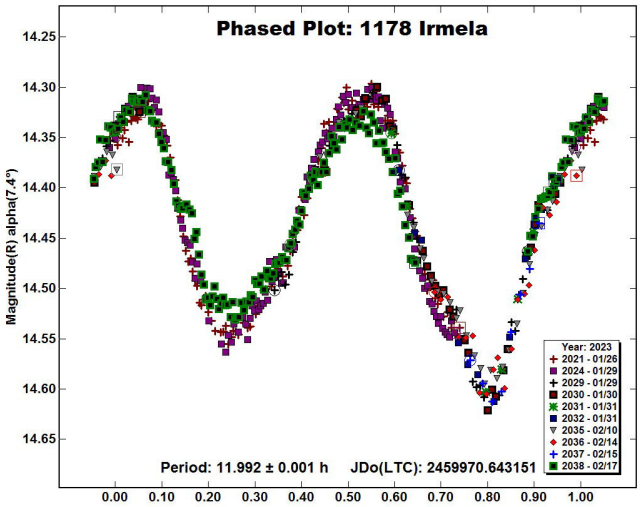
On 2023 Jan. 31, P. Bacci and M. Maestripieri obtained alternating data points in the V and R filters that show V-R = 0.40. This value is within the usual range 0.38 ± 0.05 for asteroids with C-type taxonomic classifications (Shevchenko and Lupishko, 1998).

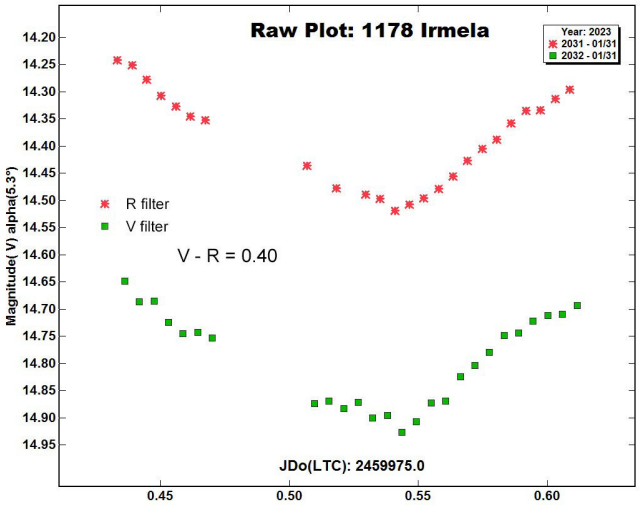
Number	Name	yyyy/mm/dd	Phase	LPAB	BPAB	Period(h)	P.E	Amp	A.E.
1178	Irmela	2023/01/26-02/17	* 7.4, 5.8	138	-5	11.992	0.001	0.29	0.02

Table I. Observing circumstances and results. The phase angle is given for the first and last date, unless a minimum (second value) was reached. LPAB and BPAB are the approximate phase angle bisector longitude and latitude at mid-date range (see Harris et al., 1984).

Observatory (MPC code)	Telescope	CCD	Filter
Organ Mesa Observatory (G50)	0.35-m SCT f/10	SBIG STL-1001E	C
Iota Scorpii(K78)	0.40-m RCT f/8	SBIG STXL-6303e (bin 2×2)	Rc
GAMP (104)	0.60-m NRT f/4	Apogee Alta	V,Rc
Beato Ermanno Astronomical Observatory (L73)	0.30-m SCT f/6	QHY174M CMOS (bin 2×2)	Rc
Astronomical Observatory, University of Siena (K54)	0.30-m MCT f/5.6	SBIG STL-6303e (bin 2×2)	C

Table II. Observing Instrumentations. MCT: Maksutov-Cassegrain, NRT: Newtonian Reflector, RCT: Ritchey-Chretien, SCT: Schmidt-Cassegrain.





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