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## COLLABORATIVE ASTEROID PHOTOMETRY FROM UAI: 2024 APRIL-JUNE

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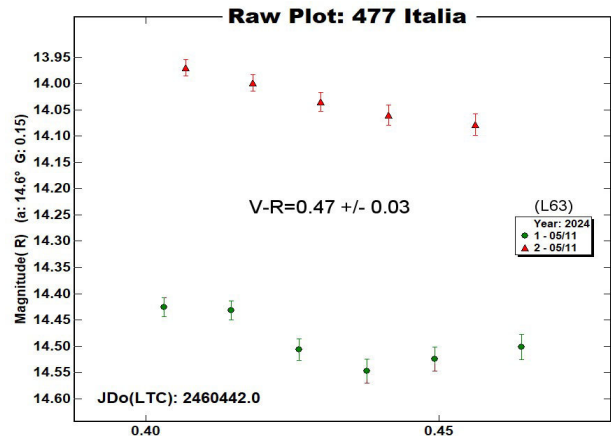
(Received: 2024 July 10)

Photometric observations of two asteroids were acquired for 477 Italia, and (21374) 1997 WS22.

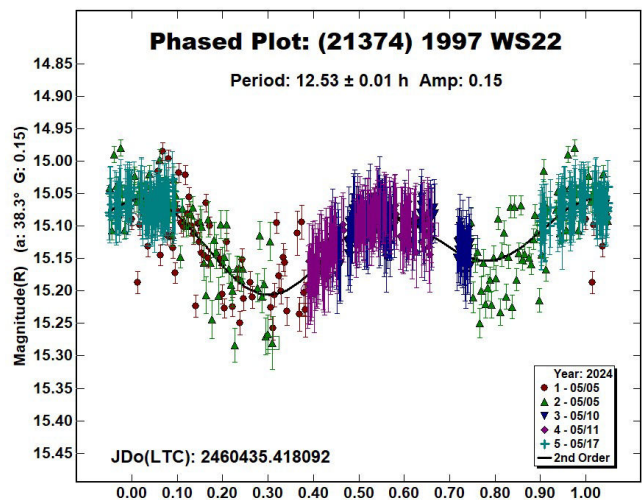
Collaborative asteroid photometry was done inside the Italian Amateur Astronomers Union (UAI; 2024) group. The targets were selected mainly in order to acquire lightcurves for shape/spin axis modeling. Table I shows the observing circumstances and results.

The CCD observations of two asteroids were made in 2024 April - June using the instrumentation described in the Table II. Unfortunately, the bad weather during the quarter did not allow for more observations. Lightcurve analysis was performed at the Balzaretto Observatory with *MPO Canopus* (Warner, 2023). All the images were calibrated with dark and flat frames and converted to standard magnitudes using solar-colored field stars from CMC15 and ATLAS catalogues, distributed with *MPO Canopus*.

477 Italia is an S-type (Bus and Binzel, 2002) inner main-belt asteroid. Multiband photometry was made by M. Iozzi (L63) on 2024 May 11. We found  $V-R = 0.47 \pm 0.03$ . This color index is close to the value found by Buchheim (2006;  $0.48 \pm 0.05$ ) and consistent with an S-type asteroid (Shevchenko and Lupishko, 1998;  $0.49 \pm 0.05$ ).



(21374) 1997 WS22 is an Amor Near-Earth asteroid. Collaborative observations were made over five nights by A. Marchini (K54) and G. Scarfi (K78), near its close approach to the Earth. The period spectrum shows a deeper minimum with a bimodal solution of  $P = 12.53 \pm 0.01$  h and an amplitude  $A = 0.15 \pm 0.06$  mag. This solution differs from the previous solutions found by Warner (2014;  $3.405 \pm 0.005$ ), Carbognani (2014;  $2.292 \pm 0.004$ ), Vaduvescu et al. (2017;  $2.4 \pm 0.1$ ), Warner (2018;  $1.96 \pm 0.01$ ).

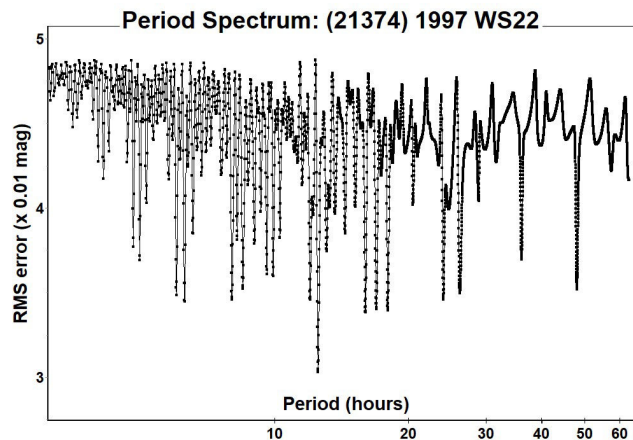


Number	Name	2024 mm/dd	Phase	L <sub>PAB</sub>	B <sub>PAB</sub>	Period(h)	P.E.	Amp	A.E.	Grp
477	Italia	05/11	14.5	198	-2					MB-I
21374	1997 WS22	05/04-05/17	38.4, 9.7	235	16	12.53	0.01	0.15	0.06	NEA

Table I. Observing circumstances and results. The first line gives the results for the primary of a binary system. The second line gives the orbital period of the satellite and the maximum attenuation. The phase angle is given for the first and last date. If preceded by an asterisk, the phase angle reached an extrema during the period. L<sub>PAB</sub> and B<sub>PAB</sub> are the approximate phase angle bisector longitude/latitude at mid-date range (see Harris et al., 1984). Grp is the asteroid family/group (Warner et al., 2009).

Observatory (MPC code)	Telescope	CCD	Filter	Observed Asteroids (#Sessions)
Iota Scorpii (K78)	0.40-m RCT f/6.1	CMOS QHY 268	C	21374 (3)
Astronomical Observatory, University of Siena (K54)	0.30-m MCT f/5.6	SBIG STL-6303e(bin 2×2)	C	21374 (2)
HOB Astronomical Observatory (L63)	0.20-m SCT f/6.0	ATIK 383L+	V, Rc	477 (1)

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



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