

PHOTOMETRIC OBSERVATIONS OF MAIN-BELT ASTEROID (10422) 1999 AN22

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Photometric observations of main-belt asteroid (10422) 1999 AN22 were obtained from May 20 to July 09, 2019, in order to determine its synodic rotation period. Observations were acquired from two observatories in Malta and one from Spain. Through our observational campaign, we present our results obtained for this asteroid that were based on 30 sessions.

Photometric observations of main-belt asteroid (10422) 1999 AN22 were carried out from three observatories shown in the Table 1.

Observatory (Location)	Telescope	CCD Sensor	Pixel Scale/ Binning
Flarestar Obs. (San Gwann, Malta)	0.25-m SCT	Moravian G2 1600/KAF 1603ME	0.99" / 1x1
Tacande Obs. (La Palma, Spain)	0.5-m Optimized Dall Kirkham	FLI ML3200/ KAF3200M E	0.98" / 2x2
Znith Obs. (Naxxar, Malta)	0.20-m SCT	Moravian G2- 1600/KAF 1603ME	1.17" / 1x1

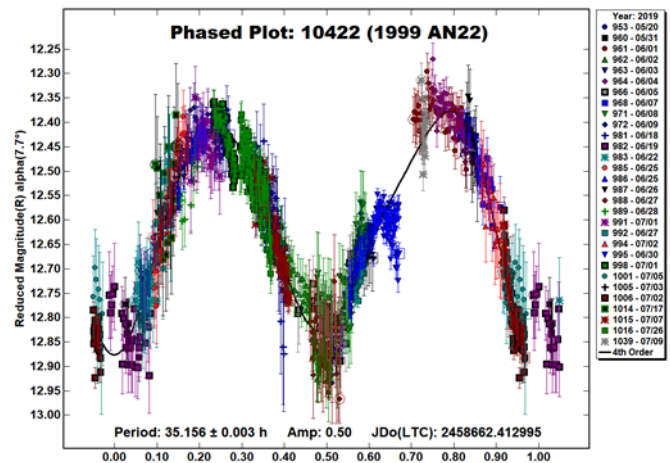
Table 1. Observatories and Equipment

All telescopes and cameras were controlled remotely. The observatories in Malta were operated from a nearby location via *Sequence Generator Pro* (Main Sequence Software, 2019), while the Tacande Observatory was controlled over the internet through *ACP Expert* Software (DC-3 Dreams, 2019). Photometric reduction, lightcurve construction and analyses were derived through *MPO Canopus* software (Warner, 2017). Differential aperture photometry was utilized and photometric measurements were derived through the use of *MPO Canopus*. Near-solar color comparisons stars were selected through the Comparison Star Selector (CSS) as used by the same software. All measurements

were based on the CMC-15 catalogue with magnitudes converted from J-K to BVRI. All images utilized in this research were dark subtracted and flat-fielded.

(10422) 1999 AN22, a large main-belt asteroid, was discovered on 1999 January 14 by the Beijing Schmidt CCD Asteroid Program from the XINGLONG station situated in the Yanshan mountains, China. The asteroid orbits the sun with a semi-major axis of 2.854 AU, eccentricity 0.2087, and orbital period of 4.82 years (JPL, 2019). The JPL Small-Bodies Database Browser lists the diameter of asteroid 10422 as 20.87 ± 0.09 km based on an absolute magnitude H of 12.2 (JPL, 2019).

The asteroid was observed from May 20 to July 09, 2019. Observations were acquired over 30 sessions generating 1350 data points. We determined the synodic period of (10422) 1999 AN22 as 35.156 ± 0.003 h with an amplitude of 0.50 ± 0.05 mag. Our results are consistent with the 2019 results obtained by Pravec and Benishek as shown on the Minorplanet.info website (Warner, 2011).



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We would like to thank Brian Warner his work in the development of *MPO Canopus* and for his efforts in maintaining the CALL website. This research has made use of the JPL's Small-Body Database and the CALL website. This research was made possible in part based on data from CMC-15 Data Access Service at CAB (INTA-CSIC) (<http://svo2.cab.inta-csic.es/vocats/cmc15/>).

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Number	Name	yyyy mm/dd	Phase	L_{PAB}	B_{PAB}	Period(h)	P.E.	Amp	A.E.	Grp
(10422)	1999 AN22	201905/20-07/09	7.6, 23.8	230	4.4	35.156	0.003	0.50	0.05	MB-O

Table 2. Observing circumstances and results. 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_{PAB} and B_{PAB} 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).

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