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PHOTOMETRIC OBSERVATIONS OF MAIN-BELT ASTEROIDS 1990 PILCHER AND 8443 SVECICA

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We report on photometric observations of two main-belt asteroids, 1990 Pilcher and 8443 Svecica, that were acquired from 2017 March to May. We found the synodic rotation period of 1990 Pilcher as 2.842 ± 0.001 h and amplitude of 0.08 ± 0.03 mag and of 8443 Svecica as 20.998 ± 0.001 h and amplitude of 0.62 ± 0.03 mag

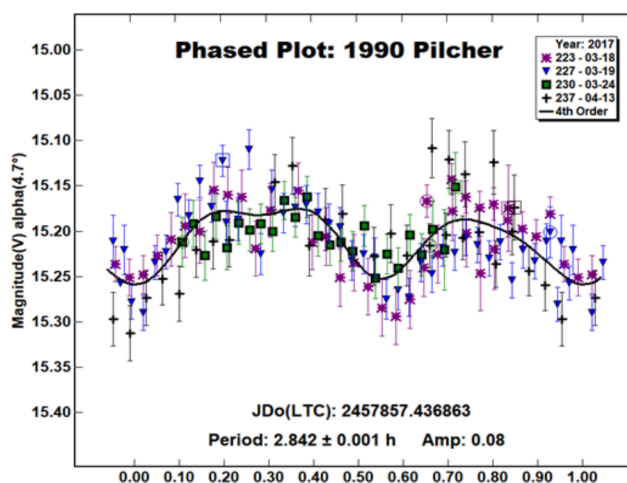
During 2017, photometric observations of two main-belt asteroids were carried out from two observatories located in Malta (Europe). The two asteroids for this research were selected through the CALL website (Warner, 2016).

Observations of 1990 Pilcher were obtained from Flarestar Observatory - MPC Code: 171 ($14^\circ 28' 12.4''$ E, $35^\circ 54' 37.2''$ N) through a 0.25-m $f/6.3$ Schmidt-Cassegrain (SCT) equipped with a Moravian G2-1600 CCD camera. Observations of 8443 Svecica were obtained through observations conducted from Antares Observatory ($14^\circ 30' 46.7''$ E, $35^\circ 52' 13.0''$ N) that used a 0.28-m SCT coupled to a SBIG ST-11000 CCD Camera. All images were taken through a clear filter and auto-guided for the duration of the exposure. Flarestar Observatory used the camera in 1x1 binning mode with a resultant pixel scale of 0.99 arcsec per pixel while Antares Observatory used its camera in 2x2 binning mode with a resultant pixel scale of 1.32 arcsec per pixel. Both cameras

were operated at sensor temperature of -15°C and images were calibrated with dark and flat-field frames.

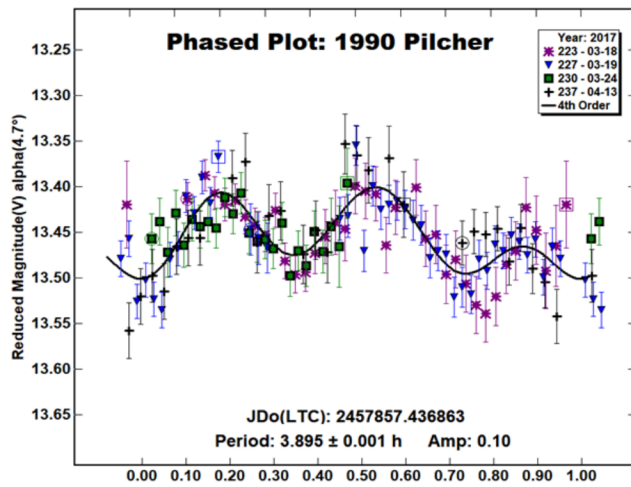
Both telescopes and cameras were controlled remotely from a nearby location via *Sequence Generator Pro* (Binary Star Software). Photometric reduction, lightcurve construction, and period analyses were done using *MPO Canopus* software (Warner, 2017). Differential aperture photometry was used and photometric measurements were based on the use of comparison stars of near-solar colour that were selected by the Comparison Star Selector (CSS) utility available through *MPO Canopus*. Asteroid magnitudes were based on MPOSC3 catalog supplied with *MPO Canopus*.

1990 Pilcher is an inner main-belt asteroid that was discovered on 1956 March 9 by K. Reinmuth at Heidelberg. Also known as 1956 EE, this asteroid was named in honor of Frederick Pilcher, associate professor of physics at Illinois College, Jacksonville (Illinois), who has promoted extensively, the interest in minor planets among amateur astronomers (Schmadel & Schmadel, 1992). The JPL (2017) Small-Bodies Database Browser lists the diameter as $6.754 \text{ km} \pm 0.167 \text{ km}$ based on $H = 13.14$.



Number	Name	yyyy/mm/dd	Pts	Phase	LPAB	BPAB	Period(h)	P.E.	Amp	A.E.	Grp
1990	Pilcher	2017 03/18-04/13	134	4.7, 2.5, 10.6	185	-0.5	2.842	0.001	0.10	0.03	MB-I
8443	Svecica	2017 03/19-05/03	382	3.4, 9.1, 19.3	185	3.1	20.998	0.001	0.62	0.03	MB-M

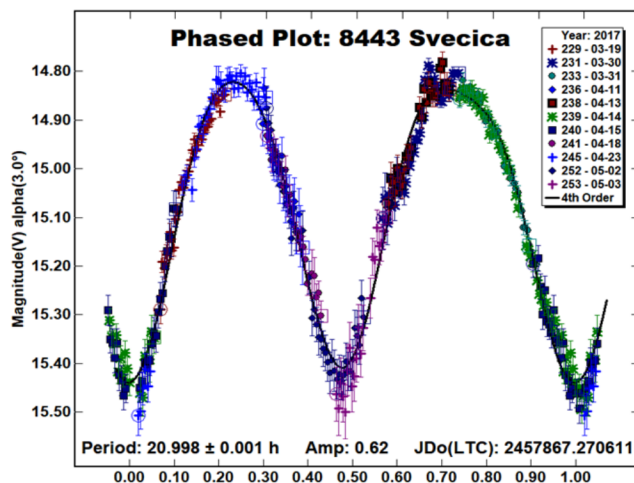
Table I. Observing circumstances and results. Pts is the number of data points. The phase angle is given for the first and last date. LPAB and BPAB are the approximate phase angle bisector longitude and latitude at mid-date range (see Harris et al., 1984). Grp is the asteroid family/group (Warner et al., 2009).



Observations conducted from Flarestar Observatory were carried out on four nights from 2017 March 18 to April 13. They indicated a synodic period of 2.842 ± 0.001 h and amplitude of 0.08 ± 0.03 mag as the most likely solution based on a bimodal lightcurve. However, if presuming that the asteroid has a non-bimodal lightcurve, the best solution would be 3.895 ± 0.001 h with amplitude of 0.10 ± 0.03 .

As discussed in Harris *et al.* (2014), the presumption of a bimodal lightcurve does not always provide the correct solution since lightcurves with amplitudes of only 0.10 mag or so cannot be assumed to be bimodal, even at low phase angles. Therefore, the 3.895 hour period cannot be overlooked and this leads us to conclude that the results obtained for 1990 Pilcher are uncertain. There were no previous entries in the asteroid lightcurve database (LCDB, Warner *et al.*, 2009) for this asteroid.

8443 Svecica is a main-belt asteroid that was discovered by on 1977 October 16 by C.J. van Houten and I. van Houten-Groeneveld on Palomar Schmidt plates taken by T. Gehrel. This asteroid was named for the small passerine bird - *Luscinia svecica*, also known as the Bluethroat. The JPL Small-Bodies Database Browser (JPL, 2017) lists the diameter of as $12.049 \text{ km} \pm 2.190 \text{ km}$ when using $H = 12.7$.



We observed 8443 Svecica on 11 nights between 2017 March 19 and May 3. The data obtained for this asteroid were acquired on five nights at Antares Observatory and six nights at Flarestar Observatory. Our analysis yielded a synodic period of $20.998 \pm$

0.001 h and amplitude of 0.62 ± 0.03 mag. The LCDB did not contain any references of the synodic period of this asteroid.

Acknowledgements

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.

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THE ROTATION PERIOD OF 10041 PARKINSON

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A rotation period of $5.69 \text{ h} \pm 0.03 \text{ h}$ and an amplitude of 0.03 mag has been derived from one night of observations of main-belt asteroid 10041 Parkinson.

During the night of 2017 April 24 UT the author obtained 69 data points while observing main-belt asteroid 10041 Parkinson. Observations were made with a fork-mounted 0.30-m Schmidt-Cassegrain. The imaging train consisted of a SBIG AO-8T adaptive optics unit, a FW8G-STT filter wheel, and an SBIG STT-1603ME camera working at 2x2 binning, the resulting resolution being 2.2 arc sec/pix. All observations were 300s. Camera sensor temperature was -40°C . Due to the faintness of the target, no filters were used. All images were reduced with dark and flat