

## ROTATION PERIOD FOR THE POTENTIALLY HAZARDOUS ASTEROID 2018 AM12

Erwin Schwab  
Tanus Observatory of the Physikalischer Verein, Frankfurt  
Westendstr. 8  
D-63329 Egelsbach, GERMANY  
e.schwab@gsi.de

Detlef Koschny  
ESA/ESTEC  
NL-2201 AZ Noordwijk ZH, THE NETHERLANDS

Marco Micheli  
ESA SSA-NEO Coordination Centre  
I-00044 Frascati (RM), ITALY

(Received: 2018 Feb 1)

The potentially hazardous asteroid 2018 AM12 was observed on 2018 January 16. The synodic period was found to be  $0.2106 \pm 0.0013$  h.

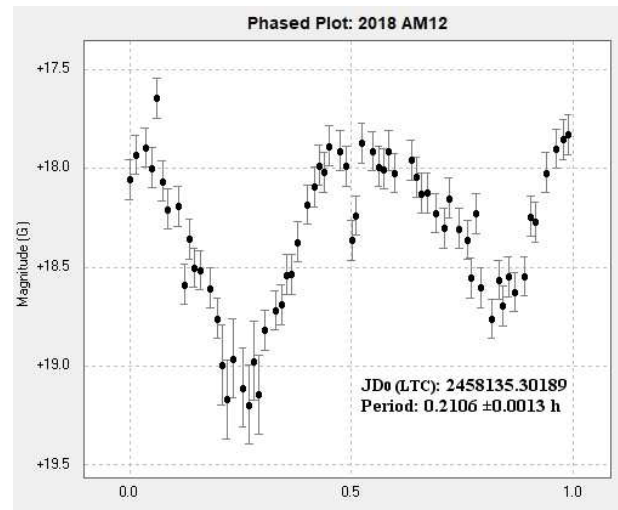
The near-Earth asteroid 2018 AM12 was discovered on 2018 January 15 by the Pan-STARRS1 survey and classified as a potentially hazardous asteroid (PHA). About 38 hours later, on 2018 January 16, we observed it remotely with the 0.8-meter f/3.0 Schmidt telescope at Calar Alto Observatory, Spain (MPC Z84).

The CCD camera used was a SBIG ST-10XME with 2184x1472 array of 6.8 micron pixels operated in un-binned mode. This configuration gave a field-of-view of 21.3x14.3 arcmin and an image scale of 0.58 arcsec per pixel. No filter was used. Due to the asteroid's rapid sky motion the exposure time was 30 s. The readout time was 25 s. Dark and flat-field frames could not be taken, because it is not yet implemented in the software for remote control.

The data reduction was done with *Astrometrica* using the Gaia DR-1 star catalogue. For the rotation period analysis the software *Peranso* was used, with the internal period analysis ANOVA method. The solution favored by the period spectrum resulted in a best value for the period of  $0.2106 \pm 0.0013$  h.

The asteroid was observed over a time span of 1.44 h, which corresponds to about 7 rotation periods. The periodic behavior is shown in the phased lightcurve. The Julian Date is light-time corrected,  $JD_0(LTC) = 2458135.30189$ . The peak-to-peak amplitude is about 1.2 mag. The observational circumstances and results are summarized in Table I.

The object has an estimated absolute magnitude of approximately 21.4, which would correspond to a diameter between 150 meter and 300 meter, assuming a typical range of albedos. It is therefore possible that this asteroid could be larger than the ~200-meter spin barrier above which only very few fast rotators are known.



### Acknowledgements

The work is funded by the Space Situational Awareness Programme of the European Space Agency (ESA), contract number 4000116155/15/D/AH (P2-NEO-VIII).

### References

- MPC (2018). MPEC 2018-B27: 2018 AM12  
[www.minorplanetcenter.net/mpec/K18/K18B27.html](http://www.minorplanetcenter.net/mpec/K18/K18B27.html)
- Raab, Herbert (2016). Astrometrica software  
[www.astrometrica.at/](http://www.astrometrica.at/)
- CBABelgium.com (2018). Peranso software  
[www.cbabelgium.com/peranso/](http://www.cbabelgium.com/peranso/)
- Warner, B.D., Harris, A.W., Pravec, P. (2009). "The Asteroid Lightcurve Database." *Icarus* **202**, 134-146. Updated 2018 Jan.  
<http://www.minorplanet.info/lightcurvedatabase.html>

Number	Name	2018 mm/dd	Pts	Phase	$L_{PAB}$	$B_{PAB}$	Period(h)	P.E.	Amp	A.E.	Grp
2018	AM12	01/16	66	88.8	70	-17	0.2106	0.0013	1.2	0.1	NEA

Table I. Observing circumstances and results. Pts is the number of data points.  $L_{PAB}$  and  $B_{PAB}$  (phase angle bisector longitude and latitude) and the phase angle are given at approximate mid-time of the observations on 2018 January 16 at 20:00 UT. Grp is the asteroid family/group (Warner et al., 2009).