

LIGHTCURVE ANALYSIS FOR 19911 RIGAUX

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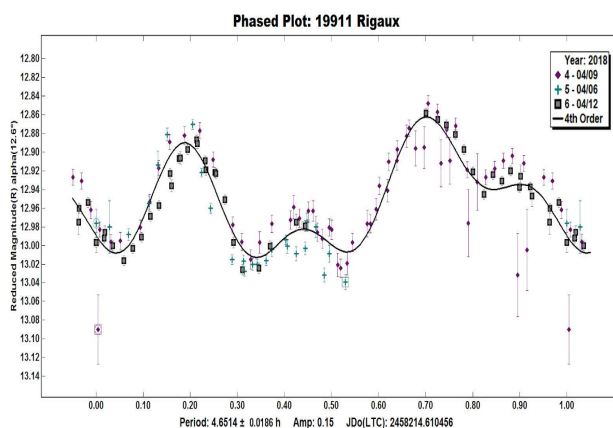
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Using *MPO Canopus*, we analyzed the lightcurve of asteroid 19911 Rigaux. The rotation period was previously unknown, and we determined it to be 4.65 ± 0.02 hours.

19911 Rigaux was discovered on 1933 March 26 by astronomer Fernand Rigaux (JPL, 2018). It has an orbital period of 5.32 years. It is a main belt asteroid with an absolute magnitude of 12.4 and a diameter of 18.341 km (JPL, 2018).

The observations took place on 2018 April 5, 8, and 11 remotely from iTelescope.net. The telescope used was T21 in Mayhill, New Mexico. It has a diameter of 0.43 m and focal length of 1940 mm, with the FLI-PL6303E CCD which has a 3072 x 2048 pixel array and a pixel size of 9 microns (Telescope, 2018). With CCD and telescope resolution combined, final images have a resolution of 0.96 arcsec/pixel (Telescope, 2018). The coordinates of the telescope are 32.9° North, and 105.5° West (Telescope, 2018). We used a luminance filter with an exposure time of 300 seconds.

The Asteroid Lightcurve Database did not contain any previously recorded data on the rotation period of the asteroid, however the data from the three observing sessions overlapped well in the phased lightcurve, yielding a convincing result. The rotation period of the asteroid was determined to be 4.65 ± 0.02 hours. The phased lightcurve also suggests that the asteroid has an irregular shape, evidenced by an unusual rise in the trough as well as after the second peak.



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References

- Harris, A.W., Young, J.W., Scaltriti, F., Zappala, V. (1984). "Lightcurves and phase relations of the asteroids 82 Alkmene and 444 Gyptis." *Icarus* **57**, 251-258.
- JPL (2018). Small-Body Database Browser. <http://ssd.jpl.nasa.gov/sbdb.cgi#top>
- Telescope (2018). iTelescope.Net-Remote Internet Telescope Network- Online Image & Telescope Hosting Services. <http://www.itelescope.net/>
- Warner, B.D., Harris, A.W., Pravec, P. (2009). *Icarus* **202**, 134-146. Updated 2018 March 19. <http://www.MinorPlanet.info/lightcurvedatabase.html>
- Warner, B.D. (2016). MPO Software, MPO Canopus version 10.7.7.0, Bdw Publishing. <http://www.minorplanetobserver.com/>

Number	Name	2018 mm/dd	Pts	Phase	L _{PAB}	B _{PAB}	Period(h)	P.E.	Amp	Grp
19911	Rigaux	04/5-04/11	143	11.1, 12.8	181	13	4.65	0.02	0.15	MB

Table I. Observing circumstances and results. Pts is the number of data points. The phase angle is given for the first and last date. L_{PAB} and B_{PAB} are the average phase angle bisector longitude and latitude (see Harris *et al.*, 1984). Grp is the asteroid family/group (Warner *et al.*, 2009). MC = Mars-crossing asteroid. For a more conservative estimate, reported period error is three times that calculated by *MPO Canopus*.