

References

Herald, D. (2021). OCCULT Prediction Software
<http://www.lunar-occultations.com/iota/occult4.htm>

IOTA (2017). IOTA-VTI Homepage
<https://videotimers.com/home.html>

Nolthenius, R. (2021), “The June 29/30, 2021 Occultation by (4337) Arecibo. Can we Constrain the Orbit?”
<https://www.dr-ricknolthenius.com/Apowers/PT-iota21.pdf>

ROTATION PERIOD DETERMINATION FOR ASTEROID
663 GERLINDE

Rafael G. Farfán
Uraniborg Observatory (Z55)
Écija (Seville, Spain)
uraniborg16@gmail.com

Faustino García (J38)
La Vara, Valdés (Asturias, Spain)

(Received: 2021 October 15)

Photometric observations of the main-belt asteroid 663 Gerlinde were taken from the Uraniborg Observatory, in Écija (Seville, Spain), in order to determine its synodic rotation period. The results are: $P = 10.254 \pm 0.001$ h, $A = 0.190$ mag.

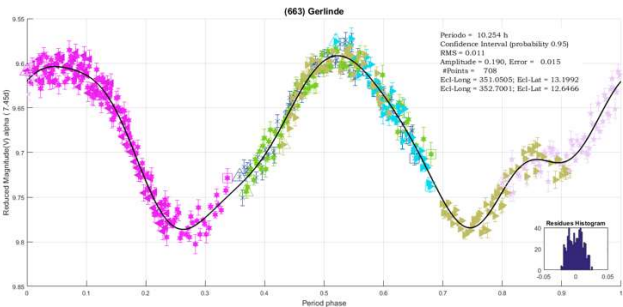
All observations were performed at the Uraniborg Observatory, (MPC-International Astronomical Union code Z55) using a 0.28-m Schmidt-Cassegrain telescope operating at f/6.3. The optical tube is mounted on NEQ6 Pro Skywatcher mount, and equipped with an ATIK 414exm CCD camera. It is a high Quantum Efficiency CCD. No filters used so as to optimize the signal-to-noise. Exposure time for all images was 90 sec. The camera was binned at 1×1. The image scale after 1×1 binning was 0.78 arcsec/pixel and the field of view 18×13 arcmin. In these fields, the asteroid and three comparison stars were measured for differential photometry.

All images were reduced in the standard manner using nightly flatfield files as well as dark-current and bias images. Photometric measurement and lightcurve analysis were performed using *FotoDif* software version 3.138 (Castellano, 2020) and *Períodos*, a script for Matlab software (Observatorio Astronómico Salvador, 2020). Besides, the light time effect was corrected. The *Cartes du Ciel* (2021) was used as the planetarium software with the most recent ephemerides downloaded from the Minor Planet Center, and *MaximDL Pro 6.0* (2021) was used for image capture.

663 Gerlinde (1980 DG; 1948 AB; 1952 WF; 1958 XP) is located in the main asteroid belt, with a semi-major axis of 3.072 AU, eccentricity 0.1455, inclination 17.81°, and an orbital period of 5.39 years. Its spectral type is X and its diameter is 107.8 km. It was discovered on June 24, 1908 by the German astronomer Augustus Kopff at the Heidelberg Observatory and named after the German female’s name.

Our goal was to check if the rotation period of 663-Gerlinde has changed in recent years since the latest observations published correspond to the years 2005-2006, (Behrend, 2020) although there is only one more in 2019 according to the consulted bibliography (ALCDEF, 2020). In all these studies, the calculated period was 0.4274 days.

The asteroid phase angle was 7.5° when our observations started and 9.8° when they finished. The period analysis shows a solution for the rotational period of $P = 10.254 \pm 0.001$ hours with an amplitude $A = 0.190 \pm 0.015$ mag, which is very close to the previously aforementioned published results.



References

ALCDEF (2020), Asteroid Photometry Database. <http://alcdef.org/>

Behrend, R. (2020). Observatoire de Genève website.
<https://obswww.unige.ch/~behrend/>

Cartes du Ciel (2021). <https://www.ap-i.net/skychart/en/start>

Castellano, J. (2020). FotoDif Software.
<http://astrosurf.com/orodeno/fotodif/index.htm>

MaximDL (2021).
<https://diffractionlimited.com/product/maxim-dl/>

Observatorio Astronómico Salvador (2020). Períodos Software.
<http://www.astrosurf.com/salvador/Programas.html>

Number	Name	20yy/mm/dd	Phase	L _{PAB}	B _{PAB}	Period (h)	P.E.	Amp	A.E.
663	Gerlinde	21/08/01-21/08/17	7.5, 9.8	351.9	12.9	10.254	0.001	0.190	0.015

Table I. Observing circumstances and results. Phase is the solar phase angle given at the start and end of the date range. If preceded by an asterisk, the phase angle reached an extrema during the period. L_{PAB} and B_{PAB} are the average phase angle bisector longitude and latitude.