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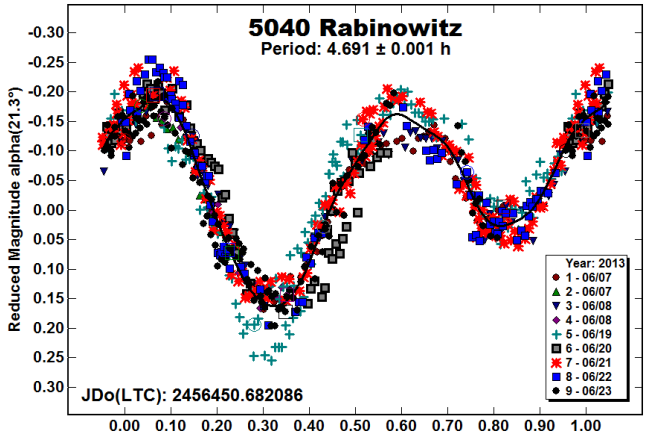

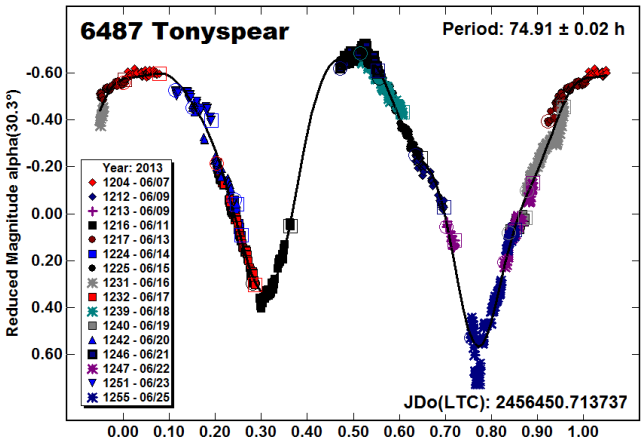

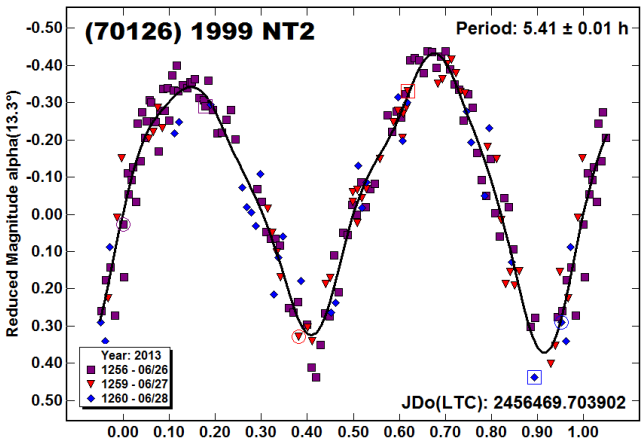

LIGHTCURVE PHOTOMETRY, H-G PARAMETERS, AND ESTIMATED DIAMETER FOR 15621 ERIKHOVLAND

Giovanni Battista Casalnuovo
C62 Eurac Observatory, Bolzano, ITALY
studioarchigraph@virgilio.it

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Photometric observations of main-belt asteroid 15621 Erikhovland were made over seven nights during May and June 2013 with a filtered system. The resulting synodic period is 5.3426 ± 0.0001 h with a high amplitude of 0.81 ± 0.02 mag. The color index V-R = 0.33 ± 0.03 mag. The measured absolute visual magnitude, Hv = 12.14 ± 0.09 mag. and the slope parameter, G = 0.08 ± 0.09, are consistent with a low albedo object, e.g., type C. The diameter is estimated to be D = 20 ± 3 km.

The main-belt asteroid 15621 Erikhovland was reported as a lightcurve photometry opportunity, for May 2013, in MPC Call (*http://www.minorplanet.info/PHP/call_OppLCDBQuery.php)*. All the observations were carried out from C62 Eurac Observatory in Bolzano (Italy), during eight observing nights, using a 0.30m reflector telescope, reduced to f/4.0 and a QHY9 CCD camera. Before each session, the observers synchronized the computer's clock with atomic clock time, via Internet NTP servers. Differential photometry and period analysis was done using *MPO Canopus* (Warner, 2012). The derived synodic period was P = 5.3426 ± 0.0001 h (Fig.1) with an amplitude of A = 0.81 ± 0.02 mag.

All filtered images (V Johnson, R Cousins) were calibrated with dark and flat-field frames. The V and R band frames were acquired in sequence changing alternatively the filters (VR VR VR). This allowed us to find the color index of V-R = 0.33 ± 0.05 mag (mean of 30 values). This value is typical of a C-type asteroid (Shevchenko and Lupishko, 1998). Assuming C-type, the geometric albedo is *pv* = 0.06 ± 0.02 (Shevchenko and Lupishko, 1998). The absolute magnitude (Hv) and slope parameter (G) ware found using the H-G Calculator function of MPO Canopus. Seven values obtained pre- and post-opposition of the asteroid, using the maximum values of the lightcurve. Unfortunately, there are no V values at small phase angles, near 0°, which are necessary for an optimal fit. We obtained Hv = 12.14 ± 0.09 mag. and the slope parameter G = 0.08 ± 0.09 (Fig. 2).

From this, we can estimate a diameter of D = 20 ± 3 km using the expression (Pravec and Harris, 2007):

$$D_{(km)} = (1329/\sqrt{Pv})10^{-0.2Hv}$$

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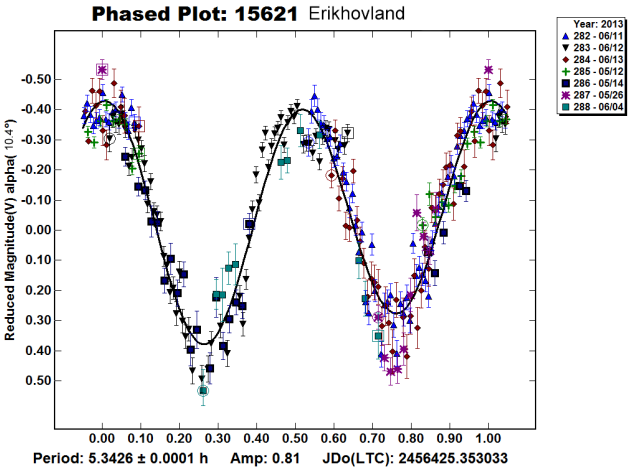

Figure 1. The lightcurve of 15621 Erikhovland with a period of 5.3426 ± 0.0001 h and an amplitude of 0.81 ± 0.02 mag.

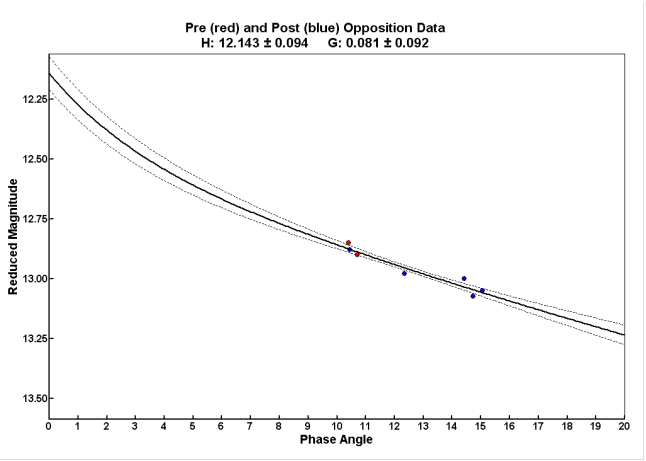

Figure 2. Visual reduced magnitude vs. phase angle for Hv = 12.14 ± 0.09 mag. and the slope parameter, G = 0.08 ± 0.09

LIGHTCURVE OF THE POTENTIALLY HAZARDOUS ASTEROID (163249) 2002 GT

Lorenzo Franco
Balzaretto Observatory, Rome, ITALY
lor_franco@libero.it

Paolo Bacci, Luciano Tesi, Giancarlo Fagioli
San Marcello Pistoiese (104)
Pistoia, ITALY

(Received: 20 June)

Photometric observations of the potentially hazardous asteroid (PHA) (163249) 2002 GT were made on 2013 June 16 and 17, before the object's relatively close approach to the Earth. Analysis of the resulting data found a synodic period P = 3.77 ± 0.01 h with an amplitude A = 0.36 ± 0.03 mag.

The Apollo class potentially hazardous asteroid (PHA) (163249) 2002 GT was discovered by Spacewatch at Kitt Peak on 2002 April 3. Due to its relatively close approach to the Earth, it was scheduled as a radar target from Arecibo and/or Goldstone in 2013 June. The JPL Small-Body Database Browser reported an absolute magnitude *H* = 18.3, or an estimated diameter from 0.6 (medium albedo) to 1.3 km (low albedo).

The asteroid was observed at San Marcello Pistoiese (MPC Code 104) for two nights on 2013 June 16 and 17, for a total of 491 unfiltered images, each of 45 seconds exposure. Data were collected with a 0.60-m *f*/4 reflector and Apogee Alta 1024x1024 CCD camera. This combination gave a field of view of 35x35 arcmin and a pixel scale of 2 arcsec/pixel. All images were calibrated with dark and flat-field frames. Differential photometry and period analysis were done using *MPO Canopus* (Warner, 2012) at Balzaretto Observatory (A81).

The derived synodic period was *P* = 3.77 ± 0.01 h with an amplitude of *A* = 0.36 ± 0.03 mag. While the period spectrum shows two nearly equal solutions, the bimodal solution is much more likely given the large amplitude of the lightcurve.

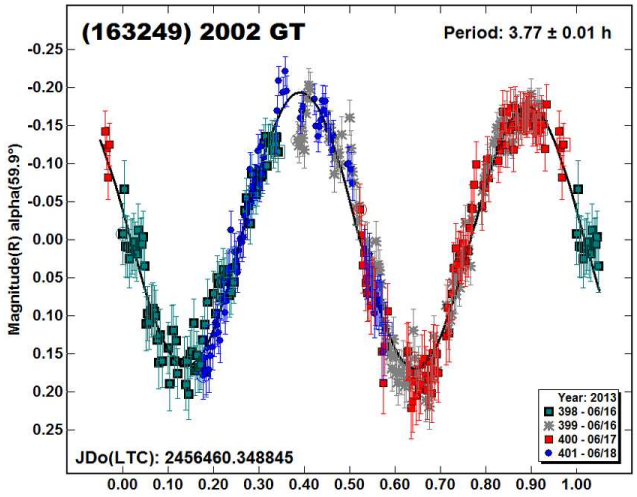

Figure 1. The lightcurve of PHA (163249) 2002 GT with a period of 3.77 ± 0.01 h and an amplitude of 0.36 ± 0.03 mag.

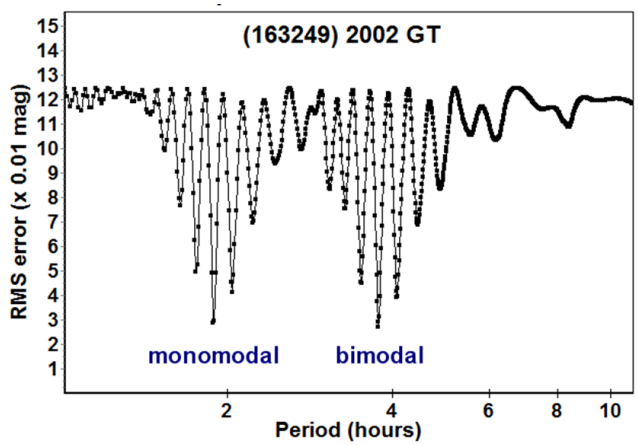

Figure 2. The period spectrum for (163249) 2002 GT shows minimums for the monomodal and bimodal solutions.

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