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ROTATION PERIOD DETERMINATION FOR 103 HERA

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For 103 Hera a synodic rotation period of 23.740 ± 0.001 hours and maximum amplitude 0.45 ± 0.03 mag have been found, confirming previous results.

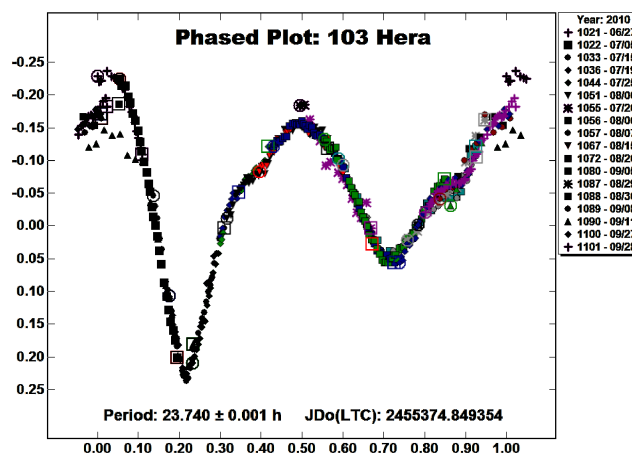
The only previous period determination for 103 Hera is by Harris and Young (1983) who found a period of 23.74 hours, amplitude 0.35 mag near longitude 355 degrees. Because of the very near commensurability with Earth's rotation period, observations over more than 3 months 1979 Aug. 29 – Dec. 10 still covered only 75% of the lightcurve. Earlier observations by Harris and Young (1979) in the year 1978 at longitude 226 degrees, latitude +8 degrees, show only irregular variation of 0.05 mag or smaller with no period determination.

For an object with a rotation period this close to Earth's period observations from widely separated longitudes are required to sample the complete lightcurve at a single apparition. Authors Pilcher and Higgins agreed to collaborate to make these observations. Pilcher at the Organ Mesa Observatory used a 35 cm Meade LX200 GPS S-C, SBIG STL-1001E CCD, R filter, 30-45 s exposures, unguided, instrumental magnitudes only. Higgins at Hunters Hill Observatory also used a 35 cm Meade LX200 GPS S-C, SBIG ST-8 CCD, R filter. Image measurement, lightcurve analysis, and data sharing were done with *MPO Canopus* software. Observations made on 18 nights 2010 June 27-Sept. 28 show a rotation period of 23.740 ± 0.001 hours and bimodal lightcurve with one minimum much deeper than the other one. To make the lightcurve more legible the large number of data points have been

binned in sets of 5 with maximum time difference 10 minutes between points. The maximum amplitude defined by this deep minimum was 0.45 ± 0.03 mag June 27 – July 19 at phase angle $23 - 19$ degrees and 0.35 ± 0.03 mag when next sampled Aug. 30 – Sept. 11 at phase angles less than 4 degrees. This decrease of amplitude with decreasing phase angle is expected as a consequence of decreased shadowing as observed from Earth. The new data provide multiple full coverage of the lightcurve with results that agree with those of Harris and Young (1983).

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LIGHTCURVE ANALYSIS OF THE NEAR-EARTH ASTEROID (154029) 2002 CY46

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CCD observations of the near-Earth asteroid (154029) 2002 CY46 were made at the Palmer Divide Observatory (PDO) and Lowell Observatory on four nights in 2010 September to support radar observations. The resulting lightcurve parameters found a synodic period of $P = 2.554 \pm 0.001$ h and amplitude of $A = 0.07 \pm 0.01$ mag. No indications of the asteroid being binary were found.

Radar observations in early 2010 September by Howell et al. (private communication) showed the near-Earth asteroid, (154029) 2002 CY46, had a rotation period on the order of 2.5 h. Given the size and rotation period, this meant the chances were good that the asteroid was binary. Lightcurve observations were requested to