

ASTEROID PHOTOMETRY REPORTS FROM ALTIMIRA OBSERVATORY – WINTER 2004-2005

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Lightcurve periods and amplitudes have been measured for asteroids 1021 Flammario ($P = 12.146 \pm 0.001$ hr, 0.36 mag) and 2105 Gudy ($P = 15.788 \pm 0.004$ hr, 0.28 mag, and $H=11.4$).

Altimira Observatory is located in southern California. Details of the observatory and equipment are available at http://www.geocities.com/oca_bob. For the studies reported here, differential photometry was performed using CCD images taken through Johnson-Cousins B, V, and R filters.

1021 Flammario. Previous determinations of the rotation period of 1021 Flammario have been reported. Hainaut-Rouelle et al (1995) reported $P = 8.097$ hours, during the October, 1990 apparition. Their observations showed only one minimum and one maximum per night. Schober et al (1993) determined a light curve period $P = 12.14$ hours during the November, 1990 apparition, based on more-complete coverage of the rotation than was available to Hainaut-Rouelle (two minima are clearly distinguished in their light curve). Two nights (16 Jan 2005 UT and 30 Jan 2005 UT) were devoted to this object, with images made in B, V, and R bands on both nights. The Altimira data are consistent with the result of Schober: my lightcurve, wrapped to a period of $P = 12.146 \pm 0.001$ hours, is shown in Figure 1. I also tried fits in the range 7.5 to 9 hours, bracketing the Hainaut-Rouelle period, but the subjective fit was poor, and the RMS error substantially larger than with $P = 12.146$ hrs. The SNR in all three filters was greater than 100:1, but no evidence of color variation with rotational angle was detected.

2105 Gudy. Four nights were devoted to this object over the range 11-24 December 2004, with images taken in B, V, and R bands on most nights. A lightcurve has been previously published by Warner (2001), and a report of brighter-than expected magnitude has been noted by Gressman (1981). The measured lightcurve matches a rotation period of $P = 15.788 \pm 0.004$ hours, as shown in Figure 2. This is in excellent agreement with Warner's (2001) observations, which indicated a period of 15.8 hours. The measured color indices for this asteroid are: $(B-V) = 1.05 \pm 0.05$ and $(V-R) = 0.49 \pm 0.05$. The measured phase curve for 2105 Gudy is shown in Figure 3. Assuming a G value of 0.15, a slightly revised value of $H=11.4$ is suggested compared with the tabulated value of $H=11.3$ (PDS Small Bodies Node).

Acknowledgements

Photometric reductions were performed with Brian Warner's MPO Canopus/PhotoRed program. Ephemerides were calculated using Chris Marriott's SkyMap Pro program, using a database from the Minor Planet Center. Automated observatory control is accomplished with Software Bisque's suite (TheSky, Automadome, Orchestrate and CCDSoft).

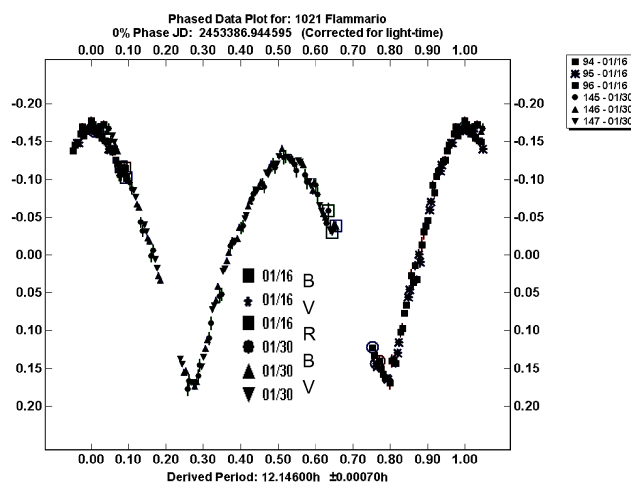


Figure 1: Lightcurve of 1021 Flammario, wrapped to $P = 12.146$ hrs.

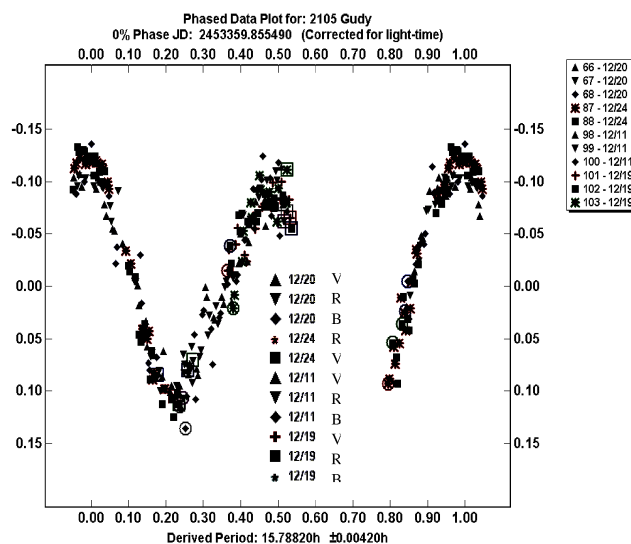


Figure 2: Lightcurve of 2105 Gudy, wrapped to $P = 15.7882$ hrs

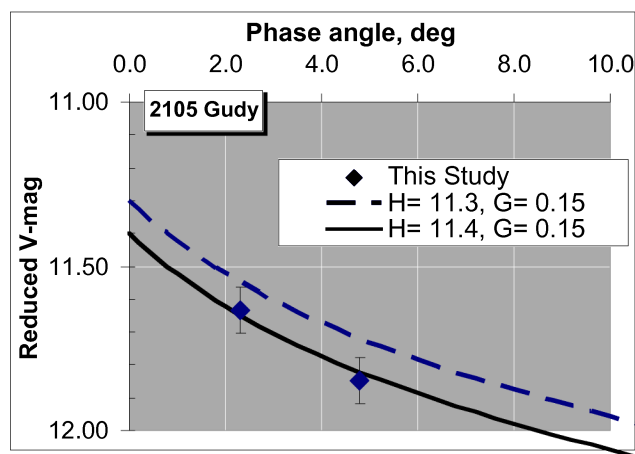


Figure 3: Phase curve fit for 2105 Gudy.

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**PHOTOMETRIC LIGHTCURVE OBSERVATIONS OF
125 LIBERATRIX, 218 BIANCA, 423 DIOTIMA,
702 ALAUDA, 1963 BEZOVEC, AND (5849) 1990 HF1**

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Photometric lightcurve measurements from the Evelyn L. Egan Observatory for six main-belt asteroids are reported. The following synodic periods and amplitudes were determined: 125 Liberatrix 3.9683 ± 0.0002 h, 0.20 mag; 218 Bianca 6.337 ± 0.001 h, 0.09 mag; 423 Diotima 4.775 ± 0.001 h, 0.11 mag; 702 Alauda 8.348 ± 0.001 h, 0.05 mag; 1963 Bezovec 18.1600 ± 0.0001 h, 0.30 mag; (5849) 1990 HF1 8.733 ± 0.001 h, 0.40 mag.

The Evelyn L. Egan Observatory is located on the campus of Florida Gulf Coast University (FGCU) in Fort Myers, Florida. Details on the equipment and methods have been previously reported (Fauerbach 2005). Targets were selected from the "Potential Lightcurve Targets" list on the CALL website (Warner, 2002), with attention to those listed as potential shape-modeling targets. We also utilized the list of known lightcurve parameters maintained by Harris and Warner (Harris, 2003) to select targets that have a high uncertainty in their previously published periods.

125 Liberatrix. Minor planet 125 Liberatrix is an M-type asteroid with a size of approximately 43 km. It was discovered by Prosper Henry on September 11, 1872. The asteroid was chosen for study, as it was a shape modeling target (Kaasalainen). Observations were obtained during 3 nights over December 12-27, 2004. Our derived rotational period is 3.9683 ± 0.0002 h with an amplitude of 0.20 mag., in good agreement with previous publications (see Harris 2003).

218 Bianca. Minor planet 218 Bianca is an S-type asteroid with a size of approximately 61 km. It was discovered by Johann Palisa

on September 4, 1880 in Pola, Italy and was named after opera singer Bianca Bianchi. The asteroid was chosen for study, as it was a shape modeling target (Kaasalainen). Observations were obtained during 3 nights between December 12 and 27, 2004. Observations were also obtained during 4 nights between February 8 and April 6, 2005. Our derived rotational period is 6.337 ± 0.001 h with an amplitude of 0.09 mag, in good agreement with previous publications (see Harris, 2003).

423 Diotima. Diotima is a large (~209 km) C-type binary asteroid. It was discovered by Auguste Charlois on December 7, 1896 in Nice. The asteroid was chosen for study, as it was a shape modeling target (Kaasalainen). Observations were obtained on December 7 and 13, 2004. Our derived rotational period is 4.775 ± 0.001 h with an amplitude of 0.11 mag, in good agreement with previous publications (see Harris, 2003).

702 Alauda. Alauda was discovered on July 16, 1910 by J. Helffrich in Heidelberg. The asteroid was chosen for study, as there was some ambiguity about the period. Observations were obtained during 6 nights between January 4, 2005 and February 12, 2005. We derived a synodic period of 8.348 ± 0.001 h with a small amplitude of 0.05 mag, in good agreement with the literature.

1963 Bezovec. This C-class asteroid was discovered on February 9, 1975 by L. Kohoutek. Lightcurve observations were obtained during 6 nights between January 6, 2005 and February 5, 2005. We derived a synodic period of 18.160 ± 0.001 h with an amplitude of 0.30 mag. No prior lightcurve data were available.

(5849) 1990 HF1. This asteroid was discovered on April 27, 1990 by E. F. Helin at Palomar. We observed it during 9 nights between January 4, 2005 and February 11, 2005. The derived synodic period that fits all the data best is 8.733 ± 0.001 h with an amplitude of 0.40 mag. No prior lightcurve data were available.

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Kaasalainen, M. <http://www.rni.helsinki.fi/~mjk/asteroids.html> and references therein.