ASTEROID PHOTOMETRY REPORTS FROM ALTIMIRA OBSERVATORY – WINTER 2004-2005

Robert K. Buchheim
Altimira Observatory (G76)
18 Altimira, Coto de Caza, CA 92679 USA
rbuchheim@earthlink.net

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Lightcurve periods and amplitudes have been measured for asteroids 1021 Flammario (P= 12.146 ± 0.001 hr, 0.36 mag) and 2105 Gudy (P= 15.788 ± 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 ± 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 ± 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 ± 0.05 and (V-R) = 0.49 ± 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).

References

Gressman, M., in Letters, *Minor Planet Bulletin* **8**, 32-33.

Hainaut-Rouelle, M.C., et al. (1995) "Lightcurves of Selected Minor Planets". Astronomy and Astrophysics Supplement Series, **112**, 125-142

Schober, H. J., et al. (1993), "Physical Studies of Asteroids XXVI". Astronomy and Astrophysics Supplement Series, **101**, 499-505

Small Bodies Node of the NASA Planetary Data System, at http://pdssbn.astro.umd.edu/

Warner, B. (2001). "Asteroid Photometry at the Palmer Divide Observatory". *Minor Planet Bulletin* **28**, 30-32.

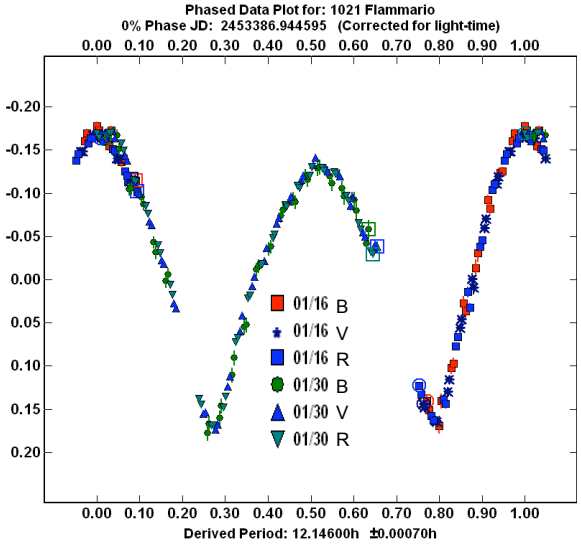

Figure 1: Lightcurve of 1021 Flammario, wrapped to P= 12.146 hrs.

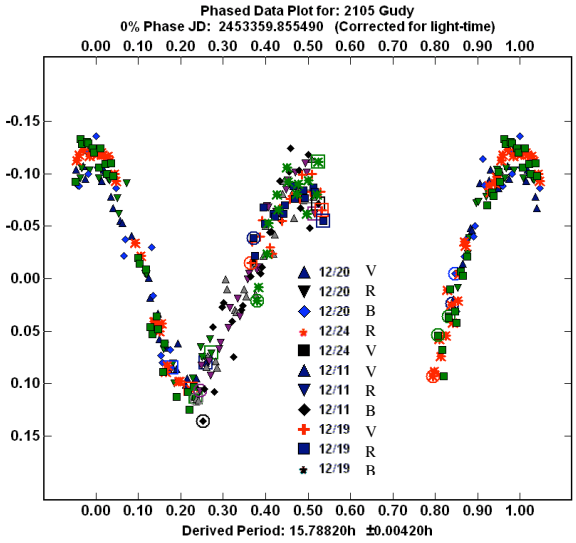

Figure 2: Lightcurve of 2105 Gudy, wrapped to P= 15.7882 hrs

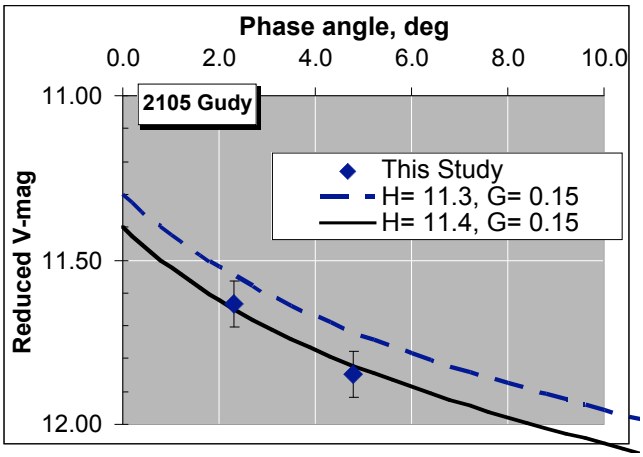

Figure 3: Phase curve fit for 2105 Gudy.