

2059-2081.

Tedesco, E.F. (1989). "Asteroid Magnitudes, UBV Colors, and IRAS Albedos and Diameters". In *Asteroids II* (R. Binzel, T. Gehrels and M. Shapley Matthews, Ed.), pp. 1090-1138. University of Arizona Press, Tucson.

Williams, J.G. (1989). "Asteroid Family Identifications and Proper Elements". In *Asteroids II* (R. Binzel, T. Gehrels and M. Shapley Matthews, Ed.), pp. 1034-1072. University of Arizona Press, Tucson.

Table I. Observation Circumstances

UT Date	α (deg)	D_{earth}	D_{sun}	#exps
96 Feb 16	17.6	1.593	2.549	5
96 Feb 22	24.7	1.629	2.557	4
96 Feb 24	27.1	1.643	2.560	31
96 Mar 22	55.5	1.907	2.600	16

THE LIGHTCURVE AND PERIOD OF THE MINOR PLANET 193 AMBROSIA

James A. DeYoung and Richard E. Schmidt
U.S. Naval Observatory
3450 Massachusetts Avenue NW
Washington, DC 20392-5420
(dey@herschel.usno.navy.mil)
(res@tuttle.usno.navy.mil)

(Received: 24 May
Revised: 20 August)

The minor planet 193 Ambrosia is found to have a photometric rotation period of 0.27420 ± 0.00025 days (6.5807 ± 0.006 hours) and an amplitude in the Kron-Cousins I-band of 0.532 ± 0.013 mag.

The minor planet 193 Ambrosia was selected for photometry after inspection of the list of photometric opportunities in Harris and Zappalà (1995). A total of 592 CCD images were obtained using a Kron-Cousins I-band filter and a Thomson CSF 1024x1024 front-illuminated CCD camera system. The telescope employed was the 0.61-m U.S. Naval Observatory Cassegrain located in Washington, DC.

Very little basic information is known about Ambrosia. Tedesco (1989) gives only the IAU magnitude coefficients which are $H = 9.80$ and $G = 0.014$.

Our photometry was performed on flat-fielded images using the synthetic aperture photometry method of DAOPHOT, Stetson (1987). Nightly differential lightcurves were produced with respect to an ensemble of bright unsaturated stars in the CCD's 8 arc minute field-of-view to reduce random errors in the photometry. All observation times were reduced to the Heliocentric Julian Date of the phenomena (HJD). See Table I for the observing log.

The period determination was done using the phase-dispersion-minimization technique, Stellingwerf (1978). Plots of phase versus normalized magnitude for all the indicated possible periods found in the periodogram were generated and compared. The only possible correct period of those indicated is

the 0.27420 ± 0.00025 day (6.5807 ± 0.006 hours) period.

The I-band lightcurve indicates a peak-to-peak amplitude of 0.532 ± 0.013 mag. The estimated scatter of a single point was 0.009 mag. No points were filtered as outliers. See figure 1 for the lightcurve.

References

Harris, A. W. and Zappalà, V. (1995). "Asteroid photometry opportunities November - January", *Minor Planet Bulletin* **22**, 45.

Stetson, P. B. (1987). "DAOPHOT: A

computer program for crowded-field stellar photometry", *Publ. Astron. Soc. Pacific* **99**, 191-222.

Stellingwerf, R. F. (1978). "Period determination using phase-dispersion-minimization", *Astrophys. Journ.* **224**, 953.

Tedesco, E. F. (1989). "Asteroid magnitudes, UBV colors, and IRAS albedos and diameters". In *ASTEROIDS II* (R.P. Binzel, T. Gehrels, and M. S. Mathews, Eds), pp. 1090-1138, Univ. Arizona Press, Tucson.

Table I. The 1995 observing log for 193 Ambrosia.

HJD - 2450000.0	Exposure (Seconds)	Phase Angle	Number of Images
63.4536 - 63.6241	90	14.5	150
68.4480 - 68.5849	60	15.8	164
69.4457 - 69.5885	60	16.1	177
107.4966 - 107.6166	90	27.1	101

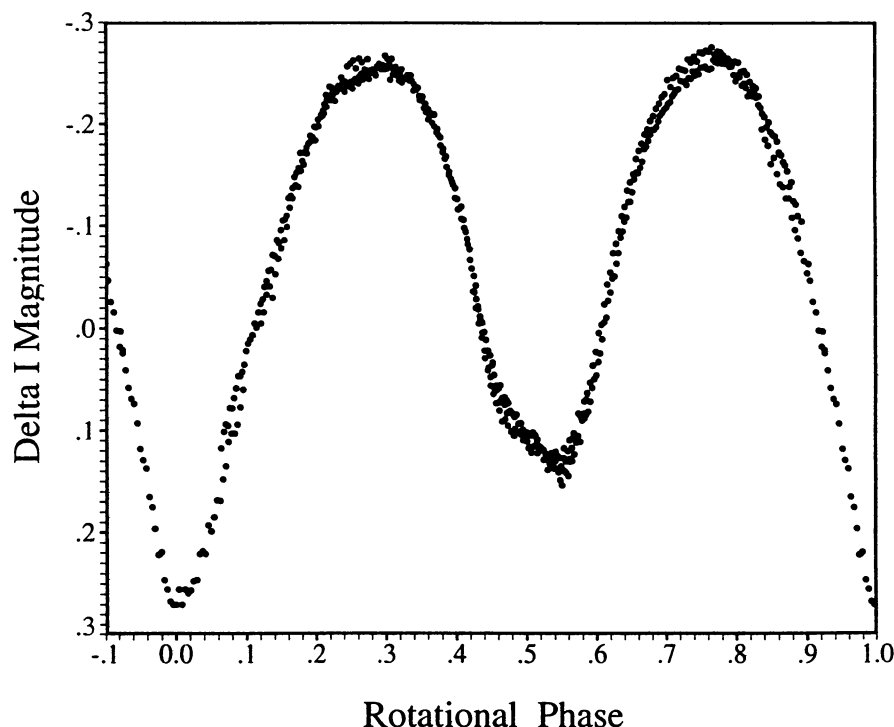


Figure 1. The instrumental I-band photometry rotational variation of 193 Ambrosia phase-folded using the period of 0.27420 days (6.5807 hours).

PHOTOMETRIC OBSERVATIONS OF MINOR PLANET 212 MEDEA

Bill Holliday
4538 Hogan
Corpus Christi, TX 78413
bholliday@mail.interconnect.net

(Received: 14 May Revised: 29 July)

CCD photometry of asteroid 212 Medea was performed in April 1996 to determine its rotational period and lightcurve amplitude. The period was found to be 10.25 ± 0.07 hours and the amplitude was 0.11 magnitudes.

Introduction

Minor planet 212 Medea was chosen for observations because it was at opposition during clear skies and the 1996 version of "Ephemerides of Minor Planets" did not show rotation lightcurve results for it.

Observations

The asteroid was observed for seven evenings during April 1996. On most evenings, especially April 18, clouds developed after only a few hours of darkness precluding long runs. On the night of April 24 the autoguider lost the guide star and the situation was not noticed for an half hour causing a gap in the data. Eventually adequate lightcurve fragments were obtained.

Four minute exposures were taken at five minute intervals between mid-exposure through a V filter. The telescope was a 25-cm F4.5 Newtonian located in Corpus Christi Texas. The detector was a SBIG-ST6 CCD operating at -15 deg. C. All images were dark subtracted and flat fielded. Nightly calibration was made to six or more Hubble guide stars appearing in the field with the minor planet. Differential photometry was performed on each image using the same Hubble guide stars as reference stars. Each night's lightcurve was converted to reduced magnitude and the apparent midpoint of the lightcurve was plotted against the phase angle. The plot indicated some nightly calibrations were in error by up to 0.2 magnitudes. This was within the error the calibration software had estimated. The lightcurves from each night were shifted up or down slightly so that their midpoints would fit a reasonable plot of reduced magnitude to phase angle. A composite lightcurve (Figure 1), was constructed after converting the measurements to reduced magnitudes for zero phase angle.

Results of the first three nights observing suggested a period between seven and

eleven hours. The final period solution of 10.25 hours is restrained by the many observations to within 0.07 hours. Other possible solutions were tested at 0.01 hour increments between 9.6 and 10.6 hours. Outside this range any other reasonable solution yields too few or too many maxima and minima cycles for a typical triaxial ellipsoid. Observational circumstances are noted in Table I. Because of the significant shifting of the nightly curves to correct for poorer than usual calibration the true value of the reduced magnitudes shown on Figure 1. could differ from those shown by 0.15 magnitude.

Results

The period was found to be restrained to within 0.07 hours of 10.25 hours and the amplitude of the lightcurve was determined to be 0.11 magnitudes.

References

Batrakov, Y. V. (1996). *Ephemerides Of Minor Planets for 1996*. Institute of Theoretical Astronomy, St. Petersburg, Russia

Table I. Observational Circumstances

DATE	RA	DEC	r	d	P.A.
96 4 9	13 9 5	-13 21 42	3.394	2.396	1.7
96 4 10	13 8 19	-13 17 30	3.395	2.396	1.6
96 4 16	13 3 50	-12 52 0	3.398	2.403	2.6
96 4 18	13 2 20	-12 43 3	3.400	2.408	3.2
96 4 24	12 58 7	-12 16 40	3.404	2.429	5.0
96 4 25	12 57 26	-12 12 17	3.405	2.434	5.3
96 4 26	12 56 47	-12 7 55	3.405	2.438	5.6

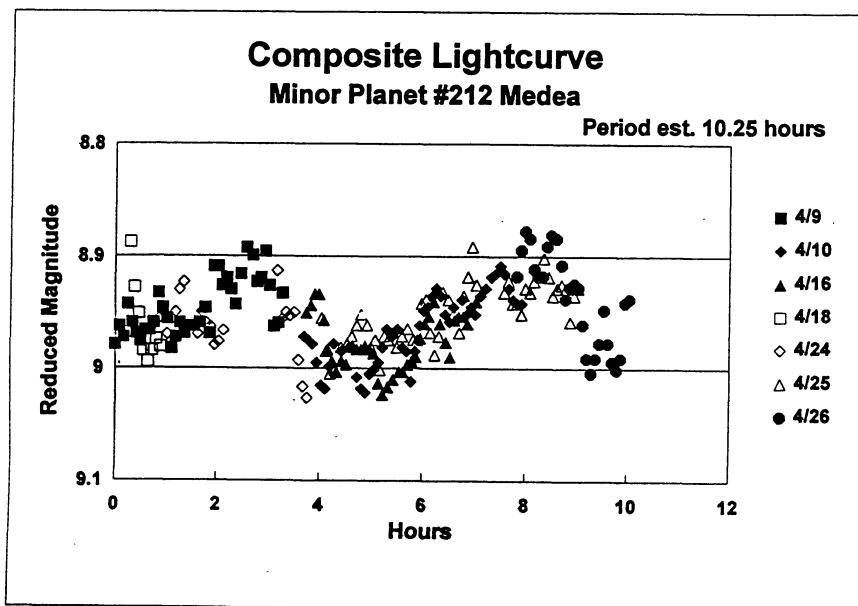


Figure 1. Lightcurve of asteroid 212 Medea during April 1996 based on a 10.25 hour period. The Y axis is reduced V magnitude for zero phase angle.