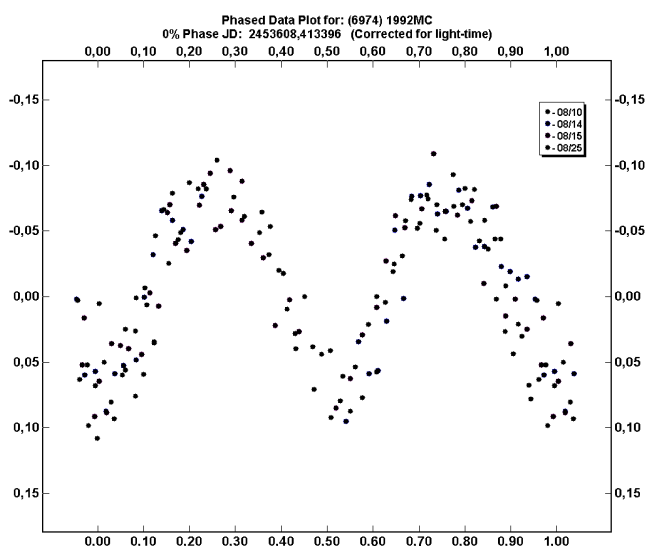
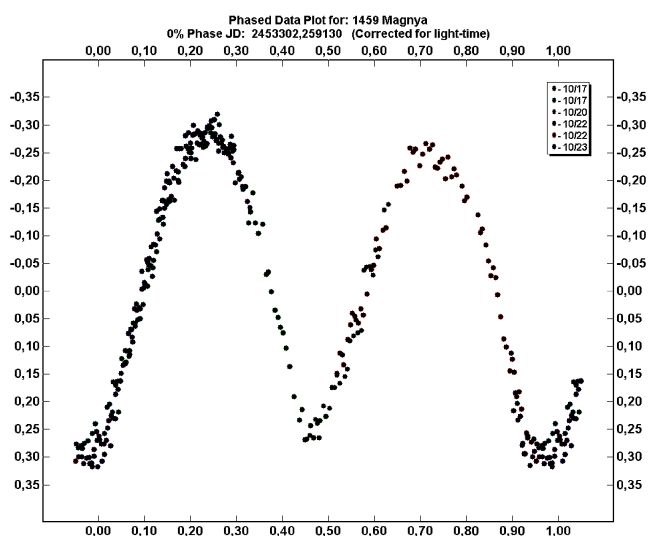
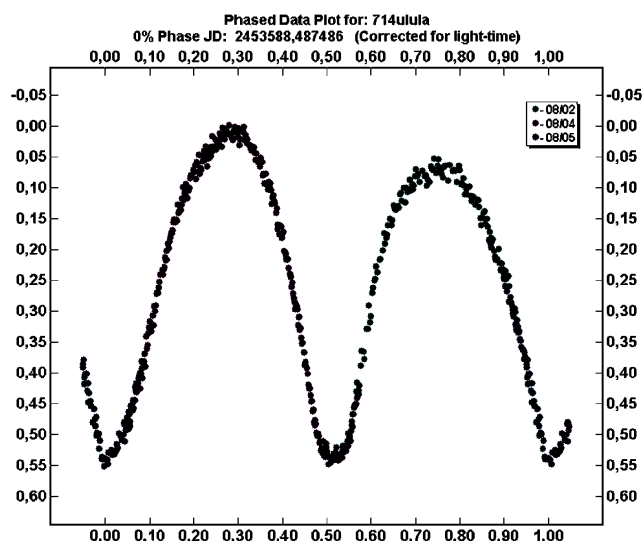




PROVISIONAL PERIOD DETERMINATION FOR 264 LIBUSSA

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Eleven nights of lightcurves of 264 Libussa indicate a rotation period of 9.238 ± 0.001 hours, or with somewhat less likelihood 18.476 ± 0.002 hours, and amplitude 0.04 ± 0.01 magnitudes.

Minor planet 264 Libussa is listed in Harris and Warner (2005) as having a period 7.056 hours, amplitude > 0.22 , and reliability code 2. This study was undertaken to improve the reliability of this result, and found that the listed period requires a large correction.

Differential CCD photometric observations of 264 Libussa were obtained on 11 nights between 2005 Feb 11 and March 18 by Walt Cooney at the Blackberry Observatory, Port Allen, Louisiana, USA (see Cooney and Robinson 2002 for a description), at which Frederick Pilcher was a guest observer for the first two nights. The images were measured and reduced by Pilcher using the Canopus program by Brian Warner. The data fit periods of 9.238 ± 0.001 hours (formal error) and 18.476 ± 0.002 hours equally well, with amplitude 0.04 ± 0.01 magnitudes. Harris (2005) considers the shorter period to be more likely. Figure 1 was constructed by binning 2 adjacent data points separated by not more than 4 minutes, in order to reduce the number of data points from 1809 to 920, and has been phased to 9.238 hours.

Lightcurves at different aspects in future oppositions will be required to definitively distinguish between the shorter and longer periods. Hutton (1990) and Armstrong et al (1996) have published for 264 Libussa amplitudes near 0.2 on the basis of data sets much less extensive than that presented here, and at other aspects. This supports the hypothesis that at the 2005 apparition this object was observed nearly pole-on. Harris (2005) suggests that while the second harmonic of a Fourier series dominates for most asteroid lightcurves, the first harmonic may dominate at a near polar aspect. This argument suggests that the shorter 9.238 hour period may be the correct one. Oppositions at which we urge our readers to obtain additional lightcurves if feasible occur in April, 2006; July, 2007 at -35 degrees declination (southern hemisphere observers please respond); and November, 2008. If lightcurves can be obtained at all of these opportunities it will probably be possible to obtain a shape model, pole position, and accurate sidereal period.

The authors wish to thank Brian Warner for continuing advice and support which made this investigation possible.

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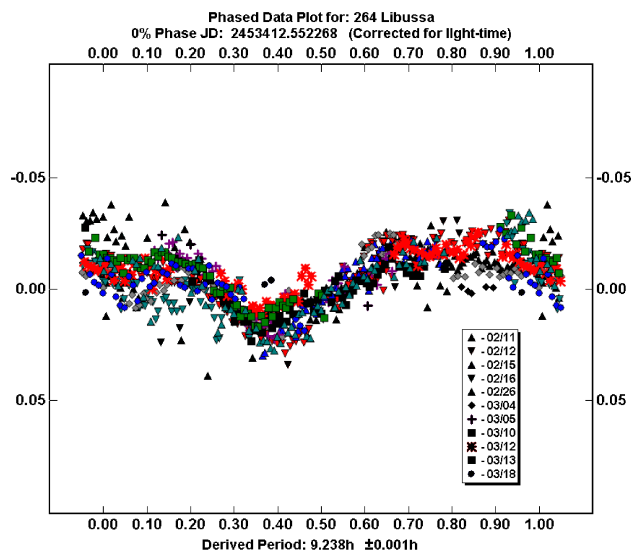
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MINOR PLANETS AT UNUSUALLY FAVORABLE ELONGATIONS IN 2006

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A list is presented of minor planets which are much brighter than usual at their 2006 apparitions. Close approaches of five minor planets: 1980 Tezcatlipoca, 3103 Eger, (11405) 1999 CV3, (23817) 2000 PN9, and (68950) 2002 QF15, are the highlights of the year.

The minor planets in the lists which follow will be much brighter at their 2006 apparitions than at their average distances at maximum elongation. Many years may pass before these minor planets will be again as bright as in 2006. Observers are encouraged to give special attention to those which lie near the limit of their equipment.

Five small minor planets will make moderately to extremely close approaches to Earth in calendar 2006 and are especially worthy of observational scrutiny. 1980 Tezcatlipoca has a moderately close approach to 0.330 AU November 17. At magnitude 13.1 on

November 28 it will be 1.5 magnitudes brighter than at any time until the year 2035. 3103 Eger has an approximate 3:5 commensurability with Earth, with close approaches every five years. These are now becoming rapidly less favorable, and this planet will not be nearly as bright for the rest of the 21st century as magnitude 13.2 which will be attained August 1. (11405) 1999 CV3 is brighter at magnitude 12.5 on August 10 and closer at 0.154 AU on July 31 than at any time since and including discovery, and until the year 2043. This planet is moving rapidly southward, being generally better observed from the northern hemisphere before maximum elongation and from the southern hemisphere afterward. (23817) 2000 PN9 becomes much closer and brighter in early March than at any time for the rest of the 21st century. It passes inferior conjunction March 5, becomes brightest at magnitude 12.0 two days later after moving 0.020 AU behind the Earth on March 6, then moves rapidly outward and fades to magnitude 16 on March 24. At far northerly declination planet 23187 will be observable only by northern hemisphere observers. (68950) 2002 QF15 reaches magnitude 14.3 on May 19 and minimum distance 0.125 AU on May 13. It will be even brighter and closer in May, 2019.

These lists have been prepared by an examination of the maximum elongation circumstances of minor planets computed by the author for all years through 2060 with a full perturbation program written by Dr. John Reed, and to whom he expresses his thanks. Elements are from EMP 1992, except that for all objects for which new or improved elements have been published subsequently in the Minor Planet Circulars or in electronic form, the newer elements have been used. Planetary positions are from the JPL DE-200 ephemeris, courtesy of Dr. E. Myles Standish. Dr. Reed's ephemeris generating program, a list of minor planet elements, and the JPL planetary ephemeris are freeware which may be obtained from the author by sending a 100 Megabyte zip disk and stamped, addressed return mailer. They cannot be downloaded directly over the Internet.

Any objects whose brightest magnitudes near the time of maximum elongation vary by at least 2.0 in this interval and in 2006 will be within 0.3 of the brightest occurring, or vary by at least 3.0 and in 2006 will be within 0.5 of the brightest occurring; and which are visual magnitude 14.5 or brighter, are included. For objects brighter than visual magnitude 13.5, which are within the range of a large number of observers, these standards have been relaxed somewhat to include a larger number of objects. Magnitudes have been computed from the updated magnitude parameters published in MPC28104-28116, on 1996 Nov. 25, or more recently in the Minor Planet Circulars.

Oppositions may be in right ascension or in celestial longitude. Here we use still a third representation, maximum elongation from the Sun, instead of opposition. Though unconventional, it has the advantage that many close approaches do not involve actual opposition to the Sun near the time of minimum distance and greatest brightness and are missed by an opposition-based program. Other data are also provided according to the following tabular listings: Minor planet number, date of maximum elongation from the Sun in format yyyy/mm/dd, maximum elongation in degrees, right ascension on date of maximum elongation, declination on date of maximum elongation, both in J2000 coordinates, date of minimum or brightest magnitude in format yyyy/mm/dd, minimum magnitude, date of minimum distance in format yyyy/mm/dd, and minimum distance in AU.