

References

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PERIOD DETERMINATION FOR 5878 CHARLENE

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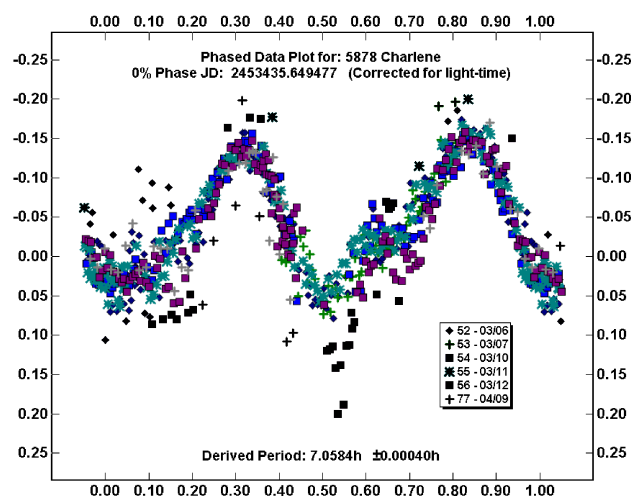
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Minor planet 5878 Charlene was observed on six nights in early 2005 and found to have a synodic period 7.0584 ± 0.0004 hours and an amplitude of 0.20 ± 0.02 mag.

Minor planet 5878 Charlene was discovered 1991 Feb. 14 by E. F. Helin at Palomar (Schmadel, 2003). No previous period determinations have been reported (Harris, 2005). Charlene was observed at Antelope Hills Observatory, MPC Code H09, located near Bennett, Colorado, USA, at an elevation of 1740 meters for five nights during 2005 March 6-12 UT. The equipment and instrumentation have been described in a previous paper (Koff, 2004). The first author (FP) was a guest co-observer on the final two nights of observation and also reduced the lightcurve. Images were obtained through a clear filter within an IR cutoff of 700 nm, calibrated with dark frames and flat field frames. Lightcurves were prepared using the program "Canopus" which is based on the method developed by Dr. Alan Harris (Harris et al., 1989) which uses aperture photometry. Differential photometry was performed to obtain instrumental asteroid magnitudes. Night-to-night comparison star variation was compensated by manually shifting individual night magnitude scales to obtain a best fit. A synodic period of 7.063 hours was established on the basis of these five nights. The authors thank Dan Klinglesmith for additional telescope time April 9 at the Frank T. Etsorn Observatory, New Mexico Institute of Mining and Technology, Socorro, New Mexico, USA, to obtain another lightcurve, this one with an R filter. The purpose of this additional lightcurve was to reduce the formal error in the period by extending the span of observation. This procedure is recommended to all observers, when circumstances permit, even after the period is already definitively established.

A total of 734 images were used to obtain a bimodal rather than monomodal lightcurve of 7.0584 hours period with 0.20 magnitude amplitude. The formal error is ± 0.0004 hour but a shift of at least 0.002 hours in phased period is required to increase the night-to-night scatter by an amount visually detectable. The minimum near phase 0.04 is wider and about 0.02 magnitude

higher than the minimum near phase 0.50. The maximum near phase 0.82 is about 0.02 higher than the maximum near phase 0.30. There is a flat portion in the rise near phase 0.63 which does not occur in the rise out of the other minimum. The complete lightcurve was covered on four of the six nights, and these features appear on all of the individual nightly lightcurves. A quadrimodal period of 14.1162 hours was also tried in which alternate extrema are nearly identical and showed the respective features described above for the 7.0584 hour lightcurve. We consider the high symmetry between alternate extrema highly unlikely for a quadrimodal lightcurve and therefore claim the 7.0584 hour period is the correct one.



Acknowledgements. The authors thank Dan Klinglesmith for telescope time to obtain an additional lightcurve on April 9. The first author thanks Brian Warner for providing the Canopus program and instruction in its use that enabled the preparation of the lightcurve.

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ROTATIONAL PERIOD DETERMINATION FOR 62 ERATO AND 165 LORELEY

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Lightcurve period and amplitudes for 62 Erato and 165 Loreley were measured at the Shed of Science Observatory in late 2004 and early 2005. The synodic period and amplitude of 62 Erato are found to be 9.22 ± 0.02 hr and 0.15 mag. The results for 165 Loreley are 7.22 ± 0.01 hr and 0.09 mag.

The Shed of Science Observatory is located in Minneapolis, Minnesota at an elevation of 271 meters. The observatory utilizes a 0.35 meter Schmidt-Cassegrain telescope operating at f8.6 with a SBIG ST10XE CCD camera binned 3x3, resulting in an image scale of 1.4 arc seconds per pixel. All observations were unfiltered. Asteroid 62 Erato was selected for observation from the CALL website operated by Brian Warner. In September, 2004, Ellen Howell and Mike Nolan of Arecibo Observatory posted a request on the Minor Planet Mailing List for a number of asteroid lightcurves. Asteroid 165 Loreley was included on that list.

62 Erato. Over three consecutive nights in January 2005, 675 observations were used to derive the synodic period of 9.22 ± 0.02 hours with an amplitude of 0.15 ± 0.01 magnitude, as shown in the figure. The lightcurve is not bimodal and is characterized by three maxima and three minima. Harris et al. (1992) estimated a period somewhat greater than 8 hours. However, Alvarez-Candal et al. (2004) recently reported a period of 5.675h based on an incomplete lightcurve. The current data were plotted with a period of 5.675h and was found to be completely incompatible with the Alvarez-Candal et al. result. In addition, the period spectrum based on the current data strongly supports the 9.22 hour period; however, a 13.82h solution cannot be ruled out. Measurements made during the same time period by Goncalves and Behrend (2005) also support the 9.22 hour period solution.

165 Loreley. Previous lightcurve measurements of Loreley by Schober et al. (1988) indicated a 7.22h period. Harris et al. (1991) also reported a 7.22h period. Roy and Behrend (2004) reported an 8.5h period. Our current data supports the 7.22h solution. The mismatch at 0.05 phase initially led to a slightly longer solution of 7.88h; however, the period spectrum from the current data does not clearly favor a single solution. On the other hand, the period spectrum of Harris et al. (1991) strongly indicates a 7.22h period. In light of the ambiguity in the current data, the 7.22h solution is favored, and shown in the figure. The mismatch at 0.05 is not explained in our data and further observations could be helpful.

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