

LIGHTCURVE AND ABSOLUTE MAGNITUDE OF 1909 ALEKHIN

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Observations of 1909 Alekhin resulted in a rotational period of 148.6 ± 0.2 h and an absolute magnitude of 12.91 ± 0.07 .

The asteroid 1909 Alekhin was chosen from a list of asteroids with suspect absolute magnitude values published by the Minor Planets Section of the Association of Lunar and Planetary Observers (ALPO) as part of their Magnitude Alert Project (MAP). Richard Miles, Director of the Asteroids and Remote Planets (ARPS) Section of the British Astronomical Association (BAA), suggested that I attempt to construct both a lightcurve and a phase curve from my observations.

For this project I used the Sierra Stars Observatory Network (SSON) 0.61-m robotic telescope located in California, USA. The work was partially funded by a BAA grant for which I am most grateful. Using the SSON telescope is simple and the owner, Rich Williams, has been extremely helpful in all matters relating to the operation of this facility. Imaging was conducted between 2009 March 24 and May 27. Images, each of 60 s duration, were taken through a V filter and spaced approximately 1 hour apart. Towards the end of the observing period the number of images that could be obtained was limited by the reducing hours of darkness, the waxing moon, and the decreasing altitude of the asteroid. Measurement of V magnitudes has become a relatively simple task by using a method in *Astrometrica* that converts r' magnitudes from the CMC14 catalog to V (Miles and Dymock, 2009). Magnitudes were measured using *Astrometrica* choosing the CMC14 catalogue while positions were similarly measured but using the USNO B1 catalogue. The relevant data were imported into *MPO Canopus* and a lightcurve and phase curve built up as each night's images were obtained. It soon became clear that the rotational period of this asteroid was unusual in its long duration. Long period asteroids have presented problems in the past due to the difficulty of combining session data when different comparison stars are used. This usually meant resorting to absolute or all-sky photometry. Inputting absolute rather than differential magnitudes made the combining of many nights' data a simple task since there was no need to use the CompAdjust form in *Canopus* to adjust the data from different sessions. Analysis of seventeen nights' images suggested that the rotational period was 148.6 ± 0.2 h (Figure 1). This being close to 6 days coupled with the short nights prevented a complete lightcurve being obtained. Petr Pravec of Ondřejov Observatory analysed my data independently and derived a unique solution of 148.8 h.

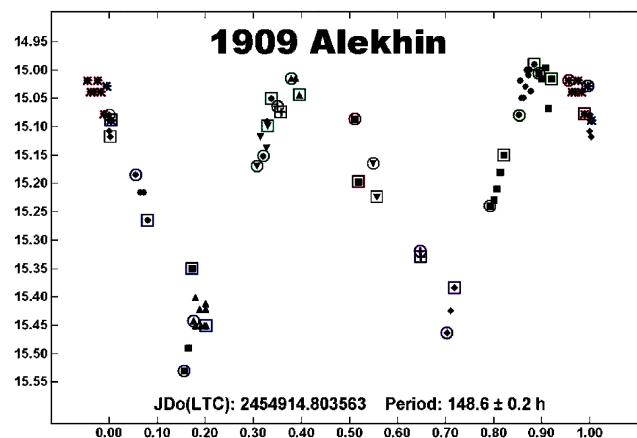
Using the *MPO Canopus H-G* calculator, the absolute magnitude, H , was determined to be 12.91 ± 0.07 with the value for the slope parameter, G , to be 0.19 ± 0.06 . The value given by the Minor Planet Center and JPL is $H = 12.3$, which is based on $G = 0.15$. The Asteroids Dynamic Site (AstDys) gives $H = 12.6$, also using $G = 0.15$. The new values for H and G values (and the observational data) have been forwarded to the Magnitude Alert Project for inclusion in a future *Minor Planet Bulletin* paper.

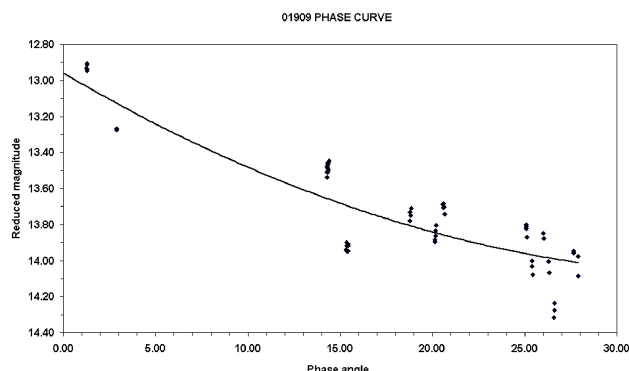
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<http://www.sierrastars.com/>





BYPRODUCT TARGETS DURING PHOTOMETRIC OBSERVATIONS FROM MODRA

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Lightcurve analysis of asteroids 1446 Sillapää, 2986 Mrinalini, 4979 Otawara, (12815) 1996 DL2, (14901) 1992 SH, (15914) 1997 UM3, (16717) 1995 UJ8, (24039) 1999 SS8, (27204) 1999 CY74, 44217 Whittle, (48073) 2001 FC13, and (99812) 2002 LW31 is reported.

The field of view of the 0.60-m f/5.5 telescope with AP8p CCD-camera at Modra is 25' x 25'. It sometimes enables us to observe some “byproduct asteroids” along with those that were part of our planned observations. A set of 12 of such byproduct asteroids is presented here.

1446 Sillapää. This target appeared by chance in the field of another asteroid being worked at Modra one month after it was studied by a group of observers in Photometric Survey for Asynchronous Binary Asteroids (Pravec, 2006). However, our new observations could not be joined with the previous data obtained by Pray, Higgins, and Marchis (Pravec 2009) since the amplitude of the lightcurve had increased by ~ 0.16 mag due to increased solar phase angle.

2986 Mrinalini and (12815) 1996 DL2. Only tentative lightcurves based on two short linked sessions are presented for these targets. A simple shape of the lightcurves is assumed. Except for the periods given here, one of ~ 11.9 h also fits the data nearly as well for both asteroids.

4979 Otawara. The synodic rotation period of this asteroid was previously found to be 2.707 ± 0.005 h (Doressoundiram et al., 1999; Le Bras et al., 2001; Fauvaud et al., 2003; and Fornasier et al., 2003). Our observations are in agreement, within errors, with those results.

(14901) 1992 SH. Two branches of mutually linked but short sessions were not enough to determine the synodic rotation period unambiguously. The presented composite lightcurve is not fully covered by observations. However, visual inspection of other possible composite lightcurves (e.g., $P = 3.7464$ h) offers only less probable results.

(15914) 1997 UM3. Two linked sessions were obtained two months after a favorable apparition for this asteroid. Except for the presented result, a period near 8.5 h would fit the data about as well. Based on the relative brightness of other objects in the field of view, it seemed that the asteroid was fainter by ~ 0.5 mag than predicted when using the absolute magnitude (H) and slope parameter (G) values given by Minor Planet Center.

(16717) 1995 UJ8, (48073) 2001 FC13, and (99812) 2002 LW31. Linked sessions indicate that these faint asteroids rotate slowly.

(24039) 1999 SS8. The rotation period was unambiguously and quickly derived due to the large amplitude of the lightcurve.

(27204) 1999 CY74 and 44217 Whittle. These asteroids were observed in the same field of view but only on two consecutive nights. Interestingly, the amplitude of their lightcurves was large and even the periods were similar. However, the results are not firm.

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