Short Paper

The rotation period of asteroid (4080) Galinskij

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A report of the Asteroids and Remote Planets Section (Director: R. Miles)

A rotation period of 7.35±0.02 hours was derived for asteroid (4080) Galinskij from V-filter images on three nights in 2009 August. The absolute magnitude (H=13.3) in the MPC database appears to be rather too low since the present observations yield a value of 13.75±0.05 for H in agreement with recent visual estimates. The rotational lightcurve exhibited an amplitude of 0.91±0.05 magnitudes.

Introduction

(4080) Galinskij was chosen from a list of asteroids with doubtful 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).[1] Recent observations by Andrew Salthouse and Gérard Faure had shown the asteroid to be fainter than predicted, indicating that its published absolute magnitude may be in error.[2]

Observations

The Sierra Stars Observatory Network (SSON) 0.61m f/10 Cassegrain remotely-operated robotic telescope located in California, USA (MPC observatory code G68) was used for this project.[3] Use of the SSON facility was simple and straightforward, and the owner, Rich Williams, was extremely helpful in all matters relating to its operation. The asteroid was first imaged on 2009 August 24 when 10 images, each of 60 seconds duration, spaced 30 minutes apart were taken through a V filter. The first night's observations showed significant variation over a short period so further observations, comprising 24×60 seconds exposures at 15-minute intervals, were scheduled for 2009 August 25 and 26 and completed successfully under good sky conditions.

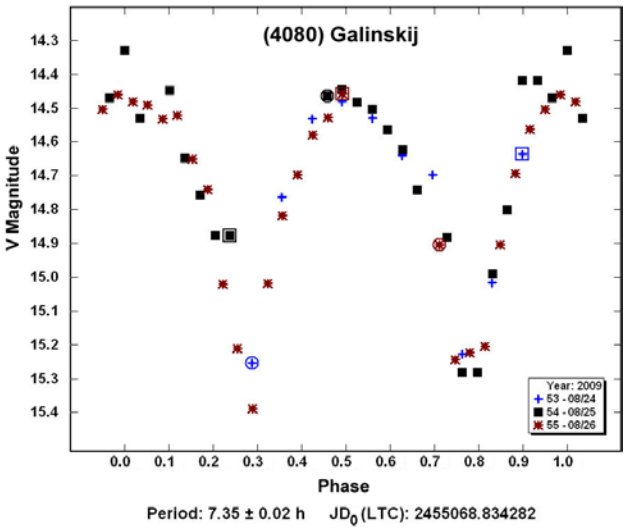

Figure 1. Lightcurve of (4080) Galinskij derived from observations on 2009 August 24–26.

Analysis

Deriving V magnitudes from astronomical FITS images has become a relatively simple task using recent versions of the software *Astrometrica,* as described in the recent paper by Miles & Dymock.[4,5] The images were analysed with *Astrometrica* v.4.5.1.377 to determine V magnitudes (using the CMC-14 catalogue) and positions (using the USNO B1.0 catalogue). The results are shown in Table 1. It can be seen that the observed brightness is 0.48 magnitudes fainter on average than the value predicted by the Minor Planet Center (MPC).[6] The data was imported into *MPO Canopus* v.9.5.0.9 and the resulting composite lightcurve is shown in Figure 1.[7]

Conclusions

(4080) Galinskij exhibited a lightcurve amplitude of 0.91±0.05 magnitudes and rotation period 7.35±0.02 hours (synodic) during its 2009 apparition. These values and the shape of the lightcurve are very similar to the values of 1.01 magnitudes and 7.36 hours derived in 2006 September by the Ondrejov Asteroid Photometric Survey.[8,9]

The absolute magnitude, H, was determined to be 13.75±0.10 using the *MPO Canopus* 'H and G calculator' together with an assumed value for the slope parameter, G, of 0.15. The value of H obtained from the MPC at the time of writing is 13.3 (G= 0.15).[10] This result confirms the visual reports of Salthouse and Faure referred to above.[2]

Table 1. Observations of (4080) Galinskij on 2009 August 24–26

Date and time (UT)	*V mag*
2009 08 24.20152	15.25
2009 08 24.22235	14.76
2009 08 24.24318	14.53
2009 08 24.26378	14.48
2009 08 24.28462	14.53
2009 08 24.30545	14.64
2009 08 24.32628	14.70
2009 08 24.34689	15.23
2009 08 24.36772	15.02
2009 08 24.38855	14.64
Average 2009 08 24	14.87
MPC 2009 08 24	14.4
2009 08 25.17235	14.49
2009 08 25.18277	14.47
2009 08 25.19318	14.51
2009 08 25.20360	14.53
2009 08 25.21402	14.59
2009 08 25.22443	14.65
2009 08 25.23485	14.77
2009 08 25.25545	14.91
2009 08 25.26587	15.31
2009 08 25.27628	15.31
2009 08 25.28670	15.02
2009 08 25.29712	14.83
2009 08 25.30753	14.45
2009 08 25.31795	14.45
2009 08 25.32814	14.50
2009 08 25.33855	14.38
2009 08 25.34897	14.56
2009 08 25.36980	14.48
2009 08 25.38022	14.68
2009 08 25.39064	14.79
2009 08 25.40105	14.91
2009 08 25.41147	14.91
Average 2009 08 25	14.88
MPC 2009 08 25	14.4

Date and time (UT)	*V mag*
2009 08 26.16934	14.96
2009 08 26.17976	15.30
2009 08 26.18994	15.28
2009 08 26.20036	15.26
2009 08 26.21078	14.96
2009 08 26.22119	14.75
2009 08 26.23161	14.62
2009 08 26.24203	14.56
2009 08 26.25244	14.52
2009 08 26.26286	14.54
2009 08 26.27304	14.55
2009 08 26.28346	14.59
2009 08 26.29388	14.58
2009 08 26.30429	14.71
2009 08 26.31471	14.80
2009 08 26.32513	15.08
2009 08 26.33554	15.27
2009 08 26.34596	15.45
2009 08 26.35638	15.08
2009 08 26.36656	14.88
2009 08 26.37698	14.76
2009 08 26.38740	14.64
2009 08 26.39781	14.59
2009 08 26.40823	14.52
Average 2009 08 26	14.99
MPC 2009 08 26	14.5

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References

1 ALPO Magnitude Alert Project: **http://astrosurf.com/aude/map/index_us.htm**
2 MAP Alerts, **#321** (2009 Aug 20) and **#323** (2009 Aug 29)
3 Sierra Stars Observatory Network: **http://www.sierrastars.com/**
4 *Astrometrica* software: **http://www.astrometrica.at/**
5 Miles R. & Dymock R., 'A method for determining the V magnitude of asteroids from CCD images', *J. Brit. Astron. Assoc.*, **119**(3), 149–156 (2009)
6 Minor Planet Ephemeris service: **http://scully.cfa.harvard.edu/~cgi/MPEph2**
7 MPO *Canopus*: **http://www.minorplanetobserver.com/MPOsoftware/MPOcanopus.htm**
8 Ondrejov Asteroid Photometry Survey: **http://www.asu.cas.cz/~ppravec/**
9 Collaborative Asteroid Lightcurve Link (CALL): **http://www.minorplanetobserver.com/astlc/LightcurveParameters.htm**
10 Minor Planet Center: **http://www.cfa.harvard.edu/iau/mpc.html**
11 BAA Robotic Telescope Project: **http://www.britastro.org/iandi/robotic02.htm**

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