The rotational period of asteroid 8077 Hoyle

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Abstract

This project studies the rotational period of asteroid 8077 Hoyle. A series of images of the asteroid were taken. The asteroid 8077 Hoyle and reference stars were located and magnitude of the asteroid were measured and constructed into light curve. The light curve shows a relationship between apparent magnitude of asteroid 8077 Hoyle and Julian Date.

The analysis from light curve shows that the rotational period of asteroid 8077 Hoyle is about 2.5 – 3.33 hour and magnitude during 17.1 to 18.4.

Introduction

Asteroids are astronomical object that non-circular shape, differently size, There are smaller than planets and mass isn't enough to unite as the planet.

Asteroid from telescope can see spot as star but asteroid moves when that compared with all reference stars in photo. In this project use asteroid 8077 Hoyle for study Objective to study rotational period of asteroid 8077 Hoyle that can be observed from changing magnitude and use to be database of asteroid 8077 Hoyle

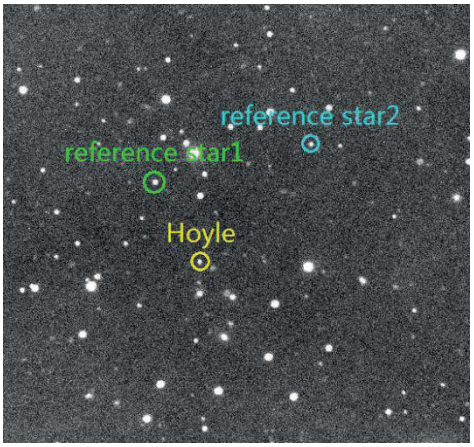
The research on rotational period of asteroid 8077 Hoyle from light curve .Axis of light curve is Julian Date minus reference Julian Date and magnitude of asteroid 8077 Hoyle

Materials and Methods

1. Studies and choose asteroids, Take photo of asteroid 8077 Hoyle by PROMPT telescope (Panchromatic Robotic Optical Monitoring and Polarimetry Telescopes) at Cerro Tololo Inter American Observatory (CTIO) Chile. The photo take time for duration 300 second in 1 photo every 10 minute for 3-7 hour in 1 day between June to October 2013

2. The photo was analyzed for the position of asteroid 8077 Hoyle and reference stars

3. Find the flux of asteroid 8077 Hoyle and reference stars using aperture photometry.



4. Calculate magnitude from Equation

$m1 - m2 = -2.5(\log (F1/F2))$

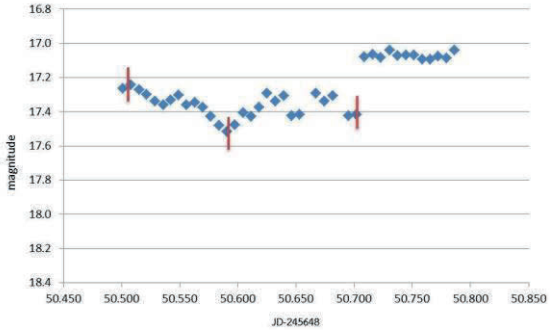
Where m1 is magnitude of asteroid 8077 Hoyle
m2 is magnitude of reference star
F1 is flux of asteroid 8077 Hoyle
F2 is flux of reference star

5. Graphing light curve from data. It show relationship between Julian Date minus reference Julian Date and magnitude of asteroid 8077 Hoyle where reference Julian Date in this research is 2456480 by Program Microsoft Office Excel

6. The rotational of asteroid 8077 Hoyle can analyze form

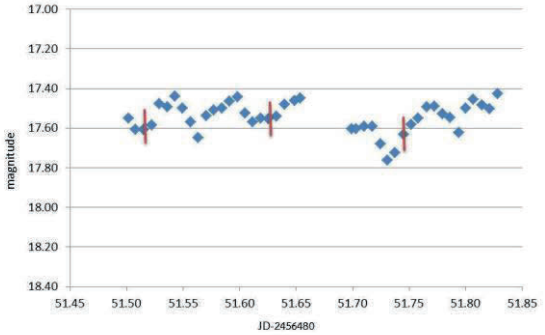
Light curve.

Results and Discussion



Graph 1 light curve from data. Axis of light curve is Julian Date minus reference Julian Date and magnitude of asteroid 8077 Hoyle reference Julian Date in this research is 2456480

Rotational period of asteroid 8077 Hoyle is2.5



Graph 2 light curve from data. Axis of light curve is Julian Date minus reference Julian Date and magnitude of asteroid 8077 Hoyle reference Julian Date in this research is 2456480

Rotational period of asteroid 8077 Hoyle is2.75

From graph number2 of the series number7. That is analyzing of asteroid 8077 Hoyle. By the complete period the point of graph is 16-17 point as 160-170 minute; 2.67-2.83 hour. Change it to days and result is 0.111-0.118 days.

Conclusions

From the graph analysis light show the relationship Between Julian Date and magnitude of asteroid 8077 Hoyle. It can be concluded that the asteroids 8077 Hoyle. Rotational period of asteroid 8077 Hoyle about 2.5-3.33 hours and have a range of magnitude from 17.1 to 18.4

Acknowledgements

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