

The Study of Factors Affecting the Brightness of Venus
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Abstract

The purpose of this research is to study the factors affecting the brightness of Venus. In this work, the data was observed between January 3rd, 2020 - May 6th, 2020 by refracting telescope and using CCD camera to record photographs. The light metering was performed by the photometry method. The results of daily light photometry were graphed to correlate with factors expected to influence brightness of Venus including distance from the Earth and illumination. The database was analyzed by the Stellarium program. The distance from the Earth is the factor that affect on brightness of Venus. Venus is the brightest, when Venus's orbit lies closer to the Earth because Venus has the more apparent diameter along with having appropriate illumination.

Introduction

Venus is so bright that it becomes the third brightest object in the sky after the Sun and the Moon. Venus looks like a moon-like crescent which allows observers through the telescope. Therefore, when you were observing Venus daily, Venus may change its brightness every day, so the researcher is interested on the factors that affect the brightness of Venus, including distance from the Earth and illumination.

Methodology of research

1. Data Collection

1.1 Determine the location and range data by selecting data collection after an hour of sunset. The storage facility is the South West Meteorological Department Phuket, which collects data from January 3rd, 2020 to May 6th, 2020

1.2 Observation was recorded by the Meade LX85 SERIES 5 refracting telescope, lens diameter 120 mm, focus length 700 mm, and recording with CCD camera model ASI224MC. It was controlled through the MaxIm DL 5 program by recording 4 frame types. Light and Dark images have exposure time of 0.0004 seconds for each image.

2. Data analysis

2.1 Analyze the photometry by performing photometry metering in the Iris program, then consider the similar brightness values of each day while considering the brightness trend from the previous day and analyzed for an average.

2.2 Collect data on factors that affect the brightness of Venus, including distance from the Earth and Illumination using daily database from Stellarium program.

2.3 The mean daily brightness of Venus graphed their correlation with factors studied in Microsoft excel. Then determined the trend of brightness of Venus with the factors studied.

Result and Discussion

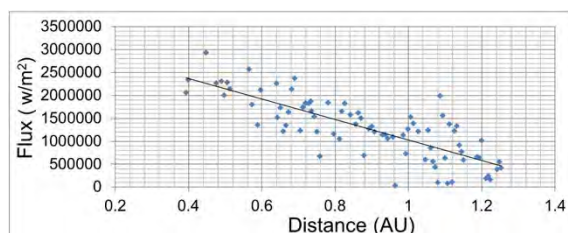


Fig 1. Distance from the Earth.

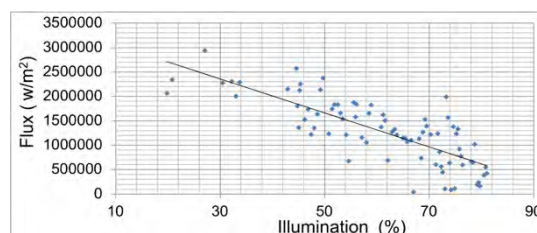


Fig 2. Illumination

Conclusions

The brightness of Venus was influenced by two factors. For the first factor, distance from the Earth affects the brightness of Venus, when Venus moves closer to the Earth, Venus becomes brighter (shown in Fig 1) and the distance from the Earth effects the apparent diameter of Venus, with the brightness of Venus likely to increase as Venus becomes more apparent in diameter. Moreover the distance from the Earth related to the elongation, elongation is less when Venus moves closer to the Earth. The second factor is Illumination, Venus' brightness increases as Venus has lower illumination (shown in Fig 2). Illumination of Venus is related to the elongation. When considering various factors found that the brightness of Venus each day has changed. It is influenced by the above two factors including distance from the Earth, illumination and the apparent diameter. The Venus is the brightest when Venus lies closer to the Earth because Venus has the more apparent diameter along with having appropriate illumination.

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