

The Study of Relationship between the Lifetime and the Area of Sunspot.

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Abstract

The purpose of this research is to study the relationship between the lifetime of sunspots with the area of sunspots. By using the database online on <http://www.spaceweatherlive.com> from 2001 to 2015. The study found that the lifetime of the sunspot with the largest area is correlated in the equation $Y=1.1486X^{0.4385}$. The relationship between the lifetime of the sunspot and the initial size is correlated following in the equation $Y=1.7728 \ln(x) + 0.5407$.

Introduction

Sunspots are temporary phenomena on the Sun's photosphere that appear as spots darker than the surrounding areas. They are regions of reduced surface temperature caused by concentrations of magnetic field flux that inhibit convection. Sunspots usually appear in pairs of opposite magnetic polarity. Their number varies according to the approximately 11-year solar cycle.

Methods

Study of the relationship between the lifetimes of sunspots and the largest area size.

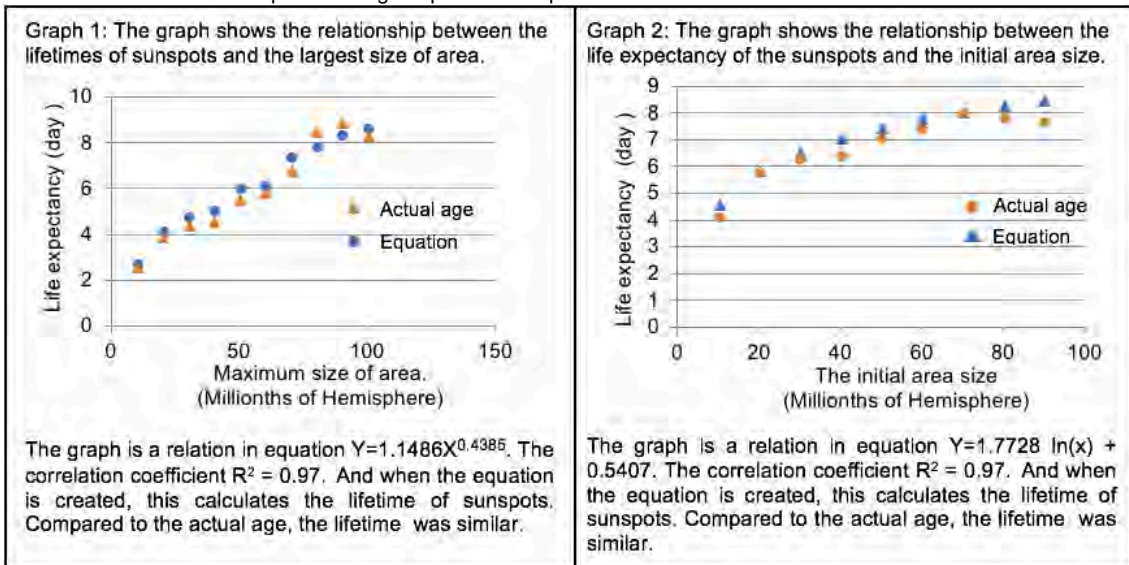
- Collect data of the lifetime of sunspots with the largest area size.
- Plot graph to study the relationship between the lifetimes of sunspots and the largest area size.
- Study the relationship by creating the relationship equation in various forms.
- Apply equations to calculate the lifetime of new sunspots.

Study of the relationship between the lifetimes of sunspots and size of the initial area.

- Collect data of the lifetime of sunspots with the initial area size.
- Plot graph to study the relationship between the lifetimes of the sunspots and size of the initial area .
- Study the relationship by creating the relationship equation in various forms.
- Apply equations to calculate the lifetime of new sunspots.

Results and Discussion

The study found that the equation of calculation of lifetime of sunspot with large area and initial size are related with the lifetime of new sunspot following Graph1 and Graph 2 below.



Conclusions

The lifetime of sunspots related to their size. The relationship between the lifetime of sunspots with the area can be explained as the equation for predicting the age of a sunspot. The study found that the lifetime of the sunspot with the largest area is correlated in the equation $Y=1.1486X^{0.4385}$. The relationship between the lifetime of the sunspot and the initial size is correlated following in the equation $Y=1.7728 \ln(x) + 0.5407$.

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Reference

Matipon Tangmatitiam, (2013). The Handbook of Astronomic Workshop, Chiang Mai: Educational Astronomic Information Service Center.