

The Study of the Types of Sunspots Affecting on Solar Flares.

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Abstract

This project studied the type of sunspots that influence the solar flare. The objectives of this study were the relationship between sunspots in its 24th solar cycle (2008 - 2018) and the solar flares. From the result, the relationship between Hale class, the position and the area of sunspots that affects the solar flare and the relationship between the probability of the solar flare and the size of the sunspots in comparison with the level of flaring level C, M, and X.

Introduction

The radiation from the solar flares inevitably affects the world. The flare caused by the sun affects the ionosphere of the earth, causes the satellite to receive damage which affects the communication. This affects human lives.

Method

Part 1 : Data Collection

1. Use the data of sunspots and the solar flares including the eruption from www.solarmonitor.org to analyze the data according to the related studying variable as follows.

1.1 The area of the sunspot classified by the size of the sunspots. And Graph 1 show the relationship between the size of sunspots and solar flares.

1.2 Hale class classified by the characteristics of the different magnetic field which classified into 5 different categories are α , β , $\beta\delta$, $\beta\gamma$, and $\beta\gamma\delta$. And the data of the annual average flaring level of solar flare of each Hale class in the year of 2010, 2014, and 2016. (See in Graph 2)

1.3 The position of the sunspot classified by the latitude of the sun between the 35 degrees north to the 35-degree south. (See in Graph 3)

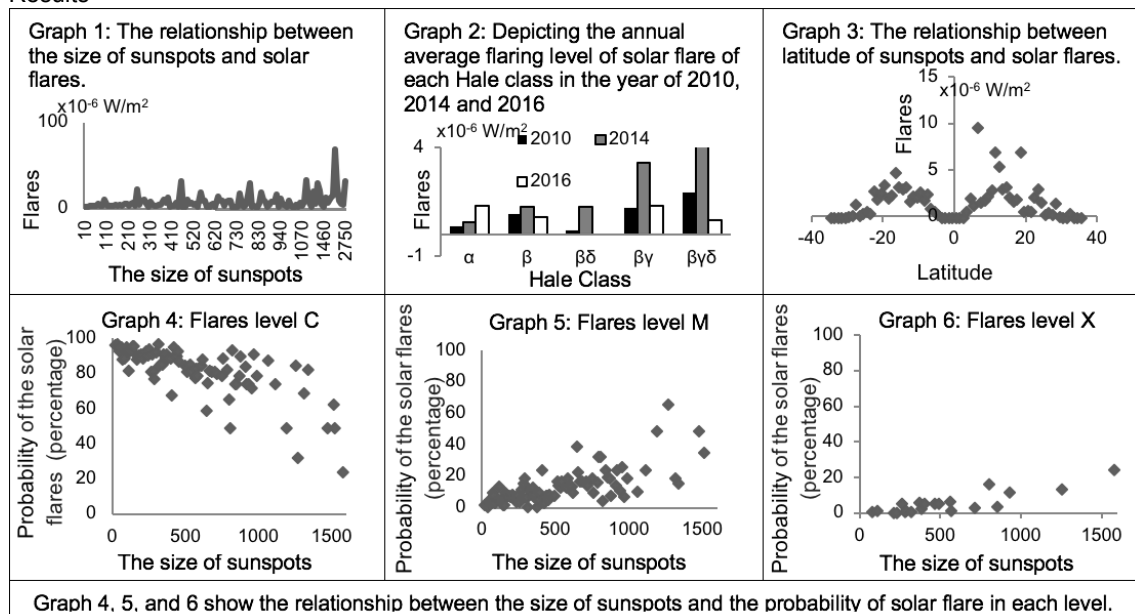
Part 2 : Data Analysis

2. The information of the solar flare caused in each sunspot compared to the relationship in an annual basis.

3. Analyze the relationship between the area of the sunspot and the probability 3 levels of solar flare are C, M, and X. (See in Graph 4, 5, and 6)

4. Analyze the relationship between the size of the sunspots, the Hale classification and the latitude of the sunspots that affects towards the solar flares.

Results



Conclusions and Discussion

According to the study, it has been found that Hale class $\beta\gamma\delta$ had more intense eruptions than the other Hale classes and almost all flaring eruptions were at the 10-20-degree latitude north and south. There is no evidence of the occurrence of such a situation on the equator of the sun. When considering only at each level of the solar flares, it has found that the area of each sunspot increased that influences the level of M and X would be increased as well. However, C level is less likely to occur.

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Reference

Matipon Tangmatitam, (2017). The Handbook of Astronomic Workshop, ChiangMai: Educational Astronomic Information Service Center.