The relationship between sunspots and solar flares

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Abstract

This study used images of sunspots in visible wavelengths and images of solar flares in X-ray wavelengths to find the relationship between sunspots and solar flares. The study found that solar flares occur on sunspot, 89% and 77% in 2011 and 2015 respectively. The relationship between the size of sunspots and intensity of solar flares has found that the size of sunspot and the solar flares has the random relationship. So we can't estimate the intensity of solar flares from the photographs of sunspots. The graph of a histogram of the level of solar flares over a five-year period reveals that the year 2011 was the year of solar maximum.

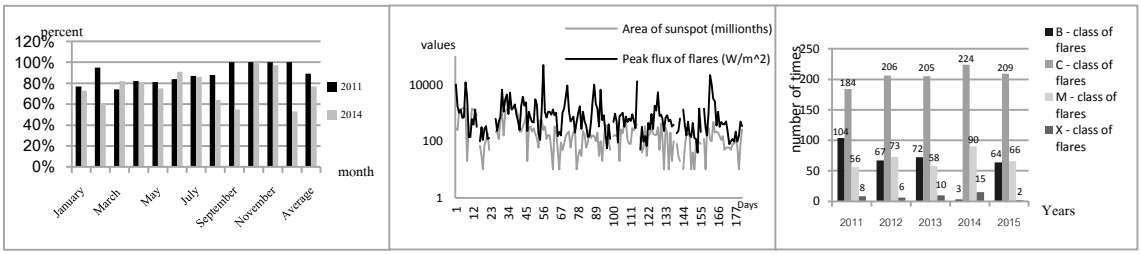
Introduction

Solar flares usually occur at sunspot. The relationship between sunspots and solar flares may help me estimate the intensity of solar flares from the photograph of sunspots .The intensity level of solar flares is from high to low, which is X, M, C, B and A . It doesn't affect to human directly because it cannot pass through the atmosphere of the Earth. However, it affects the GPS or satellite.

Materials and Method

1. Compare the photos of sunspots analyzed from the SOHO database with the photos of solar flares analyzed from the database of Hinode, then Adobe Photoshop was used to find the position of the sunspots and solar flares. The data was collected in the percentage in 2011 and 2015.
2. Collect the area of sunspots and intensity of solar flares from database receiving from the first step.
3. Create a graph of the relative size of sunspots and intensity of the solar flares from the data in the second step.
4. Collect the data of intensity of solar flares from the database for 5 years, and then create a graph of a histogram of the level of solar flares.

Results and Discussion



Conclusion

-The study found that solar flares occur on sunspot, 89% and 77% in 2011 and 2015 respectively.
- The graph showing the relationship between the size of sunspots and intensity of solar flares has found that the size of sunspot and the solar flares has the random relationship.
- The graph of a histogram of the level of solar flares over a five-year period reveals that the year 2011 was the year of solar maximum.

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