

Diagnosing flare-productive active regions using EUV images

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Solar flares and coronal mass ejections (CMEs) are the most significant phenomena for space weather. Radiation hazard from solar flares and CMEs may cause significant damage not only to the Earth but also to the satellites on geocentric orbits and deep space probes. Furthermore, as some space probes which observe partial images of the Sun such as Hinode, the information may also enable us to manage an efficient observation. Therefore, to establish of the flare prediction system for deep space probes is one of the most essential tasks in space weather researches.

Now, we can obtain the backside EUV images of the sun, by the Solar Terrestrial Relations Observatory (STEREO). In order to develop a flare prediction algorithm for deep space probes by using STEREO EUV images, we analyzed full disk 195A images obtained by SOHO/EIT. We examined the differences between the time profiles of EUV intensity of flare productive active regions (ARs) and those of non-flare productive ARs. We found that there are bright pixels in flare productive ARs even when flares were not occurring. On the other hand, in the non-flare productive ARs, the possibility of the appearance of mildly bright pixels is much less than that in the flare productive ARs. This difference possibly may be used for an indicator of flare productivity of each AR.

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