

PEM030-P07

Room:Convention Hall

Time:May 26 10:30-13:00

## Hinode flare catalog and statistical analyses of solar flares

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The catalog of solar flares have been made which were observed by three instruments (SOT, XRT, EIS) onboard the Hinode satellite from October, 2006.

Recently, the catalog or the event list of observing data of satellite are open to the public, and it has been utilized by a lot of researchers for a statistical research and the event extraction of the flare.

Field of view (FOV) of Hinode satellite does not always cover the full sun - that depends on the observing target. So, even if Hinode observes the Sun during the solar flare, that solar flare is not necessarily observed by the Hinode. Therefore, this Hinode flare catalog is expected to be utilized for a lot of researchers for flare analyses.

The procedure to make the Hinode flare catalog is as follows;

(1) Derive the solar flare event to which the flare site is known from the SSW latest image page (<http://www.lmsal.com/solarsoft/lastevents/>) of LMSAL.

(2) Derive the observational data during the flare and which flare position was located in the FOV of each instrument, and count the number of observing images.

(3) Compare with the RHESSI flare list, and check the maximum energy range of hard X-rays observed by the RHESSI.

By using the method of (1), we could include the many flares in our flare catalog. Now more than 3000 event was listed in the catalog, and more than 50% of them were observed by the Hinode satellite. These Hinode images and the summary plot of GOES X-ray also will be available on the web site soon.

Next, we introduce the example of analysis by using the Hinode flare catalog. One of these is the statistical analysis of white light flares. In association with a solar flare, we sometimes observe enhancement of visible continuum radiation, which is called a 'white-light flare'. Since close correlations of white light and hard X-ray emissions occur in many events, there is some consensus that the origin of white-light emission is accelerated particles, especially non-thermal electrons.

We analyze one of the white light flares occurred on December 14, 2006 in detail. We use G-band data of SOT as white light emission and hard X-ray data observed by the RHESSI satellite. We compared the white-light power and the electron power assuming a blackbody for the white light and the thick-target model for the non-thermal electrons, obtaining a good correlation (Watanabe et al., 2010).

In this paper, we present a statistical analysis of the SOT white-light events and discuss the flare parameters. We also review models to explain the observations in terms of particle acceleration.

Keywords: solar flare, particle acceleration