

## A statistical analysis of sudden energy release events in quiet region observed in soft X-ray.

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There are many sudden energy release events in the Sun, such as solar flares and giant arcades some of which have a large geoeffectiveness accompanying CMEs. In particular, solar flares which are occurred in active regions have a relation of the power-law between their energies and occurrence rate. It means that they do not have any characteristic scales. Therefore, it is suggested that solar flares in active regions exhibit a self-organized criticality (SOC), but the reason has not been made clear yet. On the other hand, giant arcades, which are sudden energy release events occurred in quiet regions and have physical properties similar to flares, have not been studied yet the distribution of energy frequency. It is possible that there are some difference in the energy storage process between active regions, where flux emergence and shear motion are dominantly convect energies from the subsurface to the corona, and quiet regions where such a process is rarely observed. Accordingly, comparing the statistical characteristic of the energy release events in active region and quiet region, we may be possible to get some new information between the energy store process and SOC.

In this research, we survey sudden energy release events in quiet region observed with the Soft X-ray Telescope (SXT) aboard Yohkoh and research its statistical characteristic. In former studies, it was reported that the power-law  $a$  index of solar flares was showed  $a = -1.4 \sim -1.8$ . In order to compare with statistics of flares, it is desirable to study the distribution of energy frequency in quiet region. Although we should study the energy frequency of quiet region event for direct comparison with flares, it is difficult to obtain that of giant arcades because of their large uncertainty caused by heat conduction and radiative cooling. For this reason, we substitute the distribution of the event size for energy frequency as a first step. We already surveyed 241 samples in quiet regions and found their power-law index of its event size distribution is showed  $a = -1.6$ . We will also present analysis of the distribution of their soft X-ray intensity which is ongoing.