

## Magnetic field configuration and its evolution of a highly flare-productive active region in September 2005

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Solar activities, such as flares and Coronal Mass Ejections (CMEs), have various effects to the interplanetary medium, the geomagnetic field, and the Earth's ionosphere and upper atmosphere. In order to understand the Space Weather, we need to understand the mechanisms of solar activities.

Active regions on the Sun have different flare productivities with each other. Some regions produce many large flares, while others produce no flares. The key factor of a high flare productivity is the complexity of magnetic field configuration of the region. One of the well-known characteristics of flare-productive regions is the delta-type magnetic configuration. The delta-type region has umbrae with both magnetic polarities belong the same penumbra.

The active region NOAA 10808 showed the highest flare activity during the current solar cycle (cycle 23) in September 2005. We studied the formation process of delta-type magnetic configuration using SOHO/MDI magnetograms. We also studied the evolution of magnetic shear and H-alpha filaments using H-alpha full disk images and full disk vector magnetograms obtained with Solar Magnetic Activity Research Telescope (SMART) at Hida Observatory, Kyoto University. In this paper, we summarize the characteristics of magnetic field configuration of this region and discuss its relation to high flare activity.