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## Hinode observations of activities in emerging flux regions

Toshifumi Shimizu<sup>1\*</sup>

<sup>1</sup>ISAS/JAXA

After a long silent period in the solar minimum phase, the Sun is gradually increasing its magnetic activities and produces sunspots and active regions on the surface, although slow increase. Sunspots are formed with successive emergences of magnetic flux from below the surface, Emergences trigger microflares and jets frequently, and occasionally flares. A large-scale emergence activity may cause large flares, which give influences to the geo-space environment. Thus, understanding natures of magnetic emergences and their associated activities is one of important topics in space weather researches. The solar observing satellite "Hinode" has been performing continuous observations of photospheric magnetic fields, chromospheric features and X-ray corona with the unprecedented high spatial resolution and it is an observatory suitable for investigating the relations between emerging activities and dynamics in the atmosphere. This presentation will present a continuous observation of the emerging flux region in 29-31 December 2009, which successfully captures the temporal evolution from before the emergence to the formation of a large sunspot, and discuss the magnetic field configuration responsible for activities such as microflares and jets (plasma ejections). A remarkable finding is that microflares and jets are produced with high frequency in the magnetic channel formed in the developing sunspot, and the magnetic field configuration observed there is never discussed so far.

Keywords: Sun, Emerging Flux, Flares, Jets