

**M41a Active Region Evolution of a Flare-productive Sunspot Group (NOAA 10486, 2003 Oct.)**

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We report the evolutionary characteristics of a large sunspot group NOAA 10486 (2003 Oct.) with a strong flare activity and discuss a twisted flux rope model of this region.

What is the common magnetic field configuration among flare-productive active regions? In our previous studies, we have found that the magnetic neutral line shows a rotational motion in a  $\delta$ -type active region NOAA 9026, where three X-class flares successively occurred (Kurokawa et al. 2002). During the current solar maximum (cycle 23), we studied the evolution of all the active regions that have produced at least one X-class flare and have been observed by SOHO/MDI magnetograms. The active region NOAA 10486 is the most flare-productive region during this solar cycle, that produced seven X-class flares including X28 flare on Nov. 4, 2003. 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 vector magnetograms obtained at Huairou Solar Observing Station and H $\alpha$  images obtained with the Sartorius telescope at Kwasan Observatory, Kyoto University. In this active region, we found that a development of a strong magnetic shear with new magnetic flux emergence along a magnetic neutral line plays an important role for the trigger of the X-class flare on Oct. 28. Based on these observational characteristics, we discuss the model of emerging bundles of a magnetic flux rope and its causal relation to the trigger of strong flares.