

## Triggering Mechanism for the Filament Eruption on 2005 September 13 in Active Region NOAA 10808

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Investigating trigger mechanism of filament eruption is one of the most important subjects in the field of space weather research, because such ejection of plasma and magnetic fields from the sun lead to a significant disturbance of the magnetosphere and affect human life. For space weather forecast, we need to understand and predict the filament eruptions. From this viewpoint, we focus on the event that occurred in a flare-productive active region.

On 2005 September 13 a filament eruption accompanied by a halo CME occurred in the most flare-productive active region NOAA 10808 in Solar Cycle 23. Using multi-wavelength observations before the filament eruption on September 13, we investigate the processes leading to the catastrophic eruption. We find that the filament slowly ascended at a speed of 0.1km/s over two days before the eruption. During slow ascending, many small flares were observed close to the footpoints of the filament, where new magnetic elements were emerging. On the basis of the observational facts, we discuss the trigger mechanism leading to the filament eruption. We suggest that a series of small flares played a role in changing the topology of the loops overlying the filament along the neutral line. They gradually changed the equilibrium state of the filaments and caused the filament to ascend slowly. When the filament approached the critical point for loss of equilibrium, the C2.9 flare occurred and directly led to the catastrophic filament eruption right after itself.