

Magnetic helicity injection in the 2001 April 10 solar flare

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Kusano et al. (2004) suggested that the annihilation of magnetic helicity could be a triggering mechanism of solar flares.

Furthermore, there are some observational phenomena, which have been reported to support the model, such as such as brightenings on the helicity inversion lines in the pre-flare phase (Miike et al. 2004), formation of two-ribbon structure along the helicity inversion lines in the main phase, and so on, have been reported.

We examined magnetic helicity injection in an X2.3 class flare which occurred on 2001 April 10, at an active region NOAA 9415.

By analyzing observational data of vector magnetograms of the active region, and by following the method which Kusano et al. (2002) suggest, we investigated the energy storing process before the flare and trigger mechanism which excites large energy release during the flare.

We also analyzed observational data of the flare obtained in various wavelengths, and examined the relationship between the helicity injection and observed phenomena, e.g., emerging flux region, filament formation and its destabilization.