

[S007] Pre-flare activity of a M1.2 X-ray flare

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We examine the pre-flare activity of a M1.2 X-ray flare in AR8440 using GOES, Yohkoh SXT, and TRACE 1600Å data. We note a weak enhancement (i.e. flare precursor) of GOES X-ray curve about four minutes before the flare starting time. This enhancement corresponds to pre-flare brightenings that occurred on one footpoint of the flare loop in SXT images. A series of TRACE images show that there was a small-scale S-shape sigmoid just at the location of the pre-flare brightenings and then three episodes of UV brightenings associated with the sigmoid. Its size is about 20 arcsec and the life span of each episode is about three minutes. These UV brightenings seem to be small-scale reconnections due to the following reasons: (1) The last episode is exactly coincident with the GOES pre-flare activity. (2) These brightenings are located on the polarity inversion line in BBSO magnetograms. (3) The brightenings were preceded by the interaction between sheared loops. (4) As a result, large-sized rising loops were formed. Our results support that the pre-flare activity be composed of small-scale reconnections.

[S008] Linear Force Free Extrapolation and Magnetic Twist of EUV Coronal Loops

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The linear force free field construction is a simple and fast method that models the magnetic field above the photosphere. We present how to determine the large scale three-dimensional configuration of the coronal magnetic field of an active region using SOHO/MDI and TRACE 171Å data. Specifically we focus on how to deal with the boundary effect and the perspective effect. We have constructed and examined coronal magnetic fields of 29 active regions, and we could identify 11 coronal loops that were well-fit by linear force free field. We applied the twisted flux tube model of Chae(2005) to these EUV coronal loops and found that they have twist values from 1.5π to 2.5π . Our result suggests that the winding number of EUV coronal loop may be around one.