[구SO-17] The Role of Magnetic Reconnection in the 2004 August 18 Solar Eruption

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We present a study of the 2004 August 18 solar flare, in which a prominence eruption is clearly visible as a bright helical structure on (E)UV images from the Transition Region and Coronal Explorer (TRACE) and H-alpha filtergrams of Big Bear Solar Observatory (BBSO). The associated coronal mass ejection (CME) is traced with the white light images of Mouna Loa Solar Observatory (MLSO) covering the low corona (down to 1.08 solar radii), in order to determine its causal relationship with the flare. Used as a signature of magnetic reconnection are the flare radiations in hard X-rays (HXR) and microwaves, measured by the Ramaty High Energy Solar Spectroscopic Imager (RHESSI) and the Owens Valley Solar Array (OVSA), respectively. The HXR-microwave emissions appear in multiple bursts located only near the surface in a complicated pattern that varies from a peak to another. It is clearly identified that the first HXR-microwave burst precedes the magnetic flux rising and that the prominence erupts to the full only after the HXR-microwave bursts. Therefore, the role of the first magnetic reconnection would be tether-cutting that allows the magnetic flux rope to rise through the overlying field. We argue that the subsequent reconnections play a role in adding poloidal flux to the flux rope and thus rendering it unstable to eruption, based on comparison of the observed morphological evolution of the prominence with the kink instability model by Torok and Kleim (2005).

[구SO-18] Characteristics of 3D geometry of coronal loops observed by STEREO/SECCHI

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We have developed a model-independent and one-dimensional 3D reconstruction method for curvilinear structures corresponding to coronal loops and CMEs observed by the STEREO/SECCHI launched on 2006 October 25. This reconstruction method could reduce a three-dimensional problem to a one-dimensional linear one. We have modeled a loop system in various situations and have tested the new method. We present the full 3D geometry of the coronal loops observed by EUVI of STEREO/SECCHI and discuss the characteristics of 3D structures of coronal loops in an active region, focusing on height, length, loop plane inclination angle, co-planarity, and non linear force-free alpha parameter. We compared those 3D structures to configuration of coronal magnetic fields reconstructed under the assumptions of potential and linear force-free conditions with SOHO/MDI magnetograms.