[구SO-03] CME-flare Relationship in the 2004 August 18 Solar Eruption

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This paper discusses dynamic evolution of the solar eruption that occurred on 2004 August 18 in the west limb active region NOAA 10656 based on (E)UV data from TRACE satellite, H-alpha filtergram of Big Bear Solar Observatory (BBSO), White Light images of Mouna Loa Solar Observatory (MLSO), hard X-ray data of the Reuven Ramaty High Energy Solar Spectroscopic Imager (RHESSI), and microwave data of the Owens Valley Solar Array (OVSA). The prominence evolution is thoroughly observed to show its emergence, growth in bright helical structure, and propagation into space. The kinematics of the prominence is measured as: slow emergence of a flux rope at ~50 km/s, a large acceleration ~0.73 km/s2 of the prominence, and propagating core of CME at a speed ~400 km/s. In addition, we use CME images at the low corona (down to 1.08Rs) as offered by the MLSO to judge the causal relationship between the flare and the coronal mass ejection (CME) with less ambiguity. It is found that the flux emergence occurred after the first hard X-ray burst, and that the prominence eruption started after the last HXR burst.

This result suggests that the magnetic field reconnections in this event played a role to cause the magnetic flux rope unstable leading to eruption rather than they are passively induced by the eruption.

[구SO-04] Toward a Novel Method for Coronal Magnetic Field Construction

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Coronal magnetic fields can hardly be directly measured with the current technology. We can only reconstruct coronal magnetic fields with astatic (so far force-free) assumption based on vector magnetogram data taken at a photospheric level. However, construction of nonlinear force-free fields is also a demanding task. Although several techniques have been developed for coronal field construction, they are all highly computational-resource-consuming and each of them has certain limitations. In this paper, the advantages and disadvantages of existing methods will be reviewed, and the need for a new efficient method will be argued. We set forth a plan for development of a novel method having the merits of both variational and non-variational methods. A promising algorithm for this method will be presented with implementation of possible boundary conditions.