[구SE-19] 3-D Structure of a Coronal Jet Seen in Hinode, SDO, and STEREO

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We have investigated a coronal jet near the limb on 2010 June 27 by Hinode/X-Ray Telescope (XRT), EUV Imaging Spectrograph (EIS), Solar Optical Telescope (SOT), SDO/Atmospheric Imaging Assembly (AIA), and STEREO. From EUV (AIA and EIS) and soft X-ray (XRT) images we identify the erupting jet feature in cool and hot temperatures. It is noted that there was a small loop eruption in Ca II images of the SOT before the jet eruption. Using high temporal and multi wavelength AIA images, we found that the hot jet preceded its associated cool jet. The jet also shows helical-like structures during the rising period. According to the spectroscopic analysis, the jet structure changes from blue shift to red one with time, implying the helical structure of the jet. The STEREO observation, which enables us to observe this jet on the disk, shows that there was a dim loop associated with the jet. Comparing the observations from the AIA and STEREO, the dim loop corresponds to the jet structure which implies the heated loop. Considering that the structure of its associated active region seen in STEREO is similar to that in AIA observed 5 days before, we compared the jet morphology on the limb with the magnetic fields extrapolated from a HMI vector magnetogram observed on the disk. Interestingly, the comparison shows that the open field corresponds to the jet which is seen as the dim loop in STEREO. Our observations (XRT, SDO, SOT, and STEREO) are well consistent with the numerical simulation of the emerging flux reconnection model.

[구SE-20] Multi-Observations of Magnetic Cloud

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The geometry of an MC (magnetic cloud) in the interplanetary space can be estimated by the magnetic flux rope model. But the single point observation in the interplanetary space near the Earth is scanty to comprehend the global configuration of MC because the MC is considered a huge loop extending from the Sun with both legs rooted on the Sun. If the MC is observed at two different locations sufficiently far away from each other, it may provide the global configuration of the MC. In this study, we model the MC which is observed two different locations using a simple straight cylinder model. The MC model fit parameters are the flux rope axis orientation (Θ, ϕ), the intensity of the magnetic field at the flux rope axis (B_0), the radius of the MC (R_0), and the impact parameter (p), etc. With the MC model fit parameters we look into the difference between two observed MC geometries and also calculate the magnetic flux and helicity of the MC.