[구SE-07] The effect of field-line twist on the dynamic nature and electric current structure of emerging magnetic field on the Sun

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We use three-dimensional magnetohydrodynamic simulations to investigate how the dynamic state of emerging magnetic field is related to the twist of field lines. Emergence of magnetic field is considered as one of the key physical process producing solar activity such as flares, jets, and coronal mass ejections. To understand these activities we have to know dynamic nature and electric current structure provided by emerging magnetic field. To demonstrate dynamic nature of field lines, we focus on the factors such as curvature of magnetic field line and scale height of magnetic field strength. These factors show that strong twist case forms two-part structure in which the central part is close to a force-free state while the outer marginal part is in a fairly dynamic state. For weak twist case, it still shows two-part structure but the tendency becomes weaker than strong twist case. We discuss how the curvature distribution affects the dynamic nature of emerging magnetic field. We also investigate electric current distribution provided by emerging field lines to show a possible relation between electric current structure and sigmoid observed in a preflare phase.

[구SE-08] A Bright Hα kernel Observed Using the FISS

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Hα transient bright kernels may be an important diagnostic of energy conversion processes occurring in the choromosphere during flares. We observed an Hα kernel that occurred in AR 11263 in associated with a small flare on 2011 Autust 5th using the Fast Imaging Solar Spectrograph installed at the 1.6m New Solar Telescope of Big Bear Solar Observatory. We find that both the Hα line and the CaII 8542Å line appear in emission, with a red asymmetry in that they display red wings of enhanced emission. The red asymmetry shows 5-30 km/s downward motion for 8 minutes. We determine some physical parameters by adopting the Cloud mode and discuss the physical meaning of these results.