S001-P04
ポスター 3 ：11/6　AM1/AM2 （9:00-12:30）

#中田　空 [1,2)], 徳丸　宗利 [2)], 岩井　一正 [2)], 藤木　謙一 [2)], 今田　晋亮 [3)]
([1] 名古屋大学大学院理学研究科,[2] 名大 ISEE,[3] 東京大学理学系研究科地球惑星科学専攻

Magnetic field structure and non-thermal velocity in the plasma upflow region

#Sora Nakada[1,2)], Munetoshi Tokumaru[2)], Kazumasa Iwai[2)], Kenichi Fujiki[2)], Shinsuke Imada[3)]
([1]Grad school of science, Nagoya Univ.,[2]ISEE, Nagoya Univ.,[3]Department of Earth and Planetary Science, Graduate School of Science, Univ. Tokyo

Plasma upflows have been detected by Hinode's Extreme Ultraviolet Imaging Spectrometer (EIS). They are usually observed in the transition regions or corona above the active region. Some studies have suggested that the upflow is the source of the slow solar wind. However, the relationship between upflows and the slow solar wind has not been understood. The global structure of the magnetic field associated with upflows, in particular, whether the magnetic field lines above the upflow are open or closed, will be an important point to investigate the relationship between the upflows and slow solar wind.

In this study, we analyzed EIS data obtained from Hinode observations to identify upflow events. We calibrated the EIS data using the eis_prep routine available in the Solar SoftWare (SSW) library and obtained Doppler velocity maps from a single Gaussian fit of the FeXIII 202.04 angstrom line with the eis_auto_fit routine. We also corrected the orbital variation using the eis_update_fitdata routine. We used potential field source surface (PFSS) extrapolation to study the configuration of the coronal magnetic field around the upflow region. The PFSS extrapolation was performed using the synoptic magnetogram of the ADAPT model 0. For comparison, we analyzed non-thermal velocities of the upflow regions connected to open/closed magnetic field lines. In this analysis, we chose AR 11271 (2011 Aug 21), AR 12685 (2017 Oct 26), and AR 12713 (2018 Jun 17), where both upflows associated with open and closed field lines are observed. Non-thermal velocity is a broadening of the spectral linewidth that cannot be explained by thermal or instrumental broadening, that can be an important observational constraint for coronal heating models based on nanoflares and wave dissipation (Brooks 2016).

Our analysis showed that only three of the thirteen upflows were connected to an open magnetic field line. This result is similar to that of Edward et al. 2016, where only one of the seven was connected to an open magnetic field line. This result indicates that not all upflows can be the source of solar wind. In addition to this result, our analysis shows that the open upflow regions had smaller line widths than the closed upflow regions. This result means that the thermal temperatures or non-thermal velocities are smaller in the open upflow regions. In the latter case, open and closed upflow may have different generation mechanisms.