A10b

Magnetic-field configurations of an active region formed via flux emergence on the Sun

Hwanhee Lee, Tetsuya Magara, Jun-Mo An, Jihye Kang (KHU)

Active region is reported to have a possibility of solar wind source region. We demonstrate the configurations of active region using three-dimensional magnetohydrodynamic simulation of flux emergence operating from solar subsurface region to corona. We derive properties of magnetic-field configuration depending on a twist parameter. This parameter controls expansion rate of flux tube, effective gravity and current density along coronal loops. The expansion factor indicates the expansion rate of the cross section along a flux tube. Also we follow the observation of upflow areas discovered at the edge of an active region, which might be a source of solar wind, and compare this observational result to the simulations. The observational data are obtained from Nobeyama Radioheliograph (NoRH), X-Ray Telescope (XRT) and Extreme Ultraviolet Imaging Spectrometer (EIS) onboard Hinode. On the basis of this comparison, we discuss the generation mechanism of the solar wind.