

R006-04

Zoom meeting B : 11/1 AM1 (9:00-10:30)

09:45-10:00

North-south asymmetric auroral surge development as reproduced by global MHD simulation

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Uchida et al. (2020) reported observational evidence that auroral surges expanded in opposite direction in the northern and southern hemispheres simultaneously. The directions of the surges corresponded to those of the Hall current in the vicinity of surges in each hemisphere, as expected from the results from a recent global magnetohydrodynamic (MHD) simulation (Ebihara and Tanaka, 2018). The asymmetric Hall current direction in conjugate area can be originated from the difference of two-cell convection patterns in the ionosphere because of the strong y-component of the interplanetary magnetic field (~ 6 nT in GSM). In this presentation, we show the example of the asymmetrically expanding surges as reproduced by the REPPU Level 7 code (Tanaka, 2015), which essentially support the above mentioned idea. We also quantitatively compare the simulation results with the observed features such as displacement of the initial brightening and the difference in the traveling speed of the surges in both hemispheres. This study implies that the cutting-edge MHD simulation can be used to precisely predict such a dynamic mesoscale auroral variation if computational resource is large enough.