Study of IMF By dependence of plasma injection position using real-time magnetosphere simulation data

*Yasubumi Kubota[1], Aoi Nakamizo[1], Kaori Sakaguchi[1], Tsutomu Nagatsuma[1], Mitsue Den[1], Yuki Kubo[1], Takashi Tanaka[1,2]

1. National Institute of Information and Communications Technology, 2. Kyushu University

Surface charging of artificial satellite is one of the risks caused by dynamical variations of space environment. It often occurs when a satellite is exposed by electrons of ~10 keV injected from the tail plasma sheet during substorms. Magnetosphere-ionosphere coupling global MHD simulation is one of the powerful ways to predict the timing and location of plasma injection.
Now we are developing a real-time numerical simulator for space weather forecast using magnetosphere-ionosphere coupling global MHD simulation called REPPU (REProduce Plasma Universe) code. The feature of the simulation code is high robustness for extreme solar wind parameters; the unstructured grid system enables us to calculate the whole region with the uniform accuracy. The spatial resolution is 30722 grids in the spherical planes and 240 grids in the radial direction. The simulator is driven by the real-time solar wind data obtained by the DSCOVR spacecraft.
We investigate the IMF By dependence of plasma injection position using real-time simulation data. We found that injection position tends to distribute in the dusk side (dawn side) when the IMF By is positive (negative). Comparison of the simulation results with the CPCP, AE index, and plasma variations observed by geostationary orbiting satellites will also be reported.

