Comparison of magnetospheric magnetic field variations at quasi-zenith orbit based on Michibiki observation and REPPU global MHD simulation

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We are developing a numerical simulator for future space weather forecast using magnetosphere-ionosphere coupling global MHD simulation called REPPU (REProduce Plasma Universe) code. We investigate the validity of the MHD simulation result as compared with observation. In this study we simulate some events including both quiet and disturbed geomagnetic conditions using OMNIWeb solar wind data. The simulation results are compared with magnetic field observations from Michibiki satellite, which is on the quasi-zenith orbit (QZO). In quiet geomagnetic condition, magnetic field variations at QZO obtained from simulation results have good consistency as compared correspondence with those from Michibiki observation. In disturbed geomagnetic condition in which the Dst < -50 nT, however, V component of magnetic field variations from simulation results tend to deviate from observations especially at the night side. We consider that this deviation during disturbed geomagnetic condition might be due to tail and/or ring current enhancement which is already suggested by many other MHD simulation studies as compared with the magnetic field observation at geosynchronous orbit. In this presentation, we will discuss the cause of this discrepancy in more detail with studying the relationship between the magnetic field deviation and some parameters such as Dst and solar wind.

