Numerical Simulation of Ionospheric Convection
with a Global MHD Simulation

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Abstract

To understand a pattern of the polar ionospheric convection, a numerical simulation of ionospheric convection was conducted using the global MHD simulation model developed by Tanaka (2010) and solar wind parameters derived from the ACE satellite.

We compare the ionospheric E x B plasma drift obtained from the global MHD simulation and that obtained from the SuperDARN HF Radar Network. The simulated plasma drift are not always reproducible under a southward interplanetary magnetic (IMF) condition. We think that the M-I boundary condition in the global MHD simulation includes insufficient factors for the M-I coupling process. In this paper, we present parameter study of the global MHD simulation and demonstrate the evaluation of the reliability and validity of M-I coupling process in the global MHD Simulation.

References

Tanaka et al., (2010), Substorm convection and current system deduced from the global simulation, J. Geophys. Res., 115, A05220, doi:10.1029/2009JA014676.