

磁気圏電離圏結合系の三次元 Hall-MHD シミュレーション

筒井 寛典 [1]; 荻野 竜樹 [2]; 梅田 隆行 [2]
[1] 名大・STEL; [2] 名大 STE 研

3D Hall-MHD Simulation of Magnetosphere-Ionosphere Coupling

Hironori Tsutsui[1]; Tatsuki Ogino[2]; Takayuki Umeda[2]
[1] STEL, Nagoya Univ.; [2] STEL, Nagoya Univ.

It is known that Earth's magnetosphere and ionosphere are coupled by field-aligned currents that flow between the two regions. In order to understand these current system more obviously, studies of the two regions by using computer simulation have been developed. In global MHD models of interaction of the solar wind with the earth's magnetosphere, the ionosphere has been usually treated as one sheet by the conductivity model. On the other hand, ionosphere has been solved by 2-dimensional MHD simulation. The global MHD models have been out of consideration of the altitudinal configuration of ionosphere and haven't solved the 3-dimensional configuration between the field-aligned currents, ionospheric current perpendicular to the magnetic field and plasma convection self-consistently. We have been developed a three-dimensional global MHD model to solve magnetosphere-ionosphere coupling self-consistently by taking into account of the altitudinal configuration of the ionosphere. This simulation solved Hall-MHD equations by using the Modified Leap-Frog method. We used Yin-Yang grid in spherical coordinates. For several IMF conditions, we have obtained three dimensional current system in the ionosphere from the simulation.