

様々な太陽風状態に対する磁気圏電離圏複合系の様相

藤田 茂 [1]; 田中 高史 [2]
[1] 気象大; [2] 九大

Configurations of the magnetosphere-ionosphere compound system under various solar wind conditions

Shigeru Fujita[1]; Takashi Tanaka[2]
[1] Meteorological College; [2] Kyushu University

For the space weather forecast, we need to understand the fundamental process for the global magnetosphere-ionosphere system. Therefore, it is essential to comprehend global phenomena in the magnetosphere in terms of the magnetosphere-ionosphere compound system [Tanaka, 2003]. In the compound system, the Maxwell stress invoked by the reconnection between the solar wind magnetic field and the magnetospheric one drives the magnetospheric plasma convection. This magnetospheric convection is connected with the ionospheric convection. Furthermore, the ionospheric convection is related to the ionospheric electric current driven by the magnetospheric FAC. Bearing in mind that the magnetospheric current is driven by energy converted from the thermal energy, the global self-consistency among the magnetospheric convection, the ionospheric convection, the ionospheric current, the magnetospheric current, and the magnetospheric pressure distribution holds in the magnetosphere-ionosphere compound system.

The configuration of the compound system is controlled by the solar wind. It is instructive to investigate systematically how the configuration of the magnetosphere-ionosphere compound system is controlled by the solar wind condition. In particular, it is interesting to consider the compound system for quite small IMF intensity. In this case, there is no reconnection between the solar wind magnetic field and the magnetospheric one. Thus, no Maxwell stress drives the magnetospheric convection. However, our simulation indicates the magnetosphere-ionosphere convection appears even in this condition. This convection seems to be driven the magnetosheath current that prevents the magnetospheric field from expanding across the magnetopause. Other than this peculiar case, we will present the configurations of the magnetosphere-ionosphere compound system for various cases of IMF directions if the solar wind.