

3-dimensional Hall-MHD Simulation of Magnetosphere-Ionosphere Coupling

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In global MHD models of interaction of the solar wind with the earth's magnetosphere, the ionosphere has been treated as one sheet by the conductivity model. These models have been out of consideration of the altitudinal configuration of ionosphere and haven't solved the 3-dimensional relation between the field-aligned currents, electric 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. Our past simulations had a tendency of rapid current decrease at the bottom of the ionosphere. In this study we have traced the source of the problem.