**The two-way coupling of the global MHD model and the thermosphere/ionosphere model.**

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Our study presents first results of the two-way coupling of the global MHD model of magnetosphere GAMERA/MAGE and the thermosphere/ionosphere model GSMTIP. GAMERA is a 3D global MHD model which employs high-order and non-diffusive numerics. The three-dimensional GSMTIP model calculates global evolution of density, velocity, temperature, composition of neutral and ionized species of thermosphere and ionosphere. The global MHD model provides field-aligned current into the ionosphere, as well as an electron precipitation model. Self-consistent ionospheric resistivity computed by the GSMTIP model provides the ionospheric feedback into the magnetosphere. Both models (GAMERA and GSMTIP) contain a separate ionospheric potential solvers and calculate independently the cross polar cap potentials as a diagnostics. Comparison of electron precipitation energy and geometry shows that the MHD model and empirical model of precipitation are reasonably in a good match. However, for the intense magnetic storm of March, the MHD model requires downscaling of electron energies keeping the total energy flux. The distribution of the neutral gas temperature in the ionosphere serves as a benchmark for the coupled model run. The total ionospheric-magnetospheric current in the model appears to be close to empirical values measured by AMPERE project. The success of such a coupled model will allow us to improve our understanding of global processes in those areas of the ionosphere where direct measurements are difficult.

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