Geophysical Research Abstracts
Vol. 20, EGU2018-5549-1, 2018
EGU General Assembly 2018

Prediction of the magnetic field of ionospheric origin using the Potsdam version of the Upper Atmosphere Model

Boris E. Prokhorov (1), Matthias Förster (1), Vincent Lesur (2), Alexander A. Namgaladze (3), and Matthias Holschneider (4)

(1) Helmholtz Centre Potsdam - GFZ German Research Centre for Geosciences, Potsdam, Germany, (2) Institut de Physique du Globe de Paris, Paris, France, (3) Murmansk Arctic State University, Murmansk, Russia, (4) University of Potsdam, Potsdam, Germany

The ionospheric magnetic field is a highly variable part of the Earth's magnetic field. It is generated by the ionospheric currents. The ionospheric currents are a part of the global electrical chain of the Magnetosphere – Ionosphere – Thermosphere (MIT) system. This current system has external and internal drivers. The external drivers are the solar wind and Interplanetary Magnetic Field (IMF), which interact with the magnetosphere and transfer energy to the ionosphere via the Field Aligned Currents (FACs). The internal driver is the interaction between neutral and charged particles in the Earth's ionosphere, known as the thermospheric neutral wind dynamo. The aim of this investigation is the prediction of the magnetic field generated by the 3D ionospheric current system. For modeling of the ionospheric currents, we use the Potsdam version (UAM-P) of the global, first-principal, three-dimensional, time-dependent, numerical Upper Atmosphere Model (UAM). The magnetic field is calculated using the Biot-Savart law.
The obtained prediction of the global ionospheric magnetic field and its temporal variations are validated by comparing them with ground-based measurements and satellite observations of the Earth's magnetic field.