Geophysical Research Abstracts
Vol. 12, EGU2010-7986, 2010
EGU General Assembly 2010

On the use of HF radar for diagnostics of traveling ionospheric disturbances

Vladimir I. Kurkin (1), Mark Lester (2), Alexey V. Oinats (1), and Konstantin A. Kutelev (1)

(1) Institute of Solar-Terrestrial Physics, Apper Atmosphere Physics and Radio Propagation, Irkutsk, Russian Federation (KURKIN@ISZF.IRK.RU, 73952511675), (2) University of Leicester, United Kingdom

This paper presents an investigation of an efficiency of the HF radar for diagnostics of medium-scale and large-scale traveling ionospheric disturbances (MSTIDs and LSTIDs). The simulation of the TIDs influence on the ground backscatter signal characteristics was carried out. The method of the HF signal characteristics calculation developed in ISTP SB RAS on the basis of waveguide approach was used. Ionospheric disturbance model used in the simulation was analytical representation taking into account of basic TIDs parameters. The background electron density distribution was calculated by IRI2007 model. The simulation was carried out for different sets of TIDs parameters and directions of the sounding. We studied the TIDs influence on signal characteristics of SuperDARN radars located both in European (Pykkvybaer, Hankasalmi) and Asian (Bratsk, Magadan) longitudinal sector. The simulation allowed us to determine the relation between basic TIDs parameters and variations of the received signal characteristics. The results of TIDs diagnostics for CUTLAS radars experiment are discussed.