



An analysis of topside ionosphere dynamic based on the Irkutsk incoherent scatter radar measurements

Boris Shpynev (1), Gely Zherebtsov (1), Denis Khabituev (1), Anatoly Tashchilin (1), Alexander Sherbakov (1), and Libo Liu (2)

(1) Institute of Solar-Terrestrial Physics, Irkutsk, Russia (shpynev@iszf.irk.ru), (2) Institute of Geology and Geophysics, Chinese Academy of Sciences, Beijing, China (liul@mail.igcas.ac.cn)

Data from Irkutsk Incoherent Scatter Radar were used for investigation of topside ionosphere dynamic during years 1998-2007. Electron density profiles, derived from Faraday rotation, were used for plasma scale height (Hp) calculation in the region, higher F2 peak, where diffusion equilibrium is true. Electron and ion temperatures, as well as neutral temperatures from NRLMSISE00, were used for calculation of topside drift velocity and diffusion velocity parallel to geomagnetic field over Irkutsk. Dynamics of these velocities and Hp were investigated for different seasons and different levels of solar activity. The most pronounced feature of topside Hp dynamic is the approximately constant Hp value in the daytime condition. This stable Hp level slightly changes with season and solar activity. Linear approximation of electron density to height \sim 850km was compared with DMSP data and showed acceptable agreement of these datasets. Diffusion and drift velocities were used for topside meridional wind (Vm) estimation. Variations of Vm were investigated for different season and different solar activity levels. By using the absolute calibration of Faraday rotation measurements on Irkutsk ISR, its electron density was compared with GPS Total Electron Content, for estimation of ionosphere/plasmasphere input into TEC. Difference between datasets is analyzed as possible opportunity for improvement of diagnostic capability of Irkutsk ISR and for developing of ionosphere TEC analysis.

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