

FEATURES OF DETERMINING THE ELECTRON DENSITY PROFILE, PLASMASPHERE ELECTRON CONTENT AND TRANSITION HEIGHT AT IRKUTSK INCOHERENT SCATTER RADAR

Denis Khabituev, Vladimir Ivonin, Valentin Lebedev

*Institute of Solar-Terrestrial Physics SB RAS, Irkutsk, Russia,
khabituev@iszf.irk.ru*

This work presents a new technique for determining the O⁺/H⁺ transition height and the electron content of the topside ionosphere, plasmasphere. The technique is based on a two-component ionospheric model and on the combination of IISR and GPS TEC data. This technique allows determining the height of transition from heavy ions (O⁺) to light ions (H⁺, He⁺), which is not available with standard processing techniques. The features of the standard technique for reconstructing the electron density (Ne) profile in the topside ionosphere from IISR power profile data are discussed. The necessity of correcting the Ne profile and scale height at high altitudes (much higher than H_mF₂) is shown. The results of calculating the scale height and the O⁺/H⁺ transition height for two geomagnetic disturbance periods using our technique are presented. The results are compared with data from the IRI 2020 model and the NeQuick-2 model.