

Comparison of NeQuick, PIM, and TISH/TH model results

Stanimir Stankov ¹, Pencho Marinov ², and Ivan Kutiev ³

¹Institute of Communications and Navigation, German Aerospace Centre, D-17235 Neustrelitz, Germany

²Central Laboratory for Parallel Processing, Bulgarian Academy of Sciences

³Geophysical Institute, Bulgarian Academy of Sciences

The topside ionospheric scale height (TISH) and the O⁺-H⁺ transition height (TH) are key ionospheric parameters which are of special interest when studying and modelling the plasma composition and dynamics. Recently, new TISH and TH empirical models have been developed. The database for these models has been built upon thousands of TISH and TH values deduced from electron profiles obtained via topside sounding measurements. For validation purposes, it would be interesting to compare calculations of the ionospheric scale/transition heights as calculated by the topside-sounder TISH/TH models and other well-known models - NeQuick and Parameterized Ionospheric Model (PIM). Electron density profiles, in the altitude range 200-2000 km, are obtained from the NeQuick and PIM models for a grid of input parameters, such as month, local time, geomagnetic latitude, F_{10.7} solar flux. The topside scale height and O⁺-H⁺ transition height values are extracted from each of these profiles in the same manner as it has been done for the TISH/TH model's database. These values are then compared with the respective values provided by the TISH/TH model. Results and possible implementation in the International Reference Ionosphere (IRI) model are presented and discussed.