Geophysical Research Abstracts, Vol. 9, 00026, 2007
SRef-ID: 1607-7962/gra/EGU2007-A-00026

Seasonal Variation of Parameters of F2-layer and Upper Ionosphere in Solar Activity Minimum

M.V. Klimenko (1), V.V. Klimenko (2), V.V. Bryukhanov (1)

(1) Kaliningrad State Technical University, Russia, (2) WD IZMIRAN, Kaliningrad, Russia

(maksim.klimenko@mail.ru / Phone: 7-4012-215606)

In the given work the numerical calculation results on Global Self-consistent Model of Thermosphere, Ionosphere and Protonosphere (GSM TIP) global distributions of parameters of F2-layer and external ionosphere with take into account only a dynamo-field generated by thermospheric winds are submitted. Calculations were executed by completely self-consistent manner for the quiet conditions of equinox and solstice in a minimum of solar activity for 00 UT. It is shown, that equatorial ionization anomaly is formed in all seasons. Thus the crests of anomaly exist in both hemispheres on both sides from geomagnetic equator. The middle-latitude trough in critical frequency of ionospheric F2-layer in solstice is deeper, than in an equinox and occupies the bigger area. Thus the deepest and extensive trough is formed in the summer in winter hemisphere. Middle-latitude winter anomaly is precisely shown in summer conditions. Concentrations of electrons, N_e, and ions H^+, $n(H^+)$, at height of 1500 km are high in all a summer hemisphere in solstice and do not experience the troughs. In winter hemispheres in summer and winter troughs in N_e and in concentration of light ions H^+ are formed. Thus the trough of light ions settles down closer to a pole, than trough in electron concentration. In equinox troughs in N_e and $n(H^+)$ are formed in both hemispheres, but they are less deep, occupy the smaller area and settle down further from poles. In summer hemispheres in a solstice two ring zones in ion temperature at height of 1500 km are formed. One of them, "hot", is in auroral zone, and another, "cold", is in a polar cap. Electrons at the same height are more poorly heated up on the dayside of winter hemispheres in a solstice. In the same seasons the cooling of electrons is the least on the night side of summer hemispheres.