Ionospheric Effects of Geomagnetic Storm Sequence on September 9–14, 2005 in Low Latitudes – New Calculation Results

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Earlier under carrying out the calculations of the low-latitude ionosphere effects of storm sequence on September 9–14, 2005 the model input parameters (potential difference through polar caps, field-aligned currents of the second region and particle precipitation fluxes and energy) were set as function of *Kp*-index of geomagnetic activity. The analyses of obtained results show that the reasons of quantitative distinctions of calculation results and observations can be the use of 3 hour *Kp*-index at the setting of time dependence of model input parameters; the dipole approach of geomagnetic field; the absence in model calculations the effects of the solar flares, which were taken place during the considered period. In the given study the model input parameters were set as function of *AE*- and *Kp*-indices of geomagnetic activity according to different empirical models and morphological representations. At that, we taken into account the shift of field-aligned currents of the second region to the lower latitudes and 30 min. time delay of variations of the field-aligned currents of second region relative to the variations of the potential difference through polar caps at the storm sudden commencement phase. In addition, we taken into account the ionospheric effects of solar flares. The results of numerical calculations of low-latitude ionospheric parameter behavior during this geomagnetic storm sequence with use of the Global Self-consistent Model of the Thermosphere, Ionosphere and Protonosphere (GSM TIP), developed in WD IZMIRAN are presented. We have analyzed the obtained calculation results for various low-latitude ionospheric stations; compared the calculation results with experimental data; investigated the geomagnetic storm influences on formation the additional maxima in a vertical profile of electron concentration in equatorial ionosphere and on the equatorial electrojet behavior.

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