



Morphology of the winter anomaly in NmF2 and Total Electron Content

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We analyzed the winter anomaly manifestation in the F2 peak electron density (NmF2) and Total Electron Content (TEC) based on the observation data and model calculation results. For the analysis we used 1998–2015 TEC Global Ionospheric Maps (GIM) and NmF2 ground-based ionosonde observation data from and COSMIC, CHAMP and GRACE radio occultation data. We used Global Self-consistent Model of the Thermosphere, Ionosphere, and Protonosphere (GSM TIP) and International Reference Ionosphere model (IRI-2012). Based on the observation data and model calculation results we constructed the maps of the winter anomaly intensity in TEC and NmF2 for the different solar and geomagnetic activity levels. The winter anomaly intensity was found to be higher in NmF2 than in TEC according to both observation and modeling. In this report we show the similarity and difference in winter anomaly as revealed in experimental data and model results.