Geophysical Research Abstracts
Vol. 20, EGU2018-9802, 2018
EGU General Assembly 2018

Global distribution of electron temperature from Swarm and its possible correction

Vladimir Truhlik (1), Dieter Bilitza (2,3), Phil G. Richards (4), Katerina Podolska (5), and Ludmila Triskova (6)

(1) Institute of Atmospheric Physics CAS, Praha, Czech Republic (vtr@ufa.cas.cz), (2) George Mason University, Fairfax, USA (dbilitza@gmu.edu), (3) NASA Goddard Space Flight Center, Greenbelt, USA (dieter.bilitza-1@nasa.gov), (4) George Mason University, Fairfax, USA (prichar1@gmu.edu), (5) Institute of Atmospheric Physics CAS, Praha, Czech Republic (kapo@ufa.cas.cz), (6) Institute of Atmospheric Physics CAS, Praha, Czech Republic (ltr@ufa.cas.cz)

We have analyzed the global distribution of the electron temperature (Te) measured by the Langmuir Probes on the Swarm satellites during the years 2014-2017. Comparisons between measured Te and the IRI (International Reference Ionosphere) model (TBT-2012) are presented. We found that the global patterns of Te observed by Swarm and predicted by IRI are similar, however, substantially differ in absolute values. The magnitude of the differences between Swarm and IRI Te dependent on local time and latitude. The smallest differences are observed at high latitudes where the Swarm Te is higher than the IRI Te by about 10%. The largest differences were found at low and equatorial latitudes at nighttime, where the Swarm Te is more than 100% higher than the IRI prediction. Therefore, the IRI Te model is used to correct the Swarm Te measurements by removing the bias as a function of local time and latitude. The corrected global patterns of Te are analyzed with assistance of the physics based Field Line Interhemispheric Plasma flow (FLIP) model and are also compared to other measurements (e.g., CHAMP, FPMU onboard ISS etc.).