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Oral
Slant absolute total electron content (TEC) is observed by the Formosa Satellite-7/Constellation Observing System for Meteorology, Ionosphere, and Climate-2 (FORMOSAT-7/COSMIC-2, F7/C2) Tri-GNSS Radio Occultation System (TGRS) instrument. Details of the data processing algorithms, validation, and error assessment for the F7/C2 GPS and GLONASS absolute TEC observations will be presented. The data processing includes estimation and application of solar panel dependent pseudorange multipath maps, phase to pseudorange leveling, and estimation of the differential code biases. The F7/C2 GPS absolute TEC observations are validated through comparison with colocated, independent, GPS TEC observations from the Swarm-B satellite. We additionally validate the F7/C2 GLONASS absolute TEC observations through comparison with colocated F7/C2 GPS absolute TEC observations. These comparisons are used to demonstrate that the accuracy of the F7/C2 absolute TEC observations for both GPS and GLONASS are less than 3.0 TEC units. Results will also be presented that illustrate the suitability of the F7/C2 absolute TEC observations to study the climatology and variability of the topside ionosphere and plasmasphere (i.e., altitudes above the F7/C2 orbit of ~550 km). The results demonstrate that F7/C2 provides high quality GPS and GLONASS absolute TEC observations that can be used for ionosphere-thermosphere data assimilation as well as scientific studies of the topside ionosphere and plasmasphere.
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