

Validation of UWM New Global Ionosphere Model During the Most Severe Geomagnetic Storm of the Year 2018

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SUMMARY

In this contribution, we present a prototype global ionosphere total electron content (TEC) model developed at UWM in Olsztyn. Our model is based on un-differenced multi-GNSS precise carrier phase data from 300 globally distributed stations and stochastic modeling using the Least Square Collocation technique. The model performance is evaluated during the most severe geomagnetic storm of 2018, which took place on August 26th. The derived ionospheric TEC estimates are compared to well-established global ionosphere models provided by the International GNSS Service (IGS) Ionosphere Associated Analysis Centers (IAACs). Our maps are also validated by the self-consistency analysis technique using GNSS data from 25 globally distributed stations. Finally, TEC Maps are compared to TEC data derived from altimetry satellite missions. The validation results confirm that the applied stochastic TEC modelling properly reflects variations in the ionospheric TEC induced by the geomagnetic storm. In some cases, our maps present better accuracy than IAACs' products.

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