



Ionospheric tomography phase leveling based on LEO POD GNSS data only and applications: proof of concept with Metop constellation data

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Abstract

The voxel-based tomographic modelling of the electron content has shown to be an accurate and practical approach when applied to ground-, vessel- and LEO-based GNSS, implemented thanks to the TOMION model (Hernández-Pajares et al. 1997, 1998, 1999, 2017, 2020). No background model is used, which is possible due to the proper simultaneous estimation of the electron density and geometry-free carrier phase bias, under the geometry change with a Kalman filter. In this work we extend the applicability of this strategy exclusively based on Metop-based POD GNSS data with TOMION, showing a high performance, that can be appreciated in terms of GPS transmitter DCB stability and consistent values at the level of few tenths of ns with the independent estimations from ground GNSS data provided by IGS analysis centers like CODE and JPL.

Acknowledgement:

The work is being performed within the GIMA project (Assessment of GRAS Ionospheric Measurements for Ionospheric Model Assimilation) under the EUMETSAT contract EUM/CO/21/4600002530/RN.

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