

3D ionospheric electron density determination in Scandinavia with TomoScand and EISCAT 3D

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The TomoScand network for ionospheric tomography in Scandinavia consists of a network of newly designed Beacon receivers and an extensive, dense array of GPS receivers. A novel tomographic inversion technique allows for a multi-frequency analysis for reconstruction of ionospheric electron densities, and is also able to include information of a multitude of ground-based measurements into the inversion, such as data from ionosondes, from the EISCAT radar, and from the magnetometers of the MIRACLE network in Scandinavia. We present the current status of the TomoScand network, and show latest inversion results on 2D profiles in meridional direction, together with test results that allow to evaluate the performance of the inversion technique. Further, we discuss the future development into a full 3D inversion scheme, and how the TomoScand network can be used as a "partner instrument" for the upcoming EISCAT 3D radar.

Keywords: ionospheric tomography, ionospheric electron density, ground-based observations, EISCAT 3D