

#20 Received 12/16/2014

Jacobsen, Knut Stanley; Dähnn, Michael.
Norwegian Mapping Authority

Characterization of ionospheric disturbances and their relation to GNSS positioning errors at high latitudes

Abstract:

We present results from an analysis of the distribution of ionospheric disturbances, measured by the Rate Of TEC Index (ROTI), and their relation to Precise Point Positioning (PPP) accuracy. The analysis is based on data for the entire year of 2012, for 10 receivers at latitudes from 59 to 79 degrees North. PPP solutions were computed using the GIPSY software.

The results show that elevated ROTI values occurs mainly in the cusp and nightside auroral oval regions. Elevated ROTI values are more common in the cusp, but in the nightside auroral oval they are stronger. The 3D position error is strongly correlated with ROTI for receivers that are affected by space weather, and increases exponentially with increasing ROTI.