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Analysis of GPS ionospheric scintillation measurements at high latitudes

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Transionospheric radio signals may experience fluctuations in their amplitude and phase due to irregularity in the spatial electron density distribution, referred to as scintillation. Ionospheric scintillation is responsible for transionospheric signal degradation that can affect the performance of satellite based navigation systems.

Usually, the scintillation activity is measured by means of indices such as the normalised standard deviation of the received intensity and the standard deviation of the received phase.

Statistical analyses on the use of an additional index are carried out based on 50 Hz GPS measurements recorded at Dirigibile Italia Station (Ny-Alesund, Svalbard). The usefulness of such an additional parameter for the characterization of the phase scintillation activity is discussed and advanced. Also, the understanding of the signal dynamics due to ionospheric electron density irregularities is attempted by using such a new estimate for the phase scintillation.