



Morphological response of GPS derived ionospheric scintillation activity to disturbed magnetic conditions in the European auroral sector

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Transionospheric radio signals may experience fluctuations in their amplitude and phase due to irregularities 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. The effects of different magnetic storms on GPS signals based on 50 Hz GPS measurements recorded at Dirigibile Italia Station (Ny-Alesund, Svalbard) are analysed. These effects are described by using typical scintillation indices able to assess the scintillation activity on both the intensity and phase of the received signals. Moreover, signal dynamics and fading levels are also used for characterising ionospheric effects on GPS signals.

A morphological response of the scintillation activity to disturbed magnetic conditions in the European auroral region is derived and analysed. In particular, the relationship between fluctuations in the Total Electron Content (TEC) and scintillation indices is investigated on the basis of the experimental methods adopted in the measurement campaigns as well as of the scattering theory.