



Quantitative explanation of strong multi-frequency intensity scintillation events

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Transionospheric radio signals may experience fluctuations in their amplitude and phase. The fluctuations characteristics depend on the radio frequency, magnetic and solar activity, time of day, season of the year and magnetic latitude of the observation point in the case of satellite to ground links.

Nowadays, one of the most important topic is to estimate scintillation effects on Global Navigation Satellite Systems (GNSS). Ionospheric scintillation is responsible for transionospheric signal degradation that can affect the performance of navigation systems.

The interaction of transionospheric radio waves with plasma density irregularities leading to scintillation is described in the strong scattering regime, in order to provide with as concrete as possible figures on the signal dynamics experienced in this condition.

This theoretical mechanism is compared with experimental observations (at different transmission frequencies) of strong ionospheric scintillation events at auroral latitudes and it may provide a suitable explanation of them, as well.