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Dynamic analysis of the polar ionosphere during scintillation: towards an optimization of the detrending frequency

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In the context of scintillation, the chaotic behavior of the ionospheric plasma in the high latitude region is investigated using the GPS (Global Positioning System). The study is carried out with the use of the data from the Canadian High Arctic Ionospheric Network (CHAIN). The L1 GPS signal, sampled at 50 Hz, is characterized and analyzed. The statistical analysis is performed on both components of the signal, namely the amplitude and the phase. The Tsalis entropy is constructed for the signal, and along a multiscale analysis, criteria for the determination of the optimum detrending frequency, delimiting the scintillation components from the background variations, are defined. I will present the method used in this study and discuss the importance of the detrending frequency in the mitigation process of the effect of the ionospheric scintillation on the Global Navigational Satellite System (GNSS).

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