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Properties of the high-latitude irregularites of importance in the scintillation modelling

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In-situ plasma density measurements from satellites offer an excellent database to map the global morphology of irregularity parameters that define the scintillation. The main advantage of using satellite in-situ data is the temporal and spatial coverage, much better than in the case of scintillation measurements made at sparsely distributed receiving stations. From the scintillation modelling point of view the most important parameters derived from in-situ measurements are the spectral index $p$and turbulence strength parameter C_s. The input data to our analysis are DE2 retarding potential analyzer (RPA) measurements of the ion density. The sampling frequency of RPA was 64 Hz, corresponding to every 120 m along the satellite orbit. These measurements were grouped over 8 s (512 samples) long segments. Only segments for which the corrected magnetic latitude was larger than 50^o are considered. For each segment we calculated the rms density σ_N and maximum entropy power spectra. For each spectrum the spectral index p and turbulence strength parameter C_s were estimated. In total 2132 satellite passes were analyzed providing a large database of over 211 thousands of data points. This database is used to derive various statistical dependencies and relationships. In particular, we will present and discuss probability distribution functions, dependencies on season, magnetic latitude, height, magnetic activity, and mutual relationships between derived parameters.