

Title: Fine structure of quasiperiodic emissions observed in the Earth's magnetosphere

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Abstract: Quasiperiodic emissions are a type of electromagnetic waves detected in the Earth's inner magnetosphere which are not yet fully understood. In this thesis, we use high resolution electric field data obtained by the DEMETER satellite, at an altitude of about 700 km, to analyze their fine inner structure. Overall, we analyzed 251 events, which were classified into three categories (with fine inner structure, without fine inner structure, and borderline cases). Additionally, we determined the periods of the fine inner structure and studied their dependence on relevant parameters. We show that the periods of the fine inner structure (on the order of seconds) do not significantly change during individual events and they are typically larger for events with longer modulation periods. We also show that the modulation periods of events without the fine inner structure are longer than the modulation periods of events with the fine inner structure, indicating their possibly different generation mechanisms.

Keywords: DEMETER, quasiperiodic emissions, spectral analysis