



Time frequency analysis of Jovian and Saturnian radio spectral patterns

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Prominent radio spectral patterns were observed by the Cassini Radio and Plasma Wave Science experiment (RPWS) principally at Jupiter and Saturn. The spectral shapes are displayed in the usual dynamic spectra showing the flux density versus the time and the frequency. Those patterns exhibit well-organized shapes in the time-frequency plane connected with the rotation of the planet. We consider in this analysis the auroral emissions which occurred in the frequency range between 10 kHz and approximately 3 MHz. It concerns the Jovian hectometric emission (HOM) and the Saturnian kilometric radiation (SKR). We show in the case of Jupiter's HOM that the spectral patterns are well-arranged arc structures with curvatures depending on the Jovian rotation. Regarding the SKR emission, the spectral shapes exhibit generally complex patterns, and only sometimes arc structures are observed. We emphasize the curve alterations from vertex-early to vertex-late arcs (and vice versa) and we study their dependences, or not, on the planetary rotations. We also discuss the common physical process at the origin of the HOM and SKR emissions, specifically the spectral patterns created by the interaction between planetary satellites (e.g. Io or Dione) and the Jovian and Saturnian magnetospheres.