

On the arc structures of the Saturnian kilometric radiation

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Abstract

We report on the analysis of the dynamic spectra of the Saturnian kilometric radiation (SKR) recorded by the Cassini Radio and Plasma Wave Science Experiment (RPWS) in the frequency range from 100 kHz to about 1 MHz. We investigate the Saturnian kilometric spectra recorded by RPWS experiment from 01st Jan. 2004 to 31st Dec. 2007. Different Saturnian ‘sources’ can be defined by spectral characteristics. We show that the SKR presents different kinds of arc structures. Those arcs may be classified in two sets: the ‘vertex early arcs’ (VEA) and the ‘vertex late arcs’ (VLA). The arcs of the first group set open toward increasing time, while the arcs of the other one open towards decreasing time. A total of 556 arcs have been observed during the four investigated years, where 310 and 246 correspond, respectively, to the vertex early and late arcs. The arc occurrences are mainly observed when the spacecraft was close to the apoapses, and also when the Cassini latitude was in the range -20° and $+20^\circ$. Similar VEA and VLA arc structures have been reported in the case of the Jovian hectometric (HOM) and decametric (DAM) radio emissions. In this contribution we put emphasis on the common and unusual arc features by comparing the auroral emissions related to Jupiter and Saturn.

