



Modelling Saturnian Kilometric Radiation (SKR) disappearance at high northern latitudes

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The kilometric radiation of Saturn (SKR), which dominates RPWS (Radio and Plasma Wave Science) dynamic spectra, is observed quasi-continuously by Cassini since 2003. The large number of orbits performed by Cassini brought the spacecraft down to 1.3 R_{Sat} from Saturn, through all local times and, since December 2006, at high magnetic latitudes. In a previous study, we have shown that the SKR visibility significantly varies with latitude, distance, and local time (LT) of the spacecraft. We show here how we can model the observed SKR visibility (i.e. occurrence) by assuming radio sources located along magnetic field lines whose footprints coincides with the UV auroral sources. We focused on the January of 2007 HST campaign which provided a large set of images taken over 13 days.

Based on the modelling code PRES (Planetary Radio Emission Simulator) that assumes radio emissions to be generated via the Cyclotron Maser Instability for simulating observed dynamic spectra, we show that the characteristic extinction of the highest frequencies of the SKR observed during this period, when Cassini was located at high northern latitudes, can be fitted with an emission cone aperture angle close to 70° and a typical thickness of a few degrees. We also correctly model the observed dominant polarization (linked to the hemisphere of origin of the radiation, which coincides with that crossed by the S/C). Finally assuming bright sources located in the morning side auroral regions between 2h and 12h LT, we also model the zone in SKR dynamic spectra where the intensity is systematically enhanced.