



Remote sounding of Io plasma torus using Jovian DAM/HOM radio emission

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We study the frequency and time variations of Jovian decametric (DAM) and hectometric (HOM) emissions recorded by RPWS experiment onboard Cassini spacecraft during its Jupiter flyby. It is shown that HOM radiations are highly affected by refraction effects caused by the Io plasma torus. This effect has been reported for the first time by Lecacheux et al. (JGR, 85, 1980) using Voyager/PRA data. The capabilities of the RPWS experiment leads us to re-investigate such type of phenomena, so-called "attenuation band" in literature (Gurnett et al., GRL, 25, 1998), with the aim to derive electron density distribution in the Io plasma torus, and Jovian source locations in the auroral regions. A statistical analysis covering a period of four months permits the variation of the Io plasma torus to be studied, taking into consideration the spacecraft magnetic latitude, and also the central meridian longitude (i.e. CML). First results show that attenuation bands can occur at frequency up to 6 MHz, overlapping HOM but also DAM non-Io-controlled emissions. There are two distinct attenuation bands, related each to one sense of DAM circular polarization, therefore to the corresponding Jovian auroral zone. In addition, they suggest repetitive and steady features in the plasma torus, and also irregular variation, exhibited by propagation effects of radio wave through the Io torus. These results are compared to previous (Voyager and Ulysses) and more recent (Galileo and Cassini) investigations.