

A New Beaming Model of Jupiter's Decametric Radio Emissions based on Cassini RPWS Data Analysis

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We have investigated the radiation characteristics of Jupiter's decametric radio emissions (DAM) by using the Cassini Radio and Plasma Wave Science (RPWS) data during Oct. 2, 2000 to Mar. 22, 2001. We have analyzed occurrence dependence from 0.4 MHz to 16 MHz based on Central Meridian Longitude (CML) of System III and made the occurrence probability maps for each frequency. As a result of this analysis, the two peaks in occurrence probability showed a dramatic change in longitude between 10 and 16 MHz. At 16 MHz two peaks of probability occur at 160 and 240 degrees in CML. As the frequency decreases to 10 MHz, the two peaks converged to become one peak near 210 degrees in CML at 10MHz. This peak gradually disappeared below 10MHz. Based on Jupiter's magnetic field model (VIP4), a new model was made to explain these observations by taking into account the decreasing cone half-angle of the emitting cone from 16 MHz to 10 MHz.