



Effect of Jovian magnetic field on the beaming cone of Io-controlled decameter radio emissions

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In the CML-Io phase diagram, where the occurrence probability of the Jovian decameter radio emissions is plotted versus the central meridian longitude (CML) and the orbital phase of Io, four zones of enhanced probability emerge: the so-called Io-controlled sources Io-A, Io-B (emitted from the northern hemisphere), and Io-C, Io-D (emitted from the south). Making the hypothesis that the radio emission is generated (by the cyclotron maser instability), near the local gyrofrequency, along a magnetic field line carried away by Io (with a lead angle δ) along its revolution around Jupiter, we study the occurrence probability in a polar diagram linked to the local magnetic field. We make the assumption that the magnetic field intensity gradient plays the role of an optical axis for the wave propagation. Thus, for a given Jovian magnetic field model, we are able to plot the four sources Io-A, Io-B, Io-C and Io-D as a function of the colatitude angle θ relative to the gradient of the magnetic field (radial coordinate) and an azimuth angle ψ linked to the direction of magnetic field vector. Our previous results revealed that the angle θ is not constant and that the Jovian decameter emission controlled by Io is radiated in a hollow cone which is not axi-symmetrical around the magnetic field gradient but flattened in the direction of the magnetic field vector. In the present study, we focus on the effect of the magnetic field model on the angular distribution of the sources and the consequences for the emission cone.