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Nonaxisymmetrical beaming cone of radio waves produced by cyclotron maser instability in inhomogeneous medium

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The results we have recently obtained about the beaming of the Io-controlled decameter Jovian radio emission allow us to conclude that this radiation is emitted in a hollow cone flattened in a particular direction linked to the local magnetic field. The existence of such an emission cone leads us to understand the location of the Io-controlled sources (Io-A, Io-B, Io-C, and Io-D) in the CML-Io phase diagram and to interpret their dependence on the longitude as the manifestation of a Jovian active longitude sector, where the emission mechanism is the most efficient. We study the origin of the flattening of the emission cone in the framework of a radio emission produced by the cyclotron maser instability in an inhomogeneous medium where the local magnetic field $\mathbf{B}$ and the gradient of its modulus ∇B are not parallel, i.e., in a geometry without axial symmetry. We consider that the radiation propagates in the source region in the X-mode near its cutoff frequency.