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Emission cone of Jovian decameter radiation derived from Jupiter's magnetic field observed by JUNO

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Abstract

We use Jupiter's new magnetic field model JRM09 to investigate the angular distribution of the Jovian decameter radiation occurrence probability, relatively to the local magnetic field **B** and its gradient ∇B in the source region. This model was recently proposed by Connerney et al. [*Geophys. Res. Lett.*, *45*, 2590-2596, 2018], it is derived from Juno's first nine orbits observations. We compare the results to those obtained several years ago using older models (O6, VIP4, VIT4 and VIPAL). The JRM09 model confirms the former results: the radio emission is beamed in a hollow cone presenting a flattening in a specific direction. The same assumptions were made as in the previous studies: the Jovian decameter radiation is supposed to be produced by the cyclotron maser instability (CMI) in a plasma where **B** and ∇B are not parallel. As a consequence, the emission cone does not have any axial symmetry and then presents a flattening in a privileged direction. This flattening appears to be more important for the northern emission (34.8%) than for the southern emission (12.5%) probably due to the fact that the angle between the directions of **B** and ∇B is greater in the North (~10°) than in the South (~4°).