Relevance of the magnetic field model for studying the beaming cone of the Jovian decameter emission

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We use five different Jupiter's magnetic field models (O6, VIP4, VIT4, VIPAL and JRM09) to investigate the angular distribution of the Jovian decameter radiation occurrence probability, relatively to the local magnetic field $\mathbf{B}$ and its gradient $\mathbf{\nabla}B$ in the source region. The most recent model JRM09, proposed by Connerney et al. [Geophys. Res. Lett., 45, 2590-2596, 2018], was derived from Juno’s first nine orbits observations. The JRM09 model confirms the results obtained several years ago using older models (O6, VIP4, VIT4 and VIPAL): 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 $\mathbf{B}$ and $\mathbf{\nabla}B$ 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 $\mathbf{B}$ and $\mathbf{\nabla}B$ is greater in the North (~10°) than in the South (~4°).