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## **Equipartition estimation of galactic magnetic field strength using Bayesian approach**

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The equipartition of energy between magnetic fields and cosmic rays is believed to hold in Milky Way-like galaxies. Its use provides an extremely convenient tool for estimating the strength of the galactic magnetic field from radio observations, such as from LOFAR telescope. We present a new approach to calculating magnetic field strength from energy equipartition based on Bayesian methods. Our approach makes it possible to directly apply the formulas for intensity and polarisation of synchrotron radiation for a given magnetic field geometry (forward problem) without the need to reverse these formulas (inverse problem), as has been done so far, but requires further simplifications. We assume superposition of uniform magnetic field with a random oriented field component of the constant strength in a given emitting volume. This method does not need other simplifications or additional assumptions that are necessary to solve the inverse problem. The Bayesian approach also presents a natural way to determine uncertainties in the calculated magnetic field strength resulting from both observational uncertainties and uncertainties in the assumed values of unknown physical parameters.