Observational Signatures of Galactic Turbulent Dynamos

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Résumé

We analyse the observational signatures of galactic magnetic fields that are self-consistently generated in magnetohydrodynamic
simulations of the interstellar medium through turbulence driven by supernova (SN) explosions and differential rotation. In
particular, we study the time evolution of the Faraday rotation measure (RM), synchrotron radiation, and Stokes parameters by
characterising the typical structures formed in the plane of observation. We do this by defining two distinct models for both
thermal and cosmic ray (CR) electron distributions. Our results indicate that the maps of RM have structures which are sheared
and rendered anisotropically by differential rotation and that they depend on the choice of thermal electrons model as well as the
SN rate. Synchrotron maps are qualitatively similar to the maps of the mean magnetic field along the line of sight and structures
are only marginally affected by the CR model. Stokes parameters and related quantities, such as the degree of linear polarisation,
are highly dependent on both frequency and resolution of the observation.

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