

[IM11] MHD TURBULENCE AND FARADAY ROTATION

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Using 3 dimensional data cubes obtained from direct numerical MHD turbulence simulations, we calculate structure functions (SF) of the rotation measure (RM), the dispersion measure (DM) and the emission measure (EM). We use 4 different MHD models. Each one has different Mach number and the strength of the mean magnetic field. We use the structure functions to gain quantitative knowledge about the physical parameters of the turbulence, such as the strengths of the mean magnetic field or the Mach number. We compare the scaling of the structure functions with the She-Leveque model and other models.

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[IM12] Cosmic Ray Scattering In the Turbulent Magnetic Field

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As an important example of the dynamics of cosmic ray in electromagnetic fields, we consider the motion of charged particles in static turbulent magnetic fields. The ensemble of the test particles diffuses in magnetic field and we analyze the transport of particles parallel or perpendicular to the mean magnetic field. The analyses utilize the numerical simulation that integrates the trajectories of an ensemble of test particle, from which we obtain diffusion coefficients based on the particle motions.