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MHD Turbulence and the Geodynamo

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The outer core of the Earth contains a turbulent magnetofluid that is the source of the geomagnetic field. Magnetohydrodynamic (MHD) turbulence, per se, contains a dynamo mechanism that creates and maintains the geomagnetic field. This geodynamo can be understood in terms of the statistical mechanics of rotating MHD turbulence. Here, we describe a mathematical model of the outer core, review theoretical and numerical results associated with it, explain the origin of the energetic, quasi-stationary geomagnetic dipole and thus present a solution to the dynamo problem.