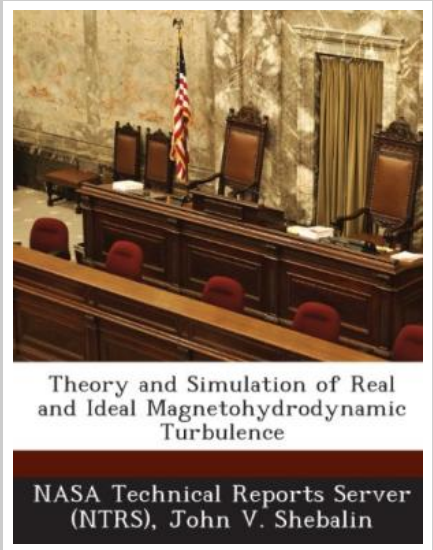

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Theory and Simulation of Real and Ideal Magnetohydrodynamic Turbulence

By John V. Shebalin

BiblioGov. Paperback. Book Condition: New. This item is printed on demand. Paperback. 34 pages. Dimensions: 9.7in. x 7.4in. x 0.1in.Incompressible, homogeneous magnetohydrodynamic (MHD) turbulence consists of fluctuating vorticity and magnetic fields, which are represented in terms of their Fourier coefficients. Here, a set of five Fourier spectral transform method numerical simulations of two-dimensional (2-D) MHD turbulence on a 512(sup 2) grid is described. Each simulation is a numerically realized dynamical system consisting of Fourier modes associated with wave vectors k, with integer components, such that k k less than or equal to k(sub max). The simulation set consists of one ideal (non-dissipative) case and four real (dissipative) cases. All five runs had equivalent initial conditions. The dimensions of the dynamical systems associated with these cases are the numbers of independent real and imaginary parts of the Fourier modes. The ideal simulation has a dimension of 366104, while each real simulation has a dimension of 411712. The real runs vary in magnetic Prandtl number P(sub M), with P(sub M) is a member of 0. 1, 0. 25, 1, 4. In the results presented here, all runs have been taken to a simulation time of t 25. Although ideal and real Fourier...

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