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Numerical studies of weak MHD turbulence[1] JEAN C. PEREZ, STANISLAV BOLDYREV, University of Wisconsin-Madison — Results from numerical simulations of weak magnetohydrodynamic (MHD) turbulence in steady-state are presented, with resolutions as high as $1024^2 \times 256$ grid points. Weak turbulence refers to the limit of MHD turbulence in which the energy transfer toward smaller scales results from the weak interaction between Alfvén waves moving along of against a strong guide magnetic field. The energies of the Alfven waves moving in the opposite directions can be either equal, in which case the turbulence is called balanced, or unequal, in which case it is unbalanced. The numerical set up is optimized as to drive either balanced or unbalanced turbulent cascades. We obtain the spectra of Alfvén waves for various degrees of imbalance and Reynolds numbers. We discuss our results and compare with recent theories of weak MHD turbulence.

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