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Simulations and Transport Models for Imbalanced Magnetohydrodynamic Turbulence[1] CHUNG-SANG NG, T. DENNIS, University of Alaska Fairbanks — We present results from a series of three-dimensional simulations of magnetohydrodynamic (MHD) turbulence based on reduced MHD equations. Alfven waves are launched from both ends of a long tube along the background uniform magnetic field so that turbulence develops due to collision between counter propagating Alfven waves in the interior region. Waves are launched randomly with specified correlation time T_c such that the length of the tube, L, is greater than (but of the same order of) $V_A * T_c$ such that turbulence can fill most of the tube. While waves at both ends are launched with equal power, turbulence generated is imbalanced in general, with normalized cross-helicity gets close to -1 at one end and 1 at the other end. This simulation setup allows easier comparison of turbulence properties with one-dimensional turbulence transport models, which have been applied rather successfully in modeling solar wind turbulence. However, direct comparison of such models with full simulations of solar wind turbulence is difficult due to much higher level of complexity involved. We will present our latest simulations at different resolutions with decreasing dissipation (resistivity and viscosity) levels and compare with model outputs from turbulence transport models.

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