

Abstract Submitted
for the DPP07 Meeting of
The American Physical Society

Simulations of extended MHD Turbulence and Sheared flows in the Helimak Configuration RUSSELL B. DAHLBURG, Naval Research Laboratory, JEAN C. PEREZ, University of Wisconsin-Madison, WENDELL HORTON, The University of Texas at Austin — We investigate the interaction of sheared plasma flows with the ambient turbulence in the Helimak configuration using a magnetohydrodynamic slab model that captures most of the important features present in the Helimak device at the University of Texas. We report 2D and fully 3D nonlinear simulations using magnetic and flow profiles based on experimental data. The experiment is well modeled as a bounded magnetized jet. The extended MHD model includes a gravitational term to account for magnetic field curvature drifts. Important features of the code include the presence of walls, resistivity and viscosity. The nonlinear development of various disturbances will be discussed. Preliminary results show that as the linear modes attain finite amplitude, there is considerable development of multiscale plasma excitation.

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Date submitted: 22 Jul 2007

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