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Drift wave turbulence in the Texas Helimak DMITRY MEYERSON, UT Austin - IFS, WENDELL HORTON, UT Austin - IFS, FRANCOIS WAELBROECK, KENNETH GENTLE, UT Austin - IFS — The BOUT++ framework is used to study resistive drift-wave turbulence in the Texas Helimak. Experimental electrostatic fluctuation data is compared with results from a three dimensional axysymmetic simulation as well as analytic predictions. The physical basis for the simulation is a nonlinear 3 field, cold ion, drift-ordered fluid model. In the linear limit eigenmodes of the system are examined analytically. The helimak is a low temperature experimental plasma device that allows convenient comparisons between theoretical models and experimental evidence. The most important geometric effects founds in a tokamak's SOL, magnetic shear and toroidicity, are present in this device. BOUT++ is an open source, C/C++ based, framework developed to quickly prototype physical models by decoupling the physics of a given model and the particular numerical methods used to evolve the desired set of equations. The original motivation was the study of the relatively low temperature scape-off-layer (SOL) in high temperature plasma devices. Two motivations are (1) to validate models of the scrape-off- layer (SOL) and (2) to investigate the role of E_r shear in forming transport barriers. A 3D axisymmetric configuration is assumed with a finite difference equations along the helical magnetic field line and in the bi-normal direction.

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