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Identifying the interaction mechanisms between the tearing mode and drift-wave turbulence[1] S.D. JAMES, University of Tulsa, D.P. BRENNAN, Princeton University, C. HOLLAND, University of California, San Diego — We present nonlinear simulations of a three-field model evolving density, vorticity, and magnetic flux in a slab geometry. Drift wave turbulence is driven by an equilibrium density gradient, extending throughout the domain while a magnetic island can be driven unstable at a rational surface in the center of the domain. We utilize an equilibrium with prescribed tearing stability properties and turbulent drives. The results show the stability of the tearing mode is affected by the presence of the turbulence and the energy transport between them is discussed in the context of a turbulent resistivity. Nonlinear island widths are presented as a function of the tearing mode stability parameter, Δ', and the equilibrium density gradient. The threshold for significant nonlinear growth of the tearing mode is modified by the background flow and turbulence, and the nonlinear saturated states of the island become oscillatory in the turbulent fields.

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