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Investigating the Interaction Between Magnetohydrodynamic Instabilities and Microturbulence S.D. JAMES, University of Tulsa, C. HOLLAND, O. IZACARD, University of California San Diego, D.P. BRENNAN, Princeton University — The effects of microturbulence on the evolution of magnetohydrodynamic (MHD) instabilities are known to be important. In turn, the MHD instabilities themselves can influence the dynamics of the turbulent fields. Microturbulence involves very small spatial and temporal scales while the global evolution of MHD instabilities involves spatial and temporal scales several orders of magnitude larger. Accurately capturing these discrepancies is a challenging computational problem. We present results for a 3-field model, which self-consistently couples turbulent density and vorticity fluctuations to magnetic flux via Ohm's law. We have developed new code, TURBO, to capture the evolution of a magnetic island in an unstable equilibrium and calculate resistive and viscous effects due to the turbulence. Comparisons with analytic approximations for a turbulent resistivity and viscosity are also presented. We discuss our approach for extending this work to a 5-field model, which includes the ion temperature gradient (ITG) mode.

S.D. James
University of Tulsa

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