Abstract Submitted
for the DPP13 Meeting of
The American Physical Society

Interactions Between Tearing Modes and Microturbulence OLIVIER IZACARD, CHRISTOPHER HOLLAND, University of California - San Diego, DYLAN BRENNAN, Princeton University, SPENCER JAMES, University of Tulsa — Understanding the physics of both large-scale magnetohydrodynamic instabilities and small-scale drift-wave microturbulence is essential for predicting and optimizing the performance of magnetic confinement based fusion energy experiments. While both types of instability have been investigated individually for many years now, less attention has been given to quantifying the interaction mechanisms between them. We report progress on understanding these interactions using both analytic theory and numerical simulation, with both the BOUT++ code and an independently developed finite-difference code used to evolve a simple five-field fluid model in a slab geometry. This initial work focuses upon understanding the dynamics of the electromagnetic ion temperature gradient instability in the presence of a background static magnetic island, as key parameters such as ion temperature gradient and magnetic configuration are varied. The simulation results are then used to calculate effective turbulent transport coefficients (e.g. viscosity, resistivity) that are compared against analytic predictions.

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Date submitted: 12 Jul 2013 Electronic form version 1.4