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Nonlinear Excitation of Damped Eigenmodes in GYRO Microturbulence Simulations DAVID HATCH, University of Wisconsin - Madison, PAUL TERRY, University of Wisconsin -Madison, BILL NEVINS, Lawrence Livermore National Laboratory — Recent work has demonstrated that linearly damped eigenmodes can be nonlinearly excited to levels that significantly affect saturated turbulent transport. This has been shown in reduced CTEM and ITG-like fluid models [1]. We analyze microturbulence data from GYRO to discover which if any of these effects exist in comprehensive simulations. It has long been noted that the spectrum for ITG-driven turbulence peaks at wavenumbers well below the fastest growing wavenumbers. In addition, the growth rate of the fastest growing ITG mode is positive well beyond the range of significant fluctuation amplitude. We examine the possibility of energy dissipation through linearly damped modes as an explanation for these phenomena. We bound damped eigenmode excitation from energetic considerations, given growth rate spectra and energy spectra. We examine cross correlations spectrally and compare to quasilinear values. Comparisons with simpler fluid models are also undertaken.

[1] P.W. Terry, D.A. Baver, and S. Gupta, Phys. Plasmas **13**, 022307 (2006)

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