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Energy Dissipation in Electromagnetic Microturbulence G.G. WHELAN, M.J. PUESCHEL, P.W. TERRY, University of Wisconsin-Madison —
Typically, almost all roots of the gyrokinetic plasma dispersion relation are damped modes. Through nonlinear transfer, often involving coupling with zonal flows, these modes receive energy from unstable modes. This has signifigant consequences and in cases the effects from mode coupling are even the dominant contributions for the saturation physics of plasma turbulence. Using the gyrokinetic code GENE, we track the zonal-flow-enabled energy transfer at a single wave number by making use of both proper orthogonal decomposition and linear eigenmode representation. Expanding on previous, electrostatic work [K.D. Makwana et al., Phys. Rev. Lett. **112**, 095002 (2014)], we investigate how finite-beta physics affect zonal flow coupling, as well as the cumulative effects of zonal modes and frequency matching. In particular: how effective zonal flows are in facilitating energy transfer to stable modes, the energy dissipation by stable modes in the drive range and the possible contributions by resonant effects respectively. In this context, consequences for the understanding of electromagnetic stabilization of ion-temperature-gradient-driven turbulence are detailed.

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