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Electromagnetic Stabilization of ITG Turbulence[1] G.G. WHELAN, M.J. PUESCHEL, P.W. TERRY, University of Wisconsin-Madison — Finite plasma β strongly reduces transport due to ion-temperature-gradient-driven turbulence, far beyond the stabilization quasilinear mixing length models predict. Gyrokinetic simulations reveal that more efficient nonlinear mode coupling, as measured by triplet correlation lifetime, is the dominant mechanism behind nonlinearly-enhanced stabilization. Electromagnetic effects increase triplet correlation lifetime which causes the instability to saturate at lower amplitudes. We will discuss contribution factors to the triplet correlation lifetime. When modified to include the effects of triplet correlation lifetime, quasilinear predictions reproduce nonlinear heat fluxes through a range of temperature gradients and β values. A second, weaker contributor is enhanced stable mode excitation which reduces energy production relative to the unstable eigenmode. This is only responsible for 10-20% of the enhanced stabilization.

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