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Turbulent Resistivity in 2D Wave Turbulence SHANE KEATING, PATRICK DIAMOND, UC San Diego — In their seminal paper, Cattaneo & Vainshtein [1] demonstrated that small-scale magnetic fields can significantly alter mean-field evolution in high-Rm MHD turbulence, even for very weak large-scale fields. Consequently, diffusion of the mean flux in 2D is strongy suppressed, or "quenched." Self-consistent mean-field electrodynamics suggests that this quench depends critically upon the magnetic Reynolds number, as well as the self-correlation time of the fluid and the field. To elucidate the theory, we consider wave turbulence in a model of 2D MHD in the presence of stable stratification. In this model, there arises an unambiguous time-scale associated with three-wave resonance of "magneto-internal waves." We show that such triad interactions can act as an alternate source of irreversibility, and that the Rm-dependent quench can be circumvented at the cost of moving to higher order in wave-slope. An explicit calculation of the flux of magnetic potential in the presence of stratification is presented. Finally, we examine certain classes of triad interaction and examine which make the dominant contribution to the turbulent resistivity.
newline [1] Cattaneo, F. and Vainshtein, S.I., Astrophys. J. 376, L21-24 (1991)

Shane Keating
UC San Diego

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