Abstract Submitted
for the DPP06 Meeting of
The American Physical Society

Gradient Scalings of Nonlinear Inward Flux Component in Trapped Electron Turbulence P.W. TERRY, R. GATTO, University of Wisconsin-Madison — Inward particle transport is desirable for ITER. Trapped electron mode turbulence has inward flux components because the nonlinearity of electron density advection strongly excites a damped eigenmode at low collisionality. We derive the scaling of inward components with density and temperature gradient to determine whether they are diffusive, convective, or of some other form. This requires a detailed solution of the saturated state, including the fluctuation levels and gradient scalings of the growing and damped eigenmodes, and their complex-valued cross correlation. We obtain such a solution in an expansion for low collisionality, proximity to threshold, and long wavelength, by checking asymptotic energy saturation balances for consistency under all possible scalings in a weak turbulence regime. The procedure yields a flux that is highly nondiffusive and has inwardly directed components that scale as L_n/L_T^2 and L_n^2/L_T^3. These components are nearly as large as the outward flux. We speculate on the effect of this mechanism in ITG, where the quasilinear flux is inward, but nonlinear effects such as this have not been explored.

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Date submitted: 21 Jul 2006

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