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Nonlinear Particle Pinch in Collisionless Trapped Electron Mode Turbulence P.W. TERRY, D.A. BAVER, University of Wisconsin-Madison, R. GATTO, Università di Roma "Tor Vergata" — Collisionless trapped electron mode turbulence is shown to have an anomalous particle pinch fundamentally unlike pinches identified previously. It arises from a nonlinear fluctuation eigenmode, placing it outside the purview of quasilinear theory. The nonlinear eigenmode develops because the nonlinearity excites a damped linear eigenmode, changing the density-potential correlation. The flux is solved from spectrum balance equations in a complete basis spanning the fluctuation space under a joint expansion in collision frequency and instability threshold parameter. The solution accounts for saturation by anisotropic energy transfer to zonal wavenumbers of the damped eigenmode. To lowest order the pinch is a convective-like flux driven by temperature gradient. It arises from the damped eigenmode energy and the real part of the correlation between damped and growing eigenmodes. The pinch is slightly smaller than the outwardly directed flux associated with the growing eigenmode, making the flux a small fraction of the quasilinear value. Work supported by US DOE.

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