

Abstract Submitted
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Gyrokinetic simulations of turbulent transport in a closed field-line geometry BARRETT ROGERS, PAOLO RICCI, Dartmouth, WILLIAM DORLAND, University of Maryland, College Park — Plasma turbulence due to small scale entropy modes is studied with gyrokinetic simulations in a simple closed field line geometry, the Z-pinch, in low-beta parameter regimes that are stable to ideal interchange modes. We find an enormous variation in the nonlinear dynamics and particle transport as a function of two main parameters, the density gradient and the plasma collisionality. This variation is explained in part by the damping and stability properties of spontaneously formed zonal flows in the system. As in toroidal systems, the zonal flows can lead to a strong nonlinear suppression of transport below a critical gradient that is determined by the stability of the zonal flows.

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