

Abstract Submitted
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On the Origin of Current Scaling of the Density Limit¹ PATRICK H. DIAMOND, RAMESWAR SINGH, University of California, San Diego — Density limits impose a fundamental limit on tokamak operation. Recent work has identified shear layer collapse as the fundamental dynamics of the rise in particle transport associated with density limit behavior. Shear layer collapse occurs when electrons become nonadiabatic (i.e. hydrodynamic). The origin of current scaling — ubiquitous in density limit dynamics — remains. Here, we explore the implications of zonal flow screening (or inertia) for the current scaling. Simple arguments show that shear perturbations are more resilient at high density, in accord with Greenwald scaling. We will discuss further developments of the theory.

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