

Abstract Submitted
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Flows and electric fields near the edge of a tokamak plasma¹

FREDERICK HINTON, UCSD — The expressions for neoclassical parallel flows are modified from their standard forms by orbit effects in plasmas with steep electric field profiles, such as near the edge of a tokamak plasma in an improved confinement mode. The diamagnetic and electric field-induced contributions to the bounce-averaged parallel flows are affected differently. This leads to modifications of the standard neoclassical expressions for poloidal and toroidal flows. These flows can change rapidly during a transition to an improved confinement mode. The electric field which develops during such a transition is partly determined by neoclassical polarization, which itself is modified by orbit effects in the steep electric field profile. By using a distribution function which is a function of particle constants of motion, plus a correction due to collisional effects, these modifications are estimated analytically.

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