Abstract Submitted
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Ion pressure gradient effects on Kelvin-Helmholtz and interchange instabilities[1] DAVID RUSSELL, JAMES MYRA, Lodestar Research Corporation — In the flow-free state, radial force-balance implies that the poloidal components of the ExB and ion diamagnetic drifts, ˜grad(Pi) / n, are mirrored : vE + vdi = 0. Analysis [1] of the linearized fluid equations shows that the mirrored state is stable in the absence of the interchange drive, ˜grad(Pe+Pi) / n, i.e., the K-H instability is absent. With the interchange drive present, the mirrored-state growth rate passes through a global *minimum* value with *increasing* ion pressure gradient, due to sheared ExB flow and diamagnetic suppression, admitting a stability interval in a neighborhood of the minimum if other damping mechanisms are present. The K-H instability is recovered, absent the interchange drive, if force-balance is generalized to include neoclassical poloidal flows (vE + vdi + vnc = 0, vnc ˜grad(Ti)) [2], so that mirroring is lost. Implications for achieving a quiescent H-mode are discussed, and SOLT simulations, which include nonlinear ion pressure effects, are compared with the linear picture. [1] J.R. Myra et al., J. Plasma Phys. **82**, 905820210 (2016). [2] L. Chôné et al., Phys. Plasmas **21**, 070702 (2014).

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