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Effects of the Perpendicular Electron Spatial Diffusion on the Excitation Properties of the Drift-Tearing Mode* V. ROYTERSHTEYN, B. COPPI, C. CRABTREE, MIT, Cambridge, MA — Contrary to relevant experimental observations, the linear theory of the drift-tearing mode[1] predicts that the mode should not be excited in the high temperature regimes in the presence of a finite perpendicular gradient of the electron temperature[2]. In particular, the values of the stability parameter Δ' (the jump in the first derivative of the perturbed magnetic field across the reconnection layer) for the modes observed in experiments are well below the linearized theory threshold $\Delta'_{\rm crit}$. We have proposed that the interaction of the drift-tearing mode with a background of microscopic modes reduces $\Delta'_{\rm crit}$. In particular, such effects as a local depression in the electron parallel thermal conductivity, or local flattening of the electron temperature profile, destabilize the mode. The limit, where the role of the background is only to create perpendicular electron spatial diffusion is investigated considering the collisionless regime[3], where such diffusion acts to mostly affect the thermal energy transport by modifying Landau resonances. For reasonable values of the perpendicular diffusion coefficient, the reduction of $\Delta'_{\rm crit}$ is rather small. Therefore other effects of a background microturbulence that can further decrease $\Delta'_{\rm crit}$ are analyzed. [1] B. Coppi, *Phys. Fluids* **8**, 2273, 1965; [2] J. Drake *et al. Phys. Fluids* **26**, 2509, 1983; [3] G. Bertin *et al. Annals of Physics* **119**,371, 1979; *Supported in part by U.S. D.O.E.

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