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On the Excitation of Drift-Tearing Modes in High-Temperature Plasmas[1] V. ROYTERSHTEYN, B. COPPI, MIT, C. YARIM, ITU, Istanbul — Contrary to relevant experimental observations in high-temperature toroidal plasmas [1], both the collisionless and weakly collisional theory of drift-tearing modes [2] in magnetically confined plasmas predict [3,4] that in the presence of a significant radial electron temperature gradient these modes should not be excited, as a result of the effects of electron Landau damping and parallel electron thermal conductivity. To reconcile the experimental observations with the theory, we propose that the presence of a background microturbulence allows for the excitation of the reconnecting mode. We have demonstrated that such effects as a local depression in the parallel electron thermal conductivity or, less likely, a local flattening of the electron temperature profile can lead to a significant reduction in the excitation threshold. In addition, a modest transverse electron thermal conductivity that can be driven by I.E.T.G. modes [5] can change significantly the topology of the drift-tearing mode and can lead to positive growth rates for realistic current density and plasma pressure distributions. [1] J. A. Snipes *et al.*, *Plasma Phys. Cont. Fus.*, **44** 381 (2002) [2] B. Coppi *Phys. Fluids*, **8** 2273 (1965) [3] B. Coppi et al., *Phys. Rev. Letters*, **42**, 1058(1979); J. Drake, *et al., Phys. Fluids*, **25**, 2509 (1983) [4] V. Roytershteyn, *et. al.*, Paper P2-27, 2005 Sherwood Conference [5] C. Yarim, *et al.*, this conference

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