Abstract Submitted
for the DPP06 Meeting of
The American Physical Society

Short wavelength turbulence and coherent modes associated with electron temperature gradients[1] KEVIN TAKASAKI, BRUNO COPPI, CHRIS CRABTREE, VADIM ROYTERSHTEYN, MIT — The effects of a background of short wavelength modes that are associated with the combined effects of a sheared magnetic field and an electron temperature gradient are shown to be relevant to the resolution of two theoretical issues: i) the excitation of drift-tearing modes and ii) the particle inflow process in high temperature regimes [1]. First, electrostatic modes whose potentials are even relative to a $\mathbf{k} \cdot \mathbf{B} = 0$ surface can form quasi-modes which have a parallel electron thermal gradient suggesting a state of enhanced "thermal resistivity" favoring the onset of drift-tearing modes. Electromagnetic modes, whose electrostatic potential has the opposite parity, involve fine-scale magnetic reconnection leading to microscopic magnetic islands. A superposition of individual modes at different "radial" positions form strings of propagating island chains that can occupy the reconnection layer of the drift-tearing mode and can provide a stochastic component to the electron orbits which also favors the onset of drift-tearing modes. Second, in the central region of the plasma column the short wavelength modes can produce a particle inflow, which in the outer region of the plasma column is associated [1] with the effects of finite electron collisional thermal conductivity. [1] B. Coppi and C. Spight, *Phys. Rev. Lett.* **41**, 551 (1978).

[1]Supported in part by U.S.D.O.E.

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Date submitted: 21 Jul 2006 Electronic form version 1.4