Short wavelength turbulence and coherent modes associated with electron temperature gradients\textsuperscript{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 \cite{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 \cite{1} with the effects of finite electron collisional thermal conductivity. \cite{1} B. Coppi and C. Spight, \textit{Phys. Rev. Lett.} \textbf{41}, 551 (1978).

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