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Non-fluid Micro-Reconnecting Modes* C. CRABTREE, B. COPPI, MIT — The main features of the micro-reconnecting mode [1] are i) it is intrinsically electromagnnetic, ii) it requires a kinetic description, iii) it produces strings of microscopic magnetic islands, iv) it has a natural transverse (to the magnetic field) scale distance of the order of $d_e = c/\omega_{pe}$, v) it does not involve electron gyroradius effects, vi) it is driven by the transverse electron temperature gradient. The mode is charaterized by $\omega \sim k_{\|}\mathrm{v}_{te}$, ω being the mode complex frequency that is of the order of $k_{\perp}cT_e/(eBr_{Te})$, and $1/r_{Te} \equiv -(\mathrm{d}\log T_e/\mathrm{d}r)$. The implied ordering, $\beta_e \sim 2r_{Te}^2/L_s^2$ where β_e, the ratio of electron thermal energy density to the magnetic energy density, is regarded as relevant to current experiments such as those carried out by the NSTX device where modes with transverse scale distances of the order of d_e have been identified [2]. The considered mode does not produce an appreciable particle transport while the relevant effective thermal diffusion coefficient $D_{e\perp}^{th}$ is estimated to be of the order of $(d_e/r_{Te})cT_e/(eB)$. The mode can also significantly reduce the effective $D_{e\|}^{th}$ and allow the possibility to excite mesoscopic drift-tearing modes [1], which depends critically on the ratio $D_{e\perp}^{th}/D_{e\|}^{th}$. A significant density gradient is found to depress these modes considerably. [1] B. Coppi, in *Collective Phenomena in Macroscopic Systems*, p. 59, *Publ. by* World Scientific (2007). [2] E. Mazzucato, R. E. Bell, J. C. Hosea, *et al.*, *Am. Phys. Soc.*, **52**, 61 (2007). * *Supported in part by the U.S. D.o.E.*

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