

Abstract Submitted
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Magnetic Reconnection Events in Weakly Collisional Regimes*¹

P. BURATTI, ENEA, Italy, B. COPPI, MIT — The known modes leading to macroscopic reconnection in weakly collisional plasmas, are: one related to the drift tearing mode [1] and another with the opposite phase velocity, in the ion diamagnetic velocity direction, requiring a high energy particle population [2]. Observation of islands, that suddenly appear at finite amplitude during a trigger event (like a sawtooth crash) led to the concept of metastable resistive tearing modes. But the observation of islands growing from very small amplitude without any trigger event [3] leads instead to considering the modes mentioned above requiring the prior excitation of other linearly unstable modes: a) for the drift-tearing mode, the micro-reconnecting mode, which is driven unstable by the electron temperature gradient [4]. b) for modes with the opposite phase velocity [5], pressure gradient driven macroscopic modes that have a similar phase velocity.

[1] B. Coppi, *Phys. Fluids* **8**, 2273(1965) [2] B. Coppi, *Bull. Am. Phys. Soc.* **45** (2000) 366. [3] P. Buratti *et al.*, 34h EPS Conf. on Pl. Phys. (July 2007) ECA **31F** O-4.018 (2007) [4] B. Coppi, “Collective phenomena...” Publ. *World Scientific*, p. 59 (2007) [5] P. Buratti *et al.*, 35th EPS Conf. Pl. Phys., (June 2008) ECA **32D**, P-1.069 (2008)

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