

Abstract Submitted
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Magnetic Reconnection in the Earth Magnetotail and Auroral Substorms* B. BASU, B. COPPI, MIT — By now it is well-accepted that magnetic reconnection is responsible for the generation of accelerated particle populations in space, such as that proposed to occur in the Earth's magnetotail [1] and generate auroral substorms. In fact, reconnection is the most probable process to explain the observed high-energy particle populations at the edge of the Heliosphere. On the other hand, the theory of this process remains in need of further attention. Since the late sixties, it has been known that departures from Maxwellian distributions for the background plasmas, such as anisotropic electron temperatures, have an important effect on the growth rate of modes producing reconnection. However, the significant effect of transverse (to the field) electron temperature gradients has yet to be included in the theory. The relationship, between the theory of reconnecting modes emerging from plane one-dimensional neutral sheets and modes emerging from cylindrical and axisymmetric toroidal laboratory plasmas, is discussed. In the latter case, a wealth of relevant experimental observations is available. *Sponsored in part by the US DOE.

[1] B. Coppi, G. Laval, and R. Pellat, *Phys. Rev. Lett.* **16**, 1207 (1966).

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