

Abstract Submitted
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**Magneto-thermal Reconnection Processes and Space Physics:
Relevant Regimes** B. COPPI, B. BASU, MIT — Referring to collisionless or weakly collisional plasma regimes such as those characteristic of Earth's magnetotail regions where the ratios of the plasma microscopic scale distances to the macroscopic scale distances are extremely small, current theories of magnetic reconnection have the problem of involving unrealistically small reconnection layers. Given this issue and that relatively steep electron temperature gradients have been observed in these regions, recent developments in the theory of magneto-thermal reconnection [1] can be proposed as being of relevance to the physics of these regions. In this context purely oscillatory modes involving endogenous [1] magnetic reconnection have been identified for regimes where the longitudinal electron thermal conductivity is relatively large and the transverse (to the magnetic field) thermal conductivity is not negligible. In this case the width of the reconnection layer depends weakly on the ratio of the two thermal conductivities and increases with the involved macroscopic lengths as neither the electrical resistivity nor the electron inertia affect it directly. [1] B. Coppi and B. Basu, Phys. Plasmas **26**, 042115 (2019).

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