Abstract Submitted
for the DPP20 Meeting of
The American Physical Society

Role of Magnetic Reconnection and of Thermonuclear Electron Heating in Fusion Burning Plasmas[1] B. COPPI, CNR of Italy, MIT, R. GATTO, CNR of Italy, B. BASU, MIT — The approach to ignition conditions involves the role of tridimensional modes and processes. A class of these concerns the case where most of the energy of the generated fusion reaction products is deposited on the electron population and radially extended or localized modes involving magnetic reconnection [1] can be excited. Regimes with a relatively large longitudinal electron thermal conductivity and a significant local electron temperature gradient are considered. Then a pair of singularities of the perturbed electron temperature associated with the rate of (thermonuclear) heating of the electron population are found to emerge in the vicinity of the rational surfaces around which magnetic reconnection can take place. The analysis of the perturbed electron temperature profile involves four radial asymptotic regions: an outer ideal MHD region, a 'thermal' region related to the thermal conductivities, a 'thermonuclear region', and an innermost region. [1] B. Coppi and B. Basu, Phys. Plasmas **26**, 042115 (2019).

[1]Supported in part by the CNR of Italy.

Bamandas Basu
Massachusetts Institute of Technology MIT

Date submitted: 09 Oct 2020 Electronic form version 1.4