

Abstract Submitted
for the DPP19 Meeting of
The American Physical Society

Collisional Relaxation and Heating in Multi-Ion Species Plasma¹

MIKHAIL MLODIK, ELIJAH KOLMES, IAN OCHS, NATHANIEL FISCH,
Princeton University, PPPL — Multi-ion species plasma that is immersed in a magnetic field features distinct collisional timescales when external forces are applied to it. We identify and explore intermediate timescales and describe metastable states of such a plasma. In particular, we identify and discuss the temperature gradients that arise in the plasma. We compare plasma to a neutral gas, where related physics, i.e. the piezothermal effect [1], are observed.

References: [1] “Piezothermal effect in a spinning gas” V. I. Geyko and N. J. Fisch, Phys. Rev. E 94, 042113 (2016).

[2] “Strategies for advantageous differential transport of ions in magnetic fusion devices” E. J. Kolmes, I. E. Ochs, and N. J. Fisch, Phys. Plasmas 25, 032508 (2018).

¹NNSA 83228-10966 [Prime No. DOE (NNSA) DE-NA0003764]; NSF PHY-1506122

Mikhail Mlodik
Princeton Plasma Physics Laboratory

Date submitted: 21 Jun 2019

Electronic form version 1.4