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Collisional Transport in Partially Magnetized Multi-Ion Species Plasma[1] MIKHAIL MLODIK, ELIJAH KOLMES, IAN OCHS, NATHANIEL FISCH, Princeton Plasma Physics Laboratory, Princeton University — Multi-ion species plasma that is immersed in a magnetic field features different collisional transport timescales in presence of external forces or temperature gradients, which leads to curious effects such as charge incompressibility, ion stratification, and heat pump. [1,2] Moreover, the ion-ion transport depends greatly on the strength of the magnetic field. In particular, the equilibrium state and the direction of impurity transport strongly depend on plasma magnetization, which is characterized by the Hall parameter (Ω_a/ν_{ab} for light species a and heavy species b). We identify the equilibrium state of the bulk plasma and impurity ions for a wide range of plasma magnetizations, as well as the parameter space where distinct collisional timescales and relevant effects can be observed. [1] "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). [2] "Heat Pump via Charge Incompressibility in a Collisional Magnetized Multi-Ion Plasma" M. E. Mlodik, E. J. Kolmes, I. E. Ochs, and N. J. Fisch, arXiv:2006.06149

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