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Cross-Field Transport of Electrons in Hall Plasma Accelerators[1]

MARK A. CAPPELLI, Stanford University — The transport of electrons across the magnetic field within the channel of a Hall discharge plasma accelerator is still the subject of much research. Experiments [1] have shown that the electron mobility is greater than can be accounted for by elastic scattering with neutrals. A number of models have been proposed but the mechanism for this anomalous transport is still heavily debated. In this presentation, we will review the measurements and discuss the mechanisms proposed, including collisions with channel walls and instabilities. We will also present past attempts at incorporating transport models into numerical simulations of Hall plasma thrusters used in space propulsion.

[1] Meezan et al., Phys. Rev. E 63, 026410 (2001)

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