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Electron Transport via Collisional Mechanisms in a Cusped Plasma Ion Accelerator¹ CHRISTOPHER YOUNG, MARK CAPPELLI, Stanford University Plasma Physics Laboratory — A plasma accelerator with applications to low power space propulsion (below 200 W) is experimentally and computationally investigated. Such devices efficiently ionize propellant by trapping electrons between strong adjacent magnetic cusps. Electron transport and ionization processes in this class of plasma accelerator are still poorly understood. A numerical model built around experimental plasma potential measurements of the device is presented, in which single test electron trajectories are traced throughout the simulation domain. A mixture of classical and anomalous collisional processes (respectively linked to the local neutral propellant density and magnetic field strength - Bohm diffusion) is required to recover the behavior observed in laboratory experiments.

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