

Abstract Submitted
for the GEC12 Meeting of
The American Physical Society

Laser Induced Fluorescence Measurements of Ion Velocity in Magnetic Cusped Plasma Accelerators¹ NATALIA MACDONALD, MARK CAPPELLI, Stanford University, WILLIAM HARGUS, JR, Air Force Research Laboratory, Edwards AFB — Cusped Field Thrusters (CFTs) are magnetized plasma accelerators that use strong cusps to shape the magnetic field and hence the electrostatic potential. The cusped magnetic field lines meter the electron transport to the anode and reduce the energetic ion flux towards the dielectric channel walls, thereby reducing the effects of erosion. This work presents time averaged laser induced fluorescence velocity measurements of the ions in the plumes of three CFT variants. These include the Cylindrical Hall Thruster (CHT), Cylindrical Cusped Field Thruster (CCFT), and Diverging Cusped Field Thruster (DCFT). Results indicate that magnetic cusps form equipotential surfaces, and that the majority of ion acceleration occurs outside of the thruster channels.

¹Research is funded through the Air Force Office of Scientific Research with Dr. M. Birkan as grant monitor.

Natalia MacDonald
Stanford University

Date submitted: 15 Jun 2012

Electronic form version 1.4