Abstract Submitted
for the DPP11 Meeting of
The American Physical Society

Ion Acceleration in Rotating Magnetized Plasma[1] N.J. FISCH, Y. RAITSES, Princeton Plasma Physics Laboratory, A. FRUCHTMAN, Holon Institute of Technology — The cylindrical Hall thruster represents a basic magnetic nozzle configuration; it also appears to work far better than it should. While its performance has been reported in considerable detail, the ability of this kind of thruster to propel ions with such a narrow plume has remained a mystery. Moreover, in the discharge overrun current regime, cylindrical Hall thrusters display increased electric fields, plume narrowing, reduction of noise, and differences in temperature and density profiles. The unexpected, unusual, and fortunate behavior of the cylindrical Hall thruster, can now be approached by considering certain self-organizing features of supersonically rotating electron plasma.

[1]Work supported by DOE, AFOSR, and BSF.

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Date submitted: 20 Jul 2011 Electronic form version 1.4