

Abstract Submitted  
for the GEC05 Meeting of  
The American Physical Society

**Development of Micro Hall Thruster** TSUYOHITO ITO, NICOLAS GASCON, MARK CAPPELLI, Stanford University — There is a growing need for advanced propulsion options for small spacecraft. Hall plasma thrusters have intrinsic properties that are attractive for potential Micropropulsion applications – high thrust densities; minimal space charge effects; the discharge is stable over a wide range of input parameters; and the thrust and specific impulse is throttled by varying the discharge voltage. In this study, we are developing a micro-Hall plasma thruster with an operating power of less than 50W. The channel has a 4 mm outer diameter and a Sm-Co magnet is employed for generating the nearly 1T magnetic field strength required for the scaling of these thrusters to low power. I-V curves with the discharge operating on Xe propellant have been measured and the characteristic breathing-mode oscillations have been observed, as expected, at higher frequency in comparison to higher power thrusters. The first prototype studied is actively cooled, and no detrimental damage to thruster components was observed in the operating conditions explored. Ongoing studies include the measurements of near-field ion energy distribution using a retarding potential analyzer.

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Date submitted: 10 Jun 2005

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