

Abstract Submitted  
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**Negative differential conductivity and discharge current oscillations in Hall thrusters**<sup>1</sup> YEVGENY RAITSES, JEFFREY B. PARKER, NATHANIEL J. FISCH, Princeton Plasma Physics Laboratory, Princeton, NJ 08543 — Large-amplitude, low-frequency, discharge current oscillations invariably occur in the Hall thrusters. The oscillations are thought to result from ionization instability [1]. Increase of the cathode electron emission was recently shown to suppress these oscillations [2]. This suppression correlates with a change in the local V-I characteristics of the discharge. In this regime, there are no plasma regions with negative differential conductivity, which are normally observed for the self-sustained thruster discharge. A similar effect can be achieved by using the thruster channel with low secondary electron emission (SEE) walls. The common feature between enhanced cathode electron emission and low SEE wall effects is that in both cases, the electron cross-field mobility is reduced inside the channel and therefore, the ion accelerating and ionization regions are located mainly in this region of a strong magnetic field. [1] S. Barral, E. Ahedo, Phys. Rev. E 79, 046401 (2009), [2] Y. Raitses, A. Smirnov, N. J. Fisch, Phys. Plasmas 16, 057106 (2009).

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