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Wall material effect on electron transport in Hall thruster discharge[1] YEVGENY RAITSES, LEONID DORF[2], IGOR KAGANOVICH, NATHANIEL J. FISCH, Princeton Plasma Physics Laboratory, Princeton, NJ, USA, DMYTRO SYDORENKO, University of Alberta, Edmonton, Canada — Plasma-wall interaction is studied for annular Hall thruster configurations, in which collisionless plasma is bounded by channel walls made of ceramic and graphite materials with different secondary electron emission (SEE) properties [1]. Plasma properties and discharge characteristics are measured for different discharge voltages at the same magnetic field [2]. It is shown that the electron cross-field mobility in the thruster with ceramic walls is higher than in the thruster with graphite walls. Results of analytical modeling [3] and participle-in-cell simulations [4] demonstrate that this effect is a consequence of higher SEE of ceramic materials. [1] Y. Raitses, D. Staack, A. Dunaevsky and N. J. Fisch, J. Appl. Phys. 99, 036103 (2006). [2] Y. Raitses, A. Smirnov, D. Staack, and N. J. Fisch, Phys. Plasmas 13, 014502 (2006). [3] I. Kaganovich, Y. Raitses, D. Sydorenko and A. Smolyakov, Phys. Plasmas 14, 057104 (2007). [4] D. Sydorenko, A. Smolyakov, I. Kaganovich, and Y. Raitses, Phys. Plasmas 13, 014501 (2006).

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