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Parametric Characterization of RF Plasma Cathode¹ JENNIFER HENDRYX, Angelo State University, SULI, Princeton Plasma Physics Laboratory, YEVGENY RAITSES, VALERY GODYAK, NATHANIEL FISCH, Princeton Plasma Physics Laboratory — A plasma cathode that utilizes electron extraction from a radio frequency (rf) plasma could potentially have a longer lifetime than conventional thermionic and field emissive cathodes [1]. We study the electron extraction for a novel low-frequency rf-cathode [2] in the presence of gas flow. The extracting electrode (anode) is movable and biased with respect to the conducting wall of the rf-cathode. The variable parameters of interest in the rf-cathode operation include extraction voltage, distance between anode and rf-plasma source, and gas flow. The results of varying these parameters will be presented. In addition, we also characterize the initiation of a low pressure rf-discharge using a ferroelectric plasma source [3]. [1] B. Longmier, S. Baalrud and N. Hershkowitz, *Rev. Sci. Instrum.*, *77*, 113504 (2006). [2] V. Godyak, Y. Raitses and N. J. Fisch, *IEPC-2007-266*, 30th Inter. Electric Propulsion Conf., Sept., 2007, Florence, Italy. [3] A. Dunaevsky, Y. Raitses, and N. J. Fisch, *J. Appl. Physics* *93*, 3481 (2003)

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