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Plasma-Wall Interaction in Presence of Intense Electron Emission from Walls IGOR D. KAGANOVICH, YEVGENY RAITSES, ALEX V. KHRABROV, MICHAEL D. CAMPANELL, ERINC TOKLUOGLU, HONGYUE WANG, Princeton Plasma Physics Laboratory, DMYTRO SYDORENKO, University of Alberta — The plasma-surface interaction in presence of strong thermionic or secondary electron emission has been studied theoretically and experimentally both as a basic phenomenon and in relation to numerous plasma applications. The electron flux to the wall is determined by the electron velocity distribution function (EVDF) and by the sheath potential, which is set by ambipolar condition consistent with the EVDF and the wall emitting properties. Nonlinear coupling between EVDF and sheath potential is responsible for a number of unusual phenomena [1]. We observed new regime where all plasma electrons leave and are substituted by secondary electrons. In this regime, there is practically no electric field in plasma and sheath, so that ions are not drawn to the wall, plasma electrons are not confined and the plasma potential is negative [2]. Finally, methods to control plasma profiles with an auxiliary electrode in dc discharges are studied experimentally [3].

[1] M. D. Campanell, *et al*, Phys. Rev. Lett. **108**, 235001 (2012).
[2] M. D. Campanell, A. Khrabrov and I. Kaganovich, to be published in Phys. Rev. Lett. **108** (2012).
[3] Y. Raitses, *et al*, IEEE Trans. on Plasma Scie. **39**, 995 (2011).

Igor D. Kaganovich
Princeton Plasma Physics Laboratory

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