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Field-enhanced Auger emission of electrons from metals B. EISMANN, Univ Toulouse, A.V. PHELPS, JILA, U. of Colorado and NIST, L.C. PITCHFORD, CNRS and Univ Toulouse — The electric field strength, E, at the cathode surface in microdischarges operating at high pressures is predicted to reach some 100 kV/cm. In this context, the objective of our work is to evaluate the influence of a high surface field on the ion-induced secondary electron emission coefficient from metal surfaces. Our starting point is the classical theory of Hagstrum (Phys. Rev., 96, 336, 1954), which we extended to include an electric field in the calculation of the probability for electron ejection following Auger neutralization of an incident ion. Among the various effects considered, the Schottky effect is by far the most important, and the secondary electron emission coefficient can be well approximated analytically as a constant (Hagstrum's original theory) plus a term depending on square root of E. The latter term is relatively more important for higher work function metals, and it is independent of the nature of the incoming ion. For argon ions incident on a tungsten surface, the calculated secondary electron emission coefficient is almost constant for E $<$ 100 kV/cm and thereafter increases from 0.05 to 0.08 for a factor of 50 increase in E.

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