

KINETIC THEORY OF IONIZATION IN A  
CATHODE SHEATH OF ABNORMAL GLOW  
DISCHARGE

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The exact integral term of ionization in the electron kinetic equation taking into account the semi-empirical differential cross section of ionization by electron impact is derived. An efficient algorithm of solution of the kinetic equation is given in the one-dimensional case in the cathode sheath of dc glow discharges in helium. The electron current density distribution over energy and the space distribution of ionization efficiency in the cathode fall region are calculated. The results obtained for a set of parameters up to the kilovolt range show the detailed picture of forming a beam-like electron flow within the cathode fall region as well as the sharp localization of the ion/electron production rate near the cathode in kilovolt discharges.