

Journal of Engineering Physics and Thermophysics 2016 vol.89 N2, pages 493-498

Self-Organization of a Laminar Structure of a Normal Glow Discharge

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Abstract

© 2016, Springer Science+Business Media New York. The behavior of a glow discharge at low pressures is considered. A combined experimental and theoretical method for determining the distributions of electron and ion concentrations in the discharge chamber is proposed. It is shown that the concentrations of charged particles in the negative glow rise not due to the intense ionization by fast electrons from the cathode regions, but instead due to the slowing down of their drift motion. The use of an experimental curve of the potential distribution along a discharge chamber and account of the nonlocal dependence of the Townsend coefficient on the electric field strength have allowed obtaining the distribution of the electric field strength and determining the exact character of variation in the concentration of charged particles along the discharge axis.

<http://dx.doi.org/10.1007/s10891-016-1401-0>

Keywords

cathode, electrode regions, Faraday dark space, glow discharge, positive column