

Abstract Submitted
for the GEC14 Meeting of
The American Physical Society

Electron heating due to coulomb collisions between slow and intermediate electrons in DC glow discharges STEPAN ELISEEV, ANATOLIY KUDRYAVTSEV, Saint Petersburg State University — As is known, the electrons in the cathode glow discharge plasma (negative glow and Faraday dark space) can be divided into three groups - slow, intermediate and fast electrons. Slow electrons, having maximum density, provide quasi-neutrality. They're locked in a potential well and have Maxwellian energy distribution. Fast electrons gain their energy in the cathode fall and maintain sufficient ionization in discharge. Intermediate electrons originate during ionization by fast electrons and carry current in the discharge. They have energies up to the threshold of inelastic collisions in the gas. At the same time they carry out their energy to the walls of the discharge and spend it on elastic collisions with gas atoms and Coulomb collisions with slow electrons and heat them. The amount of heating depends on the degree of ionization of gas, pressure, discharge tube size etc. The paper presents the results of a study on the impact of the heating on temperature and concentration of slow electrons in glow discharge.

Stepan Eliseev
Saint Petersburg State University

Date submitted: 13 Jun 2014

Electronic form version 1.4