Abstract Submitted
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Hybrid modelling of open glow discharge with account of nonlocal ionization by fast electrons.[1] STEPAN ELISEEV, ITMO University, Kronverkskiy pr. 49, St. Petersburg 197101, Russia, DENIS EREMIN, ANATOLY KUDRYAVTSEV, St. Petersburg State University, St. Petersburg 199034, Russia — Cage and open discharges as well as hollow cathode devices are used for creating negative glow plasma. In order to perform numerical simulations of such kind of plasma object properly it is necessary to account for nonlocal excitation and ionization induced by fast electrons emitted from cathode and accelerated up to energies 10^2-10^3 eV in cathode voltage drop. In this work a numerical study of open discharge in argon is presented. Simulations were performed using simple hybrid model that incorporates nonlocal ionization by fast electrons into "extended" fluid framework. Electron energy balance is written with account of electron heating due to coulomb interaction between "bulks" (with energies less than 1eV) and "intermediate" electrons (with energies up to inelastic collisions energy threshold). Distributions of main discharge parameters, such charged particle densities, electron temperature, electric potential, current-voltage characteristics of the discharge were obtained. Comparison with experimental results showed good agreement and suggests good applicability of the model.

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