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**Analytical and Numerical Studies of Non-Local Kinetics in Glow Discharge\*** ALEXANDER V. KHRABROV, IGOR D. KAGANOVICH, Princeton Plasma Physics Laboratory, VLADIMIR I. DEMIDOV, West Virginia University — We have studied the formation of electron velocity distribution function (EVDF) in different parts of the energy range in a short glow discharge in light gases. Analytical models are simplified by the fact that the EVDF for most of the electrons produced in the cathode layer is highly anisotropic, and remains so as they propagate into the negative glow (NG). Another group of non-thermal electrons, originating closer to the cathode layer-NG boundary, has sufficiently small kinetic energies to undergo several collisions within NG and become close to isotropic (these energies can still be several times larger than the ionization potential). The former group can be described by a 1D EVDF, with scattering accounted by small corrections, and the latter group, which also includes the electrons produced in NG, can be treated under a diffusion approximation. Both groups are strongly non-Maxwellian. We present the analytical model and compare it to simulation results obtained with a particle-in-cell code EDIPIC. \*This work was supported by the US DOE under Contract DE-SC0001939.

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