Abstract Submitted
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Study of the electron kinetics in abnormal dc glow discharges in oxygen by a multiterm approach and Monte Carlo simulations[1] GORDON K. GRUBERT, DETLEF LOFFHAGEN, INP Greifswald, Felix-Hausdorff-Str. 2, 17489 Greifswald, Germany — The nonequilibrium properties of the electron component in gas discharge plasmas determine decisively the behavior of the whole discharge. These properties are commonly determined by solving the electron Boltzmann equation using a multiterm approximation of the Legendre polynomial expansion of the electron momentum distribution function or by performing Monte Carlo simulations. For comparative kinetic studies of spatially inhomogeneous plasmas, consistent conditions at the spatial margins of the discharge arrangement are required. Extended boundary conditions at the electron emitting cathode are represented, which are adequate for the direct comparison of multiterm Boltzmann equation calculations and Monte Carlo simulations. First results for dc discharges in oxygen at conditions typical of abnormal glow discharges are discussed. The excellent agreement between the results of both the independent kinetic approaches verifies the extended boundary conditions deduced.

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Gordon K. Grubert
INP Greifswald, Felix-Hausdorff-Str. 2, 17489 Greifswald, Germany

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