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Diagnostics of a nonlocal plasma of a short glow discharge with active boundaries[1] VLADIMIR DEMIDOV, West Virginia University, Morgantown, WV, USA, ALEXANDER ASTAFIEV, SERGIE GUTSEV, ANATOLY KUDRYAVTSEV, ROMAN ZAMCHIY, St.Petersburg State University — Short glow discharges have attracted interest of researchers. In such discharges, the gap is chosen such a way that the positive column with direct electron heating by electric field could not be formed. However, in contrast to the positive column, the properties of the plasmas of NG and FDS are poorly understood. In this work, experimental study of the short glow discharge in helium at different gas pressures and distances between the electrodes are performed. The short discharge has a positive differential characteristic. As a result the discharge is stable even without ballast resistance, which may be important for applications. Experiments confirm that the plasma of the short glow discharge is characterized by a low electron temperature and weak electric field. Since the dimensions of the NG are determined by energy of fast electrons produced in the cathode sheath, in atomic gases, the electron distribution function is nonlocal, i.e. different groups of electrons behave independently of each other (did not have time "to mix due to collisions"). As the EDF is nonlocal, it allows measurement of the fast part of the EDF by application of measuring wall electrode. The results of measurements by Langmuir and wall probes are in good agreement.

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