Abstract Submitted
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Self-trapping of fast electrons and spectral measurements in short constricted discharge with cold cathode[1] J.C. BLESSINGTON, WVU, S.F. ADAMS, Air Force Research Laboratory, V.I. DEMIDOV, UES, Inc., B.A. TOLSON, ISSI, Inc., M.E. KOEPKE, WVU — It is known that the effect of self-trapping of the fast electrons in a plasma [1] can be used to regulate plasma properties and be useful for technological applications. It has been demonstrated experimentally that this effect is well pronounced in the cathode region of discharges. The measured wall potential in this discharge region is much higher than a few kT_e, where T_e is the electron temperature (average energy). The measurements have been conducted in short constricted discharges with a cold cathode in argon. Application of additional voltage to the discharge walls causes a redistribution of fast electron fluxes to the boundaries and changes in the intensities of argon spectral lines. Measurements of the relative intensities of spectral lines with wavelengths of 419.8 nm and 420.1 nm give a simple estimation of metastable argon atom distribution [2], which depends on the discharge configuration. 1. C. A. DeJoseph, V. Demidov, J. Blessington, and M. Koepke, Euro Phys. News, 38, #6, 21 (2007). 2. C. A. DeJoseph, J. Phys. B: At. Mol. Opt. Phys., 38, 3805 (2005).

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