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Generation of energetic electrons in a plasma source at fore-vacuum pressures.[1] YEVGENY RAITSES, SOPHIA GERSHMAN, Princeton Plasma Phys Lab — A DC plasma source with a cylindrical anode and planar cathode separated with a mm-scale distance was operated in a vacuum chamber filled with argon and nitrogen gases at 1-10 torr, without the gas flow. Plasma was characterized with electrostatic probes and optical emission spectroscopy. Results of measurements demonstrate that the operation of this source is governed by non-local electron kinetics. Electrons produced by ion-induced secondary electron emission are accelerated in the cathode sheath and generate the plasma inside and other the plasma source. Calculations showed that at the above operating pressure, the energy relaxation length is larger than the distance between the electrodes. We will also report on controlling of electron energy distribution function in the generated plasma outside the source.

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