

Abstract Submitted
for the GEC10 Meeting of
The American Physical Society

Plasma and neutral-gas flow from a radial plasma source¹ GEN-NADY MAKRINICH, DAVID ZOLER, AMNON FRUCHTMAN, H.I.T. - Holon Institute of Technology — The mixed flow of collisional plasma and of a neutral-gas out of a Radial Plasma Source (RPS) [1] is studied. In the RPS, an argon gas is ionized and accelerated radially outward by the electric field applied across an axial magnetic field between an inner anode and a cathode neutralizer located outside the source. The impulse delivered to the ion flow by the applied electric field was measured and found to be larger than the maximal impulse that can be delivered if the ions are collisionless. We show that this impulse enhancement could result from the electric force being felt by ions for a longer time; their residence time in the acceleration region is increased due to their slowing-down collisions with neutrals. In addition, the plasma potential at different distances from the source axis was deduced from the measured potential of a cylindrical emissive probe at saturation. When the RPS is not magnetized, a plasma ball is produced near the anode. The plasma flux near the plasma ball and the amplitude of forced oscillations of a pendulum induced by the flow in the vicinity of the plasma ball, both seem to be much larger than expected by the Langmuir relation in double layers.

[1] G. Makrinich and A. Fruchtman, Phys. Plasmas **16**, 043507, 2009; Appl. Phys. Lett. **95**, 181504 (2009).

¹Research supported by the Israel Science Foundation Grant 864/07.

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Date submitted: 10 Jun 2010

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