

Abstract Submitted
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Increased thrust-over-power in a plasma thruster due to ion-neutral collisions¹ AMNON FRUCHTMAN, GENNADY MAKRINICH, H.I.T. - Holon Institute of Technology — We have recently shown, in experiments conducted in our Radial Plasma Source (RPS), that the thrust per power from a plasma thruster can be increased due to ion-neutral collisions [1, 2]. The plasma in the RPS flows across a magnetic field so that the magnetic field pressure is the source of the thrust. Theory shows that the thrust increase is proportional to the square root of the number of ion-neutral collisions in the acceleration region [1, 2]. We present experimental measurements for three different gases of the thrust increase, results that confirm those theoretical predictions. The gases are argon, nitrogen, and helium. Another experimental finding is that the electron cross field transport is reduced when the cross section of the channel is made narrower. The reduced cross-field transport results in an improved efficiency.

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

[2] G. Makrinich and A. Fruchtman, Phys. Plasmas **16**, 043507 (2009).

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