

Abstract Submitted
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Plasma thruster with oscillating electromagnetic fields¹ AMNON FRUCHTMAN, GENNADY MAKRINICH, Holon Inst of Technology — There is a growing interest in developing electrode-less plasma thrusters to reduce erosion and extend life-time. In the Helicon Plasma Thruster (HPT) [1], a thrust is generated as the plasma heated by radio-frequency waves is ejected away, being accelerated through a magnetic nozzle. The excitation of a double layer at the exit of the HPT was also suggested as a way to impart momentum to the plasma [2]. Another method is imposing a travelling magnetic field [3]. Yet another method is introducing a rotating magnetic field at the exit of a helicon source [4]. Acceleration by rotating electric and magnetic fields, equivalent to the stationary fields Magneto - Plasma Dynamics (MPD) thruster, will be analysed in the talk. In the MPD, either stationary or oscillatory, about half the energy is deposited in the perpendicular electron kinetic energy [5]. The implications of this energy partitioning will be discussed.[1] C. Charles, J. Phys. D: Appl. Phys. 42, 163001 (2009). [2] C. Charles and R. W. Boswell, Appl. Phys. Lett. 82, 1356 (2003). [3] A. L. Fabris and M. A. Cappelli, IEPC-2013-86. [4] S. Shinohara et. al., IEEE Trans. on Plasma Sci. 42, 1245 (2014). [5] A. Fruchtman, Phys. Plasmas 10, 2100 (2003).

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