

Abstract Submitted
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Electron dynamics in Hall thruster¹ SAMUEL MARINI, RENATO PAKTER, Universidade Federal do Rio Grande do Sul — Hall thrusters are plasma engines those use an electromagnetic fields combination to confine electrons, generate and accelerate ions. Widely used by aerospace industries those thrusters stand out for its simple geometry, high specific impulse and low demand for electric power. Propulsion generated by those systems is due to acceleration of ions produced in an acceleration channel. The ions are generated by collision of electrons with propellant gas atoms. In this context, we can realize how important is characterizing the electronic dynamics. Using Hamiltonian formalism, we derive the electron motion equation in a simplified electromagnetic fields configuration observed in hall thrusters. We found conditions those must be satisfied by electromagnetic fields to have electronic confinement in acceleration channel. We present configurations of electromagnetic fields those maximize propellant gas ionization and thus make propulsion more efficient.

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