

Abstract Submitted
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Development of a 2D multi-fluid plasma model to study the anomalous electron transport in a Hall effect thruster.¹ C. A GONZALEZ, KENTARO HARA, Texas A&M University — Hall Effect Thruster (HET) is an electrical propulsion device that use a cross-field configuration with an axial electric and radial magnetic fields to limit the electron motion in the azimuthal direction and use them to ionize propellant and produce thrust. We present a multi-fluid simulation of HET in two dimensions that consists on the continuity, momentum and energy equations for each plasma species, which is constituted by a mixture of neutrals, ions and electrons. We assume an electrostatic model where the coupling to the fluid equations is given by the Poisson equation and a static magnetic field. We have taken into account the collision, ionization, and excitation processes. The multi-fluid model is discretized using the HLLC approximate Riemann solver and the time evolution is computed using a third-order SSP Runge-Kutta scheme.

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