

Abstract Submitted  
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**Particle-in-cell simulation for the acceleration channel of a Hall thruster**<sup>1</sup> HAE JUNE LEE, Pusan National University — The Hall electric thruster is an electric propulsion device that allows a high specific impulse compared with chemical thrusters, and thus is very useful for a small satellite. A two-dimensional particle-in-cell simulation with Monte-Carlo Collision (MCC) has been developed to investigate the discharge in the acceleration channel of a stationary plasma thruster. The dynamics of electrons and ions under the magnetic field are calculated at the time scale of electrons. Xenon neutrals are injected from the hall in the anode and experience elastic, excitation, and ionization collisions with electrons and are scattered by ions. These collisions are simulated by using an MCC model. The neutral particle motion is coupled with the plasma dynamics in the simulation. Investigated are the effects of magnetic field profiles, gas pressure, electron current density, and the applied voltage. The simulation method for the external circuit equation is also discussed.

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