

Abstract Submitted
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Development of a Two Fluid Model for Low-Temperature Magnetized Plasmas¹ RUPALI SAHU, KENTARO HARA, Texas A&M University — A two fluid model of plasma is developed to study low temperature magnetized plasmas. For the first test case, a quasi-neutral plasma between two walls is modeled under applied electric and magnetic fields. Source terms due to ionization are designed to compensate the ion diffusion toward the wall and to achieve steady state. Moments of Maxwellian distribution are calculated, which we call kinetic fluxes for the boundary conditions. Inclusion of ion momentum transfer collisions displayed variations in plasma sheath properties in close agreement with analytical trends. It was also observed that an applied transverse magnetic field could eliminate a classical sheath formation in some cases. Two fluid model is used to model discharge plasma of Hall effect thrusters. We will assess the two-fluid model in comparison with a quasi-neutral drift-diffusion model to evaluate the effects of the terms neglected in the drift-diffusion approximation.

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Rupali Sahu
Texas A&M University

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