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Simulations of plasma sheaths using continuum kinetic models¹ BHUVANA SRINIVASAN, Virginia Tech, AMMAR HAKIM, Princeton Plasma Physics Laboratory — Understanding plasma sheath physics is important for the performance of devices such as Hall thrusters due to the effect of energetic particles on electrode erosion. Plasma sheath physics is studied using kinetic and multi-fluid models with relevance to secondary electron emissions and plasma-surface interactions. Continuum kinetic models are developed to directly solve the Vlasov-Poisson equation using the discontinuous Galerkin method for each of the ion and electron species. A steady-state sheath is simulated by including a simple model for a neutral fluid. Multi-fluid simulations for the plasma sheath are also performed using the discontinuous Galerkin method to solve a complete set of fluid equations for each of the ion and electron species. The kinetic plasma sheath is compared to a multi-fluid plasma sheath.

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