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GPU-Accelerated 2D Kinetic Modeling of Transport in a Hall Thruster Channel ARJUN AGARWAL, University of Maryland, ANDREW POWIS, Princeton University, Mechanical and Aerospace Engineering, STEPHANE ETHIER, IGOR KAGANOVICH, ALEX KHANELES, Princeton Plasma Physics Laboratory, JOHAN CARLSSON, RadiaSoft LLC — The causes of anomalous electron transport across the magnetic barrier in Hall thrusters is an area of ongoing research. An understanding of the mechanisms causing this transport would allow for the development of turbulence models for this process Since the transport is kinetic, the 2D particle-in-cell code LTP-PIC serves as a fitting numerical tool to carry out this study. Such simulations may also be used to study dominant modes using a spectral diagnostic. The simulation is extended azimuthally to observe periodic structures. Given that PIC codes are computationally expensive, requiring a large number of particles and time steps, adapting this MPI + OpenMP portable code to GPU using the OpenACC standard decreases runtime while maintaining a single code base. Currently, LTP-PIC is limited by the speed of the field solver and particle-push. To further improve runtime, we explore using Ampere's law to evolve the electric field rather than solving Poisson's equation.

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