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Progress on the Development of the hPIC Particle-in-Cell Code CAMERON DART[1], ALYSSA HAYES, RINAT KHAZIEV, STEPHEN MARCINKO, DAVIDE CURRELI, Univ. of Illinois at Urbana-Champaign, LABORATORY OF COMPUTATIONAL PLASMA PHYSICS TEAM — Advancements were made in the development of the kinetic-kinetic electrostatic Particle-in-Cell code, hPIC, designed for large-scale simulation of the Plasma-Material Interface. hPIC achieved a weak scaling efficiency of 87% using the Algebraic Multigrid Solver BoomerAMG from the PETSc library on more than 64,000 cores of the Blue Waters supercomputer at the University of Illinois at Urbana-Champaign. The code successfully simulates two-stream instability and a volume of plasma over several square centimeters of surface extending out to the presheath in kinetic-kinetic mode. Results from a parametric study of the plasma sheath in strongly magnetized conditions will be presented, as well as a detailed analysis of the plasma sheath structure at grazing magnetic angles. The distribution function and its moments will be reported for plasma species in the simulation domain and at the material surface for plasma sheath simulations.

[1]Membership Pending

Cameron Dart
Univ. of Illinois at Urbana-Champaign

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