

Abstract Submitted
for the DPP07 Meeting of
The American Physical Society

Simulation of sheath problems with an accelerated Monte Carlo method¹ YANGHONG HUANG, RUSSEL CAFLISCH, University of California, Los Angeles, BRUCE COHEN, Lawrence Livermore National Laboratory, GIACOMO DIMARCO, University of Ferrara, Italy, ANDRIS DIMITS, Lawrence Livermore National Laboratory, CHIAMING WANG, University of California, Los Angeles — We simulate the interactions between a plasma and an absorbing wall in a confined volume with an accelerated Monte Carlo method for Coulomb Collisions. We treat ions as particles and the electrons to be continuum. Our method is based on the earlier work developed in the context of rarefied gas dynamics by Pareschi and Caflisch (J. Comp. Phys, 1999) and the Coulomb collision model developed by Nanbu (PRE 1997). The hybrid formulation combines particle and continuum methods and uses a thermalization and dethermalization procedure to accelerate the computation while retaining accuracy of the solution. We investigate sheath formation and compare the simulation results between Nanbu's particle method and the hybrid method.

¹Work performed for USDOE by Univ. California LLNL under contract W-7405-ENG-48 and by UCLA under grant DE-FG02-05ER25710.

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Date submitted: 18 Jul 2007

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