Abstract Submitted for the DPP11 Meeting of The American Physical Society

Thermalization simulations of strongly/weakly coupled mixtures¹ DAVID MICHTA, Princeton University, FRANK GRAZIANI, MICHAEL SURH, JAMES GLOSLI, Lawrence Livermore National Laboratory — In plasmas where certain pairs of species are strongly coupled and others weakly coupled, the assumptions that can be made in deriving simplified kinetic models are often unclear. Molecular dynamics simulation is a robust tool for probing physics in these regimes. In this study, the particle-particle particle-mesh (PPPM) molecular dynamics code ddcMD is used to simulate temperature relaxation of electron, proton, and Argondoped mixtures. Thermalization rates are calculated and compared to theoretical models. The practicality of a simplified treatment of electrons as a Langevin bath is also explored.

¹Prepared by LLNL under Contract DE-AC52-07NA27344

David Michta Princeton University

Date submitted: 15 Jul 2011

Electronic form version 1.4