

Abstract Submitted
for the DPP16 Meeting of
The American Physical Society

Charged Particle Transport in High-Energy-Density Matter¹

LIAM STANTON, Lawrence Livermore National Laboratory, MICHAEL MURILLO, CMSE, Michigan State University — Transport coefficients for dense plasmas have been numerically computed using an effective Boltzmann approach. We have developed a simplified effective potential approach that yields accurate fits for all of the relevant cross sections and collision integrals. Our results have been validated with molecular dynamics simulations for self-diffusion, interdiffusion, viscosity, thermal conductivity and stopping power. Molecular dynamics has also been used to examine the underlying assumptions of the Boltzmann approach through a categorization of behaviors of the velocity autocorrelation function in the Yukawa phase diagram. Using a velocity-dependent screening model, we examine the role of dynamical screening in transport as well. Implications of these results for Coulomb logarithm approaches are discussed.

¹This work is performed under the auspices of the U. S. Department of Energy by Lawrence Livermore National Laboratory under Contract DE-AC52-07NA27344.

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Date submitted: 15 Jul 2016

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