Abstract Submitted
for the MAR09 Meeting of
The American Physical Society

Molecular dynamics simulations of electron-ion temperature equilibration in an SF6 plasma LORIN X. BENEDICT, JAMES N. GLOSLI, DAVID F. RICHARDS, FREDERICK H. STREITZ, STEFAN P. HAU-RIEGE, FRANK R. GRAZIANI, Lawrence Livermore National Lab, MICHAEL S. MURILLO, JOHN F. BENAGE, Los Alamos National Lab — We use classical MD to investigate electron-ion temperature equilibration in a two- temperature SF_6 plasma. We choose a density of 1.0×10^{19} (dissociated) SF_6 molecules per cm^3 and initial temperatures of $T_e \sim 100$ eV and $T_S \sim T_F \sim 15$ eV in accordance with experiments currently underway at Los Alamos National Laboratory. Our computed relaxation time is significantly longer than that predicted by the classic theory of Landau and Spitzer. Similar discrepancies are found when comparing to predictions made be more recent theories of electron-ion equilibration. These differences should be large enough to be measured in the upcoming experiments.

Lorin X. Benedict
Lawrence Livermore National Lab

Date submitted: 21 Nov 2008 Electronic form version 1.4