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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, RICHARD A. LONDON, FRANK R. GRAZIANI, Lawrence Livermore National Lab, MICHAEL S. MURILLO, JOHN F. BENAGE, Los Alamos National Lab — We describe classical non-equilibrium molecular dynamics simulations aimed at studying electron-ion temperature equilibration in a two-temperature SF_6 plasma. We choose a density of 1.0×10^6 (dissociated) SF_6 molecules per cm^3 and initial temperatures of T_e= 100 eV and $T_S = T_F$= 15 eV, in accordance with experiments currently underway at Los Alamos National Lab. Our computed relaxation time lies between two oft-used variants of the Landau-Spitzer relaxation formula. Discrepancies are also found when comparing to the predictions of more recent theoretical approaches. These differences should be large enough to be measured in the upcoming experiments. We highlight one particular source of discrepancy arising from the strong ion-ion coupling: the time-dependent specific heat of the screened ion subsystem.

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