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Measurement of the Electron-Ion Thermal Equilibration Rate J.M. TACCETTI, R.P. SHURTER, B.R. HABERLE, J.P. ROBERTS, J.F. BENAGE, Los Alamos National Laboratory — We are conducting a laboratory experiment aimed at measuring the temperature equilibration rate between ions and electrons in a strongly-coupled plasma. Theory indicates that this rate could be significantly ($\approx$ 50 times) lower than that given by the usual weakly coupled model (Landau/Spitzer) due to coupled collective modes present in the dense plasma. The plasma under study is formed by heating a hypersonic SF_6 gas jet with a short pulse ($\approx$ 10 ps) laser, resulting in warm electrons ($\approx$ 100 eV) and cold ions ($\approx$ 5 eV). The electron and ion temperatures of the resulting plasma will be independently measured during and after heating, using collective Thomson scattering for electrons and a high-resolution x-ray spectrometer for the ions (measuring Doppler-broadened absorption lines). Determining how the equilibration rate varies from Landau/Spitzer requires very fast diagnostics, since Landau/Spitzer equilibration would occur within $\approx$ 100 ps. We will present our most recent experimental results.

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