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Thermal conductivity measurements of proton-heated warm dense matter A. MCKELVEY, A. FERNANDEZ-PANELLA, Lawrence Livermore National Laboratory, R. HUA, J. KIM, University of California San Diego, J. KING, The Ohio State University, H. SIO, Massachusetts Institute of Technology, C. MCGUFFEY, University of California San Diego, G.E. KEMP, Lawrence Livermore National Laboratory, R.R. FREEMAN, The Ohio State University, F.N. BEG, University of California San Diego, R. SHEPHERD, Y. PING, Lawrence Livermore National Laboratory — Accurate knowledge of conductivity characteristics in the strongly coupled plasma regime is extremely important for ICF processes such as the onset of hydrodynamic instabilities, thermonuclear burn propagation waves, shell mixing, and efficient x-ray conversion of indirect drive schemes. Recently, an experiment was performed on the Titan laser platform at the Jupiter Laser Facility to measure the thermal conductivity of proton-heated warm dense matter. In the experiment, proton beams generated via target normal sheath acceleration were used to heat bi-layer targets with high-Z front layers and lower-Z back layers. The stopping power of a material is approximately proportional to Z^2 so a sharp temperature gradient is established between the two materials. The subsequent thermal conduction from the higher-Z material to the lower-Z was measured with time resolved streaked optical pyrometry (SOP) and Fourier domain interferometry (FDI) of the rear surface. Results will be used to compare predictions from the thermal conduction equation and the Wiedemann-Franz Law in the warm dense matter regime. Data from the time resolved diagnostics for Au/Al and Au/C Targets of 20-200 nm thickness will be presented.

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