Abstract Submitted
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Thermal conductivity measurements of CH and Be by refraction-enhanced x-ray radiography[1] YUAN PING, LLNL, JIM KING, OSU, OTTO LANDEN, HEATHER WHITLEY, RICH LONDON, SEBASTIEN HAMEL, PHIL STERNE, AMALIA PANELLA, LLNL, RICK FREEMAN, OSU, GILBERT COLLINS, LLNL — Transport properties of warm dense matter are important for modeling the growth of hydrodynamic instabilities near the fuel-ablator interface in an ICF capsule, which determines the mix level in the fuel and thus is critical for successful ignition. A novel technique, time-resolved refraction-enhanced x-ray radiography, has been developed to study thermal conductivity at an interface. Experiments using OMEGA laser have been carried out for CH/Be targets isochorically heated by x-rays to measure the evolution of the density gradient at the interface due to thermal conduction. The sensitivity of this radiographic technique to discontinuities enabled observation of shock/rarefraction waves propagating away from the interface. The radiographs provide enough constraints on the temperatures, densities and scale lengths in CH and Be, respectively. Preliminary data analysis suggests that the thermal conductivities of CH and Be at near solid density and a few eV temperature are higher than predictions by the commonly used Lee-More model. Detailed analysis and comparison with various models will be presented.

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