

Abstract Submitted
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Studying the Equation of State of Isochorically Heated Al Using Streaked Optical Pyrometry D. HABERBERGER, P.M. NILSON, M.C. GREGOR, T.R. BOEHLI, D.H. FROULA, Laboratory for Laser Energetics, U. of Rochester — The thermal equilibration rates of warm (few eV) dense ($\sim 10^{23}$ g/cm³) matter is important in high-energy-density physics. The OMEGA EP laser was used to isochorically heat a 20- μ m-thick Al target using a short-pulse beam with 250 J in a 10-ps pulse. Twenty OMEGA beams were used to drive a Ti backlighter to radiograph the expansion of the foil using an x-ray framing camera (XRFC). The short duration of the heating laser pulse and the subsequent hot-electron energy deposition inside the target ensure minimal hydrodynamic expansion during the target heating phase. Streaked optical pyrometry (SOP) was used to measure the surface temperature of the foil. Together, these two measurements can be used to determine the equation of state along the release isentrope of the isochorically heated Al foil.¹ Initial analysis of the SOP and XRFC data indicate the Al foil was heated to temperatures of tens of eV. This material is based upon work supported by the Department of Energy National Nuclear Security Administration under Award Number DE-NA0001944.

¹M. E. Foord, D. B. Reisman, and P. T. Springer, Rev. Sci. Instrum. **75**, 2586 (2004).

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