Abstract Submitted for the SHOCK05 Meeting of The American Physical Society

Streaked Optical Pyrometer for Shock-Wave and EOS Studies J.E. MILLER¹, T.R. BOEHLY, E. VIANELLO², W. ARMSTRONG, C. SORCE, W. THEOBALD, D.D. MEYERHOFER³, Laboratory for Laser Energetics, U. of Rochester, D.G. HICKS, J.H. EGGERT, P.M. CELLIERS, LLNL — The optical self-emission from laser-driven shock waves provides important information about the strength of a shock and the equation of state of the shocked material. A streak camera was used to temporally and spatially resolve emission from transparent targets. A NIST-traceable lamp was used to calibrate the device to provide brightness temperatures. Various shock-timing and EOS experiments demonstrate the relationship between shock velocity (strength) and optical emission. The coalescence of two shocks and their arrival at the rear surface are observed, providing valuable shock-timing data. Temperature measurements in α -quartz samples are used to evaluate various EOS models. This work was supported by the U.S. Department of Energy Office of Inertial Confinement Fusion under Cooperative Agreement No. DE-FC03-92SF19460, the University of Rochester, and the New York State Energy Research and Development Authority. The support of DOE does not constitute an endorsement by DOE of the views expressed in this article.

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