

Abstract Submitted
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Photoacoustic Measurements to Determine Acoustic Velocities in Shocked Liquids N. HEMMI, K. ZIMMERMAN, J.M. WINEY, Y.M. GUPTA, Wash. State Univ., D.H. TORCHINSKY, K.A. NELSON, MIT — Experimental developments were carried out to implement the Impulsively Stimulated Thermal Scattering (ISTS) method in shock wave experiments. This method, an application of Brillouin scattering in the time domain, allows us to determine the sound velocity and acoustic damping properties under dynamic loading in single event experiments. We discuss our experimental developments where the capability for performing reproducible single-shot experiments is key. We also present experimental results for benzene and glycerol, highlighting the differences in the shock response for these two liquids. Sound velocities were clearly observed for benzene shocked up to 0.85 GPa, while ISTS signals from shocked glycerol could not be observed due to strong acoustic damping. Implications of these photoacoustic measurements for understanding the shocked state will be presented. Work supported by DOE and ONR.

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