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Rarefaction wave propagation in transparent windows BENNY GLAM, SNRC, ELKANA PORAT, NRCN, YOSSEF HOROVITZ, SNRC, ARNON YOSSEF-HAI, NRCN — The radial rarefaction wave velocity of polymethyl methacrylate (PMMA) and Lithium Fluoride (LiF) windows was studied by plate impact experiments and interferometery diagnostics up to pressure of 16 GPa in the PMMA and 40 GPa in the LiF. The experiments were carried out in two configurations: a) The windows were impacted directly by a metal impactor, and b) the windows were glued to Lead targets that were impacted. The VISAR measurement was done in the window interface with the target or the impactor. This information was utilized to identify the radial rarefaction arrival time to the center of different diameter windows after the shock event, and served as measurement to the radial wave velocity in the shocked material. It was found that for both windows, LiF or PMMA, the measured radial wave velocity is increasing with the pressure. Furthermore, this velocity is significantly higher than the longitudinal sound velocity calculated by the Steinberg EOS at the same pressure. In this paper we present the experimental results and a comparison to analytical calculation of the sound velocity using the Steinberg EOS.

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