

Abstract Submitted
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Passive Shock Wave Attenuation by Liquid Sheets¹ HONGJOO JEON, NICHOLAS AMEN, VERONICA ELIASSON, University of Southern California — The use of liquid sheets to understand passive shock wave attenuation was investigated experimentally by impacting planar liquid sheets of varying thicknesses with planar shock waves. To create a sheet of liquid, a liquid container was designed to hold liquid in the desired shape with 5, 10, and 20 mm thickness in the test section of a shock tube. Planar shock waves with shock Mach numbers ranging from $M_s = 1.1$ to 1.5 were generated. In addition to varying the shock Mach number, different liquid media, water and a cornstarch suspension, were used. Pressure traces show that stronger incident shock waves result in higher reflected and transmitted pressures and that a thicker sheet reduces transmitted pressure but increases reflected pressure. Furthermore, for water versus cornstarch suspensions, a different thickness threshold was found to determine whether the transmitted wave is a shock wave or a pressure wave. Also, the breakup of the liquid sheets was fundamentally different between the two liquids.

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