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Experimental Studies of Mitigation Materials for Blast Induced TBI MATTHEW ALLEY, STEVEN SON, Purdue University — The objective of this experimental study is to compare the effects of various materials obstructing the flow of a blast wave and the ability of the given material to reduce the damage caused by the blast. Several methods of energy transfer in blast wave flows are known or expected including: material interfaces with impedance mismatches, density changes in a given material, internal shearing, and particle fracture. The theory applied to this research is that the greatest energy transfer within the obstructing material will yield the greatest mitigation effects to the blast. Sample configurations of foam were varied to introduce material interfaces and filler materials with varying densities and impedances (liquids and powders). The samples were loaded according to a small scale blast produced by an explosive driven shock tube housing gram-range charges. The transmitted blast profiles were analyzed for variations in impulse characteristics and frequency components as compared to standard free field profiles. The results showed a rounding effect of the transmitted blast profile for all samples with the effects of the low density fillers surpassing all others tested.

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