Abstract Submitted
for the SHOCK11 Meeting of
The American Physical Society

Experimental and computational investigation of lateral gauge response in polycarbonate JIM ELIOT, ERNST HARRIS, AWE, PAUL HAZELL, GARETH APPLEBY-THOMAS, Cranfield University, RONALD WINTER, AWE, DAVID WOOD, Cranfield University, GARETH OWEN, AWE — Polycarbonate's use in personal armour systems means its high strain-rate response has been extensively studied. Interestingly, embedded lateral manganin stress gauges in polycarbonate have shown gradients behind incident shocks, suggestive of increasing shear strength. However, such gauges need to be embedded in a central (typically) epoxy interlayer – an inherently invasive approach. Recently, research has suggested that in such metal systems interlayer/target impedance may contribute to observed gradients in lateral stress. Here, experimental T-gauge (Vishay Micro-Measurements® type J2M-SS-580SF-025) traces from polycarbonate targets are compared to computational simulations. This work extends previous efforts such that similar impedance exists between the interlayer and matrix (target) interface. Further, experiments and simulations are presented investigating the effects of a "dry joint" in polycarbonate, in which no encapsulating medium is employed.

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Date submitted: 02 Feb 2011 Electronic form version 1.4