

Abstract Submitted  
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**Dynamic Shock Response of an S2 Glass/SC15 Epoxy Woven Fabric Composite Material System** CHRISTOPHER KEY, Applied Physical Sciences Corp., SCOTT ALEXANDER, ERIC HARSTAD, SHANE SCHUMACHER<sup>1</sup>, Sandia Natl Labs — The use of S2 glass/SC15 epoxy woven fabric composite materials for blast and ballistic protection has been an area of on-going research over the past decade. In order to accurately model this material system within potential applications under extreme loading conditions, a well characterized and well understood anisotropic equation of state (EOS) is needed. This work details both an experimental program and associated analytical modelling efforts which aim to provide better physical understanding of the anisotropic EOS behavior of this material. Experimental testing focused on planar shock impact tests loading the composite to peak pressures of 15 GPa in both the through-thickness and on-fiber orientation. Test results highlighted the anisotropic response of the material and provided a basis by which the associated numeric micromechanical investigation was compared. Results of the combined experimental and numerical modelling investigation provided insights into not only the constituent material influence on the composite response but also the importance of the geometrical configuration of the plain weave microstructure and the stochastic significance of the microstructural configuration.

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