

Abstract Submitted  
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**Statistics of Spall and Hugoniot Elastic Limit from Line VISAR**

MICHAEL FURNISH, TRACY VOGLER, C. SCOTT ALEXANDER, WILLIAM REINHART, WAYNE TROTT, LALIT CHHABILDAS, Sandia National Laboratories — Material heterogeneity appears to give rise to variability in the yield behavior of ceramics and metals under shock loading and spall conditions. The line-imaging VISAR provides a way to measure this variability, which may then be quantified by Weibull statistics or other methods. Weibull methods assign a 2-parameter representation of failure phenomena and variability. We have conducted experiments with tantalum (25 and 40  $\mu\text{m}$  grains), soda lime glass, single-crystal sapphire and silicon carbide. Line-imaging VISAR data reveal an averaged velocity response analogous to point VISAR or PDV data. As well, in addition to strength variability information, this diagnostic provides statistical bounds for the velocity histories, measurements of surface distortion with time (length scales and amplitudes), and verification of sample edge effects and wave focusing. Sandia is a multiprogram laboratory operated by Sandia Corporation, a Lockheed Martin Company, for the United States Department of Energy's National Nuclear Security Administration under Contract DE-AC04-94AL85000.

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