Comparison of Line-Imaging VISAR Inferences of Spalled Sample Distension with Metallographic Analysis of Recovered Samples[1] M.D. FURNISH, Sandia National Laboratories, G.T. GRAY III, J.F. BINGERT, Los Alamos National Laboratory — Using a line-imaging VISAR to infer the position (x) and time (t) dependent distension of a spalling sample requires two assumptions: (1) a calculated velocity surface v[no spall] (x,t) for the no-spall case to compare with the observed v [observed](x,t) surface, and (2) a lack of significant wave processing by the near-surface microstructure. We have designed and are conducting a matrix of experiments to evaluate these assumptions. In each experiment, we use a line-imaging VISAR to measure the velocity history of carefully characterized tantalum or copper samples taken to an incipient spall condition. The pre-shot characterization included spatially resolved mapping of grain locations and orientations by electron backscatter diffraction (EBSD). These samples are then soft-recovered and sectioned along the same line as monitored by the line-imaging VISAR.

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