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Transport of Particulate Matter from a Shocked Interface[1] W.T. BUTTLER, J.E. HAMMERBERG, D. ORO, F. MARIAM, C. ROUSCULP, Los Alamos National Laboratory — We have performed a series of shock experiments to measure the evolution and transport of micron and sub-micron Tungsten particles from a 40 μm thick layer deposited on an Aluminum substrate. Densities and velocity distributions were measured using proton radiography at the Los Alamos Neutron Science Center for vacuum conditions and with contained Argon and Xenon gas atmospheres at initial pressures of 9.5 bar and room temperature. A common shock drive resulted in free surface velocities of 1.25 km/s. An analysis of the time dependence of Lithium Niobate piezo-electric pin pressure profiles is given in terms of solutions to the particulate drag equations and the evolution equation for the particulate distribution function. The spatial and temporal fore-shortening in the shocked gas can be accounted for using reasonable values for the compressed gas shear viscosities and the vacuum distributions. The detailed form of the pin pressure data for Xenon indicates particulate breakup in the hot compressed gas.

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