

Abstract Submitted
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Experimental studies of gas-particle mixtures under sudden expansion¹ HEATHER ZUNINO, RONALD ADRIAN, AMANDA CLARKE, Arizona State University, ARIZONA STATE UNIVERSITY COLLABORATION, UNIVERSITY OF FLORIDA COLLABORATION — High-speed video cameras and pressure sensors were used to capture the movement of a particle bed due to a passing expansion fan created by a diaphragm burst in a shock tube. The particle bed is placed on the high-pressure side (p_4) of the shock tube. Once the diaphragm bursts, it expands upward into the low-pressure region (p_1). Several interesting structures are captured and examined, including instabilities located at the top surface of the particle bed and particle vacant regions within the bed. These features are discussed along with their relevance to the spikes of material seen radially ejected outward during a cylindrical explosion. The characteristics of this flow are compared for several different pressure regimes. Two-dimensional and three-dimensional Fourier analyses are used to further explore and measure the frequency of the features imaged.

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