Abstract Submitted
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Shock-driven formation of a cloud from particles swept off a surface[1] PATRICK WAYNE, TENNILLE BERNARD, CLINT CORBIN, GARRETT KUEHNER, PETER VOROBIEFF, C. RANDALL TRUMAN, The University of New Mexico, HUGH SMYTH, ANDY MALONEY, University of Texas - Austin — We present an experimental study of respirable particle advection in shock-driven flow. Particles of specific size (≤ 5 μm) were ultrasonically deposited on surface samples, with sample roughness and other characteristics well-known. Then the samples were exposed to normal shocks at Mach number $\sim$1.67. Time-resolved visualizations of the resulting particle clouds provide insights into the physics of the flow. As the clouds evolve, they apparently extend into the flow beyond the wall boundary layer. Several interesting features have been observed, including formation of shear-driven Kelvin-Helmholtz instability on the edge of the cloud. Initial observations suggest a prominent relationship between the force of adhesion between the particles and the surface on one hand and the propagation speed of the particle cloud on the other hand.

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