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Vortex deposition and transition to turbulence in a shock-accelerated gas with particle/droplet seeding[1] PETER VOROBIEFF, JOSEPH CONROY, MICHAEL ANDERSON, ROSS WHITE, C. RANDALL TRUMAN, The University of New Mexico, SANJAY KUMAR, The University of Texas - Brownsville — We present an experimental and numerical study of post-shock evolution of gas initially seeded with small droplets or particles. In two-phase media with gas being the embedding phase occupying most of the volume, shock acceleration can lead to vortex formation and eventually to turbulence. The physical mechanism responsible for the vorticity deposition in this case is different from that of Richtmyer-Meshkov instability that would emerge on a gas-gas density interface. After the shock passage, the particles or droplets lag behind the surrounding gas. Momentum exchange between the embedded phase and the embedding phase leads to non-uniform local equilibrium velocity distribution, and thus to shear and vortex formation. The cases we investigate include shock interaction with a cylindrical particle-seeded column (with and without reshock), as well as shock-driven advection of particles from a surface.

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