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Simulation and Modeling of Explosive Dispersal of Compressed Gas-Particle Suspensions[1] YUE LING, ANDREAS HASELBACHER, S. BALACHANDAR, University of Florida — Some effects of a detonating particle-laden explosive can be modeled through the explosion of a compressed gas-particle suspension. The suspension can be considered to be located in a spherical container and released through the instantaneous removal of the container similar to a shock tube. The transient flow generated by the removal of the container is well understood in the case without particles. Comparatively little is known about the dispersal of the particles and the unsteady interactions between the various waves and the particles. The objective of this work is to use Eulerian-Lagrangian simulations to improve our understanding of the dispersal of particles. Particular attention is focused on the interactions of the particles with the expansion fan and their effect on the flow behavior at large times. Parametric studies are carried out to systematically investigate the effects of particle size, particle density, and mass fraction.

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