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Scalable Methods for Eulerian-Lagrangian Simulation Applied to Compressible Multiphase Flows[1] DAVID ZWICK, JASON HACKL, S. BALACHANDAR, Center for Compressible Multiphase Turbulence — Multiphase flows can be found in countless areas of physics and engineering. Many of these flows can be classified as dispersed two-phase flows, meaning that there are solid particles dispersed in a continuous fluid phase. A common technique for simulating such flow is the Eulerian-Lagrangian method. While useful, this method can suffer from scaling issues on larger problem sizes that are typical of many realistic geometries. Here we present scalable techniques for Eulerian-Lagrangian simulations and apply it to the simulation of a particle bed subjected to expansion waves in a shock tube. The results show that the methods presented here are viable for simulation of larger problems on modern supercomputers.

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