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Evaporation effects in a shock-driven multiphase instability with a spherical interface MANOJ PAUDEL, JEEVAN DAHAL, JACOB MCFARLAND, University of Missouri-Columbia — This talk presents results from 3D numerical simulations of a shock driven instability of a gas-particle system with a spherical interface. Two cases, one with an evaporating particle cloud and another with a gas only approximation of this particle cloud, were run in the hydrodynamics code FLASH, developed at University of Chicago. It is shown that the gas only approximation, a classical Richtmyer Meshkov instability, cannot replicate effects from particles like, lag, clustering, and evaporation. Instead, both gas hydrodynamics and particle properties influence one another and are coupled. Results are presented to highlight the coupling of interface evolution and particle evaporation. Qualitative and quantitative differences in the RMI and SDMI are presented by studying the change in gas properties like density and vorticity within the interface. Similarly, the effect of gas hydrodynamics on particles distribution and evaporation is studied. Particle evaporation rates are compared with 1D models and show poor agreement. The variation in evaporation rates for similar sized particles and the role of gas hydrodynamics in these variation is explored.

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