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Shock Wave Interactions in Multi-Phase Particle Systems Characterized by Various Interfaces WOLFGANG BLACK, Univ of Missouri - Columbia, NICHOLAS DENISSEN, Los Alamos National Laboratory, JACOB MCFARLAND, Univ of Missouri - Columbia — Multi-phase systems have been of interest since the 1800s with Stokes studying flow over a particle, and are still an important field of study today with various applications in propulsion design, astrophysics, refrigeration, fluid instabilities, as well as fusion. Many multi-phase systems experience complex accelerations, such as shock waves, which may drive shear dominated instabilities, increase or dampen mixing between the phases, and even affect a phase change phenomena within the flow. The parameter space to study within these systems is extensive and provides a rich field for research, with hydrodynamic codes allowing new insight into old and recent experiments alike. This talk will discuss early efforts to tap into this parameter space by using high density high energy hydrodynamics codes to investigate simulations of multi-phase systems that experience a shock wave interaction across an interface, for example a particle laden gas cylinder within an unseeded shocked tube environment, and the evolution of these systems. This particular interface will be compared with recent experiments within literature while other turbulent interfaces will be discussed as future experiments to be performed by the University of Missouri Fluid Mixing Shock Tube Laboratory.

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