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Shock-particle cloud interaction: Isolated unsteadiness contributions from shock and vortical structures ZAHRA HOSSEINZADEH-NIK, JONATHAN D. REGELE, Iowa State University — The interaction between shock waves and particles in a multiphase shock tube is an efficient way to study dense compressible particle-laden flows. However, it is difficult to study the interaction between the two phases at the particle scale. Recent numerical simulations [Regele *et al.*, Int. J. Multiphase Flow **61**, 1-13 (2014)] show that after a shock wave impacts a particle cloud strong unsteady effects exist inside and in the wake immediately behind the cloud. This unsteadiness is attributed to the fluctuation associated with vortical structures and reverberating compression wave radiation. It is still unclear how the unsteady flow behavior is partitioned between vortical structures and reverberating finite disturbances. In this work numerical simulations are performed that attempt to replicate the unsteady wake behavior for the same mean flow conditions that are observed after a shock wave passage without using a shock wave to initialize the flow. The results are volume-averaged to compare the unsteady velocity magnitude with that of the previous results to determine the contribution from vortical unsteadiness.

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