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A Twist on the Richtmyer-Meshkov Instability[1] BERTRAND ROLLIN, Embry-Riddle Aero. Univ., RAHUL KONERU, FREDERICK OUELLET, CCMT - Univ. Florida — The Richtmyer-Meshkov instability is caused by the interaction of a shock wave with a perturbed interface between two fluids of different densities. Typical contexts in which it plays a key role include inertial confinement fusion, supernovae or scramjets. However, little is known of the phenomenology of this instability if one of the interacting media is a dense solid-particle phase. In the context of an explosive dispersal of particles, this gas-particle variant of the Richtmyer-Meshkov instability may play a role in the late time formation of aerodynamically stable particle jets. Thus, this numerical experiment aims at shedding some light on this phenomenon with the help of high fidelity numerical simulations. Using a Eulerian-Lagrangian approach, we track trajectories of computational particles composing an initially corrugated solid particle curtain, in a two-dimensional planar geometry. This study explores the effects of the initial shape (designed using single mode and multimode perturbations) and volume fraction of the particle curtain on its subsequent evolution. Complexities associated with compaction of the curtain of particles to the random close packing limit are avoided by constraining simulations to modest initial volume fraction of particles.

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