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Computational Study of the Richtmyer-Meshkov Instability with a Complex Initial Condition JACOB MCFARLAND, University of Missouri, DAVID REILLY, Georgia Institute of Technology, JEFFREY GREENOUGH, Lawrence Livermore National Laboratory, DEVESH RANJAN, Georgia Institute of Technology — Results are presented for a computational study of the Richtmyer-Meshkov instability with a complex initial condition. This study covers experiments which will be conducted at the newly-built inclined shock tube facility at the Georgia Institute of Technology. The complex initial condition employed consists of an underlying inclined interface perturbation with a broadband spectrum of modes superimposed. A three-dimensional staggered mesh arbitrary Lagrange Eulerian (ALE) hydrodynamics code developed at Lawerence Livermore National Laboratory called ARES was used to obtain both qualitative and quantitative results. Qualitative results are discussed using time series of density plots from which mixing width may be extracted. Quantitative results are also discussed using vorticity fields, circulation components, and energy spectra. The inclined interface case is compared to the complex interface case in order to study the effect of initial conditions on shocked, variable-density flows.

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