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A Numerical Study of the Two and Three Dimensional Richtmyer Meshkov Instability YE ZHOU, LLNL, BEN THORNBER, Univ. of Sydney — The Richtmyer-Meshkov instability occurs as shock waves pass through a perturbed material interface. This paper presents a series of large-eddy-simulations of the two dimensional turbulent RM instability and compares the results to the fully three dimensional simulations conducted by Thornber et al. There are two aims to this paper, the first is to explore the number of independent realisations which are required to give a statistically converged solution for a two dimensional flow field, in a similar vein to that undertaken by Clark. The second aim is to elucidate the key differences in flow physics between the two dimensional and three dimensional Richtmyer-Meshkov instabilities, particularly their asymptotic self-similar regime. Earlier publications on the Rayleigh Taylor instability imply that lower mixing, larger structures, and more rapid late time growth are expected. The full paper will detail the statistical convergence of the 2D simulations a function of ensemble number and grid resolution, and ensemble averaged growth rates, mixing parameters, turbulent kinetic energy and spectra compared to the equivalent parameters from 3D mixing simulations.

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