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Effect of initial conditions and Mach number on the Richtmyer-Meshkov instability in ICF like conditions POOJA RAO, DAN SHE, HYUNKYUNG LIM, JAMES GLIMM, Stony Brook University — The qualitative and quantitative effect of initial conditions (linear and non-linear) and high Mach number (1.3 and 1.45) is studied on the turbulent mixing induced by the Richtmyer-Meshkov instability in idealized ICF conditions. The Richtmyer-Meshkov instability seeds Rayleigh-taylor instabilities in ICF experiments and is one of the factors that contributes to reduced performance of ICF experiments. Its also found in collapsing cores of stars and supersonic combustion. We use the Stony Brook University code, FronTier, which is verified via a code comparison study against the AMR multiphysics code FLASH, and validated against vertical shock tube experiments done by the LANL Extreme Fluids Team. These simulations are designed as a step towards simulating more realistic ICF conditions and quantifying the detrimental effects of mixing on the yield.

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