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Large Eddy Simulation Requirements for the Richtmyer-Meshkov Instability BRITTON OLSON, JEFF GREENOUGH, Lawrence Livermore National Laboratory — The shock induced mixing of two gases separated by a perturbed interface is investigated through Large Eddy Simulation and Direct Numerical Simulation. At coarse resolutions, the effects of numerical dissipation outweigh those of physical dissipation on the entrainment and mixing process of the Richtmyer-Meshkov Instability. Decreasing the Reynolds of the flow while increasing the grid resolution largely mitigates the relative numerical dissipation but is often unachievable for realistic flows. A model for an effective viscosity is proposed which allows for an *a posteriori* analysis of the simulation data that is agnostic to the LES model, numerics and the physical Reynolds number of the simulation. An analogous approximation for an effective species diffusivity is also presented. This framework can then be used to estimate the effective Reynolds number and Schmidt number of future simulations and elucidate the impact of numerical dissipation on the mixing process for an arbitrary numerical method.

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