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Mixing Rates Due to Rayleigh-Taylor Instability[1] A. M. DIMITS, R. H. COHEN, W. P. DANNEVIK, D. E. ELIASON, B. I. JUN, A. A. MIRIN, T. A. PEYSER, O. SCHILLING, Lawrence Livermore National Laboratory, D. H. PORTER, P. R. WOODWARD, University of Minnesota — Three-dimensional simulations of turbulent mixing by the Rayleigh-Taylor (RT) instability in the near-incompressible regime have been completed using the piecewise-parabolic-method (PPM),[2] both as converged DNS with Navier-Stokes (NS) dissipation and as "pure PPM" without NS dissipation. The observed mixing rates are significantly lower than those seen in experiments,[3] and somewhat lower than other simulations in the literature.[4] Further simulations are ongoing to directly resolve this discrepancy and to more broadly explore the various sensitivities of the mixing rates to both physical and numerical aspects of the simulation models, including initial conditions, the form of the (physical or numerical) dissipation, the effective Reynolds' number, and compressibility.

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[2]P. Colella and P.R. Woodward, JCP **54**, 174 (1984).
[3]G. Dimonte et al., Phys. Rev. E**54**, 3740 (1996).
[4]D.L. Youngs, Laser and Particle Beams **12**, 725 (1994).

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