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Time-dependent study of anisotropy in Rayleigh-Taylor instability induced turbulent flows with a variety of density ratios[1] YE ZHOU, WILLIAM CABOT, LLNL — This study is part of our continued effort to understand the mixing, scaling, and anisotropy of flows induced by Rayleigh-Taylor instability (RTI). In particular, we utilize three large datasets with different Atwood numbers (density ratios) from well resolved numerical simulations at moderate Reynolds number with the goal of determining the degree of departure of this inhomogeneous flow from that of homogeneous, isotropic turbulence. A number of statistical measurements are considered in detail to delineate the role played by the acceleration or gravity. For example, the normalized dissipation rate is employed to inspect the forcing of the flow in the homogeneous and gravitational directions. The relationship between the outer-scale and the Taylor-microscale based Reynolds numbers is also clarified. These distinctive features of the high-Atwood number RTI flows are observed during the transition to turbulence.

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