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Scaling of decaying turbulence in turbulent/non-turbulent mixing.[1] EUNHYE AN, ERIC JOHNSEN, University of Michigan — The free decay of shearless, incompressible, homogeneous, isotropic turbulence (HIT) is a canonical problem in turbulence. In the present study, we evaluate the role of compressibility on turbulent/non-turbulent mixing with no mean shear. For this purpose, we conduct direct numerical simulations (DNS) of freely decaying, shearless, compressible turbulence of different initial turbulent intensities and Mach numbers adjacent to non-turbulent flow. When this inhomogeneity is introduced, kinetic energy is transferred across the interface. The interface propagates at the expected 2/3 power of time predicted by Barenblatt et al. (1987). This result allows us to appropriately scale the decaying turbulent kinetic energy with respect to time.

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