

Abstract Submitted
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A constant-energy physical-space forcing method for steadier statistics and faster convergence to homogeneous-isotropic turbulence¹
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Center for Turbulence Research, Stanford University — We investigate a new constant-energy forcing method for homogeneous-isotropic turbulent flows forced linearly in physical space. The method bears no computational overhead and it consists of a proportional controller embedded in the forcing coefficient. Comparisons of this forcing method are made with other existing variable-energy approaches, using direct numerical simulations (DNS) and large-eddy simulations (LES). We find that the proposed forcing method shortens the transient period from an user-defined artificial flow field to forced turbulence while maintaining steadier statistics. For illustration, the proposed forcing method is applied to a dilute particle-laden homogeneous-isotropic turbulent flow to highlight some of the influences of the forcing strategies on the statistics of the disperse phase.

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