

Abstract Submitted  
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**Kolmogorov hypotheses for variable-resolution turbulence simulations** DASIA REYES, SHARATH GIRIMAJI, Texas A&M University — Variable-resolution (VR) turbulence computation approaches such as detached-eddy simulations (DES), hybrid RANS-LES, partially-averaged Navier-Stokes (PANS) methods and partially-integrated turbulence model (PITM) are gaining popularity in engineering applications. Justifiably, these methods can be considered direct numerical simulations (DNS) of a variable-viscosity (non-Newtonian) fluid. Subject to this paradigm, we extend Kolmogorov's first and second similarity hypotheses for VR calculations. The resulting scaling laws can be invaluable in assessing the physical validity of spatio-temporal fluctuations of VR methods. Investigation of PANS decaying isotropic turbulence shows that the resolved field Kolmogorov scales vary with resolution as expected.

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