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Turbulence Shell Models for Initial and Inflow Conditions in Direct and Large-Eddy Simulations TOMASZ DROZDA, JEFFERY WHITE, ROBERT RUBINSTEIN, NASA Langley Research Center — Initial and inflow conditions continue to present a challenge for simulations of turbulent flows via Direct and Large-Eddy Simulations (DNS and LES). The current work utilizes the output of a Sabra [1] shell model of turbulence to synthesize a three-dimensional (3D) homogeneous, isotropic, incompressible, turbulence-in-a-box velocity field. This approach is motivated by recent work of van de Water et al. [2] on generation of wind tunnel turbulence with active grids. The properties of the new synthetic turbulence are assessed for several values of the Reynolds number by computing higher order statistics. DNS of the decay of homogeneous isotropic turbulence are also considered with initial conditions obtained using both the new method and Gaussian turbulence.

[1] L'vov, V., Podivilov, E., Pomyalov, A., Procaccia, I., and Vandembroucq, D., Improved shell model of turbulence, *Phys. Rev. E.*, **58**:1811–1822, 1998.
[2] van de Water, W., Cekli, H.E., and Joosten, R., Stirring turbulence with turbulence, in *Bulletin of the American Physical Society*, the American Physical Society, Baltimore, MD, 2011.

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