Evaluation of a multifractal model for the LES of a filtered passive-scalar field GREGORY BURTON, Lawrence Livermore National Laboratory — A model for the flux of a filtered passive scalar in large eddy simulation is developed from the multifractal structure of the scalar-dissipation field at inertial-range scales in high Reynolds-number turbulence. The model is based on a scale-invariant multifractal cascade governing the spatial structure the subgrid-scalar dissipation field $\chi^{sgs}(\mathbf{x}, t)$, and an additive cascade for the progressively isotropic decorrelation of the subgrid-scalar gradient orientations from those of the smallest resolved scale in the simulation. This approach permits the determination of the subgrid-scalar concentrations, ζ^{sgs}, permitting the direct calculation of the filtered nonlinear term, $\overline{u_j \zeta}$ in the filtered passive-scalar transport equation. Results are then presented from *a posteriori* evaluations of the model in LES of homogeneous, isotropic turbulence with a passive-scalar field that is forced by a mean-scalar gradient.

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