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A new dynamic eddy viscosity model for LES[1] ROEL VERSTAPPEN, University of Groningen, SANJEEB BOSE, Center for Turbulence Research, Stanford University, JUNGIL LEE, HAECHEON CHOI, Center for Turbulence and Flow Control Research, Seoul National University, PARVIZ MOIN, Center For Turbulence Research, Stanford University — A new dynamic eddy viscosity model based on the geometric mean of the eigenvalues of the resolved strain rate tensor, $\nu_t \sim \Delta^2(\lambda_1\lambda_2\lambda_3)^{1/3}$, is proposed. The model is derived from the formal construction of the minimal eddy viscosity that is required to guarantee that all scales smaller than the filter width, Δ, are dissipated. This dynamic eddy viscosity model correctly predicts the decay rate for decaying isotropic turbulence and the predicted energy spectra are in good agreement with filtered DNS results. The mean velocity profile and the rms fluctuations are also in good agreement with filtered DNS results in an $Re_\tau = 590$ channel flow using this model. It is shown that the eddy viscosity also obeys a y^3 scaling near the wall when the model coefficient is computed using the dynamic procedure of Germano *et al.* (1991). The eddy viscosity properly vanishes for laminar flows and at solid boundaries, even without the aid of the dynamic procedure.

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