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A subfilter-scale stress model for large eddy simulations AMIRREZA ROUHI, UGO PIOMELLI, Queen's University — In most large eddy simulations, the filter width is related to the grid. This method of specification, however, causes problems in complex flows where local refinement results in grid discontinuities. Following the work of Piomelli and Geurts (*Proce. 8th Workshop on DLES*, 2010) we propose an eddy-viscosity approach in which the filter width is based on the flow parameters only, with no explicit relationship to the grid size. This model can achieve grid-independent LES solutions, vanishing dynamically in the regions of low turbulence activity and a computational cost less than the dynamic models. The Successive Inverse Polynomial Interpolation (Geurts & Meyers *Phys. Fluids* **18**, 2006) was used to calculate the model parameter. Calculating implicitly the eddy-viscosity at each time-step removes the numerical instabilities found in previous studies, while maintaining the local character of the model. Results of simulations of channel flow at Re_τ up to 2,000, and forced homogeneous isotropic turbulence will be presented.

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