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Possible modifications to implicit large-eddy simulation J.M. MCDONOUGH, University of Kentucky — Implicit large-eddy simulation (ILES) provides an advantage over more usual LES approaches in that its construction does not involve filtering of the governing equations and, as a consequence, removal of the need to develop sub-grid scale (SGS) models to represent artificial stresses arising from this filtering. At the same time, it is clear that ILES is simply an under-resolved direct numerical simulation with advanced treatments of advection terms to better control numerical stability via dissipation that otherwise would have been provided by a SGS model. As such it cannot be expected to accurately predict interactions of fluid turbulence with other physical phenomena (*e.g.*, heat and mass transfer, chemical kinetics) on subgrid scales—as is also true of usual forms of LES. In this talk we describe a straightforward technique, based on formal multi-scale methods, whereby SGS interactions can be introduced to enhance resolved-scale results computed as in ILES, and we discuss derivation of a class of efficient models based on the "poor man's Navier–Stokes equation" (McDonough, *Phys.Rev. E* **79**, 2009; McDonough and Huang, *Int.J.Numer. Meth. Fluids* **44**, 2004). Properties of these models will be presented for a moderate-*Re* 3-D lid-driven cavity problem.

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