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A Numerical Simulation of Hybrid-Filtered Navier-Stokes Equations BERNIE RAJAMANI, JOHN KIM, UCLA — Germano(2004) derived an additive filter, by adding an LES-like filter operator ($\mathcal{F}$) and a RANS-like statistical operator ($\mathcal{E}$) with a blending function k to form a hybrid filter ($\mathcal{H}$). This filter, when applied to the Navier-Stokes equations, yields a $\mathcal{H}-$filtered Navier- Stokes equations (HFNS). The most interesting term of the HFNS is the hybrid turbulent stresses, which evolve as a second-order central moment of the velocity field. Previous studies, which blended two model equations, including DES-like models, have shown that there are problems near the RANS/LES transition zones. The additional stresses in the hybrid equations are expected to provide a smooth RANS/LES transition. However, the HFNS is somewhat difficult to solve, and the current study undertakes the task of solving numerically these equations. We will present, for a plane channel flow, *a-priori* test results as well as those obtained from a full simulation of the HFNS. Numerical issues encountered in solving the HFNS will also be discussed.

Bernie Rajamani
UCLA

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