LES of Turbulent Channel Flow at Large $Re_\tau$\textsuperscript{1} DANIEL CHUNG, DALE PULLIN, California Institute of Technology — Large-eddy simulation (LES) of turbulent channel flow will be discussed. A special near-wall, subgrid-scale (SGS) model is developed based on wall-normal averaging of the streamwise momentum equation and local inner scaling combined with an extended form of the stretched-vortex, subgrid-scale (SGS) model. The latter incorporates production of Reynolds shear stress produced by the winding of streamwise momentum by near-wall, attached, SGS vortices. This then allows calculation of an instantaneous slip velocity that is then used as a “virtual-wall” boundary condition for the LES within the log region. A Kármán-like constant is calculated dynamically as part of the LES. With this closure, LES of turbulent channel flow will be presented for $Re_\tau$ in the range $2 \times 10^3 - 2 \times 10^7$.

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