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Evaluation of Partially-Averaged Navier-Stokes (PANS) bridging method in turbulent channel flows BRANISLAV BASARA, AVL GMBH, Graz, Austria, SHARATH GIRIMAJI, Texas A&M University, PAVLOVIC PAVLOVIC, AVL GMBH, Graz, Austria — The Partially-Averaged Navier-Stokes (PANS) variable-resolution turbulence computational method is intended for seamless bridging between Reynolds-Averaged Navier-Stokes (RANS) and Direct Numerical Solution (DNS). While the success of PANS has been well documented in separated flows with largescale instabilities, its performance in wall-bounded flows is yet to be demonstrated. Toward that end, we perform channel flow simulations using the PANS ζ-f closure which is based on the near-wall RANS ζ-f model. The filter width is controlled by specifying the appropriate control parameters, unresolved-to-total ratios of turbulent kinetic energy and frequency. Computations are performed with three different grids (filter-widths) for the case of $\mathrm{Re}_\tau = 650$. Direct Numerical Simulation and Large eddy simulation data are used for comparison and evaluation. The results clearly demonstrate that PANS performs well in near-wall turbulent flows as well.

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