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Total shear stress boundary condition at upper boundary of RANS in wall-modeled large eddy simulation[1] CHANGWOO SUNG, JUNGIL LEE, HAECHEON CHOI, Seoul National University — In wall-modeled large eddy simulation, how to exchange the flow field information between the solutions from RANS and LES through the boundary condition is one of the important issues. In general, the wall boundary condition of LES is given as a form of the instantaneous wall shear stresses from the solution of RANS, whereas the upper boundary condition of RANS is provided as the instantaneous velocity from the solution of LES. However, in this approach, the total shear stress at the upper boundary is not continuous and thus momentum transfer from LES to RANS is not strictly conserved. In our study, we provide the instantaneous total shear stresses at the upper boundary of RANS with mixing-length model and conduct simulations of turbulent channel flow at high Reynolds numbers. The results show excellent predictions of turbulence statistics.

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