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Toward a simplified wall boundary condition for wall-modeled large eddy simulation[1] JUNGIL LEE, MINJEONG CHO, HAECHEON CHOI, Seoul National University — In this study, we provide the mean wall shear stress as a boundary condition for wall-modeled large eddy simulation (WMLES) without any further modeling near the wall. The motivation of using this wall boundary condition for WMLES is that in the framework of finite volume method, the accurate information of mean wall shear stress may be most important in the momentum transport near the wall, even if the first grid used in WMLES locates far away from the wall ($y^+ = O(100) \sim O(1000)$), where y is the wall-normal distance. For turbulent channel flow, the mean wall shear stress is balanced with the mean pressure gradient and thus is *a priori* prescribed during WMLES. The results of WMLES at $Re_\tau = 2000$ and 20000 with this boundary condition show very good prediction. In general turbulent boundary layer flows, the mean wall shear stress is *a priori* unknown and thus a method of dynamically obtaining the mean wall shear stress during the computation will be suggested and examined.

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