

Abstract Submitted  
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**Prediction of wall shear-stress fluctuations in wall-modeled large-eddy simulation**<sup>1</sup> GEORGE PARK, MICHAEL HOWLAND, ADRIAN LOZANO-DURAN, PARVIZ MOIN, Center for Turbulence Research, Stanford University — Wall-modeled large-eddy simulation (WMLES) is emerging as a viable and affordable tool for predicting mean flow statistics in high Reynolds number turbulent boundary layers. Recently, we examined the performance of two RANS-based wall models in prediction of wall pressure and shear stress fluctuations which are important in flow/structure interaction problems. Whereas the pressure statistics were predicted with reasonable accuracy, the magnitude of wall shear stress fluctuations was severely underestimated (Park & Moin, *Phys. Rev. Fluids* **1**, 024404 (2016)). The present study expands on this finding to characterize in more detail the capabilities of wall models for predicting  $\tau'_w$ . Predictions of several wall models in high Reynolds number channel flows ( $Re_\tau = 2000$ ) will be presented. Additionally, a recent empirical inner-outer model for  $\tau'_w$  (Mathis *et al.*, *J. Fluid Mech.* **715**:163–180 (2013)) is reconstructed using channel flow DNS database, and it is coupled to WMLES to assess its performance as a predictive model in LES.

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