Predictive wall model and LES applied to the flat-plate turbulent boundary layer M. INOUE, California Institute of Technology, R. MATHIS, I. MARUSIC, University of Melbourne, D.I. PULLIN, California Institute of Technology — An empirical inner-outer wall model (Mathis *et al*, *JFM 2011*) is used, together with time series of stream-wise, resolved-scale velocities within the logarithmic region obtained from large-eddy simulations (LES), to calculate turbulence intensities $\overline{u'^2}/u_\tau^2$ in the inner region of the zero-pressure gradient turbulent boundary layer. Comparisons are made of the LES-wall-model results with both equivalent predictions using experimental time series, and also with direct experimental measurements at $Re_\tau = 7,300, 13,600$ and $19,000$. LES combined with the wall model are then used to extend the inner-layer predictions to Reynolds numbers within a gap in $\log(Re_\tau)$ space between laboratory measurements and surface-layer, atmospheric experiments.

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