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Comparison of the one- and two-point second-order statistics for zero-pressure-gradient turbulent boundary layers and channels at $Re_\tau \approx 1000 - 2000$[1] JUAN A. SILLERO, AYSE G. GUNGOR, JAVIER JIMÉNEZ, U. Politecnica Madrid, ROBERT D. MOSER, U. Texas at Austin — One and two-points statistics are presented from a new direct simulation of the zero-pressure-gradient turbulent boundary layer in the range $Re_\theta = 2780 - 6680$, matching channel flow simulations at $Re_\tau \approx 1000 - 2000$. The integral parameters, mean velocities, Reynolds stresses and pressure fluctuations of the boundary layer closely agree with the numerical and experimental data sets available in the literature, but show clear differences with channels, when expressed in wall units at the same y/δ. Those differences seem to increase, rather than decrease, with the Reynolds number. Spectra and spatial correlations $C_{\xi\xi}(x; x'; y; y'; k_z)$ are also investigated, and include a range of scales of the energy-containing structures larger than an order of magnitude.

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