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Two-point correlations and logarithmic layer statistics in wall turbulence over a very large range of Reynolds number[1] IVAN MARUSIC, NICHOLAS HUTCHINS, University of Melbourne — An investigation was conducted of the logarithmic layer structure in turbulent boundary layers spanning three orders of magnitude change in Reynolds number. This was achieved by using two laboratory scale facilities and the atmospheric surface layer at the SLTEST facility in Utah. Several experimental techniques were used including particle image velocimetry in the laboratory, and spanwise and wall-normal arrays of hot-wires and sonic anemometers in the laboratory and atmosphere, respectively. Two-point correlation statistics are found to agree extremely over all Reynolds numbers with outer length scaling. Recent large-scale coherence noted in the logarithmic region of laboratory-scale boundary layers (superstructures) are also found to exist in the atmospheric surface layer flow.

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