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A universal logarithmic region in wall turbulence IVAN MARUSIC, JASON MONTY, University of Melbourne, MARCUS HULTMARK, ALEXANDER SMITS, Princeton University — Considerable discussion over the past few years has been devoted to the question of whether the logarithmic region in wall turbulence is indeed universal. Here, we analyse recent experimental data in the Reynolds number range of nominally $2 \times 10^3 < Re_\tau < 6 \times 10^5$ for boundary layers, pipe flow and the atmospheric surface layer, and show that within the experimental uncertainty, the data support the existence of a universal logarithmic region. The results support the theory of Townsend (1976) and Perry & Chong (1982) that an inertial region requires both a logarithmic profile for the mean flow and the streamwise turbulence intensities. The experimental data are unique given the high Reynolds numbers presented and the fidelity of the measurement techniques where both the mean velocity and streamwise turbulence intensities are measured with the same instrument.

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