

Abstract Submitted
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Scaling of near-wall turbulence in pipe flow¹ MARCUS HULTMARK, SEAN BAILEY, ALEXANDER SMITS, Princeton University — Experiments were conducted in the Princeton/ONR Superpipe. Profiles of the streamwise velocity component were measured in fully developed pipe flow at Reynolds numbers from 25×10^3 to 150×10^3 . The turbulence intensity profiles non-dimensionalized with inner coordinates indicate that the magnitude of the near-wall peak is invariant with Reynolds number in both location and magnitude. The results agree with previous pipe flow data that have sufficient spatial resolution to avoid spatial filtering effects, but stand in contrast to similar results obtained in boundary layers, where the peak displays a strong Reynolds number dependence, although its position, in wall units, is fixed at the same location as in pipe. Although it is expected that the current experiments have sufficient spatial resolution at all Reynolds numbers, experiments are being conducted at constant l^+ to investigate the potential impact of probe spatial filtering on these results.

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