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Canonical boundary layer properties at high Reynolds number as measured in the UNH Flow Physics Facility PASCHAL VINCENTI, CALEB MORRILL-WINTER, JOSEPH KLEWICKI, CHRISTOPHER WHITE, MARTIN WOSNIK, University of New Hampshire — This presentation describes the characteristics of the flow within the Flow Physics Facility (FPF) at the University of New Hampshire. Having a test section length of 72m, the FPF employs the “big and slow” solution to obtaining well-resolved turbulent boundary layer measurements at high Reynolds number. We report on experiments that investigate the wind speed and Reynolds number capability, spanwise uniformity, streamwise pressure gradient, and free-stream turbulence intensity in the FPF. Single element hot-wire measurements of the boundary layer statistical profiles (up to fourth central moment) are presented. These experiments used standard 1mm sensors to generate spatially and temporally well-resolved measurements over the Karman number range 2000 - 20000. Integral parameters and spectra, at a variety of stream-wise locations and Reynolds numbers, are presented, and compared to existing data. For a wide range of test conditions, the FPF is shown to provide high-resolution access to the turbulence of the canonical boundary layer at high Reynolds number.

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