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Pitot probe corrections for measurements in turbulent boundary layers JASON MONTY, SEAN BAILEY, MARCUS HULTMARK, BEVERLEY MCKEON, AND ICET TEAM — Mean velocity measurements over a range of Reynolds number have been taken in zero-pressure-gradient, flat plate turbulent boundary layers using Pitot probes of varied diameter. Three world-class boundary layer facilities were involved in this investigation, ensuring the results are not facility-dependent. Different methods of correcting Pitot probe data were compared to each other and to a concurrent study where hot-wire measurements provided mean velocity data. It was found that there was very little diffffference in the commonly used shear corrections, although improvements could be made in the near-wall corrections and a modification to the correction is proposed. The applicability of a turbulence correction is investigated with the final, fully corrected pitot probe measurements compared with hot-wire measurements, demonstrating excellent agreement overall between the two. This study confirms the accuracy of pitot probes for mean flow analysis in turbulent shear flows.

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