

Abstract Submitted
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Favorable Pressure Gradient Turbulent Boundary Layers: Part 1. Wall Shear Stress Calculations. KATHERINE NEWHALL, RAUL BAYOAN CAL, BRIAN BRZEK, Rensselaer Polytechnic Institute, GUNNAR JOHANSSON, Chalmers Institute of Technology, LUCIANO CASTILLO, Rensselaer Polytechnic Institute — In order to improve the understanding of favorable pressure gradient turbulent boundary layers, near-wall measurements using 2D Laser Doppler Anemometry (LDA) are performed over a smooth surface. Observing the difficulties in obtaining the skin friction, alternate methods such as the momentum integral equation and the slope at the wall have been considered. The experiments include many downstream locations so that the momentum integral equation can be used to determine accurate values for u^* and the skin friction. The various terms in the integrated momentum equation are continuously computed for each of the different cases which pertain to a set of upstream conditions. The development of the terms as the flow progresses downstream is of interest and is compared with experimental data previously obtained by Castillo and Johansson where upstream conditions are taken into account on zero pressure gradient boundary layers.

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