

3D-Measurements in an Adverse-Pressure-Gradient Turbulent Boundary Layer over Smooth and Ribbed Surfaces

Thomas Indinger, Stefan Hickel, Nikolaus A. Adams

Technische Universität Dresden, Institut für Strömungsmechanik, Dresden, Germany

3D-PIV and 2D-LDA measurements in a fully turbulent boundary with adverse pressure gradient have been performed. Two types of surfaces were investigated: a smooth surface and a surface with riblets aligned in main flow direction. Particle image velocimetry was used to determine the influence of the surface structure on large-scale structures in the near wall region whereas profiles of mean and fluctuating velocity inside the boundary layer were acquired by laser Doppler anemometry. Significant changes of size and location of near-wall vortex structures were found ongoing with a deformation of the mean velocity profile due to the riblet surface.

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