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MEASUREMENTS OF HIGHER-ORDER TURBULENT STATISTICS IN A TURBULENT BOUNDARY LAYER SUBJECTED TO A SHORT ROUGHNESS STRIP

ABSTRACT

Hot-wire measurements have been undertaken in a turbulent boundary layer which is subjected to an impulse in form of a short roughness strip with the aim of determining its effect on turbulence structure. The quantifications were made through the measurements of higher-order turbulent statistics. The changes observed in the distributions of correlation coefficient, third-order moments, skewness and flatness factor relative to the smooth wall suggests that the turbulence structure is modified downstream of the short roughness strip. Relative to the undisturbed smooth wall, the third-order moments were increased in the region between the two internal layers. This increased extends to significant portion of the outer region of the boundary layer. While a gain in turbulent kinetic energy by diffusion occurs throughout the boundary layer for a flow over the short roughness strip, those of the smooth wall occur near the wall.

KEYWORDS

[measurements](#), [turbulence](#), [boundary layer](#), [roughness](#)

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