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Boundary Layer Measurements over 2/3-D Roughness[1] KAREN FLACK, MICHAEL SCHULTZ, VOLINO RALPH, United States Naval Academy — Boundary layer flows over three-dimensional roughness show remarkable similarity to smooth-wall flows outside a region near the roughness elements. In contrast, the turbulence statistics for flows over two-dimensional bar roughness have exhibited significant differences in the outer layer compared to smooth-wall flows. It is not clear whether the difference is due to the larger scales imposed on the flow due to the spanwise extent of the roughness, or if the boundary layer is strongly perturbed by, in essence, being repeatedly tripped by the spanwise elements. To address this question, measurements have been made over spanwise rows of cubes with a spanwise spacing of one roughness height and a streamwise spacing of seven roughness heights. Results are compared to bars of the same height and streamwise spacing.

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