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Turbulence statistics for high Reynolds number rough wall turbulent boundary layers[1] KAREN A. FLACK, MICHAEL P. SCHULTZ, United States Naval Academy — The effect of Reynolds number on rough wall turbulence statistics is investigated through a series of experiments on five rough surfaces. These consist of three fine-grit sandpaper surfaces and two commercial ship bottom paints, all with a roughness height that is a very small fraction of the boundary layer thickness. Reynolds number dependence of the near wall peak in the streamwise Reynolds normal stress is well established for smooth walls, and it has been observed that this peak is destroyed in the fully rough turbulent boundary layer. Additionally, Reynolds number effects have been observed in the streamwise Reynolds stress in the log-law and outer layers for smooth walls. This Reynolds number dependence has not been tested over a wide Reynolds number range for rough walls. Results spanning a Reynolds number range of Re_θ = 3,000 - 30,000 will be presented.

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