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On Scaling Rough-Wall Turbulent Boundary Layers FARAZ MEHDI, JOSEPH KLEWICKI, University of New Hampshire — The problem of scaling rough-wall turbulent boundary layers is explored relative to the prevalent inner/outer/overalap layer model of turbulent wall flows and relative to the four layer structure associated with the mean momentum balance. Of particular interest is the characterization of the combined roughness/Reynolds number problem using the characteristic scales inherent to each model. Within this context, available rough turbulent boundary layer normal and shear stress data are examined. The locations of the peaks in these profiles are determined and sorted according to δ^+ and k_s^+. For all of the data examined, these analyses indicate that the peak positions occur within the roughness sublayer. The implications of these are discussed relative to the position of the Reynolds shear stress peak with increasing Reynolds number and relative to the effects of roughness on the structure of the mean momentum field. The present survey also reveals the lack of data sets sufficient to characterize the rough-wall problem, even under the utilization of general parameters such as equivalent sand grain roughness. Experiments addressing some of the open questions are suggested.

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