

Abstract Submitted
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**Large Eddy Simulation of Turbulent Boundary Layers over
Rough Beds**¹ KRISHNAKUMAR RAJAGOPALAN, GENO PAWLAK, AN-

TOINE PATALANO, MARCELO KOBAYASHI, University of Hawaii at Manoa —
The hydrodynamic length scale, z_o , a parameter in the logarithmic velocity profile for fully developed turbulent boundary layers over rough beds, is a simple function of the physical size of the roughness elements when the roughness is homogeneous. In the case of broad-banded and highly irregular roughness distributions as found, for example, over coral reefs, the relationship between the hydrodynamic length scale and the physical length scale is not clear. One method to characterize the irregular nature of roughness is through a spectral distribution (Nunes and Pawlak, *J.Coast.Res*, 2008). We present results from numerical and laboratory experiments that model spectral roughness using inhomogeneous distributions of square waves which can reproduce flow separation characteristics common to flow over rough beds. The numerical simulations make use of Large Eddy Simulation techniques to model the turbulent flow over the bed. Laboratory observations are presented to verify the numerical results. This study will shed light on estimating bulk parameters of the flow such as hydrodynamic length scale, mean velocity profile and bed stress for a boundary with a spectral roughness distribution.

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Krishnakumar Rajagopalan
University of Hawaii at Manoa

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