

Abstract Submitted  
for the DFD10 Meeting of  
The American Physical Society

**An analytical framework for the study of rough-wall turbulent boundary layer** KIRAN BHAGANAGAR, University of Texas, RICHARD LEIGHTON, University of Michigan — To study the dynamics of rough-wall turbulent boundary layer, an alternate set of transport equations that contain an implicit roughness drag and roughness production have been developed. The Canonical Reynolds averaged Navier-Stokes equations and transport equations are not well suited for this purpose, as they do not contain any roughness information. In this talk we present an analytical framework suitable for a rough-wall based on three-level decomposition of velocity. Direct numerical simulations have been used to simulate flow in a channel with rough-walls. We present the results for the transport equation of the mean momentum equation and discuss the significance of explicit roughness drag term that arises due to this formulation.

Kiran Bhaganagar  
University of Texas

Date submitted: 06 Aug 2010

Electronic form version 1.4