

Abstract Submitted
for the DFD15 Meeting of
The American Physical Society

Transport of heat and momentum in oscillatory wall-bounded flow ALIREZA EBADI, DRUMMOND BILES, CHRISTOPHER WHITE, University of New Hampshire, IAN POND, YVES DUBIEF, University of Vermont, UNH TEAM, UVM TEAM — The balance of the leading order terms in the mean momentum and energy equations and their thrice integrated forms are investigated in oscillatory wall-bounded flow using both DNS and experimental data. The integrated forms of the equations are used to investigate the dynamical contributions to the phase-averaged wall shear stress and wall heat flux. Preliminary results indicate that phases corresponding to flow acceleration are dynamically similar to oscillatory laminar flow and phases corresponding to flow deceleration are dynamically similar to fully developed turbulent flow. Moreover, the flow becomes more turbulent-like with increasing period of oscillation.

Alireza Ebadi
University of New Hampshire

Date submitted: 31 Jul 2015

Electronic form version 1.4