Abstract Submitted
for the DFD07 Meeting of
The American Physical Society

The effects of hot-wire spatial resolution on measurements in wall-bounded turbulence. NICHOLAS HUTCHINS, IVAN MARUSIC, MIN CHONG, University of Melbourne, TIMOTHY NICKELS, University of Cambridge — Reassessment of new and pre-existing data reveal that recorded scatter in the hot-wire measured near-wall peak in viscous- scaled streamwise turbulence intensity is due in large part to the simultaneous competing effects of Reynolds number and viscous scaled wire-length l^+. These competing factors can explain much of the disparity in existing literature, in particular explaining how previous studies have incorrectly concluded that the inner-scaled near-wall peak is independent of Re. We also investigate the appearance of the, so-called, 'outer-peak' in the broad-band streamwise intensity, found by some researchers to occur within the log-region of high Reynolds number boundary layers. We show that this 'outer-peak' is most likely a symptom of attenuation of small-scales due to large l^+. Fully mapped energy spectra, obtained with a range of l^+, are presented to demonstrate this phenomena.

Ivan Marusic
University of Melbourne

Date submitted: 03 Aug 2007 Electronic form version 1.4