Abstract Submitted
for the DFD12 Meeting of
The American Physical Society

A new scaling for the streamwise broadband turbulence intensity profiles of ZPG turbulent boundary layers VIGNESHWARAN KULANDAIVELU, NICHOLAS HUTCHINS, The University of Melbourne, THE UNIVERSITY OF MELBOURNE TEAM — Turbulent boundary layers under zero pressure gradient are investigated experimentally with the aim of proposing a new scaling for the streamwise turbulence intensity. The streamwise intensity normalized by the inner and outer scales seems to collapse the profiles near the wall and in the wake region respectively. We here suggest a new scaling that aims to collapse these profiles across both the inner and outer regions. This is done by assuming a logarithmic variation between the viscous-scaling at the wall and outer scaling in the wake region. It is defined as $\hat{z} = \log_{10}(z^+/C) \,/\, \log_{10}(\delta^+/C)$, with $\hat{z} = 0$, at $z^+ = C$ and $\hat{z} = 1$, at $z^+ = \delta^+ = Re_\tau$. A very good collapse of the data is observed from $z^+ \approx 15$ to $z/\delta \approx 1$. The constant "C" is chosen to be 15 which signifies the inner normalised wall location z^+, where the peak in turbulence intensity is observed.

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Date submitted: 10 Aug 2012 Electronic form version 1.4