

Abstract Submitted
for the DFD15 Meeting of
The American Physical Society

Interaction of two high Reynolds number axisymmetric turbulent wakes M. OBLIGADO, Imperial College London, S. KLEIN, TU Braunschweig, J.C. VASSILICOS, Imperial College London — With the recent discovery of non-equilibrium high Reynolds number scalings in the wake of axisymmetric plates (Nedic et al., PRL, 2013), it has become of importance to develop an experimental technique that permits to easily discriminate between different wake scalings. We propose an experimental setup that tests the presence of non-equilibrium turbulence using the streamwise variation of velocity fluctuations between two bluff bodies facing a flow. We have studied two different sets of plates (one with regular and another with irregular peripheries) with Hot-Wire Anemometry in a wind tunnel. By acquiring streamwise profiles for different plate separations and identifying the wake interaction length for each separation it is possible to estimate the streamwise evolution of the single wake width. From this evolution it is also possible to deduce the turbulence dissipation scalings. This work generalizes previous studies on the interaction of plane wakes (see Gomes-Fernandes et al., JFM, 2012) to include axisymmetric wakes. We find that the wake interaction length proposed in this cited work and a constant anisotropy assumption can be used to collapse the streamwise developments of the first three moments.

Martin Obligado
Imperial College London

Date submitted: 21 Jul 2015

Electronic form version 1.4