

Abstract Submitted
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Axisymmetric turbulent wakes with new non-equilibrium similarity scalings¹ JOHN CHRISTOS VASSILICOS, JOVAN NEDIC, BHARATHRAM GANAPATHISUBRAMANI, Imperial College London, TMFC, IMPERIAL COLLEGE LONDON TEAM — The recently discovered non-equilibrium turbulence dissipation law (Seoud & Vassilicos PoF 19, 2007, Mazellier & Vassilicos PoF 22, 2010, Valente & Vassilicos JFM 687, 2011, Valente & Vassilicos PRL 108, 2012, Gomes-Fernandes et al. JFM 711, 2012) implies the existence of axisymmetric turbulent wake regions where the mean flow velocity deficit decays as the inverse of the distance from the wake-generating body and the wake width grows as the square root of that distance. This behaviour is different from any documented boundary-free turbulent shear flow to date. Its existence is confirmed in wind tunnel experiments of wakes generated by plates with irregular fractal-like edges placed normal to an incoming free stream.

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