

Abstract Submitted
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Evolution of the turbulent/non-turbulent interface of an axisymmetric turbulent jet M. KHASHEHCHI, A. OOI, I. MARUSIC, Department of Mechanical Engineering, University of Melbourne, Victoria, Australia, J. SORIA, Laboratory for Turbulence Research in Aerospace and Combustion, Dept. of Mechanical and Aerospace Engineering, Monash University, Victoria, Australia — Measurements of a turbulent round air jet, using Particle Image Velocimetry (PIV), were made in order to investigate the dynamics and transport processes at the continuous and well-defined bounding interface between the turbulent and non-turbulent regions (T/NT) of the flow. The jet Reynolds number was $Re_D = 3000$ and the measurements were made between 0 and 50 nozzle diameters from the nozzle exit. A velocity thresholding technique was used and found to compare well against available results obtained using similar detection criterion reported in the literature. The evolution of the coherent turbulent structures at the interface is considered as the jet evolves from the nozzle, as indicated by the conditionally averaged streamwise velocity, azimuthal vorticity, turbulent intensity and Reynolds shear stress across the interface. A clear change in behaviour is noted going from the near-field region, $x/d = 0$ to 8, to the far field (self-similar) region. These will be described and discussed.

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