

Abstract Submitted
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Turbulence Measurements of a High Reynolds Number Inclined Jet in Crossflow using PIV and FRAP VIPLUV AGA, CLAUDIO FELICIANI, NDAONA CHOKANI, REZA ABHARI, ETH Zurich — The TKE, turbulence intensity and Reynolds shear stress for a jet inclined at 30° to the freestream with a blowing ratio of 2 and Reynolds numbers, based on hole diameter, (Re_d) of 30000 are measured using 3-D Stereoscopic PIV and a miniature Fast Response Aerodynamic Probe (*FRAP*). The Maximum Entropy Method is used to compose a spectrum for variance calculations from PIV data, thereby ameliorating the low sampling rate and systematic noise. The PIV measurements are compared with those from the *FRAP* and found to be within error estimates. TKE contours indicate that the two main sites of turbulence production are the counter rotating vortex pair and the shearing surface of the jet. It is observed that the turbulence within the vortex pair is higher and dissipates slower than that in the jet shear surface. The eddy diffusivities of momentum in different cardinal directions are also compared and found to have an anisotropic distribution. The mechanisms of turbulent mixing in this complex flow and their relevance to turbulence modeling are commented upon.

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