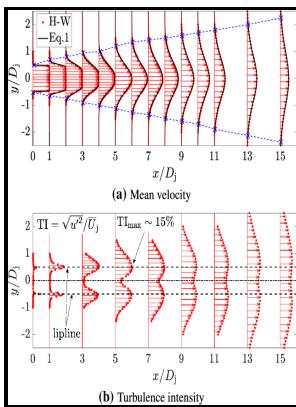


Instrumentation for and preliminary measurements of space-time correlations and convection velocities of the pressure field of a turbulent boundary layer

University of Southampton, Dept. of Aeronautics and Astronautics - Optical Instrumentation Technical Publications



Description: -

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Measurements in the annular shear layer of high subsonic and under

Visualisation of the flow structures was achieved by laser-sheet imaging of small water droplets formed as the warm humid ambient air was entrained into the cold high-speed jet. The explanation for this difference is twofold.

On the dynamic behavior of composite panels under turbulent boundary layer excitations

High Reynolds number $\sim 10^6$ and high Mach number jets issuing from a convergent nozzle at nozzle pressure ratios NPRs from 1. Solid seeding particles were, however, preferable in that they provided a high signal-to-noise ratio of scattered light leading to a higher validated data rate. Model coefficients were calibrated against compressible homogeneous shear flow data, with coefficients sensitised to compressibility using the gradient Mach number M_G the ratio of shear and acoustic timescales, i .

On the dynamic behavior of composite panels under turbulent boundary layer excitations

Data on turbulence statistics were only forthcoming when non-intrusive laser-based instrumentation was applied. Given the nature of the importance of unsteady processes in the above discussion, it will be difficult for any statistical RANS-based closure to provide an accurate description of the development of the turbulence in the jet near field nozzle exit to potential core end. Three zones can be identified in the potential core region, most clearly in the lower NPRs, but on close inspection for all NPRs.

On the dynamic behavior of composite panels under turbulent boundary layer excitations

Statistics of mean and fluctuating temperature are in excellent agreement with the previously reported experimental data for a turbulent NCBL. J Fluid Mech 373:33—79 Cite this article Joseph, L. The onset of compressibility reduction in growth rate is seen to begin earlier in the annular

shear compared to planar shear layer data.

The low

It was found that the wall pressure field data exhibit many properties similar to those reported from independent studies in subsonic boundary layer and pipe flows.

Measurement of noise radiated by boundary layer excited panels

Vyhalek, Christopher Betters, Sergio G.

Convection velocity of temperature fluctuations in a natural convection boundary layer

The present experiments and the experiments of Lau et al. Importantly, these experimental observations are in agreement with the three layer model put forth by Wells and Worster 2008. The work reported here has thus focussed on an experimental study of the axisymmetric annular shear layer behaviour associated with convergent conical nozzle jet plumes over a range of NPR, including moderately under-expanded cases.

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