



Measurement of Initial
Conditions at Nozzle Exit of
High Speed Jets

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Measurement of Initial Conditions at Nozzle Exit of High Speed Jets

By -

BiblioGov. Paperback. Book Condition: New. This item is printed on demand. Paperback. 22 pages. Dimensions: 9.7in. x 7.4in. x 0.1in. The time averaged and unsteady density fields close to the nozzle exit (0. 1 less than or xD less than or 2, x: downstream distance, D: jet diameter) of unheated free jets at Mach numbers of 0. 95, 1. 4, and 1. 8 were measured using a molecular Rayleigh scattering based technique. The initial thickness of shear layer and its linear growth rate were determined from time-averaged density survey and a modeling process, which utilized the Crocco-Busemann equation to relate density profiles to velocity profiles. The model also corrected for the smearing effect caused by a relatively long probe length in the measured density data. The calculated shear layer thickness was further verified from a limited hot-wire measurement. Density fluctuations spectra, measured using a two-Photomultiplier-tube technique, were used to determine evolution of turbulent fluctuations in various Strouhal frequency bands. For this purpose spectra were obtained from a large number of points inside the flow; and at every axial station spectral data from all radial positions were integrated. The radially-integrated fluctuation data show an exponential growth with downstream distance and an eventual...



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