

Abstract Submitted
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Time-resolved, three-dimensional imaging of the initial region of a jet discharged from a round nozzle with a tab AKINORI MURAMATSU, Department of Aerospace Engineering, College of Science and Technology, Nihon University — Enhancement or suppression of mixing between a jet fluid and the ambient fluid can be realized by operating the flow structure, namely the vortical structure, in the initial region of the jet. Changing the exit form of a jet nozzle is a method for managing the vortical structure in the jet. When the projections (tabs) are installed on the nozzle exit, it is known that the vortical structure of the jet changes by the numbers, the shapes, and the arrangement methods of the tabs. In this study, a triangular tab was attached on the exit of a round nozzle. Air jet was formed at a Reynolds number of 2,000. The Reynolds number is based on the nozzle diameter and the jet velocity. The changed vortical structure in the initial region by the triangular tab was visualized using a time-resolved, three-dimensional imaging. The three-dimensional visualization of the jet was performed using a scanning, planar laser Mie scattering and a high-speed digital video camera. A three-dimensional image for the jet was constructed by volume-rendering method from a large number of cross-sectional images. A pair of wakes are formed just behind the nozzle exit by the tab, and is a pair of streamwise vortexes. The streamwise vortexes merge with vortex rings.

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