

Special Seminar: Spring 2009

Date: Friday January 16

Time: 11:00 AM (Special Seminar)

Location: Latrobe Hall 106

Speaker: Oguz Uzol (Middle East Technical University, Turkey)

Title: *"Flow Structure and Turbulence Characteristics of Non-circular Jets"*

Abstract

Mixing helps to convert heterogeneous physical systems into more homogeneous ones. One way of improving mixing is by using non-circular nozzles as passive mixing enhancement devices, which are generally easy to apply in industrial systems. In this presentation, experimental results from the investigation of the flow, turbulence and mixing characteristics of jets emanating from circular and non-circular nozzles will be presented. The experiments are performed in a low-speed free-jet facility at near and far fields using a hot-wire anemometry system with a tri-axial hot-wire sensor. All three components of the mean velocity vector and all six components of the Reynolds stress tensor are measured for a circular, a triangular and a square jet on various streamwise and lateral planes. The maximum mean jet exit velocity is 22 m/s, which corresponds to a jet exit Reynolds number of 55,000. Far field data are used for checking the self-similarity of the jets as well as for comparing the data with previous studies. The near field data are used to demonstrate the differences in the flow and turbulence structure and entrainment characteristics of circular, square and triangular jets.