

Abstract Submitted  
for the DFD07 Meeting of  
The American Physical Society

**Three Component LDA Measurements in Swirling Jets<sup>1</sup>**

RICHARD SEMAAN, JONATHAN NAUGHTON, University of Wyoming — Previous studies of swirling jets have revealed faster growth rates in the near field in comparison to their non-swirling counterparts. Recently, the growth rates and turbulent properties of the swirling jet in the far field have been shown to relax to those of the non-swirling jet. The current effort seeks to bridge these two regions by performing velocity surveys in the near and far field of a  $Re=100000$  swirling jet using three-component Laser Doppler Anemometry (LDA). Surveys are performed for various levels of swirl number, the ratio of angular momentum flux to linear momentum flux, from 0 to 0.4. Two different exit swirl profiles are studied, and the measurements are carried out in a region from the nozzle exit to 40 diameters downstream. In addition to bridging the near- field and far-field results, the mean data and turbulence statistics provide the means to examine the relaxation of these jets to their far-field form. Further, the separation of the axial and tangential flows and the scaling suggested by Ewing may be evaluated.

<sup>1</sup>This work is supported by grant FA9550-05-1-0485 from AFOSR monitored by Dr. John Schmisser

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Date submitted: 03 Aug 2007

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