Abstract Submitted
for the DFD16 Meeting of
The American Physical Society

Multi-Measurement Correlations in the Near-Field of a Complex Supersonic Jet Using Time-Resolved Schlieren Imaging ANDREW TENNEY, THOMAS COLEMAN, JACQUES LEWALLE, MARK GLAUSER, Syracuse Univ, SIVARAM GOGINENI, Spectral Energies, LLC — Supersonic flow from a three-stream non-axisymmetric jet is visualized using time resolved schlieren photography (up to 400,000 frames per second) while pressure on the aft deck plate of the nozzle is simultaneously sampled using kulites. Time series are constructed using the schlieren photographs and conditioned to reduce the effects of signal drift and clipping where necessary. The effect of this detrending and clipping reconstruction on signal statistics is examined. In addition, signals constructed from near field schlieren will be correlated with one another to visualize the propagation of information in the near field. The goal of utilizing space-time correlations is to assist in identifying and tracking the evolution of individual structures in the near field. The schlieren signals will also be correlated with the deck pressure traces to assist in unraveling the interaction of flow structures.

Andrew Tenney
Syracuse Univ

Date submitted: 02 Aug 2016 Electronic form version 1.4