Abstract Submitted
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Analysis and comparison of non-axisymmetric and circular nozzle configurations of a high speed jet[1] MATTHEW BERRY, Syracuse University, BARRY KIEL, AFRL, ZACHARY BERGER, Syracuse University, NAIBO JIANG, SIVARAM GOGINENI, Spectral Energies LLC, MARK GLAUSER, Syracuse University — The main focus of this experiment is on the analysis and comparison of different nozzle configurations of a high speed jet. We used 3 different non-axisymmetric nozzle designs placed in 7 different orientations as well as our standard 2 inch circular nozzle. The flow field was investigated at Mach 0.6 using two-component time-resolved PIV simultaneously sampled with far-field acoustic measurements. The velocity was examined in the streamwise direction of the r-z plane using 10 kHz TRPIV with a window size of about 5 inches. An array of 12 G.R.A.S. microphones were placed about 150 inches from the jet nozzle. Low-dimensional modeling was performed on the velocity data to extract and compare the structures associate with the different nozzle designs. The overall sound pressure level at several polar angles with respect to the jet axis was also compared.

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