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**Identification and Control of Noise Source Mechanisms in a Transonic Axisymmetric Jet** ANDRE HALL, JEREMY PINIER, MARK GLAUSER, Syracuse University — An experimental examination aimed at characterizing the aeroacoustic effect linked to the turbulent mixing of the exhausted jet plume with the ambient air in high-speed jets is comprised of a 50.8mm nozzle at Mach 0.85, operated under both heated (260oC) and room temperature (0oC) conditions. Both the hydrodynamic near- field and acoustic far-field pressure regions are examined. The near- field using an azimuthal array of fifteen (15) dynamic response pressure transducers positioned near the jets lip, and the far- field using a boom array of six (6) acoustic microphones (6.35mm in diameter). Instantaneous 3 component velocity measurements are acquired, simultaneously, in the r, theta plane at several streamwise positions between z/D=3:8 (the region where the sound producing events are found to be dominant) using a stereo PIV system. This data set is utilized in conjunction with multi-point low-dimensional techniques to characterize a low-dimensional description of the velocity field, with minimal effect on far-field acoustics. The low- dimensional description of the velocity field is examined to identify the dominant noise source mechanism in both jets. Calculation of a modified Lighthill source term, and azimuthal modal forcing, are used as a measure of source intensity and a gauge for noise reduction schemes, respectively. Where control of noise sources is concerned, a modal analysis of the near-field region has shown that modal forcing may prove a promising method. We greatly acknowledge the support of the AFOSR and the CNY-PR AGEP Alliance.

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