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Examination of the dominant azimuthal structures in the near-field pressure region of a high-speed turbulent jet ANDRÉ HALL, MARK GLAUSER, Syracuse University — Numerous experiments have been conducted on characterizing the near-field region of the turbulent axisymmetric jet. The modal distribution of the velocity field has been shown to be characterized by a substantial amount of energy, both in the lower Fourier-azimuthal modes (0,1,& 2), as well as the higher modes (4,5,& 6). The near-field pressure region has demonstrated energy in the lower azimuthal modes (0,1,& 2) only. Capturing the signature of higher modes known to be present in the velocity field, in the pressure field, would be valuable in a controls application. In particular if sensed at the jet lip. Experiments are conducted using a jet nozzle 50.8mm in diameter at exit, with a flow temperature of 25°C, balanced with ambient conditions. Fluctuating pressure measurements are captured by an azimuthal array of 15 *Kulite* transducers, at an exit velocity of *Mach* 0.85 (Re=9.8E5). The array is repositioned downstream at several streamwise locations in the fully turbulent, high Reynolds number compressible flow field in an attempt to capture the higher modes found in the velocity field. If no signature of higher modes is found in the fluctuating pressure field at locations where the higher modes are present in the velocity field, these experiments will confirm that pressure cannot resolve these higher modal events. A transfer function between the two distributions can also be evaluated.

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