Title: **Parabolized Stability Equation Based Analysis of Noise from an Axisymmetric Hot Jet**

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Date: July 20th, Friday Time: 16:00-17:00 ROOM: 114

Abstract:

Noise generated from large-scale eddies in a Mach 0.9 hot axisymmetric jet is studied. The mean jet flow is computed by using a Reynolds-Averaged Navier-Stokes solver with a k-ω turbulence model. Spatial development of near-field pressure perturbations is computed by using a 3D Parabolized Stability Equation (PSE) method, and the far-field noise field, radiated from these convective instabilities, is obtained by solving linear wave equation. The developed 3D PSE method allows the effects of strong azimuthal mean-flow variations on noise reduction to be analyzed. Results show that the large-scale wave-like eddies travel at a velocity slightly above sonic speed in the first few jet diameters, and that the dominant noise sources are concentrated near the edge of jet potential core. Good agreements in *relative sound pressure levels* and *directivity* are found between computed results and experimental measurements. Also, at the lower frequency range, the predicted sound field of azimuthal wave-number *m=0* shows better agreement with experimental data than the result of *m=1*; the most amplified mode.