

Abstract Submitted
for the DFD05 Meeting of
The American Physical Society

Relation between instability waves and coherent sound in a subsonic jet investigated with phased microphone arrays¹ TAKAO SUZUKI, University of Fukui, TIM COLONIUS, California Institute of Technology, JAMES E. BRIDGES COLLABORATION, SANG-SOO LEE COLLABORATION — To investigate the role of instability waves for noise generation in a subsonic round jet, we measure instability waves with a conical phased-microphone array in the near field and compare them with coherent sound in the far-field. By introducing a beam-forming algorithm with eigenfunctions obtained from linear stability analysis, we determine amplitudes of the axi-symmetric and first two azimuthal modes. In addition, data acquired in the near field provide streamwise evolution as well as local wavenumbers (i.e. phase velocity) of instability waves. We compare these results with coherent sound signals obtained from a far-field microphone array at NASA Glenn Research Center. Cross spectral matrices obtained from the far-field array provide sound radiation patterns of POD modes. We focus on the azimuthal mode balance at frequencies near the peak radiation and investigate the effects of chevron nozzles in this presentation.

¹Supported by AARC

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Date submitted: 10 Aug 2005

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