Abstract Submitted
for the DFD07 Meeting of
The American Physical Society

Strategic Forcing of Jets in Crossflow[1] JULIETT DAVITIAN, EDSON RODRIGUEZ, ROBERT M'CLOSKEY, ANN KARAGOZIAN, UCLA — This presentation will describe recent experiments that explore the response of a gaseous jet in crossflow to alternative methods of acoustic forcing. Building on an extensive prior exploration of transverse jet upstream shear layer instabilities[2], the present studies employ alternative temporal waveforms for jet forcing, depending on the jet-to- crossflow velocity ratio R, through which transverse jet behavior may be strategically controlled. Smoke visualization is used to observe jet response to forcing. Jets that are injected both flush and elevated with respect to the wind tunnel surface are considered. For values of $R > 3.5$, prior studies show that the jet's shear layer instabilities appear convective in nature, and hence low to moderate sinusoidal jet forcing can impact jet shear layer response and spread. In contrast, for relatively low values of R (below 3.5 for the flush jet and below 1.2 for the elevated jet), strong natural shear layer instabilities are generated, hence even high amplitude sinusoidal forcing has little effect. At these low R conditions, much higher amplitude square wave forcing is required to produce a jet response, necessitating the introduction of a characteristic time scale associated with vorticity generation.

[1]Supported by NSF grant CTS-0457413 and the NASA GSRP.
[2]Megerian, Davitian, Alves, and Karagozian, **JFM**, to appear.

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Date submitted: 04 Aug 2007 Electronic form version 1.4