

Abstract Submitted
for the DFD13 Meeting of
The American Physical Society

Surface Pressure Fluctuations Produced by an Axisymmetric Impinging Jet: Spatio-Temporal Characteristics¹ AHMED NAGUIB, MALEK AL-AWENI, Michigan State University — This is the second of a sequence of two presentations concerned with understanding the nature and generation mechanisms of the unsteady surface pressure in impinging jet flows. In the first presentation, the mechanisms influencing the evolution of the surface pressure are studied by examining instantaneous realizations obtained from time-resolved flow visualization and concurrent surface-embedded microphone array measurements; along with numerical simulations of related model problems. In this presentation, the focus is on examining the statistical importance and persistence of these mechanisms by comparing knowledge obtained from the instantaneous analysis to that resulting from inspection of conditional spatio-temporal surface-pressure behaviors, frequency-wavenumber spectra and other statistical measures. Results are presented for surface-pressure measurements at a Reynolds number based on jet diameter of approximately 7000. Dependence of the results on the spacing between the impingement wall and the jet as well as the jet impingement angle is also considered.

¹Partly funded by NSF grant OISE-0611984 and Libyan-North American Scholarship program

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Date submitted: 02 Aug 2013

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