

Abstract Submitted
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Modeling and Experimentation on a Two-dimensional Synthetic jet YUNFEI WANG, KAMRAN MOHSENI, Department of Aerospace Engineering, University of Colorado, Boulder, CO — Hotwire anemometry is employed in order to investigate the spatial development of a two-dimensional synthetic jet. Flow velocity at various locations downstream from a slit is measured. A self similar behavior in the measured velocity is observed. An analytical model for a steady synthetic jet is developed that accurately matches the experimental data. As observed by other groups, the two-dimensional synthetic jet spreads at a rate higher than a continuous jet. This rate is accurately predicted by our model. It is identified that the main difference between a continuous jet and a synthetic jet is the higher value of the virtual viscosity (eddy viscosity) in a synthetic jet. This is attributed to the pulsate nature of a synthetic jet that makes it more susceptible to turbulence.

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