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Title of presentation: Morphology of synthetic jet
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Abstract: <p>Synthetic jet devices consist of an oscillating driver, a cavity, and a small opening such as a circular, square or rectangular orifice. When driver is oscillating it produces a series of vortex pairs/rings at the slot/orifice. The device is called zero net mass flux ZNMF because the integration of the mass flow rate across the orifice over an integer number of cycles is identically equal to zero. Although there is no net mass transfer to its surroundings, the ZNMF device has the interesting property of causing a finite amount of momentum transfer to its surroundings.</p> <p>The synthetic jet devices are useful tools for flow control applications such as mixing enhancement, heat transfer, boundary layer separation control and driving small underwater vehicle.</p> <p>In this paper experimental result of synthetic jet flow visualization is presented. Synthetic jet visualization is carried out using smoke visualization with light sheet. Five qualitatively different flow field regimes were identified, depending upon the Reynolds and Stokes number. In this paper vortex ring generation and propagation was presented and analyzed. Flow visualization has revealed synthetic jet formation threshold $Re/Stk^2=0.2$ in comparison with the generally accepted in open literature formation criteria $Re/Stk^2=0.16$.</p>