

Effect of Synthetic Jet on Wind Turbine Noise

Authors : Reda Mankbadi

Abstract : The current work explores the use of Synthetic Jet Actuators (SJAs) for control of the acoustic radiation of a low-speed transitioning airfoil in a uniform stream. In the adopted numerical procedure, the actuator is modeled without its resonator cavity through imposing a simple fluctuating-velocity boundary condition at the bottom of the actuator's orifice. The orifice cavity, with the properly defined boundary condition, is then embedded into the airfoil surface. High-accuracy viscous simulations are then conducted to study the effects of the actuation on sound radiated by the airfoil. Results show that SJA can considerably suppress the radiated sound of the airfoil in uniform incoming stream.

Keywords : simulations, aeroacoustics, wind turbine noise, synthetic jet actuators (SJAs)

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