عنوان مقاله:

Experimental Study of Flow Control on Bluff Body using Piezoelectric Actuators

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خلاصه مقاله:

Active flow control is experimentally investigated on a car-type bluff body. The actuation is based on a synthetic jet actuator placed at the top of the Ahmed body rear window. In the present paper, a synthetic jet characterization is presented, the frequencies and the optimal amplitudes with regard to the spatial evolution are analyzed. All the measurements are carried out in a wind tunnel at Reynolds numbers based on the body length between ۱۰۶ and ۳ ۱۰۶. The bluff body shows a maximum drag reduction of ۱۰% when optimal control is applied. Independent effect of the reduced frequency and the momentum coefficient actuation parameters on the drag reduction are also detailed in the present paper. This reduction induces changes in the flow field due to the piezoelectric actuation. The flow topology modification is investigated via particle image velocimetry measurements in order to estimate the flow response to a local excitation and to understand the mechanism involved in the aerodynamic drag control.

کلمات کلیدی:

Bluff body, Flow control, Piezoelectric actuator, Drag reduction, Synthetic jet