

Abstract Submitted
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Synthetic jet-based control of wing tip vortices. CARLO SALVATORE GRECO, ANDREA PICCOLO, MIRKO ZACCARA, GERARDO PAOLILLO, TOMMASO ASTARITA, GENNARO CARDONE, Universita' degli Studi di Napoli "Federico II" — Wing tip vortices are coherent structures generated by the roll-up process developing in the wake of a finite lifting wing. Currently, winglets are the unique passive control device employed in the general aviation to weaken these undesired vortices, reducing their related problems, although active control devices (ACD) are studied in the literature. ACD try to weaken the wing tip vortices by triggering their inherent instabilities. Although these instabilities are caused by the mutual induction of the vortices, all the experimental works in this field employ only half-wing models and report only time-averaged results. The purpose of the present experiment is testing the effects of rectangular synthetic jets, placed at the wing tips and actuated at the wing-tip vortex instability frequencies, on the wing tip vortices generated by a finite span airfoil placed at the exit of an open jet wind tunnel. Phase-locked Stereo-PIV measurements of the flow field in the wing extended near-wake are carried out. The main observed effects of the control are the reduction of the wing tip vortex vorticity and induced rotational velocity.

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