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Experimental and Numerical Investigation of Flow Control Using a Novel Active Slat

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Abstract : An active slat is developed to increase the lift and delay the separation for a DU96-W180 airfoil. The active slat is a fixed slat that can be closed, fully opened or intermittently opened by a rotating vane depending on the need. Experimental results show that the active slat has reduced the mean pressure and increased the mean velocity on the suction side of the airfoil for all positive angles of attack, indicating an increase of lift. The experimental data and numerical simulations also show that the direction of actuator vane rotation can influence the mixing of the flow streams on the suction side and hence influence the aerodynamic performance.

Keywords : active slat, flow control,experimental investigation, aerodynamic performance
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