**BOUNDARY LAYER STREAKS CONTROL IN BYPASS TRANSITION UTILISING PLASMA ACTUATORS**

|  |  |  |
| --- | --- | --- |
| Konstantinos D. Eleftheriou  Department of Mechanical Engineering  Aristotle University of Thessaloniki, Greece | Kevin Gouder  Department of Aeronautics  Imperial College London, UK | Jonathan Morrison  Department of Aeronautics  Imperial College London, UK |

Abstract

This paper investigates the ability of a Feedforward Control Scheme to attenuate naturally and stochastically produced streaks in a Blasius boundary layer undergoing bypass transition. Based on previous work, linear growth of the streaks for the current setup occurs until around 350 mm from the leading edge; the control’s sensing and actuation hardware is installed within this linear growth region. A plasma actuator, which consist of two sub-actuators, one imparting positive, and the other negative disturbances, operates to control low and high-speed streaks respectively. Simultaneous data from one wall-shear-stress sensor upstream and a roving hot-wire downstream of the plasma actuator are used to implement the sensing process. The wall-normal location of the roving hot-wire was adjusted in order to identify potential increases in control effectiveness with design point location. Results show that the scheme results in a reduction of the rms velocity profile, and that this reduction increases for cases where the design point is located closer to the wall.