the effect of plasma actuator placement on drag coefficient reduction of ahmed body as an aerodynamic model

James Julian, author

Abstrak

In recent developments in the area of thermofluid technologies, active flow control has emerged as an interesting topic of research. One of the latest methods, which will be discussed in this paper, is the application of a plasma actuator. Plasma actuation is achieved by conducting a high-voltage electric current through an actuator device. Our research was specifically conducted to discover its effect on the reduction of the drag coefficient, with Ahmed Body the experimental object put inside a suction-flow wind tunnel with varying inputs of flow velocity. The plasma actuator device was run with an A.C. power supply and installed in three different placement configurations on the aerodynamic model to determine which most optimally affected the aerodynamic drag, while the drag coefficients were acquired via the use of a load cell installed as the harness for the aerodynamic model inside the tunnel. The results of the experiments include that the optimal configuration of the actuator placement was on the leading edge, the optimal wind flow velocity of the experiment, which was essential for the actuation to be observed, was at 1.7 m/s, and the resulting drag reduction percentage, as a result of induced flow, was 22% of the initial drag coefficient.