

Abstract Submitted
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On the Near Wake of an Inclined Circular Cylinder with Active Flow Control LUTZ TAUBERT, ISRAEL WYGNANSKI, University of Arizona
— Coherent structures in the near wake of a circular cylinder at different angles of inclination were investigated by 3D-PIV. Active flow control in the form of oscillatory, zero mass flux excitation generated by internal actuators was applied through two slots located symmetrically on the circumference of the cylinder or a single slot at varying positions. The diameter was 3" with L/D larger than 16, the Reynolds number for the flow normal to the cylinder was 30000. Pressure measurements were taken in the wake and on the surface to determine the forces on the model. Drag and lift were controlled by periodic perturbations emanating either symmetrically from a pair of slots or a from single slot. In addition to the changes in the radial flow patterns significant modifications of the axial flow were observed. Single pulse and short wavetrain perturbations were applied to investigate the stability of the flow. Single-point hotwire measurements were taken for time-resolved analysis. Phase-locked 3D-PIV data was acquired to access the spatial development of the introduced disturbances in the near wake.

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