

## **Distributed Plasma Forcing of Flow Over a Circular Cylinder**

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Numerical simulations are performed for flow over a circular cylinder and its control based on a distributed (i.e., spatially varying) forcing. In this study, the forcing is realized by dielectric barrier discharge plasma actuators located at upper and lower surfaces of the cylinder. The exposed electrodes are mounted for the whole span, whereas covered electrodes are mounted only at specific spanwise locations. The Reynolds numbers based on the cylinder diameter  $D$  are 300 and 3,900 covering three-dimensional laminar and turbulent flows. The wavelength of distributed forcing is varied from  $1D$  to  $4D$  to understand its effects on drag and lift forces on the cylinder. For many cases considered, reduction of mean drag and lift fluctuation is obtained and flow structures are significantly changed. The optimum wavelength of forcing and detailed information on flow structures will be given in the final presentation.

**Keywords:** Distributed Forcing, Plasma, Circular Cylinder