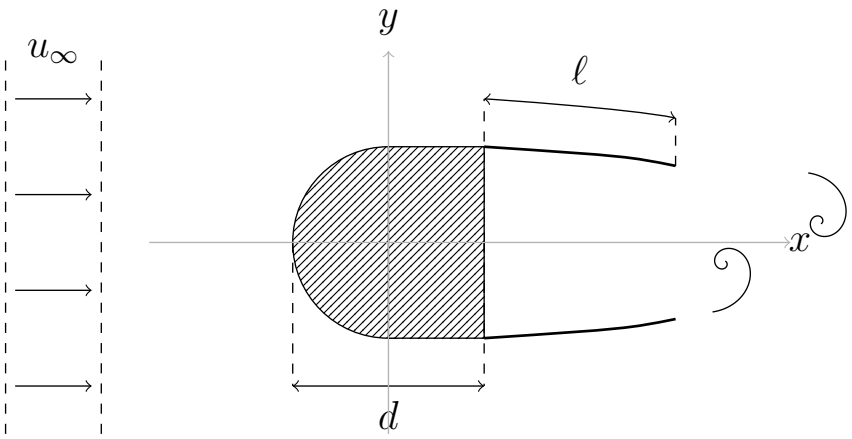
Force measurements for passive flow control in Wakes

Abstract

This proposal involves the upgrade and application of a wind tunnel force measuring system for a fluid-structure interaction problem. Present balance in the laboratory will be modified through a force gauge with load cell using Arduino acquisition card.

In this context, passive control methods for drag reduction in wake flows will be characterize. Passive control requires no external energy input and mainly relies on hydrodynamic design. We will consider the flow around a D-shape bluff body, and control will be achieve using flexible foils attached to the body's surface, as illustrated in the figure. Force measurements will be performed setting the device in a wind tunnel working in the $8000 < Re < 14000$ range, where preliminary results shown significant drag reduction for similar systems. The kinematics of the foils will be simultaneously recovered from fast camera recordings. These measurements allow for the characterization of the drag reduction through the wake manipulation, made by the elastic behaviour of the foils.



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