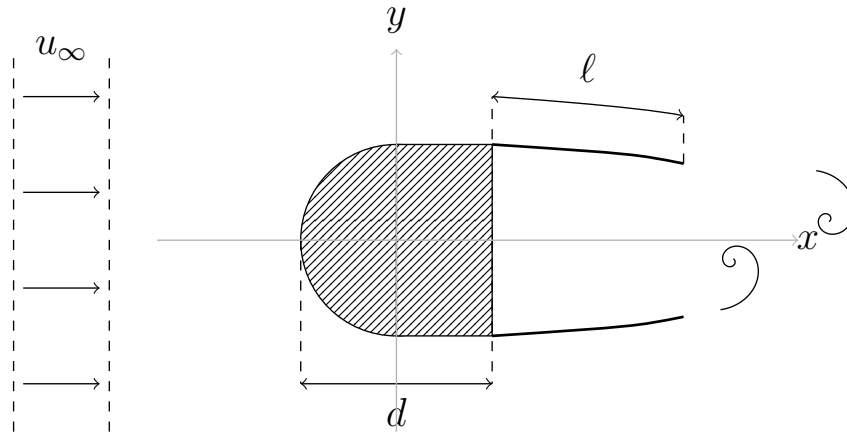


Direct force measurements for passive flow control in Wakes

Abstract

This proposal involves the upgrade, calibration and use of a force measuring system conceived to be set in a wind channel for versatile drag measurements. These measurements allow to analyze drag reduction due to body elasticity as a fluid-structure interaction problem. The present design of the laboratory scale will be modified through a force gauge with load cell using an 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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