Experimental Setup for Feedback Control of a Circular Cylinder Wake

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The design of a water tunnel experiment to enable experimental verification of control strategies for the absolutely unstable circular cylinder wake flow will be presented. The experiment operates over a Reynolds number range between 80 and 1000. Real time multi sensor information based on Particle Image Velocimetry (PIV) is available as input to the controller, which moves a single degree of freedom actuator providing translation. A large number of sensors can be placed throughout the entire flow field at the discretion of the controller designer. Control algorithms coded in Simulink can be directly implemented in the experiment. We envision making this flow control experiment available to the control community in the form of a benchmark problem.