Abstract Submitted
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Experimental investigation of the influence of inlet conditions to a bluff body wake[1] BENGT FALLENIUS, JENS FRANSSON, Linne Flow Centre, KTH Mechanics, Royal Institute of Technology — Wind tunnel experiments have been performed in a bluff body wake with varying inlet conditions in order to enhance the physical understanding of the wake flow instability, which may lead to successful flow control and in turn reduced aerodynamic drag. The geometry consists of a rectangular-based forebody with permeable surfaces, an elliptic leading edge and a blunt trailing edge. Length, width and base height of the forebody is 2.3, 0.5 and 0.04 meters, respectively. Applying continuous suction or blowing, of different levels, through the permeable surfaces along the forebody, varies the wall-normal trailing edge velocity profile in a systematic way and hence the inlet condition to the wake. The streamwise velocity component has been measured both throughout the boundary layer and in the wake behind the body using hot-wire anemometry. High-speed stereo PIV has been used in the wake in order to collect statistics of vortical structures in the wake. The influence of boundary layer parameters on the wake flow characteristics, such as vortex shedding frequency and base pressure, will be presented.

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