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6. The Back-vortex System in Swept Cylinder/Flat Plate Interactions

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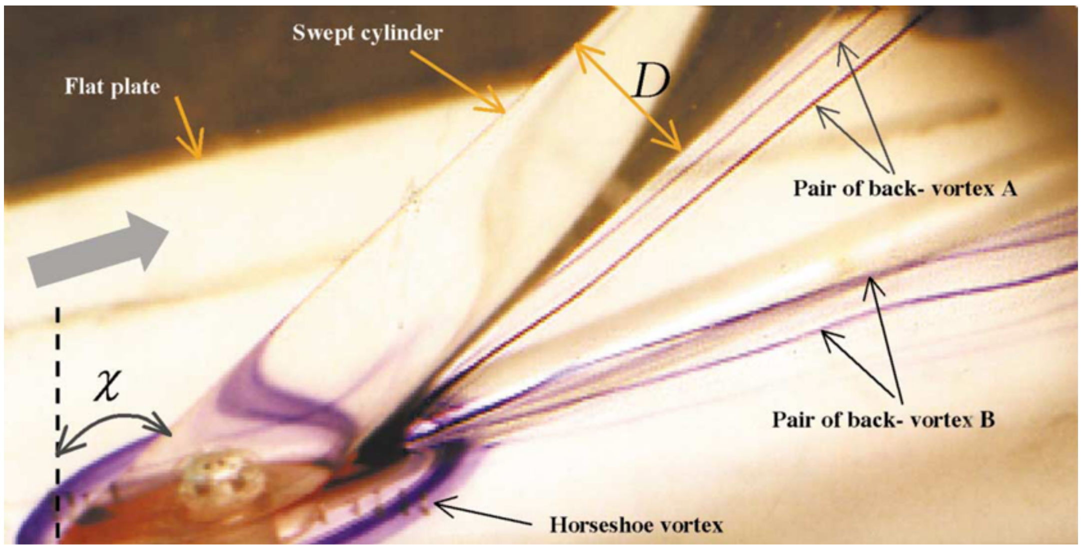
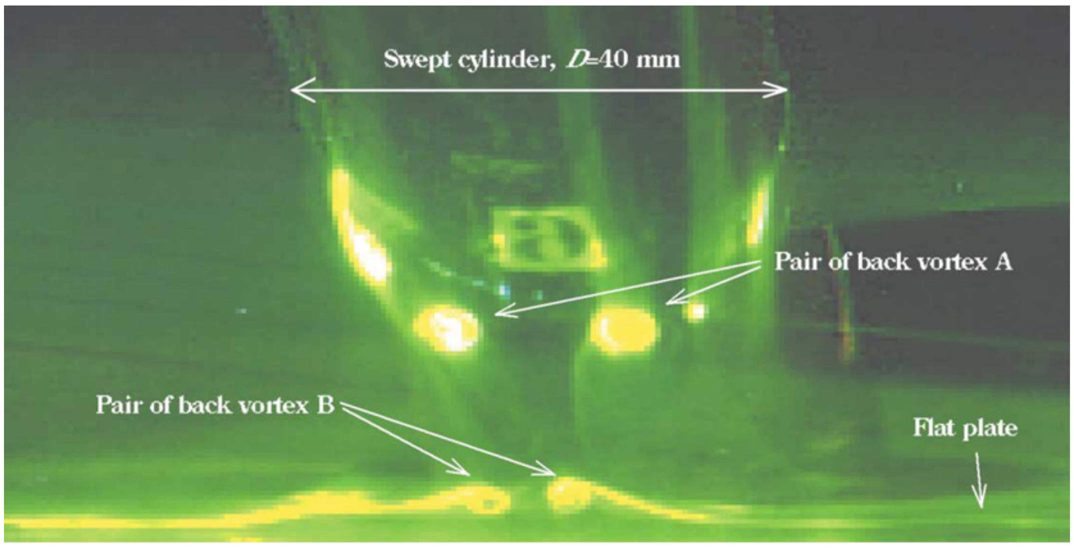


The side view of back-vortex system in swept cylinder/flat plate interactions, diameter D=40 mm, swept angle x=60˚



The back view of back-vortex system in swept cylinder/flat plate interactions, diameter D=40 mm, swept angle x=60˚

The cylinder/flat plate junction presents the simplest juncture flow interactions. It is well known that the adverse pressure gradient supplied by the model would cause the horseshoe vortex system in front of and round the model.

For the swept-cylinder/flat-plate interactions, there exists another kind of 3-D space vortex system----back-vortex. There are two sets (pair) of back-vortices, one close to the swept cylinder (labeled back-vortex A), and another close to the flat plate (labeled back-vortex B). The axes of back-vortex A and B start from the back corner of the juncture and extend to downstream. The back-vortices are essentially stable and the periodical oscillating or shedding off phenomena is not observed. The mechanism of forming back-vortex is virtually similar to that of horseshoe vortex except the source of the vortex vorticity. The back-vortex A would break-down under smaller swept angle. The back-vortex B might interact with the two legs of horseshoe vortex and wrap into a new vortex.