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Time-resolved PIV Measurement of Three-dimentional Cylinder Wake

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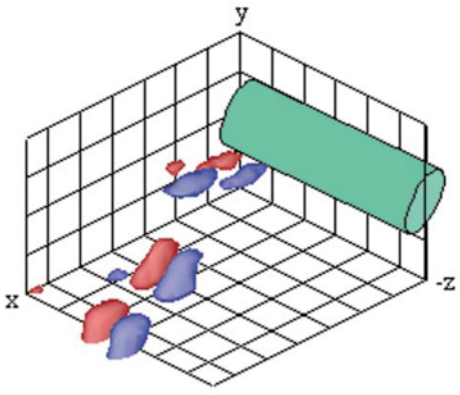
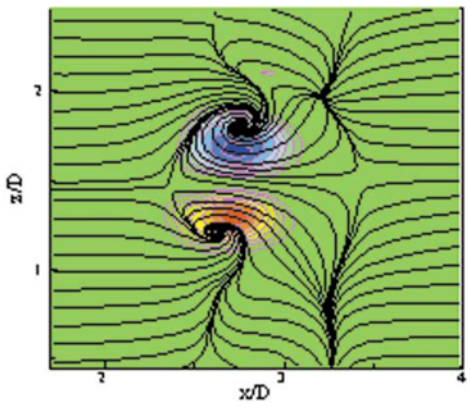
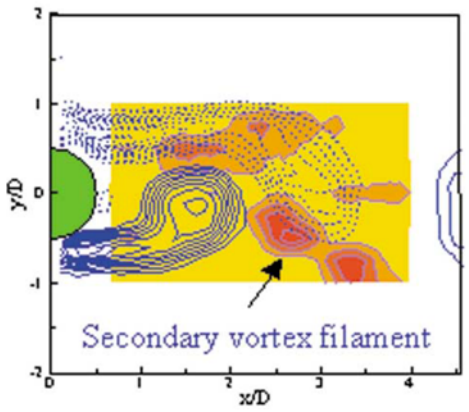


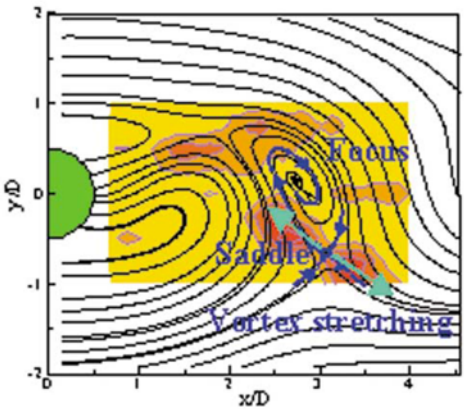
Iso-vorticity (ω_y) surfaces



Mushroom-type structure



Phase-locked primary and secondary vortices



Flow topology around a saddle

Phase-averaged three-dimensional near wake behind a circular cylinder in the wake-transition regime of Reynolds number 360 was measured by a time-resolved PIV system. The upper-left figure shows iso-vorticity surfaces of secondary vortices (ω_y), which were reconstructed from the phase-averaged vorticity fields on several z-x planes. Sectional streamlines around the secondary vortices in the upper-right figure were obtained by subtracting convection velocity, which gives a good evidence for the mushroom-type structure. In the lower two figures, the primary flow in a moving frame of reference was overlapped with the x-y plane view of the secondary vortices. Their spatial dispositions and vortex stretching process can be explained well.