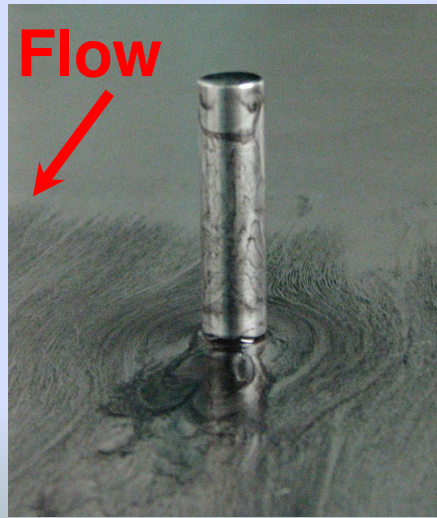


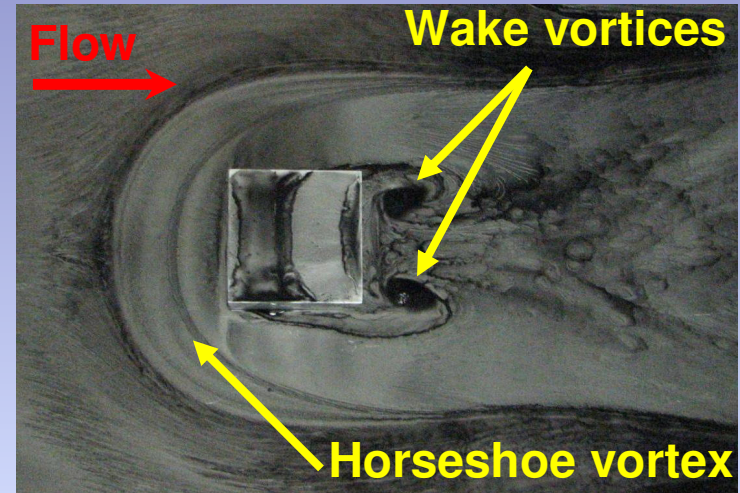
VORTEX-DOMINATED FLOWS AROUND 3-D SURFACE-MOUNTED BLUFF BODIES

Background

Surface mounted bluff-bodies may have a range of different shapes and they play a role in areas like wind engineering, heat transfer from rough surfaces and aerodynamics.



Oil film surface flow visualization of square and circular section cylinders with $AR = 4$



Plan view of oil film surface flow visualization of a cube ($AR=1$)

Objective

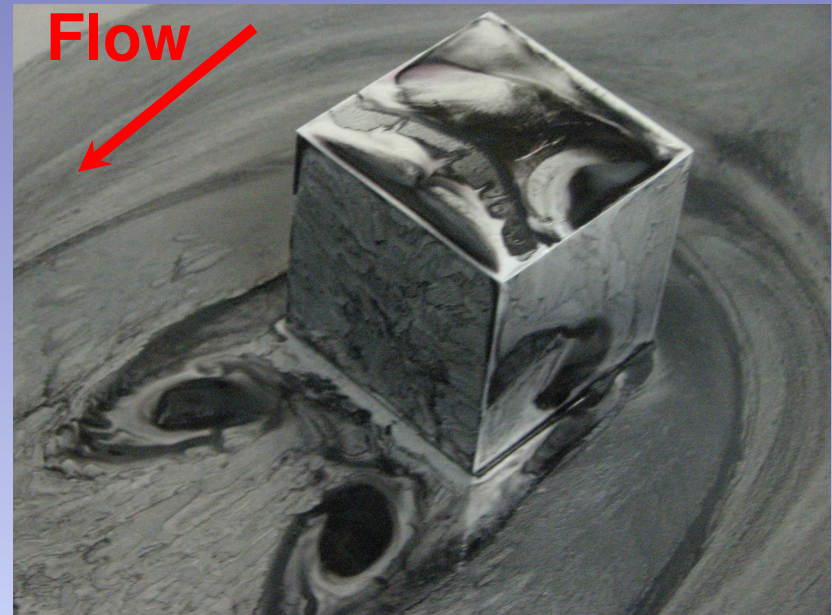
To quantify the effects of body shape, aspect ratio ($AR = \text{height}/\text{width}$) and approach flow conditions on the vortex-dominated flows around 3-D bodies.

Research Carried Out

Wind tunnel flow visualization, velocity measurements (LDV and PIV) and numerical modelling using direct numerical simulation (DNS), in collaboration with Univ Calgary and Univ Saskatchewan.

Expected Outcomes

- Explanation for the formation of the different tip vortex structures.
- Quantification of shedding frequencies and vortex shedding mechanisms.
- Assessment of the effects of aspect ratio and boundary layer thickness on these phenomena.



Oil film surface flow visualization of square and circular section cylinders with aspect ratio of $AR = 1$