EXTERNAL FLOW AROUND A CYLINDER AT RENOLDS NUMBER EQUALS TO 100

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Abstract

External flow around a cylinder is a classic problem in fluid mechanics. The problem of a cylinder subjected to external flow is important in many engineering disciplines, heat transfer applications in heat exchangers, and pipelines/risers in offshore engineering. Vortex Shedding occurs when an object such as a cylinder or sphere is subjected to a free stream cross flow which will result in vortices being shed in the wake of the cylinder, also known as a von Karman Vortex Street. In this case, we are going to solve the flow around a cylinder at Reynolds number equals 100. We are going to use incompressible solvers in laminar which is icoFoam. Therefore, the governing equations of the problem are the incompressible laminar Navier-Stokes equations. We are going to work on a 2D domain. This simulation can be validated with drag and lift force on cylinder.

Procedure-
• Mesh generated using blockMesh utility
• Setting boundary/initial conditions (BC/IC)
• Mesh imported into OpenFOAM
• Simulated in icoFoam solver
• Post-processing in Paraview and Gnuplot
• Validation of simulated data