NUMERICAL SIMULATION OF FLOW AROUND AND OVER SIX IN-LINE SQUARE CYLINDERS

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ABSTRACT

The objective of the present project is to present the simulation of fluid flow around the six in-line square cylinders using OpenFOAM. Different types of flow will be shown by varying Reynolds Number and S/d ratio where S is the surface-to- surface distance and d the dimension of the cylinder. I have used two turbulence models: k-epsilon and k-omega for a given set of the cases to compare the effect of turbulence model on the flow. The graphs of streamline and vorticity contours will be obtained as the results of the simulation.

PROBLEM STATEMENT

The flow is assumed to be incompressible, turbulent, unsteady. Simulation will be performed on the geometry as shown in figure 01. The flow around the cylinders are not affected by the range of external boundary of the computational domain as it is shown in the literature C. M. Sewatet.al (2012), flow around six in-line square cylinders). The number of cylinders has been chosen so that increase in the number of in-line cylinders will not affect the flow regimes around the cylinders. blockMeshing will be done in the computational region. Simulation will be performed using pimpleFoam Solver.

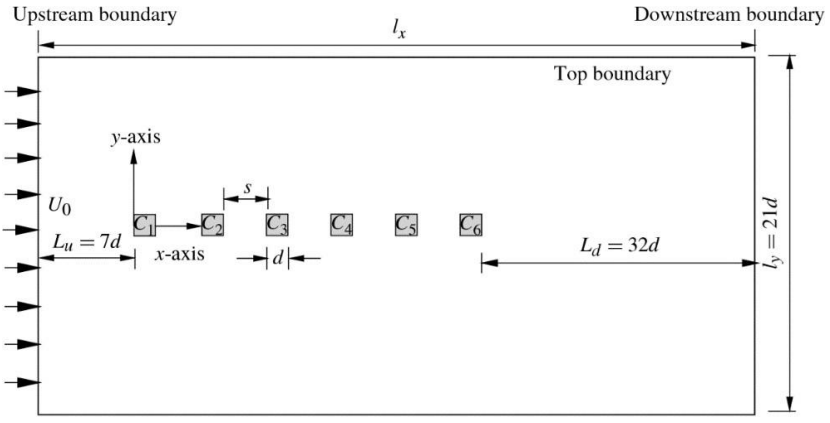

Figure 01: Computational domain
(C. M. Sewatet.al (2012))