Numerical Simulation of Vortex Shedding Supression From a Circular Cylinder Using Rigid Splitter Plates

Vinoth Kumar D
Mtech - Aerodynamics
Department of Aerospace Engineering
Indian Institute of Technology-Bombay, Mumbai, Maharastra, India.

The objective of the present project is to describe the implementation of passive method of flow control on a circular cylinder in a laminar flow regime. Three cases including the cylinder with one, two or three rigid splitter plates attached at its rear surface were considered and the location of horizontal plates (attachment angle) was varied between 0̊ and 9̊0̊.
A comprehensive parametric study was performed to identify the optimum arrangement of the plates using the openFOAM-4.x simpleFoam Solver.
& Gmsh-3.0.6 will be used for grid generation. The effect of the location and number of the plates have crucial effects on the wake control. The effect of Increasing the number of splitter plates from one to two symmetric parallel plates led to a reduction in drag force,vortex shedding frequency and fluctuation of lift force.This is evident from **literature (Rezvan Abdi et.al - Reduction of Fluid Forces and Vortex Shedding Frequency of a Circular Cylinder using Rigid Splitter Plates)**.The results of our simulations are compared with the literature's results & the approach can then be extended with other configurations of splitter plates & for square cylinders too.

Keywords: rigid splitter plate, vortex shedding, drag reduction, laminar flow, circular cylinder, Strouhal number.

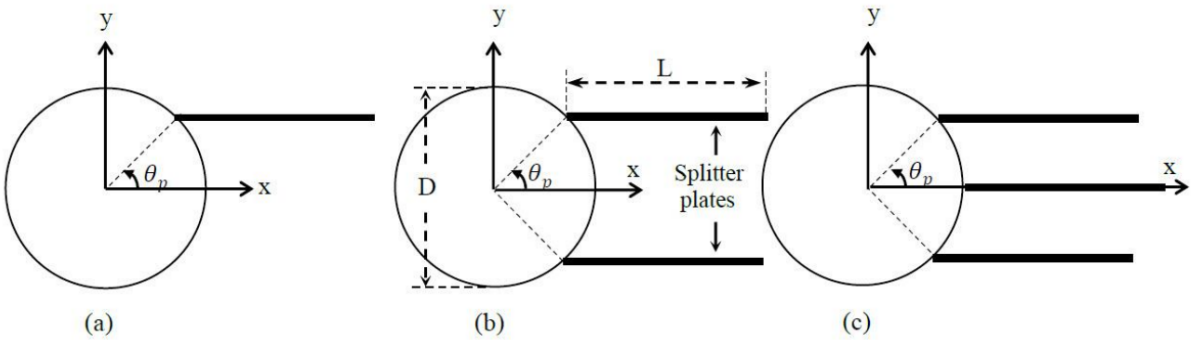

Figure-1 : Schematic diagram of a cylinder with splitter plates.
(a) Single-splitter (b) dual-splitters (c) tri-splitters

``