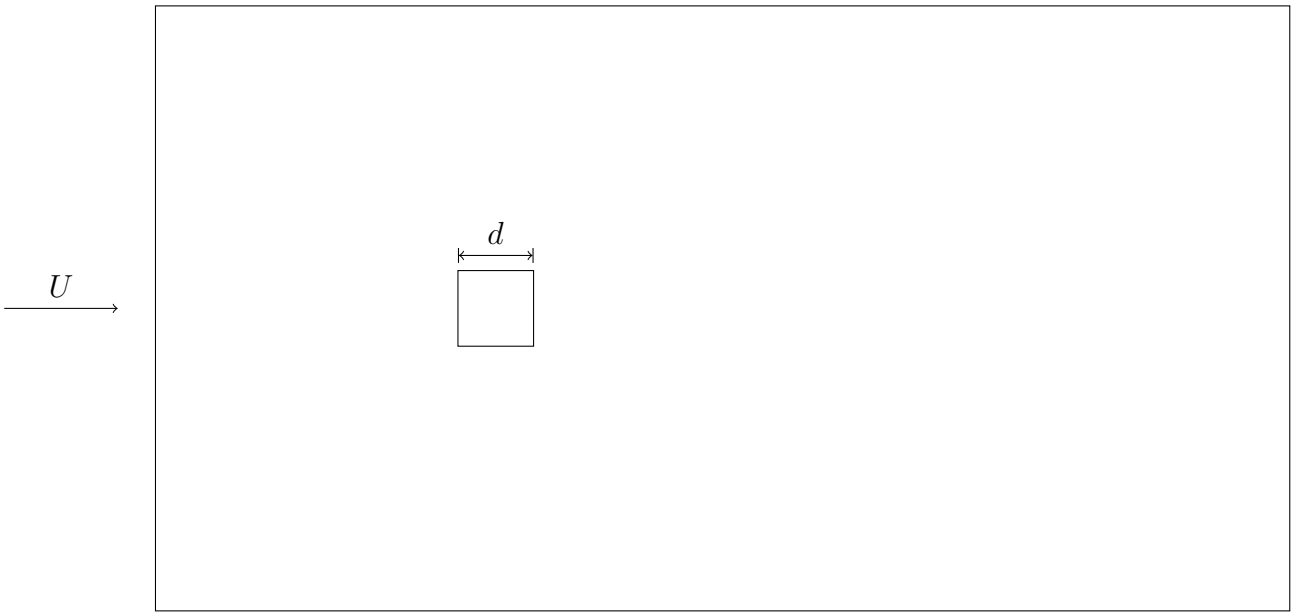
Abstract

The purpose of the report is to get familiar with the dynamic mesh handling in OpenFOAM by simulating flow past oscillating square cylinder at low Reynolds number. Further the aerodynamic results of oscillating square cylinder would be compared to the simulation done by Singh & Muralidhar [1].

Problem Specification

Simulation would be done at Reynolds number $(Re = Ud/\nu)$ 100 or 150, where U is freestream velocity, d is width of square and ν is kinematic viscosity. The motion of square in transverse direction is decribed as $y = Asin(2\pi f_r St)$, where A is amplitude, St is strouhal number and $f_r = f_e/f_o$ (f_e is excitation frequency of cylinder and f_o is the frequency of vortex shedding of stationary cylinder). Following figure is showing some depiction:



References

[1] V. K. Carpenter V. Eswaran A. P. Singh, A. K. De and K. Muralidhar. Flow past a transversely oscillating square cylinder in free stream at low reynolds numbers. *International Journal for Numerical Methods in Fluids*, 61:658–682, 2009.