Reduction of Pressure Variation on NACA0015 Hydrofoil Using Cavitation- Bubble Generator

Monalisha

Final-Year B.E. Student

Department of Civil and Environment Engineering,

Birla Institute of Technology, Mesra, Ranchi

Email: - monathealchemist@gmail.com

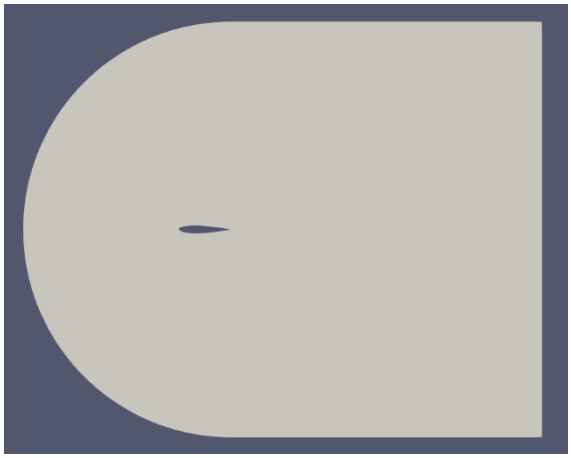
Date: - 20/05/2020

Abstract

Cavitation is the formation, increment and rupture of bubble in liquid. Cavitation occurs in the region which local pressure decreases below the vapour pressure of the liquid. The sudden rupture of bubble causes the release of high energy and the narrow water jet. This process causes cavities on the surface of hydrofoil. Hydrofoil is used in many instruments like turbine, Propeller etc. Cavitation reduces the efficiency and the working range of the hydrofoils and so the instrument. The aim of the project is to reduce cavitation on the hydrofoil NACA0015. To reduce cavitation a passive cavitation controller will be added to the hydrofoil. The effect of position and size of the controller will be studied. OpenFOAM will be used for this purpose.

Problem Statement

The aim is to study the flow over the hydrofoil NACA0015 and Cavities will be tried to obtain on the surface of hydrofoil by varying the flow conditions like velocity. The effect of Cavitation will be obtained by studying the drag and lift coefficients on the hydrofoil. The flow is 2-Dimensional, incompressible, isothermal, immiscible, unsteady. In this problem the scientific parameter will be pressure on the surfaces of the hydrofoil and drag and coefficients will be the engineering parameters. The solver will be used for the problem is InterPhaseChangeFoam. The total length of the computational domain is 10c and breadth is 8c. The radius of semicircle is 4c, and 190000 hexahedral meshes.



Computational Domain