

IN THE NAME OF GOD

Investigation of laminar flow and vortex shedding around two aerodynamic shapes predicted by CFD

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ABSTRACT

In this research, the simulation of air cross flow past the cylinders wall was accomplished based on the finite volume method and also a two-dimensional large eddy simulation is performed with no-slip boundary conditions at the solid walls, a section of a cylinder that has a cavity in order to simulation a cross-section of a cylinder. An elliptical cylinder and in another case a circular cylinder with a diameter of 3 centimeters is obtained into the theAnsysFluent software. It is found that an elliptical cylinder is more aerodynamic than circular cylinder because of their behavior in high Reynolds, the critical Reynolds obtained for elliptical and circular cylinders around 43 and 36 respectively. modeling in this study is based on the dynamics of computational fluids (CFD) and is carried out in two-dimensional systems in steady and transient systems. The modeling results are the speed contours that generate the sequence, and also predict critical Reynolds with it vortices created behind sections. When flows go into the critical Reynolds, the lines of the velocity around The wall are mixed and, as Reynolds increases, this asymmetry is more evident. In addition, changes in lift and drag coefficients have been evaluated in different Reynolds.

Keywords: CFD, Large eddy simulation, Elliptic cylinder, circular cylinder.