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Influence of Major Axis on the Aerodynamic Characteristics of Elliptical Section

Authors : K. B. Rajasekarababu, J. Karthik, G. Vinayagamurthy

Abstract : This paper is intended to explain the influence of major axis on aerodynamic characteristics of elliptical section. Many engineering applications such as off shore structures, bridge piers, civil structures and pipelines can be modelled as a circular cylinder but flow over complex bodies like, submarines, Elliptical wing, fuselage, missiles, and rotor blades, in which the parameters such as axis ratio can influence the flow characteristics of the wake and nature of separation. Influence of Major axis in Flow characteristics of elliptical sections are examined both experimentally and computationally in this study. For this research, four elliptical models with varying major axis [*AR=1, 4, 6, 10] are analysed. Experimental works have been conducted in a subsonic wind tunnel. Furthermore, flow characteristics on elliptical model are predicted from k-ε turbulence model using the commercial CFD packages by pressure based transient solver with Standard wall conditions.The analysis can be extended to estimation and comparison of Drag coefficient and Fatigue analysis of elliptical sections.

Keywords : elliptical section, major axis, aerodynamic characteristics, k-ε turbulence model
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