

VIBRATION CONTROL OF THE PLUNGING DISPLACEMENT IN THE HYPERSONIC FLOW BY USING FLC

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In this paper, a fuzzy logic control method is used to suppress the vibration of the plunging displacement in hypersonic flow. First, the dynamic equations of airfoil model are obtained by using the energy theory. Then the governing equations of system are made dimensionless. Fuzzy logic control is designed in the next part of this study. The aim of this controller is to minimize the vibration of the plunging displacement and control of the pitching angle. The rule table of the fuzzy logic controller is created by using error, its derivative and integral of the error in changing time. This controller is applied to the airfoil model and is simulated in the computer program. The figures of the pitching angle and dimensionless displacement with controller are shown in the conclusion part. The result of this study is compared with the uncontrolled model, and its shown obviously that the result of this study is satisfactory.