Abstracts of MMA2015, May 26–29, 2015, Sigulda, Latvia

DEVELOPMENT OF A BACKSTEPPING CONTROLLER FOR AIRFOIL CONTROL IN HYPERSONIC FLOW

OMUR CAN OZGUNEY AND BOGAC BILGIC

Faculty of Engineering, Department of Mechanical Engineering, Istanbul University.

34320 Avcilar, Istanbul, Turkey

E-mail: omur.ozguney@istanbul.edu.tr

In this paper, backstepping control method is investigated for airfoil control design. The most important part of the backstepping control is using the feedback control law and the Lyapunov function together. For this study, controller is used to minimize the vibration of the plunging displacement and to control the pitching angle. To create the model of the system, dynamic equation of the airfoil model is obtained. Backstepping controller is designed for this model. Airfoil model and the controller are simulated in the computer program. Figures of the pitching angle and dimensionless displacement with controller and without controller are shown in the final part of this study. Finally it is understood that, the results of the developed controller are closed to expected results and they are satisfactory.