

Fuzzy Sliding Mode Control of a Flexible Structure for Vibration Suppression Using MFC Actuator

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Abstract : Active vibration control is good for low frequency excitation, with advantages of light weight and adaptability. This paper use a macro-fiber composite (MFC) actuator for vibration suppression in a cantilevered beam due to its higher output force to suppress the disturbance. A fuzzy sliding mode controller is developed and applied to this system. Experimental results illustrate that the controller and MFC actuator are very effective in attenuating the structural vibration near the first resonant frequency. Furthermore, this controller is shown to outperform the traditional skyhook controller, with nearly 90% of the vibration suppressed at the first resonant frequency of the structure.

Keywords : Fuzzy sliding mode controller, macro-fiber-composite actuator, skyhook controller, vibration suppression

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