

Suppressing vibration using sliding mode control

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چکیده :

In the present paper, Sliding mode controller (SMC) is proposed to alleviate dynamic response of structure subjected to seismic excitation. Stability of this method against uncertainties of system parameters and uncertain dynamic loadings has made it a proper algorithm to reduce the building vibrations. The main drawback of SMC is the so-called chattering phenomena which is highly undesirable. Therefore, chattering is eliminated by smoothing the control force in a thin boundary layer with a specified thickness and introducing saturation function. Designing an optimal sliding surface coefficient matrix makes the response trajectories to move toward the sliding surface and stay on it, so the system remains stable. The robustness of control method and the control effectiveness are all demonstrated by numerical simulation results. Simulation results indicate that the performance of the sliding mode control methods is remarkable

کلید واژه : Sliding mode control, Structural control, Uncertainty, Chattering, Boundary layer

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