

Magneto-Rheological Damper Based Semi-Active Robust H^∞ Control of Civil Structures with Parametric Uncertainties

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Abstract : In developing a mathematical model of a real structure, the simulation results of the model may not match the real structural response. This is a general problem that arises during dynamic motion of the structure, which may be modeled by means of parameter variations in the stiffness, damping, and mass matrices. These changes in parameters need to be estimated, and the mathematical model is updated to obtain higher control performances and robustness. In this study, a linear fractional transformation (LFT) is utilized for uncertainty modeling. Further, a general approach to the design of an H^∞ control of a magneto-rheological damper (MRD) for vibration reduction in a building with mass, damping, and stiffness uncertainties is presented.

Keywords : uncertainty modeling, structural control, MR Damper, H^∞ , robust control

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