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H-inf Control for Smart Multistory Building Structures

Daniela Marinova[(1)], Georgios Stavroulakis[(2)]

(1) *Technical University of Sofia, Sofia, Bulgaria*
(2) *University of Ioannina and Technical University of Braunschweig, Braunschweig, Germany*

One of the important problems in achieving reliable active control structures that could ensure the safety for strong earthquake is its robustness. A dynamic finite element model for multistory buildings under external excitations is presented in this paper. Structured uncertainties associated with the design model are considered to reflect the errors between the model and the reality. H-inf optimal control for the active control structure is implemented. The cost functional is the H-inf norm of the transfer function from the exogenous disturbances to the errors that is to be inimized. The goal is to design the control forces vector satisfying the dynamic equations of the structure and subjected to this optimal performance criterion. Relevant numerical techniques, which have been done with the help of MATLAB routines, are applied to solve the arising structural control problem. Numerical results show high robust performance of the proposed method.

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