PREDICTIVE CONTROL FOR EARTHQUAKE RESPONSE MITIGATION OF BUILDINGS USING SEMI-ACTIVE FLUID DAMPERS

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SUMMARY: In this paper a predictive control strategy in conjunction with semi-active control algorithms are proposed for damping control of base isolation systems employing semi-active fluid dampers when subjected to earthquakes. Twenty artificial accelerograms for the Portuguese territory were considered in the numerical simulations of the base isolation system representative model. The results of a parametric study give some hints for controller design in this type of problems. It will be shown that a well tuned controller could outperform the original structure and the structural system with a passive device (optimized) in terms of performance: relative displacement and absolute acceleration reductions.

KEYWORDS: Predictive Control, Semi-active control systems, Seismic protection, Vibration mitigation.