**SHAKING TABLE TEST OF PSEUDO-NEGATIVE-STIFFNESS CONTROL OF A BASE ISOLATED BUILDING EMPLOYING MR DAMPER**

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**ABSTRACT**

This study presents experimental studies on the effectiveness and adaptability of pseudo-negative-stiffness control of a base isolated structure employing magneto-rheological damper (MRD). Shaking table tests on conventional base-isolated structure, passive controlled structure with input current of 0 A, passive controlled structure with input current of 1 A and smart controlled structure with displacement-based pseudo-negative-stiffness (DPNS) control algorithm were conducted. Each type of the control system was subjected to four representative seismic ground motions with peak ground accelerations (PGAs) varying from 0.1 g to 0.6 g. Through comparative analysis of structural response and damper response, the control effect of DPNS control algorithm and energy dissipation characteristics of the control force of the magneto-rheological damper were studied. The experimental results indicate that the DPNS control can reduce the base isolation displacement and the superstructure responses simultaneously under low-to-median and even extreme seismic excitations, and it can adapt to both far-field and near-field seismic excitations. Because of the time-delay effect of the control system, the DPNS control force shows a small value under low-to-median seismic excitations and a large energy dissipation capacity under extreme seismic excitations.

***Keywords:*** *Smart isolation; Magneto-rheological fluid damper; Pseudo-negative-stiffness control; Shaking table test*

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