

## عنوان مقاله:

INNOVATIVE FUZZY CONTROLLER FOR SEMI- ACTIVE BASE ISOLATION SYSTEMS

## محل انتشار:

هفتمین کنفرانس بین المللی زلزله شناسی و مهندسی زلزله (سال: 1394)

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## خلاصه مقاله:

Development of the controlling algorithms is one of the most challenging aspects of the structural researchers with the aim of improving the behaviour of the building structures equipped with controllable devices under the seismic hazards. Base isolator of the building structures can be designed for a specific magnitude earthquake level. Obviously, the design is not optimal for all earthquake excitations. In this paper, a semi-active base isolation (SABI) system is employed to enhance the performance of the base isolated structures under the several seismic conditions. A semi-active magneto-rheological (MR) damper works parallel with base isolation system to adjust the damping force of the base isolation. An innovative fuzzy controller is designed to control the applied voltage of the MR damper in accordance to the feedbacks of the structure. To investigate the performance of the controller in reducing the responses of the structure, a fourteen-story building structure is subjected to El Centro, Hachinohe, Kobe, Northridge and Tabas earthquake accelerations. The displacement and acceleration responses of the building's roof story with passive and SABI devices is compared with that of the fixed base structure. Also, to study the influence of the semi-active controller on the lateral displacement responses of the structure, drift stories is compared in the controlled and fixed cases. The results have been showed the efficiency of the fuzzy controller in comparison with the passive base isolation system in reducing the system vibrational responses under the various earthquake excitations.

## کلمات کلیدی:

Semi-active Base Isolation, Magneto-rheological Damper, Fuzzy Controller, Earthquake Excitation

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