

PREVENTING THE DISPLACEMENT OF BASE ISOLATED STRUCTURES WITH OPTIMUM TUNED MASS DAMPERS

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Key Words: *Base Isolation, Harmony Search, Tuned Mass Damper, Structural Control, Optimization, Earthquake*

In base isolated structures, the peak displacement of the isolation system must be limited. Otherwise, the isolation system may fail and also, base isolated structure may collide to other structures if the seismic gap is not enough for the sway of the base isolated structure. In this study, the displacements of structures equipped with linear isolation systems are limited by using optimum tuned mass dampers (TMD). Single degree of freedom base isolated structures with different periods are investigated. A metaheuristic method, harmony search algorithm is employed to find optimum TMD parameters such as mass, frequency and damping ratio. The optimization is conducted for six different near fault ground excitation in order to find a global optimum solution. The method is effective to find optimum TMD parameters for reducing the displacement of isolation system.