

Time Delay Study in Semi-active Control of Structures with MR Damper

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چکیده :

The semi-active control with the advantages of both passive control and active control has been shown to be a promising strategy in mitigating seismic responses of structures. A Magnetorheological (MR) damper is one of the best smart semi-active devices that is suitable for this aim. Since semi-active control system needs proceeding time to feedback the structural responses and calculate the demand control force by the used control algorithm, the effect of time delay is inevitable. The time-delay effect of structures equipped with MR dampers, is studied in this paper. A time-delay compensation method based on Newmark's integration is adopted to mitigate time-delay effect, following the seismic response of structures with and without time delay compared. In previous studies, compensation Newmark method used in a bridge with only two degrees of freedom, but this paper used this method in a MDOF building, for the first time. The numerical results reveal that this method has a satisfactory performance of decreasing the time-delay effect in the semi-active control system with using a MR damper.

کلید واژه : Semi-Active control, MR Damper, Time Delay, Newmark's compensator.

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