

Behavior of structures equipped with variable friction dissipative systems

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Abstract

Usually, in order to mitigate the stresses in framed structures, different strategies are used.

Among them the base isolation, the viscous dampers and tuned mass dampers have been widely investigated, viscous dampers resulting the most diffused for the simplicity in the applications.

Viscous dampers dissipate energy depending on the kinetic energy stored by a structure. However, such a strategy has two limitations:

- i) to be effective and not dangerous for structures request limited interstorey drifts;
- ii) the elevate costs.

In this paper a different strategy is proposed, that is a braking system borrowed from the mechanical engineering. The constitutive law of such a system is linearly dependent on the displacement of the device and therefore on the interstorey displacement and depends on the signum function of the interstorey velocity.

The feasibility of the braking system, the amount of energy that can be dissipated and the overall performance of structures provided of these type of systems are studied in details.