

## Optimum Parameter of a Viscous Damper for Seismic and Wind Vibration

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**Abstract :** Determination of optimal parameters of a passive control system device is the primary objective of this study. Expanding upon the use of control devices in wind and earthquake hazard reduction has led to development of various control systems. The advantage of non-linearity characteristics in a passive control device and the optimal control method using LQR algorithm are explained in this study. Finally, this paper introduces a simple approach to determine optimum parameters of a nonlinear viscous damper for vibration control of structures. A MATLAB program is used to produce the dynamic motion of the structure considering the stiffness matrix of the SDOF frame and the non-linear damping effect. This study concluded that the proposed system (variable damping system) has better performance in system response control than a linear damping system. Also, according to the energy dissipation graph, the total energy loss is greater in non-linear damping system than other systems.

**Keywords :** passive control system, damping devices, viscous dampers, control algorithm

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