

Building Suspensions with Inerters

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Abstract

This article investigates the performance benefits of building suspension systems that employ a newly developed mechanical element called an *inertor*. The inertor was proposed as a genuine two-terminal mechanical device to substitute for the mass element, which allows mechanical and electrical networks to become truly analogous. This study applied inertors to building suspension control. First, a one-degree-of-freedom (DOF) building model was examined in order to show the significant performance improvement by inertors, especially with a multilayer design. Second, the discussion was extended to a two-DOF building model. Finally, a ballscrew inertor was constructed for testing. From the results, the inertors were deemed effective in reducing building vibrations.