

Evaluation Of Semi-Active Control For Base Isolation System With Nonlinearity By Dual Real-Time Hybrid Simulation

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When the shear strain of laminated rubber bearings of base-isolated structures surpasses a certain high level, they exhibit nonlinear behavior. The hardening of bearings can cause increased absolute acceleration response and make it difficult to maintain building safety and functionality. This study verified the effectiveness of semi-active control using MR damper for a base-isolated structure with nonlinear restoring force characteristics of laminated rubber bearings. Laminated rubber bearings and MR damper include uncertainties related to nonlinearity and velocity-dependent elements. Therefore, the authors developed and conducted a dual real-time hybrid (DRTH) simulation. Actually, DRTH simulation, which is an extension of real-time hybrid (RTH) simulation, enables excitement of the MR damper by the shaking table and laminated rubber bearings by the hydraulic actuator. This report describes the DRTH simulation experiment setup and explains the validity by calculating the time delay.