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Analog/Digital Real-Time Hybrid Testing of PSIVC Floor Isolation System by Multi-Axial Seismic Test System

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ABSTRACT

This study applies a Real-Time Hybrid Testing method to verify the control performance of a Polynomial Sliding Isolators with Variable Curvature - Floor Isolation System (PSIVC-FIS). Hardware-in-the-loop simulation (HILS) is also used in this research, where both primary structures and subsystems are numerical models, with real-time communication through the SCRAMNet optical fiber interface (digital) or AD/DA with BNC connectors (analog). The dynamic characteristics and operational limitations of the shake table are analyzed through HILS before the physical real-time hybrid testing to ensure system stability and equipment safety. The adopted control device, a PSIVC-FIS, is tested as a subsystem through the real-time hybrid testing using the Multi-Axial Seismic Test (MAST) system at the southern branch of the National Center for Research on Earthquake Engineering (NCREE).

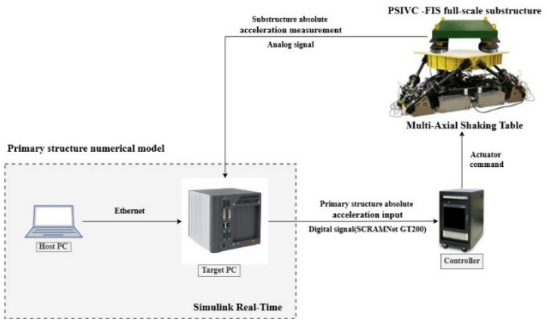

Fig. 1 The configuration of the Real-Time Hybrid Testing of PSIVC-FIS on MAST

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