REALTIME HYBRID SIMULATION AT CU NEES

ERIC STAUFFER

Technical Director
NEES-FHT Laboratory
University of Colorado
Boulder, CO 80301
Eric.Stauffer@colorado.edu

The Fast Hybrid Testing (FHT) system at the University of Colorado (CU) enhances the conventional pseudodynamic testing method by facilitating real-time or close to real-time with consistent scaling of the temporal component of earthquake simulations. The CU FHT system achieves a rate of loading that is significantly higher than that of conventional pseudodynamic testing and has achieved hard realtime for a variety of test configurations. In general hybrid simulation presents a broad set of challenges in that both a numerical and experimental structure are ultimately simultaneously involved and indeed interacting in the final simulation. Until fairly recently realtime hybrid simulation was not feasible owing to computational and technological limitations. Advances in realtime networking technology, realtime operating systems and computation efficiency have made realtime earthquake simulation within the context of a hybrid model possible. This paper summarizes recent advances in the techniques utilized at the CU NEES Fast Hybrid Testing Facility. The FHT system at CU is part of the George E. Brown, Jr. Network for Earthquake Engineering Simulations (NEES).

Keywords: Real-Time, Hybrid, Simulation