

QuakeSim Fault Interaction Simulations

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Early QuakeSim involvement with earthquake simulators included implementing a scalable parallel implementation of Virtual California and making the software and results available to a wide user base. Recent activities cover a broad range of extensions to that effort. Correlation analysis of a fresh 100,000 year simulation has led to better understanding of clusters and sequences of earthquakes. Application to the M7.2 El Mayor-Cucapah earthquake uses time-lagged correlations as well as cataloging virtual events that happen after north Baja California events, leading to a probability analysis forecasting potential large events on the southern San Andreas, San Jacinto and Elsinore faults. The GeoFEST finite element code has been adapted to creating Virtual California green's functions, so that local regions of complex geometry may be included in a simulation run. In addition a GeoFEST fault model revision allows fault interaction within time-dependent GeoFEST runs, including the effects of viscosity and aseismic slip.