Stochastic Finite Fault Modeling of Ground Motions from the 1992 Southwest-Cairo, Egypt, Earthquake

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The Nile valley and its Delta are characterized by small to moderate earthquakes that have caused extremely severe damage to recent and historical constructions. The most vulnerable area along the Nile valley is that of southwest Cairo area. The high-frequency seismic field near the epicenter of the 1992 Southwest-Cairo, Egypt, earthquake is modeled using the stochastic method for simulating ground motions from finite faults. The method involves discretization of the fault plane into smaller sub-faults, each of which assigned an spectrum. The contributions from all sub-faults are empirically attenuated to the observation site and summed to produce the synthetic acceleration time history. Average response spectrum for 5% damping was calculated. Results showed that the simple stochastic simulation method using the spectra agrees well with the observed peak acceleration amplitudes for the high frequency content (more than 2 Hz) ground motion from the Southwest Cairo earthquake.