عنوان مقاله:

Monte Carlo Based Seismic Hazard Model for Southern Ghana

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خلاصه مقاله:

Seismic hazard assessment involves quantifying the likely ground motion intensities to be expected at a particular site or region. It is a crucial aspect of any seismic hazard mitigation program. The conventional probabilistic seismic hazard assessment is highly reliant on the past seismic activities in a particular region. However, for regions with lower rates of seismicity, where seismological data is scanty, it would seem desirable to use a stochastic modelling (Monte Carlo based) approach. This study presents a Monte Carlo simulation hazard model for Southern Ghana. Six sites are selected in order to determine their expected ground motion intensities (peak ground acceleration and spectral acceleration). Results revealed that Accra and Tema as the highly seismic cities in Southern Ghana, with Ho and Cape Coast having relatively lower seismicities. The expected peak ground acceleration corresponding to a 10% probability of exceedance in 50 years for the proposed seismic hazard model was as high as 0.06 g for the cities considered. However, at the rather extreme 2% probability of exceedance in 50 years, a PGA of 0.5 g can be anticipated. Evidently, the 2% in 50 years uniform hazard spectrum for the highly seismic cities recorded high spectral accelerations, at a natural vibrational period within the ranges of about 0.1-0.3 sec. This indicates that low-rise structures in these cities may be exposed to high seismic risk.

کلمات کلیدی:

Seismic Hazard; Monte Carlo Simulation; Uniform Hazard Spectrum; Seismic Hazard Curve; Ghana