

Simulating Time-Histories and Pseudo-Spectral Accelerations from the 1992 Cairo Earthquake at the Proposed El-Fayoum New City Site, Egypt

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Abstract

El-Fayoum New City represents one of the new urban settlements that are recently erected all over Egypt. Because seismic recordings are not available, I used the stochastic method to simulate the largest damaging earthquake from the closest seismic source to the proposed area of the city. To verify the method and its computed results in Egypt, a study termed “method verification” was performed. I found that the October 12, 1992, earthquake ($M_b = 5.8$) that occurred southwest of Cairo in the vicinity of the Dahshour region, at the coordinates 29.77°N , 31.07°E , is a significant earthquake to the city. The parameters of the path from the hypocenter of the event to the city were taken into consideration. To determine the site parameters, a shallow seismic refraction survey was carried out in the studied area. Accordingly, I simulated time-histories and pseudo-spectral accelerations from the October 12, 1992, earthquake at the location of seismic profiles. Finally, it is demonstrated that the site is characterized by high ground motion amplification factors, producing a high ground motion acceleration value.

Key words: seismic refraction, amplification factor, ground motion simulation, Egypt.