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Seismic Hazard Assessment for the Northwestern Part of Egypt

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The objective of this study is to evaluate the seismic hazard at the northwestern part of Egypt using the probabilistic seismic hazard assessment approach (PSHA). PSHA was studied based on a recent data set to tack into account the historic seismicity and updated instrumental seismicity. A homogenous earthquake catalogue was compiled and a proposed seismic source model is presented. The doubly-truncated exponential model was adopted for calculations of the recurrence parameters. Ground-motion prediction equations that recently recommended by experts and developed based upon earthquake data obtained from tectonic environments similar to those in and around the studied area were weighted and used for assessment of seismic hazard in the frame of logic tree approach. Considering a grid of $0.2^\circ \times 0.2^\circ$ covering the study area, seismic hazard curves for every node were calculated. Hazard maps at bedrock conditions were produced for peak ground acceleration, in addition to six spectral periods (0.1, 0.2, 0.3, 1.0 , 2.0 and 3.0 s) for return periods of 72, 475 and 2475 years. The unified hazard spectra of selected rock sites for Alexandria, and Mersa Matruh Cities were provided. Finally, the hazard curves were de-aggregated to determine the sources that contribute much at hazard level of 10% probability of exceedance in 50 years for the mentioned selected sites.