

Seismogenic nodes defined in north-east Egypt by the pattern recognition approach

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The too short time span of the instrumental and historical earthquake catalogs relative to the long recurrence interval of intraplate and mid-plate earthquakes, and/or the poor understanding of earthquake rupture process and the characters of the seismogenic zones, make it difficult to efficiently identify the full earthquake potential of the seismogenic sources and related hazard. So, it is rational to suppose that not all the potentially seismogenic sources are marked by strong earthquakes or showed up a significant activity during the time covered by the historical record. The pattern recognition of morphostructural nodes could provide quantitative and methodical criteria for identifying the areas where large earthquakes may occur, taking into account a wide set of possible tectonic, geologic, topographic maps, gravity data, and satellite images (see also, Alekseevskaya et al., 1977; Rantsman, 1979; Gorshkov et al., 2003 and Peresan et al, 2015 and reference therein). In this study, an earthquake is considered as a strong if it has a size of M5+, the choice of this threshold is based on the seismicity level in the northeast Egypt. The result from this study is very important for knowledgeable seismic hazard assessment for Egypt. The study region includes the Sinai Peninsula and part of the Eastern Desert, between the Nile River and the Red Sea. We expect that the incorporation of seismogenic nodes information in seismic hazard computation will improve the performance of the resulting maps for the studied region especially for the sites of rare or no seismic activity so far. Using seismogenic nodes with defined zones could enhance the performance of seismic hazard map.

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