

Multi-disciplinary views on seismic hazard analysis in the eastern Caucasus (Azerbaijan)

Strong earthquakes cause numerous human losses and infrastructure damages. The earthquake occurrences jeopardize cities, villages, state critical facilities, constructions (oil-gas pipeline, terminals, water reservoirs and others). The studied area is situated in the complex zone from the viewpoint of geodynamics and tectonics, included in the Alpine folded system. The seismic activity in the area is characterized by uneven seismicity with periodic format. The goal of the research is seismic hazards analysis in the eastern Caucasus (Azerbaijan) with the use of multi-parametric integrated method. The integrated method with the multidisciplinary character includes mathematical and statistical estimation of seismic parameters and probabilistic approach and also mapping of the area in peak ground acceleration value. In this study, the earthquake occurrences based on probabilistic theory was assessed, peak ground acceleration maps for scenario earthquakes were prepared using the interpolation algorithm and compared with the map of lithology. Clear correlation was observed between the distribution of peak ground acceleration and soil amplification maps. The results can be applied not only in the construction of hydro-technical structures, oil and gas pipelines, but also in the early stage projection of civil and industrial objects. Besides, the results can be used in the mid-term seismic prognosis researches.

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