# SEISMIC HAZARD ASSESSMENT OF SHAHR-E KORD IRAN

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Iran is located in Alps-Himalaya belt, where the number of destructive earthquakes is approximately high. In this paper, we choose a place centered by Shahr-e Kord, where plenty of Iran huge dams are constructed. At the first step, we collected database of earthquakes between January of 2006 and November 2018 from Iranian seismological centre (IRSC) and earthquakes database from January of 1963 and December of 2005, is provided from U.S. Geological Survey (USGS). Early instrument and historical earthquakes of the region are extracted from Ambraseys, Melville, & Falcon, (1982). Subsequently, we divided the region to three sources (Figure 1), and the seismicity parameters were evaluated by Z-map software for uniform catalog. In the next step, we took advantage of Kijko software, which can calculate seismicity parameters for inhomogeneous catalog and probability of exceedance for different returning periods. Afterward, we employed the probabilistic seismic hazard method with EZ-frisk software by Boore & Atkinson (2008), NGA attenuation equation (Figures 2 & 3). We got results that for different returning periods (50 years, 475 years, and 2475 years) 0.14 second have the highest spectral acceleration. At the end of the research, we used deterministic seismic hazard analysis for a site located in Shahr-e Kord with different active faults of the region. Acceleration are computed by Ambraseys et al. (1992) equation, and main recent fault has the highest ability to generate peak ground acceleration (PGA) of 0.17 g in Shahr-e Kord.
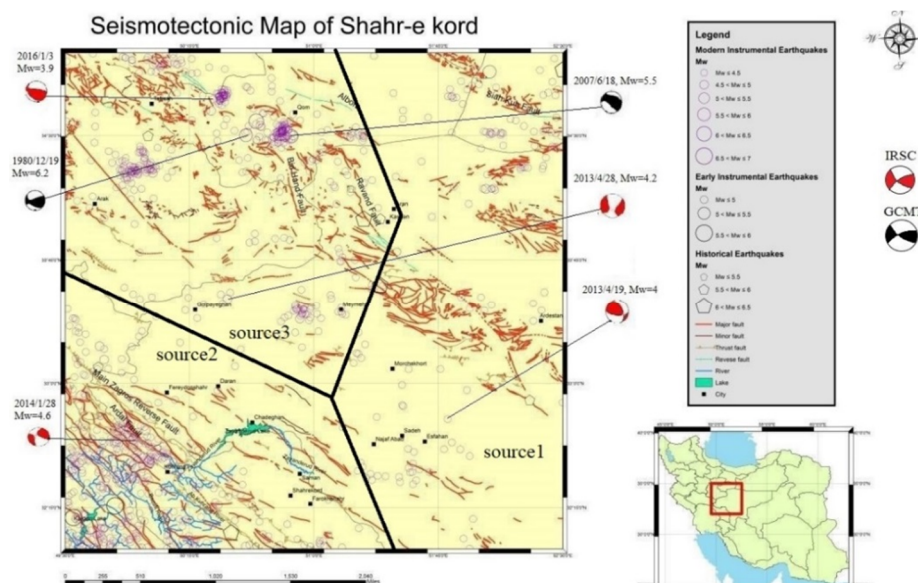


*Figure 1. Source map is provided with respect to seismicity parameters, earthquakes mechanism and region seismotectonic of Shahr-e Kord.*
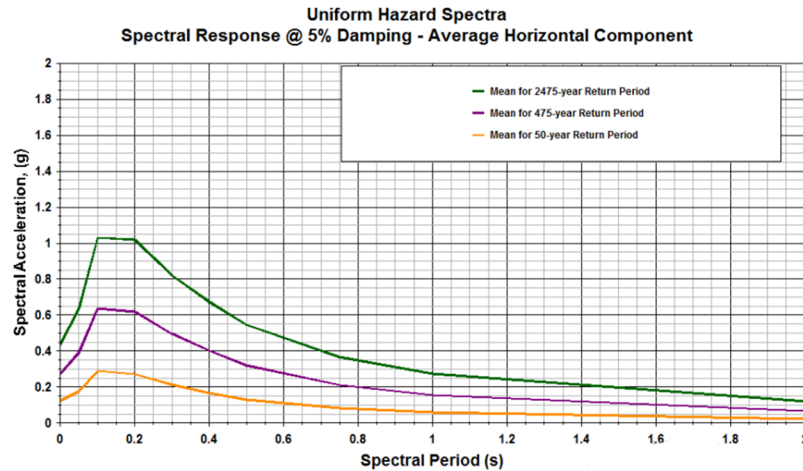
**Uniform Hazard Spectra**
**Spectral Response @ 5% Damping - Average Horizontal Component**



— Mean for 2475-year Return Period
— Mean for 475-year Return Period
— Mean for 50-year Return Period

*Figure 2. Response Spectral with 5% damping for three returning periods in Shahr-e Kord.*



**Legend**
**CONTOUR**
— < 0.01
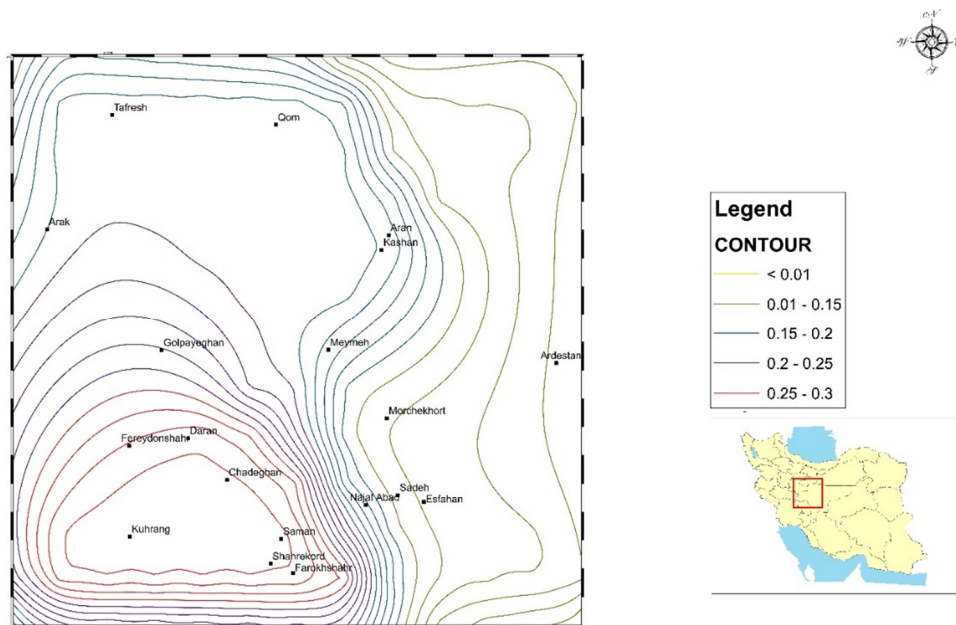— 0.01 - 0.15
— 0.15 - 0.2
— 0.2 - 0.25
— 0.25 - 0.3

*Figure 3. Acceleration contours calculating with probabilistic method for returning period of 50 years and structural period of 0.1 second in the region- Contours are multiples of g= 9.8.*

**REFERENCES**

Ambraseys, N.N., Melville, C.P., and Falcon, N.L. (1982). A History of Persian Earthquakes. *The Geographical Journal*, *149*.

Boore, D.M. and Atkinson, G.M. (2008). Ground-Motion Prediction Equations for the Average Horizontal Component of PGA, PGV, and 5%-Damped PSA at Spectral Periods between 0.01 s and 10.0 s. *Earthquake Spectra*, *24*(1), 99-138.

Mousavi-Bafrouei, S.H., Mirzaei, N., and Shabani, E. (2015). A declustered earthquake catalog for the Iranian Plateau. *Annals of Geophysics*, *57*(6), 1-25.