

# Probabilistic seismic hazard assessment of Sanandaj, Iran

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**Abstract.** In this paper, the peak horizontal ground acceleration over the bedrock (PGA) is calculated by a probabilistic seismic hazard assessment (PSHA). For this reason, at first, all the occurred earthquakes in a radius of 200 km of Sanandaj city have been gathered. After elimination of the aftershocks and foreshocks, the main earthquakes were taken into consideration to calculate the seismic parameters (SP) by Kijko (2000) method. The seismotectonic model of the considered region and the seismic sources of the region have been modeled. In this research, Sanandaj and its vicinity has been meshed as an 8 (vertical lines) \* 10 (horizontal lines) and the PGA is calculated for each point of the mesh using the logic tree method and the five attenuation relationships (AR) with different weighted coefficient. These calculations have been performed by the Poisson distribution of four hazard levels. Then by using it, four regional maps of the seismic hazard regions have been provided for Sanandaj and its vicinity. The results show that the maximum and minimum value of PGA for the return periods of 75, 225, 475, 2475 years are (0.114, 0.074) (0.157, 0.101), (0.189, 0.121) and (0.266, 0.170), respectively.

**Keywords:** probabilistic seismic hazard assessment; seismicity parameters; peak ground acceleration; Sanandaj; Iran.

## 1. Introduction

Many disasters have been occurred in Iran due to the occurrence of earthquakes, causing large economic and life losses. The specifications of some catastrophic earthquakes like Bouin-Zahra

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