عنوان مقاله:

REDUCING EPISTEMIC UNCERTAINTY OF PROBABILISTIC SEISMIC HAZARD ANALYSIS USING MONTE CARLO SIMULATION

محل انتشار:

هفتمین کنفرانس بین المللی زلزله شناسی و مهندسی زلزله (سال: 1394)

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خلاصه مقاله:

One of the significant concerns of conventional method of Probabilistic Seismic Hazard Analysis (PSHA) is management and treatment of uncertainties. These uncertainties originate from unavoidable reliance of PSHA on subjective decisions and using simplified assumptions and models in calculation. Monte Carlo simulation is actually a second approach for calculation of PSAH and provides a way for reducing such epistemic uncertainties. Monte Carlo simulation is a computational algorithm that relies on repeated random sampling for their results. This algorithm calculates seismic hazard by simulating of future pattern of ground shaking at the site. This method requires only information about past seismicity as minimum input data to generate a synthetic catalog. This simple method is a potent approach to bypass the need for identifying and quantification of parameters and models and as a result, decrease epistemic uncertainty of analysis. In this paper, a comprehensive comparison is made between the results of conventional PSHA and Monte Carlo simulation approach in order to reveal the influence of epistemic uncertainty on conventional PSHA and the power of Monte Carlo approach in controlling these uncertainties. To this end, a number of analyses have been carried out for a site in Tabriz city, Iran. It is turned out that Monte Carlo simulation introduces a way to reduce such kind of uncertainty.

کلمات کلیدی:

Monte Carlo Simulation, Seismic Hazard, Epistemic Uncertainty, Tabriz