SIMULATION OF STRONG GROUND MOTION FOR ARAK CITY

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We have simulated strong ground motion for an earthquake with magnitude 5.9, based on deaggregation results for Arak city based on realistic ground motion and stochastic simulation methods at selected stations. The computation of synthetic seismograms has been carried out by the hybrid method. In this method, synthetic signals are first computed by the modal summation along the bedrock (1D) model, which is defined as a stack of horizontal layers, each characterized by its thickness, longitudinal and transversal wave velocity, density, and Q-factor, controlling the anelastic attenuation. Then these signals are numerically propagated through the laterally varying local structure by the finite-difference scheme. The seismograms were computed for frequencies reaching 10 Hz, and were subsequently filtered to **f**≤6 Hz. These signals are numerically propagated through the laterally varying local structure by the finite difference grid is formed first, approximating the laterally varying model. The resulting signals are used for the seismic microzoning, using as zoning criteria the **"**response spectra ratio**"** (RSR), i.e., the spectral amplification defined by: where Sa(2D) is the response spectrum (at 5% of damping) for the signals calculated in the laterally varying structure, and Sa(1D) is the one calculated for signals at the top of the counterpart bedrock regional reference structure.

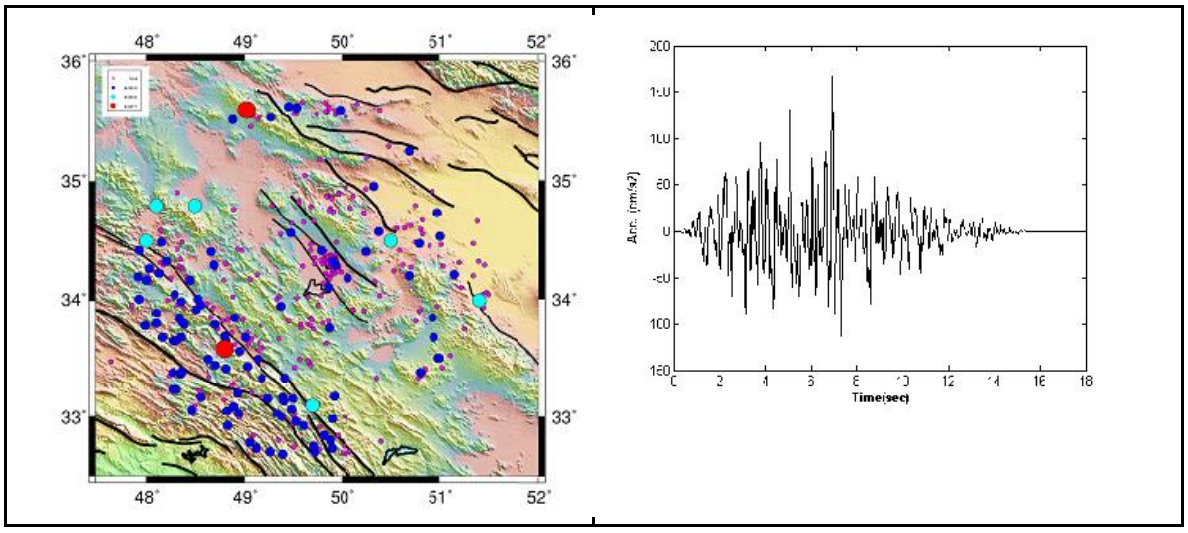

Figure 1. Simulated ground motion at selected site at Arak by using stochastic finite fault

We have also simulated strong ground motion by using stochastic finite-fault modeling. In the stochastic model, a large fault is divided into N subfaults, and each subfault is considered as a point source. A random slip distribution is assumed by using a random number as the basis to assign a relative slip to each subfault. Ground motions due to subfaults are calculated

by the stochastic point-source method and are summed with an appropriate delay time to produce the motion due to the whole for the rupture.

Finally, the results of both simulated methods for scenario earthquake due to Farahan fault have been compared. The result of hybrid method, which considered site effects, is more reliable compare to stochastic method.

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