Yasser Eslamian,Mohsen Bozorgnasab,Afsoon Nicknam

(PhD Student),(PhD Student),(MSc Student)

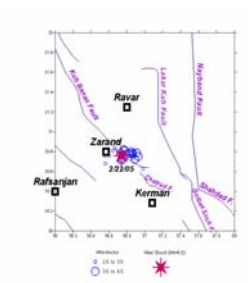
[2007 AEES Conference]

Supervisor

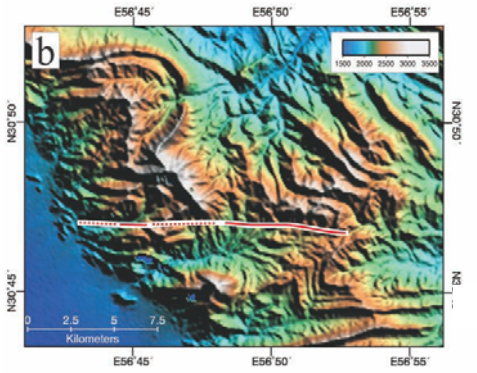
Ahmad Nicknam

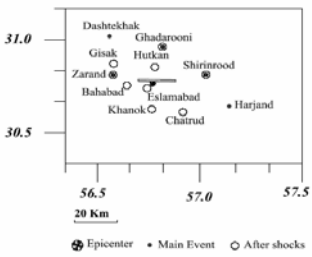
Modification of Seismological Parameters of Zarand Earthquake Using Empirical Green's Function Method

Summary: **The main purpose of this article is to modify the seismological source parameters such as, fault plane orientation/geometry, nucleation point, stress drop, maximum slip, average slip and source duration of 2005 February 22 Zarand earthquake located at the central part of Iran. We used the Empirical Green's Function approach for simulating the strong motions recorded at three stations far away from the source so that not being influenced by near source effects such as directivity. The synthesized strong motions and also the 5% response spectrum of the strong motions at three stations, are compared with those of the recorded data.**



Main shock near Zarand (22/02/2005) and it's aftershocks (35 aftershocks)



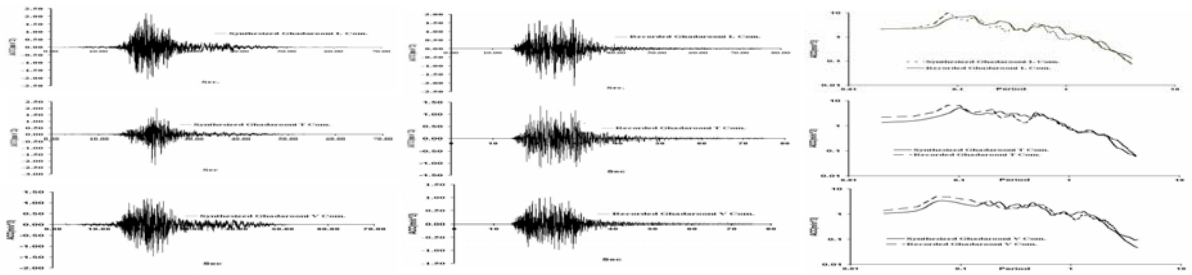


locations of epicenter, main shock and stations at which the after shocks were recorded during the 2005 Zarand earthquake

The coseismic rupture in the 2005 Dahuiyeh earthquake is marked by the red line (after Talebian et al 2005)

Objectives: Modification of Seismological Parameters of Zarand Earthquake,in Central Iran

Methodology: Empirical Green's Function for Simulating the Strong Motions Recorded at 3 Stations



Comparison of sensitized strong motions and elastic response spectra at station Ghadarooni with those of recorded data

Summary of source parameters for the earthquakes

Longitude Degree	Latitude Degree	Depth (Km)	Moment Mw	Focal mechanism (STK DP SV)	Reference
56.734	30.804	10	6.4	--	BHRC
56.9	30.79	--	6.4	261 , 51 , 97	IGTU
56.801	30.75	42	--	279 , 46 , 124	NEIC
56.79	30.73	--	--	--	EMSC
56.74	30.76	--	6.4	--	IEES
56.736	30.774	7	6.4	270 , 60 , 104	Talebian et al
56.76	30.764	10	6.4	270 , 60 , 104	This study (Used)

The results obtained form EMPSYN FORTRAN

Maximum slip	Rise time	Average slip	Source duration	Stress drop
111.24cm	3.21 s	80.1cm	5.06s	44.6 bars

Conclusion:

It is not claimed that: the results of this study is quite accurate and the whole seismological factors are incorporated in the model because of many reasons such as constant stress drop assumption which in fact is a dynamic problem and variable through the rupture length

We claim that: the selected source-path model parameters and also the site soil conditions were sufficiently acceptable to be used in hazard analysis of engineering problems for the region.

In fact, We observed,through the simulation procedure, that more accurate results can be obtained using more aftershocks records (EGFs), which seems to be natural due to the fact that, more realistic small events are used.