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THE BEST EARTHQUAKE REPORT TO ASSESS THE EARTHQUAKE MACROSEISMIC PARAMETERS

Hamideh AMINI
Researcher, Geophysics Institute of Tehran University, Tehran, Iran
hiamini@ut.ac.ir

Anooshiravan ANASRI
Associate Professor, IIEES, Tehran, Iran
a.ansari@iiees.ac.ir

Morteza FATTAHI
Associate Professor, Geophysics Institute of Tehran University, Tehran, Iran
mfattahi@ut.ac.ir

Mehdi ZARE
Professor, IIEES, Tehran, Iran
mzare@iiees.ac.ir

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Intensity is one of the most important factors of each earthquake that its information can be useful for the researchers in different fields and help them to extract more details on the event. After each earthquake, people from different centers, institutes, universities and organizations visit the locations (cities, villages, etc.) affected by earthquake and they may publish several reports depending on their observations and available information. The best reports are the ones consist of more information in various fields with more details on them as it can be useful for more researchers. In this paper, a form with a list of the titles suggest to be completed as much as possible, after each earthquake, to collect the best dataset of the observations to extract more details on the event. After occurring each earthquake, its instrumental information (Table 1) is published almost immediately after the earthquake by several global centers such as USGS, ISC, NEIC, and EHB. The specific centers for recording Iranian earthquakes are BHRC, IIEES and IGUT. Moreover, more details on each earthquake may publish in various fields by researches and people who go to the affected regions, observe and document several effects of the earthquake. The most important information to assess the earthquake macroseismic parameters is its descriptions on building damages (according to the EMS98 intensity scale; Grünthal, 1993, 1998) and environmental effects (according to the ESI2007 intensity scale; Michetti et al., 2004, 2007; Guerrieri et al., 2015) in each city or villages affected by the event. According to Grünthal (1998) various types of structures such as masonry, reinforced concrete, wood, and steel can have various affected possibilities of damages in five grades: 1) negligible to slight damage, 2) moderate damage, 3) substantial to heavy damage, 4) very heavy damage, and 5) destruction. Numbers of each type of structures in each location (cities or villages) and numbers of the special damages of each ones (structures) is important to estimate the intensity values of each location (Table 2).There are two main important effects on environment, primary and secondary effects. The main primary effects are surface ruptures and displacements. The most important secondary effects are different hydrological anomalies [variation in water level, in flow-rate of springs, in chemical-physical properties of water, in qanats (stop/ start/ decrease/ increase their water flowing)], ground cracks (maximum one/ more frequent one), slope movements, liquefactions, tree shakings, dust clouds, and jumping stones (Michetti et al., 2004, 2007) (Table 3). These details are necessary to assess more accurate intensity value for each location. Feeling the earthquake by people and their observations can be also helpful for estimating the intensity values and for other studies (Table 5). Applying each location intensity values and their geographical coordinates are essential to extract the earthquake macroseismic parameters (Bakun and Wentworth, 1997; Musson and Jiménez, 2008; Gasperini et al., 2010). As for the earthquakes occurred in the past, some of their locations removed by the events, their last (main) locations and their references, reported the location (Table 4), is important in extracting the earthquake parameters. Moreover, considering the acceleration of the earthquake in each location and details on the numbers of people affected by earthquake (death, injured, homeless, etc.) can be helpful in crisis management researches such as estimating the fatality models.

Table 1. The instrumental information of earthquakes consist of the date and time of occurrence, depth, magnitude, and its location consist of latitude and longitude of epicenter and also source of information.

Date			**Time**			**Depth**	**Magnitude**	**Location**		Reference
Year	Month	Day	Hour	Minute	Second		Mw	Latitude	Longitude	

Table 2. For each grade of building damage, we should consider various type of building structure.

How many building are				**How many building with damage Grade...are**				**Reference**
Masonry?	Reinforced concreted?	Steel?	Wood?	Masonry?	Reinforced concreted?	Steel?	Wood?	

Table 3. Table of primary and secondary effects can be observed and recorded for each earthquake.

Primary effects						**Secondary effects**						
Surface rupture		Displacement (cm)				Slope movement (Maximum one)				Liquefaction		
Total length	Ref*	V	H	Maximum	Ref*	landslide	rockfall	earth flow	Ref*	diameter	value	Ref*

V: Vertical; H: Horizontal; Ref: Reference

Secondary effects										
area affected (km^2)	Hydrological anomalies in					Ground cracks [maximum one (M)/ more frequent one (F)]				
	Water level	Flow rate	Chemical physical properties	Qanats	Ref*	Length (M)	Width (M)	Length (F)	Width (F)	Ref*

Table 4. Information about feeling earthquake by people and its effects on people.

Earthquake						**People**						
felt by people		Felt by			Ref	How many were?	How many Homeless?	How many injured?	How many at hospital?	How many out of hospital?	How many died?	Ref
indoor	outdoor	all	most	Less								

Table 5. The name of the affected location and its latitude, longitude, and acceleration can be useful to extract the earthquake acceleration.

City, village, …				**Maximum Acceleration (cm)**		
Name	Latitude	Longitude	Reference	Vertical	Horizontal	Reference

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