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Technical Report

THE MOST IMPORTANT CHARACTERISTICS OF STRONG GROUND MOTION DATA IN IRAN IN 2011

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ABSTRACT

During January–December 2011 more than 311 records were recovered from permanent Iran strong motion stations operated by the Road, Housing and Urban Development Research Center. Accelerograms were recovered from ISMN triggered by 199 earthquakes in the magnitude 2.0 to 7.2 ranges.

Peak ground acceleration was recorded in Baba Monir station about 299 cm/s2 on March 5th, 2011 earthquake.

Keywords: Accelerogram; accelerograph; earthquake; strong motion; peak ground acceleration.

1. INTRODUCTION

The Iranian plateau is one of the seismically active areas of the world and frequently suffers destructive earthquakes that cause heavy loss of human life and widespread damage. Safeguarding life and property from destructive effects of earthquakes is a major national as well as world-wide problem. Earthquake strong motion data provide the basis for design of engineered buildings, bridges, dams and other critical structures as well as the basis for research on fundamental problems related to earthquake processes, and internal structure of the earth. Strong motion instrumentation program in Iran is operated by ISMN.

Iran Strong Motion Network (ISMN) started its activities in 1973 at the former Planning and Budget Organization. In 1981, the ISMN was transferred to BHRC and a new phase of its activities began. Until 1992, the ISMN had 274 analog accelerographs. At the present time (August 2013) ISMN has 1149 digital accelerographs. More than 9770 three component accelerograms have been recorded by these instruments.

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2. STRONG MITION DATA IN 2011

During January – December 2011, 199 earthquake triggered 175 accelerographs, among them 165 earthquakes had magnitude greater than 4 (Figures 1 and 2). In addition, more than 311 accelerograms were recovered from the permanent Iran Strong Motion Network, operated by the Building & Housing Research Center (Figure 3). Amongst these the South-West Pakistan Earthquake of the 18 January 2011, with Mw7.2 was the greatest one. The main shock of this earthquake triggered 10 accelerographs. Its maximum PGA was about 78 gals that was registered by Saravan station, but the highest acceleration in this period recorded at Baba Monir station in the event of March 5th, 2011. The strong motion and seismological data of important accelerograms are listed in the appendix table.

• In appendix table we classify the information collected for each entry in the database under three headings: (1) Earthquake information (date, epicentral coordinates, magnitude, and depth), (2) Station information (coordinates, location, 1D, altitude,) and (3) record information (trigger times, peak ground motion amplitudes of each waveform). The earthquake information was obtained from both national and international seismic agencies. We processed all records with $M \ge 4$, and only for these records PGV, PGD and spectral quantities were computed because ground motion records of events with smaller magnitudes are unlikely to be significant for engineering use. The most important earthquakes in 2011 are listed in below.



Figure 1: The epicentres of the earthquakes occurred in Iran and neighbouring countries that recorded by ISMN in 2011



Figure 2. The number of earthquakes with magnitude >4 in 2011



Figure 3. The number of accelerograms in 2011

2.1 Sepidan Earthquake of January 5th, 2011

On January 5th, 2011 at 05:55:47 (UTC), an earthquake with Mw5.4 (BHRC), Mn5.3 (IGTU), M15.2 (IIEES) and mb5.4 (NEIC), occurred in the west of Sepidan town (Fars Province) in South of Iran. This event was recorded by 7 sets of digital accelerographs of Iran Strong Motion Network (ISMN) (Figure 4). The uncorrected peak acceleration of about 135 cm/s² was recorded in Sepidan station. The epicenter of this event was located in 30.16N, 51.70E (BHRC), 30.20N, 51.79E (IGTU), 30.20N, 51.99E (IIEES) and 30.13N, 51.76E (NEIC). Many aftershocks occurred in the region, some of them are discussed below.



Figure 4. The Location map of January 5th, 2011 Sepidan Earthquake and triggered stations



Figure 5. Uncorrected & corrected time-histories, Response and Fourier spectrums of Sepidan accelerogram

2.2 Sepidan Earthquake Aftershock of January 7th, 2011

On January 7th 2011 at 23:52:59 (UTC), an earthquake with Mw5.1 (BHRC), Mn5.1 (IGTU), MI5.2 (IIEES) and mb5.1 (NEIC), occurred in the West of Sepidan city (Fars province). This event was recorded by 5 sets of digital accelerographs (Figure 6) of Iran Strong Motion Network (ISMN) (Sepidan, Baba Monir, Shah Qasem Dam1, Ghaemiyeh and Basht). The uncorrected peak acceleration was recorded in Sepidan station (66 cm/s²). The epicenter of this event has been located at 30.17N, 51.74E (BHRC), 30.17N, 51.76E (IGTU), 30.20N, 51.68E (IIEES) and 30.15N, 51.59E (NEIC).



Figure 6. The location map of January 7th, 2011 Sepidan earthquake and triggered stations

D (D IN		Components						
Date	Kecord No.	Strong Motion Parameters	L	V	Т				
2011/01/07		Corrected Acceleration (cm/s ²)	58	23	65				
2011/01/07	5157/07	Velocity (cm/s)	1.3	0.5	1.2				
23:52:59	5157/07	Displacement (cm)	0.07	0.04	0.09				
		Duration (sec)	7.8	8.1	8.0				



Figure 7. Uncorrected and corrected time-histories, Response and Fourier spectrums of Sepidan accelerogram

2.3 South-West Pakistan Earthquake of January 18th, 2011

A massive earthquake with the Magnitude of 7.2 (NEIC) struck a remote area in south-west of Pakistan on early Wednesday, January 18th at 20:23:26. The epicenter of this event has reported in 310 Km ESE of Zahedan with Mn7.2 (IGUT), MI7.0 (IIEES) and Mw7.2 (NEIC). This event was recorded by 10 sets of digital accelerographs of Iran Strong Ground Motion Network in Saravan, Jaleq, Pishin Dam1, 2 and 3, Gosht, Sib Sooran, Sabz Gaz, Sarbaz and Zabol stations (Figure 8). The maximum uncorrected peak acceleration of 78 cm/s² was recorded in Saravan station. The epicenter of this event has been located at 28.87N, 63.97 (IGUT), 28.04N, 63.85E (IIEES) and 28.84N, 63.95E (NEIC).



Figure 8. The location map of January 18th, 2011 South-West Pakistan earthquake and triggered stations



Figure 9. Uncorrected and corrected time-histories, Response and Fourier spectrums of Saravan accelerogram

2.4 Rigan Earthquake of January 27th, 2011 (Main shock)

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On the 27th of January, 2011 at 08:38:28 (UTC), a relatively strong earthquake with the magnitude of Mw6.1 (BHRC), Mn6.0 (IGUT), mb6.2 (IIEES) and Mw6.2 (NEIC), occurred South of Rigan city in Kerman province in South-East of Iran. This event was recorded by 12 sets of digital accelerographs of Iran Strong Motion Network (ISMN) (Figure 10). The maximum uncorrected peak acceleration of about 192 cm/s² was recorded in Sarzeh station. The epicenter of this event has been located at 28.15N, 59.00E (BHRC), 28.25N, 59.07E (IGUT), 28.15N, 59.09E (IIEES) and 28.19 N, 58.97E (NEIC).



Figure 10. The location map of January 27th, 2011 Rigan earthquake and triggered stations



Figure 11. Uncorrected and corrected time-histories, Response and Fourier spectrums of the Sarzeh earthquake

2.5 Baba Monir Earthquake of March 5th, 2011

On March 5th, 2011 at 11:24:41 (UTC), an earthquake with Mw5.2 (BHRC), Mn5.2 (IGTU), Ml5.1 (IIEES) and mb5.1 (NEIC), occurred near Baba Monir town (Fars Province), South-West of Iran. This event was recorded by 7 sets of digital accelerograph of Iran Strong Ground Motion Network (ISMN) (Figure 12). The maximum peak acceleration was recorded in Baba Monir station (299 cm/s²). The epicenter of this event has been located at 30.00N, 51.19E (BHRC), 30.04N, 51.11E (IGTU), 30.02N, 51.19E (IIEES) and 30.021N, 51.15E (NEIC).



Figure 12. The location map of March 5th, 2011 Baba Monir earthquake and triggered stations



Figure 13. Uncorrected and corrected time-histories, Response and Fourier spectrums of Baba Monir accelerogram

2.6 Rudbar Earthquake of June 15th, 2011

On June 15th, 2011 at 01:05:30 UTC an earthquake with magnitude of Mw5.6(BHRC), Mn5.3 (IGTU), M15.7 (IIEES) and mb5.3 (NEIC) occurred in South of Kerman Province. This event was recorded by 5 sets of accelerograph (Figure 14) stations of ISMN and the maximum peak acceleration of about 48 cm/s² has been recorded in Rudbar station. BHRC estimated the epicenter on 27.80N, 57.79E and the magnitude of this event to be Mw5.6 using the recorded strong motion data. This event was also located to be at the coordinates of 27.78N, 57.77E (IGTU), 27.94N, 57.75E (IIEES) and 28.00N, 57.65E (NEIC).



Figure 14. The location map of June 15th, 2011 Rudbar earthquake and triggered stations



Figure 15. Uncorrected and corrected time-histories, response and Fourier spectrums of Roodbar accelerogram

2.7 Turkey-Iran Border Region Earthquake of October 23rd, 2011

On October 23rd, 2011 at 10:41:21 (UTC), an earthquake with Mw7.0 (BHRC), Mn7.1 (IGUT), and Mw7.1 (NEIC), occurred in Turkey near Iran border line. This event was recorded by 11 sets of digital accelerographs (Figure 16) of Iran Strong Ground Motion Network (Siah-Cheshmeh, Makoo, Avagiq, Salmas1, Qotoor, Hadi Shahr, Qareziaodin, Pol Dasht, Kelvans, Khoy and Seylab). The maximum uncorrected peak acceleration of about 72 cm/s² was recorded in Siah-Cheshmeh station (ISMN stations). The epicenter of this event has been located at 38.51N, 43.46E (BHRC), 38.67N, 43.71E (IGUT) and 38.63N, 43.49E (NEIC).



Figure 16. The location map of October 23rd, 2011 Turkey-Iran Border region earthquake and triggered stations



Figure 17. Uncorrected and corrected time-histories, Response and Fourier spectrums of Siah-Cheshme accelerogram

Strong Motion Data (BHRC)									Seismological Data						
No	Station	Record	Coor	dinate	U.P.G.A	ts-tp	Vs30	Origin	Time	Epic	enter	Mamituda	Pef		
140.	Station	No.	Ν	E	(cm/s/s)	(sec)	(m/s)	Y/M/D	h:m:s	Ν	E	Magintude	Rei.		
										30.25	49.71	Mn4.4	IGTU		
1	Hendijan	5204	30.23	49.71	16	4.0		2011/01/03 13:37:5	13:37:57	30.30	49.80	MI4.2	IIEES		
										30.22	49.78	mb4.2	NEIC		
	Sepidan	5151/01	30.27	51.98	135	4.0				30.16	51 70	Mw5 4 MI5 8	BHRC		
	Masiri	5154/02	30.25	51.52	81	2.8	1262								
	Shah Qasem Dam1	5311/02	30.58	51.57	54	6.2	-	100000		30 20	51 79	Mn5.3	IGTU		
2	Ghaemiyeh	5150	29.85	51.59	28	4.9	617	2011/01/05	05:55:47				100.00		
	Basht	5152	30.34	51.16	28	7.1				30.20	51 99	MI5 2	IIEES		
	Dalin	5170	30.06	52.12	20	7.6	1230								
	Yasooj	5318/02	30.65	51.60	14	7.4				30.13	51.76	mb5.4	NEIC		
12	Masiri	5154/03	30.25	51.52	35	2.7	1262	1000	and the second	30.18	51.66	Mw4.6	BHRC		
3	Sepidan	5157/04	30.27	51.98	24	4.4		2011/01/05	16:32:21	30.14	51.58	Mn4.3	IGTU		
	Shah Qasem Dam1	5311/03	30.58	51.57	21	5.9				30.22	51.65	MI4.4	IIEES		
	Masiri	5154/04	30.25	51.52	30	2.7	1262			30.19	51.66	Mw4.5	BHRC		
4	Shah Qasem Dam1	5311/04	30.58	51.57	14	5.7		2011/01/05	17:50:53	30.19	51.63	Mn4.2	IGTU		
	Sepidan	5157/05	30.27	51.98	14	4.3				30.24	51.75	MI4.1	IIEES		
	Sepidan	5157/07	30.27	51.98	66	2.4				30,17	51,74	Mw5.0	BHRC		
2.53	Baba Monir	5155/01	30.07	51.21	23	7.7	832	100000000000000000000000000000000000000	255.000			0.0.0			
5	Shah Qasem Dam1	5311/06	30.58	51.57	18	6.4	100000	2011/01/07	23:52:59	30.17	51.76	Mn5.0	IGTU		
	Ghaemiyeh	5156/01	29.85	51.59	15	5.6	617			30.20	51.68	MI5.0	IIEES		
	Basht	5164/01	30.34	51.16	15	7.4		5		30.15	51.59	mb4.9	NEIC		
	Sepidan	5157/08	30.27	51.98	68	4.3				30.23	51.68	Mw5.2	BHRC		
	Masiri	5154/06	30.25	51.52	39	3.0	1262		00:24:24						
6	Ghaemiyeh	5156/02	29.85	51.59	28	5.6	617	2011/01/08		30,19	51.75	Mn5.1	IGTU		
	Baba Monir	5155/02	30.07	51.21	22	6.2	832								
	Basht	5164/02	30.34	51.16	19	6.9				30.18	51.71	MI5.2	IIEES		
_	Shah Qasem Dam1	5311/07	30.58	51.57	17	6.7				30.18	51.71	mb5.0	NEIC		
120	Evaz	5191	27.76	54.01	42	3.4	757	1000000000000	001001000	27.59	54.02	Mn4.1	IGTU		
7	Kooreh	5167	27.92	53.80	14	5.0	386	2011/01/09	13:13:04	27.51	54.26	MI4.2	IIEES		
-										27.78	54.08	mb4.3	NEIC		
8	Sirch	5239	30.20	57.56	29	2.4	398	2011/01/09	18:11:04	30.23	57.46	Mn4.3	IGTU		
1000	Joshan	5233	30.12	57.61	15	3.4	776	and an	andre excelent	30.33	57.33	MI4.5	IIEES		
	Saravan	5163	27.37	62.32	78	25.9									
	Jaleq	5161	27.60	62.71	74	25 - 2				28.87	63.97	Mn7.2	IGTU		
	Pishin Dam Cocht	5160	26.03	61.69	72	10.00									
	Sib Sooran	5196	27.19	62.00	20										
9	Dishin Dam	5185	26.02	61.68	20			2011/01/18	20:23:26	28 04	63.85	MIZ O	HEES		
	Sabz Gaz	5162	28.34	61.00	24					20.04	50.00	1117.0	ALLO		
	Sarbaz	5208	26 63	61 26	14	24-2									
	Pishin Dam	5183	26.03	61.69	13					28.84	63.95	Mw7.2	NEIC		
	Zabol	5231	31.03	61.50	11								and and a second second		

Strong Motion Data (BHRC)									Seismological Data							
N	Station	Record	Coor	dinate	U.P.G.A	ts-tp	Vs30	Origin	Time	Epicenter		ter Magnitudo				
INO.	Station	No.	Ν	E	(cm/s/s)	(sec)	(m/s)	Y/M/D	h:m:s	Ν	E	Magnitude	KeI.			
	Sarzeh	5179/02	28.33	59.02	59	2.7				28.17	58.99	Mw4.7	BHRC			
10	Chah Malek	5176/02	28.55	59.16	32	5.7		2011/01/27	07:02:06	28.26	58.99	Mn5.1	IGTU			
10	Deh Reza	5177/02	28.67	59.26	13	8.0			07.02.06	28.12	59.07	MI4.9	IIEES			
	Zeh Kelot	5180/01	27.79	58.59	11	-				28.30	58.90	mb5.0	NEIC			
	Sarzeh	5179/04	28.33	59.02	192	3.0										
	Chah Malek	5176/03	28.55	59.16	43	6.3				28.15	59.00	Mw6.1 MI6.2	BHRC			
	Ghale Ganj	5172	27.52	57.88	42	-	683									
	Reygan	5173	28.65	59.01	30	6.2	437									
	Deh Reza	5177/03	28.67	59.26	25	8.2				28.25	59.07	Mn6.0	IGTU			
11	Bam1	5171	29.08	58.35	23	14.0		2011/01/27	08:38:28							
	Zeh Kelot	5180/02	27.79	58.59	20	8.9		2011/01/21	00.00.20			mb6.2	IIEES			
	Qotb Abad	5174	28.88	58.48	20	11.4	648			28.15	59.09					
	Fahraj	5178	28.95	58.89	19	11.1	280									
	Bampoor	5187	27.20	60.45	18	-										
	Iran Shahr	5182	27.20	60.69	11	-				28.19	58.97	Mw6.2	NEIC			
	Dalgan	5188	27.48	59.45	11	-										
12	Sarzeh	5179/05	28.33	59.02	58	3.0		2011/01/27	08:43:30	28.31	59.14	Mn4.8	IGTU			
12	Saizen	5175/05	20.00	33.02	5	5.0		2011/01/21	00.43.50	28.10	59.17	MI5.3	IIEES			
13	Sarzeh	5179/06	28.33	59.02	14	2.5		2011/01/27	09:05:21	28.18	59.18	Mn4.2	IGTU			
14	Sarzeh	5179/08	28.33	59.02	41	22		2011/01/27	09:07:54	28.24	58.96	Mn4.8	IGTU			
	Guizon	0110/00	20.00	00.02		2.2		2011/01/21	00.07.04	28.07	59.20	MI5.0	IIEES			
										28.42	58.92	Mn4.6	IGTU			
15	Sarzeh	5179/09	28.33	59.02	56	2.6		2011/01/27	15:01:47	28.18	59.09	MI4.6	IIEES			
										27.84	58.87	mb4.3	NEIC			
	Sarzeh	5179/11	28.33	59.02	83	2.4				28.37	58.96	Mn5.3	IGTU			
16	Chah Malek	5176/04	28.55	59.16	25	5.8		2011/01/28	04.20.42	28.15	59.07	MI5.3	IIEES			
	Bam1	5175	29.08	58.35	12	14.0		2011/01/20	01.20.12	28.15	59.07	mb5.0	NEIC			
	Sarzeh	5179/12	28.33	59.02	43	2.3				28.42	58.93	Mn4.9	IGTU			
17	Chah Malek	5176/05	28.55	59.16	12	5.7		2011/01/28	05:06:49	28.19	59.11	MI4.8	IIEES			
										28.42	58.93	mb4.5	NEIC			
										28.44	58.96	Mn4.3	IGTU			
18	Sarzeh	5179/13	28.33	59.02	14	2.4		2011/01/28	06:34:04	28.30	59.06	MI4.2	IIEES			
										28.44	58.96	mb4.0	NEIC			

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	Str	Seismological Data											
No	Station	Record	Coor	dinate	U.P.G.A	ts-tp	Vs30	Origin	Time	Epic	enter	Mamituda	Pof
110.	Station	No.	Ν	E	(cm/s/s)	(sec)	(m/s)	Y/M/D	h:m:s	Ν	E	Magintude	Kei.
	Sarzeh	5179/17	28.33	59.02	63	2.3				28.33	59.02	Mn5.0	IGTU
19	Chab Malok	5170/00	20 55	50.10	14	57		2011/01/29	04:43:19	28.16	59.07	MI4.7	IIEES
	Chan Malek	5170/00	20.00	33.10	14	5.7				28.33	59.02	mb4.6	NEIC
										27.12	53.37	Mn4.4	IGTU
20	Beyram	5190	27.44	53.51	17	2.9	377	2011/01/30	18:58:13	27.01	53.47	MI4.4	IIEES
	2									27.34	53.42	mb4.7	NEIC
	Khalkhal1	5197/03	37.61	48.54	227	1.3	485			37.82	48.34	Mn4.3	IGTU
21	Firoozabad	5215/02	37.59	48.24	19	3.7	459	2011/03/04	09:46:30	37.73	48.61	MI4.3	IIEES
							100.00			37.83	48.69	mb4.6	NEIC
	Baba Monir	5194/01	30.07	51.21	299	1.4	832			30.00	51.19	Mw5.2	BHRC
	Ghaemiyeh	5210/01	29.85	51.59	95	6.5	617			and the second s	1966 N 1978 N 17 - 1		2.0400.027.0
-	Basht	5195/02	30.34	51.16	51	5.0		0044/00/05	11.04.11	30.04	51.11	Mn5.2	IGTU
22	Dogonbadan	5196	30.35	50.79	32	6.9		2011/03/05	11.24.41				1111
	Baba Kalan Kapat Takhtah	5209	30.11	50.82	30	5.7	450			30.02	51.19	MI5.1	IIEES
	Konal Takillen	5190	29.00	51.64	12	0.9	400			20.02	51.15	mb5 1	NEIC
_	Raba Monir	5194/02	29.65	51.04	13	0.9	022	2011/03/05		30.02	01.10	THUS. I	NEIC
23	Ghaemiyeh	5210/02	29.85	51 59	16	7.4	617		11:28:39	30.04	51.02	Mn4.0	IGTU
-	Soghan	5210/02	28.35	56.88	14	6.0	017	e		28.30	57 14	Mn5.1	IGTU
24	oognan	021202	20.00	00.00		0.0		2011/03/05	20:42:53	28.42	56.95	MI4 9	IIFES
1.245	Faryab	5216	28.10	57.23	14		641			28.28	57.13	mb5.1	NEIC
	Siyahoo	5245	27.76	56.34	26	6.8	627			27.84	56.71	Mn4.7	IGTU
25		50.10		50.07			500	2011/03/14	07:55:08	27.70	56.79	MI4.8	IIEES
	Anmadi	5243	27.94	56.67	10	4.4	528			27.84	56.71	mb4.8	NEIC
20	Qasreshirin	5217/01	34.51	45.59	16	2.7		2011/04/06	10:17:17	34.31	45.53	Mn4.4	IGTU
20	Sar Pol-e-Zahab	5219/01	34.46	45.87	15	4.5		2011/04/06	13.17.17	34.32	45.49	MI4.4	IIEES
	Qasreshirin	5217/02	34.51	45.59	20	2.5				34.38	45.48	Mn4.6	IGTU
27	Sar Pol-e-Zahab	5219/02	34 46	45 87	12	4.5		2011/04/07	04:47:35	34.36	45.57	MI4.4	IIEES
										34.36	45.57	mb4.6	NEIC
28	Goorsefid	5225	34.22	45.85	12	5.1		2011/04/08	04:27:44	34.46	45.46	Mn4.3	IGTU
										34.37	45.37	MI4.3	IIEES
	Ghaemiyeh	5229/02	29.85	51.59	12	8.4	617			29.81	50.88	Mn4.8	IGTU
29	Shabankareh	5230	29.47	50.99	10	-	368	2011/05/08	22:17:32	29.84	51.00	MI4.9	IIEES
					1.1.1					29.79	50.96	mb4.9	NEIC
	Meymand	5317	31.10	51.27	102	2.5				30.96	51.31	Mw4.9	BHRC
30	Pataveh	5252	30.96	51.26	35	2.6		2011/05/12	14:25:59	30.94	51.30	Mn4.8	IGIU
	Khatr	5250/02	31.00	51.48	21	3.0				31.04	51.40	MI4.6	ILEES
L	Komeh	5463	31.07	51.59	15	4.2				30.94	51.30	mb4.8	NEIC

	Str	ong Motion	Data (E	BHRC)				Seismological Data						
N	Can dian	Record	Coor	dinate	U.P.G.A	ts-tp	Vs30	Origin Time		Epicenter		Mandala	D .6	
NO.	Station	No.	N	E	(cm/s/s)	(sec)	(m/s)	Y/M/D	h:m:s	Ν	E	Magnitude	KeI.	
	Kadkan	5251	35.59	58.87	20	4.9	571			35.65	58.77	Mn4.5	IGTU	
31	Divach	5255	25.49	59 47	17	5.6	429	2011/05/24	20:30:11	35.68	58.63	MI4.5	IIEES	
	Rivasii	5255	55.40	30.47	17	5.0	420			35.72	58.67	mb4.6	NEIC	
	Roodbar	5254	28.03	58.00	48	6.0				27 80	57 79	Mw5.6	BHRC	
	Ghale Ganj	5248	27.52	57.88	37	7.0	683			27.00	51.15	101003.0	DIIKO	
32	Kahnooj	5249	27.95	57.71	28	4.4	1564	2011/06/15	01:05:30	27.78	57.77	Mn5.3	IGTU	
	Ziyarat Ali	5257	27.75	57.23	16	7.7	1334			27.94	57.75	MI5.7	IIEES	
	Hasan Langi	5416	27.39	56.86	10	343	251			28.00	5 <mark>7.</mark> 65	mb5.3	NEIC	
	Joshan	5260	30.12	57.61	81	2.3	776			30.03	57 58	Mw/ 9 MI5 6	BHRC	
	Sirch	5261	30.20	57.56	79	3.2	398			00.00	07.00	WW4.5 WI5.0	DIIICO	
33	Golbaf1	5262	29.89	57.73	38	3.3	365	2011/06/26	19:47:00	30.21	57.63	Mn5.2	IGTU	
	Andoohjerd	5259	30.23	57.75	22	3.9	566			30.12	57.54	MI5.1	IIEES	
	Mahan	5265	30.07	57.29	15	4.0	1085			30.18	57.56	<mark>Mw</mark> 5.1	NEIC	
24	Foroomad	5277/02	36.50	56.76	109	3.0				36.61	56.76	Mw5.2	BHRC	
	Davarzan	5276	36.35	56.88	24	4.6	604	2011/07/26 04:04	04:04:12	36.58	56.93	Mn4.9	IGTU	
04	logata	5278	36.63	57.07	19	4.4	964	2011/01/20	04.04.12	36.52	<mark>56.8</mark> 9	MI4.7	IIEES	
	ooquid	0210	00.00	01.01	19	4.4	504			36.63	56.79	mb5.0	NEIC	
	Mojen	5280	36.48	54.65	45	2.6	876			36.62	54 73	MI5 2	BHRC	
	Abarsej	5279	36.58	5 <mark>4.9</mark> 2	13	2.6				00.02	04.10	WIO.2	Drinto	
35	Shahrood	5281	36.41	54.97	13	4.4		2011/08/11	22:32:18	36.56	54.81	MI4.7	IIEES	
	Chahar Bagh	5289	36.60	54.50	13	3.0				36.53	54.73	Mn4.9	IGTU	
	Tazareh	5282	36.40	5 <mark>4.4</mark> 8	11	4.3				36.63	54.75	mb5.0	NEIC	
	Konar Takhteh	5297/02	29.53	51.39	27	1.6	450			29. <mark>4</mark> 5	51.28	Mn4.2	IGTU	
36	Dalaki	5294	29 13	51 29	20	32	971	2011/08/27	02:55:59	29.54	51.39	MI4.1	IIEES	
	Dalaki	02.04	23.40	01.23	20	0.2	571			29.55	<mark>51.13</mark>	mb4.4	NEIC	
	Bardeskan	5292	35.27	57.97	60	1.6	993			3 <mark>5.</mark> 23	58.04	Mn4.1	IGTU	
37	Azim Abad	5291	35.15	58.07	20		237	2011/09/05	00:52:16	35.24	58.00	MI4.1	IIEES	
	Azim Abad	0201	55.15	00.07	20		201			35.57	<mark>58.1</mark> 6	mb4.2	NEIC	
										28.09	54.30	Mn5.3	IGTU	
38	Haji Abad1	5321	28.36	54.43	23	4.3	561	2011/10/19	02:52:34	28.84	54.84	MI5.1	IIEES	
										28.15	54.30	mb5.5	NEIC	
										27.70	56.29	Mn4.1	IGTU	
39	Siyahoo	5337	27.76	56.34	13	2.7	627	2011/10/20	06:57:26	27.51	56.47	MI4.3	IIEES	
										27.54	56.22	mb4.5	NEIC	

THE MOST IMPORTANT CHARACTERISTICS OF STRONG GROUND MOTION ... 305

	Str	BHRC)	Seismological Data											
No	Station	Record	Coor	dinate	U.P.G.A	ts-tp	Vs30	Origin	Time	Epic	enter	Magnituda	Ref	
110.	Station	No.	Ν	E	(cm/s/s)	(sec)	(m/s)	Y/M/D	h:m:s	Ν	E	Magintude	Ittl.	
	Siah-Cheshmeh	5325	39.07	44.39	72	14.9								
	Makoo	5323	39.29	44.45	29	14.5				38.51	43.46	Mw7.0	BHRC	
	Avagiq	5322	39.33	44.16	26	12.7				00.01	40.40	10007.0	Driiko	
	Salmas1	5327	38.20	44.85	25	-								
	Qotoor	5329	38.48	44.41	21	14.5								
40	Hadi Shahr	5331	38.84	45.66	15	-		2011/10/23	10:41:21	20.67	42 74	Mp7.1		
	Qareziaoddin	5326	38.89	45.02	14	-				38.67	43.71	WIN7.1	IGIU	
	Pol Dasht	5330	39.35	45.06	14	-								
	Kelvans	5332	38.72	44.70	14	-								
	Khoy	5324	38.55	44.96	13	-			38.6	38.63	43.49	Mw7.1	NEIC	
	Seylab	5328	38.31	44.76	12	-								
	Gotvand Dam1	5352	32.27	48.92	36	5.3				32.49	48.97	Mn4.6	IGTU	
41	Lali	5336	00.04	40.00	17	4.0		2011/10/28	22:48:01	32.46	49.02	MI4.7	IIEES	
			32.34	49.09	17	4.2				32.46	49.02	mb4.7	NEIC	
40		E 4 1 E	EAAE	29.40	57.00	20		644	0044/44/40	44:44:00	28.14	57.05	Mn4.5	IGTU
42	Faryab	5415	28.10	57.23	20	3.4	641	2011/11/13	14.11.06	28.26	57.04	MI4.4	IIEES	
	Golestan Dam1	5458	37.32	55.28	100	2.1				37.32	55.35	Mn4.0	IGTU	
43	Minoodasht	5342	37.23	55.37	78	2.2	449	2011/12/04	08:48:41	07.44	55.00	NII0 5		
	Golestan Dam2	5459	37.33	55.29	48	1.6				37.41	55.28	MI3.5	TIEES	
	Esfarayen	5343	37.06	57.50	28	2.4		0011/10/00	00:04:00	37.18	57.56	Mn4.5	IGTU	
44	Esfarayen Dam2	5618/01	37.08	57.64	18	3.9		2011/12/00	20.04.55	37.13	57.45	MI4.3	IIEES	
										27.21	53.08	Mn4.9	IGTU	
45	Parsian	5340/02	27.21	53.04	152	2.3	549	2011/12/09	03:23:33	27.09	53.21	MI4.7	IIEES	
										27.20	53.15	mb4.9	NEIC	
40	No cost Albord	5050	00.00	50.00				0044/40/40	04-50-50	30.16	59.41	Mn4.6	IGTU	
46	Nosrat Abad	5350	29.86	59.98	22	6.3		2011/12/19	01:52:56	30.04	59.47	MI4.5	IIEES	
	Garmkhan	5348/01	37.51	57.49	66	1.3				37.57	57.63	Mn4.2	IGTU	
47	Maria	50.40/64	07.07	57.40				2011/12/26	01:49:12	37.63	57.57	MI4.1	IIEES	
	Naven	5349/01	37.67	57.42	44	2.8				37.63	57.57	mb4.5	NEIC	

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