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Technical Note

THE MOST IMPORTANT CHARACTERISTICS OF THE STRONG GROUND MOTION DATA IN IRAN IN THE YEAR 2009

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ABSTRACT

During January – December 2009 more than 219 accelerograph records were recovered from permanent Iran strong motion stations operated by the Building and Housing Research Center. Accelerograms were recovered from ISMN triggered by 159 earthquakes in the magnitude 2.6 to 5.5 range. 21 Of these recording are related to the 17 October 2009 South of Tehran earthquake.

Peak ground acceleration was recorded in Bandar Abbas station about 478 cm/s/s on November 3, 2009 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 2011) ISMN has 1156 digital accelerographs. More than 7841 three component accelerograms have been recorded by these instruments.

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2. STRONG MITION DATA IN 2009

During January – December 2009, more than 159 earthquake triggered 128 accelerographs, among them 48 earthquakes had magnitude greater than 4 (Figures 1 and 2). In addition, more than 219 accelerograms were recovered from the permanent Iran Strong Motion Network, operated by the Building & Housing Research Center (Figure 3). Amongst these the Tomban (Qeshm Island) earthquake of 22th July. 2009, with Mw5.5 was the greatest one. The main shock of this earthquake triggered 3 accelerographs. Its maximum PGA was about 378 gals that was registered by Tomban station, but the highest acceleration in this period recorded at Bandar abbas station in the event of November 3rd 2009. The strong motion and seismological data of important accelerograms are listed in the appendix table.

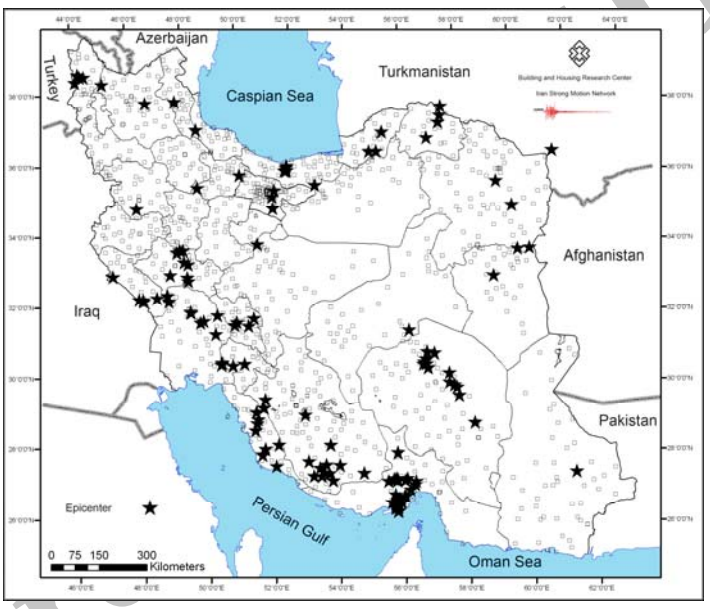

Figure1. The epicentres of the earthquakes with magnitude >4 in 2009

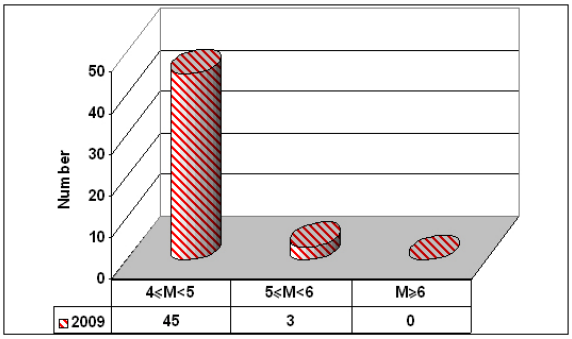

Figure 2. The number of the earthquakes with magnitude >4 in 2009

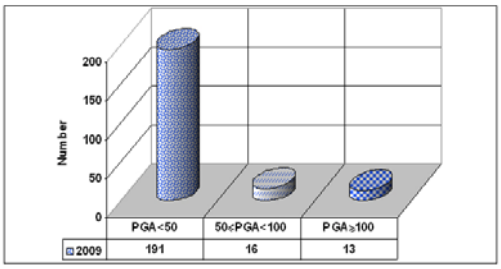

Figure 3. The number of accelerograms recorded in 2009

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, ID, 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 ≥ 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 2009 are listed in below.

2.1 Qadrooni dam area earthquake of February 15th, 2009

On February 15th, 2009 at 21:22:20 (UTC), an earthquake with Mw4.9 (BHRC), M4.9 (IGTU) and Ml4.7 (IIEES), occurred near Qadrooni Dam (Kerman Province), South-East of Iran. This event was recorded by 3 sets of digital accelerographs (Figure 4) of Iran Strong Motion Network (ISMN). The uncorrected peak acceleration (43 cm/s/s) was recorded in Qadrooni Dam station. The epicenter of this event was located in 31.10N, 57.07E (BHRC), 31.09N, 57.03E (IGTU), 31.06N, 57.00E (IIEES) and 31.07N, 57.07E (NEIC).

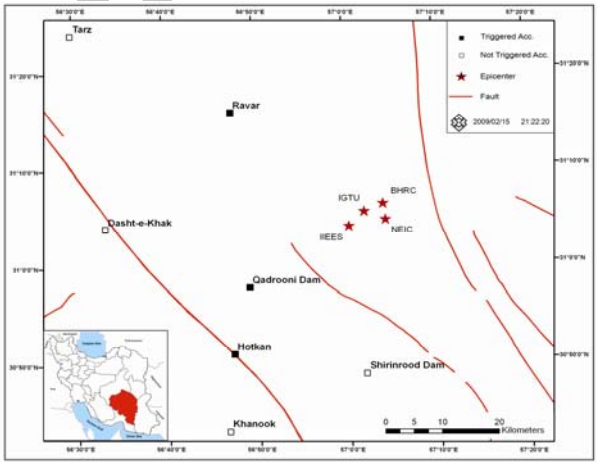

Figure 4. The location map of February 15th, 2009 Qadrooni dam area earthquake and the triggered stations

2.2 Hotkan earthquake of March 7th, 2009

On March 7th, 2009 at 06:47:07 (UTC), an earthquake with Mw4.4 (BHRC), Mn4.3 (IGTU), Ml4.1 (IIEES) and mb4.1 (NEIC) occurred near Hotkan town (Kerman Province), South-East of Iran. This event was recorded by 3 sets of digital accelerographs of Iran Strong Ground Motion Network (ISMN). The uncorrected peak acceleration (100 cm/s/s) was recorded in Hotkan station (Figure 5). The epicenter of this event was located in 30.81N, 56.70E (BHRC), 30.86N, 56.73E (IGTU), 30.79N, 56.77E (IIEES) and 30.79N, 56.77E (NEIC). On February 22nd, 2005 a magnitude 6.4 earthquake occurred at epicentral area of Hotkan earthquake. At least 602 people killed and 991 injured in Zarand earthquake.

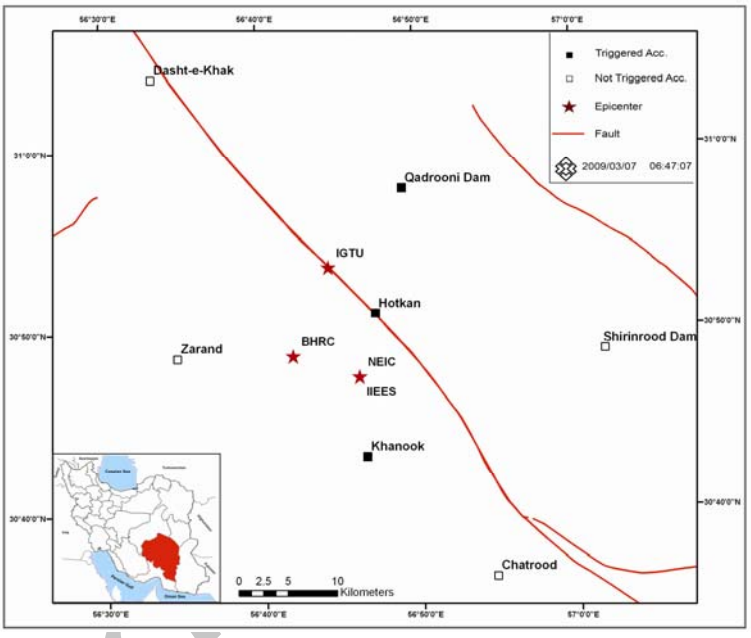

Figure 5. The location map of March 7th, 2009 Hotkan earthquake and triggered stations

2.3 Sirch earthquake of May 11th, 2009

On May 11th, 2009 at 02:14:06 (UTC), an earthquake with Mw4.5 (BHRC), Mn4.9 (IGUT), Ml4.8 (IIEES) and mb4.1 (NEIC), occurred near Sirch town in Gowk valley (Kerman Province), South-East of Iran. This event was recorded by 6 sets of digital accelerographs (Figure 6) of Iran Strong Motion Network (ISMN). The uncorrected peak acceleration was recorded in Sirch station (153 cm/s/s).The epicenter of this event has been located at 30.27N, 57.54E (BHRC), 30.33N, 57.64 (IGUT), 30.29N, 57.51E (IIEES) and 30.29N, 57.51E (NEIC). Gowk valley is one of the most seismically active areas in Iran. This area has experienced more than 5 large earthquakes in the past 32 years. The corrected time histories of acceleration, velocity and displacement have shown in figures7-9. Acceleration Response spectrum of this record shows predominant period about 0.1 sec on horizontal component and 0.08 (sec) on vertical component (Figure 10).

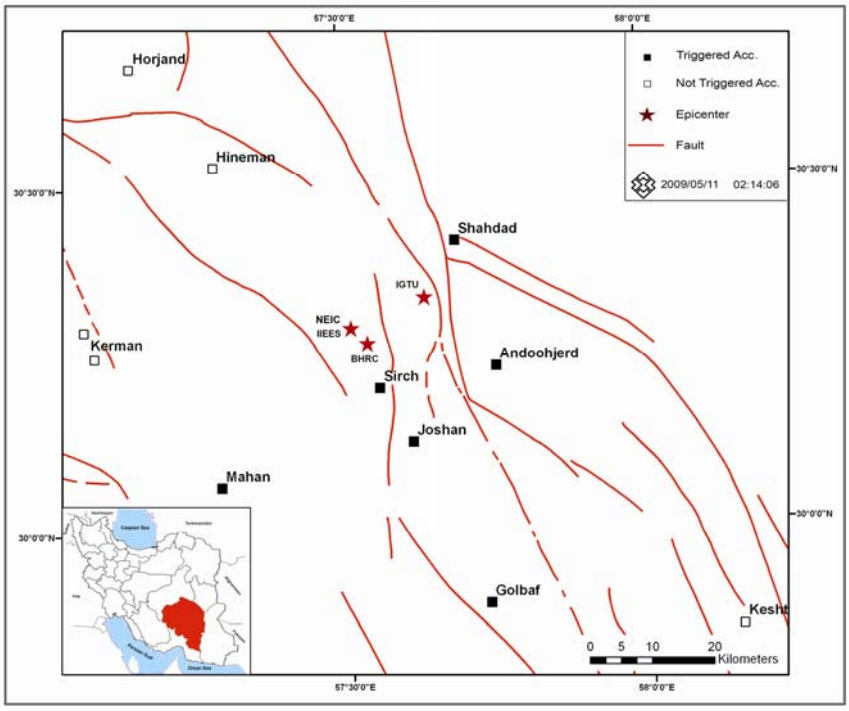

Figure 6. The location map of May 11th, 2009 Sirch earthquake and the triggered stations

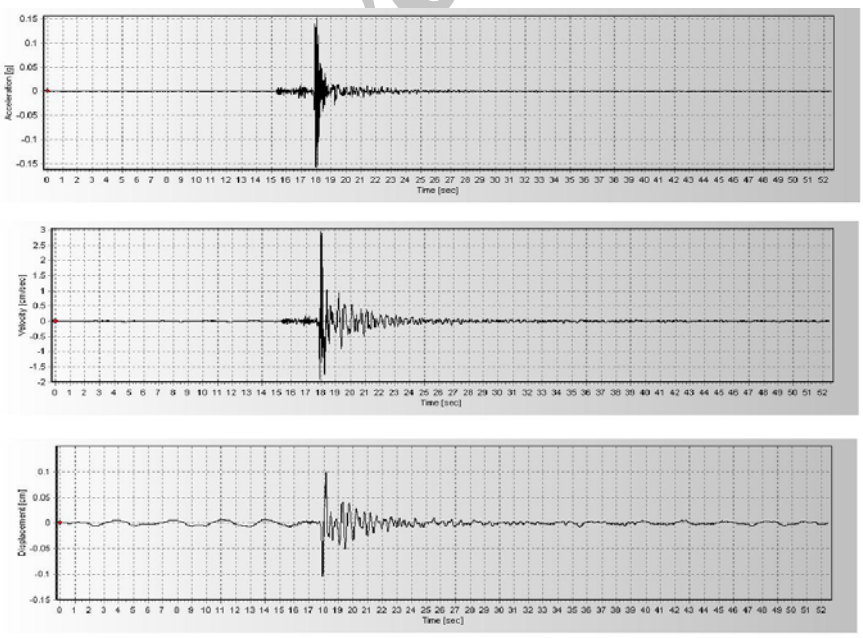

Figure 7. Time histories of acceleration, velocity and displacement of L component of Sirch record

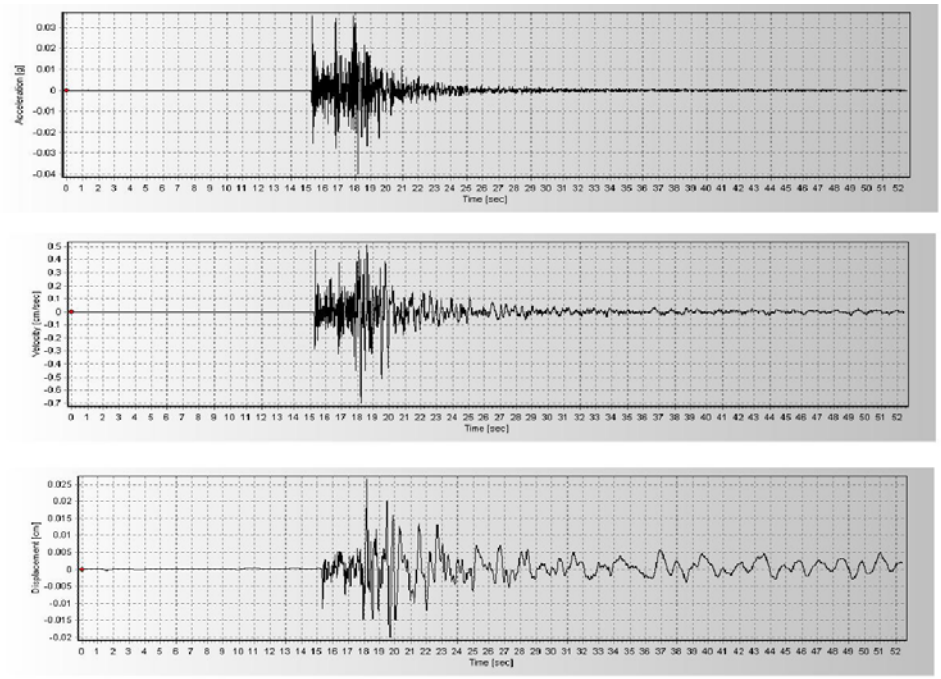

Figure 8. Time histories of acceleration, velocity and displacement of vertical component of Sirch record

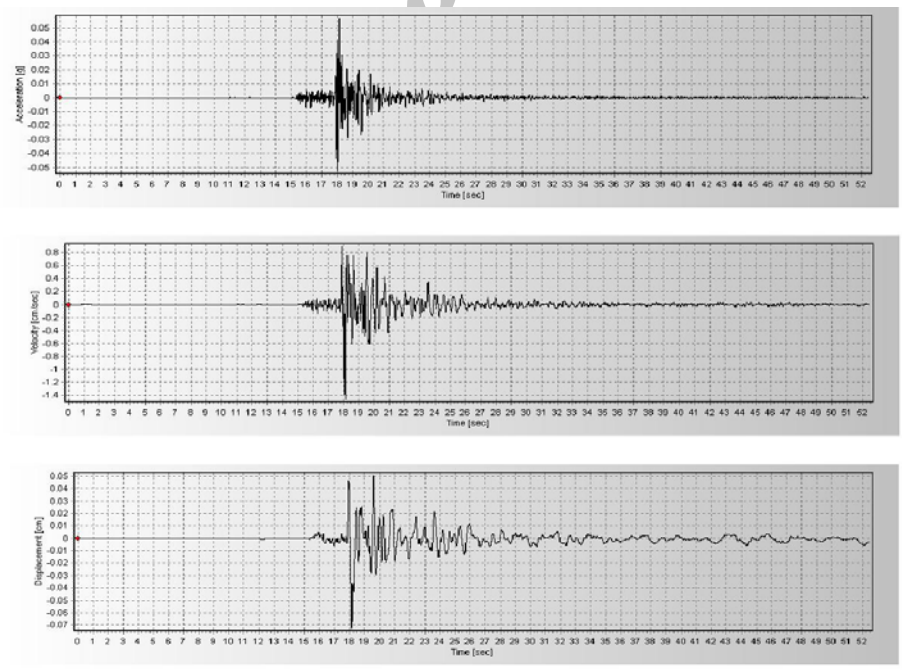

Figure 9. Time histories of acceleration, velocity and displacement of T component of Sirch record

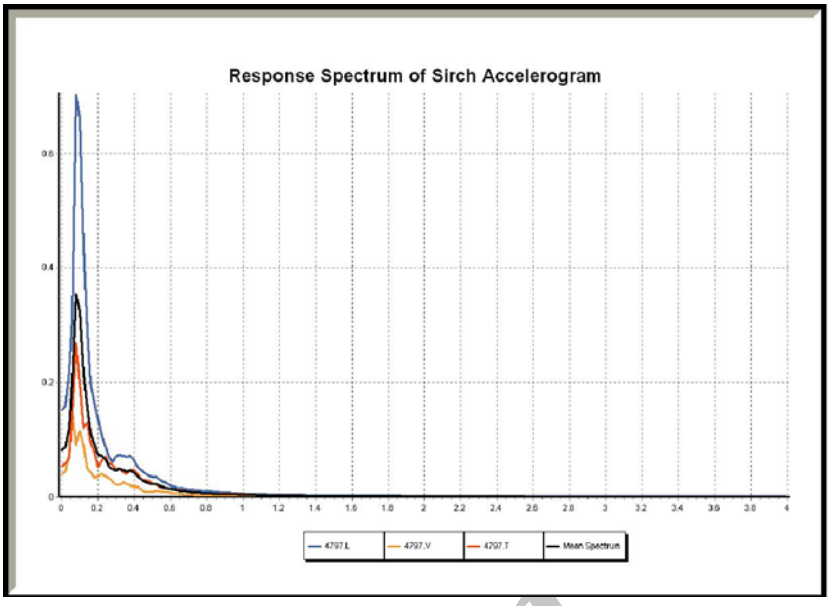

Figure 10. Response spectrum of the Sirch accelerogram

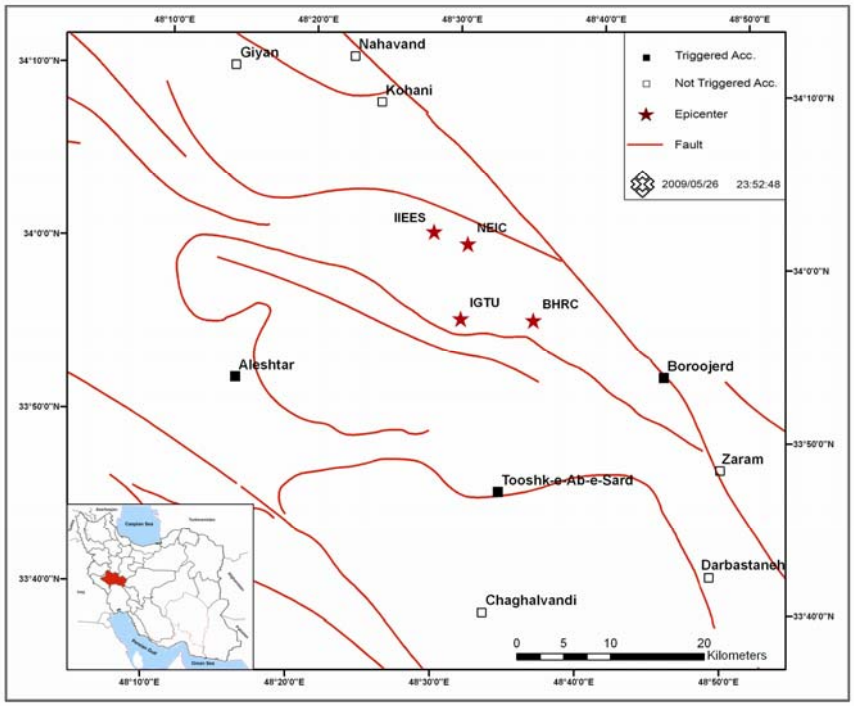

Figure 11. The location map of May 26th, 2009 Tooshk-e-Ab-e-Sard earthquake and the triggered stations

2.4 Tooshk-e-Ab-e-Sard Earthquake of May 26th, 2009

On May 26th, 2009 at 23:52:48 (UTC), an earthquake with Mw4.6 (BHRC), Mn4.8 (IGUT), Ml4.7 (IIEES) and mb4.7 (NEIC), occurred in the North of Tooshk-e-Ab-e-Sard town (Lorestan Province). This event was recorded by 3 sets of digital accelerographs of Iran Strong Ground Motion Network (Figure 11). The uncorrected peak acceleration was recorded in Tooshk-e-Ab-e-Sard station (65 cm/s/s). The epicenter of this event has been located at 33.94N, 48.60E (BHRC), 33.94N, 48.52 (IGUT), 34.02N, 48.48E (IIEES) and 34.01N, 48.52E (NEIC).

2.8 Tomban Earthquake of July 22th, 2009

On July 22th, 2009 at 03:53:03 (UTC), an earthquake with Mn5.4 (IGTU), mb5.5 (IIEES) and mb5.5 (NEIC), occurred near Tomban village (Qeshm Island), in the south of Iran. This event was recorded by 3 sets of digital accelerographs (Figure 12) of Iran Strong Motion Network (ISMN). The uncorrected peak acceleration was recorded in Tomban station (378 cm/s/s). The epicenter of this event has been located at 26.89N, 55.61E (IGTU), 26.83N, 55.78E (NEIC) and 26.77N, 55.79E (IIEES). In the recent years, Qeshm Island, the largest Island in persian Gulf has experienced some moderate earthquake with magnitude between 5 and 6. The Tomban station in central of Qeshm Island has recorded more than 102 event until July 22th, earthquake. This event was the largest earthquake which occurred in Iran in 2009. The corrected time histories of acceleration,velocity and displacement have shown in figures 13-15 . Acceleration Response spectrum of this record shows predominant period about 0.12 sec on horizontal component and 0.1 (sec) on vertical component (Figure 16).

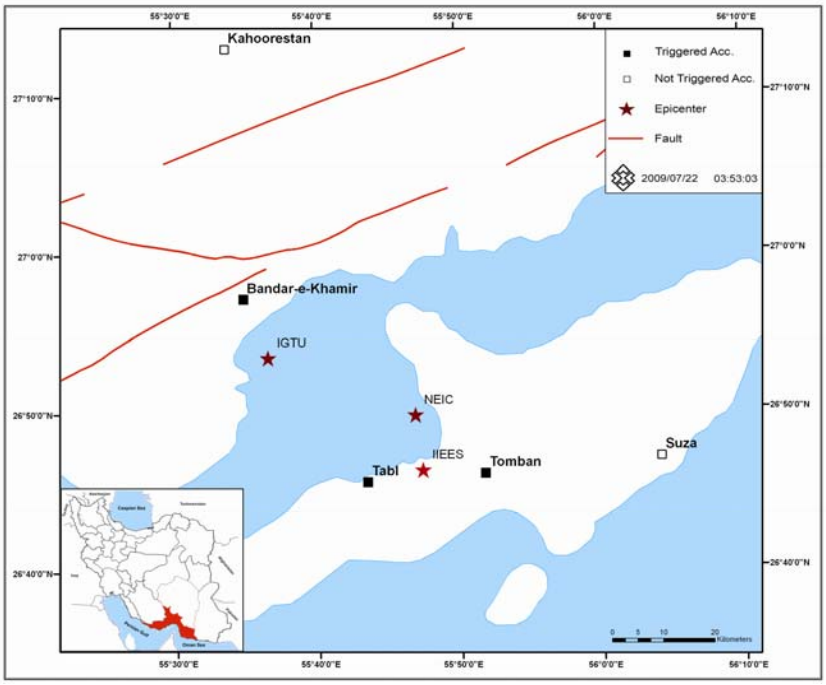

Figure 12. The location map of July 22th, 2009 Tomban earthquake and the triggered stations

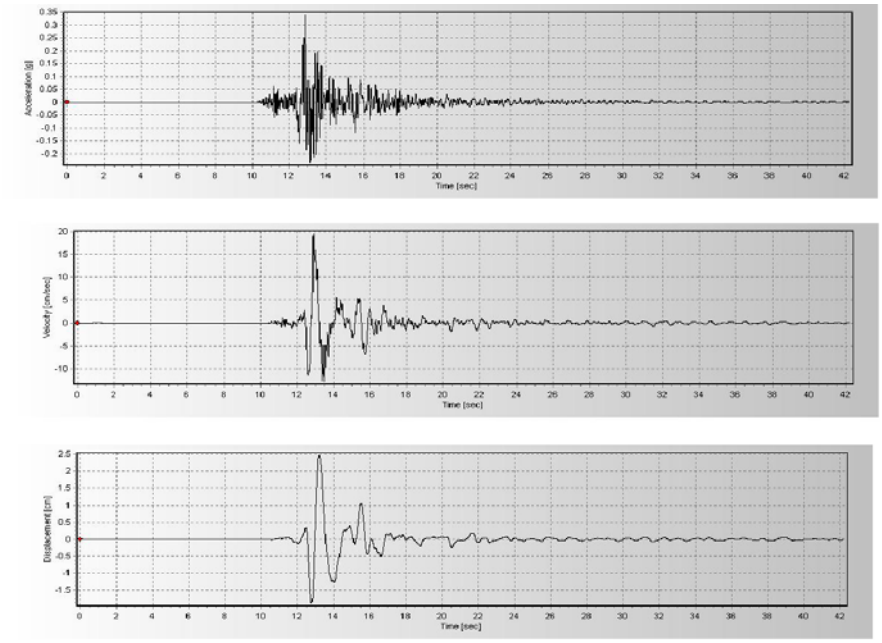

Figure 13. Time histories of acceleration, velocity and displacement of L component of the Tomban record

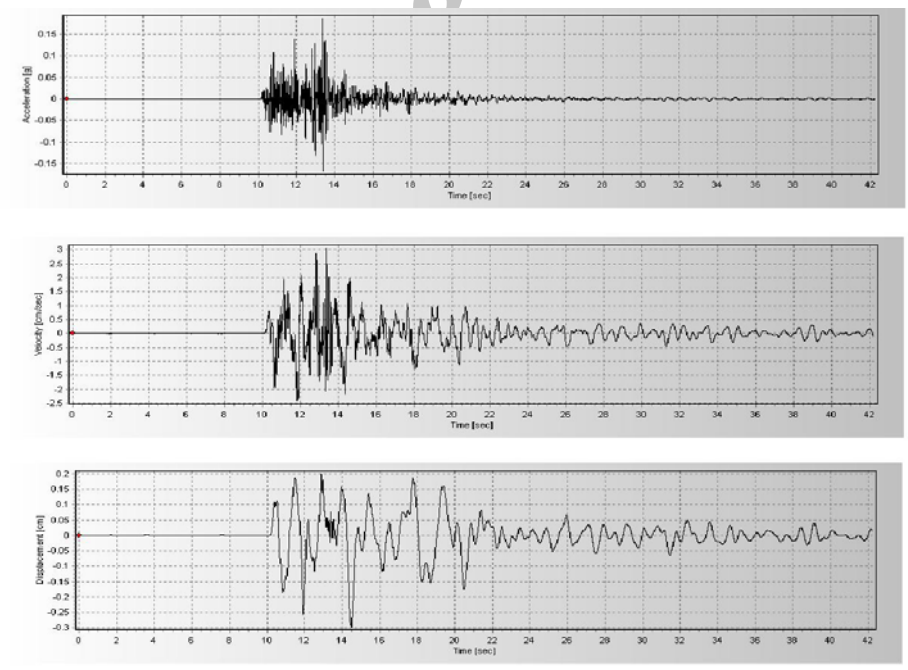

Figure 14. Time histories of acceleration, velocity and displacement of vertical component of the Tomban record

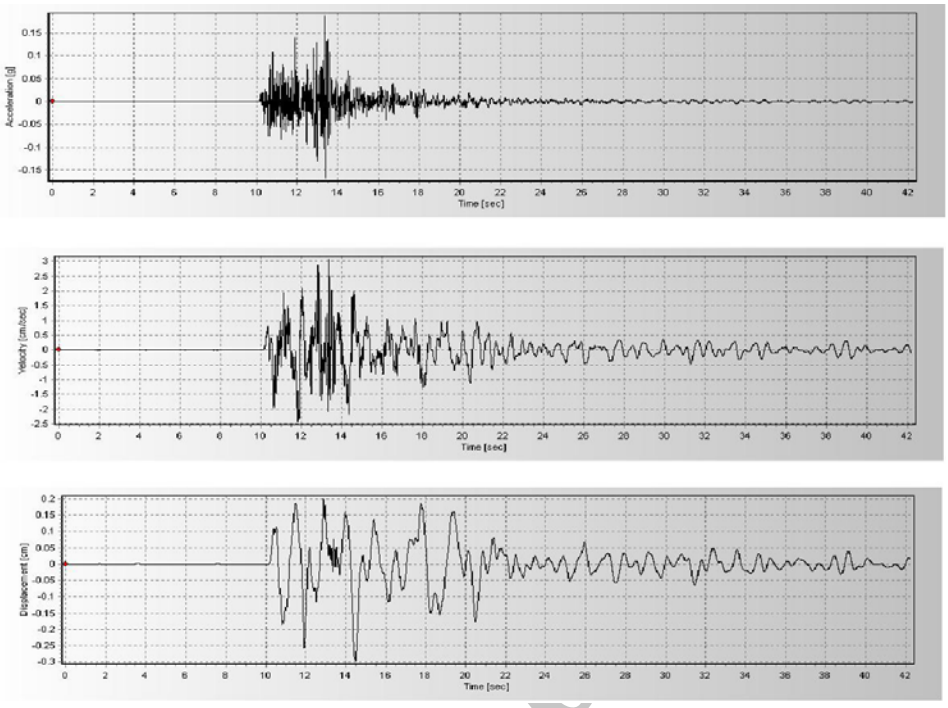

Figure 15. Time histories of Acceleration, velocity and displacement of T component of the Tomban record

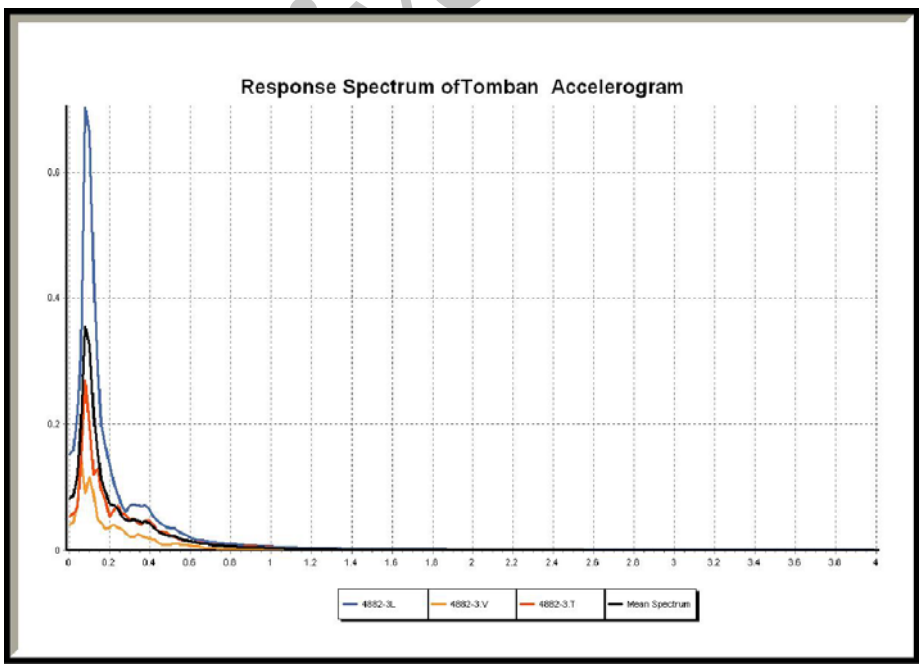

Figure 16. Response spectrum of the Tomban accelerogram

2.5 Shahr-e-Rey Earthquake of October 17th, 2009

On October 17th, 2009 at 10:53:57 UTC an earthquake with a magnitude of Mw3.8 (BHRC), Mn4.0 (IGTU) and Ml3.9 (IIEES) occurred in Tehran Province. This event was recorded by 21 sets of accelerographs (Figure 17) stations of ISMN and the maximum uncorrected acceleration of about 28 cm/s/s has been recorded in Tehran13 station. BHRC estimated the epicenter on 35.58N, 51.59E and the magnitude of this event to be Mw3.8 and Ml4.2 using the available data. This event was also located to be at the coordinates of 35.57N, 51.50E (IGTU) and 35.50N, 51.59E (IIEES).

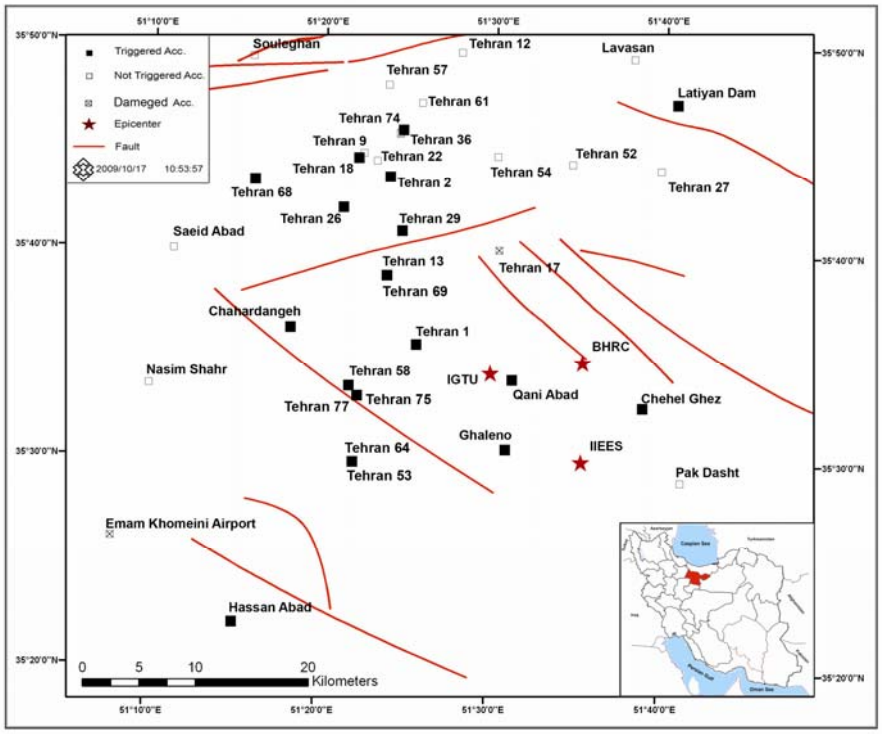

Figure 17. The location map of October 17th, 2009 Shahr-e- Rey earthquake and the triggered stations

REFERENCES

1. Building and Housing Research Center. www.bhrc.ac.ir.
2. Institute of Geophysics Tehran University, Iran Seismological Center. www.irsc.ut.ac.ir.
3. International institute of earthquake engineering and seismology. http://www.iiees.ac.ir.
4. National earthquake information center. http://earthquake.usgs.gov/regional/neic/.

Strong Motion Data (BHRC)								Seismological Data					
No.	Station	Record No.	Coordinate		U.P.G.A (cm/s/s)	ts-tp (sec)	Shear Wave Vel.	Origin Time		Epicenter		Magnitude	Ref.
			N	E				Y-M-D	h:m:s	N	E		
1	Bahabad	4769	31.87	56.02	36	2.6	458	2009/01/07	10:58:02				BHRC
2	Yamchi Daml	4840	38.07	48.08	25	2.4		2009/01/24	04:30:19	38.15 38.05	48.01 48.03	Mn3.5 Ml3.1	IGTU IIEES
3	Bonyabad	4897/01	34.08	59.88	22	1.5	677	2009/01/29	00:08:41	33.99 34.18	60.00 59.93	Mn3.8 Ml3.8	IGTU IIEES
4	Hosseiniyeh Olya	4932	32.67	48.25	28	2.4		2009/01/30	00:36:04	32.62 32.65	48.17 48.20	Mn3.3 Ml3.1	IGTU IIEES
5	Bonyabad	4897/02	34.08	59.88	44	2.2	677	2009/02/05	18:53:51	34.01 34.17	60.40 60.02	Mn3.9 Ml3.7	IGTU IIEES
6	Maharloo	4774	29.52	52.82	36	2.4	570	2009/02/09	10:34:41	29.36 29.34	52.84 52.69	Mn3.8 Ml3.8	IGTU IIEES
7	Ravar	4776	31.26	56.79	16	4.5	853	2009/02/15	21:22:20	31.10	57.07	Mw4.9	BHRC
	Hotkan	4790/05	30.85	56.79	24	5.1	837			31.09	57.03	Mn4.9	IGTU
	Qadrooni Dam	4791/03	30.96	56.82	43	3.8				31.06 31.07	57.00 57.07	Ml4.7 mb4.9	IIEES NEIC
8	Aru	4781	30.59	50.70	36	4.2		2009/02/18	09:12:34	30.72	50.45	Mn4.3	IGTU
9	Sedeh	4778	33.33	59.24	71	1.7	1180	2009/02/19	07:33:53	33.27 33.48	59.14 59.13	Mn3.0 Ml3.1	IGTU IIEES
10	Dorzo sayban	4917	27.86	55.42	15	4.6	1250	2009/02/23	11:11:00	27.62	55.52	Mn4.8	IGTU
	Fin1	4771	27.63	55.90	21	5.9	681			27.69 27.58	55.66 55.37	Ml4.7 mb5.1	IIEES NEIC
11	Kooreh	4787/01	27.92	53.80	140	0.4	386	2009/02/24	23:13:46	27.72	53.62	Mn3.0	IGTU
12	Tomban	4882/01	26.77	55.86	37	2.5	778	2009/02/25	01:13:16	26.74 26.98	55.75 55.78	Mn3.2 Ml2.8	IGTU IIEES
13	Kooreh	4787/02	27.92	53.80	35	0.4	386	2009/02/25	03:39:00				BHRC
14	Qotoor	4779/01	38.48	44.41	35	1.8		2009/02/25	17:28:54	38.70 38.66	44.47 44.47	Mn3.7 Ml3.4	IGTU IIEES
15	Farrashband	4785	28.86	52.09	31	1.7	630	2009/03/05	03:58:16	28.50	52.01	Mn2.7	IGTU
16	Veshnaveh	4818	34.25	51.00	54	2.4		2009/03/05	22:01:44	34.20	51.12	Mn4.2	IGTU
	Joshaghan Astarak	4887	34.05	51.22	9	3.4				34.24	51.16	Ml4.2	IIEES
17	Khanook	4773	30.72	56.78	19	1.7	1083	2009/03/07	06:47:07	30.81	56.70	Mw4.4	BHRC
	Hotkan	4804/01	30.85	56.79	100	1.3	837			30.86	56.73	Mn4.3	IGTU
	Qadrooni Dam	4805	30.96	56.82	15	2.8				30.79 30.79	56.77 56.77	Ml4.1 mb4.1	IIEES NEIC
18	Javad Abad	4871	35.22	51.67	29	3.1		2009/03/22	10:02:30	35.25 35.15	51.62 51.64	Mn3.5 Ml3.3	IGTU IIEES
19	Chalan Choolan	4812	33.66	48.91	49	1.0	428	2009/04/02	07:17:37	33.56 33.67	48.81 48.81	Mn3.6 Ml3.5	IGTU IIEES
20	Dasht-e-Abbas	4784	32.41	47.83	38	4.8		2009/04/07	17:32:53	32.53 32.96	47.83 47.81	Mn4.5 mb4.5	IGTU NEIC
21	Kooreh	4824/01	27.92	53.80	35	2.1	386	2009/04/14	18:33:42	27.52 27.70	53.75 53.89	Mn3.2 Ml3.3	IGTU IIEES
22	Bahmaei	4810	30.89	50.10	28	3.1		2009/04/15	04:15:20				BHRC
23	Behbahan 2	4783/01	30.59	50.26	27	4.2		2009/04/15	07:40:21	30.74	50.07	Mn4.4	IGTU
24	Sepid Dasht	4823/01	33.22	48.89	72	2.3	1177	2009/04/25	15:14:56	33.08	48.84	Mn4.4	IGTU
	Bakhtiyari Dam	4847	32.95	48.75	38	4.2				33.14 33.05	48.97 48.83	Ml4.4 mb4.6	IIEES NEIC
25	Showgan	4835/02	37.34	56.89	49	4.9		2009/04/25	15:16:14				BHRC
26	Khash	4794	28.22	61.21	11	10.7		2009/04/30	10:04:29	27.57	61.48	Mw5.4	BHRC
	Sabz Gaz	4795	28.34	61.46	16	11.4				27.70	61.51	Mn5.2	IGTU
	Sib Sooran	4796	27.29	62.00	12	9.6				27.84 27.82	61.27 61.46	Ml5.0 mb5.6	IIEES NEIC
27	Dalaki	4815	29.43	51.29	27	0.7	971	2009/05/02	02:36:51				BHRC
28	Sirch	4797	30.20	57.56	153	2.6	398	2009/05/11	02:14:06	30.27	57.54	Mw4.5	BHRC
	Joshan	4801	30.12	57.61	68	3.3	776						
	Shahdad	4798	30.41	57.69	22	3.1	1247			30.33	57.64	Mn4.9	IGTU
	Golbaf1	4800	29.89	57.73	20	5.9	365						
	Andoohjerd	4799	30.23	57.75	15	3.6	566			30.29	57.51	Ml4.8	IIEES
	Mahan	4802	30.07	57.29	14	4.7	1085			30.29	57.51	mb4.1	NEIC

Strong Motion Data (BHRC)								Seismological Data					
No.	Station	Record No.	Coordinate		U.P.G.A (cm/s/s)	ts-tp (sec)	Shear Wave Vel.	Origin Time		Epicenter		Magnitude	Ref.
			N	E				Y-M-D	h:m:s	N	E		
29	Joshan	4806	30.12	57.61	22	1.2	776	2009/05/12	06:30:51	30.20	57.63	Mn4.3	IGTU
	Sirch	4808	30.20	57.56	54	1.7	398			30.19	57.45	Ml3.7	IIEES
30	Aleshtar	4809	33.87	48.26	20	4.7	621	2009/05/26	23:52:48	33.94	48.60	Mw4.6	BHRC
	Boroojerd	4811/01	33.89	48.75	27	3.2	579			33.94	48.52	Mn4.8	IGTU
	Tooshk-e-Ab-e-Sard	4836/01	33.77	48.57	65	3.5	891			34.02	48.48	Ml4.7	IIEES
										34.01	48.52	mb4.7	NEIC
31	Boroojerd	4811/02	33.89	48.75	16	3.3	579	2009/05/27	00:10:50	33.93	48.54	Mn4.1	IGTU
	Tooshk-e-Ab-e-Sard	4836/02	33.77	48.57	22	3.5	891			33.98	48.48	Ml4.0	IIEES
										33.96	48.54	mb4.3	NEIC
32	Ardal	4819/01	32.00	50.66	60	1.3		2009/05/28	03:46:36	32.27	50.63	Mn2.8	IGTU
										31.35	50.75	Ml2.9	IIEES
33	Golbaf1	4966/02	29.89	57.73	67	2.7	365	2009/06/24	20:50:21	29.89	57.84	Mn4.0	IGTU
										29.96	57.71	Ml4.0	IIEES
34	Fin1	4880/01	27.63	55.90	27	4.9	681	2009/07/05	14:09:50	27.50	55.50	Mn4.2	IGTU
										27.70	55.62	Ml4.3	IIEES
										27.44	55.57	mb4.4	NEIC
35	Hashem Abad	4845	28.18	55.76	32	2.4	1287	2009/07/06	01:03:25	28.29	55.81	Mn3.6	IGTU
										28.21	55.82	Ml3.6	IIEES
36	Kaki	4843/02	28.34	51.52	39	2.0	470	2009/07/12	17:38:17	28.22	51.49	Mn3.5	IGTU
										28.47	51.56	Ml3.4	IIEES
37	Ghaemiyeh	4838	29.85	51.59	27	1.6	617	2009/07/14	14:28:38				BHRC
38	Tomban	4882/03	26.77	55.86	378	2.3	778	2009/07/22	03:53:03	26.89	55.61	Mn5.4	IGTU
	Tabl	4826/01	26.76	55.73	67	3.6	931			26.77	55.79	mb5.5	IIEES
	Bandar-e-Khamir	4825	26.95	55.58	29	4.5	679			26.83	55.78	mb5.5	NEIC
39	Tabl	4826/02	26.76	55.73	13	3.5	931	2009/07/22	04:26:32	26.72	55.72	Mn3.5	IGTU
	Tomban	4882/04	26.77	55.86	20	2.4	778			26.87	55.73	Ml3.5	IIEES
40	Tomban	4882/05	26.77	55.86	54	2.3	778	2009/07/22	04:32:49	26.77	55.72	Mn3.5	IGTU
										26.93	55.82	Ml3.2	IIEES
41	Tomban	4882/07	26.77	55.86	41	2.3	778	2009/07/22	04:35:13	26.99	55.83	Mn3.1	IGTU
42	Tomban	4882/08	26.77	55.86	42	2.3	778	2009/07/22	05:07:29	26.63	55.79	Mn3.2	IGTU
43	Tomban	4882/09	26.77	55.86	59	2.4	778	2009/07/22	05:20:49	26.82	55.71	Mn3.2	IGTU
										26.54	55.75	Ml3.0	IIEES
44	Tomban	4882/10	26.77	55.86	30	2.3	778	2009/07/22	05:41:33	26.87	55.78	Mn3.1	IGTU
45	Tomban	4882/11	26.77	55.86	81	2.3	778	2009/07/22	05:46:57	26.76	55.74	Mn3.6	IGTU
										26.99	55.76	Ml3.1	IIEES
46	Tomban	4882/12	26.77	55.86	200	2.3	778	2009/07/22	06:50:00	26.75	55.78	Mn4.1	IGTU
										26.95	55.75	Ml3.8	IIEES
47	Tomban	4882/13	26.77	55.86	38	2.3	778	2009/07/22	09:10:06	26.66	55.81	Mn3.4	IGTU
										26.95	55.77	Ml3.1	IIEES
48	Tomban	4882/14	26.77	55.86	35	2.3	778	2009/07/22	17:44:55	26.96	55.79	Mn3.8	IGTU
										26.91	55.94	Ml3.7	IIEES
49	Qotoor	4829/02	38.48	44.41	39	1.2		2009/07/25	07:41:56	38.49	44.40	Mn3.4	IGTU
										38.50	44.14	Ml3.0	IIEES
50	Tomban	4882/16	26.77	55.86	26	2.3	778	2009/07/25	10:42:04				BHRC
51	Tomban	4882/17	26.77	55.86	33	2.3	778	2009/07/27	19:16:25				BHRC
52	Dalaki	4842	29.43	51.29	28	2.1	971	2009/08/08	14:18:42	29.42	51.25	Mn3.9	IGTU
										29.58	51.37	Ml4.0	IIEES
53	Bagh-Malek	4827	31.54	49.87	18	4.1		2009/08/13	06:12:42	31.59	49.84	Mn4.3	IGTU
	Izeh1	4828	31.82	49.86	25	3.0				31.61	49.86	Ml4.1	IIEES
										31.61	49.86	mb4.2	NEIC
54	Reiskola	4830/01	36.38	52.03	27	1.9	525	2009/08/13	13:57:45	36.33	52.06	Mn4.0	IGTU
										36.39	51.94	Ml3.8	IIEES
55	Reiskola	4830/02	36.38	52.03	119	2.2	525	2009/08/14	22:05:03	36.47	52.07	Mn4.4	IGTU
	Baladeh	4898	36.20	51.80	12	4.5				36.33	52.02	Ml4.2	IIEES
										36.45	52.07	mb4.1	NEIC
56	Reiskola	4830/04	36.38	52.03	39	1.7	525	2009/08/15	00:28:40	36.34	52.00	Mn3.8	IGTU
										36.23	51.91	Ml3.8	IIEES
57	Abad	4891	29.02	51.26	31	2.1	482	2009/08/15	04:46:42	28.90	51.25	Mn3.3	IGTU
										28.99	51.21	Ml3.4	IIEES

Strong Motion Data (BHRC)								Seismological Data					
No.	Station	Record No.	Coordinate		U.P.G.A (cm/s/s)	ts-tp (sec)	Shear Wave Vel.	Origin Time		Epicenter		Magnitude	Ref.
			N	E				Y-M-D	h:m:s	N	E		
58	Ali Abad	4841	27.70	54.69	31	2.7	1729	2009/08/22	04:08:02	27.73 28.08	54.73 54.77	Mn3.7 Ml3.6	IGTU IIEES
59	Tomban	4882/19	26.77	55.86	66	2.3	778	2009/08/29	01:40:37	27.11 27.09	55.72 55.67	Mn3.4 Ml3.3	IGTU IIEES
60	Tomban	4882/20	26.77	55.86	24	2.3	778	2009/08/29	09:37:20	26.86 27.27	55.73 55.79	Mn3.6 Ml3.0	IGTU IIEES
61	Tomban	4882/21	26.77	55.86	31	2.4	778	2009/08/30	16:36:23				BHRC
62	Tomban	4882/22	26.77	55.86	95	2.4	778	2009/09/04	00:55:19	26.76 26.93	55.80 55.94	Mn3.6 Ml3.3	IGTU IIEES
63	Naveh Shirindareh Dam1	4844 5053	37.67 37.71	57.42 57.11	124 12	1.8 3.8		2009/09/11	20:53:01	37.88 38.14	57.48 57.49	Mn4.0 Ml3.7	IGTU IIEES
64	Konar Takhteh	4920	29.53	51.40	27	2.7	450	2009/09/26	19:44:59	29.55 29.55	51.50 51.47	Mn3.7 Ml3.8	IGTU IIEES
65	Bandar-e-Abbas 2	4878/01	27.19	56.30	18	3.6		2009/09/30	19:39:55	27.06	56.01	Mn4.1	IGTU
	Bandar-e-Abbas 1	4879/01	27.19	56.29	22	3.7	337			27.26	56.07	Ml4.1	IIEES
66	AbbasPoor Dam 3	4929	32.05	49.60	65	2.9		2009/10/04	21:50:50	31.94	49.42	Mw5.1	BHRC
	AbbasPoor Dam 1	4927	32.05	49.60	48	3.1							
	Masjed Soleyman	4853	31.98	49.25	35	5.7				31.87	49.49	Mn5.1	IGTU
	AbbasPoor Dam 2	4928	32.05	49.60	33	2.8							
	Izeh1	4852	31.82	49.86	30	4.8				31.82	49.54	Ml5.1	IIEES
	Lali	4933/01	32.34	49.09	19	10.2							
	Gotvand Dam1	4931/01	32.27	48.92	12	10.9				31.76	49.68	mb5.1	NEIC
67	Fin1	4880/02	27.63	55.90	35	3.0	681	2009/10/10	01:25:32	27.51 27.42	55.78 55.77	Mn3.4 Ml3.3	IGTU IIEES
68	Fin1	4880/03	27.63	55.90	127	3.0	681	2009/10/10	01:28:09	27.57 27.48	55.75 55.78	Mn4.0 Ml3.8	IGTU IIEES
69	Fin1	4880/04	27.63	55.90	26	2.9	681	2009/10/10	07:31:03	27.55 27.60	55.68 55.91	Mn3.3 Ml3.2	IGTU IIEES
70	Dinevar1	4854	34.58	47.45	19	9.1	514	2009/10/13	00:54:27	35.05	46.93	Mw5.1	BHRC
	Kamyaran	4855	34.79	46.93	177	3.6				34.88 34.94	46.85 46.95	Mn4.8 Ml4.9	IGTU IIEES
	Sonqor	4856	34.79	47.60	13	8.3	1477			34.94	46.89	Mw4.8	NEIC
71	Tehran 13	4866	35.65	51.40	28	7.9		2009/10/17	10:53:57	35.58	51.59	Mw3.8	BHRC
	Hassan Abad	4862	35.37	51.25	27	-	450						
	Qani Abad	4858	35.57	51.52	27	2.3							
	Tehran 1	4860	35.59	51.43	25	2.4				35.57	51.50	Mn4.0	IGTU
	Chahardangeh1	4868	35.60	51.30	23	3.9							
	Latiyan Dam2	5102	35.79	51.68	22	4.2				35.50	51.59	Ml3.9	IIEES
	Tehran 69	4907	35.65	51.40	21	-							
	Tehran 26	4911	35.70	51.35	21	-							
	Ghaleno	4859	35.51	51.52	17	2.2							
	Chehel Ghez	4857	35.54	51.65	15	3.0				35.6	51.6	Mw3.8	BHRC
	Tehran 29	4864	35.68	51.41	14	3.1							
	Tehran 2	4863	35.73	51.40	13	3.5							
	Tehran58	4867	35.56	51.36	11	2.8							
	Tehran 75	4909	35.55	51.37	11	-							
	Tehran 53	4865	35.50	51.37	9	3.4		2009/10/17	10:53:57	35.57	51.50	Mn4.0	IGTU
	Tehran 64	4904	35.50	51.37	8	-	323						
	Tehran 18	4861	35.74	51.37	8	3.9							
	Tehran 74	4908	35.76	51.41	8	-							
	Tehran 77	4910	35.55	51.37	3	-							
	Tehran 67	4906	35.72	51.27	8	-				35.50	51.59	Ml3.9	IIEES
	Tehran 68	4905	35.72	51.27	1	-							

Strong Motion Data (BHRC)								Seismological Data					
No.	Station	Record No.	Coordinate		U.P.G.A (cm/s/s)	ts-tp (sec)	Shear Wave Vel.	Origin Time		Epicenter		Magnitude	Ref.
			N	E				Y-M-D	h:m:s	N	E		
72	Joshan	4869	30.12	57.61	148	1.0	776	2009/10/17	17:08:10	30.19	57.70	Mn4.4	IGTU
	Sirch	4870/02	30.20	57.56	13	2.4	398			30.17	57.40	Ml4.1	IIEES
73	Fin1	4880/05	27.63	55.90	43	2.9	681	2009/10/21	00:44:07	27.56	55.79	Mn3.4	IGTU
										27.64	55.87	Ml3.3	IIEES
74	Hotkan	4967/01	30.85	56.79	47	-	837	2009/10/27	17:19:36	30.95	56.78	Mn3.8	IGTU
75	Changoureh1	4912/01	35.78	48.96	27	2.0	468	2009/11/02	09:34:54	35.75	48.98	Mn3.1	IGTU
										35.76	48.85	Ml3.0	IIEES
76	Bandar-e-Abbas 3	4973	27.19	56.30	478	-		2009/11/03	23:26:49	27.24	56.20	Mn4.9	IGTU
	Qeshm	4876	26.96	56.28	14	5.9	757			27.22	56.19	Ml4.9	IIEES
										27.33	56.20	mb5.1	NEIC
77	Bandar-e-Abbas 2	4878/03	27.19	56.30	140	1.7		2009/11/06	00:00:03	27.39	56.35	Mn3.8	IGTU
	Bandar-e-Abbas 1	4879/03	27.19	56.29	91	1.9	337			27.25	56.20	Ml3.8	IIEES
78	Bostan Abad	4893	37.85	46.84	42	1.8		2009/11/22	17:29:23	38.05	46.96	Mn3.8	IGTU
										37.96	46.97	Ml3.8	IIEES
79	Zahedshahr	4895	28.74	53.81	28	2.4	390	2009/12/02	12:37:54	28.52	53.66	Mn4.5	IGTU
										28.58	53.49	Ml4.5	IIEES
										28.66	53.67	mb4.6	NEIC
80	Bandar-e-Dayyer	4965	27.83	51.93	43	2.1	508	2009/12/10	06:09:17	27.92	51.94	Mn2.9	IGTU
81	Kooreh	4919/02	27.92	53.80	38	3.8	386	2009/12/12	21:37:36	27.65	53.39	Mn4.3	IGTU
										27.49	53.22	Ml4.4	IIEES
										27.61	53.33	mb4.9	NEIC
82	Khonj	4894	27.89	53.43	29	2.2	308	2009/12/13	20:24:37				BHRC
83	Khonj	4896/01	27.89	53.43	46	2.0	308	2009/12/14	11:18:30	27.97	53.53	Mn2.9	IGTU
84	Khonj	4918	27.89	53.43	46	1.9	308	2009/12/14	11:18:30	27.97	53.53	Mn2.9	IGTU
85	Masjed Soleyman	4913	31.98	49.25	42	2.0		2009/12/21	23:08:37	31.90	49.32	Mn3.8	IGTU
										31.87	49.28	Ml3.7	IIEES
86	Tooshk-e-Ab-e-Sard	5042	33.77	48.57	23	2.8	891	2009/12/24	17:17:15	33.87	48.40	Mw3.9	BHRC
	Khoram Abad2	5040	33.52	48.37	20	5.1	821			33.71	48.28	Mn3.9	IGTU
	Khoram Abad1	5039	33.49	48.36	15	5.3				33.89	48.48	Ml3.9	IIEES
87	Lali	4933/02	32.34	49.09	33	2.2		2009/12/25	06:37:58	32.17	48.99	Mn3.8	IGTU
										32.29	49.06	Ml3.8	IIEES
88	Gotvand Dam1	4931/02	32.27	48.92	13	3.0		2009/12/25	07:17:55	32.20	48.97	Mn3.8	IGTU
	Lali	4933/03	32.34	49.09	18	2.3				32.26	49.07	Ml3.7	IIEES