



*REPUBLIC OF TURKEY
Prime Ministry
Disaster And Emergency Management Presidency,
Earthquake Department, Ankara - TURKEY*

*PRELIMINARY REPORT ON
SAROS BAY EARTHQUAKE
(WESTERN TURKEY)
MI= 5.3*

An earthquake with magnitude $M_L=5.3$ occurred at local time 04:51 on November, 03, 2010. Epicentral coordinates of the earthquake is determined as 40.3997 N-26.3147 E with focal depth 28.9 km. The earthquake also was felt in the neighboring provinces of Çanakkale, Bursa, Balıkesir, Tekirdağ, İstanbul.

According to the data were determined in DDA Ankara Center: After the main shock, 17 aftershock occurred in the same day. Aftershocks were determined with magnitude range 1.7–2.8 (Fig. 1).

Main shock and aftershocks is associated to Saros Fault (strike N75E, length= 42 km). Earthquake activity in the last one year are given in Fig.2

Historical and Instrumental Period earthquakes for this region are given in Table 1, 2

Moment Tensor Solutions of the main shock is shown in (Fig.3). Mechanism solutions show a right lateral strike slip faulting. acceleration – time records, maximum acceleration values, peak ground acceleration and seismic intensity map are given in Fig.4, (Fig.5a-l), Fig. 6,7,8,9

Earthquake activity of this region (and all of Turkey) has been observed in Earthquake Department Data Center Ankara 7 day/24 hours with 174 seismic station and 300 accelerometer. Obtained results are shared with public, press and relevant authorized

For your information.

ACCELERATION VALUES OF SAROS BAY ($M_L=5.3$) EARTHQUAKE

No	Station		Equipment Type	NS (gal)	EW (gal)	Vertical (gal)	Distance of station to epicenter (km)
	City	District					
1	ÇANAKKALE	MERKEZ	CMG-5TD	22.84	25.68	9.33	29.6
2	EDİRNE	ENEZ	CMG-5TD	31.15	25.85	10.60	40.9
3	ÇANAKKALE	BOZCAADA	CMG-5TD	2.56	3.26	1.50	60.7
4	BALIKESİR	EDREMİT	CMG-5TD	7.19	7.82	3.83	108.0
5	BALIKESİR	GÖNEN	CMG-5TD	4.75	4.78	4.41	117.3
6	BALIKESİR	MERKEZ	CMG-5TD	5.28	6.08	2.57	156.0
7	İSTANBUL	K.ÇEKMECE	CMG-5TD	5.25	4.04	1.53	216.0
8	MANİSA	MERKEZ	CMG-5TD	0.94	1.05	0.46	219.0
9	BURSA	KELES	CMG-5TD	2.19	1.99	1.47	254.0
10	MANİSA	SALİHLİ	CMG-5TD	1.52	1.27	0.79	265.0
11	KÜTAHYA	EMET	CMG-5TD	1.04	0.86	0.69	278.0

HISTORICAL AND INSTRUMENTAL SEISMICITY OF SAROS BAY REGION

The earthquakes which occurred in historical and instrumental period in this region are given below

Historical Period

DATE	LATITUDE	LONGITUDE	INTENSITY	LOCATION
93	40.6	26.7	6	Gelibolu
138	40.15	26.4	6	Çanakkale
368	?	?	8	Çanakkale
14.10.1344	?	?	?	Gelibolu
1354-56	40.8	27	8	Gelibolu-Bolayır-Malkara
?04.1672	40.?	26.?	8	Bozcaada
02.11.1762	40.15	26.4	7	Çanakkale
1831	37.7	26.8	6	Çanakkale-Sisam Island
25.11.1835	40.15	26.6	6	Çanakkale
19.9.1846	40.41	26.65	6	Gelibolu
4.7.1847	40.41	26.65	6	Gelibolu
17.08.1860	?	?	8	Gelibolu-Sakız
22.08.1860	40.41	26.65	6	Gelibolu-Sakız
14.6.1864	40.3	26.5	6	Gelibolu-Çanakkale
23.02.1865	40.15	26.4	8	Midilli-Çanakkale
23.07.1865	39.4	26.2	9	Midilli-Çanakkale-Gelibolu
20.3.1867	40.41	26.65	6	Gelibolu
31.3.1867	39.3	26.3	6	Edirne - Midilli
23.04.1868	40.15	26.4	6	Midilli-Çanakkale
17.05.1868	40.15	26.4	?	Midilli-Çanakkale
30.07.1868	?	?	?	Midilli-Çanakkale
03.01.1870	40.5	26.5	6	Saros Bay
11.10.1871	40.41	26.65	5	Gelibolu
13.12.1872	40.3	26.5	6	Gelibolu-Çanakkale
18.08.1874	40.2	26.4	6	Çanakkale-Edremit
05.03.1875	40.15	26.4	7	Çanakkale
??10.1875	40.15	26.4	9	Çanakkale
23.12.1875	40.2	26.4	6	Çanakkale,Ezine
25.10.1876	40.15	26.4	6	Çanakkale
04.10.1881	40.4	26.7	6	Gelibolu-Edirne
23.01.1884	39.78	26.3	6	Ezine-Çanakkale
03.08.1894	40.2	26.4	5	Çanakkale-Biga-Lapseki
16.01.1895	40.41	26.7	5	Gelibolu-Edirne

Table 1: Historical time earthquakes for Çanakkale-Saros Bay Region

Instrumental Period

Instrumental Period
(Year) 1912 M= 7.2 Şarköy-Mürefte
M= 6.3 Şarköy-Mürefte
M = 6.8 Şarköy-Mürefte
1953 M= 7.2 Yenice-Gönen
1975 M =5.0 Ezine
1975 M= 5.5 Gelibolu
1983 M= 5.4 Biga

Table 2: Instrumental time earthquakes for Çanakkale-Saros Bay Region

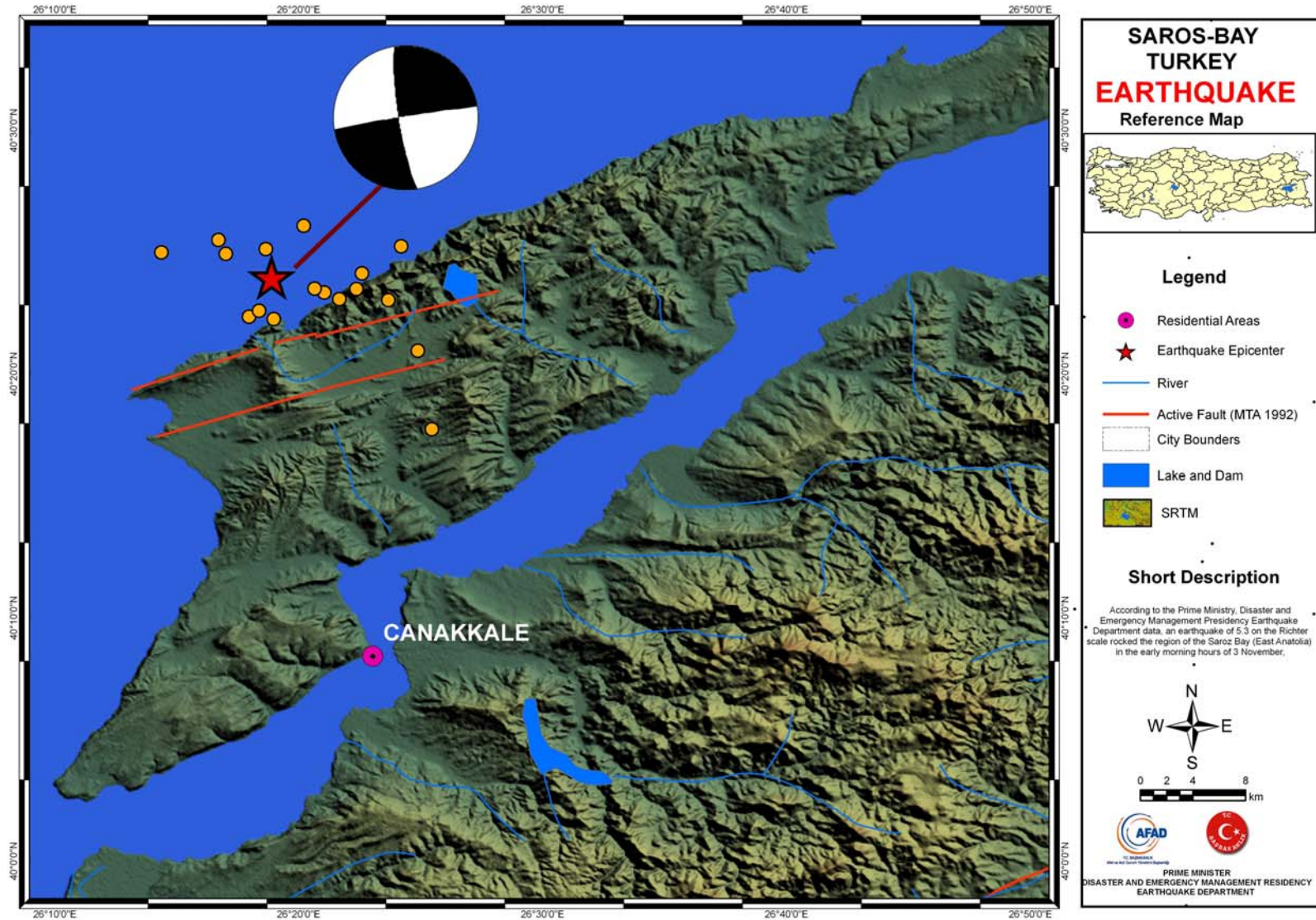


Figure 1: Main shock and aftershock distribution of Saros Bay Earthquake

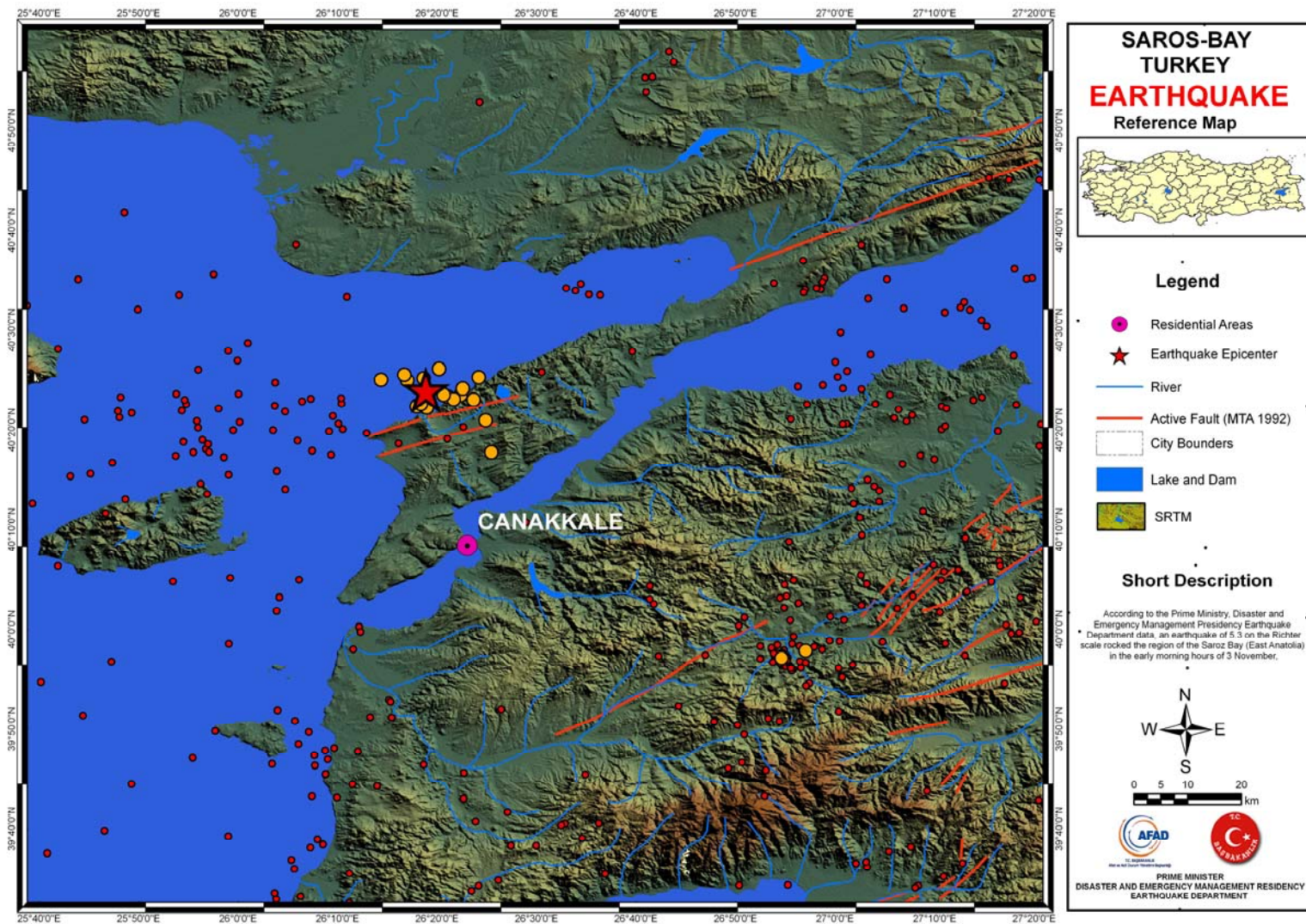


Figure 2: Earthquake activity in the last one year for this region

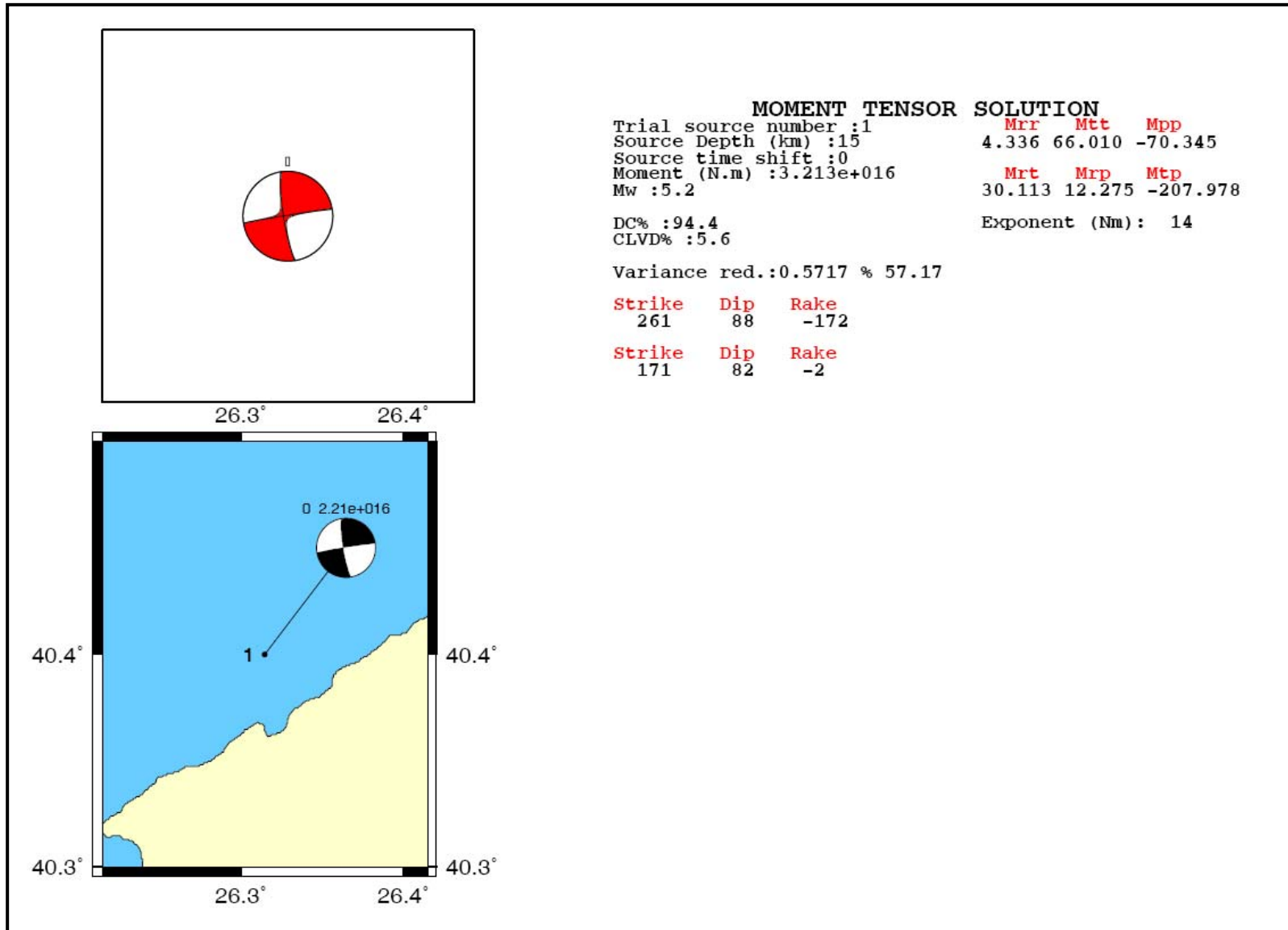


Figure 3: Moment Tensor Solutions of Saros Bay Earthquake

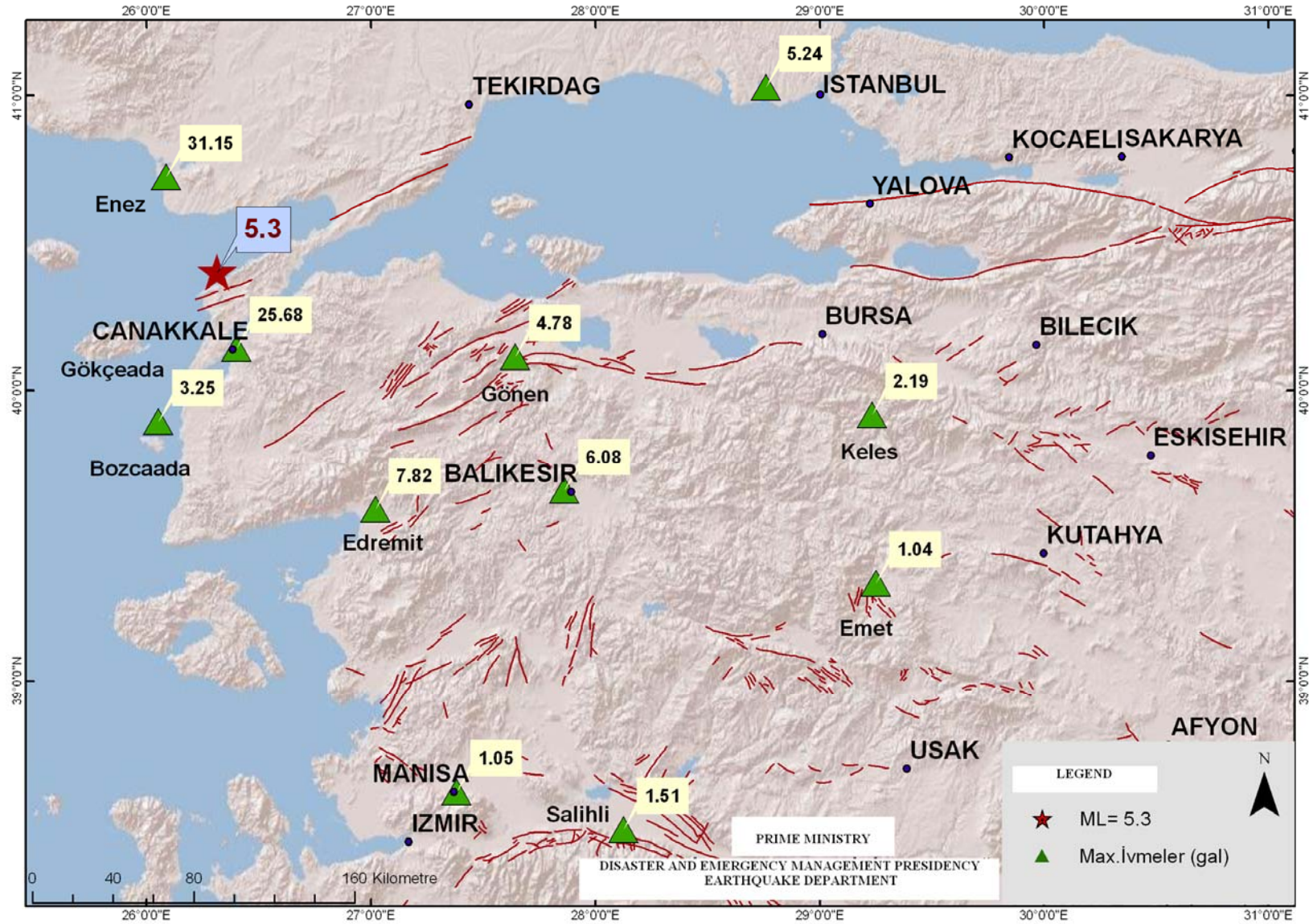


Figure 4: Maximum Acceleration Values of Saros Bay Earthquake

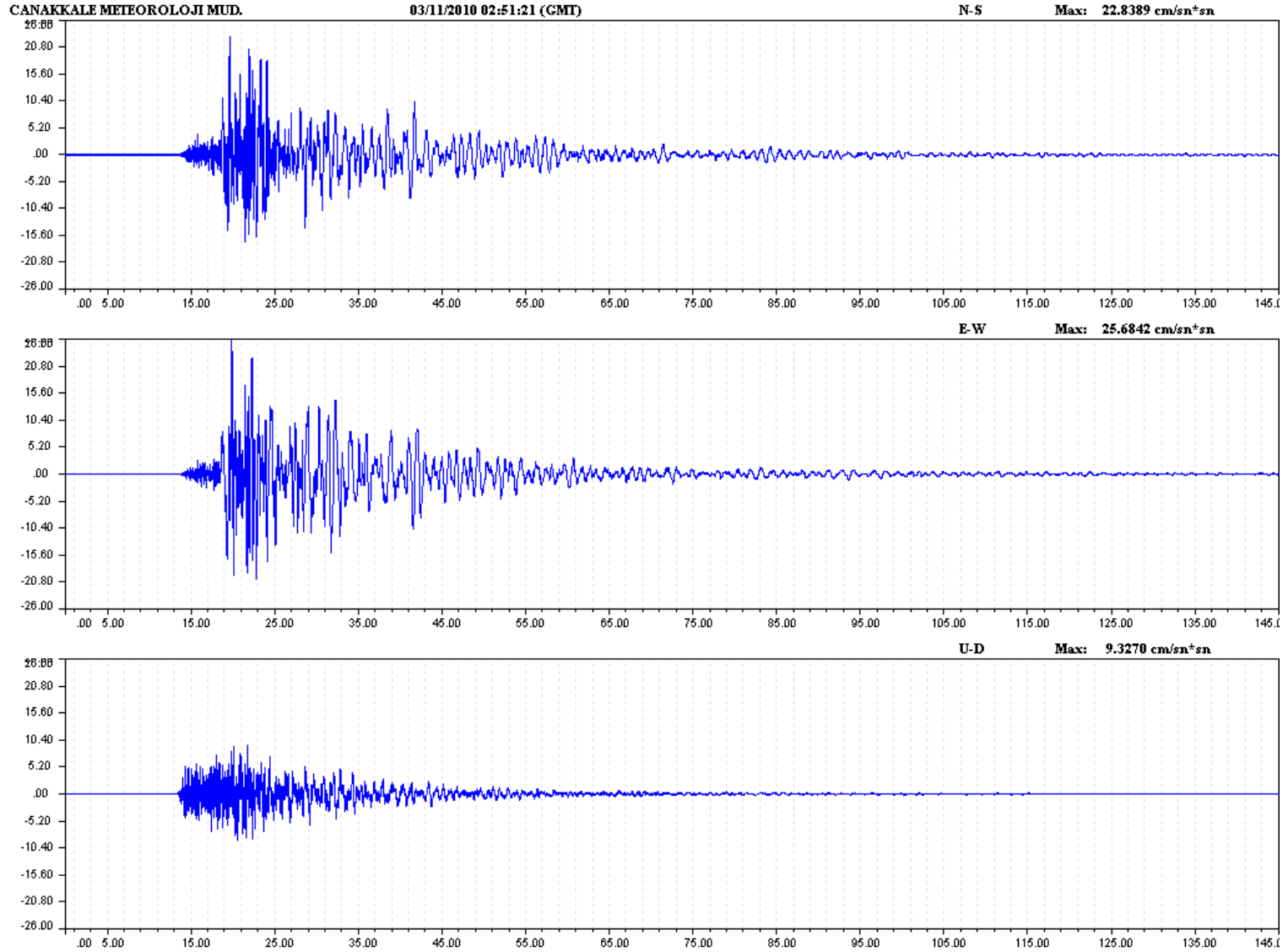


Figure 5a: acceleration-time record according to Çanakkale Station

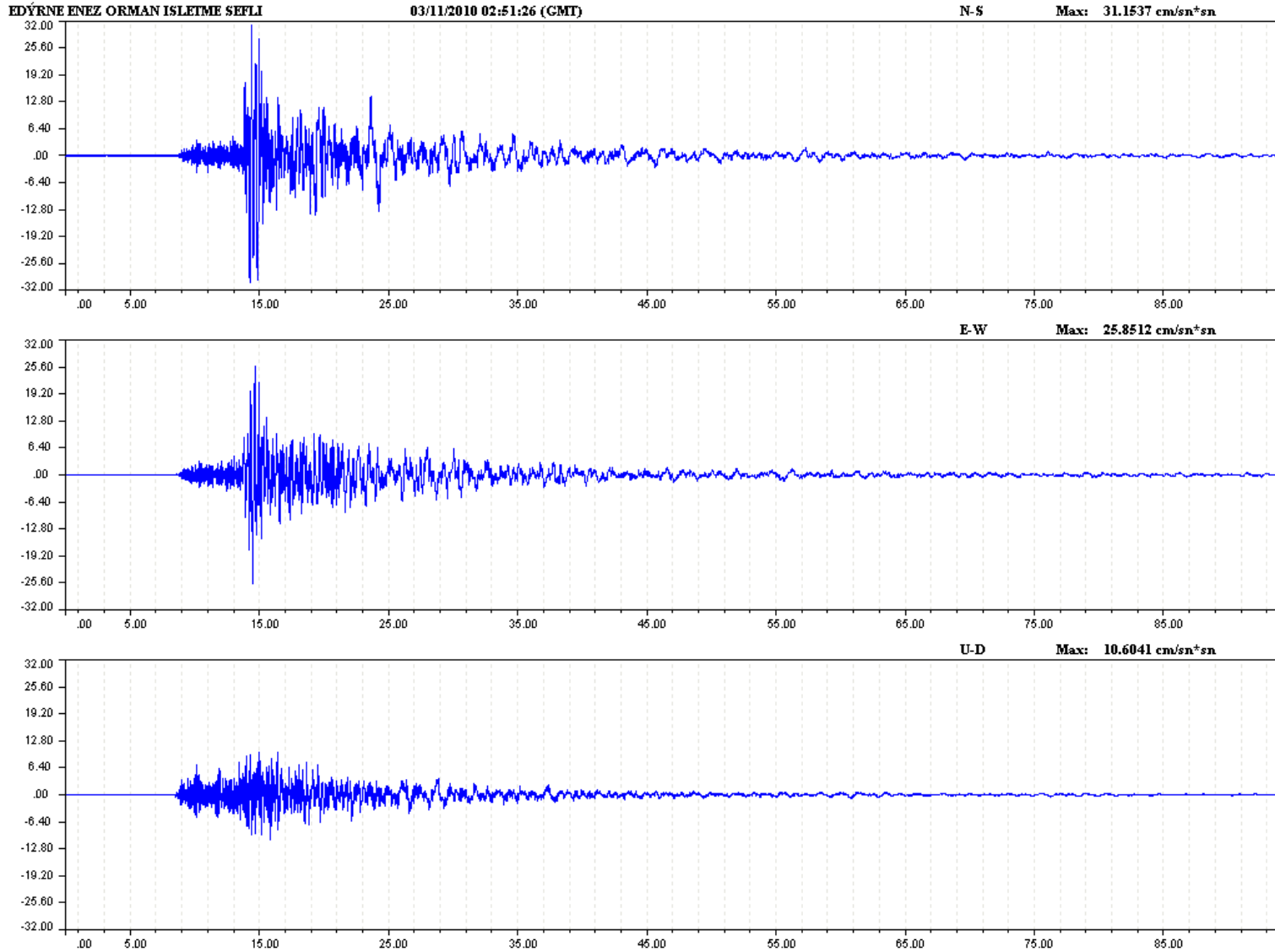


Figure 5b: acceleration-time record according to Edirne-Enez Station

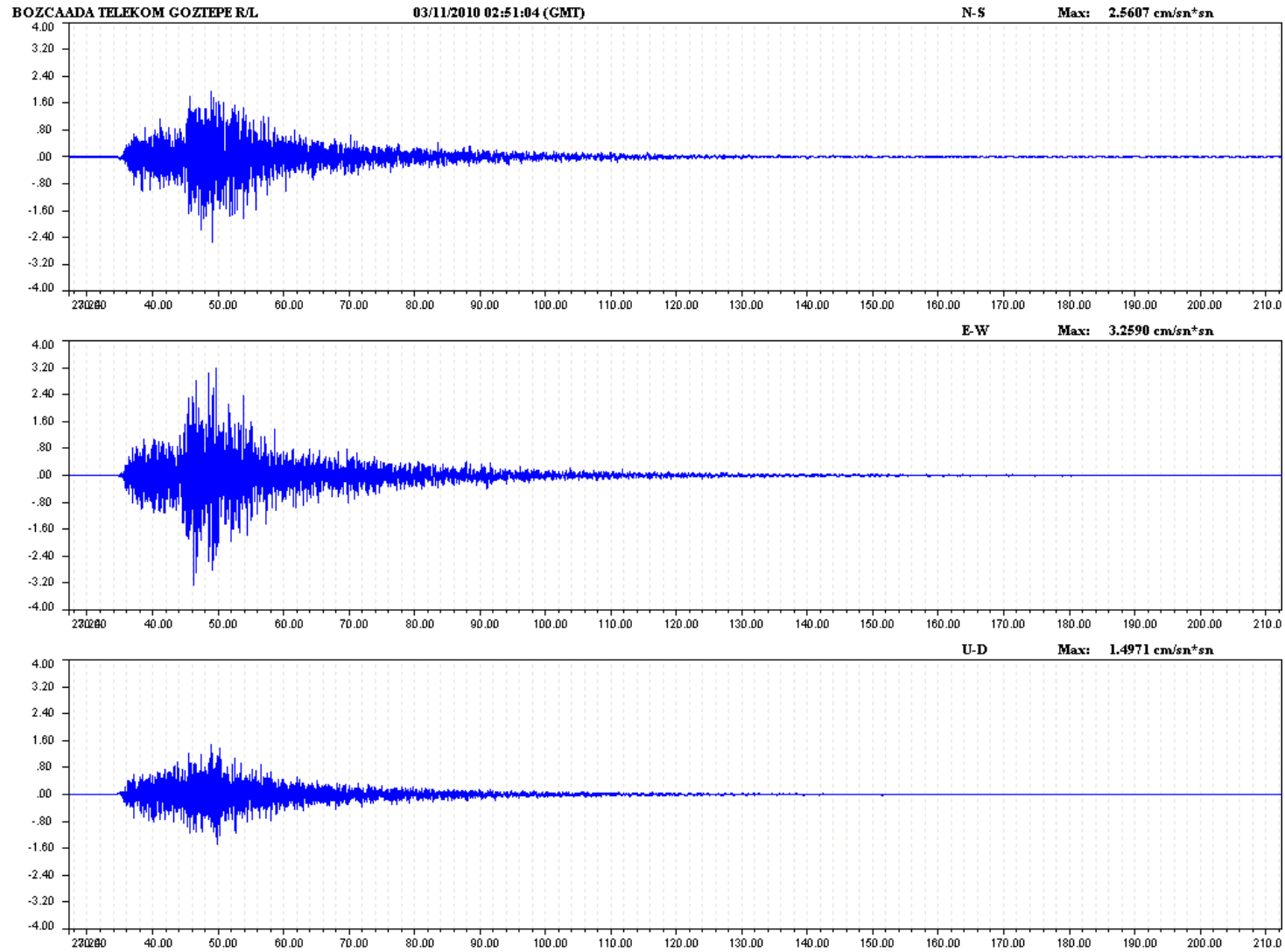


Figure 5c: acceleration-time record according to Bozcaada Station

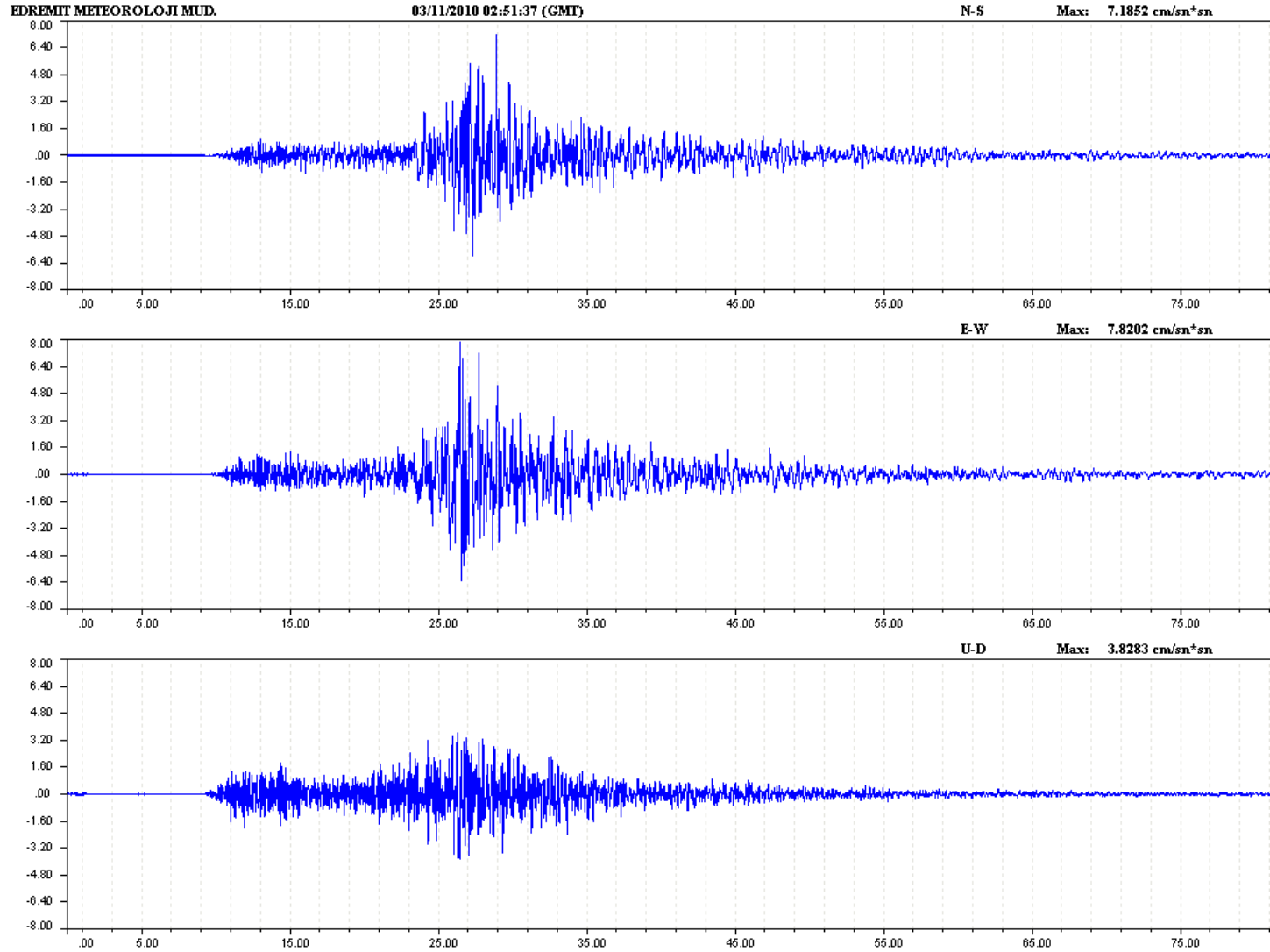


Figure 5d: acceleration-time record according to Edremit Station

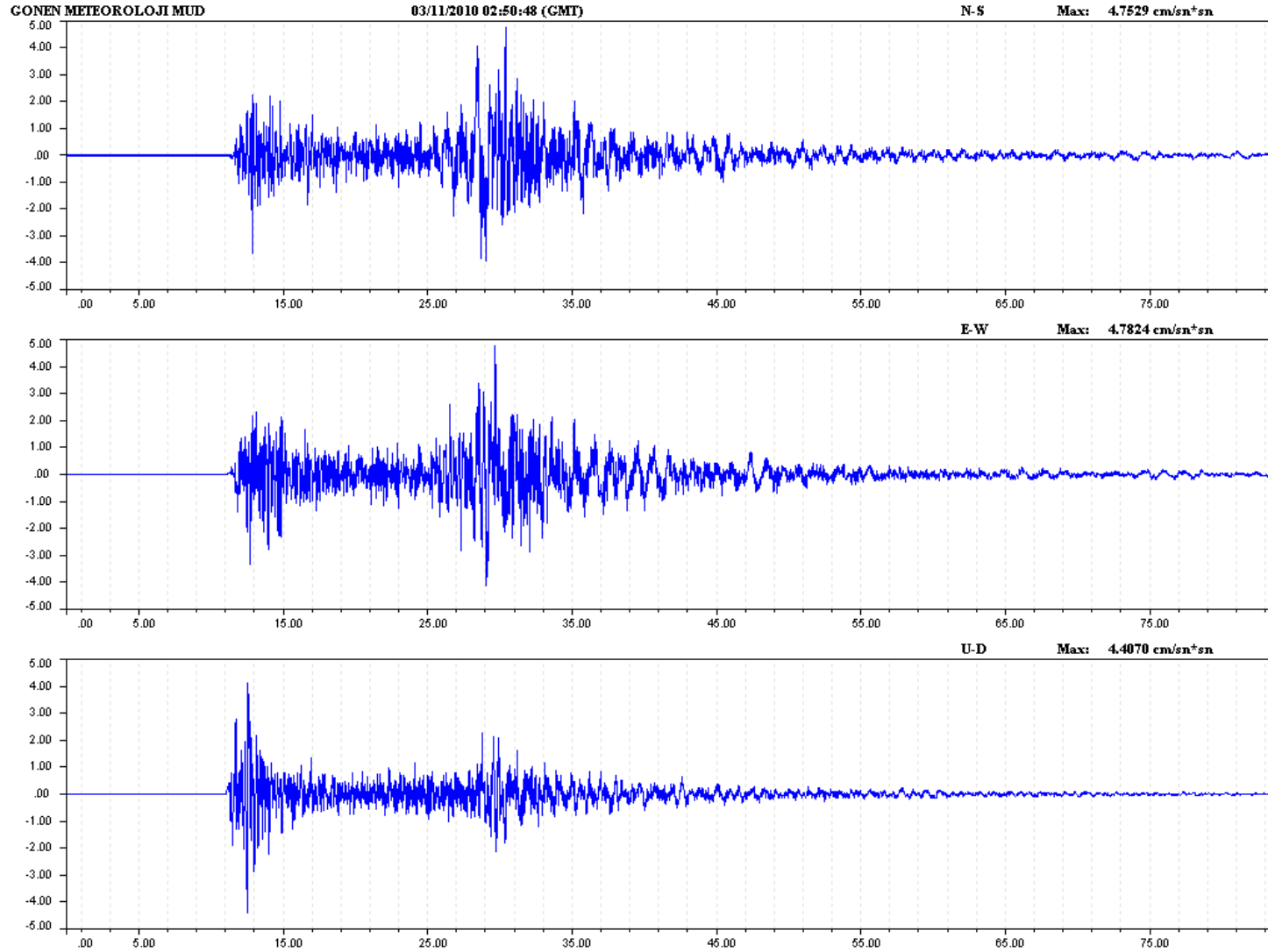


Figure 5e: acceleration-time record according to Gönen Station

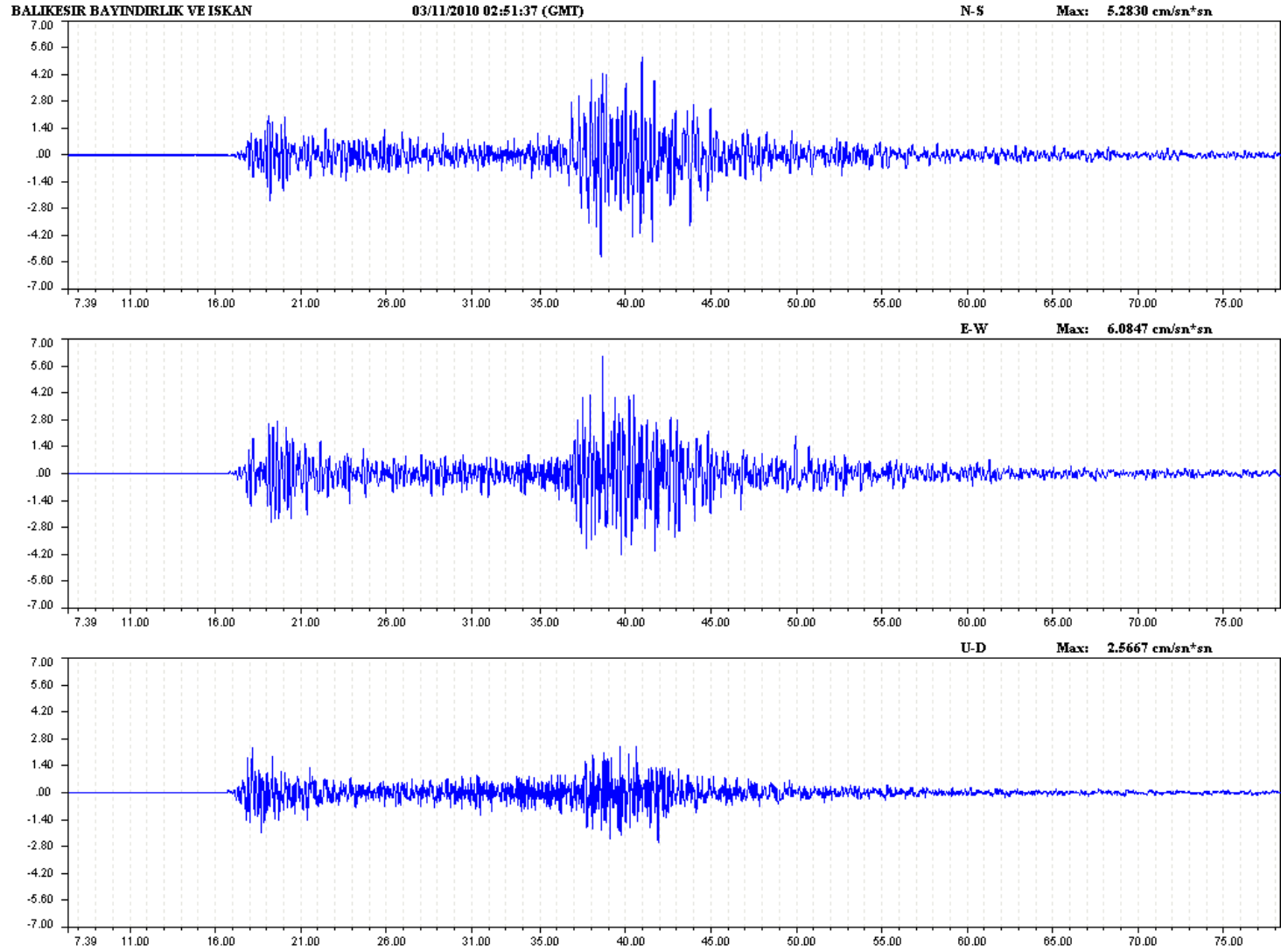


Figure 5f: acceleration-time record according to Balıkesir Station

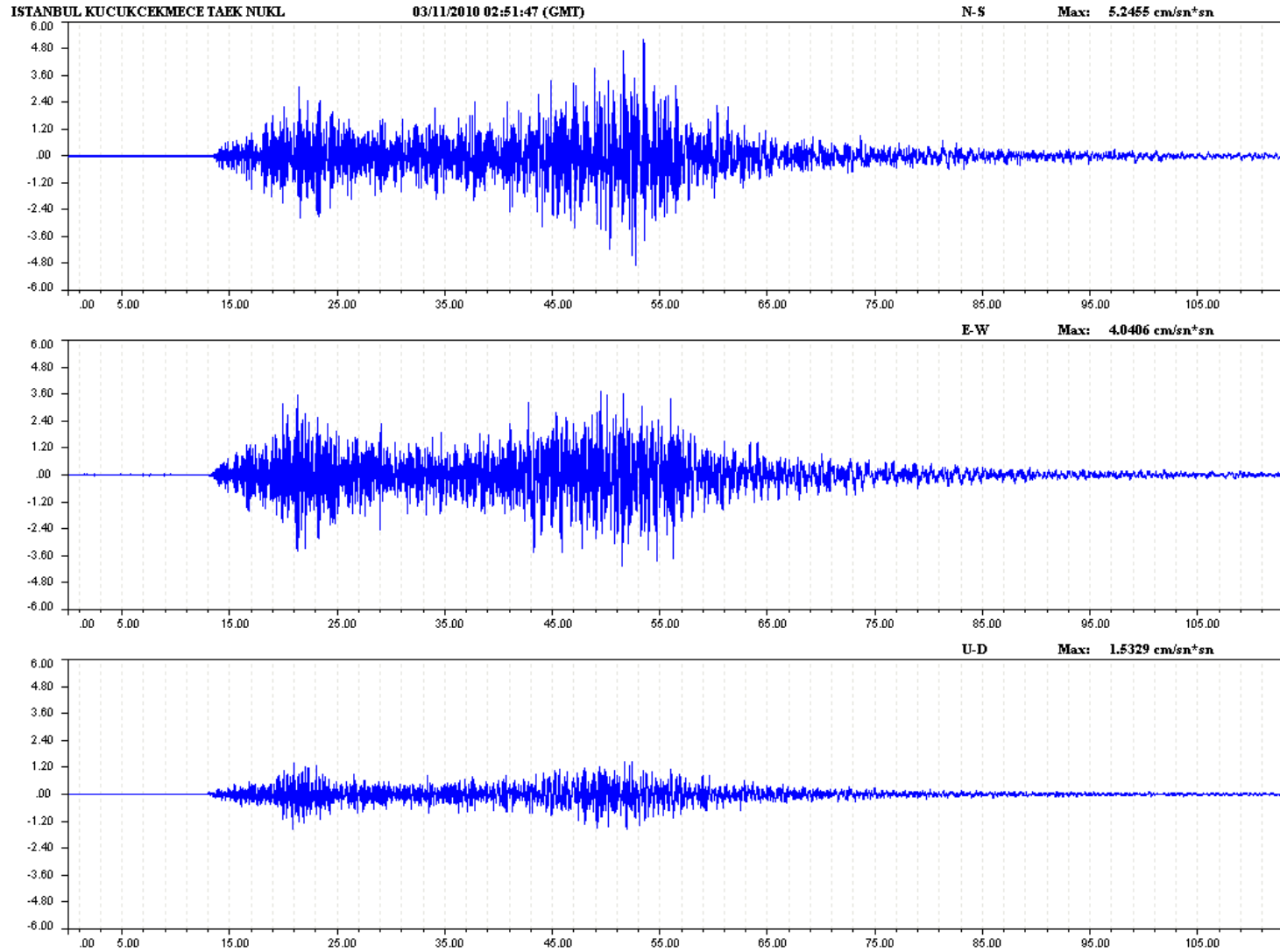


Figure 5g: acceleration-time record according to İstanbul-Küçükçekmece Station

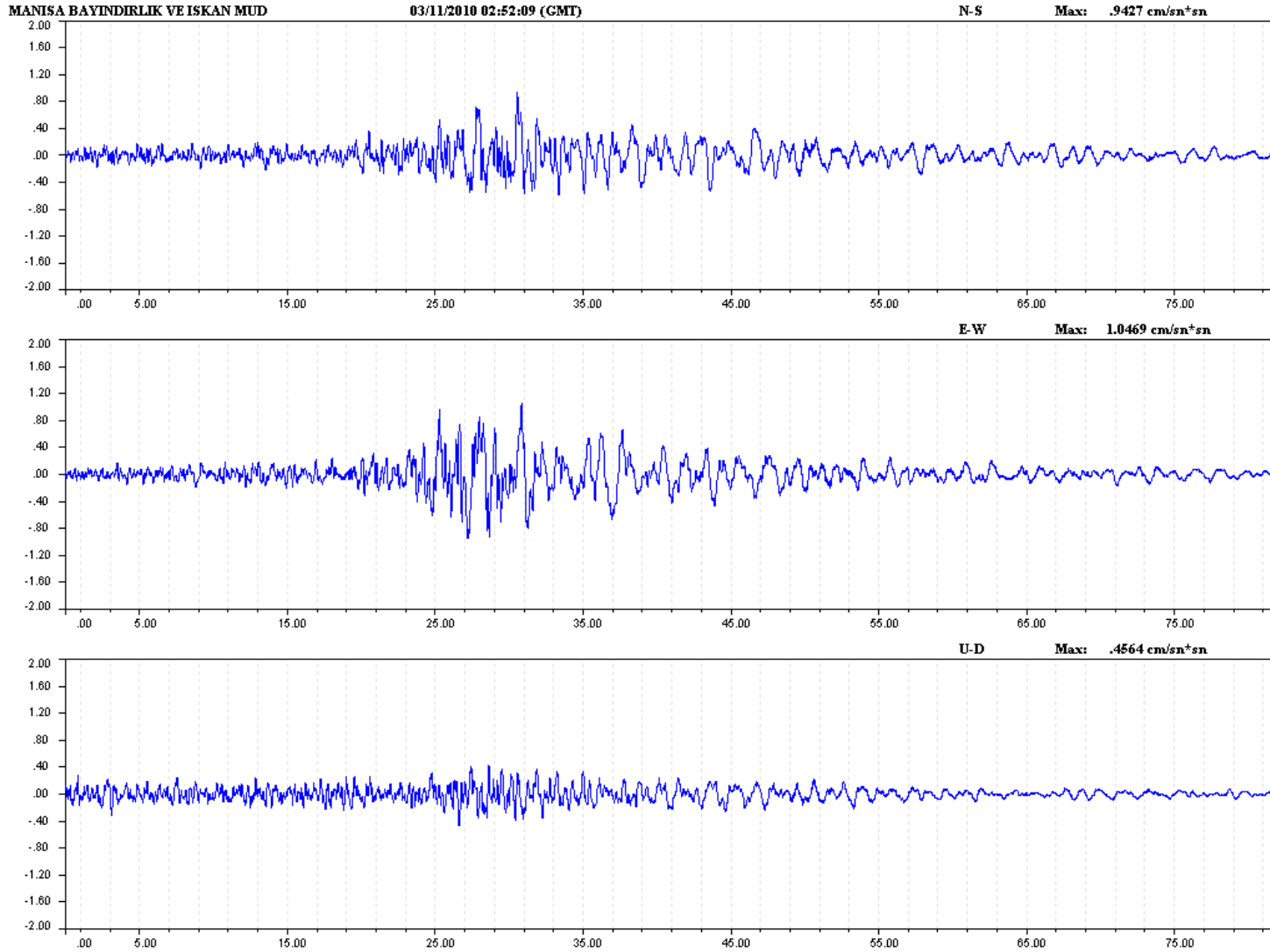


Figure 5h: acceleration-time record according to Manisa Station

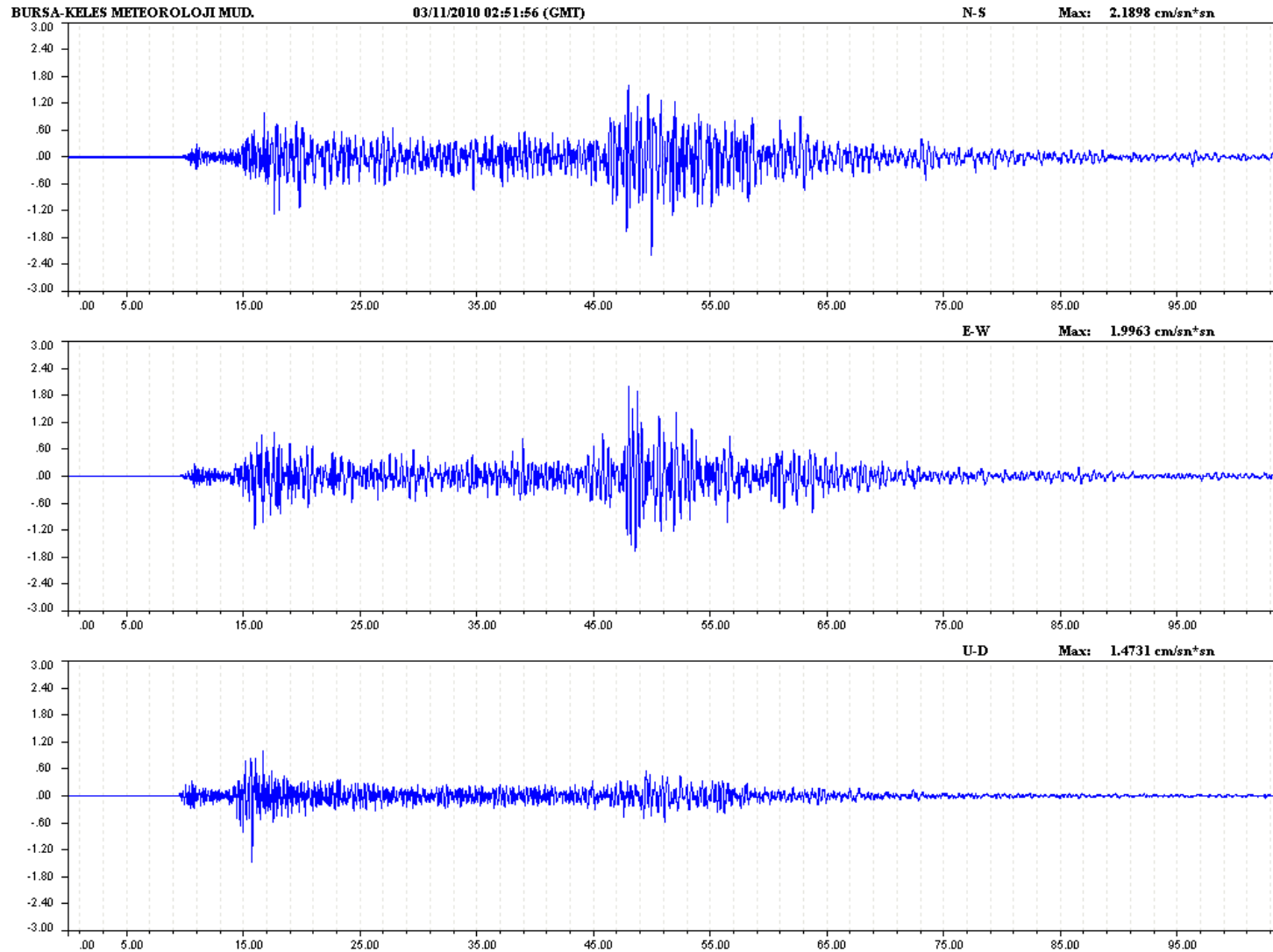


Figure 5j: acceleration-time record according to Bursa-Keles Station

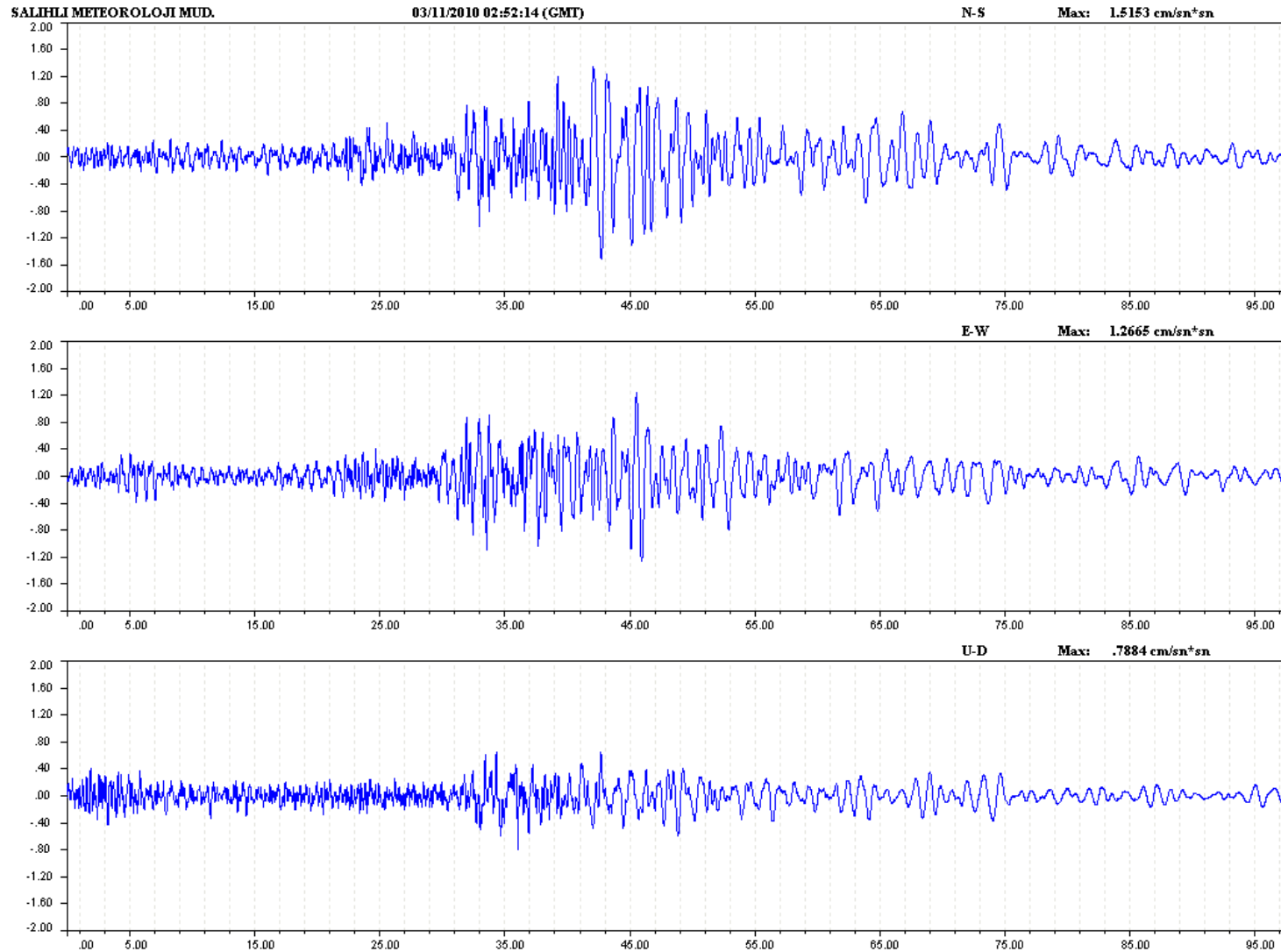


Figure 5k: acceleration-time record according to Salihli Station

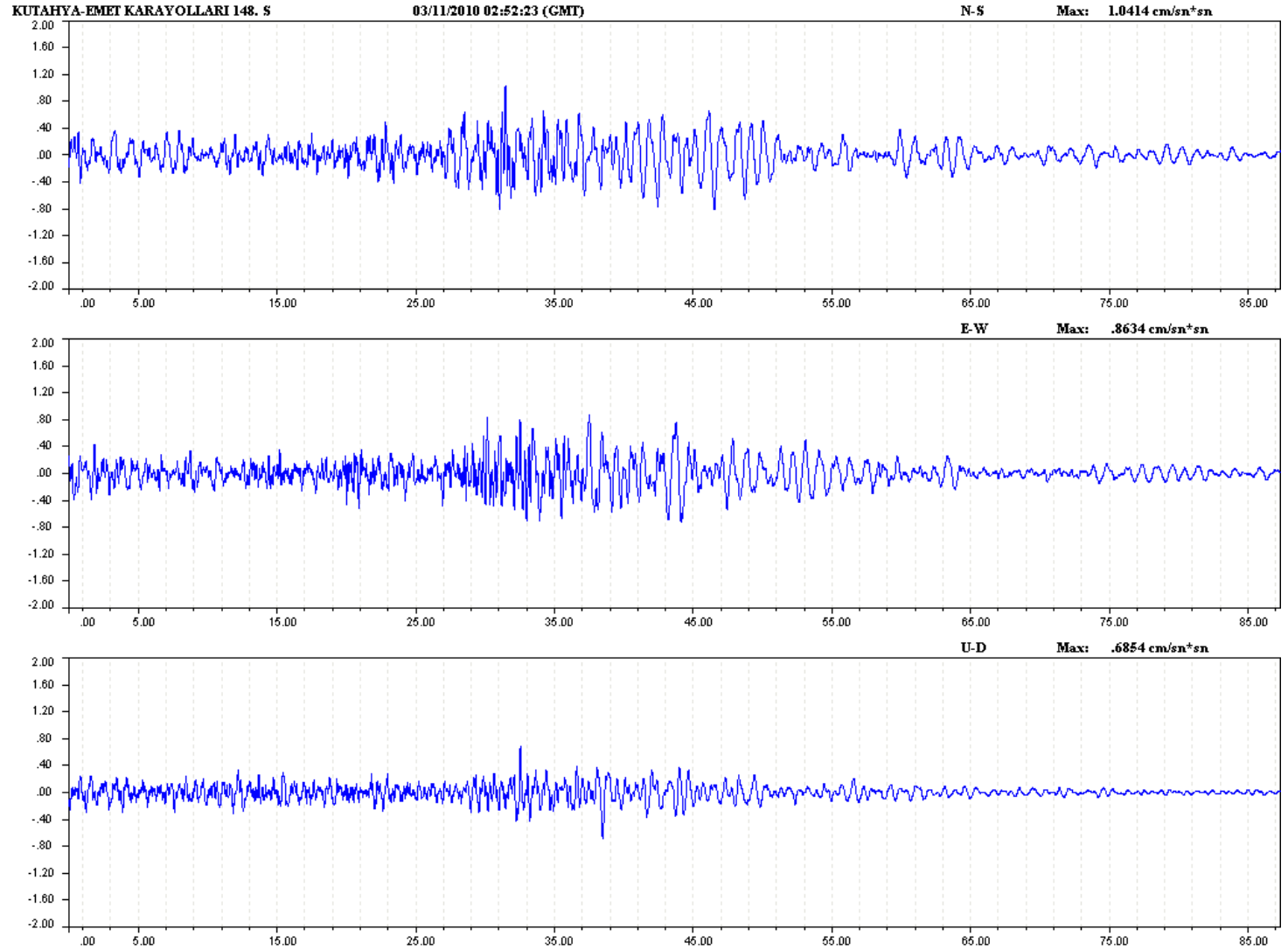


Figure 5I: acceleration-time record according to Kütahya-Emet Station

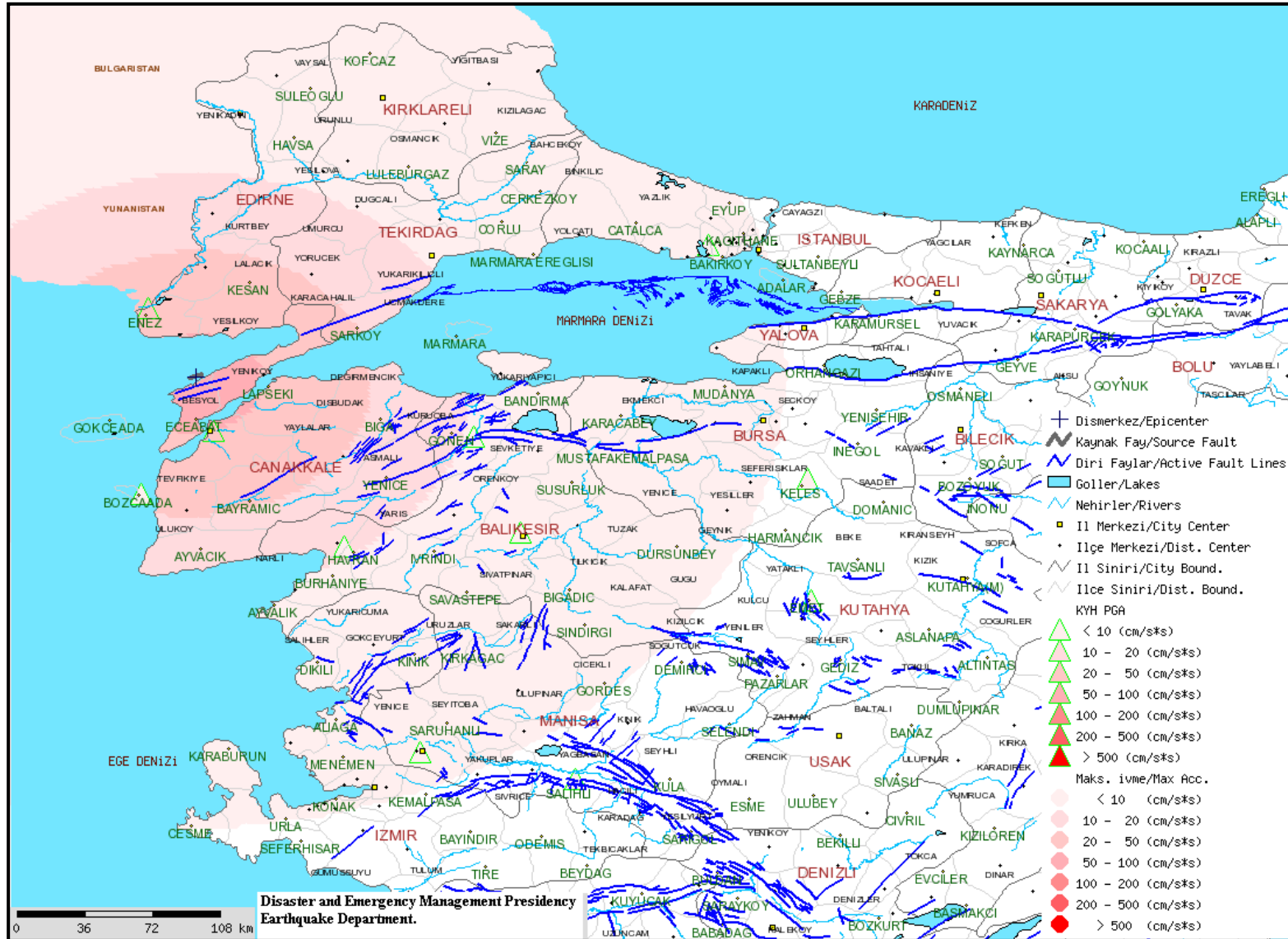


Figure 6: Peak Ground Acceleration Distribution Map of Saros Bay Earthquake (MI=5.3)
(according to Yoshimitsu Fukushima and Teiji Tanaka, 1990)

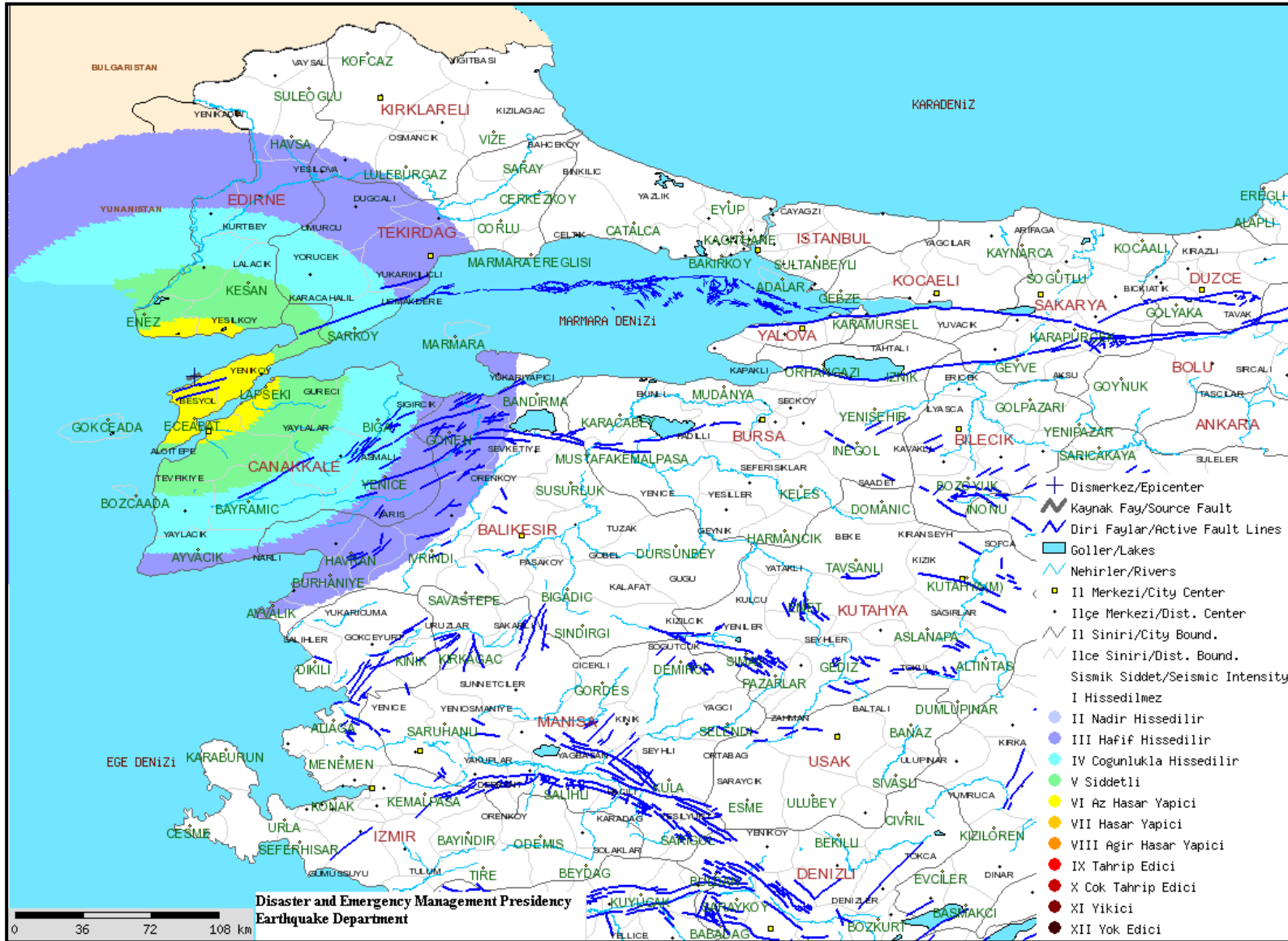
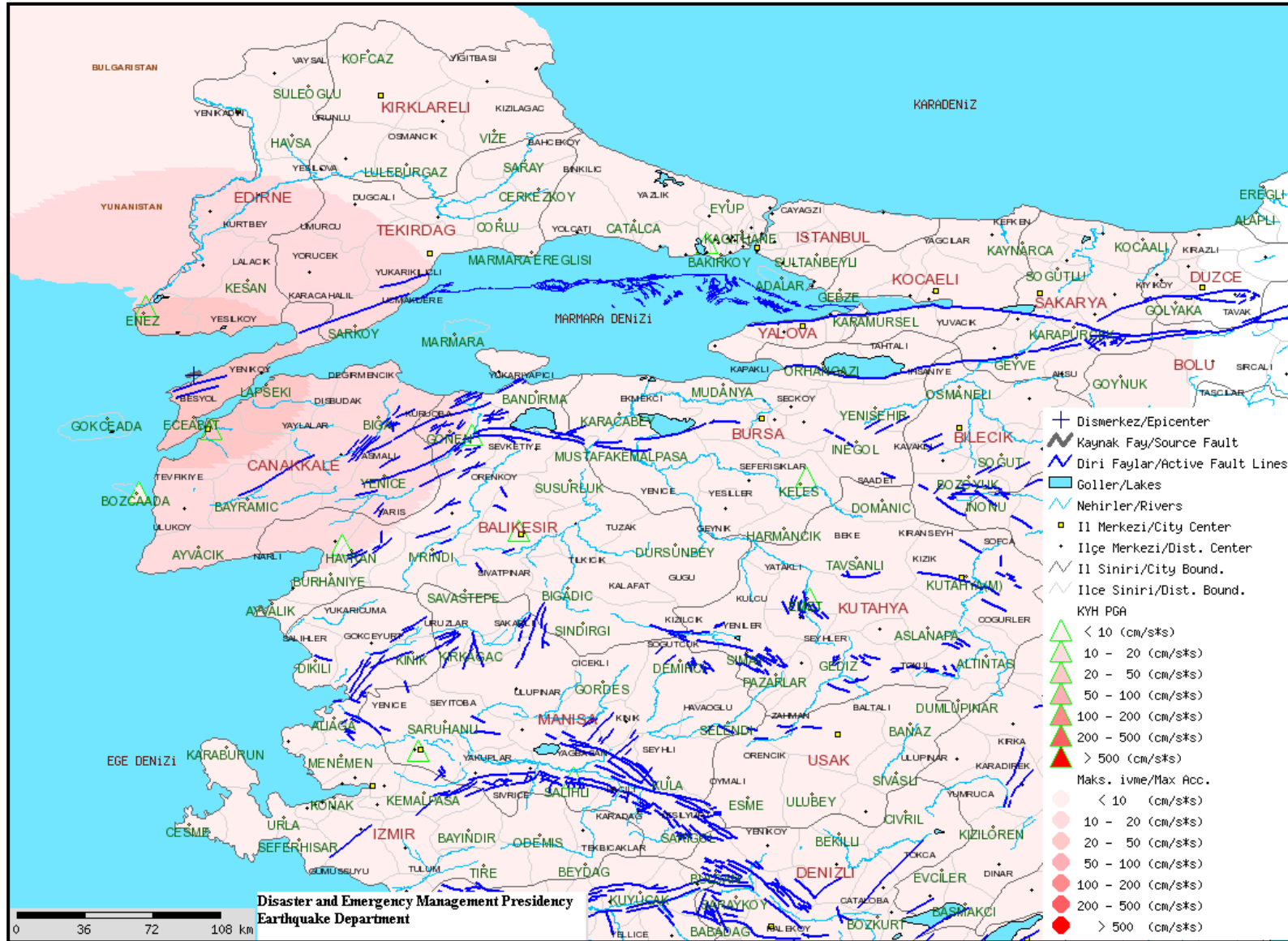


Figure 7: Seismic Intensity Map of Saros Bay Earthquake (MI=5.3) (according to Yoshimitsu Fukushima and Teiji Tanaka, 1990) (Arioğlu E., Arioğlu B. M., Girgin C. (2001))



**Figure 8: Peak Ground Acceleration Distribution Map of Saros Bay Earthquake (MI=5.3)
(according to Çeken U., Beyhan G. ve Gülkan P. 2008.)**

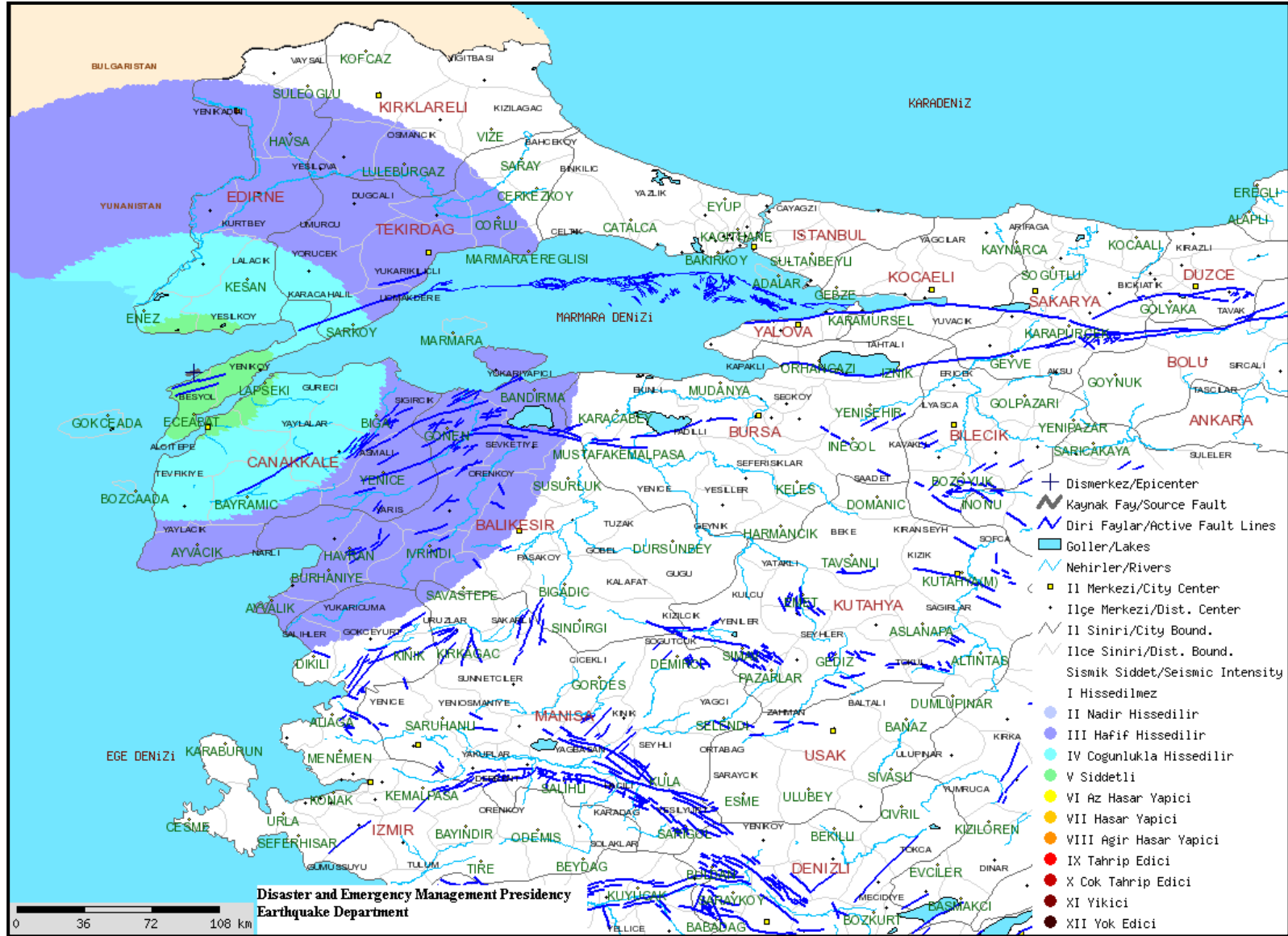


Figure 9: Seismic Intensity Map of Saros Bay Earthquake (MI=5.3) (according to Çeken U., Beyhan G. ve Gülkan P. 2008.) (Arioğlu E., Arioğlu B. M., Girgin C. (2001)

References

Ariođlu E., Ariođlu B. M., Girgin C. (2001). Dođu Marmara Depreminin Yer İvme Deđerleri Açısından Deđerlendirilmesi, *Beton Prefabrikasyon*, 57-58, 5-15.

Çeken U., Beyhan G. ve Gülkan P. (2008). Kuzeybatı Anadolu Depremleri için Kuvvetli Yer Hareketi Azalım İlişkisi, *18. Uluslararası Jeofizik Kongre ve Sergisi*, Vol:3B14, ss:1-4, Maden Tetkik ve Arama Genel Müdürlüğü, Kültür Sitesi, Ankara, 14-17 Ekim.

Yoshimitsu Fukushima and Teiji Tanaka, 1990, A New Attenuation Relation for Peak Horizontal Acceleration of Strong Earthquake Ground Motion in Japan, *Bull. Seism. Soc. Am.*, Vol. 80, No. 4, 757-783.

Yoshimitsu Fukushima and Teiji Tanaka, 1992, The revision of “A New Attenuation Relation for Peak Horizontal Acceleration of Strong Earthquake Ground Motion in Japan”, *Abstracts The Seismological Society of Japan*, 1992, Fall Meeting, B18 (in Japanese).