

PRELIMINARY REPORT

January, 08, 2013
Aegean Sea Earthquake
MI=6.2

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REPUBLIC OF TUKEY
PRIME MINISTRY
DISASTER AND EMERGENCY MANAGEMENT
PRESIDENCY
EARTHQUAKE DEPARTMENT

AEGEAN SEA EARTHQUAKE (MI=6.2)

An earthquake with magnitude $M_I=6.2$ occurred at local time 16:16 on January, 08, 2013. Epicentral coordinates of the earthquake was determined as 39.6553 N - 25.5912 E. The magnitude of earthquake was identified with AFAD National Seismological Observation Network and Kandilli Observatory and Earthquake Research Institute. After this earthquake, 147 aftershocks were determined with magnitude range 1.9- 4.9 in first 50 hours. (Fig.1, Graph 1).

This earthquake was also felt in Çanakkale, İzmir and all Aegean and Marmara Regions. It didn't caused loss of life and damage.

Focal Mechanism Solutions performed by considering first motion direction of P wave and moment tensor solution of $M_I=6.2$ earthquake is emerged from strike slip faulting (Fig.2,3). The fault which caused earthquake is thought to be a branch of North Anatolian Fault Zone in the Aegean Sea. Focal mechanism solutions support to this idea.

Instrumental period earthquakes that occurred in the last century are given as; 1912 $M=7.2$, $M=6.3$, $M=6.8$ Şarköy Mürefte, 1953 $M=7.2$ Yenice-Gönen, 1972 $M=5.0$ Ezine, 1975 $M=5.5$ Gelibolu, 1983 $M=5.5$ Biga earthquakes and 29 December 2008 Northeast of Gökçeada earthquake $M=5.1$.

January 08, 2013 Aegean Sea Earthquake was recorded by accelerometers at 55 different locations within National Strong Ground Motion Observation Network operated by Earthquake Department at Disaster and Emergency Management Presidency of Turkey. Peak ground acceleration values recorded at Bozcada station (33 gal in NS direction, 17.54 gal in EW direction and 10.24 gal in up-down direction) (Table 1, Fig.4, 5).

Peak ground acceleration and seismic intensity values that can be created by January, 08, 2013 Aegean Sea earthquake in the earthquake-hit area and its vicinity are estimated and the maps showing the spatial distribution of these values are prepared (Fig.6,7).



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Earthquake activity of this region (and all of Turkey) has been observed in Disaster and Emergency Management Presidency, Earthquake Department Data Center Ankara 7 days/24 hours with 205 Seismic station and 385 accelerometer. Obtained results are shared with public, press and relevant authorized.

For your information.



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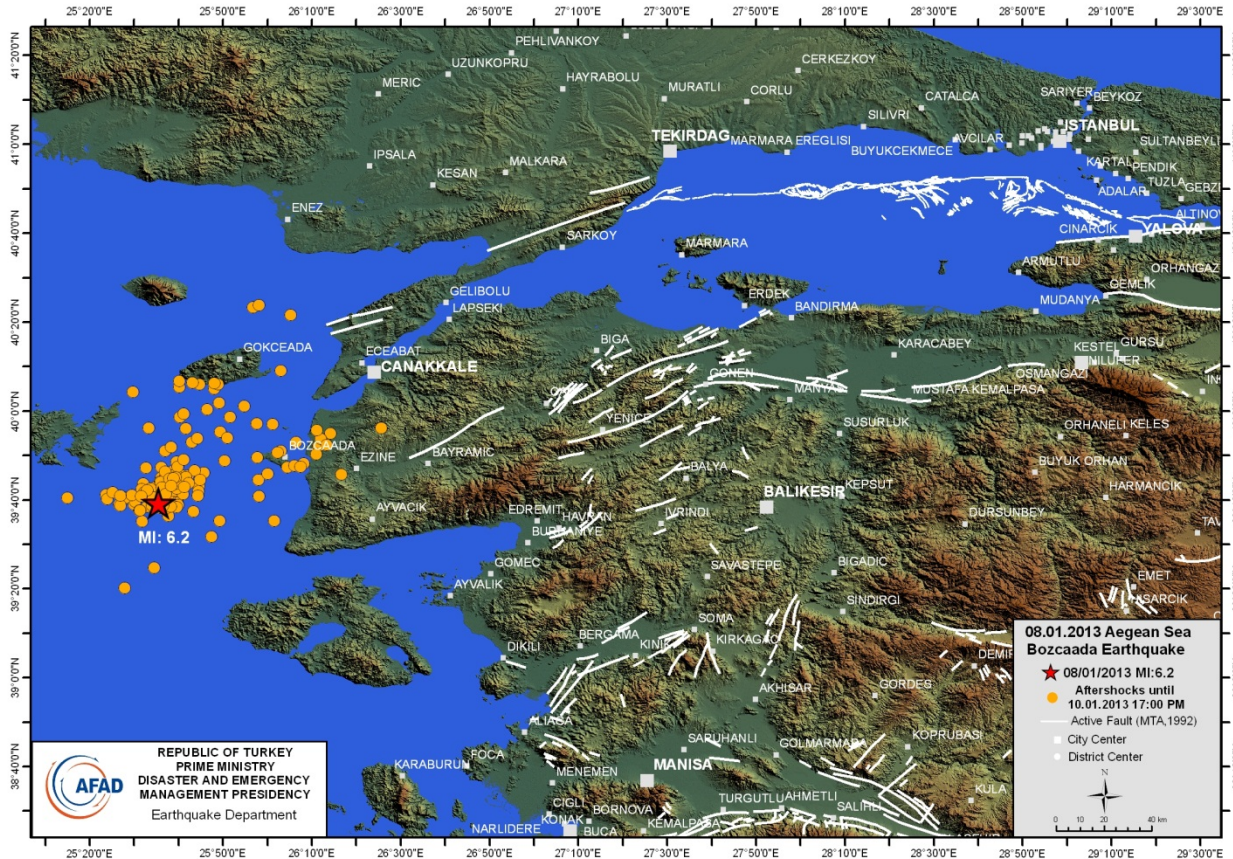
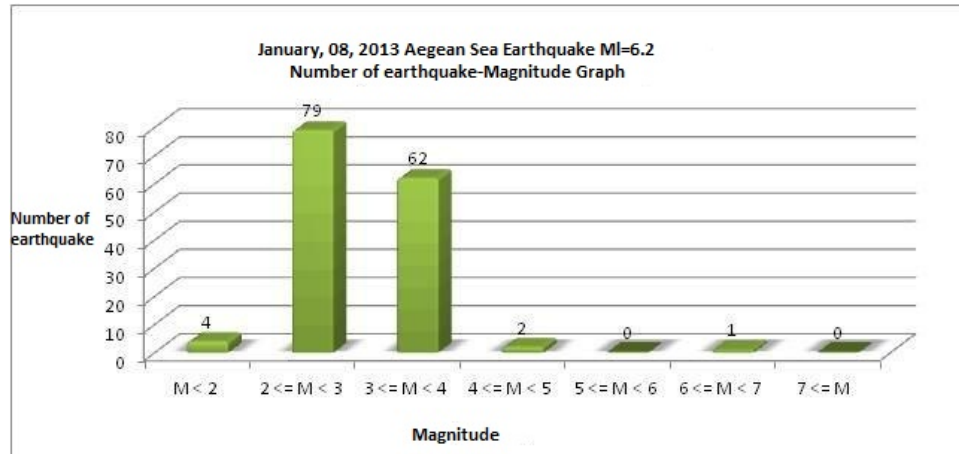
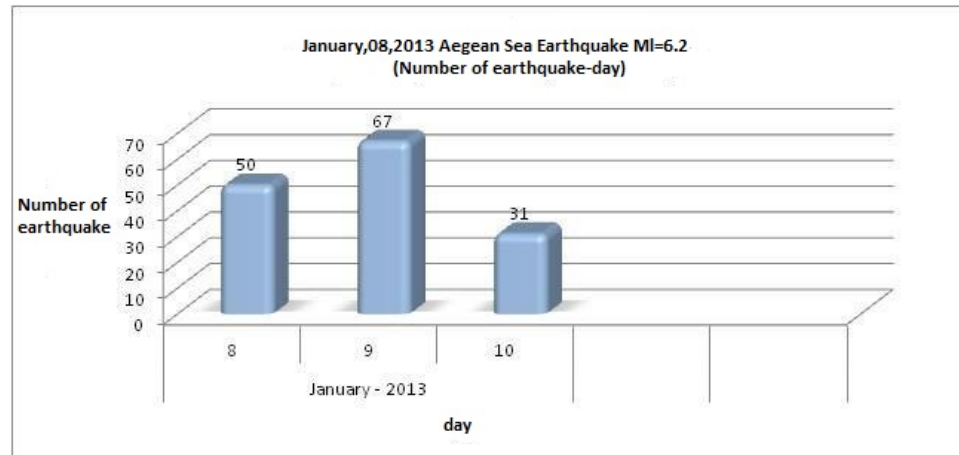


Fig. 1. 08/01/2013 Aegean Sea earthquake and aftershocks (MI=6.2)



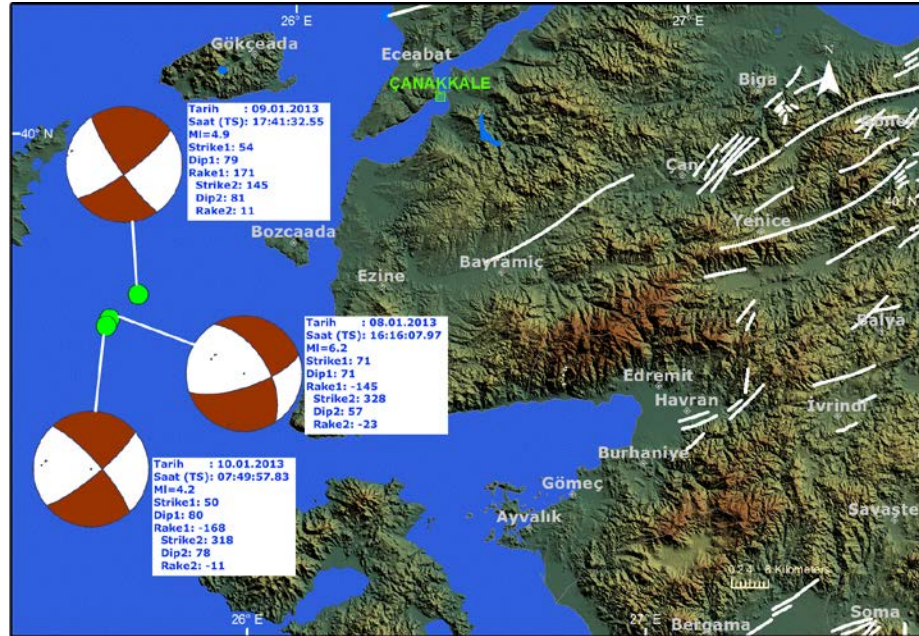
AEGEAN SEA EARTHQUAKE (MI=6.2)



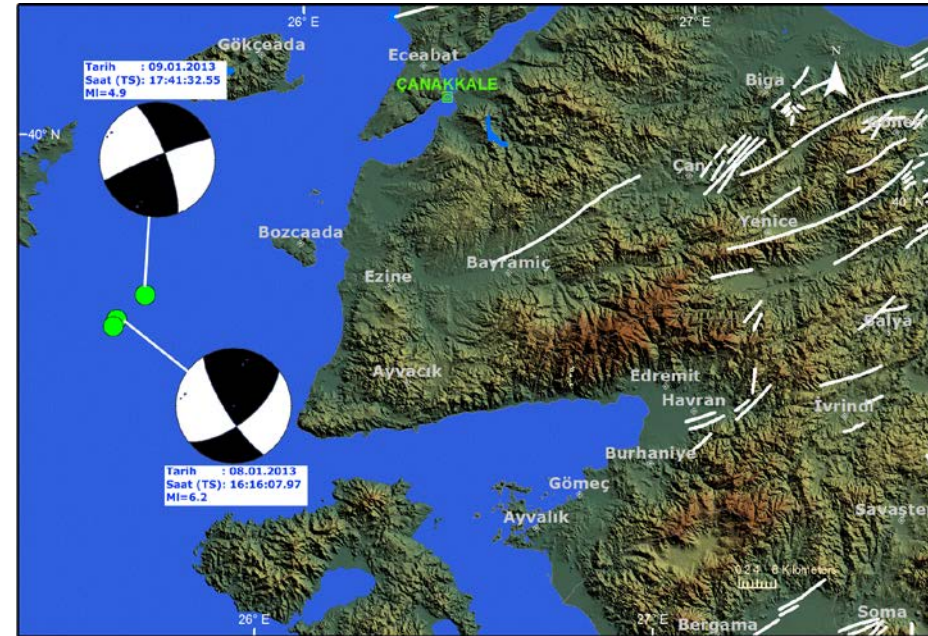
Graph 1. Distribution of aftershocks



AEGEAN SEA EARTHQUAKE (MI=6.2)



(According to P wave first motion)



(Moment Tensor Solution with Isola_Gui Software)

Fig. 2. Focal Mechanism Solutions of Aegean Sea earthquake



AEGEAN SEA EARTHQUAKE (MI=6.2)

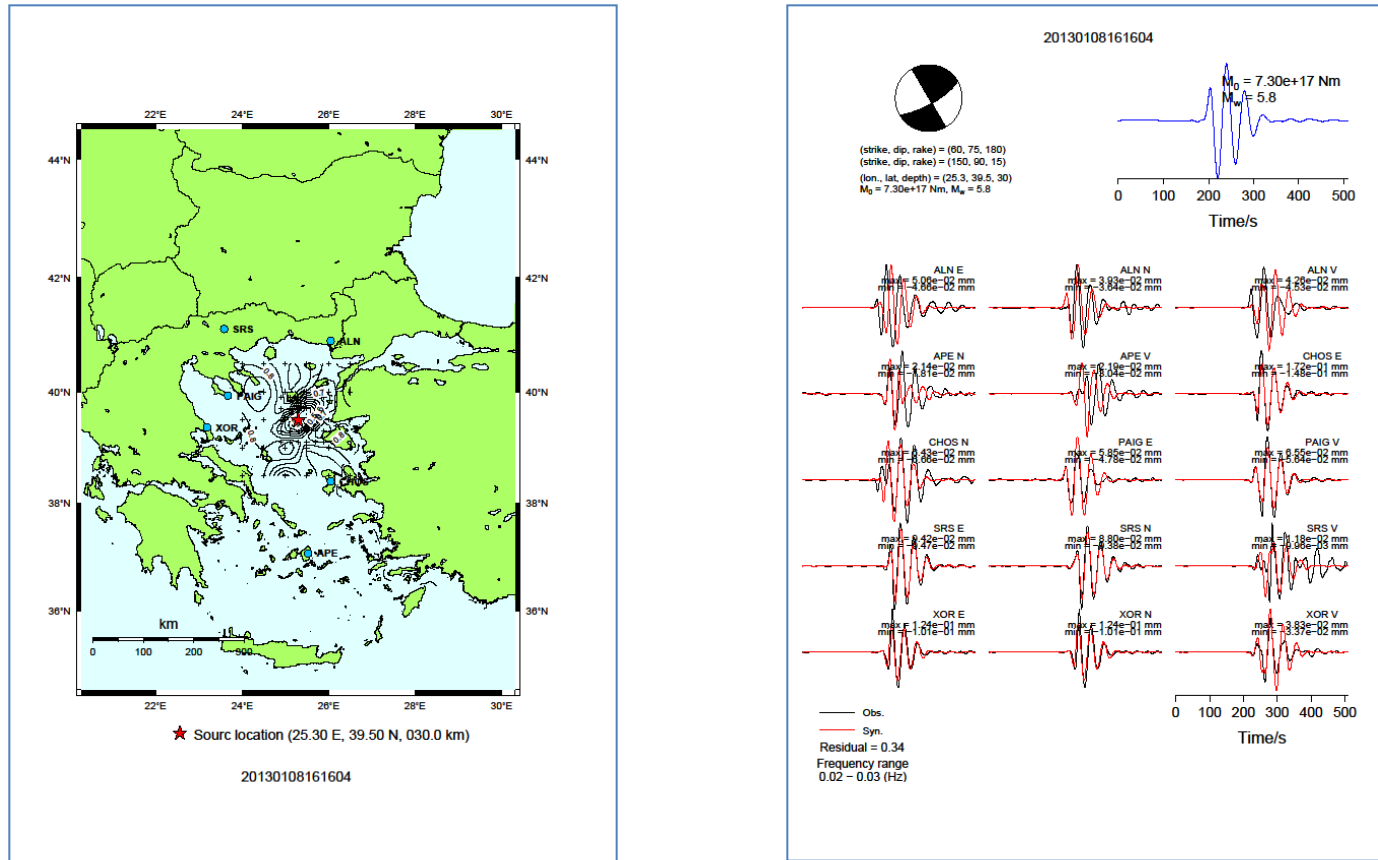


Fig. 3. Moment Tensor solution of MI=6.2 earthquake with Swift Software

AEGEAN SEA EARTHQUAKE (MI=6.2)

STATION			Lat	Lon	Altitude (m)	Type of Accelerometer	ACCELEROMETER VALUES (gal)			Distance R _{epi} (km)	Share Wave Velocity V _{S30} (m/sn)
N	CITY	TOWN					NS	EW	UD		
1	ÇANAKKALE	BOZCAADA	39.8419	26.0528	195	CMG-5TD	33.12	17.54	10.24	45	
2	ÇANAKKALE	MERKEZ	40.14145	26.39948	1	CMG-5TD	21.28	18.78	7.01	87	192
3	BALIKESIR	AYVALIK	39.31134	26.68601	4	CMG-5TD	16.07	19.41	7.84	102	387
4	BALIKESIR	EDREMIT	39.58952	27.01924	22	CMG-5TD	17.81	16.62	7.77	123	223
5	ÇANAKKALE	GELIBOLU	40.42334	26.66715	40	CMG-5TD	23.53	22.98	8.88	125	286
6	EDIRNE	ENEZ	40.72448	26.08731	15	CMG-5TD	20.74	13.01	4.8	126	
7	IZMIR	DIKILI	39.0739	26.88834	3	CMG-5TD	19.92	17.9	5.77	129	193
8	IZMIR	KARABURUN	38.63903	26.51277	60	CMG-5TD	3.23	2.57	2.57	138	
9	IZMIR	FOCA	38.66241	26.75856	13	ETNA	5.32	5.03	1.64	150	328
10	ÇANAKKALE	BIGA	40.23182	27.26288	24	CMG-5TD	13.67	10.82	6.05	156	304
11	TEKIRDAG	SARKOY	40.61485	27.12256	10	CMG-5TD	18.39	23.41	10.51	168	225
12	IZMIR	MENEMEN	38.57823	26.97953	6	CMG-5TD	4.42	3.82	1.45	170	
13	BALIKESIR	SAVASTEPE	39.38041	27.65438	284	CMG-5TD	3.22	3.27	1.86	180	
14	BALIKESIR	GONEN	40.11399	27.64236	33	CMG-5TD	3.03	3.62	2.01	182	397
15	IZMIR	GUZELBAHCE	38.3706	26.8907	17	CMG-5TD	1.67	1.94	0.72	182	460
16	IZMIR	MAVISEHIR	38.46792	27.07636	1	CMG-5TD	4.27	5.02	1.99	185	145
17	IZMIR	BALCOVA	38.409	27.043	3	CMG-5TD	2.2	2.5	0.83	188	313
18	IZMIR	KARSIYAKA	38.4525	27.1112	10	CMG-5TD	4.9	5.67	1.92	188	131
19	IZMIR	BAYRAKLI	38.4762	27.1581	197	CMG-5TD	1.69	1.41	1.09	189	836

Table 1. Acceleration values of Eagean Sea earthquake



AEGEAN SEA EARTHQUAKE (MI=6.2)

STATION			Lat	Lon	Altitude (m)	Type of Accelerometer	ACCELEROMETER VALUES (gal)			Distance R_{epi} (km)	Share Wave Velocity V_{S30} (m/sn)
N	CITY	TOWN					NS cm/sn^2	EW cm/sn^2	UD cm/sn^2		
20	IZMIR	GUZELYALI	38.39443	27.08211	26	CMG-5TD	1.05	0.88	0.56	191	771
21	IZMIR	MERKEZ	38.4584	27.1671	2	CMG-5TD	4.33	4.11	1.96	191	196
22	IZMIR	MANAVKUYU	38.478	27.2111	184	CMG-5TD	1.85	1.45	1.02	192	875
23	BALIKESIR	MERKEZ_2	39.64966	27.85715	262	CMG-5TD	4.61	3.32	2.24	194	662
24	IZMIR	BORNOVA	38.45302	27.22444	35	CMG-5TD	2.32	2.45	1.01	195	270
25	IZMIR	BUCA	38.4009	27.1516	79	CMG-5TD	1.74	1.34	0.58	195	468
26	IZMIR	ÇAMDIBI	38.4357	27.1987	68	CMG-5TD	3.64	2.94	1.23	195	249
27	IZMIR	YESILYURT	38.3723	27.1084	106	CMG-5TD	1.68	1.79	0.94	195	745
28	IZMIR	PINARBASI	38.4213	27.2563	76	CMG-5TD	1.31	1.35	0.65	200	827
29	BALIKESIR	BANDIRMA	40.33193	27.99662	61	CMG-5TD	8.02	7.61	3.12	217	321
30	TEKIRDAG	MERKEZ	40.98205	27.54794	64	CMG-5TD	5.79	6.43	1.93	221	
31	EDIRNE	MERKEZ	41.67049	26.58585	67	CMG-5TD	2.35	2.7	1.57	239	
32	AYDIN	KUSADASI	37.85997	27.26501	24	CMG-5TD	1.2	1.39	1.09	248	369
33	BALIKESIR	DURSUNBEY	39.57798	28.63232	649	CMG-5TD	1.35	1.53	0.62	261	561
34	KIRKLARELI	MERKEZ	41.73774	27.21509	218	CMG-5TD	1.27	1.92	0.79	268	
35	ISTANBUL	SILIVRI	41.07339	28.25569	31	CMG-5TD	1.91	1.76	0.89	273	639
36	MANISA	DEMIRCI	39.03503	28.64812	853	CMG-5TD	5.44	5.19	2.23	273	336
37	BURSA	MUDANYA	40.35095	28.92815	34	CMG-5TD	3.14	2.09	1.02	293	
38	BURSA	MERKEZ	40.22566	29.07518	91	ETNA	7.52	0.37	2.13	303	249
39	BURSA	YILDIRIM	40.1824	29.1296	193	ETNA	3.45	2.74	1.37	306	459

Table 1. Acceleration values of Eagean Sea earthquake



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STATION			Lat	Lon	Altitude (m)	Type of Accelerometer	ACCELEROMETER VALUES (gal)			Distance R_{ep} (km)	Share Wave Velocity V_{S30} (m/sn)
N	CITY	TOWN					NS cm/sn^2	EW cm/sn^2	UD cm/sn^2		
40	BURSA	KURTUL	40.36298	29.12207	74	ETNA	6.19	4.84	1.39	309	274
41	BURSA	GEMLIK	40.42539	29.16658	2	ETNA	9.98	11.36	4.46	315	228
42	BURSA	ORHANGAZI	40.49411	29.2993	218	ETNA	1.97	1.95	0.79	327	1602
43	YALOVA	MERKEZ	40.65756	29.24725	2	ETNA	3.9	4.28	1.53	328	195
44	YALOVA	SUGOREN	40.56416	29.30603	343	ETNA	2.61	2.74	1.92	330	375
45	BURSA	INEGOL	40.06708	29.50882	304	CMG-5TD	4.65	3.99	1.63	337	252
46	KOCAELI	GEBZE	40.78627	29.45003	198	CMG-5TD	0.55	0.81	0.71	348	701
47	KOCAELI	KARAMURSEL	40.6844	29.5888	30	CMG-5TD	2.29	2.29	1.2	356	300
48	BURSA	IZNIK	40.42923	29.71682	95	CMG-5TD	2.92	3.18	1.54	360	251
49	KOCAELI	KORFEZ	40.7768	29.7335	33	CMG-5TD	0.45	0.69	0.3	370	300
50	KOCAELI	KORFEZ__TUPRAS	40.74328	29.78015	7	CMG-5TD	2.31	1.25	1.27	373	
51	KOCAELI	GOLCUK	40.7245	29.84	10	CMG-5TD	2.65	2.69	1.65	377	352
52	KOCAELI	BASISKELE	40.71956	29.86583	3	CMG-5TD	3.18	2.44	1.17	379	
53	KOCAELI	KARABAS_KBB_B	40.76021	29.93244	12	CMG-5TD	2.15	2.08	0.9	386	305
54	KOCAELI	KARABAS_KBB_C	40.76023	29.93293	22	CMG-5TD	3.91	4.55	0.68	386	
55	KOCAELI	ALIKAHYA_B	40.78463	30.02649	126	CMG-5TD	0.5	0.37	0.29	394	1013

Table 1. Acceleration values of Eagean Sea earthquake



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Fig. 4. Distribution of accelerometers recorded during the Aegean Sea Earthquake



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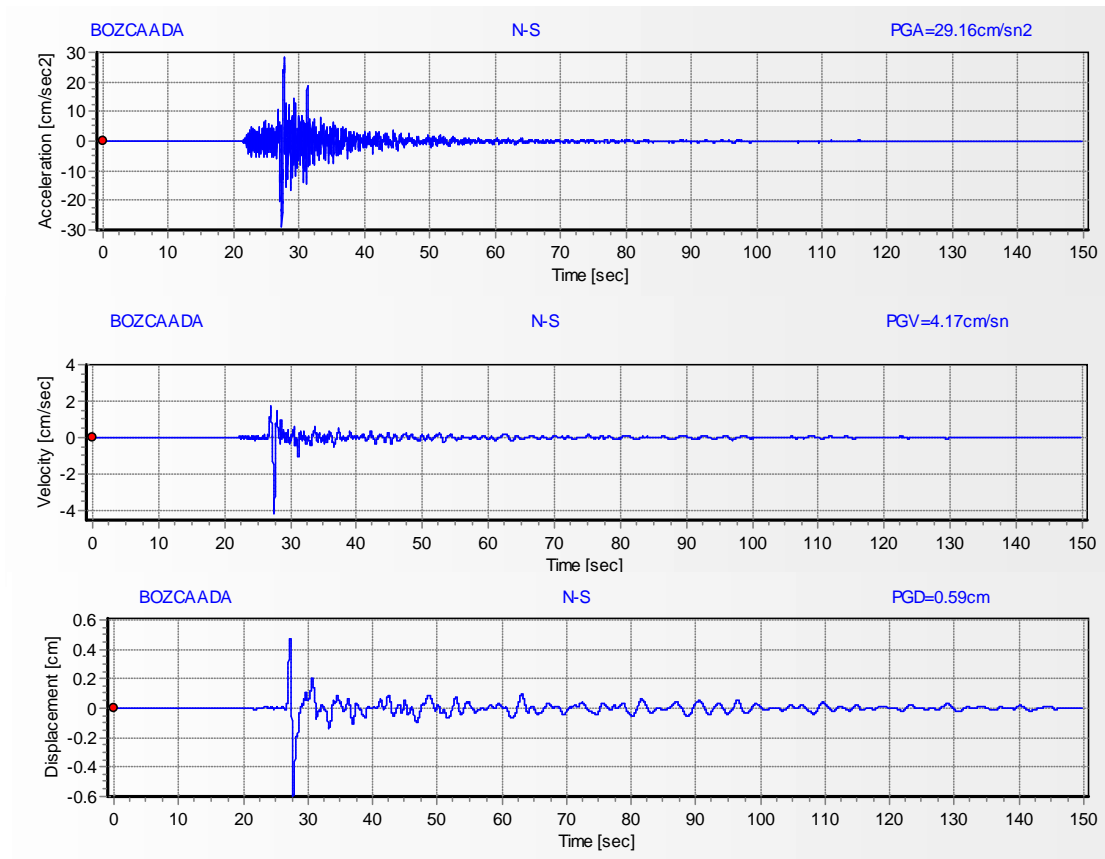


Fig. 5. Wave forms of PGA, PGV and PGD applied base line correction and 0.2-25 Hz Butterworth Band Pass filter for Çanakkale-Bozcaada Station (N-S component).



AEGEAN SEA EARTHQUAKE (MI=6.2)

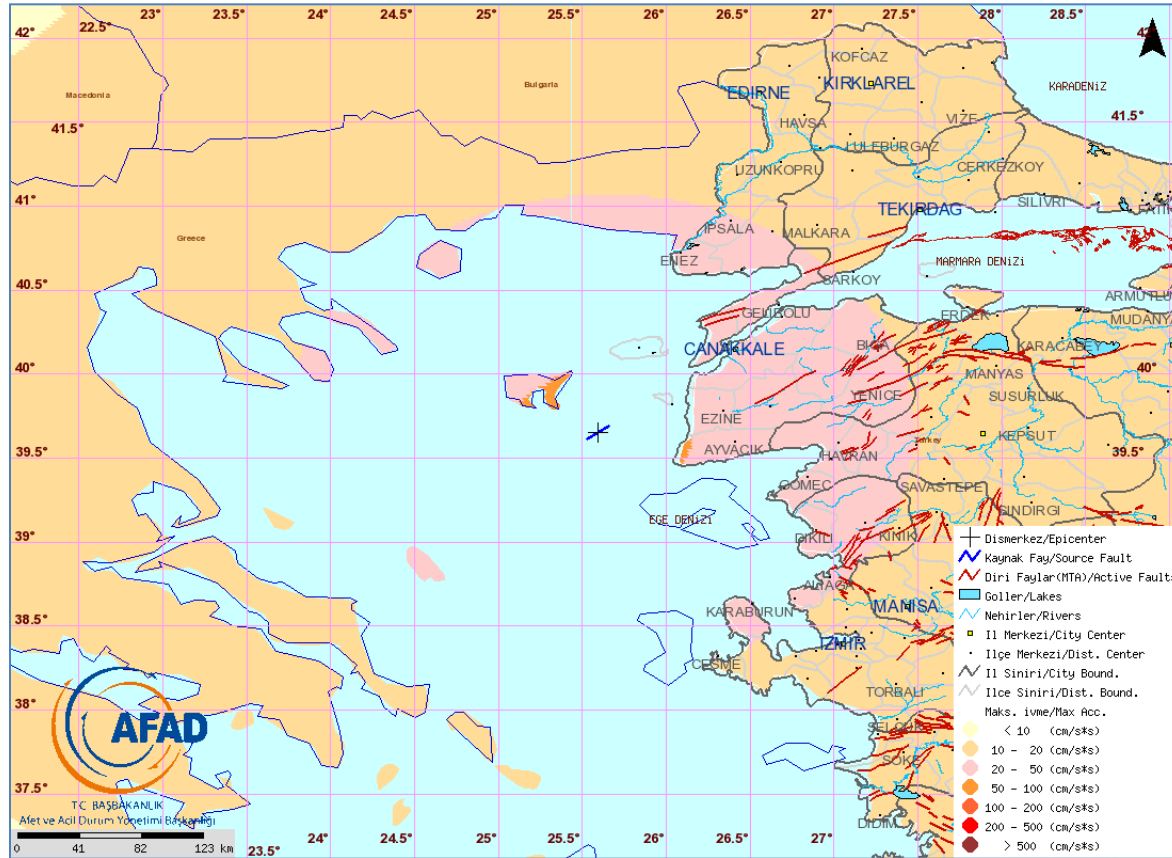


Fig.6. Peak Ground Acceleration Distribution of Aegean Sea Earthquake (MI=6.2) (Boore et.al 1997)



AEGEAN SEA EARTHQUAKE (MI=6.2)

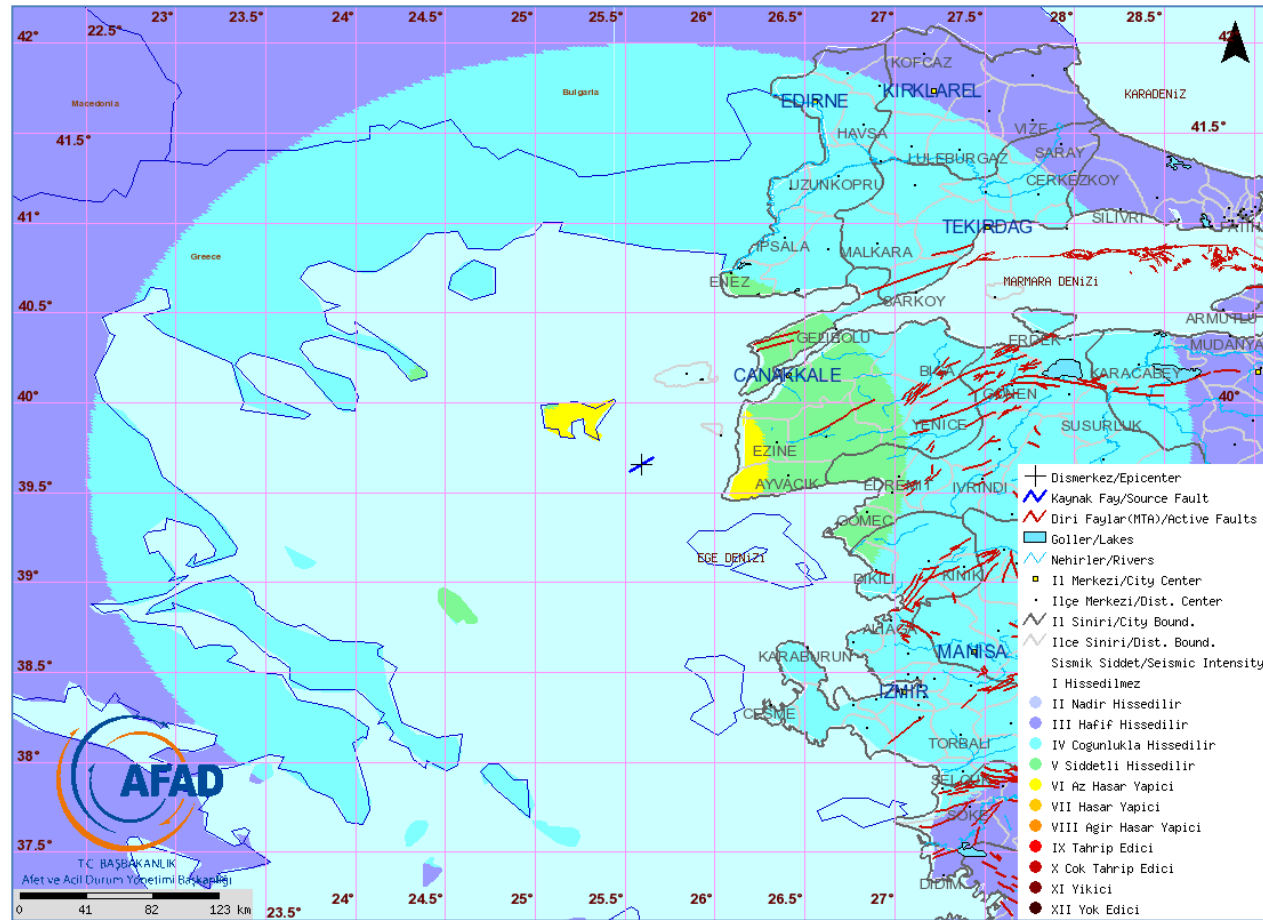


Fig.7. Seismic Intensity Map of Aegean Sea Earthquake (MI=6.2) (Arioğlu et.all 2001)



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