



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

*PRELIMINARY REPORT ON
KUTAHYA-SIMAV EARTHQUAKE
(WESTERN TURKEY)
MI=5.7*

An earthquake with magnitude $M_L= 5.7$ occurred at local time 23:15 on May, 19, 2011. Epicentral coordinates of the earthquake is determined as 39.1328 N – 29.0820 E with focal depth 24.46 km. After this earthquake, 470 earthquakes were determined with magnitude range 1.3 – 4.8 between 19.05.2011-21.05.2011 (Fig 1). Aftershocks are continuing in the region. The earthquake that occurred on May 19, 2011 caused 2 deaths and over 70 injured . This earthquake was also felt in neighbour provinces and wide range, Afyon, Bursa, Bilecik, Denizli, İzmir, İstanbul, Ankara and it caused damages at some structures.

Focal mechanism solutions performed by considering first motion direction of P wave of $M_L=5.7$ earthquake and their aftershocks with magnitude, $M \geq 4$ as well as their moment tensor solutions point out that these earthquakes are emerged from normal faults. (Fig 2,3) These solutions are consistent with the structure of region.

May 19, 2011 Kutahya-Simav earthquake was recorded by accelerometers at 10 different locations within National Strong Ground Motion Observation Network (NSGMON) operated by Earthquake Department at Disaster and Emergency Management Presidency of Turkey. Maximum acceleration values recorded at Emet station which is located at nearest distance (about 27 km) to epicenter of this earthquake are **74.69** cm/sec² in NS direction, 73.13 cm/sec² in EW direction and 46.34 cm/sec² in up-down direction and Gediz Station which is located at nearest distance (about 31 km) to epicenter of this earthquake are 92.33 cm/sec² in NS direction, **103.92** cm/sec² in EW direction and 67.83 cm/sec² in up-down direction. (Fig.4 and Table 1)

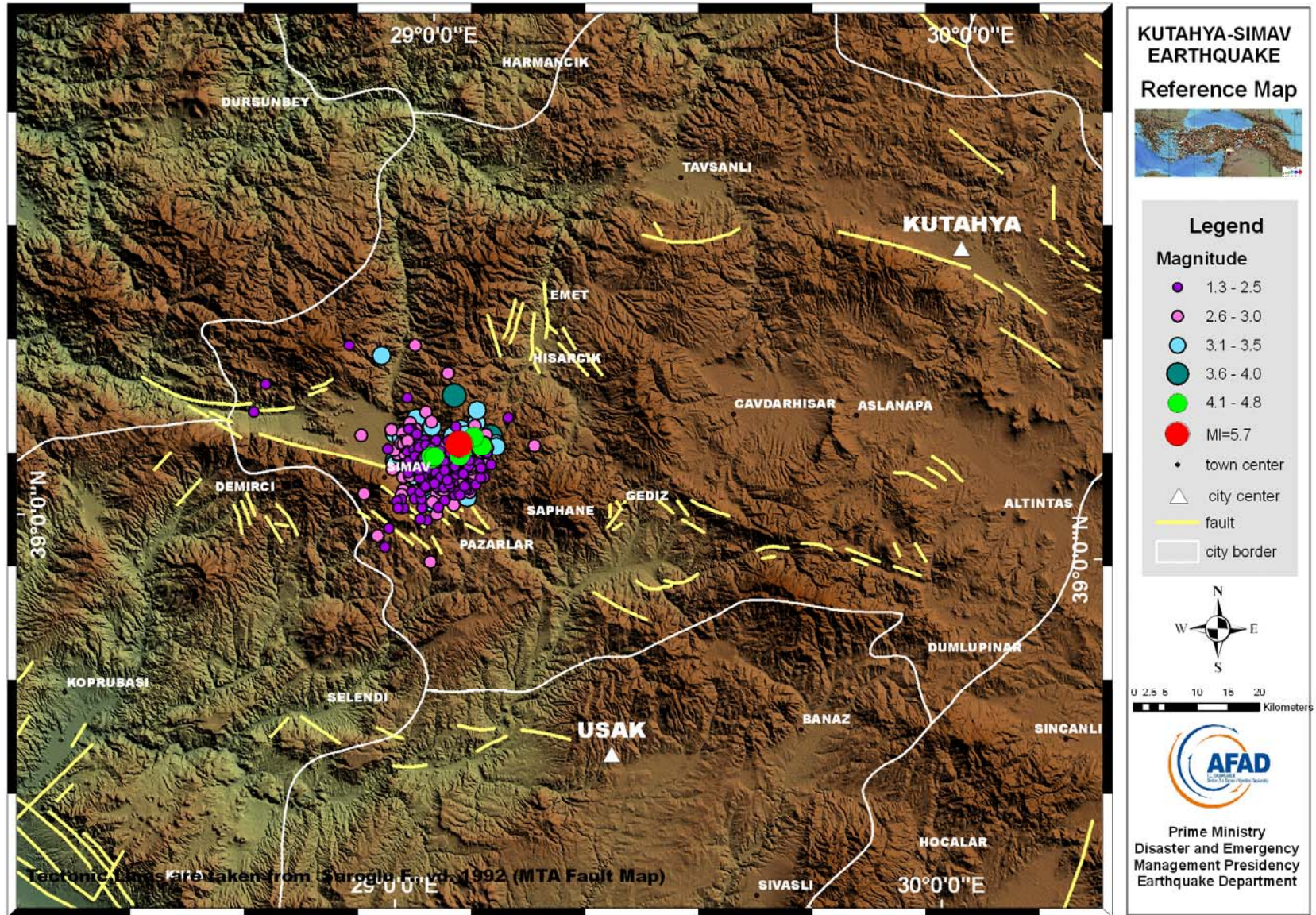
Peak ground acceleration and seismic intensity values that can be created by 19 May 2011 Kutahya-Simav earthquake in the earthquake-hit area and its vicinity are estimated and the maps showing the spatial distribution of these values are prepared. These maps are given Fig 5,6.

This region is a very active in terms of seismicity. It is known damaging earthquakes occurred in this region. The main structures that cause earthquakes are Gediz-Emet Fault Zone, Simav Fault Zone and Kutahya Fault Zone. The biggest earthquakes that occurred in the last century are 1928 $M=6.2$ Emet , 1944 $M=6.2$ Şaphane, 1970 $M=7.2$ Gediz and 1970 $M=5.9$ Çavdarhisar earthquakes.

Historical and Instrumental Period earthquakes for this region are given in Fig 7 and Table 2

Earthquake activity of this region (and all of Turkey) has been observed in Disaster and Emergency Management Presidency, Earthquake Department Data Center Ankara 7 day/24 hours with 185 seismic station and 300 accelerometer. Obtained results are shared with public, press and relevant authorized

For your information.



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Figure 1: Kütahya-Saray Earthquake (MI=5.7) and aftershocks

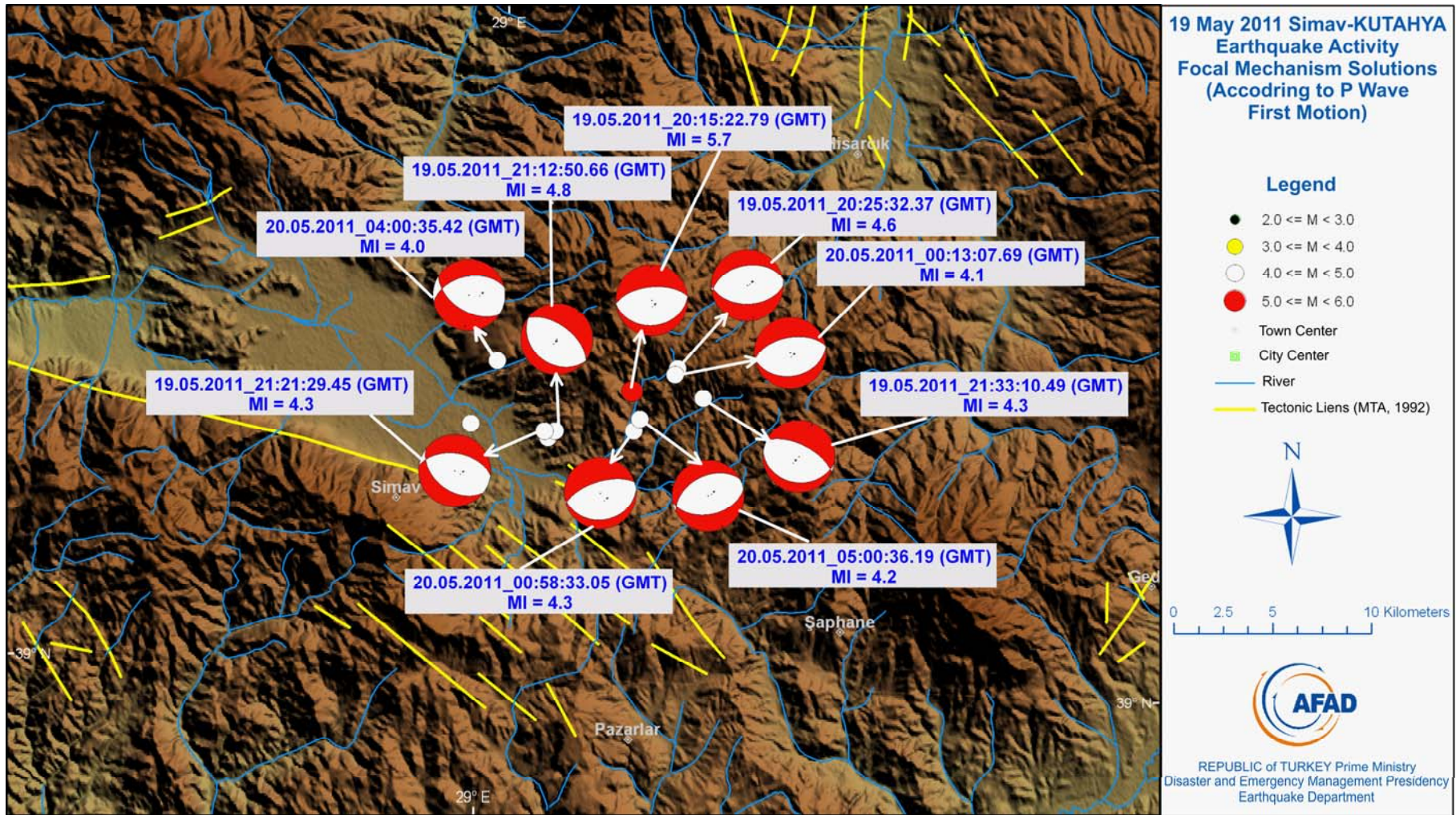


Fig.2: Focal Mechanism Solutions of Kutahya-Simav Earthquakes ($M \geq 4.0$) (according to p wave first motion)

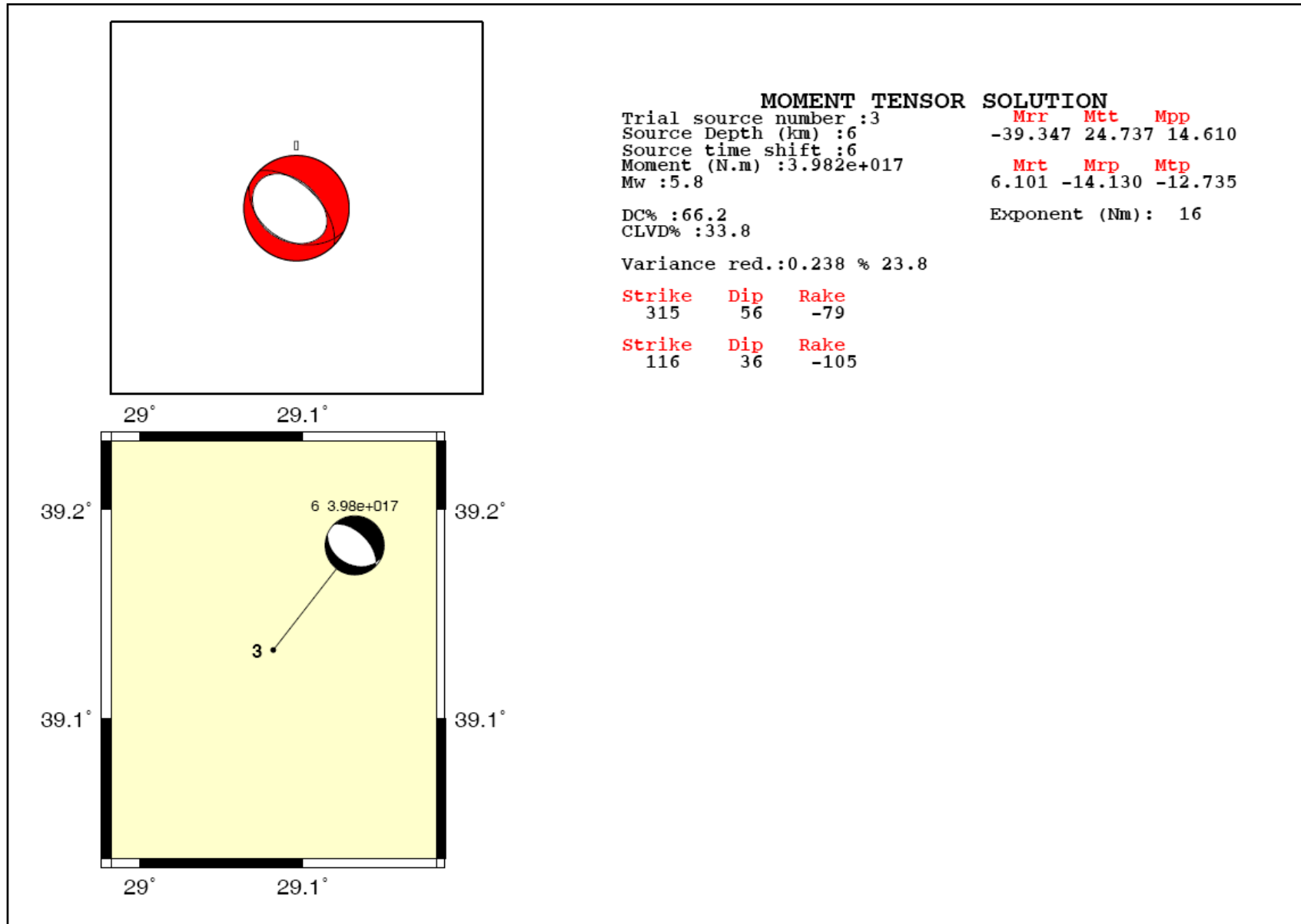


Fig.3: Moment Tensor Solution of Kutahya-Simav Earthquake (MI=5.7)

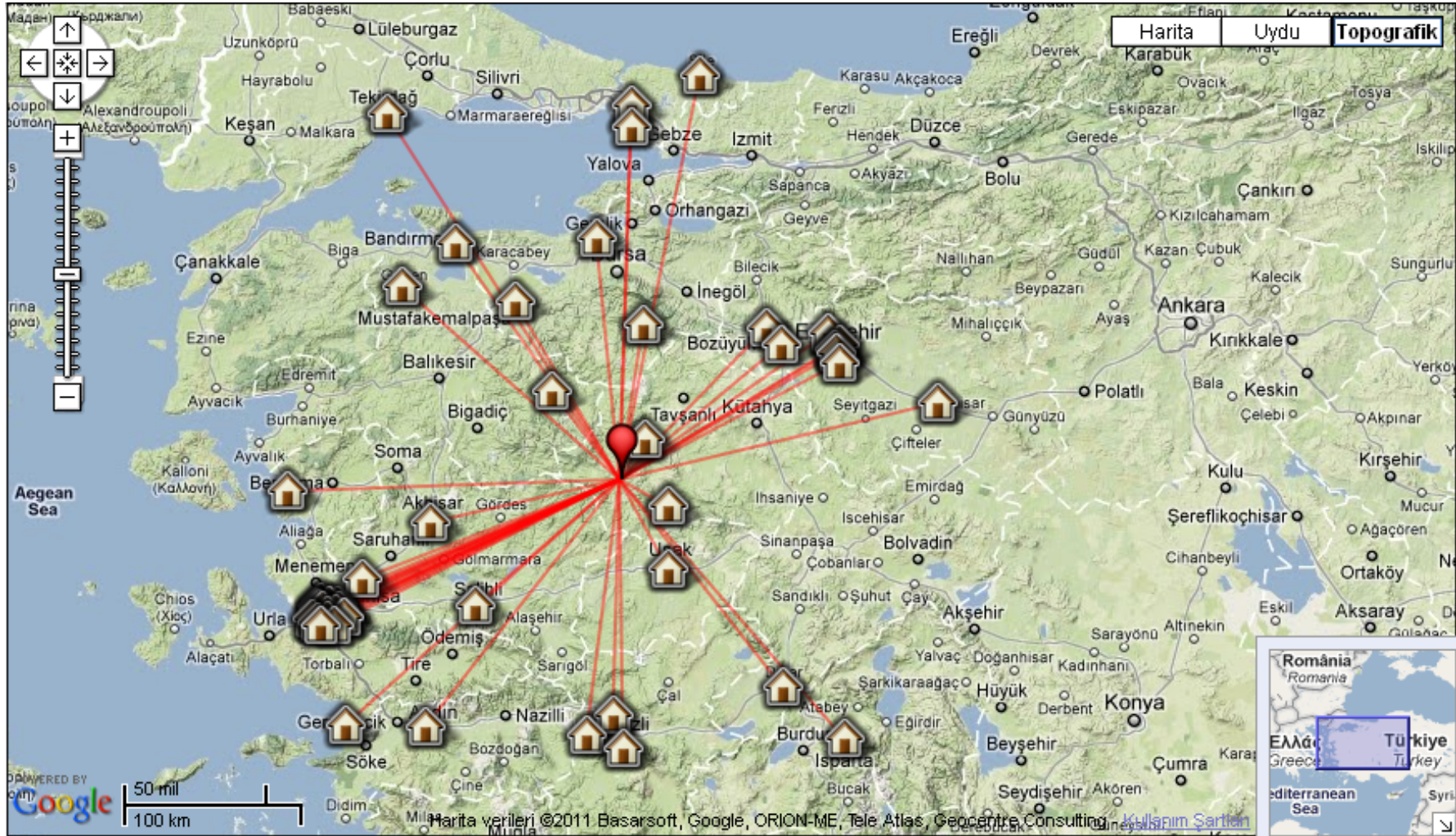


Fig.4: Acceleration value of Kutahya-Simav Earthquake

No	Station		Equipment Type	Acceleration Records			Distance of station to Epicenter (km)
	City	District		NS (gal)	EW (gal)	Vertical (gal)	
1	KÜTAHYA	EMET	CMG-5TD	74.69	73.13	46.34	27
2	KÜTAHYA	GEDİZ	CMG-5TD	92.33	103.92	67.83	31
3	UŞAK	MERKEZ	CMG-5TD	47.87	46.91	23.14	58
4	BURSA	KELES	CMG-5TD	24.62	17.24	9.08	88
5	MANİSA	AKHİSAR	CMG-5TD	18.00	17.32	5.33	112
6	BURSA	M.K.PAŞA	CMG-5TD	29.40	62.04	16.74	116
7	BİLECİK	BOZÜYÜK	CMG-5TD	14.65	11.60	5.73	119
8	BURSA	MUDANYA	CMG-5TD	13.65	15.11	5.93	125
9	AFYON	DİNAR	CMG-5TD	10.65	6.77	3.70	152
10	BALIKESİR	BANDIRMA	CMG-5TD	18.31	16.00	8.64	162

Table 1: Acceleration Records of Kutahya-Simav Earthquakes

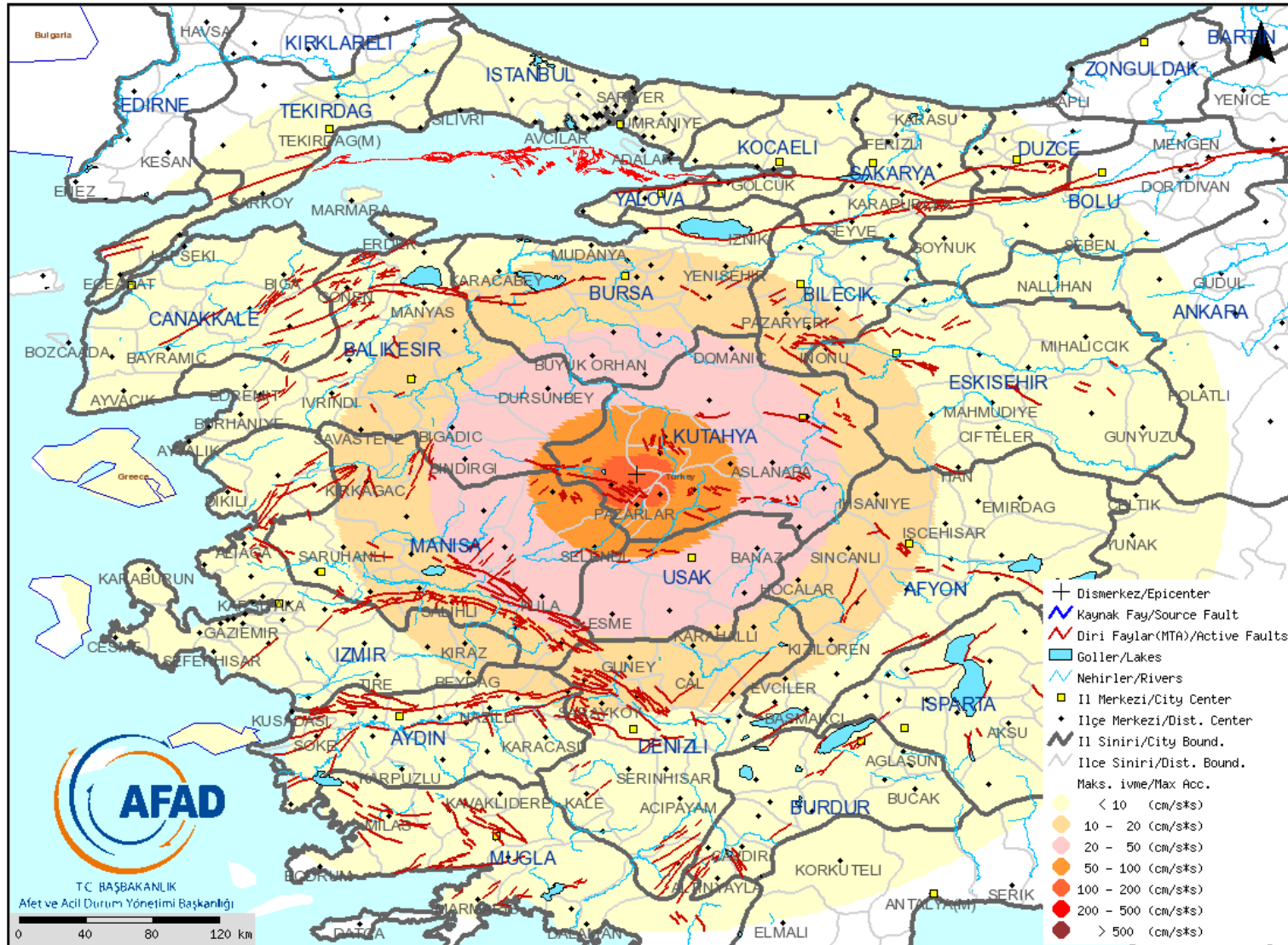


Fig.5: Peak Ground Acceleration Distribution of Kutahya –Simav Earthquake (Ml=5.7)(Fukushima and Tanaka 1992)

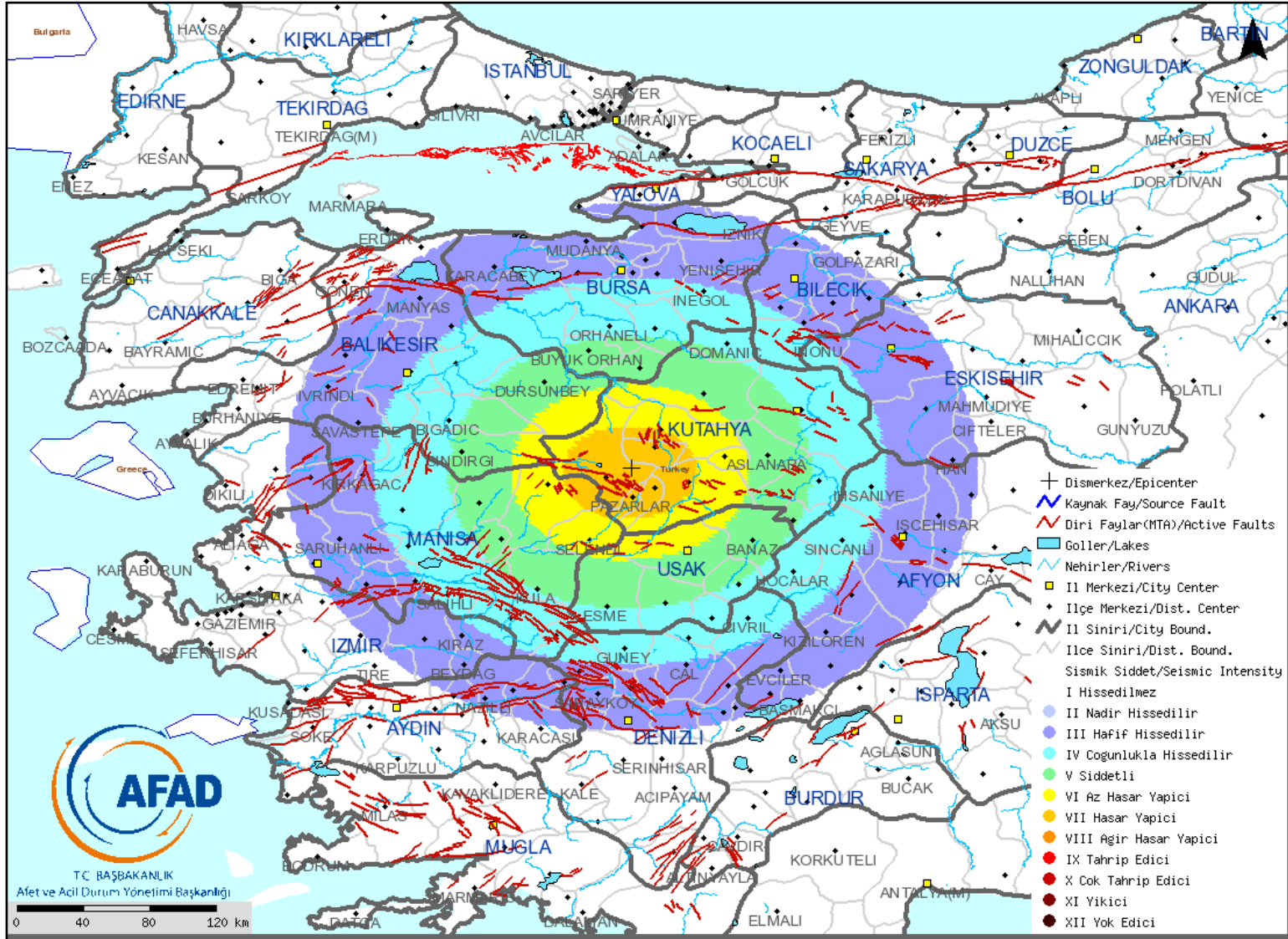


Fig.6: Seismic Intensity Map of Kutahya_Simav Earthquake (Ml=5.7) (Arioğlu E., Arioğlu B. M., Girgin C. (2001))

HISTORICAL AND INSTRUMENTAL SEISMICITY OF KUTAHYA REGION

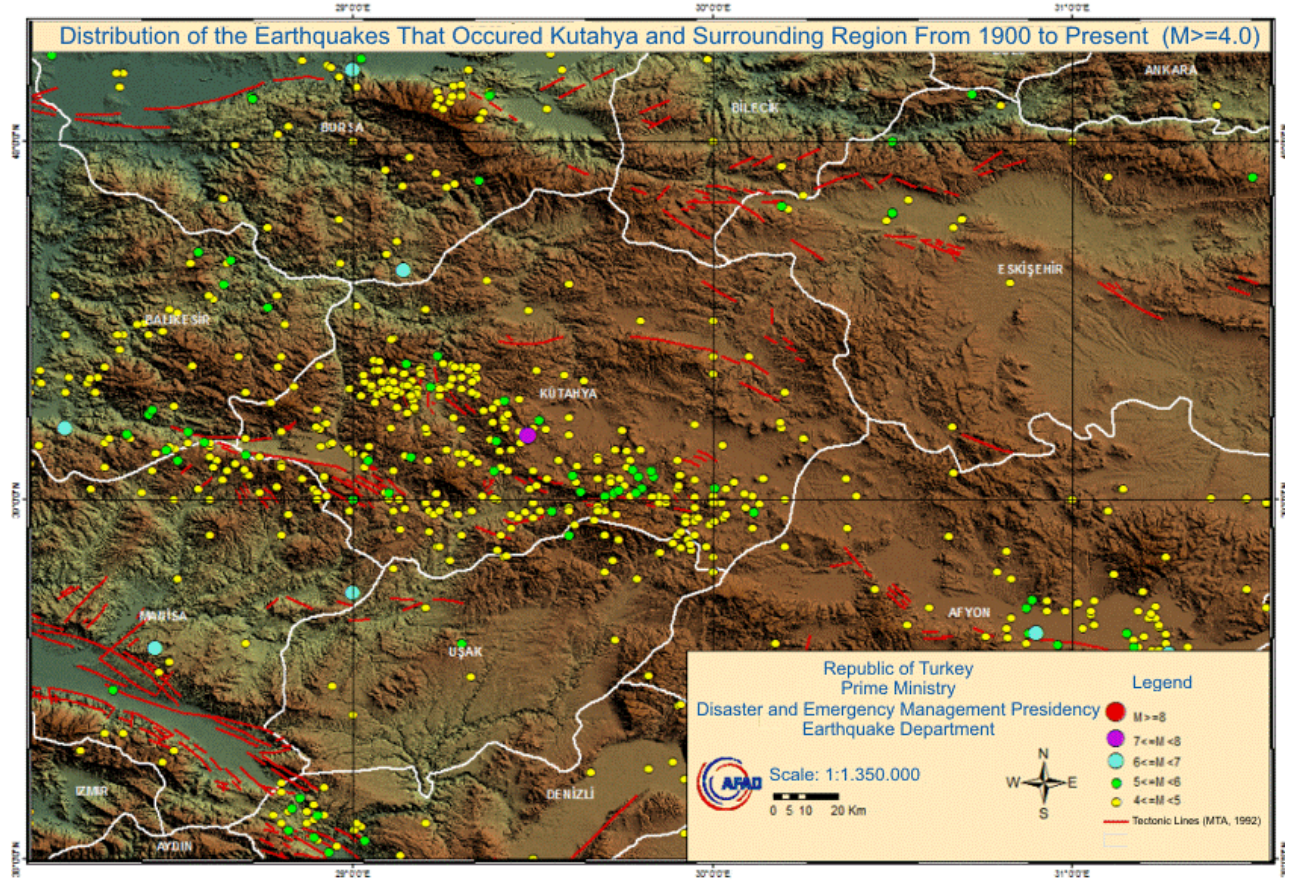


Figure 7: Kutahya and Surrounding Region Earthquakes From 1900 to Present ($M \geq 4.0$)

Historical Period

Beginning	Year	Day	Latitude	Longitude	Location	Intensity	Reference	References
M.S	1896	16	39	29	Emet ve Geniş Yöresi	8	A1	11,2,8,20,4
M.S	1875		39	29	Uşak	7	A3	20,2,1,8,11,40

Table 2: Historical time earthquakes of Kutahya Region

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- C2** Bilgi ve belgeleri yetersiz.
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