

THE OCTOBER 23, 2011 VAN, TURKEY EARTHQUAKE (MW=7.2)

The Mw=7.2 earthquake took place on October 23, 2011 at 10:41 GMT in the province of Van, located in Eastern Turkey near Lake Van. The epicenter is about 30 km to the north of the Van city center. The province of Van has a population of 1,035,418. The population of the city center is 367,419. Although figures on damage and casualties are just emerging, given its size and location the earthquake is expected to cause significant losses. The earthquake parameters reported by various institutions are presented in Table 1. The moment tensor solutions of USGS and GFZ are given in Table 2 and shown in Figure 1.

Table 1.

Date / Time	2011 / 10/ 23 13:41:21(Local) (KOERI*)	2011 / 10/ 23 10:41:21 UTC (USGS*)	2011 / 10/ 23 10:41:22.7 UTC (EMSC*)	2011 / 10/ 23 10:41:00 (UTC) (INGV*)
Latitude	38.7578N (KOERI)	38.628N (USGS)	38.86N(EMSC)	38.86N(INGV)
Longitude	43.3602E (KOERI -)	43.486E (USGS)	43.48E(EMSC)	43.48E(INGV)
Depth	5 km (KOERI)	20 km (USGS)	10 km (EMSC)	10 KM (INGV)
Magnitude	6.6 (ML), 7.2 (Mw)- KOERI	7.2 (USGS)	7.3 (Mw) (EMSC)	7.3 (Mw) (INGV)
Location	Tabanlı- VAN	Eastern Turkey	Eastern Turkey	Eastern Turkey

*KOERI- Kandilli Observatory and Earthquake Research Institute
(<http://www.koeri.boun.edu.tr/scripts/1st9.asp>)

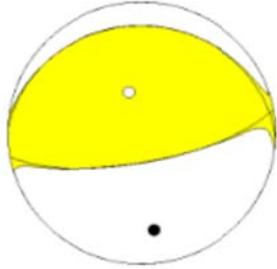
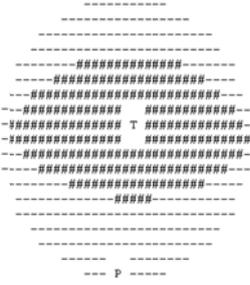
*USGS- United State Geological Survey
(<http://earthquake.usgs.gov/earthquakes/recenteqsww/Quakes/usb0006bqc.php#details>)

*INGV- Istituto Nazionale di Geofisica e Vulcanologia
(http://cnt.rm.ingv.it/data_id/8219894410/event.html#maggiori_informazioni_sismiche)

EMSC- Centre- Mediterranean Seismological – Mediterranean
(<http://www.emsc-csem.org/Earthquake/earthquake.php?id=239856#summary>)



Table 2.

<p>USGS http://earthquake.usgs.gov/earthquakes/eqinthenews/2011/usb0006bqc/neic_b0006bqc_cmt.php 1/10/23 10:41:21.73</p> <p>Epicenter: 38.710 43.446 MW 7.3</p> <p>USGS CENTROID MOMENT TENSOR 11/10/23 10:41:44.50 Centroid: 39.451 43.354 Depth 16 No. of sta: 159 Moment Tensor; Scale 10^{19} Nm Mrr= 5.89 Mtt=-6.13 Mpp= 0.24 Mrt= 7.73 Mrp= 1.60 Mtp=-0.51 Principal axes: T Val= 9.83 Plg=63 Azm=344 N 0.22 4 81 P -10.05 26 173</p> <p>Best Double Couple:Mo=$9.9 \cdot 10^{19}$ NP1:Strike= 80 Dip=71 Slip= 86 NP2: 272 19 101</p> <div style="text-align: center;">  </div>	<p>GFZ (http://geofon.gfz-potsdam.de/geofon/alerts/gfz2011lutuo/mt.txt)</p> <p>GFZ Event gfz2011lutuo 11/10/23 10:41:22.22 Turkey Epicenter: 38.674 43.581 MW 7.1</p> <p>GFZ MOMENT TENSOR SOLUTION Depth 15 No. of sta: 114 Moment Tensor; Scale 10^{19} Nm Mrr= 4.43 Mtt=-4.61 Mpp= 0.18 Mrt= 1.40 Mrp=-0.28 Mtp=-4.61 Principal axes: T Val= 4.66 Plg=81 Azm= 22 N 0.17 3 272 P -4.83 9 182</p> <p>Best Double Couple:Mo=$4.7 \cdot 10^{19}$ NP1:Strike= 94 Dip=54 Slip= 94 NP2: 268 36 85</p> <div style="text-align: center;">  </div>
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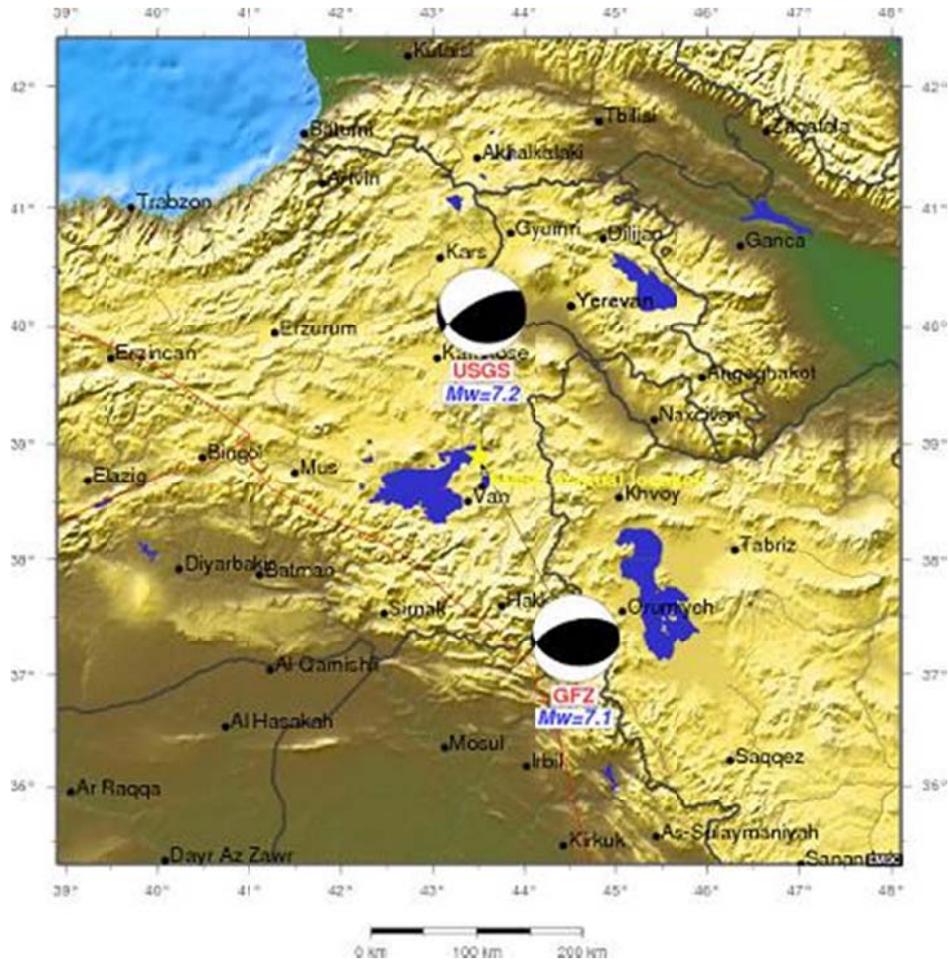


Figure 1. Source KOERI



Aftershock Activity

A significant aftershock activity is underway in the earthquake region. Figures 2 and 3 show the aftershock activity in 2D and 3D respectively as of 28 October 12:00 local time. The figures include events with $M_l > 2.4$. There was practically no seismic activity in the region prior to the main shock.

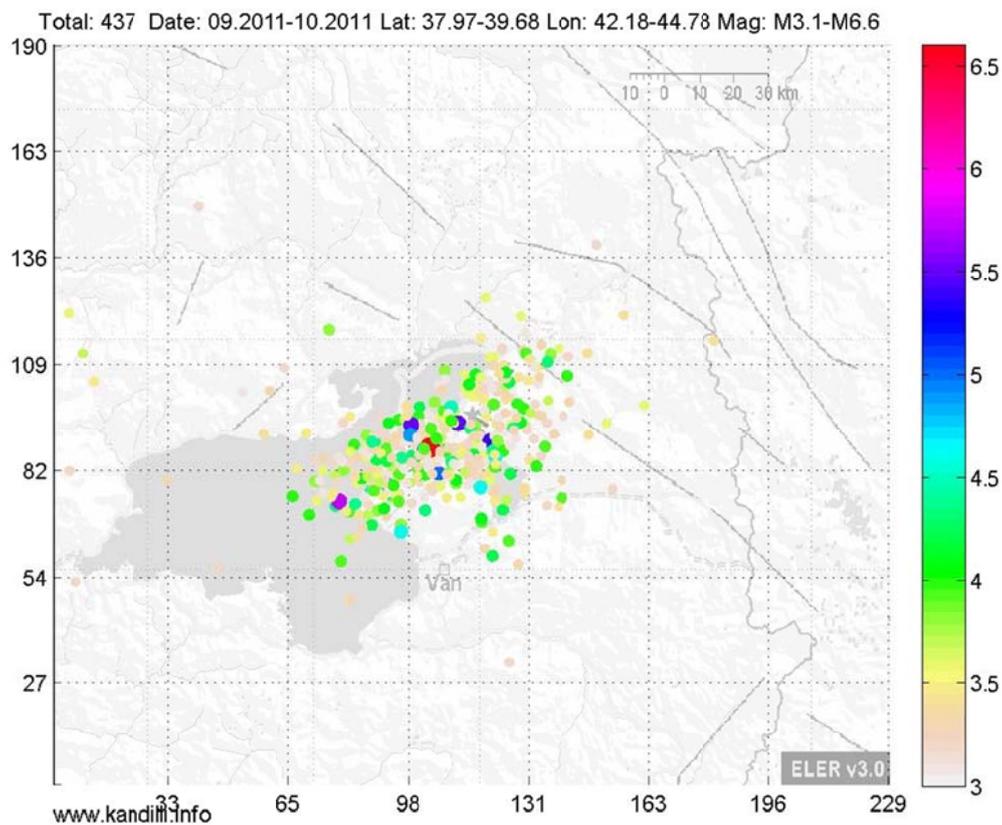


Figure 2. The aftershock activity in the earthquake region within 5 days of the mainshock.

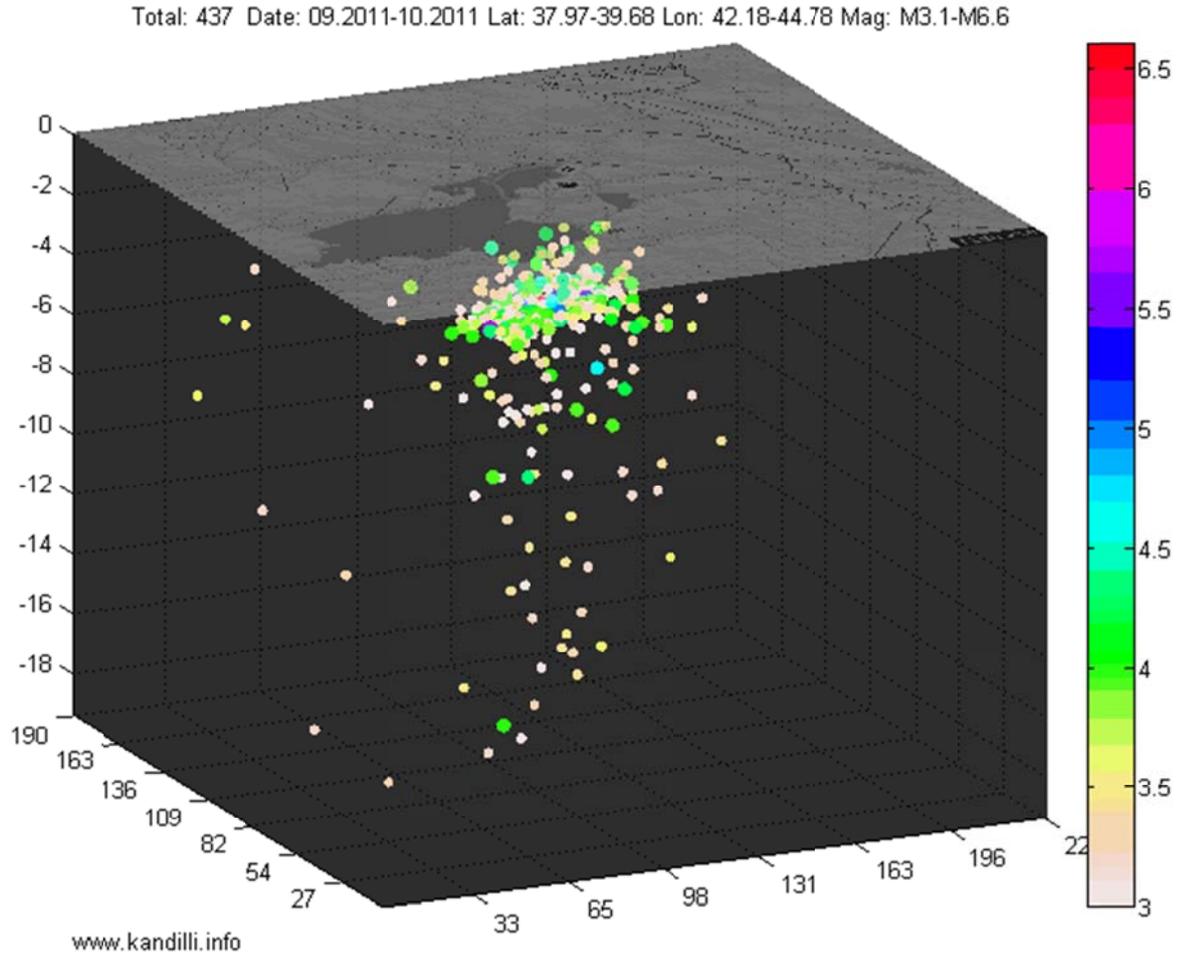


Figure 3. The aftershock activity in the earthquake region within 5 days of the mainshock, shown in 3D.

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