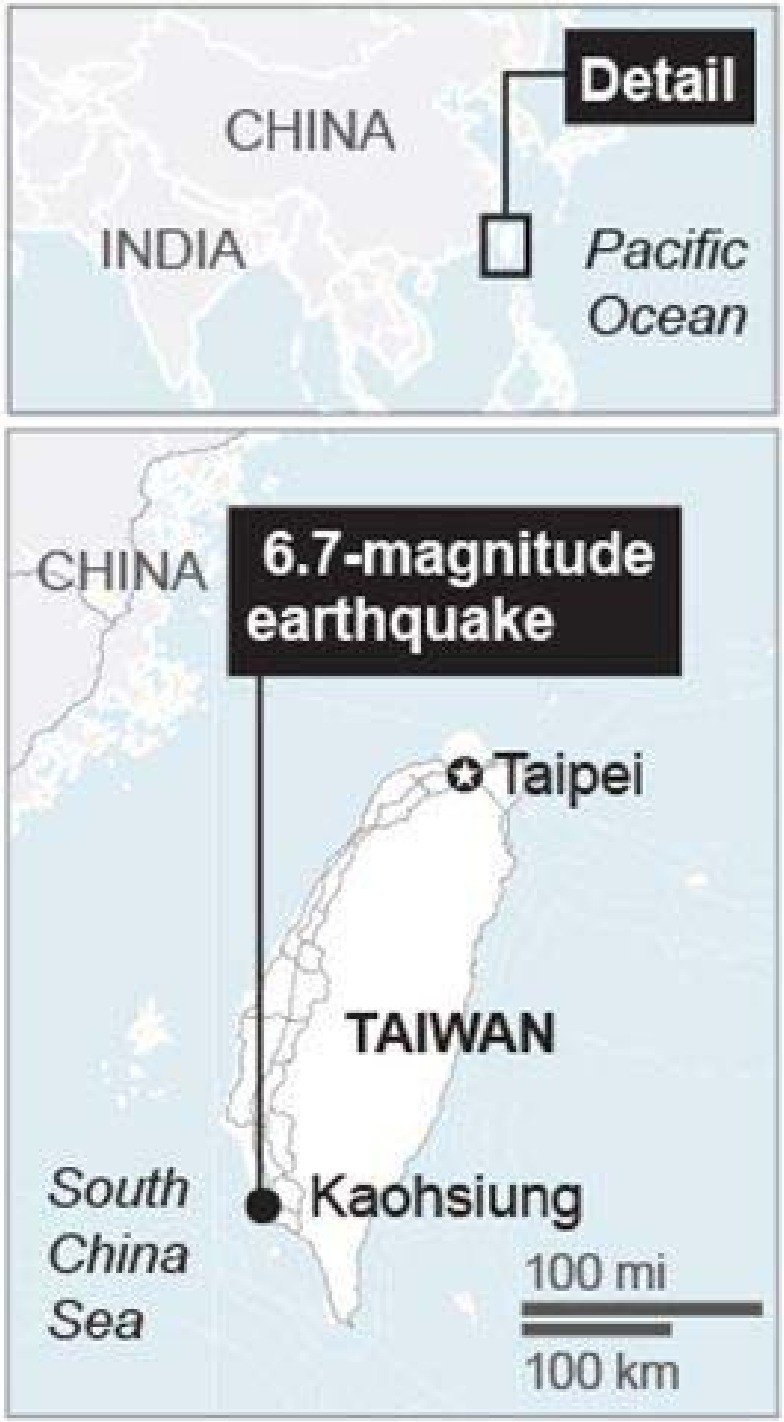
2016 Kaohsiung earthquake, Taiwan

M_W 6.4, 6 February 2016

By Evangelia GARINI and George GAZETAS, NTUA, Greece

8 February 2016



Date	6 February 2016
Origin time	03:57:27 (Taiwan time)
Magnitude	6.4 M_w
Depth	23.0 km
Epicenter	Kaohsiung, Taiwan
Areas affected	Republic of China (Taiwan)
Max. intensity	Very strong
Casualties	37 dead
	More than 500 injured
	121 missing

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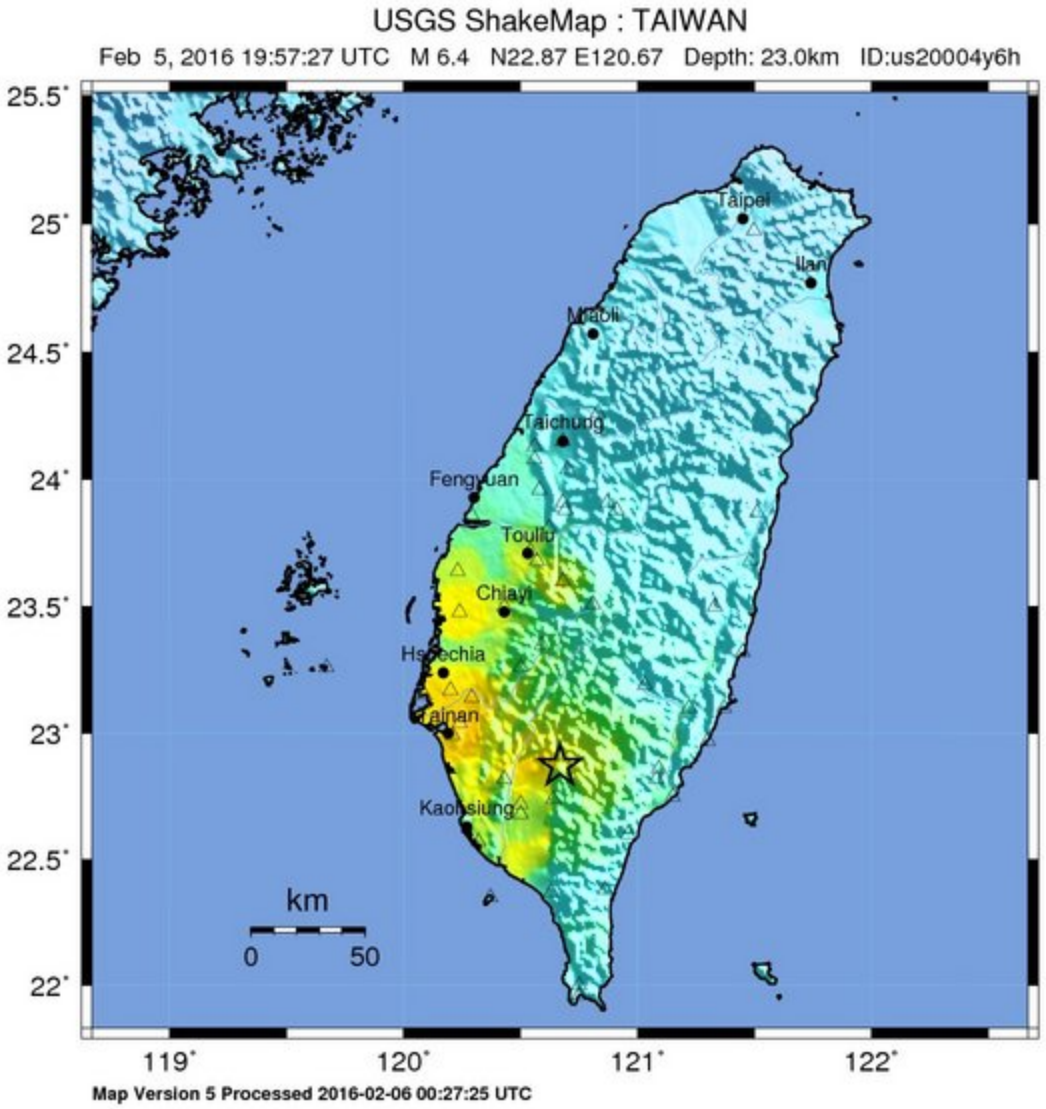

PERCEIVED SHAKING	Not felt	Weak	Light	Moderate	Strong	Very strong	Severe	Violent	Extreme
POTENTIAL DAMAGE	none	none	none	Very light	Light	Moderate	Mod./Heavy	Heavy	Very Heavy
PEAK ACC.(%g)	<0.05	0.3	2.8	6.2	12	22	40	75	>139
PEAK VEL.(cm/s)	*<0.02*	*0.1*	*1.4*	*4.7*	*9.6*	*20*	*41*	*86*	*>178*
INSTRUMENTAL INTENSITY	I	II-III	IV	V	VI	VII	VIII	IX	X+

Scale based upon Worden et al. (2012)

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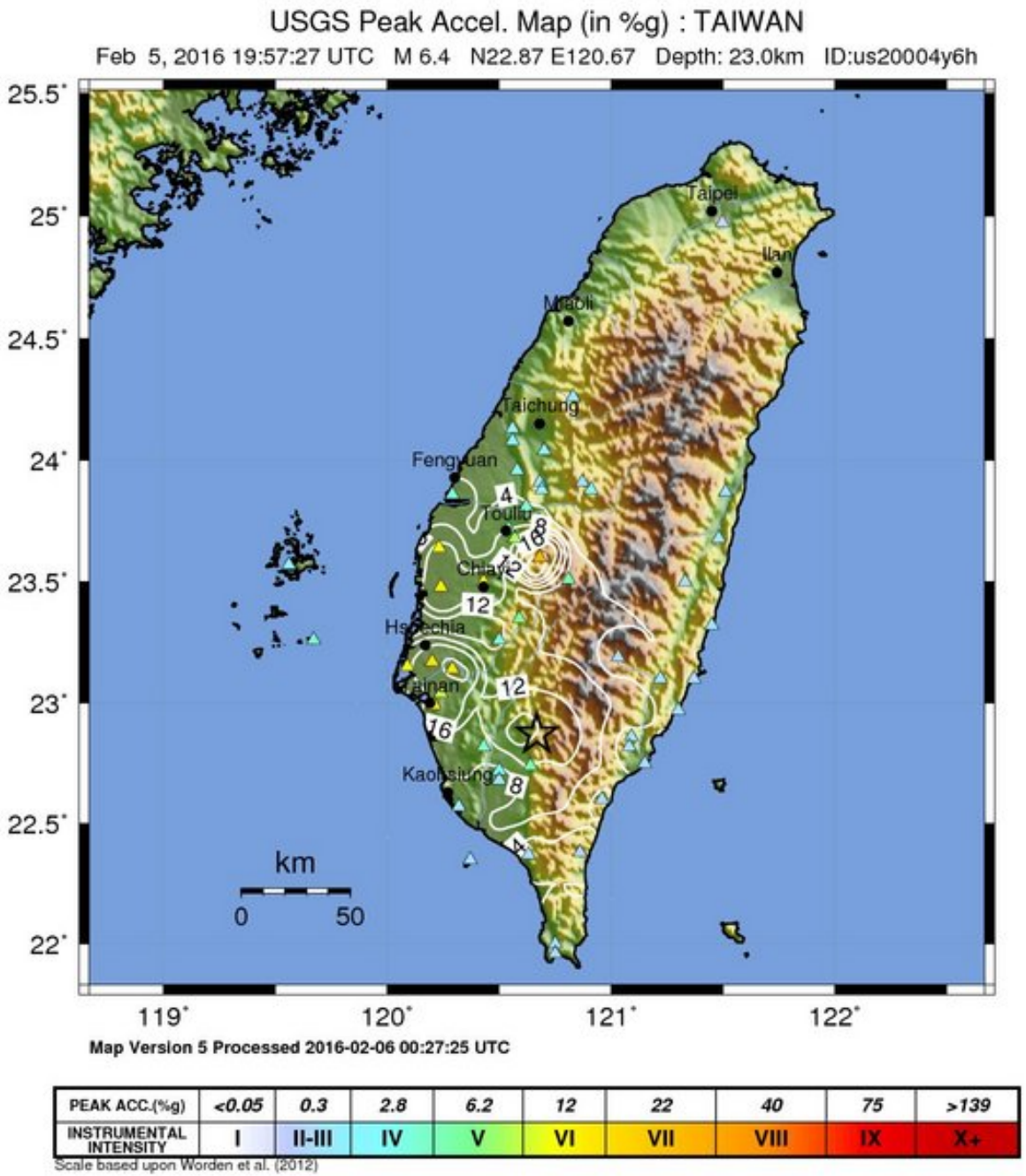
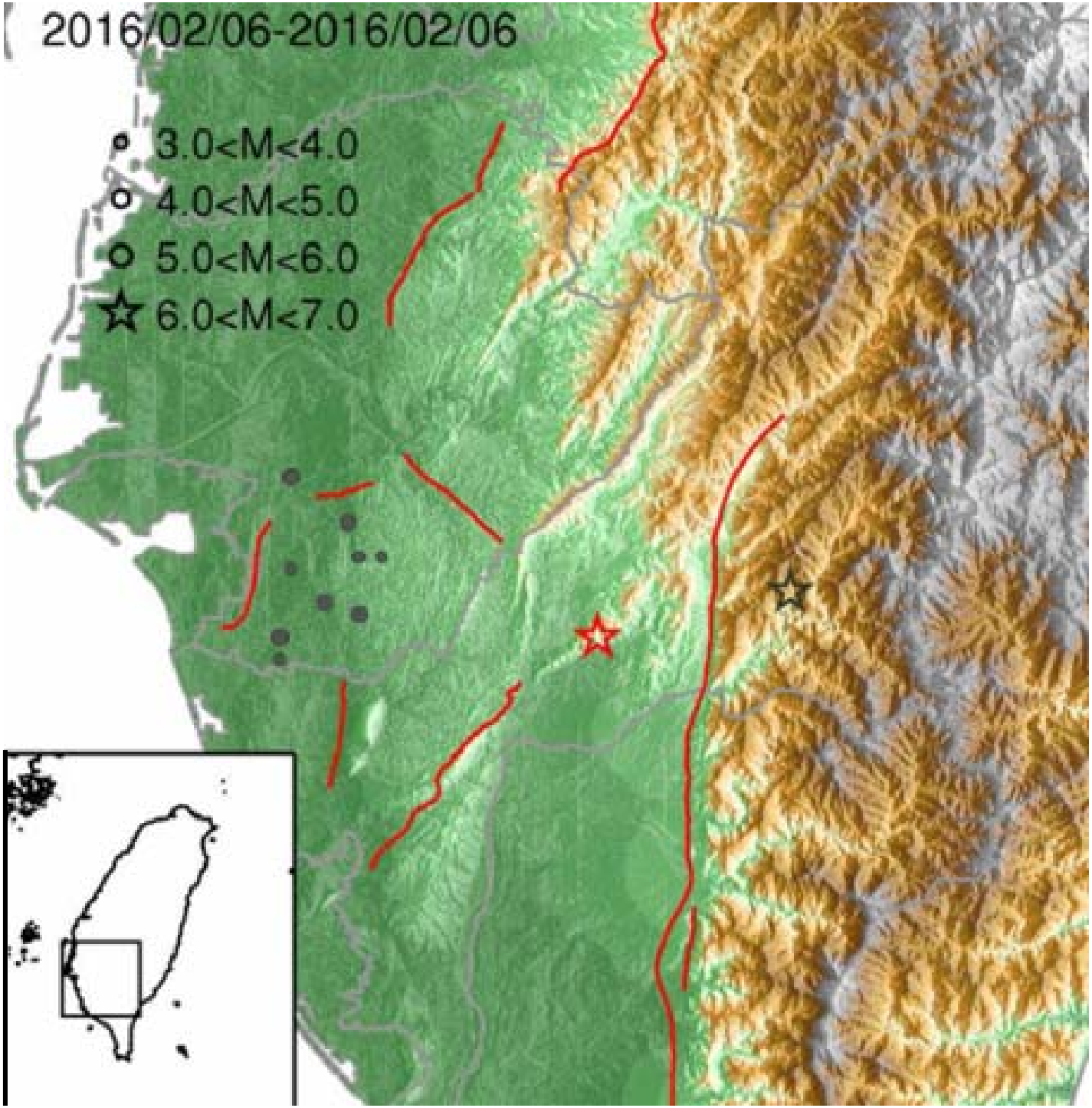
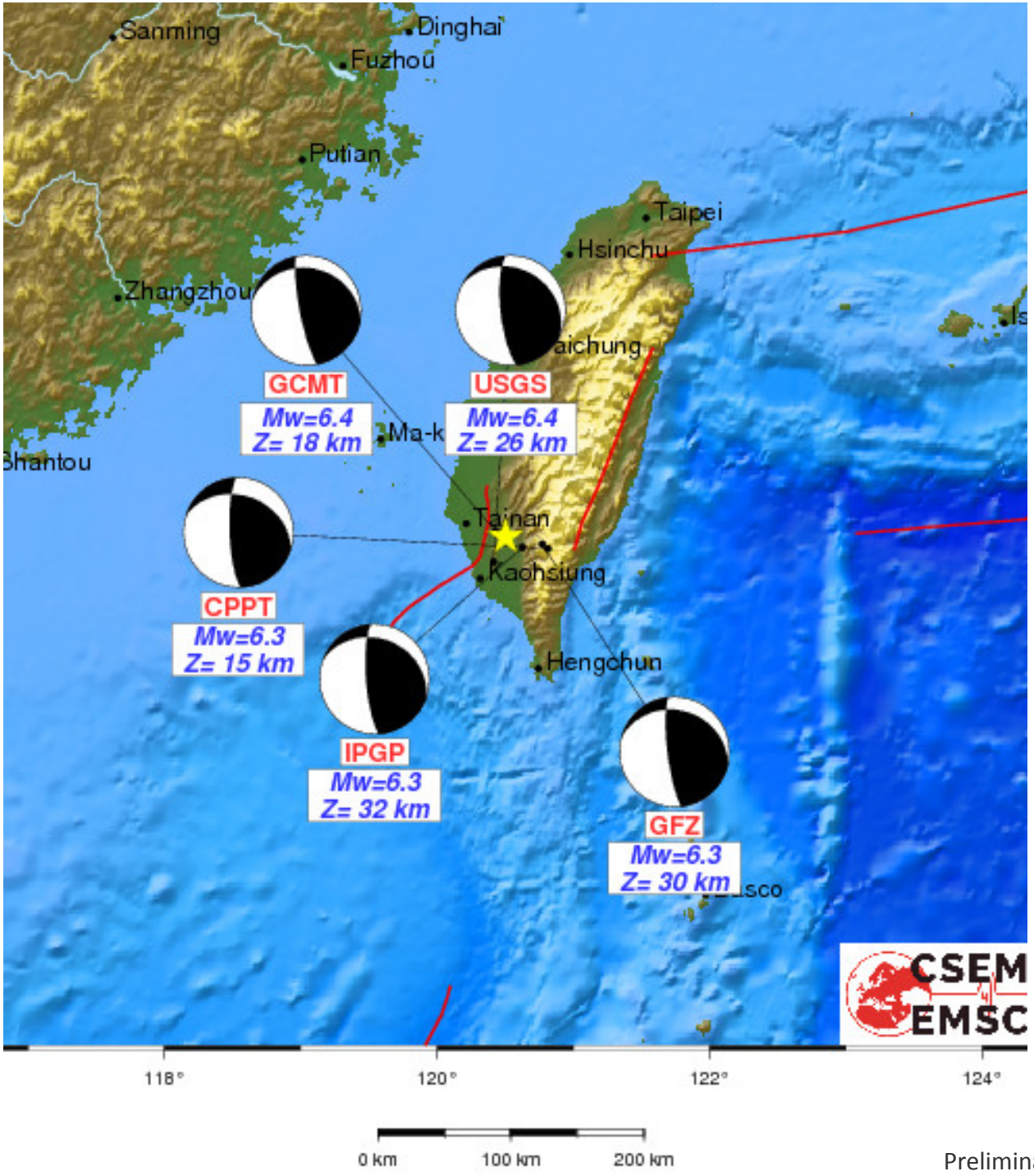

USGS Peak Accel. Map (in %g) : TAIWAN
Feb 5, 2016 19:57:27 UTC M 6.4 N22.87 E120.67 Depth: 23.0km ID:us20004y6h
25.5°
25°
24.5°
24°
23.5°
23°
22.5°
22°
119°
120°
121°
122°
Taipei
Ilan
Miaoli
Taichung
Fengyuan
Toulu
Chiayi
Hsinchia
Tainan
Kaohsiung
4
8
12
16
18
km
0
50
Map Version 5 Processed 2016-02-06 00:27:25 UTC
PEAK ACC.(%g) <0.05 0.3 2.8 6.2 12 22 40 75 >139
INSTRUMENTAL INTENSITY I II-III IV V VI VII VIII IX X+
Scale based upon Worden et al. (2012)



☆ : Main shock

● : Aftershocks

☆ : Main shock of Jiasian EQ, 2010/03/04



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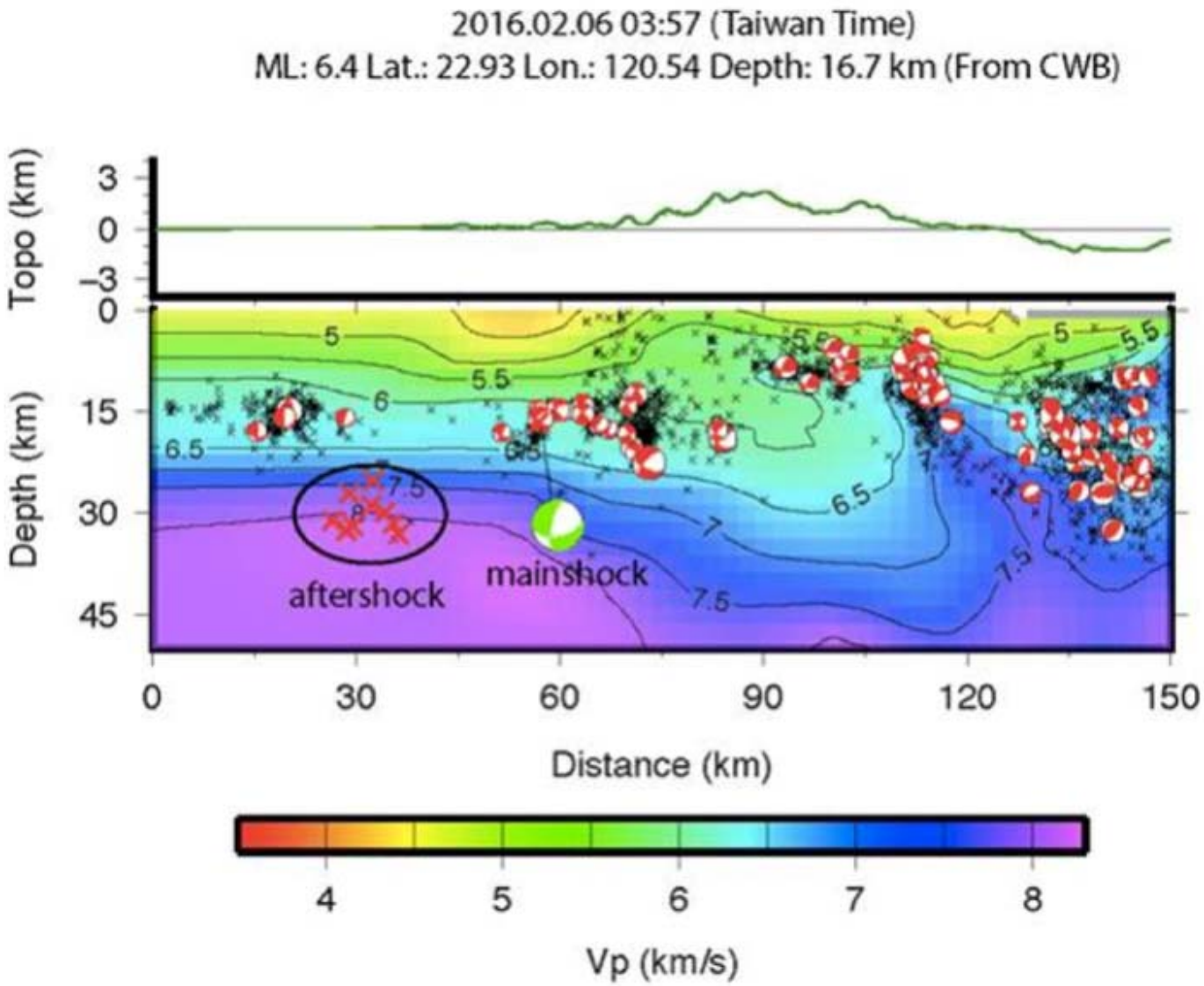

In this cross-section, W is on the left and E is on the right. The topography is in green at top, and the seismic wave speed, Vp, is at bottom Francis T. Wu. The 6 Feb 2016 (Taiwan time) M=6.4 mainshock is the green 'beach ball' (focal mechanism). Taiwanese seismologists suspect that the rupture aligns with the small red beachballs on a gently inclined 'blind' thrust fault.

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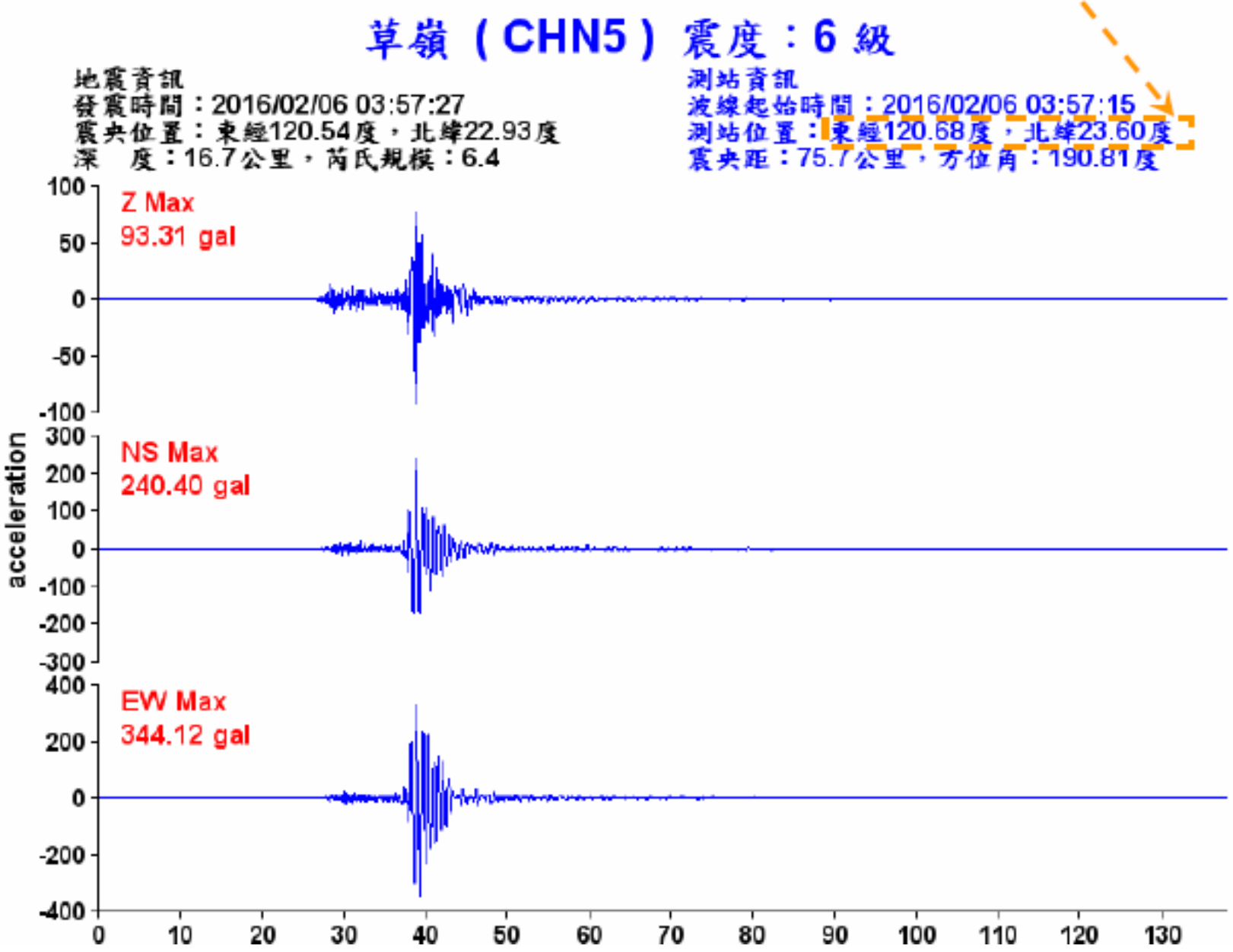
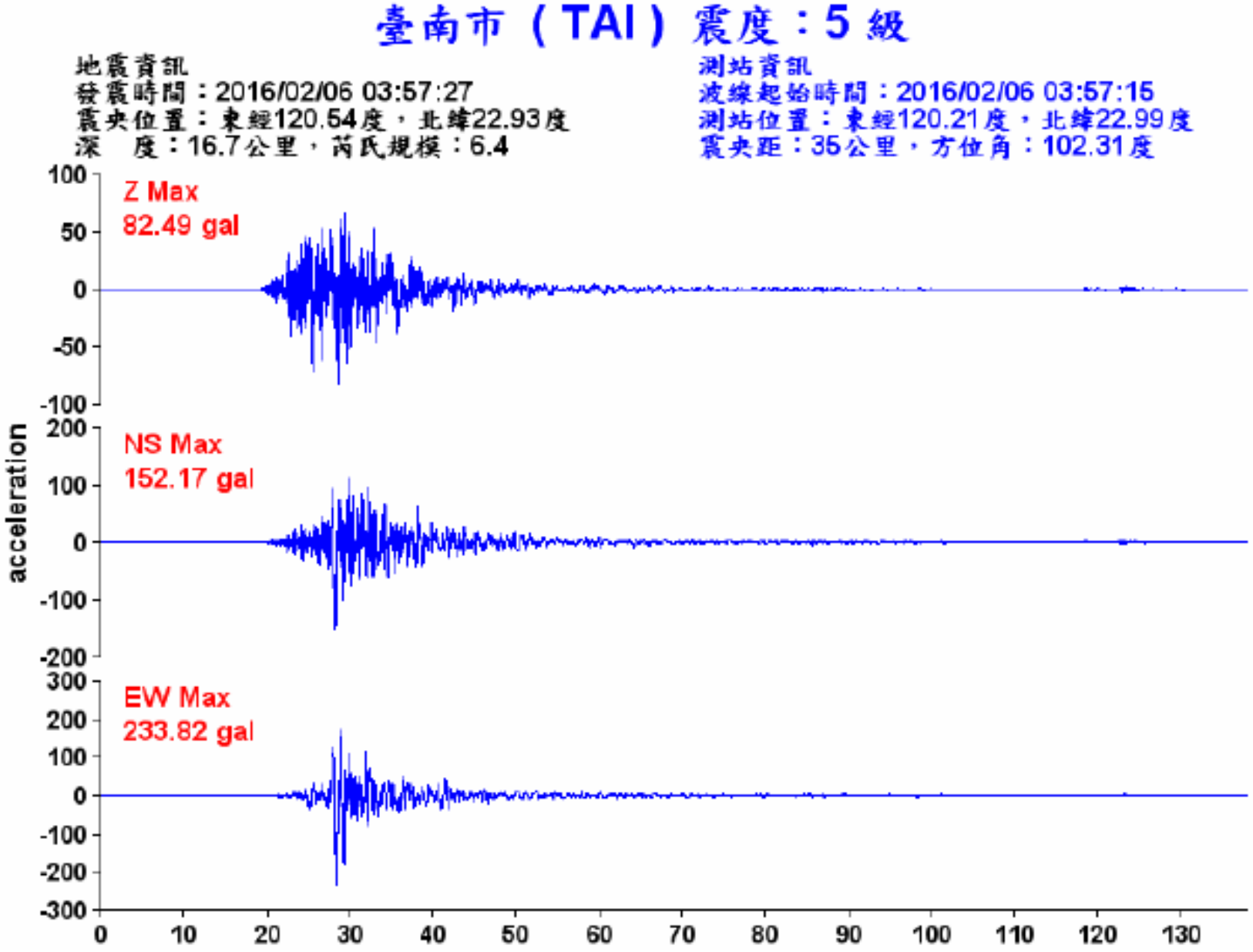
- Maximum PGA at Caoling, Yunlin (120.68E, 23.60N)



Reconnaissance Report by Yi-Hsuan Tu, Associate Prof., Dept. of Architecture, National Cheng Kung University, Taiwan.

Downtown area, Tainan City



Reconnaissance Report by Yi-Hsuan Tu, Associate Prof., Dept. of Architecture, National Cheng Kung University, Taiwan.


球場震出小河
交通
高鐵明天中午前
嘉義到高雄停駛
搶救18小時 小病請先暫勿前往大醫院急症室
台北-台南
災情通報專線
0800-022-967
現在溫度 大武16.3℃
強震過後... 台南高球場驚現10公尺裂縫
22:25
南台6.4震
泰山企業響應救災 捐出數百箱物資

- The epicenter of the quake was in Kaohsiung City's Meinong District (at a depth of 16.7 km) giving off energy equivalent to two atom bombs. It was the strongest earthquake to jolt the island since March 2010.

- The 5 Feb 2016 M=6.3 event struck at a depth of 20 km (12 mi) about 40 km (25 mi) east of the southern city of Tainan, with a population of 1.9 million.

- Based on the focal mechanism, aftershocks, geology, and the distribution of shaking, the earthquake most likely involves slip on a blind thrust fault.

- The worst affected city was Tainan, where numerous buildings reportedly collapsed including at least one 17-story residential building with hundreds of people trapped in collapsed buildings.

- Eight buildings collapsed or were semi-collapsed, several of which were left leaning at alarming angles.

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The Weiguan Jinlong building, Tainan City

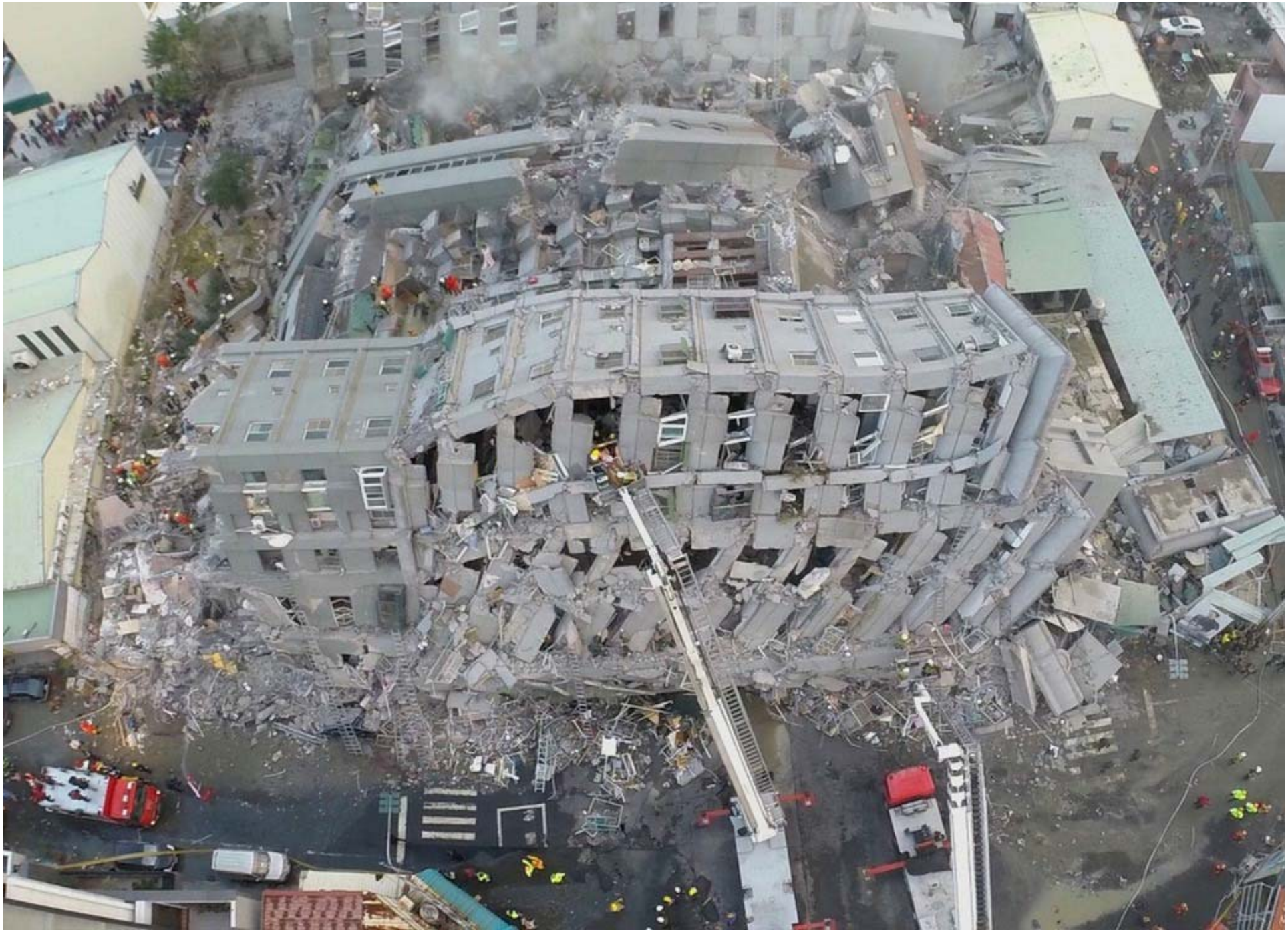
Before earthquake

- 16 stories with 1- story basement
- About 16 years old
- Collapsed and overturned to the street side
- 1F-2F: commercial (big electronic store)
- Above 3F: residential

256 people registered as living in the complex comprising 96 apartments.

However, it was not clear how many people were inside the building at the time of the quake.

As of 9:30 pm, rescuers had pulled 167 people from the building, while 155 remained unaccounted for, according to family members.



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臺南市
消防
臺南市
義消
台南市
義消

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Used oil tanks cast in the concrete were used as inside formwork of non-structural façade to reduce the weight.

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Hsinhua branch of King's Town Bank

10 stories with 1-story basement

About 20 years old

1F-3F collapsed and inclined to the street side

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KYMCO
檳榔
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Collapsed 3-story building in Rende district

Before

After

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