

The Turkey-Syria M_w 7.8 Earthquake of February 6th 2023

Recorded Accelerograms and their Response Spectra

Evangelia GARINI and George GAZETAS

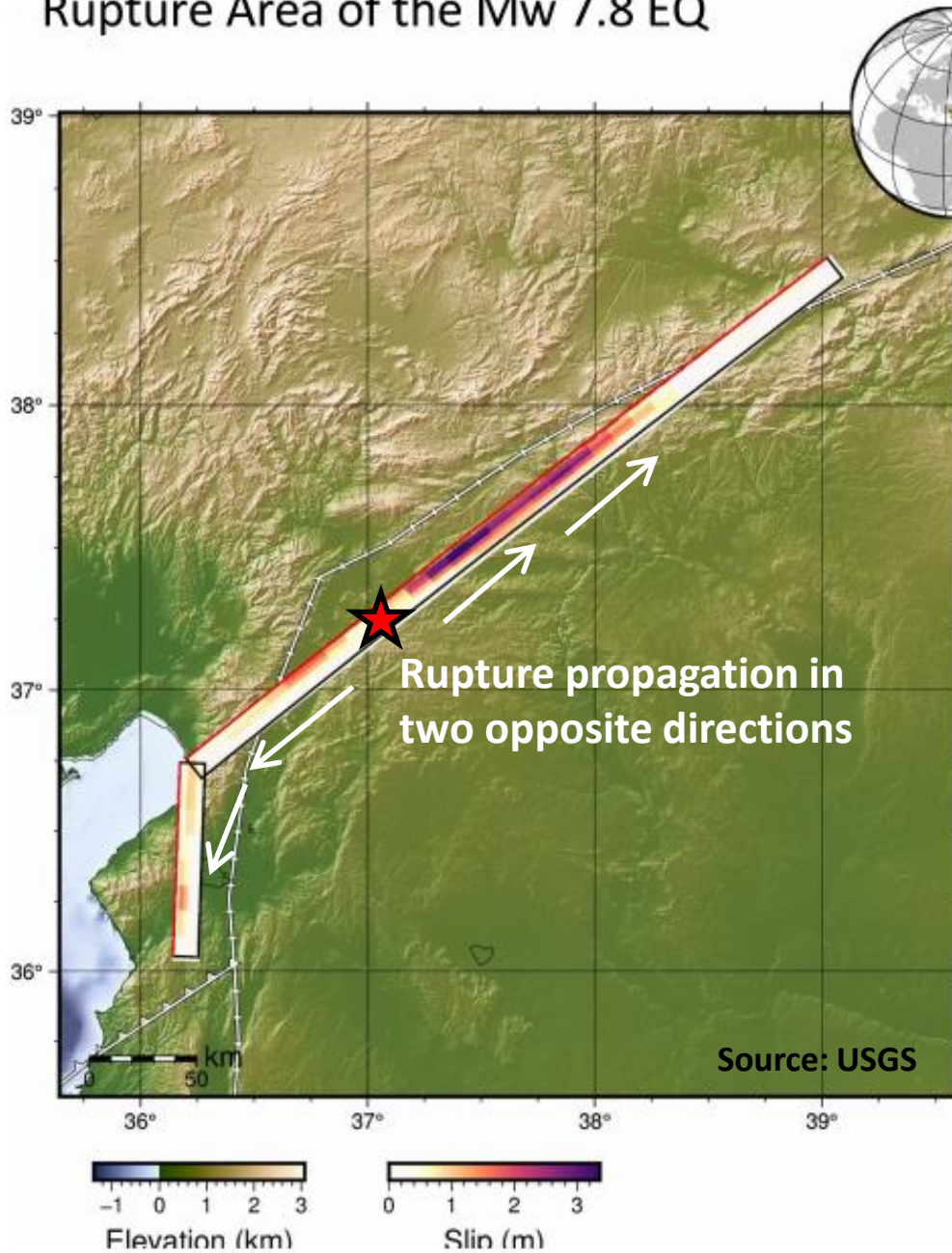


**School of Civil Engineering,
National Technical University of Athens**

We are thankful to our Turkish colleagues in AFAD for the immediate and open publishing of the huge number of accelerograms.

Disclaimer: The data utilised are taken from the AFAD website, as they are published on 10 February 2023. Mistakes on baseline corrections or other issues are noticed by the Authors but are not solved here.

Rupture Area of the Mw 7.8 EQ



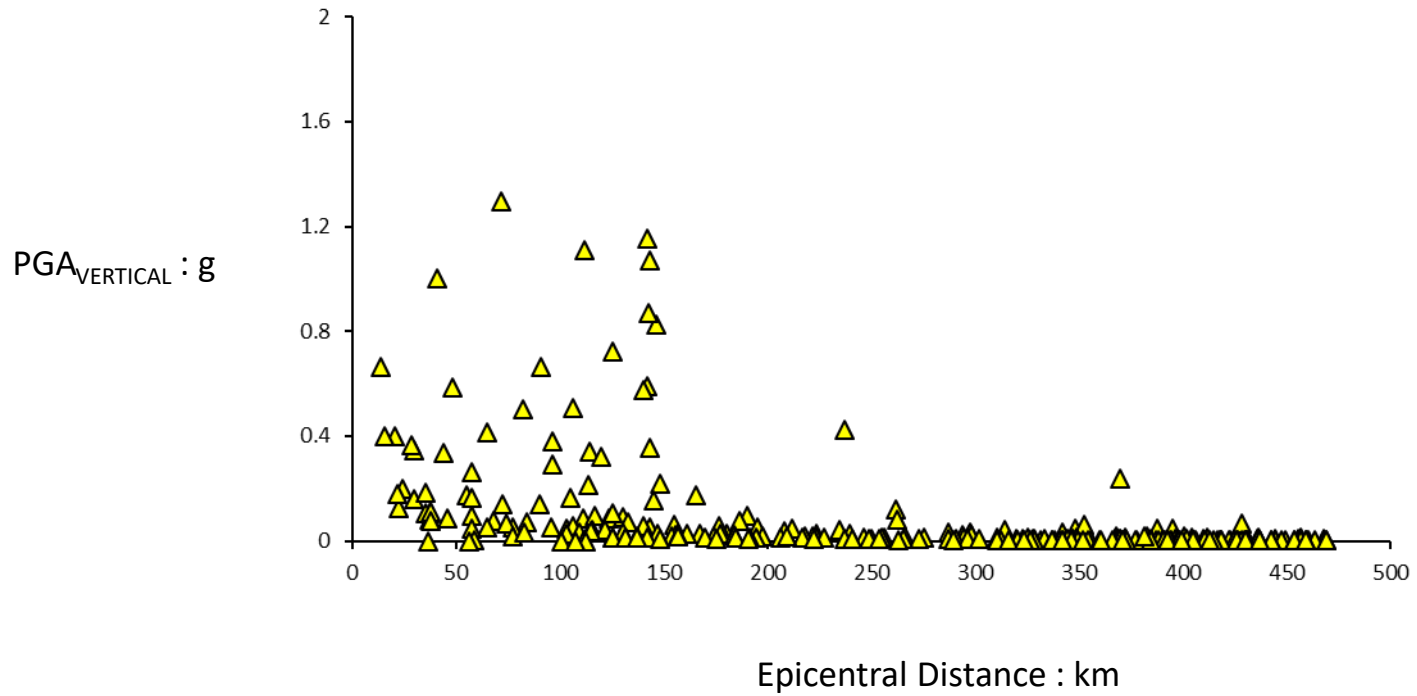
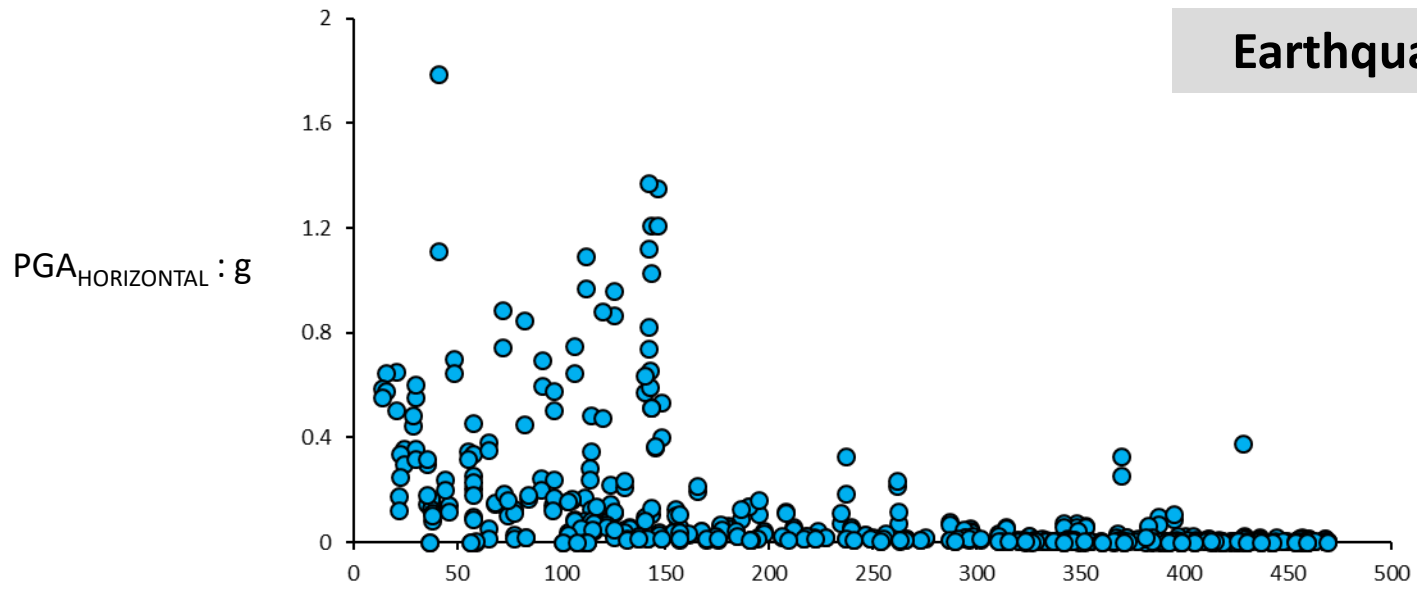
The recorded motions of this M7.8 event are of relatively limited duration (for such a huge magnitude) due to the **bilateral propagation** of the fault rupture.

Moreover, in the **southern part** (in the region of Antakya) the records exhibit strong **forward-rupture directivity effects** as you can see in the acceleration and velocity time histories.

Records from the $M_w 7.8$ event with $PGA > 0.5$ g

Code	R_{epi} [km]	PGA_{NS} [g]	PGA_{EW} [g]	PGA_{UD} [g]
2708	41	1.788	1.110	1.003
3129	146	1.353	1.210	0.826
3126	144	1.211	1.030	1.071
3117	112	0.969	1.093	1.111
3141	125	0.961	0.869	0.723
3138	72	0.889	0.747	1.296
3125	142	0.823	1.122	1.152
3135	142	0.741	1.372	0.589
2718	48	0.702	0.645	0.586
3123	143	0.656	0.594	0.868
4616	21	0.653	0.503	0.397
3142	106	0.647	0.750	0.506
NAR	15	0.647	0.579	0.399
3145	91	0.600	0.696	0.663
4615	14	0.588	0.556	0.665
3139	96	0.577	0.505	0.379
3124	140	0.573	0.638	0.578
2712	30	0.555	0.603	0.346
3136	148	0.534	0.402	0.220
3132	143	0.515	0.515	0.354
201	120	0.474	0.880	0.319
3137	82	0.453	0.848	0.502

Earthquake $M_w 7.8$



Earthquake $M_W 7.8$

Station 2708:



at **Gaziantep** city, Islahiye District

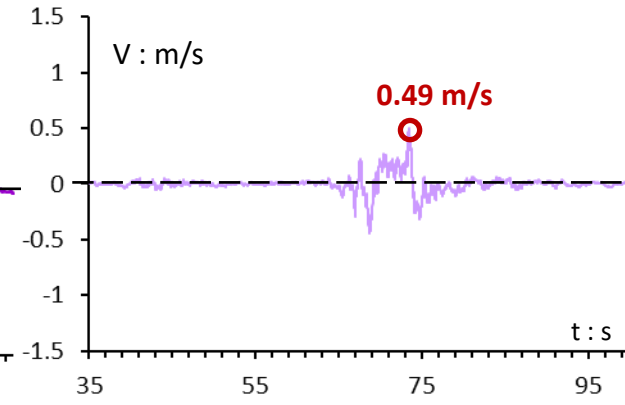
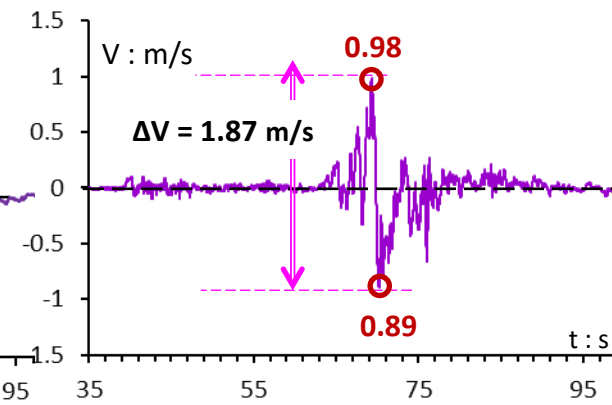
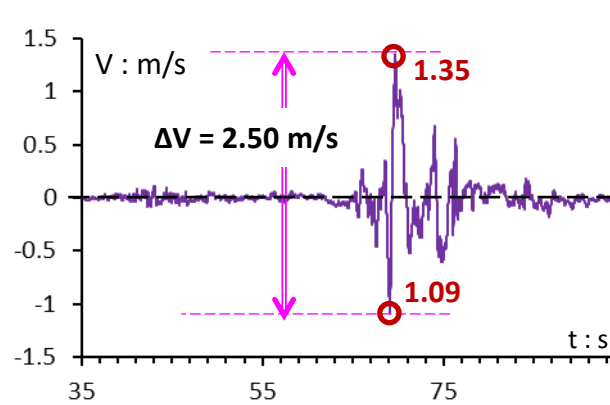
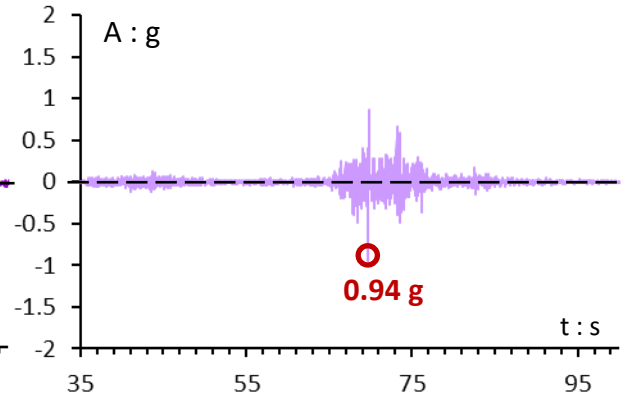
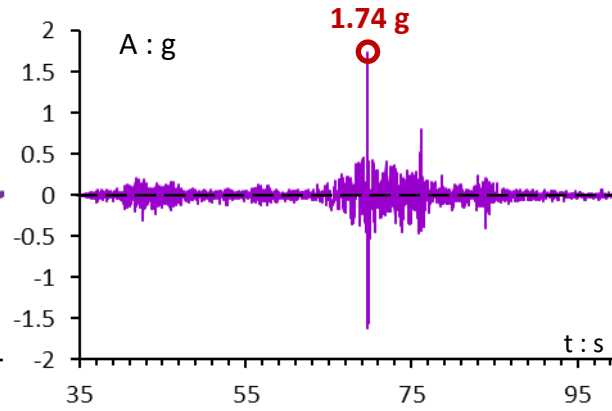
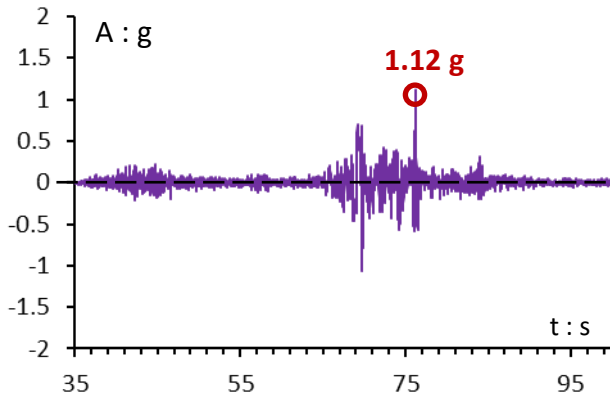
Station at **Free field**, $V_{s30} = 523$ m/s (EC8 Type B)

Exact Location: 36.648373 (Long.) 37.09933 (Lat.)

Horizontal EW
component

Horizontal NS
component

Vertical
component

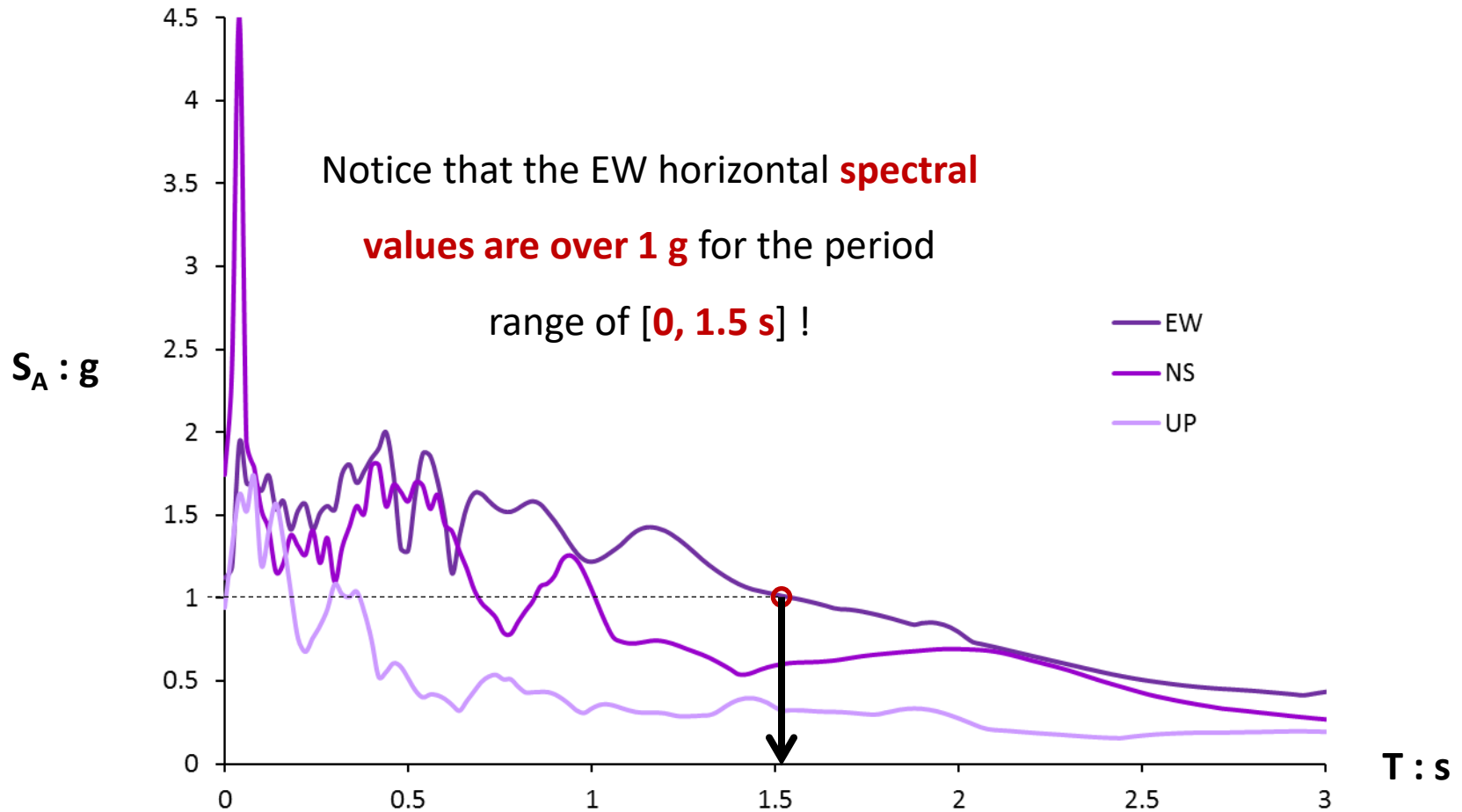


Earthquake $M_w 7.8$

Station 2708: at **Gaziantep** city, İslahiye District

Station at **Free field**, $V_{s30} = 523$ m/s (EC8 Type B)

Exact Location: 36.648373 (Long.) 37.09933 (Lat.)



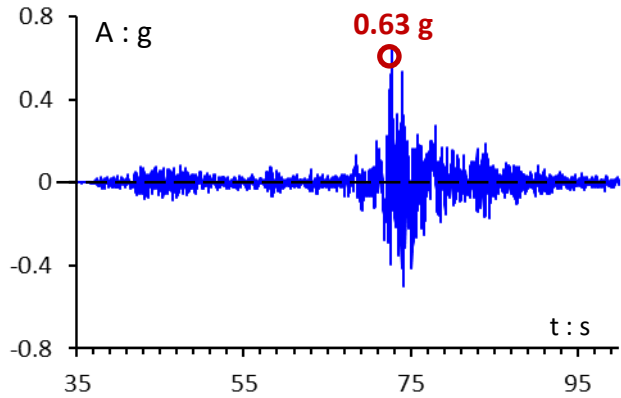
Earthquake $M_W 7.8$

Station 2718: at **Gaziantep** city, Islahiye District

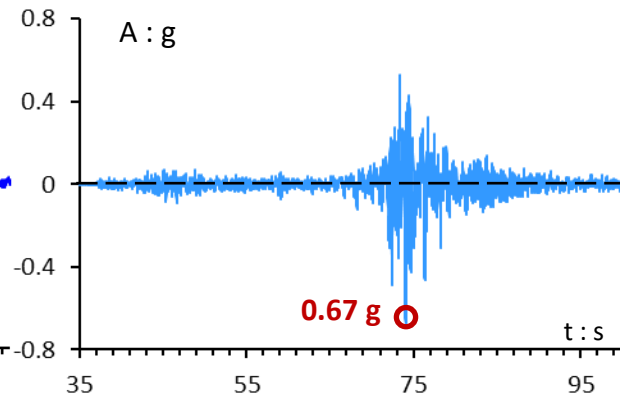
NO soil data available

Exact Location: 36.6266 (Long.) 37.00777 (Lat.)

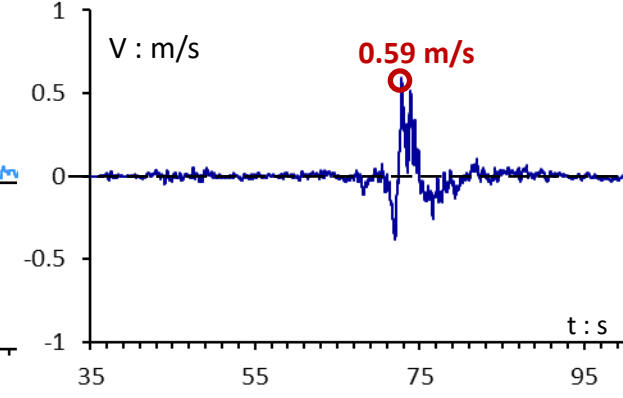
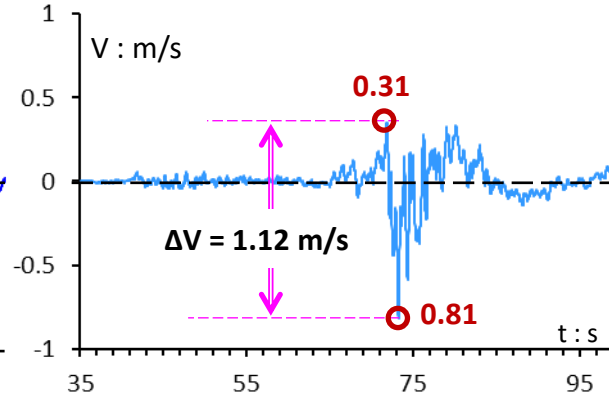
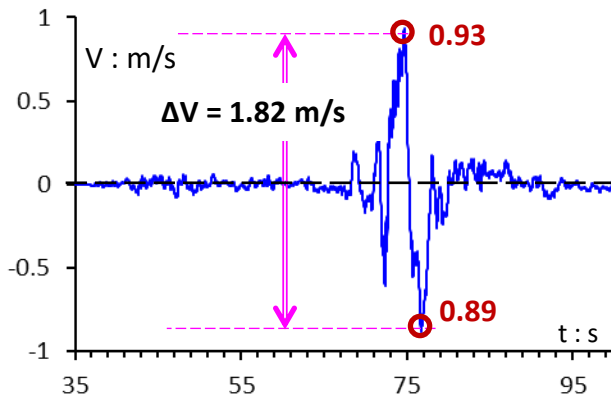
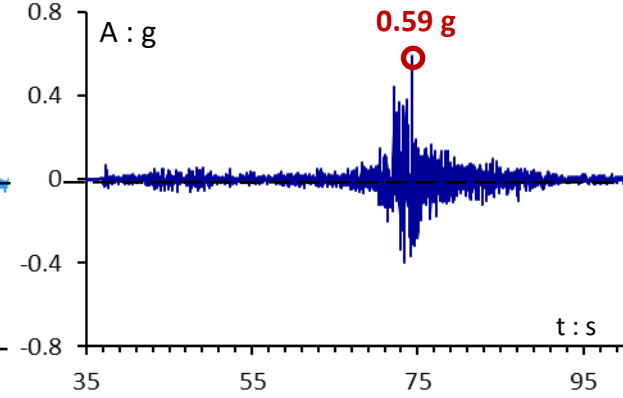
Horizontal EW
component



Horizontal NS
component



Vertical
component

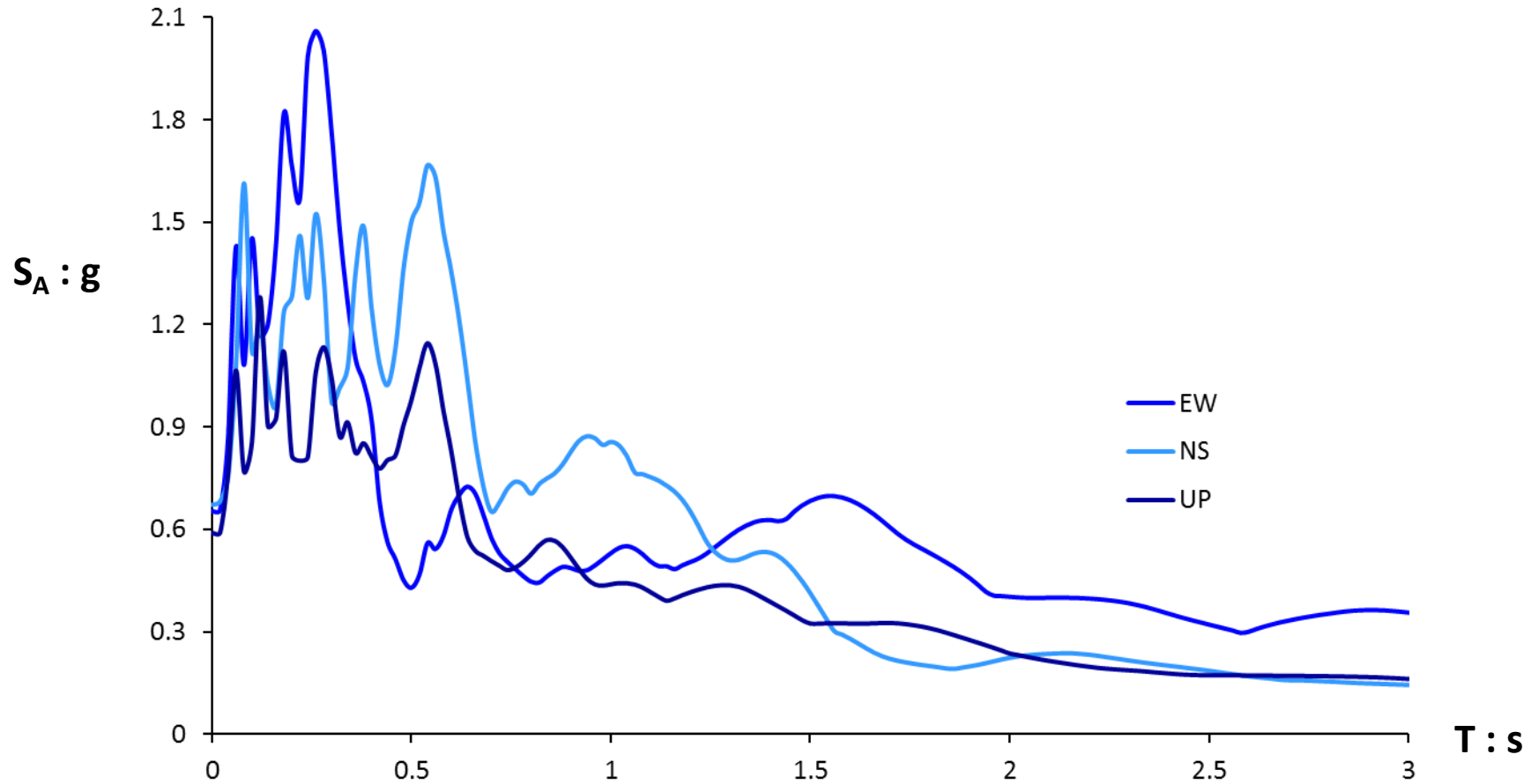


Earthquake M_w 7.8

Station 2718: at **Gaziantep** city, İslahiye District

NO soil data available

Exact Location: 36.6266 (Long.) 37.00777 (Lat.)



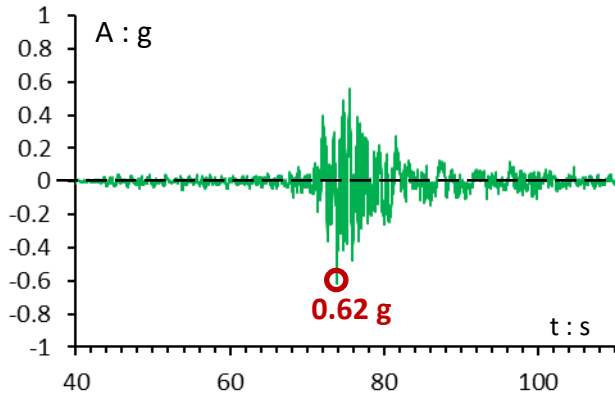
Earthquake $M_W 7.8$

Station 3123: at **Hatay** city, Antakya District

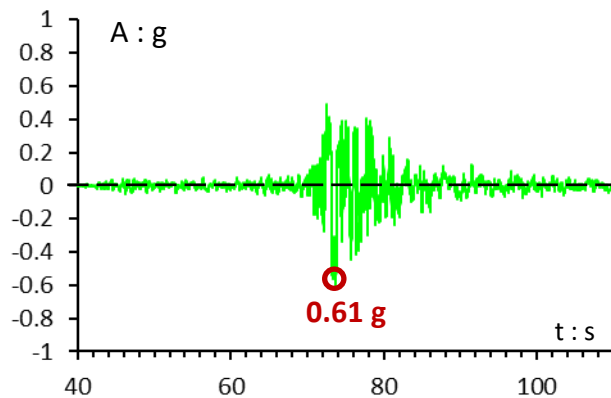
Station at **Free field**, $V_{s30} = 470$ m/s (EC8 Type B)

Exact Location: 36.15973 (Long.) 36.21423 (Lat.)

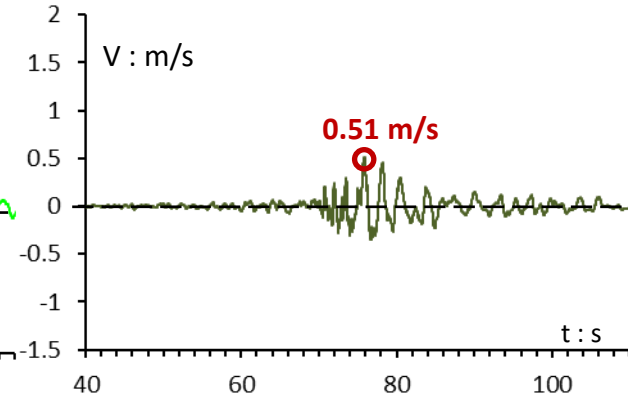
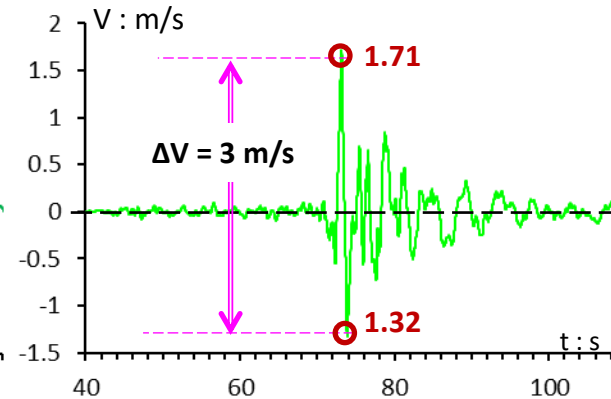
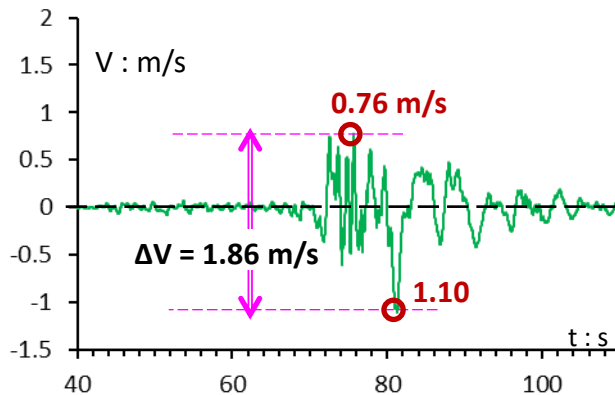
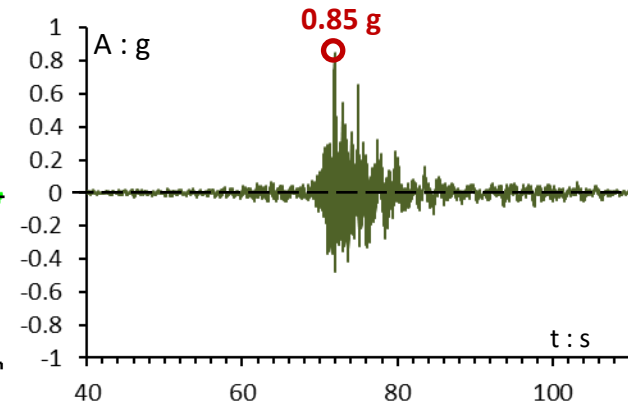
Horizontal EW
component



Horizontal NS
component



Vertical
component

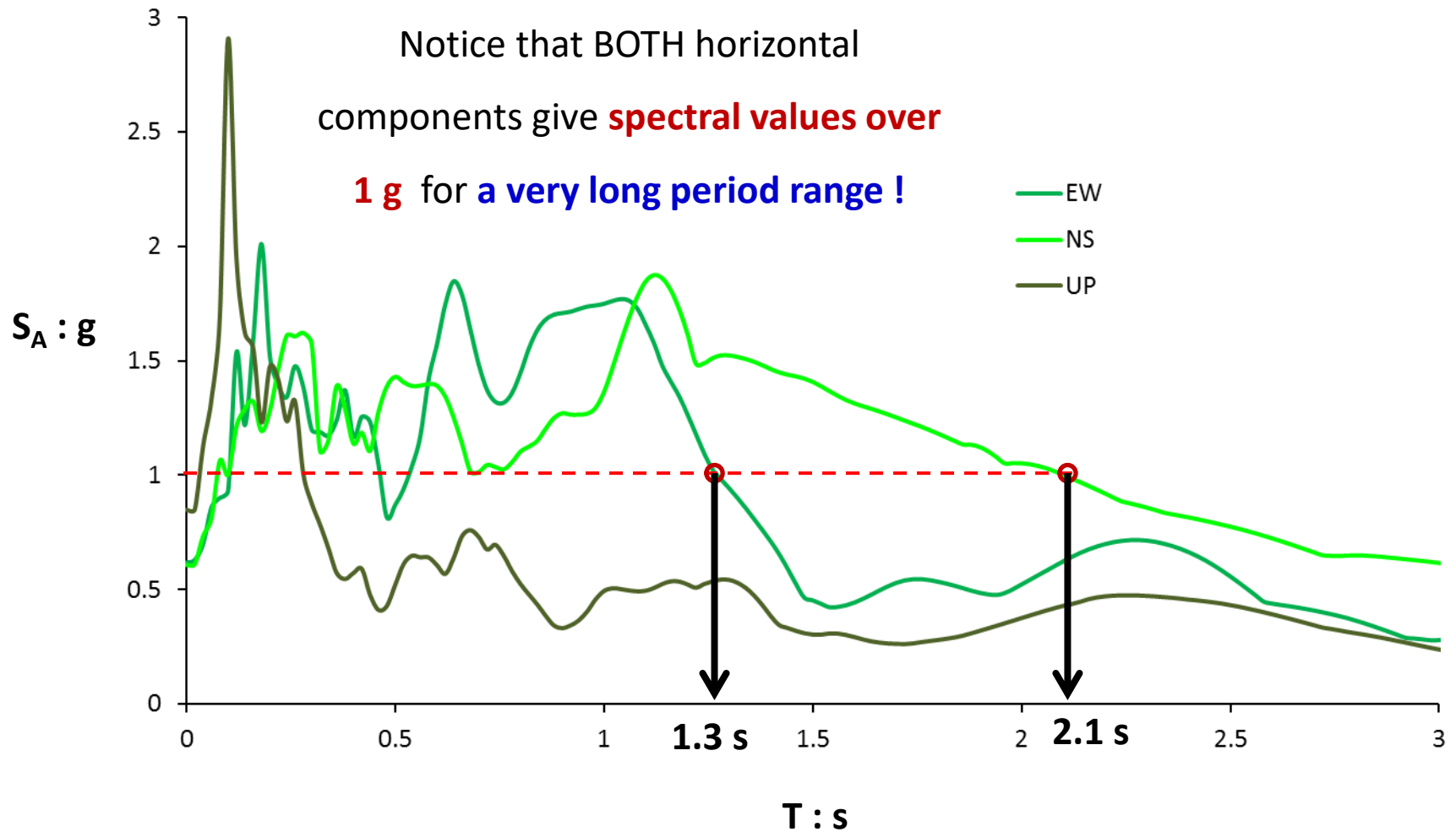


Earthquake M_w 7.8

Station 3123: at **Hatay** city, Antakya District

Station at **Free field**, $V_{s30} = 470$ m/s (EC8 Type B)

Exact Location: 36.15973 (Long.) 36.21423 (Lat.)



Earthquake $M_W 7.8$

Station 3125:

at **Hatay** city, Antakya District

Station at **Free field**, $V_{S30} = 448$ m/s (EC8 Type B)

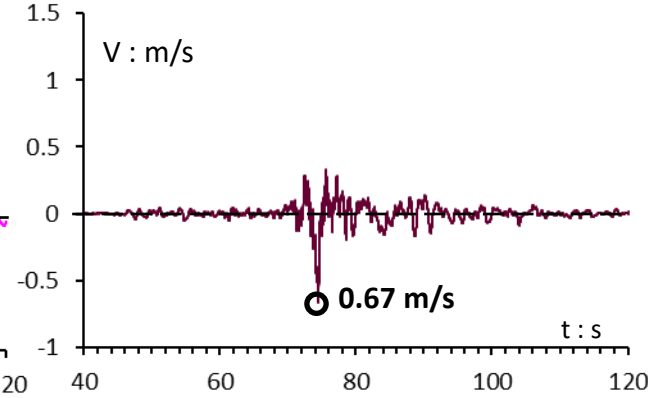
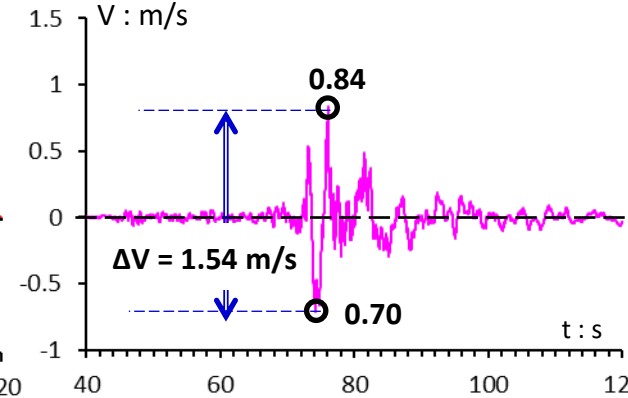
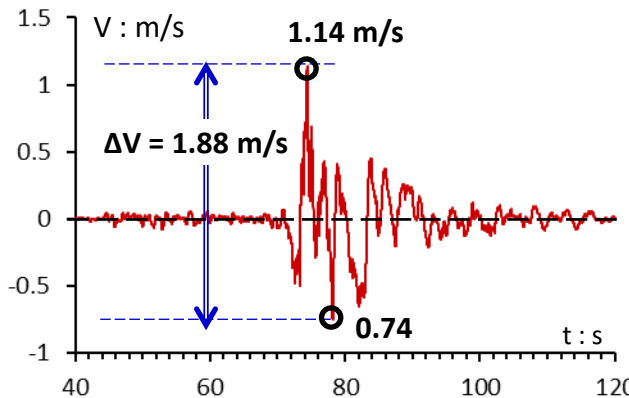
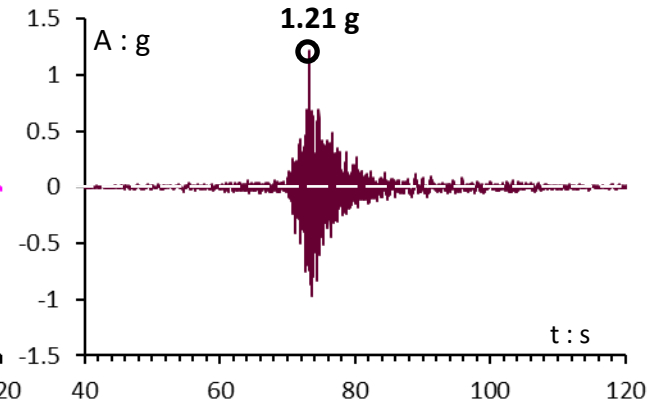
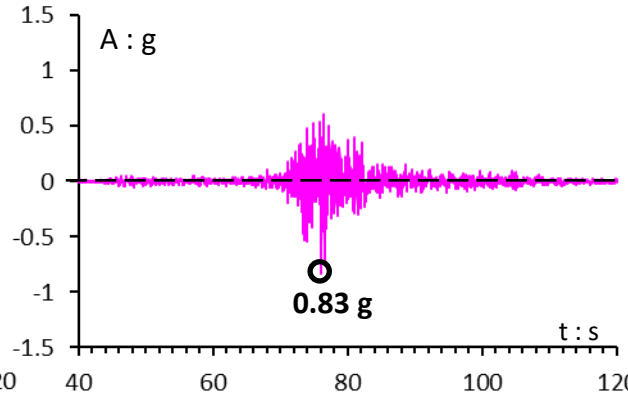
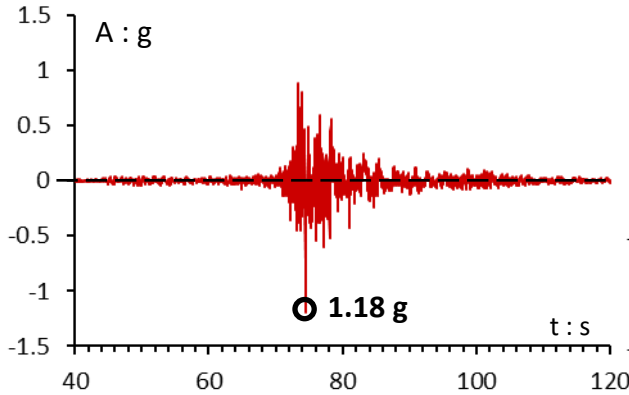
Exact Location: 36.13264 (Long.) 36.23808 (Lat.)



Horizontal EW component

Horizontal NS component

Vertical component

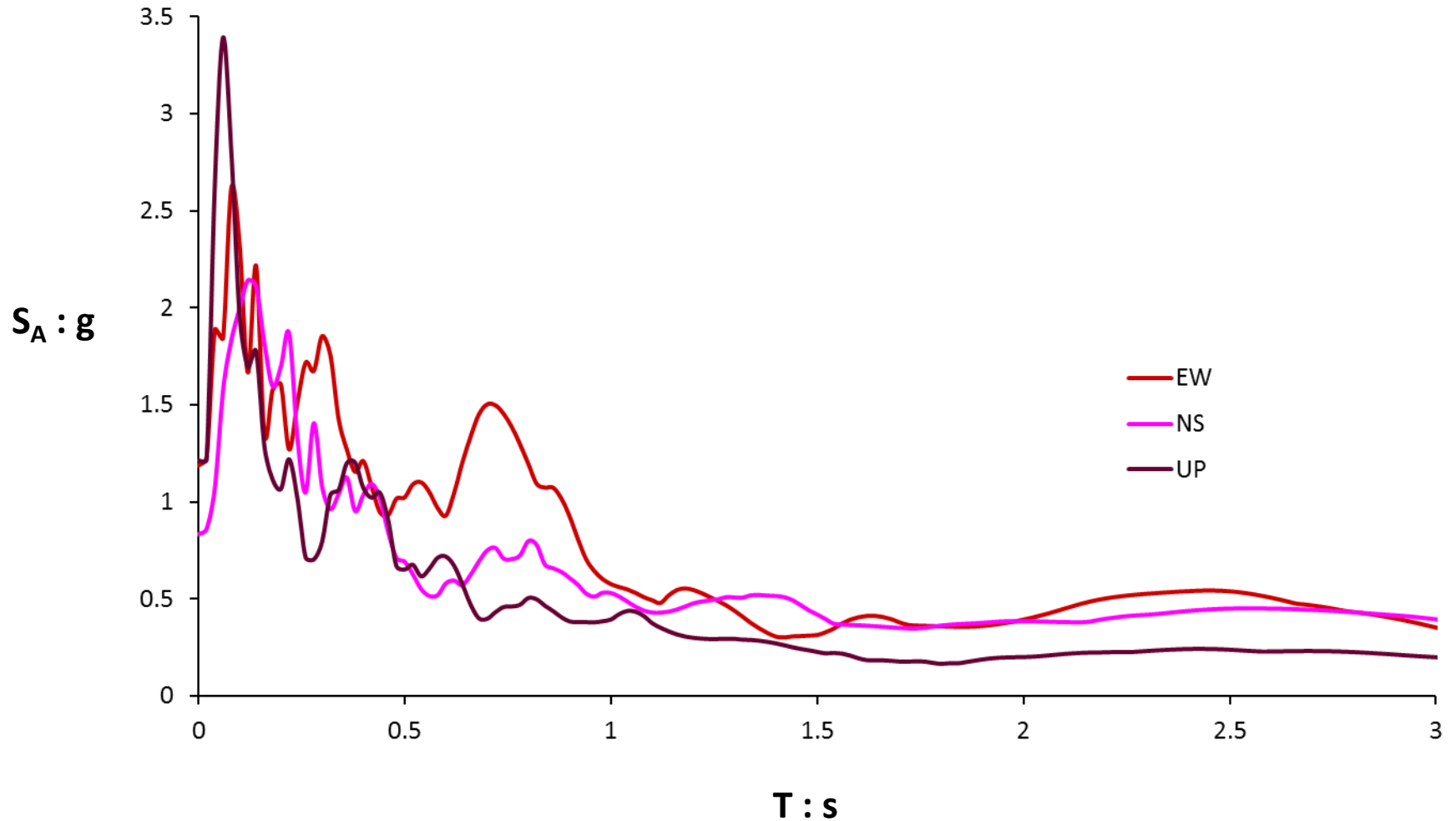


Earthquake $M_w 7.8$

Station 3125: at **Hatay** city, Antakya District

Station at **Free field**, $V_{s30} = 448$ m/s (EC8 Type B)

Exact Location: 36.13264 (Long.) 36.23808 (Lat.)



Earthquake $M_W 7.8$

Station 3126:

at **Hatay** city, Antakya District

Station at **Free field**, $V_{s30} = 350$ m/s (EC8 Type C)

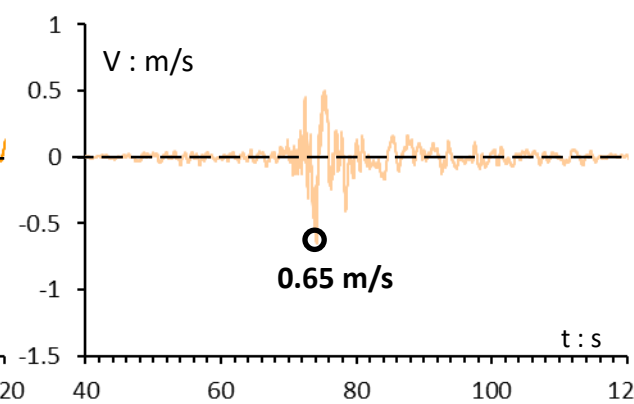
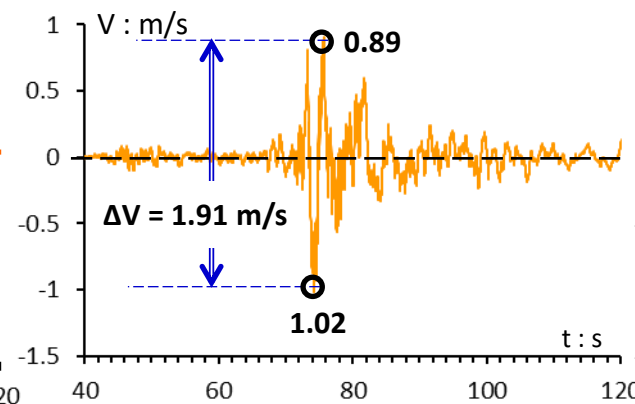
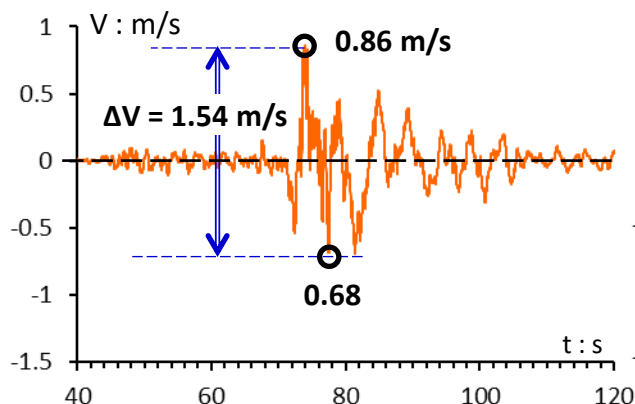
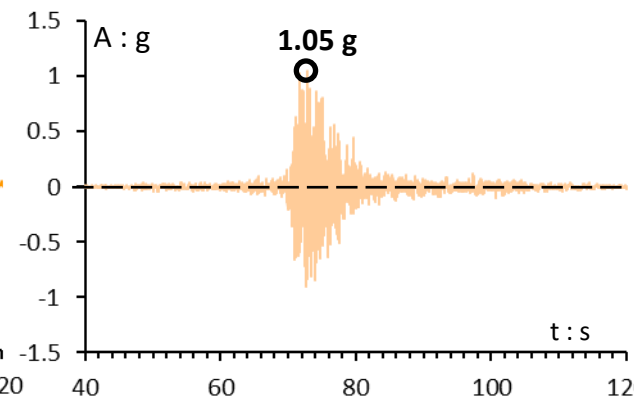
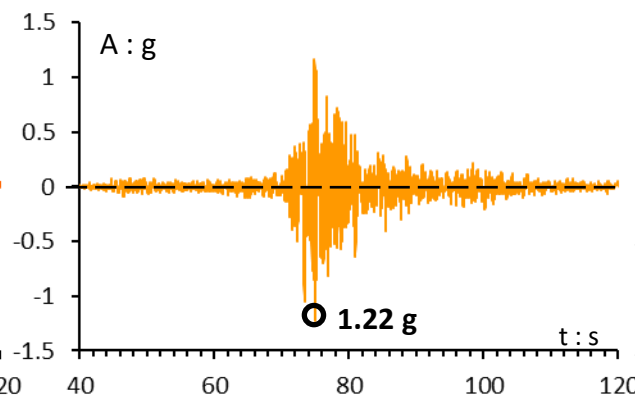
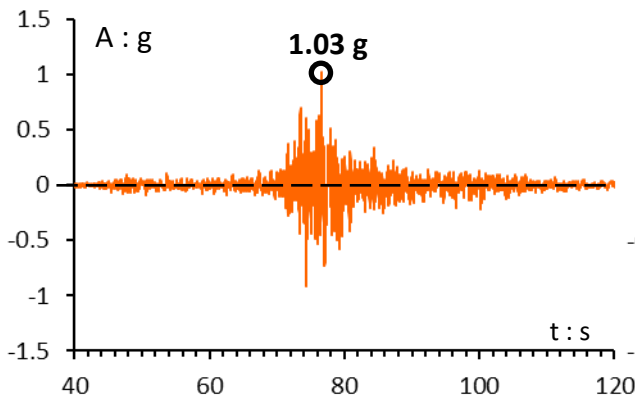
Exact Location: 36.1375 (Long.) 36.2202 (Lat.)



Horizontal EW component

Horizontal NS component

Vertical component

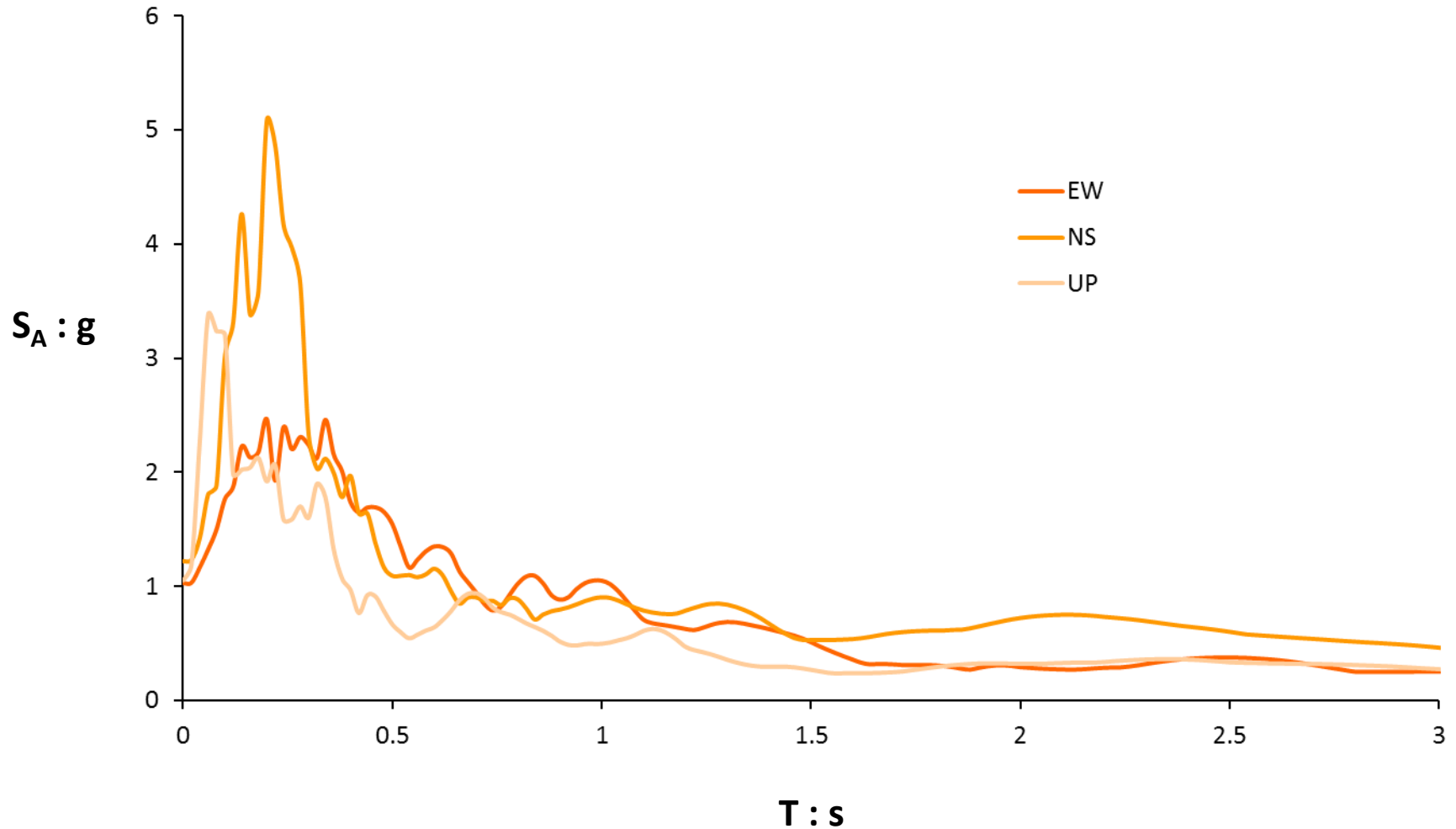


Earthquake M_w 7.8

Station 3126: at **Hatay** city, Antakya District

Station at **Free field**, $V_{s30} = 350$ m/s (EC8 Type C)

Exact Location: 36.1375 (Long.) 36.2202 (Lat.)



Earthquake $M_W 7.8$

Station 3129:

at **Hatay** city, Defne District

Station at **Free field**, $V_{s30} = 447$ m/s (EC8 Type B)

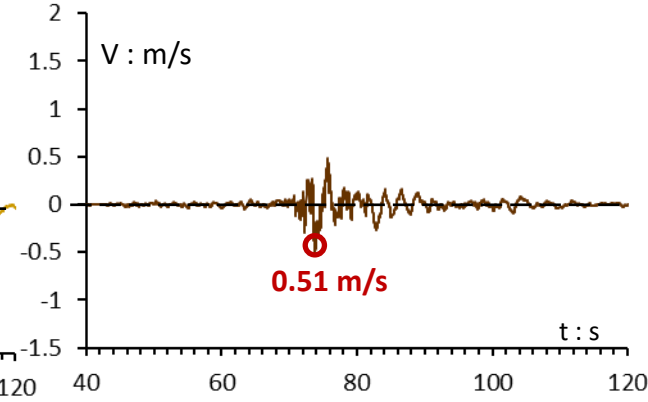
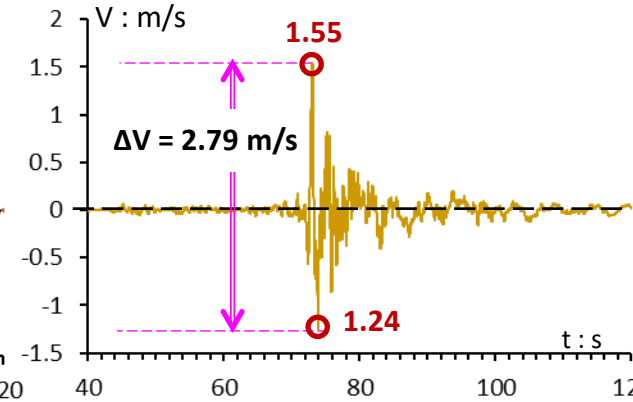
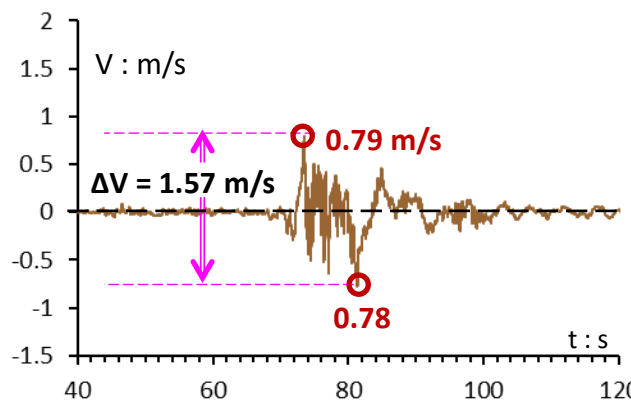
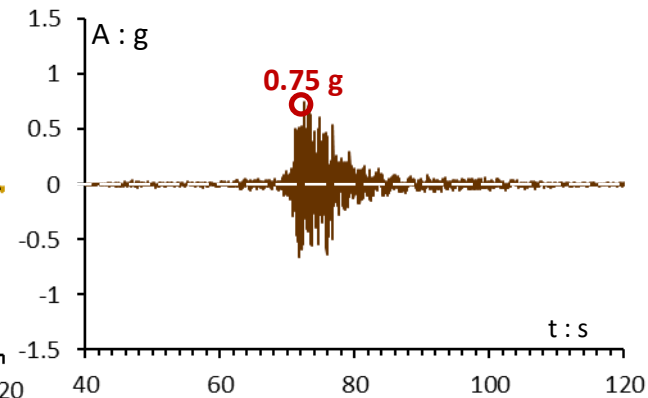
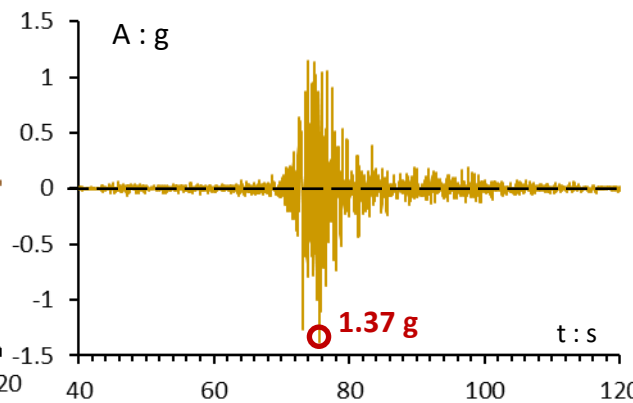
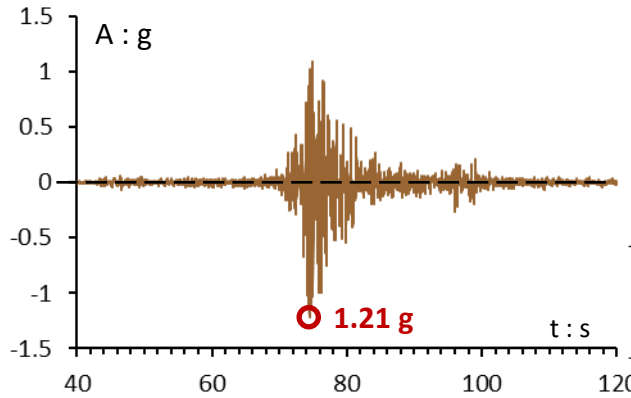
Exact Location: 36.1343 (Long.) 36.19117 (Lat.)



Horizontal EW
component

Horizontal NS
component

Vertical
component

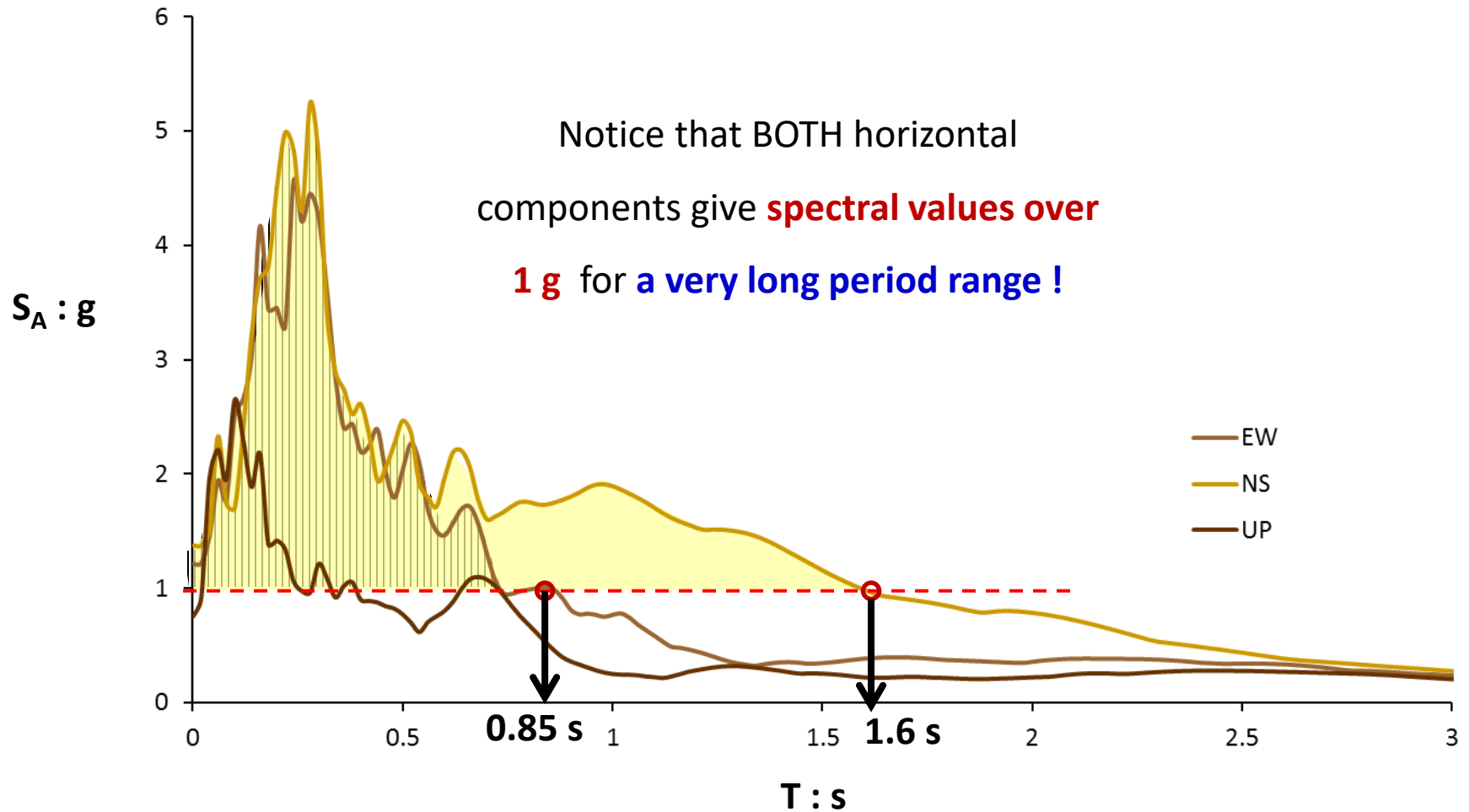


Earthquake M_w 7.8

Station 3129: at **Hatay** city, Defne District

Station at **Free field**, $V_{s30} = 447$ m/s (EC8 Type B)

Exact Location: 36.1343 (Long.) 36.19117 (Lat.)



Earthquake $M_W 7.8$

Station 3135:

at **Hatay** city, Arsuz District

Station at **Free field**, $V_{s30} = 460$ m/s (EC8 Type B)

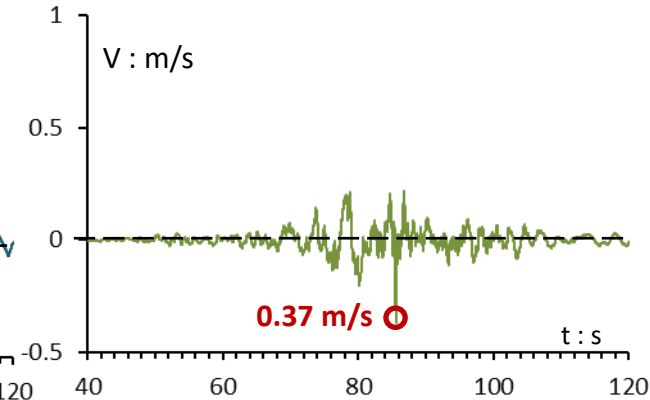
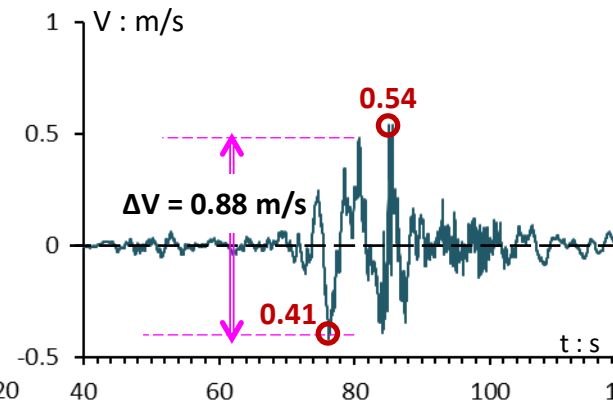
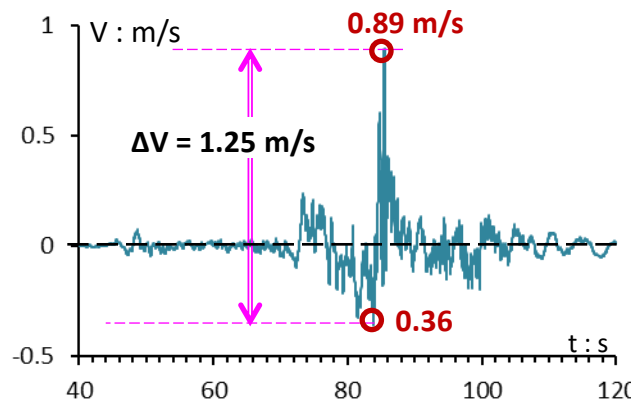
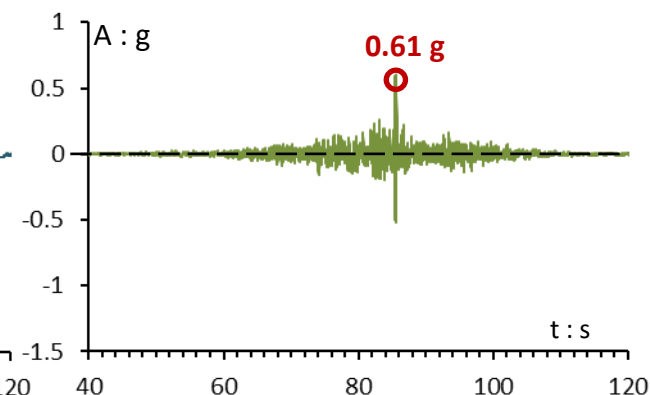
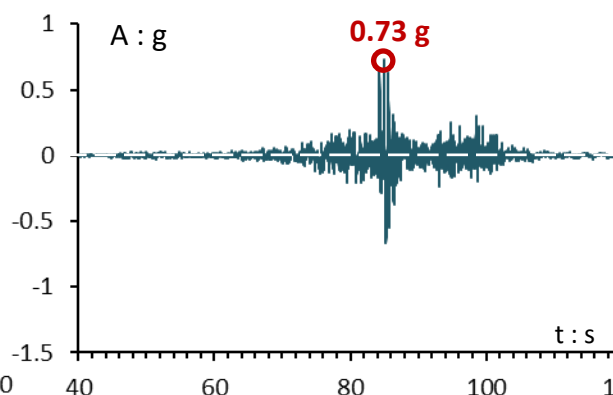
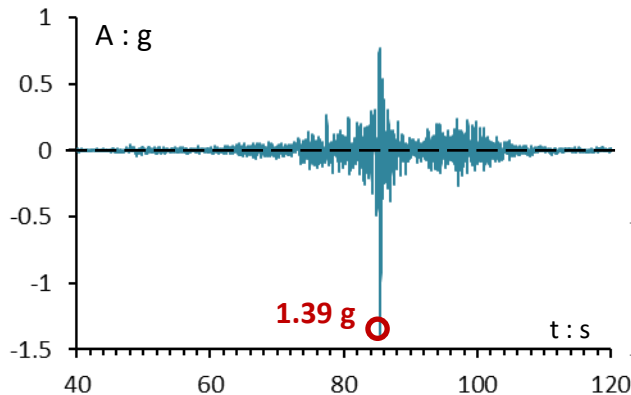
Exact Location: 35.8831 (Long.) 36.40886 (Lat.)



Horizontal EW
component

Horizontal NS
component

Vertical
component

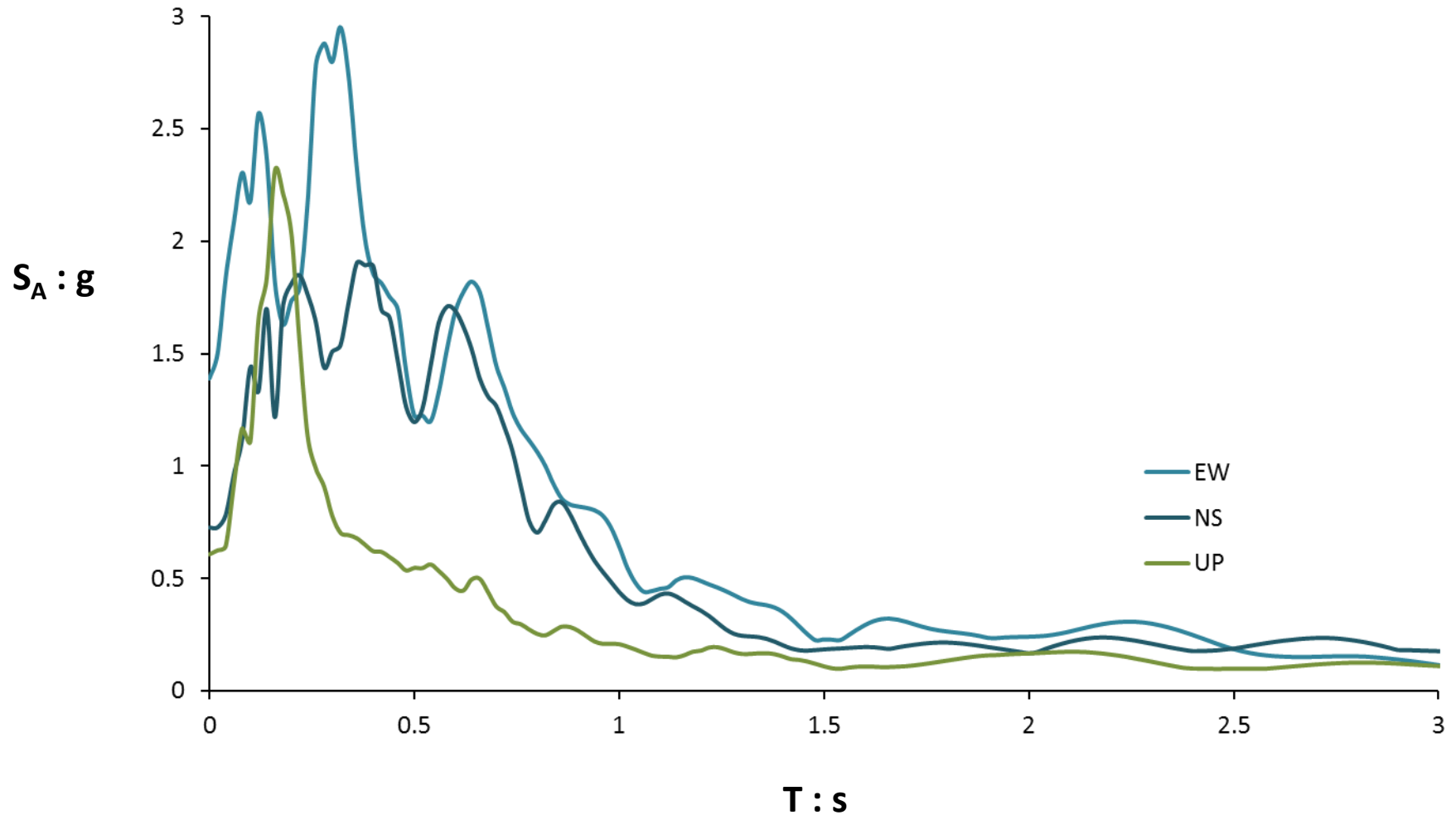


Earthquake $M_w 7.8$

Station 3135: at **Hatay** city, Arsuz District

Station at **Free field**, $V_{s30} = 460$ m/s (EC8 Type B)

Exact Location: 35.8831 (Long.) 36.40886 (Lat.)



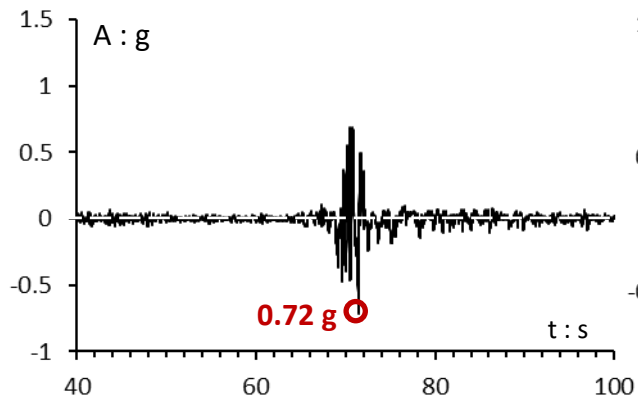
Earthquake $M_W 7.8$

Station 3138: at **Hatay** city, Hassa District

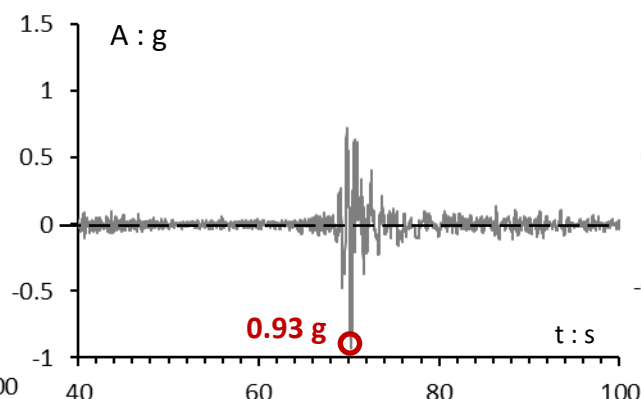
Station at **Free field**, $V_{s30} = 618$ m/s (EC8 Type B)

Exact Location: 36.51119 (Long.) 36.80262 (Lat.)

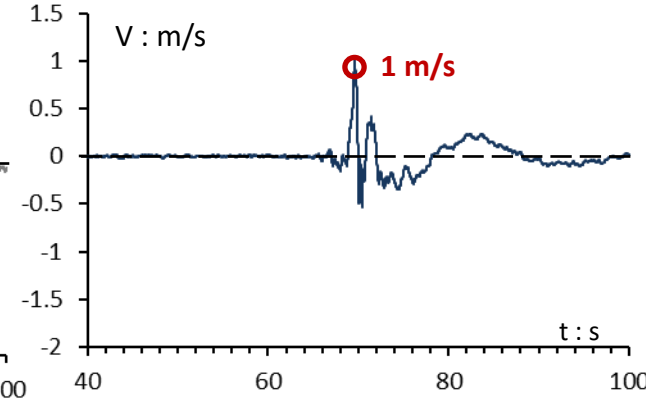
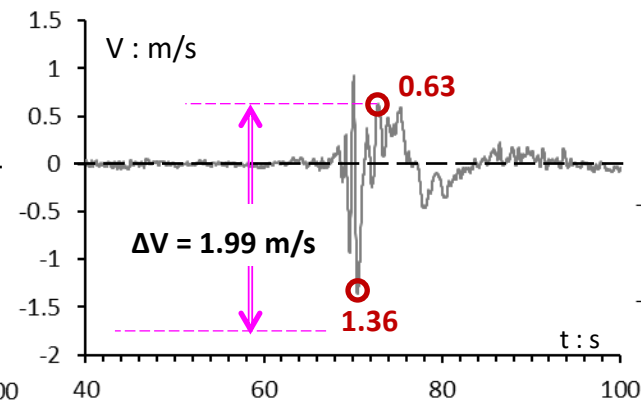
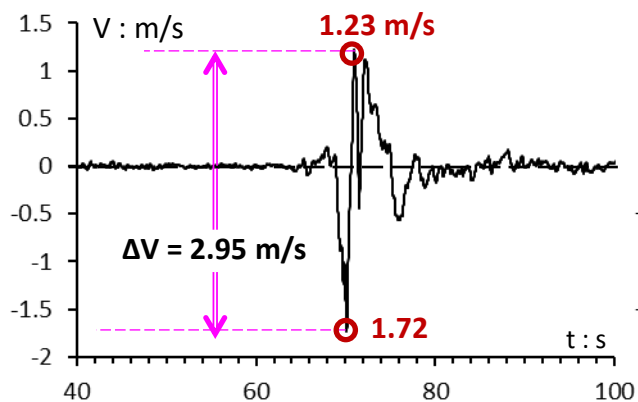
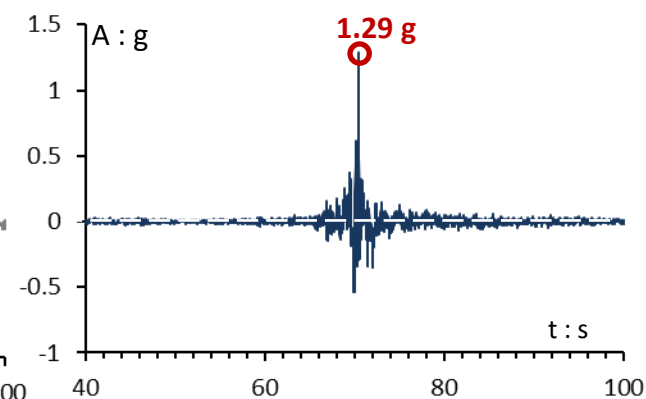
Horizontal EW
component



Horizontal NS
component



Vertical
component

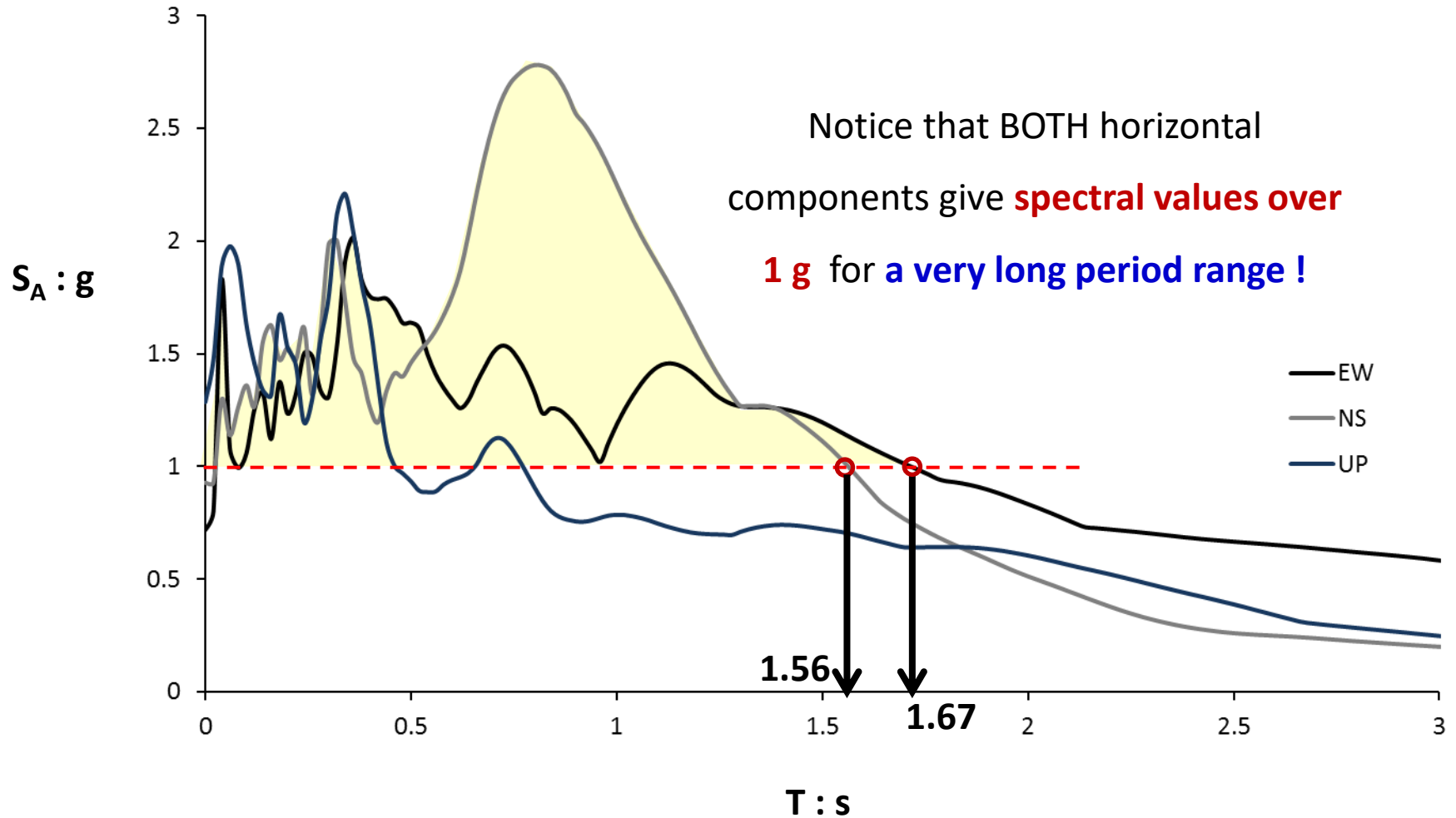


Earthquake $M_w 7.8$

Station 3138: at **Hatay** city, Hassa District

Station at **Free field**, $V_{s30} = 618$ m/s (EC8 Type B)

Exact Location: 36.51119 (Long.) 36.80262 (Lat.)



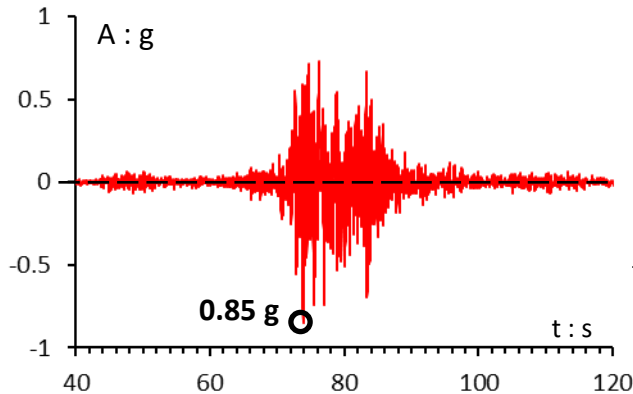
Earthquake $M_W 7.8$

Station 3141: at **Hatay** city, Antakya District

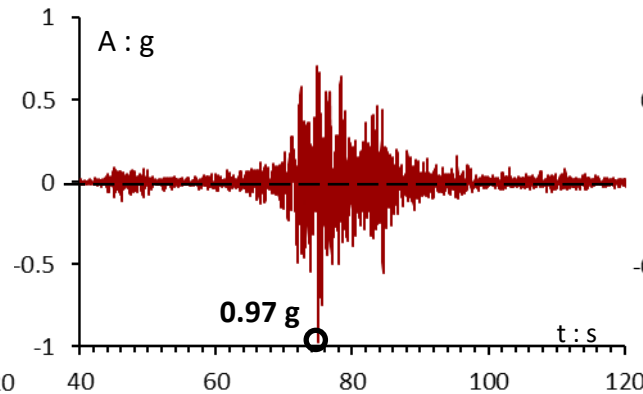
Station at **Free field**, $V_{S30} = 338$ m/s (EC8 Type C)

Exact Location: 36.21973 (Long.) 36.3726 (Lat.)

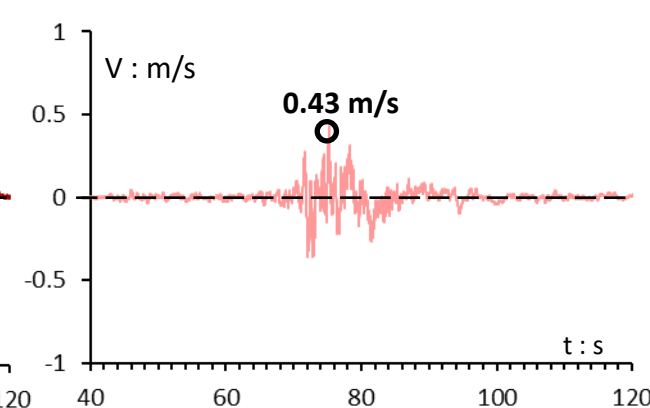
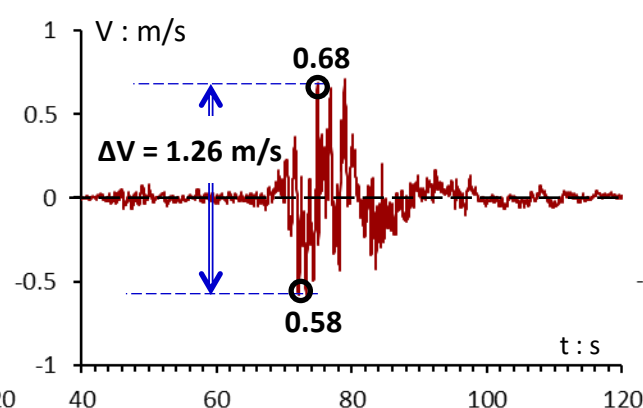
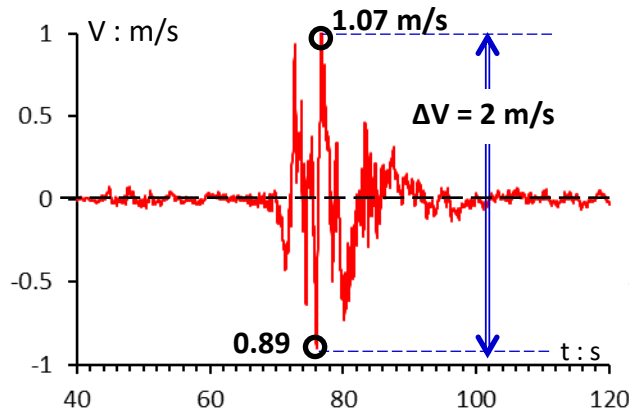
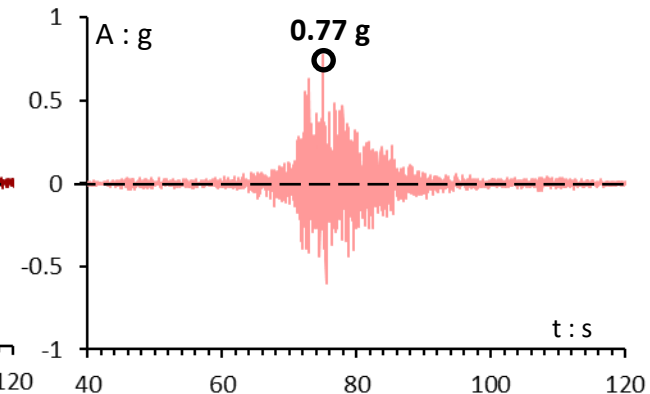
Horizontal EW
component



Horizontal NS
component



Vertical
component

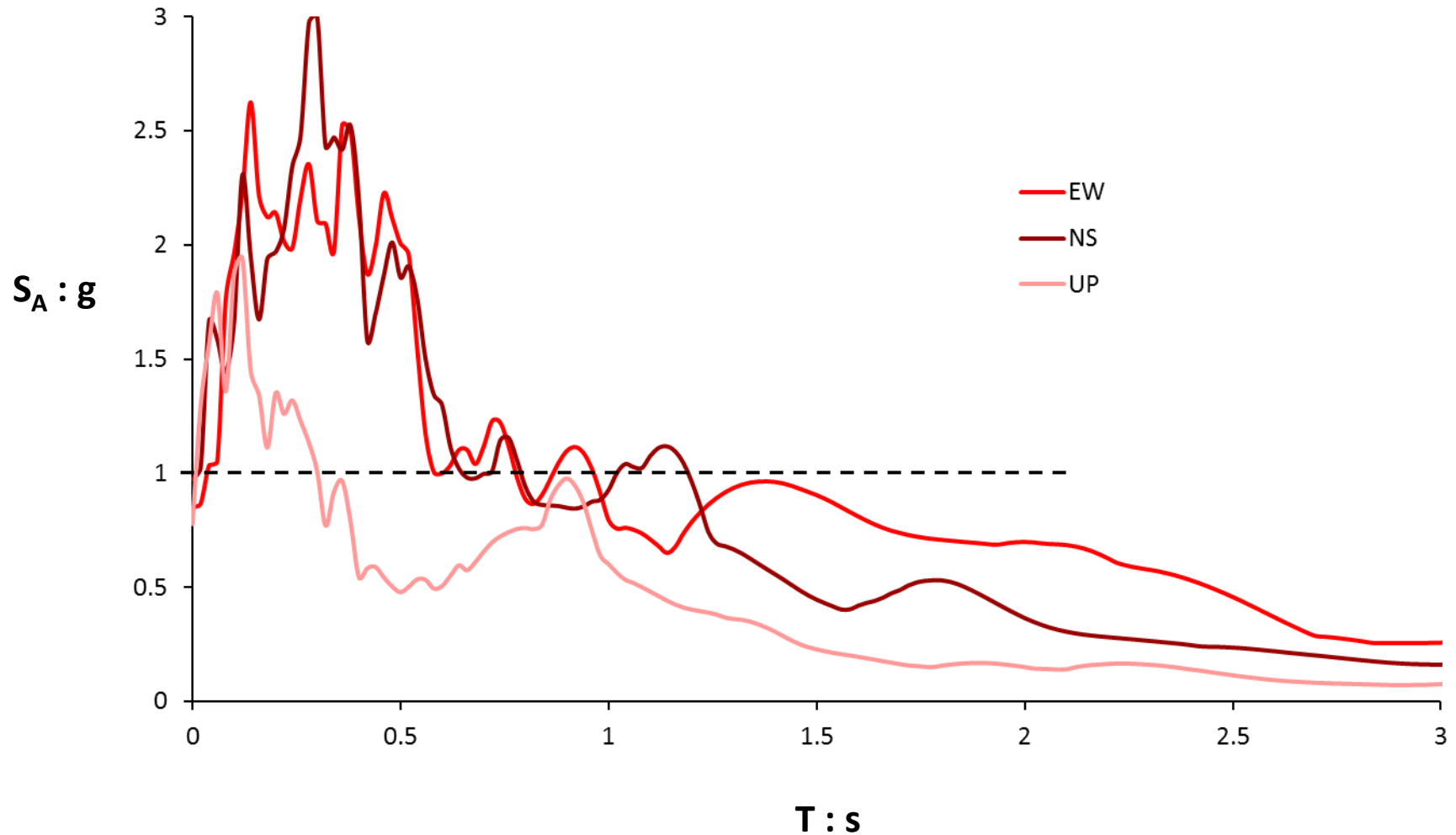


Earthquake $M_W 7.8$

Station 3141: at **Hatay** city, Antakya District

Station at **Free field**, $V_{s30} = 338$ m/s (EC8 Type C)

Exact Location: 36.21973 (Long.) 36.3726 (Lat.)



**All the elastic response spectra
of the 10 stations of earthquake $M_w 7.8$ (presented herein)**

