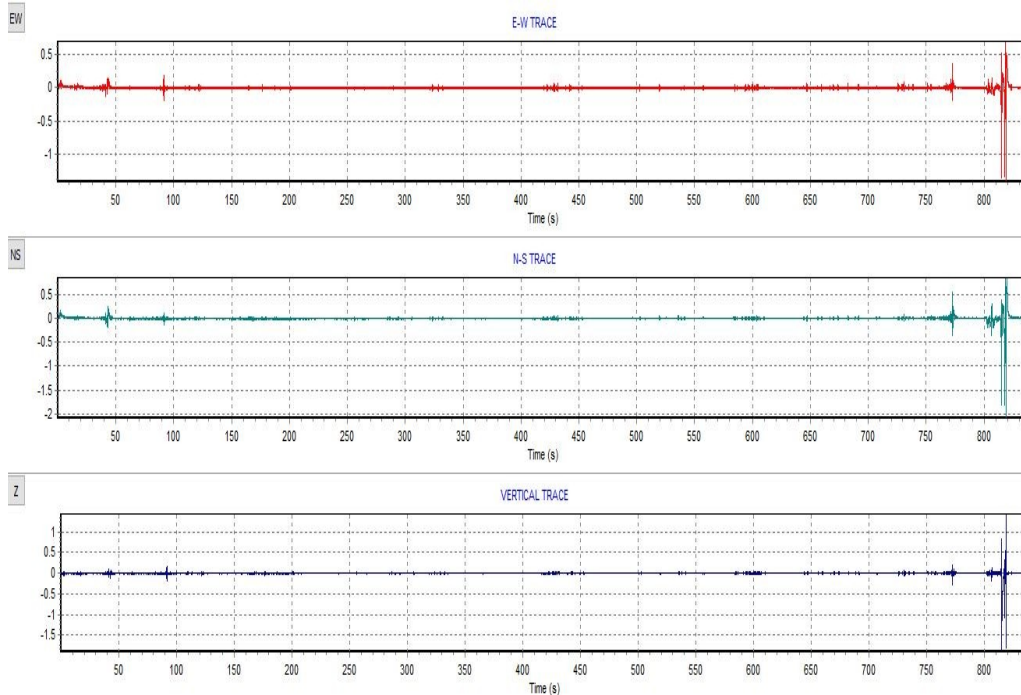


## GeoHVSr ver.1:

processing data by Horizontal to Vertical Spectral Ratio (HVSr) technique  
 elaborazione dati da misure con tecnica Horizontal to Vertical Spectral Ratio (HVSr)



### Input data Dati di input:

SAF, Seg2 and ASCII recording.

Formato SAF, Seg2 e ASCII.

### Processing methods- Metodi di elaborazione:

theoretical spectrum by Arai e Tokimatsu (2004);

spettro teorico secondo Arai e Tokimatsu (2004);

processing of surface waves by propagator matrix method [Thomson(1950) and Haskell (1953), reformulated by Dunkin (1965) and Watson (1970)];

elaborazione delle onde di superficie con il metodo della matrice del propagatore [Thomson(1950) e Haskell (1953), riformulato da Dunkin (1965) e Watson (1970)];

optional genetic algorithm to gain the best fitting curve.

Algoritmo genetico opzionale per ottenere una migliore sovrapposizione far le curve

### Signal processing – Elaborazione del segnale:

**offset removal;**

**tapered cosine window;**

**smoothing by Konno & Ohmachi method.**

**lisciamento con il metodo di Konno & Ohmachi**

**Calculated parameters – Parametri calcolati:**

**S wave velocity profile and Vseq;**

**Profilo della velocità delle onde S a stima di Vseq;**

**site class after EC8;**

**classe del sito secondo le NT2018**

**Young modulus, edometric modulus, bulk modulus and shear modulus for low strain;**

**Modulo di Young, modulo edometrico, modulo volumetrico e modulo di taglio per basse deformazioni;**

**Young modulus and edometric modulus for high strain (Fahey & Carter, 1993);**

**Modulo di Young, modulo edometrico, modulo volumetrico e modulo di taglio per alte deformazioni (Fahey & Carter, 1993);**

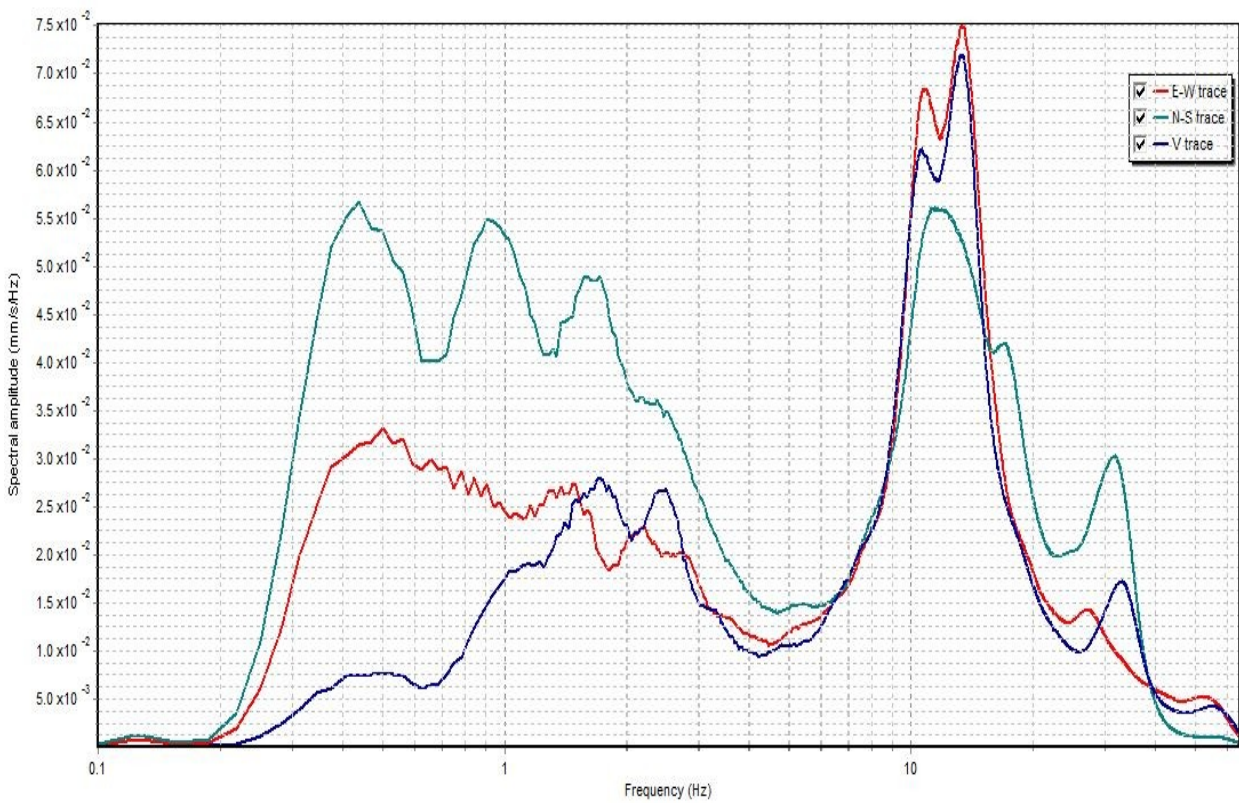
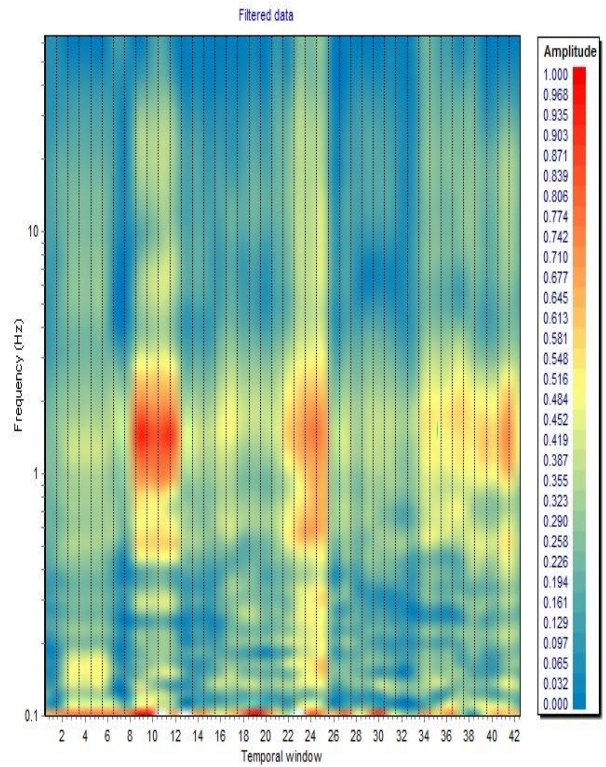
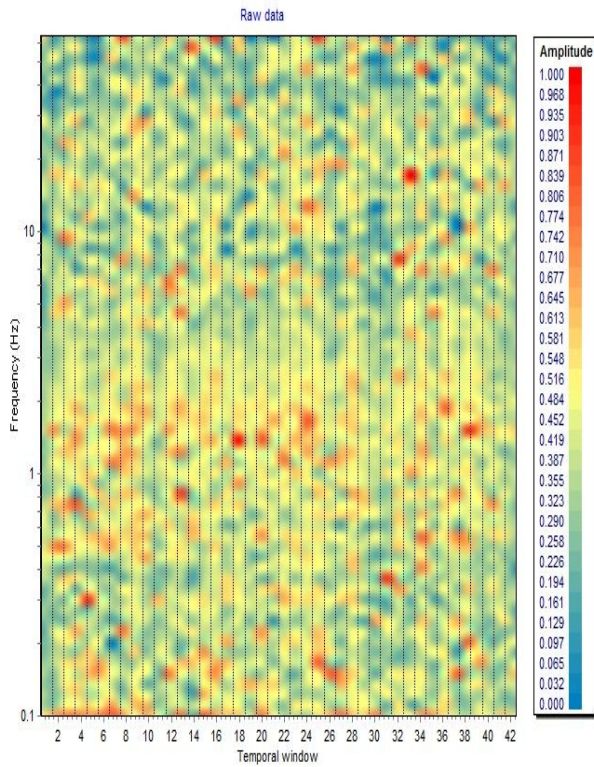
**undrained cohesion (Levesques et al., 2007);**

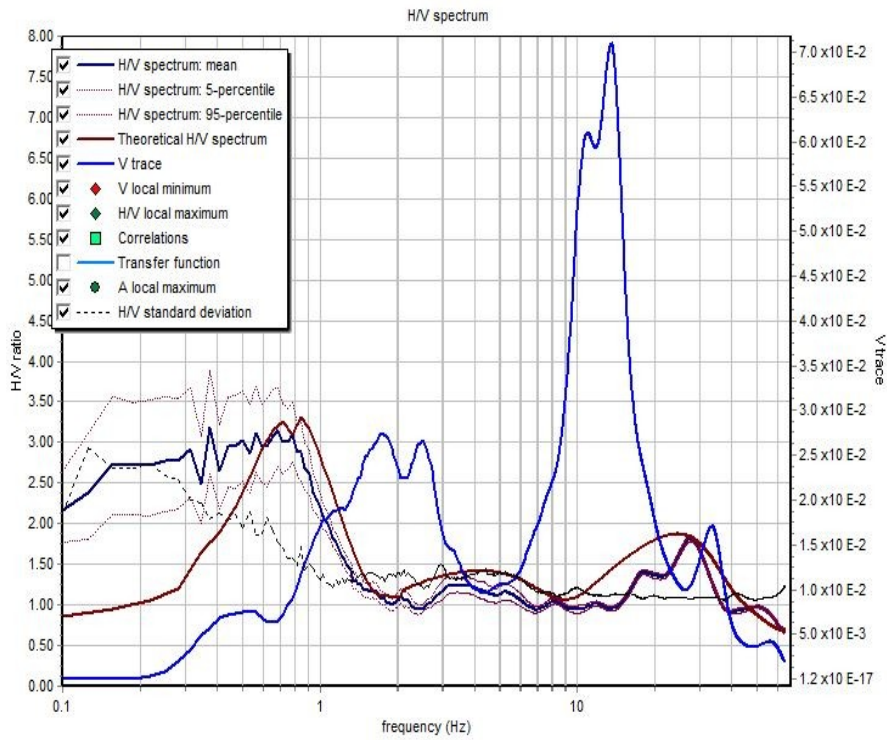
**coesione non drenata (Levesques et al., 2007);**

**peak angle of internal friction (Uzielli et al., 2013);**

**angolo di attrito di picco (Uzielli et al., 2013);**

**Rock Quality Designation (R.Q.D.).**





Stratigraphic peaks

Soil profile

Vs profile and Vs30

N.	fz(Hz)	H/V	K <sub>σ</sub>	H1(m)	H2(m)	H3(m)
1	0.69	3.14	14.37	89.37	52.05	44.06
2	1.06	2.03	3.86	50.02	29.14	24.66
3	2.06	1.1	0.59	20.66	12.04	10.19
4	3.78	1.24	0.41	9.21	5.36	4.54
5	8.13	1.05	0.13	3.32	1.94	1.64
6	11.81	1.02	0.09	2.02	1.18	0.99
7	27.56	1.82	0.12	0.65	0.38	0.32
8	49.19	0.98	0.02	0.3	0.18	0.15

N.	up (m)	bottom (m)	dz (m)	Vs(m/s)	U.W.(kN/n)	Dampino	Vp(m/s)	G0(Mpa)	Ed(Mpa)	Kv(Mpa)
1	0.0	0.36	0.36	70	16.55	0.05	146	8.27	35.82	24.8
2	0.36	1.08	0.72	119	17.5	0.05	262	25.26	122.41	88.73
3	1.08	3.07	1.99	183	18.31	0.05	381	62.52	270.91	187.55
4	3.07	4.08	1.01	125	16.56	0.05	260	26.37	114.27	79.11
5	4.08	6.99	2.91	187	17.71	0.05	389	63.11	273.49	189.34
6	6.99	29.09	22.1	264	18.13	0.05	503	128.77	467.65	295.95
7	29.09	67.09	38.0	286	17.73	0.05	545	147.82	536.83	339.73
8	67.09	198.09	131.0	549	19.38	0.05	897	595.31	1587.48	793.74
9	0.0	0.0	0.0	1012	21.31	0.05	1653	2224.21	5931.24	2965.62