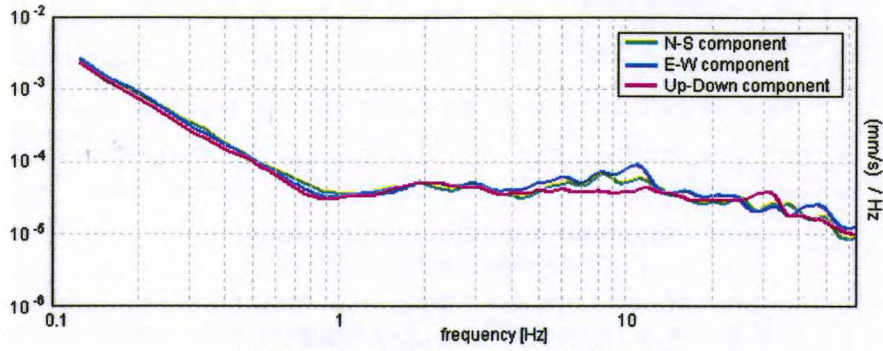
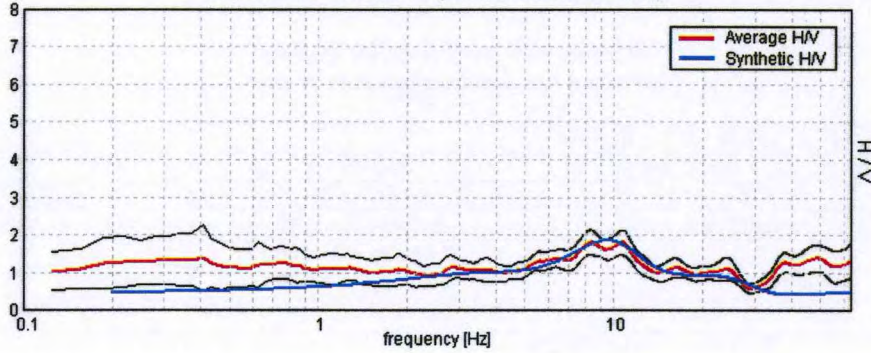


SPETTRI DELLE SINGOLE COMPONENTI



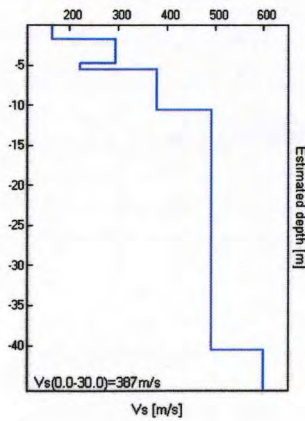
H/V SPERIMENTALE vs. H/V SINTETICO

Picco H/V a 8.31 ± 0.85 Hz (nell'intervallo 0.0 - 64.0 Hz).



Profondità alla base dello strato [m]	Spessore [m]	Vs [m/s]	Rapporto di Poisson
1.80	1.80	162	0.35
4.80	3.00	293	0.35
5.60	0.80	221	0.35
10.60	5.00	379	0.35
40.60	30.00	493	0.35
inf.	inf.	600	0.35

Vs(0.0-30.0)=387m/s





[Secondo le linee guida SESAME, 2005. Si raccomanda di leggere attentamente il manuale di *Grilla* prima di interpretare la tabella seguente].

Picco H/V a 8.31 ± 0.85 Hz (nell'intervallo 0.0 - 64.0 Hz).

Criteri per una curva H/V affidabile
[Tutti 3 dovrebbero risultare soddisfatti]

$f_0 > 10 / L_w$	$8.31 > 0.50$	OK	
$n_c(f_0) > 200$	$5985.0 > 200$	OK	
$\sigma_A(f) < 2$ per $0.5f_0 < f < 2f_0$ se $f_0 > 0.5$ Hz $\sigma_A(f) < 3$ per $0.5f_0 < f < 2f_0$ se $f_0 < 0.5$ Hz	Superato 0 volte su 400	OK	

Criteri per un picco H/V chiaro
[Almeno 5 su 6 dovrebbero essere soddisfatti]

Esiste f^- in $[f_0/4, f_0] \mid A_{H/V}(f^-) < A_0 / 2$			NO
Esiste f^+ in $[f_0, 4f_0] \mid A_{H/V}(f^+) < A_0 / 2$	26.219 Hz	OK	
$A_0 > 2$	$1.81 > 2$		NO
$f_{\text{picco}} [A_{H/V}(f) \pm \sigma_A(f)] = f_0 \pm 5\%$	$ 0.04943 < 0.05$	OK	
$\sigma_f < \epsilon(f_0)$	$0.41093 < 0.41563$	OK	
$\sigma_A(f_0) < \theta(f_0)$	$0.1635 < 1.58$	OK	

L_w	lunghezza della finestra
n_w	numero di finestre usate nell'analisi
$n_c = L_w n_w f_0$	numero di cicli significativi
f	frequenza attuale
f_0	frequenza del picco H/V
σ_f	deviazione standard della frequenza del picco H/V
$\epsilon(f_0)$	valore di soglia per la condizione di stabilità $\sigma_f < \epsilon(f_0)$
A_0	ampiezza della curva H/V alla frequenza f_0
$A_{H/V}(f)$	ampiezza della curva H/V alla frequenza f
f^-	frequenza tra $f_0/4$ e f_0 alla quale $A_{H/V}(f^-) < A_0/2$
f^+	frequenza tra f_0 e $4f_0$ alla quale $A_{H/V}(f^+) < A_0/2$
$\sigma_A(f)$	deviazione standard di $A_{H/V}(f)$, $\sigma_A(f)$ è il fattore per il quale la curva $A_{H/V}(f)$ media deve essere moltiplicata o divisa
$\sigma_{\log H/V}(f)$	deviazione standard della funzione $\log A_{H/V}(f)$
$\theta(f_0)$	valore di soglia per la condizione di stabilità $\sigma_A(f) < \theta(f_0)$

Intervallo di freq. [Hz]	Valori di soglia per σ_f e $\sigma_A(f_0)$				
	< 0.2	0.2 - 0.5	0.5 - 1.0	1.0 - 2.0	> 2.0
$\epsilon(f_0)$ [Hz]	$0.25 f_0$	$0.2 f_0$	$0.15 f_0$	$0.10 f_0$	$0.05 f_0$
$\theta(f_0)$ per $\sigma_A(f_0)$	3.0	2.5	2.0	1.78	1.58
$\log \theta(f_0)$ per $\sigma_{\log H/V}(f_0)$	0.48	0.40	0.30	0.25	0.20

10_09_30_FUCCCHIO, FUCCCHIO TR1

Instrument: TEP-0085/01-10

Start recording: 30/09/10 10:08:30 End recording: 30/09/10 10:22:31

Channel labels: NORTH SOUTH; EAST WEST ; UP DOWN

GPS data not available

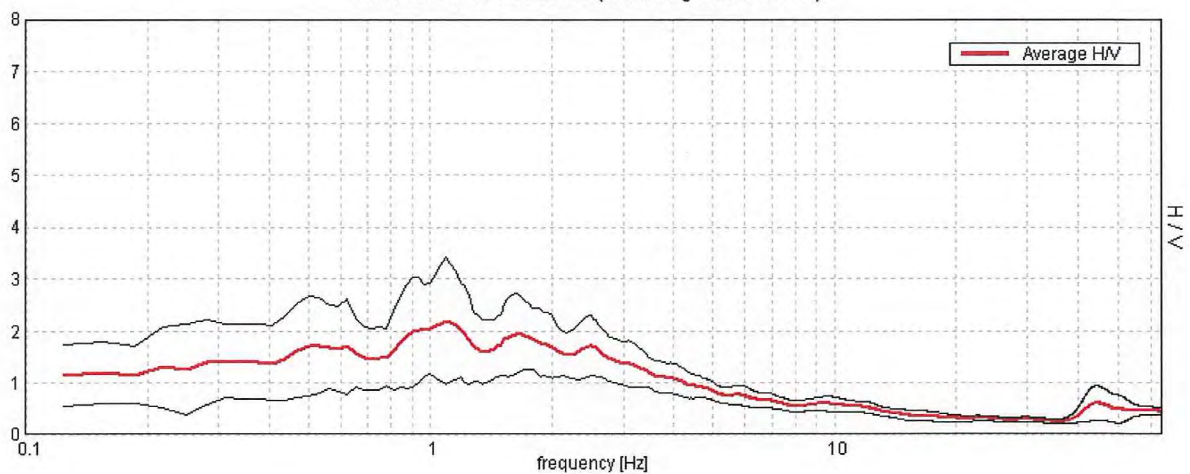
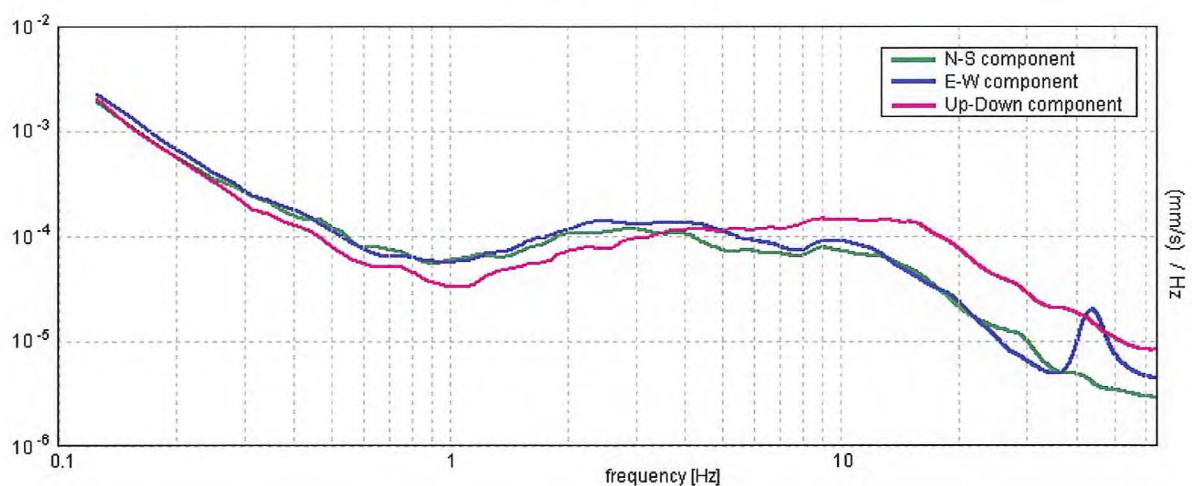
Trace length: 0h14'00". Analysis performed on the entire trace.

Sampling rate: 128 Hz

Window size: 20 s

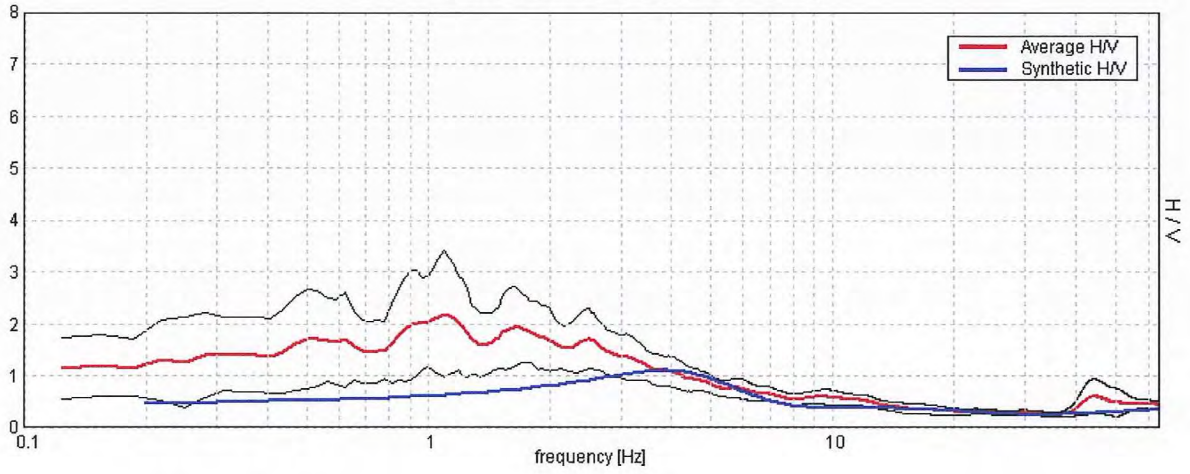
Smoothing type: Triangular window

Smoothing: 10%

HORIZONTAL TO VERTICAL SPECTRAL RATIOMax. H/V at 1.09 ± 0.05 Hz (in the range 0.0 - 64.0 Hz).**SINGLE COMPONENT SPECTRA**

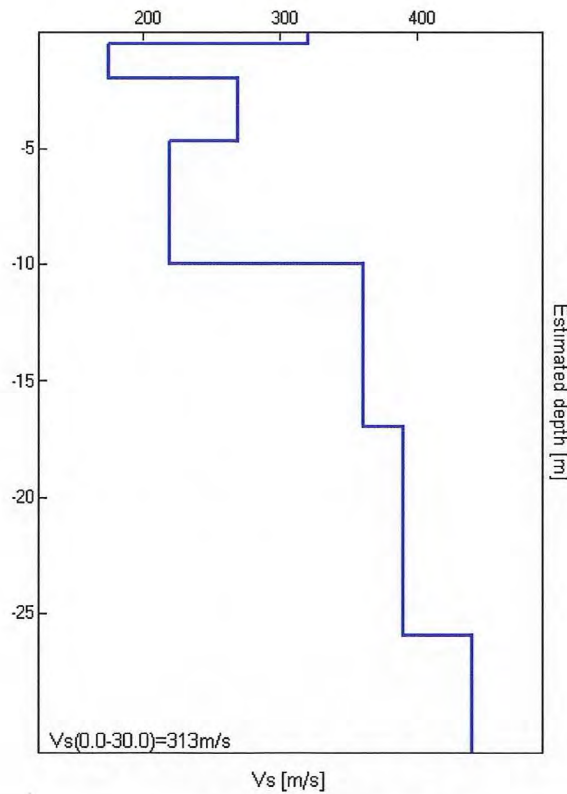
EXPERIMENTAL vs. SYNTHETIC H/V

Max. H/V at 1.09 ± 0.05 Hz (in the range 0.0 - 64.0 Hz).



Depth at the bottom of the layer [m]	Thickness [m]	Vs [m/s]
0.50	0.50	320
2.00	1.50	175
4.70	2.70	270
10.00	5.30	220
17.00	7.00	360
26.00	9.00	390
inf.	inf.	440

Vs(0.0-30.0)=313m/s



10_09_30_FUCCCHIO, FUCCCHIO TR2

Instrument: TEP-0085/01-10

Start recording: 30/09/10 11:03:58 End recording: 30/09/10 11:17:59

Channel labels: NORTH SOUTH; EAST WEST ; UP DOWN

GPS data not available

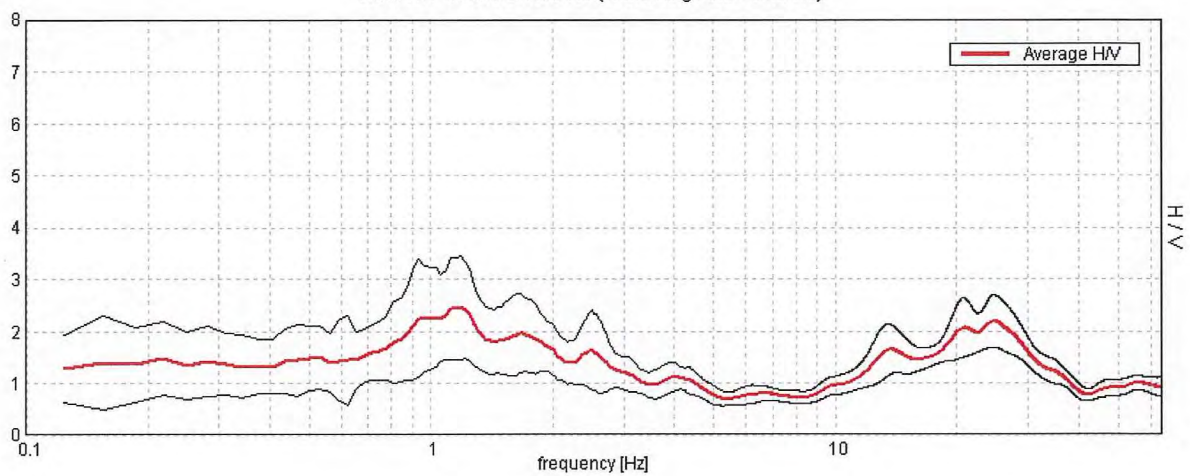
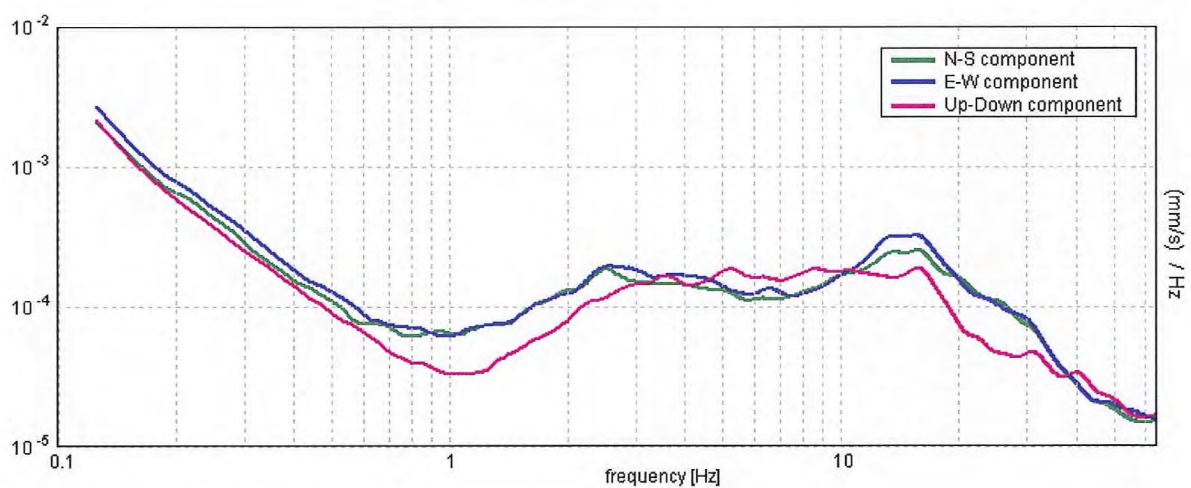
Trace length: 0h14'00". Analysis performed on the entire trace.

Sampling rate: 128 Hz

Window size: 20 s

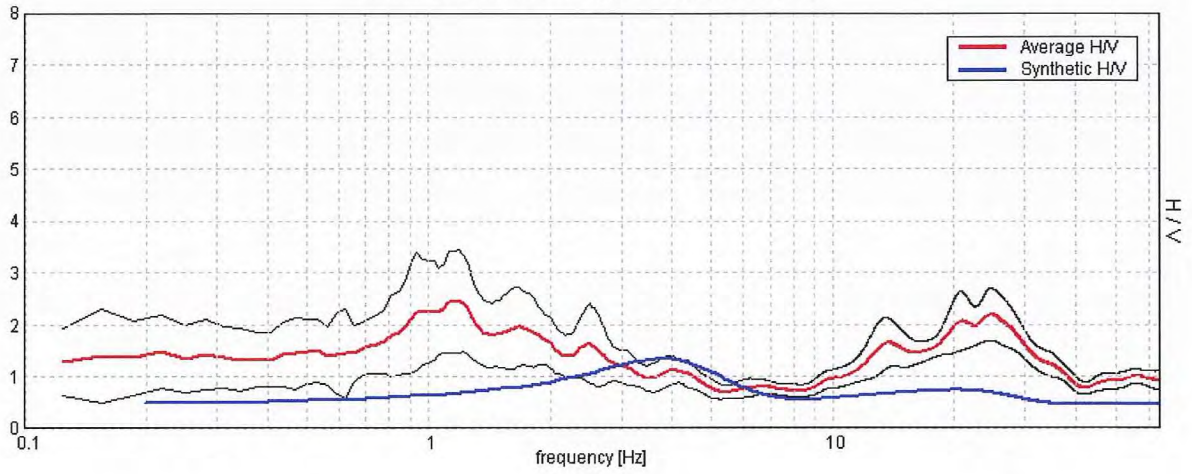
Smoothing type: Triangular window

Smoothing: 10%

HORIZONTAL TO VERTICAL SPECTRAL RATIOMax. H/V at 1.19 ± 0.06 Hz (in the range 0.0 - 64.0 Hz).**SINGLE COMPONENT SPECTRA**

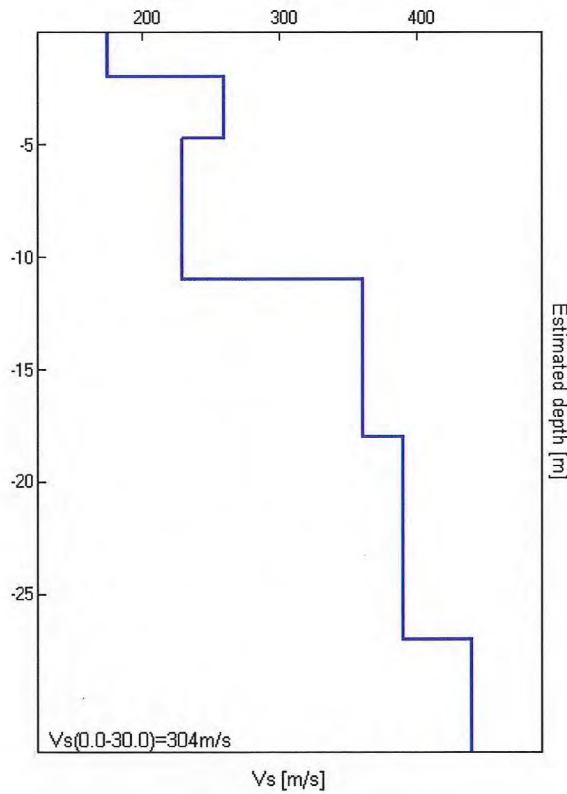
EXPERIMENTAL vs. SYNTHETIC H/V

Max. H/V at 1.19 ± 0.06 Hz (in the range 0.0 - 64.0 Hz).



Depth at the bottom of the layer [m]	Thickness [m]	Vs [m/s]
2.00	2.00	175
4.70	2.70	260
11.00	6.30	230
18.00	7.00	360
27.00	9.00	390
inf.	inf.	440

Vs(0.0-30.0)=304m/s



Dati misure down hole

Registrazione Nr.	Z (m)	· Tp (msec)	Ts (msec)
1	1,00	3,40	6,40
2	2,00	4,50	14,90
3	3,00	5,30	25,00
4	4,00	6,50	31,00
5	5,00	7,20	35,40
6	6,00	7,90	39,10
7	7,00	8,10	44,80
8	8,00	8,50	49,00
9	9,00	8,70	52,80
10	10,00	9,00	57,30
11	11,00	9,50	60,50
12	12,00	9,90	64,60
13	13,00	10,50	70,00
14	14,00	11,20	75,10
15	15,00	11,40	77,70
16	16,00	12,00	84,50
17	17,00	12,40	90,20
18	18,00	12,70	96,00
19	19,00	13,00	102,70
20	20,00	13,40	105,30
21	21,00	13,70	108,00
22	22,00	13,90	114,20
23	23,00	14,30	118,30
24	24,00	14,80	123,70
25	25,00	15,60	125,60
26	26,00	16,20	130,80
27	27,00	16,70	134,50
28	28,00	17,50	137,10
29	29,00	17,80	139,20
30	30,00	18,50	142,10
31	31,00	19,10	144,50
32	32,00	19,60	149,50

Tabella 3

Risultati

SR (m)	Tpcorr (msec)	Tscorr (msec)
1,8028	1,886	3,5501
2,50	3,60	11,92
3,3541	4,7405	22,3607
4,272	6,0861	29,0262
5,2202	6,8963	33,9071
6,1847	7,6641	37,9326
7,1589	7,9202	43,8056
8,1394	8,3544	48,1607
9,1241	8,5816	52,0816
10,1119	8,9004	56,6661
11,1018	9,4129	59,9452
12,0934	9,8236	64,1012
13,0863	10,4308	69,5386
14,0801	11,1363	74,6726

15,0748	11,3434	77,3144
16,0702	11,9476	84,1311
17,0661	12,352	89,8509
18,0624	12,6561	95,6684
19,0591	12,9597	102,3814
20,0562	13,3625	105,0051
21,0535	13,6652	107,7255
22,0511	13,8678	113,9355
23,0489	14,2697	118,0492
24,0468	14,7712	123,4591
25,045	15,572	125,3745
26,0432	16,1731	130,5829
27,0416	16,6743	134,2929
28,0402	17,4749	136,9037
29,0388	17,7762	139,0142
30,0375	18,4769	141,9227
31,0363	19,0777	144,3311
32,0351	19,5785	149,336

Tabella 4

Metodo diretto

Profondità di riferimento: 30 m
VS30: 213,39 m/s

Sismostrati con metodo diretto

Descrizione (-)	Profondità (m)
limi sabbiosi	3,05
argilla limosa	32

Tabella 5

Valori medi

Vp medio (m/s)	Vs medio (m/s)	g medio (kN/mc)	ni medio	G medio (MPa)	Ed medio (MPa)	E medio (MPa)	Ev medio (MPa)
634,1	134,42	17,33	0,48	31,93	710,5	94,28	667,93
1960,05	228,58	17,53	0,49	93,37	6865,56	278,83	6741,06

Tabella 6

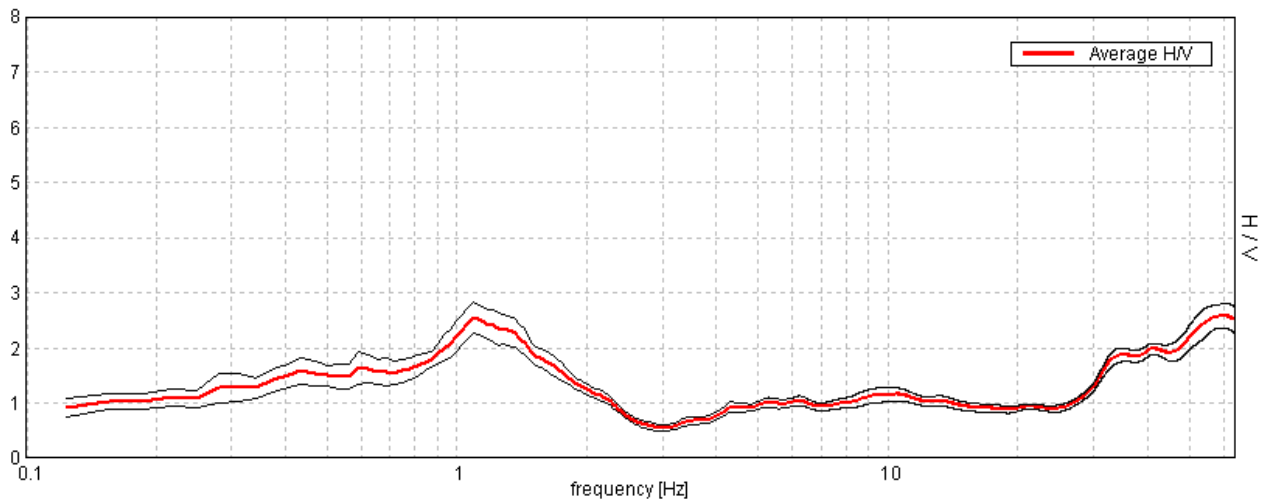
10_06_03_FUCECCHIO, SAN PIERINO TR1

Start recording: 03/06/10 17:06:18 End recording: 03/06/10 17:20:19
 Channel labels: NORTH SOUTH; EAST WEST ; UP DOWN
 GPS data not available

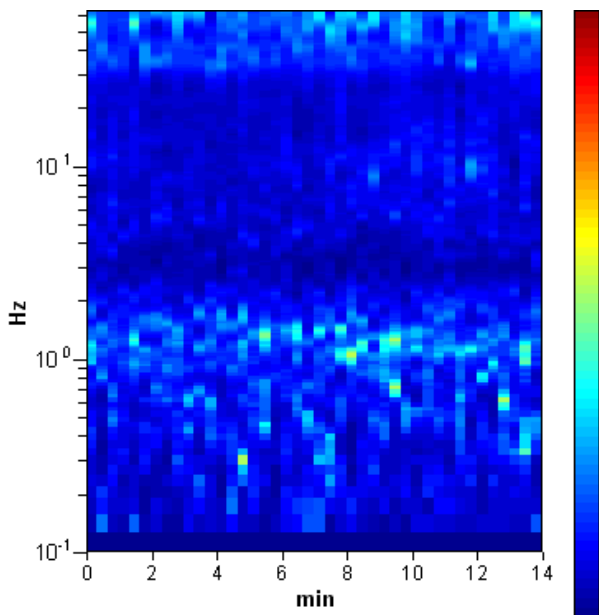
Trace length: 0h14'00". Analysis performed on the entire trace.
 Sampling frequency: 128 Hz
 Window size: 20 s
 Smoothing window: Triangular window
 Smoothing: 10%

HORIZONTAL TO VERTICAL SPECTRAL RATIO

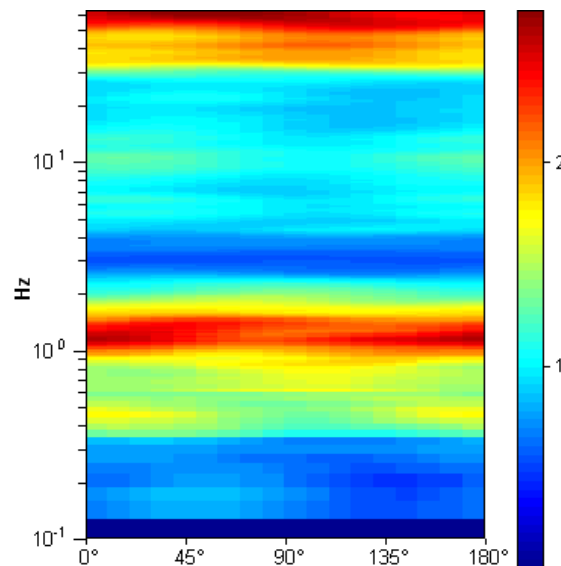
Max. H/V at 60.47 ± 5.82 Hz. (in the range 0.0 - 64.0 Hz).



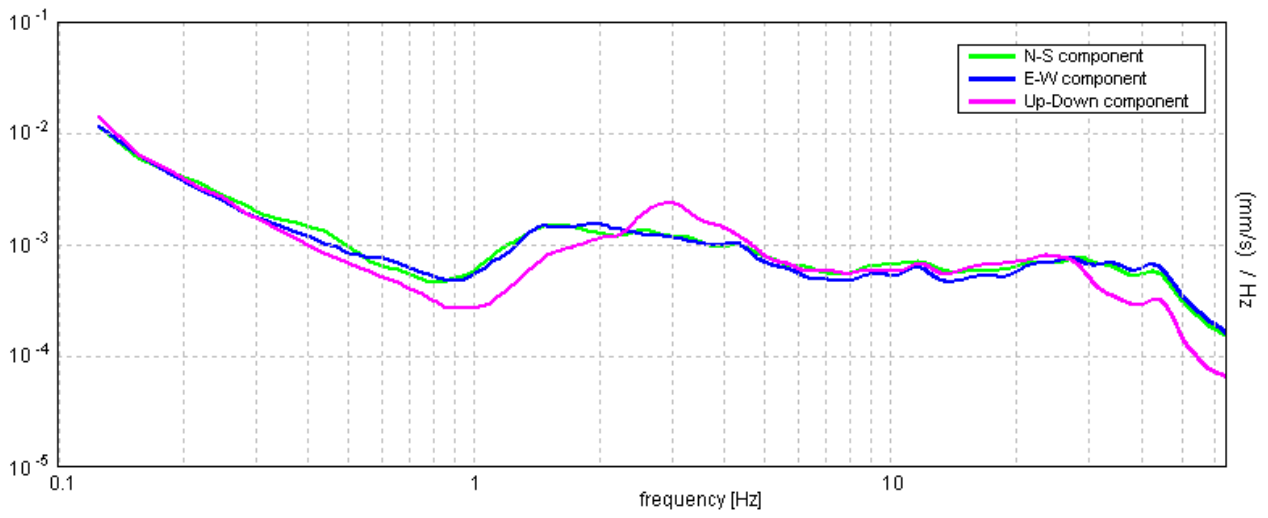
H/V TIME HISTORY



DIRECTIONAL H/V

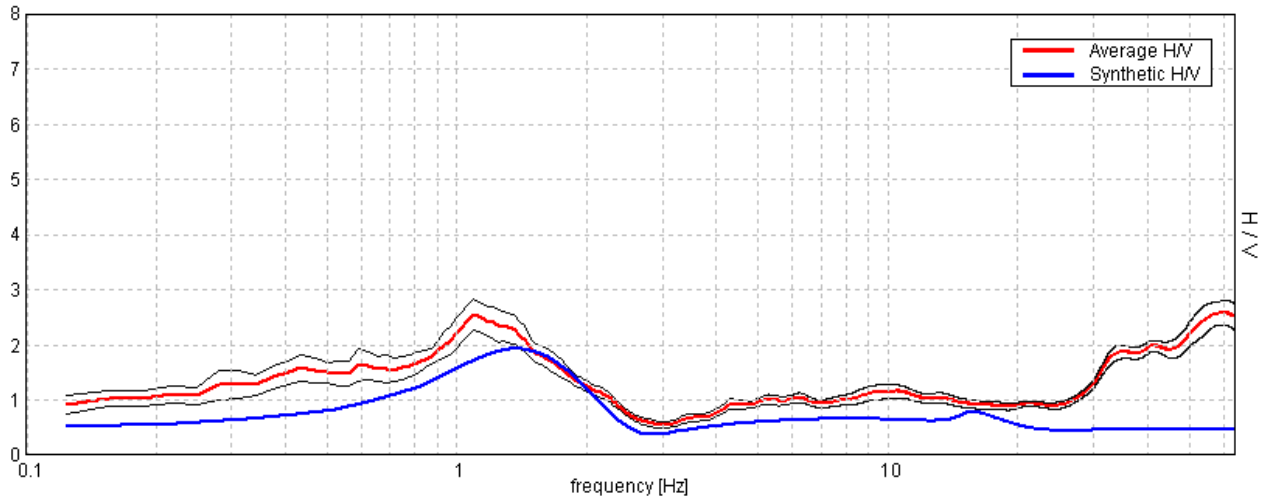


SINGLE COMPONENT SPECTRA



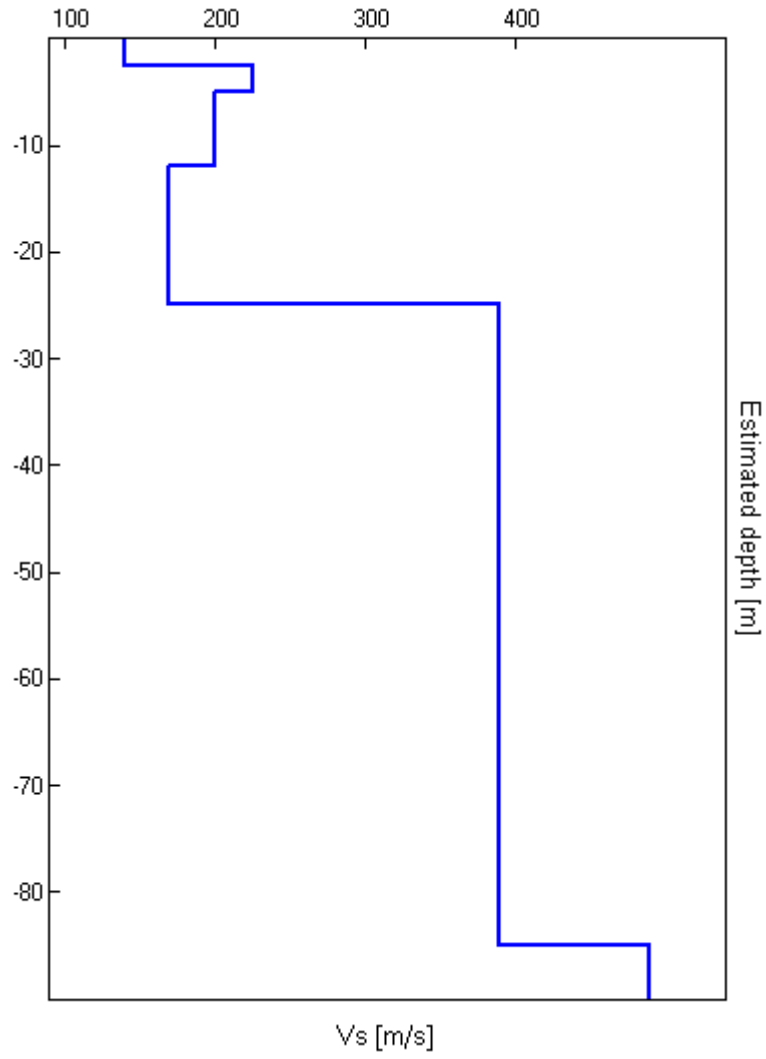
EXPERIMENTAL VS. SYNTHETIC H/V

Max. H/V at 60.47 ± 5.82 Hz. (in the range 0.0 - 64.0 Hz).



Depth at the bottom of the layer [m]	Thickness [m]	Vs [m/s]
2.50	2.50	140
5.00	2.50	225
12.00	7.00	200
25.00	13.00	170
85.00	60.00	390
inf.	inf.	490

Vs(0.0-30.0)=196m/s



[According to the Sesame, 2005 guidelines. Please read carefully the *Grilla* manual before interpreting the following tables.]

Max. H/V at 60.47 ± 5.82 Hz. (in the range 0.0 - 64.0 Hz).

Criteria for a reliable HVSR curve

[All 3 should be fulfilled]

$f_0 > 10 / L_w$	60.47 > 0.50	OK	
$n_c(f_0) > 200$	50793.8 > 200	OK	
$\sigma_A(f) < 2$ for $0.5f_0 < f < 2f_0$ if $f_0 > 0.5\text{Hz}$ $\sigma_A(f) < 3$ for $0.5f_0 < f < 2f_0$ if $f_0 < 0.5\text{Hz}$	Exceeded 0 out of 1082 times	OK	

Criteria for a clear HVSR peak

[At least 5 out of 6 should be fulfilled]

Exists f^- in $[f_0/4, f_0]$ $A_{H/V}(f^-) < A_0 / 2$	29.969 Hz	OK	
Exists f^+ in $[f_0, 4f_0]$ $A_{H/V}(f^+) < A_0 / 2$			NO
$A_0 > 2$	2.58 > 2	OK	
$f_{\text{peak}}[A_{H/V}(f) \pm \sigma_A(f)] = f_0 \pm 5\%$	$ 0.0471 < 0.05$	OK	
$\sigma_f < \varepsilon(f_0)$	2.84815 < 3.02344	OK	
$\sigma_A(f_0) < \theta(f_0)$	0.1094 < 1.58	OK	

L_w	window length
n_w	number of windows used in the analysis
$n_c = L_w n_w f_0$	number of significant cycles
f	current frequency
f_0	H/V peak frequency
σ_f	standard deviation of H/V peak frequency
$\varepsilon(f_0)$	threshold value for the stability condition $\sigma_f < \varepsilon(f_0)$
A_0	H/V peak amplitude at frequency f_0
$A_{H/V}(f)$	H/V curve amplitude at frequency f
f^-	frequency between $f_0/4$ and f_0 for which $A_{H/V}(f^-) < A_0/2$
f^+	frequency between f_0 and $4f_0$ for which $A_{H/V}(f^+) < A_0/2$
$\sigma_A(f)$	standard deviation of $A_{H/V}(f)$, $\sigma_A(f)$ is the factor by which the mean $A_{H/V}(f)$ curve should be multiplied or divided
$\sigma_{\log H/V}(f)$	standard deviation of $\log A_{H/V}(f)$ curve
$\theta(f_0)$	threshold value for the stability condition $\sigma_A(f) < \theta(f_0)$

Threshold values for σ_f and $\sigma_A(f_0)$

Freq.range [Hz]	< 0.2	0.2 – 0.5	0.5 – 1.0	1.0 – 2.0	> 2.0
$\varepsilon(f_0)$ [Hz]	0.25 f_0	0.2 f_0	0.15 f_0	0.10 f_0	0.05 f_0
$\theta(f_0)$ for $\sigma_A(f_0)$	3.0	2.5	2.0	1.78	1.58
Log $\theta(f_0)$ for $\sigma_{\log H/V}(f_0)$	0.48	0.40	0.30	0.25	0.20

J11_063_03_25_FUCECCHIO_TR, SAN PIERINO TR1

Strumento: TEP-0085/01-10

Inizio registrazione: 25/03/11 11:24:13 Fine registrazione: 25/03/11 11:38:14

Nomi canali: NORTH SOUTH; EAST WEST; UP DOWN

Dato GPS non disponibile

Durata registrazione: 0h14'00".

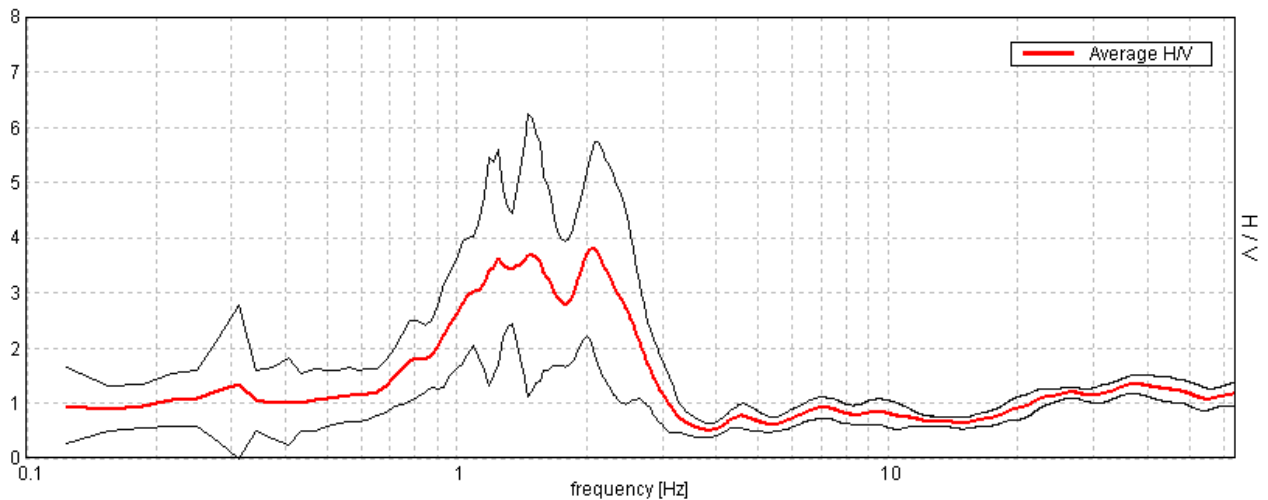
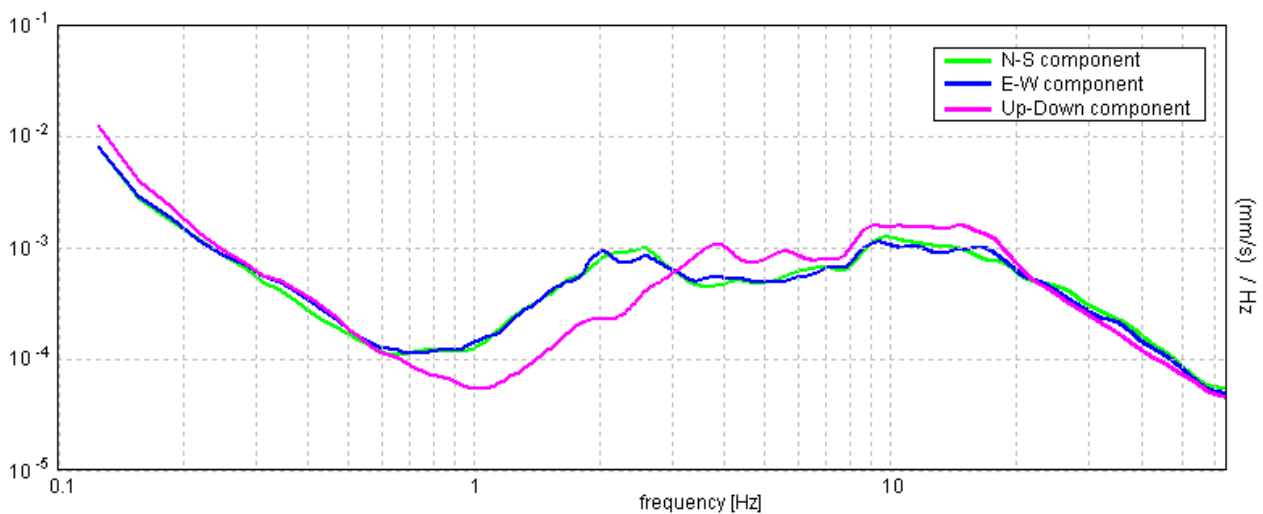
Analisi effettuata sull'intera traccia.

Freq. campionamento: 128 Hz

Lunghezza finestre: 20 s

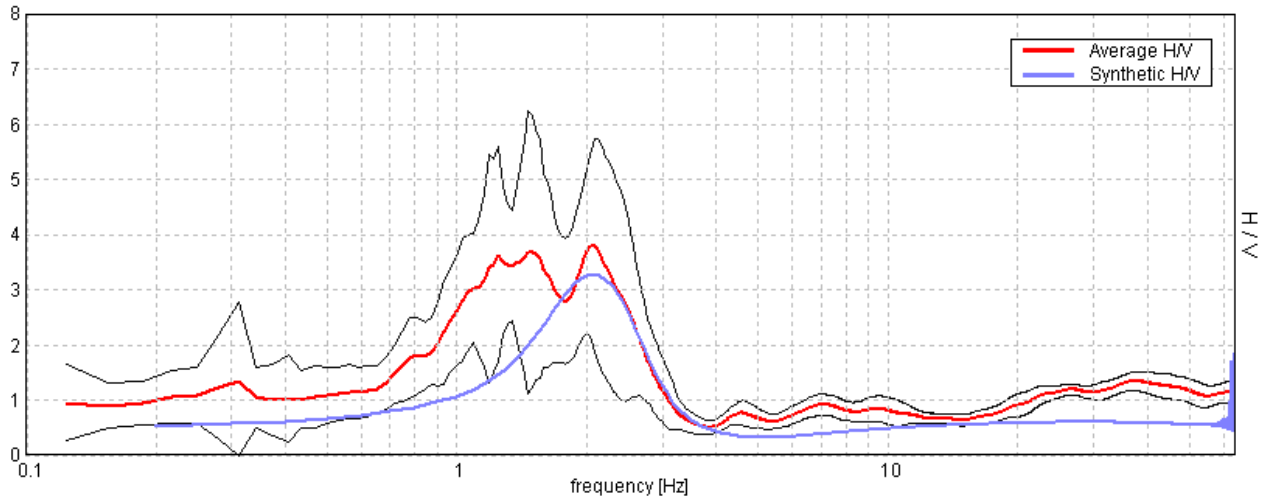
Tipo di lisciamento: Triangular window

Lisciamento: 10%

RAPPORTO SPETTRALE ORIZZONTALE SU VERTICALEPicco H/V a 2.09 ± 0.18 Hz (nell'intervallo 0.0 - 64.0 Hz).**SPETTRI DELLE SINGOLE COMPONENTI**

H/V SPERIMENTALE vs. H/V SINTETICO

Picco H/V a 2.09 ± 0.18 Hz (nell'intervallo 0.0 - 64.0 Hz).



Profondità alla base dello strato

[m]

1.00
3.00
7.50
15.50
36.50
inf.

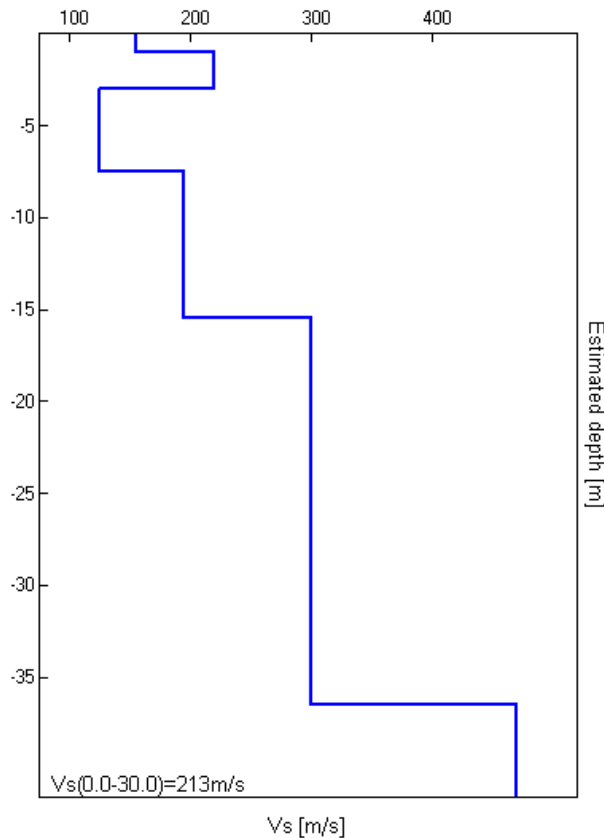
Spessore [m]

1.00
2.00
4.50
8.00
21.00
inf.

Vs [m/s]

155
220
125
195
300
470

Vs(0.0-30.0)=213m/s



Rif.: j11.063.03.25_fcc.doc

J11_063_03_25_FUCECCHIO_TR, SAN PIERINO TR2

Strumento: TEP-0085/01-10

Inizio registrazione: 25/03/11 12:13:15 Fine registrazione: 25/03/11 12:27:16

Nomi canali: NORTH SOUTH; EAST WEST; UP DOWN

Dato GPS non disponibile

Durata registrazione: 0h14'00".

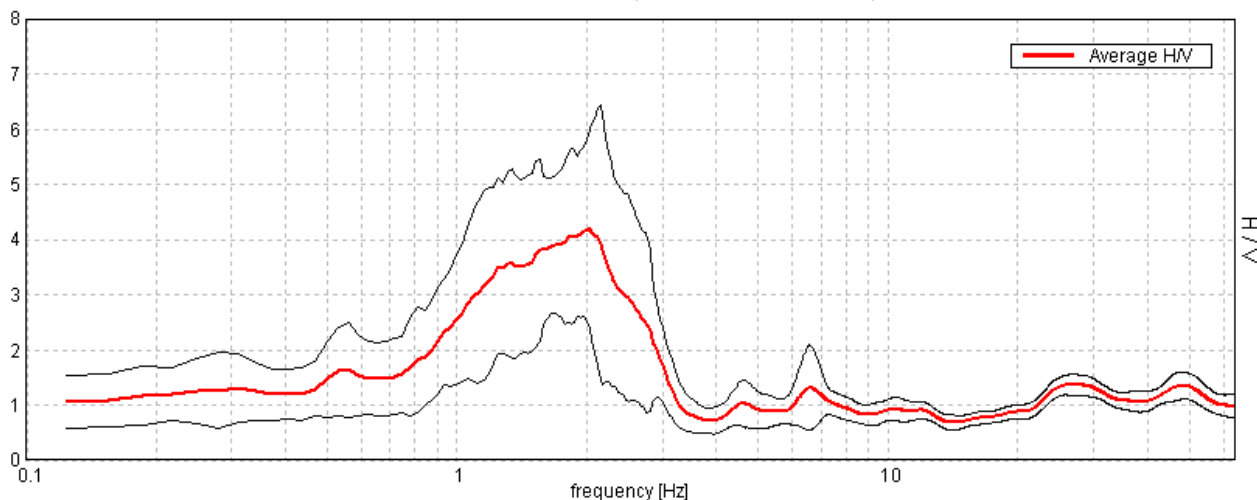
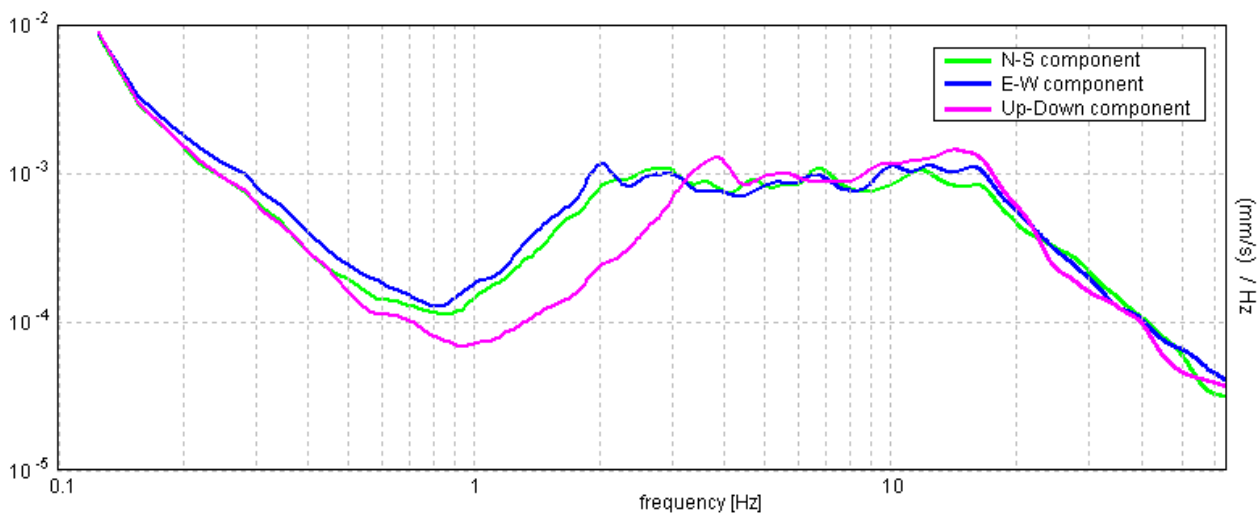
Analizzato 88% tracciato (selezione manuale)

Freq. campionamento: 128 Hz

Lunghezza finestre: 20 s

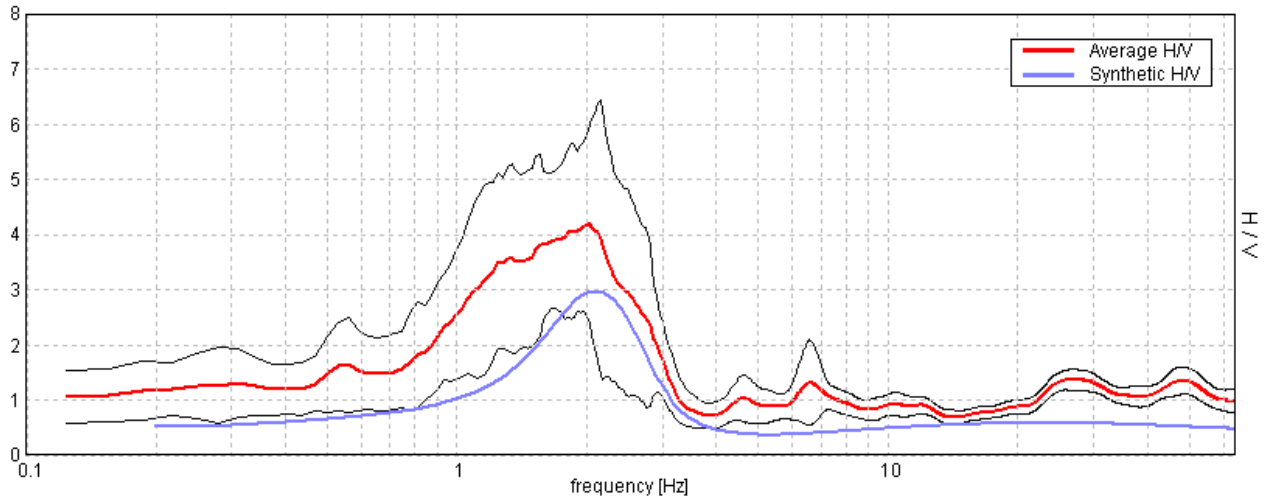
Tipo di lisciamento: Triangular window

Lisciamento: 10%

RAPPORTO SPETTRALE ORIZZONTALE SU VERTICALEPicco H/V a 2.03 ± 0.13 Hz (nell'intervallo 0.0 - 64.0 Hz).**SPETTRI DELLE SINGOLE COMPONENTI**

H/V SPERIMENTALE vs. H/V SINTETICO

Picco H/V a 2.03 ± 0.13 Hz (nell'intervallo 0.0 - 64.0 Hz).



Profondità alla base dello strato

[m]

- 1.00
- 3.00
- 7.50
- 15.50
- 35.50
- inf.

Spessore [m]

- 1.00
- 2.00
- 4.50
- 8.00
- 20.00
- inf.

Vs [m/s]

- 155
- 220
- 145
- 195
- 300
- 470

Vs(0.0-30.0)=221m/s

