Piano Strutturale
variante generale

settembre 2012

DB.7
Dati di Base

progetto:

ldp [studio]

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PREMESSA

Nel mese di Giugno 2012, su incarico del Dott. Geol. Luca Pagliazzi, è stata svolta una campagna di indagine sismica, estesa sul territorio comunale del Comune di Pian di Scò (Ar), nell'ambito del progetto di studio di microzonazione sismica di primo livello, di supporto alla Variante generale al Piano Strutturale redatta ai sensi del *Regolamento di attuazione dell'articolo 62 della legge regionale 3 gennaio 2005, n. 1 (Norme per il governo del territorio)* in materia di indagini geologiche (Decreto del Presidente della Giunta Regionale 25 ottobre 2011 n. 53/R.

La campagna di indagine ha previsto la realizzazione di 54 misure di sismica passiva con tecnica a 'stazione singola' (HVSR), 4 misure di sismica passiva acquisite con array bidimensionali elaborati in modalità ESAC, 1 misura di sismica attiva acquisita con array monodimensionale e tecnica a rifrazione per la definizione della velocità del bedrock affiorante.

Le misure sono state distribuite sui centri urbani maggiormente significativi, individuati dal Comune di Pian di Scò di concerto con l'autorità competente, e riportate nelle tavole di Piano Strutturale e di Regolamento Urbanistico, ovvero quelli del Capoluogo (Pian di Scò), Faella, Matassino, Ontaneto, Montalpero e Vaggio. Le misure sono state ubicate secondo lo schema di seguito riportato.

Nei successivi paragrafi vengono esposte le basi teoriche della metodologia adottata, le specifiche tecniche dello strumento utilizzato ed infine i risultati ottenuti.

INTRODUZIONE

L'andamento delle velocità di propagazione delle onde di taglio nel primo sottosuolo (profilo delle Vs) rappresenta in generale una informazione importante ai fini della caratterizzazione meccanica (in campo dinamico) dei terreni. In particolare essa risulta fondamentale negli studi della risposta sismica locale. A seguito di un terremoto, si ha spesso modo di osservare come la distribuzione dei danni sul territorio sia assai eterogenea a parità di vulnerabilità dell'edificato. Le condizioni geologico-tecniche degli strati più superficiali, nonché le caratteristiche geomorfologiche possono concorrere, infatti, ad accrescere localmente lo scuotimento indotto da un terremoto. Per un'efficace azione di prevenzione, in materia di rischio sismico, è necessario tener conto non solo, quindi, della zonazione sismica nazionale, ma anche di eventuali sfavorevoli condizioni locali, a scala intra-comunale.

Particolarmente rilevanti sono i cosiddetti effetti di amplificazione di sito, ossia l'insieme delle variazioni in ampiezza, durata e contenuto in frequenza che un moto sismico, rispetto ad una formazione rocciosa di base, subisce attraversando gli strati sovrastanti, fino alla

superficie. Tali effetti sono causati, essenzialmente, da un processo di intrappolamento e risonanza dell'energia del terremoto all'interno di un volume di sottosuolo costituito da materiali sedimentari a bassa impedenza sismica (IS: prodotto della velocità di propagazione dell'onda per la densità del mezzo attraversato) e posto sopra ad un dominio con più alta impedenza sismica, per esempio un substrato roccioso o un suolo particolarmente rigido. Il raggio sismico, durante la propagazione dalla sorgente al sito, subisce un processo di verticalizzazione a causa del fenomeno della rifrazione e tende ad emergere lungo una direzione sub-verticale. Le onde compressionali (P), dunque, sollecitano all'incirca verticalmente l'edificato; tuttavia è la sollecitazione orizzontale, dovuta alle onde trasversali (S), la causa principale del danneggiamento per le costruzioni. Gli edifici e le opere architettoniche in genere sono collaudate per resistere a forti carichi statici ma quasi mai viene valutata la risposta della costruzione a carichi dinamici orizzontali.

Sulla base di tali considerazioni si deduce che studiare le modalità di propagazione ed amplificazione delle onde trasversali o di taglio (S) nel sottosuolo vuol dire prevedere, a basso costo, le sollecitazioni che una struttura dovrà sopportare durante il verificarsi di un probabile evento sismico. Tra le metodologie che consentono di ricavare il profilo Vs del sottosuolo stanno suscitando particolare interesse quelle definite di tipo 'passivo' ovvero basate sullo studio della continua vibrazione del suolo dovuta a cause sia antropiche che naturali (Vibrazioni Ambientali).

Tali tecniche consentono di misurare le velocità di propagazione delle onde sismiche già presenti nel terreno per effetto di sorgenti naturali (ad esempio il vento e le mareggiate) o antropiche (ad esempio il traffico cittadino e l'attività industriale). A parità di caratteristiche degli stendimenti e dei sensori, le metodologie di tipo 'passivo' raggiungono profondità di esplorazione di gran lunga superiori a qualsiasi altra tecnica sismica. Le più comuni tecniche 'attive' (quali la rifrazione e la riflessione) non sono in grado di indagare spessori di terreno superiori a qualche decina di metri.

Questo dipende dal fatto che tale tipologia di indagini registra le velocità di propagazione dei segnali generati artificialmente da sorgenti controllate a bassa energia (colpo di martello per esempio) che non garantiscono una penetrazione delle onde nel sottosuolo tale da giustificare profondità d'esplorazione superiori a quelle precedentemente indicate.

Al contrario le metodologie 'passive', sfruttando sorgenti energeticamente importanti (si pensi alle onde marine), oltre ad essere caratterizzate da profondità di esplorazione dell'ordine delle centinaia di metri, sono particolarmente adatte ad essere applicate in aree urbane, poiché sfruttando quella porzione di segnale che gli altri metodi geofisici scartano, difficilmente

soffrono per un basso rapporto tra segnale e rumore. Se da un lato, quindi, le tecniche 'passive' dimostrano numerosi vantaggi applicativi, d'altro canto il fatto che le sorgenti non siano note e controllate comporta una inferiore precisione delle misure che si traduce in notevoli ambiguità in fase di elaborazione dati.

Le registrazioni di Vibrazioni Ambientali sono caratterizzate spesso da forti incertezze e si dimostrano efficaci nel momento in cui si parte almeno da una sommaria conoscenza delle litologie in esame che permetta di scartare i risultati più improbabili. In quest'ottica, tuttavia, questi metodi sono applicazioni molto potenti poiché consentono di caratterizzare in tempi brevi e costi relativamente contenuti, non solo grandi spessori di sottosuolo ma anche estese aree in pianta.

Di seguito vengono esposti i principi teorici delle due principali tecniche di acquisizione dati di Vibrazioni Ambientali (Antenna Sismica e HVSR).

PRINCIPI TEORICI DELLE TECNICHE ADOTTATE

Misure su 'Antenna Sismica' (ESAC)

La metodologia consiste nel valutare i tempi di arrivo delle diverse onde sismiche a un insieme di sensori (geofoni) posti alla superficie del terreno. Questi sensori possono essere distribuiti secondo geometrie variabili fino a coprire distanze dell'ordine delle decine di metri (antenna sismica). Il segnale registrato, dovuto alle Vibrazioni Ambientali, risulta un insieme articolato di fasi sismiche dove tuttavia le onde superficiali (Sw) rappresentano la fase energeticamente prevalente e dunque più facilmente analizzabile. Oggetto di studio di tali metodi sono dunque proprio le Sw ed in particolare la loro caratteristica propagazione dispersiva in mezzi stratificati.

In termini qualitativi, la dispersione delle onde Sw può essere spiegata come segue.

Onde superficiali di diversa frequenza (f) si propagano interessando volumi di terreno fino ad una profondità circa pari alla loro lunghezza d'onda (λ). La velocità di propagazione (v) sarà strettamente dipendente dalle proprietà fisiche degli strati coinvolti. Dal momento che f e λ sono correlate da una semplice relazione, si ha che onde Sw ad alta frequenza avranno tendenzialmente una minore lunghezza d'onda e si propagheranno nei livelli di terreno più superficiali, viceversa onde a bassa frequenza interesseranno strati più profondi. Ne deriva anche che differenti componenti armoniche delle onde superficiali avranno diverse velocità di propagazione.

La funzione che associa la velocità di propagazione alla frequenza è detta curva di dispersione: essa è univocamente correlata alla struttura meccanico-stratigrafica del sito e può essere

ricavata attraverso differenti metodologie di elaborazione dei dati acquisiti in campagna (E-SAC, FK, HR) [**Ohori et al., 2002]**. La figura 1 mostra un esempio di antenna sismica mentre viene acquisita e una curva tipica di dispersione.

Dispersion curve

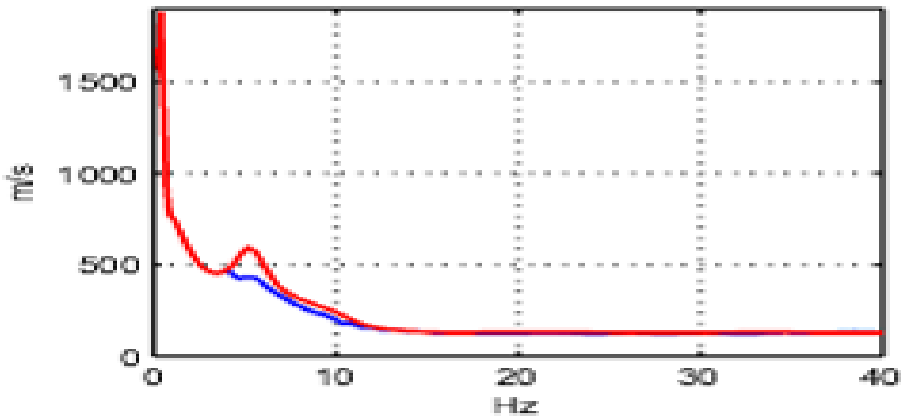

Figura 1: Esempio di misura realizzata con la tecnica dell'antenna sismica. Nella foto si può osservare la disposizione dei sensori nella misura di Faella; nel grafico una curva tipica di dispersione.

Considerando che le onde superficiali sono essenzialmente un prodotto delle onde di volume ed in particolar modo delle onde trasversali (S), attraverso opportune procedure numeriche, definite di inversione, è possibile infine risalire al profilo di velocità Vs nel sottosuolo partendo dalla curva di dispersione ricavata dai dati acquisiti in campagna. [**Pileggi et al., 2011].**

Metodologia a 'Stazione Singola' (HVSR)

Accanto alle tecniche basate sull'impiego di una antenna sismica esistono altre tecniche basate

sull'uso di una singola stazione di misura. In questo caso vengono misurate le vibrazioni ambientali nelle tre direzioni dello spazio attraverso un unico sensore tridirezionale posto sulla superficie del terreno. In particolare viene valutato il rapporto di ampiezza fra le componenti orizzontali e verticali del moto (metodo HVSR ovvero "Horizontal to Vertical Spectral Ratios") [**Bard., 1998]**.

Analizzando misure di questo tipo è possibile identificare le modalità di vibrazione del terreno. In particolare è possibile individuare la frequenza f di questa vibrazione definita di 'risonanza'.

Sapendo che in generale esiste una relazione semplice fra la frequenza f, lo spessore della parte più soffice del terreno e la velocità media delle onde sismiche nel sottosuolo (ricavata per esempio dai metodi con antenna), attraverso le misure HVSR è possibile risalire allo spessore di questo strato.

In figura 2 viene mostrato un esempio di misura a stazione singola e la curva HVSR corrispondente.

Il massimo della curva HVSR indica la frequenza fondamentale di risonanza del sito.

Figura 2: Esempio di misura realizzata con la tecnica a stazione singola. Nella foto si può osservare il sensore tridirezionale e la curva dei rapporti spettrali.

Questa tipologia di misure può contribuire, inoltre, a ridurre la variabilità dovuta alla non unicità della soluzione del problema inverso realizzando una procedura d'inversione congiunta della curva di dispersione ricavata con le antenne sismiche e della curva HVSR [**Pileggi et al., 2011].**

CAMPAGNA DI RACCOLTA DATI

Durante il mese di Giugno e parte del mese di Luglio 2012 sono state realizzate 58 registrazioni di Vibrazioni Ambientali nel territorio comunale di Pian di Scò, in particolare così distribuite: 19 in corrispondenza dell'abitato di Pian di Scò, 11 nell'abitato di Vaggio, 16 a Faella, 12 a Matassino.

Di queste misure 54 sono state realizzate con tecnica a 'stazione singola' (HVSR) mentre 4 registrazioni sono state realizzate per mezzo di antenne sismiche bidimensionali (ARRAY).

Inoltre è stata acquisita una linea di Sismica a rifrazione nella porzione settentrionale dell'abitato di Pian di Scò nel tentativo di misurare la velocità del substrato roccioso affiorante.

Località	HVSR	ARRAY	Rifrazione
Capoluogo	18	1	1
Vaggio	10	1	
Faella	15	1	
Matassino	11	1	
Totale	**54**	**4**	1

Tabella 1: Sintesi delle misure realizzate nei siti in studio

La Tabella 1 sintetizza il numero di registrazioni effettuate in ognuna delle località in studio, l'ubicazione delle misure è riportata in allegato.

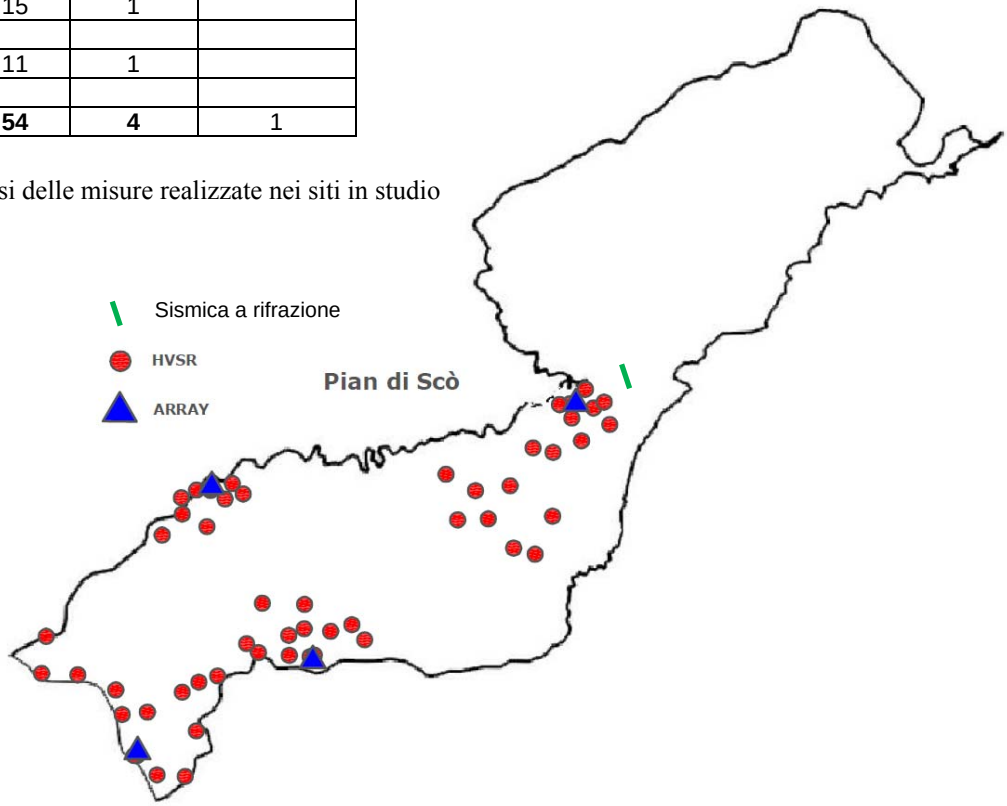

Figura 3: Ubicazione delle misure di sismica. I triangoli blu rappresentano le registrazioni su antenna (ARRAY), i pallini rossi quelle a stazione singola (HVSR), la linea verde la rifrazione.

Le 4 registrazioni su antenna sono state realizzate con un acquisitore a 16 canali e 24 bit equivalenti (Brainspy, Micromed). Per la ricostruzione delle 4 curve di dispersione è stata utilizzata in fase di elaborazione la metodologia ESAC **[Ohori et al., 2002].**

Per le misure HVSR è stato impiegato un tromografo digitale modello 'Tromino' (Micromed).

I dati di vibrazioni ambientali, acquisiti con questa tecnica d'indagine sono stati successivamente elaborati con il software 'Grilla' in dotazione al tromografo e catalogati in base ai criteri proposti da Albarello e Mucciarelli, pubblicati nel volume *Contributi per l'aggiornamento degli 'Indirizzi e criteri per la microzonazione sismica'* di supplemento alla rivista "Ingegneria Sismica", nel numero 2 del 2011.

Ogni misura è stata inserita in una delle seguenti 3 classi di appartenenza:

- Classe A: registrazione affidabile ed interpretabile che può essere utilizzata anche da sola;
- Classe B: registrazione sospetta da utilizzare con cautela ed in presenza di altre misure ottenute nelle vicinanze;
- Classe C: registrazione scadente e di difficile interpretazione.

In base ai criteri di classificazione 52 misure sono rientrate in classe A e B; pertanto sono state ritenute affidabili. Il totale di registrazioni HVSR ritenute attendibili è alla fine risultato di 52 su 54 totali.

LOCALITA'	NOME MISURA	Fq1(Hz)	A1	Fq2(Hz)	A2	Fq3(Hz)	A3	CLASSE
Faella	T1	flat	flat	flat	flat	flat	flat	A2
Faella	T2	6.13	3	0.9	1.5	flat	flat	A1
Faella	T3	flat	flat	flat	flat	flat	flat	A2
Faella	T4	3.85	2.1	0.85	1.8	0.4	1.5	B1
Faella	T5	flat	flat	0.8	1.3	0.3	1.5	B2
Faella	T21	flat	flat	flat	flat	flat	flat	B2
Faella	T22	?	?	?	?	?	?	non classificabile
Faella	T29	3.38	2.2	1.2	1.8	0.3	1.8	A1
Faella	T30	3.69	2.5	0.95	1.8	flat	flat	B1
Faella	T31	flat	flat	0.9	1.5	0.33	1.5	B2
Faella	T32	2.81	2.2	0.9	1.5	flat	flat	B1
Faella	T33	5.28	2.8	flat	flat	0.32	2.5	A1
Faella	T47	flat	flat	flat	flat	0.31	2.2	A1
Faella	T48	flat	flat	flat	flat	0.31	3	B1
Faella	T51	3.63	3.4	flat	flat	0.31	3	B1
Pian di Scò	T6	2.5	2.3	flat	flat	flat	flat	A1
Pian di Scò	T7	9.56	1.8	flat	flat	flat	flat	B1
Pian di Scò	T8	flat	flat	flat	flat	flat	flat	A2
Pian di Scò	T9	flat	flat	flat	flat	flat	flat	B2
Pian di Scò	T10	flat	flat	flat	flat	flat	flat	A2
Pian di Scò	T11	flat	flat	flat	flat	flat	flat	B2
Pian di Scò	T36	8.6	2.5	flat	flat	flat	flat	B1
Pian di Scò	T37	flat	flat	flat	flat	flat	flat	C2
Pian di Scò	T38	flat	flat	flat	flat	flat	flat	A2
Pian di Scò	T39	2.5	1.8	flat	flat	flat	flat	B1
Pian di Scò	T40	?	?	?	?	?	?	non classificabile
Pian di Scò	T41	flat	flat	flat	flat	0.3	2	A1
Pian di Scò	T42	2	2	flat	flat	flat	flat	B1
Pian di Scò	T43	1.8	2	flat	flat	flat	flat	B1
Pian di Scò	T44	flat	flat	flat	flat	flat	flat	A2
Pian di Scò	T45	flat	flat	flat	flat	flat	flat	A2
Pian di Scò	T46	flat	flat	flat	flat	flat	flat	B2
Pian di Scò	T54	2.5	3	flat	flat	flat	flat	A1
Matassino	T13	1.3	1.9	0.94	2.2	flat	flat	B1
Matassino	T14	2.8	1.8	0.85	2	flat	flat	B1
Matassino	T15	flat	flat	0.94	1.8	flat	flat	B1
Matassino	T16	2.4	1.8	0.9	1.8	flat	flat	B1
Matassino	T17	flat	flat	0.92	1.8	0.31	2	B1
Matassino	T18	3	1.8	0.88	1.8	0.35	1.5	B1
Matassino	T19	2.6	1.8	0.9	1.6	flat	flat	B1
Matassino	T20	3.5	3	flat	flat	flat	flat	B1
Matassino	T49	flat	flat	0.9	1.5	0.31	3	B1
Matassino	T50	flat	flat	flat	flat	0.28	3	B1
Matassino	T52	flat	flat	0.85	1.9	0.4	1.8	B1
Vaggio	T12	flat	flat	flat	flat	flat	flat	B2
Vaggio	T23	flat	flat	flat	flat	flat	flat	B2
Vaggio	T24	flat	flat	0.9	1.8	flat	flat	B1
Vaggio	T25	2.06	1.8	flat	flat	flat	flat	B1
Vaggio	T26	flat	flat	flat	flat	flat	flat	B2
Vaggio	T27	flat	flat	1.2	2	flat	flat	B2
Vaggio	T28	flat	flat	1.2	2	0.3	1.8	B2
Vaggio	T34	flat	flat	flat	flat	0.31	3.2	A1
Vaggio	T35	flat	flat	flat	flat	0.31	2.2	A1
Vaggio	T53	flat	flat	0.9	2.2	0.38	1.8	A1

Metodologia sismica a 'Rifrazione'

L'indagine sismica consiste nel produrre sulla superficie del terreno, in prossimità del sito da investigare, sollecitazioni dinamiche verticali per la generazione di onde di volume (P) e sollecitazioni dinamiche orizzontali per la generazione di onde di taglio (SH) e nel registrare le vibrazioni prodotte, sempre in corrispondenza della superficie, a distanze note e prefissate mediante sensori a componente verticale ed orizzontale.

L'interpretazione dei segnali rilevati e la conseguente stima del profilo di velocità delle onde sismiche, può scomporsi nelle seguenti fasi fondamentali:

1. individuazione del primo arrivo per ogni traccia, sui sismogrammi registrati;
2. ricostruzione delle relative dromocrone;
3. interpretazione delle dromocrone con conseguente ricostruzione delle geometrie del sottosuolo.

Apparecchiatura usata e schema della prova

L'apparecchiatura utilizzata si compone delle seguenti parti:

- sistema sorgente;
- sistema di ricezione;
- sistema di acquisizione dati;
- trigger.

Sorgente onde P:

La sorgente deve essere in grado di generare onde elastiche ad alta frequenza ricche di energia, con forme d'onda ripetibili, con la possibilità di ottenere prevalentemente onde di compressione, ad esempio grave in caduta libera (massa da 110 kg); in alternativa è possibile utilizzare un cannoncino a cartucce industriali o una mazza di 8 kg adoperata per colpire una piastra di alluminio appoggiata sul terreno.

Sorgente onde SH:

La sorgente deve essere in grado di generare onde elastiche ad alta frequenza ricche di energia, con forme d'onda ripetibili e direzionali, cioè con la possibilità di ottenere prevalentemente onde di taglio polarizzate sul piano orizzontale.

Tale sorgente è costituita da un parallelepipedo di forma tale da poter essere colpita lateralmente ad entrambe le estremità con una massa pesante. E' importante che il parallelepipedo venga gravato di un carico statico addizionale in modo che possa rimanere aderente al terreno sia nel momento in cui viene colpito sia successivamente, affinché l'energia prodotta non venga in parte dispersa. Con questo dispositivo è possibile generare essenzialmente delle onde e-

lastiche di taglio polarizzate orizzontalmente, con uniformità sia nella direzione di propagazione che nella polarizzazione e con una generazione di onde P trascurabile.
L'accoppiamento parallelepipedo-terreno è fatto per "contatto" e non per "infissione".
I profili sismici a rifrazione sono realizzati energizzando ad intervalli regolari lungo stendimenti di sensori detti geofoni: ciascuno stendimento multicanale viene denominato base sismica.

Sistema di ricezione:

Il sistema di ricezione è costituito da 24 geofoni a componente verticale per le onde P, con frequenza propria di circa 14 Hz e 24 goefoni a componente orizzontale per le onde SH, con frequenza propria di circa 10 Hz. Per l'acquisizione i geofoni sono accoppiati al terreno e posizionati verticalmente tramite il puntale di cui sono dotati.

Sistema di acquisizione dati:

Le registrazioni sono state acquisite mediante un sismografo digitale con 24 canali a 16 bit, si tratta di un sistema multicanale in grado di registrare su ciascun canale in modo digitale i segnali provenienti da ogni trasduttore di velocità (geofoni) a cui è collegato e conservarli su memoria di massa dinamica. Le forme d'onda acquisite sono visualizzabili come tracce a partire dall'impulso inviato dal trigger nel computer portatile ad esso collegato e salvabili in forma numerica in modo definitivo.

Trigger:

Il trigger consiste in un circuito elettrico che viene chiuso nell'istante in cui il grave o la mazza colpisce la base di battuta, consentendo la produzione di un impulso che viene inviato a un sensore collegato al sistema di acquisizione dati; in questo modo è possibile individuare e visualizzare l'esatto istante in cui la sorgente viene attivata e parte la sollecitazione dinamica.

Interpretazione dei profili sismici:

I tempi di arrivo delle onde letti in corrispondenza di ciascun geofono hanno permesso di ricostruire i diagrammi spazio-tempo, detti dromocrone. L'interpretazione delle dromocrone fatta attraverso il softwares Rayfract, ha permesso di definire un modello della stratigrafia del terreno basato sulle variazioni della velocità delle onde di volume e di taglio.

Risultati:

Dall'elaborazione dei dati acquisiti si sono ottenuti elaborati tomografici dell'andamento delle velocità delle onde di taglio Vs e delle onde di volume Vp, oltre alle relative sezioni sismostratigrafiche che schematizzano gli spessori individuati di seguito allegati.

ELABORAZIONI E RISULTATI

Inversioni congiunte ESAC-HVSR per la stima dei profili Vs

Per 4 siti, in corrispondenza dei quali sono stati ricavati, nel medesimo punto, sia la curva di dispersione che la curva dei rapporti spettrali, sono state realizzate attraverso una procedura agli "**algoritmi genetici**" una serie di inversioni congiunte per la stima dei profili di velocità delle onde di taglio Vs. Ciascuna procedura di inversione ha permesso di identificare un profilo compatibile con le osservazioni di campagna. Come precedentemente spiegato, infatti, le tecniche d'inversione non permettono di risalire ad un unico modello di velocità (non esiste l'univocità della soluzione) ma ciascuna elaborazione porterà all'identificazione di un possibile profilo di velocità parzialmente differente dal precedente ma ugualmente compatibile con i dati di campagna.

CONCLUSIONI

La zona indagata risulta geologicamente caratterizzata, in maniera schematica, da terreni di copertura plio-pleistocenici, riferibili ai depositi palustro-fluvio-lacustri e di conoide alluvionale, e olocenici, riferibili ai depositi alluvionali recenti ed alluvionali terrazzati. Localmente si rilevano coperture detritiche e depositi eluvio-colluviali di limitata entità e spessore modesto.

Tali depositi assumono spessori rilevanti spostandosi dal margine verso il centro del bacino, mentre in corrispondenza della porzione apicale delle conoidi alluvionali lo spessore è minore.

Il substrato di tali depositi è rappresentato dai litotipi lapidei riferibili all'Unità Tettonica Toscana 'Cervarola-Falterona' di età Oligocenica.

Le misure sismiche realizzate rispecchiano in generale l'assetto geologico descritto.

Infatti tra le misure effettuate si individuano tre gruppi di frequenze ricorrenti: a 0.3 hz, su 1.0 hz e frequenze superiori a 2.5 hz.

La frequenza più bassa intorno agli 0.3 hz indica il contrasto di impedenza più forte e più profondo rappresentato dal substrato geologico di età oligocenica. I litotipi riferibili al substrato sono presenti in affioramento a monte dell'abitato di Pian di Scò, e tramite la linea di sismica a rifrazione ST01 ne è stata determinata la velocità che per le onde di taglio è risultata di circa 1300 m/sec. La velocità così definita, è servita ad interpretare i profili di Vs ricavati delle elaborazioni congiunte delle indagini di sismica passiva Esac e H/V, dalle quali sono emersi a profondità dell'ordine di alcune centinaia di metri contrasti evidenti sui 1300 m/sec., coerentemente con la situazione geologica locale.

La frequenza intorno ad 1.0 hz evidenzia l'eterogeneità dei materiali di copertura, probabilmente i contrasti di impedenza con le argille sovraconsolidate del Pleistocene inferiore, poste a profondità dell'ordine di un centinaio di metri.

Le frequenze più elevate sono state riscontrate in due zone distinte.

Per quanto riguarda le zone di fondovalle, tali frequenze sono riferibili alla presenza dei depositi alluvionali del Torrente Faella, dell'Arno e del Resco, sovrastanti depositi palustro-lacustri sovra consolidati; invece, per quanto riguarda la porzione settentrionale dell'abitato di Pian di Scò le frequenze alte stanno ad indicare la progressiva diminuzione di profondità del substrato geologico, spostandosi dalla porzione centrale al margine della conoide alluvionale, come si nota anche nella misura passiva ESAC4.

GeoEcho S.n.c.

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ALLEGATI

Carte delle ubicazioni a scala 1:2000

-Pian di Scò 1

-Pian di Scò 2

-Pian di Scò 3

-Pian di Scò 4

-Vaggio

-Faella 1

-Faella 2

-Matassino 1

-Matassino 2

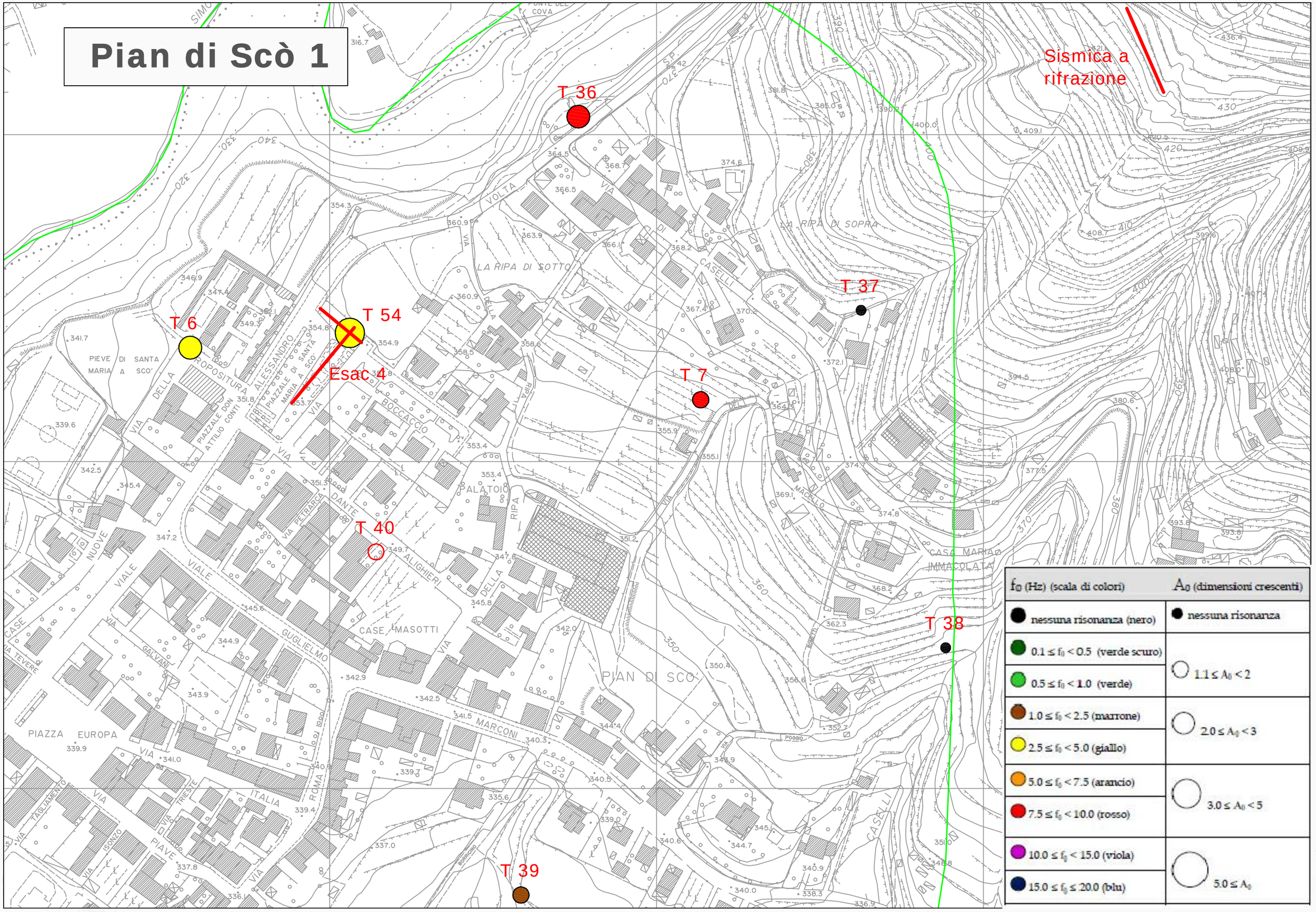
-Matassino 3

Elaborati misure ESAC

Elaborati sismica a rifrazione

Elaborati misure HVSR

Pian di Scò 1



f_0 (Hz) (scala di colori)	A_0 (dimensioni crescenti)
nessuna risonanza (nero)	nessuna risonanza
$0.1 \le f_0 < 0.5$ (verde scuro)	$1.1 \le A_0 < 2$
$0.5 \le f_0 < 1.0$ (verde)	
$1.0 \le f_0 < 2.5$ (marrone)	$2.0 \le A_0 < 3$
$2.5 \le f_0 < 5.0$ (giallo)	
$5.0 \le f_0 < 7.5$ (arancio)	$3.0 \le A_0 < 5$
$7.5 \le f_0 < 10.0$ (rosso)	
$10.0 \le f_0 < 15.0$ (viola)	$5.0 \le A_0$
$15.0 \le f_0 \le 20.0$ (blu)	

Pian di Scò 2

T 8

T 10

T 39

T 45

f_0 (Hz) (scala di colori)	A_0 (dimensioni crescenti)
nessuna risonanza (nero)	nessuna risonanza
$0.1 \le f_0 < 0.5$ (verde scuro)	$1.1 \le A_0 < 2$
$0.5 \le f_0 < 1.0$ (verde)	
$1.0 \le f_0 < 2.5$ (marrone)	$2.0 \le A_0 < 3$
$2.5 \le f_0 < 5.0$ (giallo)	
$5.0 \le f_0 < 7.5$ (arancio)	$3.0 \le A_0 < 5$
$7.5 \le f_0 < 10.0$ (rosso)	
$10.0 \le f_0 < 15.0$ (viola)	$5.0 \le A_0$
$15.0 \le f_0 \le 20.0$ (blu)	

Pian di Scò 3

T 42

T 9

T 45

T 41

T 43

f_0 (Hz) (scala di colori)	A_0 (dimensioni crescenti)
nessuna risonanza (nero)	nessuna risonanza
$0.1 \le f_0 < 0.5$ (verde scuro)	$1.1 \le A_0 < 2$
$0.5 \le f_0 < 1.0$ (verde)	
$1.0 \le f_0 < 2.5$ (marrone)	$2.0 \le A_0 < 3$
$2.5 \le f_0 < 5.0$ (giallo)	
$5.0 \le f_0 < 7.5$ (arancio)	$3.0 \le A_0 < 5$
$7.5 \le f_0 < 10.0$ (rosso)	
$10.0 \le f_0 < 15.0$ (viola)	$5.0 \le A_0$
$15.0 \le f_0 \le 20.0$ (blu)	

Pian di Scò 4

T 43

T 46

T 44

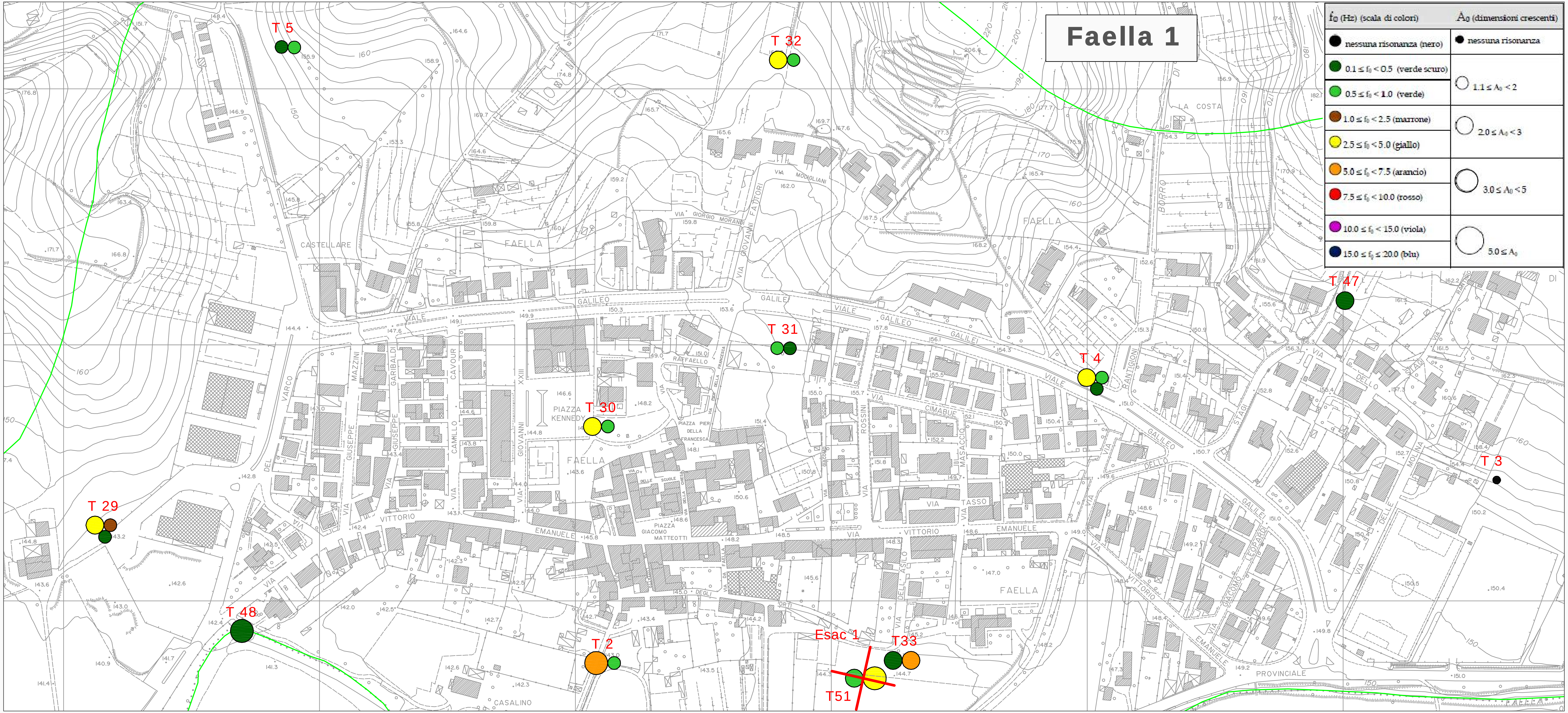
T 11

f_0 (Hz) (scala di colori)	A_0 (dimensioni crescenti)
nessuna risonanza (nero)	nessuna risonanza
$0.1 \le f_0 < 0.5$ (verde scuro)	$1.1 \le A_0 < 2$
$0.5 \le f_0 < 1.0$ (verde)	
$1.0 \le f_0 < 2.5$ (marrone)	$2.0 \le A_0 < 3$
$2.5 \le f_0 < 5.0$ (giallo)	
$5.0 \le f_0 < 7.5$ (arancio)	$3.0 \le A_0 < 5$
$7.5 \le f_0 < 10.0$ (rosso)	
$10.0 \le f_0 < 15.0$ (viola)	$5.0 \le A_0$
$15.0 \le f_0 \le 20.0$ (blu)	

Vaggio

T 12
T 23
T 24
T 25
T 26
T 27
T 28
T 53
T35
T34
Esac 3

f_0 (Hz) (scala di colori)	A_0 (dimensioni crescenti)
nessuna risonanza (nero)	nessuna risonanza
$0.1 \le f_0 < 0.5$ (verde scuro)	$1.1 \le A_0 < 2$
$0.5 \le f_0 < 1.0$ (verde)	
$1.0 \le f_0 < 2.5$ (marrone)	$2.0 \le A_0 < 3$
$2.5 \le f_0 < 5.0$ (giallo)	
$5.0 \le f_0 < 7.5$ (arancio)	$3.0 \le A_0 < 5$
$7.5 \le f_0 < 10.0$ (rosso)	
$10.0 \le f_0 < 15.0$ (viola)	$5.0 \le A_0$
$15.0 \le f_0 \le 20.0$ (blu)	



Faella 1
f0 (Hz) (scala di colori)
A0 (dimensioni crescenti)
nessuna risonanza (nero)
nessuna risonanza
0.1 ≤ f0 < 0.5 (verde scuro)
0.5 ≤ f0 < 1.0 (verde)
1.0 ≤ f0 < 2.5 (marrone)
2.5 ≤ f0 < 5.0 (giallo)
5.0 ≤ f0 < 7.5 (arancio)
7.5 ≤ f0 < 10.0 (rosso)
10.0 ≤ f0 < 15.0 (viola)
15.0 ≤ f0 ≤ 20.0 (blu)
1.1 ≤ A0 < 2
2.0 ≤ A0 < 3
3.0 ≤ A0 < 5
5.0 ≤ A0
T 5
T 32
T 31
T 47
T 4
T 30
T 3
T 29
T 48
T 2
Esac 1
T33
T51
CASTELLARE
FAELLA
LA COSTA
VIA GIORGIO MORANDI
VIA MODIGLIANI
VIA GIOVANNI FATTORI
VIALE GALILEO GALILEI
PIAZZA KENNEDY
PIAZZA PIER DELLA FRANCESCA
PIAZZA GIACOMO MATTEOTTI
VIA VITTORIO EMANUELE
VIA TASSO
VIA CIMABUE
VIA ROSSINI
VIA DEL VARCO
VIA GIUSEPPE MAZZINI
VIA GIUSEPPE GARIBALDI
VIA CAMILLO CAVOUR
VIA GIOVANNI XXIII
VIA GIACOMO LEOPARDI
VIA DELLE STAGI
PROVINCIALE
CASALINO

Faella 2

T 1

T21

T 22

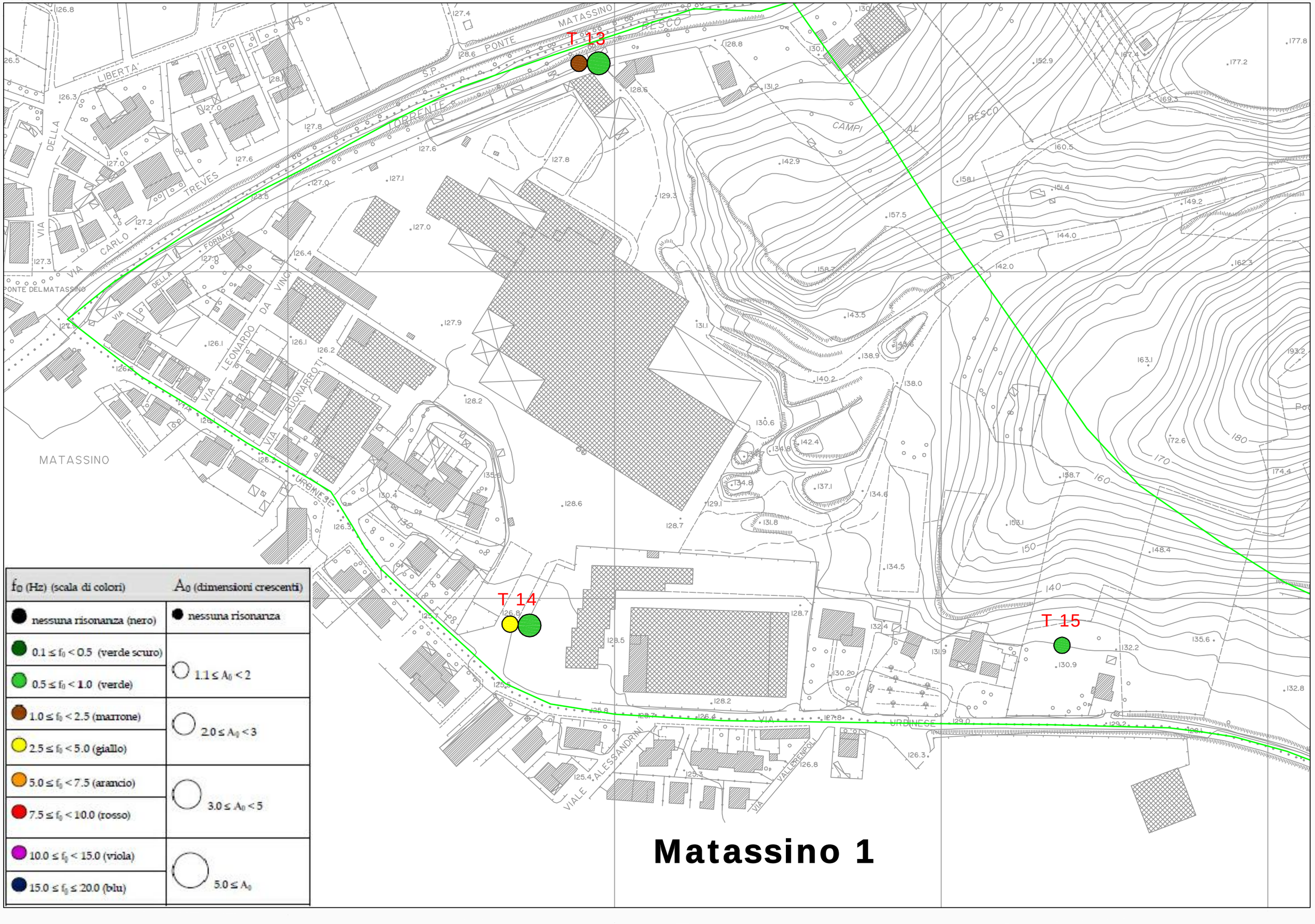
MAGGIORI

STRADA

FIORENTINA

FAELLA

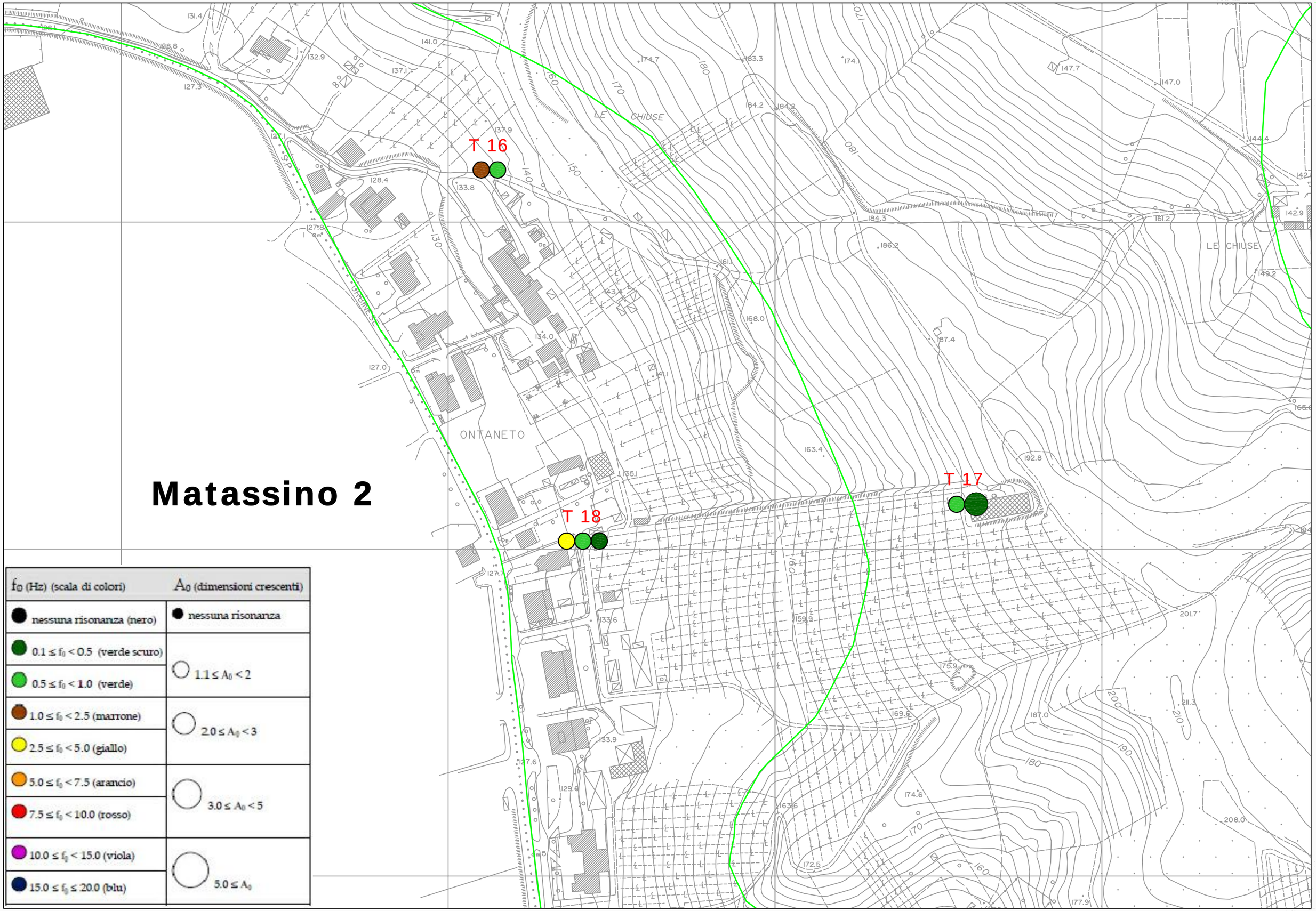
f_0 (Hz) (scala di colori)	A_0 (dimensioni crescenti)
nessuna risonanza (nero)	nessuna risonanza
$0.1 \le f_0 < 0.5$ (verde scuro)	$1.1 \le A_0 < 2$
$0.5 \le f_0 < 1.0$ (verde)	
$1.0 \le f_0 < 2.5$ (marrone)	$2.0 \le A_0 < 3$
$2.5 \le f_0 < 5.0$ (giallo)	
$5.0 \le f_0 < 7.5$ (arancio)	$3.0 \le A_0 < 5$
$7.5 \le f_0 < 10.0$ (rosso)	
$10.0 \le f_0 < 15.0$ (viola)	$5.0 \le A_0$
$15.0 \le f_0 \le 20.0$ (blu)	



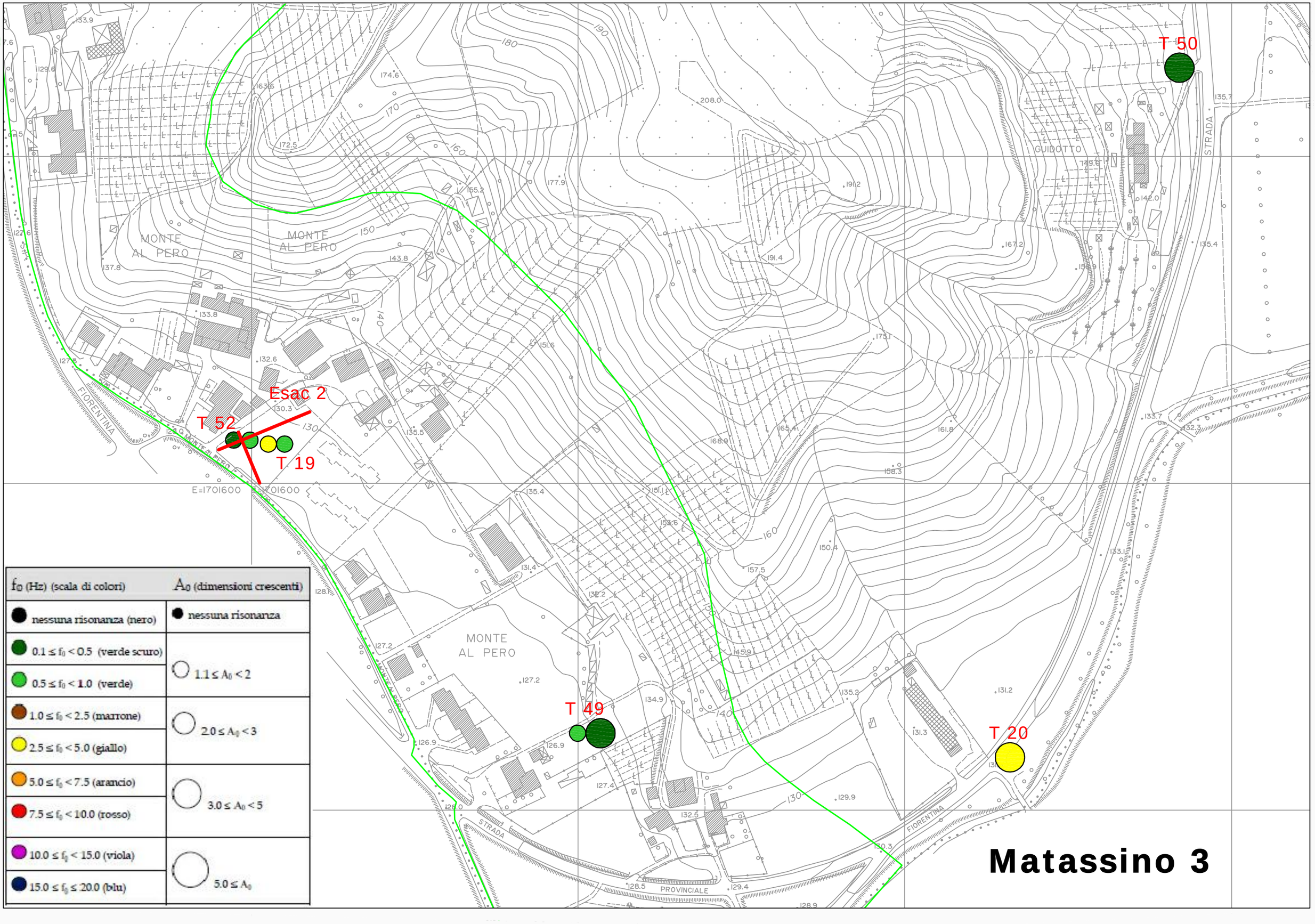
f_0 (Hz) (scala di colori)	A_0 (dimensioni crescenti)
nessuna risonanza (nero)	nessuna risonanza
$0.1 \le f_0 < 0.5$ (verde scuro)	$1.1 \le A_0 < 2$
$0.5 \le f_0 < 1.0$ (verde)	
$1.0 \le f_0 < 2.5$ (marrone)	$2.0 \le A_0 < 3$
$2.5 \le f_0 < 5.0$ (giallo)	
$5.0 \le f_0 < 7.5$ (arancio)	$3.0 \le A_0 < 5$
$7.5 \le f_0 < 10.0$ (rosso)	
$10.0 \le f_0 < 15.0$ (viola)	$5.0 \le A_0$
$15.0 \le f_0 \le 20.0$ (blu)	

Matassino 1

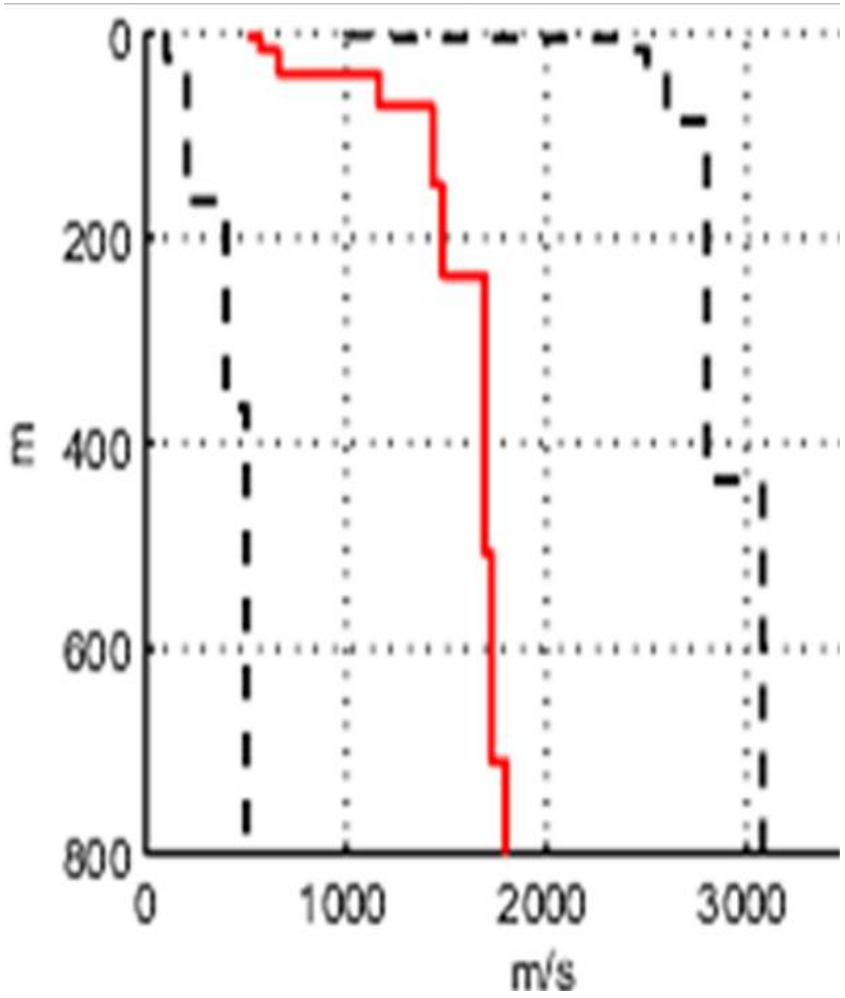
Matassino 2

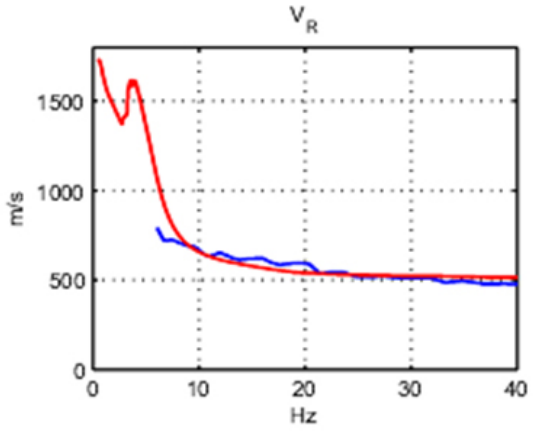


f_0 (Hz) (scala di colori)	A_0 (dimensioni crescenti)
nessuna risonanza (nero)	nessuna risonanza
$0.1 \le f_0 < 0.5$ (verde scuro)	$1.1 \le A_0 < 2$
$0.5 \le f_0 < 1.0$ (verde)	
$1.0 \le f_0 < 2.5$ (marrone)	$2.0 \le A_0 < 3$
$2.5 \le f_0 < 5.0$ (giallo)	
$5.0 \le f_0 < 7.5$ (arancio)	$3.0 \le A_0 < 5$
$7.5 \le f_0 < 10.0$ (rosso)	
$10.0 \le f_0 < 15.0$ (viola)	$5.0 \le A_0$
$15.0 \le f_0 \le 20.0$ (blu)	

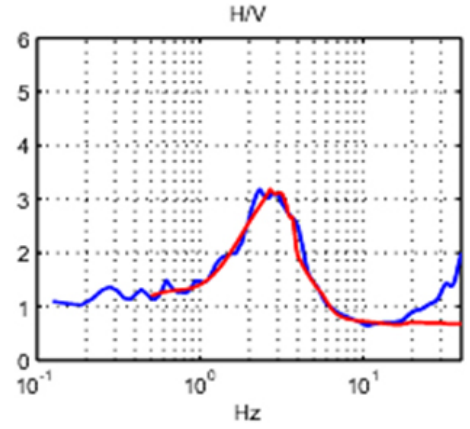

T 50
Esac 2
T 52
T 19
T 49
T 20
MONTE AL PERO
GUIDOTTO
STRADA
FIORENTINA
PROVINCIALE
E=1701600
N=4701600
f_0 (Hz) (scala di colori)
A_0 (dimensioni crescenti)
nessuna risonanza (nero)
nessuna risonanza
0.1 ≤ f_0 < 0.5 (verde scuro)
0.5 ≤ f_0 < 1.0 (verde)
1.1 ≤ A_0 < 2
1.0 ≤ f_0 < 2.5 (marrone)
2.5 ≤ f_0 < 5.0 (giallo)
2.0 ≤ A_0 < 3
5.0 ≤ f_0 < 7.5 (arancio)
7.5 ≤ f_0 < 10.0 (rosso)
3.0 ≤ A_0 < 5
10.0 ≤ f_0 < 15.0 (viola)
15.0 ≤ f_0 ≤ 20.0 (blu)
5.0 ≤ A_0
Matassino 3

Profilo di Vs ESAC 4 Pian di Scò

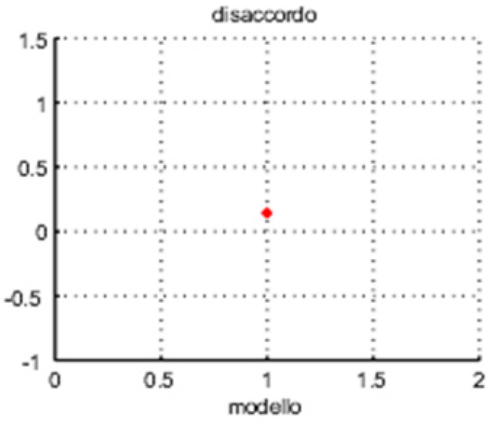




Match curva di dispersione teorica /sperimentale Array



Match curva di dispersione teorica /sperimentale HVSR

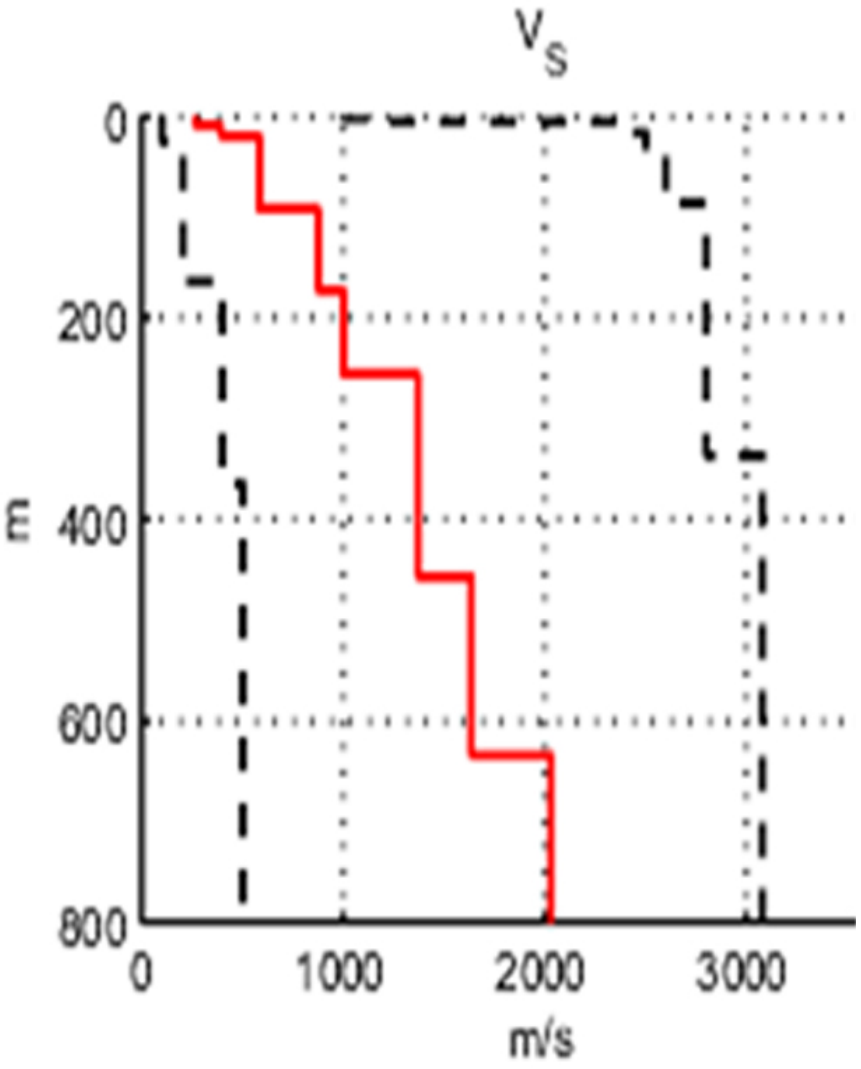


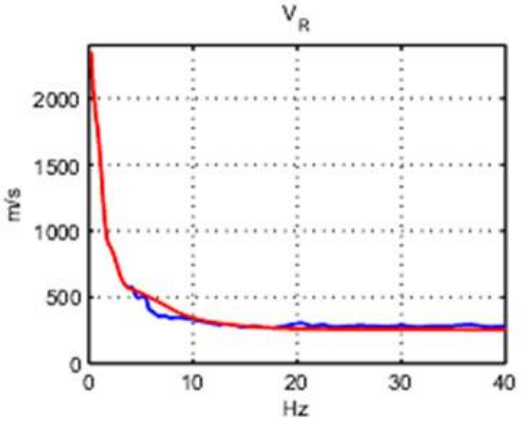
Disaccordo tra le curve

Modello monodimensionale Esac 4 Pian di Scò

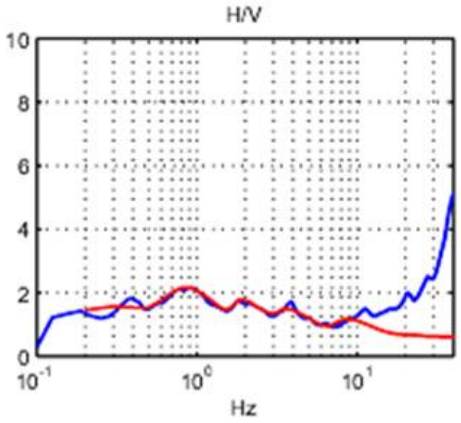
spessore (m)	Vp(m/s)	Vs(m/s)	ro(kg/m^3)	profondità	Vs me-die
4.90	1192.08	523.56	1873.90	0.00	523.56
12.04	1843.11	569.80	1377.32	4.90	555.61
22.76	2011.83	659.82	1705.77	16.94	610.93
31.32	2697.85	1163.44	1334.31	39.69	772.79
77.37	2991.40	1430.50	1684.26	71.01	1016.48
87.93	3000.00	1479.77	1574.78	148.38	1150.51
271.46	3000.00	1691.98	1997.07	236.31	1387.97
203.03	3000.00	1726.30	1838.71	507.77	1470.28
341.06	3000.00	1798.73	2747.80	710.80	1562.81
0.00	3300.00	1998.63	2702.84	1051.85	1562.81

Profilo di Vs ESAC 3 Vaggio

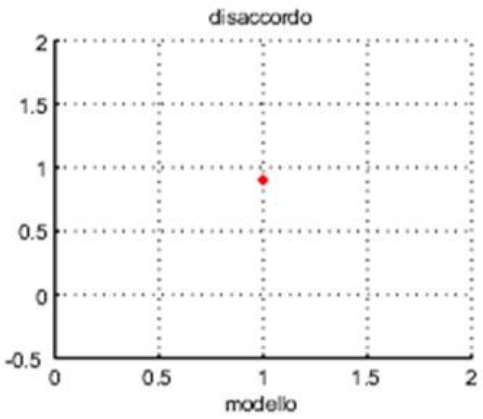




Match curva di dispersione teorica /sperimentale Array



Match curva di dispersione teorica /sperimentale HVSR

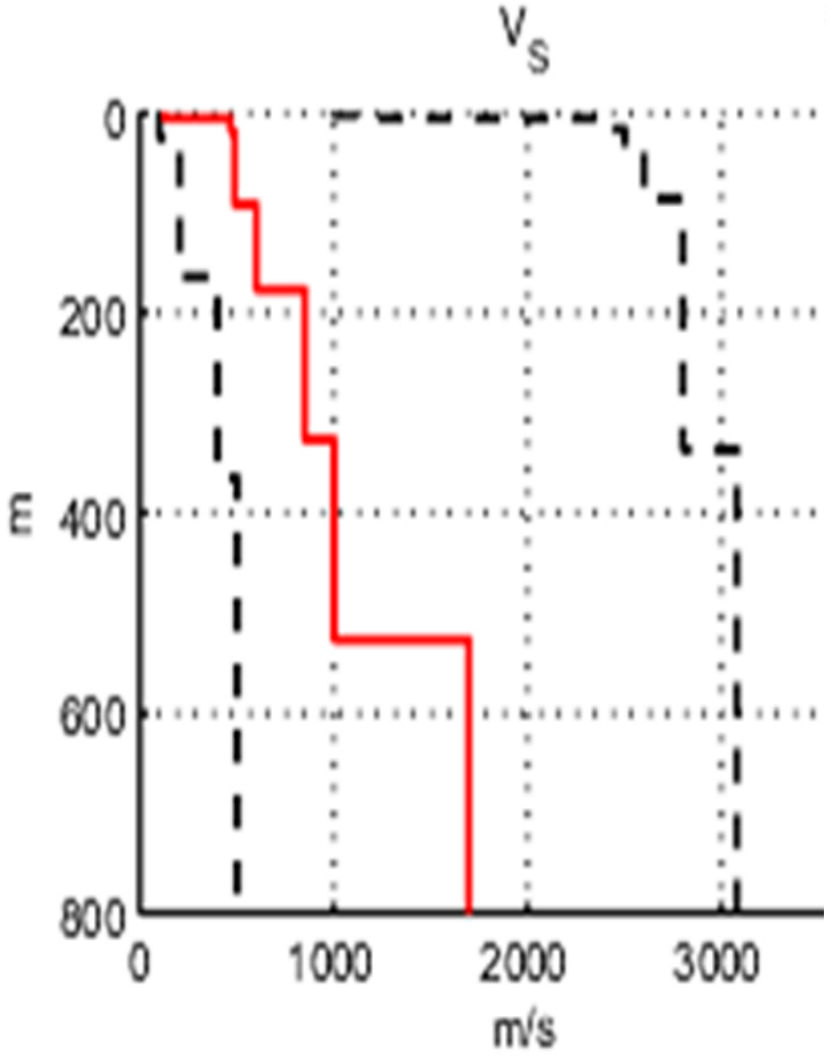


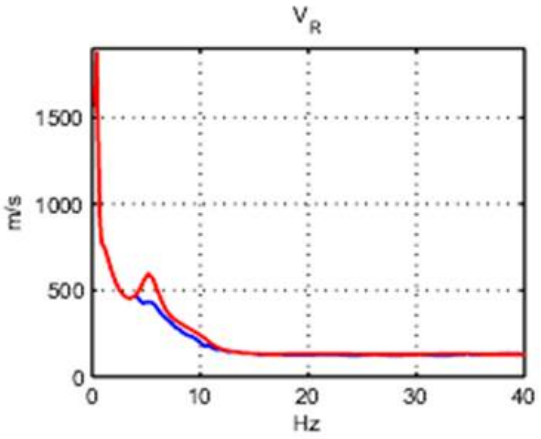
Disaccordo tra le curve

Modello monodimensionale Esac 3 Vaggio

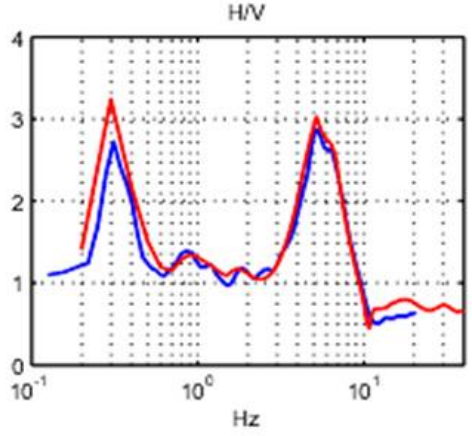
spessore (m)	Vp(m/s)	Vs(m/s)	ro(kg/m^3)	profondità	Vs medie
9.01	572.53	264.94	2020.53	0.00	264.94
9.92	805.87	391.01	1391.01	9.01	318.82
73.48	1729.62	581.33	1701.86	18.93	497.42
80.60	3665.79	876.15	1975.56	92.41	622.84
83.48	4180.65	1000.00	1068.43	173.01	710.00
199.82	4757.58	1372.04	2714.57	256.49	900.21
178.20	4992.18	1636.36	1060.61	456.31	1030.40
851.32	5460.41	2032.75	1400.78	634.51	1436.15
0.00	6600.00	2830.30	1001.96	1485.83	1436.15

Profilo di Vs ESAC 1 Faella

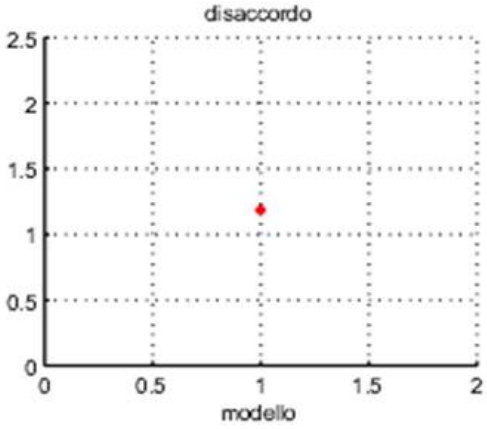




Match curva di dispersione teorica /sperimentale Array



Match curva di dispersione teorica /sperimentale HVSR

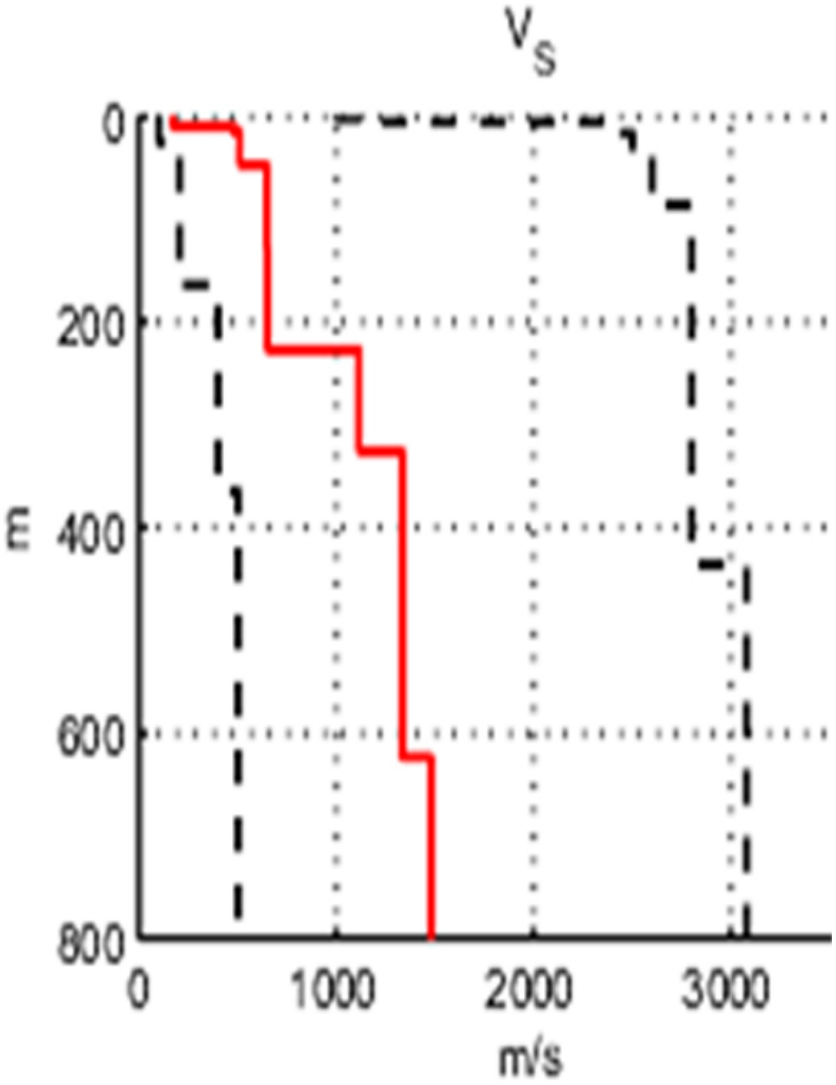


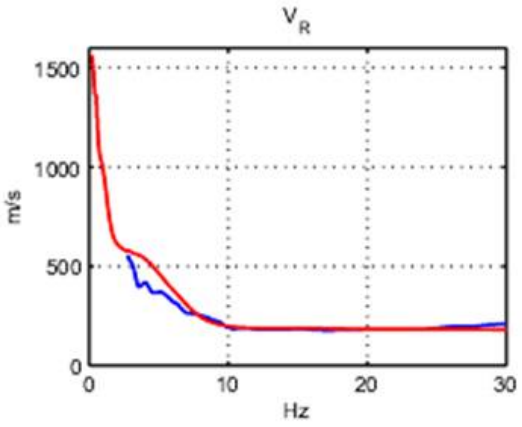
Disaccordo tra le curve

Modello monodimensionale Esac 1 Faella

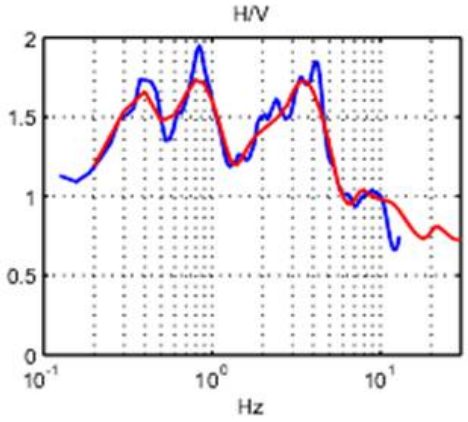
spessore (m)	Vp(m/s)	Vs(m/s)	ro(kg/m^3)	profondità	Vs medie
5.72	1500.00	125.02	3000.00	0.00	125.02
13.26	1501.96	468.96	2749.76	5.72	256.35
72.49	2255.13	489.15	2000.98	18.98	411.60
84.99	2976.54	600.00	2501.47	91.47	484.94
150.00	3000.00	850.15	1654.94	176.45	604.20
204.03	3001.47	1000.00	1000.00	326.45	712.69
298.44	3495.02	1699.71	2018.57	530.48	901.08
1000.00	3500.00	1982.21	1250.24	828.92	1283.99
0.00	4200.00	2180.84	1000.00	1828.92	1283.99

Profilo di Vs ESAC 2 Matassino

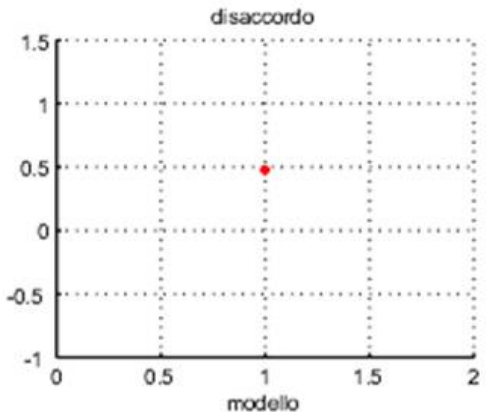




Match curva di dispersione teorica /sperimentale Array



Match curva di dispersione teorica /sperimentale HVSR

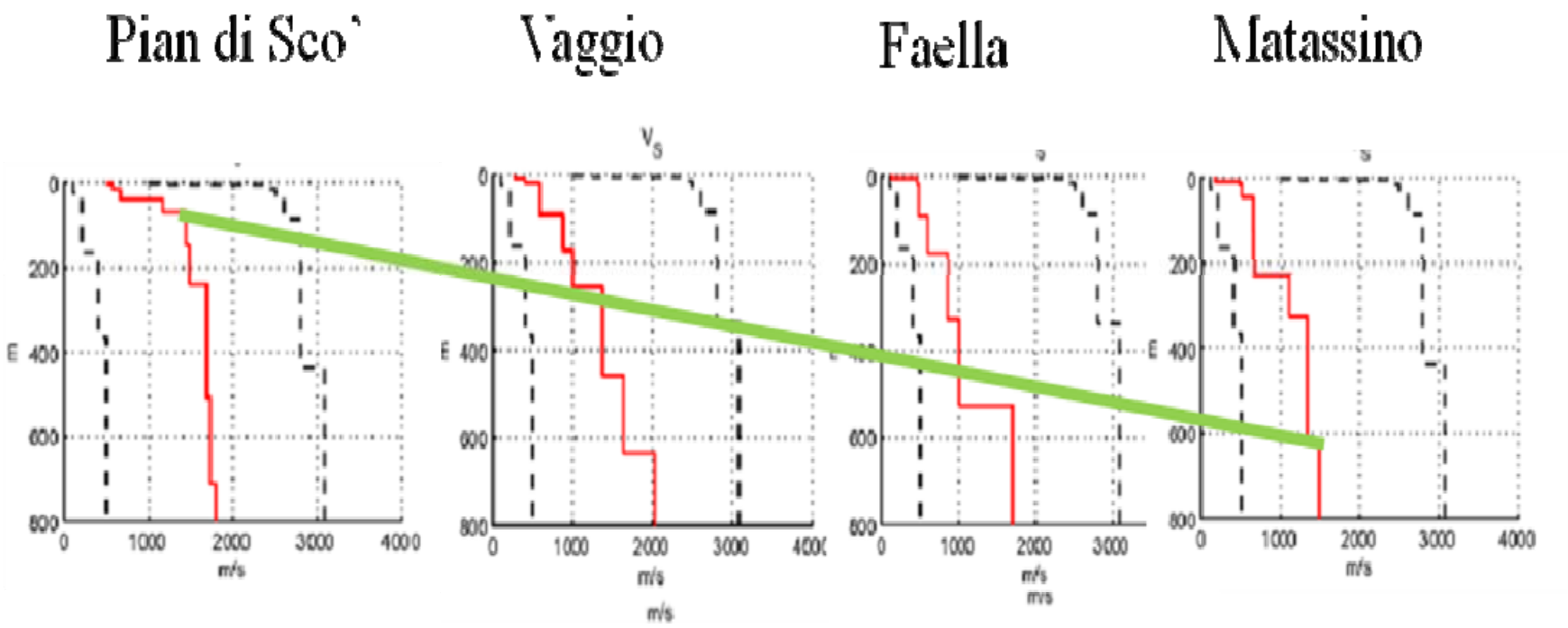


Disaccordo tra le curve

Modello monodimensionale Esac 2 Matassino

spessore (m)	Vp(m/s)	Vs(m/s)	ro(kg/m^3)	profondità	Vs medie
9.45	521.99	169.80	3000.00	0.00	169.80
5.79	1249.27	478.50	1248.29	9.45	224.96
31.99	1250.73	511.24	1500.49	15.24	362.44
79.94	1250.73	647.70	1373.41	47.23	501.19
99.51	1356.99	649.07	2000.98	127.17	556.89
99.32	2918.28	1114.37	2710.66	226.68	657.03
298.05	3000.00	1334.90	1046.92	326.00	867.39
240.57	3000.00	1479.77	1050.83	624.05	980.26
494.14	3000.00	1714.86	1498.53	864.61	1161.16
0.00	3300.00	1980.84	1001.96	1358.75	1161.16

Andamento schematico del substrato geologico



LINEA ST01

INDAGINE DI SISMICA A RIFRAZIONE IN ONDE P e SH

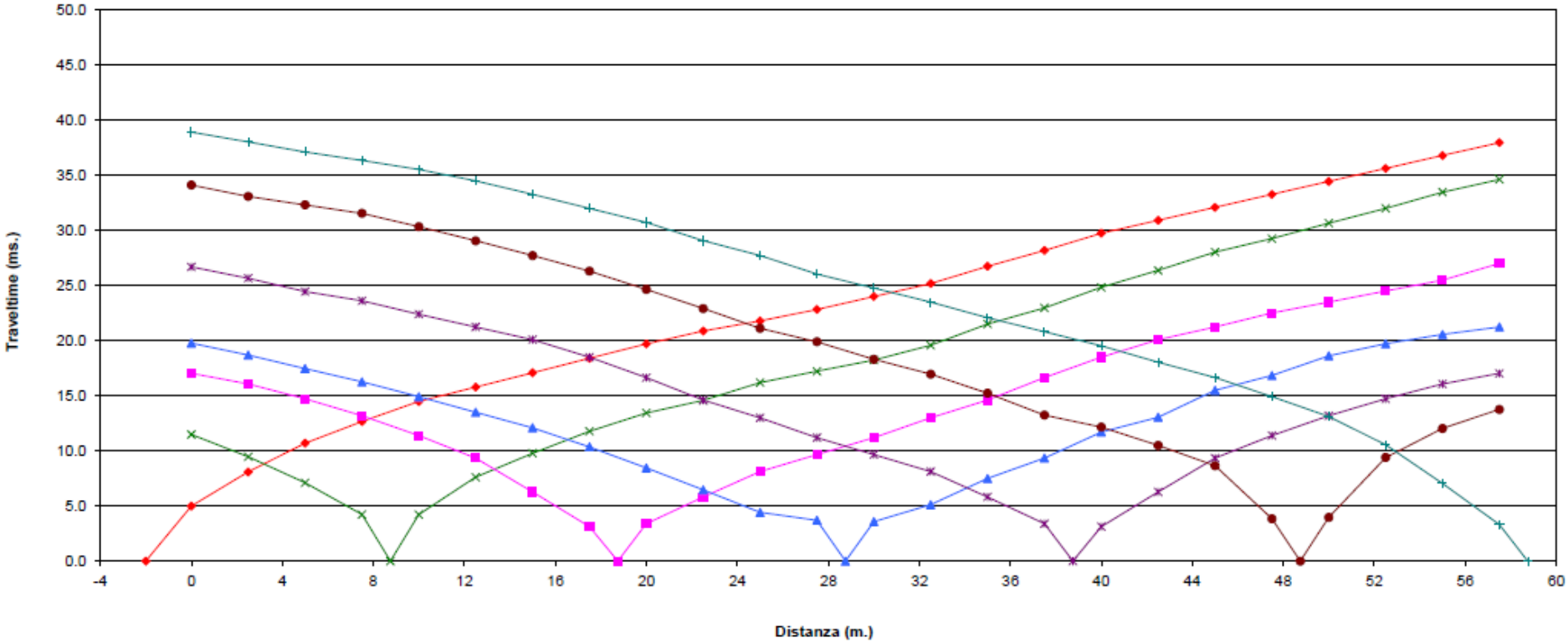
SCHEMA DETTAGLIATO DELLA LINEA DI ACQUISIZIONE

GEOFONI N.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
DISTANZA PROGRESSIVA (m)	0	2.5	5	7.5	10	12.5	15	17.5	20	22.5	25	27.5	30	32.5	35	40	42.5	45	47.5	50	52.5	55	57.5	60
DISTANZA PARZIALE (m)	0	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
QUOTA (metri s.l.m.)	428.00	428.00	428.00	428.00	428.00	428.00	428.00	428.00	428.00	428.00	428.00	428.00	428.00	428.00	428.00	428.00	428.00	428.00	428.00	428.00	428.00	428.00	428.00	428.00

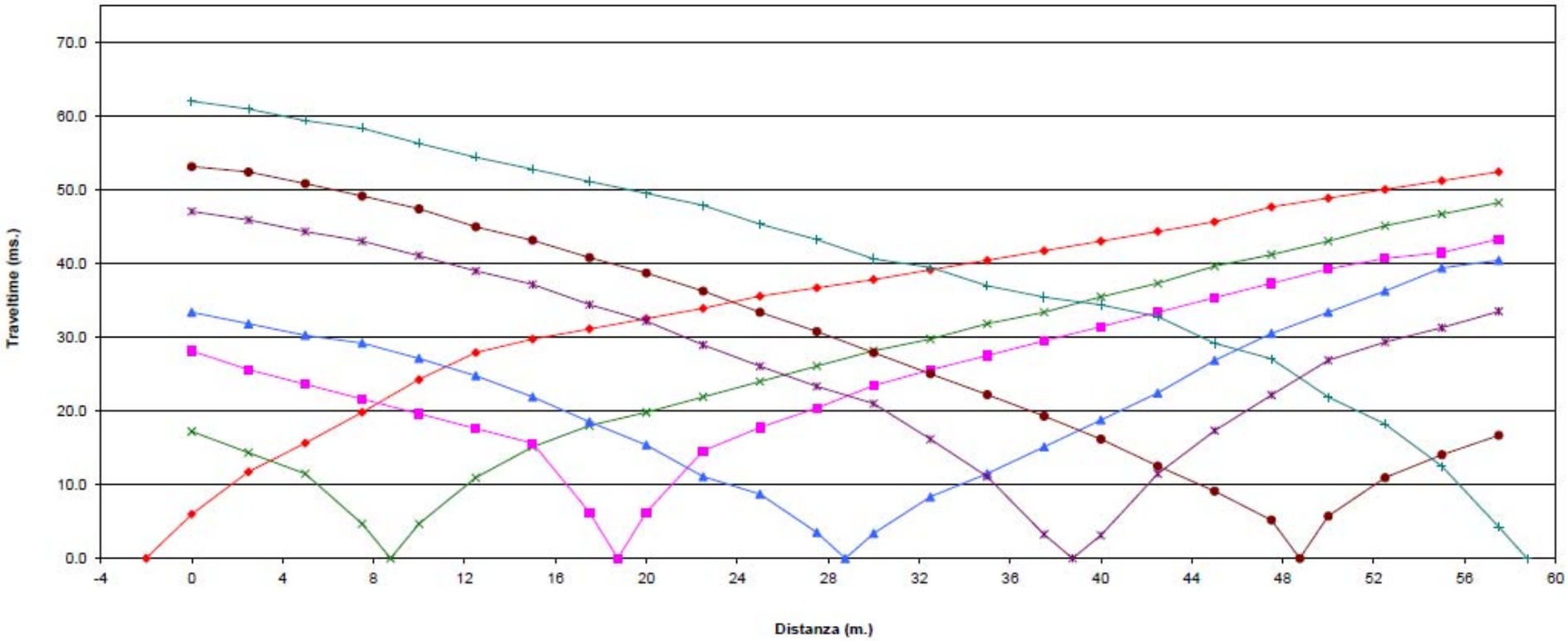
PUNTI DI ENERGIZZAZIONE ONDE P e SH

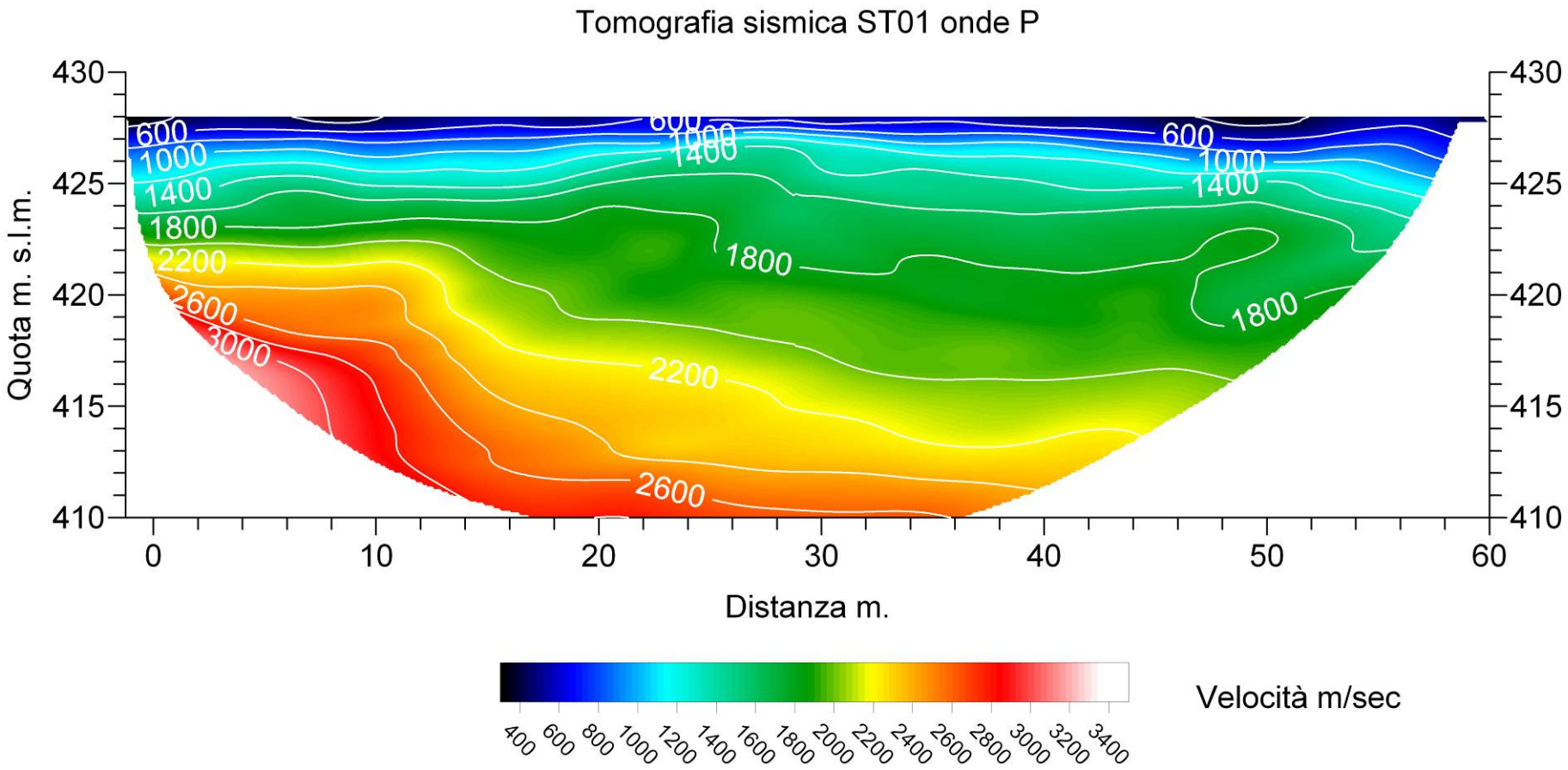
	SCOPPIO 1	SCOPPIO 2	SCOPPIO 3	SCOPPIO 4	SCOPPIO 5	SCOPPIO 6	SCOPPIO 7
POSIZ. DAL GEOF. N 1 (m)	-1.25	8.75	18.75	28.75	38.75	48.75	58.75
QUOTA (metri s.l.m.)	428.00	428.00	428.00	428.00	428.00	428.00	428.00

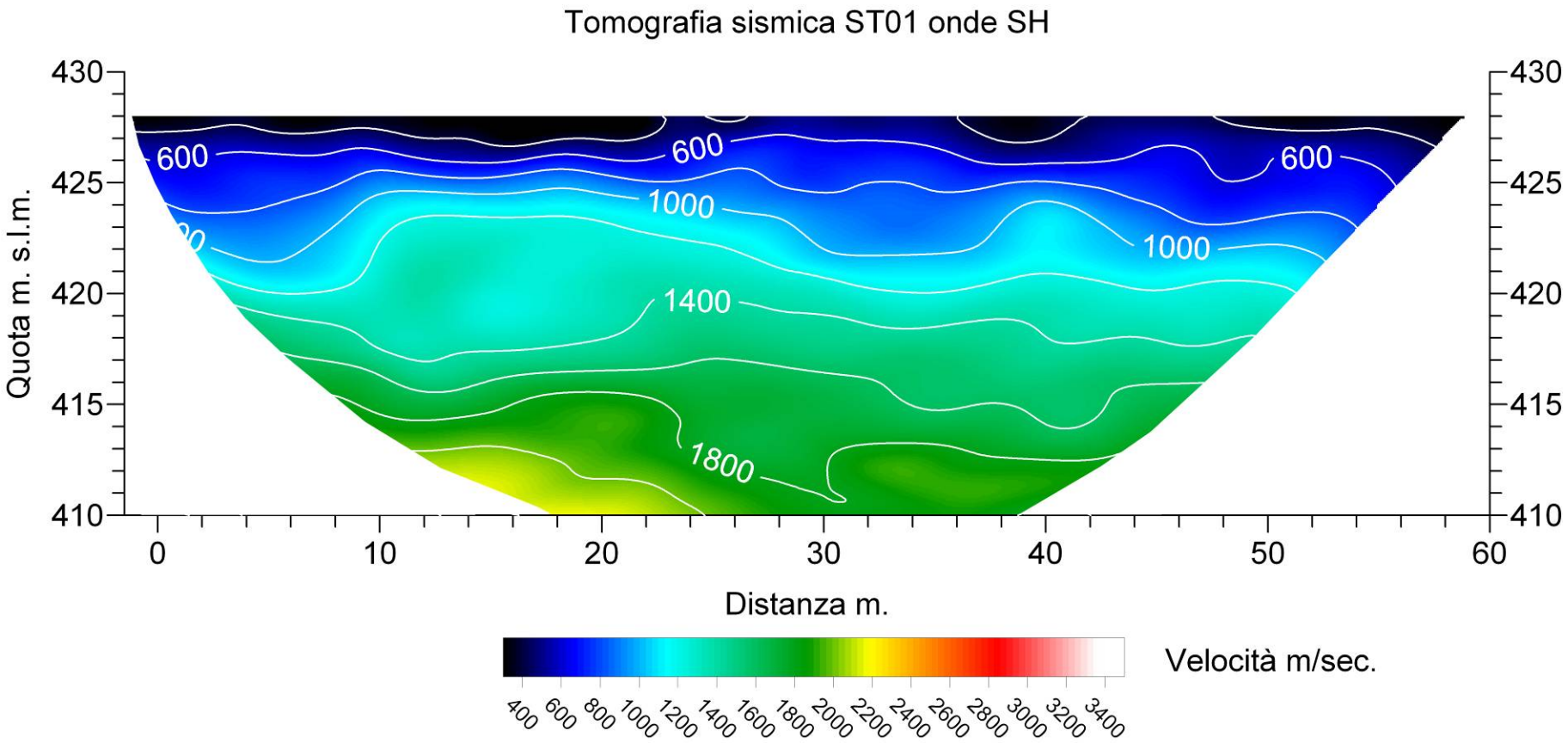
ST01 – DROMOCRONE - ONDE P



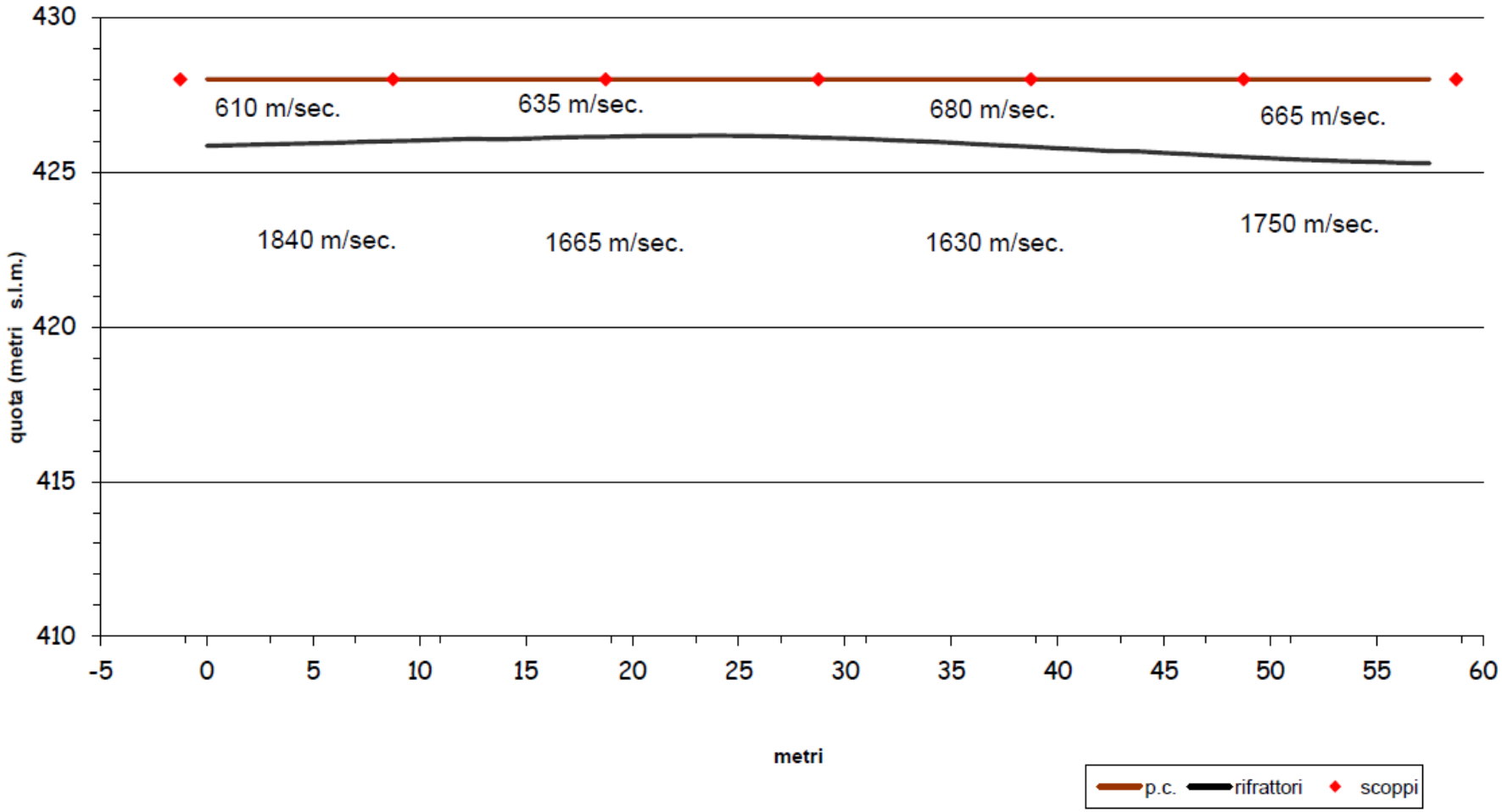
ST01 – DROMOCRONE - ONDE SH




Tomografia sismica ST01 onde P
Quota m. s.l.m.
Distanza m.
Velocità m/sec
430
425
420
415
410
0
10
20
30
40
50
60
600
1000
1400
1800
2200
2600
3000
400
600
800
1000
1200
1400
1600
1800
2000
2200
2400
2600
2800
3000
3200
3400


Tomografia sismica ST01 onde SH
Quota m. s.l.m.
430
425
420
415
410
600
1000
1400
1800
0
10
20
30
40
50
60
Distanza m.
Velocità m/sec.
400
600
800
1000
1200
1400
1600
1800
2000
2200
2400
2600
2800
3000
3200
3400

ST01 – SEZIONE SISMOSTRATIGRAFICA - ONDE P



ST01 – SEZIONE SISMOSTRATIGRAFICA - ONDE SH

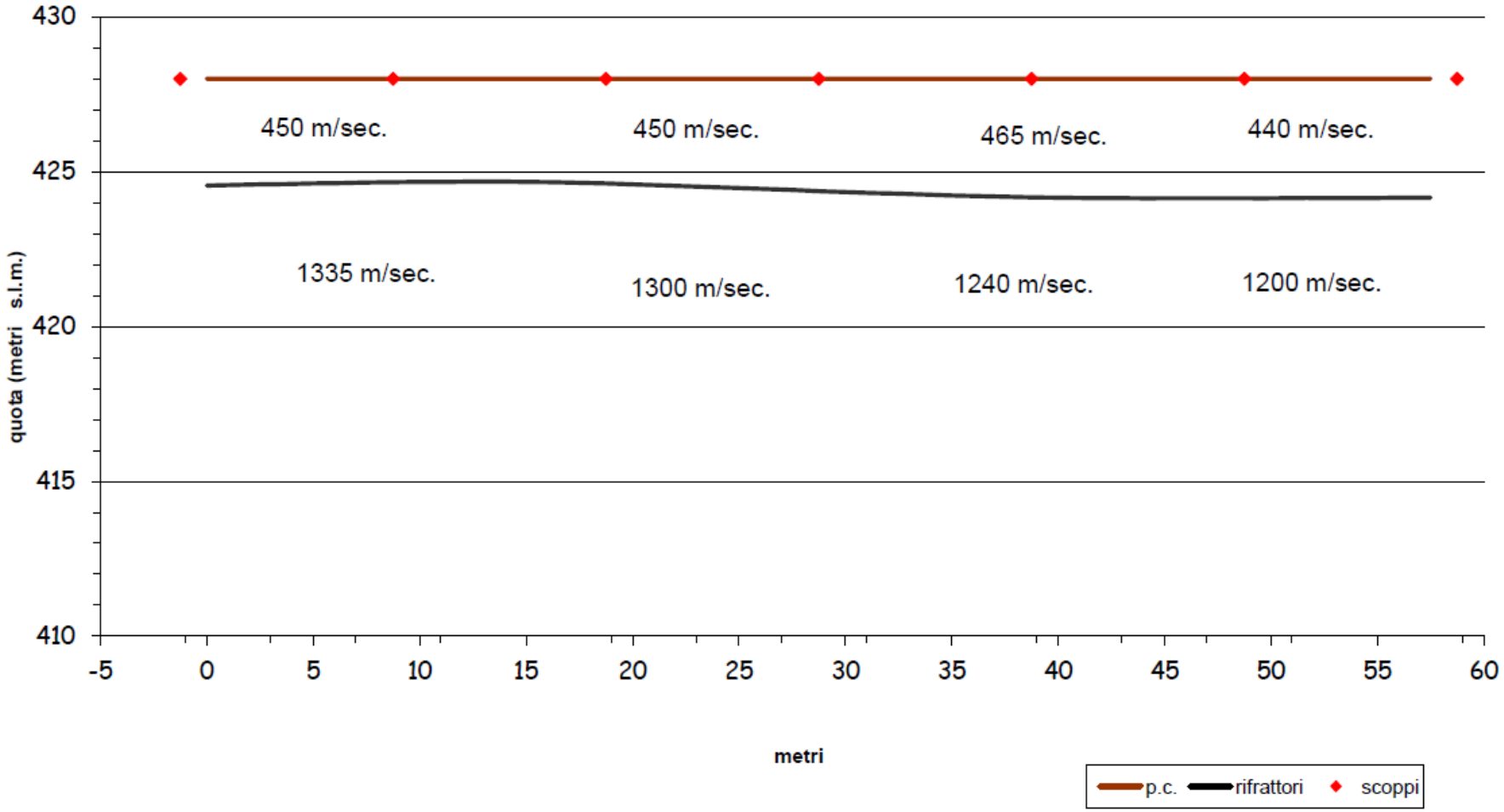


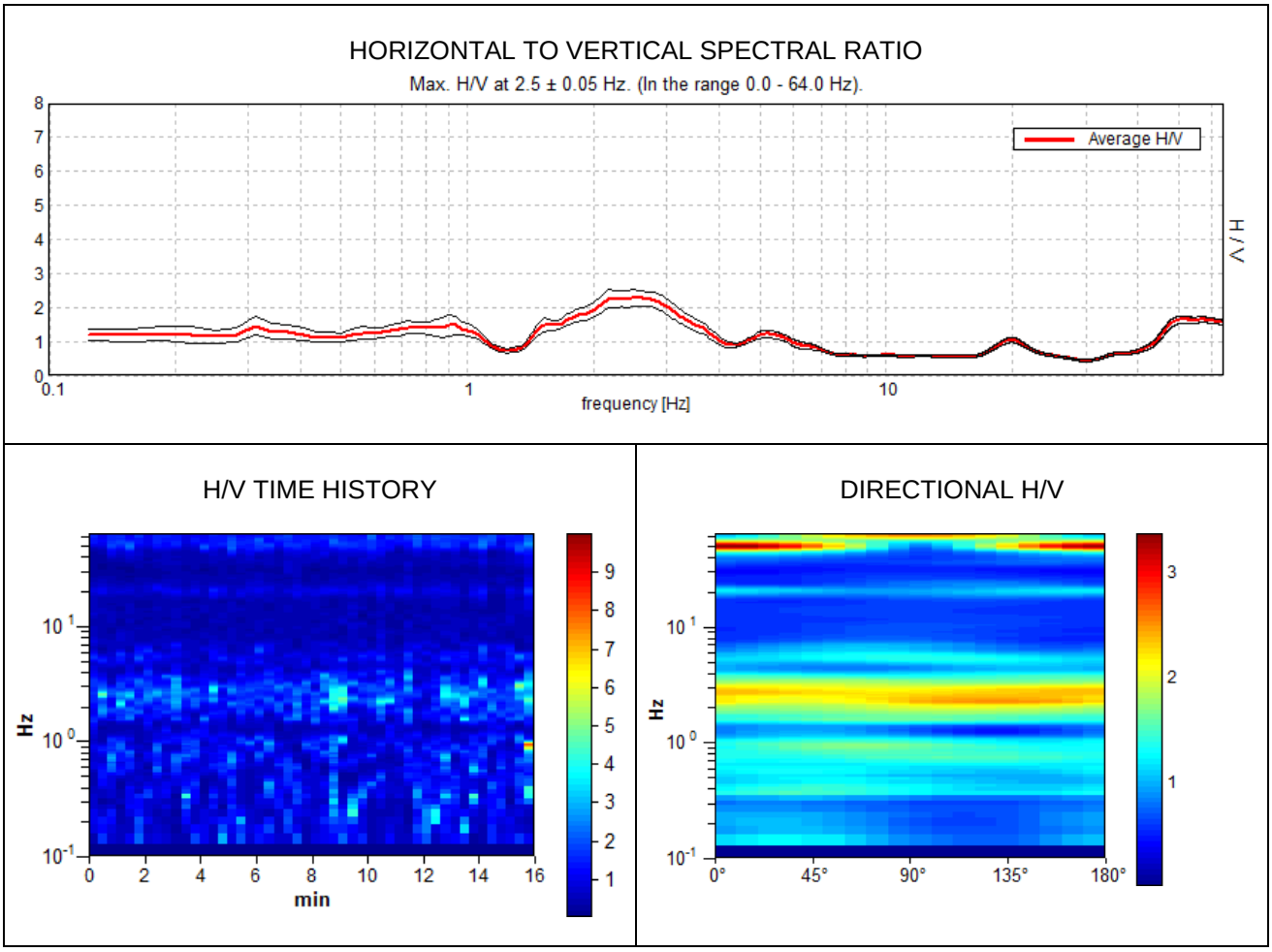
Tabella velocità e spessori Onde P					Linea	ST01
Distanza dal geof.1	Quota	V1 m/sec	Profondità 1 m.	V2 m/sec	Profondità 2 m.	V3 m/sec
-	428.00	591.3	2.15	1 929.99		
1.25	428.00	596.4	2.13	1 916.99		
2.50	428.00	601.6	2.11	1 903.30		
3.75	428.00	607.4	2.09	1 889.30		
5.00	428.00	613.2	2.07	1 873.34		
6.25	428.00	616.9	2.05	1 855.86		
7.50	428.00	620.7	2.02	1 837.39		
8.75	428.00	617.7	2.00	1 817.90		
10.00	428.00	614.7	1.98	1 797.37		
11.25	428.00	611.5	1.95	1 775.48		
12.50	428.00	608.3	1.93	1 754.77		
13.75	428.00	611.8	1.94	1 765.44		
15.00	428.00	615.3	1.92	1 743.86		
16.25	428.00	618.8	1.89	1 729.80		
17.50	428.00	622.3	1.87	1 718.54		
18.75	428.00	625.9	1.86	1 700.99		
20.00	428.00	629.4	1.84	1 680.89		
21.25	428.00	632.9	1.83	1 660.76		
22.50	428.00	636.4	1.83	1 649.63		
23.75	428.00	639.9	1.82	1 640.90		
25.00	428.00	643.4	1.83	1 632.62		
26.25	428.00	646.9	1.84	1 621.93		
27.50	428.00	650.4	1.86	1 612.16		
28.75	428.00	653.9	1.89	1 604.97		
30.00	428.00	657.4	1.91	1 601.19		
31.25	428.00	660.9	1.94	1 596.36		
32.50	428.00	664.5	1.98	1 594.95		
33.75	428.00	668.0	2.01	1 600.01		
35.00	428.00	671.5	2.05	1 603.80		
36.25	428.00	675.0	2.10	1 613.00		
37.50	428.00	678.5	2.14	1 623.81		
38.75	428.00	684.8	2.18	1 636.74		
40.00	428.00	691.0	2.23	1 654.14		
41.25	428.00	693.2	2.27	1 671.76		
42.50	428.00	695.4	2.32	1 686.78		
43.75	428.00	691.6	2.33	1 668.98		
45.00	428.00	687.7	2.38	1 683.75		
46.25	428.00	686.2	2.42	1 699.29		
47.50	428.00	684.8	2.47	1 713.11		
48.75	428.00	678.8	2.51	1 726.13		
50.00	428.00	672.8	2.55	1 739.12		
51.25	428.00	666.6	2.59	1 752.15		
52.50	428.00	660.4	2.62	1 765.59		
53.75	428.00	652.4	2.65	1 777.38		
55.00	428.00	644.3	2.67	1 790.22		
56.25	428.00	644.8	2.70	1 803.57		
57.50	428.00	645.3	2.71	1 816.03		

Tabella velocità e spessori Onde				SH	Linea	ST01
Distanza dal geof.1	**Quota**	**V1 m/sec**	**Profondità 1 m.**	**V2 m/sec**	**Profondità 2 m.**	**V3 m/sec**
-	428.00	452.0	3.45	1 389.66		
1.25	428.00	452.2	3.43	1 377.20		
2.50	428.00	452.4	3.41	1 363.63		
3.75	428.00	452.1	3.40	1 349.82		
5.00	428.00	451.7	3.38	1 336.88		
6.25	428.00	449.8	3.37	1 324.58		
7.50	428.00	447.8	3.35	1 316.95		
8.75	428.00	445.9	3.34	1 311.58		
10.00	428.00	443.9	3.33	1 308.28		
11.25	428.00	441.9	3.33	1 306.28		
12.50	428.00	439.9	3.32	1 306.42		
13.75	428.00	438.7	3.32	1 309.16		
15.00	428.00	437.5	3.33	1 309.77		
16.25	428.00	438.2	3.34	1 308.31		
17.50	428.00	438.9	3.36	1 303.40		
18.75	428.00	441.4	3.38	1 299.21		
20.00	428.00	443.9	3.41	1 294.56		
21.25	428.00	448.2	3.44	1 290.93		
22.50	428.00	452.6	3.47	1 286.16		
23.75	428.00	455.6	3.50	1 287.88		
25.00	428.00	458.7	3.53	1 287.26		
26.25	428.00	461.0	3.56	1 286.18		
27.50	428.00	463.3	3.59	1 286.38		
28.75	428.00	467.4	3.63	1 285.44		
30.00	428.00	471.5	3.66	1 282.17		
31.25	428.00	469.7	3.69	1 279.22		
32.50	428.00	467.8	3.71	1 277.08		
33.75	428.00	466.1	3.74	1 269.78		
35.00	428.00	464.4	3.77	1 258.09		
36.25	428.00	464.5	3.79	1 245.32		
37.50	428.00	464.6	3.81	1 234.15		
38.75	428.00	464.3	3.83	1 220.18		
40.00	428.00	464.0	3.84	1 206.85		
41.25	428.00	461.7	3.85	1 199.00		
42.50	428.00	459.5	3.85	1 192.29		
43.75	428.00	457.5	3.86	1 186.03		
45.00	428.00	455.4	3.86	1 180.58		
46.25	428.00	454.0	3.86	1 175.52		
47.50	428.00	452.6	3.86	1 171.02		
48.75	428.00	447.3	3.86	1 169.65		
50.00	428.00	442.1	3.86	1 167.41		
51.25	428.00	438.8	3.85	1 168.05		
52.50	428.00	435.6	3.85	1 167.73		
53.75	428.00	431.9	3.85	1 168.39		
55.00	428.00	428.1	3.85	1 171.29		
56.25	428.00	426.9	3.84	1 175.05		
57.50	428.00	425.7	3.84	1 176.30		

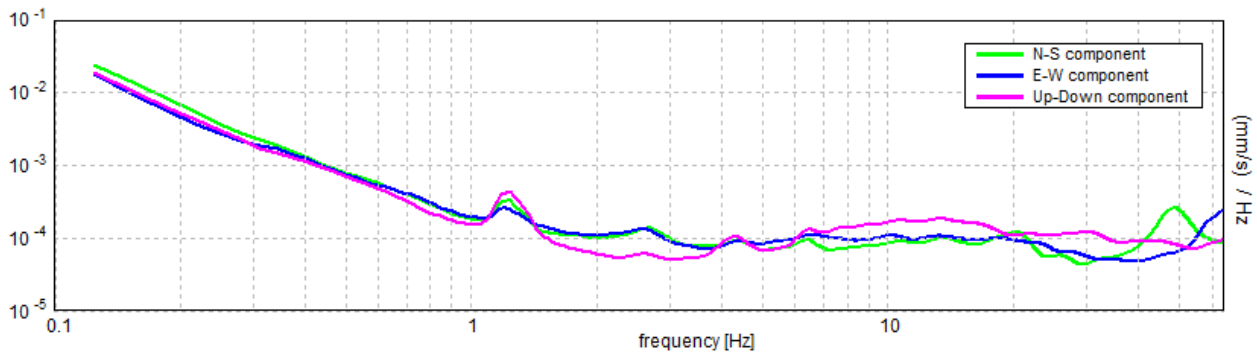
Misure HVSR Pian di Scò

T 6 PIAN DI SCO'

Instrument: TRS-0004/00-06
Start recording: 18/05/12 14:06:08 End recording: 18/05/12 14:22:09
Channel labels: NORTH SOUTH; EAST WEST ; UP DOWN
GPS data not available
Trace length: 0h16'00". Analysis performed on the entire trace.
Sampling frequency: 128 Hz
Window size: 20 s
Smoothing window: Triangular window
Smoothing: 10%



SINGLE COMPONENT SPECTRA



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

Max. H/V at 2.5 ± 0.05 Hz (in the range 0.0 - 64.0 Hz).

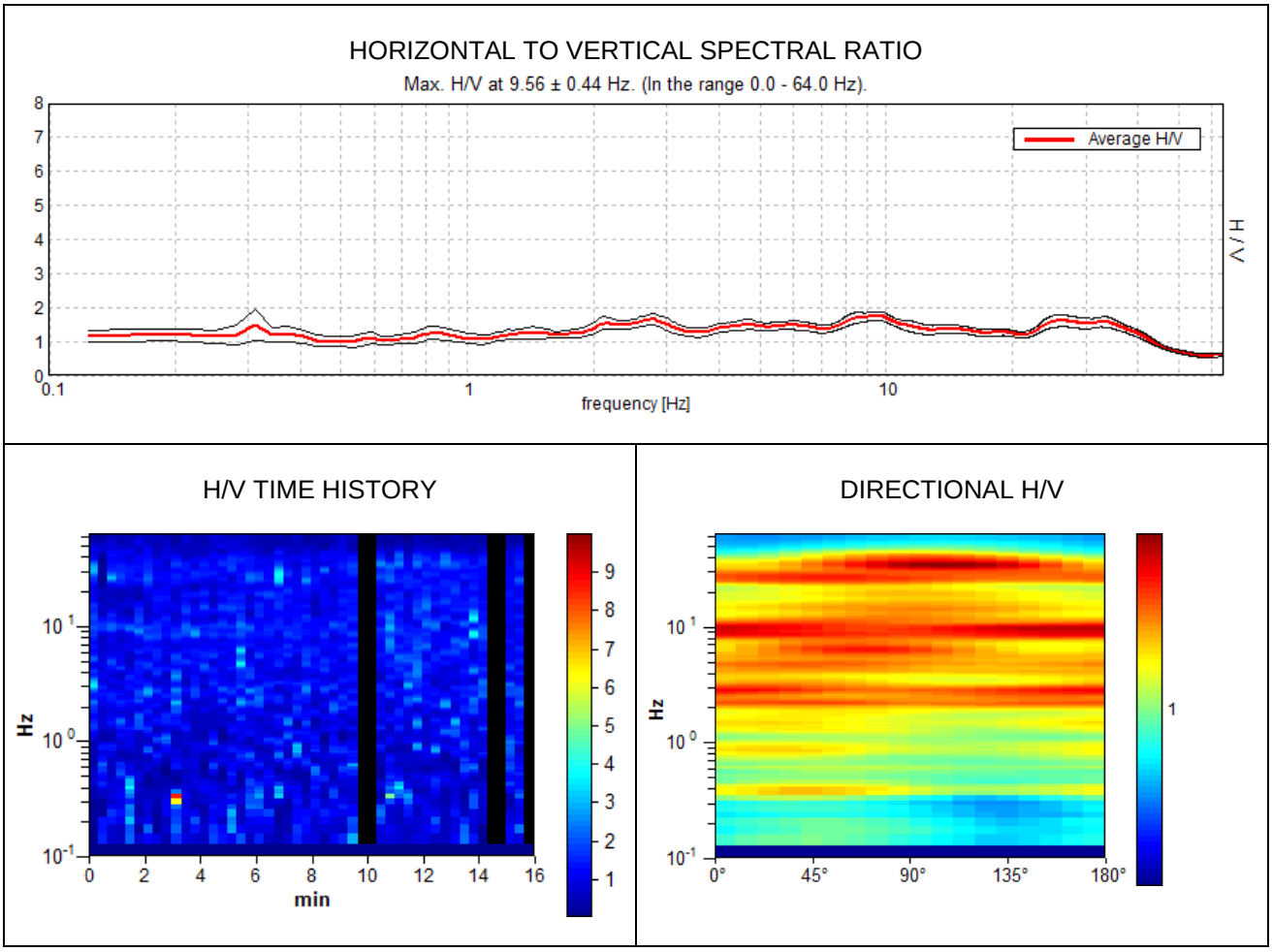
Criteria for a reliable HVSR curve [All 3 should be fulfilled]			
$f_0 > 10 / L_w$	2.50 > 0.50	OK	
$n_c(f_0) > 200$	2400.0 > 200	OK	
$\sigma_A(f) < 2$ for $0.5f_0 < f < 2f_0$ if $f_0 > 0.5$Hz **$\sigma_A(f) < 3$ for $0.5f_0 < f < 2f_0$ if $f_0 < 0.5$Hz**	Exceeded 0 out of 121 times	OK	
Criteria for a clear HVSR peak [At least 5 out of 6 should be fulfilled]			
Exists f^- in $[f_0/4, f_0]$ | $A_{H/V}(f^-) < A_0 / 2$	1.406 Hz	OK	
Exists f^+ in $[f_0, 4f_0]$ | $A_{H/V}(f^+) < A_0 / 2$	3.906 Hz	OK	
$A_0 > 2$	2.27 > 2	OK	
$f_{peak}[A_{H/V}(f) \pm \sigma_A(f)] = f_0 \pm 5\%$	|0.00978| < 0.05	OK	
$\sigma_f < \varepsilon(f_0)$	0.02446 < 0.125	OK	
$\sigma_A(f_0) < \theta(f_0)$	0.1237 < 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
$\sigma_{logH/V}(f)$	standard deviation of log $A_{H/V}(f)$ curve
$\theta(f_0)$	threshold value for the stability condition $\sigma_A(f) < \theta(f_0)$

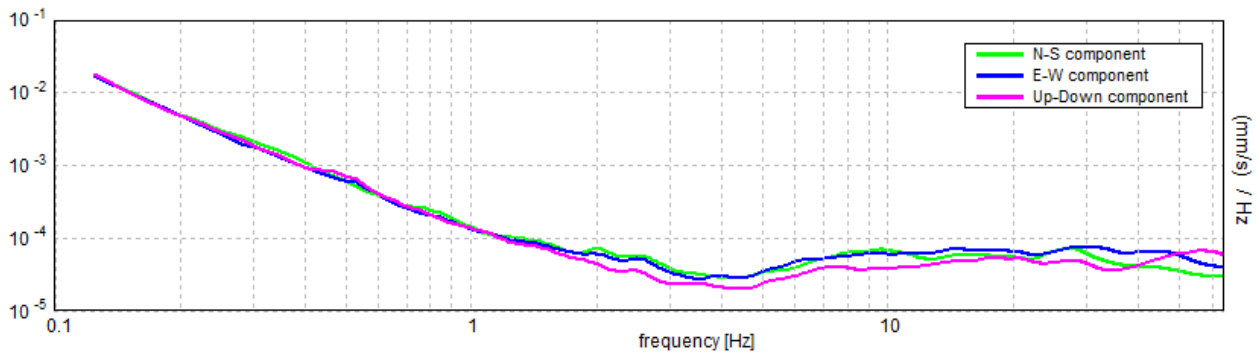
Threshold values for σ_f and $\sigma_A(f_0)$					
Freq.range [Hz]	< 0.2	0.2 – 0.5	0.5 – 1.0	1.0 – 2.0	> 2.0
$\varepsilon(f_0)$ [Hz]	0.25 f_0	0.2 f_0	0.15 f_0	0.10 f_0	0.05 f_0
$\theta(f_0)$ for $\sigma_A(f_0)$	3.0	2.5	2.0	1.78	1.58
Log $\theta(f_0)$ for $\sigma_{logH/V}(f_0)$	0.48	0.40	0.30	0.25	0.20

T 7 PIAN DI SCO'

Instrument: TRS-0004/00-06
Start recording: 18/05/12 14:29:50 End recording: 18/05/12 14:45:50
Channel labels: NORTH SOUTH; EAST WEST ; UP DOWN
GPS data not available
Trace length: 0h16'00''. Analyzed 90% trace (manual window selection)
Sampling frequency: 128 Hz
Window size: 20 s
Smoothing window: Triangular window
Smoothing: 10%



SINGLE COMPONENT SPECTRA



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

Max. H/V at 9.56 ± 0.44 Hz (in the range 0.0 - 64.0 Hz).

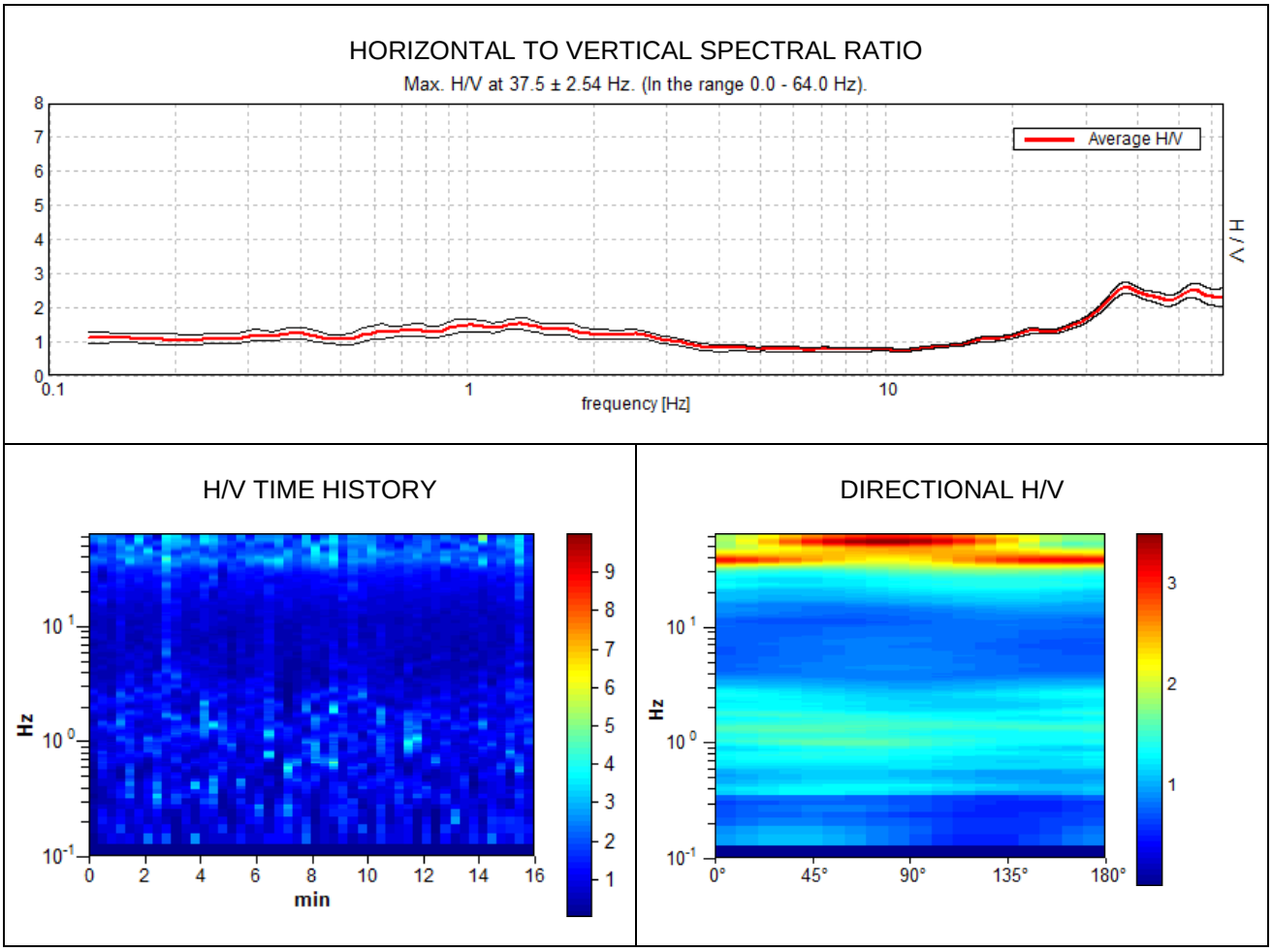
Criteria for a reliable HVSR curve [All 3 should be fulfilled]			
$f_0 > 10 / L_w$	9.56 > 0.50	OK	
$n_c(f_0) > 200$	8223.8 > 200	OK	
$\sigma_A(f) < 2$ for $0.5f_0 < f < 2f_0$ if $f_0 > 0.5$Hz **$\sigma_A(f) < 3$ for $0.5f_0 < f < 2f_0$ if $f_0 < 0.5$Hz**	Exceeded 0 out of 460 times	OK	
Criteria for a clear HVSR peak [At least 5 out of 6 should be fulfilled]			
Exists f^- in $[f_0/4, f_0]$ | $A_{H/V}(f^-) < A_0 / 2$			NO
Exists f^+ in $[f_0, 4f_0]$ | $A_{H/V}(f^+) < A_0 / 2$			NO
$A_0 > 2$	1.74 > 2		NO
$f_{peak}[A_{H/V}(f) \pm \sigma_A(f)] = f_0 \pm 5\%$	|0.02278| < 0.05	OK	
$\sigma_f < \varepsilon(f_0)$	0.21779 < 0.47813	OK	
$\sigma_A(f_0) < \theta(f_0)$	0.063 < 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
$\sigma_{logH/V}(f)$	standard deviation of log $A_{H/V}(f)$ curve
$\theta(f_0)$	threshold value for the stability condition $\sigma_A(f) < \theta(f_0)$

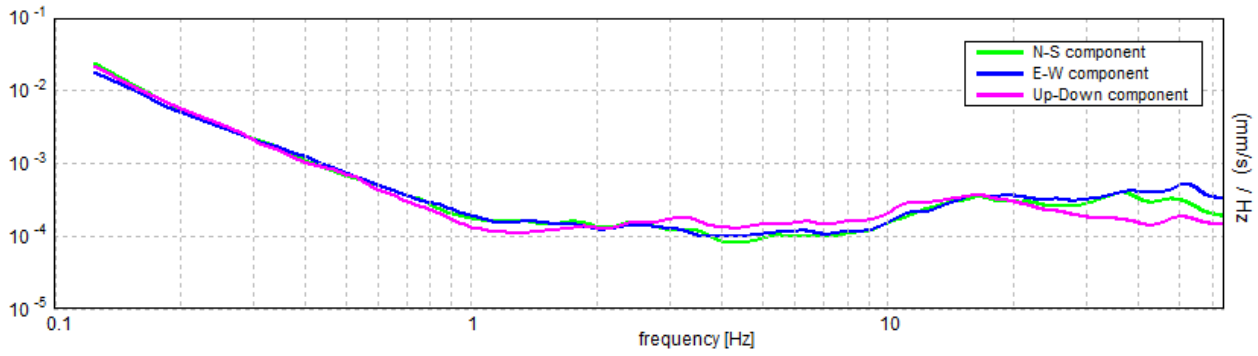
Threshold values for σ_f and $\sigma_A(f_0)$					
Freq.range [Hz]	< 0.2	0.2 – 0.5	0.5 – 1.0	1.0 – 2.0	> 2.0
$\varepsilon(f_0)$ [Hz]	0.25 f_0	0.2 f_0	0.15 f_0	0.10 f_0	0.05 f_0
$\theta(f_0)$ for $\sigma_A(f_0)$	3.0	2.5	2.0	1.78	1.58
Log $\theta(f_0)$ for $\sigma_{logH/V}(f_0)$	0.48	0.40	0.30	0.25	0.20

T 8 PIAN DI SCO'

Instrument: TRS-0004/00-06
Start recording: 18/05/12 14:53:02 End recording: 18/05/12 15:09:03
Channel labels: NORTH SOUTH; EAST WEST ; UP DOWN
GPS data not available
Trace length: 0h16'00". Analysis performed on the entire trace.
Sampling frequency: 128 Hz
Window size: 20 s
Smoothing window: Triangular window
Smoothing: 10%



SINGLE COMPONENT SPECTRA



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

Max. H/V at 37.5 ± 2.54 Hz (in the range 0.0 - 64.0 Hz).

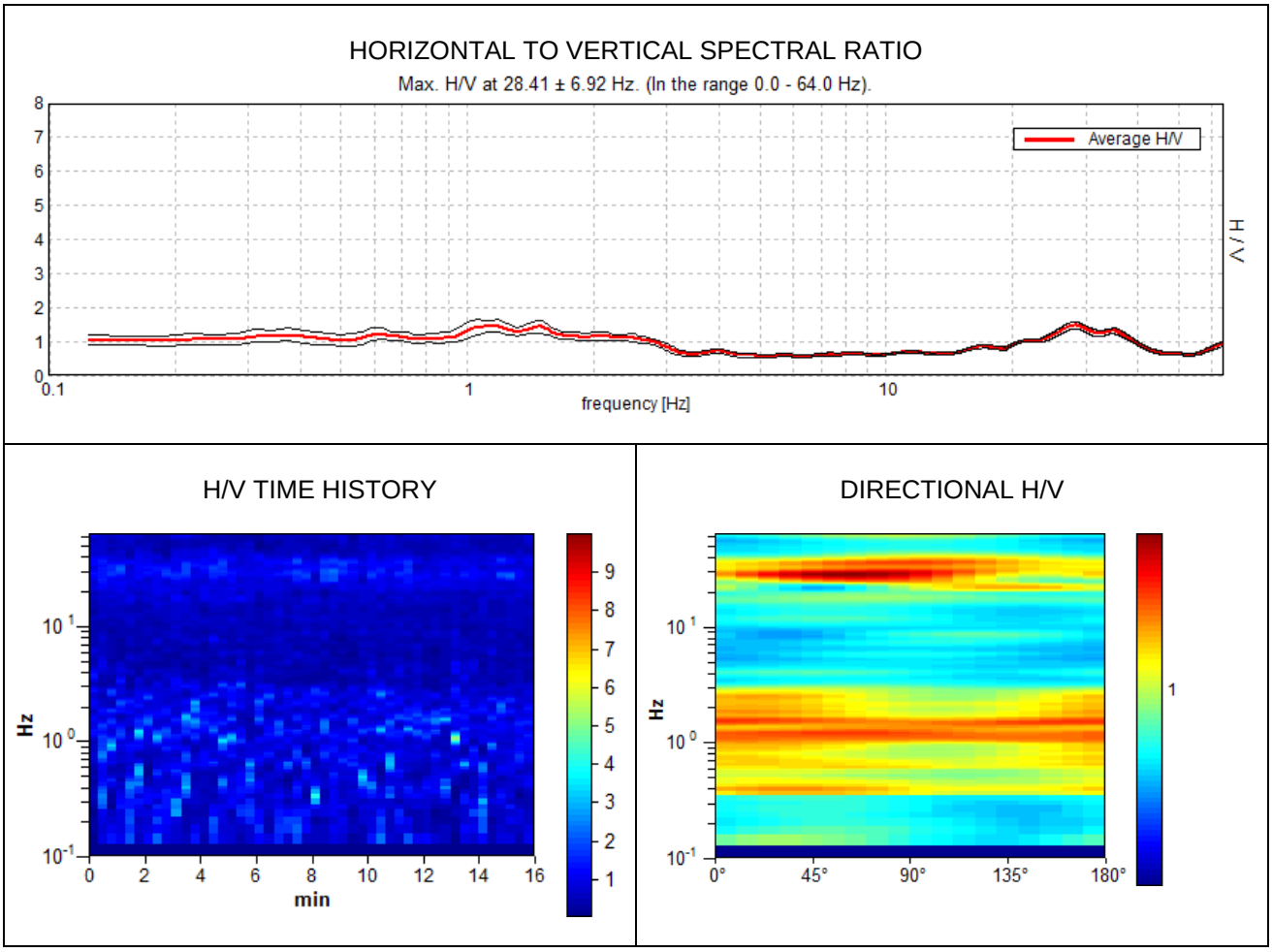
Criteria for a reliable HVSR curve [All 3 should be fulfilled]			
$f_0 > 10 / L_w$	37.50 > 0.50	OK	
$n_c(f_0) > 200$	36000.0 > 200	OK	
$\sigma_A(f) < 2$ for $0.5f_0 < f < 2f_0$ if $f_0 > 0.5$Hz **$\sigma_A(f) < 3$ for $0.5f_0 < f < 2f_0$ if $f_0 < 0.5$Hz**	Exceeded 0 out of 1449 times	OK	
Criteria for a clear HVSR peak [At least 5 out of 6 should be fulfilled]			
Exists f^- in $[f_0/4, f_0]$ | $A_{H/V}(f^-) < A_0 / 2$	25.219 Hz	OK	
Exists f^+ in $[f_0, 4f_0]$ | $A_{H/V}(f^+) < A_0 / 2$			NO
$A_0 > 2$	2.58 > 2	OK	
$f_{peak}[A_{H/V}(f) \pm \sigma_A(f)] = f_0 \pm 5\%$	|0.03325| < 0.05	OK	
$\sigma_f < \varepsilon(f_0)$	1.24693 < 1.875	OK	
$\sigma_A(f_0) < \theta(f_0)$	0.0801 < 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
$\sigma_{logH/V}(f)$	standard deviation of log $A_{H/V}(f)$ curve
$\theta(f_0)$	threshold value for the stability condition $\sigma_A(f) < \theta(f_0)$

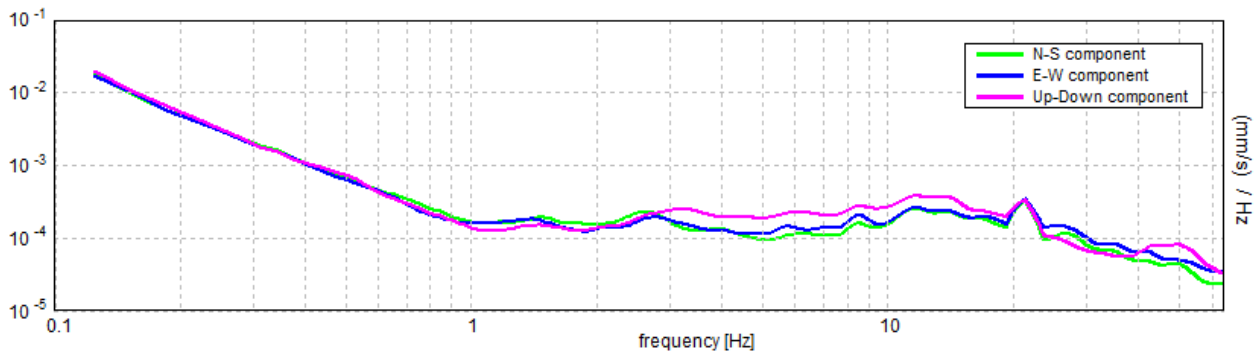
Threshold values for σ_f and $\sigma_A(f_0)$					
Freq.range [Hz]	< 0.2	0.2 – 0.5	0.5 – 1.0	1.0 – 2.0	> 2.0
$\varepsilon(f_0)$ [Hz]	0.25 f_0	0.2 f_0	0.15 f_0	0.10 f_0	0.05 f_0
$\theta(f_0)$ for $\sigma_A(f_0)$	3.0	2.5	2.0	1.78	1.58
Log $\theta(f_0)$ for $\sigma_{logH/V}(f_0)$	0.48	0.40	0.30	0.25	0.20

T 9 PIAN DI SCO'

Instrument: TRS-0004/00-06
Start recording: 18/05/12 15:17:51 End recording: 18/05/12 15:33:52
Channel labels: NORTH SOUTH; EAST WEST ; UP DOWN
GPS data not available
Trace length: 0h16'00". Analysis performed on the entire trace.
Sampling frequency: 128 Hz
Window size: 20 s
Smoothing window: Triangular window
Smoothing: 10%



SINGLE COMPONENT SPECTRA



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

Max. H/V at 28.41 ± 6.92 Hz (in the range 0.0 - 64.0 Hz).

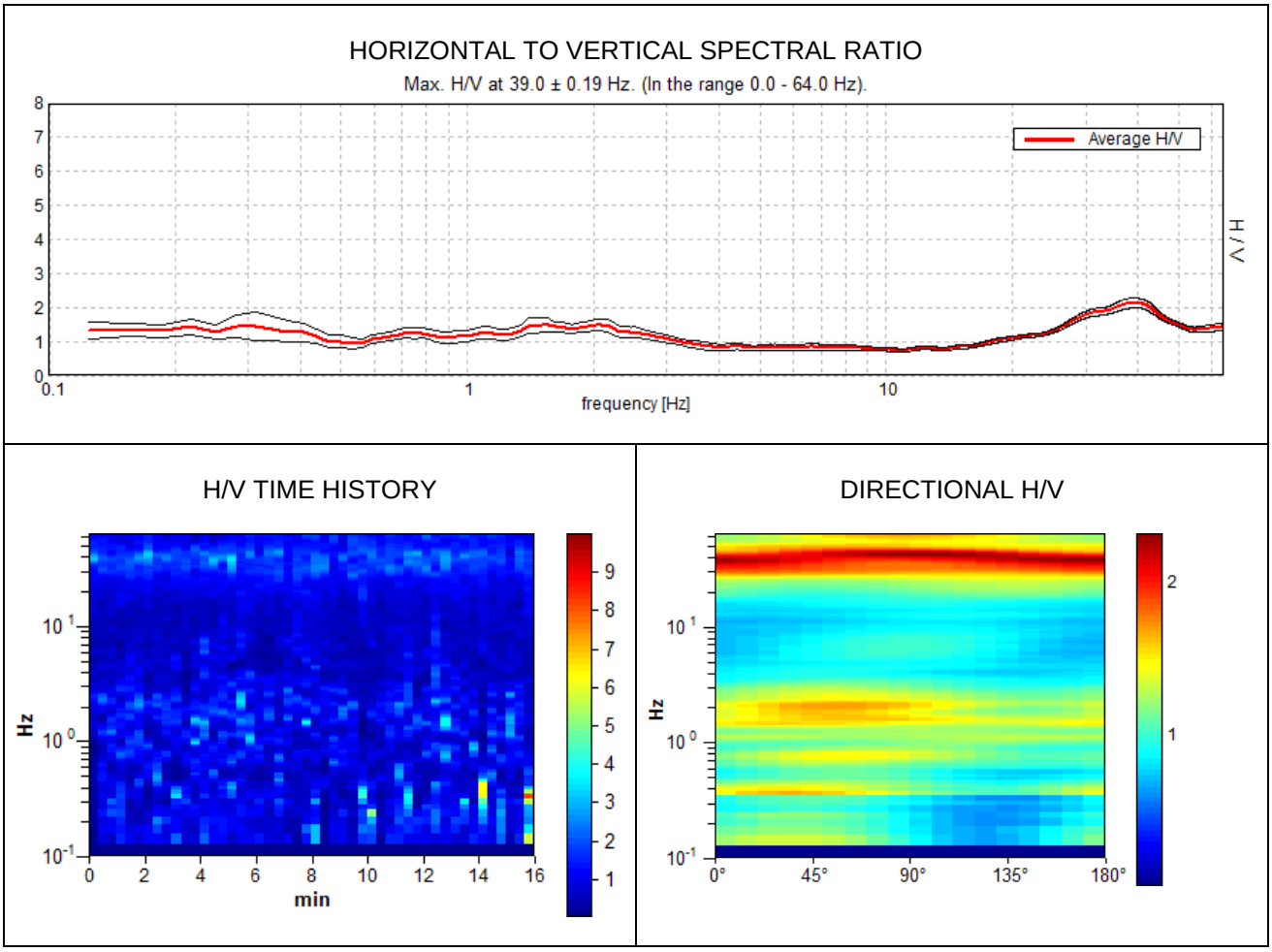
Criteria for a reliable HVSR curve [All 3 should be fulfilled]			
$f_0 > 10 / L_w$	28.41 > 0.50	OK	
$n_c(f_0) > 200$	27270.0 > 200	OK	
$\sigma_A(f) < 2$ for $0.5f_0 < f < 2f_0$ if $f_0 > 0.5$Hz **$\sigma_A(f) < 3$ for $0.5f_0 < f < 2f_0$ if $f_0 < 0.5$Hz**	Exceeded 0 out of 1364 times	OK	
Criteria for a clear HVSR peak [At least 5 out of 6 should be fulfilled]			
Exists f^- in $[f_0/4, f_0]$ | $A_{H/V}(f^-) < A_0 / 2$	15.406 Hz	OK	
Exists f^+ in $[f_0, 4f_0]$ | $A_{H/V}(f^+) < A_0 / 2$	43.156 Hz	OK	
$A_0 > 2$	1.47 > 2		NO
$f_{peak}[A_{H/V}(f) \pm \sigma_A(f)] = f_0 \pm 5\%$	|0.11975| < 0.05		NO
$\sigma_f < \varepsilon(f_0)$	3.40172 < 1.42031		NO
$\sigma_A(f_0) < \theta(f_0)$	0.0505 < 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
$\sigma_{logH/V}(f)$	standard deviation of log $A_{H/V}(f)$ curve
$\theta(f_0)$	threshold value for the stability condition $\sigma_A(f) < \theta(f_0)$

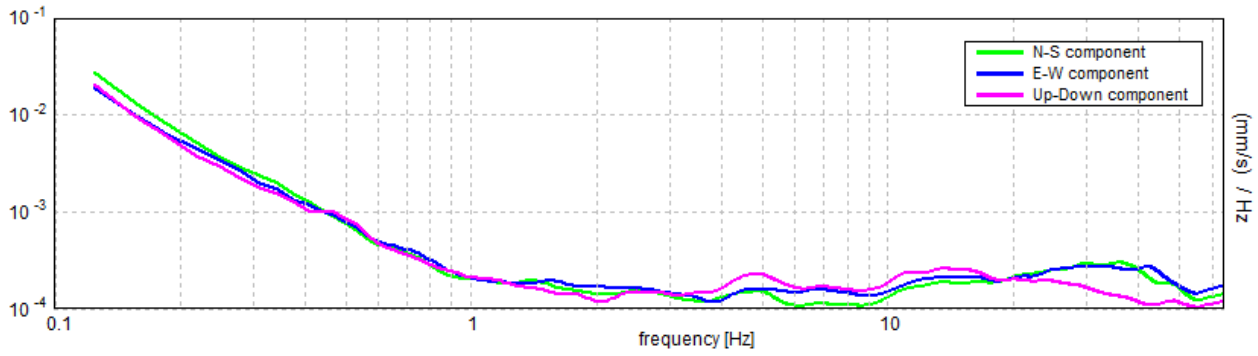
Threshold values for σ_f and $\sigma_A(f_0)$					
Freq.range [Hz]	< 0.2	0.2 – 0.5	0.5 – 1.0	1.0 – 2.0	> 2.0
$\varepsilon(f_0)$ [Hz]	0.25 f_0	0.2 f_0	0.15 f_0	0.10 f_0	0.05 f_0
$\theta(f_0)$ for $\sigma_A(f_0)$	3.0	2.5	2.0	1.78	1.58
Log $\theta(f_0)$ for $\sigma_{logH/V}(f_0)$	0.48	0.40	0.30	0.25	0.20

T 10 PIAN DI SCO'

Instrument: TRS-0004/00-06
Start recording: 18/05/12 15:45:25 End recording: 18/05/12 16:01:26
Channel labels: NORTH SOUTH; EAST WEST ; UP DOWN
GPS data not available
Trace length: 0h16'00". Analysis performed on the entire trace.
Sampling frequency: 128 Hz
Window size: 20 s
Smoothing window: Triangular window
Smoothing: 10%



SINGLE COMPONENT SPECTRA



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

Max. H/V at 39.0 ± 0.19 Hz (in the range 0.0 - 64.0 Hz).

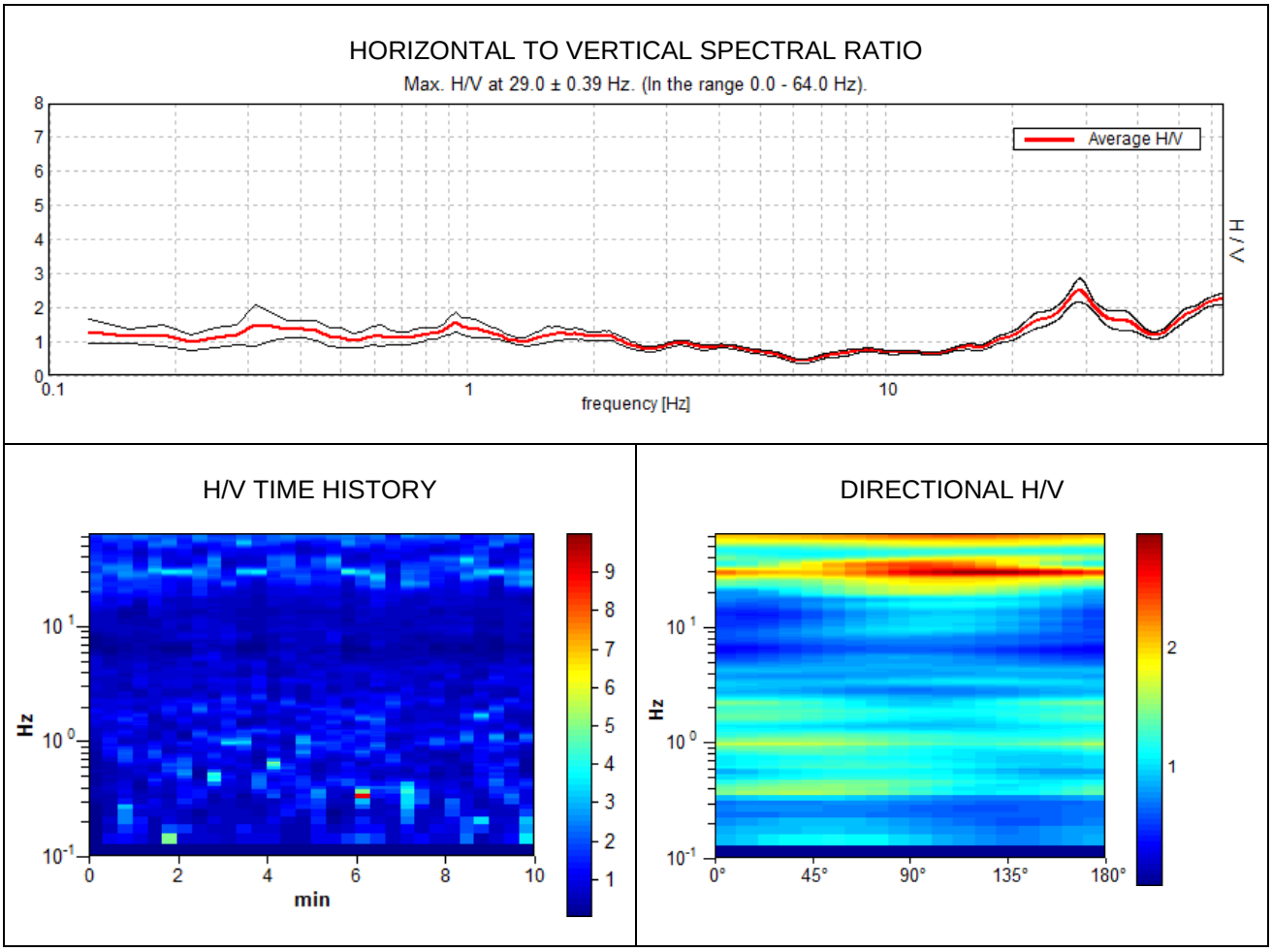
Criteria for a reliable HVSR curve [All 3 should be fulfilled]			
$f_0 > 10 / L_w$	39.00 > 0.50	OK	
$n_c(f_0) > 200$	37440.0 > 200	OK	
$\sigma_A(f) < 2$ for $0.5f_0 < f < 2f_0$ if $f_0 > 0.5$Hz **$\sigma_A(f) < 3$ for $0.5f_0 < f < 2f_0$ if $f_0 < 0.5$Hz**	Exceeded 0 out of 1425 times	OK	
Criteria for a clear HVSR peak [At least 5 out of 6 should be fulfilled]			
Exists f^- in $[f_0/4, f_0]$ | $A_{H/V}(f^-) < A_0 / 2$	19.281 Hz	OK	
Exists f^+ in $[f_0, 4f_0]$ | $A_{H/V}(f^+) < A_0 / 2$			NO
$A_0 > 2$	2.13 > 2	OK	
$f_{peak}[A_{H/V}(f) \pm \sigma_A(f)] = f_0 \pm 5\%$	|0.00241| < 0.05	OK	
$\sigma_f < \varepsilon(f_0)$	0.0939 < 1.95	OK	
$\sigma_A(f_0) < \theta(f_0)$	0.0703 < 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
$\sigma_{logH/V}(f)$	standard deviation of log $A_{H/V}(f)$ curve
$\theta(f_0)$	threshold value for the stability condition $\sigma_A(f) < \theta(f_0)$

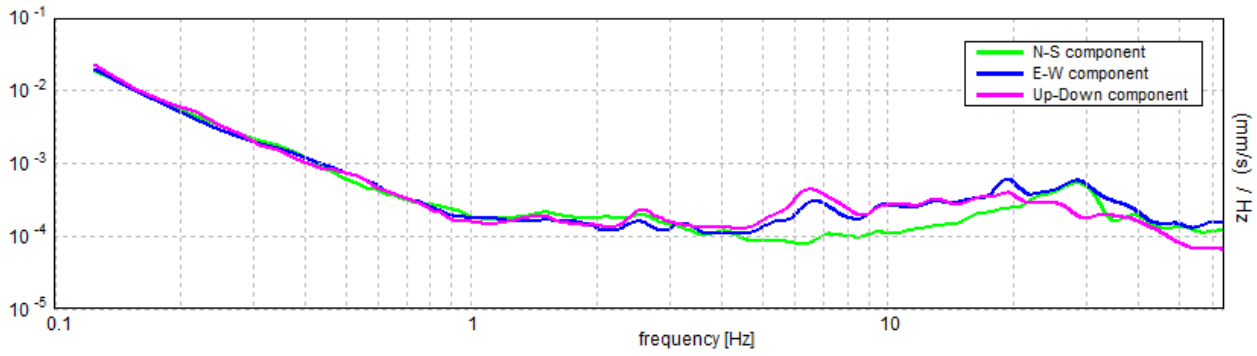
Threshold values for σ_f and $\sigma_A(f_0)$					
Freq.range [Hz]	< 0.2	0.2 – 0.5	0.5 – 1.0	1.0 – 2.0	> 2.0
$\varepsilon(f_0)$ [Hz]	0.25 f_0	0.2 f_0	0.15 f_0	0.10 f_0	0.05 f_0
$\theta(f_0)$ for $\sigma_A(f_0)$	3.0	2.5	2.0	1.78	1.58
Log $\theta(f_0)$ for $\sigma_{logH/V}(f_0)$	0.48	0.40	0.30	0.25	0.20

T 11 PIAN DI SCO'

Instrument: TRS-0004/00-06
Start recording: 18/05/12 16:26:44 End recording: 18/05/12 16:36:45
Channel labels: NORTH SOUTH; EAST WEST ; UP DOWN
GPS data not available
Trace length: 0h10'00''. Analysis performed on the entire trace.
Sampling frequency: 128 Hz
Window size: 20 s
Smoothing window: Triangular window
Smoothing: 10%



SINGLE COMPONENT SPECTRA



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

Max. H/V at 29.0 ± 0.39 Hz (in the range 0.0 - 64.0 Hz).

Criteria for a reliable HVSR curve [All 3 should be fulfilled]			
$f_0 > 10 / L_w$	29.00 > 0.50	OK	
$n_c(f_0) > 200$	17400.0 > 200	OK	
$\sigma_A(f) < 2$ for $0.5f_0 < f < 2f_0$ if $f_0 > 0.5$Hz **$\sigma_A(f) < 3$ for $0.5f_0 < f < 2f_0$ if $f_0 < 0.5$Hz**	Exceeded 0 out of 1393 times	OK	
Criteria for a clear HVSR peak [At least 5 out of 6 should be fulfilled]			
Exists f^- in $[f_0/4, f_0]$ | $A_{H/V}(f^-) < A_0 / 2$	20.656 Hz	OK	
Exists f^+ in $[f_0, 4f_0]$ | $A_{H/V}(f^+) < A_0 / 2$	41.75 Hz	OK	
$A_0 > 2$	2.50 > 2	OK	
$f_{peak}[A_{H/V}(f) \pm \sigma_A(f)] = f_0 \pm 5\%$	|0.00645| < 0.05	OK	
$\sigma_f < \varepsilon(f_0)$	0.18708 < 1.45	OK	
$\sigma_A(f_0) < \theta(f_0)$	0.1666 < 1.58	OK	

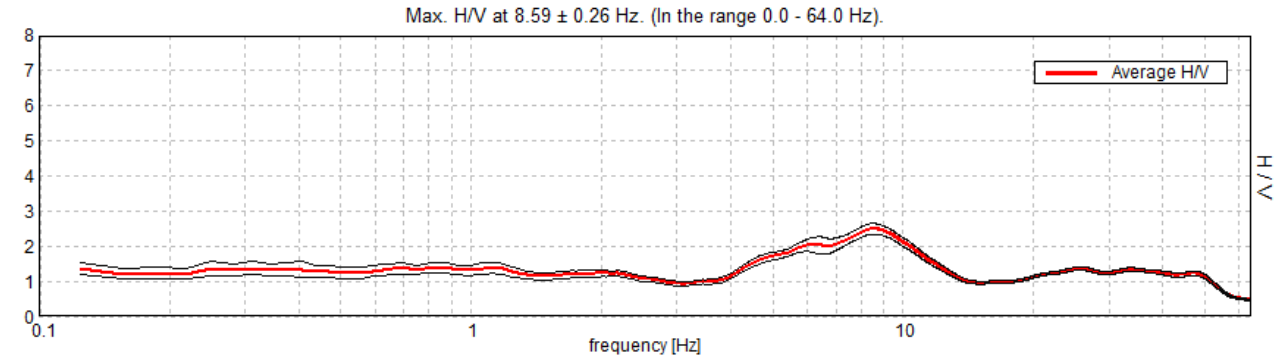
L_w	window length
n_w	number of windows used in the analysis
$n_c = L_w n_w f_0$	number of significant cycles
f	current frequency
f_0	H/V peak frequency
σ_f	standard deviation of H/V peak frequency
$\varepsilon(f_0)$	threshold value for the stability condition $\sigma_f < \varepsilon(f_0)$
A_0	H/V peak 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
$\sigma_{logH/V}(f)$	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 $\sigma_{logH/V}(f_0)$	0.48	0.40	0.30	0.25	0.20

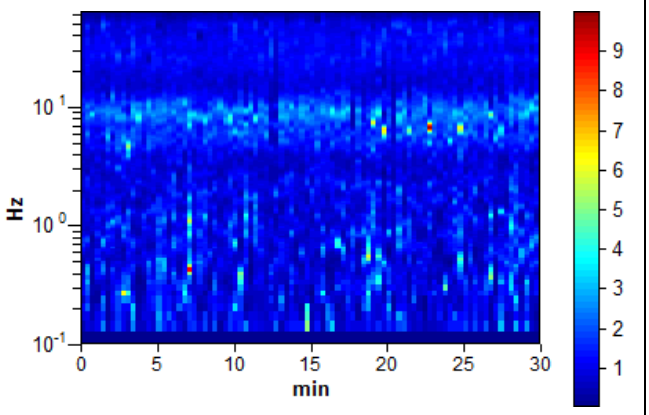
T 36 PIAN DI SCO'

Instrument: TRS-0004/00-06
Start recording: 04/06/12 19:18:24 End recording: 04/06/12 19:48:25
Channel labels: NORTH SOUTH; EAST WEST ; UP DOWN
GPS data not available
Trace length: 0h30'00''. Analysis performed on the entire trace.
Sampling frequency: 128 Hz
Window size: 20 s
Smoothing window: Triangular window
Smoothing: 10%

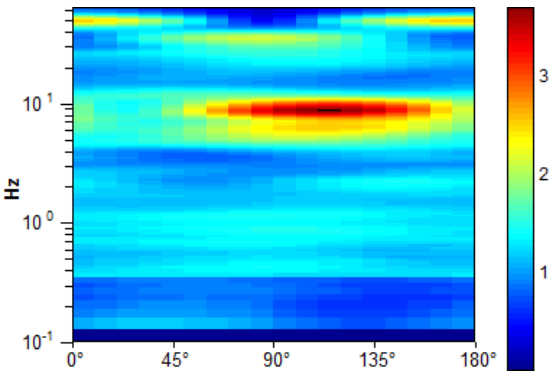
HORIZONTAL TO VERTICAL SPECTRAL RATIO



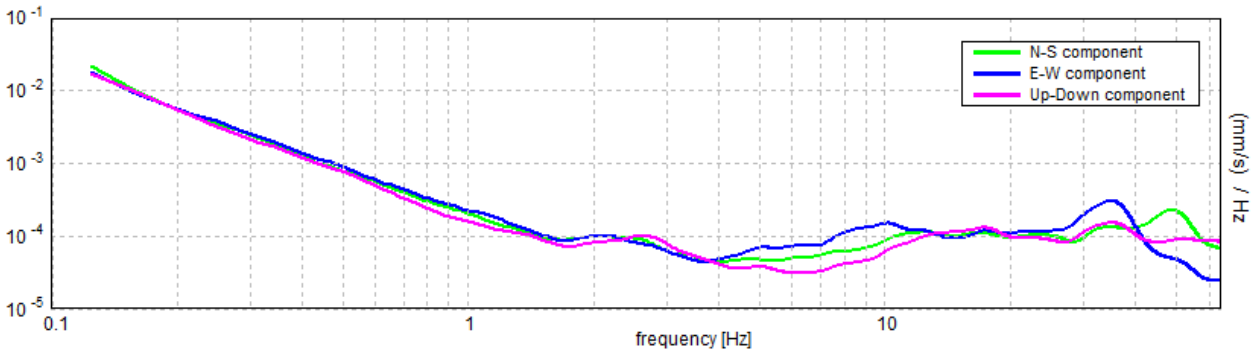
H/V TIME HISTORY



DIRECTIONAL H/V



SINGLE COMPONENT SPECTRA



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

Max. H/V at 8.59 ± 0.26 Hz (in the range 0.0 - 64.0 Hz).

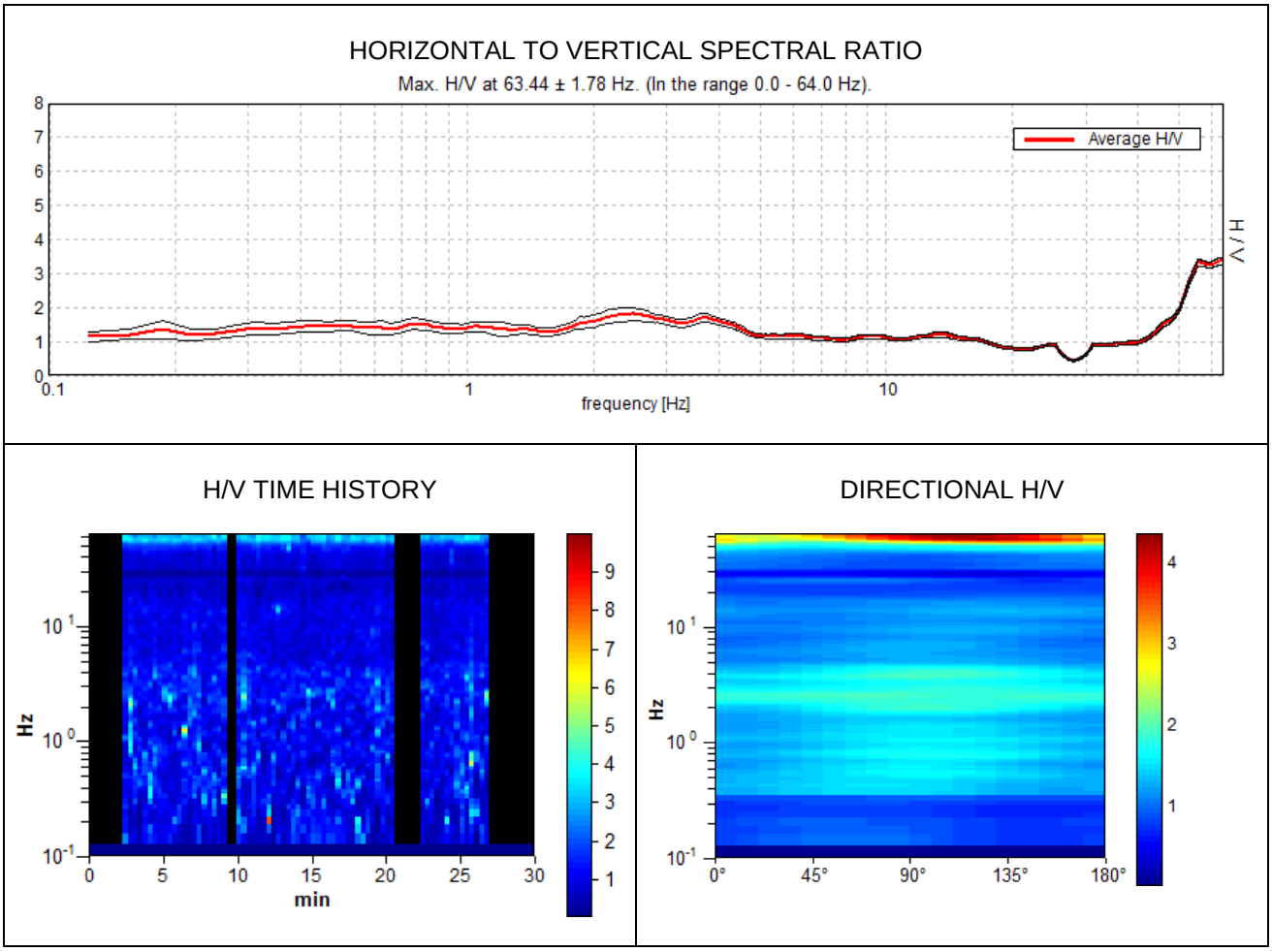
Criteria for a reliable HVSR curve [All 3 should be fulfilled]			
$f_0 > 10 / L_w$	8.59 > 0.50	OK	
$n_c(f_0) > 200$	15468.8 > 200	OK	
$\sigma_A(f) < 2$ for $0.5f_0 < f < 2f_0$ if $f_0 > 0.5$Hz **$\sigma_A(f) < 3$ for $0.5f_0 < f < 2f_0$ if $f_0 < 0.5$Hz**	Exceeded 0 out of 414 times	OK	
Criteria for a clear HVSR peak [At least 5 out of 6 should be fulfilled]			
Exists f^- in $[f_0/4, f_0]$ | $A_{H/V}(f^-) < A_0 / 2$	4.125 Hz	OK	
Exists f^+ in $[f_0, 4f_0]$ | $A_{H/V}(f^+) < A_0 / 2$	12.813 Hz	OK	
$A_0 > 2$	2.49 > 2	OK	
$f_{peak}[A_{H/V}(f) \pm \sigma_A(f)] = f_0 \pm 5\%$	|0.01495| < 0.05	OK	
$\sigma_f < \varepsilon(f_0)$	0.12848 < 0.42969	OK	
$\sigma_A(f_0) < \theta(f_0)$	0.075 < 1.58	OK	

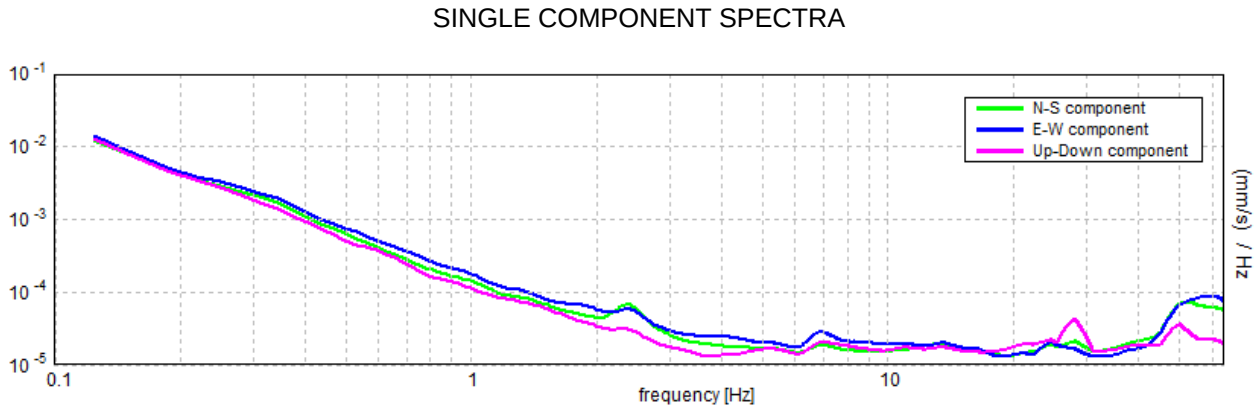
L_w	window length
n_w	number of windows used in the analysis
$n_c = L_w n_w f_0$	number of significant cycles
f	current frequency
f_0	H/V peak frequency
σ_f	standard deviation of H/V peak frequency
$\varepsilon(f_0)$	threshold value for the stability condition $\sigma_f < \varepsilon(f_0)$
A_0	H/V peak 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
$\sigma_{logH/V}(f)$	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 $\sigma_{logH/V}(f_0)$	0.48	0.40	0.30	0.25	0.20

T 37 PIAN DI SCO'

Instrument: TR-0007-01-05
Start recording: 13/06/12 10:21:54 End recording: 13/06/12 10:51:55
Channel labels: NORTH SOUTH; EAST WEST ; UP DOWN
GPS data not available
Trace length: 0h30'00''. Analyzed 74% trace (manual window selection)
Sampling frequency: 128 Hz
Window size: 20 s
Smoothing window: Triangular window
Smoothing: 10%





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

Max. H/V at 63.44 ± 1.78 Hz (in the range 0.0 - 64.0 Hz).

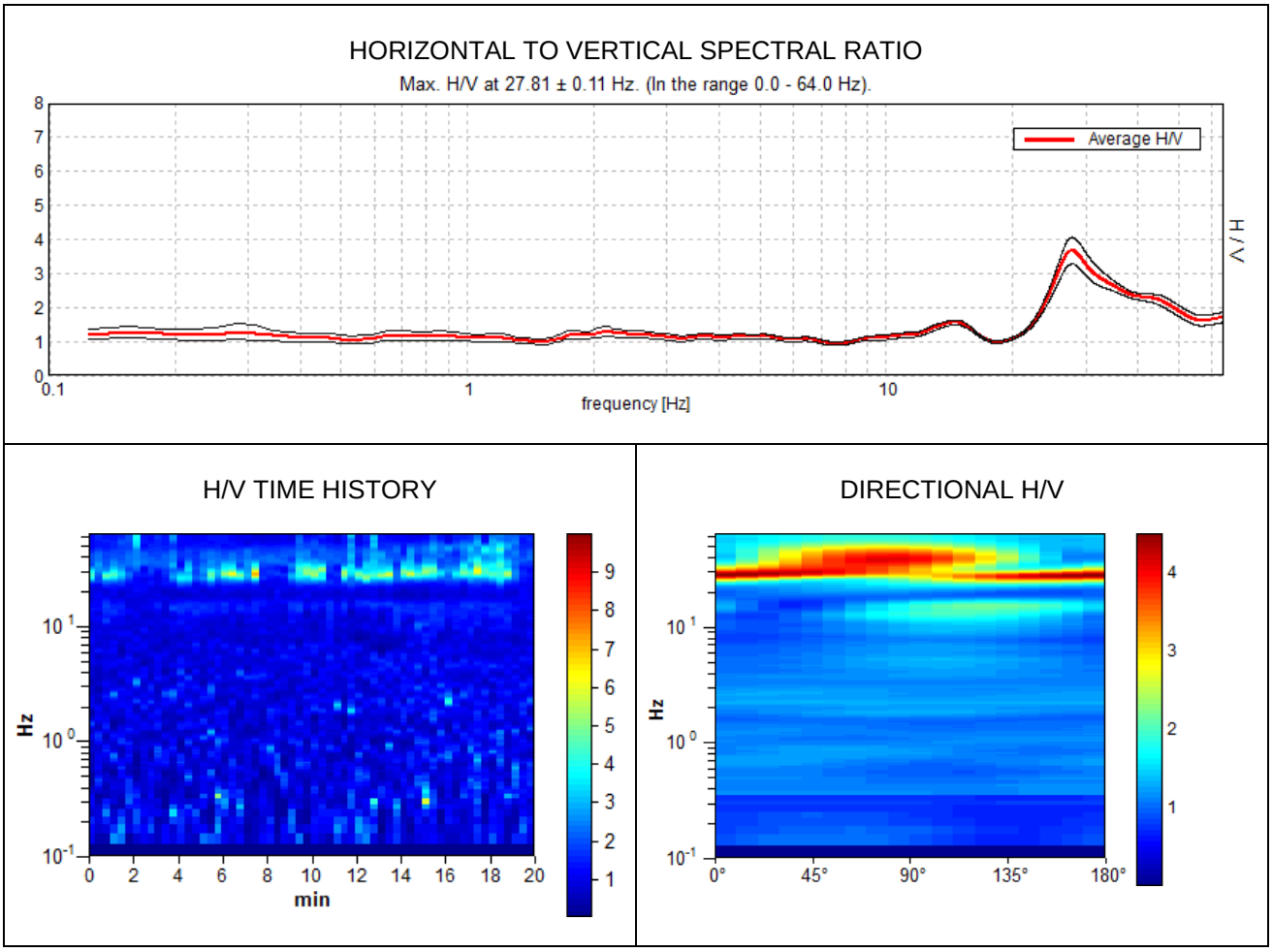
Criteria for a reliable HVSR curve [All 3 should be fulfilled]			
$f_0 > 10 / L_w$	63.44 > 0.50	OK	
$n_c(f_0) > 200$	85006.3 > 200	OK	
$\sigma_A(f) < 2$ for $0.5f_0 < f < 2f_0$ if $f_0 > 0.5$Hz **$\sigma_A(f) < 3$ for $0.5f_0 < f < 2f_0$ if $f_0 < 0.5$Hz**	Exceeded 0 out of 1034 times	OK	
Criteria for a clear HVSR peak [At least 5 out of 6 should be fulfilled]			
Exists f^- in $[f_0/4, f_0]$ | $A_{H/V}(f^-) < A_0 / 2$	48.313 Hz	OK	
Exists f^+ in $[f_0, 4f_0]$ | $A_{H/V}(f^+) < A_0 / 2$			NO
$A_0 > 2$	3.36 > 2	OK	
$f_{peak}[A_{H/V}(f) \pm \sigma_A(f)] = f_0 \pm 5\%$	|0.01391| < 0.05	OK	
$\sigma_f < \varepsilon(f_0)$	0.88246 < 3.17188	OK	
$\sigma_A(f_0) < \theta(f_0)$	0.0538 < 1.58	OK	

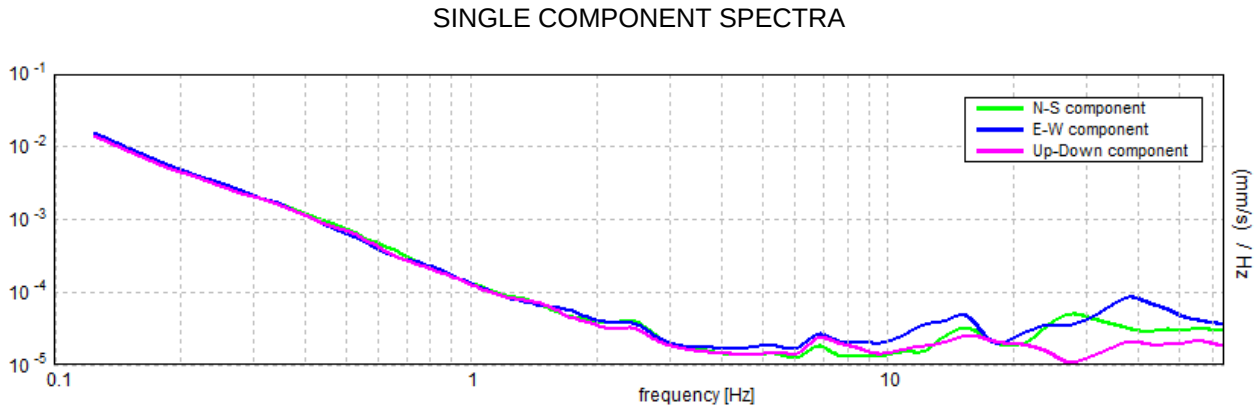
L_w	window length
n_w	number of windows used in the analysis
$n_c = L_w n_w f_0$	number of significant cycles
f	current frequency
f_0	H/V peak frequency
σ_f	standard deviation of H/V peak frequency
$\varepsilon(f_0)$	threshold value for the stability condition $\sigma_f < \varepsilon(f_0)$
A_0	H/V peak 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
$\sigma_{logH/V}(f)$	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 $\sigma_{logH/V}(f_0)$	0.48	0.40	0.30	0.25	0.20

T 38 PIAN DI SCO'

Instrument: TRS-0009/00-06
Start recording: 13/06/12 10:30:13 End recording: 13/06/12 10:50:14
Channel labels: NORTH SOUTH; EAST WEST ; UP DOWN
GPS data not available
Trace length: 0h20'00''. Analysis performed on the entire trace.
Sampling frequency: 128 Hz
Window size: 20 s
Smoothing window: Triangular window
Smoothing: 10%





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

Max. H/V at 27.81 ± 0.11 Hz (in the range 0.0 - 64.0 Hz).

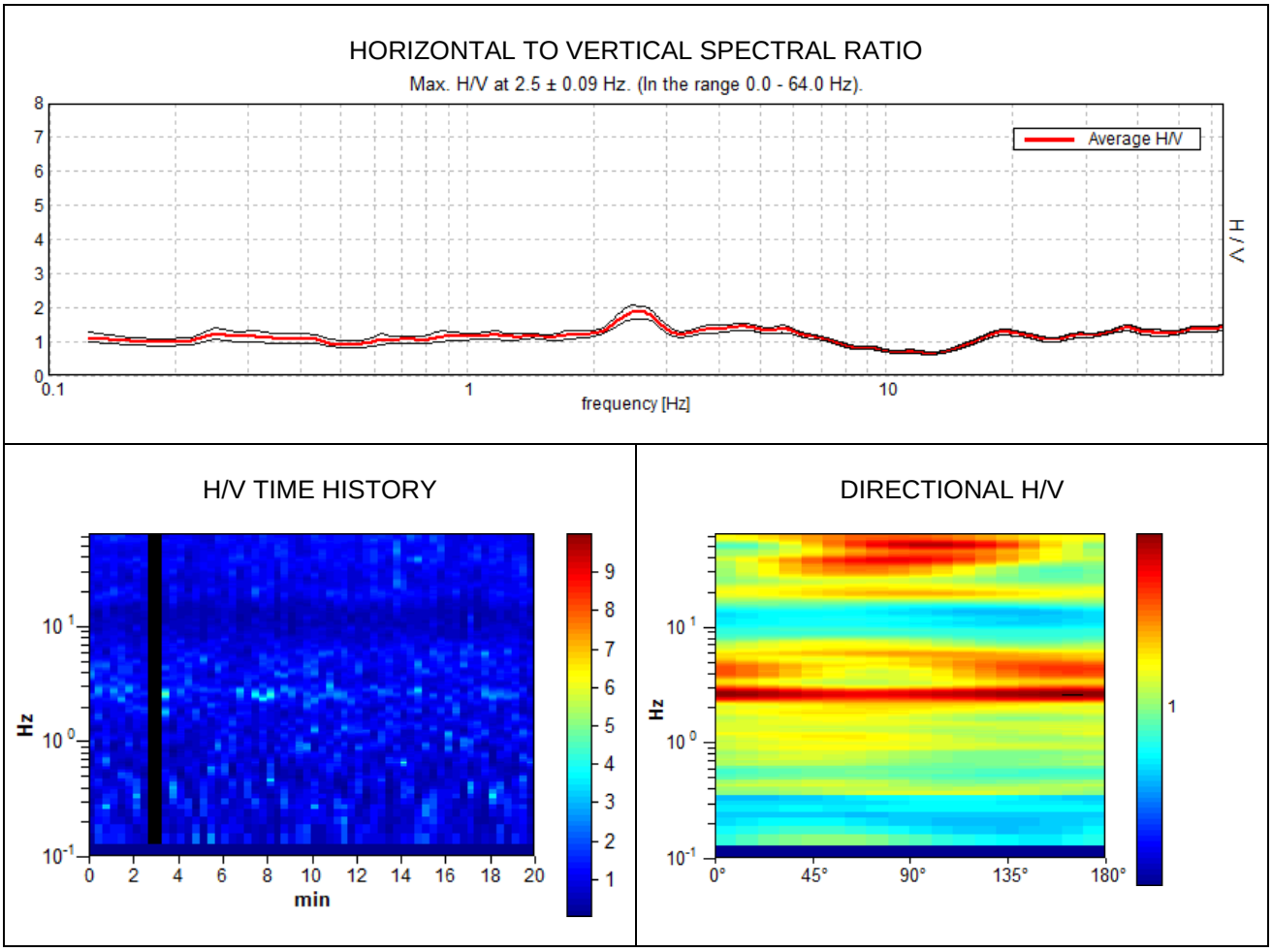
Criteria for a reliable HVSR curve [All 3 should be fulfilled]			
$f_0 > 10 / L_w$	27.81 > 0.50	OK	
$n_c(f_0) > 200$	33375.0 > 200	OK	
$\sigma_A(f) < 2$ for $0.5f_0 < f < 2f_0$ if $f_0 > 0.5$Hz **$\sigma_A(f) < 3$ for $0.5f_0 < f < 2f_0$ if $f_0 < 0.5$Hz**	Exceeded 0 out of 1336 times	OK	
Criteria for a clear HVSR peak [At least 5 out of 6 should be fulfilled]			
Exists f^- in $[f_0/4, f_0]$ | $A_{H/V}(f^-) < A_0 / 2$	23.25 Hz	OK	
Exists f^+ in $[f_0, 4f_0]$ | $A_{H/V}(f^+) < A_0 / 2$	50.938 Hz	OK	
$A_0 > 2$	3.67 > 2	OK	
$f_{peak}[A_{H/V}(f) \pm \sigma_A(f)] = f_0 \pm 5\%$	|0.00193| < 0.05	OK	
$\sigma_f < \varepsilon(f_0)$	0.05372 < 1.39063	OK	
$\sigma_A(f_0) < \theta(f_0)$	0.1934 < 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
$\sigma_{logH/V}(f)$	standard deviation of log $A_{H/V}(f)$ curve
$\theta(f_0)$	threshold value for the stability condition $\sigma_A(f) < \theta(f_0)$

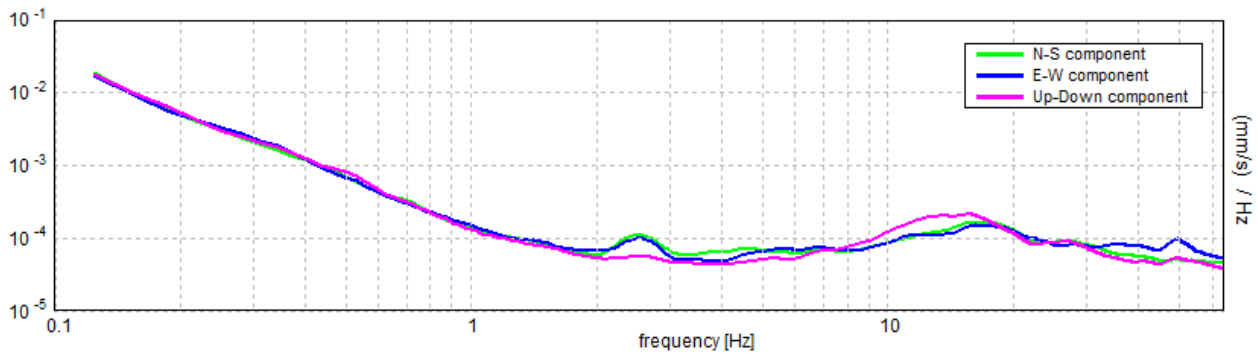
Threshold values for σ_f and $\sigma_A(f_0)$					
Freq.range [Hz]	< 0.2	0.2 – 0.5	0.5 – 1.0	1.0 – 2.0	> 2.0
$\varepsilon(f_0)$ [Hz]	0.25 f_0	0.2 f_0	0.15 f_0	0.10 f_0	0.05 f_0
$\theta(f_0)$ for $\sigma_A(f_0)$	3.0	2.5	2.0	1.78	1.58
Log $\theta(f_0)$ for $\sigma_{logH/V}(f_0)$	0.48	0.40	0.30	0.25	0.20

T 39 PIAN DI SCO'

Instrument: TRS-0009/00-06
Start recording: 13/06/12 11:18:27 End recording: 13/06/12 11:38:28
Channel labels: NORTH SOUTH; EAST WEST ; UP DOWN
GPS data not available
Trace length: 0h20'00''. Analyzed 97% trace (manual window selection)
Sampling frequency: 128 Hz
Window size: 20 s
Smoothing window: Triangular window
Smoothing: 10%



SINGLE COMPONENT SPECTRA



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

Max. H/V at 2.5 ± 0.09 Hz (in the range 0.0 - 64.0 Hz).

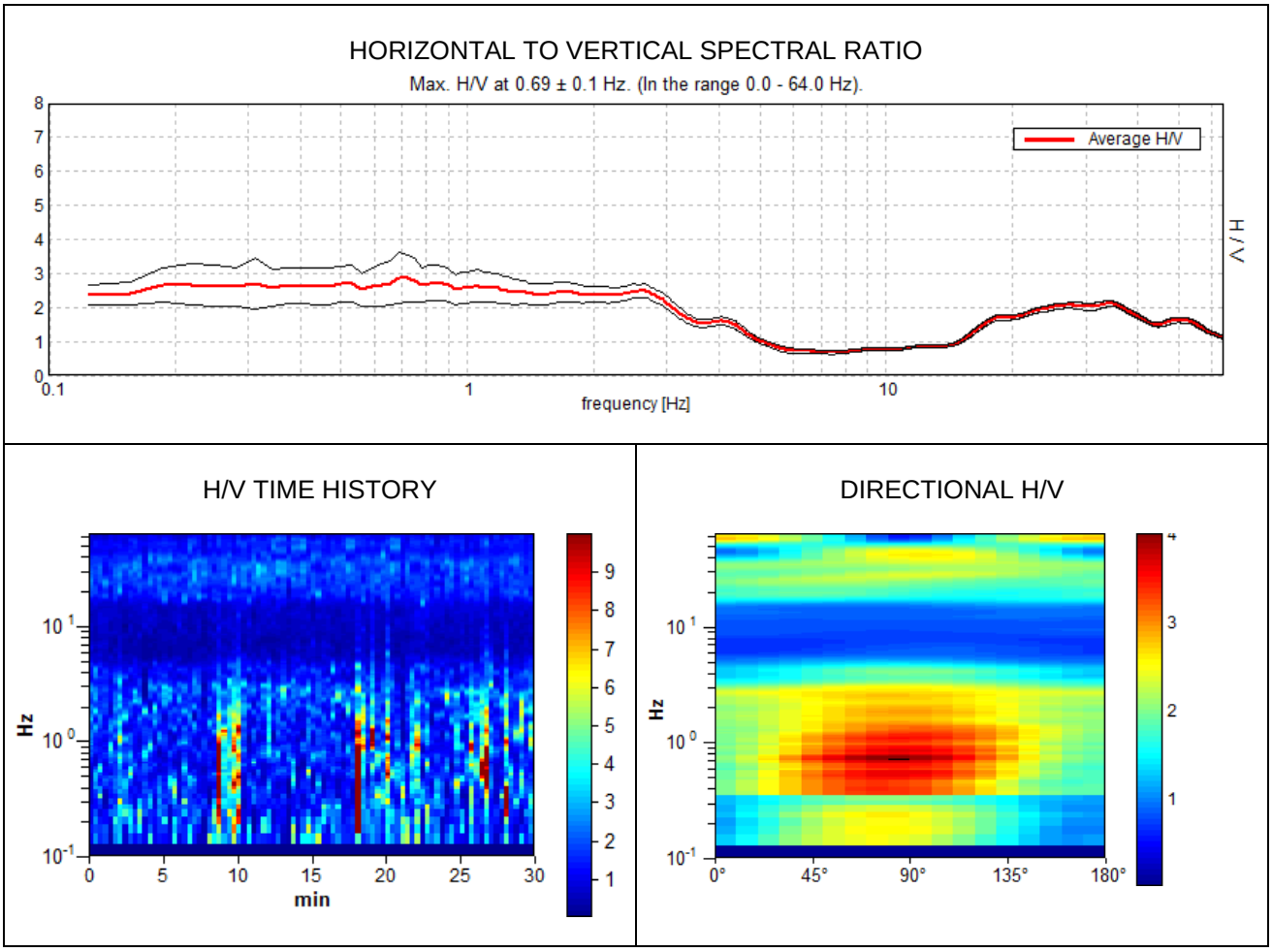
Criteria for a reliable HVSR curve [All 3 should be fulfilled]			
$f_0 > 10 / L_w$	2.50 > 0.50	OK	
$n_c(f_0) > 200$	2900.0 > 200	OK	
$\sigma_A(f) < 2$ for $0.5f_0 < f < 2f_0$ if $f_0 > 0.5$Hz **$\sigma_A(f) < 3$ for $0.5f_0 < f < 2f_0$ if $f_0 < 0.5$Hz**	Exceeded 0 out of 121 times	OK	
Criteria for a clear HVSR peak [At least 5 out of 6 should be fulfilled]			
Exists f^- in $[f_0/4, f_0]$ | $A_{H/V}(f^-) < A_0 / 2$			NO
Exists f^+ in $[f_0, 4f_0]$ | $A_{H/V}(f^+) < A_0 / 2$	7.75 Hz	OK	
$A_0 > 2$	1.87 > 2		NO
$f_{peak}[A_{H/V}(f) \pm \sigma_A(f)] = f_0 \pm 5\%$	|0.01744| < 0.05	OK	
$\sigma_f < \varepsilon(f_0)$	0.04359 < 0.125	OK	
$\sigma_A(f_0) < \theta(f_0)$	0.1039 < 1.58	OK	

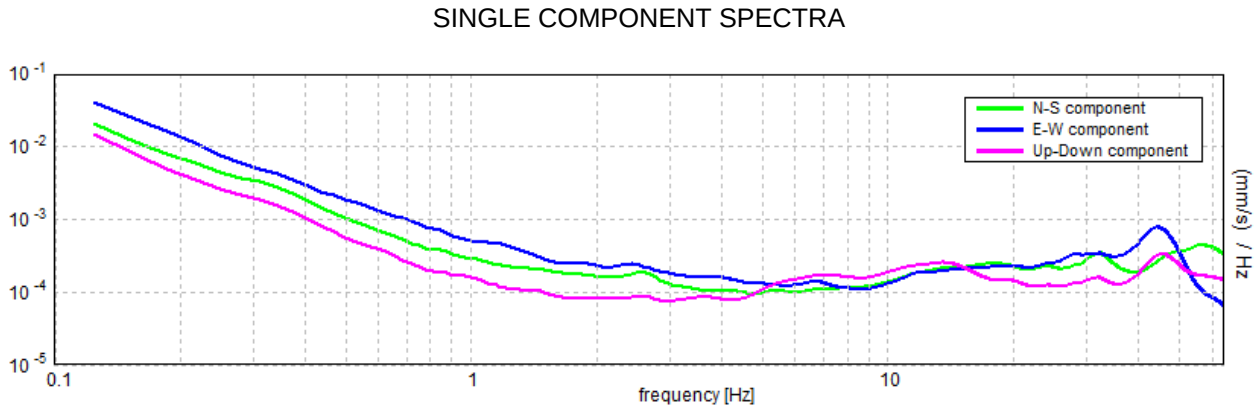
L_w	window length
n_w	number of windows used in the analysis
$n_c = L_w n_w f_0$	number of significant cycles
f	current frequency
f_0	H/V peak frequency
σ_f	standard deviation of H/V peak frequency
$\varepsilon(f_0)$	threshold value for the stability condition $\sigma_f < \varepsilon(f_0)$
A_0	H/V peak 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
$\sigma_{logH/V}(f)$	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 $\sigma_{logH/V}(f_0)$	0.48	0.40	0.30	0.25	0.20

T 40 PIAN DI SCO'

Instrument: TR-0007-01-05
Start recording: 13/06/12 11:15:28 End recording: 13/06/12 11:45:29
Channel labels: NORTH SOUTH; EAST WEST ; UP DOWN
GPS data not available
Trace length: 0h30'00''. Analysis performed on the entire trace.
Sampling frequency: 128 Hz
Window size: 20 s
Smoothing window: Triangular window
Smoothing: 10%





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

Max. H/V at 0.69 ± 0.1 Hz (in the range 0.0 - 64.0 Hz).

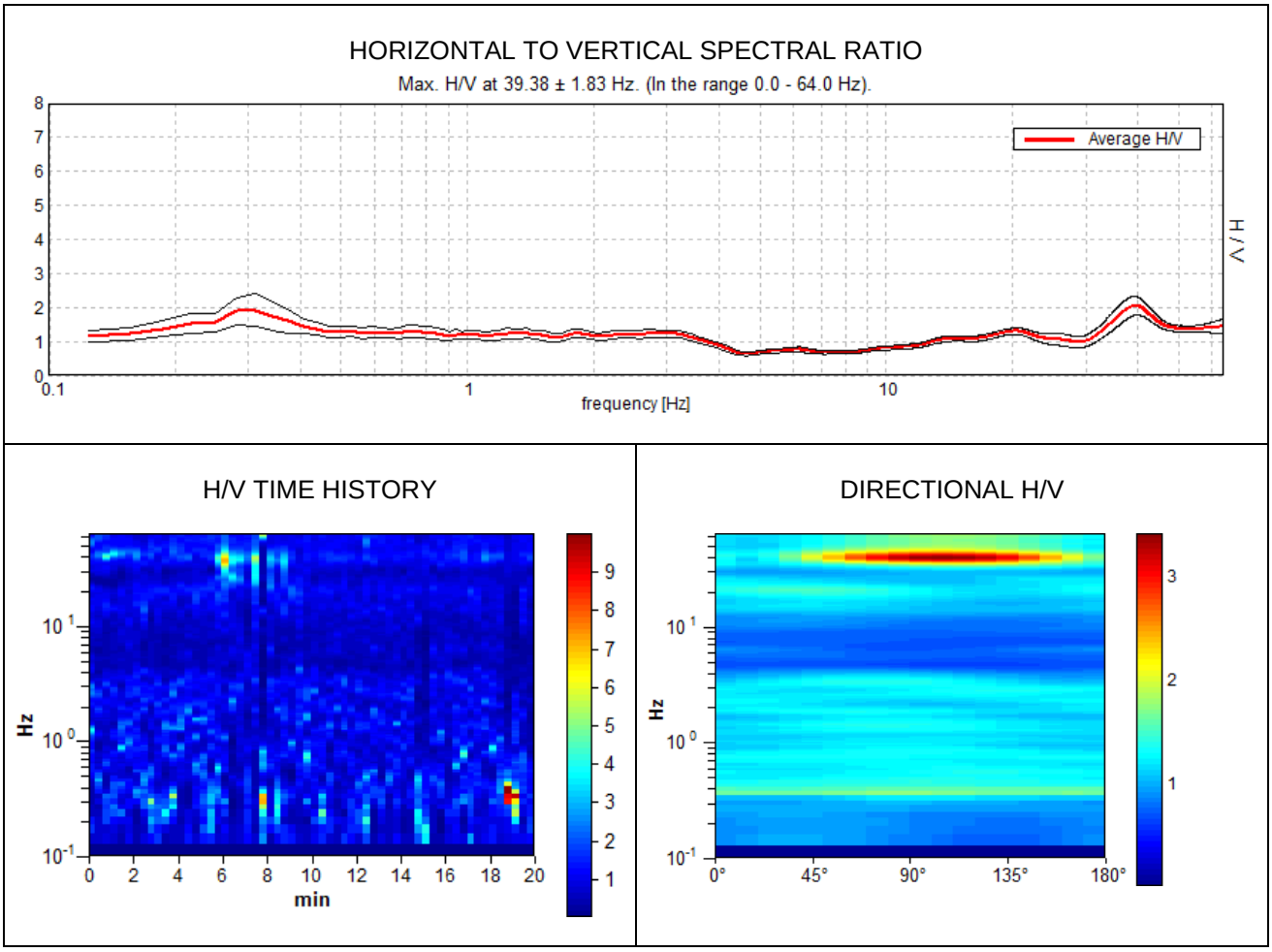
Criteria for a reliable HVSR curve [All 3 should be fulfilled]			
$f_0 > 10 / L_w$	0.69 > 0.50	OK	
$n_c(f_0) > 200$	1237.5 > 200	OK	
$\sigma_A(f) < 2$ for $0.5f_0 < f < 2f_0$ if $f_0 > 0.5$Hz **$\sigma_A(f) < 3$ for $0.5f_0 < f < 2f_0$ if $f_0 < 0.5$Hz**	Exceeded 0 out of 34 times	OK	
Criteria for a clear HVSR peak [At least 5 out of 6 should be fulfilled]			
Exists f^- in $[f_0/4, f_0]$ | $A_{H/V}(f^-) < A_0 / 2$			NO
Exists f^+ in $[f_0, 4f_0]$ | $A_{H/V}(f^+) < A_0 / 2$			NO
$A_0 > 2$	2.87 > 2	OK	
$f_{peak}[A_{H/V}(f) \pm \sigma_A(f)] = f_0 \pm 5\%$	|0.07569| < 0.05		NO
$\sigma_f < \varepsilon(f_0)$	0.05203 < 0.10313	OK	
$\sigma_A(f_0) < \theta(f_0)$	0.3772 < 2.0	OK	

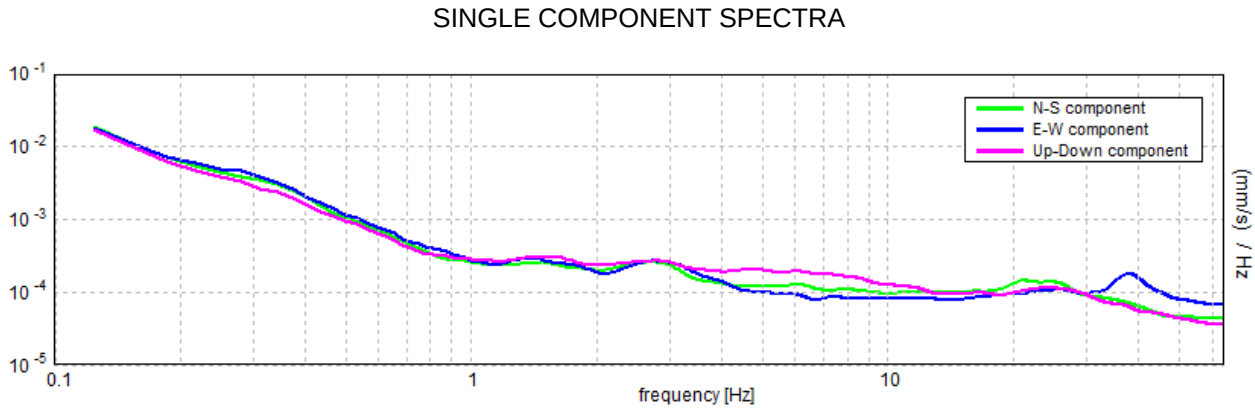
L_w	window length
n_w	number of windows used in the analysis
$n_c = L_w n_w f_0$	number of significant cycles
f	current frequency
f_0	H/V peak frequency
σ_f	standard deviation of H/V peak frequency
$\varepsilon(f_0)$	threshold value for the stability condition $\sigma_f < \varepsilon(f_0)$
A_0	H/V peak 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
$\sigma_{logH/V}(f)$	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 $\sigma_{logH/V}(f_0)$	0.48	0.40	0.30	0.25	0.20

T 41 PIAN DI SCO'

Instrument: TRS-0009/00-06
Start recording: 13/06/12 11:59:38 End recording: 13/06/12 12:19:39
Channel labels: NORTH SOUTH; EAST WEST ; UP DOWN
GPS data not available
Trace length: 0h20'00''. Analysis performed on the entire trace.
Sampling frequency: 128 Hz
Window size: 20 s
Smoothing window: Triangular window
Smoothing: 10%





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

Max. H/V at 39.38 ± 1.83 Hz (in the range 0.0 - 64.0 Hz).

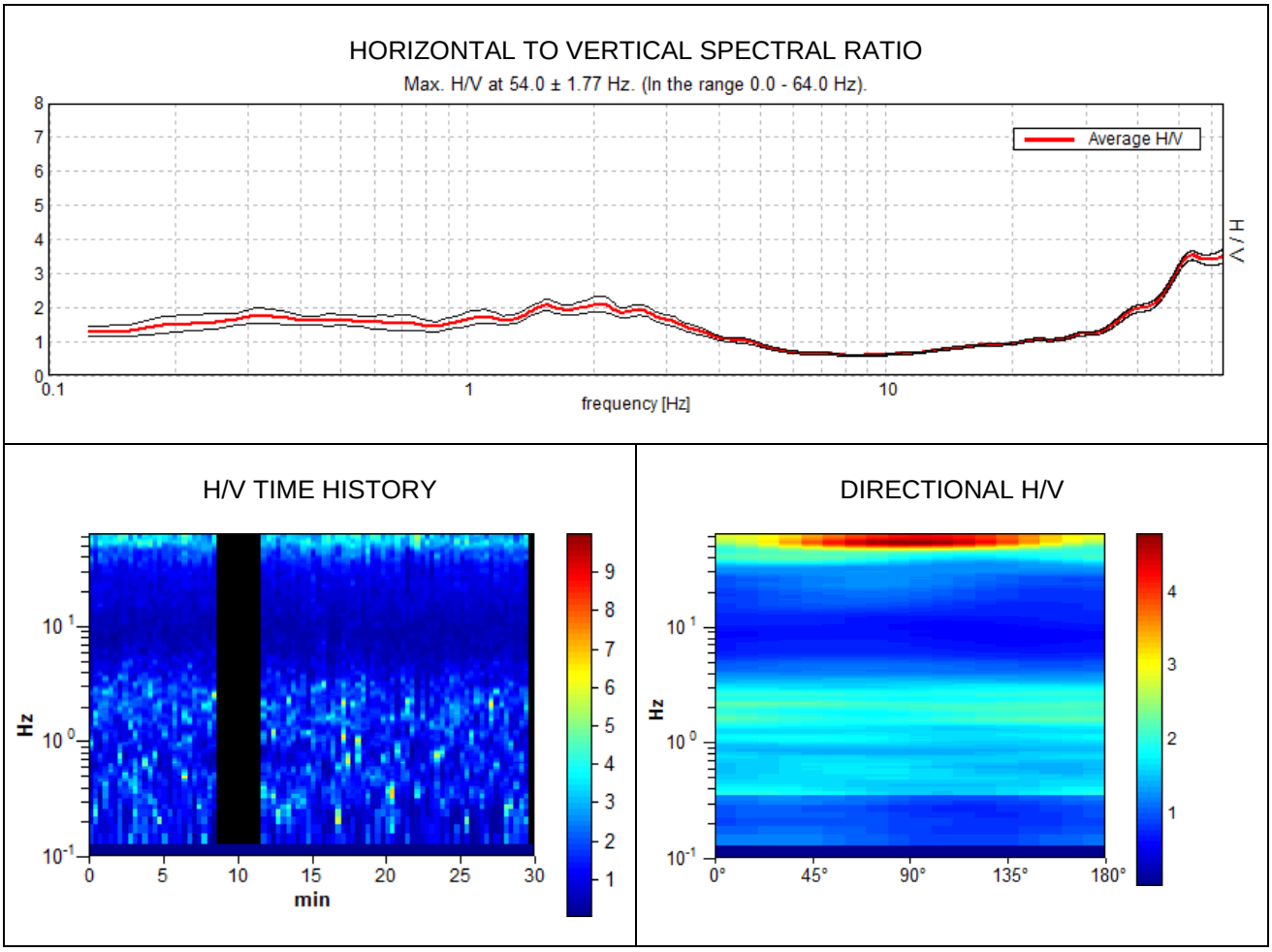
Criteria for a reliable HVSR curve [All 3 should be fulfilled]			
$f_0 > 10 / L_w$	39.38 > 0.50	OK	
$n_c(f_0) > 200$	47250.0 > 200	OK	
$\sigma_A(f) < 2$ for $0.5f_0 < f < 2f_0$ if $f_0 > 0.5$Hz **$\sigma_A(f) < 3$ for $0.5f_0 < f < 2f_0$ if $f_0 < 0.5$Hz**	Exceeded 0 out of 1419 times	OK	
Criteria for a clear HVSR peak [At least 5 out of 6 should be fulfilled]			
Exists f^- in $[f_0/4, f_0]$ | $A_{H/V}(f^-) < A_0 / 2$	30.156 Hz	OK	
Exists f^+ in $[f_0, 4f_0]$ | $A_{H/V}(f^+) < A_0 / 2$			NO
$A_0 > 2$	2.05 > 2	OK	
$f_{peak}[A_{H/V}(f) \pm \sigma_A(f)] = f_0 \pm 5\%$	|0.02303| < 0.05	OK	
$\sigma_f < \varepsilon(f_0)$	0.90684 < 1.96875	OK	
$\sigma_A(f_0) < \theta(f_0)$	0.1391 < 1.58	OK	

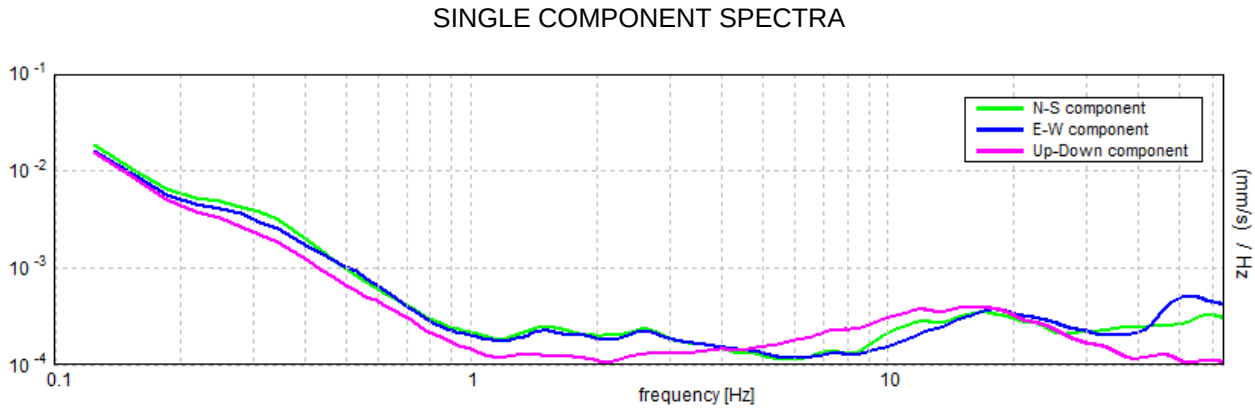
L_w	window length
n_w	number of windows used in the analysis
$n_c = L_w n_w f_0$	number of significant cycles
f	current frequency
f_0	H/V peak frequency
σ_f	standard deviation of H/V peak frequency
$\varepsilon(f_0)$	threshold value for the stability condition $\sigma_f < \varepsilon(f_0)$
A_0	H/V peak 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
$\sigma_{logH/V}(f)$	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 $\sigma_{logH/V}(f_0)$	0.48	0.40	0.30	0.25	0.20

T 42 PIAN DI SCO'

Instrument: TR-0007-01-05
Start recording: 13/06/12 12:00:32 End recording: 13/06/12 12:30:33
Channel labels: NORTH SOUTH; EAST WEST ; UP DOWN
GPS data not available
Trace length: 0h30'00''. Analyzed 89% trace (manual window selection)
Sampling frequency: 128 Hz
Window size: 20 s
Smoothing window: Triangular window
Smoothing: 10%





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

Max. H/V at 54.0 ± 1.77 Hz (in the range 0.0 - 64.0 Hz).

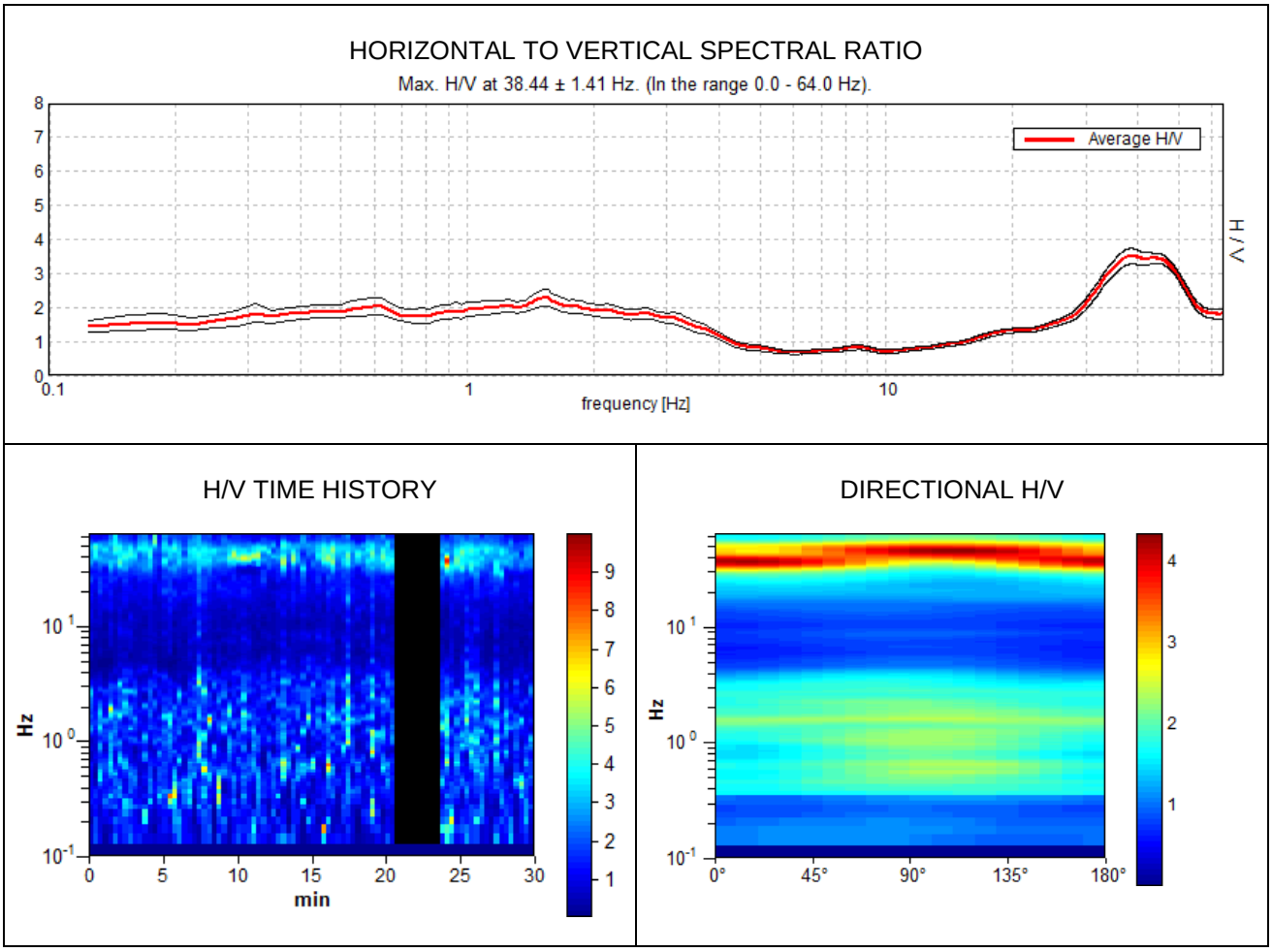
Criteria for a reliable HVSR curve [All 3 should be fulfilled]			
$f_0 > 10 / L_w$	54.00 > 0.50	OK	
$n_c(f_0) > 200$	86400.0 > 200	OK	
$\sigma_A(f) < 2$ for $0.5f_0 < f < 2f_0$ if $f_0 > 0.5$Hz **$\sigma_A(f) < 3$ for $0.5f_0 < f < 2f_0$ if $f_0 < 0.5$Hz**	Exceeded 0 out of 1185 times	OK	
Criteria for a clear HVSR peak [At least 5 out of 6 should be fulfilled]			
Exists f^- in $[f_0/4, f_0]$ | $A_{H/V}(f^-) < A_0 / 2$	37.125 Hz	OK	
Exists f^+ in $[f_0, 4f_0]$ | $A_{H/V}(f^+) < A_0 / 2$			NO
$A_0 > 2$	3.53 > 2	OK	
$f_{peak}[A_{H/V}(f) \pm \sigma_A(f)] = f_0 \pm 5\%$	|0.01633| < 0.05	OK	
$\sigma_f < \varepsilon(f_0)$	0.88157 < 2.7	OK	
$\sigma_A(f_0) < \theta(f_0)$	0.0657 < 1.58	OK	

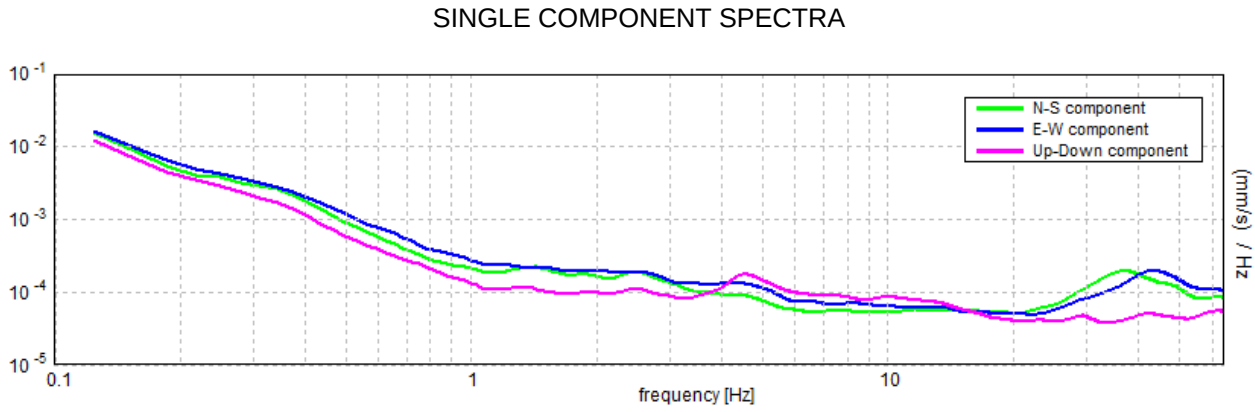
L_w	window length
n_w	number of windows used in the analysis
$n_c = L_w n_w f_0$	number of significant cycles
f	current frequency
f_0	H/V peak frequency
σ_f	standard deviation of H/V peak frequency
$\varepsilon(f_0)$	threshold value for the stability condition $\sigma_f < \varepsilon(f_0)$
A_0	H/V peak 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
$\sigma_{logH/V}(f)$	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 $\sigma_{logH/V}(f_0)$	0.48	0.40	0.30	0.25	0.20

T 43 PIAN DI SCO'

Instrument: TR-0007-01-05
Start recording: 13/06/12 12:40:45 End recording: 13/06/12 13:10:46
Channel labels: NORTH SOUTH; EAST WEST ; UP DOWN
GPS data not available
Trace length: 0h30'00''. Analyzed 90% trace (manual window selection)
Sampling frequency: 128 Hz
Window size: 20 s
Smoothing window: Triangular window
Smoothing: 10%





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

Max. H/V at 38.44 ± 1.41 Hz (in the range 0.0 - 64.0 Hz).

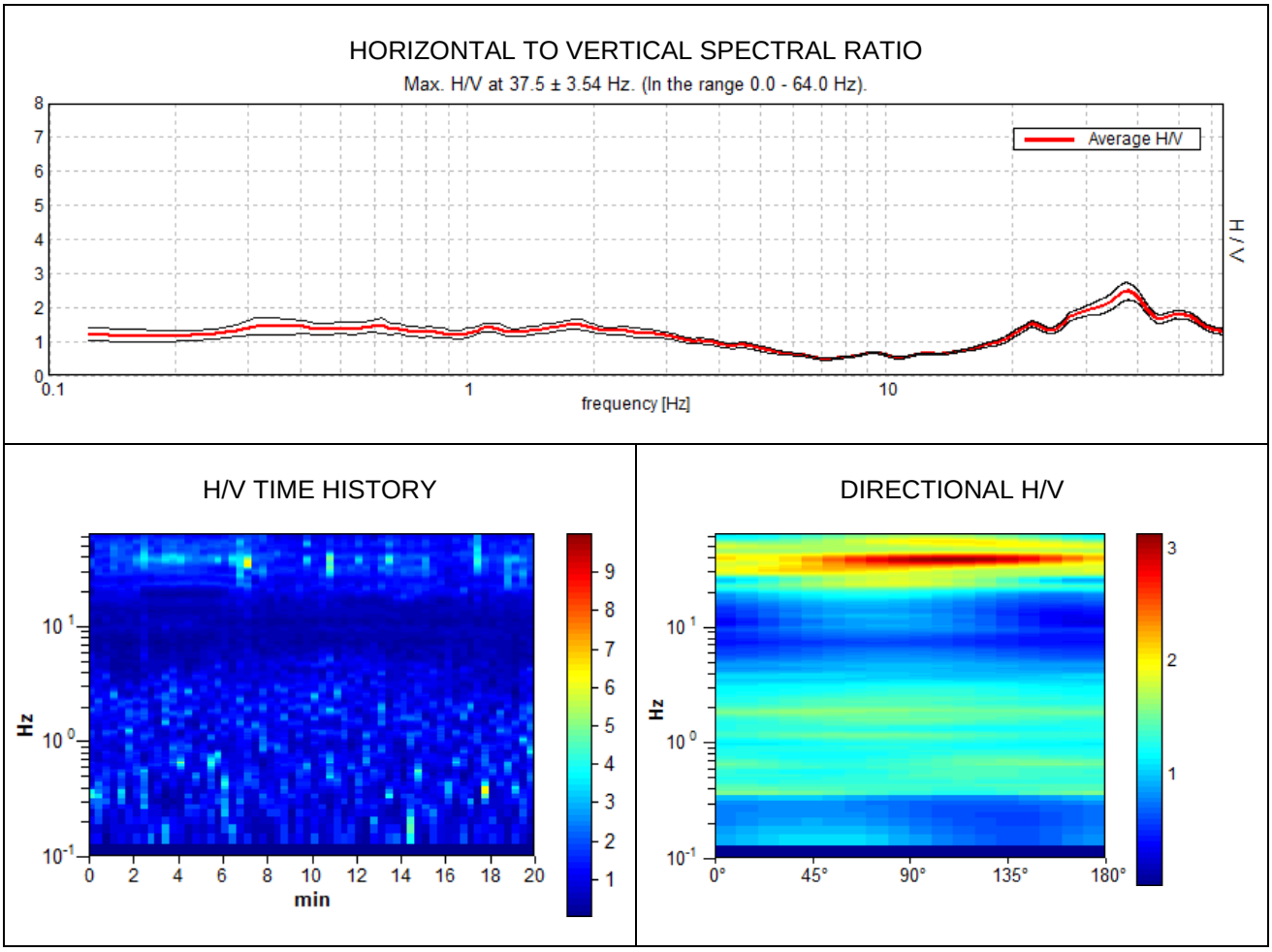
Criteria for a reliable HVSR curve [All 3 should be fulfilled]			
$f_0 > 10 / L_w$	38.44 > 0.50	OK	
$n_c(f_0) > 200$	62268.8 > 200	OK	
$\sigma_A(f) < 2$ for $0.5f_0 < f < 2f_0$ if $f_0 > 0.5$Hz **$\sigma_A(f) < 3$ for $0.5f_0 < f < 2f_0$ if $f_0 < 0.5$Hz**	Exceeded 0 out of 1434 times	OK	
Criteria for a clear HVSR peak [At least 5 out of 6 should be fulfilled]			
Exists f^- in $[f_0/4, f_0]$ | $A_{H/V}(f^-) < A_0 / 2$	28.0 Hz	OK	
Exists f^+ in $[f_0, 4f_0]$ | $A_{H/V}(f^+) < A_0 / 2$			NO
$A_0 > 2$	3.51 > 2	OK	
$f_{peak}[A_{H/V}(f) \pm \sigma_A(f)] = f_0 \pm 5\%$	|0.01827| < 0.05	OK	
$\sigma_f < \varepsilon(f_0)$	0.70243 < 1.92188	OK	
$\sigma_A(f_0) < \theta(f_0)$	0.1145 < 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
$\sigma_{logH/V}(f)$	standard deviation of log $A_{H/V}(f)$ curve
$\theta(f_0)$	threshold value for the stability condition $\sigma_A(f) < \theta(f_0)$

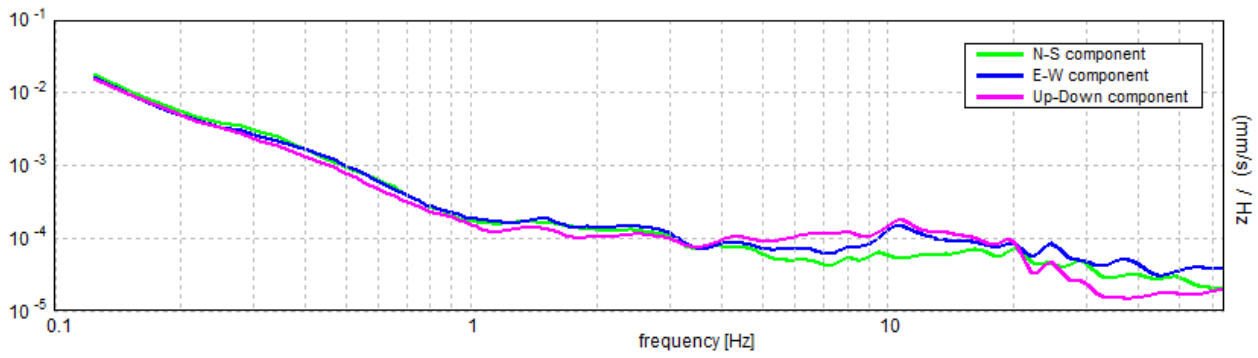
Threshold values for σ_f and $\sigma_A(f_0)$					
Freq.range [Hz]	< 0.2	0.2 – 0.5	0.5 – 1.0	1.0 – 2.0	> 2.0
$\varepsilon(f_0)$ [Hz]	0.25 f_0	0.2 f_0	0.15 f_0	0.10 f_0	0.05 f_0
$\theta(f_0)$ for $\sigma_A(f_0)$	3.0	2.5	2.0	1.78	1.58
Log $\theta(f_0)$ for $\sigma_{logH/V}(f_0)$	0.48	0.40	0.30	0.25	0.20

T 44 PIAN DI SCO'

Instrument: TRS-0009/00-06
Start recording: 13/06/12 12:42:31 End recording: 13/06/12 13:02:32
Channel labels: NORTH SOUTH; EAST WEST ; UP DOWN
GPS data not available
Trace length: 0h20'00''. Analysis performed on the entire trace.
Sampling frequency: 128 Hz
Window size: 20 s
Smoothing window: Triangular window
Smoothing: 10%



SINGLE COMPONENT SPECTRA



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

Max. H/V at 37.5 ± 3.54 Hz (in the range 0.0 - 64.0 Hz).

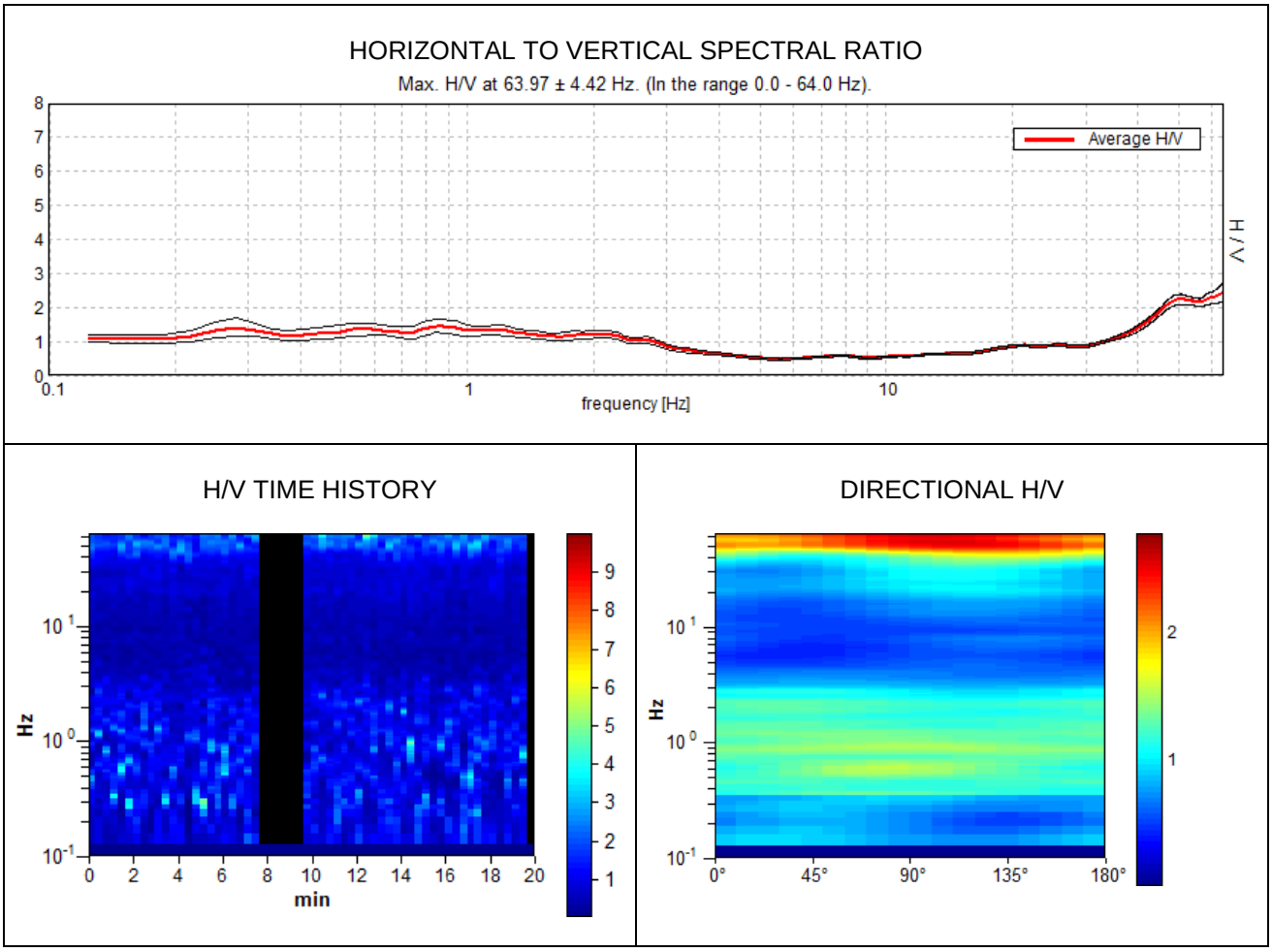
Criteria for a reliable HVSR curve [All 3 should be fulfilled]			
$f_0 > 10 / L_w$	37.50 > 0.50	OK	
$n_c(f_0) > 200$	45000.0 > 200	OK	
$\sigma_A(f) < 2$ for $0.5f_0 < f < 2f_0$ if $f_0 > 0.5$Hz **$\sigma_A(f) < 3$ for $0.5f_0 < f < 2f_0$ if $f_0 < 0.5$Hz**	Exceeded 0 out of 1449 times	OK	
Criteria for a clear HVSR peak [At least 5 out of 6 should be fulfilled]			
Exists f^- in $[f_0/4, f_0]$ | $A_{H/V}(f^-) < A_0 / 2$	20.281 Hz	OK	
Exists f^+ in $[f_0, 4f_0]$ | $A_{H/V}(f^+) < A_0 / 2$			NO
$A_0 > 2$	2.48 > 2	OK	
$f_{peak}[A_{H/V}(f) \pm \sigma_A(f)] = f_0 \pm 5\%$	|0.04675| < 0.05	OK	
$\sigma_f < \varepsilon(f_0)$	1.75318 < 1.875	OK	
$\sigma_A(f_0) < \theta(f_0)$	0.128 < 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
$\sigma_{logH/V}(f)$	standard deviation of log $A_{H/V}(f)$ curve
$\theta(f_0)$	threshold value for the stability condition $\sigma_A(f) < \theta(f_0)$

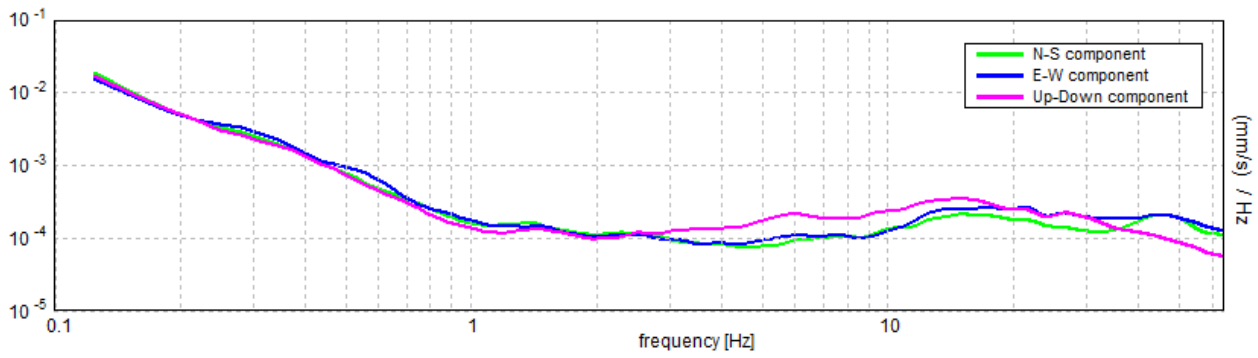
Threshold values for σ_f and $\sigma_A(f_0)$					
Freq.range [Hz]	< 0.2	0.2 – 0.5	0.5 – 1.0	1.0 – 2.0	> 2.0
$\varepsilon(f_0)$ [Hz]	0.25 f_0	0.2 f_0	0.15 f_0	0.10 f_0	0.05 f_0
$\theta(f_0)$ for $\sigma_A(f_0)$	3.0	2.5	2.0	1.78	1.58
Log $\theta(f_0)$ for $\sigma_{logH/V}(f_0)$	0.48	0.40	0.30	0.25	0.20

T 45 PIAN DI SCO'

Instrument: TRS-0009/00-06
Start recording: 13/06/12 13:24:26 End recording: 13/06/12 13:44:27
Channel labels: NORTH SOUTH; EAST WEST ; UP DOWN
GPS data not available
Trace length: 0h20'00''. Analyzed 88% trace (manual window selection)
Sampling frequency: 128 Hz
Window size: 20 s
Smoothing window: Triangular window
Smoothing: 10%



SINGLE COMPONENT SPECTRA



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

Max. H/V at 63.97 ± 4.42 Hz (in the range 0.0 - 64.0 Hz).

Criteria for a reliable HVSR curve [All 3 should be fulfilled]			
$f_0 > 10 / L_w$	63.97 > 0.50	OK	
$n_c(f_0) > 200$	67806.9 > 200	OK	
$\sigma_A(f) < 2$ for $0.5f_0 < f < 2f_0$ if $f_0 > 0.5$Hz **$\sigma_A(f) < 3$ for $0.5f_0 < f < 2f_0$ if $f_0 < 0.5$Hz**	Exceeded 0 out of 1026 times	OK	
Criteria for a clear HVSR peak [At least 5 out of 6 should be fulfilled]			
Exists f^- in $[f_0/4, f_0]$ | $A_{H/V}(f^-) < A_0 / 2$	37.781 Hz	OK	
Exists f^+ in $[f_0, 4f_0]$ | $A_{H/V}(f^+) < A_0 / 2$			NO
$A_0 > 2$	2.47 > 2	OK	
$f_{peak}[A_{H/V}(f) \pm \sigma_A(f)] = f_0 \pm 5\%$	|0.03411| < 0.05	OK	
$\sigma_f < \varepsilon(f_0)$	2.18207 < 3.19844	OK	
$\sigma_A(f_0) < \theta(f_0)$	0.1354 < 1.58	OK	

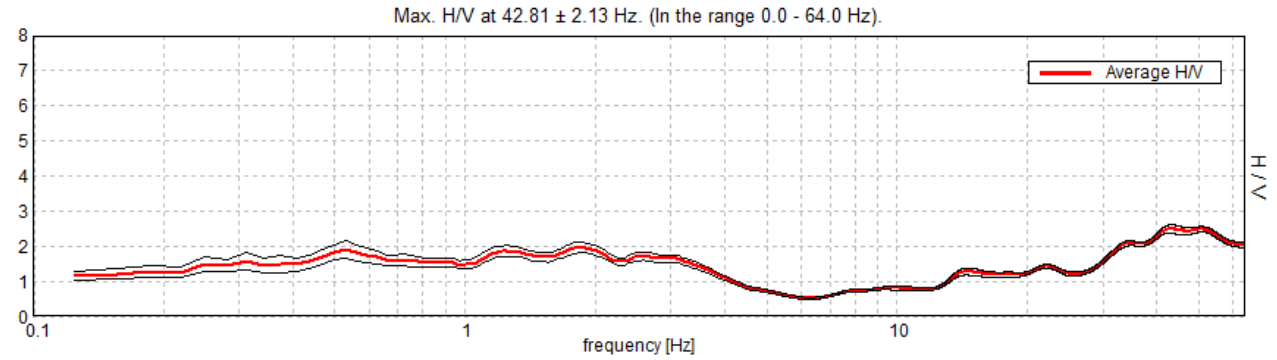
L_w	window length
n_w	number of windows used in the analysis
$n_c = L_w n_w f_0$	number of significant cycles
f	current frequency
f_0	H/V peak frequency
σ_f	standard deviation of H/V peak frequency
$\varepsilon(f_0)$	threshold value for the stability condition $\sigma_f < \varepsilon(f_0)$
A_0	H/V peak 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
$\sigma_{logH/V}(f)$	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 $\sigma_{logH/V}(f_0)$	0.48	0.40	0.30	0.25	0.20

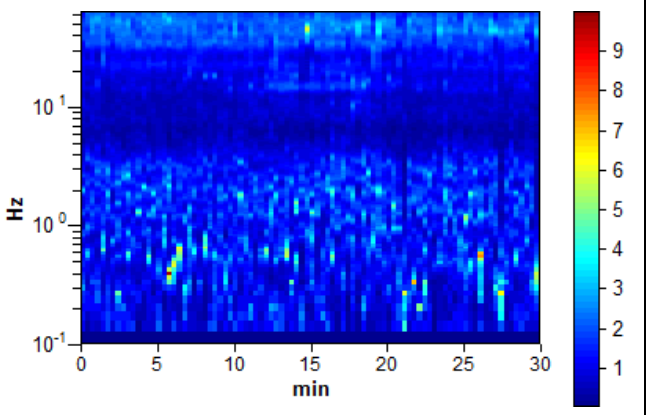
T 46 PIAN DI SCO'

Instrument: TR-0007-01-05
Start recording: 13/06/12 13:22:02 End recording: 13/06/12 13:52:03
Channel labels: NORTH SOUTH; EAST WEST ; UP DOWN
GPS data not available
Trace length: 0h30'00''. Analysis performed on the entire trace.
Sampling frequency: 128 Hz
Window size: 20 s
Smoothing window: Triangular window
Smoothing: 10%

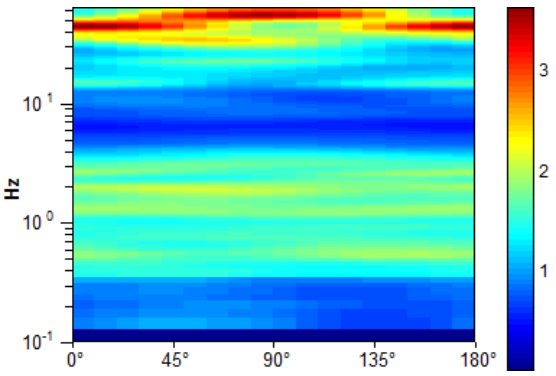
HORIZONTAL TO VERTICAL SPECTRAL RATIO



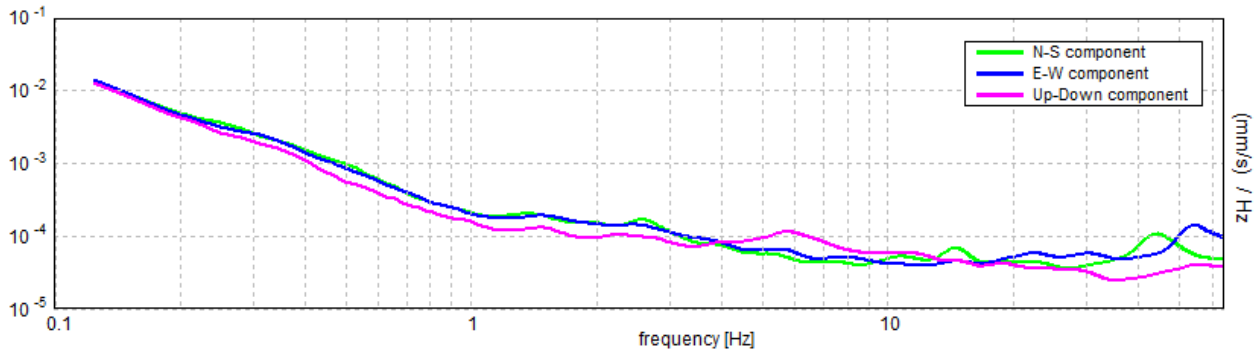
H/V TIME HISTORY



DIRECTIONAL H/V



SINGLE COMPONENT SPECTRA



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

Max. H/V at 42.81 ± 2.13 Hz (in the range 0.0 - 64.0 Hz).

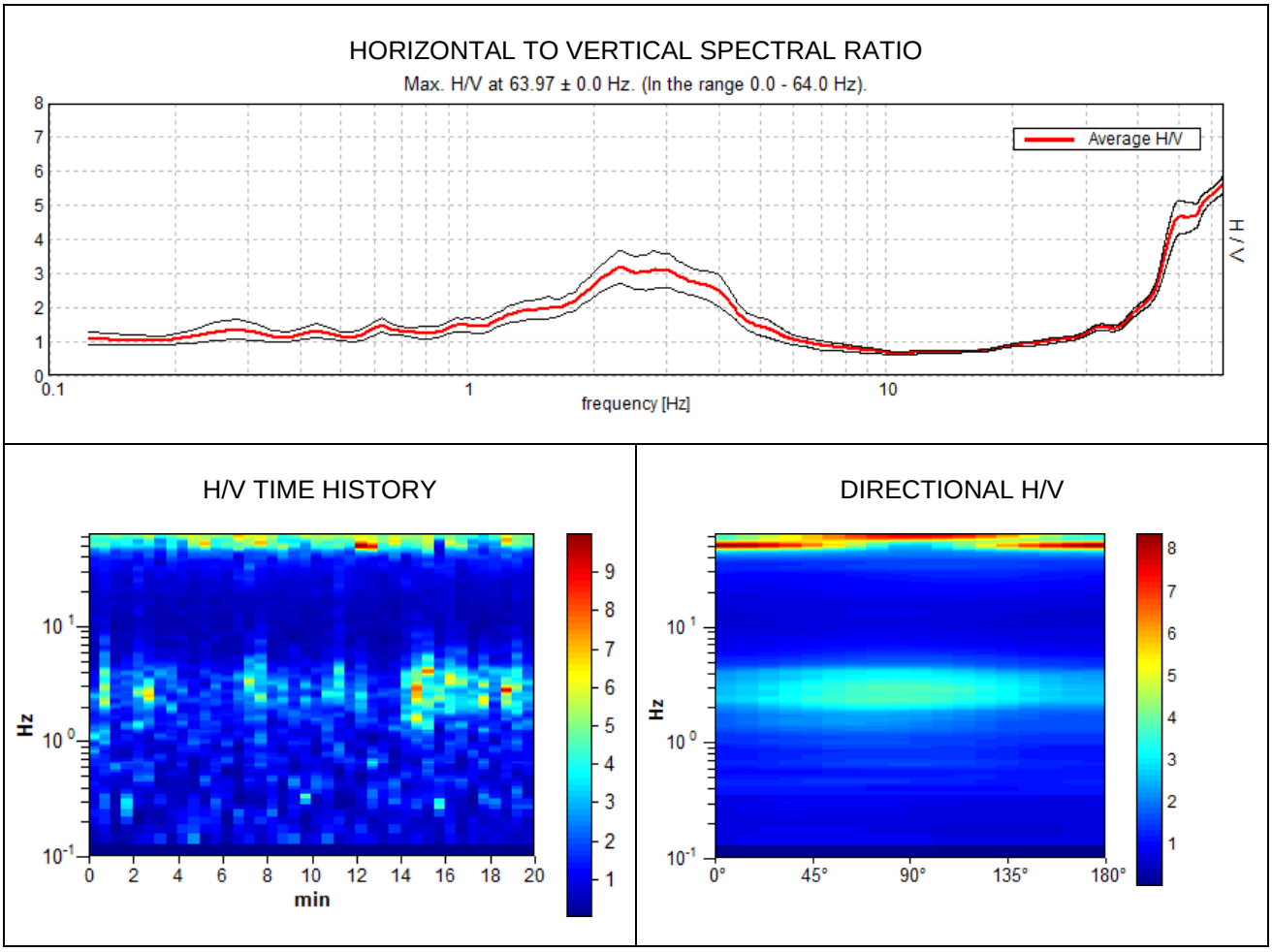
Criteria for a reliable HVSR curve [All 3 should be fulfilled]			
$f_0 > 10 / L_w$	42.81 > 0.50	OK	
$n_c(f_0) > 200$	77062.5 > 200	OK	
$\sigma_A(f) < 2$ for $0.5f_0 < f < 2f_0$ if $f_0 > 0.5$Hz **$\sigma_A(f) < 3$ for $0.5f_0 < f < 2f_0$ if $f_0 < 0.5$Hz**	Exceeded 0 out of 1364 times	OK	
Criteria for a clear HVSR peak [At least 5 out of 6 should be fulfilled]			
Exists f^- in $[f_0/4, f_0]$ | $A_{H/V}(f^-) < A_0 / 2$	27.094 Hz	OK	
Exists f^+ in $[f_0, 4f_0]$ | $A_{H/V}(f^+) < A_0 / 2$			NO
$A_0 > 2$	2.49 > 2	OK	
$f_{peak}[A_{H/V}(f) \pm \sigma_A(f)] = f_0 \pm 5\%$	|0.02496| < 0.05	OK	
$\sigma_f < \varepsilon(f_0)$	1.06844 < 2.14063	OK	
$\sigma_A(f_0) < \theta(f_0)$	0.0584 < 1.58	OK	

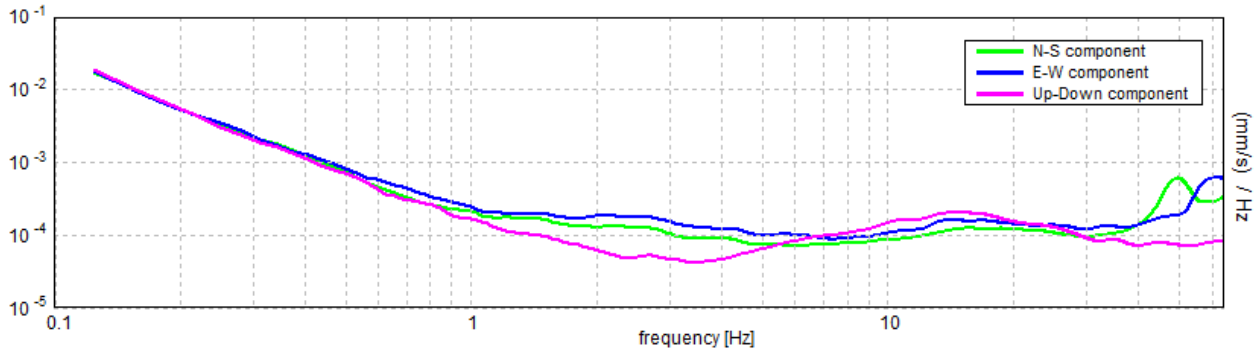
L_w	window length
n_w	number of windows used in the analysis
$n_c = L_w n_w f_0$	number of significant cycles
f	current frequency
f_0	H/V peak frequency
σ_f	standard deviation of H/V peak frequency
$\varepsilon(f_0)$	threshold value for the stability condition $\sigma_f < \varepsilon(f_0)$
A_0	H/V peak 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
$\sigma_{logH/V}(f)$	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 $\sigma_{logH/V}(f_0)$	0.48	0.40	0.30	0.25	0.20

T 54 PIAN DI SCO'

Instrument: TR-0007-01-05
Start recording: 11/07/12 19:07:56 End recording: 11/07/12 19:27:57
Channel labels: NORTH SOUTH; EAST WEST ; UP DOWN
GPS data not available
Trace length: 0h20'00''. Analysis performed on the entire trace.
Sampling frequency: 128 Hz
Window size: 30 s
Smoothing window: Triangular window
Smoothing: 10%





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

Max. H/V at 63.97 ± 0.0 Hz (in the range 0.0 - 64.0 Hz).

Criteria for a reliable HVSR curve [All 3 should be fulfilled]			
$f_0 > 10 / L_w$	63.97 > 0.33	OK	
$n_c(f_0) > 200$	76762.5 > 200	OK	
$\sigma_A(f) < 2$ for $0.5f_0 < f < 2f_0$ if $f_0 > 0.5$Hz **$\sigma_A(f) < 3$ for $0.5f_0 < f < 2f_0$ if $f_0 < 0.5$Hz**	Exceeded 0 out of 1026 times	OK	
Criteria for a clear HVSR peak [At least 5 out of 6 should be fulfilled]			
Exists f^- in $[f_0/4, f_0]$ | $A_{H/V}(f^-) < A_0 / 2$	44.813 Hz	OK	
Exists f^+ in $[f_0, 4f_0]$ | $A_{H/V}(f^+) < A_0 / 2$			NO
$A_0 > 2$	5.64 > 2	OK	
$f_{peak}[A_{H/V}(f) \pm \sigma_A(f)] = f_0 \pm 5\%$	|0.0| < 0.05	OK	
$\sigma_f < \varepsilon(f_0)$	0.0 < 3.19844	OK	
$\sigma_A(f_0) < \theta(f_0)$	0.1261 < 1.58	OK	

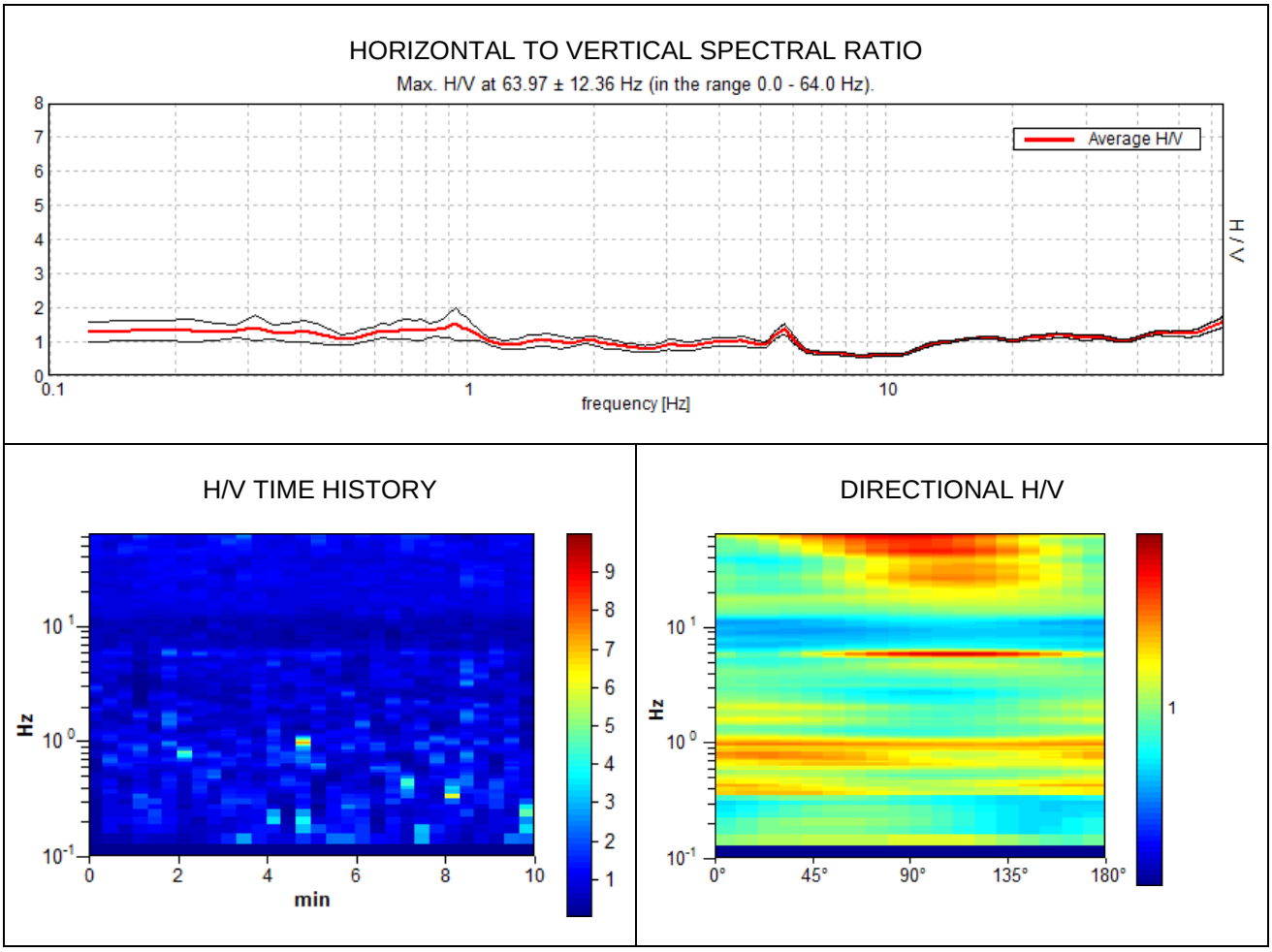
L_w	window length
n_w	number of windows used in the analysis
$n_c = L_w n_w f_0$	number of significant cycles
f	current frequency
f_0	H/V peak frequency
σ_f	standard deviation of H/V peak frequency
$\varepsilon(f_0)$	threshold value for the stability condition $\sigma_f < \varepsilon(f_0)$
A_0	H/V peak 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
$\sigma_{logH/V}(f)$	standard deviation of log $A_{H/V}(f)$ curve
$\theta(f_0)$	threshold value for the stability condition $\sigma_A(f) < \theta(f_0)$

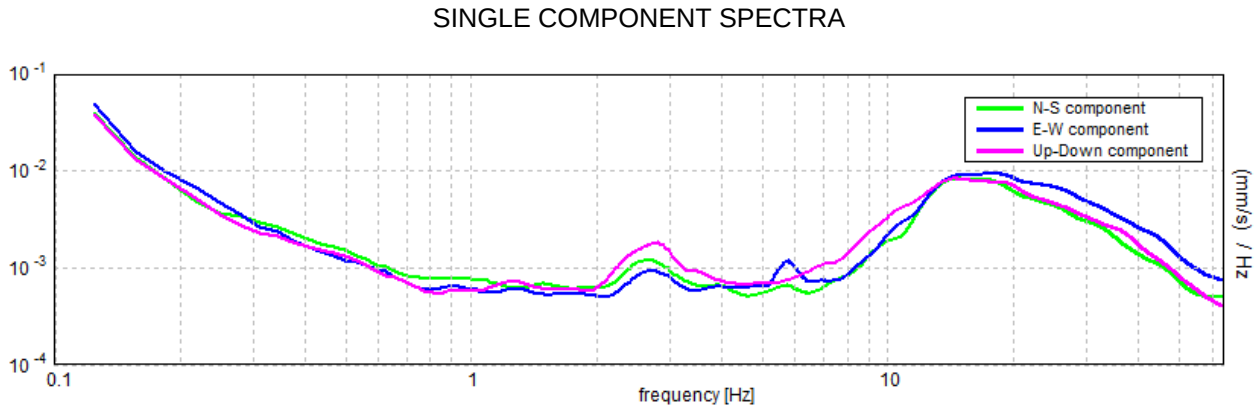
Threshold values for σ_f and $\sigma_A(f_0)$					
Freq.range [Hz]	< 0.2	0.2 – 0.5	0.5 – 1.0	1.0 – 2.0	> 2.0
$\varepsilon(f_0)$ [Hz]	0.25 f_0	0.2 f_0	0.15 f_0	0.10 f_0	0.05 f_0
$\theta(f_0)$ for $\sigma_A(f_0)$	3.0	2.5	2.0	1.78	1.58
Log $\theta(f_0)$ for $\sigma_{logH/V}(f_0)$	0.48	0.40	0.30	0.25	0.20

Misure HVSR Vaggio

T 12 VAGGIO

Instrument: TRS-0004/00-06
Start recording: 18/05/12 16:48:11 End recording: 18/05/12 16:58:12
Channel labels: NORTH SOUTH; EAST WEST ; UP DOWN
GPS data not available
Trace length: 0h10'00''. Analysis performed on the entire trace.
Sampling frequency: 128 Hz
Window size: 20 s
Smoothing window: Triangular window
Smoothing: 10%





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

Max. H/V at 63.97 ± 12.36 Hz (in the range 0.0 - 64.0 Hz).

Criteria for a reliable HVSR curve [All 3 should be fulfilled]			
$f_0 > 10 / L_w$	63.97 > 0.50	OK	
$n_c(f_0) > 200$	38381.3 > 200	OK	
$\sigma_A(f) < 2$ for $0.5f_0 < f < 2f_0$ if $f_0 > 0.5$Hz **$\sigma_A(f) < 3$ for $0.5f_0 < f < 2f_0$ if $f_0 < 0.5$Hz**	Exceeded 0 out of 1026 times	OK	
Criteria for a clear HVSR peak [At least 5 out of 6 should be fulfilled]			
Exists f^- in $[f_0/4, f_0] \mid A_{H/V}(f^-) < A_0 / 2$			NO
Exists f^+ in $[f_0, 4f_0] \mid A_{H/V}(f^+) < A_0 / 2$			NO
$A_0 > 2$	1.59 > 2		NO
$f_{peak}[A_{H/V}(f) \pm \sigma_A(f)] = f_0 \pm 5\%$	|0.09285| < 0.05		NO
$\sigma_f < \varepsilon(f_0)$	5.93969 < 3.19844		NO
$\sigma_A(f_0) < \theta(f_0)$	0.0819 < 1.58	OK	

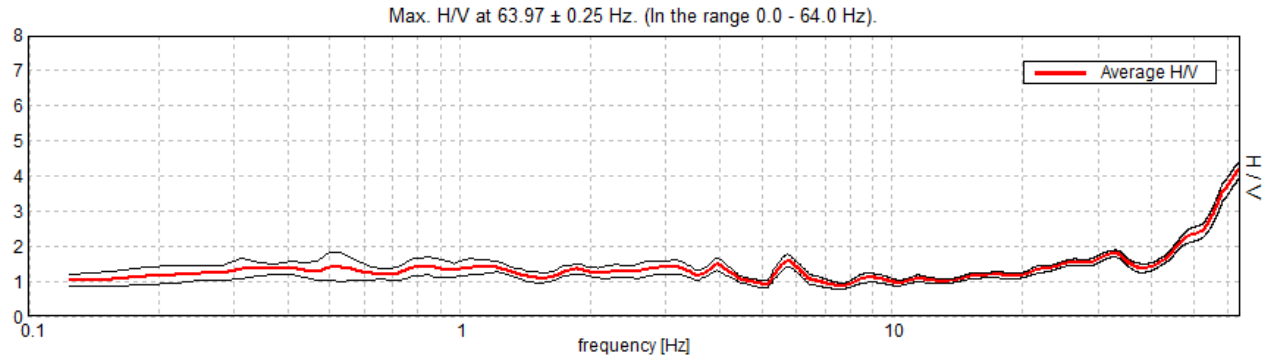
L_w	window length
n_w	number of windows used in the analysis
$n_c = L_w n_w f_0$	number of significant cycles
f	current frequency
f_0	H/V peak frequency
σ_f	standard deviation of H/V peak frequency
$\varepsilon(f_0)$	threshold value for the stability condition $\sigma_f < \varepsilon(f_0)$
A_0	H/V peak 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
$\sigma_{logH/V}(f)$	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 $\sigma_{logH/V}(f_0)$	0.48	0.40	0.30	0.25	0.20

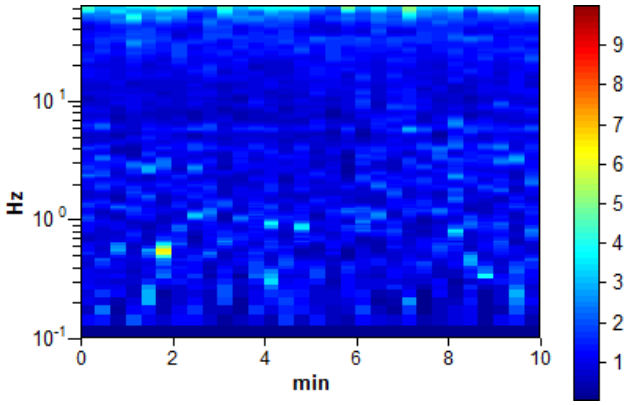
T 23 VAGGIO

Instrument: TR-0007-01-05
Start recording: 28/05/12 15:10:35 End recording: 28/05/12 15:20:36
Channel labels: NORTH SOUTH; EAST WEST ; UP DOWN
GPS data not available
Trace length: 0h10'00''. Analysis performed on the entire trace.
Sampling frequency: 128 Hz
Window size: 20 s
Smoothing window: Triangular window
Smoothing: 10%

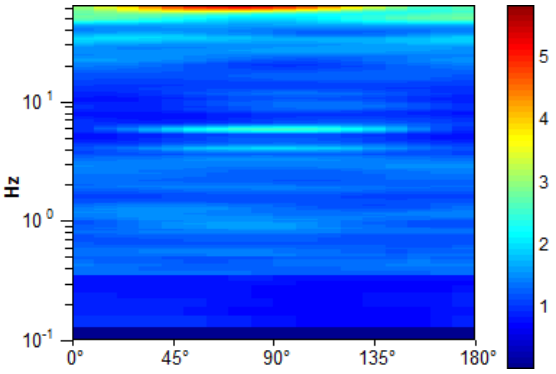
HORIZONTAL TO VERTICAL SPECTRAL RATIO



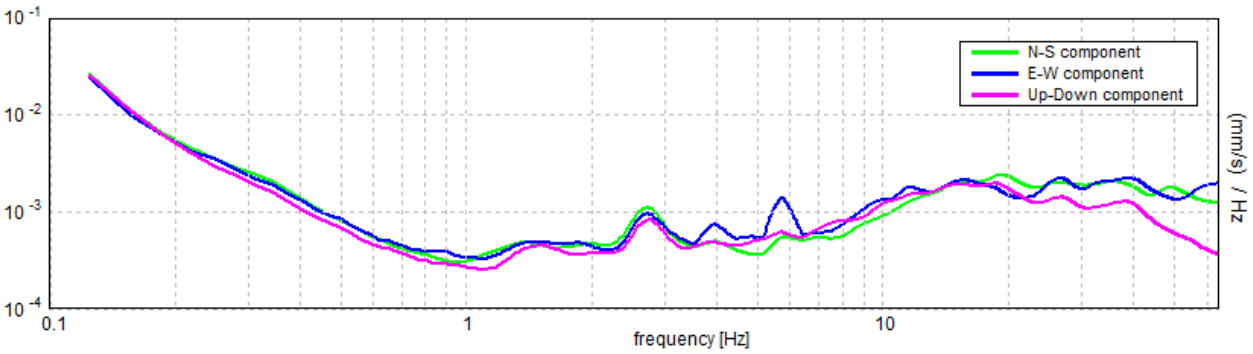
H/V TIME HISTORY



DIRECTIONAL H/V



SINGLE COMPONENT SPECTRA



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

Max. H/V at 63.97 ± 0.25 Hz (in the range 0.0 - 64.0 Hz).

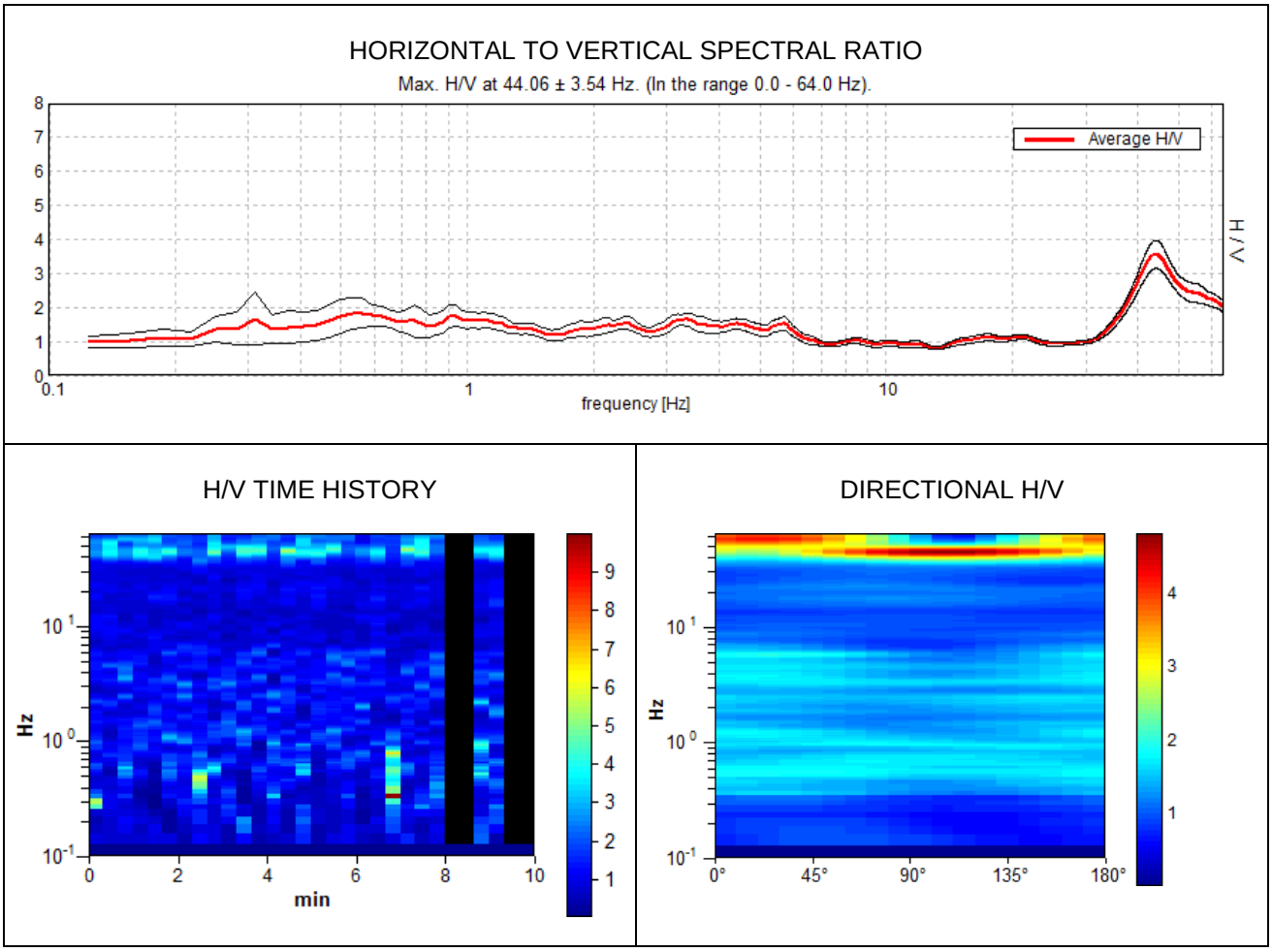
Criteria for a reliable HVSR curve [All 3 should be fulfilled]			
$f_0 > 10 / L_w$	63.97 > 0.50	OK	
$n_c(f_0) > 200$	38381.3 > 200	OK	
$\sigma_A(f) < 2$ for $0.5f_0 < f < 2f_0$ if $f_0 > 0.5$Hz **$\sigma_A(f) < 3$ for $0.5f_0 < f < 2f_0$ if $f_0 < 0.5$Hz**	Exceeded 0 out of 1026 times	OK	
Criteria for a clear HVSR peak [At least 5 out of 6 should be fulfilled]			
Exists f^- in $[f_0/4, f_0]$ | $A_{H/V}(f^-) < A_0 / 2$	46.5 Hz	OK	
Exists f^+ in $[f_0, 4f_0]$ | $A_{H/V}(f^+) < A_0 / 2$			NO
$A_0 > 2$	4.19 > 2	OK	
$f_{peak}[A_{H/V}(f) \pm \sigma_A(f)] = f_0 \pm 5\%$	|0.00188| < 0.05	OK	
$\sigma_f < \varepsilon(f_0)$	0.12043 < 3.19844	OK	
$\sigma_A(f_0) < \theta(f_0)$	0.1199 < 1.58	OK	

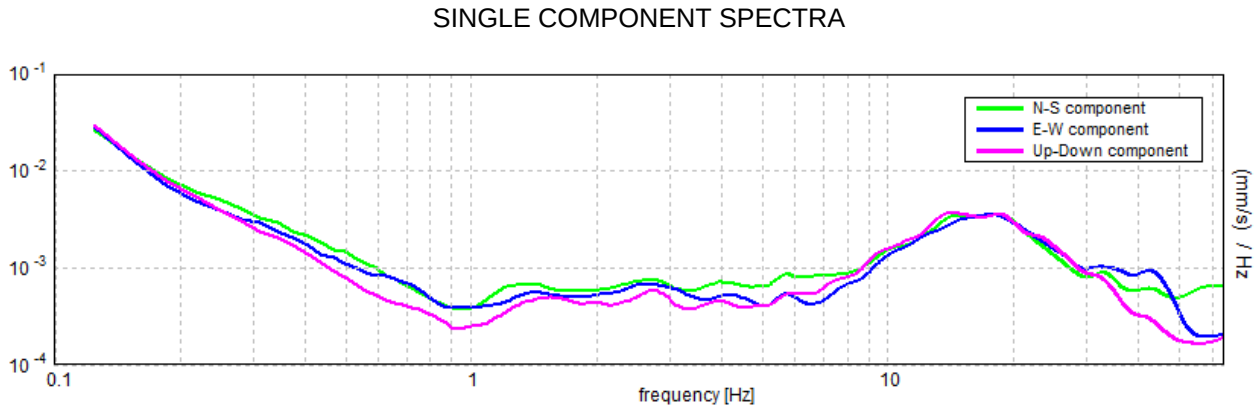
L_w	window length
n_w	number of windows used in the analysis
$n_c = L_w n_w f_0$	number of significant cycles
f	current frequency
f_0	H/V peak frequency
σ_f	standard deviation of H/V peak frequency
$\varepsilon(f_0)$	threshold value for the stability condition $\sigma_f < \varepsilon(f_0)$
A_0	H/V peak 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
$\sigma_{logH/V}(f)$	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 $\sigma_{logH/V}(f_0)$	0.48	0.40	0.30	0.25	0.20

T 24 VAGGIO

Instrument: TR-0007-01-05
Start recording: 28/05/12 15:29:42 End recording: 28/05/12 15:39:43
Channel labels: NORTH SOUTH; EAST WEST ; UP DOWN
GPS data not available
Trace length: 0h10'00''. Analyzed 87% trace (manual window selection)
Sampling frequency: 128 Hz
Window size: 20 s
Smoothing window: Triangular window
Smoothing: 10%





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

Max. H/V at 44.06 ± 3.54 Hz (in the range 0.0 - 64.0 Hz).

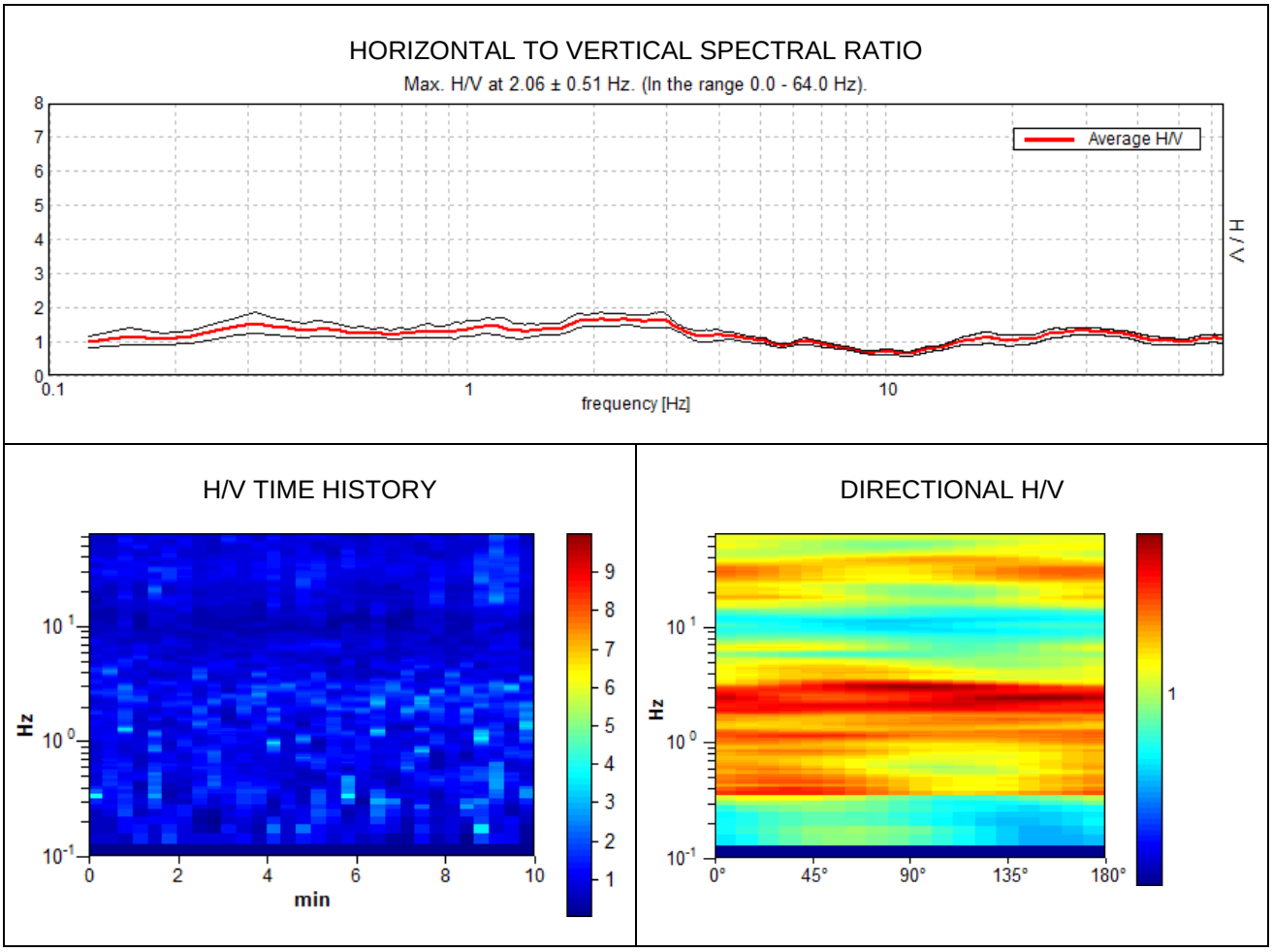
Criteria for a reliable HVSR curve [All 3 should be fulfilled]			
$f_0 > 10 / L_w$	44.06 > 0.50	OK	
$n_c(f_0) > 200$	22912.5 > 200	OK	
$\sigma_A(f) < 2$ for $0.5f_0 < f < 2f_0$ if $f_0 > 0.5$Hz **$\sigma_A(f) < 3$ for $0.5f_0 < f < 2f_0$ if $f_0 < 0.5$Hz**	Exceeded 0 out of 1344 times	OK	
Criteria for a clear HVSR peak [At least 5 out of 6 should be fulfilled]			
Exists f^- in $[f_0/4, f_0]$ | $A_{H/V}(f^-) < A_0 / 2$	36.219 Hz	OK	
Exists f^+ in $[f_0, 4f_0]$ | $A_{H/V}(f^+) < A_0 / 2$			NO
$A_0 > 2$	3.56 > 2	OK	
$f_{peak}[A_{H/V}(f) \pm \sigma_A(f)] = f_0 \pm 5\%$	|0.03826| < 0.05	OK	
$\sigma_f < \varepsilon(f_0)$	1.68585 < 2.20313	OK	
$\sigma_A(f_0) < \theta(f_0)$	0.1972 < 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
$\sigma_{logH/V}(f)$	standard deviation of log $A_{H/V}(f)$ curve
$\theta(f_0)$	threshold value for the stability condition $\sigma_A(f) < \theta(f_0)$

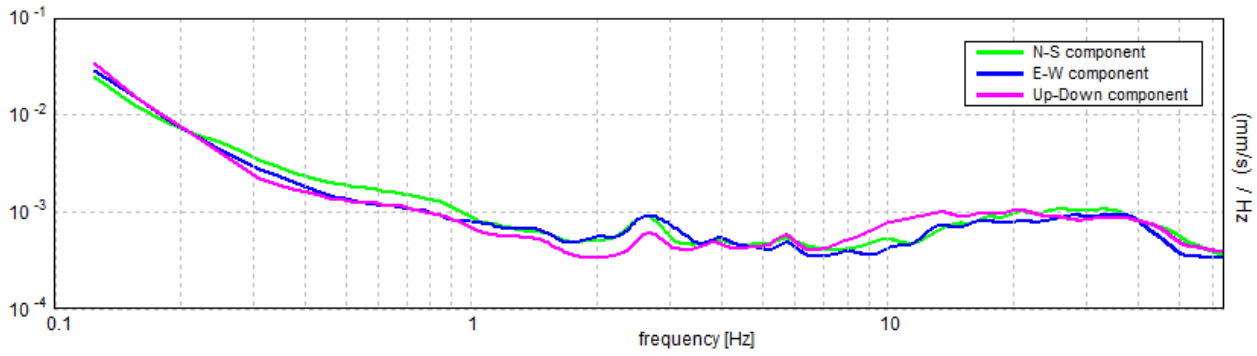
Threshold values for σ_f and $\sigma_A(f_0)$					
Freq.range [Hz]	< 0.2	0.2 – 0.5	0.5 – 1.0	1.0 – 2.0	> 2.0
$\varepsilon(f_0)$ [Hz]	0.25 f_0	0.2 f_0	0.15 f_0	0.10 f_0	0.05 f_0
$\theta(f_0)$ for $\sigma_A(f_0)$	3.0	2.5	2.0	1.78	1.58
Log $\theta(f_0)$ for $\sigma_{logH/V}(f_0)$	0.48	0.40	0.30	0.25	0.20

T 25 VAGGIO

Instrument: TR-0007-01-05
Start recording: 28/05/12 15:46:05 End recording: 28/05/12 15:56:06
Channel labels: NORTH SOUTH; EAST WEST ; UP DOWN
GPS data not available
Trace length: 0h10'00". Analysis performed on the entire trace.
Sampling frequency: 128 Hz
Window size: 20 s
Smoothing window: Triangular window
Smoothing: 10%



SINGLE COMPONENT SPECTRA



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

Max. H/V at 2.06 ± 0.51 Hz (in the range 0.0 - 64.0 Hz).

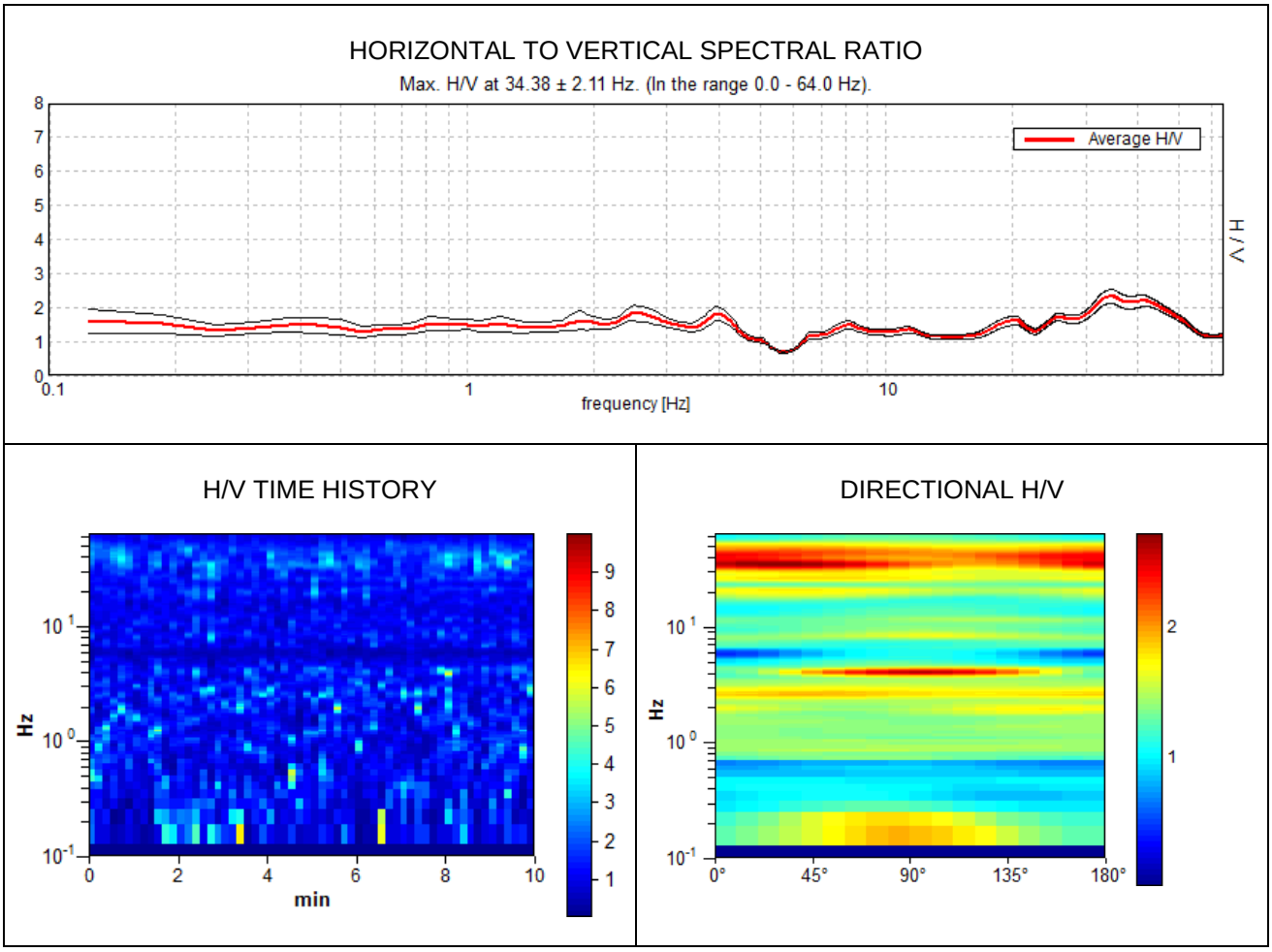
Criteria for a reliable HVSR curve [All 3 should be fulfilled]			
$f_0 > 10 / L_w$	2.06 > 0.50	OK	
$n_c(f_0) > 200$	1237.5 > 200	OK	
$\sigma_A(f) < 2$ for $0.5f_0 < f < 2f_0$ if $f_0 > 0.5$Hz $\sigma_A(f) < 3$ for $0.5f_0 < f < 2f_0$ if $f_0 < 0.5$Hz	Exceeded 0 out of 100 times	OK	
Criteria for a clear HVSR peak [At least 5 out of 6 should be fulfilled]			
Exists f^- in $[f_0/4, f_0]$ | $A_{H/V}(f^-) < A_0 / 2$			NO
Exists f^+ in $[f_0, 4f_0]$ | $A_{H/V}(f^+) < A_0 / 2$	7.844 Hz	OK	
$A_0 > 2$	1.65 > 2		NO
$f_{peak}[A_{H/V}(f) \pm \sigma_A(f)] = f_0 \pm 5\%$	|0.11807| < 0.05		NO
$\sigma_f < \varepsilon(f_0)$	0.24353 < 0.10313		NO
$\sigma_A(f_0) < \theta(f_0)$	0.093 < 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
$\sigma_{logH/V}(f)$	standard deviation of log $A_{H/V}(f)$ curve
$\theta(f_0)$	threshold value for the stability condition $\sigma_A(f) < \theta(f_0)$

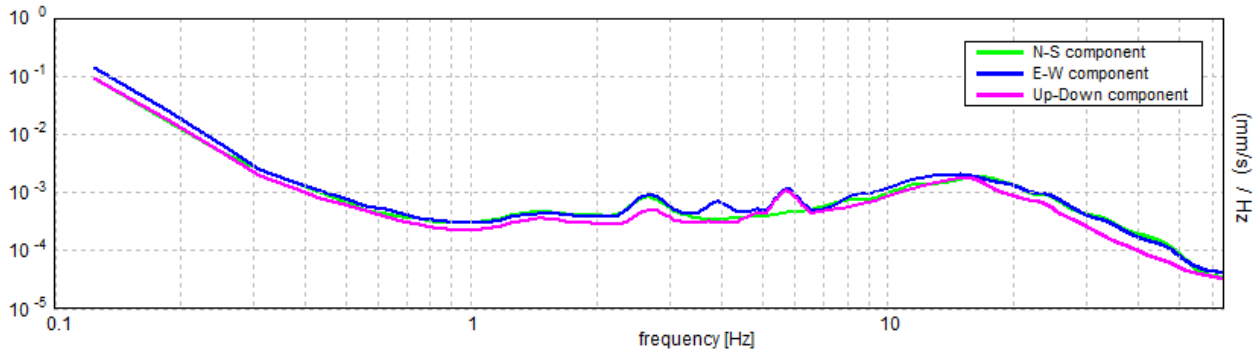
Threshold values for σ_f and $\sigma_A(f_0)$					
Freq.range [Hz]	< 0.2	0.2 – 0.5	0.5 – 1.0	1.0 – 2.0	> 2.0
$\varepsilon(f_0)$ [Hz]	0.25 f_0	0.2 f_0	0.15 f_0	0.10 f_0	0.05 f_0
$\theta(f_0)$ for $\sigma_A(f_0)$	3.0	2.5	2.0	1.78	1.58
Log $\theta(f_0)$ for $\sigma_{logH/V}(f_0)$	0.48	0.40	0.30	0.25	0.20

T 26 VAGGIO

Instrument: TR-0007-01-05
Start recording: 28/05/12 16:03:01 End recording: 28/05/12 16:13:02
Channel labels: NORTH SOUTH; EAST WEST ; UP DOWN
GPS data not available
Trace length: 0h10'00''. Analysis performed on the entire trace.
Sampling frequency: 128 Hz
Window size: 10 s
Smoothing window: Triangular window
Smoothing: 10%



SINGLE COMPONENT SPECTRA



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

Max. H/V at 34.38 ± 2.11 Hz (in the range 0.0 - 64.0 Hz).

Criteria for a reliable HVSR curve [All 3 should be fulfilled]			
$f_0 > 10 / L_w$	34.38 > 1.00	OK	
$n_c(f_0) > 200$	20625.0 > 200	OK	
$\sigma_A(f) < 2$ for $0.5f_0 < f < 2f_0$ if $f_0 > 0.5$Hz **$\sigma_A(f) < 3$ for $0.5f_0 < f < 2f_0$ if $f_0 < 0.5$Hz**	Exceeded 0 out of 750 times	OK	
Criteria for a clear HVSR peak [At least 5 out of 6 should be fulfilled]			
Exists f^- in $[f_0/4, f_0]$ | $A_{H/V}(f^-) < A_0 / 2$	16.125 Hz	OK	
Exists f^+ in $[f_0, 4f_0]$ | $A_{H/V}(f^+) < A_0 / 2$	58.688 Hz	OK	
$A_0 > 2$	2.32 > 2	OK	
$f_{peak}[A_{H/V}(f) \pm \sigma_A(f)] = f_0 \pm 5\%$	|0.03049| < 0.05	OK	
$\sigma_f < \varepsilon(f_0)$	1.04809 < 1.71875	OK	
$\sigma_A(f_0) < \theta(f_0)$	0.1 < 1.58	OK	

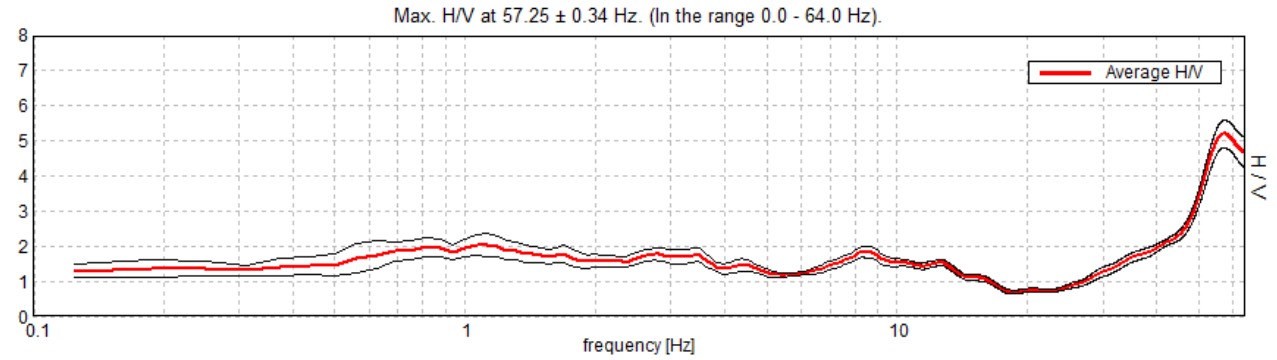
L_w	window length
n_w	number of windows used in the analysis
$n_c = L_w n_w f_0$	number of significant cycles
f	current frequency
f_0	H/V peak frequency
σ_f	standard deviation of H/V peak frequency
$\varepsilon(f_0)$	threshold value for the stability condition $\sigma_f < \varepsilon(f_0)$
A_0	H/V peak 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
$\sigma_{logH/V}(f)$	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 $\sigma_{logH/V}(f_0)$	0.48	0.40	0.30	0.25	0.20

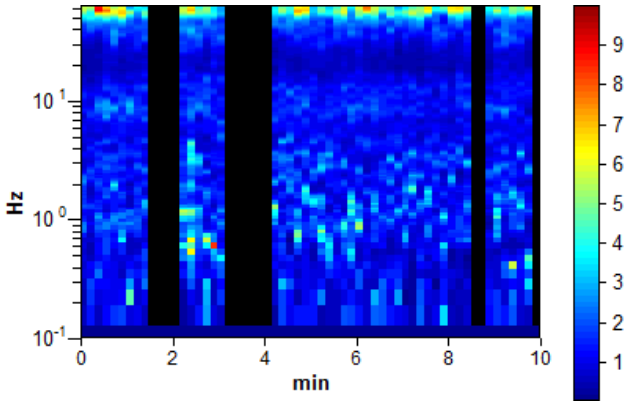
T 27 VAGGIO

Instrument: TR-0007-01-05
Start recording: 28/05/12 16:19:32 End recording: 28/05/12 16:29:32
Channel labels: NORTH SOUTH; EAST WEST ; UP DOWN
GPS data not available
Trace length: 0h10'00''. Analyzed 78% trace (manual window selection)
Sampling frequency: 128 Hz
Window size: 10 s
Smoothing window: Triangular window
Smoothing: 10%

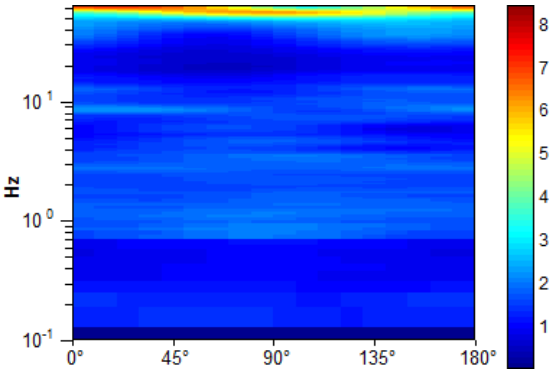
HORIZONTAL TO VERTICAL SPECTRAL RATIO



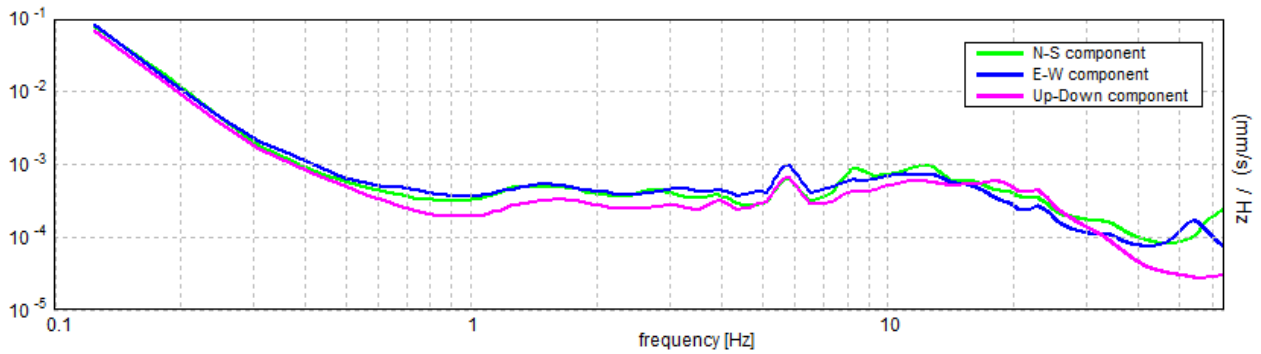
H/V TIME HISTORY



DIRECTIONAL H/V



SINGLE COMPONENT SPECTRA



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

Max. H/V at 57.25 ± 0.34 Hz (in the range 0.0 - 64.0 Hz).

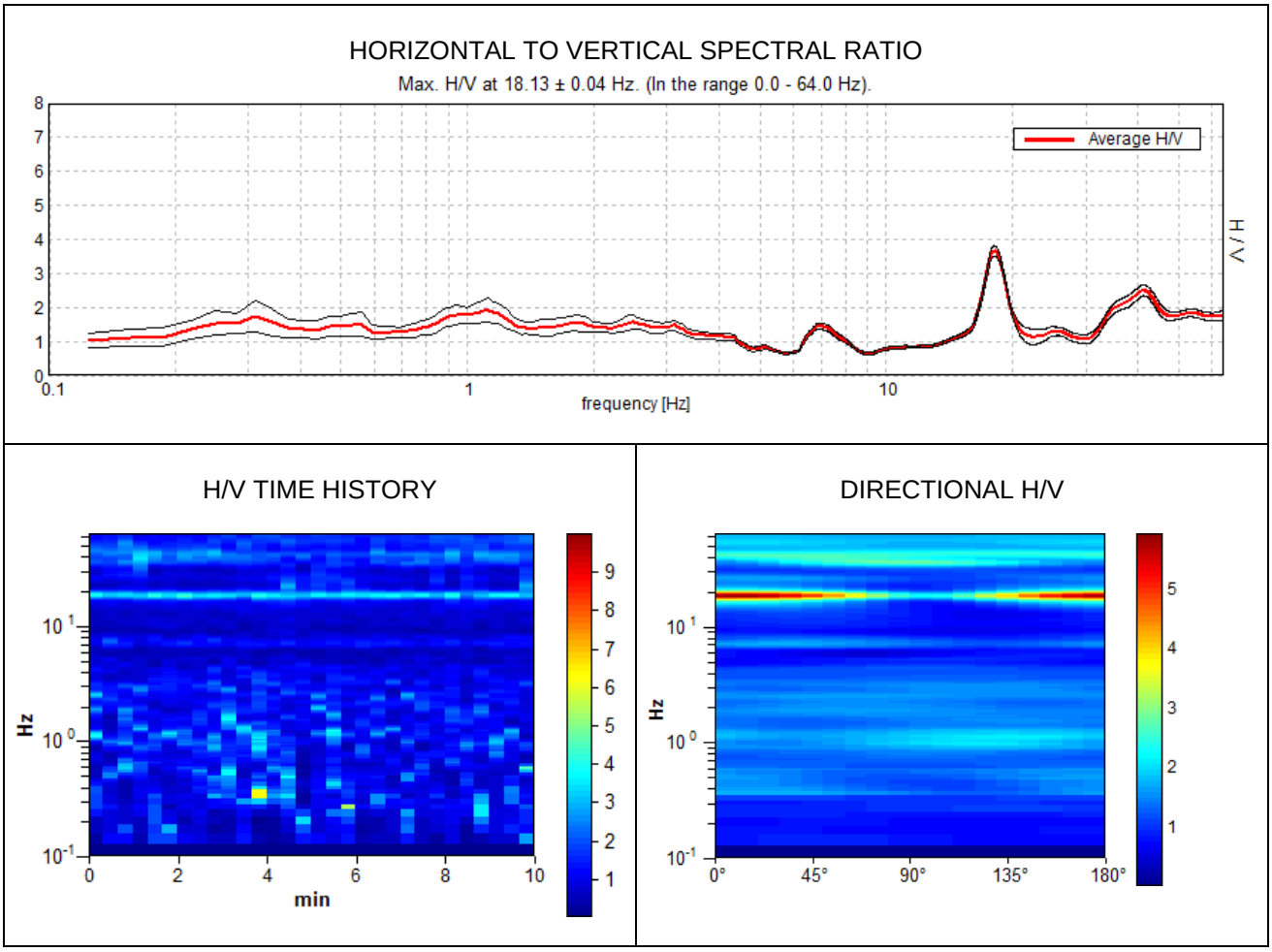
Criteria for a reliable HVSR curve [All 3 should be fulfilled]			
$f_0 > 10 / L_w$	57.25 > 1.00	OK	
$n_c(f_0) > 200$	26907.5 > 200	OK	
$\sigma_A(f) < 2$ for $0.5f_0 < f < 2f_0$ if $f_0 > 0.5$Hz **$\sigma_A(f) < 3$ for $0.5f_0 < f < 2f_0$ if $f_0 < 0.5$Hz**	Exceeded 0 out of 567 times	OK	
Criteria for a clear HVSR peak [At least 5 out of 6 should be fulfilled]			
Exists f^- in $[f_0/4, f_0]$ | $A_{H/V}(f^-) < A_0 / 2$	47.0 Hz	OK	
Exists f^+ in $[f_0, 4f_0]$ | $A_{H/V}(f^+) < A_0 / 2$			NO
$A_0 > 2$	5.21 > 2	OK	
$f_{peak}[A_{H/V}(f) \pm \sigma_A(f)] = f_0 \pm 5\%$	|0.00288| < 0.05	OK	
$\sigma_f < \varepsilon(f_0)$	0.16494 < 2.8625	OK	
$\sigma_A(f_0) < \theta(f_0)$	0.1933 < 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
$\sigma_{logH/V}(f)$	standard deviation of log $A_{H/V}(f)$ curve
$\theta(f_0)$	threshold value for the stability condition $\sigma_A(f) < \theta(f_0)$

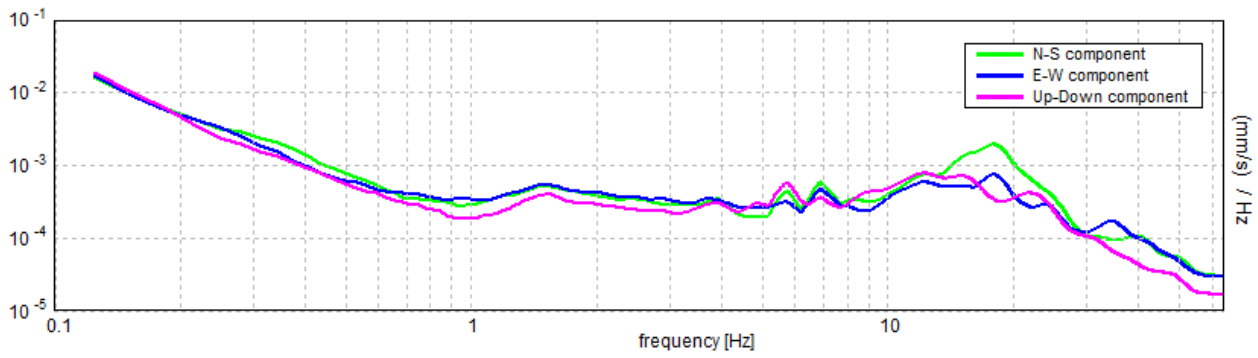
Threshold values for σ_f and $\sigma_A(f_0)$					
Freq.range [Hz]	< 0.2	0.2 – 0.5	0.5 – 1.0	1.0 – 2.0	> 2.0
$\varepsilon(f_0)$ [Hz]	0.25 f_0	0.2 f_0	0.15 f_0	0.10 f_0	0.05 f_0
$\theta(f_0)$ for $\sigma_A(f_0)$	3.0	2.5	2.0	1.78	1.58
Log $\theta(f_0)$ for $\sigma_{logH/V}(f_0)$	0.48	0.40	0.30	0.25	0.20

T 28 VAGGIO

Instrument: TR-0007-01-05
Start recording: 28/05/12 16:39:00 End recording: 28/05/12 16:49:01
Channel labels: NORTH SOUTH; EAST WEST ; UP DOWN
GPS data not available
Trace length: 0h10'00''. Analysis performed on the entire trace.
Sampling frequency: 128 Hz
Window size: 20 s
Smoothing window: Triangular window
Smoothing: 10%



SINGLE COMPONENT SPECTRA



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

Max. H/V at 18.13 ± 0.04 Hz (in the range 0.0 - 64.0 Hz).

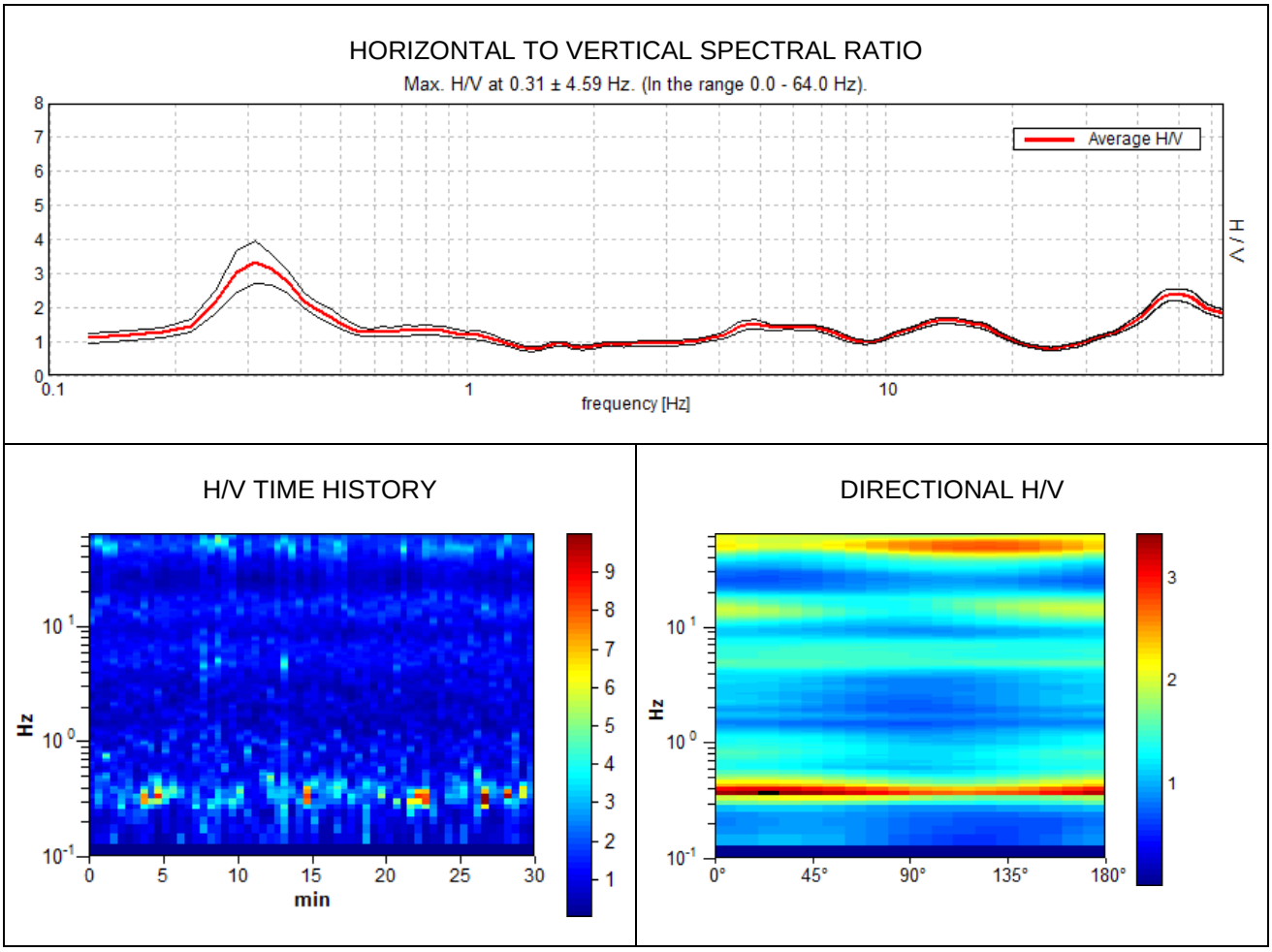
Criteria for a reliable HVSR curve [All 3 should be fulfilled]			
$f_0 > 10 / L_w$	18.13 > 0.50	OK	
$n_c(f_0) > 200$	10875.0 > 200	OK	
$\sigma_A(f) < 2$ for $0.5f_0 < f < 2f_0$ if $f_0 > 0.5$Hz **$\sigma_A(f) < 3$ for $0.5f_0 < f < 2f_0$ if $f_0 < 0.5$Hz**	Exceeded 0 out of 871 times	OK	
Criteria for a clear HVSR peak [At least 5 out of 6 should be fulfilled]			
Exists f^- in $[f_0/4, f_0]$ | $A_{H/V}(f^-) < A_0 / 2$	16.531 Hz	OK	
Exists f^+ in $[f_0, 4f_0]$ | $A_{H/V}(f^+) < A_0 / 2$	20.063 Hz	OK	
$A_0 > 2$	3.67 > 2	OK	
$f_{peak}[A_{H/V}(f) \pm \sigma_A(f)] = f_0 \pm 5\%$	|0.00098| < 0.05	OK	
$\sigma_f < \varepsilon(f_0)$	0.0178 < 0.90625	OK	
$\sigma_A(f_0) < \theta(f_0)$	0.0768 < 1.58	OK	

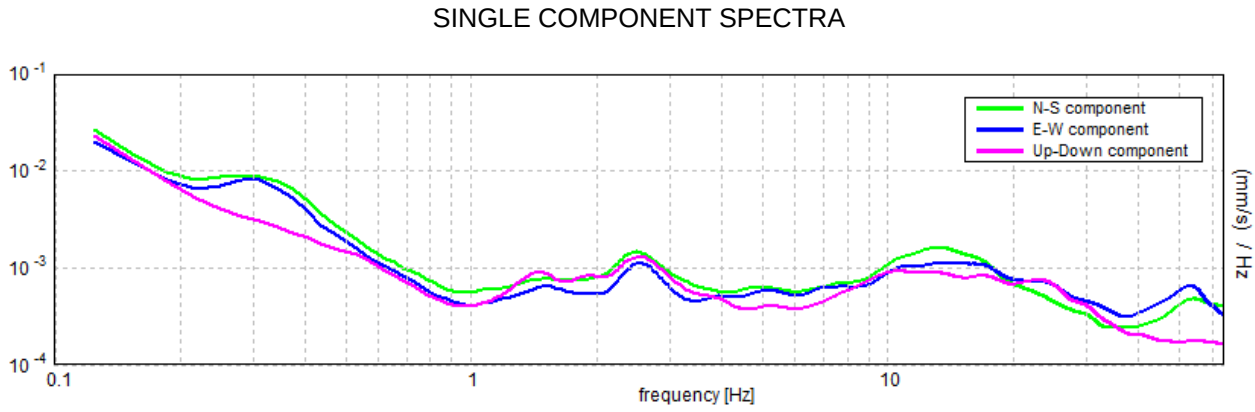
L_w	window length
n_w	number of windows used in the analysis
$n_c = L_w n_w f_0$	number of significant cycles
f	current frequency
f_0	H/V peak frequency
σ_f	standard deviation of H/V peak frequency
$\varepsilon(f_0)$	threshold value for the stability condition $\sigma_f < \varepsilon(f_0)$
A_0	H/V peak 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
$\sigma_{logH/V}(f)$	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 $\sigma_{logH/V}(f_0)$	0.48	0.40	0.30	0.25	0.20

T 34 VAGGIO

Instrument: TRS-0004/00-06
Start recording: 04/06/12 17:25:25 End recording: 04/06/12 17:55:26
Channel labels: NORTH SOUTH; EAST WEST ; UP DOWN
GPS data not available
Trace length: 0h30'00''. Analysis performed on the entire trace.
Sampling frequency: 128 Hz
Window size: 30 s
Smoothing window: Triangular window
Smoothing: 10%





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

Max. H/V at 0.31 ± 4.59 Hz (in the range 0.0 - 64.0 Hz).

Criteria for a reliable HVSR curve [All 3 should be fulfilled]			
$f_0 > 10 / L_w$	0.31 > 0.33		**NO**
$n_c(f_0) > 200$	562.5 > 200	**OK**	
$\sigma_A(f) < 2$ for $0.5f_0 < f < 2f_0$ if $f_0 > 0.5$Hz **$\sigma_A(f) < 3$ for $0.5f_0 < f < 2f_0$ if $f_0 < 0.5$Hz**	Exceeded 0 out of 16 times	**OK**	
Criteria for a clear HVSR peak [At least 5 out of 6 should be fulfilled]			
Exists f^- in $[f_0/4, f_0]$ | $A_{H/V}(f^-) < A_0 / 2$	0.219 Hz	**OK**	
Exists f^+ in $[f_0, 4f_0]$ | $A_{H/V}(f^+) < A_0 / 2$	0.5 Hz	**OK**	
$A_0 > 2$	3.33 > 2	**OK**	
$f_{peak}[A_{H/V}(f) \pm \sigma_A(f)] = f_0 \pm 5\%$	|7.28064| < 0.05		**NO**
$\sigma_f < \varepsilon(f_0)$	2.2752 < 0.0625		**NO**
$\sigma_A(f_0) < \theta(f_0)$	0.3075 < 2.5	**OK**	

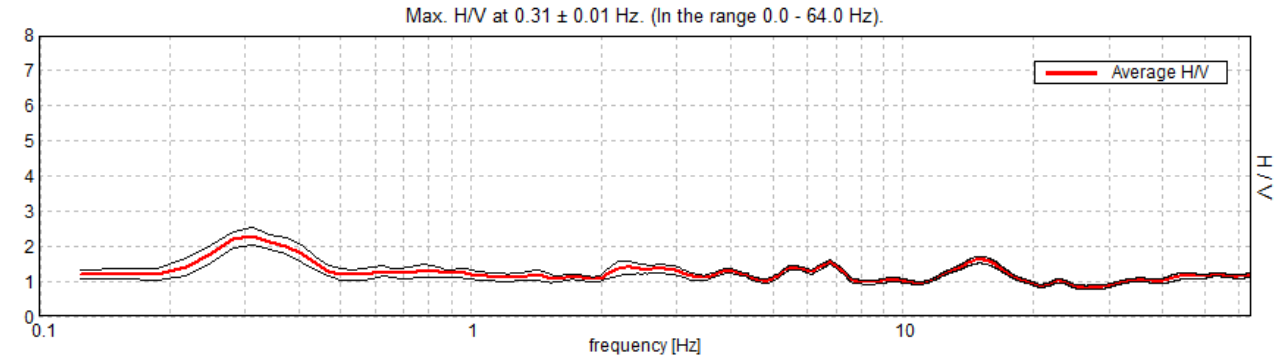
L_w	window length
n_w	number of windows used in the analysis
$n_c = L_w n_w f_0$	number of significant cycles
f	current frequency
f_0	H/V peak frequency
σ_f	standard deviation of H/V peak frequency
$\varepsilon(f_0)$	threshold value for the stability condition $\sigma_f < \varepsilon(f_0)$
A_0	H/V peak 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
$\sigma_{logH/V}(f)$	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 $\sigma_{logH/V}(f_0)$	0.48	0.40	0.30	0.25	0.20

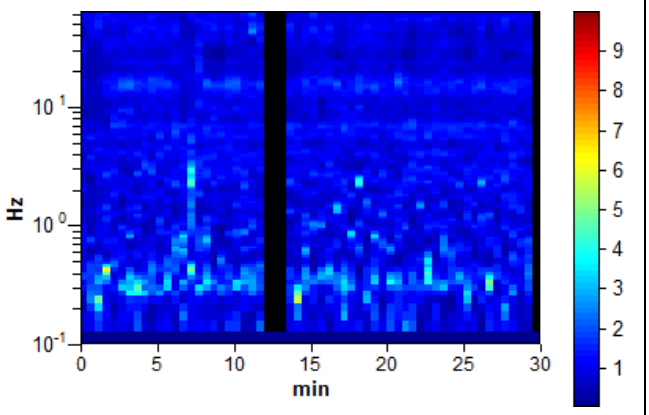
T 35 VAGGIO

Instrument: TRS-0004/00-06
Start recording: 04/06/12 18:11:12 End recording: 04/06/12 18:41:13
Channel labels: NORTH SOUTH; EAST WEST ; UP DOWN
GPS data not available
Trace length: 0h30'00". Analyzed 93% trace (manual window selection)
Sampling frequency: 128 Hz
Window size: 30 s
Smoothing window: Triangular window
Smoothing: 10%

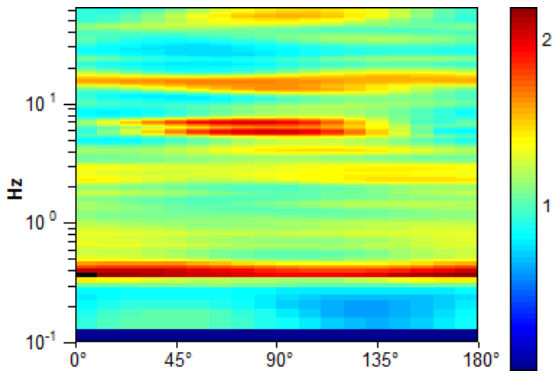
HORIZONTAL TO VERTICAL SPECTRAL RATIO



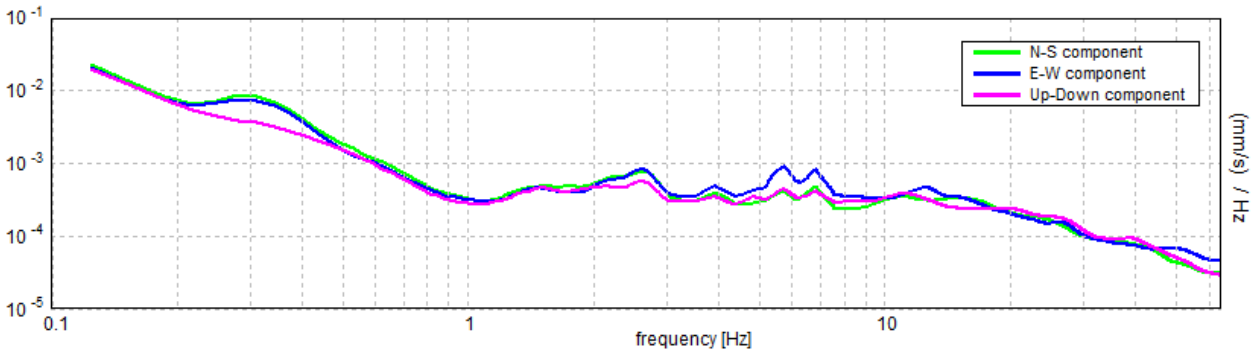
H/V TIME HISTORY



DIRECTIONAL H/V



SINGLE COMPONENT SPECTRA



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

Max. H/V at 0.31 ± 0.01 Hz (in the range 0.0 - 64.0 Hz).

Criteria for a reliable HVSR curve [All 3 should be fulfilled]			
$f_0 > 10 / L_w$	0.31 > 0.33		**NO**
$n_c(f_0) > 200$	525.0 > 200	**OK**	
$\sigma_A(f) < 2$ for $0.5f_0 < f < 2f_0$ if $f_0 > 0.5$Hz **$\sigma_A(f) < 3$ for $0.5f_0 < f < 2f_0$ if $f_0 < 0.5$Hz**	Exceeded 0 out of 16 times	**OK**	
Criteria for a clear HVSR peak [At least 5 out of 6 should be fulfilled]			
Exists f^- in $[f_0/4, f_0]$ | $A_{H/V}(f^-) < A_0 / 2$	0.094 Hz	**OK**	
Exists f^+ in $[f_0, 4f_0]$ | $A_{H/V}(f^+) < A_0 / 2$	1.094 Hz	**OK**	
$A_0 > 2$	2.29 > 2	**OK**	
$f_{peak}[A_{H/V}(f) \pm \sigma_A(f)] = f_0 \pm 5\%$	|0.01546| < 0.05	**OK**	
$\sigma_f < \varepsilon(f_0)$	0.00483 < 0.0625	**OK**	
$\sigma_A(f_0) < \theta(f_0)$	0.122 < 2.5	**OK**	

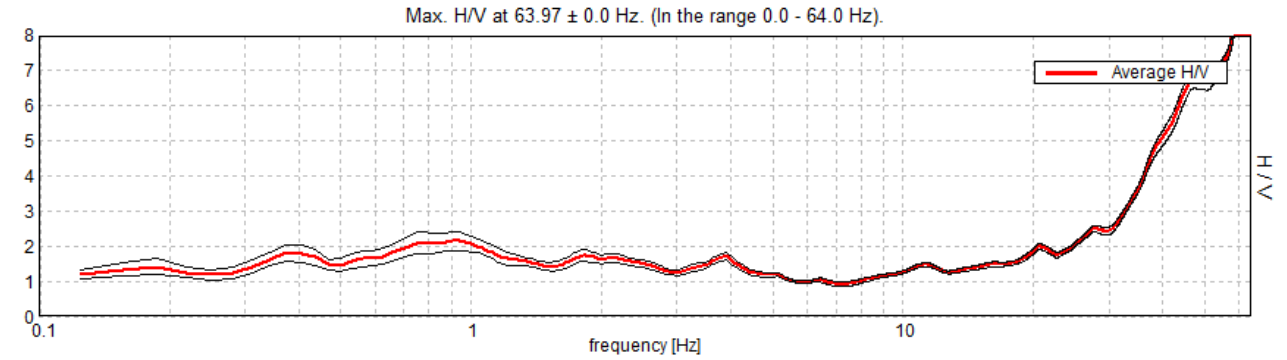
L_w	window length
n_w	number of windows used in the analysis
$n_c = L_w n_w f_0$	number of significant cycles
f	current frequency
f_0	H/V peak frequency
σ_f	standard deviation of H/V peak frequency
$\varepsilon(f_0)$	threshold value for the stability condition $\sigma_f < \varepsilon(f_0)$
A_0	H/V peak 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
$\sigma_{logH/V}(f)$	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 $\sigma_{logH/V}(f_0)$	0.48	0.40	0.30	0.25	0.20

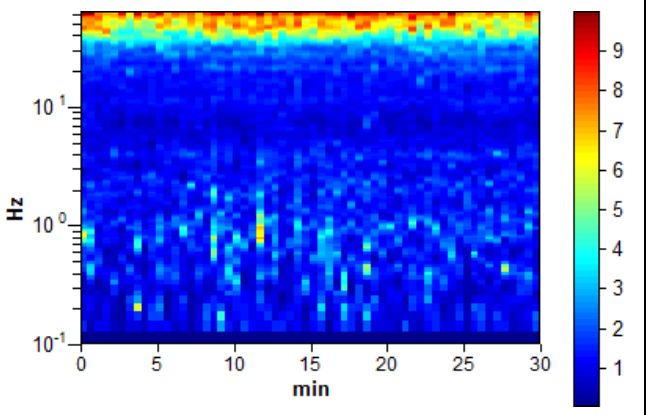
T 53 VAGGIO

Instrument: TR-0007-01-05
Start recording: 11/07/12 14:53:49 End recording: 11/07/12 15:23:50
Channel labels: NORTH SOUTH; EAST WEST ; UP DOWN
GPS data not available
Trace length: 0h30'00". Analysis performed on the entire trace.
Sampling frequency: 128 Hz
Window size: 30 s
Smoothing window: Triangular window
Smoothing: 10%

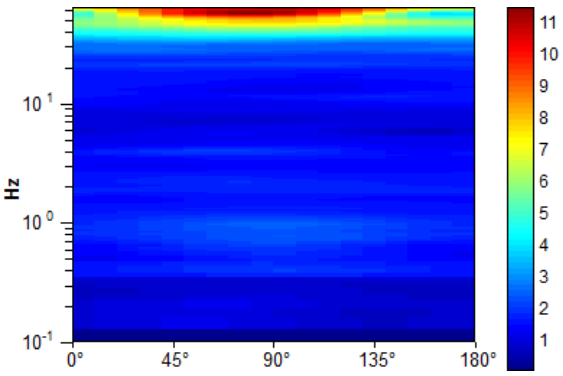
HORIZONTAL TO VERTICAL SPECTRAL RATIO



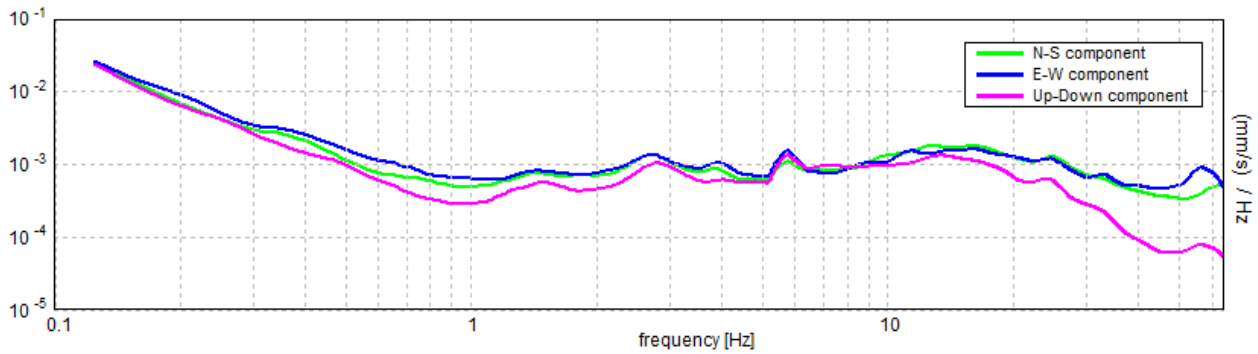
H/V TIME HISTORY



DIRECTIONAL H/V



SINGLE COMPONENT SPECTRA



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

Max. H/V at 63.97 ± 0.0 Hz (in the range 0.0 - 64.0 Hz).

Criteria for a reliable HVSR curve [All 3 should be fulfilled]			
$f_0 > 10 / L_w$	63.97 > 0.33	OK	
$n_c(f_0) > 200$	115143.8 > 200	OK	
$\sigma_A(f) < 2$ for $0.5f_0 < f < 2f_0$ if $f_0 > 0.5$Hz **$\sigma_A(f) < 3$ for $0.5f_0 < f < 2f_0$ if $f_0 < 0.5$Hz**	Exceeded 0 out of 1026 times	OK	
Criteria for a clear HVSR peak [At least 5 out of 6 should be fulfilled]			
Exists f^- in $[f_0/4, f_0]$ | $A_{H/V}(f^-) < A_0 / 2$	38.875 Hz	OK	
Exists f^+ in $[f_0, 4f_0]$ | $A_{H/V}(f^+) < A_0 / 2$			NO
$A_0 > 2$	9.77 > 2	OK	
$f_{peak}[A_{H/V}(f) \pm \sigma_A(f)] = f_0 \pm 5\%$	|0.0| < 0.05	OK	
$\sigma_f < \varepsilon(f_0)$	0.0 < 3.19844	OK	
$\sigma_A(f_0) < \theta(f_0)$	0.2724 < 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
$\sigma_{logH/V}(f)$	standard deviation of log $A_{H/V}(f)$ curve
$\theta(f_0)$	threshold value for the stability condition $\sigma_A(f) < \theta(f_0)$

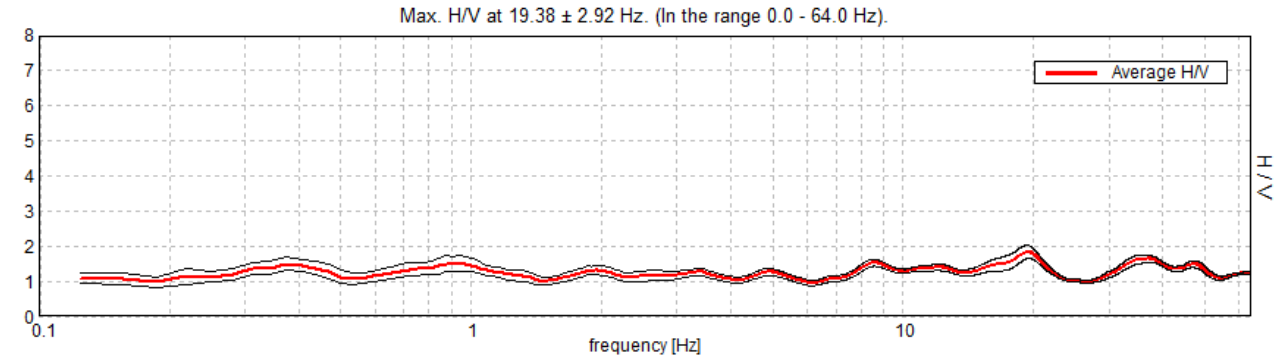
Threshold values for σ_f and $\sigma_A(f_0)$					
Freq.range [Hz]	< 0.2	0.2 – 0.5	0.5 – 1.0	1.0 – 2.0	> 2.0
$\varepsilon(f_0)$ [Hz]	0.25 f_0	0.2 f_0	0.15 f_0	0.10 f_0	0.05 f_0
$\theta(f_0)$ for $\sigma_A(f_0)$	3.0	2.5	2.0	1.78	1.58
Log $\theta(f_0)$ for $\sigma_{logH/V}(f_0)$	0.48	0.40	0.30	0.25	0.20

Misure HVSR Faella

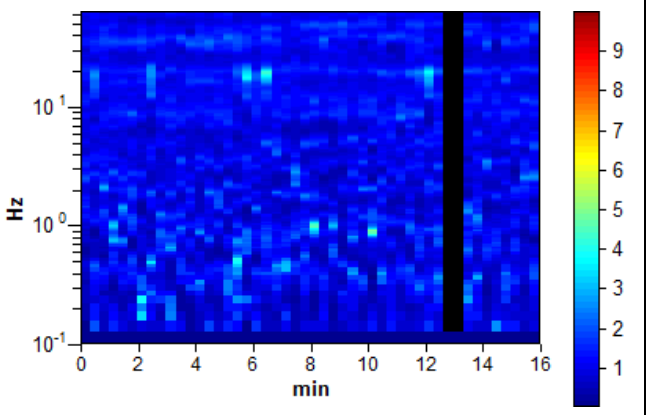
T 1 FAELLA

Instrument: TRS-0004/00-06
Start recording: 18/05/12 11:18:51 End recording: 18/05/12 11:34:52
Channel labels: NORTH SOUTH; EAST WEST ; UP DOWN
GPS data not available
Trace length: 0h16'00". Analyzed 96% trace (manual window selection)
Sampling frequency: 128 Hz
Window size: 20 s
Smoothing window: Triangular window
Smoothing: 10%

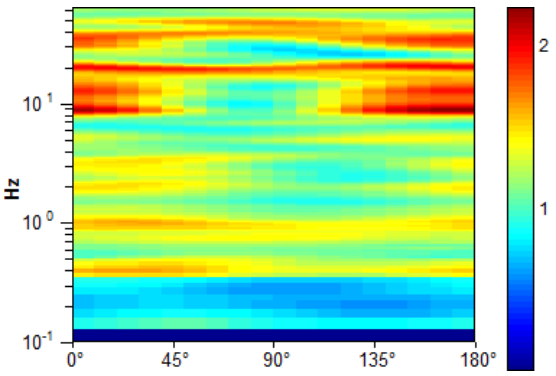
HORIZONTAL TO VERTICAL SPECTRAL RATIO



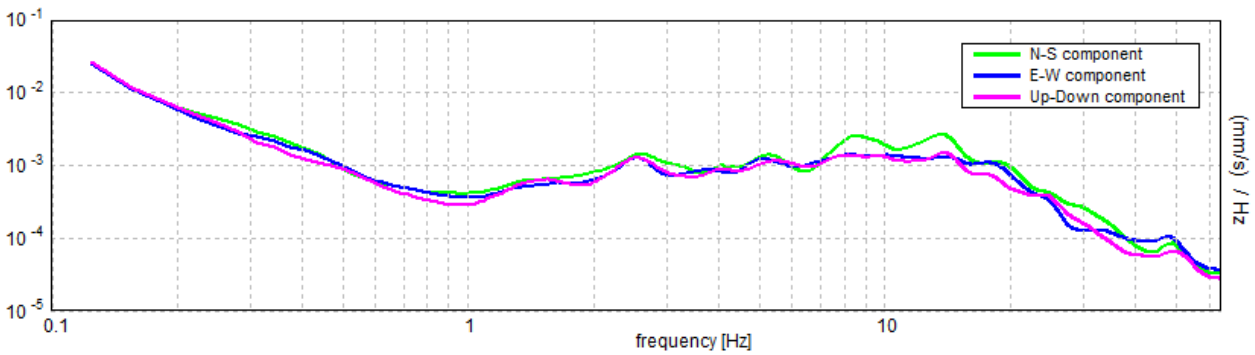
H/V TIME HISTORY



DIRECTIONAL H/V



SINGLE COMPONENT SPECTRA



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

Max. H/V at 19.38 ± 2.92 Hz (in the range 0.0 - 64.0 Hz).

Criteria for a reliable HVSR curve [All 3 should be fulfilled]			
$f_0 > 10 / L_w$	19.38 > 0.50	OK	
$n_c(f_0) > 200$	17825.0 > 200	OK	
$\sigma_A(f) < 2$ for $0.5f_0 < f < 2f_0$ if $f_0 > 0.5$Hz **$\sigma_A(f) < 3$ for $0.5f_0 < f < 2f_0$ if $f_0 < 0.5$Hz**	Exceeded 0 out of 931 times	OK	
Criteria for a clear HVSR peak [At least 5 out of 6 should be fulfilled]			
Exists f^- in $[f_0/4, f_0]$ | $A_{H/V}(f^-) < A_0 / 2$			NO
Exists f^+ in $[f_0, 4f_0]$ | $A_{H/V}(f^+) < A_0 / 2$			NO
$A_0 > 2$	1.84 > 2		NO
$f_{peak}[A_{H/V}(f) \pm \sigma_A(f)] = f_0 \pm 5\%$	|0.07385| < 0.05		NO
$\sigma_f < \varepsilon(f_0)$	1.43091 < 0.96875		NO
$\sigma_A(f_0) < \theta(f_0)$	0.0944 < 1.58	OK	

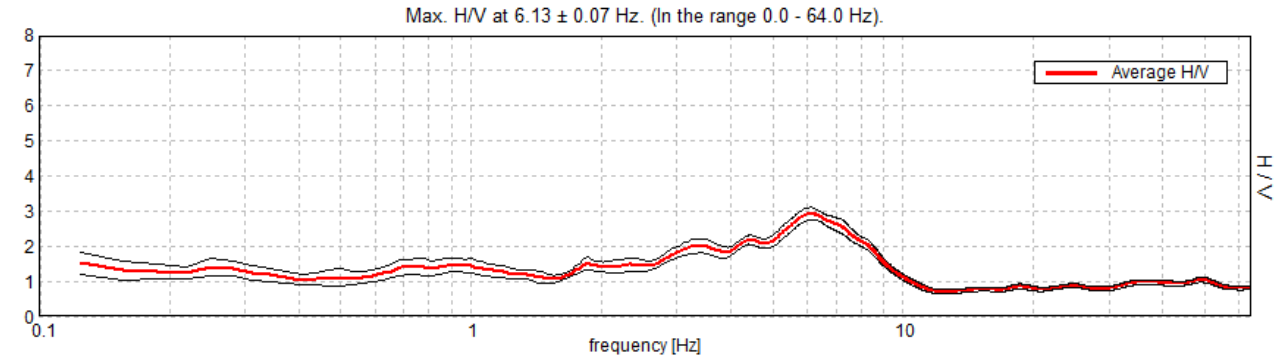
L_w	window length
n_w	number of windows used in the analysis
$n_c = L_w n_w f_0$	number of significant cycles
f	current frequency
f_0	H/V peak frequency
σ_f	standard deviation of H/V peak frequency
$\varepsilon(f_0)$	threshold value for the stability condition $\sigma_f < \varepsilon(f_0)$
A_0	H/V peak 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
$\sigma_{logH/V}(f)$	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 $\sigma_{logH/V}(f_0)$	0.48	0.40	0.30	0.25	0.20

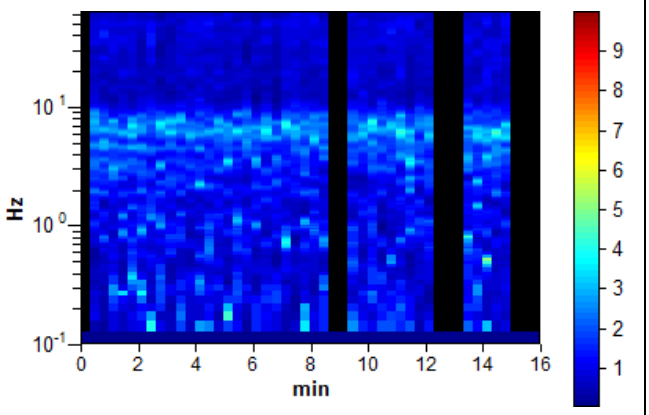
T 2 FAELLA

Instrument: TRS-0004/00-06
Start recording: 18/05/12 11:40:48 End recording: 18/05/12 11:56:49
Channel labels: NORTH SOUTH; EAST WEST ; UP DOWN
GPS data not available
Trace length: 0h16'00". Analyzed 81% trace (manual window selection)
Sampling frequency: 128 Hz
Window size: 20 s
Smoothing window: Triangular window
Smoothing: 10%

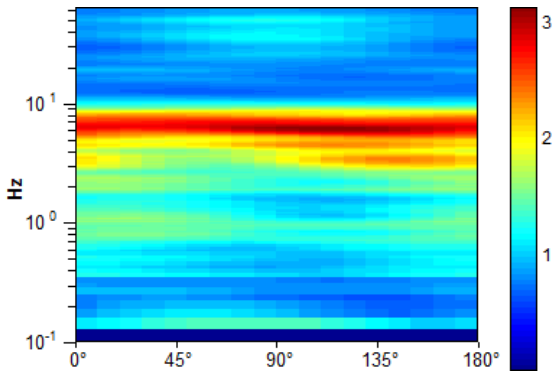
HORIZONTAL TO VERTICAL SPECTRAL RATIO



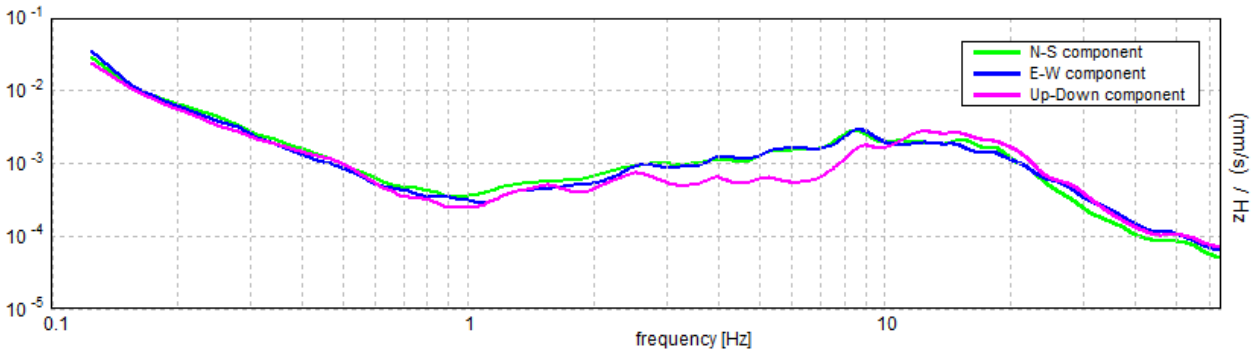
H/V TIME HISTORY



DIRECTIONAL H/V



SINGLE COMPONENT SPECTRA



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

Max. H/V at 6.13 ± 0.07 Hz (in the range 0.0 - 64.0 Hz).

Criteria for a reliable HVSR curve [All 3 should be fulfilled]			
$f_0 > 10 / L_w$	6.13 > 0.50	OK	
$n_c(f_0) > 200$	4777.5 > 200	OK	
$\sigma_A(f) < 2$ for $0.5f_0 < f < 2f_0$ if $f_0 > 0.5$Hz **$\sigma_A(f) < 3$ for $0.5f_0 < f < 2f_0$ if $f_0 < 0.5$Hz**	Exceeded 0 out of 295 times	OK	
Criteria for a clear HVSR peak [At least 5 out of 6 should be fulfilled]			
Exists f^- in $[f_0/4, f_0]$ | $A_{H/V}(f^-) < A_0 / 2$	2.625 Hz	OK	
Exists f^+ in $[f_0, 4f_0]$ | $A_{H/V}(f^+) < A_0 / 2$	9.188 Hz	OK	
$A_0 > 2$	2.93 > 2	OK	
$f_{peak}[A_{H/V}(f) \pm \sigma_A(f)] = f_0 \pm 5\%$	|0.00557| < 0.05	OK	
$\sigma_f < \varepsilon(f_0)$	0.03413 < 0.30625	OK	
$\sigma_A(f_0) < \theta(f_0)$	0.0831 < 1.58	OK	

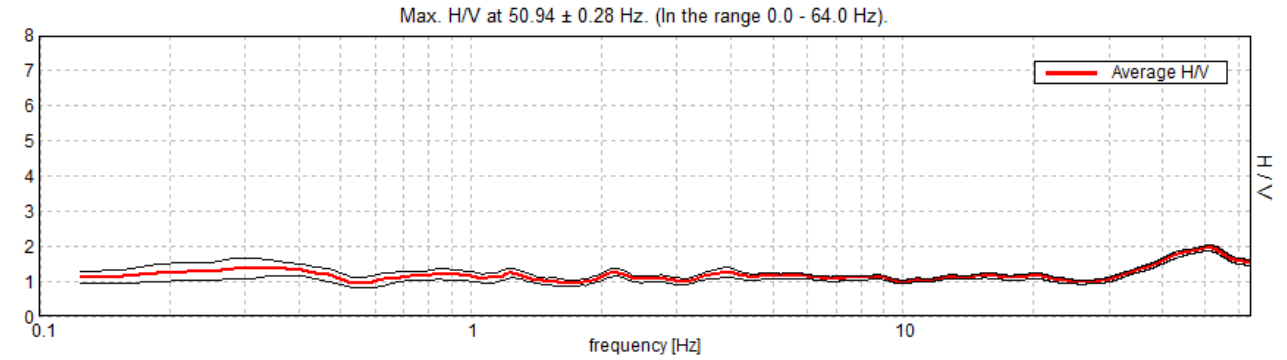
L_w	window length
n_w	number of windows used in the analysis
$n_c = L_w n_w f_0$	number of significant cycles
f	current frequency
f_0	H/V peak frequency
σ_f	standard deviation of H/V peak frequency
$\varepsilon(f_0)$	threshold value for the stability condition $\sigma_f < \varepsilon(f_0)$
A_0	H/V peak 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
$\sigma_{logH/V}(f)$	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 $\sigma_{logH/V}(f_0)$	0.48	0.40	0.30	0.25	0.20

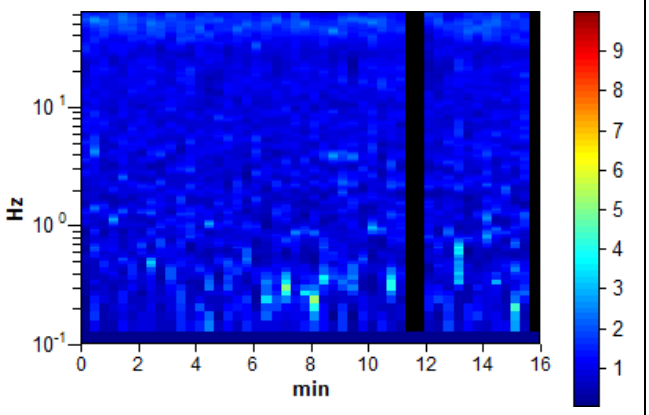
T 3 FAELLA

Instrument: TRS-0004/00-06
Start recording: 18/05/12 12:06:05 End recording: 18/05/12 12:22:06
Channel labels: NORTH SOUTH; EAST WEST ; UP DOWN
GPS data not available
Trace length: 0h16'00". Analyzed 94% trace (manual window selection)
Sampling frequency: 128 Hz
Window size: 20 s
Smoothing window: Triangular window
Smoothing: 10%

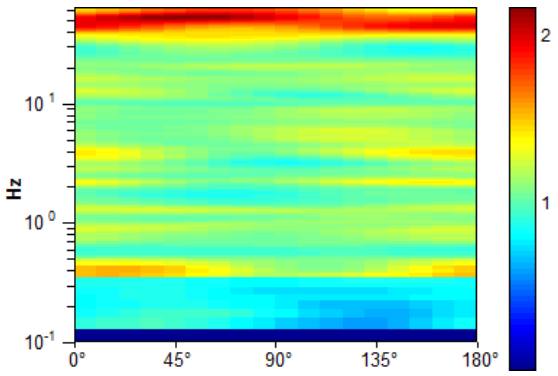
HORIZONTAL TO VERTICAL SPECTRAL RATIO



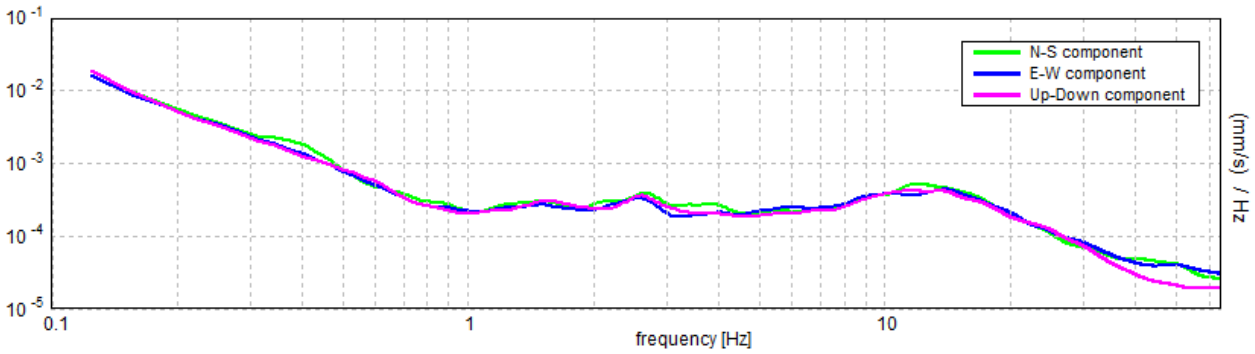
H/V TIME HISTORY



DIRECTIONAL H/V



SINGLE COMPONENT SPECTRA



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

Max. H/V at 50.94 ± 0.28 Hz (in the range 0.0 - 64.0 Hz).

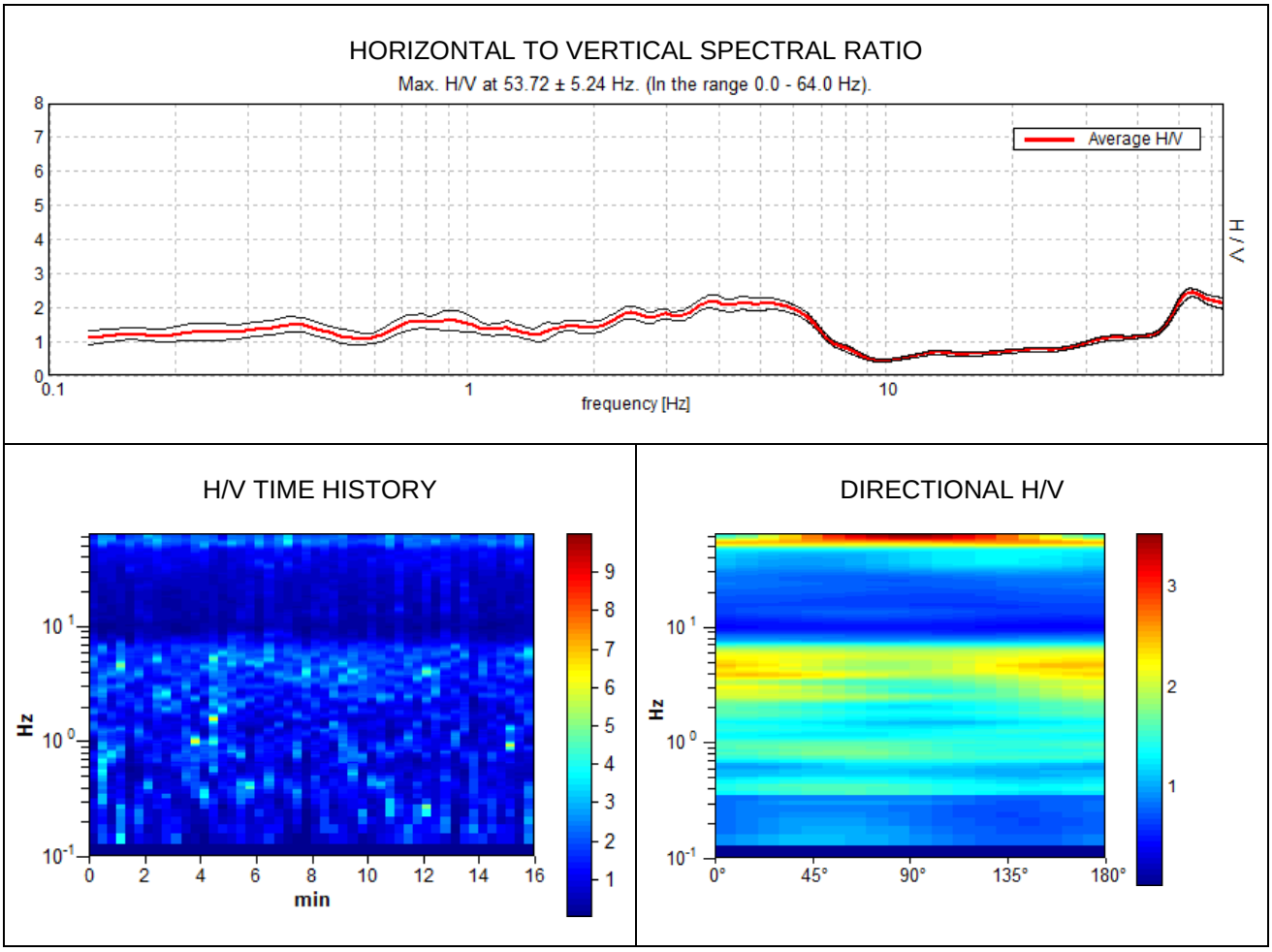
Criteria for a reliable HVSR curve [All 3 should be fulfilled]			
$f_0 > 10 / L_w$	50.94 > 0.50	OK	
$n_c(f_0) > 200$	45843.8 > 200	OK	
$\sigma_A(f) < 2$ for $0.5f_0 < f < 2f_0$ if $f_0 > 0.5$Hz **$\sigma_A(f) < 3$ for $0.5f_0 < f < 2f_0$ if $f_0 < 0.5$Hz**	Exceeded 0 out of 1234 times	OK	
Criteria for a clear HVSR peak [At least 5 out of 6 should be fulfilled]			
Exists f^- in $[f_0/4, f_0]$ | $A_{H/V}(f^-) < A_0 / 2$	26.344 Hz	OK	
Exists f^+ in $[f_0, 4f_0]$ | $A_{H/V}(f^+) < A_0 / 2$			NO
$A_0 > 2$	1.94 > 2		NO
$f_{peak}[A_{H/V}(f) \pm \sigma_A(f)] = f_0 \pm 5\%$	|0.00272| < 0.05	OK	
$\sigma_f < \varepsilon(f_0)$	0.13831 < 2.54688	OK	
$\sigma_A(f_0) < \theta(f_0)$	0.0401 < 1.58	OK	

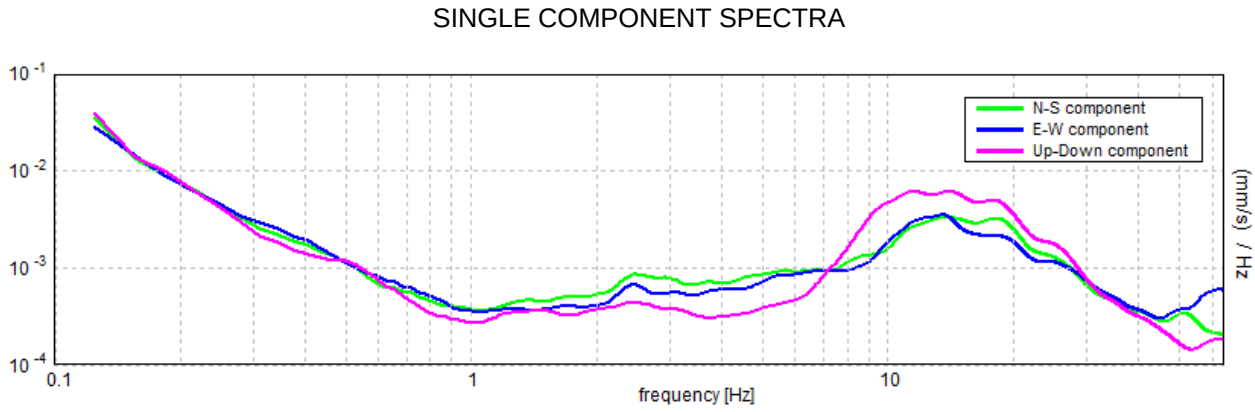
L_w	window length
n_w	number of windows used in the analysis
$n_c = L_w n_w f_0$	number of significant cycles
f	current frequency
f_0	H/V peak frequency
σ_f	standard deviation of H/V peak frequency
$\varepsilon(f_0)$	threshold value for the stability condition $\sigma_f < \varepsilon(f_0)$
A_0	H/V peak 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
$\sigma_{logH/V}(f)$	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 $\sigma_{logH/V}(f_0)$	0.48	0.40	0.30	0.25	0.20

T 4 FAELLA

Instrument: TRS-0004/00-06
Start recording: 18/05/12 12:29:37 End recording: 18/05/12 12:45:37
Channel labels: NORTH SOUTH; EAST WEST ; UP DOWN
GPS data not available
Trace length: 0h16'00". Analysis performed on the entire trace.
Sampling frequency: 128 Hz
Window size: 20 s
Smoothing window: Triangular window
Smoothing: 10%





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

Max. H/V at 53.72 ± 5.24 Hz (in the range 0.0 - 64.0 Hz).

Criteria for a reliable HVSR curve [All 3 should be fulfilled]			
$f_0 > 10 / L_w$	53.72 > 0.50	OK	
$n_c(f_0) > 200$	51570.0 > 200	OK	
$\sigma_A(f) < 2$ for $0.5f_0 < f < 2f_0$ if $f_0 > 0.5$Hz **$\sigma_A(f) < 3$ for $0.5f_0 < f < 2f_0$ if $f_0 < 0.5$Hz**	Exceeded 0 out of 1190 times	OK	
Criteria for a clear HVSR peak [At least 5 out of 6 should be fulfilled]			
Exists f^- in $[f_0/4, f_0]$ | $A_{H/V}(f^-) < A_0 / 2$	43.844 Hz	OK	
Exists f^+ in $[f_0, 4f_0]$ | $A_{H/V}(f^+) < A_0 / 2$			NO
$A_0 > 2$	2.43 > 2	OK	
$f_{peak}[A_{H/V}(f) \pm \sigma_A(f)] = f_0 \pm 5\%$	|0.04794| < 0.05	OK	
$\sigma_f < \varepsilon(f_0)$	2.57509 < 2.68594	OK	
$\sigma_A(f_0) < \theta(f_0)$	0.0611 < 1.58	OK	

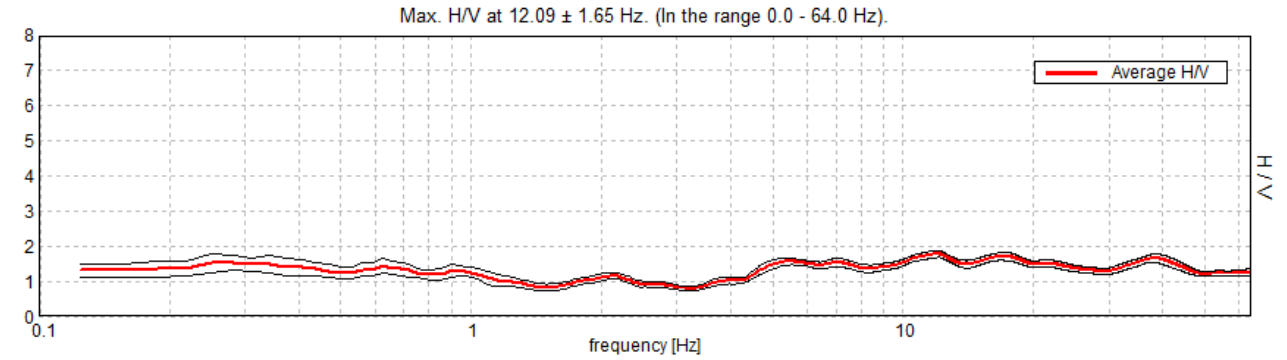
L_w	window length
n_w	number of windows used in the analysis
$n_c = L_w n_w f_0$	number of significant cycles
f	current frequency
f_0	H/V peak frequency
σ_f	standard deviation of H/V peak frequency
$\varepsilon(f_0)$	threshold value for the stability condition $\sigma_f < \varepsilon(f_0)$
A_0	H/V peak 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
$\sigma_{logH/V}(f)$	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 $\sigma_{logH/V}(f_0)$	0.48	0.40	0.30	0.25	0.20

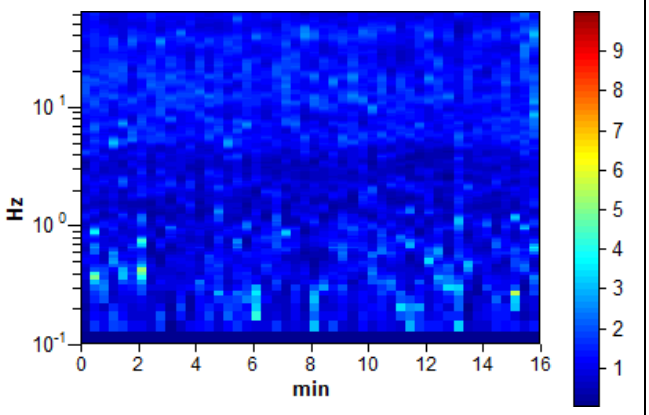
T 5 FAELLA

Instrument: TRS-0004/00-06
Start recording: 18/05/12 12:51:15 End recording: 18/05/12 13:07:16
Channel labels: NORTH SOUTH; EAST WEST ; UP DOWN
GPS data not available
Trace length: 0h16'00". Analysis performed on the entire trace.
Sampling frequency: 128 Hz
Window size: 20 s
Smoothing window: Triangular window
Smoothing: 10%

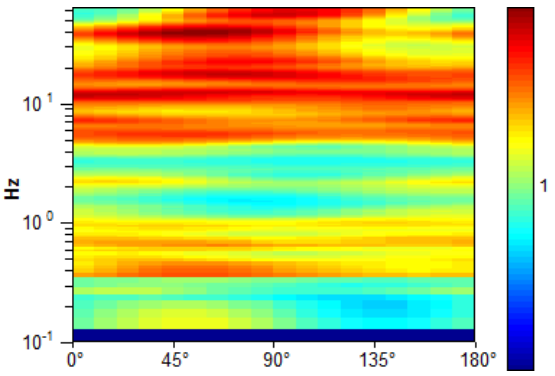
HORIZONTAL TO VERTICAL SPECTRAL RATIO



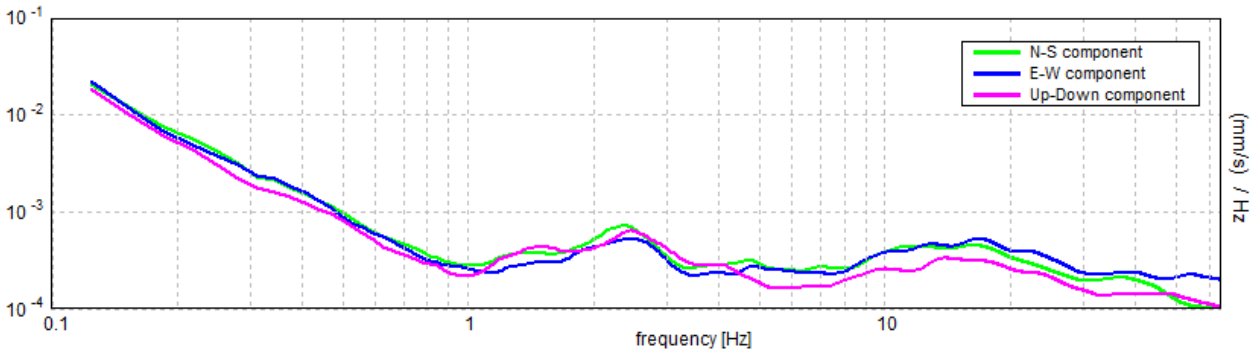
H/V TIME HISTORY



DIRECTIONAL H/V



SINGLE COMPONENT SPECTRA



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

Max. H/V at 12.09 ± 1.65 Hz (in the range 0.0 - 64.0 Hz).

Criteria for a reliable HVSR curve [All 3 should be fulfilled]			
$f_0 > 10 / L_w$	12.09 > 0.50	OK	
$n_c(f_0) > 200$	11610.0 > 200	OK	
$\sigma_A(f) < 2$ for $0.5f_0 < f < 2f_0$ if $f_0 > 0.5$Hz **$\sigma_A(f) < 3$ for $0.5f_0 < f < 2f_0$ if $f_0 < 0.5$Hz**	Exceeded 0 out of 582 times	OK	
Criteria for a clear HVSR peak [At least 5 out of 6 should be fulfilled]			
Exists f^- in $[f_0/4, f_0]$ | $A_{H/V}(f^-) < A_0 / 2$	3.5 Hz	OK	
Exists f^+ in $[f_0, 4f_0]$ | $A_{H/V}(f^+) < A_0 / 2$			NO
$A_0 > 2$	1.78 > 2		NO
$f_{peak}[A_{H/V}(f) \pm \sigma_A(f)] = f_0 \pm 5\%$	|0.0671| < 0.05		NO
$\sigma_f < \varepsilon(f_0)$	0.81152 < 0.60469		NO
$\sigma_A(f_0) < \theta(f_0)$	0.0486 < 1.58	OK	

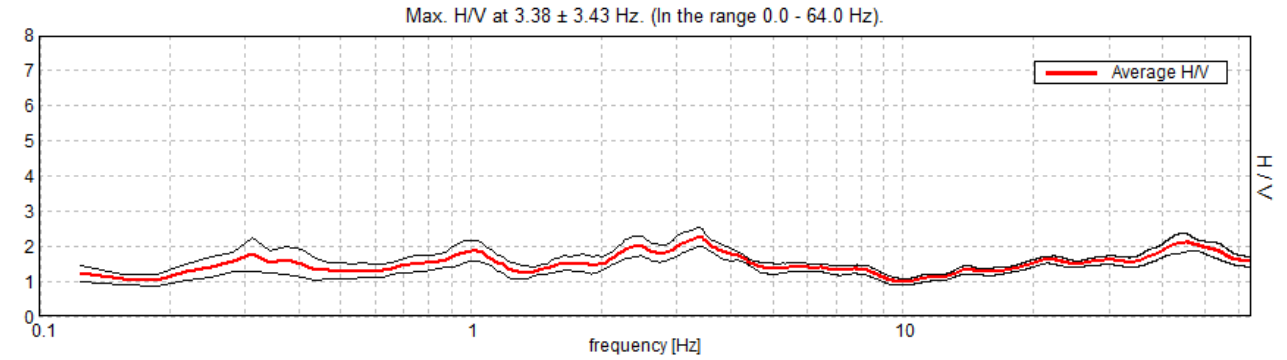
L_w	window length
n_w	number of windows used in the analysis
$n_c = L_w n_w f_0$	number of significant cycles
f	current frequency
f_0	H/V peak frequency
σ_f	standard deviation of H/V peak frequency
$\varepsilon(f_0)$	threshold value for the stability condition $\sigma_f < \varepsilon(f_0)$
A_0	H/V peak 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
$\sigma_{logH/V}(f)$	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 $\sigma_{logH/V}(f_0)$	0.48	0.40	0.30	0.25	0.20

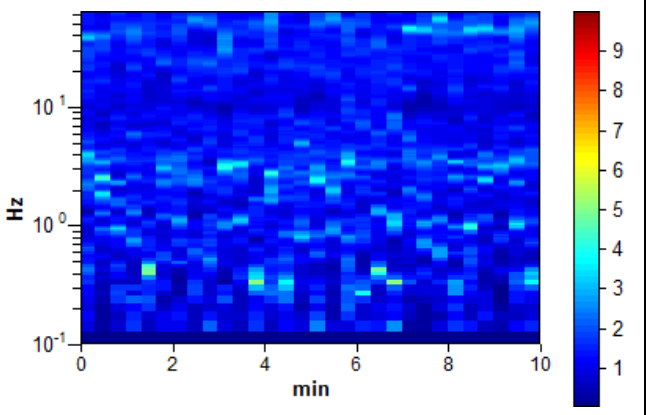
T 29 FAELLA

Instrument: TR-0007-01-05
Start recording: 28/05/12 17:29:41 End recording: 28/05/12 17:39:42
Channel labels: NORTH SOUTH; EAST WEST ; UP DOWN
GPS data not available
Trace length: 0h16'00". Analysis performed on the entire trace.
Sampling frequency: 128 Hz
Window size: 20 s
Smoothing window: Triangular window
Smoothing: 10%

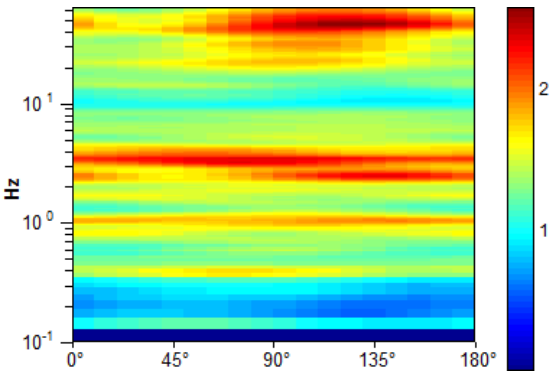
HORIZONTAL TO VERTICAL SPECTRAL RATIO



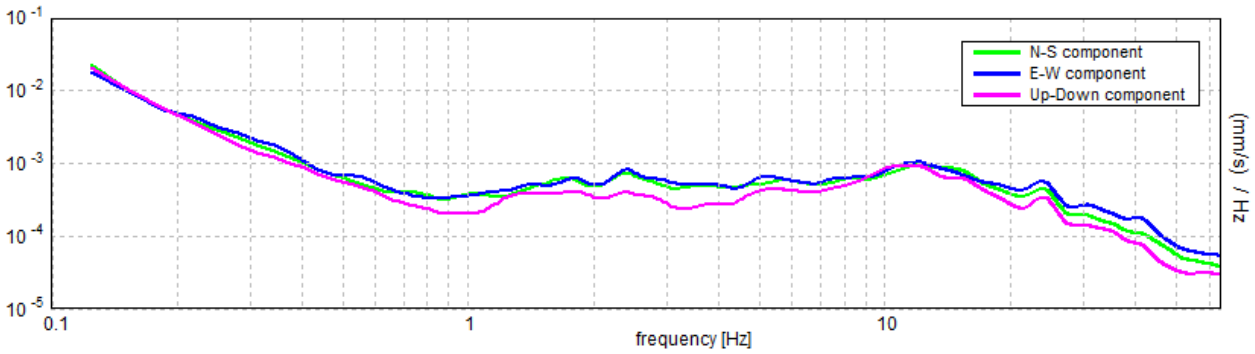
H/V TIME HISTORY



DIRECTIONAL H/V



SINGLE COMPONENT SPECTRA



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

Max. H/V at 3.38 ± 3.43 Hz (in the range 0.0 - 64.0 Hz).

Criteria for a reliable HVSR curve [All 3 should be fulfilled]			
$f_0 > 10 / L_w$	3.38 > 0.50	OK	
$n_c(f_0) > 200$	2025.0 > 200	OK	
$\sigma_A(f) < 2$ for $0.5f_0 < f < 2f_0$ if $f_0 > 0.5$Hz **$\sigma_A(f) < 3$ for $0.5f_0 < f < 2f_0$ if $f_0 < 0.5$Hz**	Exceeded 0 out of 163 times	OK	
Criteria for a clear HVSR peak [At least 5 out of 6 should be fulfilled]			
Exists f^- in $[f_0/4, f_0]$ | $A_{H/V}(f^-) < A_0 / 2$			NO
Exists f^+ in $[f_0, 4f_0]$ | $A_{H/V}(f^+) < A_0 / 2$	8.906 Hz	OK	
$A_0 > 2$	2.27 > 2	OK	
$f_{peak}[A_{H/V}(f) \pm \sigma_A(f)] = f_0 \pm 5\%$	|0.48835| < 0.05		NO
$\sigma_f < \varepsilon(f_0)$	1.64817 < 0.16875		NO
$\sigma_A(f_0) < \theta(f_0)$	0.1286 < 1.58	OK	

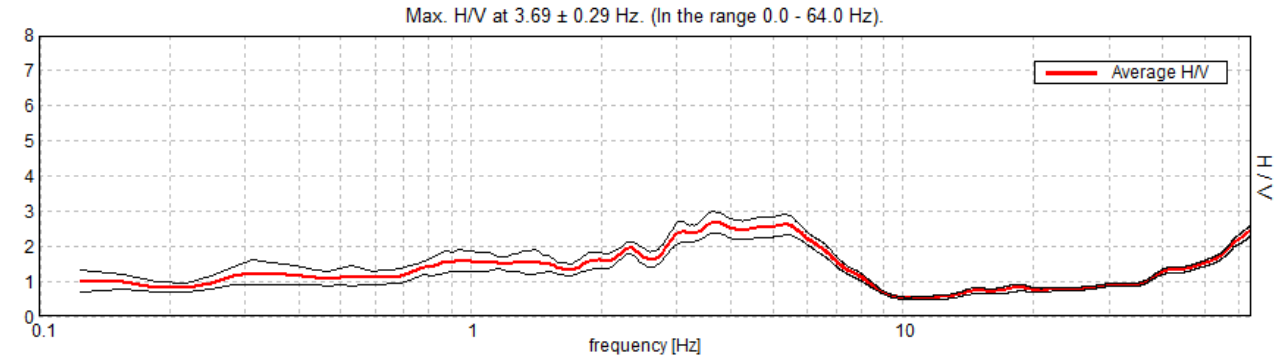
L_w	window length
n_w	number of windows used in the analysis
$n_c = L_w n_w f_0$	number of significant cycles
f	current frequency
f_0	H/V peak frequency
σ_f	standard deviation of H/V peak frequency
$\varepsilon(f_0)$	threshold value for the stability condition $\sigma_f < \varepsilon(f_0)$
A_0	H/V peak 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
$\sigma_{logH/V}(f)$	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 $\sigma_{logH/V}(f_0)$	0.48	0.40	0.30	0.25	0.20

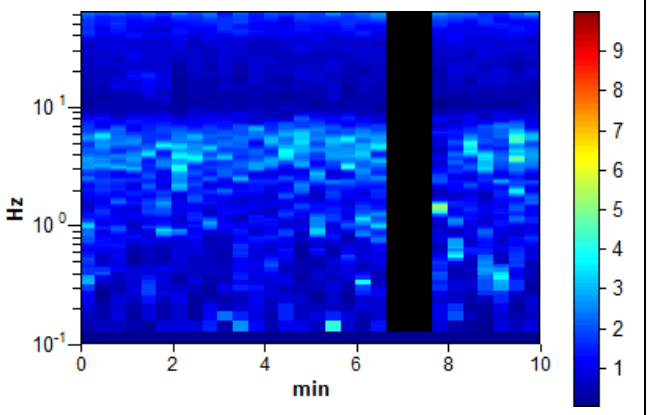
T 30 FAELLA

Instrument: TR-0007-01-05
Start recording: 28/05/12 17:44:56 End recording: 28/05/12 17:54:57
Channel labels: NORTH SOUTH; EAST WEST ; UP DOWN
GPS data not available
Trace length: 0h10'00''. Analyzed 90% trace (manual window selection)
Sampling frequency: 128 Hz
Window size: 20 s
Smoothing window: Triangular window
Smoothing: 10%

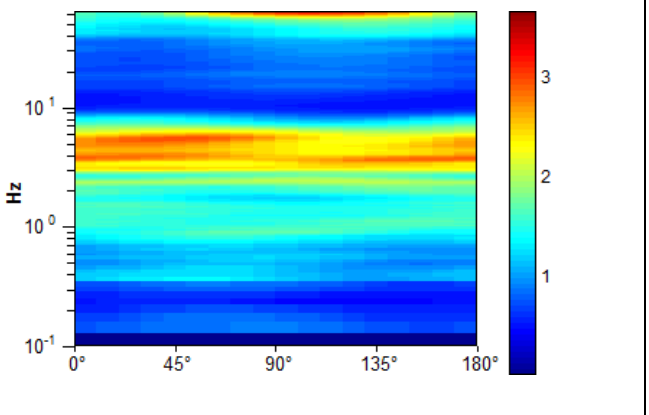
HORIZONTAL TO VERTICAL SPECTRAL RATIO



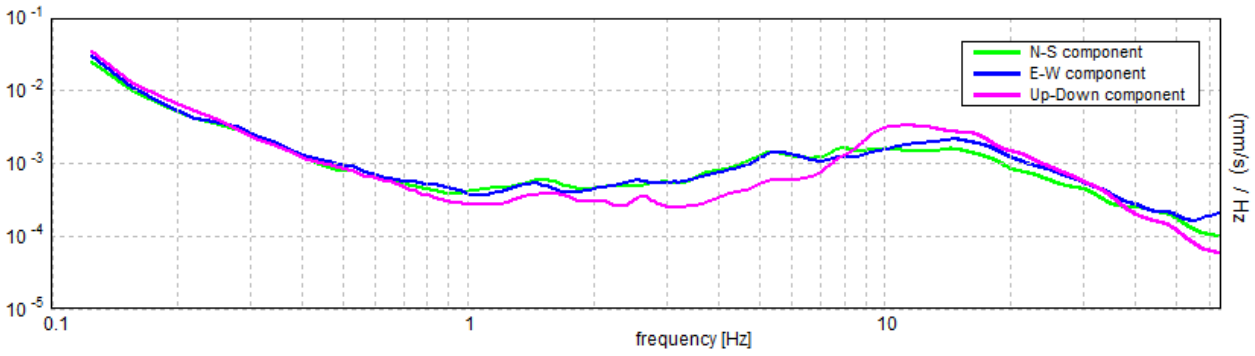
H/V TIME HISTORY



DIRECTIONAL H/V



SINGLE COMPONENT SPECTRA



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

Max. H/V at 3.69 ± 0.29 Hz (in the range 0.0 - 64.0 Hz).

Criteria for a reliable HVSR curve [All 3 should be fulfilled]			
$f_0 > 10 / L_w$	3.69 > 0.50	OK	
$n_c(f_0) > 200$	1991.3 > 200	OK	
$\sigma_A(f) < 2$ for $0.5f_0 < f < 2f_0$ if $f_0 > 0.5$Hz **$\sigma_A(f) < 3$ for $0.5f_0 < f < 2f_0$ if $f_0 < 0.5$Hz**	Exceeded 0 out of 178 times	OK	
Criteria for a clear HVSR peak [At least 5 out of 6 should be fulfilled]			
Exists f^- in $[f_0/4, f_0]$ | $A_{H/V}(f^-) < A_0 / 2$	1.719 Hz	OK	
Exists f^+ in $[f_0, 4f_0]$ | $A_{H/V}(f^+) < A_0 / 2$	7.438 Hz	OK	
$A_0 > 2$	2.67 > 2	OK	
$f_{peak}[A_{H/V}(f) \pm \sigma_A(f)] = f_0 \pm 5\%$	|0.03717| < 0.05	OK	
$\sigma_f < \varepsilon(f_0)$	0.13707 < 0.18438	OK	
$\sigma_A(f_0) < \theta(f_0)$	0.1413 < 1.58	OK	

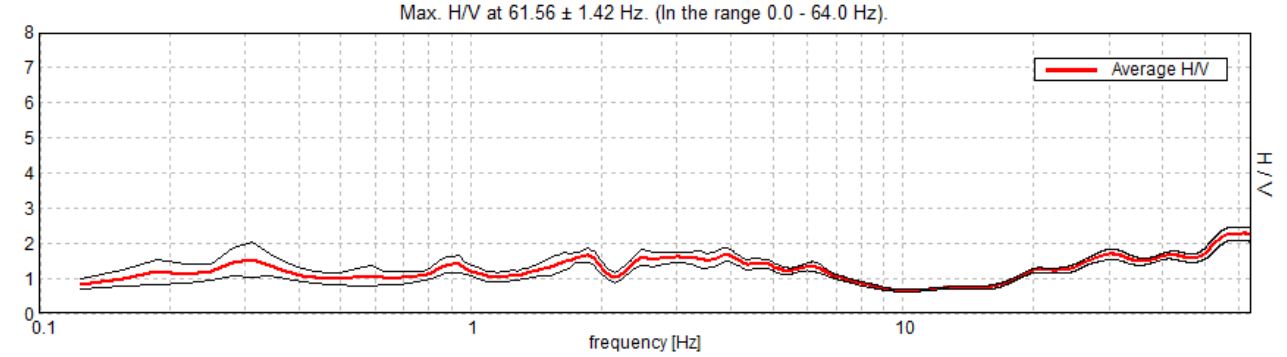
L_w	window length
n_w	number of windows used in the analysis
$n_c = L_w n_w f_0$	number of significant cycles
f	current frequency
f_0	H/V peak frequency
σ_f	standard deviation of H/V peak frequency
$\varepsilon(f_0)$	threshold value for the stability condition $\sigma_f < \varepsilon(f_0)$
A_0	H/V peak 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
$\sigma_{logH/V}(f)$	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 $\sigma_{logH/V}(f_0)$	0.48	0.40	0.30	0.25	0.20

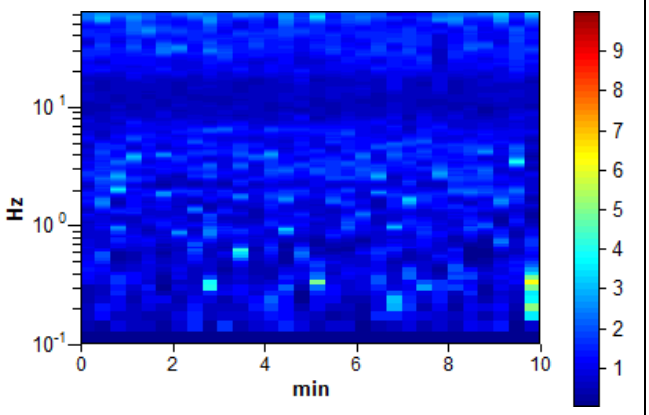
T 31 FAELLA

Instrument: TR-0007-01-05
Start recording: 28/05/12 18:06:44 End recording: 28/05/12 18:16:45
Channel labels: NORTH SOUTH; EAST WEST ; UP DOWN
GPS data not available
Trace length: 0h10'00''. Analysis performed on the entire trace.
Sampling frequency: 128 Hz
Window size: 20 s
Smoothing window: Triangular window
Smoothing: 10%

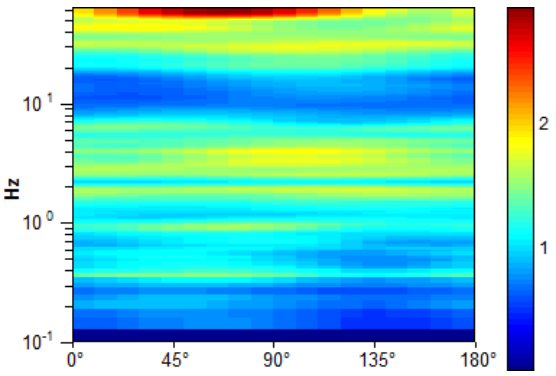
HORIZONTAL TO VERTICAL SPECTRAL RATIO



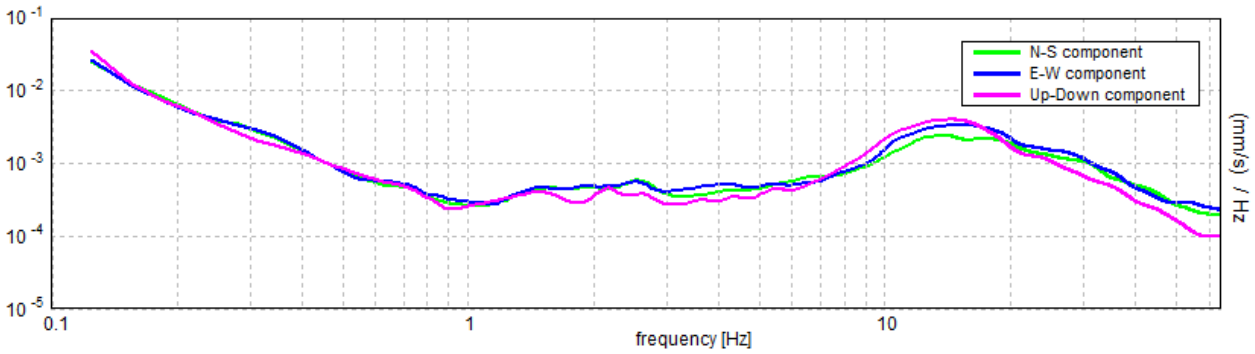
H/V TIME HISTORY



DIRECTIONAL H/V



SINGLE COMPONENT SPECTRA



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

Max. H/V at 61.56 ± 1.42 Hz (in the range 0.0 - 64.0 Hz).

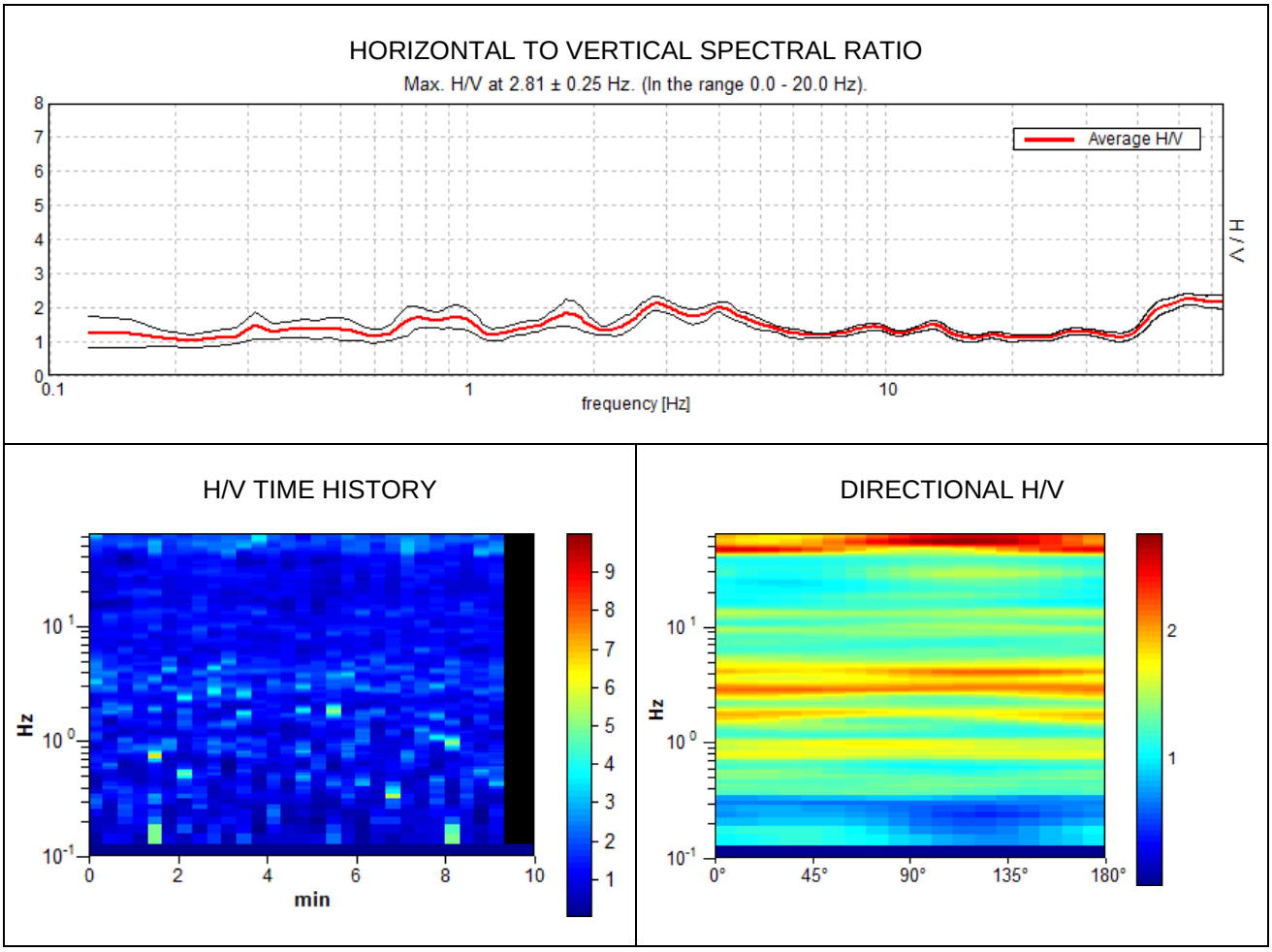
Criteria for a reliable HVSR curve [All 3 should be fulfilled]			
$f_0 > 10 / L_w$	61.56 > 0.50	OK	
$n_c(f_0) > 200$	36937.5 > 200	OK	
$\sigma_A(f) < 2$ for $0.5f_0 < f < 2f_0$ if $f_0 > 0.5$Hz **$\sigma_A(f) < 3$ for $0.5f_0 < f < 2f_0$ if $f_0 < 0.5$Hz**	Exceeded 0 out of 1064 times	OK	
Criteria for a clear HVSR peak [At least 5 out of 6 should be fulfilled]			
Exists f^- in $[f_0/4, f_0]$ | $A_{H/V}(f^-) < A_0 / 2$	19.25 Hz	OK	
Exists f^+ in $[f_0, 4f_0]$ | $A_{H/V}(f^+) < A_0 / 2$			NO
$A_0 > 2$	2.26 > 2	OK	
$f_{peak}[A_{H/V}(f) \pm \sigma_A(f)] = f_0 \pm 5\%$	|0.01105| < 0.05	OK	
$\sigma_f < \varepsilon(f_0)$	0.68057 < 3.07813	OK	
$\sigma_A(f_0) < \theta(f_0)$	0.0952 < 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
$\sigma_{logH/V}(f)$	standard deviation of log $A_{H/V}(f)$ curve
$\theta(f_0)$	threshold value for the stability condition $\sigma_A(f) < \theta(f_0)$

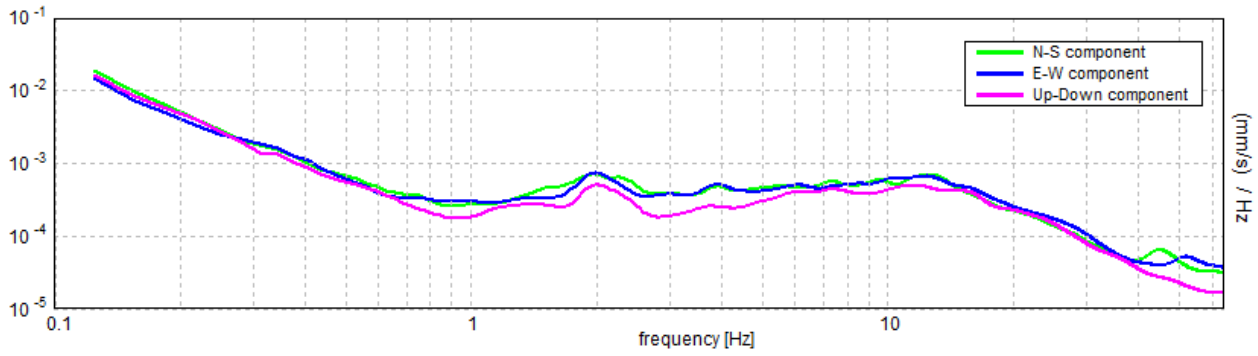
Threshold values for σ_f and $\sigma_A(f_0)$					
Freq.range [Hz]	< 0.2	0.2 – 0.5	0.5 – 1.0	1.0 – 2.0	> 2.0
$\varepsilon(f_0)$ [Hz]	0.25 f_0	0.2 f_0	0.15 f_0	0.10 f_0	0.05 f_0
$\theta(f_0)$ for $\sigma_A(f_0)$	3.0	2.5	2.0	1.78	1.58
Log $\theta(f_0)$ for $\sigma_{logH/V}(f_0)$	0.48	0.40	0.30	0.25	0.20

T 32 FAELLA

Instrument: TR-0007-01-05
Start recording: 28/05/12 18:25:58 End recording: 28/05/12 18:35:59
Channel labels: NORTH SOUTH; EAST WEST ; UP DOWN
GPS data not available
Trace length: 0h10'00''. Analyzed 93% trace (manual window selection)
Sampling frequency: 128 Hz
Window size: 20 s
Smoothing window: Triangular window
Smoothing: 10%



SINGLE COMPONENT SPECTRA



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

Max. H/V at 2.81 ± 0.25 Hz (in the range 0.0 - 20.0 Hz).

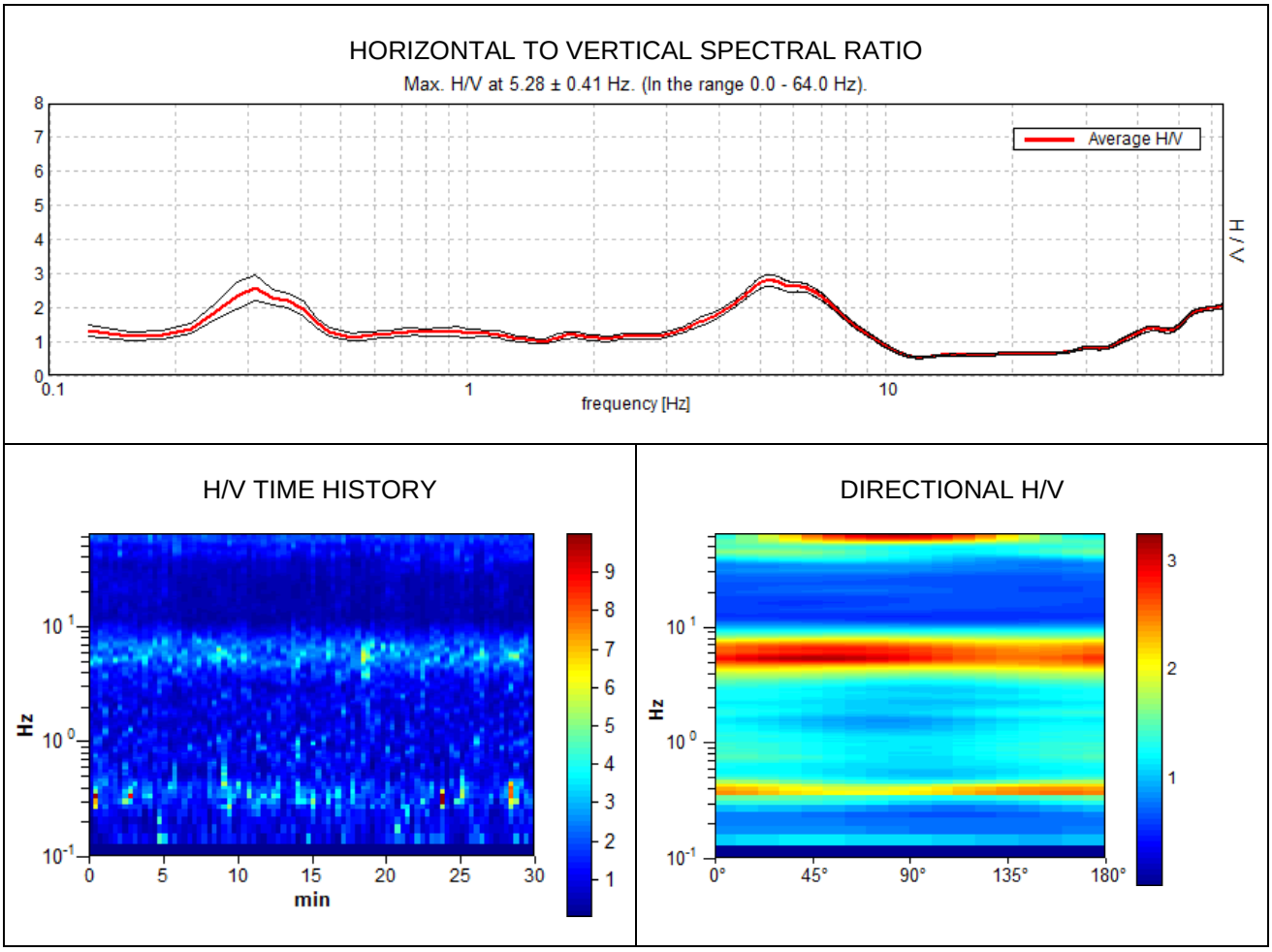
Criteria for a reliable HVSR curve [All 3 should be fulfilled]			
$f_0 > 10 / L_w$	2.81 > 0.50	OK	
$n_c(f_0) > 200$	1575.0 > 200	OK	
$\sigma_A(f) < 2$ for $0.5f_0 < f < 2f_0$ if $f_0 > 0.5$Hz **$\sigma_A(f) < 3$ for $0.5f_0 < f < 2f_0$ if $f_0 < 0.5$Hz**	Exceeded 0 out of 136 times	OK	
Criteria for a clear HVSR peak [At least 5 out of 6 should be fulfilled]			
Exists f^- in $[f_0/4, f_0]$ | $A_{H/V}(f^-) < A_0 / 2$			NO
Exists f^+ in $[f_0, 4f_0]$ | $A_{H/V}(f^+) < A_0 / 2$			NO
$A_0 > 2$	2.12 > 2	OK	
$f_{peak}[A_{H/V}(f) \pm \sigma_A(f)] = f_0 \pm 5\%$	|0.04218| < 0.05	OK	
$\sigma_f < \varepsilon(f_0)$	0.11865 < 0.14063	OK	
$\sigma_A(f_0) < \theta(f_0)$	0.0991 < 1.58	OK	

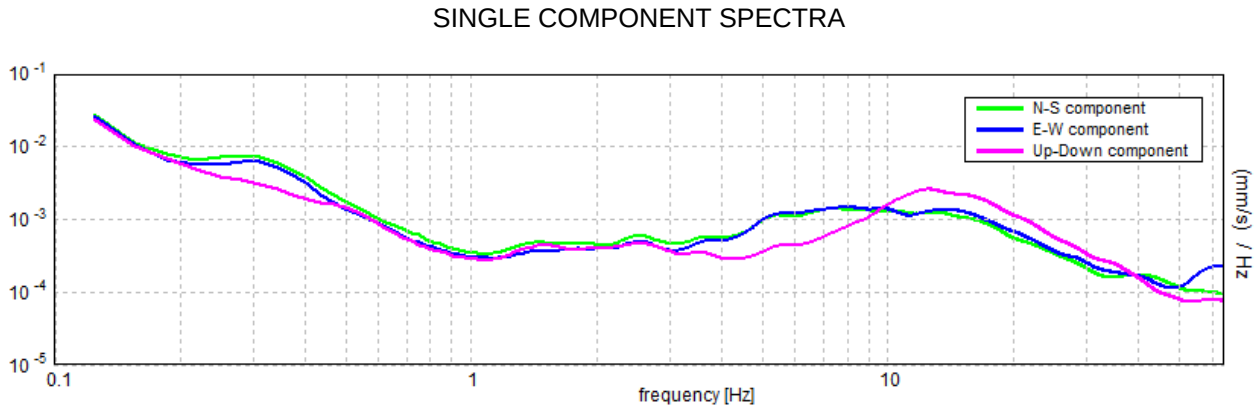
L_w	window length
n_w	number of windows used in the analysis
$n_c = L_w n_w f_0$	number of significant cycles
f	current frequency
f_0	H/V peak frequency
σ_f	standard deviation of H/V peak frequency
$\varepsilon(f_0)$	threshold value for the stability condition $\sigma_f < \varepsilon(f_0)$
A_0	H/V peak 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
$\sigma_{logH/V}(f)$	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 $\sigma_{logH/V}(f_0)$	0.48	0.40	0.30	0.25	0.20

T 33 FAELLA

Instrument: TRS-0004/00-06
Start recording: 04/06/12 16:18:05 End recording: 04/06/12 16:48:06
Channel labels: NORTH SOUTH; EAST WEST ; UP DOWN
GPS data not available
Trace length: 0h30'00''. Analysis performed on the entire trace.
Sampling frequency: 128 Hz
Window size: 20 s
Smoothing window: Triangular window
Smoothing: 10%





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

Max. H/V at 5.28 ± 0.41 Hz (in the range 0.0 - 64.0 Hz).

Criteria for a reliable HVSR curve [All 3 should be fulfilled]			
$f_0 > 10 / L_w$	5.28 > 0.50	OK	
$n_c(f_0) > 200$	9506.3 > 200	OK	
$\sigma_A(f) < 2$ for $0.5f_0 < f < 2f_0$ if $f_0 > 0.5$Hz **$\sigma_A(f) < 3$ for $0.5f_0 < f < 2f_0$ if $f_0 < 0.5$Hz**	Exceeded 0 out of 254 times	OK	
Criteria for a clear HVSR peak [At least 5 out of 6 should be fulfilled]			
Exists f^- in $[f_0/4, f_0]$ | $A_{H/V}(f^-) < A_0 / 2$	3.344 Hz	OK	
Exists f^+ in $[f_0, 4f_0]$ | $A_{H/V}(f^+) < A_0 / 2$	8.594 Hz	OK	
$A_0 > 2$	2.80 > 2	OK	
$f_{peak}[A_{H/V}(f) \pm \sigma_A(f)] = f_0 \pm 5\%$	|0.03924| < 0.05	OK	
$\sigma_f < \varepsilon(f_0)$	0.20724 < 0.26406	OK	
$\sigma_A(f_0) < \theta(f_0)$	0.0873 < 1.58	OK	

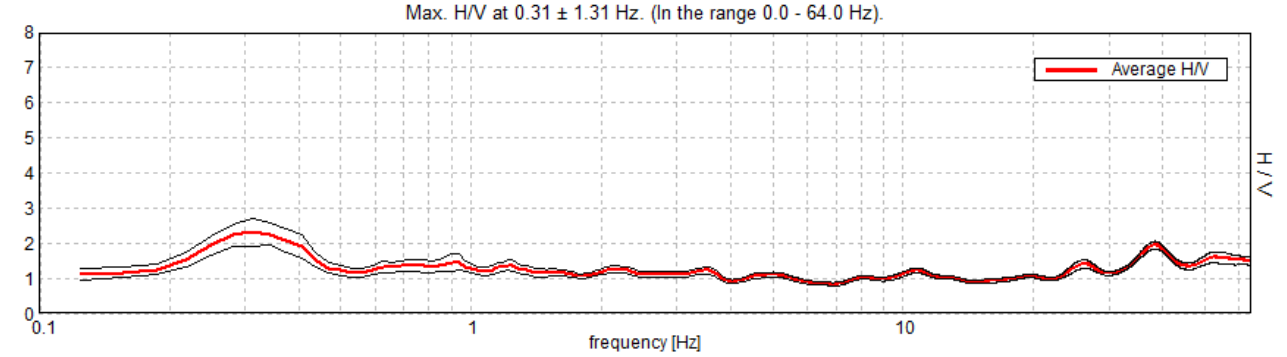
L_w	window length
n_w	number of windows used in the analysis
$n_c = L_w n_w f_0$	number of significant cycles
f	current frequency
f_0	H/V peak frequency
σ_f	standard deviation of H/V peak frequency
$\varepsilon(f_0)$	threshold value for the stability condition $\sigma_f < \varepsilon(f_0)$
A_0	H/V peak 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
$\sigma_{logH/V}(f)$	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 $\sigma_{logH/V}(f_0)$	0.48	0.40	0.30	0.25	0.20

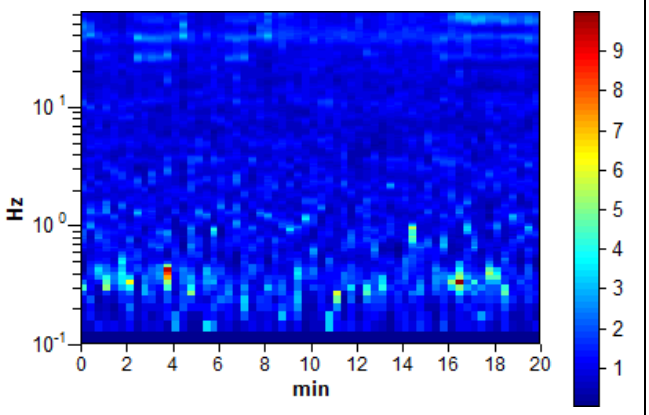
T 47 FAELLA

Instrument: TRS-0009/00-06
Start recording: 13/06/12 14:50:17 End recording: 13/06/12 15:10:18
Channel labels: NORTH SOUTH; EAST WEST ; UP DOWN
GPS data not available
Trace length: 0h20'00". Analysis performed on the entire trace.
Sampling frequency: 128 Hz
Window size: 20 s
Smoothing window: Triangular window
Smoothing: 10%

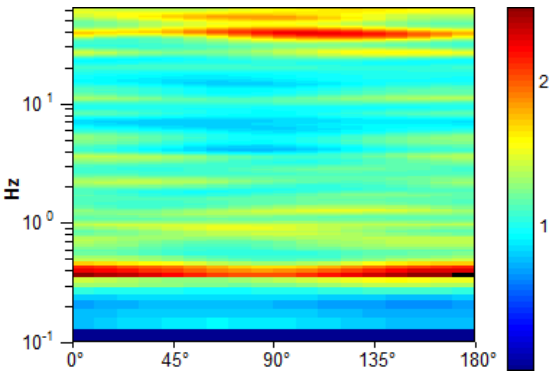
HORIZONTAL TO VERTICAL SPECTRAL RATIO



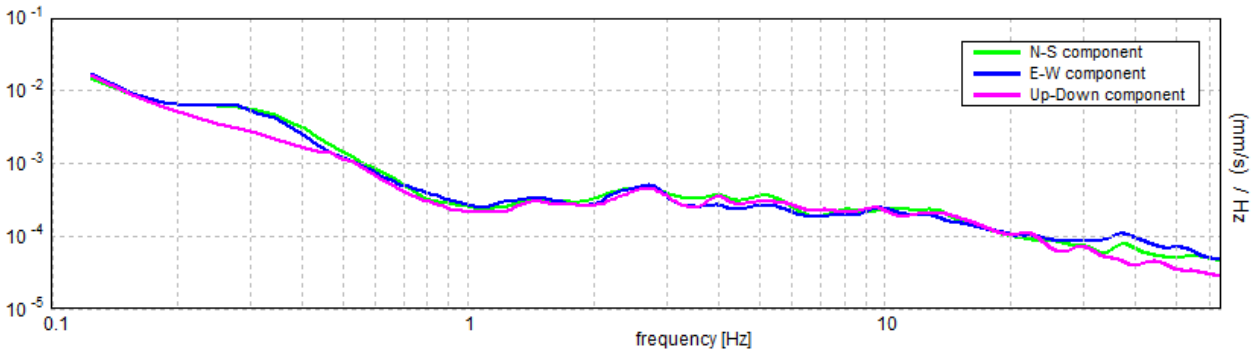
H/V TIME HISTORY



DIRECTIONAL H/V



SINGLE COMPONENT SPECTRA



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

Max. H/V at 0.31 ± 1.31 Hz (in the range 0.0 - 64.0 Hz).

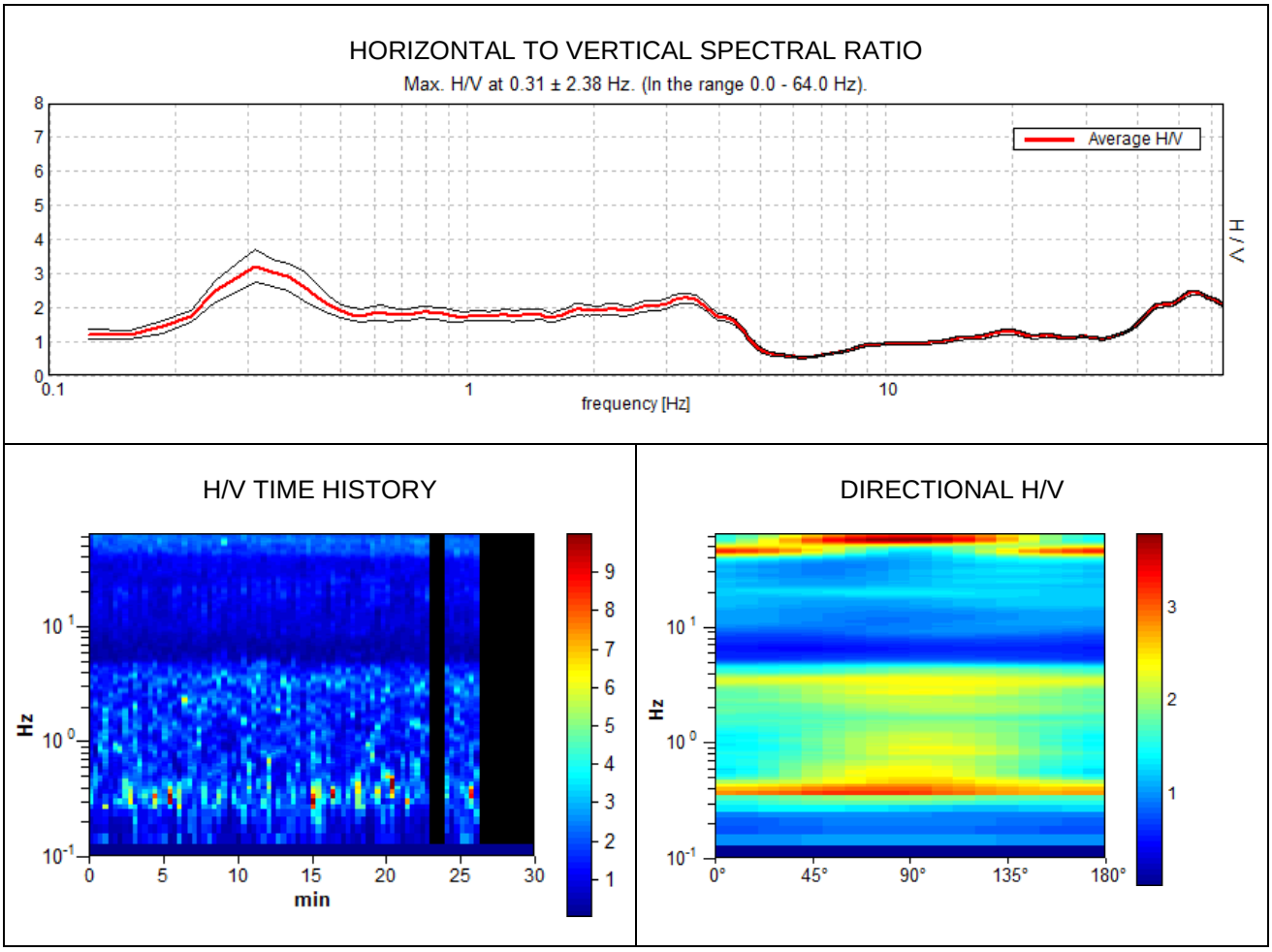
Criteria for a reliable HVSR curve [All 3 should be fulfilled]			
$f_0 > 10 / L_w$	0.31 > 0.50		**NO**
$n_c(f_0) > 200$	375.0 > 200	**OK**	
$\sigma_A(f) < 2$ for $0.5f_0 < f < 2f_0$ if $f_0 > 0.5$Hz **$\sigma_A(f) < 3$ for $0.5f_0 < f < 2f_0$ if $f_0 < 0.5$Hz**	Exceeded 0 out of 16 times	**OK**	
Criteria for a clear HVSR peak [At least 5 out of 6 should be fulfilled]			
Exists f^- in $[f_0/4, f_0]$ | $A_{H/V}(f^-) < A_0 / 2$	0.125 Hz	**OK**	
Exists f^+ in $[f_0, 4f_0]$ | $A_{H/V}(f^+) < A_0 / 2$	0.531 Hz	**OK**	
$A_0 > 2$	2.31 > 2	**OK**	
$f_{peak}[A_{H/V}(f) \pm \sigma_A(f)] = f_0 \pm 5\%$	|2.08336| < 0.05		**NO**
$\sigma_f < \varepsilon(f_0)$	0.65105 < 0.0625		**NO**
$\sigma_A(f_0) < \theta(f_0)$	0.2005 < 2.5	**OK**	

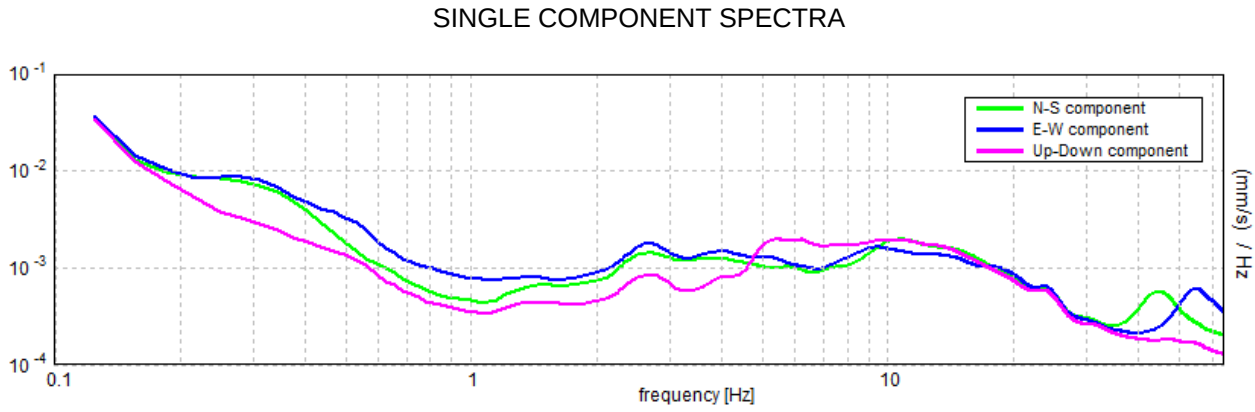
L_w	window length
n_w	number of windows used in the analysis
$n_c = L_w n_w f_0$	number of significant cycles
f	current frequency
f_0	H/V peak frequency
σ_f	standard deviation of H/V peak frequency
$\varepsilon(f_0)$	threshold value for the stability condition $\sigma_f < \varepsilon(f_0)$
A_0	H/V peak 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
$\sigma_{logH/V}(f)$	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 $\sigma_{logH/V}(f_0)$	0.48	0.40	0.30	0.25	0.20

T 48 FAELLA

Instrument: TR-0007-01-05
Start recording: 13/06/12 14:52:58 End recording: 13/06/12 15:22:59
Channel labels: NORTH SOUTH; EAST WEST ; UP DOWN
GPS data not available
Trace length: 0h30'00''. Analyzed 84% trace (manual window selection)
Sampling frequency: 128 Hz
Window size: 20 s
Smoothing window: Triangular window
Smoothing: 10%





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

Max. H/V at 0.31 ± 2.38 Hz (in the range 0.0 - 64.0 Hz).

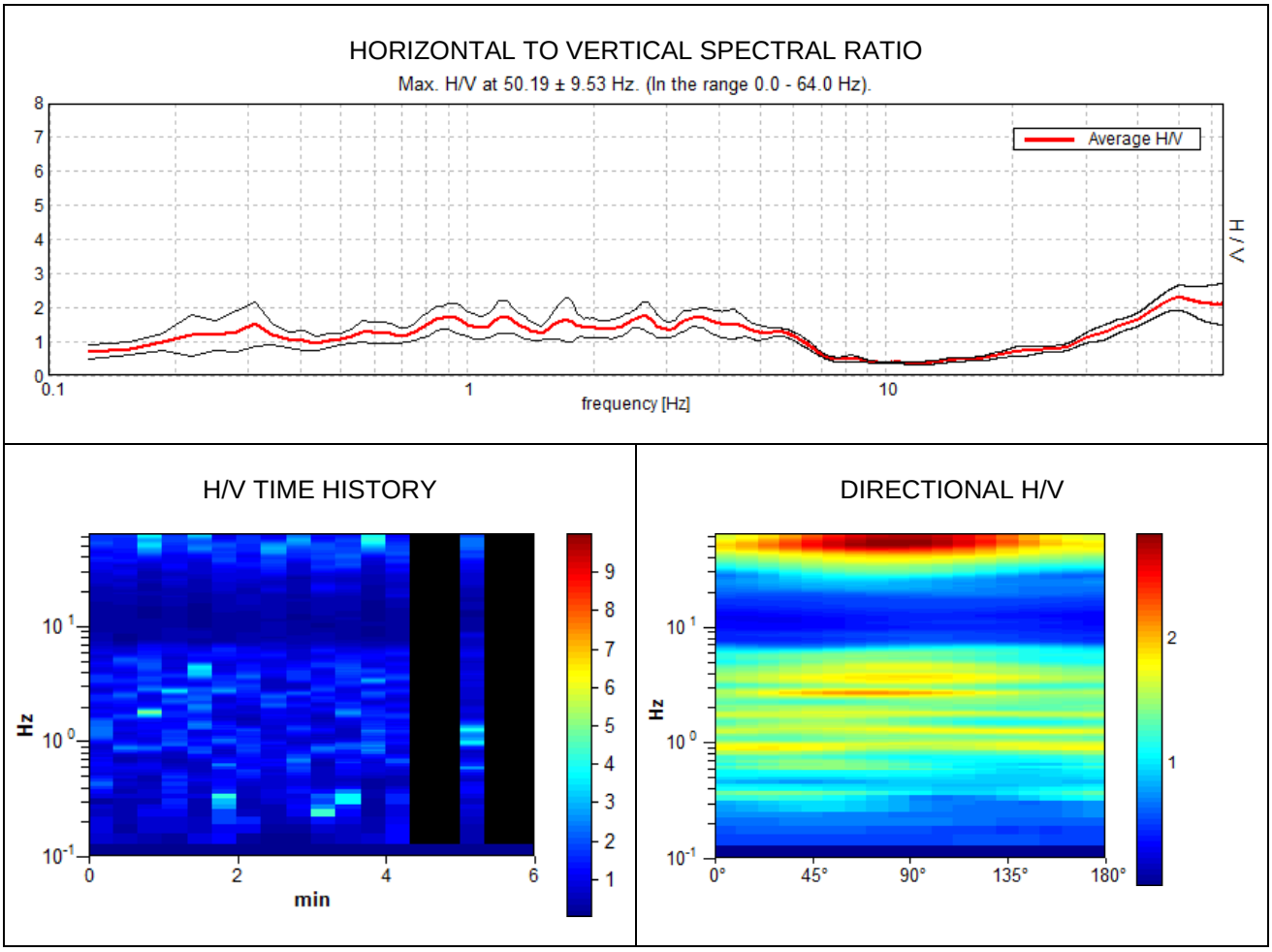
Criteria for a reliable HVSR curve [All 3 should be fulfilled]			
$f_0 > 10 / L_w$	0.31 > 0.50		**NO**
$n_c(f_0) > 200$	475.0 > 200	**OK**	
$\sigma_A(f) < 2$ for $0.5f_0 < f < 2f_0$ if $f_0 > 0.5$Hz **$\sigma_A(f) < 3$ for $0.5f_0 < f < 2f_0$ if $f_0 < 0.5$Hz**	Exceeded 0 out of 16 times	**OK**	
Criteria for a clear HVSR peak [At least 5 out of 6 should be fulfilled]			
Exists f^- in $[f_0/4, f_0]$ | $A_{H/V}(f^-) < A_0 / 2$	0.188 Hz	**OK**	
Exists f^+ in $[f_0, 4f_0]$ | $A_{H/V}(f^+) < A_0 / 2$			**NO**
$A_0 > 2$	3.21 > 2	**OK**	
$f_{peak}[A_{H/V}(f) \pm \sigma_A(f)] = f_0 \pm 5\%$	|3.79053| < 0.05		**NO**
$\sigma_f < \varepsilon(f_0)$	1.18454 < 0.0625		**NO**
$\sigma_A(f_0) < \theta(f_0)$	0.2397 < 2.5	**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
$\sigma_{logH/V}(f)$	standard deviation of log $A_{H/V}(f)$ curve
$\theta(f_0)$	threshold value for the stability condition $\sigma_A(f) < \theta(f_0)$

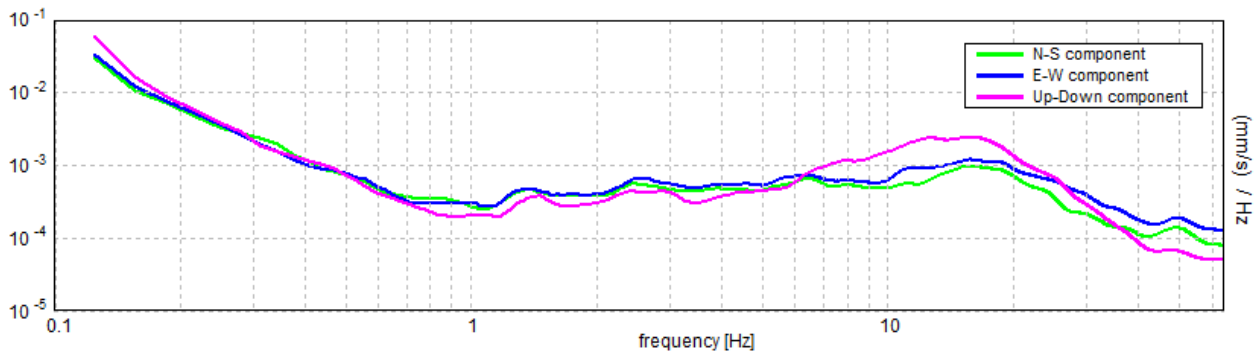
Threshold values for σ_f and $\sigma_A(f_0)$					
Freq.range [Hz]	< 0.2	0.2 – 0.5	0.5 – 1.0	1.0 – 2.0	> 2.0
$\varepsilon(f_0)$ [Hz]	0.25 f_0	0.2 f_0	0.15 f_0	0.10 f_0	0.05 f_0
$\theta(f_0)$ for $\sigma_A(f_0)$	3.0	2.5	2.0	1.78	1.58
Log $\theta(f_0)$ for $\sigma_{logH/V}(f_0)$	0.48	0.40	0.30	0.25	0.20

T 21 FAELLA

Instrument: TR-0007-01-05
Start recording: 28/05/12 13:30:48 End recording: 28/05/12 13:36:49
Channel labels: NORTH SOUTH; EAST WEST ; UP DOWN
GPS data not available
Trace length: 0h10'00". Analyzed 78% trace (manual window selection)
Sampling frequency: 128 Hz
Window size: 20 s
Smoothing window: Triangular window
Smoothing: 10%



SINGLE COMPONENT SPECTRA



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

Max. H/V at 50.19 ± 9.53 Hz (in the range 0.0 - 64.0 Hz).

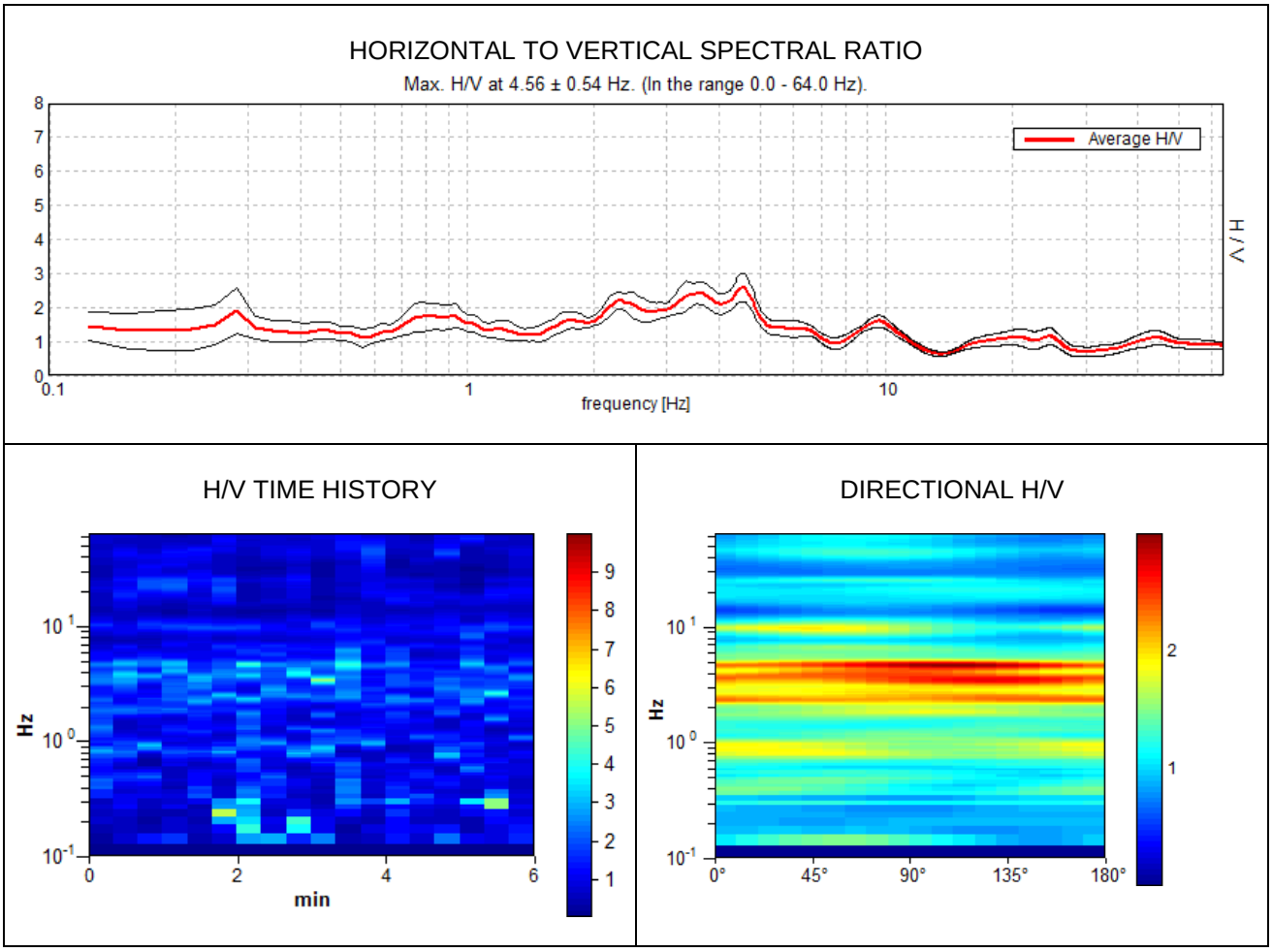
Criteria for a reliable HVSR curve [All 3 should be fulfilled]			
$f_0 > 10 / L_w$	50.19 > 0.50	OK	
$n_c(f_0) > 200$	14052.5 > 200	OK	
$\sigma_A(f) < 2$ for $0.5f_0 < f < 2f_0$ if $f_0 > 0.5$Hz **$\sigma_A(f) < 3$ for $0.5f_0 < f < 2f_0$ if $f_0 < 0.5$Hz**	Exceeded 0 out of 1246 times	OK	
Criteria for a clear HVSR peak [At least 5 out of 6 should be fulfilled]			
Exists f^- in $[f_0/4, f_0]$ | $A_{H/V}(f^-) < A_0 / 2$	30.594 Hz	OK	
Exists f^+ in $[f_0, 4f_0]$ | $A_{H/V}(f^+) < A_0 / 2$			NO
$A_0 > 2$	2.28 > 2	OK	
$f_{peak}[A_{H/V}(f) \pm \sigma_A(f)] = f_0 \pm 5\%$	|0.08471| < 0.05		NO
$\sigma_f < \varepsilon(f_0)$	4.25162 < 2.50938		NO
$\sigma_A(f_0) < \theta(f_0)$	0.1637 < 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
$\sigma_{logH/V}(f)$	standard deviation of log $A_{H/V}(f)$ curve
$\theta(f_0)$	threshold value for the stability condition $\sigma_A(f) < \theta(f_0)$

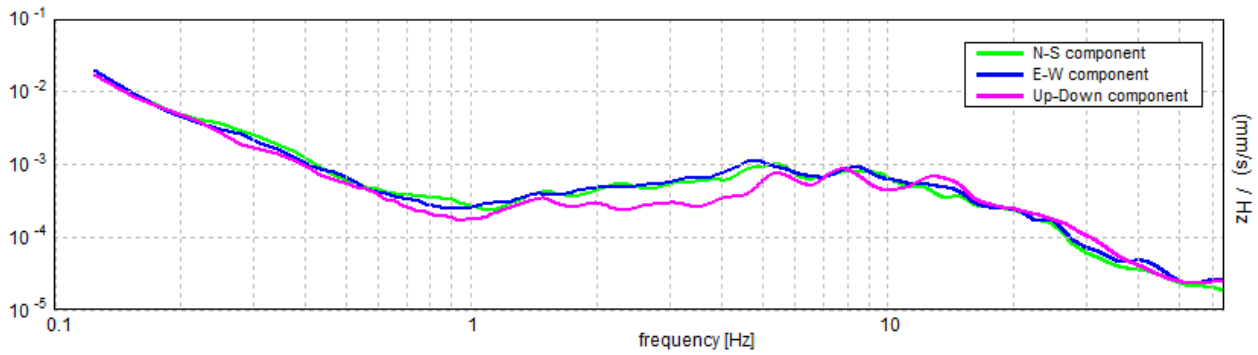
Threshold values for σ_f and $\sigma_A(f_0)$					
Freq.range [Hz]	< 0.2	0.2 – 0.5	0.5 – 1.0	1.0 – 2.0	> 2.0
$\varepsilon(f_0)$ [Hz]	0.25 f_0	0.2 f_0	0.15 f_0	0.10 f_0	0.05 f_0
$\theta(f_0)$ for $\sigma_A(f_0)$	3.0	2.5	2.0	1.78	1.58
Log $\theta(f_0)$ for $\sigma_{logH/V}(f_0)$	0.48	0.40	0.30	0.25	0.20

T 22 FAELLA

Instrument: TR-0007-01-05
Start recording: 28/05/12 13:41:47 End recording: 28/05/12 13:47:48
Channel labels: NORTH SOUTH; EAST WEST ; UP DOWN
GPS data not available
Trace length: 0h06'00''. Analysis performed on the entire trace.
Sampling frequency: 128 Hz
Window size: 20 s
Smoothing window: Triangular window
Smoothing: 10%



SINGLE COMPONENT SPECTRA



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

Max. H/V at 4.56 ± 0.54 Hz (in the range 0.0 - 64.0 Hz).

Criteria for a reliable HVSR curve [All 3 should be fulfilled]			
$f_0 > 10 / L_w$	4.56 > 0.50	OK	
$n_c(f_0) > 200$	1642.5 > 200	OK	
$\sigma_A(f) < 2$ for $0.5f_0 < f < 2f_0$ if $f_0 > 0.5$Hz **$\sigma_A(f) < 3$ for $0.5f_0 < f < 2f_0$ if $f_0 < 0.5$Hz**	Exceeded 0 out of 220 times	OK	
Criteria for a clear HVSR peak [At least 5 out of 6 should be fulfilled]			
Exists f^- in $[f_0/4, f_0]$ | $A_{H/V}(f^-) < A_0 / 2$	1.531 Hz	OK	
Exists f^+ in $[f_0, 4f_0]$ | $A_{H/V}(f^+) < A_0 / 2$	6.688 Hz	OK	
$A_0 > 2$	2.59 > 2	OK	
$f_{peak}[A_{H/V}(f) \pm \sigma_A(f)] = f_0 \pm 5\%$	|0.05422| < 0.05		NO
$\sigma_f < \varepsilon(f_0)$	0.24738 < 0.22813		NO
$\sigma_A(f_0) < \theta(f_0)$	0.1899 < 1.58	OK	

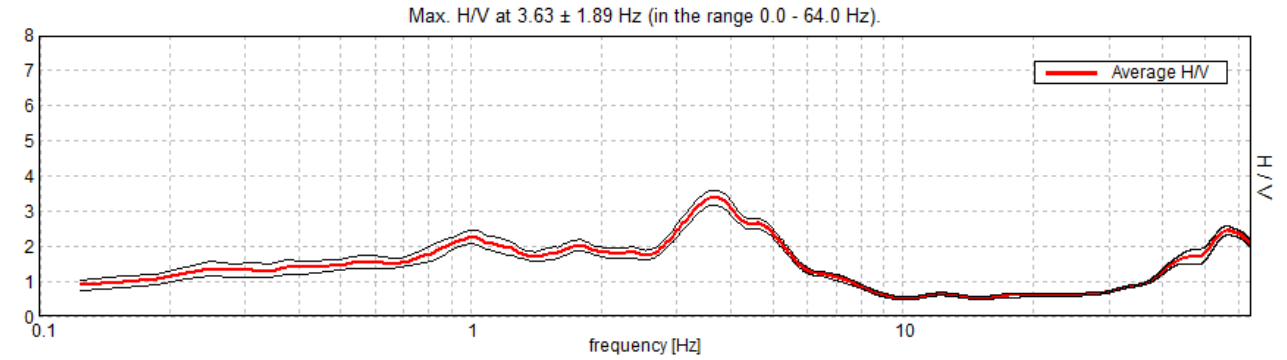
L_w	window length
n_w	number of windows used in the analysis
$n_c = L_w n_w f_0$	number of significant cycles
f	current frequency
f_0	H/V peak frequency
σ_f	standard deviation of H/V peak frequency
$\varepsilon(f_0)$	threshold value for the stability condition $\sigma_f < \varepsilon(f_0)$
A_0	H/V peak 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
$\sigma_{logH/V}(f)$	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 $\sigma_{logH/V}(f_0)$	0.48	0.40	0.30	0.25	0.20

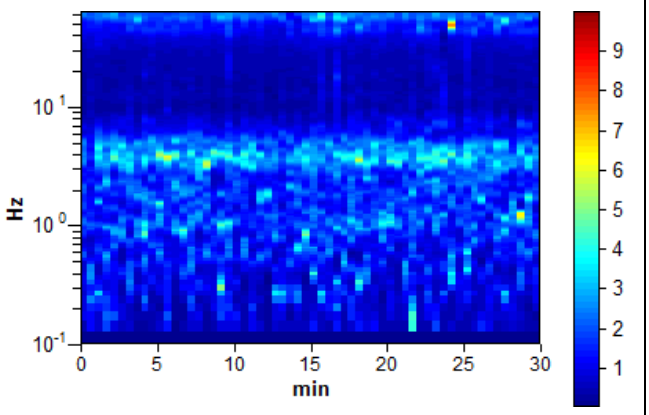
T 51 FAELLA

Instrument: TR-0007-01-05
Start recording: 11/07/12 09:52:24 End recording: 11/07/12 10:22:25
Channel labels: NORTH SOUTH; EAST WEST ; UP DOWN
GPS data not available
Trace length: 0h30'00''. Analysis performed on the entire trace.
Sampling frequency: 128 Hz
Window size: 30 s
Smoothing window: Triangular window
Smoothing: 10%

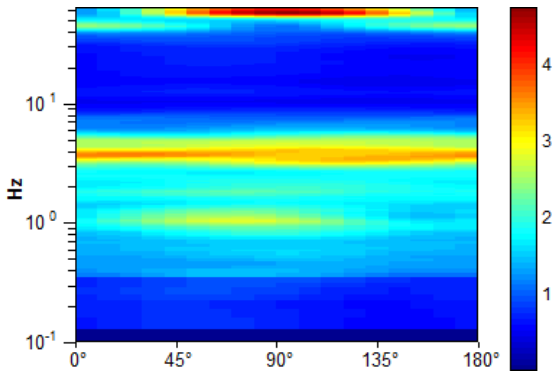
HORIZONTAL TO VERTICAL SPECTRAL RATIO



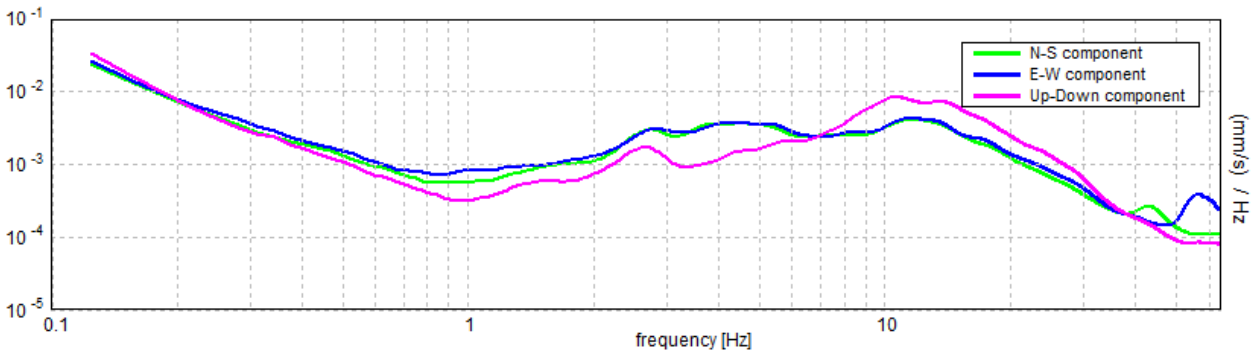
H/V TIME HISTORY



DIRECTIONAL H/V



SINGLE COMPONENT SPECTRA



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

Max. H/V at 3.63 ± 1.89 Hz (in the range 0.0 - 64.0 Hz).

Criteria for a reliable HVSR curve [All 3 should be fulfilled]			
$f_0 > 10 / L_w$	3.63 > 0.33	OK	
$n_c(f_0) > 200$	6525.0 > 200	OK	
$\sigma_A(f) < 2$ for $0.5f_0 < f < 2f_0$ if $f_0 > 0.5$Hz **$\sigma_A(f) < 3$ for $0.5f_0 < f < 2f_0$ if $f_0 < 0.5$Hz**	Exceeded 0 out of 175 times	OK	
Criteria for a clear HVSR peak [At least 5 out of 6 should be fulfilled]			
Exists f^- in $[f_0/4, f_0]$ | $A_{H/V}(f^-) < A_0 / 2$			NO
Exists f^+ in $[f_0, 4f_0]$ | $A_{H/V}(f^+) < A_0 / 2$	5.563 Hz	OK	
$A_0 > 2$	3.38 > 2	OK	
$f_{peak}[A_{H/V}(f) \pm \sigma_A(f)] = f_0 \pm 5\%$	|0.25893| < 0.05		NO
$\sigma_f < \varepsilon(f_0)$	0.93863 < 0.18125		NO
$\sigma_A(f_0) < \theta(f_0)$	0.1 < 1.58	OK	

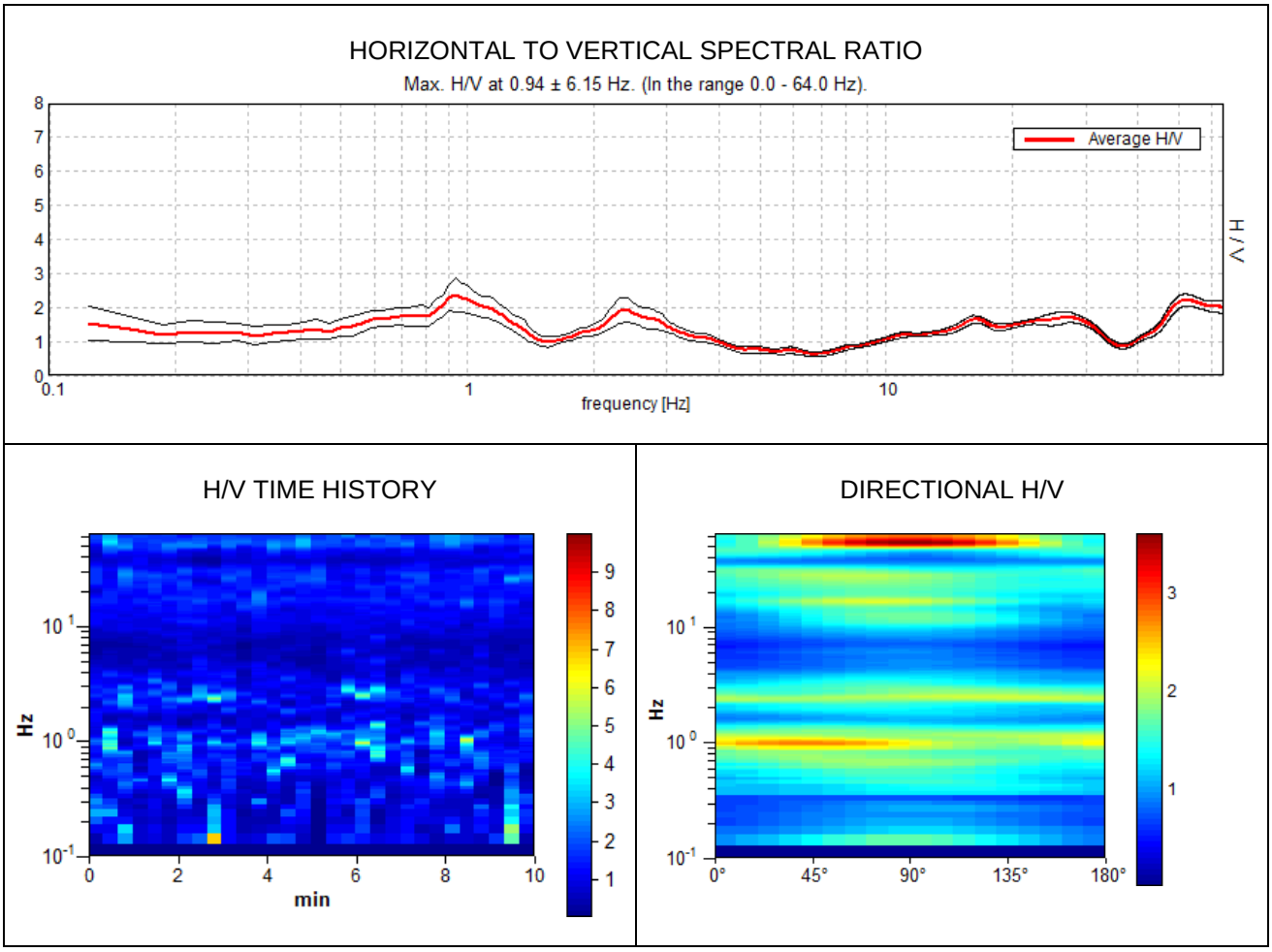
L_w	window length
n_w	number of windows used in the analysis
$n_c = L_w n_w f_0$	number of significant cycles
f	current frequency
f_0	H/V peak frequency
σ_f	standard deviation of H/V peak frequency
$\varepsilon(f_0)$	threshold value for the stability condition $\sigma_f < \varepsilon(f_0)$
A_0	H/V peak 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
$\sigma_{logH/V}(f)$	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 $\sigma_{logH/V}(f_0)$	0.48	0.40	0.30	0.25	0.20

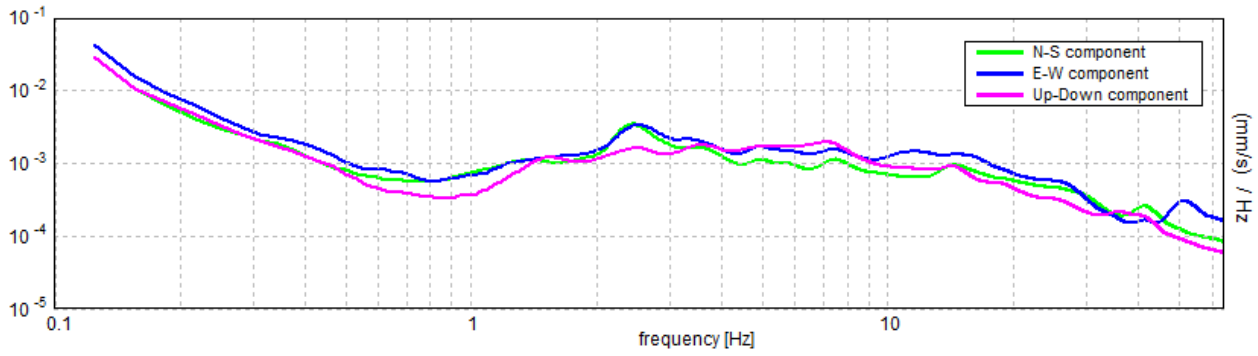
Misure HVSR Matassino

T 13 MATASSINO

Instrument: TR-0007-01-05
Start recording: 28/05/12 11:04:21 End recording: 28/05/12 11:14:22
Channel labels: NORTH SOUTH; EAST WEST ; UP DOWN
GPS data not available
Trace length: 0h10'00''. Analysis performed on the entire trace.
Sampling frequency: 128 Hz
Window size: 20 s
Smoothing window: Triangular window
Smoothing: 10%



SINGLE COMPONENT SPECTRA



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

Max. H/V at 0.94 ± 6.15 Hz (in the range 0.0 - 64.0 Hz).

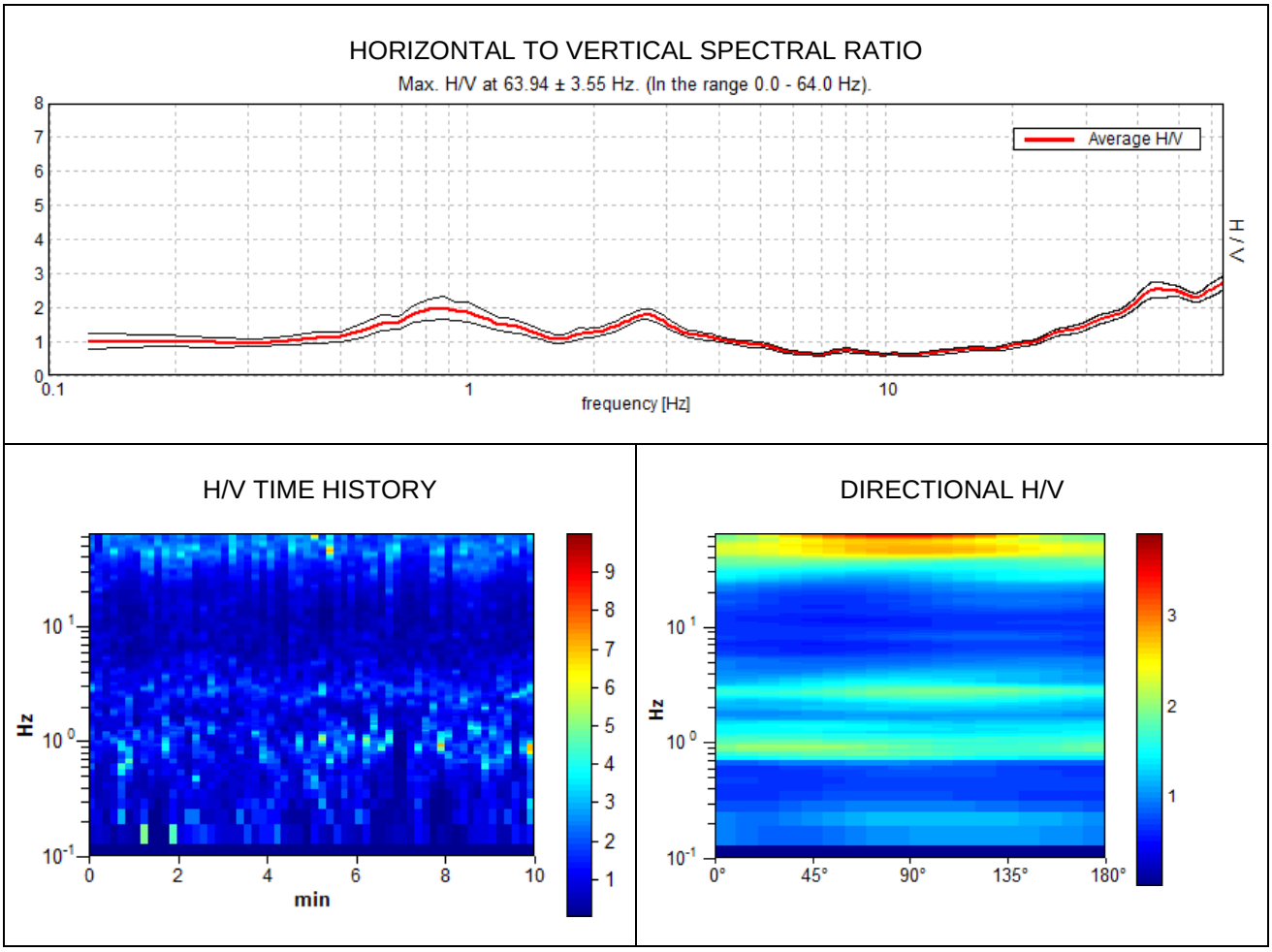
Criteria for a reliable HVSR curve [All 3 should be fulfilled]			
$f_0 > 10 / L_w$	0.94 > 0.50	OK	
$n_c(f_0) > 200$	562.5 > 200	OK	
$\sigma_A(f) < 2$ for $0.5f_0 < f < 2f_0$ if $f_0 > 0.5$Hz **$\sigma_A(f) < 3$ for $0.5f_0 < f < 2f_0$ if $f_0 < 0.5$Hz**	Exceeded 0 out of 46 times	OK	
Criteria for a clear HVSR peak [At least 5 out of 6 should be fulfilled]			
Exists f^- in $[f_0/4, f_0]$ | $A_{H/V}(f^-) < A_0 / 2$	0.313 Hz	OK	
Exists f^+ in $[f_0, 4f_0]$ | $A_{H/V}(f^+) < A_0 / 2$	1.438 Hz	OK	
$A_0 > 2$	2.36 > 2	OK	
$f_{peak}[A_{H/V}(f) \pm \sigma_A(f)] = f_0 \pm 5\%$	|3.151| < 0.05		NO
$\sigma_f < \varepsilon(f_0)$	2.95406 < 0.14063		NO
$\sigma_A(f_0) < \theta(f_0)$	0.2381 < 2.0	OK	

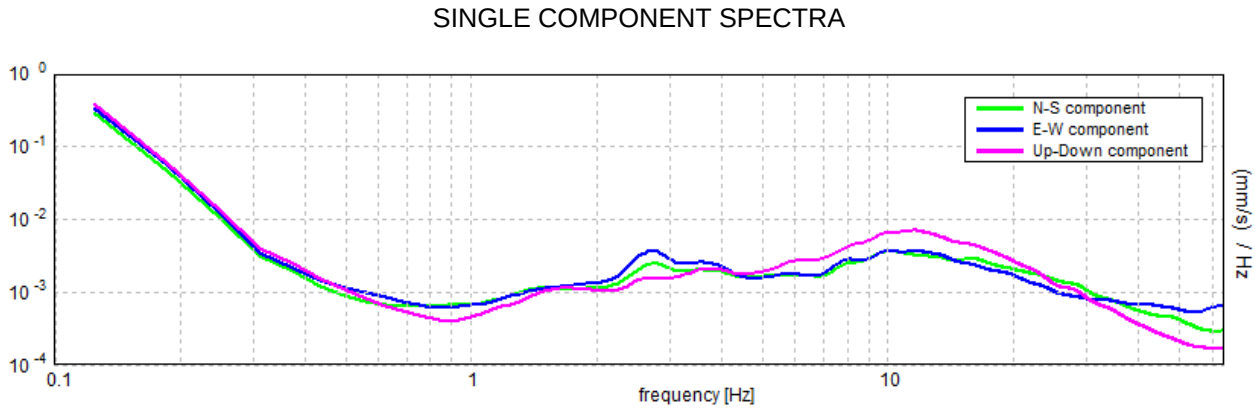
L_w	window length
n_w	number of windows used in the analysis
$n_c = L_w n_w f_0$	number of significant cycles
f	current frequency
f_0	H/V peak frequency
σ_f	standard deviation of H/V peak frequency
$\varepsilon(f_0)$	threshold value for the stability condition $\sigma_f < \varepsilon(f_0)$
A_0	H/V peak 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
$\sigma_{logH/V}(f)$	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 $\sigma_{logH/V}(f_0)$	0.48	0.40	0.30	0.25	0.20

T 14 MATASSINO

Instrument: TR-0007-01-05
Start recording: 28/05/12 11:27:34 End recording: 28/05/12 11:37:35
Channel labels: NORTH SOUTH; EAST WEST ; UP DOWN
GPS data not available
Trace length: 0h10'00''. Analysis performed on the entire trace.
Sampling frequency: 128 Hz
Window size: 10 s
Smoothing window: Triangular window
Smoothing: 10%





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

Max. H/V at 63.94 ± 3.55 Hz (in the range 0.0 - 64.0 Hz).

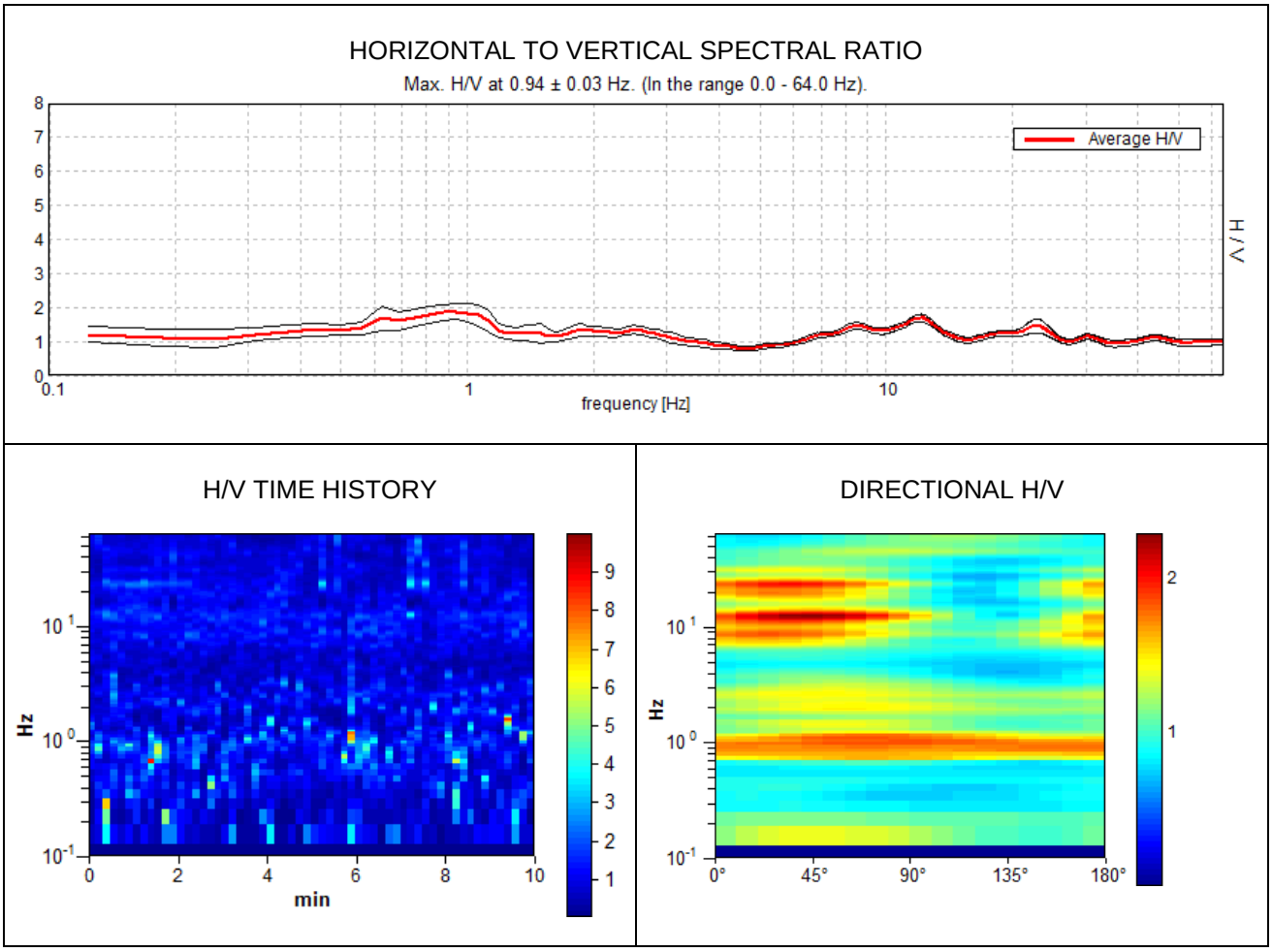
Criteria for a reliable HVSR curve [All 3 should be fulfilled]			
$f_0 > 10 / L_w$	63.94 > 1.00	OK	
$n_c(f_0) > 200$	38362.5 > 200	OK	
$\sigma_A(f) < 2$ for $0.5f_0 < f < 2f_0$ if $f_0 > 0.5$Hz **$\sigma_A(f) < 3$ for $0.5f_0 < f < 2f_0$ if $f_0 < 0.5$Hz**	Exceeded 0 out of 514 times	OK	
Criteria for a clear HVSR peak [At least 5 out of 6 should be fulfilled]			
Exists f^- in $[f_0/4, f_0]$ | $A_{H/V}(f^-) < A_0 / 2$	28.625 Hz	OK	
Exists f^+ in $[f_0, 4f_0]$ | $A_{H/V}(f^+) < A_0 / 2$			NO
$A_0 > 2$	2.74 > 2	OK	
$f_{peak}[A_{H/V}(f) \pm \sigma_A(f)] = f_0 \pm 5\%$	|0.02748| < 0.05	OK	
$\sigma_f < \varepsilon(f_0)$	1.75725 < 3.19688	OK	
$\sigma_A(f_0) < \theta(f_0)$	0.099 < 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
$\sigma_{logH/V}(f)$	standard deviation of log $A_{H/V}(f)$ curve
$\theta(f_0)$	threshold value for the stability condition $\sigma_A(f) < \theta(f_0)$

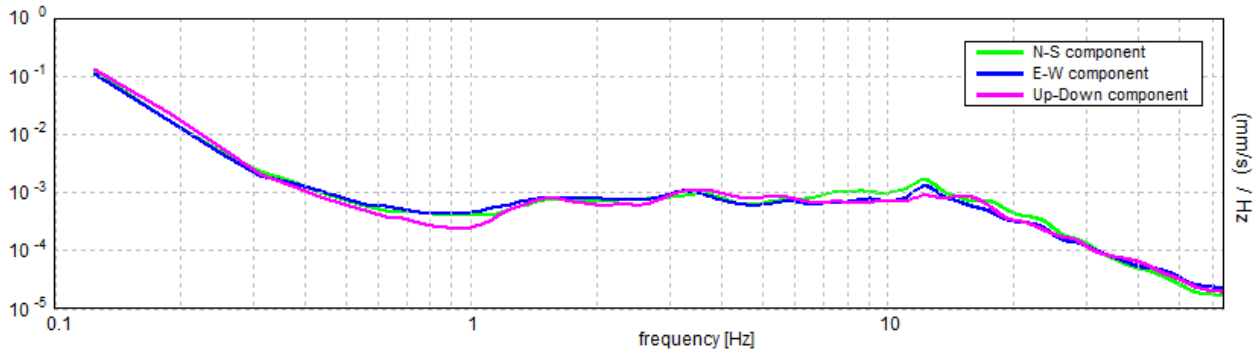
Threshold values for σ_f and $\sigma_A(f_0)$					
Freq.range [Hz]	< 0.2	0.2 – 0.5	0.5 – 1.0	1.0 – 2.0	> 2.0
$\varepsilon(f_0)$ [Hz]	0.25 f_0	0.2 f_0	0.15 f_0	0.10 f_0	0.05 f_0
$\theta(f_0)$ for $\sigma_A(f_0)$	3.0	2.5	2.0	1.78	1.58
Log $\theta(f_0)$ for $\sigma_{logH/V}(f_0)$	0.48	0.40	0.30	0.25	0.20

T 15 MATASSINO

Instrument: TR-0007-01-05
Start recording: 28/05/12 11:46:17 End recording: 28/05/12 11:56:18
Channel labels: NORTH SOUTH; EAST WEST ; UP DOWN
GPS data not available
Trace length: 0h10'00''. Analysis performed on the entire trace.
Sampling frequency: 128 Hz
Window size: 10 s
Smoothing window: Triangular window
Smoothing: 10%



SINGLE COMPONENT SPECTRA



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

Max. H/V at 0.94 ± 0.03 Hz (in the range 0.0 - 64.0 Hz).

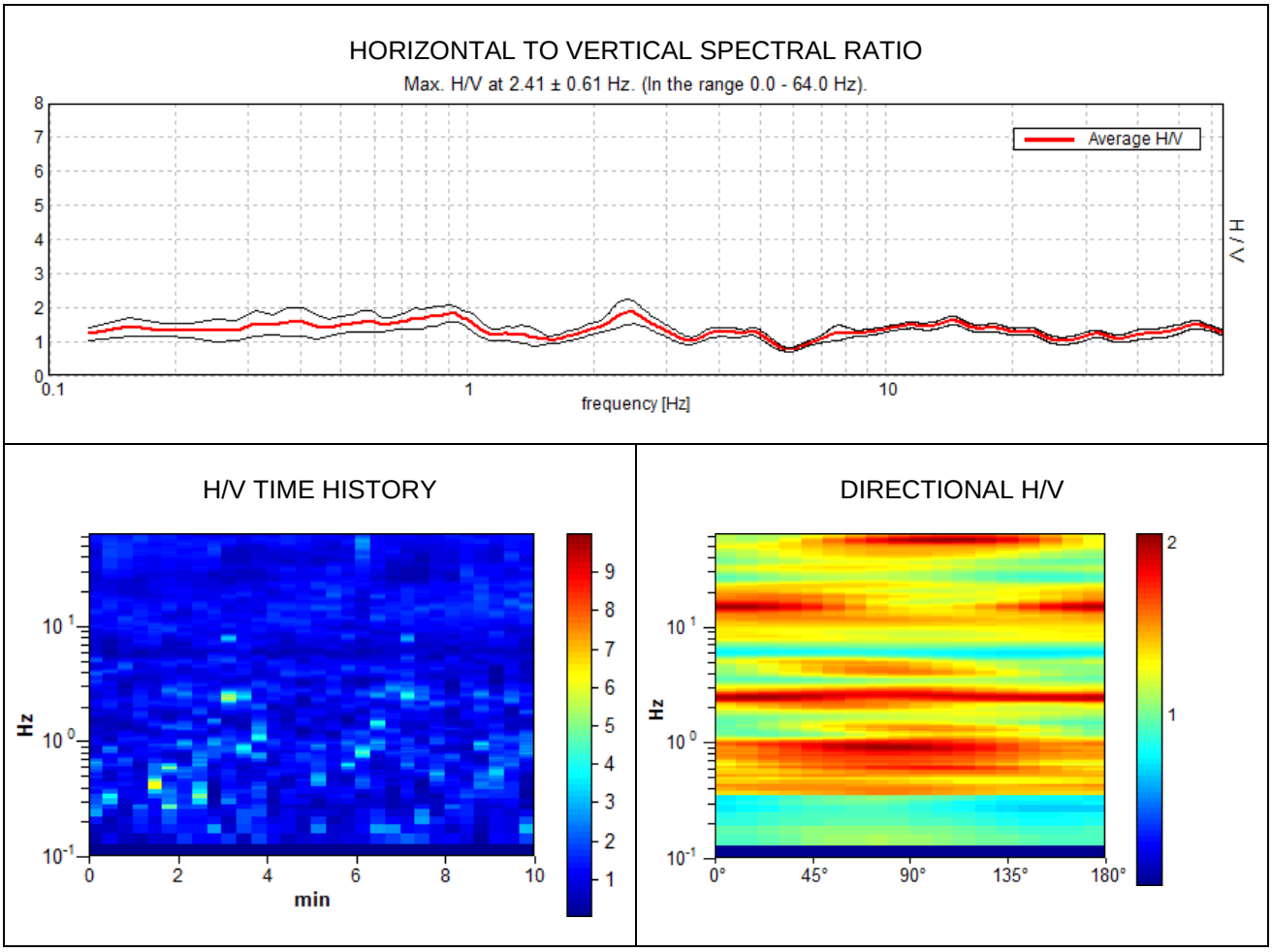
Criteria for a reliable HVSR curve [All 3 should be fulfilled]			
$f_0 > 10 / L_w$	0.94 > 1.00		**NO**
$n_c(f_0) > 200$	562.5 > 200	**OK**	
$\sigma_A(f) < 2$ for $0.5f_0 < f < 2f_0$ if $f_0 > 0.5$Hz **$\sigma_A(f) < 3$ for $0.5f_0 < f < 2f_0$ if $f_0 < 0.5$Hz**	Exceeded 0 out of 24 times	**OK**	
Criteria for a clear HVSR peak [At least 5 out of 6 should be fulfilled]			
Exists f^- in $[f_0/4, f_0]$ | $A_{H/V}(f^-) < A_0 / 2$			**NO**
Exists f^+ in $[f_0, 4f_0]$ | $A_{H/V}(f^+) < A_0 / 2$	3.688 Hz	**OK**	
$A_0 > 2$	1.88 > 2		**NO**
$f_{peak}[A_{H/V}(f) \pm \sigma_A(f)] = f_0 \pm 5\%$	|0.01644| < 0.05	**OK**	
$\sigma_f < \varepsilon(f_0)$	0.01542 < 0.14063	**OK**	
$\sigma_A(f_0) < \theta(f_0)$	0.1139 < 2.0	**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
$\sigma_{logH/V}(f)$	standard deviation of log $A_{H/V}(f)$ curve
$\theta(f_0)$	threshold value for the stability condition $\sigma_A(f) < \theta(f_0)$

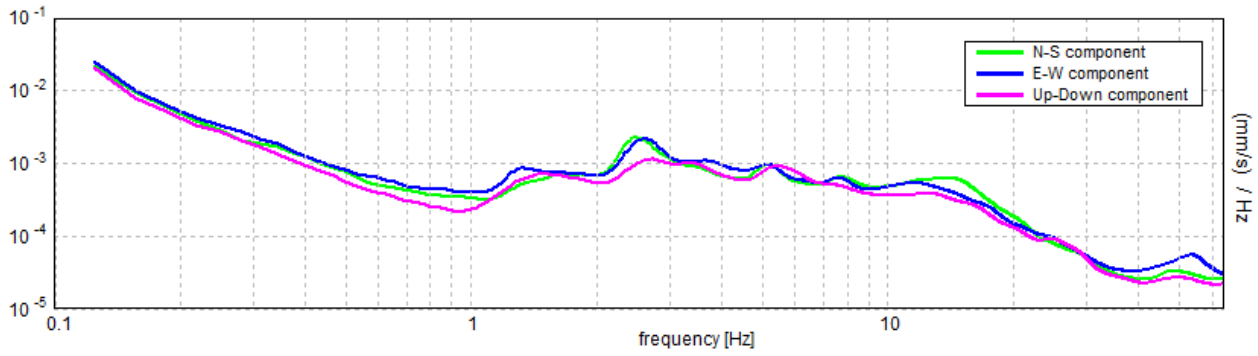
Threshold values for σ_f and $\sigma_A(f_0)$					
Freq.range [Hz]	< 0.2	0.2 – 0.5	0.5 – 1.0	1.0 – 2.0	> 2.0
$\varepsilon(f_0)$ [Hz]	0.25 f_0	0.2 f_0	0.15 f_0	0.10 f_0	0.05 f_0
$\theta(f_0)$ for $\sigma_A(f_0)$	3.0	2.5	2.0	1.78	1.58
Log $\theta(f_0)$ for $\sigma_{logH/V}(f_0)$	0.48	0.40	0.30	0.25	0.20

T 16 MATASSINO

Instrument: TR-0007-01-05
Start recording: 28/05/12 12:02:28 End recording: 28/05/12 12:12:29
Channel labels: NORTH SOUTH; EAST WEST ; UP DOWN
GPS data not available
Trace length: 0h10'00". Analysis performed on the entire trace.
Sampling frequency: 128 Hz
Window size: 20 s
Smoothing window: Triangular window
Smoothing: 10%



SINGLE COMPONENT SPECTRA



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

Max. H/V at 2.41 ± 0.61 Hz (in the range 0.0 - 64.0 Hz).

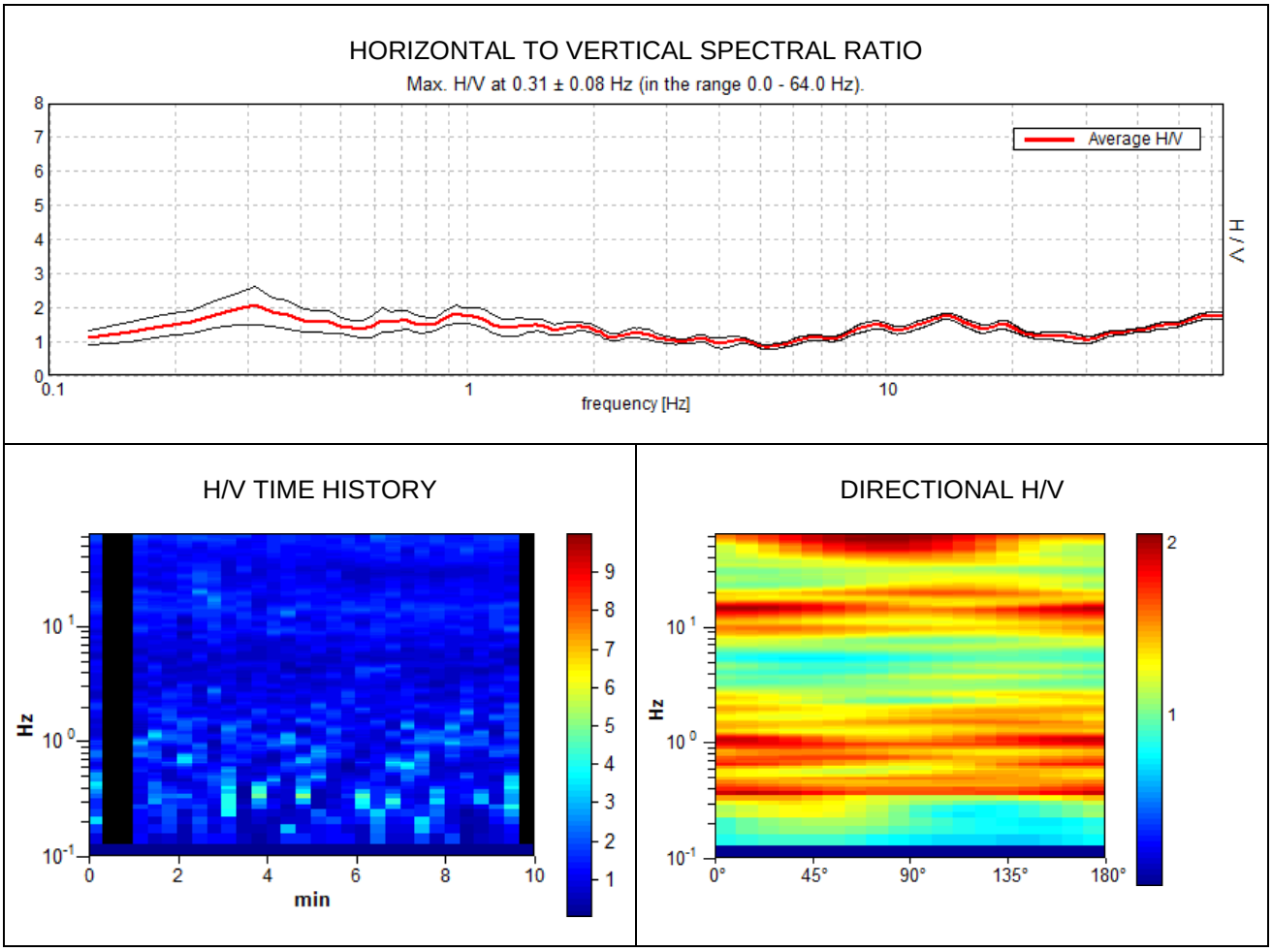
Criteria for a reliable HVSR curve [All 3 should be fulfilled]			
$f_0 > 10 / L_w$	2.41 > 0.50	OK	
$n_c(f_0) > 200$	1443.8 > 200	OK	
$\sigma_A(f) < 2$ for $0.5f_0 < f < 2f_0$ if $f_0 > 0.5$Hz **$\sigma_A(f) < 3$ for $0.5f_0 < f < 2f_0$ if $f_0 < 0.5$Hz**	Exceeded 0 out of 116 times	OK	
Criteria for a clear HVSR peak [At least 5 out of 6 should be fulfilled]			
Exists f^- in $[f_0/4, f_0]$ | $A_{H/V}(f^-) < A_0 / 2$			NO
Exists f^+ in $[f_0, 4f_0]$ | $A_{H/V}(f^+) < A_0 / 2$	5.406 Hz	OK	
$A_0 > 2$	1.88 > 2		NO
$f_{peak}[A_{H/V}(f) \pm \sigma_A(f)] = f_0 \pm 5\%$	|0.12222| < 0.05		NO
$\sigma_f < \varepsilon(f_0)$	0.29409 < 0.12031		NO
$\sigma_A(f_0) < \theta(f_0)$	0.1833 < 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
$\sigma_{logH/V}(f)$	standard deviation of log $A_{H/V}(f)$ curve
$\theta(f_0)$	threshold value for the stability condition $\sigma_A(f) < \theta(f_0)$

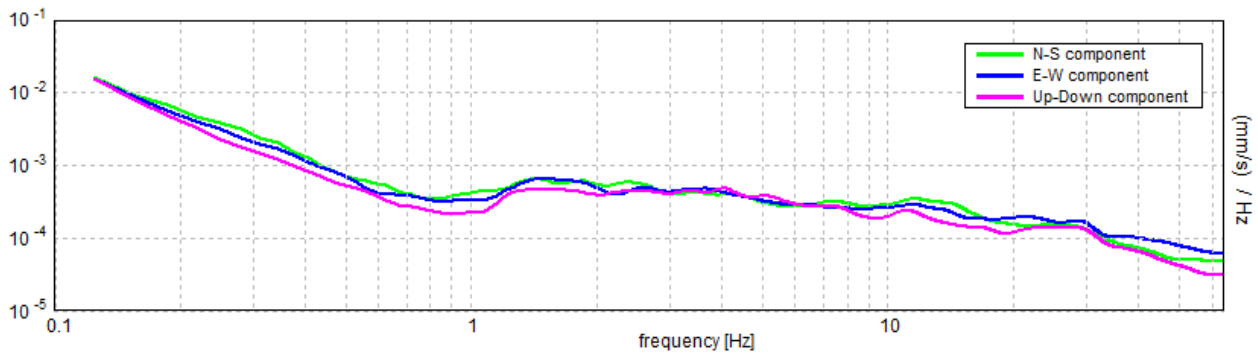
Threshold values for σ_f and $\sigma_A(f_0)$					
Freq.range [Hz]	< 0.2	0.2 – 0.5	0.5 – 1.0	1.0 – 2.0	> 2.0
$\varepsilon(f_0)$ [Hz]	0.25 f_0	0.2 f_0	0.15 f_0	0.10 f_0	0.05 f_0
$\theta(f_0)$ for $\sigma_A(f_0)$	3.0	2.5	2.0	1.78	1.58
Log $\theta(f_0)$ for $\sigma_{logH/V}(f_0)$	0.48	0.40	0.30	0.25	0.20

T 17 MATASSINO

Instrument: TR-0007-01-05
Start recording: 28/05/12 12:23:56 End recording: 28/05/12 12:33:57
Channel labels: NORTH SOUTH; EAST WEST ; UP DOWN
GPS data not available
Trace length: 0h10'00''. Analyzed 90% trace (manual window selection)
Sampling frequency: 128 Hz
Window size: 20 s
Smoothing window: Triangular window
Smoothing: 10%



SINGLE COMPONENT SPECTRA



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

Max. H/V at 0.31 ± 0.08 Hz (in the range 0.0 - 64.0 Hz).

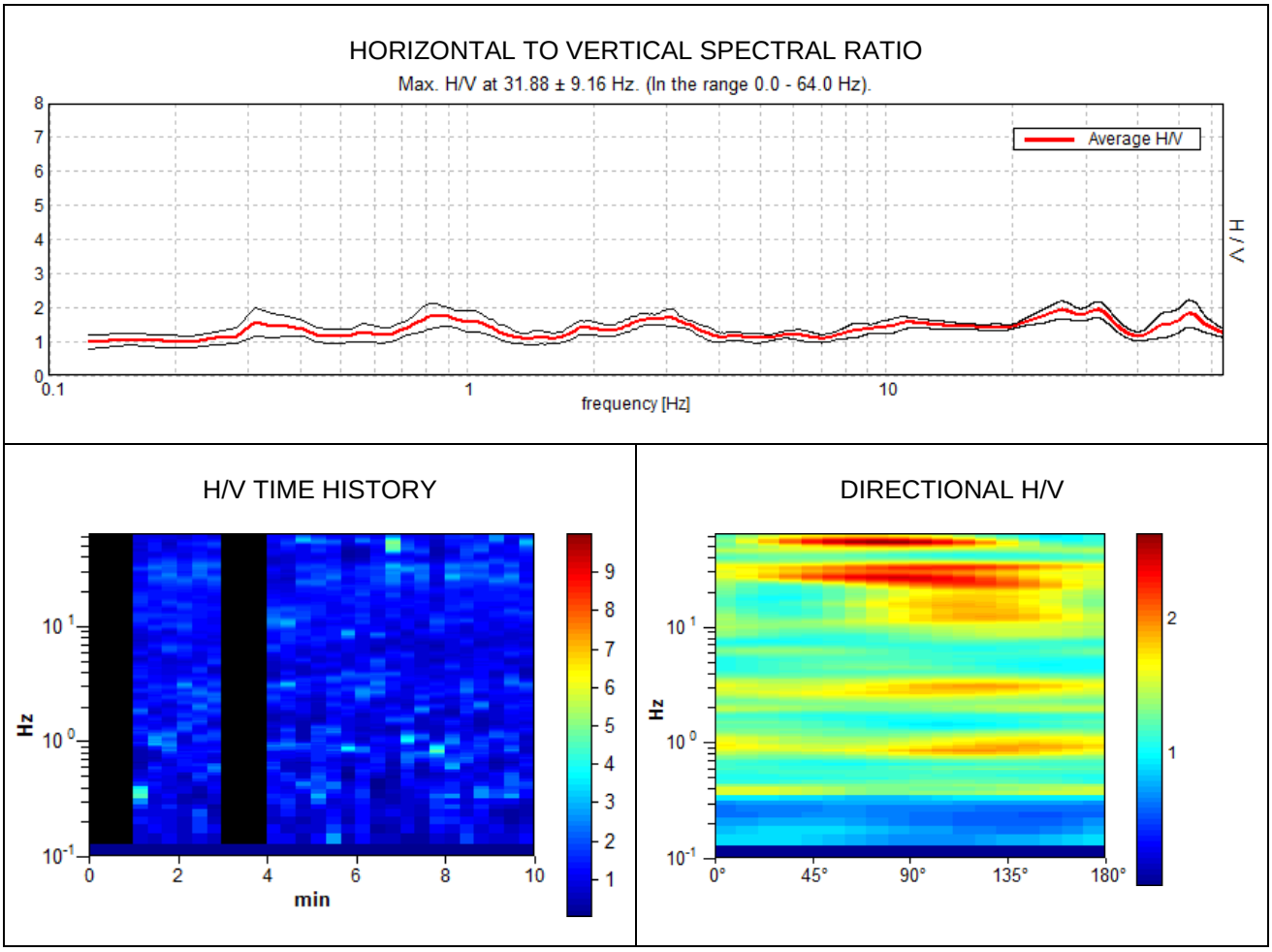
Criteria for a reliable HVSR curve [All 3 should be fulfilled]			
$f_0 > 10 / L_w$	0.31 > 0.50		**NO**
$n_c(f_0) > 200$	168.8 > 200		**NO**
$\sigma_A(f) < 2$ for $0.5f_0 < f < 2f_0$ if $f_0 > 0.5$Hz **$\sigma_A(f) < 3$ for $0.5f_0 < f < 2f_0$ if $f_0 < 0.5$Hz**	Exceeded 0 out of 16 times	**OK**	
Criteria for a clear HVSR peak [At least 5 out of 6 should be fulfilled]			
Exists f^- in $[f_0/4, f_0]$ | $A_{H/V}(f^-) < A_0 / 2$	0.094 Hz	**OK**	
Exists f^+ in $[f_0, 4f_0]$ | $A_{H/V}(f^+) < A_0 / 2$			**NO**
$A_0 > 2$	2.06 > 2	**OK**	
$f_{peak}[A_{H/V}(f) \pm \sigma_A(f)] = f_0 \pm 5\%$	|0.12776| < 0.05		**NO**
$\sigma_f < \varepsilon(f_0)$	0.03993 < 0.0625	**OK**	
$\sigma_A(f_0) < \theta(f_0)$	0.263 < 2.5	**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
$\sigma_{logH/V}(f)$	standard deviation of log $A_{H/V}(f)$ curve
$\theta(f_0)$	threshold value for the stability condition $\sigma_A(f) < \theta(f_0)$

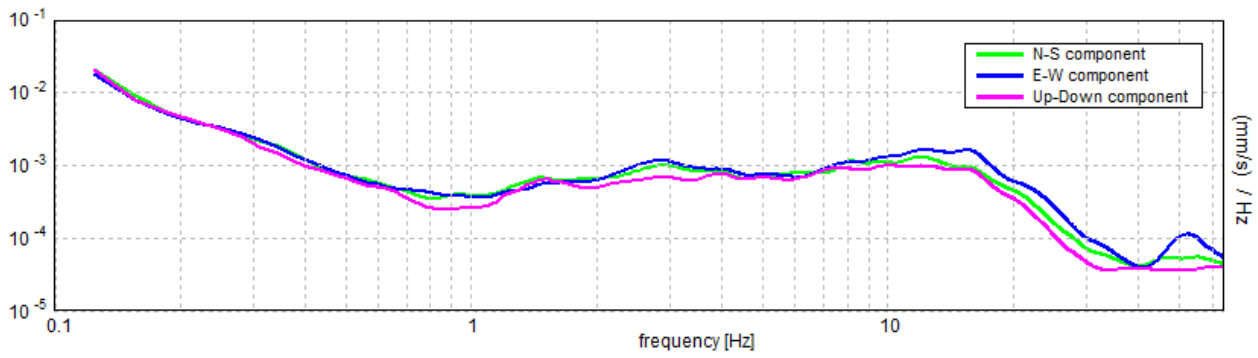
Threshold values for σ_f and $\sigma_A(f_0)$					
Freq.range [Hz]	< 0.2	0.2 – 0.5	0.5 – 1.0	1.0 – 2.0	> 2.0
$\varepsilon(f_0)$ [Hz]	0.25 f_0	0.2 f_0	0.15 f_0	0.10 f_0	0.05 f_0
$\theta(f_0)$ for $\sigma_A(f_0)$	3.0	2.5	2.0	1.78	1.58
Log $\theta(f_0)$ for $\sigma_{logH/V}(f_0)$	0.48	0.40	0.30	0.25	0.20

T 18 MATASSINO

Instrument: TR-0007-01-05
Start recording: 28/05/12 12:38:14 End recording: 28/05/12 12:48:15
Channel labels: NORTH SOUTH; EAST WEST ; UP DOWN
GPS data not available
Trace length: 0h10'00''. Analyzed 80% trace (manual window selection)
Sampling frequency: 128 Hz
Window size: 20 s
Smoothing window: Triangular window
Smoothing: 10%



SINGLE COMPONENT SPECTRA



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

Max. H/V at 31.88 ± 9.16 Hz (in the range 0.0 - 64.0 Hz).

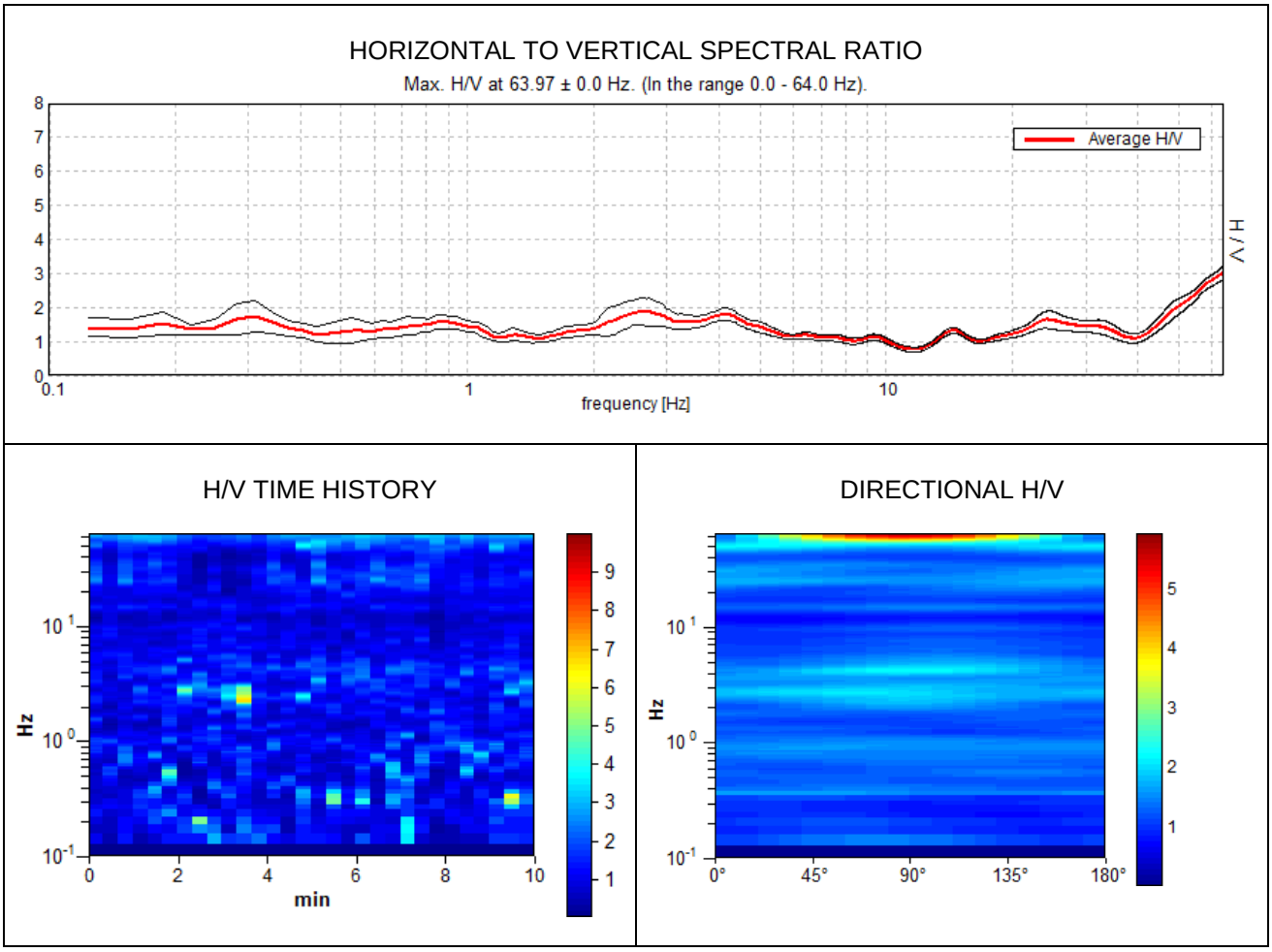
Criteria for a reliable HVSR curve [All 3 should be fulfilled]			
$f_0 > 10 / L_w$	31.88 > 0.50	OK	
$n_c(f_0) > 200$	15300.0 > 200	OK	
$\sigma_A(f) < 2$ for $0.5f_0 < f < 2f_0$ if $f_0 > 0.5$Hz **$\sigma_A(f) < 3$ for $0.5f_0 < f < 2f_0$ if $f_0 < 0.5$Hz**	Exceeded 0 out of 1531 times	OK	
Criteria for a clear HVSR peak [At least 5 out of 6 should be fulfilled]			
Exists f^- in $[f_0/4, f_0]$ | $A_{H/V}(f^-) < A_0 / 2$			NO
Exists f^+ in $[f_0, 4f_0]$ | $A_{H/V}(f^+) < A_0 / 2$			NO
$A_0 > 2$	1.93 > 2		NO
$f_{peak}[A_{H/V}(f) \pm \sigma_A(f)] = f_0 \pm 5\%$	|0.136| < 0.05		NO
$\sigma_f < \varepsilon(f_0)$	4.33515 < 1.59375		NO
$\sigma_A(f_0) < \theta(f_0)$	0.109 < 1.58	OK	

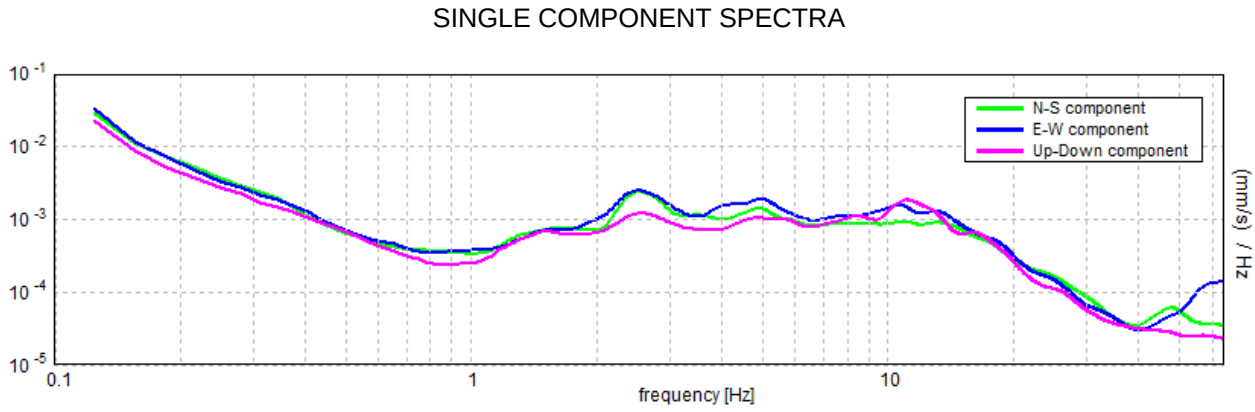
L_w	window length
n_w	number of windows used in the analysis
$n_c = L_w n_w f_0$	number of significant cycles
f	current frequency
f_0	H/V peak frequency
σ_f	standard deviation of H/V peak frequency
$\varepsilon(f_0)$	threshold value for the stability condition $\sigma_f < \varepsilon(f_0)$
A_0	H/V peak 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
$\sigma_{logH/V}(f)$	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 $\sigma_{logH/V}(f_0)$	0.48	0.40	0.30	0.25	0.20

T 19 MATASSINO

Instrument: TR-0007-01-05
Start recording: 28/05/12 12:54:08 End recording: 28/05/12 13:04:09
Channel labels: NORTH SOUTH; EAST WEST ; UP DOWN
GPS data not available
Trace length: 0h10'00". Analysis performed on the entire trace.
Sampling frequency: 128 Hz
Window size: 20 s
Smoothing window: Triangular window
Smoothing: 10%





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

Max. H/V at 63.97 ± 0.0 Hz (in the range 0.0 - 64.0 Hz).

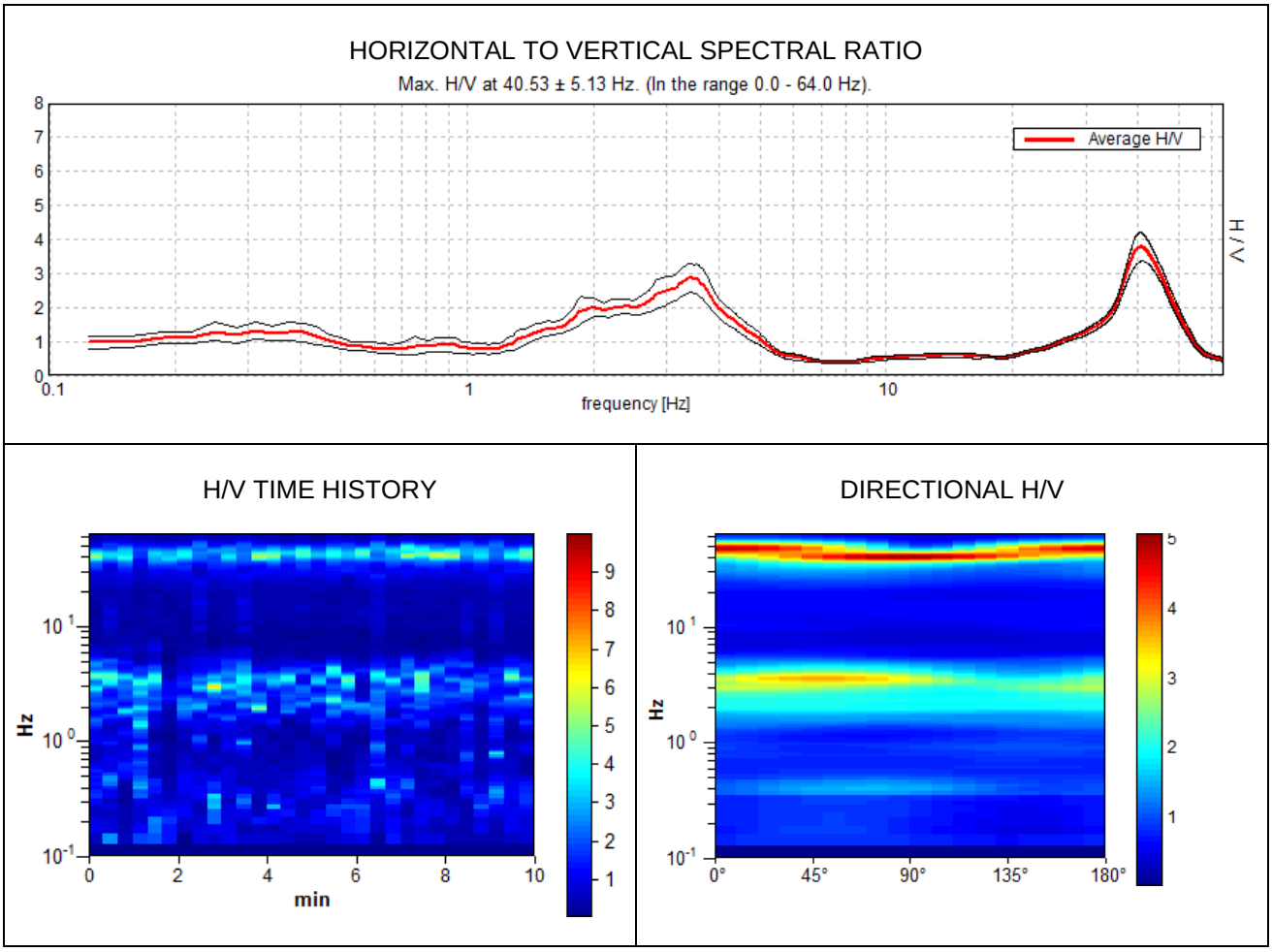
Criteria for a reliable HVSR curve [All 3 should be fulfilled]			
$f_0 > 10 / L_w$	63.97 > 0.50	OK	
$n_c(f_0) > 200$	38381.3 > 200	OK	
$\sigma_A(f) < 2$ for $0.5f_0 < f < 2f_0$ if $f_0 > 0.5$Hz **$\sigma_A(f) < 3$ for $0.5f_0 < f < 2f_0$ if $f_0 < 0.5$Hz**	Exceeded 0 out of 1026 times	OK	
Criteria for a clear HVSR peak [At least 5 out of 6 should be fulfilled]			
Exists f^- in $[f_0/4, f_0]$ | $A_{H/V}(f^-) < A_0 / 2$	44.75 Hz	OK	
Exists f^+ in $[f_0, 4f_0]$ | $A_{H/V}(f^+) < A_0 / 2$			NO
$A_0 > 2$	3.02 > 2	OK	
$f_{peak}[A_{H/V}(f) \pm \sigma_A(f)] = f_0 \pm 5\%$	|0.0| < 0.05	OK	
$\sigma_f < \varepsilon(f_0)$	0.0 < 3.19844	OK	
$\sigma_A(f_0) < \theta(f_0)$	0.0946 < 1.58	OK	

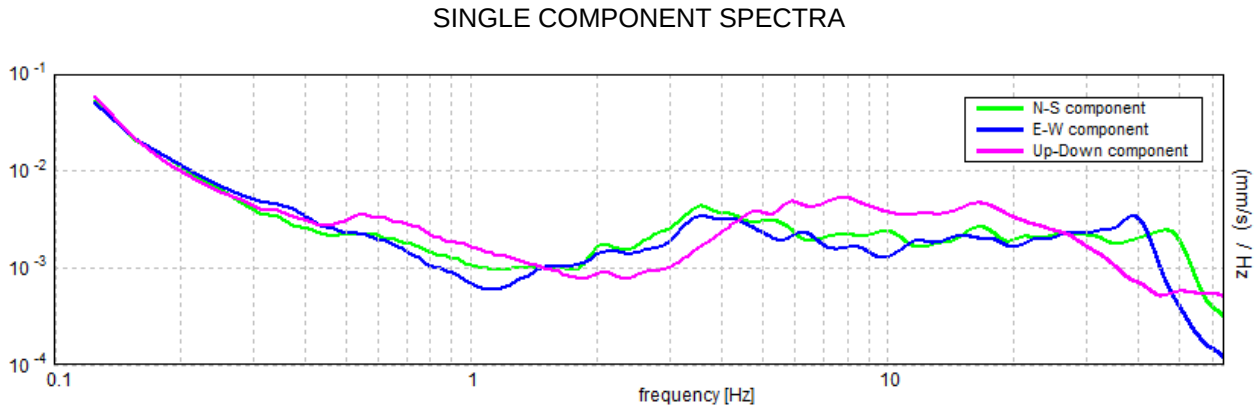
L_w	window length
n_w	number of windows used in the analysis
$n_c = L_w n_w f_0$	number of significant cycles
f	current frequency
f_0	H/V peak frequency
σ_f	standard deviation of H/V peak frequency
$\varepsilon(f_0)$	threshold value for the stability condition $\sigma_f < \varepsilon(f_0)$
A_0	H/V peak 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
$\sigma_{logH/V}(f)$	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 $\sigma_{logH/V}(f_0)$	0.48	0.40	0.30	0.25	0.20

T 20 MATASSINO

Instrument: TR-0007-01-05
Start recording: 28/05/12 13:12:02 End recording: 28/05/12 13:22:03
Channel labels: NORTH SOUTH; EAST WEST ; UP DOWN
GPS data not available
Trace length: 0h10'00''. Analysis performed on the entire trace.
Sampling frequency: 128 Hz
Window size: 20 s
Smoothing window: Triangular window
Smoothing: 10%





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

Max. H/V at 40.53 ± 5.13 Hz (in the range 0.0 - 64.0 Hz).

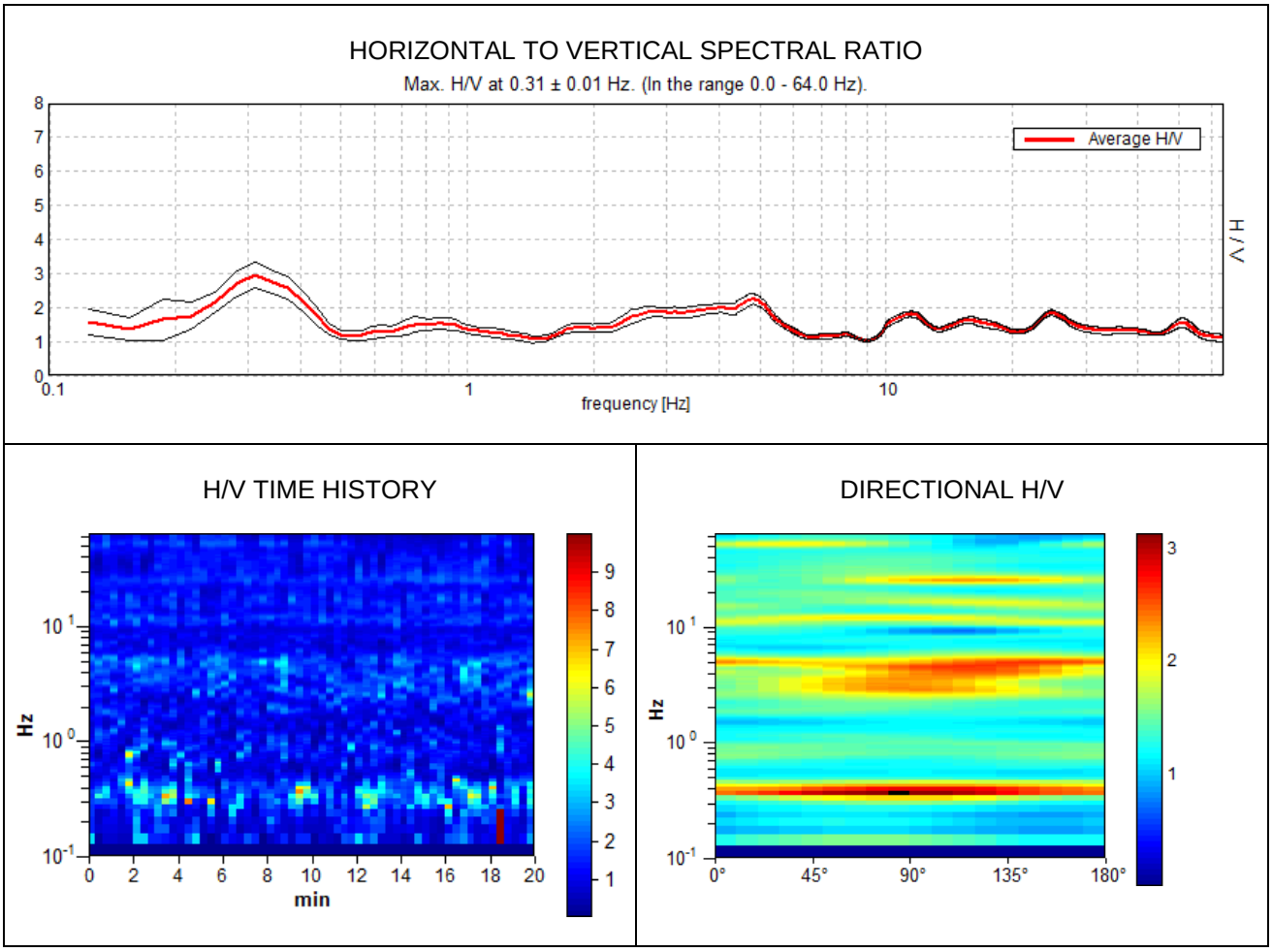
Criteria for a reliable HVSR curve [All 3 should be fulfilled]			
$f_0 > 10 / L_w$	40.53 > 0.50	OK	
$n_c(f_0) > 200$	24318.8 > 200	OK	
$\sigma_A(f) < 2$ for $0.5f_0 < f < 2f_0$ if $f_0 > 0.5$Hz **$\sigma_A(f) < 3$ for $0.5f_0 < f < 2f_0$ if $f_0 < 0.5$Hz**	Exceeded 0 out of 1400 times	OK	
Criteria for a clear HVSR peak [At least 5 out of 6 should be fulfilled]			
Exists f^- in $[f_0/4, f_0]$ | $A_{H/V}(f^-) < A_0 / 2$	34.719 Hz	OK	
Exists f^+ in $[f_0, 4f_0]$ | $A_{H/V}(f^+) < A_0 / 2$	49.656 Hz	OK	
$A_0 > 2$	3.78 > 2	OK	
$f_{peak}[A_{H/V}(f) \pm \sigma_A(f)] = f_0 \pm 5\%$	|0.06082| < 0.05		NO
$\sigma_f < \varepsilon(f_0)$	2.46495 < 2.02656		NO
$\sigma_A(f_0) < \theta(f_0)$	0.2054 < 1.58	OK	

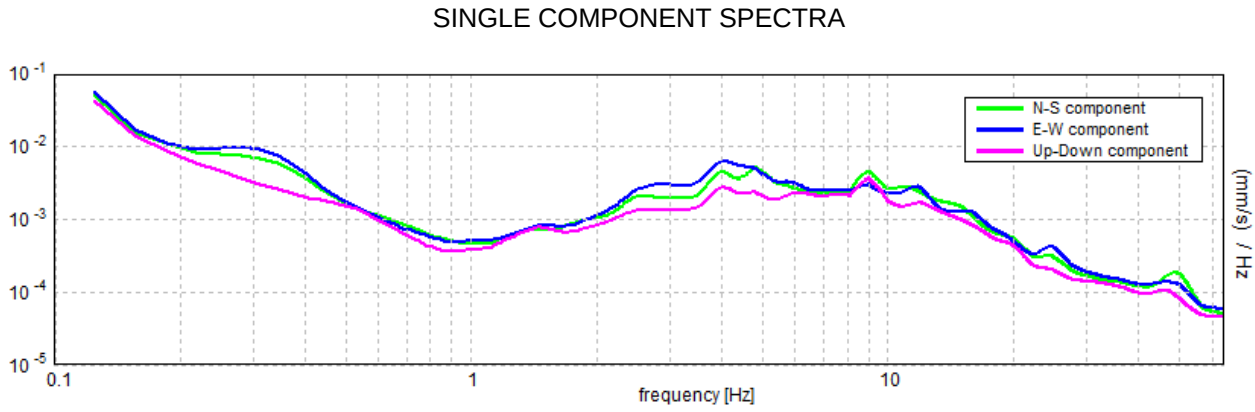
L_w	window length
n_w	number of windows used in the analysis
$n_c = L_w n_w f_0$	number of significant cycles
f	current frequency
f_0	H/V peak frequency
σ_f	standard deviation of H/V peak frequency
$\varepsilon(f_0)$	threshold value for the stability condition $\sigma_f < \varepsilon(f_0)$
A_0	H/V peak 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
$\sigma_{logH/V}(f)$	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 $\sigma_{logH/V}(f_0)$	0.48	0.40	0.30	0.25	0.20

T 49 MATASSINO

Instrument: TRS-0009/00-06
Start recording: 13/06/12 15:39:15 End recording: 13/06/12 15:59:16
Channel labels: NORTH SOUTH; EAST WEST ; UP DOWN
GPS data not available
Trace length: 0h20'00''. Analysis performed on the entire trace.
Sampling frequency: 128 Hz
Window size: 20 s
Smoothing window: Triangular window
Smoothing: 10%





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

Max. H/V at 0.31 ± 0.01 Hz (in the range 0.0 - 64.0 Hz).

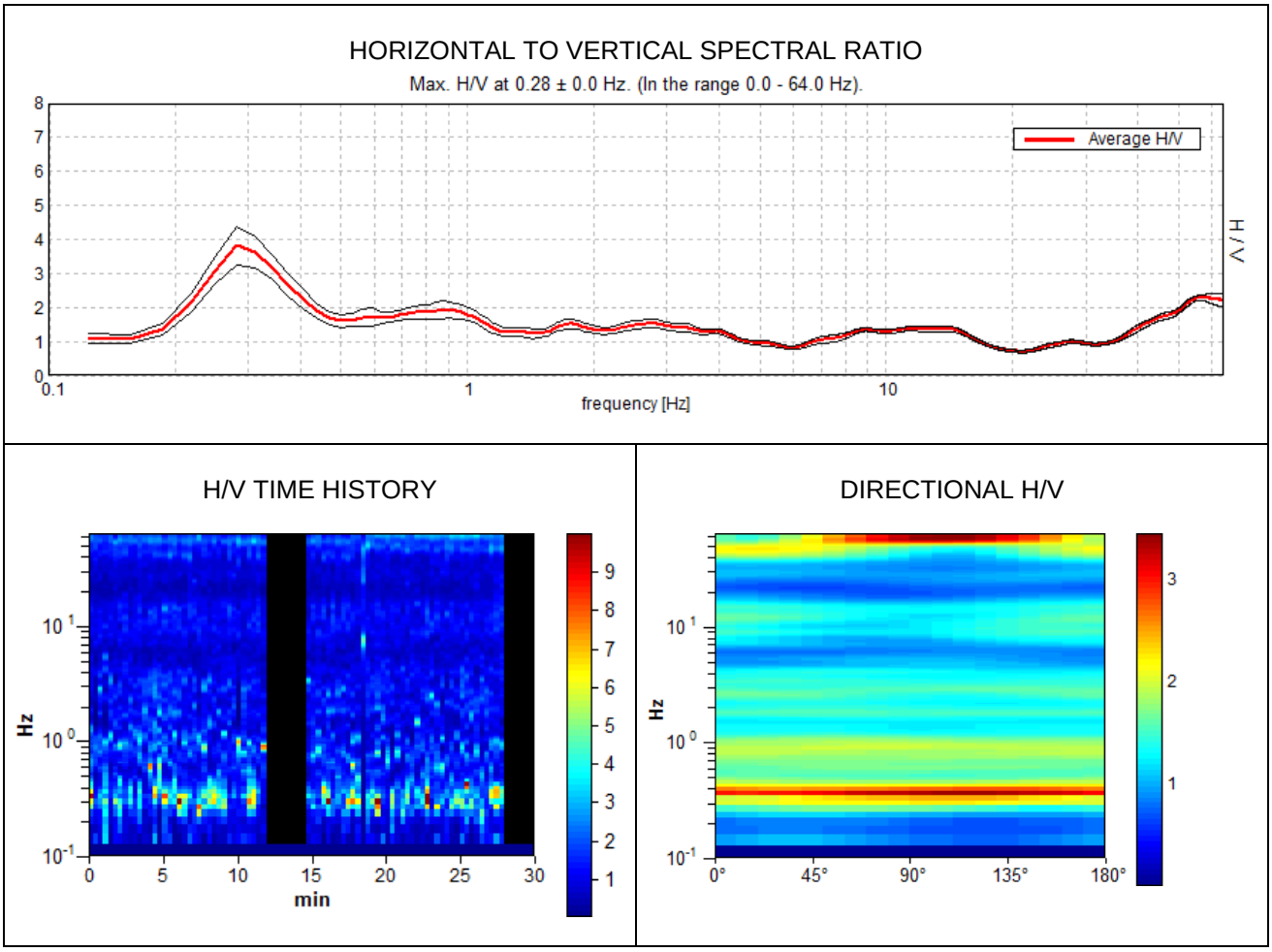
Criteria for a reliable HVSR curve [All 3 should be fulfilled]			
$f_0 > 10 / L_w$	0.31 > 0.50		**NO**
$n_c(f_0) > 200$	375.0 > 200	**OK**	
$\sigma_A(f) < 2$ for $0.5f_0 < f < 2f_0$ if $f_0 > 0.5$Hz **$\sigma_A(f) < 3$ for $0.5f_0 < f < 2f_0$ if $f_0 < 0.5$Hz**	Exceeded 0 out of 16 times	**OK**	
Criteria for a clear HVSR peak [At least 5 out of 6 should be fulfilled]			
Exists f^- in $[f_0/4, f_0]$ | $A_{H/V}(f^-) < A_0 / 2$	0.156 Hz	**OK**	
Exists f^+ in $[f_0, 4f_0]$ | $A_{H/V}(f^+) < A_0 / 2$	0.469 Hz	**OK**	
$A_0 > 2$	2.96 > 2	**OK**	
$f_{peak}[A_{H/V}(f) \pm \sigma_A(f)] = f_0 \pm 5\%$	|0.01067| < 0.05	**OK**	
$\sigma_f < \varepsilon(f_0)$	0.00333 < 0.0625	**OK**	
$\sigma_A(f_0) < \theta(f_0)$	0.1823 < 2.5	**OK**	

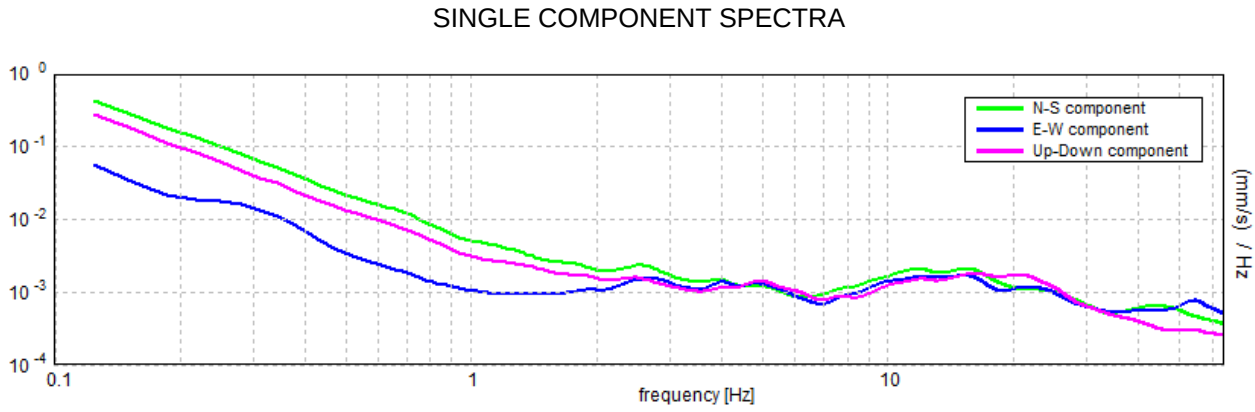
L_w	window length
n_w	number of windows used in the analysis
$n_c = L_w n_w f_0$	number of significant cycles
f	current frequency
f_0	H/V peak frequency
σ_f	standard deviation of H/V peak frequency
$\varepsilon(f_0)$	threshold value for the stability condition $\sigma_f < \varepsilon(f_0)$
A_0	H/V peak 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
$\sigma_{logH/V}(f)$	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 $\sigma_{logH/V}(f_0)$	0.48	0.40	0.30	0.25	0.20

T 50 MATASSINO

Instrument: TR-0007-01-05
Start recording: 13/06/12 15:34:59 End recording: 13/06/12 16:05:00
Channel labels: NORTH SOUTH; EAST WEST ; UP DOWN
GPS data not available
Trace length: 0h30'00". Analyzed 84% trace (manual window selection)
Sampling frequency: 128 Hz
Window size: 20 s
Smoothing window: Triangular window
Smoothing: 10%





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

Max. H/V at 0.28 ± 0.0 Hz (in the range 0.0 - 64.0 Hz).

Criteria for a reliable HVSR curve [All 3 should be fulfilled]			
$f_0 > 10 / L_w$	0.28 > 0.50		**NO**
$n_c(f_0) > 200$	427.5 > 200	**OK**	
$\sigma_A(f) < 2$ for $0.5f_0 < f < 2f_0$ if $f_0 > 0.5$Hz **$\sigma_A(f) < 3$ for $0.5f_0 < f < 2f_0$ if $f_0 < 0.5$Hz**	Exceeded 0 out of 14 times	**OK**	
Criteria for a clear HVSR peak [At least 5 out of 6 should be fulfilled]			
Exists f^- in $[f_0/4, f_0]$ | $A_{H/V}(f^-) < A_0 / 2$	0.188 Hz	**OK**	
Exists f^+ in $[f_0, 4f_0]$ | $A_{H/V}(f^+) < A_0 / 2$	0.438 Hz	**OK**	
$A_0 > 2$	3.82 > 2	**OK**	
$f_{peak}[A_{H/V}(f) \pm \sigma_A(f)] = f_0 \pm 5\%$	|0.00547| < 0.05	**OK**	
$\sigma_f < \varepsilon(f_0)$	0.00154 < 0.05625	**OK**	
$\sigma_A(f_0) < \theta(f_0)$	0.2817 < 2.5	**OK**	

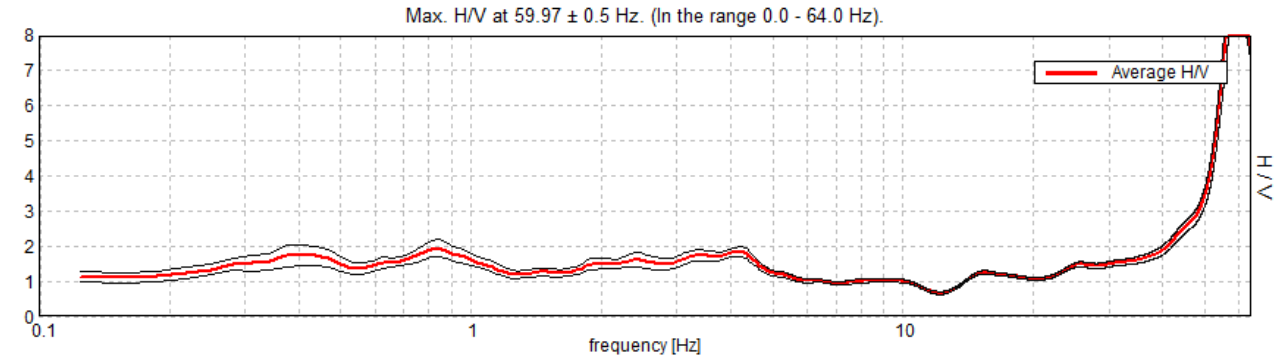
L_w	window length
n_w	number of windows used in the analysis
$n_c = L_w n_w f_0$	number of significant cycles
f	current frequency
f_0	H/V peak frequency
σ_f	standard deviation of H/V peak frequency
$\varepsilon(f_0)$	threshold value for the stability condition $\sigma_f < \varepsilon(f_0)$
A_0	H/V peak 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
$\sigma_{logH/V}(f)$	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 $\sigma_{logH/V}(f_0)$	0.48	0.40	0.30	0.25	0.20

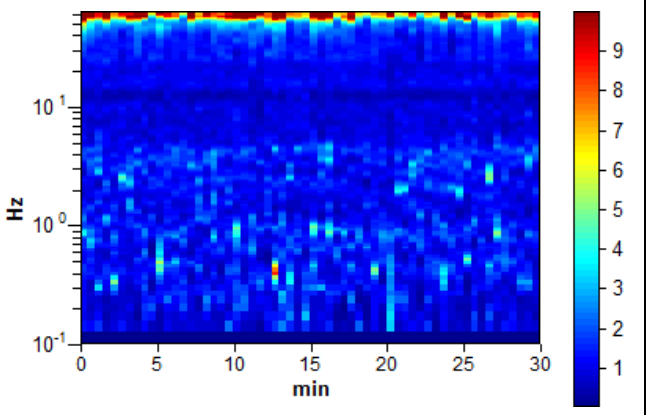
T 52 MATASSINO

Instrument: TR-0007-01-05
Start recording: 11/07/12 12:33:30 End recording: 11/07/12 13:03:31
Channel labels: NORTH SOUTH; EAST WEST ; UP DOWN
GPS data not available
Trace length: 0h30'00". Analysis performed on the entire trace.
Sampling frequency: 128 Hz
Window size: 30 s
Smoothing window: Triangular window
Smoothing: 10%

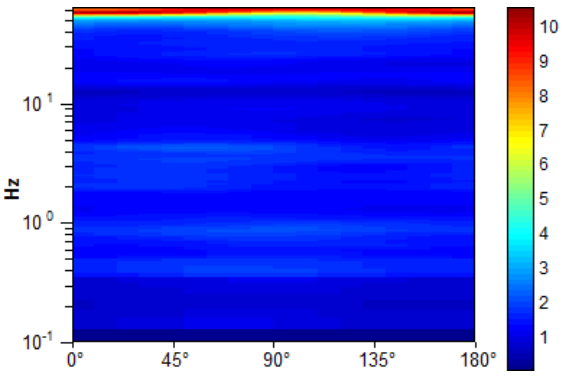
HORIZONTAL TO VERTICAL SPECTRAL RATIO



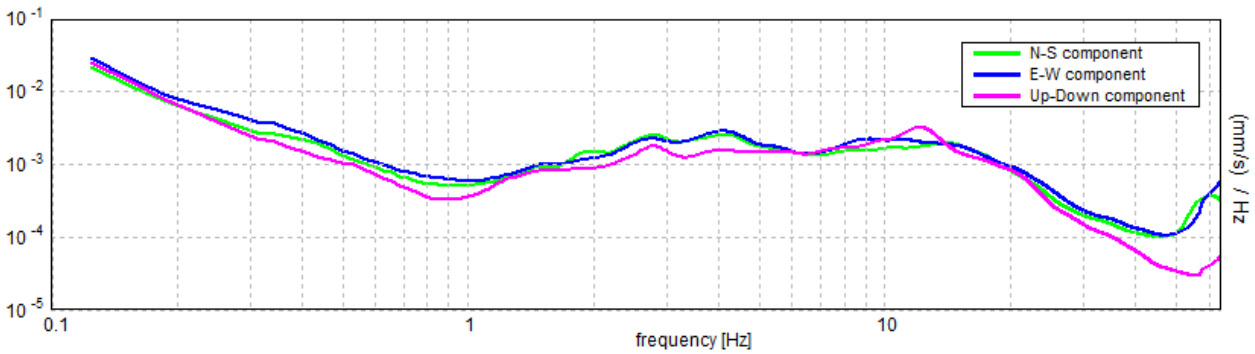
H/V TIME HISTORY



DIRECTIONAL H/V



SINGLE COMPONENT SPECTRA



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

Max. H/V at 59.97 ± 0.5 Hz (in the range 0.0 - 64.0 Hz).

Criteria for a reliable HVSR curve [All 3 should be fulfilled]			
$f_0 > 10 / L_w$	59.97 > 0.33	OK	
$n_c(f_0) > 200$	107943.8 > 200	OK	
$\sigma_A(f) < 2$ for $0.5f_0 < f < 2f_0$ if $f_0 > 0.5$Hz **$\sigma_A(f) < 3$ for $0.5f_0 < f < 2f_0$ if $f_0 < 0.5$Hz**	Exceeded 0 out of 1090 times	OK	
Criteria for a clear HVSR peak [At least 5 out of 6 should be fulfilled]			
Exists f^- in $[f_0/4, f_0]$ | $A_{H/V}(f^-) < A_0 / 2$	52.125 Hz	OK	
Exists f^+ in $[f_0, 4f_0]$ | $A_{H/V}(f^+) < A_0 / 2$			NO
$A_0 > 2$	8.92 > 2	OK	
$f_{peak}[A_{H/V}(f) \pm \sigma_A(f)] = f_0 \pm 5\%$	|0.00414| < 0.05	OK	
$\sigma_f < \varepsilon(f_0)$	0.24846 < 2.99844	OK	
$\sigma_A(f_0) < \theta(f_0)$	0.2557 < 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
$\sigma_{logH/V}(f)$	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 $\sigma_{logH/V}(f_0)$	0.48	0.40	0.30	0.25	0.20