ALLEGATO 2

Report della campagna geognostica e geofisica

HVSR1C

DATE 06.07.2017	HOUR 9:30	PLACE Fornace Zarattini
OPERATOR Geologica Toscana - Prospezioni Geofisiche S.n.c.	GPS TYPE and #	
GAUSS-BOAGA LATITUDE 4922889.63	GAUSS-BOAGA LONGITUDE 2294779.43	ALTITUDE
STATION TYPE GPA	SENSOR TYPE 4,5 Hz	
STATION #	SENSOR #	DISK #
FILE NAME Ra HVSR1		POINT #
GAIN	SAMPL. FREQ. 100 Hz	REC. DURATION 30 min (minutes / seconds)

WEATHER CONDITIONS
WIND ● none ☐ weak (5m/s) ☐ medium ☐ strong Measurement (if any): _____
RAIN ● none ☐ weak ☐ medium ☐ strong Measurement (if any): _____
Temperature (approx): 30 Remarks _____

GROUND TYPE
● earth (● hard ☐ soft) ☐ gravel ☐ sand ☐ rock ☐ grass (☐ short ☐ tall)
☐ asphalt ☐ cement ☐ concrete ☐ paved ☐ other _____
● dry soil ☐ wet soil Remarks _____

ARTIFICIAL GROUND-SENSOR COUPLING ● no ☐ yes, type _____

BUILDING DENSITY ☐ none ☐ scattered ● dense ☐ other, type _____

TRANSIENTS	none	few	moderate	many	very dense	distance
cars			●			
trucks		●				
pedestrians	●					
other		●				

MONOCHROMATIC NOISE SOURCES (factories, works, pumps, rivers...)
● no ☐ yes, type _____

NEARBY STRUCTURES (description, height, distance) (trees, polls, buildings, bridges, underground structures,...)
Trees, Bridge

OBSERVATIONS

FREQUENCY: Hz (if computed in the field)

Qualità della misura:

Durata: rispettata
Stazionarietà: rispettata
Isotropia: rispettata
Assenza di disturbi: rispettata
Plausibilità fisica: rispettata
Robustezza statistica: rispettata

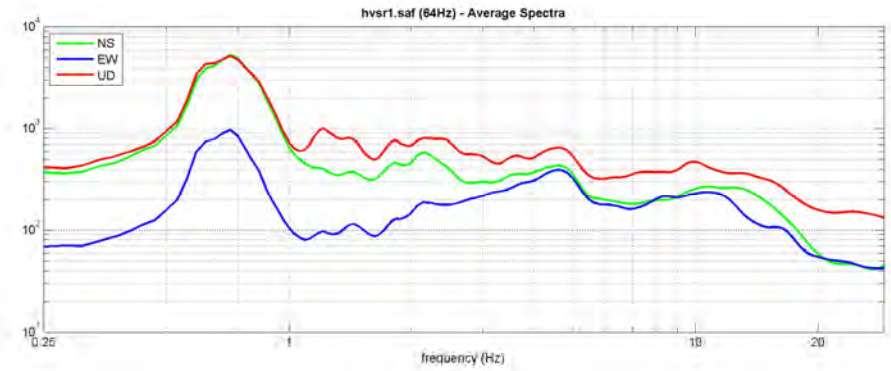
MISURA TIPO A2

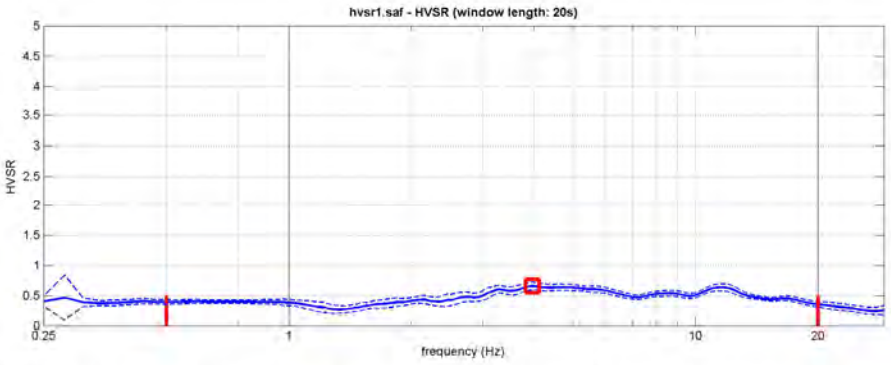
HVSR1

Peak frequency (Hz): 4.0 (±2.9)
Peak HVSR value: 0.7 (±0.1)

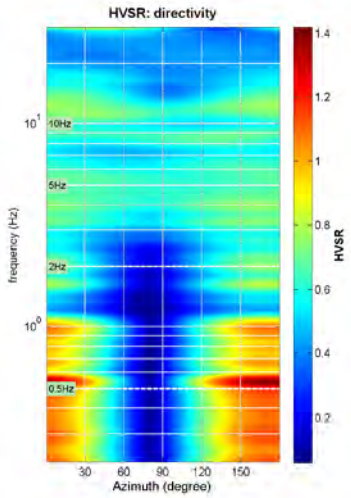
=== Criteria for a reliable H/V curve ==========
#1. [f0 > 10/Lw]: 3.973 > 0.5 (OK)
#2. [nc > 200]: 13904 > 200 (OK)
#3. [f0>0.5Hz; sigmaA(f) < 2 for 0.5f0 < f < 2f0] (OK)

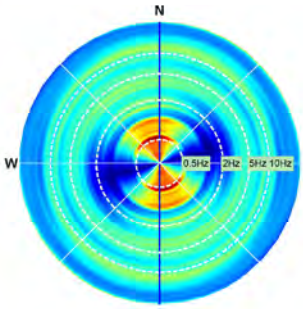
=== Criteria for a clear H/V peak (at least 5 should be fulfilled) ==========
#1. [exists f- in the range [f0/4, f0] | AH/V(f-) < A0/2]: yes, at frequency 1.2Hz (OK)
#2. [exists f+ in the range [f0, 4f0] | AH/V(f+) < A0/2]: (NO)
#3. [A0 > 2]: 0.7 < 2 (NO)
#4. [fpeak[Ah/v(f) ą sigmaA(f)] = f0 ą 5%]: (OK)
#5. [sigmaf < epsilon(f0)]: 2.910 > 0.199 (NO)
#6. [sigmaA(f0) < theta(f0)]: 0.065 < 1.58 (OK)

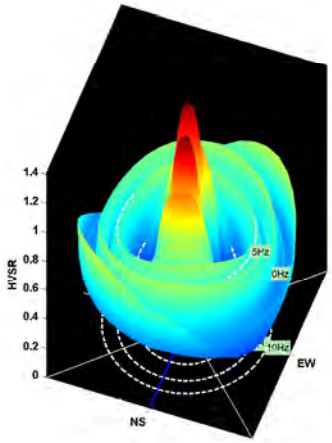


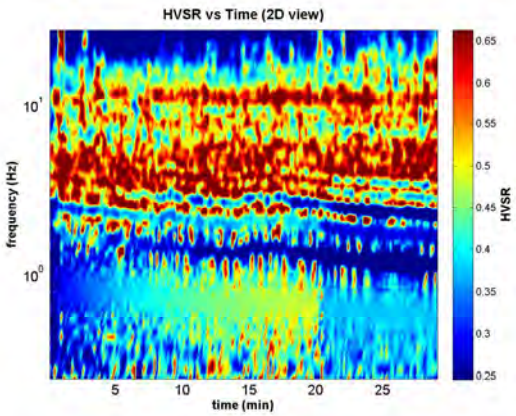


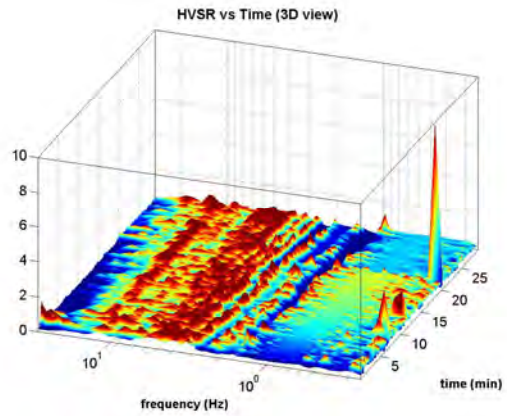
To model the HVSR (also jointly with MASW or ReMi/ESAC data), save the HV curve, go to the "Velocity Spectrum/a. Modeling & Picking" panels and upload the saved HV curve











HVSR2C

DATE 06.07.2017	HOUR 11.15	PLACE Centro Culturale
OPERATOR Geologica Toscana - Prospezioni Geofisiche S.n.c.	GPS TYPE and #	
GAUSS-BOAGA LATITUDE 4922540.84	GAUSS-BOAGA LONGITUDE 2293342.19	ALTITUDE
STATION TYPE GPA	SENSOR TYPE 4,5 Hz	
STATION #	SENSOR #	DISK #
FILE NAME Ra HVSR2		POINT #
GAIN	SAMPL. FREQ. 100 Hz	REC. DURATION 30 min (minutes / seconds)

WEATHER CONDITIONS: WIND ● none ☐ weak (5m/s) ☐ medium ☐ strong Measurement (if any): ____ ; RAIN ● none ☐ weak ☐ medium ☐ strong Measurement (if any): ____ ; Temperature (approx): 35 Remarks ____

GROUND TYPE: ☐ earth (☐ hard ☐ soft) ☐ gravel ☐ sand ☐ rock ● grass = (● short ☐ tall) ; ☐ asphalt ☐ cement ☐ concrete ☐ paved ☐ other ____ ; ● dry soil ☐ wet soil Remarks ____

ARTIFICIAL GROUND-SENSOR COUPLING ● no ☐ yes, type ____

BUILDING DENSITY ☐ none ● scattered ☐ dense ☐ other, type ____

TRANSIENTS	none	few	moderate	many	very dense	distance
cars					●	
trucks				●		
pedestrians	●					
other ____		●				

MONOCHROMATIC NOISE SOURCES (factories, works, pumps, rivers...) ● no ☐ yes, type ____

NEARBY STRUCTURES (description, height, distance) (trees, polls, buildings, bridges, underground structures,...)

Trees, Buildings

OBSERVATIONS

FREQUENCY: Hz (if computed in the field)

Qualità della misura:

Durata: rispettata
Stazionarietà: rispettata
Isotropia: rispettata
Assenza di disturbi: non rispettata
Plausibilità fisica: rispettata
Robustezza statistica: rispettata

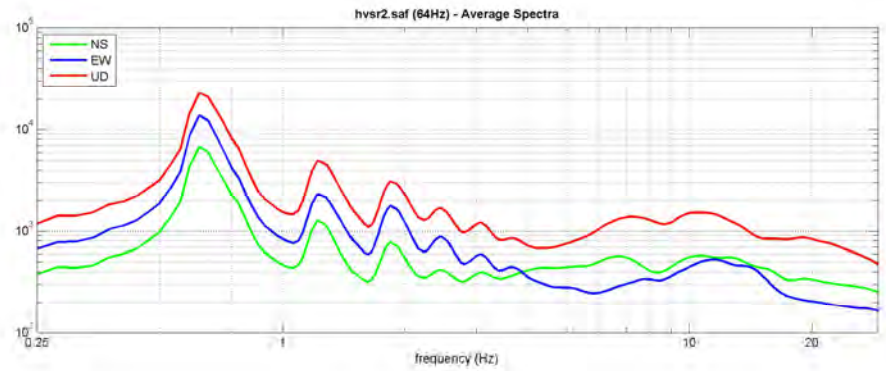
MISURA TIPO B2

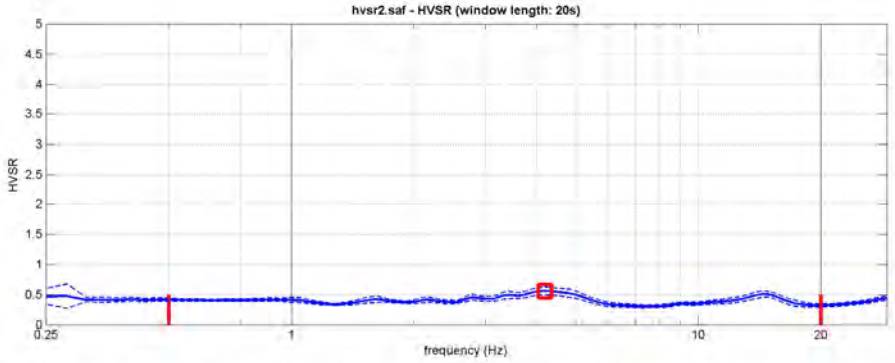
HVSR2

Peak frequency (Hz): 4.2 (±4.7)
Peak HVSR value: 0.6 (±0.1)

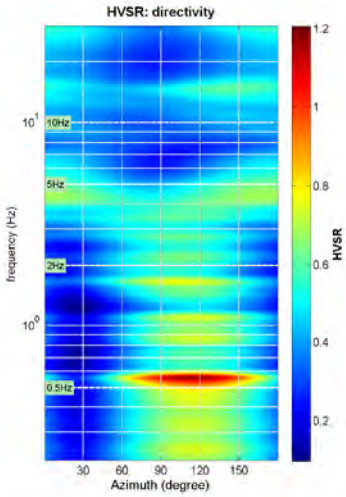
=== Criteria for a reliable H/V curve ==========
#1. [f0 > 10/Lw]: 4.192 > 0.5 (OK)
#2. [nc > 200]: 14251 > 200 (OK)
#3. [f0>0.5Hz; sigmaA(f) < 2 for 0.5f0 < f < 2f0] (OK)

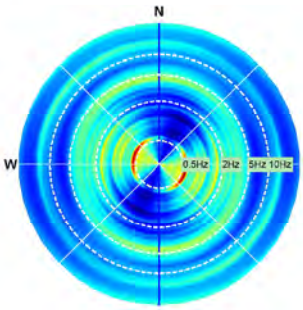
=== Criteria for a clear H/V peak (at least 5 should be fulfilled) ==========
#1. [exists f- in the range [f0/4, f0] | AH/V(f-) < A0/2]: (NO)
#2. [exists f+ in the range [f0, 4f0] | AH/V(f+) < A0/2]: (NO)
#3. [A0 > 2]: 0.6 < 2 (NO)
#4. [fpeak[Ah/v(f) ą sigmaA(f)] = f0 ą 5%]: (OK)
#5. [sigmaf < epsilon(f0)]: 4.721 > 0.210 (NO)
#6. [sigmaA(f0) < theta(f0)]: 0.063 < 1.58 (OK)

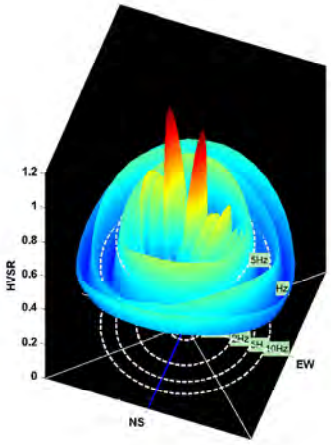


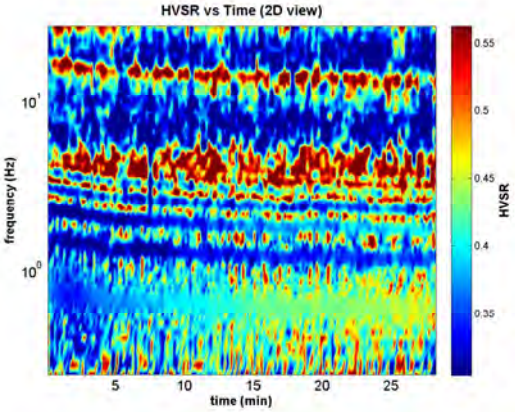


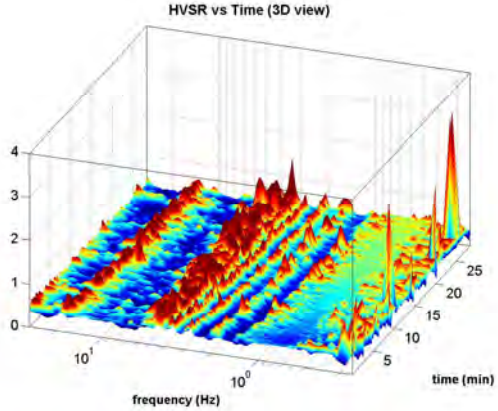
To model the HVSR (also jointly with MASW or ReMi/ESAC data), save the HV curve, go to the "Velocity Spectrum/a. Modeling & Picking" panels and upload the saved HV curve











HVSR3C

DATE 10.07.2017	HOUR 15:30	PLACE Romea Vecchia
OPERATOR Geologica Toscana - Prospezioni Geofisiche S.n.c.	GPS TYPE and #	
GAUSS-BOAGA LATITUDE 4918790.1	GAUSS-BOAGA LONGITUDE 2299696.58	ALTITUDE
STATION TYPE GPA	SENSOR TYPE 4,5 Hz	
STATION #	SENSOR #	DISK #
FILE NAME Ra HVSR3		POINT #
GAIN	SAMPL. FREQ. 100 Hz	REC. DURATION 30 min (minutes / seconds)

WEATHER CONDITIONS: WIND [ ] none [x] weak (5m/s) [ ] medium [ ] strong Measurement (if any): ____ ; RAIN [x] none [ ] weak [ ] medium [ ] strong Measurement (if any): ____ ; Temperature (approx): 38 ; Remarks ____

GROUND TYPE: [ ] earth ([ ] hard [ ] soft) [ ] gravel [ ] sand [ ] rock [x] grass = ([x] short [ ] tall)
[ ] asphalt [ ] cement [ ] concrete [ ] paved [ ] other ____
[x] dry soil [ ] wet soil Remarks ____

ARTIFICIAL GROUND-SENSOR COUPLING [x] no [ ] yes, type ____

BUILDING DENSITY [ ] none [x] scattered [ ] dense [ ] other, type ____

TRANSIENTS	none	few	moderate	many	very dense	distance
cars		x				
trucks	x					
pedestrians		x				
other		x				

MONOCHROMATIC NOISE SOURCES (factories, works, pumps, rivers...): [x] no [ ] yes, type ____

NEARBY STRUCTURES (description, height, distance) (trees, polls, buildings, bridges, underground structures,...): Trees

OBSERVATIONS

FREQUENCY: Hz (if computed in the field)

Qualità della misura:

Durata: rispettata
Stazionarietà: rispettata
Isotropia: rispettata
Assenza di disturbi: rispettata
Plausibilità fisica: rispettata
Robustezza statistica: rispettata

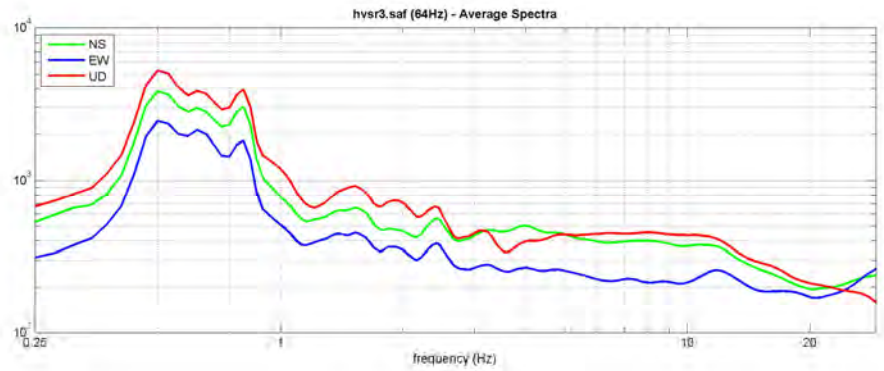
MISURA TIPO A2

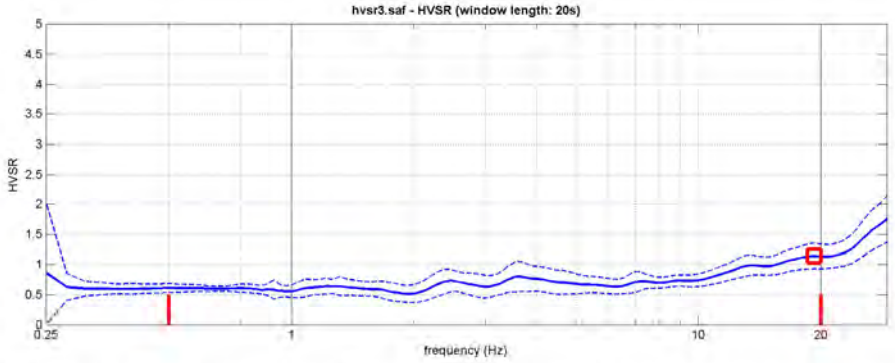
HVSR3

Peak frequency (Hz): 19.2 (±6.9)
Peak HVSR value: 1.1 (±0.2)

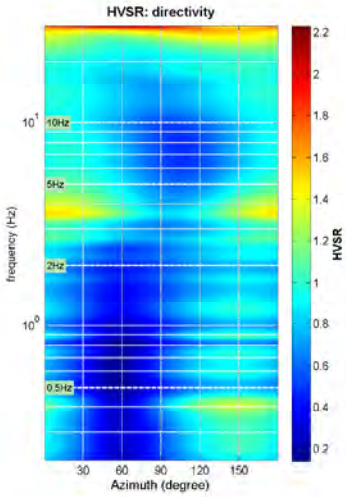
=== Criteria for a reliable H/V curve ==========
#1. [f0 > 10/Lw]: 19.206 > 0.5 (OK)
#2. [nc > 200]: 67990 > 200 (OK)
#3. [f0>0.5Hz; sigmaA(f) < 2 for 0.5f0 < f < 2f0] (OK)

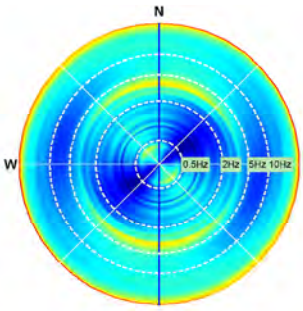
=== Criteria for a clear H/V peak (at least 5 should be fulfilled) ==========
#1. [exists f- in the range [f0/4, f0] | AH/V(f-) < A0/2]: yes (considering standard deviations), at frequency 4.8Hz (OK)
#2. [exists f+ in the range [f0, 4f0] | AH/V(f+) < A0/2]: (NO)
#3. [A0 > 2]: 1.1 < 2 (NO)
#4. [fpeak[Ah/v(f) ą sigmaA(f)] = f0 ą 5%]: (OK)
#5. [sigmaf < epsilon(f0)]: 6.920 > 0.960 (NO)
#6. [sigmaA(f0) < theta(f0)]: 0.211 < 1.58 (OK)

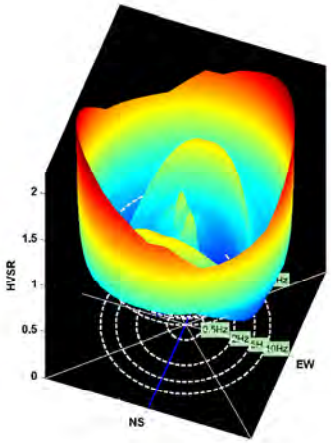


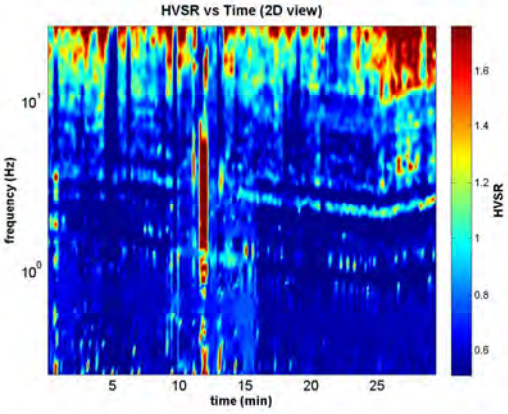


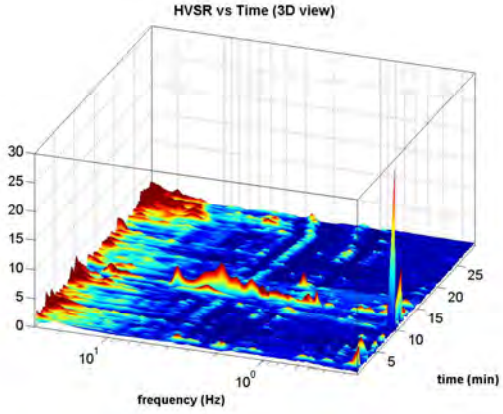
To model the HVSR (also jointly with MASW or ReMi/ESAC data), save the HV curve, go to the "Velocity Spectrum/a. Modeling & Picking" panels and upload the saved HV curve











HVSR4C

DATE 18.07.2017	HOUR 12:00	PLACE Lido Adriano
OPERATOR Geologica Toscana - Prospezioni Geofisiche S.n.c.	GPS TYPE and #	
GAUSS-BOAGA LATITUDE 4921599.44	GAUSS-BOAGA LONGITUDE 2305564.44	ALTITUDE
STATION TYPE GPA	SENSOR TYPE 4,5 Hz	
STATION #	SENSOR #	DISK #
FILE NAME Ra HVSR lido A.		POINT #
GAIN	SAMPL. FREQ. 100 Hz	REC. DURATION 30 min (minutes / seconds)

WEATHER CONDITIONS: WIND ● none ☐ weak (5m/s) ☐ medium ☐ strong Measurement (if any): ____ ; RAIN ● none ☐ weak ☐ medium ☐ strong Measurement (if any): ____ ; Temperature (approx): 31 Remarks ____

GROUND TYPE: ● earth (☐ hard ● soft) ☐ gravel ☐ sand ☐ rock ☐ grass (☐ short ☐ tall) ☐ asphalt ☐ cement ☐ concrete ☐ paved ☐ other ____ ; ● dry soil ☐ wet soil Remarks ____

ARTIFICIAL GROUND-SENSOR COUPLING ● no ☐ yes, type ____

BUILDING DENSITY ☐ none ☐ scattered ● dense ☐ other, type ____

TRANSIENTS	none	few	moderate	many	very dense	distance
cars		●				
trucks	●					
pedestrians		●				
other ____	●					

MONOCHROMATIC NOISE SOURCES (factories, works, pumps, rivers...) ● no ☐ yes, type ____

NEARBY STRUCTURES (description, height, distance) (trees, polls, buildings, bridges, underground structures,...): Trees, Buildings

OBSERVATIONS

FREQUENCY: Hz (if computed in the field)

Qualità della misura:

Durata: rispettata
Stazionarietà: rispettata
Isotropia: rispettata
Assenza di disturbi: non rispettata
Plausibilità fisica: rispettata
Robustezza statistica: rispettata

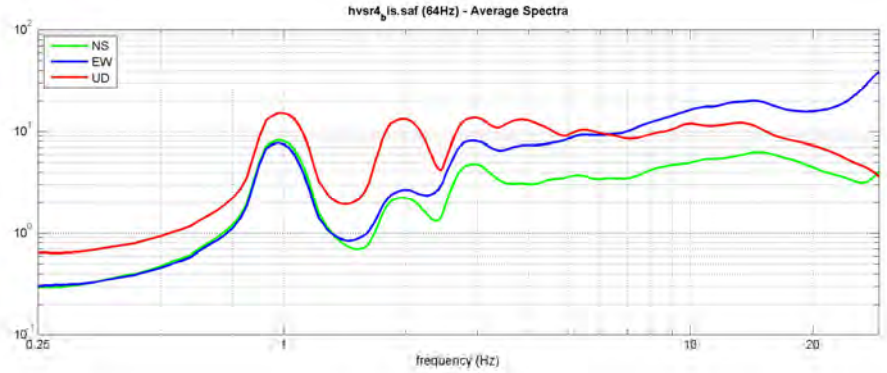
MISURA TIPO B2

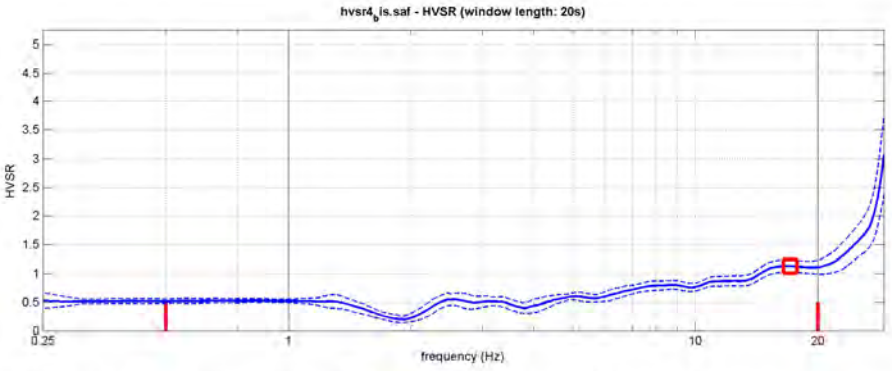
HVSR4

Peak frequency (Hz): 17.1 (±4.5)
Peak HVSR value: 1.1 (±0.1)

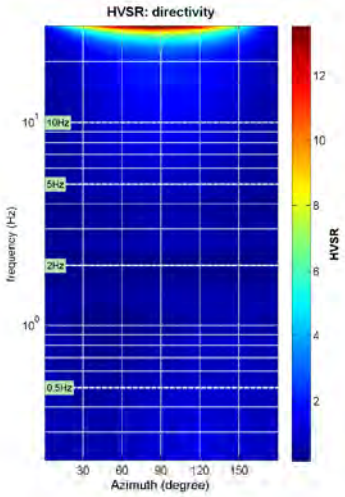
=== Criteria for a reliable H/V curve ==========
#1. [f0 > 10/Lw]: 17.079 > 0.5 (OK)
#2. [nc > 200]: 60802 > 200 (OK)
#3. [f0>0.5Hz; sigmaA(f) < 2 for 0.5f0 < f < 2f0] (OK)

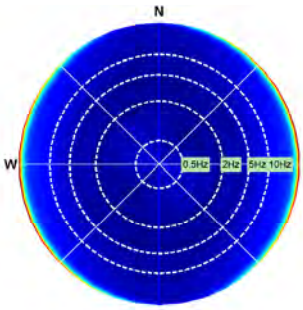
=== Criteria for a clear H/V peak (at least 5 should be fulfilled) ==========
#1. [exists f- in the range [f0/4, f0] | AH/V(f-) < A0/2]: yes, at frequency 4.3Hz (OK)
#2. [exists f+ in the range [f0, 4f0] | AH/V(f+) < A0/2]: (NO)
#3. [A0 > 2]: 1.1 < 2 (NO)
#4. [fpeak[Ah/v(f) ą sigmaA(f)] = f0 ą 5%]: (OK)
#5. [sigmaf < epsilon(f0)]: 4.467 > 0.854 (NO)
#6. [sigmaA(f0) < theta(f0)]: 0.104 < 1.58 (OK)

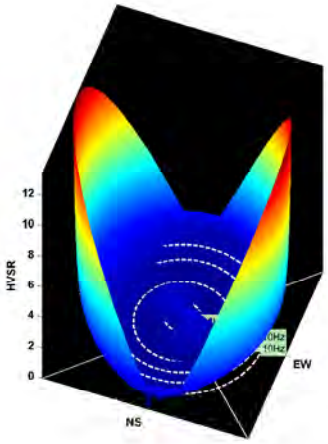


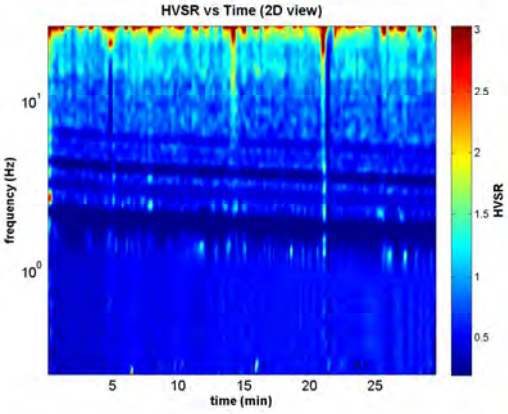


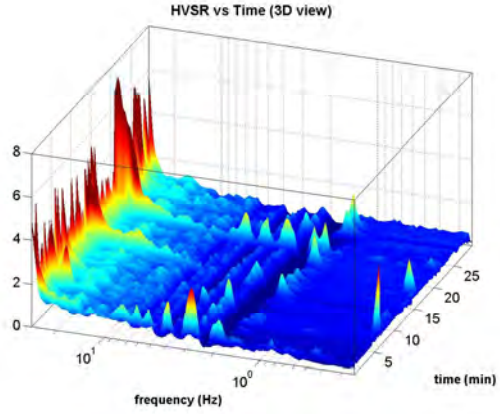
To model the HVSR (also jointly with MASW or ReMi/ESAC data), save the HV curve, go to the "Velocity Spectrum/a, Modeling & Picking" panels and upload the saved HV curve











HVSR5C

DATE 25.07.2017	HOUR 10:20	PLACE Biblioteca Oriani
OPERATOR Geologica Toscana - Prospezioni Geofisiche S.n.c.	GPS TYPE and #	
GAUSS-BOAGA LATITUDE 4921919.6	GAUSS-BOAGA LONGITUDE 2297159.94	ALTITUDE
STATION TYPE GPA	SENSOR TYPE 4,5 Hz	
STATION #	SENSOR #	DISK #
FILE NAME Ra HVSR5		POINT #
GAIN	SAMPL. FREQ. 100 Hz	REC. DURATION 30 min (minutes / seconds)

WEATHER CONDITIONS: WIND (●none ☐weak (5m/s) ☐medium ☐strong Measurement (if any): ____) RAIN (●none ☐weak ☐medium ☐strong Measurement (if any): ____) Temperature (approx): 22 Remarks ____

GROUND TYPE: (●earth (●hard ☐soft) ☐gravel ☐sand ☐rock ☐grass = (☐short ☐tall) ☐asphalt ☐cement ☐concrete ☐paved ☐other ____) (●dry soil ☐wet soil Remarks ____)

ARTIFICIAL GROUND-SENSOR COUPLING: (●no ☐yes, type ____)

BUILDING DENSITY: (☐none ☐scattered ●dense ☐other, type ____)

TRANSIENTS	none	few	moderate	many	very dense	distance
cars	●					
trucks	●					
pedestrians		●				
other ____	●					

MONOCHROMATIC NOISE SOURCES (factories, works, pumps, rivers...): (●no ☐yes, type ____)

NEARBY STRUCTURES (description, height, distance) (trees, polls, buildings, bridges, underground structures,...): Trees, Buildings

OBSERVATIONS

FREQUENCY: Hz (if computed in the field)

Qualità della misura:

Durata: rispettata
Stazionarietà: rispettata
Isotropia: rispettata
Assenza di disturbi: non rispettata
Plausibilità fisica: rispettata
Robustezza statistica: rispettata

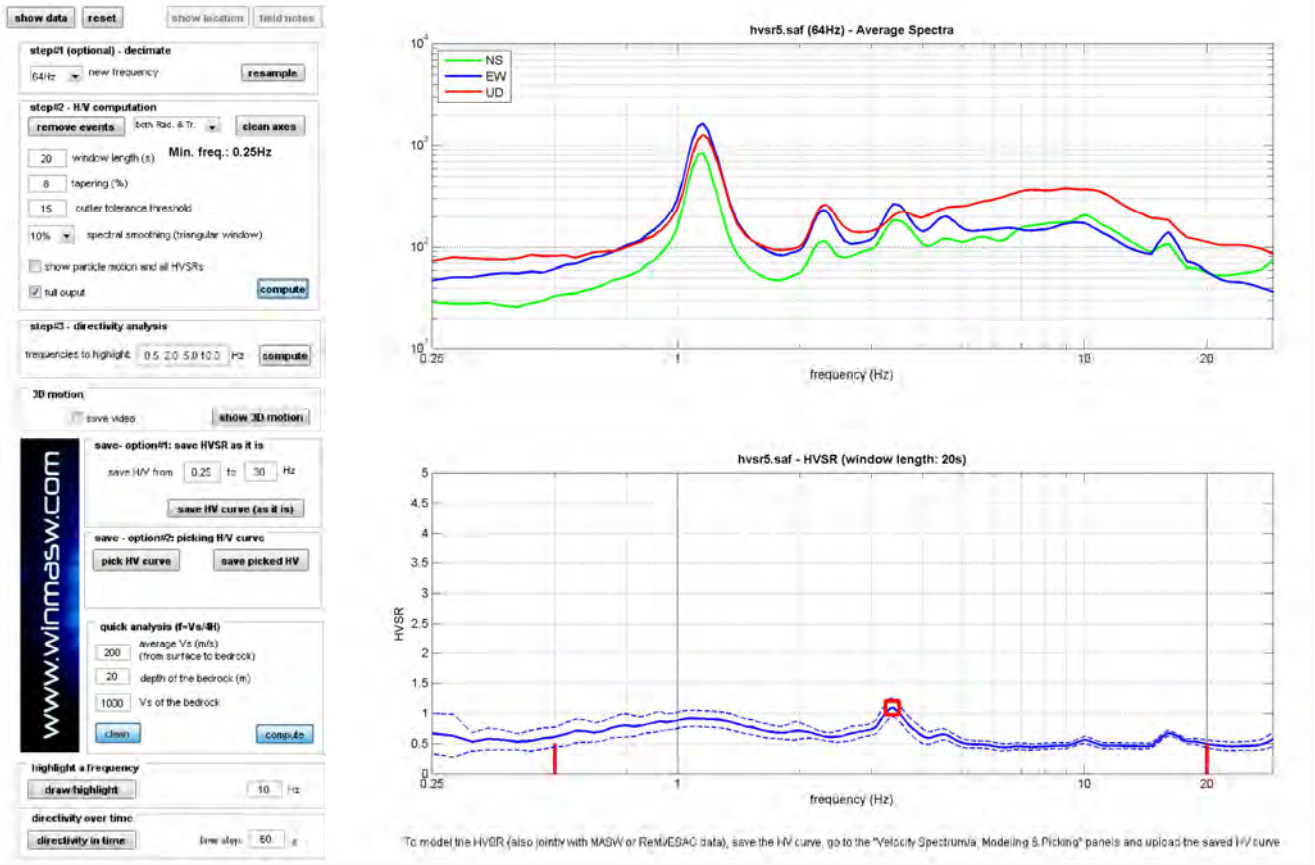
MISURA TIPO B2

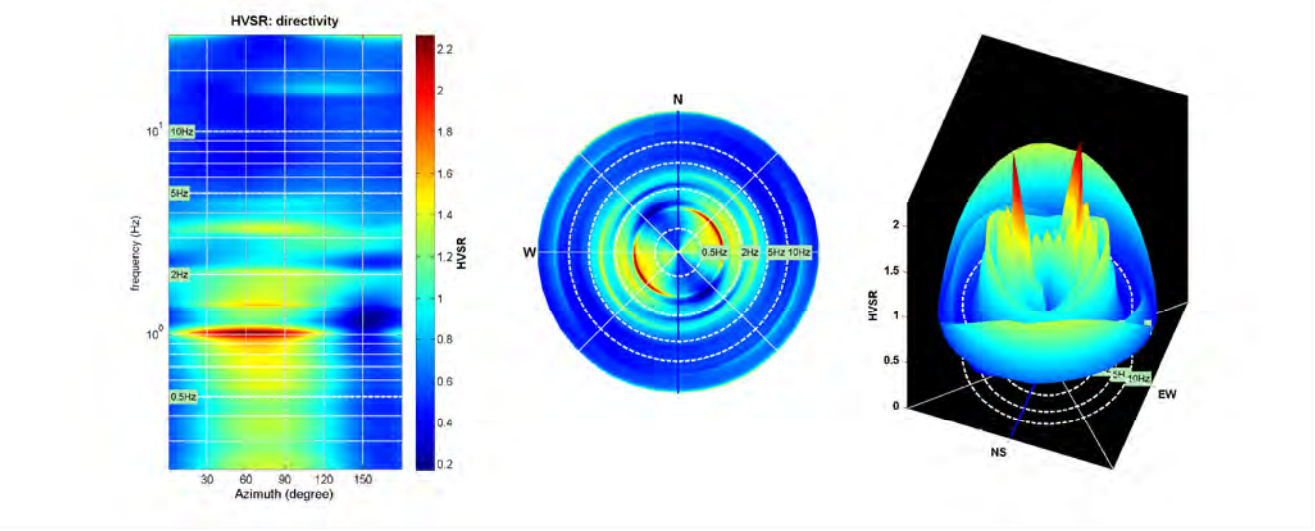
HVSR5

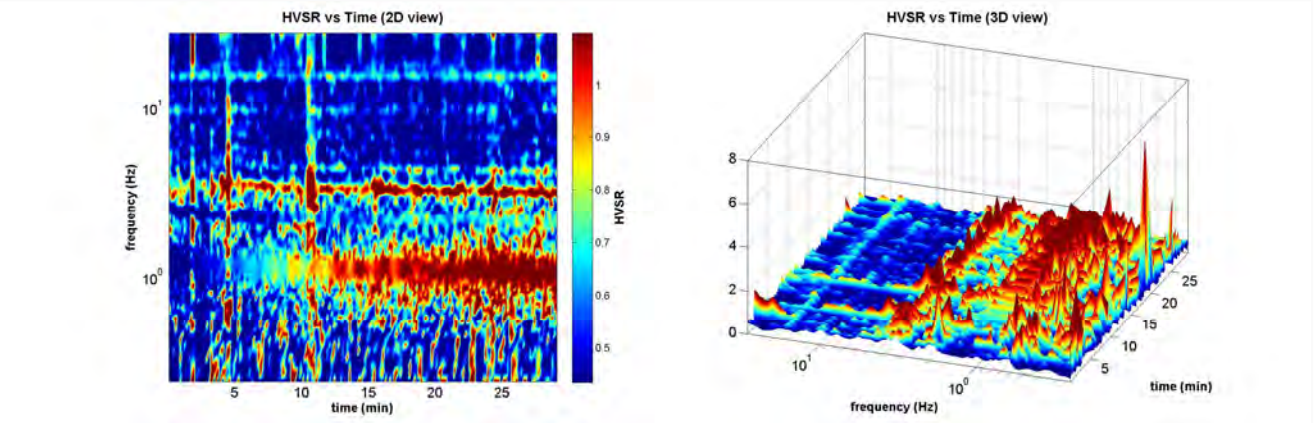
Peak frequency (Hz): 3.4 (±1.2)
Peak HVSR value: 1.1 (±0.1)

=== Criteria for a reliable H/V curve ==========
#1. [f0 > 10/Lw]: 3.378 > 0.5 (OK)
#2. [nc > 200]: 11824 > 200 (OK)
#3. [f0>0.5Hz; sigmaA(f) < 2 for 0.5f0 < f < 2f0] (OK)

=== Criteria for a clear H/V peak (at least 5 should be fulfilled) ==========
#1. [exists f- in the range [f0/4, f0] | AH/V(f-) < A0/2]: yes (considering standard deviations), at frequency 2.3Hz (OK)
#2. [exists f+ in the range [f0, 4f0] | AH/V(f+) < A0/2]: yes, at frequency 4.9Hz (OK)
#3. [A0 > 2]: 1.1 < 2 (NO)
#4. [fpeak[Ah/v(f) ą sigmaA(f)] = f0 ą 5%]: (OK)
#5. [sigmaf < epsilon(f0)]: 1.214 > 0.169 (NO)
#6. [sigmaA(f0) < theta(f0)]: 0.151 < 1.58 (OK)


show data
reset
show location
field notes
step#1 (optional) - decimate
64Hz
new frequency
resample
step#2 - H/V computation
remove events
both Rad. & Tr.
clean axes
20
window length (s)
Min. freq.: 0.25Hz
8
tapering (%)
15
outlier tolerance threshold
10%
spectral smoothing (triangular window)
show particle motion and all HVSRs
full ouput
compute
step#3 - directivity analysis
frequencies to highlight
0.5 2.0 5.0 10.0
Hz
compute
3D motion
save video
show 3D motion
www.winmasw.com
save- option#1: save HVSR as it is
save H/V from
0.25
to
30
Hz
save HV curve (as it is)
save - option#2: picking H/V curve
pick HV curve
save picked HV
quick analysis (f=Vs/4H)
200
average Vs (m/s)
(from surface to bedrock)
20
depth of the bedrock (m)
1000
Vs of the bedrock
clean
compute
highlight a frequency
draw highlight
10
Hz
directivity over time
directivity in time
time step:
60
s
hvsr5.saf (64Hz) - Average Spectra
NS
EW
UD
frequency (Hz)
hvsr5.saf - HVSR (window length: 20s)
HVSR
frequency (Hz)
To model the HVSR (also jointly with MASW or ReMi/ESAC data), save the HV curve, go to the "Velocity Spectrum/a, Modeling & Picking" panels and upload the saved HV curve


HVSR: directivity
10Hz
5Hz
2Hz
0.5Hz
frequency (Hz)
Azimuth (degree)
HVSR
N
W
0.5Hz
2Hz
5Hz
10Hz
HVSR
EW
NS


HVSR vs Time (2D view)
frequency (Hz)
time (min)
HVSR
HVSR vs Time (3D view)
frequency (Hz)
time (min)

HVSR6C

DATE 25.07.2017	HOUR	PLACE Scuola Materna Felici
OPERATOR Geologica Toscana - Prospezioni Geofisiche S.n.c.	GPS TYPE and #	
GAUSS-BOAGA LATITUDE 4922471.97	GAUSS-BOAGA LONGITUDE 2295256.65	ALTITUDE
STATION TYPE PGA	SENSOR TYPE 4,5 Hz	
STATION #	SENSOR #	DISK #
FILE NAME Ra HVSR6		POINT #
GAIN	SAMPL. FREQ. 100 Hz	REC. DURATION 30 min (minutes / seconds)

WEATHER CONDITIONS: WIND [●] none [ ] weak (5m/s) [ ] medium [ ] strong Measurement (if any): ____ ; RAIN [●] none [ ] weak [ ] medium [ ] strong Measurement (if any): ____ ; Temperature (approx): 28 Remarks ____

GROUND TYPE: [●] earth ([■] hard [ ] soft) [ ] gravel [ ] sand [ ] rock [ ] grass = ([ ] short [ ] tall); [ ] asphalt [ ] cement [ ] concrete [ ] paved [ ] other ____; [●] dry soil [ ] wet soil Remarks ____

ARTIFICIAL GROUND-SENSOR COUPLING [●] no [ ] yes, type ____

BUILDING DENSITY [ ] none [ ] scattered [●] dense [ ] other, type ____

TRANSIENTS	none	few	moderate	many	very dense	distance
cars	●					
trucks	●					
pedestrians	●					
other	●					

MONOCHROMATIC NOISE SOURCES (factories, works, pumps, rivers...): [●] no [ ] yes, type ____

NEARBY STRUCTURES (description, height, distance) (trees, polls, buildings, bridges, underground structures,...): Trees, Buildings

OBSERVATIONS

FREQUENCY: Hz (if computed in the field)

Qualità della misura:

Durata: rispettata
Stazionarietà: rispettata
Isotropia: rispettata
Assenza di disturbi: rispettata
Plausibilità fisica: rispettata
Robustezza statistica: rispettata

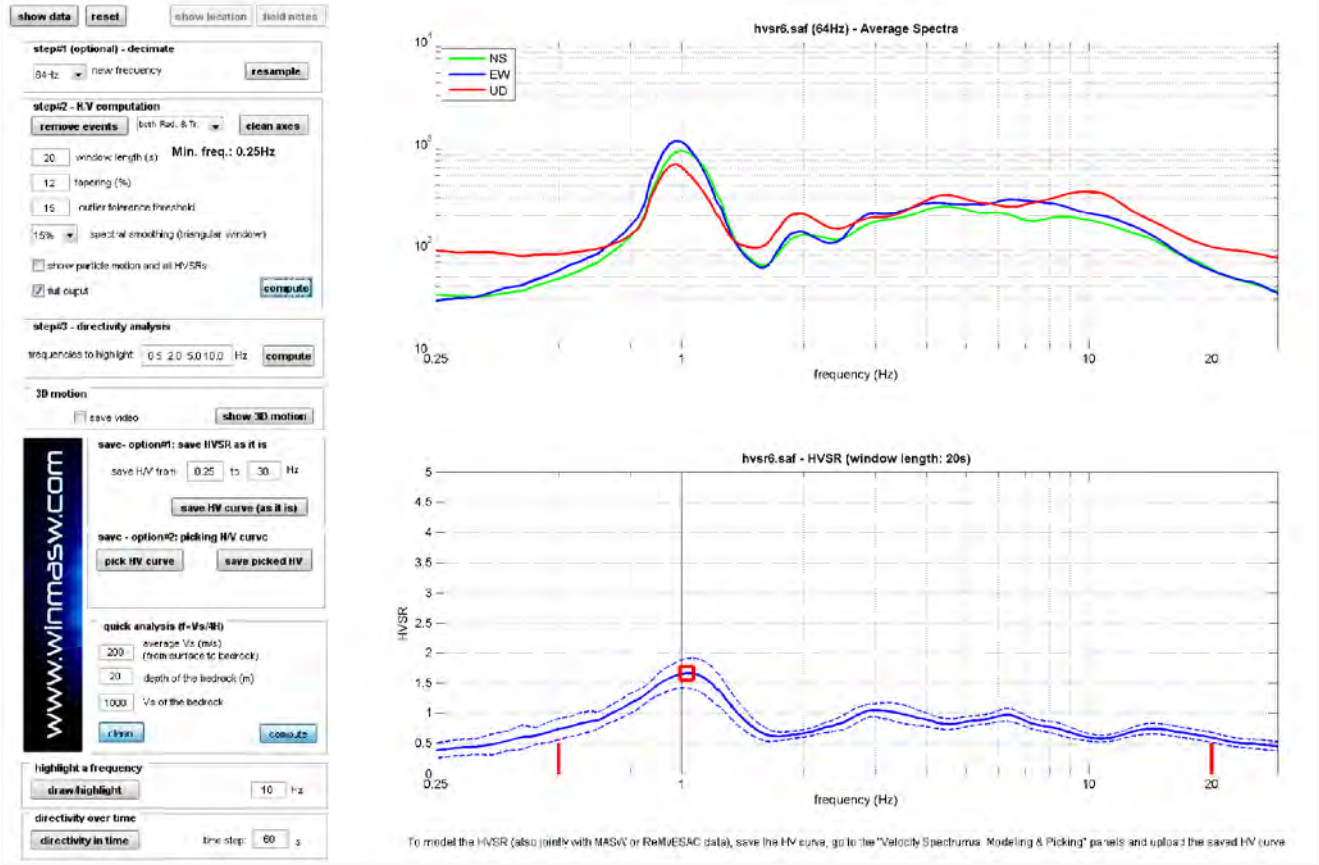
MISURA TIPO B2

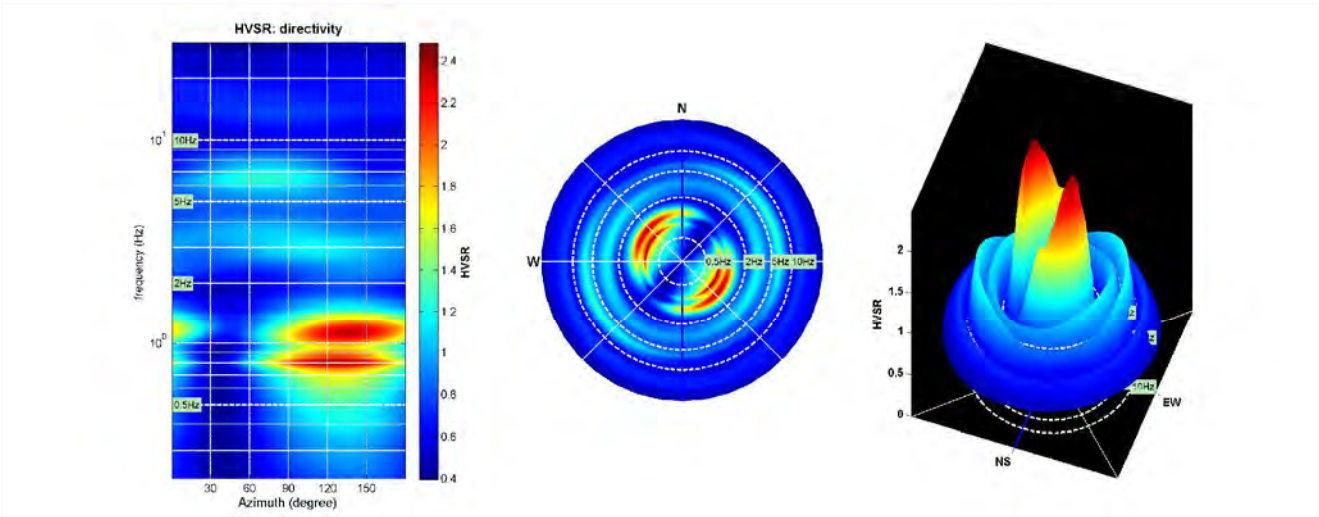
HVSR 6

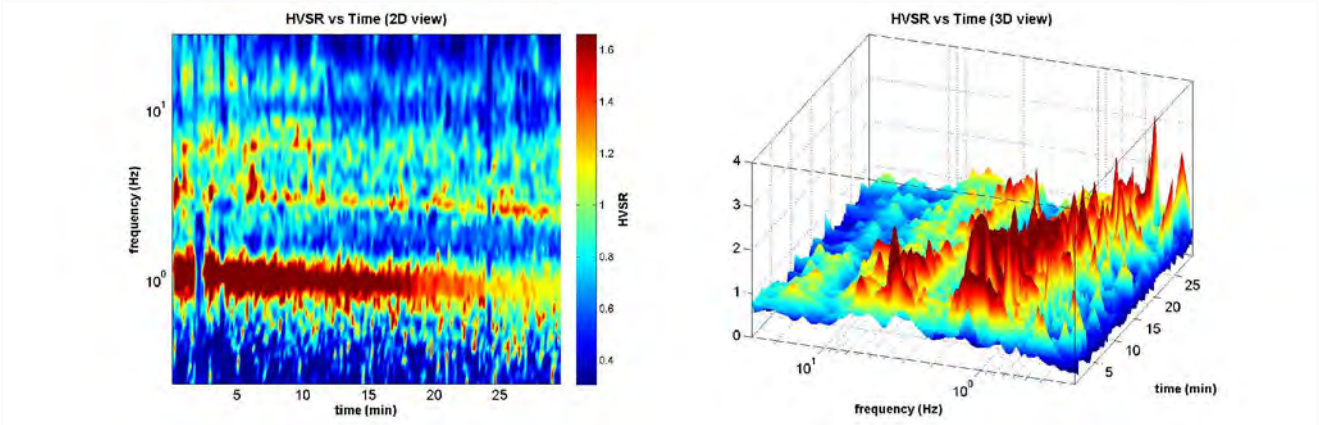
Peak frequency (Hz): 1.0 (±0.9)
Peak HVSR value: 1.7 (±0.3)

=== Criteria for a reliable H/V curve ==========
#1. [f0 > 10/Lw]: 1.032 > 0.5 (OK)
#2. [nc > 200]: 3675 > 200 (OK)
#3. [f0>0.5Hz; sigmaA(f) < 2 for 0.5f0 < f < 2f0] (OK)

=== Criteria for a clear H/V peak (at least 5 should be fulfilled) ==========
#1. [exists f- in the range [f0/4, f0] | AH/V(f-) < A0/2]: yes, at frequency 0.5Hz (OK)
#2. [exists f+ in the range [f0, 4f0] | AH/V(f+) < A0/2]: yes, at frequency 1.5Hz (OK)
#3. [A0 > 2]: 1.7 < 2 (NO)
#4. [fpeak[Ah/v(f) ± sigmaA(f)] = f0 ± 5%]: (OK)
#5. [sigmaf < epsilon(f0)]: 0.882 > 0.103 (NO)
#6. [sigmaA(f0) < theta(f0)]: 0.247 < 1.78 (OK)


show data
reset
show location
field notes
step#1 (optional) - decimate
84 Hz
new frequency
resample
step#2 - H/V computation
remove events
both Rad. & Tr.
clean axes
20
window length (s)
Min. freq.: 0.25Hz
12
tapering (%)
15
outlier tolerance threshold
15%
spectral smoothing (triangular window)
show particle motion and all HVSRs
full ouput
compute
step#3 - directivity analysis
frequencies to highlight
0.5 2.0 5.0 10.0
Hz
compute
3D motion
save video
show 3D motion
www.winmasw.com
save- option#1: save HVSR as it is
save H/V from
0.25
to
30
Hz
save HV curve (as it is)
save - option#2: picking H/V curve
pick HV curve
save picked HV
quick analysis (f=Vs/4H)
200
average Vs (m/s)
(from surface to bedrock)
20
depth of the bedrock (m)
1000
Vs of the bedrock
clean
compute
highlight a frequency
draw highlight
10
Hz
directivity over time
directivity in time
time step:
60
s
hvsr6.saf (64Hz) - Average Spectra
NS
EW
UD
frequency (Hz)
hvsr6.saf - HVSR (window length: 20s)
HVSR
frequency (Hz)
To model the HVSR (also jointly with MASW or ReMiESAC data), save the HV curve, go to the "Velocity Spectrums Modeling & Picking" panels and upload the saved HV curve


HVSR: directivity
frequency (Hz)
10Hz
5Hz
2Hz
0.5Hz
Azimuth (degree)
HVSR
N
W
0.5Hz
2Hz
5Hz
10Hz
HVSR
NS
EW


HVSR vs Time (2D view)
frequency (Hz)
time (min)
HVSR
HVSR vs Time (3D view)
frequency (Hz)
time (min)

HVSR7C

DATE 25.07.2017	HOUR	PLACE Scuola Materna Pasi
OPERATOR Geologica Toscana - Prospezioni Geofisiche S.n.c.	GPS TYPE and #	
GAUSS-BOAGA LATITUDE 4922409.24	GAUSS-BOAGA LONGITUDE 2296156.37	ALTITUDE
STATION TYPE GPA	SENSOR TYPE 4,5 Hz	
STATION #	SENSOR #	DISK #
FILE NAME Ra HVSR7		POINT #
GAIN	SAMPL. FREQ. 100 Hz	REC. DURATION 30 min (minutes / seconds)

WEATHER CONDITIONS: WIND [x] none [ ] weak (5m/s) [ ] medium [ ] strong Measurement (if any): ____ ; RAIN [x] none [ ] weak [ ] medium [ ] strong Measurement (if any): ____ ; Temperature (approx): 27 Remarks ____

GROUND TYPE: [x] earth ([ ] hard [ ] soft) [ ] gravel [ ] sand [ ] rock [ ] grass = ([ ] short [ ] tall) [ ] asphalt [ ] cement [ ] concrete [ ] paved [ ] other ____ ; [x] dry soil [ ] wet soil Remarks ____

ARTIFICIAL GROUND-SENSOR COUPLING [x] no [ ] yes, type ____

BUILDING DENSITY [ ] none [ ] scattered [x] dense [ ] other, type ____

TRANSIENTS	none	few	moderate	many	very dense	distance
cars		●				
trucks	●					
pedestrians		●				
other ____	●					

MONOCHROMATIC NOISE SOURCES (factories, works, pumps, rivers...) [x] no [ ] yes, type ____

NEARBY STRUCTURES (description, height, distance) (trees, polls, buildings, bridges, underground structures,...)

Trees, Buildings

OBSERVATIONS

FREQUENCY: Hz (if computed in the field)

Qualità della misura:

Durata: rispettata
Stazionarietà: rispettata
Isotropia: rispettata
Assenza di disturbi: rispettata
Plausibilità fisica: rispettata
Robustezza statistica: rispettata

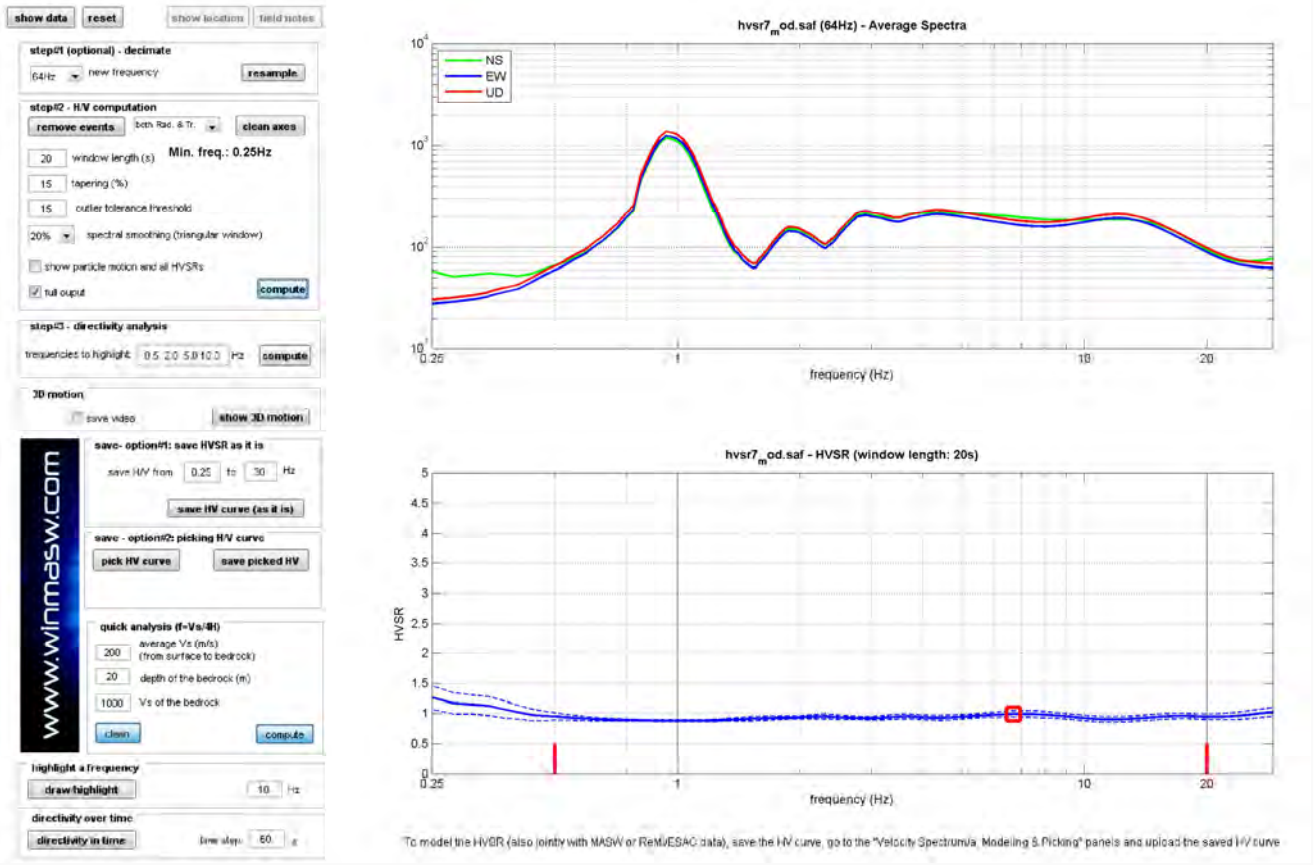
MISURA TIPO A2

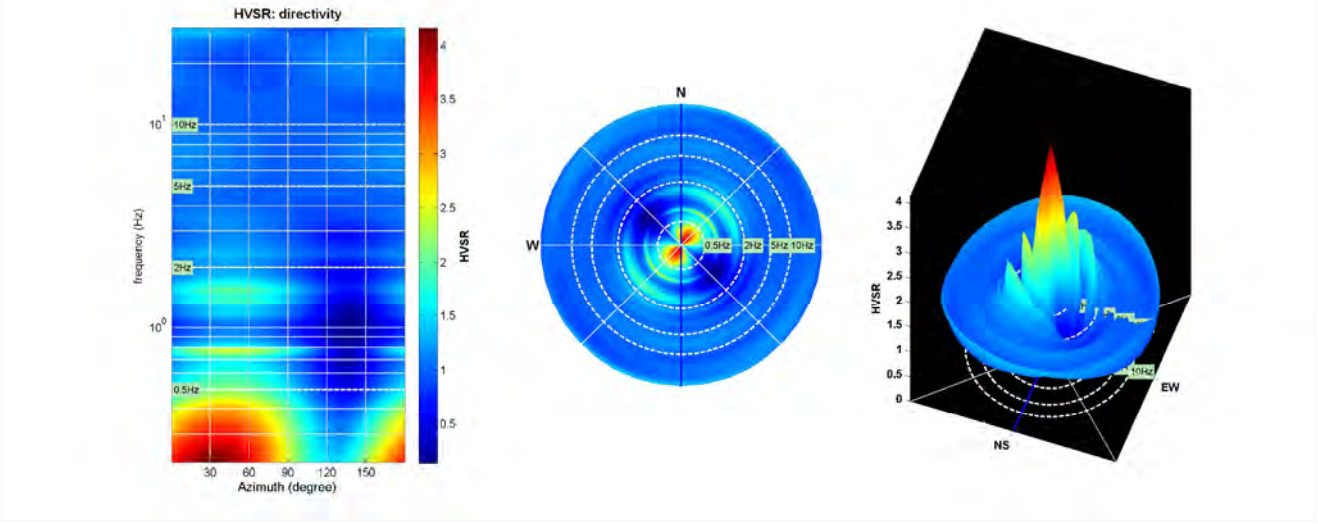
HVSR7

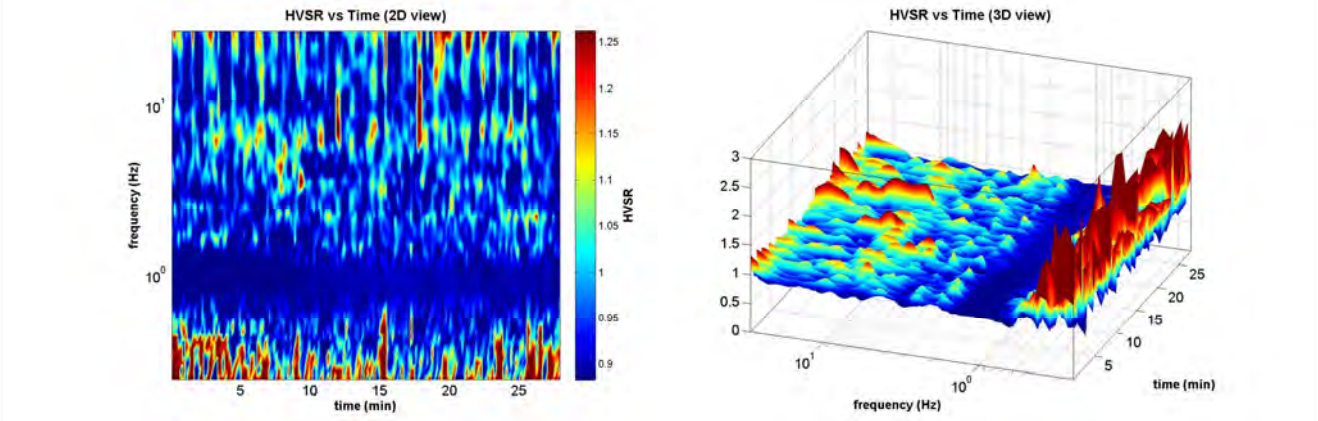
Peak frequency (Hz): 6.7 (±5.0)
Peak HVSR value: 1.0 (±0.1)

=== Criteria for a reliable H/V curve ==========
#1. [f0 > 10/Lw]: 6.694 > 0.5 (OK)
#2. [nc > 200]: 22492 > 200 (OK)
#3. [f0>0.5Hz; sigmaA(f) < 2 for 0.5f0 < f < 2f0] (OK)

=== Criteria for a clear H/V peak (at least 5 should be fulfilled) ==========
#1. [exists f- in the range [f0/4, f0] | AH/V(f-) < A0/2]: (NO)
#2. [exists f+ in the range [f0, 4f0] | AH/V(f+) < A0/2]: (NO)
#3. [A0 > 2]: 1.0 < 2 (NO)
#4. [fpeak[Ah/v(f) ą sigmaA(f)] = f0 ą 5%]: (NO)
#5. [sigmaf < epsilon(f0)]: 5.033 > 0.335 (NO)
#6. [sigmaA(f0) < theta(f0)]: 0.051 < 1.58 (OK)


show data
reset
step#1 (optional) - decimate
resample
step#2 - H/V computation
remove events
clean axes
window length (s)
Min. freq.: 0.25Hz
tapering (%)
outlier tolerance threshold
spectral smoothing (triangular window)
show particle motion and all HVSRs
full ouput
compute
step#3 - directivity analysis
frequencies to highlight
compute
3D motion
save video
show 3D motion
www.winmasw.com
save- option#1: save HVSR as it is
save H/V from
to
Hz
save HV curve (as it is)
save - option#2: picking H/V curve
pick HV curve
save picked HV
quick analysis (f=Vs/4H)
average Vs (m/s)
(from surface to bedrock)
depth of the bedrock (m)
Vs of the bedrock
clean
compute
highlight a frequency
draw highlight
Hz
directivity over time
directivity in time
time step
s
hvsr7_m_od.saf (64Hz) - Average Spectra
NS
EW
UD
frequency (Hz)
hvsr7_m_od.saf - HVSR (window length: 20s)
HVSR
frequency (Hz)
To model the HVSR (also jointly with MASW or ReMi/ESAC data), save the HV curve, go to the "Velocity Spectrum/a. Modeling & Picking" panels and upload the saved HV curve


HVSR: directivity
frequency (Hz)
10Hz
5Hz
2Hz
0.5Hz
Azimuth (degree)
HVSR
N
W
0.5Hz
2Hz
5Hz
10Hz
HVSR
EW
NS


HVSR vs Time (2D view)
frequency (Hz)
time (min)
HVSR
HVSR vs Time (3D view)
frequency (Hz)
time (min)

HVSR8C

DATE 25.07.2017	HOUR	PLACE Via Bacinotti
OPERATOR Geologica Toscana - Prospezioni Geofisiche S.n.c.	GPS TYPE and #	
GAUSS-BOAGA LATITUDE 4923832.2	GAUSS-BOAGA LONGITUDE 2299162.12	ALTITUDE
STATION TYPE GPA	SENSOR TYPE 4,5 Hz	
STATION #	SENSOR #	DISK #
FILE NAME Ra HVSR8		POINT #
GAIN	SAMPL. FREQ. 100 Hz	REC. DURATION 30 min (minutes / seconds)

WEATHER CONDITIONS: WIND [●] none [ ] weak (5m/s) [ ] medium [ ] strong Measurement (if any): ____ ; RAIN [●] none [ ] weak [ ] medium [ ] strong Measurement (if any): ____ ; Temperature (approx): 29 ; Remarks ____

GROUND TYPE: [ ] earth ([ ] hard [ ] soft) [ ] gravel [ ] sand [ ] rock [●] grass = ([●] short [ ] tall) ; [ ] asphalt [ ] cement [ ] concrete [ ] paved [ ] other ____ ; [●] dry soil [ ] wet soil Remarks ____

ARTIFICIAL GROUND-SENSOR COUPLING [●] no [ ] yes, type ____

BUILDING DENSITY [ ] none [●] scattered [ ] dense [ ] other, type ____

TRANSIENTS	none	few	moderate	many	very dense	distance
cars			●			
trucks			●			
pedestrians	●					
other ____	●					

MONOCHROMATIC NOISE SOURCES (factories, works, pumps, rivers...) [●] no [ ] yes, type ____

NEARBY STRUCTURES (description, height, distance) (trees, polls, buildings, bridges, underground structures,...)

Trees, Buildings

OBSERVATIONS

FREQUENCY: Hz (if computed in the field)

Qualità della misura:

Durata: rispettata
Stazionarietà: rispettata
Isotropia: rispettata
Assenza di disturbi: non rispettata
Plausibilità fisica: rispettata
Robustezza statistica: rispettata

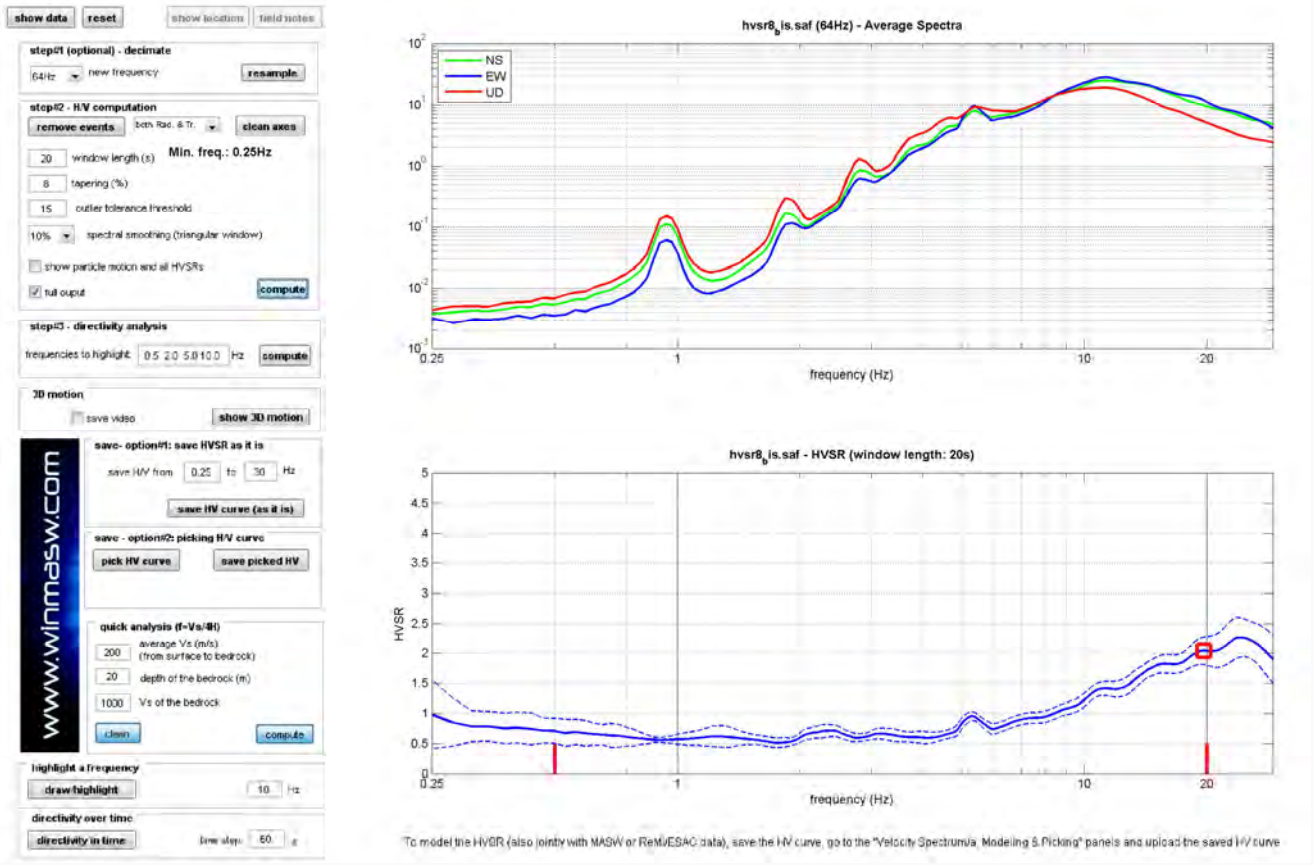
MISURA TIPO B2

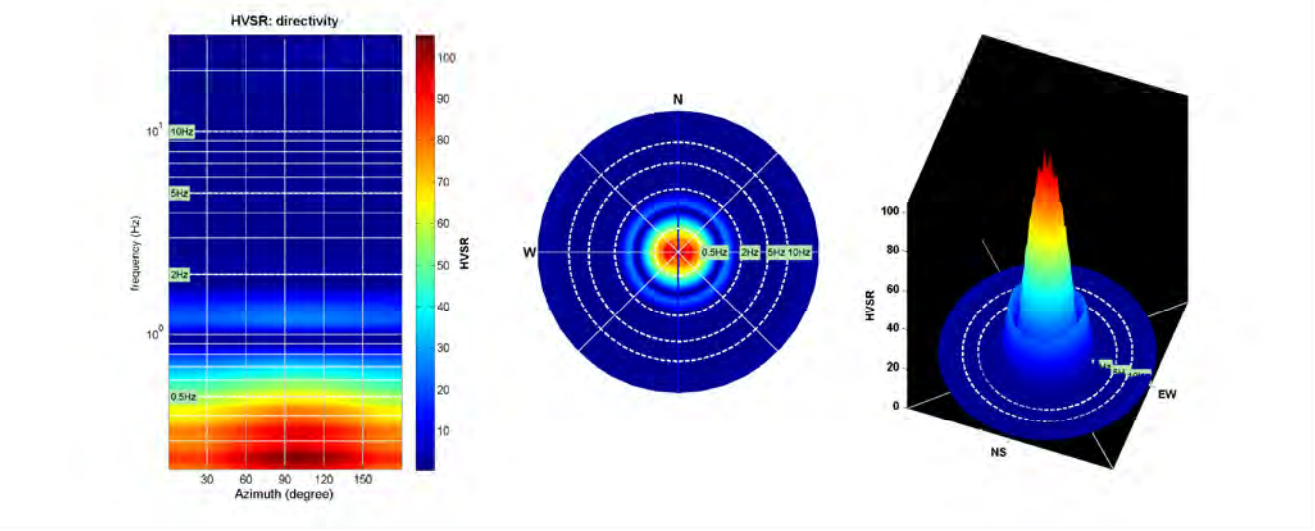
HVSR8

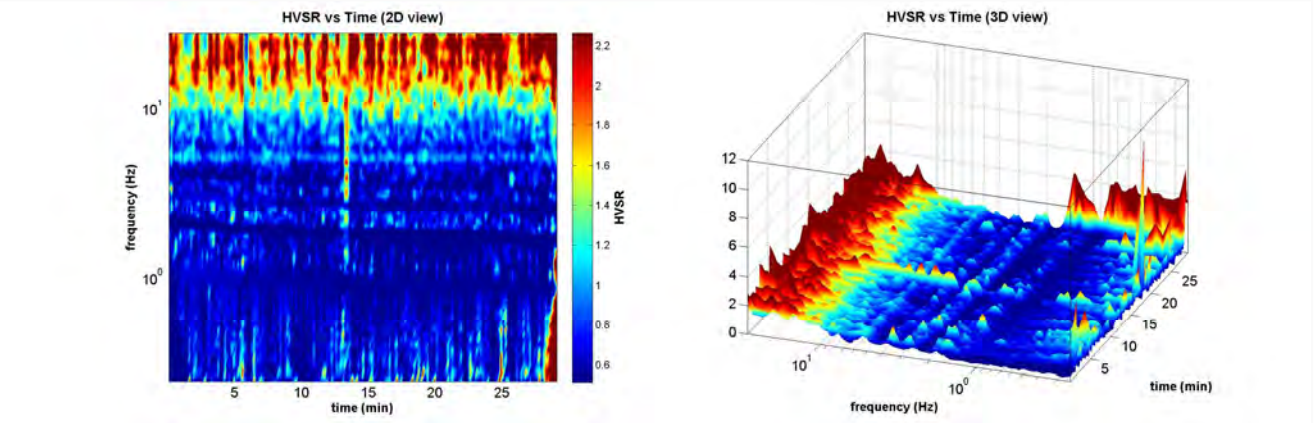
Peak frequency (Hz): 19.6 (±3.0)
Peak HVSR value: 2.0 (±0.2)

=== Criteria for a reliable H/V curve ==========
#1. [f0 > 10/Lw]: 19.644 > 0.5 (OK)
#2. [nc > 200]: 68755 > 200 (OK)
#3. [f0>0.5Hz; sigmaA(f) < 2 for 0.5f0 < f < 2f0] (OK)

=== Criteria for a clear H/V peak (at least 5 should be fulfilled) ==========
#1. [exists f- in the range [f0/4, f0] | AH/V(f-) < A0/2]: yes, at frequency 4.9Hz (OK)
#2. [exists f+ in the range [f0, 4f0] | AH/V(f+) < A0/2]: (NO)
#3. [A0 > 2]: 2.0 > 2 (OK)
#4. [fpeak[Ah/v(f) ą sigmaA(f)] = f0 ą 5%]: (OK)
#5. [sigmaf < epsilon(f0)]: 3.015 > 0.982 (NO)
#6. [sigmaA(f0) < theta(f0)]: 0.232 < 1.58 (OK)


show data
reset
step#1 (optional) - decimate
resample
step#2 - H/V computation
remove events
clean axes
Min. freq.: 0.25Hz
window length (s)
tapering (%)
outlier tolerance threshold
spectral smoothing (triangular window)
show particle motion and all HVSRs
full ouput
compute
step#3 - directivity analysis
frequencies to highlight
compute
3D motion
save video
show 3D motion
www.winmasw.com
save- option#1: save HVSR as it is
save H/V from
to
Hz
save HV curve (as it is)
save - option#2: picking H/V curve
pick HV curve
save picked HV
quick analysis (f=Vs/4H)
average Vs (m/s) (from surface to bedrock)
depth of the bedrock (m)
Vs of the bedrock
clean
compute
highlight a frequency
draw highlight
directivity over time
directivity in time
time step
hvsr8_b is.saf (64Hz) - Average Spectra
NS
EW
UD
frequency (Hz)
hvsr8_b is.saf - HVSR (window length: 20s)
HVSR
frequency (Hz)
To model the HVSR (also jointly with MASW or ReMi/ESAC data), save the HV curve, go to the "Velocity Spectrum/a. Modeling & Picking" panels and upload the saved HV curve


HVSR: directivity
10Hz
5Hz
2Hz
0.5Hz
frequency (Hz)
Azimuth (degree)
HVSR
N
W
0.5Hz
2Hz
5Hz
10Hz
HVSR
NS
EW


HVSR vs Time (2D view)
frequency (Hz)
time (min)
HVSR
HVSR vs Time (3D view)
frequency (Hz)
time (min)

HVSR9C

DATE 25.07.2017	HOUR	PLACE Centro Avv. Professionale
OPERATOR Geologica Toscana - Prospezioni Geofisiche S.n.c.	GPS TYPE and #	
GAUSS-BOAGA LATITUDE 4925874.63	GAUSS-BOAGA LONGITUDE 2298321.69	ALTITUDE
STATION TYPE GPA	SENSOR TYPE 4,5 Hz	
STATION #	SENSOR #	DISK #
FILE NAME Ra HVSR9		POINT #
GAIN	SAMPL. FREQ. 100 Hz	REC. DURATION 30 min (minutes / seconds)

WEATHER CONDITIONS
WIND ● none ☐ weak (5m/s) ☐ medium ☐ strong Measurement (if any): _____
RAIN ● none ☐ weak ☐ medium ☐ strong Measurement (if any): _____
Temperature (approx): 30 Remarks _____

GROUND TYPE
☐ earth (☐ hard ☐ soft) ☐ gravel ☐ sand ☐ rock ● grass (☐ short ☐ tall)
☐ asphalt ☐ cement ☐ concrete ☐ paved ☐ other _____
● dry soil ☐ wet soil Remarks _____

ARTIFICIAL GROUND-SENSOR COUPLING ● no ☐ yes, type _____

BUILDING DENSITY ☐ none ☐ scattered ● dense ☐ other, type _____

TRANSIENTS	none	few	moderate	many	very dense	distance
cars			●			
trucks		●				
pedestrians	●					
other	●					

MONOCHROMATIC NOISE SOURCES (factories, works, pumps, rivers...)
● no ☐ yes, type _____

NEARBY STRUCTURES (description, height, distance) (trees, polls, buildings, bridges, underground structures,...)
Trees, Buildings

OBSERVATIONS

FREQUENCY: Hz (if computed in the field)

Qualità della misura:

Durata: rispettata
Stazionarietà: rispettata
Isotropia: rispettata
Assenza di disturbi: rispettata
Plausibilità fisica: rispettata
Robustezza statistica: rispettata

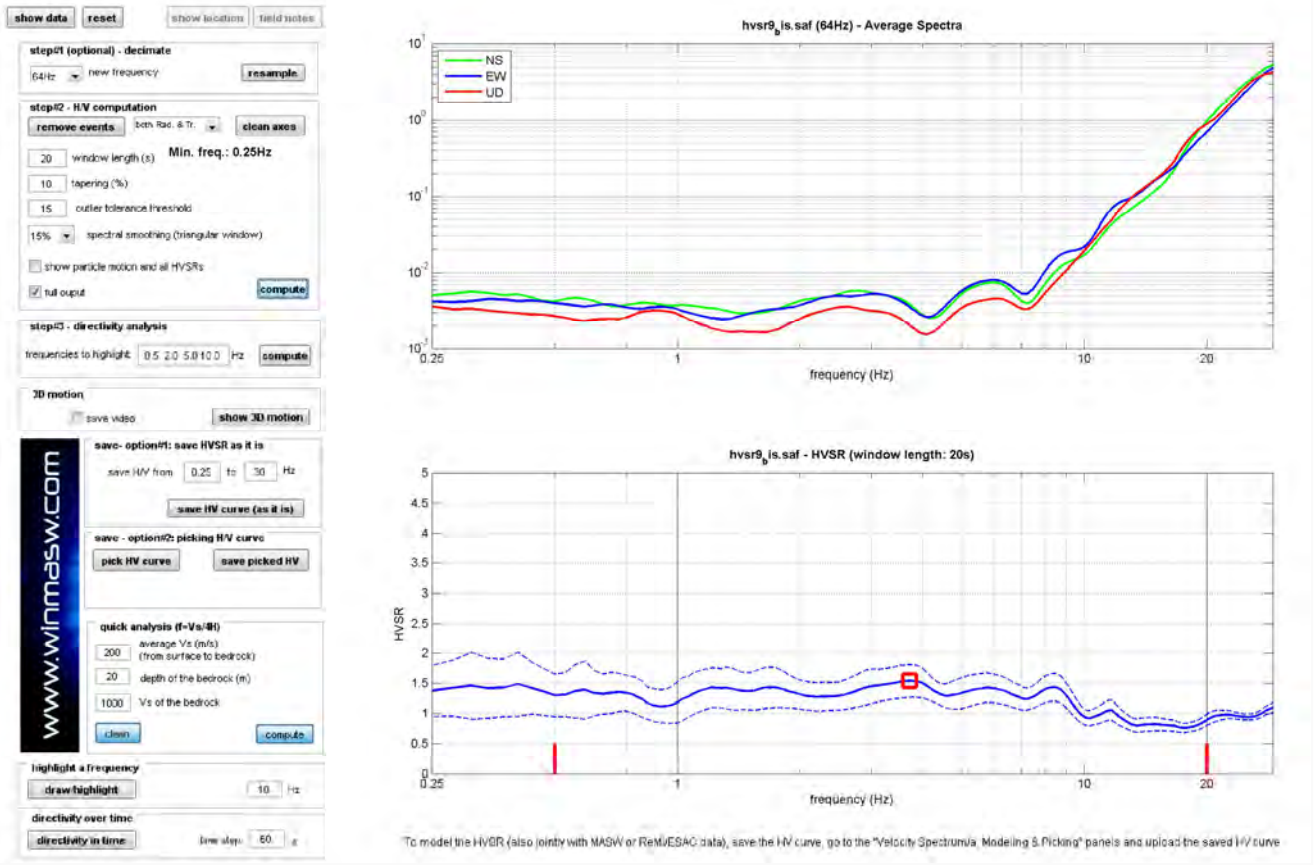
MISURA TIPO A2

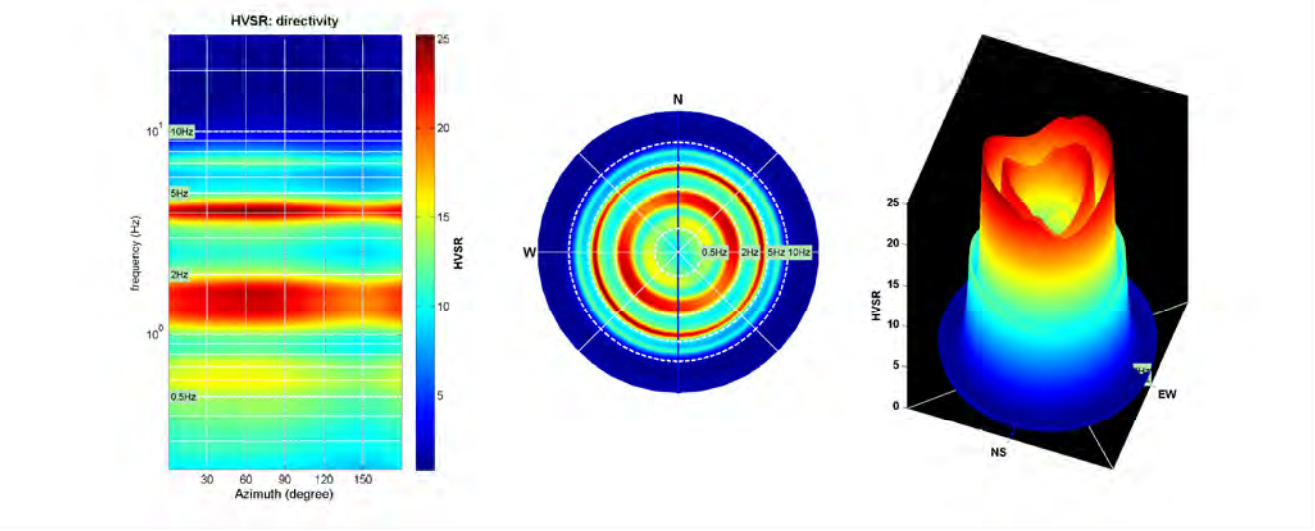
HVSR9

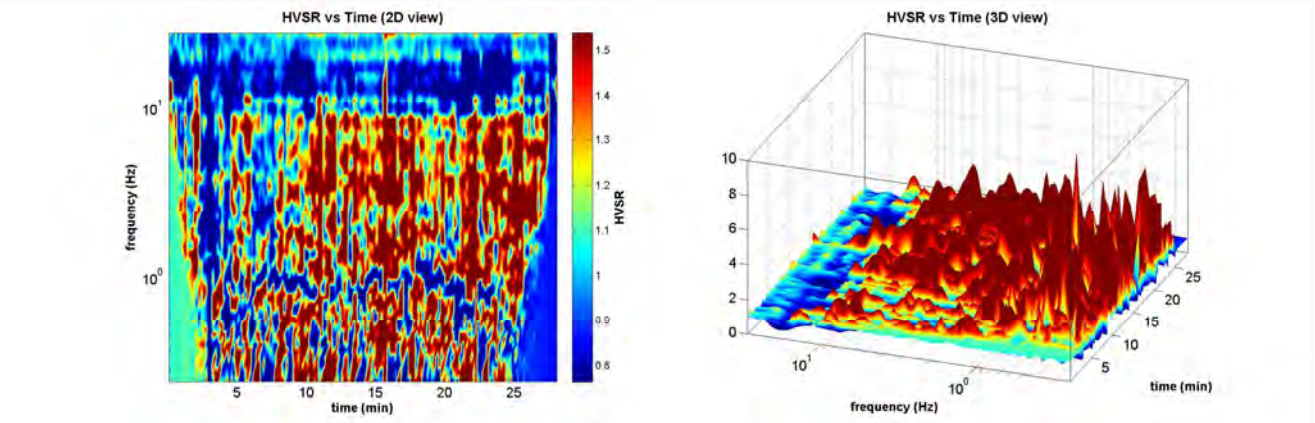
Peak frequency (Hz): 3.7 (±2.8)
Peak HVSR value: 1.5 (±0.3)

=== Criteria for a reliable H/V curve ==========
#1. [f0 > 10/Lw]: 3.722 > 0.5 (OK)
#2. [nc > 200]: 12582 > 200 (OK)
#3. [f0>0.5Hz; sigmaA(f) < 2 for 0.5f0 < f < 2f0] (OK)

=== Criteria for a clear H/V peak (at least 5 should be fulfilled) ==========
#1. [exists f- in the range [f0/4, f0] | AH/V(f-) < A0/2]: (NO)
#2. [exists f+ in the range [f0, 4f0] | AH/V(f+) < A0/2]: yes (considering standard deviations), at frequency Hz (OK)
#3. [A0 > 2]: 1.5 < 2 (NO)
#4. [fpeak[Ah/v(f) ą sigmaA(f)] = f0 ą 5%]: (NO)
#5. [sigmaf < epsilon(f0)]: 2.829 > 0.186 (NO)
#6. [sigmaA(f0) < theta(f0)]: 0.271 < 1.58 (OK)

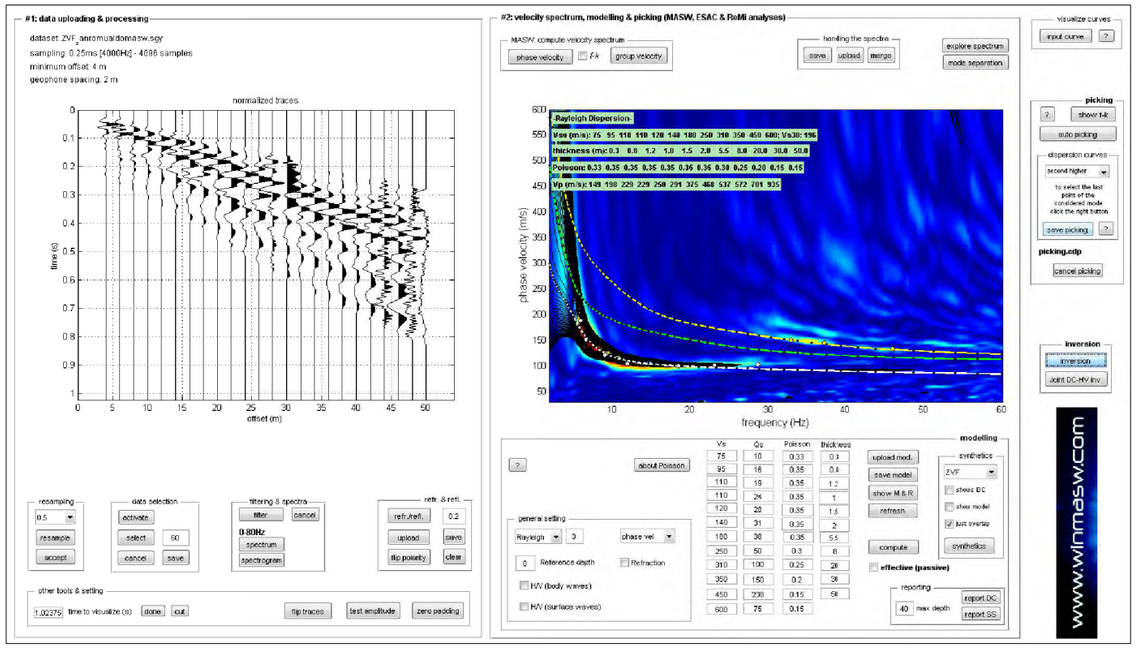

show data
reset
show location
field notes
step#1 (optional) - decimate
64Hz
new frequency
resample
step#2 - H/V computation
remove events
both Rad. & Tr.
clean axes
20
window length (s)
Min. freq.: 0.25Hz
10
tapering (%)
15
outlier tolerance threshold
15%
spectral smoothing (triangular window)
show particle motion and all HVSRs
full ouput
compute
step#3 - directivity analysis
frequencies to highlight
0.5 2.0 5.0 10.0
Hz
compute
3D motion
save video
show 3D motion
www.winmasw.com
save- option#1: save HVSR as it is
save H/V from
0.25
to
30
Hz
save HV curve (as it is)
save - option#2: picking H/V curve
pick HV curve
save picked HV
quick analysis (f=Vs/4H)
200
average Vs (m/s)
(from surface to bedrock)
20
depth of the bedrock (m)
1000
Vs of the bedrock
clean
compute
highlight a frequency
draw highlight
10
Hz
directivity over time
directivity in time
time step:
60
s
hvsr9_b is.saf (64Hz) - Average Spectra
NS
EW
UD
frequency (Hz)
hvsr9_b is.saf - HVSR (window length: 20s)
HVSR
frequency (Hz)
To model the HVSR (also jointly with MASW or ReMi/ESAC data), save the HV curve, go to the "Velocity Spectrum/a. Modeling & Picking" panels and upload the saved HV curve


HVSR: directivity
10Hz
5Hz
2Hz
0.5Hz
frequency (Hz)
HVSR
Azimuth (degree)
N
W
0.5Hz
2Hz
5Hz
10Hz
HVSR
EW
NS

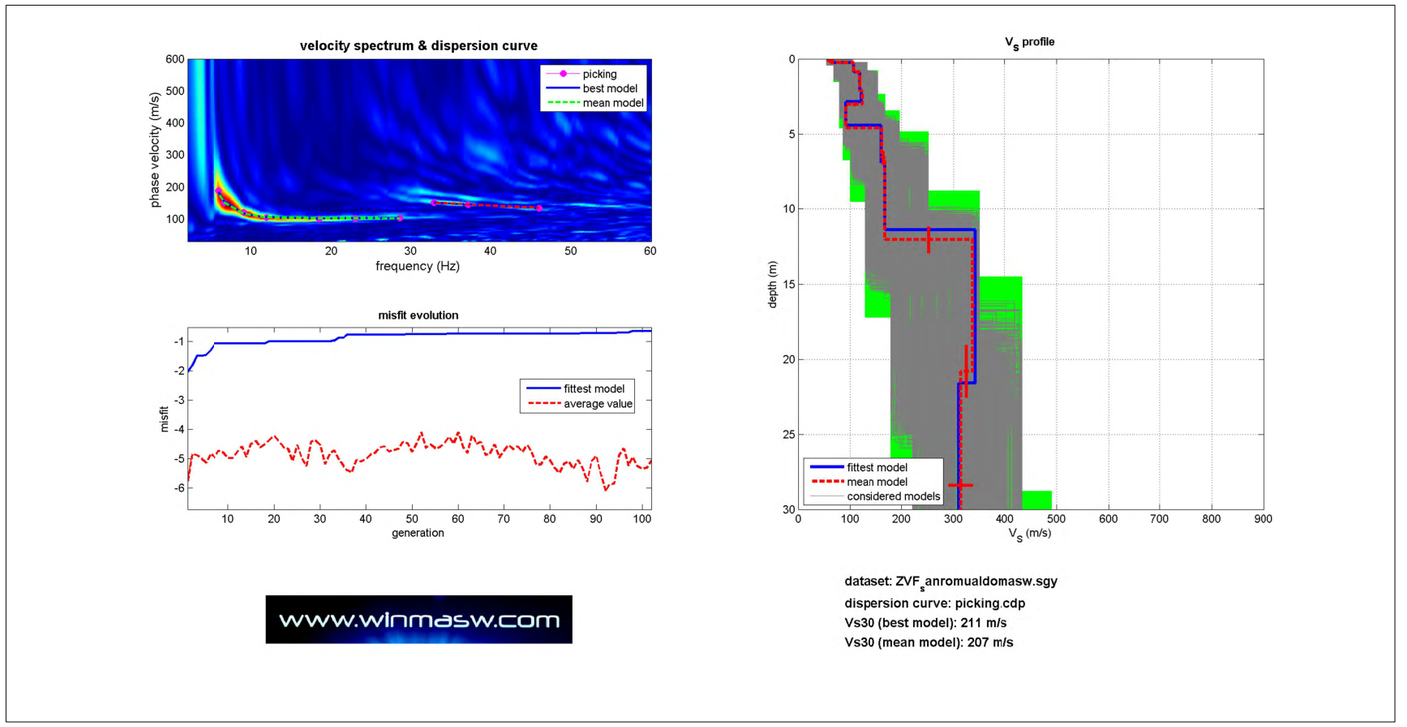

HVSR vs Time (2D view)
frequency (Hz)
time (min)
HVSR
HVSR vs Time (3D view)
frequency (Hz)
time (min)

Stendimento MASW

SPETTRO DI VELOCITA' MASW



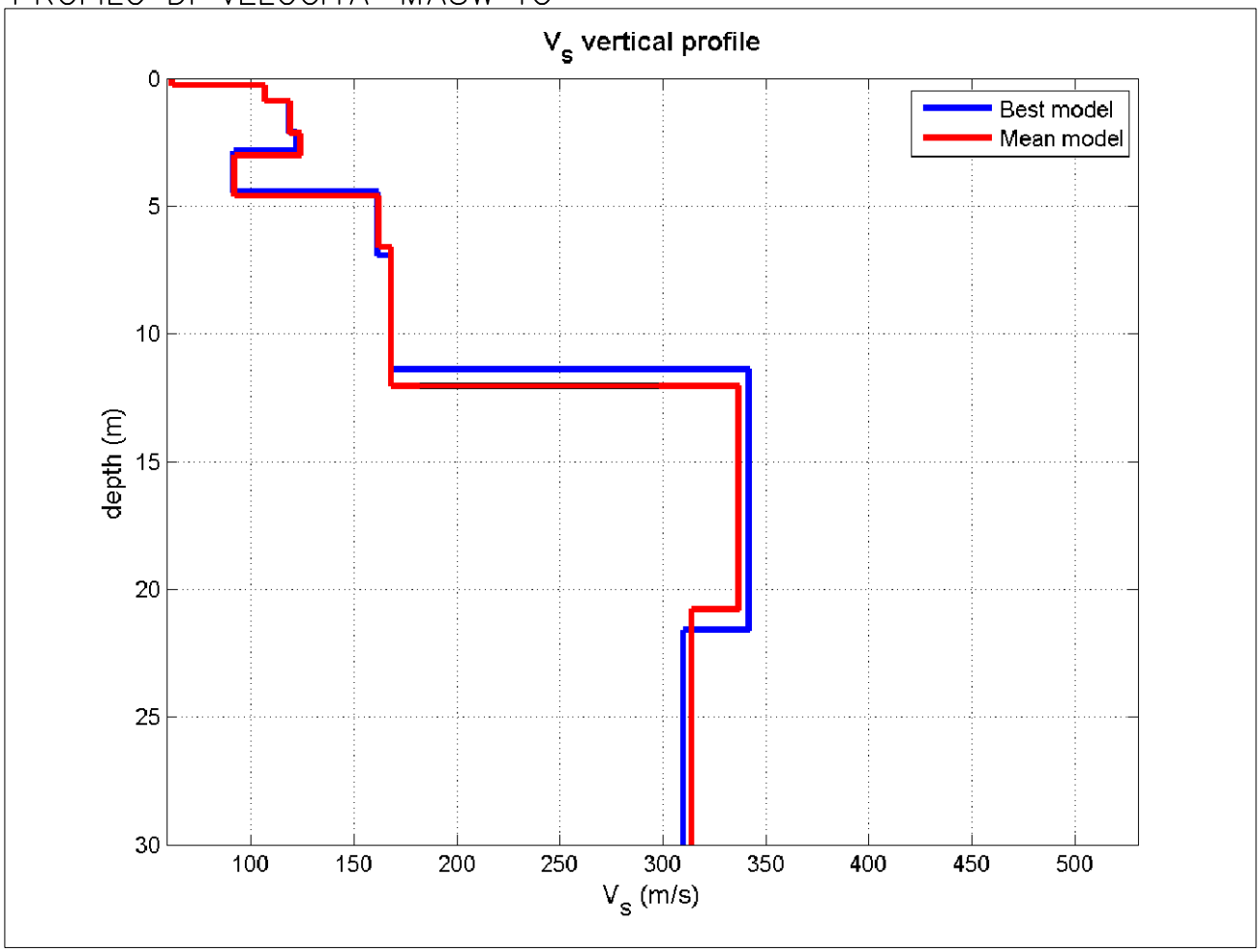
INVERSIONE DEL MASW E PROFILO DI VELOCITA'



GEOLOGICA TOSCANA
Prospezioni Geofisiche s.n.c.

RISULTANZE DELL'ANALISI SISMICA MASW 1C

PROFILO DI VELOCITA' MASW 1C



Mean model
Vs (m/s): 62, 107, 119, 124, 92, 162, 168, 337, 314, 362, 532
Thickness (m): 0.3, 0.6, 1.2, 0.9, 1.6, 2.0, 5.5, 8.7, 15.3, 33.0, 63.5

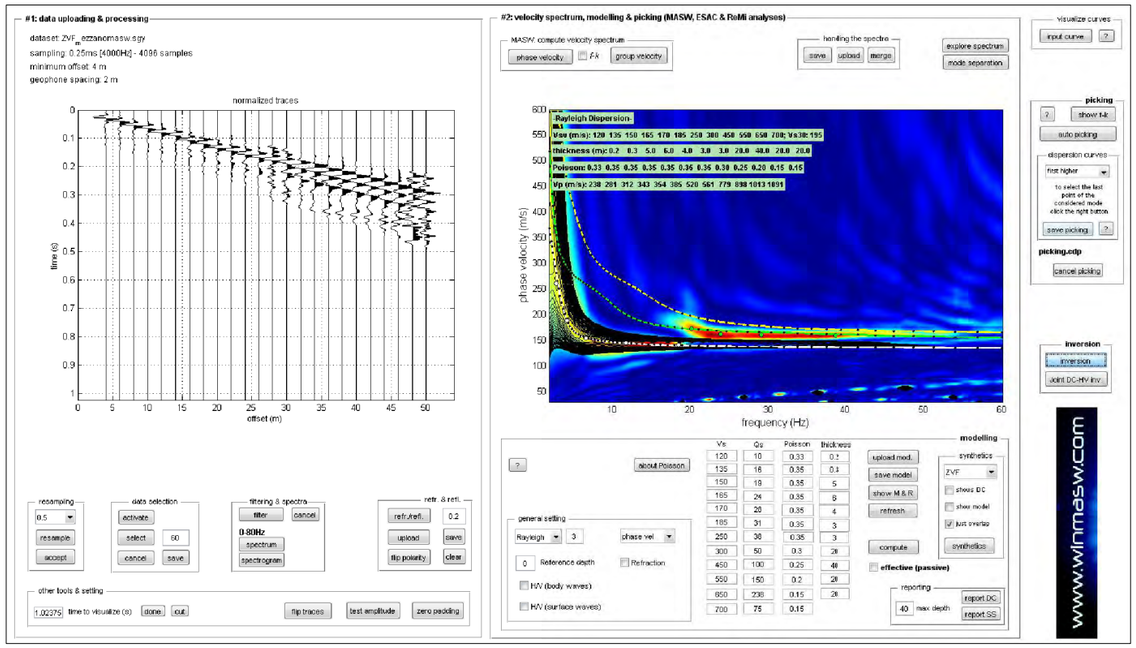
Density (gr/cm3) (approximate values): 1.52 1.70 1.75 1.75 1.62 1.84 1.80 1.99 1.89 1.92 2.01
Seismic/Dynamic Shear modulus (MPa) (approximate values): 6 19 25 27 14 48 51 226 187 252 568

Approximate values for Vp and Poisson
Vp (m/s): 109 227 282 284 162 412 354 781 513 581 828
Poisson: 0.26 0.36 0.39 0.38 0.26 0.41 0.35 0.39 0.20 0.18 0.15

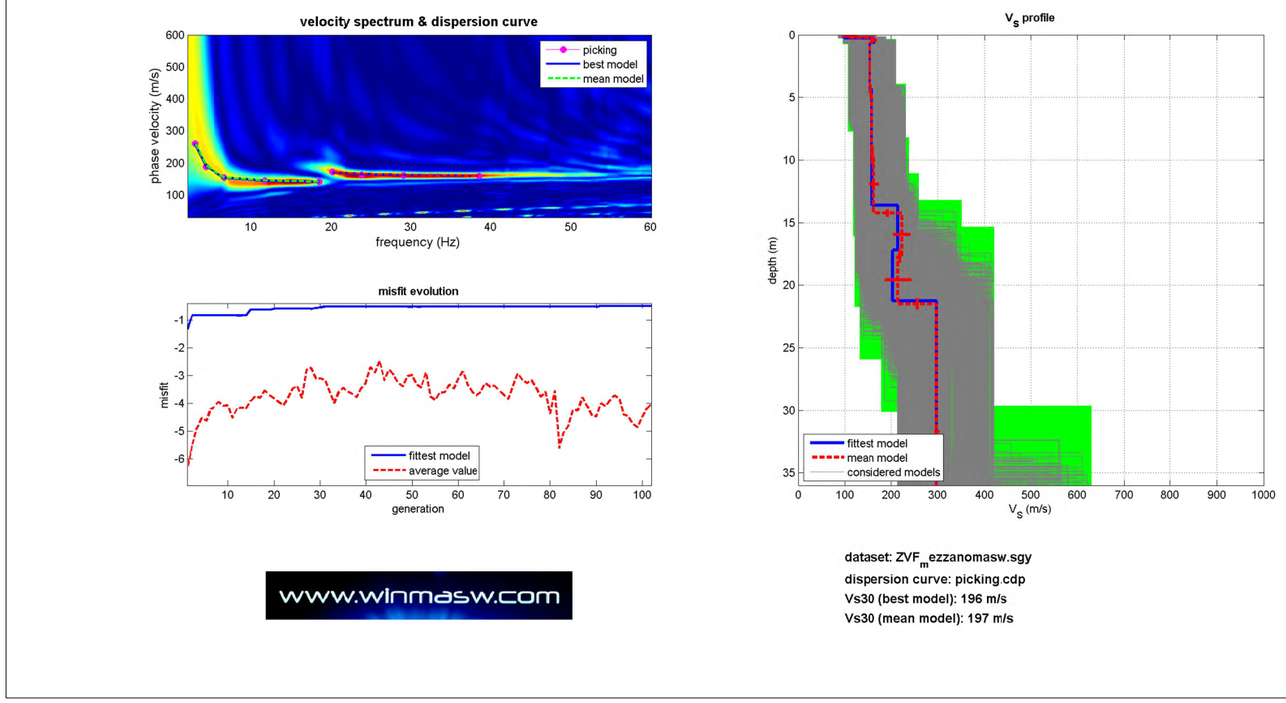
Vs30 (m/s): 207

Stendimento MASW

SPETTRO DI VELOCITA' MASW



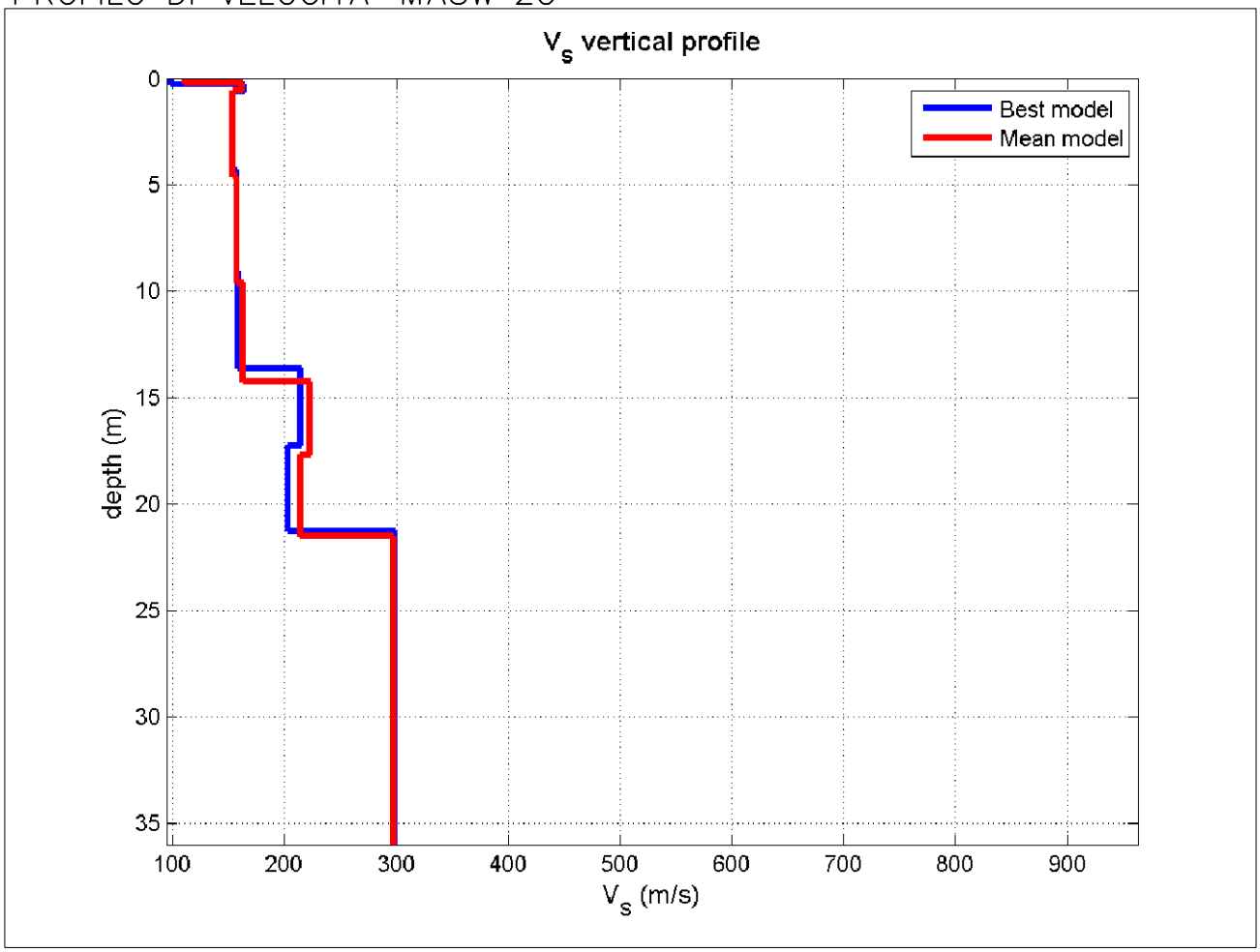
INVERSIONE DEL MASW E PROFILO DI VELOCITA'



GEOLOGICA TOSCANA
Prospezioni Geofisiche s.n.c.

RISULTANZE DELL'ANALISI SISMICA MASW 2C

PROFILO DI VELOCITA' MASW 2C



Mean model
Vs (m/s): 111, 162, 154, 158, 163, 223, 215, 298, 397, 489
Thickness (m): 0.2, 0.3, 4.0, 5.0, 4.7, 3.4, 3.8, 20.4, 45.5, 19.1

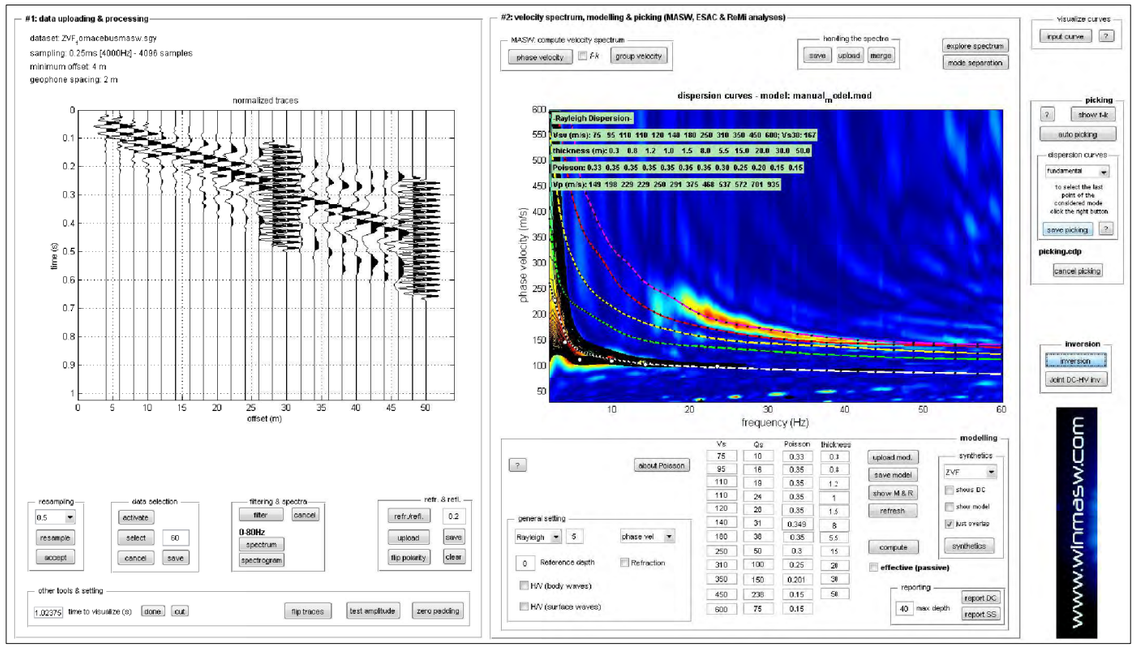
Density (gr/cm3) (approximate values): 1.66 1.76 1.77 1.84 1.77 1.84 1.83 1.93 1.96 1.99
Seismic/Dynamic Shear modulus (MPa) (approximate values): 20 46 42 46 47 92 85 171 308 475

Approximate values for Vp and Poisson
Vp (m/s): 195 294 314 413 308 413 402 593 669 759
Poisson: 0.26 0.28 0.34 0.41 0.31 0.29 0.30 0.33 0.23 0.15

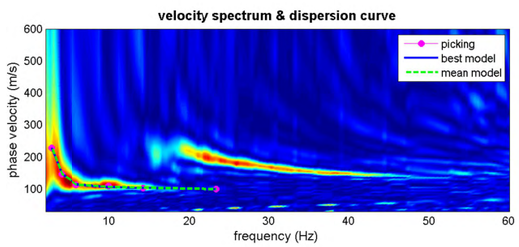
Vs30 (m/s): 197

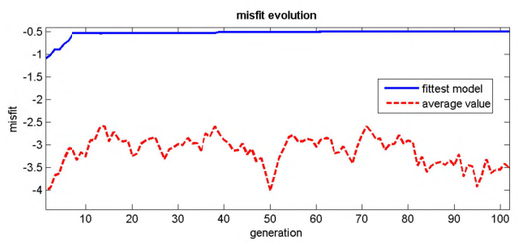
Stendimento MASW

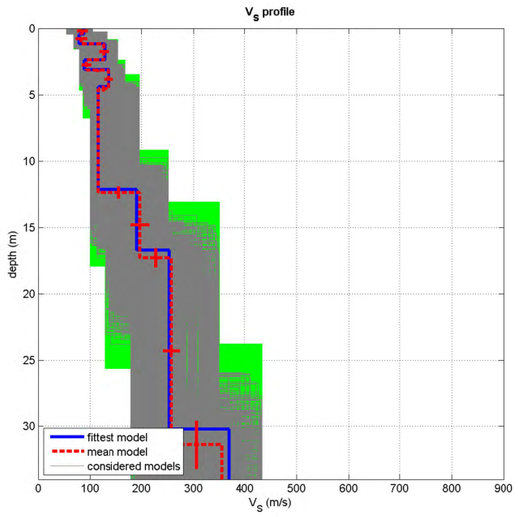
SPETTRO DI VELOCITA' MASW



INVERSIONE DEL MASW E PROFILO DI VELOCITA'







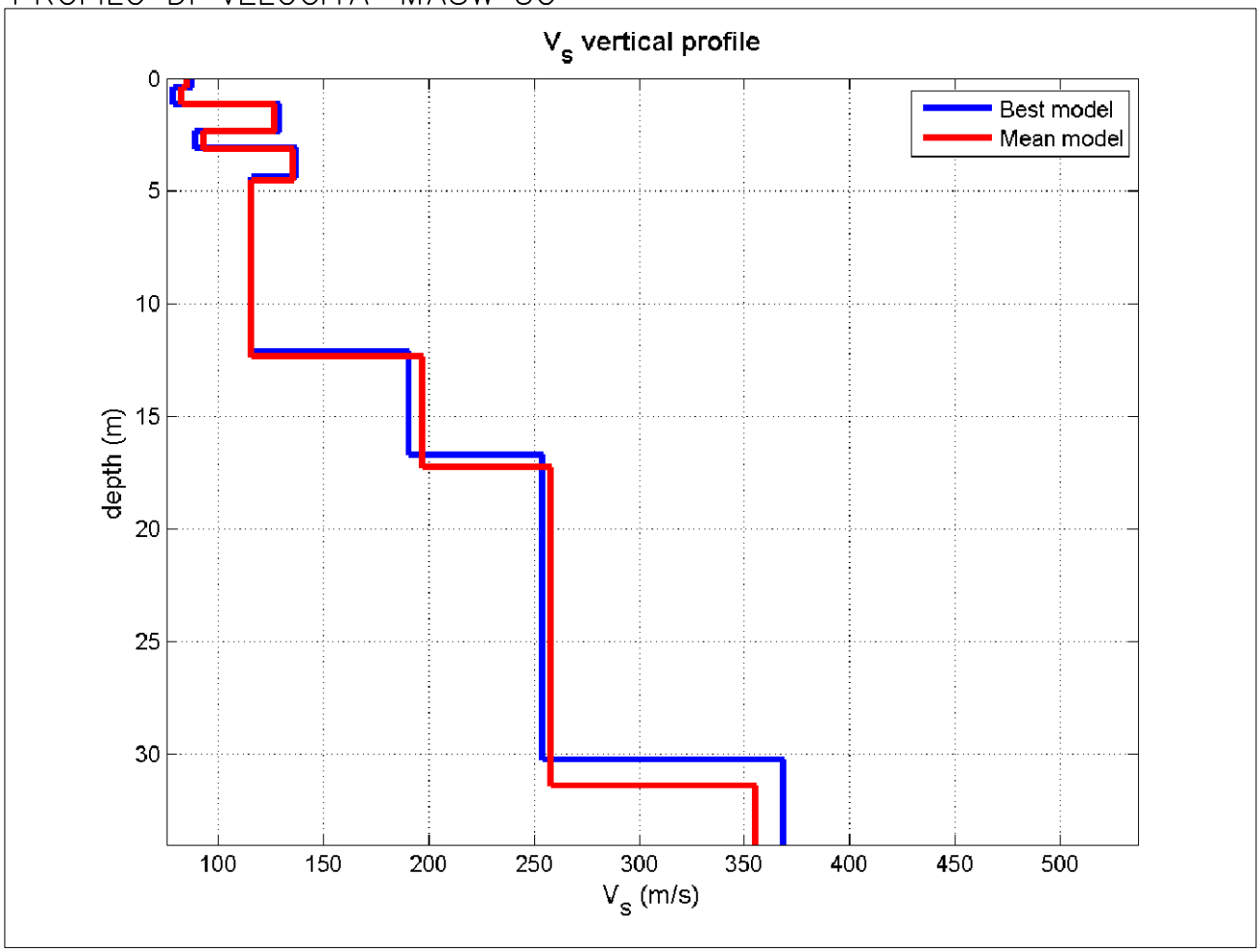
www.winmasw.com

dataset: ZVF_ornacebusmasw.sgy
dispersion curve: picking.cdp
Vs30 (best model): 163 m/s
Vs30 (mean model): 163 m/s

GEOLOGICA TOSCANA
Prospezioni Geofisiche s.n.c.

RISULTANZE DELL'ANALISI SISMICA MASW 3C

PROFILO DI VELOCITA' MASW 3C



Mean model
Vs (m/s): 85, 83, 127, 93, 136, 116, 197, 258, 355, 298, 453
Thickness (m): 0.4, 0.8, 1.2, 0.8, 1.4, 7.8, 4.9, 14.1, 24.3, 30.9, 52.4

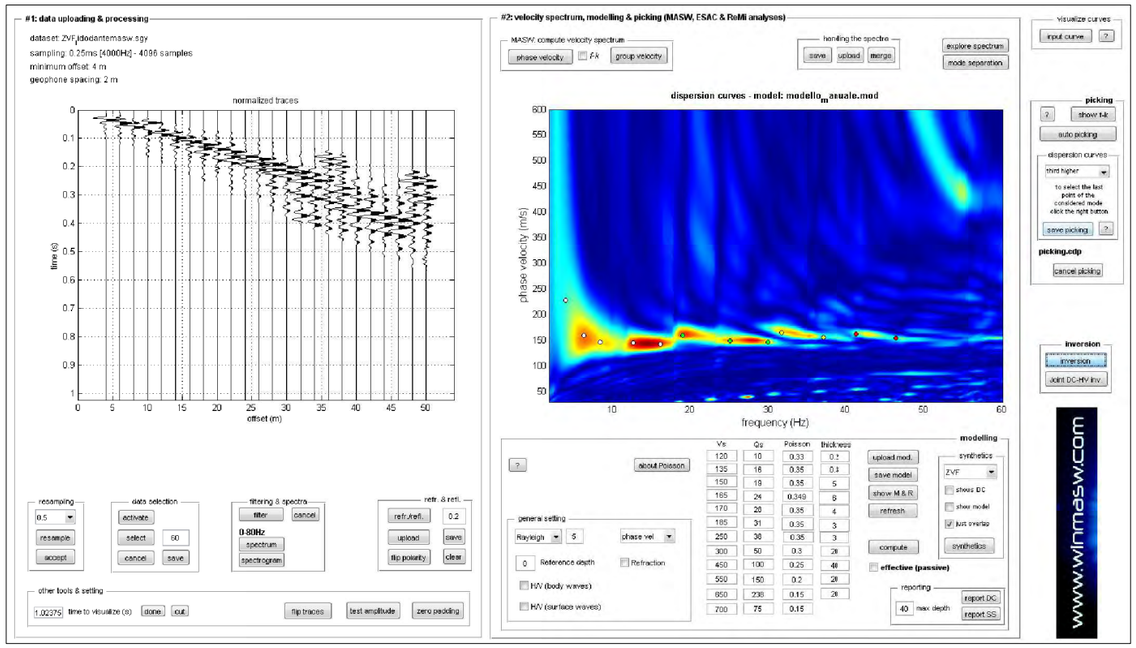
Density (gr/cm3) (approximate values): 1.68 1.65 1.78 1.67 1.73 1.71 1.82 1.85 1.93 1.88 1.97
Seismic/Dynamic Shear modulus (MPa) (approximate values): 12 11 29 14 32 23 71 123 244 167 404

Approximate values for Vp and Poisson
Vp (m/s): 214 186 327 201 256 243 384 437 606 486 701
Poisson: 0.41 0.38 0.41 0.36 0.30 0.35 0.32 0.23 0.24 0.20 0.14

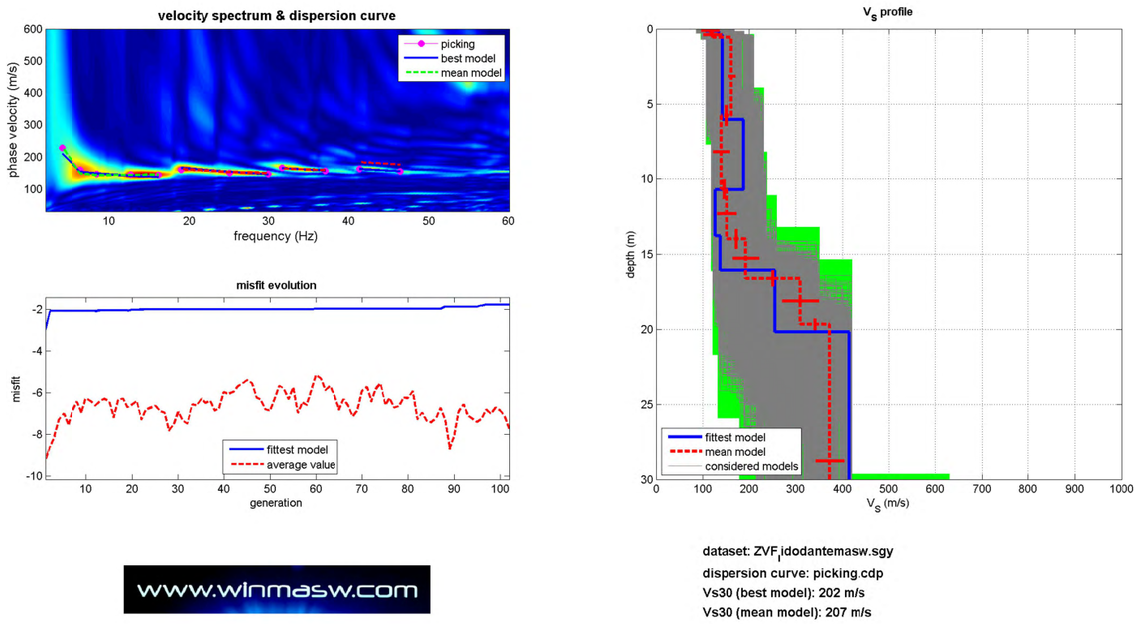
Vs30 (m/s): 163

Stendimento MASW

SPETTRO DI VELOCITA' MASW



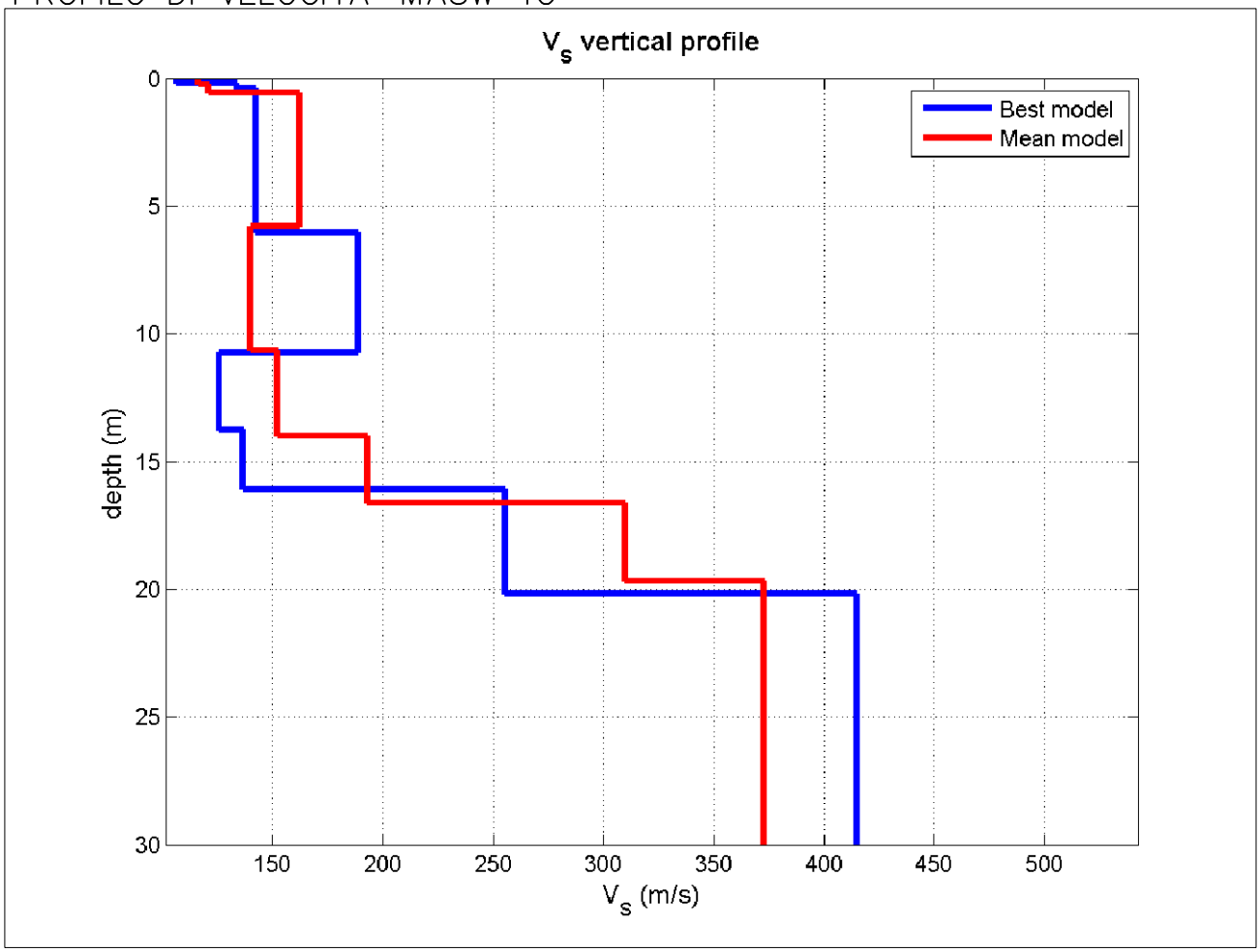
INVERSIONE DEL MASW E PROFILO DI VELOCITA'



GEOLOGICA TOSCANA
Prospezioni Geofisiche s.n.c.

RISULTANZE DELL'ANALISI SISMICA MASW 4C

PROFILO DI VELOCITA' MASW 4C



Mean model
Vs (m/s): 116, 121, 162, 140, 152, 193, 310, 373, 485,
Thickness (m): 0.2, 0.3, 5.2, 4.9, 3.3, 2.6, 3.1, 18.2, 45.2

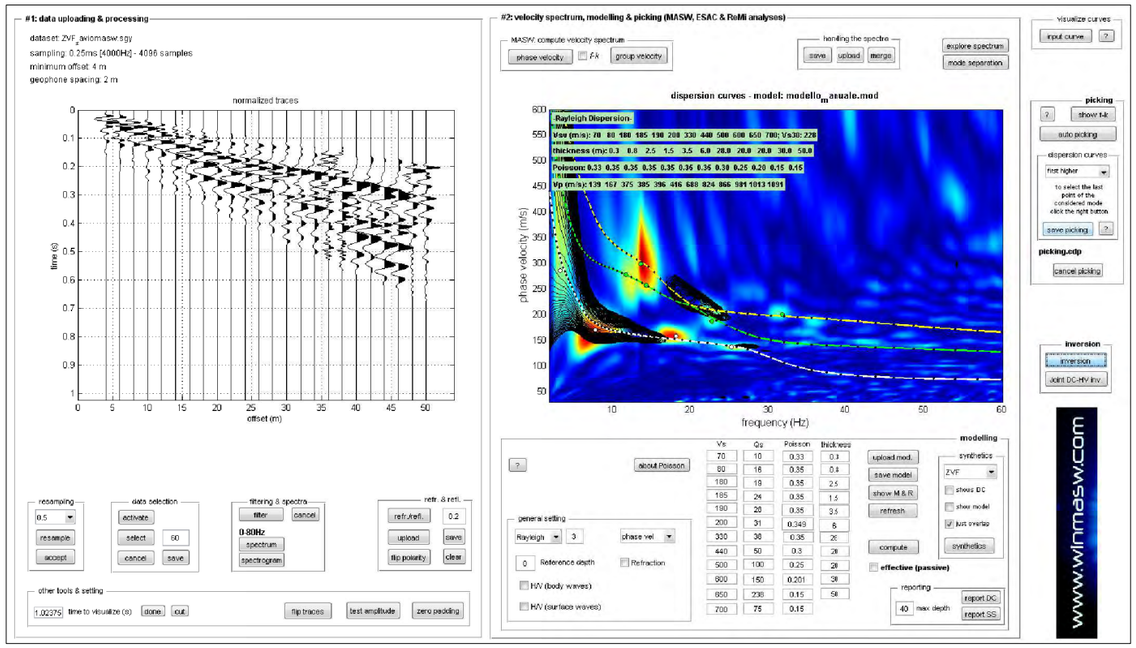
Density (gr/cm3) (approximate values): 1.67 1.72 1.85 1.75 1.84 1.84 1.94 1.98 2.00
Seismic/Dynamic Shear modulus (MPa) (approximate values): 22 25 49 34 42 68 187 275 470

Approximate values for Vp and Poisson
Vp (m/s): 202 253 436 284 409 410 633 731 791
Poisson: 0.25 0.35 0.42 0.34 0.42 0.36 0.34 0.32 0.20

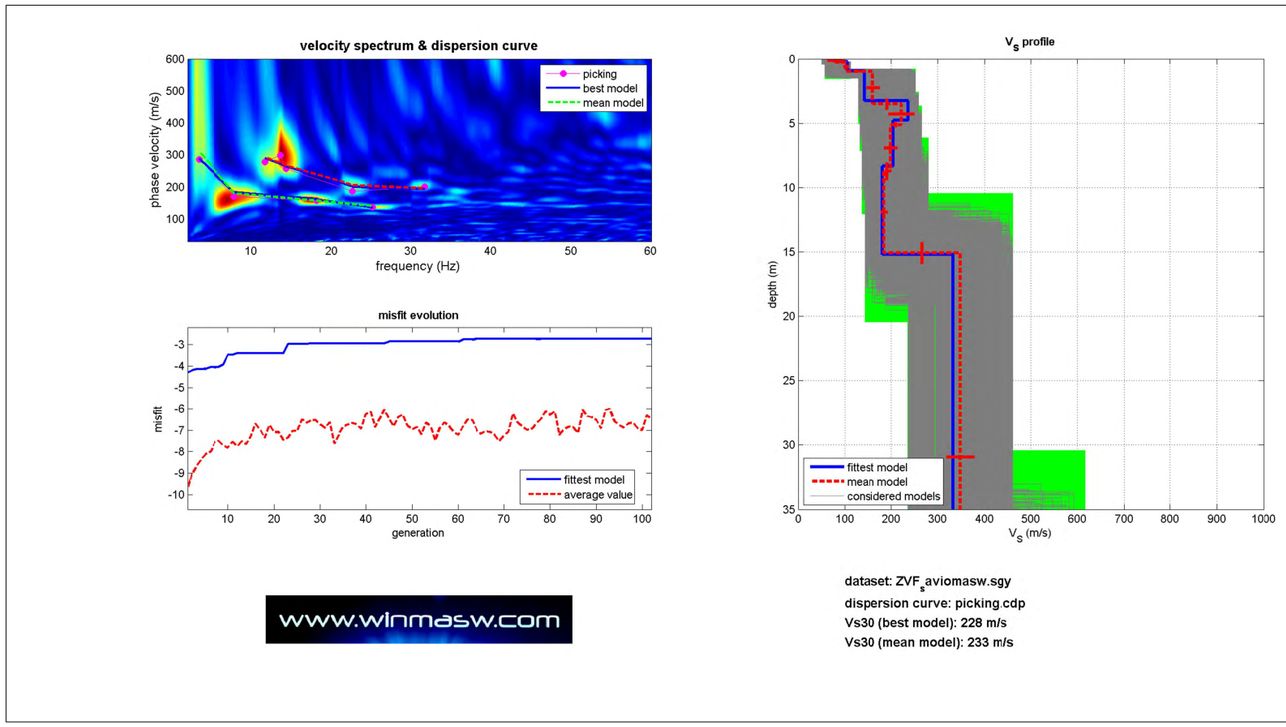
Vs30 (m/s): 207

Stendimento MASW

SPETTRO DI VELOCITA' MASW



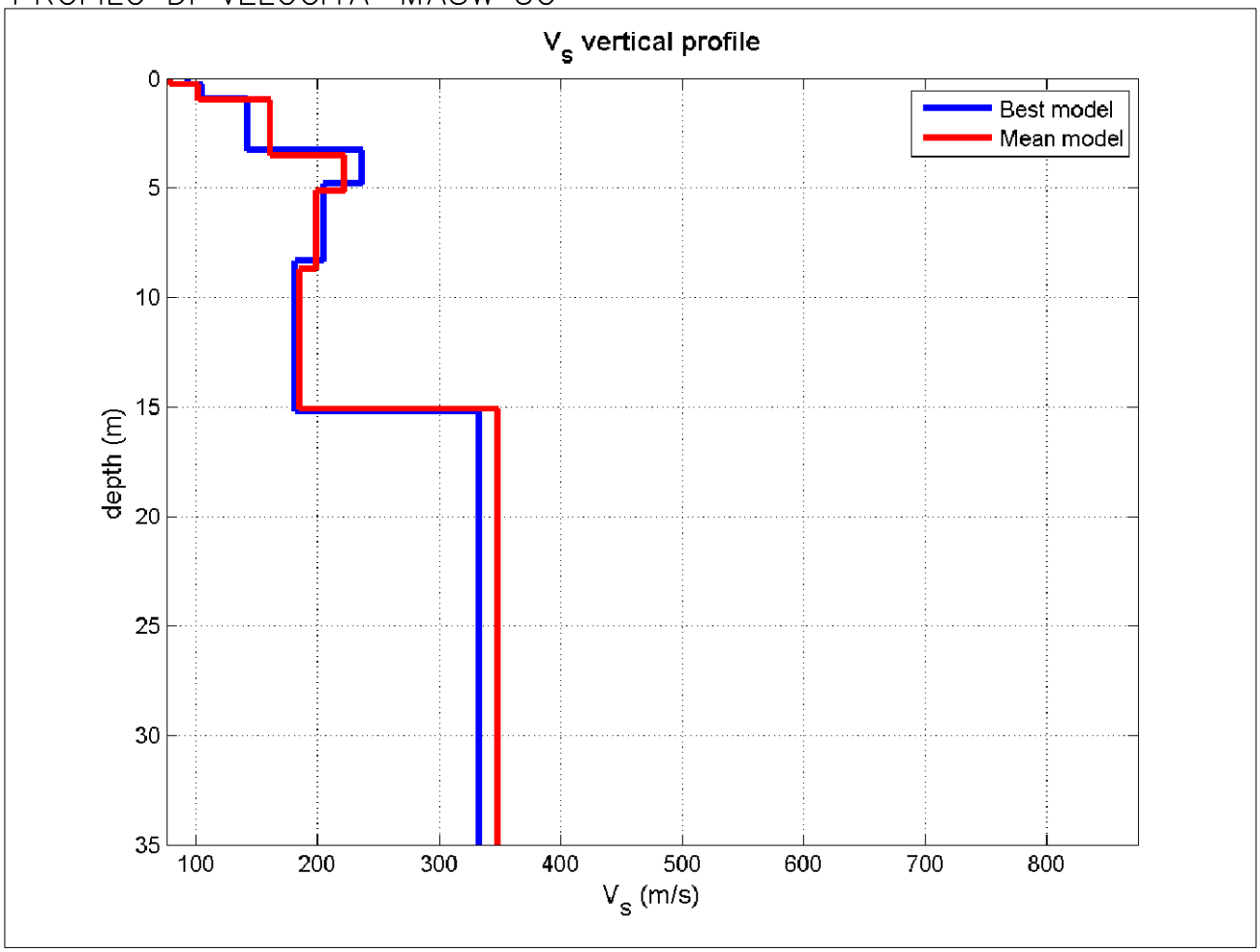
INVERSIONE DEL MASW E PROFILO DI VELOCITA'



GEOLOGICA TOSCANA
Prospezioni Geofisiche s.n.c.

RISULTANZE DELL'ANALISI SISMICA MASW 5C

PROFILO DI VELOCITA' MASW 5C



Mean model
Vs (m/s): 79, 102, 161, 222, 199, 185, 348, 409, 521
Thickness (m): 0.3, 0.7, 2.5, 1.6, 3.6, 6.4, 31.7, 20.4, 23.1

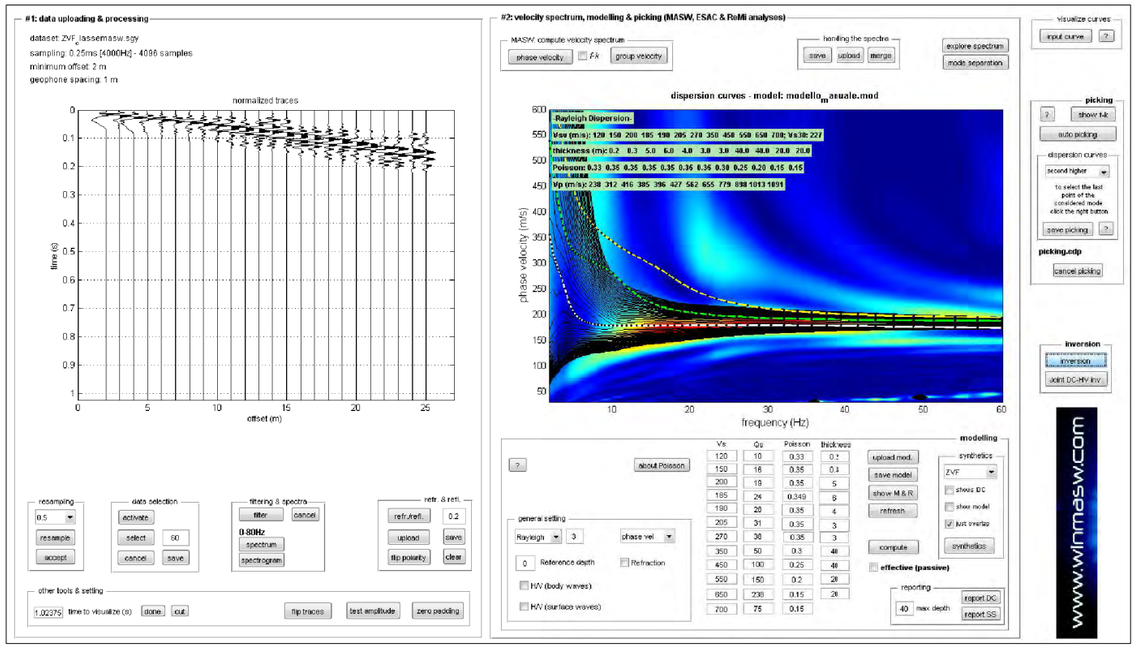
Density (gr/cm3) (approximate values): 1.60 1.68 1.77 1.90 1.88 1.87 1.96 1.98 2.04
Seismic/Dynamic Shear modulus (MPa) (approximate values): 10 17 46 94 74 64 238 332 554

Approximate values for Vp and Poisson)
Vp (m/s): 151 208 313 530 485 464 686 748 944
Poisson: 0.31 0.34 0.32 0.39 0.40 0.41 0.33 0.29 0.28

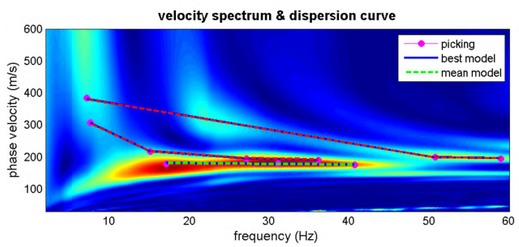
Vs30 (m/s): 233

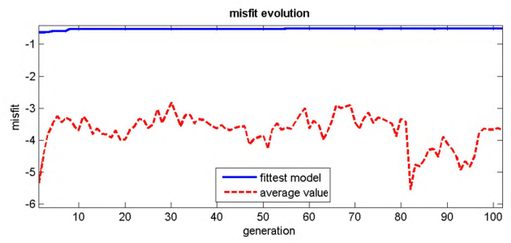
Stendimento MASW

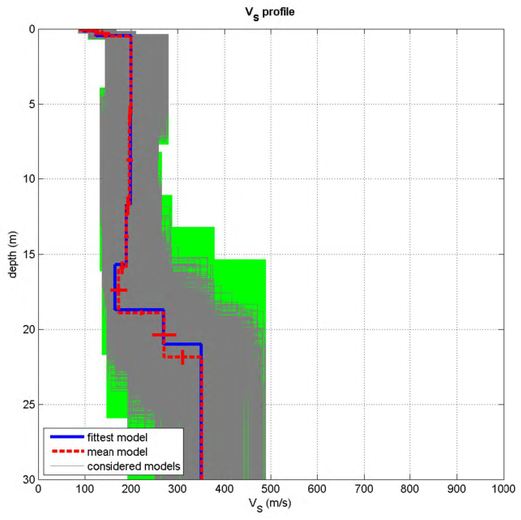
SPETTRO DI VELOCITA' MASW



INVERSIONE DEL MASW E PROFILO DI VELOCITA'







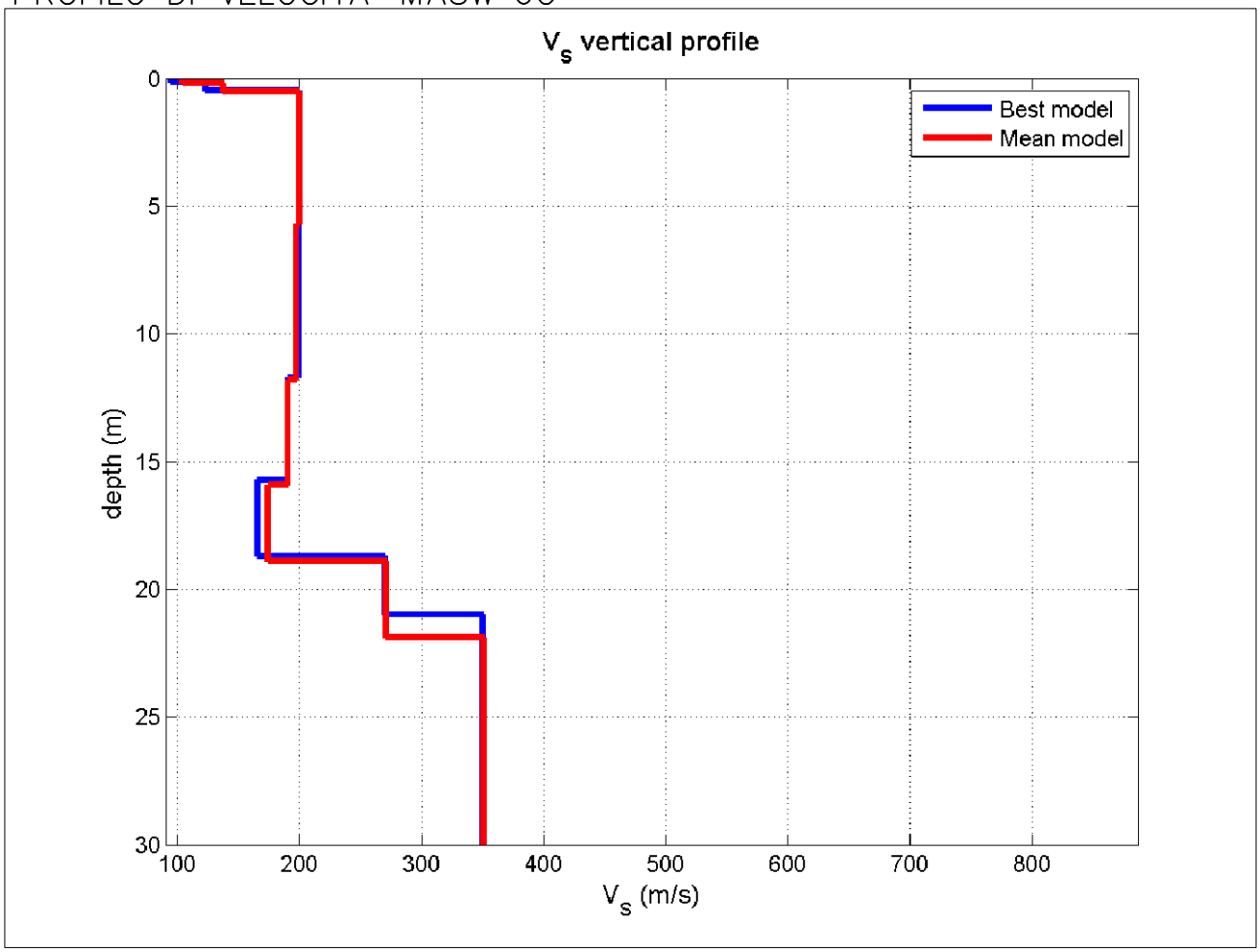
www.winmasw.com

dataset: ZVF_lassemasw.sgy
dispersion curve: picking.cdp
Vs30 (best model): 224 m/s
Vs30 (mean model): 224 m/s

GEOLOGICA TOSCANA
Prospezioni Geofisiche s.n.c.

RISULTANZE DELL'ANALISI SISMICA MASW 6C

PROFILO DI VELOCITA' MASW 6C



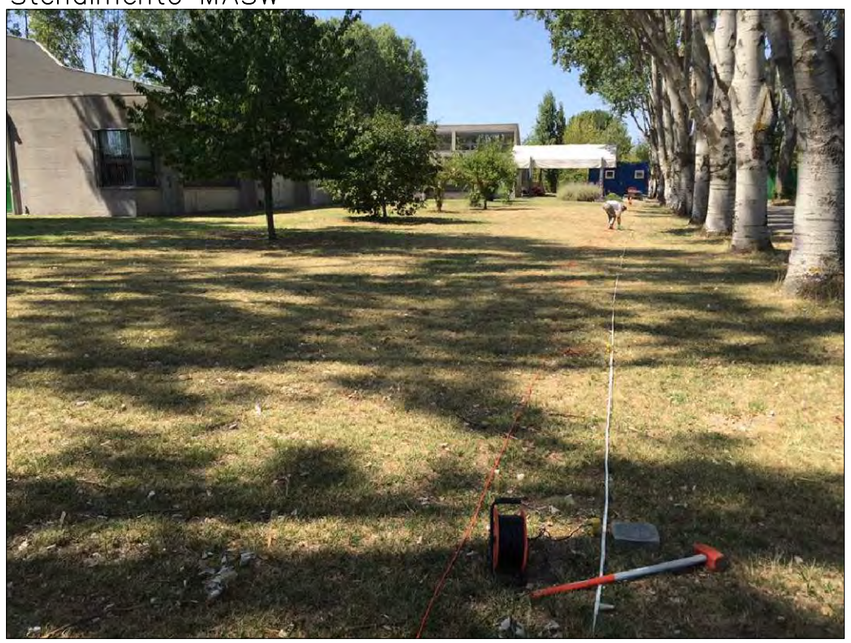
Mean model
Vs (m/s): 104, 137, 200, 197, 190, 174, 271, 351, 477
Thickness (m): 0.2, 0.3, 5.2, 6.1, 4.1, 3.0, 3.0, 40.9, 43.8

Density (gr/cm3) (approximate values): 1.68 1.78 1.84 1.83 1.82 1.81 1.92 1.96 2.02
Seismic/Dynamic Shear modulus (MPa) (approximate values): 18 33 74 71 66 55 141 241 460

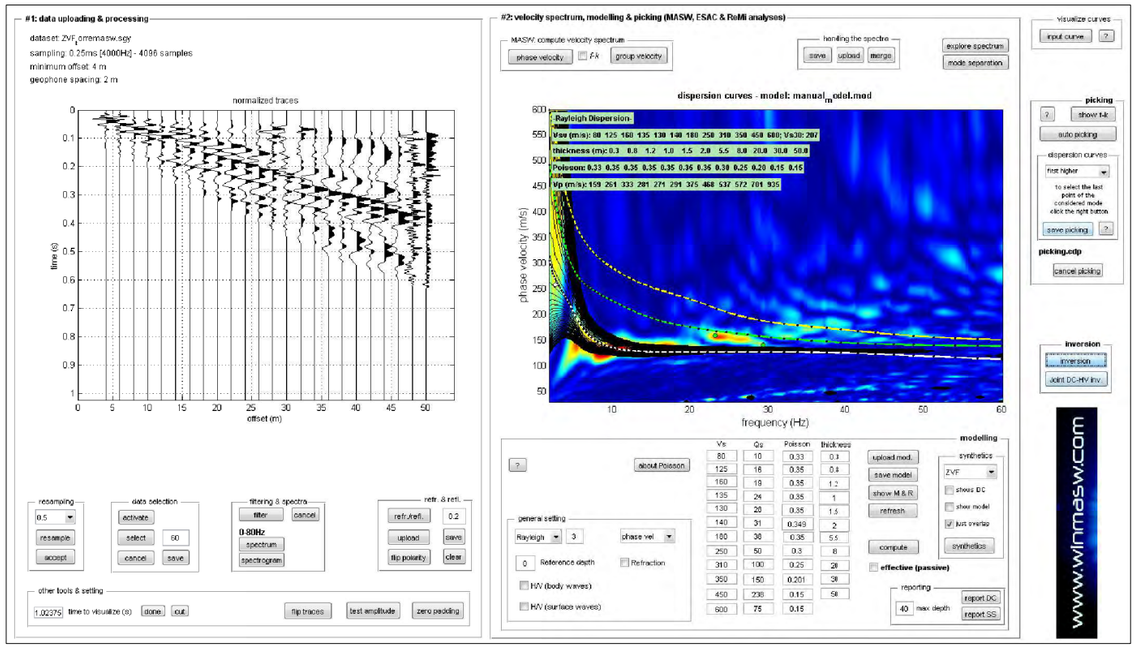
Approximate values for Vp and Poisson
Vp (m/s): 209 320 412 401 378 361 564 679 872
Poisson: 0.34 0.39 0.35 0.34 0.33 0.35 0.35 0.32 0.29

Vs30 (m/s): 224

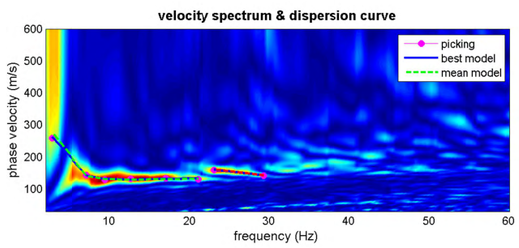
Stendimento MASW

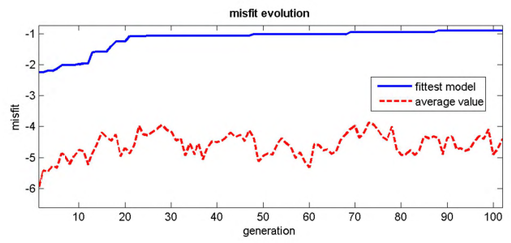


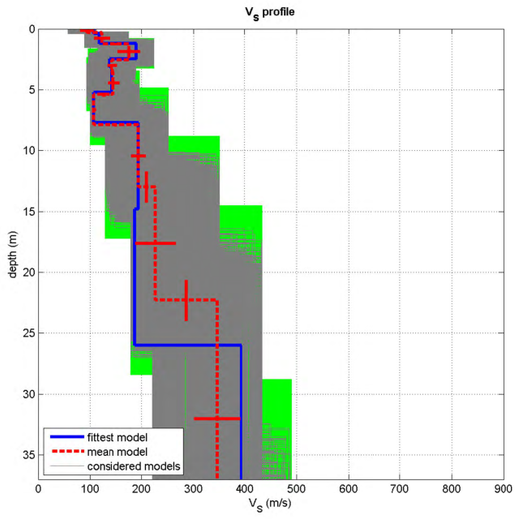
SPETTRO DI VELOCITA' MASW



INVERSIONE DEL MASW E PROFILO DI VELOCITA'







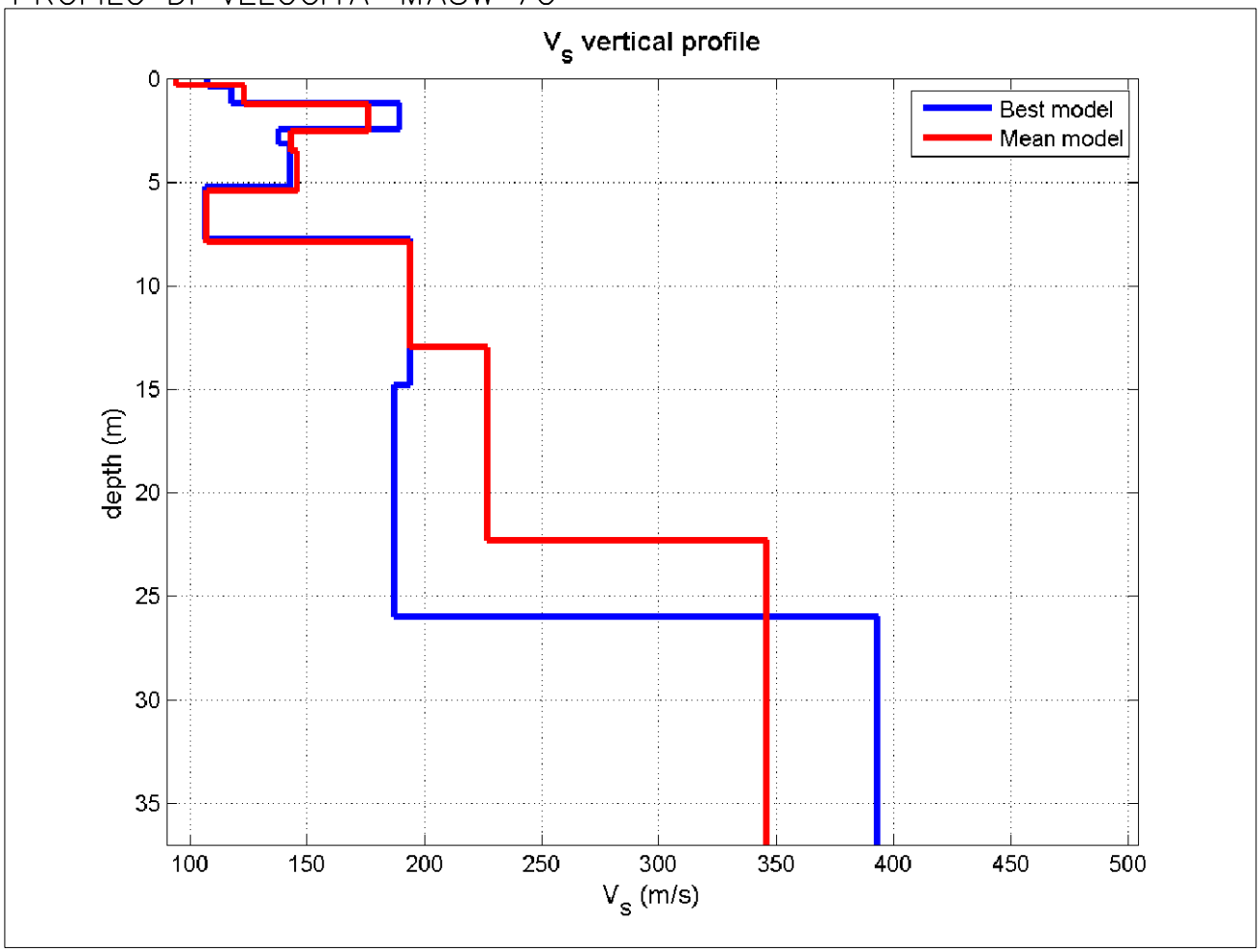
www.winmasw.com

dataset: ZVFtorremasw.sgy
dispersion curve: picking.cdp
Vs30 (best model): 180 m/s
Vs30 (mean model): 199 m/s

GEOLOGICA TOSCANA
Prospezioni Geofisiche s.n.c.

RISULTANZE DELL'ANALISI SISMICA MASW 7C

PROFILO DI VELOCITA' MASW 7C



Mean model
Vs (m/s): 94, 123, 176, 143, 146, 107, 194, 227, 346, 350, 474
Thickness (m): 0.3, 0.9, 1.3, 1.0, 1.9, 2.5, 5.1, 9.3, 19.5, 32.4

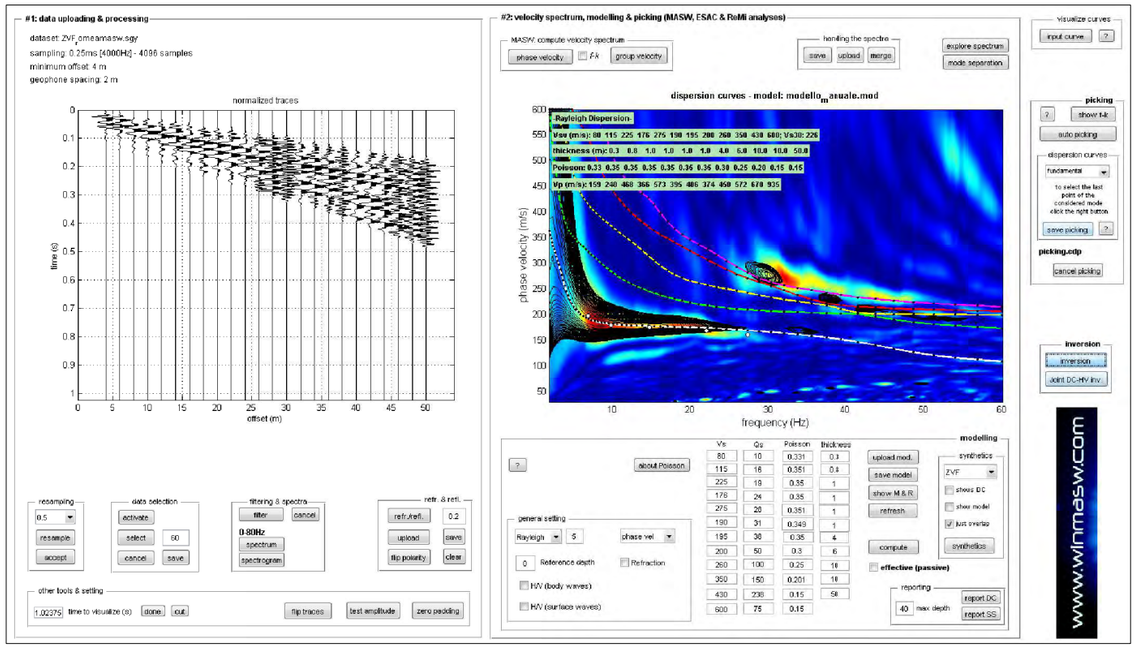
Density (gr/cm3) (approximate values): 1.64 1.70 1.84 1.76 1.77 1.81 1.87 1.83 1.93 1.92
Seismic/Dynamic Shear modulus (MPa) (approximate values): 15 26 57 36 38 21 70 94 231 235

Approximate values for Vp and Poisson
Vp (m/s): 182 234 413 294 308 364 467 398 608 581
Poisson: 0.32 0.31 0.39 0.35 0.36 0.45 0.40 0.26 0.26 0.22

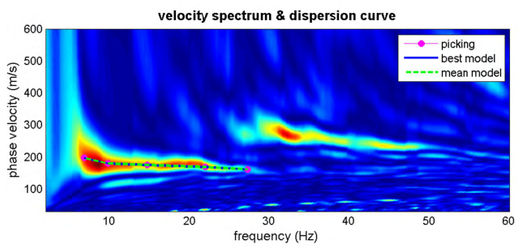
Vs30 (m/s): 199

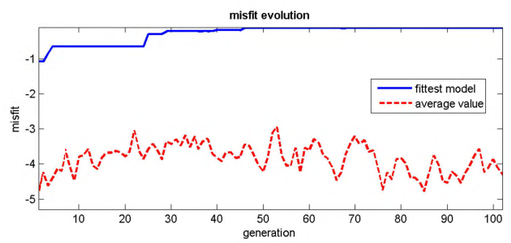
Stendimento MASW

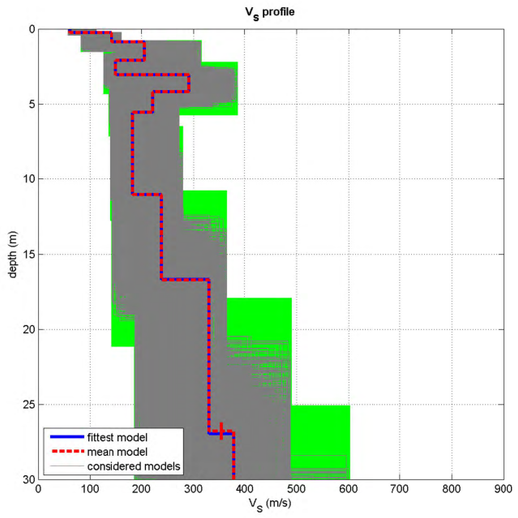
SPETTRO DI VELOCITA' MASW



INVERSIONE DEL MASW E PROFILO DI VELOCITA'







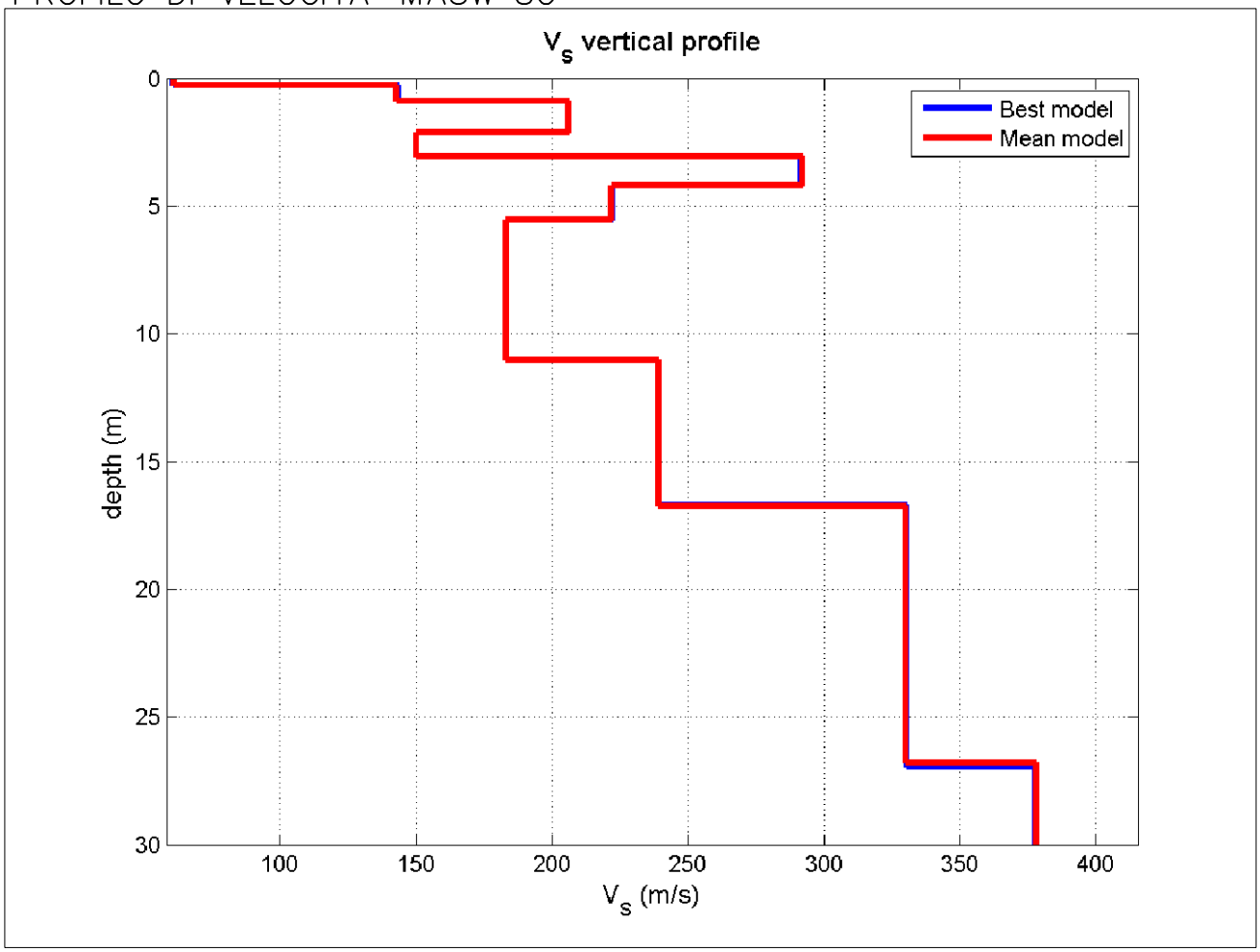
www.winmasw.com

dataset: ZVF_romeamasw.sgy
dispersion curve: picking.cdp
Vs30 (best model): 242 m/s
Vs30 (mean model): 242 m/s

GEOLOGICA TOSCANA
Prospezioni Geofisiche s.n.c.

RISULTANZE DELL'ANALISI SISMICA MASW 8C

PROFILO DI VELOCITA' MASW 8C



Mean model
Vs (m/s): 61, 143, 206, 150, 292, 222, 183, 239, 330, 378, 370
Thickness (m): 0.3, 0.6, 1.2, 1.0, 1.1, 1.4, 5.5, 5.7, 10.1, 11.1, 42.1

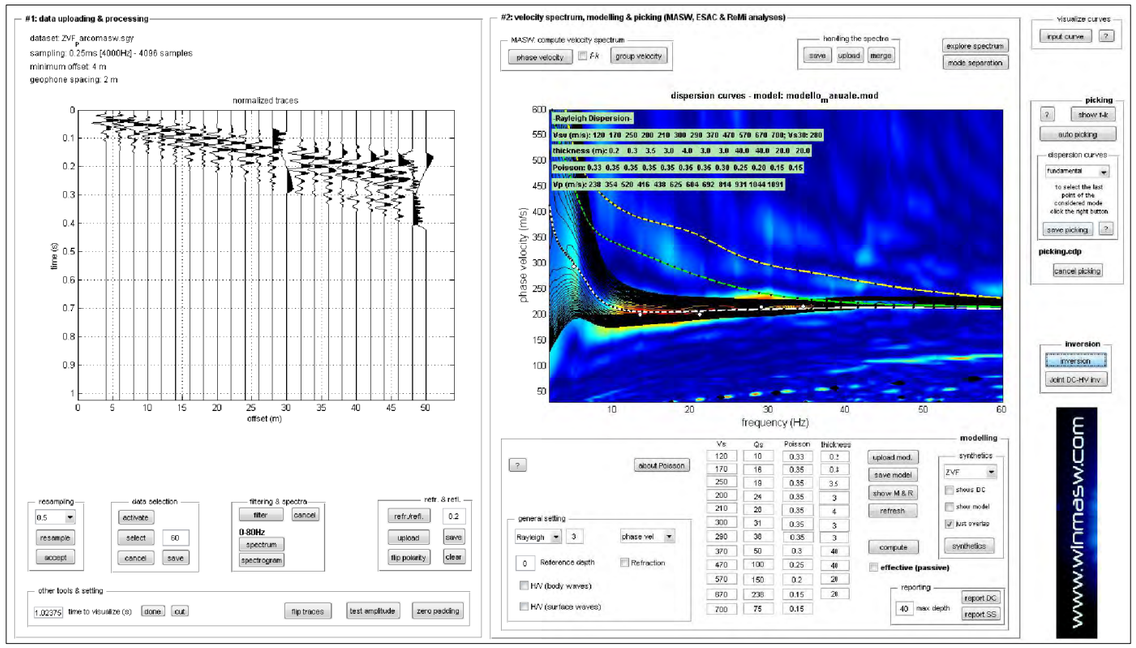
Density (gr/cm3) (approximate values): 1.62 1.73 1.81 1.73 2.05 1.86 1.79 1.86 1.89 1.95 1.92
Seismic/Dynamic Shear modulus (MPa) (approximate values): 6 35 77 39 175 92 60 106 206 279 263

Approximate values for Vp and Poisson
Vp (m/s): 165 259 362 257 985 451 339 457 517 663 586
Poisson: 0.42 0.28 0.26 0.24 0.45 0.34 0.29 0.31 0.16 0.26 0.17

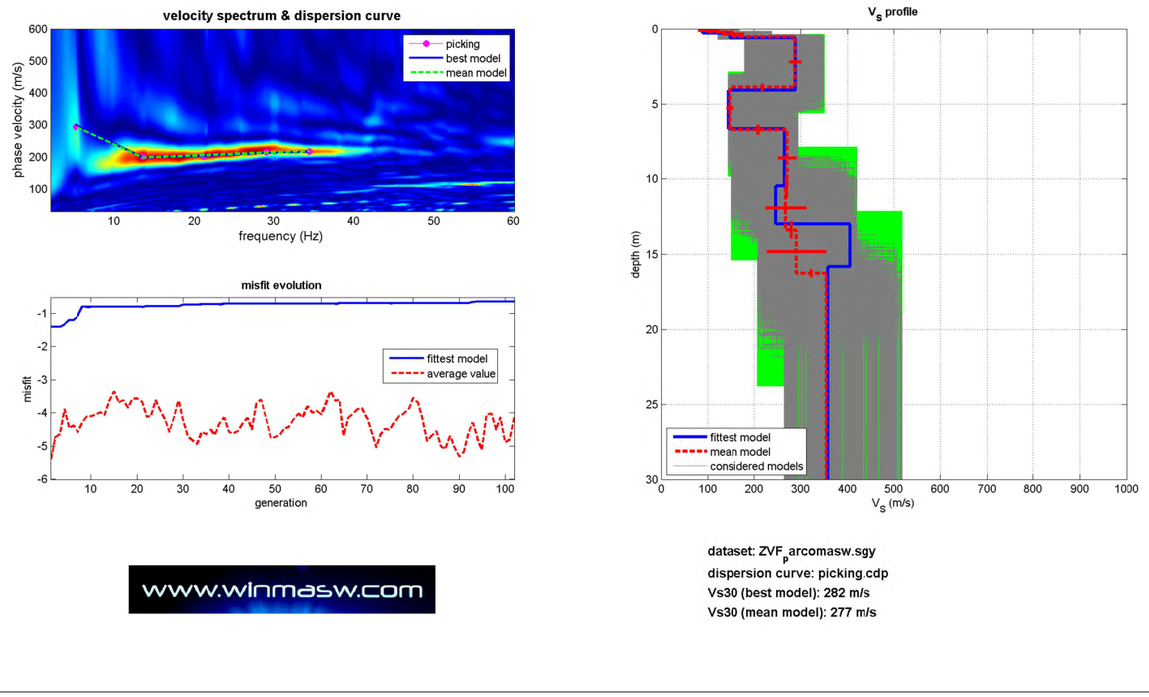
Vs30 (m/s): 242

Stendimento MASW

SPETTRO DI VELOCITA' MASW



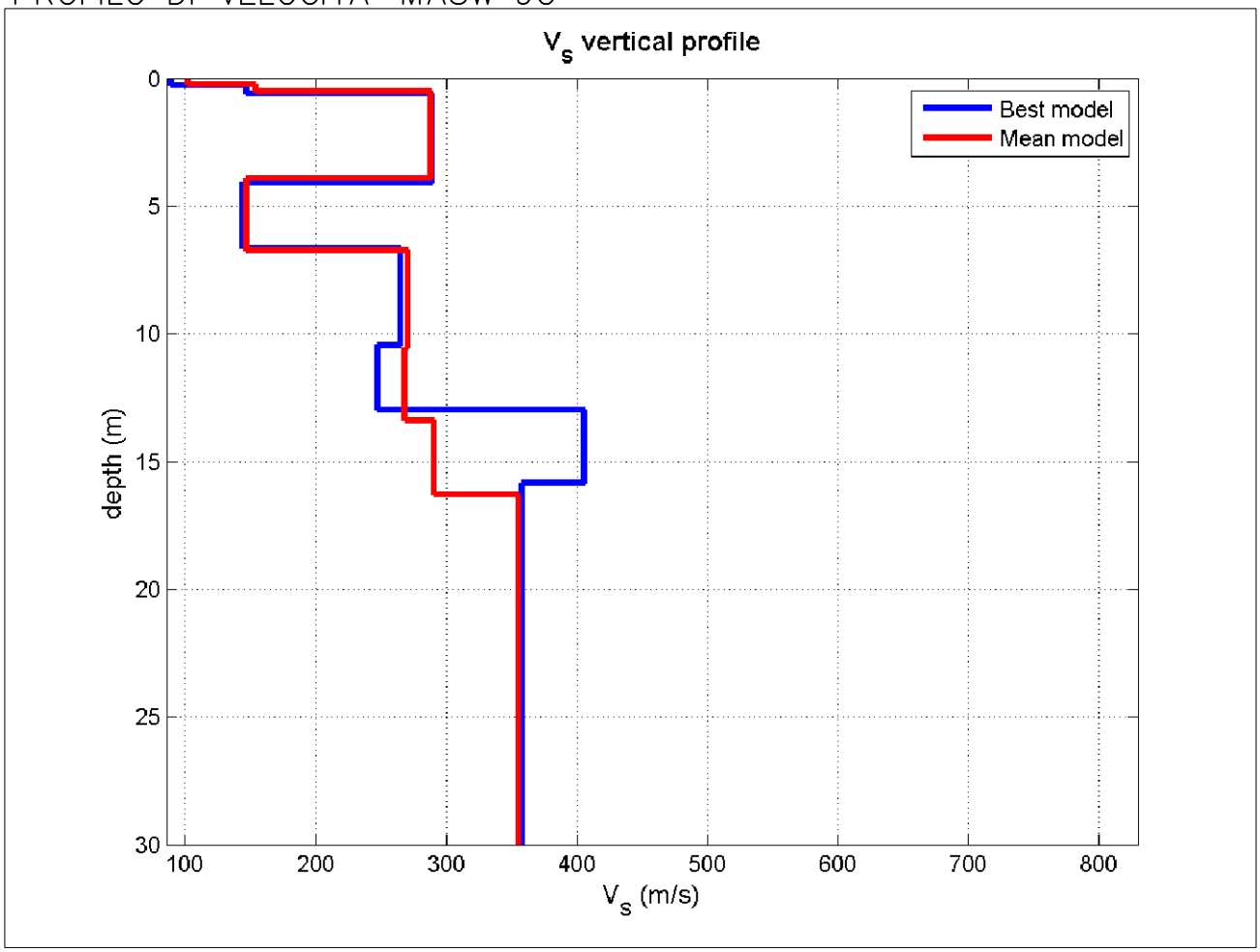
INVERSIONE DEL MASW E PROFILO DI VELOCITA'



GEOLOGICA TOSCANA
Prospezioni Geofisiche s.n.c.

RISULTANZE DELL'ANALISI SISMICA MASW 9C

PROFILO DI VELOCITA' MASW 9C



Mean model
Vs (m/s): 102, 154, 288, 147, 271, 268, 291, 355, 529
Thickness (m): 0.2, 0.3, 3.4, 2.8, 3.8, 2.9, 2.9, 44.8, 42.6

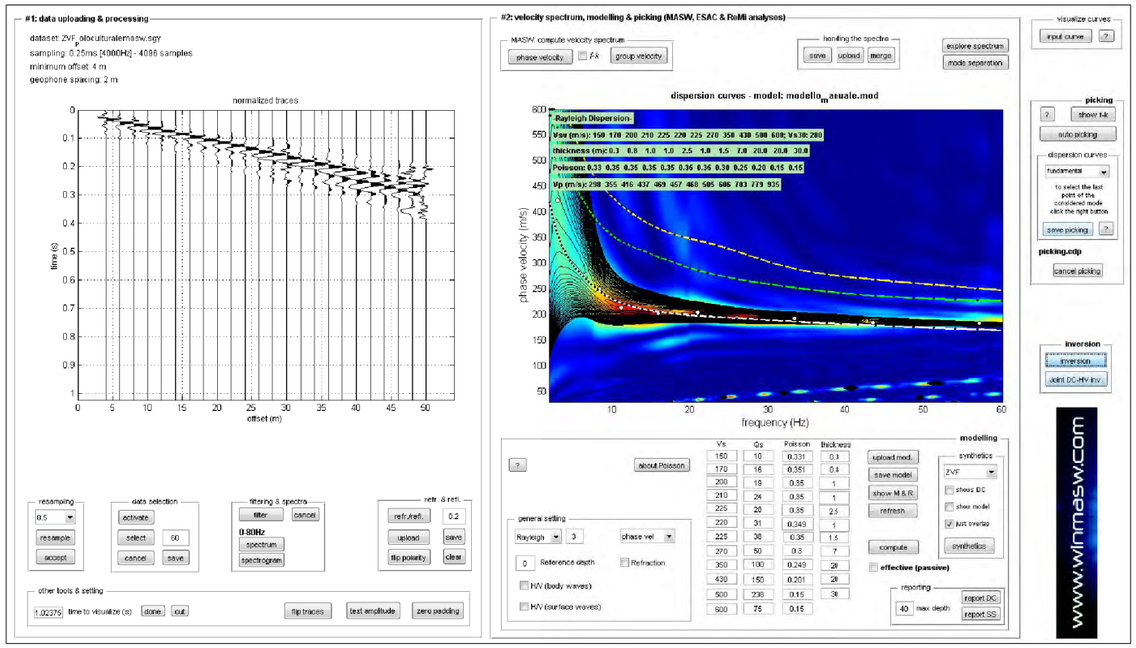
Density (gr/cm3) (approximate values): 1.68 1.79 1.93 1.77 1.90 1.92 1.96 1.99 2.04
Seismic/Dynamic Shear modulus (MPa) (approximate values): 17 42 160 38 139 138 166 251 570

Approximate values for Vp and Poisson
Vp (m/s): 209 330 589 304 528 572 667 766 931
Poisson: 0.34 0.36 0.34 0.35 0.32 0.36 0.38 0.36 0.26

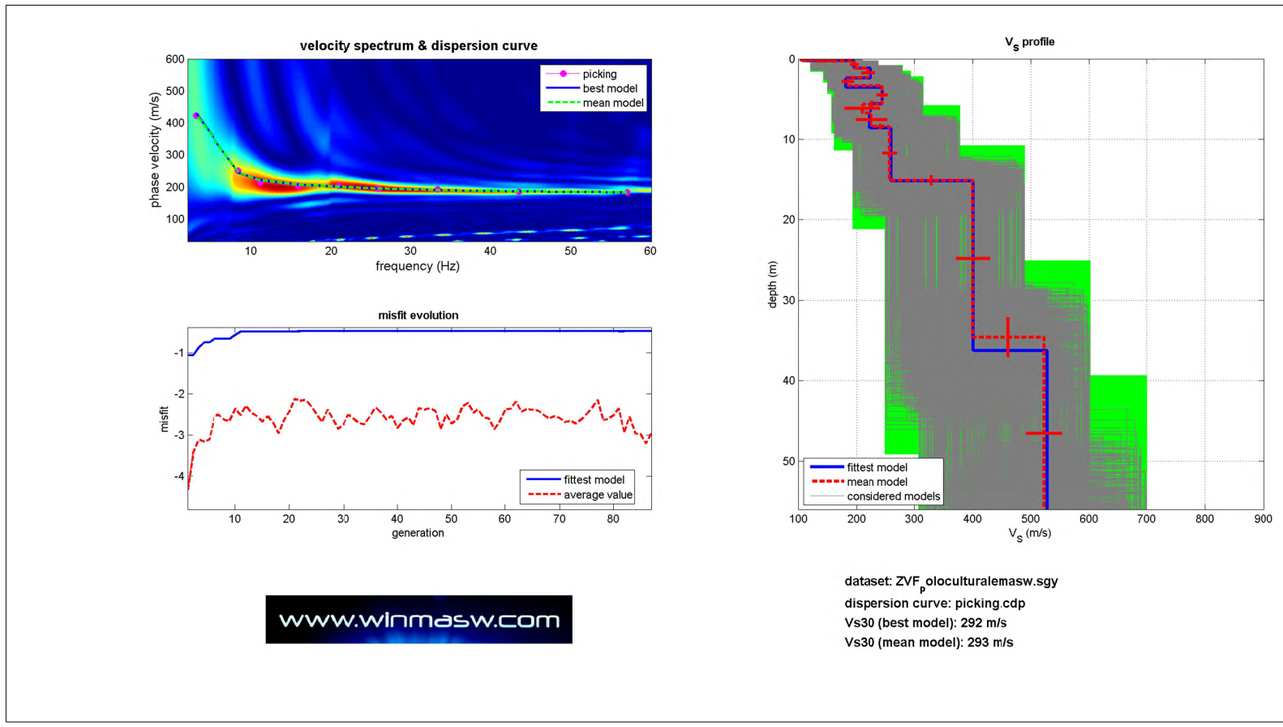
Vs30 (m/s): 277

Stendimento MASW

SPETTRO DI VELOCITA' MASW



INVERSIONE DEL MASW E PROFILO DI VELOCITA'



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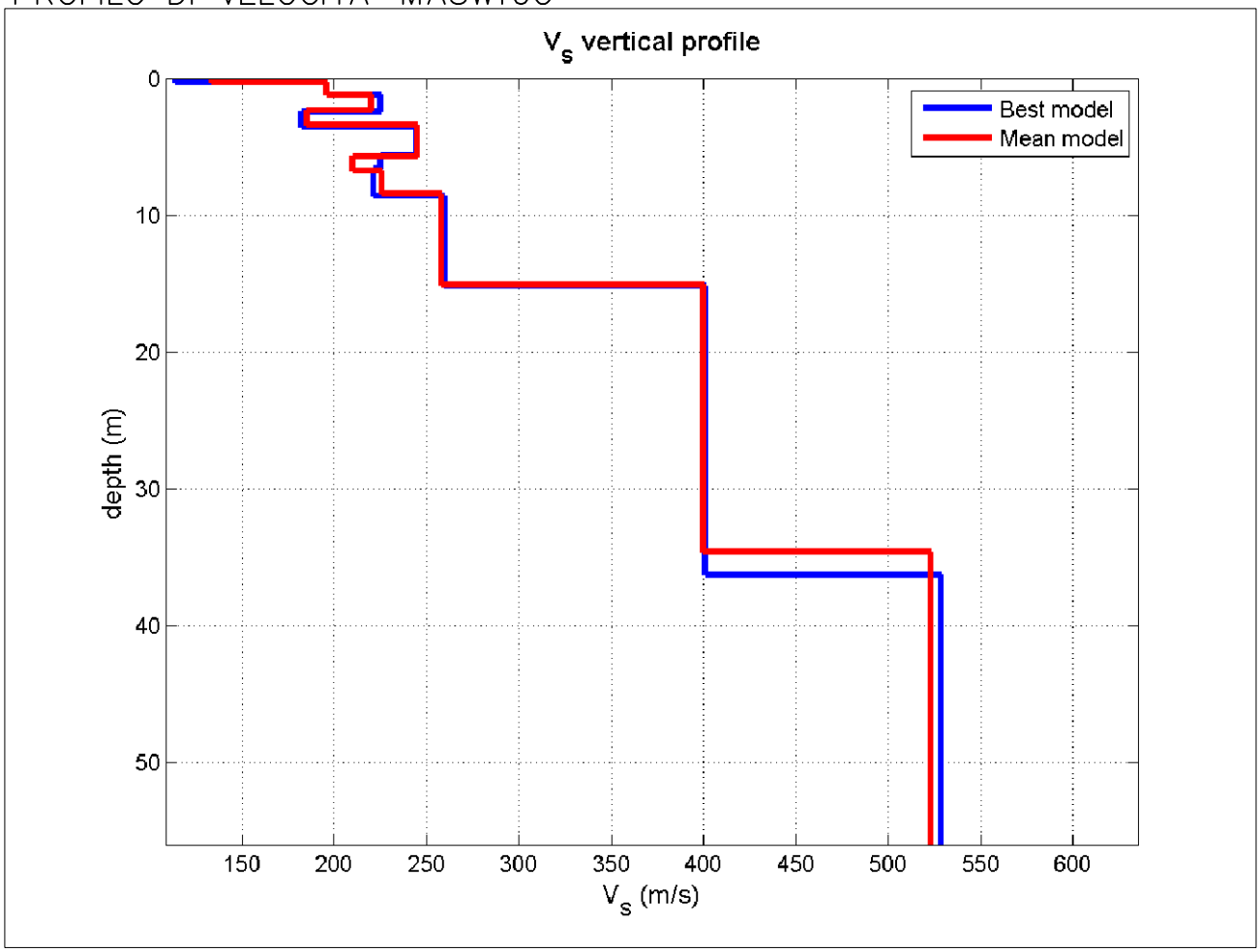
Prospezioni Geofisiche s.n.c.

RISULTANZE DELL'ANALISI SISMICA MASW 10C

PROFILO DI VELOCITA' MASW10C



Mean model
Vs (m/s): 134, 196, 220, 185, 245, 210, 226, 258, 400, 523
Thickness (m): 0.3, 0.9, 1.1, 1.0, 2.3, 1.0, 1.7, 6.7, 19.5, 23.9

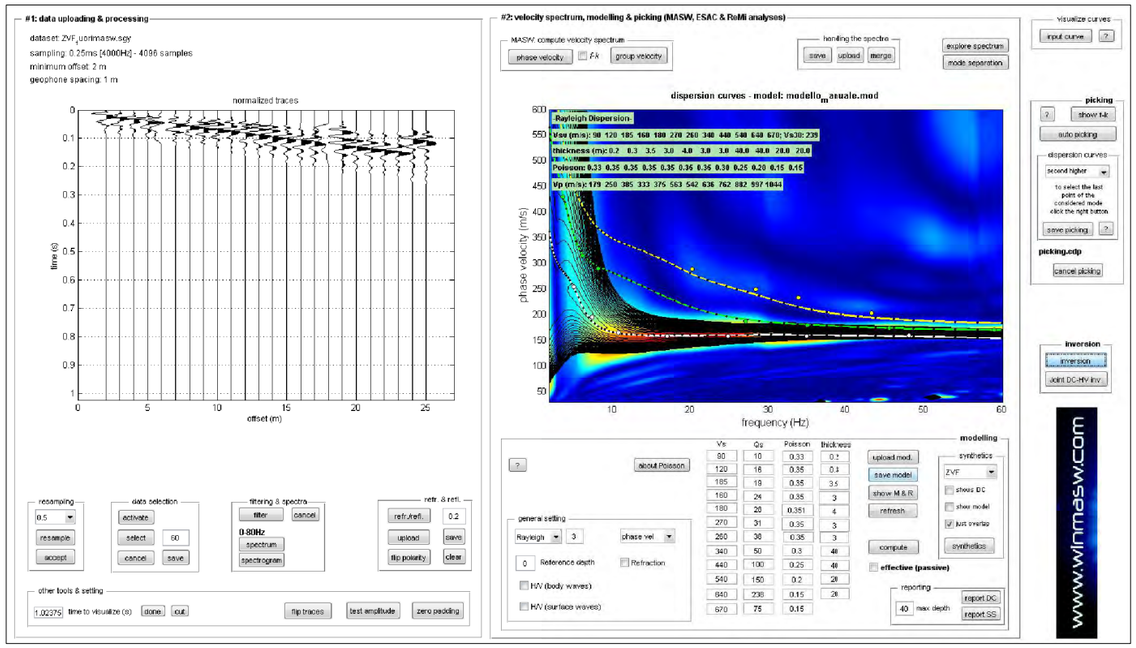
Density (gr/cm3) (approximate values): 1.74 1.82 1.85 1.86 1.94 1.90 1.85 1.88 1.97 2.02
Seismic/Dynamic Shear modulus (MPa) (approximate values): 31 70 90 64 116 84 94 125 316 552

Approximate values for Vp and Poisson
Vp (m/s): 275 373 431 451 621 526 429 481 721 858
Poisson: 0.34 0.31 0.32 0.40 0.41 0.41 0.31 0.30 0.28 0.20

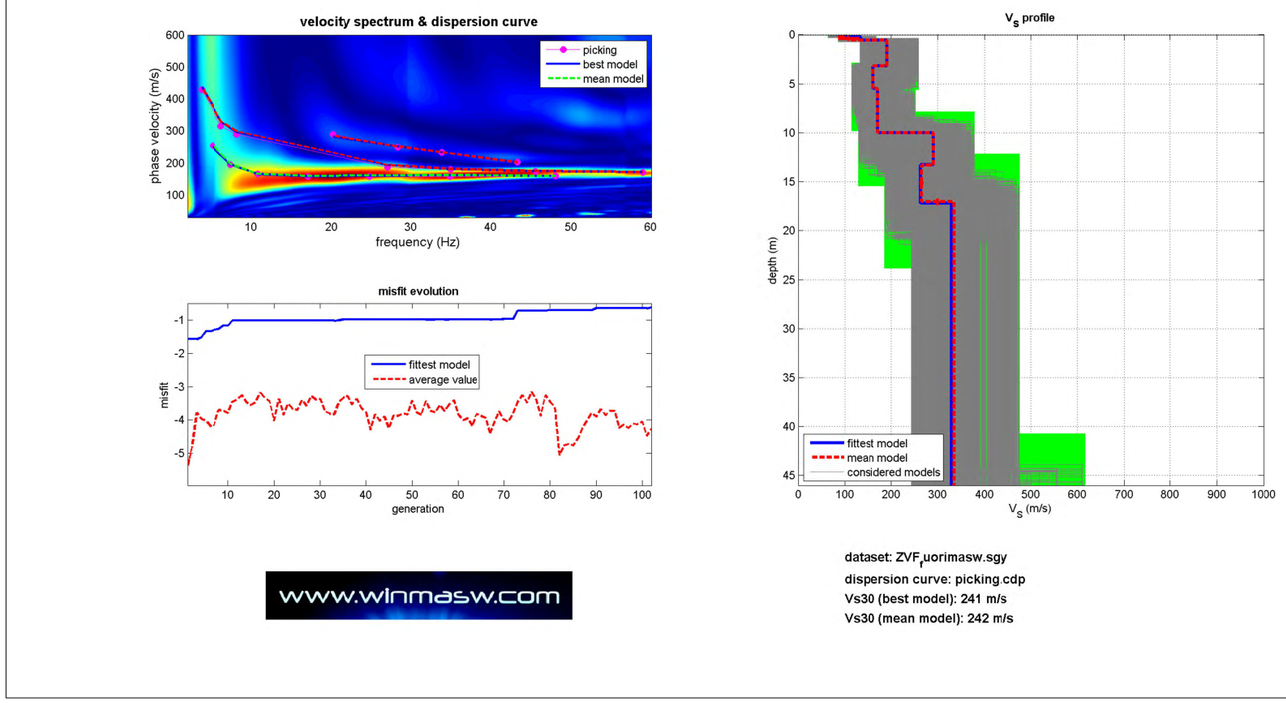
Vs30 (m/s): 293

Stendimento MASW

SPETTRO DI VELOCITA' MASW



INVERSIONE DEL MASW E PROFILO DI VELOCITA'



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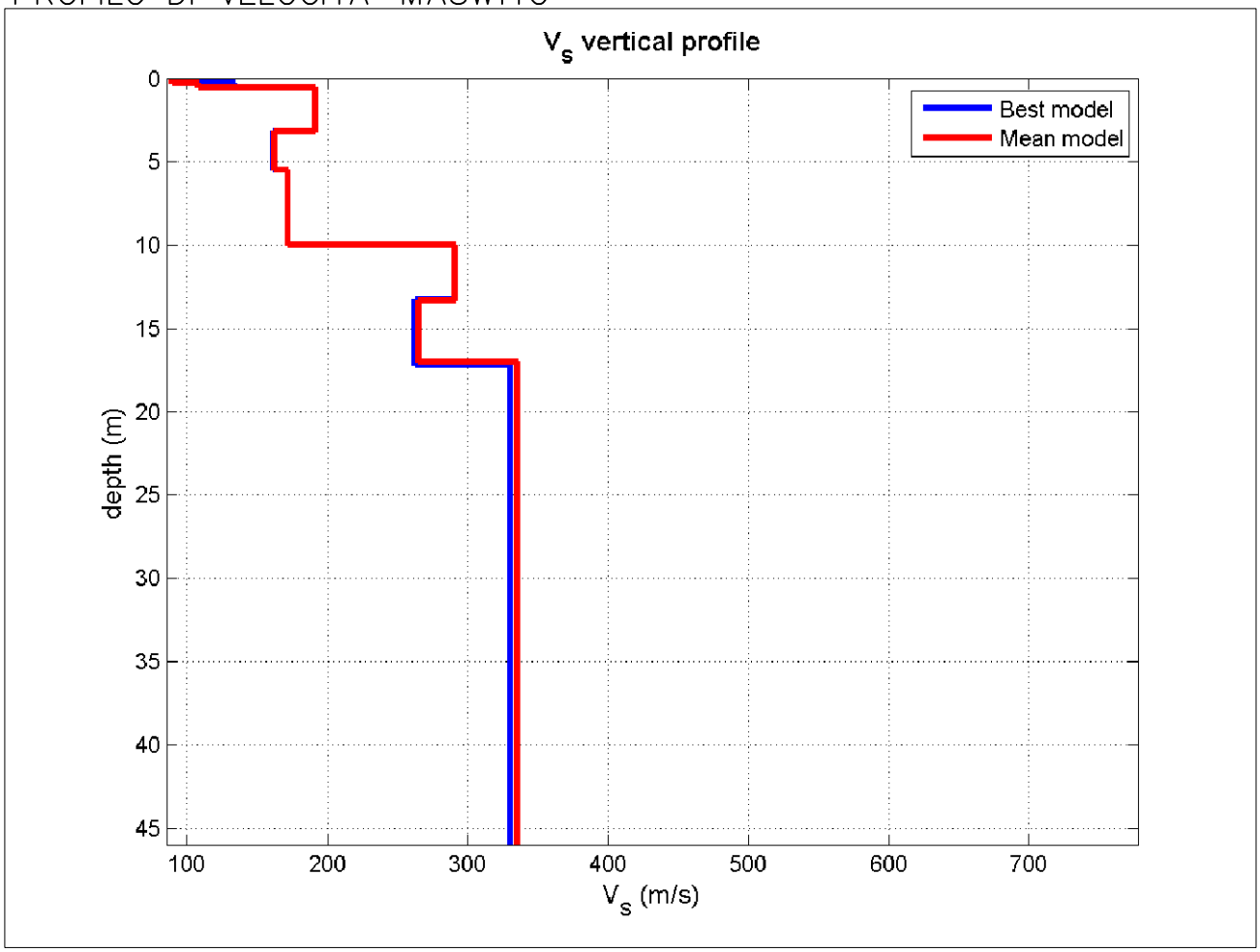
Prospezioni Geofisiche s.n.c.

RISULTANZE DELL'ANALISI SISMICA MASW 11C

PROFILO DI VELOCITA' MASW11C



Mean model
Vs (m/s): 89, 108, 191, 162, 172, 291, 265, 335, 374
Thickness (m): 0.3, 0.3, 2.6, 2.3, 4.6, 3.3, 3.7, 40.8, 47.8

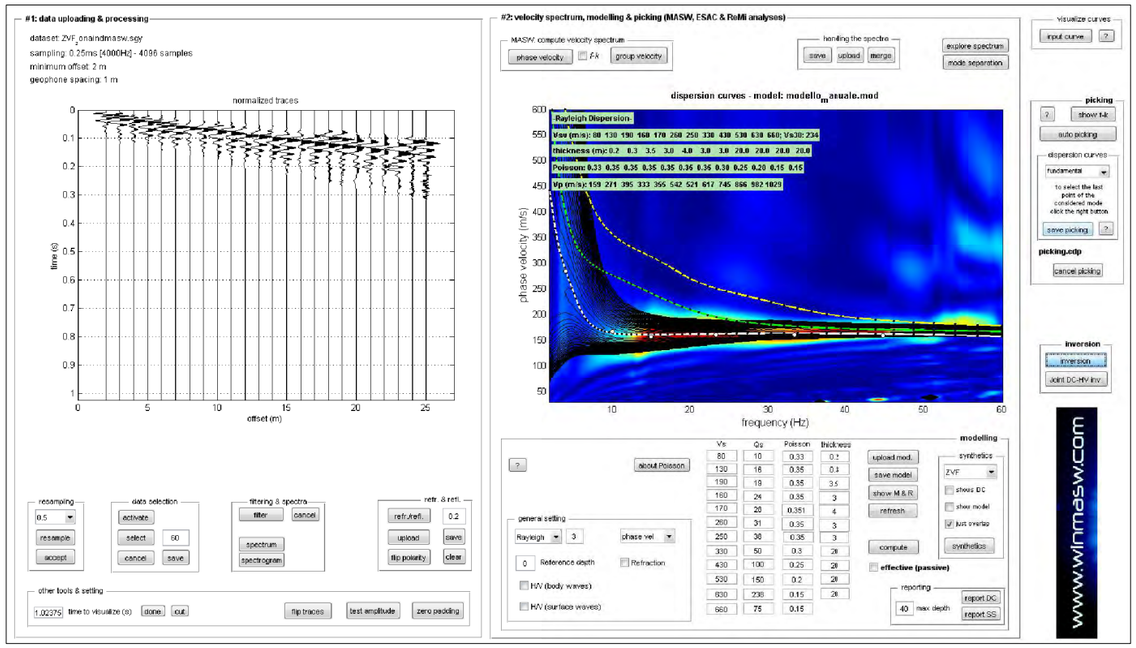
Density (gr/cm3) (approximate values): 1.65 1.66 1.95 1.80 1.81 1.89 1.92 1.93 1.97
Seismic/Dynamic Shear modulus (MPa) (approximate values): 13 19 71 47 53 160 135 216 276

Approximate values for Vp and Poisson
Vp (m/s): 186 191 643 352 361 504 584 595 713
Poisson: 0.35 0.26 0.45 0.37 0.35 0.25 0.37 0.27 0.31

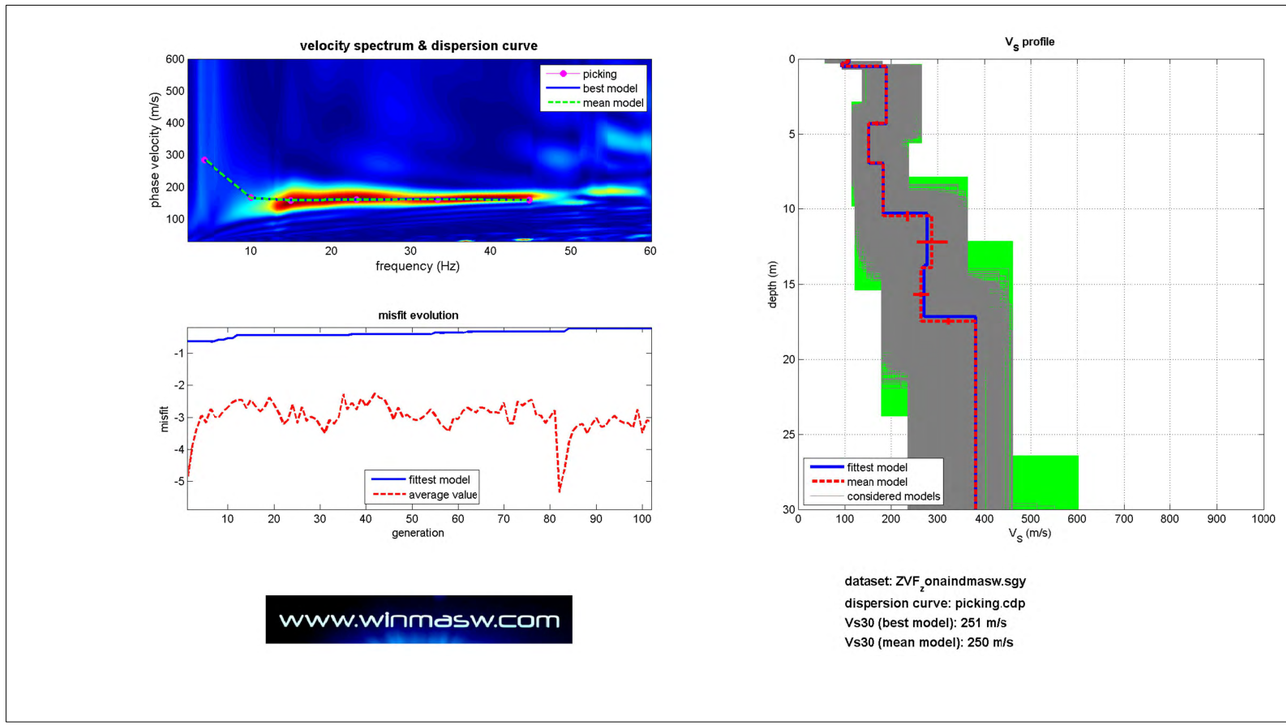
Vs30 (m/s): 242

Stendimento MASW

SPETTRO DI VELOCITA' MASW



INVERSIONE DEL MASW E PROFILO DI VELOCITA'



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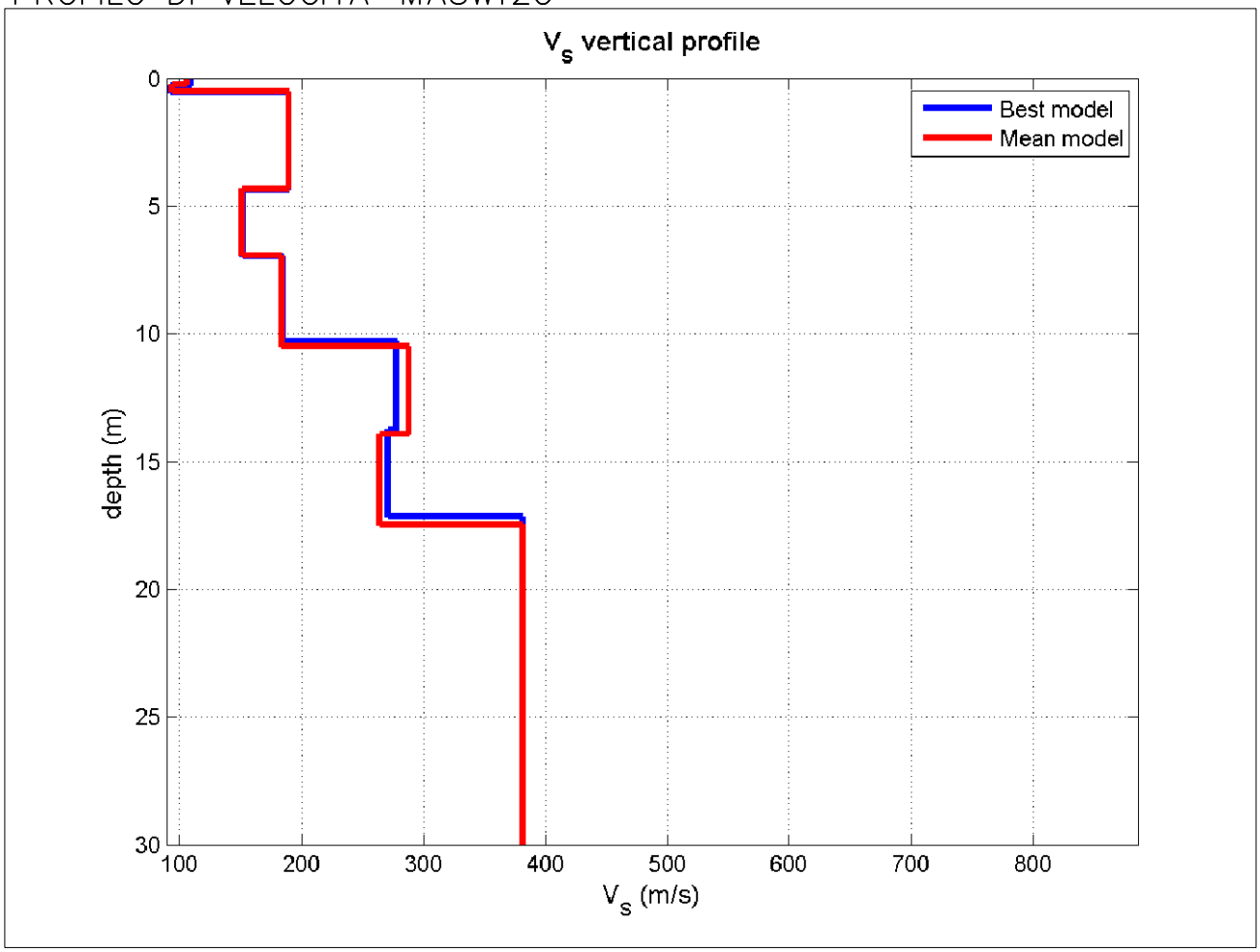
Prospezioni Geofisiche s.n.c.

RISULTANZE DELL'ANALISI SISMICA MASW 12C

PROFILO DI VELOCITA' MASW12C



Mean model
Vs (m/s): 106, 94, 190, 151, 184, 288, 264, 381, 307, 493
Thickness (m): 0.2, 0.3, 3.8, 2.6, 3.5, 3.5, 3.6, 19.7, 17.0, 27.0

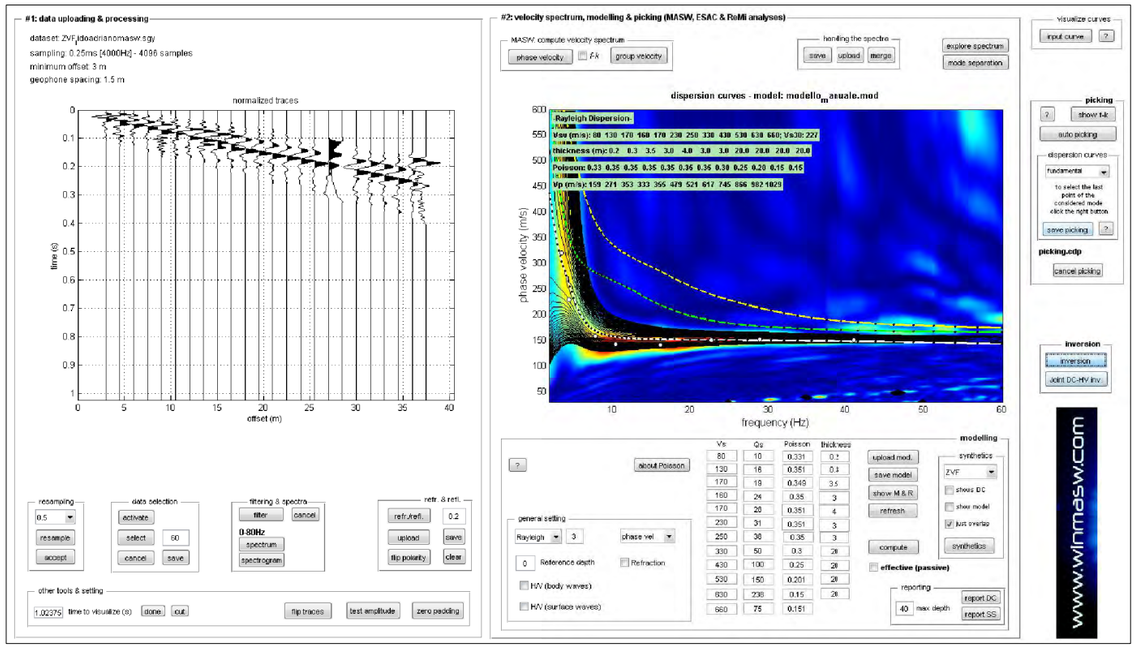
Density (gr/cm3) (approximate values): 1.72 1.67 1.80 1.79 1.80 1.89 1.93 1.98 1.91 2.02
Seismic/Dynamic Shear modulus (MPa) (approximate values): 19 15 65 41 61 156 134 287 180 491

Approximate values for Vp and Poisson
Vp (m/s): 250 207 344 330 347 500 591 727 560 873
Poisson: 0.39 0.37 0.28 0.37 0.30 0.25 0.38 0.31 0.29 0.27

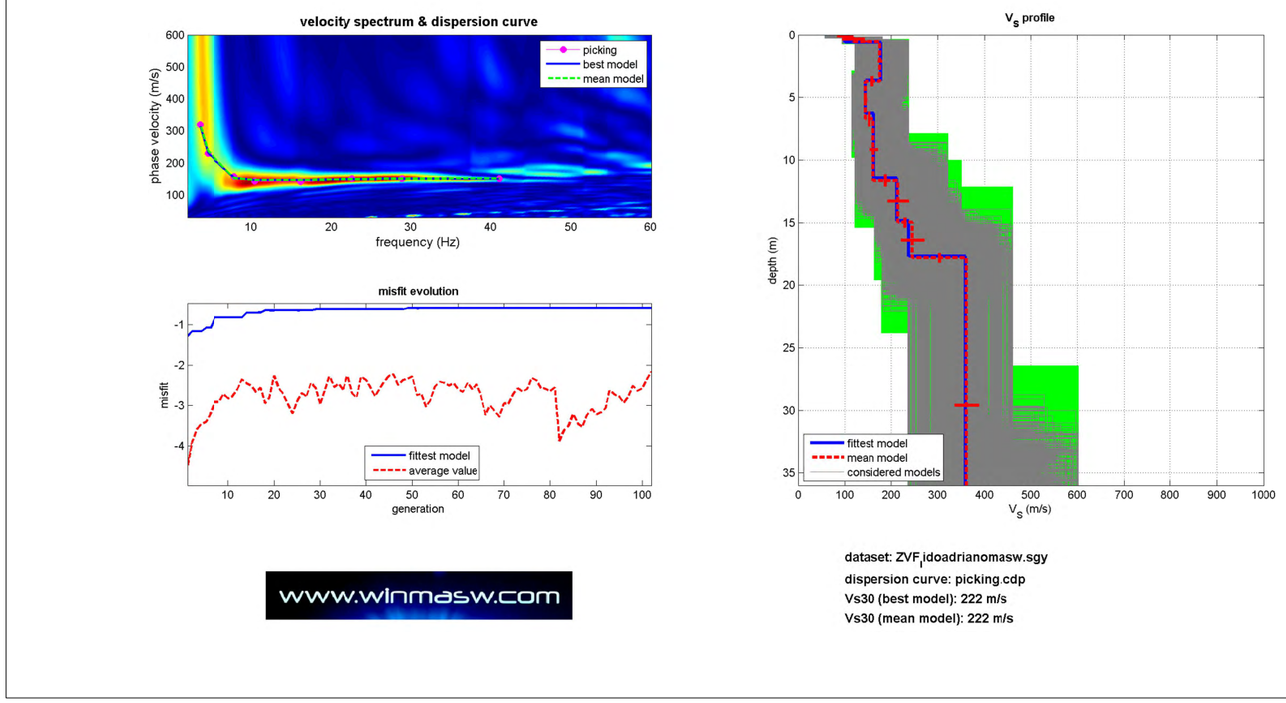
Vs30 (m/s): 250

Stendimento MASW

SPETTRO DI VELOCITA' MASW



INVERSIONE DEL MASW E PROFILO DI VELOCITA'



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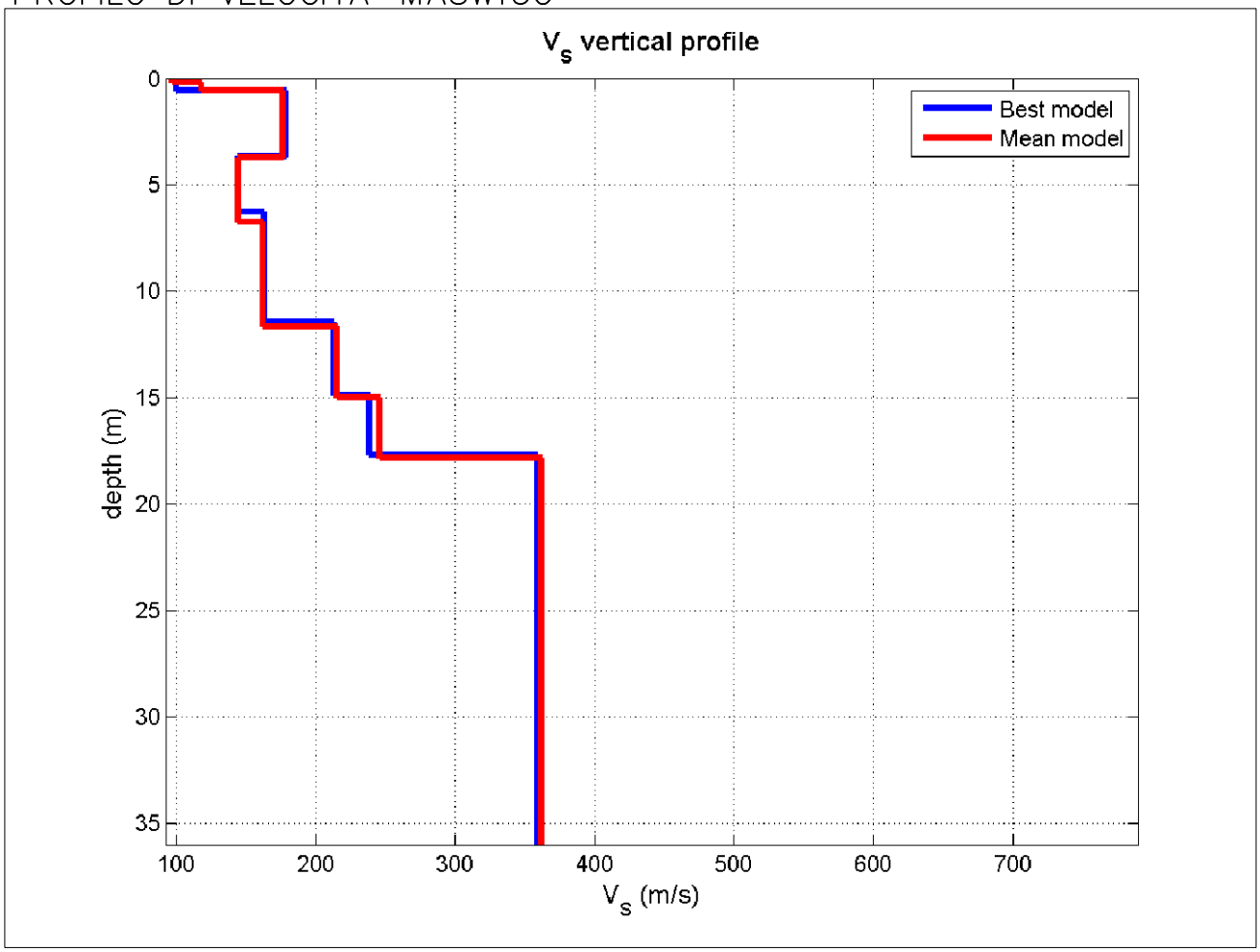
RISULTANZE DELL'ANALISI SISMICA MASW 13C

PROFILO DI VELOCITA' MASW13C



Mean model
Vs (m/s): 97, 118, 176, 144, 162, 215, 246, 362, 520
Thickness (m): 0.2, 0.4, 3.2, 3.0, 4.9, 3.4, 2.8, 23.6, 23.3

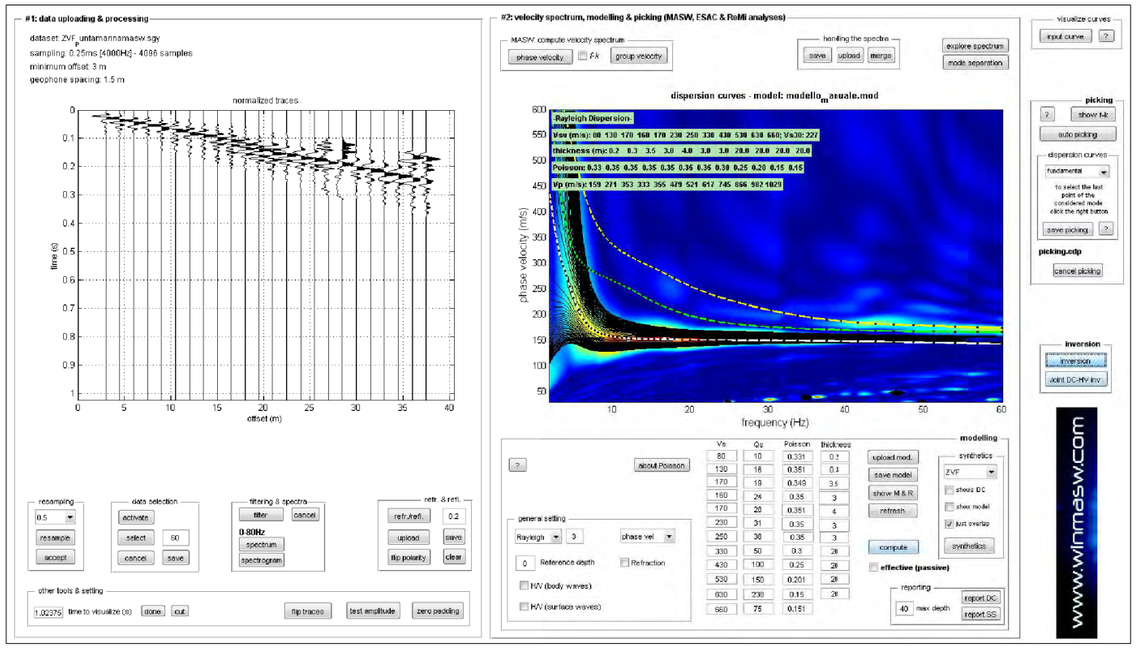
Density (gr/cm3) (approximate values): 1.64 1.72 1.82 1.73 1.75 1.85 1.90 2.00 2.02
Seismic/Dynamic Shear modulus (MPa) (approximate values): 15 24 56 36 46 86 115 262 547

Approximate values for Vp and Poisson
Vp (m/s): 180 249 374 258 288 431 525 795 885
Poisson: 0.30 0.36 0.36 0.27 0.27 0.33 0.36 0.37 0.24

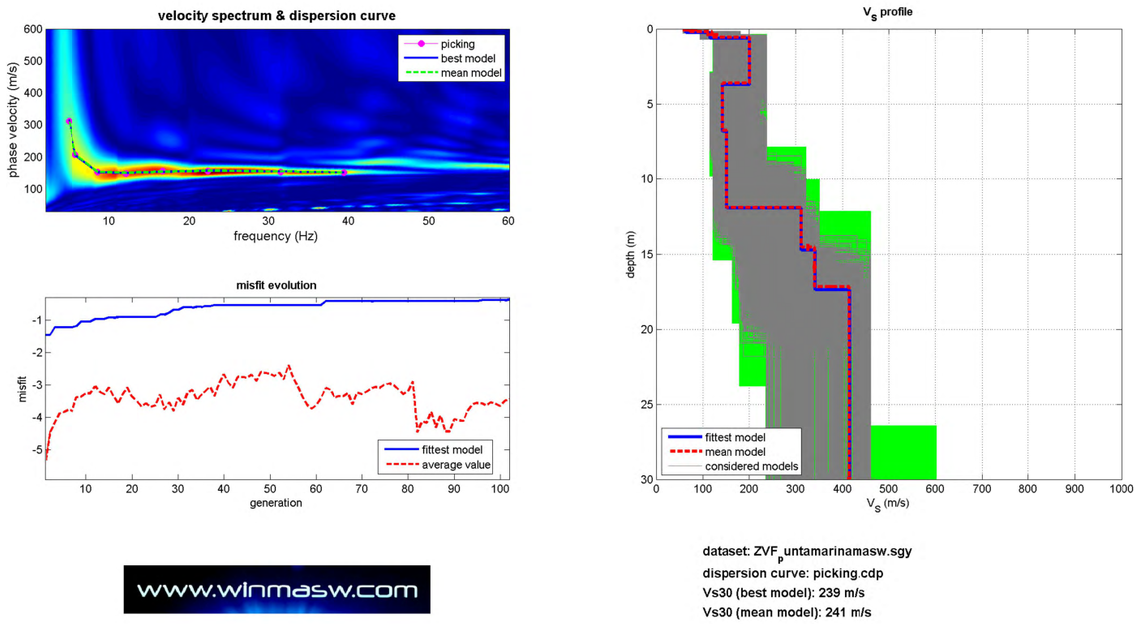
Vs30 (m/s): 222

Stendimento MASW

SPETTRO DI VELOCITA' MASW



INVERSIONE DEL MASW E PROFILO DI VELOCITA'



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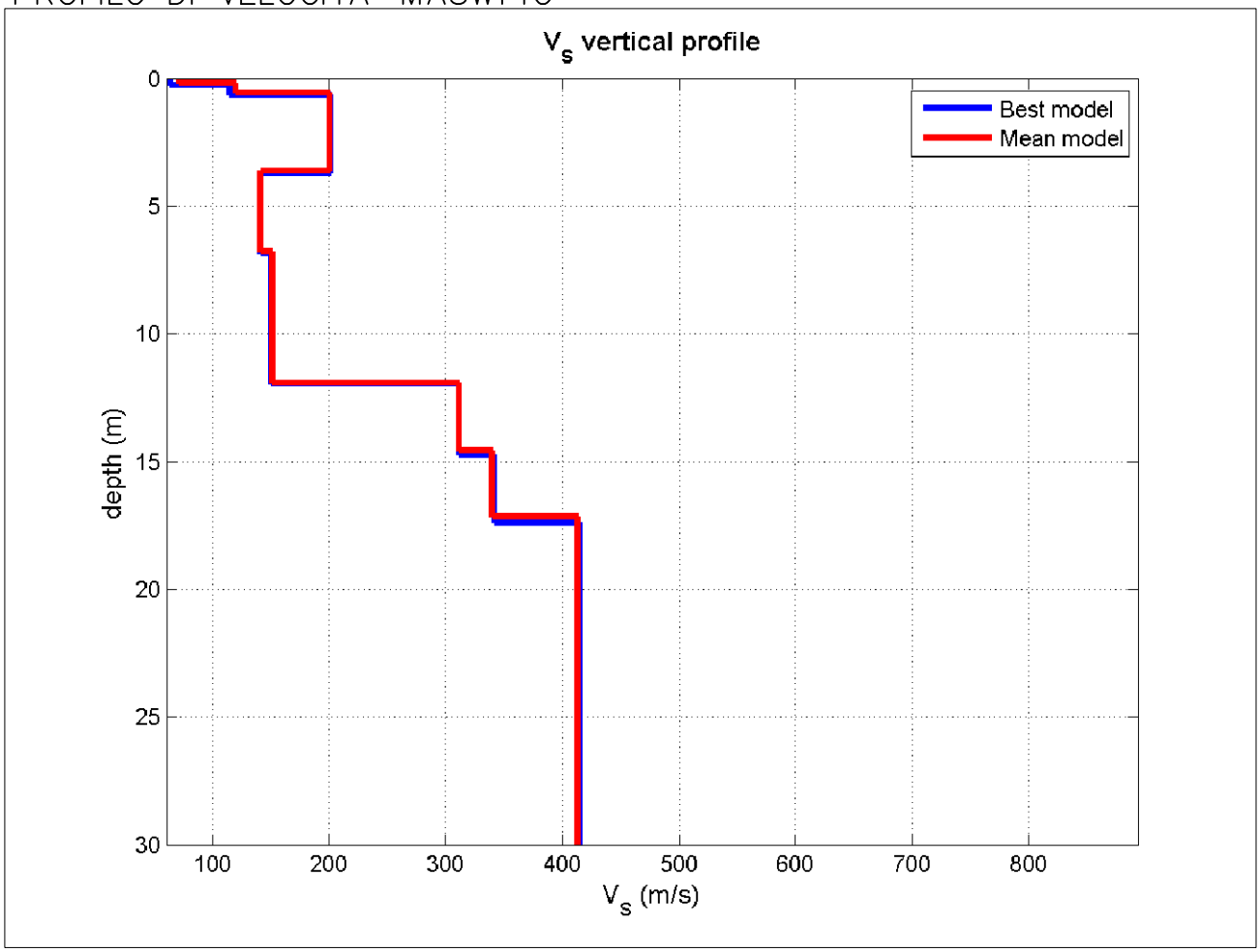
Prospezioni Geofisiche s.n.c.

RISULTANZE DELL'ANALISI SISMICA MASW 14C

PROFILO DI VELOCITA' MASW14C



Mean model
Vs (m/s): 72, 120, 201, 142, 151, 312, 340, 414, 424, 535
Thickness (m): 0.2, 0.4, 3.0, 3.1, 5.2, 2.7, 2.6, 25.6, 21.7, 20.7

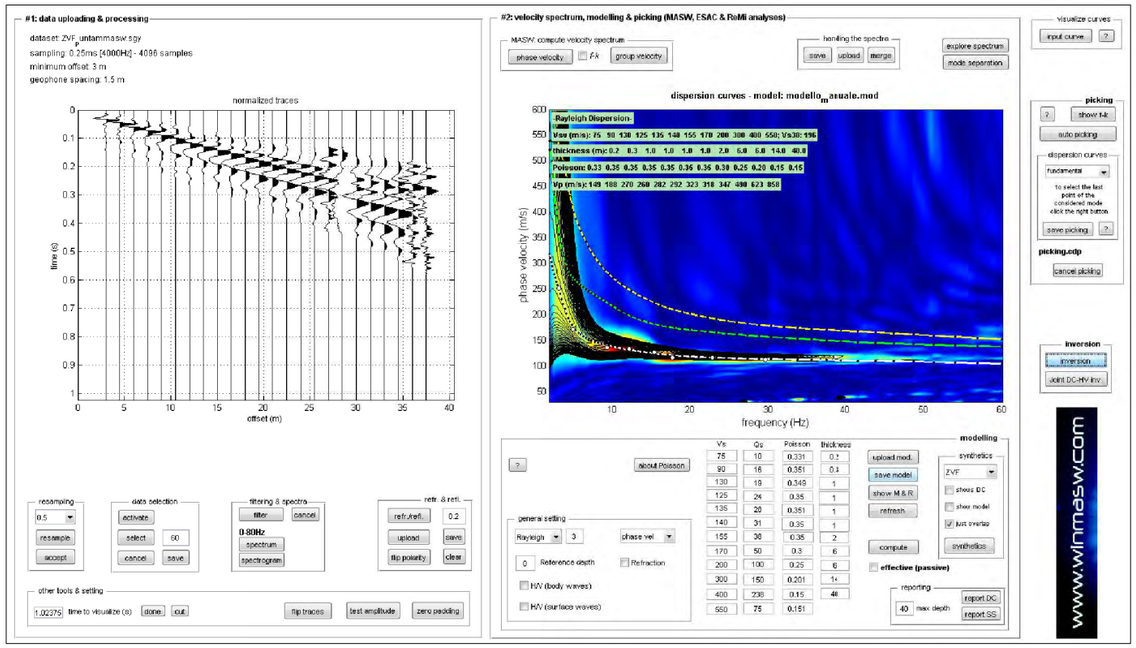
Density (gr/cm3) (approximate values): 1.69 1.77 1.85 1.71 1.91 1.95 1.94 1.99 1.98 2.01
Seismic/Dynamic Shear modulus (MPa) (approximate values): 9 26 75 34 44 190 224 341 355 576

Approximate values for Vp and Poisson
Vp (m/s): 225 310 436 240 548 649 620 759 725 839
Poisson: 0.44 0.41 0.37 0.23 0.46 0.35 0.28 0.29 0.24 0.16

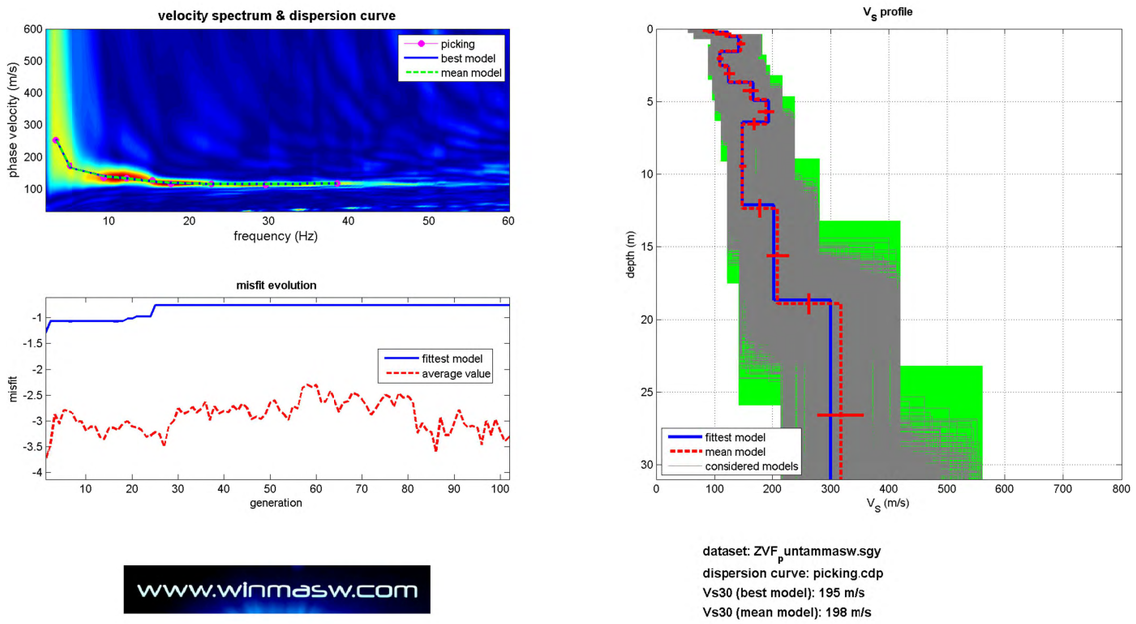
Vs30 (m/s): 241

Stendimento MASW

SPETTRO DI VELOCITA' MASW



INVERSIONE DEL MASW E PROFILO DI VELOCITA'



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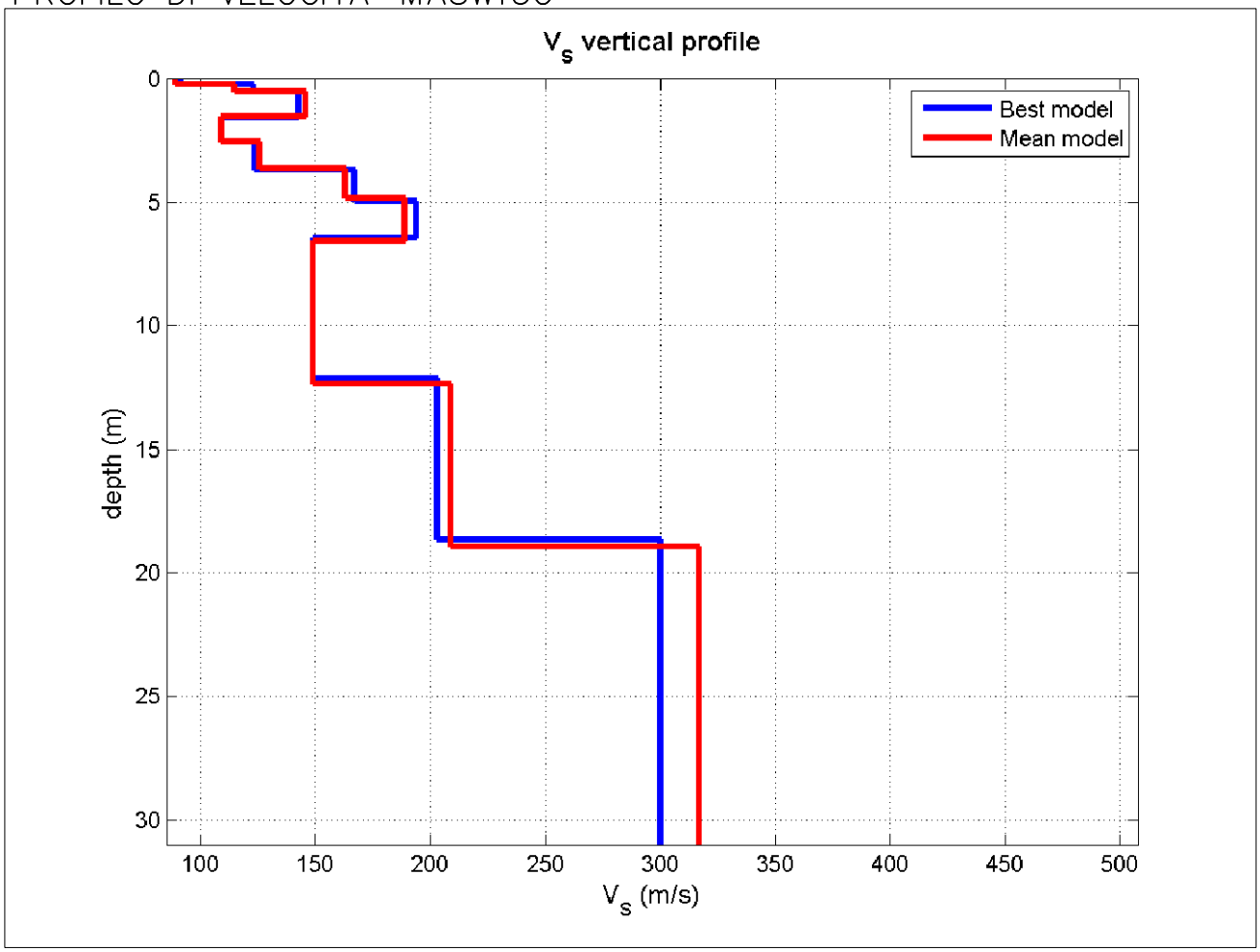
Prospezioni Geofisiche s.n.c.

RISULTANZE DELL'ANALISI SISMICA MASW 15C

PROFILO DI VELOCITA' MASW15C



Mean model
Vs (m/s): 89, 115, 146, 109, 126, 163, 189, 149, 209, 317, 444
Thickness (m): 0.2, 0.3, 1.0, 1.0, 1.1, 1.2, 1.7, 5.8, 6.6, 15.3, 45.6

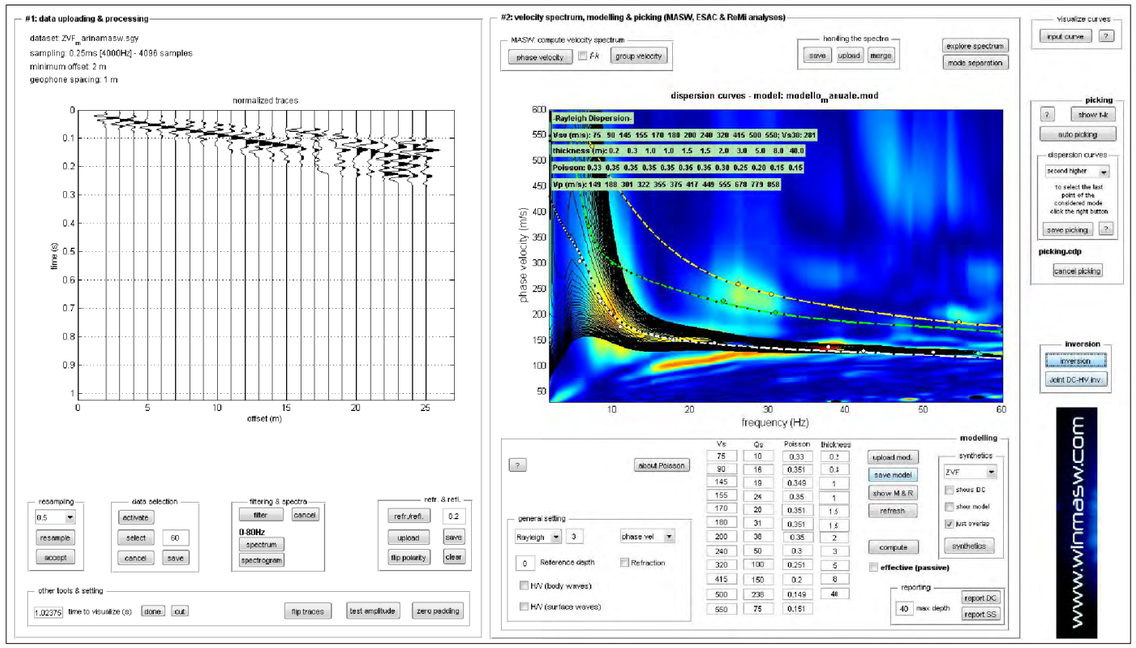
Density (gr/cm3) (approximate values): 1.65 1.68 1.77 1.67 1.74 1.77 1.87 1.75 1.80 1.89 1.96 2.00
Seismic/Dynamic Shear modulus (MPa) (approximate values): 13 22 38 20 28 47 67 39 79 190 386 499

Approximate values for Vp and Poisson
Vp (m/s): 189 213 314 207 278 308 469 280 352 509 680 788
Poisson: 0.36 0.29 0.36 0.31 0.37 0.31 0.40 0.30 0.23 0.18 0.13 0.16

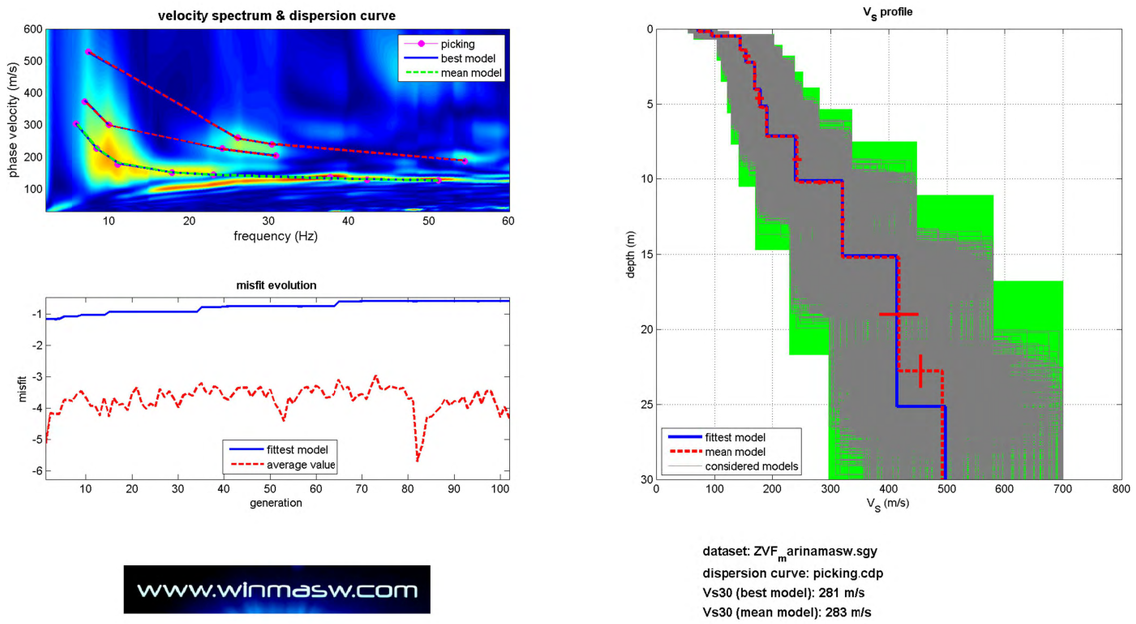
Vs30 (m/s): 198

Stendimento MASW

SPETTRO DI VELOCITA' MASW



INVERSIONE DEL MASW E PROFILO DI VELOCITA'



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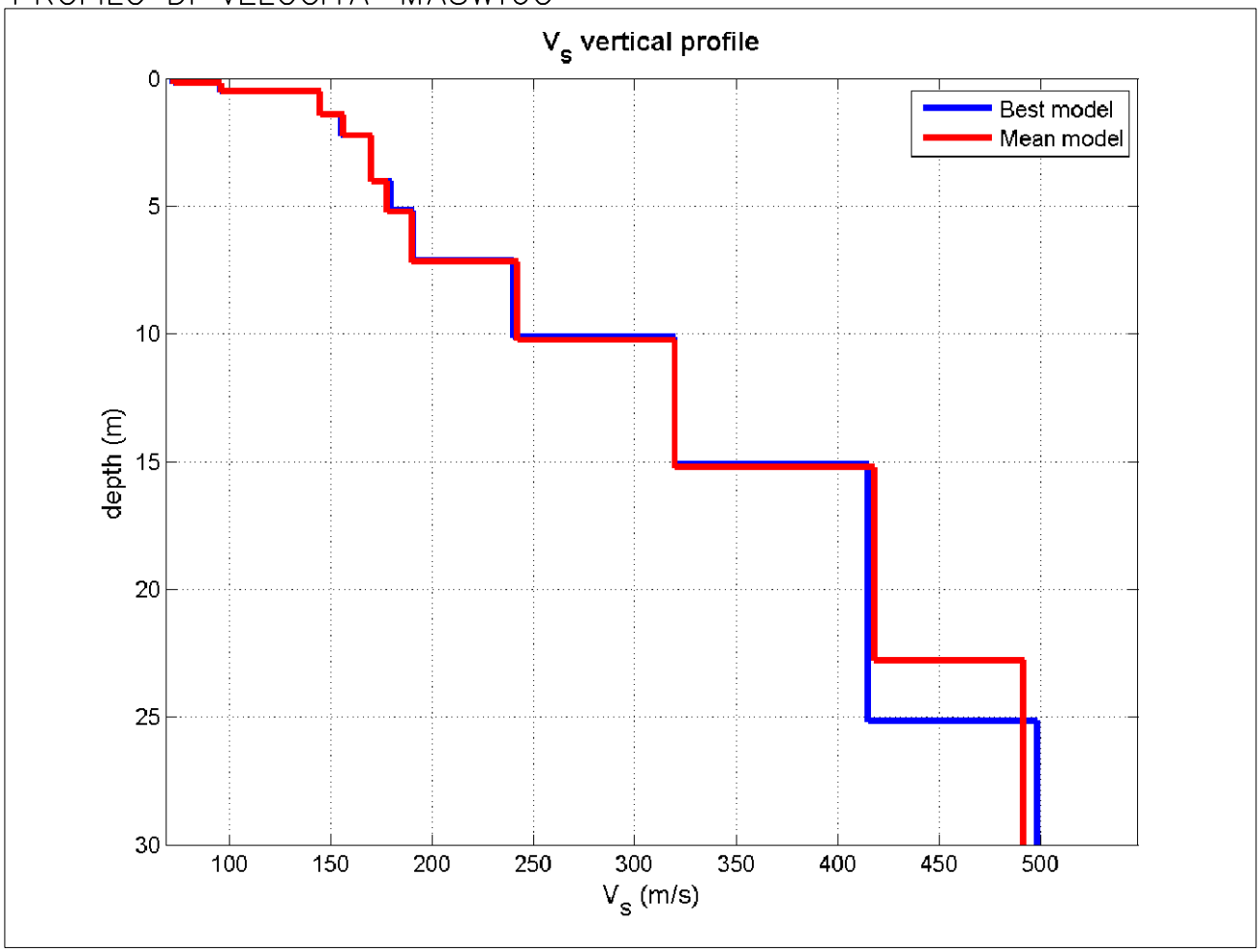
Prospezioni Geofisiche s.n.c.

RISULTANZE DELL'ANALISI SISMICA MASW 16C

PROFILO DI VELOCITA' MASW16C



Mean model
Vs (m/s): 73, 96, 145, 156, 170, 178, 190, 242, 320, 418, 492
Thickness (m): 0.2, 0.3, 0.9, 0.8, 1.8, 1.2, 2.0, 3.0, 5.0, 7.6, 35.3

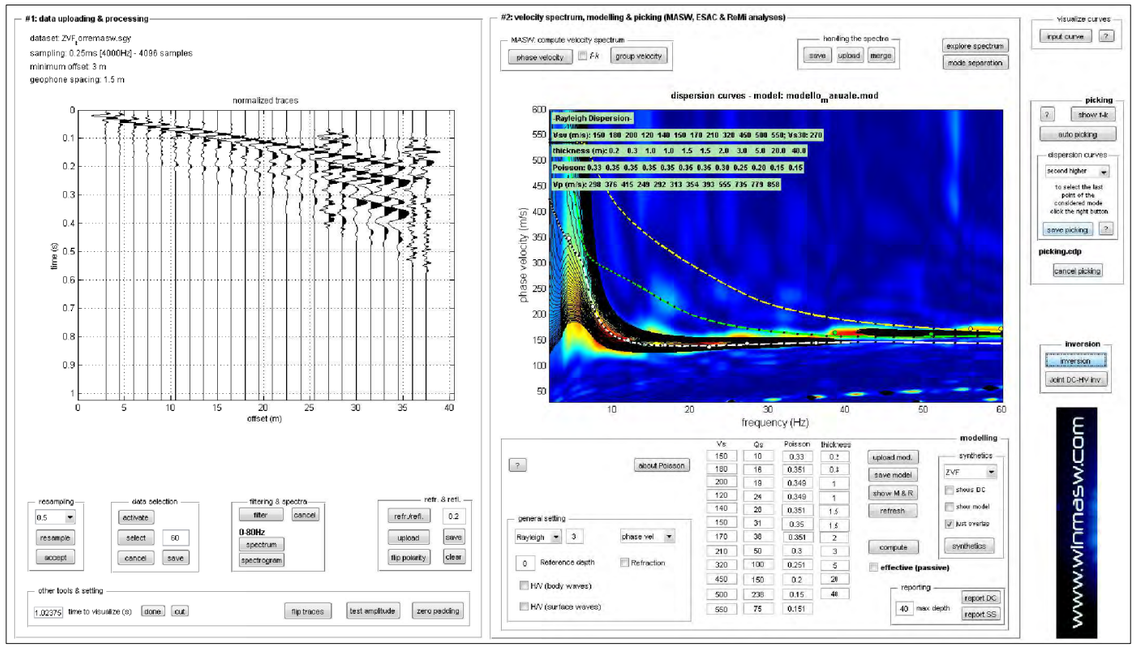
Density (gr/cm3) (approximate values): 1.68 1.75 1.77 1.75 1.76 1.78 1.87 1.86 1.89 1.96 1.99 2.02
Seismic/Dynamic Shear modulus (MPa) (approximate values): 9 16 37 43 51 56 67 109 194 342 482 610

Approximate values for Vp and Poisson
Vp (m/s): 210 290 303 282 294 324 460 454 510 677 772 859
Poisson: 0.43 0.44 0.35 0.28 0.25 0.28 0.40 0.30 0.18 0.19 0.16 0.15

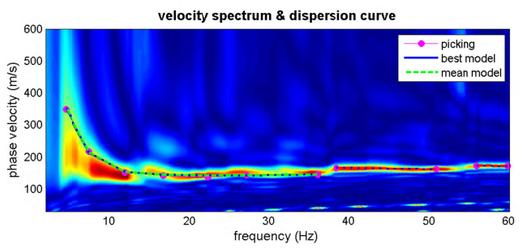
Vs30 (m/s): 283

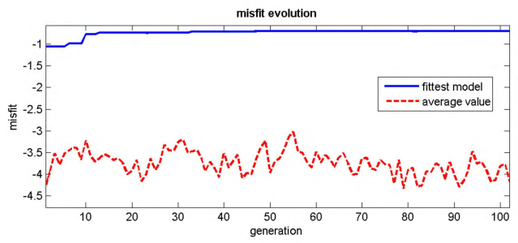
Stendimento MASW

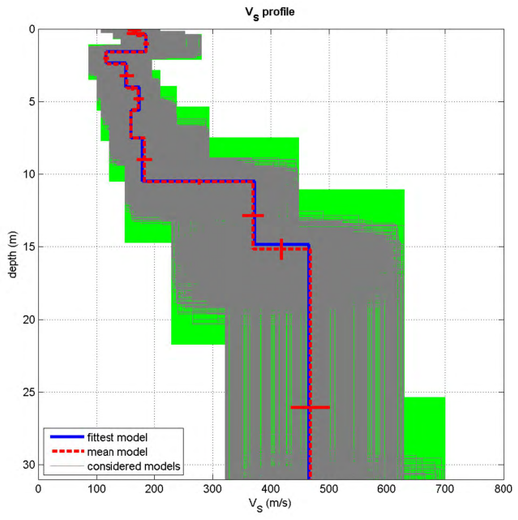
SPETTRO DI VELOCITA' MASW



INVERSIONE DEL MASW E PROFILO DI VELOCITA'







www.winmasw.com

dataset: ZVF_orremasw.sgy
dispersion curve: picking.cdp
Vs30 (best model): 277 m/s
Vs30 (mean model): 277 m/s

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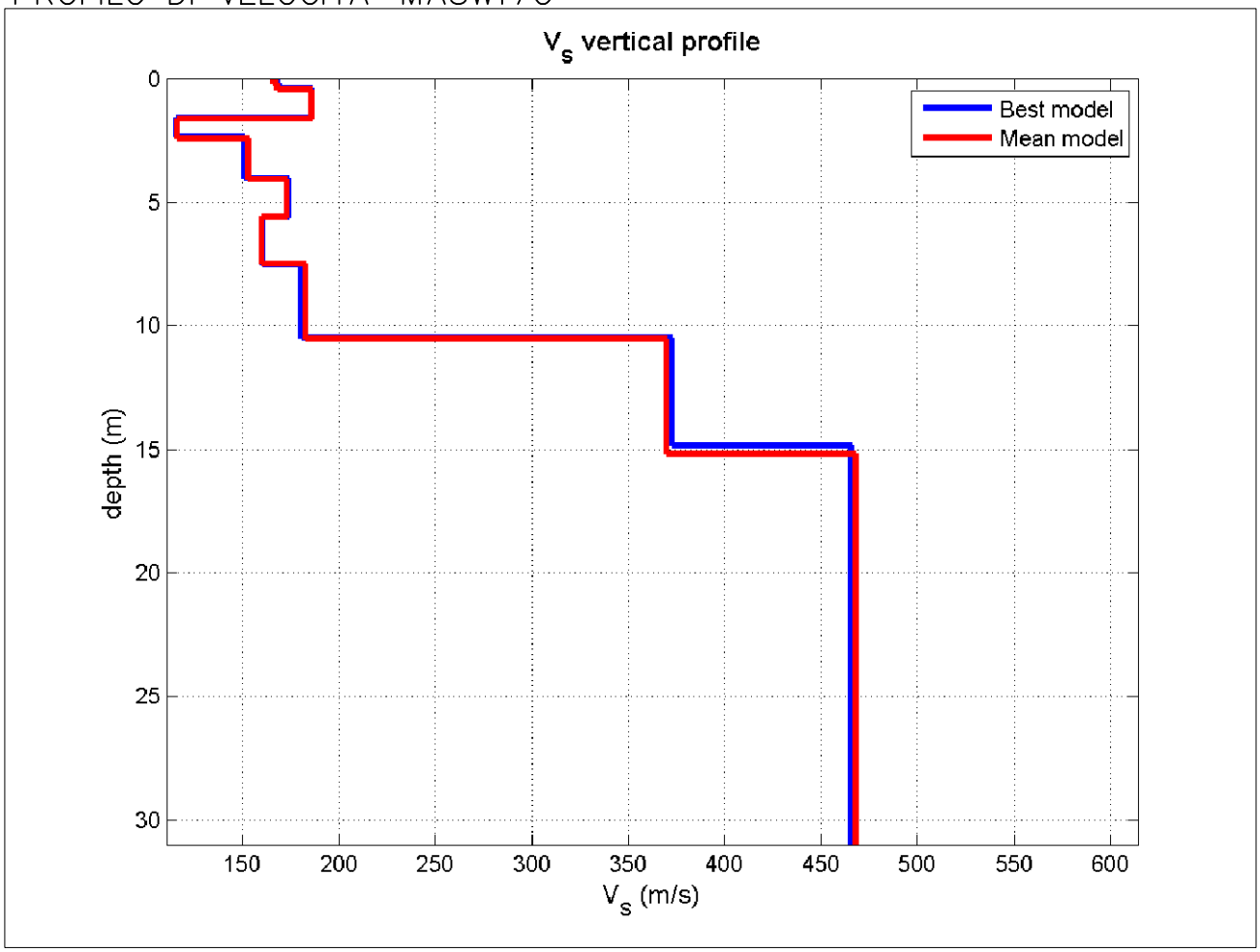
Prospezioni Geofisiche s.n.c.

RISULTANZE DELL'ANALISI SISMICA MASW 17C

PROFILO DI VELOCITA' MASW17C



Mean model
Vs (m/s): 166, 168, 186, 116, 153, 173, 160, 183, 370, 468, 558
Thickness (m): 0.2, 0.3, 1.2, 0.8, 1.6, 1.5, 1.9, 3.0, 4.6, 21.8, 34.8

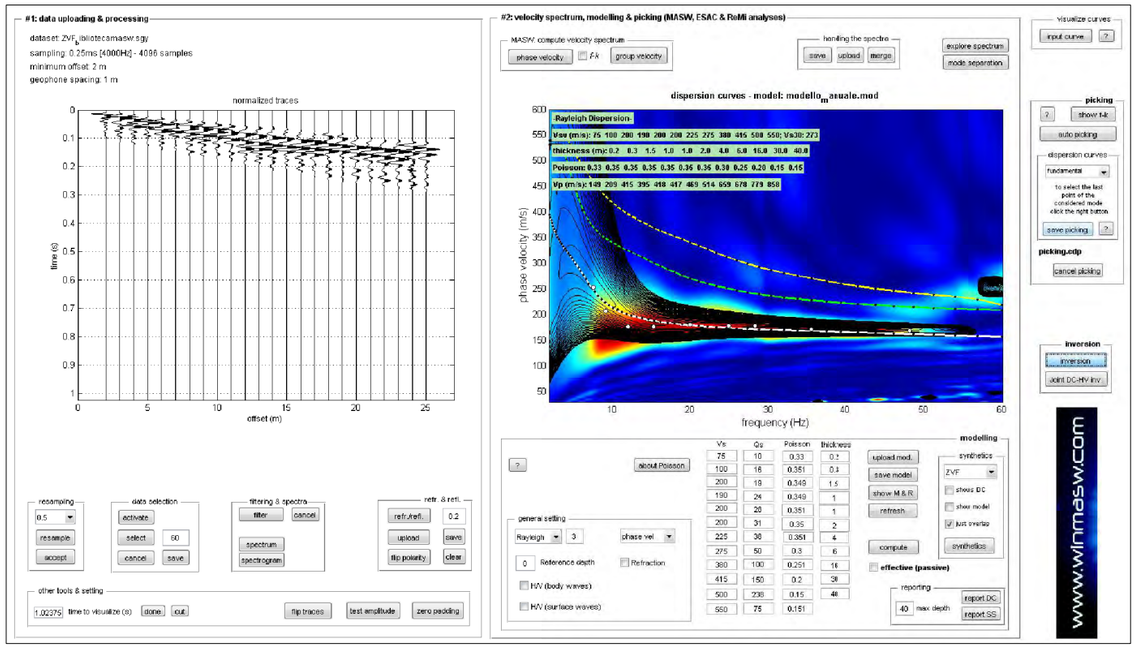
Density (gr/cm3) (approximate values): 1.75 1.77 1.79 1.72 1.75 1.88 1.87 1.79 1.94 1.98 2.02
Seismic/Dynamic Shear modulus (MPa) (approximate values): 48 50 62 23 41 56 48 60 265 433 628

Approximate values for Vp and Poisson
Vp (m/s): 288 309 342 255 284 490 470 335 621 734 860
Poisson: 0.25 0.29 0.29 0.37 0.30 0.43 0.43 0.29 0.22 0.16 0.14

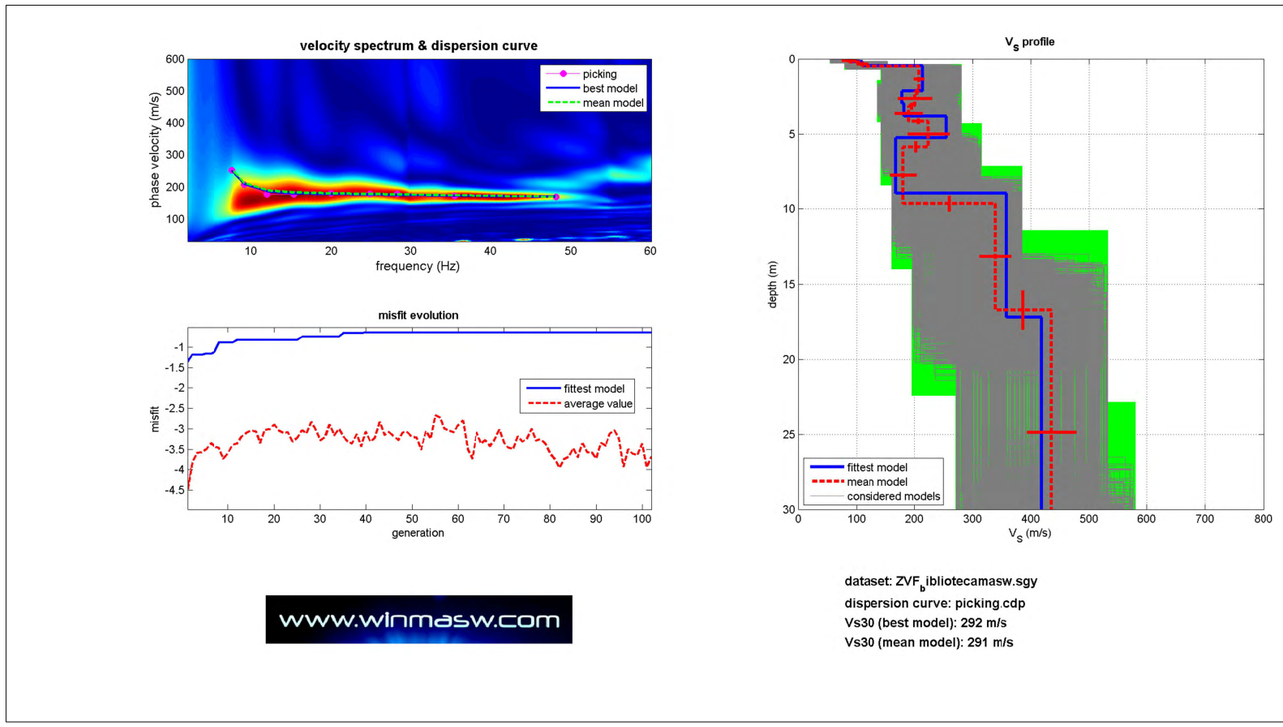
Vs30 (m/s): 277

Stendimento MASW

SPETTRO DI VELOCITA' MASW



INVERSIONE DEL MASW E PROFILO DI VELOCITA'



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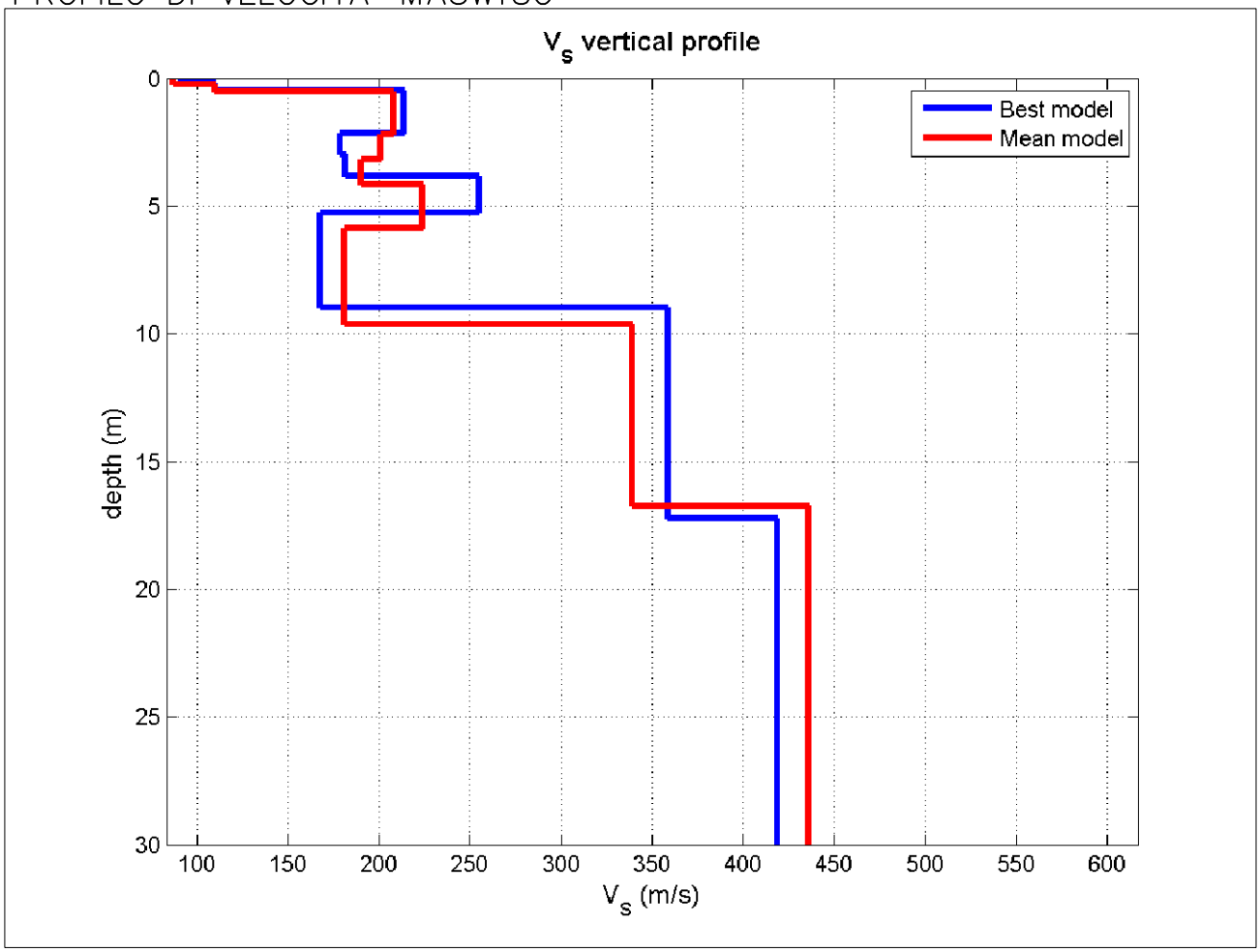
Prospezioni Geofisiche s.n.c.

RISULTANZE DELL'ANALISI SISMICA MASW 18C

PROFILO DI VELOCITA' MASW18C



Mean model
Vs (m/s): 87, 110, 208, 201, 190, 224, 181, 339, 436, 410
Thickness (m): 0.2, 0.3, 1.7, 1.0, 1.0, 1.7, 3.8, 7.1, 16.3, 36.6

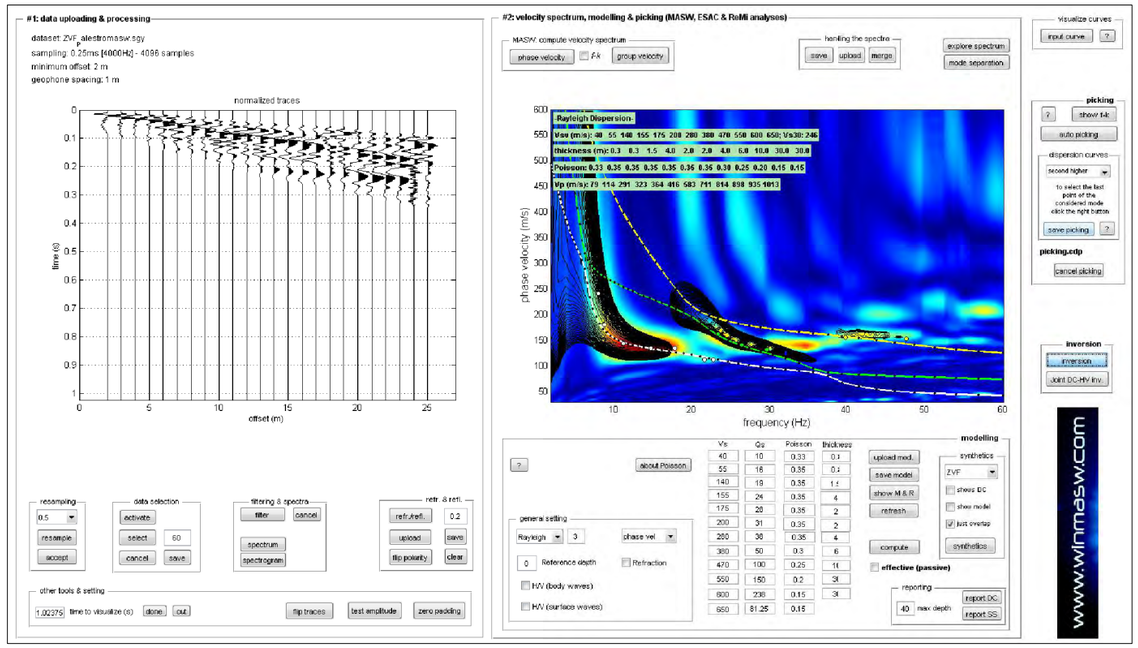
Density (gr/cm3) (approximate values): 1.62 1.70 1.82 1.82 1.90 1.91 1.81 1.94 1.98 1.964
Seismic/Dynamic Shear modulus (MPa) (approximate values): 12 21 79 74 69 96 59 222 376 329

Approximate values for Vp and Poisson
Vp (m/s): 162 230 381 379 533 543 363 615 731 666
Poisson: 0.30 0.35 0.29 0.30 0.43 0.40 0.33 0.28 0.22 0.19

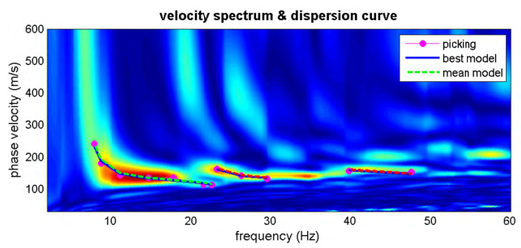
Vs30 (m/s): 291

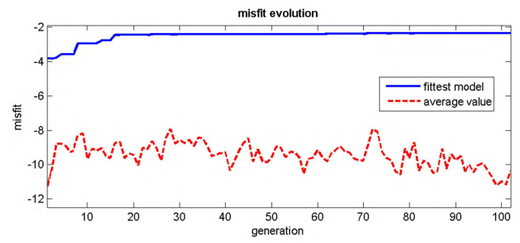
Stendimento MASW

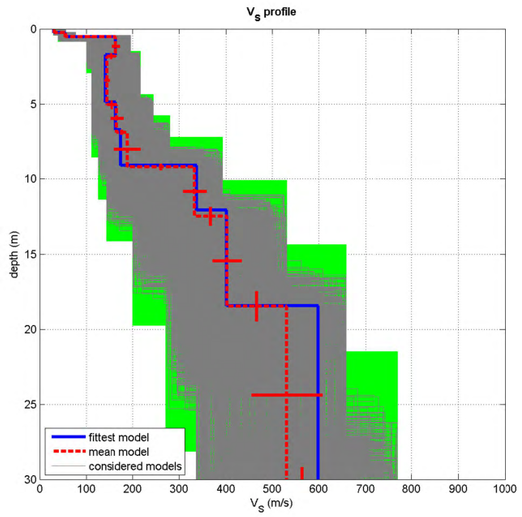
SPETTRO DI VELOCITA' MASW



INVERSIONE DEL MASW E PROFILO DI VELOCITA'







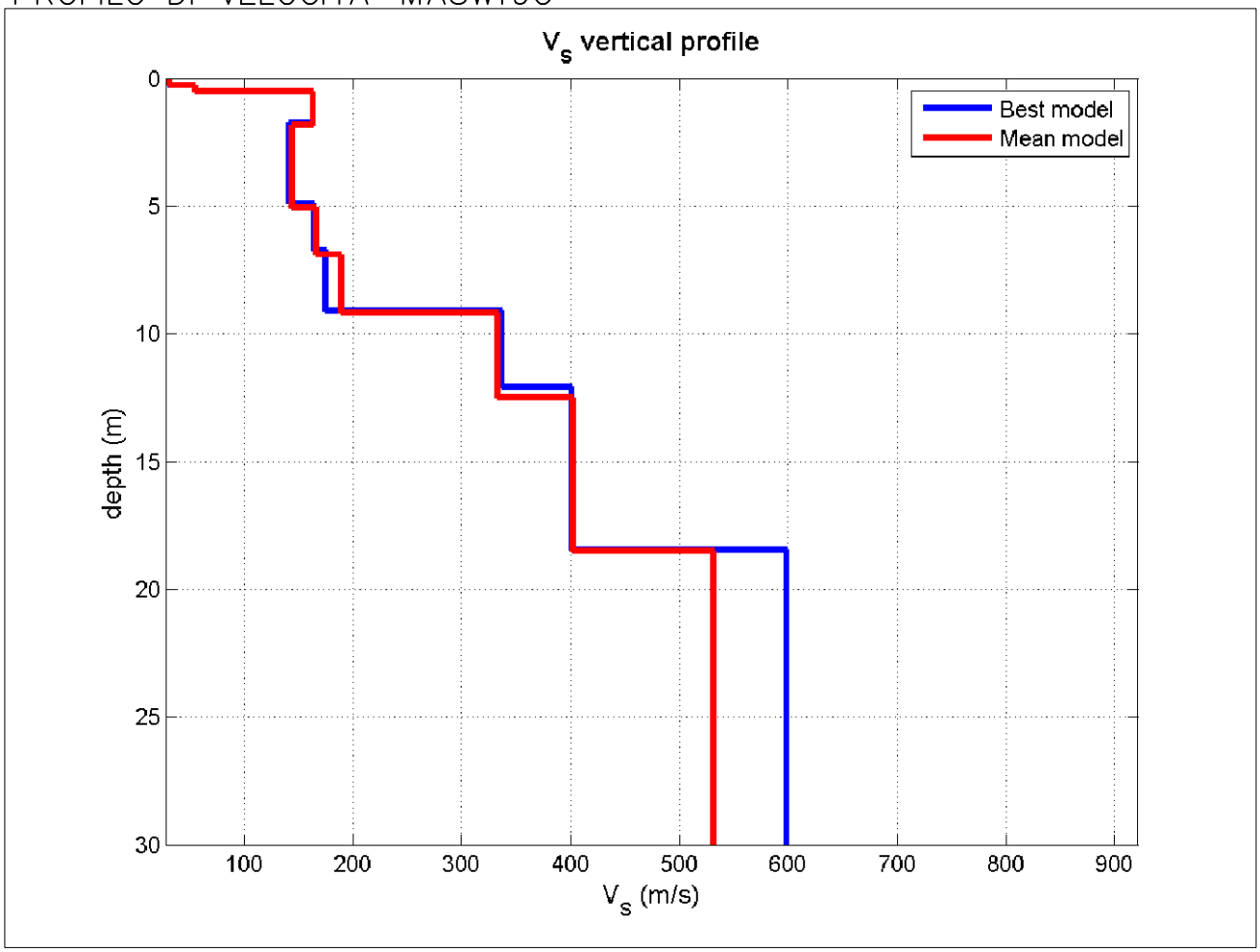
www.winmasw.com

dataset: ZVF_alestromasw.sgy
dispersion curve: picking.cdp
Vs30 (best model): 268 m/s
Vs30 (mean model): 264 m/s

GEOLOGICA TOSCANA
Prospezioni Geofisiche s.n.c.

RISULTANZE DELL'ANALISI SISMICA MASW 19C

PROFILO DI VELOCITA' MASW19C



Mean model
Vs (m/s): 31, 55, 164, 144, 166, 189, 333, 402, 532, 598, 628
Thickness (m): 0.3, 0.3, 1.3, 3.2, 1.8, 2.3, 3.3, 6.0, 11.8, 32.4, 28.7

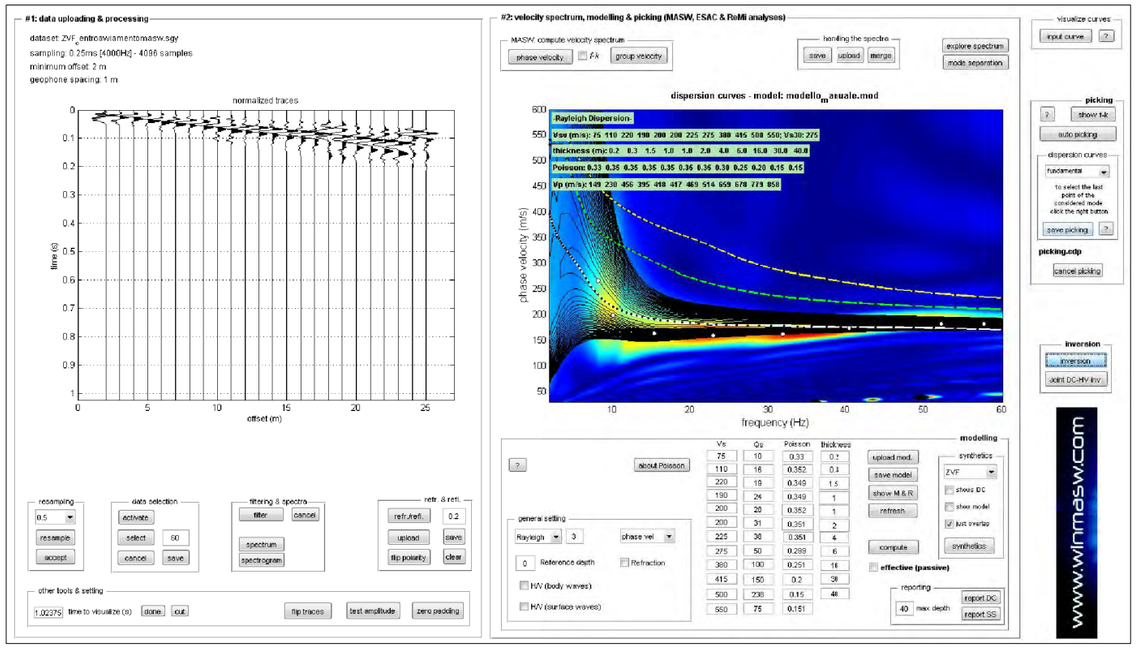
Density (gr/cm3) (approximate values): 1.42 1.58 1.78 1.81 1.79 1.85 2.06 2.00 2.03 2.06 2.05
Seismic/Dynamic Shear modulus (MPa) (approximate values): 1 5 48 37 49 66 228 323 576 737 808

Approximate values for Vp and Poisson
Vp (m/s): 71 140 318 357 331 430 1005 801 922 1024 979
Poisson: 0.38 0.41 0.32 0.40 0.33 0.38 0.44 0.33 0.25 0.24 0.15

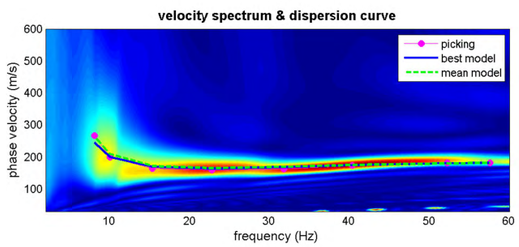
Vs30 (m/s): 264

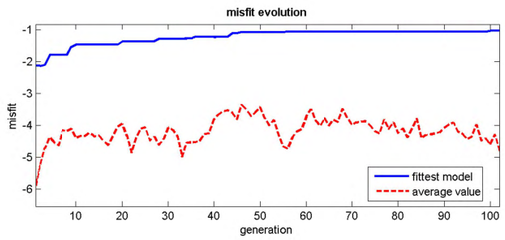
Stendimento MASW

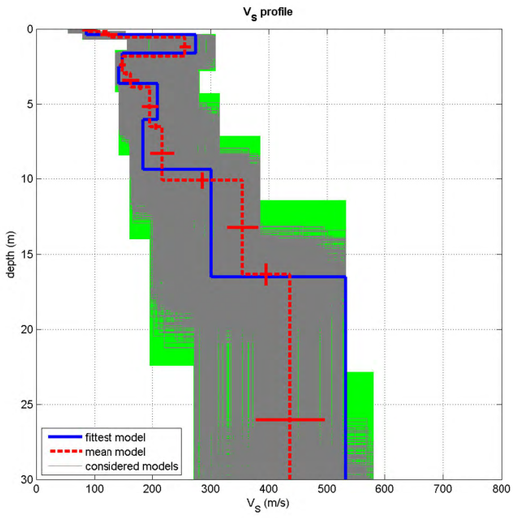
SPETTRO DI VELOCITA' MASW



INVERSIONE DEL MASW E PROFILO DI VELOCITA'







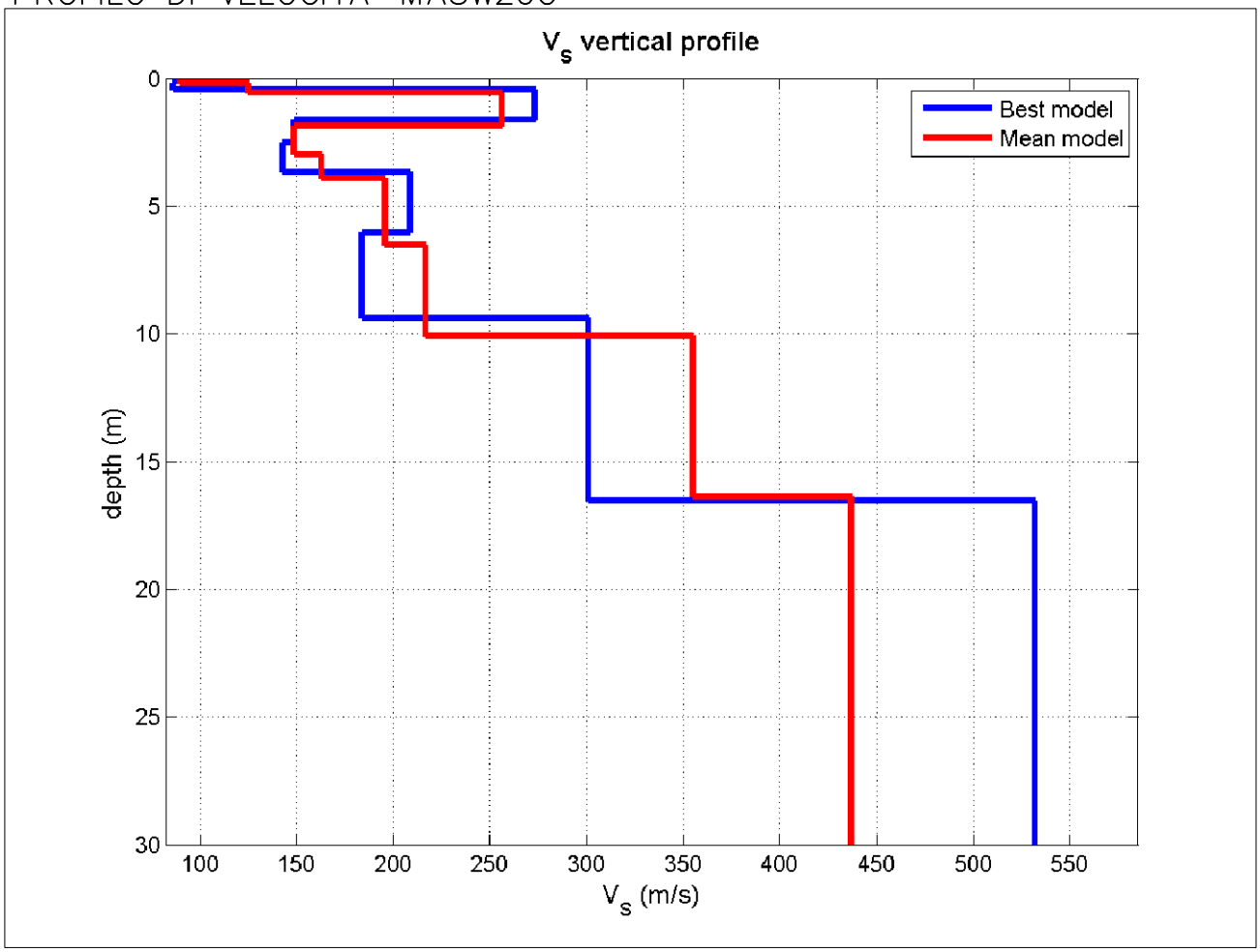
www.winmasw.com

dataset: ZVF_entroavviamentomasw.sgy
dispersion curve: picking.cdp
Vs30 (best model): 295 m/s
Vs30 (mean model): 294 m/s

GEOLOGICA TOSCANA
Prospezioni Geofisiche s.n.c.

RISULTANZE DELL'ANALISI SISMICA MASW 20C

PROFILO DI VELOCITA' MASW20C



Mean model
Vs (m/s): 90, 125, 256, 149, 163, 196, 217, 355, 437, 499
Thickness (m): 0.2, 0.4, 1.3, 1.1, 0.9, 2.6, 3.6, 6.3, 19.4, 27.5

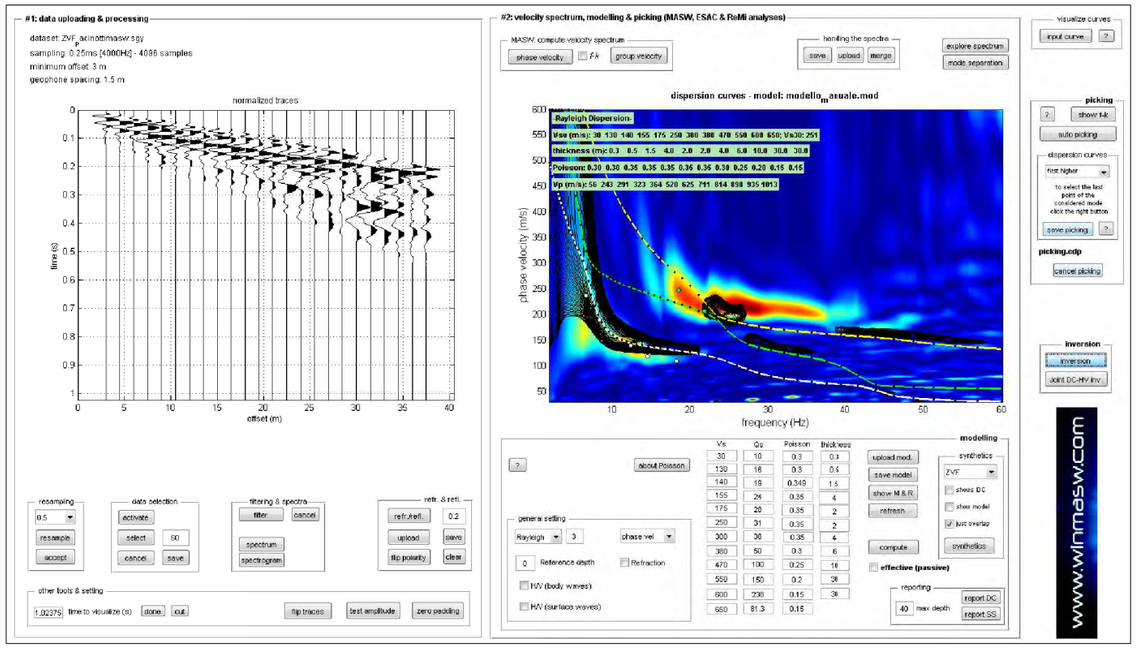
Density (gr/cm3) (approximate values): 1.63 1.89 1.89 1.75 1.76 1.83 1.86 1.97 1.97 2.00
Seismic/Dynamic Shear modulus (MPa) (approximate values): 13 29 124 39 47 70 88 248 377 497

Approximate values for Vp and Poisson
Vp (m/s): 174 504 508 283 295 394 454 698 713 794
Poisson: 0.32 0.47 0.33 0.31 0.28 0.34 0.35 0.33 0.20 0.17

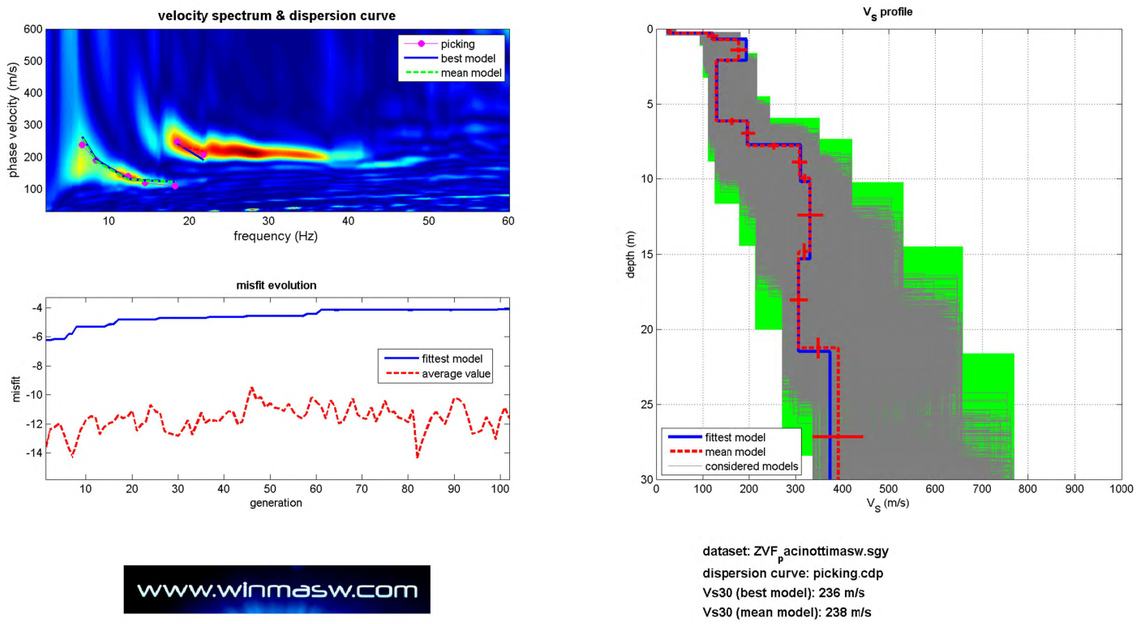
Vs30 (m/s): 294

Stendimento MASW

SPETTRO DI VELOCITA' MASW



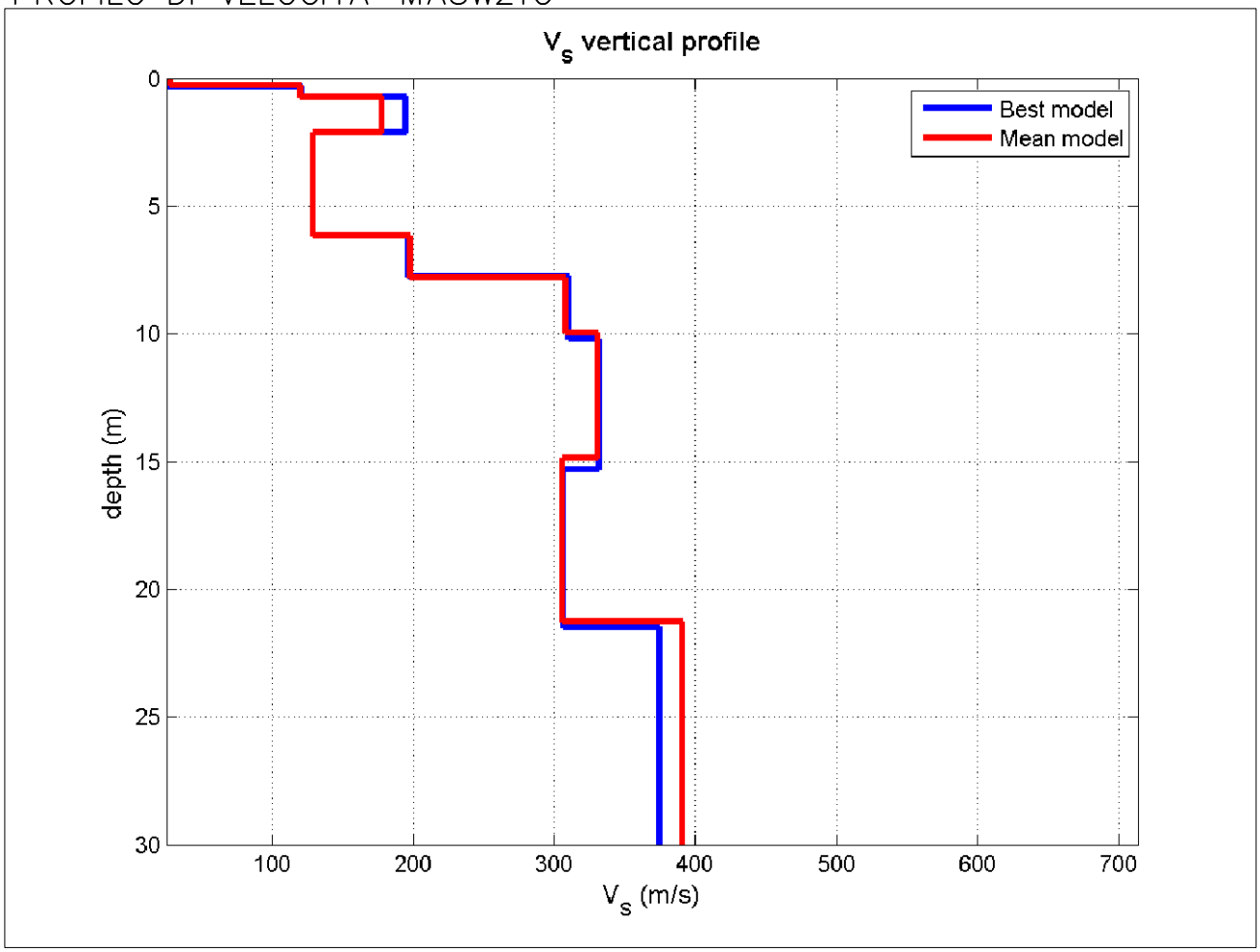
INVERSIONE DEL MASW E PROFILO DI VELOCITA'



GEOLOGICA TOSCANA
Prospezioni Geofisiche s.n.c.

RISULTANZE DELL'ANALISI SISMICA MASW 21C

PROFILO DI VELOCITA' MASW21C



Mean model
Vs (m/s): 28, 120, 178, 129, 198, 308, 331, 306, 391, 546
Thickness (m): 0.3, 0.4, 1.4, 4.1, 1.6, 2.2, 4.9, 6.4, 11.8, 29.5

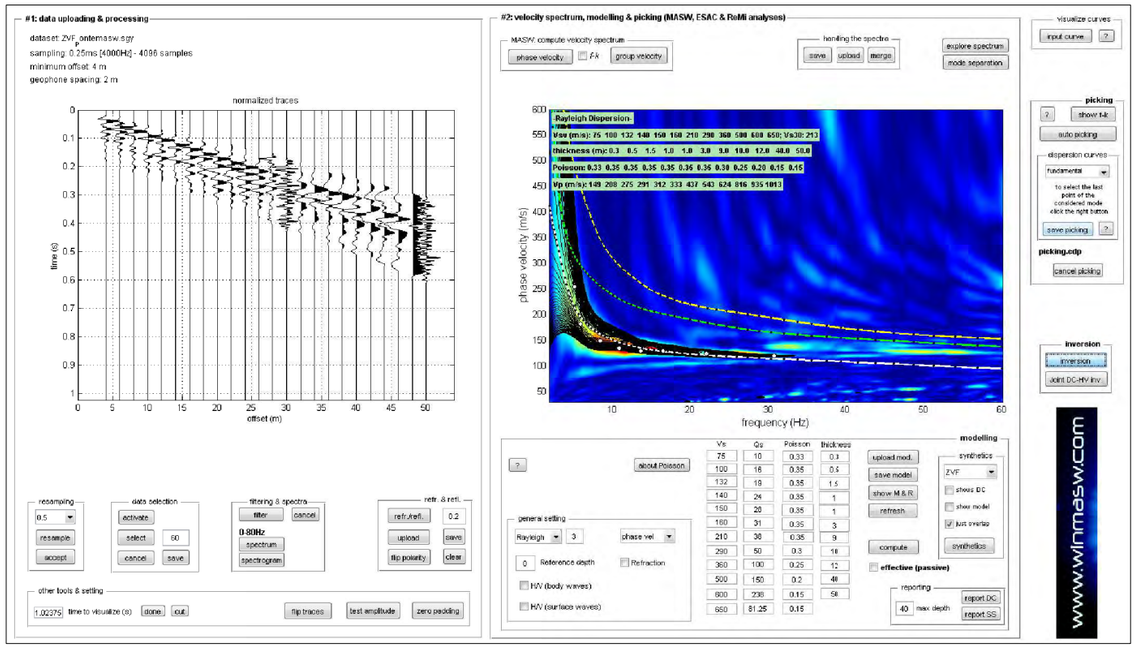
Density (gr/cm3) (approximate values): 1.33 1.67 1.82 1.72 1.88 2.00 1.94 1.92 1.98 2.02
Seismic/Dynamic Shear modulus (MPa) (approximate values): 1 24 58 29 74 190 212 179 302 6026

Approximate values for Vp and Poisson
Vp (m/s): 48 207 384 255 496 801 619 564 723 863
Poisson: 0.24 0.25 0.36 0.33 0.41 0.41 0.30 0.29 0.29 0.17

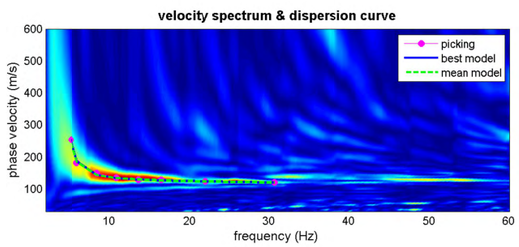
Vs30 (m/s): 238

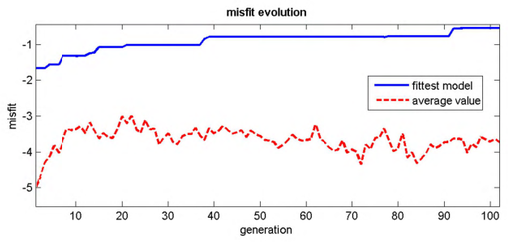
Stendimento MASW

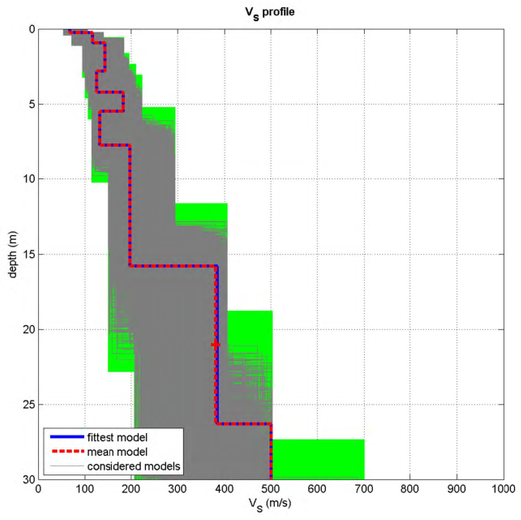
SPETTRO DI VELOCITA' MASW



INVERSIONE DEL MASW E PROFILO DI VELOCITA'







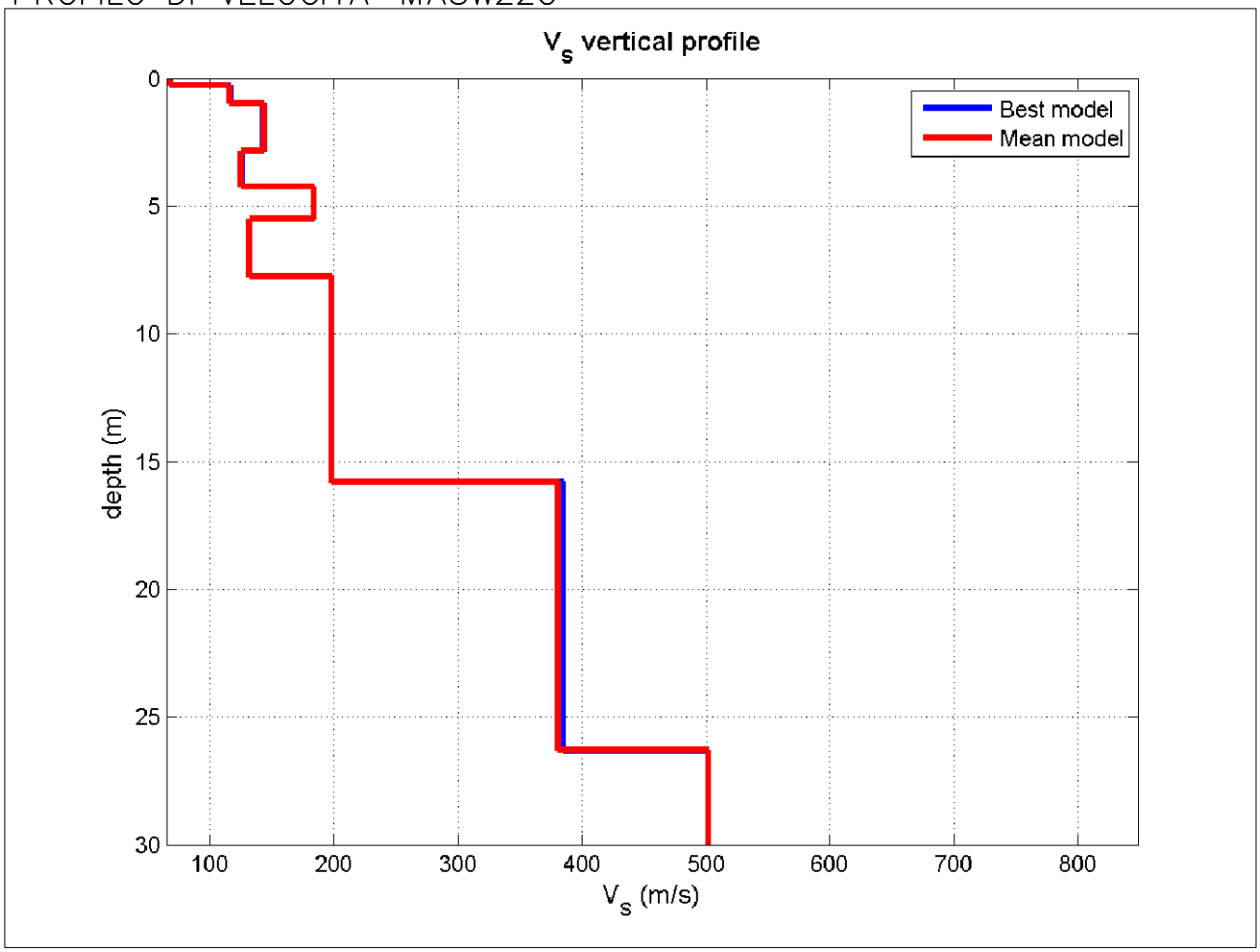
www.winmasw.com

dataset: ZVFpontemasw.sgy
dispersion curve: picking.cdp
Vs30 (best model): 225 m/s
Vs30 (mean model): 225 m/s

GEOLOGICA TOSCANA
Prospezioni Geofisiche s.n.c.

RISULTANZE DELL'ANALISI SISMICA MASW 22C

PROFILO DI VELOCITA' MASW22C



Mean model
Vs (m/s): 68, 116, 143, 125, 184, 132, 198, 381, 502, 598
Thickness (m): 0.3, 0.7, 1.9, 1.4, 1.3, 2.2, 8.0, 10.5, 12.3, 47.8

Density (gr/cm3) (approximate values): 1.56 1.74 1.71 1.94 1.83 1.69 1.95 2.03 2.02 2.05
Seismic/Dynamic Shear modulus (MPa) (approximate values): 7 23 35 30 62 29 76 294 508 735

Approximate values for Vp and Poisson
Vp (m/s): 127 275 237 614 390 219 650 899 856 1003
Poisson: 0.30 0.39 0.21 0.48 0.36 0.21 0.45 0.39 0.24 0.22

Vs30 (m/s): 225