ALLEGATO 1

dataset: 2maswserra2sx.dat
minimum offset (m): 5
geophone spacing (m): 2
sampling (ms): 0.125
Dispersion curve: 2 MASW SERRAPETRONA.cdp
Number of individuals: 30
Number of generations: 31

Adopted search space (minimum Vs & thickness): 122 0.9312261 137 1.862452 133 1.862452 142 1.862452 356.4365
Adopted search space (maximum Vs & thickness): 183 6.704828 226 7.449809 228 7.449809 256 7.449809 511
Adopted Poisson values: 0.35 0.35 0.35 0.35 0.3

Output folder: C:\WINMAS~1\output

==o== SECTION#2

Rayleigh wave analysis
Optimizing Vs & Thickness - generation: 1; average & best misfits: -17.2452 -9.62324
Optimizing Vs & Thickness - generation: 2; average & best misfits: -17.3893 -7.62316
Optimizing Vs & Thickness - generation: 3; average & best misfits: -16.7977 -5.5299
Optimizing Vs & Thickness - generation: 4; average & best misfits: -15.621 -5.5299
Optimizing Vs & Thickness - generation: 5; average & best misfits: -17.0828 -5.5299
Optimizing Vs & Thickness - generation: 6; average & best misfits: -14.6346 -4.02208
Optimizing Vs & Thickness - generation: 7; average & best misfits: -13.9906 -4.02208
Optimizing Vs & Thickness - generation: 8; average & best misfits: -12.3986 -3.39333
Optimizing Vs & Thickness - generation: 9; average & best misfits: -13.8312 -3.39333
Optimizing Vs & Thickness - generation: 10; average & best misfits: -13.9481 -3.39333
Optimizing Vs & Thickness - generation: 11; average & best misfits: -13.2583 -3.39333
Optimizing Vs & Thickness - generation: 12; average & best misfits: -13.7796 -3.39333
Optimizing Vs & Thickness - generation: 13; average & best misfits: -12.6907 -3.39333
Optimizing Vs & Thickness - generation: 14; average & best misfits: -12.6948 -3.39333
Optimizing Vs & Thickness - generation: 15; average & best misfits: -12.9716 -3.39333
Optimizing Vs & Thickness - generation: 16; average & best misfits: -12.106 -3.01931
Optimizing Vs & Thickness - generation: 17; average & best misfits: -12.3267 -3.01931
Optimizing Vs & Thickness - generation: 18; average & best misfits: -11.9264 -3.01931
Optimizing Vs & Thickness - generation: 19; average & best misfits: -12.5823 -3.01931
Optimizing Vs & Thickness - generation: 20; average & best misfits: -13.7222 -3.01931
Optimizing Vs & Thickness - generation: 21; average & best misfits: -12.3308 -3.01931
Optimizing Vs & Thickness - generation: 22; average & best misfits: -11.3963

-3.01931
Optimizing Vs & Thickness - generation: 23; average & best misfits: -10.4612
-3.01931
Optimizing Vs & Thickness - generation: 24; average & best misfits: -10.8182
-2.75367
Optimizing Vs & Thickness - generation: 25; average & best misfits: -11.8522
-2.75367
Optimizing Vs & Thickness - generation: 26; average & best misfits: -11.78
-2.75367
Optimizing Vs & Thickness - generation: 27; average & best misfits: -13.4186
-2.75367
Optimizing Vs & Thickness - generation: 28; average & best misfits: -11.9491
-2.75367
Optimizing Vs & Thickness - generation: 29; average & best misfits: -13.4798
-2.75367
Optimizing Vs & Thickness - generation: 30; average & best misfits: -13.9393
-2.75367
Optimizing Vs & Thickness - generation: 31; average & best misfits: -15.0212
-2.75367

Checking the new search space (for the finer search)

Now a finer search around the most promising search space area

Rayleigh wave analysis
Optimizing Vs & Thickness - generation: 1; average & best misfits: -11.354
-2.75367
Optimizing Vs & Thickness - generation: 2; average & best misfits: -13.1902
-2.75367
Optimizing Vs & Thickness - generation: 3; average & best misfits: -13.1862
-2.75367
Optimizing Vs & Thickness - generation: 4; average & best misfits: -13.8284
-2.75367
Optimizing Vs & Thickness - generation: 5; average & best misfits: -12.3905
-2.75367
Optimizing Vs & Thickness - generation: 6; average & best misfits: -11.89
-2.58641
Optimizing Vs & Thickness - generation: 7; average & best misfits: -12.6078
-2.58641
Optimizing Vs & Thickness - generation: 8; average & best misfits: -12.24
-2.58641
Optimizing Vs & Thickness - generation: 9; average & best misfits: -12.7947
-2.58641

Model after the Vs & Thickness optimization (fixed Poisson values):
Vs (m/s): 172 177 215 237 417
Poisson: 0.35 0.35 0.35 0.35 0.3
Thickness (m): 2.4 7.2 1.9 3.2

Number of models considered to calculate the average model: 12

##
RESULTS winMASW 4.1 Standard
##

Dataset: 2maswserra2sx.dat
Analyzed curve: 2 MASW SERRAPETRONA.cdp

==o== SECTION#3

==========
MEAN MODEL

VS (m/s): 173 177 205 242 421
Standard deviations (m/s): 2 3 14 8 24

Thickness (m): 2.5 6.9 2.5 3.2
Standard deviations (m): 0.9 0.6 0.8 0.6

Approximate values for Vp, density & elastic moduli
Vp (m/s): 360 368 427 504 788
Density (gr/cm3): 1.81 1.81 1.85 1.89 2.00
Vp/Vs ratio: 2.08 2.08 2.08 2.08 1.87
Poisson: 0.35 0.35 0.35 0.35 0.30
Young modulus (MPa): 146 153 210 299 920
Sjear modulus (MPa): 54 57 78 111 354
Lamé (MPa): 126 132 182 258 532
Bulk modulus (MPa): 162 170 233 332 768

Fundamental mode
Mean model

f(Hz)	VR(m/s)
5.28401	303.2559
6.15165	246.7381
8.32077	185.8424
10.5983	172.7087
13.9605	167.0609
17.648	165.0795
23.6131	163.8831
28.4936	163.357
37.2785	162.7165

==o== SECTION#4

==========
BEST MODEL

Vs (m/s): 172.4047 176.5764 215.2167 237.1963 416.9649
thickness (m): 2.4316 7.1888 1.8625 3.2341

Approximate values for Vp, density & elastic moduli
Vp (m/s): 359 368 448 494 780
Density (gr/cm3): 1.81 1.81 1.86 1.88 1.99
Vp/Vs ratio: 2.09 2.08 2.08 2.08 1.87
Poisson: 0.35 0.35 0.35 0.35 0.30
Young modulus (MPa): 144 153 232 286 901
Shear modulus (MPa): 53 57 86 106 347
Lamé (MPa): 126 132 201 248 520
Bulk modulus (MPa): 162 170 259 319 751

dispersion curve (frequency - Rayleigh phase velocity)

Fundamental mode)
best model

F(Hz)	VR(m/s)
5.28401	305.4646
6.15165	254.2081
8.32077	187.2856
10.5983	172.8798
13.9605	166.7848
17.648	164.6822
23.6131	163.4364
28.4936	162.8918
37.2785	162.2229

==o== SECTION#5

Maximum penetration depth according to the "Steady State Rayleigh Method": 23 m

Inversion quality: very good

VS5 (mean model): 175 m/s
VS5 (best model): 175 m/s

VS20 (mean model): 221 m/s
VS20 (best model): 223 m/s

VS30 (mean model): 263 m/s
VS30 (best model): 264 m/s

==o== SECTION#6

Possible Soil Type: C
(based on the mean model)

For the Italian Users:
Dalla normativa (modifiche del D.M. 14/09/2005 Norme Tecniche per le Costruzioni, emanate con D.M. Infrastrutture del 14/01/2008, pubblicato su Gazzetta Ufficiale Supplemento ordinario n° 29 del 04/02/2008):
A - Ammassi rocciosi affioranti o terreni molto rigidi,caratterizzati da valori di VS30 superiori a 800 m/s, eventualmente comprendenti in superficie uno strato di alterazione, con spessore massimo di 3 m.
B - Rocce tenere e depositi di terreni a grana grossa molto addensati o terreni a grana fine molto consistenti, con spessori superiori a 30 m, caratterizzati da graduale miglioramento delle proprietà meccaniche con la profondità e valori del VS30 compresi tra 360 m/s e 800 m/s (ovvero NSPT30 > 50 nei terreni a grana grossa e cu30> 250 kPa nei terreni a grana fina).
C - Depositi di terreni a grana grossa mediamente addensati o terreni a grana fine mediamente consistenti, con spessori superiori a 30 m caratterizzati da graduale miglioramento delle proprietà meccaniche con la profondità e valori del VS30 compresi tra 180 m/s e 360 m/s (ovvero 15 < NSPT30 < 50 nei terreni a grana grossa e 70 < cu30 < 250 kPa nei terreni a grana fina).
D - Depositi di terreni a grana grossa scarsamente addensati o terreni a grana fine scarsamente consistenti, con spessori superiori a 30 m caratterizzati da graduale miglioramento delle proprietà meccaniche con la profondità e valori del VS30 inferiori a 180 m/s (ovvero NSPT30 < 15 nei terreni a grana grossa e cu30 < 70 kPa nei terreni a grana fina).
E - Terreni dei sottosuoli dei tipi C o D per spessori non superiori a 20 m, posti sul substrato di riferimento (con VS > 800 m/s).
S1 - Depositi di terreni caratterizzati da valori di VS30 inferiori 100 m/s (ovvero 10 < cuS30 < 20 kPa) che includono uno strato di almeno 8 m di terreni a grana fina di bassa consistenza, oppure che includano almeno 3 m di torba o argille altamente organiche.
S2 - Depositi di terreni suscettibili di liquefazione, di argille sensitive, o qualsiasi altra categoria di sottosuolo non classificabile nei tipi precedenti.

Results saved in the folder "C:\WINMAS~1\output".

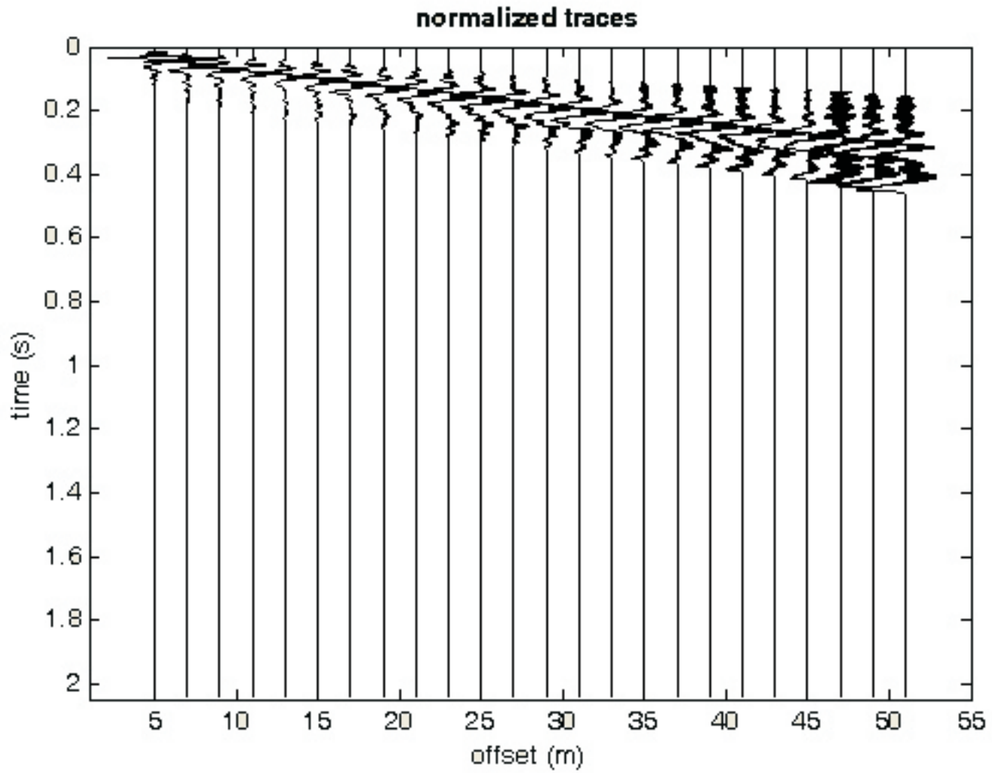
==========

winMASW 4.1 Standard
Surface Wave Analysis
via MASW - Multichannel Analysis of Surface Waves

www.eliosoft.it

#1: uploading & processing (MASW analyses)

dataset: 2maswserra2sx.dat
minimum offset: 5 m
geophone spacing: 2 m
sampling: 0.125 ms



utilities
flip traces
spectrum
movie ?

data selection
activate
select 20
cancel save

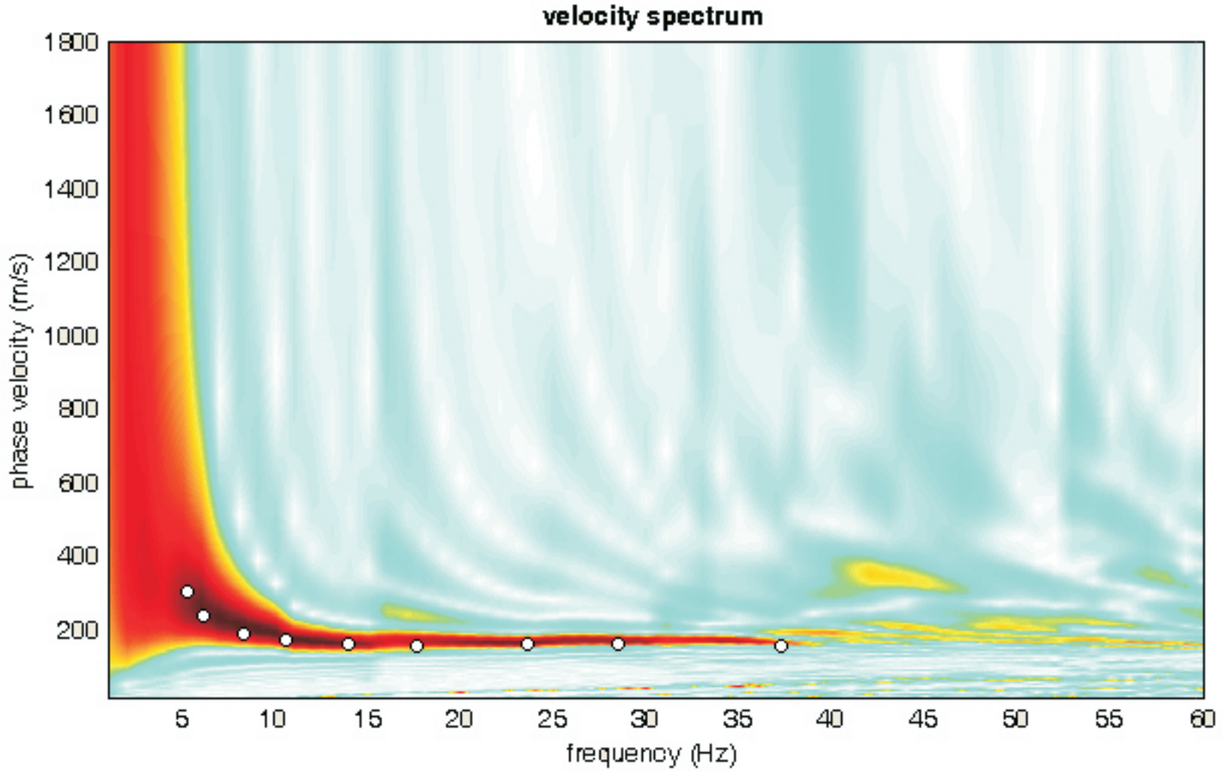
refraction
Professional version

#2: velocity spectrum, modelling & picking (MASW & ReMi analyses)

MASW
calculate spectrum Tau - v

ReMi
Professional version

visualize curves
input curve ?



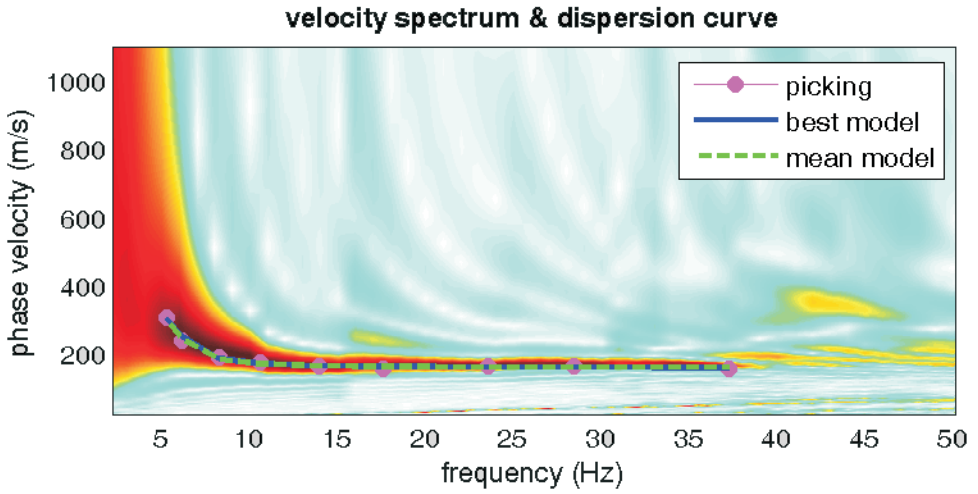
explore spectrum

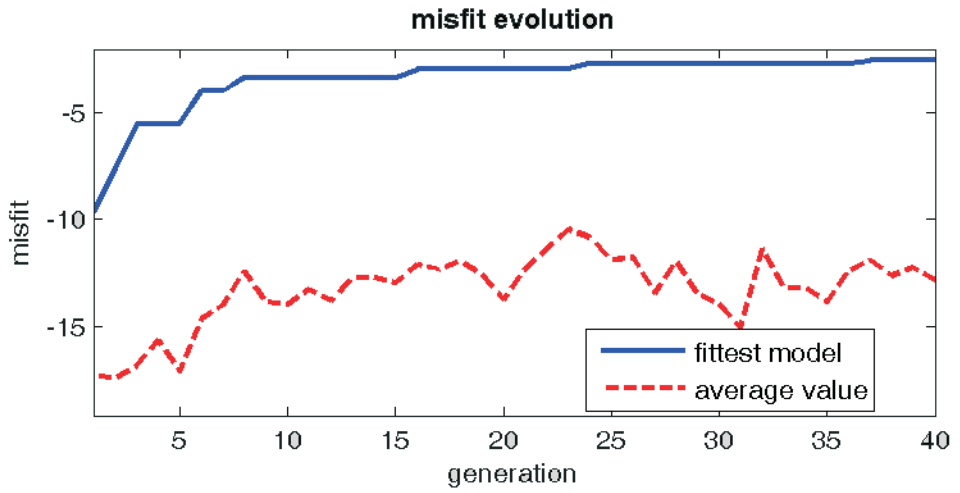
2 MASW SERRAPETRONA.cdp

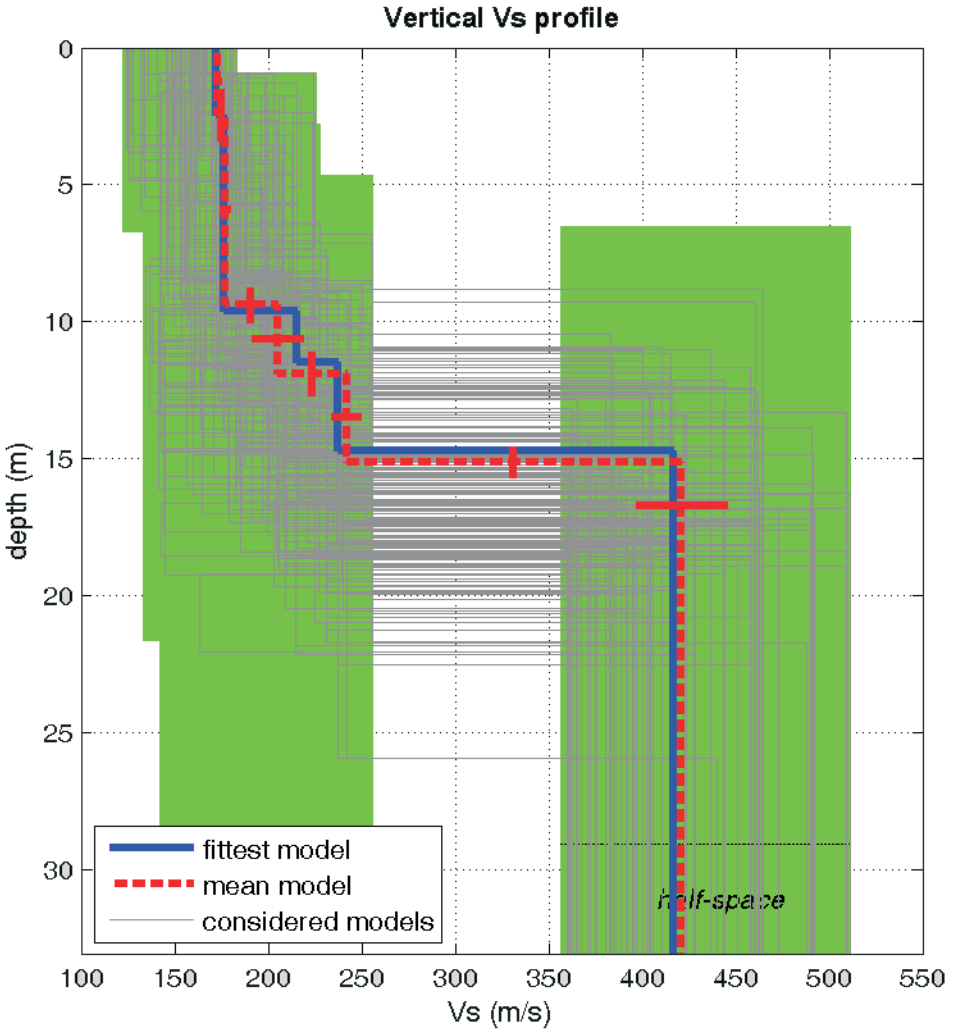
modelling
parameters save model
upload model 3 Love analysis: Professional version
eigen period refresh ?

picking
fundamental ?
use the right button to select the last point of the considered mode
save picking ? cancel picking

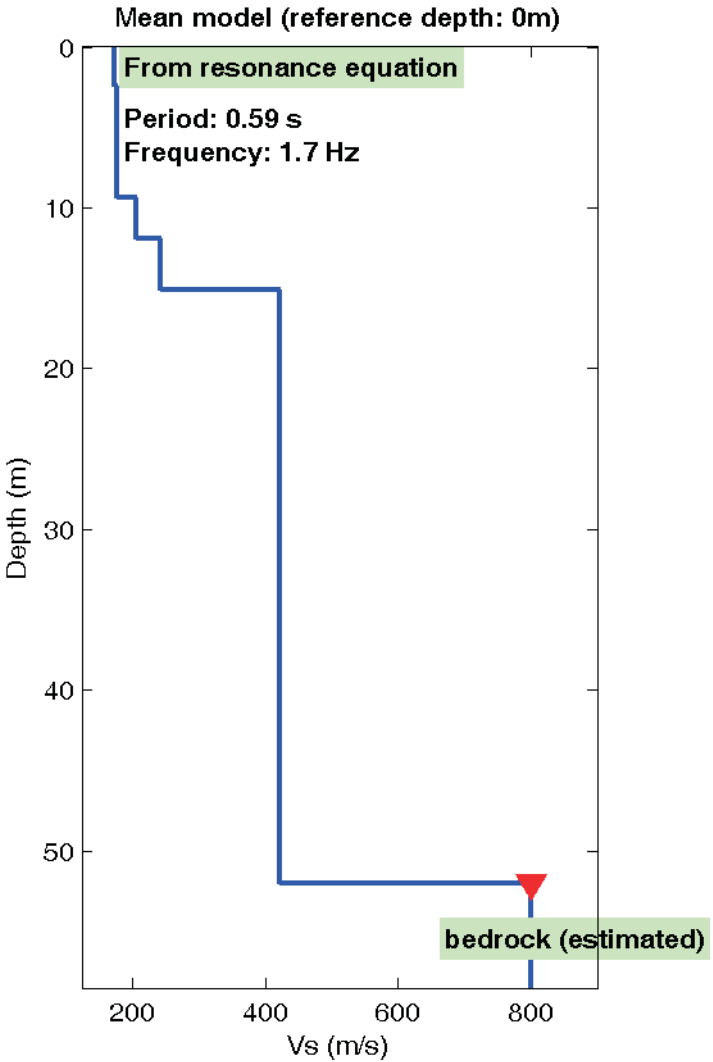
inversion
exit

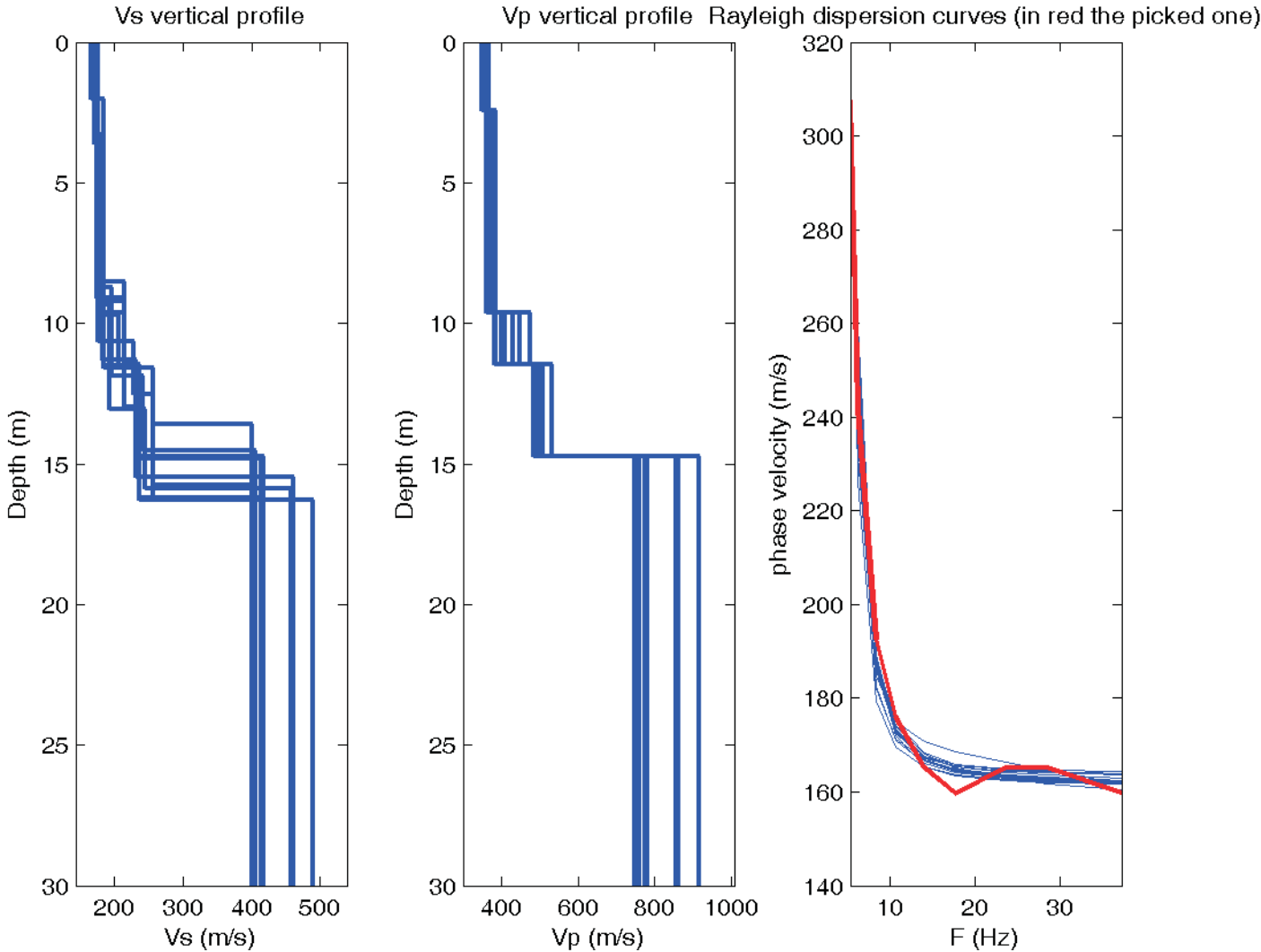


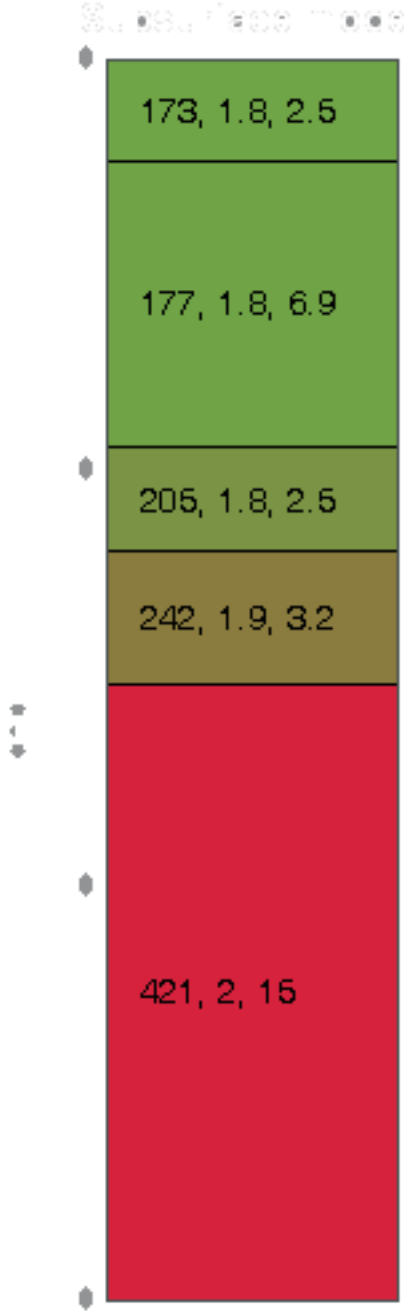




dataset: 2maswserra2sx.dat
dispersion curve: 2 MASW SERRAPETRONA.cdp
VS30 (best model): 264 m/s
VS30 (mean model): 263 m/s


Mean model (reference depth: 0m)
From resonance equation
Period: 0.59 s
Frequency: 1.7 Hz
bedrock (estimated)
Depth (m)
0
10
20
30
40
50
200
400
600
800
Vs (m/s)


Vs vertical profile
Vp vertical profile
Rayleigh dispersion curves (in red the picked one)
Depth (m)
Vs (m/s)
Vp (m/s)
phase velocity (m/s)
F (Hz)
0
5
10
15
20
25
30
200
300
400
500
600
800
1000
140
160
180
200
220
240
260
280
300
320
10
20
30



Vs (m/s)	*density* (gr/cm^3)	*thickness* (m)