ALLEAGTO 1

dataset: 4maswserra2dx.dat
minimum offset (m): 5
geophone spacing (m): 1.5
sampling (ms): 0.125
Dispersion curve: 4 MASW SERRAPETRONA.cdp
Number of individuals: 30
Number of generations: 31

Adopted search space (minimum Vs & thickness): 140 2.1 210
1.4 280 4.9 630
Adopted search space (maximum Vs & thickness): 260 3.9 390
2.6 520 9.1 1170
Adopted Poisson values: 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: -38.0949
-4.16908
Optimizing Vs & Thickness - generation: 2; average & best misfits: -31.6099
-4.15795
Optimizing Vs & Thickness - generation: 3; average & best misfits: -30.1578
-4.15795
Optimizing Vs & Thickness - generation: 4; average & best misfits: -32.931
-4.15795
Optimizing Vs & Thickness - generation: 5; average & best misfits: -27.8939
-4.15795
Optimizing Vs & Thickness - generation: 6; average & best misfits: -24.0076
-4.15795
Optimizing Vs & Thickness - generation: 7; average & best misfits: -27.9555
-4.15795
Optimizing Vs & Thickness - generation: 8; average & best misfits: -30.3181
-4.15795
Optimizing Vs & Thickness - generation: 9; average & best misfits: -34.4733
-4.15795
Optimizing Vs & Thickness - generation: 10; average & best misfits: -29.5575
-4.15795
Optimizing Vs & Thickness - generation: 11; average & best misfits: -29.9041
-4.15795
Optimizing Vs & Thickness - generation: 12; average & best misfits: -28.0326
-4.15795
Optimizing Vs & Thickness - generation: 13; average & best misfits: -27.3532
-4.15795
Optimizing Vs & Thickness - generation: 14; average & best misfits: -25.7589
-4.15795
Optimizing Vs & Thickness - generation: 15; average & best misfits: -25.6983
-4.15795
Optimizing Vs & Thickness - generation: 16; average & best misfits: -28.4493
-4.15795
Optimizing Vs & Thickness - generation: 17; average & best misfits: -24.7998
-4.15795
Optimizing Vs & Thickness - generation: 18; average & best misfits: -23.9011
-4.15795
Optimizing Vs & Thickness - generation: 19; average & best misfits: -29.8338
-4.15795
Optimizing Vs & Thickness - generation: 20; average & best misfits: -29.8494
-4.15795
Optimizing Vs & Thickness - generation: 21; average & best misfits: -30.2892
-4.15795
Optimizing Vs & Thickness - generation: 22; average & best misfits: -32.4824
-4.15795
Optimizing Vs & Thickness - generation: 23; average & best misfits: -30.2144

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-4.15795
Optimizing Vs & Thickness - generation: 24; average & best misfits: -31.2624
-4.15795
Optimizing Vs & Thickness - generation: 25; average & best misfits: -28.836
-4.15795
Optimizing Vs & Thickness - generation: 26; average & best misfits: -24.0343
-4.15795
Optimizing Vs & Thickness - generation: 27; average & best misfits: -27.3907
-4.15795
Optimizing Vs & Thickness - generation: 28; average & best misfits: -27.7767
-4.15795
Optimizing Vs & Thickness - generation: 29; average & best misfits: -29.4924
-4.15795
Optimizing Vs & Thickness - generation: 30; average & best misfits: -34.3605
-4.15795
Optimizing Vs & Thickness - generation: 31; average & best misfits: -32.6171
-4.15795

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: -33.7583
-4.15795
Optimizing Vs & Thickness - generation: 2; average & best misfits: -33.6956
-4.15795
Optimizing Vs & Thickness - generation: 3; average & best misfits: -28.6261
-4.15795
Optimizing Vs & Thickness - generation: 4; average & best misfits: -30.5644
-4.15795
Optimizing Vs & Thickness - generation: 5; average & best misfits: -31.7364
-4.15795
Optimizing Vs & Thickness - generation: 6; average & best misfits: -33.4208
-4.15795
Optimizing Vs & Thickness - generation: 7; average & best misfits: -34.1186
-4.15795
Optimizing Vs & Thickness - generation: 8; average & best misfits: -41.1208
-4.15795
Optimizing Vs & Thickness - generation: 9; average & best misfits: -31.4294
-4.15795

Model after the Vs & Thickness optimization (fixed Poisson values):
Vs (m/s): 200  300  400  900
Poisson: 0.35      0.35      0.35       0.3
Thickness (m): 3        2        7

Number of models considered to calculate the average model: 2


######################################################################
RESULTS winMASW 4.1 Standard
######################################################################

Dataset: 4maswserra2dx.dat
Analyzed curve: 4 MASW SERRAPETRONA.cdp


==o== SECTION#3

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

VS (m/s):                   196  303  404  915
Standard deviations (m/s): 7   6   7  29

Thickness (m):            3.0         2.1         7.2
Standard deviations (m): 0.1         0.2         0.3
```

Approximate values for Vp, density & elastic moduli
Vp (m/s): 408 631 841 1712
Density (gr/cm3): 1.84 1.94 2.01 2.18
Vp/Vs ratio: 2.08 2.08 2.08 1.87
Poisson: 0.35 0.35 0.35 0.30
Young modulus (MPa): 191 482 887 4756
Sjear modulus (MPa): 71 178 328 1829
Lamé (MPa): 165 417 766 2745
Bulk modulus (MPa): 212 536 985 3964

Fundamental mode
Mean model

f(Hz)	VR(m/s)
11.1406	592.8441
12.7675	537.0598
14.6112	444.1603
16.2381	380.3901
18.0818	340.2097
19.6002	317.0073
21.4439	292.9237
23.83	264.9541
26.4329	240.5178
29.9035	219.2458
39.8814	194.9009

==o== SECTION#4

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BEST MODEL

Vs (m/s): 200 300 400 900
thickness (m): 3 2 7.0325

Approximate values for Vp, density & elastic moduli
Vp (m/s): 416 624 833 1684
Density (gr/cm3): 1.84 1.94 2.01 2.18
Vp/Vs ratio: 2.08 2.08 2.08 1.87
Poisson: 0.35 0.35 0.35 0.30
Young modulus (MPa): 199 471 868 4593
Shear modulus (MPa): 74 175 322 1766
Lamé (MPa): 171 406 751 2651
Bulk modulus (MPa): 221 523 966 3829

dispersion curve (frequency - Rayleigh phase velocity)

Fundamental mode)
best model

F(Hz)	VR(m/s)
11.1406	590.7175
12.7675	538.536
14.6112	447.8336
16.2381	381.322
18.0818	339.7215
19.6002	316.1946
21.4439	292.4363
23.83	265.6491
26.4329	242.5153
29.9035	222.2341
39.8814	198.5996

==o== SECTION#5

Maximum penetration depth according to the "Steady State Rayleigh Method": 21 m

Inversion quality: very good

VS5 (mean model): 229 m/s
VS5 (best model): 231 m/s

VS20 (mean model): 414 m/s
VS20 (best model): 416 m/s

VS30 (mean model): 507 m/s
VS30 (best model): 507 m/s

==o== SECTION#6

Possible Soil Type: B
(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".

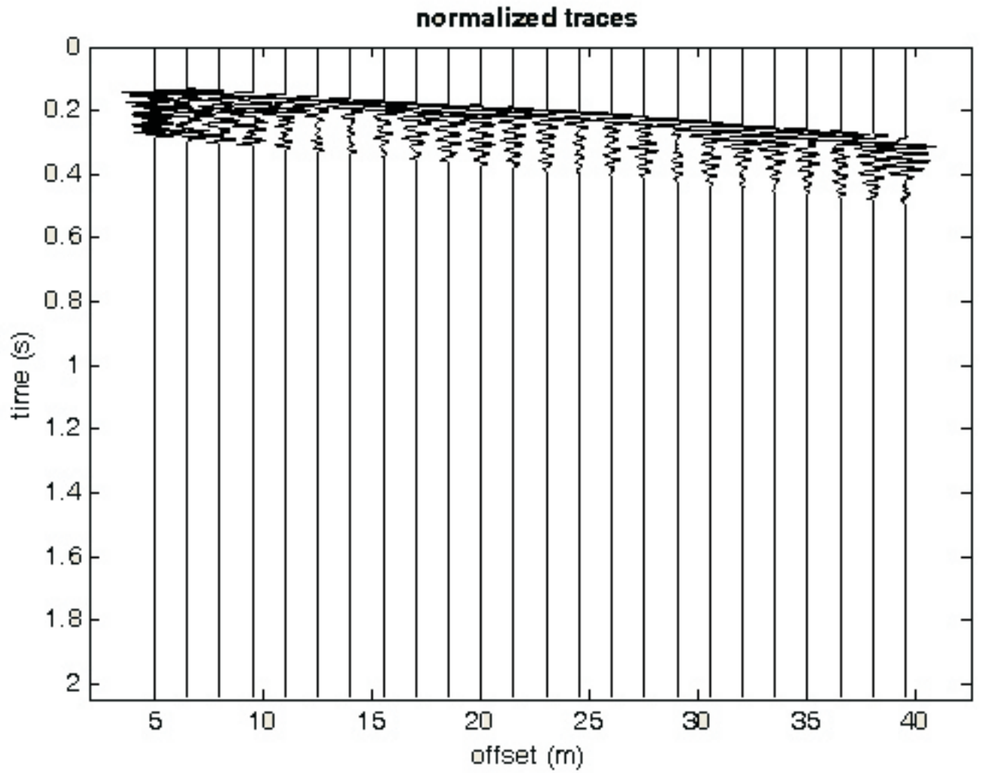
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winMASW 4.1 Standard
Surface Wave Analysis
via MASW - Multichannel Analysis of Surface Waves

www.eliosoft.it

#1: uploading & processing (MASW analyses)

dataset: 4maswserra2dx.dat
minimum offset: 5 m
geophone spacing: 1.5 m
sampling: 0.125 ms



utilities
flip traces
spectrum
movie
?

data selection
activate
select
20
cancel
save

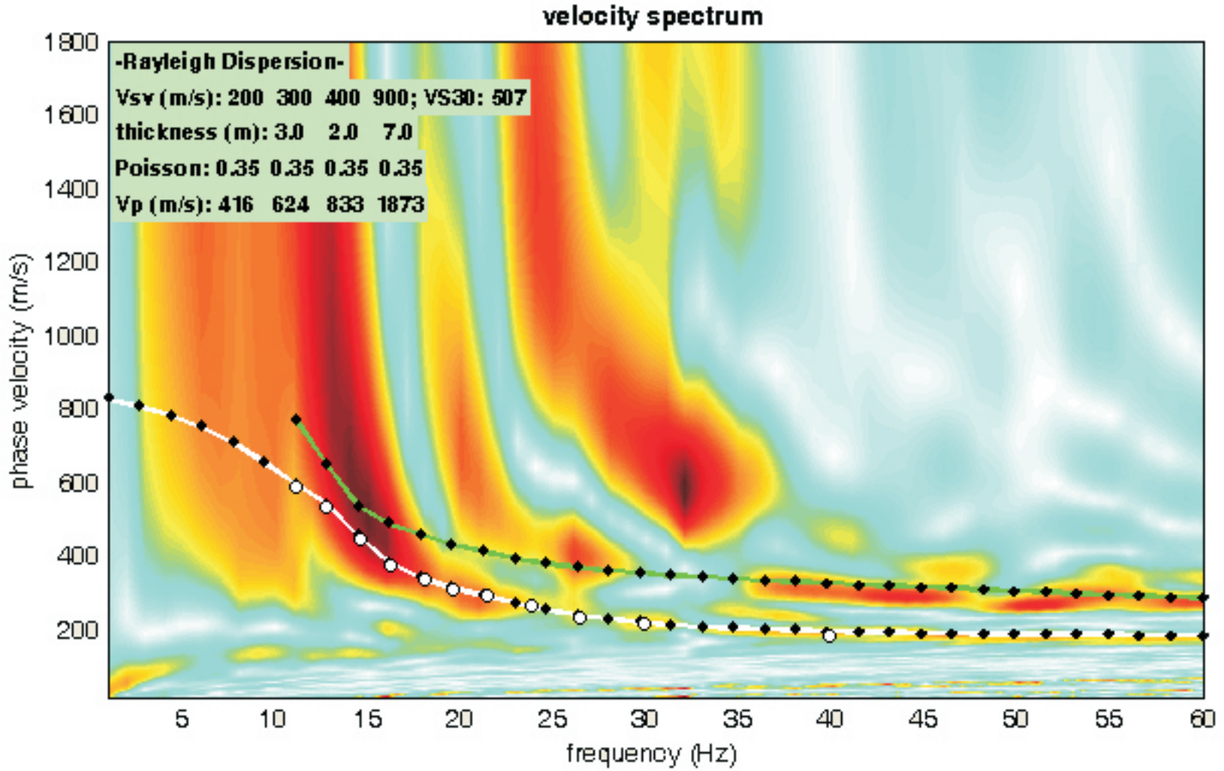
refraction
Professional version

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

MASW
calculate spectrum
Tau - v

ReMi
Professional version

visualize curves
input curve
?



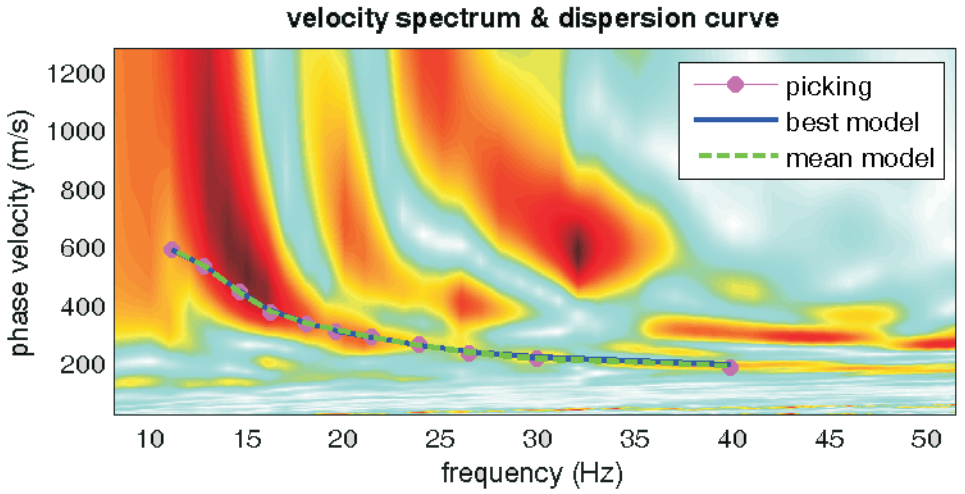
explore spectrum

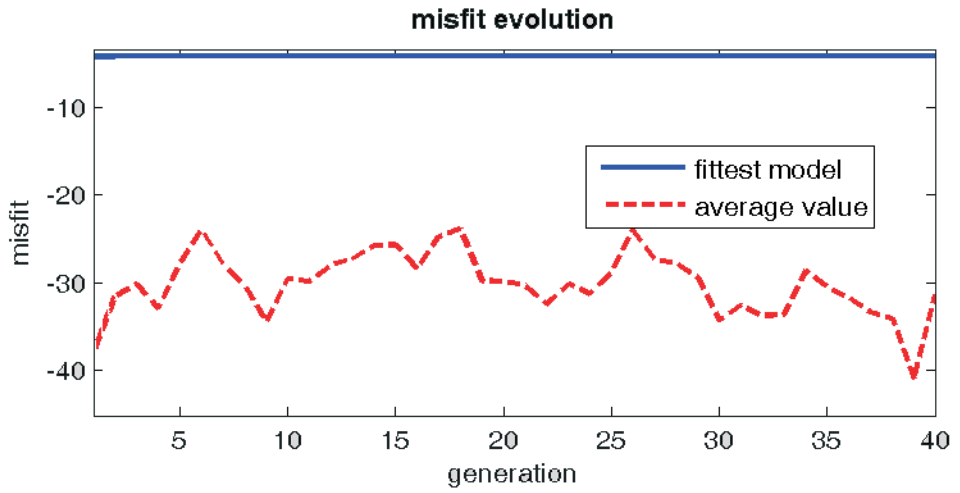
4 MASW SERRAPETRONA.cdp

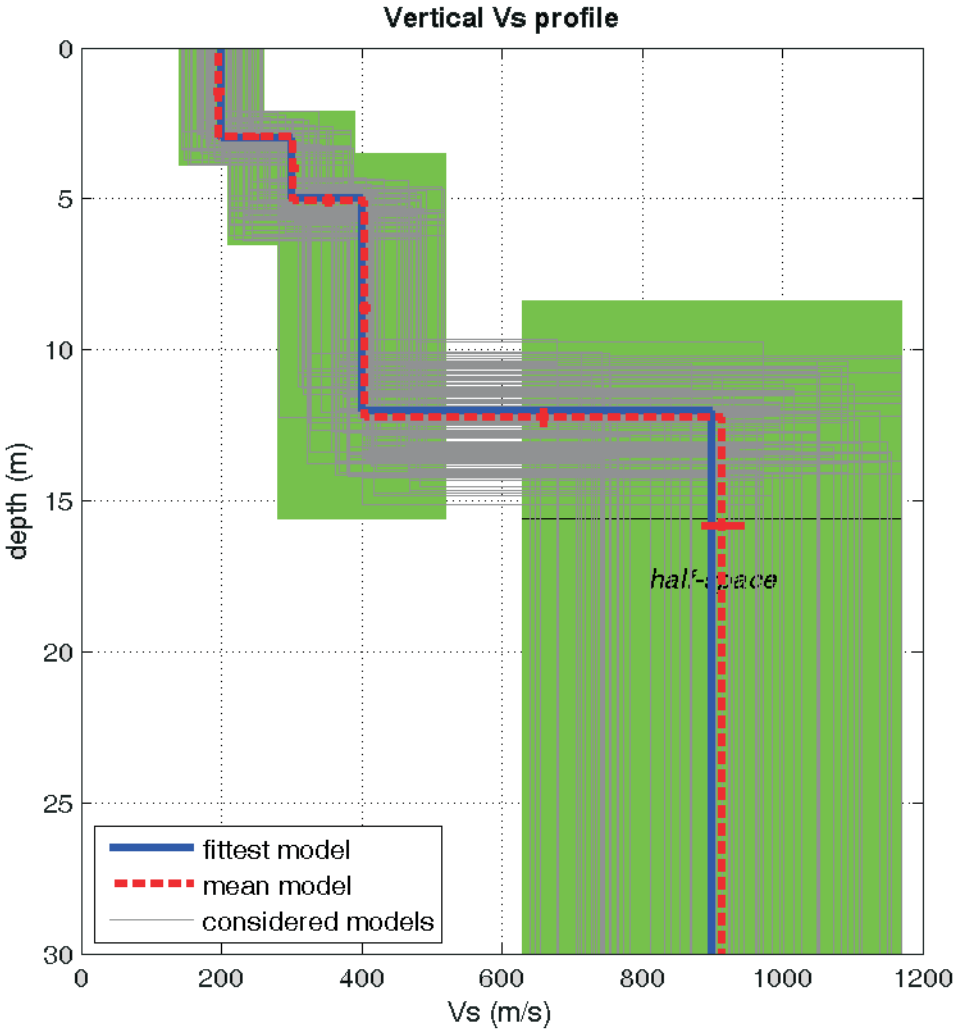
modelling
parameters
save model
upload model
3
Love analysis:
Professional version
eigen period
refresh
?

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

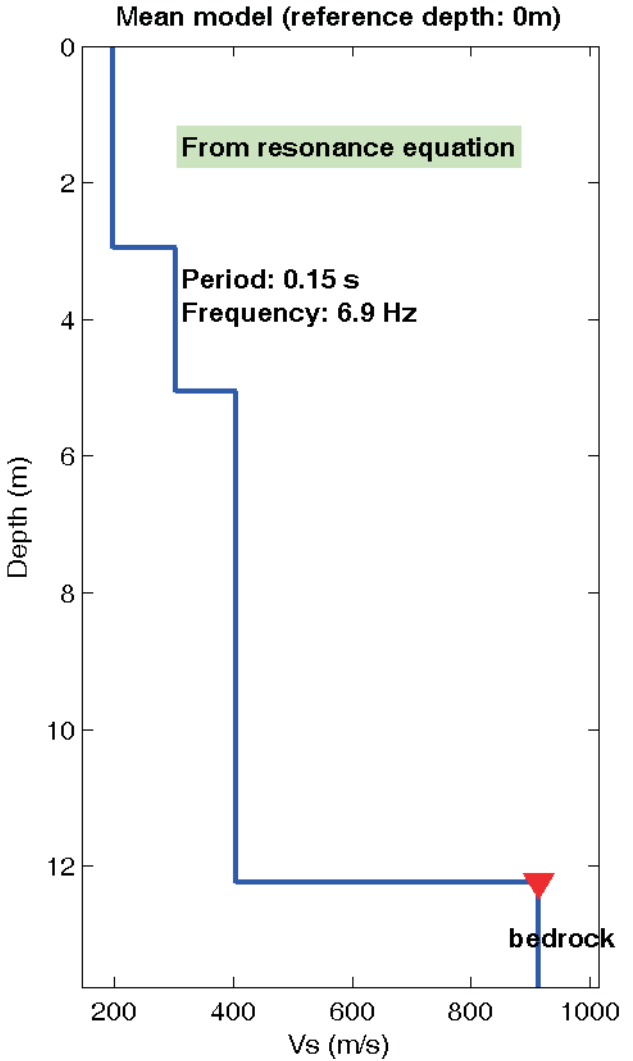
inversion
exit

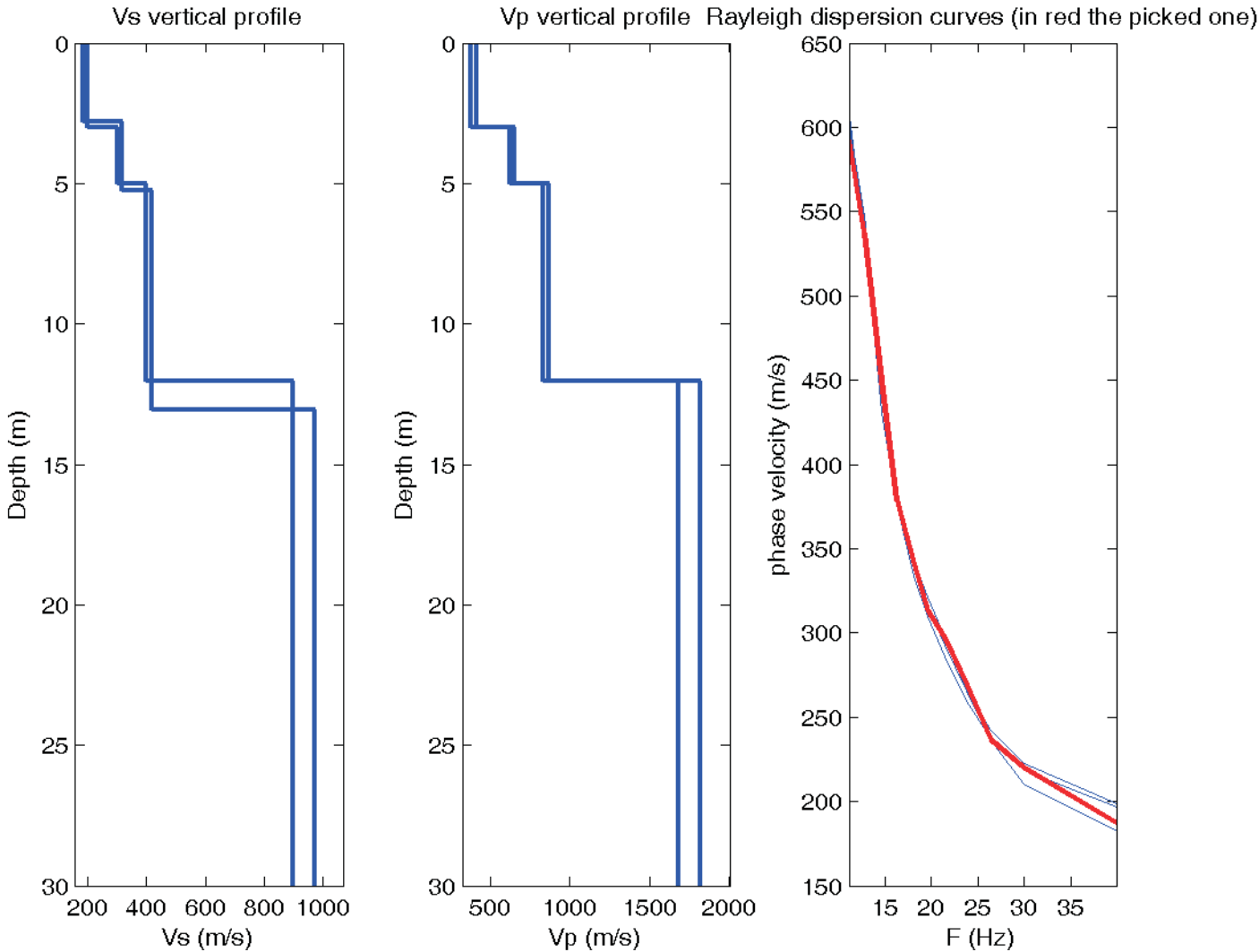


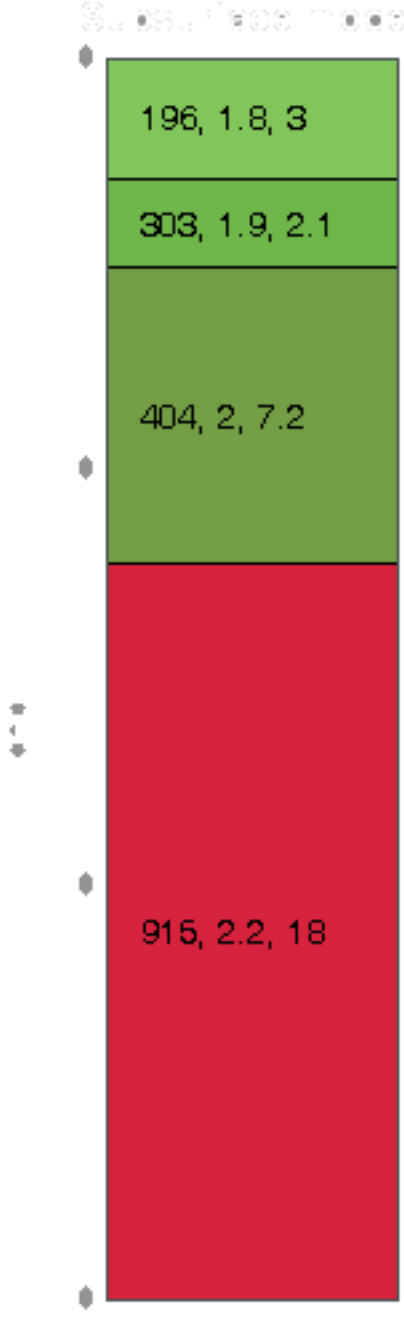




dataset: 4maswserra2dx.dat
dispersion curve: 4 MASW SERRAPETRONA.cdp
VS30 (best model): 507 m/s
VS30 (mean model): 507 m/s


Mean model (reference depth: 0m)
From resonance equation
Period: 0.15 s
Frequency: 6.9 Hz
bedrock
Depth (m)
Vs (m/s)
0
2
4
6
8
10
12
200
400
600
800
1000


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
400
600
800
1000
500
1000
1500
2000
650
600
550
500
450
400
350
300
250
200
150
15
20
25
30
35



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