

winMASW\_report

Dispersion curve: number of frequency-velocity points=6

==0== SECTION#1

dataset: 5R.sgy
minimum offset (m): 5
geophone spacing (m): 2
sampling (ms): 0.131
Dispersion curve: nunz52.cdp
Number of individuals: 30
Number of generations: 31

Rayleigh-wave dispersion analysis

Adopted search space (minimum Vs & thickness): 200 1 213 4 250 3 300
Adopted search space (maximum Vs & thickness): 250 3 350 6 400 6 450
Adopted Poisson values: 0.4 0.35 0.3 0.3 0.3

Output folder: C:\WINMAS~2\output

==0== SECTION#2

Rayleigh wave analysis

Optimizing Vs & Thickness - generation: 1; average & best misfits: -27.7261
-6.95488
Optimizing Vs & Thickness - generation: 2; average & best misfits: -24.6825
-6.95488
Optimizing Vs & Thickness - generation: 3; average & best misfits: -18.5341
-6.95488
Optimizing Vs & Thickness - generation: 4; average & best misfits: -17.2553
-6.95488
Optimizing Vs & Thickness - generation: 5; average & best misfits: -16.1583
-6.38337
Optimizing Vs & Thickness - generation: 6; average & best misfits: -15.2233
-5.54356
Optimizing Vs & Thickness - generation: 7; average & best misfits: -15.6966
-5.54356
Optimizing Vs & Thickness - generation: 8; average & best misfits: -14.8094
-5.54356
Optimizing Vs & Thickness - generation: 9; average & best misfits: -15.3393
-5.54356
Optimizing Vs & Thickness - generation: 10; average & best misfits: -13.5147
-5.54356
Optimizing Vs & Thickness - generation: 11; average & best misfits: -15.6265
-5.54356
Optimizing Vs & Thickness - generation: 12; average & best misfits: -15.0241
-5.54356
Optimizing Vs & Thickness - generation: 13; average & best misfits: -15.6736
-5.54356
Optimizing Vs & Thickness - generation: 14; average & best misfits: -16.8215
-5.54356
Optimizing Vs & Thickness - generation: 15; average & best misfits: -16.0944
-5.54356
Optimizing Vs & Thickness - generation: 16; average & best misfits: -15.3706
-5.3213
Optimizing Vs & Thickness - generation: 17; average & best misfits: -16.0378
-5.3213
Optimizing Vs & Thickness - generation: 18; average & best misfits: -15.7205
-5.3213
Optimizing Vs & Thickness - generation: 19; average & best misfits: -16.0974

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-5.3213  
 Optimizing Vs & Thickness - generation: 20; average & best misfits: -15.1252  
 -5.3213  
 Optimizing Vs & Thickness - generation: 21; average & best misfits: -15.3321  
 -5.3213  
 Optimizing Vs & Thickness - generation: 22; average & best misfits: -15.3905  
 -5.3213  
 Optimizing Vs & Thickness - generation: 23; average & best misfits: -13.8474  
 -5.31261  
 Optimizing Vs & Thickness - generation: 24; average & best misfits: -16.8729  
 -5.31261  
 Optimizing Vs & Thickness - generation: 25; average & best misfits: -18.3994  
 -5.31261  
 Optimizing Vs & Thickness - generation: 26; average & best misfits: -15.0468  
 -5.31261  
 Optimizing Vs & Thickness - generation: 27; average & best misfits: -15.9125  
 -5.31261  
 Optimizing Vs & Thickness - generation: 28; average & best misfits: -14.7063  
 -5.31261  
 Optimizing Vs & Thickness - generation: 29; average & best misfits: -16.5742  
 -5.2838  
 Optimizing Vs & Thickness - generation: 30; average & best misfits: -13.8388  
 -5.2838  
 Optimizing Vs & Thickness - generation: 31; average & best misfits: -16.6359  
 -5.2838

Now a finer search around the most promising search space area

Rayleigh wave analysis

Optimizing Vs & Thickness - generation: 1; average & best misfits: -20.3239  
 -5.2838  
 Optimizing Vs & Thickness - generation: 2; average & best misfits: -19.5504  
 -5.2838  
 Optimizing Vs & Thickness - generation: 3; average & best misfits: -17.0758  
 -5.2838  
 Optimizing Vs & Thickness - generation: 4; average & best misfits: -19.5452  
 -5.2838  
 Optimizing Vs & Thickness - generation: 5; average & best misfits: -17.1433  
 -5.2838  
 Optimizing Vs & Thickness - generation: 6; average & best misfits: -16.2943  
 -5.2838  
 Optimizing Vs & Thickness - generation: 7; average & best misfits: -16.3075  
 -5.2838  
 Optimizing Vs & Thickness - generation: 8; average & best misfits: -19.9477  
 -5.2838  
 Optimizing Vs & Thickness - generation: 9; average & best misfits: -16.9569  
 -5.2838

Model after the Vs & Thickness optimization (fixed Poisson values):

Vs (m/s): 216 315 377 420 676  
 Poisson: 0.4 0.35 0.3 0.3 0.3  
 Thickness (m): 2.7 5.2 5.9 6 0.3

Number of models considered to calculate the average model: 13

#####  
 RESULTS winMASW Pro  
 #####

Dataset: 5R.sgy  
 Analyzed curve: nunz52.cdp

==0== SECTION#3

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 MEAN MODEL

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VS (m/s): 215 313 383 431 680  
 Standard deviations (m/s): 5 7 27 35 14

Thickness (m): 2.8 5.2 6.2 6.5  
 Standard deviations (m): 0.3 0.5 0.5 0.7

Approximate values for vp, density & elastic moduli

Vp (m/s): 527 652 717 806 1272  
 Density (gr/cm3): 1.90 1.95 1.97 2.00 2.11  
 Vp/Vs ratio: 2.45 2.08 1.87 1.87 1.87  
 Poisson: 0.40 0.35 0.30 0.30 0.30  
 Young modulus (MPa): 246 516 753 967 2539  
 Shear modulus (MPa): 88 191 289 372 977  
 Lamé (MPa): 352 447 435 557 1464  
 Bulk modulus (MPa): 410 574 628 805 2115

Fundamental mode

Mean model

f(Hz)	VR(m/s)
4.97115	539.6965
6.01849	516.4959
8.89867	410.2113
11.2552	351.2723
17.6265	296.8915
48.5229	213.3674

==0== SECTION#4

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BEST MODEL

Vs (m/s): 216 315 377 420 676  
 thickness (m): 2.7401 5.2087 5.947 6

Approximate values for vp, density & elastic moduli

Vp (m/s): 529 656 705 786 1265  
 Density (gr/cm3): 1.90 1.95 1.97 2.00 2.11  
 Vp/Vs ratio: 2.45 2.08 1.87 1.87 1.87  
 Poisson: 0.40 0.35 0.30 0.30 0.30  
 Young modulus (MPa): 248 523 728 915 2508  
 Shear modulus (MPa): 89 194 280 352 965  
 Lamé (MPa): 354 453 419 529 1449  
 Bulk modulus (MPa): 413 582 606 763 2092

dispersion curve (frequency - Rayleigh phase velocity)

Fundamental mode)

best model

F(Hz)	VR(m/s)
4.97115	538.5183
6.01849	516.4195
8.89867	411.0481
11.2552	349.9174
17.6265	297.4429
48.5229	214.9485

==0== SECTION#5

Maximum penetration depth according to the "Steady State Rayleigh Method": 46 m

# winMASW Pro - Inversion of Surface-Wave Dispersion Curves

## Main results

See "winMASW\_report.txt" for further details.

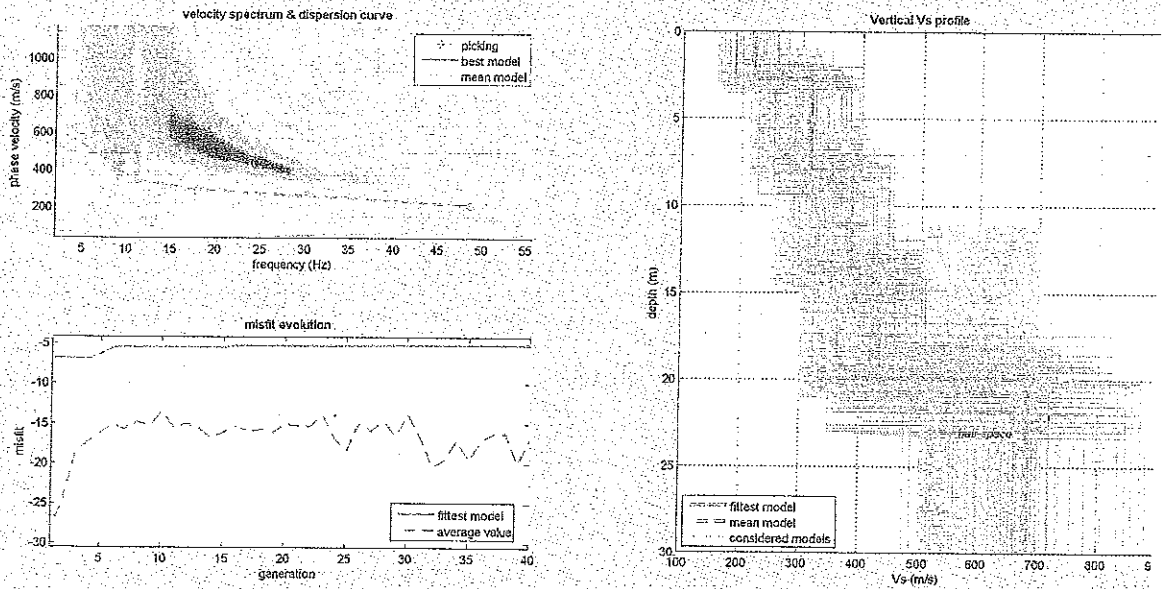
www.eliasoft.it

Date: 12/2/2011

Time: 19:23

Dataset: 5R.sgy

Considered dispersion curve: nunz52.cdp



dataset: 5R.sgy  
dispersion curve: nunz52.cdp  
VS30 (best model): 404 m/s  
VS30 (mean model): 402 m/s

### Mean model

Vs (m/s): 215, 313, 383, 431, 680

Standard deviations (m/s): 5, 7, 27, 35, 14

Thickness (m): 2.8, 5.2, 6.2, 6.5

Standard deviations (m/s): 0.3, 0.5, 0.5, 0.7

Density (gr/cm<sup>3</sup>): 1.90, 1.95, 1.97, 2.00, 2.11

Shear modulus (MPa): 88, 191, 289, 372, 977