

**RISULTATI INDAGINE MASW n° 1**  
**Podere Miciolaia, Serrazzano, Comune di Pomarance**

**L62**

dispersion curve: number of frequency-velocity points=9  
dataset: 5 metri.sgy  
minimum offset (m): 5  
geophone spacing (m): 2  
sampling (ms): 0.131  
dispersion curve: picking 5 metri.cdp  
number of individuals: 30  
number of generations: 41

Adopted search space (minimum Vs & thickness): 350 2 350 2 580 12 900  
Adopted search space (maximum Vs & thickness): 480 4 750 4 1030 18 1450  
Adopted Poisson values: 0.25 0.25 0.25 0.25

Rayleigh wave analysis

Optimizing Vs & Thickness - generation: 1; average & best misfits: -87.4524	-45.1207
Optimizing Vs & Thickness - generation: 2; average & best misfits: -69.4592	-34.5011
Optimizing Vs & Thickness - generation: 3; average & best misfits: -55.7722	-28.0845
Optimizing Vs & Thickness - generation: 4; average & best misfits: -54.5332	-17.6364
Optimizing Vs & Thickness - generation: 5; average & best misfits: -44.2759	-16.4227
Optimizing Vs & Thickness - generation: 6; average & best misfits: -48.6912	-16.4227
Optimizing Vs & Thickness - generation: 7; average & best misfits: -58.7824	-16.4227
Optimizing Vs & Thickness - generation: 8; average & best misfits: -58.3051	-16.4227
Optimizing Vs & Thickness - generation: 9; average & best misfits: -53.5207	-16.4227
Optimizing Vs & Thickness - generation: 10; average & best misfits: -49.2854	-16.4227
Optimizing Vs & Thickness - generation: 11; average & best misfits: -51.5719	-15.8087
Optimizing Vs & Thickness - generation: 12; average & best misfits: -42.4753	-15.8087
Optimizing Vs & Thickness - generation: 13; average & best misfits: -38.8377	-15.6899
Optimizing Vs & Thickness - generation: 14; average & best misfits: -37.3259	-13.7963
Optimizing Vs & Thickness - generation: 15; average & best misfits: -45.0318	-13.7963
Optimizing Vs & Thickness - generation: 16; average & best misfits: -47.8705	-13.7963
Optimizing Vs & Thickness - generation: 17; average & best misfits: -39.4392	-13.7963
Optimizing Vs & Thickness - generation: 18; average & best misfits: -43.8424	-13.7963
Optimizing Vs & Thickness - generation: 19; average & best misfits: -52.4659	-13.7963
Optimizing Vs & Thickness - generation: 20; average & best misfits: -41.6119	-13.7963
Optimizing Vs & Thickness - generation: 21; average & best misfits: -39.208	-12.6156
Optimizing Vs & Thickness - generation: 22; average & best misfits: -41.066	-12.6156
Optimizing Vs & Thickness - generation: 23; average & best misfits: -34.9942	-12.5209
Optimizing Vs & Thickness - generation: 24; average & best misfits: -44.5541	-11.2983
Optimizing Vs & Thickness - generation: 25; average & best misfits: -39.3698	-11.2983
Optimizing Vs & Thickness - generation: 26; average & best misfits: -39.6613	-11.0945
Optimizing Vs & Thickness - generation: 27; average & best misfits: -40.0559	-11.0945
Optimizing Vs & Thickness - generation: 28; average & best misfits: -40.4839	-11.0945
Optimizing Vs & Thickness - generation: 29; average & best misfits: -41.7943	-11.0945
Optimizing Vs & Thickness - generation: 30; average & best misfits: -37.8957	-11.0945
Optimizing Vs & Thickness - generation: 31; average & best misfits: -45.7495	-11.0945
Optimizing Vs & Thickness - generation: 32; average & best misfits: -41.0408	-11.0945
Optimizing Vs & Thickness - generation: 33; average & best misfits: -43.5754	-10.3592
Optimizing Vs & Thickness - generation: 34; average & best misfits: -38.1211	-10.3592
Optimizing Vs & Thickness - generation: 35; average & best misfits: -41.0877	-10.3592
Optimizing Vs & Thickness - generation: 36; average & best misfits: -40.7116	-10.3592
Optimizing Vs & Thickness - generation: 37; average & best misfits: -40.1818	-10.3592
Optimizing Vs & Thickness - generation: 38; average & best misfits: -43.9643	-10.3592
Optimizing Vs & Thickness - generation: 39; average & best misfits: -48.3249	-10.3592
Optimizing Vs & Thickness - generation: 40; average & best misfits: -47.9022	-10.3592
Optimizing Vs & Thickness - generation: 41; average & best misfits: -42.3838	-10.3592

Rayleigh wave analysis

Optimizing Vs & Thickness - generation: 1; average & best misfits: -37.9384	-10.3592
Optimizing Vs & Thickness - generation: 2; average & best misfits: -41.2106	-10.3592
Optimizing Vs & Thickness - generation: 3; average & best misfits: -47.6426	-10.3592
Optimizing Vs & Thickness - generation: 4; average & best misfits: -47.4588	-10.3592
Optimizing Vs & Thickness - generation: 5; average & best misfits: -50.1385	-10.3592
Optimizing Vs & Thickness - generation: 6; average & best misfits: -46.5701	-10.3592
Optimizing Vs & Thickness - generation: 7; average & best misfits: -43.101	-10.3592
Optimizing Vs & Thickness - generation: 8; average & best misfits: -42.4028	-10.2814
Optimizing Vs & Thickness - generation: 9; average & best misfits: -47.8954	-10.2814
Optimizing Vs & Thickness - generation: 10; average & best misfits: -46.2894	-10.2814
Optimizing Vs & Thickness - generation: 11; average & best misfits: -47.879	-10.2814

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

Vs (m/s): 390 604 866 1438

Poisson: 0.25 0.25 0.25 0.25

Thickness (m): 2.7 2.5 14

Number of models considered to calculate the average model: 9

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RESULTS winMASW Pro  
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## MEAN MODEL

VS (m/s): 390 603 866 1438

Standard deviations (m/s): 0 0 0 0

Thickness (m): 2.7 2.5 12.9

Standard deviations (m): 0.0 0.0 0.0

Approximate values for Vp, density & elastic moduli

Vp (m/s): 675 1044 1500 2491

Density (gr/cm3): 1.96 2.06 2.15 2.28

Vp/Vs ratio: 1.73 1.73 1.73 1.73

Poisson: 0.25 0.25 0.25 0.25

Young modulus (MPa): 745 1876 4036 11767

Shear modulus (MPa): 298 751 1614 4706

Lamé (MPa): 297 749 1614 4710

Bulk modulus (MPa): 495 1249 2691 7848

Fundamental mode - Mean model

f(Hz) VR(m/s)

10.5119 1116.4611

11.0928 1102.6162

13.2711 1044.2346

18.0634 871.6022

30.6976 649.77151

38.83 585.17311

48.2693 501.24342

62.6461 421.13645

75.716 390.24259

## BEST MODEL

Vs (m/s): 389.88063 603.79547 865.83345 1438.297

thickness (m): 2.67881 2.47804 14.1435

Approximate values for Vp, density & elastic moduli

Vp (m/s): 675 1046 1500 2491

Density (gr/cm3): 1.96 2.06 2.15 2.28

Vp/Vs ratio: 1.73 1.73 1.73 1.73

Poisson: 0.25 0.25 0.25 0.25

Young modulus (MPa): 744 1883 4036 11767

Shear modulus (MPa): 298 753 1614 4707

Lamé (MPa): 297 753 1614 4710

Bulk modulus (MPa): 495 1255 2691 7848

Fundamental mode - Best model

F(Hz) VR(m/s)

10.5119 1104.4017

11.0928 1089.2595

13.2711 1023.6195

18.0634 838.32129

30.6976 646.59288

38.83 583.93233

48.2693 500.21034

62.6461 420.59588

75.716 389.8884

Maximum penetration depth according to the "Steady State Rayleigh Method": 44 m

Inversion quality: very good

VS5 (mean model): 467 m/s

VS20 (mean model): 735 m/s

VS30 (mean model): 878 m/s

VS5 (best model): 467 m/s

VS20 (best model): 720 m/s

VS30 (best model): 863 m/s

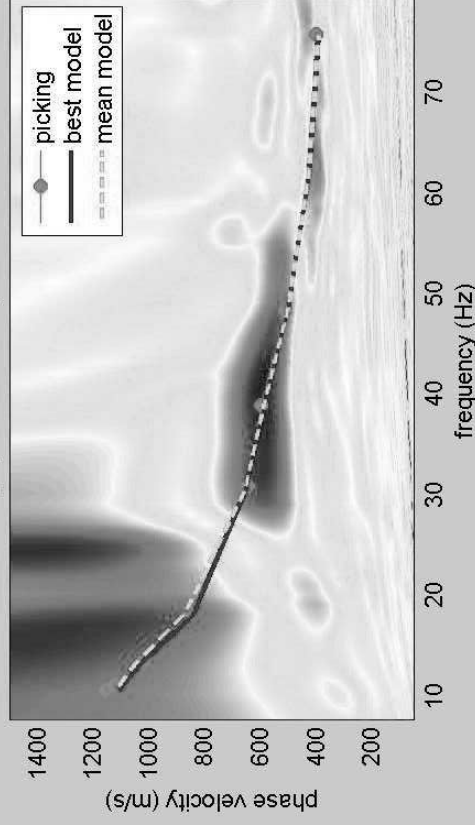
winMASW 4.2 Pro

Surface Wave Analysis

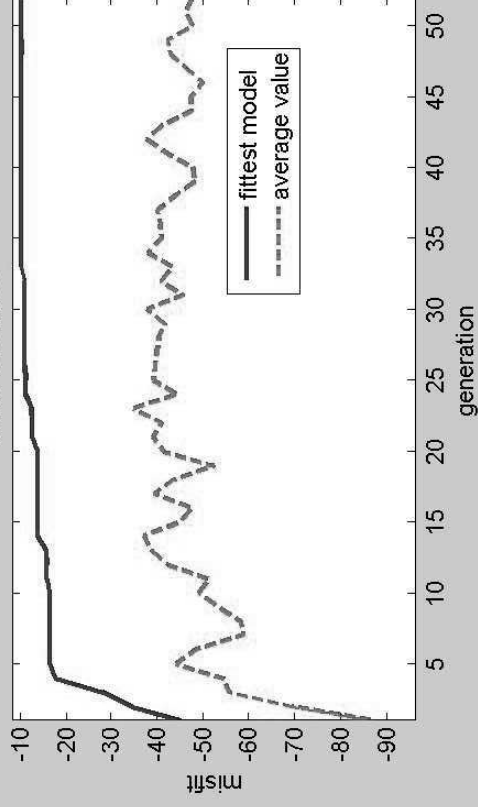
via MASW - Multichannel Analysis of Surface Waves

www.eliosoft.it

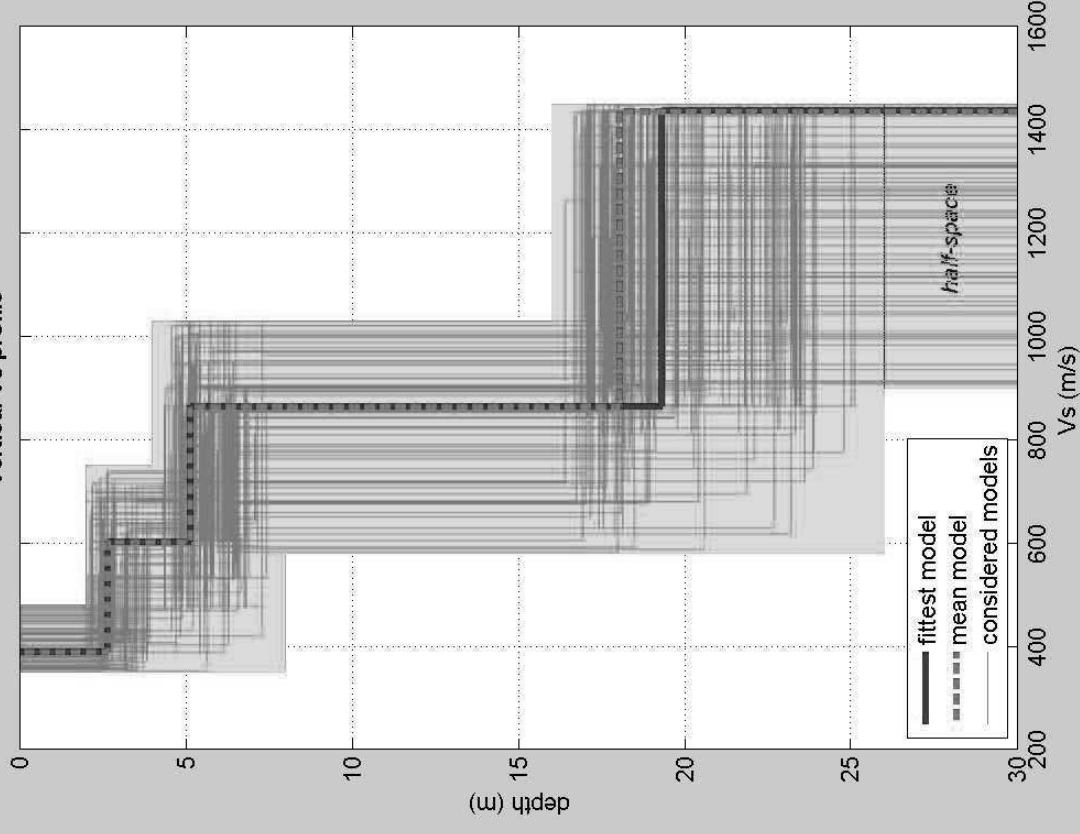
velocity spectrum & dispersion curve



misfit evolution



Vertical Vs profile



dataset: 5 metri.sgy

dispersion curve: picking 5 metri.cdp

VS30 (best model): 863 m/s

VS30 (mean model): 878 m/s

