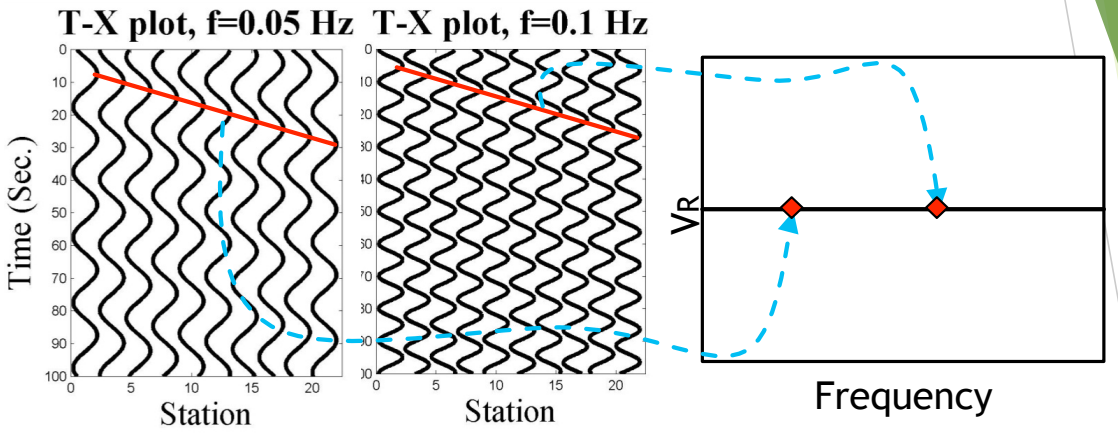
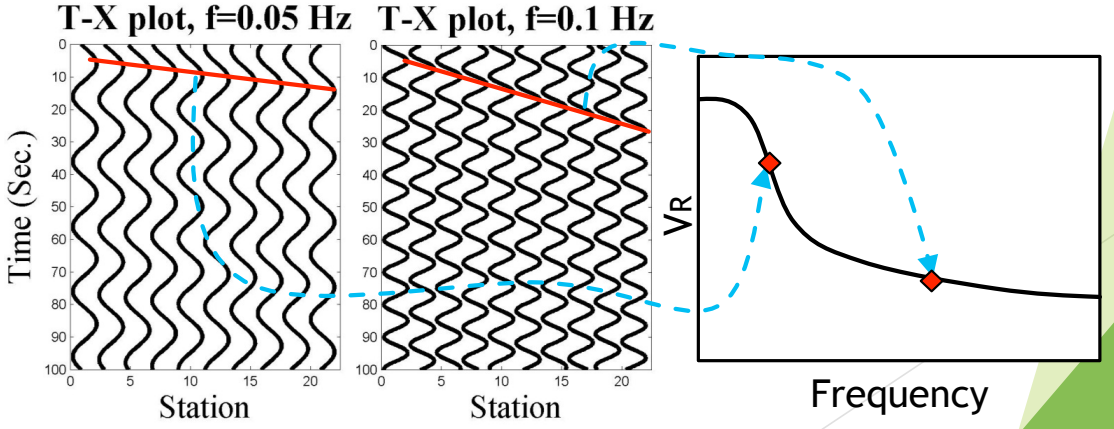
Inversion of Phase Velocity Dispersion Curves

Heterogeneity : Source for Dispersion





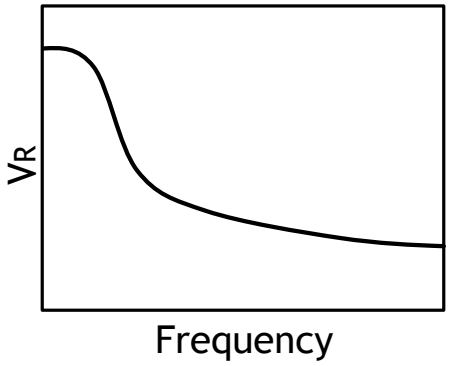
Dispersion Curve and Inversion Concepts

Known Profile

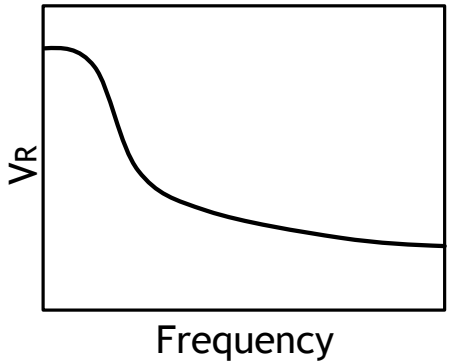
ρ_1	$V_{P,1}$	$V_{S,1}$	H_1
ρ_2	$V_{P,2}$	$V_{S,2}$	H_2
ρ_3	$V_{P,3}$	$V_{S,3}$	H_3
ρ_4	$V_{P,4}$	$V_{S,4}$	H_4

Theoretical
Forward Method

Theoretical Dispersion curve



Experimental Dispersion curve

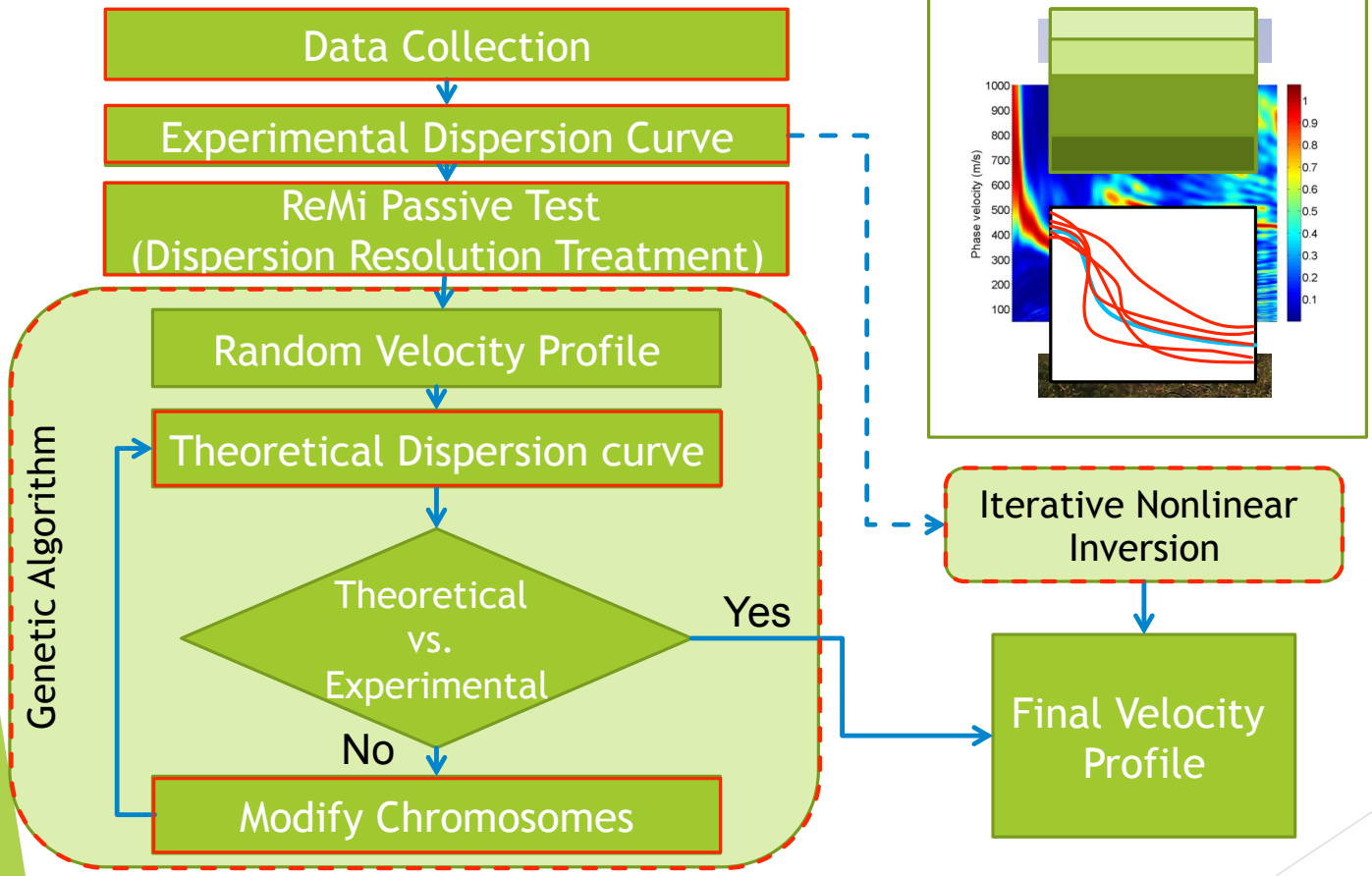


Inversion

Unknown Profile

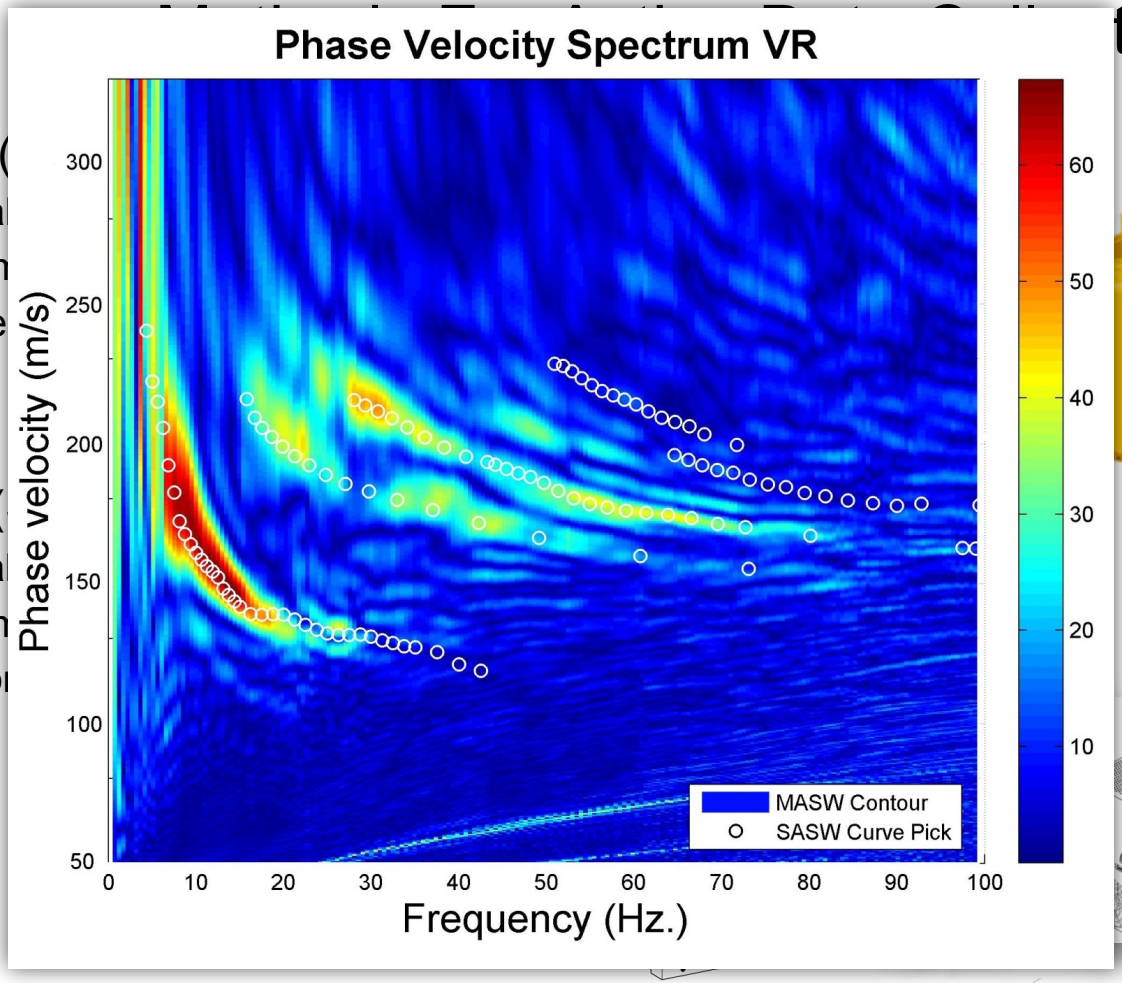
ρ_1	$V_{P,1}$	$V_{S,1}$	H_1
ρ_2	$V_{P,2}$	$V_{S,2}$	H_2
ρ_3	$V_{P,3}$	$V_{S,3}$	H_3
ρ_4	$V_{P,4}$	$V_{S,4}$	H_4

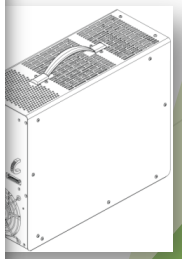
Inversion Methodology



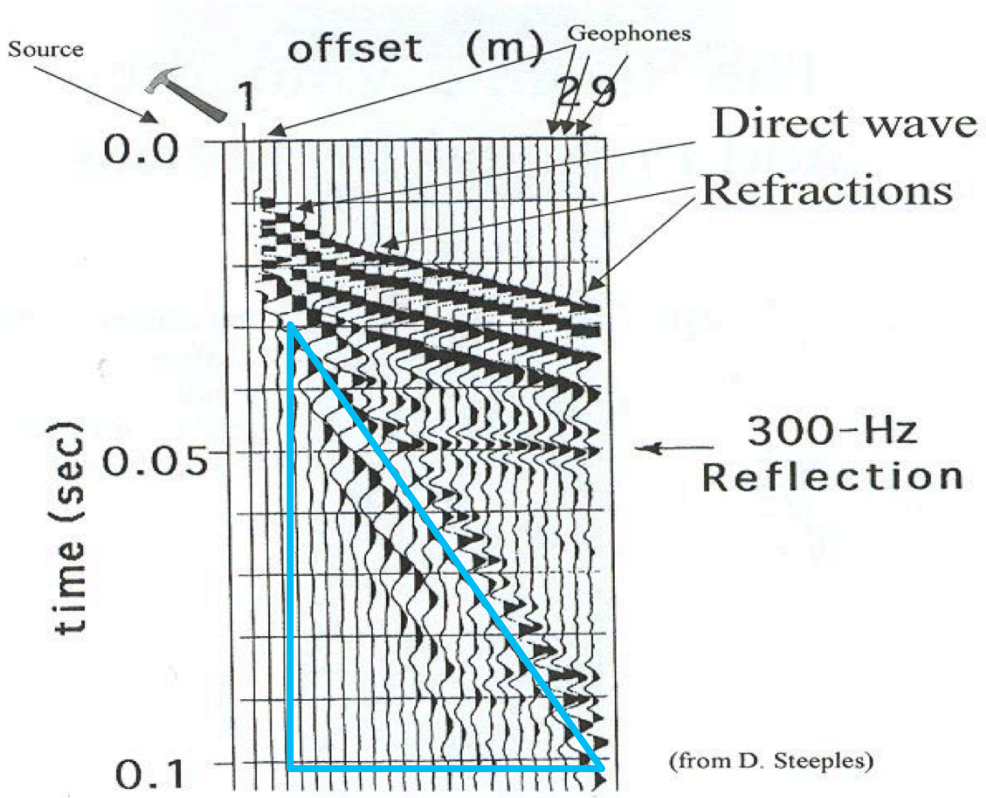
Com tion

- MASW (
  - Vertica
  - Uniform
  - Sledge
- SASW (
  - Vertica
  - Uniform
  - Harmo

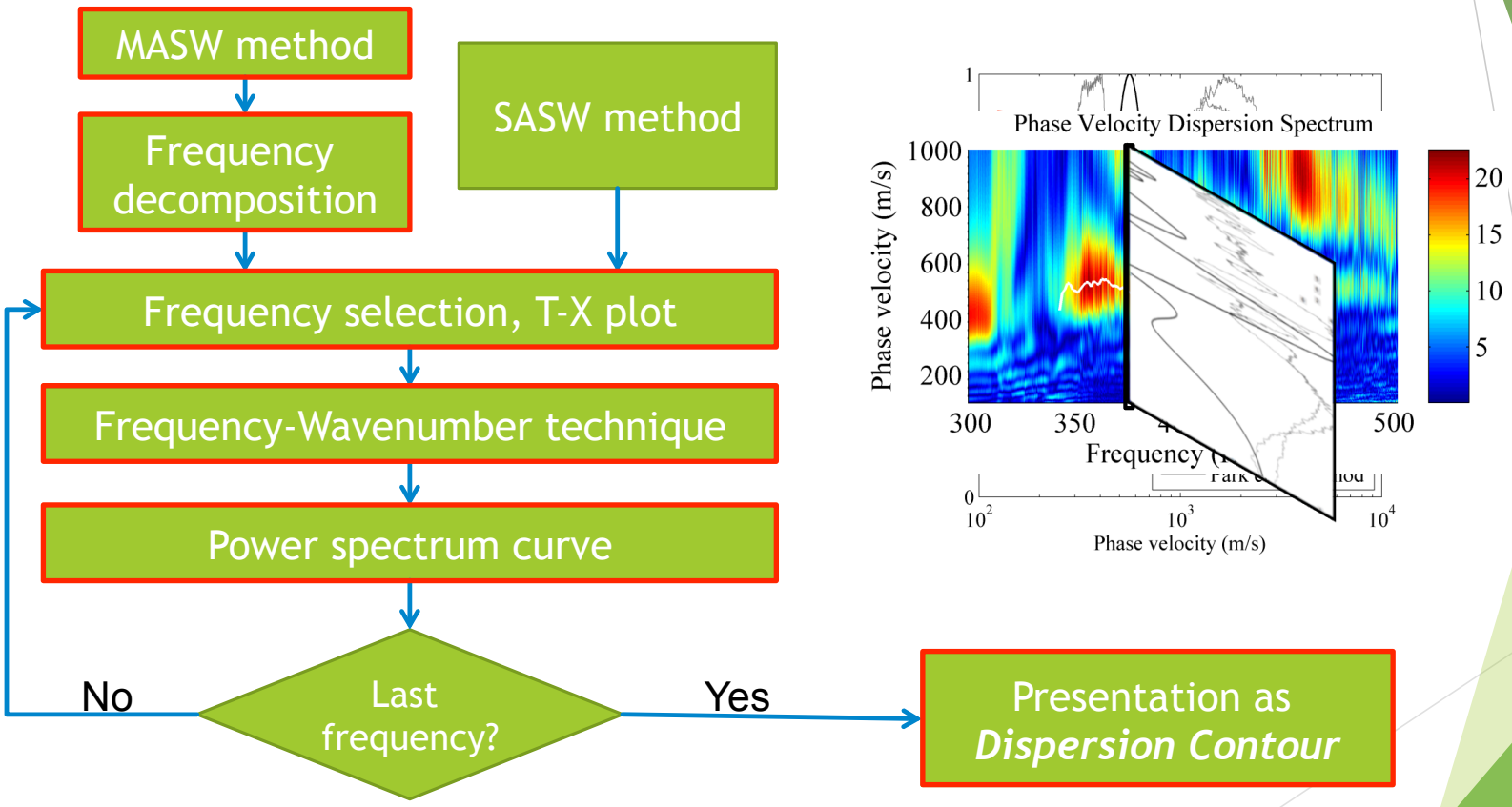


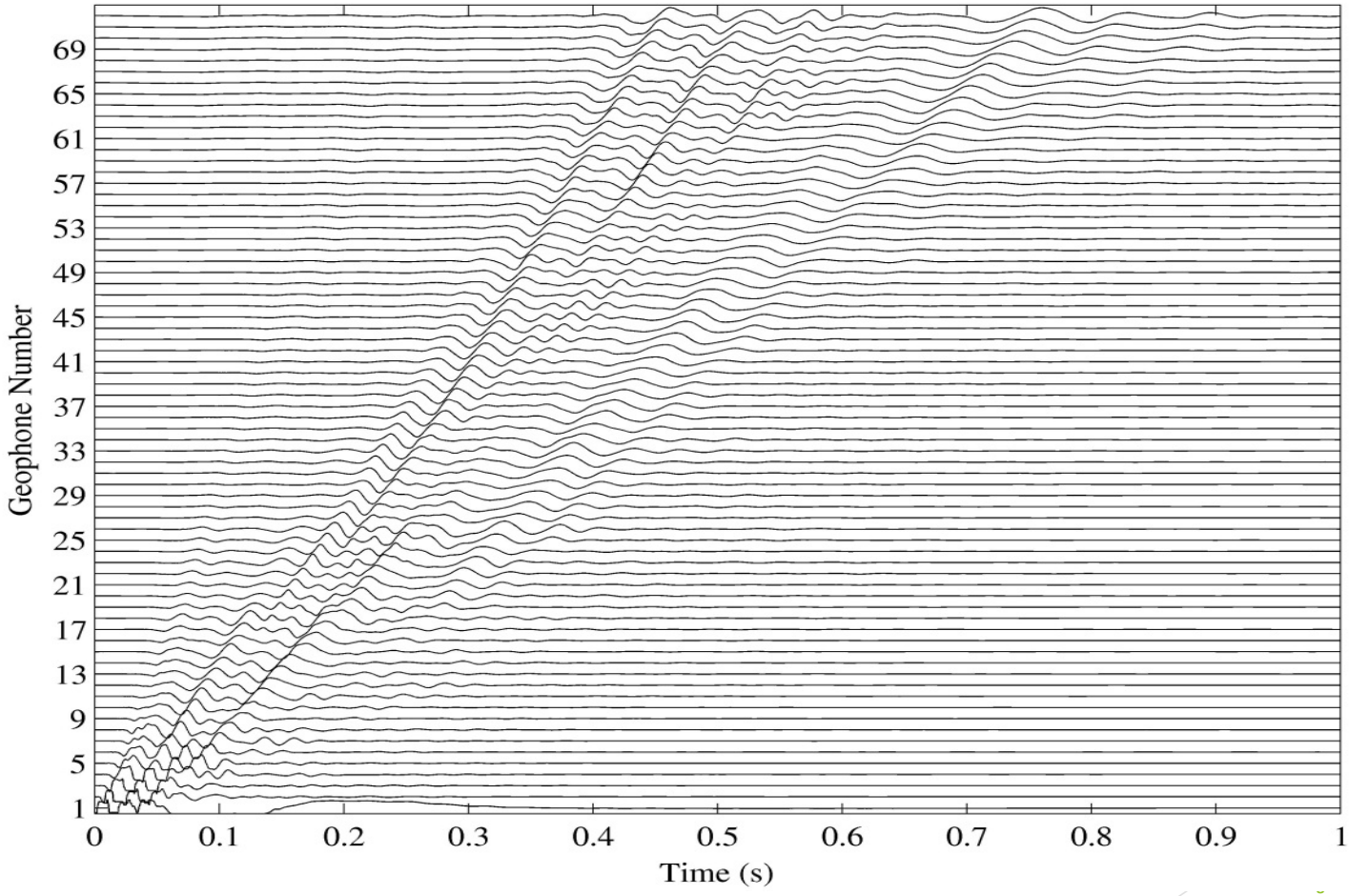


T-X Plot in Reality



Experimental Dispersion Curve




Geophone Number
69
65
61
57
53
49
45
41
37
33
29
25
21
17
13
9
5
1
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1
Time (s)

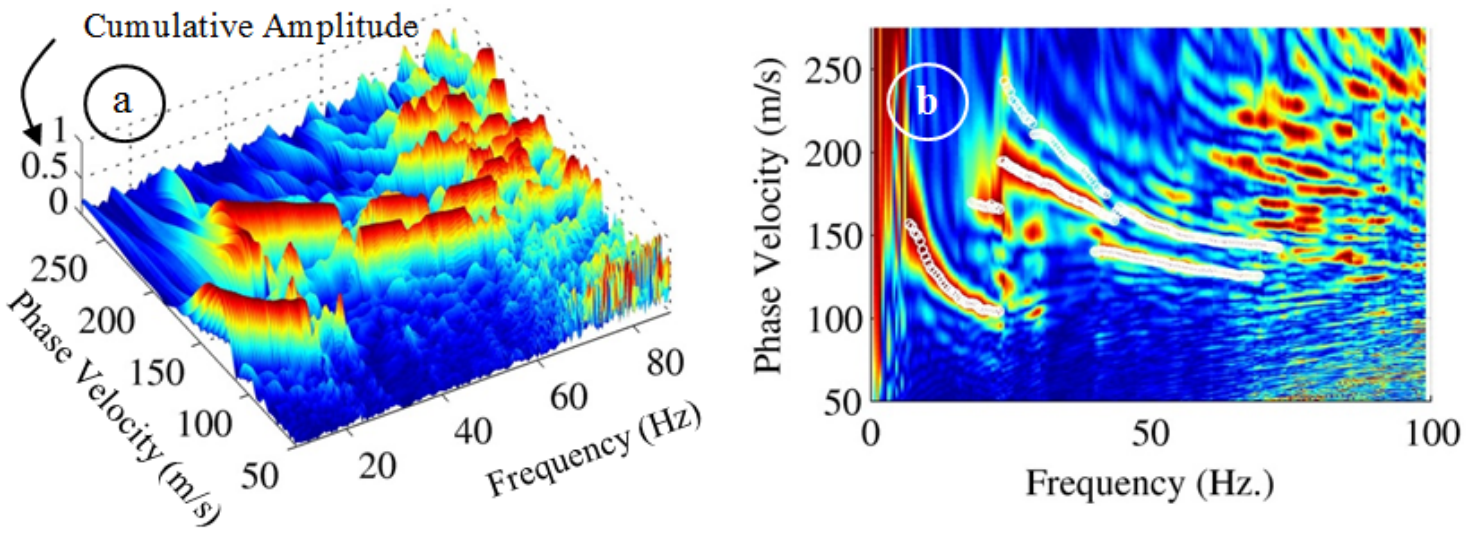
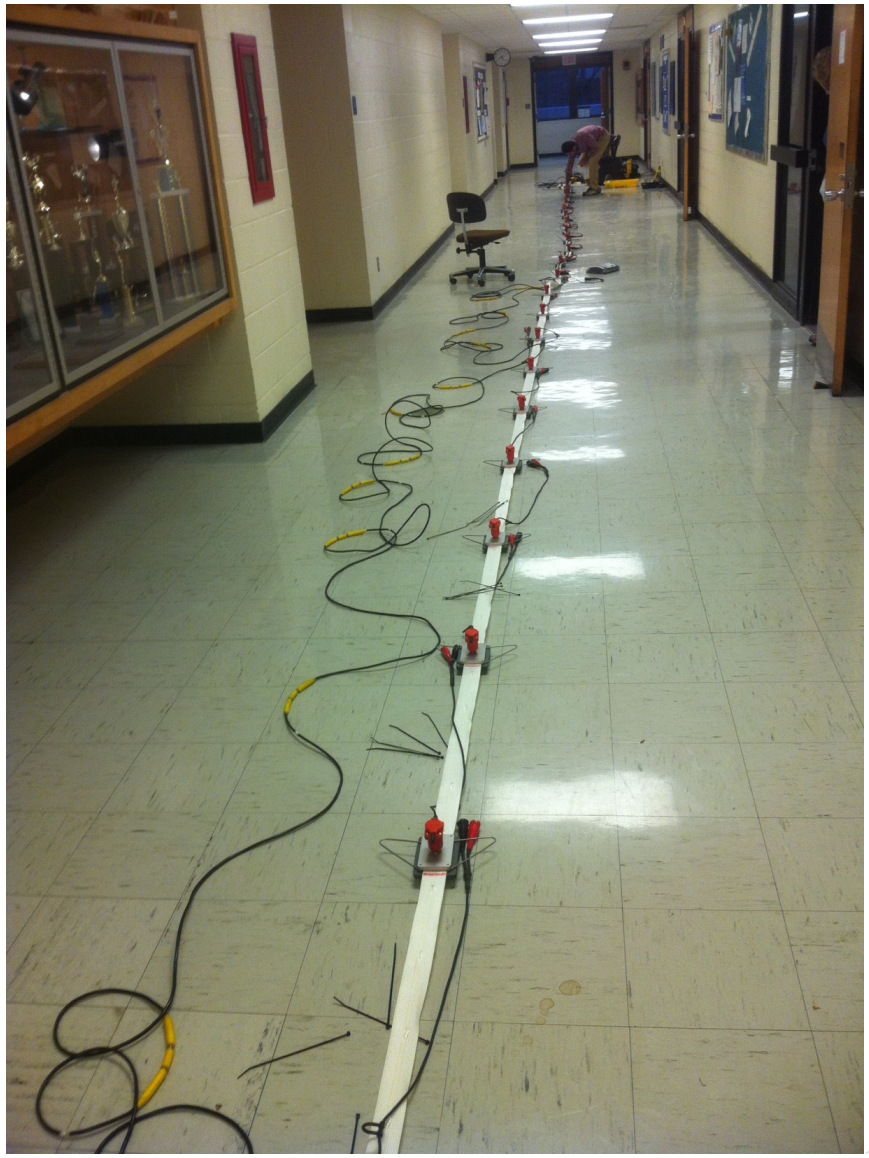
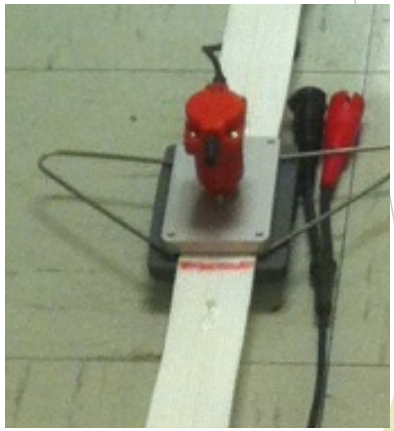


Figure 6.4. (a) Phase velocity spectrum $\mathbf{P}(f, V_R)$ is plotted as a function of phase velocity and frequency. (b) Two dimensional representation of the same spectrum in (a). Final phase velocity dispersion curve (white circle) is determined by picking high amplitude points.

Downhole





MASW

Questions ?