Multichannel Analysis of Surface Waves (3A)

Young Won Lim
14년 2월 14일

Please send corrections (or suggestions) to youngwlim@hotmail.com.

This document was produced by using OpenOffice and Octave.

Young Won Lim
14년 2월 14일

Multichannel Analysis (1)

a fast method of evaluating near-surface *vs* profile
without changing receiver configuration
the inclusion of noise wavefields
- body waves (direct, refracted, reflected, and air waves)
- reflected
- higher-modes

ground roll can be identified
- by their different coherency in arrival times on a multi-channel record and

can be handled properly
- by various kinds of multi-channel data processing techniques

the strong first arrivals (refraction events) is most troublesome.
Inclusion of nonplanar Rayleigh waves

Multichannel Analysis (2)

On a Vibroseis uncorrelated record,
all the characteristics of ground roll
can be identified on the level of each single frequency component
because each individual frequency component is
represented in isolation with other components.

Cross-Correlation of Stacked Amplitudes with Sweep (CCSAS) can be used to construct the dispersion curve.

Multichannel Analysis

does not attempt to calculate individual phase velocity first
constructs an image space
finds out dispersion trends from the pattern of energy accumulation in this space
extracts the necessary dispersion curves by following the image trends.

all kinds of seismic waves can be found in this space, having significant energy

imaging process,
a multichannel record in time (t)-space (x) domain is transformed into
either frequency (f)-wavenumber (Kx)
- the traditional f-k method

or frequency (f)-phase velocity (Cf) domain.
- the pi-omega transformation (McMechan and Yedlin, 1981)
- the phase-shift method (Park et al., 1998)

the f-k method results in the lowest resolution in imaging
the phase-shift method achieves the higher resolution than the pi-omega method (Park et al., 1998; Moro et al., 2003).

References

[1] http://en.wikipedia.org/
[2] C.B. Park, et. al, “Multi-Channel Analysis of Surface Waves (MASW)”
[3] www.masw.com