F-K Domain Analysis (3A)

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2D FT seismic example

24 receivers   each with 25m spacing

Time Shift 15 ms/trace

Seismogram Total Length 1sec

Sampling Period 0.001 sec $f_s = 1000 \ samples/sec$

Narrow band signal's frequency 12 Hz

Phase Velocity?

15 ms/trace * 23 trace   = 345 ms   = 0.345 sec

12 Hz $\Rightarrow$ 12 cycles / sec   * 0.345 s   = 4.14 cycles

25m spacing $\Rightarrow$ 25m* 23   = 575 m   = 0.575 km

$$k = \frac{4.14 \ cycles}{0.575 \ km} \qquad\qquad k = \frac{2\pi}{\lambda}$$

2D FT seismic example

$$k \;=\; \frac{4.14 \;\; cycles}{0.575 \;\; km} \qquad\qquad\qquad k \;=\; \frac{2\,\pi}{\lambda}$$

References

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