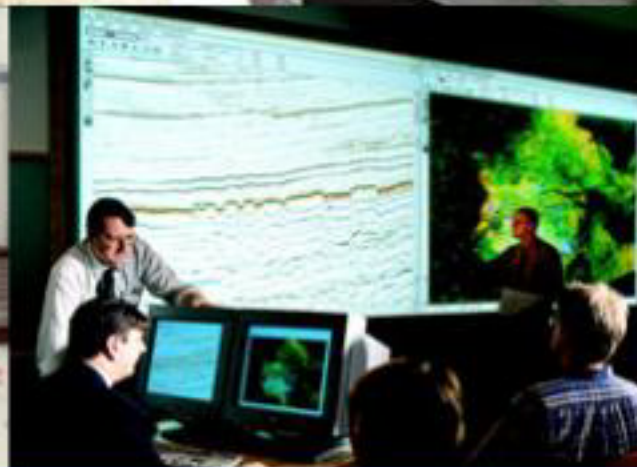
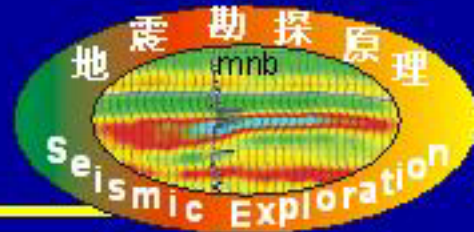


# 地震勘探原理 双语教学材料



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## Exercise 11:

- 20 Hz seismic wave
- Travels with 5 km/s
- Propagates for 1000 m. through  
Medium: absorption coefficient  $0.25 \text{ dB}/\lambda$
- What is the wave attenuation in dB due solely to absorption?

## Exercise 12:

- Wave with  $\lambda=100$  m propagates through homogeneous medium
- Between two detectors at radial distances of 1 km and 2 km the wave amplitude is attenuated by 10 dB.
- Calculate contribution of geometrical spreading to this value of attenuation and, thus, determine the absorption coefficient of the medium in dB/  $\lambda$ .

## Exercise 13

Sampling at 4ms intervals

- What is the Nyquist frequency
- In absence of anti-alias filtering, at what frequency would noise at 200 Hz be aliased back into the Nyquist interval?

# Exercise 14

Determine the parameters for a seismic measurement.

- (a) The interesting Frequencies are between 30 Hz and 400 Hz.  
Which sampling interval should be used for this measurement?  
What is the Nyquist frequency for the used sampling interval
- (b) The target of the measurements is present at about 300 m depth.  
The maximum offset used is 200 m. We assume that the seismic velocities are between 1000 m/s and 2000 m/s (obtained from e.g. Refraction measurements). How long should the time window be?
- (c) The measurements, for the parameters determined in (a) und (b), are measured with a 120-channel-System. The system stores the data using 4-Bytes per value. How much space on a harddrive is needed for 600 shots?
- (d) The Geophones have a separation of 5m. Every 20m a shot is fired.  
What is the fold using a 80 channel system?

# Exercise 15

The following dataset was obtained from a reversed seismic refraction line 275 m long. The survey was carried out in a level area of alluvial cover to determine depths to the underlying bedrock surface.

Carry out a plus-minus interpretation of the data and comment briefly on the resultant bedrock profile.

Offset	Forward	Reverse
12.5	6	6
25	12.5	12.5
37.5	19	17
50	25	19.5
75	37	25
100	42.5	30.5
125	48.5	37.5
150	53	45.5
175	57	52
200	61.5	59
225	66	65.5
250	71	71
275	76.5	76.5