地震勘探原理 双语教学材料

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Exercise 22

(a) Make a list of the important processing steps in seismic data processing and shortly describe the processing step in one sentence

(b) Explain spatial aliasing and explain the spatial sampling criterium. (not discussed in 06/07)

(c) What is the aim of migration?

(d) What is the relation between the real dip (α_{real}) and the dip in a stacked section (α_{stack}) for a dipping layer? Explain this in detail with sketches of the two dips.

Exercise 23

Discuss the following differences between the P-wave seismic method and the GPR

- draw a CMP measurement for both cases and show interface waves, air waves, ground wave, reflected and refracted waves. Is velocity generally increasing or decreasing with depth?
- Range of velocities ms or ns, frequencies, Depth penetration
- Air wave velocities for GPR and Seismic
- Longitudinal or Transversal wave propagation
- Common measurement setup
- Typical applications
- Used sources / receivers

Exercise 24

- You have unmigrated and migrated seismic sections for a particular profile. A planar interface indicates slopes of 25 and 30 degrees before and after migration. Do these values fit with simple geometrical relations? If they do not fit, give an explanation.

Exercise 25

- On a seismic record, a reflection is seen to extend between two points A and B, where average seismic velocity is 2500 m/s. Termination of the reflection is attributed to faults. Point A is at x=100 m and t0=1.75 s, and point B is at x=1500 m and t0=1.25 s. Determine the actual location of faults by computing coordinates for the points A and B after migration.
- Compute the length of reflector segments before and after migration. Which one is shorter?

Exercise 26

Construct an unmigrated zero-offset section from the geological structure shown in the figure on the next page (Diffractions etc.).