

TPG4190 Seismic data acquisition and processing

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Curriculum

1. Martin LandrøLecture notes Sections 2.2-2.10
2. Lecture 1: Sources
3. Lecture 2: Receivers
4. Lecture 3: The CMP method
5. Lecture 4: Fourier transforms
6. Lecture 5: Deghosting
7. Lecture 6: Seismic modelling
8. Lecture 8: Filters
9. Lecture 9: Processing
10. Lecture 12: Reverse-Time Migration (RTM)
11. Lecture 15: Ray modelling
12. Lecture 17: Radon demult
13. Lecture 18: Surface Related Multiple Removal (SRME)
14. Lecture 19: Tomography
15. Lecture 21: Full Waveform Inversion (FWI)

Sources

1. What is an airgun
2. Bubble
3. P/B ratio
4. Ghost
5. Ghost spectrum - depth relation

Recivers

1. Array response of receiver groups
2. Anti-Aliasing

CMP method

1. CMP sorting
2. Fold
3. 2D - 3D Flip-Flop sources
4. NMO - Stack
5. RMS velocity

Fourier transforms

1. What is a Fourier transform
2. Simple Fourier transforms
3. Nyquist limit, sampling, Aliasing

Deghosting

1. Up-Down separation

Seismic modelling

1. What is it?
2. What is it used for?

Filters

1. Convolution in the Fourier domain
2. impulse response
3. Common filters and what are they used for
4. F-K filters

Processing

1. Basic processing sequence
2. Principle for migration (imaging)
3. Kirchhoff migration

Reverse time migration

1. What is RTM
2. Cost/Benefit

Ray modelling

1. What are rays?
2. How is Ray modelling used?

Radon transform

1. What is the Radon transform
2. How is the Radon transform used for removing multiples?

SRME

1. What is the basic idea behind SRME?

Tomography

1. What is tomography

FWI

1. What is Full Waveform Inversion?
2. What is FWI used for?