4D monitoring enhancement with LostCor filtering – A case study

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Matthieu Botz
matthieu.botz@estimages.com
4D monitoring enhancement with LostCor filtering

**Case study highlights**

- 2 full stack seismic volumes over an area of ~600km²: base and monitor surveys acquired with an 8 years interval
- 4 regional interpretations
- Other geological input: located cemented zones, coherency attribute

A short-scale isotropic artefact is identified on both full stack volumes. It accounts for ~20% of the total spatial variability of the data sets.
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**LostCor filtering**

**Baseline**

**Key parameter:** correlation coefficient

**Monitor**

**full stack cross-line section**

200 ms TWT

2500 m

NW SE

2D monitoring enhancement with LostCor filtering – A case study
4D monitoring enhancement with LostCor filtering

LostCor filtering

Baseline

Key parameter: correlation coefficient

Monitor

full stack cross-line section

NW

SE

2500m

200 msTWT
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4D difference: Base - Monitor

Thanks to **local parameters (M-GS®)**, filtering with **multi-variable approach**, parallel to reservoir dip, has attenuated steeply dipping events whilst maintaining the signal strength from the reservoir.

A **co-variogram model** is used to filter out the noise components of the base and monitor simultaneously. As a result, reflectors parallel to the reservoir are strengthened whereas reflectors with steeper dip are attenuated.
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![Cross-line vertical section](image)

A **co-variogram model** is used to filter out the noise components of the base and monitor simultaneously. As a result, reflectors parallel to the reservoir are strengthened whereas reflectors with steeper dip are attenuated.
Co-filtering the base and monitor with the LostCor model enables easier interpretation of 4D difference attributes: all 4D QC properties are improved and the amplitude difference shows a more laterally consistent response around producing wells. Vertical resolution is not affected (no change in frequency spectrum).

Combination of multi-variable geostatistics and local parameters ensures the optimal removal of all types of noise.
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4D observations and conclusions

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