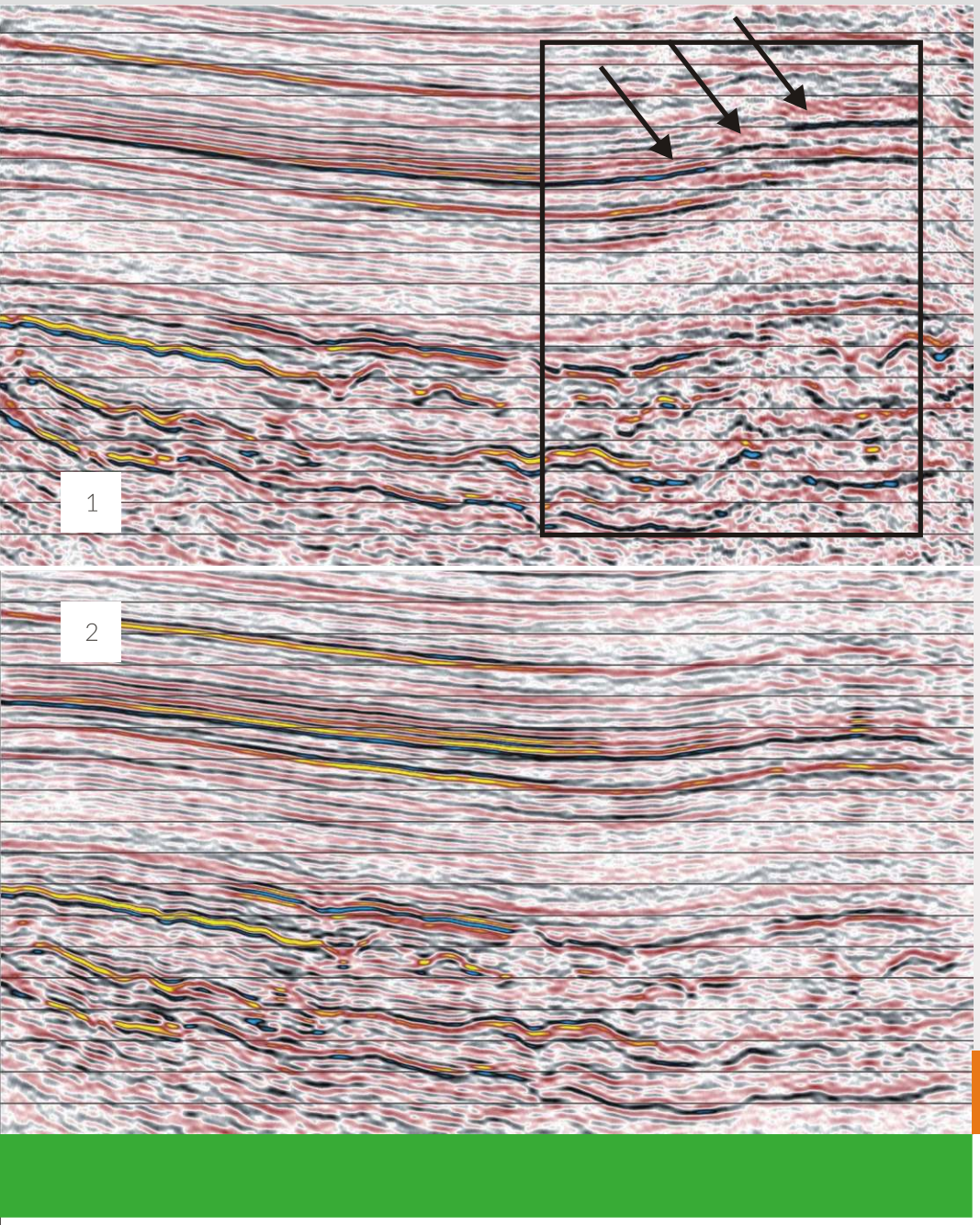


1 - Conventional seismic section
2 - Section after HVC processing

# HIGH VELOCITY CORRECTIONS (HVC)
# INTERACTIVE RESIDUAL STATIC CORRECTIONS (IRSC)
# MODELING LOW VELOCITY LAYER (MLVL)

SEISMIC STATICS WITHOUT COMPROMISE

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GRUPA PGNiG

# GT PROCESSING SOLUTIONS

## HIGH VELOCITY CORRECTIONS (HVC)

## INTERACTIVE RESIDUAL STATIC CORRECTIONS (IRSC)

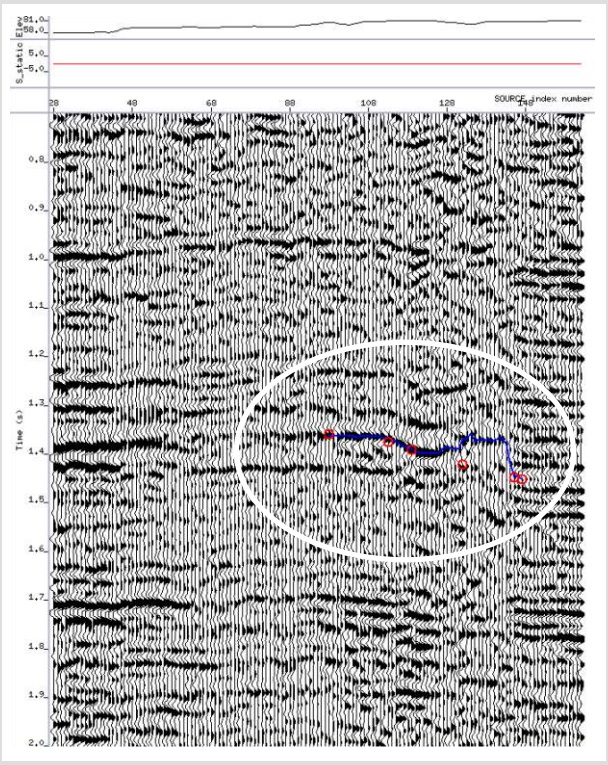
## MODELING LOW VELOCITY LAYER (MLVL)

There are areas where near-surface intervals cast large and complex deformations on seismic data. Only hybrid solutions consisting of several methods are able to bring proper static corrections. Such composite procedures need interpretive approach for both, workflow setting and QC. GT developed a comprehensive set of processing modules to solve even the most complicated cases regarding statics estimation. For most demanding problems, advanced proprietary GT solutions can be applied:

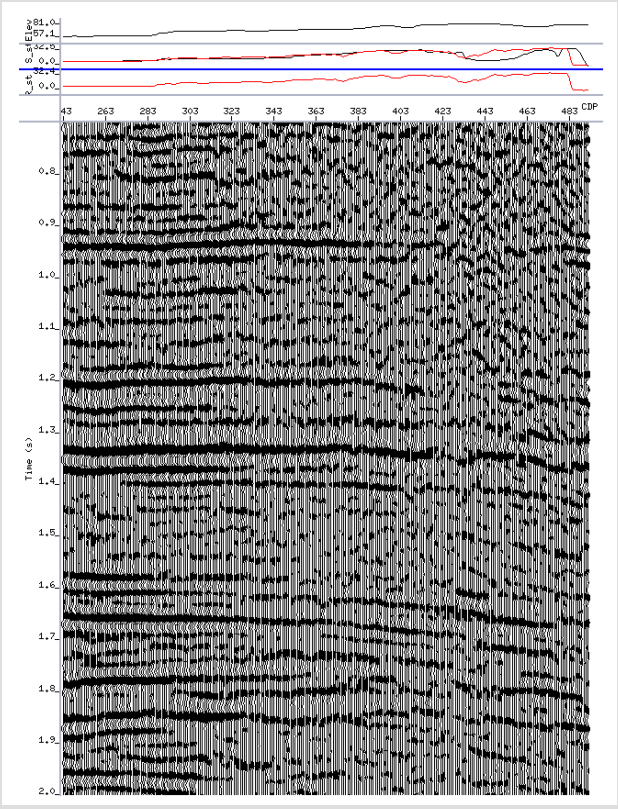
- Interactive Residual Static Corrections (IRSC)
- Advanced modeling of LVL (MLVL)
- High velocity correction for shallow anomalies (HVC)

IRSC is a software subpackage used when residual statics are larger than half of dominant period of the seismic wavelength, thus generating cycle skips. While lowering frequencies with low-pass bandpass or applying wavelet envelop, can help in some cases, more general and reliable solution is a generation of common source, common receiver and CDP stacks, and subsequent interpretation of sections at different stages.

IRSC session can include several iterations: application of partial static corrections and stacks in various domains interleaved with interpretations and trial stacks, with velocity analysis as a final check.



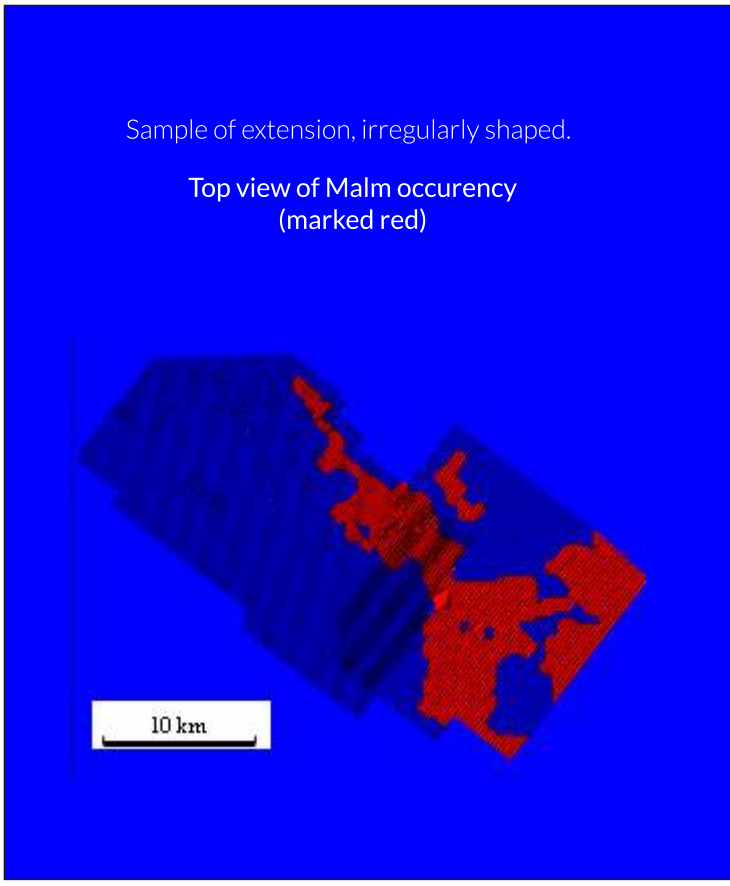
Horizon interpreted on input COS section



QC: CMP section after correction

HVC was originally developed in GT to solve supplement refraction statics in areas of high velocity anomalies at 200 to 400 m depth (Upper Jurassic called Malm). Bodies are large, of irregular shape, cause large time delays and their bottom does not generate refractions by their nature (velocity inversion known as hidden layers phenomenon). GT's solution resembles a way of building a salt body model, but is designed to work in time domain, with 3D seismic characterized by low stacking fold that does not provide continuous reflection image.

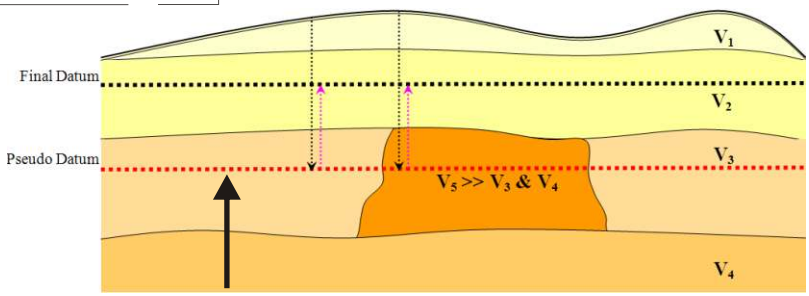
Statics compensating for the high velocity bodies are estimated as surface-consistent, shot and receiver components. Values of statics are usually large. Once pre-stack depth migration is being applied, results of the HVC are removed to avoid double correction. The model of the high velocity anomaly can be merged into a Pre-SDM initial velocity model.



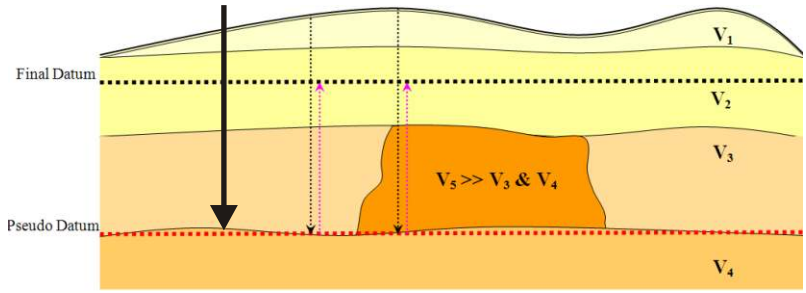

## In areas of complex near surface geology, final static solutions can comprise of:

- Automatic residual statics
- Refraction statics for the hole area but high velocity subarea
- HVC statics only for areas with high velocity anomalies
- Interactive residual static corrections (IRSC)

three components merged



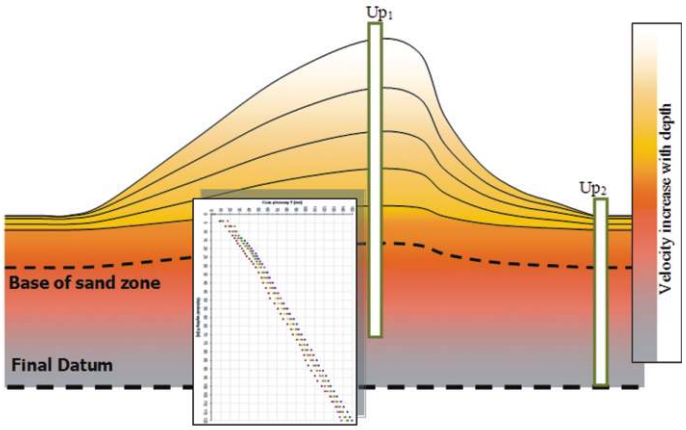

Working datum is sinked through iterations



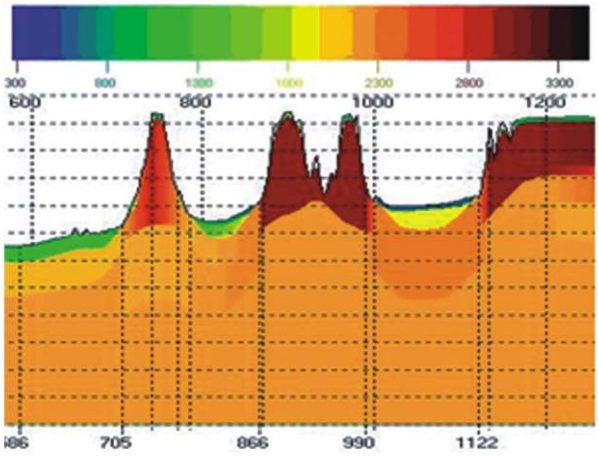

View of the Malm body.
High velocity (up to 5000 m/s) causes not only time delays, but large inaccuracies in CMP stacking (see front cover).

# LVL modeling

In some cases, refraction statics (GLI inversion or refraction tomography) are not sufficient enough. Comprehensive testing indicates that, in some areas, LVL modeling is necessary.

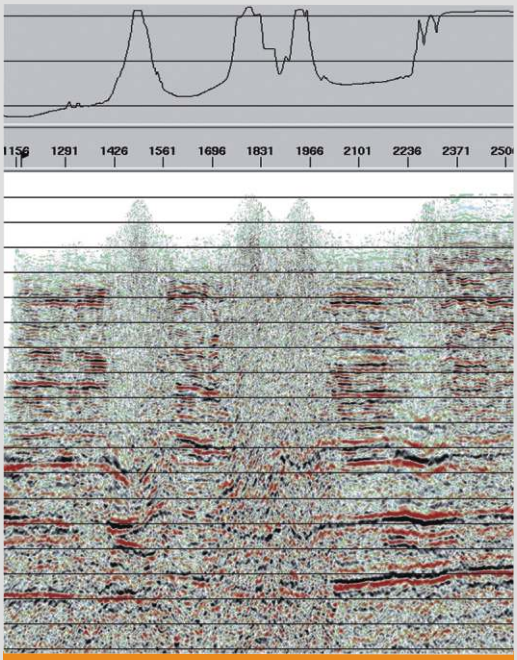



Idea of LVL modeling

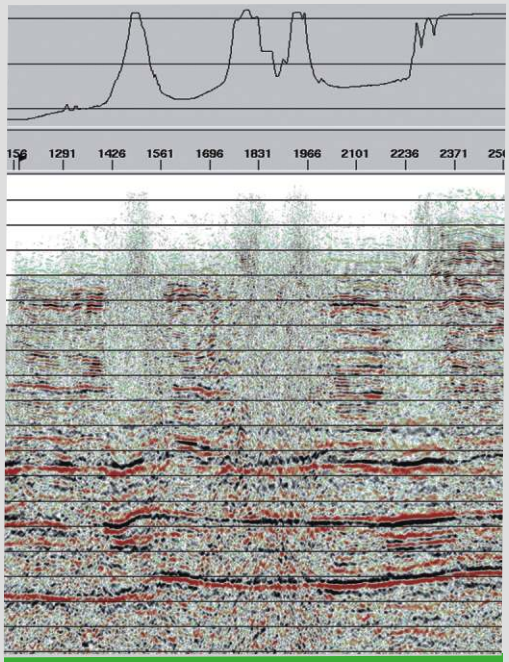



Sample model in real case

In case of modeling statics, it is sometimes optimal to merge different solutions. Interactive access to processing database also proves helpful.




Refraction statics applied




Statics from LVL modeling

Final approval requires quality control of the estimated static solution. Examination of post-stack and pre-stack behavior of processed data is accompanied by inspection stacking velocities. Well known mutual impact of statics and stacking velocities is incorporated in GT's QC procedure.