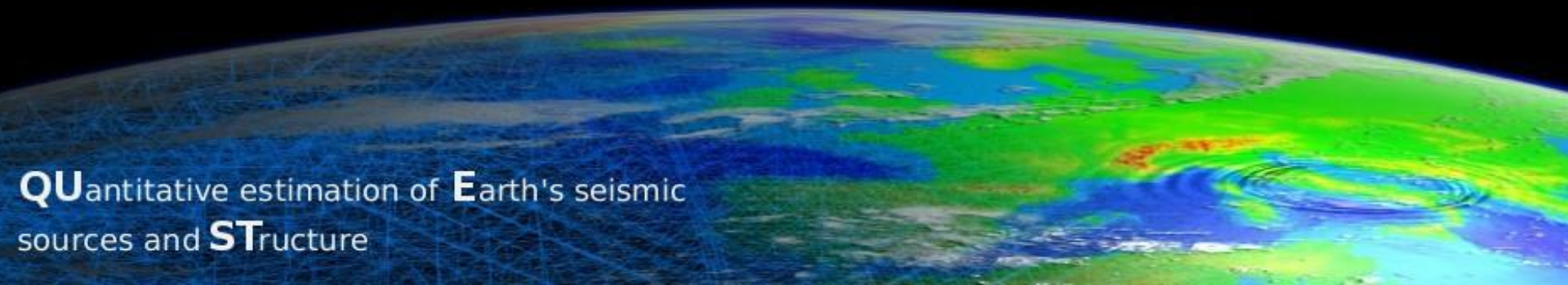
Summary

WP4 – Inverse Problems



Grand Challenges

- Uncertainty analysis in large-scale nonlinear inverse problems
- Full waveform inversion for noise tomography
- Study of exotic observables and their incorporation in tomography
- Efficient optimisation schemes
- Design of misfit functionals
- Inversion for interfaces
- Multi-parameter inversions
- Upscaling and downscaling

Projects included in or associated with WP4

1. Source modelling and anisotropy using normal modes (UEA)
2. Inversion of strain/rotation for local structures (UEA)
3. Inversion for velocity and Q on the reservoir scale (Spectraseis, ETH)
4. Observability of multiply reflected P waves (Geoazur)
5. New observations of splitting multiplets (Geoazur)
6. Noise tomography and monitoring (LGIT)
7. Smooth velocity building in exploration seismology (Novosibirsk)
8. Full waveform tomography using instantaneous phase measurements (UU)
9. Full waveform tomography to images the Chilean slab (Geoazur)
10. Full waveform tomography of crustal targets and near surface structures (Geoazur)
11. Data misfit criteria and validation of models (INGV)
12. Separation of intrinsic and extrinsic anisotropy (IPGP)
13. Adjoint tomography of ambient noise (ETH)
14. Adjoint tomography of the CMB (ETH)
15. Incorporation of rotation measurements in tomography (LMU)
16. Finite-frequency inversion using triplicated body waves (LMU)

Deliverables

1. Everybody‘s results
2. Waveform inversion packages (UU, Seiscorp)
3. Cross-validation of Europe models

Workshop

- Additional workshop for WP4 on *Uncertainty Analysis in Nonlinear Inverse Problems.*
- To coincide with *Lorentz Centre Workshop* in Leiden (November 2011).
- Bring together Geoscientists and Mathematicians.