Seismic noise analysis and Green functions

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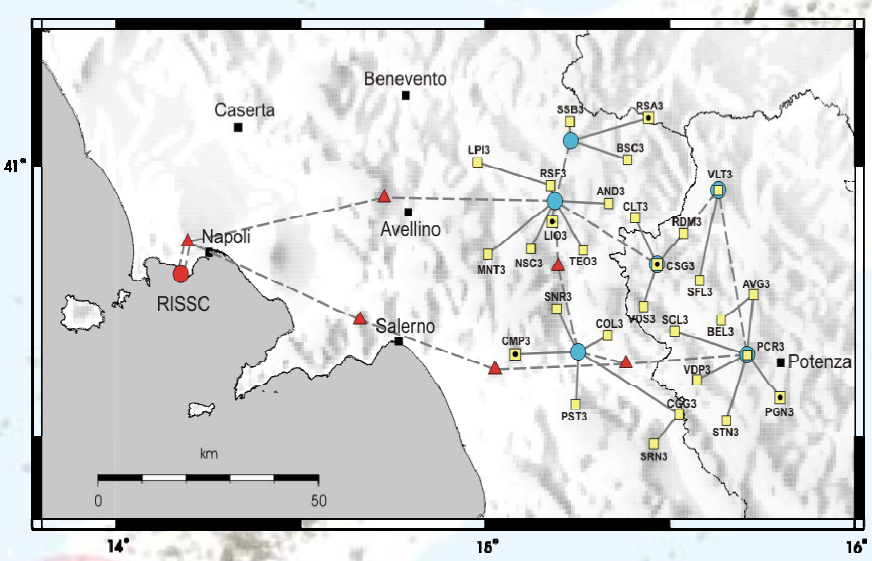
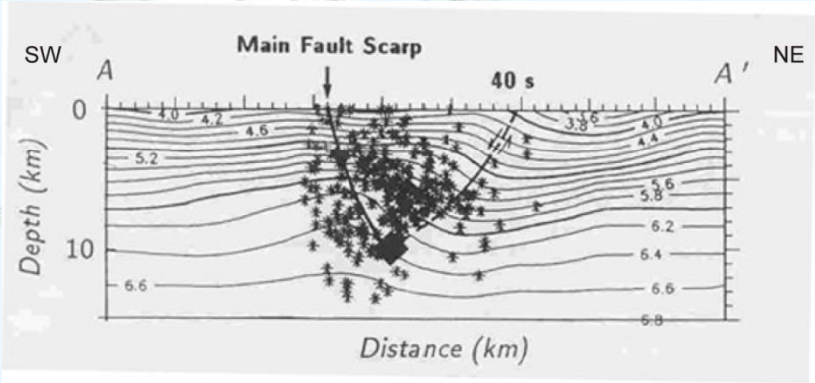
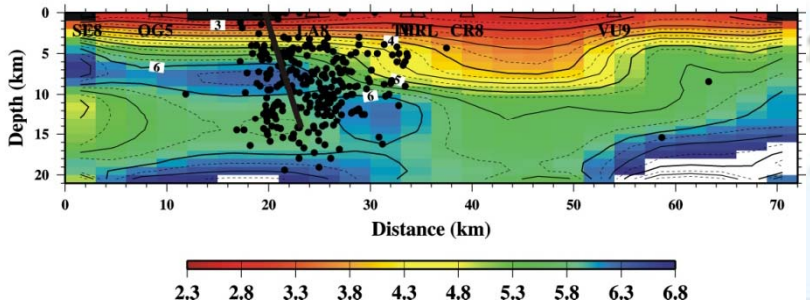
A dense seismic network:

- **A field laboratory to study the seismic source at small scales**
- **An advanced infrastructure to test early warning procedures**





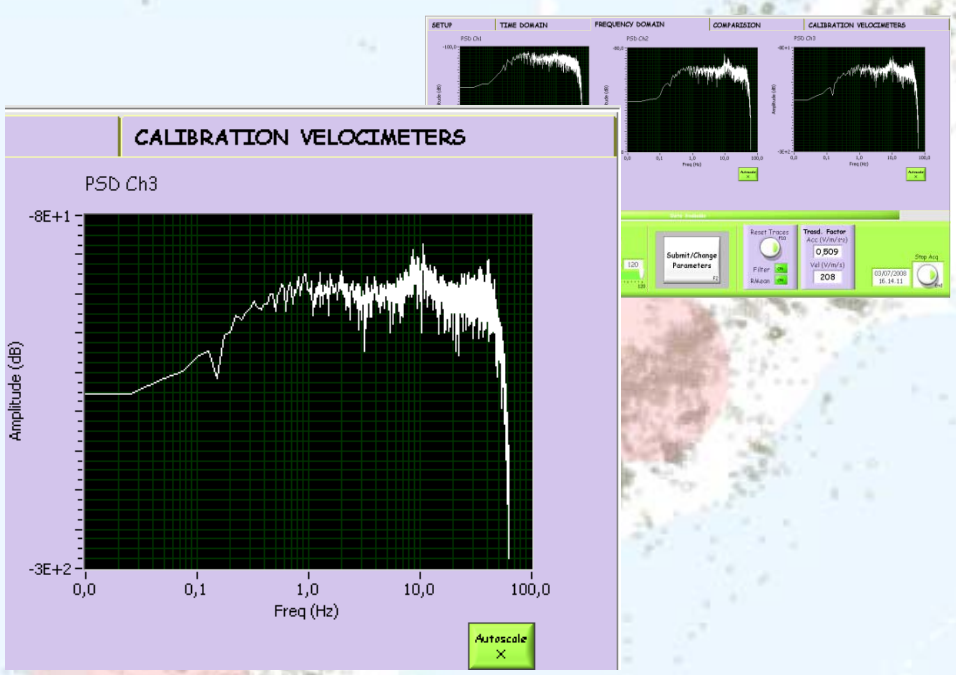


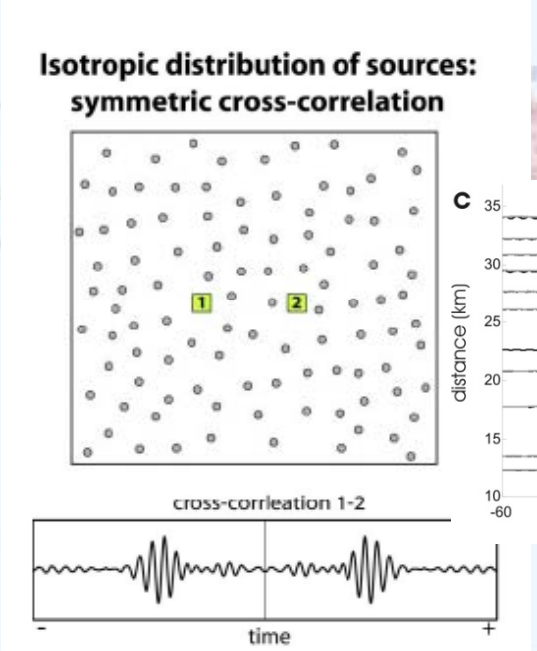
Key-role of velocity models

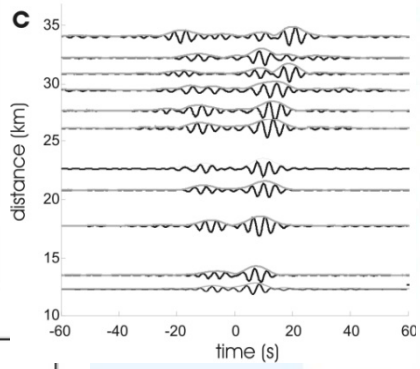
- **Present models : 1D for eqk location. Some 2D-3D models with poor resolution (smallest scale ~ 2-3 km)**
- **Need for high resolution 3D models**
- **Surface waves : shallow S wave models**

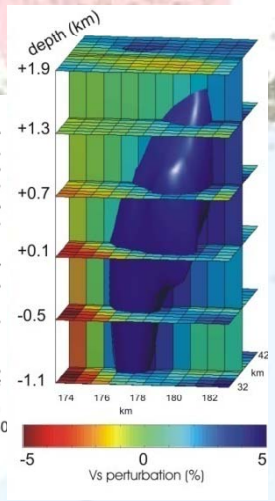
Seismic noise :

- **A huge resource of continuous data …..**
- **We currently use it to check the health of ISNet**









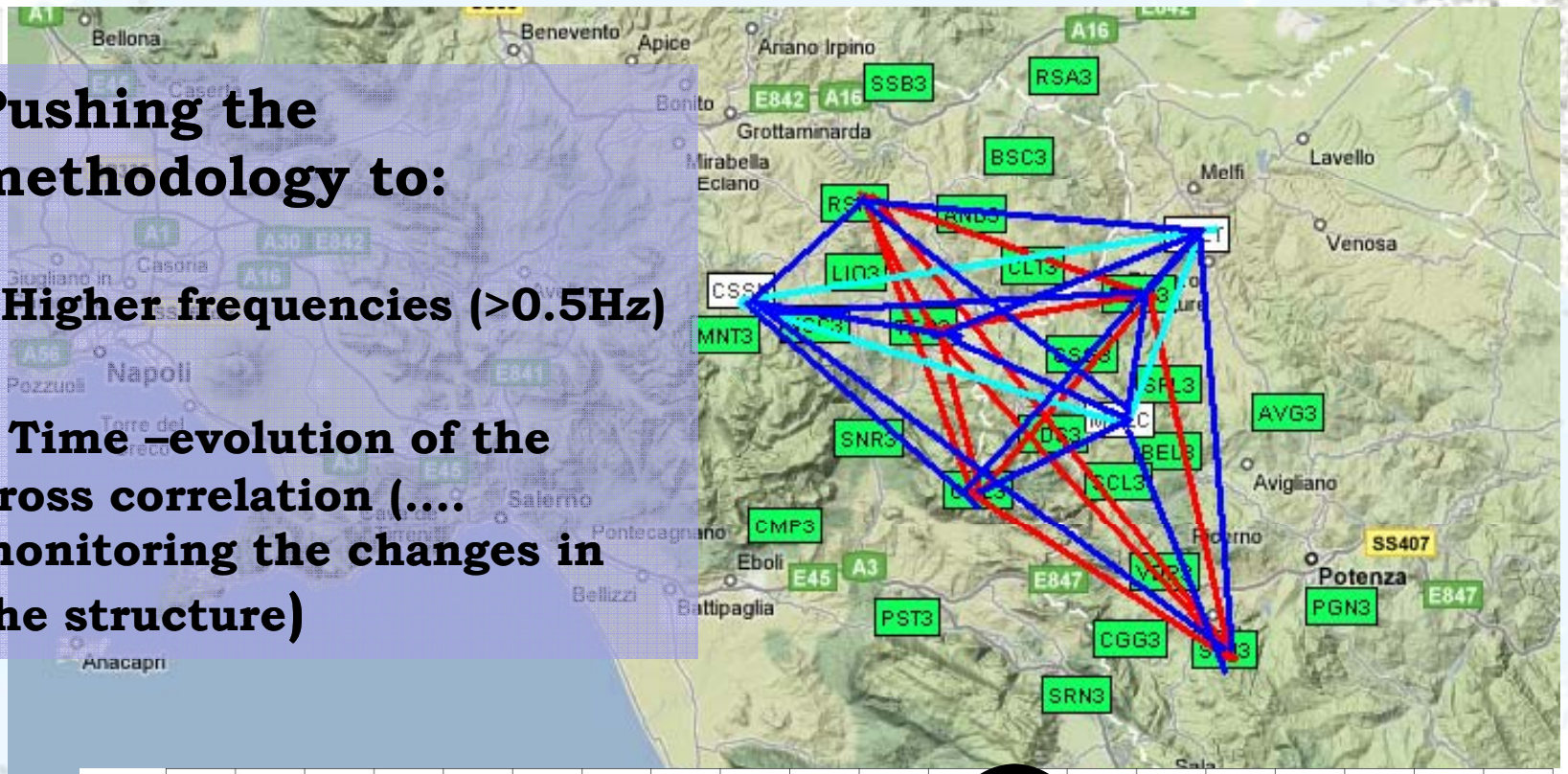
Cross correlation

- **Search for coherence in seismic noise : Green functions (dominated by surface waves)**
- **Dispersion curves**

DPC 2007-2009
High-resolution multi-disciplinary monitoring of active fault test-site areas in Italy

Pushing the methodology to:

- **Higher frequencies (>0.5Hz)**
- **Time –evolution of the cross correlation (…. monitoring the changes in the structure)**



Deliverables for the first year :

- **Structuring a database of waveforms to be managed by Matlab / Labview for cross-correlation analysis**

- **Database of (Imaginary Part of) Green Functions and dispersion analysis**

Deliverables for the whole project :

- **Database of Ambient noise Green functions**

- **Velocity model for the shallow area, definition of upper frequency analysis**

Additional ideas :

- **Continuous monitoring of GF: checking the clock drift and the changes in the structure (correlated or not with migration of the seismicity, changes in the state of the stress)**