

SPIN

MONITORING A RESTLESS EARTH

http://spin-itn.eu

University of Hamburg, Germany



- Celine Hadziioannou
- Sven Schippkus (MFP, dense arrays)
- Anjali Dhabu (Giotto project, SHM with 6C measurements)
- Marco Dominguez Bureos (ESR 4.2)
- Mahsa Safarkhani (ESR 3.4)
- Charlotte Bruland (microseism location, 26 second microseism)
- Jana Klinge (6C seismic noise compensation for gravitational wave detection)
- Master students:
 - Antonia Kiel
 - Regina Maass
 - Fabio Venegas

Research focus: ambient seismic noise

Sense it

Large N
Rotations
DAS
4C OBS (with LMU)

3C beamforming (differentiate wave types)

"Rotation BF" Matched Field Processing

Understand it

Sources of ocean microseism Other seismic noise sources

- wind parks,
- mysterious 26s source,
- ..etc

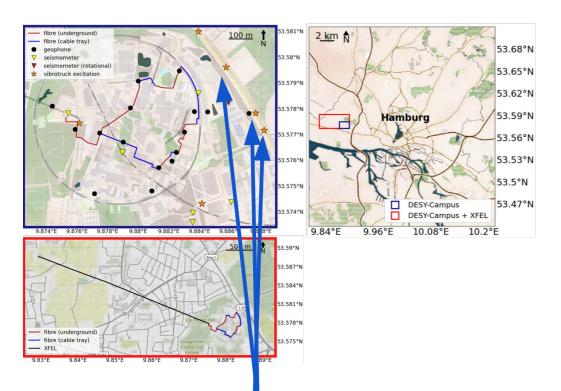
Complex wavefields Gradients Ambient Seismic Noise

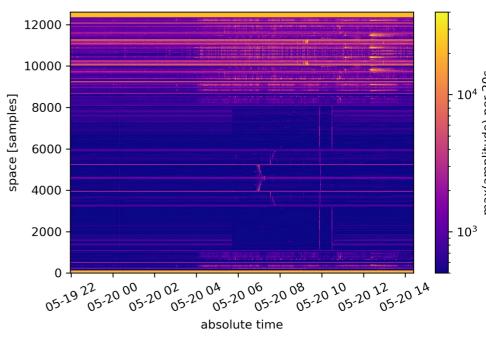
Improve monitoring with DAS
Correct measurement bias (ML)
Improve measurements
(monitoring, imaging, GWD, ..)

Use it

Monitoring (surface processes, water)
Imaging subsurface structure + gradients
Noise correlations with rotations

DAS deployment on DESY campus





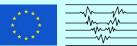






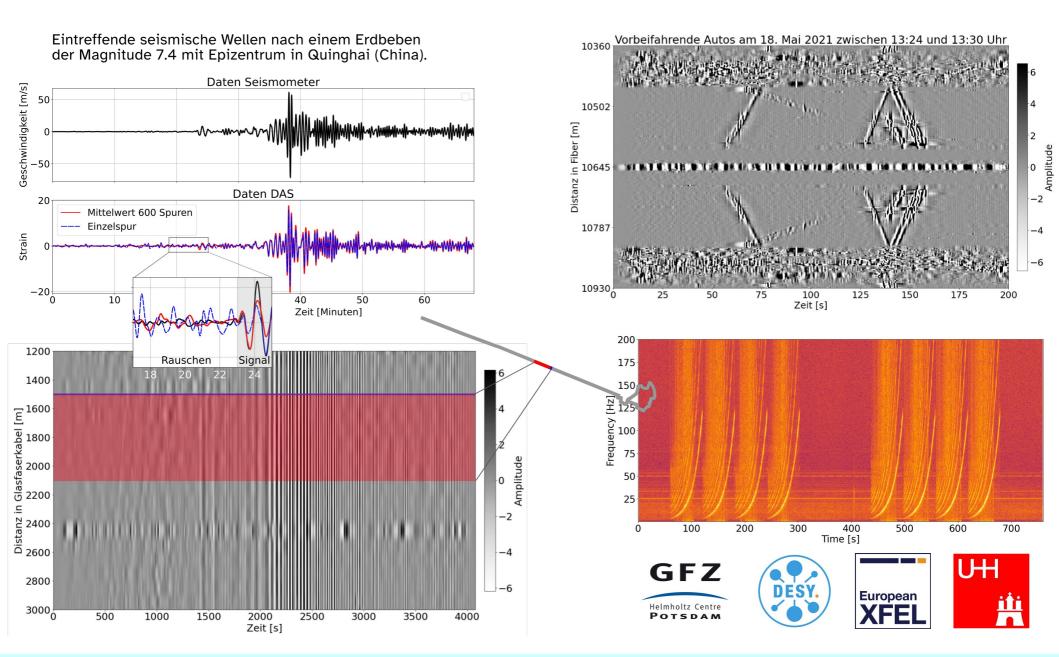








DAS deployment on DESY campus



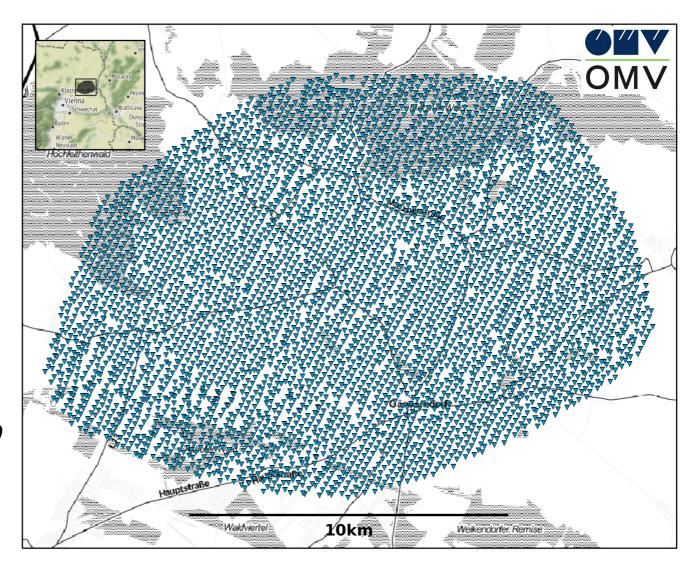




Large-N array in the Vienna basin

Stats

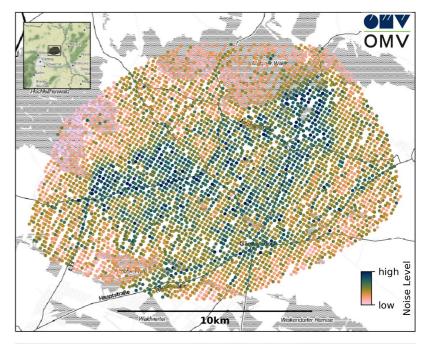
- 4907 stations
- 10Hz geophones each 12 stacked
- 4 weeks
- 80 TB of data
- On top of "Matzen" oil & gas field
- Dataset similar to
 Schippkus et al. 2020

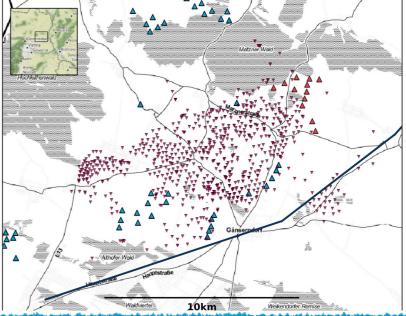


Large-N array in the Vienna basin

Research

- Noise sources Impact? Disturbance? Potential?
- Imaging "Classical" ambient noise imaging Wavefield gradients







GIOTTO - SHM with CWI and rotations

Motivation:

- gradient measurements to locate changes
- more sensitive 6C measurements on buildings















