

Waves and Structure Off-Site Team Meeting

24th and 25th of May 2023



Institut des Sciences de la Terre

UC San Diego



Florent Brenguier, permanent



@UCSD: Frank Vernon



@USC: Yehuda Ben-Zion



Laura Pinzon-Rincon
PostDoc
Projet DAM DAS



Seismic attenuation variations from train signals: two study cases

Areas of interest: Passive seismic imaging, environmental seismology and seismic hazard

Collaborators: **Destin Nziengui Bâ**, Yixiao Sheng, Aurelien Mordret, Florent Brenguier, Olivier Coutant & Sisprobe Team

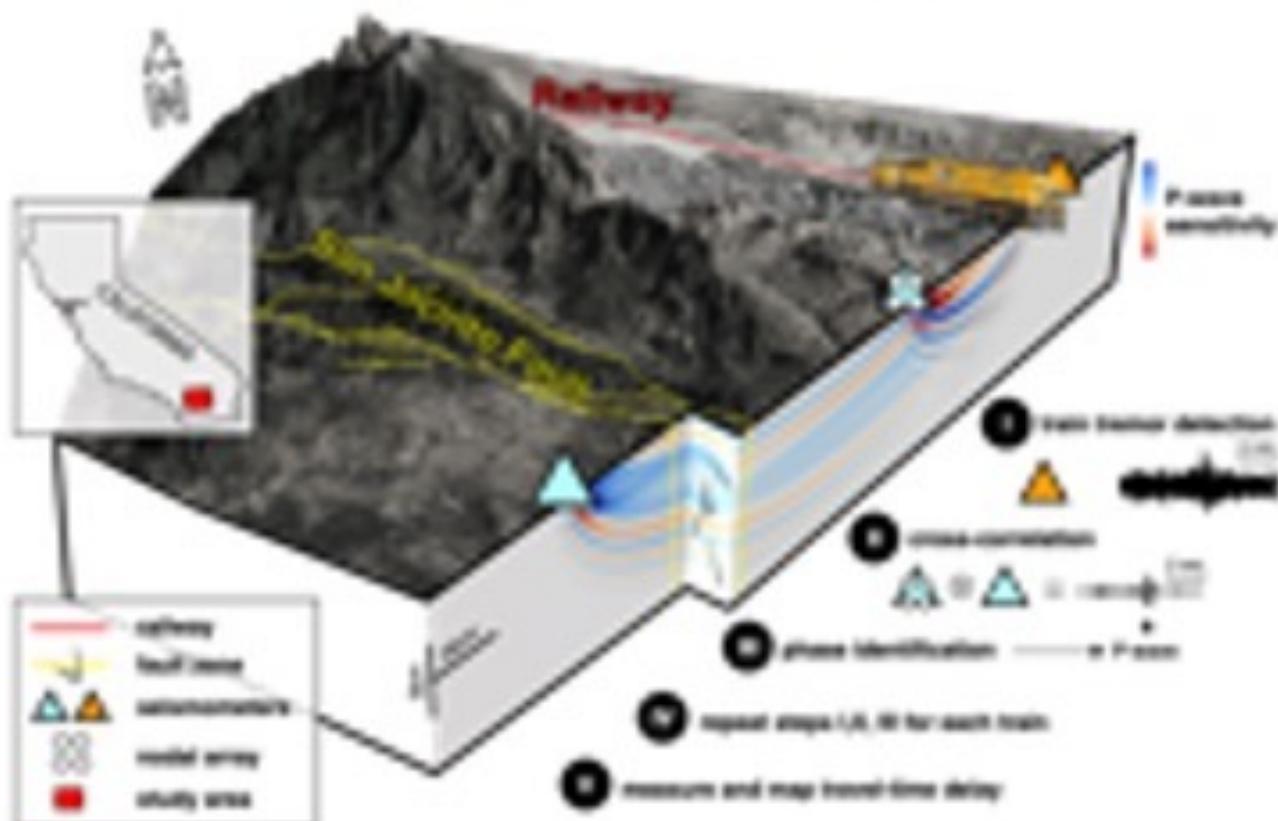


Yixiao Sheng
PostDoc
FaultScan



Investigating seismic velocity
change near fault zone

Florent Brenguier, Aurélien Mordret,
Pierre Boué, Quentin Higuéret

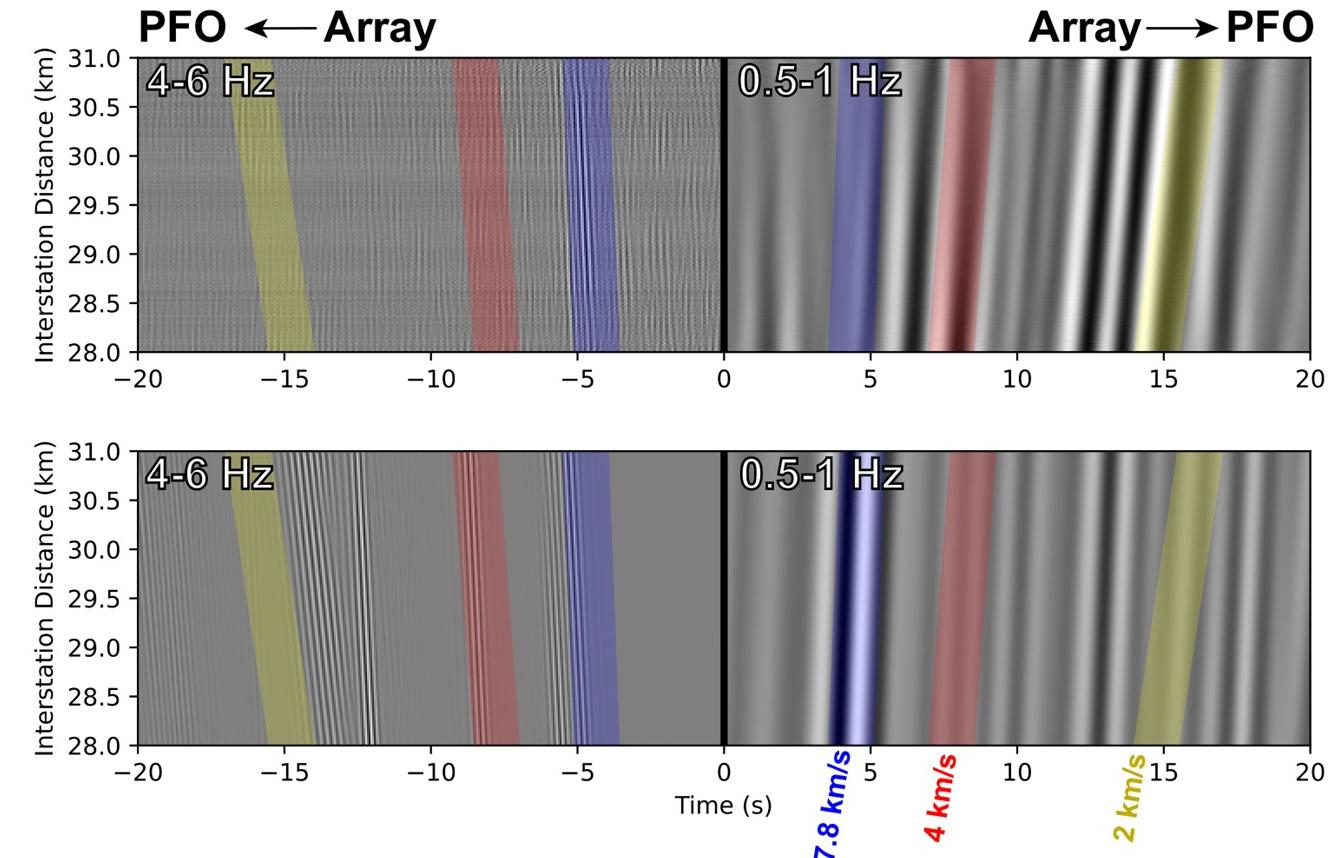


HIGUERET QUENTIN

PhD
Faultscan

Long-range noise correlation
modelling for seismic velocity
monitoring : A case study at the
San Jacinto fault zone

Florent Brenguier, Aurélien Mordret,
Yixiao Sheng, Pierre Boué





Nicolas PARIS
Intern
Faultscan



Assessing the temporal evolution of high frequency P-wave seismic noise from oceanic sources in Parkfield region.

Collaborators :

- Pierre Boué
- Florent Brenguier
- Yixiao Sheng
- Quentin Higueret



ISTerre

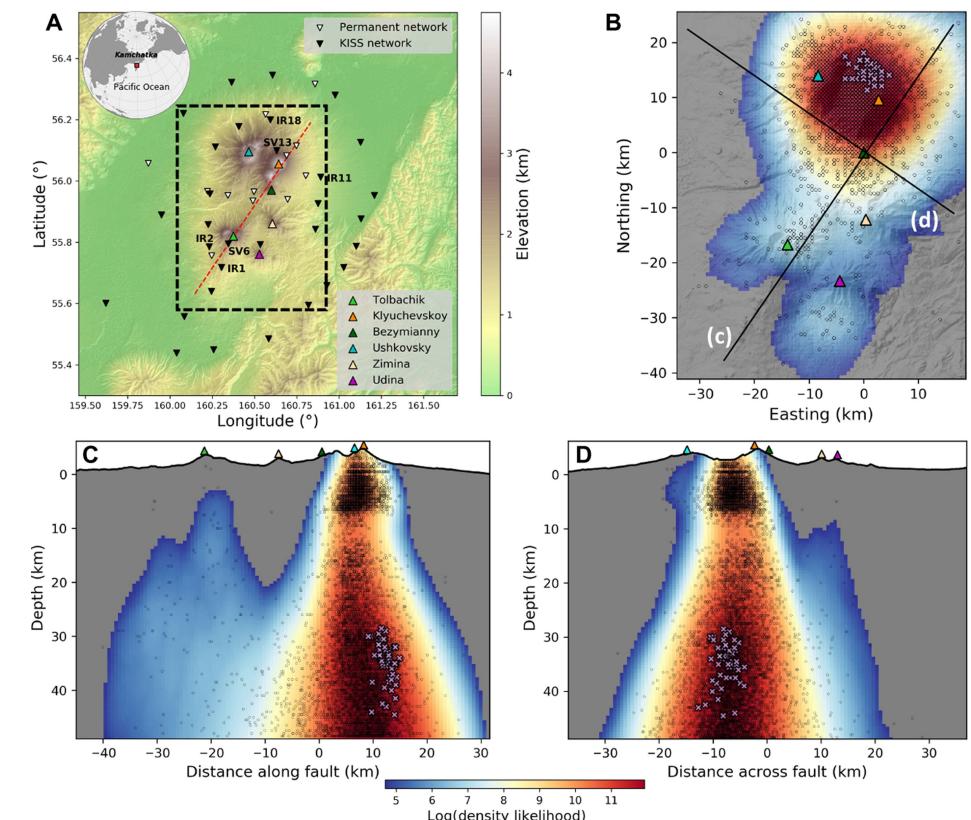
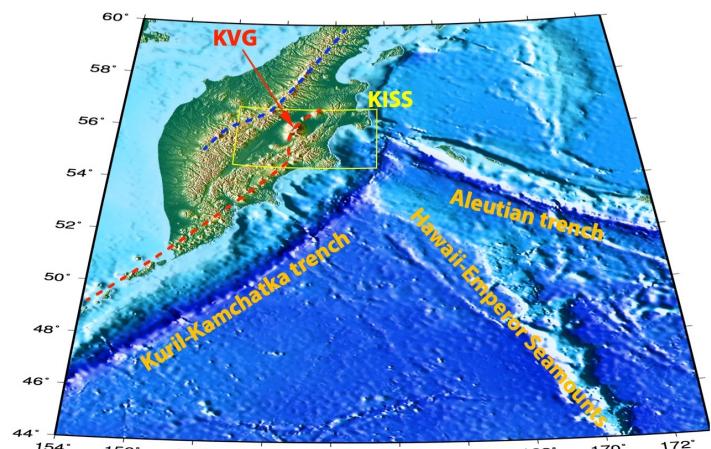
Nikolai SHAPIRO

Permanent Project:



Areas of interest:
seismology
volcanoes
seismic cycle

Collaborators:
Michel Campillo
Oleg Melnik
Anne Paul
Aurélien Mordret
Natalia Galina
Tatiana Kartseva
Andres Barajas
Emmanuel Caballero
Sina Massoumi





ISTerre



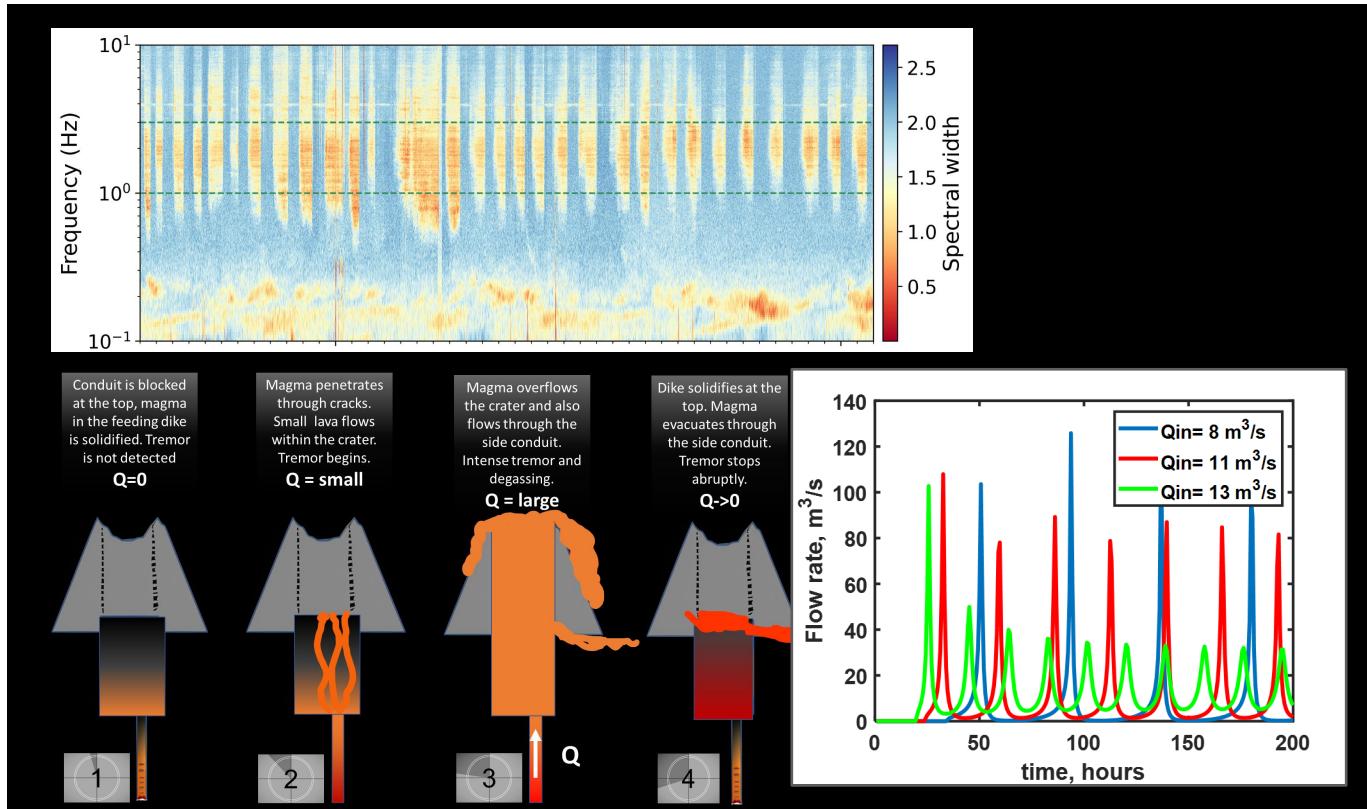
Oleg Melnik, Professor, researcher.



- ✓ Mechanisms of long-period earthquakes on active volcanoes
- ✓ Volcanic tremor sources
- ✓ Periodic regimes of magma extrusion
- ✓ Crystal growth in magma

Collaborators

Nikolai Shapiro, Jean Soubestre,
Alexander Sobolev, Anastasia
Borisova (Toulouse)



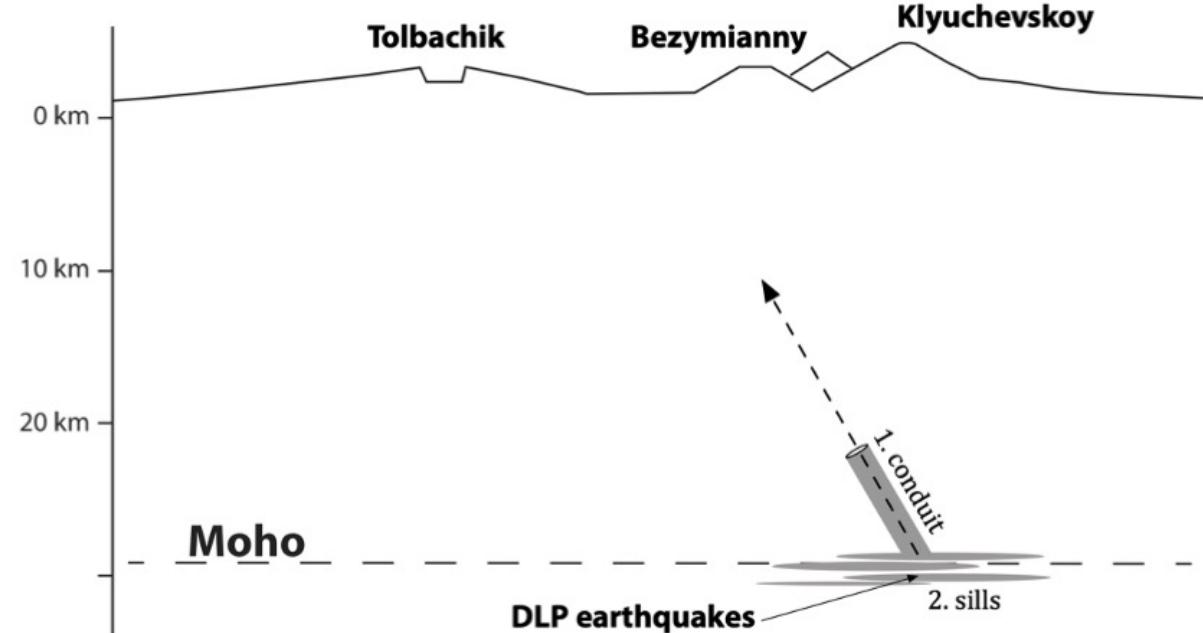


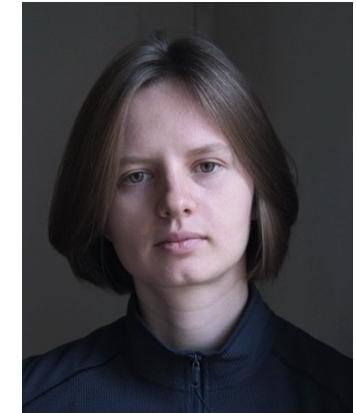
Nataliya GALINA
PhD student
SEISMAZE

Study of deep long period earthquakes beneath the
Klyuchevskoy volcano group (Kamchatka, Russia)



Thesis supervisor : Nikolai SHAPIRO

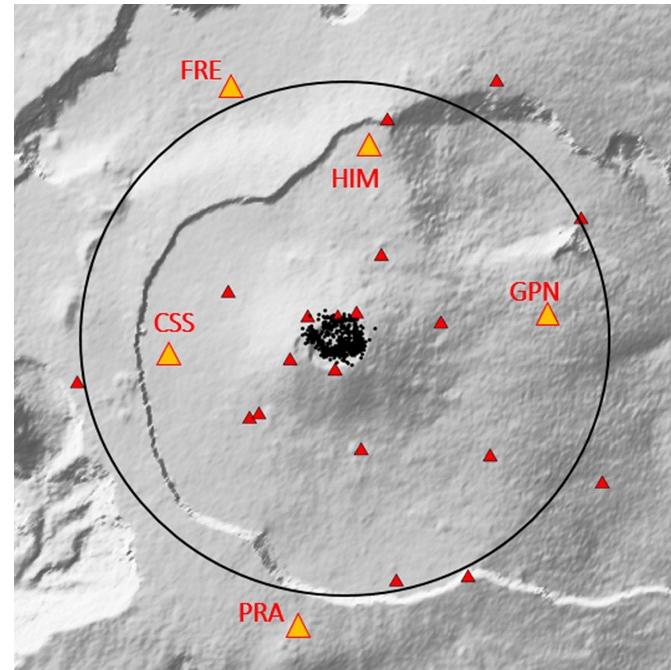




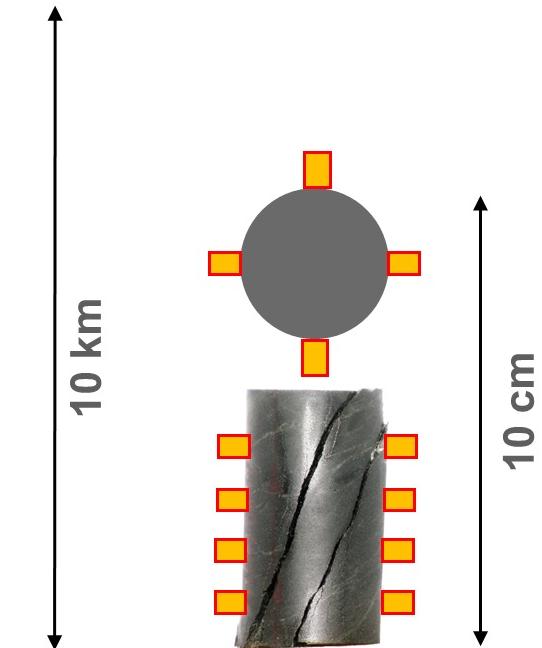
Earthquake Source Spectra
Analyses:

from Laboratory Micro-Scale
to Volcano-Tectonic Seismicity

Supervisor: Nikolai Shapiro



Piton de la Fournaise
Volcano (La Réunion)



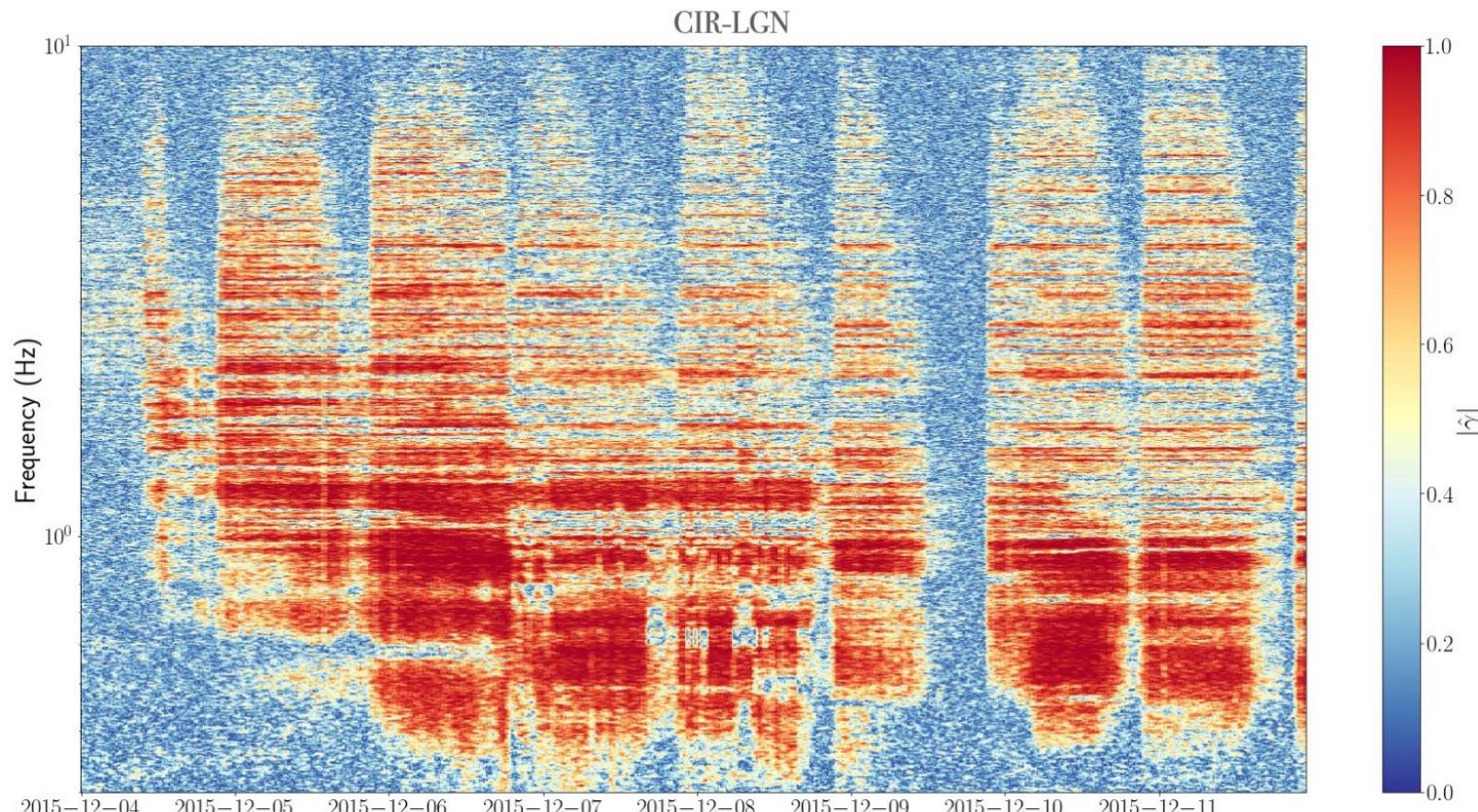
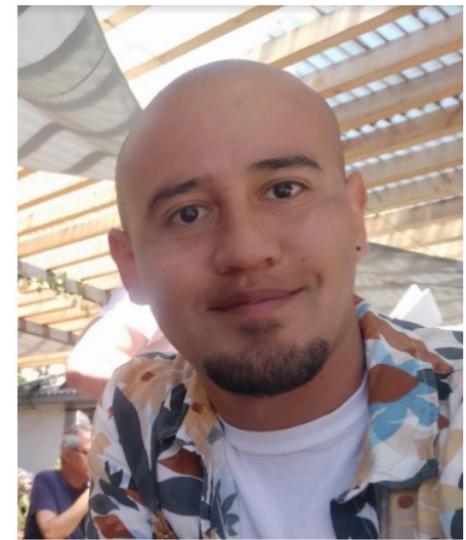
Cylindrical
Rock Sample



Andrés Barajas Postdoc Seismaze

**Relative Phase Analysis for
Volcanic Tremor Detection
and Source Location**

Andrés Barajas, Nikolai M. Shapiro



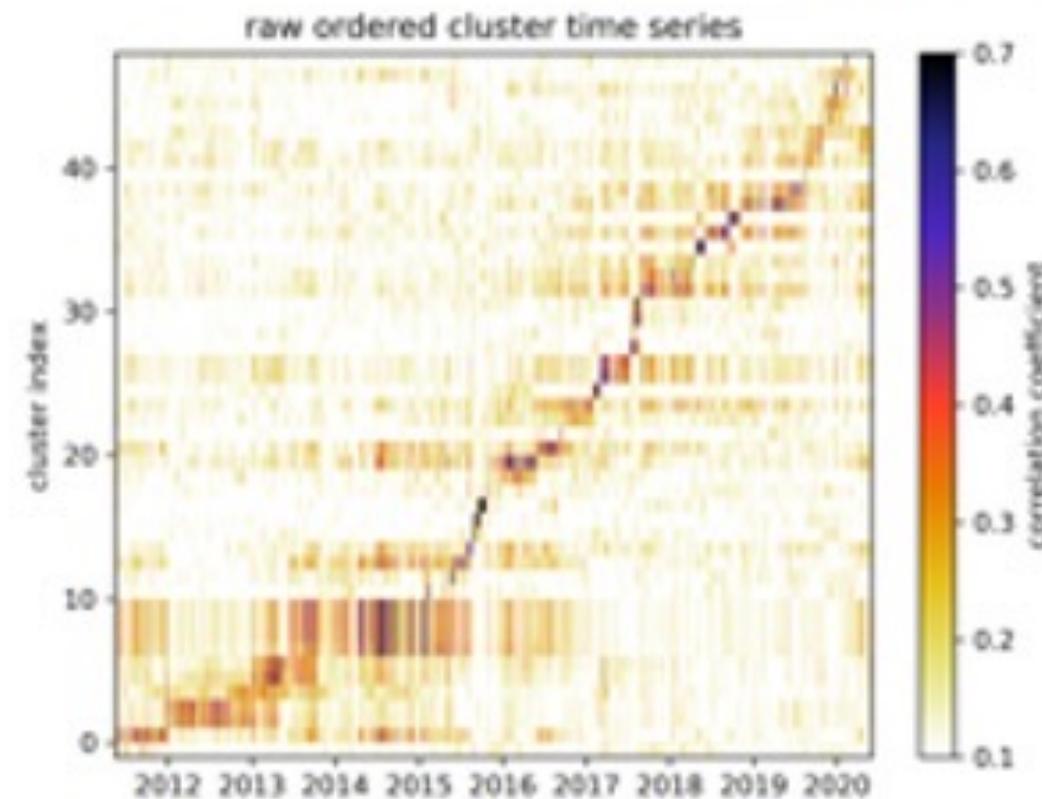


Emmanuel Caballero
PostDoc
SEISMAZE



Long-term evolution of the
spectral content of continuous
seismo-volcanic signals from a
network-based analysis /
Volcano-Seismology

Nikolai Shapiro, Cyril Journeau,
Léonard Seydoux, Jean
Soubestre, Andrés Barajas



Sina MASSOUMI

PostDoc

**Study the Along Fault Variability of Slow
Earthquakes in Subduction Zone**



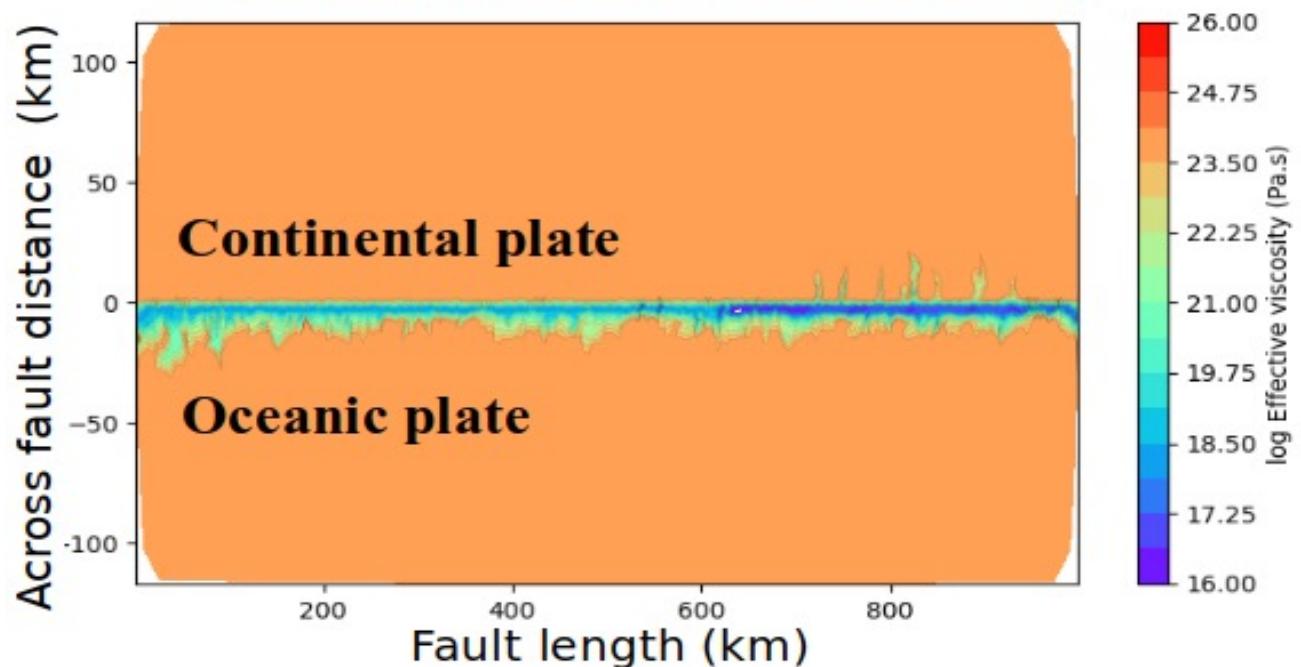
Solid Mechanics,

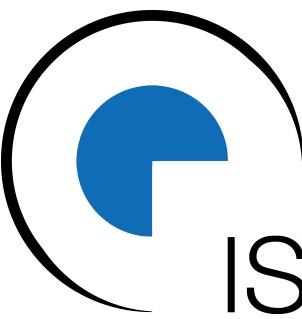
Complex Modeling, FEM

Collaborators:

Nikolai M. Shapiro, Michel Campillo,
Véronique Dansereau, Jérôme Weiss,

Distribution of the effective viscosity



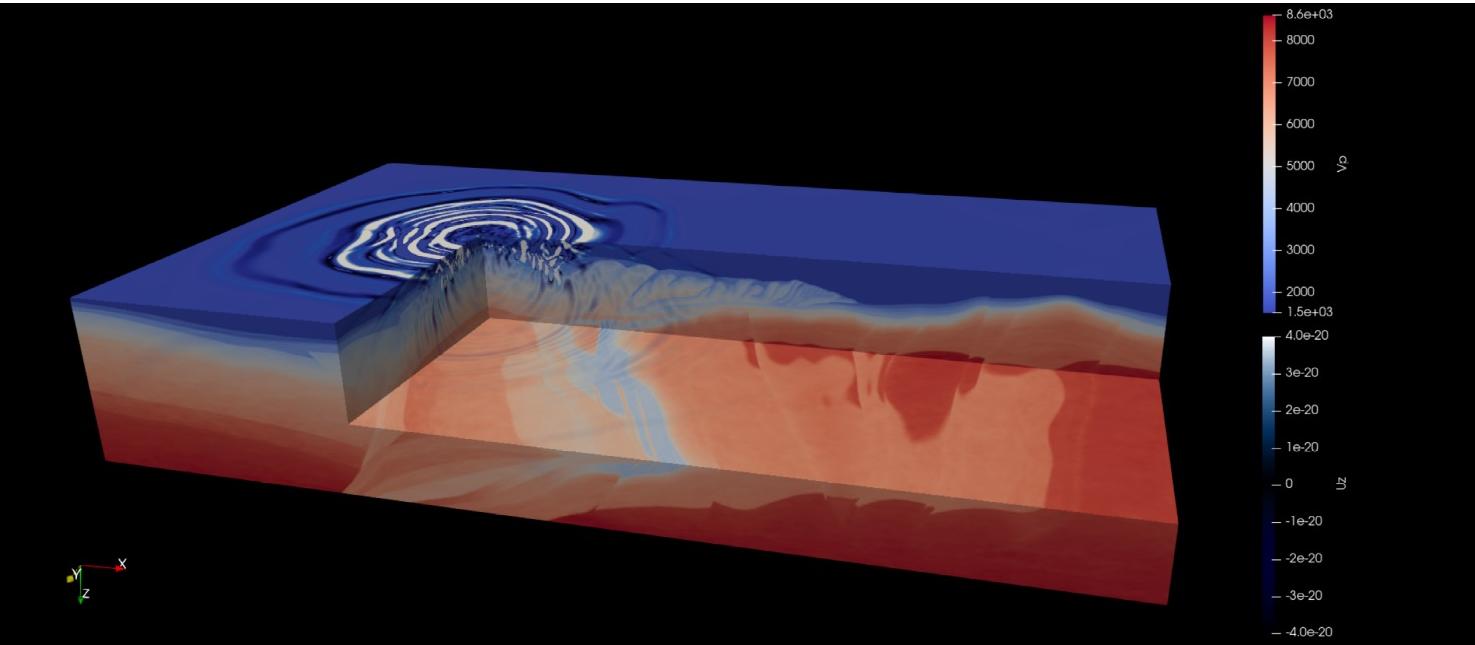


ISTerre

Romain Brossier
Ass. Professor (Permanent)
SEISCOPE



Modeling of wave propagation
Full Waveform Inversion
High Resolution Tomography
Inverse Problems



Works on :

Reflection-based FWI

Seismic interferometry (**Poster**)

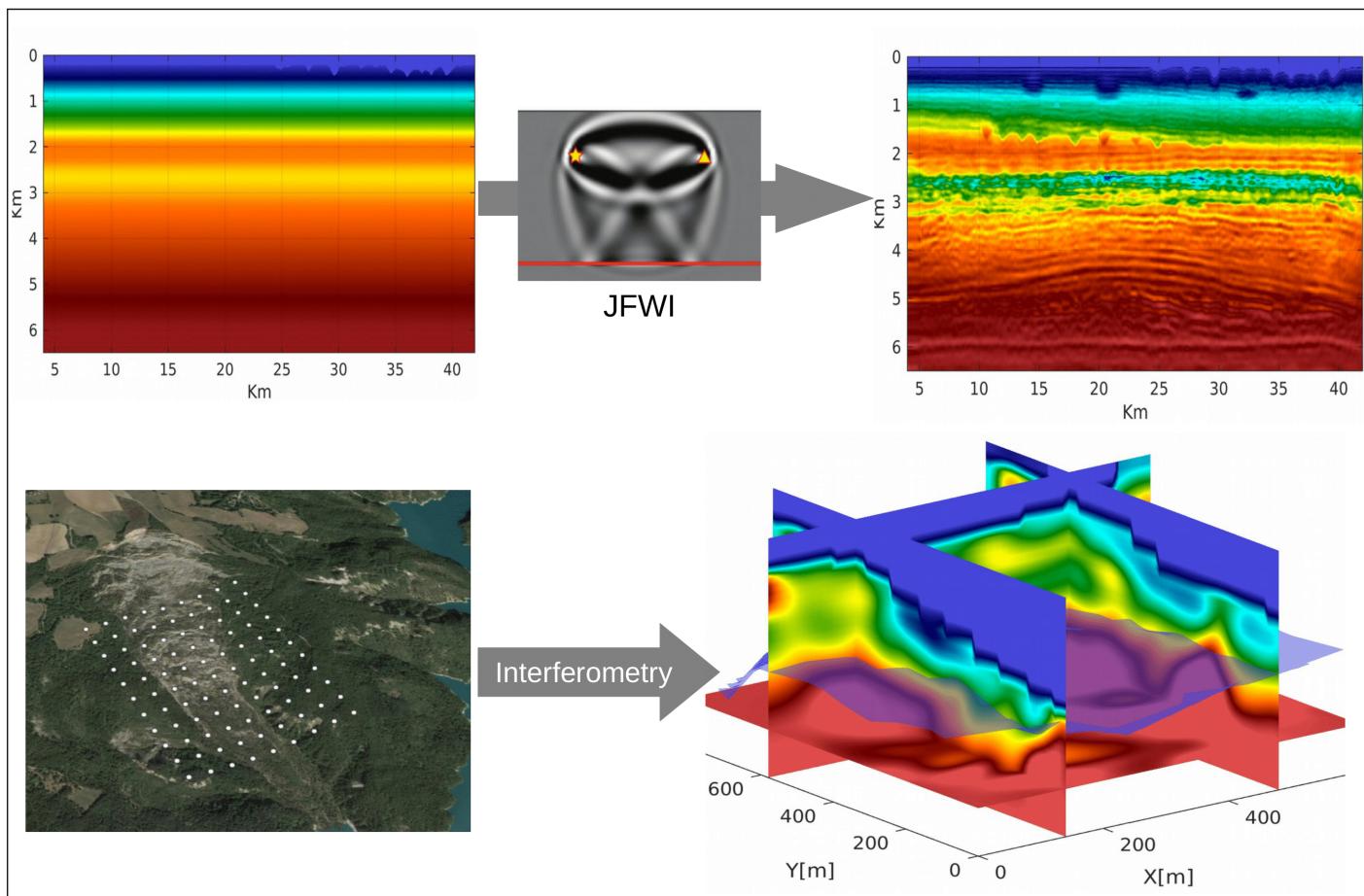
Wave-equation tomography

In collaboration with:

Romain Brossier, Ludovic Métivier,

Stéphane Garambois,

Grégory Bièvre



Mustapha Benziane

PhD student - SEISCOPE

Extension strategies for a robust waveform inversion

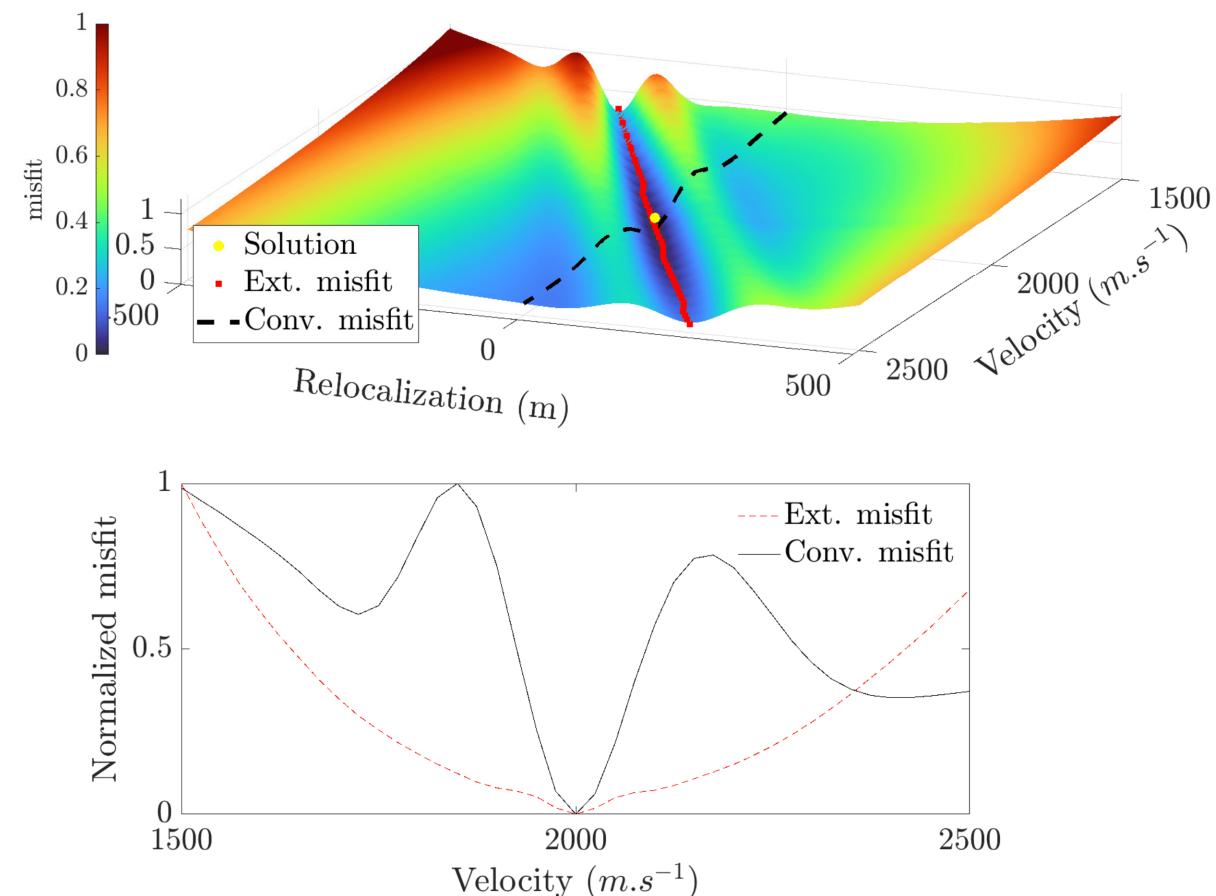


Receiver extension waveform inversion:

A time-dependent relocalization approach

Supervised by R. Brossier, L. Métivier

In collaboration with
all the Seiscope team members



Serge Sambolian

Postdoc

SEISCOPE

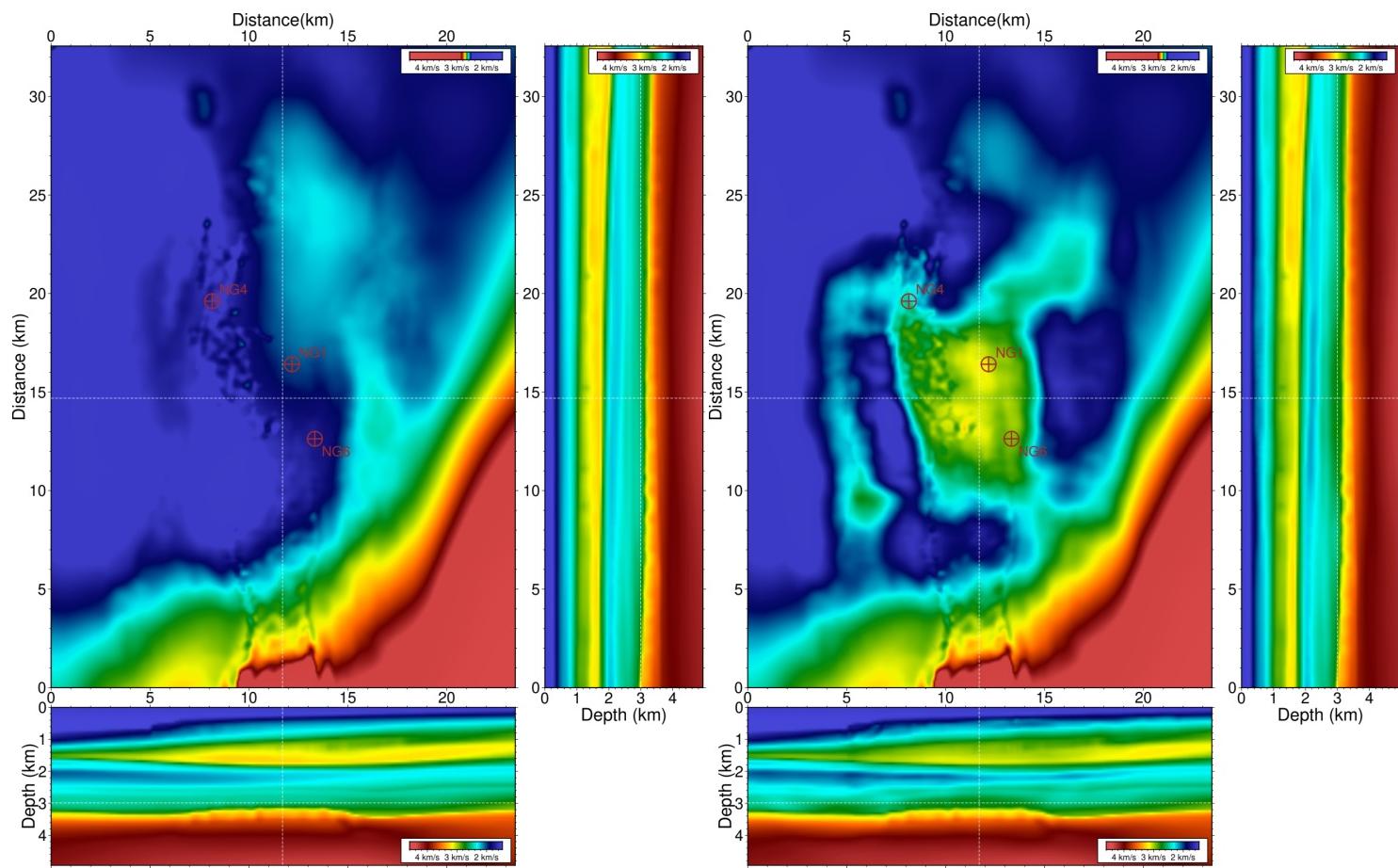


Projects:

- Polarization-based FWI
- Gorgon data inversion

Collaborators:

- Romain Brossier
- Ludovic Metivier
- The SEISCOPE group



Areas of interest:

→ High Performance Computing

- * codes maintenance

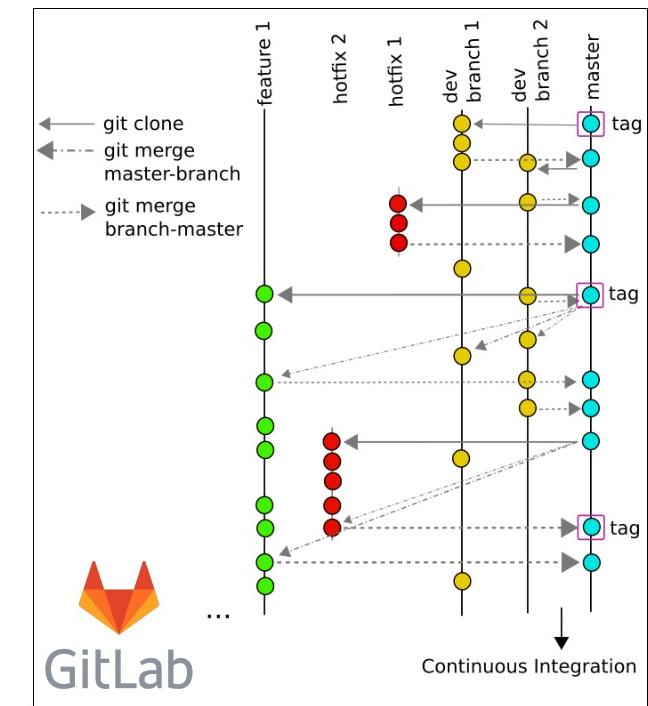
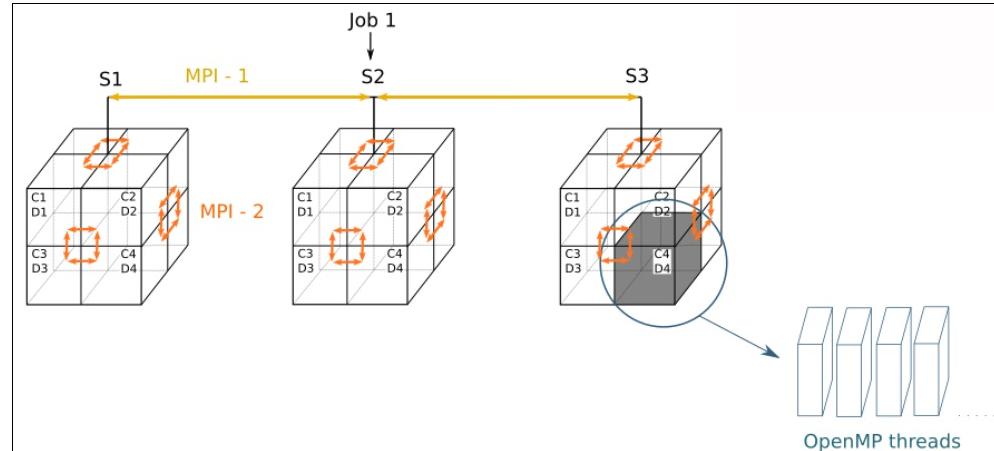
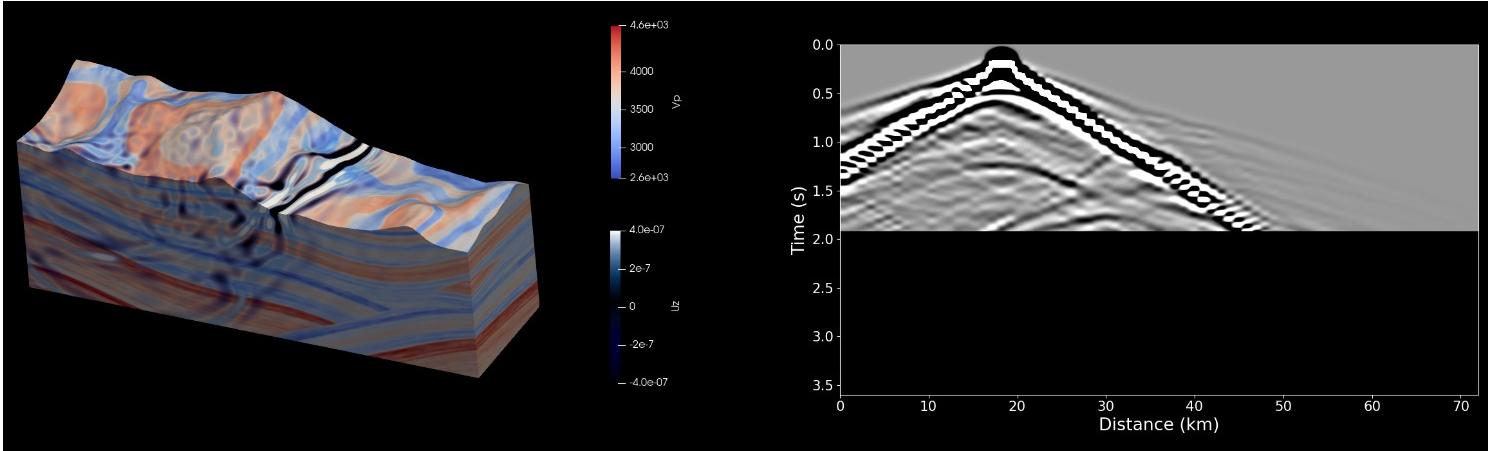
- * porting and portability

- * development

Collaborators

in the team/others:

SEISCOPE/ISTerre/OSUG





Ludovic Métivier
Permanent
SEISCOPE



High resolution seismic imaging

Wave propagation modeling in complex media

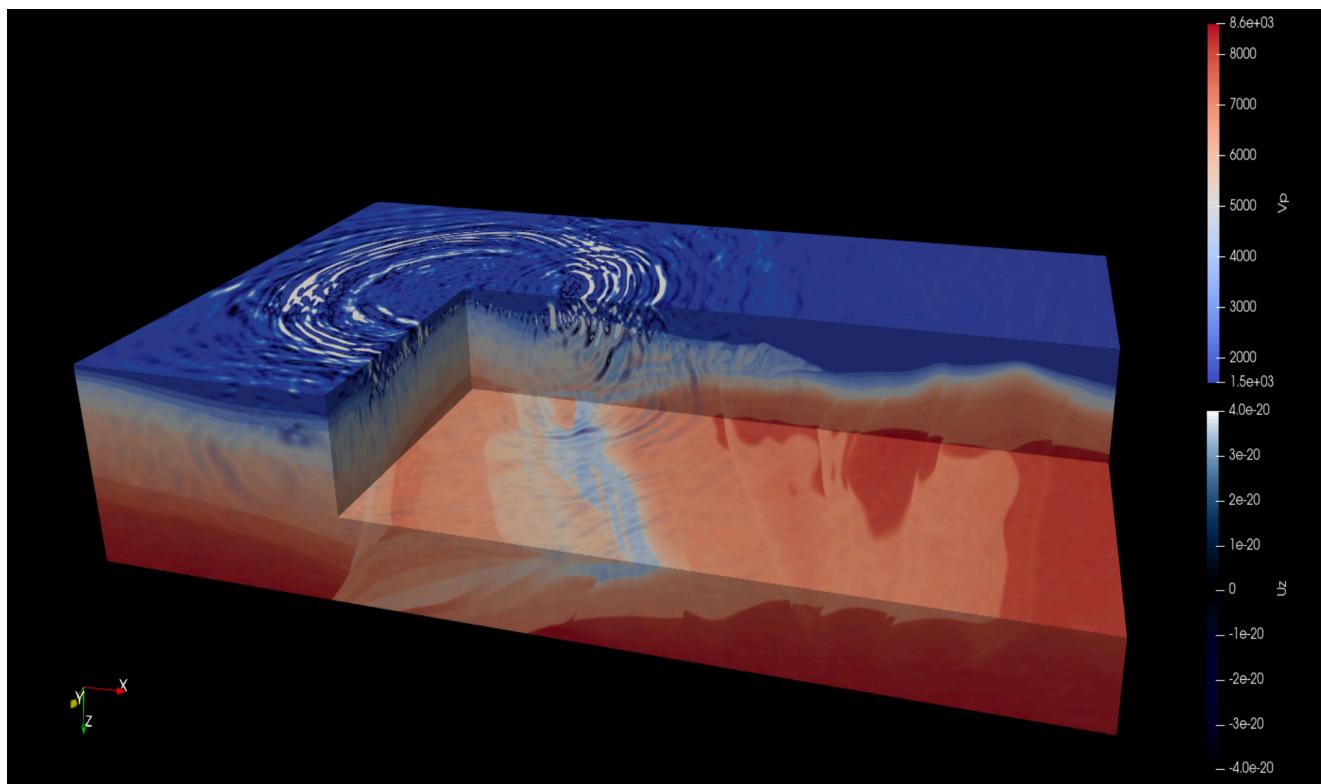
Collaboration with

All SEISCOPE members

Stéphane Garambois, Claire Bouligand,

Ludovic Moreau, Philippe Roux,

Philippe Gueguen, Grégory Bièvre





Amine ABDELLAZIZ
PhD student
Seiscope

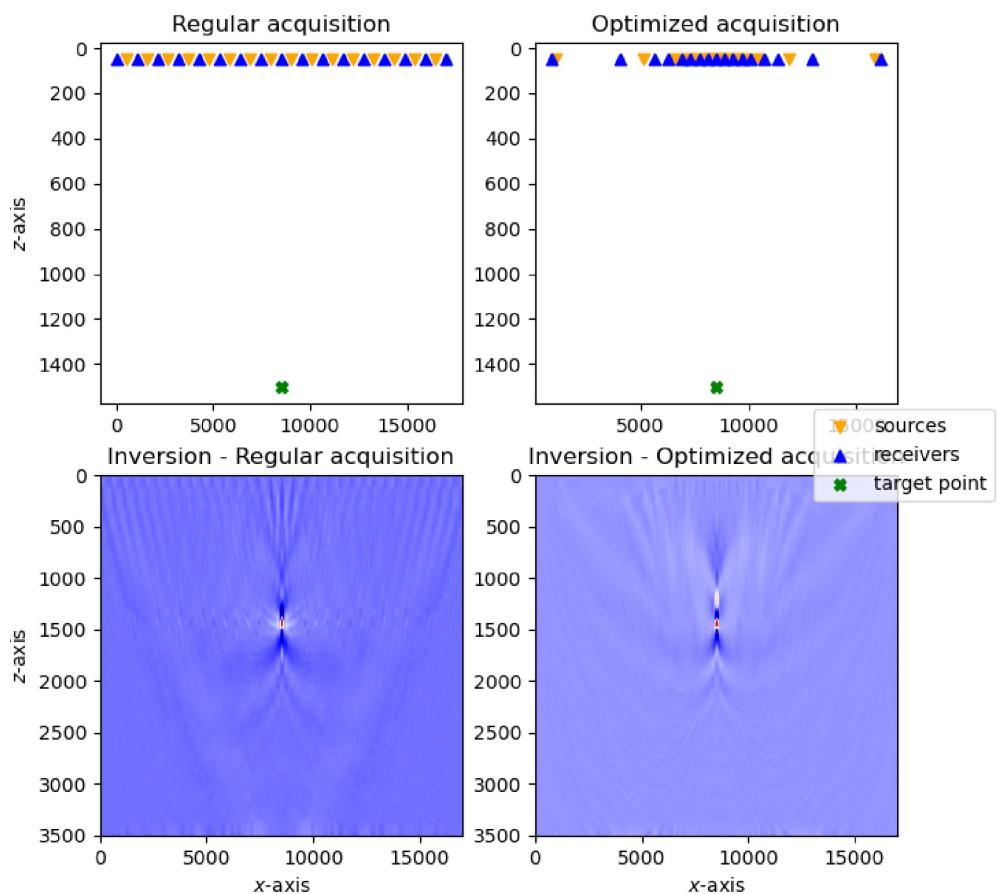


Optimal Experimental Design for Full Waveform Inversion

Ludovic MÉTIVIER,

Romain BROSSIER,

Édouard OUDET (LJK)



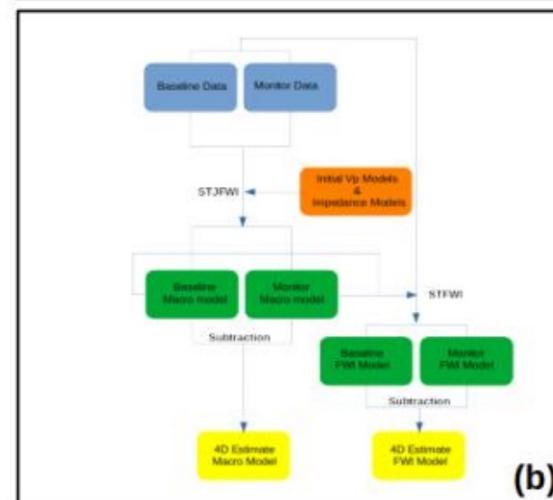
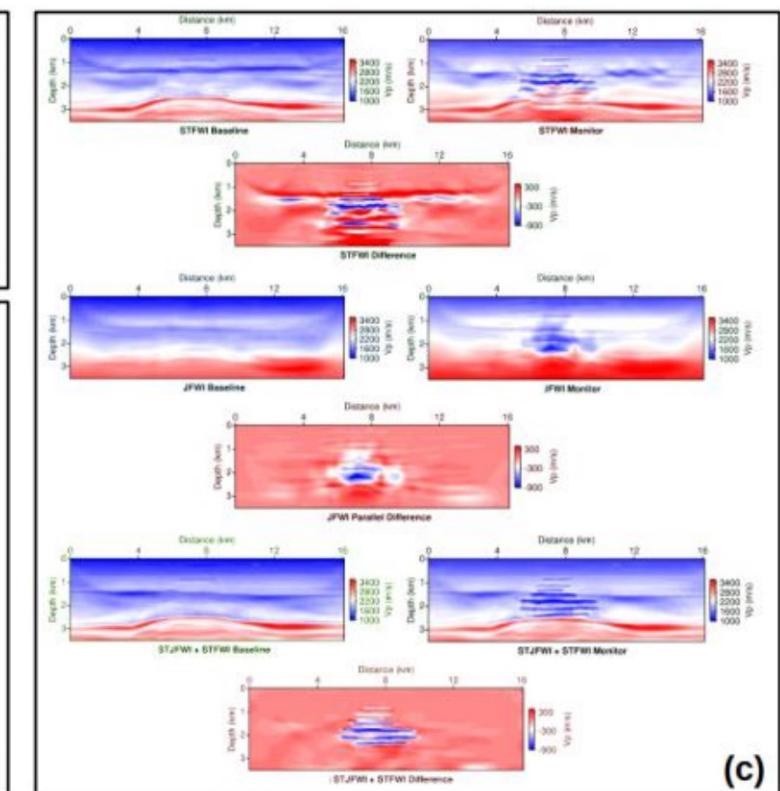
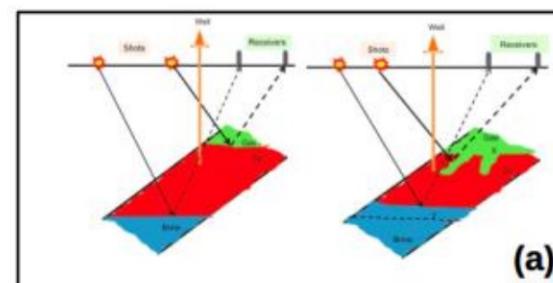
Fandy Adji FACHTONY

PhD

4D Full Waveform Inversion

4D FWI with Reflection Oriented Workflow

Fandy Adji Fachtony, Romain Brossier, Ludovic M'etivier, Bastien Dupuy, Anouar Romdhane and SEISCOPE Group



Lahcene Bellounis

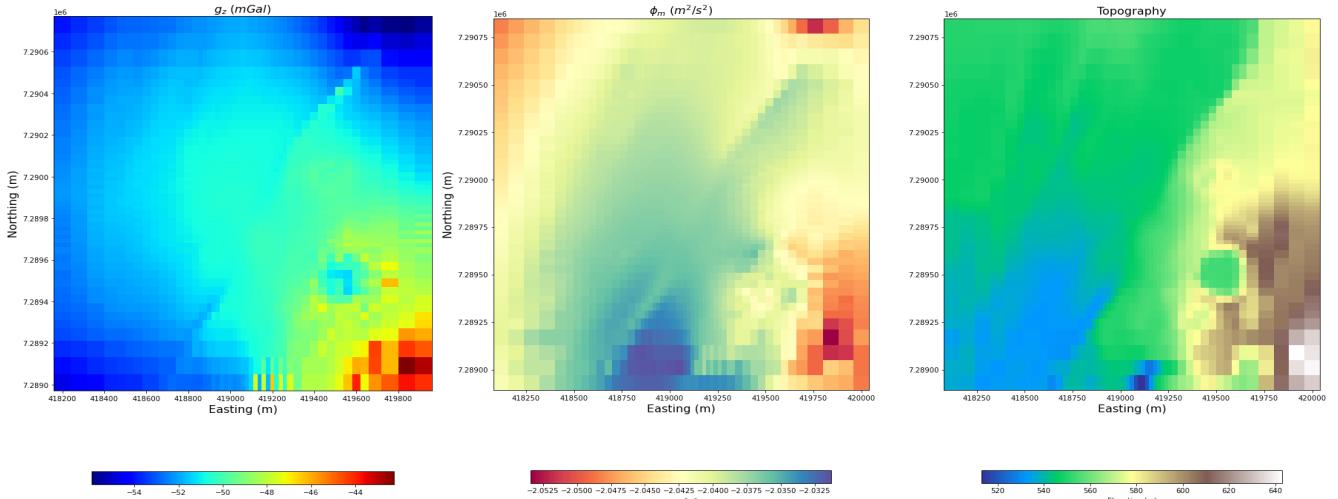
Intern

Forward and Inverse Modeling of Gravity and Magnetic Data Applied to Volcanic Domains



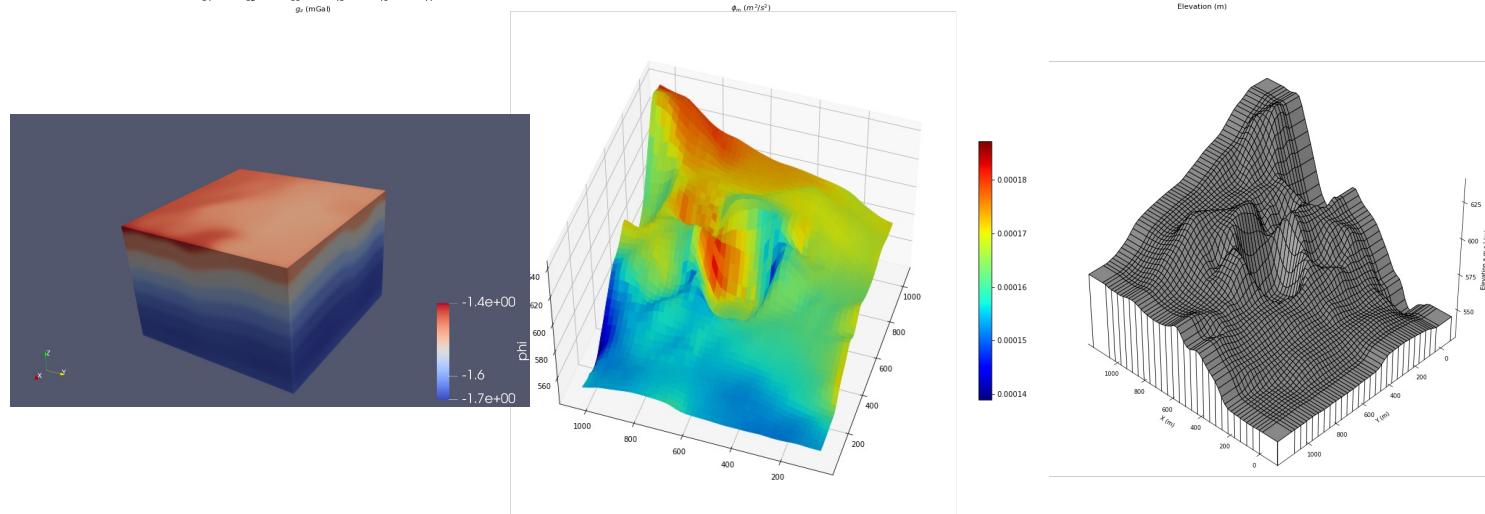
Supervised by:

- Claire Bouligand (Géoph. Des Volcans)
- Romain Brossier (Ondes et structures)
- Ludovic Métivier (Ondes et structures)
- Stéphane Garambois (Ondes et structures)



Interests:

- Potential Field Methods
- Numerical Modeling
- Inverse Problems



Arthur Grange

PhD student

SEISCOPE



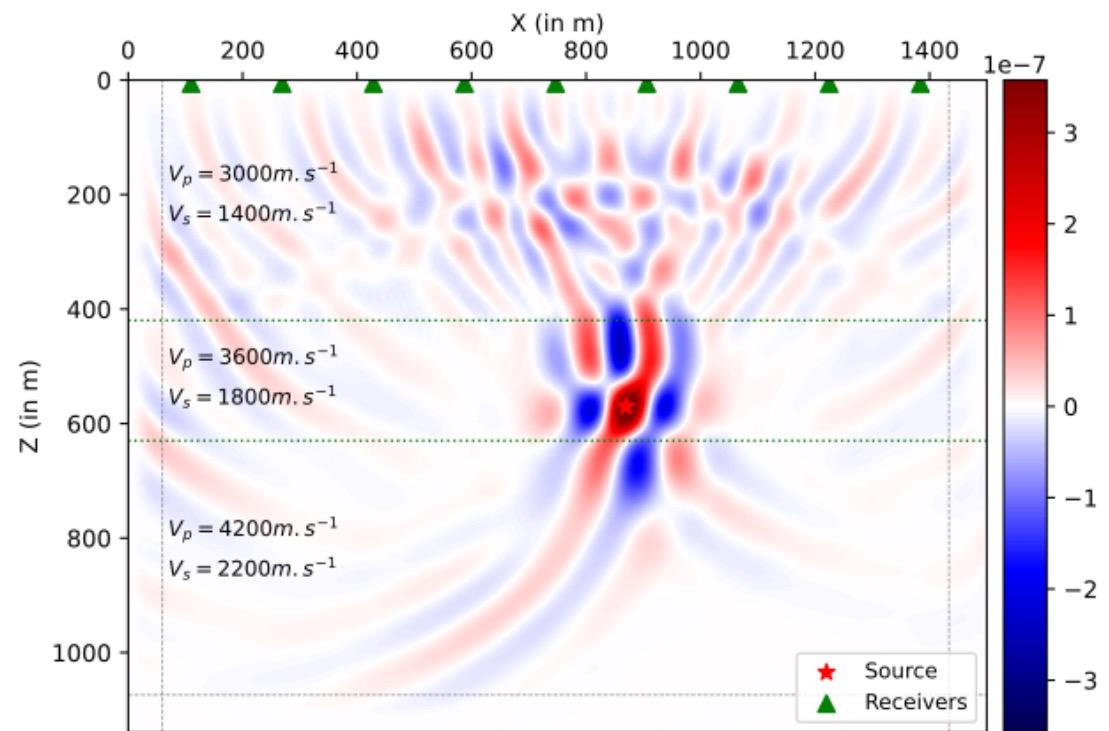
Source location by waveform inversion in Argentière glacier

Supervised by:

- Romain Brossier
- Ludovic Métivier
- Philippe Roux

In collaboration with:

- All the Seiscope team members
- The Resolve team



Coffee Break



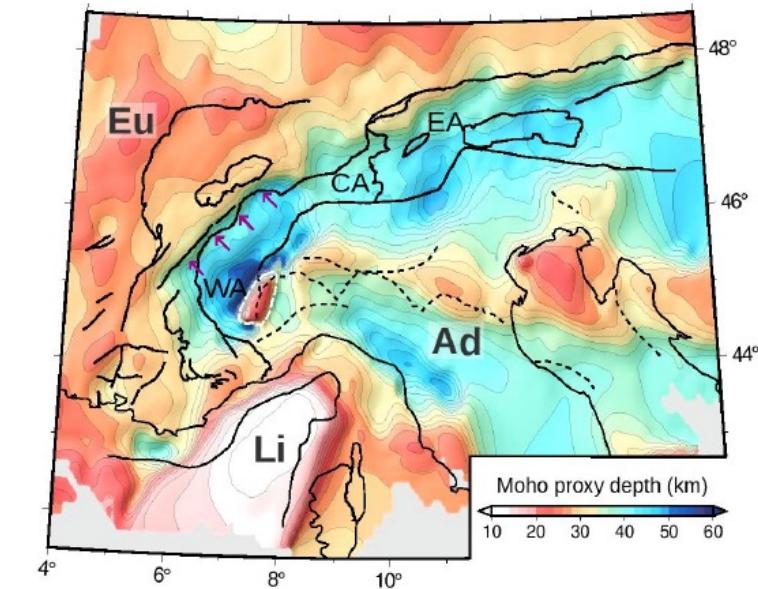
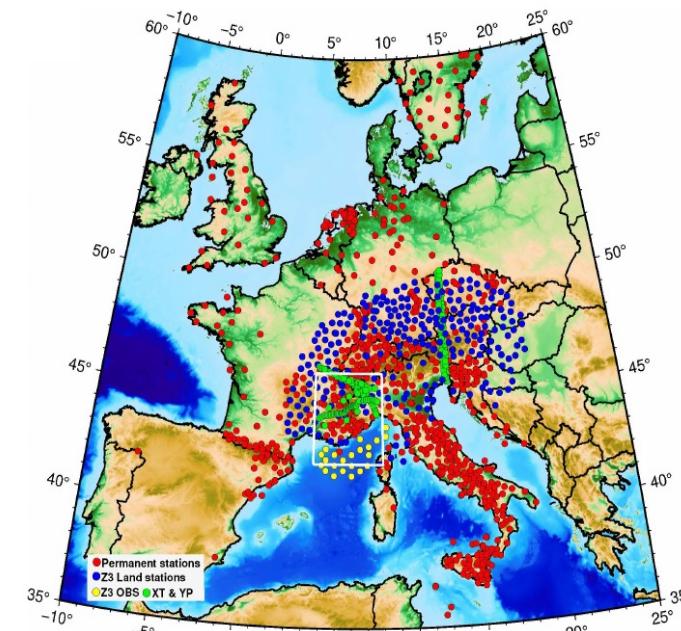
ISTerre

- Laurent Stehly
- Permanent
- AlpArray, Rise, Dare, TerraCorr, FrLitho3D



Ambient noise - tomography -
monitoring of the crust

Pierre Boué,
Emmanuel Chaljub,
Romain Brossier,
François Lavoué
Anne Paul,
Helle Pedersen,



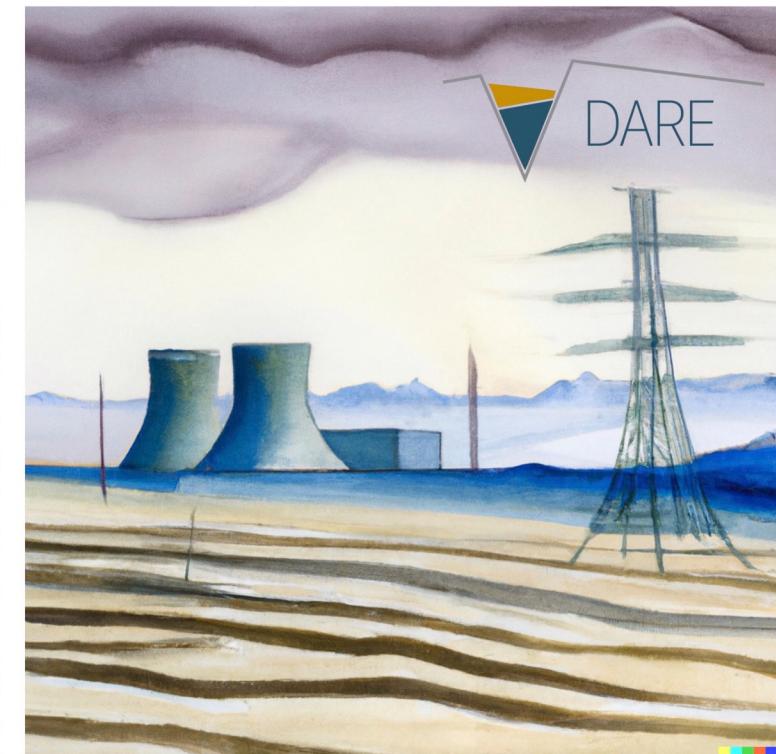
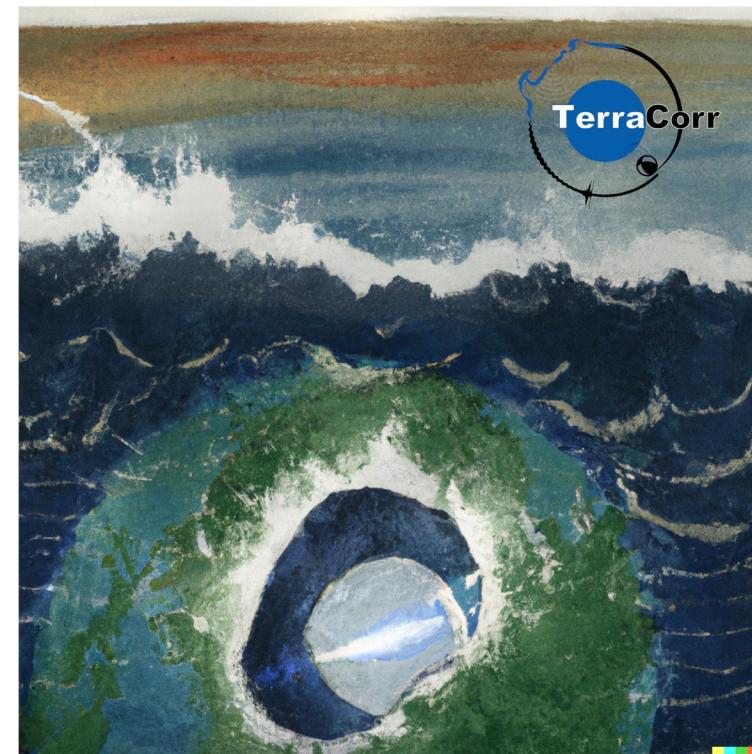
Proxy for the Moho depth – from the PhD of Ahmed Nouibat



PIERRE BOUE
Maitre de Conférences UGA (Assistant Prof.)
TerraCorr, Dare, Faultscan, F-image...



Correlation-based seis.,
Imaging, Array-based
Detections, Global seis.,
seis. Hazard, Fault
Monitoring, Opportunistic
sources...





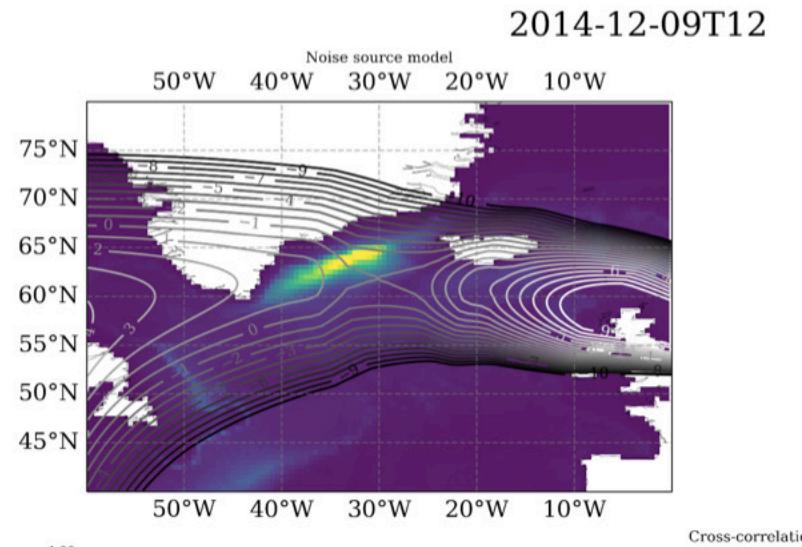
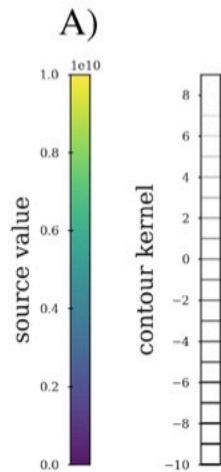
Lisa Tomasetto

PhD

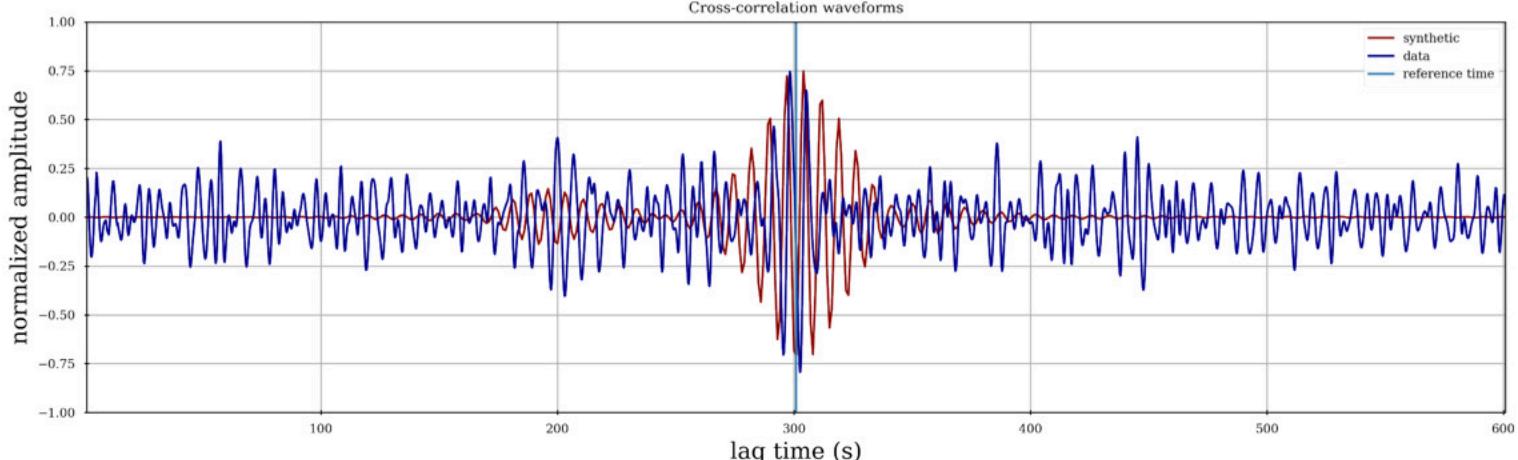
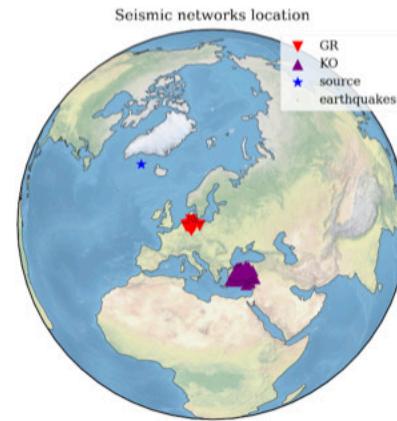
Terracorr



Travel time evolution of P-waves retrievals in the secondary microseismic band using seismic interferometry.



B)



Working with Pierre Boué,
Laurent Stehly, Pratul Ranjan,
Ruohan Zhang.



Pierrick Blanchet

Intern

Terracorr

Ray path maps applied to seismic interferometry in
the secondary microseismic band.

Supervised by Pierre Boué,
working with Lisa Tomasetto



DARE

IRSN
INSTITUT DE RADIOPROTECTION
ET DE SÛRETÉ NUCLÉAIRE



(*Dense ARray for seismic site effect Estimation*)

Passive seismic imaging and numerical simulations for site effect estimation in the Tricastin basin (Rhône valley)



François Lavoué
PostDoc
DARE Project

DARE Collaborators:

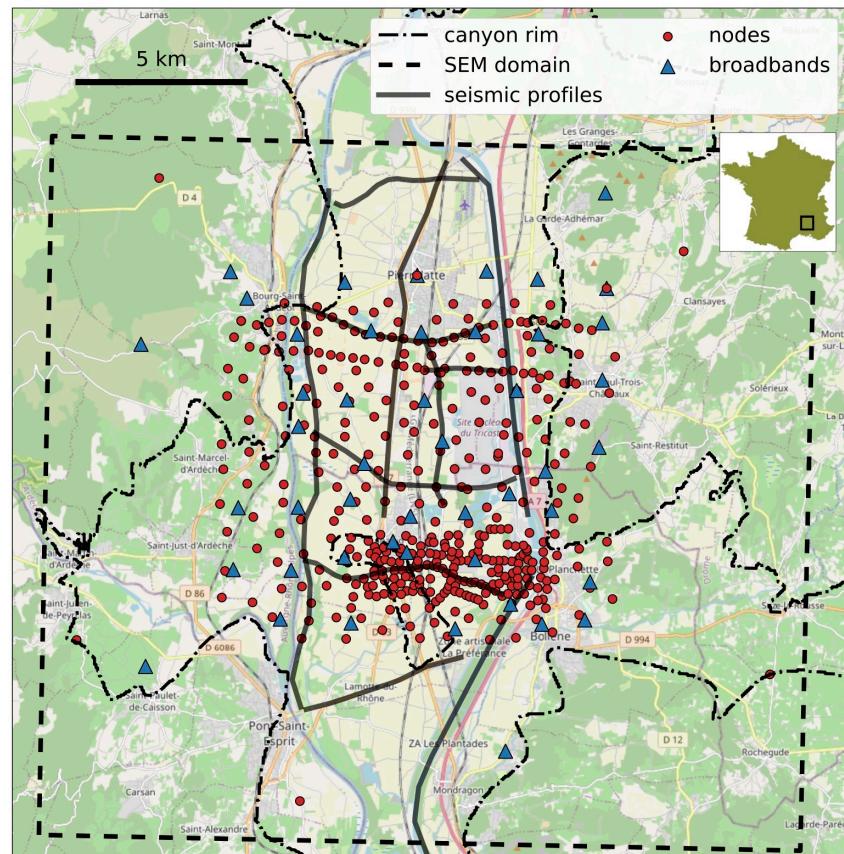
(IRSN) Bérénice Froment, Céline Gélis,
E. Marc Cushing

(ISTerre) Laurent Stehly, Pierre Boué,
Emmanuel Chaljub, ...

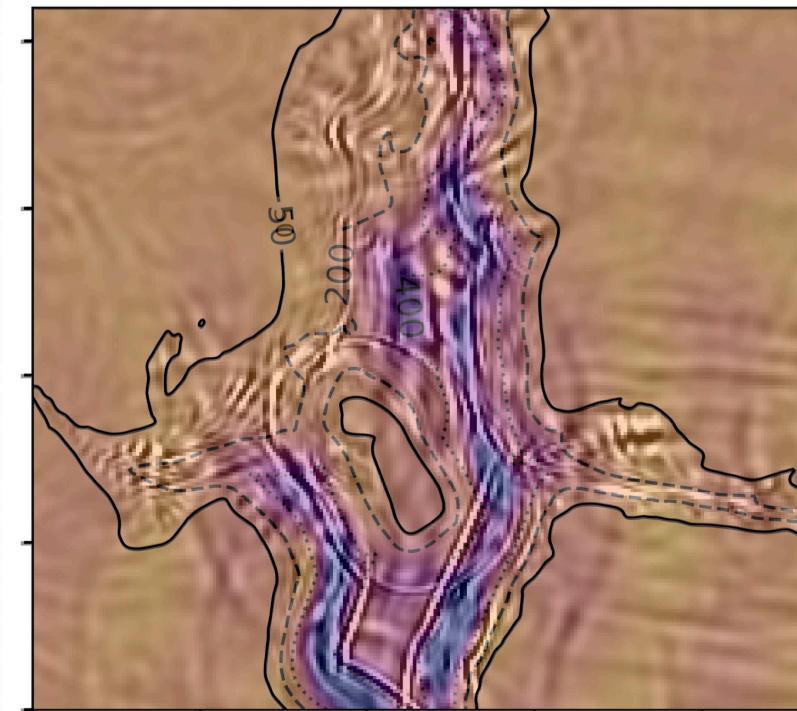
(BRGM) Florent De Martin

Areas of interest:

- Geophysical imaging
- Waveform modelling and inversion
- Various physics: seismics, EM (GPR)
- Various scales: near surface, basins,
global Earth (mantle anisotropy)



Seismic wave propagation and
amplification at 0.5 Hz.





ISTerre

**Christina Akleh
Intern
DARE Project**

**Probabilistic ambient noise surface wave tomography geared towards
site effect estimation in the Tricastin basin**

Supervised by:

Francois Lavoué
Pierre boué
Laurent Stehly



ISTerre

**Michel Dietrich
Permanent**

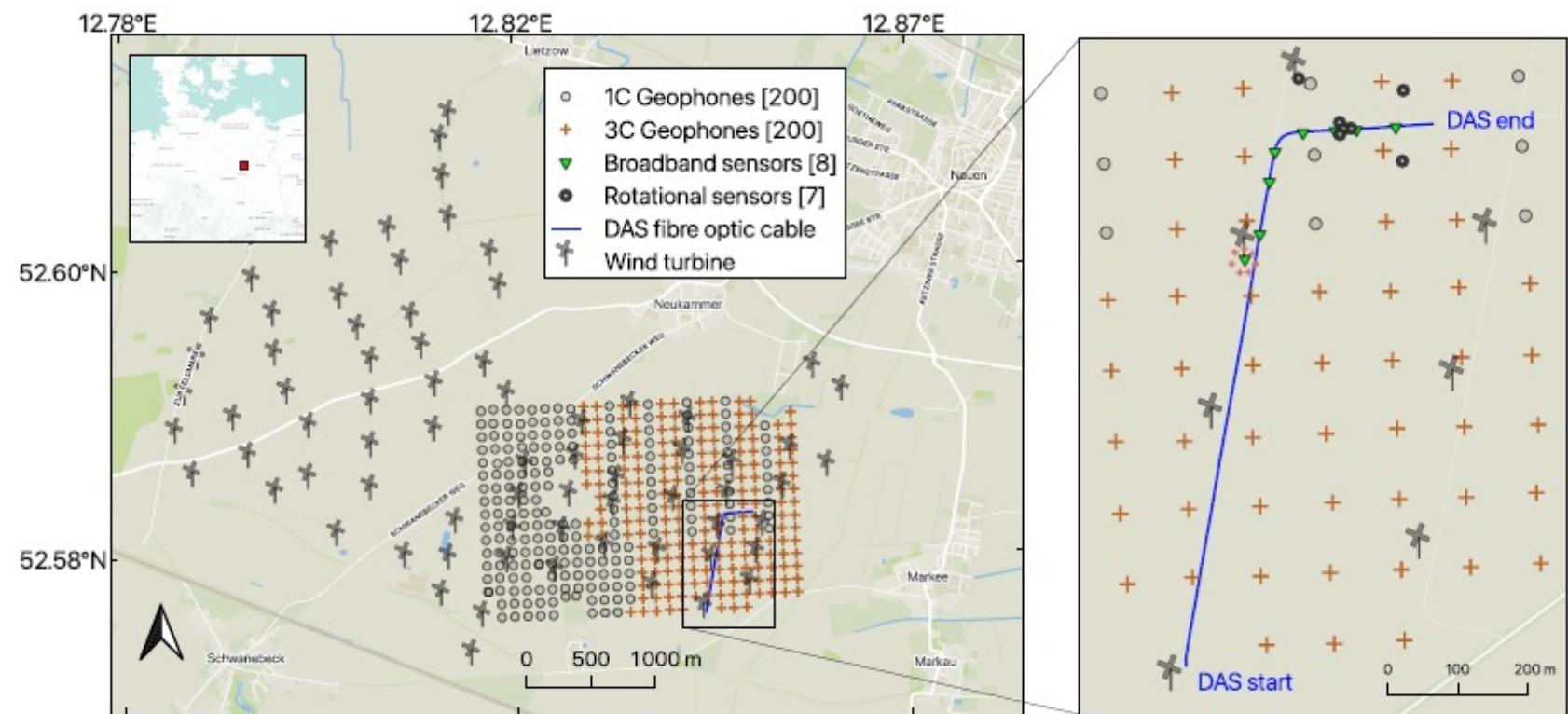


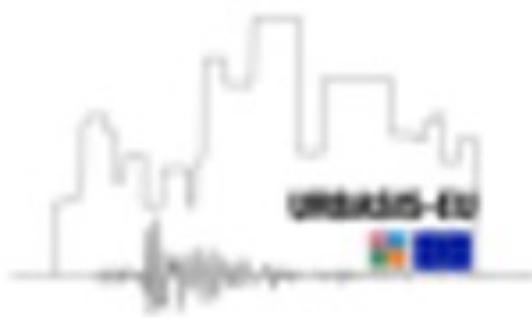
ISTerre

Roux Philippe Permanent RESOLVE & META-WT

Wave propagation in complex media

Stéphane Garambois,
Philippe Guéguen,
Ludovic Métivier,
Romain Brossier,
Pierre Boué,
Michel Campillo.





Shoaib Ayjaz Mohammed

PhD Student

URBASIS Project

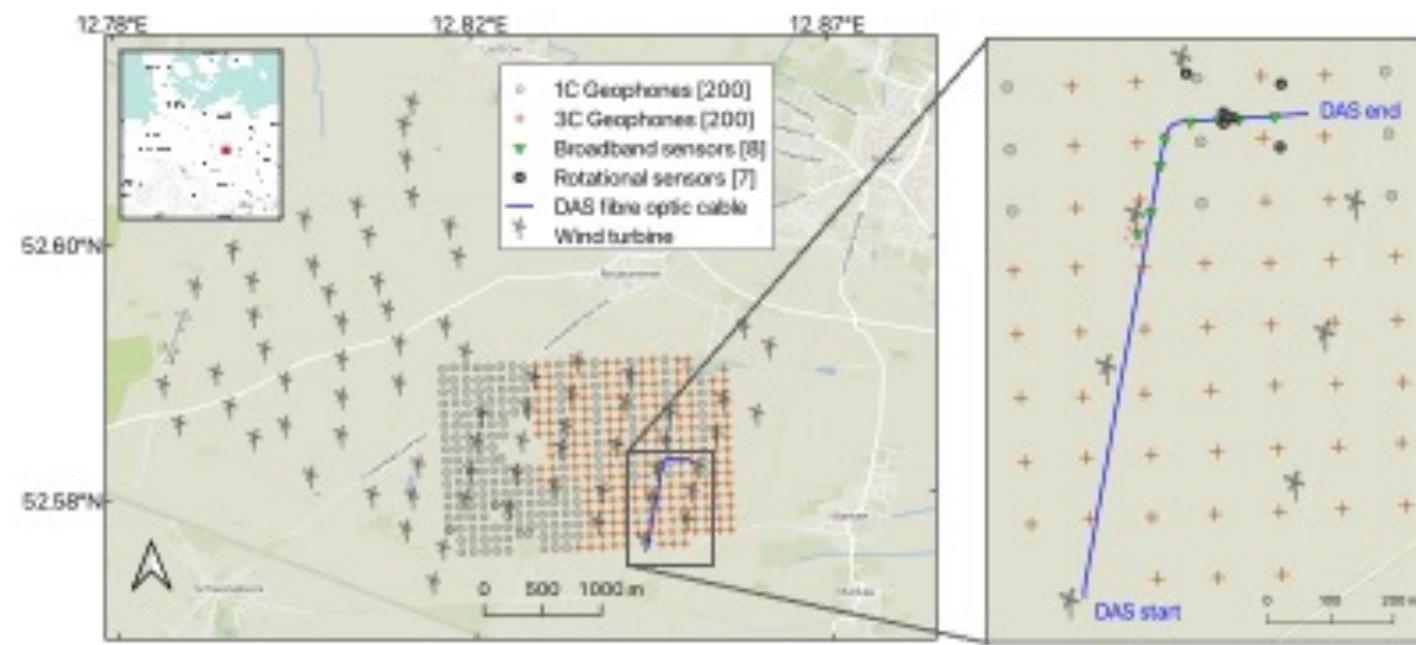


Areas of Interest:

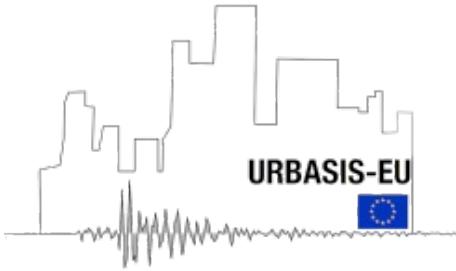
Array Seismology, Ambient Noise analysis, seismic metamaterials

Collaborators:

Philippe Roux, Philippe Gueguen, Coralie Aubert, Axel Jung, Marco Pilz, Fabrice Cotton, Andrés Olivar-Castaño, Felix Bernauer, Matthias Ohrnberger, Raphaël F. Garcia



The META-WT Experiment: Can A Dense Wind Farm Behave as a Seismic Metasurface?



Philippe Guéguen

DR (Univ. Gustave Eiffel)

Urban Seismology

Seismic ground motion,
building response and damage/loss
assessment in urban area

Collaborators in the team/others

Philippe Roux

Romain Brossier

Ludovic Metivier

Laurent Baillet (Failles)

Laurence Audin, Céline Beauval (Cycles)

Emeline Mauffroy, Sreeram Kotha (GRE)





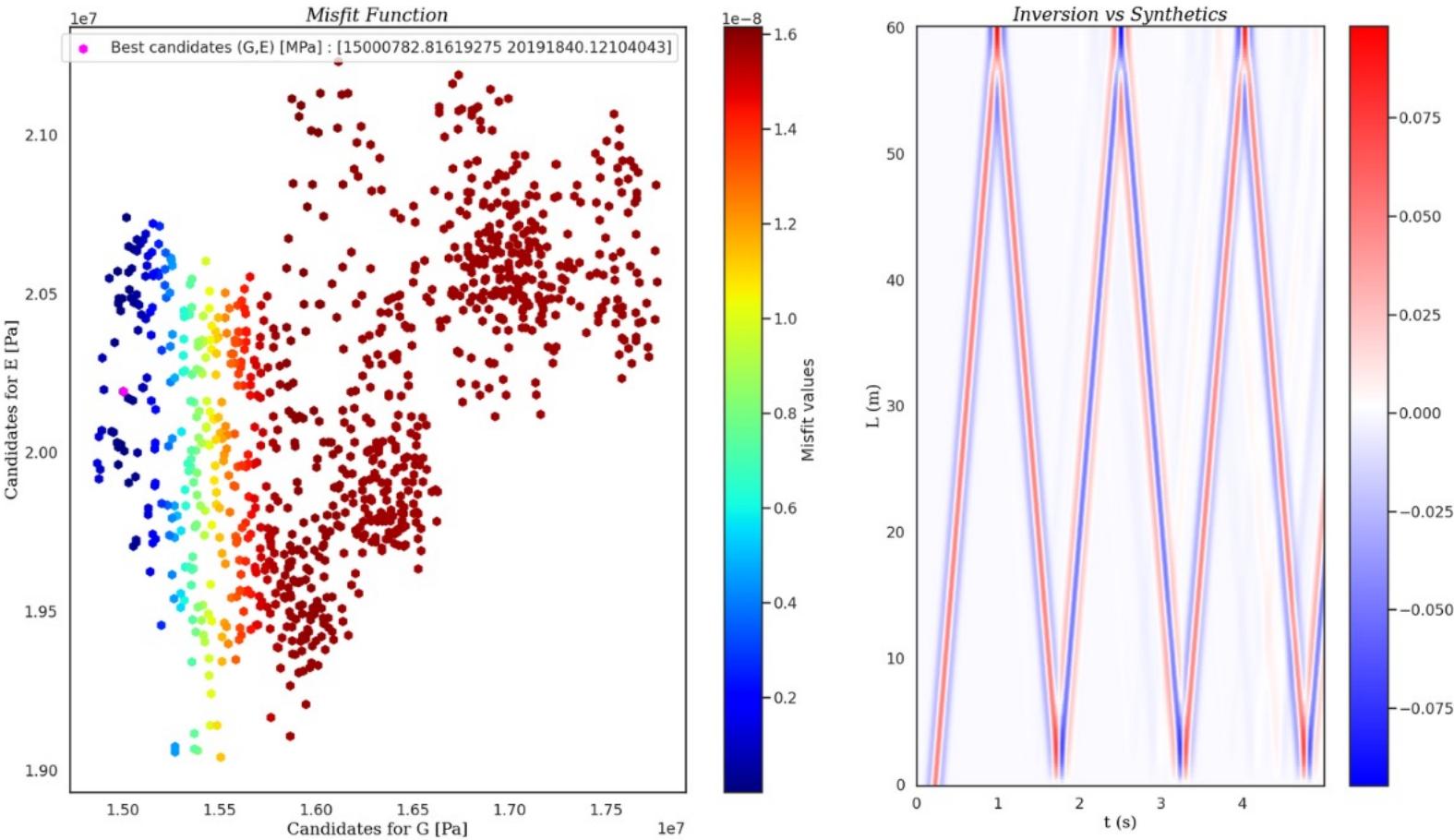
Ricardo Caiza Grijalva

Master's Student Intern

Toward FWI in Buildings
SEM modeling of the
Timoshenko Model

Romain Brossier

Philippe Gueguen





ISTerre

Olivier Coutant
Permanent

Distributive Acoustic Sensing (DAS)

PhD Supervisor: Destin Nziengui Bâ



Julius Grimm

PhD candidate

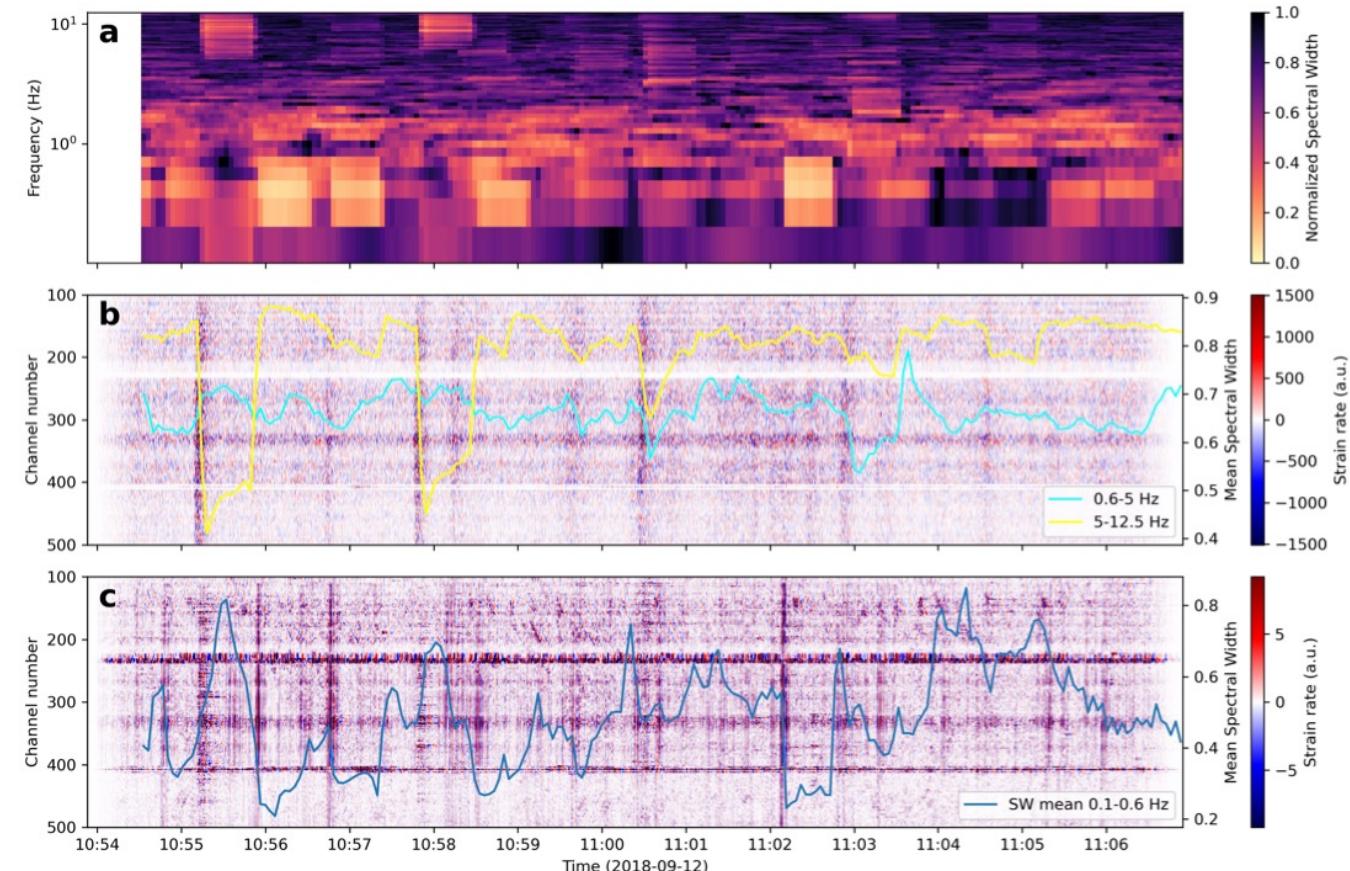
SPIN project



Detecting seismo-volcanic events
based on inter-channel coherency of a
DAS cable

PhD Supervisors:

Piero Poli, Cédric Schmelzbach





ISTerre

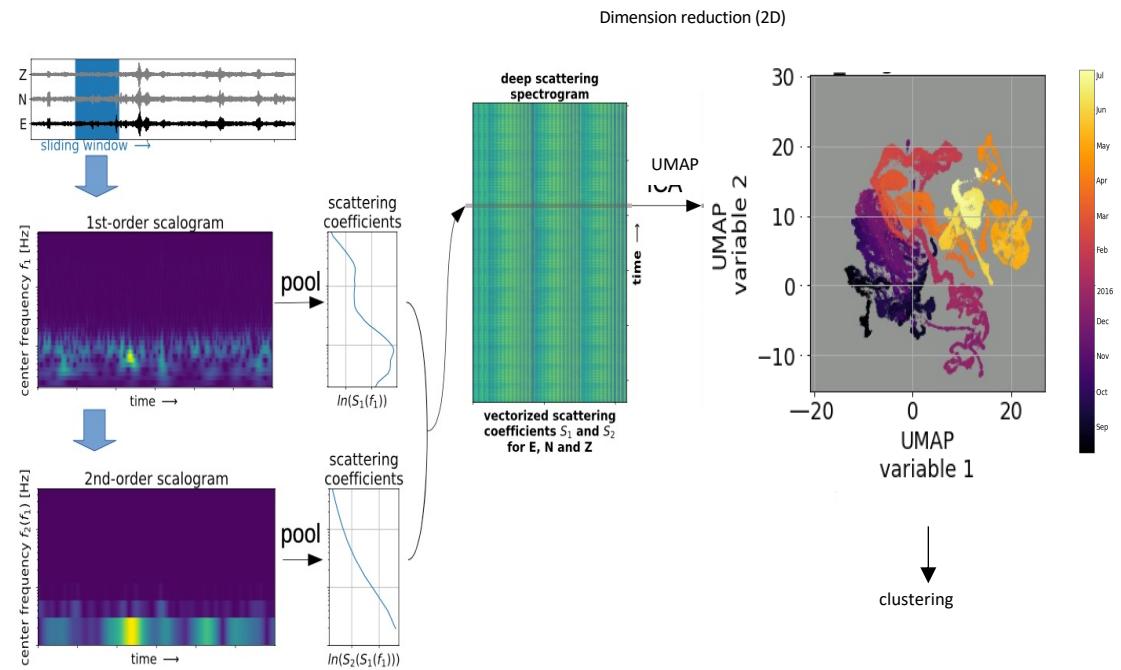
Michel Campillo
Permanent
F-IMAGE / SPIN / MIAI



Talk title:

Medium Changes and Source Diversity Revealed by Unsupervised Machine Learning.

Collaborators in the team/others: R. Steinmann, S. Mouaoued, M. Bracale, C. Huguel, N. Compaire, L. Seydoux, N. Shapiro, M. de Hoop, +.....





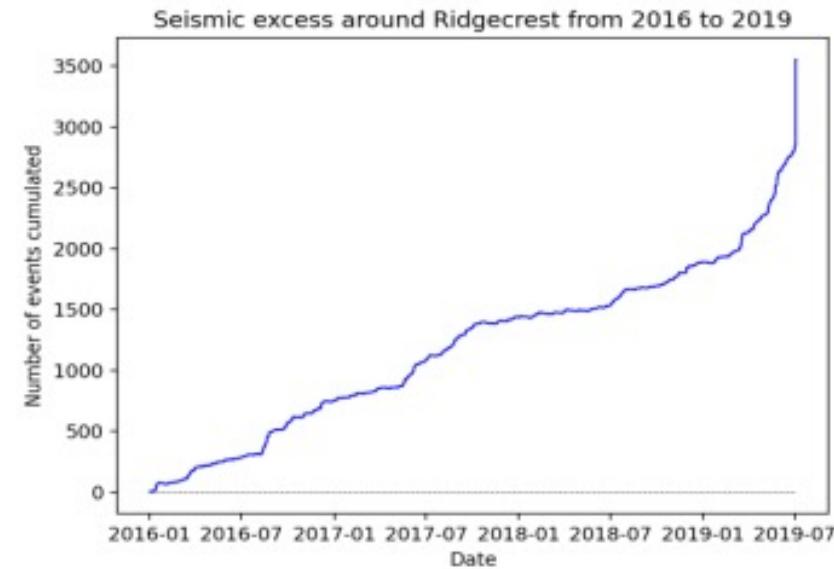
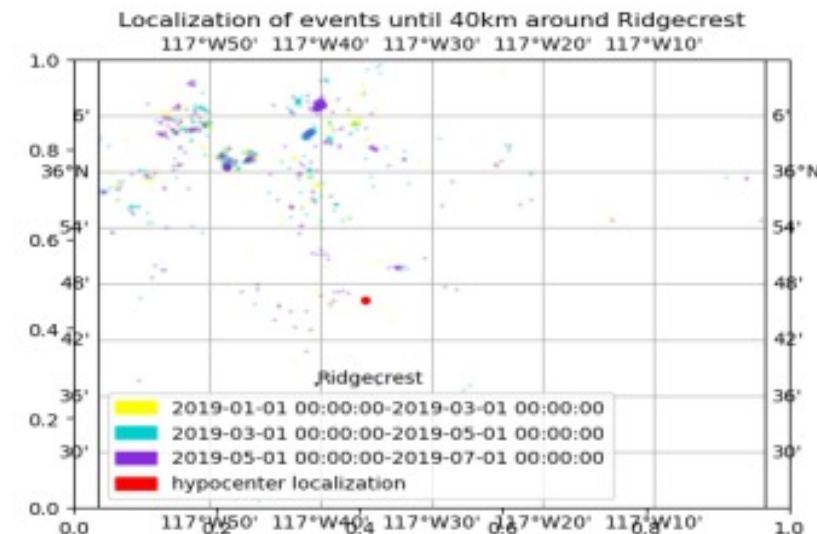
Sarah Mouaoued

PhD

F-Image

Unsupervised deep learning method to automate the search of seismic signals

Supervisors : Michel Campillo, Léonard Seydoux



Mirko Bracale

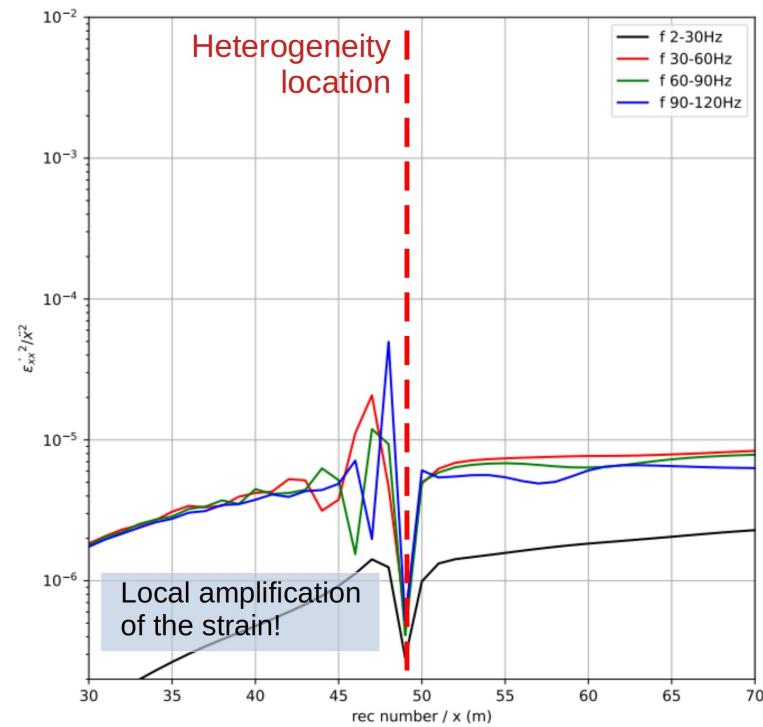
PhD student
SPIN ITN

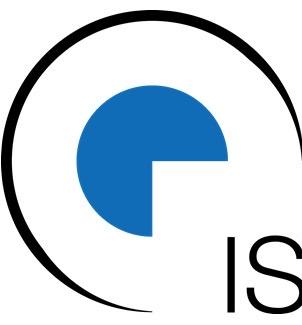


Research topic: Characterization of strain - rotation rate measurements in different contexts and their comparison with the acceleration field.

Effect of shallow heterogeneities on wavefield gradients measurements

Mirko Bracale, Michel Campillo, Helle Pedersen, Romain Brossier

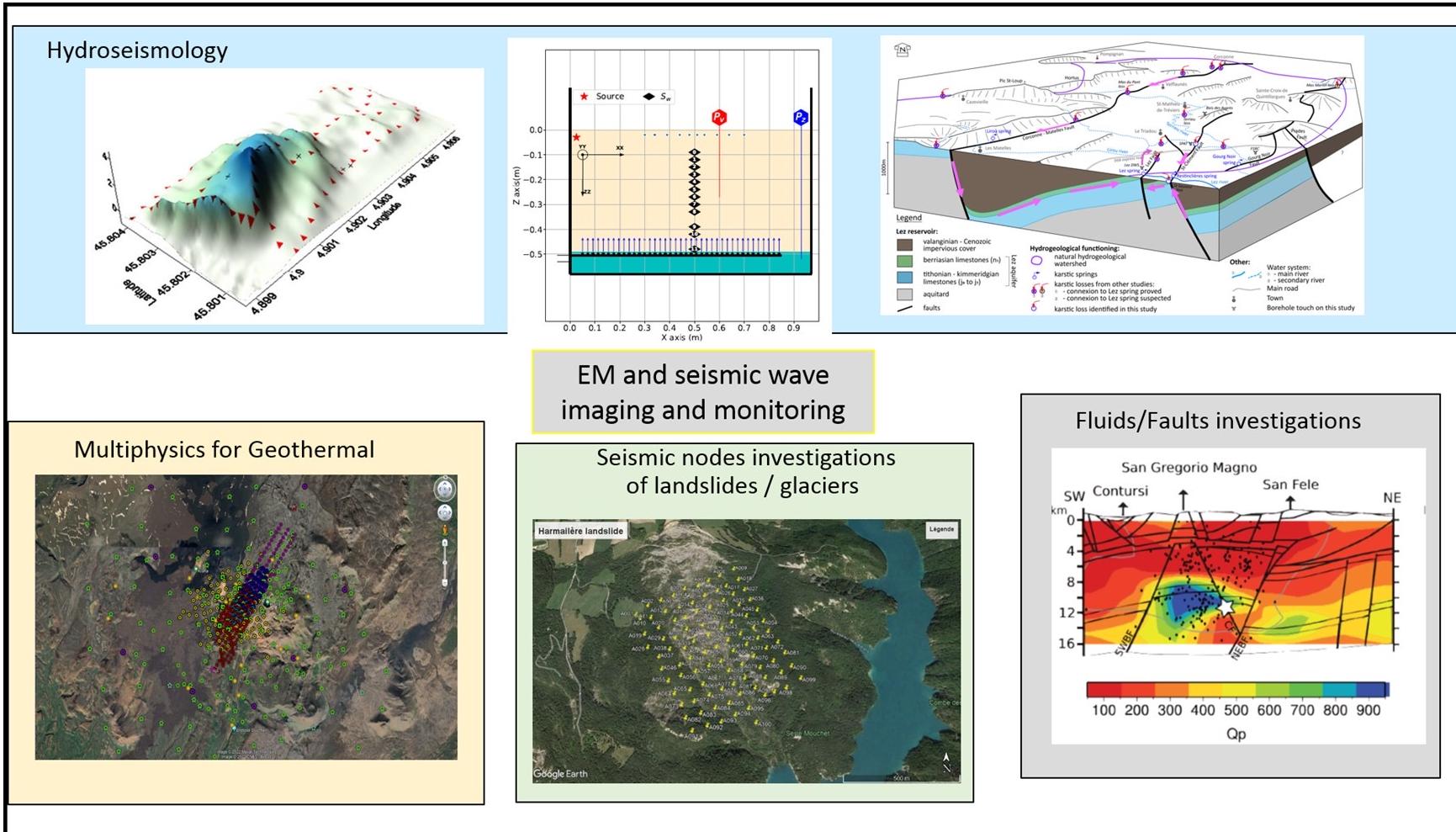




Garambois Stéphane

Permanent – Prof UGA

Multiphysics imaging and monitoring of fluid related processes



Collaborators : waves & Structure team

Volcanic geophysics & geothermics

Seismic cycles

IGE, University Pau, Padova, ...



Ludovic Moreau
Permanent
Ice Wave Guide

Ice Waves, Sea Ice

PhD supervisor of Hooshmand Zandi

Hooshmand ZANDI
PhD,
Icewaveguide



Inversion of seismic waveforms to study the dynamics of sea ice

Ludovic Moreau¹, Ludovic Métivier^{1,2},
Romain Brossier¹

¹ ISTerre, Univ. Grenoble Alpes,

² LJK, CNRS, Univ. Grenoble Alpes, France

