

**Workshop BRUIT-FM**  
**06 juin 2023, IPGP**  
**Minutes**

## Participants

### On site:

Simon Rebeyrol, Stephan Ker, Richard Dréo, Wayne Crawford, Guilhem Barruol, Véronique Farra, Mohammed Amin Aminian, Eléonore Stutzmann,

### By zoom

Sara Bazin, David Hautemayou, Zongbo Xu, Aude Lavayssière

## WP Overviews

### WP1 (Wayne)

Major roadblock is lack of consortium agreement, due to loss of iXblue partner (see below) iXblue was sold, name changed to eXail and new management decided to abandon the blueSeis rotational seismometer division. Need to redefine consortium with only IPGP and IFREMER, complicates affairs for IFREMER because they have to go from “private” to “public” status (IFREMER accepts this change). Try not to lose science but rather redefine rotational seismometer project as best possible and give funding to some underfunded or new aspects of the project:

- Transfer the iXblue money (37 k€) to IPGP and use to find new options for rotational seismometer in a BBOBS
- Redistribute IPGP (28k€) and IFREMER (3,2 k€) funds to enhancing BRUIT-FM, possibilities include:
  - o Adding funding for internships for partners which were otherwise unfunded in the initial budget
  - o Funding a “Big Noise Challenge” (see Crawford presentation)
  - o Funding AIS data for orienting OBSs using ship traffic

Need to submit proposition for money redistribution to ANR quickly, Wayne will write a draft, to be improved and approved by the administrative group. If members have other ideas for things to fund, please speak up!

### WP2 (Richard)

Data inventory (FDSN & Ocean Hemisphere Project), searched for OBS stations (elevation < 0?)

BRUIT-FM Web site now presents this data by table/map/station/sensor type

(<http://www.bruit-fm.org/datasets.html> )

Access by map or by sortable tables

Evolution: add search filters?

Richard has second set of maps with downloaded data. These data can be requested by other BRUIT-FM members: he will send them a disk. Can be much faster than downloading over web. Richard has a dedicated Raspberry Pi machine downloading data.

### WP3 (Eleonore)

Problem finding a post-doc (Zongbo Xu could be the good candidate)

Objective: investigate and model the noise levels at different sites, different oceans, depth, sensor, frequency

### WP4 (Stephan)

Work on compliance with Simon

Problem of Jerome Mars who decided to leave Bruit-FM

Needs discussion to clarify why

Sara: what about integrating Raphael Abreu in Bruit-FM?

WC: hope that the Big Noise Challenge and the possibility of internship money can convince Jerome and Michel Olivier to stay

### WP5 (Guilhem)

Update on cryoseismology on the astrolabe glacier.

SEIS-ADELICE experiment, involving SP OBS and Guralp "BREVE" OBS

## Scientific talks:

Simon Rebeyrol: (post doc IFREMER)

### **Improving Seafloor Compliance Noise Removal**

IG waves that deform the seafloor at LP

Signal removal to access the compliance.

Used Cascadia initiative data sets, perfectly levelled OBSs, 3 different depths

Use Multi-scale deviation analysis to select windows

Robust compliance estimation

Ongoing:

- Comparison of seasons, station depths.
- Use of distance metrics and divergence to quantify robustness

Targeting SRL paper submission by end of August

ES: could you compare rejected periods with removal lengths that are suggested w.r.t. EQ magnitudes?

Richard Dréo:

### **Whales in the Mozambique channel.**

Use of REVOSIMA instruments (MAYOBS OBSs and MAHY Hydrophones)

Different species of whales detected

New detection algorithm based on ICI (Inter Call I) by involving cepstrogram analyses

Validation through a manual annotation database

Seasonal detection of whales

Absence of fin whales over the 3 years of analysed data

Wayne Crawford:

### **Big noise challenge**

Provide pressure and acceleration datasets, ask for transfer function between pressure and vertical acceleration. Methods sought: physics-based, machine learning, multivariate, ...

2 data sets:

1. Rainbow compliance measurements (1 week, unknown signal and noise levels)
2. Synthetic example (known signal and noise levels)

Comparison of various techniques and algorithms to enhance the signal quality over the various frequency bands

Challenges

1. Best pressure / acceleration coherency
2. Lowest (true) response function uncertainty
  - Accounting for noise on both channels
3. Simplest (successful) implementation
  - Ease of learning
  - Ease/rapidity of implementing

Output

- Paper on Rainbow compliance using the best method/author
- Group paper comparing methods

Questions

- How to organize such challenge?
- Who to invite/ solicitate?
- How to valorize the winner?

**ES:** There was a theoretical noise shootout four the Mars seismometer

Mohammad-Amin Aminian:

### **RHUM-RUM BBOBS compliance**

Multiple processing steps to lower the seismic noise and access the compliance

Glitch/EQ/tilt corrections -> compliance

Monte Carlo inversion for shear velocity. Tested at one station. When fully secure, will apply to all stations.