SnT 2021
CTBT: SCIENCE AND TECHNOLOGY CONFERENCE

CTBTO
PREPARATORY COMMISSION

Obtaining the infrasound bulletin for IS08

G.A. Fernandez[1], B. Joly[2], R. Tintaya[1], M. Nieto[1], J. Baldivieso[1], S. Godey[2], J. Vergoz[2], N. Brachet[2].

O1.1-320

ORAL PRESENTATION

1. Fundación Privada de Fieles Observatorio San Calixto

2. Commissariat à l'énergie atomique et aux énergies alternatives (CEA), France

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➢ Introduction.

Definition — Sound waves below 20 Hz

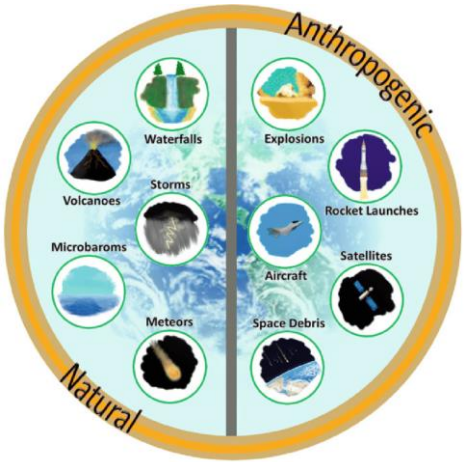
- Those waves can travel around the world due to the long wavelength

Applications — From Scientific to Civil

- Natural: Earthquakes, Volcans, Bolides, Meteors, Hurricanes, Aurora Boreal.
- Man-Made: Explosions, Rockets, Aircrafts.

IMS — A technology to strength the verification protocol

- 60 arrays deployed all around the world.
- IS08 (Peñas) is a 4 element array from CEA/DASE installed and operated by OSC-NDC



"Infrasound Monitoring for Atmospheric Studies" (Silver & Brown, 2019)

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➢ Introduction.

- IS08-Peñas is installed at high Andes of Bolivia (Plurinational State of).
- The array is composed by 4 elements separated ~1 km.
- The sensors installed are MB2000.
- Real time data is send to OSC, CEA and IDC by a VSAT link.

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➢ Introduction.

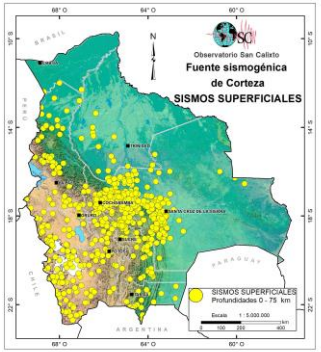
"PSHBO-2019" (OSC, 2019)

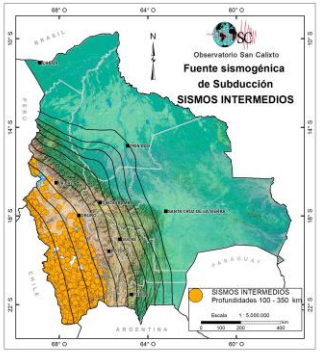
Stations (S+I)

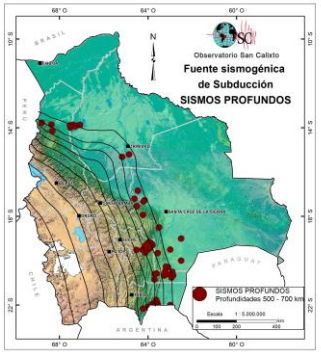
Seismicity

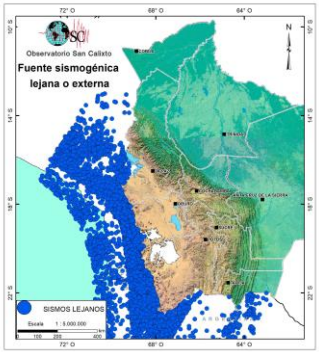
Atmospherics

"Meteoritos en Aiquile" (El Diario, 2016)









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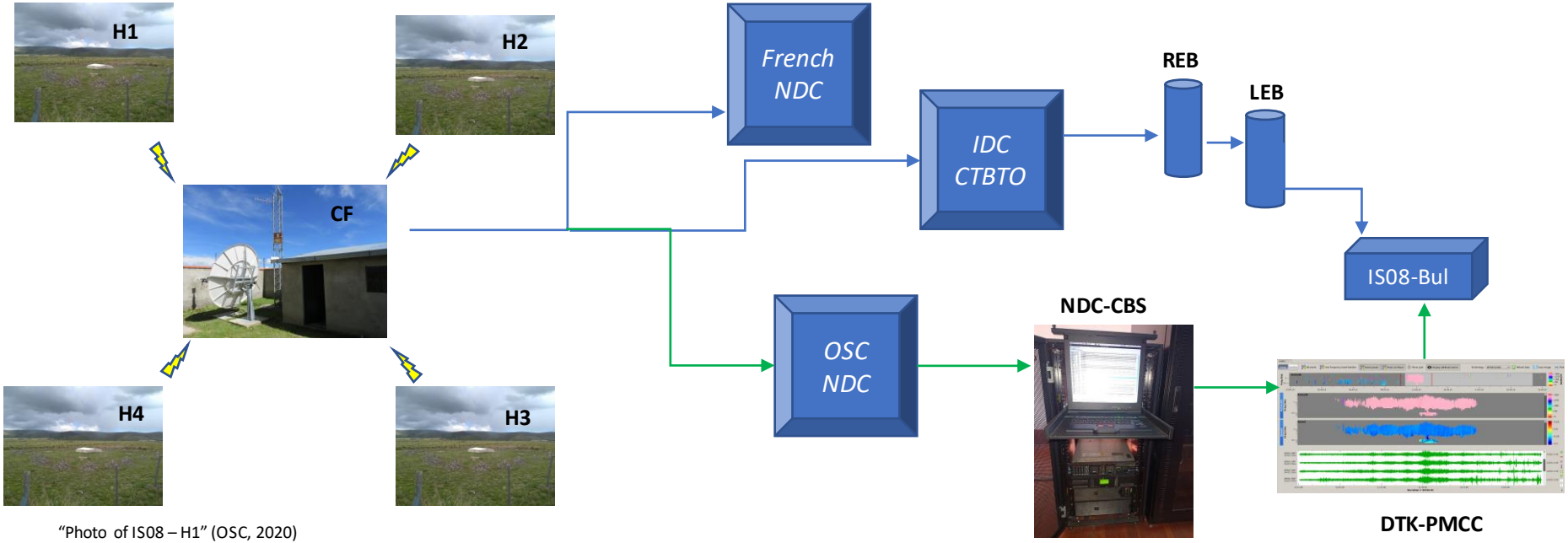
➢ Network Architecture



"Photo of IS08 – H1" (OSC, 2020)

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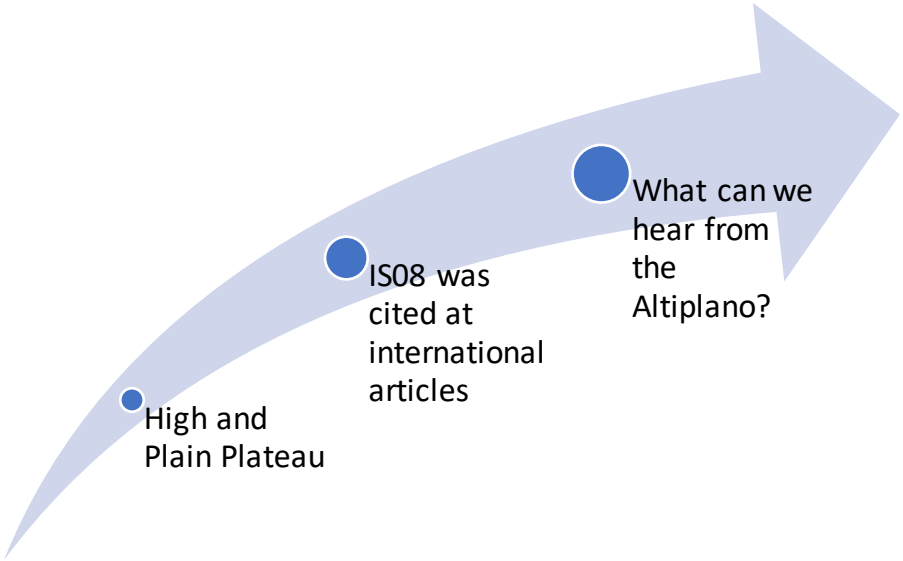
➢ Motivation

DATA	INTEGRATION	RECENT TOPIC
Available since 1999 at our NDC	Seismic + Infrasound	Not many local researches interested on this topic



"OSC-NDC" (OSC, 2021)

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➢ Motivation

Geophysical Research Letters

Free Access

Ground-coupled air waves and diffracted infrasound from the Arequipa earthquake of June 23, 2001

A. Le Pichon, J. Guilbert, A. Vega, M. Garcés, N. Brachet

First published: 26 September 2002 | https://doi.org/10.1029/2002GL015052 | Citations: 45

RESEARCH ARTICLE

Low-Frequency Atmospheric Gravity Waves from Vertical Tectonic Deformation During Two Recent Chilean Megathrust Events: the 2010 Maule (Mw8.8), and 2014 Iquique (Mw8.2) Earthquakes

Takeshi Mikumo[1, *], Takuo Shibutani[2], Makiko Iwakuni[3], Nobuo Arai[4]
[1] Kyoto University, Uji, Kyoto 611-0001, Japan,
[2] Disaster Prevention Research Institute, Kyoto University, Uji, Kyoto 611-0001, Japan
[3] Japan Weather Association, Tokyo 170-6045, Japan
[4] Disaster Mitigation Research Center, Nagoya University, Nagoya 464-8601, Japan

The Meteoritical Society

Meteoritics & Planetary Science 43, Nr 11, 1797–1809 (2008)
Abstract available online at http://meteoritics.org

Evidence for a meteoritic origin of the September 15, 2007, Carancas crater

A. LE PICHON*, K. ANTIER[1], Y. CANSI[1], B. HERNANDEZ[1], E. MINAYA[2], B. BURGOA[2], D. DROB[3], L. G. EVERS[4], and J. VAUBAILLON[5]

These articles (some examples) used IS08 data

"OSC-NDC" (OSC, 2021)

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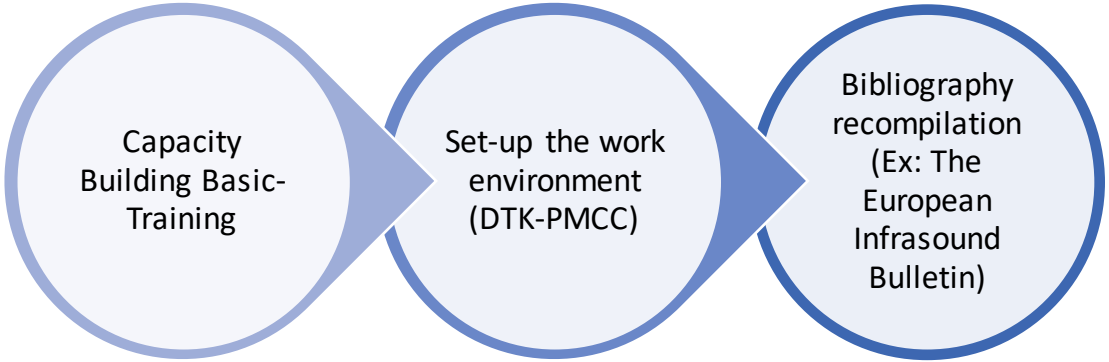
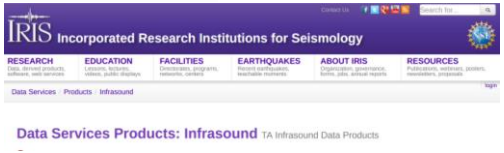
➢ Methods



INFRASOUND TECHNOLOGY WORKSHOP 2019 (ITW2019)

LATIN AMERICA AND CARIBBEAN REGIONAL INFRASOUND WORKSHOP AND INTEGRATED TRAINING FOR NDCS



"OSC-NDC" (OSC, 2021)

Disclaimer: The views expressed on this presentation are those of the author and do not necessarily reflect the view of the CTBTO

Obtaining the infrasound bulletin for IS08

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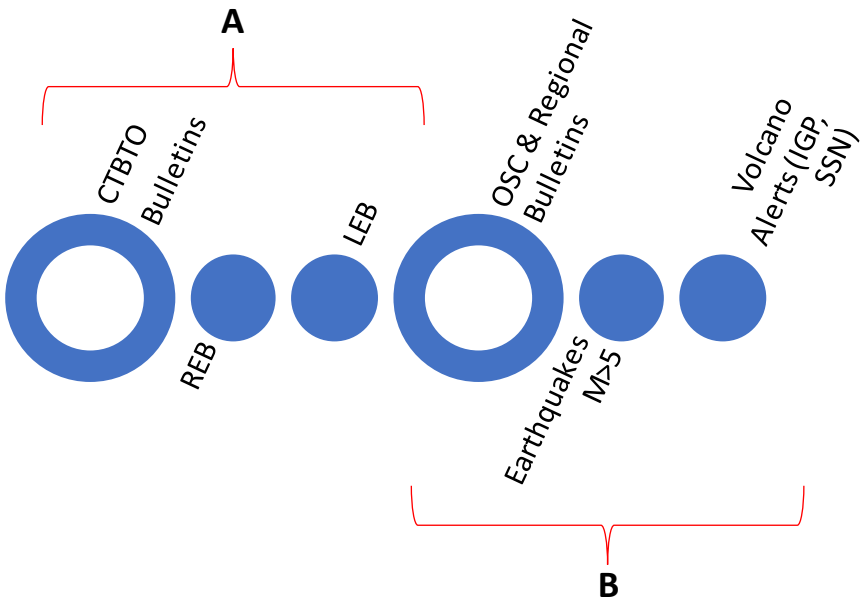
➢ Methods

First Try "test" (2016-2018)



A — Reviewed in daily bases at our NDC to compare with OSC solutions

B — Produced by our NDC and cross checked with regional agencies.

- The aim was to obtain some seismo-acoustic events at our region and to analyze / compare with IDC solutions.
- A few seismo-acoutics events were found.

"OSC-NDC" (OSC, 2021)

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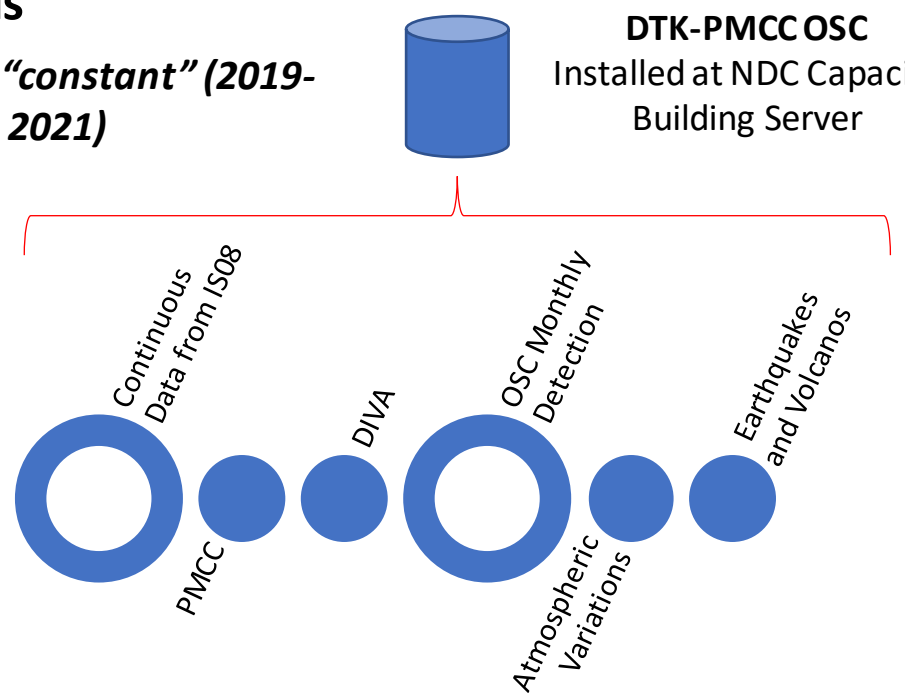
➢ Methods

Second Try "constant" (2019-2021)



- We were able to "hear" different infrasound catch by IS08.
- We compiled information of specifics events (Meteorite at Aiquile and Ubinas).
- We have a compiles catalog from 2014 to 2020

"OSC-NDC" (OSC, 2021)

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➢ Methods

"test"

- To learn the algorithms (PMCC and DIVA)
- To tune the configuration files for PMCC and DIVA
- To study specific events

"constant"

- To put in practice the learning.
- To "hear" all events catch by IS08
- To produce a bulletin

"OSC-NDC" (OSC, 2021)

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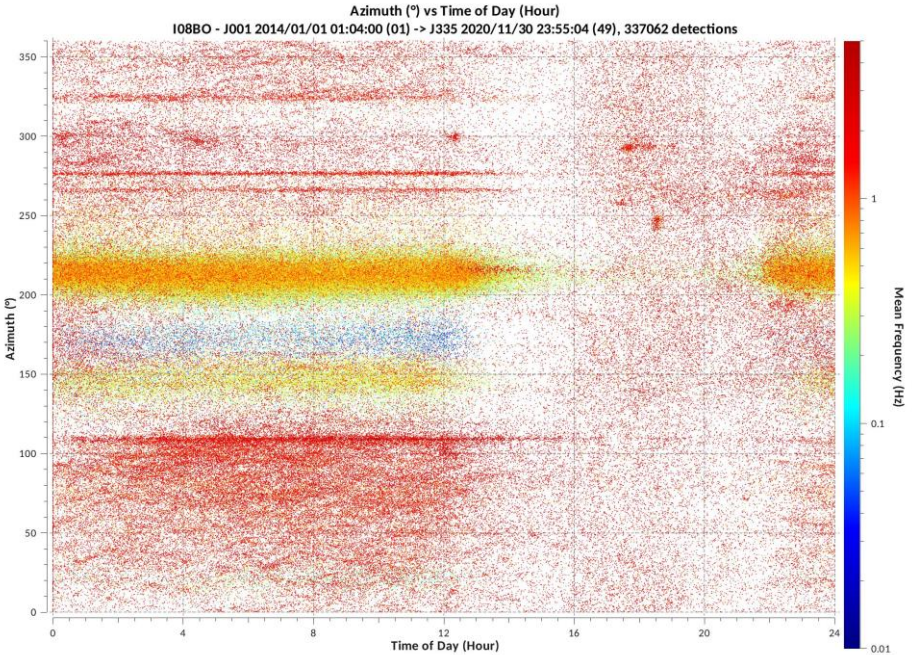
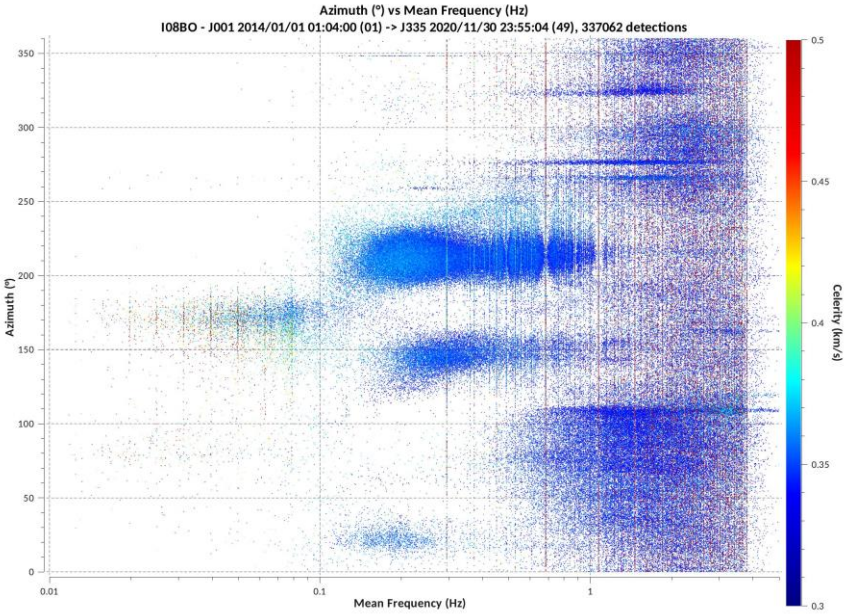
➢ Results





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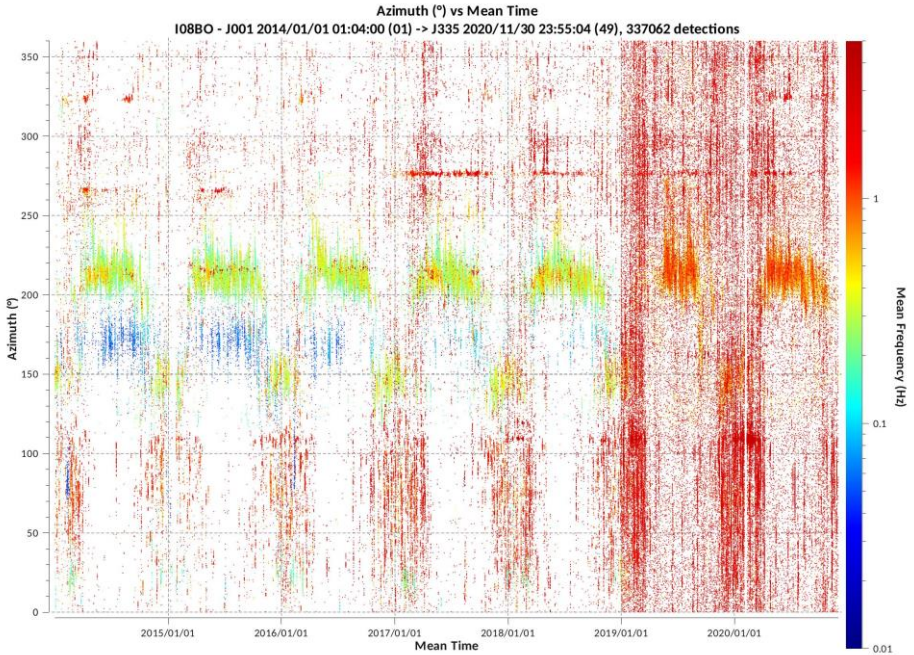

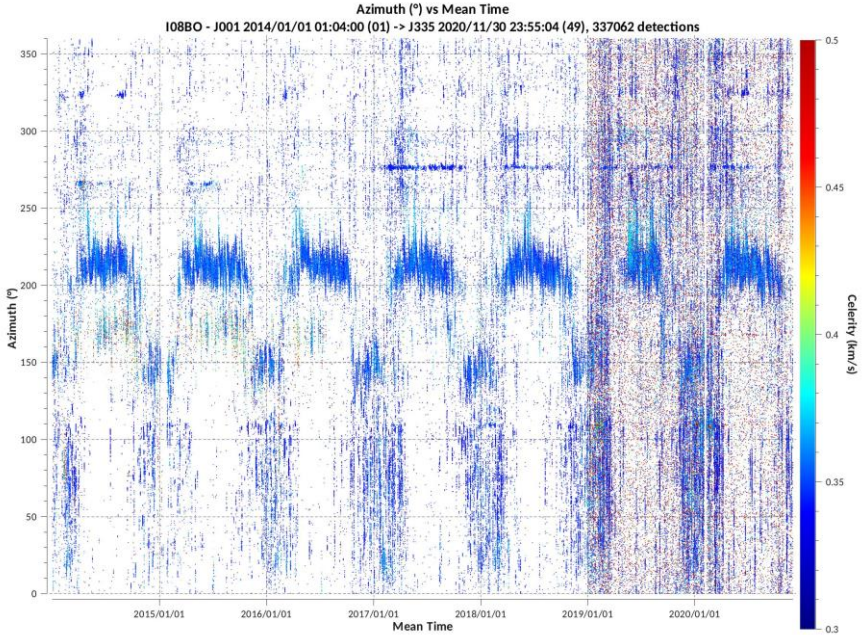

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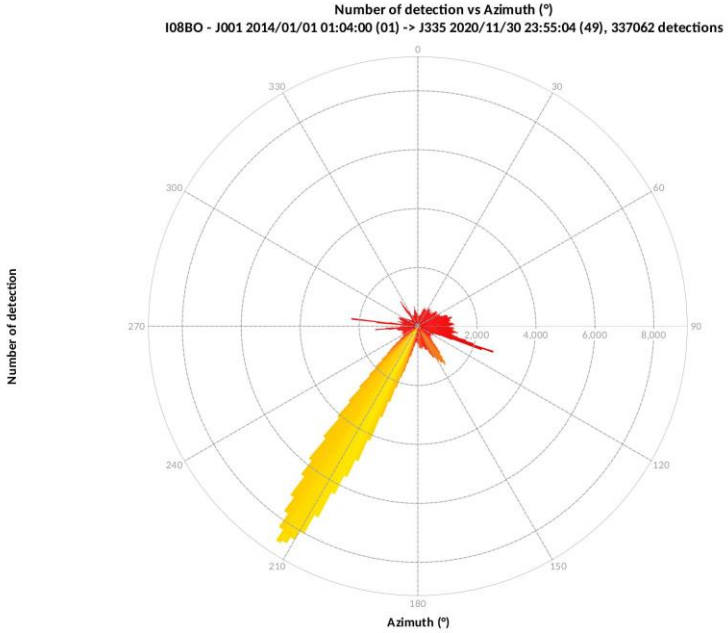

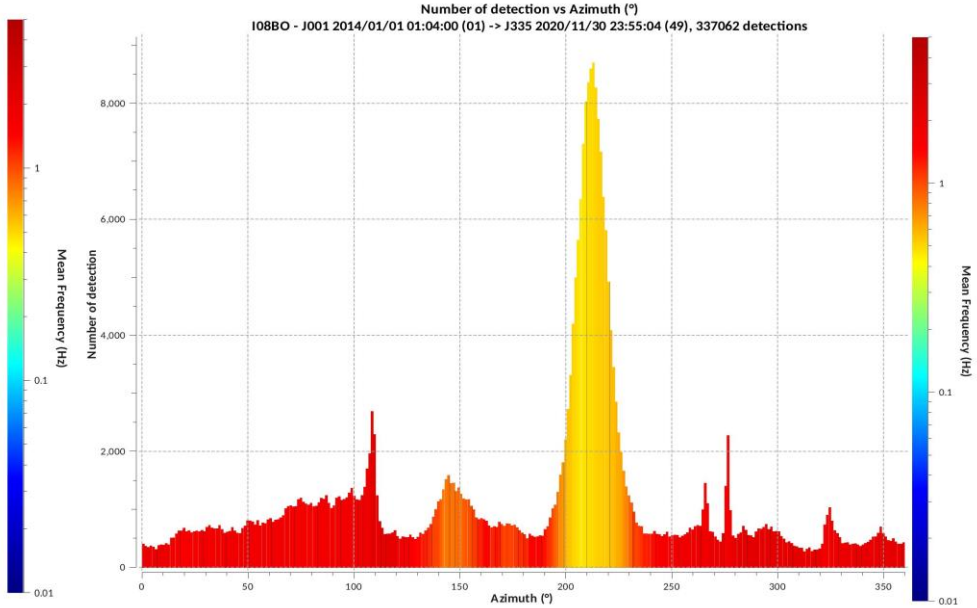

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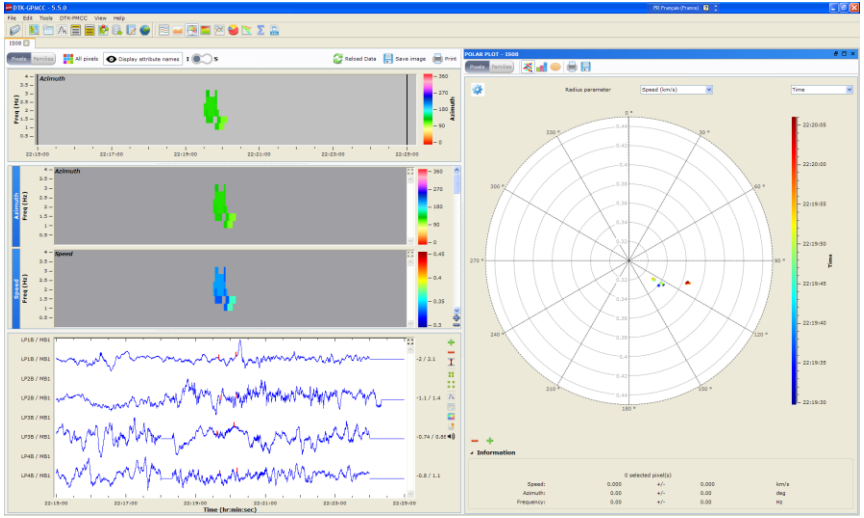
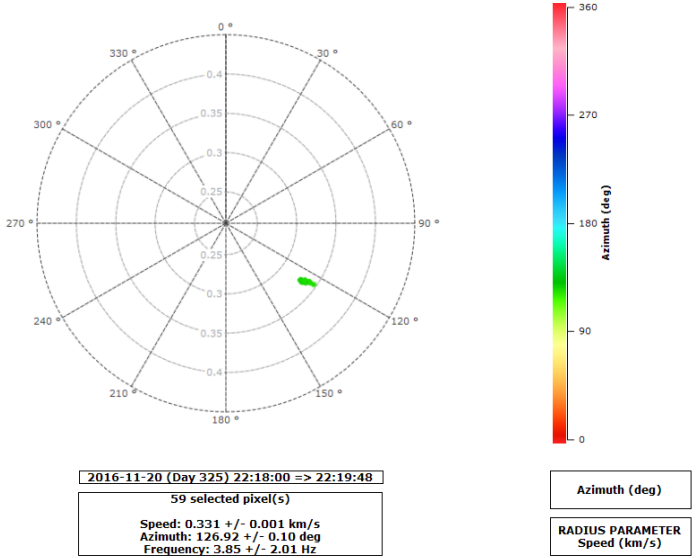
➢ Results

Aiquile Meteorite (Bolivia) 2016/11/20.





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➢ Discussion

IS08 — CEA/DASE station operated by OSC-NDC

- A well known collaboration from more than 40 years allowed us to exchange knowledge, it is a good example of NDC's collaborations

Bulletin — First stage

- We noted clearly the microbaroms from Pacific Ocean.
- We noted some specific events such as meteorites in our country.

Perspectives — From medium to long term

- Be able to have categorized events (GT's).
- Be able to propose a wind model for our region.
- Strength the knowledge collaboration with Paraguay NDC

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#TAKEYOURVACCINE
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