

FIRE:

WP5 Seismic sources

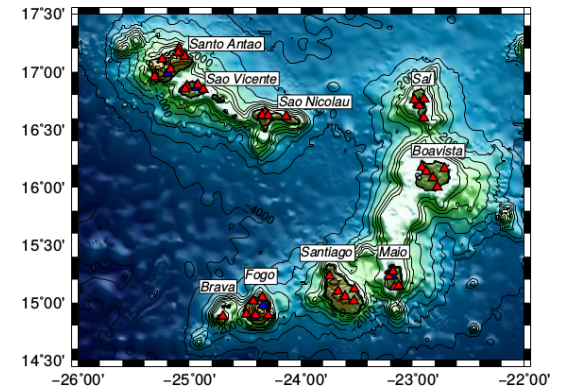
**WP6 Using Ambient Noise
towards 4D Monitoring**

Graça Silveira

AL1: Volcanic structure

Imaging the Cape Verde hotspot structure

- Characterization of microseismic noise sources in Cape Verde;
- Seismic structure from teleseismic events:
 - High temperature in the upper mantle beneath the Cape Verde Hotspot;
 - Seismic anisotropy beneath the Cape Verde Hotspot.
- Ambient noise tomography:
 - Group velocity distribution (Rayleigh and Love waves)
 - V_S profiles



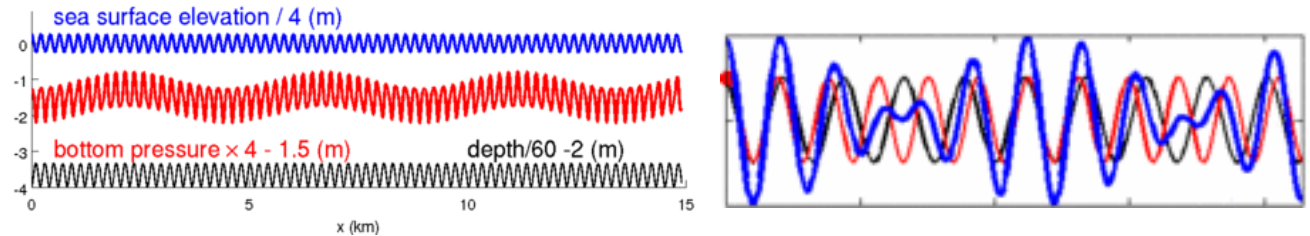
AL1: Volcanic structure

- Seismic structure from teleseismic events:

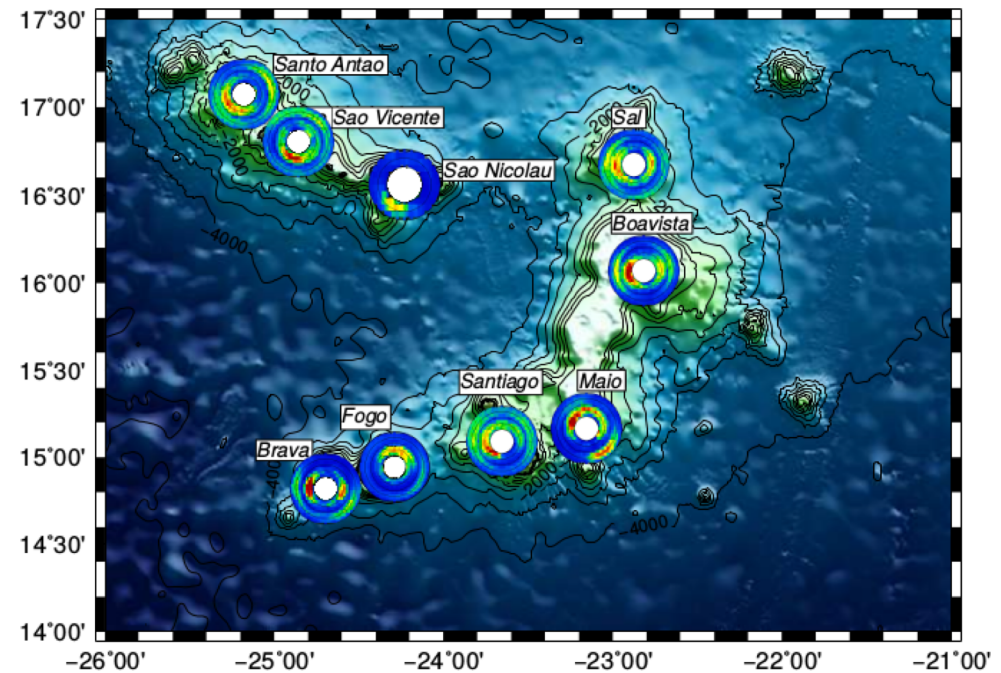
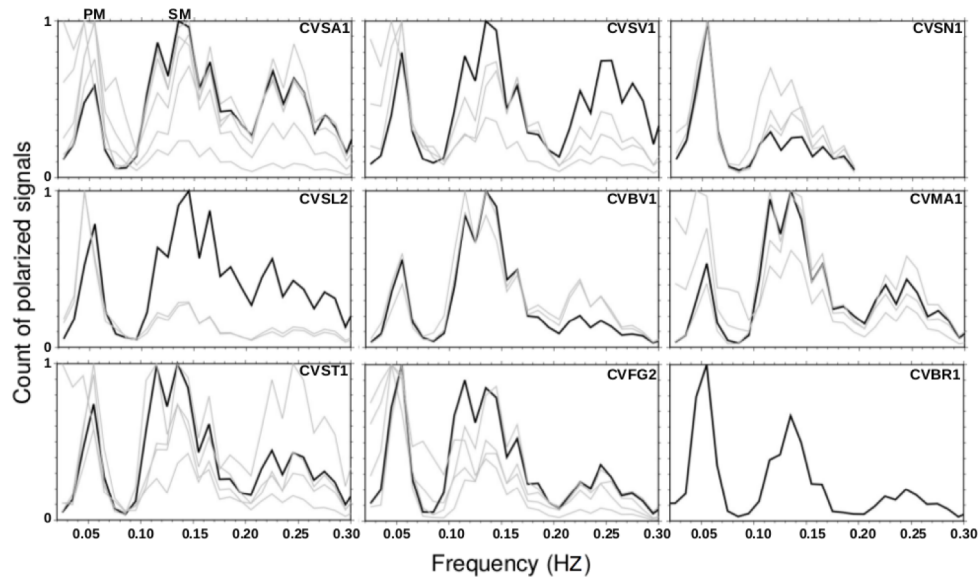
Generation of 'primary and secondary microseisms'

Period band: 3 – 20s

Surface waves



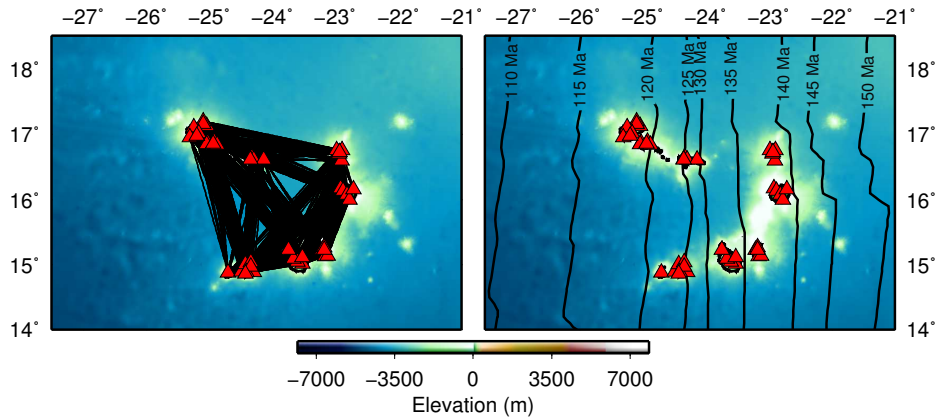
Arhduin et al., 2011



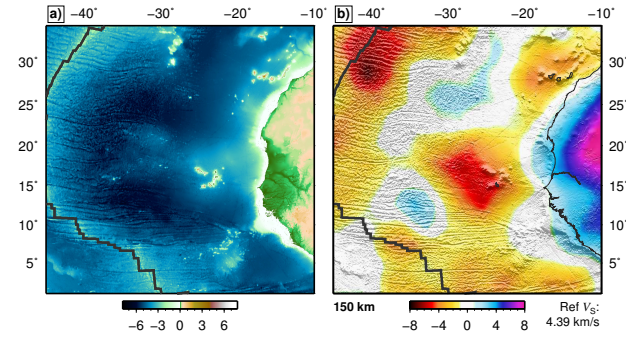
AL1: Volcanic structure

Celli et al., 2018
submitted

- Seismic structure from teleseismic events:



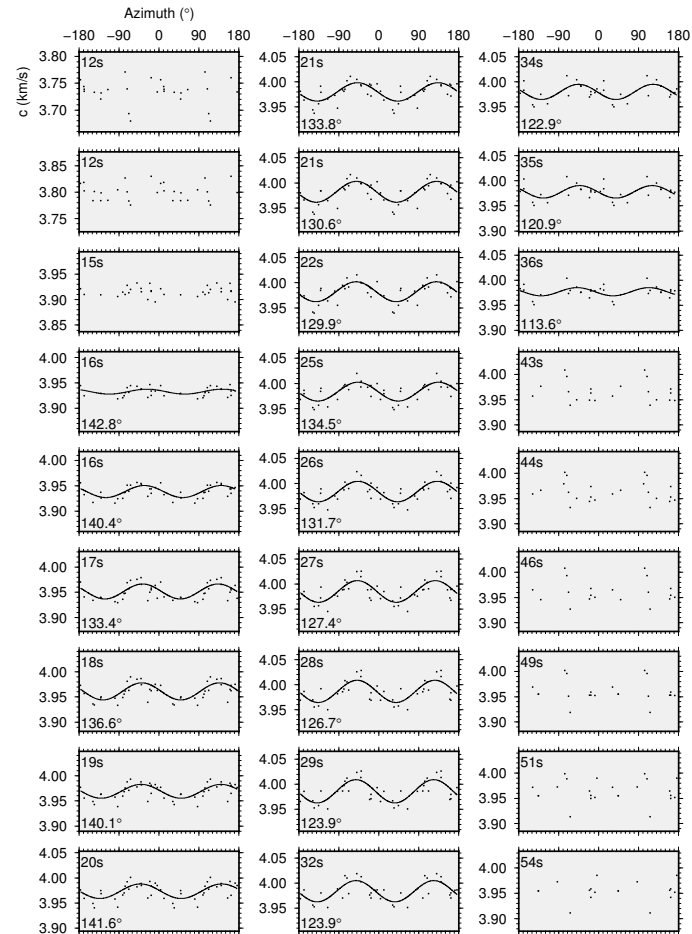
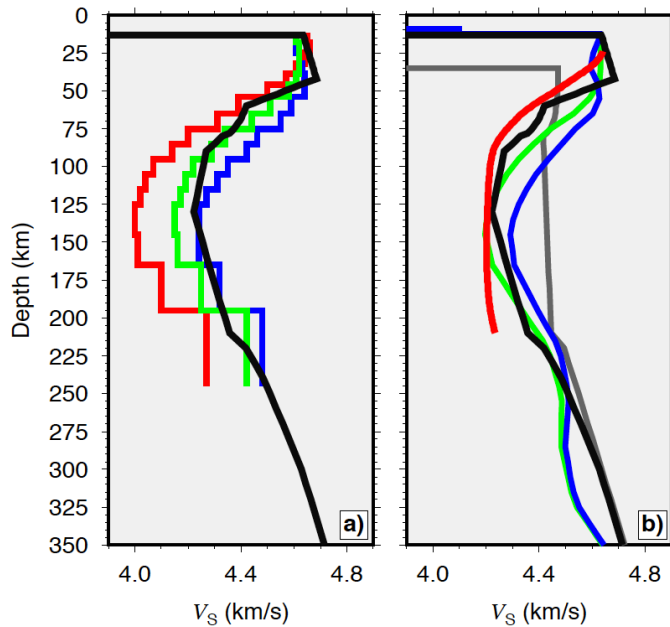
network



V_S Profile

Hawaii
[Laske et al., 2011]
— Active volcanism
— Away from volcanism
— Past volcanism

Pacific
[Nishimura and Forsyth, 1989]
— 52–110 m.y.
— 110+ m.y.
— TdC
[Kennet et al., 1995]
— AK135

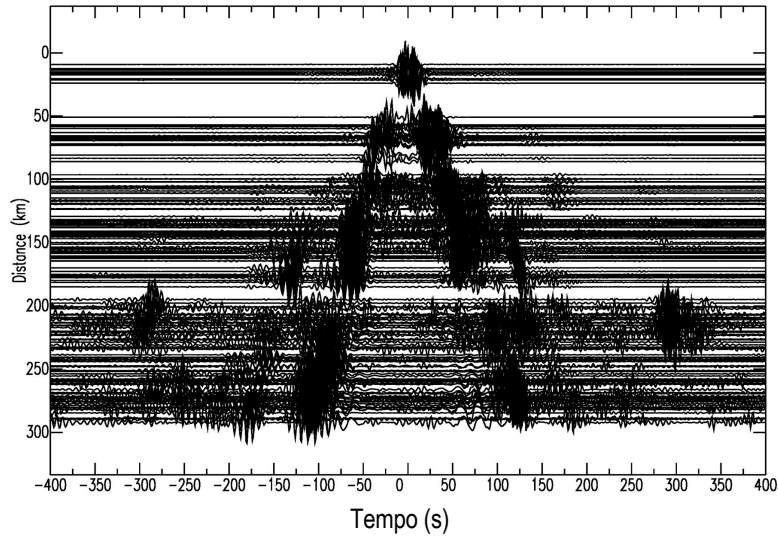


Azimuthal anisotropy

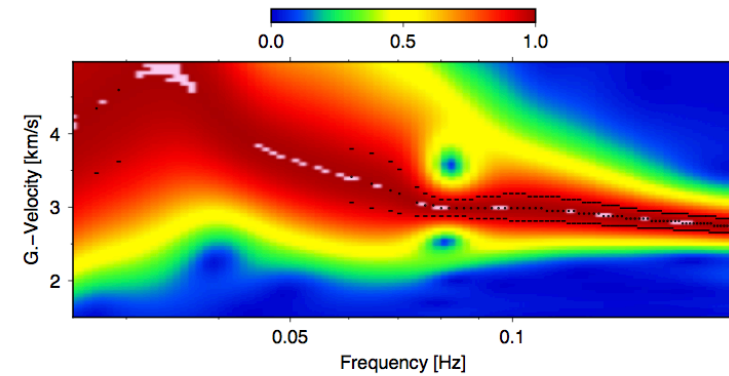
AL1: Volcanic structure

- Seismic structure from seismic ambient noise:

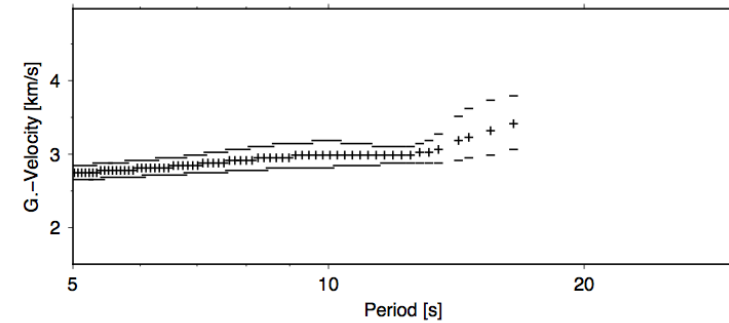
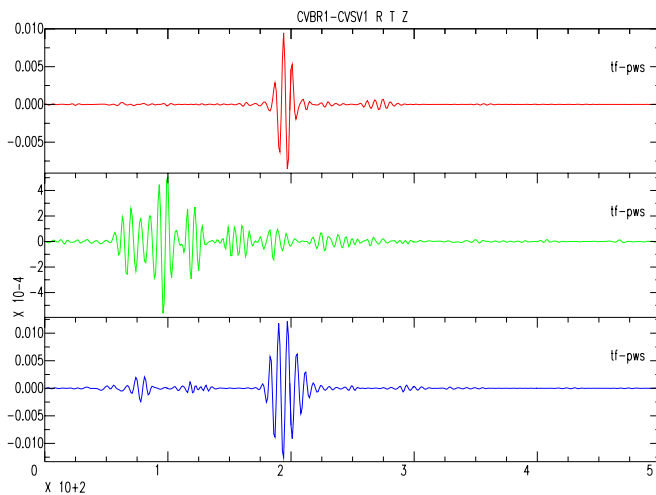
Boavista station with all other stations



Stations: CVBR1Z_CVSA6Z, Distance: 238.967 km



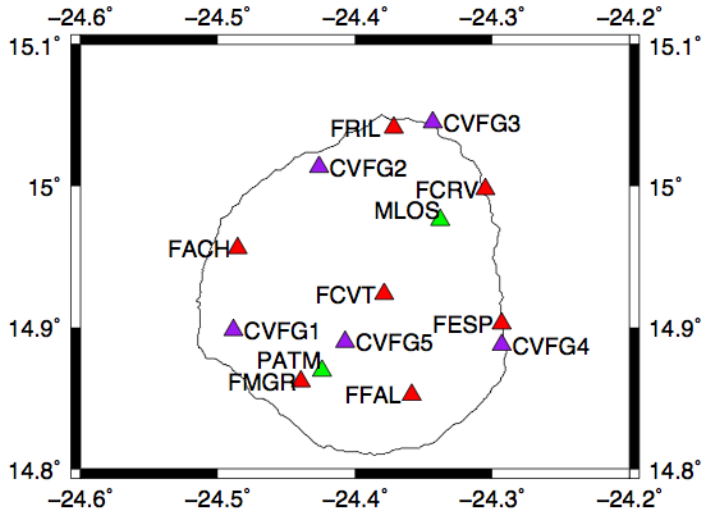
Rayleigh and Love waves



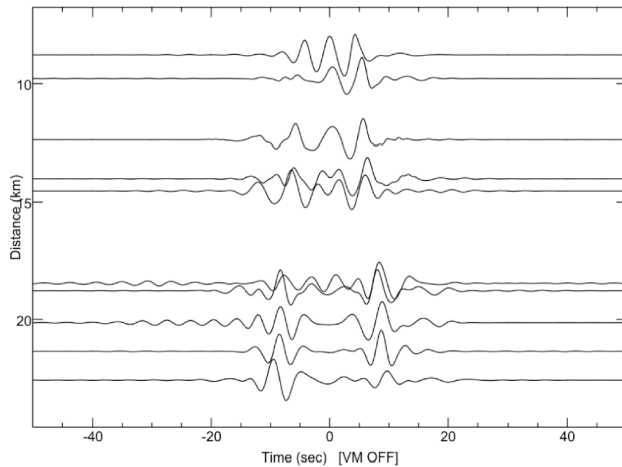
Group velocity

AL1: Volcanic structure

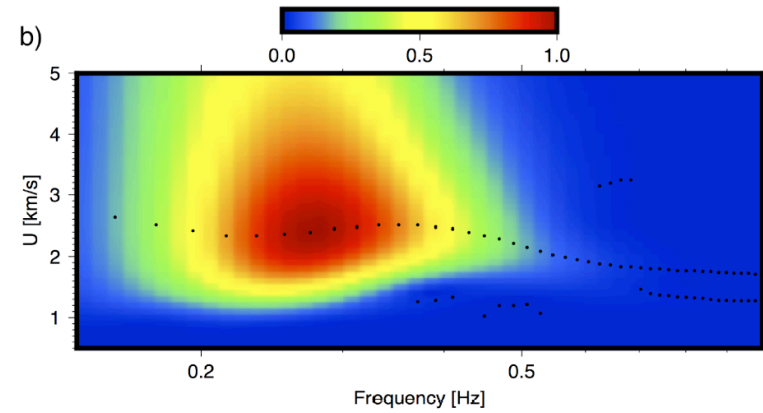
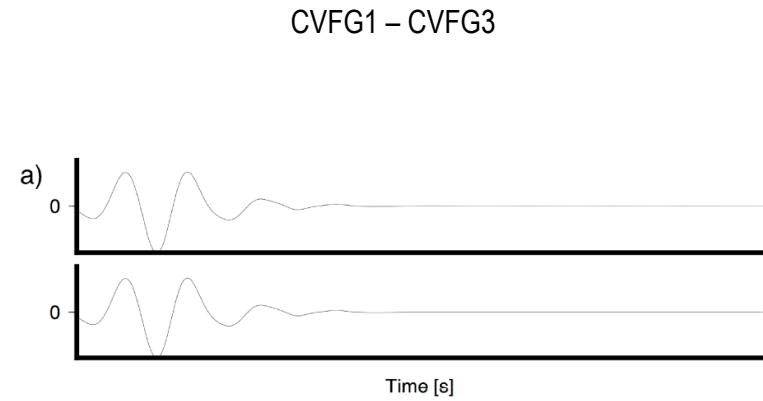
- Fogo:



Fogo deployments: Green – YW; Purple – 9A;
Red – 9B



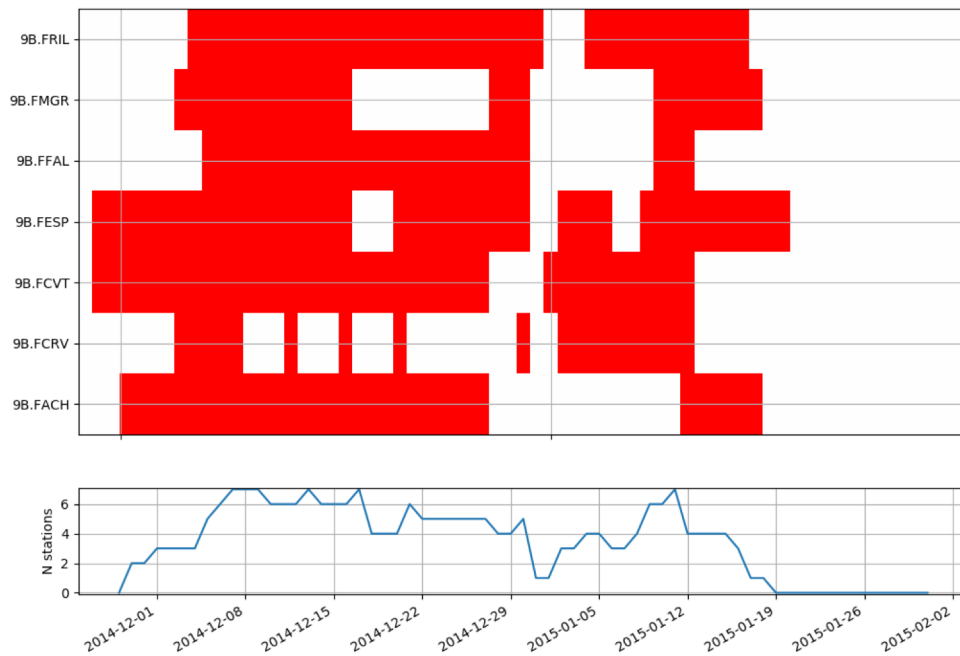
9A cross-correlograms



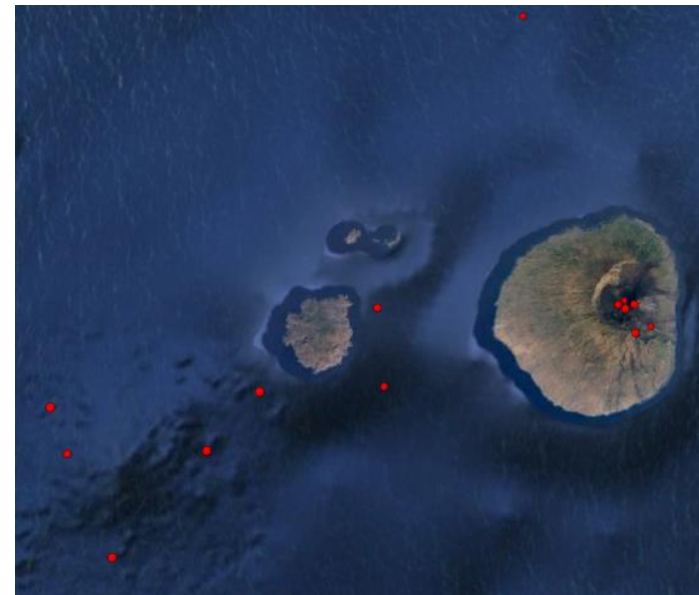
Group velocity

AL2: Eruption dynamics

- Data availability



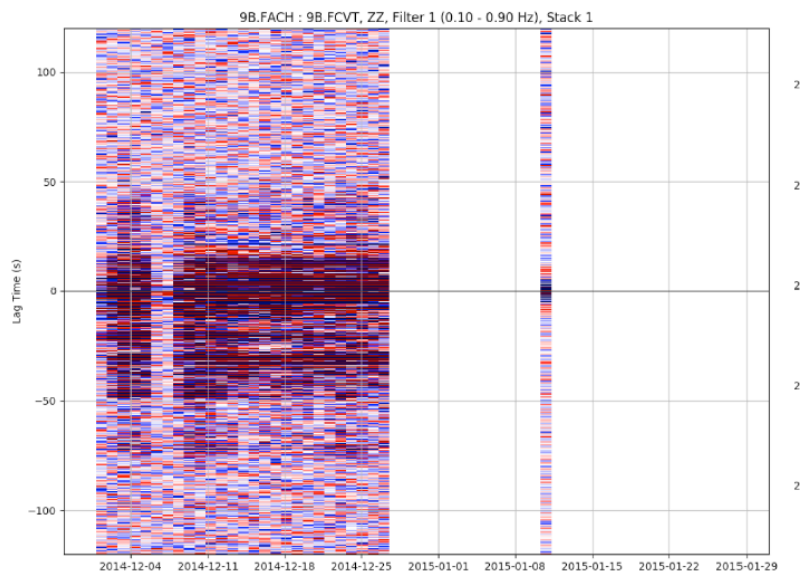
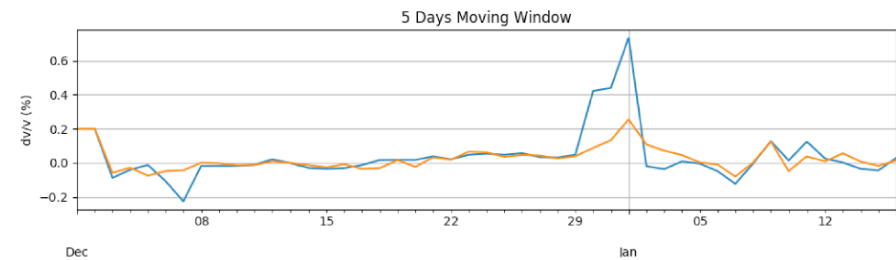
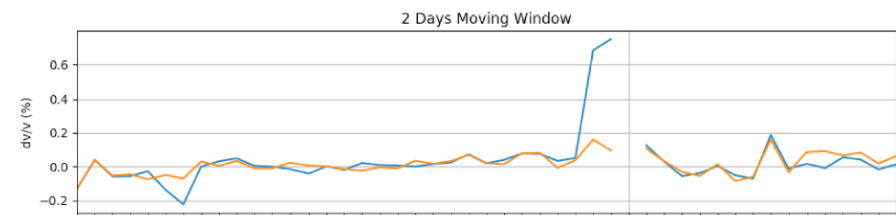
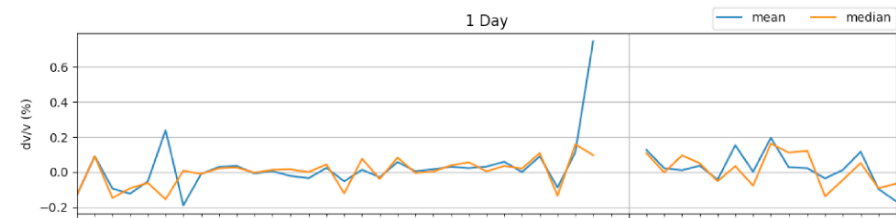
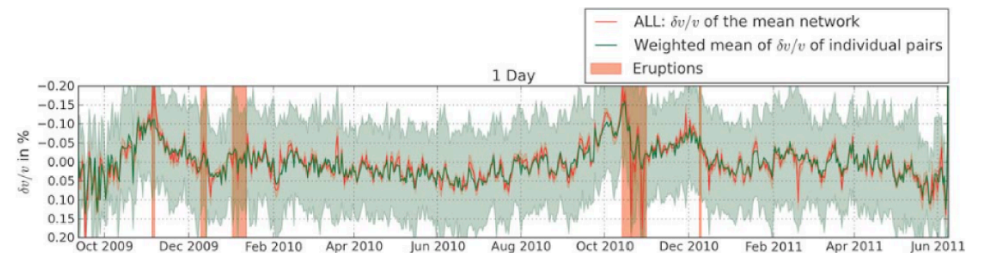
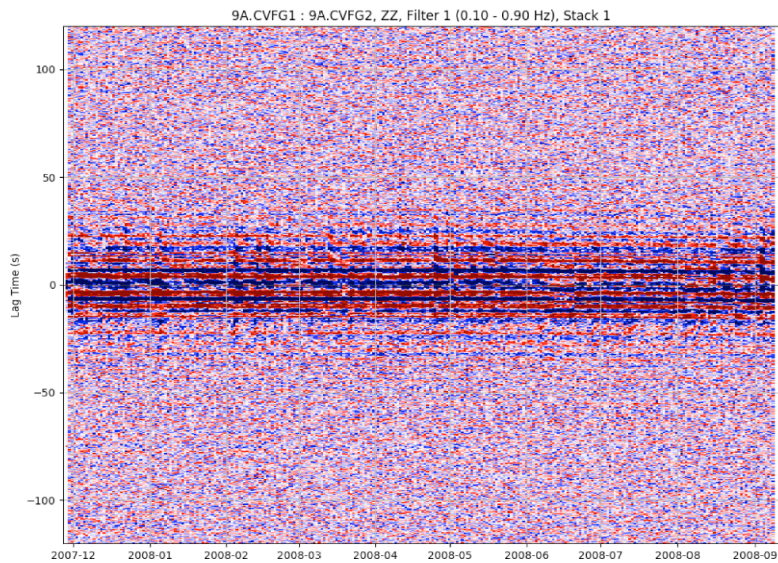
- Events – preliminary results



Localizações preliminares calculadas por L. Pinto, CERENA, IST


AL2: Eruption dynamics

- Using Ambient Noise towards Monitoring and 4D Imaging





AL3: Strategies for risk mitigation



Challenges/issues encountered/anticipated

Data availability

- without access to the permanent network both monitoring and 4D imaging are impossible;
- H/V also needs more data;
- the Évora group cannot accomplish their tasks (source and focal mechanisms).



Plans for coming months

- Finish the Cape Verde imaging;
- To complete Fogo island structure;
- If data available – to continue both monitoring and 4D imaging are impossible;
- Contact the German group?

Dissemination

Number of papers:

- in prep. : **3** (Characterization of microseismic noise sources in Cape Verde G³;
High temperature in the upper mantle beneath the Cape Verde
Hotspot EPSL;
anisotropy patter (title tbd)
- submitted: **0**
- published: **0**

Number of communications (national and international):

- planned: **5** (ESC2018, AGU2018)
- done: **2** (APMG2017, EGU2018)

Number of outreach: **0**