SnT 2025
CTBT: SCIENCE AND TECHNOLOGY CONFERENCE
8 SEPTEMBER
ONLINE DAY
9 TO 12 SEPTEMBER
AT HOFBURG PALACE, VIENNA & ONLINE

O3.5-597

Azores infrasound network: Statistical analysis and characterisation of the main detections

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# Introduction to the Azores infrasound network
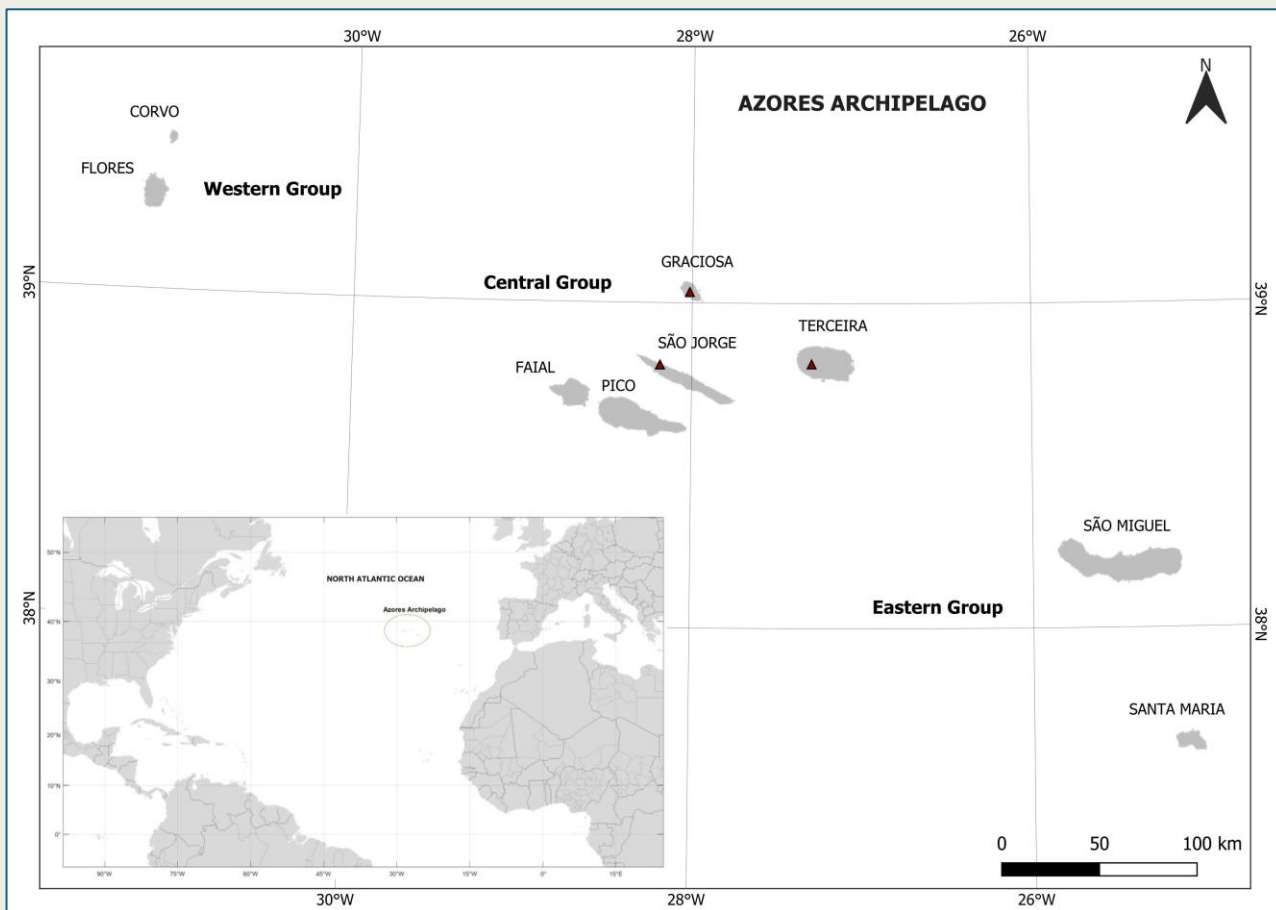
- **IMS IS42** with 8 absolute pressure sensors on Graciosa Island

- **SJ1** portable array with 4 differential sensors on São Jorge Island

- **TER** portable array with 6 differential sensors on Terceira Island

- Plans to expand the infrasound network to Faial Island (FAY) and Santa Maria Island (see P3.1-641)

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Introduction to the Azores infrasound network

- Geometry: main array shaped as a pentagon with an aperture triangular sub-array
- Maximum aperture of ≈2 Km
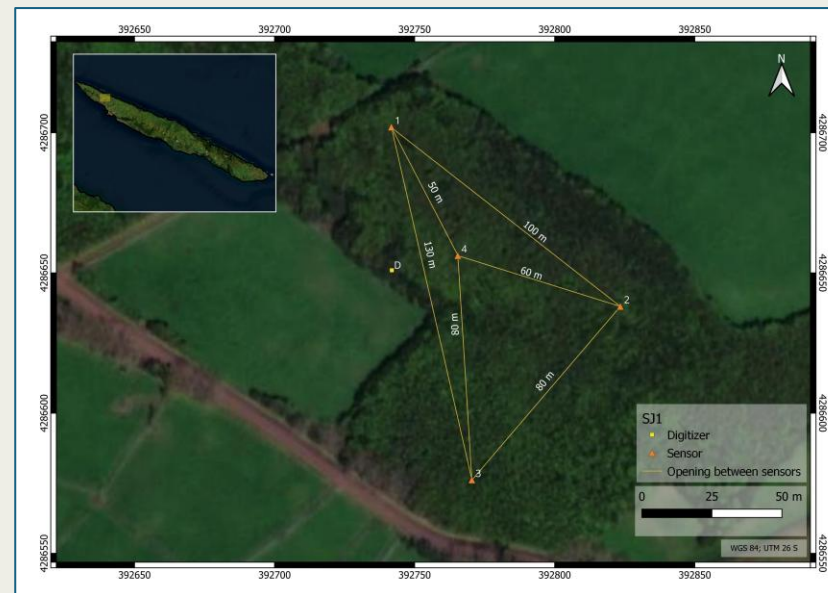
- Geometry: centred triangular design
- Maximum aperture of ≈130 m
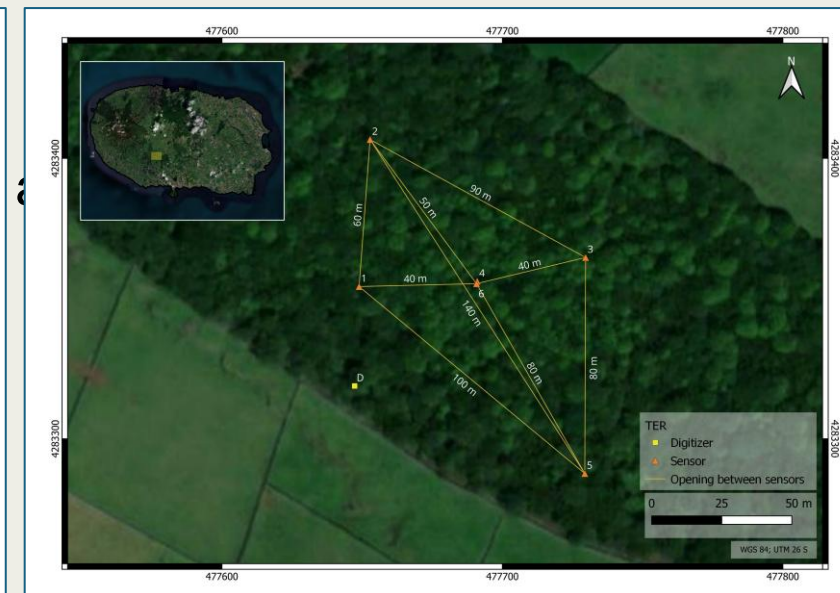
- Geometry: diamond shape with 2 centred sensors
- Maximum aperture of ≈140 m

Multichannel correlation analysis in the time domain

Windows length: 10 s

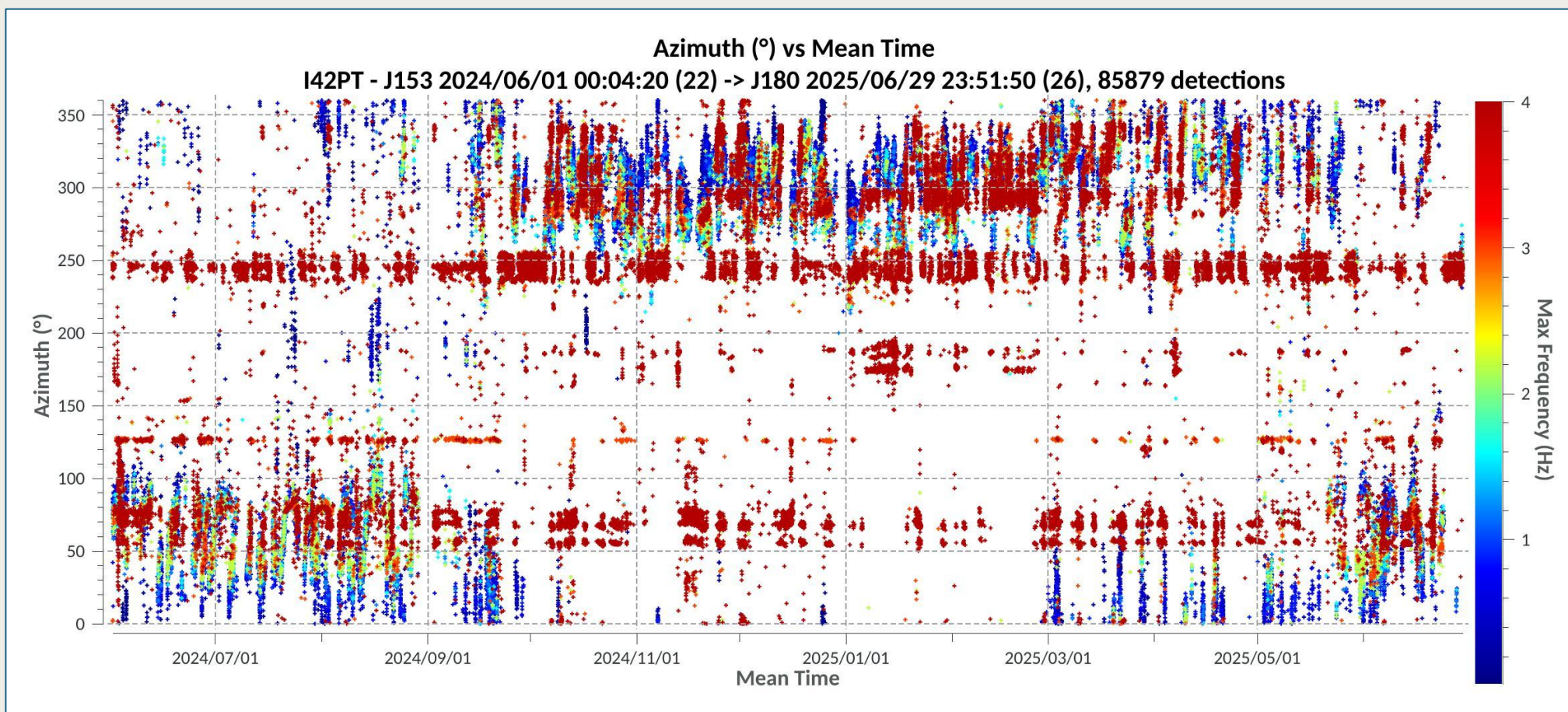Shift: 1 s (up to 86400 detections day)

Band pass filtered: [1 to 10 Hz]

Detections characterized in terms of amplitude, back-azimuth, apparent velocity, residuals and frequency (PSD on the beamformed data window)

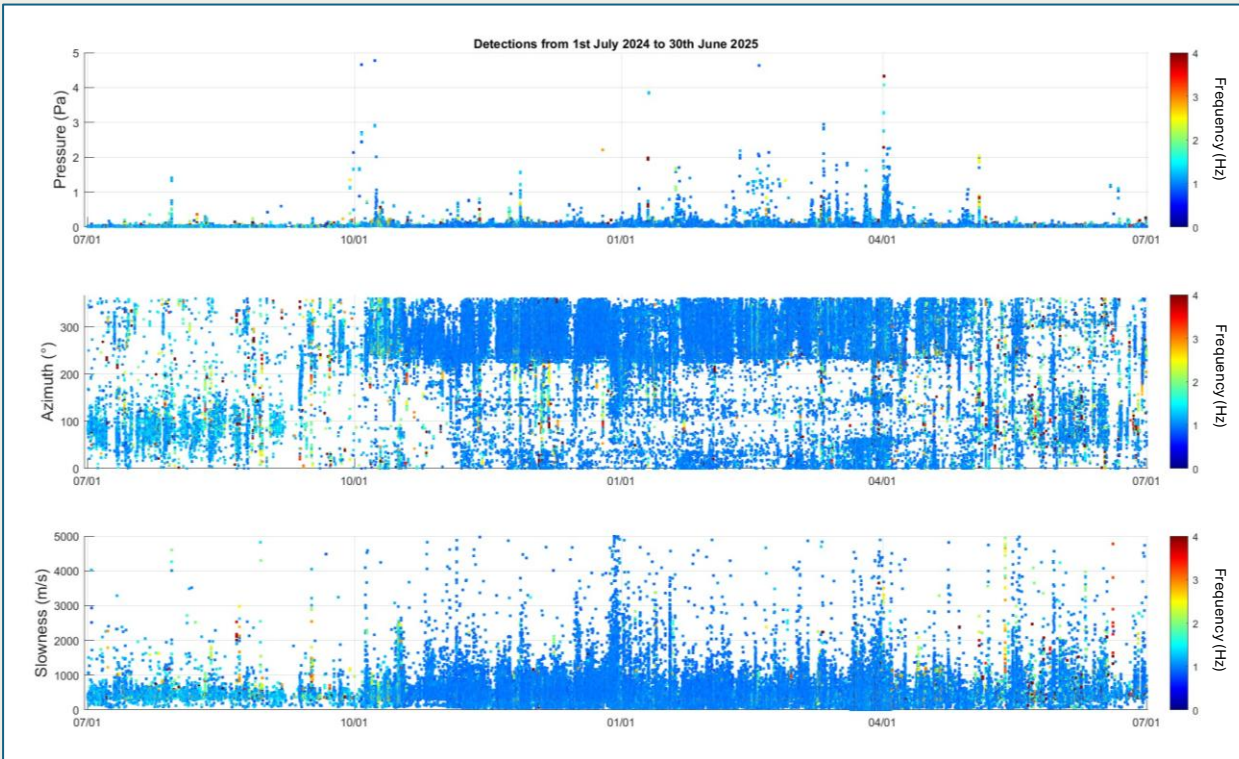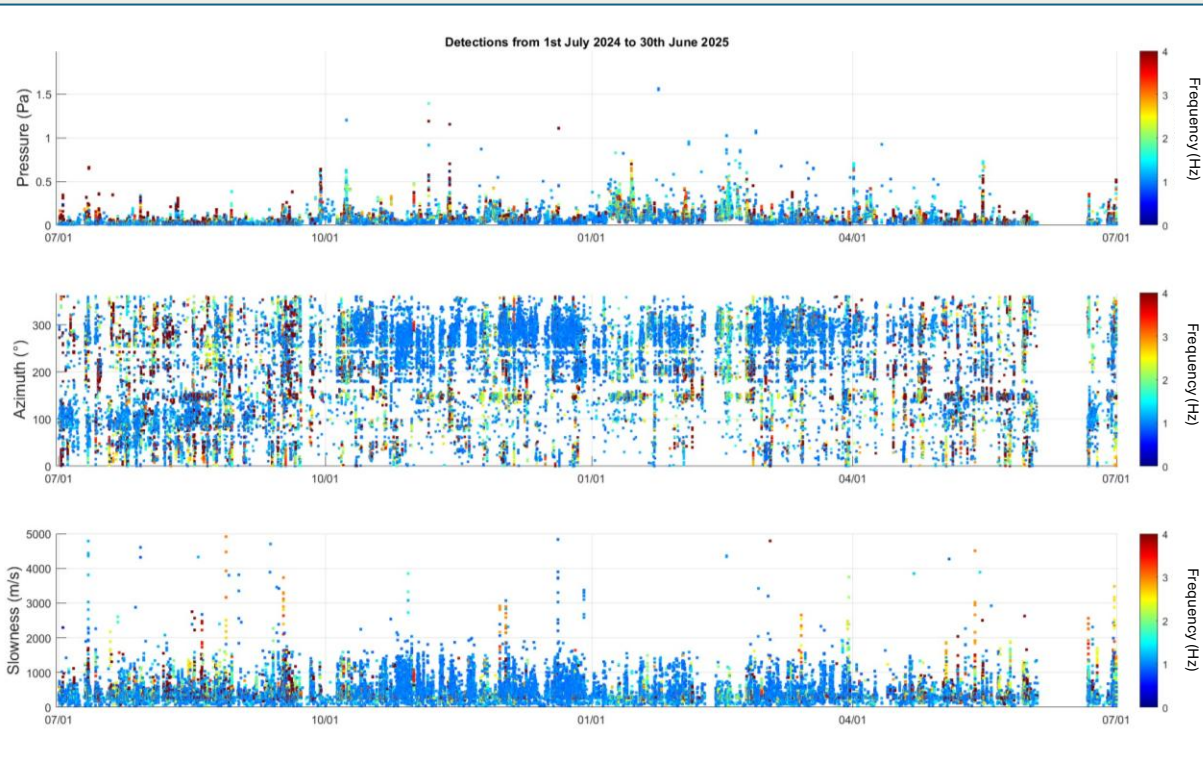# Azores infrasound network: Statistical analysis and characterisation of the main detections

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IS42: 1 year data

Azimuth (°) vs Mean Time
I42PT - J153 2024/06/01 00:04:20 (22) -> J180 2025/06/29 23:51:50 (26), 85879 detections

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1 year data

SJ1

TER

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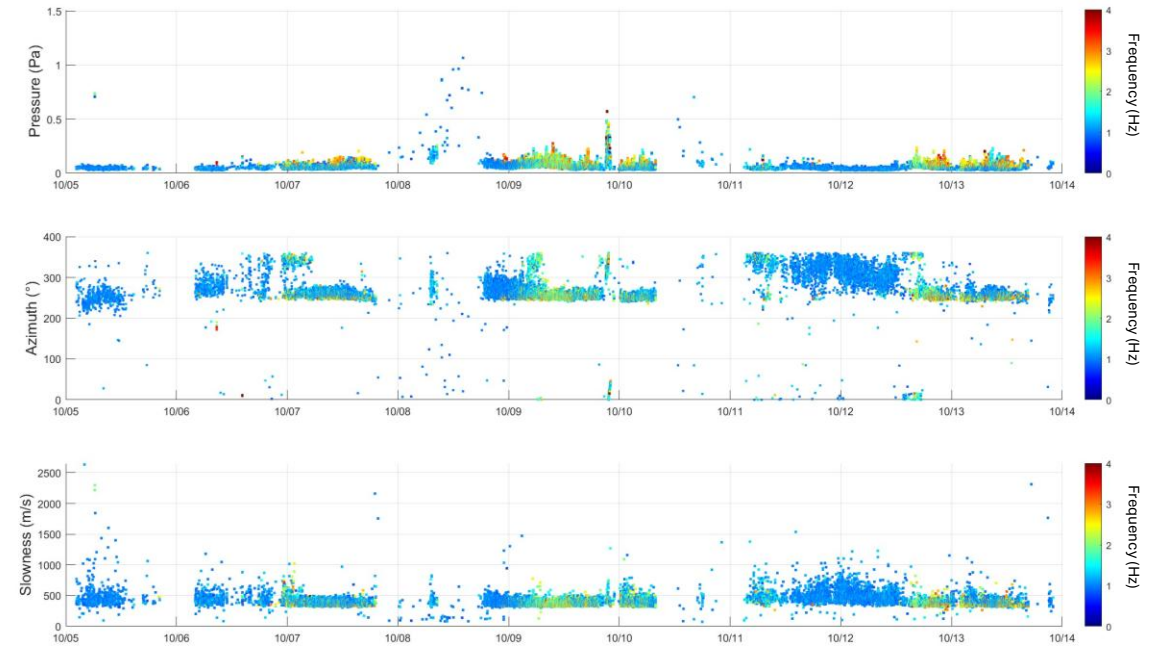
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Events Analysis: Storms

SJ1

TER

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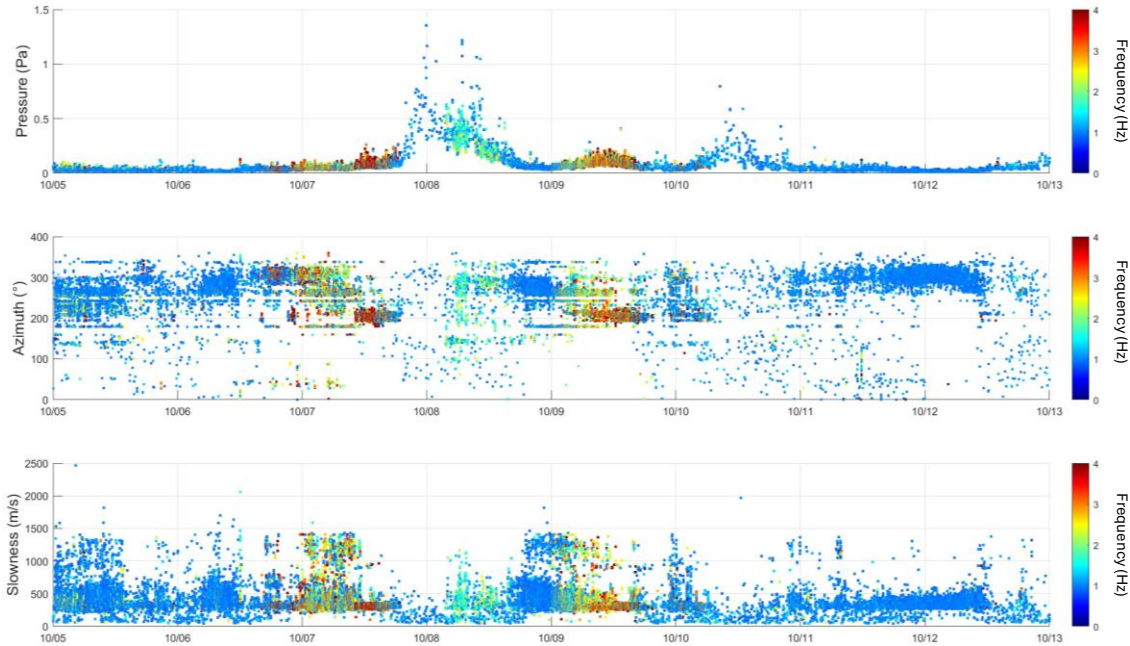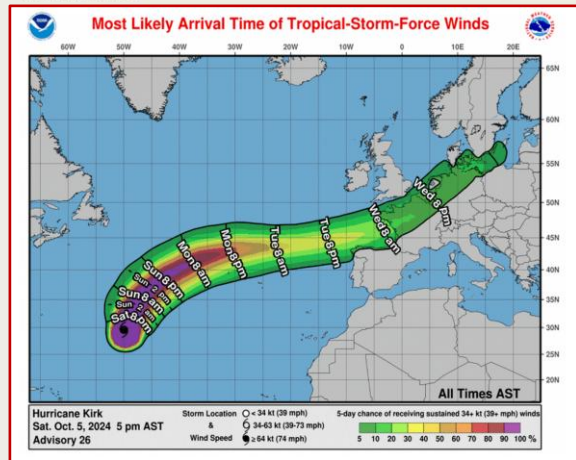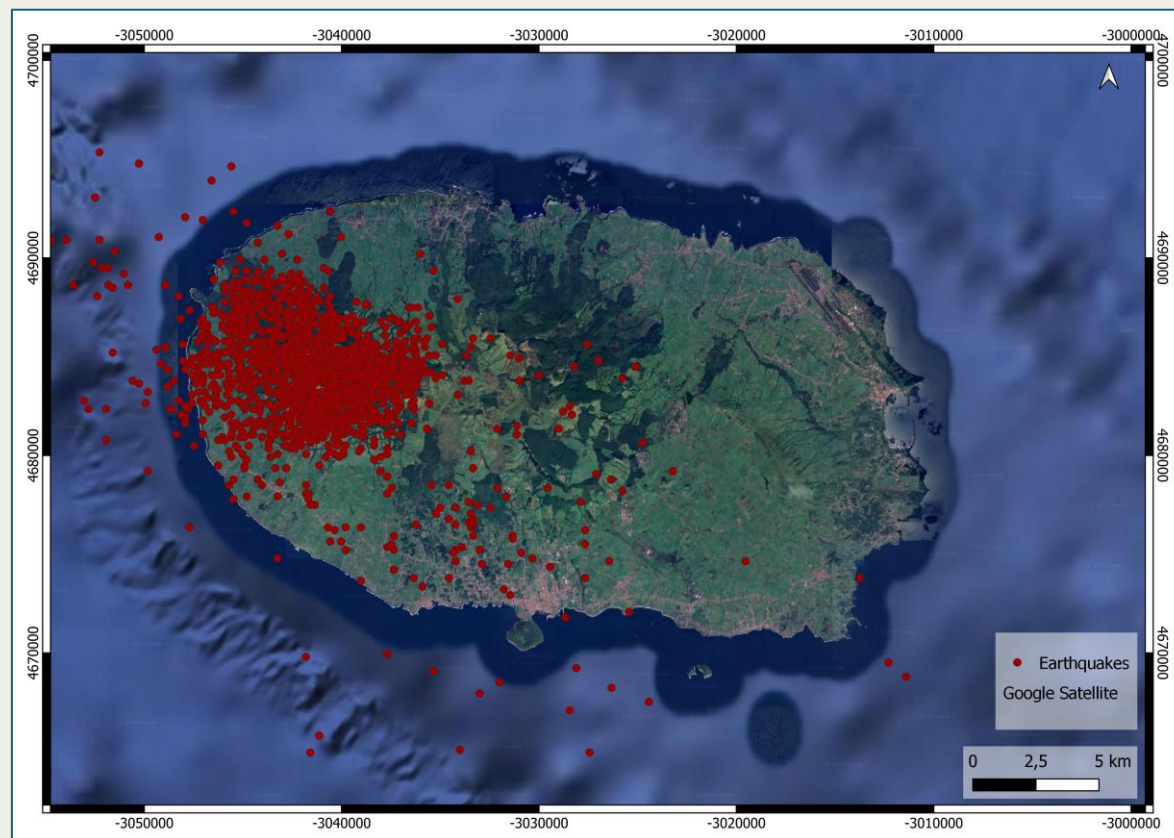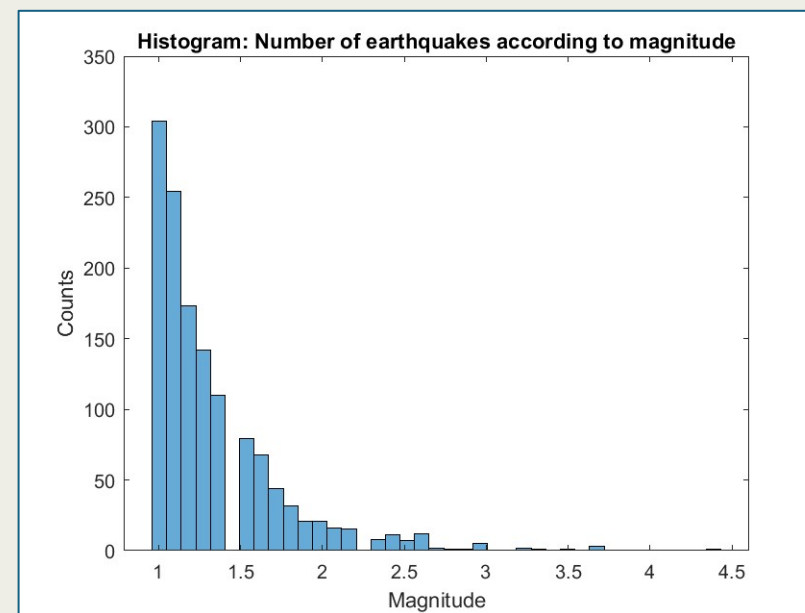
Events Analysis: Seismo-volcanic crisis ongoing in Terceira Island

TER: 1794 events in one year

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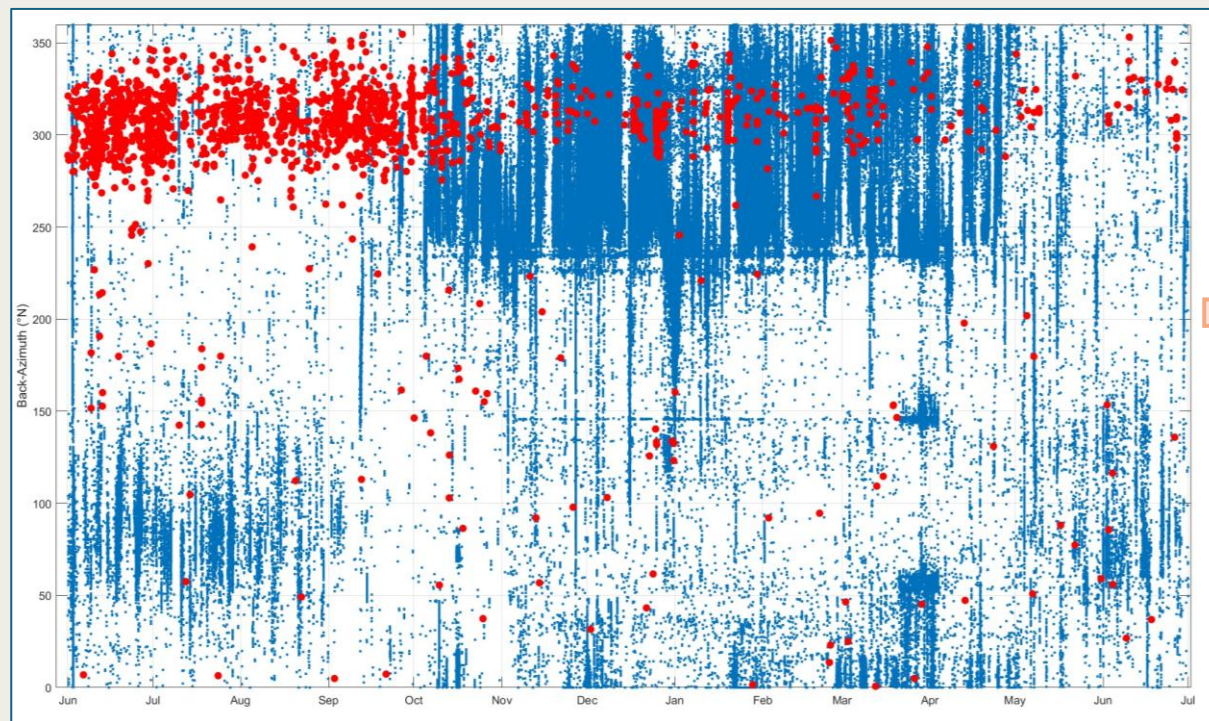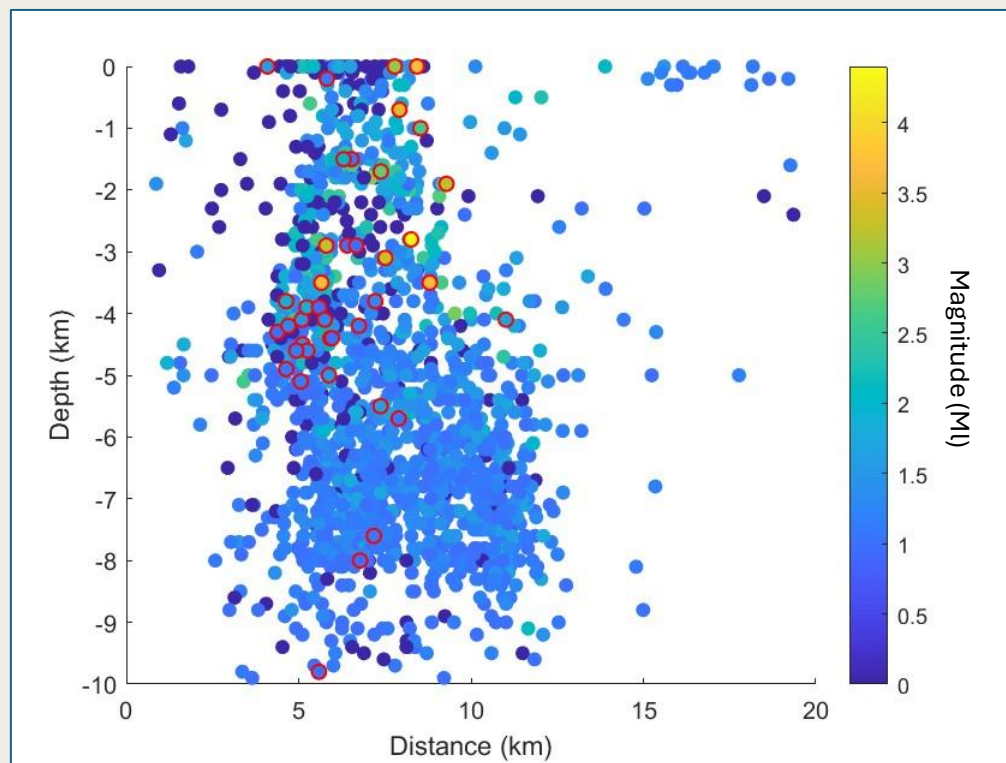8 SEPTEMBER
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Events Analysis: Earthquakes

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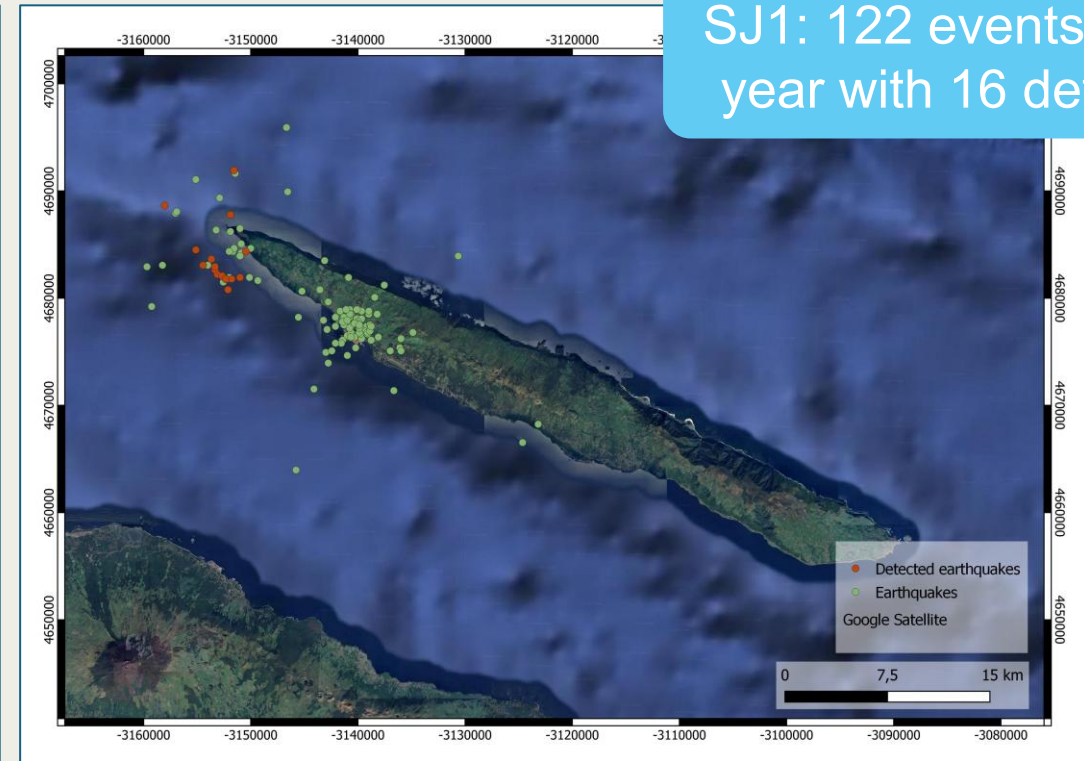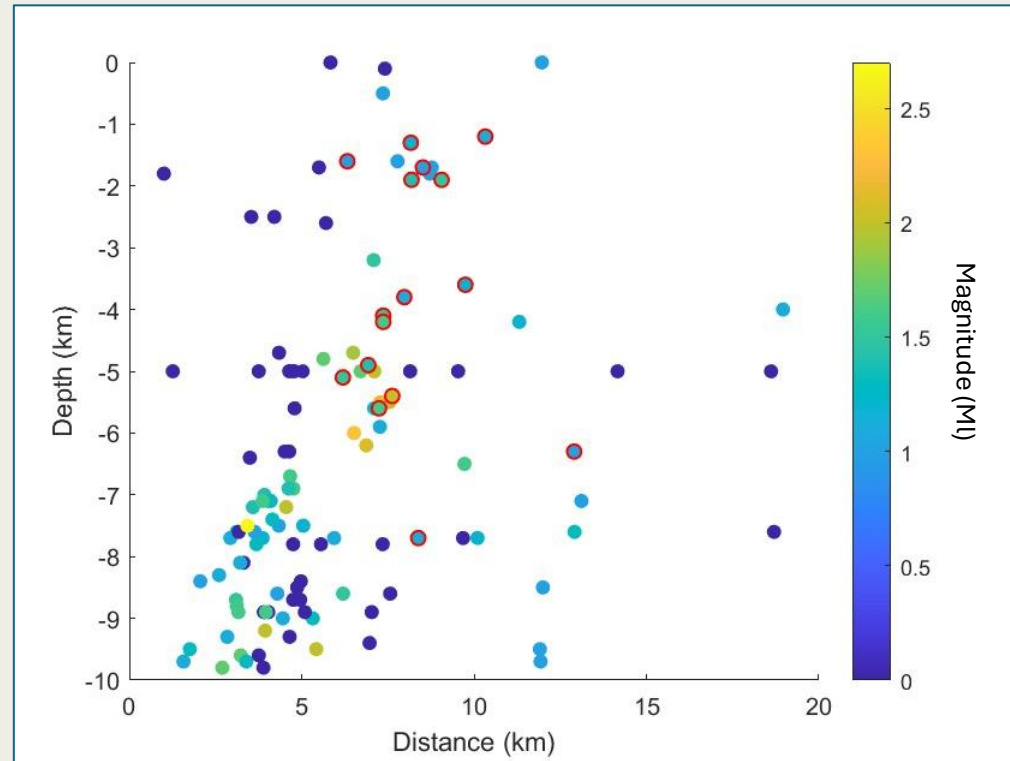
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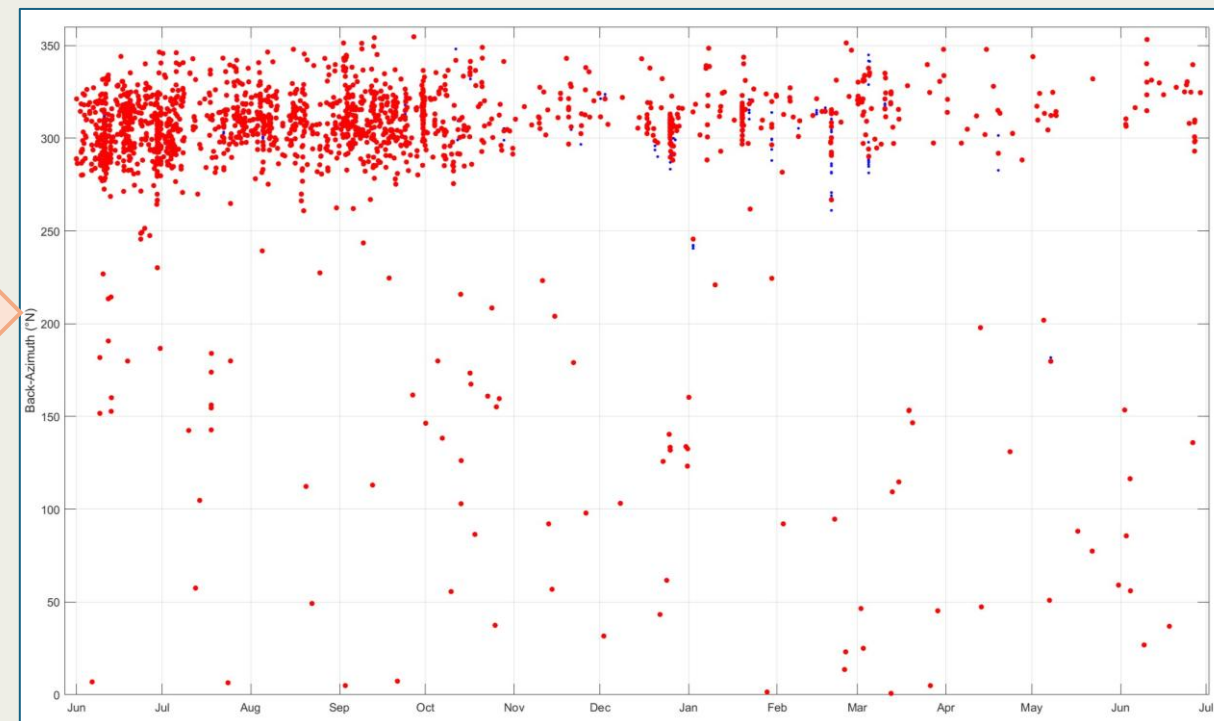
Events Analysis: Terceira earthquakes

TER: 1794 events with 40 detected
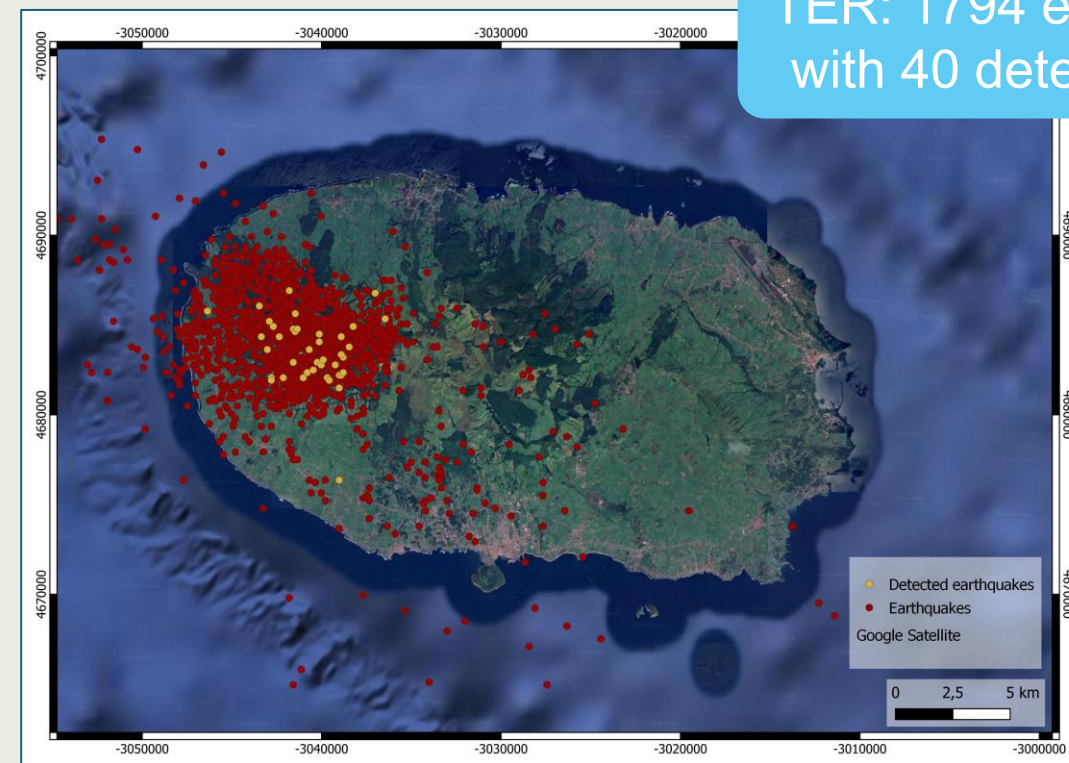
Shallow earthquakes (< 8 km) with magnitude larger than 1.5 Ml and distances less than 12 km from the array

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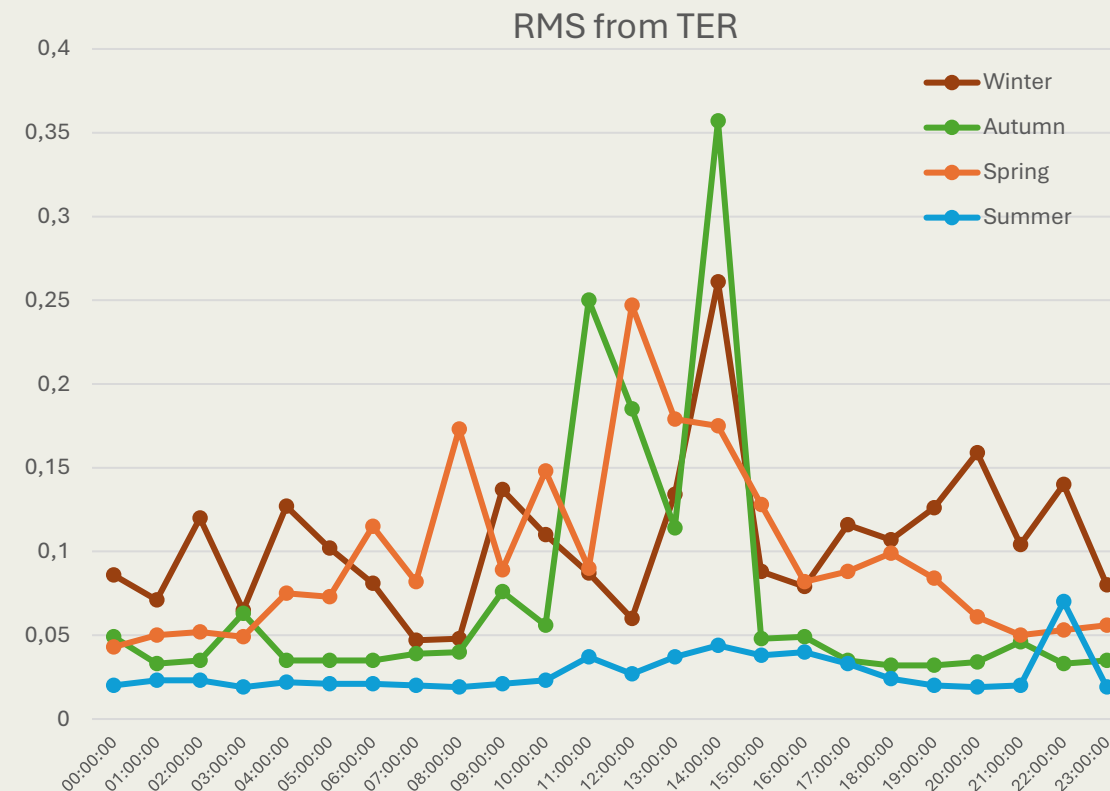
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Events Analysis: São Jorge earthquakes
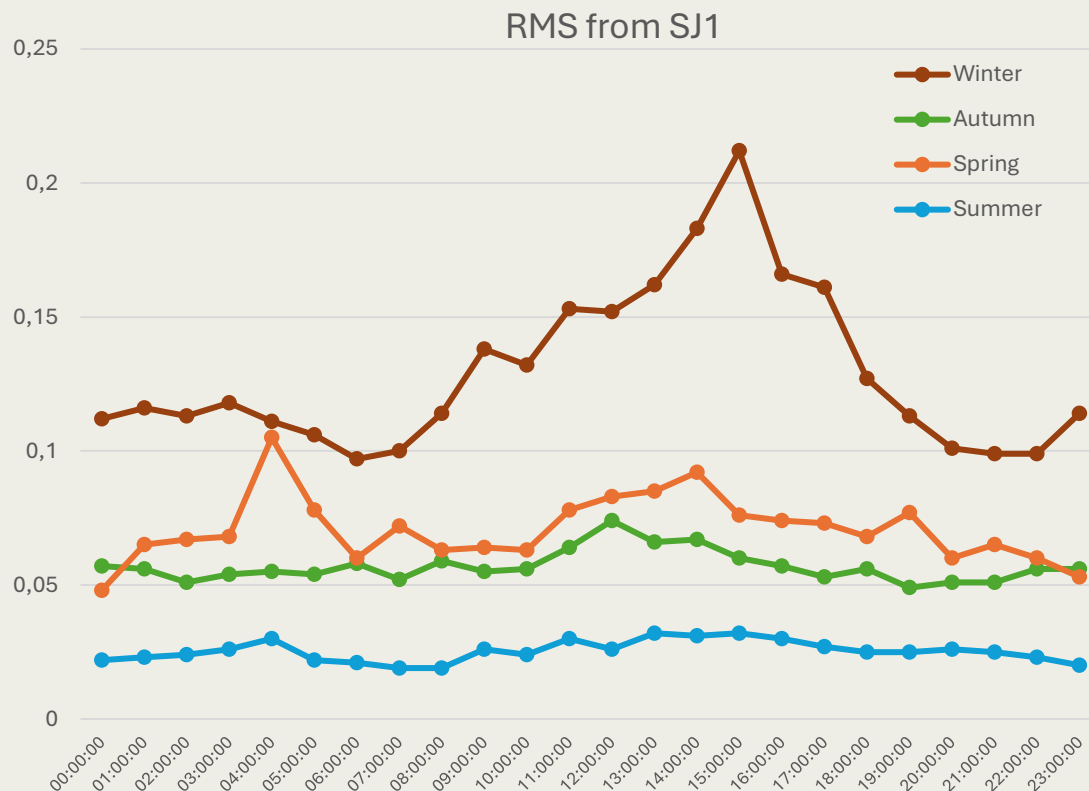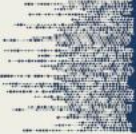

SJ1: 122 events in one year with 16 detected

Shallow earthquakes (< 8 km) with magnitude larger than 1.5 Ml and distances less than 12 km from the array

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RMS

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RMS

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The detections to the west are consistent with the quarry that is in operation during the day.

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Conclusion

1-year detections:
Expected seasonal variance, in all arrays

Terceira array is affected by local sources of energy during daytime, like quarry and blast activities nearby (230 to 260º). São Jorge is free of these occurrence.

Storms:
Produce high energy detected at the arrays in terms of high amplitude (more than 0.5 Pa) and high frequency (more than 2 Hz) detections.

Earthquakes:
Detections in the arrays depend on the hypocentre shallowness, magnitude and distances of the the array. Detectability also depends on the noise level at the array (with large daily noise variation in Terceira).

Thank You