Advancing the Analysis of Volcano-seismic Signals on Etna using Rotational Sensor Data

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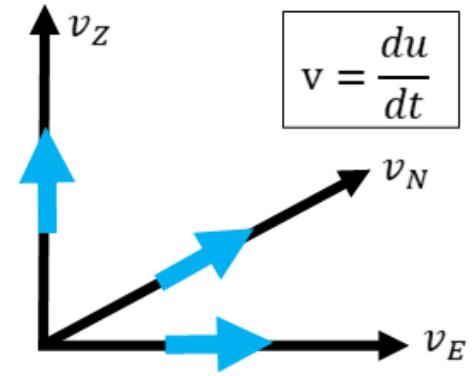
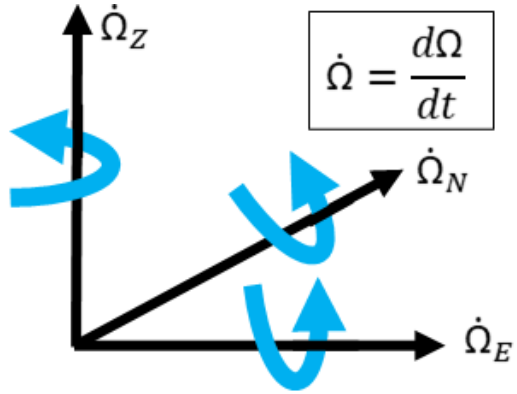
- LP events, VT events and tremor indicate hazardous volcanic activity.
- Real time monitoring is needed to mitigate the negative effects.
- We tested the performance of rotational sensors on Etna, Italy.



Ground velocity v (m/s)

&



Rotation Ω in spectrograms (rad)

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Rotational sensor detects VT events & LP events

Translation

HHE

HHN

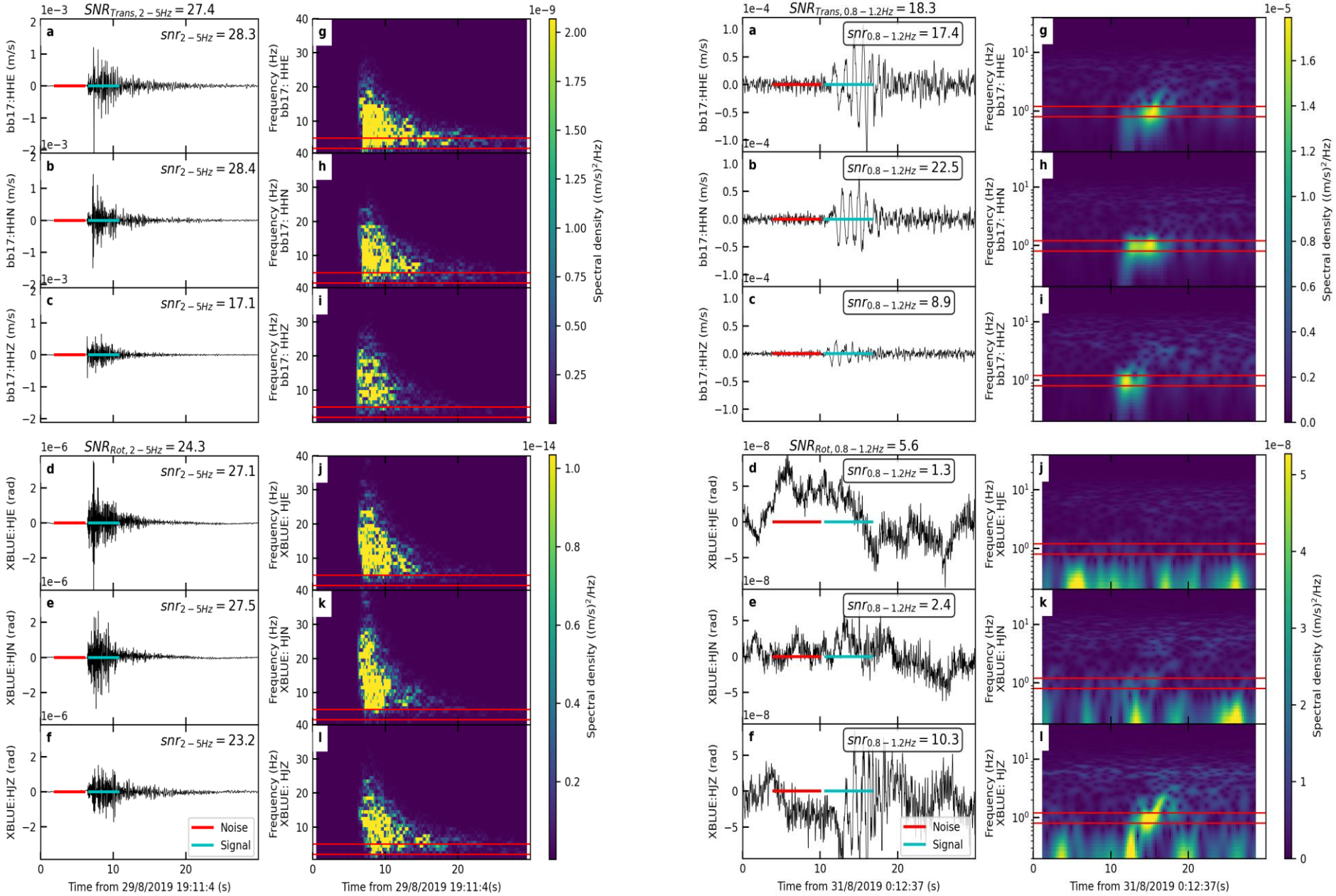
HHZ

Rotation

HJE

HJN

HJZ



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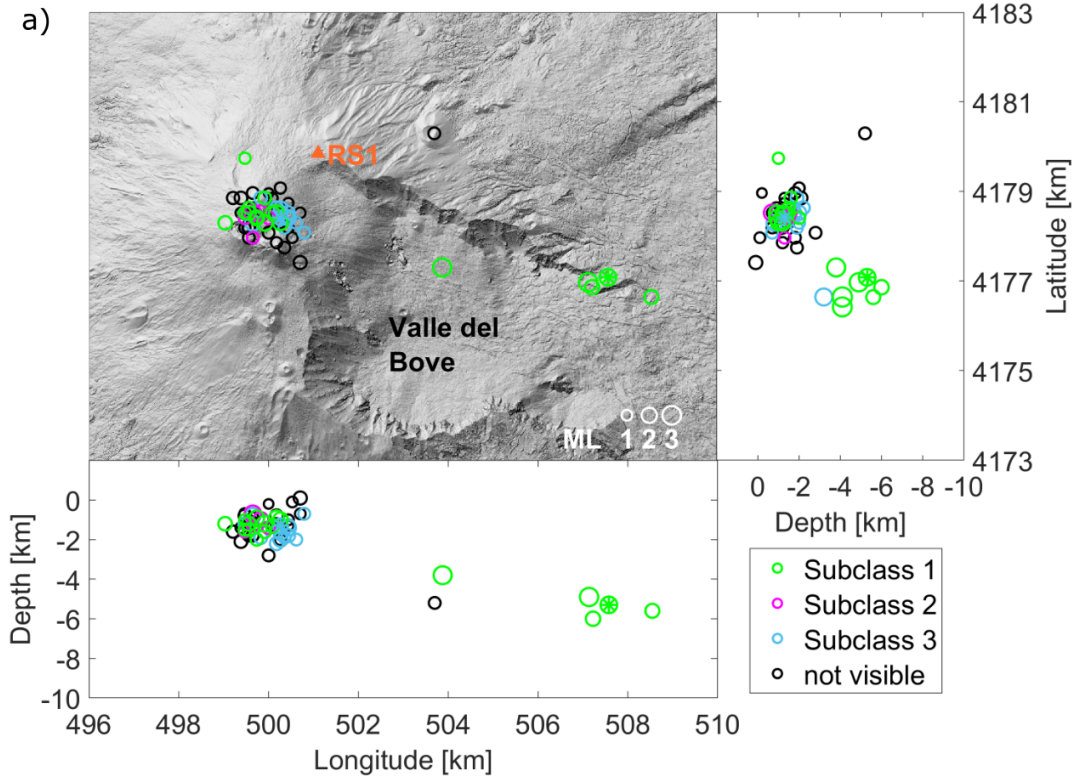
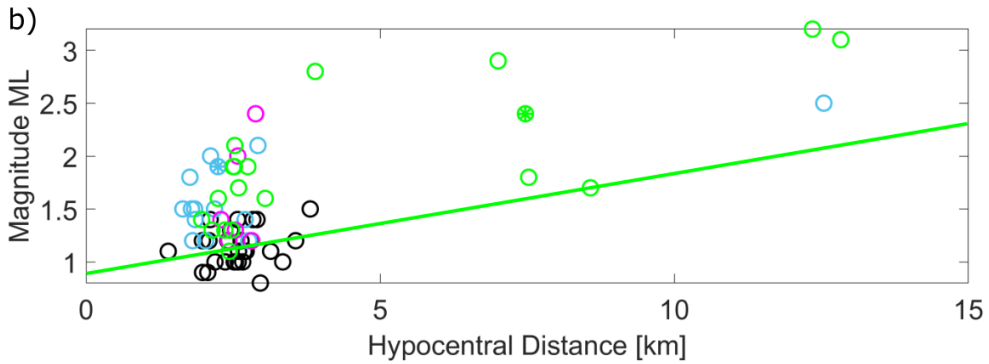
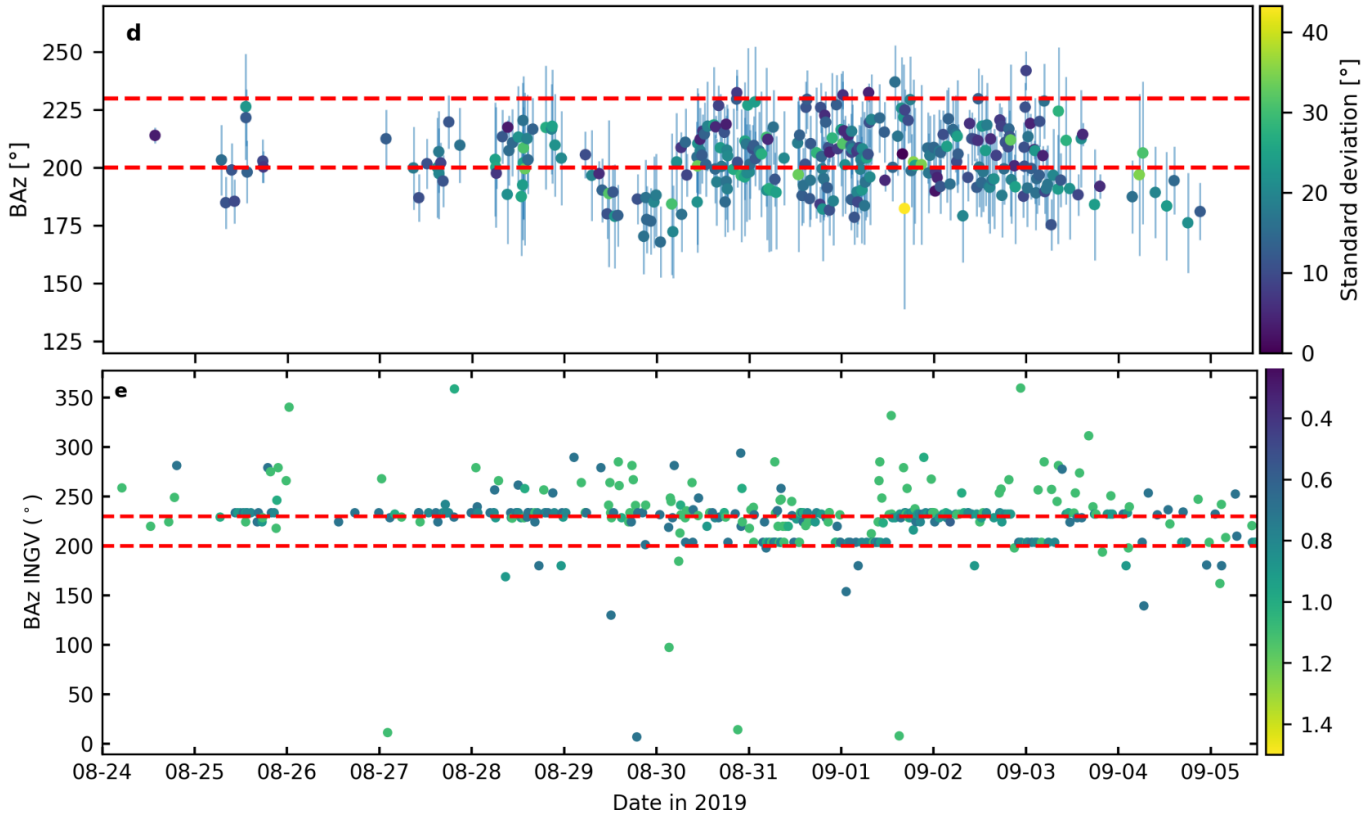
Good location of VT events & LP events in comparison to the INGV locations







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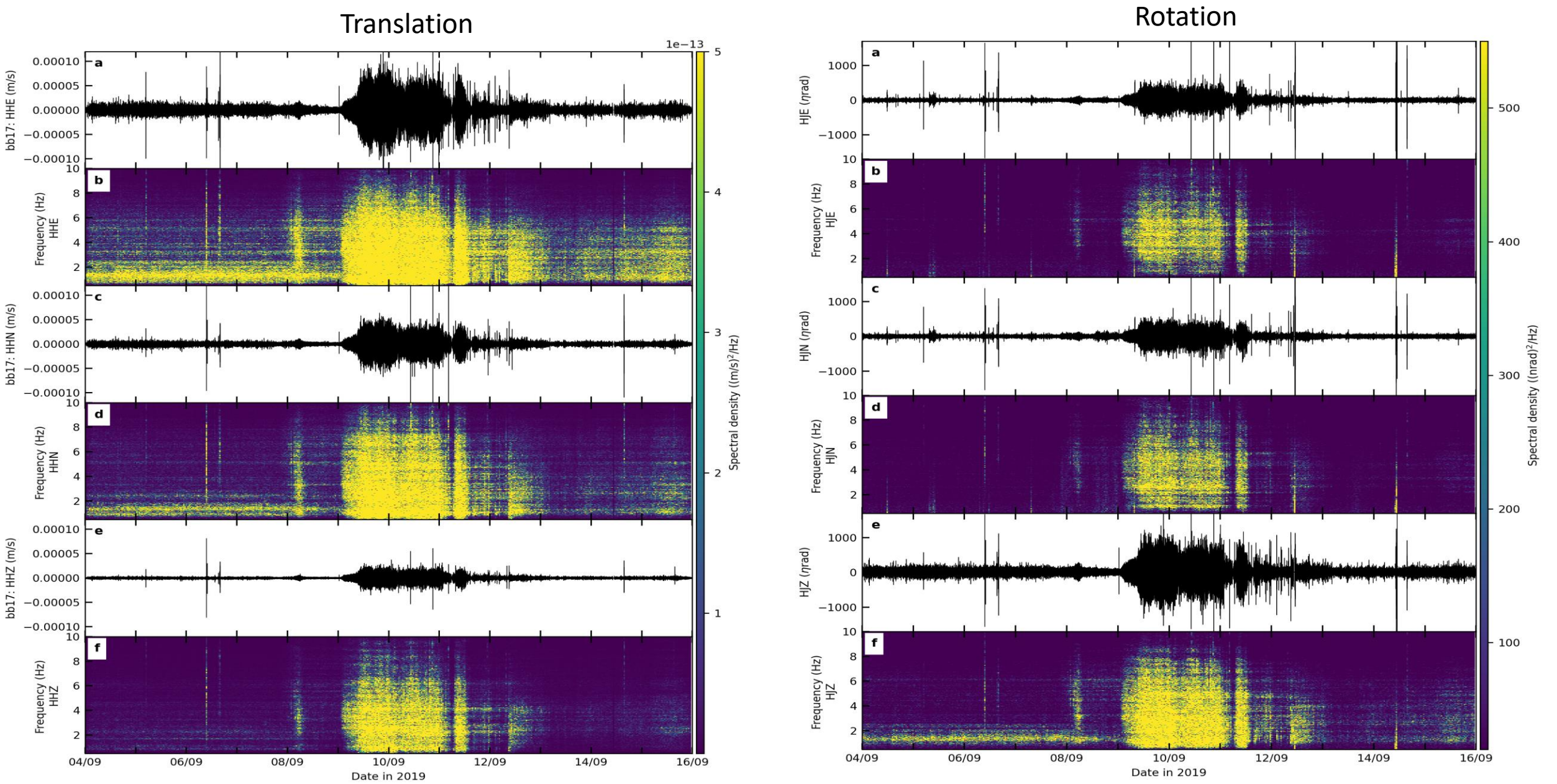
Rotational sensor detects tremor



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Easy characterization & location of tremor using the rotational sensor

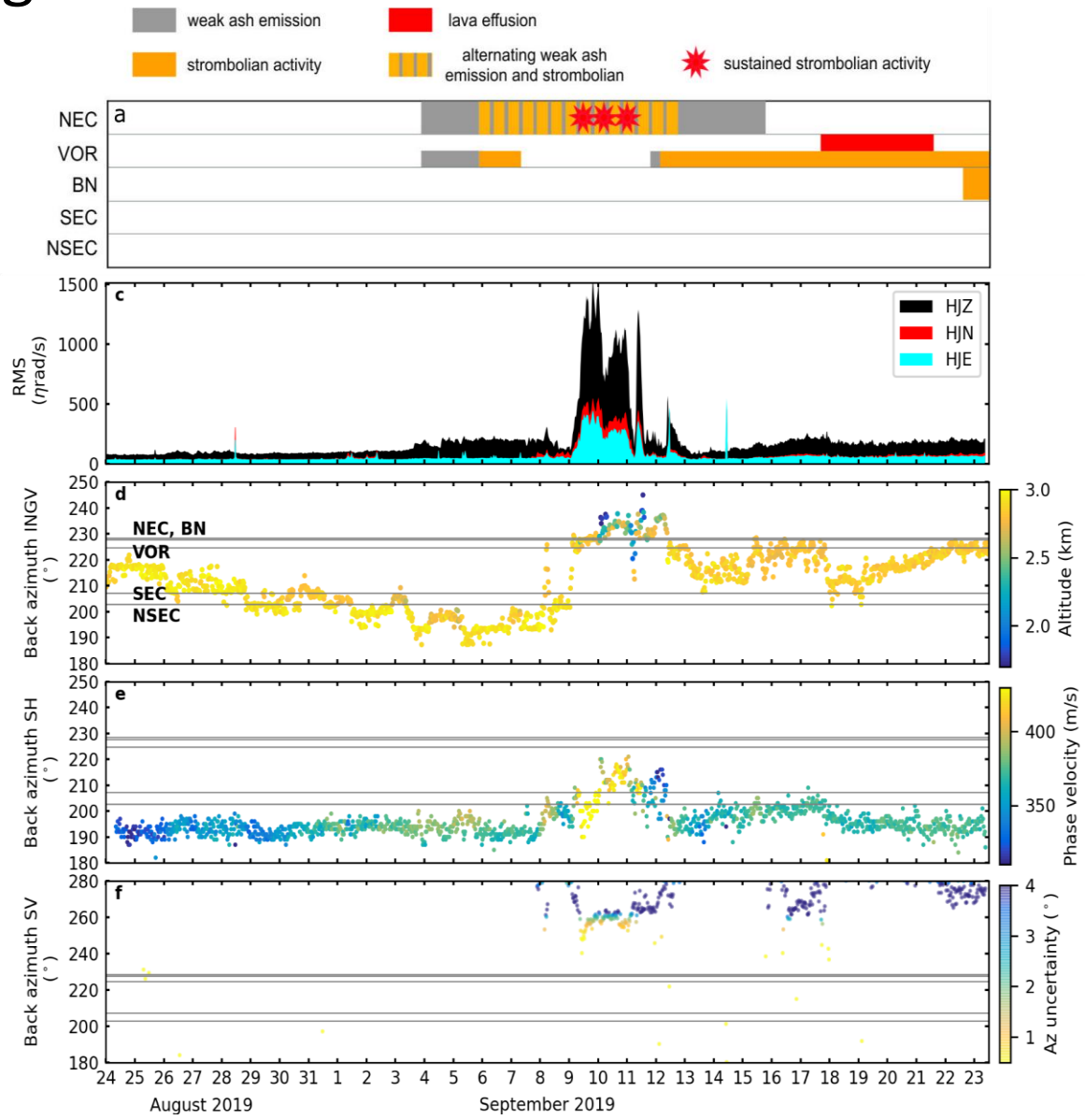
Vent activity

RMS

Location by INGV

Location based on SH-type waves

Location based on SV-type waves



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The rotational sensor is useful in remote areas

- We tested the performance of a rotational sensor using LP, VT events and tremor
- LP events are dominated by SH-type waves
- VT events are dominated by SV-type waves
- Tremor changed from SH-type to a mixed wavefield during strombolian eruptions
- Event location were compared with location by INGV
- The rotational sensor can enhance our understanding in a remote or dangerous volcanic environment.

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