



Pitfalls and ambiguities in the inversion of volcanic infrasound data

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Recent studies pointed out the importance of taking into account of the multipolar components of sources of infrasonic signals associated to volcanic explosive activity. This leads to a more complex approach when inverting the data and to possible ambiguities in the results.

In this work we performed a systematic analysis on synthetic datasets, taking into account various elementary source models and different network configurations. We propose a non-linear approach for the constrained inversion of the data which improves the stability of the estimated source models.

For each combination we computed synthetic signals and performed both unconstrained and constrained inversions. For networks configurations with 3 or more sensors we also performed the location of the source.

We quantify the correctness of each result by considering the RMS on both the data and the source-time function, the difference between the synthetic and estimated source models and the difference in source localization (when possible).

Our results demonstrate that the inversion of infrasonic data is highly dependent on the network configuration and the selected source model. This highlight the needing of a critical revision of standard approaches used until now to retrieve source parameters from infrasound data.