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-acoustic data fusion: determining the best acquisition designs for multi-phenomenological monitoring campaigns

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For low-yield monitoring applications, the combined analysis of seismic and infrasound data could lead to significant improvements in our understanding of the processes that simultaneously generate both types of signals. Assembling datasets that contain seismic and infrasound signals generated by a single source can provide a better understanding of specific source processes. The successful combination of signals requires understanding the fidelity of infrasound measurements – especially for local, temporary instrumentation. Therefore, the first part of this presentation will focus on understanding and constructing methods by which the quality of infrasound data can be enhanced to match that of seismic data. Then, we present an in-depth analysis on the current state of seismo-acoustic data fusion and examine its use in monitoring applications. This presentation will cover a series of seismo-acoustic datasets that contain signals generated by a variety of source processes, including earthquake sequences, avalanche/landslide signals, rocket launches, and industrial explosions. We also present findings from joint analyses of these datasets to examine the unique properties of each source type. Ultimately, we determine the best acquisition designs for multi-phenomenological monitoring campaigns with a focus on seismo-acoustic data fusion.

Promotional text

The presentation supports the conference goal to identify opportunities and methods for improving nuclear test monitoring and verification. Evaluating acquisition designs for multi-phenomenological monitoring campaigns leads to a better understanding of source processes.

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