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Updates and New Features in the InfraPy Infrasound Signal Analysis Software

Monitoring of phenomena in the atmosphere and at shallow depth of burial using infrasonic signals is often performed via automated detection, localization and characterization with refinement using interactive tools for an identified event of interest. Ongoing infrasound research and development at Los Alamos National Laboratory includes development and evaluation of various signal analysis algorithms as well as refined user interfaces and workflows. These tools are bundled into the open source InfraPy software suite. Single channel detection based on spectrogram and density based clustering has been investigated with promising results for analysis when coherence-based detection is not possible. Propagation likelihoods have been modified to enable inclusion of detections lacking direction of arrival information in localization analysis. Also, an event-specific localization method leveraging time-reversed infrasonic ray tracing is being actively evaluated for use as the next generation to the Bayesian Infrasonic Source Localization framework. Lastly, in addition to existing command line and graphical user interfaces, an automated pipeline capability is being developed for network level monitoring applications. Database connectivity is being explored for all user interfaces to store analysis results in a familiar structure for geophysical monitoring SMEs. An overview of the InfraPy algorithm suite, various user interfaces, data I/O, and workflow options will be presented.

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