

Improving propagation-based, stochastic models for Bayesian infrasonic localization and characterization

Bayesian methodologies have been developed for network level analysis of infrasonic signals including association, localization, and characterization. In the case of localization and characterization, the underlying propagation models utilized in computing the source parameters can be simplistic and generalized or include propagation-based, stochastic models unique to a given spatial and temporal scenario such as the western US during winter. Previously, these propagation-based, stochastic models have been constructed using archived atmospheric specification data and large-scale propagation simulation campaigns. Statistical analysis of the underlying seasonal variability in the atmosphere has led to refinement in the profiles needed for use in the simulation campaigns and methods are being developed to further refine the construction of propagation models for events of interest using atmospheric updating techniques. An overview of the construction and use of these propagation models will be presented along with discussion of several applications including standard signal analysis for localization and characterization of infrasonic events as well as optimization of network configuration for signal detectability.

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Track Classification: Theme 1. The Earth as a Complex System