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# of ground-truth events with reduced models

While long-range infrasound propagation modeling is a useful tool in nuclear treaty verification, the inherent unpredictability of subgrid-scale atmosphere dynamics results in a poorly constrained propagation medium. When faced with such a situation it is natural to treat incomplete knowledge within a probabilistic framework and to seek a numerical approach that describes long-range propagation at the lowest numerical cost and complexity. Such a task is rendered complex by the fact that each plausible atmospheric state produces large deviations from the operational numerical weather predictions. The approach used in this work for propagation modeling is based on reduced-order models provided by the numerical platform FLOWS (Fast Low-Order Wave Simulation). Such models are obtained by retaining a few propagating modes that are confined within waveguides causing the sound to propagate through multiple paths to the receiver. The overall performance of this approach is demonstrated using several ground truth events from the IDC Infrasound Reference Event Database (IRED). A particular focus will be made on the computational cost in relation to a operational-like environment such as in the French NDC or at the IDC.

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