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T1.1-P16. Reanalysis of large infrasound datasets with stochastic low-order models

Since the late 1990s, steady progress has been made in understanding the physics of long-range infrasound propagation in the atmosphere. However, it appears that the propagation problems are still solved principally by numerical techniques developed long ago. One of the most frustrating aspects of these techniques is their inability to predict the waveform sensitivities to atmospheric uncertainties. With recent renewed interest in the role of gravity waves in infrasound variability, there is a need to develop new algorithms for the prediction of sensitivities. In the present approach, the gravity waves are represented as a random field that is superimposed on the average background state, and the wave equation is solved using a reduced-order model, starting from the classical normal mode technique. The reduced model is obtained by retaining a few propagating modes, with the aim of simplifying the acoustic model to the point that the predicted statistics/sensitivities of signals are correct. We focus on the asymptotic behavior of the transmitted waves in the weakly heterogeneous regime, for which the coupling between the wave and the medium is weak. It is expected that this new approach could help reducing the number of bogus infrasound events in the IDC automatic system.

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