

Infrasound propagation modeling: near-real-time environmental characterization and variability studies.

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Developments in the propagation modeling capabilities of the InfraMAP analysis tool kit are reported in two areas. First, the output products of numerical weather prediction models are being used to supplement the baseline climatological characterizations of the propagation environment. These near-real-time wind and temperature updates capture atmospheric features at finer temporal and spatial scales than do climatological models. Second, the propagation variability induced by the environment is predicted and used to evaluate the performance of infrasonic networks. A gravity wave spectral model is used to generate realizations of horizontal wind perturbation as a function of height. A Monte Carlo simulation is then executed to calculate probability distributions of travel time and azimuthal deviation for a path of interest. Modeled variances, along with the uncertainty introduced by measurement error, are used to calculate the confidence bounds of multi-station localizations. Applications and case studies are discussed.

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