



Implications for array processing due to perturbations in the frequency-response of wind-noise-reduction pipe systems at infrasound stations

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Recent development of a methodology for in-situ calibration of atmospheric-infrasound sensors including the effects of wind-noise-reduction pipe systems [Gabrielson, JASA, 2011] and subsequent application on operational infrasound stations has shown that the frequency-response of pipe systems may be significantly perturbed from the reference situation. The associated transfer functions, which can vary from element to element and are time and frequency-dependent, suggest that the observed pressure signals over infrasound arrays could be distorted. This, in turn, may have consequences for the detectability of infrasound and the uncertainties associated with infrasound wavefront parameters.

In this presentation, we investigate the implications for array processing related to perturbations in the frequency-response of pipe systems, making use of infrasound recordings and recent transfer function measurements at International Monitoring System station IS48 in Tunisia [Kallel et al., ITW 2013]. Preliminary results suggest the presence of biases and the broadening in the confidence intervals of wavefront parameters in addition to the decrease in coherence of infrasound across the array. The understanding of these implications is of importance for various infrasound applications, such as passive acoustic remote sensing of the atmosphere, which is currently pursued in the Atmospheric Dynamics InfraStructure in Europe (ARISE) project.