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experiences with passive on-site calibration made at IMS infrasound array IS26

As part of the International Monitoring System a dedicated 60-element infrasound network is currently under construction to monitor compliance with the Comprehensive Nuclear-Test-Ban Treaty. As of now, 51 out of these 60 stations are certified and operational. The infrasound signals of interest are typically in the range from 0.02 to 4 Hz. The measurement of these acoustic signals takes place outdoors and even weak acoustic background noise, such as light winds, might overwhelm the signal of interest. To average spatially over the short wavelength acoustic background noise field, an infrasound element consists of a transducer connected to a wind-noise-reduction system consisting of multiple inlet pipes. For being able to fully understand the systems' ability to detect and identify acoustic events, it is crucial to obtain knowledge about the complete frequency response of the system.

Therefore, a passive calibration method has been deployed at IMS station IS26, Germany, in 2015; whereas at each of the eight array elements a calibrated reference microbarometer with a single inlet port is located beside a regular microbarometer being connected to a wind-noise reduction system. Following Gabrielson approach (2011) we have analyzed data from all array elements in the frequency range of interest to estimate the variation in the operational element sensitivity, considering the coherency in the background noise, through the seasons and years. Moreover, for long period background noise we have studied inter-site correlation for both the reference and standard sensors. This work is part for establishing traceability in on-site calibration of an infrasound array following international standards in metrology.

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