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novel approach for the reconstruction of microbarom soundscapes

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In this study, a comparison is made between in-situ infrasound recordings in the microbarom band and simulations using a microbarom source model. The recordings are obtained by the 'Infrasound-Logger' (IL), a miniature sensor that has been deployed as biollogger near the Crozet Islands in January 2020. The sensors provide barometric and differential pressure observations that have been obtained directly above the sea surface. A method is introduced to appropriately account for all microbarom source contributions surrounding the IL, as the full field consist of multiple spatially distributed sources. In this method, range and frequency-dependent losses due to propagation in the atmosphere are accounted for. While the method relies on several assumptions, a good agreement can be observed: the reconstructed soundscape is found to be within ± 5 dB for 80% of the measurements in the frequency band of 0.1-0.3 Hz. The development of microbarom soundscapes is essential for a better understanding of the ambient infrasonic noise field. Earlier work has shown that such knowledge is useful for infrasonic remote sensing of the upper atmosphere. Moreover, insights in the ambient noise field will improve the monitoring of natural hazards and the verification of the Comprehensive Nuclear-Test-Ban Treaty.

Promotional text

In this study we propose a new method to reconstruct the microbarom sourcefield, and compared it with in-situ infrasound recordings by the 'Infrasound-Logger' (IL). The IL is a miniature biollogger that has been deployed near the Crozet Islands. Such comparisons are unprecedented.

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