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The Global and Coherent Infrasond Wavefield: Recent Advances in Reprocessing the Full International Monitoring System Infrasond Data

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We present recent advances and results of reprocessing the IMS infrasond dataset from its beginning until early 2021. A new implementation of the Progressive Multi-Channel Correlation (PMCC) algorithm enables characterization, with a single processing run, of coherent noise in log-spaced frequency with one-third octave bands from 0.01 to 5 Hz. Such an array processing algorithm enables better characterization of all received signals in their wave parameter spaces (e.g. frequency–azimuth, frequency–trace velocity). This, in turn, permits more accurate signal discrimination and source and propagation studies. The latest comprehensive reprocessing of the IMS infrasond database covers the period from January 2003 to December 2020; in the meantime, the number of stations has increased from 30 to 53. The obtained results clearly indicate a continuous spectrum of coherent signals at IMS stations within the 0.01 to 5.0 Hz frequency range, as well as the wave parameters' relation to middle atmosphere dynamics. Also, more sources are identified when comparing the recent results with those of previous reprocessing approaches or the standard IDC products.

Promotional text

Our comprehensive dataset (up to 18 years) serves as the reference for a microbarom model validation (abstract by De Carlo et al.). It also opens up avenues for further studies (abstract by Hupe et al.) presenting tailored products for atmospheric and civilian applications.

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