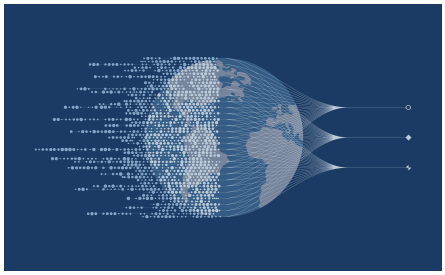

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-resolution analysis of spatio-temporal ambient noise variations across the IMS infrasound network

Temporal variations of the noise conditions constrain the ability to detect and identify signals of interest at infrasound stations. Station-dependent factors that contribute to the noise include wind and turbulence. A coherent source of ambient noise at the global infrasound station network of the International Monitoring System are microbaroms from the oceans, which vary seasonally such that most stations observe the maximum noise during local winter.
For a realistic estimate of the station noise statistics, we computed the power spectral density (PSD) at all elements of the operational IMS stations on an hourly basis over a six-year period (2019-2024), resulting in more than 15 million computed PSDs. This systematic processing of the background noise allows an assessment of the sensitivity of each measurement system to geographic and environmental parameters that include both wind-generated noise and coherent signals from geophysical and anthropogenic events. Using this unique high-resolution PSD dataset, we analyse the spatiotemporal noise variation across the IMS network and examine local effects at the array sites such as vegetation or snow cover that also contribute to the noise level. This work aims at updating earlier statistical ambient noise models and facilitating detection capability simulations with high temporal resolution.

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