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of the IMS hydrophone stations network to characterize low level underwater seismicity, underwater volcanism and iceberg events

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The hydroacoustic component of the IMS network consists of a series of five island-based seismic stations and six cabled hydrophone installations located in the Indian, Pacific and Atlantic Oceans. In this study, we focus only on hydrophone stations, which provide low back ground high quality data: each one of these stations hosts a set of three hydrophones deployed at a depth of the SOFAR channel, as a small-aperture (~2 km) horizontal triangular array. The direction of arrival and the apparent velocities of broadband acoustic arrivals can be determined from array processing based on correlation or beam forming techniques, therefore enhancing the detection and location capabilities of such a sparse network. Several years of data are processed with DTK-PMCC detector and global association is performed to build automatic events. The precision of estimated wavefront parameters allows to image with an unexpected accuracy the spatial locations of active seismic areas associated to ridge, subduction and volcanic seismicity, for which propagation paths are not blocked by bathymetric structures. Antarctica iceberg events are also clearly detected with season-dependent locations. Obtained seismic events are compared to LEB events, and differences are discussed in terms of location accuracy, source energy level and ground-to-water coupling.

Promotional text

This presentation demonstrates the capability of the IMS hydrophone stations network to characterize low level underwater seismicity, underwater volcanism and iceberg events

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