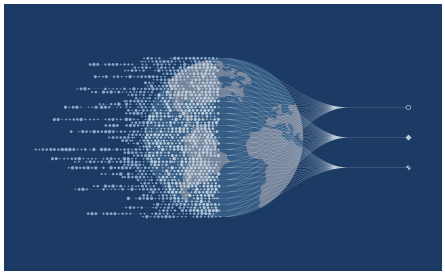

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Chain In-Situ Calibration of Hydroacoustic Hydrophone Stations

Hydroacoustic hydrophone stations of the International Monitoring System (IMS) network continuously monitor the global oceans for nuclear test explosions. The stations are equipped with hydrophones in triplet configurations placed in the SOFAR channel, where the speed of sound reaches its minimum, to detect acoustic events. Acoustic signals detected by the hydrophones are conveyed to the deep-water node, which contains the electronics that convert them into digital signals, via analog cables. These signals are then transmitted to CRF through fiber-optic cables. The full-chain calibration of a hydrophone station is currently performed once, in a laboratory setting, before deployment. After deployment, the calibration is performed from the CRF up to the node section without the contribution of the analog part that contains information related to the hydrophone and the riser cable. The end to end in situ calibration of hydroacoustic stations is important for assessing the health of the full chain. Key challenges include the low frequency spectrum range and deep-ocean conditions. Since the hydrophone is the primary sensing component, full-chain calibration with active source has the potential to provide valuable information regarding the overall receiving sensitivity levels and support the assessment of the station's sustainability. The current approaches and feasibility for low frequency underwater acoustic in situ calibration will be presented.

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