

## **of IMS hydrophone triplet data associated with undersea volcanic activity of Ioto Island**

Real-time monitoring and early detection of undersea volcanic activity are indispensable in relation to disaster reduction, however it remains difficult to implement continuous in-situ observation of undersea volcanoes due to their difficult accessibility compared to above-surface volcanoes. International Monitoring System (IMS) hydroacoustic stations, which are equipped with triplets of hydrophones, are installed at six locations in the world's oceans. A Hydrophone triplet makes it possible to detect and determine the direction-of-arrival (DOA) of hydroacoustic signals. In the present study, data from HA11 Wake Island (a U.S. Territory in the Pacific) is examined to investigate the association of hydroacoustic signals with undersea volcanic activity at Ioto (formerly called Iwojima) volcanic island in the northwestern Pacific Ocean. The cross-correlation analysis indicates that the DOA of recorded hydroacoustic signals can be associated with sources at Ioto with a high degree of confidence. Temporal evolution of the detected hydroacoustic signals makes it possible to establish a direct association with in-situ seismic observations obtained with equipment which is permanently deployed at Ioto. Our study shows that the IMS hydrophone triplets can contribute to the identification and far-field monitoring of hydroacoustic signals generated by undersea volcanic activity.

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**Track Classification:** 2. Data analysis and signal processing methods for CTBT verification purposes