

IMS discrimination between T-phases originating from volcanic tremors versus H-phases induced by volcanic eruptions in the northwestern Pacific Ocean

Hydrophone triplet data recorded by the Wake Island IMS hydroacoustic station HA11 was examined with the intent to determine the directivity and number of event arrivals from undersea eruptions originating from the Japanese volcanic island of Ioto (formerly named Iwojima). Ioto is located 2700 km northwest of HA11 and is categorized as an active above-surface volcano. In-situ measurements of volcanic tremors showed that volcanic activity increased during the month of September 2018, when up to 772 detections per day were recorded. Local flyover observations identified that undersea eruptions were occurring in the nearshore shallow-water area during this time. However, there remained the difficulty with regard to discriminating between in-situ seismic arrivals corresponding to volcanic tremors, and ones corresponding to undersea eruptions. The analysis of the data recorded at HA11 made it possible to discriminate between T-phase arrivals from volcanic tremors originated from Ioto and arrivals from the eruptions, which more closely resemble H-phase arrivals. The arrivals from Ioto at HA11 and the in-situ observations showed good correlation. Our results suggest that two-thirds of the arrivals can be associated with volcanic tremors and one-third with the undersea eruptions.

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