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## at IMS hydrophone stations of Primary and Tertiary phases from the sixth announced DPRK underground nuclear test

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Primary seismic phases, P-phases, associated with the sixth announced DPRK underground nuclear test of 3 September 2017 (DPRK6) were identified at frequencies below 4 Hz at four of the six CTBT IMS hydroacoustic hydrophone stations, namely HA01, HA03, HA08 and HA11. The signals match P-phase arrival times for these stations except for HA03, where the arrival time matches a path through the outer core. No P-phase detections were made at the two remaining stations, HA04 and HA10, likely because they fall within shadow zones of core phases. Moreover, T-phases originating from the DPRK6 event were detected at both triplets of the station nearest to the test, HA11 Wake Island, at frequencies below 10 Hz. The arrival times of these T-phases are consistent with a P-phase travelling from the source through the Earth's crust, to an off-shore location along the Japan Trench where the bathymetry crosses the SOFAR channel and from there along water borne paths to both triplets of HA11. The back-azimuths of these T-phase arrivals point to this SOFAR crossing as the location where the P-phase coupled into the hydroacoustic paths. To the authors' best knowledge, DPRK6 is the first nuclear test detected at IMS HA hydrophone stations.

### Promotional text

P-phases from the 6th announced DPRK underground nuclear test were detected at four of the six IMS HA hydrophone stations. Additionally, a T-phase consistent with this event was also detected at HA11. These appear to be the first detections of this kind at IMS HA stations.

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