

Information from Signals Undergoing Hydroacoustic Blockage

When the direct line of sight from a hydro-acoustic sensor to a source of an underwater sound is obstructed by land, the blocked signal may still be detected. Acoustic propagation around an island acts as a transfer function, changing the direction and duration of the sound source. Recordings made on CTBT hydro-acoustic stations in the Indian Ocean demonstrate acoustic redirection caused by islands. The transfer function of blocked signals received on the South Station of Diego Garcia is characterized by inspection of T-phases generated by subaqueous seismic events cataloged from 2000-2014. These signals, originating primarily along the Carlsburg Ridge, are used to build a filter to detect blocked signals. The filter identifies additional events not recorded in the catalog, providing a useful tool for study of this seismologically active area. Furthermore, the filter allows for detection of events while the north station is inoperative. The directional information and timing of features within the blocked arrival allows for an estimate of the event epicenter. This work benefits the CTBT by salvaging event detection from the blind side of an island while costly retrofits of inoperative stations are underway.

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