

and interpretation of variability in long-range, underwater acoustic signal propagation recorded on CTBT IMS hydrophone stations

On 15th November, 2017, the CTBT IMS hydroacoustic stations HA10 (Atlantic Ocean) and HA04 (southern Indian Ocean) detected an unusual impulse-like event whose estimated location was in the vicinity of the last known position of the missing Argentine submarine ARA San Juan (EGU2018-18559, 2018). This detection and localization was further confirmed by a controlled air-dropped depth charge deployed by the Argentine Navy, on 1st December 2017, close to the estimated location of the unusual event. The focus of this presentation is on the signal from these impulse-like events propagating out to a distance of more than 6000 kilometres along geodesic paths from the event origin through two very different underwater environments (EGU2019-9253, 2019). The impact of the ocean waveguide on the signal propagation is manifested by strong frequency low-pass filtering and time dispersion of the signal recorded on HA04 compared to the recordings on HA10. An interpretation of the signal characteristics recorded on HA10 and HA04 from the impulse-like events is performed by two-dimensional propagation modelling of full time-series including spatially dependent oceanographic database information. The modelling results broadly agree with observed features and point to the importance of adapting detection and classification algorithms to specific propagation paths.

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