

## **-phase signals from events with epicentres in 'blocked' locations.**

T-phase signals generated by earthquakes with epicentres in or close to ocean areas may be detected after oceanic propagation over distances of tens of thousands of kilometres. Ocean environments are close to being horizontally stratified but lateral variability in water depth or sea-water sound-speed can lead to out-of-plane propagation. This can result in T-phases being detected in locations at which the geodesic path between receiving station and epicentre is blocked by land or water too shallow to act as an efficient waveguide. Data from the International Monitoring System of CTBTO is used to illustrate the detection at hydro-acoustic stations of T-phases from seismic events with epicentres in the “acoustic shadow” of land masses. A fully three-dimensional parabolic equation model is used to demonstrate that lateral variability of the bathymetry can explain this phenomenon. The implications of this are that the CTBTO network has greater coverage than predicted by 2-D models and that inclusion of diffraction in future processing can improve the automatic global association of hydroacoustic events.

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