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Calculation of Hydroacoustic Propagation and Conversion to Seismic Phases at T-Stations

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The IMS Hydroacoustic network consists of 6 Hydrophone stations and 5 T-stations. The T-stations are high-frequency seismic stations (sample rates of 100 Hz) situated on islands or coastal stations and intended primarily to capture signals from in-water explosions. However, while there are numerous recordings of impulsive-like signals at the hydrophone stations, recordings of this type of signal at the T-stations are relatively rare. This is because the conversion of the seismic signal as it propagates from ocean to land is both complex and characterized by strong attenuation. To improve the understanding of this phase conversion at T-stations, we are performing numerical calculations using the spectral element code SPECFEM2D, modelling the underwater propagation along a path leading towards each T-station and the phase conversion through the ocean/land interface to the seismometer. Environmental information from a variety of sources was gathered to construct the earth and ocean models used in the calculations. The goal of this part of the work is to provide a set of calculated waveforms to complement the limited set of observed waveforms and to assist in the characterization of arrivals from explosion-generated hydroacoustic waves at T-stations.

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