



Passive probing of the Atlantic Ocean's SOFAR channel with hydro-acoustic observations from earthquakes

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The International Monitoring System includes a hydro-acoustic part to verify the Comprehensive Nuclear-Test-Ban Treaty. Monitoring stations detect acoustic waves from earthquakes that travel through the SOFAR channel. The traveltimes of such detections are listed in the Reviewed Event Bulletin, which is statistically evaluated for station H10 located in the Atlantic Ocean. H10 consists of two hydro-acoustic arrays and has been operational for over six years. The celerities (epicentral distance over travel time) are distributed around two peaks, corresponding to high propagation velocities in the northern Atlantic and low values in the south. A detailed acoustic velocity distribution as a function of latitude is retrieved from Mid-Atlantic Ridge earthquakes. No significant changes in the celerity are found as a function of time that might have been caused by temperature changes. These results compare remarkably well with those from active experiments, showing the ability of passively probing the SOFAR channel with hydro-acoustic waves from earthquakes.