



Secondary microseism wavefield characterisation in the NE Atlantic, offshore Ireland

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We look at the comparison between 3D simulations of acoustic and seismic wave propagation with OBS data recorded across the shelf-break offshore Ireland. Both real and synthetic observations are combined to characterise the acoustic and seismic wavefields in the marine environment and particularly study the propagation of the secondary microseism signal from deep to shallow water to the land. The recorded OBS data show a strong change in the energy of “noise events” in the secondary microseism band affected by the transition from deep water to the shelf, but also highlight seasonal variations in the seismic and acoustic wavefield likely related to changes in noise source locations. The numerical simulations of acoustic and seismic wave propagation in the Rockall Trough (3 km deep water) enable us to reconcile deep ocean, shelf and land seismic observations with changes in the water column and sediments thickness. The use of 3D simulations brings new insights on the bathymetry and sediments lateral effects on signal propagation with the opportunity to generate acoustic and seismic data from any location in the area of interest defined by the mesh. A significant finding is that the surface wave component of the secondary microseism signal is strongly influenced by the propagation effects associated with steep sea-floor topography whereas as expected the weaker body waves in the microseism wavefield remain unaffected.