

Observation and Simulation of Microseisms Offshore Ireland

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Although more and more used in seismic imagery, ocean induced ambient seismic noise is still not so well understood, particularly how the signal propagates from ocean to land. Between January and September 2016, 10 broadband Ocean Bottom Seismometers (OBSs) stations, including acoustic sensors (hydrophone), were deployed across the shelf offshore Donegal and out into the Rockall Trough. The preliminary results show spatial and temporal variability in the ocean generated seismic noise which holds information about changes in the generation source process, including meteorological information, but also in the geological structure.

In addition to the collected OBS data, numerical simulations of acoustic/seismic wave propagation are also considered in order to study the spatio-temporal variation of the broadband acoustic wavefield and its connection with the measured seismic wavefield in the region. Combination of observations and simulations appears significant to better understand what control the acoustic/seismic coupling at the sea floor as well as the effect of the water column and sediments thickness on signal propagation. Ocean generated seismic ambient noise recorded at the seafloor appears to behave differently in deep and shallow water and 3D simulations of acoustic/seismic wave propagation look particularly promising for reconciling deep ocean, shelf and land seismic observations.