



Measuring oceanic internal waves in Rockall Trough (NE Atlantic) using seismic reflection data

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We describe a new method for imaging and directly measuring oceanic internal waves. An undulating reflection that represents a constant density surface is identified on a standard stacked seismic reflection image of the water layer. The same reflection is traced across pre-stack shot gathers. Depth picks from the shot gathers are contoured on axes of distance versus time during data acquisition. Amplitudes, wavelengths and components of propagation velocity relative to the ship and in the plane of the seismic profile are measured directly, and propagation velocity components over the seabed are easily calculated. In principle, true horizontal propagation velocities can be measured using 3D seismic reflection data. We demonstrate the new technique using oil industry seismic data from Rockall Trough (NE Atlantic). The maps of variations in internal wave properties over large spatial areas allow wave generation sites to be identified so that important generation mechanisms can be inferred.