

Seismogram Modelling applied to Surficial Sediments

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During the past two decades, methods for dealing with seismological data have been refined to the extent that our understanding of the structure and mechanical properties of large features in the lithosphere have been considerably improved. These methods have not previously been carried over into the investigation of surficial sediments of the seabed, a field in which seismic investigation is usually restricted to the deployment (either high or low in the water column) of some type of normal-incidence subbottom profiler.

Such devices are widely used to reveal as 'reflectors' the position (in

time) of discontinuities in the variation with depth of some mechanical property, but they are neither able to deal with a continuous variation of mechanical properties nor to determine seismic velocities.

The use of suitably designed multichannel seismic equipment allows observations to be made which are appropriate for analysis by the methods of modern seismology. An example from the Beaufort Sea shows that the results of this analysis may be quite different from those deduced by the application of conventional travel-time methods to the very same field data.