Reflection

In reflection seismology we record seismic pulses that are reflected from boundaries which separate layers that have different acoustic impedances. Unlike in refraction surveying, information in the seismogram which comes after the first arrival is important. In general the processing is considerably different than in refraction surveying.

In reflection seismology, seismic records from many sets of shots and receivers are used to generate a Normal Incidence Reflection Seismogram which has reflections that correspond to a vertically traveling wave. The reflections occur at travel times that are determined by the velocity and the length of the travel path in each layer. The normal incidence reflection seismograms are acquired at regular distances along the surface and are composited into a seismic section. This generates an image of the substructure that can be used in an identical manner to a radar section.

In order to benefit from gathering several echoes from each reflecting point there are numerous operations that need to be applied to the data. Much of the data processing is tied to the hypothesis that the earth's properties vary most strongly in the vertical direction. The following points illustrate the fundamental procedural concept underlying the creation of a final seismic reflection section:

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| ./images/geom3.gif |

type (3)

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| ./images/geom2.gif |

type (2)

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| ./images/geom1.gif |

type (1)

seismic\_reflection\_seismogram seismic\_reflection\_filtering seismic\_reflection\_processing\_fundamental seismic\_reflection\_static\_corrections seismic\_reflection\_stacking seismic\_reflection\_migration

Note

From Kearey, Philip and Micheal Brooks, 'An Introduction to Geophysical Exploration'. 2nd ed. Blackwell Science: 1991.