

ratio being deteriorated for the high frequency acoustic waves.

~~One purpose~~ Embodiments of the present invention ~~is seek~~ to ~~propose~~ provide a technique to acquire marine seismic data which ~~has~~ may have broad dynamics with respect to the depth of the reflectors able to be located, and which ~~is~~ may be simple and efficient with respect to operations and economics.

PRESENTATION OF THE INVENTION

According to an aspect of the invention, there is provided a seismic wave acquisition method using at least one streamer towed by a vessel and comprising a plurality of seismic receivers, characterized in that the streamer comprises a head portion in which the depth of the receivers increases the further ~~they lie away~~ their distance from the vessel, so that said head portion has a first ~~slant angle~~ slope, and a tail portion comprising at least one section having a second ~~slant~~ slope different to said first ~~slant~~ slope.

PRESENTATION OF THE FIGURES

Other characteristics and advantages of the invention will become further apparent from the following description which is solely illustrative and non-limiting, and is to be read with reference to the appended drawings in which:

- figures 1 and 2 illustrate acquisition devices belonging to the prior art;
- figures 1' and 2' illustrate spectra of a shallow event, obtained using the devices illustrated figures 1 and 2;
- figures 3 and 4 illustrate two embodiments of an acquisition device according to the invention;

CLAIMS

1. Method of acquiring seismic waves by means of at least one streamer ~~(1)~~ towed by a vessel and comprising a plurality of seismic receivers ~~(4)~~, wherein the streamer comprises a head portion ~~(1a)~~ in which the depth of the receivers increases the further their distance from the vessel so that said head portion has a first slope, and a tail portion ~~(1b)~~ comprising at least one section having a second slope different to the first slope.

2. Method according to claim 1, wherein the head portion ~~(1a)~~ is tilted relative to the horizontal at a tilt angle of between 1 and 2°.

3. Method according to any of the preceding claims, wherein the head portion ~~(1a)~~ has a length of between 1 and 3 km.

4. Method according to any of the preceding claims, wherein the seismic receiver ~~(4)~~ the closest to the surface of the water ~~(3)~~ lies at a depth of between 7 metres and 8 metres.

5. Method according to any of claims 1 to 4, wherein the tail portion ~~(1b)~~ has a zero slope.

6. Method according to any of claims 1 to 4, wherein the tail portion ~~(1b)~~ comprises at least two sections ~~(1c, 1d)~~ whose receivers have a depth which increases the further they lie distant from the vessel, the section ~~(1c)~~ the closest to the ship having a slant greater than that of section ~~(1d)~~ lying furthest from the vessel.

7. Method according to any of claims 1 to 4, wherein the tail portion—~~(1b)~~ comprises at least one portion comprising a section whose receivers have a depth which increases the further they lie distant from the vessel, and a section whose receivers have a depth which decreases the further they lie distant from the vessel.

8. Method according to any of claims 1 to 7, wherein the seismic receivers—~~(4)~~ of the streamers—~~(1)~~ are hydrophones.

9. Method according to any of claims 1 to 7, wherein the seismic receivers—~~(4)~~ of the streamers—~~(1)~~ comprise in combination hydrophones and geophones.

10. Device to acquire seismic waves towed by a vessel ~~(2)~~ and including at least one streamer—~~(1)~~ comprising a plurality of seismic receivers—~~(4)~~ and equipped with depth controllers—~~(5)~~ spaced apart along its length, characterized in that said controllers—~~(5)~~ are adjusted so that, in the head portion—~~(1a)~~ of the streamer, the depth of the receivers increases the further they lie distant from the vessel, the streamer having a first slope relative to the surface of the water—~~(3)~~, and its tail portion—~~(1b)~~ comprises at least one section having a second slope different to the first slope.