

Upward propagation (up-travelling wave) is defined by propagation angles relative to the horizontal of between 0° and 180° , downward propagation (down-travelling wave) by propagation angles of 180° to 360° .

5 The methods described in US 4,353,121 and US 4,922,922 are one dimensional (1D) and two-dimensional (2D) seismic processing methods. Yet, said methods are not generalized in three dimensions. Sampling of the sensors in the 3rd dimension is effectively given by
10 the lateral distance between the streamers, in the order of 150 m, which is much larger than the sampling of sensors along the streamers which is in the order of 12.5 m.

Embodiments~~One general purpose~~ of the present
15 invention ~~seeks~~ to provide a 3D seismic processing method which can be used to image the geology of the subsurface, from marine seismic data recorded by seismic receivers of which at least some lie at different water depths, without involving a datuming step and without any
20 restrictions regarding the direction of wave propagation.

PRESENTATION OF THE INVENTION

According to an aspect of~~For this purpose,~~ the present invention, there is provided~~proposes~~ a method
25 of~~the~~ processing marine seismic data gathered by means of at least one seismic streamer towed by a vessel, and comprising a plurality of seismic receivers ($R_1, \dots, R_n$) located at respective water depths ($z_1, \dots, z_n$)
the method~~characterized in that it comprises~~ an adapted mirror migration step for~~of~~ said data in which
30 the recordings of the different seismic receivers ($R_1, \dots, R_n$) at their effective positions are added to the migration, whilst adding the opposite of the same recordings at their mirror positions.