

ABSTRACT

METHOD OF MARINE SEISMIC EXPLORATION

In dual-sensor, bottom-cable (16) marine seismic exploration where hydrophone/geophone pairs (18) are deployed on the marine bottom (20), coupling imperfections between the geophones and the marine bottom contribute to differences between the impulse response of the geophones and the impulse response of the hydrophones. To correct for the coupling imperfection, a filter is designed which compensates for the inherent impulse response differences as well as response differences caused by the imperfect coupling. Preferably, the filter is designed using a calibration procedure prior to production shooting. First, the response of a hydrophone and geophone to a seismic wave is recorded. Then, these recorded responses are transformed into the frequency domain. Once transformed, the response of the hydrophone is divided by the response of the geophone to produce a filtering function. When the filtering function is applied to geophone signals during production shooting, the filter compensates the geophone signals to alleviate differences in response characteristics between the geophone signals and the hydrophone signals.

Fig. 1

