

METHOD FOR THREE DIMENSIONAL SEISMIC TRAVEL TIME TOMOGRAPHY IN TRANSVERSELY ISOTROPIC MEDIA

Abstract

[0048] A method for estimating seismic velocities in vertically transversely isotropic media includes generating an initial estimate of vertical interval velocity and interval normal moveout velocity with respect to depth from seismic data. An initial estimate is generated of a first anisotropy parameter with respect to depth. The first anisotropy parameter is related to the interval normal moveout velocity and the interval vertical velocity. An initial estimate is generated with respect to depth of a second anisotropy parameter. The second anisotropy parameter is related to the first anisotropy parameter and an interval anelliptic parameter. A first tomographic inversion is performed with respect to the interval normal moveout velocity and the second anisotropy parameter at a constant value of the first anisotropy parameter until travel time differentials reach minimum values. Layer depths are adjusted with the initial estimate of vertical interval velocity. Using values of the second anisotropy parameter determined in the first tomographic inversion, a second tomographic inversion is performed of interval normal moveout velocity and the first anisotropy parameter with respect to depth. The adjusted layer depths, interval normal moveout velocities and interval vertical velocities are again adjusted and interval anelliptic parameters are calculated from the second tomographic inversion.

FIG. 1



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