TOMOGRAPHIC INVERSION USING KINEMATIC NORMAL INCIDENT POINT WAVE ATTRIBUTES FOR DEPTH DOMAIN SEISMIC VELOCITY MODEL DETERMINATION

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Abstract

A seismic velocity model is required for the transformation of recorded seismic reflection data into a structural image of the subsurface by depth migration. The traveltime information, to determine velocity model using tomographic inversion, is picked from seismic prestack data. This picking process will be difficult to do in the low signal-to-noise ratio data.

In this research, the determination of velocity model using reflection tomographic inversion with kinematic normal incident point attributes, are presented. Automatic picking was performed on the zero offset section of CRS stack results. Picking results are then used as input data for tomographic inversion process. Prestack depth migration was performed by using the resulting velocity model and then it compared with result from conventional processes. The qualitatively determining performed on stacking results by considering the results of the initial section and coherence section. The qualitative and quantitative analysis performed on the model velocity tomographic inversion result.

From the results obtained that stacking section from CRS stack has a better reflector image and there are fewer artifacts than conventional processes. Tomographic velocity model generated after 21\textsuperscript{th} iteration. Cost function value
decreased by 92.17% of the value of the initial cost. The result of the prestack depth migration shows that it was influenced by the stacking section data and velocity model. The migration result using CRS stack velocity data has more detail structure than conventional ones.

**Keyword:** common reflection surface, seismic tomography, kinematic wavefield attributes, prestack depth migration.