COMPARISON BETWEEN DEKONVOLUTION APPLIED IN T-X AND LINEAR TAU-P DOMAINT TO REDUCE MULTIPLE OF 2D MARINE SEISMIC DATA

ABSTRACT

Multiple effects will rise on the seismic record when the seismic waves were trapped inside the water column or rock layer. The waves will be reflected several times in the same layer and results wrong information about the bigger traveltime. Some methods are used to remove the effect without distract the primary event. One of the methods is called deconvolution which can be done in the time-offset and intercept-ray parameter $(\tau - p)$ linear domain.

In the $t - x$ domain, traces will be filtered using predictive deconvolution without any other additional step outside the standard step in seismic processing. The $\tau - p$ linear method principle requires domain transformation from $t - x$ to $\tau - p$ domain and then it will be refiltered with predictive deconvolution. When the multiple removals are success, the data will be transformed inversely in the $t - x$ domain. The research will compare the results from both methods.

Multiple's amplitude, shot gather condition, spectral analysis, and the continuity of primary reflection in the stack section are some categories that will be compared as the results of both method. Deconvolution in $\tau - p$ linear domain gives a lower multiple's amplitude than the $t - x$ domain method does. Based on shot gather, the $\tau - p$ linear domain also removes effectively the middle-far offset multiples which consist of inconsistent repeatability. The same method also gives a finer spectral analysis than the $(t - x)$ method does which indicate noise reduction. The stack section shows a good continuity of the primary reflector when $(\tau - p)$ linear domain method is applied.

The $(\tau - p)$ linear deconvolution gives the best results based on the comparison. Multiple has a more stable periodicity in $(\tau - p)$ domain while in $(\tau - x)$ domain the periodicity is not stable at the non-zero offset position.

Keywords: Multiple; Predictive Deconvolution; time-offset; intercept time-ray parameter