

An Improved Technique for Static Correction in a High Resolution Seismic Reflection Data Using Difference In Reflection Times

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Seismic reflection survey was carried out in Zaria, located in the basement complex of central northern Nigeria. The effect of near surface material, which could make reflection events appear disjointed or deeper than they really are, could be enormous if not corrected for. This work sets out to correct for this effect by making use of difference in reflection times. During the data acquisition the receivers were placed at 1 m interval, with a constant offset of 10 m. The common midpoint (CMP) method with 12 fold coverage was employed. The observed reflection times was used to generate 2D velocity model of the subsurface. The new estimated model was later adjusted to fit the previous known refraction tomography model carried out on the same profile. The difference in travel time induced by the near surface materials which resulted in the initial difference of the two velocities models (estimated and known) before adjustment was noted. The results obtained showed that the reflection events were more coherent and in their actual reflecting point on the statically corrected seismic sections, compared to the section without static correction because of the excess time from the near surface material with variable p wave velocity. This experiment has proved that difference in reflection travel times obtained from previous known model or borehole information in conjunction with the observed travel times, serve as a better tool in applying static correction to seismic reflection data, than any previous known conventional methods that relies on a single technique.