

Challenges of statics computation in Algerian Seismic data, the impact of the heterogeneities to estimate real static model of WZ (case study)

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ABSTRACT

Static corrections are applied to seismic data in order to compensate the various effects on the data such as those related to near surface, variation in elevation, weathering zone and reference to a datum.

Our case held in central Algerian Sahara presents a diversity of geology aspects such as Cliffs, Wadis and Outcrops of limestone slab, which causes large lateral variations of both wave propagation velocities and thicknesses of the Weathered Zone (WZ).

In inversion Methods, Picking first break is required. It is challenging in our case because of Limestone slab previously mentioned along with high level of noise (Acquisition Single Sensor Single source BBSS). While computing statics with several models calibrating to the weathered zone base estimated from Upholes provides similar results in terms of time shift.

Classical methods for determining static corrections (uphole, direct Method) are insufficient to build a reliable image of WZ because of areas of strong altimetric variations, lateral and vertical velocities variations (near surface complex).

After comparing the different solutions generated (Direct and inversion), the Non-linear inversion methods provide best estimations of the WZ model, the thing confirmed with better well ties in the region resulting in trustworthy imaging solution.