

Delineation of the Geoelectric and Geovelocity Parameters in the Basement Complex of Northwestern Nigeria

Authors : M. D. Dogara, G. C. Afuwai, O. O. Esther, A. M. Dawai

Abstract : The geology of Northern Nigeria is under intense investigation particularly that of the northwest believed to be of the basement complex. The variability of the lithology is consistently inconsistent. Hence, the need for a close range study, it is, in view of the above that, two geophysical techniques, the vertical electrical sounding employing the Schlumberger array and seismic refraction methods, were used to delineate the geoelectric and geovelocity parameters of the basement complex of northwestern Nigeria. A total area of 400,000 m² was covered with sixty geoelectric stations established and sixty sets of seismic refraction data collected using the forward and reverse method. From the interpretation of the resistivity data, it is suggestive that the area is underlain by not more than five geoelectric layers of varying thicknesses and resistivities when a maximum half electrode spread of 100m was used. The result of the interpreted seismic data revealed two geovelocity layers, with velocities ranging between 478m/s to 1666m/s for the first layer and 1166m/s to 7141m/s for the second layer. The results of the two techniques, suggests that the area of study has an undulating bedrock topography with geoelectric and geovelocity layers composed of weathered rock materials.

Keywords : basement complex, delineation, geoelectric, geovelocity, Nigeria

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