

NUMERICAL INVESTIGATION INTO THE DOUBLE FOURIER ANALYSIS FOR DETERMINING THE QUANTITY OF UNDERGROUND MINERAL DEPOSIT

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ABSTRACT

Geophysical exploration is a reliable technique for detecting underground mineral resources. Its methods include natural-source method such as gravimetric method and artificial-source method like seismic method. Previous studies have shown that the gravimetric method is a good alternative to the more expensive seismic method. Yet, seismic method is widely preferred in Nigeria and many other countries to the gravimetric method for mineral exploration. This is due, probably, to the inverse problem in the gravimetric method, which has defied satisfactory solution. This inherent problem includes amongst others the determination of the most probable quantity of the underground mineral deposit. In this study, an attempt is made to carry out numerical determination of the estimated quantity of underground mineral deposit. Data used for the study are the rectangular coordinates and residual gravity anomalies of gravity stations obtained along some profiles in Bauchi State of Nigeria. The data distributed in profile pattern was later resolved into square grids using Kriging method of interpolation. Thereafter, the estimated quantity of the underground mineral deposit was determined using the method of double Fourier analysis. It can be inferred, from the analysis of the results obtained, that the computed quantity of the mineral deposit is satisfactory. Therefore, it shows that the solution of the inverse problem in gravimetric technique has been satisfactorily attempted. Also, double Fourier analysis has been shown to serve as effective tool for the determination of the quantity of underground mineral deposit,

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