

Integrated Electric Resistivity Tomography and Magnetic Techniques in a Mineralization Zone, Erkowit, Red Sea State, Sudan

Authors : Khalid M. Kheiralla, Georgios Boutsis, Mohammed Y. Abdelgalil, Mohammed A. Ali, Nuha E. Mohamed

Abstract : The present study focus on integrated geoelectrical surveys carried out in the mineralization zone in Erkowit region, Eastern Sudan to determine the extensions of the potential ore deposits on the topographically high hilly area and under the cover of alluvium along the nearby wadi and to locate other occurrences if any. The magnetic method (MAG) and the electrical resistivity tomography (ERT) were employed for the survey. Eleven traverses were aligned approximately at right angles to the general strike of the rock formations. The disseminated sulfides are located on the alteration shear zone which is composed of granitic and dioritic highly ferruginated rock occupying the southwestern and central parts of the area, this was confirmed using thin and polished sections mineralogical analysis. The magnetic data indicates low magnetic values for wadi sedimentary deposits in its southern part of the area, and high anomalies which are suspected as gossans due to magnetite formed during wall rock alteration consequent to mineralization. The significant ERT images define low resistivity zone as traced as sheared zones which may associated with the main loci of ore deposition. By itself, no geophysical anomaly can simply be correlated with lithology, instead, magnetic and ERT anomalies raised due to variations in some specific physical properties of rocks which were extremely useful in mineral exploration.

Keywords : ERT, magnetic, mineralization, Red Sea, Sudan

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