Although appearance of the magnetic anomalies gives some ideas about buried objects in the subsurface, the advanced spectral methods were applied to the magnetic anomalies in order to identify subsurface objects such as walls, metals, grave jars and burnt ceramics. The residual magnetic anomalies mostly orientated in the N-S direction, implying the presence of remanent magnetization. RTP (Reduction the Pole) transformation could not entirely remove disoriented polarities arising from the effect of remnant magnetization. Therefore, analytical signal technique decreases the distortions caused by the remanence effects. The analytic signal of the magnetic anomalies was calculated to delineate the source fields of these anomalies. The boundaries of the various archaeological features can be identified based on the analytic signal of the magnetic data. The magnetic signatures were appeared to be well correlated with the walls, metals, grave jars and burnt ceramics. Results of this magnetic survey can be used to guide the archaeologist and give some ideas about the planning of an excavation in the future, and so provides decreasing the cost and time for excavation.

Geological settings and conditions of genesis of volcanogenic deposits of non-ferrous metals in Paleoisland arc environments

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By the example of the Pontian-South Caucasian paleoisland arc actively functioning during the whole Mesozoic the authors consider the main peculiarities of spatial-temporal relationships between ores of non-ferrous metals and enclosing rocks, and discuss the conditions of the evolution of ore-magmatic systems. The authors' conclusions are substantiated by data on $^{87}Sr/^{86}Sr$ ratios, concentration of rare elements in enclosing volcanogenic rocks, isotopic ratio of sulphur and oxygen in ores, and results of thermobarogeochemical studies. The authors hold the opinion shared by many mining geologists that the main part of ore components in non-ferrous metal deposits was extracted from nearby magmatites enclosing and underlying mineralized zones. The solutions from which ores precipitated were, by their salinity, very close to sea water. The maximum temperature of ore formation at epigenetic deposits reached 400°C for copper ores and 280°C for barite-polymetallic ores, whereas the pressure did not exceed 200 bar. As for hydrothermal-sedimentary ores, they could most likely form at the sea bottom, at depths of 2-3km and maximum temperature no more than 300°C.

Ψηφιακή Βιβλιοθήκη Θεόφραστος - Τμήμα Γεωλογίας. Α.Π.Θ.