

DETAILED MAGNETIC INVESTIGATIONS AT ROMAN ARCHAEOLOGICAL SITES IN ISRAEL

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Ancient Roman sites in Israel are ones of the most perspective archaeological targets for conducting detailed magnetic investigations. The targets, as a rule, hold some initial shape and are distinguished by their magnetic properties from the host medium. At the same time interpretation of magnetic surveys is complicated by: (a) Earth's oblique magnetization ($\approx 45^\circ$), (b) influence of industrial distortions, (c) multi-layer structure of sites and (d) rugged topography. The complicated factors require application of advanced procedures for magnetic data processing and interpretation. The common interpreting system (*Khesin, Alexeyev and Eppelbaum, 1996*) has been specially developed for complicated environments and includes: (1) elimination of secondary effects of magnetic temporary variations, (2) calculation of averaged medium magnetization, (3) statistical-probabilistic procedures for revealing targets against noise background, (4) inverse problem solution (for conditions of oblique magnetization, uneven relief and unknown level of the normal field) and (5) 3-D modeling using *GSFC* program. The system has been successfully applied at several ancient Roman sites in Israel: Beit-Gouvrin II (remains of road), Yodefat (remains of fortress) and Banias (remains of cemetery and aqueduct).