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Integrated geophysical methods to investigate chamber tombs in the Necropolis of Monte Abatone, Cerveteri (Roma, Italy)

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The Monte Abatone Necorpolis is one of the main important necropolis of Cerveteri, located 60 km north of Rome (Latium, Italy). In this area, several tombs have been discovered and excavated from the 1800, though still many remain hidden underneath the subsurface.
In the last year, geophysical surveys have been carried out to investigate the unexplored portions of the ancient Etruscan Necropolis, to provide a complete mapping of the position of the tombs. Ground Penetrating Radar and the Magnetometric method have been used to investigate the area. In particular, GPR system SIR 3000 (GSSI), equipped with a 400 MHz antenna with constant offset was employed to survey 3 different areas where the presence of tombs was hypothesized from archaeological studies. Furthermore, differential magnetic surveys were carried out using the Geoscan FM256 in two areas, overlapping the GPR areas.
All the GPR profiles were processed with GPR-SLICE v7.0 Ground Penetrating Radar Imaging Software (Goodman 2017). The basic radargram signal processing steps included: post processing pulse regaining; DC drift removal; data resampling; band pass filtering; background filter and migration. With the aim of obtaining a planimetric vision of all possible anomalous bodies, the time-slice representation technique was applied using all processed profiles showing anomalous sources up to a depth of about 2.5 m.
The magnetic data was instead processed employing GEOPLOT 3.0 software (GEOSCAN research). After de-spiking, filtering and rearranging, the data was processed using 2D cross-correlation technique to enhance the signal to noise ratio and to better define the spatial location and geometry of possible targets.
With the aim to have a better understanding of the subsurface, a qualitative and quantitative integration of the results, have been employed. For the integration process the following techniques: maps overlays and RGB colour composites (graphical integration), binary data analysis and cluster analysis (discrete data integration) and data sum, data product and principal component analysis (continuous data integration) have been used.
The results obtained from the geophysical surveys were interpreted together with the archaeologists to enhance the knowledge of the correct geometry and position of the tombs; after the geophysical surveys, excavations have been conducted, which brought to light one of the investigated structures.

References

Campana S., Piro S., 2009. Seeing the Unseen. Geophysics and Landscape Archaeology. Campana & Piro Editors. CRC Press, Taylor & Francis Group. Oxon UK, ISBN 978-0-415-44721-8.
Goodman, D., Piro, S., 2013. GPR Remote sensing in Archaeology, Springer: Berlin.
Piro S., Papale E., Zamuner D., Kuculdemirci M., 2018. Multimethodological approach to investigate urban and suburban archaeological sites. In “Innovation in Near Surface Geophysics. Instrumentation, application and data processing methods.”, Persico R., Piro S., Linford N., Ed.s. pp. 461 – 504, ISBN: 978-0-12-812429-1, pp.1-505, Elsevier.