F. Almeida, R. Moura, A. Rocha, A. Silva, C. Martins

Geophysical Techniques and GIS Applied to Archaeological Prospecting in Porto Old Town Center (Portugal)

Ground Probing Radar techniques can be used to analyse projects at shallow depths of investigation. At the University of Aveiro, Portugal, GPR techniques have been widely used in Archaeology, Geotechnics, Hydrogeology and Environmental problems. However, these techniques should be always used in conjunction with other geophysical methods so that a better overall interpretation is proposed.

Archaeological application of GPR in conjunction with seismic refraction and electrical resistivity measures from Infante Square, Porto (North Portugal) are discussed. GPR was used to delineate bedrock topography as well as local diffraction from buried structures. GPR interpretation is supported by seismic refraction interpreted using the Generalised Reciprocal Method. The overall geophysical model was tested and adjusted using local mechanical soundings. The information was integrated using a GIS for geophysical and geological interpretation and for further utilisation by archaeologists and architects.

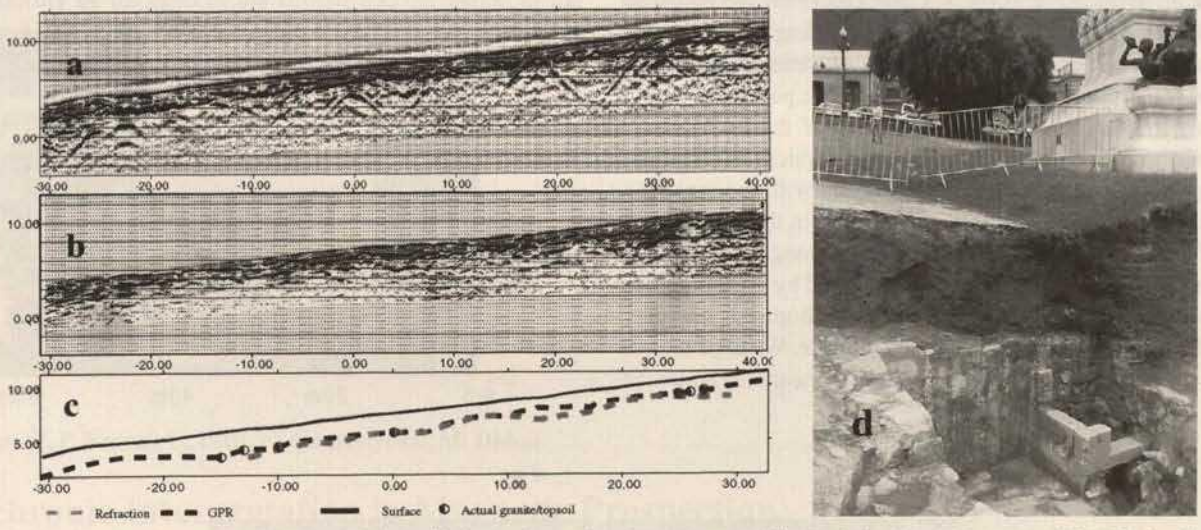

Fig. (a) GPR unmigrated section (AGC plot). (b) GPR migrated section (exponential/spherical gain). (c) Interpreted GPR bedrock (dashed black lines); mechanical soundings (symbol); GRM refraction interpretation (dashed grey lines). (d) Local picture of excavations and top soil at hiperbole nearby position 0 in (a)

C. Batt

The Use of in situ Magnetic Susceptibility Measurements to Interpret Archaeological Deposits

The value of magnetic susceptibility as a tool for the location of archaeological sites has been demonstrated on many occasions. However, recent studies have shown that magnetic susceptibility also has the potential to aid the identification and interpretation of deposits during excavation.

This paper examines the information that can be provided by *in situ* measurements of magnetic susceptibility on archaeological deposits such as hearths, cultivated soils, middens and industrial residues. The discussion is illustrated by case study examples using deposits encountered during the excavation of a multiperiod settlement mound at Scatness, Shetland. Significant variations in magnetic susceptibility were found in both excavated deposits and exposed sections, allowing distinctions to be made between features resulting from different anthropogenic activities, including heating, cultivation, domestic residue disposal and iron smithing. It also appeared possible to detect changes in the use of fuel sources over time.

The relative merits of the Exploranium GS meter and the Bartington field coil for studies of this nature are presented and *in situ* magnetic susceptibility measurements are compared with laboratory measurements of the same contexts. In addition, mineral magnetic measurements, soil micromorphology, soil chemical analysis and archaeological evidence from artefact and ecofact assemblages, are used to confirm the interpretation of the deposits examined.

It is demonstrated that *in situ* measurements of magnetic susceptibility can provide the archaeologist with a rapid, simple and cheap measurement, which can be used during excavation to indicate the origin of deposits and any subsequent anthropogenic modification.