

## RESISTIVITY AND IP SURVEYS APPLIED TO FORENSIC RESEARCH IN TROPICAL SOILS

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### Abstract

Shallow Geophysics methods are applied in Forensic Science aiming to help locating and mapping hidden objects or even corpses covered by soil. Some geophysical methods have been successfully applied, e.g. DC Resistivity and Ground Penetrating Radar. However, sometimes there is a lack of knowledge about the geophysical response for forensic applications. An example is the detectability of buried corpse according to its degree of decomposition. Many factors may influence the decomposition of organic material, such as the chemical interaction between the soil and the organic material itself, the activity of necrophagous animals and the soil water content. The purpose of this work is to evaluate the capability of detection of a pig carcass buried in a simulated outdoor crime scene experiment in a tropical environment. Pig carcasses are commonly used due to their size and body fat ratios, which are comparable to average human bodies. The clayey soil with small amount of sand and iron oxide, characteristic of tropical soils, provides an environment suitable for organic decomposition. In this study 2D DC resistivity and induced polarization imaging data were acquired at different times aiming the monitoring of the decomposition and the evaluation of how this process would be reflected in the electric characteristics of the natural environment. The 2D profiles surveyed at different time intervals after the burial of the pig carcass showed significant changes in the simulated grave, indicating that the carcass was decomposed relatively quickly.

**Keywords:** DC resistivity, induced polarization, forensic science, tropical soils