GPR and Ert Modelling to Detect Pipeline

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Ground Penetrating Radar is the non-destructive electromagnetic methods that use radio waves in high frequencies, and has several applications in near surface investigations, such as mineral exploration, geological, geotechnical, hydrogeological, environmental, archaeological studies, etc. Particularly GPR is efficient to characterization and interference mapping in subsoil, for example, in detection of steel and plastic tank, oil, and gas pipeline, water pipeline, galleries of pluvial waters, electrical and telephony cables, among others.

GPR has a long and sometimes checkered history of pipe detection. Although it is perhaps the best general pipe locator available, it is often mistakenly assumed to be a silver bullet. In fact, GPR has difficulty in highly conductive clay and silty soils. Sometimes clutter from other objects can obscure pipes. And most commonly, subtleties in processing and interpretation mean that less skilled surveyors may fail to detect pipes that would otherwise be clearly resolved. This means that GPR can never be 100% successful at locating pipes. However, expanding GPR's capabilities into full 3D images has made detection much more robust, and interpretation much simpler. This means that GPR is really now entering into a new phase of capability, making it far more versatile than ever before. The combination of GPR and ERT for detecting pipeline and structure can give good results.

In this paper we have used the too methods to modeling same buried objects, varying the dielectric permittivity, the diameter, depth and frequency for the GPR; and resistivity, thickness, electrode spacing and geometric array for the ERT.