

A sampling method for detecting buried objects

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Abstract

We consider a simple (but fully three-dimensional) mathematical model for the electromagnetic exploration of buried objects within the soil underground. Moving an electric device parallel to the ground at constant height in order to generate a magnetic field, we measure the induced magnetic field within the device, and factor the underlying mathematics into a product of three operations which correspond to the primary excitation, some kind of reflection on the surface of the buried object(s) and the corresponding secondary excitation, respectively. Using this factorization we are able to give a justification of the so-called sampling method from inverse scattering theory for this particular setup.