

Effects of the measurement configuration in GPR prospecting

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The measurement configuration is an issue of great interest in problems of inverse scattering in general, and in particular in problems regarding GPR data. In particular, the measurement configuration has an influence on the amount of retrievable information [1-2] and can be a way to achieve an intrinsic two dimensional filtering of the data [3], possibly accounting for the characteristics of the exploited antennas too [4]. However, no filter is able to erase exactly the undesired contribution to the comprehensive signal while leaving unperturbed the useful part of the gathered datum. In other word, any filtering of the data (included those implicitly imposed through the measurement configuration) has some price in terms of loss or distortion of the received information, and therefore it has to be applied only when needed and only at the right degree of intensity. In particular, differential measurement configurations have been introduced in the last few years, especially with interest in the field of detection of UXO [5-6]. The filtering effects in some differential configuration are not immediately understood, but need some deep reasoning. In particular, the theory of the diffraction tomography, allows to quantify the retrievable spatial frequencies under the measurement configuration at hand, and so allows to quantify the filtering effect of the differential configurations. Examples will be shown at the conference, regarding both a horizontal and a vertical differential configuration.

References

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