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Characterization of targets buried in disordered medium

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We consider in this paper the problem of the determination of the permittivity profile of an unknown buried object from measurements of the electromagnetic scattered field. The target under test is assumed to be buried in one of the two involved media while the sources and the receivers are located in the other medium (limited-aspect data configuration).This ill-posed and non-linear inverse scattering problem is reformulated as an optimization problem that is solved iteratively. This method consists in building up a sequence of the parameter of interest by minimizing, at each iteration step, a cost functional representing the discrepancy between the data and those that would be obtained with the best available estimation of the parameter. In addition, when clutter is present, the decomposition of the time reversal operator method is used to improve the signal-to-clutter ratio, since it allows us to synthesize a wave that focuses on the scatterer. The data associated with this incident field are included in the iterative minimization procedure.