

# Multilevel methods for EM parameter estimation in 3D

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We consider a nonlinear constrained optimization formulation for the inverse problem. Multilevel grid continuation techniques are proposed with the intent of performing as much of the computation as possible on coarse grids.

The necessary conditions for the inverse optimization problem yield a large, nonlinear, tightly coupled set of PDEs. We devise multigrid methods coupled with preconditioned Krylov solvers for the rapid solution of such systems.