

A Two-Grid Parametric Inversion Approach for Electromagnetic Measurements in the Earth

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As known in the literature, the main bottleneck in the Newton-type inversion algorithms is the computation of the so-called sensitivity Jacobian matrix. Even with a very fast-forward modeling solver, in the full three-dimensional cases, the computation of this Jacobian matrix might be prohibitive. In this talk we present two approaches to reduce the computation time of this Newton-type algorithm with the use of the well-developed optimal grid approach. In the first approach we use a coarse optimal grid as a preconditioner and in the second approach we use the coarse optimal grid only in the computation of the Jacobian matrix. We compare both approaches using examples of twodimensional DC resistivity inversion and full three-dimensional low-frequency electromagnetic inversion.