

Finite-difference Solution of the 3D EM Problem Using Integral Equation Type Preconditioners

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The CSEM marine problem requires fine gridding to account for sea bottom bathymetry and to model complicated targets. This results in large computational costs using conventional finite-difference solvers. To circumvent these problems, we employ a volume integral equation approach for preconditioning and to eliminate the background, thus significantly reducing the condition number and dimensionality of the problem. We consider and compare two types of preconditioners, one is based on a magnetic field formulation and the other is based on what is referred to as the dissipative approach by singer. Theory and preliminary numerical results will be presented.