

# A reduced forward operator for electromagnetic wave scattering problems

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**Abstract** This paper describes the development of a reduced forward operator for solving electromagnetic scattering problems with a conjugate gradient fast Fourier transform scheme. The reduction is obtained by decoupling the interaction between the locations in the spatial computational domain at which there is non-zero contrast and those positions at which there is zero contrast. The decoupling is achieved by multiplying the kernel by a diagonal matrix whose entries reflect the presence or absence of contrast at the associated point. Numerical results prove that the reduced operator improves the convergence rate.