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Accelerated solution of the frequency-domain Maxwell's equations by engineering the spectrum of the operator using the continuity equation

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We introduce a simple method to accelerate the convergence of iterative solvers of the frequency-domain Maxwell's equations. The method modifies the original Maxwell's equations to eliminate the high multiplicity of near-zero eigenvalues that exists in the original operator. The impact of the modified eigenvalue spectrum on the accelerated convergence is explained by visualizing the components of the residual vector with respect to the eigenvector basis at each iteration step. A comparison with the previous approach that is similar to our method is also presented.