

Abstracts

Efficient Solution of the Differential Form of Maxwell's Equations in Rectangular Regions

L.E. Garcia-Castillo, M. Salazar-Palma, T.K. Sarkar and R.S. Adve. "Efficient Solution of the Differential Form of Maxwell's Equations in Rectangular Regions." 1995 Transactions on Microwave Theory and Techniques 43.3 (Mar. 1995 [T-MTT]): 647-654.

One of the problems of the finite element and the finite difference method is that as the dimension of the problem increases, the condition number of the system matrix increases as $\Theta(1/h^2)$ (of the order of h^2 , where h is the subsection length). Through the use of a suitable basis function tailored for rectangular regions, it is shown that the growth of the condition number can be checked while still retaining the sparsity of the system matrix. This is achieved through a proper choice of entire domain basis functions. Numerical examples have been presented for efficient solution of waveguide problems with rectangular regions utilizing this approach.

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