Abstracts

Finite-Difference Analysis of Dielectric-Loaded Cavities Using the Simultaneous Iteration of the Power Method with the Chebyshev Acceleration Technique

C.-C. Su and J.-M. Guan. "Finite-Difference Analysis of Dielectric-Loaded Cavities Using the Simultaneous Iteration of the Power Method with the Chebyshev Acceleration Technique." 1994 Transactions on Microwave Theory and Techniques 42.10 (Oct. 1994 [T-MTT]): 1998-2006.

A numerical procedure using the finite-difference technique, simultaneous iteration based on the power method, and the Chebyshev-polynomial preconditioning is proposed to analyze dielectric-loaded cavities. The merit of this method is that no matrix inversions are invoked and the convergence rate of the power method is greatly accelerated by the preconditioning. The TE, TM, and hybrid modes in axisymmetrical cavities loaded with a rod or ring dielectric resonator are analyzed. For the hybrid modes, an H/sub r/-H/sub z/ formulation is proposed. Accurate numerical results are obtained efficiently and no spurious solutions are found by the present method.

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