Abstracts

A new hybrid mode-matching/numerical method for the analysis of arbitrarily shaped inductive obstacles and discontinuities in rectangular waveguides

H. Esteban, S. Cogollos, V.E. Boria, A.S. Blas and M. Ferrando. "A new hybrid mode-matching/numerical method for the analysis of arbitrarily shaped inductive obstacles and discontinuities in rectangular waveguides." 2002 Transactions on Microwave Theory and Techniques 50.4 (Apr. 2002 [T-MTT]): 1219-1224.

A new and efficient hybrid mode-matching method is presented for the analysis of arbitrarily shaped inductive obstacles and/or discontinuities in a rectangular waveguide. The irregular region with obstacles and/or discontinuities is characterized using a full-wave hybrid spectral/numerical open-space technique expanding the fields in cylindrical wave functions. Next, a full-wave mode-matching procedure is used to match the cylindrical wave functions to guided modes in all ports and a generalized scattering matrix for the structure is finally obtained. The obstacles can be metallic or dielectric with complex permittivities and arbitrary geometries. The structure presents an arbitrary number of ports, each one with different orientation and dimensions. The accuracy of the method is validated comparing with results for several complex problems found in the literature. CPU times are also included to show the efficiency of the new method.

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