Abstracts

Vector Variational Solutions of Inhomogeneously Loaded Cylindrical Waveguide Structures

W.J. English. "Vector Variational Solutions of Inhomogeneously Loaded Cylindrical Waveguide Structures." 1971 Transactions on Microwave Theory and Techniques 19.1 (Jan. 1971 [T-MTT]): 9-18.

A vector variational formulation of the Maxwell curl equations in terms of all six electromagnetic field components is developed for circular waveguides symmetrically loaded with dialectric. A guide-wall boundary integral term, which renders the electric Dirichlet boundary conditions natural, is included in the variational expression. It is, therefore, unnecessary for the trial electromagnetic field functions to satisfy any guide-wall boundary conditions. This greatly extends the class of problems for which the vector variational-solution procedure is applicable and permits simple expansion functions for the trial fields, thus facilitating integral calculations. Solution results for several hybrid-mode circulator-waveguide structures are presented and compared with available experimental data.

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