Abstracts

An Efficient FEM Formulation for Rotationally Symmetric Coaxial Waveguides

In this paper, an efficient finite element method formulation (FEM) is applied to rotationally symmetric coaxial waveguides, in which the dependence of the dominant TEM mode on the radius of the cylindrical coordinate system is explicitly taken into account in the basis functions. In this way, a physically appropriate approximation of the unknown field distribution is achieved. After scaling, the resulting sparse matrix equation is solved iteratively by using the biconjugate gradient method (BCG). The numerical results show excellent agreement with results of the mode matching technique (MMT). Compared with the conventional FEM formulation, this method yields a significant improvement in accuracy within the frequency range where the TEM mode dominates.

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