Abstracts

Vector Finite Element Method with Mixed-Interpolation-Type Triangular-Prism Element for Waveguide Discontinuities

K. Hirayama, M.S. Alam, Y. Hayashi and M. Koshiba. "Vector Finite Element Method with Mixed-Interpolation-Type Triangular-Prism Element for Waveguide Discontinuities." 1994 Transactions on Microwave Theory and Techniques 42.12 (Dec. 1994, Part I [T-MTT]): 2311-2316.

The mixed-interpolation-type triangular-prism element is proposed and an approach based on the finite element method (FEM) with the element is formulated for the analysis of three-dimensional discontinuity problems of electromagnetic waveguides. Here, in order to treat the infinite uniform waveguide with arbitrarily shaped cross section, the eigenmodes of the uniform waveguide are computed by using the FEM with the high-order mixed-interpolation-type triangular element, and the analytical relations in the uniform waveguide are constructed numerically. A finline discontinuity, a dielectric-loaded waveguide, and a junction between a rectangular waveguide and a circular one are analyzed, and then the validity and versatility are confirmed.

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