Abstracts

The Generalized Scattering Matrix Separation Technique Combined with the MM/FE Method for the Efficient Modal Analysis of a Comprehensive Class of 3D Passive Waveguide Circuits

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A novel and versatile technique for the efficient modal analysis of passive waveguide structures, called the generalized scattering matrix separation (GSMS) technique, is introduced. Its combination with the well-proven hybrid mode-matching/finite element (MM/FE) method achieves the fast and rigorous modal analysis of a comprehensive class of three-dimensional waveguide components which include homogeneous segments of arbitrarily shaped cross-section and one or more side coupled rectangular waveguide ports. This combined method takes the higher order mode coupling between all discontinuities or ports into account and requires only one frequency independent application of the two-dimensional finite element (FE) method. The method is verified by excellent agreement with measurements.

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