Abstracts

The Transfinite Element Method for Modeling MMIC Devices (Dec. 1988 [T-MTT])

Z.J. Cendes and J.-F. Lee. "The Transfinite Element Method for Modeling MMIC Devices (Dec. 1988 [T-MTT])." 1988 Transactions on Microwave Theory and Techniques 36.12 (Dec. 1988 [T-MTT] (1988 Symposium Issue)): 1639-1649.

A new numerical procedure called the transfinite element method is employed in conjunction with the planar waveguide model to analyze MMIC devices. By using analytic basis functions together with finite element approximation functions in a variational technique, the transfinite element method is able to determine the fields and scattering parameters for a wide variety of stripline and microstrip devices. With minor modification, the transfinite element method can also be applied to waveguide junctions. We show that the transfinite element method can be used to treat singular points in waveguide junctions very efficiently. Examples that have been calculated by this method are a rectangular waveguide two-slot-20 dB coupler, stripline band-elimination filter, and several microstrip discontinuity problems. Good agreement of the numerical results with published values demonstrates the validity of the proposed procedure.

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