Abstracts

Recurrence Modal Analysis for Multiple Waveguide Discontinuities and its Application to Circular Structures

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A general formulation for the scattering from multiple waveguide discontinuities is presented. It is based on the modal analysis technique where the corresponding fields are expanded in terms of vector eigenfunctions and the boundary conditions are imposed at each junction. Analytic expressions for the global scattering matrices are derived using a recurrence procedure that requires substantially less computation than the traditional cascading techniques. The matrix equations are truncated in a manner that satisfies the conditions for a good overall convergence, which is illustrated for step-discontinuities in circular waveguides. Numerical results are presented for a thick iris in a circular waveguide and for iris matched dielectric window designs.

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