Abstracts

Eigenvalues for waveguides containing re-entrant corners by a finite-element method with superelements

B. Schiff and Z. Yosibash. "Eigenvalues for waveguides containing re-entrant corners by a finite-element method with superelements." 2000 Transactions on Microwave Theory and Techniques 48.2 (Feb. 2000 [T-MTT] (Mini-Special Issue on Research Reported at the 1999 Radio Frequency Integrated Circuits (RFIC) Symposium)): 214-220.

Superelements have been developed to enable the finite-element method to be used for computing accurate eigenvalues of the Laplacian over domains containing re-entrant corners of arbitrary angle. A truncated asymptotic expansion of the solution is employed in the region of the corner and linear blending is used over the remainder of the superelement to provide a smooth transition to piecewise quadratics over the superelement boundary. The superelement thus conforms with the usual triangular or quadrilateral isoparametric elements used over the remainder of the domain, and can be easily incorporated into a general finite-element program. The scheme has been tested on various waveguides containing one or more angles of size 3/spl pi//2 or 2/spl pi/, and also on domains containing various other angles, and the results agree well with those obtained by other methods, mostly of less general applicability.

❑ Return to main document.