Letters

Comments on "Power-Handling Capability of the Rhombic Waveguide"

Patricio A. A. Laura and Liberto Ercoli

The purpose of the present correspondence is two fold: first to congratulate the author for his important contribution [1] and the second to present some considerations regarding the solution of Helmholtz equation as well as other wave-type equations in rhombic domains.

It seems possible to use Overfelt's approach in unsteady diffusion problems in rhombic domains. This is certainly an interesting possibility since no analytical solutions are available in that area. On the other hand several publications which deal with vibrating rhombic plates are available in the open literature [2]–[4]. The conformal mapping approach has been applied in [2]–[5] and also in [6] in order to obtain the fundamental cut-off frequency of a waveguide of rhombic boundary with a concentric circular hole (TM modes).

References

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Reply to Comments on "Power-Handling Capability of the Rhombic Waveguide"

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The authors would like to thank Patricio A. A. Laura and Liberto Ercoli for their comments and suggestions on the rhombic waveguide problem [1]. Since the time period in which that work was completed, we have found that the infinite series of nonseparable solutions technique can be applied to most linear partial differential equations with constant coefficients. Thus boundary value problems for complex geometries governed by the Laplace, diffusion, free-particle Schrodinger, etc. equations can be solved using this method. However we have always assumed the usual Dirichlet and Neumann boundary conditions and do not know how the method would perform for more complicated boundary conditions. The idea of applying our approach to unsteady diffusion problems in rhombic domains is a fascinating one.

For many years we have been aware of Professor Laura's work on eigenvalues of waveguides with complicated geometries [2], [3] but were unaware of his work on rhombic plates and membranes (see above [2], [5], and [6]). We are grateful for having these references pointed out.

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Comments on "Spectral-Domain Computation of Characteristic Impedances and Multiport Parameters of Multiple Coupled Microstrip Lines"

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In the above mentioned paper [1] the authors present an extensive discussion of the problem of systems of coupled lines. The spectral domain technique is used to extract the dispersion relations of the structure along with the corresponding current densities on the different lines. However, in equation (7) page 216, they state that the eigencurrent matrix $[M_I]$ and the corresponding eigenvoltage matrix $[M_v]$ are related by

$$[M_v] = [[M_I]^T]^{-1}. \quad (1)$$

(Equations in this article are referred to as eqn.n whereas those in the authors's paper as equation (n)). I should hasten to say that this is not the first time this equation has been mentioned. Indeed Marx [2] states, as do the authors, that this relation holds if the both eigencurrents and eigenvoltages are normalized (for each mode). This mathematical statement cannot be disputed. The point that the authors failed to see is to examine the meaning of the normalization itself for the problem under consideration. Is it POSSIBLE to normailize both currents and voltages SIMULTANEOUSLY?. For the

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