Abstracts

Rigorous and Numerically Efficient Computation of the Irrotational Electric and Magnetic Eigenfunctions of Complex Gyrotron Cavities (1994 Vol. I [MWSYM])

A. Jostingmeier, C. Rieckmann and A.S. Omar. "Rigorous and Numerically Efficient Computation of the Irrotational Electric and Magnetic Eigenfunctions of Complex Gyrotron Cavities (1994 Vol. I [MWSYM])." 1994 MTT-S International Microwave Symposium Digest 94.1 (1994 Vol. I [MWSYM]): 321-324.

For the modal analysis of complex gyrotron cavities, complete sets of eigenfunctions of the corresponding completely shielded cavity are required. In this contribution, it is shown that the generalized scattering matrix method which is well-known for the computation of the resonance modes can also be applied to the calculation of the irrotational electric and magnetic eigenfunctions. It is demonstrated that for the determination of the irrotational magnetic eigenfunctions the "TE/sub 00/ waveguide mode" has to be included in the analysis. The validity of the method is checked by investigating a spherical cavity for which the analytical solution is known. Furthermore, a special subdivision of tapered cavity sections is presented which considerably improves the numerical efficiency of the method.

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