Abstracts

Solution of the general Helmholtz equation in homogeneously filled waveguides using a static Green's function

M. Balagangadhar, T.K. Sarkar, I. Rejeb and R.R. Boix. "Solution of the general Helmholtz equation in homogeneously filled waveguides using a static Green's function." 1998 Transactions on Microwave Theory and Techniques 46.3 (Mar. 1998 [T-MTT]): 302-307.

The new boundary-integral method used in this paper illustrates a novel approach to solve the general Helmholtz equation in homogeneously filled waveguides. Based on the method-of-moments Laplacian solution, the main feature of this formulation is that the Helmholtz equation is "reduced" to the Poisson's equation, which is then solved by using a static Green's function. In other words, the Green's function used in this method is frequency independent, unlike the most conventionally used Hankel functions. Hence, the computational time, while analyzing the waveguide over a range of different frequencies, is reduced considerably compared to other well-known numerical methods, since the frequency term just appears as a scaling factor in the evaluation of matrix elements. The numerical results obtained using the present method compare well with actual results (in the case of rectangular waveguides) and published results (in the ease of L-shaped and single-ridge waveguides).

❑ Return to main document.