Abstracts

Variational Analysis of Dielectrically Loaded Multidepth Corrugated Waveguides

M.I. Oksanen. "Variational Analysis of Dielectrically Loaded Multidepth Corrugated Waveguides." 1989 Transactions on Microwave Theory and Techniques 37.1 (Jan. 1989 [T-MTT]): 191-197.

The propagation behavior in a multidepth corrugated waveguide is analyzed. The analysis is based on the theory of nonstandard eigenvalues and variational methods. This method is tested for an empty dual-depth corrugated guide, the results of which have been previously calculated in the literature by using surface impedance and space harmonic methods. These methods are summarized here. Also, space harmonic formulas are rederived in the form where the fundamental surface admittance component is separated from the higher order terms. It is seen that, with elementary trial functions, very accurate dispersion relations can be obtained by the variational method. Encouraged by this, the method is then extended for a tridepth guide operating in three different frequency bands, and for dielectrically loaded dual- and tridepth guides. The latter components may hold considerable promise because of their simpler fabrication technique.

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