

Abstracts

On the Inadequacy of Discrete Mode-Matching Techniques in Some Waveguide Discontinuity Problems

L. Lewin. "On the Inadequacy of Discrete Mode-Matching Techniques in Some Waveguide Discontinuity Problems." 1970 *Transactions on Microwave Theory and Techniques* 18.7 (Jul. 1970 [T-MTT]): 364-369.

It is shown that inattention to the limits of validity of a field expansion can lead to field matching along impermissible boundaries. Nevertheless the error may not show up in any obvious way, since the method amounts to an expansion in terms of an incomplete modal set. The "diffusion" of a discrete mode into a continuum takes place in a distance which may be of the order of a tenth of a wavelength or more, so that in fact fairly accurate numerical results can nevertheless ensue over quite a range of parameters. This would seem to be the case for some examples taken from the literature in which the analysis has apparently been undertaken on the assumption that the initial formulation was exact.

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