Abstracts

Null-Field Method for Waveguides of Arbitrary Cross Section

F.L. Ng and R.H.T. Bates. "Null-Field Method for Waveguides of Arbitrary Cross Section." 1972 Transactions on Microwave Theory and Techniques 20.10 (Oct. 1972 [T-MTT]): 658-662.

It is shown how to obtain accurate numerical values for waveguide characteristics using the null-field method, which is derived using Waterman's extended boundary condition. Computational results are presented for the sector waveguide (for which the field is known in closed form), the cross section of which possesses a sharp re-entrant corner. It is demonstrated that explicitly satisfying the edge conditions at this corner significantly improves the computational accuracy. In agreement with a previous conjecture it is shown, by example using the sector waveguide, that the straightforward point-matching method sometimes gives completely erroneous fields, even when predicting cutoff wavenumbers with moderate accuracy.

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