Abstracts

Upper and Lower Bounds on the Characteristic Impedance of TEM Mode Transmission Lines (Correspondence)

C.T. Carson and G.K. Cambrell. "Upper and Lower Bounds on the Characteristic Impedance of TEM Mode Transmission Lines (Correspondence)." 1966 Transactions on Microwave Theory and Techniques 14.10 (Oct. 1966 [T-MTT]): 497-498.

A numerical method of obtaining the characteristic impedance of TEM mode transmission lines, which has been described by several authors, has the major disadvantage of giving little indication of the resulting error. This correspondence shows how it is possible to extend the finite difference solution of Laplace's Equation to extract an upper and lower bound on the exact solution by using variational formulas. Examples illustrate the high accuracy of solutions obtained with the aid of a digital computer which has been programmed not only to set up and solve the Laplace finite difference equations by systematic over-relaxation but also, at the same time, to compute an upper and a lower bound on the exact solution. Although the method has been used in conjunction with a finite difference solution of Laplace’s Equation it can also be used in conjunction with the Rayleigh Ritz method.

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