Abstracts

Numerical Formation of Finite-Difference Operators (Correspondence)

P. Silvester. "Numerical Formation of Finite-Difference Operators (Correspondence)." 1970 Transactions on Microwave Theory and Techniques 18.10 (Oct. 1970 [T-MTT]): 740-743.

A matrix formulation is given for the classical Taylor's series method of approximating differential operators by finite differences. This formulation lends itself to digital computation, so that automatic generation of finite-difference formulas becomes possible. A program to perform this task has been written and tested, with good results for those operators of particular interest in microwave theory (Laplace's, Helmholtz's, and related types). Following a brief description of the program, its use is illustrated for the case of the scalar axisymmetric Laplacian. It is concluded that a wide variety of special finite-difference operators such as recently devised for specific microwave problems can now be generated automatically.

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