Abstracts

Application of Davidenko's Method to the Solution of Dispersion Relations in Lossy Waveguiding Systems

S.H. Talisa. "Application of Davidenko's Method to the Solution of Dispersion Relations in Lossy Waveguiding Systems." 1985 Transactions on Microwave Theory and Techniques 33.10 (Oct. 1985 [T-MTT] (Special Issue on Numerical Methods)): 967-971.

Davidenko's method is a reduction of Newton's method for the numerical solution of n-coupled nonlinear algebraic equations into n-coupled first-order differential equations in a dummy variable. This algorithm is useful for the solution of dispersion relations of electromagnetic waves propagating in lossy waveguiding structures, particularly layered geometries containing one or more gyrotropic layers. In this class of problems, Newton-based numerical techniques are not always satisfactory and Davidenko offers an altenative which is efficient and reliable and which relaxes the extent of the restriction placed on the initial guess to be sufficiently close to the solution. Presented are Davidenko's method, its application to lossy-waveguide dispersion relations, and an example where the algorithm was applied successfully.

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