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1A.2 Novel Applications of TLM Method: Description of Neurological Activity Using the TLM MethodII. NOTATION AND MAPPING OF PHYSICAL PROPERTIES; 2.1 1D Cell Notation and Mapping of Conductivity and Field; 2.2 Neighboring 1D Cells With Unequal Impedance; 2.3 2D Cell Notation. Mapping of Conductivity and Field; 2.4 3D Cell Notation. Mapping of Conductivity and Field; Other Node Controlled Properties; 2.5 Node Control of 2D Scattering Coefficients Due to Finite Node Resistance; 2.6 Simultaneous Conductivity Contributions; 2.7 Signal Gain; 2.8 Signal Generation. Use of Node Coupling
2.9 Mode Conversion Example of Mapping:Node Resistance in a Photoconductive Semiconductor; 2.10 Semiconductor Switch Geometry (2D); 2.11 Node Resistance Profile in Semiconductor; III. SCATTERING EQUATIONS; 3.1 1D Scattering Equations; 3.2 2D Scattering Equations; 3.3 Effect of Symmetry on Scattering Coefficients; 3.4 3D Scattering Equations: Coplanar Scattering; General Scattering, Including Scattering Normal to Propagation Plane; 3.5 Equivalent TLM Circuit. Quasi-Coupling Effect; 3.6 Neglect of Quasi-Coupling; 3.7 Simple Quasi-Coupling Circuit: First Order Approximation
3.8 Correction to Quasi-Coupling Circuit: Second Order Approximation
3.9 Calculation of Load Impedance with Quasi-Coupling; 3.10 Small Coupling Approximation of Second Order Quasi-Coupling; 3.11 General 3D Scattering Process Using Cell Notation.; 3.12 Complete Iterative Equations; 3.13 Contribution of Electric and Magnetic Fields to Total Energy; Plane Wave Behavior; 3.14 Response of 2D Cell Matrix to Input Plane Wave; 3.15 Response of 2D Cell Matrix to Input Waves With Arbitrary Amplitudes; 3.16 Response of 3D Cell Matrix to Input Plane Wave
3.17 Response of 3D Cell Matrix to Input Waves With Arbitrary Amplitudes

Sommario/riassunto

Problems in electromagnetic propagation, especially those with complex geometries, have traditionally been solved using numerical methods, such as the method of finite differences. Unfortunately the mathematical methods suffer from a lack of physical appeal. The researcher or designer often loses sight of the physics underlying the problem, and changes in the mathematical formulation are often not identifiable with any physical change. This book employs a relatively new method for solving electromagnetic problems, one which makes use of a transmission line matrix (TLM). The propagation space i