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Nota di contenuto	Contents; 1. Fundamental Concepts and Theorems; 1.1 Maxwell's Equation in Differential Time Domain Form; 1.2 Maxwell's Equations in Integral Form; 1.3 Maxwell's Equations in Phasor Form; 1.4 Natural Boundary Conditions; 1.5 Poynting's Theorem; 1.6 Uniqueness Theorem; 1.7 Superposition Theorem; 1.8 Duality Theorem; 1.9 Volume Equivalence Theorem; 1.10 Surface Equivalence Theorem; 1.11 Reciprocity and Reaction Theorems; 1.12 Approximate Boundary Conditions; Problems; Bibliography; 2. Field Solutions and Representations; 2.1 Field Solutions in Terms of Vector and Hertz Potentials 2.2 Solution for the Vector and Scalar Potentials2.3 Near- and Far-Zone Field Expressions; 2.4 Direct Solution of the Vector Wave Equation; 2.5 Two-Dimensional Fields; 2.6 Spectral Field Representations; 2.7 Radiation over a Dielectric Half Space; Problems; Bibliography; 3. Integral Equations and Other Field Representations; 3.1 Three-Dimensional Integral Equations; 3.2 Two-Dimensional Representations; Problems; Bibliography; 4. Solution of Integral Equations for Wire Radiatorsand Scatterers; 4.1 Formulation; 4.2 Basis Functions; 4.3 Pulse-Basis-Point-Matching Solution; 4.4 Source Modeling 4.5 Calculation of the Far-Zone Field and AntennaCharacteristics4.6 Piecewise Sinusoidal-Basis-Point-Matching Solution; 4.7 Method of Weighted Residuals/Method of Moments; 4.8 Method of Moments for

Nonlinear Wires; 4.9 Wires of Finite Conductivity; 4.10 Construction of Integral Equations via the Reaction/Reciprocity Theorem; 4.11 Iterative Solution Methods: The Conjugate Gradient Method Problems; Problems; Bibliography; 5. Two-Dimensional Scattering; 5.1 Flat Resistive Strip; 5.2 Metallic Cylinders; 5.3 H-Polarized (TE) Scattering by Curved Resistive Strips
5.4 Piecewise Homogeneous Dielectric Cylinders 5.5 Elimination of Interior Resonances; 5.6 Simulation of Inhomogeneous Dielectric Cylinders; Bibliography; 6. Three-Dimensional Scattering; 6.1 Scattering by Metallic Bodies; 6.2 Curved Triangular and Quadrilateral Elements; 6.3 Evaluation of MoM Matrix Entries; 6.4 Volumetric Modeling; 6.5 Scattering Examples; 6.6 Step by Step Moment Method Example; Bibliography; 7. Fast Multipole Method and Its Multilevel Implementation; 7.1 Fast Multipole Method; 7.2 Multilevel Fast Multipole Method; 7.3 MLFMM Formulation; 7.4 Radiation and Scattering Exa
7.5 MLFMM for Volume Integral Equations Bibliography; Appendix: Integral Equations for Microstrip Antennas; A.1 Dyadic Green's Function for a Grounded Substrate; A.2 Moment Method Formulation; A.3 Far-Zone Field Evaluation; Bibliography; Index

Sommario/riassunto

This text/reference is a detailed look at the development and use of integral equation methods for electromagnetic analysis, specifically for antennas and radar scattering. Developers and practitioners will appreciate the broad-based approach to understanding and utilizing integral equation methods and the unique coverage of historical developments that led to the current state-of-the-art. In contrast to existing books, Integral Equation Methods for Electromagnetics lays the groundwork in the initial chapters so students and basic users can solve simple problems and work their way up to the mo
