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Nota di contenuto	Integral Methods in Low-Frequency Electromagnetics; Contents; List of Figures; List of Tables; Preface; Acknowledgments; 1 Electromagnetic Fields and their Basic Characteristics; 1.1 Fundamentals; 1.1.1 Maxwell's equations in integral form; 1.1.2 Maxwell's equations in differential form; 1.1.3 Constitutive relations and equation of continuity; 1.1.4 Media and their characteristics; 1.1.5 Conductors; 1.1.6 Dielectrics; 1.1.7 Magnetic materials; 1.1.8 Conditions on interfaces; 1.2 Potentials; 1.2.1 Scalar electric potential; 1.2.2 Magnetic vector potential; 1.2.3 Magnetic scalar potential 1.3 Mathematical models of electromagnetic fields 1.3.1 Static electric field; 1.3.2 Static magnetic field; 1.3.3 Quasistationary electromagnetic field; 1.3.4 General electromagnetic field; 1.4 Energy and forces in electromagnetic fields; 1.4.1 Energy of electric field; 1.4.2 Energy of magnetic field; 1.4.3 Forces in electric field; 1.4.4 Forces in magnetic field; 1.5 Power balance in electromagnetic fields; 1.5.1 Energy in electromagnetic field and its transformation; 1.5.2 Balance of power in linear electromagnetic field; 2 Overview of Solution Methods

2.1 Continuous models in electromagnetism 2.1.1 Differential models; 2.1.2 Integral and integrodifferential models; 2.2 Methods of solution of the continuous models; 2.2.1 Analytical methods; 2.2.2 Numerical methods; 2.2.3 Methods based on the stochastic approach; 2.2.4 Specific methods; 2.3 Classification of the analytical methods; 2.3.1 Methods built on the basic laws of electromagnetics; 2.3.2 Methods based on various transforms; 2.3.3 Direct solution of the field equations; 2.4 Numerical methods and their classification; 2.5 Differential methods; 2.5.1 Difference methods
2.5.2 Weighted residual methods 2.5.3 Variational and other related methods; 2.6 Finite element method; 2.6.1 Discretization of the definition area and selection of the approximate functions; 2.6.2 Computation of the functional and its extremization; 2.6.3 Further prospectives; 2.7 Integral and integrodifferential methods; 2.8 Important mathematical aspects of numerical methods; 2.8.1 Stability; 2.8.2 Convergence; 2.8.3 Accuracy; 2.9 Numerical schemes for parabolic equations; 2.9.1 Explicit scheme; 2.9.2 Implicit scheme; 3 Solution of Electromagnetic Fields by Integral Expressions
3.1 Introduction 3.2 1D integration area; 3.2.1 Review of typical problems; 3.2.2 Electric field generated by a solitary filamentary conductor of infinite length; 3.2.3 Electric field of charged thin circular ring; 3.2.4 Magnetic field generated by a solitary filamentary conductor of infinite length; 3.2.5 Magnetic field of thin circular current carrying loop; 3.2.6 Electric field generated by a system of uniformly charged parallel thin filaments of infinite length; 3.2.7 Magnetic field generated by a system of currents carrying parallel filamentary conductors of infinite length
3.3 2D integration area

Sommario/riassunto

A modern presentation of integral methods in low-frequency electromagnetics This book provides state-of-the-art knowledge on integral methods in low-frequency electromagnetics. Blending theory with numerous examples, it introduces key aspects of the integral methods used in engineering as a powerful alternative to PDE-based models. Readers will get complete coverage of: The electromagnetic field and its basic characteristics An overview of solution methods Solutions of electromagnetic fields by integral expressions Integral and integrodifferential methods<l