

1. Record Nr.	UNINA9910144829403321
Autore	Katsenelenbaum B. Z (Boris Zakharovich)
Titolo	Electromagnetic fields [[electronic resource] ] : restrictions and approximation // Boris Z. Katsenelenbaum
Pubbl/distr/stampa	Weinheim, : Wiley-VCH, c2003
ISBN	1-282-37228-9 9786612372285 3-527-60256-9 3-527-62208-X
Descrizione fisica	1 online resource (238 p.)
Disciplina	511.4 530.141
Soggetti	Electromagnetic fields - Measurement Electronic books.
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Description based upon print version of record.
Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	Electromagnetic Fields - Restrictions and Approximation; Preface; Contents; 1 Introduction; 1.1 Introduction; 1.2 Subject and Method of Investigation; 1.3 Realizability, Approximability, Amplitude Approximability; 1.4 Outline of the Book; 2 Nonapproximability of Patterns; 2.1 Nonapproximability and Zero Lines of the Real Wave Field; 2.2 Examples of Specific Lines. "Prohibited" Antenna Shapes; 2.3 Amplitude Nonapproximability; 2.4 Probabilistic Description of Body Shape by the Likeness Principle; 2.5 Body Shape Reconstruction by its Scattered Patterns; 2.6 Properties of Specific Lines 3 Nonapproximability of Near Fields 3.1 Approximability Condition for Near Fields; 3.2 Construction of a Field by its Zero Line. Case of the Circle Arc; 3.3 Analytical Extension of the Eigenoscillation Field outside the Boundary of the Domain; 4 The Norm of the Current; 4.1 The Minimal Current Norm at a Given Accuracy of Approximation; 4.2 Generalized Functions of Double Orthogonality. Nonapproximability and Existence of Nonradiating Currents; 4.3 Optimal Current Synthesis. The General Case; 4.4 Domain of Specific Line Influence; 5 Electromagnetic Field. The Maxwell Equations

5.1 Trivial Generalizations 5.2 Properties of Specific Surfaces; 6 Long Narrow Beam of Electromagnetic Waves; 6.1 Two-dimensional Fourier Transformation; 6.2 Transmission of Field by Wave Beam: Possibilities and Restrictions; 6.3 Shape of Antenna and Rectenna; Bibliography for Chapters 1-6; Appendix Antenna Synthesis by Amplitude Radiation Pattern and Modified Phase Problem (by N. N. Voitovich); A.1 Synthesis of Antennas by Amplitude Radiation Pattern; A.1.1 Introduction; A.1.2 Problem formulation for the curvilinear antenna; A.1.3 Reducing to the Lagrange-Euler equation  
A.1.4 Case of linear antenna. Main properties of solutions A.2 Modified Phase Problem. Continuous Case; A.2.1 Modified phase problem and related mathematical and physical problems; A.2.2 Analytical solutions to the Lagrange-Euler equation for linear antenna. Theoretical results; A.2.3 Solution branching; A.2.4 Numerical example. Problem with symmetrical data; A.2.5 Problems with nonsymmetrical data; A.3 Modified Phase Problem. Discrete Case; A.3.1 Problem formulation for linear antenna array. Lagrange-Euler equations; A.3.2 Theoretical results; A.3.3 Numerical results  
Bibliography for Appendix Index

---

Sommario/riassunto

The fields scattered by metallic bodies or radiated by some types of antennas are created by the surface currents and therefore they are subject to some restrictions. The book is the first one where the properties of these fields are investigated in details. The properties have the important significance for the antenna synthesis, body shape reconstruction and other diffraction problems. The material of the book lies in the meeting point of the antenna theory, high frequency electrodynamics and inverse scattering problems. The author is an internationally renowned investigator in the field of

---