

Modern Lens Antennas For Communications Engineering Full

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U.S. Government Research Reports - 1963

Metamaterials for Antenna Applications - Amit K. Singh 2021-09-13

The book presents an engineering approach for the development of metamaterials and metasurfaces with emphasis on application in antennas. It offers an in-depth study, performance analysis and extensive characterization on different types of metamaterials and metasurfaces. Practical examples included in the book will help readers to enhance performance of antennas and also develop metamaterial-based absorbers for a variety of applications. Key Features Provides background for design and development of metamaterial structures using novel unit cells Gives in-depth performance study of miniaturization of microstrip antennas Discusses design and development of both transmission and reflection types, metasurfaces and their practical applications. Verifies a variety of Metamaterial structures and Metasurfaces experimentally The target audience of this book is postgraduate students and researchers involved in antenna designs. Researchers and engineers interested in enhancing the performance of the antennas using metamaterials will find this book extremely useful. The book will also serve as a good reference for developing artificial materials using metamaterials and their practical applications. Amit K. Singh is Assistant Professor in the Department of Electrical Engineering at the Indian Institute of Technology Jammu, India. He is a Member of the IEEE, USA. Mahesh P. Abegaonkar is Associate Professor at the Centre for Applied Research in Electronics at the Indian Institute of Technology Delhi. He is a Senior Member of the IEEE, USA. Shiban Kishen Koul is Emeritus Professor at the Centre for Applied Research in Electronics at the Indian Institute of Technology Delhi. He is a Life Fellow of the Institution of Electrical and Electronics Engineering (IEEE), USA, a Fellow of the Indian National Academy of Engineering (INAE), and a Fellow of the Institution of Electronics and Telecommunication Engineers (IETE).

Non-Imaging Microwave and Millimetre-Wave Sensors for Concealed Object Detection

 - Boris Y. Kapilevich 2017-12-19

In response to the ever-increasing global threat of terrorist attacks, the personal screening industry has been growing at a rapid rate. Many methods have been developed for detecting concealed weapons and explosives on the human body. In this important new book, the authors

discuss their experiences over the last decade designing and testing microwave and millimetre wave detection and screening systems. It includes examples of actual devices that they have built and tested, along with test results that were obtained in realistic scenarios. The book focuses on the development of non-imaging detection systems, which are similar to radar. These systems do not form a conventional image of the scene and the person(s) being screened. Instead, the sensors detect and analyze the effect that the body, and any concealed objects, has on a transmitted waveform. These systems allow remote detection of both metallic and dielectric devices concealed on the human body in both indoor and outdoor environments. The book discusses a number of sensor types, including active millimetre wave sensors using the direct detection and the heterodyne approach, active microwave sensors for CNR-based object detection, passive millimetre wave sensors, and the role of shielding effects in operating non-imaging MM-wave sensors. The goal of this book is to systemize the test results obtained by the authors, helping specialists to develop improved screening systems in the future. Another goal is to show how the use of non-imaging systems can reduce the cost of the screening process.

Antenna Engineering Handbook, Fourth Edition

 - John Volakis 2007-06-08

The “bible of antenna engineering” fully updated to provide state-of-the-art coverage in antenna design and applications Edited by John L. Volakis, one of the world's leading authorities in antenna engineering, this trusted resource covers all the classic antenna types plus many new types and designs used in communications systems, satellites, radars, and emerging applications from WLAN to automotive systems to biomedical to smart antennas. You will also find expert discussion of topics critical to successful antenna design and engineering, such as measurement techniques and computational methods, a materials guide, wave propagation basics, microwave circuits, and matching techniques, as well as diversity and MIMO propagation models, frequency selective surfaces, and metamaterials. Packed with 1,500 illustrations, the 4th Edition of Antenna Engineering Handbook presents: Step-by-step guidance on most antennas (modern and classic) 59 chapters with 21 new chapters and 38 fully updated chapters from the previous edition Contributions from over 80 well-known antenna experts Full-color insert illustrating many commercial and military antennas Get Quick Access to All of Today's Cutting-Edge

Antennas • Printed and Conformal Antennas • Wideband Patch Antennas • Wideband Arrays • Leaky-Wave Antennas • EBG Antennas • UWB Antennas and Arrays • Portable TV Antennas • Reconfigurable Antennas • Active Antennas • Millimeter Wave and TeraHertz Antennas • Fractal Antennas • Handset and Terminal Antennas • Biomedical Antennas • ECM and ESM antennas • Dielectric Resonator Antennas • Lens Antennas • Radiometer Antennas • Satellite Antennas • Reflector and Earth Station Antennas • and Dozens More!

Time-Domain Electromagnetic Reciprocity in Antenna Modeling - Martin Stumpf 2019-09-02

Describes applications of time-domain EM reciprocity and the Cagniard-deHoop technique to achieve solutions to fundamental antenna radiation and scattering problems. This book offers an account of applications of the time-domain electromagnetic (TD EM) reciprocity theorem for solving selected problems of antenna theory. It focuses on the development of both TD numerical schemes and analytical methodologies suitable for analyzing TD EM wave fields associated with fundamental antenna topologies. *Time-Domain Electromagnetic Reciprocity in Antenna Modeling* begins by applying the reciprocity theorem to formulate a fundamentally new TD integral equation technique – the Cagniard-deHoop method of moments (CdH-MoM) – regarding the pulsed EM scattering and radiation from a thin-wire antenna. Subsequent chapters explore the use of TD EM reciprocity to evaluate the impact of a scatterer and a lumped load on the performance of wire antennas and propose a straightforward methodology for incorporating ohmic loss in the introduced solution methodology. Other topics covered in the book include the pulsed EM field coupling to transmission lines, formulation of the CdH-MoM concerning planar antennas, and more. In addition, the book is supplemented with simple MATLAB code implementations, so that readers can test EM reciprocity by conducting (numerical) experiments. In addition, this text: Applies the thin-sheet boundary conditions to incorporate dielectric, conductive and plasmonic properties of planar antennas. Provides illustrative numerical examples that validate the described methodologies. Presents analyzed problems at a fundamental level so that readers can fully grasp the underlying principles of solution methodologies. Includes appendices to supplement material in the book. *Time-Domain Electromagnetic Reciprocity in Antenna Modeling* is an excellent book for researchers and professors in EM modeling and for applied researchers in the industry.

Terahertz Planar Antennas for Next Generation Communication - Kumud Ranjan Jha 2014-01-10

This book describes various methods to enhance the directivity of planar antennas, enabling the next generation of high frequency, wireless communication. The authors discuss various applications to the terahertz regime of the electromagnetic spectrum, with an emphasis on gain enhancement mechanisms. The numerical models of these antennas are presented and the analytical results are supported, using commercial

simulators. The multilayer substrate microstrip transmission line at terahertz frequency is also explored and a method to obtain the various parameters of this interconnect at high frequency is described. This book will be a valuable resource for anyone needing to explore the terahertz band gap for future wireless communication, in an effort to solve the bandwidth (spectrum scarcity) problem.

Novel Advances in Microsystems Technologies and Their Applications - Laurent A. Francis 2017-07-28

Microsystems technologies have found their way into an impressive variety of applications, from mobile phones, computers, and displays to smart grids, electric cars, and space shuttles. This multidisciplinary field of research extends the current capabilities of standard integrated circuits in terms of materials and designs and complements them by creating innovative components and smaller systems that require lower power consumption and display better performance. *Novel Advances in Microsystems Technologies and their Applications* delves into the state of the art and the applications of microsystems and microelectronics-related technologies. Featuring contributions by academic and industrial researchers from around the world, this book: Examines organic and flexible electronics, from polymer solar cell to flexible interconnects for the co-integration of micro-electromechanical systems (MEMS) with complementary metal oxide semiconductors (CMOS). Discusses imaging and display technologies, including MEMS technology in reflective displays, the fabrication of thin-film transistors on glass substrates, and new techniques to display and quickly transmit high-quality images. Explores sensor technologies for sensing electrical currents and temperature, monitoring structural health and critical industrial processes, and more. Covers biomedical microsystems, including biosensors, point-of-care devices, neural stimulation and recording, and ultra-low-power biomedical systems. Written for researchers, engineers, and graduate students in electrical and biomedical engineering, this book reviews groundbreaking technology, trends, and applications in microelectronics. Its coverage of the latest research serves as a source of inspiration for anyone interested in further developing microsystems technologies and creating new applications.

Proceedings of the International Conference on Recent Cognizance in Wireless Communication & Image Processing - Nitin Afzalpulkar 2016-04-28

This volume comprises the proceedings of the International Conference on Recent Cognizance in Wireless Communication & Image Processing. It brings together content from academicians, researchers, and industry experts in areas of Wireless Communication and Image Processing. The volume provides a snapshot of current progress in computational creativity and a glimpse of future possibilities. The proceedings include two kinds of paper submissions: (i) regular papers addressing foundation issues, describing original research on creative systems development and

modeling; and (ii) position papers describing work-in-progress or research directions for computational creativity. This work will be useful to professionals and researchers working in the core areas of wireless communications and image processing.

Telecommunications and Radio Engineering - 1969

Communications Engineering Desk Reference - Erik Dahlman 2009-03-23

A one-stop Desk Reference, for R&D engineers involved in communications engineering; this is a book that will not gather dust on the shelf. It brings together the essential professional reference content from leading international contributors in the field. Material covers a wide scope of topics including voice, computer, facsimile, video, and multimedia data technologies * A fully searchable Mega Reference Ebook, providing all the essential material needed by Communications Engineers on a day-to-day basis. * Fundamentals, key techniques, engineering best practice and rules-of-thumb together in one quick-reference. * Over 2,500 pages of reference material, including over 1,500 pages not included in the print edition

High-Altitude Platforms for Wireless Communications - Alejandro Aragón-Zavala 2008-11-24

Provides an introduction to High-Altitude Platform Stations (HAPS) technology and its applications for wireless communications High-altitude platform stations offer a promising new technology that combines the benefits of terrestrial and satellite communication systems for delivering broadband communications to users at a low cost. They are easily deployable and easy to maintain, which is why they offer a good alternative for network operators who need to find ways to get more coverage to satisfy the increasing demand for more capacity. HAPS are usually balloons, airships or unmanned aerial systems (UAS) located in the stratosphere. An enormous interest has grown worldwide to examine their use not only for broadband communications, but also for emergency services, navigation, traffic monitoring, cellular, etc. Key features include: Unique book focusing on emerging HAPS technology and its applications Provides a thorough overview of the technology including HAPS-based communications systems, antennas for HAPS, radio propagation and channel modelling issues and HAPS networking aspects Presents various HAPS-related projects and initiatives developed throughout the world (North America, Europe and Asia-Pacific) Features a comprehensive overview on both aeronautical and telecommunications regulatory aspects, which will affect the deployment and future developments in the field of HAPS High-Altitude Platform Systems for Wireless Communications will prove essential reading for postgraduate students in the field of HAPS, engineers, developers and designers involved in the design and maintenance of HAPS, aerospace engineers, and communications system planners and researchers.

Proceedings of the IRE. - Institute of Radio Engineers 1958

Vols. 34- include section: Waves and electrons.

From ER to E.T. - Rajeev Bansal 2016-12-06

This book covers the study of electromagnetic wave theory and describes how electromagnetic technologies affect our daily lives. From ER to ET: How Electromagnetic Technologies Are Changing Our Lives explores electromagnetic wave theory including its founders, scientific underpinnings, ethical issues, and applications through history. Utilizing a format of short essays, this book explains in a balanced, and direct style how electromagnetic technologies are changing the world we live in and the future they may create for us. Quizzes at the end of each chapter provide the reader with a deeper understanding of the material. This book is a valuable resource for microwave engineers of varying levels of experience, and for instructors to motivate their students and add depth to their assignments. In addition, this book: Presents topics that investigate all aspects of electromagnetic technology throughout history Explores societal and global issues that relate to the field of electrical engineering (emphasized in current ABET accreditation criteria) Includes quizzes relevant to every essay and answers which explain technical perspectives Rajeev Bansal, PhD, is a professor of Electrical and Computer Engineering at the University of Connecticut. He is a member of IEEE and the Connecticut Academy of Science and Engineering. He is a Fellow of the Electromagnetics Academy. His editing credits include Fundamentals of Engineering Electromagnetics and Engineering Electromagnetics: Applications. Dr. Bansal contributes regular columns to IEEE Antennas and Propagation Magazine and IEEE Microwave Magazine.

Powering the Internet of Things With 5G Networks - Mohanan, Vasuky 2017-07-12

With the rise of mobile and wireless technologies, more sustainable networks are necessary to support such communications. These next generation networks can now be utilized to strengthen the growing era of the Internet of Things. Powering the Internet of Things With 5G Networks is a comprehensive reference source for the latest scholarly research on the progression and design of fifth generation networks and their role in supporting the Internet of Things. Including a range of perspectives on topics such as privacy and security, large scale monitoring, and scalable architectures, this book is ideally designed for technology developers, academics, researchers, and practitioners interested in the convergence of the Internet of Things and 5G networks.

Contemporary Developments in High-Frequency Photonic Devices -

Bhattacharyya, Siddhartha 2019-06-14

Microwave photonics and information optics provide high bandwidth and precision along with ultrafast speed at a low cost. In order to reduce noise at the communication trans-receivers, scattering in the devices needs to be decreased, which can be achieved by replacing optoelectronic devices with photonic devices because in the latter only photons propagate electromagnetic waves. Contemporary Developments in High-Frequency

Photonic Devices is a crucial research book that examines high-frequency photonics and their applications in communication engineering. Featuring coverage on a wide range of topics such as metamaterials, optoelectronic devices, and plasmonics, this book is excellent for students, researchers, engineers, and professionals.

Millimeter Wave Technology in Wireless PAN, LAN, and MAN - Shao-Qiu Xiao 2008-05-28

Driven by the demand for high-data-rate, millimeter wave technologies with broad bandwidth are being explored in high-speed wireless communications. These technologies include gigabit wireless personal area networks (WPAN), high-speed wireless local area networks (WLAN), and high-speed wireless metropolitan area networks (WMAN). As a result of this technological push, standard organizations are actively calling for specifications of millimeter wave applications in the above wireless systems. Providing the guidance needed to help you navigate through these new technologies, *Millimeter Wave Technology in Wireless PAN, LAN, and MAN* covers the fundamental concepts, recent advances, and potential that these millimeter wave technologies will offer with respect to circuits design, system architecture, protocol development, and standardization activities. The book presents essential challenges and solutions related to topics that include millimeter wave monolithic integrated circuit (MMIC), packaging technology of millimeter wave system and circuits, and millimeter wave channel models. With numerous figures, tables and references, this text allows speedy access to the fundamental problems, key challenges, open issues, future directions, and further readings on millimeter wave technologies in relation to WPAN, WLAN, and WMAN.

Fundamentals of Aperture Antennas and Arrays - Trevor S. Bird 2016-01-19

This book is intended as an advanced text for courses in antennas, with a focus on the mature but vital background field of aperture antennas. The book is aimed at final year, MSc, PhD and Post-Doctoral students, as well as readers who are moving from academia into industry, beginning careers as wireless engineers, system designers, in R&D, or for practising engineers. It assumes the reader has undertaken an earlier course of study on Maxwell's equations, fields and waves. Some of these topics are summarised in the early few chapters in order to provide continuity and background for the remaining chapters. The aperture antennas covered include the main types of horns, reflectors and arrays as well as microstrip patches, reflectarrays and lenses. To provide more than a superficial treatment of arrays, the topic of mutual coupling is covered in greater detail than most similar books in the area. Also included is an introduction to arrays on non-planar surfaces, which is of importance for applications that involve curved surfaces such as in aerodynamics or for making aperture antennas unobtrusive. A chapter is included on some modern aperture antennas to illustrate design techniques beyond the most

common types of aperture antennas described in the early chapters. This is to show where advances have recently been made and where they could be improved in the future. Also included are selected topics of a practical nature for aperture antennas, namely fabrication and measurement.

Modern Lens Antennas for Communications Engineering - John Thornton 2013-03-06

The aim of this book is to present the modern design principles and analysis of lens antennas. It gives graduates and RF/Microwave professionals the design insights in order to make full use of lens antennas. Why do we want to write a book in lens antennas? Because this topic has not been thoroughly publicized, its importance is underestimated. As antennas play a key role in communication systems, recent development in wireless communications would indeed benefit from the characteristics of lens antennas: low profile, and low cost etc. The major advantages of lens antennas are narrow beamwidth, high gain, low sidelobes and low noise temperature. Their structures can be more compact and weigh less than horn antennas and parabolic antennas. Lens antennas with their quasi-optical characteristics, also have low loss, particularly at near millimeter and submillimeter wavelengths where they have particular advantages. This book systematically conducts advanced and up-to-date treatment of lens antennas.

Satellite Communication Engineering, Second Edition - Michael Olorunfunmi Kolawole 2013-11-23

An undeniably rich and thorough guide to satellite communication engineering, *Satellite Communication Engineering, Second Edition* presents the fundamentals of information communications systems in a simple and succinct way. This book considers both the engineering aspects of satellite systems as well as the practical issues in the broad field of information transmission. Implementing concepts developed on an intuitive, physical basis and utilizing a combination of applications and performance curves, this book starts off with a progressive foundation in satellite technology, and then moves on to more complex concepts with ease. What's New in the Second Edition: The second edition covers satellite and Earth station design; global positioning systems; antenna tracking; links and communications systems; error detection and correction; data security; regulations and procedures for system modeling; integration; testing; and reliability and performance evaluation. Provides readers with the systems building blocks of satellite transponders and Earth stations, as well as the systems engineering design procedure. Includes the tools needed to calculate basic orbit characteristics such as period, dwell time, coverage area, propagation losses; antenna system features such as size, beamwidth, aperture-frequency product, gain, tracking control; and system requirements such as power, availability, reliability, and performance. Presents problem sets and starred sections containing basic mathematical development. Details recent developments

enabling digital information transmission and delivery via satellite Satellite Communication Engineering, Second Edition serves as a textbook for students and a resource for space agencies and relevant industries.

Advanced Radio Frequency Antennas for Modern Communication and Medical Systems - Albert Sabban 2020-09-23

The main objective of this book is to present novel radio frequency (RF) antennas for 5G, IOT, and medical applications. The book is divided into four sections that present the main topics of radio frequency antennas.

The rapid growth in development of cellular wireless communication systems over the last twenty years has resulted in most of world population owning smartphones, smart watches, I-pads, and other RF communication devices. Efficient compact wideband antennas are crucial in RF communication devices. This book presents information on planar antennas, cavity antennas, Vivaldi antennas, phased arrays, MIMO antennas, beamforming phased array reconfigurable Fabry-Perot cavity antennas, and time modulated linear array.

WAVE PROPAGATION AND ANTENNA ENGINEERING - KUMAR, SANJAY 2015-12-14

The book is primarily designed to cater to the needs of undergraduate and postgraduate students of Electronics and Communication Engineering and allied branches. It also caters for fundamental requirements of professionals working on design and development of antenna and wave propagation related equipment either in research laboratories or industries or academic institutions elsewhere. The book has been written with intent to grasp the basic understanding of theoretical as well as practical aspects of electromagnetic wave propagation and antenna engineering. The text has been aptly scripted considering the requirements of average students who can easily grasp and comprehend the basics of wave propagation and radiation mechanism of varieties of antennas coupled with their critical functionalities, utilities, advantages/disadvantages without any external assistance of teachers or other reference books. The book broaches very well on practical methods of parametric measurements of antenna with right measuring test equipment and associated tools. The last chapter of the book is dedicated to advance technology adopted in design and development of modern antenna. Key features

- A fairly large number of well labelled diagrams to provide practical understanding of the concepts.
- The placement of numericals at appropriate places develops confidence among readers and entuses them further to read in depth to crack any regular or competitive examinations.
- Chapter summary highlights important points for quick recap and revision before examination.
- Well-crafted multiple choice questions with answers at the end of each chapter to stimulate thought process and prepare better for viva-voce and competitive examinations.
- Appropriate number of unsolved numerical problems with answers to improve problem solving skill of students.

Substrate-Integrated Millimeter-Wave Antennas for Next-Generation Communication and Radar Systems - Zhi Ning Chen 2021-04-08

Substrate-Integrated Millimeter-Wave Antennas for Next-Generation Communication and Radar Systems The first and only comprehensive text on substrate-integrated mmW antenna technology, state-of-the-art antenna design, and emerging wireless applications Substrate-Integrated Millimeter-Wave Antennas for Next-Generation Communication and Radar Systems elaborates the most important topics related to revolutionary millimeter-wave (mmW) technology. Following a clear description of fundamental concepts including substrate-integrated waveguides and loss analysis, the text treats key design methods, prototyping techniques, and experimental setup and testing. The authors also highlight applications of mmW antennas in 5G wireless communication and next-generation radar systems. Readers are prepared to put techniques into practice through practical discussions of how to set up testing for impedance matching, radiation patterns, gain from 24GHz up to 325 GHz, and more. This book will bring readers state-of-the-art designs and recent progress in substrate-integrated mmW antennas for emerging wireless applications. Substrate-Integrated Millimeter-Wave Antennas for Next-Generation Communication and Radar Systems is the first comprehensive text on the topic, allowing readers to quickly master mmW technology. This book: Introduces basic concepts such as metamaterials Huygens's surface, zero-index structures, and pattern synthesis Describes prototyping in the form of fabrication based on printed-circuit-board, low-temperature-co-fired-ceramic and micromachining Explores applications for next-generation radar and imaging systems such as 24-GHz and 77-GHz vehicular radar systems Elaborates design methods including waveguide-based feeding network, three-dimensional feeding structure, dielectric loaded aperture antenna element, and low-sidelobe synthesis The mmW is one of today's most important emerging technologies. This book provides graduate students, researchers, and engineers with the knowledge they need to deploy mmW systems and develop new antenna designs with low cost, low loss, and low complexity.

Electromagnetic Wave Propagation, Radiation, and Scattering - Akira Ishimaru 2017-10-27

One of the most methodical treatments of electromagnetic wave propagation, radiation, and scattering—including new applications and ideas Presented in two parts, this book takes an analytical approach on the subject and emphasizes new ideas and applications used today. Part one covers fundamentals of electromagnetic wave propagation, radiation, and scattering. It provides ample end-of-chapter problems and offers a 90-page solution manual to help readers check and comprehend their work. The second part of the book explores up-to-date applications of electromagnetic waves—including radiometry, geophysical remote sensing and imaging, and biomedical and signal processing applications. Written by a world renowned authority in the field of electromagnetic research, this new edition of *Electromagnetic Wave Propagation, Radiation, and Scattering: From Fundamentals to Applications* presents detailed

applications with useful appendices, including mathematical formulas, Airy function, Abel's equation, Hilbert transform, and Riemann surfaces. The book also features newly revised material that focuses on the following topics: Statistical wave theories—which have been extensively applied to topics such as geophysical remote sensing, bio-electromagnetics, bio-optics, and bio-ultrasound imaging Integration of several distinct yet related disciplines, such as statistical wave theories, communications, signal processing, and time reversal imaging New phenomena of multiple scattering, such as coherent scattering and memory effects Multiphysics applications that combine theories for different physical phenomena, such as seismic coda waves, stochastic wave theory, heat diffusion, and temperature rise in biological and other media Metamaterials and solitons in optical fibers, nonlinear phenomena, and porous media Primarily a textbook for graduate courses in electrical engineering, *Electromagnetic Wave Propagation, Radiation, and Scattering* is also ideal for graduate students in bioengineering, geophysics, ocean engineering, and geophysical remote sensing. The book is also a useful reference for engineers and scientists working in fields such as geophysical remote sensing, bio-medical engineering in optics and ultrasound, and new materials and integration with signal processing.

Advances in Materials and Manufacturing Engineering - T. Rajmohan
2020-09-21

This book comprises selected papers from the Fourth International Conference on Materials and Manufacturing Engineering (ICMME 2019). The contents focus on the latest developments in the synthesis and characterization of new materials, and highlights the challenges involved in the manufacturing and machinability of different materials. Advanced and cost-effective manufacturing processes and their applications are also discussed in the book. In addition, it covers topics like robotics, fluid dynamics, design and development, and different optimization techniques. The contents of this book will be beneficial to students, researchers, and industry professionals.

Four-arm Spiral Antennas - Robert G. Corzine 1990

Explains in detail the underlying principles of four-arm spiral direction-finding antennas for those who wish to design such systems. Includes performance results and practical aspects for the first-time designer. For all models, and for symmetrical and simplified variations, discusses mode forming,

Modern Antenna Design - Thomas A. Milligan 2005-07-08

A practical book written for engineers who design and use antennas The author has many years of hands on experience designing antennas that were used in such applications as the Venus and Mars missions of NASA The book covers all important topics of modern antenna design for communications Numerical methods will be included but only as much as are needed for practical applications

Modern Methods of Reflector Antenna Analysis and Design - Craig Scott

1990

Here's the first complete reference available on all of the modern reflector antenna analysis and design techniques. This book demystifies modern reflector antenna analysis by proceeding from the early numerical integration approaches to today's powerful techniques, such as the Jacobi-Bessel and Fourier-Bessel Methods.

Scientific and Technical Aerospace Reports - 1992

Electronically Scanned Arrays - Robert J. Mailloux 2022-06-01

Scanning arrays present the radar or communications engineer with the ultimate in antenna flexibility. They also present a multitude of new opportunities and new challenges that need to be addressed. In order to describe the needs for scanned array development, this book begins with a brief discussion of the history that led to present array antennas. This text is a compact but comprehensive treatment of the scanned array, from the underlying basis for array pattern behavior to the engineering choices leading to successful design. The book describes the scanned array in terms of radiation from apertures and wire antennas and introduces the effects resulting directly from scanning, including beam broadening, impedance mismatch and gain reduction and pattern squint and those effects of array periodicity including grating and quantization lobes and array blindness. The text also presents the engineering tools for improving pattern control and array efficiency including lattice selection, subarray technology and pattern synthesis. Equations and figures quantify the phenomena being described and provide the reader with the tools to tradeoff various performance features. The discussions proceed beyond the introductory material and to the state of the art in modern array design.

Contents: Basic Principles and Applications of Array Antennas / Element Coupling Effects in Array Antennas / Array Pattern Synthesis / Subarray Techniques for Limited Field of View and Wide Band Applications

Satellite Communication Engineering - Michael Olorunfunmi Kolawole
2002-05-24

Highlighting satellite and earth station design, links and communication systems, error detection and correction, and regulations and procedures for system modeling, integrations, testing, and evaluation, *Satellite Communication Engineering* provides a simple and concise overview of the fundamental principles common to information communications. It discusses block and feedback ciphering; covers orbital errors; evaluates multi-beam satellite networks; illustrates bus, electrical, and mechanical systems design; analyzes system reliability and availability; elucidates reflector/lens, phased array, and helical antenna systems; explores channel filters and multiplexers; and more.

Antenna Engineering Handbook, Fourth Edition - John Volakis 2007-06-07

The "bible of antenna engineering" fully updated to provide state-of-the-art coverage in antenna design and applications Edited by John L. Volakis, one of the world's leading authorities in antenna engineering, this trusted

resource covers all the classic antenna types plus many new types and designs used in communications systems, satellites, radars, and emerging applications from WLAN to automotive systems to biomedical to smart antennas. You will also find expert discussion of topics critical to successful antenna design and engineering, such as measurement techniques and computational methods, a materials guide, wave propagation basics, microwave circuits, and matching techniques, as well as diversity and MIMO propagation models, frequency selective surfaces, and metamaterials. Packed with 1,500 illustrations, the 4th Edition of Antenna Engineering Handbook presents: Step-by-step guidance on most antennas (modern and classic) 59 chapters with 21 new chapters and 38 fully updated chapters from the previous edition Contributions from over 80 well-known antenna experts Full-color insert illustrating many commercial and military antennas Get Quick Access to All of Today's Cutting-Edge Antennas • Printed and Conformal Antennas • Wideband Patch Antennas • Wideband Arrays • Leaky-Wave Antennas • EBG Antennas • UWB Antennas and Arrays • Portable TV Antennas • Reconfigurable Antennas • Active Antennas • Millimeter Wave and TeraHertz Antennas • Fractal Antennas • Handset and Terminal Antennas • Biomedical Antennas • ECM and ESM antennas • Dielectric Resonator Antennas • Lens Antennas • Radiometer Antennas • Satellite Antennas • Reflector and Earth Station Antennas • and Dozens More!

Reflector and Lens Antennas - Carlyle J. Sletten 1988

Low-cost Smart Antennas - Qi Luo 2019-03-18

An authoritative guide to the latest developments for the design of low-cost smart antennas Traditional smart antenna systems are costly, consume great amounts of power and are bulky size. Low-cost Smart Antennas offers a guide to designing smart antenna systems that are low cost, low power, and compact in size and can be applied to satellite communications, radar and mobile communications. The authors – noted experts on the topic – provide introductions to the fundamental concepts of antennas, array antennas and smart antennas. The book fills a gap in the literature by presenting the design techniques of low-cost radio frequency (RF) smart antennas as well as approaches for implementing the hardware of the antenna and the beamforming network (BFN). A comprehensive and accessible book, Low-cost Smart Antennas not only presents an up-to-date review of the topic but includes illustrative case studies that contain in-depth explorations of the theory and technology of smart antennas. While other resources highlight the software (signal processing algorithms), this book is unique by focusing on the antenna hardware. This important book: Offers an introduction to the most recent developments of the design of low-cost smart antennas and their applications Presents a unique book that puts the focus on antenna hardware Includes a variety of case studies that clearly demonstrate the implementation of current design techniques Introduces both fundamental

theories as well as more advanced topics Written for students and researchers and antenna engineers, Low-cost Smart Antennas explores the most recent advances in the field with an emphasis on antenna hardware.

Millimeter Wave Wireless Communications - Theodore S. Rappaport 2015

The Definitive, Comprehensive Guide to Cutting-Edge Millimeter Wave Wireless Design “This is a great book on mmWave systems that covers many aspects of the technology targeted for beginners all the way to the advanced users. The authors are some of the most credible scholars I know of who are well respected by the industry. I highly recommend studying this book in detail.” –Ali Sadri, Ph.D., Sr. Director, Intel Corporation, MCG mmWave Standards and Advanced Technologies Millimeter wave (mmWave) is today's breakthrough frontier for emerging wireless mobile cellular networks, wireless local area networks, personal area networks, and vehicular communications. In the near future, mmWave products, systems, theories, and devices will come together to deliver mobile data rates thousands of times faster than today's existing cellular and WiFi networks. In Millimeter Wave Wireless Communications, four of the field's pioneers draw on their immense experience as researchers, entrepreneurs, inventors, and consultants, empowering engineers at all levels to succeed with mmWave. They deliver exceptionally clear and useful guidance for newcomers, as well as the first complete desk reference for design experts. The authors explain mmWave signal propagation, mmWave circuit design, antenna designs, communication theory, and current standards (including IEEE 802.15.3c, Wireless HD, and ECMA/WiMedia). They cover comprehensive mmWave wireless design issues, for 60 GHz and other mmWave bands, from channel to antenna to receiver, introducing emerging design techniques that will be invaluable for research engineers in both industry and academia. Topics include Fundamentals: communication theory, channel propagation, circuits, antennas, architectures, capabilities, and applications Digital communication: baseband signal/channel models, modulation, equalization, error control coding, multiple input multiple output (MIMO) principles, and hardware architectures Radio wave propagation characteristics: indoor and outdoor applications Antennas/antenna arrays, including on-chip and in-package antennas, fabrication, and packaging Analog circuit design: mmWave transistors, fabrication, and transceiver design approaches Baseband circuit design: multi-gigabit-per-second, high-fidelity DAC and ADC converters Physical layer: algorithmic choices, design considerations, and impairment solutions; and how to overcome clipping, quantization, and nonlinearity Higher-layer design: beam adaptation protocols, relaying, multimedia transmission, and multiband considerations 60 GHz standardization: IEEE 802.15.3c for WPAN, Wireless HD, ECMA-387, IEEE 802.11ad, Wireless Gigabit Alliance (WiGig)

Antenna Engineering Handbook - John Volakis 2018-11-05

The gold-standard reference on the design and application of classic and modern antennas—fully updated to reflect the latest advances and technologies. This new edition of the “bible of antenna engineering” has been updated to provide start-to-finish coverage of the latest innovations in antenna design and application. You will find in-depth discussion of antennas used in modern communication systems, mobile and personal wireless technologies, satellites, radar deployments, flexible electronics, and other emerging technologies, including 5G, terahertz, and wearable electronics. *Antenna Engineering Handbook, Fifth Edition*, is bolstered by real-world examples, hundreds of illustrations, and an emphasis on the practical aspects of antennas. Featuring 60 chapters and contributions from more than 80 renowned experts, this acclaimed resource is edited by one of the world’s leading antenna authorities. This edition features all of the classic antenna types, plus new and emerging designs, with 13 all-new chapters and important updates to nearly all chapters from past editions. *Antenna Engineering Handbook, Fifth Edition*, clearly explains cutting-edge applications in WLANs, automotive systems, PDAs, and handheld devices, making it an indispensable companion for today’s antenna practitioners and developers. Coverage includes:

- Antenna basics and classic antennas
- Design approaches for antennas and arrays
- Wideband and multiband antennas
- Antennas for mobile devices and PDAs, automotive applications, and aircraft
- Base station and smart antennas
- Beamforming and 5G antennas
- Millimeter-wave and terahertz antennas
- Flexible, wearable, thin film, origami, dielectric, and on-chip antennas
- MIMO antennas and phased arrays
- Direction-finding and GPS antennas
- Active antennas
- Low-profile wideband antennas
- Nanoantennas
- Reflectors and other satellite and radio-telescope antennas
- Low-frequency, HF, VHF, UHF, ECM, and ESM antennas
- Impedance-matching techniques and material characteristics
- Metastructured and frequency selective surfaces
- Propagation and guided structures
- Computational techniques and toolsets
- Indoor and outdoor measurements

Proceedings of International Conference on Communication, Circuits, and Systems - Sukanta Kumar Sabut 2021-04-02

The book proposes new technologies and discusses innovative solutions to various problems in the field of communication, circuits, and systems, as reflected in high-quality papers presented at International Conference on Communication, Circuits, and Systems (IC3S 2020) held at KIIT, Bhubaneswar, India from 16 – 18 October 2020. It brings together new works from academicians, scientists, industry professionals, scholars, and students together to exchange research outcomes and open up new horizons in the areas of signal processing, communications, and devices.

Boundary Conditions in Electromagnetics - Ismo V. Lindell 2019-11-26

A comprehensive survey of boundary conditions as applied in antenna and microwave engineering, material physics, optics, and general electromagnetics research. Boundary conditions are essential for determining electromagnetic problems. Working with engineering problems,

they provide analytic assistance in mathematical handling of electromagnetic structures, and offer synthetic help for designing new electromagnetic structures. *Boundary Conditions in Electromagnetics* describes the most-general boundary conditions restricted by linearity and locality, and analyzes basic plane-wave reflection and matching problems associated to a planar boundary in a simple-isotropic medium. This comprehensive text first introduces known special cases of particular familiar forms of boundary conditions – perfect electromagnetic conductor, impedance, and DB boundaries – and then examines various general forms of boundary conditions. Subsequent chapters discuss sesquilinear boundary conditions and practical computations on wave scattering by objects defined by various boundary conditions. The practical applications of less-common boundary conditions, such as for metamaterial and metasurface engineering, are referred to throughout the text. This book:

- Describes the mathematical analysis of fields associated to given boundary conditions
- Provides examples of how boundary conditions affect the scattering properties of a particle
- Contains ample in-chapter exercises and solutions, complete references, and a detailed index
- Includes appendices containing electromagnetic formulas, Gibbsian 3D dyadics, and four-dimensional formalism

Boundary Conditions in Electromagnetics is an authoritative text for electrical engineers and physicists working in electromagnetics research, graduate or post-graduate students studying electromagnetics, and advanced readers interested in electromagnetic theory.

Printed Antennas for 5G Networks - Ladislau Matekovits 2022-05-04

The book provides a comprehensive overview of antennas for 5G technology, such as MIMO, multiband antennas, Magneto-Electric Dipole Antenna and PIFA Antenna for 5G networks, phased array antennas for 5G access, beam-forming and beam-steering issues, 5G antennas for specific applications (smartphone, cognitive radio) and advance antenna concept and materials for 5G. The book also covers optimizations methods for passive and active devices in mm-Wave 5G networks. It explores topics which influence the design and characterization of antennas such as data rates, high isolation, pattern and spatial diversity, making 5G antennas more suitable for a multipath environment. The book represents a learning tool for researchers in the field, and enables engineers, designers and manufacturers to identify key design challenges of antennas for 5G networks, and characterize novel antennas for 5G networks.

Proceedings of the 12th National Technical Seminar on Unmanned System Technology 2020 - Khalid Isa 2021-09-24

This book comprises the proceedings of the 12th National Technical Symposium on Unmanned System Technology 2020 (NUSYS’20) held on October 27–28, 2020. It covers a number of topics, including intelligent robotics, novel sensor technology, control algorithms, acoustics signal processing, imaging techniques, biomimetic robots, green energy sources,

and underwater communication backbones and protocols, and it appeals to researchers developing marine technology solutions and policy-makers interested in technologies to facilitate the exploration of coastal and oceanic regions.

Antenna Theory and Practice - Rajeswari Chatterjee 1996

This Book Has Been Designed For Both The Undergraduate And Postgraduate In Electronic Engineering, Electrical Communication Engineering And Electrical Engineering, And For The Postgraduate In Physics Specialising In Electronics. It Is A Compact And Comprehensive Text And It Stresses The Basic Principles Of Antenna Theory And Practice. Starting With Electromagnetics And The Theory Of Radiation Which Forms The Basis Of Antenna Theory, It Treats In Detail Different Types Of Antennas Like The Linear Antenna, The Cylindrical Antenna, The Biconical Antenna, The Loop Antenna, The Helical Antenna, Slot And

Microstrip Antennas, Horn Antennas, Reflector Antennas, Lens Antennas, Leaky Wave And Surface-Wave Antennas Including Dielectric And Dielectric Loaded Antennas, Wide Band Antennas And Some Modern Special Types Of Antennas. There Are Also Chapters On Antenna Synthesis, Antenna Practice, Antenna Measurements And Electromagnetic Wave Propagation. The Detailed Coverage Of Electromagnetic Theory Enables The Student To Understand The Theoretical Aspects With Comparative Ease. The Chapters On Antenna Synthesis, Antenna Practice And Antenna Measurements Are Useful For The Practical Antenna Engineer. The Problems At The End Of Chapters, Tables And Numerous Illustrations Add To The Value Of The Text. In This Second Edition A New Chapter On Antenna Impedance And Some Solved Problems Have Been Added. The Book Presupposes Only The Knowledge Of Mathematics Which A Student Of Undergraduate Engineering Or Undergraduate Physics Has Required.