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*Problem Solving in Electromagnetics,
Microwave Circuit, and Antenna Design
for Communications Engineering*
Springer

The accurate design of earth-space systems requires a comprehensive understanding of the various propagation media and phenomena that differ depending on frequencies and types of applications. The choice of the relevant channel models is crucial in the design process and constitutes a key step in performance evaluation and testing of earth-space systems. The subject of this book is built around the two characteristic cases of satellite

systems: fixed satellites and mobile satellite systems. Radio Wave Propagation and Channel Modeling for Earth-Space Systems discusses the state of the art in channel modeling and characterization of next-generation fixed multiple-antennas and mobile satellite systems, as well as propagation phenomena and fade mitigation techniques. The frequencies of interest range from 100 MHz to 100 GHz (from VHF to W band), whereas the use of optical free-space communications is envisaged. Examining recent research advances in space-time tropospheric propagation fields and optical satellite communication channel models, the book covers land mobile multiple antennas satellite- issues and relative propagation campaigns and stratospheric channel models for various applications and frequencies. It also

presents research and well-accepted satellite community results for land mobile satellite and tropospheric attenuation time-series single link and field synthesizers. The book examines aeronautical communications channel characteristics and modeling, relative radio wave propagation campaigns, and stratospheric channel model for various applications and frequencies.

Propagation effects on satellite navigation systems and the corresponding models are also covered.

Plasma Antennas, Second Edition

CRC Press

This is the first truly comprehensive and most up-to-date handbook available on modern reflector antennas and feed sources for diversified space and ground applications. There has never been such an all-encompassing reflector handbook in print, and no currently available title offers coverage of such recent research developments. The Handbook consists of three volumes. Volume I provides a unique combination of theoretical underpinnings with design considerations and techniques. The need for knowledge in reflector antennas has grown steadily over the last two decades due to increased use in space and ground applications, as well as their high gain and wide bandwidth capabilities at relatively low cost. This volume brings you to the leading edge of developments in the field related to numerical techniques, classical reflector geometries, adaptive reflector antennas, shaped reflectors, bifocal and bicollimated dual reflectors, advanced reflectors, and reflect arrays. A must-have reference for both practicing engineers as well as academic researchers.

Antenna Engineering Using Physical Optics Springer Nature

Stutzman's 3rd edition of Antenna Theory and Design provides a more pedagogical approach with a greater emphasis on computational methods. New features include additional modern material to make the text more exciting and relevant to practicing engineers; new chapters on systems, low-profile elements and base station antennas; organizational changes to improve understanding; more details to selected important topics such as microstrip antennas and arrays; and expanded measurements topic.

Mobile Antenna Systems Handbook

John Wiley & Sons

Why yet another book on antennas? The aim of the authors was to offer a didactic text appropriate for advanced graduate students, as well as a practical work for practicing engineers; to combine a solid theoretical treatment with a practical development which should allow the serious reader to undertake antenna design from first principles. To accomplish these goals, the authors bring together their contributions from both industry and the academic environment. The developments of the various topics start at a level which is accessible to a novice in the speciality, but give a treatment which culminates at an advanced level. Another important feature of the book is its use of practical examples illustrating real engineering problems and designs. In most cases, the explanation is sufficient to grasp the principles of operation of the related equipment, and, where appropriate, the reader is referred to a relevant bibliography for more complete and hence more sophisticated methodologies of design. Of particular note are the chapters on specialist subjects such as antennas and signal theory, and signal processing antennas, showing how the

antenna may be combined with signal processing techniques in imaging applications, in angular superresolution, and in adaptive arrays to suppress interference and jamming. Another example is the chapter on the use of polarimetry to enhance the wealth of information which may be extracted, for example, from radar signals.

Microstrip Antenna Design

Handbook Artech House

This book presents the state-of-the-art of Terahertz spectroscopy. It is a modern source for a beginners and researcher interested in THz spectroscopy. The basics and physical background of THz spectroscopy and technology are explained, and important applications are described. The book presents the highlights of scientific research in the field of THz science and provides an excellent overview of the field and future directions of research. Over the last decade the field of terahertz spectroscopy has developed into one of the most rapidly growing fields of spectroscopy with large impact across a wide range of scientific disciplines. Due to substantial advances in femtosecond laser technology, terahertz time-domain spectroscopy (THz-TDS) has established itself as the dominant spectroscopic technique for experimental scientists interested in measurements in this frequency range. In solids and liquids terahertz radiation is at resonance with both phonon modes and hydrogen bonding modes which makes it an ideal tool to study the interaction between molecules in a unique way, thus opening a wealth of opportunities for research in physics, chemistry, biology, materials science and pharmaceuticals. This book provides an easy access to scientists, engineers and students alike who want to understand the theory and

applications of modern terahertz spectroscopy.

Analyzing the Physics of Radio Telescopes and Radio Astronomy

Springer Science & Business Media

Lists citations with abstracts for aerospace related reports obtained from world wide sources and announces documents that have recently been entered into the NASA Scientific and Technical Information Database.

Scientific and Technical Aerospace Reports John Wiley & Sons

Techniques based on the method of modal expansions, the Rayleigh-Stevenson expansion in inverse powers of the wavelength, and also the method of moments solution of integral equations are essentially restricted to the analysis of electromagnetic radiating structures which are small in terms of the wavelength. It therefore becomes necessary to employ approximations based on "high-frequency techniques" for performing an efficient analysis of electromagnetic radiating systems that are large in terms of the wavelength. One of the most versatile and useful high-frequency techniques is the geometrical theory of diffraction (GTD), which was developed around 1951 by J. B. Keller [1,2,3]. A class of diffracted rays are introduced systematically in the GTD via a generalization of the concepts of classical geometrical optics (GO). According to the GTD these diffracted rays exist in addition to the usual incident, reflected, and transmitted rays of GO. The diffracted rays in the GTD originate from certain "localized" regions on the surface of a radiating structure, such as at discontinuities in the geometrical and electrical properties of a surface, and at points of grazing incidence on a smooth convex surface as illustrated in Fig. 1. In particular, the

diffracted rays can enter into the GO shadow as well as the lit regions. Consequently, the diffracted rays entirely account for the fields in the shadow region where the GO rays cannot exist.

Engineering Applications of the Modulated Scatterer Technique

ScholarlyEditions

Spend less time setting up complex antenna design problems and improve the accuracy of your results with this practical new book and software package. It shows you how to combine physical optics modeling techniques with the free space dyadic Green's function to quickly and easily calculate antenna patterns and diffraction from nearby objects, letting your PC do the specialized math for you.

Sparse Phased Array Antennas: Theory and Applications Artech House

ANTENNA AND EM MODELING WITH MATLAB ANTENNA TOOLBOX™ An essential text to MATLAB Antenna Toolbox™ as accessible and easy-to-use full-wave antenna modeling tool Antenna and EM Modeling with MATLAB Antenna Toolbox™ is a textbook on antennas intended for a one semester course. The core philosophy is to introduce the key antenna concepts and follow them up with full-wave modeling and optimization in the MATLAB Antenna Toolbox™. Such an approach will enable immediate testing of theoretical concepts by experimenting in software. It also provides the direct path to research work. The fundamental families of antennas — dipoles, loops, patches, and traveling wave antennas — are discussed in detail, together with the respective antenna arrays. Using antenna parameters such as impedance, reflection coefficient, efficiency, directivity, and gain, the reader is

introduced to the different ways of understanding the performance of an antenna. Written for senior undergraduates, graduates as well as RF/Antenna engineers, Antenna and EM Modeling with Antenna Toolbox™ is a resource that: Provides 14 video assisted laboratories on using Antenna Toolbox™ Includes approximately 50 real-world examples in antenna and array design Offers approximately 200 homework problems Provides multiple ready-to-use standalone MATLAB® scripts

Electromagnetics and Antenna

Technology Artech House

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 Marsmissions of NASA The book covers all important topics of modern antenna designfor communications Numerical methods will be included but only as much as areneeded for practical applications

Adaptive Array Measurements in Communications Springer Science & Business Media

This comprehensive handbook provides readers with a single-source reference to the theoretical fundamentals, physical mechanisms and principles of operation of all known microwave devices and various radars. The author discusses proven methods of computation and design development, process, schematic, schematic-technical and construction peculiarities of each breed of the microwave devices, as well as the most popular and original technical solutions for radars. Coverage also includes the history of creation of the most widely used radars, as well as guidelines for their potential upgrading. Offers readers a comprehensive,

systematized view of all contemporary knowledge, acquired during the last 20 years, on radars and related disciplines; Provides a single-source reference on the physical mechanisms and principles of operation of the basic components of radio location devices, including theoretical aspects of designing the necessary, high-efficiency electronic devices and systems, as well as key, practical methods of computation and design; Presents complex topics using simple language, minimizing mathematics.

Multiband Integrated Antennas for 4G Terminals CRC Press

One of the most damaging factors associated with any radio communication system is the effect of undesirable or interference signals. This innovative new book gives you the knowledge you need to ensure your adaptive array system is protecting your communication links to the fullest. It presents concepts and procedures that help you realize the maximum processing capabilities of a given system, choose the right system for a specific application, and identify precautionary steps to avoid adverse effects.

Microwave Journal Cambridge University Press

This is the first textbook that contains a holistic treatment of antennas both for traditional antennas mounted on masts (Line-of-Sight antenna systems) and for small antennas used on modern wireless devices such as smart phones being subject to signal variations (fading) due to multipath propagation. The focus is on characterization, as well as describing classical antennas by modern complex vector theory - thereby linking together many disciplines such as electromagnetic theory, classical

antenna theory, wave propagation, and antenna system performance. Overall, this book represents a rethinking of the way basic antenna theory is presented. The book contains many references to important old and new papers and books on the analysis and design of the most useful antenna types, for the most interested readers.

Modern Antennas Artech House

The move toward worldwide wireless communications continues at a remarkable pace, and the antenna element of the technology is crucial to its success. With contributions from more than 30 international experts, the Handbook of Antennas in Wireless Communications brings together all of the latest research and results to provide engineering professionals and students with a one-stop reference on the theory, technologies, and applications for indoor, hand-held, mobile, and satellite systems. Beginning with an introduction to wireless communications systems, it offers an in-depth treatment of propagation prediction and fading channels. It then explores antenna technology with discussion of antenna design methods and the various antennas in current use or development for base stations, hand held devices, satellite communications, and shaping beams. The discussions then move to smart antennas and phased array technology, including details on array theory and beamforming techniques. Space diversity, direction-of-arrival estimation, source tracking, and blind source separation methods are addressed, as are the implementation of smart antennas and the results of field trials of systems using smart antennas implemented. Finally, the hot media topic of the safety of mobile phones receives due attention, including details

of how the human body interacts with the electromagnetic fields of these devices. Its logical development and extensive range of diagrams, figures, and photographs make this handbook easy to follow and provide a clear understanding of design techniques and the performance of finished products. Its unique, comprehensive coverage written by top experts in their fields promises to make the Handbook of Antennas in Wireless Communications the standard reference for the field.

Effects of Random Surface Errors on the Performance of Paraboloidal Reflectors Artech House

Due to the spectacular growth of electronic systems and the steady demand for new services with increased functionality, the development of more efficient measurement techniques has become of paramount importance. This practical resource details the cutting-edge Modulated Scatterer Technique, which offers a low-invasive and rapid method for testing and measuring systems and equipment used in a wide range of electronic engineering applications. Extensively referenced with 125 illustrations and 100 equations.

Modern Electromagnetic Scattering Theory with Applications Artech House Publishers

This new resource covers the latest developments in computational electromagnetic methods, with emphasis on cutting-edge applications. This book is designed to extend existing literature to the latest development in computational electromagnetic methods, which are of interest to readers in both academic and industrial areas. The topics include advanced techniques in MoM, FEM and FDTD, spectral domain method, GPU and Phi hardware acceleration, metamaterials, frequency

and time domain integral equations, and statistics methods in bio-electromagnetics.

Radio Wave Propagation and Channel Modeling for Earth-Space Systems Artech House

This book details the ideas underlying geometrical theory of diffraction (GTD) along with its relationships with other EM theories.

Optical Antennas Artech House

"This book cuts through the confusion and controversy about whether modern economics has succeeded or failed"-- Provided by publisher.

Handbook of Antennas in Wireless Communications IET

"Presenting information typically not found in other books, the authors explore the numerous advantages of these antennas - including high-speed signal acquisition, fixed input impedance, low loss, and small footprint. Professionals find practical design examples, strategies, and optimization methods for designing economical switched parasitic antennas for applications such as direction finding and multibeam communications systems. Cutting-edge technologies and applications such as MEMs RF switches are also discussed."--Jacket.

Antenna Handbook John Wiley & Sons

The most up-to-date, comprehensive treatment of classical and modern antennas and their related technologies Modern Antenna Handbook represents the most current and complete thinking in the field of antennas. The handbook is edited by one of the most recognizable, prominent, and prolific authors, educators, and researchers on antennas and electromagnetics. Each chapter is authored by one or more leading international experts and includes coverage of current and future antenna-

related technology. The information is of a practical nature and is intended to be useful for researchers as well as practicing engineers. From the fundamental parameters of antennas to antennas for mobile wireless communications and medical applications, Modern Antenna Handbook covers everything professional engineers, consultants, researchers, and students need to know about the recent

developments and the future direction of this fast-paced field. In addition to antenna topics, the handbook also covers modern technologies such as metamaterials, microelectromechanical systems (MEMS), frequency selective surfaces (FSS), and radar cross sections (RCS) and their applications to antennas, while five chapters are devoted to advanced numerical/computational methods targeted primarily for the analysis and design of antennas.