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Fundamentals of electromagnetics with engineering applications Stuart M. Wentworth 2005

Principles of Electromagnetic Waves and Materials

Dikshitulu K. Kalluri 2017-11-14 This book focuses primarily on senior undergraduates and graduates in Electromagnetics Waves and Materials courses. The book takes an integrative approach to the subject of electromagnetics by supplementing quintessential "old school" information and methods with instruction in the use of new commercial software such as MATLAB. Homework problems, PowerPoint slides, an instructor's manual, a solutions manual, MATLAB downloads, quizzes, and suggested examination problems are included. Revised throughout, this new edition includes two key new chapters on artificial electromagnetic materials and electromagnetics of moving media.

Engineering Electromagnetics and Waves Umran S. Inan 2015-03-19 This is the eBook of the printed book and may not include any media, website access codes, or print supplements that may come packaged with the bound book. Engineering Electromagnetics and Waves is designed for upper-division college and university engineering students, for those who wish to learn the subject through self-study, and for practicing engineers who need an up-to-date reference text. The student using this text is assumed to have completed typical lower-division courses in physics and mathematics as well as a first course on electrical engineering circuits. This book provides engineering students with a solid grasp of electromagnetic fundamentals and electromagnetic waves by emphasizing physical understanding and practical applications. The topical organization of the text starts with an initial exposure to transmission lines and transients on high-speed distributed circuits, naturally bridging electrical circuits and electromagnetics. Teaching and Learning Experience This program will provide a better teaching and learning experience—for you and your students. It provides: Modern Chapter Organization Emphasis on Physical Understanding Detailed Examples, Selected Application Examples, and Abundant Illustrations Numerous End-of-chapter Problems, Emphasizing Selected Practical Applications Historical Notes on the Great Scientific Pioneers Emphasis on Clarity without Sacrificing Rigor and Completeness Hundreds of Footnotes Providing Physical Insight, Leads for Further Reading, and Discussion of Subtle and Interesting Concepts and Applications

Applied Mechanics Reviews 1975

Electromagnetics of Time Varying Complex Media

Dikshitulu K. Kalluri 2018-09-03 Completely revised and updated to reflect recent advances in the fields of materials science and electromagnetics, *Electromagnetics of Time Varying Complex Media, Second Edition* provides a comprehensive examination of current topics of interest in the research community—including theory, numerical simulation, application, and experimental work. Written by a world leader in the research of frequency transformation in a time-varying magnetoplasma medium, the new edition of this bestselling reference discusses how to apply a time-varying medium to design a frequency and polarization transformer. This authoritative resource remains the only electromagnetic book to cover time-varying anisotropic media, Frequency and Polarization Transformer based on a switched magnetoplasma medium in a cavity, and FDTD numerical simulation for time-varying complex medium. Providing a primer on the theory of using magnetoplasmas for the

coherent generation of tunable radiation, early chapters use a mathematical model with one kind of complexity—eliminating the need for high-level mathematics. Using plasma as the basic medium to illustrate various aspects of the transformation of an electromagnetic wave by a complex medium, the text highlights the major effects of each kind of complexity in the medium properties. This significantly expanded edition includes: Three new parts: (a) Numerical Simulation: FDTD Solution, (b) Application: Frequency and Polarization Transformer, and (c) Experiments A slightly enhanced version of the entire first edition, plus 70% new material Reprints of papers previously published by the author—providing researchers with complete access to the subject The text provides the understanding of research techniques useful in electro-optics, plasma science and engineering, microwave engineering, and solid state devices. This complete resource supplies an accessible treatment of the effect of time-varying parameters in conjunction with one or more additional kinds of complexities in the properties of particular mediums.

Conformal Mapping Roland Schinzingler 2012-04-30 This volume introduces the basic mathematical tools behind conformal mapping, describes advances in technique, and illustrates a broad range of applications. 1991 edition. Includes 247 figures and 38 tables.

Radar and Laser Cross Section Engineering David C. Jenn 2005 There have been many new developments in the ten years since the first edition of *Radar and Laser Cross Section Engineering* was published. Stealth technology is now an important consideration in the design of all types of platforms. The second edition includes a more extensive introduction that covers the important aspects of stealth technology and the unique tradeoffs involved in stealth design. Prediction, reduction, and measurement of electromagnetic scattering from complex three-dimensional targets remains the primary emphasis of this text, developed by the author from courses taught at the Naval Postgraduate School. New topics on computational methods like the finite element method and the finite integration technique are covered, as well as new areas in the application of radar absorbing material and artificial metamaterials. Matlab [registered] software, homework problems, and a solution manual (available to instructors) supplement the text. Written as an instructional text, this book is recommended for upper-level undergraduate and graduate students. introduction to the physics and mathematics of radar cross section in order to better understand the interdisciplinary aspects of stealth. Matlab is a registered trademark of The MathWorks, Inc.

Sustainable Process Engineering Andrzej Benedykt Koltuniewicz 2014-08-19 The vital need for alternative resources and reaction routes, environmentally friendly and economically feasible industrial chemical processes has become a ubiquitous reality. This very timely introductory text covers new materials, processes and industry sectors: nanotechnology, microreactors, membrane separations, hybrid processes, clean technologies, energy savings and safe production of energy, renewables and biotechnology. Some completely new processes for the solid-liquid systems are also discussed in detail, thus creating new opportunities of sustainable development not only in industrial practice. **Numerical Electromagnetics** Umran S. Inan 2011-04-07 Beginning with the development of finite difference equations, and leading to the complete FDTD algorithm, this is a coherent introduction to the FDTD method (the

method of choice for modeling Maxwell's equations). It provides students and professional engineers with everything they need to know to begin writing FDTD simulations from scratch and to develop a thorough understanding of the inner workings of commercial FDTD software. Stability, numerical dispersion, sources and boundary conditions are all discussed in detail, as are dispersive and anisotropic materials. A comparative introduction of the finite volume and finite element methods is also provided. All concepts are introduced from first principles, so no prior modeling experience is required, and they are made easier to understand through numerous illustrative examples and the inclusion of both intuitive explanations and mathematical derivations.

Journal of Southeast University 2006

Cumulative Book Index 1969

Principles of Photonic Integrated Circuits Richard Osgood jr. 2021-05-21 This graduate-level textbook presents the principles, design methods, simulation, and materials of photonic circuits. It provides state-of-the-art examples of silicon, indium phosphide, and other materials frequently used in these circuits, and includes a thorough discussion of all major types of devices. In addition, the book discusses the integrated photonic circuits (chips) that are currently increasingly employed on the international technology market in connection with short-range and long-range data communication. Featuring references from the latest research in the field, as well as chapter-end summaries and problem sets, *Principles of Photonic Integrated Circuits* is ideal for any graduate-level course on integrated photonics, or optical technology and communication.

Nature-Inspired Computing Nazmul H. Siddique 2017-05-19 *Nature-Inspired Computing: Physics and Chemistry-Based Algorithms* provides a comprehensive introduction to the methodologies and algorithms in nature-inspired computing, with an emphasis on applications to real-life engineering problems. The research interest for Nature-inspired Computing has grown considerably exploring different phenomena observed in nature and basic principles of physics, chemistry, and biology. The discipline has reached a mature stage and the field has been well-established. This endeavour is another attempt at investigation into various computational schemes inspired from nature, which are presented in this book with the development of a suitable framework and industrial applications. Designed for senior undergraduates, postgraduates, research students, and professionals, the book is written at a comprehensible level for students who have some basic knowledge of calculus and differential equations, and some exposure to optimization theory. Due to the focus on search and optimization, the book is also appropriate for electrical, control, civil, industrial and manufacturing engineering, business, and economics students, as well as those in computer and information sciences. With the mathematical and programming references and applications in each chapter, the book is self-contained, and can also serve as a reference for researchers and scientists in the fields of system science, natural computing, and optimization.

Planar Microwave Engineering Thomas H. Lee 2004-08-30

Sample Text

Electromagnetics for Engineering Students Part I Sameir M. Ali Hamed 2017-09-20 *Electromagnetics for Engineering Students* starts with an introduction to vector analysis and progressive chapters provide readers with information about dielectric materials, electrostatic and magnetostatic fields, as well as wave propagation in different situations. Each chapter is supported by many illustrative examples and solved problems which serve to explain the principles of the topics and enhance the knowledge of students. In addition to the coverage of classical topics in electromagnetics, the book explains advanced concepts and topics such as the application of multi-pole expansion for scalar and vector potentials, an in depth treatment for the topic of the scalar potential including the boundary-value problems in cylindrical and spherical coordinates systems, metamaterials, artificial magnetic conductors and the concept of negative refractive index. Key features of this textbook include: • detailed and easy-to follow presentation of mathematical analyses and problems • a total of 681 problems (162 illustrative examples, 88 solved problems, and 431 end of chapter problems) • an

appendix of mathematical formulae and functions *Electromagnetics for Engineering Students* is an ideal textbook for first and second year engineering students who are learning about electromagnetism and related mathematical theorems.

Computational Problems for Physics Rubin H. Landau 2018-05-30 Our future scientists and professionals must be conversant in computational techniques. In order to facilitate integration of computer methods into existing physics courses, this textbook offers a large number of worked examples and problems with fully guided solutions in Python as well as other languages (Mathematica, Java, C, Fortran, and Maple). It's also intended as a self-study guide for learning how to use computer methods in physics. The authors include an introductory chapter on numerical tools and indication of computational and physics difficulty level for each problem. Readers also benefit from the following features: • Detailed explanations and solutions in various coding languages. • Problems are ranked based on computational and physics difficulty. • Basics of numerical methods covered in an introductory chapter. • Programming guidance via flowcharts and pseudocode. Rubin Landau is a Distinguished Professor Emeritus in the Department of Physics at Oregon State University in Corvallis and a Fellow of the American Physical Society (Division of Computational Physics). Manuel Jose Paez-Mejia is a Professor of Physics at Universidad de Antioquia in Medellín, Colombia.

Engineering Electromagnetics Umran S. Inan 1999 *Engineering Electromagnetics* provides a solid foundation in electromagnetics fundamentals by emphasizing physical understanding and practical applications.

Electromagnetics, with its requirements for abstract thinking, can prove challenging for students. The authors' physical and intuitive approach has produced a book that will inspire enthusiasm and interest for the material. Benefiting from a review of electromagnetic curricula at several schools and repeated use in classroom settings, this text presents material in a rigorous yet readable manner. **FEATURES/BENEFITS** Starts with coverage of transmission lines before addressing fundamental laws, providing a smooth transition from circuits to electromagnetics. Emphasizes physical understanding and the experimental bases of fundamental laws. Offers detailed examples and numerous practical end-of-chapter problems, with each problem's topical content clearly identified. Provides historical notes, abbreviated biographies, and hundreds of footnotes to motivate interest and enhance understanding. Back Cover Benefiting from a review of electromagnetics curricula at several schools and repeated use in classroom settings, this text presents material in a comprehensive and practical yet readable manner. **Features:** Starts with coverage of transmission lines before addressing fundamental laws, providing a smooth transition from circuits to electromagnetics. Emphasizes physical understanding and the experimental bases of fundamental laws. Offers detailed examples and numerous practical end-of-chapter problems, with each problem's topical content clearly identified. Provides historical notes, abbreviated biographies, and hundreds of footnotes to motivate interest and enhance understanding.

Physics Briefs 1991

Electromagnetic Computation Methods for Lightning Surge Protection Studies Yoshihiro Baba 2016-02-02

Presents current research into electromagnetic computation theories with particular emphasis on Finite-Difference Time-Domain Method This book is the first to consolidate current research and to examine the theories of electromagnetic computation methods in relation to lightning surge protection. The authors introduce and compare existing electromagnetic computation methods such as the method of moments (MOM), the partial element equivalent circuit (PEEC), the finite element method (FEM), the transmission-line modeling (TLM) method, and the finite-difference time-domain (FDTD) method. The application of FDTD method to lightning protection studies is a topic that has matured through many practical applications in the past decade, and the authors explain the derivation of Maxwell's equations required by the FDTD, and modeling of various electrical components needed in computing lightning electromagnetic fields and surges with the FDTD method. The book describes the application of FDTD method to current and emerging problems of lightning surge protection of continuously more complex installations, particularly in

critical infrastructures of energy and information, such as overhead power lines, air-insulated sub-stations, wind turbine generator towers and telecommunication towers. Both authors are internationally recognized experts in the area of lightning study and this is the first book to present current research in lightning surge protection. Examines in detail why lightning surges occur and what can be done to protect against them. Includes theories of electromagnetic computation methods and many examples of their application. Accompanied by a sample printed program based on the finite-difference time-domain (FDTD) method written in C++ program.

Modern Electrodynamics Andrew Zangwill 2013 An engaging writing style and a strong focus on the physics make this graduate-level textbook a must-have for electromagnetism students.

Stanford Bulletin 2006

Books in Print 1991

Electromagnetics through the Finite Element Method José Roberto Cardoso 2016-10-03 Shelving Guide: Electrical Engineering Since the 1980s more than 100 books on the finite element method have been published, making this numerical method the most popular. The features of the finite element method gained worldwide popularity due to its flexibility for simulating not only any kind of physical phenomenon described by a set of differential equations, but also for the possibility of simulating non-linearity and time-dependent studies. Although a number of high-quality books cover all subjects in engineering problems, none of them seem to make this method simpler and easier to understand. This book was written with the goal of simplifying the mathematics of the finite element method for electromagnetic students and professionals relying on the finite element method for solving design problems. Filling a gap in existing literature that often uses complex mathematical formulas, *Electromagnetics through the Finite Element Method* presents a new mathematical approach based on only direct integration of Maxwell's equation. This book makes an original, scholarly contribution to our current understanding of this important numerical method.

Computational Acoustics David R. Bergman 2018-02-27

Covers the theory and practice of innovative new approaches to modelling acoustic propagation. There are as many types of acoustic phenomena as there are media, from longitudinal pressure waves in a fluid to S and P waves in seismology. This text focuses on the application of computational methods to the fields of linear acoustics. Techniques for solving the linear wave equation in homogeneous medium are explored in depth, as are techniques for modelling wave propagation in inhomogeneous and anisotropic fluid medium from a source and scattering from objects. Written for both students and working engineers, this book features a unique pedagogical approach to acquainting readers with innovative numerical methods for developing computational procedures for solving problems in acoustics and for understanding linear acoustic propagation and scattering. Chapters follow a consistent format, beginning with a presentation of modelling paradigms, followed by descriptions of numerical methods appropriate to each paradigm. Along the way important implementation issues are discussed and examples are provided, as are exercises and references to suggested readings. Classic methods and approaches are explored throughout, along with comments on modern advances and novel modeling approaches. Bridges the gap between theory and implementation, and features examples illustrating the use of the methods described. Provides complete derivations and explanations of recent research trends in order to provide readers with a deep understanding of novel techniques and methods. Features a systematic presentation appropriate for advanced students as well as working professionals. References, suggested reading and fully worked problems are provided throughout. An indispensable learning tool/reference that readers will find useful throughout their academic and professional careers, this book is both a supplemental text for graduate students in physics and engineering interested in acoustics and a valuable working resource for engineers in an array of industries, including defense, medicine, architecture, civil engineering, aerospace, biotech, and more.

Engineering Finite Element Analysis Ramana Pidaparti 2022-06-01 Finite element analysis is a basic foundational topic that all engineering majors need to understand in order for them to be productive

engineering analysts for a variety of industries. This book provides an introductory treatment of finite element analysis with an overview of the various fundamental concepts and applications. It introduces the basic concepts of the finite element method and examples of analysis using systematic methodologies based on ANSYS software. Finite element concepts involving one-dimensional problems are discussed in detail so the reader can thoroughly comprehend the concepts and progressively build upon those problems to aid in analyzing two-dimensional and three-dimensional problems. Moreover, the analysis processes are listed step-by-step for easy implementation, and an overview of two-dimensional and three-dimensional concepts and problems is also provided. In addition, multiphysics problems involving coupled analysis examples are presented to further illustrate the broad applicability of the finite element method for a variety of engineering disciplines. The book is primarily targeted toward undergraduate students majoring in civil, biomedical, mechanical, electrical, and aerospace engineering and any other fields involving aspects of engineering analysis.

Principles of Plasma Physics for Engineers and Scientists Umran S. Inan 2010-12-02 This unified introduction provides the tools and techniques needed to analyze plasmas and connects plasma phenomena to other fields of study. Combining mathematical rigor with qualitative explanations, and linking theory to practice with example problems, this is a perfect textbook for senior undergraduate and graduate students taking one-semester introductory plasma physics courses. For the first time, material is presented in the context of unifying principles, illustrated using organizational charts, and structured in a successive progression from single particle motion, to kinetic theory and average values, through to collective phenomena of waves in plasma. This provides students with a stronger understanding of the topics covered, their interconnections, and when different types of plasma models are applicable. Furthermore, mathematical derivations are rigorous, yet concise, so physical understanding is not lost in lengthy mathematical treatments. Worked examples illustrate practical applications of theory and students can test their new knowledge with 90 end-of-chapter problems.

Computational Electromagnetics with MATLAB, Fourth Edition Matthew N.O. Sadiku 2018-07-20 This fourth edition of the text reflects the continuing increase in awareness and use of computational electromagnetics and incorporates advances and refinements made in recent years. Most notable among these are the improvements made to the standard algorithm for the finite-difference time-domain (FDTD) method and treatment of absorbing boundary conditions in FDTD, finite element, and transmission-line-matrix methods. It teaches the readers how to pose, numerically analyze, and solve EM problems, to give them the ability to expand their problem-solving skills using a variety of methods, and to prepare them for research in electromagnetism. Includes new homework problems in each chapter. Each chapter is updated with the current trends in CEM. Adds a new appendix on CEM codes, which covers commercial and free codes. Provides updated MATLAB code.

Electromagnetic Waves Umran S. Inan 2000 For courses in *Electromagnetic Fields & Waves*. *Electromagnetic Waves* continues the applied approach used in the authors' successful *Engineering Electromagnetics*. The second book is appropriate for a second course in *Electromagnetics* that covers the topic of waves and the application of Maxwell's equations to electromagnetic events.

The Advanced Materials Revolution Sanford L. Moskowitz 2014-05-19 A comprehensive treatment of the economic and global impacts of the advanced materials industry. This book represents the first comprehensive investigation of the emerging international advanced materials industry and its profound impact on the world's industrialized and newly emerging economies. It examines the ways in which science, technology, business, and markets have converged to produce one of the most dynamic industries in recent years—one that is increasingly controlling global technological progress as a whole. From the unique vantage point of this crucial industry, this book illuminates the major differences in how the world's two economic superpowers—the United States and the European Union—perceive and carry forward the technology creation process and what these differences mean for

achieving national and regional competitive advantage in the twenty-first century. It draws upon a rich body of source materials spanning from 1970 through 2007 as well as actual in-depth interviews and internal corporate and governmental documentation. The book is organized thematically, with each section highlighting critical perspectives on the rise of the international advanced materials industry and its impact on the relative competitiveness of the United States and the European Union. It concludes with a discussion of how what we have learned about advanced materials in the West tells us of the future competitive power of an emerging Asia. The Advanced Materials Revolution is essential reading for researchers, executives, and managers working in the advanced materials and related technological fields, as well as professionals and scholars in the academic, investment, consulting, and government communities. It also serves as a valuable case study textbook for advanced undergraduate and graduate courses in business, management, entrepreneurship, technology studies, chemical and materials engineering, economics, economic history, and regional and economic development.

Wireless Networks Hamid R. Arabnia 2018-02 This volume contains the proceedings of the 2017 International Conference on Wireless Networks (ICWN'17).

Engineering 1892

Scientific and Technical Aerospace Reports 1976

Government Reports Announcements & Index 1995

World Congress on Medical Physics and Biomedical

Engineering 2018 Lenka Lhotska 2018-05-29 This book (vol. 3) presents the proceedings of the IUPESM World Congress on Biomedical Engineering and Medical Physics, a triennially organized joint meeting of medical physicists, biomedical engineers and adjoining health care professionals. Besides the purely scientific and technological topics, the 2018 Congress will also focus on other aspects of professional involvement in health care, such as education and training, accreditation and certification, health technology assessment and patient safety. The IUPESM meeting is an important forum for medical physicists and biomedical engineers in medicine and healthcare learn and share knowledge, and discuss the latest research outcomes and technological advancements as well as new ideas in both medical physics and biomedical engineering field.

Engineering Electromagnetics Nathan Ida 2007-08-01 This text not only provides students with a good theoretical understanding of electromagnetic field equations but it also treats a large number of applications. No topic is presented unless it is directly applicable to engineering design or unless it is needed for the understanding of another topic. Included in this new edition are more than 400 examples and exercises, exercising every topic in the book. Also to be found are 600 end-of-chapter problems, many of them applications or simplified applications. A new chapter introducing numerical methods into the electromagnetic curriculum discusses the finite element, finite difference and moment methods.

Zwarte gaten blues Janna Levin 2016-10-05 Zwarte gaten zijn donker, de naam zegt het al. Als ze botsen, is daar niets van te zien. Toch komt bij een botsing van zwarte gaten een onvoorstelbaar grote hoeveelheid kracht vrij. Einstein voorspelde, precies een eeuw geleden, dat je zou moeten kunnen zien dat ruimte en tijd een beetje veranderen wanneer zo'n botsing plaatsvindt. Een 'zwaarte krachtgolf', die veroorzaakt dat tijd en ruimte niet meer constant zijn. Maar hoe observeer je zo iets? Wetenschappers zijn er tientallen jaren mee bezig geweest, en Janna Levin volgde hen op de voet: van de eerste tekeningen tot aan meetapparatuur van 40 kilometer groot, midden in de woestijn. De apparatuur werd aangezet. En vanaf dat moment was het afwachten.

Zou er iets gebeuren? Had Einstein gelijk? Iedereen dacht dat het jaren zou duren voordat de eerste resultaten binnenkwamen. Maar nog geen twee weken later was er iets vreemds te zien...

Engineering Electromagnetics and Waves Umran S. Inan 2014-12-04 Engineering Electromagnetics and Waves is designed for upper-division college and university engineering students, for those who wish to learn the subject through self-study, and for practicing engineers who need an up-to-date reference text. The student using this text is assumed to have completed typical lower-division courses in physics and mathematics as well as a first course on electrical engineering circuits. This book provides engineering students with a solid grasp of electromagnetic fundamentals and electromagnetic waves by emphasizing physical understanding and practical applications. The topical organization of the text starts with an initial exposure to transmission lines and transients on high-speed distributed circuits, naturally bridging electrical circuits and electromagnetics. Teaching and Learning Experience This program will provide a better teaching and learning experience—for you and your students. It provides: Modern Chapter Organization Emphasis on Physical Understanding Detailed Examples, Selected Application Examples, and Abundant Illustrations Numerous End-of-chapter Problems, Emphasizing Selected Practical Applications Historical Notes on the Great Scientific Pioneers Emphasis on Clarity without Sacrificing Rigor and Completeness Hundreds of Footnotes Providing Physical Insight, Leads for Further Reading, and Discussion of Subtle and Interesting Concepts and Applications

Use of Microwave-resonant Slot Antennas to Detect Protein Conformational Change Kimberly M. Taylor 2005 *Book Review Index* 2003 Vols. 8-10 of the 1965-1984 master cumulation constitute a title index.

Electromagnetic Modeling and Simulation Levent Sevgi 2014-03-13 This unique book presents simple, easy-to-use, but effective short codes as well as virtual tools that can be used by electrical, electronic, communication, and computer engineers in a broad range of electrical engineering problems. Electromagnetic modeling is essential to the design and modeling of antenna, radar, satellite, medical imaging, and other applications. In this book, author Levent Sevgi explains techniques for solving real-time complex physical problems using MATLAB-based short scripts and comprehensive virtual tools. Unique in coverage and tutorial approach, *Electromagnetic Modeling and Simulation* covers fundamental analytical and numerical models that are widely used in teaching, research, and engineering designs—including mode and ray summation approaches with the canonical 2D nonpenetrable parallel plate waveguide as well as FDTD, MoM, and SSPE scripts. The book also establishes an intelligent balance among the essentials of EMMODSIM: The Problem (the physics), The Theory and Models (mathematical background and analytical solutions), and The Simulations (code development plus validation, verification, and calibration). Classroom tested in graduate-level and short courses, *Electromagnetic Modeling and Simulation*: Clarifies concepts through numerous worked problems and quizzes provided throughout the book. Features valuable MATLAB-based, user-friendly, effective engineering and research virtual design tools. Includes sample scenarios and video clips recorded during characteristic simulations that visually impact learning—available on wiley.com. Provides readers with their first steps in EMMODSIM as well as tools for medium and high-level code developers and users. *Electromagnetic Modeling and Simulation* thoroughly covers the physics, mathematical background, analytical solutions, and code development of electromagnetic modeling, making it an ideal resource for electrical engineers and researchers.