# Unlock the Secrets of Time Domain Numerical Methods for Solving Electromagnetic Phenomena

The study of electromagnetic phenomena is crucial in understanding a wide range of scientific and engineering applications, including antenna design, microwave circuits, and electromagnetic compatibility.

Time domain numerical methods are powerful computational techniques that enable engineers and scientists to analyze and solve complex electromagnetic problems by discretizing the problem's governing equations in both space and time domains.
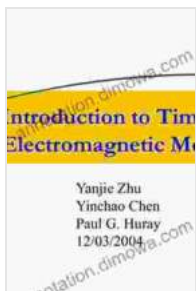
### Introduction to Time-Domain Numerical Methods for Solving Electromagnetic Problems by Michael C. Gemignani

★★★★☆ 4.5 out of 5

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| Language | : English |
| File size | : 1095 KB |
| Text-to-Speech | : Enabled |
| Screen Reader | : Supported |
| Print length | : 600 pages |
| Hardcover | : 174 pages |
| Item Weight | : 1.03 pounds |
| Dimensions | : 7.7 x 0.4 x 9.4 inches |

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This comprehensive book, **to Time Domain Numerical Methods for Solving Electromagnetic**, provides a comprehensive to the theory,

implementation, and applications of time domain numerical methods for solving electromagnetic problems.

**Key Features**

- In-depth coverage of the finite-difference time-domain (FDTD) method, one of the most widely used time domain numerical methods for solving electromagnetic problems.

- Detailed explanations of the finite-element time-domain (FETD) method, a powerful technique for solving complex electromagnetic problems in complex geometries.

- Exploration of the transmission line matrix (TLM) method, a versatile technique for modeling electromagnetic wave propagation in transmission lines and other waveguide structures.

- Presentation of the method of moments (MoM),an integral equation-based technique for solving electromagnetic problems in electrically large structures.

- Discussion of advanced topics such as the auxiliary differential equation (ADE) method, a powerful technique for solving electromagnetic problems in dispersive media.

**Applications**

The applications of time domain numerical methods for solving electromagnetic problems are vast and include:

- Antenna design and analysis

- Microwave circuit design

- Electromagnetic compatibility (EMC)

- Radar and imaging systems

- Computational electromagnetics (CEM)

**Target Audience**

This book is written for:

- Electrical engineers and computer scientists

- Physicists

- Applied mathematicians

- Graduate students in electrical engineering, computer science, and physics

**Why Choose This Book?**

There are many reasons to choose this book as your guide to time domain numerical methods for solving electromagnetic problems:

- **Comprehensive coverage:** This book covers all the major time domain numerical methods used for solving electromagnetic problems, providing a comprehensive overview of the field.

- **Clear explanations:** The book's explanations are clear and concise, making it easy to understand the underlying concepts and algorithms.

- **Practical examples:** The book includes numerous practical examples that illustrate how to apply time domain numerical methods to solve real-world electromagnetic problems.

- **Up-to-date content:** The book includes the latest developments in time domain numerical methods, ensuring that readers are up-to-date on the latest techniques.

- **Excellent references:** The book's extensive references provide readers with a wealth of additional information on the topic.

## About the Authors

The authors of this book are leading experts in the field of time domain numerical methods for solving electromagnetic problems. They have extensive experience in both research and teaching, and they are passionate about sharing their knowledge with others.

**to Time Domain Numerical Methods for Solving Electromagnetic** is an essential resource for anyone who wants to learn about the theory, implementation, and applications of time domain numerical methods for solving electromagnetic problems.

Whether you are a student, a researcher, or an engineer, this book will provide you with the knowledge and skills you need to succeed in this field.
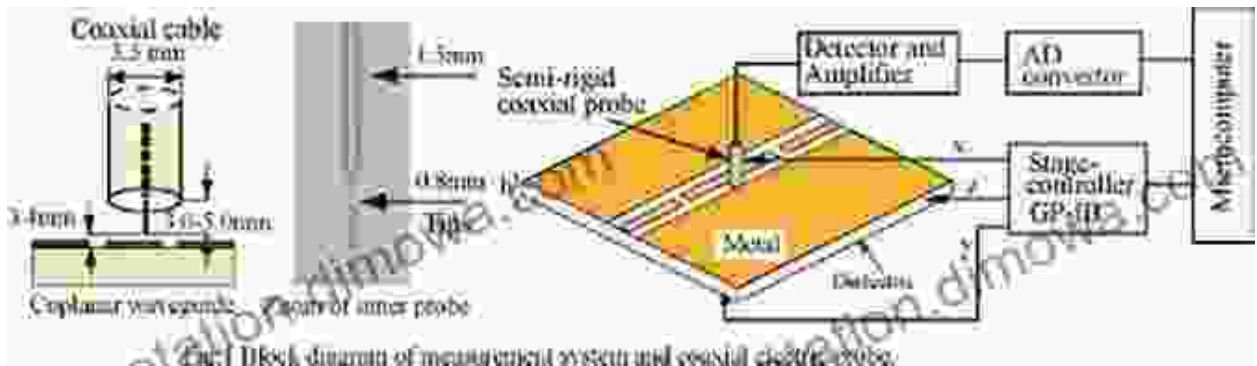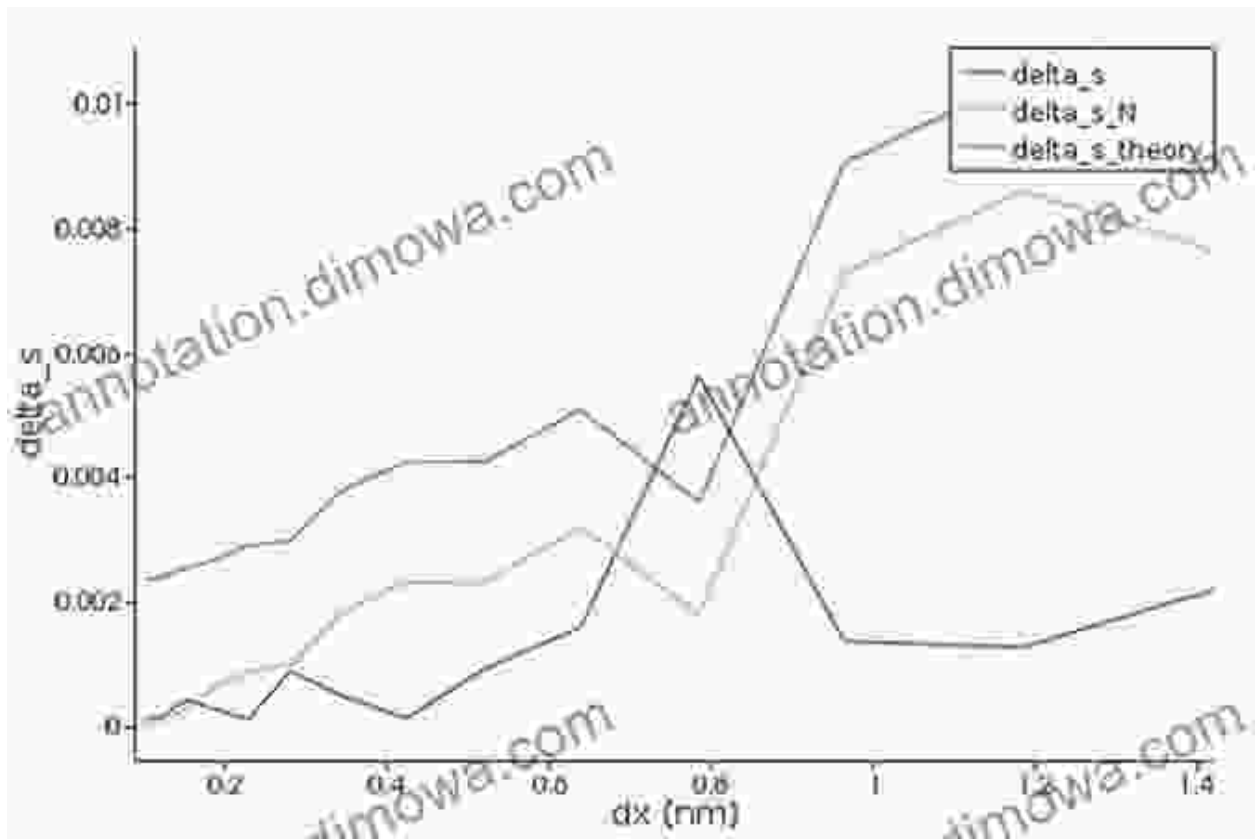
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## Additional Resources

- Website of the book

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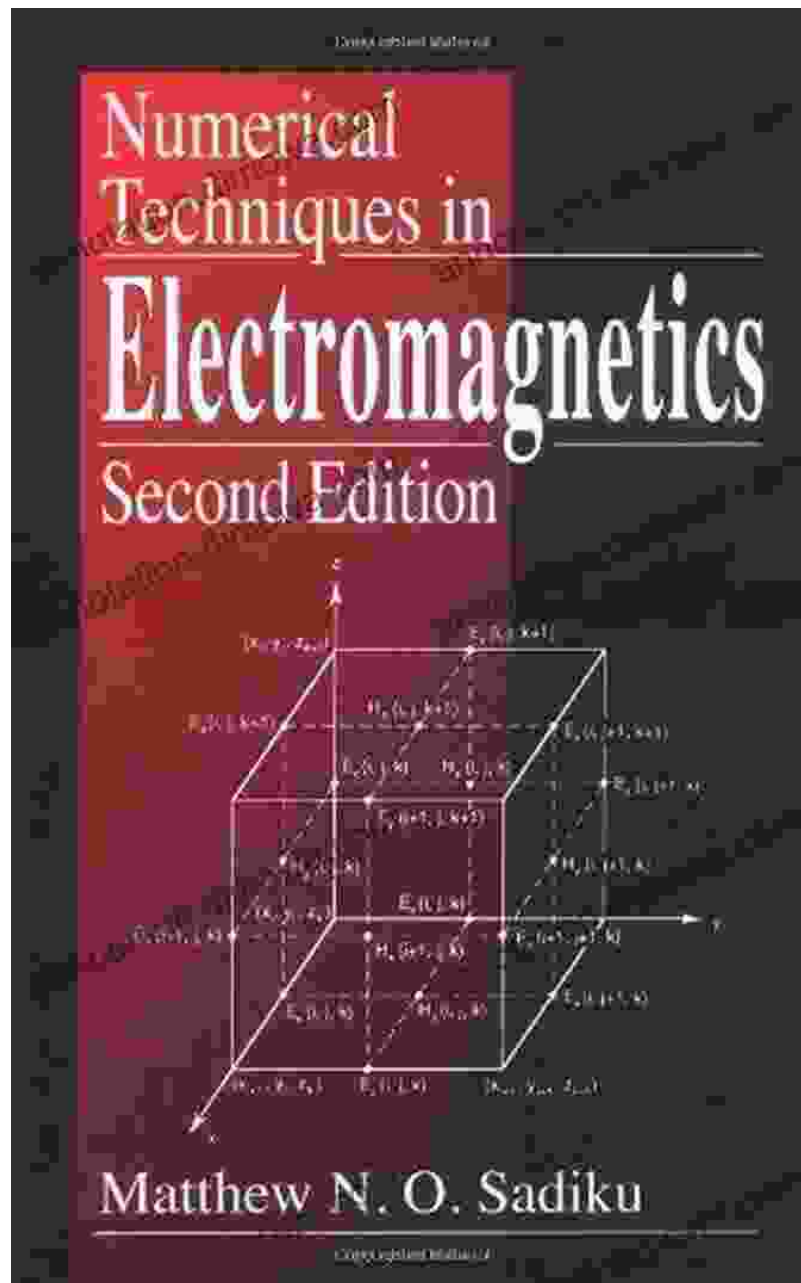
Fig.1 Block diagram of measurement system and coaxial electric probe.

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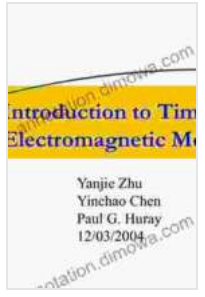
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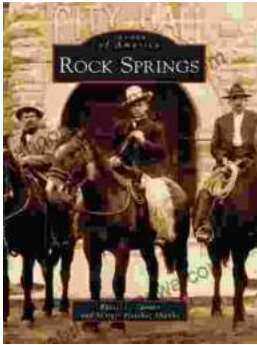
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