Numerical and Asymptotic Techniques in Electromagnetics

Edited by R. Mittra

With Contributions by
F. J. Deadrick   R. F. Harrington   W. A. Imbriale
C. A. Klein   R. G. Kouyoumjian   E. K. Miller
R. Mittra   W. V. T. Rusch

With 112 Figures

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Professor RAJ MITTRA

University of Illinois at Urbana-Champaign, College of Engineering
Department of Electrical Engineering, Electromagnetics Laboratory
Urbana, IL 61801, USA

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Preface

During the past two decades a large number of books have been written on the general subject of electromagnetics. Most of these publications have dealt with the classical approaches to solving electromagnetic boundary value problems. There are only a few notable exceptions to these, for instance, a monograph by HARRINGTON on the application of the moment method for the solution of field problems and a text by MITTRA on computer techniques for solving electromagnetic scattering and radiation problems. Since the appearance of these two books much progress has been made in the areas of computerated electromagnetics and the application of ray-optical techniques in the low-frequency and high-frequency regions, respectively. This book attempts to present a comprehensive description of some of these important recent developments and to illustrate the application of these techniques to a variety of problems of practical interest, e.g., design of dipole arrays and reflector antennas. Almost all of the material appearing in the book is relatively new and has not appeared elsewhere in any other publication except in the form of journal articles. It is hoped that the book will serve to fill the gap that exists in the current literature on numerical and asymptotic techniques in electromagnetics and will be found useful both as a convenient reference and as a practical tool for investigating electromagnetic radiation scattering problems. All of the contributing authors are well known throughout the world for their many contributions on moment methods, numerical aspects of computerated solution, ray-optical techniques and other topics covered in the book and they have made every attempt to present the material in the text in a coherent and easily readable form. It is their fervent hope that the reader will not only find the book useful as a tool for modern electromagnetic analysis and design, but will also enjoy the clarity of presentation of the advanced material discussed in the book.

Finally, the editor (R. M.) would like to thank all of the authors for their excellent cooperation and the publishers for their extremely efficient production schedule.

Urbana, Illinois, January 1975 R. MITTRA

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Contributors

DEADRICK, FREDERICK J.
Lawrence Livermore Laboratory, P.O. Box 808, Livermore, CA 94550, USA

HARRINGTON, ROGER F.
Syracuse University, Electrical Engineering Department, Syracuse, NY 13210, USA

IMBRIALE, WILLIAM A.
TRW Systems Group, One Space Park, Redondo Beach, CA 90278, USA

KLEIN, CHARLES A.
University of Illinois at Urbana-Champaign, College of Engineering, Department of Electrical Engineering, Electromagnetics Laboratory, Urbana, IL 61801, USA

KOUYOUMJIAN, ROBERT G.
The Ohio State University, Department of Electrical Engineering, 2015 Neil Avenue, Columbus, OH 43210, USA

MILLER, EDMUND K.
Lawrence Livermore Laboratory, P.O. Box 808, Livermore, CA 94550, USA

MITTRA, RAJ
University of Illinois at Urbana-Champaign, College of Engineering, Department of Electrical Engineering, Electromagnetics Laboratory, Urbana, IL 61801, USA

RUSCH, WILLARD V. T.
University of Southern California, Department of Electrical Engineering, Los Angeles, CA 90007, USA