PIER 4

Progress In Electromagnetics Research

PIER Progress in Electromagnetics Research
Jin Au Kong, *Chief Editor*
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PREFACE

PIER 4 is a regular volume in the series on PROGRESS IN ELECTROMAGNETICS RESEARCH (PIER) which publishes special volumes addressing specific current research topics as well as regular volumes containing wide ranging topics.

In this volume of PIER 4, eleven chapters are included. Chapter 1 is authored by Dr. R. W. P. King on the topic of radiation efficiency of a vertical electric dipole above a half-space medium. In Chapter 2, microstrip antennas are modelled as a generalized transmission line which is employed to determine the impedance and radiation characteristics of various patch shapes. Chapter 3 addresses the modelling of lossy microstrips with finite thickness by using the spectral domain Green's function to formulate a multiconductor transmission line analysis. In Chapter 4, Dr. Censor presents application-oriented relativistic electrodynamics axiomatically, and Chapter 5 is devoted to the electromagnetic field analysis for electrical machine design.

The propagation of low-frequency electromagnetic waves in the terrestrial environment with special reference to whistler is investigated by Dr. Lu in Chapter 6. In Chapter 7, a neural network method is devised for high range resolution target classification, and in Chapter 8 the Fourier-Bessel expansion method is developed for reflectors with elliptical apertures. With the conjugate-gradient and the fast Fourier transform method, Chapter 9 treats the problem of scattering from flat metallic periodic structures. Scattering from a cylinder in the presence of an interface is studied in Chapter 10 with the bymoment method. In Chapter 11, the finite-difference time-domain (FDTD) technique is discussed in relation to the issues of absorbing boundary conditions (ABC), the use of triangular grids, and application to problems involving frequency dispersive materials.

The production and realization of this volume bear the efforts of Anh Lieu, Son V. Nghiem, and Murat E. Veysoglu.

J. A. Kong

Cambridge, Massachusetts
August, 1990

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