
**ELECTROMAGNETIC
WAVES PIERC 03**

**Progress
In
Electromagnetics
Research C**

© 2008 EMW Publishing. All rights reserved.

No part of this publication may be reproduced. Request for permission should be addressed to the Publisher.

All inquiries regarding copyrighted material from this publication, manuscript submission instructions, and subscription orders and price information should be directed to: EMW Publishing, P. O. Box 425517, Kendall Square, Cambridge, Massachusetts 02142, USA.

E-ISSN 1937-8718

**ELECTROMAGNETIC
WAVES PIERC 03**

Progress
In
Electromagnetics
Research C

Chief Editor: J. A. Kong

EMW Publishing
Cambridge, Massachusetts, USA

CONTENTS

DESIGN AND OPTIMIZATION OF PLANAR MULTILAYER ANTIREFLECTION METAMATERIAL COATINGS AT KU BAND UNDER CIRCULARLY POLARIZED OBLIQUE PLANE WAVE INCIDENCE

H. Oraizi and A. Abdolali

1	Introduction.....	1
2	Numerical Procedure	2
3	Optimization by the Combination of MLS, GA and CG	5
4	Materials and Metamaterials for RAMs	5
5	Correct Sign of Wave Number k and Wave Impedance η	6
6	Numerical Examples	7
7	Conclusion	15

NUMERICAL ANALYSIS OF COMBINED FIELD INTEGRAL EQUATION FORMULATIONS FOR ELECTROMAGNETIC SCATTERING BY DIELECTRIC AND COMPOSITE OBJECTS

P. Ylä-Oijala

1	Introduction.....	19
2	Combined Field Integral Equations	21
3	Iteration Convergence of JM-CFIE(α) Formulations	23
4	Permittivity Instability of JM-CFIE(α)	26
5	Stabilizing JM-CFIE(α) Formulations	29
6	Solution Accuracy	34
7	Conclusions	40

NUMERICAL ANALYSIS OF HOMOJUNCTION avalanche photodiodes (APDs)

H. Mokari and M. H. Seyed

1	Introduction.....	45
2	Theory Review	46
3	Results and Discussion	50
4	Conclusion	53

ANALYSIS OF NONLINEAR OSCILLATORS WITH u^n FORCE BY HE'S ENERGY BALANCE METHOD*M. Akbarzade, D. D. Ganji, and H. Pashaei*

1	Introduction.....	57
2	Basic Idea	58
3	Applications.....	59
4	Conclusions	64

**AN ESTIMATE OF INTERFERENCE EFFECT ON
HORIZONTALLY POLARIZED SIGNAL TRANSMISSION
IN THE TROPICAL LOCATIONS: A COMPARISON OF
RAIN-CELL MODELS***J. S. Ojo and C. I. Joseph-Ojo*

1	Introduction.....	68
2	The Simplified Radar Equation and Input Parameters	69
3	Results and Discussions	73
4	Conclusion	77

**CIRCULAR POLARIZED DIELECTRIC RESONATOR
ANTENNAS USING A SINGLE PROBE FEED***S. A. Malekabadi, M. H. Neshati, and J. Rashed-Mohassel*

1	Introduction.....	82
2	Antennas Configurations	84
3	Antenna Analysis and Parametric Study	85
4	Radiation Pattern.....	91
5	Conclusion	91

**A NEW ROOF MODEL ON RANDOMLY PLACED
BUILDINGS IN MOBILE COMMUNICATION***N. Altin and E. Yazgan*

1	Introduction.....	95
2	Formulation	96
3	The Calculation of Propagation Path Loss with Heuristic Slope Diffraction Method That Is Applied Consecutive Roofs with Various Angles	99
4	Conclusion	100

**INVESTIGATION OF OPTICAL PROPERTIES OF SI-NC
ER-DOPED FIBER AMPLIFIER WITH THE GAUSSIAN
RADIUS DISTRIBUTION OF NC***S. Ahmadian, H. G. Fard, and A. Rostami*

1	Introduction.....	103
2	Modeling Si-Nanocrystal-Er Interaction	105
3	Rate Equations	106
4	Simulation Results	108
5	Conclusion	115

**DESIGN OF A DUAL MONOPOLE ANTENNA WITH
WIDEBAND FREQUENCY***J. S. Mandeep and T. C. How*

1	Introduction.....	119
2	Antenna Design.....	120
3	Results and Discussion	122
4	Conclusion	125

**MULTI-WAVELENGTHS OPTICAL SWITCHING AND
TUNABLE FILTERS USING DYNAMIC
SUPERIMPOSED PHOTOREFRACTIVE BRAGG
GRATING***M. J. Moghimi, H. G. Fard, and A. Rostami*

1	Introduction.....	129
2	Theory of Photorefractive Effect	131
3	Photorefractive Materials	132
4	Mathematical Background	133
5	Simulation Results and Discussion	136
6	Conclusion	140

**FDTD HARD SOURCE AND SOFT SOURCE REVIEWS
AND MODIFICATIONS***M. Mansourabadi and A. Pourkazemi*

1	Introduction.....	143
2	The Yee Algorithm's Notation	144
3	Direction of Propagation of a Plane Wave Hard Source	146
4	Plane Wave Soft Source.....	153
5	TM_z Mode Sinusoidal Soft Source.....	155

6	TM_z Generalized Soft Source	157
7	Conclusions	159
	Appendix A.	159

**L-PROBE FED CIRCULAR POLARIZED WIDEBAND
PLANAR PATCH ANTENNA ON CYLINDRICAL
STRUCTURE**

M. Pirai and H. R. Hassani

1	Introduction	161
2	Antenna Configuration	162
3	Simulated Results	163
4	Conclusion	166

**MICROWAVE CHARACTERIZATION OF DIELECTRIC
MATERIALS USING BAYESIAN NEURAL NETWORKS**

H. Ackgoz, Y. L. Bihan, O. Meyer, and L. Pichon

1	Introduction	169
2	Measurement Setup and Numerical Method	170
3	Implementation of the NN	172
4	Inversion of Simulated Data	176
5	Experimental Results	178
6	Conclusions	181

**MODELING AND COMPENSATING MEMORY EFFECT
IN HIGH POWER AMPLIFIER FOR OFDM SYSTEMS**

H. Karkhaneh, A. Ghorbani, and H. Amindavar

1	Introduction	183
2	AM/AM and AM/PM and Two Tone Response	185
3	Adaptive Development of PA in and OFDM System	186
4	An Adaptive Nonlinear Predistorter in an OFDM System ...	188
5	Computer Simulation	190

**SMALL SIZE EDGE-FED SIERPINSKI CARPET
MICROSTRIP PATCH ANTENNAS**

W.-L. Chen and G.-M. Wang

1	Introduction	195
2	Small Size Edge-Fed SCMPAs	196
3	Conclusion	201

**ON EXAMINING THE INFLUENCE OF A THIN
DIELECTRIC STRIP POSED ACROSS THE DIAMETER
OF A PENETRABLE RADIATING CYLINDER***C. A. Valagiannopoulos*

1	Introduction.....	203
2	Definition of the Problem	204
3	Analysis of the Strip-Free Problem	206
4	Estimation of the Strip Effect	207
5	Indicative Results	210

CURVELET FUSION OF MR AND CT IMAGES*F. E. Ali, I. M. El-Dokany, A. A. Saad, and F. E. Abd El-Samie*

1	Introduction.....	215
2	Wavelet Fusion	216
3	The Curvelet Transform	217
4	The Proposed Fusion Algorithm	220
5	Experimental Results.....	221
6	Conclusion	223

**THEORETICAL ANALYSIS OF BIT ERROR RATE OF
SATELLITE COMMUNICATION IN KA-BAND UNDER
SPOT DANCING AND DECREASE IN SPATIAL
COHERENCE CAUSED BY ATMOSPHERIC
TURBULENCE***T. Hanada, K. Fujisaki, and M. Tateiba*

1	Introduction.....	226
2	Formulation	226
3	Result	236
4	Discussion	242
5	Conclusion	243
	Appendix A. Approximation of Equation (22)	243