

Progress in Electromagnetics Research Symposium 2012

(PIERS 2012 Moscow)

**Moscow, Russia
19-23 August 2012**

Volume 1 of 2

**ISBN: 978-1-62748-162-5
ISSN: 1559-9450**

Printed from e-media with permission by:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571



Some format issues inherent in the e-media version may also appear in this print version.

Copyright© (2012) by the Electromagnetics Academy
All rights reserved.

Printed by Curran Associates, Inc. (2013)

For permission requests, please contact the Electromagnetics Academy
at the address below.

Electromagnetics Academy
777 Concord Avenue, Suite 207
Cambridge, MA 02138

Phone: (617) 258-8766
Fax: (617) 258-8766

tpc@piers.org

Additional copies of this publication are available from:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571 USA
Phone: 845-758-0400
Fax: 845-758-2634
Email: curran@proceedings.com
Web: www.proceedings.com

Contents

Spectrum-sliced Split-step Fourier Method for Precise Simulation of Supercontinuum Generation in Dispersion-Engineered Photonic Crystal Fibers	10
Influence of Geometric Parameters on the SOI Racetrack Resonator Properties	13
Formation Mechanism and Applications of Laser Induced Elemental Distribution in Glasses	18
Effect of Gap Shape on the Spectral Response and Field Enhancement of Dimer-based Biosensor	24
Artificial Neural Network Model for MNG-Metamaterial Spiral Resonator	29
Guiding Behavior of a Periodic Subwavelength Metallic Domino Array	34
A Compact Split Ring Resonator Loaded Antenna	37
WA-systems of Functions in Reconstruction and Visualization of 2D and 3D Images	41
Nonparametric Estimations of Probability Density Functions Based on the Family of Atomic Functions $ch_{a,n}(x)$ in Problems of Digital Signal Processing	46
Statistical Synthesis of Optimal and Quasi-optimal Chopper Radiometers	51
Maximum Permissible Values of Biometric Code Bits Correlation	56
On the Issue of Modeling Long Biometric Codes with Dependent Bit States	59
Statistical Description of Output States of the Neural Network “Biometrics-code” Transformers	62
Evaluation of Multidimensional Entropy on Short Strings of Biometric Codes with Dependent Bits	67
Information-telecommunication System with Multibiometric Protection of User’s Personal Data	71
Optimum Algorithm of Formation of Radar-tracking Images in CW SAR	75
Design and Manufacturing of a Dual-band, Dual-polarized and Dual Fed Perforated Array Patch Antenna Pair	80
Dual-frequency, Two Shorting Pin-loaded Equilateral Triangular Patch Antennas	85
Design of Monopole Antenna Using Coupling Characteristic of Spiral Parasitic Patch	88
Design of the Dual-band Planner Monopole Antenna for Coupled Rectangular-loop Structure and T-shape Rectangular Patch	92
Design and Relative Permittivity Determination of an EBG-based Wearable Antenna	96
Antenna Array for IEEE 802.11/a/b MIMO Application	100
Analysis of a Dual Frequency Circular Patch Antenna	103
Eigenanalysis of Arbitrarily Shaped 2-D and 3-D Closed and Open-Radiating Structures: A Review ..	107
Introducing Clifford Analysis as the Natural Tool for Electromagnetic Research	112
Numerical Technique to Calculate Propagation Constants for the Problem of Polarized Wave Propagation in a Layer with Nonlinear Permittivity	117
Electromagnetic TE Wave Propagation in Nonlinear Layered Waveguide Structures. Computational Approach to Determine Propagation Constants	122
Electromagnetic Wave Diffraction on the Conducting Thin Screen Placed on the Isotropic and Anisotropic Media Interface	127
Parallel Algorithm of Solving the Electromagnetic Wave Diffraction Problem on the Spherical Screen ..	131
Integral Equation Methods in Optical Waveguide Theory	135

TM Wave Propagation in a Cylindrical Waveguide with Kerr Nonlinearity	140
X-ray Image Processing in Studying Jawbone Tissues	145
Sensors and Experimental Model Verification on HV Transformers Measurement	149
Quantum Hydrodynamics of Charge Carriers in Graphene	154
Microscopic Classic Hydrodynamic and Methods of Averaging	158
Building NMR/NQR Spectrometer	163
Magnetic Flux Density Reconstruction Method	167
Self-consistent Electrodynamics	172
Low-level Measurement of Electric Field Intensity	178
Image Reconstruction by EIT Utilizing Magnetic Field	182
Optimal Design Approaches for Linear Tubular Actuators	186
Analysis of Contactless Power Transfer Systems for Maglev	191
Dynamic Modeling of Tubular PM Linear Synchronous Actuator Using Multimodal Interpolation of 3D Finite Element Results	195
New Constructions of Kravchenko-Poisson Wavelets and Their Applications for Digital Signal Processing	199
Application of WA-functions of Distribution of Kravchenko-Rvachev for Digital Signal Processing	203
Embedded Object Detection by Using Planar Antenna Measurement System	208
Electromagnetic Object Recognition for Dielectric Coated Conductors Based on WD-PCA Type Fused Feature Extraction	212
Accurate Measurement of Power Transfer to an RFID Tag with On-chip Antenna	216
A Reduced-size Antipodal Vivaldi Antenna with a Reconfigurable Band Notch	220
Effect of Small Size Antenna inside Complex PCB	225
An Evaluation of Capacitive Feed Methods for Electrically Small and Low-profile Meander Line Antennas	229
Broadband Circularly Polarized Moxon Based Antennae for RFID and GPS	234
Bended Rectangular Slotted Waveguide Antenna	239
Leaky Wave Radiation for Body-centric Wireless Communications	246
Full Wave Maxwell's Equations Solver EMWSolver3D	252
New Mathematical Model and Measurement Scheme of Electrical Tomography and Its Fast Resolution by General Ray Method	256
Noise Influence of Magnetic Field to Conductivity Image Reconstruction	260
Electric and Magnetic Components of Waves on the Interface	264
Mixed Signal Processing for Cable Diagnostics	268
Light Scattering from Nanostructured Media	273
Technological Aspects of Obtaining Gradient Optical Metamaterial	277
Measurers' Exposure to Extremely Low Frequency Magnetic Fields at 400 kV Substations	282
The Possible Exposure of Children to Extremely Low Frequency Magnetic Fields in the Home	286
Electrical Impedance of Plasma Filled Waveguides in the MHz Range	289
Equilibrium Conditions of Radiofrequency-heated Plasma Cylinders	293
LogicView: An Open Source Software for 3D Visualization of Models and Fields in Electromagnetics	298
A Method to Model a Spindle System with an Electromagnetic Actuator	303
A Direct Experimental Inspection of Displacement Currents	308
Analysis of the Forbidden Regions for Multilayer Planar Waveguide with LHM	313

On the Geometric Representations of Electromagnetism	317
Study on the Human Effect of a Wireless Power Transfer Device at Low Frequency	322
Design of Novel Artificial Magnetic Conductor as Reflector and Its SAR Analysis	325
A Broadband Active Integrated Microstrip Antenna Array Design in Millimeter Wave Frequency Band	329
Three-dimensional Finite Element Modelling of Current Density in Maternal Transthoracic Defibrillation	334
Evaluation of Tissue Properties in MR Images	339
Why Gamma Photons Induce Cherenkov Effect	343
Anderson Transition May Be Induced by the Self Collapse of the Electron Wave Function	348
The Momentum of Luminous Photon Can Explain the Mystery of the Scission of the Water Molecule, Fundamental Event in the Chlorophyllose Photosynthesis	353
Multiparametric Data Collection and Data Processing of Animal Tissues in MRI Images	358
The Method of Correction the B_1 Errors in Magnetization Transfer Ratio MTR	363
Influence of Material Properties on the Quality of NMR Images	367
The Measured of Air Ions Mobility Spectrum	370
The Study of Cell Growth in Tissue Culture in the Magnetic Field	375
Methodology of Thermal Properties Measurement	379
Measurement of Magnetic Flux Density by NMR Using Unsymmetrical Spin Echo	383
A Comparison of Characteristics in Parallel and Series Connections of Active Lossy FDNR Blocks	387
Compact Metamaterial-based Bias Tee Design for 1.55 μm Waveguide-photodiode Based 71–76 GHz Wireless Transmitter	393
Ultra-wideband Radio Frequency Beamforming Using Microwave BFNs	398
Wideband 1.55 μm Waveguide Photodiodes Employing Planar Resonant Circuits for E-band (60–90 GHz) Operation	403
Analysis and Design of Ferroelectric Phase Shifters Appropriate for Printed Phased Arrays	407
General Ray Method for Solution of Direct and Inverse Problems of Electromagnetism	412
Inverse Problems to Determine Constant Permittivity and Coefficient of Nonlinearity in the Problem of TE Wave Propagation in a Layer with Kerr Nonlinearity	416
Reconstruction of Complex Permittivity of a Nonhomogeneous Body of Arbitrary Shape in a Rectangular Waveguide	420
Analysis of Electromagnetic Wave Propagation through a Layer with Graded-index Distribution of Refraction Index	425
Reconstruction of Heterogeneity Parameters by Reflected Field in the Wave Guided Structure	430
Wave Diffraction Problems on Periodical Sets of Heterogeneities in the Stratified Media	435
Mid-range Wireless Power Transmission System Using Real-time Complex Impedance Control	440
Wireless Power System for Implantable Heart Pumps Based on Energy Injection Control	445
Theory of the \hat{L}_2 , $(\hat{e}, \hat{\rho}, \hat{n})$ Numbers and Its Application to the Slow Wave Propagation in the Coaxial Feffite Waveguide	450
Guided Modes of an Open Circular Magnetized Plasma Waveguide in the Resonant and Nonresonant Frequency Ranges	456
Green's Function for Paraxial Equation	460
A Simple Analytical Method for Describing Important Optical Beams Truncated by Finite Apertures ..	464
A Novel Interactive Approach for Modal Analysis of Nonlinear Waveguides Based on a Fully Hybrid Vectorial Finite Element Method	469
Kummer Function Method for Analysis of the Azimuthally Magnetized Circular Ferrite Waveguides ..	477

The Electrodynamics of the Induction Motor	482
The Stripline Structure with Multilayer Dielectrics by FDTD	487
Simultaneous Joint Inversion of Refraction Tomography and Magnetic Data	491
Data-driving Algorithms for 3D Reconstruction from Ladar Data	496
The Generalized n -th Order Maxwell's Equations	500
Comparison of Microwave Path Lengths between Temperate and Tropical Region Based on Effects of Rain	504
Pulsed EM Propulsion of Unconventional Flying Objects	508
Quantum Blooming: The Possibility of Passing through the Classically Inaccessible Area without Attenuation	513
Growth and Investigation of LiNbO ₃ Thin Films at Nanoscale by Scanning Force Microscopy	520
Evidence of Very Strong Low Frequency Magnetic Fields	524
Production of EM Surface Waves by Superconducting Spheres: A New Type of Harmonic Oscillators	529
An Ultra-wideband Dielectric Resonator Antenna with Reconfigurable Band Rejection	534
Symmetrical Slot Loaded Dual Band Elliptical Microstrip Patch Antenna	538
Symmetrical Slot Loading in Elliptical Microstrip Patch Antennas Partially Filled with Mue Negative Metamaterials	542
Research on Capacity Performance of TD-LTE System with Different Antenna Schemes	546
A Reconfigurable Antenna Based on an Ultrawideband to Narrowband Transformation	550
Multi-band Dual Polarized Indoor Antenna for Diversity and MIMO Applications	554
Applicability of DCA in HAPS-based Systems in 5850–7075 MHz Band	558
Utilizing ATPC Scheme to Facilitate Sharing between HAPS and Terrestrial in 5.7 GHz Band	561
Enhancement of Coexistence between HAPS and Terrestrial System in 5.8 GHz Band	565
Proficiency Testing of Radiated Emission Testing Laboratory in China	569
On Performance Analysis of SLNR-based Multistream Transceiver in Multiuser MIMO Downlink Channels	573
Design of Novel Monopole Antenna Using Dual Rectangular Ring Patches and L-slots	578
A Multiband Antenna Based on Mushroom Composite Right/Left-handed Transmission Line Structure	582
New Multiple Loop Antenna Design for 13.56 MHz RFID Reader	586
High Isolation MIMO Antenna Design by Using Ground Slits for Mobile Handset	589
Design and Simulation of Different Types of Meander Line Antennas with Improved Efficiency	594
Design of Dual Frequency Notched Semicircular Slot Antenna with Semicircular Tuning Stub	598
Gradient of Radio Refractivity in Troposphere	603
A Simple Miniaturized Triple-band Antenna for WLAN/WiMAX Applications	608
An Ultra-wideband Printed Monopole Antenna with a Fractal Based Reduced Ground Plane	613
A Printed Fractal Based Slot Antenna for Multi-band Wireless Communication Applications	618
Wide Band Switched Beam Circular Patch Antenna	623
An Overview of Microwave Imaging towards for Breast Cancer Diagnosis	627
Elliptical Split Ring Resonator: Mathematical Analysis, HFSS Modeling and Genetic Algorithm Optimization	631
Novel Microstrip-fed UWB Antenna with CSRR Slot for Signal Rejection in 5–6 GHz Band	636
Performance Enhancement of Patch Antenna by Fishnet Metamaterial	640
A Improved Structure for Substrate Integrated Waveguide Composite Right/Left-handed Cell	645

A Shunt-capacitance-aided Composite Right/Left-handed Leaky Wave Antenna with Large Scanning-range/Bandwidth Ratio	649
Electrical Characteristics Dependence of Monstera Leaf on Moisture Content	653
Microwave Vegetation Index from SMOS	656
A Simple Parameterization for Sensible and Latent Heat Fluxes during Unstable Daytime	659
Wireless Power Transmission by Scalar Waves	664
Study of Transmission Performance on Strong Coupling Wireless Power Transfer System in Free Position	669
Investigation of Characteristics of the Current for the Maximum Power Transfer in Wireless Power Transmission	675
The Coil Misalignment Model of Inductively Coupled Wireless Power Transfer System: Mutual Inductance Analysis and Transfer Efficiency Optimization	679
Resonant Frequency Splitting Analysis and Optimization of Wireless Power Transfer System	684
A Comparison of Analytical Models for Resonant Inductive Coupling Wireless Power Transfer	689
Adaptive Impedance Matching for Magnetically Coupled Resonators	694
Analysis of Double Negative Meta-material Asymmetric Planar Slab Waveguide by Transmission Equivalent T-circuit Model	702
Reduction of the Staircasing Error in Finite Methods by Using Transformation Media	707
A Thin Wire Method of Moments Scheme Employing King's Green Functions and Sinusoidal Basis Functions	711
A Novel Multi-physics and Circuit Co-simulation Algorithm for the Electro-thermal Analysis of Semiconductors and Circuits	715
Propagation Study of Y-branch Having Inbuilt Optical Splitters and Combiner Using Beam Propagation Method	720
An Efficient Hybrid KA-MoM for Backscattering RCS from Combined Objects by Adaptively Truncating the Size of the Rough Surface	725
Adaptive Compressed Sampling Method for Fast Computation of Monostatic Scattering	729
Design of a Wideband RF Front End Based on Multilayer Technology	733
The Casimir Force for Arbitrary Three-dimensional Objects with Low Frequency Methods	738
Radio Frequency Identification Devices (RFID) in Prevention of Medication Errors: A Review	742
Analysis of Electromagnetic Compatibility of Wireless Ambient Assisted Living Devices	746
A Thorough Analysis of SAR Evaluation in Human Head Models	750
An <i>in vitro</i> Study of Apoptosis in Pancreatic Cancer Cells by High-intensity Nanosecond Pulses	755
Enhanced Microwave Transmission and Magnetophotonic Response in One-Dimensional Magnetophotonic Crystals	759
Scattering of Waves: Imperfect Coupling and Absorption or Amplification	763
A Novel Retrodirective Array by Removing Band Pass Filter	768
Mobile Phone EMC Deterioration Due to Different Realistic Usage Patterns	773
A Parametric Study and Design of the Balanced Antipodal Vivaldi Antenna (BAVA)	778
Study of Performance Improvement on the Design of Compact SRR Embedded Microstrip Low Pass Filter	783
Optimized Design of Microstrip Low Pass Filter with ANN for Performance Improvement	789
Author Index	795

Contents

Millimeter-wave Rat-race Balun in a CMOS 65 nm Technology with Slow-wave Transmission Lines and Innovative Topology	808
Parametric Design of Stop Band Pass Filter Based on RF Metamaterials in LTCC Technology	813
Radiofrequency Interference Filters Design Based on Complementary Split Rings Resonators	818
Occupational Exposure to Extremely Low Frequency Electric Fields in Office Work	823
Analysis, Design and Implementation of a Useful Broadband Coaxial-to-microstrip Transition	826
Radar Absorbing Structure with Periodic Pattern Surface for Wind Blade	832
Metastructure to Achieving of Voltage Tunable Magnetic Resonance in a Single Longitudinal Cut-wire	836
A Full-band High Linearity CMOS T/R Switch for UWB Systems	841
A Novel Defected Microstrip Structure (DMS) Coupled Line Band Pass Filter in C Band	845
Optimized Rat-race Coupler with Different Shapes of Defected Ground Structure	849
New Wilkinson Power Dividers Using Dual and T-shaped Transmission Lines	853
Design of Bandpass Filter with Transmission Zeros Using Zeroth-order Resonator and U-shaped Resonator	857
Substrate Integrated Waveguide (SIW) Filters and Its Application to Switchable Filters	861
High Power Autonomous Pulse-train UWB Source	864
Dependence of Avalanche Response Time on Photon Flux Incident on DDR Silicon IMPATT Devices ..	867
Universal Filters for Processing of NMR Signals	873
Design of an Effective Architecture for the Envelope Tracking Power Amplifier for LTE Applications ..	877
UWB Wilkinson Power Divider Using Tapered Transmission Lines	882
Nonreciprocal Magnetoelectric Microwave Attenuator	885
A Peano Fractal-based Dual-mode Microstrip Bandpass Filters for Wireless Communication Systems ..	888
Piezoelectric Multilayer Transformer	893
EMC Pre-compliance Test of RFIC and RF Systems Using a Laboratory GTEM Chamber	896
Bayesian Estimation of Tumours in Breasts Using Microwave Imaging	901
Design of High Isolation Electronically Switchable Bandpass Filter	906
A Method of High Repetition Rate Femtosecond Optical Pulse Generation by Using Bi-stable Optical Micro-ring Resonators	909
Optimization of Phase Noise in a 2.3 ~ 3.5 GHz Voltage-controlled Oscillator Using the Impedance Locus	913
New Measuring Instrument for the Characteristics of the Two-phase Flow of the Particulate Material Based on the Microwaves and Digital Processing of the Signals. Constructional Design Issues	918
A SiGe Voltage-controlled Oscillator for 4G LTE Applications	923
Planar Heterojunction Diode for Millimeter Waves Detection	927
Plasma Relativistic Microwave Amplifier	931
SOI CMOS Miniaturized Tunable Bandpass Filter with Two Transmission Zeros for High Power Applications	935

Variability of GPS-derived Zenith Tropospheric Delay and Some Result of Its Assimilation into Numeric Atmosphere Model	940
Horizontal Structural Functions in Troposphere for Radio Waves Refractivity Index by Use of Ground Set of GPS-GLONASS Receivers	944
Remote Sensing for Estimating Cultivated and Arable Land Areas on Slopes	948
Extraction of Laver Cultivation Area Using SAR Dual Polarization Data	952
Half Loop Antenna with Ultra-wide Bandwidth	957
Wideband Linear Antenna with H-shaped Parasitic Element	961
Reduction of Cross Polarization in Circularly Polarized Broadband Waveguide Antenna Using an L-shaped Probe	964
Design of Ultra-wideband MIMO Antenna for Mobile Handset Applications	968
Circularly Polarized Leaky Wave Antenna Using Composite Right/left-handed Transmission Line	972
Dielectric Rod Antenna Array with SIW Feed Network for Radar Imaging System	976
Designing Transformation-based Metamaterials for Numerical Modeling of Low Frequency Electromagnetic Scattering	981
A Genetic Algorithm Enhanced by SVM and DPE	985
Image Restoration of the Objects with Superresolution on the Basis of Spline — Interpolation	989
Superresolution: Simultaneous Orthogonalization of Function Systems Describing the Received Signal and its Source	993
Cellular Communication by Magnetic Scalar Waves	997
The Theoretical Rationale of the Existence of Electric and Magnetic Fields Spreading Instantaneously	1001
A Local Ether Lens Path Integral Model of Electromagnetic Wave Reception by Wires	1005
Antenna Pattern Formation in the Near Field Local Ether	1009
Calculation of an Equivalent Electrical Conductivity Tensor for Multidirectional Carbon Fiber Reinforced Materials	1013
Spherical Wave Representation of the Dyadic Green's Function for a Spherical Impedance Boss at the Edge of a Perfectly Conducting Wedge	1019
Electromagnetic Sources and Observers in Motion VII — Medium Support for a New Relativity Theory	1024
Electromagnetic Sources and Observers in Motion VIII — New Relativity Theory Establishes Einstein's Ether-less Aspect of Relativity as Irrational	1030
Design of Stripline Structure for Electromagnetic Characterization at Microwave Frequency	1036
Experimental Evidence for the Magneto-kinematic Effect	1040
Investigation of Resonance Interactions of Microwaves with 3D Magnetic Nanocomposites Using the Probabilistic Model	1049
Spin and Electric Polarization Waves in Dielectric Systems of Different Dimensions	1055
Shear Vibrations of Magnetostrictive-piezoelectric Film Structure	1060
Impact of Temperature on the Electromagnetic Susceptibility of Operational Amplifiers	1063
Control of Coherence and Polarization of an Electromagnetic Beam by Means of Liquid Crystal Spatial Light Modulators	1066
Simple Technique for Generating a Secondary Electromagnetic Source with Desired Degrees of Coherence and Polarization	1070
Investigation of Electricity Quality in Ship Integrated Power System	1074
The All-optical Logic Gates Based on Mach-Zehnder Interferometer Photonic Crystal Waveguides	1079
Proposal for Large Mode Area Photonic Crystal Fibers	1083
Cantor Dust Zone Plates	1087
Analysis and Design of a UHF-band Harmonic Meter	1091

A Fiber Optic Sensor Integrated with Fuzzy Similarity Analysis to Evaluate Hydrocarbon Pollutant in Water	1094
Uncertainty Calculation for Phase Noise Optoelectronic Metrology Systems	1099
Electrophysical Investigation of the Ferroelectric Conductivity in BTO/LCMO Multilayers	1103
Enhanced Magnetization and Second Harmonic Generation in Multiferroic BST/NBFO Superstructures	1107
Two Dimensional Nano Photonic Crystals with Metallic Rod and Dielectric Clad in Metallic Background	1111
The Study of Two Dimensional Photonic Crystal Made of Two Concentric Cylindrical Nano-layers of Dielectric with Negative Refraction Index	1116
Investigation of Defect Modes on One-dimensional Ternary Metallic-dielectric Nano Photonic Crystal with Metallic Defect Layer	1121
Optimum Parameters for an Undersampled Digitally Heterodyned SFGPR	1126
Prediction of a New Superconductivity-like Effect in Galilean Reference Systems (Part II)	1130
Remote Sensing and Simulation Model for Crop Management	1134
A Microwave Optoelectronic Oscillator: Mach-Zehnder Modulator or VCSEL Based Layout Comparison	1138
Passive Components Based on Two-dimensional Photonic Crystals	1143
Low-phase Noise Photonic Millimeter Wave Generation Using a Nonlinear MZM and Four-wave Mixing in Ultra Long SOAs	1148
Single Atom Trapping of Light	1152
Gold Nanoparticles Chain Waveguide with Enhanced Transmission Method and Spectral Coding	1156
Turbulent Parameters Estimation through the Phase Decomposition into the Zernike Polynomials	1160
Possibility of O ⁺ /H ⁺ Transition Level Determination from Irkutsk Incoherent Scatter Data and GPS Total Electron Content	1164
Radiosounding of Ionospheric Disturbances Generated by Exhaust Streams of the Transport Spacecraft "Progress" Engines	1168
Investigation of Ionospheric Slab Thickness and Plasmaspheric TEC Using Satellite Measurements	1172
The Doppler Effect at the Propagation of the Signal through the Multipath Radio Channel in HF Wave Band	1176
The Real-time Forecast of HF Radio Channel on the Base of Ionosphere Sounding Data	1182
A Novel Microstrip-fed Dielectric ROD Antenna Array with High Gain	1187
On the Velocities of Motion of the Electromagnetic Field in the Near Zone of Elementary Radiators	1191
Design of Array Synthesis Horn Antenna for High Power Microwave Applications	1196
A Symmetrical Theory of Electromagnetism	1199
A Novel Way for Designing Bifocal Reflector Antennas	1204
The Effects of the Tube Characteristics on the Performance of a Plasma Monopole Antenna	1208
Characteristics of Plasma Antennas under Radial and Axial Density Variations	1212
Mathematical Modeling of Plane Chiral Waveguide Using Mixed Finite Elements	1216
Avoiding Diffraction Order Singularity in Scattering Matrix Approach Used for Grating Modelling	1220
Projective Methods in Problems of Waveguide with Singularity	1225
Wavelet Approximation of Discontinuous Solutions in EHD Model of Charged Jet Flow	1228
The Scanning Reflective Antenna with an Impedance Conformal Reflector in the Form of Laminated Structure the Semiconductor-dielectric-metal with Photonic Control	1232
A New Type of Wilkinson Power Divider with Triple-band Response Based on Dual Transmission Line	1236
Equivalent Network Extraction of a Coplanar Waveguide	1240

Grounded CPW-WR12 Transition Design for 1.55 μ m Photodiode Based E-band Transmitter	1245
Integrating Equal-split Wilkinson Power Dividers and Coupled-line Bandpass Filters	1249
Full-wave Modeling of Open Subwavelength Resonator with Metamaterial	1254
A K-band Low Noise and High Gain Down-conversion Mixer	1259
Multidimensional <i>S</i> -parameters: Modeling, Measurement, Identification and Computer-aided Design of Nonlinear Microwave Circuits	1264
Analysis of Embedded-silicon-substrate Impact on CiSP Design	1269
Ferromagnetic Microwire Usage for Magnetic Tags	1274
Tailoring of Frequency and Magnetic Field Dependence of Giant Magnetoimpedance Effect in Thin Wires	1278
EM Wave Scattering by Objects Moving on Bowditch-Lissajous Trajectories	1282
The Model of Wave Propagation in Classical Physics	1287
Prediction of a New Superconductivity-like Effect in Galilean Reference Systems (Part I)	1293
Satellite Monitoring for Energy Transfer Process of Tsunamigenic Earthquake	1298
Monitoring for Geomagnetic Reversal of the Planet Earth	1302
Monitoring for Inclination Stability of the Planet Magnetic Axis Normal to the Solar Equatorial Plane	1305
Superresolution: Data Mining	1309
Focusing GPR Images Collected from Archaeological Investigations along the “Basilian Monks’ Path of Faith” (Aspromonte National Park — Southern Calabria, Italy): Analysis of the Performances of Different Strategies	1313
Nested BiCGSTAB to Solve Complex Linear Systems Arising from Discretization of EFIE	1318
Comparison of Different Metaheuristic Optimization Methods’ Capability in Two Dimensional Inverse Scattering	1322
Localization and Electrical Parameters Estimation of a 2D Mass Using a 2 Step Method Using FDTD	1325
Reconstruction of 1-D Dielectric Scatterer with Cosine and Spline Expansions Using Differential Evolution and Particle Swarm Optimization	1330
Airship Radar System Modeling and Simulation	1335
Absorption Dependencies of Dipolar Glass Cylindrical Waveguide Coated by SiC on Temperatures and Coated Layer Thicknesses	1338
Dispersion Characteristics of Circular Layered Zero-index Anisotropic Metamaterial — Semiconductor Waveguides	1343
Defects Characterization in CFRP Materials Industrial e Civil Applications	1347
Coupling Matrix Synthesis by Optimization with Cost Function Based on Daubechies D4 Wavelet Transform	1351
A Quaternion Widely Linear One-stage Prediction Algorithm	1355
Magnetolectric Magnetic Field Sensors	1359
Electromagnetic Sensing of Partial Discharge in Air-insulated Medium Voltage Switchgear	1363
Transformations of Field Equations in Octonion Spaces	1367
Electromagnetic and Gravitational Fields in the Curved Octonion Spaces	1372
On-body Textile Monopole Antenna Characterisation for Body-centric Wireless Communications	1377
Design and Simulation of a Wearable Textile Monopole Antenna for Body Centric Wireless Communications	1381
An Interpretation of a Classical Diffraction Problem of Electromagnetism with a Fractional Derivative	1385
Gradient Index Metamaterial with Arbitrary Loss Factors in RHM and LHM Media: The Case of Constant Impedance throughout the Structure	1390
A Dual Band Planar Metamaterial Based on Hybrid Structures in Terahertz Regime	1395

Effect of Random Variations of Both the Composition and Thickness on Photonic Band Gap of One-dimensional Plasma Photonic Crystal	1399
Procedure of Near Ground Propagation Model Development for Pine Tree Forest Environment	1403
Normalized Differential Spectral Attenuation among Co-rotating LEO Satellites: Performance Analysis for Estimating the Tropospheric Water Vapor	1407
Magnetic Response of Random Ensemble of Small Non-magnetic Particles in Theory of Electromagnetic Wave Multiple Scattering	1411
Radiometric Methods of Measurement of the Total Reflectivity, the Total Transmissivity and the Coherent Transmissivity of a Weakly Absorbing Random Discrete Medium Layer in the Millimeter Wavelengths Range	1415
Analysis of the Radiated Emissions of IT Equipment	1419
Antenna Gain Measurement by Comparative Method Using an Anechoic Chamber	1424
Multilayer Microstrip Antennas Array Operating in Dual Bands	1429
Dual Band Microstrip Antenna Working in the Frequency Bands 2.4 GHz and 5.8 GHz	1433
Methods of Measuring Shielding Effectiveness of Small Shielded Chambers	1437
Ambient Electromagnetic Noise Environment Measurement	1443
The Shielding Effectiveness Measurement Using High Voltage Pulse Generator	1449
The Algorithm of Design Multi-layer Microstrip Antenna	1453
Tuning Fork UWB Antenna with Unsymmetrical Feed Line	1457
High Power Radiators for Ultra-wideband Electromagnetic Impulses	1461
Two-photon Confocal and Near-field Optics of Bio-inspired Peptide Nanostructures	1468
Local Nonlinearities of ZnO Nanostructures	1472
Femtosecond Infrared Laser Annealing of Ferroelectric PZT Films on a Metal Substrate: Confocal and Near-field Optical Studies	1475
Optical Properties of Fotonnokristallicheskikh Structures Based on Single-crystal GaAs	1479
Novel Bow-tie Bandpass Filter Design Using Multiple Radial Stubs	1484
Ultra-wideband Bandpass Filter Using Symmetrical Step-impedance Resonators	1488
Dual-band Bandpass Filter Design Using Stub-loaded Resonators	1491
Bandstop Filter Design Using Cascaded Step-impedance Resonators with Defected Ground Structure	1495
Concept of Image Based Non-line-of-sight (NLOS) Localization in Multipath Environments	1499
An Eigenvalue Hybrid FEM Formulation for Three Dimensional Open Cavities	1502
A Mode Matching Methodology for the Analysis of Circular Waveguides Loaded with Infinite and Finite Periodic Structures	1507
Using the Eigenfunction Expansion Technique for Analysis of the Electrodynamic Characteristics of a Loop Antenna Located on the Surface of a Magnetized Plasma Column	1511
A Characteristic Mode Eigenanalysis Exploiting FEM Features	1516
Computational Efficient Solution of Maxwell's Equations for Lamellar Gratings	1521
Analytical Study of Surface and Leaky Waves on a Grounded Magnetized Plasma Slab	1526
Radiation Efficiency of a Circular Loop Antenna with Pulsed Excitation in a Magnetoplasma Containing a Cylindrical Density Nonuniformity	1533
Eigenanalysis for Lossy or Open Periodic Structures Incorporating the Floquet Field Expansion	1538
IDMA System Based on Permutation Polynomial Interleaver over Integer Rings	1543
The Use of the Wigner Distribution Function for Defining the Concept of Quasi-point Source, and the Application of this Concept to the Restoration of Defocused Images	1548

Author Index 07; 5