

2016 11th International Symposium on Antennas, Propagation and EM Theory (ISAPE 2016)

**Guilin, China
18-21 October 2016**



**IEEE Catalog Number: CFP16501-POD
ISBN: 978-1-5090-4744-4**

**Copyright © 2016 by the Institute of Electrical and Electronics Engineers, Inc
All Rights Reserved**

Copyright and Reprint Permissions: Abstracting is permitted with credit to the source. Libraries are permitted to photocopy beyond the limit of U.S. copyright law for private use of patrons those articles in this volume that carry a code at the bottom of the first page, provided the per-copy fee indicated in the code is paid through Copyright Clearance Center, 222 Rosewood Drive, Danvers, MA 01923.

For other copying, reprint or republication permission, write to IEEE Copyrights Manager, IEEE Service Center, 445 Hoes Lane, Piscataway, NJ 08854. All rights reserved.

****** This is a print representation of what appears in the IEEE Digital Library. Some format issues inherent in the e-media version may also appear in this print version.***

IEEE Catalog Number:	CFP16501-POD
ISBN (Print-On-Demand):	978-1-5090-4744-4
ISBN (Online):	978-1-5090-4743-7

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) 758-2633
E-mail: curran@proceedings.com
Web: www.proceedings.com

CURRAN ASSOCIATES INC.
proceedings
.com

A. Antennas

A1	Main Beam Angle Control Microstrip Antenna Based on Phase Gradient Metasurface	L. M. Li, W. H. Li, H. Y. Shi, et al.	1
A2	Design and Implementation of a Novel C Broadband Phased-array Antenna Element.....	P. Wei, L. K. Liu, C. X. Jian	5
A3	A Low-Profile Broadband UHF Base Station Antenna Based On Lumped-Element Matching Network.....	W. J. Wu, B. R. Guan	9
A4	Capacitor-Loaded Circularly Polarized Annular-Ring Slotted Microstrip Patch Antenna.....	J. X. Li, B. He, L. M. Li, et al.	13
A5	Wideband Two Bowtie Dipole Array Antenna Integrated with a Tapered Balun.....	J. X. Li, L. M. Li, A. X. Zhang, et al.	16
A6	Design of A Novel Meander Line Reader Antenna for UHF Near-Field RFID.....	Y. S. Liang, Y. Yao, J. S. Yu, et al.	19
A7	A Wideband Segmented Line Dipole Antenna With Stable Radiation Patterns.....	X. N. Jia, D. Z. Piao	22
A8	Design of the top-loaded quadrifilar helix antenna for low profile applications.....	X. Huang, J. Pan	25
A9	A Slotted Dielectric Substrate Loaded Broadband Vivaldi Antenna Fed by SIW.....	C. J. Ma, D. Y. Shen, M. Dong, J. Su	28
A10	On the directivities of harmonic and spurious emission of phased array antennas.....	C. Wang, K. X. Lv, M. L. Huang, J. Dong	31
A11	Dual Band Directional Bowtie Antenna Loaded with a Square Loop.....	H. J. Zhang, L. Chang, J. Q. Zhang, Z. Z. Chen	35
A12	A Novel Split Ring Slot Antenna with Multiband Characteristics Based on SIW.....	M. Dong, D. Y. Shen, C. J. Ma, et al.	39
A13	Design of a dual-band combined Microstrip antenna for wireless communication applications.....	W. J. Wu, S. L. Zuo, D. E. Wen	43
A14	Low Profile and Wideband Circular Polarized Microstrip Antenna Array.....	X. F. Wang, J. Q. Liu, K. Y. Peng, et al.	46
A15	Wideband and Miniature Conical Helix Antenna.....	X. F. Wang, J. Q. Liu, K. Y. Peng, et al.	49
A16	Two Designs of Bidirectional Same-Sense Circularly Polarized Antennas with Cavity Structures	Y. F. Hou, Y. Li, T. Q. Zhai, et al.	51
A17	Dual-Polarized Omnidirectional Antennas with Folded Structures.....	P. Q. Liu, Y. Li, Y. F. Hou, et al.	53
A18	A Novel Widebeam Planar Patch Antenna for WLAN Applications.....	X. Shuai, S. Q. Xiao, X. Fan, C. Gong	55
A19	Ka Band Small Dual Reflector Antenna Fed By Dielectric Rod Antenna.....	X. H. Yu, G. F. Wu, W. P. Cao, et al.	58
A20	An Improving Broadband Circularly Polarized CPW Fed Slot Antenna.....	X. H. Yu, W. Li, W. P. Cao, et al.	60
A21	Dumbbell Slots Coupling Circular Polarization High Gain Antenna.....	W. P. Cao,	

C. H. Zhou, S.M. Li, Y. P. Liu	62
A22 Design of a Dual-band Dual-polarized Slot Antenna for Ku-band Video Satellite Application.....H. Z. Li, Y. Zhang, G. Q. Zhang	66
A23 A Novel Omnidirectional Horizontally Polarized Antenna for 4G LTE Communications.....Y. Y. Shi, Z. Z. (David) Chen, Y. Q. Yu, et al.	70
A24 Underwater Radiation Fields of Magnetic Dipole Array with 3 ×3 elements X. P. Liu, K. S. Zheng, Z. M. Mu, Y. Liu	72
A25 The Design of Array Antennas Used for Massive MIMO System in the Fifth Generation Mobile Communication.....H. W. Yuan, C. T. Wang, Y. Li, et al.	75
A26 Broadband Vertically/Horizontally Dual-Polarized Antenna for Base Stations.....X. N. Gao, Y. H. Cui, R. L. Li	79
A27 Wideband and High-Gain Magneto-Electric Dipole Antenna.....X. X. Li, D. Y. Shen, T. Y. Zhang, et al.	81
A28 Triple-Band Substrate Integrated Waveguide Antenna Based on Metamaterials.....Y.P. Zhang, D.Y Shen, X.X. Li, et al	85
A29 Dual-Band Polarized Diversity microstrip MIMO Antenna with High Isolation for WLAN Application.....H. X. Li, T. X. Wei, J. Ding, C. J. Guo	88
A30 Wideband Printed Slot Antenna using Shape Blending.....A. T. Wu, B. R. Guan, Z. H Zhang	92
A31 A Compact Printed MIMO Antenna for UWB Application with WLAN Band-Rejected.....Y. Liu, C. W. Sun	95
A32 A multi-mode and multi-frequency handset antenna.....W. Zhao, L. Xu, C. C. Dong	98
A33 A High Gain Bidirectional Circular Polarization Array Using Bow Tie Antenna Elements for Applications in Long Confined Space..... Y. Y. Zhang, D. W. Li, J. H. Wang, et al	101
A34 Single-layer Differential CPW-fed UWB Antenna with Common-mode Suppressed and Band Notched Applications.....L. Lu, Y. C. Jiao, L. Zhang, et al	105
A35 Circularly Polarized Cross Dipole with Wide Beam for Satellite-borne Application.....L. L. Chen, L. Chang, H. Wang	108
A36 A Wideband Omidirectional Antenna Array.....H. Wang, S. He, Y. F. Yu	112
A37 A New Compact Edge Coupled Filter-antenna.....C. F. Kang, H. Zhang, Y. Wang, L. Xu	115
A38 Design of a dual(UHF/S) bands Antenna Handset.....B. Z Fan, L. Xu, H. Zhang, Y. Wang	118
A39 Multi-band Planar Printed Antenna for WLAN/WiMAX Applications.....G. Qian, L. Xu, H. Zhang, Y. Wang	121
A40 Design of a Dual-Polarized Yagi-Uda Antenna for the Passive Radar.....X. M. Cao, Z. P. Gong, Y. C Yi, et al	125
A41 High-Gain Dual-Polarization Higher Order Mode Substrate Integrated Cavity Antenna Array.....C. W. Wu, H. Wang, X. Jiang, S. L. Quan, et al	129
A42 Design of a W Band Filter Antenna Array with Low Sidelobe Level Using Gap Waveguide.....X. X. Liu, H. Wang, S. L. Quan, et al	132
A43 Design of high-gain lens antenna based on phase-gradient metasurface.....Z. Li, J. X. Su, Z. R Li	135

A44	Multi-sleeve Monopole Antenna For APP-terminal Communication.....	X. H. Yu, G. Huang, W. P. Cao, et al	139
A45	A Design of Dielectric Lens Loaded Antenna Array for Beam Steering.....	Y. Yuan, X. C. Guo, Z. Xu	141
A46	Wideband Loop Antenna Based on Composite Right/Left-handed Transmission Line.....	W. P. Cao, Y. N. Cao, S. M. Li, et al	145
A47	broadband Terahertz antenna using Graphene.....	H. D Zhang, Y. N. Jiang, J. Wang, et al	149
A48	High-gain Spoof Surface Plasmon Polariton Planar Antenna Based on the Phase Gradient Metasurface.....	X. B Liu, J. S. Zhang, Z. Xu ,et al	153
A49	Design of a dual-band microstrip antenna.....	L. Hong, H. Z. Xiang, S. D. Zhi	156
A50	Non-uniform Slotted Leaky Wave Antenna Array for Broad-Beam Radiation Based on Substrate Integrated Waveguide.....	Y. J. Geng, J. H. Wang	159
A51	A Low-RCS Microstrip Antenna Using EBG and HIS Structure.....	J. X. Yang, J. Chen, A. X. Zhang, et al	163
A52	A Compact Vivaldi Antenna for Wideband Application.....	X. X. Shi, Y. G. Zhou, X. D Huang	167
A53	Dual-Band Conformal Meander-line Monopole Antenna with coupled Patch for Unmanned Aerial Vehicle Applications.....	W. Y. Shen, G. H. Chen, G. Q. Zhang	171

B. Propagation

B1	A Novel Polarization Measurement Method for Large Transmitting Antenna/Antenna Array.....	Y. G. Cui, P. P. Ban, S. J. Hao	175
B2	Multi-Zone Small Slope Approximation on dune surface scattering.....	W. Liu, K. K. Li, L. X. Guo , et al	179
B3	A method to calculate the Statistic Characters of the Transient Electromagnetic Pulse Coupling into Stochastic Transmission Lines.....	Y. J. Yan, L. Meng, X. L. Liu	183
B4	Artificial negative refraction index material consisting of dielectric perpendicular rings.....	Z. T. Zhang, Z. T. Yu, H. L. Yang, X. J. Huang	187
B5	Studying the Effects of the Rough Sea Surface on Electromagnetic Waves Propagation	W. W. Ding, S. J. Chen, Y. L. Long, K. Wang	190
B6	Broadband Microwave Propagation in a Novel Large Volume Glow Discharge Argon Plasma	R. L. Gao, C. X. Yuan, J. S. Jia, et al	194
B7	Propagation of Electromagnetic Waves in a Glow-discharge Dusty Plasma	J. S Jia, C. X. Yuan, R. L. Gao, et al	198
B8	Electromagnetic Scattering from Rough Sea Surface Covered with Oil films	X. C. Ren, Y. Q. WANG	202
B9	Terahertz Multi-band reflective polarization converter based on TSRR metamaterial	H. G. Su, F. Lan, Z. Q. Yang, et al	206
B10	Ultra-wideband polarization conversion metasurface.....	C. Y. Kong, Z. R.	

Li, Z. Wu	210
B11 Diagonse the marine atmospheric duct using satellite remote sesing technique	X. M. Guo, D. L. Zhao, X. J. Hao, et al 213
B12 Retrieving the Troposphere Duct by Using Ground-based Radiometric Profiler in South Coast in China	N. Wang, L. X. Guo, Z. W. Zhao, et al 216
B13 Analysis and Study on the Prediction Model of Rain Attenuation in Short Path	C. Z. Hou, Z. S. Wu, C. S. Lu, et al 220
B14 A Dual-Band Microstrip Antenna for Aviation and Mobile Application	Z. Q. Luo, L. Wang, D. M. Deng, et al 224
B15 Dual-band Microstrip Antenna Fed by Coaxial Probe.....	B. S. Yan, L. Wang, Z. Q. Luo, et al 228
B16 The design of a five-band antenna based on coplanar waveguide	C. C. Dong, L. Xu, Y. Wang, H. Zhang 231
B17 Radar Echo Simulation using Wideband Sweep Frequency Data	C. Jia, T. Zhao, C. Z. Dong 234
B18 Propagation of electromagnetic wave in a magnetized and non-uniform plasma	L. J. Guo, L. X. Guo 238
B19 Design of Ultra-wideband bow-tie antenna in UHF band	S. M. Li, D. X. Wang, W. P. Cao, M. Li 242
B20 Low-profile Double-frequency Fabry-Perot (F-P) Cavity Antenna	W. P. Cao, H. M. Zhang, S. M. Li 245
B21 Ultra-wideband bow-ties for hidden target detection.....	S. M. Li, K. Wang, W. P. Cao, M. Li 248
B22 A Novel, Dual-band, Miniaturized Antenna with Fractal-curve Patch and TSV-CPW feeder.....	Y. Zhou 251
B23 A Novel Omnidirectional Circular Polarized Antenna Array.....	S. Q. Wang, L. Xu, H. Zhang, Y. Wang 254
B24 One Method to Improve Gain of Holographic Surface Antennas.....	C. Gong, S. Q. Xiao, Z. T. Zhang, et al. 257
B25 A Study on Fluctuant Target detection Based on Fluctuation Factor.....	Y. L. Huang, C. X. Zhang, K. Y. Liu 260
B26 A new measurement of atmospheric coherent length using differential image motion.....	J. Ao, J. Q. Liu, C. B. Ma 264
B27 Backward Scattering from the 2-D Time-varying Rough Overturning Wave Crest by MoM.....	Y. Zhang, L. X. Guo, W. Liu 268
B28 Analysis of Scattering Characteristics of 3-D Objects with Rough Surfaces.....	X. B. Zhou, S. H. Liu, L. X. Guo, et al. 272
B29 PIN tuned Phase-Gradient-Metasurface Transmitarray for Beam Steering Application.....	W. Li, S. Xia, Z. R. Li, Z. Xu, et al. 276
B30 A Study of Multi-frequency GNSS Ionospheric Scintillations at Guilin, China.....	S. Y. Wang, Y. H. Zou 279
B31 The Array Design of the Distributed Space-based Radar Based on Sunflower Arrays.....	P. J. Jin, Z. J. Li, J. K. Wang 283
B32 Electromagnetic Scattering for Multilayered Spheres Induced by Laser Sheet	

Beam.....	J. Bai, Z. S. Wu, C. X. Ge, Q. C. Shang et al.	287
B33 Design of Miniaturized WLAN Notched Ultrawideband Microstrip Antenna.....	D. M. Deng, L. Wang, Z. Q. Luo, et al.	291
B34 Quad-Band Microstrip Antenna with Only One Slot on the Edge.....	L. Wang, D. M. Deng, B. S. Yan, et al.	295
B35 A C-band 16×16 array antenna for microwave communication.....	L. R. Mei, N. B. Zhang, L. Z. Liu, et al.	299
B36 RCS Reduction of Active Periodical Structural Scatterer.....	H. B. Li, L.X. Zhang, Z. X. Song, X. L. Zeng	303
B37 Simulation and experiment study of horn antenna loaded with ENZ metamaterial.....	T. Y. Jiang, H. Zhou	307
B38 Analysis of Vivaldi Antenna on Cross-polarization Application.....	X. C. Guo ,T. Gao, Y. Yuan, Z. Xu	311
B39 Conformal Multi-beam Directional Array Antenna.....	W. P. Cao, L. Z. Ma, S. M. Li, C. H. Zhou, Y. P. Liu	315
B40 A Novel wearable 3D Printed RFID Badge Tag.....	Q. Liu, Y. F. Yu	318
B41 Automatic Detection of Ionospheric TEC Depletions by Using Low-latitude GNSS Data.....	D. T. Li, Y. H. Zou	320

C. EM Theory

C1 Application perspective of Qujing incoherent scatter radar acting as a high Power source at 500MH.....	Z. H. Ding, R Zhang, L. D. Dai, et al.	323
C2 Three-band polarization-independent spoof plasmon polariton coupler.....	J. S. Zhang, X. B. Liu, A. X. Zhang	327
C3 Study of a Hybrid Antenna Consists of Solid and Liquid Materials.....	G. S. Li, X. J. Wei, N. Zhao, et al.	330
C4 Time and Spectrum Domain Analysis of Electromagnetic Pulse.....	H. Tan, C. H. Fang, M. L. Huang, et al.	333
C5 A Study of Multipath Scattering from Low-altitude Target above Complex Ocean Surface.....	P. Peng, L. X. Guo, C. M. Tong	337
C6 A dynamic electromagnetic scattering simulation method based on polarization transform.....	T. Zhao, C. Z. Dong	340
C7 A quick measurement method of the terminal equivalent impedance for multiple parallel cable-bundles.....	H. Y. Liu, D. L. Su, D. X. Lv, et al.	344
C8 Research on the method of combining period extraction with eigenvalue entropy.....	C. Z. Tang, H. M. Ren, Y. Li	351
C9 Denoising Effect Evaluation Indexes for EME Measurement Spectrum.....	Z. L. Yuan, D. Long, Y. F. Wang	355
C10 The Comparison of Scattering from model on the Lake to Target on the Sea Based on FSV.....	C. H. Fang, L. Tao, H. Tan	358

C11	A Powerful Analytic-Numerical Algorithm for Scattering from a 3-D Object Above a 2-D Conductive Rough surface.....	H. J. He, L. X. Guo	361
C12	A Vector Parabolic Equation Method for Propagation Predictions over Flat Terrains.....	X. W. Guan, L. X. Guo, Q. L. Li	365
C13	An analytical solution to the scattering by gyrotropic anisotropic spherical shell.....	P. F. Wang, Y. L. Geng	369
C14	Focused Field Estimation of Time Reversal Waves from Wireless Sensors in Scattered Environments.....	D. S. Zhao, C. Zhou, Y. F. Zhao, et al.	372
C15	Multipath Effects on Time Reversal OFDM Communications between Wireless Sensors.....	Z. X. Chen, Y. F. Zhao, D. S. Zhao	376
C16	An Analysis of Doppler Frequency Shift in 2D Modified Space Plasma.....	X. Sun, L. X. Guo, J. T. Li	380
C17	Generating Broadband Cherenkov Radiation with Low Energy Electrons based on Plasmonic Graded Grating.....	L. Xiao, L. Tao, H. Tan, et al.	384
C18	Difference Field Scattering Properties between Inlaid Redundant Particles and Slightly Rough Optical Surface.....	C. X. Ge, Z. S. Wu, J. Bai, et al.	387
C19	Energy Efficiency of Wireless Body Area Networks Coexistence.....	R. X. Liu, Y. L. Wang	391
C20	Effect of Discontinuous Snow Coverage on Radiation Characteristics of the Leaky Rectangular Waveguide.....	X. Q. Wu, J. H. Wang, X. Y. Huo, et al.	395
C21	Rectangular Grating Surface Plasmon Interference Model Equivalent Numerical Experiment.....	L. Gong, Z. S. Wu, Z. J. Li, et al.	400
C22	A Narrow-Angle Parabolic Equation Model in Atmospheric Ducts.....	Y. J. Wang, L. X. Guo, Q. L. Li	404
C23	Statistical Analysis of Signatures and Contributing Factors of Atmospheric Ducts Based on the Sounding Data.....	X. Shen, Z. S. Wu, Q. L. Zhu, et al.	408
C24	A special transmission characteristic of the electromagnetic wave in the plasma sheath surrounding a near-space vehicle and its analysis.....	X. Yang, B. Wei, Q. Wang	412
C25	Improvement of the Radiation and Impedance Performance for the SIW H-Plane Horn Antenna.....	S. Q. Zhang, Z. Li, J. H. Wang	415
C26	Simulation of asymmetry incoherent scatter spectra with the ion acoustic wave.....	B. Xu, Z. G. Wang, Z. W. Xu, et al.	418
C27	Uncertainty Analysis of Antenna Noise Temperature Measurement Using Y-factor Method.....	S. Y. Qin, L. J. Zhang, Z. S. Li	421
C28	An Analytic Solution for Double Scattering of Urban Structures.....	T. Wang, C. M. Tong, T. Song, et al.	424
C29	An In-Orbit External Calibration Method for Antenna Error of Aperture Synthetic Radiometer.....	J. K. Wang, W. X. Chen, Y. N. Li, et al.	427
C30	-Study on the absorption properties of A curved metamaterial absorber.....	J. Chen, H. L. Yang, S. Hu, et al.	431
C31	Electromagnetic Scattering Characteristics of Ablation Rough Surface in Plasma Sheath.....	S. F. Yang, J. T. Li, L. X. Guo	435
C32	Low Latitude Ionospheric Tomography Based on the Multi-station Method.....	W. X. Guo, Z. S. Wu, C. Z. Hou, et al.	439

C33	The study of bandwidth and dual-band for near-field broadband electric field coupling antenna.....	K. H. Fan, B. Wei	443
C34	General theory on electromagnetic Scattering of an off-axis Hermite-Gaussian beam by a rotationally uniaxial anisotropic spheroid.....	Z. J. Li, Z. S. Wu, J. Bai, et al.	447
C35	The Nested Complex Source Beam Method with Singular Value Decomposition.....	L. N. Song, J. Hu, L. W. Guo, et al.	451
C36	Study and Design of Ultra-Broadband Loaded Monopole Antenna.....	W. P. Cao, P. Liu, S. M. Li, et al.	453
C37	On Configuration and Working Model of Massive MIMO Antennas.....	H. Tang, Z. P. Nie	456
C38	Comparison of Taylor and Rachidi Models for Response Calculation of Field-to-Line Coupling.....	X. J. Yang, F. Zhu, R. Q. Qiu, et al.	460
C39	Analysis of the Doppler Effect of Wind Turbines.....	F. Gao, Z. Y. Niu	464
C40	Noncontact Measurement of Rotational Movement Using IR-UWB Radar.....	X. K. Hu, T. Jin	468
C41	A study of electromagnetic scattering from sea surface with breaking waves using generalized forward-backward method.....	X. X. Zhang, Z. S. Wu, T. Wu, et al.	472

D. Computational Electromagnetics

D1	Research on reducing grating lobe of adjoining regular subarray Using genetic algorithms (GA).....	B. J. Lu, L. Sang, X. X. Li, T. Li	475
D2	Using the Finite Difference Parabolic Equation with Nonlocal Boundary Condition for Complex Environment Radiowave Propagation Prediction.....	Z. Y. Ge, G. Z. Lu, R. D. Wang	478
D3	Numerical Simulation of Field Uniformity of Reverberation Chamber.....	H. Tan, C. H. Fang, M. L. Huang, et al.	481
D4	Reflection and Transmission Coefficients of Moving Dielectric in Half Space.....	Y. Liu, K. S. Zheng, Z. M. Mu, X. P. Liu	485
D5	Study of Dual-spectral electromagnetically induced transparency in bright-dark mode coupling metamaterials	S. Hu, H. L. Yang, J. Chen, X. J. Huang	488
D6	On the radar detection analysis under the interference environment based on the Monte Carlo method	C. Wang, K. X. Lv, M. L. Huang, et al.	492
D7	Investigation on the Far-field Characteristic of Radar Radiant Source in Ship Fleet.....	Q. F. Liu, D. G. Xie, J. W. Liu	496
D8	Optimal design of LTCC filter by extracting human experience using fuzzy algorithm	W. J. Wu, W. Zhang, Q. F. Liu, C. Ni	500
D9	Extraction of Equivalent Dipole-Moment Model Based on Improve Mapped Matrix	W. Liu, Z. W. Yan, W. J. Zhao	504
D10	A Paralle Processing Algorithm for Multipath Clutter Cancellation in Passive Radar	Y. Fu, X. R. Wan, X. Zhang, et al.	508
D11	An Accelerated Algorithm for Ray Tracing Simulation Based on High-Performance		

Computation	L. H. Wang, K. Guan, B. Ai, et al.	512
D12 Designing a radome with frequency selective surface by using the physical optics method.....	R. Zhang, G. Z. Lu, D. D. Zeng, et al.	516
D13 A Fast Algorithm for Volume Integral Equation Using Interpolative Decomposition and Multilevel Fast Multipole Algorithm.....	Y. N. Liu, X. M. Pan, X. Q. Sheng	519
D14 Fast Solution of Linear Systems With Many Right Hand Sides Using MPI Parallel Interpolative Decomposition.....	S. L. Huang, H. Xu, X. M. Pan, et al.	523
D15 Extraction of Distributed Capacitance for Microstrip lines Using Conformal Technique Based on Finite-Difference Method.....	Y. X. Sun, X. M. Wang	527
D16 Comparative Study on Recovery Algorithms for Solving Electromagnetic Scattering Problems by Compressive Sensing	X. L. Hou, M. S. Chen, Y. Y. Zhu, et al.	530
D17 Implementation of a Second-order ABC in TDFEMfor 2D Electromagnetic Problems	Z. Che, L. Xu, N. Wang	534
D18 Analysis of a combined waveform of linear frequency modulation and phase coded modulation	H. M. Li, J. Y. Zhao	539
D19 An Improved Hybrid FEM/MOM Combining MLFMA for Composite Electromagnetic Scattering.....	H. L. Sun, C. M. Tong, G. H. Wu	542
D20 Dual-layered Metalens for Polarization-agile Orbital Angular Momentum Waves	Y. F. Hou, Y. Li, Z. J. Zhang, Z. H. Feng	546
D21 Modeling of 1D Graphene Based on LTJEC-FDTD Method	M. Ahmad, L. X. Yang	550
D22 The analysis on Doppler spectrum of 2-D sea clutter in Multi-band.....	T. Wu, Z. S. Wu, Y. Y. Wei, et al.	554
D23 Scattering of a uniaxial anisotropic sphere incident by a Laguerre-Gaussian vortex beam	T. Qu, J. J. Wu, Z. S. Wu, et al.	557
D24 A Robust Interference Alignment Algorithm and The System Design.....	N. Li, Y. Liu, L. J. Zhai	561
D25 Study on the Time Domain Electromagnetic Sputtering Effect of the Slot Array with Dielectric Substrate.....	H. J. Hou, Y. Y. Zhang, J. H. Wang	565
D26 Parallel FDTD Method for EM Scattering from a Rough Surface with a Target.....	C. G. Jia, L. X. Guo, W. Liu	569
D27 Investigation of Material Parameters and SAR Distribution in Human Tissue using FDTD method	Z. F. Li, M. Y. Wang, X. B. Tan, et al.	573
D28 Modeling Of Three-dimensional Weak Magnetic Field Induced By Water Movement.....	Y. R. Liang, L. X. Guo, H. Y. Qi, et al.	577
D29 A Modeling Approach for Complex Multifloored Indoor Environments.....	Z. Y. Liu, L. X. Guo, X. W. Guan, et al.	581
D30 Some acceleration Techniques for Antenna Simulation in FDTD.....	X. Q. Zhu, J. G. Wang, Z. G. Chen	584
D31 Research on Electromagnetic Scattering Characteristics of Strat Composite Random Rough Surface Based on Improved Hybrid SBR/PO method.....	G. X. Zou, C. M. Tong, W. M. Liu, et al.	587
D32 Experimental Research on Multiple Stages EMP Protection Measure for HF Transmitter	D. D. Wang, L. Gao	592

D33	An Artificial Anisotropy WCS-FDTD Metho.....	K. K. Niu, B. Wu, Z. X. Huang , et al.	595
D34	Electromagnetic Scattering Characteristics Analysis of Slits based on Fast Backprojection Imaging	Z. C. Liang, H. Gu, B. Wang, et al.	599
D35	Numerical simulation of abnormal incoherent scatter spectra based on Zakharov model	P. F. Kong, H. Y. Li, Z. S. Wu	603
D36	Direction of Arrival estimation for monostatic MIMO radar using reduced-dimension RISR Algorithm.....	X. F. Dang, K. Ma, B. X. Chen, et al.	607
D37	Estimation of multipath parameters in wireless communications using noncircular PARAFAC algorithm.....	B. Yang, F. Q. Wen, S. Liu	612
D38	2D-DOA Estimation for Uniform Rectangular Array using Noncircular HOSVD Method.....	B. Yang, D. M. Huang, S. Liu	617
D39	An Improved DOA Estimation Algorithm Based on Sparse Reconstruction.....	W. B. Huang, H. Li	621
D40	Fast Design of Multilayer Cascade Metasurface Absorbers Using Particle Swarm Optimization	J. Liu, Y. J. Zhao, S. L. Jia	626

E. Electromagnetic Compatibility

E1	A Dual-band Recon- figurable FSS Composite Structure Based on MEMS Switches	Z. B. Lu, J. J. She , X. Q. Yan	630
E2	A Study of Defect Mode in One Dimensional Electromagnetic Band Gap Structures.....	Y. Li, H. W. Yuan, C. T. Wang, H. Wang	633
E3	Simulation study of high power microwave damage effect on GaAs HEMT.....	P. W. XUE, J. Y. FANG, Z. P. LI, J. SUN	636
E4	Ultra broadband metamaterial absorber with oblique incidence based on effective medium theory.....	X. J. Huang, S. Q. Yu, J. Chen, H. L. Yang	640
E5	A Double-Layer Miniaturized Dual Band Frequency Selective Surface.....	F. Deng, S. Q. Zheng, D. D. Wang, F. Ding	644
E6	An-order Ultra wideband Frequency Selective Surface.....	F. Deng, S. Q. Zheng, F. Ding, D. D. Wang	648
E7	Research on Electromagnetic Coupling between Concave Layout Array	D. G. Song, Q. Zhang, B. Ma	652
E8	Thermal Study of MOSFET under HEMP.....	Y. Li, H. Y. Xie, Z. Q. Yang, X. Chun, et al.	655
E9	Wideband 3D Frequency Selective Rasorber with Two Absorption Bands.....	Y. F. Yu, T. W. Deng, Z. X. Shen	657
E10	Nondata-aided Timing Recovery for Partial Response CPM.....	Y. Wang, X. B. Guo, S. L. Zhou	660
E11	Discussion on the Application of Integrated RF System in the New Armored Platform.....	K. Ma, X. Yang, J. Gao	664
E12	One case about comparison of PMSE heating effect with two different radar echoes layers	Safi Ullah, H. L. Li, Abdur Rauf, et al.	668

E13 Radar Cross Section Reduction of a Microstrip antenna with CSRRs Loaded on the Ground.....	S. Z. Wang, M. E. Chen, J. H. Wang, et al.	670
E14 Channel pre-distortion compensation techniques in SAR echo simulator.....	C. Ni, H. Tan, Q. F. Liu	674
E15 Analysis and Control of Shielding Effectiveness for a Rectangular Enclosure with a Rectangular Aperture.....	X. J. Ying, Y. Liao, G. C. Shi, Y. Zhang	678
E16 Tuning Technique of the Loaded Active Radar Absorber.....	Y. Y. Ji, L. X. Zhang, C. Y. Liu, et al.	682
E17 Graphene-based Wideband Absorbing Screen with Radar Cross Section Reduction	C. N. Gao, Y. N. Jiang, J. Zhang, et al.	686
E18 A Novel Design Approach for Wideband Absorber Screen.....	Q. Song, W. Tang, L. H. Yuan	690
E19 An Improved Design of Ortho-mode Transducer.....	W. P. Cao, K. Xie, S. Li, L. Y. Gao	693
E20 Wideband RCS Reduction Based on Polarization Conversion Metasurface.....	C. Y. Kong, Q. X. Guo, Z. R. Li, Z. Wu	696
E21 An ultra-broadband THz absorber based on graphene.....	L. Wang, Y. N. Jiang, J. Wang, et al.	699
E22 Observations on the irregularities using Kunming VHF radar.....	Z. G. Wang, B. Xu, Y. Liu, et al.	703
E23 Power Frequency Electromagnetic Interference Test and Analysis of The Rail Weighbridge Pressure sensor.....	X. Li, F. Zhu, R. Q. Qiu, et al.	706
E24 Exploration and Practice on the course of “Analysis of Electronic Information Business Case”	C. Y. Ha, Y. G. Zhang	710
E25 Bidirectional Reflection Distribution Function Modeling of Material Surface in Different Temperature.....	M. Zhang, L. Bai, Z. S. Wu, et al.	713
E26 Coupling Reduction of Closely Packed Antennas by Stringing EBG Structure.....	L. Peng, K. Sun, J. Y. Xie, et al.	716
E27 Tunable and Broadband Radar Absorber Based on PIN Diodes Controllable FSS.....	X. L. Zeng, L. X. Zhang, G. B. Wan, et al.	720
E28 Design of a Tunable Polarization Insensitive Graphene Absorber Operating at THz Band.....	X. Qin, J. Chen, A. X. Zhang, et al.	723
E29 Analysis of RCS of Certain Rough Targets in Terahertz Band.....	X. B. Zhou, S. H. Liu, L. X. Guo, et al.	727
E30 Study on the transmission characteristics of a double layered Complementary frequency selective surface.....	H. ZHAO, M. S. CHEN, L. ZHANG, et al.	731
E31 Research on RCS Time Series of Ballistic Missile Warhead in Reentry Phase.....	J. C. YUAN, X. K. ZHANG	735
E32 Modified Doherty Power Amplifier Based on Asymmetrical Load Matching Networks.....	Y. F. Cai, C. P. Yu, S. L. Li, Y. N. Liu	739
E33 Study on the Scattering Property of Gradient Index Metasurfaces with H-shaped Patches	H. J. Hou, J. H. Wang	743
E34 Rainfall Observation based on the VHF Radar.....	H. Y. Qing	746
E35 Design of a 5-States Reconfigurable Filter Based on the Structure of		

SIR	X. D. Huang, Y. G. Zhou	750
E36 Wideband polarization-independent anomalous reflection mediated by metasurface.....	G. X. Dong, S. Xia, H. Y. Shi, et al.	753

F. Others

F1 Seasonal Occurrence of Polar mesosphere summer echo variations with different layers	S. Ge, H. Li, T. Xu, et al.	756
F2 Non-data-aided timing recovery scheme for MSK signals.....	Y. Dong, Q. Wang, Z. G. Xu	759
F3 Tunable Substrate Integrated Waveguide Bandpass Filter Using Liquid Crystal Material	Z. Guo, Y. Liu, D. Jiang, et al.	763
F4 A Compact Quad-Band Bandstop Filter Using Square Spiral Resonators Based On Folded Stepped Impedance Resonator.....	P. Wang, X. Huang, Z. Yu, et al.	766
F5 Analysis of Computerized Ionospheric Tomography Using PALSAR Polarimetric Data.....	C. Wang, L. Chen, L. Liu, et al.	769
F6 Impact of Excitation Coefficients Orthogonalization on Beam Forming.....	X. J. Chen, J. X. Wan	772
F7 The Optimal Order of Processing Sensors in Sequential IPDA Filter	H. J. Zhang, Z. H. Zhang, B. M. Li, L. Chang	776
F8 The Design Method of the Radiation Source Parameter-Database Based on C/S Structure.....	Q. F. Liu, T. Hu	783
F9 A robust timing recovery algorithm with frequency offset for MIL-STD SOQPSK.....	Y. Y. Dong, Q. F. Wang, Z. G. Xu	786
F10 An optimized Interference Alignment Algorithm based on dynamic power allocation for MIMO System.....	Y. Liu, H. W. Yuan, N. Li, L. J. Zhai	790
F11 On the High-speed Railway Communication at 30 GHz Band: Feasibility and Channel Characteristics.....	G. K. Li, K. Guan, B. Ai, et al.	796
F12 Optical and Electrical Properties of Short-Pitch Plasmonic Solar Cells with Oblique Incidence.....	L. L. Cheng, Z. X. Huang, X. L. Wu	800
F13 FO-13 ID:102-The Range Alignment Algorithm for High-Resolution Range Profile of Multiple Target.....	S. Jing, H. M. Reng	804
F14 Imaging Simulation Based on Fully Polarimetric Radar of Simple Manmade Targets in a Half Space.....	D. W. Lu, X. F. Que, X. Qi, Z. P. Nie	808
F15 MIMO Channel Sounder and Millimeter Wave Measurements in a Conference Room.....	Y. S. Liu, R. Zhang, L. K. Lin	812
F16 Two Methods for BCI Probe to Improve the HighFrequency Performance	W. J. Zhao, Z. W. Yan, W. Liu	815
F17 Investigation on Down-conductor System Layout for Electronic Equipment Protection.....	Z. S. Quan, Y. H. Yan, W. D. Dong, et al.	820
F18 Compact Power Divider Based on Composite Right/Left-handed Transmission		

Line.....	W. Qiao, X. Gao, X. Y. Yu, et al.	824
F19 An Improved Type of TE ₁₁ Mode Circular Polarizer.....	X. H. Yu, S. T. Ye, W. P. Cao, et al.	828
F20 A TE ₀₁ Generator Excited by TEM.....	X. H. Yu, W. B. Wang, W. P. Cao, et al.	830
F21 Ka Band Band-stop Filter Based on Complementary Split Ring and SIW Resonators	W. P. Cao, Z. Zhang, S. M. Li, et al.	832
F22 Density and temperature characteristics of hypersonic aircraft outflow field near the wall.....	D. Y. Zhang, L. Bai, Z. S. Wu, et al.	834
F23 Design of Multistage Gradient Coaxial Based on Axial Dislocation Compensation Method	J. Zhang, Y. N. Jiang, W. P. Cao, et al.	838
F24 Design of Overmoded-Waveguide Directional Coupler and Correction of Coupling Coefficient Calculation.....	Y. T. An, J. H. Wang, Z. Li, et al.	842
F25 Analysis on Ship's Underwater Static Electric Field with Physical Scale Model.....	Y. D. Feng, G. Pan, X. Z. Xi, et al.	846
F26 Motion Compensation for High Range Resolution Profile Based on Stepped-Frequency Waveforms.....	B. Hu, L. X. Zhang, Z. X. Song, et al.	850
F27 Statistical Analysis of S-band Radar Sea Clutter Spikes.....	J. T. Wan, Q. L. Li, X. Li, et al.	854
F28 Impact of probe ring location on test area performance in 3D MIMO OTA setup.....	Y. Yuan, W. M. Wang, Y. A. Liu, et al.	858
F29 Influence of Atmospheric Duct on Low-angle Radar Tracking Errors.....	H. G. Wang, F. J. Lin, X. Dong, et al.	862
F30 Low angle estimation with colored noise in bi-static MIMO radar.....	S. Hong, M. S. Yan, Y. H. Wang, et al.	866
F31 A method separating echo by adaptive chirplet signal decomposition based on FRFT.....	W. J. Chen, L. Yuan, J. Sheng, et al.	869
F32 The Recognition Method Based on the Height of the reentry target.....	T. Y. Guang, H. C. Ying, R. H. Mei	873
F33 The Difference in Variation Characteristics of the F ₂ -peak Height HmF ₂ at the Low and Middle Latitudes.....	W. Ning, G. L. Xin, D. Z. Hua, et al.	877
F34 Mitigation of RF Blackout in Plasma Sheaths Communication via Nonlinear Effects.....	Z. J. Wang, L. X. Guo, J. T. Li	882
F35 A New Hybrid Data Compression Algorithm for Weather Radar.....	K. Ma, C. Y. Li, H. Z. Li	886
F36 Designing and Simulation of A ZigBee-Communication Printed Circuit Board.....	C. Huang, Y. Liu, B. Xiong, et al.	890
F37 Arbitrarily non-conformal ellipsoidal invisible cloak.....	W. M. Liu, X. H. Xu	893
F38 Ultra-wideband terahertz reflective polarization conversion based on anisotropic meta-mirror with interlaced-parallel-dipole metasurface.....	F. Lan, Z. Q. Yang, Z. J. Shi, et al	896
F39 A New Brightness Temperature Model for Low Elevation Angles and Application in Remote Sensing of Evaporation Ducts.....	Z. Q. Cao, S. F. Kang	900

F40	Multiband terahertz reflective polarizer based on asymmetric L-shaped split-ring-resonators metasurface.....	F. Luo, F. Lan, Z. Q. Yang, et al	905
F41	A Compact Dual-band Tunable Filter Adopting Cross Coupling Structure.....	Z. H. Zhang, Z. H. Fang, A. T. Wu, B. R. Guan	908
F42	The Statistic and Analysis of atmospheric ducts worldwide using radiosonde data.....	X. J. Hao, L. X. Guo, L. K. Lin, et al	911
F43	The Study of the Rough Medium Surface by Improved IPO.....	Y. Y. Wei, Z. S. Wu , X. X. Zhang	915
F44	Microwave Technology for Brain Activities Detection of Rats.....	X. Jiang, B. Kang, X. P. Li, L. Peng	918
F45	A Multi-Order Radiative Transfer Model for Microwave Radiometry of Vegetation Canopies.....	L. Chen, C. Wang, Q. Cui	921
F46	Multiband plasmonic filter based on double layer spoof surface plasmon polaritons.....	D. Tian , R. Xu, Z. Xu, et al	925
F47	A Handover Scheme for Seamless Multicasting in PMIPv6 Wireless Networks.....	Y. Zhang, J. C. Gao, H. F. Hu	928