

2024 IEEE International Workshop on Antenna Technology (iWAT 2024)

**Sendai, Japan
15-18 April 2024**



**IEEE Catalog Number: CFP24ATS-POD
ISBN: 979-8-3503-1476-2**

**Copyright © 2024 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:	CFP24ATS-POD
ISBN (Print-On-Demand):	979-8-3503-1476-2
ISBN (Online):	979-8-3503-1475-5

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

TABLE OF CONTENTS

Recent Progress in Circularly Polarized Meta-Antennas.....	1
<i>Hisamatsu Nakano, Tomoki Abe, Junji Yamauchi</i>	
Epsilon-Near-Zero (ENZ) Antennas.....	5
<i>Shuyu Wang, Yue Li</i>	
Lorentz Dispersive Metamaterial for Single-Mode Dual-band Antenna Design.....	8
<i>Jiexi Yin, Zhi Ning Chen, Thomas Zwick</i>	
Prior Knowledge-Guided Deep Learning Algorithms for Metantenna Design (Invited).....	11
<i>Peiqin Liu, Zhi Ning Chen</i>	
Performance Evaluation of LC Materials for Display and Non-Display Applications in Ku-Band 6x6 Antenna Array Structure	14
<i>Yun-Hao Chang, Hsi-Hsir Chou</i>	
Dual-Band Dual-Polarized Millimeter-Wave Magneto-Electric Dipole Antenna with Second-Order Bandstop Filtering Characteristic	18
<i>Jiangcheng Chen, Kimmo Rasilainen, Markus Berg, Marcin Selent, Aarno Pärssinen</i>	
Ultra-Wideband Adaptive Switchable FSS Design with High Selectivity	22
<i>Jiangcheng Ge, Yuchen Liu, Chuanhao Yang, Wen Jiang, Tao Hong</i>	
Dead-Zone-integrated Antenna Based on Spoof Surface Plasmon Polaritons with Via-less Restrictions.....	26
<i>Phuong Linh Hoang, Thi Hai-Yen Nguyen, Gangil Byun</i>	
Wideband High-Isolated Eight-Element Slot MIMO Antennas Based on Current Couplings Cancellation.....	29
<i>Cuixia Huang, Yongkang Peng, Jiangwei Sui, Du Li, Junru Li, Xiangwei Zhu</i>	
Transmitarray Design of Dielectric Resonator Antennas Using Deep Learning	32
<i>Qiheng Huang, Kwok Wa Leung</i>	
Experimental Validation of an Extended Pseudo-Scale Model for Air-Brackish Two-Layer Problem	36
<i>Hiroyasu Mimura, Nozomu Ishii</i>	
Standing Wave Dual-Band Substrate Integrated Waveguide Slotted Array Antenna for mmWave Automotive Radar Application.....	39
<i>Guillaume Ndjamba Nyami, Oludayo Sokunbi, Ahmed A. Kishk</i>	
Simultaneous Transmit-Receive Horn Antenna Based on a Nonreciprocal Metasurface with Embedded Magnetic Bias.....	43
<i>Andrew J. Park, Carl C. Pfeiffer, Andrey A. Chabanov, Anthony Grbic</i>	
Negative Capacitor and Inductor with Loss Analysis.....	47
<i>Xu Qin, Yue Li</i>	
Simple Measurement Method for Reflectarray Using Monostatic-Bistatic Equivalence Theorem.....	50
<i>Keiji Sawairi, Hiroshi Hashiguchi, Naobumi Michishita</i>	
An RFID-Controlled Reconfigurable Intelligent Surface.....	52
<i>Chuankui Shen, Weijia Li, Terry Tao Ye</i>	

Grating-Lobe Suppressing Feed Technique for 2D Phased Array with Interpolating Excitation Elements in 300-GHz Band.....	56
<i>Atsuya Yamazaki, Kunio Sakakibara, Yoshiki Sugimoto, Taisuke Uemura, Azuki Iwamoto, Nobuyoshi Kikuma</i>	
An Integrated Imaging Sensing and MMW Communication System with Universal Software Radio Peripheral	59
<i>Yuehan Yang, Shuliang Gui, Wei He, Liangcai Zhou, Guoqing Zhao, Zengshan Tian</i>	
Steering Radiated Beam of a Helical Antenna Using Plasma Reflectors	63
<i>Fatemeh Sadeghikia, Fatemeh Zamani, Hajar Jaafar, Ali Karami Horestani</i>	
Wideband Low-Sidelobe Circularly Polarized Array Using Sequential Subarray Rotation	67
<i>Jinlun Li, Sheng Gao, Hongtai Chen, Shunli Li, Hongxin Zhao, Xiaoxing Yin</i>	
Radiation-Scattering-Integrated Design of a Circularly Polarized Metantenna with Low Radar Cross-Section.....	71
<i>Xiaopeng Zhang, Qian Chen, Qingxin Guo, Zengrui Li, Jinbo Liu</i>	
2D Beam-Steerable Array Antennas for 5G Antenna-in-Package Applications	75
<i>Yingqi Zhang, Stanislav Ogurtsov, Vasilii Vasilev, Diego Caratelli</i>	
A MIMO Antenna Design with Closed Slot for Wi-Fi 6E Application	78
<i>Wen-Hsiu Hsu, Shan-Cheng Pan, Chia-Lun Tang</i>	
Generating Mode 1/-1 Circularly Polarized Nonvortex OAM Beams Using Uniform Circular Arrays	80
<i>Ravi Kadlimatti, Farhana Firdous</i>	
Novel C-Band Firecone Shaped Patch Antenna Design with High Beamwidth and Gain	84
<i>Deeptha Dinesh, Meghana M, Ananya S. H, Suganthi J</i>	
Flexible and Conformal Antennas Based on Corrugated Copper Clad Polyimide Films	88
<i>Mohammad Ameen, Koen Mouthaan</i>	
Machine Learning-Assisted Modeling in Antenna Array Design	92
<i>Qi Wu, Weiqi Chen, Yuefeng Li, Haiming Wang, Jiexi Yin, Weishuang Yin</i>	
Compact Polarization Reconfigurable Antenna with Isoflux Pattern for Space Applications	94
<i>Gong Chen, Fujiang Lin</i>	
Radiation Pattern Decoupled Circular Polarization Microstrip Antennas Using Metal Pins.....	98
<i>Guang Yao Liu, Nan Yang, Kwok Wa Leung</i>	
A Compact Orthogonal-Mode Decoupling Network for Metal-Rimmed MIMO Antennas	101
<i>Zexian Chen, Jiangwei Sui, Du Li, Junru Li, Xiangwei Zhu</i>	
A Nonradiative Dielectric Waveguide Based Wideband Reflectarray Antenna.....	105
<i>Wen Wu, Qiang Chen</i>	
Full-Vectorial Bidirectional Beam Propagation Method for Efficient Numerical Analysis of THz NRD Guide Components.....	108
<i>Akito Iguchi, Hyunuk Ahn, Keita Morimoto, Yasuhide Tsuji</i>	
Development of Jerusalem Cross Type Resorber for Wide-Angle Resorbing.....	111
<i>Kouki Kanno, Takuji Arima, Mitaro Namiki</i>	

A Dual-Passbands FSS with Wide Angular Stability and High Polarization Stability for 5G and EMC Pulse Shielding	113
<i>Yunshuai Gao, Yingsong Li, Luyu Zhao, Zhixiang Huang, Eugene Sinkevich, Vladimir Mordachev</i>	
Circularly Polarized MACKEY with Broader Bandwidth by Changing Antenna Plate Angle	115
<i>Yuto Usuda, Shigeru Makino, Toru Fukasawa</i>	
Low-Cost FR-4 Metasurface-Enhanced Microstrip Patch Antenna Array for Wideband 5G millimeter-Wave Applications	118
<i>Sarawuth Chaimool, Nuttaphat Prasert, Chawalit Rakluea</i>	
Study on Characteristics of SIW Bandpass-Filter Loaded with Full and Reduced Size of Artificial Dielectric Material.....	122
<i>Mohammad Ridwan Effendi, Muhammad Farhan Maulana, Budi Syihabuddin, Achmad Munir</i>	
Design and Analysis of a Slitted Waveguide Fed Mikaelian Lens Antenna	126
<i>Kevin Kipruto Mutai, Qiang Chen</i>	
Design and Characterization of a Low-Permittivity Lens for Sub-THz Applications	129
<i>Umair Rafique, Kimmo Rasilainen, Jiangcheng Chen, Marko E. Leinonen, Aarno Pärssinen, Ping Jack Soh</i>	
On-Chassis Wideband Antenna for Vehicle Digital Television	133
<i>Dinh Thanh Le, Masahiko Uchida, Yuya Osamura, Hiroshi Yoshimoto</i>	
Evaluation of Automotive Glass Antennas Using Commercial Base Stations	137
<i>Mizuki Kataoka, Osamu Kagaya, Kazuya Matsumoto, Yusuke Kato, Hideaki Shoji, Kazuma Tomimoto, Ryo Yamaguchi</i>	
On the Field Measurement of a Highly Efficient Reflectarray Antenna Using Electromagnets.....	140
<i>Ao Hu, Keisuke Konno, Qiang Chen</i>	
Study on Miniaturized, Circularly Polarized Microstrip Patch Antenna Using DGS at S-Band	143
<i>Linh Phuong Ta, Tohlu Matsushima, Daisuke Nakayama, Miyuki Hirose</i>	
Estimation of Phased Array Deformation Using Two Received Noisy Signals	147
<i>Jiahao Wang, Koen Mouthaan</i>	
A Study on Parallel-Arranged Leaky Wave Antenna with Dielectric Superstrate	150
<i>Shota Yamakawa, Daisuke Yamanaka, Osamu Kagaya, Takuya Kaji, Hiroyasu Sato, Qiang Chen</i>	
A Millimeter-Wave Wideband Patch Array Antenna with Parallel Connected Series-Fed Network.....	153
<i>Huanyue Song, Qiling Fan, Yajin Wang, Zengrui Li</i>	
A Dual-Band, Dual-polarized, Single-layer-fed Millimeter-wave Dielectric Resonator Antenna Fully Compatible with PCB Process	156
<i>Xin Xu, Longzhu Cai, Wei Hong</i>	
Self-Decoupled U-slot Patch Antenna Based on Field Valleys Distribution	159
<i>Chen Yang, Kwok Wa Leung, Qiang Wang, Litao Chen</i>	
Self-Duplexing Antennas for Wireless and Satellite Applications (Invited).....	162
<i>Chunxu Mao, Xiuyin Zhang</i>	

Low-Profile Proximity Coupled Cavity-less Magneto-electric Dipole Antenna	166
<i>Khalid Almegbel, Kin-Fai Tong</i>	
Efficient Methods to Enhance the Bandwidths of Transmitarray Antennas	169
<i>Peng Mei, Yang Cai, Shuai Zhang</i>	
Development of Millimeter-Wave Reconfigurable Reflect-Arrays	173
<i>Zhi Hao Jiang, Enhao Wang, Guangyao Peng, Kunjing Zhong, Wei Hong</i>	
Circularly-Polarized Antenna Arrays in Package with Rotated Sequential Feeding Network for Millimeterwave Communications	176
<i>Changhee Lee, Wootae Kang, Gangil Byun</i>	
Development of Low-Loss and Low-Cost Air-Filled Transmission Lines Based on Advanced Glass Wafer Packaging.....	177
<i>Cai Jing, Miao Zhang, Daquan Yu, Jiro Hirokawa</i>	
An Exploratory Study for the Design of Transcutaneous Antennas for High Data-Rate Full-duplex Applications.....	179
<i>Fatih Korkmaz, Viktor Doychinov, Paul Steenson, Samit Chakrabarty</i>	
Concept Proposal of Rear Feed Log-Periodic Film Antenna Using Microstrip Lines.....	183
<i>Yoshihiro Araki, Eisuke Nishiyama, Ryo Yamaguchi, Kazuma Tomimoto, Masayuki Miyashita, Ichihiko Toyoda</i>	
2-Bit Intelligent Reflection Surface Enhances Urban Wireless Communications: An Experimental Study.....	186
<i>Yufei Zhao, Afkar Mohamed Ismail, Gaohua Ju, Ziyue Wang, Yile Liu, Yong Liang Guan</i>	
Parasitic Array Loaded with Shorting Vias on Beam Steering Patch Antenna for 5G Applications.....	190
<i>Rabiatuladawiah Akhbar, Hajar Ja' Afar, Nurul Huda Abd Rahman, Nurulazlina Ramli, Rina Abdullah, Fatemeh Sadeghikia</i>	
Study of Dual-Band Horn Antennas for Offset Parabolic Reflector Antenna in 12- and 21-GHz- Band Satellite Broadcasting Reception	194
<i>Masafumi Nagasaka, Masashi Kamei</i>	
Low-Cost Dual-Band Transparent Antenna for WLAN Communication Systems	198
<i>Chawalit Rakluea, Sarawuth Chaimool, Norakamon Wongsin, Wantanee Amonvatsirikul, Anatda Chandadaeng, Paitoon Rakluea</i>	
Demonstration of IoT Sensors Powered by Ambient RF Energy Harvesting	202
<i>Chi-Yuk Chiu, Charles Ng, Ross Murch</i>	
An Omnidirectional Antenna for CPE Device Application	206
<i>De-Lun Huang, Ming-Hong Lee</i>	
Design of Switchable Dual-Axis Monopulse Array Antenna with Wide Beam-Steering Functionality Employing Tri-State SPDT Switches	209
<i>Maodudul Hasan, Eisuke Nishiyama, Ichihiko Toyoda</i>	
Aperture-Shared Reflectarray Antenna for Sub-6 GHz and Mm-Wave Dual-Band Dual Circular Polarization Independent Beam-Shaping	213
<i>Jianfeng Zhu, Yang Yang, Quan Xue</i>	
Four-Port Printed MIMO Dipole Antennas at Wi-Fi 6E/7 Bands for Wireless Modem Applications	216
<i>Shiang-An Shie, Wen-Shan Chen, Wen-Hsiu Hsu</i>	

Gain Enhancement of Low-Profile Folded Dipole Antenna Array	220
<i>Go Kasahara, Takumi Nishime, Hiroshi Hashiguchi, Naobumi Michishita</i>	
A 0.3-6 GHz Ultra-Wideband Vivaldi Array Antenna	222
<i>Minjian Ao, Yajin Wang, Jianxun Su, Zengrui Li</i>	
A Compact Dual-Band and High-Gain Antenna with a Large Frequency Ratio	225
<i>Shuai Gao, Hang Wong</i>	
Foldable Dual Linear Polarized Dipole L Band Antenna Using Polyimide and Gamma Match	228
<i>Gong Chen, Fujiang Lin, Koen Mouthaan</i>	
Multilayer and Low-Profile Optically Semi-Transparent Antenna for Conformal Applications	232
<i>Mohammad Ameen, Koen Mouthaan</i>	
Dual-Polarized Cylindrical Dielectric Resonant Antenna for Tri-band Wi-Fi Applications	236
<i>Xu Han, Peng Fei Hu, Kwok Wa Leung</i>	
Flexible Substrate Based D-Band End-fire Antenna for 6G Application	239
<i>Daisuke Yamanaka, Osamu Kagaya</i>	
A Dual-Band MIMO Antenna for Wi-Fi 6E / 7 System in a Small Base Station	242
<i>Jui-Han Lu, Xiang-Yu Liu, Yu-Yang Wang</i>	
FDTD Analysis of Electromagnetic Scattering Sheet Using Surface Impedance Method	245
<i>Jerdvisanop Chakaroathai, Kazuma Takeya, Jun Shibayama, Yukihiisa Suzuki, Katsumi Fujii</i>	
Study of Single Point-Feed Wi-Fi 2GHz/5GHz Band Antenna Using MACKEY A-Shaped Structure	247
<i>Hayato Ide, Toru Fukasawa, Shigeru Makino</i>	
Measurement Results of Broadbanding a Reflectarray Antenna by Controlling Phase Center of Primary Radiator	250
<i>Ryusei Yamada, Toru Fukasawa, Shigeru Makino</i>	
Scattering Beam Reconfigurable Circularly Polarized Antenna Array	254
<i>Pengfei Wang, Ying Liu, Yongtao Jia</i>	
Design of Miniaturized SFSS with High Selectivity and High Switching Isolation	257
<i>Jie Tian, Tao Hong, Zhili Jia, Jiangcheng Ge</i>	
Analysing a Horn Antenna at 220–330 GHz Using Simulations and Near-Field Measurements	260
<i>Kimmo Rasilainen, Asad Husein, Klaus Nevala, Marko E. Leinonen, Aarno Pärssinen</i>	
Millimeter-Wave On-Chip Aperture-Coupled Patch Antennas Using Hot-Via Street Option in a GaAs Integrated Passive Device Process	264
<i>Yi-Hung Chiang, Jia-Shiang Fu</i>	
Axial Ratio and Gain Measurements for Circularly-Polarized Antenna Using Two Identical Antennas	267
<i>Hongtai Chen, Feiyu Ge, Jinlun Li, Shunli Li, Hongxin Zhao, Xiaoxing Yin</i>	
Field Measurement on an Extended Pseudo-Scale Model of Air-Shallow Sea Problems at 200 MHz	270
<i>Makoto Goto, Nozomu Ishii</i>	
Permittivity Extraction of Multilayer Coated Bumper and Bumper Optimization	273
<i>Siew Bee Yeap, Mingchao He, Lei Yu, Xiaojun Wu</i>	

Multiple People Detection & Localization with Multistatic UWB Radar in Vehicle Cabin.....	277
<i>Francesco Fioranelli, Elisabet Rufas, Alexander Yarovoy</i>	
Compact and Easy Antenna with Reflector for 2.4-GHz Applications.....	281
<i>Suguru Kojima</i>	
Surface Wave Propagation Enhancement and Control Using Metasurfaces Platforms	285
<i>Abdulrahman Alshehry</i>	
Design and Evaluation of a Lens Horn Antenna in the 300 GHz Band.....	289
<i>Seiji Nishi, Kazuhiko Tamesue, Toshio Sato, San Hlaing Myint, Takuro Sato, Tetsuya Kawanishi</i>	
A Lumped Elements Integrated Miniaturization Super-Wideband Antenna.....	293
<i>Yinfeng Xia, Yingsong Li, Wei Xue, Luyu Zhao, Eugene Sinkevich, Vladimir Mordachev</i>	
Circularly Polarized Antenna Based on a High-Order-Mode Dipole	295
<i>Yuqi Xiao, Kwok Wa Leung</i>	
A Compact Multiband Monopole Antenna for Wi-Fi Applications.....	298
<i>Chang-Keng Lin, Ding-Bing Lin, Chung-Ke Yu</i>	
A Triangular Dual-Band Patch Antenna with Harmonic Frequencies Suppression.....	302
<i>Rezki Benedikto Renwarin, Harfan Hian Ryanu, Agus Dwi Prasetyo, Achmad Munir</i>	
Design of a Circularly Polarized Dipole Antenna with Twisted Elements	306
<i>Tomoki Kiyota, Ryuji Kuse, Makoto Sano, Takeshi Fukusako</i>	
PIN Diode-Based Switchable Polarized Microstrip Patch Antenna for GPS L1 Application.....	308
<i>Elmi Cahyaningsih, Trasma Yunita, Mohammad Ridwan Effendi, Achmad Munir</i>	
Design of Optically Transparent Metasurface for Microwave Wireless Power Transmission with a Nondiffractive Beam	312
<i>Jiaqi Dong, Jinling Zhang, Xiaoxian Zhang, Dunyu Chang, Xiaohui Li, Yikai Tie</i>	
Research and Development of Yagi-Uda Antenna.....	316
<i>Kunio Sawaya</i>	
100 Years History of the Yagi-Uda Antenna : The Yagi-Uda Antenna Used for Television Reception and Has the History Along with the Spread of Television Broadcasting	317
<i>Yutaka Ozawa</i>	
Reconfigurable Yagi-Uda Antenna	320
<i>Pei-Yuan Qin, Y. Jay Guo</i>	
A Yagi-Uda Antenna Implemented with Solar Cells	323
<i>Ahmed Ali, Heesu Wang, Ikmo Park</i>	
Circularly Polarized Electromagnetically Controlled Beam-Steerable Mm-wave Reflectarray Antenna	326
<i>Daniel E. Serup, Peyman Aghabeyki, Shuai Zhang, Gert Frølund Pedersen</i>	
D-Band Antenna Module Combining a FOWLP Antenna-in-Packaging and GRIN Lens Featuring Flat-top Radiation Pattern.....	330
<i>Sirous Bahrami, Ho-Jin Song, Wonbin Hong</i>	

Restoration Strategies for the Radiation Pattern of a 5G mmWave 1×4 Antenna Array Embedded in a Smartphone.....	334
<i>Chow-Yen-Desmond Sim, Ting-Jia Liu, Huang-Yi Kao, Kuan-Ying Wu, Jeng-Jr Lo</i>	
Phase Sensitivity Evaluation of Dual-Controlled Reconfigurable Intelligent Surface for Future 6G Communications.....	337
<i>Kwok L. Chung</i>	
Time-Frequency Resolution Analysis for Continuous Human Activity Recognition Using Radar Networks	341
<i>Ronny G. Guendel, Francesco Fioranelli, Alexander Yarovoy</i>	
A Low-SAR Frame-Antenna for Mobile Phone Based on Tangential Fields Cancellation	345
<i>Quan Deng, Si-Xin Dong, Yue Xiao, Qing-Xin Chu</i>	
Electromagnetic Interference Analysis of TV And/or Radio Broadcasting Transmitting Tower Station Located Nearby Observation Deck	348
<i>Kyeong-Sik Min, You-Seok Yeoh, Seung-Woo Yi</i>	
A Broadband SIW-Based Filtering Antenna for 5G mmWave Base Station Application.....	351
<i>Ruipeng Li, Yejun He, Chaoyun Song</i>	
Two-Layered High Gain and Wide Bandwidth Metamaterial Antenna for 5G mm-Wave Applications Using Multi-Trial Vector-Based Differential Evolution	354
<i>Tzouras Hlias, Aikaterini I. Griva, Georgios Korompilis, Achilles D. Boursianis, Sotirios K. Goudos, Koulouridis Stavros</i>	

Author Index