

2021 Cross Strait Radio Science and Wireless Technology Conference (CSRSWTC 2021)

**Shenzhen, China
11 – 13 October 2021**



**IEEE Catalog Number: CFP2190M-POD
ISBN: 978-1-6654-3244-3**

**Copyright © 2021 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:	CFP2190M-POD
ISBN (Print-On-Demand):	978-1-6654-3244-3
ISBN (Online):	978-1-6654-3243-6
ISSN:	2378-1297

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

Tu1C: Antennas Theory and Antenna Array Techniques III

Chairs: Yujian Li, Beijing Jiaotong University, China; Jian Ren, Xidian University, China

- Tu1C-1 **Spoof Surface Plasmon Polaritons-Fed Dual Polarized Patch Antenna Array**
Di Cao, Yujian Li, Junhong Wang
Beijing Jiaotong University, China
- Tu1C-2 ^C **A Broadband Circularly Polarized Planar Monopole Filter-Antenna With Novel GND-Plane Structure**
PAGE 1 *Jiyuan Wang¹, Lei Chen², Qinjuan Zhang², Xudong An²*
¹Communication University of China, China
²China Academy of Information and Communications Technology, China
- Tu1C-3 ^C **Equivalent Magnetic Currents Controlling of LP Patch Antennas for Multi-Mode Multifunctional Performance**
PAGE 4 *Neng-Wu Liu¹, Lei Zhu²*
¹Xidian University, China
²University of Macau, Macau
- Tu1C-4 ^C **A 1-Bit Reconfigurable Antenna in Ku-Band**
PAGE 7 *Xin Li, Zhan Hao Wu, Qiang Cheng*
Southeast University, China
- Tu1C-5 ^C **Co-Aperture Dual Frequency Circularly Polarized GPS Antenna Array**
PAGE 10 *Tao Yin, Jian Ren, Jiayang Hao, Yingzeng Yin*
Xidian University, China
- Tu1C-6 ^C **Multi-Beam Antenna Based on Square Ring Slot and Metasurface**
PAGE 13 *Zhen Zhao, Wenmei Zhang*
Shanxi University, China

Tu1E: Microwave and Millimeter-Wave Measurement Techniques

Chair: Tao Yuan, Shenzhen University, China

- Tu1E-1  **Challenges and Applicability of OTA Measurement for 5G Millimeter Wave Mobile Device**
PAGE 16
Yuanyuan Liu, Xiangqian Sun, Yu Zhou
China Academy of Information and Communications Technology, China
- Tu1E-2  **Use of CDF Functions for Evaluating GNSS Antennas Radiation Performance**
PAGE 19
Xiang Wu, Lei Li, Xiang Zhang
China Academy of Information and Communications Technology, China
- Tu1E-3 **Application Researches of Flexible Printed Circuit Board With AiP Module**
Xianqin Hu
Avary Holding (Shenzhen) Co., Ltd., China

Tu1P: Antennas Theory and Antenna Array Techniques I

*Chairs: Ying Liu, Xidian University, China; Yong-Mei Pan, South China University of Technology, China;
Zhi Hao Jiang, Southeast University, China*

- Tu1P-1  **The Design and Verification of a Hierarchical Wideband Beamforming System for SKA MFAA**
PAGE 21
Lihui Jiang, Rui Cao, Xiaohui Tao, Zhuang Li, Guoliang Peng, Yan Zhang
Key Laboratory of Aperture Array and Space Application, China
- Tu1P-2 **Dual-Mode Circularly Polarized Radiations on a Thin Dielectric by Surface Wave Manipulation**
Bo Wang, Yatsing To, Hang Wong
City University of Hong Kong, Hong Kong
- Tu1P-3  **A Broadside Integrated Microwave/Millimeter-Wave Shared-Aperture Antenna**
PAGE 24
Xin-Hao Ding¹, Wen-Wen Yang¹, Lei Guo², Wei Qin¹, Jian-Xin Chen¹
¹Nantong University, China
²Dalian University of Technology, China
- Tu1P-4  **A 1-Bit Ultra-Wideband Frequency-Scanning Planar Array Antenna**
PAGE 26
Qiang Wang, Wei Xiang Jiang
Southeast University, China
- Tu1P-5 **A New Method for Side Lobe Suppression is Coined**
Xin Dai, Kwai Man Luk
City University of Hong Kong, Hong Kong
- Tu1P-6 **Integrated Sub-6 GHz MIMO Antenna and Millimeter-Wave Antenna Array With Shared Radiator**
Xiao-Ting Yuan, Zhe Chen
Shenzhen University, China

Tu2C: RF, Microwave, Millimeter-Wave Components and Circuits III

Chairs: Wing Shing Chan, City University of Hong Kong, Hong Kong; Shilpa Mehta, Auckland University of Technology, New Zealand

- Tu2C-1 **Integration Method of Millimeter Wave Chip Cavity Passive Components Based on Metal Assisted Chemical Etching**
Wen Huang¹, Yan Sun¹, Xiang Luo¹, Mark Kraman², Lei Sang¹, Xiaochen Chen³
¹Hefei University of Technology, China
²University of Illinois, Urbana-Champaign, USA
³China Academy of Information and Communications Technology, China
- Tu2C-2 ^C **A Wideband 3 × 3 Nolen Matrix With Flat Phase Differences**
PAGE 28 *Ye Yang¹, Yu Fei Pan¹, Wing Shing Chan¹, Zhen Xing Yang¹, Shao Yong Zheng²*
¹City University of Hong Kong, Hong Kong
²Sun Yat-sen University, China
- Tu2C-3 ^C **Design and Realization of a Ku-Band High Performance Frequency Synthesizer for Radar System**
PAGE 31 *Hongbo Yin, Jinyang Li, Xuhui Chen*
Marine Electronic Instrument Institute, China
- Tu2C-4 ^C **Optimal Design of a High Power Coaxial Microstrip Transition Structure**
PAGE 34 *Hongbo Yin, Liang Li, Fei Guan*
Marine Electronic Instrument Institute, China
- Tu2C-5 ^C **Design of an X-Band Filter Limiting RF Receiver Front-End With Withstanding 250W Pulse Power**
PAGE 37 *Liang Li, Kun Chen, Hongbo Yin, Fei Guan, Dahai Ni*
Marine Electronic Instrument Institute, China
- Tu2C-6 ^C **A High Linearity Reconfigurable Mixer for Software-Defined Radios**
PAGE 40 *Shilpa Mehta, Xue Jun Li*
Auckland University of Technology, New Zealand

Tu2E: 5G/6G Wireless or Mobile Systems







Chairs: Lei Guo, Dalian University of Technology, China; Zheng Li, Beijing Jiaotong University, China

- Tu2E-1 **Electrically Leaky-Wave Antenna With Fixed-Frequency Beam-Scanning Property**
Zheng Li, Bang Wei, Shanzhe Wang, Shan Liu, Junhong Wang
Beijing Jiaotong University, China
- Tu2E-2 [©] **Design of Compact Tri-Band MIMO Antenna Using Decoupling Structures for 5G Mobile Terminals**
PAGE 43 *Jing Luo¹, Peihua Wang², Xiaochen Chen²*
¹Communication University of China, China
²China Academy of Information and Communications Technology, China
- Tu2E-3 [©] **A Dual-Channel Energy Harvesting SOLANT Module for RF and Optical Energy Harvesting**
PAGE 46 *Zhantao Zhao¹, Jiayue Yu¹, Xinyu Zhu²*
¹Hohai University, China
²Nanjing University of Information Science and Technology, China
- Tu2E-4 **Design of Water Patch Antennas**
Jie Sun, Kwai Man Luk
City University of Hong Kong, Hong Kong
- Tu2E-5 **Modeling and Design of Dual-Band Rectenna for 5G-IoT Applications**
Xuwang Li¹, Wenwen Yang², Lei Guo¹
¹Dalian University of Technology, China
²Nantong University, China
- Tu2E-6 [©] **Bidirectional Dielectric Resonator Antenna With Two Reflectors**
PAGE 49 *Salah Aldeen Abdo Alghurbani¹, Li Ying Feng¹, Meng Wang²,
Mohammed Jajere Adamu³, Wu Sheng Ji¹*
¹Tianjin University of Technology and Education, China
²Innetech (Tianjin) Electronic Co., Ltd., China
³Tianjin University, China

Tu2P: RF, Microwave, Millimeter-Wave Components and Circuits

I

Chairs: Ying Liu, Xidian University, China; Yong-Mei Pan, South China University of Technology, China; Zhi Hao Jiang, Southeast University, China

- Tu2P-1  **Optimized Design of Ni/GaN Schottky Barrier IMPATT Diode With n-Type GaN Deep Level Defects**
PAGE 52
Xiao-Yu Zhang¹, Hu Lei², Lin Du³, Siwei Ji³, Xiaotong Li³, Yang Li¹, Lin-An Yang¹, Yue Hao¹
¹Xidian University, China
²Shanghai Institute of Space Power-Sources, China
³Shanghai Precision Metrology and Testing Research Institute, China
- Tu2P-2  **Quantitative Study of Near-Field Microwave Microscopy: Application to Metrology of Dielectrics at Nanoscale**
PAGE 55
Wen Guo, Hao Xu, Weijun Liang, Qiulai Gao
National Institute of Metrology, China
- Tu2P-3  **Design of Generative Simulator System Based on Broadband Carrier**
PAGE 58
Ruipeng Zhang, Qiang Li, Ming Song, Jing Cao, Guodong Liu, Rundong Xue
Beijing Institute of Space Long March Vehicle, China
- Tu2P-4  **Hierarchical Basis Function Based DGTD Method With Conformal PML to Analyze Electromagnetic Scattering Problem**
PAGE 61
Chao Li¹, Qiang Ren¹, Xuan Wei², Rongrong Huang², Yuanguo Zhou²
¹Beihang University, China
²Xi'an University of Science and Technology, China
- Tu2P-5  **Human Behavior Recognition Based on BP Neural Network**
PAGE 64
Hongli Liu¹, Liang Tu^{2,3}, Tao Chen¹, Chengcheng Xie¹, Julan Xiao¹, Ying Chen¹
¹Chengdu Technological University, China
²Information Communication Company (Big Data Center), China
³State Grid Yueyang Power Supply Company, China
- Tu2P-6  **Wrist Pulse Wave Velocity Measurement Based on Dual Complementary Split Ring Resonators Pairs**
PAGE 67
Yao Li, Chien-Sen Lee, Yi Ding, Chu-Xing Jiang, Bo Zhang, Zhi-Qiang Wang
Dalian University of Technology, China




TuSS_01: Planar Antennas With Multifunctional Performances

Chairs: Neng-Wu Liu, Xidian University, China; Yun Fei Cao, South China University of Technology, China

- TuSS_01-1  **Miniaturized Full-Wavelength Slot Antenna With Bent Ground Plane and Loaded Microstrip Resonators**
PAGE 70
Yu Lan, Yun Fei Cao
South China University of Technology, China
- TuSS_01-2  **Suppression of Stopbands in Periodic Leaky-Wave Antennas**
PAGE 72
Juhua Liu, Shufen Yin, Shuangqi Cai
Sun Yat-sen University, China
- TuSS_01-3  **A Wideband Compact Dual-Polarized Microstrip Patch Antenna Under Triple-Resonance**
PAGE 75
Yu-Dong Liang¹, Neng-Wu Liu¹, Guang Fu¹, Lei Zhu²
¹Xidian University, China
²University of Macau, Macau
- TuSS_01-4  **Compact Pattern-Diversity Patch Antenna by Using TM_{10} and TM_{20} Modes**
PAGE 77
Hui Deng, Lei Zhu
University of Macau, Macau
- TuSS_01-5  **Dual-Polarization and Wideband Metasurface with Eight OAM Beams**
PAGE 80
Hui-Fen Huang, Shu-Hui Xie
South China University of Technology, China
- TuSS_01-6  **Near-Field Spatial Shaping Based on Planar Time Reversal Mirror**
PAGE 83
Hui-Fen Huang, Xiu-Ling Tang
South China University of Technology, China

TuSS_02: New Concepts of Intelligent Metamaterial and Metasurface

Chairs: Guomin Yang, Fudan University, China; Haiyang Fu, Fudan University, China

- TuSS_02-1 **A New Anti-Jamming Wireless Communication Scheme Based on Spread-Spectrum Metasurface**
Xiaoyi Wang
Polytechnique Montréal, Canada
- TuSS_02-2 **A Compact Lateral Excited Gradient Refractive Index Metamaterial Unit Cell**
Xue Ren¹, Quan-Wei Lin¹, Hang Wong¹, Wenlong He²
¹City University of Hong Kong, Hong Kong
²Shenzhen University, China
- TuSS_02-3  **An OOK Wireless Communication System Based on Transmissive Digital Coding Metasurface**
PAGE 86
Jun Chen Ke, Yu Xuan Jiang, Ming Zheng Chen, Jun Wei Zhang, Qiang Cheng
Southeast University, China
- TuSS_02-4  **Dynamic Control of Electromagnetic Waves by 2-Bit Programmable Metasurface in Dual-Band**
PAGE 89
Yasir Saifullah, Guo-Min Yang, Feng Xu
Fudan University, China
- TuSS_02-5 **Perfect Control Diffraction Order Based on PGM**
Yuxiang Wang¹, Yueyi Yuan¹, Qun Wu¹, S. N. Burokur², Kuang Zhang¹
¹Harbin Institute of Technology, China
²Université Paris Nanterre, France
- TuSS_02-6  **Grating Lobe Reduction in Sparse Arrays With a Metasurface Lens**
PAGE 92
Shan Lin¹, Yuehe Ge², Zhizhang (David) Chen²
¹Huaqiao University, China
²Fuzhou University, China





TuSS_03: Electromagnetic Metamaterials and Their Applications

Chairs: Weiren Zhu, Shanghai Jiao Tong University, China; Xiong Wang, ShanghaiTech University, China

- TuSS_03-1  **Analysis of Topological Slow-Light by a Tailored Transfer-Matrix Method**
PAGE 95
Yi-Xin Sha, Ming-Yao Xia
Peking University, China
- TuSS_03-2  **Decoupling Control of Orthogonally-Polarized Waves via Dual-Programmable Metasurfaces**
PAGE 98
Xin Ge Zhang, Ya Lun Sun, Wei Xiang Jiang
Southeast University, China
- TuSS_03-3  **A Low-Profile Omnidirectional Ultra-Wideband Planar Monopole Antenna Based on Highly Conductive Graphene Film**
PAGE 100
Wenhua Li¹, Wenling Luo², Wen Su³, Jinjin Liu¹, Bian Wu¹
¹Xidian University, China
²Wuhan Zhongyuan Electronic Group Co., Ltd., China
³China Academy of Space Technology (Xi'an), China
- TuSS_03-4 **An Ultra-Thin Reconfigurable Polarization Converter Based on an Active Metasurface**
Xiangjin Ma, Yifeng Lin, Tong Wang, Guangyao Liu, Jiaqi Han, Long Li
Xidian University, China
- TuSS_03-5  **High Temperature Resistant Ultra-Wideband Resorber Using Low Loss Insulate Tile and Double Lossy Frequency Selective Surface**
PAGE 103
Shuwai Leung¹, Chengpeng Liang¹, Yanan Wang¹, Mingxing Zhou², Feifei Li¹, Yin Poo¹
¹Nanjing University, China
²The General Design Institute of Hubei Aerospace Technology Research Institute, China
- TuSS_03-6  **Design of Energy Selective Surface With Ultra-Wide Protection Band**
PAGE 106
Wenjian Gong, Wenmei Zhang
Shanxi University, China

TuSS_04: Antenna Design for 5G/6G Mobile Terminals

Chairs: Yan Wang, Fudan University, China; Le Chang, Xi'an Jiaotong University, China

- TuSS_04-1  **A Decoupling Method for E-Plane Coupled Millimeter-Wave MIMO Dielectric Resonator Antennas**
PAGE 109
Xuan-Ji Wu¹, Zhe Chen¹, Tao Yuan¹, Shi-Zhong Liu²
¹*Shenzhen University, China*
²*China Ship Development and Design Center, China*
- TuSS_04-2  **A Multi-Band Antenna in Terminal Device by Machine-Learning Design**
PAGE 112
Yu Pan, Yangfu Fang, Yi He, Jing Zhou, Hualin Li, Yongfu Jin
Huawei Technologies Co. Ltd., China
- TuSS_04-3  **Opportunities and Challenges of Antenna Design for Future 5G Mobile Terminals**
PAGE 115
Shen Wang, Rihui Li, Yongjian Han, Ming Yao
vivo Mobile Communication Co., Ltd., China
- TuSS_04-4 **One Way to Realize Decoupled MIMO Antenna on Shared Aperture for 5G Mobile Phone**
Si Li, Zedong Wang
OPPO Guangdong Mobile Telecommunication Co., Ltd., China
- TuSS_04-5  **A Four-Element 5G MIMO Antenna Design for Mobile Terminals Using Self-Curing Decoupling Technique**
PAGE 117
Jiangwei Sui, Xiaohu Fang, Zhiyong Luo
Sun Yat-sen University, China
- TuSS_04-6  **MIMO Antenna With Decoupled Antenna Pairs for 5G Mobile Terminals**
PAGE 120
Shu-Min Liao
Shenzhen Sunway Communication Company Ltd., China


TuSS_05: Advanced Multifunctional Antennas for Future Wireless Communications

Chairs: Changfei Zhou, Dalian University of Technology, China; Xumin Ding, Harbin Institute of Technology, China

- TuSS_05-1  **An Electrically Tunable Leaky-Wave Antenna Based on Slotted Metagratings Using Liquid Crystal**
PAGE 123
Odai Hassan Raheem Al Soad¹, Changfei Zhou², Jiahui Fu¹, Qun Wu¹
¹Harbin Institute of Technology, China
²Dalian University of Technology, China
- TuSS_05-2  **A Differentially-Fed High-Gain Tri-Band Hybrid Antenna for 2.4/3.5/5.2 GHz**
PAGE 126
Changfei Zhou
Dalian University of Technology, China
- TuSS_05-3  **A Microstrip Antenna for UWB Applications**
PAGE 129
Mengyu Wang, Jun Xiao, Tongyu Ding
Jimei University, China
- TuSS_05-4  **Miniaturized Dual-Frequency Directional Antenna Suitable for Radio Frequency Identification**
PAGE 131
Jie Guo, Chong-Zhi Han, Liang Zhang, Tong-Yu Ding
Jimei University, China
- TuSS_05-5 **Anisotropic Coding Metasurface for Vortex Beam Generator Application**
Liang Zhang¹, Changfei Zhou², Tongyu Ding¹
¹Jimei University, China
²Dalian University of Technology, China
- TuSS_05-6  **A Reconfigurable Omnidirectional Circularly Polarized Antenna**
PAGE 134
Mengyu Chen, Jie Huang, Hucheng Sun, Xinyu Zhu
Nanjing University of Information Science and Technology, China

TuSS_06: Microwave Imaging System and Technology

Chairs: Xiuzhu Ye, Beijing Institute of Technology, China; Kuiwen Xu, Hangzhou Dianzi University, China

- TuSS_06-1 **Learning Approach to Inverse Scattering Problem for Anisotropic Scatterer Imaging**
Xiuzhu Ye¹, Daohan Yang²
¹Beijing Institute of Technology, China
²Beihang University, China
- TuSS_06-2 **Machine-Learning-Based Microwave-Induced Thermoacoustic Tomography for Brain Hemorrhage Detection**
Xiong Wang
ShanghaiTech University, China
- TuSS_06-3 **A Resonant Microwave Sensor for Non-Destructive Testing of Damages in Dielectrics**
Xiaoquan He¹, Jingyi Hao¹, Bing Lv¹, Changyou Li¹, Yongqian Du², Guiyun Tian³
¹Northwestern Polytechnical University, China
²Research and Development Institute of Northwestern Polytechnical University in Shenzhen, China
³Newcastle University, United Kingdom
- TuSS_06-4  **Design of 180°-Scanning Leaky-Wave Antenna at Sub-6 GHz Band**
PAGE 137 *Yifei Wei, Qingfeng Zhang*
Southern University of Science and Technology, China
- TuSS_06-5  **Design of Millimeter-Wave MIMO Endfire Antenna Array for 5G Communication**
PAGE 140 *Zekai Ruan, Qingfeng Zhang*
Southern University of Science and Technology, China
- TuSS_06-6 **Scalable Cascaded Convolutional Neural Networks for Solving Inverse Scattering Problems**
Chen Zhang¹, Kuiwen Xu¹, Rencheng Song²
¹Hangzhou Dianzi University, China
²Hefei University of Technology, China

TuSS_07: Numerical Techniques in Modern Electromagnetics

Chairs: Kai Wang, Peng Cheng Laboratory, China; Amir Khurram Rashid, Southern University of Science and Technology, China

- TuSS_07-1 **Finite Thickness Incorporated GSTC for Characterizing Zero-Thickness Metasurfaces**
Kai Wang, Qingfeng Zhang, Qinyu Zhang
Peng Cheng Laboratory, China
- TuSS_07-2 **An Efficient Spectral Domain Method of Moments for Electrically Large Planar Circuits**
Amir K. Rashid, Qingfeng Zhang, Kai Wang
Southern University of Science and Technology China, China
- TuSS_07-3 **Modes Analysis of 2D Waveguides in Terms of SE Using the MFCM**
Kai Wang¹, Feng-Qi Yu¹, Amir Khurram Rashid², Qingfeng Zhang², Qin-Yu Zhang³
¹Shenzhen Institutes of Advanced Technology, China
²Southern University of Science and Technology, China
³Peng Cheng Laboratory, China
- TuSS_07-4  **Transmission Line Coupling Analysis Using FDTD Algorithm and MTL Model**
PAGE 143
Jiaxing Li, Yibo Wang, Xiao Jia
Beijing Jiaotong University, China
- TuSS_07-5  **A Hybrid Fast Hankel Transform Algorithm for Electromagnetic Simulation of Multilayer Medium Problem**
PAGE 145
Minjin Fan¹, Peng Zhao^{1,2}, Zhiying Zhao^{1,2}, Bo Yuan^{1,2}, Gaofeng Wang^{1,2}
¹Hangzhou Dianzi University, China
²Faraday Dynamics, Ltd., China

TuSS_08: Advanced Power Amplifier Techniques for Modern Wireless Communications

Chairs: Xinyu Zhou, Princeton University, USA; Shichang Chen, Hangzhou Dianzi University, China

- TuSS_08-1  **Class-F Power Amplifier With Dual-Mode Filtering Response**
PAGE 148
Liheng Zhou¹, Xinyu Zhou², Zhen Xing Yang¹, Wing Shing Chan¹
¹City University of Hong Kong, Hong Kong
²Princeton University, USA
- TuSS_08-2  **Design of Harmonic Tuned Dual-Band Generalized High-Efficiency Parallel-Circuit Class-E/F₃ Power Amplifier**
PAGE 151
Zhen Xing Yang, Wing Shing Chan, Liheng Zhou
City University of Hong Kong, Hong Kong
- TuSS_08-3  **A New Method to Design Highly Efficient C-Band Harmonic-Tuned Power Amplifiers**
PAGE 154
Jie Shi¹, Xiaohu Fang¹, Xinyu Zhou²
¹Sun Yat-sen University, China
²Princeton University, USA
- TuSS_08-4  **A Highly Efficient Doherty Power Amplifier Based on Harmonic-Tuned Technique for 5G Application**
PAGE 157
Weiqing Dong, Wa Kong, Jing Xia
Jiangsu University, China
- TuSS_08-5  **A Bandwidth Enhanced Outphasing Power Amplifier**
PAGE 160
Shiping Li¹, Shichang Chen¹, Jialin Cai¹, Xinyu Zhou², Gaofeng Wang¹, Taijun Liu³
¹Hangzhou Dianzi University, China
²Princeton University, USA
³Ningbo University, China
- TuSS_08-6  **Design of W-Band SiGe BiCMOS Balanced Power Amplifier**
PAGE 163
Yulong Xu, Zhuang Li, Guoliang Peng, Xiaohui Tao, Yan Zhang, Rui Cao
No.38 Research Institute of CETC, China

We1C: Antennas and RF, Microwave Components

Chairs: Lu Guo, Nanjing University of Science and Technology, China; Sai-Wai Wong, Shenzhen University, China

- We1C-1 **C** **Reflectarray Unit Cell Designs Using Half-Cut Technique**
PAGE 166 *Peng Ning, Lu Guo*
Nanjing University of Science and Technology, China
- We1C-2 **C** **A Compact Wideband Open-Slot MIMO Antenna With Parasitic Strips**
PAGE 168 *Hongfei Liu, Long Zhang, Yejun He, Wenting Li, Sai-Wai Wong*
Shenzhen University, China
- We1C-3 **Microwave Delay Lines Based on Intercalated Graphene**
*Wen Huang¹, Kang Wang¹, Qing He¹, Mark Kraman², Lei Sang¹,
Xiaochen Chen³*
¹*Hefei University of Technology, China*
²*University of Illinois, Urbana-Champaign, USA*
³*China Academy of Information and Communications Technology, China*
- We1C-4 **C** **Design of a Broadband Frequency Selective Absorption and
Transmission Structure**
PAGE 171 *Zhen Yang, Xiaohong Zhang, Xiaochun Liu*
*The Research Institute for Special Structures of Aeronautical Composite
AVIC, The Aeronautical Science Key Laboratory for High Performance
Electromagnetic Windows, China*
- We1C-5 **C** **Comparison of UV and IR Signatures of Rocket Plumes With Different
Observation Angles**
PAGE 173 *Danmeng Zhang, Lu Bai*
Xidian University, China
- We1C-6 **C** **A Ka-Band Compact Five-Port Power Divider**
PAGE 175 *Fan Yang, Qing-Xin Chu*
South China University of Technology, China

We1E: Scattering, Diffraction and Inverse Scattering

Chairs: Zhong Xiang Shen, Nanyang Technological University, Singapore; Yu Yang, Xidian University, China, Xi'an Technological University, China

- We1E-1 **Energy-Selective Surfaces of Low Radar Cross-Section**
Lin Zhou, Zhong Xiang Shen
Nanyang Technological University, Singapore
- We1E-2 ^C **A Parallel Monte Carlo Simulation Algorithm for the Irradiance**
PAGE 177 **Reflectance Properties of a Rough Sea Surface Based on MPI**
Yu Yang^{1, 2}, Lixin Guo¹
¹Xidian University, China
²Xi'an Technological University, China
- We1E-3 ^C **Research on Scattering Characteristics of Ship Targets on Two-**
PAGE 180 **Dimensional Dynamic Sea Surface**
Fangyuan Shi¹, Jinxing Li¹, Wangqiang Jiang¹, Min Zhang¹, Zhiqiang Li²
¹Xidian University, China
²Beijing Electro-Mechanical Engineering Institute, China
- We1E-4 ^C **Simulation of Correlated 3-D Sea Clutter Based on Statistical Model on**
PAGE 183 **the Zynq Platform**
Shuhao Zhang¹, Pengbo Wei¹, Ding Nie¹, Min Zhang¹, Yuanlong Cai²
¹Xidian University, China
²Beijing Institute of Control and Electronics Technology, China
- We1E-5 ^C **Simulation for the Ship Kelvin Wake With Narrow Components in SAR**
PAGE 186 **Image**
Letian Wang, Jiong Liu, Gang Min, Yunhong Xie
National University of Defense Technology, China

We1P: Antennas Theory and Antenna Array Techniques II

*Chairs: Ying Liu, Xidian University, China; Yong-Mei Pan, South China University of Technology, China;
Zhi Hao Jiang, Southeast University, China*

- We1P-1  **Pattern Conversion Methods for EH_0 -Mode Microstrip Leaky Wave Antenna**
PAGE 189
Junbing Duan, Lei Zhu
University of Macau, Macau
- We1P-2 **A Wideband Multi-Linear Polarization Reconfigurable Antenna Based on AMC Reflector**
Dingzhao Chen¹, Yanhui Liu², Shu-Lin Chen³
¹*Xiamen University, China*
²*Yangtze Delta Region Institute (Quzhou) University of Electronic Science and Technology of China, China*
³*University of Technology Sydney, Australia*
- We1P-3  **Dual-Band Reconfigurable Fabry-Pérot Cavity Antenna Based on Metasurface**
PAGE 192
Lin Bai, Xin Ge Zhang, Wei Xiang Jiang
Southeast University, China
- We1P-4 **Dual Circular Polarized Fabry-Pérot Antenna With Loaded Polarizer**
Yuan-Long Li, Kwai Man Luk
City University of Hong Kong, Hong Kong
- We1P-5  **A Simple Decoupling Method for Patch Antennas With Restored Radiation Patterns**
PAGE 194
Changwu Tong¹, Nan Yang¹, Zhiwei Wu¹, Kwok Wa Leung^{1,2}, Zhe Chen³
¹*Sun Yat-sen University, China*
²*City University of Hong Kong, Hong Kong*
³*Shenzhen University, China*
- We1P-6  **A High-Gain Patch Antenna With Reconfigurable Broadside and Bidirectional Beams Under Operation of Dual High-Order Modes**
PAGE 197
Kai-Dong Hong¹, Xiao Zhang¹, Zhe Chen¹, Lei Zhu², Tao Yuan¹
¹*Shenzhen University, China*
²*University of Macau, Macau*

We2E: Internet of Things/Terahertz Sciences and Technologies

Chairs: Yang Li, Xidian University, China; Wei Lin, University of Technology Sydney, Australia

- We2E-1  **Electrically Small Huygens Dipole Rectennas for Wireless Power Transfer Applications**
PAGE 200
Wei Lin, Richard W. Ziolkowski
University of Technology Sydney, Australia
- We2E-2 **Performance Improvements for On-Chip Antenna Via Structural and Material Engineering**
Qing He¹, Kang Wang¹, Mark Kraman², Lei Sang¹, Wei He³, Wen Huang¹
¹Hefei University of Technology, China
²University of Illinois, Urbana-Champaign, USA
³China Academy of Information and Communications Technology, China
- We2E-3  **Dual-Band GaN Transistor-Based RF-DC Rectifier**
PAGE 202
Zhiwei Zhang¹, Zhiqun Cheng¹, Vincent Fusco², Neil Buchanan², Chao Gu²
¹Hangzhou Dianzi University, China
²Queen's University Belfast, United Kingdom
- We2E-4  **Design and Optimization of Terahertz Bandpass Filter Based on SiC Substrate**
PAGE 205
Siyu Liu¹, Kunzhe Zhang², Shuliang Cao³, Zhongguang Wu⁴, Yongyi Xu³, Yang Li¹, Lin-An Yang¹, Yue Hao¹
¹Xidian University, China
²Ceyear Technology Instruments Co., Ltd., China
³Shanghai Precision Metrology and Testing Research Institute, China
⁴Shanghai Academy of Spaceflight Technology, China
- We2E-5 **Theoretical Investigation on Negative Differential Resistance Characteristics of Lattice-Matched AlGaInN/GaN Resonant Tunneling Diodes**
Wenlu Yang¹, Lin Du², Kunshu Wang², Yinglian Zeng², Minwei Zhu², Yang Li¹, Lin-An Yang¹, Yue Hao¹
¹Xidian University, China
²Shanghai Precision Metrology and Testing Research Institute, China

We2E continued ...

We2E-6 **Effect of Fixed Charge at Interface Between InP and Bonding Layer on Performance of Double δ -Doping InP HEMT-on-Silicon Substrate**

Yao Chen¹, Jianshe Lou², Lin Du², Xiang Song², Luqi Di², Yang Li¹, Lin-An Yang¹, Yue Hao¹

¹Xidian University, China

²Shanghai Precision Metrology and Testing Research Institute, China

We2P: RF, Microwave, Millimeter-Wave Components and Circuits

II

*Chairs: Ying Liu, Xidian University, China; Yong-Mei Pan, South China University of Technology, China;
Zhi Hao Jiang, Southeast University, China*

We2P-1 **C** **A Dual-Band Millimeter-Wave Cavity-Backed Slot Antenna for Terminal Applications**
PAGE 208

*Xing Yin, Xujun Yang, Lei Ge
Shenzhen University, China*

We2P-2 **C** **EIT Metamaterial Biosensor for Sensitive Detection of Glioma Cells**
PAGE 210

*Jin Zhang¹, Ning Mu², Longhai Liu³, Tunan Chen², Weiren Zhu¹
¹Shanghai Jiao Tong University, China
²Southwest Hospital, Army Medical University, China
³Advantest (China) Co., Ltd., China*

We2P-3 **C** **Spin-Distance Multiplexing Microwave Holography for Information Encoding With a Non-Interleaved Metasurface**
PAGE 213

*Zhenfei Li, Weiren Zhu
Shanghai Jiao Tong University, China*

We2P-4 **C** **A Novel Multimode Dielectric Resonator Filter Without Shielding**
PAGE 216

*Zerong Wu, Weisheng Tang, Shaoyong Zheng
Sun Yat-sen University, China*

We2P-5 **C** **A High-Efficiency Broadband Rectifier With Wide Input Power Range**
PAGE 219







*Kaibiao Zhang, Baihua Zeng, Shaoyong Zheng, Minghua Xia
Sun Yat-sen University, China*

We2P-6 **C** **A Novel Dual-Mode Dielectric Resonator Filter Based on Half-Mode Resonance**
PAGE 222

*Bingxiong Zhao, Sai-Wai Wong, Diji Wang
Shenzhen University, China*

WeIF1: Interactive Forum

Chair: Hao-Zhan Li, Shenzhen University, China

- WeIF1-1 
PAGE 225 **Millimeter-Wave Circularly Polarized Staircase Curl Antenna Array With 50% Axial Ratio Bandwidth**
Jie Tian¹, Zhijiao Chen¹, Haiwen Liu², Junsheng Yu¹, Xiaodong Chen³
¹Beijing University of Posts and Telecommunications, China
²Xi'an Jiaotong University, China
³Queen Mary University of London, United Kingdom
- WeIF1-2 
PAGE 228 **Flexible Omnidirectional Circularly Polarized Wrist-Band Array Antenna for Wearable Applications**
Hongcai Yang, Xiongying Liu, Zeqing Zhang
South China University of Technology, China
- WeIF1-3 
PAGE 231 **Dual-Polarized Broadband Wide-Angle Scanning Array Antenna Based on Metasurface**
Qi Zhang, Wen Jiang, Jiaolong Zhang
Xidian University, China
- WeIF1-4 
PAGE 234 **A Mode Reconfigurable Antenna Based on Liquid Crystal**
Jun Shu, Yueping Zhang
Shanghai Jiao Tong University, China
- WeIF1-5 
PAGE 237 **A Miniature Tri-Band Folded Shorted-Patch Antenna for 5G Communication**
Shihao Lin, Xujun Yang, Lei Ge
Shenzhen University, China
- WeIF1-6 **Design of a Filtering Dielectric Resonator Antenna Array With Simple Feeding Network**
Chenxi Zhao, Yong-Mei Pan
South China University of Technology, China
- WeIF1-7 
PAGE 240 **A Dual-Band Negative Group Delay Circuit With Three-Conductor Coupled Lines**
Yuwei Meng, Zhongbao Wang, Zihui Zhu, Shaojun Fang, Hongmei Liu
Dalian Maritime University, China

WeIF1 continued ...

- WeIF1-8^C **The Utility Model Relates to a Substrate Integrated Dielectric Resonator Antenna Using a Microstrip Line Coupled With a T-Slot**
PAGE 243
Xiang-Wei Zhou¹, Wu-Sheng Ji¹, Li Ying Feng¹, Meng Wang², Bao-Le Zhao¹
¹Tianjin University of Technology and Education, China
²Innetech (Tianjin) Electronic Co., Ltd., China
- WeIF1-9^C **A 3-D Printed Circularly Polarized Open-Ended Waveguide Antenna**
PAGE 246
Chu Wei Zhang, Zi Long Ma
South China University of Technology, China
- WeIF1-10^C **A Double-Layer 2-D Monopulse SIW Slot Array Antenna Using Cavity Resonators**
PAGE 248
Baoxin Wu, Rao Tang, Ziheng Zhou, Lei Chen, Tianling Zhang
Xidian University, China
- WeIF1-11^C **Chinese-Characters Jin-Shaped Patch Antenna Array for 5G Millimeter Wave Communications**
PAGE 251
Jinyu Jiang, Botao Feng
Shenzhen University, China
- WeIF1-12^C **Research on Field-Circuit Co-Simulation of Cable Shielded With Pigtail**
PAGE 254
Zhiyan Chen, Hang Yuan, Qunsheng Cao
Nanjing University of Aeronautics and Astronautics, China
- WeIF1-13^C **Balanced Microstrip Circuit with Differential Negative Group Delay Characteristics**
PAGE 257
Zihui Zhu, Zhongbao Wang, Yuwei Meng, Shaojun Fang, Hongmei Liu
Dalian Maritime University, China
- WeIF1-14^C **Modified Tolley-Lawson Model for Elimination of Magnetic Interference by Aeromagnetic Platform**
PAGE 260
Zifan Yuan¹, Sen Jing², Changping Du², Mingyao Xia²
¹University of Electronic Science and Technology of China, China
²Peking University, China
- WeIF1-15 **RCS Reduction for UAV Array**
Lei Zhou^{1,2}, Haosu Zhou¹, Yizhao Wang³, Beichen Liu³, Zhenbin Lv¹, Qi Tang²
¹Shanghai Spaceflight Electronic and Communication Equipment Research Institute, China
²Science and Technology on Near-Surface Detection Laboratory, China
³Nanjing University of Science and Technology, China
- WeIF1-16 **A Dual-Polarized Lens Antenna Using LTCC Based Phase-Shifting Surface for D Band Applications**
Qing-Yi Guo, Guan Hua Sun, Hang Wong
City University of Hong Kong, Hong Kong

WeIF1 continued ...



- WeIF1-17 **C** **Investigation on Failure Modes and Failure Mechanisms of Novel Silicon Based MMEMS Coupler Under Thermal-Shock Test**
PAGE 263
Kunshu Wang, Ganggang Liu, Lin Du, Yun Jiang, Siwei Ji, Weiming Zhu
Shanghai Precision Metrology and Testing Research Institute, China
- WeIF1-18 **C** **A Broadband 4×4 Butler Matrix With Tunable Phase Shifters Group**
PAGE 266
Xi-Zhu Wang, Fu-Chang Chen
South China University of Technology, China
- WeIF1-19 **C** **3D Scattering Center Extraction Based on ESPRIT Algorithm**
PAGE 269
Ya Ru Wang¹, Yu Mao Wu¹, Xin Yi He²
¹Fudan University, China
²Science and Technology on Electromagnetic Scattering Laboratory, China
- WeIF1-20 **Broadband Monopole Antenna Design With Integrated CB-CPW, SIW and Slots Structure**
Zhendong Ding¹, Yan Wang¹, Shifei Tao¹, Hao Wang¹, Changbao Pei¹, Dan Zhang²
¹Nanjing University of Science and Technology, China
²Nanjing Forestry University, China
- WeIF1-21 **C** **A Compact Wideband Vivaldi Antenna for K and Ka Bands**
PAGE 272
Junyang Chen, Xiangyu Meng, Mo Zhou, Yunjiang Jin
Sun Yat-sen University, China
- WeIF1-22 **C** **A Dual-Band High-Efficiency Power Amplifier Based on Novel Impedance Matching and Harmonic Control Structure**
PAGE 275
Ze-Bin Zhang, Liu-Yu Wei, Fu-Chang Chen
South China University of Technology, China
- WeIF1-23 **C** **Design of Efficiency-Enhanced Wideband Power Amplifiers Based on Novel Matching Network With Controllable Transmission Zeros**
PAGE 278
Liu-Yu Wei, Ze-Bin Zhang, Fu-Chang Chen
South China University of Technology, China
- WeIF1-24 **C** **Gas Heating Analysis in High-Power Microwave Breakdown Process Based on SETD Method**
PAGE 281
Mingming Tang, Lin Wang, Huaguang Bao, Zhenhong Fan, Dazhi Ding, Rushan Chen
Nanjing University of Science and Technology, China
- WeIF1-25 **A Wideband Central-Fed Magneto-Electric Dipole for Millimeter-Wave Applications**
Lei Xiang, Ding Wei Xi, Fan Wu
Southeast University, China

WeIF2: Interactive Forum

Chair: Hao-Zhan Li, Shenzhen University, China

- WeIF2-1 ^C
PAGE 284 **DGTD Method With Multi-Level Local Time-Stepping Scheme for Field-Circuit Co-Simulation**
Junpei Zhu, Tiancheng Zhang, Zhenhong Fan, Huaguang Bao, Dazhi Ding, Rushan Chen
Nanjing University of Science and Technology, China
- WeIF2-2 **A Ridge Gap Waveguide 4×4 Butler Matrix for Multibeam Application**
Liang-Qin Luo, Lei Chen, Yi-Fu Yang
Xidian University, China
- WeIF2-3 **Design of LTCC Millimeter Wave Broadband Array Antenna Based on Characteristic Mode Theory**
Yan Wang¹, Zhendong Ding¹, Shifei Tao¹, Hao Wang¹, Changbao Pei¹, Dan Zhang²
¹Nanjing University of Science and Technology, China
²Nanjing Forestry University, China
- WeIF2-4 ^C
PAGE 287 **Compact and Wideband Circularly Polarized Metamaterial Antenna for the 3.5GHz Band Communication**
Bei Zhang, Kaya Pi, Xiaofei Xu
Shanghai University, China
- WeIF2-5 **A New Characteristic Basis Function Generation Method for General EM Problems**
Chao Li
Shandong Normal University, China
- WeIF2-6 ^C
PAGE 289 **Recognition of 3D Target ISAR Images Based on Lightweight Network**
Jiang Hao Zhou, Yu Mao Wu, Chen Shun Yue
Fudan University, China
- WeIF2-7 **Design of a Broadband 200 GHz Mixer Used in the Terahertz Communication System**
Jin Meng, Dehai Zhang, Xiaopeng Li, Haotian Zhu
National Space Science Center, Chinese Academy of Sciences, China

WeIF2 continued ...

- WeIF2-8  **Active Planar Van Atta Array Reflector With Switchable Retroreflection**
PAGE 292 *Jing Ning, Ke Chen, Yilin Zheng, Shu Zhou, Junming Zhao, Yijun Feng*
Nanjing University, China
- WeIF2-9  **Solutions of Magnetic-Field Integral Equation Using Linear-Linear Basis Function With Characteristic Basis Function**
PAGE 295 *Fan Gao¹, Xinlei Chen^{1,2,3}, Liyang Zhang¹, Guiyue Yu¹, Zhiwen Dong¹, Changqing Gu¹*
¹Nanjing University of Aeronautics and Astronautics, China
²Southeast University, China
³Nanjing University of Information Science and Technology, China
- WeIF2-10 **Mutual Coupling Reduction of Patch MIMO Antenna Using Shorting Pins**
Qinlong Li¹, Muhammad Abdullah², Yeqing Yin¹, Xiaoming Chen¹
¹Xi'an Jiaotong University, China
²Reykjavik University, Iceland
- WeIF2-11  **A Shaping-Time-Adjustable Shaper Designed for High-Rate Photon Counting X-Ray Detectors**
PAGE 298 *Yuhao Yang¹, Xin Wang², Hongri Li², Zhanfeng Xing², Yongle Wu¹, Hao Xu³, Weimin Wang¹*
¹Beijing University of Posts and Telecommunications, China
²QuantumTec Medical Devices Ltd., China
³ShanghaiTech University, China
- WeIF2-12  **Evaluation of Routing Protocol for Aircraft Ad Hoc Networks Communication**
PAGE 301 *Xiaoqin Xue, Jing Cao, Gang Meng, Pei Zheng, Lu Gao*
Beijing Aerospace Long March Vehicle Research Institute, China
- WeIF2-13  **A 1-Bit Programmable Phase-Gradient Lens Based on Polarization Conversion Metasurface**
Die Li¹, Jianjia Yi¹, Rui Feng², Menglan Lin², Xin Zhao²
¹Xi'an Jiaotong University, China
²Xidian University, China
- WeIF2-14  **A Pin-Loaded and SIW-Fed Circular Patch Antenna With Stable High Gain and Wide Impedance Bandwidth**
PAGE 304 *Yu-Fan Yang¹, Xiao Zhang¹, Ting-Yan Tan¹, Lei Zhu², Tao Yuan¹*
¹Shenzhen University, China
²University of Macau, Macau
- WeIF2-15 **A Slot Spiral GNSS Antenna With Wide AR Bandwidth and Beamwidth**
Zeng-Pei Zhong, Xiao Zhang, Tao Yuan
Shenzhen University, China

WeIF2 continued ...

- WeIF2-16 **C** **A Multi-Polynomial CRC Circuit for 5G Standard Using Parallel Pipelining Architecture**
PAGE 307
Jia-Hao Pan, Shida Zhong, Peichang Zhang, Tao Yuan
Shenzhen University, China
- WeIF2-17 **C** **Multi-Port Metasurface Antenna on Fan-Out Wafer Level Packaging**
PAGE 310
Lin Zhong, Zihao Chen
Harbin Institute of Technology (Shenzhen), China
- WeIF2-18 **Spatial Distribution of Electromagnetic Fields from Underwater Double Electric-Dipoles**
Xingming Zhang¹, Kuisong Zheng¹, Xiaoman Sun¹, Zenghui Yan¹, Shitian Zhang²
¹*Northwestern Polytechnical University, China*
²*China Research Institute of Radio Wave Propagation Qingdao Research Center, China*
- WeIF2-19 **Intelligent Beamforming on Programmable Metasurface**
Shangyang Li, Guo-Min Yang, Feng Xu
Fudan University, China
- WeIF2-20 **C** **Bonding Wire Based RF Front-End Tunable Impedance Matching Network for K and Ka Bands**
PAGE 313
Junyang Chen, Xiangyu Meng, Mo Zhou, Yunjiang Jin
Sun Yat-sen University, China
- WeIF2-21 **C** **A Dual-Band Dielectric Resonator Antenna With Triple-Mode for Monopole-Like Linear and Circular Polarizations**
PAGE 316
Lin Wang, Sai-Wai Wong, Rui-Sen Chen
Shenzhen University, China
- WeIF2-22 **C** **Benchmark Analysis of YOLO Performance on Edge Intelligence Devices**
PAGE 319
Haogang Feng, Gaoze Mu, Shida Zhong, Peichang Zhang, Tao Yuan
Shenzhen University, China
- WeIF2-23 **Broadband Pattern-Reconfigurable Patch Antenna Fed by Resonators**
Ting-Yan Tan, Xiao Zhang, Tao Yuan
Shenzhen University, China
- WeIF2-24 **C** **Design of a MMW Circularly Polarized Lens Antenna**
PAGE 322
Xu Cai, Kai Xu Wang
Harbin Institute of Technology (Shenzhen), China

CSRSWTC 2021 Table of Contents

WeIF2 continued ...

WeIF2-25 **A Circularly-Polarized-Reconfigurable Water Antenna With Liquid Dielectric**





Hao-Zhan Li¹, Zhe Chen¹, Hang Wong², Xiao Zhang¹, Xiao-Ting Yuan¹, Tao Yuan¹

¹Shenzhen University, China

²City University of Hong Kong, Hong Kong

WeSS_01: Filtering Antennas for Compact RF Systems

Chairs: Peng Fei Hu, City University of Hong Kong, Hong Kong; Yanting Liu, Nanjing University of Science and Technology, China

- WeSS_01-1  **Compact Filtering Dielectric Resonator Antenna With Quasi-Isotropic Radiation Pattern**
PAGE 325
Peng Fei Hu¹, Kwok Wa Leung¹, Yong-Mei Pan², Shao Yong Zheng³
¹*City University of Hong Kong, Hong Kong*
²*South China University of Technology, China*
³*Sun Yat-sen University, China*
- WeSS_01-2 **Bandwidth-Controllable Omnidirectional Filtering Dielectric Resonator Antenna With Planar Feeding Method**
Nan Yang¹, Kwok Wa Leung², Yanting Liu³
¹*Sun Yat-sen University, China*
²*City University of Hong Kong, Hong Kong*
³*Nanjing University of Science and Technology, China*
- WeSS_01-3  **A Filtering Dielectric Resonator Antenna With Defected Ground Structures**
PAGE 328
Xiyao Liu^{1, 2}, Kwok Wa Leung^{1, 2}, Nan Yang³
¹*City University of Hong Kong, Hong Kong*
²*City University of Hong Kong Shenzhen Research Institute, China*
³*Sun Yat-sen University, China*
- WeSS_01-4  **A Magnetolectric Dipole Filtering Antenna With Asymmetric Feed Structure**
PAGE 331
Rongxu Hou, Jian Ren, Yingzeng Yin
Xidian University, China
- WeSS_01-5  **A Planar Filtering Quasi-Yagi Antenna Using an Absorptive Branch**
PAGE 333
Shiyan Wang¹, Fei Fan¹, Gang Zhang¹, Roberto Gómez-García², Li Yang², Yin Li³, Sai-Wai Wong³
¹*Nanjing Normal University, China*
²*University of Alcalá, Spain*
³*Shenzhen University, China*

WeSS_01 continued ...

WeSS_01-6  **On the Paraxial Approximation and Phase-Gradient Methods for Risley Prism Inspired Beam-Steering Metasurface Antennas**

PAGE 336

Jingru Wang¹, Yuehe Ge², Zhizhang Chen²

¹Huaqiao University, China

²Fuzhou University, China

WeSS_02: Filtering Components/Structures

Chairs: Gang Zhang, Nanjing Normal University, China; Fei Xiao, University of Electronic Science and Technology of China, China

- WeSS_02-1 © **Novel Equivalent Circuit Analysis Method of FSS Based on Full-Connected Neural Networks**
PAGE 339
Sibo Mao¹, Shining Sun², Xiaochun Liu², Bian Wu¹
¹*Xidian University, China*
²*The Aeronautical Science Key Laboratory for High Performance Electromagnetic Windows, China*
- WeSS_02-2 **Slow-Wave Substrate Integrated Waveguide Filter With Miniaturized Dimensions and Controllable Transmission Zeros**
Dan Dan Yuan, Jing Ya Deng, Lin Qian Luo
Xidian University, China
- WeSS_02-3 © **Application of Quasi-Bandpass Filter in 3.5 GHz Microstrip Oscillator**
PAGE 342
Dan Huang¹, Jing Lei², Yang Chen¹, Bangchao Chen¹, Bing Yuan¹, Fei Xiao¹
¹*University of Electronic Science and Technology of China, China*
²*Southwest China Institute of Electronic Technology, China*
- WeSS_02-4 © **Millimeter-Wave Balanced Filtering Crossover Using Multi-Layered SIW Cavity**
PAGE 345
Xin Zhou, Gang Zhang, Jian Zheng, Mingjia Li
Nanjing Normal University, China
- WeSS_02-5 © **Modular Design of a Fourth-Order Waveguide Bandpass Filter With High Selectivity**
PAGE 348
Longji Chen, Zai-Cheng Guo, Gang Zhang
Nanjing Normal University, China
- WeSS_02-6 © **Design of a Dual-Wideband Filtering Power Divider Using Genetic Algorithm**
PAGE 351
Wei Li, Gang Zhang, Zhuowei Zhang
Nanjing Normal University, China

WeSS_03: Microwave and Millimeter Wave Antennas for 5G and B5G Applications

Chairs: Lei Guo, Dalian University of Technology, China; Nan Yang, Sun Yat-sen University, China

- WeSS_03-1 **Compact Broadband Dielectric Resonator Antenna for 5G Applications**
Lei Guo¹, Changfei Zhou¹, Hui Li¹, Wenwen Yang²
¹Dalian University of Technology, China
²Nantong University, China
- WeSS_03-2 **Substrate-Integrated Filtering Dielectric Resonator Antenna for 28-GHz Applications**
Yan-Ting Liu
Nanjing University of Science and Technology, China
- WeSS_03-3 ^C **Millimeter-Wave Ultra-Wideband Circularly Polarized Planar Antenna Using Spiral-Arm Loaded Dipole**
PAGE 354 *Yingming Li, Kuikui Fan, Guoqing Luo*
Hangzhou Dianzi University, China
- WeSS_03-4 ^C **Ultrathin Spoof Surface Plasmons Polaritons Antenna With Flat-Top Radiation Patterns**
PAGE 357 *Chuangkai Wang, Yixuan Zheng, Shaoyong Zheng*
Sun Yat-sen University, China
- WeSS_03-5 **Millimeter-Wave Higher-Order-Mode Slotted Cavity Antennas With Polarization Flexibility**
Shu-Lin Chen
University of Technology Sydney, Australia

WeSS_04: High-Isolation Antenna and Array for 5G and Beyond

Chairs: Min Li, The Hong Kong University of Science and Technology, Hong Kong; Di Wu, Shenzhen University, China

- WeSS_04-1  **A High Isolation Circularly Polarized Antenna for Full-Duplex Applications**
PAGE 360
Di Wu¹, Yu-Xiang Sun¹, Bo Wang², Ruina Lian³
¹*Shenzhen University, China*
²*City University of Hong Kong, Hong Kong*
³*Henan University, China*
- WeSS_04-2  **Decoupling of Antennas With Adjacent Frequency Bands**
PAGE 362
Min Li¹, Lijun Jiang², Lawrence Kwan Yeung²
¹*The Hong Kong University of Science and Technology, Hong Kong*
²*The University of Hong Kong, Hong Kong*
- WeSS_04-3  **The Design of a Novel Dual-Polarized Reflectarray Antenna Element With High Isolation**
PAGE 365
Yuxin Mo¹, Min Wang¹, Zhengchuan Chen², Zhong Tian²
¹*Chongqing University of Posts and Telecommunications, China*
²*Chongqing University, China*
- WeSS_04-4  **Mutual Coupling Reduction of CP Patch Antennas Using Hybrid Technique**
PAGE 367
Muhammad Yasir Jamal, Min Li, Lijun Jiang
The University of Hong Kong, Hong Kong
- WeSS_04-5  **Millimeter-Wave Substrate-Integrated Dielectric Resonator Antennas**
PAGE 369
Yu-Xiang Sun^{1,2}, Di Wu¹
¹*Shenzhen University, China*
²*Southeast University, China*
- WeSS_04-6 **High Gain Hexagonal Shaped Antenna Array for Mobile Ground Penetrating Radar Applications**
Muhammad Waqas¹, Sajjad Ur Rehman¹, Amir Khurram Rashid², Waqar Ahmad Malik³, Abdul Aziz⁴
¹*Namal Institute, Pakistan*
²*Southern University of Science and Technology, China*
³*Abasyn University, Pakistan*
⁴*The Islamia University of Bahawalpur, Pakistan*

WeSS_05: Terahertz Sensing and Antenna

*Chairs: Shu-Yan Zhu, City University of Hong Kong, Hong Kong, Sun Yat-sen University, China;
Jie Huang, Southwest University, China*

- WeSS_05-1  **Imprint and Si Dry Etching Technologies for THz Antennas at 1 THz**
PAGE 372 *Shu-Yan Zhu^{1,2}, Yuan-Long Li², Geng-Bo Wu², Chi-Hou Chan², Kwai Man Luk², Stella W. Pang²*
¹Sun Yat-sen University, China
²City University of Hong Kong, Hong Kong
- WeSS_05-2 **Silicon-Based Rod Probe for the Near-Field THz Antenna Measurement**
Zhao-Ming Peng^{1,2}, Hao-Tian Zhu¹, Jin Meng¹, Dehai Zhang¹
¹National Space Science Center, Chinese Academy of Sciences, China
²University of Chinese Academy of Sciences, China
- WeSS_05-3  **Low-Cost Wet-Etching Method to Fabricate a Robust THz Tri-Layer Polarizer With a High Extinction Ratio**
PAGE 374 *Zhe Huang¹, Hau Ping Chan², Emma Pickwell-MacPherson³, Edward P. J. Parrott³*
¹Zhejiang University of Science and Technology, China
²City University of Hong Kong, Hong Kong
³Chinese University of Hong Kong, Hong Kong
- WeSS_05-4  **Planar Terahertz Yagi Antenna Fed by Corrugated Substrate Integrated Waveguide**
PAGE 377 *Qing Le Zhang, Bao Jie Chen, Kam-Man Shum, Chi Hou Chan*
City University of Hong Kong, Hong Kong
- WeSS_05-5  **Performance Analysis of Millimeter-Wave Optic Modulators in Thin-Film Lithium Niobate**
PAGE 380 *Yiwen Zhang, Ke Zhang, Jingwei Yang, Cheng Wang*
City University of Hong Kong, Hong Kong
- WeSS_05-6  **Hybrid Thin-Film Lithium Niobate/Silicon Waveguide Scheme for Efficient Terahertz Generation**
PAGE 382 *Jingwei Yang, Cheng Wang*
City University of Hong Kong, Hong Kong

WeSS_06: Advanced Circuits and Systems for Next-Generation Communication

Chairs: Ying-Jiang Guo, China Academy of Engineering Physics, China; Kai-Da Xu, Xi'an Jiaotong University, China

- WeSS_06-1  **Propagation Measurement at 340 GHz**
PAGE 384 *Ying-Jiang Guo¹, Zhongheng Cai¹, Xianjin Deng¹, Kai-Da Xu²*
¹China Academy of Engineering Physics, China
²Xi'an Jiaotong University, China
- WeSS_06-2  **60-GHz On-Chip Half-Mode SIW Bandpass Filter Using GaAs Technology**
PAGE 387 *Xiaoyu Weng¹, Kai-Da Xu¹, Yingjiang Guo², Qiang Chen³*
¹Xi'an Jiaotong University, China
²China Academy of Engineering Physics, China
³Tohoku University, Japan
- WeSS_06-3  **Bandpass Filter Based on Spoof Surface Plasmon Polaritons and Substrate Integrated Waveguide**
PAGE 390 *Yiqun Liu¹, Kai-Da Xu¹, Longfei Tan², Qiang Chen³*
¹Xi'an Jiaotong University, China
²Sichuan Fire Science and Technology Research Institute of Ministry of Emergency Management, China
³Tohoku University, Japan
- WeSS_06-4  **Dual Band Class E Power Amplifier With π Network**
PAGE 393 *Chuicai Rong, Hao Xu, Chenghui Li*
Gannan Normal University, China
- WeSS_06-5  **Dual Band Divide-by-2 Injection-Locked Frequency Divider Using Multi-Inductance**
PAGE 395 *Wen-Cheng Lai¹, Sheng-Lyang Jang², Hao-Wei Liu²*
¹National Yunlin University of Science and Technology, Taiwan
²National Taiwan University of Science and Technology, Taiwan
- WeSS_06-6  **Cross-Coupled Divide-by-4 Differential Injection-Locked Frequency Divider With LC Tank**
PAGE 397 *Wen-Cheng Lai¹, Sheng-Lyang Jang²*
¹National Yunlin University of Science and Technology, Taiwan
²National Taiwan University of Science and Technology, Taiwan