

APPLIED COMPUTATIONAL ELECTROMAGNETICS SOCIETY JOURNAL

**Special Issue on ACES-China 2022
Conference**

Guest Editors:

Jiaqi Liu, National Key Laboratory of Science and Technology on Test
Physics & Numerical Mathematics

Jun Wang, China University of Mining and Technology

Ruofeng Xu, China University of Mining and Technology

Kuikui Fan, Hangzhou Dianzi University

Jun Hu, Hefei University of Technology

Zhuowei Miao, Southeast University

Shengjun Zhang, National Key Laboratory of Science and Technology
on Test Physics & Numerical Mathematics

Lei Zhao, China University of Mining and Technology

September 2023
Vol. 38 No. 9
ISSN 1054-4887

The ACES Journal is abstracted in INSPEC, in Engineering Index, DTIC, Science Citation Index Expanded, the Research Alert, and to Current Contents/Engineering, Computing & Technology.

The illustrations on the front cover have been obtained from the ARC research group at the Department of Electrical Engineering, Colorado School of Mines

Published, sold and distributed by: River Publishers, Alsbjergvej 10, 9260 Gistrup, Denmark

THE APPLIED COMPUTATIONAL ELECTROMAGNETICS SOCIETY

<http://aces-society.org>

EDITORS-IN-CHIEF

Atef Elsherbeni
Colorado School of Mines, EE Dept.
Golden, CO 80401, USA

Sami Barmada
University of Pisa, ESE Dept.
56122 Pisa, Italy

ASSOCIATE EDITORS

Maokun Li
Tsinghua University
Beijing 100084, China

Wei-Chung Weng
National Chi Nan University, EE Dept.
Puli, Nantou 54561, Taiwan

Paolo Mezzanotte
University of Perugia
I-06125 Perugia, Italy

Mauro Parise
University Campus Bio-Medico of Rome
00128 Rome, Italy

Alessandro Formisano
Seconda Università di Napoli
81031 CE, Italy

Luca Di Rienzo
Politecnico di Milano
20133 Milano, Italy

Yingsong Li
Harbin Engineering University
Harbin 150001, China

Piotr Gas
AGH University of Science and Technology
30-059 Krakow, Poland

Lei Zhao
Jiangsu Normal University
Jiangsu 221116, China

Riyadh Mansoor
Al-Muthanna University
Samawa, Al-Muthanna, Iraq

Long Li
Xidian University
Shaanxi, 710071, China

Sima Noghianian
Commscope
Sunnyvale, CA 94089, USA

Lijun Jiang
University of Hong Kong, EEE Dept.
Hong Kong

Steve J. Weiss
US Army Research Laboratory
Adelphi Laboratory Center (RDRL-SER-M)
Adelphi, MD 20783, USA

Nunzia Fontana
University of Pisa
56122 Pisa, Italy

Shinishihiro Ohnuki
Nihon University
Tokyo, Japan

Jiming Song
Iowa State University, ECE Dept.
Ames, IA 50011, USA

Stefano Selleri
DINFO - University of Florence
50139 Florence, Italy

Kubilay Sertel
The Ohio State University
Columbus, OH 43210, USA

Toni Bjorninen
Tampere University
Tampere, 33100, Finland

Yu Mao Wu
Fudan University
Shanghai 200433, China

Giulio Antonini
University of L'Aquila
67040 L'Aquila, Italy

Santanu Kumar Behera
National Institute of Technology
Rourkela-769008, India

Fatih Kaburcuk
Sivas Cumhuriyet University
Sivas 58140, Turkey

Antonio Musolino
University of Pisa
56126 Pisa, Italy

Daniele Romano
University of L'Aquila
67100 L'Aquila, Italy

Huseyin Savci
Istanbul Medipol University
34810 Beykoz, Istanbul

Abdul A. Arkadan
Colorado School of Mines, EE Dept.
Golden, CO 80401, USA

Alireza Baghai-Wadji
University of Cape Town
Cape Town, 7701, South Africa

Zhixiang Huang
Anhui University
China

Salvatore Campione
Sandia National Laboratories
Albuquerque, NM 87185, USA

Marco Arjona López
La Laguna Institute of Technology
Torreon, Coahuila 27266, Mexico

Amin Kargar Behbahani
Florida International University
Miami, FL 33174, USA

Ibrahim Mahariq
American University of the Middle East
Kuwait and University of
Turkish Aeronautical Association
Turkey

Kaikai Xu
University of Electronic Science
and Technology of China
China

Laila Marzall
University of Colorado, Boulder
Boulder, CO 80309, USA

EDITORIAL ASSISTANTS

Matthew J. Inman
University of Mississippi, EE Dept.
University, MS 38677, USA

Shanell Lopez
Colorado School of Mines, EE Dept.
Golden, CO 80401, USA

EMERITUS EDITORS-IN-CHIEF

Duncan C. Baker
EE Dept. U. of Pretoria
0002 Pretoria, South Africa

Allen Glisson
University of Mississippi, EE Dept.
University, MS 38677, USA

Ahmed Kishk
Concordia University, ECS Dept.
Montreal, QC H3G 1M8, Canada

Robert M. Bevensee
Box 812
Alamo, CA 94507-0516

Ozlem Kilic
Catholic University of America
Washington, DC 20064, USA

David E. Stein
USAF Scientific Advisory Board
Washington, DC 20330, USA

EMERITUS ASSOCIATE EDITORS

Yasushi Kanai
Niigata Inst. of Technology
Kashiwazaki, Japan

Mohamed Abouzahra
MIT Lincoln Laboratory
Lexington, MA, USA

Alexander Yakovlev
University of Mississippi, EE Dept.
University, MS 38677, USA

Levent Gurel
Bilkent University
Ankara, Turkey

Sami Barmada
University of Pisa, ESE Dept.
56122 Pisa, Italy

Ozlem Kilic
Catholic University of America
Washington, DC 20064, USA

Erdem Topsakal
Mississippi State University, EE Dept.
Mississippi State, MS 39762, USA

Alistair Duffy
De Montfort University
Leicester, UK

Fan Yang
Tsinghua University, EE Dept.
Beijing 100084, China

Rocco Rizzo
University of Pisa
56123 Pisa, Italy

Atif Shamim
King Abdullah University of Science and
Technology (KAUST)
Thuwal 23955, Saudi Arabia

William O'Keefe Coburn
US Army Research Laboratory
Adelphi, MD 20783, USA

Mohammed Hadi
Kuwait University, EE Dept.
Safat, Kuwait

Amedeo Capozzoli
Univerita di Naoli Federico II, DIETI
I-80125 Napoli, Italy

Wenxing Li
Harbin Engineering University
Harbin 150001, China

Qiang Ren
Beihang University
Beijing 100191, China

EMERITUS EDITORIAL ASSISTANTS

Khaleb ElMaghoub
Trimble Navigation/MIT
Boston, MA 02125, USA

Kyle Patel
Colorado School of Mines, EE Dept.
Golden, CO 80401, USA

Christina Bonnington
University of Mississippi, EE Dept.
University, MS 38677, USA

Anne Graham
University of Mississippi, EE Dept.
University, MS 38677, USA

Madison Lee
Colorado School of Mines, EE Dept.
Golen, CO 80401, USA

Allison Tanner
Colorado School of Mines, EE Dept.
Golden, CO 80401, USA

Mohamed Al Sharkawy
Arab Academy for Science and Technology, ECE Dept.
Alexandria, Egypt

SEPTEMBER 2023 REVIEWERS

Behrokh Beiranvand
Xi Cheng
Yong-Feng Cheng
Kuikui Fan
Naixing Feng
Jun Hu
Zheng-Yu Huang
Taha Imeci
Weibin Kong
Maokun Li
Qingdong Li

Matteo Bruno Lodi
Zhuo-Wei Miao
Lin Peng
Andrew Peterson
Yi Song
Jianpeng Wang
Jun Wang
Liye Xiao
Ruofeng Xu
Peng Zhang
Hong-Xing Zheng

TABLE OF CONTENTS

Neural Network Modeling for the Reduction of Scattering Grating Lobes of Arrays
Zhi-Xian Liu, Wen-Hao Su, Sheng-Jun Zhang, and Wei Shao 633

Outlier Detection-aided Supervised Learning for Modeling of Thinned Cylindrical Conformal Array
Yang Hong, Wei Shao, Yan He Lv, and Zhi Ning Chen 638

Parametric Modeling for Curved Slots of Vivaldi Antenna Based on Artificial Neural Network
Wen-Hao Su, Wei Shao, Haiyan Ou, and Sheng-Jun Zhang 646

A Pre-splitting Green’s Function based Hybrid Fast Algorithm for Multiscale Problems
Guang-Yu Zhu, Wei-Dong Li, Wei E. I. Sha, Hou-Xing Zhou, and Wei Hong 652

Physics-informed Deep Learning to Solve 2D Electromagnetic Scattering Problems
Ji-Yuan Wang and Xiao-Min Pan 667

A Hybrid QOGWO-GPR Algorithm for Antenna Optimization
Hao-Yun Zhu, Jia-Wei Qian, Xiao-Hui Tang, and Wei-Dong Li 674

Realization of an Optimum Load for Wireless Power Transfer System
Chaoling Wang and Qi Wu 681

Antenna Shape Modeling based on Histogram of Oriented Gradients Feature
Hai-Ying Luo, Wen-Hao Su, Haiyan Ou, Sheng-Jun Zhang, and Wei Shao 687

Wideband Multi-polarization Reconfigurable Antenna based on Non-uniform Polarization Convert AMC Reflector
Long Li, Jia-Jun Liang, Xiaoxiao Liu, Tiejun Chen, Jier Lv, and Zhao Wu 695

A Compact Low-profile 5G Millimeter-wave Circularly Polarized Antenna Based on LTCC
Ting Wang, Jun Wang, Chenyu Ding, Zhuowei Miao, Jie Wang, and Lei Zhao 703

Research on Quasi-isotropic Radiation of Small Circular Arc Antenna
Hailong Liu, Jinbo Liu, Xiaoxia Nie, Jiming Song, and Zengrui Li 710

A Sector Ring Shape UWB Antenna by Tightly Coupling Ziqin Wang, Zhihao Chen, Zhengming Tang, Lam Phav, and Fangyuan Chen	717
Design of Multilayer Wideband Microwave Absorbers using Improved Grey Wolf Optimizer Hao Nan Zhang, Zhi Fei Zhang, Yi Du, Wei Bin Kong, Xiao Fang Yang, and Zhong Qing Fang	725
Design of a Pulse Transformer for X-band Klystron Yongfang Liu, Yonghua Wu, Xiaoxuan Zhou, and Jin Tong	734
A Miniaturized C-B and SIW Bandpass Filter based on LTCC Wei Tang, Ruo-Feng Xu, and Lei Zhao	741
A Compact Bandpass Filter with Active Switchable Passband Status Ruofeng Xu, Wei Tang, Jun Wang, and Lei Zhao	746
Magnetic Field Analysis and Measurement of Pulsed Septum Magnet Jin Tong and Yongfang Liu	751

**2022 International Applied Computational Electromagnetics Society (ACES) Symposium
July 28-31, 2022**

ACES-China 2022

Guest Editors:

Jiaqi Liu, National Key Laboratory of Science and Technology on Test Physics & Numerical Mathematics

Jun Wang, China University of Mining and Technology

Ruofeng Xu, China University of Mining and Technology

Kuikui Fan, Hangzhou Dianzi University

Jun Hu, Hefei University of Technology

Zhuowei Miao, Southeast University

Shengjun Zhang, National Key Laboratory of Science and Technology on Test Physics & Numerical Mathematics

Lei Zhao, China University of Mining and Technology

The ACES-China 2022 symposium was successfully held in Xuzhou, China on July 28-31 2022. The conference chairs along with a dedicated team of guest editors edited this special issue to provide the whole technical community the opportunity to further explore the most significant contributions to the symposium. Seventeen papers are presented in this special issue. All have been carefully peer reviewed and we hope that you find this special issue a valuable and inspiring contribution to the development of applied computational electromagnetics.

This special issue covers the following topics:

Computational Methods and its applications

Modeling, simulation, and design of metamaterials and meta-devices

Wideband and multiband antennas; Wearable and implantable antennas; Antenna arrays

Spoof surface plasmon polaritons and its applications

Millimeter wave and terahertz devices and beamforming antennas

Metamaterials and metasurfaces for sensing applications

We'd like to also thank the Editors in Chief of ACES Journal, Professor Sami Barmadi and Professor Atef Elsherbeni for their support. And we'd like to express our thanks to the editorial and publication team at ACES Journal for their assistance.