

APPLIED COMPUTATIONAL ELECTROMAGNETICS SOCIETY JOURNAL

December 2023
Vol. 38 No. 12
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

Sheng Sun

University of Electronic Science and
Tech. of China
Sichuan 611731, China

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

DECEMBER 2023 REVIEWERS

Intan Sorfina Zainal Abidin
Ghulam Ahmad
Ebrahim Amiri
Alireza Baghai-Wadji
Thomas Bauernfeind
Billel Bentouhami
Malcolm M. Bibby
Gaowei Cai
Biswajit Dwivedy
Giacomo Giannetti
Alfredo Gomes Neto
Taha Imeci
Pankaj Jha

Ashutosh Kedar
Fabrizio Loreto
Rajesh Natarajan
Mahdi Oliaei
Shi Pu
Alain Reineix
Manthan Shah
M. Mohammadi Shirkolaei
Cui Zhen Sun
Kechen Wang
Erdem Yazgan
Shihyuan Yeh
Wei-Hua Zong

TABLE OF CONTENTS

A Passive Adaptive Metamaterial Radome based on PIN Diodes
Ting-Ting Ge, Ming-Shun Li, Wei Song, Kai-Jiang Xu, Ke-Xin Xing,
and Xin-Qing Sheng922

Uncertainty Quantification and Optimal Design of EV-WPT System Efficiency based on
Adaptive Gaussian Process Regression
Xinlei Shang, Linlin Xu, Quanyi Yu, Bo Li, Gang Lv, Yaodan Chi, and Tianhao Wang 929

Mitigation of Feed Horn Overlapping Condition for Multi-beam Parabolic Reflector
Antenna
Nur Faiqah Fauzi, Nurul Huda Abd Rahman, Yoshihide Yamada,
Robi'atun Adayiah Awang, and Idnin Pasya.....941

Inductive Reactance Isolated Dynamic Seawater Monopole Antenna of High Efficiency
Lihua Li, Shimin Feng, and Menglei Xiu 952

Design of Wilkinson Power Dividers with SITL Compensated Microstrip Bandpass
Filters
Ravee Phomloungsri, Somkuan Srisawat, Somchat Sonasang,
and Mitchai Chongcheawchamnan 958

A Symmetrical Fractal-based Balanced Branch-Line Coupler for Simultaneous Low- and
Mid-band 5G Frequencies Applications
Abdulkadir B. Shallah, Farid Zubir, Mohamad Kamal A. Rahim, and Zubaida Yusoff 965

Single-mode Condition and Bending Loss Analysis of Ultrafast Laser-inscribed
Mid-infrared Waveguides in GeAsSe Chalcogenide Glass
Takashi Yasui975

An Investigation of the Relationship between Effective Relative Permittivity and
Infill Density in a 3D Printed Slab
Bibek Kattel, Winn Elliott Hutchcraft, and Richard K. Gordon 981

Resonant Frequency Modelling of Microstrip Antennas by Consensus Network and Student's-T Process
Xuefeng Ren, Yubo Tian, Qing Li, and Hao Fu 987

Multi-polarized Reconfigurable Antenna with Ground Plane Slot and Capacitance Feeding for UAV-to-everything Communications
Seong-Hyeop Ahn, Yu-Seong Choi, Mohamed Elhefnawy, and Wang-Sang Lee 998