

**APPLIED
COMPUTATIONAL
ELECTROMAGNETICS
SOCIETY
JOURNAL**

August 2018
Vol. 33 No. 8
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 research groups at the Department of Electrical Engineering, The University of Mississippi.

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-IN-CHIEF: REGULAR PAPERS

Mohammed Hadi

Kuwait University, EE Dept.
Safat, Kuwait

Antonio Musolino

University of Pisa
56126 Pisa, Italy

Marco Arjona López

La Laguna Institute of Technology
Torreon, Coahuila 27266, Mexico

Alistair Duffy

De Montfort University
Leicester, UK

Abdul A. Arkadan

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

Paolo Mezzanotte

University of Perugia
I-06125 Perugia, Italy

Wenxing Li

Harbin Engineering University
Harbin 150001, China

Salvatore Campione

Sandia National Laboratories
Albuquerque, NM 87185, USA

Luca Di Rienzo

Politecnico di Milano
20133 Milano, Italy

Maokun Li

Tsinghua University
Beijing 100084, China

Wei-Chung Weng

National Chi Nan University, EE Dept.
Puli, Nantou 54561, Taiwan

Rocco Rizzo

University of Pisa
56123 Pisa, Italy

Mauro Parise

University Campus Bio-Medico of Rome
00128 Rome, Italy

Alessandro Formisano

Seconda Università di Napoli
81031 CE, Italy

Lei Zhao

Jiangsu Normal University
Jiangsu 221116, China

Yingsong Li

Harbin Engineering University
Harbin 150001, China

Piotr Gas

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

Sima Noghianian

University of North Dakota
Grand Forks, ND 58202, USA

ASSOCIATE EDITORS-IN-CHIEF: EXPRESS PAPERS

Lijun Jiang

University of Hong Kong, EEE Dept.
Hong, Kong

Amedeo Capozzoli

Univerita di Napoli Federico II, DIETI
I-80125 Napoli, Italy

Shinichiro Ohnuki

Nihon University
Tokyo, Japan

Steve J. Weiss

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

Yu Mao Wu

Fudan University
Shanghai 200433, China

Kubilay Sertel

The Ohio State University
Columbus, OH 43210, USA

Jiming Song

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

Maokun Li

Tsinghua University, EE Dept.
Beijing 100084, 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, USA

Ozlem Kilic

Catholic University of America
Washington, DC 20064, USA

David E. Stein

USAF Scientific Advisory Board
Washington, DC 20330, USA

EMERITUS ASSOCIATE EDITORS-IN-CHIEF

Yasushi Kanai

Niigata Inst. of Technology
Kashiwazaki, Japan

Levent Gurel

Bilkent University
Ankara, Turkey

Erdem Topsakal

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

Mohamed Abouzahra

MIT Lincoln Laboratory
Lexington, MA, USA

Sami Barmada

University of Pisa, ESE Dept.
56122 Pisa, Italy

Alexander Yakovlev

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

Ozlem Kilic

Catholic University of America
Washington, DC 20064, USA

Fan Yang

Tsinghua University, EE Dept.
Beijing 100084, China

EMERITUS EDITORIAL ASSISTANTS

Khaled ElMaghoub

Trimble Navigation/MIT
Boston, MA 02125, USA

Anne Graham

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

Christina Bonnington

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

Mohamed Al Sharkawy

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

AUGUST 2018 REVIEWERS: REGULAR PAPERS

Erkan Afacan

Giulio Antonini

Marco Arjona

Emrah Cetin

William Coburn

Qian Ding

Alistair Duffy

Ibrahim Elshafiey

Ian Flintoft

Alessandro Formisano

Jose Maria Gonzalez-Arbesu

He Huang

Bassem Jmai

Kenichi Kagoshima

Omid Manoochehri

Sofiane Mendaci

Abbas Omar

Antonio Orlandi

Andrew Peterson

Vince Rodriguez

Wei Song

Sellakkutti Suganthi

Xuezhe Tian

Yunus Uzun

Ioannis Vardiambasis

Jiangong Wei

Steven Weiss

Fan Yang

Ali Yapar

Xingqiu Yuan

Huapeng Zhao

AUGUST 2018 REVIEWERS: EXPRESS PAPERS

Vinh Dang

Ozgur Ergul

Ozlem Ozgun

TABLE OF CONTENTS – REGULAR PAPERS

Single-Snapshot Time-Domain Direction of Arrival Estimation under Bayesian Group-Sparse Hypothesis and Vector Sensor Antennas
Marco Muzi, Nicola Tedeschi, Luca Scorrano, Vincenzo Ferrara, and Fabrizio Frezza 822

Efficient Sub-Gridded FDTD for Three-Dimensional Time-Reversed Electromagnetic Field Shaping
Xiao-Kun Wei, Wei Shao, Xiao Ding, and Bing-Zhong Wang 828

Effect of Symmetry on Insertion Loss in SRR and CSRR Transmitarray Unit Cells Implementing the Element Rotation Method
Emre Erdil, Kagan Topalli, and Ozlem Aydin Civi 835

Semi-inverse Method to the Klein-Gordon Equation with Quadratic Nonlinearity
Wei Yan, Quan Liu, ChongMing Zhu, Yang Zhao, and Yuxiang Shi 842

Stochastic Analysis of Multi-conductor Cables with Uncertain Boundary Conditions
Gang Zhang, Jinjun Bai, Lixin Wang, and Xiyuan Peng 847

Design of a Microstrip-Fed Printed-Slot Antenna Using Defected Ground Structures for Multiband Applications
Nasr H. Gad and Matjaz Vidmar 854

Design of Reconfigurable Antenna Feeding Network Using Coupled-line Switch for 5G Millimeter-wave Communication System
Sangkil Kim and Jusung Kim 861

Multi-Beamformer with Adjustable Gain: Projection Approach
Jie Chen and Yingzeng Yin 868

A Novel Design of Wideband Koch like Sided Sierpinski Square Carpet Multifractal Antenna
Amandeep K. Sidhu and Jagtar S. Sivia 873

Review of RF Cloaking Techniques for Antenna Applications
Narayanasamy Kumutha, Kalluvan Hariharan, Narayanasamy Amutha, and Balakrishnan. Manimegalai 880

Analysis, Modeling, and Measurement of Shielding Effectiveness for a Cylindrical Waveguide with a Hexagonal Insert Structure
Scott W. Faust and Daniel N. Aloï 886

Voltage Parameter Identification of AC Overhead Transmission Lines by Using Measured Electric Field Data Dongping Xiao, Qi Zheng, Yutong Xie, Qichao Ma, and Zhanlong Zhang	895
Design and Analysis of a Novel Variable Frequency Transformer Xianming Deng, Na Liu, Yuanda Sun, Qifen Guo, and Miaofei Zhang	904
Performance Analysis of Outer Rotor Wound Field Flux Switching Machine for Direct Drive Application Naseer Ahmad, Faisal Khan, Noman Ullah, and Md Zarafi Ahmad	913
Comparison of Analytical Methodologies for Analysis of Single Sided Linear Permanent Magnet Flux Switching Machine: No-Load Operation Noman Ullah, Muhammad Kashif Khan, Faisal Khan, Abdul Basit, Wasiq Ullah, Tanvir Ahmad, and Naseer Ahmad	923

TABLE OF CONTENTS – EXPRESS PAPERS

The 2D Type-3 Non-Uniform FFT in CUDA Amedeo Capozzoli, Claudio Curcio, Angelo Liseno, and Jonas Piccinotti	931
--	-----