

APPLIED COMPUTATIONAL ELECTROMAGNETICS SOCIETY JOURNAL

**January 2017
Vol. 32 No. 1
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>

EDITOR-IN-CHIEF

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

ASSOCIATE EDITORS-IN-CHIEF

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

Mohammed Hadi
Kuwait University, EE Dept.
Safat, Kuwait

Alistair Duffy
De Montfort University
Leicester, UK

Mohamed Bakr
McMaster University, ECE Dept.
Hamilton, ON, L8S 4K1, Canada

Abdul Arkadan
Marquette University, ECE Dept.
Milwaukee, WI 53201, USA

Paolo Mezzanotte
University of Perugia
I-06125 Perugia, Italy

Antonio Musolino
University of Pisa
56126 Pisa, Italy

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

EDITORIAL ASSISTANTS

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

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

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

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

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

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

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

EMERITUS ASSOCIATE EDITORS-IN-CHIEF

Yasushi Kanai
Niigata Inst. of Technology
Kashiwazaki, Japan

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

Levent Gurel
Bilkent University
Ankara, Turkey

Mohamed Abouzahra
MIT Lincoln Laboratory
Lexington, MA, USA

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

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

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

EMERITUS EDITORIAL ASSISTANTS

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

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

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

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

JANUARY 2017 REVIEWERS

Iftikhar Ahmed
Mohamed Ahmed
Tahmina Ajmal
Rodolfo Araneo
Ercument Arvas
Walter Fuscaldio
Saughar Jarchi
Ian Jeffrey
Kenichi Kagoshima
Mohsen Kalantari
Chris Kalialakis
Yasushi Kanai
Fernando Las-Heras
Feng Li

Si Li
Peyman Mahouti
Salah Obayya
Yongmei Pan
Andrew Peterson
Alain Reineix
Ioannis Rekanos
Sellakkutti Suganthi
Candace Suriano
Mohamed Talaat
Shifei Tao
Yubo Tao
Ioannis Tastsoglou
Margarita Tecpoyotl-Torres

THE APPLIED COMPUTATIONAL ELECTROMAGNETICS SOCIETY
JOURNAL

Vol. 32 No. 1

January 2017

TABLE OF CONTENTS

Mathematical Model for Calibration of Potential Detection of Nonlinear Responses in Biological Media Exposed to RF Energy Chan H. See, Raed A. Abd-Alhameed, Ahmed F. Mirza, Neil J. McEwan, Peter S. Excell, and Quirino Balzano	1
Time-Domain Electromagnetic Inversion Technique for Biological Tissues by Reconstructing Distributions of Cole-Cole Model Parameters Guangdong Liu.....	8
Novel Extraction Method of Inductance Parameter for Nonuniform Transmission Line in Anisotropic Dielectric Yaxiu Sun and Xiaomeng Wang	15
The Investigation of Substrate's Dielectric Properties for Improving the Performance of Witricity Devices Mohd H. M. Salleh, Norhudah Seman, and Raimi Dewan	24
Assessment of Kapton-based Flexible Antenna for Near Field Wireless Energy Transfer Mohamad H. Misran, Sharul K. A. Rahim, Akaa A. Eteng, and Guy A. E. Vandenbosch	31
Determination of Reverse-Current Coil Turns Layout to Mitigate Over-Coupling in Resonant Inductive Power Transfer Links Akaa A. Eteng, Sharul K. A. Rahim, Chee Y. Leow, Beng W. Chew, and Guy A. E. Vandenbosch	37
A Data Collection Method Based on the Region Division in Opportunistic Networks Yaqing Ma, Shukui Zhang, Chengkuan Lin, and Lingzhi Li.....	43
Design of Parabolic Reflector Antenna with Two Directional Cosecant-Squared Pattern Using Curve-Deformation Equations Ki-Bok Kong	50
Compact Broad Band-Stop Filter with Circular Fractal-Shaped Stubs for X-Band Radar Applications Mohammad Pourbagher, Javad Nourinia, and Changiz Ghobadi	56

RCS Validation of Asymptotic Techniques Using Measured Data of an Electrically Large Complex Model Airframe

Ciara Pienaar, Johann W. Odendaal, Johan Joubert, Johan C. Smit, and Jacques E. Cilliers	60
A Novel UWB Monopole Antenna with Controllable Band-Notch Characteristics Nasrin Tasouji, Javad Nourinia, Changiz Ghobadi, and Farnaz Mirzamohammadi.....	68
A Novel Compact Polarization Diversity Ultra-Wideband MIMO Antenna Saeid Karamzadeh.....	74
Dual-Band Wide-Angle Circularly-Polarized Microstrip Antenna by Ferrite Ring Inserted in Its Cavity Domain Fazel R. Rostami, Gholamreza Moradi, and Reza S. Shirazi.....	81
Computationally Efficient Technique for Wide-Band Analysis of Grid-Like Spatial Shields for Protection Against LEMP Effects Andrzej Karwowski, Artur Noga, and Tomasz Topa.....	87
Shape Reconstruction of Three Dimensional Conducting Objects Using Opposition-Based Differential Evolution Mojtaba Maddahali, Ahad Tavakoli, and Mojtaba Dehmollaian	93