ACES

The Applied Computational Electromagnetics Society

NEWSLETTER

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In this issue:

Editor's note:

Hello again.

For those in the Northern Hemisphere, I hope summer is being good to you and for those in the Southern Hemisphere, I hope winter is behaving itself.

I was planning to bring you full details of the new Fellows and Directors, I hit a couple of hitches there and hope to be able to update you in due course. However, you will find Levent Gürel's biography later in the Newsletter. Congratulations to Andy Peterson who was elected ACES President in Williamsburg. The first of Andy's columns is straight after my note. The reports back from the Conference were great. I was gutted I had to miss it. However, CJ has produced a great report.

Wishing you all well.   Alistair Duffy   apd@dmu.ac.uk

Greetings from the President!

Andrew F. Peterson

Andrew F. Peterson has been involved in ACES since he attended the *First Annual Review of Progress in Applied Computational Electromagnetics* in 1985. Since then, he has served ACES at various times as Chair of the Software Performance Standards Committee, the Nominations Committee, the Bylaws Committee, the Finance Committee, the Publications Committee, and the Fellows Committee. He served as a Director from 1992-1997 and as Treasurer from 1994-1996. He has been guest editor for two special issues of the *ACES Journal* and was Technical Program co-Chair for the *25th Review*

I would like to thank the ACES Board of Directors for choosing me as ACES President for the 2011-2013 term of office! I also thank my predecessor, Osama Mohammed, for his years of dedicated service to ACES. I sincerely hope that he continues to contribute his talents to the Society. I look forward to working with Atef Elsherbeni, recently elected ACES Vice-President, and the other Officers and Directors in the years ahead.

From my perspective, ACES is a stable and financially strong organization that has established a well-defined presence in the CEM community and is positioned to contribute to the development of the profession and of our members in the future. The primary purpose of ACES is to provide a forum for technical interaction & education within the broad discipline of CEM, and to provide a link between developers and users of electromagnetic modeling tools. The most visible signs of ACES are the annual conference (the *27th Annual Review of Progress* was recently held in Williamsburg, VA, under the effective leadership of C. J. Reddy and Erik Vedeler, with approximately 200 attendees) and the *ACES Journal*, which is currently being published monthly under the editorial guidance of Atef Elsherbeni and his team of associate editors.

The strength of any professional society rests on its members, and leverages their participation and willingness to volunteer in activities. Active members make it possible to publish high-quality products, offer an annual conference, keep the society website current, etc. Active members presumably find reward in participation. While ACES membership is relatively inexpensive ($35 US), the total society membership has not grown much in recent years. It

of Progress in 2009. He was elected ACES Fellow in 2008.

seems that those of us who find value in ACES activities need to do more to convey to others the benefits these activities offer. Are your CEM colleagues ACES members? If not, please ask them "why not?" I seek your input as to how we can continue to grow the membership, and how we can increase the participation level of our members. How do we prevent "burn-out" on the part of our more active volunteers? I would love to hear answers to these questions! I would also like to know what you would like to receive in return for your ACES membership. What could ACES offer that would enhance your membership?

Andrew F. Peterson

School of Electrical and Computer Engineering

Georgia Institute of Technology

Atlanta, GA 30332-0250

USA

peterson@ece.gatech.edu

Report on ACES 2011 - The 27ᵗʰ International Review of Progress in Applied Computational Electromagnetics, March 27-31, 2011, Williamsburg, Virginia

The 27th International Review of Progress in Applied Computational Electromagnetics (ACES 2011) was held in Williamsburg, Virginia (USA) during last week of March 27 to 31, 2011.

The Applied Computational Electromagnetics Society (ACES) provides a forum for issues relevant to numerical modeling in applied electromagnetics. The primary focus of ACES is on computational techniques, electromagnetics modeling software, and applications. The Applied Computational Electromagnetics Society offers the ACES annual symposium, publications, code user groups, benchmark problem solution workshops, short courses, software demonstrations, and other activities which serve the professional community. The ACES organization began as a four-day workshop followed by several newsletters and grew into an international entity. This growth has taken ACES from its origins in California to many areas of the world. In 2010, the ACES 2010 was held in Tampere, Finland. This year, ACES 2011 was held in historic town, Williamsburg, Virginia. Dr. C. J. Reddy of EM Software and Systems (USA) Inc/Applied EM Inc and Mr. Erik Vedeler of NASA Langley were the General Chairs of the conference. Prof. Atef Elsherbeni of University of Mississippi was the Technical Program Chair.

About Williamsburg Virginia

Williamsburg was the thriving colonial capital of Virginia. From 1699 to 1780, Williamsburg was the political, cultural, and educational center of what was then the largest, most populous, and most influential of the American colonies. Near the end of the Revolutionary War and through the influence of Thomas Jefferson, the seat of government of Virginia was moved up the peninsula to the safer and more centrally located city of Richmond. For nearly a century and a half, Williamsburg was a simple, quiet college town, home of the College of William and Mary, which is second oldest college in the US. Today, the Colonial Williamsburg Foundation operates the world's largest living history museum. In the early 20th century many of the historic buildings were in ruins. With the vision of Rev. W.A.R. Goodwin and the financial backing of John D. Rockefeller Jr. Colonial Williamsburg was preserved and restored. Today, tourists can relive 17th century colonial life in the Historic Area which stretches over 301 acres, and includes 88 original 18th-century structures. Hundreds of houses, shops and public outbuildings are reconstructed on their original foundations populated by re-enactors in period costume.

Figure 1. ACES 2011 conference was held in historic town – Williamsburg, Virginia during March 27-31, 2011. Photo courtesy of The Colonial Williamsburg Foundation, Williamsburg, Virginia.

Williamsburg is part of historic triangle along Jamestown and Yorktown. In 1607, 13 years before the Pilgrims landed in Massachusetts, a group of 104 English men and boys began a

settlement on the banks of Virginia's James River. They were sponsored by the Virginia Company of London, whose stockholders hoped to make a profit from the resources of the New World. The community suffered terrible hardships in its early years, but managed to endure, earning the distinction of being America's first permanent English colony. On October 19, 1781, the decisive military campaign of the American Revolution culminated with the British surrender to combined American and French forces under the command of George Washington. The Siege of Yorktown effectively ended the six-year struggle of the Revolutionary War and set the stage for a new government and nation.

Williamsburg is also part of metropolitan area known as "Hampton Roads", which is home of NASA Langley Research Center, Newport News Ship Building and Jefferson National Laboratory. Langley Research Center was established in 1917. Just fourteen years after the Wright Brothers made their first historic powered flight -- the United States decided to establish the first civilian laboratory dedicated to unlocking the mysteries of flight. It was on the banks of the Chesapeake Bay in Hampton, VA. Newport News Shipbuilding is the largest shipbuilding company in the US and is the only place where aircraft carriers are built and also is the only two places in the US where submarines are built. The Thomas Jefferson National Accelerator Facility (Jefferson Lab) is funded by the U.S. Department of Energy's Office of Science. As a user facility for scientists worldwide, its primary mission is to conduct basic research of the atom's nucleus at the quark level.

ACES 2011 Conference

Williamsburg Lodge was the conference hotel. The Lodge is located next to the Colonial Williamsburg, providing great opportunity for conference attendees to explore the historic area. The Lodge presents the ambience of a southern family home—furnishings are inspired by art from the Abby Aldrich Rockefeller Folk Art Museum. One of the two original hotels envisioned by John D. Rockefeller, the property has now matured to comprise eight buildings, interconnected by sheltered, brick-paved walkways. Conference venue is served by three international airports (Newport News-Williamsburg Intl. Airport, Norfolk Intl. Airport and Richmond Intl. Airport). Having three accessible airports was critical to welcoming attendees from 30 different countries (Figure 2).
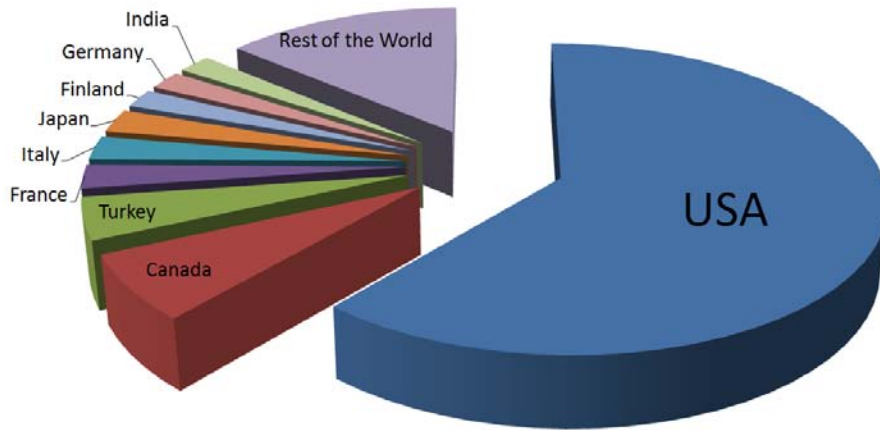

Figure 2. Attendees at ACES 2011 represented 30 countries. Distribution is shown in percentages.

Welcome Reception

A welcome reception was held on Sunday, March 27, 2011. Reception provided a great opportunity for conference attendees to network and meets old friends as well as makes new friends.

Figure 3. Group photo at the welcome reception.

Short Courses:	Various short courses were held during ACES 2011 conference. Following short courses were conducted on Sunday, March 27, 2011.

- GPU Acceleration of EM Solvers by Matthew Inman and Atef Elsherbeni

- CEM Algorithms for EMC/EMI Modeling: Electrically Large (Antennas on Platform) and Small (SI in ICS and Packagings) Problems by J. F. Lee and Z. Peng
- FDTD Modeling of Metamaterials and Invisible Cloaks by Yang Hao and Raj Mittra
- EM Modeling with FEKO by U. Jacobus and Rensheng Sun

On Thursday, March 31, 2011, the following short course was conducted:

- The FDTD Technique for Antenna Application by Atef Elsherbeni and Veysel Demir.

Figure 4. Prof. Osama Mohammed, President of ACES welcomed the attendees.

Keynote Speaker:	It is customary in ACES conferences to have plenary speakers. For the first time at ACES 2011, we had a keynote speaker. Lesa Roe, Director of NASA Langley Research Center accepted our request. Lesa Roe is first female Director of NASA's Langley Research Center, the place where NASA researches solutions to problems from global climate change and access to space, to air travel, future aviation vehicles. Appointed as Director in 2005, Lesa is the senior management official of the Center, overseeing facilities valued at more than \$3.3B, and employing over 3,600 engineers and scientists. Director Roe gave a very enthusiastic presentation on various research activities at NASA Langley. Director Roe's presentation and a NASA video are available on ACES web site

(http://aces.ee.olemiss.edu/conference/2011/Keynote_Address.pdf)

Figure 5. Key note speech at ACES 2011 was given by Lesa Roe, Director of NASA Langley Research Center.

Plenary Speakers:

As a tradition, ACES brings well known personalities in computational electromagnetics as plenary speakers. Plenary Speakers at ACES 2011 were

- Dr. S.M.Rao - Electromagnetic Scattering from Dielectric Bodies using RWG Functions- A Critical Analysis
- Levent Gürel - Solutions of Extremely Large Integral-Equation Problems Involving Hundreds of Millions of Unknowns and Their Applications in Computational Electromagnetics
- Joe LoVetri - Electromagnetic Inverse Problems: Formulations, Algorithms, and Applications to Biomedical Microwave Tomography
- Osama Mohammed - Electromagnetic Field Computations for the Evaluation of Signatures and EMI Issues in Multi Component Energy Systems
- John Volakis - Metamaterial Antennas and Arrays

Figure 6. Dr. S.M. Rao delivered the plenary speech as part of "30 Years of RWG Basis Functions"

30 Years of RWG Basis Functions

RWG (Rao-Wilton-Glisson) basis functions were introduced approximately 30 years ago by the paper –

S. M. **Rao**, D. R. **Wilton**, and A. W. **Glisson**, "Electromagnetic scattering by surfaces of arbitrary shape," IEEE Trans. Antennas Propagation, vol. AP-30, pp. 409-418, May 1982.

Since then RWG basis functions have been the staple for many developments in computational electromagnetics. It is not an exaggeration to say, RWG basis functions are widely used in many research codes, commercial EM simulation codes, as well as in

teaching graduate EM courses at many universities. Indirectly they are used by many application engineers worldwide contributing to their productivity. To celebrate 30 years of RWG basis functions, following activities were conducted during ACES 2011 conference.

- **Plenary Talk by Dr. S. M. Rao (March 28, 2011)**
  - o Electromagnetic Scattering from Dielectric Bodies Using RWG Functions - A Critical Analysis
- **Special Session on 30 Years of RWG Basis Functions**
  - o Session Organizer: Prof. Don Wilton
  - o Session Chairs: Prof. Don Wilton and Dr. S.M.Rao

Following papers were presented at the RWG special session:

1. A. W. Glisson, S. M. Rao, and D. R. Wilton - *Approximating Electromagnetic Field*
2. Su Yan, Jian-Ming Jin, and Zaiping Nie - *Accuracy Improvement of the Numerical Solutions to the Second-Kind Integral Equations for Electromagnetic Scattering Analysis*
3. Andrew F. Peterson - *Beyond RWG/Galerkin Solutions of the EFIE: Investigations into Pointmatched, Discontinuous, and Higher Order Discretizations*
4. Jian-Gong Wei, Zhen Peng, and Jin-Fa Lee - *A Fast Direct Matrix Solver for Surface Integral Equation Methods for Electromagnetic Wave Problems in R3*
5. Dennis T. Schobert and Thomas F. Eibert - *Surface Integral Equation Solution by Fast Fourier Transform Accelerated Multilevel Green's Function Interpolation for Conducting and Impedance Boundary Objects*
6. Roberto D. Graglia and Andrew F. Peterson - *Hierarchical Vector Basis Functions for Meshes with Hexahedra, Tetrahedra, and Triangular Prism Cells*
7. F. Vipiana, M. A. Francavilla, and G. Vecchi - *High-Fidelity Modeling of Complex Multi-Scale Structures through the Method of Moments*
8. Shiquan He, Peng H. Yang, Lijun Jiang, W. C. Chew, and Zaiping Nie - *Generalized Impedance Boundary Condition Based on the Finite Element Method and Its Applications to Aid RFID Antenna Design*
9. John Shaeffer - "MERCURY MOM™ *an Applied RWG EM Scattering Code for Electrically Large Bodies*
10. Levent Gürel and Özgür Ergül - *LL Basis Functions: Half-Order Increase over RWG Functions Significantly Improves MFIE and CFIE Results*
11. S. M. Rao, D. R. Wilton, and A. W. Glisson - *Concluding Remarks and Discussion by RWG*

Figure 7. Dr. S.M. Rao, Prof. Don Wilton and Prof. Allen Glisson at the Reception. Re-union of the three to celebrate 30 years of RWB basis functions.

Software Demonstrations :	Keeping the "applied" theme of the conference, a special session on software demonstrations was organized. Many commercial and non-commercial software codes were demonstrated giving a unique opportunity for the conference attendees to appreciate capabilities of various software tools. Session was organized and chaired by Andrew Drozd, Adriene Croneiser, and C. J. Reddy. Following is the list of software codes demonstrated at this special session:

Wenhua Yu - *High Performance GEMS Package Accelerated by General Hardware Platforms*
Madele Von der Walt - *Simulation of Metamaterial Antenna Designs and their Applications using FEKO*
Branko M. Kolundzija - *WIPL-D PO Driven MoM Application for Efficient Simulation of Electrically Large Scatterers and Antenna Placement Problems*
Greg Alton - *Sonnet Adaptive Band Sweep (ABS) Interpolation Applied to Rapid Microwave Filter Analysis*
Andrew Drozd - *Co-site EMC Analysis of Complex Systems Using E3Expert's Progressive Modeling and Simulation Approach*
Matthew C. Miller - *Application of Savant and EMIT to Solve Complex Installed Antenna Performance and Cosite Interference Problems*
Cagatay Tokgoz - *uCAST – UTD Code for EM Analysis of Electrically Large Structures*
Bo Strand - *Using the Efield MDMM (Multi Domain and Multi Method) Solver for Cavity RCS and Cavity Antenna Installation Problems*
James F. Stack - *Accelerating Antenna Applications with Remcom's XF 7*

Software Giveaways:	Now-a-days, use of commercial electromagnetics tools has become main stream with almost all application engineers using one tool or the other for their design and analysis work. As a unique opportunity, at ACES 2011, we provided an opportunity for fully registered attendees to get free software from participating vendors. Following free software was provided

1. Sonnet LITE Plus
2. FEKO Software with 512MB Memory Limit
3. GEMS Sequential version

Software giveaways have proved to be successful with almost all fully registered attendees making use of this unique opportunity.

Student Paper Competition:	As it is the tradition at all ACES conference, a student paper competition was held at ACES 2011 conference as well. A record number of 25 papers were submitted to the competition. 12 papers were finalized to participate in the competition. The following 5

papers were given the student paper awards.

First Prize: Su Yan, Jian-Ming Jin, and Zaiping Nie "Accuracy Improvement of the Numerical Solutions to the Second-Kind Integral Equations for Electromagnetic Scattering Analysis"

Second Prize: Haixin Liu and Dan Jiao "Layered $\mathcal{H}$-Matrix Based LU factorization of Significantly Reduced Complexity for Direct Finite-Element-Based Computation of Large-Scale Electromagnetic Problems"

Third Prize: Matthew B. Stephanson and Jin-Fa Lee "Adaptive, Black-Box Model Order Reduction Using Radial Basis Functions"

Fourth Prize: Xiaochuan Wang, Zhen Peng, and Jin-Fa Lee "Application of a Multi-Solver Domain Decomposition Method for Antenna Placements on a Large Air Platform"

Fifth Prize: Dennis T. Schobert and Thomas F. Eibert "Surface Integral Equation Solution by Fast Fourier Transform Accelerated Multilevel Green's Function Interpolation for Conducting and Impedance Boundary Objects"

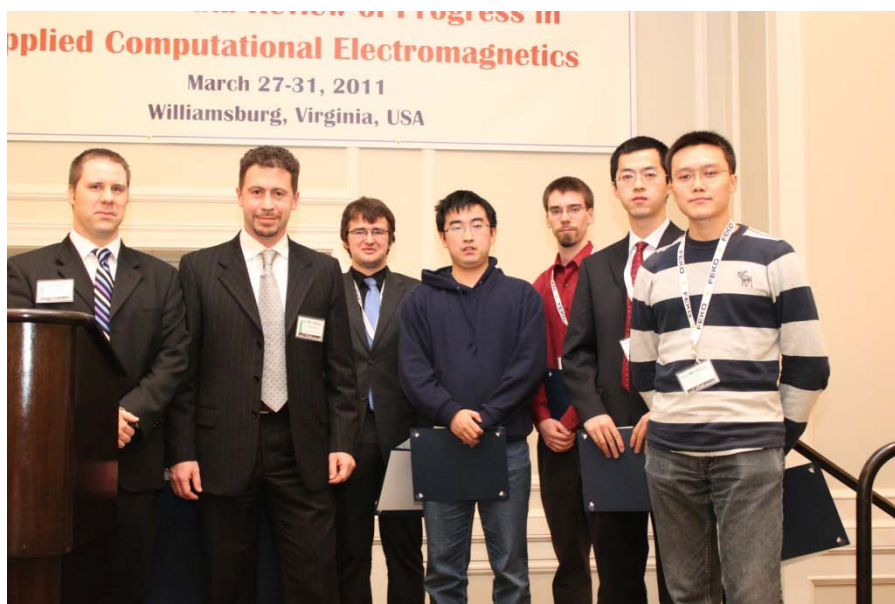For the remaining 7 papers each student author was given a $100 gift certificate donated by SciTech Publications.

Figure 8. Winners of Student Paper Competition with Prof. Sami Barmada of University of Pisa and Mr. Greg Alton of Sonnet Software.

Banquet:	Conference banquet was held on Wednesday, March 30, 2011. Banquet gala started with Fife and Drums of Colonial Williamsburg leading the group into the banquet hall. As attendees are enjoying the dinner, they were entertained by balladeers of Colonial Williamsburg. Conference attendees were treated to a surprise guest – General George Washington. General Washington was leading the revolutionary army against British forces. General Washington took questions from the audience. Irrespective of questions asked General Washington answered them in the context of the revolutionary war.

At the Banquet, Prof. John Volakis and Prof. Amir Zaghloul were given the ACES Fellow Awards. Prof. Osama Mohammed was recognized for his long and outstanding service to the society as the President from 2002 to 2011.

1.1.1 ACES 2012 Conference:

The 28th International Review of Progress in Applied Computational Electromagnetics (ACES 2012) will be held in Columbus, Ohio, USA during April 10-14, 2012. Prof. Jin-Fa Lee and Dr. Kubilay Sertel are the General Chairs for the conference. A call for papers is available at http://aces.ee.olemiss.edu/conference/ACES_2012_CFP_Ver_2.pdf.
It is not too early to plan submission of the papers to ACES 2012. An exciting technical and social program is being planned by Prof. Lee and Dr. Sertel.

Figure 9. General Chairs, Dr. C. J. Reddy and Mr. Erik Vedeler

Figure 10. Fife and Drums of Colonial Williamsburg performing before the Banquet and leading the audience into the Banquet hall.

Figure 11. General George Washington addressing the audience at the Banquet

Figure 12. Balladeers of Colonial Williamsburg entertained the audience at the Banquet

Figure 13. Prof. John Volakis receiving the ACES Fellow award from Prof. Osama Mohammed, President of ACES.

Figure 14. Prof. Amir Zaghloul receiving the ACES Fellow award from Prof. Osama Mohammed, President of ACES.

Figure 15. Outgoing President, Prof. Osama Mohammed (left) was recognized for his long and outstanding service to the Society. Plaque was presented by Dr. C. J. Reddy (right) and Prof. Atef Elsherbeni (Center).

ACES 2012 Conference	The 28th International Review of Progress in Applied Computational Electromagnetics (ACES 2012) will be held in Columbus, Ohio, USA during April 10-14, 2012. Prof. Jin-Fa Lee and Dr. Kubilay Sertel are the General Chairs for the conference. A call for papers is available at http://aces.ee.olemiss.edu/conference/ACES_2012_CFP_Ver_2.pdf. It is not too early to plan submission of the papers to ACES 2012. An exciting technical and social program is being planned by Prof. Lee and Dr. Sertel.

Prof. Levent Gürel, *FIEEE*

Director, Computational Electromagnetics Research Center (BiLCEM)
Professor, Department of Electrical & Electronics Engineering
Bilkent University, Ankara, Turkey

Levent Gürel received the B.Sc. degree from the Middle East Technical University (METU), Ankara, Turkey, in 1986, and the M.S. and Ph.D. degrees from the University of Illinois at Urbana-Champaign (UIUC) in 1988 and 1991, respectively, all in electrical engineering. He joined the Thomas J. Watson Research Center of the International Business Machines Corporation, Yorktown Heights, New York, in 1991, as a Research Staff Member. Since 1994, he has been a faculty member in the Department of Electrical and Electronics Engineering of the Bilkent University, Ankara, where he is currently a Professor. He was a Visiting Associate Professor at the Center for Computational Electromagnetics (CCEM) of the UIUC for one semester in 1997. He returned to the UIUC as a Visiting Professor in 2003-2005, and as an Adjunct Professor after 2005. He founded the Computational Electromagnetics Research Center (BiLCEM) at Bilkent University in 2005, where he is serving as the Director.

Prof. Gürel's research interests include the development of fast algorithms for computational electromagnetics (CEM) and the application thereof to scattering and radiation problems involving large and complicated scatterers, antennas and radars, frequency-selective surfaces, high-speed electronic circuits, optical and imaging systems, nanostructures, metamaterials, electromagnetic compatibility and interference, subsurface scattering and ground penetrating radars. He published 60+ journal articles, 170+ conference papers, and edited two conference proceedings. Since 2006, his research group has been breaking several world records by solving extremely large integral-equation problems, involving hundreds of millions of unknowns.

Among the recognitions of Prof. Gürel's accomplishments, the two prestigious awards from the Turkish Academy of Sciences (TUBA) in 2002 and the Scientific and Technical Research Council of Turkey (TUBITAK) in 2003 are the most notable. He is a member of the Board of Directors of the Applied Computational Electromagnetic Society (ACES), a member of the USNC of the International Union of Radio Science (URSI) and the Chairman of Commission E (Electromagnetic Noise and Interference) of URSI Turkey National Committee. He served as a member of the General Assembly of the European Microwave Association (EuMA) during 2006-2008. He is currently serving as an associate editor for *Radio Science, IEEE Antennas and Wireless Propagation Letters, Journal of Electromagnetic Waves and Applications (JEMWA)*, and *Progress in Electromagnetics Research (PIER)*. Prof. Gürel served as the Chairman of the AP/MTT/ED/EMC Chapter of the IEEE Turkey Section in 2000-2003. He founded the IEEE EMC Chapter in Turkey in 2000. He served as the Cochairman of the 2003 IEEE International Symposium on Electromagnetic Compatibility. He is the organizer and General Chair of the CEM'07 and CEM'09 Computational Electromagnetics International Workshops held in 2007 and 2009.

Prof. Levent Gürel is an IEEE Fellow and he is elected as a Distinguished Lecturer of the IEEE Antennas and Propagation Society for 2011-2013. He presented more than 35 invited talks all over the world. He is invited to the 2011 ACES Conference in Virginia, USA, as a Plenary Speaker.

BiLCEM Computational Electromagnetics Research Center

Book review "Numerical Methods for Engineering: An Introduction Using MATLAB and Computational Electromagnetics" by Dr. Karl F. Warnick

Review by Kazimierz "Kai" Siwiak, Ph.D., P.E
TimeDerivative Inc.
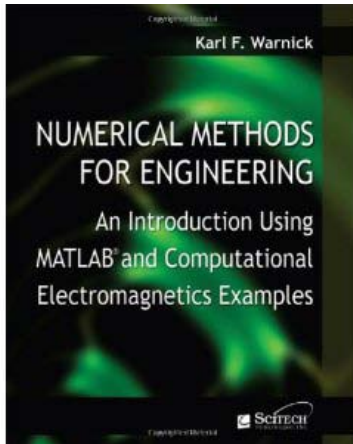
This textbook teaches students to create computer codes used to engineer antennas, microwave circuits, and other critical technologies for wireless communications and other applications of electromagnetic fields and waves. Worked code examples are provided for MATLAB technical computing software.

It is the only textbook on numerical methods that begins at the undergraduate engineering student level but bring students to the state-of-the-art by the end of the book. It focuses on the most important and popular numerical methods, going into depth with examples and problem sets of escalating complexity.

This book requires only one core course of electromagnetics, allowing it to be useful both at the senior and beginning graduate

This text book is an outstanding work wherein the author satisfies the stated purposes:
(1) translating numerical methods into useful code
(2) develop understanding of merits, limitations and properties of popular classes of numerical techniques.

The author has a pleasant tutorial approach in presenting the material. The book begins with a terse but clear review of basic electromagnetics in a form geared to numerical analysis, with complexity increasing throughout the text. I fully agree with the author that a deeper understanding of Maxwell's equations comes with manipulating the equations numerically as prescribed in this text. I can see how the text can be used as the basis of a university course, but more importantly, I see the book as a shelf reference item for the practicing engineer. For example, it is well worth revisiting Section 1.5, writing code and code construction rules, and code debugging rules before embarking on any software project.

I am tempted to recommend one more coding rule based on personal experience:
Always enter known physical constants to their full known precision. It might help tease out numerical issues. To that end, the code fragment in Section 3.2.6 might better be:
   c0=299792458 m/s by definition this is the exact value, and
   mu0=4*pi*1e-7 H/m also exactly, so that the derived quantity is then known exactly as well:
   eps0=1/(mu0*c0^2) F/m now also known to full precision.
Then, solving a canonical case numerically where the answer is a known constant such as pi, or c0 or

levels. Developing and using numerical methods in a powerful tool for students to learn the principles of intermediate and advanced electromagnetics. This book fills the missing space of current textbooks that either lack depth on key topics (particularly integral equations and the method of moments) and where the treatment is not accessible to students without an advanced theory course. Important topics include: Method of Moments; Finite Difference Time Domain Method; Finite Element Method; Finite Element Method-Boundary Element Method; Numerical Optimization; and Inverse Scattering.

mu0, eta, and so on, or multiples of these, it is important to notice a result, of for example, a numerical result of 3.1420 when exactly pi was expected. It isn't that an answer to 12 or so places is any more useful than an answer to 3 places, but a numerical error discovered in the 4th decimal place (for example) can provide an important debugging clue.

Dr. Warnick definitely keeps the promise of matching the complexity of Maxwell's equations to the presented coding problem. There is also a very excellent set of references at the end of each chapter. The introduction to MATLAB code in Chapter 2 is gentle but moves rapidly to useful results. I like the illustrative dealing with various electromagnetic problems in 1-, 2- and 3- dimensions (as summarized in Table 3.1). The details of numerical differentiation, leading to edge conditions, and the integration methods are complete, clear and very important. Descriptions and details of the several more important numerical computational techniques are interesting and thought provoking, especially in light of code fragments used to illustrate points.

I found the chapter end problems challenging and important to the understanding of the material, but for the practicing engineer a solution or at least answers to some of the problems would be useful. Of course, the author must balance this against use of the text in a university course.

In summary this well written text serves as an excellent introduction to MATLAB, and is a very good reference on basic code writing and debugging. The descriptions of computational techniques are valuable.
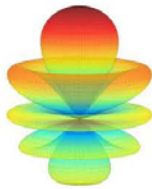
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CALL FOR PAPERS

The 28th International Review of Progress in Applied Computational Electromagnetics
April 10-14, 2012, Columbus, Ohio

The international ACES Symposium serves as a forum for developers, analysts, and users of computational techniques applied to electromagnetic field problems for all frequency ranges. The symposium includes technical invited plenary and regular presentations, software demonstrations, vendor booths, and short courses.

Papers may address general issues in applied computational electromagnetics or focus on specific applications, techniques, codes, or computational issues of potential interest to the Applied Computational Electromagnetics Society (ACES) membership. The following is a list of suggested topics, although contributions in other areas of computational electromagnetics will be considered.

Computational Methods:
Integral Equation
Differential Equation
Hybrid and Multi-Physics
Low Frequency
Asymptotic and High Frequency
Fast and Efficient

EM Applications:
RFID Systems
Nanotechnology
MEMS and MMIC
Bio-Electromagnetics
Remote Sensing
Inverse Scattering
Propagation Analysis

High Performance Computing:
Parallel and GPU Computations
Optimization Techniques

EM Modeling:
Antenna Arrays
Small Antennas
TeraHertz Antennas
Dielectric Resonator Antennas
Printed and Conformal Antennas
Wideband and Multiband Antennas
Electrically Large Structures
Guided Structures
EBG and Frequency Selective Surfaces
Metamaterial and Artificial Materials

Authors of accepted papers will have the option to submit an extended version of their paper or papers for review and publication in a special issue of ACES Journal.

SYMPOSIUM STRUCTURE

The international annual ACES Symposium traditionally includes: oral sessions, regular and invited, poster sessions, a student paper competition, short courses, software demonstration, an awards banquet, vendor exhibits, and social events. The ACES Symposium also includes plenary and panel sessions, where invited speakers deliver original essay-like reviews of hot topics of interest to the computational electromagnetics community.

PAPER FORMATTING REQUIREMENTS

The recommended paper length is four (4) pages, with six (6) pages as a maximum. **Submitted papers should be formatted for printing on 8.5x11-inch US standard paper, and should strictly follow the conference paper template posted on ACES site.**

PAPER SUBMISSION PROCEDURE

No email, fax or hard-copy paper submission will be accepted. Papers are required in Adobe Acrobat format (*.PDF) and must be submitted through the conference section on ACES web site. Successful submission will be acknowledged by email after completing the uploading procedure on ACES web site.

SUBMISSION DEADLINE AND REGISTRATION REQUIREMENT

Submission deadline is **October 15, 2011.** Upon the completion of the review process, the decision notification along with the pre-registration information will be emailed to the corresponding author on or about **December 15, 2011.** Corresponding author takes the responsibility to inform all other co-authors about the status of the paper. Each presenting author is required to complete the paid pre-registration and the execution of any required paper corrections by the firm deadline of **January 15, 2012** for final acceptance for presentation and inclusion in the symposium CD proceedings. Only two accepted papers can be associated with one conference registration.

STUDENT PAPERS CONTEST

Members of the ACES student paper competition committee selects the top ten (**10**) student papers submitted for presentation in a special session on the first day of the conference. Those ten students will be recognized at the 28th ACES Annual Review symposium banquet. Additionally, the top five (**5**) student papers presented will be announced and awarded cash prizes. The first, second, third, fourth, and fifth winners will be awarded **$500, $400, $300, $200,** and **$100**, respectively.

General Chairs	Technical Program Chairs	Short Course Chair	Exhibits Chair	Publicity Chairs
J. F. Lee The Ohio State University *lee.1863@osu.edu*	*Atef Elsherbeni* The University of Mississippi *atef@olemiss.edu*	*Robert Burkholder* The Ohio State University *burkholder@ece.osu.edu*	*C. J. Reddy* EM Software and Systems (USA) *cjreddy@emssusa.com*	*Osama Mohammed* Florida International University *mohammed@fiu.edu*
K. Sertel The Ohio State University *sertel.1@osu.edu*	*Fernando Teixeira* The Ohio State University *teixeira@ece.osu.edu*		*Kezhong Zhao* Ansoft/Ansys Inc. *kezhong.zhao@ansys.com*	*Teh-Hong Lee* The Ohio State University *lee.52@osu.edu*

For more information, please visit ACES on-line at: *http://aces.ee.olemiss.edu.*

Fellow Elections

October 15th
Deadline

The grade of Fellow is bestowed by the BOD upon a person with exceptional achievements in computational electromagnetics, including ACES publications, and extensive service to ACES. The candidate, the nominator, and the references must be members of ACES in the nomination year and the year this honor is bestowed. Nominations are submitted to the Awards and Membership Committee by 15 Oct. The Awards and Membership Committee provides a list of recommended candidates to the BOD. At the Fall BOD meeting, the BOD votes to approve the list. ACES Fellows will be officially announced in the March Newsletter and will be recognized at the following ACES conference awards banquet.

Go to http://aces.ee.olemiss.edu/fellownominations.php

Committee information	If you are interested in the work of any of these committees, please contact the committee Chairs directly.

COMMITTEE	CHAIRMAN	EMAIL ADDRESS
Finance	Andy Peterson	Peterson@ece.gatech.edu
Publications	Atef Elsherbeni	atef@olemiss.edu
Ethics and Publication Conduct	Amir Zaghloul	amirz@vt.edu
Conference	Osama Mohammed	mohammed@fiu.edu
Industry Relations	Andy Drozd	andro1@aol.com
Constitution and Bylaws	Natalia K. Nikolova	talia@mcmaster.ca
Membership and Communications	Vincente Rodriguez	rodriguez@ieee.org
BoD Nominations and Elections	Amir Zaghloul	amirz@vt.edu
Awards and Membership Grades	Allen Glisson	aglisson@olemiss.edu
ACES Fellows Committee	Andy Peterson	Peterson@ece.gatech.edu

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Andrew Drozd Andro1@aol.com	Ozlem Kilic Kilic@cua.edu	Amir Zaghloul amirz@vt.edu

2014
Levent Gürel lgurel@ee.bilkent.edu.tr
Ahmed Kishk ahmed@olemiss.edu
Jin-Fa Lee lee.1863@osu.edu

ACES Newsletter points of contact

Editor-in-Chief	Alistair Duffy apd@dmu.ac.uk
Tutorial	Giulio Antonini giulio.antonini@univaq.it
Technical Feature	Andy Drozd andro1@aol.com

Newsletter information

NEWSLETTER ARTICLES AND VOLUNTEERS WELCOME	The ACES Newsletter is always looking for articles, letters and short communications of interest to ACES members. All individuals are encouraged to write, suggest or solicit articles either on a one-time or continuing basis. Please contact a Newsletter Editor.
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The last word	**It is the lone worker who makes the first advance in a subject; the details may be worked out by a team, but the prime idea is due to enterprise, thought, and perception of an individual.** Alexander Fleming Quoted form www.brainyquote.com