ACES 2006

The 22th Annual Review of Progress in Applied Computational Electromagnetics

Miami, Florida
March 12-16, 2006

Symposium General Chair: **Osama Mohamed**

Symposium Technical Chair: **Atef Elsherbeni**

Short Course Chair: **Alexander Yakovlev**

Exhibits Chair: **Andrew Drozd**

Publicity Chair: **C. J. Reddy**

Administrative Assistant: **Matthew Inman**

and

Mohamed Al Sharkawy

Conference Secretary: **Dora Hernandez**

February 11, 2006

ACES 2006 Invited Plenary Talks

Title and Presenter	Room
Monday	
"Particle Swarm Optimization (PSO) in Electromagnetics: Let Bees Design Your Antennas!" **Prof. Yahya Rahmat-Samii**	**Jasmine**
"Design and Analysis of L-Probe Coupled Patch Antenna and Array" **Prof. Kwai-Man Luk** **Prof. Kai-Fong Lee**	**Jasmine**
Tuesday	
"Metamaterial Analysis and Phenomenology for Antenna Applications" **Prof. John L. Volakis**	**Jasmine**
"Pushing the Frontiers of Computational Electromagnetics on the IBM BlueGene/L World's Fastest (petaflop) Machine using a Parallelized FDTD Field Solver" **Prof. Raj Mittra**	**Jasmine**
Wednesday	
"A Perspective on the 40-Year History of FDTD Computational Electrodynamics" **Prof. Allen Taflove**	**Jasmine**
"US Army Research Office Programs and Research Challenges in Computational Electromagnetics" **Dr. William D. Palmer**	**Jasmine**

ACES 2006 Sessions Overview

Session Title	Room
Monday (Sessions 1-8)	
Plenary Session - 1	Jasmine
Hybrid Numerical Techniques in EM for Modeling Electrically Large Structures	Jasmine
Poster Session- Students Paper Competition	Hibiscus A
Poster Session	Hibiscus B
Hybrid Techniques	Tuttle N
Object Oriented Computational Electromagnetics	Tuttle N
Advanced Computational Techniques in Electromagnetics - 1	Tuttle S&C
Low Frequency Applications - 1	Tuttle S&C
Tuesday (Sessions 2,3, 9-17)	
Plenary Session - 2	Jasmine
Nanoscale Frequency Selective Surfaces	Jasmine
Applied CEM for EMC applications	Jasmine
Artificial Material for Electromagnetic Applications	Jasmine
Poster Session- Students Paper Competition	Hibiscus A
Poster Session	Hibiscus B
Computational Electromagnetics for Nondestructive Evaluation	Tuttle N
Advances in Electromagnetic Modeling by WIPL-D Software	Tuttle N
Integral Equation Methods and Applications	Tuttle S&C
Low Frequency Applications - 2	Tuttle S&C
Advanced Computational Techniques in Electromagnetics - 2	Tuttle S&C
Wednesday (Sessions 18-25)	
Plenary Session - 3	Jasmine
Novel Modeling Techniques and RF MEMS	Jasmine
Advances in Computer-Aided Design of Electromagnetic Structures and Devices	Jasmine
Advances in Finite Element Technique and its Applications	Hibiscus A&B
FEKO Modeling and Analysis -1	Hibiscus A&B
NSF Workshop	Tuttle
Numerical Optimization	Orchid B
Advanced Antenna Applications	Orchid B
Modeling Methods for Metamaterials	Orchid B
Thursday (Sessions 26-28)	
Dielectric Resonator Antennas	Jasmine
Phased Arrays	Orchid A
FEKO Modeling and Analysis - 2	Orchid B
NSF Workshop	Tuttle

ACES 2006 Short Courses

Title and Presenter	Room
Sunday – Full Day Easy and efficient use of WIPL-D for antenna simulation **Prof. Branko Kolundzija**	**Orchid B**
Sunday – Full Day Conservative Finite Difference Method: A Recipe for Combining the Simplicity of FDM with the Flexibility of FEM **Prof. Alireza Baghai-Wadji**	**Orchid A**
Sunday – Full Day Clutter Removal in Microwave and Ultrasonic Imaging **Prof. Abbas Omar**	**Tuttle N**
Sunday - Afternoon Numerical Analysis of Antennas with Soft-Hard Surfaces and EBG Surfaces **Prof. Per-Simon Kildal and Prof. Ahmed A. Kishk**	**Tuttle S&C**
Thursday – Full Day Finite Difference and Finite Difference Frequency Domain Techniques for Accurate and Efficient Analysis of Electromagnetic Applications **Prof. Atef Z. Elsherbeni, Dr. Veysel Demir, and Mr. Mohamed Al Sharkawy**	**Orchid C**
Thursday – Afternoon Computational NanoElectromagnetics – GHz, THz, and Optical Analysis of Nanostructures **Prof. George W. Hanson**	**Orchid A**
Thursday – Afternoon Dielectric Resonator Antennas, Theory and Design **Prof. Ahmed A. Kishk**	**Orchid B**
Thursday - Afternoon Surface Impedance Boundary Conditions **Dr. Luca Di Rienzo, Prof. Nathan Ida, and Dr. Sergey Yuferev**	**Tuttle S&C**

ACES 2006 Program

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Symposium General Chair: Osama Mohamed, Symposium Technical Chair: Atef Elsherbeni, Short Course Chair: Alexander Yakovlev, Exhibits Chair: Andrew Drozd, Publicity Chair: C. J. Reddy, Administrative Assistant: Matthew Inman and Mohamed Al Sharkawy Conference Secretary: Dora Hernandez

Sunday, March 12

Room: Orchid D
8:00-5:00 Conference Registration

8:00-5:00 Short Courses (See page above for assigned rooms)

Room: Orchid C
5:00-7:00 ACES Board of Directors Meeting

Room: Brickell
7:00 PM Reception

Monday, March 13

Room: Orchid D
8:00-5:00 Conference Registration

Room: Lower Promenade
8:00-5:00 Exhibitors

Room: Orchid C
5:00-9:00 ACES Board of Directors Meeting

Room: Jasmine
8:00-8:15 ACES Business Meeting
Osama Mohamed

8:15-8:30 Welcome
Atef Elsherbeni

8:30-10:05 Plenary Session - 1 Session 1

8:30-9:15 "Particle Swarm Optimization (PSO) in Electromagnetics: Let Bees Design Your Antennas!"
Yahya Rahmat-Samii

9:20-10:05 "Design and Analysis of L-Probe Coupled Patch Antenna and Array"
Kwai-Man Luk, and Kai-Fong Lee

10:05-10:15 Break

Room: **Hibiscus A** **Session 2**

10:05-12:00 **Poster Session- Students Paper Competition**

Session Chair: Allen Glisson

"A Multiresolution Frequency Domain Method Using Biorthogonal Wavelets"
Mesut Gokten, Atef Z. Elsherbeni, and Ercument Arvas

"Self-Adjoint Sensitivity Analysis of High-Frequency Structures with FEKO"
Jiang Zhu, Natalia K. Nikolova, and John W. Bandler

"Enhancement of the Iterative Multi-Region Algorithm by Using the Multigrid Technique for Efficient Analysis of Electromagnetic Scattering Problems"
Mohamed Al Sharkawy, Veysel Demir, and Atef Z. Elsherbeni

"Investigation of the Electromagnetic Interference Threat Posed by a Wireless Network Inside a Passenger Aircraft"
Nicole L. Armstrong and Yahia M.M. Antar

"Modeling of Electromagnetic Interference Between GPS Reception and VHF/UHF Transmission on a Military Aircraft"
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"A Hybrid VSIE Method for Periodic Media and Metamaterials"
Brian C. Usner, Kubilay Sertel, John L. Volakis

"CPW-fed Elliptical Slot UWB Antenna with a tuning Uneven U-shape Stub on Liquid Ctrystal Polymer"
Symeon Nikolaou, George E. Ponchak, John Papapolymerou, and Manos M. Tentzeris

"Modeling and Testing a Prototype HF Towel-Bar Antenna on a Coast Guard Patrol Boat - 110-Ft Working Patrol Boat (WPB)"
Cadet Rachel C. Beckmann, Cadet Bradley R. Clemons, Dr. Michael E. McKaughan

"Simulation of Wireless Channels via Biorthogonal Interpolating Function-Based High Order S-MRTD Time Domain Techniques"
Abbas Alighanbari, and Costas D. Sarris

"3D FDTD Acceleration Using Graphical Processing Units"
Matthew J. Inman and Atef Z. Elsherbeni

Room: **Hibiscus B** **Session 3**

10:05-12:00 **Poster Session**

Session Chair: Veysel Demir

"Surface Impedance Boundary Conditions of High Order of Approximation for the Finite Integration Technique"
Luca Di Rienzo, Nathan Ida, and Sergey Yuferev

"Analysis of Millimeter Wave Conformal Antenna Array on Conical Surface"
Yanmin Yu, and Wen Wu

"Electromagnetic Fields and Radiated Power Case Study: Dammam Coast Radio Station"
Jamil. M. Bakhashwain

"Suspended ring resonator method for measurement of dielectric permittivity for bulk foam samples in L/S bands"

Isaac Waldron, Sergey N. Makarov, Scott Biederman, and Reinhold Ludwig

"Scattering by Closed and Unclosed Metallic Rings in a Circular Waveguide"
Victor A. Klymko, Alexander B. Yakovlev, Ahmed A. Kishk, and Allen W. Glisson

"Radiation From A Large Circular Loop Around A Dielectric Coated Conducting Sphere"
Hakan P. Partal, Joseph R. Mautz, and Ercument Arvas

"A Hybrid Technique for Describing Periodic Waveguide Structures"
Birgit Neuhaus, Peter Waldow, and Adalbert Beyer

"Analysis of Antennas in Image Line Technique"
Dietmar Koether, Peter Waldow, and Adalbert Beyer

12:00-1:00 Lunch

Room: **Jasmine** **Session 4**

1:00-5:25 **Hybrid Numerical Techniques in EM for Modeling Electrically Large Structures**
Session Organizers: Amir Zaghloul and Ozlem Kilic
Session Chairs: Amir Zaghloul and Ozlem Kilic

1:00-1:25 "Estimation of Blockage Effects of Complex Structures on the Performance of the Spacecraft Reflector Antennas by a Hybrid PO/NF-FF Method"
Keyvan Bahadori and Yahya Rahmat-Samii

1:25-1:50 "A Novel FDTD Based Approach for Solving Very Large Problems"
Hany Abdel-Raouf, Nader Farahat, Ji-Fu Ma, Neng-Tien Huang and Raj Mittra

1:50-2:15 "Combined Analytical-FDTD Approach to Rotman Lens Design"
Samuel Albarano III, Erik H. Lenzing, Christopher W. Penney, and Raymond Luebbers

2:15-2:40 Application of FPGA Based FDTD Simulators to Rotman Lenses
Ozlem Kilic 1, Mark S. Mirotznik 1, and James P. Durbano2

2:40-3:05 "Enhancement of the Iterative Multi-Region Algorithm by Using the Multigrid Technique for Efficient Analysis of Electromagnetic Scattering Problems"
Mohamed Al Sharkawy, Veysel Demir, and Atef Elsherbeni

3:05-3:20 Break

3:20-3:45 "Hybrid Numerical-Asymptotic Modeling of Electrically Large EM Structures"
Branislav M. Notaroš and Miroslav Djordjeviæ

3:45-4:10 "Generalized Hybrid Approach for Antenna/Platform Analysis"
R. J. Burkholder, R. W. Kindt, P. H. Pathak, K. Sertel, R. J. Marhefka, and J. L. Volakis

4:10-4:35 "An Accelerated Non-Conforming DP-FETI Domain Decomposition Method for Analyzing Metamaterials in Electromagnetics"
Seung-Cheol Lee, Kezhong Zhao, and Jin-Fa Lee

4:35-5:00 "Investigation on Near-Field Effects and Cell-Phone/Hearing-Aid Interaction Using MoM and FEM Hybrid Simulations"
Taeyoung Yang and William A. Davis

5:00-5:25 "A Dual-Band Spiral Antenna for Automotive Applications"
Tutku Karacolak and Erdem Topsakal

5:25-5:50 "Electromagnetic Modeling of Cylindrical Obstacles in UTD Geometrical Optics"
Dave G. Trappeniers, Emmanuel H. Van Lil, and Antoine R. Van de Capelle

Room: Tuttle N — Session 5
1:00-3:05 **Hybrid Techniques**
Session Organizer: Poman So
Session Chairs: Poman So and Fritz Arndt

1:00-1:25 "A Novel Efficient Hybrid TLM/TDMOM Method for Numerical Modeling of Transient Interference"
Rachid Khlifi and Peter Russer

1:25-1:50 "A Hybrid Microwave Device Modeling Technique Using Combination of Neural Networks, Empirical Equations, and Equivalent Circuits"
Lei Zhang, and Qi-Jun Zhang

1:50-2:15 "Fast Hybrid CAD Technique for the Optimization of Advanced Waveguide Components and Aperture Antennas"
Fritz Arndt, Valeriu Catina, and Joern Brandt

2:15-2:40 "A Novel Approach for Designing Circular Antenna Arrays for UltraWide Band (UWB) Applications"
Bruno Biscontini and Peter Russer

3:05-3:20 Break

Room: Tuttle N — Session 6
3:20-5:25 **Object Oriented Computational Electromagnetics**
Session Organizer: Poman So
Session Chair: Poman So

3:20 - 3:45 "Driving and Extending Legacy Codes using Python"
Neilen Marais and David B. Davidson

3:45-4:10 "An Object Oriented Finite-Volume Time-Domain Computational Engine"
Dmitry K. Firsov, Ian Jeffrey, Joe LoVetri and Colin Gilmore

4:10-4:35 "An Object-Oriented Framework for Computational Electromagnetics"
Poman So

4:35-5:00 "Wrapping Existing Electromagnetic Code into an Object-Oriented Scripting Programming Language"
Petr Lorenz and Peter Russer

Room: Tuttle S & C — Session 7
1:00-3:05 **Low Frequency Applications - 1**
Session Organizers: Yasushi Kanai and Shuo Liu
Session Chairs: Yasushi Kanai and Shuo Liu

1:00-1:25 "New Heating Characteristics of a Radio Frequency Rectangular Resonant Cavity Applicator using an L-Type Antenna for Hyperthermic Treatment"
Yutaka Tange, Yasushi Kanai, and Yoshiaki Saitoh

1:25-1:50 "Harmonic Balance - Finite Element Method (HB-FEM) for Low Frequency Electromagnetic Field Analysis"
Junwei Lu

1:50-2:15 " Numerical Calculation of End Region Electromagentic Field "
Yanping Liang, Hao Huang, and Linhe Li

2:15-2:40 "Characterization and Design Optimization of ALA Rotor Synchronous Reluctance Motor Drives for Traction Applications"

A.A Arkadan, A.A. Hanbali, and N. AL-Aawar

2:40-3:05 " Benchmarking-based approach to engineering stray-field loss problems"
Zhiguang Cheng, Norio Takahashi, Shuo Liu, Sumei Yang, Changzai Fan, Qifan Hu, Lanrong Liu, Mansheng Guo, and Junjie Zhang

3:05-3:20 Break

Room: **Tuttle S & C** **Session 8**
3:20-5:25 **Advanced Computational Techniques in Electromagnetics - 1**
Session Organizer: Alireza.Baghai-Wadji
Session Chair: Alireza.Baghai-Wadji

3:20-3:45 "Development of a Sparse, Parallel, Direct Solver for Electromagnetic Scattering Problems"
William R. Dearholt, and Steven P. Castillo

3:45-4:10 "A Well-Conditioned Solution to the 1D Inverse Scattering Problem using the Distorted Born Iterative Method"
Ian Jeffrey, Vladimir I. Okhmatovski and Joe LoVetri

4:10-4:35 "High-Order FVTD on Unstructured Grids"
Dmitry Firsov, Joe LoVetri, Ian Jeffrey, Vladimir Okhmatovski1, and Walid Chamma

4:35-5:00 "B-spline Wavelets Constructed from Spectral-Domain Asymptotic Tails of Green's Functions"
A. R. Baghai-Wadji

5:00-5:25 "Simple Parallelization of Iterative Matrix Solvers on Affordable, Desktop Supercomputers"
Pedro Barba and Leo Kempel

Tuesday, March 14

Room: **Orchid D**
8:00-5:00 **Conference Registration**

Room: **Lower Promenade**
8:00-5:00 **Exhibitors**

Room: **Jasmine** **Session 9**
8:00-9:35 **Plenary Session - 2**

8:00-8:45 "Metamaterial Analysis and Phenomenology for Antenna Applications"
John L. Volakis

8:50-9:35 "Pushing the Frontiers of Computational Electromagnetics on the IBM BlueGene/L-- World's Fastest (petaflop) Machine--using a Parallelized FDTD Field Solver"
Raj Mittra

9:35-9:55 Break

Room: **Jasmine** **Session 10**
9:55-12:00 **Nanoscale Frequency Selective Surfaces**
Session Organizers: Erdem Topsakal and Douglas Werner
Session Chairs: Erdem Topsakal and Douglas Werner

9:55-10:20 "Frequency Selective Volume Based Optical Filters for Heavy Metal Monitoring"

Erdem Topsakal, and Cetin Yuceer

10:20-10:45 "Modeling Infrared Frequency Selective Surfaces with Frequency Dependent Materials"
James Ginn, Brian Lail, David Shelton, Jeffrey Tharp, William Folks, and Glenn Boreman

10:45-11:10 "The Synthesis of Frequency Selective Surfaces for Infrared Filters "
Jeremy A. Bossard, Douglas H. Werner, Ling Li, Theresa S. Mayer, Jacob A. Smith, and Robert P. Drupp

11:10-11:35 "Design and Measurements of Frequency Selective Surfaces on Silicon Substrates for Sub-mm Wave Applications "
Stephan Biber, Maurizio Bozzi, Luca Perregrini, and Lorenz-Peter Schmidt

Room: **Tuttle N** **Session 11**
9:55-12:00 **Computational Electromagnetics for Nondestructive Evaluation**
Session Organizer: Jeremy S. Knopp
Session Chairs: Jeremy S. Knopp and John Aldrin

9:55-10:20 "Nondestructive Evaluation of Cement-based Materials using Microwaves"
Kavitha Arunachalam, Vikram R. Melapudi, Lalita Udpa and Satish S. Udpa

10:20-10:45 "A Parametric Inversion Technique in Nondestructive Evaluation Using Element-Free Galerkin Model"
X. Liu, Y. Deng, Z. Zeng, L. Udpa, and J. S. Knopp

10:45-11:10 "A Meshless Boundary Integral Equation Method for 2D Wave Propagation and Diffusion Problems"
Zhigang Chen and Norio Nakagawa

11:10-11:35 "Strategies for Improving Inverse Methods for Eddy Current NDE Corrosion Characterization"
John C. Aldrin, Harold A. Sabbagh, Elias H. Sabbagh, R. Kim Murphy, Eric Lindgren, Jeremy Knopp

11:35-12:00 "Improved Conjugate-Gradient Solutions for Volume-Integral Equations Using a Simple Change of Variables"
R. Kim Murphy, Harold A. Sabbagh, and Elias H. Sabbagh

Room: **Tuttle S & C** **Session 12**
9:55-12:00 **Integral Equation Methods and Applications**
Session Organizer: Andrew F. Peterson
Session Chairs: Andrew F. Peterson and Malcolm M. Bibby

9:55-10:20 "Carbon Nanotube Dipoles: Infrared and Optical Antenna Properties"
J. Hao and G.W. Hanson

10:20-10:45 "Elimination of the Derivatives from the Conventional MFIE Operator"
Malcolm M. Bibby and Andrew F. Peterson

10:45-11:10 "Resonances in microcavities : a numerical method"
F. Seydou1, T. SeppÄanen1, and Omar Ramahi

11:10-11:35 "Scattering from an Arbitrarily Shaped Three-Dimensional Inhomogeneous Magnetic and Dielectric Scatterer"
Moamer Hasanovic, Chong Mei, Joseph R. Mautz, and Ercument Arvas

11:35-12:00 "A Modification of Wavelet-Based Method of Moment"
Hidetoshi Chiba*, Yoshio Inasawa, Naofumi Yoneda, Yonehiko Sunahara, and Shigeru Makino

Room: **Hibiscus A** **Session 2**

9:55-12:00 **Poster Session: Students Paper Competition**

Session Chair: Allen Glisson

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Cadet Rachel C. Beckmann, Cadet Bradley R. Clemons, Dr. Michael E. McKaughan

"3D FDTD Acceleration Using Graphical Processing Units"
Matthew J. Inman and Atef Z. Elsherbeni

Room: **Hibiscus B**

9:55-12:00 **Poster Session** **Session 3**

Session Chair: Veysel Demir

"Simulation of Wireless Channels via Biorthogonal Interpolating Function-Based High Order S-MRTD Time Domain Techniques"
Abbas Alighanbari, and Costas D. Sarris

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"Analysis of Antennas in Image Line Technique"
Dietmar Koether, Peter Waldow, and Adalbert Beyer

12:00-1:00 Lunch

Room: **Jasmine** **Session 13**
1:00-3:05 **Applied CEM for EMC Applications**
Session Organizers: Bruce Archameault and Andy Drozd
Session Chair: Andy Drozd

1:00-1:25 "Transmission plane models for parallel-plane power distribution system and signal integrity analysis"
Yuriy Shlepnev

1:25-1:50 "A Study on FDTD Cell Size for Evaluating Human Head Exposure to Near EM Field"
Hiroshi SHIRAI, Jun OHISA., and Shoji MOCHIZUKI

1:50-2:15 "Study on Differential Signaling with the Decoupling Capacitor in the Rectangular Power-Bus Structure"
Sungtek Kahng

2:15-2:40 "EMC Computer Modeling and Simulation Techniques"
Junwei Lu and David Thiel

2:40-3:05 "A Few Examples of Unverified Spacecraft Failures Attributed to EMC Issues"
Ray Perez

3:05-3:20 Break

Room: **Jasmine** **Session 14**
3:20-5:00 **Artificial Material for Electromagnetic Applications**
Session Organizer: Erdem Topsakal
Session Chairs: Alexander V. Kildishev and Alkim Akyurtlu

3:20-3:45 "A Hybrid VSIE Method for Periodic Media and Metamaterials"
Brian C. Usner, Kubilay Sertel, John L. Volakis

3:45-4:10 "Simulation of Optical Negative Index Materials Using Parallel FDTD Method"
Alexander V. Kildishev, Uday Chettiar, and Vladimir M. Shalaev

4:10-4:35 "Simulation of EBG Antennas"
Olanike Folayan and Richard Langley

Room: **Tuttle N** **Session 15**
1:00-5:00 **Advances in Electromagnetic Modelingby WIPL-D Software**
Session Organizer: Branko Kolundzija
Session Chair: Branko Kolundzija

1:00-1:25 "Particle Swarm Optimization Applied to EM Problems"
Dragan I. Olćan and Ružica M. Golubović

1:25-1:50 "Design and Modeling of a VHF Bow-Tie Cross-Dipole Antenna onboard a Generic Fuselage"
Artem S. Saakian and Saad N. Tabet

1:50-2:15 "Blue Force Tracker Antenna Placement Study on a CH-53E Helicopter"
Duc H. Vu and Dennis Decarlo

2:15-2:40 "Solution of Large Complex Problems on 32-bit Desktop/Laptop Computers Using an Efficient and Accurate Out-of-Core Solver"
Mengtao Yuan, Mary C. Taylor and Tapan K. S

2:40-3:05 "Two element phased array dipole antenna"
Mitsuo Taguchi, Kotaro Era, and Kazumasa Tanaka

3:05-3:20 Break

3:20-3:45 "PO Driven Iterative Least Square Solution of MFIE"
Miodrag. S. Tasić, Branko. M. Kolundžija

3:45-4:10 "A Two Dimensional Slot Array Antenna"
Ronald H. Johnston1 and Qinjiang Rao

4:10-4:35 "WIPL-D Model and Simulation Results for a 6ft Diameter Impulse Radiating Antenna (IRA)"
Mary Cannella Taylor and Tapan K. Sarkar

4:35-5:00 "Analyses of VHF/UHF and GPS Antennas onboard an unmanned aerial vehicle helicopter"
Saad N. Tabet

Room: **Tuttle S & C**

1:00-3:05 **Low Frequency Applications - 2** **Session 16**

Session Organizers: Yasushi Kanai and Shuo Liu

Session Chairs: Yasushi Kanai and Shuo Liu

1:00- 1:25 "High Frequency Phase Variable Model of Electric Machines from Electromagnetic Field Computation"
O. A. Mohammed, S. Ganu, N. Abed, S. Liu, and Z. Liu

1:25-1:50 " Modeling of Photonic Waveguide for Biosensing"
Jin Sun and Er-Ping Li

1:50-2:15 "Patterned Soft Underlayer for Perpendicular and 3D Magnetic Recording Systems: Numerical Analysis Perspective"
Yazan S. Hijazi, Rabee Ikkawi, Nissim Amos, Andrey Lavrenov, David Doria, Nikhil Joshi, Roman Chomko, Dmitri Litvinov, and Sakhrat Khizroev

2:15-2:40 " Patterned Medium Perpendicular Magnetic Recording: Design, Materials, Fabrication"
Dmitri Livinov, Chunsheng E1, Darren Smith, Vishal Parekh, Ariel Ruiz, Paul Ruchhoeft, John C. Wolfe, Dieter Weller , Sakhrat Khizroev

2:40-3:05 "Approximate Solution For a plane Wave Scattered by N Dielectric Coated Conducting Strips"
Hassan A. Ragheb, and Essam Hassan

Room: Tuttle S & C — **Session 17**
3:20-5:00 **Advanced Computational Techniques in Electromagnetics - 2**
Session Organizer: Alireza.Baghai-Wadji
Session Chair: Alireza.Baghai-Wadji

3:20-3:45 "Generating a High Resolution Wideband Response using RCS data from Electromagnetic Systems"
Jie Yang and Tapan K. Sarkar

3:45-4:10 "A Diakoptic Approach to Analysis of Large 2D Problems"
Dragan I. Olæan, Juan R. Mosig, Ivica M. Stevanoviæ, and Antonije R. Djordjeviæ

4:10-4:35 "A Block-Solve Multigrid-FDTD Method"
Peter Chow 1, Tetsuyuki Kubota 2, and Takefumi Namiki

4:35-5:00 "Multidomain Basis functions devoted to Antenna Siting Electromagnetic Modelling"
Andre Barka

5:00-5:25 "On the Origin of the Addition Theorem and its Role in Multipole Expansions"
A. R. Baghai-Wadji

5:25-5:50 "Enhanced Functionality for Hardware-Based FDTD Accelerators "
Petersen F. Curt, James P. Durbano, Michael R. Bodnar, Shouyuan Shi, and Mark S. Mirotznik

Wednesday, March 15

Room: Orchid D
8:00-5:00 **Conference Registration**

Room: Lower Promenade
8:00-5:00 **Exhibitors**

Room: Jasmine — **Session 18**
8:00-9:35 **Plenary Session - 3**

8:00-8:45 "A Perspective on the 40-Year History of FDTD Computational Electrodynamics"
Allen Taflove

8:50-9:35 "US Army Research Office Programs and Research Challenges in Computational Electromagnetics"
William D. Palmer

Room: Tuttle N, S & C
8:00-9:35 **NSF Workshop**

9:35-9:55 Break

Room: Jasmine — **Session 19**
9:55-12:00 **Novel Modeling Techniques and RF MEMS**
Session Organizer: Michiko Kuroda
Session Chairs: Michiko Kuroda

9:55-10:20 "Simulation of Non Linear Circuits by the Use of a State Variable Approach in the Wavelet Domain "
S. Barmada, A. Musolino, and M. Raugi

10:20-10:45 "Novel Numeical Technique for the Analysis of the Moving Boundary Problems by Using the Overset Grid Generation"
Nadiah Hanim, Binghu Piao, Michiko Kuroda, and Shigeaki Kuroda

10:45-11:10 "Modeling and Optimization of MEMS Devices Using the Lumped Element Equivalent Circuit Approach"
G. DeJean and M. M. Tentzeris

11:10-11:35 "Three-Dimensional Electromechanical Coupled Analysis for Capacitive RF MEMS Switches"
Ehab K. I. Hamad, Atef Z. Elsherbeni, and Abbas S. Omar

11:35-12:00 "Tracking Human Experience for Tuning Microwave Filters using Parallel Fuzzy Controllers"
V. Mirafrtab, and R. R. Mansour

Room: **Orchid B** **Session 20**
9:55-12:00 **Numerical Optimization**
Session Organizer: Randy Haupt
Session Chair: Randy Haupt

9:55-10:20 "Compact ESM Sensor Based on Computationally Optimized Fragmented Aperture Antennas"
James G. Maloney, James A. Acree, John Schultz, John Little, and Dan Reuster

10:20-10:45 "A Combined Continuous/Binary Genetic Algorithm for Microstrip Antenna Design"
Randy L. Haupt

10:45-11:10 "Design of Antenna Integrated Honeycomb Sandwich Structure Using Hybrid Electrical/Mechanical Optimization Technique"
Chisang You, Daniela Staiculescu, Lara Martin, Woonbong Hwang, and Manos Tentzeris

11:10-11:35 "Controlled Radiation Pattern of Circular Antenna Array"
S.H. Zainud-Deen, Eman S. Mady, K.H. Awadalla, and H.A. Sharshar

11:35-12:00 "Analysis of Quadruple-Ridged Square Waveguide by Multilayer Perceptron Neural Network Model"
Yiming Tang and Wen Wu

Room: **Hibiscus A&B** **Session 21**
9:55-12:00 **Advances in Finite Element Technique and its Applications**
Session Chairs: John R. Brauer and Robert Lee

9:55-10:20 "Finite Element Computation of Magnetic Diffusion Times in Nonlinear Steel with Surface Field Turned On and Off"
John R. Brauer

10:20-10:45 "Modeling of Surface Roughness Effects on the Performance of Rectangular micro-Coaxial Lines"
Milan Lukic,and Dejan S. Filipovic

10:45-11:10 "Improvement of Point-matched Time Domain Finite Element Method"
Huiqi Li, Xiang Cui, Lin Li, and Lei Qi

11:10-11:35 "Curvilinear Vector Finite Elements using Hierarchical Basis Functions"
J. P. Swartz and D. B. Davidson

11:35-12:00 "Use of Hanging Variables for Nested h Refinement in 2D FETD"
Yudhapoom Srisukh, and Robert Lee

Room: Tuttle N, S & C
9:55-12:00 **NSF Workshop**

12:00-1:00 Lunch

Room: Jasmine **Session 22**
1:00-5:25 **Advances in Computer-Aided Design of Electromagnetic Structures and Devices**
Session Organizer: Natalia Nikolova
Session Chairs: Natalia Nikolova and Mohamed H. Bakr

1:00-1:25 "Electromagnetic scattering from a three-dimensional chiral body"
Huseyin H. Erkut , Ahmet F. Yagli , and Ercument Arvas

1:25-1:50 "Electromagnetic Scattering From Three-Dimensional Gyrotropic Objects at Single Frequency Using The TLM Method"
Ahmet F. Yagli, Ercument Arvas, and Jay K. Lee

1:50-2:15 " Full wave analysis of substrate integrated strctures"
Emilio Arnieri , Giandomenico Amendola, Luigi Boccia and Giuseppe Di Massa

2:15-2:40 "Numerical Investigation of the Quarter Wave Coaxial Cavity Resonator Quality Factor through Wire Grid Modeling in NEC"
Franz A. Pertl, Andrew D. Lowery, and James E. Smith

2:40-3:05 "Hybrid optimization techniques including deterministic electromagnetic /mechanical simulators and statistical tools"
Daniela Staiculescu, Lara Martin, Chisang You, and Manos Tentzeris

3:05-3:20 Break

3:20-3:45 "ANN Based Methods for Microwave Modeling and Computer-Aided Design"
Q.J. Zhang 1 and A.G. Wang

3:45-4:10 "Compact Reduced Order Models for Mircrowave Filter Optimization"
Klaus Krohne and R¨udiger Vahldieck

4:10-4:35 "Accelerating Cauchy Interpolation Using Adjoint Sensitivities"
Peter A. W. Basl, Mohamed H. Bakr and Natalia K. Nikolova

4:35-5:00 "Self-adjoint Sensitivity Analysis of Linear Electromagnetic Problems in the Time Domain"
Natalia K. Nikolova, Ying Li, Yan Li, and Mohamed H. Bakr

5:00-5:25 "Self-adjoint S-parameter Sensitivities for TLM Problems"
Mohamed H. Bakr and Natalia K. Nikolova

Room: Hibiscus A & B **Session 23**
1:00-3:05 **FEKO Modeling and Analysis - 1**
Session Organizer: C. J. Reddy
Session Chair: C. J. Reddy

1:00-1:25 " Recent extensions in FEKO: Parallel MLFMM and waveguide excitations"
Ulrich Jakobus, Marianne Bingle, and Johann J. van Tonder

1:25-1:50 " Optimizing Salisbury Screens Using FEKO"
Randy L. Haupt

1:50-2:15 "Simulations of Wing Mockup Sizes for EMI Measurements using FEKO"

Praveen Anumolu, Ronald Pirich, and Danielle Schefer

2:15-2:40 "Modeling and Analysis of a Dual-Band Dual-Polarization Radiator Using FEKO "
Amir I. Zaghloul, C. Babu Ravipati, and M. T. Kawser

2:40-3:05 "Meshing Silicon Valley - An HF Antenna over Finite Curved Earth"
Keith Snyder

Room: **Orchid B** **Session 24**
1:00-3:05 **Advanced Antenna Applications**
Session Chair: Vicente Rodriguez

1:00-1:25 "Design of an Open-Boundary Quad-Ridged Guide Horn Antenna using a Finite Integration Time Domain Technique"
Vicente Rodriguez

1:25-1:50 "Investigation of the Electromagnetic Interference Threat Posed by a Wireless Network Inside a Passenger Aircraft"
Nicole L. Armstrong and Yahia M.M. Antar

1:50-2:15 "Enhancement of the isolation between two closely spaced mobile phone internal antennas by a neutralization effect"
A. Diallo, C. Luxey, P. Le Thuc, R. Staraj, and G. Kossiavas

2:15-2:40 "Space Antenna Feed Design at Alcatel Alenia Space (F)"
P. Mader, K. Tossou, F. Delepaux, and P. Lepeltier

2:40-3:05 "A linearly-polarized compact broadband UHF PIFA with foam support"
Shashank D. Kulkarni, Robert M. Boisse, and Sergey N. Makarov

Room: **Tuttle N, S & C**
1:00-3:05 **NSF Workshop**

Room: **Orchid B** **Session 25**
3:20-5:25 **Modeling Methods for Metamaterials**
Session Organizers: **John L. Volakis and Robert Lee**
Session Chairs: **John L. Volakis and Robert Lee**

3:20-3:45 "Scattering Properties of Parallel Metamaterial Cylinders Using Scattering Matrix Method"
Yao-Jiang Zhang, and Er-Ping Li

3:45-4:10 "Numerical Analysis of Parallel Plate Waveguide Loaded with Magnetic Photonic Crystals (MPC's)"
Ryan A. Chilton, Robert Lee, and Khaled Jazzar

4:10-4:35 "CRLH Extended Equivalent Circuit (EEC) FDTD Method and its Application to an Open Metamaterial-Loaded Resonator"
Andreas Rennings, Simon Otto, Christophe Caloz, and Ingo Wolff

4:35-5:00 "Numerical Dispersion and Stability of an Extended FDTD Method Applied to Negative Refractive Index Media Modeling"
Costas D. Sarris

5:00-5:25 "Periodic FDTD Characterization of Guiding and Radiation Properties of Negative Refractive Index Transmission Line Metamaterials"
Costas D. Sarris

Room: **Tuttle N, S & C**
3:20-5:25 **NSF Workshop**

Room: **Riverfront South**
7:00 PM **Conference Banquet**

Thursday, March 16

Room: **Orchid D**
8:00-12:00 **Conference Registration**

8:00-5:00 **Short Courses**

Room: **Jasmine** **Session 26**
8:00-12:00 **Dielectric Resonator Antennas**
Session Organizer: K. W. Leung and Ahmed Kishk
Session Chairs: K. W. Leung and Ahmed Kishk

8:00-8:25 "Control of Rectangular Dielectric Resonator Characteristics by Ground Plane Shape"
Emad El-Deen, S.H. Zainud-Deen, H.A. Sharshar and M. A. Binyamin

8:25-8:50 "A Microstrip Excitation Technique in FVTD and its Application to Slot-Fed Dielectric Resonator Antennas"
Dirk Baumann, Christophe Fumeaux, Georgios Almpanis, and Rüdiger Vahldieck

8:50-9:15 "Analysis of Two-Layer Hemispherical Dielectric Resonator Antenna"
K. W. Leung and K. K. So

9:15-9:40 "A Rigorous Solution of Chiral Resonator Antennas With Arbitrary Shape"
D. X. Wang, Edward K. N. Yung, and R. S. Chen

9:40-10:05 "Circularly polarized dielectric resonator loaded patch antenna array"
K. Y. Hui and K. M. Luk

10:05-10:20 Break

10:20-10:45 "A Hybrid Dielectric-Resonator-on-Patch Antenna with Metal Shorting Walls"
Januar Janapsatya, Karu Esselle, and Trevor Bird

10:45-11:10 " Double-Bowtie-Slot-Coupled DRA for Enhanced Bandwidth"
Georgios Almpanis, Christophe Fumeaux and Rüdiger Vahldieck

11:10-11:35 "Aperture Feed Elliptical Dielectric Resonator Antenna for Circularly Polarized Applications"
S. L. Steven Yang, Ricky Chair, A. A. Kishk, K. F. Lee, and K. M. Luk

11:35-12:00 "Practical Implementation of Infinitesimal Dipole Models and Their Applications"
Said Mikki and Ahmed Kishk

Room: **Orchid A** **Session 27**
8:00-10:05 **Phased Arrays**
Session Organizer: Deb Chatterjee
Session Chairs: Deb Chatterjee and Raed Shubair

8:00-8:25 "Modeling Large Phased Array Antennas Using the Finite Difference Time Domain Method and the Characteristic Basis Function Approach"
Nader Farahat1, Raj Mittra and Neng-Tien Huang

8:25-8:50 "GAs with PDSS and Adaptive Parameters for Phased Array Synthesis"
Sunday C. Ekpo1, Edidiong-Obong U. Ekpo, and Armstrong A. Sunday

8:50-9:15 "Radiation by a Linear Array of Half-Width Leaky-Wave Antennas"
Joshua Radcliffe, Daniel Killips, Leo Kempel and Stephen Schneider

9:15-9:40 "Modeling doubly curved conformal array antennas using UTD"
Patrik Persson

9:40-10:05 "Improved Smart Antenna Design using Displaced Sensor Array Configuration"
Raed M. Shubair

Room: **Orchid B** **Session 28**

8:00-11:10 **FEKO Modeling and Analysis - 2**
Session Organizer: C. J. Reddy
Session Chair: Ulrich Jakobus

8:00-8:25 "Analysis and design of a multiband, multipolarized two arm sinuous antenna"
Michael C. Buck and Dejan S. Filipović

8:25-8:50 "Coupling between spiral antenna elements of a conformal wideband array"
François Chauvet 1, Régis Guinvarc'h 1 and Marc Hélier

8:50-9:15 "Method of Simulation of Closely Spaced, Finite, Periodic, Radiating or Reflecting Structures, Including Metamaterials "
Steven J. Franson,and Richard W. Ziolkowski

9:15-9:40 "Modeling Large Finite Frequency-Selective Surfaces with FEKO"
Rensheng Sun and C. J. Reddy

9:40-10:05 "Self-Adjoint Sensitivity Analysis of High-Frequency Structures with FEKO"
Jiang Zhu, Natalia K. Nikolova, and John W. Bandler

10:05-10:20 Break

10:20-10:45 "Using FEKO Software for Analysis of Radiated Electric Field "
Y. Rousset, V. Arnautovski-Toseva, C. Pasquier, K. El Khamlichi Drissi, and L. Grcev

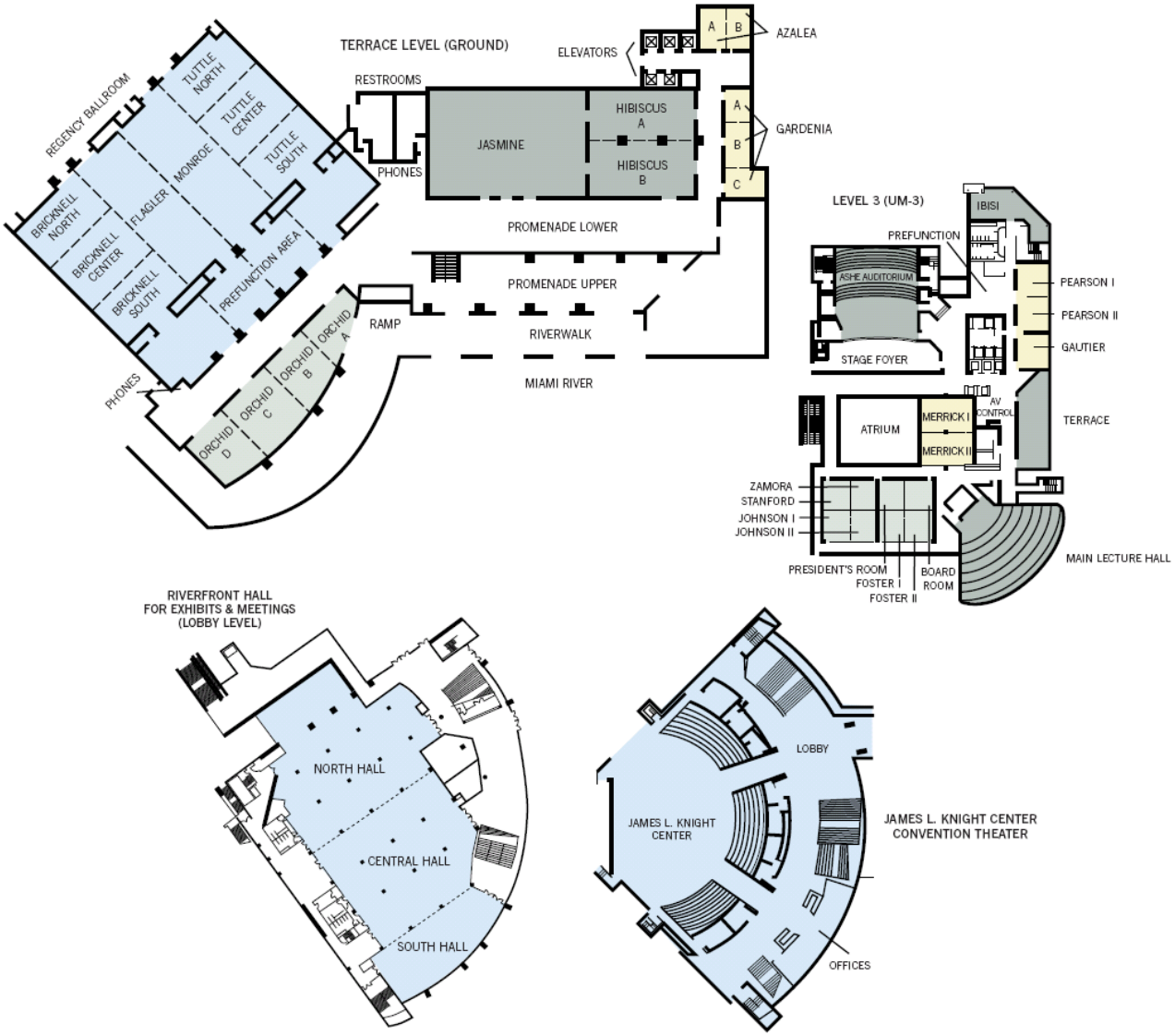
10:45-11:10 "Numerical Simulation of the Generation of Synchrotron Radiation in a Vacuum Chamber with FEKO"
Andreas Paech, Thomas Weiland

Room: **Tuttle N, S & C**
8:00-12:00 **NSF Workshop**

12:00-1:00 Lunch

Room: **Tuttle N, S & C**
8:00-5:00 **NSF Workshop**

Hyatt Regency Miami
Floor Plan



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Hyatt Regency Miami

DIRECTIONS

From Miami International Airport (8 miles): Take 836 East to I-95 South. Exit 3 Biscayne Blvd. Go right on S.E. Second Ave. 1/4 block.

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