

2008 ANTENNA APPLICATIONS



**Robert Allerton Park, Monticello, Illinois
September 16-18, 2008**

Sponsored by

**Antenna Technology Branch
AFRL Sensors Directorate
Hanscom AFB, Massachusetts**

**US Army Research Office
Army Research Laboratory
Research Triangle Park, North Carolina**

**Antennas and Propagation Laboratory
University of Massachusetts
Amherst, Massachusetts**

**Electromagnetics Laboratory
University of Illinois
Urbana-Champaign, Illinois**

The Antenna Applications Symposium and its predecessor, the Air Force Antenna R&D Symposium, have for fifty years provided a unique forum for exchange of ideas and information about the practical aspects of antenna design, development, and use in systems. The Antenna Applications Symposium emphasizes antenna design and application to systems. It is a unique forum where engineers are encouraged to present practical solutions to problems that are encountered during development and integration of antennas and antenna systems. Military and commercial applications are included.

Papers typically span all areas of antenna design and development: empirical, analytical and numerical methods; feed networks; system architecture; integration with other systems and subsystems; materials; compatibility with modern platforms and materials; and measurements. Topics often span the frequency range from HF to millimeter waves and from single radiators to phased arrays to reflectors. Antenna phenomena learned from numerical simulation, empirical design, manufacturing, system integration and testing are typical topics at the symposium, as are novel and potentially revolutionary technologies.

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Contact:
Daniel H. Schaubert
Electrical & Computer Engineering
Marcus Hall, 100 Natural Resources Road
University of Massachusetts
Amherst, MA 01003

Tel: (413) 545-2530
Fax: (413) 545-4611
email: allerton@ecs.umass.edu

Advance Program
2008 Antenna Applications Symposium

Tuesday, September 16, 2008

Arrays I

- 8:40 **Advances in the Development of Electronically Scanned Arrays of Balanced Antipodal Vivaldi Antennas**
M.W. Elsallal, Rockwell Collins, D.H. Schaubert, Univ. of Massachusetts, and J.B. West, Rockwell Collins
- 9:05 **Broadband Properties of Arrays with Time-Delayed Four and Eight Element Polyomino Subarrays**
R.J. Mailloux, Univ. of Massachusetts, S.G. Santarelli, T.M. Roberts and D. Luu, AFRL Hanscom
- 9:30 **Broadband Phased Array**
M. Stasiowski, Nurad, and D.H. Schaubert, Univ. of Massachusetts
- 9:55 Break
- 10:25 **Stripline Fed Low Profile Radiating Elements for Use in Integrated Arrays**
M.J. Buckley, L.M. Paulsen and J.D. Wolf, Rockwell Collins
- 10:50 **Antenna Element Pattern Reconfigurability in Adaptive Arrays**
T.L. Roach and J.T. Bernhard, Univ. of Illinois
- 11:15 **μ -Coaxial Phased Arrays for Ka-band Communications**
D. Filipovic, Univ. of Colorado, G.Potvin, D. Fontaine, BAE Systems, Y. Saito, Univ. of Colorado, J-M. Rollin, Rohm and Hass, Z. Popovic, M. Lukic, Univ. Colorado, and C. Nichols, Rohm and Hass
- 11:40 **Phased Array for Multi-Direction Secure Communication**
M. Daly and J. Bernhard, Univ. of Illinois
- 12:05 Lunch
- Student Paper Contest*
- 1:15 **A Wideband, Dual-Polarized, Differentially-Fed Cavity-Backed Slot Antenna**
R.C. Paryani, P.F. Wahid and N. Behdad, Univ. of Central Florida
- 1:40 **Miniaturized Microstrip Patch Antennas for Dual Band GPS Operation**
S.S. Holland and D.H. Schaubert, Univ. of Massachusetts
- 2:05 **On the Use of Spiral Antennas for Electronic Attack**
M.J. Radway, W.N. Kefauver and D.S. Filipovic, Univ. of Colorado
- 2:30 **A Class of Electrically Small Spherical Antennas with Near-Minimum Q**
J.J. Adams and J.T. Bernhard, Univ. of Illinois
- 2:55 Break

Practical Applications of Metamaterials

- 3:25 **Metamaterials for Military Applications -Antenna and Antenna Array Enhancements for Army Platforms - Invited**
S. Weiss and A. Zaghoul, US Army Research Laboratory
- 3:55 **Aperstructures and Topside Integration for Naval Combatants - Invited**
S.J. Russell, Office of Naval Research
- 4:25 **Metamaterials and Their RF Behavior - Invited**
J. Derov, AFRL Hanscom
- 4:55 **Metamaterial Discussion**

Wednesday, September 17, 2008

Arrays II

- 8:15 **Scan Impedance for an Infinite Dipole Array: Analytical Solution vs. Ansoft HFSS / CST Simulations**
S. Makarov, Worcester Polytechnic Institute, A. Puzella, Raytheon, and V. Iyer, Worcester Polytechnic Institute
- 8:40 **Novel Hybrid Tolerance Analysis Method with Application to the Low Cost Manufacture of Edge Slot Waveguide Arrays**
B.J. Herting, M.W. Elsallal, J.C. Mather and J.B. West, Rockwell Collins
- 9:05 **Pillbox Antenna with a Dipole Feed**
W.R. Pickles and M.G. Parent, Naval Research Laboratory
- 9:30 **Design of Coplanar Waveguide Fed Tapered-Slot Antenna Arrays for High-Power Space-Distributed Amplifier Applications**
A. Rivera-Albino and R.A. Rodriguez-Solis, Univ. of Puerto Rico Mayaguez
- 9:55 Break
- Antenna Design Techniques I*
- 10:25 **Efficient Global Optimization for Antenna Design**
H. Southall, Vistrionix Inc., T. O'Donnell, Arcon Corp., and Bryan Kaanta, AFRL Hanscom
- 10:50 **Radome Design, Modeling and Measurements**
M. Stasiowski, Nurad
- 11:15 **Transmission of a 1 MHz Signal Using a Directly Driven Antenna System**
W.D. Palmer, US Army Research Office, W.T. Joines, Duke University, and S.D. Keller, US Army Research Laboratory
- 11:40 **Biologically Inspired Concepts for Smart Skins and Reconfigurable Antennas: The RF Cuttlefish**
G.H. Huff, S. Goldberger, S.A. Long and J. McDonald, Texas A&M Univ.

Antenna Design Techniques II

- 1:30 **Investigation of the Null Steering Capability of Yagi-Uda Arrays with Variable Reactive Loads**
D.F. Kelley and T.J. Destan, Bucknell Univ.
- 1:55 **Non-Foster Matching of Electrically-Small Antennas to Transmitters**
S.E. Sussman-Fort and R.M. Rudish, ITT Corp.
- 2:20 **Using Series Resonators in Parallel to Achieve Broadband Performance in Inductively-Loaded Antennas**
P.E. Mayes, P.W. Klock and S. Barot, Univ. of Illinois
- 2:45 **Design and Limitations of Ku/Ka Band Compact Feeds Employing Dielectric Loaded Corrugated Horns**
J.P. Creticos and D.H. Schaubert, Univ. of Massachusetts
- 3:10 Break
- Antenna Design and Performance*
- 3:40 **The State-of-the-Art in Small Wideband Antennas**
S.R. Best, Mitre Corp.
- 4:05 **Compact Quasi-Volumetric Dual-Element Antenna Array for RF Communications**
F. Scire Scappuzzo, J.P. Towle, Physical Sciences Inc., and S. Makarov, Worcester Polytechnic Institute
- 4:30 **A Dielectric Patch Antenna**
E.M.A. Oliveira and S. Makarov, Worcester Polytechnic Institute
- 4:55 **Investigation of a Reconfigurable Stacked Patch with Beamsteering Capabilities**
J.E. Ruyle and J.T. Bernhard, Univ. of Illinois

Thursday, September 18, 2008

Antenna Platform Interaction

- 8:30 **A Structurally-Functionalizable Archimedean Spiral Aperchassis**
G.H. Huff, Texas A&M Univ.
- 8:55 **Evaluation of Human Body Interaction for the Enhancement of a Broadband Body-Borne Radio Geolocation System**
A. Lalezari, F. Lalezari, FIRST RF Corp., and D. Filipovic, Univ. of Colorado
- 9:20 **Analysis of Ground Plane Structure for Reduction of Coupling Between Cosited Microstrip Antennas**
K.C. Kerby and J.T. Bernhard, Univ. of Illinois
- 9:45 **Mutual Coupling Improvement Skills with Metamaterial Antenna for MIMO System**
S. Hwang, J. Byun and A.S. Kim, Samsung Electronics Co.
- 10:10 **A Direction Finder for Wildlife Research II**
T.A. Borrowman, S.J. Franke and G.W. Swenson, Jr., Univ. of Illinois