National Academies of Sciences and Engineering
National Research Council
of the
United States of America

United States National Committee
International Union of Radio Science

2009 NRSM

National Radio Science Meeting
5-8 January 2009

Sponsored by USNC/URSI

University of Colorado at Boulder
Boulder, Colorado
USA

2009 NRSM
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International Union of Radio Science/ Union Radio Scientifique Internationale

Founded in 1919, the International Union of Radio Science (URSI) coordinates studies, research, applications, scientific exchange, and communication in all fields of radio science from telecommunications and radio astronomy to medicine (*www.ursi.org).*

Both the union and the U.S. national committee are organized into ten commissions:
Electromagnetic Metrology (Commission A)
Fields and Waves (Commission B)
Radio Communication Systems and Signal Processing (Commission C)
Electronic and Photonics (Commission D)
Electromagnetic Noise and Interference (Commission E)
Wave Propagation and Remote Sensing (Commission F)
Ionospheric Radio Propagation (Commission G)
Waves in Plasmas (Commission H)
Radio Astronomy (Commission J)
Electromagnetics in Biology and Medicine (Commission K)

About the USNC/URSI

The U.S. National Committee to URSI (USNC/URSI) is appointed by the National Research Council of the National Academies and represents U.S. radio scientists in URSI. It encourages studies in radio science, provides a forum for the dissemination of research findings, and provides an organizational infrastructure for the radio science community in the United States.

The USNC/URSI hosts the National Radio Science meeting each January in Boulder, Colorado. The National Radio Science symposium, co-sponsored by the USNC/URSI and the Antennas and Propagation Society of the Institute of Electrical and Electronics Engineers (IEEE/AP-S), is held each summer. Every few years, a North American Radio Science (NARS) meeting is organized, co-sponsored by the U.S. and Canadian National Committees to URSI. Ottawa, Canada hosted the most recent NARS meeting in July 2007.

The international URSI General Assembly is held every three years in locations around the world. The USNC/URSI is proud to have hosted the 29th General Assembly in Chicago, Illinois August 7-16, 2008. Over 1,200 U.S. and international scientists, including over 350 students and Young Scientists, participated in sessions covering all ten commissions. The USNC/URSI helped to support meeting expenses for approximately 200 U.S. and international students and Young Scientists. The 30th URSI General Assembly will be held in Istanbul, Turkey in 2011. *For further information on the USNC/URSI please visit www.usnc-ursi.org.*

U.S. National Committee Leadership and Commission Chairs (2009-2011)

(In addition to the individuals below, the USNC/URSI includes Members at Large, Society Representatives, and scientists serving in executive roles in international URSI)

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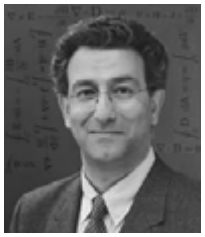

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URSI National Radio Science Meeting
Boulder, Colorado, January 5-8, 2009

SCIENTIFIC PROGRAM

SUNDAY PM — 4 January 2009

1900 – 2300 **USNC/ URSI Committee, Millennium Hotel**

MONDAY AM — 5 January 2009

Session AS1 – Dielectric and Magnetic Measurements and Theory
Room 150

Co-Chairs: James Baker-Jarvis, *NIST, Boulder, CO*
Michael D. Janezic, *NIST, Boulder, CO*

0900 **AS1-1 ENTROPY AND ENTROPY PRODUCTION RATE IN DIELECTRIC AND MAGNETIC METROLOGY AND RELAXATION**
J. Baker-Jarvis
NIST, Boulder, CO

0920 **AS1-2 RF TO MICROWAVE MEASUREMENTS AND METHODS ON SEVERAL TISSUE-EQUIVALENT MATERIALS**
J. Baker-Jarvis*, M.D. Janezic, R. Powers
NIST, Boulder, CO

0940 **AS1-3 MEASUREMENT OF THE DIELECTRIC CONSTANT OF SEAWATER AT L-BAND: TECHNIQUES AND MEASUREMENTS**
R.H. Lang[1], C. Utku[2], Y. Tarkocin[1], D.M. Le Vine[2]
[1]*George Washington University, Washington, DC*
[2]*NASA Goddard Space Flight Center, Greenbelt, MD*

1000 **Break**

1020 **AS1-4 HIGH-FREQUENCY ELECTRICAL CHARACTERIZATION OF PRINTED CIRCUIT BOARDS**
M.D. Janezic*[1], S. Bertling[2], J. Baker-Jarvis[1]
[1]*NIST, Boulder, CO*
[2]*Park Electrochemical Corp., Tempe, AZ*

1040 **AS1-5 ON NOVEL APPROACH FOR HIGH PRECISION CHARACTERIZATION OF COMPLEX PERMITTIVITY WITH LOW LOSS DIELECTRICS**
Z. Guo*, G. Pan
Arizona State University, AZ

1100 **AS1-6 PERMITTIVITY AND PERMEABILITY CHARACTERIZATION OF ENGINEERED COMPOSITES**
J.-Y. Chung*, K. Sertel, J.L. Volakis
The Ohio State University ElectroScience Laboratory, Columbus, OH

Session B1 – Small Antennas
Room 1B40

Chair: William A Davis, *Virginia Tech, Blacksburg, VA*

0900 **B1-1 MINIMUM RADIATION-Q OF ANTENNAS WITH ARBITRARY POLARIZATIONS**
T. Yang*, W.A. Davis, W.L. Stutzman
Virginia Tech Antenna Group, Department of Electrical and Computer Engineering, Virginia Polytechnic Institute and State University, Blacksburg, VA

0920 **B1-2 ANTENNA MINIATURIZATION BEYOND THE FUNDAMENTAL LIMITS**
M. Manteghi
Virginia Tech Antenna Group, Department of Electrical and Computer Engineering, Virginia Polytechnic Institute and State University, Blacksburg, VA

0940 **B1-3 CHARACTERISTIC MODE ANALYSIS OF A TM10 ELECTRICALLY SMALL SPHERICAL ANTENNA**
J.J. Adams*, J.T. Bernhard
Electromagnetics Laboratory, University of Illinois at Urbana-Champaign, Urbana, IL

1000 **Break**

1020 **B1-4 LOW-PROFILE INVERTED-HAT MONOPOLE ANTENNA FOR UWB APPLICATION**
J. Zhao*, C.C. Chen, J.L. Volakis
ElectroScience Laboratory, The Ohio State University, Columbus, OH

1040 **B1-5 METAMATERIAL-INSPIRED EFFICIENT ELECTRICALLY SMALL Z AND STUB ANTENNAS**
P. Jin*, R.W. Ziolkowski
Department of Electrical and Computer Engineering, University of Arizona, Tucson, AZ

1100 **B1-6 LOWER FREQUENCY METAMATERIAL-INSPIRED MAGNETIC-BASED EZ ANTENNAS**
C.-C. Lin*, R.W. Ziolkowski
Department of Electrical and Computer Engineering, University of Arizona, Tucson, AZ

Session BS1 – Novel Materials and Effects
Room 151

Organizers: Hossein Mosallaei, *Northeastern University, Boston, MA*
Manos Tentzeris, *Georgia Institute of Technology, Atlanta, GA*
Co-Chairs: Hossein Mosallaei and Manos Tentzeris

0820 **BS1-1 SIZE MINIATURIZATION BY SLOW WAVE AND METAMATERIAL**
P.-L. Chi, T. Itoh
Department of Electrical Engineering, University of California, Los Angeles, CA

0840 **BS1-2 ADVANCES IN FERRITE DESIGN, PROCESSING, AND PACKAGING TOWARDS MINIATURE MICROWAVE COMPONENTS**
V.G. Harris
Northeastern University, Boston, MA

0900 **BS1-3 SMALL ARRAY BEHAVIOR OF FREQUENCY RECONFIGURABLE ANTENNAS ENABLED BY FUNCTIONALIZED DISPERSIONS OF COLLOIDAL MATERIALS**

S. Goldberger*[1], F. Drummond[2], R. Anderson[2], J. Barrera[2], A. Bolon[2], S. Davis[2], J. Edelen[2], J. Marshall[2], C. Peters[2], D. Umana[2], G.H. Huff[1]
[1]Electromagnetics and Microwave Laboratory, Department of Electrical and Computer Engineering, Texas A & M University, College Station, TX
[2]Space Engineering Institute, Texas A & M University, College Station, TX

0920 **BS1-4 CONDUCTIVE POLYMER-CARBON NANOTUBE SHEETS FOR CONFORMAL LOAD BEARING ANTENNAS**
Y. Zhou*[1], Y. Bayram[1], L. Dai[2], J.L. Volakis[1]
[1]Department of Electrical and Computer Engineering, The Ohio State University, Columbus, OH

[2]Department of Chemical and Materials Engineering, University of Dayton, Dayton, OH

0940 **BS1-5 ULTRASENSITIVE WIRELESS GAS-SENSOR UTILIZING CARBON NANOTUBES ON PAPER, LIQUID AND ORGANIC SUBSTRATES**
T. Thai[1], J. Ratner[1], G. DeJean[2], A. Traille[1,3], L. Yang[1], M.M. Tentzeris[1]
[1]GEDC, School of ECE, Georgia Institute of Technology, Atlanta, GA
[2]Microsoft Research, One Microsoft Way, Redmond, WA
[3]GTRI-SEAL, Georgia Institute of Technology, Smyrna, GA

1000 **Break**

1020 **BS1-6 A LOW-COST BROADBAND 60 GHZ BEAMFORMING ARRAY WITH INTEGRATED CMOS COMPONENTS**
W.F. Moulder*[1], J.L. Volakis[1], R.M. Emrick[2]
[1]ElectroScience Laboratory, The Ohio State University, Columbus, OH
[2]Motorola Labs, Tempe, AZ

1040 **BS1-7 COMPARISON AND ANALYSIS OF GROUND PLANE SLOT STRUCTURES FOR COSITED ANTENNAS**
K.C. Kerby*, J.T. Bernhard
Electromagnetics Laboratory, Department of Electrical and Computer Engineering, University of Illinois at Urbana-Champaign, Urbana, IL

1100 **BS1-8 ANALYSIS OF ELECTRICAL PROPERTY VARIATIONS FOR COMPOSITE MEDIUM USING A STOCHASTIC COLLOCATION METHOD**
J. Shen*[1], H. Yang[1], J. Chen[1], C. Fuller[2]
[1]Department of Electrical and Computer Engineering, University of Houston, Houston , TX
[2]ATK, Plymouth, MN

1120 **BS1-9 DESIGN, FABRICATION, AND TESTING OF NONVOLATILE TUNABLE METAMATERIALS**
J.P. Barrett, S.A. Cummer
Department of Electrical and Computer Engineering, Duke University, Durham, NC

1140 **BS1-10 IMAGING EFFECT OF AN ELLIPTIC PERFECT LENS**
O. Akgol, D. Erricolo, P.L.E. Uslenghi
Department of Electrical and Computer Engineering, University of Illinois at Chicago, Chicago, IL

Session FS1 – Waves in Random and Complex Media with Applications in Remote Sensing
Room 105

Organizers: Akira Ishimaru, *University of Washington, Seattle, WA*
Saba Mudaliar, *Air Force Research Laboratory, Hanscom AFB, MA*

Co-Chairs: Akira Ishimaru and Saba Mudaliar

0820 **FS1-1 MIMO CHANNEL CAPACITY IN RANDOM MEDIA FOR COMMUNICATION THROUGH TURBULENCE**
A. Ishimaru, S. Jaruwatanadilok, Y. Kuga
Dept. of EE, University of Washington, Seattle, WA

0840 **FS1-2 PROPAGATION OF COHERENT AND INCOHERENT WAVES IN A TRUNK DOMINATED FOREST**
C. Utku[1], R. Lang[2], S. Torrico[3]
[1]Instrumentation Sciences Branch, NASA ,GSFC, Greenbelt, MD
[2]Dept. of ECE., George Washington University, Washington, DC
[3]Comsearch, Ashburn, VA

0900 **FS1-3 PROPAGATION OF ULTRA-SHORT INFRARED LASER PULSES IN RANDOM DILUTE MEDIUM OF WATER DROPLETS AND AEROSOLS AND IMAGING THROUGH CLOUDS**
E.H. Bleszynski, M. Bleszynski, T. Jaroszewicz
Monopole Research, Thousand Oaks, CA

0920 **FS1-4 AN EFFICIENT METHOD OF RETRIEVAL OF PARAMETERS FOR THREE-LAYER NONSMOOTH-INTERFACE MEDIA**
Y. Goykhman*, M. Moghaddam
Radiation Laboratory, Department of EECS, The University of Mi chigan,Ann Arbor, MI

0940 **FS1-5 RADAR DOPPLER SPECTRA FROM A NONLINEAR SEA SURFACE WITH BREAKING WAVES: NUMERICAL SIMULATIONS**
V. Zavorotny, A. Voronovich
NOAA, Boulder, CO

1000 **Break**

1020 **FS1-6 SPLITTING RULE: SEPARATION OF SURFACE AND VOLUME EFFECTS IN SCATTERING**
S. Mudaliar
Air Force Research Laboratory, Hanscom AFB, MA

1040 **FS1-7 MODIFYING TAU-OMEGA MODEL TO ACCOUNT FOR FOREST CANOPY SCATTERING**
M. Kurum*[1], R.H. Lang[1], C. Utku[2], P.E. O'Neill[3]
[1]George Washington University, Dept. of ECE,Washington, DC
[2]Instrumentation Sciences Branch, NASA GSFC, Greenbelt, MD
[3]Hydrological Sciences Branch, NASA GSFC, Greenbelt, MD

1100 **FS1-8 POLAR ICE AS A COMPLEX PROPAGATION MEDIA: EVIDENCE FROM GPR PROFILES OF PROGRADING AND METAMORPHIC STRUCTURES IN EAST ANTARCTICA**
S. Arcone
U.S. Army ERDC-Cold Regions Research and Engineering Laboratory,Hanover, NH

1120 **FS1-9 EFFECT OF TARGETS ILLUMINATION REGION ON RCS IN RANDOM MEDIA WITH HORIZONTAL POLARIZATION**
H. El-Ocla
Computer Science Department, Lakehead University, Ontario, CA

1140 **FS1-10 MUELLER MATRICES FOR LIKE AND CROSS POLARIZED SCATTERING FROM IRREGULAR LAYERED STRUCTURES BASED ON A FULL WAVE**

APPROACH THEORY
E. Bahar*[1], R. Kubik[2]
[1]*University of Nebraska Lincoln, Dept of EE, Lincoln, NE*
[2]*Motorola Inc, Washington, DC*

1200 **FS1-11 MUELLER MATRICES FOR LIKE AND CROSS POLARIZED SCATTERING FROM IRREGULAR LAYERED STRUCTURES COMPARISON OF FULL WAVE SOLUTIONS WITH EXPERIMENTS**
E. Bahar*[1], R. Kubik[2]
[1]*University of Nebraska Lincoln, Dept of EE, Lincoln, NE*
[2]*Motorola Inc, Washington, DC*

Session G1 – Ionospheric Models and Data Assimilation
Room 200

Co-Chairs: Gary S. Bust, *ASTRA, San Antonio, TX*
Attila Komjathy, *Jet Propulsion Laboratory, Pasadena, CA*

0840 **G1-1 USING PRINCIPAL COMPONENT ANALYSIS TO CHARACTERIZE THE EQUATORIAL F2 PEAK DURING GEOMAGNETIC STORMS**
L.H. Krause*, A. Stevenson, L. Taylor
U.S. Air Force Academy, CO

0900 **G1-2 SPATIAL VARIATION OF THE PRE-REVERSAL ENHANCEMENT MODEL RESULTS**
T.W. Fang[1,2], A.D. Richmond[1], J.Y. Liu[2], A. Maute[1]
[1]*High Altitude Observatory, National Center for Atmospheric Research, USA*
[2]*Institute of Space Science, National central University, Taiwan*

0920 **G1-3 NON-LINEAR IONOSPHERIC RETRIEVAL OF ELECTRON DENSITY PROFILES USING FORTE BROADBAND DATA**
E.H. Lay*[1], S. Close[1], G. Bust[2], A.R. Jacobson[3]
[1]*Los Alamos National Laboratory, NM*
[2]*ASTRA, San Antonio, TX*
[3]*University of Washington, Seattle, WA*

0940 **G1-4 ESTIMATING THE IONOSPHERIC AND PLASMASPHERIC TOTAL ELECTRON CONTENT (TEC) WITH GPS IN A KALMAN FILTER APPROACH**
A. Anghel*[1], A. Gasiewski[1], C. Carrano[2]
[1]*University of Colorado, Boulder, CO*
[2]*Atmospheric and Environmental Research, Inc., Lexington, MA*

1000 **Break**

1020 **G1-5 REAL-TIME SPECIFICATION OF HF PROPAGATION SUPPORT BASED ON GAIM MODELS OF THE IONOSPHERE**
L.F. McNamara*[1], G.R. Baker[2], W.S. Borer
[1]*Boston College, Chestnut Hill, MA*
[2]*Air Force Research Lab., Hanscom AFB, MA*

1040 **G1-6 ESTIMATING MODEL PARAMETERS FROM IONOSPHERIC REVERSE ENGINEERING (EMPIRE)**
G.S. Bust, S. Datta-Baruah, G. Crowley, A. Reynolds
ASTRA, San Antonio, TX

1100 **G1-7 REDISTRIBUTION OF HIGH-ALTITUDE PLASMA DURING STORMS**
G.S. Bust, G. Crowley, N. Curtis
ASTRA, San Antonio, TX

1120 **G1-8 ESTIMATING E-REGION DENSITY PROFILES USING COSMIC OCCULTATIONS AND IDA4D**
F.S. Rodrigues[1], M.J. Nicholls[2], G.S. Bust[1], M.C. Kelley[3], G. Crowley[1], D.L. Hysell[3], J.L. Chau[4]
[1]*ASTRA, San Antonio, TX*
[2]*SRI International, Menlo Park, CA*
[3]*Cornell University, Ithaca, NY*
[4]*Jacamarca Radio Observatory, Lima, Peru*

1140 **G1-9 THE IONOSPHERIC RESPONSE TO THE TOTAL SOLAR ECLIPSE ON 1ST AUGUST 2008 OVER NORTHERN HEMISPHERE**
M.A. Momani, B. Yatim, M. Abdullah, T.S. Fong
Universiti Kebangsaan, Bangi Selangor, Malaysia

Session HG1 – Dusty Plasmas and Space Plasma Laboratory Experiments
Room 245

Co-Chairs: Mihaly Horanyi, *University of Colorado, Boulder, CO*
Wayne Scales, *Virginia Tech, Blacksburg, VA*

0820 **HG1-1 A LABORATORY EXPERIMENT TO DEMONSTRATE MAGNETOSPHERIC CYCLOTRON MASER MECHANISMS**
K. Ronald*[1], D.C. Speirs[1], S.L. McConville[1], K.M. Gillespie[1], A.D.R. Phelps[1], R. Bingham[1,2], A.W. Cross[1], C.W. Robertson[1], C.G. Whyte[1], W. He[1], I. Vorgul[3], R.A. Cairns[3], B.J. Kellett[2]
[1]*University of Strathclyde, Glasgow, U.K.*
[2]*STFC Rutherford Appleton Laboratory, Didcot, U.K.*
[3]*University of St. Andrews, St. Andrews, U.K.*

0840 **HG1-2 MULTI-SCALE EXPERIMENTS ON THE ASYMMETRIC RESPONSE OF PLASMAS TO INHOMOGENEOUS FLOWS**
E. Thomas Jr*[1], W. Amatucci[2], M. Cianciosa[1], A. Eadon[1], E. Tejero[2,3], G. Ganguli[2]
[1]*Auburn University, Auburn, AL*
[2]*Naval Research Laboratory, Washington, DC*
[3]*SFA Inc., Crofton, MD*

0900 **HG1-3 DUST LIFT-OFF AND TRANSPORT ON SURFACES IN PLASMA**
X. Wang*, T. Munsat, M. Horanyi, S. Robertson, Z. Sternovsky
University of Colorado, Boulder, CO

0920 **HG1-4 RESULTS AND ANALYSIS FROM THE COSMIC DUST EXPERIMENT**
D. James*, A. Poppe, M. Horanyi
University of Colorado, Boulder, CO

0940 **HG1-5 ADAPTIVE GRID PIC CAPABILITY FOR DUSTY PLASMA STUDIES**
C. Fichtl*[1,2], J.M. Finn[2], G.L. Delzanno[2]
[1]*University of New Mexico, Albuquerque, NM*
[2]*Los Alamos National Laboratory, Los Alamos, NM*

1000 **Break**

1020 **HG1-6 PLASMA TURBULENCE ASSOCIATED WITH ARTIFICIAL DUSTY SPACE PLASMAS**

W. Scales
Virginia Tech, Blacksburg, VA

1040 **HG1-7 MASS ANALYSIS OF CHARGED AEROSOL PARTICLES DURING THE MASS/ECOMA ROCKET CAMPAIGN**
S. Knappmiller, S. Robertson, M. Horanyi, Z. Sternovsky
University of Colorado, Boulder, CO

1100 **HG1-8 PARTICLE-IN-CELL SIMULATIONS OF THE LUNAR DUSTY PLASMA ENVIRONMENT**
A.R. Poppe[1], M. Horanyi[1,2]
[1]*Laboratory for Atmospheric and Space Physics, Boulder, CO*
[2]*University of Colorado, Boulder, CO*

1120 **HG1-9 IONOSPHERIC DUSTY PLASMA IN THE LABORATORY**
W. Handley, S. Robertson
University of Colorado, Boulder, CO

1140 **HG1-10 DETECTION OF METEORIC SMOKE PARTICLES IN THE D-REGION USING THE ARECIBO 430 MHZ RADAR: A SEASONAL STUDY**
J.T. Fenzke[1,2], D. Janches[1], I. Strelnikova[3], M. Rapp[3]
[1]*NorthWest Research Associates, CoRA Division*
[2]*University of Colorado, Boulder, CO*
[3]*Leibniz Institute of Atmospheric Physics*

Session J1 – ALMA Technology, Science and Status
Room 265

Co-Chairs: Alwyn Wootten, *NRAO, Charlettsville, VA*
David P. Woody, *OVRO, Caltech, CA*

0820 **J1-1 ALMA CONSTRUCTION STATUS AND SCIENCE PERSPECTIVE**
A. Wootten
NRAO, Charlottsville, VA

0840 **J1-2 THE ALMA FRONT END**
J.C. Webber
National Radio Astronomy Observatory, Charlottesville, VA

0900 **J1-3 SCIENCE AT THE ARIZONA RADIO OBSERVATORY WITH ALMA-STYLE FRONTENDS**
L.M. Ziurys
University of Arizona

0920 **J1-4 THE ALMA TEST FACILITY IN RETROSPECT**
D. Shepherd
NRAO

0940 **J1-5 THE ALMA REAL TIME CONTROL SYSTEM**
J.S. Kern*, T.A. Juerges, R.G. Marson
National Radio Astronomy Observatory

1000 **Break**

1020 **J1-6 ATMOSPHERIC PHASE CORRECTION FOR ALMA WITH WATER-VAPOUR RADIOMETERS**
B. Nikolic*[1], J.S. Richer[1], R.E. Hills[2]

[1]*University of Cambridge, UK*
[2]*Joint ALMA Office, Chile*

1040 **J1-7 HOLOGRAPHY MEASUREMENTS OF ALMA PRODUCTION ANTENNAS**
D. Emerson*
NRAO

1100 **J1-8 THE ALMA DATA TRANSMISSION SYSTEM**
C. Langley*
NRAO

1120 **J1-9 THE SCIENCE CASE FOR ALMA BAND 1**
J.D. Francesco*
National Research Council of Canada

1140 **J1-10 ABSOLUTE ANTENNA GAIN CALIBRATION FOR ALMA**
W.J. Welch*, J. Gibson
Radio Astronomy Laboratory, University of California, Berkeley, CA

MONDAY PM 5 January 2009

Session A1 – Antennas and Measurement Techniques
Room 150

Co-Chairs: Ronald J. Pogorzelski, *Jet Propulsion Laboratory, Pasadena, CA*
William A. Davis, *Virginia Tech, Blacksburg, VA*

1400 **A1-1 COMPUTER SIMULATION OF ARTIFACT REMOVAL IN SPHERICAL NEAR-FIELD MEASUREMENTS VIA PROBE CALIBRATION**
R.J. Pogorzelski
Jet Propulsion Laboratory, Pasadena, CA

1420 **A1-2 DUAL-FED SINGLE MICROSTRIP PATCH ANTENNA FOR POLARIZATION AND ANGLE DIVERSITY REALIZATION IN MIMO APPLICATIONS**
L.Y. Ting*, J.T. Bernhard
University of Illinois at Urbana-Champaign, Urbana, IL

1440 **A1-3 SINGLE AND DUAL BAND-NOTCH ULTRA-WIDEBAND ANTENNA FOR WLAN (5.25 GHZ AND 5.75 GHZ) BAND**
K.S. Ryu*, A.A. Kishk
University of Mississippi, MS

1500 **Break**

1520 **A1-4 POLE-RESIDUE ANALYSIS OF A NOTCHED UWB ELLIPTICAL DIPOLE TAG**
A. Blischak*, M. Manteghi
Virginia Polytechnic Institute and State University, Blacksburg, VA

1540 **A1-5 MAGNETO-DIELECTRIC SUBSTRATES FOR ANTENNA MINIATURIZATION**
N. Altunyurt*[1], M. Swaminathan[1], R.M. Pulugurtha[1], V.K. Nair[2]
[1]*Georgia Institute of Technology, Atlanta, GA*
[2]*Intel Corporation, Chandler, AZ*

1600 **A1-6 MULTIPATH MITIGATION IN ANTENNA PATTERN MEASUREMENTS BASED ON THE SINGULARITY EXPANSION METHOD**

T. Yang*, W.A. Davis, W.L. Stutzman
Virginia Tech Antenna Group, Blacksburg, VA

Session B2 – Antenna Analysis, Design, and Measurements
Room 1B40

Co-Chairs: Dejan S. Filipovic, *University of Colorado, Boulder, CO*
Sembiam R. Rengarajan, *California State University, Northridge, CA*

1320 **B2-1 A NOVEL VISUALIZATION OF RADIATION PATTERNS**
D.D. Vaccaro, S.R. Laxpati
Department of Electrical and Computer Engineering, University of Illinois at Chicago, Chicago, IL

1340 **B2-2 INVESTIGATION ON CORRELATIONS BETWEEN ANTENNA PHYSICAL STRUCTURE AND SEM-BASED TRANSFER FUNCTION FOR VARIOUS TYPES OF ANTENNAS**
T. Yang*, W.A. Davis, W.L. Stutzman
Virginia Tech Antenna Group, Department of Electrical and Computer Engineering, Virginia Polytechnic Institute and State University, Blacksburg, VA

1400 **B2-3 PHASELESS TECHNIQUES IN ANTENNA NEAR-FIELD MEASUREMENTS: ALGORITHMS, SIMULATIONS AND EXPERIMENTS**
S.-F. Razavi, Y. Rahmat-Samii
Department of Electrical Engineering, University of California, Los Angeles, CA

1420 **B2-4 A DESIGN METHOD FOR TRAP-LOADED MONOPOLE ANTENNAS**
S. Bates*, W.A. Davis
Virginia Tech Antenna Group, Department of Electrical and Computer Engineering, Virginia Polytechnic Institute and State University, Blacksburg, VA

1440 **B2-5 SINGLE REFLECTOR ANTENNA FOR ONE DIMENSIONAL BEAM SCANNING**
S.R. Rengarajan, R.E. Hodges
Department of Electrical and Computer Engineering, California State University, Northridge, CA

1500 **Break**

1520 **B2-6 IMPROVED EMBEDDED ANTENNA DESIGN USING SUBWAVELENGTH ANTI-REFLECTIVE SURFACES**
B. Good, M. Mirotznik
Department of Electrical Engineering, The Catholic University of America, Washington, DC

1540 **B2-7 SLOT ANTENNAS INTEGRATED ON SOLAR PANELS OF A CUBESAT**
M.N. Mahmoud*, R. Baktur
Department of Electrical and Computer Engineering, Utah State University, Logan, UT

1600 **B2-8 EFFECTS OF CAVITY BACKING ON THE PHASE CENTER OF SPIRAL ANTENNAS**
M.J. Radway*[1], T.P. Cencich[2], D.S. Filipovic[1]
[1]*University of Colorado, Boulder, CO*
[2]*Lockheed Martin Space Systems Company, Littleton, CO*

1620 **B2-9 MICRO-COAXIAL CAVITY-BACKED ANTENNAS AND ARRAYS**
Y. Saito*, D.S. Filipovic
Department of Electrical and Computer Engineering, University of Colorado, Boulder, CO

1640 **B2-10 RF-NEMS INTEGRATED FREQUENCY RECONFIGURABLE ANTENNA FOR WAVEFORM DIVERSITY SCHEMES**
Y. Damgaci*, X. Yuan, N. Biyikli, B.A. Cetiner
Department of Electrical and Computer Engineering, Utah State University, Logan, UT

Session BDS1 – Micro/Nano Electromagnetics and Meta-Devices
Room 151

Organizers: Nader Engheta, *University of Pennsylvania, Philadelphia, PA*
Hossein Mosallaei, *Northeastern University, Boston, MA*
Richard W. Ziolkowski, *University of Arizona, Tucson, AZ*
Co-Chairs: Richard W. Ziolkowski and Hossein Mosallaei

1340 **BDS1-1 TWO DIMENSIONAL ACTIVE CNP METAFILMS**
J.A. Gordon*[1], R.W. Ziolkowski[2]
[1]*National Institute of Standards and Technology, Boulder, CO*
[2]*Department of Electrical and Computer Engineering, University of Arizona, Tucson, AZ*

1400 **BDS1-2 ACTIVE COATED NANO-PARTICLE DRIVEN BY AN ELECTRIC HERTZIAN DIPOLE**
S. Arslanagic[1], R.W. Ziolkowski*[2]
[1]*Department of Electrical Engineering, Technical University of Denmark, Lyngby, Denmark*
[2]*Department of Electrical and Computer Engineering, University of Arizona, Tucson, AZ*

1420 **BDS1-3 WAVEGUIDES COMPOSED OF METAFILMS/METASURFACES**
C.L. Holloway*[1], D. Novotny[1], E.F. Kuester[2]
[1] *National Institute of Standards and Technology, Electromagnetics Division, Boulder, CO*
[2] *Department of Electrical and Computer Engineering, University of Colorado, Boulder, CO*

1440 **BDS1-4 A RECONFIGURABLE FREQUENCY SELECTIVE SURFACE USING ADDRESSABLE METAMATERIALS**
T.H. Hand*, S.A. Cummer
Department of Electrical and Computer Engineering, Duke University, Durham, NC

1500 **Break**

1520 **BDS1-5 NANOSCALE OPTICAL ELEMENTS USING NEGATIVE INDEX METAMATERIALS**
S. Sridhar
Northeastern University, Boston, MA

1540 **BDS1-6 MAGNETIC RESONANCE ON A PETALS STRUCTURE AND THE ASSOCIATED SURFACE PLASMON POLARITON**
J. Li*[1], L. Thylen[1,2,3], A.M. Bratkovski[1], S.-Y. Wang[1], S. Williams[1]
[1]*IQSL, Hewlett-Packard Research Lab, Palo Alto, CA*
[2]*KTH Department of Microelectronics and Applied Physics, Royal Institute of Technology, Kista, Sweden*
[3]*Joint Research Center of Photonics, Royal Institute of Technology and Zhejiang University, Hangzhou, China*

1600 **BDS1-7 MINIATURE ANTENNA USING COUPLED MICROSTRIP LINES EMULATING MAGNETIC PHOTONIC CRYSTALS**
E. Irci*, K. Sertel, J.L. Volakis
ElectroScience Laboratory, Department of Electrical and Computer Engineering, The Ohio State University, Columbus, OH

1620 **BDS1-8 ULTRACOMPACT OPTICAL CAVITY RESONATOR WITH FISHNET STRUCTURE**
J. Li*[1], L. Thylen[1,2,3], A.M. Bratkovski[1], S.-Y. Wang[1], R.S. Williams[1]
[1] IQSL, Hewlett Packard Research Lab, Palo Alto, CA
[2] KTH Department of Microelectronics and Applied Physics, Royal Institute of Technology, Kista, Sweden
[3] Joint Research Center of Photonics, Royal Institute of Technology and Zhejiang University, Hangzhou, China

1640 **BDS1-9 NOVEL PLANAR CIRCULATOR BASED ON MAGNETIZED SEMICONDUCTOR PLASMA**
S.S. Alshannaq*, R.G. Rojas
ElectroScience Laboratory, Department of Electrical and Computer Engineering, The Ohio State University, Columbus, OH

1700 **BDS1-10 SCATTERING FROM LARGE AMPLITUDE, SHORT PERIOD SURFACE ROUGHNESS**
G.S. Brown*, T.H. Black
EMIL, Bradley Department of Electrical and Computer Engineering, Virginia Polytechnic Institute and State University, Blacksburg, VA

1720 **BDS1-11 ELLIPSOIDAL NEGATIVE PARAMETERS METAMATERIAL SUBWAVELENGTH RADIATORS**
A. Ahmadi*, H. Mosallaei
Department of Electrical and Computer Engineering, Northeastern University, Boston, MA

Session E1 – High Power Electromagnetics
Room 105

Co-Chairs: Everett G. Farr, *Farr Research, Inc.*
Robert L. Gardner, *Naval Surface Warfare Center*

1320 **E1-1 REVIEW OF SUSCEPTIBILITY DATA AND ANALYSIS TECHNIQUES IN HIGH-POWER ELECTROMAGNETICS**
R.L. Gardner*, D.C. Stoudt
Naval Surface Warfare Center

1340 **E1-2 ELECTROMAGNETIC FIELD PULSES RADIATED BY LIGHTNING PROCESSES**
A. Nag*[1], V.A. Rakov[1], B.A. DeCarlo[1,2], D. Tsalikis[1]
[1] Department of Electrical and Computer Engineering, University of Florida, Gainesville, FL
[2] Sikorsky Aircraft Corporation, Stratford, CT

1400 **E1-3 PULSE EXCITATION OF A LARGE GTEM CELL**
D.V. Giri
University of New Mexico, Albuquerque, NM

1420 **E1-4 WAVEGUIDE NARROW WALL LONGITUDINAL SLOT ARRAY FOR HIGH POWER**
N.R. Devarapalli*, C.G. Christodoulou, C.E. Baum, E. Schamiloglu
University of New Mexico, Albuquerque, NM

1440 **E1-5 IMPEDANCE-MATCHED MAGIC TEE**
C.E. Baum
University of New Mexico, Albuquerque, NM

1500 **Break**

1520 **E1-6 EXPERIMENTAL LENS DESIGN PARAMETERS FOR ELECTROMAGNETIC IMPLOSION**
S. Altunc*, C.E. Baum, C.G. Christodoulou, E. Schamiloglu, C.J. Buchenauer
University of New Mexico, Albuquerque, NM

1540 **E1-7 ANALYTICAL CALCULATIONS OF AN ELECTROMAGNETIC LENS TO OBTAIN A SPHERICAL TEM WAVE**
S. Altunc*, C.E. Baum, C.G. Christodoulou, E. Schamiloglu
University of New Mexico, Albuquerque, NM

1600 **E1-8 DISCRIMINATION OF HIGH-ALTITUDE EMP IN THE PRESENCE OF LIGHTNING ENVIRONMENTS FOR GROUND-BASED SENSORS**
C.E. Baum
University of New Mexico, Albuquerque, NM

1620 **E1-9 WINDSCREEN SHIELD MONITORING USING A SPIRAL TRANSMISSION LINE**
E.G. Farr*[1], W.S. Bigelow[1], L.H. Bowen[1], C.E. Baum[2], W.D. Prather[3]
[1] Farr Research, Inc.
[2] University of New Mexico, Albuquerque, NM
[3] Air Force Research Laboratory

1640 **E1-10 DYADIC GREENS FUNCTION NUMERICAL-ANALYTICAL TECHNIQUES FOR COMPUTING IEMI FIELDS THROUGH LAYERED MEDIA**
I. Kohlberg*[1], S.A. Von Laven[2], R.W. McMillan[3]
[1]Kohlberg Associates, Inc.
[2]Amtec Corporation
[3]U.S. Army Space and Missile Defense Command

Session GH1 – Ionospheric Irregularities and Instabilities
Room 200

Co-Chairs: David Hysell, *Cornell University, Ithaca, NY*
Keith Groves

1300 **GH1-1 HOMER RADAR OBSERVATIONS OF ARTIFICIAL E REGION FIELD-ALIGNED PLASMA DENSITY IRREGULARITIES**
D.L. Hysell*, E. Nossa
Cornell University, Ithaca, NY

1320 **GH1-2 FIRST RESULTS FROM THE ST. CROIX COHERENT SCATTER RADAR IMAGER**
D.L. Hysell*[1], E. Nossa[1], M.F. Larsen[2], J. Munro[3], N. Aponte[4], S.A. Gonzalez[4], J. Friedman[4], M.P. Sulzer[4], S.M. Smith[5]
[1]Cornell University, Ithaca, NY
[2]Clemson University, Clemson, SC
[3]University of the Virgin Islands, St. Croix, USVI
[4]Arecibo Radio Observatory, Arecibo, Puerto Rico
[5]Boston University, Boston, MA

1340 **GH1-3 ELECTRIC FIELD AND PLASMA DENSITY STRUCTURES AND IRREGULARITIES GATHERED IN THE LOW-LATITUDE IONOSPHERE WITH THE VEFI INSTRUMENT ON THE C/NOFS SATELLITE**

R. Pfaff*, D. Rowland, G. Le, H. Freudenreich, K. Bromund
NASA Goddard Space Flight Center

1400 **GH1-4 FIRST SUCCESSFUL MEASUREMENTS OF THE SMALL-SCALE IRREGULARITY SPECTRUM PARAMETERS BY DYNASONDE DATA ANALYSES AT JICAMARCA**
N.A. Zabotin*[1,2], J.W. Wright[1,2]
[1]*University of Colorado, Boulder, CO*
[2]*Dynasonde Solutions Ltd., Longmont, CO*

1420 **GH1-5 COORDINATED UV IMAGING OF EQUATORIAL PLASMA BUBBLES USING MULTIPLE SATELLITES**
J. Comberiate*, L.J. Paxton
Johns Hopkins Applied Physics Lab., Laurel, MD

1440 **GH1-6 FIRST COMPARISONS OF EQUATORIAL IRREGULARITIES MEASUREMENTS OF TEC AND SCINTILLATIONS USING CERTO AND CITRIS WITH IN-SITU PLASMA DENSITY MEASUREMENTS ON C/NOFS**
C.L. Siefring[1], P.A. Bernhardt[1], P. Roddy[2]
[1]*Plasma Physics Division, Naval Research Laboratory, Washington, DC*
[2]*Space Vehicles Directorate, Air Force Research Laboratory, Hanscom AFB, MA*

1500 **Break**

1520 **GH1-7 C/NOFS OBSERVATIONS OF PLASMA DEPLETIONS AT SUNRISE**
O. De La Beaujardiere[1], D. Hunton[1], G. Wilson[1], P. Roddy[1], J. Retterer[1], D. Cooke[1], W. Burke[1], R. Pfaff[2], D. Hysell[3]
[1]*Air Force Research Laboratory, Hanscom AFB, MA*
[2]*NASA Goddard Space Flight Center*
[3]*Cornell University, Ithaca, NY*

1540 **GH1-8 CUBESAT-BASED GROUND-TO-SPACE BISTATIC RADAR EXPERIMENT: RADIO AURORA EXPLORER**
H. Bahcivan[1], J. Cutler[2]
[1]*SRI International, Menlo Park, CA*
[2]*University of Michigan, Ann Arbor, MI*

1600 **GH1-9 THE SCATTERING CHARACTERISTICS OF PMSE AT 33 CM WITH THE POKER FLAT INCOHERENT SCATTER RADAR**
M.J. Nicolls[1], M.C. Kelley[2], R.H. Varney[2], C.J. Heinselman[1]
[1]*Center for Geospace Studies, SRI International, Menlo Park, CA,*
[2]*Cornell University, Ithaca, NY*

1620 **GH1-10 THREE-DIMENSIONAL SIMULATION OF EQUATORIAL SPREAD-F WITH WIND EFFECTS**
J. Krall[1], J.D. Huba[1], G. Joyce[2]
[1]*Plasma Physics Division, Naval Research Laboratory, Washington, DC*
[2]*Icarus Research, Inc., Bethesda, MD*

1640 **GH1-11 SIMULATION OF IONOSPHERIC IRREGULARITIES FOR THE 2008 C/NOFS ALTAIR CAMPAIGN**
J.M. Retterer
Space Vehicles Directorate, Air Force Research Laboratory

1700 **GH1-12 PARTICLE-IN-CELL SIMULATION OF ENHANCED INCOHERENT SCATTER RADAR SPECTRUM**

M.A. Diaz, M. Oppenheim, J.L. Semeter
Center for Space Physics, Boston University, Boston, MA

Session H1 – Radiation Belts
Room 245

Co-Chairs: Gurudas Ganguli, *Naval Research laboratory, Washington, DC*
William E. Amatucci, *Naval Research laboratory, Washington, DC*

1400 **H1-1 SEASONAL VARIATION OF INNER BELT ELECTRON PRECIPITATION WITH LIGHTNING**
E.S. Gemelos*[1], U.S. Inan[1], M. Walt[1], J.-A. Sauvaud[2], M. Parrot[3]
[1]*STAR Laboratory, Stanford University, Stanford, CA*
[2]*CESR, Toulouse, France*
[3]*LPCE/CNRS, Orleans, France*

1420 **H1-2 TIME-EVOLUTION OF VLF TRANSMITTER-INDUCED PRECIPITATION OF ELECTRON RADIATION**
R.T. Newsome*, U.S. Inan
STAR Laboratory, Stanford University, Stanford, CA

1440 **H1-3 PROPERTIES OF THE DAYSIDE OUTER ZONE (DOZ) CHORUS RELEVANT TO WAVE-PARTICLE INTERACTIONS**
B.T. Tsurutani*[1], O.P. Verkhoglyadova[1,2], G.S. Lakhina[3], S. Yagitani[4], H. Kojima[5], H. Matsumoto[6]
[1]*Jet Propulsion Lab., California Institute of Technology, Pasadena, CA*
[2]*CSPAR, University of Alabama, Huntsville, AL*
[3]*India Institute of Geomagnetism, Navi Mumbai, India*
[4]*Kanazawa University, Kanazawa, Japan*
[5]*Kyoto University, Kyoto, Japan*
[6]*RISH, Kyoto University, Uji, Japan*

1500 **Break**

1520 **H1-4 MODELING OF WHISTLER AMPLIFICATION BY ENERGETIC ELECTRONS OBSERVED ON SIPLE**
A.V. Streltsov*[1], E.V. Mishin[2], A.R. Gibby[3]
[1]*Dartmouth College, Hanover, NH*
[2]*Boston College, Chestnut Hill, MA*
[3]*STAR Laboratory, Stanford University, Stanford, CA*

1540 **H1-5 PLASMA SHEATH STRUCTURES AROUND A RADIO FREQUENCY ANTENNA**
J. Tu*, P. Song, B.W. Reinisch
University of Massachusetts, Lowell, MA

1600 **H1-6 IMPEDANCE CHARACTERISTICS OF AN ACTIVE TRANSMITTING SYSTEM IN SPACE PLASMA**
V.V. Paznukhov*, G.S. Sales, K. Bibl, B.W. Reinisch, P. Song
University of Massachusetts, Lowell, MA

1620 **H1-7 FREQUENCY-TIME SIGNATURES OF VERY LOW FREQUENCY TRIGGERED EMISSIONS**
J.A. Papon*, U.S. Inan, T.F. Bell
STAR Laboratory, Stanford University, Stanford, CA

Session J2a – New Telescopes, Techniques and Observations
Room 265

Co-Chairs: James M. Cordes, *Cornell University, Ithaca, NY*
David P. Woody, *OVRO, Caltech, CA*

1340 **J2a-1 DESIGN AND PERFORMANCE OF A WIDEBAND RADIO TELESCOPE**
W.A. Imbriale*[1], S. Weinreb[2], G. Jones[2], H. Mani[2]
[1]*Jet Propulsion Laboratory*
[2]*California Institute of Technology*

1400 **J2a-2 DESIGN OF THE FEED HORN FOR THE KAT-7 RADIO TELESCOPE**
R. Lehmensiek, I.P. Theron*, S.J. Marais
EMSS Antennas (Pty) Ltd, Stellenbosch , South Africa

1420 **J2a-3 GAIN STABILIZATION TECHNIQUES FOR PAPER**
C.R. Parashare*[1], R.F. Bradley[2]
[1]*Department of Electrical and Computer Engineering, University of Virginia, Charlottesville, VA*

[2]*NRAO Technology Center, Charlottesville, VA*

1440 **J2a-4 PAPERS SWEET SIXTEEN: IMAGING THE LOW-FREQUENCY SKY WITH A SIXTEEN-ELEMENT ARRAY**
N. Gugliucci*[1,2], R. Bradley[2], D. Backer[3], A. Parsons[3], J. Aguirre[4], A. Datta[5,2], C. Carilli[2], G. Foster[3], C. Parashare[6,2], E. Mastrantonio[2], J. Manley[7,3,8]
[1]*University of Virginia, Dept. of Astronomy*
[2]*National Radio Astronomy Observatory*
[3]*University of California, Berkeley, Astronomy Dept.*
[4]*University of Pennsylvania, Dept. of Physics and Astronomy*
[5]*New Mexico Institute of Mining and Technology, Physics Dept.*
[6]*University of Virginia, Dept. of Electrical and Computer Engineering*
[7]*MeerKAT, Square Kilometer Array, South Africa*
[8]*University of Cape Town, Radar and Remote Sensing Group*

1500 **Break**

1520 **J2a-5 ASTROPULSE: A MULTIBEAM SKY SURVEY FOR MICROSECOND TRANSIENT RADIO SIGNALS USING ARECIBO OBSERVATORY**
J. Von Korff*, D. Werthimer, E. Korpela
Space Sciences Lab, University of California, Berkeley, CA

1540 **J2a-6 THE FLYS EYE: A SEARCH FOR MILLISECOND RADIO PULSES USING THE ALLEN TELESCOPE ARRAY**
A. Siemion*[1,2], G. Bower[2], G. Foster[1,2], J. Van Leeuwen[1,2], W. Mallard[1], P. McMahon[1,4,5], M. Wagner[1,3], M. Wagner[1,3]
[1]*Center for Astronomy Signal Processing and Electronics Research, University of California, Berkeley*
[2]*Department of Astronomy, University of California, Berkeley*
[3]*Space Sciences Laboratory, University of California, Berkeley*
[4]*Department of Electrical Engineering, University of Cape Town, South Africa*
[5]*Karoo Array Telescope, South Africa*

1600 **J2a-7 SETI SURVEYS WITH THE ALLEN TELESCOPE ARRAY**
J.C. Tarter
The ATA Team, SETI Institute

1620 **J2a-8 DIGITAL BACK END PROCESSING AT THE ATA**
W.C. Barott*[1], O. Milgrome[2], M. Wright[2], J. Tarter[3], P. Backus[3], T. Kilsdonk[3], T. Kilsdonk[2,3]
[1]*Embry-Riddle Aeronautical University, Daytona Beach, FL*
[2]*University of California, Berkeley,CA*
[3]*SETI Institute*

1640 **J2a-9 REAL TIME INTERFEROMETER IMAGING**
G.K. Keating*[1], S. Croft[1], A. Bauermeister[1], J.R. Forster[1], W.C. Barott[2]
[1]*UC Berkeley, Berkeley, Ca*
[2]*SETI Institute, Mountain View, CA*

1700 **J2a-10 THE AUSTRALIAN SKA PATHFINDER (ASKAP)**
A.E.T. Schinckel*, D.R. DeBoer
CSIRO/ATNF, Australia

1720 **J2a-11 MEETING THE FUTURE CALIBRATION AND PROCESSING CHALLENGES FOR THE SQUARE KILOMETER ARRAY**
A.J. Kemball*
University of Illinois at Urbana-Champaign, Urbana, IL

Business Meetings

1700	**Commission A**	**Room 150**
1700	**Commission E**	**Room 105**
1800	**Commission B**	**Room 1B40**
1800	**Commission J**	**Room 265**

Session A2 – Metrology Related Applications in Electromagnetics
Room 105

Co-Chairs: Carl E. Baum, *University of New Mexico, Albuquerque, NM*
Guangwen Pan, *Arizona State University, Tempe, AZ*

0900 **A2-1 A NOVEL SUBGRIDDING APPROACH WITH HUYGENS SURFACE AND UNCONDITIONALLY STABLE METHOD**
Z. Huang*, G. Pan
Arizona State University, Tempe, AZ

0920 **A2-2 WATER STRUCTURES, RF AND THEIR IMPACTS ON BIOLOGICAL SYSTEMS**
S. Tigrek*, F. Barnes
University of Colorado, Boulder, CO

0940 **A2-3 ELECTRODE POSITIONS AT A DIELECTRIC INTERFACE FOR UNIFORM ELECTRIC FIELD**
C.E. Baum
University of New Mexico, Albuquerque, NM

1000 **Break**

1020 **A2-4 A NOVEL UNCONDITIONALLY STABLE FDTD SCHEME WITH UUPML FOR STRUCTURES WITH CURVED SURFACES**
Z. Huang*, G. Pan
Arizona State University, Tempe, AZ

1040 **A2-5 FULL-WAVE BASED MODAL ANALYSIS FOR THROUGH SILICON VIAS IN LAYERED MEDIA**
Z. Guo*[1], G. Pan[1], C. Pan[2]
[1]*Arizona State University, Tempe, AZ*
[2]*Quallcom Co., San Diego, CA*

1100 **A2-6 MEASUREMENT ON EFFECTIVE CONDUCTIVITIES ON OVER AND UNDER SURFACES OF COPPER-COATED SUBSTRATES AT MILLIMETER WAVELENGTHS**
F. Kuroki, N. Matsuda, Y.-S. Omote
Kure National College of Technology, Japan

Session B3 – Antenna Arrays and Reflectarrays
Room 1B40

Co-Chairs: Jennifer T. Bernhard, *University of Illinois at Urbana-Champaign, Urbana, IL*
Yahya Rahmat-Samii, *University of California, Los Angeles, CA*

0820 **B3-1 INVESTIGATING PATTERN RECONFIGURABLE ANTENNAS FOR USE IN ADAPTIVE ARRAYS**
T.L. Roach*, J.T. Bernhard
Electromagnetics Laboratory, Department of Electrical and Computer Engineering, University of Illinois at Urbana-Champaign, Urbana, IL

0840 **B3-2 KA-BAND PATCH ANTENNA ARRAY WITH INTEGRATED MEMS PHASE SHIFTERS FOR ARMY SATELLITE COMMUNICATIONS ON-THE-MOVE UPLINK MECHANISM**
S.D. Keller
U.S. Army Research Laboratory, Adelphi, MD

0900 **B3-3 ANTENNA ARRAY FOR A RADAR USING MEMS PZT PHASE SHIFTERS**
C. Patterson*, S. Weiss, T. Anthony
U.S. Army Research Laboratory, Adelphi, MD

0920 **B3-4 NEAR FIELD FOCUSED MICROSTRIP ARRAY WITH A DOLPH-CHEBYSHEV DESIGN**
S. Karimkashi, A.A. Kishk
Department of Electrical Engineering, University of Mississippi, University, MS

0940 **B3-5 LOW-LOSS CIRCULAR PATCH ARRAY WITH CORPORATE BEAM-FORMING NETWORK**
L. Grimsrud*[1,2], D. Filipovic[1], F. Lalezari[2]
[1]*University of Colorado, Boulder, CO*
[2]*FIRST RF Corporation,, Boulder, CO*

1000 **Break**

1020 **B3-6 BROADBAND COLLINEAR ARRAYS**
J.L. McDonald*[1,2], F. Lalezari[2], D.S. Filipovic[1]
[1]*Department of Electrical and Computer Engineering, University of Colorado, Boulder, CO*
[2]*FIRST RF Corporation,, Boulder, CO*

1040 **B3-7 DIRECTION OF ARRIVAL ESTIMATION OF ELECTROMAGNETIC SIGNALS WITH AN ELECTRICALLY SMALL ANTENNA ARRAY**
M.D. Anderson*, C.D. Schmitz, D.L. Jones, J.T. Bernhard
Department of Electrical and Computer Engineering, University of Illinois at Urbana-Champaign, Urbana, IL

1100 **B3-8 SURFACE WAVES IN MEDIUM-SIZED, TIGHTLY-COUPLED PLANAR ARRAYS**
T.R. Vogler*, W.A. Davis
Virginia Tech Antenna Group, Department of Electrical and Computer Engineering, Virginia Polytechnic Institute and State University, Blacksburg, VA

1120 **B3-9 OPTIMIZING APERTURE EFFICIENCY OF REFLECTARRAY ANTENNAS**
A. Yu*[1], F. Yang[1], A.Z. Elsherbeni[1], J. Huang[2], Y. Rahmat-Samii[3]
[1]*Department of Electrical Engineering, University of Mississippi, University, MS*
[2]*Jet Propulsion Laboratory, California Institute of Technology, Pasadena, CA*
[3]*Department of Electrical Engineering,, University of California, Los Angeles, CA*

1140 **B3-10 ON THE ASSESSMENT OF DIELECTRIC LOSS IN MICROSTRIP REFLECTARRAY FOR LOW/HIGH LOSS SUBSTRATES**
H. Rajagopalan*, . Rahmat-Samii
Department of Electrical Engineering, University of California, Los Angeles, CA

Session FS2 – Propagation Modeling and Measurements
Room 150

Organizers: D. Dockery and M. Newkirk
Co-Chairs: D. Dockery and M. Newkirk

0820 **FS2-1 EXTRACTING UTD WEDGE DIFFRACTION COEFFICIENTS FROM ELECTRIC FIELD MEASUREMENTS**
R.J. Pirkl*[1], G.D. Durgin[1], A.C.M. Austin[2], M.J. Neve[2]
[1]*Georgia Institute of Technology, Atlanta, GA*
[2]*University of Auckland, Auckland, New Zealand*

0840 **FS2-2 A COMPARATIVE ANALYSIS OF MULTIPLE KNIFE-EDGE DIFFRACTION METHODS FOR PROPAGATION MODELING**
N. DeMinco*, P. McKenna
U.S. Department of Commerce, Institute for Telecommunication Sciences, Boulder, CO

0900 **FS2-3 AN ACCURATE INTERPOLATION METHOD FOR PROPAGATION MODELS**
J.Z. Gehman*, J.K. Kuttler, T.R. Hanley
The Johns Hopkins University Applied Physics Laboratory, Laurel, MD

0920 **FS2-4 A LATE-SUMMER STRONG SURFACE-BASED DUCTING EVENT AND ITS POTENTIAL CAUSES**
T.R. Hanley*[1], A.K. Kochhar[1], T. Haack[2], R.E. Marshall[3], J.R. Rottier[1]
[1]*The Johns Hopkins University Applied Physics Laboratory, Laurel, MD*
[2]*Naval Research Laboratory, Marine Meteorology Division, Monterey, CA*
[3]*Naval Surface Warfare Center, Dahlgren Division, Dahlgren, VA*

0940 **FS2-5 THE ABCANZ MESOSCALE NUMERICAL WEATHER PREDICTION REFRACTIVITY COLLABORATION**
R.E. Marshall*[1], T. Haack[2]
[1]*Naval Surface Warfare Center, Dahlgren Division, Dahlgren, VA*
[2]*Marine Meteorology Division, Naval Research Laboratory, Monterey, CA*

1000 **Break**

1020 **FS2-6 ATMOSPHERIC RADAR PERFORMANCE SURFACES**
T. Haack*[1], P.S. Guest[2], K.L. Davidson[2], P. Fredrickson[2], W. Patterson[3], A. Barrios[3]
[1]*Naval Research Laboratory, Washington, DC*
[2]*Naval Postgraduate School*
[3]*Space and Naval Warfare System Center*

1040 **FS2-7 A CLIMATOLOGY-BASED ASSESSMENT OF RADAR REFRACTION ERRORS**
R.P. Wasky*, J.Z. Gehman, J. Goldhirsh
The Johns Hopkins University, Applied Physics Laboratory, Laurel, MD

1100 **FS2-8 MULTI-BEAM EXPERIMENT FOR THE PHASED ARRAY RADAR CALIBRATION AND SIDELOBE REDUCTION**
G. Zhang[1], Y. Li[1], R.J. Doviak[2], J. Carter[2], D. Priegnitz[2]
[1]*University of Oklahoma, Norman , OK*
[2]*National Severe Storms Laboratory, NOAA, Norman, OK*

1120 **FS2-9 THREE BODY SCATTERING AND HAIL SIZE**
D.S. Zrnic*[1], G. Zhang[2], V. Melnikov[3], J. Andric[3]
[1]*National Severe Storms Laboratory, NOAA, Norman, OK*
[2]*University of Oklahoma, Norman , OK*
[3]*Cooperative Institute for Mesoscale Meteorological Studies (CIMMS), Norman, OK*

1140 **FS2-10 SCAN OPTIMIZATION FOR DUAL DOPPLER RETRIEVAL IN COLLABORATIVE RADAR NETWORKS**

Y. Wang, V. Chandrasekar
Colorado State University, Fort Collins, CO

Session GH2 – Meteor Physics
Room 200

Co-Chairs: Sigrid Close, *Los Alamos National Laboratories, Los Alamos, NM*
Julio Urbina, *Pennsylvania State University, University Park, PA*

0800 **GH2-1 LARGE-SCALE DYNAMICS AND GRAVITY WAVE MOMENTUM FLUX MEASUREMENTS IN THE MLT USING A NEW GENERATION METEOR RADAR**
D. Janches[1], D.C. Fritts[1], W. Hocking[2], N.J. Mitchell[3], N. Arnold[4], B. Vandepeer[5], J.L. Hormaechea[6], C. Brunini[7], H. Levato[8]
[1]*NWRA/CoRA Div., Boulder, CO*
[2]*University of Western Ontario, Canada*
[3]*University of Bath, UK*
[4]*University of Leicester, UK*
[5]*Genesis Software Pty Ltd., Australia*
[6]*Estacion Astronomica Rio Grande, Argentina,*
[7]*Universidad de La Plata, Argentina*
[8]*Compljo AstronomicoEl Leoncito, Argentina*

0820 **GH2-2 POLARIZATION PROPERTIES OF HEAD ECHOES COLLECTED AT ALTAIR**
L.E. Vertatschitsch*[1], S. Close[2], P.L. Colestock[2], J.D. Sahr[1]
[1]*Dept. of EE, University of Washington, Seattle, WA*
[2]*Los Alamos National laboratories, Loa Alamos, NM*

0840 **GH2-3 EVOLUTION OF METEOR TRAILS AND ITS DEPENDENCE ON ALTITUDE**
A. Malhotra*, J. Mathews
Pennsylvania State University, University Park, PA

0900 **GH2-4 OVERVIEW AND INITIAL RESULTS OF A FPGA BASED DIGITAL RECEIVER FOR METEOR RADAR APPLICATIONS**
C.V. Vaudrin*, S.E. Palo
University of Colorado, Boulder, CO

0920 **GH2-5 REMOTE SENSING WIND PROFILES USING NON-SPECULAR METEOR TRAIL MEASUREMENTS**
M.M. Oppenheim[1], G. Sugar[1], N. Slowey[1], E. Bass[1], Y.S. Dimant[1], S. Close[2], J. Chau[3]
[1]*Boston university, Boston, MA*
[2]*Los Alamos National Laboratories, Los Alamos, NM*
[3]*Jicamarca Radio Observatory, Lima, Peru*

0940 **GH2-6 DETERMINING ATMOSPHERIC PROPERTIES WITH HPLA METEOR OBSERVATIONS**
E.N. Bass*[1], M.M. Oppenheim[1], G.F. Sugar[1], J.L. Chau[2]
[1]*Boston University, Boston, MA*
[2]*Jicamarca Radio Observatory Lima, Peru*

1000 **Break**

1020 **GH2-7 NEXT GENERATION METEOR RADAR RECEIVER USING AN OPEN HARDWARE/SOFTWARE RADIO PLATFORM**

R. Seal*, J. Urbina
Pennsylvania State University, University Park, PA

1040 **GH2-8 SIMULATING THE EFFECTS OF LATITUDE, LONGITUDE, NEUTRAL WIND, AND PLASMA DENSITY ON NON-SPECULAR METEOR TRAILS**
E. Hibit*[1], J. Urbina[1], L. Dyrud[2]
[1]*Pennsylvania State University, University Park, PA*
[2]*Center for Remote Sensing, Inc., Fairfax, VA*

1100 **GH2-9 DAY TO NIGHT VARIABILITY OF NON-SPECULAR RADAR METEOR TRAILS IN MID-LATITUDES**
A. Kummer[1], E. Hibit[1], J. Urbina[1], L. Dyrud[2]
[1]*Pennsylvania State University, University park, PA*
[2]*Center for Remote Sensing, Fairfax, VA*

1120 **GH2-10 THE DIURNAL VARIABILITY OF THE MICROMETEOR ALTITUDE DISTRIBUTION AND ITS RELATION TO METEOROID ASTRONOMICAL AND PHYSICAL CHARACTERISTICS**
J. Sparks*[1,2], D. Janches[1]
[1]*NorthWest Research Associates, CoRA Div., Boulder, CO*
[2]*University of Colorado, Boulder, CO*

1140 **GH2-11 DIRECT OBSERVATION OF MICROMETEOR DIFFERENTIAL ABLATION**
D. Janches[1], L.P. Dyrud[2], S.L. Broadley[3], J.M.C. Plane[3]
[1]*NWRA/CoRA Div., Boulder, CO*
[2]*Center for Remote Sensing, Inc., Fairfax, VA*
[3]*University of Leeds, Leeds, UK*

1200 **GH2-12 GLOBAL VARIATION OF METEOR TRAIL PLASMA TURBULENCE**
L.P. Dyrud*[1], D. Janches[2], J. Fentzke[3], J. Urbina[4], J. Urbina[1]
[1]*Center for remote sensing, Inc., Fairfax, VA*
[2]*NWRA/CoRA Div., Boulder, CO*
[3]*University of Colorado, Boulder, CO*
[4]*Pennsylvania State university, State College, PA*

1220 **GH2-13 VERY SMALL METEORS COMPUTER MODELS AND DATA COMPARISONS**
J. Zinn[1], P.L. Colestock[1], S. Close[1], D. Janches[2]
[1]*Los Alamos National laboratory, Los Alamos, NM*
[2]*Northwest research Associates, Inc., Boulder, CO*

Session HG2 – Plasma Waves and Ionospheric Modification
Room 245

Co-Chairs: Eric Donovan
Frank T. Djuth, *Geospace Research Inc., El Segundo, CA*
Michael Sulzer, *Arecibo Observatory, Arecibo, Puerto Rico*

0820 **HG2-1 ELF/VLF GENERATION EXPERIMENTS AT THE HAARP FACILITY**
M.B. Cohen*, U.S. Inan, M. Golkowski, N.G. Lehtinen, D. Piddyachiy
Stanford University, Stanford, CA

0840 **HG2-2 INITIAL AMPLITUDE AND PHASE DYNAMICS OF VLF TRIGGERED EMISSIONS EXCITED BY THE HAARP HF HEATER**
M. Golkowski[1], U.S. Inan[1], M.B. Cohen[1], A.R. Gibby[1,2]

[1]*STAR Lab., Stanford University, Stanford, CA*
[2]*Arion Systems, Inc.*

0900 **HG2-3 FARLEY-BUNEMAN TURBULENCE IN 3D**
M.M. Oppenheim[1], Y.S. Dimant[1], L.P. Dyrud[2]
[1]*Boston university, Boston, MA*
[2]*Center for Remote Sensing, Fairfax, VA*

0920 **HG2-4 3D FDTD MODELING OF ELECTROMAGNETIC WAVE PROPAGATION IN MAGNETIZED COLD PLASMA**
Y. Yu*, J.J. Simpson
University of New Mexico, Albuquerque, NM

0940 **HG2-5 DYNAMICS OF THE TRAPPED ELECTRON PHASE SPACE DENSITY IN RELATION TO THE WAVE ACTIVITY IN THE INNER MAGNETOSPHERE**
D. Vassiliadis, M. Koepke
West Virginia University

1000 **Break**

1020 **HG2-6 ENHANCED ION ACOUSTIC LINES DUE TO STRONG ION CYCLOTRON WAVE FIELDS**
H. Bahcivan, R. Cosgrove
SRI International, Menlo Park, CA

1040 **HG2-7 TIME-DEPENDENT OBSERVATIONS AND MODELING OF THE ENHANCED ION-LINE MATCHING HEIGHT DURING HF HEATING OF THE F-REGION IONOSPHERE**
C.T. Fallen*, B.J. Watkins
University of Alaska Fairbanks, Fairbanks, AK

1100 **HG2-8 HIGH RESOLUTION TOMOGRAPHY AND COMPUTER SIMULATION OF AN ARTIFICIAL IONOSPHERIC CAVITY**
C.A. Selcher*[1], P.A. Bernhardt[1], F.T. Djuth[2], J.D. Huba[1]
[1]*Naval Research laboratory, Washington, DC*
[2]*Geospace Research Inc., El Segundo, CA*

1120 **HG2-9 ELF/VLF WAVE RADIATION PRODUCED BY AN EQUATORIAL IONOSPHERIC HEATER**
N.G. Lehtinen, U.S. Inan
Stanford University, Stanford, CA

1140 **HG2-10 LOCATION OF THE DOMINANT ELF/VLF SOURCE REGION FOR GROUND-BASED OBSERVATIONS**
R.C. Moore*, S. Fujimaru, T. Wang
University of Florida, Gainesville, FL

1200 **HG2-11 CORRELATION BETWEEN ELF SIGNAL INTENSITY AND MAGNETOMETER DEVIATIONS IN MODULATED IONOSPHERIC HEATING EXPERIMENTS**
G. Jin, M. Spasojevic, U.S. Inan
STAR Laboratory, Stanford University, Stanford, CA

Session J3 – Wideband Astronomy Instrumentation
Room 265

Co-Chairs: T. Bastian
David P. Woody, *OVRO, Caltech, CA*

0820 **J3-1 THE CHALLENGES OF BROADBAND FEED DESIGN**
R. Bradley*[1], R. Gawande[2]
[1]*National Radio Astronomy Observatory, Charlottesville, VA*
[2]*University of Virginia, Charlottesville, VA*

0840 **J3-2 OCTAVE-BAND ORTHOMODE TRANSDUCERS FOR THE EXPANDED VERY LARGE ARRAY**
G.M. Coutts*, H. Dinwiddie, P. Lilie
National Radio Astronomy Observatory, Socorro, NM

0900 **J3-3 NRAO-EVLA WIDEBAND TECHNIQUES**
S. Durand*, R. Perley, J. Jackson
National Radio Astronomy Observatory, Socorro, NM

0920 **J3-4 THE ZPECTROMETER: AN ULTRAWIDEBAND SPECTROMETER FOR ASTRONOMICAL OBSERVATIONS WITH THE GREEN BANK TELESCOPE**
A.I. Harris*[1], S.G. Zonak[1], A.J. Baker[2], G. Watts[3]
[1]*University of Maryland, College Park, MD,*
[2]*Rutgers University, Piscataway, NJ,*
[3]*National Radio Astronomy Observatory, Green Bank, WV*

0940 **J3-5 THE MARK 5C VLBI DATA SYSTEM**
R. Whitney*[1], J.D. Romney[2], K. Owens[3]
[1]*MIT Haystack Observatory, Westford, MA*
[2]*National Radio Astronomy Observatory, Socorro, NM*
[3]*Conduant Corporation, Longmont, CO*

1000 **Break**

1020 **J3-6 WIDEBAND PULSAR INSTRUMENTATION AT GREEN BANK**
J. Ford*[1], P. Brandt[1], G. Langston[1], R. McCullough[1], J. Ray[1], P. Demorest[2], R. DuPlain[2], S. Ransom[2]
[1]*National Radio Astronomy Observatory, Green Bank, WV*
[2]*National Radio Astronomy Observatory, Charlottesville, VA*

1040 **J3-7 INITIAL RESULTS FROM THE GAVRT DIGITAL BACKEND**
G. Jones
California Institute of Technology, Pasadena, CA

1100 **J3-8 ULTRA-WIDEBAND SAMPLERS (10 TO 20GSPS) FOR USE IN RADIO ASTRONOMY**
D.W. Hawkins*[1], D.P. Woody[1], K.P. Rauch[2]
[1]*Caltech/CARMA, Big Pine, CA*
[2]*University of Maryland/CARMA, College Park, MD*

1120 **J3-9 A WIDEBAND SPECTROMETER WITH AUTOMATIC RFI DETECTION**
D.E. Gary*, Z. Liu, G.M. Nita
New Jersey Institute of Technology, Newark, NJ

1140 **J3-10 OPEN SOURCE HARDWARE AND GATEWARE FOR WIDE-BAND RADIO ASTRONOMY INSTRUMENTATION**

D. Werthimer*[1], D. Backer[1], H. Chen[1], M. Dexter[1], G. Foster[1], T. Filiba[1], S. Gowda[1], B. Mallard[1], J. Manley[3], D. MacMahon[1], P. McMahon[2], O. Milgrome[1], A. Parsons[1], A. Siemion[1], L. Urry[1], M. Wagner[1], M. Wright[1]
[1]*University of California, Berkeley,CA*
[2]*Stanford University Stanford, CA*
[3]*Meerkat/SKA, South Africa*

1200 **J3-11 WIDEBAND FPGA SPECTROMETERS AND CORRELATORS**
T. Filiba*[1,2], H. Chen[1], S. Gowda[1,2], W. Mallard[1], J. Manley[1,3,4], P. McMahon[1,5], A. Siemion[1,6], L. Spitler[1,7], M. Wagner[1], D. Werthimer[1,8]
[1]*Center for Astronomy Signal Processing and Electronics Research, University of California, Berkeley, CA*
[2]*Department of Electrical Engineering and Computer Science, University of California, Berkeley, CA*
[3]*Department of Electrical Engineering, University of Cape Town, South Africa*
[4]*Karoo Array Telescope, South Africa*
[5]*Department of Electrical Engineering, Stanford University, CA*
[6]*Department of Astronomy, University of California, Berkeley,CA*
[7]*Department of Astronomy, Cornell University, Ithaca, NY*
[8]*Space Sciences Laboratory, University of California, Berkeley, CA*

Session K1 – Biological effects and medical applications of electromagnetic fields and waves
Room 151

Co-Chairs: Frank Barnes, *University of Colorado, Boulder, CO*
Susan C. Hagness, *University of Wisconsin, Madison, WI*

0900 **K1-1 MODIFICATION OF THE DISEASE STATE BY THE IN-VIVO NON-INVASIVE APPLICATION OF ELECTROMAGNETIC FIELDS**
L. Portelli*, F. Barnes
University of Colorado, Boulder, CO

0920 **K1-2 ON THE MODELING OF THE EFFECTS OF ELECTRICALLY INDUCED TRAUMA ON MUSCLE TISSUE**
C.J. Cela*[1], R.C. Lee[2], G. Lazzi[1]
[1]*NC State University, Raleigh, NC*
[2]*University of Chicago, Chicago , IL*

0940 **K1-3 EVIDENCE FOR BIOLOGICAL EFFECTS OF RF AT LOW EXPOSURES**
F. Barnes*, L. Portelli
University of Colorado, Boulder, CO

1000 **Break**

1020 **K1-4 2D ANALYTIC SOLUTION TO OBTAIN OPTIMAL B1 EXCITATION FIELD IN ULTRA-HIGH FIELD MRI APPLICATIONS**
G. Carluccio*, D. Erricolo
University of Illinois at Chicago, Chicago, IL

1040 **K1-5 SARS AND TEMPERATURE INCREASE INDUCED BY MRI FIELDS IN A MODEL OF THE HUMAN HEAD WITH RETINAL IMPLANTS**
Z. Tong*, G. Lazzi
NC State University, Raleigh, NC

1100 **K1-6 MICROWAVE DETECTION OF BREAST CANCER VIA CONTRAST-ENHANCED DIFFERENTIAL IMAGING IN THREE DIMENSIONS**
J.D. Shea, P. Kosmas, B.D. Van Veen, S.C. Hagness*
University of Wisconsin, Madison, WI

TUESDAY PM 6 January 2009

Session B4 – Numerical Methods
Room 1B40

Chair: Donald R. Wilton, *University of Houston, Houston, TX*

1320 **B4-1 INCREASED EFFICIENCY OF INTEGRAL EQUATION SOLUTIONS OF ANTENNAS BY INCORPORATION OF NETWORK PRINCIPLES**
A.W. Schreiber*, C.M. Butler
Clemson University, Clemson, SC

1340 **B4-2 FULL-WAVE SCATTERING AT ONE MILLION WAVELENGTH OBJECTS**
J. Fostier, F. Olyslager*
Department of Information Technology, Ghent University, Ghent, Belgium

1400 **B4-3 FPGA ACCELERATED PHASED ARRAY DESIGN USING THE ANT COLONY OPTIMIZATION**
O. Kilic*[1], D. Barger[2]
[1]*The Catholic University of America, Washington, DC*
[2]*Mikira Systems, Potomac, MD*

1420 **B4-4 NEAR-FIELD TRANSFORMATION UTILIZING MULTILEVEL PLANE WAVE REPRESENTATION APPLIED TO PLANAR MEASUREMENTS**
C.H. Schmidt*[1], T.F. Eibert[2]
[1]*Institute of Radio Frequency Technology, Universität Stuttgart, Stuttgart, Germany*
[2]*Lehrstuhl fur Hochfrequenztechnik Technische, Universität Munchen, Munchen, Germany*

1440 **B4-5 A SEMI-ANALYTICAL VECTOR SPECTRAL ELEMENT METHOD AND ITS APPLICATION TO WAVEGUIDE DISCONTINUITY PROBLEMS**
J. Chen[1], B. Zhu[1,2], W. Zhong[2], Q.H. Liu[1]
[1]*Department of Electrical and Computer Engineering, Duke University, Durham*
[2]*Department of Engineering Mechanics, Dalian University of Technology, Dalian, China*

Session B5 – Scattering
Room 1B40

Chair: Danilo Erricolo, *University of Illinois at Chicago, Chicago, IL*

1520 **B5-1 SMALL WAVELENGTH APPROXIMATIONS FOR FLAT STRIP AND CYLINDRICAL WIRE MESHES**
S. Seran, J.P. Donohoe, E. Topsakal
Department of Electrical and Computer Engineering, Mississippi State University, Mississippi State, MS

1540 **B5-2 INCREMENTAL FRINGE FORMULATION FOR COMPLEX POINT SOURCES DIFFRACTION BY EDGES IN PLANAR METALLIC OBJECTS**
S.M. Canta*[1], D. Erricolo[1], A. Toccafondi[2]

[1]*Department of Electrical and Computer Engineering, University of Illinois at Chicago, Chicago, IL*
[2]*Department of Information Engineering, University of Siena, Siena, Italy*

1600 **B5-3 AXIAL SCATTERING BY A CONCAVE PARABOLIC CYLINDER MADE OF DNG METAMATERIAL**
P.L.E. Uslenghi
Department of Electrical and Computer Engineering, University of Illinois at Chicago, Chicago, IL

1620 **B5-4 MONTE CARLO SIMULATIONS OF ALTIMETER PULSE RETURNS AND THE ELECTROMAGNETIC BIAS**
P. Naenna*, J.T. Johnson
Department of Electrical Engineering and ElectroScience Laboratory, The Ohio State University, Columbus, OH

1640 **B5-5 APPLICATION OF THE BROWN MODEL TO ESTIMATE THE SCATTERING COEFFICIENT OF LAYERED ROUGH SURFACES**
N. Niamsuwan*, J.T. Johnson
Department of Electrical Engineering and ElectroScience Laboratory, The Ohio State University, Columbus, OH

Session BKS1 – Wearable/ Implantable Sensors and Body Area Networks
Room 151

Organizers: Erdem Topsakal, *Mississippi State University, Mississippi State, MS*
Yahya Rahmat-Samii, *University of California, Los Angeles, CA*
Chair: Erdem Topsakal

1320 **BKS1-1 CONFORMAL ANTENNA DESIGN FOR INGESTIBLE CAPSULE IMAGING SYSTEM**
H. Rajagopalan, P. Izdebski, Y. Rahmat-Samii*
Department of Electrical Engineering, University of California, Los Angeles, CA

1340 **BKS1-2 THE DESIGN OF MINIATURE ANTENNA AND RF POWERING CIRCUIT FOR IMPLANTABLE INTRAOCULAR PRESSURE SENSOR**
C.-L. Yang[1], E.Y. Chow[2], S. Moon[1], Y. Ouyang[1], P.P. Irazoqui[2], W.J. Chappell[1]
[1]*IDEAS Microwave Laboratory, Department of Electrical and Computer Engineering, Purdue University, West Lafayette, IN*
[2]*BCI Laboratory, Weldon School of Biomedical Engineering, Purdue University,West Lafayette, IN*

1400 **BKS1-3 A PARAMETRIC STUDY TO IMPROVE THE EFFICIENCY OF IMPLANTABLE ANTENNA SENSORS FOR CONTINUOUS GLUCOSE MONITORING**
T. Karacolak*[1], E.C. Moreland[2], E. Topsakal[1]
[1]*Department of Electrical and Computer Engineering, Mississippi State University, Mississippi State, MS*
[2]*Department of Pediatrics, University of Alabama at Birmingham Childrens Hospital, Pediatric Endocrinology, Birmingham, AL*

1420 **BKS1-4 BODY-CENTRIC ANTENNAS FOR WIRELESS CARDIAC MONITORING**
T. Yilmaz*, T. Karacolak, E. Topsakal
Department of Electrical Engineering, Mississippi State University, Mississippi State, MS

1440 **BKS1-5 DIVERSITY EVALUATION FOR MULTIPLE BODY-WORN ANTENNAS**
G.-Y. Lee, D. Psychoudakis, C.-C. Chen, J.L. Volakis
Department of Electrical and Computer Engineering and ElectroScience Laboratory, The Ohio State University, Columbus, OH

Session D1 – RF Components and Systems
Room 105

Co-Chairs: John Papapolymerou, *Georgia Institute of Technology, Atlanta, GA*
Jennifer T. Bernhard, *University of Illinois at Urbana-Champaign, Urbana, IL*

1400 **D1-1 MAGNETIC FIELD ALTERATION OF SEMICONDUCTOR LASER DIODE EMISSION GEOMETRY**
E.M. Kim
University of San Diego, CA

1420 **D1-2 CURRENT STATUS AND FUTURE PROSPECTS OF 4H-SIC RF BJTS**
F. Zhao
Dept. of electrical engineering, University of South Carolina, Columbia, SC

1440 **D1-3 A LOW-VOLTAGE HIGH-SPEED OHMIC RF MEMS SWITCH ON SILICON**
N. Tavassolian[1], S. Bhattacharya[1], G.E. Ponchak[2], J. Papapolymerou*[1]
[1]*Georgia Institute of technology, Atlanta, GA*
[2]*NASA Glenn Research Center, Cleveland, OH*

1500 **Break**

1520 **D1-4 RECONFIGURABLE ANTENNAS WITH INTEGRATED RF MEMS SWITCHES FOR MILITARY MIMO APPLICATIONS**
T. Wojtaszek*[1], G. Huff[2], D.J. Chung[3], J. Papapolymerou[3], J.T. Bernhard[1]
[1]*University of Illinois at Urbana-Champaign, Urbana, IL*
[2]*Texas A&M University, College Station, TX*
[3]*Georgia Institute of Technology, Atlanta, GA*

1540 **D1-5 A SINGLE-CHIP 4-BIT SIGE BICMOS T/R MODULE FOR X-BAND PHASED-ARRAY RADAR SYSTEMS**
T.K. Thrivikraman[1], C.M. Grens[1], J.M. Andrews[1], W.-M.L. Kuo[1], J.P. Comeau[1], M. Morton[1], J.D. Cressler[1], J. Papapolymerou[1], M. Mitchell[2]
[1]*Georgia Institute of Technology, Atlanta, GA*
[2]*Georgia Tech Research Institute, Atlanta, GA*

1600 **D1-6 ANALYSIS OF GUNN DIODE OSCILLATOR IN FREQUENCY DOMAIN AT MILLIMETER-WAVE FREQUENCIES**
F. Kuroki, K.-I. Ohue
Kure National College of Technology, Kure, Japan

1620 **D1-7 IMITATING NETWORKS**
A.M. Alaa
Dept. of Communication and Computer Engineering, Cairo University, Egypt

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Session FS3 – Passive Remote Sensing of the Earths Environment
Room 150

Organizers: Ed R. Westwater, *NOAA, Boulder, CO*
Steven C. Reising, *Colorado State University, Fort Collins, CO*
Co-Chairs: Ed R. Westwater and Steven C. Reising

1320 **FS3-1 ATOMMS: THE ACTIVE TEMPERATURE, OZONE AND MOISTURE MICROWAVE SPECTROMETER**
C. Groppi[1], E.R. Kursinski[1], D. Ward[1], M. Schein[1], S.A. Banna[1], W. Bertiger[2], M. Miller[2], H. Pickett[2]
[1]University of Arizona , Tucson , AZ
[2]NASA Jet Propulsion Lab, Pasadena, CA

1340 **FS3-2 ONGOING DEVELOPMENT OF AN ULTRA-LIGHTWEIGHT DIGITAL CORRELATION RADIOMETER FOR L-BAND PASSIVE REMOTE SENSING FROM UAVS**
E.M. McIntyre, A.J. Gasiewski
Dept of ECE, Center for Environmental Technology, University of Colorado, Boulder, CO

1400 **FS3-3 A THEORETICAL STUDY OF CROSS-FREQUENCY BLANKING FOR PULSED SINUSOIDAL RADIO FREQUENCY INTERFERENCE DETECTION**
B. G¨uner*, J.T. Johnson
Dept. of ECE and ElectroScience Laboratory, Ohio State University, Columbus, OH

1420 **FS3-4 AIRBORNE L-BAND RADIO FREQUENCY INTERFERENCE STUDIES WITH THE L-BAND INTERFERENCE SUPPRESSING RADIOMETER (LISR) AND PALS**
J. Park*[1], N. Majurec[1], N. Niamsuwan[1], M. Frankford[1], JOELT. Johnson[1], S. Dinardo[1], S. Yueh[2]
[1]Dept. of ECE and ElectroScience Lab, Ohio State University, Columbus, OH
[2]NASA Jet Propulsion Lab, Pasadena, CA

1440 **FS3-5 ALL-SKY OPTICAL POLARIZATION IMAGING IN VARIABLY CLOUDY SKIES**
J.A. Shaw*, N.J. Pust, A. Dahlberg
Electrical and Computer Engineering Department, Montana State University, Bozeman, MT

1500 **Break**

1520 **FS3-6 PASSIVE MICROWAVE OBSERVATIONS DURING STRONG CONVECTION**
R. Ware[1,2], W. Brown[2], G. Frederick[3], A. MacDonald[5], M. Moncrieff[2], S.-R.-H. Rizvi[2], J. Vivekanandan[2], E. Westwater[4], Y. Xie[5]
[1]Radiometrics Corporation, Boulder, CO
[2]National Center for Atmospheric Research, Boulder, CO
[3]Vaisala,Boulder, CO
[4]Cooperative Institute for Research in the Environmental Sciences, Boulder, CO
[5]NOAA Earth System Research Laboratory, Boulder, CO

1540 **FS3-7 PROGRESS IN GROUND-BASED MILLIMETER-WAVE OBSERVATIONS IN THE ARCTIC WINTER**
D. Cimini[1], E.R. Westwater[2], F. Nasir[1], A.J. Gasiewski[2], M. Klein[2], V. Leuski[2], D. Turner[3], V. Payne[4], E. Mlawer[4], M. Exner[5], M. Cadeddu[6]
[1]CETEMPS, University of LAquila, Italy.
[2]CET/ECE, University of Colorado, Boulder, CO
[3]SSEC, University of Wisconsin, Madison, WI
[4]AER Inc., Lexington, MA
[5]Radiometrics Corporation, Boulder, CO
[6]Argonne National Laboratory, Argonne, IL

1600 **FS3-8 RADIOMETRIC OBSERVATIONS OF THE ARCTIC ENVIRONMENT DURING THE 2008 ARCTIC MECHANISMS OF INTERACTION BETWEEN THE SURFACE AND ATMOSPHERE (AMISA) CAMPAIGN**
A.J. Gasiewski*[1], E. McIntyre[1], D. Kraft[1], O. Persson[2], V. Leusky[1], M. Tjernstrom[3], M. Tian[1], A.

Chaturvedi[1]
[1]CU Center for Environmental Technology, University of Colorado, Boulder, CO
[2]NOAA-CIRES, University of Colorado, Boulder, CO
[3]Dept. of Meteorology, Stockholm University, Stockholm, Sweden

1620 **FS3-9 RETRIEVAL OF ATMOSPHERIC HUMIDITY WITH FINE SPATIAL RESOLUTION USING 3D TOMOGRAPHIC INVERSION OF PASSIVE MICROWAVE MEASUREMENTS FROM A GROUND-BASED NETWORK OF SCANNING RADIOMETERS**
S.C. Reising[1]*, S. Padmanabhan[1], J. Vivekanandan[2], F. Iturbide-Sanchez[3]
[1]Dept of ECE., Colorado State University, Fort Collins, CO
[2]National Center for Atmospheric Research, Boulder, CO
[3]NOAA/NESDIS Center for Satellite Applications and Research, Camp Springs , MD

1640 **FS3-10 AN ANISOTROPIC OCEAN SURFACE EMISSIVITY MODEL BASED ON WINDSAT POLARIMETRIC BRIGHTNESS OBSERVATIONS**
D.F. Smith*, B.L. Weber, A.J. Gasiewski
Center for Environmental Technology, University of Colorado, Boulder, CO

Session G2a – Radar and Radio Techniques I
Room 200

Co-Chairs: Frank Lind, *MIT Haystack Observatory, Westford, MA*
T. L. Gaussiran, *University of Texas, TX*

1340 **G2a-1 EXTRACTING PLASMA FREQUENCY PROFILES FROM ARECIBO SPECTRAL DATA SETS**
M. Sulzer
Arecibo Observatory, Arecibo, Purto Rico

1400 **G2a-2 COMBINING ION LINE AND PLASMA LINE MEASUREMENTS TO STUDY THE F1 REGION AT ARECIBO**
N. Aponte*[1], M.P. Sulzer[1], M.J. Nicolls[2], S.A. Gonzalez[1]
[1]Arecibo Observatory, Arecibo, Puerto Rico
[2]SRI International, Menlo Park, CA

1420 **G2a-3 ESTIMATION OF VECTOR VELOCITY FIELD USING AN ARRAY OF CLOSELY-SPACED ISR MEASUREMENTS**
T.W. Butler*[1], J. Semeter[1], M. Nicolls[2], C. Heinselman[2], J. Kelly[2]
[1]Boston University, Boston, MA
[2]SRI International, Menlo Park, CA

1440 **G2a-4 INVESTIGATION OF CODING SCHEMES FOR INCOHERENT SCATTER RADAR EXPERIMENTS AT ARECIBO**
R. Nikoukar[1], F. Kamalabadi[1], E. Kudeki[1], M. Sulzer[2], S. Gonzalez[2]
[1]University of Illinois at Urbana-Champaign, Urbana, IL
[2]National Astronomy and Ionosphere Center, Arecibo Observatory, Puerto Rico

1500 **Break**

1520 **G2a-5 JOINT DETECTION OF OVERSAMPLED DEEP FLUCTUATING TARGETS**
J.D. Sahr
University of Washington, Seattle, WA

1540 **G2a-6 RECENT KWAJALEIN ATOLL RADIO SCIENCE STUDIES**
T. Beach*[1], F. Centinello[1], R. Caton[2], D. Sponseller[3], K. Groves[1]

[1]*Air Force research lab., Hanscom AFB, MA*
[2]*Atmospheric & Environmental Research, Inc., Mansfield, TX*
[3]*Kwajalein Range Services LLC, Kwajalein Atoll, Marshall Islands*

1600 **G2a-7 MEASUREMENTS AND SIMULATION OF VHF AND UHF RADAR SIGNALS**
P.S. Cannon[1], N.C. Rogers[1], K.M. Groves[2]
[1]*Center for RF Operational Environments, QinetiQ, Malvern, UK*
[2]*Air Force Research Laboratory, Hanscom AFB, MA*

1620 **G2a-8 IMAGING OF SPORADIC E LAYERS WITH THE POKER FLAT INCOHERENT SCATTER RADAR**
C.J. Heinselman, M.J. Nicolls
SRI International, Menlo Park, CA

1640 **G2a-9 THE ARECIBO HF FACILITY: STATUS AND THE PLAN TO MAXIMIZE THE NEW SCIENCE ON A CONSTRAINED BUDGET**
M.P. Sulzer*, S.A. Gonzalez
Arecibo Observatory, Arecibo, Puerto Rico

1700 **G2a-10 THE ANTARCTIC INCOHERENT SCATTER RADAR PROJECT THE NEXT BIG STEP IN GROUND-BASED SOLAR-TERRESTRIAL RESEARCH**
A. Strømme[1], T. Van Eyken[2], J. Kelly[1], R. Clauer[3], E. Sanchez[1]
[1]*SRI International, Menlo Park, CA*
[2]*EISCAT Scientific Association*
[3]*Virginia Tech, Blacksburg, VA*

Session GH3a – Ionospheric effects of Lightning I
Room 245

Co-Chairs: Robert C. Moore, *University of Florida, Gainesville, FL*
Steven A. Cummer, *Duke University, Durham, NC*

1320 **GH3a-1 MULTI-SENSOR OBSERVATIONS OF TLES AND LIGHTNING FROM AN ASYMMETRIC MCS OVER OKLAHOMA (9 MAY 2007)**
W.A. Lyons*[1], T.J. Lang[2], S.A. Rutledge[2], S.A. Cummer[3], M.A. Stanley[1], J.D. Meyer[1], R.H. Holzworth[4]
[1]*FMA Research, Ft. Collins, CO*
[2]*Colorado State University, Ft. Collins, CO*
[3]*Duke University, Durham, NC*
[4]*University of Washington, Seattle, WA*

1340 **GH3a-2 EARLY/FAST VLF EVENTS OBSERVED IN FLORIDA**
R.C. Moore*
University of Florida, Gainesville, FL

1400 **GH3a-3 ANALYSIS OF TLES OBSERVED IN THE SOUTHEASTERN US**
S.A. Cummer*[1], J. Li[1], W.A. Lyons[2]
[1]*Duke University, Durham, NC*
[2]*FMA Research, Fort Collins, CO*

1420 **GH3a-4 STATISTICS OF GROUND-BASED ELVE PHOTOMETRY**
R.T. Newsome*, U.S. Inan
STAR Laboratory, Stanford University, Stanford, CA

1440 **GH3a-5 THE RELATIONSHIP OF SPRITE STREAMER PROPAGATION VELOCITIES AND LIGHTNING-GENERATED MESOSPHERIC ELECTRIC FIELDS**

J. Li *, S.A. Cummer
Duke University, Durham, NC

1500 **Break**

1520 **GH3a-6 ASSESSMENT OF SPRITE INITIATING ELECTRIC FIELDS USING STREAMER MODELING AND EXPERIMENTAL OBSERVATIONS**
N. Liu
Florida Institute of Technology, Melbourne, FL

1540 **GH3a-7 NUMERICAL MODELING OF THE FORMATION OF THE SCREENING CHARGE NEAR THE THUNDERCLOUD BOUNDARIES AND ITS IMPACT ON THE INITIATION AND EARLY STAGES OF DEVELOPMENT OF BLUE JETS**
J.A. Riousset*[1], V.P. Pasko[1], P.R. Krehbiel[2], W. Rison[2], R.J. Thomas[3], M.A. Stanley[3]
[1]*Pennsylvania State University, University park, PA*
[2]*New Mexico Institute of Mining and Technology, Socorro, NM*
[3]*114 Mesa Verde Road, Jemez Springs, NM*

1600 **GH3a-8 ELECTROSTATIC MECHANISM OF LIGHTNING ASSOCIATED INFRASONIC PULSES**
V.P. Pasko*
Pennsylvania State University, University Park, PA

1620 **GH3a-9 SUMMER HIGH LATITUDE MESOSPHERIC OBSERVATIONS OF SUPERSONIC WIND AND EMISSION RATE OF O(1S) WITH THE UARS/WINDII INSTRUMENT AND THE ASSOCIATION WITH POLAR MESOSPHERIC CLOUDS AND LIGHTNING**
Y.-S. Lee*, G.G. Shepherd
York University, Toronto, Ontario, Canada

1640 **GH3a-10 THE FIREFLY MISSION: AN NSF CUBESAT TO STUDY THE RELATIONSHIP BETWEEN LIGHTNING AND TGFS**
D. Rowland*[1], A.T. Weatherwax[2], J.T. Kujawski[2], J.E. Hill[1,3], J. Jones[4], D. McCarthy[4]
[1]*NASA Goddard Space Flight Center, Greenbelt, MD*
[2]*Siena College, Loudonville, NY*
[3]*Universities Space Research Association, Columbia, MD*
[4]*Hawk Institute for Space Sciences, Pocomoke City, MD*

Session J4 – Astronomy at Terahertz Frequencies
Room 265

Co-Chairs: R. Blundell
David P. Woody, *OVRO, Caltech, CA*

1400 **J4-1 THE USE BY THE RADIO ASTRONOMY SERVICE OF FREQUENCIES BETWEEN 275 GHZ AND 3 THZ**
A.W. Clegg*, T.E. Gergely
National Science Foundation, Arlington. VA

1420 **J4-2 THE CORNELL CALTECH ATACAMA TELESCOPE (CCAT)**
S.J.E. Radford*[1], R. Giovanelli[2], J. Glenn[3], T.A. Sebring[2], D. Woody[1], J. Zmuidzinas[1]
[1]*California Institute of Technology, Pasadena, CA*
[2]*Cornell University, Ithaca, NY*
[3]*University of Colorado, Boulder, CO*

1440 **J4-3 CASIMIR: THE CALTECH AIRBORNE SUBMILLIMETER INTERSTELLAR MEDIUM INVESTIGATIONS RECEIVER**
M.L. Edgar[1], A.I. Harris[2], A. Karpov[1], S. Lin[1], D. Miller[1], S.J.E. Radford*[1], F. Rice[1], J. Zmuidzinas[1]
[1]*California Institute of Technology, Pasadena, CA*
[2]*University of Maryland, College Park, MD*

1500 **Break**

1520 **J4-4 1.3 THZ HEB MIXER FOR APEX TELESCOPE FACILITY RECEIVER**
D. Meledin*, V. Desmaris, S.-E. Ferm, M. Fredrixon, D. Henke, I. Lapkin, O. Nyström, A. Pavolotsky, M. Strandberg, E. Sundin, V. Belitsky
Group for Advanced Receiver Development, Chalmers University of Technology, Gothenburg, Sweden

1540 **J4-5 THZ ASTRONOMY FROM DOME A, ANTARCTICA**
Q. Zhang
Harvard-Smithsonian Center for Astrophysics, USA

1600 **J4-6 SUPERCAM: A 64 PIXEL HETERODYNE ARRAY RECEIVER**
C. Groppi*[1], C. Walker[1], C. Kulesa[1], D. Golish[1], P. Gensheimer[1], S. Weinreb[2,3], G. Jones[3], J. Barden[3], H. Mani[3], T. Kuiper[2], J. Kooi[3], A. Lichtenberger[4], T. Cecil[4], G. Narayanan[5], P. Pütz[6], A. Hedden[7]
[1]*University of Arizona, Tucson, AZ*
[2]*NASA Jet Propulsion Laboratory, Pasadena, CA*
[3]*California Institute of Technology, Pasadena, CA*
[4]*University of Virginia,VA*
[5]*University of Massachussetts,MA*
[6]*Universität Zu Köln,Germany*
[7]*Harvard-Smithsonian Center for Astrophysics, USA*

1620 **J4-7 THE REDSHIFT (Z) AND EARLY UNIVERSE SPECTROMETER (ZEUS): DESIGN AND FIRST SCIENCE RESULTS**
G.J. Stacey*[1], S. Hailey-Dunsheath[1], T. Nikola[1], T.E. Oberst[1], S.C. Parshley[1], D. Brisbin[1], C. Ferkinhoff[1], D. Benford[2], J. Staguhn[2]
[1]*Cornell University, Ithaca, NY*
[2]*NASA Goddard Space Flight Center, Greenbelt, MD*

Session K2 – Human body interactions with antennas and other electromagnetic devices
Room 151

Co-Chairs: Gianluca Lazzi, *NC State University, Raleigh, NC*
Susan C. Hagness, *University of Wisconsin, Madison, WI*

1520 **K2-1 CELL-PHONE ANTENNAS AND THE HUMAN BODY: THE POWER AMPLIFIER PERSPECTIVE**
L.S. Sankey*, Z. Popovic
University of Colorado, Boulder, CO

1540 **K2-2 CHARACTERIZATION OF BODY PERTURBATION EFFECTS ON THE SENSITIVITY OF A BODY-BORNE RADIO DIRECTION FINDING/GEOLOCATION SYSTEM**
A. Lalezari[1,2], F. Lalezari[2], D. Filipovic[1]
[1]*University of Colorado, Boulder, CO*
[2]*FIRST RF Corporation, Boulder, CO*

1600 **K2-3 THREE-DIMENSIONAL ELECTROMAGNETIC MODELS OF THE HUMAN EYES FOR SPECIFIC ABSORPTION RATE EVALUATION**
L. Liu*, N.K. Nikolova
McMaster University, Hamilton, ON, Canada

1620 **K2-4 ESTIMATION OF SAR FOR MULTIPLE-INPUT AND MULTIPLE-OUTPUT ANTENNA SYSTEMS**
L. Lin*[1], J. Chen[1], D. Jackson[1], W. Kainz[2]
[1]*University of Houston, Houston , TX*
[2]*Division of Physics, Food and Drug Administration, Silver Spring, MD*

1640 **K2-5 STANDARDIZATION AND VARIATION ANALYSIS OF HUMAN EXPOSURE IN AUTOMOTIVE ENVIRONMENTS FOR COMPLIANCE EVALUATION**
M. Wang*[1], J. Chen[1], G. Bit-Babik[2]
[1]*University of Houston, Houston , TX*
[2]*Corporate EME Research Laboratory, Motorola Labs, Fort Lauderdale, FL*

1700 **K2-6 THE USE OF THE ADI-FDTD METHOD FOR CALCULATING RECRUITMENT VOLUME IN HUMAN TORSO DUE TO CONTACT ELECTRODES**
N. Kwatra*, V. Singh, G. Lazzi
NC State University, Raleigh, NC

Business Meetings

1700	**Commission D**	**Room 105**
1700	**Commission F**	**Room 150**
1800	**Commission G**	**Room 200**
1800	**Commission K**	**Room 151**

Reception

1830 – 2100 **Engineering Center Lobby**

WEDNESDAY AM 7 January 2009

Plenary session **Math Auditorium**

Student Paper Competition
Organizer and Chair: Danilo Erricolo, *University of Illinois at Chicago*

0830 **Announcements**

0840 **Presentations by the three finalists**

0940 **Break**

Electromagnetism in Natural Plasmas: from the Upper Atmosphere to Space
Organizers and Co-Chairs: John D. Sahr (Comm. G), *University of Washington*
William E. Amatucci (Comm. H), *Naval Research Laboratory*

1015 **P-1 LIGHTNING-INDUCED EFFECTS IN THE IONOSPHERE AND RADIATION BELTS**
U.S. Inan
Stanford university, Stanford, CA

1100 **P-2 WAVES IN THE EARTHS PLASMA ENVIRONMENT**
G. Ganguli
Naval Research laboratory, Washington, DC

1145 **Awards Ceremony – Student Paper Competition**

WEDNESDAY PM 7 January 2009

Session B6 – Guiding and Coupled Systems
Room 1B40

Chair: Edward F. Kuester, *University of Colorado, Boulder, CO*

1300 **B6-1 OPTIMIZED PASSBAND IMPEDANCE MATCHING SYNTHESIS WITH NONUNIFORM TRANSMISSION LINES**
Y.-W. Hsu*, E.F. Kuester
Department of Electrical and Computer Engineering, University of Colorado, Boulder, CO

1320 **B6-2 INVESTIGATION OF WIRELESS POWER TRANSFER FOR WELL-PIPE APPLICATIONS**
S. Pan*[1], D.R. Jackson[1], J. Chen[1], P. Tubel[2]
[1]*Department of Electrical and Computer Engineering, University of Houston, Houston , TX*
[2]*Tubel Energy, Inc., The Woodlands, TX*

1340 **B6-3 UNDERSTANDING BACKSCATTER RADIO PROPAGATION THROUGH NEW RADIO LINK BUDGETS**

J.D. Griffin*, G.D. Durgin
Georgia Institute of Technology, Atlanta, GA

1400 **B6-4 METAL WAVEGUIDES WITH SHAPE CHANGED CROSS SECTIONS**
T. Zhou, W.T. Joines
Department of Electrical and Computer Engineering, Duke University, Durham, NC

1420 **B6-5 TRANSMISSION OF A SURFACE PLASMON POLARITON THROUGH A SLIT OF A FINITE LENGTH ON A PLANAR METAL SURFACE**
A.A. Maradudin, T.A. Leskova
Department of Physics and Astronomy, University of California, Irvine, CA

1440 **B6-6 NEGATIVE REFRACTION OF A SURFACE PLASMON POLARITON**
T.A. Leskova, A.A. Maradudin
Department of Physics and Astronomy, University of California, Irvine, CA

Session C1 – Signals and Systems
Room 151

Chair: Dev Palmer, *U.S. Army Research Laboratory*

1420 **C1-1 ON THE USE OF DUAL-BAND RECONFIGURABLE ANTENNAS IN DELAY-SENSITIVE MULTI-HOP WIRELESS SENSOR NETWORKS**
J.-F. Chamberland, G.H. Huff
Dept. of Electrical and Computer Engineering, Texas A&M University, College Station, TX

1440 **C1-2 RETROREFLECTOR ELEMENT WITH FREQUENCY AND POLARIZATION SELECTIVITY USED AS A RADAR TARGET FOR GRANULAR MATERIAL RESEARCH**
C. Van Niekerk*, J.T. Bernhard
Dept. of ECE, University of Illinois at Urbana-Champaign, Urbana, IL

1500 **Break**

1520 **C1-3 COMPUTER MODELING OF THE DOPPLER SIGNATURE OF A WALKING HUMAN**
T. Dogaru*, C. Le, G. Kirose
U.S. Army Research laboratory, Adelphi, MD

1540 **C1-4 ADAPTIVE CLEAN WITH TARGET REFOCUSING FOR THROUGH-WALL IMAGE IMPROVEMENT**
P.C. Chang*, R.J. Burkholder, J.L. Volakis
ElectroScience Lab., Ohio State University, Columbus, OH

1600 **C1-5 FPGA PLATFORM FOR SATELLITE OBSERVATIONS OF VLF EMISSIONS**
N.W. Moussa, I. Linscott, U.S. Inan
Stanford University, Stanford, CA

1620 **C1-6 NRD GUIDE PULSE RADAR FOR RANGE FINDING OF MULTI-LAYERED TARGETS AT 60 GHZ**
F. Kuroki, K. Takayama, S. Takeda
Kure National College of Technology, Kure, Japan

Session G2b – Radar and Radio Techniques II
Room 200

Co-Chairs: Frank Lind, *MIT Haystack Observatory,Westford, MA*
T. L. Gaussiran, *University of Texas, TX*

1340 **G2b-1 50 MHZ SOFTWARE DEFINED RADAR FOR METEOR AND AERONOMICAL SCINCE**
J. Urbina[1], R. Seal[1], L. Dyrud[2]
[1]*Pennsylvania State University, State College, PA*
[2]*Center for Remote Sensing, Fairfax, VA*

1400 **G2b-2 THE MILLSTONE UHF RADAR TIMING SYSTEM MODERNIZATION**
F.D. Lind, P.J. Erickson, J. Marchese
MIT Haystack Observatory, Westford, MA

1420 **G2b-3 FIRST SUCCESSFUL APPLICATION OF DYNASONDE DATA ANALYSIS METHODS WITH THE DATA FROM CANADIAN ADVANCED DIGITAL IONOSONDE (CADI)**
N.A. Zabotin*[1,2], J.W. Wright[1,2], J. MacDougall[3]
[1]*University of Colorado, Boulder, CO*
[2]*Dynasonde Solutions Ltd., Longmont, CO*
[3]*University of Western Ontario, London, Ontario, Canada*

1440 **G2b-4 CONSORTIUM APPROACH FOR THE UPPER ATMOSPHERIC FACILITIES**
J. MacDougall

Session GH3b – Ionospheric effects of Lightning II
Room 245

Co-Chairs: Robert C. Moore, *University of Florida, Gainesville, FL*
Steven A. Cummer, *Duke University, Durham, NC*

1520 **GH3b-1 REMOTE OBSERVATIONS OF RUNAWAY ELECTRON PRODUCTION INSIDE THUNDERCLOUDS**
J.R. Dwyer
Florida Institute of Technology, Melbourne, FL

1540 **GH3b-2 TERRESTRIAL GAMMA-RAY FLASH ELECTRON OBSERVATIONS BY THE SAMPEX SATELLITE AND THEIR IMPLICATIONS**
B.E. Carlson*, N.G. Lehtinen, U.S. Inan
Stanford University, Stanford, CA

1600 **GH3b-3 THE SPECTRAL DEPENDENCE OF TGFS ON SOURCE DISTANCE AND OTHER INSIGHTS INTO RHESSI TGFS FROM GEOLOCATED SFERIC DATA**
B.J. Hazelton*[1], D.M. Smith[1], B.W. Grefenstette[1], J.R. Dwyer[2], E.H. Lay[3], R.H. Holzworth[3], X.-M. Shao[4], S.A. Cummer[5], T. Chronis[6]
[1]*University of California, Santa Cruz, CA*
[2]*Florida Institute of Technology, Melbourne, FL*
[3]*University of Washington, Seattle, WA*
[4]*Los Alamos National Laboratory, Los Alamos, NM*
[5]*Duke University, Durham, NC*
[6]*Hellenic Center for Marine Research, Anavissos-Attica, Greece*

1620 **GH3b-4 SPECTROSCOPY OF THE BATSE TGFS WITH THE LADS**
B.W. Gefenstette*[1], D.M. Smith[1], B.J. Hazelton[1], J.R. Dwyer[2]

[1]*University of California, Santa Cruz, CA*
[2]*Florida Institute of Technology, Melbourne, FL*

Session J2b – New Telescopes, Techniques and Observations
Room 265

Co-Chairs: James M. Cordes, *Cornell University, Ithaca, NY*
David P. Woody, *OVRO, Caltech, CA*

1320 **J2b-1 SIMULATIONS OF A PAIRED ANTENNA ATMOSPHERIC DELAY CORRECTION SCHEME FOR CARMA**
J.W. Lamb*, D.P. Woody
Owens Valley Radio Observatory, California Institute of Technology, CA

1340 **J2b-2 CARMA PAIRED ANTENNA CALIBRATION SYSTEM (PACS) FOR ATMOSPHERIC CORRECTION OVER LONG BASELINES**
A. Zauderer*[1], L.M. Peréz[2], M.C.H. Wright[3], J.W. Lamb[4], D.P. Woody[4], A.D. Bolatto[1]
[1]*Department of Astronomy, University of Maryland, College Park, MD*
[2]*Astronomy Department, California Institute of Technology, CA*
[3]*Department of Astronomy and Radio Astronomy Lab., University of California, Berkeley, CA*
[4]*Owens Valley Radio Observatory, California Institute of Technology, CA*

1400 **J2b-3 FIRST SCIENCE OBSERVATIONS WITH MUSTANG ON THE GBT**
B.S. Mason*[1], S.R. Dicker[2], M.J. Devlin[2], P.M. Korngut[2], W.D. Cotton[1], P.A.R. Ade[3], J. Aguirre[2], T.J. Ames[4], D.J. Benford[4], J.A. Chervenak[4], E. Figueroa-Feliciano[5], K.D. Irwin[6], S. Maher[4], M.J. Mello[7], S.H. Moseley[4], J. Staguhn[4], D.J. Tally[4], C. Tucker[4], S.D. White[7]
[1]*National Radio Astronomy Observatory, Charlottesville, VA,*
[2]*University of Pennsylvania, Dept. of Physics & Astronomy, PA*
[3]*School of Physics and Astronomy, Cardiff University, UK*
[4]*NASA Goddard Space Flight Center, Greenbelt, MD*
[5]*Dept. of Physics, Massachusetts Institute of Technology, Cambridge, MA*
[6]*National Institute of Standards and Technology, Boulder, CO*
[7]*National Radio Astronomy Observatory, Green Bank, WV*

1420 **J2b-4 REMOVAL OF DAYTIME THERMAL DEFORMATIONS IN THE GBT ACTIVE SURFACE VIA OUT-OF-FOCUS HOLOGRAPHY**
T.R. Hunter*[1], M. Mello[1], B. Nikolic[2], B. Mason[1], F. Schwab[1], F. Ghigo[1], S. Dicker[3]
[1]*National Radio Astronomy Observatory,Charlottesville, VA*
[2]*Cavendish Laboratory, Cambridge, UK*
[3]*University of Pennsylvania, Philadelphia, PA*

1440 **J2b-5 ASTRONOMICAL APPLICATIONS FOR A QUADRANT DETECTOR INSTRUMENT**
P.A. Ries*[1], T. Hunter[2], F. Ghigo[2]
[1]*University of Virginia*
[2]*NRAO*

Session J5 – Long Baseline Interferometry
Room 265

Co-Chairs: C. Walker
David P. Woody, *OVRO, Caltech, CA*

1520 **J5-1 VLBA OBSERVATIONS OF CASSINI TO IMPROVE THE SATURN EPHEMERIS**
D.L. Jones*[1], E. Fomalont[2], V. Dhawan[3], J. Romney[3], G. Lanyi[1], J. Border[1]

[1]*Jet Propulsion Laboratory, California Institute of Technology, Pasadena, CA*
[2]*National Radio Astronomy Observatory, Charlottesville, VA*
[3]*National Radio Astronomy Observatory, Socorro, NM*

1540 **J5-2 MM/SUBMM-VLBI OF SGRA*: A CLEAR PATH TOWARDS OBSERVING A BLACK HOLE EVENT HORIZON**
S.S. Doeleman
MIT Haystack Observatory, Westford, MA

1600 **J5-3 THE VLBA SENSITIVITY UPGRADE PROJECT**
J.D. Romney*, W.F. Brisken, S.J. Durand, R.C. Walker
National Radio Astronomy Observatory, Socorro, NM

1620 **J5-4 A BANDPASS SAMPLING TECHNIQUE APPLICABLE TO THE VLBA AND SKA PATHFINDER ARRAYS**
S. Durand*, K. Shores, J. Jackson
National Radio Astronomy Observatory, Socorro, NM

1640 **J5-5 JAPANESE VLBI ACTIVITIES - VERA AND VSOP-2**
H. Kobayashi*[1], Y. Murata[2]
[1]*National Astronomical Observatory of Japan, Mitaka, Tokyo, Japan*
[2]*Institute of Space and Astronautical Science, Sagamihara, Kanagawa, Japan*

1700 **J5-6 SOFTWARE CORRELATORS FOR RADIO ASTRONOMY**
A.T. Deller[1], W.F. Brisken*[2]
[1]*Swinburne University of Technology, Melbourne, AU*
[2]*National Radio Astronomy Observatory, Socorro, NM*

THURSDAY AM 8 January 2009

0630 – 0800 **USNC/URSI Executive Council, Millennium Hotel**

Author Index

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