USNC–URSI National Radio Science Meeting

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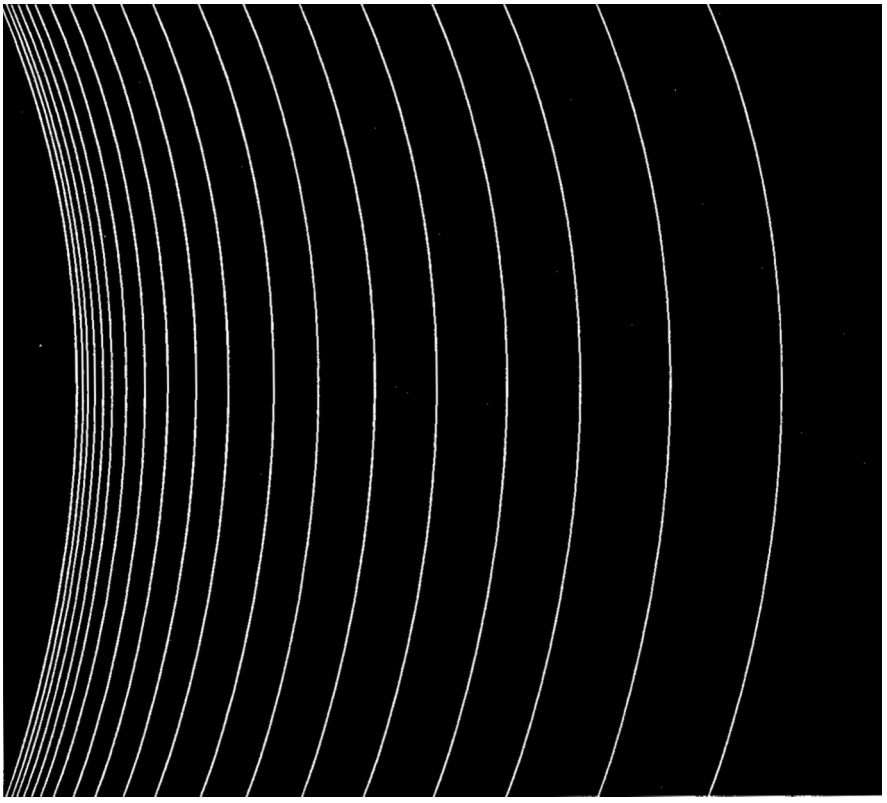

9–12 January 2013

Boulder, Colorado, USA

Sponsored by the US National Committee for

International Union of Radio Science

and CU Conference Services,

University of Colorado Boulder

www.nrsmboulder.org

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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)
Radiocommunication Systems and Signal Processing (Commission C)
Electronics and Photonics (Commission D)
Electromagnetic Environment and Interference (Commission E)
Wave Propagation and Remote Sensing (Commission F)
Ionospheric Radio and 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 of 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 IEEE International Symposium on Antennas and Propagation and USNC-URSI National Radio Science Meeting, 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 five to seven years, a North American Radio Science Meeting (NARSM) is organized, co-sponsored by the U.S. and Canadian National Committees to URSI. Ottawa, Canada hosted the most recent NARSM meeting in July 2007.

The international URSI General Assembly and Scientific Symposium is held every three years in locations around the world. The 30th URSI General Assembly and Scientific Symposium was held in Istanbul, Turkey on August 13-20, 2011. Over 1,000 U.S. and international scientists, including 264 students and Young Scientists, participated in sessions covering all ten commissions. The USNC-URSI is also proud to have hosted the 29th General Assembly in Chicago, Illinois August 7-16, 2008. The USNC-URSI helped to support meeting expenses for approximately 200 U.S. and international students and Young Scientists to attend that meeting. The 31st URSI General Assembly and Scientific Symposium will be held in Beijing, China, in 2014. For further information on USNC-URSI, please visit www.usnc-ursi.org.

U.S. National Committee Leadership and Commission Chairs (2012-2014)

(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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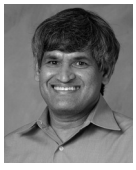

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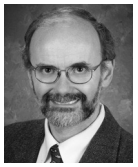

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Starting with this year, authors have the option to have their abstracts archived in IEEE Xplore (subject to standard IEEE processing) through the technical co-sponsorship of the meeting by the IEEE Antennas and Propagation Society (IEEE/AP-S).

UNITED STATES NATIONAL COMMITTEE
INTERNATIONAL UNION OF RADIO SCIENCE

TECHNICAL PROGRAM

National Radio Science Meeting
9-12 January 2013
University of Colorado at Boulder
Sponsored by USNC-URSI

Wednesday Morning **9 January 2013**

Session A1: Antennas: Measurements and Theory
Room 151

Co-Chairs: Steven Weiss, *US Army Research Lab*
Christopher Holloway, *NIST*

08:20 A1-1 ACTIVE ELEMENT PATTERNS FOR LARGE ARRAYS

Alan L. O'Donnell*[1], William A. Davis[2]
[1]*ECE/VTAG, Virginia Tech, Blacksburg*
[2]*ECE/VTAG, Virgnia Tech, Blacksburg*

08:40 A1-2 FLEXIBLE 2-GRAM RECTENNA WITH 50% CONVERSION EFFICIENCY AT VERY LOW INCIDENT POWER DENSITIES

Sean Regalia-Korhummel*
ECEE, CU Boulder, Boulder

09:00 A1-3 THE YAGHJIAN/BEST Q FORMULA AND FUNDAMENTAL LIMITS BOTH FIELD AND CIRCUIT VIEWPOINTS

William A. Davis*
Elec & Comp Engr, Virginia Tech, Blacksburg, VA

09:20 A1-4 COMPACT LOW PROFILE COMMON APERTURE POLARIZATION AND PATTERN DIVERSITY ANTENNAS

Jungsuek Oh*, Kamal Sarabandi
Electrical Engineering and Computer Science, University of Michigan, Ann Arbor, Ann Arbor, MI

10:00 Break

10:20 A1-5 RESONANT PATCH ANTENNAS ON SPHERICAL GROUND PLANES AND THE NEED FOR FRACTIONAL ORDER ASSOCIATED LEGENDRE FUNCTIONS

Steven Weiss*
US Army Research Lab, Adelphi, MD

10:40 A1-6 DESIGN OPTIMIZATION OF BOWTIE NANOANTENNA FOR HIGH-EFFICIENCY THERMOPHOTOVOLTAICS

Sangjo Choi*, Kamal Sarabandi
Electrical Engineering and Computer Science, University of Michigan, Ann Arbor

Session B1: Complex Media
Room 1B40

Co-Chairs: Kubilay Sertel, *The Ohio State University*
Filippo Capolino, *University of California, Irvine*

08:20 B1-1 DESIGN AND EVALUATION OF A CLASS OF MINIATURIZED METAL-BACKED ANTENNA

Jiangfeng Wu*, Kamal Sarabandi
Department of Electrical Engineering and Computer Science, University of Michigan, Ann Arbor, Michigan

08:40 B1-2 FUNDAMENTAL PASSIVITY AND CAUSALITY BOUNDS ON METAMATERIAL CLOAKING

Francesco Monticone*, Andrea Alu
Department of Electrical and Computer Engineering, The University of Texas at Austin, Austin, TX

09:00 B1-3 METAMATERIAL BASED SLOW WAVE STRUCTURE FOR TRAVELLING WAVE TUBES

Nil Apaydin*, Panagiotis Douris, Kubilay Sertel, John L. Volakis
The Ohio State University, ElectroScience Laboratory, Columbus

09:20 B1-4 INCREASED LOCAL DENSITY OF STATES AND ELECTROMAGNETIC WELL EFFECT BY USING VERY THIN HYPERBOLIC METAMATERIAL

Caner Guclu*, Salvatore Campione, Filippo Capolino
Electrical Engineering and Computer Science, University of California, Irvine, Irvine, California

09:40 B1-5 HOMOGENIZATION THEORY, GENERALIZED RETRIEVAL AND INVERSE DESIGN FOR PERIODIC METAMATERIALS

Xing-Xiang Liu*, Andrea Alu
Electrical and Computer Engineering Department, The university of Texas at Austin, Austin

10:00 Break

10:20 B1-6 CONDITIONS FOR ELECTRIC FIELD ENHANCEMENT IN ε-NEAR-ZERO SLABS UNDER TM-POLARIZED OBLIQUE INCIDENCE

Salvatore Campione*[1], Domenico de Ceglia[2], Maria A. Vincenti[2], Michael Scalora[3], Filippo Capolino[1]
[1]*University of California Irvine, Irvine, CA*
[2]*Aegis Technologies Inc., Huntsville, AL*
[3]*US Army Charles M. Bowden Research Center, Huntsville, AL*

10:40 B1-7 ULTRA-BROADBAND ABSORPTION IN METALLIC GRATINGS AT THE PLASMONIC BREWSTER ANGLE

Christos Argyropoulos*, Andrea Alu
Electrical and Computer Engineering, University of Texas at Austin, Austin, TX

11:00 B1-8 A LATTICE-BASED EQUIVALENT CIRCUIT MODEL FOR FREQUENCY SELECTIVE SURFACES

David L. Rolando*, Gregory H. Huff
Department of Electrical and Computer Engineering, Texas A&M University, College Station, TX

11:20 B1-9 SIMULATION AND EXPERIMENTAL RESULTS FOR A PLANAR STRIP DIPOLE OVER PEC AND FERRITE-METAMATERIAL GROUND PLANES

Mohamed Khalil*[1], James K. Breakall[2], Kate J. Duncan[1], Glenn Minko[1]
[1]*STCD, CERDEC, Aberdeen Proving Ground MD*
[2]*Electrical Enginnering Department, Penn State University, University Park PA*

11:40 B1-10 TERAHERTZ NANOCIRCUITS BASED ON ACTIVE GRAPHENE TRANSMISSION-LINES

Pai-Yen Chen*, Andrea Alu
Electrical and Computer Engineering, University of Texas at Austin, Austin

Session B2: Antenna Arrays
Room 155

Co-Chairs: Yahya Rahmat-Samii, *University of California, Los Angeles*
Karl Warnick, *Brigham Young University*

10:20 B2-1 IMPROVED SCANNING OF WIDEBAND ARRAYS USING A RECONFIGURABLE SURFACE

Jonathan P. Doane*, Kubilay Sertel, John L. Volakis
ElectroScience Laboratory, Ohio State University, Columbus

10:40 B2-2 BROADBAND, HIGH EFFICIENCY DIELECTRIC RESONATOR ANTENNA ARRAY FOR SATELLITE COMMUNICATION

Binh T. Tran*, Karl F. Warnick
Department of Electrical and Computer Engineering, Brigham Young University, Provo, Utah

11:00 B2-3 JOINT TIME AND FREQUENCY DESIGN OF ULTRA-WIDE BAND TIGHTLY COUPLED CIRCULARLY POLARIZED SPIRAL ARRAYS

Dejan S. Filipovic, Mohamed Elmansouri*
University of Colorado, Boulder, Colorado

11:20 B2-4 SIGNAL QUALITY IN A MULTIBEAM TRANSMIT ARRAY

Randy L. Haupt[1], Manoja D. Weiss*[2]
[1]*Dept. of Electrical Engineering and Computer Science, Colorado School of Mines, Golden, CO*
[2]*Ball Aerospace and Technologies Corp., Westminster, CO*

11:40 B2-5 LOW COST, ELECTRONICALLY STEERED ARRAY FEED SYSTEM FOR KU BAND SATELLITE COMMUNICATION

Kyle C. Browning*, Karl F. Warnick
ECE Dept., Brigham Young University, Provo

Session BK1: Sensors for Independent Living
Room 155

Co-Chairs: Erdem Topsakal, *Mississippi State University*
John Volakis, *Ohio State University*

08:20 BK1-1 TRULY WEARABLE RFID TAGS FOR WIRELESS BODY-CENTRIC IDENTIFICATION AND SENSING SYSTEMS

Karoliina Koski*[1], Elham Moradi[1], Toni Bjrninen[1], Leena Ukkonen[1], Yahya Rahmat-Samii[2]
[1]*Department of Electronics, Tampere University of Technology, Tampere, Finland*
[2]*Electrical Engineering Department, University of California Los Angeles, Los Angeles*

08:40 BK1-2 WIRELESS SMARTPHONE COMMUNICATION FOR MEDICAL TELEMETRY SYSTEMS

Ryan Green*, Mustafa Asili, Erdem Topsakal
Mississippi State University, Mississippi State, MS

09:00 BK1-3 DETERMINING THE RELATIVE PERMITTIVITY OF DEEP EMBEDDED BIOLOGICAL TISSUES

Safa Salman*, John L. Volakis
The Electroscience Lab - The Ohio State University, Columbus Ohio

09:20 BK1-4 AN IMPLANTABLE MICROFLUIDIC ANTENNA FOR BIOMEDICAL SENSING

Pu Chen[1], Utkan Demirci*[1], Erdem Topsakal[2]
[1]*Brigham and Women's Hospital, Harvard Medical School, Boston, MA*
[2]*Electrical and Computer Engineering, Mississippi State University, Mississippi State, MS*

09:40 BK1-5 ANALYSIS OF NON-LINEAR MAGNETIC CORE FOR MAGNETIC NEURAL STIMULATORS

Anil K. RamRakhyani*, Gianluca Lazzi
ECE, University of Utah, Salt Lake City

Session EFJ1: Radio Frequency Interference Mitigation and Spectrum Usage
Room 265

Co-Chairs: Andrew Clegg, *National Science Foundation*
Charles Baylis, *Baylor University*
David Kunkee, *The Aerospace Corporation*

08:20 EFJ1-1 SPECTRUM MANAGEMENT FOR SCIENCE IN THE 21ST CENTURY

Michael M. Davis*
Committee on Radio Frequencies, Board on Physics and Astronomy National Academies, Washington, DC

08:40 EFJ1-2 SPECTRUMWIKI: A FRAMEWORK FOR A CROWD-SOURCED REPOSITORY OF INFORMATION ON SPECTRUM USAGE

Andrew Clegg*
National Science Foundation, Arlington, Virginia

09:00 EFJ1-3 PERFORMANCE CHARACTERIZATION OF THE SMAP RFI MITIGATION ALGORITHM USING DIRECT-SAMPLED SMAPVEX 2012 DATA

Sidharth Misra*[1], Joel Johnson[2], Mustafa Aksoy[2], Jeffrey Piepmeier[3], Damon Bradley[3], Hsin Li[3], James Mederios[3], Ian O'Dwyer[1]
[1]*Jet Propulsion Laboratory, Pasadena, CA*
[2]*Ohio State University, Columbus, OH*
[3]*Goddard Space Flight Center, Greenbelt, MD*

09:20 EFJ1-4 RFI CHARACTERIZATION FOR SMAP USING L-BAND DIRECT SAMPLED DATA OBTAINED DURING THE SMAPVEX12 AIRBORNE CAMPAIGN

Mustafa Aksoy*[1], Joel T. Johnson[1], Sidharth Misra[2], Ian ODwyer[2]
[1]*The Ohio State University, Columbus, OH*
[2]*Jet Propulsion Laboratory, Pasadena, CA*

09:40 EFJ1-5 PRECISE ESTIMATION OF PASSIVE ENVIRONMENTAL MICROWAVE BRIGHTNESS TEMPERATURES IN THE PRESENCE OF WEAK DIGITAL INTERFERING SIGNALS

Eric M. McIntyre*, Albin J. Gasiewski
Electrical Engineering, University of Colorado at Boulder, Boulder

10:00 Break

10:20 EFJ1-6 FUTURE CHALLENGES FOR RADIO ASTRONOMY

Karen Oneil*, John Ford, Mike McCarty, Toney Minter, Richard Prestage
National Radio Astronomy Observatory, Green Bank, WV

10:40 EFJ1-7 RADIO FREQUENCY INTERFERENCE MANAGEMENT EFFORTS AT THE NATIONAL RADIO ASTRONOMY OBSERVATORY GREEN BANK SITE

Carla Beaudet, John Ford*, Toney Minter, Mike McCarty, Karen O'Neil, Richard Prestage
National Radio Astronomy Observatory, Green Bank, WV

11:00 EFJ1-8 RADIO FREQUENCY INTERFERENCE IDENTIFICATION AND MITIGATION IN PULSAR OBSERVATIONS USING MACHINE LEARNING TECHNIQUES

Mike McCarty[1], Gary Doran[2], T. Joseph W. Lazio[2], David R. Thompson[2], John Ford*[1], Richard Prestage[1]
[1]*National Radio Astronomy Observatory, Green Bank, WV*
[2]*Jet Propulsion Laboratory, California Institute of Technology, Pasadena, CA*

11:20 EFJ1-9 A METHODOLOGY FOR RADIO NOISE MEASUREMENT AND MODELING

Qingsheng Zeng*
Communications Research Centre Canada, Ottawa, Ontario, Canada

11:40 EFJ1-10 ANALYSIS AND PREDICTION OF CANADIAN ELECTROMAGNETIC ENVIRONMENT

Qingsheng Zeng*
Communications Research Centre Canada, Ottawa, Ontario, Canada

Session F1: Atmospheric and Oceanic Remote Sensing
Room 150

Co-Chairs: Andreas Muschinski, *NorthWest Research Associates, CoRA Office*
Kultegin Aydin, *Pennsylvania State University*

08:20 F1-1 ESTIMATION OF NEAR FIELD THERMAL EMISSION FROM BODIES WITH INHOMOGENEOUS TEMPERATURE PROFILE FOR RADIOMETER CALIBRATION

Srikumar Sandeep*, Albin J. Gasiewski
Department of electrical, computer and energy engineering, University of Colorado, Boulder, Boulder, Colorado

08:40 F1-2 CONVECTIVE VERSUS STRATIFORM RAIN MICROPHYSICS CHARACTERIZED BY 2D-VIDEO DISDROMETER AND POLARIMETRIC RADAR OBSERVATIONS - THE FUZZY LOGIC APPROACH

Petar Bukovcic*[1,2,3,4], Dusan Zrnic[2], Guifu Zhang[1,4]
[1]*School of Meteorology, University of Oklahoma, Norman, OK*
[2]*National Severe Storms Laboratory, Norman, OK, United States of America*
[3]*Cooperative Institute for Mesoscale Meteorological Studies, Norman, OK, United States of America*
[4]*Advanced Radar Research Center, Norman, OK, United States of America*

09:00 F1-3 FIRST RESULTS FROM THE NCAR 449 MHZ, 126-ELEMENT WIND PROFILER RADAR

Brad Lindseth*[1,2], William O. J. Brown[1], Charlie Martin[1], Terry Hock[1], Stephen A. Cohn[1], Zoya Popovic[2]
[1]*Earth Observing Laboratory, NCAR, Boulder, Colorado*
[2]*Electrical, Computer and Energy Engineering, University of Colorado, Boulder, Colorado*

09:20 F1-4 USING DUAL-SCAN AND DUAL-POLARIZATION OF WEATHER RADAR SIGNALS TO DETECT GROUND CLUTTER

Yinguang Li*[1], Guifu Zhang[2], Richard J. Doviak[3]
[1]*School of Electrical and Computer Engineering, University of Oklahoma, Norman, OK*
[2]*School of Meteorology, University of Oklahoma, Norman, OK*
[3]*NSSL, Norman, OK*

09:40 F1-5 AN OPTICAL STEREOSCOPIC METHOD FOR RANGE-RESOLVED RETRIEVAL OF THE CROSS-PATH WIND VELOCITY

Shiril Tichkule*[1], Andreas Muschinski[2]
[1]*University of Colorado Boulder, Boulder, CO*
[2]*NorthWest Research Associates, Boulder, CO*

10:00 Break

10:20 F1-6 ON THE ESTIMATION OF WIND VECTORS OVER THE SEA SURFACE FROM NEAR-NADIR RADAR OBSERVATIONS

Jeffrey D. Ouellette*[1], Joel T. Johnson[1], Ninoslav Majurec[1], Alexey Nekrasov[2,3]
[1]*The Ohio State University, Columbus, OH*
[2]*Southern Federal University, Taganrog, Rostov Region, Russia*
[3]*The University of New South Wales, Kingsford, Sydney, New South Wales, Australia*

10:40 F1-7 CONFORMAL ARRAY OF LOG-PERIODIC FOLDED SLOT ANTENNAS FOR AN ENDFIRE OBSTACLE AVOIDANCE SAR ON A CRYOBOT

Srikumar Sandeep, Albin J. Gasiewski*
Department of electrical, computer and energy engineering, University of Colorado, Boulder, Boulder, Colorado

11:00 F1-8 POTENTIAL ROLE OF DUAL-POLARIZATION X-BAND RADAR IN HYDROLOGICAL APPLICATION

Haonan Chen*, V. Chandrasekar
Colorado State University, Fort Collins, Colorado

Session GH1: Meteors, Orbital Debris, and Dusty Plasmas I
Math 100

Co-Chairs: Christopher Crabtree, *Naval Research Laboratory*
Sigrid Close, *Stanford University*

08:20 GH1-1 RADIO SCIENCE ASPECTS OF RADAR METEOR OBSERVATIONS: WHAT NEXT?

John D. Mathews*
Radar Space Sciences Lab, Penn State University, University Park, PA

08:40 GH1-2 ORBITAL DEBRIS REMEDIATION BY HYPERVELOCITY DUST IMPACT

Gurudas Ganguli*
Naval Research Laboratory, Washington DC

09:00 GH1-3 3D EVOLUTION OF INTERPOSED COMPRESSIBLE MAGNETOFLUIDS

Russell B. Dahlburg*[1], Leonid Rudakov[2], Guru Ganguli[3]
[1]*Laboratory for Computational Physics and Fluid Dynamics, Naval Research Laboratory, Washington DC*
[2]*Icarus Research Inc., Bethesda MD*
[3]*Plasma Physics Division, Naval Research Laboratory, Washington DC*

09:20 GH1-4 EXPERIMENTAL OBSERVATION AND COMPUTATIONAL MODELING OF HYPERVELOCITY IMPACTS WITH EMPHASIS ON PLASMA FORMATION AND ITS CONSEQUENCES

David A. Crawford*
Sandia National Laboratories, Albuquerque, NM

09:40 GH1-5 TEMPERATURE CHARACTERIZATION OF IMPACT-GENERATED PLASMA

Andrew Collette*, Keith Drake, Anna Mocker
CCLDAS/LASP, University of Colorado at Boulder, Boulder, CO

10:00 Break

10:20 GH1-6 THEORY AND EXPERIMENTS CHARACTERIZING HYPERVELOCITY IMPACT PLASMAS: TOWARD WEATHERPROOF SPACECRAFT SYSTEMS

Nicolas Lee*, Sigrid Close
Aeronautics and Astronautics, Stanford University, Stanford, CA

10:40 GH1-7 TRANSIENT PLASMA ANALYZER FOR HYPERVELOCITY IMPACT EXPERIMENTS

David Lauben*, Sigrid Close, Ashish Goel, Nicholas Lee, Paul Tarantino
Stanford University, Stanford, CA

11:00 GH1-8 PLASMA TURBULENCE OF NON-SPECULAR TRAIL PLASMAS AS MEASURED BY A HIGH POWER LARGE APERTURE RADAR

Jonathan Yee*, Sigrid Close
Aeronautics/Astronautics, Stanford University, Stanford, California

11:20 GH1-9 HIGH-ALTITUDE METEORS AND METEOROID FRAGMENTATION OBSERVED AT JICAMARCA

John D. Mathews*, Boyi Gao, Julio Urbina, Freddy Galindo
Radar Space Sciences Lab, Penn State University, University Park, PA

11:40 GH1-10 MODELING THE EFFECT OF TURBULENCE ON SPECULAR METEOR ECHOES: PRELIMINARY RESULTS

Freddy Galindo*[1], Julio Urbina[2], Lars Dyrud[2], Jonathan Fentzke[2]
[1]*Electrical Engineering, Pennsylvania State University, University Park, Pennsylvania*
[2]*Applied Physics Laboratory, John Hopkins University, Columbia, Maryland*

Session GHE1: Lightning and its Interaction with the Ionosphere I
Room 105

Co-Chairs: Sebastien Celestin, *LPC2E, University of Orleans / CNRS*
Ningyu Liu, *Florida Institute of Technology*
Joseph Dwyer, *Florida Tech*

08:20 GHE1-1 RECENT ROCKET-AND-WIRE TRIGGERED LIGHTNING EXPERIMENTS AT CAMP BLANDING: DE/DT AND X-RAY TIME-OF-ARRIVAL MEASUREMENTS OF THE PROPAGATION MECHANISMS AND GROUND ATTACHMENT PROCESSES OF DART-STEPPED LEADERS

Jonathan D. Hill*[1], Martin A. Uman[1], Douglas M. Jordan[1], Terry Ngin[1], William Gamerota[1], John T. Pilkey[1], Joseph R. Dwyer[2], Hamid Rassoul[2]
[1]*Electrical and Computer Engineering, University of Florida, Gainesville, FL*
[2]*Physics and Space Sciences, Florida Institute of Technology, Melbourne, FL*

08:40 GHE1-2 LIGHTNING ENERGETICS

Hugh J. Christian*, Phillip Bitzer, Daniel Walker, Jeffrey Burchfield
ESSC, University of Alabama in Huntsville, Huntsville, AL

09:00 GHE1-3 PRODUCTION OF VERY HIGH POTENTIAL IN INTRA-CLOUD LIGHTNING IN CONNECTION WITH TERRESTRIAL GAMMA RAY FLASHES

Sotirios A. Mallios*, Sebastien Celestin, Victor P. Pasko
Electrical Engineering, Pennsylvania State University, University Park, PA

09:20 GHE1-4 LONG RECOVERY OF THE LOWER IONOSPHERE FROM THE QUASI-ELECTROSTATIC EFFECTS OF CLOUD-TO-GROUND LIGHTNING

Ningyu Liu*
Physics and Space Sciences, Florida Institute of Technology, FL

09:40 GHE1-5 MINIMUM CHARGE MOMENT CHANGE IN POSITIVE AND NEGATIVE CLOUD TO GROUND LIGHTNING DISCHARGES PRODUCING SPRITES

Jianqi Qin*, Sebastien Celestin, Victor P. Pasko
The Pennsylvania State University, University Park, PA

10:00 Break

10:20 GHE1-6 LOW FREQUENCY ELECTROMAGNETIC RADIATION FROM SPRITE STREAMERS

Jianqi Qin*, Sebastien Celestin, Victor P. Pasko
Electrical Engineering, The Pennsylvania State University, University Park, PA

10:40 GHE1-7 SPECTRAL OBSERVATIONS OF EARLY/FAST VLF SCATTERING EVENTS

Daniel A. Kotovsky*, Robert C. Moore
Electrical and Computer Engineering, University of Florida, Gainesville, FL

11:00 GHE1-8 SPREAD-SPECTRUM VLF REMOTE SENSING OF LEP EVENTS

Michael Mitchell*, Robert C. Moore
Electrical and Computer Engineering, University of Florida, Gainesville, FL

11:20 GHE1-9 THE EFFECT OF LIGHTNING RETURN STROKE SPEED ON EARTH-IONOSPHERE WAVEGUIDE EXCITATION

Neal A. Dupree, Robert C. Moore*
Electrical and Computer Engineering, University of Florida, Gainesville, FL

Session HGF1: Global Navigation Satellite Systems and Radio Beacon Remote Sensing I
Room 245

Co-Chairs: Charles Carrano, *Boston College*
Anthea Coster, *MIT*
Valery Zavorotny, *NOAA/Earth System Research Laboratory*

08:20 HGF1-1 SATELLITE-BASED MEASUREMENTS OF RADIO PHASE SCINTILLATION USING CITRIS, DORIS AND CERTO

Carl L. Siefring*, Paul A. Bernhardt
Plasma Physics Division, Naval Research Laboratory, Washington, DC

08:40 HGF1-2 LONGITUDE-ALTITUDE TOMOGRAPHIC IMAGES OF EQUATORIAL PLASMA DEPLETIONS USING THE C/NOFS CERTO BEACON

Matthew A. Hei[1], Carl L. Siefring*[1], Paul A. Bernhardt[1], Matthew R. Wilkens[2], Joseph D. Huba[1], Jonathan F. Krall[1], Cesar E. Valladares[3], Trevor Garner[4], Roderick Heelis[5]
[1]*Plasma Physics Division, Naval Research Laboratory, Washington, DC*
[2]*Sotera Defense Solutions Inc, Herndon, VA*
[3]*Institute for Scientific Research, Boston College, Chestnut Hill, MA*
[4]*SGL/ARL, University of Texas at Austin, Austin, TX*
[5]*Center for Space Sciences, University of Texas at Dallas, Richardson, TX*

09:00 HGF1-3 LOW-LATITUDE ELECTRON DENSITY PROFILES OBSERVED BY COSMIC COMPARED WITH IN SITU ION DENSITIES MEASURED BY CNOFS

William J. Burke*, Pei-Chen Lai
Institute for Scientific Research, Boston College, Chestnut Hill, MA

09:20 HGF1-4 ESTIMATE OF ABSOLUTE TEC FROM DUAL-BAND BEACON RECEIVER NETWORK IN SOUTHEAST ASIA

Mamoru Yamamoto*[1], Kornyanat Watthanasangmechai[1], Sudarsanam Tulasi Ram[2]
[1]*RISH, Kyoto University, Uji, Kyoto, Japan*
[2]*EGRL, Indian Institute of Geomagnetism, Tirunelveli, India*

09:40 HGF1-5 PRELIMINARY RESULTS FROM THE AURORAL GPS SCINTILLATION ARRAY

Gary Bust*[1], Seebany Datta-Barua[2], Susan Skone[3], Kshitija Deshpande[4]
[1]*Geospace and Earth Science Group, JHUAPL, Laurel Maryland*
[2]*Mechanical and Aerospace Engineering, Illinois Institute of Technology, Chicago Illinois*
[3]*Schulich School of Engineering, University of Calgary, Calgary Alberta, Canada*
[4]*Electrical and Computer Engineering, Virginia Tech University, Blacksburg Virginia*

10:00 Break

10:20 HGF1-6 STRUCTURE OF POLAR CAP PATCHES AND FAST SHEAR FLOWS FOLLOWING THE CME IMPACT ON 22 JANUARY 2012 INFERRED FROM GPS SCINTILLATION SPECTRA

Charles S. Carrano*[1], Santimay Basu[1], Sunanda Basu[1], Eileen MacKenzie[1], Keith Groves[1], Todd Pedersen[2], Jeffrey Holmes[2]
[1]*Boston College, Chestnut Hill, MA*
[2]*Air Force Research Laborartory, Albuquerque, MA*

10:40 HGF1-7 IONOSPHERIC SCINTILLATION STUDY OVER INDIAN ANTARCTICA STATION MAITRI USING GPS DATA AS PART OF IPY 2008

Purushottam Bhawre*, Parvaiz A. Khan, Azad A. Mansoori, A K. Gwal
Department of physics, Barkatullah University, Bhopal, Madhya Pradesh, India

11:00 HGF1-8 ROLE OF ATMOSPHERIC COUPLING PROCESSES ON EQUATORIAL SPREAD-F (ESF)

Sanjay Kumar*, Abhay K. Singh
Aryabhatta Research Institute of Observational Sciences (ARIES), Manora Peak, Uttarakhand, India

Session B3: Antenna Theory, Design and Measurement
Room 1B40

Co-Chairs: John Volakis, *Ohio State University*
Sembiam Rengarajan, *California State University*

13:20 B3-1 COMPUTATION OF THE Q LIMITS FOR ARBITRARY-SHAPED ANTENNAS USING CHARACTERISTIC MODES

Jeffrey Chalas*, Kubilay Sertel, John L. Volakis
Electrical and Computer Engineering, The Ohio State University, Columbus, OH

13:40 B3-2 EBG-DIPOLE ARRAY ANTENNA CREATING BEAM-TILT FOR BASE-STATION APPLICATIONS

Ilkyu Kim*, Yahya Rahmat-Samii
Electrical Engineering, UCLA, Los Angeles and California

14:00 B3-3 FAR FIELD EXTRAPOLATION IN THE BORESIGHT DIRECTION FROM NEAR FIELD SAMPLES TO IMPROVE THE SIGNAL INTEGRITY IN TIME DOMAIN MEASUREMENT

Sembiam R. Rengarajan*
Electrical and Computer Engineering, California State University, Northridge, CA

14:20 B3-4 USING TRANSIENT PROPERTIES OF A TUNABLE NARROWBAND ANTENNA TO REALIZE A DUAL-BAND ANTENNA

Mohsen Salehi*, Majid Manteghi
ECE, Virginia Tech, Blacksburg, VA

14:40 B3-5 SMALL CASSEGRAIN ANTENNA FOR PASSIVE REMOTE SENSING AT L-BAND

Wasyl Wasylkiwskyj*, Roger Lang, Mehmet Ogut
Electrical and Computer Engineering, George Washington University, Washington DC

15:00 Break

15:20 B3-6 HIGH CROSS POLARIZED KU-BAND OMT DESIGN FOR SNG VEHICLES

Salih M. Bostan*[1], Hamid Torpi[2], Julio V. Urbina[1]
[1]*Electrical Engineering/Communications and Space, Sciences Laboratory, The Pennsylvania State University, State College, PA*
[2]*Electronics and Communication Engineering/ EM Fields and Microwave Techniques, Yildiz Technical University, Istanbul, Turkey*

15:40 B3-7 WRAPAROUND S-BAND AND GPS ANTENNA ARRAYS FOR SOUNDING ROCKET SUB-PAYLOAD

Maimaitirebike Maimaiti*, Reyhan Baktur
ECE Dep., Utah State University, Logan, Utah

16:00 B3-8 A COMPARATIVE STUDY BETWEEN CMA EVOLUTION STRATEGIES AND PARTICLE SWARM OPTIMIZATION FOR ANTENNA APPLICATIONS

Joshua M. Kovitz*, Yahya Rahmat-Samii
Electrical Engineering Department, University of California Los Angeles, Los Angeles, CA

16:20 B3-9 A 60-GHZ ACTIVE-INTEGRATED ANTENNA OSCILLATOR

Chuan-Chang Liu*, Renaud Moussounda, Roberto G. Rojas
The Ohio State University, Columbus

16:40 B3-10 HIGH FREQUENCY VECTOR SENSOR DESIGN AND TESTING

Geoffrey S. San Antonio*, William W. Lee, Mark G. Parent
Radar Division, Naval Research Laboratory, Washington, DC

Session BK2: Biophotonics
Room 155

Co-Chairs: Ilker Capoglu, *Northwestern University*
Jamesina Simpson, *University of Utah*

13:20 BK2-1 PLASMONIC NANOSTRUCTURES FOR SENSING

Kevin L. Shuford*
Department of Chemistry, Baylor University, Waco, TX

13:40 BK2-2 DETERMINATION OF CELL DEATH MECHANISMS INITIATED DURING GOLD NANOPARTICLE-MEDIATED PHOTOTHERMAL THERAPY

Varun P. Pattani*, James W. Tunnell
Department of Biomedical Engineering, The University of Texas at Austin, Austin, TX

14:00 BK2-3 SHG MICROSCOPY AND SCATTERING SPECTROSCOPY TO PROBE EXTRACELLULAR MATRIX ALTERATIONS IN OVARIAN CANCER

Paul J. Campagnola*, Karissa Tilbury, Kirby Campbell, Chi-Hsiang Lien, Gunnsteinn Hall
University of Wisconsin-Madison, Madison, WI

14:20 BK2-4 FIBER OPTIC PROBE FOR EARLY DETECTION OF LUNG CANCER

Nikhil N. Mutyal*, Andrew Radosevich, Jeremy D. Rogers, Hemant K. Roy, Vadim Backman
Biomedical Engineering, Northwestern University, Evanston IL

14:40 BK2-5 MEASURING THE NANOSCALE MASS-DENSITY FLUCTUATIONS WITHIN BIOLOGICAL CELLS USING OPTICAL AND ELECTRON MICROSCOPY

Dhwanil P. Damania*[1], Ilker Capoglu[1], Jeremy D. Rodgers[1], Hariharan Subramanian[1], Lusik Cherkezyan[1], Reiner Bleher[2], Jinsong Wu[2], Vinayak Dravid[2], Vadim Backman[1]
[1]Biomedical Engineering, Northwestern University, Evanston,IL
[2]Department of Materials Science and Engineering, Northwestern University, Evanston,IL

15:00 Break

15:20 BK2-6 QUANTITATIVE IMAGING OF TUMOR VASCULARITY TO EXPLORE CHANGES ASSOCIATED WITH COLON CARCINOGENESIS

Sarah Ruderman*[1], Mariano Gonzalez-Haba[2], Urszula Dougherty[2], Jana Zujovic[1], Jeremy D. Rogers[1], Andrew J. Gomes[1], Thrasyvoulos N. Pappas[1], Vani Konda[2], Vadim Backman[1]
[1]Biomedical Engineering, Northwestern University, Evanston, IL
[2]Division of Biological Sciences, University of Chicago, Chicago, IL

15:40 BK2-7 REAL TIME BLOOD TESTING USING QUANTITATIVE PHASE IMAGING

Gabriel Popescu*
Beckman Institute, University of Illinois Urbana-Champaign, Urbana, IL

16:00 BK2-8 VIRTUAL OPTICS: SEEING THROUGH TURBID MEDIA AND BEYOND

Snow H. Tseng*, Wei-Lun Ting
Graduate Institute of Photonics and Optoelectronics, National Taiwan University, Taipei, Taiwan

16:20 BK2-9 SPECTRAL ENCODING OF SPATIAL FREQUENCY APPROACH FOR IMAGING AND CHARACTERIZATION OF 3D STRUCTURES

Shikhar Uttam*[1], Sergey Alexandrov[2], Rajan Bista[1], Yang Liu[1]
[1]Dept. of Medicine, Dept. of Bioengineering, University of Pittsburgh, Pittsburgh, PA
[2]Dept. of Physics, National University of Ireland, Galway, Ireland

16:40 BK2-10 BIOPHOTONICS: COMPUTATIONAL AND OPTICAL ADVANCES IN MULTIDIMENSIONAL BIOLOGICAL IMAGING

Kevin W. Eliceiri*
LOCI, University of Wisconsin at Madison, Madison

Session EF1: RFI Mitigation and High-Power Electromagnetics
Room 1B51

Co-Chairs: Everett Farr, *Farr Fields, LC*
Lawrence Cohen, *Naval Research Laboratory*

13:20 EF1-1 A SUMMARY OF SPECTRUM ENGINEERING, THE WHY AND HOW

Eric L. Mokole*, Lawrence S. Cohen
Radar Division, Naval Research Laboratory, Washington DC

13:40 EF1-2 RADAR PERFORMANCE DEGRADATION WITH IN-BAND OFDM COMMUNICATIONS SYSTEM INTERFERENCE

Brian D. Cordill[1], Sarah A. Seguin*[1], Lawrence Cohen[2]
[1]*Electrical Engineering and Computer Science, University of Kansas, Lawrence, KS*
[2]*Naval Research Laboratory, Washington, D.C.*

14:00 EF1-3 FAST LOAD-IMPEDANCE OPTIMIZATION TO REDUCE SPECTRAL SPREADING AND MAXIMIZE EFFICIENCY IN RADAR TRANSMITTER AMPLIFIERS

Josh Martin[1], Charles Baylis*[1], Robert J. Marks[1], Lawrence Cohen[2]
[1]*Dept. of Electrical and Computer Engineering, Baylor University, Waco, Texas*
[2]*Radar Div., Naval Research Laboratory, Washington, DC*

14:20 EF1-4 RADAR WAVEFORM OPTIMIZATION TO REDUCE SPECTRAL SPREADING AND MAXIMIZE TARGET DETECTION

Charles Baylis*[1], Matthew Moldovan[1], Matthew Fellows[1], David Moon[1], Robert J. Marks II[1], Lawrence Cohen[2]
[1]*Dept. of Electrical and Computer Engineering, Baylor University, Waco, Texas*
[2]*Radar Div., Naval Research Laboratory, Washington, DC*

14:40 EF1-5 INTERFERENCE MITIGATION VIA PHASE-ONLY TRANSMIT NULLING: PRELIMINARY EXPERIMENTAL RESULTS

Thomas Higgins*, Tegan Webster, Aaron K. Shackelford
Radar Division, United States Naval Research Laboratory, Washington, DC

15:00 Break

15:20 EF1-6 CONSIDERATIONS OF HIGH POWER ELECTROMAGNETIC (HPEM) TRANSIENTS WITH RESPECT TO SMART GRID

William A. Radasky[1], Galen Koepke*[2]
[1]*Metatech Corporation, Goleta, California*
[2]*NIST, Boulder, Colorado*

15:40 EF1-7 A SECOND LOOK AT CHARACTERIZING ANTENNA PERFORMANCE IN THE TIME DOMAIN

Everett G. Farr*
Farr Fields, LC, Albuquerque, NM

Session F2: Passive Remote Sensing of the Earth's Environment: In Honor of the Career of Dr. Hans J. Liebe
Room 150

Co-Chairs: Edgeworth Westwater, *University of Colorado at Boulder (retired)*
Albin Gasiewski, *University of Colorado at Boulder*
Steven Reising, *Colorado State University*

13:20 F2-1 MICROWAVE SPECTRAL LINE MODEL DEVELOPMENT: A RETROSPECTIVE IN HONOR OF DR. HANS J. LIEBE

Albin J. Gasiewski*[1], Ed R. Westwater[1], Philip W. Rosenkranz[2]
[1]*Dept of ECEE, University of Colorado at Boulder, Boulder, CO*
[2]*Research Laboratory of Electronics, Massachusetts Institute of Technology, Cambridge, MA*

13:40 F2-2 A UNIFIED MICROWAVE RADIATIVE TRANSFER MODEL WITH JACOBIAN FOR GENERAL STRATIFIED MEDIA: EXTENSION AND NUMERICAL RESULTS

Miao Tian*, Albin J. Gasiewski
ECEE, University of Colorado at Boulder, Boulder, Colorado

14:00 F2-3 RETRIEVAL OF WET-PATH DELAY FROM SSMIS OBSERVATIONS OVER COASTAL AND INLAND WATER REGIONS USING THE BRIGHTNESS TEMPERATURE DEFLECTION RATIO METHOD

Kyle L. Gilliam*[1], Xavier Bosch-Lluis[1], Steven C. Reising[1], Alan W. Tanner[2], Shannon Brown[2], Pekka Kangaslahti[2]
[1]*Microwave Systems Laboratory, Colorado State University, Fort Collins, CO*
[2]*Jet Propulsion Laboratory, California Institute of Technology, Pasadena, CA*

14:20 F2-4 HIGH-RESOLUTION WET-TROPOSPHERIC PATH DELAY CORRECTIONS FOR COASTAL AND INLAND WATER ALTIMETRY USING WIDE-BAND AIRBORNE MICROWAVE AND MILLIMETER-WAVE RADIOMETERS

Steven C. Reising*[1], Pekka Kangaslahti[2], Shannon T. Brown[2], Alan B. Tanner[2], Sharmila Padmanabhan[2], Chaitali Parashare[2], Xavier Bosch-Lluis[1], Scott P. Nelson[1], Thaddeus Johnson[1], Victoria Hadel[1], Douglas E. Dawson[2], Oliver Montes[2], Todd Gaier[2], Behrouz Khayatian[2], Kyle L. Gilliam[1]
[1]*Microwave Systems Laboratory, Colorado State University, Fort Collins, CO*
[2]*California Institute of Technology, Jet Propulsion Laboratory, Pasadena, CA*

14:40 F2-5 L-BAND RETRIEVAL OF OCEAN SURFACE SALINITY AND WIND USING AQUARIUS COMBINED ACTIVE-PASSIVE DATA

Simon Yueh*, Wenqing Tang, Alexander Fore, Akiko Hayashi
Jet Propulsion Laboratory, California Institute of Technology, Pasadena, California

15:00 Break

15:20 F2-6 CUBESAT BASED SENSORS FOR GLOBAL WEATHER FORECASTING

Albin J. Gasiewski*[1], Brian T. Sanders[2], David Gallaher[3]
[1]*Dept of ECEE, University of Colorado at Boulder, Boulder, CO*
[2]*Colorado Space Grant Consortium, University of Colorado at Boulder, Boulder, CO*
[3]*National Snow and Ice Data Center, University of Colorado at Boulder, Boulder, CO, Unites States*

15:40 F2-7 A COMPACT 118 GHZ RADIOMETER FOR THE MICRO-SIZED MICROWAVE ATMOSPHERIC SATELLITE (MICROMAS)

I. Osaretin*[1], W. Blackwell[1], C. Galbraith[1], R. Leslie[1], M. Shields[1], S. Conrad[1], E. Thompson[1], D. Toher[1], C. Semisch[1], B. Reid[1], W. Osborn[1], G. Allen[1], N Erickson[2]
[1]*MIT Lincoln Laboratory, Lexington, MA*
[2]*University of Massachusetts, Amherst, MA*

16:00 F2-8 SPATIAL RESOLUTION AND ACCURACY OF RETRIEVALS OF 2D AND 3D WATER VAPOR FIELDS FROM GROUND-BASED RADIOMETER NETWORKS

Swaroop Sahoo*[1], Xavier Bosch-Lluis[1], Steven C. Reising[1], Jothiram Vivekanandan[2]
[1]*Microwave Systems Laboratory, Colorado State University, Fort Collins, CO, United States of America*
[2]*Earth Observing Laboratory, National Center for Atmospheric Research, Boulder, CO, United States of America*

16:20 F2-9 PERFORMANCE OF AN L-BAND ANTENNA FOR RADIOMETRIC MEASUREMENTS

Mehmet Ogut*[1], Roger H. Lang[1], Wasyl Wasylkiwskyj[1], Mehmet Kurum[2], Peggy E. O'Neill[2]
[1]*Electrical and Computer Engineering, The George Washington University, Washington DC*
[2]*Hydrological Sciences Laboratory, NASA Goddard Space Flight Center, Greenbelt, Maryland*

16:40 F2-10 PARAMETRIZATION OF AN ANISOTROPIC OCEAN SURFACE EMISSIVITY MODEL BASED ON WINDSAT POLARIMETRIC OBSERVATIONS

Dean F. Smith*[1], Albin J. Gasiewski[1], Srikumar Sandeep[1], Bob L. Weber[2]
[1]*Dept. of ECEE, University of Colorado, Boulder CO*
[2]*De Tech, Inc., Longmont CO*

Session F3: Computational Electromagnetics for Hydrometeors
Room 151

Co-Chairs: Jani Tyynela, *Colorado State University*
Chandrasekar V Chandra, *Colorado State University*

13:20 F3-1 MODELING ICE CRYSTALS AND AGGREGATES AND THEIR RADAR SCATTERING CHARACTERISTICS

Kultegin Aydin*[1], Giovanni Botta[1,2], Johannes Verlinde[2], Yinghui Lu[2], Eugene Clothiaux[2]
[1]*Electrical Engineering, Pennsylvania State University, University Park, PA*
[2]*Meteorology, Pennsylvania State University, University Park, PA*

13:40 F3-2 ACCURATE ELECTROMAGNETIC MODELING OF MELTING HAIL

Elene Chobanyan*[1], Jelena Notaros[2], Chandrasekar V. Chandra[1], Branislav Notaros[1]
[1]*Colorado State University, Fort Collins, CO*
[2]*University of Colorado, Boulder, CO*

14:00 F3-3 USING DOMAIN DECOMPOSITION TO EXTEND THE DDSCAT UPPER LIMIT OF TARGET SIZE PARAMETER FOR HYDROMETEORS

Kwo-Sen Kuo*[1,2], Robert W. Numrich[3], Thomas L. Clune[2]
[1]*Earth Systems Science Interdisciplinary Center, University of Maryland, College Park, Maryland*
[2]*NASA Goddard Space Flight Center, Greenbelt, Maryland*
[3]*The Graduate Center, City University of New York, New York, New York*

14:20 F3-4 DUAL-POLARIZATION COMPUTATIONS OF SNOW AT VARIOUS RADAR FREQUENCIES

Jani Tyynela*[1], Venkatachalam Chandrasekar[1], Jussi Leinonen[2], Dmitri Moiseev[3]
[1]*Engineering, Colorado State University, Fort Collins, CO*
[2]*Finnish Meteorological Institute, Helsinki, Finland*
[3]*Atmospheric sciences, University of Helsinki, Helsinki, Finland*

14:40 F3-5 FULL WAVE EM CALCULATION OF POLARIMETRIC VARIABLES FROM THE ATMOSPHERIC SCATTERERS WITH NONSPHEROIDAL SHAPE

Djordje Mirkovic*[1,2,3], Dusan Zrnic[2], Alexander Ryzhkov[1]
[1]*CIMMS, University of Oklahoma, Norman, OK*
[2]*NSSL, NOAA, Norman, OK*
[3]*School of Electrical and Computer Engineering, University of Oklahoma, Norman, OK*

15:00 Break

15:20 F3-6 EXPLORING VARIABILITY OF RADAR BACKSCATTERING CROSS SECTIONS OF DENDRITES

Yinghui Lu*[1], Eugene Clothiaux[1], Kultegin Aydin[2], Giovanni Botta[1,2], Johannes Verlinde[1]
[1]*Meteorology, Pennsylvania State University, University Park, PA*
[2]*Electrical Engineering, Pennsylvania State University, University Park, PA*

15:40 F3-7 POSSIBLE COMBINATION OF MEASUREMENTS TO CHARACTERIZE SNOW

Venkatachalam Chandrasekar*, Jani Tyynela
Engineering, Colorado State University, Fort Collins, CO

Session GH2: Meteors, Orbital Debris, and Dusty Plasmas II
Math 100

Co-Chairs: Sigrid Close, *Stanford University*
Christopher Crabtree, *Naval Research Laboratory*

13:20 GH2-1 METEOR TRAIL OBSERVATIONS COLLECTED WITH THE NEW PENN STATE VHF RADAR

Julio Urbina*[1], Jonathan Fentzke[2], Lars Dyrud[2], Ryan Seal[1], Alexander Hackett[1]
[1]*Electrical Engineering, Penn State, University Park, PA*
[2]*Applied Physics Laboratory, John Hopkins University, Columbia, MD*

13:40 GH2-2 A METEOR WIND RADAR MEASUREMENT CAMPAIGN USING THE COLORADO SOFTWARE DEFINED RADAR WITH METEOR TRIAL ECHOES INTERPRETED UNDER A MODERN DIFFUSION THEORY

Cody Vaudrin*, Scott Palo
Aerospace Engineering Sciences, University of Colorado at Boulder, Boulder, CO

14:00 GH2-3 DETECTION OF METEORIC DUST IN THE MESOSPHERE BY THE CHAMPS ROCKETS

Zoltan Sternovsky*[1], Scott Robertson[1], Shannon Dickson[1], Mihaly Horanyi[1], Martin Friedrich[2], Diego Janches[3], Biff Williams[4]
[1]*Univ of Colorado, Boulder, CO*
[2]*Graz University of Technology, Graz, Austria*
[3]*Goddard Space Flight Center, Greenbelt MD*
[4]*GATS-Inc., Boulder, CO*

14:20 GH2-4 THE SOUTHERN ARGENTINA AGILE METEOR RADAR (SAAMER): A PLATFORM FOR COMPREHENSIVE METEOR OBSERVATIONS AND STUDIES

Diego Janches*[1], Steven Pifko[2], Jose Luis Hormaechea[3], Wayne Hocking[4], David C. Fritts[5], Claudio Brunini[6], Sigrid Close[2], Robert Michell[7], Marilia Samara[7]
[1]*Space Weather Lab, NASA, Greenbelt, MD*
[2]*Dept. of Aeronautics and Astronautics, Stanford University, Palo Alto, CA*
[3]*Estacion Astronomica Rio Grande, Rio Grande, Tierra del Fuego, Argentina*
[4]*Dept. Physics and Astronomy, University of Western Ontario, London, ON, Canada*
[5]*Gats Inc., Boulder, CO*
[6]*Dept. of Astronomy and Geophysics, Universidad Nacional de La Plata, La Plata, Buenos Aires, Argentina*
[7]*SouthWest Research Institute, San Antonio,TX*

14:40 GH2-5 MODELING SOLAR WIND MASS-LOADING DUE TO DUST IN THE VICINITY OF THE SUN

Anthony Rasca*, Mihaly Horanyi
Laboratory for Atmospheric and Space Physics, University of Colorado at Boulder, Boulder, CO

15:00 Break

15:20 GH2-6 NANO-DUST ANALYZER FOR THE DETECTION AND ANALYSIS OF NANOMETER SIZE DUST PARTICLES AND BETA METEOROIDS ORIGINATING NEAR THE SUN

Leela E. O'Brien*[1], Andrew Gemer[2], Eberhard Gruen[3], Andrew Collette[4], Mihaly Horanyi[2], Eberhard Moebius[5], Siegfried Auer[6], Antal Juhasz[7], Ralf Srama[8], Zoltan Sternovsky[9]
[1]*Aerospace Engineering Sciences, University of Colorado, Boulder, Boulder, Colorado*
[2]*Laboratory for Atmospheric and Space Physics, University of Colorado,Boulder, Boulder, Colorado*
[3]*Max Planck Institute for Nuclear Physics, Heidelberg, Germany*
[4]*Laboratory for Atmospheric and Space Physics, University of Colorado, Boulder, Boulder,Coloroado*
[5]*Institute for the Study of Earth, Oceans, and Space, University of New Hampshire, Durham, New Hampshire*
[6]*A&M Associates, Bayse, Virginia*
[7]*6. KFKI Research Institute for Particle and Nuclear Physics, Budapest, Hungary*
[8]*Institute of Space Systems, University of Stuttgart, Stuttgart, Germany*
[9]*Laboratory for Atmospheric and Space Physics, University of Colorado, Boulder, Boulder, Colorado*

15:40 GH2-7 MODELING DUST CLOUDS ON THE MOON

Jamey R. Szalay*[1,2], Mihaly Horanyi[1,2]
[1]*Physics, University of Colorado Boulder, Boulder, CO*
[2]*Laboratory for Atmospheric and Space Physics, Boulder, CO*

16:00 GH2-8 SEASONAL STUDIES OF HIGH LATITUDE UHF DIURNAL METEOR OBSERVATIONS

Stanley Briczinski*[1], John Mathews[2]
[1]*Plasma Physics Division, NRL, Washington, DC*
[2]*Penn State, University Park, PA*

Session GHE2: Lightning and its Interaction with the Ionosphere II
Room 200

Co-Chairs: Joseph Dwyer, *Florida Tech*
Ningyu Liu, *Florida Institute of Technology*
Sebastien Celestin, *LPC2E, University of Orleans / CNRS*

13:20 GHE2-1 A STATISTICAL ANALYSIS OF Q-BURST OBSERVATIONS AT ARRIVAL HEIGHTS, ANTARCTICA

Sydney N. Greene*, Robert C. Moore
Electrical and Computer Engineering, University of Florida, Gainesville, FL

13:40 GHE2-2 EARTHQUAKE LIGHTS: TIME-DEPENDENT EARTH SURFACE-IONOSPHERE COUPLING MODEL

Victor P. Pasko*
Penn State University, University Park, Pennsylvania

14:00 GHE2-3 ANALYSIS OF NEW RHESSI TGFS

Thomas Gjesteland*[1], Nikolai Ostgaard[1], Ragnhild S. Hansen[1], Brant E. Carlson[2], Andrew Collier[3,4]
[1]*Dept. of Physics and Technology, University of Bergen, Bergen, Norway*
[2]*Physics department, Carthage College, WI*
[3]*SANSA Space Science, Hermanus, South Africa*
[4]*Space Physics Research Institute,, University of KwaZulu-Natal, Durban, South Africa*

14:20 GHE2-4 DETAILED RADIO OBSERVATIONS OF LIGHTNING PROCESSES ASSOCIATED WITH TERRESTRIAL GAMMA RAY FLASHES

Steven Cummer*[1], Gaopeng Lu[1], Michael Briggs[2], Valerie Connaughton[2], Shaolin Xiong[2], Gerald Fishman[3], Joseph Dwyer[4]
[1]*Duke University, Durham, NC*
[2]*University of Alabama in Huntsville, Huntsville, AL*
[3]*NASA Marshall Space Flight Center, Huntsville, AL*
[4]*Florida Institute of Technology, Melbourne, FL*

14:40 GHE2-5 RELATIVISTIC FEEDBACK DISCHARGE THEORY

Joseph R. Dwyer*, Ningyu Liu
Physics and Space Sciences, Florida Tech, Melbourne

15:00 Break

15:20 GHE2-6 A NUMERICAL STUDY ON TGFS AND RELATIVISTIC FEEDBACK DISCHARGES

Ningyu Liu*, Joseph R. Dwyer
Physics and Space Sciences, Florida Institute of Technology, FL

15:40 GHE2-7 LONG DURATION GAMMA-RAY GLOWS ABOVE THUNDERCLOUDS

Nicole A. Kelley*[1], David M. Smith[1], Joseph R. Dwyer[2], Bryna J. Hazelton[3], Brian W. Grefenstette[4], Alex W. Lowell[5], Michael E. Splitt[6], Steve M. Lazarus[6], Hamid K. Rassoul[2]
[1]*Physics/SCIPP, University of California, Santa Cruz, Santa Cruz, CA*
[2]*Physics and Space Sciences, Florida Institute of Technology, Melbourne, FL*
[3]*Physics, University of Washington, Seattle, WA*
[4]*Space Radiation Lab, Caltech, Pasadena, CA*
[5]*Space Sciences Lab, University of California, Berkeley, Berkeley, CA*
[6]*Marine and Environmental Systems, Florida Institute of Technology, Melbourne, FL*

16:00 GHE2-8 MONTE CARLO SIMULATION OF NEUTRON GENERATION BY LIGHTNING LEADERS

Wei Xu*, Sebastien Celestin, Victor P. Pasko
Electrical Engineering, Pennsylvania State University, University Park, PA

Session H1: Turbulence in Space Plasmas
Room 245

Co-Chairs: Manish Mithaiwala, *Naval Research Laboratory*
Vladimir Sotnikov,

15:20 H1-1 LOW FREQUENCY WAVES IN MAGNETOSPHERIC PLASMAS AS THE SOURCE OF HIGH FREQUENCY TURBULENCE

George V. Khazanov*, David G. Sibeck
NASA, Greenbelt, MD

15:40 H1-2 BEAM-PLASMA INTERACTION AND LANGMUIR TURBULENCE

Peter H. Yoon*
IPST, University of Maryland, College Park, MD

16:00 H1-3 FORMATION OF WHISTLER CAVITY BY NONLINEAR SCATTERING RESULTING IN MULTI-PASS GAIN

Christopher Crabtree*[1], Gurudas Ganguli[1], Leonid Rudakov[2], Manish Mithaiwala[1]
[1]Naval Research Laboratory, Washington, DC
[2]Icarus Research Inc., Bethesda, MD

16:20 H1-4 RECENT RESULTS FROM RAX RADAR MEASUREMENTS OF HIGH-LATITUDE IONOSPHERIC IRREGULARITIES

Hasan Bahcivan*[1], James W. Cutler[2], Richard Doe[1]
[1]Center for Geospace Studies, SRI International, Menlo Park, CA
[2]Aerospace Engineering, University of Michigan, Ann Arbor, MI

16:40 H1-5 QUASILINEAR EVOLUTION FROM WHISTLER AND KAW TURBULENCE IN THE HIGH BETA SOLAR WIND

Manish J. Mithaiwala*[1], Leonid Rudakov[2], Gurudas Ganguli[1], Chris Crabtree[1]
[1]Plasma Physics, Naval Research Laboratory, Washington, DC
[2]Icarus Research Inc., Washington, DC

17:20 H1-6 LANGMUIR TURBULENCE DRIVEN BY NATURAL O-/Z-MODE EMISSIONS IN THE AURORAL IONOSPHERE

Hassanali Akbari*, Joshua L. Semeter
Boston University, Boston

Session HGF2: Global Navigation Satellite Systems and Radio Beacon Remote Sensing II
Room 245

Co-Chairs: Valery Zavorotny, *NOAA/Earth System Research Laboratory*
Charles Carrano, *Boston College*
Anthea Coster, *MIT*

13:20 HGF2-1 TURBULENCE RETRIEVALS FROM RADIO OCCULTATIONS

Lakshmi Kantha*[1], Elliott Barlow[1], Penina Axelrad[1], David Hooper[2], Larry Cornman[3]
[1]Aerospace Engineering, University of Colorado, Boulder, CO
[2]STFC Rutherford Appleton Laboratory, Didcot, UK
[3]National Center for Atmospheric Research, Boulder, CO

13:40 HGF2-2 USING GROUND-BASED GNSS OBSERVATIONS TO IMPROVE AVIATION TURBULENCE MONITORING AND PREDICTION

Seth Gutman*[1], Yehuda Bock[2], Peng Fang[2], Angelyn Moore[3], Jennifer Mahoney[1]
[1]NOAA Earth System Research Laboratory, Boulder, Colorado
[2]Scripps Institution of Oceanography, UCSD, La Jolla, California
[3]Jet Propulsion Laboratory, California Institute of Technology, Pasadena, California

14:00 HGF2-3 GNSS REFLECTROMETRY USING THE L5 AND E5A SIGNALS FOR REMOTE SENSING APPLICATIONS

Sara J. Powell*, Dennis M. Akos
Department of Aerospace Engineering Sciences, University of Colorado, Boulder, CO

14:20 HGF2-4 OCEAN SURFACE WIND VECTOR MEASUREMENTS FROM HIGH-ALTITUDE AIRCRAFT USING GPS DELAY-DOPPLER MAPS

Valery U. Zavorotny*[1], Enric Valencia[2], Dennis M. Akos[3], Adriano Camps[2]
[1]*Physical Sciences Division, NOAA/Earth System Research Laboratory, Boulder, CO*
[2]*Remote Sensing Lab, Dept. Teoria del Senyal i Comunicacions, Universitat Politcnica de Catalunya, Barcelona, Spain*
[3]*3Department of Aerospace Engineering Sciences, University of Colorado at Boulder, Boulder, CO*

Session J1: New Telescopes, Techniques, and Observations
Room 265

Co-Chairs: David DeBoer, *University of California*
Richard Bradley, *National Radio Astronomy Observatory*

13:20 J1-1 THE VLA LOW BAND SYSTEM: A NEW TOOL FOR EXPLORING THE LOW-FREQUENCY SKY, INCLUDING THE RADIO TRANSIENT UNIVERSE

Sean E. Cutchin*[1], Namir E. Kassim[2], Tracy E. Clarke[2], Brian C. Hicks[2], Frazer N. Owen[3], Rick A. Perley[3], Gregory B. Taylor[4], Frederick A. Jenet[5]
[1]*NRC Postdoc at the U.S. Naval Research Laboratory, Washington, D.C.*
[2]*U.S. Naval Research Laboratory, Washington, D.C.*
[3]*National Radio Astronomy Observatory, Socorro, NM*
[4]*University of New Mexico, Albuquerque, NM*
[5]*University of Texas at Brownsville, Brownsville, TX*

13:40 J1-2 DESIGN OF A MULTIBEAM SPECTROMETER FOR THE GREEN BANK TELESCOPE

John Ford*[1], Marty Bloss[1], Patrick Brandt[1], Hong Chen[2], Jayanth Chennamangalam[3], Jeff Cobb[2], Ramon Creager[1], Paul Demorest[4], Glenn Jones[5], Randy McCullough[1], Jason Ray[1], D. Anish Roshi[4], Simon Scott[2], Andrew Siemion[2], Mark Wagner[2], Galen Watts[1], Dan Werthimer[2], Mark Whitehead[1]
[1]*National Radio Astronomy Observatory, Green Bank, WV*
[2]*University of California, Berkeley, Berkeley, CA*
[3]*West Virginia University, Morgantown,WV*
[4]*National Radio Astronomy Observatory, Charlottesville, VA*
[5]*Columbia University, New York,NY*

14:00 J1-3 THE AUSTRALIA TELESCOPE NATIONAL FACILITY - RECENT UPGRADES AND FUTURE PLANS

Douglas C. -J. Bock*, Graeme J. Carrad
CSIRO Astronomy and Space Science, Marsfield, NSW, Australia

14:20 J1-4 THE AUSTRALIAN SKA PATHFINDER - AN UPDATE

Antony E. T. Schinckel*
CSIRO Astronomy and Space Science, Epping, NSW, Australia

14:40 J1-5 THE MICROWAVE RECEIVER UPGRADE FOR THE GGAO 12M GEODETIC VLBI SYSTEM

Christopher J. Beaudoin*[1], Brian E. Corey[1], Alan R. Whitney[1], Mark Derome[1], Peter Bolis[1], Spencer Cappallo[1], Chopo Ma[2], Tom Clark[2], Bill Petrachenko[3]
[1]*Haystack Observatory, MIT, Westford,MA*
[2]*Goddard Space Flight Center, NASA, Greenbelt,MD*
[3]*NRCan, Penticton,BC, Canada*

15:00 Break

15:20 J1-6 ARRAY CONFIGURATION AND TOTAL POWER CALIBRATION FOR THE LARGE-APERTURE EXPERIMENT TO DETECT THE DARK AGES

Frank K. Schinzel*, Joseph Craig
University of New Mexico, Albuquerque, New Mexico

15:40 J1-7 DEPLOYABLE ANTENNA CONCEPTS FOR THE DARK AGES RADIO EXPLORER MISSION

Deborah A. Sigel*[1], Vinh M. Bach[1], Mark W. Thomson[1], Richard F. Bradley[2], Joseph Lazio[1], Jack O. Burns[3]
[1]*Jet Propulsion Laboratory, California Institute of Technology, Pasadena, CA*
[2]*National Radio Astronomy Observatory, Charlottesville, VA*
[3]*University of Colorado, Boulder, CO*

16:00 J1-8 DACOTA: THE DENSE ARRAY FOR COSMOLOGICAL TRANSITIONS

David R. DeBoer*[1], Geoffrey C. Bower[1], Garrett Keating[1], Richard Plambeck[1], Tzu-Ching Chang[2], Paul T. P. Ho[2], Daniel Marrone[3]
[1]*Radio Astronomy Laboratory, University of California, Berkeley, CA*
[2]*Academica-Sinica Institute for Astronomy and Astrophysics, Taipei, Taiwan*
[3]*Astronomy, University of Arizona, Tucson, AZ*

16:20 J1-9 EXPLORING THE OBSTACLES OF CO EOR MEASUREMENTS: AN ARCHIVAL ANALYSIS OF SZA DATA

Garrett K. Keating*[1], Geoffrey C. Bower[1], Daniel Marrone[2], David DeBoer[1]
[1]*Radio Astronomy Lab, Univ of California, Berkeley, Berkeley, CA*
[2]*Department of Astronomy, University of Arizona, Tucson, AZ*

16:40 J1-10 DEVELOPMENTS IN THE RADIO SEARCH FOR EXTRATERRESTRIAL INTELLIGENCE

Andrew P. V. Siemion*[1], Dave Anderson[1], Henry Chen[2], Jeff Cobb[1], Jim Cordes[3], Paul Demorest[4], Terry Filiba[1], Abhimat Gautam[1], Andrew Howard[1], Eric Korpela[1], Glen Langston[4], Matt Lebofsky[1], Ron Maddalena[4], Geoff Marcy[1], Laura Spitler[3], Jill Tarter[5], Mark Wagner[1], Dan Werthimer[1]
[1]*University of California, Berkeley, Berkeley, CA*
[2]*University of California, Los Angeles, Los Angeles, CA*
[3]*Cornell University, Ithaca, NY*
[4]*National Radio Astronomy Observatory, Green Bank, WV*
[5]*SETI Institute, Mountain View, CA*

17:00 J1-11 PRACTICAL APPLICATION OF CYCLIC SPECTROSCOPY TO PULSAR SIGNALS

Glenn Jones*[1], Jim Cordes[2], Paul B. Demorest[3], Tim Dolch[4], Maura McLaughlin[5], Nipuni Palliyaguru[5], Dan Stinebring[4]
[1]*NRAO / Columbia University, New York, NY*
[2]*Cornell University, Ithaca, NY*
[3]*NRAO, Charlottesville, VA*
[4]*Oberlin College, Oberlin, OH*
[5]*West Virginia University, Morgantown, WV*

Session P2: Meeting Highlight: Remote Sensing and Communication Systems in Disaster Mitigation and Response
Math 100

Co-Chairs: Amir Zaghloul, *US Army Research Laboratory*
Chandrasekar V Chandra, *Colorado State University*

10:20 P2-1 THE PROMISE OF COGNITIVE RADIO FOR COMMUNICATIONS AND REMOTE SENSING FOR CRITICAL INFRASTRUCTURE, DISASTER, SAFETY AND RISK MANAGEMENT

Charles W. Bostian*
Electrical and Computer Engineering, Virginia Tech, Blacksburg, VA

10:40 P2-2 TOKYO METROPOLITAN AREA CONVECTION STUDY FOR EXTREME WEATHER RESILIENT CITIES (TOMACS)

Masayuki Maki*
National Research Institute for Earth Science and Disaster Prevention and Tsukuba University, Tsukuba, Japan

Session A2: Reverberation Chamber Measurements
Room 105

Co-Chairs: Christopher Holloway, *NIST*
John Ladbury, *NIST*

13:20 A2-1 RATIONALE FOR REVERBERATION CHAMBER TESTING

Vignesh Rajamani*[1], Charles F. Bunting[1], Gustav J. Freyer[2]
[1]*ECEN, Oklahoma State University, Stillwater, OK*
[2]*GJF Consulting, Monument, CO*

13:40 A2-2 UTILIZING REVERBERATION CHAMBERS AS A VERSATILE TEST ENVIRONMENT FOR ASSESSING THE PERFORMANCE OF COMPONENTS AND SYSTEMS

Dennis M. Lewis*
Metrology, Boeing, Seattle, Washington

14:00 A2-3 AN INVESTIGATION ON THE CORRELATION-COEFFICIENT AND POWER METRICS FOR MIMO ANTENNAS IN A REVERBERATION CHAMBER

Nick Janssen[1], William F. Young*[2], Christopher L. Holloway[2], Kate A. Remley[2]
[1]*Electromagnetics, TU/e, Eindhoven, Netherlands*
[2]*Electromagnetics, NIST, Boulder*

14:20 A2-4 EFFECTS OF ANTENNA PROXIMITY ON RECEIVED-POWER MEASUREMENTS OF LARGE-FORM-FACTOR WIRELESS DEVICES IN REVERBERATION CHAMBERS

Kate A. Remley*[1], Willem Burger[2], Christopher L. Holloway[1]
[1]*Electromagnetics Division, NIST, Boulder, CO*
[2]*Faculty of Electrical Engineering, Technical University Eindhoven, Eindhoven, The Netherlands*

14:40 A2-5 PREDICTING AND CORRECTING FOR ANTENNA IMPERFECTIONS IN REVERBERATION CHAMBER MEASUREMENTS

John M. Ladbury*, Jason B. Coder
National Institute of Standards and Technology, Boulder, CO

15:00 Break

15:20 A2-6 A LOWER BOUND OF ANTENNA EFFICIENCY BASED ON THE TWO-PORT MODEL: HOW CLOSE IS IT?

Jason Coder*[1], Mark Golkowski[2], John Ladbury[1]
[1]*RF Fields, National Institute of Standards and Technology, Boulder, CO*
[2]*Electrical Engineering, University of Colorado Denver, Denver, CO*

15:40 A2-7 BACKSCATTER COEFFICIENT MEASUREMENTS FOR REVERBERATION CHAMBER CHARACTERIZATION

Colton R. Dunlap*[1,2], Christopher L. Holloway[1], Edward F. Kuester[2], John Ladbury[1]
[1]*Electromagnetics Division, National Institute of Standards and Technology, Boulder*
[2]*Electrical Computer and Energy Engineering Department, University of Colorado at Boulder, Boulder*

16:00 A2-8 INTERCONNECTION OF COMPLEX CAVITIES ANALYZED BY THE RANDOM COUPLING MODEL

Gabriele Gradoni*[1], Thomas M. Antonsen[1], Steven M. Anlage[2], Edward Ott[1]
[1]*Institute for Research in Electronics and Applied Physics, University of Maryland, College Park, MD*
[2]*Center for Nanophysics and Advanced Materials, University of Maryland, College Park, MD*

16:20 A2-9 THE POWER DELAY PROFILE VERSUS EIGENVALUE DISTRIBUTION OF RESONANT ELECTROMAGNETIC ENVIRONMENTS

John Galbraith*
Los Alamos National Lab, Los Alamos, NM

Session B4: Numerical Methods
Room 1B40

Co-Chairs: Branislav Notaros, *Colorado State University*
Donald Wilton, *University of Houston*

13:20 B4-1 ON THE ACCURATE EVALUATION OF REACTION INTEGRALS IN THE METHOD OF MOMENTS

Donald R. Wilton[1], Francesca Vipiana*[2], William A. Johnson[3]
[1]*Dept. of Electrical and Computer Engineering, University of Houston, Houston, TX*
[2]*Antenna and EMC Lab, Politecnico di Torino, Torino, Italy*
[3]*Consultant, Albuquerque, NM*

13:40 B4-2 NEW APPROACH FOR THE NUMERICAL EVALUATION OF REACTION INTEGRALS IN THE METHOD OF MOMENTS

Donald R. Wilton*[1], William A. Johnson[2]
[1]*Dept. of Electrical and Computer Engineering, University of Houston, Houston, TX*
[2]*Consultant, Albuquerque, NM*

14:00 B4-3 NUMERICAL STUDIES OF GROUND EFFECTS ON EM WAVE PROPAGATION IN THE PROXIMITY OF STAND-ALONE AND VEHICLE MOUNTED SOURCES

Dejan S. Filipovic, Timothy Samson*, Chang Ahn, Maxim Ignatenko
University of Colorado, Boulder, Colorado

14:20 B4-4 An Efficient Spectral Domain Method of Moments for Reflectarray Antennas

Jordan F. Budhu*, Yahya Rahmat-Samii
Electrical Engineering, University of California Los Angeles, Los Angeles, California

14:40 B4-5 TRANSIENT ANALYSIS OF DISPERSIVE, PERIODIC STRUCTURES FOR OBLIQUE PLANE WAVE INCIDENCE USING LAGUERRE MARCHING-ON-IN-DEGREE (MOD)

Srikumar Sandeep*, Albin J. Gasiewski
Department of electrical, computer and energy engineering, University of Colorado, Boulder, Boulder, Colorado

15:00 Break

15:20 B4-6 DIRECT AND INDIRECT TIME-DOMAIN FEM HIGHER ORDER SOLUTIONS TO 3-D CLOSED-REGION PROBLEMS

Nada J. Sekeljic*[1], Sanja B. Manic[1], Milan M. Ilic[1,2], Branislav M. Notaros[1]
[1]*Department of Electrical and Computer Engineering, Colorado State University, Fort Collins, Colorado*
[2]*School of Electrical Engineering, University of Belgrade, Belgrade, Serbia*

15:40 B4-7 SINGLE LEVEL FAST MULTIPOLE METHOD ON GPU CLUSTER FOR ELECTROMAGNETIC PROBLEMS

Vinh Dang*, Quang Nguyen, Ozlem Kilic, Esam El-Araby
Department of Electrical Engineering and Computer Sciences, The Catholic University of America, Washington DC

16:00 B4-8 NUMERICAL COMPUTATION OF SINGULAR INTEGRALS IN HIGHER ORDER METHOD OF MOMENTS USING CURVED QUADRILATERAL PATCHES

Ana B. Manic*[1], Miroslav Djordjevic[2], Eric Smith[1], Branislav M. Notaros[1]
[1]*Electrical & Computer Engineering Department, Colorado State University, Fort Collins, CO*
[2]*ICT College, Belgrade, Serbia*

16:20 B4-9 HIGHER ORDER VOLUME AND SURFACE INTEGRAL EQUATION MODELING OF 3-D SCATTERING AND RADIATION PROBLEMS

Elene Chobanyan*[1], Milan M. Ilić[1,2], Branislav M. Notaros[1]
[1]*Electrical and Computer Engineering, Colorado State University, Fort Collins, Colorado*
[2]*School of Electrical Engineering, University of Belgrade, Blegrade, Serbia*

16:40 B4-10 NUMERICAL STUDY OF COPPER SURFACE ROUGHNESS EFFECTS FOR STRIPLINE STRUCTURES

Xichen Guo*, Ji Chen, David R. Jackson
Electrical and Computer Engineering, University of Houston, Houston, TX

Session B5: Inverse Scattering
Room 155

Co-Chairs: Kamal Sarabandi, *University of Michigan, Ann Arbor*
Danilo Erricolo, *UIC*

13:20 B5-1 RESOLUTION ANALYSIS OF A RADIO FREQUENCY TOMOGRAPHY SYSTEM

Vittorio Picco*, Tadahiro Negishi, Danilo Erricolo
ECE, University of Illinois at Chicago, Chicago, IL

13:40 B5-2 CHALLENGE ON DIELECTRIC AND METALLIC TARGETS RECOGNITION FOR RADIO FREQUENCY TOMOGRAPHY

Tadahiro Negishi*, Vittorio Picco, Danilo Erricolo
ECE, University of Illinois at Chicago, Chicago, Illinois

14:00 B5-3 GPU IMPLEMENTATION OF PARALLELIZED MICROWAVE TOMOGRAPHY ALGORITHM

Michael W. Holman*
Dept. of Electrical Engineering, University of North Dakota, Grand Forks

14:20 B5-4 ULTRAWIDEBAND INVERSE SCATTERING IN CONTINUOUS MEDIA BASED ON BAYESIAN COMPRESSIVE SENSING

Ahmed E. Fouda*, Fernando L. Teixeira
ElectroScience Laboratory, Department of Electrical and Computer Engineering, The Ohio State University, Columbus, OH

14:40 B5-5 A LOW PROFILE MULTI-BIT CHIPLESS RFID TAG

Reza Rezaiesarlak*, Majid Manteghi
ECE, Virginia Tech, Blacksburg, VA

Session B6: Wideband Antennas
Room 155

Co-Chairs: Dejan Filipovic, *University of Colorado, Boulder*
Gregory Huff, *Texas A&M University*

15:20 B6-1 WIDEBAND ANTENNAS ON ELECTRICALLY LARGE CONDUCTING CYLINDERS

Dejan S. Filipovic, Jageun Ha*, Matthew Radway
University of Colorado, Boulder, Colorado

15:40 B6-2 BANDWIDTH ENHANCEMENT OF IRON SLOT ANTENNA WITH REACTIVE IMPEDANCE LAYER

Yun Seo Koo*, Aly E. Fathy
EECS, University of Tennessee, Knoxville, TN

16:00 B6-3 ON THE USE OF LOG-PERIODIC ANTENNAS IN PULSED ULTRA-WIDE BAND COMMUNICATION LINKS

Dejan S. Filipovic, Frhat Aeiad*, Mohamed Elmansouri
University of Colorado, Boulder, Colorado

16:20 B6-4 W-BAND VIVALDI ANTENNAS AND ARRAYS

Dejan S. Filipovic, Nathan Jastram*
University of Colorado, Boulder, Colorado

16:40 B6-5 AN AERODYNAMICALLY FUNCTIONALIZED WIDEBAND ANTENNA

Franklin J. Drummond*, Gregory H. Huff
Texas A&M University, College Station, TX

Session CD1: Communications, Radar, and Imaging Systems above 100 GHz
Room 1B51

Co-Chairs: Charles Dietlein, *US Army Research Laboratory*
Zoya Popovic, *University of Colorado Boulder*

13:20 CD1-1 THZ IMAGING USING BROADBAND DIRECT DETECTION OF PULSED THZ RADIATION

Zachary D. Taylor*[1], Shijun Sung[1], Priyamvada Tewari[1], Ioanna Kakouli[2], Jean-Pierre Hubschman[3], Sophie Deng[3], Elliott Brown[4], Warren Grundfest[1]
[1]Bioengineering, UCLA, Los Angeles, CA
[2]Archaeology, UCLA Cotsen Institute, Los Angeles, CA
[3]Ophthalmology, UCLA Jules Stein Eye Institute, Los Angeles, CA
[4]Physics/Electrical Engineering, Wright State, Dayton, OH

13:40 CD1-2 TERAHERTZ COMPUTED TOMOGRAPHY USING A LARGE-FORMAT, REAL-TIME FOCAL PLANE ARRAY SENSOR

Georgios Trichopoulos*, Kubilay Sertel
ECE, The Ohio State University, ElectroScience Laboratory, Columbus, OH

14:00 CD1-3 NEAR 4PI COVERAGE OF MONO-STATIC RADAR CROSS SECTION AT 200 GHZ USING A SPHERICAL ANTENNA MEASUREMENT SYSTEM

David R. Novotny*, Joshua A. Gordon, Jason Coder, Jeffrey Guerrieri
Physical Measurements Laboratory, National Institute of Standards and Technology, Boulder, Colorado

14:20 CD1-4 BI-DIRECTIONAL REFLECTANCE DISTRIBUTION FUNCTION OF STATISTICALLY KNOWN SAMPLES OVER 220-500 GHZ USING A FREQUENCY DOMAIN BASED SCATTEROMETER: MEASUREMENTS AND PHENOMENOLOGY

Joshua A. Gordon*[1], David R. Novotny[1], Edwin J. Heilweil[2], Shu Zee A. Lo[2], Nina P. Basta[3], Erich N. Grossman[3]
[1]Electromagnetics, NIST, Boulder, CO
[2]Radiation and Bio-physics, NIST, Gaithersburg, MD
[3]Quantum Electronics and Photonics, NIST, Boulder, Co

14:40 CD1-5 G-BAND MICRO-FABRICATED FREQUENCY-SCANNED ANTENNA ARRAYS WITH 60 DEGREE BEAM STEERING OVER A 30 GHZ BANDWIDTH

Leonardo M. Ranzani*[1], Daniel G. Kuester[1], Kenneth Vanhille[2], Zoya Popovic[1]
[1]University of Colorado at Boulder, Boulder, CO
[2]Nuvotronics, LLC, Roanoke, VA

15:00 Break

15:20 CD1-6 CMOS TECHNIQUES FOR COMMUNICATIONS LINKS BEYOND 100 GHZ

Adrian Tang*
Submillimeter Wave Advanced Technology, Jet Propulsion Laboratory, Pasadena, California

15:40 CD1-7 KILOMETER-RANGE COMMUNICATIONS LINK IN THE 220 GHZ ATMOSPHERIC WINDOW USING CONTINUOUS PHASE MODULATION

Charles R. Dietlein*, Joe X. Qiu
Sensors and Electron Devices Directorate, US Army Research Laboratory, Adelphi, MD

16:00 CD1-8 LINK BUDGET ANALYSIS FOR 350 GHZ COMMUNICATION LINK

Shubhendu Bhardwaj*, Niru Nahar, John L. Volakis
Eelectroscience lab, The Ohio State University, Columbus

16:20 CD1-9 WIDEBAND IMPEDANCE-MATCHED INTEGRATED TRANSCEIVERS FOR FUTURE THZ-BAND WIRELESS NETWORKS

Yasir Karisan*, Kubilay Sertel
The Electroscience Laboratory, The Ohio State University, Columbus

16:40 CD1-10 DEVICE CHARACTERIZATION WITH NON-CONTACT PROBES IN THE THZ BAND

Cosan Caglayan*, Georgios C. Trichopoulos, Kubilay Sertel
Electroscience Laboratory, The Ohio State University, Columbus OH

Session D1: Electronic Devices, Circuits, and Applications
Room 151

Co-Chairs: Christos Christodoulou, *University of New Mexico*
Jennifer Bernhard, *University of Illinois at Urbana-Champaign*

13:20 D1-1 MICROWAVE RECEIVER PROTOTYPE DEVELOPMENT FOR THE HYPERSPECTRAL MICROWAVE ATMOSPHERIC SOUNDER (HYMAS)

Idahosa A. Osaretin*[1], William J. Blackwell[1], Christopher Galbraith[1], Timothy Hankcock[1], Eric Thompson[1], Mike Shields[1], R. V. Leslie[1], Paul Racette[2], L. M. Hilliard[2]
[1]*MIT Lincoln Laboratory, Lexington, MA*
[2]*NASA Goddard Space Flight Center, Greenbelt, MD*

13:40 D1-2 A METHOD FOR THE ELECTROMAGNETIC CHARACTERIZATION OF AN UNKNOWN SAMPLE LAYERED ON A KNOWN SUBSTRATE

Kurt R. Schab*[1], Benjamin C. Masters[2], Charles P. Marsh[2], Jennifer T. Bernhard[1]
[1]*Electromagnetics Laboratory, University of Illinois at Urbana-Champaign, Champaign, IL*
[2]*Construction Engineering Research Laboratory, Engineer Research and Development Center, US Army Corps of Engineers, Champaign, IL*

14:00 D1-3 CONSIDERATION ON PRINCIPLE OF OPERATION OF SELF-INJECTION LOCKED NRD GUIDE GUNN OSCILLATOR USING EQUIVALENT CIRCUIT MODEL

Futoshi Kuroki*, Tomohiro Tanaka
Kure National College of Technology, Kure, Japan

14:20 D1-4 COMPENSATION NETWORKS TO IMPROVE PERFORMANCE OF NON-FOSTER CIRCUITS

Aseim M. Elfrgani*, Roberto G. Rojas
The Ohio State University, Columbus, Ohio

14:40 D1-5 COHERENT CHAOTIC OSCILLATOR AT 100 MHZ

Firas N. Ayoub, Christos G. Christodoulou*, Sameer D. Hemmady, Youssef A. Tawk
Electrical and Computer Engineering, University of New Mexico, Albuquerque - NM

Session D2: Advances in Tunable Filter Theory and Technology
Room 151

Co-Chairs: Juseop Lee, *Korea University*
Hjalti Sigmarsson, *University of Oklahoma*

15:20 D2-1 GENERALIZED RF: TUNABLE AND ADAPTABLE FILTERS FOR RECONFIGURABLE FRONT-ENDS

Christopher A. Maxey*[1], William J. Chappell[2]
[1]*Booz Allen Hamilton, Arlington, VA*
[2]*Defense Advanced Research Projects Agency, Arlington, VA*

15:40 D2-2 INTRINSICALLY-SWITCHED FILTERS AND APPLICATIONS

Andrew C. Guyette*
Microwave Technology Branch, Naval Research Laboratory, Washington, DC

16:00 D2-3 MEMS TUNABLE BANDSTOP AND BANDPASS FILTERS

Mina Rais-Zadeh*, Yonghyun Shim, Zhengzheng Wu
Electrical Engineering and Computer Science, University of Michigan, Ann Arbor, MI

16:20 D2-4 TUNABLE RF FILTERS BASED ON RADIALLY LOADED EVANESCENT-MODE CAVITY RESONATORS

Akash Anand[1], Joshua Small[1], Xiaoguang Liu*[1], Hjalti H. Sigmarsson[2]
[1]*Department of Electrical and Computer Engineering, University of California Davis, Davis, CA*
[2]*School of Electrical and Computer Engineering, University of Oklahoma, Norman, OK*

16:40 D2-5 TUNING THE BANDWIDTH AND CENTER FREQUENCY OF MICROMECHANICAL ACOUSTIC RESONATORS

Roy H. Olsson III*, Bongsang Kim, Janet Nguyen, Peggy Clews, Tammy Pluym, Kenneth E. Wojciechowski
Sandia National Laboratories, Albuquerque NM

17:20 D2-6 MODELING TUNABLE NEAR FIELD FILTER SYSTEMS WITH A COUPLING MATRIX EXTRACTED FROM A FULL-WAVE SIMULATION

Andrew T. Wegener*, William J. Chappell
Electrical and Computer Engineering, Purdue University, West Lafayette, IN

Session F4: Propagation Models and Measurements
Room 150

Co-Chairs: Teresa Rusyn, *Institute for Telecommunication Sciences*
Frank Ryan, *Applied Technology, Inc.*

13:20 F4-1 THE UNDISTURBED-FIELD MODEL: A PROPAGATION MODEL FOR CLOSE-IN DISTANCES AND VERY LOW ANTENNA HEIGHTS

Nicholas N. DeMinco*
NTIA/ITS.E, Institute for Telecommunication Sciences, Boulder, Colorado

13:40 F4-2 RESOLVING DISCONTINUITIES IN THE COST 231 EXTENDED OKUMURA-HATA MODEL IN THE PROPAGATION MODELING WEBSITE (PMW) SOFTWARE

Teresa L. Rusyn*, Julie Kub
NTIA/ITS, U.S. Department of Commerce, Boulder, CO

14:00 F4-3 RECONSTRUCTING ANALOG WAVEFORMS SENSED IN REVERBERANT ENVIRONMENTS

John Galbraith*
Los Alamos National Lab, Los Alamos

14:20 F4-4 TEMPERATURE RISE IN OBJECTS DUE TO OPTICAL FOCUSED BEAM THROUGH ATMOSPHERIC TURBULENCE NEAR GROUND AND OCEAN SURFACE

Matthew Stoneback*[1], Akira Ishimaru[1], Colin Reinhardt[2], Yasuo Kuga[1]
[1]University of Washington, Seattle, WA
[2]Atmospheric Propagation Branch, US Navy SSC-PAC, San Diego, CA

14:40 F4-5 EVALUATION OF A MODIFIED LKB-BASED EVAPORATION DUCT MODEL FOR STABLE ENVIRONMENTS

Michael H. Newkirk*[1], Thomas R. Hanley[1], Paul A. Frederickson[2]
[1]The Johns Hopkins University - Applied Physics Laboratory, Laurel, MD
[2]Naval Postgraduate School, Monterey, CA

15:00 Break

15:20 F4-6 MMW PROPAGATION IN WARM WATER EVAPORATION DUCTS

Frank Ryan*
Applied Technology, Inc., San Diego, CA

15:40 F4-7 MODELING AND ANALYSIS OF COSMIC RADIO OCCULTATION (RO) SCINTILLATION EVENTS

Charles L. Rino*[1], Lung-Chih Tsai[2], Ernest Macalalad[2]
[1]Rino Consulting, Menlo Park, California
[2]Center for Space and remote Sensing Research, National Central University Taiwan, Taiwan, R. O. C.

Session G1: Space Plasma Measurement Techniques I
Room 200

Co-Chairs: Tom Gaussiran, *ARL:UT*
Philip Erickson, *MIT Haystack Observatory*

13:20 G1-1 A NEW UHF HIGH DYNAMIC RANGE RECEIVER FOR THE ARECIBO OBSERVATORY

Amanda C. Mills*[1], Julio V. Urbina[1], Ganesh Rajagopalan[2,3], Sixto A. Gonzalez[2], Mike Sulzer[2], Mark Wharton[1]
[1]Communications and Space Sciences Laboratory, The Pennsylvania State University, University Park, Pennsylvania
[2]Arecibo Observatory, Arecibo, Puerto Rico
[3]Center for Radiophysics and Space Research, Cornell University, Ithaca, New York

13:40 G1-2 PHASE AND PATTERN CALIBRATION OF THE JICAMARCA RADAR USING SATELLITES

Boyi Gao*[1], John D. Mathews[1], Jorge L. Chau[2]
[1]Electrical Engineering, Pennsylvania State University, State College, PA
[2]Radio Observatorio de Jicamarca, Instituto Geofsico del Per, Lima, Peru

14:00 G1-3 EXTRACTING PLASMA FREQUENCIES FROM HIGH RESOLUTION ARECIBO PLASMA LINE DATA: DEVELOPING THE MODEL AND FITTING TECHNIQUES

Michael P. Sulzer*
Arecibo Observatory, Arecibo, PR

14:20 G1-4 SIGNAL CHAIN ARCHITECTURES FOR EFFICIENT IONOSPHERIC RADAR PROCESSING

Philip J. Erickson*, William C. Rideout, Frank D. Lind
Atmospheric Sciences Group, MIT Haystack Observatory, Westford, MA

14:40 G1-5 RAPID (RADIO ARRAY OF PORTABLE INTERFEROMETRIC DETECTORS)

Frank D. Lind*[1], Colin J. Lonsdale[1], Andrew J. Faulkner[2], Paul Alexander[2], Chris Mattmann[3]
[1]MIT Haystack Observatory, Westford, MA
[2]University of Cambridge, Cambridge, UK
[3]Jet Propulsion Laboratory, Pasadena, CA

15:00 Break

15:20 G1-6 AN MF/HF ANTENNA ARRAY FOR IONOSPHERIC SOUNDING AND MEASUREMENT OF IONOSPHERIC RADIO EMISSIONS

Brett Isham*
Electrical and Computer Engineering, Interamerican University of Puerto Rico, Bayamon, PR

15:40 G1-7 SATELLITE-BASED STUDIES OF THE IONOSPHERE USING MRM RADIO RECEIVERS

David M. Suszcynsky*[1], William H. Atkins[1], Zachary K. Baker[1], Kalpak A. Dighe[1], Mark E. Dunham[1], Paul S. Graham[1], Matthew J. Heavner[1], John P. Layne[1], Michael J. Pigue[1], Heather M. Quinn[1], David A. Smith[1], Paul A. Bernhardt[2]
[1]Space & Remote Sensing Sciences Group, Los Alamos National Laboratory, Los Alamos, NM
[2]Plasma Physics Division, Naval Research Laboratory, Washington DC

16:00 G1-8 FIRST RESULTS FROM A COHERENT-SCATTER ATMOSPHERIC PASSIVE RADAR IMAGER (CAPRI) FOR PASSIVE RADIO SENSING OF EQUATORIAL PLASMA INSTABILITIES NEAR THE PERUVIAN ANDES

Burak Tuysuz*[1], Julio Urbina[1], Frank D. Lind[2]
[1]Electrical Engineering, Penn State University, University Park, PA
[2]Haystack Observatory, Massachusetts Institute of Technology, Westford, MA

16:20 G1-9 FIRST STEPS TOWARDS THE IMPLEMENTATION OF A COGNITIVE RADAR TO STUDY PLASMA INSTABILITIES NEAR THE PERUVIAN ANDES

Robert M. Sorbello[1], Julio Urbina*[1], Zach Stephens[2]
[1]Electrical Engineering, Pennsylvania State University, University Park, PA
[2]Electrical Engineering, Univerisity of Illinois, Champaign, IL

16:40 G1-10 SUBSTORM IMAGING AT 450 MHZ WITH THE ELECTRONICALLY STEERABLE POKER FLAT ISR

Joshua Semeter*[1], Thomas Butler[1], Michael Nicolls[2], Craig Heinselman[2]
[1]Boston University, Boston, MA
[2]SRI International, Menlo Park, CA

Session H2: Physics of the Radiation Belts
Room 245

Co-Chairs: Michael Starks, *Air Force Research Laboratory*
Mark Golkowski, *University of Colorado Denver*

13:20 H2-1 CHARACTERISTICS OF QUASI FIELD-ALIGNED AND VERY OBLIQUE WHISTLER-MODE EMISSIONS OBSERVED ON THEMIS AND RBSP

Wen Li*[1], Richard M. Thorne[1], Jacob Bortnik[1], Lunjin Chen[1], Vassilis Angelopoulos[2]
[1]Department of Atmospheric and Oceanic Sciences, UCLA, Los Angeles, CA
[2]Institute of Geophysics and Planetary Physics/ Earth and Space Sciences, UCLA, Los Angeles, CA

13:40 H2-2 RADIATION BELT ELECTRON ENHANCEMENTS: HISTORY AND NEW RESULTS FROM RBSP

Daniel N. Baker*[1], Shrikanth G. Kanekal[2], Xinlin Li[1], Scot R. Elkington[1], Harlen Spence[3]
[1]LASP, Univ. of Colorado Boulder, Boulder, CO
[2]Goddard Space Flight Center, NASA, Greenbelt, MD
[3]Ctr for Earth, Oceans and Space, University of New Hampshire, Durham, NH

14:00 H2-3 MODELING THE WAVE NORMAL DISTRIBUTION OF CHORUS WAVES

Lunjin Chen*, Richard Thorne, Wen Li, Jacob Bortnik
Atmospheric and Oceanic Sciences, University of California, Los Angeles, Los Angeles, CA

14:20 H2-4 SCATTERING OF ENERGETIC RADIATION BELT ELECTRONS BY SIMULATED MAGNETOSPHERIC CHORUS WAVES

Vijay Harid*[1], Mark Golkowski[2], Maria Spasojevic[1], Timothy Bell[1], Umran S. Inan[1]
[1]EE, Stanford University, Palo Alto, CA
[2]EE, University of Colorado, Denver, Denver, CO

14:40 H2-5 ANALYSIS OF WHISTLER MODE SIDEBANDS OF MAGNETOSPHERIC TRIGGERED EMISSIONS

Mark Golkowski*[1], Vijay Harid[2]
[1]Electrical Engineering, University of Colorado Denver, Denver, CO
[2]Stanford University, Stanford, CA

15:00 Break

15:20 H2-6 ANALYTICAL TREATMENT OF NONLINEAR ELECTRON BEHAVIOR IN RESONANCE WITH LARGE AMPLITUDE WHISTLER WAVES

Jay M. Albert*
Air Force Research Laboratory, Kirtland AFB, NM

15:40 H2-7 INCLUDING VLF WAVE INTERACTIONS IN A COMPREHENSIVE MHD/PARTICLE SIMULATION OF THE RADIATION BELTS

Scot R. Elkington*[1], Anthouny A. Chan[2]
[1]Laboratory for Atmospheric and Space Physics, University of Colorado, Boulder, Colorado
[2]Department of Physics and Astronomy, Rice University, Houston, Texas

Session J2: Timely Technical Tutorials
Room 265

Co-Chairs: Richard Bradley, *National Radio Astronomy Observatory*
David DeBoer, *University of California*

13:20 J2-1 SPATIAL ARRAY PROCESSING METHODS FOR RADIO ASTRONOMICAL RFI MITIGATION

Brian D. Jeffs*, Karl F. Warnick
Brigham Young University, Provo, UT

13:40 J2-2 TUTORIAL: NEW TELESCOPES, TECHNIQUES, AND OBSERVATIONS

Geoffrey Bower*
UC Berkeley, CA

14:00 J2-3 SHORT DURATION TRANSIENTS

Dale Frail*
Assistant Director, National Radio Astronomy Observatory, Socorro, NM

14:20 J2-4 TUTORIAL: PHASED ARRAY ANTENNAS FOR RADIO ASTRONOMY

Karl F. Warnick*, Brian D. Jeffs
ECE Dept., Brigham Young University, Provo, UT

14:40 J2-5 EARLY TIMES AT A UNIVERSITY RADIO OBSERVATORY NEW ASTRONOMY AND TELESCOPES AND LESSONS LEARNED

Jack Welch*
University of California Berkeley, Berkeley CA

Session B7: Electromagnetic Theory
Room 155

Co-Chairs: David Jackson, *University of Houston*
Piergiorgio Uslenghi, *University of Illinois at Chicago*

08:20 B7-1 MULTISTATIC POLARIMETRIC RADAR DATA MODELING

Tegan Webster*[1], Margaret Cheney[2], Eric L. Mokole[1]
[1]*Radar Division, United States Naval Research Laboratory, Washington, DC*
[2]*Department of Mathematics, Colorado State University, Fort Collins, CO*

08:40 B7-2 EXACT SCATTERING FOR AXIAL INCIDENCE ON CONCAVE SOFT AND HARD PARABOLOIDS

Piergiorgio L. E. Uslenghi*
Dept. of ECE, University of Illinois at Chicago, Chicago, Illinois

09:00 B7-3 THE INTERACTION OF ELECTROMAGNETIC WAVES AND THREE-DIMENSIONAL NON-ISOTROPIC (UNIAXIAL) WIRE MEDIUM METAMATERIALS BASED ON A TRANSPORT MODEL

Ebrahim Forati*, George W. Hanson
Electrical Engineering, University of Wisconsin Milwaukee, Milwaukee

09:20 B7-4 STUDYING DIPOLE MOMENT MODIFICATION IN A SINGLE FLUORESCENT DYE BESIDE METALLIC NANO-PARTICLE BASED ON THE GREENS FUNCTION THEORY

Faezeh Tork Ladani*, Caner Guclu, Salvatore Campione, Filippo Capolino
Electrical Engineering and Computer Science, University of California Irvine, Irvine

09:40 B7-5 RESONANCES OF A SPHERICAL ANTENNA

10:00 Break

10:20 B7-6 OPTICAL COMPOSITE NANOPARTICLES WITH BROADBAND FINITE ABSORPTION IN THE LIMIT OF INFINITESIMALLY SMALL LOSSES

Nasim Mohammadi Estakhri*, Andrea Alu
Electrical and Computer Engineering Department, The University of Texas at Austin, Austin,Texas

10:40 B7-7 IMPULSE RESPONSE AND TRANSIENT NEAR-FIELD OF A HERTZIAN DIPOLE

Majid Manteghi*
Virginia Tech, Blacksburg

11:00 B7-8 VERTICAL STRIP TRANSMISSION LINE PRIMARY RADIATOR ETCHED ON FR-4 SUBSTRATE AT 60 GHZ

Futoshi Kuroki*, Tomonori Morita
Kure National College of Technology, Kure, Japan

11:20 B7-9 FIELD STUDY OF RADIO FREQUENCY QUADRUPOLE CAVITY END-REGION

Ki R. Shin*[1], Yoon W. Kang[2], Aly E. Fathy[1]
[1]*EECS, University of Tennessee, Knoxville TN*
[2]*Spallation Neutron Source, Oak Ridge National Laboratory, Oak Ridge TN*

11:40 B7-10 WIRELESS POWER TRANSMISSION FOR GEOPHYSICAL APPLICATIONS

Xiyao Xin*[1], David Jackson[1], Ji Chen[1], Paul Tubel[2]
[1]*Department of Electrical and Computer Engineering, University of Houston, Houston, TX*
[2]*Tubel Energy, Inc., The Woodlands, TX*

Session BC1: Cognitive Radio
Room 1B40

Co-Chairs: Christos Christodoulou, *University of New Mexico*
Amir Zaghloul, *US Army Research Laboratory*

08:20 BC1-1 SOFTWARE CONTROLLED MECHANICALLY RECONFIGURABLE ANTENNAS FOR COGNITIVE RADIO

Joseph Costantine[1], Youssef Tawk[2], Christos G. Christodoulou*[2]
[1]Electrical Engineering, California State University Fullerton, Fullerton, CA
[2]Electrical and Computer Engineering, University of New Mexico, Albuquerque, NM

08:40 BC1-2 COGNITIVE RADIO ANTENNAS THAT LEARN AND ADAPT USING NEURAL NETWORKS

Youssef Tawk[1], Joseph Costantine[2], Eyad Al-Zuraiqi[1], Christos Christodoulou*[1]
[1]Electrical and Computer Engineering, University of New Mexico, Albuquerque NM
[2]Electrical Engineering, California State University Fullerton, Fullerton CA

09:00 BC1-3 A NOVEL MEMS RECONFIGURABLE WIDEBAND E-SHAPED PATCH ELEMENT FOR ADVANCED COGNITIVE RADIO BASE STATIONS

Joshua M. Kovitz*, Yahya Rahmat-Samii
Electrical Engineering Department, University of California Los Angeles, Los Angeles, CA

09:20 BC1-4 COGNITIVE RF PROCESSING FOR NONLINEAR RADAR

Anthony F. Martone*, David McNamara, Greg Mazzaro, Abigail Hedden
US Army Research Laboratory, Adelphi, MD

10:00 Break

10:20 BC1-5 ACTIVE REFLECTION PHASE SURFACES FOR COGNITIVE RADAR

Amir I. Zaghloul*
SEDD, US Army Research Laboratory, Adelphi, MD

10:40 BC1-6 INTERLEAVING TECHNOLOGIES FOR SIGNAL DESIGN

Jing Jane He[1], Qingsheng Zeng*[2]
[1]School of Mathematics and Statistics, Carleton University, Ottawa, Ontario, Canada
[2]Industry Canada, Government of Canada, Ottawa, Ontario, Canada

Session C1: Radar Remote Sensing and Target Detection
Room 1B51

Co-Chairs: Anthony Martone, *US Army Research Laboratory*
Gregory Huff, *Texas A&M University*

08:20 C1-1 EQUIVALENT TIME SAMPLING TECHNIQUES PERFORMANCE IN A HIGH ACCURACY LOCALIZATION SYSTEM

Essam Elkhouly*[1], Aly Fathy[1], Mohamed Mahfouz[2]
[1]EECS, University of Tennessee, Knoxville, TN
[2]MABE, University of Tennessee, Knoxville, TN

08:40 C1-2 A NEW MOBILE PASSIVE RADAR DESIGNED FOR TRANSMITTERS UP TO 1.5 GHZ FOR DETECTION OF AEROSPACE AND GEOSCIENCE TARGETS

Laura E. Vertatschitsch*, John D. Sahr
Dept of Electrical Engineering, University of Washington, Seattle, WA

09:00 C1-3 ULTRA WIDEBAND TRANSMIT-ONLY BASED DIGITAL COMMUNICATION FOR TAG ID TRANSMISSION IN A MILLIMETER ACCURACY LOCALIZATION SYSTEM

Nathan C. Rowe*[1], Aly E. Fathy[1], Michael J. Kuhn[2], Mohamed R. Mahfouz[2]
[1]EECS, University of Tennessee, Knoxville, TN
[2]MABE, University of Tennessee, Knoxville, TN

09:20 C1-4 Y-BAND RADAR ASSESSMENT FOR INDOOR NAVIGATION AND MAPPING

Meysam Moallem*, Kamal Sarabandi
Radiation Laboratory, University of Michigan, Ann Arbor, Ann Arbor, Michigan

09:40 C1-5 HIGH SPEED COMPUTATION FOR NEW DIGITAL VHF AND UHF PASSIVE RADAR RECEIVER

Weiwei Sun*, John D. Sahr
University of Washington, Seattle, WA

10:00 Break

10:20 C1-6 EXPERIMENTAL EVALUATION OF DETECTION PERFORMANCE OF A MIMO RADAR TESTBED

Tetsuya Otsuki*, Idnin Pasya, Takehiko Kobayashi
Tokyo Denki University, Senju-Asahi-cho, Tokyo, Japan

10:40 C1-7 CALIBRATION OF GROUND RADARS DURING THE MID LATITUDE CONTINENTAL CONVECTIVE CLOUD EXPERIMENT (MC3E)

Joseph C. Hardin*, Venkatachalam Chandrasekar
Electrical and Computer Engineering, Colorado State University, Fort Collins, CO

Session D3: THz and Photonic Devices, Circuits, and Applications
Room 151

Co-Chairs: Zoya Popovic, *University of Colorado Boulder*
Jamesina Simpson, *University of Utah*

08:20 D3-1 DESIGN OF MICRO-OPTICAL PARAMETRIC OSCILLATORS BASED ON THIRD-ORDER NONLINEARITY

Xiaoge Zeng*, Milos Popovic
ECEE, University of Colorado at Boulder, Boulder

08:40 D3-2 CIRCUIT MODELING OF AC PERFORMANCE OF GRAPHENE NANODEVICES

Pai-Yen Chen*, Andrea Alu
University of Texas at Austin, Austin

09:00 D3-3 SYNTHESIS OF HIGH-Q LINEAR PHOTONIC CRYSTAL MICROCAVITIES BASED ON A REAL-K BAND STRUCTURE SOLVER

Chris Poulton*, Xiaoge Zeng, Milos A. Popovic
University of Colorado at Boulder, Boulder, CO

09:20 D3-4 CHARACTERIZATION OF A QUANTUM DOT MODE LOCKED LASER FUNCTIONING AS A PHOTONIC MICROWAVE SOURCE

Georgios Atmatzakis*[1], David Murell[2], Christos G. Christodoulou[1], Luke F. Lester[2]
[1]Department of Electrical and Computer Engineering, The University of New Mexico, Albuquerque, NM
[2]Center for High Technology Materials, The University of New Mexico, Albuquerque, NM

09:40 D3-5 POLE-ZERO MICRORING-RESONATOR FILTERS FOR DENSE WAVELENGTH-DIVISION MULTIPLEXED LINKS IN ON-CHIP INTERCONNECTS

Mark Wade*, Milos Popovic
ECEE, University of Colorado Boulder, Boulder, CO

10:00 Break

10:20 D3-6 INJECTION LOCKING PROPERTIES OF A PHOTONIC MICROWAVE OSCILLATOR BASED ON A QUANTUM DOT MODE LOCKED LASER

Georgios Atmatzakis*[1], David Murell[2], Christos G. Christodoulou[1], Luke F. Lester[2]
[1]*Department of Electrical and Computer Engineering, The University of New Mexico, Albuquerque, NM*
[2]*Center for High Technology Materials, The University of New Mexico, Albuquerque, NM*

10:40 D3-7 EFFICIENT, FIBER-TO-CHIP COUPLING AND OPTICAL THROUGH-SILICON VIAS FOR MONOLITHICALLY INTEGRATED ELECTRONIC-PHOTONIC CIRCUITS

Kareem Nammari*, Cale Gentry, Milos Popovic
Electrical Engineering, University of Colorado at Boulder, Boulder, CO

11:00 D3-8 LIGHTSABERS (LASER SWORDS) FOR IMPROVING PHOTODETECTOR SPEED AND RESPONSIVITY

I. M. Mehdi Hasan*, Jamesina J Simpson
Electrical and Computer Engineering, University of Utah, Salt Lake City, Utah

11:20 D3-9 CIRCULAR WIGGLER: A NOVEL CONTACTED MICROCAVITY WITH SUPPRESSED RADIATION LOSS BASED ON IMAGINARY FREQUENCY SPLITTING

Yangyang Liu*, Jeffrey M. Shainline, Milos Popovic
Electrical, Computer and Energy Engineering, University of Colorado at Boulder, Boulder, CO

11:40 D3-10 DESIGN OF OPTO-ELECTRONIC NANO-STRUCTURES, CAPABILITY FOR OPTIMIZATION OF DIFFERENT SOLAR CELLS

Ahmadreza Ghahremani*, Aly E. Fathy
EECS, University of Tennessee Knoxville, Knoxville, TN

Session F5: Mesoscale Numerical Weather Prediction in Support of Wave Propagation Modeling
Room 150

Co-Chairs: Katherine Horgan, *Naval Surface Warfare Center Dahlgren Division*
tracy haack, *NRL*

08:20 F5-1 MESOSCALE MODELING AND EM PROPAGATION DURING THE SMARTEX FIELD CAMPAIGN

Tracy Haack*[1], Sally Garrett[2]
[1]*NRL, Monterey, CA*
[2]*DTA, Auckland, New Zealand*

08:40 F5-2 USING THE OUTPUT DATA OF THE WEATHER FORECAST MODEL COSMO TO PREDICT THE TURBULENT MODULAR TRANSFER FUNCTION OVER A TROPICAL OCEAN AND COMPARISON WITH EXPERIMENTAL RESULTS DURING THE SMARTEX TRIAL

Detlev Sprung*[1], Erik Sucher[1], Ulrich Trempel[2]
[1]*Signatorics, Fraunhofer Institute of Optronics, System Technologies and Image exploitation IOSB, Ettlingen, Germany*
[2]*Wehrtechnische Dienststelle fr Waffen und Munition (WTD91), Meppen, Germany*

09:00 F5-3 REDUCED TURBULENT MIXING IN A MESOSCALE NWP MODEL FOR RADAR PROPAGATION FORECASTING

Stuart Fox*
Met Office, Exeter, Devon, United Kingdom

09:20 F5-4 INTEGRATION OF REFRACTIVITY FROM CLUTTER AND NUMERICAL WEATHER PREDICTION

Caglar Yardim*, Ali Karimian
Marine Physical Lab., University of California, San Diego, La Jolla, CA

09:40 F5-5 SURFACE AND ELEVATED DUCTS AND IMPLICATIONS ON THE MODELING OF MESOSCALE NWP REFRACTIVITY AND RADIO-WAVE PROPAGATION

Andy S. Kulessa*[1], Jorg M. Hacker[2]
[1]*EWRD, Defence Science & Technology Organisation, Edinburgh, SA, Australia*
[2]*Airborne Research Australia, Salisbury South, SA, Australia*

10:00 Break

10:20 F5-6 EXTENDED AND PERSISTENT SURFACE BASED RADIO FREQUENCY DUCTING OVER ARID LAND

Robert E. Marshall*, Katherine L. Horgan, Isha M. Renta, Victor R. Wiss
NSWCDD, Dahlgren, VA

10:40 F5-7 COMPARISON OF CLIMATE REANALYSIS DATA WITH DATA FROM A HIGH-RESOLUTION MESOSCALE MODEL

Ian Will*
Naval Research Lab, Washington, DC

11:00 F5-8 A COMPARISON OF DUCT CLIMATOLOGIES BASED ON VARIOUS DATA SOURCES

Thomas R. Hanley*[1], Jonathan Z. Gehman[1], Brian T. Taylor[1], Tracy Haack[2]
[1]*Johns Hopkins University Applied Physics Laboratory, Silver Spring, MD*
[2]*Naval Research Laboratory, Monterey, CA*

11:20 F5-9 A RADIOSONDE-BASED UPPER-AIR ELECTROMAGNETIC DUCTING CLIMATOLOGY DATABASE AND ANALYSIS SYSTEM

Paul Frederickson*[1], Tom Murphree[1], Chuck Skupniewicz[2], David Ramsaur[2], Megan Hutchins[2], Amalia Barrios[3]
[1]*Department of Meteorology, Naval Postgraduate School, Monterey, California*
[2]*Climatology Division, Fleet Numerical Meteorology and Oceanography Center, Monterey, California*
[3]*Atmospheric Propagation Branch, Space and Naval Warfare Systems Center, Pacific, San Diego, California*

11:40 F5-10 CLIMATOLOGIES OF POD WITH THE COUPLED SYSTEM WRF-APM

Francois C. Vandenberghe*[1], Eric Mandine[2], Michel Aidonidis[3]
[1]*Research Applications Laboratory, National Center for Atmospheric Research, Boulder CO*
[2]*C-S Information System, Toulon, France*
[3]*Meteo-France, Brest, France*

Session G2: Space Plasma Measurement Techniques II
Room 200

Co-Chairs: Philip Erickson, *MIT Haystack Observatory*
Tom Gaussiran, *ARL:UT*

08:20 G2-1 RADAR INTERFEROMETRIC IMAGING USING THE MAXIMUM ENTROPY METHOD FOR THE CASE OF POINT TARGETS

Qian Zhu*, John D. Mathews
Electrical Engineering, The Pennsylvania State University, State College, PA

08:40 G2-2 CLUSTERING AND CONFIDENCE INTERVALS FOR RADAR TARGET IDENTIFICATION AND ESTIMATION

Ryan Volz*[1], Sigrid Close[1], Philip J. Erickson[2]
[1]*Aeronautics and Astronautics, Stanford University, Stanford, CA*
[2]*Atmospheric Sciences Group, MIT Haystack Observatory, Westford, MA*

09:00 G2-3 D REGION METEORIC SMOKE AND NEUTRAL TEMPERATURE RETRIEVAL USING THE POKER FLAT INCOHERENT SCATTER RADAR

Jonathan T. Fentzke*[1], Vicki Hsu[2], Christiano Brum[3], Irina Strelnikova[4], Marcus Rapp[4]
[1]*Space Department, Johns Hopkins University Applied Physics Laboratory, Laurel, MD*
[2]*Aerospace Engineering Sciences, University of Colorado Boulder, Boulder, CO*

[3]*Arecibo Observatory, SRI, Arecibo, PR*
[4]*Radar and Rocket Sounding, Leibniz-Institut fuer Atmosphaerenphysik, Kuehlungsborn, Germany*

09:20 G2-4 SPACE WEATHER MONITORING: RECENT DETECTED EVENTS BY CALLISTO-SWMC DURING 2011-2012

Ayman M. Mahrous*[1], Christian Monstein[2]
[1]*Space Weather Monitoring Center, Helwan University, Cairo, Egypt*
[2]*Institute of Astronomy, ETH Zrich, Zrich, Switzerland*

Session G3: Space Weather Events and Assimilative Models I
Room 200

Co-Chairs: Atilla Komjathy, *JPL*
Anthea Coster, *MIT*

10:20 G3-1 UPPER ATMOSPHERE DATA ASSIMILATION WITH AN ENSEMBLE KALMAN FILTER

Tomoko Matsuo*[1,2], I-Te Lee[3,4], Jeffrey Anderson[3], Arthur Richmond[3]
[1]*University of Colorado, Boulder, CO*
[2]*NOAA, Boulder, CO*
[3]*National Center for Atmospheric Research, Boulder, CO*
[4]*National Central University, Jhongli, Taiwan*

10:40 G3-2 ASSIMILATION OF FORMOSAT-3/COSMIC ELECTRON DENSITY PROFILES INTO A COUPLED THERMOSPHERE/IONOSPHERE MODEL USING ENSEMBLE KALMAN FILTERING

I-Te Lee*[1,2], Tomoko Matsuo[3,4], Arthur D. Richmond[1], Wenbin Wang[1], Jann-Yeng Liu[2,5], Charles Lin[6]
[1]*National Center for Atmospheric Research, High Altitude Observatory, Boulder, CO*
[2]*National Central University, Institute of Space Science, Chungli, TAIWAN*
[3]*University of Colorado at Boulder, Cooperative Institute for Research in Environmental Sciences, Boulder, CO*
[4]*National Oceanic and Atmospheric Administration, Space Weather Prediction Center, Boulder, CO*
[5]*National Space Organization, Hsinchu, Taiwan*
[6]*National Cheng Kung University, Department of Earth Science, Tainan, Taiwan*

11:00 G3-3 L BAND IONOSPHERE SCINTILLATION IMPACT ON GNSS RECEIVERS

Yu (Jade) Morton*[1], Steve Taylor[1], Jun Wang[1], Yu Jiao[1], Wouter Pelgrum[2]
[1]*Electrical and Computer Eng., Miami University, Oxford, OH*
[2]*Electrical Eng. and Computer Science, Ohio University, Athens, OH*

11:20 G3-4 AN ELECTROMAGNETIC COMPONENT FOR THE RAYLEIGH-TAYLOR INSTABILITY: EVIDENCE FROM THE C/NOFS SATELLITE

William J. Burke*[1], Louise C. Gentile[1], Patrick A. Roddy[2]
[1]*Boston College Institute for Scientific Research, Chestnut Hill, MA*
[2]*Air Force Research Laboratory Space Vehicles Directorate, Kirtland AFB, NM*

11:40 G3-5 DATA ASSIMILATION OF EQUATORIAL ELECTRIC FIELDS FROM C/NOFS

Gary Bust*[1], Seebany Datta-Barua[2], Odile De La Beaujardiere[3], Patrick Roddy[3], Rod Heelis[4], Fabiano Rodrigues[4]
[1]*Geospace and Earth Science Group, JHUAPL, Laurel Maryland*
[2]*Mechanical and Aerospace Engineering, Illinois Institute of Technology, Chicago Illinois*
[3]*AFRL, Albuquerque New Mexico*
[4]*Aerospace Corporation, El Segundo California*

Session H3: Waves in Space and Laboratory Plasmas
Room 105

Co-Chairs: Nikolai Lehtinen, *Stanford University*
Erik Tejero, *Naval Research Laboratory*

08:20 H3-1 FULL-WAVE D-REGION COUPLING OF ATMOSPHERIC LIGHTNING TO PLASMASPHERIC ELECTRON WHISTLERS

Abram R. Jacobson*[1], Robert W. Holzworth[1], Xuan-Min Shao[2], Erin Lay[2]
[1]*Earth and Space Sciences, University of Washington, Seattle, WA*
[2]*ISR2, Los Alamos National Laboratory, Los Alamos, NM*

08:40 H3-2 WHISTLER INTERACTIONS WITH DENSITY GRADIENTS IN THE MAGNETOSPHERE

Anatoly V. Streltsov*, Jesse R. Woodroffe
Embry-Riddle Aeronautical University, Daytona Beach

09:00 H3-3 MAGNETOSPHERIC WAVE POWER DENSITY FROM GROUND-BASED VLF TRANSMITTERS

David Lauben*, Morris Cohen, Umran Inan
Stanford University, Stanford, CA

09:20 H3-4 NATURAL CYCLOTRON HARMONIC RADIATION FROM THE IONOSPHERE

James W. LaBelle*
Dept of Physics, Dartmouth College, Hanover NH

09:40 H3-5 MODE CONVERSION OF DOWNWARD-PROPAGATING LANGMUIR WAVES IN THE TOPSIDE IONOSPHERE

Nikolai G. Lehtinen*[1], Nicholas L. Bunch[1], Umran S. Inan[2]
[1]*Stanford University, Stanford, CA*
[2]*Koc University, Istanbul, Turkey*

10:00 Break

10:20 H3-6 LABORATORY INVESTIGATION OF ENERGETIC ELECTRON PITCH ANGLE SCATTERING BY WHISTLER WAVES

Christopher D. Cothran*[1], Erik M. Tejero[2], William E. Amatucci[2], Carl L. Enloe[3]
[1]*Sotera Defense Solutions, Inc., Annapolis Junction, MD*
[2]*Plasma Physics Division, U. S. Naval Research Laboratory, Washington, DC*
[3]*Physics Department, U. S. Air Force Academy, Colorado Springs, CO*

10:40 H3-7 LABORATORY INVESTIGATION OF NONLINEAR WHISTLER WAVE PROCESSES*

Bill Amatucci*[1], Chris Cothran[2], Erik Tejero[1], Dave Blackwell[1], Guru Ganguli[1]
[1]*Plasma Physics Division, Code 6755, Naval Research Laboratory, Washington, DC*
[2]*Sotera Defense Solutions, Crofton, MD, Unites States*

11:00 H3-8 LABORATORY STUDIES OF WAVES IN MAGNETIZED PLASMAS AND MAGNETIZED DUSTY PLASMAS

Edward E. Thomas, Jr.*, Ami M. Dubois, Ross K. Fisher
Physics Department, Auburn University, Auburn, AL

Session HG1: Ionospheric Modification I
Room 245

Co-Chairs: Paul Bernhardt, *Naval Research Laboratory*
Robert Moore, *University of Florida*

08:20 HG1-1 MODULATION OF AURORAL ELECTROJET CURRENTS USING DUAL HF BEAMS WITH ELF PHASE OFFSET, A POTENTIAL D-REGION DIAGNOSTIC

Mark Golkowski*[1], Morris B. Cohen[2,3], Robert C. Moore[4]
[1]*Electrical Engineering, University of Colorado Denver, Denver, CO*
[2]*Electrical Engineering, Stanford Unviersity, Stanford, CA*
[3]*National Science Foundation, Washington, DC*
[4]*Electrical Engineering, University of Florida, Gainesville , FL*

08:40 HG1-2 FREQUENCY RESPONSE AND POLARIZATION OF ELF/VLF SIGNALS GENERATED VIA IONOPSHERIC MODIFICATION

Jason R. Carpenter*, Ryan T. Jacobs, Mark Golkowski
Electrical Engineering, University of Colorado Denver, Denver CO

09:00 HG1-3 SYNTHESIZING ARBITRARY HF BEAM PATTERNS FOR ELF/VLF WAVE GENERATION

Shuji Fujimaru*, Robert C. Moore
Electrical and Computer Engineering, University of Florida, Gainesville, FL

09:20 HG1-4 DUAL-BEAM ELF/VLF TOA MEASUREMENTS AS A FUNCTION OF HF POWER

Brittany L. Finch*, Shuji Fujimaru, Divya Agrawal, Robert C. Moore
Electrical and Computer Engineering, University of Florida, Gainesville, Florida

09:40 HG1-5 QUANTIFICATION OF D-REGION ABSORPTION USING HF CROSS-MODULATION

Jerrod S. Langston*, Robert C. Moore
Electrical and Computer Engineering, University of Florida, Gainesville, FL

10:00 Break

10:20 HG1-6 NONLINEAR MULTI-BEAM INTERACTIONS IN THE D-REGION IONOSPHERE

Robert C. Moore*, Shuji Fujimaru, Daniel A. Kotovsky
Electrical and Computer Engineering, University of Florida, Gainesville, FL

10:40 HG1-7 ARTIFICIAL E-REGION FIELD-ALIGNED PLASMA DENSITY IRREGULARITIES

David Hysell*, Robert Miceli
Earth and Atmospheric Sciences, Cornell University, Ithaca, NY

11:00 HG1-8 RECENT OBSERVATIONS AND MODELING OF NARROWBAND STIMULATED ELECTROMAGNETIC EMISSIONS SEES AT HAARP

Wayne A. Scales*[1], Maitrayee R. Bordikar[1], Alireza Samimi[1], Alireza Mahmoudian[1], Hayiang Fu[1], Paul A. Bernhardt[2], Stanley J. Briczinski[2], Michael J. McCarrick[3]
[1]*Bradley Department of Electrical and Computer Engineering, Virginia Tech, Blacksburg, VA*
[2]*Plasma Physics Division, Naval Research Laboratory, Washington D.C.*
[3]*Marsh Creek, LLC, Gakona, AK*

11:20 HG1-9 ELECTROMAGNETIC SIGNATURES OF ELECTRON ACCELERATION BY HIGH POWER RADIO WAVES IN THE IONOSPHERE

Paul A. Bernhardt*[1], Stanley J. Briczinski[1], Wayne A. Scales[2], Haiyang Haiyang Fu[2], Alireza Mahmoudian[2], Alireza Samami[2]
[1]*Plasma Physics Division, Naval Research Laboratory, Washington, DC*
[2]*Electrical Engineering Department, Virginia Tech University, Blacksburg, VA*

11:40 HG1-10 SIMULTANEOUS ELECTRON TEMPERATURE MEASUREMENTS AT EISCAT THROUGH ISR AND SEE

Stanley Briczinski*[1], Paul Bernhardt[1], Mike Kosch[2], Andrew Senior[2], Mike Reitveld[3]
[1]*NRL, Washington, DC*
[2]*Department of Physics, University of Lancaster, Lancaster, UK*
[3]*EISCAT Scientific Association, Tromso, Norway*

Session J3: Detection of Short-Duration Transients
Room 265

Co-Chairs: Joseph Lazio, *Jet Propulsion Laboratory, California Institute of Technology*
Scott Ransom, *National Radio Astronomy Observatory*

08:20 J3-1 DISCOVERIES OF ROTATING RADIO TRANSIENTS IN THE GREEN BANK TELESCOPE DRIFT-SCAN SURVEY

Chen Karako-Argaman*
Physics, McGill University, Montreal, QC, Canada

08:40 J3-2 THE HIGH TIME RESOLUTION UNIVERSE SURVEY FOR PULSARS AND FAST TRANSIENTS

Sarah Burke-Spolaor*[1], On Behalf Of The HTRU Survey Team[2]
[1]*Jet Propulsion Laboratory, Califorinia Institute of Technology, Pasadena, CA*
[2]*various, various, various*

09:00 J3-3 DSN TRANSIENT OBSERVATORY

Walid Majid*, Thomas Kuiper, Joseph Lazio, Robert Navarro, Lawrence Teitelbaum, Joseph Trinh
JPL/CIT, Pasadena, CA

09:20 J3-4 AN FPGA-BASED BACK END FOR REAL TIME, MULTI-BEAM TRANSIENT SEARCHES OVER A WIDE DM RANGE

Larry D'Addario*[1], Nathan Clarke[2], Robert Navarro[1], Joseph Trinh[1]
[1]*Jet Propulsion Laboratory, Cailfornia Institute of Technology, Pasadena, CA*
[2]*Curtin University, Perth, Western Australia, Australia*

09:40 J3-5 A YEAR OF COMMENSAL OBSERVATIONS WITH THE V-FASTR TRANSIENT DETECTION SYSTEM

Walter F. Brisken*[1], Sarah Burke-Spolaor[2], Adam T. Deller[3], Walid A. Majid[2], Dayton L. Jones[2], Divya Palaniswamy[4], Steven J. Tingay[4], David R. Thompson[2], Kiri L. Wagstaff[2], Randall B. Wayth[4]
[1]*NRAO, Socorro,NM*
[2]*Jet Propulsion Laboratory, California Institute of Technology, Pasadena,CA*
[3]*ASTRON, Dwingeloo PD, Netherlands*
[4]*International Centre for Radio Astronomy Research, Curtin University, Perth, WA, Australia*

10:00 Break

10:20 J3-6 SEARCH FOR SCATTERED RADIO TRANSIENTS IN THE GALACTIC CENTER USING ARCHIVAL VLA DATA

Robert Wharton*[1], Ani Chiti[1], Shami Chatterjee[1], James Cordes[1], Joseph Lazio[2]
[1]*Department of Astronomy, Cornell University, Ithaca, NY*
[2]*Jet Propulsion Laboratory, California Institute of Technology, Pasadena, CA*

10:40 J3-7 REAL-TIME RADIO TRANSIENT DETECTION WITH INTERFEROMETRIC CLOSURE QUANTITIES

Casey J. Law*, Geoffrey C. Bower
Astronomy, UC Berkeley, Berkeley

11:00 J3-8 PULSAR TIMING AND SEARCHING WITH THE JANKSY VLA

Paul Demorest*[1], Scott Ransom[1], Joseph Lazio[2], Adam Deller[3]
[1]*National Radio Astronomy Observatory, Charlottesville, VA*
[2]*Jet Propulsion Laboratory, California Institute of Technology, Pasadena, CA*
[3]*ASTRON, Dwingeloo, Netherlands*

11:20 J3-9 THE MIDAS TELESCOPE FOR MICROWAVE DETECTION OF ULTRA-HIGH ENERGY COSMIC RAYS

Paolo Privitera, Christopher Williams*
University of Chicago, Chicago Illinois

11:40 J3-10 SUBORBITAL DETECTION OF NANOSECOND RADIO TRANSIENTS FROM ULTRA-HIGH ENERGY PARTICLES WITH ANITA

Peter W. Gorham*
Dept. of Physics & Astronomy, University of Hawaii at Manoa, Honolulu, HI

12:00 J3-11 SEARCHING FOR SHORT DISPERSED PULSES WITH LWA1

Steve Ellingson*[1,2]
[1]*Bradley Dept. of Electrical & Comp. Eng., Virginia Tech, Blacksburg VA*
[2]*LWA1 Radio Observatory, NM*

Session A3: Electromagnetic Metrology
Room 105

Co-Chairs: William Davis, *Virginia Tech*
Steven Weiss, *US Army Research Lab*

13:20 A3-1 EFFECTS ON FLUOROPTIC TEMPERATURE PROBES ON HEATING MEASUREMENTS FOR MRI IMPLANTABLE DEVICES

Shi Feng*, Yan Liu, Songsong Qian, Ji Chen
Electrical and Computer Engineering, The University of Houston, Houston, TX

13:40 A3-2 NUMERICAL SIMULATION OF AIMD COMPATIBILITY IN AN MRI ENVIRONMENT

Dawei Li*, Yan Liu, Ji Chen
Electrical and Computer Engineering, University of Houston, Houston

14:00 A3-3 AUTO-BALANCED DETECTOR FOR FIBER LASER BASED STIMULATED RAMAN SCATTERING (SRS) MICROSCOPY

Wenlong Yang*[1], Christian Freudiger[1], Gary Holtom[1], Khanh Kieu[2], Xiaoliang S. Xie[1]
[1]*Chemistry and Chemical Biology, Harvard University, Cambridge, MA*
[2]*College of Optical Science, The University of Arizona, Tucson, AZ*

14:20 A3-4 MEASUREMENT OF THE INTRINSIC CONDUCTIVITY OF COPPER AT NEAR-TERAHERTZ FREQUENCIES

M. P. Kirley*, John H. Booske
University of Wisconsin-Madison, Madison, WI

15:00 Break

15:20 A3-5 PRECISE MEASUREMENT OF THE DIELECTRIC CONSTANT OF SEAWATER AT 1.413 GHZ: THE CAPILLARY EXIT HOLE CORRECTION

Yiwen Zhou*[1], Roger Lang[1], Cuneyt Utku[2], David Le Vine[2]
[1]*Dept. of Electrical and Computer Engineering, The George Washington University, Washington, DC*
[2]*NASA Goddard Space Flight Center, Cryospheric Sciences Laboratory, Greenbelt, MD*

15:40 A3-6 SIMULATION AND MEASUREMENT OF A GUIDED MICROWAVE SPECTROMETRY SYSTEM

Joshua Daniliuc*, Randall Jean, Yang Li
Dept. Electrical and Computer Engineering, Baylor University, Waco Texas

Session BJ1: Developments in Array Technology for Radio Astronomy
Room 265

Co-Chairs: Karl Warnick, *Brigham Young University*
John Volakis, *Ohio State University*

13:20 BJ1-1 A HIGH-PERFORMANCE REFLECTOR ANTENNA DESIGN APPROPRIATE FOR HIGH-VOLUME PRODUCTION

Matthew C. Fleming*[1], Gordon Lacy[2], Lynn Baker[3], Peter Byrnes[2], German Cortes-Medellin[3], David DeBoer[1], Joelef Fitzsimmons[2], Richard Hellyer[2], Gary Hovey[2], William Imbriale[4], Bruce Veidt[2]
[1]*University of California, Berkeley, CA*
[2]*Herberg Institute for Astrophysics, Canada National Research Council, Penticton, Canada*
[3]*Cornell University, Ithaca, NY*
[4]*Jet Propulsion Laboratory, Pasadena, CA*

13:40 BJ1-2 PLANAR REFLECTARRAY ANTENNAS WITH SPHERICAL PHASE DISTRIBUTION FOR TWO-DIMENSIONAL BEAM-SCANNING

Payam Nayeri*[1], Fan Yang[1,2], Atef Z. Elsherbeni[1]
[1]*Electrical Engineering, The University of Mississippi, Oxford, MS*
[2]*Electronic Engineering Department, Tsinghua University, Beijing, China*

14:00 BJ1-3 ELECTROMAGNETIC CHARACTERIZATION OF THE LWA1 ANTENNA ARRAY

Steve Ellingson*[1,2]
[1]*Bradley Dept. of Electrical & Comp. Eng., Virginia Tech, Blacksburg VA*
[2]*LWA1 Radio Observatory, NM*

14:20 BJ1-4 ASKAP ADVANCEMENTS IN BEAMFORMER AND CORRELATOR OPTICAL BACKPLANE TECHNOLOGY

Grant A. Hampson*[1], Andrew Brown[1], Stephan Neuhold[1], John Bunton[2], Adam Macleod[1], John Tuthill[1], Ron Beresford[1]
[1]*Astronomy and Space Science, CSIRO, Marsfield, NSW, Australia*
[2]*Information and Communication Technologies Centre, CSIRO, Marsfield, NSW, Australia*

14:40 BJ1-5 RECEIVER ARCHITECTURE FOR SECOND GENERATION ASKAP

Ron Beresford*[1], Grant A. Hampson[1], Paul Roberts[1], Wan Cheng[1], Dick Ferris[1], John Bunton[2], Russell Gough[1], Jega Kanapathippillai[1], Mark Leach[1], Adam Macleod[1], Rob Shaw[2]
[1]*Astronomy and Space Science, CSIRO, Marsfield, NSW, Australia*
[2]*Information and Communication Technologies Centre, CSIRO, Marsfield, NSW, Australia*

15:00 Break

15:20 BJ1-6 NRAO VLBA SYNTHESIZER PROJECT 2013

Steven Durand*, Rob Long, Chip Scott, Walter Brisken, Keith Morris, Jon Romney, Craig Walker
National Radio Astronomy Observatory, Socorro, NM

15:40 BJ1-7 L-BAND ANTENNA ELEMENT DESIGN FOR A CRYOGENIC PHASED ARRAY FEED ON THE GREEN BANK TELESCOPE

Karl F. Warnick*, Taylor Webb, Manoj Adhikari
ECE Dept., Brigham Young University, Provo, UT

16:00 BJ1-8 DEVELOPMENT OF AN ALL-CRYOGENIC PAF CAMERA FOR RADIO ASTRONOMY

German Cortes-Medellin*[1], Donald B. Campbell[2]
[1]*Center for Radio Physics and Space Research, Cornell University, Ithaca, NY*
[2]*Department of Astronomy, Cornell University, Ithaca, NY*

16:20 BJ1-9 ULTRAWIDEBAND SUBSTRATE-LOADED TIGHTLY COUPLED ARRAY WITH INTEGRATED FEED STRUCUTRE

Will Moulder*, Kubilay Sertel, John L. Volakis
Electrical and Computer Engineeering, Electroscience Laboratory, The Ohio State University, Columbus, OH

16:40 BJ1-10 KA-BAND PHASED ARRAY ANTENNA WITH INTEGRATED MEMS PHASE SHIFTERS

Woon-Gi Yeo*, Niru K. Nahar, Kubilay Sertel
Electrical and Computer Engineering/ElectroScience Laboratory, The Ohio State University, Columbus

17:00 BJ1-11 FEEDBACK CALIBRATION OF THE MOFF CORRELATOR

Adam P. Beardsley*
Department of Physics, University of Washington, Seattle, WA

Session C2: Processing for Sensor and Mobile Networks
Room 1B51

Co-Chairs: Jean-Francois Chamberland, *Texas A&M University*
Gregory Huff, *Texas A&M University*

13:20 C2-1 A MATLAB BASED TEST TOOL FOR LTE SIGNAL ANALYSIS

Linh P. Vu*[1], Robert B. Stafford[2]
[1]NTIA/ITS.E, Institute for Telecommunication Sciences, Boulder, Colorado
[2]NTIA/ITS.P, Institute for Telecommunication Sciences, Boulder, Colorado

13:40 C2-2 BENEFITS OF IP IN SENSOR NETWORKS

Geoff Mulligan*
IPSO Alliance, Colorado Springs, CO

14:00 C2-3 RECONFIGURABLE ANTENNAS, PREEMPTIVE SWITCHING AND VIRTUAL CHANNEL MANAGEMENT UNDER PARTIAL OBSERVATIONS

Santhosh Kumar, Jean-Francois Chamberland*, Gregory H. Huff
Texas A&M University, College Station, Texas

14:20 C2-4 COMPARISON OF SPARSE PLANAR ARRAYS WITH RANDOM AND PERIODIC ELEMENT CONFIGURATIONS

Zhenchun Xia, Gregory H. Huff*
Department of Electrical and Computer Engineering, Texas A&M University, College Station

14:40 C2-5 EXPLOITING HF AMBIENT NOISE TO SYNCHRONIZE DISTRIBUTED RECEIVERS

David Hong*, Jeffrey L. Krolik
Department of Electrical and Computer Engineering, Duke University, Durham, NC

Session F6: Waves in Random and Complex Media
Room 150

Co-Chairs: akira ishimaru, *university of washington*
Saba Mudaliar, *Air Force Research Laboratory*

13:20 F6-1 TIME-REVERSAL AND MUSIC IMAGING OF OBJECTS NEAR ROUGH SURFACE BASED ON SURFACE FLATTENING TRANSFORM

Ce Zhang*, Akira Ishimaru, Yasuo Kuga
Electrical Engineering, University of Washington, Seattle

13:40 F6-2 SCINTILLATION THEORY FOR VERY LONG AND INTERMEDIATE PATHS: COMPARISON WITH EXPERIMENTS

Viatcheslav Tatarskii*[1], Valerian Tatarskii[2]
[1]*School of Earth and Atmospheric Sciences, Georgia Institute of Technology, Atlanta, GA*
[2]*Radio-Hydro-Physics LLC, Fairmont, WV*

14:00 F6-3 COHERENT SCATTERING OF ELECTROMAGNETIC WAVES FROM LAYERED ROUGH SURFACES WITHIN THE KIRCHHOFF REGIME

Alireza Tabatabaeenejad*, Mahta Moghaddam
Department of Electrical Engineering---Electrophysics, University of Southern California, Los Angeles, CA

14:20 F6-4 UTD ANALYSIS OF FOLIAGE PENETRATION FOR USE IN PROPAGATION MODELING

Daniel E. Davis*, Gary S. Brown
Virginia Tech, Blacksburg, VA

14:40 F6-5 IMAGING THROUGH OBSCURING RANDOM MEDIA BASED ON INTERFERENCE GATING OF THE MUTUAL COHERENCE FUNCTION

Elizabeth Bleszynski*, Marek Bleszynski, Thomas Jaroszewicz
Monopole Research, Thousand Oaks, CA

15:00 Break

15:20 F6-6 WAVE PROPAGATION IN A RANDOM MEDIUM LAYER WITH ROUGH BOUNDARIES

Saba Mudaliar*
Sensors Directorate, Air Force Research Laboratory, Dayton, OH

15:40 F6-7 APPLYING MOMI TO A DIELECTRIC FOLIAGE LAYER ABOVE GROUND FOR PROPAGATION PREDICTION

Daniel E. Davis*, Benjamin A. Westin, Gary S. Brown
Virginia Tech, Blacksburg, VA

16:00 F6-8 COMPUTATIONAL STUDY OF ANTENNA-PLATFORM INTERACTION IN THE PRESENCE OF RANDOM ROUGH SURFACES

Dejan S. Filipovic, Maxim Ignatenko*, Timothy Samson
University of Colorado, Boulder, Colorado

16:20 F6-9 FREQUENCY SPECTRA OF OPTICAL ANGLE-OF-ARRIVAL FLUCTUATIONS IN THE ATMOSPHERIC SURFACE LAYER

Andreas Muschinski*[1], Shiril Tichkule[2]
[1]*CoRA Office, NorthWest Research Associates, Boulder, CO*
[2]*Dept. of Electrical, Computer, and Energy Engineering, University of Colorado at Boulder, Boulder, CO*

16:40 F6-10 GENERALIZED TELEGRAPHISTS' EQUATIONS FOR ELECTROMAGNETIC WAVE SCATTERING FROM A ROUGH INTERFACE ABOVE CHIRAL MEDIUM

Ezekiel Bahar[1], Paul Crittenden* Paul E Crittenden*[2]
[1]*Electrical Engineering, University of Nebraska Lincoln, Lincoln Nebraska*
[2]*Mathematics, Jacksonville University, Jacksonville Florida, united States*

Session G4: Space Weather Events and Assimilative Models II
Room 200

Co-Chairs: Anthea Coster, *MIT*
Atilla Komjathy, *JPL*

13:20 G4-1 REAL TIME ASSIMILATIVE FOF2 MAPS FOR IRI

Bodo W. Reinisch*[1,2], Xueqin Huang[2], Ivan Galkin[2], Dieter Bilitza[3]
[1]*Lowell Digisonde International, Lowell, MA*
[2]*Center For Atmospheric Research, University of Massachusetts, Lowell, MA*
[3]*School of Physics, Astronomy, and Computational Sciences, George Mason University, Fairfax, VA*

13:40 G4-2 EXTENDING THE REANALYSIS TO THE IONOSPHERE BASED ON GROUND AND LEO BASED GNSS OBSERVATIONS

Xinan Yue*, William S. Schreiner, Ying-Hwa Kuo
COSMIC, University Corporation for Atmospheric Research, Boulder, CO

14:00 G4-3 NUMERICAL SIMULATION OF THE IMPACT OF THE MIDDLE ATMOSPHERE PARAMETERS ON THE LOWER IONOSPHERE AND VLF/LF RADIOWAVES PROPAGATION USING MLS EOS AURA DATA

Andrey N. Lyakhov*, Andrey A. Egoshin, Julius I. Zetzer, Kateryna N. Yakimenko
Div. Electromagnetic processes in geophysics, Institute of Geospheres Dynamics, Moscow, Russian Federation

14:20 G4-4 EFFECTS OF BACKGROUND AND OBSERVATIONAL ERROR COVARIANCE MODELS ON IONOSPHERIC DATA ASSIMILATION

Chi-Yen Lin*[1,2,3], Tomoko Matsuo[1,2], Eduardo A. Araujo-Pradere[1,2], Jann-Yenq Liu[3]
[1]*Cooperative Institute for Research in Environmental Sciences, University of Colorado, Boulder*
[2]*Space Weather Prediction Center, National Oceanic and Atmospheric Administration, Boulder*
[3]*Institute of Space Science, National Central University, Chungli, TAIWAN*

14:40 G4-5 PROGRESS IN IONOSPHERIC DATA ASSIMILATION WITH THE USC/JPL GLOBAL ASSIMILATIVE IONOSPHERIC MODEL

Mark D. Butala*, Xiaoqing Pi, Attila Komjathy, Brian D. Wilson, Anthony J. Mannucci
Jet Propulsion Laboratory, California Institute of Technology, Pasadena, CA

15:00 Break

15:20 G4-6 INFERENCE OF MERIDIONAL NEUTRAL WINDS AND ZONAL ELECTRIC FIELDS FORM NMF2 AND HMF2 OBSERVATIONS

Yang-Yi Sun*[1,2,3], Tomoko Matsuo[1,2], Naomi Maruyama[1,2], Eduardo A. Araujo-Pradere[1,2], Jann-Yenq Liu[3]
[1]*Cooperative Institute for Research in Environmental Sciences, University of Colorado at Boulder, Boulder*
[2]*Space Weather Prediction Center, National Oceanic and Atmospheric Administration, Boulder*
[3]*Institute of Space Science, National Central University, Chung-Li, Taiwan*

15:40 G4-7 ANALYSIS OF THE PHYSICAL MECHANISMS BEHIND THE WEDDELL SEA ANOMALY USING A PHYSICS-BASED DATA ASSIMILATION MODEL

Levan Lomidze*, Ludger Scherliess
Center for Atmospheric and Space Sciences, Utah State University, Logan, UT

16:00 G4-8 STATISTICAL STUDY OF STORMTIME BEHAVIOUR OF TOTAL ELECTRON CONTENT (TEC) AT LAGOS, NIGERIA

Larry L. N. Amaeshi*, Paul P. Amaechi
Department of Physics, University of Lagos, Lagos Nigeria, Lagos, Nigeria

16:20 G4-9 IONOSPHERIC INFLUENCES OF THE SOLAR FLARES

Sharad C. Tripathi*, Parvaiz A. Khan, Aslam A. Muhammad, Azad A. Mansoori, Purushottam Bhawre, Ashok K. Gwal
Space Science Laboratory, Department of Physics, Barkatullah University, Bhopal, India, Bhopal, Madhya Pradesh, India

Session HG2: Ionospheric Modification II
Room 245

Co-Chairs: Robert Moore, *University of Florida*
Paul Bernhardt, *Naval Research Laboratory*

13:20 HG2-1 SPECTRAL CHARACTERISTICS OF HF-ENHANCED ION-LINE SIGNALS DETECTED DURING THE INITIAL RESPONSE, AND EXTENDED HEATING PHASE AT THE HAARP FACILITY

Brenton Watkins*[1], Chris Fallen[2]
[1]*Geophysical Institute, University of Alaska, Fairbanks, AK*
[2]*Arctic Regions Supercomputer Center, Fairbanks, AK*

13:40 HG2-2 ION GYRO-HARMONIC STRUCTURING IN THE STIMULATED RADIATION SPECTRUM DURING THIRD ELECTRON GYRO-HARMONIC HEATING

Alireza Mahmoudian*[1], Wayne Scales[1], Stan Briczinski[2], Paul Bernhardt[2]
[1]Bradley Department of Electrical and Computer Engineering, Virginia Tech, Blacksburg
[2]Plasma Physics Division, Naval Research Laboratory, Washington, DC

14:00 HG2-3 INVESTIGATION OF STIMULATED ELECTROMAGNETIC EMISSION (SEE) DURING SECOND ELECTRON GYRO-HARMONIC HEATING

Alireza Samimi*[1], Wayne A. Scales[1], Hayiang Fu[1], Paul A. Bernhardt[2], Stanley J. Briczinski[2], Michael J. McCarrick[3]
[1]ECE, Virginia Tech, Blacksburg, VA
[2]Plasma Physics Division, Naval Research Laboratory, Washington D.C.
[3]Marsh Creek, LLC, Gakona, AK

14:20 HG2-4 GENERATION OF LARGE-AMPLITUDE ULF WAVES BY IONOSPHERIC HEATING

Thomas M. Guido*, Beket Tulegenov, Anatoly V. Sreltsov
Physical Sciences, Embry Riddle Aeronautical University, Daytona Beach, Florida

Session K1: Human Body Interactions with Antennas and Other Electromagnetic Devices
Room 155

Co-Chairs: Erdem Topsakal, *Mississippi State University*
Gianluca Lazzi, *University of Utah*

13:20 K1-1 MICROWAVE-INDUCED THERMOACOUSTIC TOMOGRAPHY EXPERIMENTAL STUDY AND FDTD MODELING

Ryan T. Jacobs*, Xiaoye Chen, Mark Golkowski, Yiming Deng
Electrical Engineering, University of Colorado Denver, Denver, Colorado

13:40 K1-2 MICROWAVE DIELECTRIC PROPERTIES OF BROWN ADIPOSE TISSUE (BAT)

Erin Colebeck*, Erdem Tosakal
Electrical and Computer Engineering, Mississippi State University, Mississippi State, MS

14:00 K1-3 ANTENNA DESIGN FOR MICROWAVE CANCER ABLATION OF OSTEOSARCOMA

Erik S. Gamez*, Ajit Rajagopalan, Darin Y. Furgeson, Gianluca Lazzi
University of Utah, Salt Lake City, Utah

14:20 K1-4 THE EFFECT OF TEMPERATURE ON ANTENNA RETURN LOSS FOR MICROWAVE ABLATION ANTENNAS

Mustafa Asili*, Erin Colebeck, Ryan Green, Erdem Topsakal
Department of Electrical and Computer, Mississippi State University, Mississippi State, MS

14:40 K1-5 3-D MICROWAVE IMAGING USING A LEVEL SET METHOD FOR BREAST DENSITY EVALUATION

Timothy J. Colgan*, Susan C. Hagness, Barry D. Van Veen
Department of Electrical and Computer Engineering, University of Wisconsin - Madison, Madison, WI

15:00 Break

15:20 K1-6 ULTRAWIDEBAND MICROWAVE ABLATION THERAPY (UMAT)

Erdem Topsakal*, Erin Colebeck, Mustafa Asili, Ryan Green
Electrical and Computer Engineering, Mississippi State University, Mississippi State, MS

15:40 K1-7 THE EFFECT OF TEMPERATURE ON THE MICROWAVE DIELECTRIC PROPERTIES OF PORCINE LIVER, LUNG, AND HEART

Erin Colebeck*, Mustafa Asili, Ryan Green, Erdem Topsakal
Electrical and Computer Engineering, Mississippi State University, Mississippi State, MS

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