Final Program

2016 URSI Asia-Pacific Radio Science Conference

URSI AP-RASC 2016

August 21 - 25, 2016

Grand Hilton Seoul Hotel, Seoul, Korea

Organized by

KIEES URSI

Co-Organized by

RRA NATIONAL RADIO RESEARCH AGENCY ETRI KASI Korea Astronomy and Space Science Institute NFRI

Technically Co-Sponsored by

EiC IEEE Antennas and Propagation Society IEEE Seoul Chapter KICS IEIE

Supported by

KOFST SEOUL METROPOLITAN GOVERNMENT KOREA TOURISM ORGANIZATION www.visitkorea.or.kr

Contents

Welcome Message

Welcome to the 2016 URSI Asia-Pacific Radio Science Conference!

On behalf of the organizing committee of the URSI AP-RASC 2016, it is a great pleasure and an honor to extend to you our warmest welcome and invite you to the 2016 URSI Asia-Pacific Radio Science Conference to be held in Seoul, South Korea from August 21~25, 2016.

AP-RASC is a triennial international conference in the field of radio science, where experts from all over the world gather to share their knowledge and experience, and to encourage scientific exchange and fellowship amongst industry colleagues and professionals globally. We would like to invite many participants from different cultures and continents, representing Europe, South and North America, Oceania, Africa, and Asia. Although Korea is hosting the URSI AP-RASC 2016, I believe that each and every one of you is the real host.

The scientific program will provide an opportunity for participants to exchange new ideas and information on many important issues in radio science and related issues. High-standard general lectures will be provided by outstanding scholars invited both from academia and industry. This conference will be an occasion for participants to make new acquaintances and strengthen existing friendships. Also, the technical exhibitions promise to be another highlight of the conference. You will be able to see and come in direct contact with the latest innovations in radio science and related industries.

Korea is covered with beautiful hills and fields, where a unique archival culture has bloomed and grown. The URSI AP-RASC 2016 will be a chance not only to introduce Korean archival culture which has blossomed over the last 5,000 years, but also to share the results of a recent archival cultural renaissance and to contribute to the development of humanity's archival culture. The URSI AP-RASC 2016 will be held with a fresh cultural festival and events composed of various programs which accompanying family members may also enjoy.

We are confident that this conference will offer much to see, learn, and take away as long-lasting memories, and we invite you to participate in this wonderful experience.

Thank you for your continued interest and support, and we look forward to welcoming you to the URSI AP-RASC 2016 in Seoul, Korea!

Sincerely,

Sangwook Nam
General Chair of URSI AP-RASC 2016
Seoul National University, Korea

Kazuya Kobayashi
General Co-Chair of URSI AP-RASC 2016
Chuo University, Japan

Piergiorgio L. E. Uslenghi
General Co-Chair of URSI AP-RASC 2016
University of Illinois at Chicago, USA

Committee

Honorary Conference Chair

Jung Woong Ra (Past President, South Korea National Committee of URSI / Professor Emeritus, Korea Advanced Institute of Science and Technology)

Local Advisory Committee

Chair — **Hyo Joon Eom** (Professor Emeritus, Korea Advanced Institute of Science and Technology)

Vice-Chairs — **Jung Woong Ra** (Professor Emeritus, Korea Advanced Institute of Science and Technology)
Hyuck Jae Lee (Professor Emeritus, Korea Advanced Institute of Science and Technology)
Young-Ki Cho (Kyungpook National University)

Members — **Dong Chul Park** (Chungnam National University)
Dong Il Kim (Korea Maritime University)
Seung In Yang (Soongsil University)
Noh Hoon Myung (Korea Advanced Institute of Science and Technology)
Sang Won Yun (Sogang University)
Jeong Ki Pack (Chungnam National University)
Hai-Young Lee (Ajou University)
Young Joong Yoon (Yonsei University)
Ki-Chai Kim (Yeungnam University)
Jaehoon Choi (Hanyang University)
Taek-kyung Lee (Korea Aerospace University)
Kyung Heon Koo (Incheon National University)

General Chair

Sangwook Nam (President, South Korea National Committee of URSI / Seoul National University)

General Co-Chairs

Kazuya Kobayashi (URSI Assistant Secretary-General / Chuo University)
Piergiorgio L. E. Uslenghi (URSI Assistant Secretary-General / University of Illinois at Chicag)

General Vice-Chairs

Jeong Hwan Kim (Korea Research Institute of Standards and Science)
Seog Tae Han (Korea Astronomy and Space Science Institute)
Jinwoong Kim (Electronics and Telecommunications Research Institute)
Yeong-Kook Oh (KSTAR Research Center, National Fusion Research Institute)

Young Scientist Program Committee

Chair — **Peter Van Daele** (URSI Assistant Secretary-General / Ghent University)

Co-Chairs — **Paul S. Cannon** (URSI President / University of Birmingham)
Jeong-Hae Lee (Hongik University)
Ikmo Park (Ajou University)

Members

Commission A

Yasuhiro Koyama (Chair, URSI Commission A / National Institute of Information and Communications Technology)
Jeong Hwan Kim (Korea Research Institute of Standards and Science)

Commission B

Kazuya Kobayashi (Vice-Chair, URSI Commission B / Chuo University)
Ikmo Park (Ajou University)

Commission C

Amir I. Zaghloul (Vice-Chair, URSI Commission C / Virginia Polytechnic Institute and State University)
Jungwoo Lee (Seoul National University)

Commission D

Günter Steinmeyer (Chair, URSI Commission D / Max Born Institute)
Jae-Sung Rieh (Korea University)

Commission E

Frank Gronwald (Vice-Chair, URSI Commission E / Technische Universität Hamburg-Harburg)
Wansoo Nah (Sungkyunkwan University)

Commission F

V. Chandrasekar (Vice-Chair, URSI Commission F / Colorado State University)
Yisok Oh (Hongik University)

Commission G

Iwona Stanislawska (Chair, URSI Commission G / Space Research Centre, Polish Academy of Sciences)
Dong-Hun Lee (Kyung Hee University)

Commission H

Wen Li (Early Career Representative (ECR), URSI Commission H / University of California, Los Angeles)
Jin Joo Choi (Kwangwoon University)

Commission J

Richard Bradley (Vice-Chair, URSI Commission J / Technology Center, National Radio Astronomy Observatory)
Jongsoo Kim (Korea Astronomy and Space Science Institute)

Commission K

Samyoung Chung (Vice-Chair, URSI Commission K / National Radio Research Agency)

Finance Committee

Chairs **Bomson Lee** (Kyung Hee University)
Hwang-Jae Rhee (National Radio Research Agency)

Publication Committee

Chair **Jong-Gwan Yook** (Yonsei University)
Member **Yong Bae Park** (Ajou University)

Exhibition & Workshops/Short Courses Committee

Chair **Churl-Hun Seo** (Soongsil University)

Member **Jin-Seob Kang** (Korea Research Institute of Standards and Science)

Moon-Que Lee (University of Seoul)

Publicity Committee

Chair **Sungtek Kahng** (Incheon National University)

Co-Chair **Songcheol Hong** (Korea Advanced Institute of Science and Technology)

Member **Byungwook Min** (Yonsei University)

Minseok Han (Korea Advanced Institute of Science and Technology)

Local Arrangement Committee

Chairs **Kyeong-Sik Min** (Korea Maritime and Ocean University)

Nam-Jae Lee (Hanwha)

Member **Hosung Choo** (Hongik University)

Registration Committee

Chair **Yeon-Choon Chung** (Seokyeong University)

Member **Seungyoung Ahn** (Korea Advanced Institute of Science and Technology)

General Secretary

Jae-Wook Lee (Korea Aerospace University)

Technical Program Committee

Chair **Seong-Ook Park** (Secretary, South Korea National Committee of URSI, Korea Advanced Institute of Science and Technology)

Co-Chair **Makoto Ando** (URSI Vice-President, Tokyo Institute of Technology)

Nam Kim (Chungbuk National University)

Kazuya Kobayashi (URSI Assistant Secretary-General, Chuo University)

Commission A (Electromagnetic Metrology, Electromagnetic Measurements and Standards)

Yasuhiro Koyama (Chair, URSI Commission A / National Institute of Information and Communications Technology)

Jeong Hwan Kim (Korea Research Institute of Standards and Science)

Commission B (Fields and Waves)

Kazuya Kobayashi (Vice-Chair, URSI Commission B / Chuo University)

Ikmo Park (Ajou University)

Jae Hoon Yun (Electronics and Telecommunications Research Institute)

Commission C (Radio-communication Systems and Signal Processing)

Amir I. Zaghloul (Vice-Chair, URSI Commission C / Virginia Polytechnic Institute and State University)
Yong-Seok Choi (Electronics and Telecommunications Research Institute)
Jungwoo Lee (Seoul National University)

Commission D (Electronics and Photonics)

Günter Steinmeyer (Chair, URSI Commission D / Max Born Institute)
Jae-Sung Rieh (Korea University)
Hyunchol Shin (Kwangwoon University)
Fabian Rotermund (Korea Advanced Institute of Science and Technology)
Jungwon Kim (Korea Advanced Institute of Science and Technology)

Commission E (Electromagnetic Noise and Interference)

Frank Gronwald (Vice-Chair, URSI Commission E / Technische Universität Hamburg-Harburg)
Wansoo Nah (Sungkyunkwan University)
Joungho Kim (Korea Advanced Institute of Science and Technology)

Commission F (Wave Propagation and Remote Sensing)

V. Chandrasekar (Vice-Chair, URSI Commission F / Colorado State University)
Young Kil Kwag (Korea Aerospace University)
Min-Ho Ka (Yonsei University)
Sanghun Lim (Korea Institute of Civil Eng. and Bld. Tech.)

Commission G (Ionospheric Radio and Propagation)

Iwona Stanislawska (Chair, URSI Commission G / Space Research Centre, Polish Academy of Sciences)
Dong-Hun Lee (Kyung Hee University)
Young-Sil Kwak (Korea Astronomy and Space Science Institute)

Commission H (Waves in Plasmas)

Wen Li (Early Career Representative, URSI Commission H / University of California)
Jin Joo Choi (Kwangwoon University)
Young-Soon Bae (National Fusion Research Institute)

Commission J (Radio Astronomy)

Richard Bradley (Vice-Chair, URSI Commission J / Technology Center, National Radio Astronomy Observatory)
Jongsoo Kim (Korea Astronomy and Space Science Institute)
Jung-Won Lee (Korea Astronomy and Space Science Institute)

Commission K (Electromagnetics in Biology and Medicine)

Samyoung Chung (Vice-Chair, URSI Commission K / National Radio Research Agency)
Yun-Sil Lee (Ewha Womans University)

Session Conveners

Commission A (Electromagnetic Metrology, Electromagnetic Measurements and Standards)

[S-A1] EM Basic Metrology
Tae-Weon Kang (Korea Research Institute of Standards and Science) and Shan Yueyan (Agency for Science, Technology and Research)

[S-A3] Antenna Related Metrology
Satoru Kurokawa (National Institute of Advanced Industrial Science and Technology) and Ki-Chai Kim (YeongNam University)

Commission B (Fields and Waves)

[S-B1] Electrically Large Antennas
Iikyu Kim (DTaQ) and Shenheng Xu (Tsinghua University)

[S-B2] Reconfigurable Antennas and Miniaturized Antennas
Sungjoon Lim (Chung-Ang University)

[S-B3] Groundwave Propagation Modeling, Simulation and Measurement
Il-Suek Koh (Inha University) and Levent Sevgi (Okan University)

[S-B4] Metamaterials & FSS
Sungtek Kahng (Incheon National University) and Hisamatsu Nakano (Hosei University)

[S-B5] Electromagnetic Field Theory
Soon-Soo Oh (Chosun University) and Lotfollah Shafai (University of Manitoba)

[S-B6] Wireless Power Transfer
Franklin Bien (Ulsan National Institute of Science and Technology) and Luca Roselli (University of Perugia)

[S-B7] Computational Technique and EM Simulation
Yong Heui Cho (Mokwon University) and Do-Hoon Kwon (University of Mass)

[S-B8] Negative Group Delay (NGD) Devices and Its Applications
Blaise Ravelo (ESIGELEC) and Yongchae Jeong (Chonbuk National University)

[S-B9] Computational Techniques and EM Field Simulators
Shinichiro Ohnuki (Nihon University) and Lijun Jiang (The University of Hong Kong)

[S-B12] Novel Mathematical Methods in Electromagnetics
Kazuya Kobayashi (Chuo University) and Yury Shestopalov (University of Gävle)

[S-B13] Advances in Super- and High- Resolution Electromagnetic Imaging
Lianlin Li (Peking University) and Weixiang Jiang (Southeast University)

[S-B14] Multiscale Multiphysics Techniques and Applications
Qing Huo Liu (Duke University)

Commission C (Radio-communication Systems and Signal Processing)

[S-C3] Wireless network
Seung-Hoon Hwang (Dongguk University) and Jangwon Lee (Yonsei University)

[S-C4] Radio Localization Techniques
Dongsoo Han (Korea Advanced Institute of Science and Technology) and Sunwoo Kim (Hanyang University)

[S-C6] IoT and green communications
Byounghyo Shim (Seoul National University)

[S-C7] Massive MIMO and millimeter wave communications
Y.-W. Peter Hong (National Tsing Hua University), Hyun Kyu Chung (Electronics and Telecommunications Research Institute), and Youngchul Sung (Korea Advanced Institute of Science and Technology)

[S-C8] Satellite and Terrestrial Networks
Jihwan Choi (Daegu Gyeongbuk Institute of Science & Technology)

Commission D (Electronics and Photonics)

[S-D1] Microwave and THz photonics
Jungwon Kim (Korea Advanced Institute of Science and Technology) and Shilong Pan (Nanjing University of Aeronautics and Astronautics)

[S-D2] Ultrafast Photonics
Uwe Griebner (Max Born Institute) and Fabian Rotermund (Korea Advanced Institute of Science and Technology)

[S-D3] Terahertz Electronics and Photonics
Jae-Sung Rieh (Korea University) and Minoru Fujishima (Hiroshima University)

[S-D4] Microwave and mm-wave Integrated Circuits
Byung-Wook Min (Yonsei University) and Tiku Yu (National Taipei University)

[S-D5] High Power RF Devices and Circuits
Naoki Hara (Fujitsu) and Youngoo Yang (Sungkyunkwan University)

[S-D6] Low-energy Wireless Sensor Electronics
Hyunchol Shin (Kwangwoon University) and Chun Huat Heng (National University of Singapore)

[S-D7] Photonic/Electromagnetic Metamaterials and Metadevices
Bumki Min (Korea Advanced Institute of Science and Technology) and Junsuk Rho (Pohang University of Science and Technology)

[S-DBC1] Optical, Electrical and Optoelectronic Generation and Distribution of Microwave Signal
B N Biswas (Sir J. C School of Engineering) and Arindum Mukherjee (Central Institute of Technology)

Commission E (Electromagnetic Noise and Interference)

[S-E1] Common-Mode Issues Related to Power Electronics
Yoshitaka Toyota (Okayama University) and Wansoo Nah (Sungkyunkwan University)

[S-E2] Signal Integrity and EMI of Chip, Package, and PCB
Joungho Kim (Korea Advanced Institute of Science and Technology) and Wen-Yan Yin (Zhejiang University)

[S-E3] Modeling of Electromagnetic Immunity, EMS, and ESD
Jonghoon Kim (Korea Advanced Institute of Science and Technology) and Jingook Kim (Ulsan National Institute of Science and Technology)

[S-E4] EMC Problems in Mobile Devices
Dong Gun Kam (Ajou University) and Hyun Ho Park (University of Suwon)

[S-E5] EMC and Information Security
Jong-Gwan Yook (Yonsei University) and Yu-Ichi Hayashi (Tohoku Gakuin University)

[S-EB] EMC Modeling and Techniques
Sungtek Kahng (Incheon National University) and Erping Li (Zhejiang University)

Commission F (Wave Propagation and Remote Sensing)

[S-F1] Wave Propagation and Scattering
Yisok Oh (Hongik University) and Yang Du (Zhejiang University)

[S-F2] Remote Sensing for Land and Sea
Duk-Jin Kim (Seoul National University) and Kazuo Ouchi (National Defense Academy)

[S-F3] Remote Sensing of the Atmosphere
Sanghun Lim (Korea Institute of Civil Engineering and Building Technology) and Tomoo Ushio (Osaka University)

[S-F4] Advanced Sensor and Radar Technology
Min-Ho Ka (Yonsei University) and Xiongjun Fu (Beijing Institute of Technology)

[S-F5] Radio Wave Propagation Aspects in Body Area Networks
Slawomir J. Ambroziak (Gdansk University of Technology) and Luis M. Correia (University of Lisbon)

[S-F6] Remote Sensing of Precipitation
Tomoo Ushio (Osaka University) and Animesh Maitra (University of Calcutta)

Commission G (Ionospheric Radio and Propagation)

[S-G1] GPS/GNSS Monitoring of the Ionosphere
Kwan-Dong Park (Inha University) and Shuanggen Jin (Chinese Academy of Sciences)

[S-G2] Ionospheric Density Variability in the Polar Region
Geonhwa Jee (Korea Polar Research Institute) and Qian Wu (National Center for Atmospheric Research)

[S-G3] Radar Probing for the Ionospheric Variability
Young-Sil Kwak (Korea Astronomy and Space Science Institute) and Yuichi Otsuka (Nagoya University)

[S-G4] Satellite Probing for the Ionospheric Variability
Jaeheung Park (Korea Astronomy and Space Science Institute) and Charles Lin (National Cheng Kung University)

[S-G5] Observation of Ionospheric Plasma Density Variation
Young-Sil Kwak (Korea Astronomy and Space Science Institute) and Geonhwa Jee (Korea Polar Research Institute)

[S-GH1] ULF/VLF Waves
Dong-Hun Lee (Kyung Hee University) and Kazue Takahashi (Johns Hopkins University)

[S-GH2] Space Weather Impact and Mitigation Efforts
Jun-Chul Mun (National Radio Research Agency) and Mamoru Ishii (National Institute of Information and Communications Technology)

Commission H (Waves in Plasmas)

[S-H1] Theory and Simulation of Waves in Plasma
Myoung-Jae Lee (Hanyang University) and Hae June Lee (Pusan National University)

[S-H2] Generation and Characteristics of Waves in Space
Dae-Young Lee (Chungbuk National University) and Ensang Lee (Kyung Hee University)

[S-H3] Radio Science for Space Weather
Viviane Pierrard (Belgian Institute for Space Aeronomy) and Mauro Messerotti (INAF-Astronomical Observatory of Trieste)

[S-H4] Waves in Nuclear Fusion Plasmas and Laser-Plasma Accelerator
Young-Soon Bae (National Fusion Research Institute) and Hee-Yong Suk (Gwangju Institute of Science and Technology)

[S-H5] Coherent Radiation Sources
EunMi Choi (Ulsan National Institute of Science and Technology) and Heather Song (University of Colorado-Colorado Springs)

[S-HG1] Effects of Wave-Particle Interactions in Earths Magnetosphere and Upper Atmosphere
Wen Li (University of California) and Ondrej Santolik (The Czech Academy of Sciences)

Commission J (Radio Astronomy)

[S-J1] New technology in Very Long Baseline Interferometry and Single Dishes
Do Young Byun (Korea Astronomy and Space Science Institute) and Z.-Q. Shen (Chinese Academy of Science)

[S-J2] Science and Technology of the Square Kilometer Array
Bong-Won Sohn (Korea Astronomy and Space Science Institute) and Hideyuki Kobayashi (National Astronomy Observatory of Japan)

[S-J3] Science and Technology of Atacama Large Millimeter/Submillimeter Array
Jongsoo Kim (Korea Astronomy and Space Science Institute) and Satoru Iguchi (National Astronomy Observatory of Japan)

[S-J5] Receivers for Radio Astronomy
Jungwon Lee (Korea Astronomy and Space Science Institute) and Sheng-Cai Shi (Chinese Academy of Sciences)

[S-J6] Science and Technology for Solar and Heliophysics
Kyungsuk Cho (Korea Astronomy and Space Science Institute) and Yihua Yan (Chinese Academy of Sciences)

[S-JDE4] Digital Technology for Radio Astronomy
Se-Jin Oh (Korea Astronomy and Space Science Institute) and Homin Jiang (Astronomy and Astrophysics, Academia Sinica)

Commission K (Electromagnetics in Biology and Medicine)

[S-K1] Biological Effects of EMF
Young-Hwan Ahn (Ajou University) and Xu Zhengping (Zhejiang University)

[S-K2] Exposure Assessment and EMF Standards
Soichi Watanabe (National Institute of Information and Communications Technology) and Niels Kuster (ETH Zurich)

[S-K3] Numerical Dosimetry (EMF Dosimetry)
Ae-Kyoung Lee (Electronics and Telecommunications Research Institute) and Masao Taki (Tokyo Metropolitan University)

[S-K4] EMFs for New Technologies
Teruo Onishi (NTT Docomo) and Jung-Ick Moon (Electronics and Telecommunications Research Institute)

[S-K5] Biomedical Applications of EM Wave
Jeong-Ki Pack (Chungnam National University) and Jianqing Wang (Nagoya Institute of Technology)

[S-K6] Dosimetry for WBAN Antennas and Devices
Ping Jack Soh (University Malaysia Perlis) and Koichi Ito (Chiba University)

[S-K7] EM Biomedical Imaging
Soon-Ik Jeon (Electronics and Telecommunications Research Institute) and Puyan Mojabi (University of Manitoba)

[S-KE] EMC in Biomedical Applications
Jun-Gyu Yang (National Radio Research Agency) and Eisuke Hanada (Saga University)

General Information

Registration Desk

Registration desks are located in Lobby (3F), Convention Center, Grand Hilton Seoul Hotel. Credit cards and cash are the only accepted forms of payment for on-site registration. The registration desks will be open during the conference according to the following schedule.

Location: Lobby (3F), Convention Center, Grand Hilton Seoul Hotel
Operation Hours:

- August 21, 2016 / 12:00 ~ 18:00
- August 22, 2016 / 08:00 ~ 18:00
- August 23, 2016 / 08:00 ~ 18:00
- August 24, 2016 / 08:00 ~ 18:00
- August 25, 2016 / 08:00 ~ 14:00

Conference Kit

URSI AP-RASC 2016 conference kit will be given to each regular/student registered delegate at the registration desk. The kit contains Program book, Proceedings, and so on.

Secretariat Office

Location: Board Room (2F), Grand Hilton Seoul Hotel
Operation Hours:

- August 21, 2016 / 09:00 ~ 18:00
- August 22, 2016 / 08:00 ~ 18:00
- August 23, 2016 / 08:00 ~ 18:00
- August 24, 2016 / 08:00 ~ 18:00
- August 25, 2016 / 08:00 ~ 18:00

Exhibition

An exhibition will be held throughout the conference 4th floor lobby, Convention Center, Grand Hilton Seoul Hotel

Location: Lobby (4F), Convention Center, Grand Hilton Seoul Hotel
Operation Hours:

- August 22, 2016 / 09:00 ~ 18:00
- August 23, 2016 / 09:00 ~ 18:00
- August 24, 2016 / 09:00 ~ 18:00
- August 25, 2016 / 09:00 ~ 18:00

Lunches

Lunch box will be provided for participants, who have a lunch coupon. Find coupon which is included name badge.

Location: Grand Ballroom (2F), Grand Hilton Seoul Hotel
Operation Hours:

- August 22, 2016 / 12:00 ~ 13:30
- August 23, 2016 / 12:00 ~ 13:30
- August 24, 2016 / 12:00 ~ 13:30
- August 25, 2016 / 12:00 ~ 13:30

Coffee Breaks

Location: 3rd, 4th Floor Lobby, Convention Center and 2nd Floor Lobby, Grand Hilton Seoul Hotel

Event Information

Official Events

■ Welcome Reception

Date and Time: August 21, 2016 / 18:00~20:00
Location: Lotus Hill Garden (2F), Grand Hilton Seoul Hotel

The Welcome Reception will be an excellent opportunity to catch up with old colleagues and make new friends while enjoying some delicious foods and refreshing beverages, as well as traditional Korean culture. Come and join this entertaining ice-breaker to expand professional networks and form partnerships.

■ Opening Ceremony

Date and Time: August 22, 2016 / 10:00~10:40
Location: Convention A~C (4F), Convention Center, Grand Hilton Seoul Hotel

The URSI AP-RASC 2016 will officially open with the Opening Ceremony.
All registered participants are cordially invited, please join us and celebrate this conference.

■ Banquet

Date and Time: August 24, 2016 / 18:00~20:30
Location: Convention A~E (4F), Convention Center, Grand Hilton Seoul Hotel

Banquet is a key networking event in the conference. This will be a great opportunity to relax with wonderful entertainment while also giving us the time to know each other better. Also, you will have unforgettable impression and memory through this banquet. Also, you can enjoy the special performance full of wit and laughter. You could create a memorable moment.

Business Meeting

Board Meeting 1 *members only
August 20, 2016 / 10:00~16:30, Swan, Grand Hilton Seoul Hotel

Coordinating Committee Meeting 1 *members only
August 21, 2016 / 10:00-13:00, Emerald B, Convention Center, Grand Hilton Seoul Hotel

Joint Meeting: Coordinating Committee Meeting 1 / Informal Council Meeting *members only
August 21, 2016 / 14:00-16:30, Emerald B, Convention Center, Grand Hilton Seoul Hotel

AP-RASC Standing Committee Meeting 1 *members only
August 22, 2016 / 12:00-13:30, Peacock, Grand Hilton Seoul Hotel

Young Scientist Program Committee (YSPC) Meeting *members only
August 22, 2016 / 18:00~18:30, Flamingo, Grand Hilton Seoul Hotel

Radio Science Bulletin (RSB) Meeting *members only
August 23, 2016 / 12:00-13:30, Flamingo, Grand Hilton Seoul Hotel

Commission Business Meetings *open to all the participants
August 23, 2016 / 18:00-20:00, Session Room (Room A ~ J), Grand Hilton Seoul Hotel

AP-RASC Standing Committee Meeting 2 *members only
August 24, 2016 / 12:00-13:30, Peacock, Grand Hilton Seoul Hotel

Board Meeting 2 *members only
August 24, 2016 / 16:00-16:30, Peacock, Grand Hilton Seoul Hotel

Early Career Representatives (ECRs) Meeting *members only
August 25, 2016 / 12:00-13:30, Flamingo, Grand Hilton Seoul Hotel

Coordinating Committee Meeting 2 *members only
August 25, 2016 / 18:00-19:30, Flamingo, Grand Hilton Seoul Hotel

Board Meeting 3 *members only
August 26, 2016 / 10:00-16:30, Swan, Grand Hilton Seoul Hotel

Information on Technical Program

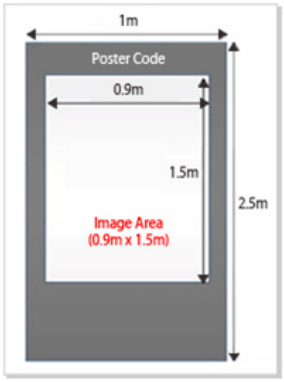
Oral Presentation

We highly recommend presenters to follow the instructions noted below carefully. You need to check your presentation file in advance to confirm all fonts read correctly and all embedded video clips play smoothly within your presentation.

- The authors of papers accepted for oral presentation are asked to bring PowerPoint (or PDF) slides and present their research in a podium presentation.
- We will prepare a computer for presentation, and authors are encouraged to use the conference computer for presentation, to avoid wasting time switching between personal laptops.
- To avoid software compatibility problems (MS PowerPoint), speakers are advised to save their PowerPoint presentation on a USB memory stick AND bring a backup version of their presentation.
- Files should be uploaded to the local laptop in the session room during the breaks between the sessions.
- Local laptop available at the meeting will run PowerPoint 2013.
- Speakers should arrive in the session room 10 minutes BEFORE the start of their sessions to report to the session chair.
- A proctor will also be available in case you need technical assistance.

Poster Presentation

The presenters of paper accepted for poster presentation are asked to prepare a poster and display it for the duration of the conference on a designated panel provided by the conference.



- Location: Lobby, 3F, Convention Center, Grand Hilton Seoul Hotel
- Poster Panel Size: 1.0m in width and 2.5m in height.
- The poster board is self-standing.
- Each paper's code will be shown on the board.
- Scotch tape will be provided for your use.
- Use of double-sided tape is prohibited.
- All presenters are required to preside at their poster panel during the poster presentation time.
- During the session for anticipated discussion with participants.
- Each poster should indicate the paper title, authors, and affiliation must fit within a 0.9m x 1.5m space.

Poster Session	
Date / Time	August 24 (Wed.), 2016 / 16:00~18:00
Put-up Time	August 22 (Mon.), 2016 ~ August 23 (Tue.) / 09:00~18:00
Presentation Time	August 24 (Wed.), 2016 / 16:00~18:00
Take-down Time	August 25 (Thu.), 2016 / 09:00~16:00

* Please note that posters remaining after the session will be discarded. Thus please ensure to take your posters down during the take-down time.

Short Course

Short Courses cover a broad range of topic areas at a variety of educational levels. Enhance your industry knowledge by learning the latest and most innovative information on radio science fields. The Short Course program offers skill-building training for professionals and students alike. Gain insight and an edge in radio science!

"Advanced Electromagnetics and its Application"

Date / Time: August 21 (Sun.) / 13:00~17:30
Place: Diamond (3F), Convention Center, Grand Hilton Seoul Hotel
Session Chair: Sungtek Kahng (Incheon National University)

Short Course 1 13:00~13:50

The Physics, Mathematics, and Realization of the Propagation Mechanism in Cellular Wireless Communication Systems
Tapan Kumar Sarkar (DL) (Syracuse University, USA)

Short Course 2 13:50~14:40

Reflectarray Antennas: Beautiful Children of Reflector and Array Antennas
Rahmat Samii (DL) (University of California. USA)

Short Course 3 14:40~15:30

Transformation Optics in Antenna Engineering
Yang Hao (Queen Mary University of London, UK)

Short Course 4 15:50~16:40

Innovation in Antenna Design using Electromagnetic Principles
Lotfollah Shafai (University of Manitoba, Canada)

Short Course 5 16:40~17:30

Subsurface Sensing and Super-Resolution Imaging: Application of Computational Electromagnetics and Acoustics
Qing Huo Liu (DL) (Duke University, USA)

General Lecture

General Lecture I

Date / Time: August 22 (Mon.) / 11:00~12:00
Place: Convention A~C (4F), Convention Center, Grand Hilton Seoul Hotel
Session Chair: Ikmo Park (Ajou University)

Yahya Rahmat-Samii
(University of California, USA)

Talk Title: Nature Inspired Optimization Techniques in Modern Engineering: Let Darwin and the Bees Help Improve your Designs

Biography

Yahya Rahmat-Samii is a Distinguished Professor, holder of the Northrop-Grumman Chair in electromagnetics, member of the US National Academy of Engineering (NAE), winner of the 2011 IEEE Electromagnetics Award and the former chairman of the Electrical Engineering Department at the University of California, Los Angeles (UCLA). Before joining UCLA, he was a Senior Research Scientist at Caltech/NASA's Jet Propulsion Laboratory. Dr. Rahmat-Samii was the 1995 President of the IEEE Antennas and Propagation Society and 2009-2011President of the United States National Committee (USNC) of the International Union of Radio Science (URSI). He has also served as an IEEE Distinguished Lecturer presenting lectures internationally. Dr. Rahmat-Samii is a Fellow of the IEEE, AMTA and ACES. Dr. Rahmat-Samii has authored and co-authored over 1000 technical journal articles and conference papers and has written over 35 book chapters and five books. Dr. Rahmat-Samii has received numerous awards, including the 1992 and 1995 Wheeler Best Application Prize Paper Award for his papers published in the IEEE Antennas and Propagation Transactions, 1999 University of Illinois ECE Distinguished Alumni Award, the IEEE Third Millennium Medal, AMTA'2000 Distinguished Achievement Award, 2001 recipient of an Honorary Doctorate Cassa from the University of Santiago de Compostela, Spain, 2001 Foreign Membership of the Royal Flemish Academy of Belgium for Science and the Arts, 2002 Technical Excellence Award from JPL, 2005 URSI Booker Gold Medal, 2007 Chen-To Tai Distinguished Educator Award of the IEEE AP-S, 2009 IEEE AP-S Distinguished Achievement Award, 2010 UCLA School of Engineering Lockheed Martin Excellence in Teaching Award, 2011 UCLA Distinguished Teaching Award, 2015 Distinguished Engineering Achievement Awards of the Engineers' Council and 2015 NASA Group Achievement Award. He has had pioneering research contributions in diverse areas of electromagnetics, antennas, measurement and diagnostics techniques, numerical and asymptotic methods, satellite and personal communications, remote sensing and planetary mission antennas, human/antenna interactions, RFID and implanted antennas in medical applications, frequency selective surfaces, electromagnetic band-gap and meta-material structures, applications of the genetic algorithms and particle swarm optimization, etc., (visit http:www.antlab.ee.ucla.edu). Prof. Rahmat-Samii is the designer of the IEEE AP-S logo which is displayed on all IEEE AP-S publications.

Abstract

Engineers are constantly challenged with the temptation to search for optimum solutions for complex engineering system designs. The ever increasing advances in computational power have fueled this temptation. The well-known

brute force design methodologies are systematically being replaced by the state-of-the-art Evolutionary Optimization (EO) techniques. In recent years, EO techniques are finding growing applications to the design of all kind of systems with increasing complexity. Among various EO's, nature inspired techniques such as Genetic Algorithms (GA), Particle Swarm Optimization (PSO) and the Covariance Matrix Adaptation (CMA) Evolution Strategies (ES) have attracted considerable attention. GA utilizes an optimization methodology which allows a global search of the cost surface via the mechanism of the statistical random processes dictated by the Darwinian evolutionary concept (adaptation, selection, survivability and mutation). PSO is a robust stochastic evolutionary computation technique based on the movement and intelligence of swarms of bees looking for the most fertile feeding location applying their cognitive and social knowledge. The CMA-ES technique is based upon the evolution of a population of individuals, capitalizing on the ideas of survival of the fittest, recombination, and mutation, and this version of ES has only been recently introduced to the applied electromagnetic community. This algorithm has certain similarities in comparison to the standard Genetic Algorithms; however the selection and recombination operators have some key differences. In particular, the notion of average performance among the individuals is an important part of the evolution processes in this algorithm. This presentation will focus on: (a) an engineering introduction to GA, PSO and CMEAES by describing in a novel fashion the underlying concepts and recent advances for those who have used these techniques and for those who have not had any experiences in these areas, (b) demonstration of potential applications of these evolutionary optimization techniques to a variety of electromagnetic engineering designs dealing with space and planetary missions, medical and wireless devices, metamaterials and nano structures, etc., and (c) assessment of the advantages and the limitations of these techniques.

General Lecture II

Date / Time: August 23 (Tue.) / 11:00~12:00
Place: Convention A~C (4F), Convention Center, Grand Hilton Seoul Hotel
Session Chair: Kyung-Suk Cho (Korea Astronomy and Space Science Institute)

Lou-Chuang Lee
(Institute of Earth Sciences, Academia Sinica, Taiwan)

Talk Title: Electrodynamic Coupling Processes in the Solar-Terrestrial Environment

Biography

Professor Lou-Chuang Lee received a B. S. degree from National Taiwan University in 1969 and a Ph.D. degree from Caltech in 1975. He specializes in space and plasma physics. Before 1995, he performed research at NASA/Goddard Space Flight Center, University of Maryland and University of Alaska. Upon returning to Taiwan in 1995, Prof. Lee served as the Dean of the College of Science, National Cheng Kung University, Director of National Space Program Office, the founding President of the National Applied Research Laboratories, the President of National Central University, and the Minister of National Science Council. He is currently a distinguished research fellow of Institute of Earth Sciences, Academia Sinica. Prof. Lee received many honors, including the Fulbright Distinguished Scholar, the Presidential Science Prize in Taiwan, Academician of Academia Sinica, Elected Member of the World Academy of Sciences (TWAS), International Academy of Astronautics (IAA) and International Academy of Engineering, Russian Academy of Engineering (IAE). Prof. Lee developed several new theories to explain observed space phenomena. His major research achievements include: (a) the turbulence spectrum of interstellar medium,

(b) the cyclotron maser theory for the generation of auroral kilometric radiation, (c) the multiple X-line reconnection model for magnetic flux transfer events, (d) the formation mechanism of solar prominences, (e) a new mechanism for solar coronal heating, (f) the discovery of "gigantic jets" in the Earth's upper atmosphere, and (g) an electric coupling model of lithosphere-atmosphere-ionosphere.

Abstract

The solar–terrestrial system consists of many neighboring physical regions, which include the photosphere, solar corona, solar wind, magnetosphere, ionosphere, atmosphere, lithosphere and interstellar medium. The electrodynamic coupling among neighboring regions leads to the generation of many observed natural phenomena. The followingimportant electrodynamic coupling processes will be presented and reviewed in this talk. (a)The plasma shear flows in the solar photosphere lead to the formation and eruption of solar prominences. (b)The coupling between solar wind and magnetosphere through magnetic reconnection and kinetic Alfvén waves (KAWs) leads to the transport of particles and energy from the solar wind to magnetosphere.(c) The electric coupling among lithosphere, atmosphere and ionosphere may lead to total electron content (TEC)variations and formation of nighttimeplasma bubbles in the ionosphere. The stressed-rockin the lithosphere can generate currents before earthquake and acts as a dynamo to provide currents for the lithosphere-atmosphere-ionosphere coupling.(d) The coupling of heliosphere to the interstellar medium leads to the formation of termination shock, heliosheath and heliopause as observed by Voyager 1 and 2.

General Lecture III

Date / Time: August 24 (Wed.) / 11:00~12:00
Place: Convention A~C (4F), Convention Center, Grand Hilton Seoul Hotel
Session Chair: Jungwoo Lee (Seoul National University)

Kyungwhoon Cheun
(Executive Vice President, Next Generation Communications Business Team IT and Mobile Communications Division, Samsung Electronics Co., Ltd, Korea)

Talk Title: 5G, Moving Steps Closer to Commercialization

Biography

Dr. Kyungwhoon Cheun received his B.S. degree in Electronics Engineering from Seoul National University in 1985. He earned his M.S. and Ph.D. degrees from the University of Michigan, Ann Arbor in 1987 and 1989, respectively. He served as a professor at the University of Delaware from 1989 to 1991 and then at the Pohang University of Science and Technology (POSTECH) from 1991 to 2014. While at POSTECH, he headed the national ITRC center for Broadband OFDM Multiple Access (BrOMA), an eight-year research program supported by the Korean Ministry of Knowledge and Economy.

Aside from his academic achievements, he, as an engineering consultant, has contributed to many break-through innovations in diverse industry areas of wireless communications and audio signal processing. He was on leave at Witechs and NSystems in San Diego where he developed efficient receiver algorithms for WLANs and WCDMA. From 2004 to 2011, he served as the Chief Technical Officer (CTO) of Pulsus Technologies Inc., taking the lead of developing sound processing algorithms and sigma-delta modulation based full digital audio amplifier SoCs. Since 2012, he has been with Samsung Electronics leading research and development for next generation cellular

and Wi-Fi networks. Currently he is an Executive Vice President of the Next Generation Communications Business Team.

Abstract

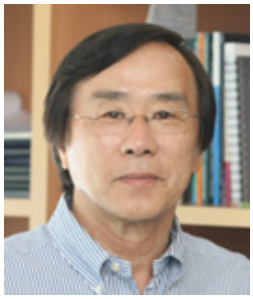
With the ever-increasing demands on mobile data traffic and stronger requirements on latency and reliability of novel mobile services, it becomes more challenging to meet those diverse needs by sheer migration of the existing cellular technologies. Consequently, 3GPP set out 5G standardization to accommodate those needs with evolutionary technologies in April 2016. Many mobile operators and equipment vendors started to take into consideration 5G as more than just a research topic and even show strong interests in the pre-commercial trials of 5G technologies in the coming years.

With a commitment to take the lead role of pursuing technical innovations in the mobile communication industry, Samsung has put lots of efforts to research and development of 5G core technologies since 2011. Major research areas include, but not limited to, millimeter wave, new waveform, enhanced channel coding, FD-MIMO, which have been verified and refined up to commercial-grade technologies.

This presentation starts from the 5G vision and requirements, Samsung's recent R&D results both in the legacy bands below 6GHz and higher bands above 6GHz. It describes recent channel measurements/modeling activities, test bed developments and various test results in the millimeter wave bands, and also the R&D results in the legacy bands such as new waveform and FD-MIMO. Finally, some results from the field trials with leading mobile operators are shown as clear evidence to the feasibility of the new 5G technologies in the real environments.

General Lecture IV

Date / Time: August 25 (Thu.) / 11:00~12:00
Place: Convention A~C (4F), Convention Center, Grand Hilton Seoul Hotel
Session Chair: Jin Joo Choi (Kwangwoon University)



Hyeon K. Park
(National Fusion Research Institute & Ulsan National Institute of Science and Technology, Korea)

Talk Title: Role of Electromagnetic Waves in Magnetic Fusion Plasma Research

Biography

Hyeon K. Park received Ph.D. from UCLA, USA in 1984 for the first multi-channel FIR scattering experiment from the plasma waves in laboratory plasmas. Since then, he was with the Princeton Plasma Physics Laboratory (PPPL), Princeton University from 1984 to 2007. Here, he developed a Multi-channel IR Interferometer/polarimeter system for the US flagship fusion device, Tokamak Fusion Test Reactor (TFTR) and multi-channel scattering system for National Spherical Tokamak Experiment (NSTX) at PPPL. In late 1990's, he has focused on developing an Electron Cyclotron Emission Imaging (ECEI) and Microwave Imaging Reflectometry (MIR) systems for 2D visualization of magnetohydrodynamic instabilities and turbulences in the plasma to enhance the understanding of complex physics of plasma dynamics. Following the first successful demonstration on TEXTOR device, Germany, the ECEI system has been deployed in most of the toroidal fusion plasma devices (DIII-D, USA, AUG, Germany, EAST, China, LHD, Japan) throughout the world and many new physics, that were not available with the conventional diagnostics, have been reported. In 2008, he joined the POSTECH, Korea as professor in physics department and established

fusion plasma research center for developing the most advanced 2D/3D ECE imaging and MIR systems on KSTAR. His team unveiled the images of edge instabilities (ELMs) for the first time in KSTAR. In 2013, he moved to physics department, UNIST, Korea and established Fusion Plasma Stability and Confinement Research Center. The objective the UNIST center is to challenge the unsolved physics problems in tokamak physics in KSTAR and WEST, France in which his team is developing ECEI system. In addition to the leading role in UNIST effort, he has been appointed as the director of KSTAR Research Center, NFRI, Daejeon Korea in 2015 and leads the KSTAR research. He is a Fellow of APS and has served International Tokamak Plasma Activity diagnostic division as Co-chair and Chair in 2008-2013. He has served numerous international and national scientific and policy committees. He has been serving PPCF as an editorial board member since 2008. He has published ~600 papers [SCI journals (~300) and conference proceedings (~300)] and numerous plenary and invited talks in major and topical conferences for fusion plasma research.

Abstract

The progress of magnetic fusion plasma research via tokamak device (i.e., fusion grade plasma confined in a toroidal magnetic field) has reached to a point where electrical breakeven is challenged in ITER in which the output power will be 10 times more than the input power. Such progress is feasible due to advances in high power Radio Frequencies (RF) and Microwave technologies and understanding of wave behaviors in magnetically confined plasmas where waves are extremely rich due to its collective behavior. The high temperature plasma confined in magnetic field is also rich in emissions of a wide range of wavelength ranging from radio frequencies to γ-ray. The passive emissions from the plasmas have been used to diagnose the plasma properties. For active diagnostic purpose, variety of form EM waves (lasers and microwaves) has been employed for study of plasma dynamics and measurement of plasma parameters. Tokamak device such as the Korean Superconducting Tokamak Advanced Research (KSTAR) not only requires external heating schemes to increase the ion temperature up to ~10keV for optimum DT reaction but also external current drive sources for steady state operation. Here, RF and microwave heating based on cyclotron resonance of ion and electron in plasmas has been effective in conjunction to high power neutral beam. The tokamak device based on superconducting magnets requires externally launched current drive system for steady state operation. For effective heating and current derive in tokamaks, the key research issues are; Development of stable and robust high power RF (30~100 MHz) and microwave sources (50~100 GHz), design and fabrication of robust launchers for RF and microwaves and understanding of the physics of wave propagation and absorption/damping process in plasmas aided by modeling of wave propagation and coupling in the plasma. For passive plasma diagnostics, emissions from acceleration, ionization and recombination process of the plasma species have been widely used to measure the plasma parameters. The examples are ion temperature and plasma rotation measurement by X-ray crystal spectroscopy and Charge Exchange Recombination, Motional Stark Effect of energetic beam ions for magnetic field measurement, and Electron Cyclotron Emission for electron temperature and 2D images of electron temperature fluctuations. For active non perturbing diagnostics, analysis of transmission, reflection and scattering of the externally launched EM waves is aided by the physics modeling to probe the macroscopic instabilities, underlying physics of transport in addition to the measurement of plasma parameters. They are coherent and incoherent Thomson scattering for electron temperature, density and fluctuations, and interferometry and polarimetry for electron density and magnetic field measurement, and reflectometry for electron density and fluctuations.

Keynote Speaker

Commission A: Electromagnetic Metrology, Electromagnetic Measurements, and Standards

Antenna and Field Probe Metrology: A NIST Perspective

August 23, 2016 / 13:30~14:10, Room I (Crane)

Perry F. Wilson
National Institute of Standards and Technology, USA

Biography

Perry F. Wilson (S'78-M'82-SM'93-F'05) received his Ph.D. in Electrical Engineering from the University of Colorado in 1983. He currently leads the RF Fields Group in the RF Technology Division of the National Institute of Standards and Technology, in Boulder, Colorado. Dr. Wilson's research has focused on the application of electromagnetic theory to problems in electromagnetic compatibility EMC) and RF field metrology. Dr. Wilson is a Fellow of the IEEE, a member of US IEC TC77B TAG, past Editor-in-Chief of the IEEE EMC Transactions, a recipient of a 2010 IEEE EMC Society Technical Achievement Award, a recipient of the 2002 IEEE EMC Transactions Best Paper Award, and a recipient of a 2007 US Department of Commerce Gold Medal.

Abstract

Two core metrology activities in the RF Fields Group at the National Institute of Standards and Technology (NIST) in Boulder, Colorado are antenna parameters (pattern, gain, polarization) and electric field strength (V/m). This talk will cover recent NIST research and results in these two areas. First, NIST has brought on line a new antenna range with application from about 50 – 500 GHz based on a six-degree-of-freedom, articulated-arm industrial robot. Coupled with a dynamic laser tracker system and spatial geometry software, the range allows us to perform near-field scans and make antenna parameter measurements at mmw frequencies with high precision. Second, NIST is progressing with work to develop a quantum based field strength probe that allows us to directly measure field strength without the need for a calibrated probe or calibrated reference field. Based on the Rydberg state of alkali atoms (rubidium, cesium) the probe is projected to be small, non-metallic, self-calibrating, and wideband (1 GHz – 1 THz). Measurement results for both the antenna and field strength systems will be shown.

Commission B: Fields and Waves

Challenges of Antenna Miniaturization and Performance Enhancement

August 23, 2016 / 16:00~16:40, Room A (Emerald A)

Lotfollah Shafai
University of Manitoba, Canada

Biography

Lotfollah Shafai B.Sc. from University of Tehran in 1963 and M.Sc. and Ph.D., from University of Toronto, in 1966 and 1969. In November 1969, he joined the Department of Electrical and Computer Engineering, University of Manitoba as a Lecturer, Assistant Professor 1970, Associate Professor 1973, Professor 1979, and Distinguished professor 2002, and Distinguished Professor Emeritus 2016. His assistance to industry was instrumental in establishing an Industrial Research Chair in Applied Electromagnetics at the University of Manitoba in 1989, which he held until July 1994. In 1986, he established the symposium on Antenna Technology and Applied Electromagnetics, ANTEM, at the University of Manitoba, which has grown to be the premier Canadian conference in Antenna technology and related topics.

Abstract

A number of new technologies have recently emerged that cover different areas in communications, autonomous navigation, remote sensing, medical imaging and health monitoring, that operate with wireless information exchanges among multiple devices. Since the dominant means of information exchange is electromagnetic waves, they need antennas to transmit and receive the waves and electronics to process them. However, antennas must interface two separate bounded and unbounded media, where waves have distinct sizes. Consequently, to interact efficiently with waves their dimensions have become wavelength dependent, limiting their size reductions. This is the major impediment for antenna miniaturization. On the other hand, advancement of traditional technologies and emergence of new ones require ongoing size reductions to incorporate more features and operate at lower cost. This size discrepancy, thus, has made antennas the "Achilles' heel" of technology progress, and is not limited to any particular area. Any small reduction in the antenna size provides a major progress in related technologies. This presentation will highlight the penalties paid for antenna miniaturization using traditional design methods, and provide examples of new design techniques that can overcome them.

Commission C: Radio-communication Systems and Signal Processing

Measurement-Based Millimeter-Wave Wideband Channel Characteristics for 5G Communication Systems

August 25, 2016 / 09:50~10:30, Room F (Convention C)

Hyun Kyu Chung
Electronics and Telecommunications Research Institute, Korea

Biography

Dr. Hyun Kyu Chung is a vice president of ETRI(Electronics and Telecommunications Research Institute) and head of 5G Giga-communications Research Laboratory. In this role, he is responsible for mobile communication R&D and CPND(Contents, Platform, Network and Device) technologies for the Giga-Korea Project in ETRI. He received B.S. degree from Seoul National University in 1985 and his master degree on electrical engineering from KAIST in 1988. Then, he joined to KT(Korea Telecom) in 1988 as a researcher. After moving his career to SK Telecom in 1993, he had served as a researcher for deploying world-first CDMA commercial networks in Korea. Since then, he had served as head of SK Telecom U.S. R&D Center at Fairfield, New Jersey. In U.S. he pursued Ph.D. degree in electrical engineering in Polytechnic institute of NYU, Brooklyn, New York, where his research interest was wave propagation for mobile communications. After his doctoral degree in 2000, he joined to Lucent Technologies in New Jersey as a member of technical staff and then joined ETRI in 2001.

Abstract

In contrast to the frequency bands below 6 GHz, there have been numerous debates on the use of millimeter-wave (mmWave) frequencies for mobile cellular networks. The debates were primarily caused by misunderstandings about the mmWave propagation behavior regarding path loss and straight-line propagation properties. These myths were commonly accepted because of their apparent inherency to very high frequencies. In this keynote talk, we discuss these issues by investigating mmWave propagation characteristics and channel models with field measurement data especially targeting mobile cellular networks. The path loss characteristics will clarify the severity of mmWave propagation losses and provide information on the radius of cell coverage, amount of interference, calculation of link margin, etc. The multipath angular profiles tell us from where signals are arriving and provide information for the determination of beamwidth and beamforming. The multipath delay characteristics provide the frequency-selectivity information on system design such as symbol period and the cyclic prefix length in OFDM. In addition to these fundamental mmWave propagation properties, we discuss a 3GPP-like stochastic channel model and provide parameters appropriate to the mmWave bands. Finally, we discuss mmWave system impacts caused by the adoption of directional antenna beamforming: beam mis-alignment and selection of beamwidth. Our measurement data were collected in both an outdoor urban microcellular (UMi) and indoor hotspot (InH) environments with our custom-developed sounder operating at 28 and 38 GHz.

Commission D: Electronics and Photonics

Millimeter-wave and Terahertz Technologies Enabled by Photonics

August 22, 2016 / 13:30~14:10, Room J (Swan)

Tadao Nagatsuma
Osaka University, Japan

Biography

Tadao Nagatsuma received B.S., M.S., and Ph.D. degrees in electronic engineering from Kyushu University, Fukuoka, Japan, in 1981, 1983, and 1986, respectively. From 1986 to 2007, he was with Nippon Telegraph and Telephone Corporation (NTT), Atsugi, Kanagawa, Japan. Since 2007, he has been a Professor at Graduate School of Engineering Science, Osaka University, and a Director of the Science and Technology Entrepreneurship Laboratory at Osaka University. His research interests include millimeter-wave and terahertz photonics and their applications to wireless communications, sensing, and measurement. He is a Fellow of the IEEE, a Fellow of the Institute of Electronics, Information and Communication Engineers (IEICE), Japan, and a Fellow of the Electromagnetics Academy. He currently serves as an Associate Editor of the IEEE Photonics Technology Letters, and a Director of the IEICE.

Abstract

This talk presents how effectively photonics technologies are implemented not only in generation, detection and transmission of continuous millimeter waves (MMW) and terahertz (THz) waves, but also in system applications such as communications, measurements, spectroscopy and imaging to efficiently enhance their performance. First, key device and component technologies are reviewed. Then, wireless communications applications are discussed aiming at a data rate of terabit/s. Next, frequency-domain THz spectroscopy systems are described, in particular focusing on the approach to increasing a measurement sensitivity, and a similar technique is successfully applied to visualization of MMW/THz electric-field radiation and propagation, which is useful for the characterization of devices and systems. Moreover, 2D/3D imaging applications are presented. Finally, in order to make MMW/THz systems more compact and cost-effective, recent challenges in photonic integration technologies are described, which include monolithically integrated photonic signal generators, and hybrid integration schemes using, for example, photonic crystal platforms.

Commission E: Electromagnetic Environment and Interference

Pulsed Antennas for Applications in High-Power Electromagnetics (HPEM)

August 22, 2016 / 16:00~16:40, Room I (Crane)

D. V. Giri
University of New Mexico, USA

Biography

Dr. Giri has 40 years of work experience in the general field of electromagnetic theory and its applications in NEMP (Nuclear Electromagnetic Pulse), HPM (High-Power Microwaves), Lightning, and UWB (Ultra Wideband). A complete description of his academic training and work experience may be seen at his website: www.dvgiri.com He obtained the B.Sc., Mysore University, India, (1964), B.E., M.E., Indian Institute of Science, (1967) (1969), M.S., Ph.D., Harvard University, (1973) (1975), Certificate, Harvard Introduction to Business Program, (1981).
Since 1984, he is a self-employed consultant doing business as Pro-Tech, in Alamo, CA, performing R&D work for U.S. Government and Industry. He is also an Adjunct Professor in the Dept. of ECE, University of New Mexico, Albuquerque, NM. Dr. Giri has taught graduate and undergraduate courses in the Dept. of EECS, University of California, Berkeley campus. From May 1978 to September 1984, he was a staff scientist at LuTech, Inc., in Berkeley, CA. Prior to his association with LuTech, Inc., Dr. Giri was a Research Associate for the National Research Council at the Air Force Research Laboratory (AFRL), Kirtland AFB, New Mexico, where he conducted research in EMP and other aspects of electromagnetic theory. Dr. Giri is a LIFE FELLOW of IEEE, a Charter Member of the Electromagnetics Society, and Member of Commission B, URSI and International Chairman of Commission E, URSI. He has served on the editorial board of the Journal of Electromagnetics, published by the Electromagnetics Society. He has also served as an Associate Editor for the IEEE Transactions on Electromagnetic Compatibility. He was elected to the grade of FELLOW by the awards committee of Summa Foundation in 1994 for his contributions to EMP simulator design and HPM antenna design. He has coauthored a book titled High-Power Microwave Systems and Effects published by Taylor and Francis in 1994. He is a co-recipient of the IEEE Antennas and Propagation Society's 2006 John Kraus Antenna Award. His second book titled High-Power Electromagnetic Radiators: Nonlethal Weapons and Other Applications has been published by Harvard University Press in 2004. He has also published over 100 papers, reports etc. He is a recipient of 2006 John Kraus Antenna Award by IEEE Antennas and Propagation Society.

He is a Co-Editor with Prof. Raj Mittra, and they have started an on-line Forum and Journal on Electromagnetics called FERMAT (www.e-fermat.org).

Abstract

Natural lightning is the only nature-made example of an HPEM signal. There are many man-made HPEM signals such as Nuclear Electromagnetic Pulse (NEMP), High-Power Microwaves (HPM) , Hyperband (short pulse) systems etc. [D. V. Giri and F. M. Tesche, "Classification of Intentional Electromagnetic Environments (IEME), IEEE Trans. EMC, Aug. 2004]. To study the effects of such HPEM signals on electronic systems – from a simple device to fully assembled systems such as an aircraft or a ship, we need pulse power technologies and complex EM facilities to propagate and radiate these signals. In this presentation, we discuss ways of generating high-power pulses and how such pulses can be applied to transmission lines and antennas to produce the proper transient EM environment for vulnerability tests. The transmission lines can be very large two-conductor facilities. Examples of radiating systems are: resistively loaded monopoles, helical antennas, transmission-line fed paraboloidal reflectors etc. The fundamental working principles of such facilities will be discussed with many illustrative examples.

Commission F: Wave Propagation and Remote Sensing

Global Measurement of Rainfall and Precipitation Microphysics

August 23, 2016 / 13:30~14:10, Room K (White Heron)

V. Chandrasekar
Colorado State University, USA

Biography

Prof Chandra is currently a University Distinguished professor of Colorado State University. He has been actively involved with research and development of weather radar systems for over 35 years. He has played a key role in developing the CSU-CHILL National Radar Facility as one of the most advanced meteorological radar systems available for research and education. He serves as the Research Director of the NSF-ERC, Center for Collaborative Adaptive Sensing of the Atmosphere. He is an avid experimentalist conducting special experiments to collect in situ observations to verify the new techniques and technologies. He is a co-author of two text books and five general books, and 190 journal articles. He has served as academic advisor for over 60 graduate students, where half of them were PhD scholars. Dr. Chandrasekar has served as a member of the National Academy of Sciences Committee that wrote the books, "Weather Radar Technology beyond NEXRAD'' and "Flash Flood Forecasting in Complex Terrain. He served as the General Chair for the IEEE, IGARSS'06 Symposium and served as the Chief Editor of the Journal of Atmospheric and Oceanic technology. He has been a visiting professor of National Research Council of Italy; Distinguished Visiting Scientist at NASA (GSFC), and currently serves as the Distinguished Professor of University of Helisnki and Finnish Meteorological Institute, and an affiliate scientist of the NASA Jet propulsion Laboratory.
He has received numerous awards including, NOAA/ NWS Director's Medal of Excellence the Abell Foundation Outstanding Researcher Award, NASA Technical Contribution Award, IEEE Education Award, University Outstanding Advisor Award, the Abell Foundational Award for International Contributions and the as well as The CSU Research Foundation Innovation Award. He is an Elected Fellow of the IEEE, American Meteorological Society and NOAA/ CIRA.

Abstract

Global observation of rainfall has been a long standing goal of the remote sensing community ever since meteorological Satellites were launched. This quest reached a new level of advancement with the launch of the Tropical Rainfall Measuring Mission (TRMM) which was a joint mission between NASA and JAXA. Hailed as one of the most successful missions, the satellite lasted for an unprecedented 17 years and collected valuable data over tropical rainfall. The key instruments that were on the TRMM satellite used for rainfall measurements were the precipitation radar and the microwave radiometer. The TRMM program was the first demonstration of precipitation radar from space. Building on the success of the TRMM mission the Global precipitation mission was launched that is again a global cooperation of space agencies with NASA and JAXA jointly building and launching the dual-frequency precipitation radar. The authors of this paper have been fortunate to have been part of both programs and have developed algorithms for not only rainfall estimation, but also microphysical characterization of rainfall on a global scale with cross validation with ground observations. This paper will describe rainfall comparisons, microphysical characterizations of global precipitation primarily from the current GPM satellite.

Commission G: Ionospheric Radio and Propagation

Incoherent Scatter Radars: Present and Future

August 23, 2016 / 16:00~16:40, Room G (Convention D)

Craig J. Heinselman

EISCAT Scientific Association, Sweden

Biography

Dr. Heinselman obtained a B.S. degree from Harvey Mudd College in 1979 and M.S. and Ph.D. degrees from Stanford University in 1996 and 1999, respectively. He has worked in the field of incoherent scatter radar for three and a half decades and has been the principal investigator of the Sondrestrom Facility in Kangerlussuaq, Greenland and the Advanced Modular Incoherent Scatter Radars (AMISRs) near Fairbanks, Alaska and Resolute Bay, Canada. He is presently the Director of the EISCAT Scientific Association with facilities in northern Norway, Sweden, Finland and on Svalbard. He has held this post since 2013. He has been a member of the IEEE since 1979 and the American Geophysical Union since 1988. His research interests include high-latitude ionospheric physics, ionosphere/neutral atmosphere physical and chemical interactions, incoherent scatter radar techniques, and phased-array radar technologies.

Abstract

The incoherent scatter radar (ISR) technique is one of the most powerful ways of probing the ionospheric plasma. Due in large part to a robust theoretical foundation, ISRs can measure the most important parameters of that plasma, including electron density, electron and ion temperatures, and ion drift velocity as well as, under certain conditions, ion composition and ion-neutral collision frequency. It can do this as functions of altitude, horizontal coverage, and time largely regardless of atmospheric conditions and continuously for years at a time (system and budget permitting). A number of other key parameters describing the state of the system can also be derived from these basic measurements.

The presently operating ISR systems sport a range of capabilities and a number of key locations around the planet. Various tradeoffs were made in the system architectures at each location, largely driven by the technologies available when they were established but also in response to the ionospheric conditions of those locations. As a result, there exists a fairly wide variety of system designs supporting this kind of research. In recent years, several of the newer systems have exploited advances in both RF and digital technology to enable rapidly steerable phased-array configurations. These advances have opened measurement possibilities that didn't exist in earlier systems.

Progress is also being made in designing the next generation of ISR systems, using more fully digital techniques with very large numbers of individual antennas. A prime example of this is the EISCAT_3D system which is now primed for implementation in the northern European auroral zone. This multi-static system of phased array antennas will open new measurement possibilities in one of the most dynamic regions of the ionosphere.

Commission H: Waves in Plasmas

Magnetosphere-Ionosphere Coupling by ULF Waves

August 23, 2016 / 13:30~14:10, Room H (Convention E)

Robert L. Lysak
University of Minnesota, USA

Biography

Professor Robert L. Lysak received his Ph.D. from the University of California, Berkeley, in 1980 under the supervision of Professors Forrest Mozer and Mary K. Hudson. He has been a member of the faculty in the School of Physics and Astronomy at the University of Minnesota since 1982 and has been a full professor since 1991. He has over 30 years of experience in developing space plasma physics theory and investigating wave phenomena in the magnetosphere and auroral particle acceleration by means of numerical simulation. He has studied wave dispersion relations and linear instabilities of relevance to the auroral zone and the resulting wave-particle interactions. His main focus is on the propagation of ULF waves through the magnetosphere, their coupling to the ionosphere, and their relation to auroral particle acceleration. He has over 100 publications in refereed journals. He recently served as the Senior Editor for the Journal of Geophyscal Research: Space Physics from 2010-2013. He is a Fellow of the American Geophysical Union and the American Physical Society, and was awarded the Hannes Alfvén Medal of the European Geosciences Union in 2015.

Abstract

ULF waves play a critical role in the coupling of magnetospheric dynamics to the ionosphere. Shear mode Alfven waves carry field-aligned current, and as kinetic Alfven waves, can develop a parallel electric field to accelerate auroral particles. In the inhomogeneous magnetosphere, shear Alfven waves are coupled to compressional fast mode waves that can be driven by magnetospheric compressions as well as plasma instabilities such as the Kelvin-Helmholtz instability. The global response of these waves has been studied by means of a three-dimensional numerical simulation of the coupled wave modes in dipolar geometry. The coupling to the ionosphere is modeled by a fully resolved conductivity profile, which allows for a direct computation of the ground signatures of these waves.

Commission J: Radio Astronomy

Development of Highly Sensitive Superconducting Receivers for ALMA Band 10 and Future Prospects

August 23, 2016 / 08:30~09:10, Room C (Diamond)

Yoshinori Uzawa
National Institute of Information and Communications Technology, Japan

Biography

Yoshinori Uzawa is a Director of the Collaborative Research Laboratory of Terahertz Technology, Terahertz Technology Research Center, National Institute of Information and Communications Technology (NICT) from 2014, after completing the development of the Atacama Large Millimeter/submillimeter Array (ALMA) band 4 & 10 receivers as an Associate Professor of the National Astronomical Observatory of Japan (NAOJ) from 2005. Before this job, he was with the Communications Research Laboratory (present NICT), where he worked on the development of quasi-optical submillimeter-wave receivers with NbN SIS junctions, after earning a master's degree in applied electronics from the Tokyo Institute of Technology (TIT) in 1991. He received his Ph.D degree in applied electronics from TIT in 2000, and is the recipient of several awards and honors. His research interests include the superconducting electronics and terahertz technologies. He is a Visiting Professor of NAOJ from 2015.

Abstract

The Atacama Large Millimeter/submillimeter Array (ALMA) is the largest ground-based radio telescope and has been constructed in the Atacama Desert in Chile at an altitude of about 5,000 m, as an international collaboration project involving East Asia, Europe, and North America in cooperation with Chile. This paper briefly introduces the telescope, and describes the development of the ALMA Band 10 (0.79-0.95 THz) receiver, which covers the highest frequency band in ALMA and is recognized as the most difficult in terms of superconducting technology. The development started in 2005, and the manufacturing/testing of all the receivers to be installed in a total of 66 Cassegrain reflector antennas that compose ALMA was completed in 2013. One of the key developments to meet the stringent ALMA requirements was Band 10 superconductor-insulator-superconductor (SIS) mixers with high quality superconducting NbTiN films. Successful additional results related to the Band 10 receivers and future prospects are also presented.

Commission K: Electromagnetics in Biology and Medicine

The Effects of RF-EMF in Animal Models

August 22, 2016 / 13:30~14:10, Room D (Convention A)

Yun-Sil Lee
Ewha Womans University, Korea

Biography

Dr. Yun-Sil Lee is an professor of Graduate School of Pharmaceutical Sciences at Ewha Womans University. She received her B.S., M.S. and Ph.D. in College of Pharmacy from Ewha Womans University. She went on to do postdoctoral work in NCI, USA before 18 years working at Korea Institute of Radiological and Medical Sciences as a Principal Scientist, where she had a lot of works about radiation damage modulators and biological effects on EMF. Her research group focuses on development of radiation protectors or sensitizers targeted for heat shock factor 1 (HSF1) or heat shock protein 27 (HSP27) using natural products. She is also working about basic radiation damage response in relationship with cancer development. Another her interest is the biological effects of EMF including ELF and RF fields. Recent working fields for EMF are the effects on RF on development of Alzheimer disease.

Abstract

The present study investigated the effects of RF-EMF in various animal models including lymphoma development, teratogenicity, reproductive functions, immune and endocrine system, and Alzheimer disease after exposure of CDMA (849 MHz) or WCDMA (1.95 GHz) with total SAR dose of 4.0 W/kg, which is a relatively high SAR level compared to the exposure levels for the human system recommended by ICNIRP.

Technical Program

Session Title	[S-B14] Multiscale Multiphysics Techniques and Applications
Date and Time	August 22 (Mon.) / 13:30~15:30
Room	Room A (Emerald A)
Session Organizer	Qing Huo Liu (Duke University)
Session Chair	Qing Huo Liu (Duke University)

[S-B14-1] **13:30~13:50**

[Invited] The Efficient Finite Element Method with Impedance Transmission Boundary Condition for Computing Optical Waveguide Modes

Na Liu[1], Guoxiong Cai[1], and Qing Huo Liu[2]
[1]Xiamen University, China, [2]Duke University, USA

[S-B14-2] **13:50~14:10**

[Invited] Multiphysics Coupling of Fluid Flow and Electromagnetic fields for Subsurface Sensing

Yunyun Hu and Qing Huo Liu
Duke University, USA

[S-B14-3] **14:10~14:30**

[Invited] Multiphysics Modeling and Simulation of Plasma Sheath

Hou Zhang, Tao Zhong, and Xiong Yin
Air Force Engineering University, China

[S-B14-4] **14:30~14:50**

[Invited] Numerical Verification of Magnetization Reversal Process of Bit-Patterned Media

Shinichiro Ohnuki, Ryota Oida, and Akira Kuma
Nihon University, Japan

[S-B14-5] **14:50~15:10**

[Invited] Transmission of a Single Rectangular Hole Filled with Dispersive Material

Hengxin Ruan, Longgang Wang, and Lianlin Li
Peking University, China

[S-B14-6] **15:10~15:30**

[Invited] Radar Cross Section Analysis of a Thin Material Strip

Takashi Nagasaka and Kazuya Kobayashi
Chuo University, Japan

Session Title	[S-B12a] Novel Mathematical Methods in Electromagnetics (1)
Date and Time	August 22 (Mon.) / 13:30~15:30
Room	Room B (Emerald B)
Session Organizer	Kazuya Kobayashi (Chuo University) Yury Shestopalov (University of Gävle)
Session Chairs	Keiji Goto (National Defense Academy) Tsuneki Yamasaki (Nihon University)

[S-B12a-1] **13:30~13:50**

[Invited] Performance Comparison of Orbital Angular Momentum Modes using Deformed Cassegrain Reflector Antennas

Woo Jin Byun[1], Y. S. Lee[1], B. S. Kim[1], K. S. Kim[1], M. S. Kang[1], M. S. Song[1], and Yong Heui Cho[2]
[1]Electronics and Telecommunications Research Institute, Korea, [2]Mokwon University, Korea

[S-B12a-2] **13:50~14:10**

[Invited] Sometimes Phase Correction Does not Increase Directivity of Electromagnetic Bandgap Resonator Antennas - A Case Study

Muhammad U. Afzal and Karu P. Esselle
Macquarie University, Australia

[S-B12a-3] **14:10~14:30**

[Invited] Interpretation Method for Response Waveform of Transient Scattered Magnetic Field by a Coated Cylinder Covered with a Thick Material

Keiji Goto, Keishi Hagiwara, Layla Okada, Yuta Takeno, and Shohei Tokumaru
National Defense Academy, Japan

[S-B12a-4] **14:30~14:50**

[Invited] Functional Characteristics of Optical Waves in Transverse Acousto-Optic Waveguide and Active Coupler using SAW

Yasumitsu Miyazaki
Aichi Mathematical Technology Laboratory, Japan

[S-B12a-5] **14:50~15:10**

[Invited] Optical Functional Characteristics of Transverse A-O Waveguide With SAW By FDTD Analysis

Rakkappan Balasubramanian[1], Yasumitsu Miyazaki[2], and Nobuo Goto[3]
[1]Synclayer, Inc., Japan, [2]Aichi Mathematical Tech. Lab., Japan, [3]The University of Tokushima, Japan

[S-B12a-6] **15:10~15:30**

[Invited] Distribution of Energy Density for Dielectric Waveguides with Various Properties of Dielectric Constants in the Middle Layer

Ryosuke Ozaki and Tsuneki Yamasaki
Nihon University, Japan

Session Title	[S-J1] New Technology in Very Long Baseline Interferometry and Single Dishes
Date and Time	August 22 (Mon.) / 13:30~15:10
Room	Room C (Diamond)
Session Organizer	Do Young Byun (Korea Astronomy and Space Science Institute) Z.-Q. Shen (Chinese Academy of Science)
Session Chair	Jongsoo Kim (Korea Astronomy and Space Science Institute)

[S-J1-1] **13:30~13:50**

[Invited] The KaVA (KVN and VERA Array) : Status and Recent Activities

Do-Young Byun[1], Mareki Honma[2], Hyun-Goo Kim[1], Katsunori M. Shibata[2], Sang-Sung Lee[1], Hideyuki Kobayashi[2], Kiyoaki Wajima[1], Tomoya Hirota[2], Taehyun Jung[1], JeongSook Kim[2], Kee-Tae Kim[1], Bon Won Sohn[1], Motoki Kino[1], Se-Jin Oh[1], Duk-Gyoo Roh[1], Seog-Tae Han[1], Chungsik Oh[1], Jongsoo Kim[1], Se-Hyung Cho[1], and Tomoaki Oyama[2]
[1]Korea Astronomy and Space Science Institute, Korea, [2]National Astronomy Observatory of Japan, Japan

[S-J1-2] **13:50~14:10**

[Invited] Simultaneous Multi Frequency mm-VLBI on Global Baselines: the Extended KVN

R. Dodson[1], T. Jung[2], M. Rioja[1,3,4], J. Stevens[3], M. Honma[5], B. W. Sohn[2], and P. de Vicente[4]
[1]University of Western Australia, Australia, [2]Korea Astronomy and Space Science Institute, Korea, [3]Commonwealth Scientific and Industrial Research Organisation, Australia, [4]OAN (IGN), [5]National Astronomy Observatory of Japan, Japan

[S-J1-3] **14:10~14:30**

[Invited] VLBI Astrometry up to 130 GHz using MultiFrequency Calibration

M. Rioja[1,2,3], R. Dodson[1], T. Jung[4], and B.W. Sohn[4]
[1]University of Western Australia, Australia, [2]Commonwealth Scientific and Industrial Research Organisation, Australia, [3]OAN (IGN), [4]Korea Astronomy and Space Science Institute, Korea

[S-J1-4] **14:30~14:50**

Wide-band VLBI Observations of Multiple SiO Maser Lines using the OCTAVE System

Hiroshi Imai[1], Sho Kuwahara[1], Amane Kano[1], Miyako Oyadomari[1], Sze-Ning Chong[1], Tomoaki Oyama[2], Yusuke Oyama[2], Tomoya Hirota[2], Syunsaku Suzuki[2], Masahiro Kanaguchi[2], Takashi Nishikawa[2], Noriyuki Kawaguchi[2], Takumi Nagayama[2], and Hideyuki Kobayashi[2]
[1]Kagoshima University, Japan, [2]National Astronomical Observatory of Japan, Japan

[S-J1-5] **14:50~15:10**

[Invited] Greenland Telescope Project Current Status and Collaboration in East Asia

Makoto Inoue
Academia Sinica Institute of Astronomy and Astrophysics, Taiwan

Session Title	[S-K1a] Biological Effects of EMF (1)
Date and Time	August 22 (Mon.) / 13:30~15:30
Room	Room D (Convention A)
Session Organizer	Young-Hwan Ahn (Ajou University) Xu Zhengping (Zhejiang University)
Session Chairs	Young-Hwan Ahn (Ajou University) Xu Zhengping (Zhejiang University)

[S-K1a-1] **13:30~14:10**

[Keynote] The Effects of RF-EMF in Animal Models

Jeong-Ki Pack[1], Nam Kim[2], Jong Hwa Kwon[3], Hyung-Do Choi[3], Yun-Sil Lee[4], and Hae-June Lee[5]
[1]Chungnam National University, Korea, [2]Chungbuk National University, Korea, [3]Electronics and Telecommunications Research Institute, Korea, [4]Ewha Womans University, Korea, [5]Korea Institute of Radiological and Medical Sciences, Korea

[S-K1a-2] **14:10~14:30**

[Invited] Children's Health Following Prenatal Radiofrequency Radiation Expsoure

Mina Ha
Dankook University, Korea

[S-K1a-3] **14:30~14:50**

[Invited] Biologic Influence of RFID-EMF on Brain: In vovo Study

Young Hwan Ahn[1], Hye Sun Kim[1], Man-Jeong Paik[2], Yun-Sil Lee[3], Hyung Do Choi[4], Jong Hwa Kwon[4], Jeong-Ki Pack[5], and Nam Kim[6]
[1]Ajou University, Korea, [2]Sunchon National University, Korea, [3]Ewha Women's University, Korea, [4]Electronics and Telecommunications Research Institution, Korea, [5]Chungnam National University, Korea, [6]Chungbuk National University, Korea

[S-K1a-4] **14:50~15:10**

[Invited] Differential Genotoxic Responses of Different Cells to Radiofrequency Electromagnetic Fields

Chuan Sun, Liling Su, Guangdi Chen, and Zhengping Xu
Zhejiang University, China

[S-K1a-5] **15:10~15:30**

[Invited] Study on Bioeffects of Electromagnetic Field Exposure in China

Zhengping Yu
Third Military Medical University, China

Session Title	SPC Special Session
Date and Time	August 22 (Mon.) / 13:30~15:10
Room	Room E (Convention B)
Session Chairs	Peter Van Daele (URSI Assistant Secretary-General, Ghent University) Paul S. Cannon (URSI President, University of Birmingham) Jeong-Hae Lee (Hongik University) Ikmo Park (Ajou University)

[SPC-1] **13:30~13:50**

[Invited] Transmission and Resonance of a Single Rectangular Hole Filled with Anisotropic Material

Hengxin Ruan[1], Lianlin Li[1], and Tie Jun Cui[2]
[1]Peking University, China, [2]Southeast University, China

[SPC-2] **13:50~14:10**

Output Power Enhancement by Optical Pulse Compression in Photonic-Based RF Generation

Takashi Yamaguchi, Hiroki Morimoto, and Hiroyuki Toda
Doshisha University, Japan

[SPC-3] **14:10~14:30**

Investigation of Optical Path Functional for High and Low Ionospheric Radio Rays

Igor A. Nosikov[1], Maxim V. Klimenko[2], Pavel F. Bessarab[3], and Gennady A. Zhbankov[4]
[1]Immanuel Kant Baltic Federal University, Russia, [2]West Department of IZMIRAN, Russia, [3]Royal Institute of Technology KTH, Sweden, [4]Southern Federal University, Russa

[SPC-4] **14:30~14:50**

Suppression of Multi-Path Coupling in Scaled-Down Expreiment using Cross-Borehole Pulse Radar

Jae-Hyoung Cho[1,2], Ji-Hyun Jung[3], Jong-Gwan Yook[2], and Se-Yun Kim[1]
[1]Korea Institute of Science and Technology, Korea, [2]Yonsei University, Korea, [3]Hanwha Thales, Korea

[SPC-5] **14:50~15:10**

Thermal Modelling of Coaxial line for Cryogenic Noise Measurements

Ahmed Soliman, Andrew Janzen, and Sander Weinreb
California Institute of Technology, USA

Session Title	[S-C3] Wireless Network
Date and Time	August 22 (Mon.) / 13:30~15:10
Room	Room F (Convention C)
Session Organizer	Seung-Hoon Hwang (Dongguk University) Jangwon Lee (Yonsei University)
Session Chair	Seung-Hoon Hwang (Dongguk University)

[S-C3-1] **13:30~13:50**

[Invited] 5G Cellular Systems with D2D Assisted NOMA Relay

Young Bae Song, Hyeon Su Kang, and Duk Kyung Kim
Inha University, Korea

[S-C3-2] **13:50~14:10**

[Invited] Performance Evaluation of Heterogeneous Networks with Cell ID Operation of Small Cell

Kyungsik Min[1], Taehyoung Kim[1], Takki Yuy[2], Hano Wang[3], Daesik Hong[1], and Sooyong Choi[1]
[1]Yonsei University, Korea, [2]SK Telecom, Co., Ltd., Korea, [3]Sangmyung University, Korea

[S-C3-3] **14:10~14:30**

[Invited] Joint Cell Association and Resource Scheduling for OFDMA Multi-Cell HetNets

Jeong-Ahn Kwon and Jang-Won Lee
Yonsei University, Korea

[S-C3-4] **14:30~14:50**

[Invited] Uplink Open Loop Power Control for LTE HetNet

Amir Haider[1], Seong-Hee Lee[1], Seung-Hoon Hwang[1], Dae Ik Kim[2], and Jee Hyeon Na[2]
[1]Dongguk University, Korea, [2]Electronics and Telecommunications Research Institute, Korea

[S-C3-5] **14:50~15:10**

Convex Optimization-based Rotation Parameter Estimation using Micro Doppler

Kyungwoo Yoo[1], Joohwan Chun[1], Seungoh Yoo[2], and Chungho Ryu[2]
[1]Korea Advanced Institute of Science and Technology, Korea, [2]Agency for Defense Development, Korea

Session Title	[S-G1] GPS/GNSS Monitoring of the Ionosphere
Date and Time	August 22 (Mon.) / 13:30~15:10
Room	Room G (Convention D)
Session Organizer	Kwan-Dong Park (Inha University) Shuanggen Jin (Chinese Academy of Sciences)
Session Chairs	Shuanggen Jin (Chinese Academy of Sciences) Kwan-Dong Park (Inha University)

[S-G1-1] **13:30~13:50**

[Invited] Characteristics of GPS Ionospheric Scintillation and TEC Depletion in the Chinese Low Latitude Region

Baiqi Ning, Guozhu Li, and Kangkang Liu
Chinese Academy of Sciences, China

[S-G1-2] **13:50~14:10**

Comparison of Ionospheric TEC Obtained by GPS with IRI 2012 Over China

Cheng Wang
Wuhan University, China

[S-G1-3] **14:10~14:30**

Hemispheric and Annual Asymmtry of NmF2 Observed by FORMOSAT-3/COSMIC Radio Occultation Observations

V. Sai Gowtam and S. Tulasi Ram
Indian Institute of Geomagnetism, India

[S-G1-4] **14:30~14:50**

On the Variation of TEC Over the Equatorial, Mid and High Latitudes During a Long Duration Positive Ionospheric Storm

Shreedevi P. R.[1], Smitha V. Thampi[1], D. Chakrabarty[2], Rajkumar Choudhary[1], and Tarun Kumar Pant[1]
[1]Indian Space Research Organisation, India, [2]Physical Research Laboratory, India

[S-G1-5] **14:50~15:10**

Estimation Method of Ionospheric TEC Distribution from Single Frequency GPS Measurements using a Slant Effect Model

Win Zaw Hein, Yusuke Kashiwa, Yoshitaka Goto, and Yoshiya Kasahara
Kanazawa University, Japan

Session Title	[S-H1] Theory and Simulation of Waves in Plasma
Date and Time	August 22 (Mon.) / 13:30~15:10
Room	Room H (Convention E)
Session Organizer	Myoung-Jae Lee (Hanyang University) Hae June Lee (Pusan National University)
Session Chair	Myoung-Jae Lee (Hanyang University)

[S-H1-1] **13:30~13:50**

[Invited] Gyrokinetic Simulation of Micro-Turbulence and Intrinsic Rotation in Tokamak Plasma

J. M. Kwon[1], S. Yi[1], T. Rhee[1], and P.H. Diamond[2]
[1]National Fusion Research Institute, Korea, [2]University of California, USA

[S-H1-2] **13:50~14:10**

[Invited] Magnetic Field Generation and Particle Acceleration by Weibel and Filamentation Instabilities

C. M. Ryu and C. T. Huynh
Pohang University of Science and Technology, Korea

[S-H1-3] **14:10~14:30**

[Invited] Implications of a Non-Modal Theory for the L-H Transition in Tokamaks

V. S.Mikhailenko, V. V. Mikhailenko, and H. J. Lee
Pusan National University, Korea

[S-H1-4] **14:30~14:50**

Nonlinear Dynamics of Electrons Interacting with Oblique Whistler Mode Waves in the Magnetosphere

Yikai Hsieh and Yoshiharu Omura
Kyoto University, Japan

[S-H1-5] **14:50~15:10**

[Invited] Studies of the Self-Modulation and Other Instabilities in Proton Beam-Driven Plasma Wakefield Accelerators

Moses Chung[1], Kookjin Moon[1], Seongyeol Kim[1], HaeJune Lee[2], V. V. Mikhailenko[2], and V. S. Mikhailenko[2]
[1]Ulsan National Institute of Science and Technology, Korea, [2]Pusan National University, Korea

Session Title	[S-E1] Common-Mode Issues Related to Power Electronics
Date and Time	August 22 (Mon.) / 13:30~15:10
Room	Room I (Crane)
Session Organizer	Yoshitaka Toyota (Okayama University) Wansoo Nah (Sungkyunkwan University)
Session Chairs	Yoshitaka Toyota (Okayama University) Wansoo Nah (Sungkyunkwan University)

[S-E1-1] **13:30~13:50**

[Invited] Evaluation on Active Power of Common-mode Conducted Disturbance

Farhan Mahmood[1], Ken Okamoto[1], Yuichiro Okugawa[1], Kazuhiro Takaya[1], Takaaki Ibuchi[2], and Tsuyoshi Funaki[2]
[1]NTT Network Technology Laboratories, Japan, [2]Osaka University, Japan

[S-E1-2] **13:50~14:10**

[Invited] Influence of Induced Voltage Noise on Switching Characteristics for a Power Converter Circuit

Ko Ogata and Keiji Wada
Tokyo Metropolitan University, Japan

[S-E1-3] **14:10~14:30**

[Invited] Modal-equivalent Circuit with Injection Probe Models for Electromagnetic Immunity Analysis

Koji Kumegawa, Kengo Iokibe, and Yoshitaka Toyota
Okayama University, Japan

[S-E1-4] **14:30~14:50**

[Invited] EMI Filter Design Method for Three-Conductor Circuit System using Mode Analysis

Nan Zhang and Wansoo Nah
Sungkyunkwan University, Korea

[S-E1-5] **14:50~15:10**

[Invited] A Study of Linear Equivalent Circuit Modeling for Conducted Disturbance Estimation of Power Converter Circuit

Y. Yano[1], H. Geshi[1], K. Iokibe[1], Y. Toyota[1], and T. Watanabe[2]
[1]Okayama University, Japan, [2]Industrial Technology Center of Okayama Prefecture, Japan

Session Title	[S-D1] Microwave and THz photonics
Date and Time	August 22 (Mon.) / 13:30~15:30
Room	Room J (Swan)
Session Organizer	Jungwon Kim (Korea Advanced Institute of Science and Technology) Shilong Pan (Nanjing University of Aeronautics and Astronautics)
Session Chairs	Min Xue (Nanjing University of Aeronautics and Astronautics) Jungwon Kim (Korea Advanced Institute of Science and Technology)

[S-D1-1] **13:30~14:10**

[Keynote] Millimeter-wave and Terahertz Technologies Enabled by Photonics

Tadao Nagatsuma
Osaka University, Japan

[S-D1-2] **14:10~14:30**

[Invited] Photonics-based Ultra-Low Phase Noise Microwave Generation

S. Lecomte, E. Portuondo-Campa, S. Kundermann, and G. Buchs
Centre Suisse d'Electronique et de Microtechnique, Switzerland

[S-D1-3] **14:30~14:50**

[Invited] Ultrahigh-Resolution Optical Vector Analysis based on Single-Sideband Modulation

Min Xue and Shilong Pan
Nanjing University of Aeronautics and Astronautics, China

[S-D1-4] **14:50~15:10**

[Invited] All-Optical Central-Frequency-Programmable and Bandwidth-Tailorable Radar Architecture

Weiwen Zou, Siteng Zhang, Kan Wu, and Jianping Chen
Shanghai Jiao Tong University, China

[S-D1-5] **15:10~15:30**

[Invited] Optimisation of Fiber-Wireless Networks

Ampalavanapillai Nirmalathas, Chaturika Ranaweera, Chamil Jayasundara, Christina Lim, and Elaine Wong
The University of Melbourne, Australia

Session Title	[S-F1] Wave Propagation and Scattering
Date and Time	August 22 (Mon.) / 13:30~15:10
Room	Room K (White Heron)
Session Organizer	Yisok Oh (Hongik University) Yang Du (Zhejiang University)
Session Chair	Yisok Oh (Hongik University)

[S-F1-1] **13:30~13:50**

[Invited] Basic Properties of Time-Reversal Image of Target in Clutter Environment

Il-Suek Koh[1], Hyung-Ha Yoo[1], Joonsuk Kim[2], and Yongshik Lee[2]
[1]Inha University, Korea, [2]Yonsei University, Korea

[S-F1-2] **13:50~14:10**

[Invited] Examination of the Sensitivity of Soil Moisture Retrieval from Radar Backscatters of Vegetated Fields

Sinmyong Park and Yisok Oh
Hongik University, Korea

[S-F1-3] **14:10~14:30**

[Invited] EM Wave Scattering Characteristics of Mobile and Ground based TACAN

Jin-Young Hong
Korea Airport Corporation, Korea

[S-F1-4] **14:30~14:50**

[Invited] Polarimetric Simulations of Bistatic Scattering from Sea Surfaces at Low Wind Speed at L Band

Jingsong Yang, Yang Du, Jiancheng Shi, and Dejun Li
Zhejiang University, China

[S-F1-5] **14:50~15:10**

Yearly Variations of Rapid Changes in CrossPolarization Discrimination of the Ka-band Satellite Radio Wave Signals due to Thunderstorm

Yasuyuki Maekawa
Osaka Electro-Communication University, Japan

Session Title	[S-B2] Reconfigurable Antennas and Miniaturized Antennas
Date and Time	August 22 (Mon.) / 16:00~18:20
Room	Room A (Emerald A)
Session Organizer	Sungjoon Lim (Chung-Ang University)
Session Chair	Sungjoon Lim (Chung-Ang University)

[S-B2-1] **16:00~16:20**

[Invited] Microfluidics for Reconfigurable Antenna

Muhammad Usman Memon and Yunsik Seo
Chung-Ang University, Korea

[S-B2-2] **16:20~16:40**

[Invited] Electrically Small, Copper Strip Made Folded Spherical Helix Antennas Realized by 3D Printing Technology

Myeongjun Kong[1], Geonyeong Shin[1], Sung-Hee Lee[2], and Ick-Jae Yoon[1]
[1]Chungnam National University, Korea, [2]Korea Institute of Industrial Technology, Korea

[S-B2-3] **16:40~17:00**

[Invited] Simple Composite Right/Left-Handed Leaky-Wave Antennas for Continuous Beam Scanning from Backward to Forward Direction

Debabrata K. Karmokar and Karu P. Esselle
Macquarie University, Australia

[S-B2-4] **17:00~17:20**

[Invited] An Improved Method for Estimating Antenna Correlation Coefficient of Lossy MIMO Arrays

Susilo Ady Saputro and Jae-Young Chung
Seoul National University of Science and Technology, Korea

[S-B2-5] **17:20~17:40**

GPS Antennas for Small Unmanned Aerial Systems (SUAS)

John Patton[1] and Amir I. Zaghloul[1,2]
[1]Virginia Tech, USA, [2]US Army Research Lab., USA

[S-B2-6] **17:40~18:00**

Wideband Subarray Design for 5G Antenna Arrays

Seyyedehelnaz Ershadi[1,2], Asghar Keshtkar[1], Ahmed H. Abdelrahman[2], Xiaoju Yu[2], and Hao Xin[2]
[1]Imam Khomeini International University, Iran, [2]University of Arizona, USA

[S-B2-7] **18:00~18:20**

[Invited] On Use of Focusing Media for Elimination of Inverse Problem Ill-Posedness in Microwave Tomography

Vladimir Okhmatovski and Lotfollah Shafai
University of Manitoba, Canada

Session Title	[S-B12b] Novel Mathematical Methods in Electromagnetics (2)
Date and Time	August 22 (Mon.) / 16:00~18:20
Room	Room B (Emerald B)
Session Organizer	Kazuya Kobayashi (Chuo University) Yury Shestopalov (University of Gävle)
Session Chairs	Said Mikki (University of New Haven) Rachid Talhi (CNRS – LPCEE)

[S-B12b-1] **16:00~16:20**

[Invited] Physical Fields and Radiations from the Human Body: New Type of Noninvasive Medical Diagnostics

Yury V. Gulyaev
Kotel'nikov Institute of Radio-engineering and Electronics, Russian Academy of Sciences, Russia

[S-B12b-2] **16:20~16:40**

[Invited] Volume Singular Integro-Differential Equations in the Electromagnetic Diffraction Problem

Yury Smirnov, Aleksei Tsupak, and Dmitry Valovik
Penza State University, Russia

[S-B12b-3] **16:40~17:00**

[Invited] Nonlocal Electromagnetics: The Physics of New Behaviour in Engineering Applications

Said M. Mikki[1] and Yahia Antar[2]
[1]University of New Haven, USA, [2]Royal Military College, Canada

[S-B12b-4] **17:00~17:20**

[Invited] Stochastic Wave Theory Applied to SEISMIC CODA Waves of P (pressure), S (shear), and Rayleigh Surface Waves in Random Media

Akira Ishimaru, Yasuo Kuga, and Ce Zhang
University of Washington, USA

[S-B12b-5] **17:20~17:40**

[Invited] Electromagnetic TM Wave Propagation in a Layer with Kerr Nonlinearity: Analytical Results

Dmitry Valovik and Yury Smirnov
Penza State University, Russia

[S-B12b-6] **17:40~18:00**

[Invited] Propagation and Scattering of E.M Waves in Complex Media : Numerical Treatment and Some Open Questions

Rachid Talhi
CNRS - LPC2E and University of Tours

[S-B12b-7] **18:00~18:20**

[Invited] Numerical Modeling of Thick Conducting Irises using FDTD Method-Comparison with the Modified Residue-Calculus Method-

Shota Arai[1], Toshihiko Shibazaki[1], and Teruhiro Kinoshita[2]
[1]Tokyo Metropolitan College of Industrial Technology, Japan, [2]Tokyo Polytechnic University, Japan

Session Title	[S-J2] Science and Technology of the Square Kilometer Array
Date and Time	August 22 (Mon.) / 16:00~18:00
Room	Room C (Diamond)
Session Organizer	Bong-Won Sohn (Korea Astronomy and Space Science Institute) Hideyuki Kobayashi (National Astronomy Observatory of Japan)
Session Chairs	Bong-Won Sohn (Korea Astronomy and Space Science Institute) Hideyuki Kobayashi (National Astronomy Observatory of Japan)

[S-J2-1] **16:00~16:20**

Science with the Square Kilometre Array

Jeff Wagg, Robert Braun, Tyler Bourke, and Evan Keane
Square Kilometre Array Organization, UK

[S-J2-2] **16:20~16:40**

[Invited] Radio Astrometry Towards the Nearby Universe with the Square Kilometre Array

Hiroshi Imai[1], Ross Burns[2], Gabor Orosz[1], Yoshiyuki Yamada[3], Tahei Yano[4], Naoteru Gouda[4], Kotaro Niinuma[5], and Kenji Bekki[6]
[1]Kagoshima University, Japan, [2]Joint Institute for VLBI in Europe, Netherlands, [3]Kyoto University, Japan, [4]National Astronomical Observatory of Japan, Japan, [5]Yamaguchi University, Japan, [6]University of Western Australia, Australia

[S-J2-3] **16:40~17:00**

[Invited] Recent SKA Related Activities in Korea

Bong Won Sohn
Korea Astronomy and Space Science Institute, Korea

[S-J2-4] **17:00~17:20**

[Invited] Recent SKA-Related Activities in Japan

Takuya Akahori
Kagoshima University, Japan

[S-J2-5] **17:20~17:40**

[Invited] The Suitability of Cloud, Massive and Moderate Computing Environments for SKA Scale Data

Richard Dodson[1], Kevin Vinsen[1], Chen Wu[1], Attila Popping[1], Martin Meyer[1], Andreas Wicenec[1], Peter Quinn[1], Jacqueline van Gorkom[2], and Emmanuel Momjian[3]
[1]International Centre for Radio Astronomy Research, Australia, [2]Columbia University, USA, [3]National Radio Astronomy Observatory, USA

[S-J2-6] **17:40~18:00**

[Invited] UAV-Aided Calibration for Commissioning of Phased Array Radio Telescopes

Stefan J. Wijnholds[1], Giuseppe Pupillo[2], Pietro Bolli[2], and Giuseppe Virone[3]
[1]Netherlands Institute for Radio Astronomy, Netherlands, [2]National Institute for Astrophysics, Italy, [3]National Research Council, Italy

Session Title	[S-K1b] Biological Effects of EMF (2)
Date and Time	August 22 (Mon.) / 16:00~18:00
Room	Room D (Convention A)
Session Organizer	Young-Hwan Ahn (Ajou University) Xu Zhengping (Zhejiang University)
Session Chairs	Young-Hwan Ahn (Ajou University) Xu Zhengping (Zhejiang University)

[S-K1b-1] **16:00~16:20**

EM Fields in the Model of Biological Cell

Ö. Hazar, S. S. Şeker, and O. Cerezci
Bogazici University

[S-K1b-2] **16:20~16:40**

Investigations on the Biological Effects of Wearable Antennas at UHF and UWB Frequencies Utilizing Infra-red Thermography

Varshini Karthik and T.Rama Rao
SRM University, India

[S-K1b-3] **16:40~17:00**

Analysis of Temperature Elevation on Human Body at 60 GHz with Antipodal Linear Tapered Slot Antenna

T. Rama Rao and Purva Shrivastava
SRM University, India

[S-K1b-4] **17:00~17:20**

Biochemical and Morphological Changes of Rat brain Cells Chronically Exposed to Microwave Radiation

Paulraj R.[1] and J. Behari[2]
[1]Jawaharlal Nehru University, India, [2]Amity University, India

[S-K1b-5] **17:20~17:40**

Extremely Low-Frequency Electromagnetic Fields Promote in Vitro Neuronal Differentiation and Neurite Outgrowth of Embryonic Neural Stem Cells via Up-Regulating TRPC1

Qinlong Ma, Chunhai Chen, Ping Deng, Lei Zhang, Shangcheng Xu, and Zhou Zhou
Third Military Medical University, China

[S-K1b-6] **17:40~18:00**

Hints of Media: An Experimental Study of Effect of Media Warnings About Health Hazards of MP Use on Self-Reported Symptoms

Feizhou Zheng, Peng Gao, Mindi He, and Lei Zhang
Third Military Medical University, China

Session Title	[C1] Spectrum Engineering Technology
Date and Time	August 22 (Mon.) / 16:00~17:20
Room	Room E (Convention B)
Session Chair	Feng Zhang (Beijing Institute of Technology)

[C1-1] **16:00~16:20**

Worst Case Signal to Interference Ratio using Different Beamforming Techniques for Frequency Reuse Cellular Systems

Osama H. Elgzar[1], Imbaby I. Mahmoud[1], Sherief M. Hashima[1], and H. A. Konber[2]
[1]Egyptian Atomic Energy Authority, Egypt, [2]Al Azhar University, Egypt

[C1-2] **16:20~16:40**

Analysis of Downlink Sectored Frequency Reuse Cellular Systems Combined with Different Beamforming Techniques

Osama Elgzar[1], Imbaby Mahmoud[1], Sherief Hashima[1], and Hussien Konber[2]
[1]Egyptian Atomic Energy Authority, Egypt, [2]Al Azhar University, Egypt

[C1-3] **16:40~17:00**

Frequency Interference Test-Bed Considering both Interferer's Frequency and Time Domain Parameters

Jisu Yun[1], Jin-Soo Park[1], Hyungoo Yoon[2], and Byung-Jun Jang[1]
[1]Kookmin University, Korea, [2]Myongji College, Korea

[C1-4] **17:00~17:20**

Analysis of Clustered SC-FDMA Intermodulation Distortion on LTE Spectrum

Heechang Seong, Seongsoo Bae, Seungmo Cho, and Jinhyo Park
SK Telecom, Korea

Session Title	[S-C4] Radio Localization Techniques
Date and Time	August 22 (Mon.) / 16:00~17:40
Room	Room F (Convention C)
Session Organizer	Dongsoo Han (Korea Advanced Institute of Science and Technology) Sunwoo Kim (Hanyang University)
Session Chairs	Dongsoo Han (Korea Advanced Institute of Science and Technology) Sunwoo Kim (Hanyang University)

[S-C4-1] **16:00~16:20**

[Invited] Performance Evaluation of Maring Beacons for Ship Indoor Positioning System

Taehyun Park and Hyuk-Soon Kwon
NET Co., Ltd, Korea

[S-C4-2] **16:20~16:40**

[Invited] Kalman Tracking of Mobile Devices Considering Range-Free Localization Accuracy

Hyowon Kim, Jaehoon Lee, Junhyuk Kim, and Sunwoo Kim
Hanyang University, Korea

[S-C4-3] **16:40~17:00**

[Invited] Hierarchical Asset Tracking System using IEEE 802.15.4a Radio in Container Terminals

Sanghyun Son, Beomjun Kim, Heejin Park, and Yunju Baek
Pusan National University, Korea

[S-C4-4] **17:00~17:20**

[Invited] A Method of Single-Direction Calibration for Accurate DoA Estimation

Gangil Byun[1], Haengik Kang[2], Seungmok Han[2], and Hosung Choo[1]
[1]Hongik University, Korea, [2]LIG NEX1 Co., Ltd, Korea

[S-C4-5] **17:20~17:40**

[Invited] Cellular Based Non-Line-of-Sight Positioning

Jai Hyung Cho
Electronics and Telecommunications Research Institute, Korea

Session Title	[S-G3] Radar Probing for the Ionospheric Variability
Date and Time	August 22 (Mon.) / 16:00~18:00
Room	Room G (Convention D)
Session Organizer	Young-Sil Kwak (Korea Astronomy and Space Science Institute) Yuichi Otsuka (Nagoya University)
Session Chairs	Young-Sil Kwak (Korea Astronomy and Space Science Institute) Yuichi Otsuka (Nagoya University)

[S-G3-1] **16:00~16:20**

[Invited] Irregularity Observation with Multiple VHF Coherent Radars in China

Guozhu Li[1], Baiqi Ning[1], Jinsong Chen[2], and Chen Zhou[3]
[1]Chinese Academy of Sciences, China, [2]Research Institute of Radio Wave Propagation, China, [3]Wuhan University, China

[S-G3-2] **16:20~16:40**

[Invited] Study of Magnetosphere-Ionosphere-Thermosphere Coupling Processes using the SuperDARN Hokkaido Pair of (HOP) Radars

Nozomu Nishitani
Nagoya University, Japan

[S-G3-3] **16:40~17:00**

[Invited] The Daejeon 40.8 MHz VHF Radar Observations of the E- and F-Region Field-Aligned Irregularities in the Middle Latitude

Young-Sil Kwak[1,2], Tae-Yong Yang[1,2], and Hyosub Kil[3]
[1]Korea Astronomy and Space Science Institute, Korea, [2]University of Science and Technology, Korea, [3]The Johns Hopkins University Applied Physics Laboratory, USA

[S-G3-4] **17:00~17:20**

[Invited] Study of Ionospheric Field-Aligned Irregularity over Japan by using the MU Radar and Other Instruments

Mamoru Yamamoto
Kyoto University, Japan

[S-G3-5] **17:20~17:40**

[Invited] The Case Study on the Causal Relationship of the Occurrence of the Electron Density Irregularities in the Middle-Latitude F-Region Observed by VHF Radar in Korea

Seung Jun Oh[1], Hyosub Kil[2], Young-Sil Kwak[3], and Taeyong Yang[3]
[1]SELab, Inc., Korea,[2]The Johns Hopkins University Applied Physics Laboratory, USA, [3]Korea Astronomy and Space Science Institute, Korea

[S-G3-6] **17:40~18:00**

[Invited] Simultaneous Imaging Observations of Post-Midnight Field-Aligned Irregularities and 630-nm Airglow

Yuichi Otsuka[1], Tam Dao[1], and Kazuo Shiokawa[1], and Mamoru Yamamoto[2]
[1]Nagoya University, Japan, [2]Kyoto University, Japan

Session Title	[S-H2] Generation and Characteristics of Waves in Space
Date and Time	August 22 (Mon.) / 16:00~18:00
Room	Room H (Convention E)
Session Organizer	Dae-Young Lee (Chungbuk National University) Ensang Lee (Kyung Hee University)
Session Chairs	Dae-Young Lee (Chungbuk National University) Ensang Lee (Kyung Hee University)

[S-H2-1] **16:00~16:20**

[Invited] Characteristics of Nonlinear Waves in Space Plasmas: Accuracy Issues

Dong-Hun Lee[1], Kyung-Im Kim[1], Jaehun Kim[1], KiChang Yoon[2], and Young Yun Kim[2]
[1]Kyung Hee University, Korea, [2]Korean Space Weather Center, Korea

[S-H2-2] **16:20~16:40**

[Invited] Linear and Nonlinear Theory of Upper-Hybrid Wave Excitation in the Auroral Ionosphere

Peter Yoon[1,2]
[1]University of Maryland, USA, [2]Kyung Hee University, Korea

[S-H2-3] **16:40~17:00**

[Invited] Magnetosonic Wave Discrete and Continuous Spectrum Characteristics

Lunjin Chen[1], Jicheng Sun[2], Quanming Lu[2], and Xinliang Gao[2]
[1]University of Texas, USA, [2]University of Science and Technology of China, China

[S-H2-4] **17:00~17:20**

[Invited] Generation of Non-Propagating Alfvenic Electromagnetic Plasma Structures by Nonlinear Interaction of Alfven Wave Packets and the Acceleration of Auroral Particles

Yan Song and Robert L. Lysak
University of Minnesota, USA

[S-H2-5] **17:20~17:40**

[Invited] Nonlinear Generation Mechanisms of Whistler-Mode Chorus and Hiss Emissions

Yoshiharu Omura
Kyoto University, Japan

[S-H2-6] **17:40~18:00**

[Invited] MHD Waves in the Solar Corona

Valery M. Nakariakov[1,2]
[1]University of Warwick, UK, [2]Kyung Hee University, Korea

Session Title	[S-E2] Signal Integrity and EMI of Chip, Package, and PCB
Date and Time	August 22 (Mon.) / 16:00~18:00
Room	Room I (Crane)
Session Organizer	Joungho Kim (Korea Advanced Institute of Science and Technology) Wen-Yan Yin (Zhejiang University)
Session Chair	Seungyoung Ahn (Korea Advanced Institute of Science and Technology)

[S-E2-1] **16:00~16:40**

[Keynote] Pulsed Antennas for Applications in High-Power Electromagnetics (HPEM)

D. V. Giri
University of New Mexico, USA

[S-E2-2] **16:40~17:00**

[Invited] PCB-Package to Chip Wireless Power Transfer using Magnetic-Field Resonance Coupling for Area and Cost Reduction in 3-D IC

Jinwook Song, Seungtak Jung, Shinyoung Park, Hongseok Kim, and Joungho Kim
Korea Advanced Institute of Science and Technology, Korea

[S-E2-3] **17:00~17:20**

[Invited] An Efficient Crosstalk-Included Eye-Diagram Estimation Method using Equivalent Circuit Model of Coupled Microstrip Channel for 2.5D and 3D IC

Sumin Choi, Heegon Kim, Daniel H. Jung, Jonghoon J. Kim, Jaemin Lim, Hyunsuk Lee, Kyungjun Cho, and Joungho Kim
Korea Advanced Institute of Science and Technology, Korea

[S-E2-4] **17:20~17:40**

Wireless Power and Data Transfer System for Internet of Things Over Metal Walls and Metal Shielded Environments

Sai Kiran Oruganti, Olzhas Kaiyrakhmet, and Franklin Bien
Ulsan National institute of Science and Technology, Korea

[S-E2-5] **17:40~18:00**

Conductive RFI Noise Reduction using Antenna Ground Isolation for Mobile Devices

Jaejin Lee, Hao-han Hsu, Joseph Chen, and Ying Ern Ho
Intel Corporation, USA

Session Title	[S-D3] Terahertz Electronics and Photonics
Date and Time	August 22 (Mon.) / 16:00~18:00
Room	Room J (Swan)
Session Organizer	Jae-Sung Rieh (Korea University) Minoru Fujishima (Hiroshima University)
Session Chairs	Jae-Sung Rieh (Korea University) Minoru Fujishima (Hiroshima University)

[S-D3-1] **16:00~16:20**

[Invited] Transistor-based Electronic THz Sources and Detectors

Jae-Sung Rieh
Korea University, Korea

[S-D3-2] **16:20~16:40**

[Invited] 20-Gbit/s ASK Wireless System in 300-GHz-Band and Front-Ends with InP MMICs

Hiroshi Hamada[1], Toshihiko Kosugi[1], Ho-Jin Song[1], Hideaki Matsuzaki[1], Amine El Moutaouakil[1], Hiroki Sugiyama[1], Makoto Yaita[1], Takuro Tajima[1], Hideyuki Nosaka[1], Osamu Kagami[1], Yoichi Kawano[2], Tsuyoshi Takahashi[2], Yasuhiro Nakasha[2], Naoki Hara[2], Katsumi Fujii[3], Issei Watanabe[3], and Akifumi Kasamatsu[3]
[1]NTT Corporation, Japan, [2]Fujitsu Limited, Japan, [3]National Institute of Information and Communications Technology, Japan

[S-D3-3] **16:40~17:00**

[Invited] Channel Allocation of 300GHz Band for Fiber-Optic-Speed Wireless Communication

Minoru Fujishima
Hiroshima University, Japan

[S-D3-4] **17:00~17:20**

[Invited] Giant THz Electric Field Enhancement

Salvatore Bagiante[1], Hans Sigg[1], Yannik Waeber[2], and Thomas Feurer[2]
[1]Paul Scherrer Institute, Switzerland, [2]University of Bern, Switzerland

[S-D3-5] **17:20~17:40**

[Invited] Nonlinear Terahertz-Wave Generation using Graphene Metadevicves

Chihun In[1,2] and Hyunyong Choi[1]
[1]Yonsei University, Korea, [2]Korea Atomic Energy Research Institute, Korea

[S-D3-6] **17:40~18:00**

[Invited] Graphene-Ferroelectric Memory Metadevices

Woo Young Kim[1], Hyeon-Don Kim[1], Teun-Teun Kim[1], Hyun-Sung Park[1], Kanghee Lee[1], Hyun Joo Choi[1], Seung Hoon Lee[1], Jaehyeon Son[1], Bumki Min[1], and Namkyoo Park[2]
[1]Korea Advanced Institute of Science and Technology, Korea, [2]Seoul National University, Korea

Session Title	[S-F2a] Remote Sensing for Land and Sea (1)
Date and Time	August 22 (Mon.) / 16:00~18:00
Room	Room K (White Heron)
Session Organizer	Duk-Jin Kim (Seoul National University) Kazuo Ouchi (National Defense Academy)
Session Chair	Duk-Jin Kim (Seoul National University)

[S-F2a-1] **16:00~16:20**

[Invited] Global Surface Soil Moisture Monitoring with L-band Spaceborne Monostatic Synthetic Aperture Radar

S. Kim[1], A. Colliander[1], J. van Zyl[1], S. Yueh[1], and D. Entekhabi[2]
[1]Jet Propulsion Laboratory, USA, [2]Massachusetts Institute of Technology, USA

[S-F2a-2] **16:20~16:40**

[Invited] Seasonal Changes of ALOS PALSAR Polarimetric Signatures in Eastern Siberia

Sang-Eun Park
Sejong University, Korea

[S-F2a-3] **16:40~17:00**

[Invited] A Long Baseline Airborne SAR Interferometry for Tidal Flat Mapping

Duk-jin Kim, Jungkyo Jung, Changhyun Choi, Ki-mook Kang, Seung Hee Kim, and Ji-Hwan Hwang
Seoul National University, Korea

[S-F2a-4] **17:00~17:20**

[Invited] A Co-Polarization Ratio-Based Parameter for Urban Man-made Target Detection

Junjun Yin[1] and Jian Yang[2]
[1]University of Science and Technology Beijing, China, [2]Tsinghua University, China

[S-F2a-5] **17:20~17:40**

[Invited] Flooding Area Detection By ALOS-2 Fully Polarimetric Data

Yoshio Yamaguchi, Nana Takahashi, and Hiroyoshi Yamada
Niigata University, Japan

[S-F2a-6] **17:40~18:00**

[Invited] Urban Growth Extraction using Landsat Time Series Data and Random Forest Classifier: A Case Study of Beijing Area

Peijun Li[1] and Jun Zhang[2]
[1]Peking University, China, [2]National Geomatics Center of China, China

Session Title	[S-B3] Groundwave Propagation Modeling, Simulation and Measurement
Date and Time	August 23 (Tue.) / 08:30~09:50
Room	Room A (Emerald A)
Session Organizer	Il-Suek Koh (Inha University) Levent Sevgi (Okan University)
Session Chair	Il-Suek Koh (Inha University)

[S-B3-1] **08:30~08:50**

[Invited] Analysis of Inverse Source Algorithms for Different Propagation Mechanisms

Zeina El-Ahdab, Funda Akleman, and Özgür Özdemir
Istanbul Technical University, Turkey

[S-B3-2] **08:50~09:10**

[Invited] Mechanism of Radio Wave Propagation in Cellular Wireless Communication

Tapan K Sarkar[1] and Magdalena Salazar Palma[2]
[1]Syracuse University, USA, [2]University Carlos III, Spain

[S-B3-3] **09:10~09:30**

[Invited] Propagation Characteristics Prediction and Experimental Measurement of LF Radio Waves Near the Earth Surface

Lili Zhou[1,2], Xiaoli Xi[2], Yurong Pu[2], and Dandan Wang[2]
[1]Shaanxi University of Science and Technology, China, [2]Xi'an University of Technology, China

[S-B3-4] **09:30~09:50**

[Invited] Frequency Characteristics of Changes in Received Levels by Human Body Blockage in Indoor Environment

Koshiro Kitao, Ngochao Tran, Tetsuro Imai, and Yukihiko Okumura
NTT Docomo, Inc., Japan

Session Title	[S-B12c] Novel Mathematical Methods in Electromagnetics (3)
Date and Time	August 23 (Tue.) / 08:30~10:30
Room	Room B (Emerald B)
Session Organizer	Kazuya Kobayashi (Chuo University) Yury Shestopalov (University of Gävle)
Session Chairs	Tadashi Takano (Nihon University) Debatosh Guha (University of Calcutta)

[S-B12c-1] **08:30~08:50**

[Invited] Generation of a Beamed Wave using a Phased Array Antenna

Tadashi Takano, Takashi Uno, Kuniaki Shibata, and Kenji Saegusa
Nihon University, Japan

[S-B12c-2] **08:50~09:10**

[Invited] Rigorous Calculation of Scattered Field by Conductive Disk using Multiple Precision Arithmetic -Calculation Precision and Parameter Selection-

Takashi Kuroki[1], Keisuke Fukunaga[1], Toshihiko Shibazaki[1], and Teruhiro Kinoshita[2]
[1]Tokyo Metropolitan College of Industrial Technology, Japan, [2]Tokyo Polytechnic University, Japan

[S-B12c-3] **09:10~09:30**

[Invited] Measurement and Visualization of Radio Waves Incident on Thin Metamaterial Absorber

Satoshi Yagitani[1], Mitsunori Ozaki[1], Tomohiko Imachi[1], Ryohei Hayashi[1], Ryohei Kanaura[1], Yoshiyuki Yoshimura[2], and Hirokazu Sugiura[2]
[1]Kanazawa University, Japan, [2]Industrial Research Institute of Ishikawa, Japan

[S-B12c-4] **09:30~09:50**

[Invited] New Theory for Fabry-Perot Cavity Antenna

Debatosh Guha[1], Koushik Dutta[2], and Chandrakanta Kumar[3]
[1]University of Calcutta, India, [2]Netaji Subhash Engineering College, India, [3]Indian Space Research Organisation, India

[S-B12c-5] **09:50~10:10**

[Invited] Anharmonic Microwaves in Nonlinear Gradient Transmission Lines

A. B. Shvartsburg[1,2,3], N. V. Silin[3], and Iu. G. Nesterov[3]
[1]Joint Institute for High Temperatures, Russia, [2]Institute for Space Researches, Russia, [3]Far Eastern Federal University, Russia

[S-B12c-6] **10:10~10:30**

[Invited] Composites with Radially Anisotropic Cylinders

Henrik Wallén and Ari Sihvola
Aalto University, Finland

Session Title	[S-J3] Science and Technology of Atacama Large Millimeter/ Submillimeter Array
Date and Time	August 23 (Tue.) / 08:30~10:30
Room	Room C (Diamond)
Session Organizer	Jongsoo Kim (Korea Astronomy and Space Science Institute) Satoru Iguchi (National Astronomy Observatory of Japan)
Session Chairs	Jongsoo Kim (Korea Astronomy and Space Science Institute) Satoru Iguchi (National Astronomy Observatory of Japan)

[S-J3-1] **08:30~09:10**

[Keynote] Development of Highly Sensitive Superconducting Receivers for ALMA Band 10 and Future Prospects

Y. Uzawa[1,2], K. Makise[1], S. Saito[1], H. Terai[1], Z. Wang[1], T. Kojima[2], M. Kroug[2], Y. Fujii[2], A. Gonzalez[2], and K. Kaneko[2]
[1]National Institute of Information and Communications Technology, Japan, [2]National Astronomical Observatory of Japan, Japan

[S-J3-2] **09:10~09:30**

[Invited] East Asian ALMA Future Development

Daisuke Iono, Satoru Iguchi, and Shin'ichiro Asayama
National Astronomical Observatory of Japan, Japan

[S-J3-3] **09:30~09:50**

[Invited] The Atacama Large Millimeter/Submillimeter Array (ALMA) Band-1 Receiver

Yau De(Ted) Huang, Oscar Morata, Patrick Michel Koch, Ciska Kemper, Yuh-Jing Hwang, Chau-Ching Chiong, Eddie Huang, Bill Liu, Shou-Hsien Weng, Chin-Ting Ho, Po-Han Chiang, Hsiao-Ling Wu, Chih-Cheng Chang, Shou-Ting Jian, Chien-Feng Lee, Yi-Wei Lee, Satoru Iguchi, Shin'ichiro Asayama, Daisuke Iono, Alvaro Gonzalez, John Effland, Kamaljeet Saini, Marian Pospieszalski, Doug Henke, Keith Yeung, Ricardo Finger, Valeria Tapia, and Nicolas Reyes
Institute of Astronomy and Astrophysics, Academia Sinica, Taiwan

[S-J3-4] **09:50~10:10**

ALMA Band 2 Optics: Design, Constraints, Implementation and Measurements

Sivasankaran Srikanth and Alvaro Gonzalez
[1]National Radio Astronomy Observatory, USA, [2]National Astronomical Observatory of Japan, Japan

[S-J3-5] **10:10~10:30**

[Invited] ASTE Focal Plane Array as Prototype FPA for ALMA TP Array

Jung-Won Lee[1], Do-Heung Je[1], Bangwon Lee[1], Hyunwoo Kang[1], Jongsoo Kim[1], Jan Wagner[1], Shin'ichiro Asayama[2], Alvaro Gonzalez[2], Matthias Kroug[2], Takafumi Kojima[2], Wenlei Shan[2], Satoru Iguchi[2], and Daisuke Iono[2]
[1]Korea Astronomy and Space Science Institute, Korea, [2]National Observatory of Japan, Japan

Session Title	[S-K2a] Exposure Assessment and EMF Standards (1)
Date and Time	August 23 (Tue.) / 08:30~10:30
Room	Room D (Convention A)
Session Organizer	Soichi Watanabe (National Institute of Information and Communications Technology) Niels Kuster (ETH Zurich)
Session Chairs	Lira Hamada (National Institute of Information and Communications Technology) Niels Kuster (ETH Zurich)

[S-K2a-1] **08:30~08:50**

[Invited] Development of Multi-Band Personal Dosimeter for RF and ELF Exposure Monitoring

J. H. Hwang, S. I. Kwak, J. H. Kwon, and H. D. Choi
Electronics and Telecommunications Research Institute, Korea

[S-K2a-2] **08:50~09:10**

[Invited] Technical and Biological Electromagnetic Field Assessment for RF Safety Standard Regulation and Harmonization

Sergey Perov[1], Quirino Balzano[2], and Niels Kuster[3]
[1]Research Institute of Occupational Health, Russia, [2]University of Maryland, USA, [3]Foundation for Research on Information Technologies in Society, Switzerland

[S-K2a-3] **09:10~09:30**

[Invited] Hygienic Standardization of EMF in the Russian Federation. History, Modern State, Perspectives

N. B. Rubtsova
Research Institute of Occupational Health, Russia

[S-K2a-4] **09:30~09:50**

[Invited] Application of the Specific Absorption Rate measurement for base station antennas

Takahiro Iyama[1], Teruo Onishi[1], Yoshiaki Tarusawa[1], Lira Hamada[2], and Soichi Watanabe[2]
[1]NTT Docomo, Inc., Japan, [2]National Institute of Information and Communications Technology, Japan

[S-K2a-5] **09:50~10:10**

[Invited] Compliance Evaluations for Radio Regulations of the Human Exposure in Japan

Lira Hamada and Soichi Watanabe
National Institute of Information and Communications Technology, Japan

[S-K2a-6] **10:10~10:30**

[Invited] Past, Present, and Future of SAR Evaluations

Mark Douglas[1], Niels Kuster[1,2], and Katja Pokovic[3]
[1]IT'IS Foundation, Switzerland, [2]Swiss Federal Institute of Technology, Switzerland, [3]Schmid & Partner Engineering AG, Switzerland

Session Title	[S-C6] IoT and green communications
Date and Time	August 23 (Tue.) / 08:30~10:30
Room	Room F (Convention C)
Session Organizer	Byounghyo Shim (Seoul National University)
Session Chair	Byounghyo Shim (Seoul National University)

[S-C6-1] **08:30~08:50**

[Invited] Internet of Things Localizaton: Matrix Completion Approach

Luong Trung Nguyen, Sangtae Kim, and Byonghyo Shim
Seoul National University, Korea

[S-C6-2] **08:50~09:10**

[Invited] Dynamic Multi-User Detection Based on Structured Compressive Sensing for IoT-Oriented 5G Systems

Bichai Wang, Talha Mir, Ruicheng Jiao, and Linglong Dai
Tsinghua University, China

[S-C6-3] **09:10~09:30**

[Invited] Crosstalk-Free Magnetic MIMO Communication using Heterogeneous Antenna Array

Han-Joon Kim and Ji-Woong Choi
Daegu Gyeongbuk Institute of Science & Technology, Korea

[S-C6-4] **09:30~09:50**

[Invited] Time-Switching Based In-Band Full Duplex Wireless Powered Two-Way Relay

Jong Jin Park, Jong Ho Moon, and Dong In Kim
Sungkyunkwan University, Korea

[S-C6-5] **09:50~10:10**

[Invited] Energy Signal Design and Decoding Procedure for Full-Duplex Two-Way Wireless Powered Relay

Jong Ho Moon, Jong Jin Park, and Dong In Kim
Sungkyunkwan University, Korea

[S-C6-6] **10:10~10:30**

[Invited] Opportunistic Transmission and Harvesting in RF Powered Cognitive Radio Network

Shanai Wu, Yoan Shin, Jin Young Kim, and Dong In Kim
[1]Soongsil University, Korea, [2]Kwangwoon University, Korea, [3]Sungkyunkwan University, Korea

Session Title	[S-G2] Ionospheric Density Variability in the Polar Region
Date and Time	August 23 (Tue.) / 08:30~10:30
Room	Room G (Convention D)
Session Organizer	Geonhwa Jee (Korea Polar Research Institute) Qian Wu (National Center for Atmospheric Research)
Session Chairs	Geonhwa Jee (Korea Polar Research Institute) Qian Wu (National Center for Atmospheric Research)

[S-G2-1] **08:30~08:50**

[Invited] CCMC High-Latitude Driver Swapping Tool for MI Coupling Study - Preliminary Results

J. S. Shim[1], M. Kuznetsova[2], and L. Rastaetter[2]
[1]CUA/NASA GSFC, USA, [2]NASA/GSFC, USA

[S-G2-2] **08:50~09:10**

[Invited] New Results from High Latitude Thermospheric Wind Observation and Simulation

Qian Wu[1], Geonhwa Jee[2], Changsup Lee[2], and William Ward[3]
[1]National Center for Atmospheric Research, USA, [2]Korea Polar Research Institute, Korea, [3]University of New Brunswick, Canada

[S-G2-3] **09:10~09:30**

[Invited] The Variation of Electron Temperature and Density Induced by Ionospheric Heating Near Fifth Electron Gyrofrequency

Jun Wu, Jian Wu, Haisheng zhao, and Zhengwen Xu
China Research Institute of Radio Wave Propagation, China

[S-G2-4] **09:30~09:50**

[Invited] Magnetospheric and Ionospheric Responses to the Passage of the Interplanetary Shock

Hyuck-Jin Kwon[1], Khan-Hyuk Kim[2], Su-in Kim[2], Nozomu Nishitani[3], and Tomoaki Hori[3]
[1]Korea Polar Research Institute, Korea, Korea, [2]Kyung-Hee University, Korea [3]Nagoya University, Japan

[S-G2-5] **09:50~10:10**

[Invited] The First Korean Antarctic Ionosonde for Ionospheric Studies in the Polar Cap Region

Changsup Lee[1], Geonhwa Jee[1], Jeong-Han Kim[1], HyuckJin Kwon[1], Young-Bae, Ham[1], Terry Bullett[2], Nikolay Zabotin[2], and Robert Livingston[3]
[1]Korea Polar Research Institute, Korea, [2]University of Colorado, USA, [3]Scion Associates, USA

[S-G2-6] **10:10~10:30**

[Invited] Dynamics of the Neutral Thermosphere: Probing Coupling Between the Mesopause and Lower Thermosphere

William E. Ward[1], Qian Wu[2], Marianna Shepherd[3], Wayne Hocking[4], Alan Manson[5], Chris Meek[5], Sam Kristoffersen[1], Chris Vail[1], and Caroline Gi[4]
[1]University of New Brunswick, Canada, [2]National Center for Atmospheric Research, USA, [3]York University, Canada, [4]Western University, Canada, [5]University of Saskatchewan, Canada

Session Title	[S-H3a] Radio Science for Space Weather (1)
Date and Time	August 23 (Tue.) / 08:30~09:50
Room	Room H (Convention E)
Session Organizer	Viviane Pierrard (Belgian Institute for Space Aeronomy) Mauro Messerotti (INAF-Astronomical Observatory of Trieste)
Session Chairs	Yuriy Voitenko (Royal Belgian Institute for Space Aeronomy) Mauro Messerotti (INAF-Astronomical Observatory of Trieste)

[S-H3a-1] **08:30~08:50**

[Invited] Radio Science for Space Weather

Mauro Messerotti
University of Trieste, Italy

[S-H3a-2] **08:50~09:10**

[Invited] Role of Solar Radio Observations in Space Weather

Dale E. Gary
New Jersey Institute of Technology, USA

[S-H3a-3] **09:10~09:30**

[Invited] Radio Imaging and Spectroscopy Tools for Space Weather Applications

Nicole Vilmer
LESIA-Paris Observatory, France

[S-H3a-4] **09:30~09:50**

[Invited] Low-Frequency Radio Bursts and Space Weather

N. Gopalswamy
NASA Goddard Space Flight Center, USA

Session Title	[S-A1] EM Basic Metrology
Date and Time	August 23 (Tue.) / 08:30~10:30
Room	Room I (Crane)
Session Organizer	Tae-Weon Kang (Korea Research Institute of Standards and Science) Shan Yueyan (Agency for Science, Technology and Research)
Session Chair	Tae-Weon Kang (Korea Research Institute of Standards and Science)

[S-A1-1] **08:30~08:50**

[Invited] Waveguide Microcalorimeters for Millimeter-wave Power Standards

Jae-Yong Kwon[1,2], Tae-Weon Kang[1,2], and No-Weon Kang[1]
[1]Korea Research Institute of Standards and Science, Korea, [2]University of Science and Technology, Korea

[S-A1-2] **08:50~09:10**

[Invited] Development of a National WR-10 (75 to 110 GHz) Microcalorimeter

Xiaohai Cui[1], Wenze Yuan[1], Yong Li[1], Chao Jia[1], and Yu Song Meng[2]
[1]National Institute of Metrology, China, [2]Agency for Science, Technology and Research, Singapore

[S-A1-3] **09:10~09:30**

[Invited] Evaluation of Verification Devices with Precise Probe Measurement System in NMIJ

Ryo Sakamaki and Masahiro Horibe
National Institute of Advanced Industrial Science and Technology, Japan

[S-A1-4] **09:30~09:50**

[Invited] Connector Conversion Technique for General-Purpose Connectors in S-parameter Calibration

Shintaro Nakamura[1], Ryoko Kishikawa[2], Keiko Sato[1], and Masahiro Horibe[2]
[1]Japan Quality Assurance Organization, Japan, [2]National Institute of Advanced Industrial Science and Technology, Japan

[S-A1-5] **09:50~10:10**

Connection Repeatability of Waveguide Verification Standards for VNA System

Nosherwan Shoaib[1], Marco Sellone[2], Luciano Brunetti[2], and Luca Oberto[2]
[1]Petroleum Institute, United Arab Emirates, [2]Istituto Nazionale di Ricerca Metrologica, Italy

[S-A1-6] **10:10~10:30**

[Invited] Measurement of Traceable Error Vector Magnitute using a Real-Time Digital Osilloscope

Chihyun Cho, Dongju Kim, and Joo-Gawng Lee
Korea Research Institute of Standards and Science, Korea

Session Title	[S-D2] Ultrafast Photonics
Date and Time	August 23 (Tue.) / 08:30~10:30
Room	Room J (Swan)
Session Organizer	Uwe Griebner (Max Born Institute) Fabian Rotermund (Korea Advanced Institute of Science and Technology)
Session Chairs	Uwe Griebner (Max Born Institute) Fabian Rotermund (Korea Advanced Institute of Science and Technology)

[S-D2-1] **08:30~08:50**

[Invited] Bulk-Structured Topological Insulators for 2-μm Pulsed Fiber Lasers

Ju Han Lee, Joonhoi Koo, and Junsu Lee
University of Seoul, Korea

[S-D2-2] **08:50~09:10**

[Invited] Research on Graphene Optical Devices for Ultrafast Fiber Laser Applications

Dong-Il Yeom
Ajou University, Korea

[S-D2-3] **09:10~09:30**

[Invited] High-Energy, kilohertz Repetition Rate Ho:YLF Regenerative Amplifiers at 2050 nm

Uwe Griebner, Lorenz von Grafenstein, Martin Bock, and Thomas Elsaesser
Max Born Institute, Gemany

[S-D2-4] **09:30~09:50**

[Invited] Femtosecond Lasers for Precision Metrology in Space

Young-Jin Kim[1] and Seung-Woo Kim[2]
[1]Nanyang Technological University, Singapore, [2]Korea Advanced Institute of Science and Technology, Korea

[S-D2-5] **09:50~10:10**

[Invited] Development of Yb:KGW Femtosecond Laser System for Industrial Applications

G. H. Kim[1], J. Yang[1], B. Lee[1], S. A. Chizhov[1], E. G. Sall[1], and V. E. Yashin[2]
[1]Korea Electrotechnology Research Institute, Korea, [2]State Optical Institute, Russia

[S-D2-6] **10:10~10:30**

[Invited] Broadband Photoresponse of Novel Ultrafast Optical Materials

Fengqiu (Frank) Wang
Nanjing University, China

Session Title	[S-F2b] Remote Sensing for Land and Sea (2)
Date and Time	August 23 (Tue.) / 08:30~09:50
Room	Room K (White Heron)
Session Organizer	Duk-Jin Kim (Seoul National University) Kazuo Ouchi (National Defense Academy)
Session Chair	Yoshio Yamaguchi (Niigata University)

[S-F2b-1] **08:30~08:50**

Polarimetric SAR Scattering Mechanism Modeling and Interpretation for Urban Damage Level Mapping

Si-Wei Chen and Xue-Song Wang
National University of Defense Technology, China

[S-F2b-2] **08:50~09:10**

Experimetal Study on Polarimetric Scattering for Grasping State of Stricken Bridge

R. Sato, T. Yajima, M. Masaka, Y. Yamaguchi, and H. Yamada
Niigata University, Japan

[S-F2b-3] **09:10~09:30**

Coherence Change Detection using Temporal Decorrelation Model for Multi-temporal SAR Data

Jungkyo Jung and Duk-jin Kim
Seoul National University

[S-F2b-4] **09:30~09:50**

Fundamental Study on Multi-baseline SAR Tomography by Pi-SAR-L2

Fumiki Urasawa, Hiroyoshi Yamada, Yoshio Yamaguchi, and Ryoichi Sato
Niigata University, Japan

Session Title	[S-B4] Metamaterials & FSS
Date and Time	August 23 (Tue.) / 13:30~15:30
Room	Room A (Emerald A)
Session Organizer	Sungtek Kahng (Incheon National University) Hisamatsu Nakano (Hosei University)
Session Chairs	Sungtek Kahng (Incheon National University) Junji Yamauchi (Hosei University)

[S-B4-1] **13:30~13:50**

[Invited] Circularly Polarized Reconfigurable Metaline Antenna

H. Nakano, T. Yoshida, K. Anjo, K. Sakata, Y. Kameta, and J. Yamauchi
Hosei University, Japan

[S-B4-2] **13:50~14:10**

[Invited] Recent Topic of Magnet-Less Non-Reciprocal Metamaterial, Performance Enhancement and Antenna Application

Toshiro Kodera
Meisei University, Japan

[S-B4-3] **14:10~14:30**

[Invited] Dispersion Engineering of Nonreciprocal Metamaterials and Their Applications to Leaky Wave Antennas

Tetsuya Ueda[1] and Tatsuo Itoh[2]
[1]Kyoto Institute of Technology, Japan, [2]University of California, USA

[S-B4-4] **14:30~14:50**

[Invited] Investigating Electromagnetic Power Transfer Ratio of Circular Polarizing Planar Metasurface Lens

M. K. Khattak[1], C. Lee[1], D. Han[1], S. Kahng[1], and K. Kahng[2]
[1]Incheon National University, Korea, [2]Acetechnology, Korea

[S-B4-5] **14:50~15:10**

[Invited] Effective Modeling Method of Metamaterials in FDTD Method by Utilizing Surface Impedance Boundary Conditions

Takuji Arima, Masahiro Gunji, and Toru Uno
Tokyo University of Agriculture and Technology, Japan

[S-B4-6] **15:10~15:30**

[Invited] Microwave Analogues of Multi-ordered Metatronic Filters with Waveguide Metamaterials

Yue Li[1] and Nader Engheta[2]
[1]Tsinghua University, China, [2]University of Pennsylvania, USA

Session Title	[S-B13a] Advances in Super- and High- Resolution Electromagnetic Imaging (1)
Date and Time	August 23 (Tue.) / 13:30~15:30
Room	Room B (Emerald B)
Session Organizer	Lianlin Li (Peking University) Weixiang Jiang (Southeast University)
Session Chairs	Lianlin Li (Peking University) Weixiang Jiang (Southeast University)

[S-B13a-1] **13:30~13:50**

[Invited] Knowledge-aided Object-Oriented ThreeDimensional Microwave Imaging

Longgang Wang[1], Lianlin Li[1], Xiaoyang Zhou[2], Tiejun Cui[2], and Arye Nehorai[3]
[1]Peking University, China, [2]Southeast University, China, [3]Washington University, USA

[S-B13a-2] **13:50~14:10**

[Invited] Microwave Imaging Based on Holographic Metasurfaces

Qiang Cheng, Jun Yan Dai, and Yun Bo Li
Southeast University, China

[S-B13a-3] **14:10~14:30**

[Invited] Acoustic Planar Magnifying Hyperlens

Zhaojun Wang and Xiaoming Zhou
Beijing Institute of Technology, China

[S-B13a-4] **14:30~14:50**

[Invited] A Novel Physics-driven Fast Parallel Three-Dimension Radar Imaging Method

Lianlin Li[1], Longgang Wang[1], Xiaoyang Zhou[2], Tiejun Cui[2], and Arye Nehorai[3]
[1]Peking University, China, [2]Southeast University, China, [3]Washington University, USA

[S-B13a-5] **14:50~15:10**

[Invited] Sparsity Reconstruction Algorithm for Nonlinear Microwave Problems

Hidayet Zaimaga[1] and Marc Lambert[2]
[1]Laboratoire Des Signaux et Systèmes, France, [2]GeePs -Group of Electrical Engineering, France

[S-B13a-6] **15:10~15:30**

[Invited] Strong Extrinsic 2D-Chiral Response in Symmetric Achiral Metasurface

L. Mao, Y. Zou, and T. Cao
Dalian University of Technology, China

Session Title	[S-J5a] Receivers for Radio Astronomy (1) (Joint with The 17th Workshop on Submillimeter-Wave Receiver Technologies in Eastern Asia)
Date and Time	August 23 (Tue.) / 13:30~15:30
Room	Room C (Diamond)
Session Organizer	Jungwon Lee (Korea Astronomy and Space Science Institute) Sheng-Cai Shi (Chinese Academy of Sciences)
Session Chair	Sheng-Cai Shi (Chinese Academy of Sciences)

[S-J5a-1] **13:30~13:50**

Gravity Loading Effect Analysis of the 5 Meter Terahertz Antenna for Dome A, Antarctica

Hairen Wang, Jingquan Cheng, Zheng Lou, Yuan Qian, Yingxi Zuo, and Ji Yang
Chinese Academy of Sciences, China

[S-J5a-2] **13:50~14:10**

Research on High Precision Antenna For DATE5

Yuan Qian, Zheng Lou, Yingxi Zuo, Hairen Wang, and Ji Yang
Chinese Academy of Sciences, China

[S-J5a-3] **14:10~14:30**

[Invited] An 8×8 CPW MKIDs Developed for Terahertz Superconducting Imaging Array

Jing Li, Qing Shi, Jin-Ping Yang, Dong Liu, Zheng Wang, Zhen-Hui Lin, Wen-Ying Duan, Zheng Lou, Wei Miao, Wen Zhang, and Sheng-Cai Shi
Chinese Academy of Sciences, China

[S-J5a-4] **14:30~14:50**

[Invited] Current and Near-Term Instrumentation at the James Clerk Maxwell Telescope

J. T. Dempsey[1], P. T. P. Ho[1], P. Friberg[1], D. Bintley[1], C. Walther[1], and M.-T. Chen[2]
[1]East Asia Observatory, USA, [2]Academica Sinica Institute of Astronomy and Astrophysics, Taiwan

[S-J5a-5] **14:50~15:10**

[Invited] Next Generation Heterodyne Array for JCMT

M.-T. Chen, P. T. P. Ho, J. Dempsey, P. Friberg, D. Bintley, and C. Walther
[1]Academia Sinica Institute of Astronomy & Astrophysics, Taiwan, [2]East Asia Observatory, USA

[S-J5a-6] **15:10~15:30**

Development of 1.5 THz Cartridge-type Multi-pixel Receiver Based on HEB Mixers

Yen-Ru Huang, Chuang-Ping Chiu, Wei-Chun Lu, Hsian-Hong Chang, Yen-Yu Chiang, and Ming-Jye Wang
Institute of Astronomy and Astrophysics, Academia Sinica, Taiwan

Session Title	[S-K2b] Exposure Assessment and EMF Standards (2)
Date and Time	August 23 (Tue.) / 13:30~15:30
Room	Room D (Convention A)
Session Organizer	Soichi Watanabe (National Institute of Information and Communications Technology) Niels Kuster (ETH Zurich)
Session Chairs	Lira Hamada (National Institute of Information and Communications Technology) Niels Kuster (ETH Zurich)

[S-K2b-1] **13:30~13:50**

[Invited] Probe Calibration of SAR Measurement System Below 300 MHz

Yoon Myoung Gimm
Dankook University

[S-K2b-2] **13:50~14:10**

[Invited] Numerical Study of EMF Exposure for a 60 GHz Application

Joyner Ken
Samsung Electronics Co. Ltd., Korea

[S-K2b-3] **14:10~14:30**

[Invited] Protecting and Educating the Australian Public: Environmental Level RF Exposure Assessments

Stuart Henderson
Australian Radiation Protection and Nuclear Safety Agency, Australia

[S-K2b-4] **14:30~14:50**

[Invited] Dosimetry of Infant's Exposure to EMF from ELF to RF

Tongning Wu and Congsheng Li
China Academy of Telecommunication Research, China

[S-K2b-5] **14:50~15:10**

[Invited] Revision of IEC 62232 - Determination of Radio-Frequency (RF) Field Strength and Specific Absorption Rate (SAR) in the Vicinity of Radiocommunication Base Stations (RBS) for the Purpose of Evaluating Human Exposure

Takahiro Iyama[1] and Mike Wood[2]
[1]NTT Docomo, Inc., Japan, [2]Telstra, Australia

[S-K2b-6] **15:10~15:30**

Dosimetry of Ultra-High Voltage Transmission Power Lines With AC-750 Kv

Mai Lu and Shoogo Ueno
[1]Lanzhou Jiaotong University, China, [2]Kyushu University, Japan

Session Title	[S-K7] EM Biomedical Imaging
Date and Time	August 23 (Tue.) / 13:30~15:10
Room	Room E (Convention B)
Session Organizer	Soon-Ik Jeon (Electronics and Telecommunications Research Institute) Puyan Mojabi (University of Manitoba)
Session Chairs	Soon-Ik Jeon (Electronics and Telecommunications Research Institute) Puyan Mojabi (University of Manitoba)

[S-K7-1] **13:30~13:50**

[Invited] Recent Advances in Biomagnetic Stimulation and Imaging by Electromagnetic Techniques

Shoogo Ueno[1,2]
[1]*The University of Tokyo, Japan,* [2]*Kyushu University, Japan*

[S-K7-2] **13:50~14:10**

[Invited] Study of the Contrast Source Inversion Method for Image Reconstruction in Focusing Media

A. Menshov[1] and V. Okhmatovski[2]
[1]*The University of Texas, USA,* [2]*University of Manitoba, Canada*

[S-K7-3] **14:10~14:30**

[Invited] Electromagnetic Inversion for Biomedical Imaging, Antenna Characterization, and Sea Ice Remote Sensing Applications

Puyan Mojabi, Nariman Firoozy, Nozhan Bayat, Trevor Brown, Chaitanya Narendra, Pedram Mojabi, Chen Niu, Tyler Tiede, Thomas Neusitzer, Xiang Li, Ian Jeffrey, Joe LoVetri, and David Barber
University of Manitoba, Canada

[S-K7-4] **14:30~14:50**

[Invited] Acceleration of Electromagnetic Solver for Microwave Tomography

Nikolai Simonov, Soon-Ik Jeon, Bo-Ra Kim, Kwang-Jae Lee, and Seong-Ho Son
Electronics and Telecommunications Research Institute, Korea

[S-K7-5] **14:50~15:10**

[Invited] Clinical Trial of Microwave Tomography Imaging

Soon-Ik Jeon, Bo-Ra Kim, and Seong-Ho Son
Electronics and Telecommunications Research Institute, Korea

Session Title	[S-C7] Massive MIMO and millimeter wave communications
Date and Time	August 23 (Tue.) / 13:30~15:30
Room	Room F (Convention C)
Session Organizer	Y.-W. Peter Hong (National Tsing Hua University) Hyun Kyu Chung (Electronics and Telecommunications Research Institute) Youngchul Sung (Korea Advanced Institute of Science and Technology)
Session Chair	Juyul Lee (Electronics and Telecommunications Research Institute)

[S-C7-1] **13:30~13:50**

[Invited] On the Mutual Information of OFDM with Low-Resolution ADC

Chao-Kai Wen[1], Shi Jin[2], Hanqing Wang[2], and Pangan Ting[3]
[1]National Sun Yat-sen University, Taiwan, [2]Southeast University, China, [3]Industrial Technology Research Institute, Taiwan

[S-C7-2] **13:50~14:10**

[Invited] Random Beamforming Combined with Receive Beamforming in mmWave Multiuser MIMO Downlink

Gilwon Lee and Youngchul Sung
Korea Advanced Institute of Science and Technology, Korea

[S-C7-3] **14:10~14:30**

[Invited] Multiuser Hybrid Beamforming for Non-Orthogonal Multiple Access in Millimeter Wave Systems

Che-Yuan Hu, Yung-Shun Wang, and Y.-W. Peter Hong
National Tsing Hua University, Taiwan

[S-C7-4] **14:30~14:50**

[Invited] Compressed Sensing-Based Channel Estimation for Wideband Millimeter Wave Systems

Yonghee Han and Jungwoo Lee
Seoul National University, Korea

[S-C7-5] **14:50~15:10**

[Invited] Power Losses Due to Steering Beam Mis-Alignment in Directional-Antenna Millimeter-Wave Systems

Juyul Lee, Jinyi Liang, Myung-Don Kim, Jae-Joon Park, Bonghyuk Park, and Hyun Kyu Chung
Electronics and Telecommunications Research Institute, Korea

[S-C7-6] **15:10~15:30**

[Invited] Investigating the Effect of Antenna Beamwidth on Millimeter-wave Channel Charaterization

Myung-Don Kim, Jinyi Liang, Juyul Lee, Jaejoon Park, Bonghyuk Park and Hyun Kyu Chung
Electronics and Telecommunications Research Institute, Korea

Session Title	[S-G4] Satellite Probing for the Ionospheric Variability
Date and Time	August 23 (Tue.) / 13:30~15:30
Room	Room G (Convention D)
Session Organizer	Jaeheung Park (Korea Astronomy and Space Science Institute) Charles Lin (National Cheng Kung University)
Session Chairs	Jaeheung Park (Korea Astronomy and Space Science Institute) Charles Lin (National Cheng Kung University)

[S-G4-1] **13:30~13:50**

[Invited] Numerical Simulation of Magnetic Field Variation Associated with Equatorial Plasma Bubble

Tatsuhiro Yokoyama[1] and Claudia Stolle[2]
[1]National Institute of Information and Communications Technology, Japan, [2]German Research Centre for Geosciences, Germany

[S-G4-2] **13:50~14:10**

Study of Atmosphere-Ionosphere Coupling using FORMOSAT-3/COSMIC

Charles Lin
National Cheng Kung University, Taiwan

[S-G4-3] **14:10~14:30**

Numerical Simulation on Ionospheric Electron Density Response to Currents from Lower Atmosphere and Lithosphere

Chuan-Ping Lien[1], Charles Lin[1], Jann-Yenq Liu[2], and Chia-Hung Chen[1]
[1]National Cheng-Kung University, Taiwan, [2]National Central University, Taiwan

[S-G4-4] **14:30~14:50**

[Invited] Ionospheric Data Assimilation during Geomagnetic Storm Conditions

Chia-Hung Chen[1], Charles Lin[2], I-Te Lee[2], Tomoko Matsuo[3], and Jann-Yenq Liu[4]
[1]National Cheng Kung University, Taiwan, [2]Central Weather Bureau, Taiwan, [3]University of Colorado Boulder, USA, [4]National Central University, Taiwan

[S-G4-5] **14:50~15:10**

[Invited] Satellite Observation of Ionopshere Disturbance Caused by Large Earthquakes

K.-I. Oyama[1], L. Bankov[2], D. Minakshi[3], T. Uozumi[4], C. H. Chen[1], K. Ryu[5], and J. Y. Liu[6]
[1]National Cheng Kung University, Taiwan, [2]Space Research and Technology Institute, Bulgaria, [3]Gauhati University, India, [4]Kyushu University, Japan, [5]Korea Advanced Institute of Science and Technology, Korea, [6]National Central University, Taiwan

[S-G4-6] **15:10~15:30**

[Invited] Research on the Intrinsic Ionospheric Variation using Multisatellite Measurements During the Last Solar Minimum and Its Implication on Study of Lithosphere-Ionospheric Coupling

K. Ryu[1], K. I. Oyama[2], J. C. Lee[1], and J. H. Park[3], and K. W. Min[1]
[1]Korea Advanced Institute of Science and Technology, Korea, [2]Kyushu University, Japan, [3]Korea Astronomy and Space Science Institute, Korea

Session Title	[S-H3b] Radio Science for Space Weather (2)
Date and Time	August 23 (Tue.) / 13:30~15:30
Room	Room H (Convention E)
Session Organizer	Viviane Pierrard (Belgian Institute for Space Aeronomy) Mauro Messerotti (INAF-Astronomical Observatory of Trieste)
Session Chair	Mauro Messerotti (INAF-Astronomical Observatory of Trieste)

[S-H3b-1] **13:30~14:10**

[Keynote] Magnetosphere-Ionosphere Coupling by ULF Waves

Robert L. Lysak
University of Minnesota, USA

[S-H3b-2] **14:10~14:30**

[Invited] Narrow-band Bursts of Solar Radio Emission at 15-30 MHz

Yuriy Voitenko[1], Valentin Melnik[2], Viviane Pierrard[1], Anatoliy Brazhenko[2], and Anatoliy Frantsuzenko[2]
[1]Royal Belgian Institute for Space Aeronomy, Belgium, [2]The National Academy of Sciences of Ukraine, Ukraine

[S-H3b-3] **14:30~14:50**

[Invited] New Insights into the Non Thermal Continuum Radiations: The Cluster Whisper Perspective

Patrick Canu[1], Pierrette Décréau[2], and Sandrine Grimald Rochel[3]
[1]LPP/CNRS/Ecole Polytechnique, France, [2]LPCEE/CNRS/Université d'Orléans, France, [3]ONERA, France

[S-H3b-4] **14:50~15:10**

[Invited] Analysis of the Fine Structure of Chorus Wave Packets using Measurements of the Van Allen Probes

Ondrej Santolik[1], Ivana Kolmasova[1], William S. Kurth[2], George B. Hospodarsky[2], Craig A. Kletzing[2], and Scott R. Bounds[2]
[1]Charles University, Czech, [2]The University of Iowa, USA

[S-H3b-5] **15:10~15:30**

[Invited] MLT Dependence of the Plasmapause from Satellite Observations and Quasi-Interchange Instability Mechanism

Pierrard Viviane and Voitenko Yuriy
Royal Belgian Institute for Space Aeronomy, Belgium

Session Title	[S-A3] Antenna Related Metrology
Date and Time	August 23 (Tue.) / 13:30~15:30
Room	Room I (Crane)
Session Organizer	Satoru Kurokawa (National Institute of Advanced Industrial Science and Technology) Ki-Chai Kim (YeongNam University)
Session Chairs	Satoru Kurokawa (National Institute of Advanced Industrial Science and Technology) Ki-Chai Kim (YeongNam University)

[S-A3-1] **13:30~14:10**

[Keynote] Antenna and Field Probe Metrology: A NIST Perspective

Perry F. Wilson
National Institute of Standards and Technology, USA

[S-A3-2] **14:10~14:30**

[Invited] Error Estimation of Far-Field Absolute Gain Pattern by 1-D Circular Near-Field to Far-Field Transformation for Elongated Radar Antenna The Case for the Shift of the Radiation Center

Masanobu Hirose and Satoru Kurokawa
National Institute of Advanced Industrial Science and Technology, Japan

[S-A3-3] **14:30~14:50**

[Invited] Beam Forming Characteristics of Antenna-Coupled-Electrode Electro-Optic Modulators Operating in Millimeter-Wave Bands

Hiroshi Murata, Toshiyuki Inoue, Hidehisa Shiomi, and Yasuyuki Okamura
Osaka University, Japan

[S-A3-4] **14:50~15:10**

[Invited] Site Attenuation Measurements using a Balun-less Dipole Antenna Pair

Takehiro Moirioka
National Institute of Advanced Industrial Science and Technology, Japan

[S-A3-5] **15:10~15:30**

[Invited] Measurement Uncertainty of Far Field Antenna Factor for Biconical Antenna using Amplitude Center Modified Equation

Satoru Kurokawa, Masanobu Hirose, Michitaka Ameya, and Yuanfeng She
National Institute of Advanced Industrial Science and Technology, Japan

Session Title	[S-D4] Microwave and mm-wave Integrated Circuits
Date and Time	August 23 (Tue.) / 13:30~15:10
Room	Room J (Swan)
Session Organizer	Byung-Wook Min (Yonsei University) Tiku Yu (National Taipei University)
Session Chairs	Byung-Wook Min (Yonsei University) Tiku Yu (National Taipei University)

[S-D4-1] **13:30~13:50**

[Invited] Recent Trends in Millimeter-Wave Phased-Array ICs

Munkyo Seo
Sungkyunkwan University, Korea

[S-D4-2] **13:50~14:10**

[Invited] A Four Channel Bi-directional CMOS T/R Chipset for Ka-band Phased Array System

Jang-Hoon Han, Jin-Hyun Kim, Jeong-Soo Park, and Jeong-Geun Kim
Kwangwoon University, Korea

[S-D4-3] **14:10~14:30**

A 117 GHz All-Parallel Sub-Harmonically Injection-Locked Quadrature CMOS Voltage-Controlled Oscillator

Dongmin Kang, Chae Jun Lee, Hyuk Su Son, Haejin Lee, and Chul Soon Park
Korea Advanced Institute of Science and Technology, Korea

[S-D4-4] **14:30~14:50**

DC - 38 GHz CMOS Distrubuted Amplifier with a Triple Stacked-FET

Jihoon Kim, Wonho Lee, Hongjong Park, and Youngwoo Kwon
Seoul National University, Korea

[S-D4-5] **14:50~15:10**

A W-band Push-Push VCO using Non-Foster Circuit for Enhanced Frequency Tuning Range

Wonho Lee, Sangho Lee, Hongjong Park, Kwangseok Choi, Woosang Lee, and Youngwoo Kwon
Seoul National University, Korea

Session Title	[S-F3a] Remote Sensing of the Atmosphere (1)
Date and Time	August 23 (Tue.) / 13:30~15:30
Room	Room K (White Heron)
Session Organizer	Sanghun Lim (Korea Institute of Civil Engineering and Building Technology) Tomoo Ushio (Osaka University)
Session Chairs	Sanghun Lim (Korea Institute of Civil Engineering and Building Technology) Christian Kummerow (Colorado State Univeristy)

[S-F3a-1] **13:30~14:10**

[Keynote] Global Measurement of Rainfall and Precipitation Microphysics

V. Chandrasekar
Colorado State University, USA

[S-F3a-2] **14:10~14:30**

[Invited] Development of X-Band Polarimetric Phased Array Radar System for Weather Measurement

Hiroshi Kikuchi[1], Ting Wu[1], Gwan Kima[1], Tomoo Ushio[1], Hideto Goto[2], and Fumihiko Mizutani[2]
[1]Osaka University, Japan, [2]Toshiba Corporation, Japan

[S-F3a-3] **14:30~14:50**

[Invited] RainDrop Size Distribution (DSD) Retrieval from Dual-Polarization Radar Measurements on a Bayesian Scheme

Eiichi Yoshikawa[1], V. Chandrasekar[2], Tomoo Ushio[3], and Takahiro Matsuda[3]
[1]Japan Aerospace Exploration Agency, Japan, [2]Colorado State University, USA, [3]Osaka University, Japan

[S-F3a-4] **14:50~15:10**

[Invited] Observations of Precipitation and MIE Scattering Signatures with the CSU-CHILL Dual-wavelength Dual-polarization Weather Radar System

Francesc Junyent and V. Chandrasekar
Colorado State University, USA

[S-F3a-5] **15:10~15:30**

[Invited] Development of a High-Resolution Wind Profiler Radar using Radar Imaging Techniques

Masayuki K. Yamamoto[1], Seiji Kawamura[1], and Koji Nishimura[2]
[1]National Institute of Information and Communications Technology, Japan, [2]National Institute of Polar Research, Japan

Session Title	[S-B5] Electromagnetic Field Theory
Date and Time	August 23 (Tue.) / 16:00~18:20
Room	Room A (Emerald A)
Session Organizer	Soon-Soo Oh (Chosun University) Lotfollah Shafai (University of Manitoba)
Session Chairs	Soon-Soo Oh (Chosun University) Lotfollah Shafai (University of Manitoba)

[S-B5-1] **16:00~16:40**

[Keynote] Challenges of Antenna Miniaturization and Performance Enhancement

Lotfollah Shafai
University of Manitoba, Canada

[S-B5-2] **16:40~17:00**

[Invited] Design of a Waveguide Short-Slot 2-Plane Coupler Including 2-D Mode Polarity in the Coupled Region

Jiro Hirokawa and Dong-Hun Kim
Tokyo Institute of Technology, Japan

[S-B5-3] **17:00~17:20**

[Invited] Two Elements Compact MIMO Antenna with Reconfigurable Lower Band and Consistent High Band for Tablet Applications

Anthony Wang and Satish K. Sharma
San Diego State University, USA

[S-B5-4] **17:20~17:40**

[Invited] Antenna Pattern Reconstruction of Optical Leaky Waveguide Antenna by Phase-less Measurement

Hiroshi Hashiguchi, Hiroyuki Arai, Keisuke Kondo, and Toshihiko Baba
Yokohama National University, Japan

[S-B5-5] **17:40~18:00**

[Invited] Image Refocusing of Targets in Oblique Layers with Gradually Changing Permittivity

Haewon Jung and Kangwook Kim
Gwangju Institute of Science and Technology, Korea

[S-B5-6] **18:00~18:20**

Resonance Effects in Antennas Coated with Material and MetaMaterials

Lotfollah Shafai and Navid Rezazadeh
University of Manitoba, Canada

Session Title	[S-B13b] Advances in Super- and High- Resolution Electromagnetic Imaging (2)
Date and Time	August 23 (Tue.) / 16:00~17:40
Room	Room B (Emerald B)
Session Organizer	Lianlin Li (Peking University) Weixiang Jiang (Southeast University)
Session Chairs	Lianlin Li (Peking University) Weixiang Jiang (Southeast University)

[S-B13b-1] **16:00~16:20**

[Invited] 3D RF Profile Detection using Zero-Padding and a GPU

HyungTae Kim[1], KyungChan Jin[1], Jongseok Kim[1], and Seung-Bok Choi[2]
[1]Korea Institute of Industrial Technology, Korea, [2]Inha University, Korea

[S-B13b-2] **16:20~16:40**

[Invited] Verification of In-Place Calibration for Time-Domain Microwave Imaging

Sollip Kwon[1], Seong-Ho Son[2], Kwang-Jae Lee[2], and Seungjun Lee[1]
[1]Ewha Womans University, Korea, [2]Electronics and Telecommunications Research Institute, Korea

[S-B13b-3] **16:40~17:00**

[Invited] Transmission and Resonance of a Single Rectangular Hole Filled with Anisotropic Material

Hengxin Ruan[1], Lianlin Li[1], and Tie Jun Cui[2]
[1]Peking University, China, [2]Southeast University, China

[S-B13b-4] **17:00~17:20**

[Invited] Reverse Time Migration For Subsurface Imaging

Hai Liu[1], Yuxian Zhang[1], Zhijun Long[1], Fen Han[1], and Qing Huo Liu[2]
[1]Xiamen University, China, [2]Duke University, USA

[S-B13b-5] **17:20~17:40**

Improving the Resolution of Diagnostics of Inhomogeneous Plasma Media in Conditions of Strong Phase Variations

Sergey Knizhin
[1]Institute of Solar-Terrestrial Physics SB RAS, Russia, [2]Irkutsk State University, Russia

Session Title	[B5] Fields and Waves Filter/Resonator/Circuit
Date and Time	August 23 (Tue.) / 16:00~18:00
Room	Room C (Diamond)
Session Chair	Chi-Hyung Ahn (Korea Railroad Research Institute)

[B5-1] **16:00~16:20**

Improved Stopband Characteristics of Microstrip Lowpass Filter using Linearly Distributed Transmission Zeros

Nainu P. Chaudhari[1], Rajas Khokle[2], Karu P. Esselle[2], and A. K. Verma[1,2]
[1]University of Delhi, India, [2]Macquarie University, Australia

[B5-2] **16:20~16:40**

A Miniaturized Wideband Bandpass Filter

Vinay Kumar Killamsetty and Biswajeet Mukherjee
Indian Institute of Information Technology, Design and Manufacturing Jabalpur, India

[B5-3] **16:40~17:00**

Amplitude-Equalized Microwave C-Section

Shulabh Gupta
Carleton University, Canada

[B5-4] **17:00~17:20**

Analysis of Loop Type Ground Radiation Antenna using Equivalent Circuit Model

Zeeshan Zahid and Hyeongdong Kim
Hanyang University, Korea

[B5-5] **17:20~17:40**

Transparent Electrode Resonators for MR-WPT

Hoon Hee Lee and Chang Won Jung
Seoul National University of Science and Technology, Korea

[B5-6] **17:40~18:00**

Avoidance of Off-switch Resonance in True Time Delay Line using Cascaded Switches

Minyoung Yoon and Sangwook Nam
Seoul National University, Korea

Session Title	[S-K3a] Numerical Dosimetry (EMF Dosimetry) (1)
Date and Time	August 23 (Tue.) / 16:00~18:00
Room	Room D (Convention A)
Session Organizer	Ae-Kyoung Lee (Electronics and Telecommunications Research Institute) Masao Taki (Tokyo Metropolitan University)
Session Chairs	Ae-Kyoung Lee (Electronics and Telecommunications Research Institute) Masao Taki (Tokyo Metropolitan University)

[S-K3a-1] **16:00~16:20**

[Invited] Numerical Method for Exposure Assessment in the Low-Frequency Ranges

SangWook Park[1] and MinHyuk Kim[2]
[1]Korea Automotive Technology Institute, Korea, [2]Seoul National University, Korea

[S-K3a-2] **16:20~16:40**

[Invited] Specific Absorption Rates in Human Brain for Different Length of Bar Phones

Ae-Kyoung Lee, Seon-Eui Hong, and Jong-Hwa Kwon
Electronics and Telecommunications Research Institute, Korea

[S-K3a-3] **16:40~17:00**

[Invited] Verification and Validation in Computational Simulations of Specific Absorption Rate for a Multiband Handheld Device

Chan-Ho Jeong[1,2], Jong-Gwan Yook[1], and Bum-Kook Lee[2]
[1]Yonsei University, Korea, [2]LG Electronics, Korea

[S-K3a-4] **17:00~17:20**

[Invited] Near Field Numerical Dosimetry using Spherical Wave Expansion and Advanced Statistical Methods

Joe Wiart[1], Pierric Kersaudy[1], Yenny Pinto[1], Odile Picon[2], and Shermilla Mostarshedi[2]
[1]Telecom ParisTech, CNRS, France, [2]Universite Paris Est Marne la Vallée, France

[S-K3a-5] **17:20~17:40**

[Invited] Induced Current Density Calculation for Korean Male Body Model under 60 Hz Uniform Magnetic Fields using Impedance Method

Byeong-Yoon Lee
Korea Electrotechnology Research Institute, Korea

[S-K3a-6] **17:40~18:00**

[Invited] Thresholds of Central Nervous System Stimulation at Intermediate Frequencies

Ilkka Laakso[1] and Takenobu Murakami[2]
[1]Aalto University, Finland, [2]Fukushima Medical University, Japan

Session Title	[S-KE] EMC in Biomedical Applications
Date and Time	August 23 (Tue.) / 16:00~18:20
Room	Room E (Convention B)
Session Organizer	Jun-Gyu Yang (National Radio Research Agency) Eisuke Hanada (Saga University)
Session Chairs	Jun-Gyu Yang (National Radio Research Agency) Eisuke Hanada (Saga University)

[S-KE-1] **16:00~16:20**

[Invited] Managing the Availability of Hospital Wireless Communication Systems

Eisuke Hanada[1] and Takato Kudou[2]
[1]Saga University, Japan, [2]Oita University, Japan

[S-KE-2] **16:20~16:40**

[Invited] Numerical Analysis of Electromagnetic Band-Stopping using Non-Metal Periodic Structures

Takato Kudou[1] and Eisuke Hanada[2]
[1]Oita University, Japan, [2]Saga University, Japan

[S-KE-3] **16:40~17:00**

[Invited] Performance Evaluation on Wireless Capsule Endoscope Location Estimation

Daisuke Anzai
Nagoya Institute of Technology, Japan

[S-KE-4] **17:00~17:20**

[Invited] Use of Wireless LAN in Medical Facilities in Japan

Naoyuki Oda
Kanagawa Prefectural Hospital Organization, Japan

[S-KE-5] **17:20~17:40**

[Invited] Research and Analysis of Electromagnetic Field Environment in Hospitals

Nam Kim[1], Seungwoo Lee[1], Jun-Gyu Yang[2], and Hong-Sik Keum[3]
[1]Chungbuk National University, Korea, [2]National Radio Research Agency, Korea, [3]Korea Radio Promotion Association, Korea

[S-KE-6] **17:40~18:00**

[Invited] Electromagnetic Shielding in MRI Room

ByungKook Lee
DaeHan Shield Engineering Co., Ltd., Korea

[S-KE-7] **18:00~18:20**

[Invited] Effects of a Patient Monitor by Radiated Susceptibility Test using a Broadband Signal

Hongsik Keum[1], Jun-Gyu Yang[2], Sang-Ho Choi[1], and Heunggyoon Ryu[3]
[1]Radio Promotion Association, Korea, [2]National Radio Research Agency, Korea, [3]Chungbuk National University, Korea

Session Title	[S-C8] Satellite and Terrestrial Networks
Date and Time	August 23 (Tue.) / 16:00~18:00
Room	Room F (Convention C)
Session Organizer	Jihwan Choi (Daegu Gyeongbuk Institute of Science & Technology)
Session Chair	Jihwan Choi (Daegu Gyeongbuk Institute of Science & Technology)

[S-C8-1] **16:00~16:20**

[Invited] Mutual Coupling between Dipole Antennas for RF Power Transmission

Junhee Kim and Jihwan Choi
Daegu Gyeongbuk Institute of Science & Technology, Korea

[S-C8-2] **16:20~16:40**

[Invited] Cancellation Performance Analysis for a Coexistence Solution in Heterogeneous Networks

Jongyeop Kim and Jihwan P. Choi
Daegu Gyeongbuk Institute of Science & Technology, Korea

[S-C8-3] **16:40~17:00**

[Invited] Performance Analysis of Onboard Processing Multibeam Satellites Equipped with Advanced Phased Array Antenna

Jihwan Choi
Daegu Gyeongbuk Institute of Science & Technology, Korea

[S-C8-4] **17:00~17:20**

[Invited] Multimedia Communications in MIMO Channels

Seok-Ho Chang
Dankook University, Korea

[S-C8-5] **17:20~17:40**

Enhanced Direct Path Detection using Feedback from High Resolution Algorithm for OFDM Systems

Jung-Yong Lee, Won-Tae Yu, and Seong-Cheol Kim
Seoul National University, Korea

[S-C8-6] **17:40~18:00**

Millimeter Multi-User Massive MIMO Simplified using Antenna Selection and One-bit Quantized Channel Estimation

Karim H. Moussa[1] and Said E. El-Khamy[2]
[1]Alexandria Institute of Engineering and Technology, Egypt, [2]Alexandria University, Egypt

Session Title	[S-G5] Observation of Ionospheric Plasma Density Variation
Date and Time	August 23 (Tue.) / 16:00~17:40
Room	Room G (Convention D)
Session Organizer	Young-Sil Kwak (Korea Astronomy and Space Science Institute) Geonhwa Jee (Korea Polar Research Institute)
Session Chairs	Young-Sil Kwak (Korea Astronomy and Space Science Institute) Geonhwa Jee (Korea Polar Research Institute)

[S-G5-1] **16:00~16:40**

[Keynote] Incoherent Scatter Radars: Present and Future

Craig J. Heinselman
EISCAT Scientific Association, Sweden

[S-G5-2] **16:40~17:00**

[Invited] A Comparative Study on the Diurnal Variations of Electron Density in the Auroral Oval and Polar Cap Regions

Eun-Young Ji and Geonhwa Jee
Korea Polar Research Institute, Korea

[S-G5-3] **17:00~17:20**

[Invited] ULF Pc5 Pulsation in the Summer D-Region Electron Density of Polar Mesospheric Summer Echoes Driven by Solar Wind Dynamic Pressure Enhancement and the Pc5 Pulsation

Young-Sook Lee[1], Sheila Kirkwood[2], Young-Sil Kwak[1,3], and Kyung-Chan Kim[4]
[1]Korea Astronomy and Space Science Institute, Korea, [2]Swedish Institute of Space Physics, Sweden, [3]University of Science and Technology, Korea, [4]Daegu University, Korea

[S-G5-4] **17:20~17:40**

[Invited] Examples of Rocket Exhaust Depletions as Observed by Swarm Constellation

Jaeheung Park[1], Hyosub Kil[2], Claudia Stolle[3], Hermann Lühr[3], Anthea Coster[4], and Young-Sil Kwak[1]
[1]Korea Astronomy and Space Science Institute, Korea, [2]Johns Hopkins University Applied Physics Laboratory, USA, [3]Helmholtz Centre Potsdam GFZ German Research Centre for Geosciences, Germany, [4]Massachusetts Institute of Technology, USA

Session Title	[S-H4] Waves in Nuclear Fusion Plasmas and Laser-Plasma Accelerator
Date and Time	August 23 (Tue.) / 16:00~18:00
Room	Room H (Convention E)
Session Organizer	Young-Soon Bae (National Fusion Research Institute) Hee-Yong Suk (Gwangju Institute of Science and Technology)
Session Chairs	Young-Soon Bae (National Fusion Research Institute) Hee-Yong Suk (Gwangju Institute of Science and Technology)

[S-H4-1] **16:00~16:20**

[Invited] Recent Progress on Laser Wakefield Acceleration Experiments using 200 TW Laser System at Shanghai Jiao Tong University

Nasr A. M. Hafz, Song Li, Mohammad Mirzaie, Zhengming Sheng, and Jie Zhang
Shanghai Jiao Tong University, China

[S-H4-2] **16:20~16:40**

[Invited] A Quasi-Monoenergetic Proton Beam form a Structured Foil Irradiated by an Intense Laser Pulse

Kitae Lee[1], Kyung Nam Kim[1], Ha-Na Kim[2], Manoj Kumar[1], Seong Hee Park[1], Young Uk Jeong[1], and Nikolay Vinokurov[1]
[1]Korea Atomic Energy Research Institute, Korea, [2]Chungnam University, Korea

[S-H4-3] **16:40~17:00**

[Invited] Development of a Gas Cell/Plasma Source for Laser Wakefield Acceleration Research at GIST

H. Suk, J. Kim, M. Kim, D. Jang, S. Lee, and I. Nam
Gwangju Institute of Science and Technology, Korea

[S-H4-4] **17:00~17:20**

[Invited] RF Powers in KSTAR Tokamak for High Pressure Plasmas

S. J. Wang, M. Joung, J. H. Jeong, S. U. Jeong, J. H. Kim, H. J. Kim, H. H. Wi, Y. S. Bae, and J. G. Kwak
National Fusion Research Institute, Korea

[S-H4-5] **17:20~17:40**

[Invited] High Power Radio Frequency System for Long Pulse Operation In EAST

Xinjun Zhang, Yanping Zhao, Fukun Liu, Jiafang Shan, Baonian Wan, and Jiangang Li
Chinese Academy of Sciences, China

[S-H4-6] **17:40~18:00**

[Invited] Physics of Lower Hybrid Current Drive and Heating in Fusion Plasmas: Theory, Simulation, and Experiment

P. T. Bonoli, S. Shiraiwa, J. P. Lee, G. M. Wallace, and J. C. Wright
Massachusetts Institute of Technology, USA

Session Title	[A1] Antenna
Date and Time	August 23 (Tue.) / 16:00~18:00
Room	Room I (Crane)
Session Chairs	Nozomu Ishii (Niigata University) Jin-Seob Kang (Korea Research Institute of Standards and Science)

[A1-1] **16:00~16:20**

[Invited] A Study of Standard Antenna Method using Two Homogeneous Horn Antennas

Jong-Hyuk Lim, Bo-Weon Lee, Sung-Hwan Park, Yun-Jo Choi, and Myung-Won Seo
National Radio Research Agency, Korea

[A1-2] **16:20~16:40**

Derivation of Some Expansions of Near-Field Gain of Antennas in Lossy Medium

Nozomu Ishii[1], Lira Hamada[2], Jerdvisanop Chakarothai[2], Kanako Wake[2], and Soichi Watanabe[2]
[1]Niigata University, Japan, [2]National Institute of Information and Communications Technology, Japan

[A1-3] **16:40~17:00**

An Application of Elliptic Field Representation to Near-Field Far-Field RCS Transformation

Shuntaro Omi[1], Toru Uno[1], Takuji Arima[1], and Takao Fujii[2]
[1]Tokyo University of Agriculture and Technology, Japan, [2]Fujitsu System Integration Laboratories Ltd., Japan

[A1-4] **17:00~17:20**

High Gain Yagi-Uda Origami Antenna

Syed Imran Hussain Shah and Sungjoon Lim
Chung-Ang University, Korea

[A1-5] **17:20~17:40**

Instrumental Radar Calibration on Sea Surface

Alexander Andreev and Ilya Shikhov
Krylov Shipbuilding Research Centre, Russia

[A1-6] **17:40~18:00**

Sensitivity Analysis of Multiport S-Parameter Due to Non-Ideal TRL Calibration Standards

Min Wang, Yongjiu Zhao, Yumin Jin, and Yonggang Zhou
Nanjing University of Aeronautics and Astronautics, Chiana

Session Title	[S-D5] High Power RF Devices and Circuits
Date and Time	August 23 (Tue.) / 16:00~18:00
Room	Room J (Swan)
Session Organizer	Naoki Hara (Fujitsu) Youngoo Yang (Sungkyunkwan University)
Session Chair	Youngoo Yang (Sungkyunkwan University)

[S-D5-1] **16:00~16:20**

A Reconfigurable Dual-Band CMOS Power Amplifier With an Integrated Switchable Transformer

Jaeyong Ko and Sangwook Nam
Seoul National University, Korea

[S-D5-2] **16:20~16:40**

[Invited] High-Performance GaN-HEMT Technology for W-band Amplifier

K. Makiyama[1,2,3], S. Ozaki[1,2], T. Ohki[1,2], N. Okamoto[1,2], Y. Minoura[1,2], Y. Niida[1,2], M. Sato[1,2], Y. Kamada[1,2], K. Joshin[1,2], K. Watanabe[1,2], and Y. Miyamoto[3]
[1]Fujitsu Limited, Japan, [2]Fujitsu Laboratories Ltd., Japan, [3]Tokyo Institute of Technology, Japan

[S-D5-3] **16:40~17:00**

A 5.7 GHz GaN Transformer-based Doherty Power Amplifier for 40-MHz LTE-A Applications

Bo Jin, Jung-Lin Woo, Sunghwan Park, and Youngwoo Kwon
Seoul National University, Korea

[S-D5-4] **17:00~17:20**

[Invited] Monolithically Integrated AlGaN/GaN-on-Si Power Switching Devices

Ho-Young Cha and Sang-Woo Han
Hongik University, Korea

[S-D5-5] **17:20~17:40**

[Invited] Overview on Linearization Techniques for Envelope Tracking Power Amplifier

Bumman Kim[1], Kyunghoon Moon[1], Sangsu Jin[2], and Jooseung Kim[3]
[1]Pohang University of Science and Technology, Korea, [2]Qualcomm Technologies Inc., USA, [3]Samsung Electronics Co. Ltd., Korea

[S-D5-6] **17:40~18:00**

[Invited] Diamond Devices for RF Applications

Makoto Kasu and Toshiyuki Oishi
Saga University, Japan

Session Title	[S-F3b] Remote Sensing of the Atmosphere (2)
Date and Time	August 23 (Tue.) / 16:00~18:00
Room	Room K (White Heron)
Session Organizer	Sanghun Lim (Korea Institute of Civil Engineering and Building Technology) Tomoo Ushio (Osaka University)
Session Chairs	Dong-Bin Shin (Yonsei University) Francesc Junyent (Colorado State University)

[S-F3b-1] **16:00~16:20**

[Invited] New Products and Perspectives from the Global Precipitation Measurement (GPM) Mission

Christian Kummerow, Veljko Petkovic, and David Randel
Colorado State University, USA

[S-F3b-2] **16:20~16:40**

[Invited] Understanding Model Precipitation Microphysics based on Observations from TRMM/GPM Microwave Imagers and Precipitation Radars

Dong-Bin Shin and Yeji Choi
Yonsei University, Korea

[S-F3b-3] **16:40~17:00**

[Invited] Validation of NASA's Global Precipitation Measurement Mission with a High-Resolution Ground Radar Network

Haonan Chen and V. Chandrasekar
Colorado State University, USA

[S-F3b-4] **17:00~17:20**

Remote Sensing of Sc Clouds Over the Arabian Sea using CloudSat Observations and Its Dynamical Aspects

Kandula Venkata Subrahmanyam and Karanam Kishore Kumar
Indian Space Research Organisation, India

[S-F3b-5] **17:20~17:40**

Simulation of Clouds in Different Resolutions of CFS and Its Comparison with Multiple Satellite Products

Renu Siddharth, P. M. Krishna R, and Suryachandra A. Rao
Indian Institute of Tropical Meteorology, India

[S-F3b-6] **17:40~18:00**

Initial Observation Results in the Research and Development (R&D) of Airport Lightning Avoidance Product

Eiichi Yoshikawa[1], Satoru Yoshida[2], Toru Adachi[2], Hanako Inoue[2], Kenichi Kusunoki[2], and Tomoo Ushio[3]
[1]Japan Aerospace Exploration Agency, Japan, [2]Japan Meteorological Agency, Japan, [3]Osaka University, Japan

Session Title	[S-B6] Wireless Power Transfer
Date and Time	August 24 (Wed.) / 08:30~10:10
Room	Room A (Emerald A)
Session Organizer	Franklin Bien (Ulsan National Institute of Science and Technology) Luca Roselli (University of Perugia)
Session Chair	Franklin Bien (Ulsan National Institute of Science and Technology)

[S-B6-1] **08:30~08:50**

Active Metamaterial Designs for Dyanamically Controllable Wireless Power Transfer Applications

A. L. A. K. Ranaweera, Thanh Son Pham, Viet Ngo, and Jong-Wook Lee
Kyung Hee University, Korea

[S-B6-2] **08:50~09:10**

High Q-factor Compact Coils Having Non-Uniform Wire Width for Wireless Power Transfer System

Tae-Hyung Kim[1], Byung-Hyun Kim[1], Gi-Ho Yun[2], Woong Yong Lee[3], and Jong-Gwan Yook[1]
[1]Yonsei University, Korea, [2]Sungkyul University, Korea, [3]Amotech, Korea

[S-B6-3] **09:10~09:30**

Wideband Energy Harvesting Antenna with 2 by 2 Mu-zero Array for Wireless Power Transfer

Chang-Hyun Lee and Jeong-Hae Lee
Hongik University, Korea

[S-B6-4] **09:30~09:50**

Control of Magnetic Field Distribution by Excitation Phases of Transmitters in MIMO WPT System

Bomson Lee and Sejin Kim
Kyung-Hee University, Korea

[S-B6-5] **09:50~10:10**

Wearable and Implantable Magnetic Resonant Wireless Power Transfer

Seok Hyon Kang and Chang Won Jung
Seoul National University of Science and Technology, Korea

Session Title	[S-B1] Electrically Large Antennas
Date and Time	August 24 (Wed.) / 08:30~10:30
Room	Room B (Emerald B)
Session Organizer	Iikyu Kim (DTaQ) Shenheng Xu (Tsinghua University)
Session Chair	Iikyu Kim (DTaQ)

[S-B1-1] **08:30~08:50**

[Invited] Trade-Off of Multibeam Reflector Antenna Configuration for Satellite Onboard Application

Takashi Tomura, Michio Takikawa, Yoshio Inasawa, and Hiroaki Miyashita
Mitsubishi Electric Corporation, Japan

[S-B1-2] **08:50~09:10**

[Invited] Calculation of Mutual Coupling beween Two Antennas for Satellite Communication

Ilkyu Kim[1] and Yahya Rahmat-Samii[2]
[1]Defense Agency for Technology and Quality, Korea, [2]University of California, USA

[S-B1-3] **09:10~09:30**

[Invited] Simulation Model Decomposition for Large-Scale Antenna Systems

Jaehoon Kim[1], Peter Futter[2], Danie le Roux[2], and Jordi Soler[3]
[1]Altair Engineering Inc., Korea, [2]Altair Engineering Inc., South Africa, [3]Altair Engineering Inc., Spain

[S-B1-4] **09:30~09:50**

[Invited] Performance of Solid Surface Deployable Antenna for Panel Misalignment

Ji Yong Lee, Seong Sik Yoon, Sang Hee Kim, Taek-Kyung Lee, Jae Wook Lee, Jin Ho Roh, and Dong Woo Yi
Korea Aerospace University, Korea

[S-B1-5] **09:50~10:10**

Design of SIW fed Antipodal Linearly Tapered Slot Antenna with Curved and Hat Shaped Dielectric Loading at 60 GHz for Inter-Satellite Communication

T. Rama Rao[1], C. Sarath[1], Nishesh Tiwari[1], and Rajeev Jyoti[2]
[1]SRM University, India, [2]Indian Space Research Organisation, India

[S-B1-6] **10:10~10:30**

[Invited] Radiation Characteristics of Corner Reflector Antenna Employing Frequency Selective Surface

Yusuke Tanizawa, Keizo Cho, Hideya So, and Atsuya Ando
[1]Chiba Institute of Technology, Japan, [2]NTT Corporation, Japan

Session Title	[S-J5b] Receivers for Radio Astronomy (2) (Joint with The 17th Workshop on Submillimeter-Wave Receiver Technologies in Eastern Asia)
Date and Time	August 24 (Wed.) / 08:30~10:30
Room	Room C (Diamond)
Session Organizer	Jungwon Lee (Korea Astronomy and Space Science Institute) Sheng-Cai Shi (Chinese Academy of Sciences)
Session Chair	Jungwon Lee (Korea Astronomy and Space Science Institute)

[S-J5b-1] **08:30~08:50**

[Invited] Phased Array Feed Systems for Radio Astronomy65

Tasso Tzioumis
Commonwealth Scientific and Industrial Research Organisation, Australia

[S-J5b-2] **08:50~09:10**

[Invited] Silicon Platelets Stacking Technology for Developing Multi-Pixel Submillimeter-Wave Heterodyne Receivers

C. Lee, T. Reck, C. Jung-Kubiak, M. Alonso-delPino, K. Cooper, J. Siles, A. Peralta, E. Decrossas, I. Mehdi, and G. Chattopadhyay
Jet Propulsion Laboratory, USA

[S-J5b-3] **09:10~09:30**

High Current Density SIS Mixers for the 400-500 GHz Band

M. Kroug, K. Uemizu, S. Ezaki, Y. Niizeki, and T. Kojima
National Astronomical Observatory of Japan, Japan

[S-J5b-4] **09:30~09:50**

[Invited] MMIC for Next Generation Radio Astronomical Heterodyne Receiver Front-End

Chau-Ching Chiong
Institute of Astronomy and Astrophysics, Academia Sinica, Taiwan

[S-J5b-5] **09:50~10:10**

A 24.5-50 GHz Mixer using Cascode Structure with Wide 0.5-16 GHz Intermediate Frequency Bandwidth Based on Low Noise PHEMT Process

Shou-Hsien Weng[1], Chau-Ching Chiong[1], Chih-Chen Chang[1], Hsiao-Ling Wu[1], Hong-Yeh Chang[2], and Ming-Jye Wang[1]
[1]Institute of Astronomy and Astrophysics, Academia Sinica, Taiwan, [2]National Central University, Taiwan

[S-J5b-6] **10:10~10:30**

Thermal Modelling of Coaxial line for Cryogenic Noise Measurements

Ahmed Soliman, Andrew Janzen, and Sander Weinreb
California Institute of Technology, USA

Session Title	[S-K3b] Numerical Dosimetry (EMF Dosimetry) (2)
Date and Time	August 24 (Wed.) / 08:30~10:10
Room	Room D (Convention A)
Session Organizer	Ae-Kyoung Lee (Electronics and Telecommunications Research Institute) Masao Taki (Tokyo Metropolitan University)
Session Chairs	Nam Kim (Chungbuk National University) Masao Taki (Tokyo Metropolitan University)

[S-K3b-1] **08:30~08:50**

FDTD Calculations of SAR Around an Implanted Cardiac Pacemaker from Wireless Radio Terminal

Ryota Akiyama, Kazuyuki Saito, Soichi Watanabe, and Koichi Ito
[1]*Chiba University, Japan,* [2]*National Institute of Information and Communications Technology, Japan*

[S-K3b-2] **08:50~09:10**

Reduction Technique of Specific Absorption Rates by using Novel AMC Reflector

Nam Kim and Seungwoo Lee
Chungbuk National University, Korea

[S-K3b-3] **09:10~09:30**

Computational Estimation of The Induced Electric Fields in Visual Tissues by Circular-Halo Coil

Mai Lu[1] and Shoogo Ueno[2]
[1]*Lanzhou Jiaotong University, China,* [2]*Kyushu University, Japan*

[S-K3b-4] **09:30~09:50**

A Study on the Meander-Type Dipole Antenna for SAR Validation Test at 150 MHz Band

Ki Hwea Kim[1], Ju Dong Jang[1], Sam Young Chung[1], and Yoon Myoung Gimm[2]
[1]*National Radio Research Agency, Korea,* [2]*Dankook University, Korea*

[S-K3b-5] **09:50~10:10**

[Invited] Recent Advances in Computational Radio Frequency Bioelectromagnetics Dosimetry

James Lin
University of Illinois, USA

Session Title	[S-E3] Modeling of Electromagnetic Immunity, EMS, and ESD
Date and Time	August 24 (Wed.) / 08:30~10:30
Room	Room E (Convention B)
Session Organizer	Jonghoon Kim (Korea Advanced Institute of Science and Technology) Jingook Kim (Ulsan National Institute of Science and Technology)
Session Chairs	Seungyoung Ahn (Korea Advanced Institute of Science and Technology) Jingook Kim (Ulsan National Institute of Science and Technology)

[S-E3-1] **08:30~08:50**

[Invited] EM Noise Immunity Enhancement using Schmitt Trigger Logic Gates in CMOS Process

SangHyeok Park[1], Kyungsoo Kim[2], Hai Au Huynh[1], Soyeon Joo[1], and SoYoung Kim[1]
[1]Sungkyunkwan University, Korea, [2]Samsung Electronics, Korea

[S-E3-2] **08:50~09:10**

[Invited] Measurement and Modeling of System-level ESD Noise Voltages in Real Mobile Products

Myungjoon Park[1], Junsik Park[1], Manho Seung[2], Joungcheul Choi[2], Seokkiu Lee[2], and Jingook Kim[1]
[1]Ulsan National Institute of Science and Technology, Korea, [2]SK Hynix Inc., Korea

[S-E3-3] **09:10~09:30**

[Invited] The Reproducibility Improving Method of Systemlevel ESD Test Through Operating Program Workload Analysis

JungHo Jin, ChoongPyo Jeon, JinHwan Kim, and YuChul Hwang
Samsung Electronics, Korea

[S-E3-4] **09:30~09:50**

[Invited] Fast Simulation of Multilayered Power Delivery Network using Multilayered Triangular Subcell Method and Block-Type Leapfrog Scheme

Ikki Arakaki, Tadatoshi Sekine, and Hideki Asai
Shizuoka University, Japan

[S-E3-5] **09:50~10:10**

[Invited] Radiated Susceptibility Tests of Electromagnetic Bandgap Power Bus using a Reverberation Chamber

Myunghoi Kim[1], Sang Il Kwak[1], and Jong Hwa Kwon[2]
[1]Hankyong National University, Korea, [2]Electronics and Telecommunications Research Institute, Korea

[S-E3-6] **10:10~10:30**

[Invited] Estimation of the Worst-Case Conducted Emission Noise due to Multiple Parallel Power Converters

Jaehoon Jeong, Jingook Kim, Sunghyun Kim, and Cheolsoo Kim
[1]Ulsan National Institute of Science and Technology, Korea, [2]EMCIS Co., Ltd., Korea

Session Title	[C2] Radio Communication Systems and New Radio Service
Date and Time	August 24 (Wed.) / 08:30~10:30
Room	Room F (Convention C)
Session Chair	Yong-Seok Choi (Electronics and Telecommunications Research Institute)

[C2-1] **08:30~08:50**

Wideband Measurements in the 60 GHz Band for Short Range Communication

S. Salous[1] and Y. Gao[1,2]
[1]Durham University, UK, [2]Northwestern Polytechnical University, China

[C2-2] **08:50~09:10**

SAR Image Despeckling by Employment of Multiwavelet based Hidden Markov Model

Wen Long Song and Dong Seog Han
Kyungppook National University, Korea

[C2-3] **09:10~09:30**

Analysis of LO-RF Amplitude Modulation Effect in FMCW Radar

Jong-Seop Koo, Byungjoon Kim, and Sangwook Nam
Seoul National University, Korea

[C2-4] **09:30~09:50**

Design of Satellite Beacon Receiver using Array-based Digital Filter

Kyung-Soon Lee and Kyung Heon Koo
Incheon National University, Korea

[C2-5] **09:50~10:10**

Position-freshness Based Intermediate Node Filtering for VANET

Guhyoung Kwon, Sungwon Lee, Enbae Moon, and Dongkyun Kim
Kyungpook National University, Korea

[C2-6] **10:10~10:30**

The Performance Analysis for the Spatial Correlated MIMO Systems in V2V

Myung Chul Park and Dong Seog Han
Kyungpook National University, Korea

Session Title	[S-GH1] ULF/VLF Waves
Date and Time	August 24 (Wed.) / 08:30~10:30
Room	Room G (Convention D)
Session Organizer	Dong-Hun Lee (Kyung Hee University) Kazue Takahashi (Johns Hopkins University)
Session Chair	Kazue Takahashi (Johns Hopkins University)

[S-GH1-1] **08:30~08:50**

[Invited] (B,V) Paradigm of Magnetosphere-Ionosphere Coupling

Akimasa Yoshikawa
Kyushu University, Japan

[S-GH1-2] **08:50~09:10**

[Invited] Magnetospheric ULF Waves Excited by Interplanetary Shocks and Associated Oscillations of Energetic Particle Fluxes: Van Allen Probes Observations

Kazue Takahashi[1], Seth G. Claudepierre[2], David M. Malaspina[3], John R. Wygant[4], and Craig A. Kletzing[5]
[1]The Johns Hopkins University Applied Physics Laboratory, USA, [2]The Aerospace Corporation, USA, [3]University of Colorado Boulder, USA, [4]University of Minnesota, USA, [5]University of Iowa, USA

[S-GH1-3] **09:10~09:30**

[Invited] Spatial Structure of Compressional Pc3 Waves in the Topside Ionosphere

Balázs Heilig[1] and Peter R. Sutcliffe[2]
[1]Geological and Geophysical Institute of Hungary, Hungary, [2]PSouth African National Space Agency, South Africa)

[S-GH1-4] **09:30~09:50**

[Invited] Effects of Ionospheric Heavy Ions on EMIC Wave Propagation

Eun-Hwa Kim, Jay R. Johnson, and Scott Keller
Princeton University, USA

[S-GH1-5] **09:50~10:10**

[Invited] Simulation of Bounce Resonance ULF Wave-Particle Interactions

R. Rankin[1], C. Wang[1], D. Sydorenko[1], Y. Wang[2], Q.-G. Zong[2], and X. Zhou[2]
[1]University of Alberta, Canada, [2]Peking University, China

[S-GH1-6] **10:10~10:30**

[Invited] Numerical Study of Propagation Characteristics of Interplanetary Shocks

Jinhy Hong, Kyung-Im Kim, Ensang Lee, and Dong-Hun Lee
Kyung Hee University, Korea

Session Title	[S-H5] Coherent Radiation Sources
Date and Time	August 24 (Wed.) / 08:30~10:30
Room	Room H (Convention E)
Session Organizer	EunMi Choi (Ulsan National Institute of Science and Technology) Heather Song (University of Colorado-Colorado Springs)
Session Chair	Minsup Hur (Ulsan National Institute of Science and Technology)

[S-H5-1] **08:30~08:50**

[Invited] Ultrafast Electron Diffraction System and Timeresolved Pump/Prove Experiments

Kyu-Ha Jang, Seong Hee Park, Kitae Lee, and Young Uk Jeong
Korea Atomic Energy Institute, Korea

[S-H5-2] **08:50~09:10**

[Invited] Sub-Terahertz Slow-Wave Circuits for Coherent Radiation Sources

Chan-Wook Baik[1], Ho Young Ahn[1], Yongsung Kim[1], Jooho Lee[1], Seogwoo Hong[1], Sang Hun Lee[1], Jun Hee Choi[1], Sunil Kim[1], Jong Min Kim[1], Sungwoo Hwang[1], So-Yeon Jeon[2], SeGi Yu[2], George Collins[3], M. E. Read[3], and R. Lawrence Ives[3]
[1]Samsung Advanced Institute of Technology, Korea, [2]Hankuk University of Foreign Studies, Korea, [3]Calabazas Creek Research, Inc., USA

[S-H5-3] **09:10~09:30**

[Invited] Experiment of a Gyrotron Backward Wave Oscillator on Square Waveguide

Kwang-Ho Jang and Jin-Joo Choi
Kwangwoon University, Korea

[S-H5-4] **09:30~09:50**

[Invited] Design Study of a G-band Folded Waveguide Traveling-Wave Tube Driven by a Backward-Wave Oscillator

Ingeun Lee, Ashwini Sawant, and EunMi Choi
Ulsan National Institute of Science and Technology, Korea

[S-H5-5] **09:50~10:10**

[Invited] Selectively Enhanced Pumping of Coherent, Ultraintense THz Radiation from Laser-plasma Interaction

Min Sup Hur
Ulsan National Institute of Science and Technology, Korea

[S-H5-6] **10:10~10:30**

[Invited] Development of Magnetrons for Industrial and Medical Applications

Jung-Il Kim, Geun-Ju Kim, Jeong-Hun Lee, Sang-Hoon Kim, and In-Soo Kim
Korea Electrotechnology Research Institute, Korea

Session Title	[A2] Time and Frequency (Joint with ATF)
Date and Time	August 24 (Wed.) / 08:30~10:10
Room	Room I (Crane)
Session Chairs	Amitava Sen Gupta (The NorthCap University) Myoung-Sun Heo (Korea Research Institute of Standards and Science)

[A2-1] **08:30~08:50**

Improvement of an Yb Optical lattice Clock at KRISS

Myoung-Sun Heo, Huidong Kim, Won-Kyu Lee, Dai-Hyuk Yu, and Chang-Yong Park
Korea Research Institute of Standards and Science, Korea

[A2-2] **08:50~09:10**

Systematic Shifts in the Frequency of NPLI-CsF1

Aishik Acharya[1], Poonam Arora[1], Vattikonda Bharath[1], Shuchi Yadav[1], Ashish Agarwal[1], and Amitava Sen Gupta[2]
[1]CSIR National Physical Laboratory, India, [2]The Northcap University, India

[A2-3] **09:10~09:30**

A Novel Technique for Precise Phase and Frequency Measurement

Aishik Acharya[1], Poonam Arora[1], Shuchi Yadav[1], and Amitava Sen Gupta[2]
[1]CSIR National Physical Laboratory, India, [2]The Northcap University, India

[A2-4] **09:30~09:50**

Recent Improvement of Laser System for the KRISS-F1 Cs Fountain Clock

Sang Eon Park[1,2], Sangmin Lee[1,2], Myoung-Sun Heo[1], Taeg Yong Kwon[1], Hyun-Gue Hong[1], Sang-Bum Lee[1], and John G. Hartnett[3]
[1]Korea Research Institute of Standards and Science, Korea, [2]University of Science and Technology, Korea, [3]University of Adelaide, Australia

[A2-5] **09:50~10:10**

Development of Standard Time and Frequency Service using Low Frequency in Korea

Young-Kyu Lee, Dai-Hyuk Yu, Seong-Hoon Yang, Jong-Koo Lee, and Sang-Wook Hwang
Korea Research Institute of Standard and Science, Korea

Session Title	[S-D6] Low-energy Wireless Sensor Electronics
Date and Time	August 24 (Wed.) / 08:30~10:30
Room	Room J (Swan)
Session Organizer	Hyunchol Shin (Kwangwoon University) Chun Huat Heng (National University of Singapore)
Session Chairs	Hyunchol Shin (Kwangwoon University) Chun Huat Heng (National University of Singapore)

[S-D6-1] **08:30~08:50**

Design Considerations for Bluetooth Low Energy CMOS RF Transceivers for IoT

Shinill Chang and Hyunchol Shin
Kwangwoon University, Korea

[S-D6-2] **08:50~09:10**

[Invited] Reconfigurable, Energy Efficient Transmitter with Band-Shaping and Multi-Channel Support for Biomedical Applications

Chun-Huat Heng and Kok-Hin Teng
National University of Singapore, Singapore

[S-D6-3] **09:10~09:30**

[Invited] Buck-Boost DC-DC Converter Integrated RF Energy Harvesting for Wireless Sensors

Choon Sik Cho and Seyoung Baik
Korea Aerospace University, Korea

[S-D6-4] **09:30~09:50**

[Invited] Reference-Less Ultra-Low-Power Wake-Up Receiver with Noise Suppression

Kuang-Wei Cheng, Jhih-Syuan Lin, and Shih-En Chen
National Cheng Kung University, Taiwan

[S-D6-5] **09:50~10:10**

[Invited] Low-Energy Integrated Circuits and Microsystems for Implantable Wireless Neural Recording

Minkyu Je[1] and Seong-Jin Kim[2]
[1]Korea Advanced Institute of Science and Technology, Korea, [2]Ulsan National Institute of Science and Technology, Korea

[S-D6-6] **10:10~10:30**

[Invited] Two 180nm CMOS Wireless Transceivers for IoT Applications

Zheng Song and Baoyong Chi
Tsinghua University Beijing, China

Session Title	[S-F4a] Advanced Sensor and Radar Technology (1)
Date and Time	August 24 (Wed.) / 08:30~10:30
Room	Room K (White Heron)
Session Organizer	Min-Ho Ka (Yonsei University) Xiongjun Fu (Beijing Institute of Technology)
Session Chair	Min-Ho Ka (Yonsei University)

[S-F4a-1] **08:30~08:50**

Multisensor SAR Image Matching Based on Object Shape

Jie Rui[1,2], Chao Wang[1], Hong Zhang[1], Zhanmu Zhang[2], Zhi Liu[2], and Fei Jin[2]
[1]Chinese Academy of Sciences, China, [2]Zhengzhou Institute of Surveying and Mapping, China

[S-F4a-2] **08:50~09:10**

Ka-band Radiometric Imaging using Antennas with Pattern Synthesis

K. A. Lukin, V. V. Kudriashov, P. L. Vyplavin, Sergii Lukin, and V. P. Palamarchuk
National Academy of Sciences of Ukraine, Ukraine

[S-F4a-3] **09:10~09:30**

Assessment of Absolute Partial Discharge Intensity from a Free-space Radiometric Measurement

A. Jaber[1], P. Lazaridis[1], Y. Zhang[1], B. Saeed[1], U. Khan[1], D. Upton[1], H. Ahmed[1], P. Mather[1], M. F. Q. Vieira[2], R. Atkinson[3], M. Judd[4], and I. A. Glover[1]
[1]University of Huddersfield, UK, [2]Universidade Federal de Campina Grande, Brazil, [3]University of Strathclyde, UK, [4]High Frequency Diagnostics & Engineering Ltd, UK

[S-F4a-4] **09:30~09:50**

Investigation of Calibration Aspects of Fully and Compact Polarimetric SAR Systems

Abdullah Algafsh[1,2], Michael Inggsy[1], and Amit Kumar Mishraz[1]
[1]University of Cape Town, South Africa, [2]King Abdulaziz City for Science and Technology, Saudi Arabia

[S-F4a-5] **09:50~10:10**

The Effect of Perforating the Corner Reflector on Maximum Radar Cross Section

Abdullah Algafsh[1,2], Michael Inggsy[1], and Amit Kumar Mishraz[1]
[1]University of Cape Town, South Africa, [2]King Abdulaziz City for Science and Technology, Saudi Arabia

[S-F4a-6] **10:10~10:30**

Suppression of Multi-Path Coupling in Scaled-Down Expreiment using Cross-Borehole Pulse Radar

Jae-Hyoung Cho[1,2], Ji-Hyun Jung[3], Jong-Gwan Yook[2], and Se-Yun Kim[1]
[1]Korea Institute of Science and Technology, Korea, [2]Yonsei University, Korea, [3]Hanwha Thales, Korea

Session Title	[S-B7] Computational Technique and EM Simulation
Date and Time	August 24 (Wed.) / 13:30~15:30
Room	Room A (Emerald A)
Session Organizer	Yong Heui Cho (Mokwon University) Do-Hoon Kwon (University of Mass)
Session Chair	Yong Heui Cho (Mokwon University)

[S-B7-1] **13:30~13:50**

[Invited] FDTD Modelling on Intraband Gyrotropic Conductivity of Graphene

Liang Yang, Khalid Z. Rajab, and Yang Hao
Queen Mary University of London London, UK

[S-B7-2] **13:50~14:10**

[Invited] Parallel Computation Method for Large Metal-Only Reflectarray (MOR) Antennas

Yong Heui Cho
Mokwon University, Korea

[S-B7-3] **14:10~14:30**

[Invited] Rigorous Formulation of Electromagnetic Plane-Wave Scattering by Defected Periodic Circular Cylinder Array in Conical Mounting

Koki Watanabe
Fukuoka Institute of Technology, Japan

[S-B7-4] **14:30~14:50**

[Invited] FDTD Modeling with High Degrees-of-Freedom for Dispersive Media

Kyung-Young Jung and Sang-Gyu Ha
Hanyang University, Korea

[S-B7-5] **14:50~15:10**

[Invited] Far Field Radiation Pattern Analysis of an Antenna Installed in an Automobile

Zicai Zheng and Hiroshi Shirai
Chuo University, Japan

[S-B7-6] **15:10~15:30**

Scattering by a Metallic Wedge Cylindrically Capped with Penetrable Materials

Danilo Erricolo, Marco D. Poort, and Piergiorgio L. E. Uslenghi
University of Illinois, USA

Session Title	[B1] Fields and Waves 5G and MIMO Technology
Date and Time	August 24 (Wed.) / 13:30~15:10
Room	Room B (Emerald B)
Session Chairs	Kin-Lu Wong (National Sun Yat-sen University) Chang-Joo Kim (Electronics and Telecommunications Research Institute)

[B1-1] **13:30~13:50**

[Invited] Spectrum Policy for Hyper-connected Society in Korea

Chang-Joo Kim
Electronics and Telecommunications Research Institute, Korea

[B1-2] **13:50~14:10**

Isolation Improvement of 5 GHz WLAN Antenna Array using Metamaterial Absorber

Mayank Agarwal and Manoj Kumar Meshram
Indian Institute of Technology, India

[B1-3] **14:10~14:30**

Compact Eight MIMO Antennas for 5G Smartphones and Their MIMO Capacity Verification

Kin-Lu Wong[1], Chih-Yu Tsai[1], Jun-Yu Lu[1], De-Ming Chian[1], and Wei-Yu Li[2]
[1]National Sun Yat-sen University, Taiwan, [2]Industrial Technology Research Institute, Taiwan

[B1-4] **14:30~14:50**

Integrated MIMO Antennas for LTE and V2V Applications

Oh-Yun Kwon, Reem Song, Yu-Zhen Ma, and Byung-Sung Kim
Sungkyunkwan University, Korea

[B1-5] **14:50~15:10**

Wide Scan Angle Massive MIMO Antenna for 5G Communication

Seung-In No and Sangwook Nam
Seoul National University, Korea

Session Title	[S-J6a] Science and Technology for Solar and Heliophysics (1)
Date and Time	August 24 (Wed.) / 13:30~15:30
Room	Room C (Diamond)
Session Organizer	Kyungsuk Cho (Korea Astronomy and Space Science Institute) Yihua Yan (Chinese Academy of Sciences)
Session Chairs	Kyungsuk Cho (Korea Astronomy and Space Science Institute) Yihua Yan (Chinese Academy of Sciences)

[S-J6a-1] **13:30~13:50**

[Invited] Solar Radio Observations with the Expanded Owens Valley Solar Array

Dale E. Gary
New Jersey Institute of Technology, USA

[S-J6a-2] **13:50~14:10**

[Invited] Calibration and Data Processing for MUSER

Wei Wang, Yihua Yan, Fei Liu, Lihong Geng, Zhijun Chen, Linjie Chen, and Donghao Liu
Chinese Academy of Sciences, China

[S-J6a-3] **14:10~14:30**

Reinstallation of the Korean Solar Radio Burst Locator

Su-Chan Bong, Bi-Ho Jang, Yongjun Kwon, Do-Heung Je, and Gwanson Choe
[1]*Korea Astronomy and Space Science Institute, Korea,* [2]*Kyung Hee University, Korea*

[S-J6a-4] **14:30~14:50**

[Invited] Solar Observations in Cycle 4 of Atacama Large Millimeter/submillimeter Array

Masumi Shimojo
National Astronomical Observatory of Japan, Japan

[S-J6a-5] **14:50~15:10**

[Invited] Solar Activity Studies using Microwave Imaging Observations

N. Gopalswamy
NASA Goddard Space Flight Center, USA

[S-J6a-6] **15:10~15:30**

A 20 Year Decline in Solar Magnetic Fields and Solar Wind Micro-Turbulence Levels: Are we Heading Towards a Maunder-Like Minimum?

P. Janardhan[1], Susanta Kumar Bisoi[2], and S. Ananthakrishnan[3]
[1]*Physical Research Laboratory, India,* [2]*Chinese Academy of Sciences, China,* [3]*Pune University, India*

Session Title	[S-K4] EMFs for New Technologies
Date and Time	August 24 (Wed.) / 13:30~15:30
Room	Room D (Convention A)
Session Organizer	Teruo Onishi (NTT Docomo) Jung-Ick Moon (Electronics and Telecommunications Research Institute)
Session Chairs	Teruo Onishi (NTT Docomo) Jung-Ick Moon (Electronics and Telecommunications Research Institute)

[S-K4-1] **13:30~13:50**

[Invited] EMF Analysis of Wireless Power Transfer System with Dual-Transmitting Coils

Jung-Ick Moon, S. M. Kim, S. W. Kim, H. D. Choi, and I. K. Cho
Electronics and Telecommunications Research Institute, Korea

[S-K4-2] **13:50~14:10**

[Invited] Electromagnetic Compatibility in Wireless Power Transfer System

Jaehyoung Park, Jedok Kim, and Seungyoung Ahn
Korea Advanced Institute of Science and Technology, Korea

[S-K4-3] **14:10~14:30**

[Invited] Electric Field Measurement Close to Antennas at an Upper Frequency in the SHF Band

Kei Satoh and Teruo Onishi
NTT Docomo, Inc., Japan

[S-K4-4] **14:30~14:50**

[Invited] In-vitro Assessment of Electromagnetic Interference Caused by Wireless Power Transfer Device on Active Implantable Medical Devices

Takashi Hikage and Toshio Nojima
Hokkaido University, Japan

[S-K4-5] **14:50~15:10**

[Invited] A Compliance Procedure for Wireless Power Transfer Systems in MHz Band

Kanako Wake, Jerdvisanop Chakarothai, and Soichi Watanabe
National Institute of Information and Communication Technology, Japan

[S-K4-6] **15:10~15:30**

[Invited] Wideband Textile Antenna with Low Back Radiation for Wearable Applications

Ezzaty Faridah Nor Mohd Hussin[1], Ping Jack Soh[1], Mohd Faizal Jamlos[1,2], Herwansyah Lago[1], and Azremi Abdullah Al-Hadi[1]
[1]Universiti Malaysia Perlis, Malaysia, [2]Universiti Malaysia Pahang, Malaysia

Session Title	[S-E4] EMC Problems in Mobile Devices
Date and Time	August 24 (Wed.) / 13:30~15:10
Room	Room E (Convention B)
Session Organizer	Dong Gun Kam (Ajou University) Hyun Ho Park (University of Suwon)
Session Chairs	Dong Gun Kam (Ajou University) Hyun Ho Park (University of Suwon)

[S-E4-1] **13:30~13:50**

[Invited] Interference Issues of Smartphones and Challenges to Model Noise from Chipsets

Hwanwoo Shim and Jaekyu Lee
Samsung Electronics, Korea

[S-E4-2] **13:50~14:10**

[Invited] Noise Immunity Property of Relaxation Oscillator

Jihoon Kim and So Young Kim
Sungkyunkwan University, Korea

[S-E4-3] **14:10~14:30**

[Invited] Quantitative Analysis of the Effects of Differentialto-Common Mode Conversion on RFI

Woocheon Park and Dong Gun Kam
Ajou University, Korea

[S-E4-4] **14:30~14:50**

[Invited] Effects of PCB Design on the Shielding Effectiveness of a Shield Can

Daho Lee and Dong Gun Kam
Ajou University, Korea

[S-E4-5] **14:50~15:10**

[Invited] Study for Possibility of Information Leakage from Digital Video Display Interface

Ho Seong Lee[1], Kyuhong Sim[2], and Jong-Gwan Yook[1]
[1]Yonsei University, Korea, [2]LIG NEX1, Korea

Session Title	[C3] Channel Model, Antenna and Propagation (1)
Date and Time	August 24 (Wed.) / 13:30~15:10
Room	Room F (Convention C)
Session Chair	Yoshiyuki Fujino (Toyo University)

[C3-1] **13:30~13:50**

A Comparison Beetween 4-bit Fixed and Reconfigurable Microwave Discriminators for Frequency Identification

M. Espinosa-Espinosa[1], I. Llamas-Garro[2], B. G. M. de Oliveira[3], M. T. de Melo[4], and Jung-Mu Kim[5]
[1]Asociación Nacional de Normalización y Certificación del Sector Eléctrico, Mexico, [2]Centre Tecnològic de Telecomunicacions de Catalunya, Spain, [3]Instituto Federal de Pernambuco, Brazil, [4]Universidade Federal de Pernambuco, Brazil, [5]Chonbuk National University, Korea

[C3-2] **13:50~14:10**

RF MEMS based Inter-band Reconfigurable Antenna

Vishal Kumar[1] and S. K. Koul[2]
[1]Research Centre Imarat (RCI), India, [2]Indian Institute of Technology, India

[C3-3] **14:10~14:30**

Comprison of Harmonics Degradation Method of a Random Rectenna Array

Yoshiyuki Fujino and Eri Saito
Toyo University, Japan

[C3-4] **14:30~14:50**

Measurement and Analysis of Long Distance Radio Propagation Over the North Sea at 5.2 GHz

Wei Wang, Thomas Jost, and Ronald Raulefs
German Aerospace Center, Germany

[C3-5] **14:50~15:10**

Possibility of Confidential Information Recovery from EM Field Emitted by USB-Keyboard

Rostislav I. Sokolov and Renat R. Abdullin
Ural Federal University, Russia

Session Title	[S-GH2] Space Weather Impact and Mitigation Efforts
Date and Time	August 24 (Wed.) / 13:30~15:30
Room	Room G (Convention D)
Session Organizer	Jun-Chul Mun (National Radio Research Agency) Mamoru Ishii (National Institute of Information and Communications Technology)
Session Chair	Mamoru Ishii (National Institute of Information and Communications Technology)

[S-GH2-1] **13:30~13:50**

[Invited] Measurement of Ionosphere Over the Western Pacific Ocean

Mamoru Ishii, Hidekatsu Jin, Tatsuhiro Yokoyama, Takuya Tsugawa, Michi Nishioka, and Takashi Maruyama
National Institute of Information and Communications Technology, Japan

[S-GH2-2] **13:50~14:10**

[Invited] Establisment of Oblique Ionospheric Sounding Measurement System for Long Distance

Jae Woo Park[1], Ho-Cheol Jeon[1], and Jun-Chul Mun[2]
[1]Radar & Space Co. Ltd., Korea, [2]Korea Space Weather Center, Korea

[S-GH2-3] **14:10~14:30**

[Invited] Development of a HF Forecast System based on Realtime Regional Ionospheric Conditions

Kyungmin Song[1], Dongho Cha[1], and Jun-Chul Mun[2]
[1]WIBTEL Co., Ltd, Korea, [2]Korea Space Weather Center, Korea

[S-GH2-4] **14:30~14:50**

[Invited] Application of Multi-constellation GNSS Network in Ionospheric Monitoring Over China

Lianhuan Hu and Baiqi Ning
Chinese Academy of Sciences, China

[S-GH2-5] **14:50~15:10**

[Invited] Adjusted Matrix of Monitoring & Prediction of Selected Space Weather Elements for Space Situation Awareness

Iwona Stanislawska, Beata Dziak-Jankowska, Lukasz Tomasik, and Mariusz Pozoga
Polish Academy of Sciences, Poland

[S-GH2-6] **15:10~15:30**

Space Weather Studies of Ionolab Group

Feza Arikan[1], Orhan Arikan[2], Tamara L. Gulyaeva[4], Umut Sezen[1], Cenk Toker[1], Harun Artuner[1], Gurhan Bulu[1], Secil Karatay[3], Zbysek Mosna[5], Hakan Tuna[2], Uygar Demir[1], and Esra Erdem[1]
[1]Hacettepe University, Turkey, [2]Bilkent University, Turkey, [3]Kastamonu University, Turkey, [4]IZMIRAN, Russia, [5]Institute of Atmospheric Physics, Czech

Session Title	[S-HG1a] Effects of Wave-Particle Interactions in Earths Magnetosphere and Upper Atmosphere (1)
Date and Time	August 24 (Wed.) / 13:30~15:30
Room	Room H (Convention E)
Session Organizer	Wen Li (University of California) Ondrej Santolik (The Czech Academy of Sciences)
Session Chairs	Wen Li (University of California) Ondrej Santolik (The Czech Academy of Sciences)

[S-HG1a-1] **13:30~13:50**

[Invited] The Role of Magnetosonic Waves in Earth's Magnetosphere

Lunjin Chen[1], Armando Maldonado[1], Jacob Bortnik[2], and Richard M. Thorne[2]
[1]University of Texas, USA, [2]University of California, USA

[S-HG1a-2] **13:50~14:10**

[Invited] Van Allen Probes Observations of EMIC Waves and Associated Particles

Dae-Young Lee
Chungbuk National University, Korea

[S-HG1a-3] **14:10~14:30**

[Invited] Simulation of Radiation Belt Electron Dynamics in Earth's Inner Magnetosphere

Qianli Ma, Wen Li, Richard M. Thorne, and Jacob Bortnik
University of California, USA

[S-HG1a-4] **14:30~14:50**

[Invited] EMIC Waves in the Earth's Inner Magnetosphere

Maria E. Usanova[1], Ian R. Mann[2], and Fabien Darrouzet[3]
[1]University of Colorado Boulder, USA, [2]University of Alberta, Canada, [3]Belgian Institute for Space Aeronomy, Belgium

[S-HG1a-5] **14:50~15:10**

[Invited] ULF Variations in Atmospheric Precipitation of Energetic Electrons

Scot R. Elkington[1], Thiago Brito[2], Alexa Halford[3], James McCollough[4], and Michael J. Wiltberger[5]
[1]University of Colorado, USA, [2]Los Alamos National Laboratory, USA, [3]Dartmouth College, USA, [4]Air Force Research Laboratory, USA, [5]High Altitude Observatory/NCAR, USA

[S-HG1a-6] **15:10~15:30**

[Invited] Whistler Wave Energy Flow in the Plasmasphere

C. A. Kletzing[1], I. W. Christopher[1], Ondrej Santolik[2], W. S. Kurth[1], G. Hospodarsky[1], and S. R. Bounds[1]
[1]The University of Iowa, USA, [2]Charles University, Czech

Session Title	[A3] Material measurement & Network Analysis
Date and Time	August 24 (Wed.) / 13:30~15:30
Room	Room I (Crane)
Session Chairs	Kouji Shibata (Hachinohe Institute of Technology) Tah-HsiungChu (National Taiwan University)

[A3-1] **13:30~13:50**

A Study on Measurement System for Electrical Characteristics of Anisotropic Composite Material

Seong Sik Yoon[1], Jae W. Lee[1], Taek K. Lee[1], and Dong Woo Yi[2]
[1]Korea Aerospace University, Korea, [2]Agency for Defense Development, Korea

[A3-2] **13:50~14:10**

Measuremet of Properties of Ferrites at Partially Magnetized State using Cylindrical Resonator

Tae-Wan Kim and Seong-Ook Park
Korea Advanced Institute of Science and Technology, Korea

[A3-3] **14:10~14:30**

A Study on Measurement of Complex Permittivity in Liquids based on a Combination of the Open-ended Cut-off Waveguide Reflection Method and Comparison of Expressions with Reference Material

Kouji Shibata and Masaki Kobayashi
Hachinohe Institute of Technology, Japan

[A3-4] **14:30~14:50**

Analysis of the Adavanced Cavity Perturbation Method for Microwave Properties

Chul-Ki Kim and Seong-Ook Park
Korea Advanced Institute of Science and Technology, Korea

[A3-5] **14:50~15:10**

A Digital Sampling Measurement System of AC Current

Chen Shaohua and Huang Xiaoding
Beijing Orient Institute of Measurement and Test, China

[A3-6] **15:10~15:30**

Reconstruction of Multiport Scattering Matrix from One-port Measurements

Yean-Chung Lin and Tah-Hsiung Chu
National Taiwan University, Taiwan

Session Title	[S-D7] Photonic/Electromagnetic Metamaterials and Metadevices
Date and Time	August 24 (Wed.) / 13:30~15:10
Room	Room J (Swan)
Session Organizer	Bumki Min (Korea Advanced Institute of Science and Technology) Junsuk Rho (Pohang University of Science and Technology)
Session Chairs	Bumki Min (Korea Advanced Institute of Science and Technology) Junsuk Rho (Pohang University of Science and Technology)

[S-D7-1] **13:30~13:50**

[Invited] Gradient Nonlinear Metasurfaces with Giant Nonlinear Optical Response

Jongwon Lee[1], Nishant Nookala[2], Mykhailo Tymchenko[2], J. Sebastian Gomez-Diaz[2], Andrea Alu[2], and Mikhail A. Belkin[2]
[1]Ulsan National Institute of Science and Technology, Korea, [2]University of Texas, USA

[S-D7-2] **13:50~14:10**

[Invited] Spatial and Frequency Domain Engineering of Multiple Resonances for Absorption and Scattering Control

Jong Uk Kim, Myung Joon Kim, and Jonghwa Shin
Korea Advanced Institute of Science and Technology, Korea

[S-D7-3] **14:10~14:30**

[Invited] Direct Measurement of Far-Field Scattering Characteristics of a Single Metal Nano-Rod

Jinhyung Kim[1], Donghyeong Kim[1], Min-Kyo Seo[1], Kwang-Yong Jeong[2], and Hong-Gyu Park[2]
[1]Korea Advanced Institute of Science and Technology, Korea, [2]Korea University, Korea

[S-D7-4] **14:30~14:50**

[Invited] Infrared Metamaterials for High-Sensitive Surface-Enhanced Molecular Detection

Atsushi Ishikawa
Okayama University, Japan

[S-D7-5] **14:50~15:10**

[Invited] A Numerical Study for Sensitivity Enhancements of a Plasmon Coupled Whispering Gallery Modes Sensor

Tae Young Kang and Kyujung Kim
Puan National University, Korea

Session Title	[S-F4b] Advanced Sensor and Radar Technology (2)
Date and Time	August 24 (Wed.) / 13:30~15:10
Room	Room K (White Heron)
Session Organizer	Min-Ho Ka (Yonsei University) Xiongjun Fu (Beijing Institute of Technology)
Session Chair	Min-Ho Ka (Yonsei University)

[S-F4b-1] **13:30~13:50**

Single-Chip Software Defined Radio Used As Pulse-Doppler Radar

Se-Yeon Jeon, Sumin Kim, Jungwhan Han, Konstantin Nikitin, and Min-Ho Ka
Yonsei University, Korea

[S-F4b-2] **13:50~14:10**

Multi-Band Multi-Mode SDR Radar Platform for Traffic and Security Applications

Young-Kil Kwag and In-Sang Woo
Korea Aerospace University, Korea

[S-F4b-3] **14:10~14:30**

EGaIn-Injected Multiresonator using SubstrateIntegrated-Waveguide

Muhammad Usman Memon and Sungjoon Lim
Chung-Ang University, Korea

[S-F4b-4] **14:30~14:50**

A Dual PLL FMCW Radar with a Digital Time Control Technique for High-Resolution Wall-Penetration Applications

Byungjoon Kim, Jong-seop Koo, Duksoo Kim, and Sangwook Nam
Seoul National University, Korea

[S-F4b-5] **14:50~15:10**

Simulation of UWB Returns From a Computer-Animated Walking Human

Youngwook Kim[1], Jaideep Chowdhury[1], and Gangil Byun[2]
[1]California State University, USA, [2]Hongik University, Korea

Session Title	Poster Session
Date and Time	August 24 (Wed.) / 16:00~18:00
Room	Lobby (3F), Convetion Center, Grand Hilton Hotel
Session Chair	Jae-Wook Lee (Korea Aerospace University)

[P-1] **16:00~18:00**

Research on Calibration Technology of the Wide Spectrum Grating Monochromator Wavelength Accuracy

HongYuan Liu[1], ChengPing Ying[1], KunFeng Chen[1], HongChao Wang[1], Bin Jiang[1], Bin Wu[2], HengFei Wang[2], and Mingming Huo[2]
[1]The 41st Institute of China Electronic Technology Group Corporation, China, [2]Science and Technology on Electronic Test & Measurement Laboratory, China

[P-2] **16:00~18:00**

Calibration of Terahertz Spectrum by using Carbon Monoxide

Bin Wu[1], Hengfei Wang[1], Kunfeng Chen[2], Rui Zhang[2], Yanzhao Yang[2], and Chengping Ying[2]
[1]Science and Technology on Electronic Test & Measurement Laboratory, China, [2]The 41st Institute of China Electronic Technology Group Corporation, China

[P-3] **16:00~18:00**

NbN Thin Films Fabricated at High Temperature Prepared by Reactive DC Magnetron Sputtering for Hot-electron Bolometer Applications.

H. W. Chang, K. N. Lin, C. L. Wang, and M. J. Wang
Institute of Astronomy and Astrophysics, Academia Sinica, Taiwan

[P-4] **16:00~18:00**

Comparison of RF Power Sensor Calibration using a Vector Network Analyzer and a Direct Transfer System

Windi Kurnia Perangin Angin[1,3], Jae-Yong Kwon[2,3], Tae-Weon Kang[2,3], and No-Weon Kang[2]
[1]Pusat Penelitian Metrologi LIPI, Indonesia, [2]Korea Research Institute of Standards and Science, Korea, [3]University of Science and Technology, Korea

[P-5] **16:00~18:00**

An Inverse Scattering Approach to Design a Compact Microstrip RF Filter using Defected Ground Structure

Monika Singh and M Jaleel Akhtar
Indian Institute of Technology Kanpur, India

[P-6] **16:00~18:00**

Elevated and Tapered Microstrip Coupled ENZ SIW Sensor for Microwave Testing of Radome and Building Materials in 3G and ISM Bands

Abhishek Kumar Jha and M. Jaleel Akhtar
Indian Institute of Technology Kanpur, India

[P-7] **16:00~18:00**

Design and Measurement of the KRISS Reverberation Chamber 1

Aditia Nur Bakti[1,3], Jae-Yong Kwon[2,3], Jun-Ho Choi[4], and No-Weon Kang[2]
[1]Puslit Sistem Mutu dan Teknologi Pengujian LIPI, Indonesia, [2]Korea Research Institute of Standards and Science, Korea, [3]University of Science and Technology, Korea, [4]Agency for Defense Development, Korea

[P-8] **16:00~18:00**

Design of Broadband Low-pass Reflective Phasers

Qingfeng Zhang[1], Tongfeng Guo[1], Yifan Chen[1], and Christophe Caloz[2]
[1]South University of Science and Technology of China, China, [2]École Polytechnique de Montréal, Canada

[P-9] **16:00~18:00**

Multi-layer Substrate Loaded 10:1 (900MHz-9GHz) Ultrawideband Tightly Coupled Antenna Array

Hao Huang, Ke Xiao, Shengshui Wang, and Shunlian Chai
National University of Defense Technology, China

[P-10] **16:00~18:00**

CPW-Fed Tri-Band Slot Dipole Antenna with C-Shaped Strips

You-Jhu Chen, Te-Wei Liu, and Wen-Hua Tu
National Central University, Taiwan

[P-11] **16:00~18:00**

Study on the Gain-flatness Characteristics of Backward-pumped Distributed Fiber Raman Amplifier based on the Genetic Algorithm

Liu Zhiming[1], Gao Yesheng[1], Chen Kunfeng[1], and Li Jian[2]
[1]The 41st Institute of China Electronic Technology Group Corporation, China, [2]Beijing Railways Bureau, China

[P-12] **16:00~18:00**

Broadband THz Quasi-Optical Antenna System

Chao-Hai Du and Pu-Kun Liu
Peking University, China

[P-13] **16:00~18:00**

Compact Minkowski Half-hexagon Notched Dielectric Resonator Antenna for Wideband Applications

Duggirala Venkata Kiran, Dileep. Sankaranarayanan, and Biswajeet Mukherjee
Indian Institute of Information Technology Design and Manufacturing Jabalpur, India

[P-14] **16:00~18:00**

THz Super-Focusing and Enhancement of Transmission Based on Slit-Grooves

XiaoFei Zang and YiMing Zhu
University of Shanghai for Science and Technology, China

[P-15] **16:00~18:00**

Research on the Beam Spot Size Measurement of Terahertz Laser

Rui Zhang[1], Bin Wu[2], Yanzhao Yang[1], Chengping Ying[1], Hengfei Wang[2], and Kunfeng Chen[1]
[1]The 41st Institute of China Electronic Technology Group Corporation, China, [2]Science and Technology on Electronic Test & Measurement Laboratory, China

[P-16] **16:00~18:00**

Turnstile Junction Ortho-mode Transducer for W-Band Radar Seeker

Junyong Han[1], Seongsik Yoon[1], Taek K. Lee[1], Jae W. Lee[1], Sungchan Song[2], and Kyunghyun Oh[2]
[1]Korea Aerospace University, Korea, [2]Hanwha Thales, Korea

[P-17] **16:00~18:00**

Koch Snowflake Dielectric Resonator Antenna Loaded with a Circular Metallic Patch for Wideband Applications

Dileep Sankaranarayanan, Duggirala Venkata Kiran, and Biswajeet Mukherjee
PDPM Indian Institute of Information Technology Design and Manufacturing Jabalpur, India

[P-18] **16:00~18:00**

Integrated Optimization Design of Space Deployable Array Antenna Performances Based on Electromechanical Coupling

Congsi Wang[1,2], Jing Mao[1], Jingsheng Cheng[1], Wei Wang[1], Yan Wang[1], Lan Xiao[1], Jianfeng Zhong[3], and Bin Li[3]
[1]Xidian University, China, [2]University of California, USA, [3]Nanjing Research Institute of Electronics Technology, China

[P-19] **16:00~18:00**

Edge Grounding Perforated Triangular Dielectric Resonator Antenna

Nunsawath Ravi Nayak, Dhuna Ram Saini, Ravi Kumar Singh, Dileep Sankaranarayanan, Duggirala Venkata Kiran, and Biswajeet Mukherjee
PDPM Indian Institute of Information Technology Design and Manufacturing Jabalpur, India

[P-20] **16:00~18:00**

A K-band to Ka-band CPW-like Low Loss Transmission Line in 0.18-um CMOS

Cheng-Hung Hsieh and Zuo-Min Tsai
National Chung Cheng University, Taiwan

[P-21] **16:00~18:00**

Design of CRLH Transmission Lines with Stepped Impedance Resonators

Yujiro Kushiyama, Takuji Arima, and Toru Uno
Tokyo University of Agriculture and Technology, Japan

[P-22] **16:00~18:00**

Tapered Dielectric Nanorod Antenna at Optical Wavelengths

Junji Yamauchi, Satoru Honda, and Hisamatsu Nakano
Hosei University, Japan

[P-23] **16:00~18:00**

Switched-Beam Wideband Circularly Polarized 2×2 Antenna Array

Huy Hung Tran and Ikmo Park
Ajou University, Korea

[P-24] **16:00~18:00**

Multiband RF Harvesting Antenna Based on Meta-structured Transmission Line

Kwi Seob Um and Jeong-Hae Lee
Hongik University, Korea

[P-25] 16:00~18:00

Design of PIFA on the Capacitive Grating AMC Structure for SAR Reduction in the Penta-band

Jae-Gon Lee and Jeong-Hae Lee
Hongik University, Korea

[P-26] 16:00~18:00

Circularly Polarized Substrate-Integrated-Waveguide Antenna Array for Millimeter-Wave Handset Device

Seong-Jin Park and Seong-Ook Park
Korea Advanced Institute of Science and Technology, Korea

[P-27] 16:00~18:00

Electromagnetic Analysis of the Von Karman Radome Enclosed Waveguide Slot Array Antenna Based on Ray Tracing and Huygens's Principle

Jihyung Kim[1], Sung Chan Song[1], and Yong Bae Park[2]
[1]Hanwha Thales, Korea, [2]Ajou University

[P-28] 16:00~18:00

A Low-profile, Single-Arm Hexagonal Spiral Arrays with a 3:1 Bandwidth on Ground Plane

Yongduk Oh, Hakjune Lee, and Sangwook Nam
Seoul National University, Korea

[P-29] 16:00~18:00

Gain Enhancement of Microstrip Grid Array Antenna for 5G Applications

W. A. W. Muhamad[1], R. Ngah[1], M. F. Jamlos[2,3], P. J. Soh[2], and H. Lago[2]
[1]Universiti Teknologi Malaysia, Malaysia, [2]Universiti Malaysia Perlis, Malaysia, [3]Universiti Malaysia Pahang, Malaysia

[P-30] 16:00~18:00

Shape Identification of Perfectly Conducting, Arc-Like Crack in Transverse Electric Mode

Won-Kwang Park
Kookmin University, Korea

[P-31] 16:00~18:00

An Algorithm of Subarray Optimization for Low Side-lobe Multi-beam and Monopulse Beams

Heeduck Chae, Je-Woo Yu, and Jongkuk Park
LIG NEX1, Korea

[P-32] 16:00~18:00

Millimeter-wave Planar Microstrip-to-waveguide Transition with Waveguide Connected on Microstrip Signal-line

Kunio Sakakibara, Yuki Ishikawa, Yuta Mizuno, and Nobuyoshi Kikuma
Nagoya Institute of Technology, Japan

[P-33] **16:00~18:00**

Angle Modulated SRR Array as Metasurface for Circular Polarization

Jagannath Malik, Amalendu Patnaik, and M. V. Kartikeyan
Indian Institute of Technology Roorkee, India

[P-34] **16:00~18:00**

Time-domain Performance of Band-notch Techniques in UWB Antenna

Jagannath Malik, Amalendu Patnaik, and M. V. Kartikeyan
Indian Institute of Technology Roorkee, India

[P-35] **16:00~18:00**

Design of Microstrip Patch Antennas with Parasitic Elements for Minimized Polarization Mismatch

Sungjun Yoo, Gangil Byun, and Hosung Choo
Hongik University, Korea

[P-36] **16:00~18:00**

Design of a Periodic Structure to Improve Isolation using Ferrite Mateiral for Small CRPA Arrays

Jun Hur, Gangil Byun, and Hosung Choo
Hongik University, Korea

[P-37] **16:00~18:00**

SAR Reduction of Smart Watch Antenna using Meander Loop Structure

Yohan Lim, Hyengcheul Choi, Byungwoon Jung, and Chisang You
LG Electronics, Korea

[P-38] **16:00~18:00**

A CMOS Active Delay Line using Injection-locking Technique

Kang-Chun Peng[1], Chan-Hung Lee[1], and Tai-Hsuan Tsai[2]
[1]National Kaohsiung First University of Science and Technology, Taiwan, [2]Pegatron Corporation, Taiwan

[P-39] **16:00~18:00**

Channel Measurements and Modeling for 5G Communication Systems at 3.5 GHz Band

Ruisi He[1], Mi Yang[1], Lei Xiong[1], Honghui Dong[1], Ke Guan[1], Danping He[1], Bei Zhang[1], Dan Fei[1], Bo Ai[1], Zhangdui Zhong[1], Zhuyan Zhao[2], Deshan Miao[2], and Hao Guan[2]
[1]Beijing Jiaotong University, China, [2]Nokia, China

[P-40] **16:00~18:00**

A Spectrum Detection Method for Cognitive Radio Networks with Dynamic Noise Properties

Sana Salous[1], Mengwei Sun[2], and Chenglin Zhao[2]
[1]Durham University, UK, [2]Beijing University of Posts and Telecommunications, China

[P-41] **16:00~18:00**

Random Signal Analysis in the Linear Canonical Transform Domain

Liyun Xu, Feng Zhang, Mingfeng Lu, and Xin Wu
Beijing Institute of Technology, China

[P-42] **16:00~18:00**

Compressive Sensing Based Clipping Noise Cancellation for OFDM Systems

Kee-Hoon Kim[1], Hosung Park[2], Jong-Seon No[3], Habong Chung[4], and Dae-Woon Lim[5]
[1]Samsung Electronics, Korea, [2]Chonnam National University, Korea, [3]Seoul National University, Korea, [4]Hongik University, Korea, [5]Dongguk University, Korea

[P-43] **16:00~18:00**

The Test and Strategy Analysis on D+F Network of TD-LTE

Feng Linlin
China Mobile Group Design Institute Co., Ltd. Heilongjiang Branch, China

[P-44] **16:00~18:00**

Gain Enhancement Technique for Bowtie Slot Antenna

Jun Gi Jeong[1], Young Joong Yoon[1], and Hyungrak Kim[2]
[1]Yonsei University, Korea, [2]Daelim University College, Korea

[P-45] **16:00~18:00**

Channel Estimation and Communication Performance Evaluation at 700 MHz using USRP

Chan Ju Park[1], Woojoong Kim[1], Young Joong Yoon[1], and Hyungrak Kim[2]
[1]Yonsei University, Korea, [2]Daelim University College, Korea

[P-46] **16:00~18:00**

Angle Estimation for Non-Uniform Linear Array with Virtual Antenna via Single Transmit Source

Seokhyun Kang[1], Seongwook Lee[1], Heonkyo Sim[1], Jae-eun Lee[1,2], and Seong-Cheol Kim[1]
[1]Seoul National University, Korea, [2]Mando Corporation, Korea

[P-47] **16:00~18:00**

Precoding Design for Two-Way MIMO Relaying with Antenna Selection

Chia-Chang Hu, Bo-Hung Chen, Guan-Fu Liu, Yi-Chi Kao, and Yang-Jun Wang
National Chung Cheng University, Taiwan

[P-48] **16:00~18:00**

Tolerance Analysis of Antenna Array Pattern in the Presence of Array Weights and Element Position Errors

Ying Zhang, Danni Zhao, and Huapeng Zhao
University of Electronic Science and Technology of China, China

[P-49] **16:00~18:00**

Oversampling Analysis of CORR Metric for Selected Mapping Scheme of OFDM Signals

Jun-Young Woo[1], Kee-Hoon Kim[1], Kang-Seok Lee[2], Jong-Seon No[2], and Dong-Joon Shin[3]
[1]Samsung Electronics Co., Ltd., Korea, [2]Seoul National University, Korea, [3]Hanyang University, Korea

[P-50] **16:00~18:00**

Link Availability Analysis for Long-Distance Air-Ground Datalink Communication Systems

Young Jae Ryu[1,2] and Jae Min Ahn[1]
[1]Chungnam National University, Korea, [2]Agency for Defense Development, Korea

[P-51] **16:00~18:00**

Steeply Sloped Microstrip Bandpass Filter with Stepped Impedance Short-Circuited Stub

Minjae Jung and Byung-Wook Min
Yonsei University, Korea

[P-52] **16:00~18:00**

A Low-Complexity PTS Scheme using Adaptive Selection of Dominant Time-Domain Samples in OFDM Systems

Kang-Seok Lee[1], Young-Jeon Cho[1], Jong-Seon No[1], and Dae-Woon Lim[2]
[1]Seoul National University, Korea, [2]Dongguk University, Korea

[P-53] **16:00~18:00**

A Linear HBT Power Amplifier with an IMD3 Reduction Method for LTE-A Small-cell Base-station Applications

Hui Dong Lee, Seunghyun Jang, and Bonghyuk Park
Electronics and Telecommunications Research Institute, Korea

[P-54] **16:00~18:00**

A Self-Powered WSN/IoT Sensor-Node using Self Wake-up and Wireless Power Harvesting Techniques

Won-jae Jung, Ji-hoon Lee, Hyung-il Chae, and Jun-seok Park
Kookmin University, Korea

[P-55] **16:00~18:00**

Smart Beamforming Based Wireless Backhaul for Cost-effective Small Cells

Youngseok Oh[1], Sungmin Cho[1], Jinhyo Park[1], Hyukjun Oh[2], and Heejung Yu[3]
[1]SK Telecom, Korea, [2]Kwangwoon University, Korea, [3]Yeungnam University, Korea

[P-56] **16:00~18:00**

Thermal Empirical Effect on the Kapton-Based Passive Microstrip Circuit

Y. G. Rabobason, B. Ravelo, and N. Benjelloun
ESIGELEC, France

[P-57] **16:00~18:00**

A 2.4-GHz Noncontact Vital-Sign Sensor Based on Two Circulators and Frequency-Modulated/ Injection-Locked VCO

Sen Wang and Ren-Hua Chang
National Taipei University of Technology, Taiwan

[P-58] **16:00~18:00**

Electric Field Measurement with Electro-optic Sensor of High Power W-band Gyrotron

Jong-Won Yang[1], Minwoo Yi[1], Woosang Lee[1], Joonho So[1], Won Jang[1], Jungho Kim[2], Jong-Hyo Won[2], Seok Kim[3], Dong-Joon Lee[3], and Young Joong Yoon[4]
[1]Agency for Defense Development, Korea, [2]LIG NEX1, Korea, [3]Korea Research Institute of Standards and Science, Korea, [4]Yonsei University

[P-59] 16:00~18:00

Simulations of Energy-bands Bending Effect and Carriers Transportation in Semiconductor with Propagating Surface Acoustic Waves

Boqun Dong, Shiqi Guo, and Mona Zaghloul
The George Washington University, USA

[P-60] 16:00~18:00

Penta-band Based Low Noise Amplifier Design for Vehicular Wireless Communications

Ramya Vijay, T. Rama Rao and Revathi Venkataraman
SRM University, India

[P-61] 16:00~18:00

A Novel Method for the Design of Broadband Class E Power Amplifier with Contiguous Diplexer

Ninh Dang-Duy and Chulhun Seo
Soongsil University, Korea

[P-62] 16:00~18:00

SOI LDMOS Power Amplifier for WLAN

Gwanghyeon Jeong, Seunghun Wang, and Songcheol Hong
Korea Advanced Institute of Science and Technology, Korea

[P-63] 16:00~18:00

Overlooked Phenomena in Reflex Oscillators

Amit K Varshney[1], B N Biswas[1], and Arindum Mukherjee[2]
[1]Supreme Knowledge Foundation Group of Institutions, India, [2]Coimbatore Institute of Technology, India

[P-64] 16:00~18:00

Calibration on the Detection Efficiency of the Si-APD and InGaAs-APD Single-photon Detectors by Correlated Photon Pairs

Xueshun Shi[1], Kun Zhao[1], Changming Liu[1], Haidong Chen[1], Kunfeng Chen[1], and Haiyong Gan[2]
[1]The 41st Institute of China Electronic Technology Group Corporation, China, [2]National Institute of Metrology, China

[P-65] 16:00~18:00

Fabrication of 0.15 μm Recessed AlGaN/GaN MIS-HEMTs on Si Substrate

Donghwan Kim[1], Junseok Jeong[1], Kwang-Seok Seo[1], and Ho-Young Cha[2]
[1]Seoul National University, Korea, [2]Hongik University, Korea

[P-66] 16:00~18:00

Optical Diffuse Reflectance of Black Silicon and Its Isotropicity

Ahmed Elsayed[1], Yasser M. Sabry[1], Diaa Khalil[1], Frédéric Marty[2], and Tarik Bourouina[2]
[1]Ain Shams University, Egypt, [2]Université Paris-Est, France

[P-67] 16:00~18:00

A Broadband Darlington Power Amplifier using 0.5 μm GaN-on-SiC HEMT Process

Min-Li Chou, Hong-Kun Wang, Hsien-Chin Chiu, and Fan-Hsiu Huang
Chang Gung University, Taiwan

[P-68] **16:00~18:00**

Wavelength Selective Dual-band Mid-infrared Metamaterial Absorber/emitter

Jitendra Kumar Pradhan[1], S. Anantha Ramakrishna[1], and Achanta Venu Gopal[2]
[1]Indian Institute of Technology, India, [2]Tata Institute of Fundamental Research, India

[P-69] **16:00~18:00**

The Laser Scattering and Statistical Characteristics of Moving Ice Crystal Particles Which Have Rarefied Random Distribution

Mingjun Wang[1,3], Ke Xizheng[3], Ying leLi[2], and Wang Jiao[3]
[1]Xian Yang Normal College, China, [2]Shaanxi Xueqian Normal University, China, [3]Xi'an University of Technology, China

[P-70] **16:00~18:00**

The Delay Spread Characteristics of 28GHz Band at LOS Environments

Jong Ho Kim, YoungKeun Yoon, and Young Jun Chong
Electronics and Telecommunications Research Institute, Korea

[P-71] **16:00~18:00**

Propagation Characteristics for the Corner Link in Urban Hotspot Environment

YoungKeun Yoon, JongHo Kim, and YoungJun Chong
Electronics and Telecommunications Research Institute, Korea

[P-72] **16:00~18:00**

Complexity in Seasonal Dynamics of Surface Radio Refractivity Across Different Climatic Zones of Nigeria

Ogunjo S. T., Fuwape I. A., Oluyamo S. S., Akinpelu S. B
Federal University of Technology, Nigeria

[P-73] **16:00~18:00**

Improving the Wireless Communication System at a Large Antwerp Car Factory

Emmanuel Van Lil and Iris De Coster
Katholieke Universiteit Leuven, Belgium

[P-74] **16:00~18:00**

Estimation of Interfade Duration for Ku- and Ka-Band Satellite Communication System in Equatorial Malaysia

Mawarni Mohamed Yunus[1,2], Jafri Din[2], Hong Yin Lam[3], and Siat Ling Jong[3]
[1]Universiti Teknikal Malaysia Melaka, Malaysia, [2]Universiti Teknologi Malaysia, Malaysia, [3]Universiti Tun Hussein Onn Malaysia, Malaysia

[P-75] **16:00~18:00**

Measurement and Analysis of Weather Phenomena with K-Band Rain Radar

Jun-Hyeong Park[1], Ki-Bok Kong[2], and Seong-Ook Park[1]
[1]Korea Advanced Institute of Science and Technology, Korea, [2]Kukdong Telecom, Korea

[P-76] **16:00~18:00**

Microwave Sub-surface Imaging using Scattered-field Calibration Technique

Greeshmaja Govind and M. J. Akhtar
Indian Institute of Technology, India

[P-77] **16:00~18:00**

Cloud Observation using the Ka Band Cloud Radar of CUIT

Xuehua Li[1], Jianxin He[1], Ling Yang[1], Debin Su[1], Zhendong Yao[1], Zhao Shi[1], V. Chandrasekar[2], and Haonan Chen[2]
[1]Chengdu University of Information Technology, China, [2]Colorado State University, USA

[P-78] **16:00~18:00**

Radio Link Performance Investigation for UWB Wireless Communication in Indoor Environment

Susila M, RamaRao T, and Pushpalatha M
SRM University, India

[P-79] **16:00~18:00**

Analysis of Ionospheric Variations over East Asian Area with Empirical Orthogonal Function (EOF)

Jianchang Zheng and Biqiang Zhao
Institute of Geology and Geophysics, China

[P-80] **16:00~18:00**

Compact Way of the Ionosphere Layers Critical Frequency Detection

Kamil Yusupov and Adel Akchurin
Kazan Federal University, Russia

[P-81] **16:00~18:00**

The Onset Time of Equatorial Plasma Bubbles and Its Relationship with Pre-reversal Enhancement

J.-M. Choi[1,2], H. Kil[3], Y.-S. Kwak[2], and Y.-H. Kim[1]
[1]Chung-nam National University, Korea, [2]Korea Astronomy and Space Science Institute, Korea, [3]The Johns Hopkins University Applied Physics Laboratory, USA

[P-82] **16:00~18:00**

Case Study: Observation of the EMIC Wave by External Source in the Outer Magnetosphere

Sung-Hwan Lee[1], Dong-Hun Lee[1], Jiwon Choi[1], Khan-Hyuk Kim[1], Ensang Lee[1], Hyomin Kim[2], Eun-Hwa Kim[3], Jay R. Johnson[3]
[1]Kyung Hee University, Korea, [2]New Jersey Institute of Technology, USA, [3]Princeton Plasma Physics Laboratory, USA

[P-83] **16:00~18:00**

Coherent EMIC Waves and Pitch Angle Scattering of Energetic Electrons in the Magnetosphere

Remya Bhanu[1], K. H. Lee[1], L. C. Lee[1], and B. T. Tsurutani[2]
[1]Institute of Earth Sciences, Taiwan, [2]California Institute of Technology, USA

[P-84] **16:00~18:00**

Transfer of Real-time Dynamic Radiation Environment Assimilation Model (rtDREAM); Research to Operation

Junga Hwang[1], Dae-Kyu Shin[1], Gi-Jeong Kim[1], Steeve Morley[2], Mike Henderson[2], Reiner Friedel[2], Geoff Reeves[2], Taeyoung Kim[3], Seok-Hyeon Byeon, Myungjin Choi[3], KiChang Yoon[4], and Sunhak Hong[4]
[1]Korea Astronomy and Space Science Institute, Korea, [2]Los Alamos National Laboratory, USA, [3]InSpace.co.,ltd, Korea, [4]Korean Space Weather Center, Korea

[P-85] **16:00~18:00**

Determining the Statistical Significance of Relativistic Electron Precipitation Related to EMIC Waves

Dae-Kyu Shin[1], Dae-Young Lee[1], Sung-Jun Noh[1], Junga Hwang[2], and Jaejin Lee[2]
[1]Chungbuk National University, Korea, [2]Korea Astronomy and Space Science Institute, Korea

[P-86] **16:00~18:00**

A Statistical Study of EMIC Waves Observed by THEMIS Probes in the Outer Magnetosphere under Quiet Geomagnetic Conditions

Gi-Jeong Kim[1], Khan-Hyuk Kim[1], Dong-Hun Lee[1], Ensang Lee[1], Jong-Sun Park[2], Junga Hwang[3], and Ki-Chang Yoon[4]
[1]Kyung Hee University, Korea, [2]National Central University, Korea, [3]Korea Astronomy and Space Science Institute, Korea, [4]Korea Space Weather Center, Korea

[P-87] **16:00~18:00**

Electron Plasma β Dependence of Development of Whistler Instability: PIC Simulations

Sang-Yun Lee, Ensang Lee, Khan-Hyuk Kim, Dong-Hun Lee, and Jongho Seon
Kyung Hee University, Korea

[P-88] **16:00~18:00**

Current Status and Planning of the Plasma Wave Experiment (PWE) Onboard the ERG Satellite

Yoshiya Kasahara[1], Yasumasa Kasaba[2], Hirotsugu Kojima[3], Satoshi Yagiitani[1], Tomohiko Imachi[1], Mistunori Ozaki[1], Syoya Matsuda[1], Keigo Ishisaka[4], Fuminori Tsuchiya[2], and Atsushi Kumamoto[2]
[1]Kanazawa University, Japan, [2]Tohoku University, Japan, [3]Kyoto Univeristy, Japan, [4]Toyama Prefectural University

[P-89] **16:00~18:00**

A Plan for Two-element Solar Radio Spectra-Interfermeter

Lihong Geng, Yihua Yan, Zhijun Chen, Wei Wang, Donghao Liu, Linjie Chen, Long Xu, and Fei Liu
National Astronomical Observatories, China

[P-90] **16:00~18:00**

IPS Test Observation with DVAC

Liu Lijia, Liu Bin, Yu Lei, and Ma Yue
National Astronomical Observatories, China

[P-91] **16:00~18:00**

Renewal of Taeduk Radio Astronomy Observatory

Hyunwoo Kang, Changhoon Lee, Jae Hoon Jung, Young Sik Kim, Il-Gyo Jeong, Youngung Lee, Do-Heung Je, and Seungrae Kim
Korea Astronomy and Space Science Institute, Korea

[P-92] **16:00~18:00**

Q-Band Waveguide Orthomode Transducer for Radio Astronomical Receiver Application

Chih-Ming Yang[1], Yo-Shen Lin[1], Chau-Ching Chiong[2], and Chih-Cheng Chang[2]
[1]National Central University, Taiwan, [2]Institute of Astronomy and Astrophysics, Taiwan

[P-93] **16:00~18:00**

Research and Development of Risk Analysis System for Aerospace Radiation

Taeyoung Kim[1], SeokHyeon Byeon[1], Yoonhee Oh[1], Myungjin Choi[1], and Kichang Yoon[2]
[1]InSpace.Co.,Ltd, Korea, [2]Korean Space Weather Center

[P-94] **16:00~18:00**

Noise Temperature and IF Bandwidth of a 1.4 THz Superconducting HEB Mixer

K. M. Zhou[1], W. Miao[1], S. C. Shi[1], R. L.efevre[2], and Y. Delorme[2]
[1]Purple Mountain Observatory, China, [2]Observatoire de Paris, France

[P-95] **16:00~18:00**

Effect of Al Cap Layer on Nb-Al-AlOx-Al-Nb Josephson Junction with High Critical Current Density

Ming-Jye Wang, Yen-Pin Chang, Tse-Jun Chen, and Wei-Chun Lu
Academia Sinica, Taiwan

[P-96] **16:00~18:00**

Analysis of Asymmetric Resonatance Response in Kinetic Inductance Detector with Mismatched Transmission Line

Jin-Ping Yang, Zhen-hui Lin, and Sheng-Cai Shi
Purple Mountain Observatory, China

[P-97] **16:00~18:00**

Polarization Simulation for Mingantu Ultrawide SpEctral Radioheliograph

Cang Su, Wei Wang, and Yihua Yan
National Astronomical Observatories, Chinese Academy of Sciences

[P-98] **16:00~18:00**

Relationship between the Intensity of Type II Radio Bursts and Coronal Shock Strength

Nai-Hwa Chen[1], P. F. Chen[2], Kyung-Suk Cho[1], and Rok-Soon Kim[1]
[1]Korea Astronomy and Space Science Institute, Korea, [2]Nanjing University, China

[P-99] **16:00~18:00**

Effects of Long-term Exposure to 0.3 THz in Human Eye Cells

Shin Koyama[1], Eijiro Narita[1], Yoko Shimizu[1], Naoki Shinohara[1], Junji Miyakoshi[1], Takeo Shiina[2], and Masao Taki[2]
[1]Kyoto University, Japan, [2]Tokyo Metropolitan University

[P-100] **16:00~18:00**

Evaluation of SARs in a Human-body Model Due to Smart-watch Wearable Device

Seon-eui Hong and Jong-Hwa Kwon
Electronics and Telecommunication Research Institute, Korea

[P-101] **16:00~18:00**

Development of the Exposure Apparatus of Intermediate Frequency Magnetic Field for Mice and Biological Effects on Blood Properties

Akira Ushiyama[1], Naoki Kunugita[1], Kenji Hattori[2], Kazuyuki Ishii[2], Yoko Iwanami[2], Shin Ohtani[2], Yukihisa Suzuki[3], Keiji Wada[3], Kazuki Matsubara[3], Tatsuya Terai[3], and Hajime Yoshino[3]
[1]National Institute of Public Health, Japan, [2]Meiji Pharmaceutical University, Japan, [3]Tokyo Metropolitan University

[P-102] **16:00~18:00**

Evaluation of Exposure from Mobile Phone Base Stations and Comparison with the Exposure from a Third Generation Mobile Phone

Yumi Niinuma[1], Masao Taki[1], Miwa Ikuyo[1], Kaoru Esaki[1], Masaki Hagiwara[1], Tomoaki Nagaoka[2], and Kanako Wake[2]
[1]Tokyo Metropolitan University, Japan, [2]National Institute of Information and Communications Technology, Japan

[P-103] **16:00~18:00**

A Matrix Form Representation of 3-D Impedance Method for Calculations of Induced Electric Fields and Currents

Tomoaki Mori, Yukihisa Suzuki, and Masao Taki
Tokyo Metropolitan University, Japan

[P-104] **16:00~18:00**

Eight Hours of Nocturnal 915 MHz Radiofrequency Identification (RFID) Exposure Reduces Urinary Levels of Melatonin and Its Metabolite via Pineal Arylalkylamine N-acetyltransferase Activity in Male Rats

Hye Sun Kim[1], Yu Hee Lee[1], Man-Jeong Paik[2], Yun-Sil Lee[3], Hyung Do Choi[4], Jong Hwa Kwon[4], Jeong-Ki Pack[5], Nam Kim[6], and Young Hwan Ahn[1]
[1]Ajou University School of Medicine, Korea, [2]Sunchon National University, Korea, [3]Ewha Women's University, Korea, [4]Electronics and Telecommunications Research Institution, Korea, [5]Chungnam National University, Korea, [6]Chungbuk National University, Korea

[P-105] **16:00~18:00**

Evaluating Human Exposure to Electromagenetic Field Radiated by the Commercial Wireless Power Charging Device

Jun-Seok Kang[1], Byeong-Nam Kang[1], Seungwoo Lee[1], Nam Kim[1], Ic-Pyo Hong[2], and In-Kui Cho[3]
[1]Chungbuk National University, Korea, [2]Kongju National University, Korea, [3]Electronics and Telecommunications Research Insititute, Korea

[P-106] **16:00~18:00**

Research of Shielding Structure for Reducing Leakage Magnetic Field from Low Power Wireless Charging Coil

Jongchan Kim[1], Seungwoo Lee[1], Domin Choi[1], Nam Kim[1], Ic-Pyo Hong[2], and In-Kui Cho[3]
[1]Chungbuk National University, Korea, [2]Kongju National University, Korea, [3]Electronics and Telecommunications Research Insititute, Korea

[P-107] **16:00~18:00**

Generating Propulsion Force in Micro-robot using Wireless Power Transfer System

Dongwook Kim, Jaehyoung Park, Karam Hwang, and Seungyoung Ahn
Korea Astronomy and Space Science Institute, Korea

Session Title	[S-B8] Negative Group Delay (NGD) Devices and Its Applications
Date and Time	August 25 (Thu.) / 08:30~10:30
Room	Room A (Emerald A)
Session Organizer	Blaise Ravelo (ESIGELEC) Yongchae Jeong (Chonbuk National University)
Session Chairs	Blaise Ravelo (ESIGELEC) Yongchae Jeong (Chonbuk National University)

[S-B8-1] **08:30~08:50**

[Invited] Resistive and Distributed Multiband NGD Active Circuit

B. Ravelo
IRSEEM, France

[S-B8-2] **08:50~09:10**

[Invited] A Power Divider with Positive and Negative Group Delay Characteristics

Girdhari Chaudhary, Phirun Kim, Junhyung Jeong, and Yonchae Jeong
Chonbuk National University, Korea

[S-B8-3] **09:10~09:30**

[Invited] Microwave Transversal and Recursive-filter based Negative Group Delay Circuits and Non-Foster Elements

Chung-Tse Michael Wu
Wayne State University, USA

[S-B8-4] **09:30~09:50**

[Invited] A Compact MIMO Antenna with High Isolation for S, C and V Band Applications

Malay R. Tripathy[1], Vipin Choudhary[1], Aastha Gupta[1], and Yongchae Jeong[2]
[1]Amity University, India, [2]Chonbuk National University, Korea

[S-B8-5] **09:50~10:10**

[Invited] Millimeter-Wave Negative Group Delay Network

William J. Otter, Stephen M. Hanham, Norbert Klein, and Stepan Lucyszyn
Imperial College London, UK

[S-B8-6] **10:10~10:30**

[Invited] Precision E-field Uniformity Measurement of a Probe Loaded TEM Cell using an Optical Probe

Takehiro Moirioka[1], Satoru Kurokawa[1], Yoshikazu Toba[2], and Jun Ichijyo[2]
[1]National Institute of Industrial Science and Technology, Japan, [2]Seikoh Giken Co., Ltd., Japan

Session Title	[B2] Fields and Waves Metamaterials
Date and Time	August 25 (Thu.) / 08:30~10:10
Room	Room B (Emerald B)
Session Chair	Sungtek Kahng (Incheon National University)

[B2-1] **08:30~08:50**

A High Gain Wideband Patch Antenna using Zero-Index Based Multilayer Metamaterial Structure

B. Majumder[1], Krishnamoorthy K.[1], J. Mukherjee[1], and K. P. Ray[2]
[1]Indian Institute of Technology, India, [2]Society for Applied Microwave Electronic Engineering and Research, India

[B2-2] **08:50~09:10**

A Microwave Metamaterial Absorber with Wide Bandwidth

Somak Bhattacharyya[1], Saptarshi Ghosh[2], and Kumar Vaibhav Srivastva[2]
[1]Indian Institute of Information Technology, India, [2]Indian Institute of Technology, India

[B2-3] **09:10~09:30**

Broadband Characterization of Efficient Subwavelength-Profile Circularly Polarized Crossed Dipole Antenna on a Finite EBG Surface

Son Xuat Ta and Ikmo Park
Ajou University, Korea

[B2-4] **09:30~09:50**

A Compact Wideband Concentric SRR-based Metamaterial Antenna with Dual-band Characteristics

Sameer Kumar Sharma[1], Chan-Wang Park[2], and Raghvendra Kumar Chaudhary[1]
[1]Indian School of Mines Dhanbad, India, [2]University of Quebec, Canada

[B2-5] **09:50~10:10**

Thin AMC-Backed Printed Loop Antenna for ISM Band with Improved Antenna Performance and Lower SAR

Muhammad Kamran Khattak and Sungtek Kahng
Incheon National University, Korea

Session Title	[S-J6b] Science and Technology for Solar and Heliophysics (2)
Date and Time	August 25 (Thu.) / 08:30~10:30
Room	Room C (Diamond)
Session Organizer	Kyungsuk Cho (Korea Astronomy and Space Science Institute) Yihua Yan (Chinese Academy of Sciences)
Session Chairs	Kyungsuk Cho (Korea Astronomy and Space Science Institute) Yihua Yan (Chinese Academy of Sciences)

[S-J6b-1] **08:30~08:50**

[Invited] Current Trends in Solar Radiophysics

Valery M. Nakariakov
University of Warwick, UK

[S-J6b-2] **08:50~09:10**

[Invited] Solar Type III Bursts Observed with LOFAR

Hamish A. S. Reid
University of Glasgow, UK

[S-J6b-3] **09:10~09:30**

Characteristics of Radio-Loud CMEs

Pankaj Kumar[1], P. K. Manoharan[2], and K. S. Cho[1]
[1]Korea Astronomy and Space Science Institute, Korea, [2]The National Centre for Radio Astrophysics, India

[S-J6b-4] **09:30~09:50**

Coronal Electron Density Distributions Estimated from Coronal Mass Ejections, Deca-Hectometric Type II Radio Bursts, and Polarized Brightness Measurements

Jae-Ok Lee and Y. -J. Moon
Kyung Hee University, Korea

[S-J6b-5] **09:50~10:10**

On the Directivity of Low-Frequency Type IV Radio Bursts

N. Gopalswamy[1], S. Akiyama[1], P. Mäkelä[1], S. Yashiro[1], and I. H. Cairns[2]
[1]NASA Goddard Space Flight Center, USA, [2]University of Sydney, Australia

[S-J6b-6] **10:10~10:30**

A Study of the 2012 January 19 Complex Type II Radio Burst using Wind, SOHO, and STEREO Observations

T. B. Teklu[1], N. Gopalswamy[2], A. V. Gholap[1], S. Yashiro[2], P. Mäkelä[2], S. Akiyama[2], N. Thakur[2], and H. Xie[2]
[1]Addis Ababa University, Ethiopia, [2]NASA Goddard Space Flight Cente, USA

Session Title	[S-K5a] Biomedical Applications of EM Wave (1)
Date and Time	August 25 (Thu.) / 08:30~10:30
Room	Room D (Convention A)
Session Organizer	Jeong-Ki Pack (Chungnam National University) Jianqing Wang (Nagoya Institute of Technology)
Session Chairs	Jeong-Ki Pack (Chungnam National University) Jianqing Wang (Nagoya Institute of Technology)

[S-K5a-1] **08:30~08:50**

[Invited] BER Performance Improvement for 30 MHz Band Implant Communication using Equalization Technique

Kohei Nomura, Daisuke Anzai, and Jianqing Wang
Nagoya Institute of Technology, Japan

[S-K5a-2] **08:50~09:10**

[Invited] Design of Wireless Transmitter of Myoelectric Signal for Myoelectric Hand Control

Hidenao Ando, Daisuke Anzai, and Jianqing Wang
Nagoya Institute of Technology, Japan

[S-K5a-3] **09:10~09:30**

[Invited] Development of Microwave Surgical Devices with Tissue Coagulation Detecting Mechanism

Kazuyuki Saito, Naoyuki Ogasawara, and Koichi Ito
Chiba University, Japan

[S-K5a-4] **09:30~09:50**

[Invited] RF Biosensor for Biomolecule Detection

Hee-Jo Lee[1] and Jong-Gwan Yook[2]
[1]Daegu University, Korea, [2]Yonsei University, Korea

[S-K5a-5] **09:50~10:10**

[Invited] Design of An Antenna for Brain Stroke Localization

Juneseok Lee, Seongkyu Lee, and Jaehoon Choi
Hanyang University, Korea

[S-K5a-6] **10:10~10:30**

[Invited] Realization of a Portable Breast-Cancer Detection System using Microwave

Woo-Geun Kang[1], Soon-Ik Jeon[2], Hyuk-Je Kim[2], and Jeong-Ki Pack[1]
[1]Chungnam National University, Korea, [2]Elecctronics and Telecommunications Research Institute, Korea

Session Title	[S-E5] EMC and Information Security
Date and Time	August 25 (Thu.) / 08:30~10:30
Room	Room E (Convention B)
Session Organizer	Jong-Gwan Yook (Yonsei University) Yu-Ichi Hayashi (Tohoku Gakuin University)
Session Chairs	Jong-Gwan Yook (Yonsei University) Yu-Ichi Hayashi (Tohoku Gakuin University)

[S-E5-1] **08:30~08:50**

[Invited] Circuit-Level Information Leakage Prevention for Fault Detection

Kazuo Sakiyama, Reina Yagasaki, Takanori Machida, and Tatsuya Fujii
The University of Electro-Communications, Japan

[S-E5-2] **08:50~09:10**

[Invited] Introduction to a Special Session on EMC and Information Security

Yu-ichi Hayashi[1] and Jong-Gwan Yook[2]
[1]Tohoku Gakuin University, Japan, [2]Yonsei Univserity, Korea

[S-E5-3] **09:10~09:30**

[Invited] Analysis of Information Leakage from Display Devices with LCD

Ho Seong Lee[1], Kyuhong Sim[2], and Jong-Gwan Yook[1]
[1]Yonsei University, Korea, [2]LIG NEX1, Korea

[S-E5-4] **09:30~09:50**

[Invited] Reconstruction of Leaked Signal from USB Keyboards

Hyo-Joon Choi[1], Ho Seong Lee[1], Dongjoo Sim[1], Kyuhong Sim[2], and Jong-Gwan Yook[1]
[1]Yonsei University, Korea, [2]LIG NEX1, Korea

[S-E5-5] **09:50~10:10**

[Invited] Security Deterioration of Advanced Encryption Standard Circuit by Fluctuations of Side-Channel Traces in Fault Analysis Attack

Shinsuke Horinouchi[1], Kengo Iokibe[1], Hiroto Kagotani[1], Tetsushi Watanabe[2], and Yoshitaka Toyota[1]
[1]Okayama University, Japan, [2]Okayama Prefecture, Japan

[S-E5-6] **10:10~10:30**

[Invited] New Metric for Side-Channel Information Leakage: Case Study on EM Radiation from AES Hardware

Momoka Kasuya, Takanori Machida, and Kazuo Sakiyama
The University of Electro-Communications, Japan

Session Title	[C4] Channel Model, Antenna and Propagation (2)
Date and Time	August 25 (Thu.) / 08:30~10:30
Room	Room F (Convention C)
Session Chairs	Minseok Kim (Niigata University) Dongho Kim (Sejong University)

[C4-1] **08:30~08:50**

Simulation Based Mm-Wave Channel Model For Outdoor Open Area Access Scenarios

Minseok Kim[1], Tatsuki Iwata[1], Kento Umeki[1], Karma Wangchuk[2], Jun-ichi Takada[2], and Shigenobu Sasaki[1]
[1]Niigata University, Japan, [2]Tokyo Institute of Technology, Japan

[C4-2] **08:50~09:10**

A Novel Method to Reduce Physical Dimensions of Reflectarray Antennas using Near-field Feeding

Soo-Bean Cho, Eon-Seok Jo, and Dongho Kim
Sejong University, Korea

[C4-3] **09:10~09:30**

Comparative Study of Broadcasting Antenna Array Optimization using Evolutionary Algorithms

Pavlos I. Lazaridis[1], Emmanouil Tziris[2], Zaharias D. Zaharis[3], Thomas Xenos[3], Violeta Holmes[1], John P. Cosmas[2], and Ian A. Glover[1]
[1]University of Huddersfield, UK, [2]Brunel University, UK, [3]Aristotle University of Thessaloniki, Greece

[C4-4] **09:30~09:50**

Performance Analysis of LTE Multi-Antenna Technology in Live Network

Yunesung Kim, Ohyeoul Choi, Younglak Kim, and Jinhyo Park
SK Telecom, Korea

[C4-5] **09:50~10:30**

[Keynote] Measurement-Based Millimeter-Wave Wideband Channel Characteristics for 5G Communication Systems

Hyun Kyu Chung
Electronics and Telecommunications Research Institute, Korea

Session Title	[G1] Radio Wave Propagation
Date and Time	August 25 (Thu.) / 08:30~09:50
Room	Room G (Convention D)
Session Chair	Iwona Stanislawska (Polish Academy of Sciences)

[G1-1] **08:30~08:50**

VLF Modal Interference Distance for a West-East Propagation Path to Fiji

Atishnal Elvin Chand and Sushil Kumar
The University of the South Pacific, Fiji

[G1-2] **08:50~09:10**

Estimation of the Nighttime Height of the Lower Ionosphere using VLF Waves Propagation

Jorge Samanes[1], Jean-Pierre Raulin[2], and Cao Jinbin[1]
[1]Beihang University, China, [2]Universidade Presbiteriana Mackenzie, Brazil

[G1-3] **09:10~09:30**

Wide-Angle Generalization of Integral Representation as Double Weighted Fourier Transform in the Problem of Wave Reflection from a Randomly Inhomogeneous Ionospheric Layer

Mikhail V. Tinin[1] and Sergei I. Knizhin[2]
[1]Institute of Solar-Terrestrial Physics, Russia, [2]Irkutsk State University, Russia

[G1-4] **09:30~09:50**

Investigation of Optical Path Functional for High and Low Ionospheric Radio Rays

Igor A. Nosikov[1], Maxim V. Klimenko[2], Pavel F. Bessarab[3], and Gennady A. Zhbankov[4]
[1]Immanuel Kant Baltic Federal University, Russia, [2]West Department of IZMIRAN, Russia, [3]Royal Institute of Technology KTH, Sweden, [4]Southern Federal University, Russa

Session Title	[S-HG1b] Effects of Wave-Particle Interactions in Earths Magnetosphere and Upper Atmosphere (2)
Date and Time	August 25 (Thu.) / 08:30~10:30
Room	Room H (Convention E)
Session Organizer	Wen Li (University of California) Ondrej Santolik (The Czech Academy of Sciences)
Session Chairs	Wen Li (University of California) Ondrej Santolik (The Czech Academy of Sciences)

[S-HG1b-1] **08:30~08:50**

[Invited] Nonlinear Wave-Particle Interactions in the Radiation Belts

Yoshiharu Omura
Kyoto University, Japan

[S-HG1b-2] **08:50~09:10**

[Invited] Interactions of Energetic Particles With Ulf Waves In The Magnetosphere

Qiugang Zong
Peking University, China

[S-HG1b-3] **09:10~09:30**

[Invited] Data Assimilative Model of the Plasmasphere: Recent Advances on PLASMON Project

János Lichtenberger[1,2], Anders M. Jörgensen[3], Balázs Heilig[4], Dávid Koronczay[2], Mark A. Clilverd[5], Massimo Vellante[6], Jyrki Manninen[7], Craig J. Rodger[8], Andrew B. Collier[9], Jan Reda[10], Robert H. Holzworth[11], and Reinhard Friedel[12]
[1]Eötvös University, Hungary, [2]Geodetic and Geophysical Institute, Hungary, [3]New Mexico Institute of Mining and Technology, USA, [4]Geological and Geophysical Institute of Hungary, Hungary, [5]British Antarctic Survey, UK, [6]University of L'Aquila, Italy, [7]Sodankyla Geophysical Observatory, Finland, [8]University of Otago, New Zealand, [9]Exegetic Analytics, South Africa, [10]Geophysical Institute of Polish Academy of Sciences, Poland, [11]University of Washington, USA, [12]Los Alamos National Laboratory, USA

[S-HG1b-4] **09:30~09:50**

[Invited] Geospace Exploration Project ERG

Y. Miyoshi[1], I. Shinohara[2], T. Takashima[2], K. Asamura[2], H. Matsumoto[2], N. Higashio[2], T. Mitani[2], S. Yokota[2], S. Kasahara[2], S. Wang[3], Y. Kazama[3], M. Hirahara[1], Y. Kasahara[4], Y. Kasaba[5], S. Yagitani[4], A. Matsuoka[2], H. Kojima[6], Y. Katoh[5], K. Shiokawa[1], and K. Seki[7]
[1]Nagoya University, Japan, [2]Japan Aerospace Exploration Agency, Japan, [3]Institute of Astronomy and Astrophysics, Academia Sinica, Taiwan, [4]Kanazwa University, Japan, [5]Tohoku University, Japan, [5]Kyoto University, Japan, [6]Kyoto University, Japan, [7]Sodankyla Geophysical Observatory, Finland, [8]University of Otago, New Zealand, [9]Exegetic Analytics, South Africa, [10]Geophysical Institute of Polish Academy of Sciences, Poland, [11]University of Washington, USA, [12]Los Alamos National Laboratory, USA

[S-HG1b-5] **09:50~10:10**

[Invited] Challenges of Space Borne Radio Diagnostics

Hanna Rothkaehl
Centrum Badań Kosmicznych, Poland

[S-HG1b-6] **10:10~10:30**

[Invited] Effects of Dipole Geometry on the Lifetime of Poloidal Alfvén Waves

Jiwon Choi, Dong-Hun Lee, Khan-Hyuk Kim, and Ensang Lee
Kyung Hee University, Korea

Session Title	[A4] Communication Related Metrology
Date and Time	August 25 (Thu.) / 08:30~10:30
Room	Room I (Crane)
Session Chair	Qian Nan Lu (Yunnan University)

[A4-1] **08:30~08:50**

Non-contact PIM Measurement of Large Samples using a Small Anechoic Box

Hirotaka Suzuki and Nobuhiro Kuga
Yokohama National University, Japan

[A4-2] **08:50~09:10**

A Method for On-line Measurment and Calibration of Fixed Radio Monitoring Stations

Qian Nan Lu[1,2], Jing Jing Yang[1], Hao Tang[2], Zhao Yuan Jin[2], De Zhang Chen[2], and Ming Huang[1]
[1]Yunnan University, China, [2]Yunnan Provincial Industry and Information Technology Commission, China

[A4-3] **09:10~09:30**

Electrical Characteristics of and E-field Distribution in CTL (Coupled-Transmission-Line) Cell for SAR Measurement Probe Calibration at 150 MHz

Yoon Myoung Gimm[1], Samyoung Chung[2], Kihwea Kim[2], and Judong Jang[2]
[1]Dankook University, Korea, [2]Ministry of Science, ICT and Future Planning, Korea

[A4-4] **09:30~09:50**

Design of a Single-Radiator Multi-Port Antenna for Adaptive Beamforming Applications

Gangil Byun and Hosung Choo
Hongik University, Korea

[A4-5] **09:50~10:10**

A Novel Design of 0.8−1.2GHz Negative Impedance Converter Circuit

NgocDuc Au and Chulhun Seo
Soongsil University, Korea

[A4-6] **10:10~10:30**

The Effects of Antenna Position on RF Exposed Human Head

Funda Cırık Acıkaya[1], Mehmet Fatih Çelebi[1], Fulya Çallıalp Kunter[1], and Şaban Selim Şeker[2]
[1]Marmara University, Turkey, [2]Bogazici University, Turkey

Session Title	[S-DBC1] Optical, Electrical and Optoelectronic Generation and Distribution of Microwave Signal
Date and Time	August 25 (Thu.) / 08:30~10:30
Room	Room J (Swan)
Session Organizer	B N Biswas (Sir J. C School of Engineering) Arindum Mukherjee (Central Institute of Technology)
Session Chairs	B N Biswas (Sir J. C School of Engineering) Arindum Mukherjee (Central Institute of Technology)

[S-DBC1-1] **08:30~08:50**

[Invited] Elimination Of The Deleterious Effect Of using Bandpass Filter In Heterodyne PLL Demodulator

B N Biswas[1], Amit K Varshney[1], and Tulika Mehta[2]
[1]Supreme Knowledge Foundation Group of Institutions, India, [2]Fortune Consultancy Services, India

[S-DBC1-2] **08:50~09:10**

[Invited] Compact Wideband Dual Frequency (Dual Band) Microstrip Patch Antenna for Wireless Communications

Sunandan Bhunia[1], Avisankar Roy[2], and Partha Pratim Sarkar[3]
[1]Central Institute of Technology, India, [2]Haldia Institute of Technology, India, [3]University of Kalyani, India

[S-DBC1-3] **09:10~09:30**

[Invited] Locking Characteristics of a Modified Heterodyne Phase-Lock Loop

Arindum Mukherjee[1], A. Varseney[2], Tulika Mehta[3], and B N Biswas[2]
[1]Central Institute of Technology, India, [2]Supreme Knowledge Foundation Group of Institutions, India, [3]Fortune Consultancy Services, India

[S-DBC1-4] **09:30~09:50**

[Invited] Study on the Complex Dynamics of a Single Loop Optoelectronic Oscillator

Dia Ghosh[1], Arindum Mukherjee[2], Nikhil Ranjan Das[3], and Baidya Nath Biswas[4]
[1]Siliguri Institute of Technology, India, [2]Central Institute of Technology, India, [3]Calcutta University, India, [4]SKF Group of Institutions, India

[S-DBC1-5] **09:50~10:10**

[Invited] False Lock Elimination in Heterodyne PLL using Phase Frequency Control

Arindum Mukherjee[1], A. Varseney[2], Tulika Mehta[3], and B N Biswas[2]
[1]Central Institute of Technology, India, [2]Supreme Knowledge Foundation Group of Institutions, India, [3]Fortune Consultancy Services, India

[S-DBC1-6] **10:10~10:30**

[Invited] Hysteresis And Jump Phenomena In Reflex Oscillators

B N Biswas[1], Amit K Varshney[1], and Arindum Mukherjee[2]
[1]Supreme Knowledge Foundation Group of Institutions, India, [2]Central Institute of Technology, India

Session Title	[S-F5] Radio Wave Propagation Aspects in Body Area Networks
Date and Time	August 25 (Thu.) / 08:30~10:10
Room	Room K (White Heron)
Session Organizer	Slawomir J. Ambroziak (Gdansk University of Technology) Luis M. Correia (University of Lisbon)
Session Chair	Slawomir J. Ambroziak (Gdansk University of Technology)

[S-F5-1] **08:30~08:50**

[Invited] Radio Channel Measurements in Body-to-Body Communications in Different Scenarios

Slawomir J. Ambroziak[1], Luis M. Correia[2], and Kenan Turbic[2]
[1]Gdansk University of Technology, Poland, [2]University of Lisbon, Portugal

[S-F5-2] **08:50~09:10**

[Invited] Tracking Body Movement for Radio Channel Measurements in BAN with Indoor Positioning System

Jaroslaw Sadowski, Piotr Rajchowski, and Krzysztof Cwalina
Gdansk University of Technology, Poland

[S-F5-3] **09:10~09:30**

[Invited] Analysis of On-Body Communication Channels with Consideration of Wave Absorbers Emulating Free Space

Kosorl Thourn, Takahiro Aoyagi, and Jun-ichi Takada
Tokyo Institute of Technology, Japan

[S-F5-4] **09:30~09:50**

Improvement of Delay Profile Estimation using Wireless LAN Signal

Atsuki Morita, Hisato Iwai, and Hideichi Sasaoka
Doshisha University, Japan

[S-F5-5] **09:50~10:10**

An Improved Temporal Correlation Model for Vehicle-to-Vehicle Channels with Moving Scatterers

Sangjo Yoo and Kiseon Kim
Gwangju Institute of Science and Technology, Korea

Session Title	[S-B9a] Computational Techniques and EM Field Simulators (1)
Date and Time	August 25 (Thu.) / 13:30~15:30
Room	Room A (Emerald A)
Session Organizer	Shinichiro Ohnuki (Nihon University) Lijun Jiang (The University of Hong Kong)
Session Chair	Shinichiro Ohnuki (Nihon University)

[S-B9a-1] **13:30~13:50**

[Invited] A Waveguide Configuration for Reducing Both Pure Bend and Polarization Dependent Losses

Yuta Nito, Hiroto Watanabe, Junji Yamauchi, and Hisamatsu Nakano
Hosei University, Japan

[S-B9a-2] **13:50~14:10**

[Invited] Sparse Equivalent Source Method for Radiated Emission Analysis of Shielded Circuits

Huapeng Zhao, Ying Zhang, Jun Hu, and Zhizhang Chen
University of Electronic Science and Technology of China, China

[S-B9a-3] **14:10~14:30**

[Invited] Efficient Implicit FDTD Algorithm in Cylindrical Coordinates

Jun Shibayama, Masato Ito, Junji Yamauchi, and Hisamatsu Nakano
Hosei University, Japan

[S-B9a-4] **14:30~14:50**

Diagnosis of Thin Wire Antenna Arrays using Hybrid Method of Moments-Sparse Source Reconstruction

Ying Zhang and Huapeng Zhao
University of Electronic Science and Technology of China, China

[S-B9a-5] **14:50~15:10**

[Invited] A Geometry-Aware, Scalable Hybrid Finite Element-Boundary Integral Method for Time-Harmonic Maxwell's Equations

Zhen Peng and Hong-Wei Gao
University of New Mexico, USA

[S-B9a-6] **15:10~15:30**

[Invited] Performance Analysis of Massively Parallelized Practical FDTD Scheme with Many-Core Architectures: Comparison between GPU and MIC Accelerators

Yukihisa Suzuki, Ryo Imai, and Kan Okubo
Tokyo Metropolitan University, Japan

Session Title	[B3] Fields and Waves Frequency Selective Surface
Date and Time	August 25 (Thu.) / 13:30~15:10
Room	Room B (Emerald B)
Session Chair	Toshikazu Hori (University of Fukui)

[B3-1] **13:30~13:50**

A Miniaturized-Element Frequency Selective Surface with High Angular Stability

Saptarshi Ghosh[1], Kumar Vaibhav Srivastava[1], and Somak Bhattacharyya[2]
[1]Indian Institute of Technology Kanpur, India, [2]Indian Institute of Information Technology, India

[B3-2] **13:50~14:10**

Configuration of Meta-surface with FSS for Wideband Polarization Conversion

Ryuji Kuse, Toshikazu Hori, and Mitoshi Fujimoto
University of Fukui, Japan

[B3-3] **14:10~14:30**

Spatial Filter by using Multilayered FSS for Orthogonal Polarization Conversion

Shiro Handa, Ryuji Kuse, Toshikazu Hori, and Mitoshi Fujimoto
University of Fukui, Japan

[B3-4] **14:30~14:50**

Koch Snowflake Dielectric Resonator Antenna with Periodic Circular Slots for High Gain and Wideband Applications

Dileep Sankaranarayanan, Duggirala Venkatakiran, and Biswajeet Mukherjee
Indian Institute of Information Technology Design and Manufacturing Jabalpur, India

[B3-5] **14:50~15:10**

A Patch-Slot-Patch Type Frequency Selective Surface for Gain Enhancement of a Wide-Slot Antenna

Ayan Chatterjee and Susanta Kumar Parui
Indian Institute of Engineering Science and Technology, India

Session Title	[S-JDE4] Digital Technology for Radio Astronomy
Date and Time	August 25 (Thu.) / 13:30~15:10
Room	Room C (Diamond)
Session Organizer	Se-Jin Oh (Korea Astronomy and Space Science Institute) Homin Jiang (Astronomy and Astrophysics, Academia Sinica)
Session Chairs	Se-Jin Oh (Korea Astronomy and Space Science Institute) Homin Jiang (Astronomy and Astrophysics, Academia Sinica)

[S-JDE4-1] **13:30~13:50**

[Invited] HERA: The Hydrogen Epoch of Reionization Array

David R. DeBoer[1] and Kathryn Rosie[2]
[1]University of California, USA, [2]National Research Foundation, South Africa

[S-JDE4-2] **13:50~14:10**

[Invited] Progress in SKA Central Signal Processing

John D. Bunton
Commonwealth Scientific and Industrial Research Organisation, Australia

[S-JDE4-3] **14:10~14:30**

[Invited] Digital Backend Development for Yuan-Tseh Lee Array

Homin Jiang
Institute of Astronomy and Astrophysics, Academia Sinica, Taiwan

[S-JDE4-4] **14:30~14:50**

[Invited] 8192 Mbps Wideband Correlation for the KaVA

Se-Jin Oh, Duk-Gyoo Roh, Jae-Hwan Yeom, Chungsik Oh, Hyo-Ryoung Kim, and Dong-Kyu Jung
Korea Astronomy and Space Science Institute, Korea

[S-JDE4-5] **14:50~15:10**

The KFFTSpec Spectrometer: Current Status and Future Plans for ALMA

Jan Wagner[1], Jongsoo Kim[1], Manabu Watanabe[2], Satoru Iguchi[2], Shin'ichiro Asayama[2], Scott Zang[2], and Kazuyuki Kawakami[2]
[1]Korea Astronomy and Space Science Institute, Korea, [2]National Astronomical Observatory of Japan, Japan

Session Title	[S-K5b] Biomedical Applications of EM Wave (2)
Date and Time	August 25 (Thu.) / 13:30~15:10
Room	Room D (Convention A)
Session Organizer	Jeong-Ki Pack (Chungnam National University) Jianqing Wang (Nagoya Institute of Technology)
Session Chairs	Jeong-Ki Pack (Chungnam National University) Jianqing Wang (Nagoya Institute of Technology)

[S-K5b-1] **13:30~13:50**

Improvement of Ultrasound Contrast Imaging with Adaptive Beamformer based on Pulse Inversion Plane Wave Transmission

Yurong Huang[1], Jinhua Yu[1,2], Yuanyuan Wang[1,2], Shuying Li[1], and Yi Chen[1]
[1]Fudan University, China, [2]The Key Laboratory of Medical Imaging Computing and Computer Assisted Intervention of Shanghai, China

[S-K5b-2] **13:50~14:10**

Proximity Vital Sign Sensor using Self-Oscillating Mixer

Sangin Kim[1], Byung-Hyun Kim[1], Gi-Ho Yun[2], and Jong-Gwan Yook[1]
[1]Yonsei University, Korea, [2]Sungkyul University, Korea

[S-K5b-3] **14:10~14:30**

Adaptive Scaled Wiener Postfilter Beamformer for Ultrasound Imaging

Saeid Aliabadi, Yuanyuan Wang, and Jinhua Yu
Fudan University, China

[S-K5b-4] **14:30~14:50**

Analysis of Super-Resolution Effect in Microwave Tomography

Nikolai Simonov, Soon-Ik Jeon, Bo-Ra Kim, and Seong-Ho Son
Electronics and Telecommunications Research Institute, Korea

[S-K5b-5] **14:50~15:10**

Label-Free Biosensor based on Planar RF Technology for Glucose Monitoring

M. P. Jayakrishnan, Manoj M., Remsha M., Anju Pradeep, S. Mridula, and P. Mohanan
Cochin University of Science and Technology, India

Session Title	[S-EB] EMC Modeling and Techniques
Date and Time	August 25 (Thu.) / 13:30~15:30
Room	Room E (Convention B)
Session Organizer	Sungtek Kahng (Incheon National University) Erping Li (Zhejiang University)
Session Chair	Sungtek Kahng (Incheon National University)

[S-EB-1] **13:30~13:50**

[Invited] Applications of High Impedance Surfaces for Surface Wave Elimination

Xing-Chang Wei[1], Yu-Fei Shu[1], Jian-Bo Zhang[1], and Dong Wang[2]
[1]Zhejiang University, China, [2]National University of Defense Technology, China

[S-EB-2] **13:50~14:10**

[Invited] A Tunable Antenna Based on Loaded Graphene Sheets for GHz Applications

Da Li and Er-Ping Li
Zhejiang University, China

[S-EB-3] **14:10~14:30**

[Invited] Electromagnetics Computational Modelling of Magnetic Metamaterials for Wireless Power Transfer

C. Lee, D. Han, M. K. Khattak, S. Kahng, and J. Kim
[1]Incheon National University, Korea, [2]Acetechnology, Korea

[S-EB-4] **14:30~14:50**

[Invited] B-Spline Modal Method for Electromagnetic Scattering from Lamellar Grating with a Defect

Koki Watanabe
Fukuoka Institute of Technology, Japan

[S-EB-5] **14:50~15:10**

[Invited] Equivalent Circuit Modeling of Package and Board with Resonance Capacitance and Inductance

Osami Wada and Tohlu Matsuhima
Kyoto University, Japan

[S-EB-6] **15:10~15:30**

[Invited] Analysis on Field Uniformity of Radiated Fields from a Half Impulse Radiating Antenna

Tae-Heon Jang and Won-Seo Cho
Korea Testing Laboratory, Korea

Session Title	[C5] Signal Processing, Algorism and Circuit
Date and Time	August 25 (Thu.) / 13:30~15:30
Room	Room F (Convention C)
Session Chairs	Linglong Dai (Tsinghua University) Ming-feng Lu (Beijing Institute of Technology)

[C5-1] **13:30~13:50**

Robust Waveform Design for MIMO-OFDM Radar to Improve the Detection Performance of STAP

Xue Wang, Hongyan Wang, and Bingnan Pei
Dalian University, University

[C5-2] **13:50~14:10**

A Novel Method for Frequency Discriminators Construction based on Balanced Gray Code

E. M. F. de Oliveira[1], M. S. Coutinho[1], T. L. Pedrosa[1], M. T. de Melo[1], and I. Llamas-Garro[2]
[1]Universidade Federal de Pernambuco, Brazil, [2]Centre Tecnològic de Telecomunicacions de Catalunya, Spain

[C5-3] **14:10~14:30**

Research of Quality of Nonlinear Markov Filtering RGB Signal in Conditions of Gaussian and non-Gaussian Noise

Rostislav I. Sokolov and Renat R. Abdullin
Ural Federal University, Russia

[C5-4] **14:30~14:50**

Sampled Signal Analysis in the Fractional Fourier Transform Domain

Xiao-Wei Jin, Ming-Feng Lu, Yan-An Xie, and Zi-Xuan Yu
Beijing Institute of Technology, China

[C5-5] **14:50~15:10**

Priori-Aided Channel Tracking for Millimeter-Wave Beamspace Massive MIMO Systems

Linglong Dai and Xinyu Gao
Tsinghua University, China

[C5-6] **15:10~15:30**

Elimination of Cycle Slipping And Effect of Transmission Delay In Heterodyne PLL Demodulator

Shuvajit Roy, B N Biswas, and Amit K Varshney
Supreme Knowledge Foundation Group of Institutions, India

Session Title	[G2] General Ionospheric Studies (1)
Date and Time	August 25 (Thu.) / 13:30~14:50
Room	Room G (Convention D)
Session Chair	Young-Sil Kwak (Korea Astronomy and Space Science Institute)

[G2-1] **13:30~13:50**

Morphological Characteristics of Equatorial Ionization Anomaly Crest Over Nanning Region

D. H. Zhang[1] and X. H. Mo[2]
[1]Peking University, China, [2]Guangxi University for Nationalities, China

[G2-2] **13:50~14:10**

Comparison of TayAbsTEC Technique Results with GIM Data

A. A. Mylnikova and Y. V. Yasyukevich
Institute of Solar-Terrestrial Physics of Siberian Branch of Russian Academy of Sciences, Russia

[G2-3] **14:10~14:30**

The Bite-out Phonemenon in the Ionosphere Over Turkey

Secil Karatay[1], Ali Cinar[1], Feza Arikan[2], and Ersin Kamberli[1]
[1]Kastamonu University, Turkey, [2]Hacettepe University, Turkey

[G2-4] **14:30~14:50**

On the Response of the Equatorial, Low, Mid and High Latitude Ionosphere to the Geomagnetic Storm of 17 March 2013

Shreedevi P. R. and R. K. Choudhary
Indian Space Research Organisation, India

Session Title	[H1] Theory and Observation of Waves in the Earth's Magnetosphere
Date and Time	August 25 (Thu.) / 13:30~14:50
Room	Room H (Convention E)
Session Chairs	Wen Li (University of California) Kyoung-Joo Hwang (NASA Goddard Space Flight Center)

[H1-1] **13:30~13:50**

Fast Modulations of Pulsating Proton Aurora Related with Sub-Packet Structures of Pc1 Pulsations

M. Ozaki[1], S. Yagitani[1], T. Inoue[1], K. Shiokawa[2], Y. Miyoshi[2], R. Kataoka[3], Y. Ebihara[4], and M. Connors[5]
[1]Kanazawa University, Japan, [2]Nagoya University, Japan, [3]National Institute of Polar Research, Japan, [4]Kyoto University, Japan, [5]Athabasca University, Canada

[H1-2] **13:50~14:10**

MMS Observations of Kelvin-Helmholtz Waves

Kyoung-Joo Hwang[1] and Kyoung-Joo Hwang[2]
[1]NASA Goddard Space Flight Center, USA, [2]University of Maryland, USA

[H1-3] **14:10~14:30**

Quantitative Assessment of Earth's Radiation Belt Electron Acceleration

Wen Li, Qianli Ma, Richard M. Thorne, and Jacob Bortnik
University of California, USA

[H1-4] **14:30~14:50**

Frequency Distribution of Pc5-Range Waves in the Magnetosphere Observed with Ekaterinburg Decameter Radar

Maksim A. Chelpanov
Institute of Solar-Terrestrial Physics, Russia

Session Title	[D1] Optics and RF/THz Applications
Date and Time	August 25 (Thu.) / 13:30~15:30
Room	Room J (Swan)
Session Chair	Hosung Choo (Hongik University)

[D1-1] **13:30~13:50**

Spoof Plasmonic Waveguide of a Roofed Metallic Grating for Terahertz Applications

Yong-Qiang Liu, Ling-Bao Kong, and Pu-Kun Liu
Peking University, China

[D1-2] **13:50~14:10**

Output Power Enhancement by Optical Pulse Compression in Photonic-Based RF Generation

Takashi Yamaguchi, Hiroki Morimoto, and Hiroyuki Toda
Doshisha University, Japan

[D1-3] **14:10~14:30**

Analysis of Subwavelength Slit Transmittances on Ag and Au Plates at Terahertz Range

Jong-Eon Park and Hosung Choo
Hongik University, Korea

[D1-4] **14:30~14:50**

Design of All Optical Circular Shift Register using Micro-Ring Resonator

Jayanta Kumar Rakshit and Jitendra Nath Roy
National Institute of Technology Agartala, India

[D1-5] **14:50~15:10**

Relative Stability of First-Order and Second-Order Optical Phase-Locked Loop Considering NonNegligible Propagation Delay

Jayjeet Sarkar[1], Abhijit Banerjee[1], and B. N. Biswas[2]
[1]Academy of Technology, India, [2]Supreme Knowledge Foundation Group of Institutions, India

[D1-6] **15:10~15:30**

Incompletely Modulated PSK Signal Reception using Modified Balanced Optical Phase-Locked Loop

Abhijit Banerjee[1], Jayjeet Sarkar[1], and B. N. Biswas[2]
[1]Academy of Technology, India, [2]Supreme Knowledge Foundation Group of Institutions, India

Session Title	[S-F6a] Remote Sensing of Precipitation (1)
Date and Time	August 25 (Thu.) / 13:30~15:30
Room	Room K (White Heron)
Session Organizer	Tomoo Ushio (Osaka University) Animesh Maitra (University of Calcutta)
Session Chair	Animesh Maitra (University of Calcutta)

[S-F6a-1] **13:30~13:50**

[Invited] Dependence of Rain Integral Parameters on Measured Rain Drop Velocities at a Tropical Location

Thumree Sarkar, Soumyajyoti Jana, and Animesh Maitra
University of Calcutta, India

[S-F6a-2] **13:50~14:10**

[Invited] Prediction of Convective Rainfall using Multitechnique Observations

Animesh Maitra, Rohit Chakraborty, and Soumyajyoti Jana
University of Calcutta, India

[S-F6a-3] **14:10~14:30**

[Invited] Pre-Rain Scintillation of Ku-band Satellite Signal at a Tropical Location

Arijit De, Arpita Adhikari, and Animesh Maitra
University of Calcutta, India

[S-F6a-4] **14:30~14:50**

[Invited] Microphysical Characteristics Analysis of Three Heavy Snowfall Events from the MASCRAD Campaign in Greeley, Colorado, USA

Wonbae Bang[1], Kwonil Kim[1], GyuWon Lee[1], Merhala Thurai[2], Patrick Kennedy[2], V. N. Bringi[2], and Branislav Notaros[2]
[1]Kyungpook National University, Korea, [2]Colorado State University, USA

[S-F6a-5] **14:50~15:10**

[Invited] Precipitation Climatology over India: Validation with Observations and Reanalysis Datasets and Spatial Trends

P. Kishore[1], S. Jyothi[2], S. V. B. Rao[2], and Isabella Velicogna[1]
[1]University of California, USA, [2]Sri Venkateswara University, India

[S-F6a-6] **15:10~15:30**

[Invited] Precipitation Observation Capabilities of an X-Band Solid-State Weather Radar

Zhao Shi[1], Jianxin He[1], Ling Yang[1], Zhendong Yao[1], Debin Su[1], Xuehua Li[1], V. Chandrasekar[2], and Haonan Chen[2]
[1]Chengdu University of Information Technology, China, [2]Colorado State University, USA

Session Title	[S-B9b] Computational Techniques and EM Field Simulators (2)
Date and Time	August 25 (Thu.) / 16:00~18:00
Room	Room A (Emerald A)
Session Organizer	Shinichiro Ohnuki (Nihon University) Lijun Jiang (The University of Hong Kong)
Session Chair	Shinichiro Ohnuki (Nihon University)

[S-B9b-1] **16:00~16:20**

[Invited] Novel Deflectable CRLH Unit Cell Structure for Leaky-Wave Antenna Design

Cheng-Yen Ho and Fu-Chiarng Chen
National Chiao Tung University, Taiwan

[S-B9b-2] **16:20~16:40**

[Invited] Characteristics of Guided-Mode Extracted Integral Equation for Three-Dimensional Waveguides

Masahiro Tanaka and Kazuo Tanaka
Gifu University, Japan

[S-B9b-3] **16:40~17:00**

[Invited] Optical Property of Gold Nano-Cylinder Chains

Shinichiro Ohnuki, Kazuya Nagasawa, and Ryo Takahashi
Nihon University

[S-B9a-4] **17:00~17:20**

[Invited] Application of IPO Method to Calculate Scattering by Conducting and Dielectric Objects

Il-Suek Koh[1], Jae-Won Rim[1], and Woo-Tae Kim[2]
[1]Inha University, Korea, [2]Anycasting Software, Korea

[S-B9b-5] **17:20~17:40**

Performance Comparison of the Parallelized FDTD Scheme with the PML implemented on GPU and MIC Architectures

Ryo Imai, Yukihisa Suzuki, and Kan Okubo
Tokyo Metropolitan University, Japan

[S-B9b-6] **17:40~18:00**

Electromagnetic Resonance through the Transmission Cavity in a Thick Conductor

Young Ki Cho[1], Jong Gyeong Yoo[1], Kyung Je Park[1], Dae Sub Kum[1], and Ji Whan Ko[2]
[1]Kyungpook National University, Korea, [2]Kumoh National Institute of Technology, Korea

Session Title	[B4] Fields and Waves Wideband/Dualband Antenna
Date and Time	August 25 (Thu.) / 16:00~17:40
Room	Room B (Emerald B)
Session Chair	Youchung Chung (Daegu University)

[B4-1] **16:00~16:20**

Conical Wall Edge Design of Spiral Antenna for Back Lobe Suppression

Kyeong-Sik Min
Korea Maritime and Ocean University, Korea

[B4-2] **16:20~16:40**

Experimental Research of Leaky-Wave Antenna Based on Covered Rectangular Waveguide with Transverse Slots

Renat R. Abdullin and Rostislav I. Sokolov
Ural Federal University, Russia

[B4-3] **16:40~17:00**

Closed-form Expression of Axial Ratio for Circularly Polarized Patch Antenna with Perturbation Segments

Nu Pham and Jae-Young Chung
Seoul National University of Science and Technology, Korea

[B4-4] **17:00~17:20**

A Dual Band-notched Ultra Wideband Antenna using Split Ring Resonators

Sameer Kumar Sharma[1] and Chan-Wang Park[2]
[1]Indian Institute of Technology Kanpur, India, [2]University of Quebec in Rimouski, Canada

[B4-5] **17:20~17:40**

School Food Logistics and Inspection System with HF/UHF Dual Band RFID Tag on Smart Box

Franck K. Byondi, Teklebrhan H. Berhe, and Youchung Chung
Daegu University, Korea

Session Title	[J1] Five Hundred Meter Aperture Spherical Telescope (Fast)
Date and Time	August 25 (Thu.) / 16:00~18:00
Room	Room C (Diamond)
Session Chairs	Hideyuki Kobayashi (National Astronomy Observatory of Japan) Do-young Byun (Korea Astronomy and Space Science Institute)

[J1-1] **16:00~16:20**

[Invited] The Five-Hundred-Meter Aperture Spherical Radio Telescope

Di Li
National Astronomical Observatories, China

[J1-2] **16:20~16:40**

A Cryogenic, Wide Band Receiver for the 500 m Aperture Spherical Telescope (FAST)

Stephen Smith[1] and Sander Weinreb[2]
[1]Cosmic Microwave Technology, Inc., USA, [2]California Institute of Technology, USA

[J1-3] **16:40~17:00**

EMC Design for FAST

Haiyan Zhang, Rendong Nan, Hengqian Gan, Youling Yue, Jinghai Sun, Mingchang Wu, Hao Hu, Jinyou Song, Shijie Huang, Keke Si, Zhiwei Zhang, Chengjin Jin, Caihong Sun, and Bo Peng
Chinese Academy of Sciences, China

[J1-4] **17:00~17:20**

Quad-Ridge Flared Horn Feed Design for Radio Telescope Receiver System using a Genetic Algorithm

Y. Ma[1], JL. Yu[1], F. Pang[1], and C. H. See[2]
[1]Chinese Academy of Sciences, China, [2]University of Bradford, UK

[J1-5] **17:20~17:40**

Radio Observation of Venus at Meter Wavelengths using the GMRT

Nithin Mohan[1], Subhashis Roy[2], Govind Swarup[2], Divya Oberoi[2], Niruj Mohan[2], Suresh Raju C.[1], and Anil Bhardwaj[1]
[1]Vikram Sarabhai Space Center, India, [2]Tata Institute of Fundamental Research, India

[J1-6] **17:40~18:00**

Black Hole Mass Measurement in Nearby Galaxy using Molecular Gas Dynamics

Kyoko Onishi[1], Satoru Iguchi[1], Timothy Davis[2], Martin Bureau[3], Michele Cappellari[3], Leo Blitz[4], and Marc Sarzi[5]
[1]National Astronomical Observatory of Japan, Japan, [2]Cardiff University, UK, [3]University of Oxford, UK, [4]University of California, USA, [5]University of Hertfordshire, UK

Session Title	[S-K6] Dosimetry for WBAN Antennas and Devices
Date and Time	August 25 (Thu.) / 16:00~18:00
Room	Room D (Convention A)
Session Organizer	Ping Jack Soh (University Malaysia Perlis) Koichi Ito (Chiba University)
Session Chairs	Ping Jack Soh (University Malaysia Perlis) Yoon Myoung Gimm (Dankook University)

[S-K6-1] **16:00~16:20**

[Invited] Transmission Enhancement using Artificial Magnetic Conductor Sheet for Body Centric Communication

Mohammad Kamal A Rahim, M. A. Abdullah, Noor Asmawati Samsuri, Noor Asniza Murad, and Kamilia Kamardin
University Technology Malaysia, Malaysia

[S-K6-2] **16:20~16:40**

[Invited] Measurement of Electric Field Distributions in the MHz Band around an Electromagnetic Source Employing the Electro-Optic Conversion

Teruo Onishi and Satoshi Ishihara
NTT Docomo, Inc., Japan

[S-K6-3] **16:40~17:00**

[Invited] Study on Electromagnetic Wave Exposure in Automotive Environments

Seongkyu Lee, Juneseok Lee, Sungjoon Yoon, and Jaehoon Choi
Hanyang University, Korea

[S-K6-4] **17:00~17:20**

[Invited] A C-Slotted Dual Band Textile Antenna for WBAN Applications

Ping Jack Soh[1], Fatin Nabilah Giman[1], Mohd Faizal Jamlos[1,2], Herwansyah Lago[1], and Azremi Abdullah Al-Hadi[1]
[1]Universiti Malaysia Perlis, Malaysia, [2]Universiti Malaysia Pahang, Malaysia

[S-K6-5] **17:20~17:40**

[Invited] Latest Technology and Procedures on Safety and Dosimetric Evaluations of OnBody and Implanted Wireless Biomedical and Healthcare Applications

Niels Kuster
ETH Zurich, Switzerland

[S-K6-6] **17:40~18:00**

A Modified Square Koch Curve Fractal Stent Antenna Design for Medical Implants

Ramesh Patel, Franklin Bien, and Ki Jin Han
Ulsan National Institute of Science and Technology, Korea

Session Title	[E1] Radio Interference and Spectrum
Date and Time	August 25 (Thu.) / 16:00~18:00
Room	Room E (Convention B)
Session Chair	Qian Nan Lu (Yunnan University)

[E1-1] **16:00~16:20**

Assessment of PED Interference to ILS and VOR Receivers in a Small Cargo Plane

Fatih Üstüner, Coşkun Coşar, Ekrem Demirel, Ersan Baran, and I. Hakan Gökdoğan
Tubitak Bilgem

[E1-2] **16:20~16:40**

State-of-the-Art and Challenges of Radio Spectrum Monitoring in Borderlands of China

Qian Nan Lu[1,2], Jing Jing Yang[1], Zhao Yuan Jin[2], De Zhang Chen[2], and Ming Huang[1]
[1]Yunnan University, China, [2]Yunnan Provincial Industry and Information Technology Commission, China

[E1-3] **16:40~17:00**

Statistical Property of Polarization Ratio for Radar Sea Clutter

Yong Yang, Shun-ping Xiao, De-jun Feng, and Wen-ming Zhang
National University of Defense Technology, China

[E1-4] **17:00~17:20**

Insertion Loss Characteristic based on Length Change of the Blanced Transmission line through the Retangular Apertures Enclosure

Jin-kyu Choi[1], Hyeong gyu Jang[1], Sung-Min Lim[2], and Ki-Chai Kim[1]
[1]Yeungnam University, Korea, [2]SL Corporation, Korea

[E1-5] **17:20~17:40**

Indian Telecom Spectrum Allocation through Auction

Pradeep M. Shah, Prakash D. Vyavahare, and Anjana Jain
Shri Govindram Seksaria Institute of Technology and Science, Indore, India

[E1-6] **17:40~18:00**

Development of a System for Measuring Power and Phase Distributions of Radio Waves

Ryohei Kanaura, Ryohei Hayashi, Satoshi Yagitani, Tomohiko Imachi, Mitsunori Ozaki, Yoshiyuki Yoshimura, and Hirokazu Sugiura
[1]Kanazawa University, Japan, [2]Industrial Research Institute of Ishikawa, Japan

Session Title	[C6] New Radio Service
Date and Time	August 25 (Thu.) / 16:00~18:00
Room	Room F (Convention C)
Session Chair	Yunquan Dong (Seoul National University)

[C6-1] **16:00~16:20**

Multi-Feature Fusion for Target Recognition based on D-S Evidence Iterative Discount Method

Caiyun Wang, Zhiyong He, and Shuxia Wu
Nanjing University of Aeronautics & Astronautics, China

[C6-2] **16:20~16:40**

Application of TDR for Monitoring of Ground Movements in Indian Opencast Mine

Guntha karthik and Singam Jayanthu
National Institute of Technology, Rourkela, India

[C6-3] **16:40~17:00**

Distance-and-Energy-Aware Routing for Energy Harvesting Wireless Sensor Networks

Yunquan Dong[1], Jian Wang[1], Byonghyo Shim[1], and Dong In Kim[2]
[1]Seoul National University, Korea, [2]Sungkyunkwan University

[C6-4] **17:00~17:20**

Compressive Multi-User Detector for Spatial Modulation (SM)-Based Random Access in Internet of Things (IoTs)

Zhen Gao
Beijing Institute of Technology, China

[C6-5] **17:20~17:40**

Comparative Study of Sensor Fusion Methods for Hybrid Positioing Systems

Suk-hoon Jung, Byungchul Moon, Jeonghee Ahn, and Dongsoo Han
Korea Advanced Institute of Science and Technology, Korea

[C6-6] **17:40~18:00**

Data-Based Optimal Control for Double-Layer Networked Industrial Processes

Jianbin Qiu
Harbin Institute of Technology, China

Session Title	[G3] General Ionospheric Studies (2)
Date and Time	August 25 (Thu.) / 16:00~17:40
Room	Room G (Convention D)
Session Chair	Jaeheung Park (Korea Astronomy and Space Science Institute)

[G3-1] **16:00~16:20**

Solar Flare Imprints of Equatorial Electrodynamics: An Investigation using Radio and Optical Techniques

S. G. Sumod[1] and Tarun Kumar Pant[2]
[1]Mahatma Gandhi University, India, [2]Indian Space Research Organization, India

[G3-2] **16:20~16:40**

On the Possibilities of the Existence of Molecular Ions in the Lunar Ionosphere: a Study using Results from Chandrayaan-I S-Band Radio Occultation Experiment and a Photochemical Model

K. M. Ambili[1], R. K. Choudhary[2], and Anil Bhardwaj[3]
[1]Indian Institute of Space Science and Technology, India, [2]Indian Space Research Organization, India

[G3-3] **16:40~17:00**

Correlation of the Ionospheric F2-Layer Parameters with MUF during the Rise of Solar Cycle 24

Rafidah Abd Malik[1,2], Mardina Abdullah[1], Sabirin Abdullah[1], Mariyam Jamilah Homam[3], Tatsuhiro Yokoyama[4], and Clara Y. Yatini[5]
[1]Universiti Kebangsaan Malaysia, Malaysia, [2]Science & Technology Research Institute for Defence, Malaysia, [3]Universiti Tun Hussein Onn Malaysia, Malaysia, [4]National Institute of Information and Communications Technology, Japan, [5]Indonesian National Instit

[G3-4] **17:00~17:20**

Investigation of Short-Lived Es-Layers

Kamil Yusupov and Adel Akchurin
Kazan Federal University, Russia

[G3-5] **17:20~17:40**

Exploring Obvious Lunar Ionosphere Based on the Service Module of Circumlunar Return and Reentry Spacecraft

Wang Mingyuan[1], Ping Jinsong[1], Han Songtao[2], Tang Geshi[2], and Zhang Qiang[2]
[1]Chinese Academy of Sciences, China, [2]National Key Laboratory of Science and Technology on Aerospace Flight Dynamics, China

Session Title	[H2] Waves and Particles in Solar System: General
Date and Time	August 25 (Thu.) / 16:00~17:40
Room	Room H (Convention E)
Session Chairs	Ondrej Santolik (Charles University) Kichang Yoon (Korean Space Weather Center of National Radio Rese)

[H2-1] **16:00~16:20**

Derivation of Landau Damping without Landau Contour

Tadas Nakamura
Fukui Prefectural University, Japan

[H2-2] **16:20~16:40**

Scientific Questions Addressed by the Wave Measurements onboard EXOMARS Surface Platform

I. Kolmasova[1], O. Santolik[1], and A. Skalsky[2]
[1]IAP CAS and Charles University, Czech Republic, [2]Russian Academy of Sciences, Russia

[H2-3] **16:40~17:00**

Coherent Low-Frequency Electrostatic Turbulence in the Solar Wind

G. S. Lakhina and S. V. Singh
Indian Institute of Geomagnetism, India

[H2-4] **17:00~17:20**

An FDTD Formulation for Communication Through a Plasma With a Linear Density Profile

Youngjoon Lim and Sangwook Nam
Seoul National University, Korea

[H2-5] **17:20~17:40**

Study on Predcition of Solar Energetic Particle using Linear Regression

KiChang Yoon, Jaehun Kim, and Sunhak Hong
National Radio Research Agency, Korea

Session Title	[D2] Energy Harvesting and other Electronic Components
Date and Time	August 25 (Thu.) / 16:00~18:00
Room	Room J (Swan)
Session Chair	Sang-Min Han (Soonchunhyang University)

[D2-1] **16:00~16:20**

High-Sensitivity and High-Efficiency 2.4-GHz RF Energy Harvester using SiP Technique

Ming-Che Yu and Chun-Hsing Li
National Central University, Taiwan

[D2-2] **16:20~16:40**

A Review on Recent Trend of High Efficieny Rectifiers for RF Energy Harvesting Applications

Zaffar Hayat Nawaz Khan[1], Danial Khan[1], Hamed Abbasizadeh[1], Sang-Yun Kim[1], Young-Jun Park[1], Kang-Yoon Lee[1], Seong-Ho Lee[2], and Seong-Chul Lee[2]
[1]Sungkyunkwan University, Korea, [2]Korea Electronics Technology Institute, Korea

[D2-3] **16:40~17:00**

Properties of Stepped Impedance Resonator and Its Application in the Design of Chipless RFID Tag

Nijas C. M., Sajitha V. R., Jayakrishnan M. P., and Mohanan P.
Cochin University of Science and Technology, India

[D2-4] **17:00~17:20**

Study for Realization of Arbitrary Inductance Values using Distributed Elements and Capacitors

Jongsik Lim[1], Seok-Jae Lee[1], Dal Ahn[1], Sang-Min Han[1], Boram An[2], and Yongchae Jeong[2]
[1]Soonchunhyang Univesity, Korea, [2]Chonbuk National University, Korea

[D2-5] **17:20~17:40**

Open Otto Chip as an SPR Pressure Transducer

J. O. Maciel Neto[1], Gustavo Oliveira Cavalcanti[2], Ignacio Llamas-Garro[3], Jung-Mu Kim[4], and Eduardo Fontana[5]
[1]Instituto Federal de Pernambuco, Brazil, [2]Universidade de Pernambuco, Brazil, [3]Centre Tecnològic de Telecomunicacions de Catalunya, Spain, [4]Chonbuk National University, Korea, [5]Universidade Federal de Pernambuco, Brazil

[D2-6] **17:40~18:00**

A 35 dBm, 36.5% Efficiency Harmonic Tuned GaN Oscillator using Stepped Impedance Resonator

Inhyun Kim, Sunghwan Park, Jung-Lin Woo, and Youngwoo Kwon
Seoul National University, Korea

Session Title	[S-F6b] Remote Sensing of Precipitation (2)
Date and Time	August 25 (Thu.) / 16:00~17:40
Room	Room K (White Heron)
Session Organizer	Tomoo Ushio (Osaka University) Animesh Maitra (University of Calcutta)
Session Chair	Animesh Maitra (University of Calcutta)

[S-F6b-1] **16:00~16:20**

[Invited] Conceptual Design of Collaborative Radar Network for Remote Sensing of Precipitation Over Chengdu Metropolitan in Western Sichuan Basin

Debin Su[1], Jianxin He[1], Ling Yang[1], Zhendong Yao[1], Zhao Shi[1], Xuehua Li[1], V. Chandrasekar[2], and Haonan Chen[2]
[1]Chengdu University of Information Technology, China, [2]Colorado State University, USA

[S-F6b-2] **16:20~16:40**

Analysis of Precipitation Characteristics Over Southern Peninsular Malaysia for Satellite Propagation Application

Siat Ling Jong[1], Hong Yin Lam[1], Michele D'Amico[2], and Jafri Din[3]
[1]Universiti Tun Hussein Onn Malaysia, Malaysia, [2]Politecnico di Milano, Italy, [3]Universiti Teknologi Malaysia, Malaysia

[S-F6b-3] **16:40~17:00**

Diurnal Variability of Tropical Tropopause: Results Inferred from Radio Occultation Technique

K. V. Suneeth[1], Siddarth Shankar Das[1], and Subrata Kumar Das[2]
[1]Vikram Sarabhai Space Centre, India, [2]Indian Institute of Tropical Meteorology, India

[S-F6b-4] **17:00~17:20**

Variability of Critical Rain Drop Diameter and Its Effect on Rain Attenuation and Radar Reflectivity

Saurabh Das
Indian Statistical Institute, India

[S-F6b-5] **17:20~17:40**

[Invited] Energy Compaction and Multi-Resolution Decomposition Method for Weather Radar Data Compression

Bong-Joo Jang and Sanghun Lim
Korea Institute of Civil Engineering and Building Technology, Korea

Author Index

C

L

M

Q

R

S

X

Y

Z