

# Program at a Glance

Time	Room A	Room B	Room C	Room D	Room E	Room F	Room G	Room H
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## Monday, January 25

10:40-12:40	1A2: Workshop 1: Post processing techniques in 5G, Automotive & Space antenna measurements	1B2: Workshop 2: Passive human detection, localization, and posture identification, using radio technologies	1C2: Workshop 3: Advancements in 5G Antennas and Emerging 6G Antenna Technologies	1D2: Workshop 4: The Design of Millimeter-Wave Wideband Multi-Polarization Antenna Array	1E2: Workshop 5: Circularly Polarized Antennas: Design and Measurement techniques			
14:00-15:00	1A3: Opening							
15:20-16:40	1A4: Plenary Talk Part 1							
17:00-18:20	1A5: Plenary Talk Part 2							

## Tuesday, January 26

09:00-10:40	2A1: Planar/Printed Antennas and Arrays 1	2B1: Millimeter-Wave, Terahertz and Optical Antennas 1	2C1: OS: Metasurfaces/Metamaterials for Radiation and Scattering Control 1	2D1: Passive and Active Components	2E1: RFID and Its Applications	2F1: OS: Antennas and Propagation Technologies for Satellite Applications	2G1: Mobile Propagation and Measurement Techniques	Student Design Contest
11:00-13:00	2A2: Planar/Printed Antennas and Arrays 2	2B2: Millimeter-Wave, Terahertz and Optical Antennas 2	2C2: OS: Recent Antennas and Propagation Technology in ASEAN Countries	2D2: Computational Electromagnetics and applications	2E2: EMC/EMI Technologies	2F2: Radar DOA, localization, Sensing and Propagation Measurement Techniques 1	2G2: Propagation for V2X and Channel Sounding	Student Design Contest
13:00-14:20								Exhibition Technical Seminar ·Anritsu Corporation ·JSOL Corporation
14:20-16:20	2A3: Small Antennas and RF Sensors 1	2B3: OS: Antenna Arrays for Radar Applications	2C3: OS: Metasurfaces/Metamaterials for Radiation and Scattering Control 2	2D3: Short Presentation Session A1	2E3: Short Presentation Session D1	2F3: Radar DOA, localization, Sensing and Propagation Measurement Techniques 2	2G3: Short Presentation Session B1	Student Design Contest
16:40-18:40	2A4: OS: Advanced Millimeter-Wave Array Antennas	2B4: Antenna Measurement 1	2C4: Designing FSS, EBG, and Other EM Device	2D4: OS: EurAAP Session: Recent Advances in European Antennas and Propagation Research	2E4: Antenna Systems for Mobile Communications and MIMO Signal Processing	2F4: Terrestrial, Earth-Space and Ionospheric Propagation	2G4: Propagation Simulation	

## Wednesday, January 27

09:00-10:40	3A1: Small Antennas and RF Sensors 2	3B1: Antenna Measurement 2	3C1: Wireless Power Transfer Technologies	3D1: OS: Advanced Radar Technology Related to Radar Signal and Image Processing Including Antennas	3E1: OS: Orbital Angular Momentum (OAM) Multiplexing Transmission	3F1: Student Paper Award 1	3G1: Remote Sensing and Propagation Measurement	Student Design Contest
11:00-13:00	3A2: Millimeter-wave, Terahertz and Optical Antennas 3	3B2: Antenna Measurement 3	3C2: Metamaterials	3D2: OS: IAET Special Session: Antenna Technologies for 5G Mobile Communications	3E2: OS: Leading Technologies over Diversity	3F2: Student Paper Award 2	3G2: OS: Thinned and Sparse Arrays	Student Design Contest
13:00-14:20					WIE Session			Exhibition Technical Seminar ·Microwave Factory Co.,Ltd. ·TOYO Corporation
14:20-15:20	3A3-1: OS: Recent Advances in Time Domain Method	3B3: OS: Massive MIMO and its Related Techniques for 5G Beyond/ 6G Systems	3C3: Short Presentation Session A2	3D3: Short Presentation Session A3	3E3: Short Presentation Session D2	3F3: Short Presentation Session D3	3G3: Short Presentation Session B2	
15:20-16:20	3A3-2: OS: Advanced Technology of Over-The-Air Testing for 5G, IoT and Vehicular Communication Systems							

16:40-18:40	3A4: Broadband and Multiband Antennas 1	3B4: Planar/Print Antenna Arrays	3C4: OS: Novel Antennas and Propagation Modelling for the 5G Millimeter Wave Bands	3D4: OS: Emerging Technologies for the New 5G Antenna Systems	3E4: OS: Recent Developments for Next-Generation Terrestrial and Space Communication Systems	3F4: Student Paper Award 3	3G4: OS: MW Wave and Tera Hertz Propagation	
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# Thursday, January 28

09:00-10:40	4A1: Antenna Theory and Design 1	4B1: OS: Biomedical Applications of Electromagnetic Field	4C1: Broadband and Multiband Antennas 2	4D1: OS: Recent Advances in Computational Electromagnetics	4E1: OS: Millimeter-Wave and Terahertz-Wave Systems for Infrastructures and Their Standardization Activities	4F1: Radar DOA, localization, Sensing and Propagation Measurement Techniques 3	4G1: OS: Studies on Radio Wave Propagation in ITU-R SG3	
11:00-13:00	4A2: Antenna Theory and Design 2	4B2: Antennas for Mobile and V2X Applications	4C2: OS: Circularly Polarized Antennas	4D2: OS: WPT Technologies for Mobile Devices		4F2: Radar DOA, localization, Sensing and Propagation Measurement Techniques 4	4G2: Millimeter-wave and Satellite Propagation	
14:20-16:20	4A3: Antenna Theory and Design 3	4B3: Short Presentation Session A4	4C3: Short Presentation Session A5	4D3: Short Presentation Session C	4E3: Short Presentation Session D4	4F3: Radar DOA, localization, Sensing and Propagation Measurement Techniques 5	4G3: Short Presentation Session B3	
16:40-17:40	4A4: Closing and Award Ceremony							

## Monday, January 25 10:40 - 12:40 (Asia/Tokyo)

### 1A2: Workshop 1: Post processing techniques in 5G, Automotive & Space antenna measurements

Chair: Naoki Honma (Iwate University, Japan)

**Speakers: Dr. Lars Jacob Foged (Microwave Vision Group), Prof. Dr. Manuel Sierra-Castañer (Technical University of Madrid)**

#### Abstract

This course is a fast pace introduction to modern applications of post-processing techniques to exploit the antenna measurement results. Nowadays, the use of information from antenna under test, antenna measurement system and electromagnetic measurements results allow the improvement of those results for:

- Extraction of electromagnetic sources in the antenna surface.
- Detection of errors in antenna design.
- Improving measurement results cancelling echoes, leakage, noise...
- Extrapolating the radiation pattern to unmeasured angles.
- Combination of measurements and simulations to emulate the effect of the environment.

Following a brief introduction to near and far field antenna measurements theory, the course will focus on these techniques. The second part of the course will be the explanation of the following techniques:

- Time gating techniques.
- Extraction of Equivalent sources through inverse electromagnetic problems.
- Use of holographic techniques for extracting equivalent currents on a surface.
- Filtering of measurement results using spherical or cylindrical near field modes expansion.

The third session will deal with different applications of those techniques. In this section, applications for BTS antennas, automotive measurement, RADAR systems, satellite antennas will be shown. The course outline is:

- Theory and application of far-field and near field antenna measurements
- Equivalent currents using integral equation and holographic techniques.
- Time domain and time gating techniques.
- Spherical and Cylindrical modes expansion and filtering of spurious signals.
- Application in telecom, satellite, automotive and defense measurement scenarios.

### 1B2: Workshop 2: Passive human detection, localization, and posture identification, using radio technologies

Chair: Takuya Sakamoto (Kyoto University, Japan)

**Speakers: Assistant Prof. Dr. Yang Miao (Twente University, the Netherlands), Prof. Dr. Minseok Kim (Niigata University, Japan), Prof. Dr. Jörg Schäfer (Frankfurt University of Applied Sciences, Germany), Prof. Dr. Stefano Savazzi (Consiglio Nazionale delle Ricerche (CNR), Italy)**

#### Abstract

This workshop is to address one of the most challenging issues in wireless radio based assisted living, i.e., to dynamically detect, localize and track, and identify the postures of multiple humans in indoor environment. As Japanese, Europeans, etc., are growing older and healthier, these societies face tremendous challenges in securing the future wellness of a larger segment of its population requiring special attentions, e.g., the elderly and the physically impaired. This is expected to have a great impact on the future advancement of these societies. The emerging wireless technologies are enablers that can be applied to solve many of the wellness challenges, e.g., through the clever combination of wireless radio and smart buildings. Moreover, radio systems are less sensitive to visibility conditions to operate appropriately. Therefore, they naturally mitigate possible privacy concerns that may arise as compared to the camera- or the visible light-based systems where people are "observed" directly through image data or under visible conditions. The wireless radio-based assisted living can be achieved through the passive detection, the localization and the posture identification of humans. Here "passive" indicates that the assisted individual needs not to wear or carry any additional devices, i.e. "device-free". The existing passive systems employ the time of arrival, the angle of arrival, the received signal strength (RSS), the complex channel state information of radio waves to perform localization. For example, fingerprinting, a localization technique based on RSS measurements, consists of an offline phase to build a database from surveyed signals at known positions. The process is labour intensive and is not robust against changes in physical environment. Alternatively, in multiple-input multiple-output (MIMO) systems, antenna arrays with many elements provide sufficient spatial resolution to discern signals coming from different directions, while wideband provide delay resolution to separate multiple copies of these signals in time. The temporal-spatial-delay domain profiles contain information on human form-factors as well as on surrounding objects. However, it is challenging to sort out human-relevant information.

### 1C2: Workshop 3: Advancements in 5G Antennas and Emerging 6G Antenna Technologies

Chair: Manabu Yamamoto (Hokkaido University, Japan)

**Speaker: Prof. Dr. Wonbin Hong (Pohang University of Science and Technology, Korea)**

#### Abstract

The advent of millimeter-wave and sub-Terahertz for wireless, civilian applications have spurred unprecedented opportunities and challenges within the wireless society. Expanding the technological footprint of millimeter-wave and sub-THz antennas and propagation for Beyond 5G/6G cellular, access and infrastructures are expected to introduce unprecedented challenges. Practical design considerations and potential novel solutions related to the realization of millimeter-wave and sub-THz antennas with beamforming capabilities are discussed in detail. This workshop attempts to share and discuss the current and emerging challenges surrounding millimeter-wave based 5G antenna systems and the upcoming 6G sub-Terahertz antenna technologies based on realistic considerations and constraints. The workshop will assess the future direction of mobile antennas and RF circuits for high mobility devices such as future smartphones and data terminals using a holistic approach. Afterwards, a series of detailed demonstrations will be discussed.

## 1D2: Workshop 4: The Design of Millimeter-Wave Wideband Multi-Polarization Antenna Array

Chair: Kunio Sakakibara (Nagoya Institute of Technology, Japan)

**Speaker: Prof. Dr. Ying Liu (Xidian University, China)**

### Abstract

With the rapid development of wireless communication, the current fourth-generation (4G) wireless cellular system is challenging to satisfy the continuous growth of wireless traffic demands. Millimeter-wave (mmWave) band has abundant spectrum resources, and a large number of studies on the fifth-generation (5G) wireless communication show that mmWave technology will become the key to the improvement of data transmission rate and capacity in the future. In this talk, some of our recent work in mmWave wideband multi-polarization antenna array will be introduced. A broadband dual-polarized end-fire mmWave antenna array with a complete GND for 5G communication terminals is presented. The H-P and V-P radiation performance are realized by using electric dipole and SIW cavity, respectively. The measured results show that the impedance bandwidth is 24-29.5 GHz (20.6%). Then, a dual-band dual-circularly polarized magneto-electric dipole antenna array for full-duplex communication systems is presented. The proposed array can simultaneously achieve left-hand circular polarization (LHCP) around 20 GHz and right-hand circular polarization (RHCP) around 30 GHz with a low loss feed network using the printed ridge gap waveguide (PRGW). Finally, the talk will end with the future development trend of mmWave wideband multi-polarization antenna array.

## 1E2: Workshop 5: Circularly Polarized Antennas: Design and Measurement techniques

Chair: Takafumi Fujimoto (Nagasaki University, Japan)

**Speakers: Prof. Dr. Takeshi Fukusako (Kumamoto University, Japan)**

### Abstract

Circular polarization is an attractive polarization for many types of wireless telecommunications, such as satellite communication, RFID, etc. There are always strict requirements for circularly polarized (CP) antennas, such as broadband, small size, slim shape of designs, low cross-polarization in a wide radiation range of azimuth, etc. Also, designing CP antennas with such challenging performances are attractive for antenna researchers and designers. In this workshop, some design techniques for such applications and requirements are organized. In addition to this, some measurement techniques for essential parameters in circularly polarized antennas, such as axial ratio, gain measurement, will be summarized. In this opportunity, we would like to think of antennas with a point of view of polarization.

**Monday, January 25 14:00 - 15:00 (Asia/Tokyo)**

### 1A3: Opening

**Monday, January 25 15:20 - 16:40 (Asia/Tokyo)**

### 1A4: Plenary Talk Part 1

Chair: Jiro Hirokawa (Tokyo Institute of Technology, Japan)

## Plenary Talk 1

**Speaker: Hiroshi Koyama, MITSUBISHI ELECTRIC Corporation**

*Title: Perspectives of Future Space Business and Technologies*

## Plenary Talk 2

**Speaker: Sangwook Nam, Seoul National University**

*Title: Understanding of Wireless Power Transfer by Field Theoretic*

**Monday, January 25 17:00 - 18:20 (Asia/Tokyo)**

### 1A5: Plenary Talk Part 2

Chair: Masaharu Takahashi (Chiba University, Japan)

## Plenary Talk 3

**Speaker: Thomas Kuerner, Technische Universität Braunschweig**

*Title: THz Communications - A candidate for the next Generation of Wireless Systems?*

# Plenary Talk 4

Speaker: Hanyang Wang, Huawei Device Limited

*Title: Antenna Design for Mobile Terminals*

Tuesday, January 26

Tuesday, January 26 9:00 - 10:40 (Asia/Tokyo)

## 2A1: Planar/Printed Antennas and Arrays 1

Chair: Makoto Higaki (Toshiba Corporation, Japan)

**9:00 Implementation of Beamforming a Circularly Polarized Radiation Pattern on 3D Random Arrays**

Shihyuan Yeh and Zhong Chen (Texas A&M University, USA)

**9:20 Reflectarray antenna changing beam direction by polarization**

Shota Takino and Shigeru Makino (Kanazawa Institute of Technology, Japan); Sanshiro Shigemitsu (Kanazawa Institute Technology, Japan); Mei Fukaya (Kanazawa Institute of Technology, Japan); Michio Takikawa and Hiromasa Nakajima (Mitsubishi Electric Corporation, Japan)

**9:40 Conformal Subarray Antenna for Circularly Polarized Synthetic Aperture Radar onboard UAV**

Cahya Edi Santosa (National Institute of Aeronautics and Space (LAPAN), Indonesia & Chiba University, Japan); Josaphat Tetuko Sri Sumantyo (Chiba University, Japan)

**10:00 A Patch Antenna Array With a Rotatable Polarization Plane for Ku-Band Phased Arrays**

Makoto Sano, Makoto Higaki, Kentaro Wada and Koh Hashimoto (Toshiba Corporation, Japan)

**10:20 Design of a Wideband Phased Array Antenna with Ultrawide Scanning Angle to 70 Degree**

Bei Zhang and Xiaofei Xu (Shanghai University, China)

## 2B1: Millimeter-Wave, Terahertz and Optical Antennas 1

Chair: Hiroyasu Sato (Tohoku University, Japan)

**9:00 Optical High-Gain Leaky-Wave Antenna by Using a Waffle-Iron Waveguide**

Shunichi Kaneoka, Wataru Iida, Toshihiko Baba and Hiroyuki Arai (Yokohama National University, Japan)

**9:20 1X8 Slotted Array Antenna with Fan-Beam Characteristics for 28 GHz 5G Mobile Applications**

Sungpeel Kim and Jaehoon Choi (Hanyang University, Korea (South))

**9:40 Packaged Dish Antenna for Wireless Terahertz Photonic Crystal Waveguide Devices**

Daniel Headland (Osaka University, Japan); Xiongbing Yu (Tokyo Institute of Technology, Japan); Masaya Nagai (Japan); Masayuki Fujita and Tadao Nagatsuma (Osaka University, Japan)

**10:00 Measured Performance of High Gain Dielectric Lens Antenna in 300 GHz Band**

Ryota Ishihara, Kunio Sakakibara, Nobuyoshi Kikuma and Yoshiki Sugimoto (Nagoya Institute of Technology, Japan); Yoshihide Yamada (Malaysia-Japan International Institute of Technology, Universiti Teknologi Malaysia, Malaysia); Nurul Huda Abd Rahman (Universiti Teknologi MARA, Malaysia)

**10:20 Near Field Leaky-Wave Focusing Antenna Using Inhomogeneous Rectangular Waveguide**

Hiroyasu Sato (Tohoku University, Japan)

## 2C1: OS: Metasurfaces/Metamaterials for Radiation and Scattering Control 1

Chair: Atsushi Sanada (Osaka University, Japan)

**9:00 N-type Metacurl Antenna**

Hisamatsu Nakano, Tomoki Abe and Junji Yamauchi (Hosei University, Japan)

**9:20 Coaxially Fed Monopole Antenna with Choke Structure Composed of Zeroth-Order Resonator**

Keisuke Sakakibara, Takumi Nishime, Naobumi Michishita and Hisashi Morishita (National Defense Academy, Japan)

**9:40 Realization of Optimized Cylindrical Cloak Using Multi-Layer Ceramic Capacitors**

Thanh Binh Nguyen, Naobumi Michishita and Hisashi Morishita (National Defense Academy, Japan); Teruki Miyazaki and Masato Tadokoro (The Yokohama Rubber Co., Ltd., Japan)

**10:00 Design of a Huygens' Surface Generating Axisymmetric Evanescent Waves for 2-D Subwavelength Focusing**

Yuki Okumura and Atsushi Sanada (Osaka University, Japan)

**10:20 Three-Dimensional Hologram with Ultrathin Huygens' Metasurface**

Liang Wei Wu and Hui Feng Ma (Southeast University, China)

## 2D1: Passive and Active Components

Chairs: Kunio Sakakibara (Nagoya Institute of Technology, Japan), Titipong Lertwiriayaprapa (King Mongkut's University of Technology North Bangkok, Thailand)

**9:00 A Balanced Filtering Crossover for Two Paths with Different Frequencies**

Chu-Hsuan Pai and Yi-Hsin Pang (National University of Kaohsiung, Taiwan)

**9:20 Uniplanar Broadband Balun Design for Sub-THz Antenna On-Wafer Characterization**

Mohamed Habashy Mubarak and Shinsuke Hara (National Institute of Information and Communications Technology, Japan); Issei Watanabe (National Institute of Information and Communications Technology, Japan); Akifumi Kasamatsu (National Institute of Information and Communications Technology, Japan)

**9:40 Wide-band Injection-Locked Frequency Dividers of Concurrent Oscillating RF Stress**

Wen Cheng Lai (National Taiwan University of Science and Technology, Taiwan)

**10:00 A Reflection-Type Phase Shifter Using Quasi-Transmission-Line Variable Reactors and Impedance Transforming Hybrid Coupler**

Jo Tamura and Hiroyuki Arai (Yokohama National University, Japan)

**10:20 Accurate Estimation of Analog Circuit Parameters by CMA-ES Method**

Kosuke Hayashi and Koichi Ichige (Yokohama National University, Japan)

## 2E1: RFID and Its Applications

Chair: Masaharu Takahashi (Chiba University, Japan)

**9:00 An on-chip antenna with an area of 0.9 square millimeters for RFID applications in the 5.8 GHz - 24 GHz range**

Emilie Charlot (Keio University, Japan); Mototsugu Hamada (Tokyo University, Japan); Tadahiro Kuroda (Keio University, Japan)

**9:20 Development of UHF-RFID tag antenna for identifying liquid filled containers**

Atsuya Kadono (Tokyo City University Graduate School, Japan); Yoshinobu Okano (Tokyo City University, Japan)

**9:40 Analysis of Strain Sensor using Millimeter Wave Chipless RFID Tag**

Yuta Watanabe (Tokyo Metropolitan Industrial Technology Research Institute, Japan)

**10:00 Anti-Collision of RFID Tags with Blind DS-CDMA Using ICA**

Hidehisa Shiomi (Osaka University, Japan)

**10:20 Disk Loaded Monopole Antenna Installed in Metal Cylinder**

Takahiro Hashimoto, Naobumi Michishita and Hisashi Morishita (National Defense Academy, Japan); Takayuki Koshi (Komatsu Ltd., Japan)

## 2F1: OS: Antennas and Propagation Technologies for Satellite Applications

Chairs: Amane Miura (National Institute of Information and Communications Technology, Japan), Panariello Antonio (Honeywell, Canada)

**9:00 Development of Advanced HTS Onboard Ka-band Antennas for Engineering Test Satellite 9**

Amane Miura and Eihisa Morikawa (National Institute of Information and Communications Technology, Japan); Naoko Yoshimura (National Institute of Information and Communications Technology, Japan); Takashi Takahashi, Hiroyuki Tsuji and Mitsugu Ohkawa (National Institute of Information and Communications Technology, Japan); Teruaki Orihara (Institute of Information and Communications Technology, Japan); Takuya Okura, Yuma Abe and Morio Toyoshima (National Institute of Information and Communications Technology, Japan); Eiichi Sakai,

Terumi Sunaga, Nobuyoshi Horie, Toshiyasu Tsunoda, Arimasa Kanasashi, Masaaki Kusano, Shigeru Uchida and Tai Tanaka (Mitsubishi Electric Corporation, Japan)

**9:20 Common Communications Subsystem for ETS-9 Satellite**

Panariello Antonio (Honeywell, Canada)

**9:40 Study on Frequency Characteristic for Self-Calibration Method of Systematic Errors for DBF Antenna Using Gating Process**

Takuya Okura and Amane Miura (National Institute of Information and Communications Technology, Japan); Teruaki Orikasa (Institute of Information and Communications Technology, Japan); Shinji Senba (Axis Corporation, Japan)

**10:00 Effective Use of Ka-band Based on Antenna and Radio Wave Propagation for Mobile Satellite Communications**

Hiroyuki Tsuji, Amane Miura, Tomoshige Kan, Takashi Takahashi, Mitsugu Ohkawa, Takuya Okura, Yuma Abe and Morio Toyoshima (National Institute of Information and Communications Technology, Japan)

**10:20 Directional Loop-Type Antenna Technologies Applied to Satellite and Terrestrial Integrated Mobile Phone Applications**

Wei-Yu Li and Wei Chung (Industrial Technology Research Institute, Taiwan); Amane Miura (National Institute of Information and Communications Technology, Japan)

## 2G1: Mobile Propagation and Measurement Techniques

Chairs: Naoki Kita (Nippon Telegraph and Telephone Corp., Japan), Kazuma Tomimoto (Softbank Corp., Japan)

**9:00 Evaluation of Characteristics for NN and CNN in Path Loss Prediction**

Nobuaki Kuno, Wataru Yamada, Minoru Inomata, Motoharu Sasaki, Yusuke Asai and Yasushi Takatori (NTT, Japan)

**9:20 Measurement and analysis of arrival angle at MS in High Elevation Environment**

Sho Kimura, Akihiro Sato, Ho-Yu Lin and Hideki Omote (Softbank Corp., Japan)

**9:40 Propagation Loss Model of Human Body Shielding in HAPS Communications**

Akihiro Sato, Sho Kimura, Ho-Yu Lin and Hideki Omote (Softbank Corp., Japan)

**10:00 Human Blockage Loss Characteristics at 5 GHz Bands in A Crowded Stadium**

Motoharu Sasaki (NTT, Japan); Toshiro Nakahira (NTT Access Network Service Systems Laboratories, Japan); Keisuke Wakao and Takatsune Moriyama (NTT, Japan)

**10:20 Radio environment measurement over the urban area for UAV communications**

Mio Taniguchi, Erina Sasaki, Masazumi Ueba and Shoichi Kitazawa (Muroran Institute of Technology, Japan)

## Student Design Contest

Antenna Design

[Detail](#)

Tuesday, January 26 11:00 - 13:00 (Asia/Tokyo)

## 2A2: Planar/Printed Antennas and Arrays 2

Chair: Yuichi Kimura (Saitama University, Japan)

**11:00 Perpendicularly Configured Array Elements for a Shared-aperture S/X Dual-band Radar**

Sungsik Wang (Hongik University, Korea (South)); Joungmyoung Joo and Youngwan Kim (LIG Nex One Radar Research Institute, Korea (South)); Hosung Choo (Hongik University, Korea (South))

**11:20 Shaped-Beam Reflectarray Antenna Using Simple Evaluation Method**

Sanshiro Shigemitsu (Kanazawa Institute Technology, Japan); Mei Fukaya, Shigeru Makino and Shota Takino (Kanazawa Institute of Technology, Japan); Hiromasa Nakajima and Michio Takikawa (Mitsubishi Electric Corporation, Japan)

**11:40 Design of a Dual-band Shared-aperture Radar Array Using Printed Dual-loop Antennas**

Doyoung Jang (Hongik University, Korea (South), Korea (South)); Sungsik Wang (Hongik University, Korea (South)); Joungmyoung Joo and Youngwan Kim (LIG Nex One Radar Research Institute, Korea (South)); Hosung Choo (Hongik University, Korea (South))

**12:00 Design of Low Profile Broadband Dual-polarized Microstrip Patch Antenna Array**

Yongtao Shui (Beijing Institute of Space Long March Vehicle, China); GuoDong Liu, LongWei He and Xiaofei Wang (Beijing Institute of Long March Space Vehicle, China); Shuang Wang and Rundong Xue (Beijing Institute of Space Long March Vehicle, China)

**12:20 Excitation by Metal Posts of Square-arrangement Slot Antennas in Alternating-phase Feed Parallel-plate Waveguide**

Yuta Ishikawa, Takashi Tomura and Jiro Hirokawa (Tokyo Institute of Technology, Japan)

**12:40 Circularly Polarized Dual-Band Fan-Beam Metaline-based Antenna**

Tomoki Abe, Junji Yamauchi and Hisamatsu Nakano (Hosei University, Japan)

## 2B2: Millimeter-Wave, Terahertz and Optical Antennas 2

Chair: Masataka Ohira (Saitama University, Japan)

**11:00 Low-Profile Vertically Polarized Endfire Phased Array Antenna for 5G mm-Wave Applications**

Woojin Kim, Jihoon Bang and Jaehoon Choi (Hanyang University, Korea (South))

**11:20 All-metal Broadband Circularly Polarized Feed Antenna Applied to Millimeter Wave Imaging System**

Xu Han and Jinghui Qiu (Harbin Institute of Technology, China); Nannan Wang (Harbin Institute of Technology, China); Peng Gao and Alexander Denisov (Harbin Institute of Technology, China)

**11:40 20 GHz Bandwidth 3.84 dBi Gain InP On-chip Antenna for 300GHz Wireless Communication**

Go Itami, Hiroshi Hamada, Yuta Shiratori and Miwa Muto (NTT Corporation, Japan); Takuya Tsutsumi (NTT Device Technology Labs, Japan); Hideyuki Nosaka (NTT Corporation, Japan)

**12:00 Holographic Antenna with Low Surface Impedance Sensitivity Unit Cell**

Chan Yeong Park and Seung Hun Cha (Yonsei University, Korea (South)); Seongjin Park and Young Joong Yoon (Yonsei University, Korea (South)); Hyungrak Kim (Daelim University, Korea (South))

**12:20 A Filter-Technique Aided Design of 60-GHz Band Planar Single-feed Dual-polarized Antenna**

Masataka Ohira and Zhewang Ma (Saitama University, Japan)

**12:40 Design of a Multi-layer Circularly-polarized Element for a Corporate-feed Array Using Hexagonal and Circular Slot Layers**

Hiroki Nishimoto, Takashi Tomura and Jiro Hirokawa (Tokyo Institute of Technology, Japan)

## 2C2: OS: Recent Antennas and Propagation Technology in ASEAN Countries

Chairs: Mohamad Kamal A. Rahim (Universiti Teknologi Malaysia, Malaysia), Kunio Sakakibara (Nagoya Institute of Technology, Japan)

**11:00 Preliminary Result of a Wide-band Radio Frequency Moisture Sensor for Oil and Gas Pipe Thermal Insulator**

Titipong Lertwiriayaprapa (King Mongkut's University of Technology North Bangkok, Thailand); Kittisak Phaebua (King Mongkut's University of Technology North Bangkok & Faculty of Technical Education, Thailand); Pitichon Klomjit (National Science and Technology Development Agency, Thailand); Naruemit Pakkangpalang (KMUTNB, Thailand)

**11:20 Millimeter Wave Microstrip Antenna with CSRR for 5G Application**

Norsaidah Muhamad Nadzir and Mohamad Kamal A. Rahim (Universiti Teknologi Malaysia, Malaysia); Noor Asniza Murad (University Technology Malaysia, Malaysia); Mohamed Himdi (Université de Rennes 1, France)

**11:40 Radar Modeling Experiment Using Vector Network Analyzer**

Aloysius Adya Pramudita (Telkom University, Indonesia)

**12:00 Metamaterial - Based Microwave Band - Stop Filter for Wi - Fi Blocking Window**

Quang Minh Dinh (School of Electrical Engineering, Hanoi University of Science and Technology, Vietnam); Do Toan (Viettel High Technology Industries Corporation, Vietnam); Minh Thuy Le (Hanoi University of Science and Technology (HUST) & School of Electrical Engineering (SEE), Vietnam)

**12:20 A Dual-Band Dual-Polarized MIMO Antenna for 700 MHz and Sub-6 GHz 5G Systems**

Sarawuth Chaimool, Benyapa Sangwijit and Paworawan Pukna (Khon Kaen University, Thailand); Chawalit Rakluea (Rajamangala University of Technology Thanyaburi & King Mongkut's University of Technology North Bangkok, Thailand)

**12:40 Design Strategy on Medical Wearable Antenna for Tumor Detection**

Yusnita Rahayu and Rando Saputra (Universitas Riau, Indonesia)

## 2D2: Computational Electromagnetics and applications



Chairs: Jun Shibayama (Hosei University, Japan), Keisuke Konno (Tohoku University, Japan)

**11:00 Application of An Efficient Method of Moments to Numerical Analysis of 1-bit Transmitarrays**

Keisuke Konno (Tohoku University, Japan); Qiaowei Yuan (Tohoku Institute of Technology, Japan); Qiang Chen (Tohoku University, Japan); Kei Yokokawa, Jun Goto and Toru Fukasawa (Mitsubishi Electric Corporation, Japan)

**11:20 FDTD Analysis of Dipole Antenna on Multilayer Dielectric Slab**

Yuto Watanabe and Takuji Arima (Tokyo University of Agriculture and Technology, Japan); Toru Uno (Tokyo University of Agricultural Technology, Japan)

**11:40 Improved Performance of Microwave Staring Correlated Imaging by Coherent Integration**

Jianlin Zhang, Zheng Jiang, Bo Yuan, Yuanyue Guo and Dongjin Wang (University of Science and Technology of China, China)

**12:00 Electromagnetic field reconstruction of concave models using boundary integration**

Michiyoshi Nakamura (Tokyo University of Agriculture and Technology, Japan); Toru Uno (Tokyo University of Agricultural Technology, Japan); Takuji Arima (Tokyo University of Agriculture and Technology, Japan)

**12:20 A Design of Multi-band Mushroom-type EBG Structure with Multi-layer Configuration**

Ryotaro Ohashi, Tai Tanaka, Shin-ichi Yamamoto, Michio Takikawa and Yoshio Inasawa (Mitsubishi Electric Corporation, Japan)

**12:40 Development of Wideband Band-Stop Frequency Selective Surface**

Kizuku Nakasone (Tokyo University of Agriculture and Technology, Japan); Toru Uno (Tokyo University of Agricultural Technology, Japan); Takuji Arima (Tokyo University of Agriculture and Technology, Japan)

## 2E2: EMC/EMI Technologies

Chair: Takashi Hikage (Hokkaido University, Japan)

**11:00 Estimation of electromagnetic far-field from near-field using machine learning**

Kohei Takizawa, Yuta Watanabe and Kohei Fujiwara (Tokyo Metropolitan Industrial Technology Research Institute, Japan)

**11:20 Investigation of noise current on the wire harness in the EV deriving from WPT**

Shogo Nakamura and Masaharu Takahashi (Chiba University, Japan); Hiroshi Itakura and Hayato Sano (Mitsubishi Electric Corporation, Japan)

**11:40 Design of Hybrid Tapered TEM Horn for Radiated Immunity Test in Close Proximity**

Katsushige Harima (National Institute of Information and Communications Technology, Japan); Kaoru Gotoh (National Institute of Information and Communications Technology, Japan); Takayuki Kubo and Takeshi Ishida (Noise Laboratory Co., Ltd., Japan)

**12:00 Broadband Circuit Analog Absorber Using Low-Cost Frequency Selective Surface**

Koichi Furuya, Tsuyoshi Kobayashi and Noriyuki Fukui (Mitsubishi Electric Corporation, Japan); Naofumi Yoneda (Mitsubishi Electric Corporation, Japan)

**12:20 Reflection Characteristics of Metamaterial Electromagnetic Wave Absorbers and Its Relative Permittivity and Relative Permeability Evaluations**

Keita Okada, Shinichiro Yamamoto, Satoru Aikawa and Kenichi Hatakeyama (University of Hyogo, Japan); Teruhiro Kasagi (Sanyo-Onoda City University, Japan)

**12:40 Specific Absorption Rate (SAR) Calculations in the Abdomen of the Human Body Caused by Smartphone at Various Tilt Angles**

Chiaki Takasaka, Kazuyuki Saito and Masaharu Takahashi (Chiba University, Japan); Tomoaki Nagaoka and Kanako Wake (National Institute of Information and Communications Technology, Japan)

## 2F2: Radar DOA, localization, Sensing and Propagation Measurement Techniques 1

Chair: Shouhei Kidera (University of Electro-Communications, Japan)

**11:00 (invited) Development of an Antarctic Atmospheric Radar**

Toru Sato (Kyoto University, Japan); Kaoru Sato (The University of Tokyo, Japan); Masaki Tsutsumi (National Institute of Polar Research, Japan); Koji Nishimura (National Institute of Polar Research Japan, Japan); Taishi Hashimoto (National Institute of Polar Research, Japan)

**11:40 Undersea positioning using electromagnetic wave in consideration of sea wave effects**

Ryosuke Kato, Hiroki Kobayashi and Masaharu Takahashi (Chiba University, Japan); Nozomu Ishii (Niigata University, Japan); Qiang Chen (Tohoku University, Japan); Hiroshi Yoshida (JAMSTEC & MARITEC, Japan)

**12:00 Performance Evaluation of Wave Source Localization Method Using UAVs Based on the Maximum Likelihood Estimation**

Shinichi Murata (Koden Electronics Co., Ltd., Japan); Takahiro Matsuda (Tokyo Metropolitan University, Japan); Kentaro Nishimori (Graduate School of Science and Technology, Niigata University, Japan); Tsutomu Mitsui (Koden Electronics Co., Ltd, Japan)

**12:20 Theoretical error analysis on geolocation unknown emitters using TDOA of three geostationary satellites**

Takeshi Amishima (Mitsubishi Electric Corporation, Japan); Ryuhei Takahashi (MitsubishiElectricCorporation, Japan)

**12:40 A Gridless Method for Microwave Coincidence Imaging Based on Atomic Norm Minimization**

Kaicheng Cao (China); Yongqiang Cheng, Kang Liu, Hongyan Liu and Hongqiang Wang (National University of Defense Technology, China)

## 2G2: Propagation for V2X and Channel Sounding

Chairs: Hideki Omote (Softbank Corp., Japan), Motoharu Sasaki (NTT, Japan)

**11:00 Propagation Model and Scale Model Experiment of Light Domain for Clutter Loss in Urban Areas**

Shinichi Ichitsubo and Katsuki Ishimoto (Kyushu Institute of Technology, Japan); Hideki Omote and Teruya Fujii (Softbank Corp., Japan)

**11:20 Orthogonal-Polarization-Reuse-Antenna (OPRA) Evaluation at Cellular Systems**

Takaaki Beni and Hiroyuki Arai (Yokohama National University, Japan); Young-Chan Moon and Duk-Yong Kim (KMW, inc, Korea (South))

**11:40 Spreading Factor Allocation using the Standard Deviation Classification Method**

Phanupong Tempiem (King Mongkut's University of Technology Thonburi, Thailand); Rardchawadee Silapunt (King Mongkut's University of Technology Thonburi, Thailand)

**12:00 Radio Propagation Analysis of Low Base Station Antenna by Mobile Measurement in Urban Street Cell Environment**

Koyo Tategami and Mitoshi Fujimoto (University of Fukui, Japan); Koshiro Kitao, Satoshi Suyama, Hironori Ishikawa and Yasuhiro Oda (NTT DOCOMO, INC., Japan)

**12:20 Assessment of Television White Space in the Greater Metro Manila Area through Geospatial and Empirical Approaches**

Korinne Ella R Morico (Advanced Science and Technology Institute, Philippines); Kerr John G Porras (University of the Philippines - Diliman, Philippines); Julius M. Judan (Department of Science and Technology - Advanced Science and Technology Institute, Philippines); Mar Francis De Guzman (Advanced Science and Technology Institute & University of the Philippines Diliman, Philippines); Calvin Artemies Hilario (Advanced Science and Technology Institute & University of the Philippines - Diliman, Philippines)

**12:40 Evaluation of direction of arrival and XPR by hexahedral antennas based on 920-MHz band measured data**

Yasunori Shimazaki (Panasonic Corporation, Japan); Kentaro Nishimori, Yuki Igarashi and Ryotaro Taniguchi (Niigata University, Japan); Taichi Hamabe (Panasonic Corporation Connected Solutions Company, Japan); Akihiro Tatsuta, Teppei Emura and Takuya Asada (Panasonic Corporation, Japan)

## Student Design Contest

Antenna Design

[Detail](#)

Tuesday, January 26 13:00 - 14:20 (Asia/Tokyo)

### Exhibition Technical Seminar

·Anritsu Corporation

·JSOL Corporation

13:15 Anritsu Corporation (in Japanese)

13:50 JSOL Corporation (in Japanese)

Tuesday, January 26 14:20 - 16:20 (Asia/Tokyo)

## 2A3: Small Antennas and RF Sensors 1

Chairs: Hisashi Morishita (National Defense Academy, Japan), Keisuke Noguchi (Kanazawa Institute of Technology, Japan)

**14:20 PSO-aided ILA Methodology for Hemispherical Beam Coverage and Scan Loss Mitigation**

Youngno Youn, Jaehong Choi and Daehyeon Kim (Pohang University of Science and Technology, Korea (South)); Ahmed Abdelmottaleb Omar (Pohang University of Science and Technology (POSTECH), Korea (South)); Jaehyun Choi (Pohang University of Science and Technology, Korea (South)); Inseop Yoon, Seungtae Ko, Jungyub Lee and Youngju Lee (Samsung Electronics, Korea (South)); Wonbin Hong (Pohang University of Science and Technology (POSTECH), Korea (South))

**14:40 Compact Triple-band Monopole Antenna with Dual Fork-shaped Strips for WLAN/WiMAX Applications**

Xinqian Zhang (Beijing Institute of Space Long March Vehicle, China); Xiaofei Wang (Beijing Institute of Long March Space Vehicle, China); Song Weiyang (Beijing Institute of Space Long March Vehicle, China)

**15:00 Feasibility study of the bandwidth expansion for MACKEY S1 type with a short-circuit board**

Toshiki Tamura, Shigeru Makino and Kenji Itoh (Kanazawa Institute of Technology, Japan)

**15:20 Evaluation of Q factor of Antennas in Lossy Medium**

Junyi Xu and Qiang Chen (Tohoku University, Japan)

**15:40 Ultra Wide Band Antenna for Breast Tumor Detection**

Yusnita Rahayu, Muhammad Fadhlurrahman Hilmi and Eko Prasetyo (Universitas Riau, Indonesia)

**16:00 The new model MACKEY II with reduced thickness**

Keisuke Miyashita (Kanazawa-institute-of-technology, Japan); Shigeru Makino, Toshiki Tamura and Kenji Itoh (Kanazawa Institute of Technology, Japan)

## 2B3: OS: Antenna Arrays for Radar Applications

Chair: Koichi Ichige (Yokohama National University, Japan)

**14:20 Simulation Results of Satellite AIS when Utilizing Khatri-Rao (KR) product Array Processing**

Daichi Hirahara (Japan Aerospace Exploration Agency, Japan)

**14:40 Low-order linear array for FM passive radar: calibration and beamforming**

Muhammad Abdul Hadi (Prince Sultan Defense Studies and Research Center (PSDSARC) & PSATRI, Saudi Arabia); Mobien Shoaib and Khalid Jamil (Prince Sultan Defense Studies and Research Center, Saudi Arabia)

**15:00 Robust Source Number Estimation Based on FMCW Radar with Multiple Initial Frequencies**

Ryo Saito, Katsuhisa Kashiwagi and Nobuya Arakawa (Murata Manufacturing, Japan); Shohei Hamada and Koichi Ichige (Yokohama National University, Japan)

**15:20 Joint MIMO and Frequency Diverse Array for Suppressing Mainlobe Interferences**

Cheng Jie, Wen-Qin Wang and ShunSheng Zhang (University of Electronic Science and Technology of China, China)

**15:40 Accuracy Improvement of Human Motion Recognition with MW-FMCW Radar Using CNN**

Fumiya Sakagami, Hiroyoshi Yamada and Shogo Muramatsu (Niigata University, Japan)

## 2C3: OS: Metasurfaces/Metamaterials for Radiation and Scattering Control 2

Chair: Tetsuya Ueda (Kyoto Institute of Technology, Japan)

**14:20 Dispersionless Optical Activity in 3-D Chiral Metamaterial Composed of High-K Dielectric Cube and Metallic Mesh**

Jumpei Iwasa, Takuya Yamaguchi, Tetsuya Ueda, Hiroyuki Kurosawa and Shun Takahashi (Kyoto Institute of Technology, Japan); Tatsuo Itoh (UCLA, USA)

**14:40 Aperture Efficiency Improvement by Reflectionless Metasurfaces for Large-Aperture Antennas**

Yuto Kato and Yuanfeng She (National Institute of Advanced Industrial Science and Technology, Japan); Michitaka Ameya (NMIJ/AIST, Japan); Satoru Kurokawa (National Institute of Advanced Industrial Science and Technology, Japan); Atsushi Sanada (Osaka University, Japan)

**15:00 Metasurface Bandwidth Enhancement with a Non-Foster Load**

Nikita Kalmykov (Saint Petersburg Electrotechnical University, Russia); Bair Buiantuev (St. Petersburg Electrotechnical University LETI, Russia); Dmitry Kholodnyak (Saint Petersburg Electrotechnical University LETI, Russia)

**15:20 Scattering Control of Electromagnetic Waves via Space-Modulation Metasurface**

Ratanak Phon and Sungjoon Lim (Chung-Ang University, Korea (South))

## 2D3: Short Presentation Session A1

Chair: Yoshiki Sugimoto (Nagoya Institute of Technology, Japan)

### **14:20 Circularly-Polarized Circular Meandered Microstrip Antennas for WLAN Applications**

Naresh Kumar Darimireddy (University of Quebec, Canada); Rama Sanjeeva Reddy B (JNTU, UGC Autonomous, India); Chan Wang Park (University of Quebec in Rimouski & Université du Québec à Rimouski, Canada)

### **14:35 Wideband Isolation Enhancement of Dual-Antenna Array Using Hybrid Decoupling Structures**

Shasha Deng (University of Science and Technology of China, China); Yangyang Wang (National University of Defense Technology, China); Jun Ding (East China Normal University, China); Weidong Chen (University of Science & Technology of China, China); Chang Chen (University of Science and Technology of China, China)

### **14:50 Novel Simulation Approach to Microstrip Antenna Integrated with Nonlinear Circuit**

Tatsuki Kayashima, Eisuke Nishiyama and Ichihiko Toyoda (Saga University, Japan)

### **15:05 A Multi-Groove Loaded Rectangular Aperture Horn Antenna for Orthogonal Polarized Elliptical Beam**

Tomokazu Takahashi, Hiroyuki Deguchi and Mikio Tsuji (Doshisha University, Japan)

### **15:20 Obliquely-Cut Horn Antennas Loading a Half-Cylindrical Conductor for a Widely Tilted Sectoral Beam**

Haruhisa Ota, Hiroyuki Deguchi and Mikio Tsuji (Doshisha University, Japan)

### **15:35 Generalized Ray-tracing Model for Modified Geodesic Luneburg Lens Antennas**

Qingbi Liao (KTH Royal Institute of Technology, Sweden); Francisco Mesa (University of Seville, Spain); Oskar Zetterstrom (KTH Royal Institute of Technology, Sweden); Nelson Fonseca (European Space Agency, The Netherlands); Oscar Quevedo-Teruel (KTH Royal Institute of Technology, Sweden)

### **15:50 Design of Longitudinal Coupling Slots with Matching Walls for a Rectangular Parallel Plate Slot Array Antenna**

Tianyu Wang, Takashi Tomura and Jiro Hirokawa (Tokyo Institute of Technology, Japan)

### **16:05 Balanced Non-contact Connector for PIM Measurement**

Ryunosuke Murofushi (Yokohama National University & Polytechnic University, Japan); Nobuhiro Kuga (Yokohama National University, Japan); Eiji Hanayama (Polytechnic University, Japan)

## 2E3: Short Presentation Session D1

Chair: Mitoshi Fujimoto (University of Fukui, Japan)

### **14:20 Performance of interference suppression system in environment where artificial noise is mixed into multiple desired signals**

Yuya Shimizu and Mitoshi Fujimoto (University of Fukui, Japan)

### **14:35 Empirical Formulas for Performance Prediction of Concrete Embedded Antenna**

Ju Tan (The University of Sheffield, United Kingdom (Great Britain)); Yu Shao (Chongqing University of Posts and Telecommunications, China); Jiliang Zhang (The University of Sheffield, United Kingdom (Great Britain)); Jie Zhang (University of Sheffield, Dept. of Electronic and Electrical Engineering, United Kingdom (Great Britain))

### **14:50 Study of FDD downlink beamforming method suitable for WPT in real environment**

Masaki Igarashi and Kentaro Nishimori (Niigata University, Japan)

### **15:05 Service Area expansion by Adaptive Array in BRT Communications**

Shotaro Sasaki and Mitoshi Fujimoto (University of Fukui, Japan); Katsutoshi Kawai and Toshinori Iinuma (KYOCERA Corporation, Japan)

### **15:20 Modulation Scheme Estimation of Multiple Signals Using Machine Learning**

Takanori Niimi, Mitoshi Fujimoto and Tatsuhito Hasegawa (University of Fukui, Japan)

### **15:35 Correlation Control of Random Variables for Setting the Number of Paths in Monte-Carlo Simulation**

Kaito Otsubo (Toyama University, Japan); Koichi Ogawa (University of Toyama & Faculty of Engineering, Japan); Kazuhiro Honda (University of Toyama, Japan)

### **15:50 Effectiveness of the virtual massive MIMO in 5G with OFDM**

Issei Watanabe, Kentaro Nishimori and Ryotaro Taniguchi (Niigata University, Japan); Tomoki Murakami (NTT Corporation, Japan)

### **16:05 Service Area Expansion by Polarization MIMO Gap-filler in Terrestrial TV Broadcasting**

Kentaro Tanaka and Mitoshi Fujimoto (University of Fukui, Japan)

## 2F3: Radar DOA, localization, Sensing and Propagation Measurement Techniques 2

Chairs: Naruto Yonemoto (Electronic Navigation Research Institute, MPAT, Japan), Kazunari Kihira (Mitsubishi Electric Corporation, Japan)

### **14:20 Contactless Estimation Method of Complex Permittivity Using Load Modulation for Agricultural Application**

Wataru Hikichi, Naoki Honma and Kentaro Murata (Iwate University, Japan)

### **14:40 A Preliminary Experiment on Relationship between Soil Moisture and Attenuation Constant of 920 MHz Band Radio Waves**

Mami Okamoto, Makoto Kobayashi, Koichi Shin and Masahiro Nishi (Hiroshima City University, Japan)

### **15:00 Ground Reflection Power Measurements of Thin High-Voltage Power Lines Using 76 GHz Helicopter Forward-Looking Low-Transmitting Power Millimeter-Wave Radar**

Shunichi Futatsumori and Norihiko Miyazaki (Electronic Navigation Research Institute, Japan)

### **15:20 Microwave Heartbeat Detection Using Arctangent Demodulation in a Vehicle**

Kota Sasaki, Naoki Honma, Morio Iwai and Koichiro Kobayashi (Iwate University, Japan); Atsushi Sato (EQUOS RESEARCH Co., Ltd., Japan); Kentaro Murata (Iwate University, Japan)

### **15:40 Drone Detection and Classification Based on Radar Cross Section Signatures**

Vasilii Semkin (VTT Technical Research Centre of Finland, Finland); Mingsheng Yin, Yaqi Hu and Marco Mezzavilla (NYU Tandon School of Engineering, USA); Sundeep Rangan (New York University, USA)

### **16:00 EM-Transparency for Improving Angular Accuracy of a Reactively Loaded MIMO/AOA Antenna**

Yuki Otsubo (Toyama University, Japan); Koichi Ogawa (University of Toyama & Faculty of Engineering, Japan); Kazuhiro Honda (University of Toyama, Japan)

## 2G3: Short Presentation Session B1

Chair: Shinichiro Yamamoto (University of Hyogo, Japan)

### **14:20 Influence of Beam Spot Size in Measurement of Pulse Waves at Multiple Parts of the Human Body Using Millimeter-wave Array Radar**

Yuji Oyamada and Takuya Sakamoto (Kyoto University, Japan)

### **14:35 Basic Study on Polarimetric Observation of Ocean Radar**

Tatsuhiko Koizumi and Hiroyoshi Yamada (Niigata University, Japan); Satoshi Fujii (University of The Ryukyus); Yasunori Osana (University of The Ryukyus, Japan)

### **14:50 Two-dimensional Autofocus Approach for bistatic SAR Polar Format Algorithm**

Tianyue Shi, Yue Bao, Xinhua Mao and He Yan (Nanjing University of Aeronautics and Astronautics, China)

### **15:05 DoA Estimation Results in 20-GHz Band Using Compressed Sensing**

Saki Uemura, Kentaro Nishimori and Ryotaro Taniguchi (Niigata University, Japan); Koshiro Kitao, Satoshi Suyama and Yasuhiro Oda (NTT DOCOMO, INC., Japan)

### **15:20 A Study on Indoor Human Moving Route Estimation using Several Receivers of 920 MHz Band Radio Waves**

Tsugunosuke Horita, Makoto Kobayashi, Koichi Shin and Masahiro Nishi (Hiroshima City University, Japan)

### **15:35 Source Location Estimation via Compressed Sensing using UAVs**

Shun Takase (University of Niigata, Japan); Kentaro Nishimori and Ryotaro Taniguchi (Niigata University, Japan); Takahiro Matsuda (Tokyo Metropolitan University, Japan); Tsutomu Mitsui (Koden Electronics Co., Ltd, Japan)

### **15:50 Effect of Particle Filter to the Finger Print with wide coordinate interval**

Kentaro Tada, Satoru Aikawa and Shinichiro Yamamoto (University of Hyogo, Japan)

### **16:05 Displacement Measurement by Using Millimeter Wave Interferometric-SAR**

Jun Sato and Hiroyoshi Yamada (Niigata University, Japan)

## Student Design Contest

Antenna Design

[Detail](#)

## 2A4: OS: Advanced Millimeter-Wave Array Antennas

Chair: Miao Zhang (Xiamen University, China)

### 16:40 *High-performance UWB mmWave Smart Bowtie Array Antenna Technology for 5G Access and backhauling Systems*

Jian Yang and Sadegh Mansouri Moghaddam (Chalmers University of Technology, Sweden); Tianling Zhang (Xidian University, China); Ashraf Uz Zaman and Vessen Vassilev (Chalmers University of Technology, Sweden); Zhongxia Simon He (Chalmers University of Technology & Microwave Electronic Lab, Sweden); Lei Chen (Xidian University, China); Lars Manholm (Ericsson Research, Sweden); Astrid Algaba Brazález (Ericsson Research, Ericsson AB, Sweden); Nikolaos Fokos and Stefan Thoresson (Ericsson AB, Sweden); Tomas Östling (Arkivator AB, Sweden); Thomas Emanuelsson (Gapwaves AB, Sweden)

### 17:00 *A Single-Layer $\pm 45^\circ$ Dual-Polarized Array Antenna Based on Phase Control Approach*

Yu-Hang Yang, Shigang Zhou and Yi-Lin Dong (Northwestern Polytechnical University, China)

### 17:20 *Transmission Enhancement in Rectangular-Coordinate Orthogonal Multiplexing by Excitation Optimization of Slot Arrays Based on the Scattering Parameters*

Baoquan Duan, Takashi Tomura and Jiro Hirokawa (Tokyo Institute of Technology, Japan); Miao Zhang (Xiamen University, China)

### 17:40 *Near-field Aperture Distribution Measurement of 8x2-element 60-GHz-Band Circularly Polarized Post-Wall Waveguide Dipole Loaded Slot Arrays*

Takashi Tomura and Jiro Hirokawa (Tokyo Institute of Technology, Japan)

## 2B4: Antenna Measurement 1

Chair: Nozomu Ishii (Niigata University, Japan)

### 16:40 *Far field estimation by current distribution reconstruction from 5-sided box near field*

Yusuke Mitsui, Yuzo Hayashi and Hiroyuki Arai (Yokohama National University, Japan)

### 17:00 *Iteration-free phase retrieval method using phaseless single-plane near-field*

Yoshiki Sugimoto, Kunio Sakakibara and Nobuyoshi Kikuma (Nagoya Institute of Technology, Japan)

### 17:20 *Optical Fiber Link Multi Probe Near Field Antenna Measurement System using Zero Biased EA modulator and CWDM Multiplexer*

Satoru Kurokawa (National Institute of Advanced Industrial Science and Technology, Japan)

### 17:40 *Antenna Near Field to Far Field Transformation in the Presence of Ground*

Erez Gershnel, Michael Shalukhin, Shmuel Goldberg and Yehonatan Chattah (IAI, Israel)

### 18:00 *Proposal of time domain near-field measurement system for 5G antenna system*

Yusuke Maruyama and Kazuhiro Fujimori (Okayama University, Japan); Hiroyuki Arai (Yokohama National University, Japan); Toshiyasu Tanaka (Microwave Factory Co., Ltd., Japan)

## 2C4: Designing FSS, EBG, and Other EM Device

Chair: Naobumi Michishita (National Defense Academy, Japan)

### 16:40 *New Scheme to realize Ultra-wideband Absorber Based on TCDA-over-TCDA Structure*

Seoungjung Kim and Sangwook Nam (Seoul National University, Korea (South))

### 17:00 *Polarization-Insensitive Dual-Band Frequency Selective Resorber based on Concentric SRRs*

Gobinda Sen (IEST, SHIBPUR & HOWRAH, WEST BENGAL, INDIA, India); Santanu Das (Indian Institute of Engineering Science and Technology (IEST), Shibpur, India); Saptarshi Ghosh (Indian Institute of Technology Indore, India)

### 17:20 *Frequency Selective Surfaces Using Hexagonal Interwoven Structures*

Juan Andrés Vásquez Peralvo and Jose Manuel Fernández González (Universidad Politécnica de Madrid, Spain); Jonathan Michael Rigelsford (The University of Sheffield, United Kingdom (Great Britain))

### 17:40 *Digitally Tunable Frequency Selective Surface for a Physical Layer Security System in the 5 GHz Wi-Fi Band*

Markus Heinrichs and Rainer Kronberger (TH Cologne University of Applied Sciences, Germany)

### 18:00 *Hydrodynamic Approach for Deep-nanometer Scale Topologies: Analysis of Metallic Shell*

Mario Kupresak (KU Leuven, Belgium); Tomislav Marinovic (Katholieke Universiteit Leuven & Chalmers University of Technology, Belgium); Xuezhong Zheng (Katholieke Universiteit Leuven, Belgium); Guy Vandebosch (Katholieke Universiteit Leuven (KU Leuven), Belgium); Victor V. Moshchalkov (Katholieke Universiteit Leuven, Belgium)

**18:20 On the Convergence of the Iterative Gauss-Seidel-Based Electric Field Algorithm for the Solution of Antenna Array Mutual Coupling**

Tomislav Marinovic (Katholieke Universiteit Leuven & Chalmers University of Technology, Belgium); Mario Kupresak (KU Leuven, Belgium); Rob Maaskant (CHALMERS, Sweden); Guy Vandebosch (Katholieke Universiteit Leuven (KU Leuven), Belgium)

## 2D4: OS: EurAAP Session: Recent Advances in European Antennas and Propagation Research

Chairs: Manuel Sierra-Castañer (Universidad Politécnica de Madrid, Spain), Claude Oestges (Université Catholique de Louvain, Belgium)

**16:40 Stereolithography and Direct Metal Laser Sintering Applied to mm-Wave Antennas**

Adrián Tamayo-Domínguez (Universidad Politecnica de Madrid, Spain); Jose Manuel Fernández González and Manuel Sierra-Castañer (Universidad Politécnica de Madrid, Spain)

**17:00 Review on Wideband and Compact CTS Arrays at Millimeter Waves**

Michele Del Mastro (University of Rennes 1, France); Thomas Potelon (IETR - University of Rennes 1, France); Francesco Foglia Manzillo (CEA-LETI, France); Maciej Smierzchalski (CEA, France); Ronan Sauleau (University of Rennes 1, France); Mauro Ettore (University of Rennes 1 & UMR CNRS 6164, France)

**17:20 Fading Analysis for BANs in Cylindrical Rooms with Metallic Walls**

Sławomir J. Ambroziak (Gdańsk University of Technology, Poland); Filipe Cardoso (ESTSetubal/Polytechnic Institute of Setubal and INESC-ID, Portugal); Pawel Kosz (Gdansk University of Technology, Poland); Manuel Ferreira (ESTSetubal/Polytechnic Institute of Setubal, Portugal); Luis M. Correia (IST/INESC-ID - University of Lisbon & INESC, Portugal)

**17:40 Dynamic Ray Tracing: A 3D Formulation**

Denis Bilibashi, Enrico M. Vitucci and Vittorio Degli-Esposti (University of Bologna, Italy)

**18:00 Physical-Statistical Model for UAV-to-Ground Urban Radio Channels**

Claude Oestges (Université Catholique de Louvain, Belgium)

## 2E4: Antenna Systems for Mobile Communications and MIMO Signal Processing

Chair: Minh Thuy Le (Hanoi University of Science and Technology (HUST) & School of Electrical Engineering (SEE), Vietnam)

**16:40 Focal Region Ray Tracing of Dual Spherical Reflector Antenna**

Ayuni Afiqah Arjunaidi (Malaysia-Japan International Institute of Technology, Universiti Teknologi Malaysia, Malaysia); Kamelia Quzwain (Universiti Teknologi Malaysia, Malaysia); Yoshihide Yamada (Malaysia-Japan International Institute of Technology, Universiti Teknologi Malaysia, Malaysia); Kamilia Kamardin (Universiti Teknologi Malaysia, Malaysia); Nguyen Quoc Dinh (Le Quy Don Technical University & Faculty of Radio-Electronic Engineering, Vietnam)

**17:00 Connecting Networks for Two-Dimensional Butler Matrices With Improved Aggregate Gain**

Nelson Fonseca and Sophie-Abigael Gomanne (European Space Agency, The Netherlands); Jiro Hirokawa (Tokyo Institute of Technology, Japan)

**17:20 Transmit Power Control Method for Centrally Controlled Wireless LANs with MU-MIMO**

Fuga Tanaka, Soma Yamashita, Hirofumi Suganuma and Fumiaki Maehara (Waseda University, Japan)

**17:40 Frequency Domain Iterative Cancellation of Periodic Noise**

Yuya Furutani, Satoshi Denno and Yafei Hou (Okayama University, Japan)

**18:00 Performance Comparison of FBP and CS Methods on Microwave Tomography**

Dian Kurnia Imanda and Achmad Munir (Institut Teknologi Bandung, Indonesia)

**18:20 An Improved Method in Graph Coloring Algorithm for Interference Coordination in Cluster-wise Ultra-dense RAN**

Chang Ge, Sijie Xia, Qiang Chen and Fumiyuki Adachi (Tohoku University, Japan)

## 2F4: Terrestrial, Earth-Space and Ionospheric Propagation

Chairs: Masahiro Nishi (Hiroshima City University, Japan), Minoru Inomata (NTT, Japan)

**16:40 Study of 21-GHz-band Rain Attenuation Based on Annual Observations of Broadcasting Satellite Signals**

Shinsuke Yokozawa (Japan Broadcasting Corporation, Japan); Masashi Kamei (NHK, Japan); Hisashi Sujikai (NHK Science and Technical Research Laboratories, Japan)

**17:00 Rain Attenuation Characteristics due to Typhoon Wind Velocities in Satellite Communications Links**

Yasuyuki Maekawa (Osaka Electro-Communication University, Japan)

**17:20 A Beam Forming Antenna Based on Earth Shape for Micro-satellites**

Gong Chen, Chaoran Hu, Mingchuan Wei and Jiyao Zhang (Harbin Institute of Technology, China); Yue Chen (Chang Guang Satellite Technology co., Ltd, China)

**17:40 Observation of the UHF Television Duct over the Japan Sea**

Tetsuo Fukami (National Institute of Technology, Ishikawa College, Japan); Ryoichi Higashi (Ishikawa National College of Technology, Japan)

**18:00 BLOS Propagation Measurements in Gdansk Bay**

Jaroslav Stepien (Wroclaw University of Science and Technology, Poland)

**18:20 Deforestation Detection in Tropical Forests using Scattering Power Decomposition**

Ryu Sugimoto (National Institute of Advanced Industrial Science and Technology, Japan); Ryouzuke Nakamura (National Institute of Advanced Industrial Science and Technology (AIST), Japan); Chiaki Tsutsumi (AIST, Japan); Yoshio Yamaguchi (Niigata University, Japan)

## 2G4: Propagation Simulation

Chair: Katsuyuki Haneda (Aalto University, Finland)

**16:40 (invited) Ray tracing: techniques, applications and prospect**

Vittorio Degli-Esposti (University of Bologna, Italy)

**17:20 Evaluation of Ray Tracing Simulation with Urban Microcell Environment Measurements at 5G Band**

Hirokazu Yamakura and Gilbert S Ching (Kozo Keikaku Engineering Inc., Japan); Yukiko Kishiki (Kozo Keikaku Engineering, Japan); Noboru Sekino (DKK Co. Ltd., Japan); Ichiro Oshima (Denki Kogyo Co., Ltd., Japan); Tetsuro Imai (Tokyo Denki University, Germany)

**17:40 Prediction of 28 GHz Propagation Characteristics in an Indoor Office Environment Based on Large-scale Computer Simulations**

Sango Nagamoto and Manabu Omiya (Hokkaido University, Japan)

**18:00 Ray-Tracing Analysis of 60 GHz Band Propagation in Vehicle**

Kensuke Matsui (YAZAKI Corporation, Japan); Satoshi Yamakawa (Niigata University, Japan); Yuya Kaneko (Yazaki Corporation, Japan); Minseok Kim (Niigata University, Japan); Tadahide Kunitachi (YAZAKI Corporation, Japan)

**18:20 Radio Propagation Prediction Using Neural Network and Building Occupancy Estimation**

Kazuya Inoue and Koichi Ichige (Yokohama National University, Japan); Tatsuya Nagao and Takahiro Hayashi (KDDI Research, Inc., Japan)

## Wednesday, January 27

### Wednesday, January 27 9:00 - 10:40 (Asia/Tokyo)

## 3A1: Small Antennas and RF Sensors 2

Chair: Mayumi Matsunaga (Tokyo University Technology, Japan)

**9:00 Heartbeat Measurement Results by a VHF-Band Antenna with an Adaptive Matching Control Algorithm**

Saki Wada (MitsubishiElectric corp., Japan); Kengo Nishimoto, Yasuhiro Nishioka and Yoshio Inasawa (Mitsubishi Electric Corporation, Japan)

**9:20 Bent loop Inverted F antenna for TWS Bluetooth earphones**

Taehyun Woo and Young Joong Yoon (Yonsei University, Korea (South))

**9:40 Design of Omni-Directional radiation antenna by using two antennas with orthogonal polarizations**

Xiaofei Wang (Beijing Institute of Long March Space Vehicle, China); Jian Geng, Yuchun Li and Jun Li (China Academy of Launch Vehicle Technology, China); Shigang Zhou (Northwestern Polytechnical University, China)

**10:00 Research of a metamaterial microfluidic sensor based on FANO resonance**

Yunhao Cao, Kanglong Chen and Cunjun Ruan (Beihang University, China)

**10:20 Helical antennas in 920-MHz band for wireless sensor nodes under the ground**



## 3B1: Antenna Measurement 2

Chair: Satoru Kurokawa (National Institute of Advanced Industrial Science and Technology, Japan)

**9:00 (invited) Near-Field Test Challenges of High Frequency Digital Phased Array Antennas**

Daniël J Janse van Rensburg (NSI-MI Technologies & Nearfield Systems Inc, USA)

**9:40 A reduction of measurement points in cylindrical near field measurement by complex interpolation**

Yuzo Hayashi and Hiroyuki Arai (Yokohama National University, Japan)

**10:00 Near Field Co-Planar Phase-less Measurement for EIRP Evaluation**

Kyosuke Kusunose and Hiroyuki Arai (Yokohama National University, Japan)

**10:20 An Optimized Sampling Scheme for Multi-probe Spherical Near-field Measurement**

Lei Chen (China Academy of Space Technology, China)

## 3C1: Wireless Power Transfer Technologies

Chair: Satoshi Tsukamoto (Toyohashi University of Technology, Japan)

**9:00 A Planar Retrodirective Array using Dual-mode Dielectric Resonator Antennas**

Takayuki Matsumuro and Toshio Ishizaki (Ryukoku University, Japan)

**9:20 Retrodirective Array Antenna System for the Microwave Power Transmission**

Changyoung An and Heung-Gyoon Ryu (Chungbuk National University, Korea (South))

**9:40 Transmission Enhancement for Radial Line Slot Antennas in Non-Far Region Using a Feeding Slot with Better Rotating Mode**

Tuchjuta Ruckkwaen, Takashi Tomura and Jiro Hirokawa (Tokyo Institute of Technology, Japan)

**10:00 A Study on  $\Sigma$ - $\Delta$  Directional Antenna Array for Electromagnetic Wave Energy Harvesting**

Nobuyasu Takemura (Nippon Institute of Technology, Japan)

**10:20 Energy harvesting by applying Multi-Sector Yagi-Uda Rectenna**

Tamami Maruyama (National Institute of Technology, Hakodate College, Japan)

## 3D1: OS: Advanced Radar Technology Related to Radar Signal and Image Processing Including Antennas

Chair: Toshifumi Moriyama (Nagasaki University, Japan)

**9:00 Inverse scattering approach by using cost functional consisting the approximated stored energy with no information on incident field**

Toshifumi Moriyama (Nagasaki University, Japan)

**9:20 Bi-directional Updating Algorithm for ROI and Dielectric Profile in CSI Framework for Microwave Subsurface Imaging**

Takahide Morooka and Shouhei Kidera (University of Electro-Communications, Japan)

**9:40 Radio Frequency Interference Detection for Multi-Receiver Synthetic Aperture Radar Based on Interferometric Analysis of Raw Data**

Ryo Natsuaki (The University of Tokyo, Japan); Pau Prats (German Aerospace Center (DLR), Germany)

**10:00 Wide-angle Ultra-Wideband PolSAR Imaging Simulation of Canonical Targets**

Suyun Wang (Tohoku University, Japan)

**10:20 A Transfer-Learning Based Segmentation Algorithm for Remote Sensing Images**

Haipeng Wang and Xin Zhang (Fudan University, China)

## 3E1: OS: Orbital Angular Momentum (OAM) Multiplexing Transmission

Chairs: Doohwan Lee (NTT, Japan), Toshihiko Nishimura (Hokkaido University, Japan)

**9:00 Mode Group Selection Method for Inter-mode Interference Suppression in OAM Multiplexing**

Hirofumi Suganuma and Shuhei Saito (Waseda University, Japan); Kayo Ogawa (Japan Women's University, Japan); Fumiaki Maehara (Waseda University, Japan)

**9:20 Multi-mode Circular Waveguide Antenna with Orbital Angular Momentum**

Kenta Otsuka, Takeshi Fukusako and Ryuji Kuse (Kumamoto University, Japan)

**9:40 OAM-based Imaging with Cylinder-shaped Arrays**

Kang Liu, Yongqiang Cheng, Hongqiang Wang and Chenggao Luo (National University of Defense Technology, China)

**10:00 Inter-Mode Interference Caused by Antenna Swinging in OAM Mode Multiplexing**

Ryuji Zenkyu, Masashi Hirabe, Hiroaki Miyamoto, Koji Ikuta and Eisaku Sasaki (NEC Corporation, Japan)

**10:20 Rectangular-coordinate Orthogonal Multiplexing including Modulation**

Kohei Jitoshio, Takashi Tomura and Jiro Hirokawa (Tokyo Institute of Technology, Japan); Kentaro Nishimori (Niigata University, Japan)

## 3F1: Student Paper Award 1

Chair: Tetsuro Imai (Tokyo Denki University, Germany)

**9:00 Efficiency Enhancement of Wireless Power Transfer Localization using Defected Metasurface**

Chawalit Rakluea (Rajamangala University of Technology Thanyaburi & King Mongkut's University of Technology North Bangkok, Thailand); Sarawuth Chaimool (Khon Kaen University, Thailand); Yan Zhao (Chulalongkorn University, Thailand); Prayoot Akkaraekthalin (King Mongkut's University of Technology North Bangkok, Thailand)

**9:20 Compact High Efficiency Terahertz Filtering Antenna with Low Cross-Polarization Based on the Mixed-Mode Cavity**

Yi-Wen Wu (Southeast University, China); Zhang-Cheng Hao (SEU, China)

**9:40 Experimental Validation for Temperature Rise in Human Tissue Due to Implanted Metal Plates with Screw Holes Using Translucent Solid Phantom**

Atsuki Ohtsuka, Suzune Ito and Takashi Hikage (Hokkaido University, Japan); Tomoaki Nagaoka, Kanako Wake and Soichi Watanabe (National Institute of Information and Communications Technology, Japan)

**10:00 Electric Field Reconstruction of Antenna inside Phantom for Non-invasive SAR Measurement**

Rasyidah Hanan Mohd Baharin (Tokyo University of Agriculture and Technology, Japan); Toru Uno (Tokyo University of Agricultural Technology, Japan); Takuji Arima (Tokyo University of Agriculture and Technology, Japan); Shuntaro Omi (National Institute of Information and Communications Technology, Japan)

**10:20 Cost effective wideband Ka flat lens antenna**

Jose M Poyanco and Francisco Pizarro (Pontificia Universidad Catolica de Valparaiso, Chile); Eva Rajo-Iglesias (University Carlos III of Madrid, Spain)

## 3G1: Remote Sensing and Propagation Measurement

Chairs: Yasuyuki Maekawa (Osaka Electro-Communication University, Japan), Hisato Iwai (Doshisha University, Japan)

**9:00 Near Field EVM Estimation in OTA Test**

Hiroyuki Saito and Hiroyuki Arai (Yokohama National University, Japan)

**9:20 SAR Target Recognition With Limited Samples Based on Meta Knowledge Transferring Using Relation Network**

Jun Guo, Ling Wang, Daiyin Zhu and Gong Zhang (Nanjing University of Aeronautics and Astronautics, China)

**9:40 ALOS-PALSAR Quad Pol Data and Image Archive for Monitoring the Earth Environment**

Ryousuke Nakamura (National Institute of Advanced Industrial Science and Technology (AIST), Japan)

**10:00 TOF Estimation of Multipath Waves Using PN Correlation Method with M-FOCUSS**

Hiroto Takito, Kunio Sakakibara, Yoshiki Sugimoto and Nobuyoshi Kikuma (Nagoya Institute of Technology, Japan)

**10:20 Equation for Estimation of Radio Link Budget for NMHA in Human Fat Tissue Phantom**

Nur Amalina Kamaruddin (Malaysia-Japan International Institute of Technology, Universiti Teknologi Malaysia, Malaysia); Kamilia Kamardin (Universiti Teknologi Malaysia, Malaysia); Yoshihide Yamada (Malaysia-Japan International Institute of Technology, Universiti Teknologi Malaysia, Malaysia)

## Student Design Contest

## Wednesday, January 27 11:00 - 13:00 (Asia/Tokyo)

### 3A2: Millimeter-wave, Terahertz and Optical Antennas 3

Chair: Takuichi Hirano (Tokyo City University, Japan)

**11:00 *Suppression of Mutual Coupling between Microstrip Antenna Arrays by Antenna Decoupling Surfaces***

Soichi Sakurai, Takashi Tomura and Jiro Hirokawa (Tokyo Institute of Technology, Japan)

**11:20 *Gain Enhancement of Optical Leaky wave Antenna Excited by Photonic Bandgap Parabolic reflector with Thin Glass Layer***

Satoshi Sugaya (Yokohama National University, Japan); Hiroyuki Arai and Wataru Iida (Yokohama National University, Japan)

**11:40 *Beam-tilted reflectarray antenna with primary radiator offset***

Haruna Nagahara and Hiroyuki Arai (Yokohama National University, Japan)

**12:00 *Single-Layer Antenna with Dual-Band for 5G Millimeter-Wave System***

Si Li, Zhiming Yi and Guangli Yang (Shanghai University, China); Yu-Jiun Ren (Electric Connector Technology-US, USA)

**12:20 *2-Element Slot Antenna Array Based on Substrate Integrated Waveguide at Q-band***

Pengfei Liu (Southeast University & Nanjing University of Posts and Telecommunications, China); Xiaowei Zhu (Southeast University, China); Yan Zhang (State Key Laboratory of Millimeter Waves, Southeast University & Electromagnetic Communication Laboratory, The Pennsylvania State University, China); Ling Tian and Zhi Hao Jiang (Southeast University, China); Nianzu Zhang (SEU, China)

### 3B2: Antenna Measurement 3

Chairs: Takayuki Sasamori (Hokkai-Gakuen University, Japan), Yuanfeng She (National Institute of Advanced Industrial Science and Technology, Japan)

**11:00 *Basic consideration on non-contact localization for a PIM source in array antenna***

Takaya Kimino and Nobuhiro Kuga (Yokohama National University, Japan)

**11:20 *IM Evaluation of Electronic Devices using Circular Polarized Sensing Antenna***

Hiroya Mizoguchi and Nobuhiro Kuga (Yokohama National University, Japan)

**11:40 *Non-contact PIM-measurement of Array Antenna using Open-Stub Extension***

Masayoshi Kuwata and Nobuhiro Kuga (Yokohama National University, Japan)

**12:00 *Distance Dependence of Transmission Characteristics Between Small Dipole Antennas in Tissue Equivalent Liquid Operated in kHz Band***

Masuda Riki and Nozomu Ishii (Niigata University, Japan); Yuto Shimizu, Jerdvisanop Chakarothai, Kanako Wake and Soichi Watanabe (National Institute of Information and Communications Technology, Japan)

**12:20 *Verification of Underwater Position Estimation Using Received Power Profile Through Pseudo-Scale Model***

Sase Ryota and Nozomu Ishii (Niigata University, Japan); Masaharu Takahashi (Chiba University, Japan); Qiang Chen (Tohoku University, Japan); Hiroshi Yoshida (JAMSTEC & MARITEC, Japan)

### 3C2: Metamaterials

Chairs: Naobumi Michishita (National Defense Academy, Japan), Sarawuth Chaimool (Khon Kaen University, Thailand)

**11:00 *Thinning AMC substrate applying square patch with semicircle***

Ryota Shinozaki, Jo Tamura and Hiroyuki Arai (Yokohama National University, Japan)

**11:20 *Experimental Investigation of Optically Transparent Dual-Polarized Reflectarray with Suppressed Sidelobe Level***

Lin Wang, Hiroki Hagiwara, Yuko Rikuta and Toshiyuki Kobayashi (Nihon Dengyo Kosaku Co., Ltd., Japan); Hiromi Matsuno (KDDI Research, Japan); Takahiro Hayashi and Satoshi Ito (KDDI Research, Inc., Japan); Masayuki Nakano (KDDI Research, Japan)

**11:40 *Miniaturized Semicircular Disc Patch Antenna Designed with Sector-Shaped Metamaterials***

Guoxiang Dai, Xiaofei Xu and Xiao Deng (Shanghai University, China)

### **12:00 Angle-insensitive Bifunctional Resonator Based on Periodic Structure**

Ye Ming Qing and Hui Feng Ma (Southeast University, China)

### **12:20 Incident Angle Reconfigurable Metasurface by Mechanically Extending Diffraction Grating Period**

Takayoshi Sasaki (DKK Co., Ltd., Japan); Tanan Hongnara (Denki Kogyo Co. Ltd. & Japan, Japan); Yoshiki Shirasawa (DKK Co., Ltd., Japan); Katsumori Sasaki (Denki Kogyo Co., Ltd., Japan); Keisuke Sato (Denki Kogyo Co., Ltd., Japan); Ichiro Oshima (Denki Kogyo Co., Ltd., Japan); Naobumi Michishita (National Defense Academy, Japan); Hiroaki Nakabayashi and Keizo Cho (Chiba Institute of Technology, Japan)

### **12:40 Absorption evaluation of electromagnetic wave absorbers in practical environments**

Ryoma Take and Yoshinobu Okano (Tokyo City University, Japan); Kazuhiro Noda (GUNZE LIMITED, Japan)

## **3D2: OS: IAET Special Session: Antenna Technologies for 5G Mobile Communications**

Chairs: Wei-Yu Li (Industrial Technology Research Institute, Taiwan), Chow-Yen-Desmond Sim (Feng Chia University, Taiwan)

### **11:00 (invited) Recent Designs to Achieving Wideband MIMO Antenna for 5G NR Sub-6GHz Smartphone Applications**

Chow-Yen-Desmond Sim (Feng Chia University, Taiwan); Horng-Dean Chen (National Kaohsiung Normal University, Taiwan); Jayshri S Kulkarni (Vishwakarma Institute of Information Technology, India); Jeng-Jr Lo and Yu-Chieh Hsuan (Feng Chia University, Taiwan)

### **11:40 Highly-Integrated Pattern Switchable MIMO Antennas for 5G Notebook Computer Applications**

Wei-Yu Li and Wei Chung (Industrial Technology Research Institute, Taiwan); Kin-Lu Wong (National Sun Yat-Sen University, Taiwan)

### **12:00 Multi-Laptop-Antenna Designs for 2.4/5/6 GHz WLAN and 5G NR77/78/79 Operation**

Cheng-Tse Lee, Che-Chi Wan and Saou-Wen Su (ASUSTek Computer Inc., Taiwan)

### **12:20 Experimental Results of n261 Millimeter-Wave Module for Mobile Device**

Po-Wei Lin and Bin Feng (OPPO, China)

## **3E2: OS: Leading Technologies over Diversity**

Chairs: Mayumi Matsunaga (Tokyo University Technology, Japan), Yukiko Kishiki (Kozo Keikaku Engineering, Japan)

**In this session, we will have 40 minutes panel discussion after all presentations.**

### **11:00 Flexible Views without Being Held Back by Fixed Ideas is the Mother of Invention**

Mayumi Matsunaga (Tokyo University Technology, Japan)

### **11:20 Observations on Near-Field Evaluation of 5G Signal Quality**

Hanako Noda (Anritsu Corporation, Japan)

### **11:40 Looking Back on My Past - Finding Assets by Words from Others -**

Tomoko Adachi (Toshiba Corporation, Japan)

### **12:00 Women in Science -A Case Study from Husband's Point of View-**

Toru Sato (Kyoto University, Japan)

## **3F2: Student Paper Award 2**

Chair: Tetsuro Imai (Tokyo Denki University, Germany)

### **11:00 Measurement of a microstrip antenna array fed by longitudinal slots on a narrow wall of the rectangular waveguide with standing-wave excitation for linear polarization perpendicular to the axis**

Toshiki Hozen, Sakuyoshi Saito and Yuichi Kimura (Saitama University, Japan)

### **11:20 A W-Band Corporate-Fed Hollow-Waveguide Slot Array Antenna by Glass Micromachining**

Yaxiang Wu, Tian Yu, Miao Zhang and Daquan Yu (Xiamen University, China); Jiro Hirokawa (Tokyo Institute of Technology, Japan); Qing Huo Liu (Duke University, USA)

### **11:40 Design of a Wideband Wing-shaped Small Printed Dipole Antenna for High-Power Jamming Systems**

Eunjung Kang, Tae Heung Lim and Hosung Choo (Hongik University, Korea (South))

### **12:00 Efficient Optimization for Bandwidth of the Element of a Multilayer Parallel-plate Slot Array**

**12:20 SIW Cavity-Fed Filtenna Arrays for 5G Millimeter Wave Applications**

Rong Lu, Chao Yu and Wei Hong (Southeast University, China)

## 3G2: OS: Thinned and Sparse Arrays

Chairs: Koichi Ichige (Yokohama National University, Japan), Chun-Lin Liu (National Taiwan University, Taiwan)

**11:00 Coarray-Based Pattern Synthesis for Minimum Hole Arrays**

Po-Cheng Huang and Chun-Lin Liu (National Taiwan University, Taiwan)

**11:20 2D Sparse Array Selection via Deep Learning**

Steven Wandale and Koichi Ichige (Yokohama National University, Japan)

**11:40 2-D DOA Estimation for Coprime Cubic Array: A Cross-correlation Tensor Perspective**

Hang Zheng, Chengwei Zhou, Yong Wang and Zhiguo Shi (Zhejiang University, China)

**12:00 Impact of Signal Correlation in 2D Imaging with Khatri-Rao Product Expansion Array**

Honoka Hazawa and Hiroyoshi Yamada (Niigata University, Japan); Hiroki Mori (Toshiba Corporation, Japan)

**12:20 An Extended Co-prime Array with Multiple Discontinuous Period Subarrays**

Jianbo Wang, Jianyu Ye and Guang Hua (Southeast University, China)

**12:40 Sparse Synthesis Aperture Imaging using Multistatic Coprime Scheme**

Xu Zhu (Research & Development Center & Toshiba Corporation, Japan); Hiroki Mori (Toshiba Corporation, Japan)

## Student Design Contest

Inverse Problem

[Detail](#)

Wednesday, January 27 13:00 - 14:20 (Asia/Tokyo)

## WIE Session

### Exhibition Technical Seminar

- Microwave Factory Co.,Ltd.
- TOYO Corporation

13:15 Microwave Factory Co.,Ltd. (in Japanese)

13:50 TOYO Corporation (in Japanese)

Wednesday, January 27 14:20 - 15:20 (Asia/Tokyo)

## 3A3-1: OS: Recent Advances in Time Domain Method

Chairs: Takuji Arima (Tokyo University of Agriculture and Technology, Japan), Jerdvisanop Chakarothai (National Institute of Information and Communications Technology, Japan)

**14:20 Retrieval of Debye Parameters from Cole-Cole Model for Broadband FDTD Analyses**

Jerdvisanop Chakarothai (National Institute of Information and Communications Technology, Japan); Katsumi Fujii (NICT, Japan)

**14:40 Frequency-Dependent FDTD Analyses of Terahertz Plasmonic Devices**

Jun Shibayama, Junji Yamauchi and Hisamatsu Nakano (Hosei University, Japan)

**15:00 Space-time Adaptive Processing Concept for Calculation Speed Improvement In Multi-Region/FDTD Method**

## Wednesday, January 27 14:20 - 16:20 (Asia/Tokyo)

### 3B3: OS: Massive MIMO and its Related Techniques for 5G Beyond/ 6G Systems

Chairs: Kentaro Nishimori (Niigata University, Japan), Tomoki Murakami (NTT Corporation, Japan)

#### 14:20 *A new concept using MIMO and Drone for wide and high-speed area in beyond 5G and 6G*

Kentaro Nishimori (Niigata University, Japan)

#### 14:40 *Development of 3D Cross-Layer Simulators*

Isamu Shitara and Takefumi Hiraguri (Nippon Institute of Technology, Japan); Ryotaro Taniguchi and Kentaro Nishimori (Niigata University, Japan)

#### 15:00 *Physical-Layer Cell ID Detection Probability Using NR Synchronization Signals for 3GPP TDL Channel Models*

Kyogo Ota, Daisuke Inoue and Mamoru Sawahashi (Tokyo City University, Japan); Satoshi Nagata (NTT DoCoMo, Inc., Japan)

#### 15:20 *Design of High-Isolation Fragment-Type 5G Base Station Antennas with MOEA/D-GO*

Diqun Lu (The 38th Research Institute of China Electronics Technology Group Corporation, China); Jiamin Zhao (CETC 38, China)

#### 15:40 *Digital GoB-based Beamforming for 5G Communication Systems*

Gordana Raluca Barb (Politehnica University of Timisoara, Romania); Marius Otesteanu (Universitatea Politehnica Timisoara, Romania)

### 3C3: Short Presentation Session A2

Chair: Michio Takikawa (Mitsubishi Electric Corporation, Japan)

#### 14:20 *RF Power Scavenger*

Diansambo Masembo (Instituto Superior Técnico, Universidade de Lisboa, Portugal); Edward Wasige and Afesomah Ofiare (University of Glasgow, United Kingdom (Great Britain))

#### 14:35 *Antenna Sensor for Radio-Wave Type Endoscope in Actual Scale Model*

Shinya Kamito, Takafumi Fujimoto, Chai-Eu Guan and Toshiyuki Tanaka (Nagasaki University, Japan)

#### 14:50 *A Dual-band J-type Meander Antenna for 5G Applications*

Shoya Tanaka (Kanazawa Institute of Technology, Japan)

#### 15:05 *Quantitative Evaluation of the Decoupling Principle Between Two PIFAs by Using CMA*

Phung Quang Quan (National Defense Academy of Japan, Japan); Naobumi Michishita (National Defense Academy, Japan); Hiroshi Sato (Panasonic Corporation, Japan); Yoshio Koyanagi (Panasonic, Japan); Hisashi Morishita (National Defense Academy, Japan)

#### 15:20 *A design of dual-band dipole antenna with reflector and FSR using genetic algorithm*

Masumi Seki (Chiba Institute of Technology & Graduate School of Engineering, Japan); Keizo Cho (Chiba Institute of Technology, Japan)

#### 15:35 *Design of Glass-Integrated Grid Antenna Using CMA for Multiband Indoor Network*

Yu Yao (The University of Sheffield, United Kingdom (Great Britain)); Yu Shao (Chongqing University of Posts and Telecommunications, China); Jiliang Zhang (The University of Sheffield, United Kingdom (Great Britain)); Jie Zhang (University of Sheffield, Dept. of Electronic and Electrical Engineering, United Kingdom (Great Britain))

#### 15:50 *Wideband Halo Antenna with Four Parasitic Elements*

Tomokazu Mizutani, Kazuya Matsubayashi, Naobumi Michishita and Hisashi Morishita (National Defense Academy, Japan)

#### 16:05 *A Broadband Dual-Slant Polarized Metal Vivaldi Antenna for a High-Power Jammer*

Tae Heung Lim (Hongik University, Korea (South)); Seulgi Park Park (Hanwha Systems, Korea (South)); Cheol Soo Lee and Ju-Rae Park (Agency for Defense Development, Korea (South)); Hosung Choo (Hongik University, Korea (South))

### 3D3: Short Presentation Session A3

Chair: Yoshihide Yamada (Malaysia-Japan International Institute of Technology, Universiti Teknologi Malaysia, Malaysia)

#### 14:20 *Radiation Phase Control of a Single-Layer Ring Microstrip Antenna Fed by an L-Probe with a Variable Reactance Circuit*

**14:35 Frequency Control of a Varactor-Loaded Dual-Band Single-Layer Shorted Microstrip Antenna Fed by an L-probe with Reduced Cross Polarization**

Shohei Honda, Sakuyoshi Saito and Yuichi Kimura (Saitama University, Japan)

**14:50 Prototype Evaluation of Monopulse Beam Steering Circularly Polarized Array Antenna**

Daiki Iwamoto, Eisuke Nishiyama and Ichihiko Toyoda (Saga University, Japan)

**15:05 A Quad-Polarization Agile Microstrip Antenna with Diode Loaded Cross Slot and Microstrip Line**

Ryo Moroishi, Eisuke Nishiyama and Ichihiko Toyoda (Saga University, Japan)

**15:20 Phase Adjustment Algorithm for Deformation Compensation of Nonflat Reflectarray Antenna**

Masaki Kato, Hiraku Sakamoto, Takashi Tomura and Masaaki Okuma (Tokyo Institute of Technology, Japan)

**15:35 Radiation Characteristics of Electromagnetically Coupled Embroidered Patch Antennas with Reduced Amount of Conductive Yarn**

Daiki Ichikawa (Ritsumeikan University & Graduate School of Information Science and Engineering, Japan); Tadahiko Maeda (Ritsumeikan University, Japan)

**15:50 Conformal High Gain Aperture Antenna Based on Leaky-Wave Array for CubeSat Communication**

Xiaowen Li and Jun Hong Wang (Beijing Jiaotong University, China); Lei Wang and George Goussetis (Heriot-Watt University, United Kingdom (Great Britain))

**16:05 Printed elliptical monopole antenna for bidirectional circular polarization**

Naoto Otsuka, Takafumi Fujimoto and Chai-Eu Guan (Nagasaki University, Japan)

## 3E3: Short Presentation Session D2

Chair: Daisuke Uchida (Toshiba Corporation, Japan)

**14:20 Channel Capacity Estimation of  $4 \times 4$  MIMO Antenna by Machine Learning, Considering SNR, Power Imbalance, and Correlation Coefficient**

Daiki Masuda and Kazuhiro Honda (University of Toyama, Japan)

**14:35 Investigation of Hyperparameters for DOA Using Machine Learning**

Takahiro Nosho and Mitoshi Fujimoto (University of Fukui, Japan)

**14:50 A Miniaturized Large-Scale MIMO Antenna Using the Double-Ring Structure**

Hiroya Tanaka (University of Toyama, Japan); Koichi Ogawa (University of Toyama & Faculty of Engineering, Japan); Kazuhiro Honda (University of Toyama, Japan)

**15:05  $256 \times 256$  Large-Scale Pancake MIMO Antenna**

Rio Kitamura (Toyama University, Japan); Koichi Ogawa (University of Toyama & Faculty of Engineering, Japan); Kazuhiro Honda (University of Toyama, Japan)

**15:20 Blind-based demodulation scheme for virtual massive MIMO systems**

Sota Takahashi (University of Niigata, Japan); Issei Watanabe, Kentaro Nishimori and Ryotaro Taniguchi (Niigata University, Japan); Tomoki Murakami (NTT Corporation, Japan)

**15:35 Study on simple performance evaluation for MU-MIMO-OFDMA**

Hiroki Sato (Graduate School of Science and Technology, Niigata University, Japan); Kentaro Nishimori (Niigata University, Japan)

**15:50 Circular antenna arrangement for LOS-MIMO transmission independent for the transmission distance using a genetic algorithm**

Riku Okada and Kentaro Nishimori (Niigata University, Japan)

**16:05 Periodic Fluctuations in Channel Capacity due to the Rotation of Propeller in Flying Cars MIMO**

Takahiro Fuchino (Toyama University, Japan); Koichi Ogawa (University of Toyama & Faculty of Engineering, Japan); Kazuhiro Honda (University of Toyama, Japan)

## 3F3: Short Presentation Session D3

Chair: Satoru Aikawa (University of Hyogo, Japan)

**14:20 Passive Channel Estimation Technique for Microwave Wireless Power Transfer**

Shinnosuke Kondo, Shota Odajima, Kentaro Murata and Naoki Honma (Iwate University, Japan)

**14:35 Experimental Study on 2-Element Rectenna Array Using Yagi-Uda Antenna**

Shota Egashira, Eisuke Nishiyama and Ichihiko Toyoda (Saga University, Japan)

**14:50 Elucidation of Impedance Conditions in High-Efficiency Operation RF-DC Conversion Circuits**

Kensuke Kobayashi and Kazuhiro Fujimori (Okayama University, Japan)

**15:05 Experimental evaluation of series resonance scheme for 2x2 MIMO IPT**

Yugo Sakamaki, Quang-Thang Duong and Minoru Okada (Nara Institute of Science and Technology, Japan)

**15:20 Design of High-pass Space Filter Using Periodically Perforated Metal Plates and Dielectric Material**

Shuji Kawano (University of Hyogo, Japan); Shinichiro Yamamoto and Satoru Aikawa (University of Hyogo, Japan)

## 3G3: Short Presentation Session B2

Chair: Minseok Kim (Niigata University, Japan)

**14:20 Analysis of cluster characteristics in SHF band using ISTA and K-means++ algorithms**

Ryotaro Taniguchi and Kentaro Nishimori (Niigata University, Japan)

**14:35 Measurement of Received Polarization Characteristics by a Vehicle-Mounted Antenna in Cellular Communication Environments**

Okamoto Seiryu and Kawai Yuki (University of Doshisha, Japan); Hijirikawa Kei (Kojima Industries Corporation, Japan); Hisato Iwai and Shinsuke Ibi (Doshisha University, Japan)

**14:50 A study of propagation loss in micro-cell environments using measurement data at 2.2 GHz band**

Yuki Igarashi and Kentaro Nishimori (Niigata University, Japan); Yasunori Shimazaki (Panasonic Corporation, Japan); Ryotaro Taniguchi (Niigata University, Japan); Taichi Hamabe (Panasonic Corporation Connected Solutions Company, Japan); Akihiro Tatsuta, Teppei Emura and Takuya Asada (Panasonic Corporation, Japan)

**15:05 A study on outdoor to indoor penetration loss characteristics considering vertical and horizontal incident angle at 5 GHz band**

Yuta Mizuno, Kentaro Nishimori and Ryotaro Taniguchi (Niigata University, Japan)

**15:20 Estimation of Total Interference Power by Clustering Multiple Wireless Nodes**

Ryota Morimoto, Hisato Iwai and Shinsuke Ibi (Doshisha University, Japan); Takuya Kurihara (Advanced Telecommunications Research Institute International, Japan); Satoru Shimizu, Kazuto Yano and Yoshinori Suzuki (ATR, Japan)

**15:35 Complex Permittivity Evaluation of Building Materials at 200-500 GHz Using THz-TDS**

Masaaki Urahashi and Akihiko Hirata (Chiba Institute of Technology, Japan)

**15:50 Automatic Planning of 300-GHz-Band Wireless Backhaul Link Deployment in Metropolitan Area**

Ryo Okumura and Akihiko Hirata (Chiba Institute of Technology, Japan)

**16:05 10-Gbit/s Data Transmission over Dielectric Sheet for 120-GHz-band Sheet LAN**

Masaki Ushio, Futa Tokoro and Akihiko Hirata (Chiba Institute of Technology, Japan); Taiki Higashimoto, Yuta Uemura and Tadao Nagatsuma (Osaka University, Japan); Norihiko Sekine (National Institute for Information and Communications Technology, Japan); Issei Watanabe (National Institute of Information and Communications Technology, Japan); Akifumi Kasamatsu (National Institute of Information and Communications Technology, Japan)

## Wednesday, January 27 15:20 - 16:20 (Asia/Tokyo)

### 3A3-2: OS: Advanced Technology of Over-The-Air Testing for 5G, IoT and Vehicular Communication Systems

Chairs: Kun Li (Kagawa University, Japan), Kazuhiro Honda (University of Toyama, Japan)

**15:20 Three-Dimensional Over-The-Air Apparatus for Generating Cluster Environment**

Toshiya Karasawa (Toyama University, Japan); Kazuhiro Honda (University of Toyama, Japan)

**15:40 Over-The-Air Apparatus for Large-Scale MIMO Antennas to Create the Full-Rank Channel Matrix**

Kazuhiro Honda (University of Toyama, Japan); Koichi Ogawa (University of Toyama & Faculty of Engineering, Japan)

**16:00 Emulating Rician distributed channels in a hybrid chamber for OTA measurements**

Andrés Alayón Glazunov (University of Twente, The Netherlands & Chalmers University of Technology, Sweden); Oleg Lupikov and Pavlo Krasov (Chalmers University of Technology, Sweden); Robert Rehammar (Bluetest AB & Chalmers University of Technology, Sweden); Rob



## Wednesday, January 27 16:40 - 18:40 (Asia/Tokyo)

### 3A4: Broadband and Multiband Antennas 1

Chair: Qiang Chen (Tohoku University, Japan)

**16:40 (invited) Dual-polarized Antenna Loaded with Ferrite Cores for Decoupling in Multi-band Multi-array Antennas**

Qing-Xin Chu and Yu-Lin Chang (South China University of Technology, China)

**17:20 Dual-band Coplanar SSPP Endfire Radiating Antenna**

Abhishek Sundrani and Sonu Kumar (IIT Guwahati, India); Rakesh Singh Kshetrimayum (Indian Institute of Technology Guwahati, India)

**17:40 An Electrically Small Top-Loaded Mono-Cone Antenna with Ring Slot**

Kyoseung Keum and Jaehoon Choi (Hanyang University, Korea (South))

**18:00 Gain enhancement and miniaturization of UWB antenna using metamaterial-based FSS**

Abdenasser Lamkaddem (Signal Theory and Communications Department, Carlos III University of Madrid, Madrid, Spain); Ahmed El Yousfi (Universidad Carlos III De Madrid, Spain); Kerlos Atia Abdalmalak, Luis Enrique García Muñoz and Daniel Segovia-Vargas (Universidad Carlos III de Madrid, Spain)

**18:20 Bandwidth Enhancement of Microstrip Patch Antenna Using Slits for 5G Mobile Communication Networks**

Umar Musa (Bayero University kano, Nigeria)

### 3B4: Planar/Print Antenna Arrays

Chairs: Manabu Yamamoto (Hokkaido University, Japan), Takeshi Fukusako (Kumamoto University, Japan)

**16:40 An analysis of increasing the gain of the patch antenna using slots on the ground plane**

Ho-Yu Lin and Hideki Omote (Softbank Corp., Japan)

**17:00 An annular patch circularly polarized antenna in 920-MHz band**

Masaru Hasegawa, Shota Sodenaga and Hitoshi Shimasaki (Kyoto Institute of Technology, Japan)

**17:20 Circular lattice design for UHF geodesic dome phased array antenna with reduced footprint**

Charles Grech, Marc Anthony Azzopardi and Victor Buttigieg (University of Malta, Malta)

**17:40 Design of a K-band Wideband Circularly Polarized Micro-strip Array Antenna**

GuoDong Liu and LongWei He (Beijing Institute of Long March Space Vehicle, China); Shuang Wang (Beijing Institute of Space Long March Vehicle, China); Ruipeng Zhang and Xiaofei Wang (Beijing Institute of Long March Space Vehicle, China)

**18:00 Array-Fed Dual-Band Transmitarray Antenna with Wide Frequency Ratio**

Sen Liu (NICT, Japan); Qiang Chen (Tohoku University, Japan)

**18:20 New Low-Cost FDM Technology for Printing Antennas**

Rainer Kronberger (TH Cologne University of Applied Sciences, Germany); Stefan Grünwald (Technische Hochschule Köln, Germany); Volker Wienstroer and Vincent Tsatsos (TH Cologne University of Applied Sciences, Germany)

### 3C4: OS: Novel Antennas and Propagation Modelling for the 5G Millimeter Wave Bands

Chairs: Narcis Cardona (The Polytechnic University of Valencia, Spain), Sana Salous (Durham University, United Kingdom (Great Britain))

**16:40 4 x 4 Magneto-Electric Dipole Array with Single-Layer Corporate-Feed Ridge Gap Waveguide for mmWave Applications**

Wai Yan Yong (University of Twente, The Netherlands); Thomas Emanuelsson (Gapwaves AB, Sweden); Andrés Alayón Glazunov (University of Twente, The Netherlands & Chalmers University of Technology, Sweden)

**17:00 A 2-layer 45° -Slant-Polarized Phased Array Antenna with Baffles Based on Gap Waveguide Technology for mmWave 5G Systems**

Gerolf Meulman (University of Twente, The Netherlands); Alireza Bagheri (Gapwaves AB, Sweden & University of Twente, The Netherlands); Andrés Alayón Glazunov (University of Twente, The Netherlands & Chalmers University of Technology, Sweden)

**17:20 Wideband H-Slot Antenna Fed by Substrate Integrated Gap Waveguide for mmWave Arrays**

Ryosuke Kon (Tohoku University, Japan); Wai Yan Yong (University of Twente, The Netherlands); Andrés Alayón Glazunov (University of Twente, The Netherlands & Chalmers University of Technology, Sweden)

**17:40 Impact of Wall Blockage on LOS User Association Strategy in Indoor Small Cell Networks**

Yunbai Wang (The University of Sheffield, United Kingdom (Great Britain)); Hui Zheng (Ranplan Wireless Network Design Ltd., China); Xiaoli Chu (University of Sheffield, United Kingdom (Great Britain))

## 3D4: OS: Emerging Technologies for the New 5G Antenna Systems

Chairs: Mauro Ettore (University of Rennes 1 & UMR CNRS 6164, France), Eva Rajo-Iglesias (University Carlos III of Madrid, Spain)

**16:40 Doubly Curved Reflector Antenna Design Trade-Offs for a Hexagonal Lattice of Beams**

Nelson Fonseca (European Space Agency, The Netherlands); Etienne Girard (Thales Alenia Space, France); Hervé Legay (Thalès Alenia Space, France)

**17:00 Compact Double-Wing Cavity Gap Waveguide Twist for E-Band Antenna Systems**

Jian Yang (Chalmers University of Technology, Sweden)

**17:20 Higher symmetries in holey structures applied to gap waveguide technology: fundamentals and considerations**

Zvonimir Sipus and Marko Bosiljevac (University of Zagreb, Croatia); Eva Rajo-Iglesias (University Carlos III of Madrid, Spain)

**17:40 Electrically Small Huygens Dipole Array for 5G Wireless Power Transfer Enabled IoT Applications**

Wei Lin (University of Technology Sydney, Australia); Richard Ziolkowski (University of Technology Sydney, Australia & University of Arizona, USA)

**18:00 A Wideband Dual-Linearly-Polarized Millimeter Wave Antenna for 5G Terminal Application**

Xuanfeng Tong, Zhi Hao Jiang, Chao Yu and Fan Wu (Southeast University, China); Xin Xu (Shanghai Huawei Technologies Co. Ltd., China); Wei Hong (Southeast University, China)

## 3E4: OS: Recent Developments for Next-Generation Terrestrial and Space Communication Systems

Chair: Nelson Fonseca (European Space Agency, The Netherlands)

**16:40 Circularly-Polarized CTS Array Antenna for SatCom applications**

Stefano Lenzini (University of Modena and Reggio Emilia, Italy); Michele Del Mastro (University of Rennes 1, France); Luca Vincetti (University of Modena and Reggio Emilia, Italy); Mauro Ettore (University of Rennes 1 & UMR CNRS 6164, France)

**17:00 Base Station Antenna Systems for mm-Waves**

Ulf Johannsen, Thomas A. H. Bressner, Amr Elsakka and A. B. (Bart) Smolders (Eindhoven University of Technology, The Netherlands); Martin Johansson (Ericsson Research, Sweden)

**17:20 Design to operate in Two Frequency Bands by Division of the Coupling Region in a Waveguide 2-plane Hybrid Coupler**

Shihao Chen, Takashi Tomura and Jiro Hirokawa (Tokyo Institute of Technology, Japan); Kota Ito and Mizuki Suga (NTT Corporation, Japan); Yushi Shirato and Daisei Uchida (NTT, Japan); Naoki Kita (NTT Access Network Service Systems Laboratories, Japan)

**17:40 Reconfigurable Antenna Arrays for Integrated Space and Terrestrial Networks**

Y. Jay Guo (University of Technology Sydney, Australia); Shu-Lin Chen (University of Technology, Sydney, Australia); Yanhui Liu (Xiamen University & University of Technology Sydney, Australia)

**18:00 Recent Development of Substrate Edge Antennas and Arrays for Millimeter-Wave Communication**

Lei Wang (Heriot-Watt University, United Kingdom (Great Britain)); Xiaoxing Yin (State Key Laboratory of Millimeter Waves, China)

## 3F4: Student Paper Award 3

Chair: Tetsuro Imai (Tokyo Denki University, Germany)

**16:40 A Highly Efficient Rectifier with a Wide Dynamic Range Based on Variable Self-Bias Voltage**

Jinyao Zhang, Yi Huang and Jiafeng Zhou (University of Liverpool, United Kingdom (Great Britain))

**17:00 Development of Indoor Device-Free Location Estimation Using Commodity WiFi Device**

Yuan Zhou, Hideaki Momose, Satoru Yasukawa and Minseok Kim (Niigata University, Japan)

**17:20 Acceleration of DOA-TOA Simultaneous Estimation by Matrix Based Compressed Sensing with Zero Bin Removal**

Kiyotaka Shimoshige, Mitoshi Fujimoto and Koyo Tategami (University of Fukui, Japan)

**17:40 Examination of behavior estimation by MIMO sensor that can respond to the difference in distance**

Etsuko Hoshino (University of Niigata, Japan); Kentaro Nishimori (Niigata University, Japan)

**18:00 Experimental Study on Resolution Enhancement in Height for Automotive MW-3D-SAR**

Yu Mukaide and Hiroyoshi Yamada (Niigata University, Japan)

## 3G4: OS: MW Wave and Tera Hertz Propagation

Chairs: Akihiko Hirata (Chiba Institute of Technology, Japan), Hiroaki Nakabayashi (Chiba Institute of Technology, Japan)

**16:40 THz links for future mobile systems**

Tetsuya Kawanishi (Waseda University)

**17:00 300 GHz link enabled by Yagi-Uda antenna**

Guillaume Ducournau (IEMN - Lille University, France)

**17:20 Electrooptic sensing for antenna characterization and propagation investigation at THz band**

Shintaro Hisatake (Gifu University, Japan)

**17:40 Measurement of Glass Complex Permittivity at 200-500 GHz for THz Propagation Simulation**

Akihiko Hirata and Koji Suizu (Chiba Institute of Technology, Japan); Norihiko Sekine (National Institute for Information and Communications Technology, Japan); Issei Watanabe (National Institute of Information and Communications Technology, Japan); Akifumi Kasamatsu (National Institute of Information and Communications Technology, Japan)

**18:00 Link-Level and System-Level Simulation of 300 GHz wireless Backhaul Links**

Bo Kum Jung, Christoph Herold, Johannes M. Eckhardt and Thomas Kürner (Technische Universität Braunschweig, Germany)

Thursday, January 28

Thursday, January 28 9:00 - 10:40 (Asia/Tokyo)

## 4A1: Antenna Theory and Design 1

Chair: Nobuhiro Kuga (Yokohama National University, Japan)

**9:00 High-Frequency Performance Improvement of LPDA for EMC/EMI Measurements**

Jihoon Bang and Changgon Han (Hanyang University, Korea (South)); Kibum Jung (E&R Co. Ltd., Korea (South)); Jaehoon Choi (Hanyang University, Korea (South))

**9:20 Circularly Symmetric Photonic Bandgap Antenna**

Junji Yamauchi, Seita Saito, Ryo Miyamoto and Hisamatsu Nakano (Hosei University, Japan)

**9:40 Design of Deployable Center-Fed Reflectarray Antenna**

Hiromasa Nakajima, Shin-ichi Yamamoto, Michio Takikawa, Shuji Nuimura and Yoshio Inasawa (Mitsubishi Electric Corporation, Japan)

**10:00 Design of the radio fence of the EISCAT\_3D radar for human safety using Method of Moment and Geometrical Theory of Diffraction**

Taishi Hashimoto (National Institute of Polar Research, Japan); Koji Nishimura (National Institute of Polar Research Japan, Japan); Yasunobu Ogawa and Hiroshi Miyaoka (National Institute of Polar Research, Japan); Craig Heinselman (EISCAT Scientific Association, Sweden)

**10:20 Mode-matching Analysis and Genetic Algorithm Optimization for an E-plane Coupler by Changing the Cross-sectional Shape of the Coupling Region**

Shota Yamakawa, Takashi Tomura and Jiro Hirokawa (Tokyo Institute of Technology, Japan)

## 4B1: OS: Biomedical Applications of Electromagnetic Field

Chair: Kazuyuki Saito (Chiba University, Japan)

**9:00 Design of RF Coil of Low-field Portable MRI**

Shao Ying Huang (Singapore University of Technology and Design, Singapore)

### **9:20 Focusing Lens Design to Achieve Small Focal Spot Size in Human Body**

Amirah Abd Rahman and Kamilia Kamardin (Universiti Teknologi Malaysia, Malaysia); Yoshihide Yamada (Malaysia-Japan International Institute of Technology, Universiti Teknologi Malaysia, Malaysia)

### **9:40 Directive Antenna Design at 2.4 GHz on Foot Surface for Wanderer Location Identification**

Md Ismail Haque, Kengo Yoshibayashi and Jianqing Wang (Nagoya Institute of Technology, Japan); Georg Fischer and Jens Kirchner (Friedrich-Alexander-Universität Erlangen-Nürnberg (FAU), Germany)

### **10:00 Study of Antenna Misalignment Effects on Path Loss for a Liver-implant Channel**

Pongphan Leelatien (Thammasat University, Thailand); Manmohan Sharma (Huawei Technologies Sweden AB, Sweden); Akram Alomainy (Queen Mary University of London, United Kingdom (Great Britain))

### **10:20 Experimental and Theoretical Studies on Communicable Distance for Medical Telemeters between Hospitals Located with a Distance of 1,300 Meters**

Isao Kayano (Kawasaki University of Medical Welfare, Japan); Tetsuya Motoishi (Kawasaki Medical School General Medical Center, Japan); Kazuo Nishie and Aya Takayama (Kawasaki Medical School Hospital, Japan); Seiichi Mochizuki (Kawasaki University of Medical Welfare, Japan)

## **4C1: Broadband and Multiband Antennas 2**

Chairs: Eisuke Nishiyama (Saga University, Japan), Kengo Nishimoto (Mitsubishi Electric Corporation, Japan)

### **9:00 Broadband SIW Slot Antenna for Millimeter Wave Application**

Ziwen Zou, Yafei Ding, Guoqing Zhu, Guangli Yang and Yirong Li (Shanghai University, China); Yu-Jiun Ren (Electric Connector Technology-US, USA)

### **9:20 Bandwidth Enhancement of a Folded Monopole Antenna with an Iron Tower**

Shingo Yamaura, Kengo Nishimoto, Yasuhiro Nishioka and Yoshio Inasawa (Mitsubishi Electric Corporation, Japan)

### **9:40 Design Multi-band of LTE-Advanced Antenna with Multi-coupling Path Applications**

Wen Cheng Lai (National Taiwan University of Science and Technology, Taiwan)

### **10:00 Novel Broadband Corrugated Lens Antenna**

Taiki Sato, Kazuo Sekiya and Akio Kuramoto (NEC Platforms, Ltd., Japan)

### **10:20 A Dual-Band Circularly Polarized Microstrip Antenna for BDS Application**

Jiao Xiang (Chongqing University of Posts and Telecommunications, China); Guoquan Li (Chongqing University of Posts and Telecommunications & Chongqing University, China); Doudou Guo, Huakang Chen and Jian Wu (Chongqing University of Posts and Telecommunications, China)

## **4D1: OS: Recent Advances in Computational Electromagnetics**

Chairs: Ryoichi Sato (Niigata University, Japan), Shinichiro Ohnuki (Nihon University, Japan)

### **9:00 Strong Resonance in Waveguides with Irregular Wall**

Kiyofumi Katayama (Tokoha University, Japan); Kazuo Tanaka and Masahiro Tanaka (Gifu University, Japan)

### **9:20 Study on Forward Transient Scattering by a Metal Cylinder Covered with a Homogeneous Medium**

Keiji Goto, Toru Kawano and Hiroki Uda (National Defense Academy, Japan)

### **9:40 Study on Backward Transient Scattered Electric Fields from a Coated Metal Cylinder**

Toru Kawano, Keiji Goto, Toshiya Kon and Nutchapol Thamasuwan (National Defense Academy, Japan)

### **10:00 Approximate analysis of EM wave scattering from two cracks on a ground plane**

Ryoichi Sato (Niigata University, Japan); Hiroshi Shirai (Chuo University, Japan)

### **10:20 Plasmon Analysis for Metallic Nanocylinders Using Hydrodynamic Drude Model**

Yuki Ando, Seiya Kishimoto and Shinichiro Ohnuki (Nihon University, Japan)

## **4E1: OS: Millimeter-Wave and Terahertz-Wave Systems for Infrastructures and Their Standardization Activities**

Chairs: Michitaka Ameya (NMIJ/AIST, Japan), Atsushi Kanno (National Institute of Information and Communications Technology, Japan)

**9:00 Millimeter-wave and THz links under severe weather condition**

Tetsuya Kawanishi (Waseda University & National Institute of Information and Communications Technology, Japan)

**9:20 Applications of Photonics Technology for Wireless Communication Systems**

Seung-Hyun Cho (ETRI, Korea (South))

**9:40 Standardization Activities on Foreign Object and Debris Detection System for Airport**

Naruto Yonemoto (Electronic Navigation Research Institute, MPAT, Japan); Shunichi Futatsumori, Akiko Kohmura and Kazuyuki Morioka (Electronic Navigation Research Institute, Japan)

**10:00 The Trend of Research and Development and International Standardization of Radio Communication Systems using Millimeter-waves in Railway**

Kazuki Nakamura (Railway Technical Research Institute, Japan)

**10:20 IEC TC103 WG6 Activities in Response to Spectrum Regulations above 275 GHz**

Hiroyo Ogawa (National Institute of Information and Communications Technology, Japan)

## 4F1: Radar DOA, localization, Sensing and Propagation Measurement Techniques 3

Chair: Keizo Cho (Chiba Institute of Technology, Japan)

**9:00 RSSI-Based 2D Localization Using 4-Element Circular Array and 180-degree/90-degree Hybrids**

Kazuki Onodera, Daichi Kitamura, Naoki Honma and Kentaro Murata (Iwate University, Japan); Mari Takeda and Atsushi Takei (Panasonic Corporation, Japan); Kazuhiro Matsumoto (Panasonic, Japan); Nobuyuki Shibano (Panasonic Corporation, Japan); Tetsuya Hishikawa (Panasonic, Japan)

**9:20 Theoretical Analysis of Position Report Verification using Distance-based Localization**

Junichi Naganawa (Electronic Navigation Research Institute, Japan)

**9:40 Direction Finding by Time-Modulated Circular Array with Amplitude Comparison**

Lee Dong Wook (Yonsei University, Korea (South)); Seung Gook Cha (Yonsei University, Korea (South)); Kim Dong Hyun and Young Joong Yoon (Yonsei University, Korea (South)); Byung Jun Jang (Kookmin Univ, Korea (South))

**10:00 Localization of Near-field Sources Using Uniform Circular Array and Blind Calibration Method**

Tomoki Hayashi, Nobuyoshi Kikuma, Kunio Sakakibara and Yoshiki Sugimoto (Nagoya Institute of Technology, Japan)

**10:20 Direction and Location Estimation Algorithm with Power Gravity Point for Spectrum Sharing**

Hiromi Matsuno (KDDI Research, Japan); Yoshio Kunisawa and Takahiro Hayashi (KDDI Research, Inc., Japan)

## 4G1: OS: Studies on Radio Wave Propagation in ITU-R SG3

Chairs: Wataru Yamada (NTT, Japan), Hajime Suzuki (CSIRO, Australia)

**9:00 HAPS propagation loss model for urban and suburban environments**

Hideki Omote, Ho-Yu Lin, Akihiro Sato and Sho Kimura (Softbank Corp., Japan)

**9:20 HAPS to ground propagation model considering general terrestrial path**

Hajime Suzuki (CSIRO, Australia)

**9:40 Propagation Model in Corridor LOS Condition Based on ABG Approach**

Wataru Yamada, Nobuaki Kuno, Minoru Inomata and Motoharu Sasaki (NTT, Japan)

**10:00 Prediction for cluttered building entry loss using ITU-R propagation models: Sum of the building entry loss and the clutter loss**

Juyul Lee (ETRI, Korea (South))

**10:20 Experimental Reflection Characteristics of 253 GHz in a Small Closed-room**

Myung-Don Kim, Kyung-Won Kim, Heon Kook Kwon, Juyul Lee and Jae-Joon Park (ETRI, Korea (South))

Thursday, January 28 11:00 - 13:00 (Asia/Tokyo)

## 4A2: Antenna Theory and Design 2

Chair: Toru Fukasawa (Mitsubishi Electric Corporation, Japan)

**11:00 A Design Concept of Grid-loaded Step Reflector Antenna with Coaxial-Mode Excitation**

Shin-ichi Yamamoto, Shuji Nuimura and Michio Takikawa (Mitsubishi Electric Corporation, Japan)

**11:20 Influence of concrete on patch antennas installed on utility poles**

Shota Takato and Hiroyuki Arai (Yokohama National University, Japan)

**11:40 Development of high-impedance antenna for energy harvesting in ISM band**

Yanagioka Yudai and Yoshinobu Okano (Tokyo City University, Japan)

**12:00 Wideband Design of a H-plane T-junction by Shape Optimization for a Corporate-feed Circuit of a Waveguide Slot Array in the 60GHz-band**

Wataru Kuramoto, Takashi Tomura and Jiro Hirokawa (Tokyo Institute of Technology, Japan)

**12:20 High Gain Low Sidelobe Multibeam Shaped Lens Antenna at 24 GHz for Wind Profile Radar**

Ding Yafei, Ziwen Zou, Yirong Li and Guangli Yang (Shanghai University, China)

**12:40 A Low Side-Lobe Slotted Ridge Waveguide Array Manufactured by Resin Injection Molding**

Takashi Uno, Takashi Uesaka, Narihiro Nakamoto, Toru Fukasawa, Yoshio Inasawa, Takeshi Yamamoto, Tomoyuki Koyanagi and Ikuya Kakimoto (Mitsubishi Electric Corporation, Japan); Yoshihiko Konishi (Hiroshima Institute of Technology, Japan)

## 4B2: Antennas for Mobile and V2X Applications

Chairs: Tanan Hongnara (Denki Kogyo Co. Ltd. & Japan, Japan), Ichiro Oshima (Denki Kogyo Co., Ltd., Japan)

**11:00 Miniaturized Shinkansen Antenna for Overhead-Line Voltage Detection and Wireless Communication**

Kengo Nishimoto, Hiroyuki Akutsu and Yasuhiro Nishioka (Mitsubishi Electric Corporation, Japan); Naofumi Yoneda (Mitsubishi Electric Corporation, Japan); Yoshihiro Matsumura, Eishi Sasaki and Takeshi Nishiyama (Central Japan Railway Company, Japan)

**11:20 Design and Evaluation of ESPAR Antenna using Hexagonal Microstrip Patch with Hole**

Changyoung An and Heung-Gyoon Ryu (Chungbuk National University, Korea (South))

**11:40 Design of Broadband Handset Antenna Based On Characteristic Modes**

Bo Pang (Xidian University, China)

**12:00 A Self-Decoupled Antenna Pair Using Shared Radiator With Orthogonal Modes**

Jiangwei Sui (vivo Mobile Communication co., Ltd, China); Shen Wang (vivo Mobile Communication Co., Ltd, China); Junyi Wang (vivo Mobile Communication co., Ltd, China)

**12:20 Closely-spaced Four-element MIMO Antenna for 5G Mobile Terminals**

Junyi Wang (vivo Mobile Communication co., Ltd, China); Shen Wang (vivo Mobile Communication Co., Ltd, China); Jiangwei Sui (vivo Mobile Communication co., Ltd, China)

## 4C2: OS: Circularly Polarized Antennas

Chair: Takafumi Fujimoto (Nagasaki University, Japan)

**11:00 A Reconfigurable T-shaped Slot Antenna Using Characteristic Mode Analysis**

Po-Lin Huang, Kuan Chun Huang, Huy Nam Chu and Tzyh-Ghuang Ma (National Taiwan University of Science and Technology, Taiwan)

**11:20 EBG Inspired Pattern and Polarization Reconfigurable Antenna**

Mohamad Kamal A. Rahim (Universiti Teknologi Malaysia, Malaysia); Muhammad Faizal Ismail (Universiti Tun Hussein Onn Malaysia & Centre for Diploma Studies, Malaysia); Huda A. Majid (Universiti Tun Hussein Onn Malaysia, Malaysia); Mohamad Rijal Hamid (Universiti Teknologi Malaysia, Malaysia)

**11:40 Circular polarization characteristics of dipole antenna using flat elements**

Takuro Kumagawa, Takeshi Fukusako and Ryuji Kuse (Kumamoto University, Japan)

**12:00 Polarization-Sense Reconfigurable Circular Polarized Antenna**

Chai-Eu Guan and Takafumi Fujimoto (Nagasaki University, Japan)

**12:20 A Circularly Polarized Cavity-Backed Stacked Patch Antenna for Wide-Angle Beam Scanning Millimeter-Wave Phased Array**

Shunichi Ikeda (Mitsubishi Electric, Japan); Kei Yokokawa, Narihiro Nakamoto, Toru Fukasawa, Masataka Ohtsuka and Yoshio Inasawa (Mitsubishi Electric Corporation, Japan)

**12:40 A Reconfigurable Circularly Polarized Microstrip Antenna with Short-Ended Microstrip Line Perturbations**

Htet Wai Htun, Eisuke Nishiyama and Ichihiko Toyoda (Saga University, Japan)

## 4D2: OS: WPT Technologies for Mobile Devices

Chair: Qiaowei Yuan (Tohoku Institute of Technology, Japan)

**11:00 A Dual-Band Rectenna Without Impedance Matching Network for Wireless Power Transmission**

Zhongqi He, Hang Lin and Changjun Liu (Sichuan University, China)

**11:20 Quarter-Wave Line Inserted Series- and Shunt-Diodes Rectifier Tolerant of DC Load Resistance Deviation**

Shinji Abe, Ryota Gibo, Korya Chiathong and Takashi Ohira (Toyohashi University of Technology, Japan)

**11:40 EMI Reduction Techniques from 100 kW Wireless Charging Systems for Heavy-Duty Vehicles**

Hiroshi Uno, Kenichirou Ogawa, Tetsu Shijo, Yasuhiro Kanekiyo, Koji Ogura, Shuichi Obayashi and Masaaki Ishida (Toshiba Corporation, Japan)

**12:00 390-W 85-kHz band rapid wireless charging UAV and its inductive power transfer charging port with frustum shape**

Shuichi Obayashi and Yasuhiro Kanekiyo (Toshiba Corporation, Japan); Kiyokazu Sugaki (Prodrone, Japan); Hiroaki Kusada, Genyo Ueta and Hiroyuki Nozaki (Tokyo Electric Power Company Holdings, Japan); Hiroshi Hamada (Tokyo Densetsu Service Co., Ltd., Japan)

**12:20 A Transparent Antenna For Hybrid Energy Harvesting**

Fangjie Cheng (Xidian University, China)

**12:40 Improvement of Transmission Efficiency by using Annular Array Metamaterial for Magnetic Coupling Wireless Power Transmission System**

Liwei Jia and Kazuhiro Fujimori (Okayama University, Japan)

## 4F2: Radar DOA, localization, Sensing and Propagation Measurement Techniques 4

Chair: Hiroyoshi Yamada (Niigata University, Japan)

**11:00 (invited) Improved Drone Detection in FMCW Radar using SPC Technique**

Junhyeong Park (Korea Research Institute of Standards and Science, Korea (South)); Seong-Ook Park (Korea Advanced Institute of Science and Technology, Korea (South))

**11:40 Basic Shape Classification of Buried Object Using Pattern Matching in Ultrawideband Radar Image**

Budiman Putra Asma'ur Rohman (Kumamoto University, Japan & Indonesian Institute of Sciences, Indonesia); Masahiko Nishimoto (Kumamoto University, Japan)

**12:00 Effect of Antenna Pattern of Radar on Vibration Estimation for Infrastructure Monitoring**

Takahiro Kinoshita (Nippon Steel Corporation & Niigata University, Japan); Hiroyoshi Yamada (Niigata University, Japan)

**12:20 Indoor Localization with Machine Learning Based on Interpolated Received Signals of Phased Array**

Makoto Higaki (Toshiba Corporation, Japan); Yukako Tsutsumi (Toshiba Corp, Japan)

**12:40 Angle-of-Arrival-based Outdoor Localization for Spectrum Sharing at 25 GHz Band**

Panawit Hanpinitasak (Tokyo Institute of Technology, Japan); Kosuke Murakami (Tokyo Institute Technology, Japan); Kentaro Saito and Jun-ichi Takada (Tokyo Institute of Technology, Japan)

## 4G2: Millimeter-wave and Satellite Propagation

Chairs: Shinichi Ichitsubo (Kyushu Institute of Technology, Japan), Kentaro Saito (Tokyo Institute of Technology, Japan)

**11:00 Control of the reception level in a touchless entrance control gate using the millimeter-wave band waveguide slot array installed on the sides**

Mizuki Kurose, Takashi Tomura and Jiro Hirokawa (Tokyo Institute of Technology, Japan)

**11:20 Scattering Effect up to 100 GHz Band for 6G**

Minoru Inomata, Wataru Yamada, Nobuaki Kuno and Motoharu Sasaki (NTT, Japan); Koshiro Kitao, Mitsuki Nakamura, Hironori Ishikawa and Yasuhiro Oda (NTT DOCOMO, INC., Japan)

**11:40 Experimental Investigation of Millimeter-Wave Multi-Path Propagation in Passenger Vehicles**

Satoshi Yamakawa and Minseok Kim (Niigata University, Japan); Kensuke Matsui (YAZAKI Corporation, Japan); Yuya Kaneko (Yazaki Corporation, Japan); Tadahide Kunitachi (YAZAKI Corporation, Japan)

**12:00 Millimeter-Wave Double-Directional Channel Sounder using COTS RF Transceivers**

Shuaiqin Tang, Keiichiro Kumakura and Minseok Kim (Niigata University, Japan)

**12:20 Hemispherical Pattern Double-Cross Dipole Antenna for a Fixed-site Ground Station**

Saowapa Meerabeab, Pisit Charoenkarn and Vasana Jantarachote (Prince of Songkla University, Thailand)

**12:40 Low-cost fixed-site ground station system for receiving NOAA-19 satellite**

Pisit Charoenkarn, Saowapa Meerabeab and Vasana Jantarachote (Prince of Songkla University, Thailand)

## Thursday, January 28 14:20 - 16:20 (Asia/Tokyo)

### 4A3: Antenna Theory and Design 3

Chair: Narihiro Nakamoto (Mitsubishi Electric Corporation, Japan)

**14:20 A Suspended Line to Waveguide Transition for Dual-polarized Slotted Waveguide Array Antenna**

Takashi Uesaka, Takashi Uno, Narihiro Nakamoto, Toru Fukasawa, Yoshio Inasawa, Takeshi Yamamoto, Tomoyuki Koyanagi and Ikuya Kakimoto (Mitsubishi Electric Corporation, Japan); Yoshihiko Konishi (Hiroshima Institute of Technology, Japan)

**14:40 An Acceleration Method of Conformal Array Pattern Calculation**

Jiixin Yao, Huaiji Zhang, Jiangnan Xing and Tao Jiang (Harbin Engineering University, China)

**15:00 Collinear Super Turnstile Antennas for 5G Sub-6 Base Station**

Sirao Wu (Tohoku University, Japan); Lin Wang and Tetsu Kou (Nihon Dengyo Kosaku Co., Ltd., Japan); Qiang Chen (Tohoku University, Japan)

**15:20 Four-port DRA Array for MIMO Applications**

Mohit Mishra (Indian Institute of Technology, Guwahati, India); Sumantra Chaudhuri (IIT Guwahati, India); Rakesh Singh Kshetrimayum (Indian Institute of Technology Guwahati, India)

**15:40 Bandwidth Improvement Methods for Monopole Element Printed Quasi-Yagi Antenna**

Amar Dattatray Chaudhari (Defence Institute of Advanced Technology (DIAT), India); KP Ray (DIAT, Pune, India)

### 4B3: Short Presentation Session A4

Chair: Tamami Maruyama (National Institute of Technology, Hakodate College, Japan)

**14:20 Interdigital and Multi-Via Structures for Mushroom-Type Metasurface Reflectors**

Taisei Urakami (National Institute of Technology, Kagawa College, Japan); Tamami Maruyama (National Institute of Technology, Hakodate College, Japan); Takahiro Shiozawa (National Institute of Technology (KOSEN), Kagawa College, Japan)

**14:35 Matching Circuit Design of Planer Frequency Dispersive Phase Shifter for Base Station Antennas**

Toshiki Soma and Keizo Cho (Chiba Institute of Technology, Japan); Naobumi Michishita (National Defense Academy, Japan); Ichiro Oshima (Denki Kogyo Co., Ltd., Japan)

**14:50 Broadband RCS Reduction for Fabry-Perot Antenna with enhanced Bandwidth Using Polarization Conversion Metasurface**

Xiaosong Liu, Enlin Wang, Xiuqing Geng, Dandan Yang and Zehong Yan (Xidian University, China)

**15:05 The Analysis of the Octave-Band Self-Complementary Antenna**

Hitoshi Yoshimura (TAKUSHOKU University, Japan); Kazufusa Noda and Keiichi Hirano (Oshima Prototype Engineering Co., Ltd., Japan); Yasuhiro Tsunemitsu (Takushoku University, Japan)

**15:20 Leaf-Shaped Bowtie Slot Antenna Array for Application in Beam Scanning**

Mangseang Hor, Takashi Hikage and Manabu Yamamoto (Hokkaido University, Japan)

**15:35 New Gap Capacitive Structure for Broadening Left-handed Region in Composite Right/Left Handed Transmission Line**

Yuki Umezawa, Mikio Tsuji and Hiroyuki Deguchi (Doshisha University, Japan)

**15:50 Polarimetric Signature CNN based Complex Permittivity Estimation for Microwave Non-destructive Testing**

Zhang Hongyang and Shouhei Kidera (University of Electro-Communications, Japan)



## 4C3: Short Presentation Session A5

Chair: Yuto Kato (National Institute of Advanced Industrial Science and Technology, Japan)

**14:20 Design of a Miniaturized Log Periodic Dipole Antenna Using a T-loaded Structure with Dual-Polarization for Electronic Warfare Applications**

Sangwoon Youn, Hosung Choo and Tae Heung Lim (Hongik University, Korea (South))

**14:35 A Compact Multiband Circularly Polarized Antenna Exploiting Meander Geometry**

Maharana Pratap Singh (Indian Institute of Technology Indore, India); Sungjoon Lim (Chung-Ang University, Korea (South)); Saptarshi Ghosh (Indian Institute of Technology Indore, India)

**14:50 Design and measurement of a linearly dual-polarized dual-band and wideband multi-ring microstrip antenna fed by two L-probes**

Yuki Kimura (Saitama University); Sakuyoshi Saito and Yuichi Kimura (Saitama University, Japan); Masahiro Tatematsu (TDK Company, Japan)

**15:05 Compact Dual-Band Dual-Polarized Filtering Antenna for 5G Base Station Applications**

Yi Yang Liu (South China University of Technology, China); Xiu Yin Zhang (School of Electronic and Information Engineering, South China University of Technology, China)

**15:20 Design of a Triple-band and Wideband Multi-Ring Microstrip Antenna fed by an L-probe**

Kazuki Iwamoto, Yuki Kimura, Sakuyoshi Saito and Yuichi Kimura (Saitama University, Japan)

**15:35 LCMV Beamforming for Conformal Arrays Using Software Defined Radio**

Jiahao Wang and Koen Mouthaan (National University of Singapore, Singapore)

**15:50 A Microstrip-Line Gunn Oscillator Loaded Active Integrated Array Antenna Using Inclined Patches for Polarization Switching Function**

Maodudul Hasan, Eisuke Nishiyama and Ichihiko Toyoda (Saga University, Japan)

**16:05 Blind Signal Separation Using Array Antenna with Modified Optimal-Stepsize CMA**

Keita Sekiyama, Nobuyoshi Kikuma, Kunio Sakakibara and Yoshiki Sugimoto (Nagoya Institute of Technology, Japan)

## 4D3: Short Presentation Session C

Chairs: Seiya Kishimoto (Nihon University, Japan), Shunichi Futatsumori (Electronic Navigation Research Institute, Japan)

**14:20 Two-dimensional ARMA for FDTD Radiation Pattern Analysis**

Akihiro Nakao and Takuji Arima (Tokyo University of Agriculture and Technology, Japan); Toru Uno (Tokyo University of Agricultural Technology, Japan)

**14:35 Reconstruction of Dipole Antenna Current Distribution based on Boundary Integral Equations**

Maiko Iwatani (Tokyo University of Agriculture and Technology, Japan); Toru Uno (Tokyo University of Agricultural Technology, Japan); Takuji Arima (Tokyo University of Agriculture and Technology, Japan)

**14:50 A study on an online acceleration of automatic design of RF-DC conversion circuit using neural networks**

Takuma Akada and Kazuhiro Fujimori (Okayama University, Japan)

**15:05 VESBR for the Electromagnetic Scattering of Multilayered Dielectric Objects**

Yuan Huang (University of Electronic Science and Technology of China, China); Zhiqin Zhao (UESTC, China)

**15:20 Active Millimeter-Wave Imaging Using Incoherent Illumination with Multiple Incident Angles**

Atsuro Maeda (University of Tohoku, Japan); Hiroyasu Sato (Tohoku University, Japan); Riku Nishimura (Tohoku Univ, Japan); Qiang Chen (Tohoku University, Japan)

**15:35 A Study on Beam Narrowing and Gain Enhancement of Patch Array Antenna Using FSS**

Tatsuro Shigihara, Takashi Hikage and Manabu Yamamoto (Hokkaido University, Japan); Kazumitsu Sakamoto and Kento Yoshizawa (NTT, Japan)

**15:50 A Miniaturized Band-Notched Absorber for Wideband RCS Reduction**

Aditi Sharma and Sudha Malik (Indian Institute of Technology, Kanpur, India); Saptarshi Ghosh (Indian Institute of Technology Indore, India); Kumar Vaibhav Srivastava (Indian Institute of Technology Kanpur, India)

## 4E3: Short Presentation Session D4

Chairs: Takahiro Hayashi (KDDI Research, Inc., Japan), Ichihiko Toyoda (Saga University, Japan)

### **14:20 Analysis of Incoming Wave Characteristics for V2V Communication in an Urban Environment**

Mukaiyama Katsumi, Ram Satya Rao Mediseti and Kazuhiro Honda (University of Toyama, Japan)

### **14:35 EM-Decoupled Orthogonal Dipole Rotating Electric Fields in Synchronization with Propeller**

Taishi Oda and Kazuhiro Honda (University of Toyama, Japan); Koichi Ogawa (University of Toyama & Faculty of Engineering, Japan)

### **14:50 Performance of Single-Carrier LOS-MIMO Using FDE in 3GPP TDL Channel Models**

Kana Aono and Mamoru Sawahashi (Tokyo City University, Japan); Norifumi Kamiya (NEC Corporation, Japan)

### **15:05 Dual Band and Dual Polarized Reflectarray Using Cross Dipole and Patch Elements**

Nguyen Cong Oai (National Defense Academy & Morishita Laboratory, Japan); Naobumi Michishita and Hisashi Morishita (National Defense Academy, Japan); Hiromi Matsuno (KDDI Research, Japan); Satoshi Ito and Takahiro Hayashi (KDDI Research, Inc., Japan); Masayuki Nakano (KDDI Research, Japan)

### **15:20 Propagation Characteristics and Channel Capacity with Drone Height**

Shun Dohi (University of Niigata, Japan); Kentaro Nishimori (Niigata University, Japan); Wataru Yamada and Nobuaki Kuno (NTT, Japan)

### **15:35 Feedback-Free Wireless Power Transfer Technique in Conductive Enclosure Using Parasitic Antennas**

Tsukasa Chida, Kentaro Murata and Naoki Honma (Iwate University, Japan)

### **15:50 High-Q Characterization of MW-Band Dielectric Resonator Rectenna Using an Equivalent Circuit**

Kosuke Takakura (Toyama University, Japan); Kazuhiro Honda (University of Toyama, Japan); Koichi Ogawa (University of Toyama & Faculty of Engineering, Japan)

### **16:05 Experimental Study on Dual-Band Differential Rectenna with Stacked Antenna Configuration**

Kento Saito, Eisuke Nishiyama and Ichihiko Toyoda (Saga University, Japan)

## 4F3: Radar DOA, localization, Sensing and Propagation Measurement Techniques 5

Chair: Naoki Honma (Iwate University, Japan)

### **14:20 Robust Source Number Estimation using Annihilating Filter and Downsampling Scheme**

Shohei Hamada and Koichi Ichige (Yokohama National University, Japan); Katsuhisa Kashiwagi, Nobuya Arakawa and Ryo Saito (Murata Manufacturing, Japan)

### **14:40 Environment Mapping Technique using Millimeter-Wave Radio Systems**

Yuto Miyake, Minseok Kim, Takeshi Tasaki and Satoshi Yamakawa (Niigata University, Japan); Jun-ichi Takada (Tokyo Institute of Technology, Japan)

### **15:00 DoA Estimation on A MIMO Handset**

Qifeng Wang (Shanghai University, China); Nicholas E Buris (NEBENS, LLC, USA & Shanghai University, China)

### **15:20 Three-dimensional Estimation of Angle of Arrival using Newton-Raphson Method**

Ram Satya Rao Mediseti and Kazuhiro Honda (University of Toyama, Japan)

### **15:40 SA antenna-based DOA measurements for LTE base station environments**

Kazuma Tomimoto (Softbank Corp., Japan); Ryo Yamaguchi (SOFTBANK Corp., Japan); Takeshi Fukusako (Kumamoto University, Japan)

### **16:00 Radar-Based Automatic Detection of Sleep Apnea Using Support Vector Machine**

Takato Koda and Takuya Sakamoto (Kyoto University, Japan); Shigeaki Okumura and Hirofumi Taki (MaRI Co., Ltd., Japan); Satoshi Hamada and Kazuo Chin (Kyoto University, Japan)

## 4G3: Short Presentation Session B3

Chair: Koshiro Kitao (NTT DOCOMO, INC., Japan)

### **14:20 Evaluation of Target Localization Accuracy Using MIMO-OFDM Radar**

Nobuyuki Shiraki, Naoki Honma and Kentaro Murata (Iwate University, Japan); Takeshi Nakayama and Shoichi Iizuka (Panasonic Corporation, Japan)

**14:35 Study of Posture Estimation Using MIMO Sensor Based on CSI**

Tsuyoshi Ohta, Ryotaro Taniguchi and Kentaro Nishimori (Niigata University, Japan)

**14:50 Mixture Database Method in Area Estimation by Finger Printing**

Yuuhi Tanaka, Satoru Aikawa and Shinichiro Yamamoto (University of Hyogo, Japan)

**15:05 Analysis of Characteristics of an Antenna for Detection of Human Body and Paper**

Kenjiro Kubo and Hisato Iwai (Doshisha University, Japan); Takuya Kurihara (Advanced Telecommunications Research Institute International, Japan); Satoru Shimizu and Yoshinori Suzuki (ATR, Japan)

**15:20 Classification Accuracy Improvement of Traffic Monitoring MW Radar by Velocity Compensation**

Kazuma Nishimura and Hiroyoshi Yamada (Niigata University, Japan)

**15:35 Schemes to Reduce No Estimates and Database Update Errors for Finger Print Area Localization**

Yusuke Miyamoto, Satoru Aikawa and Shinichiro Yamamoto (University of Hyogo, Japan)

**15:50 Extended Beamforming by Restored Phase Information of Virtual Array Input Signal**

Shinya Morimoto, Sho Iwazaki and Koichi Ichige (Yokohama National University, Japan)

**16:05 Performance Evaluation of Millimeter-Wave Radio Tomographic Imaging (RTI) based Indoor Localization**

Takeshi Tasaki and Minseok Kim (Niigata University, Japan)

Thursday, January 28 16:40 - 17:40 (Asia/Tokyo)

**4A4: Closing and Award Ceremony**