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Technical Program

October 25 (Tue)

1A1: Opening Ceremony 09:30 - 10:10 (Room A)

Chair: Nobuyoshi Kikuma (Nagoya Institute of Technology, Japan)

1A2: Plenary Talk 10:10 - 12:30 (Room A)

Co-Chairs: Jiro Hirokawa (Tokyo Institute of Technology, Japan)

Keizo Cho (Chiba Institute of Technology, Japan)

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October 25 (Tue)

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1B3: Antennas for Mobile Communications I 14:00 - 15:40 (Room B)

Co-Chairs: Keizo Cho (Chiba Institute of Technology, Japan)
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- 15:20 **Break Time**

Technical Program

October 25 (Tue)

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Technical Program

October 25 (Tue)

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October 25 (Tue)

1E4: 3D-Printed Lens and Antennas

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Co-Chairs: Kin-Lu Wong (National Sun Yat-sen University, Taiwan)

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Technical Program

October 25 (Tue)

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October 26 (Wed)

2A1: EurAAP Session: Recent Advances in European Antennas and Propagation Research I 9:00 - 10:40 (Room A)

Co-Chairs: Juan R. Mosig (Ecole polytechnique federale de Lausanne EPFL, Switzerland)
Lars J. Foged (Microwave Vision Group, Italy)

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2A2: EurAAP Session: Recent Advances in European Antennas and Propagation Research II 11:00 - 12:40 (Room A)

Co-Chairs: Jian Yang (Chalmers University of Technology, Sweden)
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October 26 (Wed)

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Co-Chairs: Nobuyoshi Kikuma (Nagoya Institute of Technology, Japan)
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October 26 (Wed)

2B2: Advanced Base Station Antennas **11:00 - 12:40 (Room B)**

Co-Chairs: Masayuki Nakano (KDDI R&D Labs., Japan)
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Yoshio Inasawa (Mitsubishi Electric Corporation, Japan)

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Qun Wu (Harbin Institute of Technology, China)

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Yasuyuki Maekawa (Osaka Electro-Communication University, Japan)

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

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3A1: Recent Progress in Millimeter-Wave and THz Antenna Technologies I
9:00 - 10:40 (Room A)

Co-Chairs: Kyeong-Sik Min (Korea Maritime and Ocean University, Korea)
Kunio Sakakibara (Nagoya Institute of Technology, Japan)

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3A2: Recent Progress in Millimeter-Wave and THz Antenna Technologies II
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Co-Chairs: Manabu Yamamoto (Hokkaido University, Japan)
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- 2: 11:20 **A D-band High-Gain Antenna for Terahertz Applications** 546
#Zhang-Cheng Hao and Jia Wang, *Southeast University, China*
- 3: 11:40 **Terahertz Reflectarray and Transmitarray** 548
#Shi-Wei Qu⁽¹⁾, Peng-Yu Feng⁽¹⁾, Huan Yi^(1,2), Baojie Chen⁽²⁾, Kung Bo Ng⁽²⁾, Chi Hou Chan⁽²⁾ and Geng-Bo Wu⁽¹⁾, ⁽¹⁾*University of Electronic Science and Technology of China (UESTC), China*, ⁽²⁾*City University of Hong Kong, China*
- 4: 12:00 **Through-Hole Less Microstrip Line to Waveguide Transition with Quarter-Wavelength Open Stubs** 550
#Hiromasa Nakajima, Akimichi Hirota, Naofumi Yoneda and Hiroaki Miyashita, *Mitsubishi Electric Corporation, Japan*
- 5: 12:20 **PWW Bandpass Filter for 60 GHz Band Based on 2D MoM Design Optimization** 552
#Ryohei Hosono, Yusuke Uemichi, Osamu Nukaga, Xu Han and Ning Guan, *Fujikura Ltd., Japan*

Technical Program

October 27 (Thu)

3A3: Next 50 Years Antennas and Propagation Technologies in Japan

16:00 - 17:40 (Room A)

Co-Chairs: Hiroki Shoki (Toshiba Corporation, Japan)

Yoshihiko Konishi (Hiroshima Institute of Technology, Japan)

- 1: 16:00 **Antenna Systems for Next 50 Years** 554
#Kentaro Nishimori, *Niigata University, Japan*
- 2: 16:25 **My Personal Expectations about Electromagnetics Analysis and Simulation Techniques for Next 50 Years** 556
#Takuji Arima, *Tokyo University of Agriculture and Technology, Japan*
- 3: 16:50 **Expectation for Metamaterials for Antenna Applications** 558
#Naobumi Michishita, *National Defense Academy, Japan*
- 4: 17:15 **Future 50 Years of Mobile Radio Propagation Research** 560
#Koshiro Kitao, *NTT DOCOMO, INC., Japan*

3B1: Recent Advances in Computational Electromagnetics I

9:00 - 10:40 (Room B)

Co-Chairs: Takuji Arima (Tokyo University of Agriculture and Technology, Japan)

Ruey-Bing Hwang (National Chiao Tung University, Taiwan)

- 1: 9:00 **Solution of Electrically Large Scattering Problems using the Characteristic Basis Function Method** 562
Chao Li ^(1,2) and #Raj Mittra ^(1,3), ⁽¹⁾*University of Central Florida, United States*,
⁽²⁾*University of Jinan, China*, ⁽³⁾*King Abdul Aziz University, Saudi Arabia*
- 2: 9:20 **Analysis of Electromagnetic Pulse Responses by a Conducting Cylinder with Inhomogeneous Dielectric Coating** 564
#Masahiko Nishimoto ⁽¹⁾ and Yoshihiro Naka ⁽²⁾, ⁽¹⁾*Kumamoto University, Japan*,
⁽²⁾*Kyushu University of Health and Welfare, Japan*
- 3: 9:40 **Large-Scale FDTD Analysis of 4.4 GHz-band Propagation Characteristics in Aircraft Cabin** 566
#Kanji Yahagi ⁽¹⁾, Masami Shirafune ⁽¹⁾, Takashi Hikage ⁽¹⁾, Manabu Yamamoto ⁽¹⁾,
Toshio Nojima ⁽¹⁾, Shoichi Narahashi ⁽¹⁾, Syunichi Futatsumori ⁽²⁾, Akiko Kohmura ⁽²⁾
and Naruto Yonemoto ⁽²⁾, ⁽¹⁾*Hokkaido University, Japan*, ⁽²⁾*National Institute of Maritime, Port and Aviation Technology, Japan*
- 4: 10:00 **ARMA/FDTD Analysis of Loop Antennas near Human Body for MHz Band Wireless Power Transfer System** 568
#Keita Asano, Toru Uno and Takuji Arima, *Tokyo University of Agriculture and Technology, Japan*
- 5: 10:20 **A Beam Tracking System - System Analysis Incorporating Electromagnetic Field Simulation** 570
#Ruey-Bing(Raybeam) Hwang, *National Chiao Tung University, Taiwan*

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3B2: Recent Advances in Computational Electromagnetics II

11:00 - 12:40 (Room B)

Co-Chairs: Shinichiro Ohnuki (Nihon University, Japan)

Maokun Li (Tsinghua University, China)

- 1: 11:00 **Scattering of Light by Periodic Array of Metal-Coated Nanocylinders on Dielectric Slab** 572
#Kiyotoshi Yasumoto⁽¹⁾, Vakhtang Jandieri⁽²⁾, Peiwen Meng⁽³⁾ and Yunfei Liu⁽¹⁾,
⁽¹⁾Nanjing Forestry University, China, ⁽²⁾Free University of Tbilisi, Republic of Georgia, ⁽³⁾Delft University of Technology, Netherlands
- 2: 11:20 **Accelerating Nonlinear Inversion Algorithms on GPU platform for Electromagnetic Data** 574
#Maokun Li⁽¹⁾, Xue Yang Wang⁽¹⁾ and Aria Abubakar⁽²⁾, ⁽¹⁾Tsinghua University, China, ⁽²⁾Schlumberger, United States
- 3: 11:40 **Basic Study of an InSb Grating Filter in the Terahertz Region** 576
Jun Shibayama, #Ryo Umezawa, Junji Yamauchi and Hisamatsu Nakano, *Hosei University, Japan*
- 4: 12:00 **A Discontinuous Galerkin Augmented Electric Field Integral Equation for Low-Frequency Electromagnetic Scattering Analysis** 578
Yibei Hou, Xuezhe Tian and #Gaobiao Xiao, *Shanghai Jiao Tong University, China*
- 5: 12:20 **Propagation Characteristics for Dielectric Waveguide Composed of Dielectric Circular Cylinder with Air-hole Cylinder Array** 580
Ryosuke Ozaki and #Tsuneki Yamasaki, *Nihon University, Japan*

3B3: Electromagnetic Wave Theory II

16:00 - 17:40 (Room B)

Co-Chairs: Hiroshi Shirai (Chuo University, Japan)

Rafal Lech (Gdansk University of Technology, Poland)

- 1: 16:00 **Electromagnetic Scattering by Simplified Crack Models on Conducting Ground Plane** 582
#Ryoichi Sato⁽¹⁾ and Hiroshi Shirai⁽²⁾, ⁽¹⁾Niigata University, Japan, ⁽²⁾Chuo University, Japan
- 2: 16:20 **Infinite Current Behavior along a Subwavelength Perfectly Conducting Concaved Wedge** 584
#Thierry Gilles, *Royal Military Academy, Belgium*
- 3: 16:40 **Modified Cauchy Distribution Model of High-Order Passive Intermodulation** 586
#Lu Tian, Yi Wang, Ruofan Wang and Xiangyuan Bu, *Beijing Institute of Technology, China*
- 4: 17:00 **Scattering of Light by Multilayered Cylindrically Periodic Arrays of Metal-Coated Nanocylinders** 588
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- 5: 17:20 **Study of Optical Coupling at Junction of Plasmonic Waveguides** 590
Shinichiro Ohnuki, #Masahiro Kamigaki, Yuichi Kageyama, Hideomi Hashiba and Shuichiro Inoue, *Nihon University, Japan*

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October 27 (Thu)

3C1: Antennas and Propagation for 5G Systems 9:00 - 10:40 (Room C)

Co-Chairs: Katsuyuki Haneda (Aalto University School of Electrical Engineering, Finland)
Jiro Hirokawa (Tokyo Institute of Technology, Japan)

- 1: 9:00 **Prototype System Evaluation and Field Trial of 40 GHz-band Directional Division Duplex (DDD) Radio System** 592
#Yu Sudoh⁽¹⁾, Yasuhiro Toriyama⁽¹⁾, Koichiro Akahori⁽¹⁾, Yuki Hashimoto⁽¹⁾, Kazuya Kojima⁽¹⁾, Toru Taniguchi⁽¹⁾, Miao Zhang^(2,3), Jiro Hirokawa⁽²⁾ and Makoto Ando⁽²⁾,
⁽¹⁾Japan Radio Co.,Ltd., Japan, ⁽²⁾Tokyo Institute of Technology, Japan, ⁽³⁾Xiamen University, China
- 2: 9:20 **Multiplexing Efficiency of High Order MIMO in Mobile Terminal for 5G communication at 15GHz** 594
#Zhinong Ying⁽¹⁾, Kun Zhao^(1,2), Thomas Bolin⁽¹⁾, Sailing He⁽²⁾, Alessandro Scannavini⁽³⁾, Lars J. Foged⁽³⁾ and Gross Nicolas⁽³⁾, ⁽¹⁾SONY Mobile Communications AB, Sweden, ⁽²⁾KTH Royal Institute of Technology, Sweden, ⁽³⁾Microwave Vision Group, France
- 3: 9:40 **Radio Channel Sounding Campaigns in EU H2020 mmMAGIC Project for 5G Channel Modeling** 596
#Katsuyuki Haneda⁽¹⁾, Michael Peter⁽²⁾, Jonas Medbo⁽³⁾, Mark Beach⁽⁴⁾, Raffaele d'Errico⁽⁵⁾, Shangbin Wu⁽⁶⁾ and Jean-Marc Conrat⁽⁷⁾, ⁽¹⁾Aalto University School of Electrical Engineering, Finland, ⁽²⁾Fraunhofer HHI, Germany, ⁽³⁾Ericsson Research, Sweden, ⁽⁴⁾University of Bristol, United Kingdom, ⁽⁵⁾CEA-LETI, France, ⁽⁶⁾Samsung Research, United Kingdom, ⁽⁷⁾Orange, France
- 4: 10:00 **A Novel Method for Inter-Cell Interference Cancellation in Cellular Networks** 598
Shuo Yang, Kyunghoon Kim, Heungseop Ahn and #Seungwon Choi, *Hanyang University, Korea*
- 5: 10:20 **Investigation of Planar Near-Field Measurement of Millimeter-Wave Antenna for 5G Application** 600
#Bo Xu^(1,4), Jakob Helander⁽²⁾, Andreas Ericsson⁽²⁾, Zhinong Ying⁽³⁾, Sailing He⁽¹⁾, Mats Gustafsson⁽²⁾ and Daniel Sjöberg⁽²⁾, ⁽¹⁾KTH Royal Institute of Technology, Sweden, ⁽²⁾Lund University, Sweden, ⁽³⁾SONY Mobile Communications AB, Sweden, ⁽⁴⁾Zhejiang University, China

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3C2: MIMO Based Techniques for Future Wireless Communication Systems 11:00 - 12:40 (Room C)

Co-Chairs: Tsuyoshi Kashima (Huawei Technologies Japan K.K., Japan)
Kentaro Nishimori (Niigata University, Japan)

- 1: 11:00 **Large Scale Massive MIMO Field Trial for 5G Mobile Communications System** 602
#Tsuyoshi Kashima⁽¹⁾, Jing Qiu⁽²⁾, Haihua Shen⁽²⁾, Chen Tang⁽²⁾, Tingjian Tian⁽²⁾, Xin Wang⁽³⁾, Xiaolin Hou⁽³⁾, Huiling Jiang⁽³⁾, Anass Benjebbour⁽⁴⁾, Yuya Saito⁽⁴⁾ and Yoshihisa Kishiyama⁽⁴⁾, ⁽¹⁾*Huawei Technologies Japan K.K., Japan*, ⁽²⁾*Huawei Technologies Co., Ltd, China*, ⁽³⁾*DOCOMO Beijing Communications Laboratories, Co., Ltd., China*, ⁽⁴⁾*NTT DOCOMO, INC., Japan*
- 2: 11:20 **Downlink Multiuser MIMO-OFDM Transmission using Simple Receive Antenna Selection** 604
#Tomoki Murakami⁽¹⁾, Keisuke Ujihara⁽²⁾, Yasushi Takatori⁽¹⁾, Masato Mizoguchi⁽¹⁾ and Fumiaki Maehara⁽²⁾, ⁽¹⁾*Nippon Telegraph and Telephone Corporation, Japan*, ⁽²⁾*Waseda University, Japan*
- 3: 11:40 **Comparison of Large Scale Parameters of mmWave Wireless Channel in 3 Frequency Bands** 606
Hua Yan⁽¹⁾, Ziming Yu⁽¹⁾, Yanshen Du⁽¹⁾, #Jia He⁽¹⁾, Xiongfei Zou⁽¹⁾, David Steer⁽²⁾ and Guangjian Wang⁽¹⁾, ⁽¹⁾*Huawei Tech. Co., Ltd, China*, ⁽²⁾*Huawei Technologies Canada Co., Ltd., Canada*
- 4: 12:00 **Ray-tracing Based Performance Evaluation of 5G mmWave Massive MIMO in Hotspots** 608
#Chenwei Wang⁽¹⁾, Haralabos Papadopoulos⁽¹⁾, Koshiro Kitao⁽²⁾ and Tetsuro Imai⁽²⁾, ⁽¹⁾*DOCOMO Innovations, Inc., United States*, ⁽²⁾*NTT DOCOMO INC, Japan*
- 5: 12:20 **Testbed Implementation of Near-field Magnetic MIMO Communication System using SDR** 610
#Sukhyun Hwang, Han-Joon Kim, Kyung Tae Kim and Ji-Woong Choi, *Daegu Gyeongbuk Institute of Science & Technology, Korea*

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October 27 (Thu)

3C3: 5G Radio Propagation

16:00 - 17:40 (Room C)

Co-Chairs: Koshiro Kitao (NTT DOCOMO, Japan)

Tommi Jamsa (Huawei Technologies Sweden AB, Sweden)

- 1: 16:00 **Outdoor-to-Indoor Channel Characteristics at 20 GHz** 612
#Ngochao Tran, Tetsuro Imai and Yukihiro Okumura, *NTT DOCOMO INC., Japan*
- 2: 16:20 **Mm-Wave Outdoor-to-Indoor Channel Measurement In An Open Square Smallcell Scenario** 614
#Minseok Kim⁽¹⁾, Tatsuki Iwata⁽¹⁾, Kento Umeki⁽¹⁾, Karma Wangchuk⁽²⁾, Jun-ichi Takada⁽²⁾ and Shigenobu Sasaki⁽¹⁾, ⁽¹⁾*Niigata University, Japan*, ⁽²⁾*Tokyo Institute of Technology, Japan*
- 3: 16:40 **Investigations on the Frequency Dependence of the Delay Spread in an UMi Street Canyon Scenario** 616
#Michael Peter, Richard J. Weiler, Fabian Undi, Farouk El-Kanawati, Stephan Jaeckel, Leszek Raschkowski, Lars Thiele, Kei Sakaguchi and Wilhelm Keusgen, *Fraunhofer Heinrich Hertz Institute, Germany*
- 4: 17:00 **Indoor High-Resolution Channel Characterization** 618
#Niklas Jaldén⁽¹⁾, Jonas Medbo⁽¹⁾, Henrik Asplund⁽¹⁾, Nicholas Tompson⁽²⁾ and Dennis Sundman⁽¹⁾, ⁽¹⁾*Ericsson Research, Sweden*, ⁽²⁾*Telstra Corporation, Australia*
- 5: 17:20 **Study of Dominant Path Probability** 620
#Tommi Jämsä, Gerhard Steinböck and Mattias Gustafsson, *Huawei Technologies Sweden AB, Sweden*

3D1: Radar, Remote Sensing, and Applications I

9:00 - 10:40 (Room D)

Co-Chairs: Hirokazu Kobayashi (Osaka Institute of Technology, Japan)

Jian Yang (Univ. Science & Technology Beijing, China)

- 1: 9:00 **Time Series Observation of Wetland "Sakata" by PiSAR-2** 622
Yoshio Yamaguchi⁽¹⁾, Hiroyoshi Yamada⁽¹⁾ and #Shoichiro Kojima⁽²⁾, ⁽¹⁾*Niigata University, Japan*, ⁽²⁾*National Institute of Information and Communication Technology, Japan*
- 2: 9:20 **Constraint Least-Squares Estimation for Polarimetric Parameters in Compact Data** 624
#Junjun Yin⁽¹⁾ and Jian Yang⁽²⁾, ⁽¹⁾*University of Science and Technology Beijing, China*, ⁽²⁾*Tsinghua University, China*
- 3: 9:40 **Lab Color Space Assignment for Decomposed Fully Polarization Pi-SAR Data** 626
Cheng-Yen Chiang^(1,3), Kun-Shan Chen⁽²⁾, # Chih-Yuan Chu⁽³⁾, Yoshio Ymaguchi⁽⁴⁾ and Kuo-Chin Fan⁽¹⁾, ⁽¹⁾*National Central University, Taiwan*, ⁽²⁾*Chinese Academy of Science, China*, ⁽³⁾*G-AVE Technology Corp., Taiwan*, ⁽⁴⁾*Niigata University, Japan*
- 4: 10:00 **Accuracy Enhanced RPM Method Using Doppler Based Range Points Clustering for 140GHz Band UWB Radar** 628
#Shouhei Kidera⁽¹⁾, Yuta Sasaki⁽¹⁾, Shang Fang⁽¹⁾, Tetsuo Kirimoto⁽¹⁾, Kenshi Saho⁽²⁾ and Toru Sato⁽³⁾, ⁽¹⁾*The University of Electro-Communications, Japan*, ⁽²⁾*Ritsumeikan University, Japan*, ⁽³⁾*Kyoto University, Japan*
- 5: 10:20 **An Inverse Scattering Method for Lossy Objects Using Time-Reversed Fields** 630
#Toshifumi Moriyama⁽¹⁾, Toshiyuki Tanaka⁽¹⁾ and Takashi Takenaka⁽²⁾, ⁽¹⁾*Nagasaki University, Japan*, ⁽²⁾*South China Normal University, China*

October 27 (Thu)

3D2: Radar, Remote Sensing, and Applications II 11:00 - 12:40 (Room D)

Co-Chairs: Shouhei Kidera (The University of Electro-Communications, Japan)
Animesh Maitra (University of Calcutta, India)

- 1: 11:00 **Least Square Image Reconstruction Method for Sparse Array Radar System** 632
Iakov Chernyak and #Motoyuki Sato, *Tohoku University, Japan*
- 2: 11:20 **Radar Waveform Design for Extended Random Target Model with Random Pose Angle Parameters** 634
#Hyoung-soo Kim and Sung-il Yang, *Hanyang University, Korea*
- 3: 11:40 **A Maneuvering Target Detection in Time-Series Doppler Spectrums with Self-Organizing Model** 636
#Hiroyuki Yamaguchi, *Air Systems Research Center, Japan*
- 4: 12:00 **Short-Chirp Signal-based Ground Penetrating Radar System for Detecting Shallow-Depth Pipelines** 638
#Masaru Tsunasaki⁽¹⁾, Atsuo Senga⁽²⁾ and Ichiro Sugimoto⁽³⁾, ⁽¹⁾*Osaka Gas Co., Ltd., Japan*, ⁽²⁾*Nippon Signal Co., Ltd., Japan*, ⁽³⁾*Laboratory of Energy & Human Life Science Inc., Japan*
- 5: 12:20 **Doppler Compensation of MISO Range Response in Subband Division LFM Pulse MIMO Radar** 640
#Ryuhei Takahashi, Toru Takahashi and Hirohisa Tasaki, *Mitsubishi Electric Corporation, Japan*

3D3: Reflectarray 16:00 - 17:40 (Room D)

Co-Chairs: Shigeru Makino (Kanazawa Institute of Technology, Japan)
Fan Yang (Tsinghua University, China)

- 1: 16:00 **A Study of the Broadband Characteristic of Reflectarray Antennas Using Aberration Theory** 642
#Kento Takeshima⁽¹⁾, Shigeru Makino⁽¹⁾, Keisuke Noguchi⁽¹⁾, Tetsuo Hirota⁽¹⁾, Kenji Itoh⁽¹⁾, Takeshi Siode⁽²⁾ and Michio Takikawa⁽²⁾, ⁽¹⁾*Kanazawa Institute of Technology, Japan*, ⁽²⁾*Mitsubishi Electric Corporation, Japan*
- 2: 16:20 **Design of Dual-Band Reflectarray using Genetic Algorithm** 644
#Tamami Maruyama⁽¹⁾, Q Chen⁽²⁾, S Kameda⁽²⁾ and N Suematsu⁽²⁾, ⁽¹⁾*National Institute of Technology, Hakodate College, Japan*, ⁽²⁾*Tohoku University, Japan*
- 3: 16:40 **Electromagnetic Model of All-Metal Reflectarray Antennas with Non-Resonant Elements** 646
#Yao-Jiu Chen⁽¹⁾, Hsi-Tseng Chou⁽²⁾ and Hsien-Kwei Ho⁽¹⁾, ⁽¹⁾*Yuan Ze University, Taiwan*, ⁽²⁾*National Taiwan University, Taiwan*
- 4: 17:00 **High-Performance Curved Reflectarrays for Telecommunication Applications** 648
Min Zhou, #Erik Jørgensen and Stig B. Sørensen, *TICRA, Denmark*
- 5: 17:20 **Reflectarray with Arbitrarily Shaped Elements for Linear-to-Circular Polarization** 650
Shogo Matsumoto, #Hiroyuki Yamada, Hiroyuki Deguchi and Mikio Tsuji, *Doshisha University, Japan*

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3E1: Circularly Polarized Antennas 9:00 - 10:40 (Room E)

Co-Chairs: Kangwook Kim (Gwangju Institute of Science and Technology, Korea)
Akinori Matsui (Saitama Institute of Technology, Japan)

- 1: 9:00 **Pillbox Antenna Integrating Amplitude Monopulse Technique in SIW Technology** 652
#Karim Tekkouk^(1,2), Mauro Ettorre⁽¹⁾ and Ronan Sauleau⁽¹⁾, ⁽¹⁾University of Rennes 1, France, ⁽²⁾Tokyo Institute of Technology, Japan
- 2: 9:20 **A Compact Circularly Polarized SIW Slot Antenna** 654
#Hengfei Xu, Jianyi Zhou and Zhiqiang Yu, Southeast University, China
- 3: 9:40 **Millimeter-Wave High-Gain Wideband Circularly Polarized Antenna Array by Employing Aperture-Coupled Magneto-Electric Dipoles** 656
#Yujian Li⁽¹⁾, Jingxue Wang⁽¹⁾, Junhong Wang⁽¹⁾ and Kwai-Man Luk⁽²⁾, ⁽¹⁾Beijing Jiaotong University, China, ⁽²⁾City University of Hong Kong, China
- 4: 10:00 **Design of Tilted Beam Circularly Polarized Antenna for CP-SAR Sensor Onboard UAV** 658
#Yohandri⁽¹⁾, Asrizal⁽¹⁾ and Josaphat Tetuko Sri Sumantyo⁽²⁾, ⁽¹⁾FMIPA Universitas Negeri Padang, Indonesia, ⁽²⁾Chiba University, Japan
- 5: 10:20 **A Circularly Polarized Radial Line Dielectric Resonator Antenna Array** 660
#Lin Shi, Ming Su, Yuanan Liu, Jianguo Yu and Shulan Li, Beijing University of Posts and Telecommunications, China

3E2: Electromagnetic Analysis 11:00 - 12:40 (Room E)

Co-Chairs: Hiroyasu Sato (Tohoku University, Japan)
Titipong Lertwiryaprapa (King Mongkut's University of Technology North Bangkok, Thailand)

- 1: 11:00 **Fast and Memory-Efficient Method for Full-Wave Analysis of Electrically Large Reflector Antennas and Satellite Platforms** 662
#Erik Jørgensen, Oscar Borries, Peter Meincke and Niels Vesterdal, TICRA, Denmark
- 2: 11:20 **Radiation Modes Investigation of Huygens Source Type Antenna Using Spherical Wave Expansion** 664
#Abdul Sattar Kaddour⁽¹⁾, Serge Bories⁽¹⁾, Antonio Clemente⁽¹⁾, Anthony Bellion⁽²⁾ and Christophe Delaveauc⁽¹⁾, ⁽¹⁾University Grenoble Alpes, France, ⁽²⁾CNES, France
- 3: 11:40 **Radiation Analysis of an Equivalent Magnetic UHF-RFID Tag Located on a Coated Metallic Sphere using UTD method** 666
Kittisak Phaebua⁽¹⁾, Pitchanun Wongsiritorna⁽²⁾, #Titipong Lertwiryaprapa⁽¹⁾ and Chuwong Phongcharoenpanicha⁽²⁾, ⁽¹⁾King Mongkut's University of Technology North Bangkok, Thailand, ⁽²⁾King Mongkut's Institute of Technology Ladkrabang, Thailand
- 4: 12:00 **The FDTD Analysis of the Radiation Pattern of an Antenna Mounted on a Rocket** 668
#Yiwei He⁽¹⁾, Toshihiro Sezai⁽²⁾ and Koji Sunami⁽²⁾, ⁽¹⁾Osaka Electro-Communication University, Japan, ⁽²⁾JAXA, Japan
- 5: 12:20 **Advances in FETI Methods for the Simulation of Multi-Source Electromagnetic Problems** 670
#Andre Barka and Francois-Xavier Roux, The French Aerospace Lab, France

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3E3: Antennas for Wireless Applications

16:00 - 17:40 (Room E)

Co-Chairs: Tan-Huat Chio (National University of Singapore, Singapore)
Daisuke Uchida (Toshiba Corporation, Japan)

- 1: 16:00 **Two by Two MIMO Antenna Composed of Inverted L Elements Printed on Dielectric Substrate** 672
#Mitsuo Taguchi and Shoji Mori, *Nagasaki University, Japan*
- 2: 16:20 **An Ink-Reducing Printed Rectangular CPW Antenna Design via Selective Area Thickening** 674
#Pornanong Pongpaibool, Patharakorn Rattanawan, Matanee Kitjaroen, Werayuth Wallada and Siwaruk Siwamogsatham, *National Electronics and Computer Technology Center, Thailand*
- 3: 16:40 **Design of Antipodal Vivaldi Antennas Using Kernel Regression Optimization** 676
#Gangil Byun and Hosung Choo, *Hongik University, Korea*
- 4: 17:00 **Development of GPS Antenna Mounted on Shoes for Human's Position Observation** 678
#Tetsuya Nakamura and Yoshinobu Okano, *Tokyo City University, Japan*
- 5: 17:20 **Beam Divergence Reduction Using Dielectric Lens for Orbital Angular Momentum Wireless Communications** 680
#Hiroyuki Fukumoto, Hirofumi Sasaki, Doohwan Lee and Tadao Nakagawa, *NTT, Japan*

3F1: Array Antenna Technologies I

9:00 - 10:40 (Room F)

Co-Chairs: Seong-Ook Park (Korea Advanced Institute of Science and Technology, Korea)
Satoshi Yamaguchi (Mitsubishi Electric Corporation, Japan)

- 1: 9:00 **Design of a Double Layer Cavity backed Slot Array Antenna in Gap Waveguide Technology** 682
#Peiye Liu, Ashraf Uz Zaman and Pei-Simon Kildal, *Chalmers University of Technology, Sweden*
 - 2: 9:20 **Design of Broadband Planar Array Composed of 2x2 Slotted Cavities Fed by E-plane Waveguide Parallel-Feeding Circuit in Millimeter-wave Band** 684
#Katsuhiro Miyazaki, Kunio Sakakibara and Nobuyoshi Kikuma, *Nagoya Institute of Technology, Japan*
 - 3: 9:40 **A Low-profile, Decade Bandwidth, Tightly-Coupled Vivaldi Phased Array** 688
Jing Dai⁽¹⁾, #Hao Wang⁽¹⁾, Haiqing Wang⁽¹⁾, Xun Jiang⁽¹⁾, Dalong Xu⁽²⁾ and Yong Huang⁽²⁾, ⁽¹⁾*Nanjing University of Science and Technology, China*, ⁽²⁾*Suzhou Bohai Microsystem CO., LTD, China*
 - 4: 10:00 **A Photonic Phased Array Using Frequency Quadrupling without Optical Filtering** 690
#Yuta Hasegawa, Yusuke Nakatani, Yusuke Uemichi, Xu Han, Ryohei Hosono and Ning Guan, *Fujikura Ltd., Japan*
- 10:20 **Break Time**

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3F2: Array Antenna Technologies II

11:00 - 12:40 (Room F)

Co-Chairs: Shin-ichiro Matsuzawa (Toyota Central R & D Labs., Inc., Japan)
Eko Rahardjo (Universitas Indonesia, Indonesia)

- 1: 11:00 **Dual-Circularly Polarized Parabolic Reflector Antenna with Microstrip Antenna Array for 12-GHz Band Satellite Broadcasting Reception** 692
#Masafumi Nagasaka, Susumu Nakazawa and Shoji Tanaka, *NHK, Japan*
- 2: 11:20 **A Prototype Array-fed Shaped Reflector Antenna for 21-GHz Band Broadcasting Satellite** 694
#Susumu Nakazawa, Masafumi Nagasaka and Shoji Tanaka, *NHK, Japan*
- 3: 11:40 **A 3.37:1 Bandwidth and Low-profile Tightly Coupled Array Antenna** 696
#Hakjune Lee and Sangwook Nam, *Seoul National University, Korea*
- 4: 12:00 **Study on Primary Radiator using Leaky-Wave Antenna with Left-Handed Waveguides** 698
#Shigeyuki Nishimura, Hiroyuki Deguchi and Mikio Tsuji, *Doshisha University, Japan*
- 5: 12:20 **CRLH Leaky-Wave Antenna using Transmission Line Resonators** 700
#Yujiro Kushiyama, Takuji Arima and Toru Uno, *Tokyo University of Agriculture and Technology, Japan*

3F3: Millimeter Wave Antennas

16:00 - 17:40 (Room F)

Co-Chairs: Miao Zhang (Xiamen University, China)
Chi H. Chan (City University of Hong Kong, Hong Kong)

- 1: 16:00 **Millimeter-Wave Tapered Slot Array for Automotive Radar Applications** 702
Meijiao Li⁽¹⁾, Paul Schmalenberg⁽²⁾ and #Jae Seung Lee^{(2), (1)} *University of California Davis, United States, (2)Toyota Research Institute North America, United States*
- 2: 16:20 **Influence of Resin Cover on Antenna Gain for Automotive Millimeter Wave Radar** 704
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#Hang Song⁽¹⁾, Hayato Kono⁽¹⁾, Yuji Seo⁽¹⁾, Afreen Azhari⁽¹⁾, Xia Xiao⁽²⁾ and Takamaro Kikkawa⁽¹⁾, ⁽¹⁾Hiroshima University, Japan, ⁽²⁾Tianjin University, China
- 106: **Evaluation of Human Sitting-up Detection System using Electromagnetic Noise from Power-supply Line** 922
#Yuki Wakasa, Yuri Tanai, Koichi Shin and Masahiro Nishi, *Hiroshima City University, Japan*
- 107: **RSSI-Based Estimation Method of Living-Body Direction Using Parasitic Antennas** 924
#Katsumi Sasaki⁽¹⁾, Naoki Honma⁽¹⁾, Takeshi Nakayama⁽²⁾ and Shoichi Iizuka⁽²⁾,
⁽¹⁾Iwate University, Japan, ⁽²⁾Panasonic Corporation, Japan
- 108: **Basic Study of Optically Transparent Functional Wall Having Absorption and Permeation Effect** 926
#Keita Nakamura and Yoshinobu Okano, *Tokyo City University, Japan*
- 109: **Wearable Metamaterial Absorber using Screen Printed Chanel logo** 928
#Dongju Lee and Sungjoon Lim, *Chung-Ang University, Korea*

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POS2: Poster Session II

14:00 - 15:40 (Exhibition Hall)

- 110: **Experimental Estimation of E-Field Distribution in a Vehicle under Multipath Propagation Environment Using a Reverberation Chamber** 930
#Katsushige Harima⁽¹⁾, Tetsuya Nakamura⁽²⁾, Daich Akita⁽²⁾ and Shinobu Ishigami⁽³⁾,
⁽¹⁾National Institute of Information and Communications Technology, Japan,
⁽²⁾TOYO Corporation, Japan, ⁽³⁾Tohoku Gakuin University, Japan
- 111: **Design of Wideband Directional Couplers Using Three Types of Broadside Coupled-Lines** 932
#In Bok Kim⁽¹⁾, Sung Kyun Kim⁽²⁾, Wahab Mohyuddin⁽²⁾, Hyun Chul Choi⁽²⁾ and Kang Wook Kim⁽²⁾, ⁽¹⁾LIG Nex1 CO. Ltd, Japan, ⁽²⁾Kyungpook National University, Korea
- 112: **2-loop Antenna Measurement Method for the Emission Noise Test of Automotive Component** 934
#Yasuyuki Matsuda⁽¹⁾, Hiroyuki Arai⁽¹⁾, Takanori Uno⁽²⁾, Ichiro Akahori⁽²⁾ and Toshiyasu Tanaka⁽³⁾, ⁽¹⁾Yokohama National University, Japan, ⁽²⁾DENSO EMC ENGINEERING SERVICE CORPORATION, Japan, ⁽³⁾Microwave Factory Co., Ltd., Japan
- 113: **Reduction of Edge Diffraction Effect of MUT Holder Using EM Absorber in W-band Free-space Material Measurements** 936
#Jin-Seob Kang, Jeong-Hwan Kim and Jeong-II Park, Korea Research Institute of Standards and Science (KRISS), Korea
- 114: **The Design of Current Probe in the IEC Conducted Emission Measurement above 1 GHz** 938
#Yin-Cheng Chang^(1,2), Ta-Yeh Lin⁽²⁾, Ping-Yi Wang⁽¹⁾, Shawn S. H. Hsu⁽¹⁾, Mao-Hsu Yen⁽³⁾, Yen-Tang Chang⁽⁴⁾, Ming-Shan Lin⁽⁴⁾ and Da-Chiang Chang⁽²⁾, ⁽¹⁾National Tsing Hua University, Taiwan, ⁽²⁾National Applied Research Laboratories, Taiwan, ⁽³⁾National Taiwan Ocean University, Taiwan, ⁽⁴⁾Bureau of Standards, Metrology and Inspection, M.O.E.A, Taiwan
- 115: **Field Strength Estimation through a Vehicle Structure using Topological Model and PWB Method** 940
#Jae-Min Lee⁽¹⁾, JaeW Lee⁽¹⁾ and Jong-Hoon Han⁽²⁾, ⁽¹⁾Korea Aerospace University, Korea, ⁽²⁾National Security Research Institute, Korea
- 116: **Stretchable Frequency Selective Surfaces for Large-Area-Tuning and High-Power Applications** 942
#Yu-Chieh Hung and Chien-Hao Liu, National Taiwan University, Taiwan
- 117: **A Practical Microwave Absorber Design based on Salisbury Screens** 944
#Shih-Chung Tuan⁽¹⁾, Hsi-Tseng Chou⁽²⁾, Yi-Sheng Chang^(3,4), Hsieh-Ming Kun⁽⁴⁾, Pai-Lu Wang⁽⁴⁾ and Jun-Wen Zhang⁽⁴⁾, ⁽¹⁾Oriental Institute of Technology, Taiwan, ⁽²⁾National Taiwan University, Taiwan, ⁽³⁾Yuan Ze University, Taiwan, ⁽⁴⁾National Chung-Shan Institute of Science & Technology, Taiwan
- 118: **Study on the Effective Loading Method of the Magnetic Sheet for NFC / WPT Dual-Band Antenna** 946
#Takaho Sekiguchi⁽¹⁾, Hiromu Odanaka⁽¹⁾, Yoshinobu Okano⁽¹⁾ and Satoshi Ogino⁽²⁾,
⁽¹⁾Tokyo City University, Japan, ⁽²⁾Microwave Absorbers Inc., Japan
- 119: **Transmission Characteristics of RFID Antennas in a Closed Space** 948
#Luong Anh Tuan⁽¹⁾, Naobumi Michishita⁽¹⁾, Hisashi Morishita⁽¹⁾ and Takayuki Koshi⁽²⁾, ⁽¹⁾National Defense Academy, Japan, ⁽²⁾Komatsu Ltd., Japan

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POS2: Poster Session II

14:00 - 15:40 (Exhibition Hall)

- 120: **Design of the High-sensitivity RFID Sensor Tag with MOEA/D-DE** 950
#Xiaotian Song⁽¹⁾, Gang Wang^(1,2) and Yuxing He⁽¹⁾, ⁽¹⁾*University of Science and Technology of China, China*, ⁽²⁾*Chinese Academy of Sciences, China*
- 121: **Development of Nearby Tags Detection Unit with UHF-RFID Technology** 952
#Kyosuke Mayama and Yoshinobu Okano, *Tokyo City University, Japan*

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October 28 (Fri)

4A1: Recent Advances in Antennas and Propagation in ASEAN countries I 9:00 - 10:40 (Room A)

Co-Chairs: Jiro Hirokawa (Tokyo Institute of Technology, Japan)
Mohamad Kamal A. Rahim (Universiti Teknologi Malaysia, Malaysia)

- 1: 9:00 **Invited: Phased Array of Switched Beam Elements and Application** 954
Chainarong Kittiyapunya and #Monai Krairiksh, *King Mongkut's Institute of Technology Ladkrabang, Thailand*
- 2: 9:40 **Design of Beam Steering Antenna for Localization Applications** 956
#Thi Duyen Bui^(1,2), Van Duc Ngo⁽¹⁾, Ba Hieu Nguyen⁽¹⁾, Quoc Cuong NGUYEN⁽¹⁾
and Minh Thuy LE⁽¹⁾, ⁽¹⁾*Hanoi University of Science and Technology, Viet Nam*,
⁽²⁾*Electric Power University, Viet Nam*
- 3: 10:00 **A Tri-band Slot Antenna using Capacitive CPW and Meander Line Stub Technique** 958
Pongsathorn Chomtong, Suwaluck Meesonmkin and #Prayoot Akkaraekthalin, *King Mongkut's University of Technology North Bangkok, Thailand*
- 4: 10:20 **Dual Band Electromagnetic Band Gap Structure with Wideband Antenna** 960
Muhammad Abdul Hamid, Mohamad Kamal A Rahim and Umar Mussa, *Universiti Teknologi Malaysia, Malaysia*

4A2: Recent Advances in Antennas and Propagation in ASEAN countries II 11:00 - 12:40 (Room A)

Co-Chairs: Monai Krairiksh (King Mongkut's Institute of Technology Ladkrabang, Thailand)
Minh-Thuy Le (Hanoi University of Science and Technology, Viet Nam)

- 1: 11:00 **Design of Circularly Polarized Unidirectional Antenna using Probe-Excited Circular Ring Antenna above the Square Reflector with Inserted Metallic Slabs** 962
Chuwong Phongcharoenpanich⁽¹⁾, #Kittima Lertsakwimarn⁽²⁾, Rungsinee Sukkamat⁽¹⁾,
Nattaset Mhudtongon⁽¹⁾, Sompol Kosulvit⁽¹⁾ and Prayoot Akkaraekthalin⁽³⁾, ⁽¹⁾*King Mongkut's Institute of Technology Ladkrabang, Thailand*, ⁽²⁾*Rambhai Barni Rajabhat University, Thailand*, ⁽³⁾*King Mongkut's University of Technology North Bangkok, Thailand*
- 2: 11:20 **Circular Polarized Textile Antenna at 2.4 GHz** 964
Umar Mussa, #Mohamad kamal A Rahim and Muhammad Abdul Hamid, *Universiti Teknologi Malaysia, Malaysia*
- 3: 11:40 **Stretching Method Using Chebyshev Polynomial for Linear Sparse Array Antenna Design** 966
Efri Sandi, Fitri Yuli Zulkifli, Basari and #Eko Tjipto Rahardjo, *Universitas Indonesia, Indonesia*
- 4: 12:00 **A Dipole Antenna using Sierpinski Carpet Fractal Technique for RF Altimeter System.** 968
Jirada Thongbai⁽¹⁾, Apirada Namsang⁽¹⁾ and #Pongsathorn Chomtong⁽²⁾, ⁽¹⁾*Civil Aviation Training Center, Thailand*, ⁽²⁾*King Mongkut's University of North Bangkok, Thailand*
- 5: 12:20 **Development of Automatic G/T Measurement Program for THAICHOTE Ground Station** 970
#Likhit Waranon⁽¹⁾, Pawut Karnngandee⁽²⁾ and Rapirat Ritronnasak⁽¹⁾, ⁽¹⁾*Geo-Informatics and Space Technology Development Agency (GISTDA), Thailand*, ⁽²⁾*Sripatum University, Thailand*

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4A3: Small Antennas

14:00 - 15:40 (Room A)

Co-Chairs: Hisashi Morishita (National Defense Academy, Japan)
Qing-Xin Chu (South China University of Technology, China)

- 1: 14:00 **Invited: Analysis of Low Loss Magneto-Dielectric Antenna for the Mobile Communication** 972
#Seong-Ook Park, Tae-Wan Kim and Byeong-Yong Park, *KAIST, Korea*
- 2: 14:40 **Evaluation of Bandwidth for Tunable Antennas with Physical Limitations on Small Antennas** 974
#Seiya Kishimoto and Makoto Higaki, *Toshiba Corporation, Japan*
- 3: 15:00 **An Efficient Design Method of a Folded Inverted-L Antenna Including a Matching Circuit** 976
#Takashi Yamagajo, Yohei Koga and Manabu Kai, *Fujitsu Laboratories Limited, Japan*
- 4: 15:20 **A Compact Dual-Band Circularly Polarized Spiral Antenna** 978
#Mayumi Matsunaga, *Ehime University, Japan*

4B1: Wearable Device Networks

9:00 - 10:40 (Room B)

Co-Chairs: Masaharu Takahashi (Chiba University, Japan)
Jaehoon Choi (Hanyang University, Korea)

- 1: 9:00 **Curved Dual Band Film Antenna of Smart Watch for Cellular Communications** 980
#Yuki Tasaka and Hisao Iwasaki, *Shibaura Institute of Technology, Japan*
- 2: 9:20 **Design of an All-textile Antenna Integrated in Military Beret for GPS/RFID Applications** 982
#Heejae Lee, Jinpil Tak, Youngtaek Hong and Jaehoon Choi, *Hanyang University, Korea*
- 3: 9:40 **Dual Band Magnetic Textile Antenna for Body Area Network Application** 984
#Basari, Abdurrahman Wahid, Fitri Yuli Zulkifli and Eko Tjipto Rahardjo, *Universitas Indonesia, Indonesia*
- 4: 10:00 **Textile Antenna for Biological Information Monitoring** 986
#Yuta Nakatani and Masaharu Takahashi, *Chiba University, Japan*
- 5: 10:20 **Dynamic Characteristics of Intrabody Communication Channels** 988
#Nozomi Haga, Yusaku Kasahara and Kuniyuki Motojima, *Gunma University, Japan*

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4B2: Human Body Interactions and Sensors 11:00 - 12:40 (Room B)

Co-Chairs: Takashi Hikage (Hokkaido University, Japan)

Basari (Universitas Indonesia, Indonesia)

- 1: 11:00 **Experimental Study of Transmission Factor Through Conducting Human Body Equivalent Liquid** 990
#Hiroyasu Sato, Yang Li and Qiang Chen, Tohoku University, Japan
- 2: 11:20 **FDTD Analysis of Capsule Dipole Antenna In Digestive System of Human Body** 992
#Yang Li, Hiroyasu Sato and Qiang Chen, Tohoku University, Japan
- 3: 11:40 **Compact 24-GHz Doppler Radar Module for Non-Contact Human Vital-Sign Detection** 994
Tzu-Wei Hsu and #Chao-Hsiung Tseng, National Taiwan University of Science and Technology, Taiwan
- 4: 12:00 **RF Stretchable Sensor Using Flexible Substrate and Eutectic Gallium-Indium** 996
#Seung-Hyun Eom and Sungjoon Lim, Chung-Ang University, Korea
- 12:20 **Break Time**

4B3: RFID Antennas and Systems 14:00 - 15:40 (Room B)

Co-Chairs: Hisao Iwasaki (Shibaura Institute of Technology, Japan)

Ikmo Park (Ajou University, Korea)

- 1: 14:00 **Closely Located RFID Tag Antennas on High Dielectric Objects** 998
Kuan-hua Chen, #Qiang Chen and Kunio Sawaya, Tohoku University, Japan
- 2: 14:20 **Dual-Loop NFC Chip Antenna Based on Z-Shaped Coil** 1000
#Anping Zhao, Fuqiang Ai and Yu Xu, Shenzhen Sunway Communication, China
- 3: 14:40 **RFID Based Solution for the Sensing of Home Electrical Devices Activity** 1002
#Ali Louzir, Rupesh Kumar and Jean-Yves Le Naour, Technicolor, France
- 4: 15:00 **Dual-band Chipless RFID Sensor for A Material Quality Monitoring Application** 1004
#Rattapong Suwalak⁽¹⁾, Kittima Lertsakwimarn⁽²⁾, Chuwong Phongcharoenpanich⁽¹⁾ and Danai Torrungrueng⁽³⁾, ⁽¹⁾King Mongkut's Institute of Technology Ladkrabang, Thailand, ⁽²⁾Rambhai Barni Rajabhat University, Thailand, ⁽³⁾Asian University, Thailand
- 5: 15:20 **On the Decoding of Equiprobable UWB Chipless RFID Tags Using a Minimum Distance Detector** 1006
#Marvin Barahona, Diego Betancourt and Frank Ellinger, Technische Universität Dresden, Germany

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4C1: Sparsity-aware Array Antenna Technologies 9:00 - 10:40 (Room C)

Co-Chairs: Wen-Qin Wang (University of Electronic Science and Technology of China, China)
Koichi Ichige (Yokohama National University, Japan)

- 1: 9:00 **Suppression of Scattering Waves from the Outside of a Search Area Using a Gating Technique in Compressed Sensing Based Scatterer Detection** 1008
#Daisuke Abe, Yasutaka Ogawa, Toshihiko Nishimura and Takeo Ohgane, *Hokkaido University, Japan*
- 2: 9:20 **Study on Digital Beamforming for Spaceborne SAR Based on Sparse DOA Estimation** 1010
#Taoli Yang⁽¹⁾ and Yong Wang^(1,2), ⁽¹⁾*University of Electronic Science and Technology of China, China*, ⁽²⁾*East Carolina University, United States*
- 3: 9:40 **Underdetermined DOA Estimation for Uniform Circular Array Based on Sparse Signal Reconstruction** 1012
#Thomas Basikolo, Koichi Ichige and Hiroyuki Arai, *Yokohama National University, Japan*
- 4: 10:00 **2-D DOA Estimation of Multiple Signals Based on Sparse L-shaped Array** 1014
#Zhi Zheng, Yuxuan Yang, Wen-qin Wang, Jiao Yang and Yan Ge, *University of Electronic Science and Technology of China, China*
- 5: 10:20 **On Direction-of-Arrival Estimation with Khatri-Rao Transform Virtual-Array by Using Sparse Signal Reconstruction** 1016
#Suguru Ohashi, Hiroyoshi Yamada and Yoshio Yamaguchi, *Niigata University, Japan*

4C2: DOA Estimation I 11:00 - 12:40 (Room C)

Co-Chairs: Hiroyoshi Yamada (Niigata University, Japan)
Taoli Yang (University of Electronic Science and Technology of China, China)

- 1: 11:00 **Direction-of-Arrival Estimation with Lüneburg Lens and Metamaterial Absorber** 1018
#Aya Ohmae^(1,2), Wen Li⁽¹⁾, Isao Hoda⁽¹⁾, Takashi Suga⁽¹⁾ and Satoshi Yagitani⁽²⁾, ⁽¹⁾*Hitachi Ltd., Japan*, ⁽²⁾*Kanazawa University, Japan*
- 2: 11:20 **Simultaneous Estimation of Azimuth DOA and Angular Spread of Incident Radio Waves by DOA-Matrix Method Using Planar Array** 1020
#Makoto Jomoto, Nobuyoshi Kikuma and Kunio Sakakibara, *Nagoya Institute of Technology, Japan*
- 3: 11:40 **Extension of a Received Signal Estimation Method at a Remote Location to a 3-Dimensional Space** 1022
#Shunsuke Abe, Hisato Iwai and Hideichi Sasaoka, *Doshisha University, Japan*
- 4: 12:00 **Influence of Mutual Coupling between Array Elements in Location Estimation of Radio Sources Using Near-Field DOA-Matrix Method** 1024
#Kensuke Tanaka, Nobuyoshi Kikuma and Kunio Sakakibara, *Nagoya Institute of Technology, Japan*
- 5: 12:20 **Lagrange Multiplier Setting for Lp-CS Based DOA Estimation** 1026
#Takeshi Amishima and Nobuhiro Suzuki, *Mitsubishi Electric Corporation, Japan*

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4C3: DOA Estimation II

14:00 - 15:40 (Room C)

Co-Chairs: Mitoshi Fujimoto (University of Fukui, Japan)

Minseok Kim (Niigata University, Japan)

- 1: 14:00 **DOA Estimation of Desired Signals Using In-Phase Combining of Multiple Cyclic Correlations and Spatial Smoothing Processing**
#Yuta Kamiya, Nobuyoshi Kikuma and Kunio Sakakibara, *Nagoya Institute of Technology, Japan*
- 2: 14:20 **DOA Measurements Using Synthetic Aperture Method in Outdoor Environments**
#Kazuma Tomimoto, Masayuki Miyashita, Hideki Omote and Ryo Yamaguchi, *Softbank Corp., Japan*
- 3: 14:40 **Effect of Redundancy of Element Placement on DOA Estimation with Circular Array**
#Rikako Yamano, Nobuyoshi Kikuma and Kunio Sakakibara, *Nagoya Institute of Technology, Japan*
- 4: 15:00 **Estimation of Received Signals at Arbitrary Remote Locations based on Estimation of Arriving Waves by Compressed Sensing**
#Tomoya Sugimoto, Hisato Iwai and Hideichi Sasaoka, *Doshisha University, Japan*
- 5: 15:20 **Target Direction Estimation by MIMO Radar Using Root-MUSIC with Minimum Redundancy Array**
#Masatada Hokiguchi, Nobuyoshi Kikuma and Kunio Sakakibara, *Nagoya Institute of Technology, Japan*

4D1: Millimeter-Wave Antennas and Modules

9:00 - 10:40 (Room D)

Co-Chairs: Noriharu Suematsu (Tohoku University, Japan)

Vladimir Veremey (Qualcomm Inc., United States)

- 1: 9:00 **BGA Organic Module for 60 GHz LOS communications**
Aimeric Bisognin^(1,2), #Diane Titz⁽¹⁾, Frederic Ganesello⁽²⁾, Pierinno Calascibetta⁽²⁾, Jean-Michel Riviere⁽²⁾, Didier Campos⁽²⁾, Daniel Gloria⁽²⁾, Frederic Devillers⁽³⁾ and Cyril Luxey⁽¹⁾, ⁽¹⁾*Université Nice Sophia Antipolis, France*, ⁽²⁾*ST Microelectronics, France*, ⁽³⁾*Orange Labs-CREMANT, France*
- 2: 9:20 **Operational Frequencies of In-Body/Out-Body Dual Use Antenna for Tablet/Pill Implementation**
#Takuto Saito, Mizuki Motoyoshi, Suguru Kameda and Noriharu Suematsu, *Tohoku University, Japan*
- 3: 9:40 **5G Antenna in Inverted Microstrip Gap Waveguide Technology Including a Transition to Microstrip**
Eva Rajo-Iglesias⁽¹⁾ and #Astrid Algaba Brazález⁽²⁾, ⁽¹⁾*University Carlos III, Spain*, ⁽²⁾*Ericsson Research, Sweden*
- 4: 10:00 **UHF-Band Meander Line Antenna and 60-GHz-Band Patch Antenna with Single Feed Structure for 5G Terminal Application**
#Satoshi Yoshida, Keishi Maruyama, Daisuke Matsushita and Kenjiro Nishikawa, *Kagoshima University, Japan*
- 5: 10:20 **Side Coaxial Connector Feed Design for a Millimeter-Wave Patch Antenna Measurement**
#Mizuki Motoyoshi, Wenying Ye, Suguru Kameda and Noriharu Suematsu, *Tohoku University, Japan*

October 28 (Fri)

4D2: Base Station Antennas for Mobile Communications 11:00 - 12:40 (Room D)

Co-Chairs: Ryo Yamaguchi (Softbank Corporation, Japan)

Hao Wang (NanJing University of Science and Technology, China)

- 1: 11:00 **Design of a Dual-Band MIMO Antenna with Orthogonal Bi-directional Radiation Patterns**
#Ho-Yu Lin and Masayuki Nakano, *KDDI R&D Labs Inc., Japan*
- 2: 11:20 **Broadband Dual-Polarized Antenna Array For Base Station Applications**
Wei-Ji Chen⁽¹⁾, #Joseph Poujiong Wang⁽¹⁾, Li-Ruei Kuo⁽²⁾ and Tai-Hung Lin⁽²⁾,
⁽¹⁾*Industrial Technology Research Institute, Taiwan*, ⁽²⁾*Wha Yu Industrial Co. Ltd, Taiwan*
- 3: 11:40 **Design of A Dual-Band Verre de Champagne Fractal CPW Antenna for LTE and Aircraft Altimeter Application**
#Tanupat Phasithjirakul⁽¹⁾, Teerapat Wannasirimongkol⁽¹⁾, Apirada Namsang⁽¹⁾,
Reungyot Lerdwanittip⁽¹⁾ and Pongsathorn Chomthong⁽²⁾, ⁽¹⁾*Civil Aviation Training Center, Thailand*, ⁽²⁾*King Mongkut's University of Technology North Bangkok, Thailand*
- 4: 12:00 **Radiation Analysis of Antenna Located on Mobile Phone Cylindrical Tower by Using UTD Method**
#Kittisak Phaebua⁽¹⁾, Titipong Lertwiriayaprapa⁽¹⁾, Rattapong Suwalak⁽²⁾ and Chuwong Phongcharoenpanicha⁽²⁾, ⁽¹⁾*King Mongkut's University of Technology North Bangkok, Thailand*, ⁽²⁾*King Mongkut Institute of Technology Ladkrabang, Thailand*

4D3: Adaptive and Phased Array 14:00 - 15:40 (Room D)

Co-Chairs: Eisuke Nishiyama (Saga University, Japan)

Hervé Legay (Thales Alenia Space, France)

- 1: 14:00 **Incoming Waves Separating Adaptive Array for ISDB-T Mobile Reception**
#Takanobu Tabata^(1,2), Mitoshi Fujimoto⁽²⁾, Satoshi Hori⁽¹⁾, Tomohisa Wada^(3,4) and Hirokazu Asato⁽⁴⁾, ⁽¹⁾*Kojima Industries Corporation, Japan*, ⁽²⁾*University of Fukui, Japan*, ⁽³⁾*University of the Ryukyus, Japan*, ⁽⁴⁾*Magna Design Net, Inc., Japan*
- 2: 14:20 **Compact Phased Array Design with Beamforming Network for 5G MIMO System at 60-GHz**
#Anil Kumar Pandey, *Keysight Technologies, India*
- 3: 14:40 **Feasibility Study on Delay Difference Estimation through Space for Phased Array Antennas**
#Takashi Maruyama⁽¹⁾, Hiroyuki Matsumura⁽²⁾, Satoshi Yamaguchi⁽¹⁾, Masataka Otsuka⁽¹⁾ and Hiroaki Miyashita⁽¹⁾, ⁽¹⁾*Mitsubishi Electric Corporation, Japan*, ⁽²⁾*Mitsubishi Electric Engineering Company Limited, Japan*
- 4: 15:00 **The Planar Array Antenna with Two-Dimensional Radiation Pattern Reconfigurable Elements**
#Takashi Uesaka, Takashi Maruyama, Satoshi Yamaguchi, Naoyuki Yamamoto, Masataka Otsuka and Hiroaki Miyashita, *Mitsubishi Electric Corporation, Japan*
- 5: 15:20 **Beam Switched Antenna Using Inverted F Antenna for Mobile Terminal**
#Shun Yonezawa⁽¹⁾, Rohani Bakar⁽¹⁾, Hiroyuki Arai⁽¹⁾, Amane Miura⁽²⁾ and Hiroyuki Tsuji⁽²⁾, ⁽¹⁾*Yokohama National University, Japan*, ⁽²⁾*NICT, Japan*

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4E1: Antennas for MIMO Applications 9:00 - 10:40 (Room E)

Co-Chairs: RongLin Li (South China University of Technology, China)

Takashi Yanagi (Mitsubishi Electric Corporation, Japan)

- 1: 9:00 **Planar Triple-band MIMO Dipole Antenna for LTE / WLAN Access Points**
Jui-Han Lu, #Yong-Yong Zhang and Ming-Tsung Hung, *National Kaohsiung Marine University, Taiwan*
- 2: 9:20 **MIMO Dipole Antenna with Triple-band Operation for LTE Femtocell Access Points**
Jui-Han Lu, #Chia-Hao Cheng and Ming-Tsung Hung, *National Kaohsiung Marine University, Taiwan*
- 3: 9:40 **A Wideband 4-Port MIMO Antenna Using Leaf-Shaped Notch Antennas**
#Jumpei Motohashi and Manabu Yamamoto, *Hokkaido University, Japan*
- 4: 10:00 **A Dual-Band Star Chain Fractal CPW Antenna for LTE and RF Altimeter Systems**
#Raviroj Somvadee⁽¹⁾, Apirad Namsang⁽¹⁾, Reungyot Lerdwanittip⁽¹⁾ and Pongsatorn Chomtong⁽²⁾, ⁽¹⁾*Civil Aviation Training Center, Thailand*, ⁽²⁾*King Mongkut's University of Technology North Bangkok, Thailand*
- 5: 10:20 **Omnidirectional Dual Polarized Low-profile Antenna for 4G MIMO Indoor Applications**
#Xia Bai, Ming Su, Yuanan Liu and Shulan Li, *Beijing University of Posts and Telecommunications, China*

4E2: Broadband Antennas 11:00 - 12:40 (Room E)

Co-Chairs: Danai Torrungrueng (Asian University, Thailand)

Nobuyasu Takemura (Nippon Institute of Technology, Japan)

- 1: 11:00 **Compact LTE/WWAN Antenna with Reduced Ground Effects for Tablet/Laptop Applications**
#Chow-Yen-Desmond Sim, Zhe-Yu Li and Chih-Yang Chiang, *Feng Chia University, Taiwan*
- 2: 11:20 **Study of Dual Band RFID Near field Antenna for 0.92 GHz/2.45GHz**
#Zijian Xing, Kun Wei, Ling Wang and Jianying Li, *Northwestern Polytechnical University, China*
- 3: 11:40 **Potential Causes of PIM Problems in the LTE Outdoor Base Station Multi-Band Antennas**
Sheng-Ju Chou^(1,3), #Hsi-Tseng Chou⁽²⁾ and Li-Ruei Kuo⁽³⁾, ⁽¹⁾*Yuan Ze University, Taiwan*, ⁽²⁾*National Taiwan University, Taiwan*, ⁽³⁾*Whayu Industrial Corp. Inc., Taiwan*
- 4: 12:00 **A Novel Broadband Rectenna for Energy Harvesting**
#Shenyi Song, Ming Su, Yuanan Liu, Shulan Li and Bihua Tang, *Beijing University of Posts and Telecommunications, China*
- 5: 12:20 **Design and Analysis of Through Dielectric Copper Posts Based 3D Antenna**
#Madhav Rao and Sowmya N, *International Institute of Information Technology Bangalore, India*

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4E3: UWB Antennas

14:00 - 15:40 (Room E)

Co-Chairs: Yasuhiro Nishioka (Mitsubishi Electric Corporation, Japan)

Pornanong Pongpaibool (National Electronics and Computer Technology Center, Thailand)

- 1: 14:00 **A Printed UWB Antenna using Embedded Slits for 3.5/5.5 GHz Band Notching**
#Pichet Moeikham⁽¹⁾, Nonchanutt Chudpooti⁽²⁾ and Prayoot Akkaraekthalin⁽²⁾,
⁽¹⁾Rajamangala University of Technology Lanna Chiang-Rai, Thailand, ⁽²⁾King Mongkuts University of Technology North Bangkok, Thailand
- 2: 14:20 **A Study on Broadband Slot Antenna Employing a Short Strip.**
#Kenji Matsushita⁽¹⁾, Shingo Tanaka⁽¹⁾, Tatsuo Toba⁽¹⁾, Yuta Nakagawa⁽¹⁾, Kenji Shirasu⁽¹⁾, Naoto Nishiyama⁽²⁾ and Hisashi Morishita⁽²⁾, ⁽¹⁾Yazaki Corporation, Japan,
⁽²⁾National Defence Academy, Japan
- 3: 14:40 **Ultra Wideband Antenna with Quad Band Rejection Characteristics**
#Asim Quddus⁽¹⁾, Rashid Saleem⁽¹⁾, Sabih ur Rehman⁽²⁾ and M. Farhan Shafique⁽³⁾,
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- 4: 15:00 **Cross Bow-Tie Antenna for Multistatic Ground Penetrating Radar**
#Motoyuki Sato and Yasushi Iizuka, *Tohoku University, Japan*
- 5: 15:20 **Ultra Wideband Stacked Z-shaped Dielectric Resonator Antenna**
#Kedar Trivedi and Dhaval Pujara, *Nirma University, India*