



[WeA1] Small Antennas and RF Sensors

Date / Time	Oct. 24 (Wed.), 2018 / 13:00-14:40
Place	Room A (Grand Ballroom 1)
Session Chairs	You-Chung Chung (Daegu University, Korea) Rangsan Wongsan (Suranaree University of Technology, Thailand)

WeA1-1

13:00-13:20

TM₀₂ Quarter Mode Substrate-Integrated Waveguide Resonator for Dual Sensing of Chemicals

Ahmed Salim and Sungjoon Lim
Chung-Ang University, Korea

WeA1-2

13:20-13:40

Two-Element Compact Antenna Arrays with Four-Branch Diversity Using Directional Couplers and Phase Shifters

Kengo Nishimoto, Yasuhiro Nishioka, and Naofumi Yoneda
Mitsubishi Electric Corporation, Japan

WeA1-3

13:40-14:00

Dual-Beam Steering Antenna Using Switchable Small Patches on PCB Based Square Patch

Uaychai Yatongchai, Piyaphorn Meesawad, and Rangsan Wongsan
Suranaree University of Technology, Thailand

WeA1-4

14:00-14:20

Dual-Band Patch Antenna for Communication and Moisture Measurement of Coffee Bean

Hwan-Sul Chang and You-Chung Chung
Daegu University, Korea

WeA1-5

14:20-14:40

Design of Electrically Small and Thin Huygens Source Antenna

Su-Hyeon Lee, Sonapreetha Mohan Radha, Geonyeong Shin, and Ick-Jae Yoon
Chungnam National University, Korea



[WeB1] Channel Sounding and Estimation

Date / Time	Oct. 24 (Wed.), 2018 / 13:00-14:40
Place	Room B (Grand Ballroom 2)
Session Chairs	Hisato Iwai (Doshisha University, Japan) Jae-Young Chung (Seoul National University of Science and Technology, Korea)

WeB1-1

13:00-13:20

Investigation of Channel Properties for 28 GHz Band in Urban Street Microcell Environments

Minoru Inomata, Tetsuro Imai, Koshiro Kitao, and Yukihiko Okumura
NTT DOCOMO, INC., Japan

WeB1-2

13:20-13:40

Characterization of Human Body Shadowing Loss at 2.5 GHz and 5.8 GHz in an Indoor Environment

Santiago Pérez-Peña^{1,2}, Yuki Ito¹, Kai Yoshida¹, Hisato Iwai¹, and Hideichi Sasaoka¹
¹*Doshisha University, Japan*, ²*Universidad Politécnica de Madrid, Spain*

WeB1-3

13:40-14:00

Analysis of Diffraction Characteristics at 28GHz Band in a Vehicular Communication Environment

Shohei Kawasaki¹, Yuki Ito¹, Hisato Iwai¹, Satoshi Nakano², Yasuhiro Suegara³, Masaya Sibayama³,
and Masahito Umehara³
¹*Doshisha University, Japan*, ²*KDDI Corporation, Japan*, ³*KDDI Research, Inc., Japan*

WeB1-4

14:00-14:20

System Impairment Compensation of mmWave Channel Sounder with Multiple Antennas

Kyung-Won Kim, Myung-Don Kim, Heon-Kook Kwon, and Jae-Joon Park
ETRI, Korea

WeB1-5

14:20-14:40

Novel Channel Estimation Using Time and Frequency Correlation Properties for IEEE 802.11p

Joo-Young Choi¹, Cheol Mun², and Jong-Gwan Yook¹
¹*Yonsei University, Korea*, ²*Korea National University of Transportation, Korea*



[WeC1] Computational Electromagnetics

Date / Time	Oct. 24 (Wed.), 2018 / 13:00-15:00
Place	Room C (Grand Ballroom 3)
Session Chairs	Ic-Pyo Hong (Kongju National University, Korea) Shinichiro Ohnuki (Nihon University, Japan)

WeC1-1

13:00-13:20

A Fast Computation of Far Interactions in MLCBFM for Electromagnetic Analysis of Large Structures

Chan-Sun Park¹, Ic-Pyo Hong², Inkyun Jung³, and Jong-Gwan Yook¹

¹Yonsei University, Korea, ²Kongju National University, Korea, ³Korea Aerospace Industries, Korea

WeC1-2

13:20-13:40

A Study on Eigenmode Analysis of Pillar-Type Photonic Crystal Waveguide

Koki Watanabe and Kamin Kangkarn

Fukuoka Institute of Technology, Japan

WeC1-3

13:40-14:00

A General-Purpose Preconditioner for Method of Moments Matrices and a Novel Approach to Resolving the Low Frequency Breakdown Problem

Rajarshi Bhattacharya^{1,2}, Nathawut Homsup¹, and Raj Mittra¹

¹University of Central Florida, USA, ²National Institute of Technology Patna, India

WeC1-4

[Invited]

14:00-14:20

Auxiliary Divergence-Free Electromagnetic Fields

Raphael Kastner^{1,2}

¹Tel Aviv University, Israel, ²University of Pennsylvania, USA

WeC1-5

14:20-14:40

Numerical Accuracy of Finite-Difference Methods

Ryohei Ohnishi¹, Di Wu¹, Takashi Yamaguchi², and Shinichiro Ohnuki¹

¹Nihon University, Japan, ²Tokyo Metropolitan Industrial Technology Research Institute, Japan

WeC1-6

14:40-15:00

An Efficient Unconditionally Stable RPIM Meshless Algorithm Solution of Helmholtz Wave Equation in Time Domain

R. Khalef, M. T. Benhabiles, F. Grine, Z. Cheraiet, L. Benkhaoua, H. Ammari, and M. L. Riabi

Université Frères Mentouri, Algeria



[WeD1] mmWave and THz Arrays, Reflectors, and Lens

Date / Time	Oct. 24 (Wed.), 2018 / 13:00-14:20
Place	Room D (Napoli Room)
Session Chair	Jong-Eon Park (Hongik University, Korea)

WeD1-1

13:00-13:20

Quad-Beam Bidirectional Single Metal Layer Array Antenna Optimized with Genetic Algorithm

Yu Dang, Shixiong Yin, Feiyang Deng, Jiaran Qi, and Hongmei Li
Harbin Institute of Technology, China

WeD1-2

13:20-13:40

An Element-Staggered, Wide-Angle Beam Scanning Transmitarray Antenna with Four Focuses Design

Nan-Nan Wang, Bing-Xu Zhao, Mu Fang, and Jing-Hui Qiu
Harbin Institute of Technology, China

WeD1-3

13:40-14:00

V-Band Planar Helical Antenna Using TGSV Technology

Aqeel Hussain Naqvi, Jeong Heum Park, Chang-Wook Baek, and Sungjoon Lim
Chung-Ang University, Korea

WeD1-4

14:00-14:20

Compact Omnidirectional 28 GHz 2X2 MIMO Antenna Array for 5G Communications

Md Nazmul Hasan and Munkyo Seo
Sungkyunkwan University, Korea



[WeE1] Wearable Device Networks and Medical Applications

Date / Time	Oct. 24 (Wed.), 2018 / 13:00-15:00
Place	Room E (Venice Room)
Session Chairs	Qiang Chen (Tohoku University, Japan) Ick-Jae Yoon (Chungnam National University, Korea)

WeE1-1

13:00-13:20

Design of Inner-Layer Capsule Dipole Antenna For Ingestible Endoscope

Hiroyasu Sato¹, Yang Li², Junyi Xu¹, and Qiang Chen¹

¹Tohoku University, Japan, ²Tianjin Normal University, China

WeE1-2

13:20-13:40

Analytic Study on the Small Antennas Coupling for Wireless Biotelemetry

Geonyeong Shin and Ick-Jae Yoon

Chungnam National University, Korea

WeE1-3

13:40-14:00

Real-Time 2D Microwave Differential Imaging for Temperature Monitoring

Kwang-Jae Lee¹, Jang-Yeol Kim¹, Bo-Ra Kim¹, Soon-Ik Jeon¹, Nam Kim², and Seong-Ho Son¹

¹ETRI, Korea, ²Chungbuk National University, Korea

WeE1-4

14:00-14:20

Analysis of High Frequency Curved Plate Applicator for Deep Hyperthermia in Breast Cancer Treatment by Using Dielectric Heating

Supawat Kotchapradit, Thanaset Thosdeekoraphat, Samran Santalunai, and Chanchai Thongsopa

Suranaree University of Technology, Thailand

WeE1-5

14:20-14:40

Numerical Simulation and Experimental Validation on Focused Microwave Thermotherapy

Jang-Yeol Kim, Kwang-Jae Lee, Soon-Ik Jeon, Bo-Ra Kim, and Seong-Ho Son

ETRI, Korea

WeE1-6

14:40-15:00

Investigation on Dielectric and Thermal Properties of Phantom for Focused Microwave Thermotherapy

Bo-Ra Kim, Kwang-Jae Lee, Jang-Yeol Kim, Soon-Ik Jeon, and Seong-Ho Son

ETRI, Korea



[WeF1] [Special Session] Recent Advances in Electromagnetic Sensors for Wireless Sensing Applications

Date / Time	Oct. 24 (Wed.), 2018 / 13:00-15:00
Place	Room F (Miami Room)
Session Chairs	Danai Torrungrueng (King Mongkut's University of Technology North Bangkok, Thailand) Takeshi Fukusako (Kumamoto University, Jaan)

WeF1-1

[Invited Speaker]

13:00-13:40

Recent Advances in RFID Sensors for Construction Material Monitoring Applications

Rattapong Suwalak¹, Kittima Lertsakwimarn², Chuwong Phongcharoenpanich¹, Prayoot Akkaraekthalin², and Danai Torrungrueng²

¹King Mongkut's Institute of Technology Ladkrabang, Thailand,

²King Mongkut's University of Technology North Bangkok, Thailand

WeF1-2

13:40-14:00

Paddy Moisture Measurement System in Hopper Silo by Using Near-Field Transmission Technique

Somporn Seewattananon¹, Nopphamat Promasa¹, Nonchanutt Chudpooti², and Prayoot Akkaraekthalin²

¹Rajamangala University of Technology Suvarnabhumi, Thailand,

²King Mongkut's University of Technology North Bangkok, Thailand

WeF1-3

14:00-14:20

Beam Steering Technology of Near-Field Focused Phased Array of Antennas for RFID Applications

Chen-Yi Chang¹, Hsi-Tseng Chou¹, Zong-Chen Tsai¹, Ming-Yu Lee², and Chien-Te Yu²

¹National Taiwan University, Taiwan, ²Yuan-Ze University, Taiwan

WeF1-4

14:20-14:40

Low-Profile and 4-Beam Antenna for Sensor Network Applications

Takeshi Fukusako, Nobuhiro Imaizumi, and Ryuji Kuse

Kumamoto University, Japan

WeF1-5

14:40-15:00

Mitigation of Interference from Strong Scatters in Remote Sensing Scenarios

Yuan-Chang Hou and Wen-Jiao Liao

National Taiwan University of Science and Technology, Taiwan



[WeG1] [Special Session] Innovative MIMO Related Technologies for Future Wireless Communication Systems

Date / Time	Oct. 24 (Wed.), 2018 / 13:00-15:00
Place	Room G (Sicily Room)
Session Chairs	Kentaro Nishimori (Niigata University, Japan) Qiang Chen (Tohoku University, Jaan)

WeG1-1

[Invited Speaker]

13:00-13:40

Novel Technologies Using Massive MIMO Transmission toward 5G and its Beyond Systems

Kentaro Nishimori
Niigata University, Japan

WeG1-2

13:40-14:00

Evaluation of Polarization Composite Type Omnidirectional Antenna in Actual Environment

Kota Shishido¹, Ichiro Oshima¹, Takayoshi Sasaki¹, Keisuke Sato¹, and Kentaro Nishimori²
¹*Denki Kogyo Co. Ltd., Japan*, ²*Niigata University, Japan*

WeG1-3

14:00-14:20

Gain Enhancement of 60-GHz SIW Cavity-Backed Slot Array Antenna with Metallic Grooves

Youngtaek Hong and Jaehoon Choi
Hanyang University, Korea

WeG1-4

14:20-14:40

Enabling Full-Duplex MIMO Communication Exploiting Array Antenna Arrangement

Naoki Honma¹, Shotaro Heianna¹, Astuto Kawagoe¹, Shizuka Tada¹, Yoshiyuki Yamamoto², Qiaowei Yuan³,
and Qiang Chen²
¹*Iwate University, Japan*, ²*Tohoku University, Japan*, ³*National Institute of Technology, Sendai College, Japan*

WeG1-5

14:40-15:00

Real-Time 5G Radio Wave Visualizer

Tetsuro Imai, Minoru Inomata, Koshiro Kitao, and Yukihiro Okumura
NTT DOCOMO, INC., Japan



[WeA2] Broadband and Multi-band Antennas I

Date / Time	Oct. 24 (Wed.), 2018 / 16:30-18:30
Place	Room A (Grand Ballroom 1)
Session Chairs	Johnson J. H. Wang (Wang Electro-Opto Corporation, USA) Young Joong Yoon (Yonsei University, Korea)

WeA2-1

16:30-16:50

Broadband-Multiband Antennas Enabling Capacity & Security for Mobile Wireless 5G and Beyond

Johnson J. H. Wang

Wang Electro-Opto Corporation, USA

WeA2-2

16:50-17:10

Study of Folded Bow-Tie Antenna with a Reflector

Jun Abiru¹, Naobumi Michishita¹, Hisashi Morishita¹, Kenji Kawabata², and Yasuhiro Murakami²

¹National Defense Academy, Japan, ²Fujitsu Limited, Japan

WeA2-3

17:10-17:30

Design of Broadband Repeater Antenna with Firefighting Band for In-Building Mobile Communication

Kyeong-Sik Min¹, Kwang-Gun Lee¹, and Youngwook Kim²

¹Korea Maritime and Ocean University, Korea, ²California State University, USA

WeA2-4

17:30-17:50

A Planar 3.4–9 GHz UWB Monopole Antenna

Md Nazmul Hasan and Munkyo Seo

Sungkyunkwan University, Korea

WeA2-5

17:50-18:10

A Compact Modified E-Shaped Monopole Antenna for USB Dongle Applications

Suchitra Jeenawong¹, Patchadaporn Sangpet¹, Pichet Moeikham¹, and Prayoot Akkaraekthalin²

¹Rajamangala University of Technology Lanna Chiang Rai, Thailand,

²King Mongkut's University of Technology North Bangkok, Thailand

WeA2-6

18:10-18:30

Characteristic Modes Analysis to Integrate a Feeding Network in a Wideband Superdirective Array

Hussein Jaafar, Sylvain Collardey, and Ala Sharaiha

IETR, France



[WeB2] Millimeter-wave, THz and Optical Propagation

Date / Time	Oct. 24 (Wed.), 2018 / 16:30-18:30
Place	Room B (Grand Ballroom 2)
Session Chairs	Tae-In Jeon (Korea Maritime and Ocean University, Korea) Minseok Kim (Niigata University, Japan)

WeB2-1

16:30-16:50

Multilevel Modulation by LED Luminance Distribution for Optical Camera Communication

Masahiro Kinoshita, Takuya Zinda, and Wataru Chujo
Meijo University, Japan

WeB2-2

16:50-17:10

300-GHz Dual-Beam Frequency-Selective On-Chip Antenna for High- T_c Superconducting Receivers

Xiang Gao¹, Ting Zhang², Jia Du¹, and Y. Jay Guo²
¹*CSIRO Manufacturing, Australia*, ²*University of Technology Sydney, Australia*

WeB2-3

17:10-17:30

Development of Link Context-Aware Millimeter-Wave Beam Switching System Using Depth-Sensor

Minseok Kim, Hideaki Momose, and Tomoyuki Nakayama
Niigata University, Japan

WeB2-4

17:30-17:50

Long Distance Propagation of THz Pulses Having 0.4-THz Bandwidth

Gyeong-Ryul Kim¹, D. Grischkowsky², and Tae-In Jeon¹
¹*Korea Maritime and Ocean University, Korea*, ²*Oklahoma State University, USA*

WeB2-5

17:50-18:10

Analysis of Delay and AOD Spread at 67 GHz for an Urban Micro Street Canyon Scenario

Michael Peter¹, Wilhelm Keusgen¹, Taro Eichler², Kiyoshi Yanagisawa², Koshiro Kitao³, Tetsuro Imai³, Minoru Inomata³, and Yukihiro Okumura³, and Takehiro Nakamura³
¹*Fraunhofer Heinrich Hertz Institute, Germany*, ²*Rohde & Schwarz, Germany*, ³*NTT Docomo, INC., Japan*

WeB2-6

18:10-18:30

Analysis of the Effect of Antenna Beamwidth on Received Power in Large Indoor Environments Based on Millimeter-Wave Channel Measurements

Juyul Lee, Kyung-Won Kim, Jae-Joon Park, and Myung-Don Kim
ETRI, Korea



[WeC2] MIMO and Its Applications

Date / Time	Oct. 24 (Wed.), 2018 / 16:30-18:30
Place	Room C (Grand Ballroom 3)
Session Chairs	Andrés Alayón Glazunov (University of Twente, The Netherlands) Naoki Honma (Iwate University, Japan)

WeC2-1

16:30-16:50

Performance Comparison between Block Maximum SNR Algorithm and MMSE Channel Inversion Algorithm in Multiuser-MIMO Systems

Kosuke Yonezu, Nobuyoshi Kikuma, and Kunio Sakakibara
Nagoya Institute of Technology, Japan

WeC2-2

16:50-17:10

Impact of Power Normalization on System-Level Performance in MU-MIMO with User Scheduling

Ryota Mizutani, Yukiko Shimbo, Hirofumi Suganuma, and Fumiaki Maehara
Waseda University, Japan

WeC2-3

17:10-17:30

Simultaneous Detection of Multiple Targets' Vital Signs Using MIMO Radar

Shun Hasebe, Dai Sasakawa, Kazuma Kishimoto, and Naoki Honma
Iwate University, Japan

WeC2-4

17:30-17:50

Study on Number of Selected Antennas in Massive MIMO Using Block Diagonalization

Yuki Yaku¹, Kentaro Nishimori¹, Yoshiki Shirasawa¹, Ryotaro Taniguchi¹, Yoshiaki Morino², Takefumi Hiraguri², and Nobuyoshi Kikuma³
¹*Niigata University, Japan*, ²*Nippon Institute of Technology, Japan*, ³*Nagoya Institute of Technology, Japan*

WeC2-5

17:50-18:10

An Experimental Study on Indoor Massive 3D-MIMO Channel at 30-40 GHz Band

Jiliang Zhang¹, Andrés Alayón Glazunov^{1,2}, Jian Yang¹, Xiaoli Chu³, and Jie Zhang³
¹*Chalmers University of Technology, Sweden*, ²*University of Twente, The Netherlands*, ³*University of Sheffield, UK*

WeC2-6

18:10-18:30

Effect of Propagation Environment Control Method Using Drone MIMO Relay Station

Naoki Matsumura¹, Kentaro Nishimori¹, Ryotaro Taniguchi¹, Tsutomu Mitsui¹, and Takefumi Hiraguri²
¹*Niigata University, Japan*, ²*Nippon Institute of Technology, Japan*



[WeD2] Remote Sensing and Radar

Date / Time	Oct. 24 (Wed.), 2018 / 16:30-18:30
Place	Room D (Napoli Room)
Session Chairs	Hiroyuki Arai (Yokohama National University, Japan) Il-Suek Koh (Inha University, Korea)

WeD2-1

16:30-16:50

Modeling and Simulation for Evaluation of Air-to-Ground Radar Baseband Echo Signals

Bora Seo¹, Jae-Won Rim¹, Il-Suek Koh¹, Jong-Suk Yoon², and Tae-Hyung Kim²

¹Inha University, Korea, ²LIG Nex1 Co., Ltd., Korea

WeD2-2

16:50-17:10

Effect of Tilt-Modulation and Shadowing on Backscatterer of Ocean Surface

Jae-Won Rim and Il-Suek Koh

Inha University, Korea

WeD2-3

17:10-17:30

Correlation between Microwave and Blood Pressure Response Waveforms

Jun Sato, Kazuma Kishimoto, Naoki Honma, Morio Iwai, and Koichiro Kobayashi

Iwate University, Japan

WeD2-4

17:30-17:50

Design Method of Cardioid Pattern by CMA

Kazuki Kamiyama, Bakar Rohani, and Hiroyuki Arai

Yokohama National University, Japan

WeD2-5

17:50-18:10

Study on the Feature Extraction Algorithm for Efficient Ballistic Target Discrimination

In-Oh Choi¹, Min Kim¹, Ki-Bong Kang¹, Sang-Hong Park², and Kyung-Tae Kim¹

¹POSTECH, Korea, ²Pukyong National University, Korea

WeD2-6

18:10-18:30

Target Discrimination for Multiple Vital Sign Detection with Super-Resolution Algorithm

Hyunjae Lee and Jong-Gwan Yook

Yonsei University, Korea



[WeE2] [Special Session] Millimeter-Wave-Terahertz Antennas and Systems

Date / Time	Oct. 24 (Wed.), 2018 / 16:30-18:30
Place	Room E (Venice Room)
Session Chairs	Goutam Chattopadhyay (NASA-JPL/California Institute of Technology, USA) Tadao Nagatsuma (Osaka University, Japan)

WeE2-1

[Invited Speaker]

16:30-17:10

Terahertz Antenna Technologies for Space Science Applications

Goutam Chattopadhyay¹, Maria Alonso-DelPino¹, Cecile Jung-Kubiak¹, Theodore Reck¹, Choonsup Lee¹, Nacer Chahat¹, Sofia Rahiminejad¹, and David González-Ovejero²

¹California Institute of Technology, USA, ²IETR, France

WeE2-2

17:10-17:30

Fabrication of Devices and Antennas for Millimeter-Wave and Terahertz Systems

Choonsup Lee¹, D. Gonzalez-Ovejero², M. Alonso-DelPino¹, T. Reck¹, A. Peralta¹, I. Mehdi¹, and Goutam Chattopadhyay¹

¹California Institute of Technology, USA, ²IETR, France

WeE2-3

17:30-17:50

Compact Measurement Setup for Antennas Operating in the 220-325 GHz Band

C. Belem Goncalves^{1,2,3}, E. Lacombe^{1,2}, Carlos del Río⁴, F. Gianesello¹, C. Luxey², and G. Ducournau³

¹STMicroelectronics, France, ²University Nice Sophia-Antipolis, France

³Institute of Electronics, Microelectronics and Nanotechnology, France, ⁴Public University of Navarra, Spain

WeE2-4

17:50-18:10

Antenna Technologies for Terahertz Communications

Tadao Nagatsuma

Osaka University, Japan

WeE2-5

18:10-18:30

Spoof Surface Plasmon Based Planar THz Sensor System Using Dumbbell Shaped Unit Cell

M Jaleel Akhtar, Nilesh K Tiwari, and Surya P Singh

Indian Institute of Technology Kanpur, India



[WeF2] [Special Session] Special Topics on High Gain, Multi-beam and Multi-band Phased Arrays

Date / Time	Oct. 24 (Wed.), 2018 / 16:30-18:30
Place	Room F (Miami Room)
Session Chairs	Tzyh-Ghuang Ma (National Taiwan University of Science and Technology, Taiwan) Hsi-Tseng Chou (National Taiwan University, Taiwan)

WeF2-1

[Invited Speaker]

16:30-17:10

A Breakthrough of Phase Control Unit in Phased Arrays - Phased Reconfigurable Synthesized Transmission Lines

Tzyh-Ghuang Ma and Huy Nam Chu

National Taiwan University of Science and Technology, Taiwan

WeF2-2

17:10-17:30

Compact High Gain Dual-Band Dual-Polarized Base Station Antenna

Xiu Yin Zhang, Zhi Jie Zhang, Wen Duan, and Yun Fei Cao

South China University of Technology, China

WeF2-3

17:30-17:50

Development of Luneburg Lens Type Antennas for Potential Mobile Communications at Millimeter Wave Frequencies

Zhi-Da Yan¹, Hsi-Tseng Chou¹, and Yi-Sheng Chang^{2,3}

¹*National Taiwan University, Taiwan*, ²*Yuan-Ze University, Taiwan*,

³*National Chung-Shan Institute of Science and Technology, Taiwan*

WeF2-4

17:50-18:10

Withdrawn

WeF2-5

18:10-18:30

A Large Frequency Ratio Shared-Aperture Antenna Based on Structure Reuse

Jin Fan Zhang¹, Yu Jian Cheng¹, and Shu Han Liu²

¹*University of Electronic Science and Technology of China, China*, ²*University of California, USA*



[WeG2] [Special Session] Metasurface and Metasurface Antennas

Date / Time	Oct. 24 (Wed.), 2018 / 16:30-18:30
Place	Room G (Sicily Room)
Session Chairs	Hisashi Morishita (National Defense Academy, Japan) Wei E. I. Liu (National University of Singapore, Singapore)

WeG2-1

[Invited Speaker]

16:30-17:10

Wideband Cavity Backed Metasurface Antenna under Multi-Mode Resonance

Wei E. I. Liu¹, Zhi Ning Chen¹, and Xianming Qing²

¹National University of Singapore, Singapore, ²Institute for Infocomm Research, Singapore

WeG2-2

17:10-17:30

Anisotropic Metasurface for Orbital Angular Momentum Generation with Controlled Polarization

Jin Yang^{1,2} and Qiang Cheng¹

¹Southeast University, China, ²Science and Technology on Electronic Information Science Control Laboratory, China

WeG2-3

17:30-17:50

Dual-Polarized Metasurfaces Composed of Multi-Layered Ceramic Capacitors

Naoyuki Kinai¹, Naobumi Michishita¹, Hisashi Morishita¹, Teruki Miyazaki², and Masato Tadokoro²

¹National Defense Academy, Japan, ²The Yokohama Rubber Co., Ltd., Japan

WeG2-4

17:50-18:10

Waveguide Integrated Lumped Circuits Using the Cutoff and Evanescent Modes

Yue Li

Tsinghua University, China

WeG2-5

18:10-18:30

A Wide-Band Power-Splitter Fed Wide-Band Array Antenna Adoptable to Low-Weight GPR Systems

Changhyeong Lee, Heejun Park, Gwang-Gyun Namgung, Jinyoung Kwon, and Sungtek Kahng

Incheon National University, Korea



[ThA1] Antennas for Mobile and Wireless Applications I

Date / Time	Oct. 25 (Thu.), 2018 / 09:00-10:40
Place	Room A (Grand Ballroom 1)
Session Chairs	Keizo Cho (Chiba Institute of Technology, Japan) Chisang You (LG Electronics, Korea)

ThA1-1

09:00-09:20

Metal Integrated LTE Antennas for Full Vision Display Smartphones

Chisang You¹, Byungwoon Jung¹, Youngbae Kwon¹, and Kin-Lu Wong²

¹LG Electronics, Korea, ²National Sun Yat-Sen University, Taiwan

ThA1-2

09:20-09:40

Dual-Element of High-SHF PIFA MIMO Antenna for Future 5G Wireless Communication Devices

Bazilah Baharom, Mohd Tarmizi Ali, Robi'atun Adayiah Awang, Hajar Jaafar, and Hamizan Yon

Universiti Teknologi MARA, Malaysia

ThA1-3

09:40-10:00

2.4GHz Patch Antenna on Bio-Composite Substrate Using Quarter Wave Transmission Line

M. Y. Mat Zain, M. T. Ali, A. N. H. Hussin, and B. Baharom

Universiti Teknologi MARA, Malaysia

ThA1-4

10:00-10:20

Dual-Polarized Reflector Backed Dipole Antenna Using Frequency Selective Reflector

Masato Hasegawa and Keizo Cho

Chiba Institute of Technology, Japan

ThA1-5

10:20-10:40

EMSICC Based CRLH Compact Leaky-Wave Antenna with Enhanced Broadside Efficiency

Anirban Sarkar, Abhishek Sharma, Animesh Biswas, and M. J. Akhtar

Indian Institute of Technology Kanpur, India



[ThB1] Broadband and Multi-band Antennas II

Date / Time	Oct. 25 (Thu.), 2018 / 09:00-10:40
Place	Room B (Grand Ballroom 2)
Session Chairs	Yingjie Jay Guo (University of Technology Sydney, Australia) Prayoot Akkaraekthalin (King Mongkut's University of Technology North Bangkok, Thailand)

ThB1-1

09:00-09:20

Low-Profile Cone Antenna with Trapezoidal Plate Element

Kazuya Matsubayashi, Naobumi Michishita, and Hisashi Morishita
National Defense Academy, Japan

ThB1-2

09:20-09:40

A Wideband (5.6:1) Antenna Array with a Simple Low Profile Feed Structure

Alpha O. Bah¹, Pei-Yuan Qin¹, and Y. Jay Guo¹
University of Technology Sydney, Australia

ThB1-3

09:40-10:00

A Wideband Printed Slot Antenna Using Double Feed and Blended Stub with Reflector for GPR Applications

Nattaphon Dokjok, Wanwisa Thaiwirot, Akkarat Boonpoonga, and Prayoot Akkaraekthalin
King Mongkut's University of Technology North Bangkok, Thailand

ThB1-4

10:00-10:20

A Design of the Multi-Ring Ultra-Wideband Antenna for Bidirectional Radiation

Jinghui Qiu, Chen Xue, and Enze Zhang
Harbin Institute of Technology, China

ThB1-5

10:20-10:40

A Novel UWB Dipole Antenna with Stable Omnidirectional Pattern

Feiyang Deng, Shu Lin, Baoqi Zhu, Binshan Zhao, Yinghuijie Guo, and Caitian Yang
Harbin Institute of Technology, China



[ThC1] Scattering, Diffraction and RCS

Date / Time	Oct. 25 (Thu.), 2018 / 09:00-10:40
Place	Room C (Grand Ballroom 3)
Session Chairs	Masahiko Nishimoto (Kumamoto University, Japan) Seong-Ho Son (ETRI, Korea)

ThC1-1

09:00-09:20

Electromagnetic Plane Wave Diffraction by Thick Conducting Slits - E Polarization Case -

Khanh Nam Nguyen and Hiroshi Shirai
Chuo University, Japan

ThC1-2

09:20-09:40

Radar Cross Section of a Hemisphere FSS Radome Mounted on a Circular Cylinder

Hokeun Shin, Dong-Chan Son, Sangsu Lee, Jonghyup Lee, Seongro Choi, Hyungjun An, and Yong Bae Park
Ajou University, Korea

ThC1-3

09:40-10:00

Analysis of *H*-Polarized Wave Scattering by a Metal Cylinder Covered with Inhomogeneous Material

Masahiko Nishimoto¹, Budiman P.A. Rohman^{1,2}, and Yoshihiro Naka³
¹Kumamoto University, Japan, ²Indonesian Institute of Sciences, Indonesia,
³Kyushu University of Health and Welfare, Japan

ThC1-4

10:00-10:20

Real-Time Tracking of Moving Anomaly from Scattering Parameters

Won-Kwang Park¹, Kwang-Jae Lee², and Seong-Ho Son²
¹Kookmin University, Korea, ²ETRI, Korea

ThC1-5

10:20-10:40

Alternative Direct Sampling Method in 3D Inverse Electromagnetic Scattering Problem

Sangwoo Kang and Marc Lambert
CNRS Group of Electrical Engineering, Paris, France



[ThD1] [Special Session] IAET Special Session: Antenna Technologies for 4G/5G Mobile Communication Devices

Date / Time	Oct. 25 (Thu.), 2018 / 09:00-10:40
Place	Room D (Napoli Room)
Session Chairs	Wei-Yu Li (Industrial Technology Research Institute, Taiwan) Cheng-Tse Lee (ASUSTek Computer Inc., Taiwan)

ThD1-1

09:00-09:20

Compact Quad-Offset Loop/IFA Hybrid Antenna Array for Forming Eight 3.5/5.8 GHz MIMO Antennas in the Future Smartphone

Wei-Yu Li¹, Wei Chung¹, and Kin-Lu Wong²

¹Industrial Technology Research Institute, Taiwan, ²National Sun Yat-Sen University, Taiwan

ThD1-2

09:20-09:40

A MIMO Dual-Polarized Antenna Array for Small Cell Application

Chia-Lun Tang¹, Chi-Ming Chiang¹, Shih-Chi Lai¹, Wen-Hsiu Hsu², and Wei-Yan Chen²

¹Auden Techno Corp., Taiwan, ²Shu-Te University, Taiwan

ThD1-3

09:40-10:00

AI-Based Antenna Technology for 5G Software-Defined Radio Platform

Lan-Hsin Wang¹, Fu-Ren Hsiao¹, Yu-Xuan Zhang², and Tsung-Wen Chiu²

¹Advanced Wireless and Antenna Inc., Taiwan, ²BWant Co., Ltd., Taiwan

ThD1-4

10:00-10:20

Small-Sized, Tri-Band, Two-Antenna System Aimed for 4 × 4 Gbps Notebook Applications

Cheng-Tse Lee and Saou-Wen Su

ASUSTek Computer Inc., Taiwan

ThD1-5

10:20-10:40

An Eight-Band WWAN/LTE By-Hinge Printed Inverted-F Antenna on Laptop Computer

Shu-Chuan Chen¹, Chong-Wei Liou², Chung-I G. Hsu², and Jia-Yi Sze¹

¹National Defense University, Taiwan, ²National Yunlin University of Science and Technology, Taiwan



[ThE1] [Special Session] Innovative and Practical Antenna Designs

Date / Time	Oct. 25 (Thu.), 2018 / 09:00-10:40
Place	Room E (Venice Room)
Session Chairs	Chow-Yen-Desmond Sim (Feng Chia University, Taiwan) Wen-Jiao Liao (National Taiwan University of Science and Technology, Taiwan)

ThE1-1

09:00-09:20

A Coupled-Feed Monopole Antenna for UHF RFID Reader Application

Chow-Yen-Desmond Sim, Jia-He Zhuang, Wei-Sheng Liao, Jin-Rong Liou, Chia-Chin Hsu, and Jian-Yu Huang
Feng Chia University, Taiwan

ThE1-2

09:20-09:40

A Diversity-Based Multi-Antenna Design for Comprehensive RFID Tag Reading

Wen-Jiao Liao¹, Yi-Chung Li¹, Hao-De Tang¹, Hsin-Chin Liu¹, and Chin-Chung Nien²
¹*National Taiwan University of Science and Technology, Taiwan*, ²*Industrial Technology Research Institute, Taiwan*

ThE1-3

09:40-10:00

Metamaterial Self-Oscillating Active Antennas for Extending Readable Range of RFID

Tzyh-Ghuang Ma, Zhi-Hong Liu, Yu Wei Chang, and Huy Nam Chu
National Taiwan University of Science and Technology, Taiwan

ThE1-4

10:00-10:20

Dual-Band Embedded Antenna on Metallic Chassis for Tunable Low-Band and Broadband High-Band

Chien-Hao Chiu¹, Shih-Chia Chiu², Shih-An Yang², Wang-Ta Hsieh², and Shih-Yuan Chen¹
¹*National Taiwan University, Taiwan*, ²*ASUSTek Computer Inc., Taiwan*

ThE1-5

10:20-10:40

Stent-Based Antennas for Smart Stent Applications

Shuo-Chih Chen, Zhe-Yuan Zhang, and Chien-Hao Liu
National Taiwan University, Taiwan



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[ThF1] [Special Session] Antenna Measurements (AMTA) I

Date / Time	Oct. 25 (Thu.), 2018 / 09:00-10:40
Place	Room F (Miami Room)
Session Chairs	Jin-Seob Kang (KRISS, Korea) David R. Novotny (National Institute of Standards and Technology, USA)

ThF1-1

09:00-09:20

Practical Considerations When Using Commercial Robotic Arms for Antenna Metrology

David R. Novotny and Joshua A. Gordon

National Institute of Standards and Technology, USA

ThF1-2

09:20-09:40

Accuracy Improvement of Antenna-Gain Self-Calibration Method with Electronic Calibration Module

Michitaka Ameya, Sayaka Matsukawa, and Satoru Kurokawa

AIST, Japan

ThF1-3

09:40-10:00

Estimation of the Maximum Directivity of the Antennas Using the Mutual Coupling between Two Antennas

Ilkyu Kim and Sun-heon Lee

Defense Agency for Technology and Quality, Korea

ThF1-4

10:00-10:20

Novel Specification Method for Electromagnetic Wave Leak Point of the Shielding Enclosure Using Time Domain Analysis

Sayaka Matsukawa and Satoru Kurokawa

AIST, Japan

ThF1-5

10:20-10:40

Antenna Measurement Comparison of 700-1100 MHz/R-/X-Band Horn Antennas

Jin-Seob Kang, Jeong-Il Park, and Jeong-Hwan Kim

KRISS, Korea



[ThG1] [Special Session] Recent Developments in Frequency Selective Surfaces, Metasurfaces and Low-observable Surfaces for Antennas

Date / Time	Oct. 25 (Thu.), 2018 / 09:00-10:40
Place	Room G (Sicily Room)
Session Chair	Raj Mittra (University of Central Florida, USA)

ThG1-1

09:00-09:20

Design of FSS for Wideband and Wide-Angle Coverage—Challenges and Possible Solutions

Raj Mittra^{1,2} and Nathawut Homsup¹

¹University of Central Florida, USA, ²King Abdulaziz University, Saudi Arabia

ThG1-2

09:20-09:40

A Switchable Reflect-Type Linear/Circular Polarizers Based on Active Metasurface

You Li¹, Qunsheng Cao¹, and Yi Wang^{1,2}

¹Nanjing University of Aeronautics and Astronautics, China, ²Southeast University, China

ThG1-3

09:40-10:00

RCS Reduction of a Microstrip Patch Based on Broadband PRRS

Jianxiao Wang, She Shang, Dawei Song, and Xiaojun Li

National Key Laboratory of Science and Technology on Space Microwave, China

ThG1-4

10:00-10:20

A High-Gain and Low-RCS Fabry-Perot Antenna Using a Phase Gradient Metasurface

Yongtao Jia, Ying Liu, and Shuxi Gong

Xidian University, China

ThG1-5

10:20-10:40

Design of Low RCS Spiral Antenna with Low Profile

Wenbo Zhang¹, Ying Liu¹, Shuxi Gong¹, and Xianghui Wang²

¹Xidian University, China, ²Beijing Electro-Mechanical Engineering Institute, China



[ThA2] Antennas for Mobile and Wireless Applications II

Date / Time	Oct. 25 (Thu.), 2018 / 13:20-14:40
Place	Room A (Grand Ballroom 1)
Session Chairs	Soon-Soo Oh (Chosun University, Korea) Naobumi Michishita (National Defense Academy, Japan)

ThA2-1

13:20-13:40

Application of Negative Index Lens Antenna for 5G Mobile Base Station

S. Hamid¹, M.T. Ali¹, Y. Yamada², N.H. Abd Rahman^{1,2}, and N. Michishita³

¹Universiti Teknologi MARA, Malaysia, ²Universiti Teknologi Malaysia, Malaysia, ³National Defense Academy, Japan

ThA2-2

13:40-14:00

Simulation of an Antenna with Bidirectional Asymmetric Gain

Dong-Woo Kim¹, Se-Woong Na², Jin-Dae Kim², Wook-Ki Park³, and Soon-Soo Oh¹

¹Chosun University, Korea, ²Carnavicom, Korea, ³IncheonTechnopark, Korea

ThA2-3

14:00-14:20

A Yagi-Uda Antenna-Based RFID Tag for Books and Documents Management Applications

Yusei Takagi, Shigeki Takeda, Kenichi Kagoshima, and Masahiro Umehira

Ibaraki University, Japan

ThA2-4

14:20-14:40

Measurement of a Novel UHF RFID Based Battery-Less Vibration Frequency Sensing Tag

Dongfang Feng, Takuya Higuchi, Yuri Kobayashi, Shigeki Takeda, Kenichi Kagoshima, and Masahiro Umehira

Ibaraki University, Japan



[ThB2] Antenna Theory, Design, and Measurement

Date / Time	Oct. 25 (Thu.), 2018 / 13:20-15:00
Place	Room B (Grand Ballroom 2)
Session Chairs	Nobuhiro Kuga (Yokohama National University, Japan) Wang-Sang Lee (Gyeongsang National University, Korea)

ThB2-1

13:20-13:40

Cavity Resonance Free Wheeler Cap Method Using Cauchy Method for Amplitude Only Response

Nozomu Ishii and Takumi Kato
Niigata University, Japan

ThB2-2

13:40-14:00

Non-Contact PIM-Measurement of Magnetic Wave-Absorbing Materials by Using a Coaxial Tube

Yusuke Ishii, Shinji Ishiyama, and Nobuhiro Kuga
Yokohama National University, Japan

ThB2-3

14:00-14:20

Low-Profile Unidirectional Pattern Antenna Composed of Two Gate-Shaped Elements

Keita Nomoto and Nobuhiro Kuga
Yokohama National University, Japan

ThB2-4

14:20-14:40

Wide-Beam Choke Horn Antenna for Small Drone Detection

Laxmikant Minz, Hyun-Seong Kang, Muhammad Tayyab Azim, Rao Shahid Aziz, and Seong-Ook Park
KAIST, Korea

ThB2-5

14:40-15:00

A 915 MHz Dual Polarized Meandered Dipole Antenna with Dual Resonance

Dong-Geun Seo, Ji-Hong Kim, Seong-Hyeop Ahn, and Wang-Sang Lee
Gyeongsang National University, Korea



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[ThC2] Antennas and Arrays for K-band and Above

Date / Time	Oct. 25 (Thu.), 2018 / 13:20-15:00
Place	Room C (Grand Ballroom 3)
Session Chairs	Jiro Hirokawa (Tokyo Institute of Technology, Japan) Kunio Sakakibara (Nagoya Institute of Technology, Japan)

ThC2-1

13:20-13:40

Design of Feed and Radiation Elements for 2×2-Element Waveguide Slot Arrays by Filter Design Theory

Takashi Tomura and Jiro Hirokawa

Tokyo Institute of Technology, Japan

ThC2-2

13:40-14:00

Design of a Ka-Band Circularly Polarized Waveguide Antenna with a Cross Iris

Sungjoon Yoon and Jaehoon Choi

Hanyang University, Korea

ThC2-3

14:00-14:20

Design MIMO Antenna with U-Slot Rectangular Patch Array for 5G Applications

Fajar Wahyu Ardianto, Farhan Fathir Lanang, Setyawan Renaldy, and Trasma Yunita

Telkom University, Indonesia

ThC2-4

14:20-14:40

CPW Feed for Millimeter-Wave SIW-Based Antipodal Vivaldi Antenna

Zong-Huan Wu, Jing-Hui Qiu, Chen Liu, and Nan-Nan Wang

Harbin Institute of Technology, China

ThC2-5

14:40-15:00

Dielectric Loaded Coaxial Grooves Horn with Ku/Ka Feed Systems for Low Cross Polarization Use

Atsushi Hiratsuna, Yuji Akagi, Hiroyuki Deguchi, and Mikio Tsuji

Doshisha University, Japan



[ThD2] [Special Session] Ground Penetrating Radar

Date / Time	Oct. 25 (Thu.), 2018 / 13:20-15:00
Place	Room D (Napoli Room)
Session Chairs	Kangwook Kim (GIST, Korea) Se-Yun Kim (KIST, Korea)

ThD2-1

13:20-13:40

Detection of Deeply Located Dormant Tunnel Using Cross-Borehole Radar

Se-Yun Kim
KIST, Korea

ThD2-2

13:40-14:00

Design and Fabrication of Resistively Loaded Dipoles Using Planar Resistor Technology

Woong Kang¹ and Kangwook Kim²
¹Korea Institute of Geoscience and Mineral Resources, Korea, ²GIST, Korea

ThD2-3

14:00-14:20

Dual-Sensor Landmine Detection System Utilizing GPR and Metal Detector

Bobae Kim, Jihan Kang, Donghyun Kim, Jungwon Yun, Soonho Choi, and Inchan Paek
Hanwha Systems, Korea

ThD2-4

14:20-14:40

Iteration Strategy for Autofocusing Metric Evaluation in GPR Imaging

Haewon Jung and Kangwook Kim
GIST, Korea

ThD2-5

14:40-15:00

The Enhancement of Step-Frequency Multi-Carrier Ground Penetration Radar System

Dong Kyoo Kim¹, Jin Myung Kim², Eui Chul Lee², Chanho Kim², and Ho Young Ji²
¹ETRI, Korea, ²JCFT, Korea



[ThE2] [Special Session] Antenna and Propagation in ASEAN Community I

Date / Time	Oct. 25 (Thu.), 2018 / 13:20-15:00
Place	Room E (Venice Room)
Session Chairs	Mohamad Kamal A Rahim (Universiti Teknologi Malaysia, Malaysia) Eko Tjipto Rahardjo (Universitas Indonesia, Indonesia)

ThE2-1

13:20-13:40

Probability of Detection Using Reconfigurable Antenna

M. K. A. Rahim, K. H. B. Yusof, K.M Yusof, F. Zubir, and O. Ayop
Universiti Teknologi Malaysia, Malaysia

ThE2-2

13:40-14:00

Analyzing the Effects of User's Hands on the SAR of Multiple-Antenna Transmitters

Dinh Thanh Le and Soichi Watanabe
National Institute of Information and Communications Technology, Japan

ThE2-3

14:00-14:20

Passive UHF RFID Tag Antenna Using Polycarbonate and PDMS Material

N.M. Nadzir¹, M.K.A. Rahim¹, F. Zubir¹, N.A. Samsuri¹, O.Ayop¹, and H. Majid²
¹*Universiti Teknologi Malaysia, Malaysia*, ²*Universiti Tun Hussein Onn Malaysia, Malaysia*

ThE2-4

14:20-14:40

Circular Patch Filtering Antenna Design Based on Hairpin Bandpass Filter

Dwi Astuti Cahyasiwi and Eko Tjipto Rahardjo
Universitas Indonesia, Indonesia

ThE2-5

14:40-15:00

Design of Narrow-Wall Slotted Waveguide Antenna with V-Shaped Metal Reflector for X-Band Radar Application

Derry Permana Yusuf, Fitri Yuli Zulkifli, and Eko Tjipto Rahardjo
Universitas Indonesia, Indonesia



[ThF2] [Special Session] Challenges in 5G Antenna Design and Possible Solutions I

Date / Time	Oct. 25 (Thu.), 2018 / 13:20-15:00
Place	Room F (Miami Room)
Session Chairs	Raj Mittra (University of Central Florida, USA) Chi Hou Chan (City University of Hong Kong, Hong Kong, China)

ThF2-1

13:20-13:40

Wideband Magneto-Electric Dipole Antennas for Millimeter-Wave Applications with Microstrip Line Feed

Jie Sun and Kwai-Man Luk

City University of Hong Kong, Hong Kong, China

ThF2-2

13:40-14:00

A Novel Dual-Polarized Quadrapole Antenna with L-Shaped Coupling Feeding Lines

Qing-Xin Chu, Dong-Hua Huang, and Rui Wu

South China University of Technology, China

ThF2-3

14:00-14:20

Near-Zero Dielectric Loss Millimeter-Wave Leaky-Wave Antenna Using Silicon MEMS Process

Yue Li, Peiqin Liu, and Zhijun Zhang

Tsinghua University, China

ThF2-4

14:20-14:40

Broadband Circularly Polarized Dielectric Rod Antenna for Millimeter-Wave Communications

Zhuoqiao Ji, Kai Xu Wang, and Hang Wong

City University of Hong Kong, Hong Kong, China

ThF2-5

14:40-15:00

60GHz Phased Transmitarray Antenna for 5G

Shi-Wei Qu and Xiao-Han Chen

University of Electronic Science and Technology of China, China



[ThG2] [Special Session] Metamaterial/Metasurface Characterization and Application

Date / Time	Oct. 25 (Thu.), 2018 / 13:20-15:00
Place	Room G (Sicily Room)
Session Chairs	Sungtek Kahng (Incheon National University, Korea) Do-Hoon Kwon (University of Massachusetts Amherst, USA)

ThG2-1

13:20-13:40

Experimental Characterization of a Circular Polarizer with All-Dielectric Chiral Metasurface

A. Yahyaoui^{1,2}, H. Rmili^{1,3}, T. Aguilí¹, and R. Mittra^{3,4}

¹University of Tunis El Manar, Tunisia, ²University of Jeddah, Saudi Arabia,

³King Abdulaziz University, Saudi Arabia, ⁴University of Central Florida, USA

ThG2-2

13:40-14:00

Main Beam Manipulation of Patch Antenna Using Non-Uniform Meta-Surface

H. L. Zhu¹, Y. X. Cao¹, Can Ding², Gao Wei¹, and Y. Jay Guo²

¹Northwestern Polytechnical University, China, ²University of Technology Sydney, Australia

ThG2-3

14:00-14:20

A Nature-Inspired Optimization Technique for Metasurfaces to Improve the Isolation between 5G MIMO Antennas

Abdul Rehman, Changhyeong Lee, Heejun Park, Gwang-Gyun Namgung, Jinyoung Kwon, and Sungtek Kahng
Incheon National University, Korea

ThG2-4

14:20-14:40

Reflective Metasurfaces with an Arbitrary Prescribed Surface Field Distribution

Do-Hoon Kwon

University of Massachusetts Amherst, USA

ThG2-5

14:40-15:00

Study on CRLH Leaky-Wave Antenna Using Varactor-Loaded Transmission Line Resonator

Yujiro Kushiya, Takuji Arima, and Toru Uno

Tokyo University of Agriculture and Technology, Japan



[ThA3] Antennas for Mobile and Wireless Applications III

Date / Time	Oct. 25 (Thu.), 2018 / 15:20-16:20
Place	Room A (Grand Ballroom 1)
Session Chairs	Chi-Fang Huang (Tatung University, Taiwan) Xiu Yin Zhang (South China University of Technology, China)

ThA3-1

15:20-15:40

Wideband Horizontally Polarized Omnidirectional Antenna with Small Size

Liang Hua Ye, Zhi Jie Zhang, Wen Duan, and Xiu Yin Zhang
South China University of Technology, China

ThA3-2

15:40-16:00

Characteristics Analysis of WLAN Antennas Partially Enclosed by Metals

Chi-Fang Huang and Yao Niu
Tatung University, Taiwan

ThA3-3

16:00-16:20

An Asymmetric Coplanar Strip-Fed Compact Yagi-Uda Antenna Utilizing Ground as Director

Naveen Kumar Maurya, Rajarshi Bhattacharya, and Seemanti Saha
National Institute of Technology Patna, India



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[ThB3] [Special Session] EurAAP Session: Enabling Technologies for Future Terrestrial and Satellite Communication Systems

Date / Time	Oct. 25 (Thu.), 2018 / 15:20-16:20
Place	Room B (Grand Ballroom 2)
Session Chairs	Nelson J. G. Fonseca (European Space Agency, The Netherlands) Martin Johansson (Ericsson Research, Sweden)

ThB3-1

[Invited Speaker]

15:20-16:00

A Review of Lens-Based Antenna Developments Supported by ESA for Future Satellite Missions

Nelson J. G. Fonseca, Giovanni Toso, Maarten van der Vorst, Petar Jankovic, and Piero Angeletti

European Space Agency, The Netherlands

ThB3-2

16:00-16:20

A Ka-Band Glide-Symmetric Planar Luneburg Lens with Combined Dielectric/Metasurface for 5G Communications

Astrid Algaba Brazález¹, Lars Manholm¹, Martin Johansson¹, Martin Mattsson², and Oscar Quevedo-Teruel²

¹*Ericsson Research, Sweden*, ²*KTH Royal Institute of Technology, Sweden*



[ThC3] [Special Session] 3D Printed Antennas

Date / Time	Oct. 25 (Thu.), 2018 / 15:20-16:40
Place	Room C (Grand Ballroom 3)
Session Chairs	Ick-Jae Yoon (Chungnam National University, Korea) Xiaochen Chen (Tampere University of Technology, Finland)

ThC3-1

15:20-15:40

Fabrication and Evaluation of Carbon-Based Flexible RFID Tags on 3D-Printed Substrates

Han He, Xiaochen Chen, Leena Ukkonen, and Johanna Virkki
Tampere University of Technology, Finland

ThC3-2

15:40-16:00

Super-Wideband Spidron Fractal Cube Antenna Using 3D Printing Technology

Oh Heon Kwon¹, Won Bin Park¹, Sungwoo Lee¹, Jong Min Lee¹, Young Mi Park², and Keum Cheol Hwang¹
¹*Sungkyunkwan University, Korea*, ²*ADD, Korea*

ThC3-3

16:00-16:20

An Electrically Small Quasi-Isotropic Antenna Using 3D Printing Technology

Sonapreetha Mohan Radha, Geonyeong Shin, Su-Hyeon Lee, and Ick-Jae Yoon
Chungnam National University, Korea

ThC3-4

16:20-16:40

Advanced Lens for Antenna Gain Enhancement Using 3D Printing Technology

Injoong Nam¹, Seokmin Lee¹, Eon-Seok Jo², and Dongho Kim¹
¹*Sejong University, Korea*, ²*SK Hynix Inc., Korea*



[ThD3] 2D and 3D Printed Antennas and Arrays

Date / Time	Oct. 25 (Thu.), 2018 / 15:20-16:40
Place	Room D (Napoli Room)
Session Chairs	Hyoungsuk Yoo (Hanyang University, Korea) Rupam Das (University of Ulsan, Korea)

ThD3-1

15:20-15:40

Mutual Coupling Reduction Using Resistive Sheets

Seongjung Kim and Sangwook Nam
Seoul National University, Korea

ThD3-2

15:40-16:00

A 35GHz Microstrip Array Module Design for Reconnaissance Radar

Jing-Hui Qiu, Chen Liu, Zong-Huan Wu, and Nan-Nan Wang
Harbin Institute of Technology, China

ThD3-3

16:00-16:20

A Wide-Angle Beam Scanning Reflectarray Antenna with Four Focuses Design and Staggered Arrangement of Elements

Nan-Nan Wang, Bing-Xu Zhao, Mu Fang, and Jing-Hui Qiu
Harbin Institute of Technology, China

ThD3-4

16:20-16:40

Suppression of Mobile Phone Exposure by Using Compact Electromagnetic-Bandgap Array

Rupam Das¹, Sang-Bock Cho¹, and Hyoungsuk Yoo²
¹University of Ulsan, Korea, ²Hanyang University, Korea



[ThE3] [Special Session] Antenna and Propagation in ASEAN Community II

Date / Time	Oct. 25 (Thu.), 2018 / 15:20-16:40
Place	Room E (Venice Room)
Session Chairs	Monai Krairiksh (King Mongkut's Institute of Technology Ladkrabang, Thailand) Minh Thuy Le (Hanoi University of Science and Technology, Vietnam)

ThE3-1

15:20-15:40

Analysis of a Sensor Using Rician k-Factor for Identification of a Spherical Conductor Submerged in Soil

P. Yoiyod¹, S. Pathoumvanh², C. Phongcharoenpanich³, and M. Krairiksh³

¹Rangsit University, Thailand, ²National University of Laos, Lao,

³King Mongkut's Institute of Technology Ladkrabang, Thailand

ThE3-2

15:40-16:00

Multiband Antenna for RF Energy Harvesting

Ngan Nguyen¹, Ninh Nguyen Tuan¹, Quoc Cuong Nguyen¹, Vu Bang Giang Truong², Monai Krairiksh³, and Minh Thuy Le¹

¹Hanoi University of Science and Technology, Vietnam, ²Vietnam National University, Vietnam,

³King Mongkut's Institute of Technology, Thailand

ThE3-3

16:00-16:20

Preliminary Study of the Natural Resonant Frequencies of Coconut (Cocos Nucifera L.) Fruit for Quality Identification

Tanawut Tantisoparak, Panisa Keowsawat, and Rachen Kanahna

Phetchaburi Rajabhat University, Thailand

ThE3-4

16:20-16:40

A Sensor for Continuous Fruit Classification Using Rician K-Factor

Prapan Leekul¹ and Monai Krairiksh²

¹Rambhai Barni Rajabhat University, Thailand, ²King Mongkut's Institute of Technology Ladkrabang, Thailand



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[ThF3] [Special Session] Challenges in 5G Antenna Design and Possible Solutions II

Date / Time	Oct. 25 (Thu.), 2018 / 15:20-16:40
Place	Room F (Miami Room)
Session Chairs	Raj Mittra (University of Central Florida, USA) Chi Hou Chan (City University of Hong Kong, Hong Kong, China)

ThF3-1

15:20-15:40

An Ultra-Low-Profile MIMO Antenna for 5G Smart-Phones

Daqing Liu, Ming Zhang, Bin Wang, and Jun Wang
Huawei Technologies Co. Ltd, China

ThF3-2

15:40-16:00

Millimeter-Wave Low-Mutual-Coupling MIMO Dielectric Resonator Antennas

X. Qin and Y. M. Pan
South China University of Technology, China

ThF3-3

16:00-16:20

MIMO Antenna System Throughput Simulation

Nicholas E. Buris
Shanghai University, China

Discussion

16:20-16:40



[ThG3] [Special Session] Surface Electromagnetics: Phenomena, Theorem, and Applications

Date / Time	Oct. 25 (Thu.), 2018 / 15:20-16:40
Place	Room G (Sicily Room)
Session Chair	Fan Yang (Tsinghua University, China)

ThG3-1

[Invited Speaker]

15:20-16:00

Surface Electromagnetics and Its Application in Antenna Array Design

Fan Yang and Shenheng Xu
Tsinghua University, China

ThG3-2

16:00-16:20

Synthesis and Analysis of Linear and Nonlinear Bianisotropic Metasurfaces

Karim Achouri¹, Christophe Caloz², and Olivier J.F. Martin¹
¹*École Polytechnique Fédérale de Lausanne, Switzerland*, ²*Polytechnique Montréal, Canada*

ThG3-3

16:20-16:40

The Development of Nonlinear Metasurface Absorbers: From Passive to Active

Zhangjie Luo and Tie Jun Cui
Southeast University, China



[FrA1] Passive and Active Components

Date / Time	Oct. 26 (Fri.), 2018 / 08:30-10:10
Place	Room A (Grand Ballroom 1)
Session Chairs	Danai Torrungrueng (King Mongkut's University of Technology North Bangkok, Thailand) Rakesh Sinha (Chungnam National University, Korea)

FrA1-1

08:30-08:50

Compact Phase Shifter for 4G Base Station Antenna

Chul-Keun Park¹, Hee-Soo Kim¹, Jeong-Won Kim¹, and Kyeong-Sik Min²

¹AT&S Co. Ltd., Korea, ²Korea Maritime & Ocean University, Korea

FrA1-2

08:50-09:10

Miniaturized Hybrid Couplers Using Quarter Wave-Like Transformers

Sarun Thaepunkulngam¹, Panuwat Janpugdee¹, and Danai Torrungrueng²

¹Chulalongkorn University, Thailand, ²King Mongkut's University of Technology North Bangkok, Thailand

FrA1-3

09:10-09:30

Design of High Power Transmission Line Transformer for RF Heating Generator

Adisak Rattananamlom¹, Supawat Kotchapradit¹, Samran Santalunai¹, Thanaset Thosdeekoraphat¹, Phichet Moungnoul², and Chanchai Thongsopa¹

¹Suranaree University of Technology, Thailand, ²King Mongkut's Institute of Technology Ladkrabang, Bangkok, Thailand

FrA1-4

09:30-09:50

Microfluidic Impedance Tuner

Minjae Lee and Sungjoon Lim

Chung-Ang University, Korea

FrA1-5

09:50-10:10

Three-Dimensional Printed Stair-Like Metamaterial Absorber

Daecheon Lim and Sungjoon Lim

Chung-Ang University, Korea



[FrB1] Reconfigurable, Adaptive, and Smart Antennas

Date / Time	Oct. 26 (Fri.), 2018 / 08:30-09:50
Place	Room B (Grand Ballroom 2)
Session Chairs	Prayoot Akkaraekthalin (King Mongkut's University of Technology North Bangkok, Thailand) Sangwook Nam (Seoul National University, Korea)

FrB1-1

08:30-08:50

Effect of a Surface Wave in Mutual Coupling for Printed Bow-Tie Antenna Array

Hanni Koo and Sangwook Nam
Seoul National University, Korea

FrB1-2

08:50-09:10

Rollover-Resistant Vehicular MRC Adaptive Array with Weighted Polarization Combining

Taishi Oda, Hiroya Tanaka, Kazuhiro Honda, and Koichi Ogawa
Toyama University, Japan

FrB1-3

09:10-09:30

Investigation of Various U-Shaped Slots in Reconfigurable Antenna Using RF MEMS Switches

Norfatihah Bahari¹, Mohd Faizal Jamlos¹, Suramate Chalermwisutkul², Titipong Lertwiriya-prapa²,
and Prayoot Akkaraekthalin²
¹*Universiti Malaysia Perlis, Malaysia*, ²*King Mongkut's University of Technology North Bangkok, Thailand*

FrB1-4

09:30-09:50

Design of Polarization Reconfigurable Antenna Using Liquid Metal

Aqeel Hussain Naqvi and Sungjoon Lim
Chung-Ang University, Korea



[FrC1] DOA Estimation

Date / Time	Oct. 26 (Fri.), 2018 / 08:30-10:10
Place	Room C (Grand Ballroom 3)
Session Chairs	Nobuyoshi Kikuma (Nagoya Institute of Technology, Japan) Keizo Cho (Chiba Institute of Technology University, Japan)

FrC1-1

08:30-08:50

Experiments on Interferometric Angle of Arrival Estimation Using a Simple Weight Network

Daishi Iwamoto, Nana Narukawa, Kazuhiro Honda, and Koichi Ogawa
Toyama University, Japan

FrC1-2

08:50-09:10

Study on Improvement of Position Estimation Accuracy of MUSIC Method Using Array Interpolation and Spatial Averaging

Kazuki Watakabe, Keizo Cho, and Hiroaki Nakabayashi
Chiba Institute of Technology, Japan

FrC1-3

09:10-09:30

Evaluation of Position Estimation of a Human Body around a Vehicle

Yuki Ito¹, Hisato Iwai¹, Hideichi Sasaoka¹, and Kiyokazu Ieda²
¹*Doshisha University, Japan*, ²*Aisin Seiki Co., Ltd., Japan*

FrC1-4

09:30-09:50

Performance Improvement by Two-Step Search Method in DOA Estimation Based on Compressed Sensing

Toshiya Nasu, Nobuyoshi Kikuma, and Kunio Sakakibara
Nagoya Institute of Technology, Japan

FrC1-5

09:50-10:10

DOA Estimation of Desired Wave with Interference Rejection Using Beamspace Root-MUSIC

Kento Kataoka, Nobuyoshi Kikuma, and Kunio Sakakibara
Nagoya Institute of Technology, Japan



[FrD1] [Special Session] IAET Special Session: Mobile/Wireless Communication Antennas

Date / Time	Oct. 26 (Fri.), 2018 / 08:30-10:10
Place	Room D (Napoli Room)
Session Chairs	Jui-Han Lu (National Kaohsiung University of Science and Technology, Taiwan) Shu-Chuan Chen (National Defense University, Taiwan)

FrD1-1

08:30-08:50

A Smartwatch Dipole Antenna for LTE/GPS/WWAN Applications

Jui-Han Lu, Jing-Hui Zhuang, and Jia-Wen Hsu

National Kaohsiung University of Science and Technology, Taiwan

FrD1-2

08:50-09:10

A Band Reconfigurable Antenna for a Mobile Phone with the Metal Cover

Jui-Han Lu, Syue-Yi Syu, and Yong-Yong Zhang

National Kaohsiung University of Science and Technology, Taiwan

FrD1-3

09:10-09:30

A Uniplanar Monopole Antenna for LTE/UMTS/WLAN in Tablet Computer Applications

Jun-Wei Huang, Tzu-Chi Chu, You-Sheng Zhan, Bing-Liang Ke, and Hsin-Lung Su

National Pingtung University, Taiwan

FrD1-4

09:30-09:50

LTE/5G C-Band MIMO Antennas for Laptop Computers

Wen Shan Chen and Ming-Han Liang

Southern Taiwan University of Science and Technology, Taiwan

FrD1-5

09:50-10:10

Microstrip Antenna for Ambient RF Energy Harvesting

Shun-Yun Lin¹, Yi Hsien Lin¹, Yuan-Chih Lin², Chun-Yu Tsai¹, and Yan-Yu Tuan¹

¹Cheng Shiu University, Taiwan, ²Metal Industries Research&Development Centre, Taiwan



[FrE1] [Special Session] Antennas Aspects of 5G Communication in the next 5 Years

Date / Time	Oct. 26 (Fri.), 2018 / 08:30-10:10
Place	Room E (Venice Room)
Session Chairs	Wonbin Hong (POSTECH, Korea) Raj Mittra (University of Central Florida, USA)

FrE1-1

08:30-08:50

Some Challenges in Millimeter Wave Antenna Designs for 5G

Raj Mittra^{1,2}

¹University of Central Florida, USA, ²King Abdulaziz University, Saudi Arabia

FrE1-2

08:50-09:10

Advanced Coupled-Fed MIMO Antennas for Next Generation 5G Smartphones

Chisang You¹, Doochan Jung¹, Moonsoo Song¹, and Kin-Lu Wong²

¹LG Electronics, Korea, ²National Sun Yat-Sen University, Taiwan

FrE1-3

09:10-09:30

A Dual-Band Circularly Polarized Antenna with Large Frequency Ratio for 5G Applications

Shao Yong Zheng

Sun Yat-Sen University, China

FrE1-4

09:30-09:50

28 GHz Pattern Reconfigurable Block Cell Antenna Featuring Electrically Small Profile

Moogoong Choo, Junho Park, and Wonbin Hong

POSTECH, Korea

FrE1-5

09:50-10:10

Wideband 39 GHz Vertically-Polarized Endfire Antenna-in-Package (AiP) Array Featuring Near-Planar Profile

Junho Park, Seung Yoon Lee, and Wonbin Hong

POSTECH, Korea



[FrF1] [Special Session] Antenna Measurements (AMTA) II

Date / Time	Oct. 26 (Fri.), 2018 / 08:30-10:10
Place	Room F (Miami Room)
Session Chairs	Satoru Kurokawa (National Institute of Advanced Industrial Science and Technology, Japan) Daniel Janse van Rensburg (NSI-MI Technologies, USA)

FrF1-1

08:30-08:50

Antenna Measurement System Using Radio over Fiber Transceiver with Vector Network Analyzer up to 6 GHz

S. Kurokawa¹, M. Hirose¹, Y. Toba², J. Terakado², M. Onizawa², and J. Ichijo²

¹AIST, Japan, ²Seiko Giken Co., Ltd., Japan

FrF1-2

08:50-09:10

Near-Field / Far-Field Application for a Spherical Scanner at mm-Wave Frequencies

Daniël Janse van Rensburg and John Wynne

NSI-MI Technologies, USA

FrF1-3

09:10-09:30

Antenna Measurement System for 5G Application

Geonho Jang, Seho Park, Hongsik Keum, Sangho Choi, and Goonyeon Kim

Korea Radio Promotion Association, Korea

FrF1-4

09:30-09:50

Field Analysis with Novel Choke Ring Antenna for Bioelectromagnetic Exposure System at 28 GHz

Philip A. Dzagbletey and Jae-Young Chung

Seoul National University of Science and Technology, Korea

FrF1-5

09:50-10:10

Analysis of Site Attenuation for Calculable Dipole Antenna by the Mismatch Power Loss

Ki-Chai Kim¹ and Hyuk-Jun Seo²

¹Yeungnam University, Korea, ²Daegu-Gyeongbuk Medical Innovation Foundation, Korea



[FrG1] [Special Session] Metamaterial-related Antennas

Date / Time	Oct. 26 (Fri.), 2018 / 08:30-10:10
Place	Room G (Sicily Room)
Session Chairs	Hisamatsu Nakano (Hosei University, Japan) Richard W. Ziolkowski (University of Technology Sydney, Australia)

FrG1-1

08:30-08:50

Dual-Functional Electrically Small Huygens Antenna System

Wei Lin and Richard W. Ziolkowski

University of Technology Sydney, Australia

FrG1-2

08:50-09:10

A Small Real-Estate Platform for 5G Beamforming/Beam-Steering Antennas Shared with WBAN UHF-Band MIMO Antennas

Heejun Park, Gwang-Gyun Namgung, Changhyeong Lee, Jinyoung Kwon, and Sungtek Kahng

Incheon National University, Korea

FrG1-3

09:10-09:30

Phase Change for CP Conical Radiation from a Metaloop Antenna

Hisamatsu Nakano, Tomoki Abe, and Junji Yamauchi

Hosei University, Japan

FrG1-4

09:30-09:50

Coaxially Fed Monopole Antenna Composed of Composite Right/Left-Handed Transmission Line

Takatsugu Fukushima¹, Naobumi Michishita¹, Hisashi Morishita¹, and Naoya Fujimoto²

¹National Defense Academy, Japan, ²Hitachi Kokusai Electric Inc., Japan

FrG1-5

09:50-10:10

Polarization Control of Leaky Wave Radiation from Phase-Shifting Nonreciprocal CRLH Metamaterials

Junji Yamauchi¹, Tetsuya Ueda¹, and Tatsuo Itoh²

¹Kyoto Institute of Technology, Japan, ²University of California, USA



[FrA2] [Special Session] Application of Machine Learning Algorithms to Antenna Design and Radar Signal Processing

Date / Time	Oct. 26 (Fri.), 2018 / 10:30-12:10
Place	Room A (Grand Ballroom 1)
Session Chair	Youngwook Kim (California State University, USA)

FrA2-1

10:30-10:50

Application of Machine Learning to Antenna Design and Radar Signal Processing: A Review

Youngwook Kim

California State University, USA

FrA2-2

10:50-11:10

Classification of Drone Type Using Deep Convolutional Neural Networks Based on Micro Doppler Simulation

Byunggil Choi and Daegun Oh

DGIST, Korea

FrA2-3

11:10-11:30

Radar Application of Deep Neural Networks for Recognizing Micro-Doppler Radar Signals by Human Walking and Background Noise

Jihoon Kwon^{1,2}, Seoungui Lee^{1,2}, and Nojun Kwak²

¹*Hanwha Systems, Korea*, ²*Seoul National University, Korea*

FrA2-4

11:30-11:50

Decision-Level Fusion Scheme of SVM and Naive Bayes Classifier for Radar Target Recognition

Young-Jae Choi¹, In-Sik Choi¹, and Dae-Young Chae²

¹*Hannam University, Korea*, ²*ADD, Korea*

FrA2-5

11:50-12:10

Fast DCNN-Based Human Activity Classification with On-Body Antenna Using Generative Models

Hyeongmin Park and Taesup Moon

Sungkyunkwan University, Korea



[FrB2] EBG, Metamaterials and Applications

Date / Time	Oct. 26 (Fri.), 2018 / 10:30-12:30
Place	Room B (Grand Ballroom 2)
Session Chairs	Naobumi Michishita (National Defense Academy, Japan) Rangsan Wongsan (Suranaree University of Technology, Thailand)

FrB2-1

10:30-10:50

Thin Cylindrical Cloak Using Multi-Layer Ceramic Capacitors

Thanh Binh Nguyen¹, Naobumi Michishita¹, Hisashi Morishita¹, Teruki Miyazaki², and Masato Tadokoro²

¹National Defense Academy, Japan, ²The Yokohama Rubber Co., Ltd., Japan

FrB2-2

10:50-11:10

Equivalent Circuit Modeling for Combination of Square-Shaped and H-Shaped SRRs

Pornpat Pramerudeechaisak, Piyaporn Mesawad, and Rangsan Wongsan

Nakhon Ratchasima, Thailand

FrB2-3

11:10-11:30

Gain Enhancement of Asymmetric Horn for Secondary Radar Antenna System Using Hybrid Metamaterials

P. Khamsalee, P. Mesawad, and R. Wongsan

Suranaree University of Technology, Thailand

FrB2-4

11:30-11:50

An Update on Use of Unstable Non-Foster Networks in Metamaterial-Inspired EM Structures

Silvio Hrbar, Igor Krois, and Leo Vincelj

University of Zagreb, Croatia

FrB2-5

11:50-12:10

Meta-Dome Structure for Simultaneously Absorbing Radar and Protecting Environment

Heijun Jeong, Toan Trung Nguyen, and Sungjoon Lim

Chung-Ang University, Korea

FrB2-6

12:10-12:30

A Broadband Metasurface for Cross Polarization Conversion Applications

Meraj E Mustafa and Farooq A. Tahir

National University of Sciences and Technology, Pakistan



[FrC2] Sensor Networks, Adhoc Systems, and Mobile Communication Systems

Date / Time	Oct. 26 (Fri.), 2018 / 10:30-12:30
Place	Room C (Grand Ballroom 3)
Session Chairs	Munkyo Seo (Sungkyunkwan University, Korea) Peeramed Chodkaveekityada (King Mongkut's Institute of Technology Ladkrabang, Thailand)

FrC2-1

10:30-10:50

Sensitivity Analysis of Humidity Sensor with Various Sensing Region Length

Jin-Kwan Park¹, Chorom Jang¹, Hee-Jo Lee², Hyang Hee Choi¹, and Jong-Gwan Yook¹

¹Yonsei University, Korea, ²Daegu University, Korea

FrC2-2

10:50-11:10

Performance Analysis of Extended Sensor Sharing in Vehicular Ad Hoc Networks

Zhongyi Shen, Xin Zhang, and Dacheng Yang

Beijing University of Posts and Telecommunications, China

FrC2-3

11:10-11:30

A Location-Based Extended Sensor Sharing Algorithm in Vehicular Ad Hoc Networks

Zhongyi Shen, Xin Zhang, and Dacheng Yang

Beijing University of Posts and Telecommunications, China

FrC2-4

11:30-11:50

Design and Development of Effective Radiosonde for Rainmaking Process in Thailand

Peeramed Chodkaveekityada and Paramote Wardkein

King Mongkut's Institute of Technology Ladkrabang, Thailand

FrC2-5

11:50-12:10

Compact Massive MIMO Antenna Using Cubic Arrangement Suitable for Indoor Base Station

Kosei Oikawa¹, Kazunori Yuri¹, Naoki Honma¹, and Kentaro Nishimori²

¹Iwate University, Japan, ²Niigata University, Japan

FrC2-6

12:10-12:30

On the Sparsity and Aperiodicity of a Base Station Antenna Array in a Downlink MU-MIMO Scenario

N. Amani¹, R. Maaskant^{1,2}, and W. A. Van Cappellen³

¹Chalmers University of Technology, Sweden, ²Eindhoven University of Technology, The Netherlands,

³Netherlands Institute for Radio Astronomy, The Netherlands



[FrD2] EM Propagation Fundamentals and Measurements

Date / Time	Oct. 26 (Fri.), 2018 / 10:30-12:30
Place	Room D (Napoli Room)
Session Chairs	Soon-Soo Oh (Chosun University, Korea) Hajime Fukuchi (Tokyo Metropolitan University, Japan)

FrD2-1

10:30-10:50

Integration Time Dependence of Rainfall Rate Spatial Correlation Derived from Radar Rain Map

Hajime Fukuchi

Tokyo Metropolitan University, Japan

FrD2-2

10:50-11:10

The Relation of Total Electron Content between Libreville and Ny-Alesund IGS Stations

S. Z. Hamzah, M. J. Homam, and M. Z. M. Alias

Universiti Tun Hussein Onn Malaysia, Malaysia

FrD2-3

11:10-11:30

Analysis of Wave Propagation Using Half-Canyon Model

Hwa-Choon Lee¹, Young-Chul Lee², Byung-Lok Cho³, Il-Yong Lee⁴, Jong-Hyuk Lim⁴, Dae-Hwan Yoon⁴, Sung Won Park⁴, and Soon-Soo Oh¹

¹*Chosun University, Korea*, ²*Mokpo National Maritime University, Korea*, ³*Sunchon National University, Korea*,

⁴*National Radio Research Agency, Korea*

FrD2-4

11:30-11:50

Statistical Analysis of 1090 MHz Signals Measured During a Flight Experiment

Junichi Honda and Takuya Otsuyama

Electronic Navigation Research Institute, Japan

FrD2-5

11:50-12:10

Prediction Method by Deep-Learning for Path Loss Characteristics in an Open-Square Environment

Nobuaki Kuno and Yasushi Takatori

NTT Corporations, Japan

FrD2-6

12:10-12:30

Multi-Path Channel Based Detection Metric for Passive Radar Systems

Hassan El-Sallabi, Abdulaziz Aldosari, and Yahia Basahl

Qatar Armed Forces, Qatar



[FrE2] Reflector, Lens and Radomes

Date / Time	Oct. 26 (Fri.), 2018 / 10:30-12:30
Place	Room E (Venice Room)
Session Chairs	Nelson J. G. Fonseca (European Space Agency, The Netherlands) Jae W. Lee (Korea Aerospace University, Korea)

FrE2-1

10:30-10:50

A Linearly Polarized Reflectarray Suppressing Beam Shift

Hiroki Yamada, Kotaro Sakagawa, Hiroyuki Deguchi, and Mikio Tsuji
Doshisha University, Japan

FrE2-2

10:50-11:10

Reflectarray Antenna Constructed by Arranging Double Omega-Shaped Resonant Elements for Orthogonal-Polarization Conversion

Teruki Murayama, Shusuke Sasaki, Daichi Higashi, Hiroyuki Deguchi, and Mikio Tsuji
Doshisha University, Japan

FrE2-3

11:10-11:30

Comparison of Simulated Performance of Faceted & Flat Reflectarray Antennas

Chia Tse Tong^{1,2}, Chong En Fui Raelene³, and Ker Chin Tian³
¹*National University of Singapore, Singapore*, ²*DSO National Laboratories, Singapore*,
³*NUS High School of Maths & Science, Singapore*

FrE2-4

11:30-11:50

Analysis of Wideband Reflectarrays Based on Different Progressive Phase Centers

M. Hashim Dahri¹, M. H. Jamaluddin¹, M. Inam¹, R. Selvaraju¹, N. H. Shahadan², and M. R. Kamarudin³
¹*Universiti Teknologi Malaysia, Malaysia*, ²*Politeknik Ibrahim Sultan, Malaysia*, ³*Cranfield University, UK*

FrE2-5

11:50-12:10

Design of Dielectric Lens Antenna for 5G Mobile Base Station

Farizah Ansarudin^{1,2}, Tharek Abd Rahman¹, and Yoshihide Yamada¹
¹*Universiti Teknologi Malaysia, Malaysia*, ²*Universiti Kebangsaan Malaysia, Malaysia*

FrE2-6

12:10-12:30

The Water Drop Lens: A Modulated Geodesic Lens Antenna Based on Parallel Curves

Nelson J. G. Fonseca¹, Qingbi Liao², and Oscar Quevedo-Teruel²
¹*European Space Agency, The Netherlands*, ²*Royal Institute of Technology, Sweden*



[FrF2] Wearable and Implantable Antennas

Date / Time	Oct. 26 (Fri.), 2018 / 10:30-12:30
Place	Room F (Miami Room)
Session Chairs	Jae-Young Chung (Seoul National University of Science and Technology, Korea) Biswarup Rana (Seoul National University of Science and Technology, Korea)

FrF2-1

10:30-10:50

Performance Improvement for Monopole Antenna with Circumferential Wire Medium

Rapin Kudpik, Piyaphorn Meesawad, and Rangsan Wongsan
Suranaree University of Technology, Thailand

FrF2-2

10:50-11:10

Dual Band Bowtie Antenna with Matching Stub for Medical Application

Seongjin Park¹, Seonho Lim¹, Donghyun Kim¹, Hyungrak Kim², and Young Joong Yoon¹
¹*Yonsei University, Korea*, ²*Daelim University College, Korea*

FrF2-3

11:10-11:30

Electromagnetic Exposure on Human Phantom Model in Time-Reversed Wireless Power Transmission System

Joon-Hong Kim, Hoyeol Kim, and Sangwook Nam
Seoul National University, Korea

FrF2-4

11:30-11:50

Animal Skin Phantom for RFID UHF Transponder Development

Dominik Gottardi, Volker Wienstroer, and Rainer Kronberger
TH Cologne University of Applied Sciences, Germany

FrF2-5

11:50-12:10

Implantable Antenna Design for Wireless Brain Signal Monitoring

Biswarup Rana¹, Jae-Yeon Shim², and Jae-Young Chung³
Seoul National University of Science and Technology, Korea

FrF2-6

12:10-12:30

Relations of Input Resistance Increases and Current Distributions of a Normal-Mode Helical Antenna in a Human Body Condition

Norsiha Zainudin¹, Yoshihide Yamada², Tarik Abdul Latef¹, Kamilia Kamardin², and Nguyen Quoc Dinh³
¹*University of Malaya, Malaysia*, ²*Universiti Teknologi Malaysia, Malaysia*, ³*Le Quy Don Technical University, Vietnam*



[FrG2] Frequency Selective Surfaces and Filters

Date / Time	Oct. 26 (Fri.), 2018 / 10:30-12:10
Place	Room G (Sicily Room)
Session Chair	Saptarshi Ghosh (Chung-Ang University, Korea)

FrG2-1

10:30-10:50

An Improved Multifunctional Frequency Selective Surface Based on Microfluidic Technology

Saptarshi Ghosh¹, Ratanak Phon¹, Manos M. Tentzeris², and Sungjoon Lim¹

¹Chung-Ang University, Korea, ²Georgia Institute of Technology, USA

FrG2-2

10:50-11:10

Switchable Frequency Selective Surface Exhibiting Multifunctional Characteristics

Ratanak Phon, Saptarshi Ghosh, and Sungjoon Lim

Chung-Ang University, Korea

FrG2-3

11:10-11:30

Triple-Band Beam Switching Antenna Based on Active Frequency Selection Surfaces

Jun Yu, Wen Jiang, and Shuxi Gong

Xidian University, China

FrG2-4

[Invited Speaker]

11:30-12:10

Resonant Transmission of Electromagnetic Wave through Small Apertures

Young-Ki Cho

Kyungpook National University, Korea



[FrA3] EBG, Metamaterials and Nano-Electromagnetics

Date / Time	Oct. 26 (Fri.), 2018 / 14:30-16:10
Place	Room A (Grand Ballroom 1)
Session Chairs	Prayoot Akkaraekthalin (King Mongkut's University of Technology North Bangkok, Thailand) Amit Kumar Singh (Indian Institute of Technology Delhi, India)

FrA3-1

14:30-14:50

A Dual-Band Metasurface Using Ring Resonator with Interdigital Capacitors

K. Rakdanklang¹, P. Chomtong¹, P. Krachodnok², and P. Akkaraekthalin²

¹Suranaree University of Technology, Thailand, ²King Mongkut's University of Technology, Thailand

FrA3-2

14:50-15:10

Ultra-Wideband Metamaterial Using Complementary Ring with Inductive Load Strip

S. Sang-Arsa, P. Krachodnok, and R. Wongsan

Suranaree University of Technology, Thailand

FrA3-3

15:10-15:30

Design of Dual-Band Metamaterial Using Jerusalem Cross Structure with Interdigital Technique for LTE and WLAN Systems

W. Kamonsin¹, P. Chomtong², P. Krachodnok¹, and P. Akkaraekthalin²

¹Suranaree University of Technology, Thailand, ²King Mongkut's University of Technology North Bangkok, Thailand

FrA3-4

15:30-15:50

Radial Graded Index Metasurface Lens for Beam Steering and Gain Enhancement

Amit K. Singh, Mahesh P. Abegaonkar, and Shibani K. Koul

Indian Institute of Technology Delhi, India

FrA3-5

15:50-16:10

Planar Monopole Antenna with Offset Square Split Ring Resonator

Murtala Aminu-Baba, Mohammad Kamal A Rahim, Farid Zubir, Mohd Fairus Mohd Yusoff, and Noor Asmawati Samsuri

Universiti Teknologi Malaysia, Malaysia



[FrB3] Other Antenna Topics

Date / Time	Oct. 26 (Fri.), 2018 / 14:30-16:30
Place	Room B (Grand Ballroom 2)
Session Chairs	Beijia Liu (Harbin Institute of Technology, China) Gangil Byun (UNIST, Korea)

FrB3-1

14:30-14:50

Multimode Horn Antennas with Square Aperture Loading Grooves for Circular Beam and Low Cross-Polarization Characteristic

Reiko Omi, Ryo Wakabayashi, Hiroyuki Deguchi, and Mikio Tsuji
Doshisha University, Japan

FrB3-2

14:50-15:10

A Novel Deployable Quasi-Yagi Monopole Antenna Using Origami Magic Spiral Cube

Syed Imran Hussain Shah and Sungjoon Lim
Chung-Ang University, Korea

FrB3-3

15:10-15:30

Impulse Radiating Antenna Modeling Using Numerical Electromagnetics Code

Arim Ha and Kangwook Kim
GIST, Korea

FrB3-4

15:30-15:50

A Study of an In-Line Slot Array Antenna Fed by a Zigzag Ridge Waveguide

Takashi Uno¹, Narihiro Nakamoto¹, Toru Fukasawa¹, Takeshi Yamamoto¹, Ikuya Kakimoto¹, Naofumi Yoneda¹, and Yoshihiko Konishi²
¹*Mitsubishi Electric Corporation, Japan*, ²*Hiroshima Institute of Technology, Japan*

FrB3-5

15:50-16:10

Waveguide Slot Filtering Antenna with Metamaterial Surface

Wei Wang¹, Zhi Zheng¹, Hong-Tao Zhang¹, Mou-Ping Jin¹, and Ying Liu²
¹*East China Research Institute of Electronic Engineering, China*, ²*Xidian University, China*

FrB3-6

16:10-16:30

Integrated Wideband/Reconfigurable Notched Band Dielectric Resonator Antenna

Beijia Liu, Jinghui Qiu, Changhui Wang, Hua Zong, Shengchang Lan, and Nannan Wang
Harbin Institute of Technology, China



ISAP 2018

2018 INTERNATIONAL SYMPOSIUM ON
ANTENNAS AND PROPAGATION

[FrC3] [Special Session] Advanced Applications of Artificial Electromagnetic Materials and Structures

Date / Time	Oct. 26 (Fri.), 2018 / 14:30-16:10
Place	Room C (Grand Ballroom 3)
Session Chairs	Dongho Kim (Sejong University, Korea) Hang Wong (City University of Hong Kong, Hong Kong, China)

FrC3-1

14:30-14:50

Lightweight 3-D Printed Metamaterial for Electromagnetic Wave Absorption

Saptarshi Ghosh¹, Manos M. Tentzeris², and Sungjoon Lim¹

¹Chung-Ang University, Korea, ²Georgia Institute of Technology, USA

FrC3-2

14:50-15:10

Frequency Selective Film Design for Building Walls for Blocking Wireless LAN Signal

Sung-Sil Cho, In-Gon Lee, and Ic-Pyo Hong

Kongju National University, Korea

FrC3-3

15:10-15:30

3D Printed Broadband Dielectric Lens Based on Subwavelength Metamaterial

Quan-Wei Lin and Hang Wong

City University of Hong Kong, Hong Kong, China

FrC3-4

15:30-15:50

Two-Dimensional Retrodirective Metasurface Using Generalized Snell's Law

The Viet Hoang and Jeong-Hae Lee

Hongik University, Korea

FrC3-5

15:50-16:10

Electrical Beam Scan Antenna Using Miniaturized Frequency Selective Reflectors

Seokmin Lee, Injoong Nam, and Dongho Kim

Sejong University, Korea



[FrD3] [Special Session] Automotive EMC

Date / Time	Oct. 26 (Fri.), 2018 / 14:30-16:50
Place	Room D (Napoli Room)
Session Chairs	Jaegon Shin (KATRI, Korea) Ki-Chai Kim (Yeungnam University, Korea)

FrD3-1

14:30-14:50

A Study on the EMI Effect of Impedance Mismatching for LVDS Single Transmission Line in Vehicle Camera System
Byeongchan Jo and Kibum Jung
E&R Co., Ltd., Korea

FrD3-2

14:50-15:10

A Development of 146 ~222 MHz Folded Dipole Antenna in an Immunity Test of Portable Transmitters on Road Vehicle Components
Hyok Lee¹, Myogeun Yang², and Jaehoon Choi³
¹KATECH, Korea, ²IVIEW, Korea, ³Hanyang University, Korea

FrD3-3

15:10-15:30

Simulation of Radiated Emissions from a Low Voltage BLDC Motor
Jongkyong Lee¹, Kibum Jung¹, and Sungjun Park²
¹E&R Co., Ltd., Korea, ²Hanon System, Korea

FrD3-4

15:30-15:50

77 GHz Automotive Radar Simulation
A. Wien, W. Simon, and R. Kress
IMST GmbH, Germany

FrD3-5

15:50-16:10

A Broadband Conical Antenna for Measuring Partial Discharge
Jong-Woo Park¹, Sung-Woo Jung², and Ki-Chai Kim¹
¹Yeungnam University, Korea, ²Gyeongbuk Research Institute of Vehicle Embedded Technology, Korea

FrD3-6

16:10-16:30

Analysis of Electromagnetic Pulse Coupling into Electronic Device Considering Wire and PCB Resonance
Sangin Kim¹, Jongwon Lee², Jin-Soo Choi², and Jong-Gwan Yook¹
¹Yonsei University, Korea, ²ADD, Korea

FrD3-7

16:30-16:50

Analysis and Design of Microwave Plasma for Ozone Generator System by Using Magnetron Tube
Kachaporn Lhathum, Supawat Kotchapradit, Thanaset Thosdeekoraphat, Samran Santalunai, and Chanchai Thongsopa
Suranaree University of Technology, Thailand



[FrE3] [Special Session] Antennas for Military Applications

Date / Time	Oct. 26 (Fri.), 2018 / 14:30-16:10
Place	Room E (Venice Room)
Session Chairs	Keum Cheol Hwang (Sungkyunkwan University, Korea) Jong-Myung Woo (Chungnam National University, Korea)

FrE3-1

14:30-14:50

Military Antennas

Jae-Yoon Shin and Jong-Myung Woo
Chungnam National University, Korea

FrE3-2

14:50-15:10

An All Textile H-Plane SIW Horn Antenna with Corrugated Ground for Military Applications

Seongkyu Lee and Jaehoon Choi
Hanyang University, Korea

FrE3-3

15:10-15:30

Optimization of Cavity-Backed Patch Array Antenna Using Genetic Algorithm

Sang Il Kim^{1,3}, Dong Hwan Kim¹, Trinh Van Son³, Joon Young Park¹, Doo Soo Kim², and Keum Cheol Hwang³
¹*Hanwha Systems, Korea*, ²*ADD, Korea*, ³*Sungkyunkwan University, Korea*

FrE3-4

15:30-15:50

Grating Lobe Reduced Waveguide Slot Array Antenna

Son Trinh-Van¹, Sung Chan Song², Seung-Hee Seo³, and Keum Cheol Hwang¹
¹*Sungkyunkwan University, Korea*, ²*Hanwha Systems, Korea*, ³*ADD, Korea*

FrE3-5

15:50-16:10

A Validity Study on Dip & Vacuum Brazing Method for Ka-Band Waveguide Slot Array Antenna

Chae-Hyun Jung, Jong-Gyun Baek, Kook-Joo Lee, Chang-Hyun Park, and Jongkuk Park
LIG Nex1 Co., Ltd., Korea



[FrF3] [Special Session] Millimeter Wave Metasurfaces for Communication and Sensing

Date / Time	Oct. 26 (Fri.), 2018 / 14:30-16:10
Place	Room F (Miami Room)
Session Chairs	Jungsuek Oh (Seoul National University, Korea) Kuang Zhang (Harbin Institute of Technology, China)

FrF3-1

14:30-14:50

Principle of Ultra-Thin Metalenses and Applications in Manipulation of Electromagnetic Waves

Kuang Zhang, Ruiwei Dai, Yueyi Yuan, Xumin Ding, Guohui Yang, Jiahui Fu, and Qun Wu
Harbin Institute of Technology, China

FrF3-2

14:50-15:10

Continuously Tapered Sinusoidally Modulated Reactance Surface Antenna

Doohyun Yang and Sangwook Nam
Seoul National University, Korea

FrF3-3

15:10-15:30

Design of Frequency Selective Surface Loaded to Multilayer Dielectric Plate for Loss Reduction over Wide Incident Angle

Shota Ino, Tomihiro Ikegami, Kunio Sakakibara, Nobuyoshi Kikuma, and Toshikazu Hori
¹*Nagoya Institute of Technology, Japan*, ²*University of Fukui, Japan*

FrF3-4

15:30-15:50

Design of Compact Flat Lens for 5G MIMO Array Antenna System

Seungtae Ko, Yoongeon Kim, Hyunjin Kim, and Youngjoo Lee
Samsung Electronics Co., Ltd., Korea

FrF3-5

15:50-16:10

Cross Bowtie Antenna-Coupled Detector for Circularly Polarized Infrared Wave Sensing

Sangjo Choi
University of Ulsan, Korea



ISAP 2018

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ANTENNAS AND PROPAGATION

[FrG3] [Special Session] Signal Detection Technology

Date / Time	Oct. 26 (Fri.), 2018 / 14:30-16:30
Place	Room G (Sicily Room)
Session Chairs	Young Ju Park (ADD, Korea) Chiho Lee (ADD, Korea)

FrG3-1

14:30-14:50

Beamforming Characteristics of a Phased Array Reflector Using a Log Periodic Dipole Antenna as an Array Element

Sungjun Yoo and Hosung Choo

Hongik University, Korea

FrG3-2

14:50-15:10

A Compact Wideband Substrate-Integrated Waveguide MIMO Antenna for Radar Detecting Application

Yunnan Jin, Seongkyu Lee, Youngtaek Hong, Kyoseung Keum, and Jaehoon Choi

Hanyang University, Korea

FrG3-3

15:10-15:30

A Cascade AOA Estimation Technique with Rectangular Array Antenna

Tae Yun Kim, Ji Youn Mun, and Suk-Seung Hwang

Chosun University, Korea

FrG3-4

15:30-15:50

A Parallel Multi-Channel Cooperative Spectrum Sensing in Cognitive Radio Networks

Dongho Seo and Haewoon Nam

Hanyang University, Korea

FrG3-5

15:50-16:10

Radiation from Concave Optical Fiber Tips Fabricated by Laser Induced Photothermal Effects

Gyeongho Son and Kyoungsik Yu

KAIST, Korea

FrG3-6

16:10-16:30

Prediction of Electromagnetic Wave Propagation in Dispersive Atmospheric Environments

Changseong Kim, Jun Heo, Daeyeong Yoon, and Yong Bae Park

Ajou University, Korea