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POS1-24 Dual Band Coupled-fed MIMO Antennas for WLAN Application 583

#Wen-Hsiu Hsu[1], Chi-Hsiung Huang[1], Shan-Cheng Pan[1] and Chia-Lun Tang[2], *[1]HSU-TE University, Taiwan, [2]Auden Techno Corp., Taiwan*

POS1-25 Compact Metamaterial-inspired Broadband Monopole Antenna for WLAN/WiMAX Applications 588

#Hsin-Lung Su[1] and Wen Po Ho[2], *[1]National Pingtung Institute of Commerce, Taiwan, [2]Micro-Star INT'L CO., LTd., Taiwan*

POS1:Poster Session I

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POS1:Poster Session I

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POS1-38 Three-dimensional FDTD Analysis of Radio Wave Propagation at Intersection Surrounded by Compound Walls in Residential Area for Inter-vehicle Communications Using 720MHz band 640

#Kenji Taguchi, Ryosuke Aoyama, Suguru Imai and Tatsuya Kashiwa, *Kitami Institute of Technology, Japan*

POS1-39 Analysis of Multipath Propagation Characteristics for Digital Terrestrial Broadcasting in UHF Band on Urban Street Using Ray Tracing Method 644

#Suguru Imai[(1)], Kenji Taguchi[(1)], Tatsuya Kashiwa[(1)], Hiroshi Kuribayashi[(2)] and Satoru Komatsu[(2)], *[(1)]Kitami Institute of Technology, Japan, [(2)]Honda R&D Co., Ltd., Japan*

POS1-40 Transmission Characteristics of a Thin Metal Film Sandwiched between Dielectric Gratings 648

Yuu Wakabayashi, #Takato Fukui, Junji Yamauchi and Hisamatsu Nakano, *Hosei University, Japan*

POS1-41 The Convergence Property of the Method of Moment for Dipole Antenna Using New Segmentation. 652

#Saki Arahata, Toru Uno and Takuji Arima, *Tokyo University of Agriculture & Technology, Japan*

POS1-42 Grating and Plasmon Resonances in the Light Scattering by Finite Silver Nanostrip Grating 656

#Olga V. Shapoval[(1)], Ronan Sauleau[(2)] and Alexander I. Nosich[(1)], *[(1)]Institute of Radiophysics and Electronics NASU, Ukraine, [(2)]University of Rennes 1, France*

POS1-43 Research of the Indoor Reflection Wave Control with Phase Control Wall 660

#Ryokei Kitta and Yoshinobu Okano, *Tokyo City University, Japan*

POS1-44 Multilayer Rotman Lens Fed Antenna Array for System Packaging 664

#Jaeheung Kim, Woosung Lee and Young Joong Yoon, *Yonsei University, South Korea*

POS1-45 Wearable Multi-band Antenna with Tuning Function for On-body and Off-body Communications 668

#Chia-Hsien Lin, Kazuyuki Saito, Masaharu Takahashi and Koichi Ito, *Chiba University, Japan*

POS1-46 Equivalent Circuit of Intra-body Communication Channels Based on a Lossy Conductor Model 672

#Nozomi Haga[(1)] and Koichi Ito[(2)], *[(1)]Gunma University, Japan, [(2)]Chiba University, Japan*

POS1-47 Whole-body Averaged SAR Measurements of Postured Phantoms Exposed to E-/H-polarized Plane-wave Using Cylindrical Field Scanning 676

#Yoshifumi Kawamura[(1)], Takashi Hikage[(1)], Toshio Nojima[(1)], Tomoaki Nagaoka[(2)] and Soichi Watanabe[(2)], *[(1)]Hokkaido University, Japan, [(2)]National Institute of Information and Communications Technology, Japan*

POS1-48 Evaluation of SAR around an Implanted Cardiac Pacemaker Caused by Mobile Radio Terminal 680

#Yuta Endo[(1)], Kazuyuki Saito[(1,2)], Soichi Watanabe[(2)], Masaharu Takahashi[(1)] and Koichi Ito[(1)], *[(1)]Chiba University, Japan, [(2)]National Institute of Information and Communications Technology, Japan*

POS1-49 Construction of a Realistic Calculation Model of a Flip Phone for SAR Evaluations 684

#Kensuke Tanaka[(1)], Akihiro Tateno[(1)], Kazuyuki Saito[(2)], Tomoaki Nagaoka[(2)], Masaharu Takahashi[(1)] and Koichi Ito[(1)], *[(1)]Chiba University, Japan, [(2)]National Institute of Information and Communications Technology, Japan*

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POS1-50 Effects of Dipole Angle Variation at 900MHz in Frontal Phantom Face to Specific Absorption Rate N/A

#Mohd Hafizuddin Mat, Mohd Fareq Abd. Malek and Muhammad Solihin Zukefli, *Universiti Malaysia Perlis, Malaysia*

POS1-51 Whole-body Averaged SAR Measurements for Small Phantom by Calorimetric Method 692

#Takuya Akiyama[1,2], Kanako Wake[2], Takuji Arima[1,2], Soichi Watanabe[2] and Toru Uno[1], *[1]Tokyo University of Agriculture and Technology, Japan, [2]National Institute of Information and Communications Technology, Japan*

POS1-52 Analysis of Mushroom-like EBG Structure and UC-EBG for SAR Reduction 696

#Nurul Hafizah Mohd Hanafi[1,2], Mohammad Tariqul Islam[2] and Norbahiah Misran[2], *[1]Universiti Tun Hussein Onn Malaysia, Malaysia, [2]Universiti Kebangsaan Malaysia, Malaysia*

POS1-53 Whole Body SAR Measurement Technique by Using Wheeler Cap Method for Human Head Size Phantom 700

#Takuji Arima and Toru Uno, *Tokyo University of Agriculture and Technology, Japan*

POS1-54 Low Frequency Emission Simulation Using 3D Electromagnetic Solver Based on CISPR25 704

#Chihiro Ueda, *AET INC. Japan*

POS1-55 The Effective Design Approach of Radar Absorbing Leading Edge Structure of Airfoil 708

#Won-Ho Choi[1], Hong-Kyu Jang[1], Jae-Hwan Shin[1], Tae-Hoon Song[1], Jin-Kyu Kim[1], Jin-Bong Kim[2], Young-Sik Joo[3] and Chun-Gon Kim[1], *[1]Korea Advanced Institute of Science and Technology, South Korea, [2]Korea Institute of Materials Science, South Korea, [3]Agency for Defense Development, South Korea*

POS1-56 Pedestrian-to-vehicle Communication Access Method and Field Test Results 712

#Makoto Nagai, Ken Nakaoka and Yoshiharu Doi, *Panasonic Corporation, Japan*

POS1-57 A Study on Locations of Electrical Discharge in a Motor 716

#Kenichi Nakayama, Yukari Matsutake, Takahisa Yanagisawa, Shigeki Takeda and Kenichi Kagoshima, *Ibaraki University, Japan*

POS1-58 Experimental Study for DBF and Channelizer for Satellite/Terrestrial Integrated Mobile Communication System 720

#Yoshiyuki Fujino, Hiroyuki Tsuji, Norio Komiyama and Teruaki Orikasa, *National Institute of Inforamaion and Communications Technology, Japan*

POS1-59 Study of Indirect Lightning Effects on an Airborne Ultra Shortwave Antenna 724

#Jianqiang Wang[1], Shuguo Xie[1] and Hui Guo[2], *[1]Beijing University of Aeronautics and Astronautics, China, [2]Harbin Enginerring University, China*

POS1-60 Evaluation of Heating Characteristics of Microwave Thermal Therapy Using Biliary Stent Fed by Coaxial Probe 729

#Hiroshi Itakura, Kazuyuki Saito, Masaharu Takahashi and Koichi Ito, *Chiba University, Japan*

POS1-61 Development of the Coagulation Device by Microwave Energy for Biological Tissue. 733

#Mizuki Inoue, Kazuyuki Saito, Masaharu Takahashi and Koichi Ito, *Chiba University, Japan*

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3A1:MIMO and Cooperative Communication Technologies II

Co-Chairs: S.Obayashi *(Toshiba)*, N.Jalden *(Ericsson Research)* **09:00-10:40**

3A1-1 (Invited) **Evolution of Mobile Broadband and Smart-phones - LTE-A Technologies and New Antenna Era - 737**
#Narumi Umeda, *NTT DOCOMO, INC. Japan*

3A1-2 **An MMI based Adaptive Modulation and Coding for Cooperative MIMO-OFDM in Frequency Selective Channels 738**
#Masayuki Miyashita, Manabu Mikami and Hitoshi Yoshino, *Softbank Mobile Corp., Japan*

3A1-3 **Elimination of Wireless Service Blind Spot by Co-operation between Mobile Terminals 742**
#Kazuhiro Hashiba, Mitoshi Fujimoto and Toshikazu Hori, *University of Fukui, Japan*

3A1-4 **Performance Evaluation of D3LS and NCLS Smart Antenna in Mobile Communications 746**
#Akkarat Boonpoonga[(1)], Phichet Nilsuwan[(2)], Jukkrit Tagapanij[(2)] and Phaophak Sirisuk[(3)], *[(1)]King Mongkut's University of Technology North Bangkok, Thailand, [(2)]Mahanakorn University of Technology, Thailand, [(3)]King Mongkut's Institute of Technology Ladkrabang, Thailand*

3A2:New Trends in MIMO Systems I

Co-Chairs: B.Lau *(Lund Univ.)*, K.Ogawa *(Toyama Univ.)* **11:00-12:40**

3A2-1 **LTE-advanced 8×8 MIMO Measurements in an Indoor Scenario 750**
Karl Werner, Henrik Asplund, Daniel V.P. Figueiredo, #Niklas Jaldén and Björn Halvarsson, *Ericsson AB, Sweden*

3A2-2 **A Method for Controlling Phase Difference between Propagation Channels for Short-range MIMO Transmission 754**
#Kazumitsu Sakamoto, Ken Hiraga, Tomohiro Seki, Tadao Nakagawa and Kazuhiro Uehara, *NTT Corporation, Japan*

3A2-3 **Effect of Vertical Angle Spread of Multi-cluster on MIMO-OTA Spatial Channel Emulation 758**
#Shuichi Obayashi[(1)], Takafumi Ohishi[(1)], Ippei Kashiwagi[(2)] and Yoshio Karasawa[(3)], *[(1)]Corporate Research & Development Center, Toshiba, Japan, [(2)]Digital Products & Services Company, Toshiba, Japan, [(3)]The University of Electro-Communications, Japan*

3A2-4 **Secure Communications Using Interference Alignment in MIMO Interference Channels 762**
#Satoshi Sasaki, Takayuki Shimizu, Hisato Iwai and Hideichi Sasaoka, *Doshisha University, Japan*

3A2-5 **Comparison of 4×1 SIMO and 2×2 MIMO Sensors Based on Measured Propagation Channels 766**
#Keita Ushiki[(1)], Kentaro Nishimori[(1)] and Naoki Honma[(2)], *[(1)]Niigata University, Japan, [(2)]Iwate University, Japan*

3A3:New Trends in MIMO Systems II

Co-Chairs: K.Nishimori *(Niigata Univ.)*, D.Manteuffel *(Univ. of Kiel)* **14:00-15:40**

3A3-1 Compact Antenna Arrangement for MIMO Sensor in Indoor Environment 770
#Naoki Honma[(1)], Kentaro Nishimor[(2)], Hiroaki Sato[(1)] and Yoshitaka Tsunekawa[(1)], *[(1)]Iwate University, Japan, [(2)]Niigata University, Japan*

3A3-2 Compact MIMO Antenna Arrays Using Metamaterial Hybridization Band Gaps 774
#Geoffroy Lerosey[(1)], Christian Leray[(2)], Fabrice Lemoult[(1)], Julien de Rosny[(1)], Arnaud Tourin[(1)] and Mathias Fink[(1)], *[(1)]CNRS, France, [(2)]Time Reversal Communications, France*

3A3-3 Compact UWB MIMO Antenna for USB Dongles with Angle and Polarization Diversity 778
#Buon Kiong Lau[(1)], Shuai Zhang[(2,3)], Anders Sunesson[(4)] and Sailing He[(2,3)], *[(1)]Lund University, Sweden, [(2)]Royal Institute of Technology, Sweden, [(3)]Zhejiang University, China, [(4)]European Spallation Source ESS AB, Sweden*

3A3-4 The Impact of a Matching Circuit of a Handset MIMO Antenna on the Wideband Channel Capacity 782
#Takeshi Kitamura, Kazuhiro Honda and Koichi Ogawa, *Toyama University, Japan*

3A3-5 Increasing the Volume of Test Zones in Anechoic Chamber MIMO Over-the-air Test Set-ups 786
#Wim Kotterman, *Ilmenau University of Technology, Germany*

3B1:Multiband / Wideband Antennas II

Co-Chairs: D.Chang *(Oriental Inst. of Tech.)*, M.Matsunaga *(Ehime Univ.)* **09:00-10:40**

3B1-1 12/21GHz Dual-band Feed Antenna for Satellite Broadcasting Receiving Reflector Antenna 790
#Masafumi Nagasaka, Susumu Nakazawa and Shoji Tanaka, *Japan Broadcasting Corporation, Japan*

3B1-2 A Wideband, Low Profile P- and Ku-band Dual Polarized Shared Aperture Antenna 794
#Shi Gang Zhou and Tan Huat Chio, *National University of Singapore, Singapore*

3B1-3 Dual-wideband and Dual-polarized Shared Aperture Antenna 798
#Shi Gang Zhou and Tan Huat Chio, *National University of Singapore, Singapore*

3B1-4 Triple Band Spiral Antenna for Non-Linear Junction Detector 802
#Jeong-won Kim, Kyeong-sik Min, In-hwan Kim and Chan-jin Park, *Korea Maritime University, South Korea*

3B1-5 A Novel Metamaterial Microstrip Antenna of Broadband and High-Gain 806
#Long Wang and Joshua Le-wei Li, *University of Electronic Science and Technology of China, China*

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3B2:Reconfiguable Antennas

Co-Chairs: Y.Kimura *(Saitama Univ.)*, J.Lu *(Natl. Kaohsiung Marine Univ.)* **11:00-12:40**

3B2-1 Frequency Control of Multi-band Ring Microstrip Antennas with Variable Reactance Circuits 810
#Shuhei Sato, Sakuyoshi Saito and Yuichi Kimura, *Saitama University, Japan*

3B2-2 PIN Diodes Slotted Microstrip Antenna as Frequency Reconfigurable Antenna 814
#Bambang S. Nugroho, Fitri Y. Zulkifli and Eko T. Rahardjo, *Universitas Indonesia, Indonesia*

3B2-3 Novel Reconfigurable Loop Antenna for Compact Mobile Phone 818
Dau-Chyrh Chang and #Hsin-Chi Li, *Oriental Institute of Technology, Taiwan*

3B2-4 Frequency Reconfigurable Substrate Integrated Waveguide Antenna 822
#Somarith Sam and Sungjoon Lim, *Chung-Ang University, South Korea*

3B2-5 Ultra-Wide to Narrow Band Agile Reconfigurable Frequency Microstrip Slot Antenna 826
#Majid Huda, Rahim Mohamad Kamal, Hamid Mohamad Rijal and Ismail Mohd Faizal, *Universiti Teknologi Malaysia, Malaysia*

3B3: UWB Antenna

Co-Chairs: Y.Nishioka *(Mitsubishi Electric)*, L.Guo *(Natl. Univ. of Singapore)* **14:00-15:40**

3B3-1 A Study of a Leaf-shaped Bowtie Slot Antenna for UWB Applications 830
#Soh Fujita, Manabu Yamamoto and Toshio Nojima, *Hokkaido University, Japan*

3B3-2 Planar Cone-shaped Monopole Antenna with Tapered Ground for UWB Application 834
Hashimu U. Iddi[(1)], #Muhammad R. Kamarudin[(1)], Tharek A. Rahman[(1)] and Raimi Dewan[(1)], *[(1)]Universiti Teknologi Malaysia, Malaysia, [(2)]University of Dar es Salaam, Tanzania*

3B3-3 A Wideband Antenna with Fan-shaped and Trapezoidal Elements for Ultra Wideband Radio 838
#Fukuro Koshiji[(1)], Yusuke Akiyama[(1)], Shunsuke Itaya[(1)] and Kohji Koshiji[(2)], *[(1)]Kokushikan University, Japan, [(2)]Tokyo University of Science, Japan*

3B3-4 Analysis of SLL at UWB Scanning Array Based on TTD BFN 842
#Dau-Chyrh Chang and Chao-Hsiang Liao, Oriental Institute of Technology, Taiwan

3B3-5 Propeller-shaped Ultra-wideband Planar Adaptive Antenna 846
#Erika Takemoto and Akira Hirose, *The University of Tokyo, Japan*

3C1:Array Antennas

Co-Chairs: H.Shoki *(Toshiba)*, K.Min *(Korea Maritime Univ.)* **09:00-10:40**

3C1-1 A Compact 8-element Antenna Array for GPS Digital Beamforming 850
#Lu Guo, Peng-Khiang Tan and Tan-Huat Chio, *National University of Singapore, Singapore*

3C1-2 Design of A Shared Arm Slot Array for Imaging Radar Applications 854
#Woong Kang(1), Dong Won Yang(2), Seongjoon Kim(1) and Kangwook Kim(1), *(1)Gwangju Institute of Science and Technology, South Korea, (2)Agency for Defense Development, South Korea*

3C1-3 Linear Polarization Switchable Microstrip Array Antenna Using Magic-T Circuit 858
#Tomoya Onishi, Md. A. Hossain, Eisuke Nishiyama and Ichihiko Toyoda, *Saga University, Japan*

3C1-4 Adaptive Genetic Algorithm for Damaged Beam Pattern Re-synthesis of Active Phased Array 862
#Jung-Hoon Han, Sang-Ho Lim and Noh-Hoon Myung, *Korea Advanced Institute of Science and Technology, South Korea*

3C1-5 Designing an Arbitrary Tilt Angle of Dual-beam Pattern by Using Genetic Algorithm 866
#Yuko Rikuta and Yoshio Ebine, *Nihon Dengyo Kosaku Co., Ltd., Japan*

3C2:Metamaterial Antennas I

Co-Chairs: T.Hori *(Fukui Univ.)*, M.Islam *(Univ. Kebangsaan Malaysia)* **11:00-12:40**

3C2-1 A Metasurface Antenna for Space Application 870
#Gabriele Minatti(1), Stefano Maci(1), Paolo De Vita(2), Angelo Freni(3) and Marco Sabbadini(4), *(1)University of Siena, Italy, (2)Ingegneria dei Sistemi, IDS s.p.a, Italy, (3)University of Florence, Italy, (4)European Space Agency, Netherlands*

3C2-2 Enhance Efficiency of High Frequency Antennas Using Lossy Metamaterials 874
#Florent Jangal and Nicolas Bourey, *Onera - The French Aerospace Lab, France*

3C2-3 A C-Band High-gain Microstrip Antenna Using Negative Permeability Metamaterial on Low Temperature Co-fire Ceramic (LTCC) Substrate N/A
#Zhenzhe Liu and Peng Wang, *University of Electronic Science and Technology of China, China*

3C2-4 A Novel Textile Antenna for Passive UHF RFID Tag 882
#Rita Saba(1), Thibaut Deleruyelle(2), Juvenal Alarcon(1), Michel Al Khoury(1) and Philippe Pannier(1), *(1)IM2NP, France, (2)IM2NP/ISEN, France*

3C2-5 Design of Active Frequency Selective Surface for Electronically Steerable Antenna 886
#Liang Zhang, Guohui Yang and Qun Wu, *Harbin Institute of Technology, China*

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3C3:Metamaterial Antennas II

Co-Chairs: F.Jangal *(ONERA)*, R.W.Ziolkowski *(Univ. of Arizona)* **14:00-15:40**

3C3-1 Single-element ZOR Antenna with Circularly Polarization Using CRLH Transmission Line 890
#Mitsuhiro Habuta, Yuto Maejima, Kazuhiro Kitatani and Yasuyuki Okamura, *Osaka University, Japan*

3C3-2 Composite Right/Left-handed Leaky-wave Antenna with Polarization Control 894
#Kohei Nishishita, Kazuhiro Kitatani and Yasuyuki Okamura, *Osaka University, Japan*

3C3-3 Size Reduction of Microstrip Antenna with CRLH-TL Metamaterial and Partial Ground Plane Techniques 898
#Eko T. Rahardjo, Willy Yuswardi and Fitri Y. Zulkifli, *Universitas Indonesia, Indonesia*

3C3-4 Verification of On-vehicle Media Applicability of a Metamaterial Antenna 902
#Kazushi Kawaguchi[(1)], Yuji Sugimoto[(1)], Takafumi Nishi[(2)] and Ichiro Shigetomi[(2)], *[(1)]NIPPON SOKEN, Inc., Japan, [(2)]DENSO Corporation, Japan*

3C3-5 Patch Antenna Miniaturization Using Artificial Magneto-dielectric Metasubstrate 906
#Sarawuth Chaimool, Atcharaporn Pinsakul and Prayoot Akkaraekthalin, *King Mongkut's university of Technology North Bangkok, Thailand*

3D1:Computational Electromagnetic I

Co-Chairs: B.M.Kolundzija *(Univ. of Belgrade)*, S.Ohnuki *(Nihon Univ.)* **09:00-10:40**

3D1-1 Optimum Block Division in CBFM for Fast MoM 910
#Keisuke Konno, Qiang Chen and Kunio Sawaya, *Tohoku University, Japan*

3D1-2 Acceleration of FGMRES Using Fast Multipole Method for Method of Moments Based on Combined Tangential Formulation 914
#Hidetoshi Chiba, Toru Fukasawa, Hiroaki Miyashita and Yoshihiko Konishi, *Mitsubishi Electric Corporation, Japan*

3D1-3 GPU Accelerated EM Modelling in Frequency Domain: Comparison of Performance of Various GPU Cards 918
Dusan P. Zoric[(1)], Dragan I. Olcan[(2)] and #Branko M. Kolundzija[(2)], *[(1)]WIPL-D d.o.o., Serbia, [(2)]University of Belgrade, Serbia*

3D1-4 Error Prediction of a 3-D Mode Matching Technique for a Simple Geometry 922
#Kenichiro Kobayashi, Shinichiro Ohnuki and Tsuneki Yamasaki, *Nihon University, Japan*

3D1-5 Comparing between Current and Field Basis Functions in Moment Method Solutions 926
#Haim Matzner and zalman Ibragimov, *Holon Institute of Technology, Israel*

3D2:Computational Electromagnetic II

Co-Chairs: A.I.Nosich *(IRE NASU)*, Q.Chen *(Tohoku Univ.)* **11:00-12:40**

3D2-1 Rotationally Symmetric (RS)-LOD-FDTD with CPML for Analysing Resonant Structures 930
Md. Masud Rana and #Ananda S. Mohan, *University of Technology Sydney, Australia*

3D2-2 Improvement of FDTD Calculation Accuracy for Printed Bent Dipole and Loop Antennas 934
#Wataru Akaishi, Toru Uno and Takuji Arima, *Tokyo University of Agriculture and Technology, Japan*

3D2-3 Nonstandard Finite Difference Models for the Discrete Green's Function of the Scattered Field 938
#James B. Cole and Naoki Okada, *University of Tsukuba, Japan*

3D2-4 Transient Analysis of Localized Circularly Polarized Light for All-optical Magnetic Recording 943
Hiroshi Iwamatsu(1), #Tsukasa Kato(1), Shinichiro Ohnuki(1), Yoshito Ashizawa(1), Katsuji Nakagawa(1) and Weng C. Chew(2), *(1)Nihon University, Japan, (2)University of Illinois, Armenia*

3D2-5 Statistical Analysis of Multiple Scattering and Attenuation due to Many Raindrops Using FDTD 947
Yasumitsu Miyazaki(1), #Koichi Takahashi(1) and Nobuo Goto(2), *(1)Aichi University of Technology, Japan, (2)The University of Tokushima, Japan*

3D3: Computational Electromagnetic III

Co-Chairs: M.Tanaka *(Gifu Univ.)*, J.Li *(UESTC)* **14:00-15:40**

3D3-1 Alternative and Robust Technique for the Calculation of Dispersion Relations in Grounded Layered Media 951
#Juan Sebastian Gomez-Diaz(1), Alejandro Alvarez-Melcon(2) and Julien Perruisseau-Carrier(1), *(1)EPFL, Switzerland, (2)Universidad Politécnica de Cartagena, Spain*

3D3-2 Distribution of Energy Flow by Dielectric Waveguide with Rhombic Dielectric Structure along a Middle Layer 955
#Ryosuke Ozaki and Tsuneki Yamasaki, *Nihon University, Japan*

3D3-3 Electromagnetic Scattering by Multi-spheres Systems and its Application for Calculating Rain Attenuation 959
#Nguyen T. Dong, Masahiro Tanaka and Kazuo Tanaka, *Gifu University, Japan*

3D3-4 Efficient Numerical Method for Computing Per-unit-length Impedance of Transmission Lines with Lossy Substrate 963
#Makoto Matsuki and Akira Matsushima, *Kumamoto University, Japan*

3D3-5 Studying the Microcavity Lasers as Active Dielectric Resonator Antennas 967
Elena I. Smotrova(1), Iryna Gozhyk(2), Melanie Lebental(2) and #Alexander Nosich(1), *(1)Institute of Radio-Physics and Electronics NASU, Ukraine, (2)Ecole Nationale Superieur de Cachane, France*

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3E1:Body-centric Wiress Communications

Co-Chairs: J.Takada *(Tokyo Inst. of Tech.)*, A.Pellegrini *(Queen Mary, Univ. of London)* **09:00-10:40**

3E1-1 Shadowing Analysis of a BAN Diversity Antenna Based on Statistical Measurements of the Human Walking Motion 971
#Kazuhiro Honda and Koichi Ogawa, *Toyama University, Japan*

3E1-2 A wideband ZOR On-body Antenna for WBAN Applications 975
#Jisoo Baek, Youngki Lee and Jaehoon Choi, *Hanyang University, South Korea*

3E1-3 Miniaturized and High-isolation Diversity Antenna for WBAN Applications 979
#Sungjin Kim, Soonyong Lee, Kyeol Kwon, Hyungsang Park and Jaehoon Choi, *Hanyang University, South Korea*

3E1-4 On Point Source and Observation Modeling for Path Loss Calculation Using FDTD Method 983
#Jun-ichi Naganawa, Minseok Kim and Jun-ichi Takada, *Tokyo Institute of Technology, Japan*

3E1-5 Use of Motion Capture for Path Gain Modelling of Millimetre-wave On-body Communication Links 987
#Yuriy Nechayev[(1)], Costas Constantinou[(1)], Srijittra Swaisaenyakorn[(2)], Osman Rakibet[(2)], John Batchelor[(2)], Peter Hall[(1)], Clive Parini[(3)] and John Hunt[(4)], *[(1)]University of Birmingham, United Kingdom, [(2)]University of Kent, United Kingdom, [(3)]Queen Mary University of London, United Kingdom, [(4)]Roke Manor Research Ltd,. United Kingdom*

3E2:Antenna Measurement Technologies I

Co-Chairs: M.Hirose *(AIST)*, C.Cho *(Korea Research Inst. of Standards and Science)* **11:00-12:40**

3E2-1 An Experimental Consideration on the Effect of Antenna Gain on the Observed PIMs for an External PIM-source 991
#Kohei Takada[(1)], Nobuhiro Kuga[(1)] and Keizo Cho[(2)], *[(1)]Yokohama National University, Japan, [(2)]Research Laboratories, NTT DOCOMO, INC., Japan*

3E2-2 Advanced Wheeler Cap Method for Measuring the Antenna Efficiency 995
#Chihyun Cho[(1)], Hosung Choo[(2)], No-Weon Kang[(3)] and Jin-Seob Kang[(3)], *[(1)]Samsung Thales, South Korea, [(2)]Hongik University, South Korea, [(3)]Korea Research Institute of Standards and Science, South Korea*

3E2-3 Novel Techniques of Avoiding Dips of Radiation Efficiency Measured by Improved Wheeler Method 999
#Nozomu Ishii, *Niigata University, Japan*

3E2-4 Measurement Using the S-parameter Method for Radiation Characteristics and Mutual Coupling of Multiport Antennas on a Small Ground 1003
#Takashi Yanagi, Toru Fukasawa, Hiroaki Miyashita and Yoshihiko Konishi, *Mitsubishi Electric Corporation, Japan*

3E2-5 A Study on Jig Fabricated by Microstrip Line for S-parameter Method 1007
#Takayuki Sasamori, Teruo Tobana and Yoji Isota, *Akita Prefectural University, Japan*

3E3:Antenna Measurement Technologies II

Co-Chairs: N.Ishii *(Niigata Univ.)*, J.Carlsson *(SP Technical Research Inst. of Sweden)* **14:00-15:40**

3E3-1 Time Domain Analysis of Antenna Return Loss 1011

#Dae-Chan Kim[(1)], Tae-Hwan Jung[(2)], Tae-Weon Kang[(1)] and Dong-Joon Lee[(1)], *[(1)]Korea Research Institute of Standards and Science, South Korea, [(2)]Chungnam National University, South Korea*

3E3-2 Relation between Phase Center and Amplitude Center of Antenna by Kern Transmission Formula 1015

#Masanobu Hirose, Michitaka Ameya and Satoru Kurokawa, *AIST, Japan*

3E3-3 Accurate Gain Measurement for Millimeter-wave Horn and Open-ended Waveguide Antennas 1019

#Katsushige Harima, *National Institute of Information and Communications Technology, Japan*

3E3-4 Propagation and Mismatch Analysis of 50 GHz Guided Pulses Based on Optical Sampling 1023

#Dong-Joon Lee, Joo-Gwang Lee, Jin-Seob Kang and No-Weon Kang, *Korea Research Institute of Standards and Science, South Korea*

3E3-5 Pseudo EMI Measurement Using VNA and Optical Feeding Antenna for Site Performance Comparison among Public Testing Laboratories in Kanto-area in Japan 1027

#Michitaka Ameya and Satoru Kurokawa, *AIST, Japan*

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POS2: Poster Session II

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POS2-1 Effects of Shell and Body Tissue Stimulating Liquid (BTSL) on the Horseshoes Crab Planar Monopole Antenna (HC-PMA) Performance N/A

#Muhammad Solihin Zulkefli[1], Mohd Fareq Abd Malek[1], Faizal Jamlos[1], Syed Idris Syed Hassan[1], Mohd Hafizuddin Mat[1], Suzanna Harun Ronald[1], Khairudi Mohd Juni[2], Mohd Iskandar Mohd Saleh[2] and Mohd Shaharom Idris[2], *[1]Universiti Malaysia Perlis, Malaysia, [2]Politeknik Tuanku Syed Sirajuddin, Malaysia*

POS2-2 Band-notched Small Slot Antenna with Enhanced Bandwidth by Using Parasitic Structures inside Slots for UWB Applications N/A

#Shervin Amiri[1], Nasser Ojaroudi[2] and Mohammad Ojaroudi[3], *[1]Department of Iranian Research Organization for Science and Technology, Iran, [2]Shahid Rajaee Teacher Training University, Iran, [3]Islamic Azad University, Iran*

POS2-3 Application of Planar Folded Dipole Antenna with Feed Line to Small Terminal for WiMAX 1039

#Tsutomu Ito[1], Mio Nagatoshi[1], Shingo Tanaka[2] and Hisashi Morishita[1], *[1]National Defense Academy, Japan, [2]Yazaki Corporation, Japan*

POS2-4 Compact Dual-band Quasi-self-complementary Antenna for WLAN Application 1043

Li Chang, Hsuan-Yu Chien and #Ching-Her Lee, *National Changhua University of Education, Taiwan*

POS2-5 Compact Size Dual-band Antenna Printed on Flexible Substrate for WLAN Operation 1047

#Hsuan-Yu Chien[1], Chow-Yen-Desmond Sim[2] and Ching-Her Lee[1], *[1]National Changhua University of Education, Taiwan, [2]Feng Chia University, Taiwan*

POS2-6 A Novel Textile UWB Antenna 1051

Song-Tao Yu, #Ying Liu, Wen Jiang and Shu-Xi Gong, *Xidian University, China*

POS2-7 Practical Design Considerations for Tri-band Microstrip Patch Antennas 1055

#Mustafa E. Aydemir[1], Ahmet S. Turk[2], Ersin Gose[1] and Mustafe Ilarslan[1], *[1]Turkish Air Force Academy, Turkey, [2]Yildiz Technical University, Turkey*

POS2-8 Design of the Dual-polarized Dipole Antenna for Small Base Station 1059

#Jung-Nam Lee, Kwang-Chun Lee, Gweon-Do Jo, Heon-Kook Kwon, Byung-Su Kang, Jung-Hoon Oh, Myung-Don Kim and Nam-Hoon Park, *Electronics and Telecommunications Research Institute, South Korea*

POS2-9 Asymmetric Dipole Antenna Current Integral Equation 1063

#Siyu Chen[1] and Yonghong Liu[2], *[1]Tsinghua University, China, [2]Wino science&technology Co.Ltd, China*

POS2-10 Vertical Transmission from Catenaries 1067

Jean-Claude Jodogne and #Stan Stankov, *Royal Meteorological Institute (RMI), Belgium*

POS2-11 A Wideband Open-slot Antenna with High Front-to-end Ratio 1071

Chien-Jen Wang, #Kai-Long Hsiao and Yang Tai, *National University of Tainan, Taiwan*

POS2-12 Low-cost Antenna Elements for Reducing Grating Lobes 1075

#Haim Matzner and Max Loifer, *Holon Institute of Technology, Israel*

POS2: Poster Session II

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POS2-13 Novel Band-stop Small Square Monopole Antenna by Using Interdigital Strip Protruded inside the Rectangular Slot as a Band-stop Filter with its Equivalent Circuit Based on TDR Analysis for UWB Applications N/A
#Mohammad Ojaroudi and Esfandiar Mehrshahi, *Shahid Beheshti University, Iran*

POS2-14 Continuous Transverse Stub (CTS) Array Antenna 1083
#Yunxue Xu, Hailing Dong, Ying Liu and Pengfei Zhang, *Xidian University, China*

POS2-15 Near-field Gain Measurement of Waterproofed Shielded Loop Antenna in Tissue-equivalent Liquid 1087
#Hidenori Toyoshima(1), Nozomu Ishii(1,2), Lira Hamada(2) and Soichi Watanabe(2), (1)*Niigata Univercity, Japan,* (2)*National Institute of Information and Communications Technology, Japan*

POS2-16 A Consideration of Interference Prevention Technique for Doppler Weather Radars 1091
#Atsumu Hattori, Nobuyoshi Kikuma, Hiroshi Hirayama and Kunio Sakakibara, *Nagoya Institute of Technology, Japan*

POS2-17 Free Space Antenna Gain Measurements by way of Tracing the Reflected Waves in Time Domain 1095
#Jungkuy Park and Woo Nyun Kim, *National Radio Research Agency of KCC, South Korea*

POS2-18 x2 Scale Breast Phantom for Reproducing Human Breast Cancer Tissue 1100
#Fumiaki Komori, Shou Kato and Tadahiko Maeda, *Ritsumeikan University, Japan*

POS2-19 Measured Electrical Characteristics of an Array Feed Offset Parabolic Reflector Antenna 1104
#Junichi Shinohara(1), Naobumi Michishita(1), Yoshihide Yamada(1), Mohammad T. Islam(1) and Norbahiah Misran(1), (1)*National Defense Academy, Japan,* (2)*Universiti Kebangsaan Malaysia, Malaysia*

POS2-20 Radiation Efficiency Measurement Based on Wheeler Method Using 90-degree 3dB Hybrid Coupler and Sliding Short 1108
#Hirofumi Iguchi and Nozomu Ishii, Graduate School of Science and Technology, *Niigata University, Japan*

POS2-21 Frequency and Pattern Reconfigurable Antenna with Chip Inductors and Parasitic Elements 1112
#Se mi Lee, Ki joon Kim and Young Joong Yoon, *Yonsei University, South Korea*

POS2-22 Reflectarray with Arbitrary Shape Elements Suppressing their Mutual Coupling 1116
#Tomoya Asada, Hiroyuki Deguchi, Mikio Tsuji and Yuki Aoki, Doshisha University, Japan

POS2-23 Orthogonal Linear Polarization Detection Slot-ring Antenna 1120
#Md. A. Hossain, Eisuke Nishiyama and Ichihiko Toyoda, *Saga University, Japan*

POS2-24 Direction of Arrival Estimating Array Antenna 1124
#Hirotoshi Sakai, Eisuke Nishiyama and Ichihiko Toyoda, *Saga University, Japan*

POS2-25 Considerations on a Frequency Correlation for Distributed Antenna Systems 1128
#Kanako Yamaguchi, Yasutaka Ogawa, Toshihiko Nishimura and Takeo Ohgane, *Hokkaido University, Japan*

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POS2-26 Nonlinear Prediction of Frequency-Domain Channel Parameters for Channel Prediction in Fading and Fast Doppler-shift Change Environment 1132
Hiroaki Matsui and #Akira Hirose, *The University of Tokyo, Japan*

POS2-27 Passive MIMO Transmission Using Load Modulation 1136
#Keisuke Terasaki, Kosuke Kinami and Naoki Honma, *Iwate University, Japan*

POS2-28 Novel 3-D Array Configuration Based on CRLB Formulation for High-resolution DOA Estimation 1140
#Hiroki Moriya[(1)], Koichi Ichige[(1)], Hiroyuki Arai[(1)], Takahiro Hayashi[(2)], Hiromi Matsuno[(2)] and Masayuki Nakano[(2)], *[(1)]Yokohama National University, Japan, [(2)]KDDI R&D Laboratories, Japan*

POS2-29 A Consideration of Performance Improvement of Location Estimation of Scatterers in MIMO Radar 1144
#Tatsuya Hayashi, Nobuyoshi Kikuma, Hiroshi Hirayama and Kunio Sakakibara, *Nagoya Institute of Technology, Japan*

POS2-30 DOA Estimation Using Subspacing Tracking Method for Coherent Waves 1148
#Yosuke Kajimura, Nobuyoshi Kikuma, Hiroshi Hirayama and Kunio Sakakibara, *Nagoya Institute of Technology, Japan*

POS2-31 Monopulse Angle Estimation for Unresolved Targets with a Fourth Order Cumulant 1152
#Ryuhei Takahashi, Rokuzo Hara, Teruyuki Hara and Atsushi Okamura, *Mitsubishi Electric Corporation, Japan*

POS2-32 Performance Analysis of SURE Method for DOA Estimation of Coherent Sources by Uniform Linear Array 1156
#Koichi Ichige, Hanyang Li and Hiroyuki Arai, *Yokohama National University, Japan*

POS2-33 Electromagnetic Coupling on Solar -terrestrial System: Possible Effects on Seismic Activities 1160
#Mohamad Huzaimy B. Jusoh[(1,2)], Yumoto Kiyohumi[(1)], Nurul Shazana B. Abdul Hamid[(1)] and Liu Huixin[(1)], *[(1)]Kyushu University, Japan, [(2)]Universiti Teknologi MARA, Malaysia*

POS2-34 The GPS Phase Fluctuations Observed at Wuhan, and Comparison with Spread F and Medium-scale Traveling Ionospheric Disturbances N/A
#Chien-Chih Lee[(1)], Wei-Sheng Chen[(1)] and Fang-Dar Chu[(2)], *[(1)]Chien Hsin University of Science and Technology, Taiwan, [(2)]National Standard Time and Frequency Lab of Telecommunication Laboratories, Taiwan*

POS2-35 Effects of Azimuthal Difference on Orbital Diversity Using Multiple Satellites 1168
#Ayumi Iwasa[(1)], Takeshi Manabe[(1)], Wataru Chujo[(2)] and Shin-ichi Yamamoto[(3)], *[(1)]Osaka Prefecture University, Japan, [(2)]Meijo University, Japan, [(3)]NICT, Japan*

POS2-36 Angular Power Spectrum of Scattered Electromagnetic Waves in Randomly Inhomogeneous Plasma with Electron Density Fluctuations 1172
#George V. Jandieri[(1)], Akira Ishimaru[(2)] and Nino F. Mchedlishvili[(1)], *[(1)]Georgian Technical University, Georgia, [(2)]University of Washington, United States*

POS2-37 Compact and Triple Band Meta-material Antenna for All WiMAX Applications 1176
#Mahmoud Abdalla, Usama Abdelnaby and Abdelazez Mitkees, *MTC University, Egypt*

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POS2-38 Mutual Coupling Suppression in Microstrip Lines Using Metamaterial on Low Temperature Co-fire Ceramic (LTCC) Substrate 1180

#Zhenzhe Liu and Peng Wang, *University of Electronic Science and Technology of China, China*

POS2-39 A Miniaturized Microstrip Antenna Based on the Backward Waves Property of LTCC Left-handed Metamaterial Substrate 1184

#Zhenzhe Liu and Peng Wang, *Research Institute of Electronic Science and Technology of UESTC, China*

POS2-40 Effect of Spiral Split Ring Resonator (S-SRR) structure on Truncated Pyramidal Microwave Absorber Design 1188

Nornikman Hassan(1), Badrul Hisham Ahmad(1), Mohamad Zoinol Abidin Abd Aziz(1), #Muhammad Ramlee Kamarudin(2) and Abdul Rani Othman(1), *(1)Universiti Teknikal Malaysia Melaka, Malaysia, (2)Universiti Teknologi Malaysia, Malaysia*

POS2-41 Reconfigurable Frequency Using Electromagnetic Band Gap Structures for Single Band and Wideband 1192

#Osman Ayop, Mohamad Kamal A. Rahim and Noor Asniza Murad, *Universiti Teknologi Malaysia, Malaysia*

POS2-42 Parametric Study of the Position of Textile Dipole Antenna above the Textile Artificial Magnetic Conductor 1196

Muhammad Azfar B. Abdullah, Mohd Ezwan B. Jalil, Mohammad K. A. Rahim, Osman B. Ayop and #Noor Asniza B. Murad, *University Teknologi Malaysia, Malaysia*

POS2-43 A Compact Rectenna Module for Wireless Charging System N/A

Sen Wang, #Rui-Xian Wang and Chun-Tuan Chang, *National Taipei University of Technology, Taiwan*

POS2-44 Magnetic Field Forming of Spatial Multiple Antennas for Wireless Power Transfer 1204

Wei Chen(1), #Duan Zhao(1), Rani Al-Maharmah(1), Shinjae Kang(2), Seung-Ok Lim(2), Guido Bruck(1) and Peter Jung(1), *(1)Duisburg-Essen University, Germany, (2)Electronics Technology Institute, South Korea*

POS2-45 Relation Analysis between Feeding Structures and Effect of Shield for Coils in Wireless Power Transfer with Magnetically Coupled Resonance 1208

#Junya Kaneda, Keishi Miwa, Nobuyoshi Kikuma, Hiroshi Hirayama and Kunio Sakakibara, *Nagoya Institute of Technology, Japan*

POS2-46 Inverter Noise Suppression System Using PI Algorithm 1212

#Taketo Matsuoka, Mitoshi Fujimoto and Toshikazu Hori, *University of Fukui, Japan*

POS2-47 Connectivity Evaluation for Unmanned Aircraft System Using 5GHz WLAN 1216

#Naoki Kanada(1), Yasuto Sumiya(1), Naruto Yonemoto(1), Shunichi Futatsumori(1), Akiko Kohmura(1), Yasuhiro Yama(1) and Eiju Isozaki(2), *(1)Electronic Navigation Research Institute, Japan, (2)Japan Radio Air Navigation Systems Association, Japan*

POS2-48 Design of Optimal MIMO Channel under Line-of-sight Environment by Using Directional Antenna 1220

#Yusuke Hori, Daisuke Uchida and Hiroyuki Arai, *Yokohama National University, Japan*

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POS2-49 An Iterative CFO Estimator for QO-STBC Uplink MC-CDMA MIMO Systems 1224
#Tsui-Tsai Lin and Jian-Shiuan Lin, *National United University, Taiwan*

POS2-50 Performance Evaluation by MIMO Transmission in Small Rocket 1228
#Keisuke Kusumi[(1)], Kentaro Nishimori[(1)], Naoki Honma[(2)], Kenjiro Nishikawa[(3)], Yusuke Maru[(4)] and Shigeo Kawasaki[(4)], *[(1)]Niigata University, Japan, [(2)]Iwate University, Japan, [(3)]Kagoshima University, Japan, [(4)]JAXA, Japan*

POS2-51 Comparison between Measurement and Simulation for an Outdoor-indoor Scenario in WiMAX System 1232
#Navarat Lertsirisopon, Yukiko Kishiki, Akiko Komatsu and Masahiko Kawamura, *Kozo Keikaku Engineering Inc., Japan*

POS2-52 The Characteristics of the RFID Antenna by Poses of Human Body for Urination Sensing 1236
#Hiromasa Nakajima, Masaharu Takahashi, Kazuyuki Saito and Koichi Ito, *Chiba University, Japan*

POS2-53 RFID Tag Antenna for Managing Surgical Instruments 1240
#Takafumi Matsumura, Masaharu Takahashi, Kazuyuki Saito, Etsuji Yamamoto and Koichi Ito, *Chiba University, Japan*

POS2-54 Study of Implantable Antenna for Artificial Knee Joints 1244
#Soichiro Yanase, Masaharu Takahashi, Kazuyuki Saito and Koichi Ito, *Chiba University, Japan*

POS2-55 A Study of Cost-effective Conductive Ink for Inkjet-printed RFID Application 1248
#Pornanong Pongpaibool, *NECTEC, Thailand*

POS2-56 Planar Miniature Dual-band RFID / WiFi Antenna for Postal Application 1252
#Li Yang, Chin-Hong Ng, Wai-Wa Choi and Kam-Weng Tam, *University of Macau, China*

POS2-57 Implanted Helical Dipole Antenna for UHF Band Applications 1256
Basari Basari, Dwyan Zakaria, #Fitri Yuli Zulkifli and Eko Tjipto Rahardjo, *Universitas Indonesia, Indonesia*

POS2-58 Wireless Pads for RFID Reader 1260
#Takuya Okura and Hiroyuki Arai, *Yokohama National University, Japan*

POS2-59 Design of Planar Antenna for Small Implantable Devices 1264
#Kohei Kawasaki, Masaharu Takahashi, Kazuyuki Saito and Koichi Ito, *Chiba University, Japan*

4A1:Reflector/Lens Antennas and Feeds

Co-Chairs: Y.Inasawa *(Mitsubishi Electric)*, R.Kronberger *(Cologne Univ. of Applied Sciences)* **09:00-10:40**

4A1-1 (Invited) **Atacama Large Millimeter/Submillimeter Array (ALMA) 1268**
#Masato Ishiguro, *National Astronomical Observatory of Japan, Japan*

4A1-2 **Lens-corrected Coaxial-groove Horn for Illuminating Ultra Wide Area 1269**
Hiroyuki Deguchi, Mikio Tsuji, Akihiro Kobayashi and #Akihiro Omori, *Doshisha University, Japan*

4A1-3 **A Ku Band Small Reflector Antenna Using Backfire Primary Radiator for Satellite Communication System on Board Vessel 1273**
#Shin-ichi Yamamoto, Shuji Nuimura, Tomohiro Mizuno, Yoshio Inasawa, Hiroyuki Sato and Makio Tsuchiya, *Mitsubishi Electric Corporation, Japan*

4A1-4 **A Novel Compact Center-fed Reflector Antenna with One-dimensional Beam Scanning Function 1277**
#Michio Takikawa, Yoshio Inasawa and Yoshihiko Konishi, *Mitsubishi Electric Corporation, Japan*

4A2:Phased Array and Related Topics

Co-Chairs: T.Takahashi *(Mitsubishi Electric)*, P.Kabacik *(Wroclaw Univ. of Tech.)* **11:00-12:40**

4A2-1 **Design of a Bandwidth Enhanced Dual-band Dual-polarized Array Antenna 1281**
#Youngki Lee, Deukhyeon Ga, Taeho Song, Jisoo Back and Jaehoon Choi, *Hanyang Univertity, South Korea*

4A2-2 **60 GHz Band 2×4 Dipole Array Antenna Using Multi Stacked Organic Substrates Structure 1285**
#Yuya Suzuki, Satoshi Yoshida, Shoichi Tanifuji, Suguru Kameda, Noriharu Suematsu, Tadashi Takagi and Kazuo Tsubouchi, *Research Institute of Electrical Communication, Tohoku University, Japan*

4A2-3 **Polarization Agile Slot-ring Array Antenna Using Magic-T Circuit 1289**
#Yu Ushijima, Eisuke Nishiyama and Ichihiko Toyoda, *Saga University, Japan*

4A2-4 **A Reduction Method of Quantization Error of Excitation Coefficient for Phased Array Antenna 1293**
#Tasuku Kuriyama, Kazunari Kihira, Toru Takahashi and Yoshihiko Konishi, *Mitsubishi Electric Corporation, Japan*

4A2-5 **Capability Study on Superdirective Array for HF-band Receive Antenna 1297**
#Masakazu Taniguchi, Kazunari Kihira, Toru Takahashi and Yoshihiko Konishi, *Mitsubishi Electric Corporation, Japan*

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4A3:Microstrip and Printed Antennas

Co-Chairs: T.Fukusako *(Kumamoto Univ.)*, S.Sharma *(San Diego State Univ.)* **14:00-15:40**

4A3-1 Advances in EBG-resonator Antenna Research 1301
#Giuseppe Schettini[(1)], Fabrizio Frezza[(2)], Lara Pajewski[(1)], Emanuele Piuzzi[(2)] and Cristina Ponti[(1)], *[(1)]"Roma Tre" University of Rome, Italy, [(2)]"Sapienza" University of Rome, Italy*

4A3-2 Frequency Reconfigurable Spirograph Planar Monopole Antenna (SPMA) 1305
Jennifer Rayno and #Satish K. Sharma, *San Diego State University, United States*

4A3-3 A Circularly Polarized Multimode Patch Antenna with Full Hemispherical Null Steering for GPS Applications 1309
#Nathan Labadie[(1)], Satish Sharma[(1)] and Gabriel Rebeiz[(2)], *[(1)]San Diego State University, United States, [(2)]University of California, San Diego, United States*

4A3-4 An Electrically Small Planar Antenna Using Complementary Split-ring Resonators 1313
#Shih-Yuan Chen and Min-Da Chiou, *National Taiwan University, Taiwan*

4A3-5 A Comparison of Feed Methods for Electrically Small and Low-profile Meander Line Antennas 1317
#Yoshiya Saito and Takeshi Fukusako, *Kumamoto University, Japan*

4B1:Small Antennas

Co-Chairs: M.Taguchi *(Nagasaki Univ.)*, C.Phongcharoenpanich *(King Mongkut's Inst. of Tech. Ladkrabang)* **09:00-10:40**

4B1-1 Pattern Controllable Vehicular Antenna with CRLH Transmission Line for Telematics 1321
#Junya Muramatsu[(1)], Takuma Sawaya[(2)], Toshiaki Watanabe[(1)], Kazuo Sato[(1)], Akira Hishida[(2)] and Junzo Ooe[(2)], *[(1)]TOYOTA Central R&D Labs., Inc., Japan, [(2)]TOYOTA MOTOR CORPORATION, Japan*

4B1-2 Performance Improvement of Transmission Antenna Installed on Outside Broadcasting Van for Live Broadcast of Road Race 1325
#Naoto Kogo, Masahiro Yatagai, Fumihiro Murakami and Tetsuomi Ikeda, *NHK, Japan*

4B1-3 Telematics and ITS Integrated Vehicular Antenna with CRLH-TL Parasitic Element 1329
#Takuma Sawaya[(1)], Junya Muramatsu[(2)], Akira Hishida[(1)], Junzo Ooe[(1)], Toshiaki Watanabe[(2)] and Kazuo Sato[(2)], *[(1)]TOYOTA Motor Corporation, Japan, [(2)]TOYOTA Central R&D Labs., Inc, Japan*

4B1-4 A Study on a Feeding Method to the Multi-band Antenna with a Coupling Phenomenon 1333
#Kenji Saegusa, Hiroki Nishiwaki and Tadashi Takano, *Nihon University, Japan*

4B1-5 Electric and Magnetic Loop Mode Pattern Switchable Antenna 1337
#Hyunseong Kang and Sungjoon Lim, *Chung-Ang University, South Korea*

4B2:EMI / EMC

Co-Chairs: T.Sasamori (*Akita Prifecture Univ.*), Y.Yoon *(Yosei Univ.)* **11:00-12:40**

4B2-1 Estimation of the Source Position by Means of SAGE 1341
#Sin'ya Aizawa[(1)], Yoshihiko Kuwahara[(1)], Makoto Tanaka[(2)], Takanori Unou[(2)] and Koji Ichikawa[(2)], *[(1)]Shizuoka University, Japan, [(2)]DENSO CORPORATION, Japan*

4B2-2 Time Domain Analysis of Crosstalk With a Slot between Microstrip Lines 1345
#Yuki Kitsunai, Teruo Tobana, Takayuki Sasamori and Yoji Isota, *Akita Prefectural University, Japan*

4B2-3 Analysis of Coupling between a Ground Slot and a Microstrip Line 1349
#Teruo Tobana, Takayuki Sasamori and Yoji Isota, *Akita Prefectural University, Japan*

4B2-4 A Beam Switched Log-periodic Antenna for EMI measurement 1353
#Kenji Hagiwara[(1)], Hiroyuki Arai[(1)], Seiichi Izumi[(2)] and Toshiyasu Tanaka[(3)], *[(1)]Yokohama National University, Japan, [(2)]KEC Electronic Industry Development Center, Japan, [(3)]Microwave Factory Co., Ltd., Japan*

4B2-5 Broadband Simplified SAR Measurement Method Using Solid Material 1357
#Keita Ochiyama[(1)], Naobumi Michishita[(1)], Yoshihide Yamada[(1)], Hiroyuki Arai[(2)] and Toshiyasu Tanaka[(3)], *[(1)]National Defense Academy, Japan, [(2)]Yokohama National University, Japan, [(3)]Microwave Factory, Japan*

4B3:Mobile Antennas

Co-Chairs: T.Fukasawa *(Mitsubishi Electric)*, S.G.Zhou *(Natl. Univ. of Singapore)* **14:00-15:40**

4B3-1 Internal WWAN Handset Antenna Formed by a Monopole Strip Radiator and a Clearance Region Thereof as Monopole Slot Radiator 1361
#Po-Wei Lin and Kin-Lu Wong, *National Sun Yat-Sen University, Taiwan*

4B3-2 Design of a Compact Planar MIMO Antenna for LTE Mobile Application 1365
#Xing Zhao, Youngki Lee and Jaehoon Choi, *Hanyang University, South Korea*

4B3-3 x3 Scale-model Experiments on a Slot-based Directivity Control Built-in Antenna System for Mobile Terminals 1369
#Ravi R. Hasan, Fumiaki Komori and Tadahiko Maeda, *Ritsumeikan University, Japan*

4B3-4 Automatic Impedance Matching of a Tablet Type 4-branch MRC Array Close to the Human Hands 1373
#Makoto Yamazaki, Kazuhiro Honda and Koichi Ogawa, *Toyama University, Japan*

4B3-5 Multi-band Monopole Antenna Design Using Folded and Parasitic Strips for Laptop Applications 1377
#Chichang Hung, Chaohsu Wu and Tsenchieh Chiu, *National Central University, Taiwan*

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4C1:Aperture Antennas

Co-Chairs: Y.Konishi *(Mitsubishi Electric)*, E.Carrasco *(EPFL)* **09:00-10:40**

4C1-1 Design Tool for High-performance Rotationally Symmetric Reflector Antennas 1381
#Erik Jørgensen and Peter Meincke, *TICRA, Denmark*

4C1-2 Design of a Satellite Antenna for Malaysia Beams by Ray Tracing Method 1385
#Nurul Huda Abd Rahman[1,2], Mohammad Tariqul Islam[1], Norbahiah Misran[1], Yoshihide Yamada[3] and Naobumi Michishita[3], *[1]Universiti Kebangsaan Malaysia, Malaysia, [2]Universiti Teknologi MARA, Malaysia, [3]National Defense Academy, Japan*

4C1-3 Inverted-L Reflectarray Element With Interdigital Gap Loading Structure 1389
#Jianfeng Li[1], Qiang Chen[1], Kunio Sawaya[1] and Qiaowei Yuan[2], *[1]Tohoku University, Japan, [2]Sendai National College of Technology, Japan*

4C1-4 Optimum Thickness Distribution of an Inkjet-printed Resonant Line Antenna 1393
#Sumin Yun and Sangwook Nam, INMC, *Seoul National University, South Korea*

4C1-5 Application of Optimized Sparse Antenna Array in Near Range 3D Microwave Imaging 1397
Yaolong Qi, Yanping Wang, Xueming Peng, #Weixian Tan and Wen Hong, *Institute of Electronics, China*

4C2:Wire Antennas I

Co-Chairs: T.Ohishi *(Toshiba)*, W.Zhang *(Southeast Univ.)* **11:00-12:40**

4C2-1 Novel Frequency Band-notch Small Square Monopole Antenna with Inverted Omega-shaped Conductor Backed Plane for UWB Systems N/A
#Shervin Amiri[1], Nasser Ojaroudi[2] and Mohammad Ojaroudi[3], *[1]Department of Iranian Research Organization for Science and Technology, Iran, [2]Shahid Rajaee Teacher Training University, Iran, [3]Islamic Azad University, Iran*

4C2-2 Comparative Study on Printed Dual-band Antennas for WLAN Terminal 1405
#Wen-Xun Zhang and Peng Zhang, *Southeast University, China*

4C2-3 A Planar Double Inverted-L Antenna Using Short Stub in Slot Line for WLAN Applications 1409
#Chao-Shun Yang and Christina F. Jou, *National Chiao-Tung University, Taiwan*

4C2-4 Bandwidth Extension of Ultra Low Profile Inverted L Antenna by Modification of Conducting Plane 1413
#Keisuke Kozaki and Mitsuo Taguchi, *Nagasaki University, Japan*

4C2-5 Dual Band Ultra Low Profile Inverted L Antenna 1417
#Seiichi Sato and Mitsuo Taguchi, *Nagasaki University, Japan*

4C3:Wire Antennas II

Co-Chairs: Y.Okano *(Tokyo City Univ.)*, A.Sharaiha *(Univ. of Rennes 1)* **14:00-15:40**

4C3-1 An Equivalent Circuit Model for Meander-line Monopole Antenna Attached to Metallic Plate 1421
#Ryouhei Hosono, Ning Guan, Hiroiku Tayama and Hirotaka Furuya, *Fujikura Ltd., Japan*

4C3-2 A Miniature Dielectrically Loaded Spiral Folded Printed Quadrifilar Helix Antenna for GPS Dual-band Applications 1425
#Ala Sharaiha and Josh Rabemanantsao, *University of Rennes 1, France*

4C3-3 An Electrically Small Layered Meander Line Antenna with Multiple Resonances 1429
#Koji Okita and Takeshi Fukusako, *Kumamoto University, Japan*

4C3-4 Miniaturization of a Patch Antenna Using Magneto-dielectric Material 1433
#Yu Yu Kyi, Lu Guo and Jian Lu, *National University of Singapore, Singapore*

4C3-5 Study of a Line Configuration and Coupling Method in a Partially Driven Array Antenna with Transmission Line Coupling 1437
#Hiroyuki Hosono, Ryo Yamamoto, Kenji Saegusa and Tadashi Takano, *Nihon University, Japan*

4D1:Recent Studies on Earth-space Propagation Paths I

Co-Chairs: Y.Maekawa *(Osaka Electro-Communication Univ.)*, M.Esa *(Univ. Teknologi Malaysia)* **09:00-10:40**

4D1-1 Improvement of Communication Capacity of a Satellite with Ku-, Ka-band Millimeter-Wave Frequencies during Rain Attenuation 1441
#Naresh Tripathi[(1)], Wataru Chujo[(1)], Takeshi Manabe[(2)] and Sin-ichi Yamamoto[(3)], *[(1)]Meijo University, Japan, [(2)]Osaka Prefecture University, Japan, [(3)]NICT, Japan*

4D1-2 Bit Error Rate for Satellite Communications in Ka-band under Atmospheric Turbulence Predicted from Radiosonde Data in Japan 1445
#Tatsuyuki Hanada[(1)], Kiyotaka Fujisaki[(2)] and Mitsuo Tateiba[(3)], *[(1)]Japan Aerospace Exploration Agency, Japan, [(2)]Kyushu University, Japan, [(3)]Ariake National College of Technology, Japan*

4D1-3 Quantitative Assessment of Site Diversity from Rainfall Spatial Correlation Characteristics 1449
#Satoshi Maeda and Hajime Fukuchi, *Tokyo Metropolitan University, Japan*

4D1-4 Effect of Depolarization on Dual-polarized Satellite Link with 16- and 32-ary Modulation Schemes 1453
#Kenta Takahashi and Hajime Fukuchi, *Tokyo Metropolitan University, Japan*

4D1-5 Effects of Rain on Scintillation Measured on Ku- Band Satellite Signals in Tropical Region 1457
#Mandeep Singh Jit Singh[(1)], Nadirah Abdul Rahim[(2)], Rafiqul Islam[(2)] and Hassan Dao[(2)], *[(1)]Universiti Kebangsaan Malaysia, Malaysia, [(2)]International Islamic University Malaysia, Malaysia*

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November 2, 2012

4D2:Recent Studies on Earth-space Propagation Paths II

Co-Chairs: H.Iwai *(Doshisha Univ.)*, M.Jit Singh *(Univ. Kebangsaan Malaysia)* **11:00-12:40**

4D2-1 Assessment of Seasonal Asia Monsoon Rain Impact on the Earth-space Propagation in Equatorial Kuala Lumpur 1461

#Hong Yin Lam[(1)], Lorenzo Luini[(2)], Jafri Din[(1)], Carlo Capsoni[(2)] and Athanasios D. Panagopoulos[(3)], *[(1)]Universiti Teknologi Malaysia, Malaysia, [(2)]Politecnico di Milano, Italy, [(3)]National Technical University of Athens, Greece*

4D2-2 Effects of Integration Time on Rainfall Intensity and Rain Attenuation Cumulative Distribution 1465

#Shuhei Kaneko and Hajime Fukuchi, *Tokyo Metropolitan University, Japan*

4D2-3 Quantitative Evaluation of Adaptive Satellite Power Control Using Japanese Rain Radar Data 1469

#Hajime Fukuchi, Ayumi Yoshii and Yoshino Suzuki, *Tokyo Metropolitan University, Japan*

4D2-4 Characteristics of Rain Attenuation Time Variation in Ka Band Satellite Communications for the kind of Rain Types in Each Season 1473

#Ryuji Nakajo and Yasuyuki Maekawa, *Osaka Electro-Communication University, Japan*

4D3:Propagation in Terrestrial and Space Enviroments

Co-Chairs: M.Nishi *(Hiroshima City Univ.)*, H.Tsuji *(NICT)* **14:00-15:40**

4D3-1 Observations of Ionospheric Radio Propagations in the Arctic and the Mid-latitude Regions 1477

#Masahiro Nishi, Ryoichi Matsutani, Koichi Shin and Teruaki Yoshida, *Hiroshima City University, Japan*

4D3-2 Experimental Study of Propagation Characteristic for Maritime Wireless Communication 1481

#Ki Beom Kim, Maifuz Ali, Jee Hoon Lee and Seong-Ook Park, *Korea Advanced Institute of Science and Technology, South Korea*

4D3-3 Developed and Evaluation Satellite/Terrestrial Integrated Coordinate Control Simulator 1485

#Kunio Endoh, Hiroyuki Tsuji, Amane Miura and Yoshiyuki Fujino, *National Institute of Information and Communications Technology, Japan*

4D3-4 Rain Attenuation Characteristics of Ku-band Satellite Signals in relation to the Wind Velocities Observed on the Ground 1489

#Yutaka Inamori, Yoshiaki Shibagaki and Yasuyuki Maekawa, *Osaka Electro-Communication University, Japan*

4D3-5 First Challenge of PTP Time Synchronization Experiment through the Experimental Satellite for Communication, "WINDS" 1493

#Yusuke Kito[(1)], Satoshi Kubota[(1)], Fujinobu Takahashi[(1)], Takashi Takahashi[(2)], Toshio Asai[(2)] and Norihiko Katayama[(2)], *[(1)]Yokohama National Univ., Japan, Japan, [(2)]National Institute of Information and Communications Technology, Japan*

4E1:Metamaterial Antennas and Systems with FSS, EBG, MTM, & Advanced Materials

Co-Chairs: S.Kahng *(Univ. of Incheon)*, N.Michishita *(Natl. Defence Academy)* **09:00-10:40**

4E1-1 A Single Radiation Element with High-gain and a Tilted-beam 1497
Hisamatsu Nakano, #Yosuke Oishi and Junji Yamauchi, *Hosei University, Japan*

4E1-2 Design of Metamaterial Absorber Based on Resonant Magnetic Inclusion 1501
#Hongmin Lee, *Kyonggi University, South Korea*

4E1-3 A Compact Metamaterial UWB Power-divider Fed Wide-band Array Antenna 1506
#Sungtek Kahng, Dajeong Eom, Boram Lee, In-kyu Yang and Kyung-seok Kahng, *University of Incheon, South Korea*

4E1-4 Achievement of Inverse Frequency-dependent Phase Shift by Using Composite Right/Left-handed Phase Shifter 1510
#Naobumi Michishita(1), Yoshihide Yamada(1) and Keizo Cho(2), *(1)National Defense Academy, Japan, (2)Chiba Institute of Technology, Japan*

4E1-5 Magnet-less Non-reciprocal Metamaterial and its Applications in Radiative Structures 1514
#Toshiro Kodera(1), Dimitrios L. Sounas(2) and Christophe Caloz(2), *(1)Yamaguchi University, Japan, (2)Ecole Polytechnique of Montreal, Canada*

4E2:EBG and Metamaterials I

Co-Chairs: Y.Cho *(Kyungpook Natl. Univ.)*, T.Kodera *(Yamaguchi Univ.)* **11:00-12:40**

4E2-1 Metamaterial Ridged Waveguides with Wavelength Control for Array Antenna Applications 1518
#Hideki Kirino(1,2) and Koichi Ogawa(2), *(1)Panasonic Healthcare Co., Ltd., Japan, (2)University of Toyama, Japan*

4E2-2 Reflection Characteristics of AMC with Lossy Dielectric Substrate 1522
#Yasutaka Murakami, Toshikazu Hori and Mitoshi Fujimoto, *University of Fukui, Japan*

4E2-3 PMC and EBG Characteristics of Cross Type Artificial Magnetic Conductor 1526
#Ryuji Kuse, Toshikazu Hori and Mitoshi Fujimoto, *University of Fukui, Japan*

4E2-4 Improvement of Near-field Optical Storage System with an Artificial Negative Index Film 1530
#Taikei Suyama(1), Yaoju Zhang(2), Shi Bai(1) and Yoichi Okuno(1), *(1)Kumamoto University, Japan, (2)Wenzhou University, China*

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4E3:EBG and Metamaterials II

Co-Chairs: H.Chiba *(Mitsubishi Electric)*, H.Lee *(Kyonggi Univ.)* **14:00-15:40**

4E3-1 Resonance Characteristics and Field Enhancement in Cylindrical Electromagnetic Bandgap Structures 1534

#Kiyotoshi Yasumoto[(1)], Vakhtang Jandieri[(2)] and Yunfei Liu[(1)], *[(1)]Nanjing Forestry University, China, [(2)]UniversityKyungpook National University, South Korea*

4E3-2 Floquet-mode Analysis of Pillar-type Photonic Crystal Waveguide Using Spectral-domain Approach 1538

#Yoshimasa Nakatake and Koki Watanabe, *Fukuoka Institute of Technology, Japan*

4E3-3 Eigenmodes Analysis in Drude-type Dispersive EBG Structures in Frequency Domain 1542

#Amin Gul Hanif, Takuji Arima and Toru Uno, *Tokyo University of Agriculture and Technology, Japan*

4E3-4 Spoof Surface Plasmon Induced Transmission Through a Three-dimensional Metamaterial 1546

#Yujiro Kushiyama, Takuji Arima and Toru Uno, *Tokyo University of Agriculture & Technology, Japan*

4E3-5 Bandwidth Enhancement and Size Reduction of Period for Dual-band Loop-slot Frequency Selective Surfaces on Plastic Board 1550

#Katsuyuki Tachikawa[(1)], Kunio Sakakibara[(1)], Kiyotaka Kumaki[(2)], Satoshi Hori[(2)], Nobuyoshi Kikuma[(1)] and Hiroshi Hirayama[(1)], *[(1)]Nagoya Institute of Technology, Japan, [(2)]Kojima Press Industry Co.,Ltd, Japan*