

2010 International Conference on Applications of Electromagnetism and Student Innovation Competition Awards

(AEM2C 2010)

**Taipei, Taiwan
11 – 13 August 2010**



IEEE Catalog Number: CFP1044J-PRT
ISBN: 978-1-4244-6416-6

Technical Program

8/11 Wednesday

Opening Ceremony

9:00~9:30

Technical Session 1: Computational Electromagnetics

10:50~12:20

Chairmen: Prof. Wenhua Yu and Prof. Hung-Chun Chang

Fast Transient Time Domain Analysis of Gaussian Beam for Second Order
Surface.....4

Shih-Chung Tuan and Hsi-Tseng Chou, Oriental Institute of Technology, Yuan Ze University, Taiwan

A Multidomain Legendre Pseudospectral Frequency-Domain Method with Penalty
Scheme for Solving Maxwell's Equations.....9

*Chih-Yu Wang⁽¹⁾, Shih-Yung Chung⁽¹⁾, Chun-Hao Teng⁽²⁾, Chung-Ping Chen⁽¹⁾, and Hung-chun Chang⁽³⁾,
National Taiwan University⁽¹⁾, National Chiao Tung University⁽²⁾, National Taiwan University⁽³⁾,
Taiwan*

On Study of Large Symmetric Antenna Simulation Using Parallel FDTD
Method..... 14

Wenhua Yu, Xiaoling Yang, Yongjun Liu and Raj Mittra, Pennsylvania State University, USA

Study on Multi-scale Finite Element Method for EM Wave Equation.....19

Zeng Dongdong, Li Yanfei, and Lu Guizhen, Communication university of china, China

Computation of SAR levels in SAM's Head Model Located inside an
Automobile via the Parallel FDTD Algorithm.....24

*Li Li⁽¹⁾, Wenhua Yu⁽²⁾ and Raj Mittra⁽²⁾, Communication University of China⁽¹⁾, Pennsylvania State
University⁽²⁾, China*

Electromagnetic Simulations of 2D Optical Microring Resonators Using the
Multidomain Legendre Pseudospectral Time-Domain Method.....29
*Shih-Yung Chung⁽¹⁾, Chih-Yu Wang⁽¹⁾, Chun-Hao Teng⁽²⁾, Chung-Ping Chen⁽¹⁾, and Hung-Chun Chang⁽³⁾,
National Taiwan University⁽¹⁾, National Chiao Tung University⁽²⁾, National Taiwan University⁽³⁾,
Taiwan*

Technical Session 2: Novel Application

13:20~15:20

Chairmen: Dr. François Chauvet and Prof. Zhaoyun Duan

Networking Airport Fields with Identity-Oriented Dual-Surveillance.....34
*Li-Yen Hsu⁽¹⁾ and Shou-Yih Chen⁽²⁾, Dept. Aviation Services and Management⁽¹⁾, Dept. Avionics, China
University of Science and Technology⁽²⁾, Taiwan*

A mobile meal-ordering system on the bus.....39
*Chien-Nan Lee, Daniel J.H. Hsiao, Yi-Hsing Ho, Chan-Yueh Yang, Oriental Institute of Technology,
Taiwan*

Dropsondes with DGPS for Real-time Typhoon Monitoring.....44
Shiuan-Chi Tsai and Jean-Fu Kiang, National Taiwan University, Taiwan

Electromagnetic Signatures of Earthquake Preparation.....47
Ming-Xian Li and Jean-Fu Kiang, National Taiwan University, Taiwan

The effect of the Antenna Performance and SAR on Human's Abdomen.....51
*Dau-Chyrh Chang, Koichi Ito, Cheng-Wei Chen, Ti-Han Pei, Chiba University, Oriental Institute of
Technology, Taiwan*

Optical analysis of haze ratio and antireflection in structured thin film solar cell.....56
*C. C. Chao⁽¹⁾, Y. C. Pan⁽²⁾, C. M. Wang⁽²⁾, and J. Y. Chang⁽¹⁾, National Central University⁽¹⁾, National
Dong Hwa University⁽²⁾, Taiwan*

Advanced Antenna Diagnostics and Pattern Processing form Measured Data.....61
*J. L. Araque Quijano⁽¹⁾, G. Vecchi⁽¹⁾, L.J. Foged⁽²⁾ and F. Chauvet⁽³⁾, Politecnico di Torino⁽¹⁾, Satimo
Italy⁽²⁾, Satimo HK, Italy⁽³⁾, Italy*

Recent Advancements in a Novel Reversed Cherenkov Radiation.....66
*Zhaoyun Duan⁽¹⁾ and Min Chen⁽²⁾, University of Electronic Science and Technology of China⁽¹⁾,
Massachusetts Institute of Technology Cambridge⁽²⁾, China*

A study of EMI/EMC measurements of airborne SWIR infrared image module.....70
Rui-Cian Weng, Chun-Fu Lin, Shyh-Jye Jous, Chin-Wen Chang and Tai-Shan Liao, National Applied Research Center, Taiwan

Technical Session 3: Active Devices and RFIC

15:40~18:30

Chairmen: Prof. Wen-Shan Chen and Prof. Le-Wei Li

A Study of the Relationship between On-Chip Power Distribution Network Voltage Noise, Charge per Clock Cycle, On-Chip Decoupling Capacitance and Clock Jitter in a 40-nm Field Programmable Gate Array Test Chip.....75
Hui Lee Teng⁽¹⁾, Shishuang Sun⁽²⁾, Man On Wong⁽¹⁾, Peter Boyle⁽²⁾, Chee Seong Fong⁽¹⁾, Penang, Altera Corporation., Altera Corporation⁽¹⁾⁽²⁾, Malaysia

Fractional-N Frequency Synthesizer at 24 GHz.....80
Yi-Jhan Hsieh, Jin-Yu Cheng, and Jean-Fu Kiang, National Taiwan University, Taiwan

Design of Low-Power K-band Low-Noise Amplifier in 0.18 μm CMOS.....84
Ping-Yuan Deng, Yu-Tsung Lo, and Jean-Fu Kiang, National Taiwan University, Taiwan

Design of Dual-axis Accelerometer with CMOS-MEMS.....89
Tsung-Chi Kuo and Jean-Fu Kiang, National Taiwan University, Taiwan

A 4-bit MEMS Phase Shifter at 24 GHz Based on Lateral MEMS Switches.....93
Shih-Wei Lai and Jean-Fu Kiang, National Taiwan University, Taiwan

RFIC chip set employing silicon CMOS technology for applications to millimeter-wave system.....97
Young Bae Park⁽¹⁾, Bo Ra Jung⁽¹⁾, Jeong Gab Ju⁽¹⁾, Jang Hyeon Jeong⁽¹⁾, Jung In Jang⁽¹⁾, Min Seok Cha⁽¹⁾, Hyeong Cheol Kim⁽¹⁾, Eui Hoon Jang⁽¹⁾, Seong Il Hong⁽¹⁾, Chi Hong Min⁽¹⁾, Suk Youb Kang⁽¹⁾, Young Yun⁽¹⁾, Kyu Ho Park⁽²⁾ and Jin Sup Kim⁽²⁾, Korea Maritime University⁽¹⁾, Korea Electronics Technology Institute⁽²⁾, Korea

An Ultra-compact On-chip Impedance Transformer Fabricated Using a Novel
Microstrip Line Employing Periodically Arrayed Capacitive Elements on
MMIC.....102

*Jang-Hyeon Jung, Young-Bae Park, Bo-Ra Jung, Jeong-Gab Ju, Seong-il Hong, Eui-Hoon Jang,
Chi-Hong Min, Hyeong-cheol Kim, Min-seok Cha, Dong-woo Kang, Suk-Youb Kang and Young Yun,
Korea Maritime University, Korea*

Ultra-compact RF Passive Components Employing Periodically Arrayed
Ground Structure on Silicon RFIC.....107

*Jeong-Gab Ju, Young-Bae Park, Bo-Ra Jung, Jang-Hyeon Jung, Seong-Il
Hong, Eui-Hoon Jang, Chi-Hong Min, Dong-Woo Kang, Sub-Youb Kang and Young Yun, Korea
Maritime University, Korea*

The performance Comparison of the Sleeve Antenna and the Array Sleeve
Antenna.....112

Dau-Chyrh Chang, Chun-Chieh Chen, Oriental Institute of Technology, Taiwan

A Novel RFID Reader Antenna with Circular Polarization Operation.....117

Wen-Shan Chen, Yu-Che Huang, Southern Taiwan University, Taiwan

Switched Monopole Antenna for DVB-H Operation.....121

*Kekun_Chang, Guan-Yu Chen, Jwo-Shiun Sun and YD Chen, National Taipei University of Technology
(NTUT), Taiwan*

Evaluation on characteristics of wristband type RFID antenna using a layer structural
arm model.....125

*Takashi Nakajima⁽¹⁾, Masaharu Takahashi⁽²⁾, Kazuyuki Saito⁽²⁾, Koichi Ito⁽¹⁾, Chiba University⁽¹⁾⁽²⁾,
Japan*

Reception **19:00~21:00**

8/12 Thursday

Keynote Speaker **9:30~10:30**

Chairman: Prof. Raj Mittra

Wearable Antennas for Body-centric Wireless Communications.....129

Prof. Koichi Ito, Chiba University, Japan

Technical Session 4: Small Antennas

10:50~12:20

Chairmen: Dr. Kekun Chang and Dr. Saou-Wen Su

Circularly Polarized Crossed Dipole Antennas for Handheld RFID Reader.....	134
<i>Shu-An Yeh⁽¹⁾, Hua-Ming Chen⁽¹⁾, Yi-Fang Lin⁽¹⁾, Zhong-Zhe Yang⁽¹⁾ and Chien-Hung Chen⁽²⁾, National Kaohsiung University of Applied Sciences⁽¹⁾, Department of Avionics Engineering, Air Force Academy⁽²⁾</i>	
Wire Antenna for Dual Band WLAN Application.....	139
<i>Kuo-Liang Wu, Guan-Yu Chen, Jwo-Shiun Sun and YD Chen, National Taipei University of Technology (NTUT), Taiwan</i>	
A Small Wideband Folded Meander Loop Antenna with Three Coupled Modes.....	143
<i>Wang-Ta Hsieh and Jean-Fu Kiang, National Taiwan University, Taiwan</i>	
A Small-Size Penta-Band WWAN Antenna Integrated with USB Connector for Mobile Phone Applications.....	147
<i>Kin-Lu Wong⁽¹⁾, Yu-Wei Chang⁽¹⁾, Chun-Yih Wu⁽²⁾, and Wei-Yu Li⁽²⁾, National Sun Yat-sen University⁽¹⁾, Industrial Technology Research Institute⁽²⁾, Taiwan</i>	
Small-size Internal Antenna for LTE/WWAN Operation in the Laptop Computer.....	152
<i>Kin-Lu Wong and Pei-Ji Ma, National Sun Yat-sen University, Taiwan</i>	
Compact and Printed, Coupled-Fed, 2.4 GHz Loop Antenna.....	157
<i>Saou-Wen Su⁽¹⁾, Tzi-Chieh Hong⁽¹⁾, and Fa-Shian Chang⁽²⁾, Lite-On Technology Corp⁽¹⁾, Cheng Shiu University⁽²⁾, Taiwan</i>	

Technical Session 6: Microwave Devices

15:40~18:30

Chairmen: Prof. Ching-Wen Hsue and Dr. Li-Yen Hsu

Dumbbell DGS Based Broadband RF Choke for UWB LNA.....	162
<i>Chin-I Yeh, Dong-Hua Yang, Yung-Nan Chen, Tsung-Han Liu, Jeffrey S. Fu, Hsien-Chin Chiu and Hsuan-Ling Kao, Chang Gung University, Taiwan</i>	
Accurate Modeling of RF Passive Component in Deep Submicron Process.....	167
<i>Yu-Shun Tsai⁽¹⁾, Hung-Wen Chou⁽¹⁾, Yin-Chang Lin⁽¹⁾, and Tzzy-Sheng Horng⁽²⁾, Cheng Shiu. University⁽¹⁾, National Sun Yat-Sen University⁽²⁾, Taiwan</i>	
Low-Pass Filter Design Applying Short-Parallel Coupled Lines Associated with Open Stubs.....	172
<i>Wei-Chih Tai and Jan-Dong Tseng, National Chin-Yi University of Technology Taichung, Taiwan</i>	
Narrow-Band W Filters Using Parallel Stubs.....	177
<i>Jyun-Yuan Jhang, Ching-Wen Hsue, and Cheng-Chang Chen, National Taiwan University of Science and Technology, Taiwan</i>	
A Tunable Antenna-Filter Module for Simultaneous UHF RFID-based Power Facility Monitoring and Partial Discharge Measurement.....	182
<i>Pedro Cheong, Sam Ngai Lam, Yao Quan Qui, Wai Wa Choi, and Kam Weng Tam, University of Macau, China</i>	
A CPW Bandpass Filter Using Defected Ground Structure with Shorting Stubs for 60 GHz Applications.....	187
<i>Cheng-Yuan Chin, and Ruey-Bing Hwang, National Chiao-Tung University, Taiwan</i>	

Highly Miniaturized LO leakage rejection filters employing spiral lines for application to Ku-band commercial wireless communication system.....	192
<i>Bo-ra Jung, Young-bae Park, Jeong-gab Ju, Jang-hyeon Jeong, Seong-il Hong, Min-jae Kim, Hyeong-cheol Kim, Min-seok Cha, Dong-woo Kang, Suk-youb Kang, and Young Yun, Korea Maritime University, Korea</i>	
On the Propagation Characteristics of Ultra-Wideband Signal in Aluminum.....	197
<i>Daniel Piscarreta, Sut Kam Ho and Kam Weng Tam, University of Macau, China</i>	
Implementation of ESPAR Concept to a Shared Aperture Antenna.....	202
<i>Noorsaliza Abdullah⁽¹⁾, and Yoshihiko Kuwahara⁽²⁾, Universiti Tun Hussein Onn Malaysia⁽¹⁾, Shizuoka University⁽²⁾, Malaysia</i>	
Directivity Enhancement of Microstrip Antennas using Dielectric Superstrates.....	206
<i>Yanfei Li^(1,2), KyunghoYoo⁽²⁾, Raj Mitra⁽²⁾, Guizhen Lu⁽¹⁾, Dongdong Zeng⁽¹⁾ and Yalin Guan⁽¹⁾, Communication University of China⁽¹⁾, The Pennsylvania State University⁽²⁾, China</i>	
Design and Analysis of Five Element Microstrip Log-Periodic Antenn.....	210
<i>Deepak Sharma, Ravi Kumar, Jaypee University of Engineering & Technology, India</i>	
Novel Inset Feed Design Technique for Microstrip Patch Antenna.....	215
<i>Ayesha Aslam, Dr F A Bhatti, National University of Sciences and Technology (NUST), Pakistan</i>	

Banquet **19:00~21:00**

8/13 Friday

Technical Session 7: EMC/EMI Simulations and Measurements **10:50~12:20**

Chairmen: Prof. Shih-Chung Tuan and Prof. Hiroyuki Arai

Field Uniformity Measurement of a Small Reverberation Chamber.....221

Feng Zhang, Guizhen Lu, Rong Jiang, Communication University of China, China

A PSpice model of MQW-LD applicably for E-filed probe.....226

Guangchao ZHU, Jincal LIN, Guizhen LU, Chao WANG, Communication University of China, China

High Sensitivity Antennas for EMI Application.....231

Dau-Chyrh Chang, Ti-Han Pei, Cheng-Wei Chen, Kuo-Hsiang Lo, Instrument Technology Research Center, Taiwan

Capacity Enhancement Using Fixed Phase Difference Feeding in a Handset MIMO Antenna Including Human Body Effects.....235

Daisuke Uchida, Junichi Ohno, and Hiroyuki Arai, Yokohama National University, Japan

Variation of Resonant Frequency of a Rectangular Microstrip Patch Antenna Due to Accumulation of Water over its Surface.....239

Rajeev R. Wakodkar⁽¹⁾, Bhaskar Gupta⁽¹⁾ and Samik Chakraborty⁽²⁾, Jadavpur University⁽¹⁾, Indian Maritime University⁽²⁾, India

Planar Monopole Notched Ultra-wideband Antenna with U-Slot on Metallic Ground.....244

Jian Liu, Xi'an University of Science and Technology, China

Technical Session 8: Multiband/wideband Antennas

14:40~16:50

Chairmen: Prof. Cheng-Nan Hu and Prof. Jian Liu

A Novel Open Slot Monopole Antenna with a Coupling Element for WiMAX 3.5 GHz Applications.....250

Chii-Ruey Lin⁽¹⁾, Tzu-Chen Hung⁽¹⁾, Hsiu-Hsien Chiang⁽¹⁾, Jou-Hsiung Huang⁽²⁾, Jin-Sen Chen⁽²⁾ and Yuan-Chih Lin⁽¹⁾, National Taipei University of Technology⁽¹⁾, Cheng Shiu University⁽²⁾, Taiwan

A Dual-mode Aperture-coupled Stack Antenna with Square Loop Resonator for Tri-band circularly polarized Applications.....	254
<i>Ji-Chyun Liu⁽¹⁾, Salimatou Drammeh⁽²⁾, Lallah Badjie⁽²⁾, Bing-Hao Zeng^{(1),(3)}, Dau-Chyrh Chang^{(3),(4)}, Ching Yun University^{(1),(2)}, Yuan Ze University⁽³⁾, Oriental Institute of Technology⁽⁴⁾ Taiwan</i>	
Modified Antipodal Fermi Antenna with Piecewise-linear Approximation.....	259
<i>Dau-Chyrh Chang^{(1),(2)}, Bing-Hao Zeng^{(2),(3)}, Ji-Chyun Liu⁽³⁾, Oriental Institute of Technology⁽¹⁾, Yuan Ze University⁽²⁾, Ching Yun University⁽³⁾, Taiwan</i>	
Design of a Multiband Coupled-Meander-Line Monopole Antenna for M2M Applications.....	264
<i>Cheng-Nan Hu⁽¹⁾, Willy Chen⁽²⁾, J.-W Huang⁽¹⁾, and Jack Chiu, Oriental Institute of Technology⁽¹⁾, Sporton Internation Inc⁽²⁾, Taiwan</i>	
Study of Promising Internal WWAN Antenna for the Folder-Type Mobile Phone with Various Chassis Shapes.....	269
<i>Kin-Lu Wong, Chao-An Lyu, and Cheng-Tse Lee, National Sun Yat-sen University, Taiwan</i>	
Design and optimization for the satellite Ku-band CP array antennas.....	274
<i>Lung-Fai Tuen and Ching-Lieh Li, Tamkang University, Taiwan</i>	
UWB Balun for TEM Horn Antenna.....	279
<i>Dau-Chyrh Chang, Cheng-Wei Chen, and Shao-Hsiang Yen, Oriental Institute of Technology, Taiwan</i>	
Side Lobe Control of UWB Antenna Array for Real Beam Radar Imaging.....	284
<i>Chao-Hsiang Liao⁽¹⁾, Powen Hsu⁽¹⁾, and Dau-Chyrh Chang⁽²⁾, National Taiwan University⁽¹⁾, Oriental Institute of Technology⁽²⁾, Taiwan</i>	
Quantitative Analysis of an Urban Effect against the Electromagnetic Induction onto Telecommunication Line by Electricified Railway Line based on Field Measurements.....	289
<i>Sangmu Lee, Munhwan Choi, Pyung-Dong Cho, Electronics and Telecommunications Research Institute, Korea</i>	

Element Failure Diagnosis in a Planar Microstrip Antenna Array by the Use of
Neural Networks.....294

A.R. Mallahzadeh and M. Taherzadeh , Faculty of Engineering, Shahed University, Tehran, Iran*

ISC Meeting **17:10~18:00**

Closing and Award Banquet **19:00~21:00**