

2019 IEEE Asia-Pacific Conference on Applied Electromagnetics (APACE 2019)

**Melacca, Malaysia
25 – 27 November 2019**



**IEEE Catalog Number: CFP19551-POD
ISBN: 978-1-7281-2163-5**

**Copyright © 2019 by the Institute of Electrical and Electronics Engineers, Inc.
All Rights Reserved**

Copyright and Reprint Permissions: Abstracting is permitted with credit to the source. Libraries are permitted to photocopy beyond the limit of U.S. copyright law for private use of patrons those articles in this volume that carry a code at the bottom of the first page, provided the per-copy fee indicated in the code is paid through Copyright Clearance Center, 222 Rosewood Drive, Danvers, MA 01923.

For other copying, reprint or republication permission, write to IEEE Copyrights Manager, IEEE Service Center, 445 Hoes Lane, Piscataway, NJ 08854. All rights reserved.

****** This is a print representation of what appears in the IEEE Digital Library. Some format issues inherent in the e-media version may also appear in this print version.***

IEEE Catalog Number:	CFP19551-POD
ISBN (Print-On-Demand):	978-1-7281-2163-5
ISBN (Online):	978-1-7281-2162-8

Additional Copies of This Publication Are Available From:

Curran Associates, Inc
57 Morehouse Lane
Red Hook, NY 12571 USA
Phone: (845) 758-0400
Fax: (845) 758-2633
E-mail: curran@proceedings.com
Web: www.proceedings.com

CURRAN ASSOCIATES INC.
proceedings
.com

TABLE OF CONTENTS

HIGH GAIN OPTICAL BEAM SCANNING ANTENNA AND ITS MEASUREMENT	1
<i>Hiroyuki Arai</i>	
SMART DENTAL: A NEW FRONTIER?	4
<i>Lutfi Albasha</i>	
ANTENNA WITH ARTIFICIAL MAGNETIC CONDUCTOR FOR WIRELESS APPLICATION	8
<i>MKA Rahim ; MR Hamid ; NA Samsuri ; NA Murad ; F Zubir ; O Ayop ; MFM Yusof ; HA Majid</i>	
DESIGNS OF DEFORMED BUTLER MATRIX IN 0.18 μM-CMOS FOR ARRAY BEAMFORMING	13
<i>Yi-Che Hsieh ; Chia-Chan Chang ; Sheng-Fuh Chang</i>	
DESIGN OF BROADBAND ANTENNAS BASED ON THE CONTROL OF MODES	17
<i>Qing-Xin Chu ; Yu Luo ; Dong-Ze Zheng ; Rui Wu</i>	
TRANSMISSION LINE MEASUREMENT FOR CHARACTERIZATION OF NEW TEXTILE SAMPLE	21
<i>Nurul Huda Abd Rahman ; Yoshihide Yamada ; Mohd Shauqi Zulkipli ; Muhammad Shakir Amin Nordin</i>	
DESIGN OF HYBRID KOCH-MINKOWSKI FRACTAL DIPOLE ANTENNA FOR DUAL BAND WIRELESS APPLICATIONS	25
<i>Norun Abdul Malek ; Nur Alyaa Che Sabri ; Md Rafiqul Islam ; Sarah Yasmin Mohamad ; Farah Nadia Mohd Isa</i>	
A COMPACT AND LIGHTWEIGHT MICROSTRIP ANTENNA ARRAY WITH WILKINSON POWER DIVIDER FOR X-BAND APPLICATION AT 9.5 GHZ	30
<i>Najmin Mohamed ; Sarah Yasmin Mohamad ; Norun Fariahah Abdul Malek ; Farah Nadia Mohd Isa</i>	
EMPIRICAL FORMULAE TO PREDICT THE RESONANT FREQUENCIES OF THE T – SHAPED PRINTED ANTENNA	35
<i>Dik Ken Cheah ; Pei Cheng Ooi</i>	
DUAL-ELEMENT MIMO ANTENNAS WITH RECTANGULAR STRIP LINE INSULATOR FOR WI-FI HOTSPOTS APPLICATION	41
<i>M. Z. A Muhsin ; S. K. A Rahim ; M. Z. M Nor</i>	
3D PRINTED WAVEGUIDE PHASE SHIFTER FOR BUTLER MATRIX NETWORK	44
<i>Muataz W. Sabri ; N. A. Murad ; Mohammed K. A. Rahim ; Osman Ayop</i>	
DESIGN AND IMPLEMENTATION OF A LOW COST AMATEUR RADIO UNIT FOR CUBE SATELLITES	49
<i>Hanns Christian Chua ; Christian Jay Flores ; Arlu Genesis Padilla ; Charleston Dale Ambatali</i>	
DESIGN OF VIA-HOLE FOR DUAL LAYER BUTLER MATRIX	55
<i>Noorlindawaty Md Jizat ; Zubaida Yusoff ; Yoshihide Yamada ; Norsiha Zainudin</i>	
EVALUATION OF DENOISING PERFORMANCE FOR NOISY ARC FAULT SIGNAL BASED ON MOTHER WAVELET SELECTION	60
<i>Melayt Amirrussin ; Mohd Rafi Adzman ; Syahirah Abdul Halim ; Nur Adyani Mohd Affendi ; Muzamir Isa ; Hana Abdull Halim ; Muhd Hafizi Idris</i>	
MIMO MICROWAVE WIRELESS POWER TRANSFER	66
<i>Ameen Awwad ; Misbah AlKhadem ; Lutfi Albasha</i>	
ON THE NOISE ANALYSIS OF THE BALUN LNA	70
<i>Qusai Abubaker ; Lutfi Albasha</i>	
AIRY BEAM INDUCED OPTICAL PULLING OF SUB-WAVELENGTH AG-AU PLASMONIC STRUCTURES IMMERSSED IN WATER	74
<i>Shuva Mitra ; Intiaj Khan</i>	
MEASUREMENT OF AN UNEVEN TERRAIN MODEL FOR POTENTIAL APPLICATIONS IN CAVES	78
<i>Qi Ping Soo ; Soo Yong Lim ; David Wee Gin Lim ; Nurhidayah Rusli ; Ka Heng Chong ; Kian Meng Yap ; Sian Lun Lau</i>	
ELECTROMAGNETIC WAVES PROPAGATION FOR HYPERTHERMIA APPLICATION	81
<i>Amirah Abd Rahman ; Kamilia Kamardin ; Yoshihide Yamada</i>	
TOWARDS A LIVELIER ELECTROMAGNETIC EDUCATION WITH AN INTERACTIVE MATLAB-BASED GUI	86
<i>Shin Yun Wong ; Soo Yong Lim</i>	
A COST-EFFECTIVE FLIP-CHIP INTERCONNECTION FOR APPLICATIONS FROM DC UNTIL 200 GHZ	90
<i>Paolo Valerio Testa ; Helmuth Morath ; Panic Goran ; Corrado Carta ; Frank Ellinger</i>	

CONTRACTED MICROWAVE T-RESONATOR FOR PERMITTIVITY SENSING APPLICATIONS	96
<i>Z. Zakaria ; Rammah A. Alahnomi ; Zulkalnain Mohd Yussof ; Ammar Alhegazi ; Amyrul Azuan Mohd Bahar ; Norhanani Abd Rahman</i>	
MULTI-BAND NOTCHED PATCH ANTENNA FOR 5G APPLICATIONS.....	102
<i>Maryam Isa ; Hayder Sadir ; Alyani Ismail ; Roslina Sidek</i>	
DIELECTRIC RESONATOR ANTENNA EXCITED USING T-STRIP FEED LINE FOR WIDEBAND APPLICATIONS.....	107
<i>Irfan Ali ; Mohd Haizal Jamaluddin ; Abinash Gaya ; Hafizal Mohamad</i>	
A CONFORMAL METAL STRIP FED CIRCULARLY POLARIZED RECTANGULAR DIELECTRIC RESONATOR ANTENNA	110
<i>U. Illahi ; J. Iqbal ; M. I. Sulaiman ; M. Alam ; M. S. Mazliham ; M. H. Jamaluddin</i>	
DUAL BAND TEXTILE MONOPOLE ANTENNA WITH AMC PLANE FOR WLAN AND UWB APPLICATIONS	113
<i>Nur Farahiyah Mohd Aun ; Ping Jack Soh ; Azremi Abdullah Al-Hadi ; Herwansyah Lago</i>	
DESIGN OF WIDEBAND DIELECTRIC RESONATOR ANTENNA WITH SQUARE SLOTS EXCITED USING MICROSTRIP LINE AT 26 GHZ	117
<i>Irfan Ali ; Mohd Haizal Jamaluddin ; Abinash Gaya ; Hafizal Mohamad</i>	
WIDEBAND CIRCULAR SHAPED FRACTAL PATCH ANTENNA FOR 2.45 GHZ BIOMEDICAL APPLICATIONS	121
<i>Anita Garhwal ; Mohd Riduan Ahmad ; Badrul Hisham Ahmad ; Sanyog Rawat ; Pushpendra Singh ; Kanad Ray ; Anirban Bandyopadhyay</i>	
A POWER CONVERTER CIRCUIT OF CO-PLANAR WAVEGUIDE RF HARVESTER ANTENNA FOR LOW POWER WIRELESS APPLICATIONS	126
<i>Nuraiza Ismail ; Mohd Tarmizi Ali ; Ermeey Abd Kadir ; Mazratul Firdaus Mohd Zin ; Fatimah Nur Mohd Redzwan</i>	
SINGLE RESONANT TYPE TOOL FOR MEASURING THE SOLID DIELECTRICS WITH A WIDE DIELECTRIC CONSTANT INTERVAL AND EXTRA SMALL LOSSES IN L-BAND.....	130
<i>Oleksandr Kogut ; Zoya Eremenko ; Roman Dolia ; Alexei Breslavets ; Igor Kuzmichev ; Zhu Gang ; Li Rong</i>	
ON THE POSSIBILITY OF USE OF PLANAR DIELECTRIC RESONATORS FOR SOLVING THE PROBLEMS OF FREQUENCY STABILIZATION OF MILLIMETER WAVES OSCILLATORS	133
<i>Mohammad Tariqul Islam ; Aleksandr Kogut ; Iskandar Yahya ; Roman Dolia</i>	
RF RECTIFIER WITH HIGH EFFICIENCY OVER A WIDE INPUT POWER RANGE USING A VOLTAGE CONTROLLED SWITCH IN A ‘HANDOVER’ FASHION	136
<i>Abdulkadir Muhammad Lawan ; Hieng Tiong Su ; Yi Lung Then ; Jiafeng Zhou</i>	
DESIGN OF NARROWBAND TUNABLE FILTER FOR LTE BAND 5.....	140
<i>M. K. S. K. Sabir ; F. N. Mohd Isa ; A. S. M. Marzuki ; H. A. M. Ramli ; A. A. Ruslan</i>	
DESIGN AND SYNTHESIS OF PARALLEL CONNECTED CHAINED FUNCTION FILTER.....	144
<i>Chong Yi Chuan ; Cheab Sovuthy</i>	
CONCERNS ON THE RISK OF MALAYSIAN CIVIL AND DEFENSE SYSTEMS DUE TO INTENTIONAL ELECTROMAGNETIC INTERFERENCE	148
<i>F Hamamah ; WFH Wan Ahmad ; C Gomes ; M Mohd Isa ; MJ Homam</i>	
MAXIMAL RATIO COMBINING GAIN OF DUAL-BAND MIMO ANTENNA FOR SUB-6 GHZ IN THE VICINITY OF USER’S HAND AND DIFFERENT ELEMENTS CONFIGURATIONS	154
<i>Ahmed Mohamed Elshirkasi ; Azremi Abdullah Al-Hadi ; Rizwan Khan ; Ping J. Soh ; Mohd F. Mansor</i>	
MULTI-TARGETS DETECTION IN A NON-HOMOGENEOUS RADAR ENVIRONMENT USING MODIFIED CA-CFAR	160
<i>Jiwa Abdullah ; Mustafa Subhi Kamal</i>	
DRONE’S RADAR CROSS SECTION COMPUTATION FOR VARIOUS REFLECTED ANGLES USING LTE FREQUENCY.....	165
<i>Noor Mohd Kamal Khairie bin Yahya ; Nur Emileen Abd Rashid ; Nor Ayu Zakaria ; Zuhani Ismail Khan ; Khairul Khaizi Mohd Shariff</i>	
EXTENDED DIMENSIONALITY REDUCTION MUSIC METHOD FOR SIGNAL-SELECTIVE DIRECTION ESTIMATION.....	169
<i>Daniel Hallman ; Susan Berggren ; Benjamin Taylor ; Anna Leese de Escobar</i>	
CONSIDERATIONS FOR W-FI ROUTER INSTALLATION ON WIND TURBINE AT SEA	174
<i>Shen Shou Max Chung ; Shih-Chung Tuan</i>	
SIZE REDUCTION PERCENTAGE STUDY OF 5G HAIRPIN BANDPASS FILTER NONUNIFORM TRANSMISSION LINE RESONATOR.....	178
<i>Sahar Saleh ; Widad Ismail ; Intan Sorfina Zainal Abidin ; Moh’d Haizal Jamaluddin ; Samir A. Al-Gailani ; Mohammed Bataineh ; Asem Alzoubi</i>	

MULTIBEAM ANTENNAS USING MULTI-LAYER SUBSTRATE IN MILLIMETER WAVE BAND.....	183
<i>Kunio Sakakibara ; Nguyen Thanh Tuan ; Shugo Yamauchi ; Kento Yamauchi ; Shota Mariyama ; Nobuyoshi Kikuma</i>	
28 GHZ MMWAVE QUASI-LUMPED ELEMENT RESONATOR ANTENNA ON AIR-SUBSTRATE.....	186
<i>Shahanawaz Kamal ; Abdullahi SB Mohammed ; Mohd Fadzil Ain ; Fathul Najmi ; Roslina Hussin ; Zainal Arifin Ahmad ; Ubaid Ullah ; Mohamadariiff Othman ; Mohd Fariz Ab Rahman ; Mohamad Faiz Mohamed Omar</i>	
ADAPTIVE ENERGY CONCENTRATION IN HYPERTHERMIA TREATMENT OF CANCER.....	190
<i>Ibrahim Elshafiey ; Abdel-Fattah Sheta ; Mubashir Alam Nizam Uddin ; Wazie M. Abdulkawi ; Waqar A. Malik</i>	
APERTURE ANTENNAS FOR 5G MOBILE BASE STATIONS.....	195
<i>Yoshihide Yamada ; Kamelia Quzwain ; Farizah Ansarudin ; Kamilia Kamardin ; Nurul Huda Abd Rahman</i>	
DESIGN OF SLOT COUPLED RECTANGULAR DIELECTRIC RESONANT ANTENNA FOR 5G APPLICATION	199
<i>R Abdullah ; H. Ja'afar ; A.N Jaafar ; M.H. Jamaluddin ; M.A Aris ; F.N.M. Redzwan</i>	
IOT ENABLED WIRELESS HEALTH MONITORING SYSTEM USING TEXTILE ANTENNA	203
<i>Irfanuddin Shafi Ahmed ; Kamilia Kamardin ; Yoshihide Yamada ; Taj R. Noreen ; Izni Husna Idris ; Hazilah Mad Kaidi ; Nurul Aini Bani ; Suriani Mohd Sam</i>	
ANALYSIS OF HELICAL ANTENNA FOR WIRELESS APPLICATION AT 2.4 GHZ	209
<i>A. N Jaafar ; H Ja'afar ; I. Pasya ; Y. Yamada ; R. Abdullah ; M. A. Aris ; F. N. M. Redzwan</i>	
ANTENNA FOR IN-BODY COMMUNICATIONS	214
<i>N.A Kamaruddin ; S. N. Azemi ; S. Z. Ibrahim ; A. A. H. Azremi ; N.F. Kahar</i>	
MULTIBAND MONOPOLE ANTENNA FOR MOBILE APPLICATIONS	220
<i>S. S. Saravanan ; H. A. Majid ; B. A. F Esmail ; N. Fadhali ; Z. Z. Abidin ; S. M. Shah ; M. K. A. Rahim</i>	
DIELECTRIC MEASUREMENT USING PLANAR AND CURVED MICROSTRIP LINE.....	224
<i>Kim Yee Lee ; Boon-Kuan Chung ; Yeong-Nan Phua ; Eng-Hock Lim ; Kok Yeow You ; Ee Meng Cheng</i>	
METAMATERIAL INSPIRED HIGH GAIN ANTENNA FOR MICROWAVE BREAST IMAGING	230
<i>Md Tarikul Islam ; Md Samsuzzaman ; Iskandar Yahya ; A. E. Kogut ; Norbahiah Misran ; Mohammad Tariqul Islam</i>	
PERIODIC METALLIC POSTS LOADED COMPACT TM₀₁-TE₁₁ MODE CONVERTER.....	234
<i>Ashish Chittora</i>	
USING TRIGGERS FOR SYNCHRONIZATION TO MEASURE S-PARAMETERS ON A SYNTHETIC VNA	237
<i>Charleston Dale Ambatali</i>	
FACE RECOGNITION FOR STUDENT ATTENDANCE USING RASPBERRY PI	242
<i>A.S. Hasban ; N.A. Hasif ; Z. I. Khan ; M. F. Husin ; N. E. A. Rashid ; K. K M. Sharif ; N. A. Zakaria</i>	
INVESTIGATING THE POTENTIALS OF GPS REFLECTOMETRY SYSTEM IN STORM MONITORING.....	247
<i>Faisal Alawwad ; Ibrahim Elshafiey</i>	
TARGET RECOGNITION TECHNOLOGY OF PULSE DOPPLER RADIO FUZE BASED ON BANDWIDTH CHARACTERISTICS FOR ANTI-CHAFF JAMMING.....	253
<i>Zhaoshi Yan ; Xinhong Hao ; Ran Li ; Ping Li</i>	
EFFECTS OF MUTUAL COUPLING AND ARRAY DISSIMILARITY ON ANGLE ESTIMATION IN MIMO RADAR	259
<i>Abdul Azim Azhar ; Nur Emileen Abd Rashid ; Mohd Khairil Azhar Mahmood ; Idnin Pasya</i>	
SORTING OF LOW PROBABILITY OF INTERCEPT RADAR SIGNALS BASED ON FREQUENCY MODULATION CONSTANCY USING WIGNER-VILLE DISTRIBUTION.....	265
<i>Ashraf Adamu Ahmad ; Abdulkadir Muhammad Lawan ; Mohammed Ajiya ; Zainab Yunusa Yusuf</i>	
PATH LOSS MEASUREMENT OF WIDEBAND SIGNALS AT SUB-GHZ FREQUENCIES IN A LINE-OF-SIGHT UNDERWATER ENVIRONMENT	270
<i>Hanisah Mohd Zali ; Mohd Khairil Azhar Mahmood ; Idnin Pasya ; Miyuki Hirose</i>	
DUAL BAND CIRCULARLY POLARIZED RECTANGULAR DIELECTRIC RESONATOR ANTENNA FOR MILLIMETER WAVE 5G APPLICATIONS.....	274
<i>Abinash Gaya ; Mohd Haizal Jamaluddin ; Irfan Ali ; Hafizal Mohamad</i>	
HYBRID CONFORMAL FED RECTANGULAR DIELECTRIC RESONATOR ANTENNA FOR MILLI METER WAVE 5G APPLICATIONS	279
<i>Abinash Gaya ; Mohd Haizal Jamaluddin ; Irfan Ali ; Hafizal Mohamad</i>	
COMPLEMENTARY PLANAR INVERTED-F ANTENNAS (PIFAS) FOR ON-METAL RFID TAG DESIGN.....	283
<i>Yong-Hong Lee ; Eng-Hock Lim ; Fwee-Leong Bong ; Boon-Kuan Chung ; Kim-Yee Lee</i>	

COMPACT FREQUENCY SELECTIVITY WIDEBAND RECONFIGURABLE METAMATERIAL ANTENNA DESIGN	286
<i>Adamu Y Iliyasu ; Mohamad Rijal Bin Hamid ; Mohamad Kamal A Rahim ; Murtala Aminu-Baba ; Mohd Fairus Mohd Yusoff</i>	
FREQUENCY SELECTIVE SURFACE (FSS) REALIZATION IN TERAHERTZ (THZ) RANGE FOR 6G INITIATIVE STUDIES	291
<i>N.S. Ishak ; M. Hashim Dahri ; N.A. Awang ; W.Y. Chong ; F.C. Seman</i>	
FRONT TO BACK RATIO IMPROVEMENT IN MICROSTRIP ANTENNA ARRAY USING AMC FOR LTE APPLICATIONS	295
<i>M. Hashim Dahri ; T. M. Fang ; F. C. Seman ; S. A. Hamzah ; A. Syafiah ; H. Ahmad</i>	
Author Index	