

2019 IEEE 19th Mediterranean Microwave Symposium (MMS 2019)

**Hammamet, Tunisia
31 October – 2 November 2019**



**IEEE Catalog Number: CFP1946H-POD
ISBN: 978-1-7281-4065-0**

**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:	CFP1946H-POD
ISBN (Print-On-Demand):	978-1-7281-4065-0
ISBN (Online):	978-1-7281-4064-3
ISSN:	2157-9822

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

NOTCH FILTERS BASED ON MULTILAYER RING RESONATORS (MRR).....	1
<i>Seyyed Kamal Hashemi</i>	
AN UWB TAPERED SLOT VIVALDI ANTENNA (TSA) WITH IMPROVED CHARACTERESTICS.....	5
<i>Youness Akazzim, Mohammed Kanjaa, Otman El Mrabet, Luis Jofre, Mohamed Essaaidi</i>	
PARTICLE FILTER-BASED OPTIMIZED MAX DOUBLE SHEWHART CHART FOR DAMAGE DETECTION IN STRUCTURAL HEALTH MONITORING SYSTEMS.....	9
<i>Marwa Chaabane, Ahmed Ben Hamida, Majdi Mansouri, Hazem Nounou, Mohamed Nounou</i>	
THE IMPROVEMENT OF CHANGE DETECTION FROM MULTI-DATE SATELLITE IMAGES USING THE SOURCE SEPARATION	13
<i>Amira Echioui, Olfa Ben Sassi, Lamia Sellami, Ahmed Ben Hamida</i>	
A PAN-SHARPENING METHOD BASED LATENT LOW-RANK DECOMPOSITION MODEL	17
<i>Hind Hallabia, Ahmed Ben Hamida</i>	
CHARACTERIZATION OF THE PARAMETERS OF THE OPEN CATHODE STACK FUEL CELL USING AN EXPERIMENTAL WORK.....	21
<i>Tarek Medini, Arafet Bouaicha, Hatem Allegui, Abdelkader Mami</i>	
DESIGN OF ROBUST DETECTION SYSTEM FOR PRINTABLE CHIPLESS RFID TAG ALPHABET LETTERS	25
<i>Oussama Boularess, Taoufik Aguil, Jawad Yousaf, Hatem Rmili, Bandar Hakim, Smail Tedjini</i>	
IMPLEMENTATION OF A CRYPTOGRAPGY ALGORITHM FOR IMAGE TRANSMISSION.....	29
<i>Samoud Ali, Cherif Adnen</i>	
BEAM-SWITCHING ANTENNA WITH RECONFIGURABLE HEXAGONAL FREQUENCY SELECTIVE SURFACE.....	35
<i>Moufida Bouslama, Ali Gharsallah, Tayeb Ahmed Denidni</i>	
GAN BASED DRIVER AND POWER AMPLIFIER MMICS FOR X-BAND TRANSCEIVER MODULES.....	39
<i>Busra Cankaya Akoglu, Batuhan Sutbas, Omer Cengiz, Ekmel Ozbay</i>	
HIGH GAIN PATCH ANTENNA ARRAY USING DIELECTRIC SUPERSTRATE FOR THE 5G APPLICATIONS.....	43
<i>Ilhem Gharbi, Rim Barrak, Mourad Menif, Jean Marc Ribero, Aliou Diallo, Hedi Ragad</i>	
AN EFFICIENT DUAL BAND 900MHZ / 2.45GHZ RF ENERGY HARVESTER.....	47
<i>Mohamed Mokhlès Mnif, Hassene Mnif, Mourad Loulou</i>	
DESIGN OF FREQUENCY-RECONFIGURABLE PRINTED MONOPOLE ANTENNA USING CAPACITIVE LOADING	51
<i>Moheddine Smari, Saber Dakhli, Jean-Marie Floc'H, Fethi Choubani</i>	
ANALYSIS AND DESIGN OF BAND-PASS FILTER BASED ON METAMATERIAL	55
<i>Zied Troudi, Lotfi Osman</i>	

BAND SELECTIVITY BASED DIGITAL PREDISTORTION FOR CONCURRENT DUAL-BAND TRANSMITTERS.....	59
<i>S. Lajnef, M. Chouchane, N. Bouleifjen, F. M. Ghannouchi</i>	
A CMOS DIGITALLY CONTROLLED OSCILLATOR FOR RECONFIGURABLE RF APPLICATIONS.....	63
<i>F. Haddad, W. Rahajandraibe, I. Ghorbel</i>	
COMPACT HAIRPIN-LINE BANDPASS FILTER WITH HARMONIC SUPPRESSION BY PERIODIC GROOVES.....	67
<i>Sayan Chatterjee, Tarun Kumar Das</i>	
PLC AND RF COMMUNICATIONS EVALUATION FOR SMART GRID APPLICATION IN RURAL CONFIGURATION.....	71
<i>Amani Aloui, Ons Ben Rhouma, Chiheb Rebai</i>	
A SELF ADAPTIVE FCM CLUSTER FORESTS BASED FEATURE SELECTION	75
<i>Ines Lahmar, Aida Zaier, Mohamed Yahia, Ridha Bouallegue</i>	
DESIGN OF MINIATURIZED HALF MODE SIW BANDPASS FILTER USING METAMATERIAL UNIT CELL.....	79
<i>Zied Troudi, Lotfi Osman</i>	
TUNABLE TERAHERTZ RESPONSE OF SPLIT RING RESONATOR LOADED ALONG PLANAR GOUBAU LINE.....	83
<i>Abdallah Chhahadih, Mohamad Faran, Abbas Ghaddar, Gabriel Moreno, Youssef Haidar, Tahsin Akalin</i>	
DUAL BAND METAMATERIAL INVERTED-L ANTENNA	85
<i>Nabil Dakhli, Fethi Choubani</i>	
ON EVALUATING ENERGY EFFICIENT ALGORITHMS FOR INTERNET OF THINGS NETWORKS.....	89
<i>Sirine Rabah, Aida Zaier, Hassen Dahman</i>	
LOW PROFILE AND HIGH ISOLATION MIMO ANTENNA FOR WLAN APPLICATION	94
<i>Avez Syed, Rabah W. Aldhaferi</i>	
TERAHERTZ SUBSTRATE INTEGRATED WAVEGUIDE WIDEBAND ANTENNA FOR MEDICAL IMAGING AND SATELLITE COMMUNICATIONS APPLICATIONS.....	98
<i>Radhoine Aloui, Zied Houaneb, Ignacio Llamas-Garro, Hassen Zairi</i>	
CHARACTERIZATION OF DIELECTRIC PROPERTIES OF CONDUCTIVE MATERIALS BY COPLANAR WAVEGUIDE METHOD	102
<i>Plamen I. Dankov</i>	
BREAST CANCER DETECTION BASED ON CPW ANTENNA.....	106
<i>Marwa Slimi, Bassem Jmai, Paulo Mendes, Ali Gharsallah</i>	
INCREASING THE MINIATURIZATION LIMIT OF WIRELESS IMPLANTABLE DEVICES THROUGH A MULTIMODE WIRELESS POWER TRANSFER APPROACH.....	110
<i>Hugo Dinis, Ivo Colmiaris, P. M. Mendes</i>	
COMBINED HYBRID MM-WAVES AND OPTICS SENSING WITH SMART DATA FUSION FOR AUTONOMOUS VEHICLES.....	114
<i>Sidina Wane, Philippe Descamps, Philippe Eudeline</i>	

A SIMPLE AND COMPACT CPW-FED UWB ANTENNA WITH WLAN BAND REJECTION.....	117
<i>Rabah W. Aldhaheer, Ibrahim S. Alruhaili</i>	
LINEAR ESPRIT-LIKE ALGORITHMS FOR FAST DIRECTIONS OF ARRIVAL ESTIMATION WITH REAL STRUCTURE.....	121
<i>Salem Akkar, Ferid Harabi, Ali Gharsallah</i>	
SYNTHESIS OF A COMPACT HIGH IMPEDANCE SURFACE ANTENNA WITHOUT DIPOLE ON TOP FOR BCWC	125
<i>F. Dhaouadi, J. M. Ribero, S. Beldi, R. Bedira, A. Gharsallah</i>	
A MINIATURIZED METAMATERIAL UNIT CELL FOR 5G APPLICATIONS	129
<i>Imen Sansa, Abdelkhalek Nasri, Hassen Zairi</i>	
EFFICIENT RECURSIVE ALGORITHM FOR ANALYSIS OF ANISOTROPIC MICROSTRIP STRUCTURES IN MULTILAYER CONFIGURATION	133
<i>A. Khodja, D. Abbou, M. C. E. Yagoub, R. Touhami</i>	
DESIGN AND TOPOLOGY CONSIDERATIONS FOR A FAMILY OF X-BAND GAN POWER AMPLIFIER MMICS.....	137
<i>Ulas Ozipek, Armagan Gurdal, Batuhan Sutbas, Busra Cankaya Akoglu, Ekmel Ozbay</i>	
INDOOR CHANNEL CHARACTERISATION AND MODELLING FOR 5G APPLICATIONS AT 22GHZ	141
<i>Joydeep Pal, Kaushik Patra, Bhaskar Gupta</i>	
A QUARTER MODE SUBSTRATE INTEGRATED CIRCULAR CAVITY CHIPLESS TAG BASED HUMIDITY SENSOR.....	145
<i>Soumaya Sakouhi, Hedi Ragad, Ali Gharsallah, Mohamed Latrach</i>	
PERFORMANCE COMPARISON OF RECTANGULAR AND CIRCULAR COPLANAR TEXTILE ANTENNAS	150
<i>Ameni Mersani, Lotfi Osman, Jean-Marc Ribero</i>	
A MODIFIED DUAL-BAND WEARABLE ANTENNA USING AMC FOR WLAN APPLICATIONS.....	154
<i>Wahida Bouamra, Imen Sfar, Lotfi Osman</i>	
CONCURRENT DUAL BAND SIX-PORT BASED RECEIVERS: TOPOLOGIES AND CALIBRATION TECHNIQUE	158
<i>Nadia Chagmi, Manel Manai, Noureddine Boulejfen, Fadhel M. Ghannouchi</i>	
VARACTOR-LOADED SIW CAVITY BACKED ANTENNAS FOR MODERN WIRELESS COMMUNICATION SYSTEMS	162
<i>Fakher Sboui, Jan Machac, Ali Gharsallah</i>	
TUNABLE LIQUID CRYSTAL MTM SIW LWA FOR CONTINUOUS SCANNING AT FIXED FREQUENCY.....	165
<i>Rihem Noumi, Jan Machac, Ali Gharsallah</i>	
RASPBERRY PI-BASED SMART PLATFORM FOR DATA ACQUISITION, SUPERVISION AND MANAGEMENT OF A HYBRID PV/WT/BATTERIES SYSTEM.....	169
<i>Skander Lazgheb, Bacem Bayar, Malek Belouda, Hatem Oueslati, Salah Ben Mabrouk</i>	
COOPERATIVE COMMUNICATION IN ALGEBRAIC SPACE-TIME CODED MB-OFDM UWB SYSTEM.....	173
<i>Ines Ben Hassine, Ridha Bouallegue</i>	

A HIGHLY SURVIVABLE C-BAND GAN HEMT LNA WITH RESISTIVE FEEDBACK TECHNIQUE	176
<i>A. M. Elelimy Abounemra, Mohamed Helaoui, Fadhel M. Ghannouchi</i>	
ANALYSIS OF ELECTROMAGNETIC SCATTERING IN WAVEGUIDES BY HYBRID MOM-PO-GTD METHOD	180
<i>Samir Mendil, Taoufik Aguil</i>	
SAR REDUCTION IN THE HUMAN HEAD MODEL USING METAMATERIALS	185
<i>H. Messaoudi, T. Aguil</i>	
TRIPLE BAND TUNABLE SIW CAVITY ANTENNA WITH CRISTAL LIQUID MATERIALS FOR WIRELESS APPLICATIONS	190
<i>Fakher Sboui, Jan Machac, Lassaad Latrach, Ali Gharsallah</i>	
GPS AND IRIDIUM ANTENNA FOR TRACKING	194
<i>J. M. Floc'H</i>	
DESIGN OF A COMPACT MULTILAYERED APERTURE COUPLED MICROSTRIP ANTENNA FOR AUTOMOTIVE RANGE RADAR APPLICATION	198
<i>Mariam Abdi, Taoufik Aguil</i>	
RESOLUTION OF 2D SCATTERING PROBLEM USING METHOD OF MOMENT AND RWG FUNCTIONS	202
<i>Auns Khaled, Dorsaf Omri, Taoufik Aguil</i>	
A MODIFIED FDTD ALGORITHM FOR ANALYSIS OF ANISOTROPIC STRATIFIED WAVEGUIDES AND MULTILAYERED MICROWAVE FILTERS	206
<i>Mohamed Karim Laoufi, Slimane Mekaoui, Mohamed Lamine Tounsi, Mustapha C. E Yagoub</i>	
SLOW-WAVE STRUCTURE FOR MINIATURIZED SIX-PORT JUNCTION	210
<i>Maroua Said, Mohamed Azzouz Ben Taieb, Noureddine Boulejfen</i>	
PERFORMANCES EVALUATION AND OPTIMIZATION OF UPLINK MASSIVE MIMO SYSTEM	214
<i>Messaoud Eljamai, Yacoub Oueld Ahmed, Mahmoud Ammar, Ammar Bouallegue</i>	
A WIDEBAND 100W DOHERTY POWER AMPLIFIER	218
<i>Sina Rafati, Sayyed-Hosseini Javid-Hosseini, Vahid Nayyri, Mohammad Soleimani</i>	
STUDY OF THE RECTIFIER DIODE IN RECTENNA BASED ON MOM-GEC METHOD	222
<i>Soulayma Smirani, Heithem Helali, Mourad Aidi, Taoufik Aguil</i>	
ANALYSIS AND DESIGN OF A NEW PIFA ANTENNA FOR THE WIRELESS COMMUNICATIONS APPLICATIONS	227
<i>Hamza Ben Hamadi, Said Ghnimi, Lassaad Latrach, Ali Gharsallah</i>	
NEW DESIGN OF METAMATERIAL ANTENNA FOR 5G APPLICATIONS	231
<i>Mondher Labidi, Fethi Choubani</i>	
SCAN RADAR USING AN UNIFORM RECTANGULAR ARRAY FOR DRONE DETECTION WITH LOW RCS	235
<i>Ines Bouzayene, Kais Mabrouk, Ali Gharsallah, Dmitry Kholodnyak</i>	
MODELING AND EXPERIMENTAL VALIDATION OF THE AGRICULTURAL GREENHOUSE	239
<i>Manel Jomaa, Fernando Tadeo, Abdelkader Mami</i>	

DESIGN OF TRANSPARENT AND FLEXIBLE ANTENNA FOR SMART CONTACT LENSES.....	243
<i>Rania Rabhi, Salem Gahgouh, Jean-Marc Ribero, Ali Gharsallah</i>	
FREQUENCY DOMAIN ANALYSIS OF PERIODIC NON UNIFORM SUBSTRATE INTEGRATED WAVEGUIDE TRANSMISSION LINES.....	247
<i>Karima Rabaani, Maha Added, Nouredine Boulejjfen, Ammar Kouki, Fadhel Ghanounichi</i>	
GAN HEMT BASED MMIC HIGH GAIN LOW-NOISE AMPLIFIERS FOR S-BAND APPLICATIONS.....	251
<i>Muhittin Tasci, Ozlem Sen, Ulas Ozipek, Eknel Ozbay</i>	
CALCULATION APPROACH OF SIGNAL TO INTERFERENCE AND PACKET ERROR RATE ESTIMATION: APPLICATION TO AUTOMOTIVE SCENARIOS	256
<i>Oussama Sassi, Pascal Hervé, Benjamin Willmann</i>	
DETECTING AND PREVENTING SYBIL ATTACKS IN WIRELESS SENSOR NETWORKS	260
<i>Jlassi Wadii, Haddad Rim, Bouallegue Ridha</i>	
DIPOLE ANTENNA BASED ON FORWARD-COUPPLING MULTILAYER RING RESONATORS (MRR)	265
<i>Seyyedkamal Hashemi</i>	
A WIDE BAND TRANSPARENT KOCH SNOWFLAKE FRACTAL ANTENNA DESIGN FOR TELECOMMUNICATION APPLICATIONS	269
<i>Chiraz Ben Nsir, Jean-Marc Ribero, Chokri Boussetta, Ali Gharsallah</i>	
ZONE BASED ALGORITHM FOR CH SELECTION USING FUZZY LOGIC FOR HETEROGENEOUS WIRELESS SENSOR NETWORKS	272
<i>Wided Abidi, Djamel Djabour, Tahar Ezzedine</i>	
A NEW SOLUTION FOR CAR PARKING RFID READER.....	276
<i>Mahdi Abdelkarim, Seif Naoui, Chaker Essid, Ali Gharsallah</i>	
ADAPTIVE JOINT SOURCE-CHANNEL CODING USING MULTILEVEL CODES FOR UNEQUAL ERROR PROTECTION AND HIERARCHICAL MODULATION FOR SPIHT IMAGE TRANSMISSION	280
<i>Asma Ben Abdallah, Amin Zribi, Ali Dziri, Fethi Tlili, Michel Terré</i>	
LOW COMPLEXITY MEMORY POLYNOMIAL DIGITAL PREDISTORTER FOR MIMO WIRELESS TRANSMITTERS	285
<i>Imene Zemzemi, Nouredine Aloui, Mahmoud Alizadeh, Nouredine Boulejjfen, Daniel Rönnow</i>	
A MILLIMETER-WAVE TEXTILE ANTENNA LOADED WITH EBG STRUCTURES FOR 5G AND IOT APPLICATIONS	289
<i>Wisseem El May, Imen Sfar, Jean-Marc Ribero, Lotfi Osman</i>	
SENSING RESPIRATORY RATE BY USING AN FM-CW RADAR IN UHF BAND AND A TAILORED AM TECHNIQUE.....	293
<i>Manuel A. Yarlequé Medina, Flavio J. Meneses Rivera, Hansel J. Martinez Odiaga, Sthefany Álvarez Navarro</i>	
INTEGRATION OF THE SMALL BOARD COMPUTERS RASP BERRY PI IN HOME AUTOMATION BASED ON KNX PROTOCOL.....	296
<i>Elyes Feki, Karim Kassab, Abdelkader Mami</i>	

A GROUND SLOTTED UHF TAG ANTENNA FOR BLOOD BAGS MONITORING..... 300
M. El Khamlichi, O. El Mrabet, A. Álvarez Melcón

Author Index