

2025 SBMO/IEEE MTT-S International Microwave and Optoelectronics Conference (IMOC 2025)

**Campina Grande, Brazil
9-12 November 2025**

IEEE Catalog Number: CFP25SBM-POD
ISBN: 979-8-3503-9276-0



Copyright © 2025, IEEE

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:	CFP25SBM-POD
ISBN (Print-On-Demand):	979-8-3503-9276-0
ISBN (Online):	979-8-3503-9275-3

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

TABLE OF CONTENTS

A Millimeter-Wave Fan-Beam Slot Antenna with Wide-Angle Beam Flat-Top Radiation Patterns	1
<i>Evandro Cesar Vilas Boas, Felipe Augusto Pereira de Figueiredo</i>	
T-Shaped Resonant Cell Filtenna Enhanced with CSRR	5
<i>Leonardo O. de Sousa, Jorge A. I. de Araujo, Mirelli S. da Silva, Samanta M. de Holanda</i>	
<i>Lucas A. Sarmento, Ignacio Llamas-Garro, Isaac B. T. da Silva</i>	
Transmission Channel Characterization Using LoRa Device in an Industrial Environment	10
<i>Maria Carolina V. Lessa, Vinicius N. H. Silva, Mauricio W. B. Silva, Pedro V. G. Castellanos</i>	
<i>Tadeu N. Ferreira</i>	
Naval Radar Co-Site EMI Mitigation with a Novel Absorber Metamaterial	15
<i>Mário D. A. Tavares, Roberto B. Di Renna, Maurício Weber, Vinicius N. H. Silva</i>	
Joint Power Control and Beam Steering for NGSO-to-GSO Interference Mitigation in Ku Band	20
<i>Luciana R. N. Ferreira, Higo T. P. Silva, Hugerles S. Silva, Paulo Henrique Portela de Carvalho</i>	
Development of a Pre-Compliance High Voltage LISN for Conducted Emission Testing of Automotive Electronic Components Under CISPR 25	25
<i>Gustavo Ferreira Vicentine, Gabriel Costa Clemente, Caio Trevisani Ganselli, Luis Henrique Rossan</i>	
<i>Caio Carrasco, Gustavo Iervolino de Moraes</i>	
Spectral Optimization of Broadband Absorber Metasurfaces Based on Different Metaheuristics	30
<i>Felipe de Rossi Audibert, João Paulo Lebarck Pizzaia, Helder Roberto de Oliveira Rocha</i>	
<i>Marcelo Eduardo Vieira Segatto, Carlos Eduardo Schmidt Castellani</i>	
Super-Wideband Cardioid Printed Monopole Antenna	35
<i>Stéfano A. V. Rezende, Fatima S. Correra, Murilo H. Seko, Guilherme N. Kawassaki</i>	
A Wavelet-Based Reformulation of the Split-Step PE Method for Accurate Radio Coverage Estimation	40
<i>Alexandre Rocha, Diego Parada Roza, Diego Tami, A. Torres, D. Guevara, Cássio G. Rego</i>	
MIMO System Performance for Digital TV in Complex Urban Environments: Preliminary Results Based on Field Measurements	45
<i>Anderson Ribeiro, Amanda Beatriz Cunha dos Santos, Leonardo Gonsioroski, Roberto B. Di Renna</i>	
<i>Victor Fernandes, Natália Castro Fernandes</i>	
Design and Evaluation of an S/X-Band Communication Architecture for the BiomeSat CubeSat	50
<i>Jognes Panasiewicz, Juner M. Vieira</i>	
X-Band Dielectric Properties of Composite Materials for Radome Applications: Effect of Fiber Orientation on Electromagnetic Performance	55
<i>Vivian B. Cosenza, Filipe O. Andrade, Marcos C. L. Siu, Roberto C. Lima, Rodolfo A. A. Lima</i>	
Graphene-Based Quadrature Hybrid Coupler for Terahertz Region	60
<i>Wagner Castro, Geraldo Melo, Cristiano Oliveira, Francisco Nobre, Manuel Vieira</i>	
Frequency Selective Surfaces Analysis Using Different Machine Learning Algorithms	64
<i>Lucas A. Sarmento, Leonardo O. de Sousa, Mirelli S. da Silva, Samanta M. de Holanda</i>	
<i>Jorge A. I. de Araujo, Antonio L. P. S. Campos, Isaac B. T. da Silva</i>	

Analog-Digital Phase Shifter with Wide Continuously Adjustable Phase Delay and Low Insertion Loss	69
<i>Gabriel Bedutti Leoncini, Candice Müller, Fernando César Comparsi de Castro, David Peixoto</i>	
<i>Luís Henrique Farias Schneider dos Santos, Muriel Altmann</i>	
Modeling of L-Band Erbium-Doped Fiber Amplifiers Using Artificial Neural Networks	74
<i>Luis G. M. Riveros, Marcionilo J. Da Silva, Marcelo P. Nogueira, Tiago Sutili, Rafael C. Figueiredo</i>	
<i>Evandro Conforti</i>	
Optimizing L-Band EDFA Pumping Schemes via Recurrent Neural Networks and Water Cycle	
Algorithm	79
<i>Marcelo P. Nogueira, Luis G. M. Riveros, Marcionilo J. Silva, Tiago Sutili, Rafael C. Figueiredo</i>	
<i>Evandro Conforti</i>	
Analytical Determination of Phase Weights in a Time-Delayed Photonic Neural Network for Dispersion	
Compensation	84
<i>Arnaldo Paterline Togneri, Marcelo E. Vieira Segatto, Reginaldo Barbosa Nunes</i>	
Real-Time Monitoring System for Flooding in Urban Areas	89
<i>Caio Martins da Silva, Thiago Quintal da Silva, Andres Pablo Lopez Barbero, Claudia Barucke Marcondes</i>	
<i>Vinicius Nunes Henrique da Silva, M.A.D. Garrido, F.H.B. Bittar, V.A. Oliveira, A.C. Carneiro</i>	
Smart Meter Communication System Using Power Domain Non-Orthogonal Multiple Access via	
Software Defined Radio Concept	94
<i>Walter Silva Oliveira, Renan Diniz, Lucas Alves Margonato, Carlos Eduardo Capovilla</i>	
<i>Ivan Roberto Santana Casella</i>	
Design and Characterization of a Tubular LED Lamp-Based VLC Transmitter for IEEE 802.15.7	
Applications	99
<i>Beatriz Moreira Cunha, Maria Luiza Jaszczerski, Juan Camilo Castellanos Rodriguez</i>	
<i>Paulo De Tarso Neves, Alexandre De Almeida Prado Pohl</i>	
Double-Layered Fractal Proposal for Miniaturization in Circular Patch Antennas	104
<i>Mirelli S. Da Silva, Alyson Leite M. De Araujo, Leonardo O. De Sousa, Samanta M. De Holanda, Lucas A.</i>	
<i>Sarmiento, Jorge A. I. De Araujo, Gabriel G. Machado, Isaac B. T. Da Silva</i>	
Radiation Performance of Circular Patch Antenna Modified by Double-Layered Fractal	107
<i>Mirelli S. da Silva, Alyson Leite M. de Araújo, Leonardo O. de Sousa, Samanta M. de Holanda</i>	
<i>Lucas A. Sarmiento, Jorge A. I. de Araujo, Ignácio Llamas-Garro, Isaac B. T. da Silva</i>	
Photonic Lens Based on a Quasi-Periodic Metamaterial with Sixfold Repetition for Advanced Optical	
Manipulation	110
<i>João Rafael Costa F. Da Silva, Vitor L. S. T. Catão, Nilson H. O. Cunha, José P. Da Silva</i>	
<i>Cosme E. Rubio Mercedes</i>	
Photonic Spatial Switching Techniques Using Semiconductor Optical Amplifiers	114
<i>Pedro A. B. Leao, Jonathan A. Soares, Tiago Sutili, Arismar Cerqueira S., Evandro Conforti</i>	
Influence of Seismic Source Azimuth on the Dispersion Curve Using Optical Distributed Acoustic	
Sensing	119
<i>Beatriz Brusamarello, João P. Bazzo, Guilherme H. Weber, Gustavo Macioski, Larissa W. Kulik</i>	
<i>Daniel R. Pipa, Gilson A. Brunetto, Luis F. P. Melegari, Jean Carlos Cardozo da Silva, Cicero Martelli</i>	
<i>Uilian J. Dreyer</i>	

Integration of Directly Modulated Analog Radio-Over-Fiber with 2×2 MIMO Systems	124
<i>Luiz Augusto Melo Pereira, Matheus Seda Borsato Cunha, Felipe Batista Faro Pinto Juliano Silveira Ferreira, Luciano Leonel Mendes, Arismar Cerqueira Sodré</i>	
Simultaneous Power and Data Transmission Using a Single Hybrid Optical Cable Towards B5G Systems	129
<i>F. B. F. Pinto, S. B. Vasconcellos, E. S. Lima, E. L. Anderson, Arismar Cerqueira S.</i>	
Photonic True-Time Delay Beamforming Applied to Dielectric Resonator Antennas	134
<i>S.B. Vasconcellos, E. S. Lima, K. Z. Nobrega, Pei Xiao, Arismar Cerqueira S.</i>	
Performance vs Complexity Analysis of Neural Network and Memory Polynomial-Based DPD for A-RoF Fronthaul	139
<i>Carlos Daniel Fontes da Silva, Edson Porto da Silva</i>	
High Speed Processing Using a Complex Photonic Perceptron Based on Tunable MZIs	144
<i>C. R. Oliveira, Í. A. Araújo, M. A. Romero, A. F. Herbster</i>	
Low Profile Antenna Flexible Meander Line Antenna Array for Wearable Technology Applications	149
<i>Arthur Mendes da Silva, Elison Wediley dos Reis Silva, Humberto Dionisio de Andrade Caiky Breno Santiago Chaves, Pedro Arthur Freitas da Silva, Carlos Albert Maia Filgueira</i>	
Best Efficiency Point of Electrical Submersible Pump Monitoring Using Distributed Optical Fiber Sensing	154
<i>Maria C. Praczun, Gabriel Torelli, Jhoan M. C. Cubas, Jessé de Pelegrin, Gabriel A. Romero Luiz C. T. da Silva, Jurandir A. G. da Silva, Henrique Stel, Rigoberto E. M. Morales, Jean C. C. da Silva Uilian J. Dreyer</i>	
Design and Implementation of an FSS-Based Data Glove for Hand Gesture Recognition	159
<i>João G. D. Oliveira, Amanda M. D. Oliveira, Adaildo Gomes D'Assunção, Valdemir P. Silva Neto</i>	
Analysis of the Transverse and Longitudinal Insertion of Conductive Filaments in Microstrip Antenna Substrates	164
<i>João V. Macedo de O. Silva, Leonardo O. de Sousa, Humberto D. de Andrade, Isaac B. T. da Silva Idalmir de S. Queiroz Júnior, Emerson N. dos Santos, Mirelli S. da Silva, Samanta M. de Holanda</i>	
Analysis of the Transverse and Longitudinal Insertion of Conductive Filaments in Microstrip Antenna Substrates	168
<i>João V. Macedo de O. Silva, Leonardo O. de Sousa, Humberto D. de Andrade, Isaac B. T. da Silva Idalmir de S. Queiroz Júnior, Emerson N. dos Santos, Mirelli S. da Silva, Samanta M. de Holanda</i>	
Miniaturization Behavior of Microstrip Patch Antenna Modified by Firat-Based Circular Fractal	172
<i>Mirelli S. Da Silva, Alyson Leite M. De Araújo, Leonardo O. De Sousa, Lucas A. Sarmento Jorge A. I. De Araujo, Samanta M. De Holanda, Gabriel G. Machado, Isaac B. T. Da Silva</i>	
Uirapuru Horn Antenna: Integrated System for Radio Frequency Monitoring and Receiver Component Evaluation	175
<i>Lucas de F. Santana, Bruno R. de Almeida, Alisson T. Cavalcanti, Edmar C. Gurjão, Alexandre J. R. Serres Rafael A. Batista, Amilcar Queiroz, Jordany Vieira De Melo</i>	
Electro-Optical Front-end and DSP Requirements for High-Capacity and Extended-Reach Coherent Passive Optical Networks	180
<i>Eduardo Souza Rosa, Julia Aline Sousa Maciel, Edson Porto Da Silva, Tiago Sutili, Rafael C. Figueiredo</i>	

Adaptive Inter-Symbol and Multi-User Interference Cancellation for OTFS in LEO SATCOM	184
<i>Felipe F. Souto, Victor Fernandes, Vinicius N. H. Silva, Roberto B. Di Renna</i>	
Theoretical Analysis of Transverse Mode Instability Induced by the Quantum Defect in High-Power YDCFLs	189
<i>Elbis Santos Cardoso, Ricardo Elgul Samad, Cláudio Costa Motta</i>	
A W-Band 130-nm BiCMOS Bidirectional PALNA Design Based on SPST Integrated Matching Network	194
<i>Choayb Boudjeriou, Bruno Barelaud, Julien Lintignat</i>	
Impact of Wavelet-Based Denoising on the Robustness of SVM Classification of Partial Discharge Signals	198
<i>Whesdey G. S. Santos, George V. Rocha Xavier, Almir C. dos Santos Júnior, Alexandre Jean René Serres Hugerles Sales Silva</i>	
Comparative Performance and Enhancement of Water pH Microwave Sensor	203
<i>Leonardo O. de Sousa, Lucas A. Sarmento, Mirelli S. da Silva, Samanta M. de Holanda Jorge A. I. de Araujo, Gabriel G. Machado, Isaac B. T. da Silva</i>	
Three-Port Microstrip T-Resonator for Relative Permittivity Characterization of PCB Substrates	208
<i>Lucas D. Coelho, Marcelo E. V. Segatto, Álvaro A. M. De Medeiros, Úrsula C. Resende, Ulysses R. C. Vitor</i>	
Frequency-Reconfigurable Cylindrical Dielectric Resonator Antenna Using PIN Diode	213
<i>Gabriel P. Paulena, Juner M. Vieira, Edson R. Schlosser, Marcos V.T. Heckler</i>	
Reflectarray Design with Low Cross-Polarization in X-Band	218
<i>Suyane Paulo Campos, Marcos V. T. Heckler, Edson R. Schlosser</i>	
Design of Wideband Multilayered Dielectric Resonator Antenna	223
<i>S.B. Vasconcellos, K. Z. Nobrega, Pei Xiao, Arismar Cerqueira S.</i>	
Beamforming and Beam Steering Optimization for a Yagi-Uda Three-Antenna Array by Genetic Algorithm	228
<i>Renan G. M. dos Santos, Lauro R. G. S. Lourenço Novo, Marcos T. de Melo, Flávio de P. Lopes Bruno G. M. de Oliveira, Elias M. F. de Oliveira</i>	
Deep Learning-Based Detection of Cracks in Concrete Pavement Using Simulated UWB Horn Antenna GPR Signals	233
<i>Grigório Ribeiro Soares Neto, Vinicius Uchoa Oliveira, Simona Fontul Francisco Manuel Carvalho Pinto Fernandes, Jorge Carvalho Pais</i>	
Coverage Analysis for FR3 Spectrum Based on Throughput Performance	237
<i>Stephanie M. Soares, Iran Mesquita Braga, Bárbara Regina Xavier Ribeiro Faria, Dércio M. Mate</i>	
Efficient Neural Network Modeling of Nonlinear Pulse Propagation Using Single-Pulse Prediction	242
<i>Pedro Henrique de Oliveira Soares, Luís Cícero Bezerra da Silva, Marcelo Eduardo Vieira Segatto Helder Roberto de Oliveira Rocha, Carlos Eduardo Schmidt Castellani</i>	
Geolocation of Irregular Emissions Carried Out by TVWS Networks to Support Anatel	247
<i>Laert Calil, Danilo Henrique Spadoti</i>	
Assessment of Electromagnetic Interference in Clinical Devices: Experimental Results and Perspectives for VLC-Based Communication	252
<i>E. M. Ontiveros, F. B. F. Pinto, Arismar Cerqueira S.</i>	

Study of the Point Matching Method for Modeling Hollow Waveguides with Arbitrary Cross-Sections and Impedance Boundary Termination	257
<i>Lucas L. V. Jannuzzi, Pedro L. V. Jannuzzi, José. R. Bergmann, Rafael A. Penchel, Guilherme S. Rosa</i>	
Study of the Point Matching Method for Modeling Electromagnetic Wave Propagation in Curved Waveguides with Rectangular Cross-Section	262
<i>Pedro L. V. Jannuzzi, Lucas L. V. Jannuzzi, José. R. Bergmann, Rafael A. Penchel, Guilherme S. Rosa</i>	
High-Gain Pattern-Reconfigurable Dual-Band Microstrip Antenna Using FSS	267
<i>Thayuan Rolim De Sousa, Deisy Mamedes, Juliete Da Silva Souza, Valdemir Praxedes Da Silva Neto</i>	
Near-Zero and Flat Dispersion Single-Mode Porous-Core PCF for the Next-Generation of THz Communication Systems	272
<i>Gabriel Catabriga Bastida, João Paulo Lebarck Pizzaia, Marcelo Segatto, Elizandra Coelho Arnaldo Gomes Leal-Junior, Carlos Eduardo Schmidt Castellani</i>	
The Role of Topological Features in Routing and Spectrum Assignment Prioritization: A Decision Tree Analysis for Elastic Optical Networks	277
<i>Renan V. B. Carvalho, Diego Pinheiro, Henrique A. Dinarte, Raul C. Almeida, Carmelo J. A. Bastos-Filho</i>	
A Strategy for Resource Allocation in Elastic Optical Networks Aiming to Reduce Physical Layer Impairments and Spectral Fragmentation	282
<i>Sergio Amaral da Silva, Carmelo Bastos-Filho, Danilo R. B. de Araújo, Raul C. de Almeida Joaquim F. Martins-Filho</i>	
Parametric Sensitivity Analysis of EDFA Gain Ripple Using a Datadriven Machine Learning Model	287
<i>Leonardo Muñoz Rosel, Cristobal Melo, Gabriel Saavedra</i>	
Comparison of Three Different Antennas Applied to Ka-Band Satellite Communications	292
<i>Luiza F. Scalão, Maria E. B. dos Santos, Nathani B. dos Santos, Marcos V. T. Heckler, Edson R. Schlosser</i>	
Design of a Compact UWB Circular Printed Monopole Antenna-Based Sensor for Partial Discharge Detection	297
<i>Evandro C. Vilas Boas, George V. R. Xavier, Felipe A. P. de Figueiredo, Ugo S. Dias, Hugerles S. Silva</i>	
GNSS Reception System for the L1-Band Applicable to Maritime Navigation Environments	302
<i>Pedro H. A. Everling, Herick R. da Silva Rodrigues, Daniel B. dos Santos, Edson R. Schlosser Marcos V. T. Heckler</i>	
Evaluation of the Impact of 3D-Printed Surface Roughness on the Radiation Efficiency of a Coaxial Horn Antenna Operating at the Ka-Band	307
<i>Elígia Simionato, Guilherme S. Rosa, Ivan Aldaya, Everton C. Medeiros, Rafael A. Penchel</i>	
Comparative Study of CSRR and Partial Ground DGS in Multiband Microstrip Antennas for 5G mmWave Applications	312
<i>Suely Da Silva Oliveira, Fernanda Rodrigues da Silva</i>	
High-Performance Circular Phased Array Microstrip Antenna for WiFi, Bluetooth, and Ultra-Wideband Applications	317
<i>Henry Mayorga Perez, Maria Diaz Gonzalez, Ronny Toctaquiza Piedra</i>	
Sensitivity Analysis for the Irregular Terrain Propagation Model: A Case Study	322
<i>F. Rodrigo P. Cavalcanti, Carlos F. M. e Silva, Alistair Braden, White Fractal</i>	

Modeling Transmission Lines and Waveguides Using the Method of Fundamental Solutions for Laplace and Helmholtz Equations	327
<i>Bruno B. Santos, Guilherme S. Rosa, Rafael A. Penchel, Raul O. Ribeiro, Fernando L. Teixeira</i>	
Concept of a 1-Bit Reconfigurable Intelligent Surface for Future Applications: Design, Optimization, and Array Size Impact Analysis	332
<i>Felipe Henrique de Souza da Fonseca, Gustavo Ferreira Vicentine, Gustavo Iervolino de Moraes Gabriel Costa Clemente, Luis Henrique Rossan, Cesar José Bonjuani Pagan</i>	
Triple Square Loops Frequency Selective Surfaces and Their Equivalent Circuit	337
<i>Tulio José Costa Silva, Nickson Saymon de Oliveira Lopes, Sebastião Ferreira Baracho Neto José Patrocínio da Silva, Antonio Luiz Pereira de Siqueira Campos</i>	
Optimized-Pump Profile Design of a Second-Order Few-Mode Distributed Fiber Raman Amplifier with Low DMG and DSG	342
<i>Agustin Espinoza, Astrid Lozada, Ricardo Olivares, Bárbara Dumas Feris, Nicolás Jara, Ariel Leiva</i>	
Inference and Prediction of Quality of Transmission in Fully-Loaded Elastic Optical Networks	347
<i>Matheus L. dos Santos, Leonardo S. C. de Miranda, Laryssa C. da Silva, André V. S. Xavier Joaquim F. Martins-Filho, Leonardo D. Coelho, Raul C. Almeida</i>	
Analysis of Spectrum Defragmentation in QoT-Constrained Elastic Optical Networks	352
<i>Talles S. Magalhães, Carlos Natalino, Fabricio R. L. Lobato, João C. W. A. Costa, Paolo Monti</i>	
Spectral Photon-Counting System for Ultra-Weak Luminescence in Chemical and Biological Samples	357
<i>Cristiano M Gallep, João F Viana, Michal Cifra, Michaela Poplová, Gilliard N Malheiros-Silveira</i>	
Analysis of Wi-Fi and 5G Network Performance in Indoor Scenarios: A Study at Cefet-Mg	360
<i>Graziele Rodrigues Souza, Úrsula Resende, Sandro Trindade Mordente Gonçalves</i>	
Characterization of Graphene Films Deposited on Glass and Their Application in Patch Antennas	365
<i>Daniel Augusto Da Costa Oliveira, Igor Oliveira Souza, Lucas Silva Lima, Ursula Resende Rúbia Fernandes De Andrade, Camilla Caroline Moro Carmo</i>	
Impact of Receiver Coil Displacement and Orientation on the Efficiency of Resonant WPT Systems	370
<i>Maurício D Almeida, Ursula Resende, Silvia C Albuquerque</i>	
Design of a Dual-Band MIMO Rectenna with Class-E Rectifier for Wireless Power Transfer	375
<i>Fagner Fernandes Santos Ramalho, Ursula Resende, Silvia C Albuquerque, Lucas Silva Lima Igor Oliveira Souza, Daniel Augusto da Costa Oliveira</i>	
Design and Experimental Validation of a Buffered Voltage Doubler Rectifier for Rectenna Applications	380
<i>Willian Araújo Oliveira, Úrsula Resende, Lucas Silva Lima, Tulio Carvalho Daniel Augusto da Costa Oliveira, Igor Oliveira Souza</i>	
A Transmission Line-Based Approach for Material Identification	385
<i>Ursula Resende, Jennifer Bento Vieira, Ulysses R. C. Vitor, Lucas D. Coelho</i>	
Design and Implementation of a Microstrip Patch Antenna Array with Displaced Radiation Beam	390
<i>Ursula Resende, Alexandre Labossiere A Muzzi, Ulysses R. C. Vitor, Lucas D. Coelho</i>	
Radar Systems in the Context of Electronic Warfare: Electronic Countermeasures in the Modern Theater of Operations	395
<i>Reilian da S. Macilon, André Luís M. da S. Filho, Valdemir P. da Silva Neto, Adaildo G. D'Assunção</i>	

Channel Modeling and Characterization at 18 GHz in Outdoor Corridor Scenarios	400
<i>Jorge Celades-Martínez, José Garcia, Melissa E. Diago-Mosquera</i>	
Compact Meandered Loop Monopole Antenna with Metasurface for 5G FR2 Band	405
<i>Flávio R. Simões, Evandro C. Vilas Boas, Felipe A. P. De Figueiredo, William O. F. Carvalho</i>	
50 NS – Fast Bias Switching Broadband TX/RX Amplifier in Low-Swap LTCC SiP	410
<i>Daniel Mendes Adelino, João Roberto Moreira Neto, Edson C. Reis, Hugo Enrique Hernandez-Figueroa</i>	
Compatibility Study Between 6G (IMT-2030) and Fixed-Satellite Service (Earth-to-Space) in Mid-Band	415
<i>Juliana Garçon dos Santos, Samuel Rodrigues dos Santos, Adoniran Judson Braga Paulo Henrique Portela de Carvalho, Achilles Fontana da Mota, Frederico Neves</i>	
Measurements of Dielectric Properties of Biological Phantoms and Tissues for Biomedical Imaging	420
<i>Abid Raza, Ghulam Nabi, Sunble Yousaf, Muhmmad Yasir, Maryam Liaqat, M. T. de Melo</i>	
Numerical Analysis of SPR SPCE Sensor with Graphene Applied in the Detection of Markers in Power Transformer Oil	425
<i>Karlo Q. da Costa, Maikon S. da Costa</i>	
Performance Analysis of A Hetero-Core MNM Fiber-Optic Sensor for Monitoring the Electrolyte Density of Lead-Acid Batteries	430
<i>Luciano Gomes Bezerra Junior, Adler de Sousa Moura, Thales Henrique Castro de Barros Jehan Fonseca do Nascimento, Joaquim Ferreira Martins-Filho</i>	
LMAC-2: A Multichannel CSMA-based Protocol for High Throughput LoRaWAN	435
<i>Ivan R. S. Casella, Fernando S. Sousa, Carlos E. Capovilla</i>	
Compact Circularly Polarized Mimo Antenna for Cubesat Application	440
<i>Nickson Saymon De Oliveira Lopes, Antonio Luiz P. De Siqueira Campos, Antonio Sérgio Bezerra Sombra Arthur Mendes Da Silva, Raclenir Lopes Galvão, Humberto Dionísio De Andrade</i>	
Development of a 3.4-GHz Oscillator Based on a Complementary Split Ring Resonator	445
<i>Henrique Orlando Régis de Castro, José Osvaldo Rossi, Lauro Paulo da Silva Neto, Joaquim José Barroso Joaquim Leite Neto, Edl Schamiloglu</i>	
Concise Analysis of the Influence of Metal Width on the Performance of Surface Plasmon Resonance D-Shaped Photonic Crystal Fiber Sensors	450
<i>Allana C. Oliveira, Jhennifer O. Monteiro, Amanda F. Romeiro, Anderson Oliveira Silva, João Weyl Costa Maria T. R. Giraldi, A. Guerreiro, José L. Santos</i>	
Influence of Humidity Variation on Textile Substrates for Microstrip Antennas	455
<i>Alexandre Maia Gomes Chaves, Samanta M. de Holanda, Humberto D. de Andrade, Isaac B. T. da Silva Idalmir de S. Q., Leonardo O. de Sousa</i>	
Low-Cost DGS Sensor for Non-Invasive Glucose Level Monitoring	458
<i>Felipe Lucena Souza Medeiros, Georgina Karla de Freitas Serres, Alexandre Jean René Serres</i>	
Quantum Sensing: A Perspective	462
<i>Cicero Martelli, Marco Jose da Silva, Daniel Rodrigues Pipa, Jean Carlos Cardozo Da Silva Guilherme Heim Weber</i>	

From Classical to Quantum-Safe Security: the Transformative Role of Quantum Technologies	466
<i>E. Mobilon, J. B. Rosolem, M. Inga, L. G. M. Riveros, T. Sutili, A. C. P. Paixão, A. M. Braga R. C. Figueiredo</i>	
Continuous vs. Discrete Variables in QKD	475
<i>Valéria L. da Silva, Alexandre Baron Tacla, Nelson Alves Ferreira Neto, Davi Juvêncio Gomes de Sousa Vitor L. O. Sena</i>	
Directional Emission Enhancement of NV Centers in Diamond via Bullseye Nanoantenna Design	480
<i>Leonardo R. Ramos, Henrique W. Moscoso, Vinicius M. Pepino, Ben-Hur V. Borges, Achilles F. Da Mota</i>	
Delayed Luminescence of Algae Under Silver Stress	485
<i>Thuany M B de Castro, Julya C M Tavares, Cristiano M Gallep, Evandro Conforti</i>	
Simulation and Experiment of a SMF-NCF-SMF Hetero-Core Fiber Refractive Index Sensor with Discrete Interrogation	489
<i>Leonardo S. C. de Miranda, Thales H. Castro de Barros, Adler de S. Moura, Joaquim F. Martins-Filho</i>	
Analytical Modeling of a D-Shaped Single-Mode Optical Fiber SPR Sensor with Variable Curvature for Chemical and Mechanical Sensing	494
<i>Neilanny Fatima Nascimento Bastos, Luciano Gomes Bezerra, Helder A. Pereira Allamys Allan Dias Da Silva, Marianne Stely Peixoto e Silva, Jehan Fonsêca do Nascimento</i>	
Thermal Capacitance Optical Fiber Packaging for DTGS Fast Transient Measurement Error Correction	499
<i>Danilo Fernandes Gomes, Beatriz Brusamarello, Eduardo Henrique Dureck, Guilherme Heim Weber Daniel Rodrigues Pipa, Jean Carlos Cardozo Da Silva, Manoel Feliciano Da Silva Sérgio Taveira de Camargo, Cicero Martelli</i>	
Muscle Activity Detection Using Photoplethysmography and Machine Learning Algorithms: A Preliminary Study	504
<i>Victor Hugo M. Dias, Laura V. De Arco, Jair Silva, Camilo A. R. Diaz</i>	
CNN and K-NN Methods for Image-Response Recognition in Surface Plasmon Resonance Sensors	509
<i>Mateus V.L. Lopes, Leiva C. Oliveira, Antonio M.N. Lima</i>	
Numerical Analysis of RF Filters Based on Photonic Technology	514
<i>Jose G. C. Sanchez, K. Z. Nobrega, L. A. M. Pereira, Arismar C. S. Junior</i>	
Project of a Surface Plasmon Resonance Sensor for Green Hydrogen (H ₂ V) Monitoring at Generation Line	519
<i>Marcio L.S. Ribeiro, Leiva C. Oliveira</i>	
Robustness of Liquid Neural Networks to Noise: A Comparative Study with Convolutional Neural Networks	523
<i>Willian P. Silva, Arnaldo Leal, Marcelo E. Vieira Segatto, Maria Jose Pontes, Helder R. O. Rocha</i>	
Side-Channel Attacks to QKD Systems and Mitigation Techniques	528
<i>Christiano M. S. Do Nascimento, Guilherme P. Temporão</i>	
Towards the Implementation of a Quantum Internet in Recife	532
<i>Leonardo Didier Coelho, Joaquim F. Martins-Filho, Daniel Felinto</i>	
Influence of Curvature Radius on Curved Plastic Optical Fiber Sensors	536
<i>Thales H. Castro de Barros, Henrique Patriota Alves, Arnaldo C. D. Dos Santos Andrade Rodolfo Polimeni Melo, Leonardo S. C. De Miranda, Joaquim F. Martins-Filho</i>	

Diagnosis of Broken Bar Fault in Three-Phase Induction Motors Using Fibre Bragg Grating Strain Sensors Assisted by an Algorithm	540
<i>Rafael Cavalcanti, Uilian José Dreyer, Everton Luiz De Aguiar, Jean Carlos Cardozo da Silva Kleiton Morais Sousa, André Mendes</i>	
Radio- and Power-Over-Fiber Transmission Using a Hybrid Optical Cable for Scalable B5G Networks	545
<i>Paulo Kiohara, Felipe B. F. Pinto, Eduardo. S. Lima, Arismar Cerqueira Sodré</i>	
Analysis of a Thermo-Optic Phase Shifter for Photonic Switching Applications	550
<i>F. F. de Lima, Í. A. Araújo, M. A. Romero, A. F. Herbster</i>	
Integrated Photonic Enabling Massive Data Transfer: A Short Review	555
<i>Pablo Rafael Neves Marciano, Mateus Souza Coelho, Maxwell E. Monteiro, Maria Jose Pontes Marcelo E. Vieira Segatto, Evandro Conforti</i>	
InP Photonic Integrated Frequency Comb for Tunable mmWave Generation in 5G Optical-Wireless Xhaul Networks	560
<i>E. S. Lima, Arismar Cerqueira S.</i>	
Towards the All-Digital C-RAN: Centralization of DPD Using All-Digital Receivers and Neural Networks for Dynamic Nonlinear PA Behavior	565
<i>José D. Domingues, Samuel S. Pereira, Luís Almeida, Hugerles Sales Silva, Arnaldo S. R. Oliveira Nuno Borges Carvalho</i>	
Use of Silicon (Si) and Gallium Arsenide (GaAs) Doping in Microstrip Antenna Substrate Inspired by EBG-2D Geometry	570
<i>Francisco Magno Monteiro Sobrinho Lopes, Raclenir Lopes Galvão, José De Arimateia Pinto Magno Arthur M. Da Silva, Me. Nickson Saymon De Oliveira Lopes, Humberto Dionísio De Andrade</i>	
RF Rectifier with Temperature Range Trimming for Sub-6 GHz 5G Applications	574
<i>Renan Diniz, Walter S. Oliveira, Lucas A. Margonato, Ivan R. S. Casella, Carlos E. Capovilla</i>	
Integration of a 3.5 GHz Circularly Polarized Antenna with Silicon Solar Cells for Hybrid Energy Harvesting Applications	579
<i>Lucas Alves Margonato, Renan Diniz, Walter Silva Oliveira, Ivan Roberto Santana Casella Carlos Eduardo Capovilla</i>	
Wearable FSS and Machine Learning: Development and Validation of a Convolutional Neural Network for Recognition of Brazilian Sign Language (Libras)	584
<i>Amanda Maria D. Oliveira, João Guilherme D. de Oliveira, Valdemir P. Silva Neto, Adaildo G. D'Assunção</i>	
Experimental Evaluation of a Low-Power Radio-over-Fiber System for IoT Sensing with LoRaWAN Transmission	589
<i>Hugo V. Sousa, Victhor F. F. Silva, Leonardo Didier Coelho, Joaquim Ferreira Martins Filho Vladimir Diego Rojas Albuquerque</i>	
Optical System for Identifying the State of Medium Voltage Disconnect Switches	594
<i>Alex Sandro Ivankio, Juan Camilo Castellanos Rodriguez, Marcos Vinicio Haas Rambo, Uilian José Dreyer</i>	
Investigation of the Use of Microwave Sensing in Checking the Brix Degree of Melon (Cucumis Melo L.)	599
<i>Alan Pedro Vasconcelos Martins, Arthur Mendes Da Silva, Nickson Saymon De Oliveira Lopes Glauber Henrique De Sousa Nunes, José De Arimateia Pinto Magno, Humberto Dionisio De Andrade</i>	

Design and Characterization of a Band-Pass FSS an Operation Band from 3 GHz to 9 GHz	604
<i>Marina de Oliveira Alencar, Alfredo Gomes Neto, Marcos Tavares de Melo, Vitor Matheus de Assis Lima</i>	
Analysis of Microstrip Antenna with Application of Quasi-Periodic Structure Based on Penrose Tile	608
<i>Sebastião Ferreira Baracho Neto, José Patrocínio da Silva, Idalmir De Souza Queiroz</i>	
<i>Adaildo Gomes D'Assunção</i>	
DAS Low Frequency Characterization for Structural Health Monitoring	613
<i>Emmanuel Scolimoski, Beatriz Brusamarello, Eduardo Henrique Dureck, Guilherme Heim Weber</i>	
<i>Danilo Fernandes Gomes, Jean Carlos Cardozo da Silva, Cicero Martelli</i>	
MIMO Communications Through the Deep Physical Layer Model	617
<i>Luso De Jesus Torres, Sébastien Roland Marie Joseph Rondineau</i>	
A Dynamic GPF Scheduler for 5G Hetnets Aided by Neural Networks and Differential Evolution	621
<i>Getúlio M. Resende, Gabriel A. Queiroz, André L. A. da Costa, Éderson R. da Silva</i>	
Empowering Hands-On Engineering Education with a Low-Cost Iot Hub Featuring Natural Language Support on Modified TV Boxes	626
<i>Cláudio R. M. Silva, João Paulo N. Dos Santos, Felipe Augusto C. M. Silva</i>	
Over-the-Air Performance Evaluation of Real and Complex Neural Networks for Joint Channel Estimation and Equalization in QAM Systems	631
<i>Fábio D. L. Coutinho, Jonathan A. Soares, Kayol S. Mayer, Hugerles S. Silva, Arnaldo S. R. Oliveira</i>	
<i>Dalton S. Arantes</i>	
The Graduate Curriculum on Computational Electromagnetics of CETUC: A Final Boundary Condition That Will Never Fade	636
<i>Guilherme S. Rosa, Rafael A. Penchel, Maiquel S. Canabarro</i>	
Microwave-Based Device for Detecting Ethanol Content in Gasoline	640
<i>Julia S. Neves, Alexandre J. R. Serres, Marcus M. Bezerra, Pedro R. Maia</i>	
Electrolyte Level Sensor Based on Plastic Optical Fiber for Lead-Acid Batteries Applications	643
<i>Pedro Siqueira Neto, Thales H. Castro De Barros, Joaquim F. Martins-Filho, Henrique Patriota Alves</i>	
GAM Antenna Arrays for B5G Systems	646
<i>Gustavo F. Vicentine, Pei Xiao, Evandro Conforti, Arismar Cerqueira S.</i>	
Compact Semicircular Antennas for Harmonic RFID Tags in Agriculture 4.0	651
<i>Vinicius Uchoa Oliveira, Amit Kumar Baghel, Nuno Borges Carvalho</i>	
Polarization-Reconfigurable Loop Antenna for Remote Sensing Radar Systems	655
<i>Pedro A. B. Leao, Igor F. Da Costa, Arismar Cerqueira S.</i>	
A Practical Approach to Design Lattice Filters on Silicon Photonics	659
<i>L. P. B. Lacerda, Í. A. Araújo, M. A. Romero, A. F. Herbster</i>	
DSP Techniques from Coherent Optical Communication Applied to CV-QKD: A Systematic Review	664
<i>Davi Juvêncio Gomes de Sousa, Nelson Alves Ferreira Neto</i>	
Application of DAS in the Detection of Anomalies in High-Voltage Insulated Cables	669
<i>Rafael Terplak Bee, Beatriz Brusamarello, Eduardo Henrique Dureck, Danilo Fernandes Gomes</i>	
<i>Cicero Martelli, Uilian José Dreyer, Jean Carlos Cardozo da Silva</i>	

Estimating the Experimental Half-Wave Voltage from Fringe Pattern Using Webcam	674
<i>Luis Miguel Quispe-Valencia, Claudio Kitano</i>	
On the Interplay of Congestion and OSNR Degradation for TCP Over Optical Networks	679
<i>Pedro P. Pecolo F, Moises R. N. Ribeiro, Everson S. Borges, Magnos Martinello</i>	
Power Optimization in User-Centric Distributed Massive MIMO with Flower Pollination Algorithm	684
<i>Marx M. M. Freitas, Jasmine Araújo, Daynara D. Souza, André L. P. Fernandes, Hugo Kuribayashi</i> <i>André Mendes Cavalcante, Maria Marquezini, Carlos R. L. Francês, João C. W. A. Costa</i>	
Characterization of Power-Domain NOMA Versus MIMO in 6G OFDM Networks	689
<i>Fabbryccio Akkazha Chaves Machado Cardoso, Francisco Raimundo Albuquerque Parente</i> <i>Maykon Renan Pereira da Silva</i>	
User Admission Based on Deep Reinforcement Learning in Mobile Networks with Network Slicing and Different Numerologies	694
<i>Hudson Henrique de Souza Lopes, Flávio Henrique Teles Vieira</i>	
Planar Microwave Sensor for Phosphate and Nitrate Detection in Rivers and Lakes Using Machine Learning Techniques	699
<i>Bruno Matias de Sousa, Valdemir Praxedes da Silva Neto</i>	
FPGA-Based Dataflow Neural Network Accelerators for Intelligent Edge Signal Processing	704
<i>Fábio D. L. Coutinho, Arnaldo S. R. Oliveira</i>	
Design of a Planar Dual-Band Bandstop Filter with Matryoshka Resonators and Defected Ground Structure	709
<i>Marcus Estêvão Sousa Lopes, Valdemir Praxedes da Silva Neto</i>	
A 4–12 GHz Hybrid LNA with Cryogenic Operation for Radio-Astronomy Receivers	714
<i>Deisy Mamedes, Nianhua Jiang, Dominic Garcia, Adam Densmore</i>	
A Compact Microstrip Lowpass Filter with Wide Rejection Band and Sharp Roll-Off	718
<i>Gleidson Jose Ataíde de Carvalho, Marcus Vinicius Rocha Cohen, Bianca Da Silva Ferreira</i> <i>Igor Karsten Barbosa de Medeiros, Jefferson Costa e Silva, Alfredo Gomes Neto</i>	
6-Bit Active Vector-Sum Phase Shifter in SiGe BiCMOS for mm-Wave AESA	722
<i>Elmo Sette, Julien Lintignat, Anaül Lohou, Bruno Barelaud, Clément Hallepee, Bernard Jarry</i>	
Low-Cost 3D-Printed Lens Antennas for Millimeter-Wave Systems	726
<i>José-Manuel Poyanco, Francisco Pizarro, Eva Rajo-Iglesias</i>	
Development and Performance Investigation of 3D Printed Horn Antenna	730
<i>R. H. Oliveira, Miguel C Twardowski, E. S. Lima, Arismar Cerqueira Sodré Junior</i>	
A Bioinspired Antenna Based on Acer Macrophyllum Leaf for Partial Discharge Detection in High Voltage Equipment	735
<i>Dijalma D. Pinheiro Neto, George V. R. Xavier, Hugerles S. Silva</i>	
Near Field Flexible Patch Antenna for Low-Cost Microwave Breast Cancer Detection Applications Validated on Realistic Phantoms	740
<i>Charles Augusto Santos do Carmo, Francisco de Assis Brito-Filho</i>	

Python Integration with HFSS to Design Vivaldi Antipodal Antennas Via Genetic Algorithm	745
<i>Priscilla Kadja Pontes de Melo Carneiro, Wendell Pereira De Farias, Georgina Karla De Freitas Serres</i>	
<i>Alfredo Gomes Neto, Adolfo Fernandes Herbster, Alexandre J. R. Serres</i>	
Textile Broadband U-Slot Rectangular Patch Antenna	749
<i>Marcus Grilo, Fatima S. Correra</i>	
Feasibility of a Hybrid FMG-sEMG Sensor for Prosthetic Training in a Serious Game Environment	753
<i>Felipe Ramirez Cortes, Laura V. De Arco Barraza, Gustavo Nunes Lopes, Carlos A. Cifuentes</i>	
<i>Marcelo E. V. Segatto, Camilo A. R. Díaz</i>	
Evaluation of Force Localization in a FBG-Based Forearm Sensor by Feature Extraction and Clustering	758
<i>Carlos Arturo Narvaéz Delgado, Luis J. Arciniegas-Mayag, Patrick Silva, Carlos A. Cifuentes</i>	
<i>Moisés R. N. Ribeiro, Camilo A. R. Díaz</i>	
Feasibility Analysis of Using POF Sensors for Finger Movement in a Soft Hand Exoskeleton	763
<i>Juan C. Maldonado-Mejía, Carlos Arturo Narvaéz Delgado, Carlos A. Cifuentes</i>	
<i>Marcelo Eduardo Vieira Segatto, Camilo A. R. Díaz</i>	
Classification of UHF Partial Discharges Sources Through Envelope: Feature Selection and Dimensionality Reduction	768
<i>Boaventura O. Viana Filho, José Mascarenhas Lima Neto, George V. R. Xavier, Almir C. Dos Santos Júnior</i>	
<i>Alexandre Jean René Serres, Hugerles S. Silva</i>	
Screen-to-Camera Visible Light Communication on Smartphones Using CSK Modulation and Cell-Based Encoding	773
<i>Amanda Rühlemann Barreira, Hypolito José Kalinowski, Gonçalo Figueiredo, Paulo Sérgio De Brito André</i>	
Design and Cryogenic Evaluation of a 130 nm Cryo-CMOS Up-converter for Quantum Computing Applications	778
<i>Joerdson Tiago B. Silva, Francisco A. Brito-Filho</i>	
Microstrip Quadrature Coupler with Virtual Grounding for 2-4 GHz Applications	783
<i>F. C. Andrade, R. D. Ferreira J., R. J. Velásquez G., C. G. Rego, J. C. Ramirez, G. Medeiros-Ribeiro</i>	
<i>Diego Tami</i>	
A Proposed Microwave Resonator Sensor for Measuring Soil Water Content	788
<i>Isaú de Sousa Silva, Ruann V. de A. Lira, Isaac B. T. Barros, Antonio Luiz P. S. Campos</i>	
An RF Sensor for Monitoring the Moisture Content of Bean Grains	793
<i>Maura Lúcia Rodríguez Alexandre, Anderson Oliveira de Sousa, Marcus Vinicius Rocha Cohen</i>	
<i>Jefferson Costa e Silva, Joabson Nogueira de Carvalho, Alfredo Gomes Neto</i>	
Sub-6 GHz Microwave Sensor Targeting Microplastic Detection	797
<i>Glenerson Vieira da Silva Santos, Miguel César Vieira, Antonio Augusto Lisboa de Souza</i>	
<i>Carlos Alberto de Souza Filho, Antonio Marcus Nogueira Lima</i>	
Experimental Characterization of Commercial Reduced Graphene Oxide Nanoplatelets for RF and Microwave Device Applications	801
<i>Luís Henrique Farias Schneider dos Santos, Candice Müller, Fernando César Comparsi de Castro</i>	
<i>Ricardo Barreto da Silva</i>	
D-Band Transdirectional Coupler Employing an Interdigital Capacitor Structure in 55-nm BiCMOS	806
<i>Elígia Simionato, Ariana L. C. Serrano, Gustavo P. Rehder, Guilherme S. Rosa, Rafael A. Penchel</i>	
<i>Philippe Ferrari</i>	

Demonstration of a 3-10 GHz PCM-Based Wideband Impedance Tuner	811
<i>Kariny Nunes Maia, Hind Amaarour, Audrey Martin, Pierre Blondy</i>	
Quantitative Error-Budget Analysis of a Software-Defined Radio-Based Vector Network Analyzer for Microwave Imaging	815
<i>Édney M. V. Freitas, Bruno Sanches, Alexandre de Jesus Aragão, Felipe W. da Costa</i> <i>Wilhelmus A. M. Van Noije</i>	
3D Interdigital Capacitors Based on the MnM Interposer for mm-Wave Applications	820
<i>Robert Gavidia Bovadilla, Gabriel Griep, Leonardo G. Gomes, Gustavo P. Rehder, Ariana L. C. Serrano</i>	