

2020 23rd International Microwave and Radar Conference (MIKON 2020)

**Warsaw, Poland
5 – 8 October 2020**



**IEEE Catalog Number: CFP20784-POD
ISBN: 978-1-7281-5787-0**

**Copyright © 2020, Warsaw University of Technology
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:	CFP20784-POD
ISBN (Print-On-Demand):	978-1-7281-5787-0
ISBN (Online):	978-83-949421-7-5

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

23rd International Microwave and Radar Conference

Posters 1

<i>Characterization of Frequency Converters' Phase Noise Transfer Function</i> Igor Rutkowski (Warsaw University of Technology, Poland), Krzysztof Czuba (Warsaw University of Technology, Poland)	1
<i>Plasmonic Zener Tunneling in Metal Fishnet Waveguide Arrays</i> Mingzhe Gao (Naval Research Academy, China), Xiaopeng Su (MARINE DESIGN & RESEARCH INSTITUTE OF CHINA, China)	5
<i>Domain Reduction in Hybrid Technique for Electromagnetic Wave Scattering Problems</i> Malgorzata Warecka (Gdansk University of Technology, Poland), Piotr Kowalczyk (Gdansk University of Technology, Poland), Rafal Lech (Gdansk University of Technology, Poland)	9
<i>On Applications of Fractional Derivatives in Electromagnetic Theory</i> Jacek Gulgowski (University of Gdansk, Poland), Tomasz P Stefanski (Gdansk University of Technology, Poland)	13
<i>Creating a Peculiar Refraction Coefficient of Material Supplemented by a Set of Thin Wires</i> Mykhaylo Andriychuk (Pidstryhach Institute for Applied Problems in Mechanics and Mathematics, Ukraine)	18
<i>Multimodal Genetic Algorithm with Phase Analysis to Solve Complex Equations of Electromagnetic Analysis</i> Damian Trofimowicz (SpaceForest Inc., Poland), Tomasz P Stefanski (Gdansk University of Technology, Poland)	24
<i>An Approach for Human Tissues Micro-Doppler Modelling</i> Michał Kniota (Military University of Technology, Poland), Waldemar Susek (Military University of Technology, Poland)	30
<i>Simulation of Wave Propagation in Media Described by Fractional-Order Models</i> Tomasz P Stefanski (Gdansk University of Technology, Poland), Jacek Gulgowski (University of Gdansk, Poland)	34
<i>Incremental Phase Modulation in Single Drive Mach-Zehnder Modulator</i> Tibor Bercei (Budapest University of Technology and Economics, Hungary)	40
<i>Multimodal Particle Swarm Optimization with Phase Analysis to Solve Complex Equations of Electromagnetic Analysis</i> Damian Trofimowicz (SpaceForest Inc., Poland), Tomasz P Stefanski (Gdansk University of Technology, Poland)	44
<i>Design and Architecture Selection of Corporate Feeds Comprising Equal-Split Power Dividers for Low-Sidelobe Arrays</i> Stanislav Ogurtsov (Reykjavik University, Iceland), Sławomir Koziel (Gdansk University of Technology, Poland)	49
<i>Design of Broadband Reduced-Length Directional Couplers Consisting Indirectly Coupled Lines Sections for Planar and MMIC Applications</i> Robert Smolarz (AGH University of Science and Technology, Poland), Sławomir Gruszczynski (AGH University of Science and Technology, Poland), Krzysztof Wincza (AGH University of Science and Technology, Poland)	53
<i>Sensitivity Analysis of a Modular Circularly Polarized Antenna Array for 60 GHz Band</i> Jan Spurek (Brno University of Technology, Czech Republic), Zbynek Raida (Brno University of Technology, Czech Republic)	56
<i>Rotary Coupler in Microstrip Line Design for Data Transmission in the 2.45 GHz ISM Band</i> Benedict Scheiner (Friedrich-Alexander University Erlangen-Nuremberg, Germany), Christopher Beck (Friedrich-Alexander-University Erlangen-Nuremberg, Germany), Fabian Lurz (Hamburg University of Technology, Germany), Martin Frank (Friedrich-Alexander University Erlangen-Nuremberg, Germany), Fabian Michler (Friedrich-Alexander University Erlangen-Nuremberg, Germany), Robert Weigel (Friedrich-Alexander Universität Erlangen-Nürnberg, Germany), Alexander Koelpin (Hamburg University of Technology Institute of High-Frequency Technology Denickestr. 22 21073 Hamburg, Germany)	61
<i>Microwave Sensors for Detection of Floating Objects on Rivers</i> Norbert Pałka (Military University of Technology in Warsaw, Poland), Marek Życzkowski (Military University of Technology, Poland), Jarosław Młyńczak (Military University of Technology, Poland), Mateusz Karol (Military University of Technology, Poland), Piotr Markowski (Military University of Technology, Poland), Mieczysław Szustakowski (Military University of Technology, Poland), Krzysztof Cichulski (Military University of Technology, Poland), Agnieszka Wiśniewska (Military University of Technology, Poland), Sebastian Brawata (Vortex Sp. z o. o., Poland)	65
<i>Novel Method for the Wireless Synchronization of the Anchors in the UWB Localization System Utilizing Two Reference Nodes</i> Vitimir Djaja-Josko (Warsaw University of Technology, Institute of Radioelectronics and Multimedia Technology, Poland)	69
<i>Dual-Polarized Microstrip Patch Antenna Array with Dual-Feed for Target Detection</i> Ki-Baek Kim (ETRI, Korea (South)), Bang Chul Jung (Chungnam National University, Korea (South)), Jong-Myung Woo (Chungnam National University, Korea (South))	74
<i>Microstrip patch antenna with wide beamwidth for AESA TRM diagnostics</i> M. Burtowy, A. Paszkowski, P. Kurgan, M. Nojman (PIT-RADWAR S. A., Poland)	80
<i>Experimental Study of Class E Family Power Amplifiers with Shunt Filter for Reduced Duty Ratio</i> Dmitrii Chernov (Vasyl' Stus Donetsk National University, Ukraine), Paolo Colantonio (University of Roma Tor Vergata, Italy), Vladimir Krizhanovski (Vasyl' Stus Donetsk National University, Ukraine), Denis Makarov (Vasyl' Stus Donetsk National University, Ukraine)	84
<i>High-Efficiency Microwave Power Amplifier with Higher Harmonics Level Control on Basis of Defected Ground Structure Resonators</i> Yulia Rassokhina (Vasyl' Stus Donetsk National University, Ukraine), Dmitrii Chernov (Vasyl' Stus Donetsk National University, Ukraine), Paolo Colantonio (University of Roma Tor Vergata, Italy)	88
<i>Electrically Small Antenna for BeiDou Chinese Navigation Satellite System</i> Yevhen Yashchynshyn (Warsaw University of Technology, Poland), Dmytro Vynnyk (Lviv Polytechnic National University, Ukraine), Volodymyr Haiduchok (Scientific Research Company Electron-Carat, Ukraine), Ivan Solskii (Scientific Research Company Electron-Carat, Ukraine), Changying Wu (Northwestern Polytechnical University, China), Grzegorz Bogdan (Warsaw University of Technology, Poland)	92

Measurements of Electric and Magnetic Properties of Materials

<i>BST/PVDF Ferroelectric Composites Characteristics at Microwave Frequencies</i> Konrad Godziszewski (Warsaw University of Technology, Poland), Yiting Guo (Northwestern Polytechnical University, China), Yevhen Yashchyshyn (Warsaw University of Technology, Poland), Feng Gao (Northwestern Polytechnical University, China)	95
<i>Dielectric Measurement in Liquids via the Cut-off Circular Waveguide Reflection Method After S11 Calibration Using SOM Termination</i> Kouji Shibata (Hachinohe Institute of Technology, Japan)	99
<i>Broadband Microwave Characterization of Mono- And Polycrystalline Magnetic Garnet Spheres</i> Adam Pacewicz (Warsaw University of Technology, Poland), Bartłomiej Salski (Warsaw University of Technology, Poland), Jerzy Krupka (Warsaw University of Technology, Poland), Pawel Kopyt (Warsaw University of Technology, Poland), Adam Nabiałek (Institute of Physics, Polish Academy of Sciences, Warsaw, Poland), Oleksandr Chumak (Institute of Physics, Polish Academy of Sciences, Warsaw, Poland)	105
<i>Analysis of Meniscus Impact on Broadband Liquid Permittivity Determination Based on Electromagnetic Simulations</i> Michał Marcin Kalisiak (Warsaw University of Technology, Poland), Wojciech Wiatr (Warsaw University of Technology, Poland)	111
<i>Measurements of the Complex Anisotropic Permittivity of Microwave Laminates</i> Pawel Kopyt (Warsaw University of Technology, Poland), Jerzy Krupka (Warsaw University of Technology, Poland), Bartłomiej Salski (Warsaw University of Technology, Poland)	114

Antennas and Systems (1)

<i>The Results of IGLUNA 2019 Trans-Ice Longwave Communication System Tests</i> Tomasz Aleksander Miś (Warsaw University of Technology & Institute of Radioelectronics and Multimedia Technology, Poland)	118
<i>Comparison of Extended and Unscented Kalman Filters Performance in a Hybrid BLE-UWB Localization System</i> Marcin Kolakowski (Warsaw University of Technology, Poland)	122
<i>A Highly Adaptable Ultra-Low Weight Wireless Sensor Network for Tracking and Monitoring of Airborne Vertebrates</i> Niklas Duda (Friedrich-Alexander University Erlangen-Nuremberg, Germany), Robert Weigel (Friedrich-Alexander Universität Erlangen-Nürnberg, Germany), Alexander Koelpin (BTU & Chair for Electronics and Sensor Systems, Germany)	127
<i>60 GHz Microstrip Van Atta Arrays for Millimeter Wave Identification and Localization</i> Kamil Trzebiatowski (Gdansk University of Technology, Poland), Mateusz Rzymowski (Gdansk University of Technology & WiComm Center of Excellence, Poland), Lukasz Kulas (Gdansk University of Technology, Faculty of Electronics, Telecommunications and Informatics, Poland), Krzysztof Nyka (Gdansk University of Technology, Poland)	132
<i>Efficiency Analysis of High Power Microwaves Jamming Digital Communication System</i> Fengbo Lu (Naval Research Academy, China), Zeyu Xin (Naval Research Academy, China)	136

Antennas and Systems (2)

<i>Downlink Interference in Multi-Beam 5G Macro-Cell</i> Kamil Bechta (Nokia Networks, Poland), Cezary Ziółkowski (Military University of Technology, Poland), Jan M. Kelner (Military University of Technology, Poland), Leszek Nowosielski (Military University of Technology, Poland)	140
<i>Algorithms for Design of the Non-Equidistant Antenna Arrays</i> Alexander Golovkov (Saint Petersburg Electrotechnical University Leti, Russia), Igor Pivovarov (Saint Petersburg Electrotechnical University, Russia), Alexander Zhuravlev (Saint Petersburg Electrotechnical University, Russia), Polina Terenteva (Saint Petersburg Electrotechnical University LETI, Russia)	144
<i>A Method for TDOA Errors Mitigation in UWB Positioning System</i> Jerzy Kolakowski (Warsaw University of Technology, Poland)	148
<i>RSS-Based DoA Estimation in 802.11P Frequency Band Using ESPAR Antenna and PPCC-MCP Method</i> Damian Duraj (Gdansk University of Technology, Poland), Michał Tarkowski (Gdansk University of Technology, Poland), Mateusz Rzymowski (Gdansk University of Technology & WiComm Center of Excellence, Poland), Lukasz Kulas (Gdansk University of Technology, Faculty of Electronics, Telecommunications and Informatics, Poland), Krzysztof Nyka (Gdansk University of Technology, Poland)	152
<i>Dual-Band 5G Antenna Array in Fan-Out Wafer-Level Packaging (FOWLP) Technology</i> Thi Huyen Le (Fraunhofer IZM, Germany), Abhijeet Kanitkar (Fraunhofer IZM, Germany), Marco Rossi (Fraunhofer IZM, Germany), Ivan Ndip (Fraunhofer IZM, Germany), Tanja Braun (Fraunhofer IZM, Germany), Friedrich Mueller (Fraunhofer IZM, Germany), Klaus-Dieter Lang (Fraunhofer IZM, Germany), Marcel Wieland (Globalfoundries, Germany), Christian Goetze (Globalfoundries, Germany), Saquib Bin Halim (Globalfoundries, Germany), Jean Trehwella (Globalfoundries, Germany)	157

Oscillators and Synchronization Systems

<i>RF Connection from Master Oscillator to Phase Reference Line in European Spallation Source</i> Dominik Sikora (Warsaw University of Technology, Poland), Adam Abramowicz (Institute of Electronic Systems, Warsaw University of Technology, Poland), Krzysztof Czuba (Warsaw University of Technology, Poland), Mateusz Jakub Lipiński (Warsaw University of Technology, Poland), Maciej Urbanski (Warsaw University of Technology, Poland)	162
---	-----

<i>Concept of Master Oscillator Upgrade for FLASH</i>	
Bartosz Gašowski (Warsaw University of Technology, Poland), Maciej Urbanski (Warsaw University of Technology, Poland), Krzysztof Czuba (Warsaw University of Technology, Poland), Heinrich Pryschecki (Deutsches Elektronen Synchrotron, Germany), Frank Ludwig (Deutsches Elektronen Synchrotron, Germany), Julien Branlard (Deutsches Elektronen Synchrotron, Germany)	165
<i>An Energy-Efficient Low Phase Noise Class-F Oscillator in 22 nm FDSOI CMOS</i>	
Yuan Tian (Technische Universitaet Berlin, Germany)	169
<i>Concept of Redundancy Subsystem for Master Oscillator of European-XFEL</i>	
Bartosz Gašowski (Warsaw University of Technology, Poland), Tomasz Owczarek (Warsaw University of Technology, Poland), Łukasz Zembala (Warsaw University of Technology, Poland), Krzysztof Czuba (Warsaw University of Technology, Poland), Heinrich Pryschecki (Deutsches Elektronen Synchrotron, Germany), Julien Branlard (Deutsches Elektronen Synchrotron, Germany), Holger Schlarb (Deutsches Elektronen Synchrotron, Germany)	174

Material and Application Measurements from GHz to THz range

<i>Fork-Coupled Resonators for Characterization of Mold Material for 5G Applications</i>	
Abhijeet Kanitkar (Fraunhofer IZM, Germany), Marcel Wieland (Globalfoundries, Germany), Marco Rossi (Fraunhofer IZM, Germany), Ivan Ndip (Fraunhofer IZM, Germany), Mykola Chernobryvko (Fraunhofer IZM, Germany), Tanja Braun (Fraunhofer IZM, Germany), Friedrich Mueller (Fraunhofer IZM, Germany), Klaus-Dieter Lang (Fraunhofer, Germany), Christian Goetze (Globalfoundries, Germany), Saquib Bin Halim (Globalfoundries, Germany), Jean Trehwella (Globalfoundries, Germany)	177
<i>Fast and Accurate Extraction of Complex Permittivity from Surface Imaging with SPDR Scanner and Hand-Held VNAs</i>	
Marzena Olszewska-Placha (QWED Sp. z o. o., Poland), Malgorzata Celuch (QWED, Poland), Olga Stec (Military University of Technology, Poland), Janusz Rudnicki (QWED Sp. z o. o., Poland)	181
<i>Antenna Gain Enhancement with Magnetic Metasurfaces</i>	
Zsolt Szabó (Pázmány Péter Catholic University, Hungary)	186

Microwave Amplifiers

<i>A 28 GHz Broadband Low Noise Amplifier in a 130 nm BiCMOS Technology for 5G Applications</i>	
Katharina Kolb (University Erlangen/Nuermberg, Germany), Julian Potschka (University of Erlangen-Nuremberg, Germany), Tim Maiwald (University Erlangen/Nuermberg, Germany), Klaus Aufinger (Infineon Technologies AG, Germany), Marco Dietz (Friedrich-Alexander-University Erlangen-Nuremberg & Institute for Electronics Engineering, Germany), Robert Weigel (Friedrich-Alexander Universität Erlangen-Nürnberg, Germany)	192
<i>Study of Power Amplifier Harmonic Output Termination for Two AlGaIn/GaN Technologies at K-/Ka-Band</i>	
Stanislav Samis (Technische Universität Hamburg, Germany), Arne F Jacob (Technische Universität Hamburg, Germany), Christian Friesicke (Fraunhofer IAF, Germany), Rüdiger Quay (Fraunhofer IAF, Germany), Thomas Maier (Fraunhofer IAF, Germany), Roger Lozar (Fraunhofer IAF, Germany), Peter Brückner (Fraunhofer IAF, Germany)	196
<i>Highly Integrated X-Band SSPA for New Space Market</i>	
Przemyslaw Kant (SpaceForest, Poland), Jerzy Julian Michalski (SpaceForest, Poland)	200
<i>A Ka-band 33 dBm Stacked Power Amplifier Cell in 100 nm GaN-on-Si Technology</i>	
Chiara Ramella (Politecnico di Torino, Italy), Marco Pirola (Politecnico di Torino, Italy), Paolo Colantonio (University of Roma Tor Vergata, Italy)	204

Components

<i>IQ-imbalance and DC-offset Compensation in Ultrawideband Zero-IF Receiver</i>	
Dawid Rosolowski (Warsaw University of Technology, Poland), Przemyslaw Korpas (Warsaw University of Technology, Poland)	209
<i>Efficient Approximation Models of Microwave Devices Through Incremental Modeling</i>	
Pawel Barmuta (KU Leuven & Warsaw University of Technology, Belgium), Konstanty Lukasik (KU Leuven, Belgium & Warsaw University of Technology, Poland), Wojciech Wiatr (Warsaw University of Technology, Poland), Dominique Schreurs (KU Leuven, Belgium)	214
<i>A Simple and Accurate Method for Circularly Polarised Monopulse TM01 Tracking System Testing</i>	
Luca Perreggini (University of Pavia, Italy), Gabriele Ceccato (University of Pavia, Italy), Angel Mediavilla (University of Cantabria, Spain), Juan Cano (University of Cantabria, Spain)	218
<i>Analog-Multiplexer (AMUX) Circuit Realized in InP DHBT Technology for High Order Electrical Modulation Formats (PAM-4, PAM-8)</i>	
Romain Hersent (III-V Lab and Cergy-Pontoise University, France), Agnieszka Konczykowska (III-V Lab and ADesign, France), Filipe Jorge (Alcatel Thales III-V Lab, joint Ia: Bell Labs and Thales Research and Technology, France), Muriel Riet (Alcatel Thales III-V Lab, joint Ia: Bell Labs and Thales Research and Technology, France), Colin Mismar (III-V Lab, France), Virginie Nodjadjim (Alcatel-Thales 3-5 Lab, France), Bernadette Duval (III-V Lab, France), Jean-Yves Dupuy (III-V Lab, France)	222

Terahertz Technologies, Devices and Systems 1

THz Diffractive Lens Manufactured Using 3D Printer Working for 0.6 THz

Agnieszka Siemion (Warsaw University of Technology, Poland), Aneta Melaniuk (Warsaw University of Technology, Poland), Przemysław Zagrajek (Military University of Technology, Poland), Paweł Komorowski (Warsaw University of Technology, Poland), Michał Walczakowski (Military University of Technology, Poland), Mateusz Surma (Warsaw University of Technology, Poland), Piotr Sobotka (Warsaw University of Technology, Poland), Izabela Ducin (Warsaw University of Technology, Poland), Elżbieta Czerwińska (Military University of Technology, Poland) 225

Wideband Frequency Quadrupler for D-Band Applications in BiCMOS Technology

Abdul Ali (University of Rome Tor Vergata, Italy), Jongwon Yun (IHP, Germany), Herman J Ng (IHP, Germany), Dietmar Kissinger (Ulm University, Germany), Franco Giannini (University of Tor Vergata, Rome, Italy), Paolo Colantonio (University of Roma Tor Vergata, Italy) 229

Textile-integrated microwave components (1)

Textile-Integrated Electronics: State of the Art

Zbynek Raida (Brno University of Technology, Czech Republic), Jaroslav Lacik (Brno University of Technology, Czech Republic), Jiri Drinovsky (Brno University of Technology, Czech Republic), Miroslav Cupal (Brno University of Technology, Czech Republic), Jan Prasek (Brno University of Technology, Czech Republic), Dita Kracalova (SINTEX, Czech Republic), Jiri Prochazka (SINTEX, Czech Republic), Zdenka Ledrova (SINTEX, Czech Republic) 232

Textile Microwave Substrates: Special Types of 3D Knitted Materials

Dita Kracalova (SINTEX, Czech Republic), Zbynek Raida (Brno University of Technology, Czech Republic), Miroslav Cupal (Brno University of Technology, Czech Republic), Jiri Prochazka (SINTEX, Czech Republic), Jaroslav Lacik (Brno University of Technology, Czech Republic), Zdenka Ledrova (SINTEX, Czech Republic), Jiri Drinovsky (Brno University of Technology, Czech Republic) 237

Characterization of 3D-knitted Substrates

Jaroslav Lacik (Brno University of Technology, Czech Republic), Zbynek Raida (Brno University of Technology, Czech Republic), Jiri Drinovsky (Brno University of Technology, Czech Republic), Miroslav Cupal (Brno University of Technology, Czech Republic), Dita Kracalova (SINTEX, Czech Republic), Jiri Prochazka (SINTEX, Czech Republic), Zdenka Ledrova (SINTEX, Czech Republic) 241

In-plane Textile Electronics: Selection of Optimum Operation Bands

Jiri Drinovsky (Brno University of Technology, Czech Republic), Jaroslav Lacik (Brno University of Technology, Czech Republic), Zbynek Raida (Brno University of Technology, Czech Republic), Miroslav Cupal (Brno University of Technology, Czech Republic), David Krutilek (Evektor, Czech Republic) 244

Frequency Limits of Textile-Integrated Components

Miroslav Cupal (Brno University of Technology, Czech Republic), Zbynek Raida (Brno University of Technology, Czech Republic) 247

Measurements

On Lumped Port Calibration Techniques for Analysis of Planar Circuits with 3D FEM

Sebastian Dziedziewicz (Gdansk University of Technology, Poland), Michał Baranowski (Gdansk University of Technology & Faculty of Electronics, Telecommunication and Informatics, Poland), Adam Lamecki (Gdansk University of Technology, Poland), Michał Mrozowski (Gdansk University of Technology, Poland) 252

Identification of Multitone X-Parameters Under Variable Random Phase Wideband Excitations

Konstanty Lukaszik (KU Leuven, Belgium & Warsaw University of Technology, Poland), Paweł Barmuta (KU Leuven & Warsaw University of Technology, Belgium), Troels Nielsen (Keysight Technologies, Denmark), Wojciech Wiatr (Warsaw University of Technology, Poland), Dominique Schreurs (KU Leuven, Belgium) 256

Near Field Coupled Wireless Microwave Sensor

Abhishek K Jha (Gdańsk University of Technology, Poland), Adam Lamecki (Politechnika Gdańska, Poland), Roberto Gómez-García (University of Alcalá, Spain), Michał Mrozowski (Gdansk University of Technology, Poland) 260

Time-Domain Characterization of High-Speed Mid-Infrared Photodetectors Using a Laser-Based Non-Linear Vector Network Analyzer System

Mateusz Żbik (VIGO System S.A., Poland), Jarosław Szatkowski (Warsaw University of Technology, Poland), Wojciech Wiatr (Warsaw University of Technology, Poland) 263

Fully Digital Microwave Frequency Discriminator - Analysis of Realization Possibility

Adam Słowik (Military University of Technology, Poland), Michał Sobotko (9 Command Support Brigade, Poland) 268

Posters 2

Analysis on Damage Efficiency of High Power Microwave to Marine Navigation Radar

Zeyu Xin (Naval Research Academy, China) 271

An Additive Manufactured K-Band Waveguide Coupler and K-Band Antennas in SLM-Technology

Christopher Beck (Friedrich-Alexander-University Erlangen-Nuremberg, Germany), Jasmin Gabsteiger (Friedrich-Alexander-University Erlangen-Nuremberg, Germany), Marco Dietz (Friedrich-Alexander-University Erlangen-Nuremberg & Institute for Electronics Engineering, Germany), Christian Scheitler (Friedrich-Alexander-University Erlangen-Nuremberg, Germany), Robert Weigel (Friedrich-Alexander Universität Erlangen-Nürnberg, Germany), Amelie Hagelauer (University of Bayreuth, Germany) 274

<i>Passive Acoustic Radar System for Flying Vehicle Localization</i> Yevhen Chervoniak (National Aviation University, Ukraine, Ukraine), Rustem Sinitsyn (National Aviation University, Ukraine), Felix J Yanovsky (National Aviation University, Ukraine)	278
<i>An Efficient Simulation Method of Massive MIMO Antenna Arrays used in 5G Mobile Phones</i> Damian Szypulski, Grzegorz Fotyga, Michal Mrozowski (Gdansk University of Technology, Poland)	282
<i>Radar-based Detection of Birds at Wind Turbine Installations: Results from a Field Study</i> Jochen Moll (Goethe University Frankfurt am Main, Germany), Ashkan Taremi Zadeh (Goethe University Frankfurt am Main, Germany), Moritz Mälzer (Goethe University Frankfurt am Main, Germany), Jonas Simon (Goethe-University Frankfurt, Germany), Viktor Krozer (Goethe University of Frankfurt am Main, Germany), Christian Kramer (Wölfel Engineering GmbH + Co. KG, Germany), Herbert Friedmann (Wölfel Engineering GmbH + Co. KG, Germany), Andreas Nuber (Wölfel Engineering GmbH + Co. KG, Germany), Manfred Dürr (Volta Windkraft GmbH, Germany), Dimitry Pozdniakov (Hubner Germany, Germany), Rahmi Salman (HF Systems Engineering GmbH & Co. KG & Hübner Holding GmbH, Germany)	285
<i>Influence of Dielectric Overlay Permittivity on Size and Performance of Miniaturized ESPAR Antenna</i> Mateusz Czelen (Gdansk University of Technology, Poland), Mateusz Rzymowski (Gdansk University of Technology & WiComm Center of Excellence, Poland), Krzysztof Nyka (Gdansk University of Technology, Poland), Lukasz Kulas (Gdansk University of Technology, Faculty of Electronics, Telecommunications and Informatics, Poland)	289
<i>Experimental Evaluation of PA Digital Predistortion Based on Simple Feedforward Neural Network</i> Dawid Rosolowski (Warsaw University of Technology, Poland), Konrad Jędrzejewski (Warsaw University of Technology, Poland)	293

Terahertz Technologies, Devices and Systems 2

<i>Anomalous sub-THz Detection by GaN/AlGaN FinFETs</i> Maksym Dub (Institute of High Pressure Physics PAS & V. Ye. Lashkaryov Institute of Semiconductor Physics NASU, Poland), Pavlo Sai (Institute of High Pressure Physics PAS, Poland), Dmytro But (CENTERA Laboratory, Institute of High Pressure Physics PAS & CEZAMAT, Warsaw Technical University, Poland), Justinas Jorudas (Center for Physical Sciences and Technology (FTMC), Lithuania), Irmantas Kašalynas (Center for Physical Sciences and Technology (FTMC), Lithuania), Maciej Sakowicz (Institute of High Pressure Physics PAS, Poland), Grzegorz Cywinski (Institute of High Pressure Physics PAS, Poland), Sergey Rumyantsev (Rensselaer Polytechnic Institute & Ioffe Institute, USA), Wojciech Knap (Université Montpellier, CNRS, France)	297
<i>Field-Effect Transistor-Based Detector for Hyperspectral THz Imaging</i> Dovilė Čibiraitė-Lukenskienė (Goethe University of Frankfurt am Main, Germany), Alvydas Lisauskas (CENTERA Laboratories Institute of High Pressure Physics PAS Warsaw, Poland & Vilnius university, Lithuania, Lithuania), Kestutis Ikamas (Vilnius University & The General Jonas Žemaitis Military Academy of Lithuania, Lithuania), Pedro Martín-Mateos (Universidad Carlos III, Spain), Pablo Acedo (Universidad Carlos III de Madrid, Spain), Viktor Krozer (Goethe Universität Frankfurt Frankfurt, Germany & Leibniz-Institut für Höchstfrequenztechnik Berlin, Germany, Germany), Cristina de Dios (Universidad Carlos III de Madrid, Spain)	300
<i>Silicon Based Resonant Power Detector for 620 GHz</i> Dmytro But (CENTERA Laboratory, Institute of High Pressure Physics PAS & CEZAMAT, Warsaw Technical University, Poland), Alvydas Lisauskas (Vilnius University, Lithuania), Wojciech Knap (Université Montpellier, CNRS, France), Kestutis Ikamas (Vilnius University & The General Jonas Žemaitis Military Academy of Lithuania, Lithuania), Elham Javadi (School of Electrical and Computer Engineering, Iran)	305
<i>Impact of the Electron Velocity Overshoot to the Performance of Photoconductive THz Antenna</i> Gediminas Šlekas (Centre for Physical Sciences and Technology, Lithuania), Žilvinas Kancleris (Center for Physical Science and Technology, Lithuania), Andrzej Urbanowicz (Center for Physical Sciences and Technology, Lithuania)	309

Textile-integrated microwave components (2)

<i>Textile Antenna Array for Bio-Radar Applications</i> Carolina T. S. Gouveia (Instituto de Telecomunicações, Aveiro & University of Aveiro, Portugal), Caroline Loss (Universidade da Beira Interior, Portugal), Zbynek Raida (Brno University of Technology, Czech Republic), Pedro Pinho (IT - Instituto de Telecomunicações & ISEL - Instituto Superior de Engenharia de Lisboa, Portugal), Jaroslav Lacik (Brno University of Technology, Czech Republic), Jose Vieira (Universidade de Aveiro & IEETA, Portugal)	315
<i>AMC Based Textile Integrated Antenna</i> Martin Kokolia (Brno University of Technology, Czech Republic), Zbynek Raida (Brno University of Technology, Czech Republic)	320
<i>Qi Standard-Based Textile-Integrated Wireless Charger</i> Jakub Prouza (Brno University of Technology, Czech Republic), Miroslav Cupal (Brno University of Technology, Czech Republic), Zbynek Raida (Brno University of Technology, Czech Republic)	325

MIKON/URSI Plenary session

<i>Fano Resonance in Metasurfaces and Its Application</i> Žilvinas Kancleris (Center for Physical Science and Technology, Lithuania), Gediminas Šlekas (Centre for Physical Sciences and Technology, Lithuania), Andrius Kamaraukas (Centre for Physical Sciences and Technology, Lithuania), Dalius Seliuta (Center for Physical Science and Technology, Lithuania)	328
---	-----

Antenna array

UHF ERES Antenna for UHF RFID Applications

Rafał Szymczuk (ISS RFID Sp. z o. o., Poland), Luiza Leszkowska (Gdansk University of Technology, Poland), Mateusz Rzymowski (Gdansk University of Technology & WiComm Center of Excellence, Poland), Krzysztof Nyka (Gdansk University of Technology, Poland), Lukasz Kulas (Gdansk University of Technology, Faculty of Electronics, Telecommunications and Informatics, Poland) 334

Non-Planar Full-Metal Slot Reflectarray Antenna

Svyatoslav Ballandovich (Saint Petersburg Electrotechnical University LETI, Russia), Liubov Liubina (Saint Petersburg Electrotechnical University LETI, Russia), Mikhail Sugak (Saint Petersburg Electrotechnical University LETI, Russia) 338

Passive Microwave Circuits

Development of New Microstrip Ferrite Coupled Lines Isolator

Jerzy Julian Michalski (SpaceForest, Poland), Przemyslaw Kant (SpaceForest, Poland), Jerzy Mazur (Gdańsk University of Technology, Poland) 342

3-D Printed Iris Waveguide Filter in W-band

Kohei Fujiwara (Tokyo Metropolitan Industrial Technology Research Institute, Japan), Ryuichi Kobayashi (Tokyo Metropolitan Industrial Technology Research Institute, Japan), Satoshi Kuwahara (Tokyo Metropolitan Industrial Technology Research Institute, Japan), Shota Takemura (Tokyo Metropolitan Industrial Technology Research Institute, Japan), Kohei Takizawa (Tokyo Metropolitan Industrial Technology Research Institute, Japan), Yuta Watanabe (Tokyo Metropolitan Industrial Technology Research Institute, Japan) 346

Integration Concept for a Self-Biased Ka-Band Circulator

Wanja M Gitzel (Technische Universität Hamburg, Germany), Shayan Bahadori Rad (Technische Universität Hamburg, Germany), Manuel Heidenreich (Ernst-Abbe-Hochschule Jena, Germany), Jörg Töpfer (Ernst-Abbe-Hochschule Jena, Germany), Arne F Jacob (Technische Universität Hamburg, Germany) 350

Antenna Simulation and Design

Reliable Modeling of Antenna Input Characteristics by Means of Domain Confinement and Variable-Fidelity EM Simulations

Anna Pietrenko-Dabrowska (Gdansk University of Technology, Poland), Slawomir Koziel (Gdansk University of Technology, Poland) 353

Warm-Start Expedited Optimization of Antenna Structures Using Kriging Surrogates and Iterative Correction Scheme

Slawomir Koziel (Gdansk University of Technology, Poland), Anna Pietrenko-Dabrowska (Gdansk University of Technology, Poland) 357

High Gain Sectorial Beam Reflectarray Design for DVB-S Passive Radar Through Multi-Beam Optimization

Javier Rosado-Sanz (University of Alcala, Spain), Maria-Pilar Jarabo-Amores (University of Alcalá, Spain), Jean-Yves Dauvignac (Université Côte d'Azur, CNRS, LEAT, France), David Mata-Moya (University of Alcalá, Spain), Jerome Lanteri (Université Nice Sophia Antipolis, France), Claire Migliaccio (Université Côte d'Azur, CNRS, France) 361

A 110 GHz Hybrid Integrated Transmitter Design

Paweł R. Bajurko (Warsaw University of Technology, Poland), Jakub Sobolewski (Warsaw University of Technology, Poland), Michał Widlok (SIRC Sp. z o. o., Poland), Konrad Godziszewski (Warsaw University of Technology, Poland), Grzegorz Bogdan (Warsaw University of Technology, Poland), Jacek Marczewski (Institute of Electron Technology, Poland), Jan Kulawik (Institute of Electron Technology, Poland) 367

Miniaturized 3D-printed Antenna Realizations for Cylindrical Surface Mounting

Adam Raniszewski (PIT-RADWAR S.A. & Warsaw University of Technology, Poland), Barbara Aleksandra Stojewska (PIT-RADWAR S.A. & Warsaw University of Technology, Poland), Przemysław Piasecki (Warsaw University of Technology & PIT-RADWAR, Poland), Jakub Strycharz (PIT-Radwar, Poland) 371

EM Analysis of Microwave Components

Analysis of Corrugated Coaxial Line with the Use of Body of Revolution and Finite Element Method

Sebastian Dziedziewicz (Gdansk University of Technology, Poland), Rafał Lech (Gdansk University of Technology, Poland), Piotr Kowalczyk (Gdansk University of Technology, Poland) 376

Application of Mesh Deformation for Modeling of Conformal RF Components with 3D FEM

Maciej Jasinski (Gdansk University of Technology, Poland), Adam Lamecki (Gdansk University of Technology, Poland), Michał Mrozowski (Gdansk University of Technology, Poland) 381

A Study of SAR Values in High Frequency and Microwave Nearfields

Per Olov Risman (Mälardalen University, Sweden), Nikola Petrovic (Mälardalen University, Sweden) 386

Transient Simulation of EM Concealment with the FDTD Method

Oliver Csernyava (Budapest University of Technology and Economics, Hungary), Zsolt Szabó (Pázmány Péter Catholic University, Hungary), Tibor Bercei (Budapest University of Technology and Economics, Hungary) 392

Field Theory Methods

Hybrid Method Analysis of Unshielded Guiding Structures

Malgorzata Warecka (Gdansk University of Technology, Poland), Rafal Lech (Gdansk University of Technology, Poland), Piotr Kowalczyk (Gdansk University of Technology, Poland) 398

Open Access CAD, EM Tools and Examples for Teaching Microwaves

Marzena Olszewska-Placha (QWED Sp. z o. o., Poland), Malgorzata Celuch (QWED, Poland), Toai Le Quang (Federal Institute of Metrology METAS, Switzerland), Arif Gungor (ETH, Switzerland), Johannes Hoffmann (Federal Institute of Metrology METAS, Switzerland), Jasmin Smajic (ETH Zürich, Switzerland), Janusz Rudnicki (QWED Sp. z o. o., Poland) 402

Power Amplifiers

A Single GaN HEMT L-band 40W Power Module for Navigation Applications

Paolo Colantonio (University of Roma Tor Vergata, Italy), Elisa Cipriani (ESA-ESTEC, The Netherlands), Franco Giannini (University of Tor Vergata, Rome, Italy) 407

L-band High-Power GaN-on-Si HEMT Amplifier

Daniel Gryglewski (Warsaw University of Technology, Poland), Marcin Wiśniewski (Warsaw University of Technology, Poland), Wojciech Wojtasiak (Warsaw University of Technology, Poland) 411

A 3-3.8 GHz Class-J GaN HEMT Power Amplifier

Abbas Nasri (Politecnico di Torino, Italy), Motahharez Estebarsari (Politecnico di Torino, Italy), Siroos Toofan (Zanjan University, Iran), Anna Piacibello (University of Roma Tor Vergata, Italy), Chiara Ramella (Politecnico di Torino, Italy), Vittorio Camarchia (Politecnico di Torino, Italy), Marco Pirola (Politecnico di Torino, Italy) 416

A 3.4 to 3.8 GHz 45 W Inverted 3-Way Doherty Power Amplifier

Marcin Goralczyk (Microamp Solutions Sp. z o. o., Poland) 420

3.1-3.6 GHz 22W GaN Doherty Power Amplifier

Motahharez Estebarsari (Politecnico di Torino, Italy), Abbas Nasri (Politecnico di Torino, Italy), Anna Piacibello (University of Roma Tor Vergata, Italy), Chiara Ramella (Politecnico di Torino, Italy), Vittorio Camarchia (Politecnico di Torino, Italy), Marco Pirola (Politecnico di Torino, Italy) 424

Advanced Microwave Components

Analysis of Ultra-broadband Phase-Shifters for 5G User Equipment

Eduardo Anjos (KU Leuven, Belgium), Dominique Schreurs (KU Leuven, Belgium), Guy Vandenbosch (Katholieke Universiteit Leuven (KU Leuven), Belgium), Marcel Geurts (NXP Semiconductors, The Netherlands) 427

Design and Realization of High Power Diplexer for Phase Reference Line in European Spallation Source

Adam Abramowicz (Institute of Electronic Systems, Warsaw University of Technology, Poland) 431

RF SplitBox for European Spallation Source

Kamil Sapor (Warsaw University of Technology, Poland), Maciej Grzegorzolka (Warsaw University of Technology, Poland), Krzysztof Czuba (Warsaw University of Technology, Poland) 434

RF Frontend for Automated Crosstalk Reduction System

Maciej Grzegorzolka (Warsaw University of Technology, Poland), Krzysztof Czuba (Warsaw University of Technology, Poland), Bartłomiej Kola (Warsaw University of Technology, Poland) 437

Voltage Driven Phase Shifters for Phase Reference Distribution System in SINBAD

Maciej Urbanski (Warsaw University of Technology, Poland), Bartłomiej Kola (Warsaw University of Technology, Poland), Krzysztof Czuba (Warsaw University of Technology, Poland), Heinrich Pryschecki (Deutsches Elektronen Synchrotron, Germany), Frank Ludwig (Deutsches Elektronen Synchrotron, Germany) 440