

2023 53rd European Microwave Conference (EuMC 2023)

**Berlin, Germany
19-21 September 2023**

Pages 1-423



**IEEE Catalog Number: CFP23455-POD
ISBN: 979-8-3503-4739-5**

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IEEE Catalog Number:	CFP23455-POD
ISBN (Print-On-Demand):	979-8-3503-4739-5
ISBN (Online):	978-2-87487-072-9

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EuMW01 : EuMW/EuMC Opening Session

Chair: Thomas Zwick, KIT, Germany

Co-Chair: Ilona Rolfes, Ruhr-Universität Bochum, Germany

11:20–13:00, Tuesday 19th September 2023, Alpha5/6




- (NA)  **Welcome Address: Opening of the European Microwave Week 2023**
Thomas Zwick, EuMW 2023 General Chair
- (NA)  **EuMA Welcome Address**
Frank van den Bogaart, EuMA President
- (NA)  **Greetings from the IEEE MTT-S**
Nuno Borges Carvalho, IEEE MTT-S President
- (NA)  **Greetings from the EuMW 2023 Platinum Sponsor: Keysight Technologies**
- (NA)  **Technical Programme of the EuMW 2023**
Ingmar Kallfass, EuMW General TPC Chair
- (NA)  **Announcements and Notifications**
Ilona Rolfes¹, Amelie Hagelauer²
¹EuMC 2023 Chair; ²EuMC 2023 TPC Chair
- (NA)  **Near-Field Terahertz Networking**
Daniel Mittleman, Brown University, USA
- (NA)  **Awards Ceremony**
Andy Gibson, EuMA Awards Chair

EuMC01 : Interconnects and Packaging — I

Chair: Mehmet Kaynak, Texas Instruments, USA

Co-Chair: Akanksha Bhutani, KIT, Germany

09:00–10:40, Tuesday 19th September 2023, Beta2






- (NA)   **Advanced Packaging Technologies: Interconnects and Front-End Modules for Millimeter-Wave 5G/Beyond Applications** (*Industrial Keynote*)
Kamal K. Samanta, AMWT, UK
- 2   **Design and Evaluation of a Substrate Integrated Waveguide with Solid Side Walls for H-Band Applications on Organic Substrate**
Joachim Hebel, Akanksha Bhutani, Thomas Zwick, KIT, Germany
- 6   **Innovative Packaging Integration Strategy for BiCMOS ICs Operating Beyond 200GHz**
David A. Ovalle-Taylor¹, Frédéric Giancesello¹, Cyril Luxey², Guillaume Ducournau³
¹STMicroelectronics, France; ²Polytech'Lab (EA 7498), France; ³IEMN (UMR 8520), France
- 10   **Compact Transitions for Loopback Testing of Packaged Antennas with Waveguide Launchers**
Abhijit Pal, Martin Schneider, Universität Bremen, Germany
- 14   **High Density Multi-Layer Millimeter-Wave Packaging and Interconnects Using Aerosol Jet Printing**
Nicholas Sturim, Matthew Hodek, Premjeet Chahal, John D. Albrecht, John Papapolymerou, Michigan State University, USA

EuMC02 : Advances in Front-End Architectures and Active Components

Chair: Lorenz-Peter Schmidt, FAU Erlangen-Nürnberg, Germany

Co-Chair: Nils Weimann, Universität Duisburg-Essen, Germany

09:00–10:40, Tuesday 19th September 2023, Beta8




- 18  **C** **Low-Noise Amplifiers for the Arctic Weather Satellite**
*Laurenz John¹, Fabian Thome¹, Rainer Weber¹, Arnulf Leuther¹, Axel Tessmann¹,
Hermann Massler¹, Anders Emrich², Josefina Adebahr², Ville Kangas³*
¹Fraunhofer IAF, Germany; ²Omnisys Instruments, Sweden; ³ESA-ESTEC, The Netherlands
- 22  **C** **Enabling RF Circuit Techniques for 5G and Beyond**
*Florinel Balteanu, Kiran Thoomu, Ashish Pingale, Sruthi Venimadhavan, Saunak Sarkar,
Yunyoung Choi, Hardik Modi, Serge Drogi, Junhyung Lee, Bipul Agarwal, Skyworks
Solutions, USA*
- 26  **C** **Fast-Phase-Switching Current-Mode Phase Shifter for Beyond 5G Phased Array Antenna**
Asaka Kobayashi, Ren Imanishi, Hideyuki Nosaka, Ritsumeikan University, Japan
- 30  **C** **A V-Band 16% Efficiency Frequency Doubler-Based RF Beamforming Front-End Module for Vector Modulated Signal Transmission**
Mahitab Eladwy¹, Ahmed Ben Ayed¹, Ali M. Darwish², Slim Boumaiza¹
¹University of Waterloo, Canada; ²DEVCOM ARL, USA
- 34  **C** **Aluminium Based Ka-Band Radiator Combined with an Innovative SSPA Housing**
*Michael Kilian¹, Philipp Kohl¹, Matthias Tonnier², Maria Wochner²,
Christian Hartwanger¹*
¹Airbus, Germany; ²Tesat-Spacecom, Germany

EuMC03 : Integration Technologies Based on Advanced Materials and Topologies

Chair: Martin Vossiek, FAU Erlangen-Nürnberg, Germany

Co-Chair: Ke Wu, Polytechnique Montréal, Canada

09:00–10:40, Tuesday 19th September 2023, Beta9





- 38  **C** **Low-Loss MIM Capacitor on Thick SiO₂ Dielectric for GaN-on-Si Substrates with Standard and Elevated Top Electrode Configurations**
*Abdalla Eblabla¹, Arathy Varghese¹, Hareesh Chandrashekar², Michael J. Uren²,
Martin Kuball², Khaled Elgaid¹*
¹Cardiff University, UK; ²University of Bristol, UK
- 42  **C** **Sub-mmWave Transmission Lines on Silicon-Based Technologies**
Shiqi Ma, Lucas Nyssens, Jean-Pierre Raskin, Dimitri Lederer, UCLouvain, Belgium
- 46  **C** **An Ultra-Wideband DC-Block on Thin-Film Ceramic for the Next Generation of Test and Measurement Applications Up to 150GHz**
Andre Scheder¹, Tim Pfahler¹, Anna Bridier², Jan Schür¹, Martin Vossiek¹
¹FAU Erlangen-Nürnberg, Germany; ²Rohde & Schwarz, Germany
- 50  **C** **Reconfigurable Impedance Matching Network for 5G Mid-Band Utilizing Phase-Change Materials**
Tejinder Singh, Raafat R. Mansour, University of Waterloo, Canada

EuMC04 : Passive Device Development with Innovative Design Approaches

Chair: Anthony Ghiotto, IMS (UMR 5218), France

Co-Chair: Angela Stelson, NIST, USA

14:20-16:00, Tuesday 19th September 2023, Beta2






- 54  **Ⓢ** **Dual-Band Schiffman Phase Shifter with Large Frequency Ratio and Wide Bandwidths**
Faisal Amin, Lingyun Liu, Yun Liu, Yongjiu Zhao, NUAA, China
- 58  **Ⓢ** **Ultra-Low Loss Slot-Line Based Common Mode Isolator**
Timothée Le Gall¹, Anthony Ghiotto¹, Stefan Varault², Bruno Louis², Grégoire Pillet²
¹IMS (UMR 5218), France; ²Thales, France
- 62  **Ⓢ** **A Quasi-TEM Approach for Designing Microvias for PCB Layer Transition with Minimal Return Loss**
Ziad Hatab¹, Hiroaki Takahashi², Ahmad Bader Alothman Alterkawi², Michael Gadringer¹, Wolfgang Bösch¹
¹Technische Universität Graz, Austria; ²AT&S, Austria
- 66  **Ⓢ** **Compact SIW Six-Port with Improved Output Matching and Isolation**
Bartosz Tegowski, Alexander Koelpin, Technische Universität Hamburg, Germany

EuMC05 : Focused Session THz Antennas and Systems

Chair: Guillaume Ducournau, IEMN (UMR 8520), France

Co-Chair: Joachim Oberhammer, KTH, Sweden

14:20-16:00, Tuesday 19th September 2023, Beta3/4


- 70  **Ⓢ** **A 2×2 0.232-0.243THz Coherent Scalable Array in 28nm CMOS**
Sumeet Londhe, Eran Socher, Tel Aviv University, Israel
- 74  **Ⓢ** **Experimental Evaluation of a Subharmonic Detector and Corresponding 1-D Array Concept at 300GHz**
Z. Tian¹, M. Zhang¹, H. Yuan², B. Sievert¹, M. Eube³, P. Hildenhagen³, H. Roskos², D. Erni¹, A. Rennings¹
¹Universität Duisburg-Essen, Germany; ²Goethe-Universität Frankfurt, Germany; ³RF-Frontend, Germany
- 78  **Ⓢ** **THz Dielectric Resonator Antenna with Rectangular Waveguide Slot Feed**
Marius Kretschmann¹, Akanksha Bhutani¹, Peng Lu², Andreas Stöhr², Thomas Zwick¹
¹KIT, Germany; ²Universität Duisburg-Essen, Germany
- 82  **Ⓢ** **A Chip-Integrated 240-GHz-Reflectarray with Antennas on Glass Superstrate**
Susanne Brandl, Mario Mueh, Christian Waldschmidt, Universität Ulm, Germany
- 86  **Ⓢ** **Wideband, High Gain Dielectric Resonator Antenna in Embedded Surface Mount Short Horn in D-Band**
Elizabeth Bekker, Georg Gramlich, Lucas Giroto de Oliveira, Akanksha Bhutani, Thomas Zwick, KIT, Germany

EuMC06: Multi-Functional and Reconfigurable Planar Filters

Chair: Roberto Gomez-Garcia, Universidad de Alcalá, Spain

Co-Chair: Vittorio Torielli di Crestvolant, HUBER+SUHNER, Switzerland

14:20–16:00, Tuesday 19th September 2023, Beta9






- 90  **Nonreciprocal Filtering Power Divider Using Mixed Static and Time-Modulated Resonators: Numerical Design Approach and Experimental Validation**
Girdhari Chaudhary¹, Phanam Pech¹, Samdy Saron¹, Dimitra Psychogiou², Yongchae Jeong¹
¹Jeonbuk National University, Korea; ²University College Cork, Ireland
- 94  **Multi-Functional Bandpass Filters with Frequency Tunability and RF Co-Designed Isolator Functionality**
Kexin Li, Dimitra Psychogiou, University College Cork, Ireland
- 98  **Ultrawide In-Band Self-Interference Suppression Using Bandpass Filter-Based RF Cancellers**
Kevin Martin, Dimitra Psychogiou, University College Cork, Ireland
- 102  **Non-Reciprocal RF Co-Designed Filtering Phase Shifters with Continuously Tunable Phase Shift**
Zixiao Zhang, Dimitra Psychogiou, Tyndall National Institute, Ireland
- 106  **Signal-Interference Bandpass Filters Using Resonant Transversal Filtering Sections with Asymmetrical Transfer Function Characteristics**
David Chatzichristodoulou¹, Symeon Nikolaou¹, Photos Vryonides¹, Dimitra Psychogiou²
¹Frederick Research Center, Cyprus; ²University College Cork, Ireland

EuMC07: Interconnects and Packaging — II

Chair: Yinggang Li, Shenzhen Technology University, China

Co-Chair: Aurelian Crunteanu, XLIM (UMR 7252), France

16:40–18:20, Tuesday 19th September 2023, Beta2







- 110  **Low-Cost Transition from Chip to Waveguide for E-Band**
Klas Eriksson, Torbjörn Dahl, Richard Lindman, Andreas Martin, Kristoffer Andersson, Ericsson, Sweden
- 114  **Broadband, Via-Less Grounded Coplanar Waveguide-to-Microstrip Transition in D-Band**
Elizabeth Bekker, Georg Gramlich, Alexander Quint, Luca Valenziano, Lucas Giroto de Oliveira, Akanksha Bhutani, Thomas Zwick, KIT, Germany
- 118  **A K-Band Wideband Air-Filled Coaxial Transmission Line With CNC-Machined Gap Waveguide Package**
Jin Li, Zheming Li, Sicheng Chen, Zhihong Xu, Tao Yuan, Shenzhen University, China
- 122  **AW-Band, Wideband, and Low-Loss Slot-Coupled Multi-Layer Transition with Compact Leakage-Suppressing Scheme**
Ding Wang, Yong Fan, Yu Jian Cheng, UESTC, China
- 126  **Design of Chip-to-Waveguide Transition Centered at 220GHz for Sub-THz Packaging**
Haojie Chang, Zhongxia Simon He, Herbert Zirath, Chalmers University of Technology, Sweden

EuMC08: Focused Session 6G THz Communications

Chair: Andreas Stöhr, Universität Duisburg-Essen, Germany





Co-Chair: Sebastian Randel, Karlsruhe Institute of Technology (KIT), Germany

16:40–18:20, Tuesday 19th September 2023, Beta3/4

- 130   **300GHz Super Heterodyne Link Over 645m with Frequency Duplexing for Point to Point Backhauls**
A. Renau¹, C. Maye¹, Dominik Wrana², Simon Haussmann², Ingmar Kallfass², Laurenz John³, B.K. Jung⁴, U. Hellrung⁴, P. Schlegel⁴, T. Kuerner⁴, R.P. Braun⁵, Y. Leiba⁶, T. Kawanishi⁷, S. Hisatake⁸, K. Kondou⁹, P. Szriftgiser¹⁰, Guillaume Ducournau¹
¹IEMN (UMR 8520), France; ²Universität Stuttgart, Germany; ³Fraunhofer IAF, Germany; ⁴Technische Universität Braunschweig, Germany; ⁵Deutsche Telekom, Germany; ⁶Siklu Communications, Israel; ⁷Waseda University, Japan; ⁸Gifu University, Japan; ⁹HRCP Research and Development Partnership, Japan; ¹⁰PhLAM (UMR 8523), France
- 134   **200Gbit/s Wireless THz Transmission Over 52m Using Optoelectronic Signal Generation**
Joel Dittmer¹, Jonas Tebart², Christoph Füllner¹, Christian Koos¹, Andreas Stöhr², Sebastian Randel¹
¹KIT, Germany; ²Universität Duisburg-Essen, Germany
- 138   **Effects of Harmonics from Frequency-Multiplicative Carrier Generation in a Superheterodyne 300GHz Transmit Frontend**
Dominik Wrana¹, Simon Haussmann¹, Benjamin Schoch¹, Laurenz John², Axel Tessmann², Ingmar Kallfass¹
¹Universität Stuttgart, Germany; ²Fraunhofer IAF, Germany

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- 142   **Mobile 6G Communications at THz Frequencies Enabled by Leaky-Wave Antenna Beam Steering**
Jonas Tebart¹, Joel Dittmer², Thomas Haddad¹, Peng Lu¹, Sebastian Randel², Andreas Stöhr¹
¹Universität Duisburg-Essen, Germany; ²KIT, Germany
- 146   **Scalable Phased-Arrays at 140GHz Using RF and IF Beamforming Techniques**
Amr Ahmed, Minjae Jung, Siwei Li, Linjie Li, Gabriel M. Rebeiz, University of California at San Diego, USA

EuMC09: Microwave and Millimeter-Wave Systems and Applications

Chair: Mark Bantum, Technische Universiteit Eindhoven, The Netherlands

Co-Chair: Ioan E. Lager, Technische Universiteit Delft, The Netherlands

16:40–18:20, Tuesday 19th September 2023, Beta7






- 150  **C** **Characterising Scattering Parameters of Coaxial Microwave Devices at Milli-Kelvin Temperatures for Quantum Computing Technologies**
Manoj Stanley¹, Sang-Hee Shin¹, James Skinner¹, Jonas Urbonas², Nick Ridler¹
¹NPL, UK; ²Maury Microwave, USA
- 154  **C** **Temperature-Controlled Disinfection System Using Microwave and Plasma**
Saleh Alfawaz, Ibrahim N. Alquaydheb, Sara Ghayouraneh, Amirreza G. Avval, Samir El-Ghazaly, Yuchun Du, Jianhong Zhou, University of Arkansas, USA
- 158  **C** **Low-Complexity Control of an Electrical-Balance Duplexer**
Jonas Winkelhake, Lukas Hüssen, Muh-Dey Wei, Renato Negra, RWTH Aachen University, Germany
- 162  **C** **Analysis of a LINC Transmitter Architecture Based on Frequency Multipliers**
Till Schiffmann, Stefan Mueller, Renato Negra, RWTH Aachen University, Germany
- 166  **C** **Detection of Metal Edge Orientation in Near-Field Imaging Using Higher-Order Mode Coupling**
Dennis Hoffmann, Jan Hesselbarth, Universität Stuttgart, Germany

EuMC10: New Technologies in Planar Filters

Chair: Giuseppe Macchiarella, Politecnico di Milano, Italy

Co-Chair: Photos Vryonides, Frederick Research Center, Cyprus

16:40–18:20, Tuesday 19th September 2023, Beta9






- 170  **C** **Quasi-Elliptic Multi-Band BPFs using Multi-Resonant Acoustic-Wave Lumped-Element Resonators**
Mohammed R.A. Nasser, Dimitra Psychogiou, University College Cork, Ireland
- 174  **C** **Wideband Reconfigurable Bandpass-to-Bandstop Filter Based on Embedded Switches on Silicon Technology**
Miguel A. Sanchez-Soriano¹, Rozenn Allanic², Cédric Quendo², Denis Le-Berre², Douglas Silva De Vasconcellos³, Virginie Gremal³, Damien Valente³, Jérôme Billoué³
¹Universidad de Alicante, Spain; ²Lab-STICC (UMR 6285), France; ³GREMAN (UMR 7347), France
- 178  **C** **Compact Dual-Band Filters Using Substrate Integrated Coaxial and Slot-Line Resonators**
Steven Matthew Cheng, Dimitra Psychogiou, Tyndall National Institute, Ireland
- 182  **C** **Quasi-Input Reflectionless Bandpass Filter with Quasi-Elliptic Response and Controllable Transmission Zeros Using Coupled Lines**
Girdhari Chaudhary¹, Phanam Pech¹, Samdy Saron¹, Dimitra Psychogiou², Yongchae Jeong¹
¹Jeonbuk National University, Korea; ²University College Cork, Ireland
- 186  **C** **Sezawa Mode Enhancement of SAW Resonators on GaN-on-Insulator by Optimizing the Metal Thickness and its Application to RF Filters**
Yutian Zhang, Krishna Balram, Martin Cryan, University of Bristol, UK

EuMC11: Characterization of Multi-Antenna Systems

Chair: Ville Viikari, Aalto University, Finland

Co-Chair: Matthias Geissler, IMST, Germany

09:00–10:40, Wednesday 20th September 2023, Alpha5

- 190  **C** **Active Probe Array Structure for Assessment of mmWave Antenna Arrays**
Martin Obermaier¹, Martin Laabs¹, Thomas Deckert², Dirk Plettemeier¹
¹Technische Universität Dresden, Germany; ²National Instruments, Germany
- 194  **C** **An Experimental Study of Energy and Bit Efficiency in Collocated- and Distributed-MIMO Using 28GHz Testbed**
Tomoya Kaneko, Toshihide Kuwabara, Noriaki Tawa, Yasushi Maruta, NEC, Japan
- 198  **C** **Passive Characterization of the Couplings Within a Multi-Antenna System Through Noise Correlation**
Meriem Tamart¹, Elodie Richalot¹, Julien de Rosny²
¹ESYCOM (UMR 9007), France; ²ESPCI Paris, France
- 202  **C** **Experimental Study of Channel Estimation and Transmit Diversity for IRS-Based MISO System**
Yueheng Li, Sven Bettinga, Xueyun Long, Mohamad Basim Alabd, Lucas Giroto de Oliveira, Thomas Zwick, KIT, Germany
- 206  **C** **Robotic Measurement Solutions for Phased Array Calibration and Pattern Testing**
P. Pelland, D. Janse van Rensburg, NSI-MI Technologies, USA

EuMC12: Non-Planar Filters

Chair: Richard Snyder, RS Microwave, USA

Co-Chair: Michael Höft, CAU, Germany

09:00–10:40, Wednesday 20th September 2023, Beta2






- (NA)  **C** **Evolution of High-Power Filters for Space Applications (Industrial Keynote)**
Christoph Schwager, Tesat-Spacecom, Germany
- 211  **C** **Input-Absorptive Quasi-Elliptic-Type Cavity Bandpass Filter Design**
Ying-Qian He¹, Jing-Yu Lin², Xuzhou Yu¹, Sai-Wai Wong¹
¹Shenzhen University, China; ²Xiamen University, China
- 215  **C** **Reconfigurable Groove Gap Microwave Filter Based on Liquid Crystal Technology with One Transmission Zero**
Fynn Kamrath¹, Ersin Polat², Holger Maune³, Rolf Jakoby², Michael Höft¹
¹CAU, Germany; ²Technische Universität Darmstadt, Germany; ³OvG Universität Magdeburg, Germany
- 219  **C** **A Novel Multi-Resonant Rectangular Waveguide Junction and its Applications in Compact Waveguide Multi-Band Filters and Multiplexers**
Mohamed M. Fahmi¹, Jorge A. Ruiz-Cruz², Raafat R. Mansour³
¹DRDC, Canada; ²Universidad Autónoma de Madrid, Spain; ³University of Waterloo, Canada
- 223  **C** **Analysis and Validation of Fabrication and Assembly Effects on Terahertz Waveguide Bandpass Filter**
Bo Zhang, Yong Zhang, Tianhao Cao, Huali Zhu, UESTC, China

EuMC13: Additive Manufacturing of Microwave Components

Chair: Hjalti H. Sigmarsson, University of Oklahoma, USA

Co-Chair: Gerald Gold, FAU Erlangen-Nürnberg, Germany

09:00–10:40, Wednesday 20th September 2023, Beta3/4






- 227  **C Additive Integration with Aerosol-Jet Printed SIWs**
Christopher Areias, Andrew Luce, Yuri Piro, Alkim Akyurtlu, UMass Lowell, USA
- 231  **C A 3D Printed V-Band Twisted Monolithic Waveguide Bandpass Filter**
Talal Skaik¹, Daxin Wang¹, Peter Hunyor², Hui Wang², Peter G. Huggard², Thomas Starke³, Qingfeng Zhang⁴, Yi Wang¹
¹University of Birmingham, UK; ²RAL Space, UK; ³3D MicroPrint, Germany; ⁴SUSTech, China
- 235  **C Low-Pass Filters in Standard Rectangular Waveguide Using 3D Printed Dielectric Inserts**
T. Stander, University of Pretoria, South Africa
- 239  **C D-Band 90° Waveguide Twists Using 3D Printing and PVD Metallization**
Alexander Quint¹, Jerzy Kowalewski², Francesco Merli², Thomas Zwick¹
¹KIT, Germany; ²HUBER+SUHNER, Switzerland
- 243  **C SLS-Printed E-Band Waveguides and the Impact of Surface Roughness**
A. Hofmann, K. Lomakin, M. Kleinlein, T. Bader, M. Sippel, Gerald Gold, FAU Erlangen-Nürnberg, Germany

EuMC14: Signal Integrity and EMC

Chair: Christian Damm, Universität Ulm, Germany

Co-Chair: Bela Brian Szendrenyi, Advantest, USA

09:00–10:40, Wednesday 20th September 2023, Beta7






- 247  **C Tunable Dual-Frequency Interference Suppression Circuit with GaN MMIC Delay Lines**
Megan C. Robinson¹, Gregor Lasser², Zoya Popović¹
¹University of Colorado Boulder, USA; ²Chalmers University of Technology, Sweden
- 251  **C Linearity of PIN Diode Switch in Both ON-State and OFF-State**
Farhad Ghorbani¹, Jiafeng Zhou¹, Mattias Gustafsson², Yi Huang¹
¹University of Liverpool, UK; ²Huawei Technologies, Sweden
- 255  **C EMF-Measurements of Rooftop Attenuation of Cellular Radio Base Stations Deployed on Gable Roofs**
Roland Reese¹, Fabian Michler², Benedict Scheiner², Eva Radermacher¹
¹Deutsche Telekom, Germany; ²Sykno, Germany
- 259  **C Exposure Simulation and Analysis Using Downlink Beam Tracking of a Mobile User in City Scenario**
Xueyun Long, Mario Pauli, Yueheng Li, Oliver Fritz, Thomas Zwick, KIT, Germany
- 263  **C An Optically-Coupled Logger for the Measure of RF-Induced Voltage on Pacemakers and ICDs**
C. Vivarelli, F. Censi, G. Calcagnini, E. Mattei, ISS, Italy

EuMC15: High Efficiency Power Amplifier and Linearization Techniques

Chair: Zoya Popovic, University of Colorado Boulder, USA

Co-Chair: Olof Bengtsson, FBH, Germany





09:00–10:40, Wednesday 20th September 2023, Beta8/9

- 267  **Experimental Characterization of a Dual-Input OLMBA for Back-Off Efficiency Improvement**
Jean-Baptiste Urvoy¹, Roberto Quaglia¹, Jeff R. Powell², Steve C. Cripps¹
¹Cardiff University, UK; ²Skyarna, UK
- 271  **A Wideband Dual-Input Reconfigurable Doherty Power Amplifier for Mismatch Recovery**
Junfu Guo¹, Songbai He¹, Weimin Shi², Chuan Li¹, Xubin Zhang¹
¹UESTC, China; ²Chongqing University, China
- 275  **Dual-Band Pseudo-Doherty Load Modulated Balanced Amplifier Design by Exploiting the Periodicity of Branch-Line Coupler**
Jieen Xie, Kwok-Keung Michael Cheng, Tszwai Wong, Pengyu Yu, CUHK, China
- 279  **Efficiency Enhancement of Dual-PA Transmitters Using Over-the-Air Combination**
Wenqi Wu, Songbai He, Jun Peng, Jiyu Wang, UESTC, China
- 283  **Comparison Between Latest Si-LDMOS and GaN Technology for RF-Power Base Station Transistors**
Daniel Maassen, Jan de Boet, Jos van der Zanden, Rob M. Heeres, Fred van Rijs, Ampleon, The Netherlands






EuMC16: EuMC Poster 1

Chair: Amelie Hagelauer, Fraunhofer EMFT, Germany

10:40–13:00, Wednesday 20th September 2023, Exhibition

- 287  **L-Band Lithium Niobate-On-Insulator SH₀ Resonators Avoiding Transverse Spurious Modes Through Electrode Apodization**
Lluís Acosta¹, Eloi Guerrero¹, Carlos Caballero¹, Jordi Verdú¹, Albert Guerrero², Xavier Borrís³, Jaume Esteve², Pedro de Paco¹
¹Universitat Autònoma de Barcelona, Spain; ²IMB-CNM, Spain; ³ICN2, Spain
- 291  **Pin-Loaded Rectangular Hollow-Waveguide Cavities for Filter Design with Excellent Suppression of Spurious Passbands**
Jonas Weindl¹, Ananto Prasetiadi², Thomas F. Eibert¹
¹Technische Universität München, Germany; ²Wainwright Instruments, Germany
- 295  **Inline Waveguide Filter with Compact Frequency-Dependent Coupling Producing Two Additional Poles and Three Transmission Zeros**
Umar A. Majeed¹, Muhammad Y. Sandhu¹, Adam Lamecki², Roberto Gómez-García³, Michał Mrozowski²
¹Sukkur IBA University, Pakistan; ²Gdansk University of Technology, Poland; ³Universidad de Alcalá, Spain
- 299  **Suspended CPW Integration on Nanoporous Alumina Interposer for Millimeter Wave Applications**
Gustavo Palomino¹, Gabriel Griep¹, Gustavo Marcati¹, Ariana L.C. Serrano¹, Gustavo P. Rehder¹, Philippe Ferrari²
¹Universidade de São Paulo, Brazil; ²IMEP-LaHC (UMR 5130), France

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- 303  **C** **Lightweight, Low-Profile 3-Port Antenna Using Additive Manufacturing Process**
Adrien Coatanea¹, N. Nguyen-Trong², Christophe Fumeaux², Benjamin Potelon¹, Christian Person¹
¹Lab-STICC (UMR 6285), France; ²University of Adelaide, Australia
- 307  **C** **Multi-Windows Spectral Transparency and Slow Light Effect Induced by Complex Near Field Mode Coupling in Microwave Metasurface**
Oleksiy A. Breslavets¹, Yuri N. Savin¹, Zoya E. Eremenko²
¹NASU, Ukraine; ²IFW Dresden, Germany
- 311  **C** **FDTD Analysis of Space-Time Metamaterials Using Modulated TVTLs for Frequency Translation, Mixing and Non-Reciprocity**
Anand Kumar, Debdeep Sarkar, Indian Institute of Science, India
- 315  **C** **Resonant Response in Tunable Metasurface Based on Crossed All-Dielectric Grating**
Vladimir V. Yachin¹, Vyacheslav V. Khardikov², Liudmyla A Kochetova¹, Sergiy L. Prosvirnin¹
¹NASU, Ukraine; ²V.N. Karazin Kharkiv National University, Ukraine
- 319  **C** **A ROM-Less DDS Using Pseudo-Sine Generator**
Koki Nagata, Hideyuki Nosaka, Ritsumeikan University, Japan
- 323  **C** **Partially Coherent RF Noise Addition and its Mitigation in Power-Combined Solid-State Amplifiers**
Michael E. MacDonald¹, Nestor D. Lopez²
¹MIT Lincoln Laboratory, USA; ²BAE Systems, USA
- 327  **C** **A Broadband 140GHz Aperture-Coupled SPA Antenna in LTCC-Technology**
Martin Ihle¹, Steffen Ziesche¹, Christian Zech², Benjamin Baumann²
¹Fraunhofer IKTS, Germany; ²Fraunhofer IAF, Germany

EuMC17: Passive Components

Chair: Maurizio Bozzi, Università di Pavia, Italy

Co-Chair: Anthony Ghiotto, IMS (UMR 5218), France

11:20-13:00, Wednesday 20th September 2023, Beta2

- 331  **C** **Design of a Low-Loss E-Band Self-Biased Waveguide Circulator for Space Applications**
Evan Roué¹, Vincent Laur¹, Alexis Chevalier¹, Antoine Hoes¹, Gérard Tanné¹, Olivier Vendier², Rose-Marie Sauvage³, Richard Lebourgeois²
¹Lab-STICC (UMR 6285), France; ²Thales, France; ³DGA, France
- 335  **C** **A Novel Compact Six-Pole Filtering Gysel Combiner**
Mohamed M. Fahmi¹, Jorge A. Ruiz-Cruz², Raafat R. Mansour³
¹DRDC, Canada; ²Universidad Autónoma de Madrid, Spain; ³University of Waterloo, Canada
- 339  **C** **Comparison of Compact Liquid Crystal-Based Phase Shifting Topologies for Reconfigurable Intelligent Surfaces**
Robin Neuder, Tom Burmeister, Dongwei Wang, Martin Schüssler, Rolf Jakoby, Alejandro Jiménez-Sáez, Technische Universität Darmstadt, Germany
- 343  **C** **AFSIW E-Plane Bifurcation for Compact High-Performance Systems on Substrate and its Demonstration in the Design of a Dual-Band Filter**
Maxime Le Gall¹, Anthony Ghiotto², Issam Merah¹
¹Exens Solutions, France; ²IMS (UMR 5218), France
- 347  **C** **Structured-Glass Waveguides (SGW) and TRL Calibration Standards**
Chad Bartlett¹, Antonio Malavé¹, Martin Letz², Michael Höft¹
¹CAU, Germany; ²Schott, Germany

EuMC18: Microwave Components for Space Applications

Chair: Michael Kilian, Airbus, Germany

Co-Chair: Alexander Kölpin, Technische Universität Hamburg, Germany

11:20-13:00, Wednesday 20th September 2023, Beta7











- (NA)   **Tackling the Challenges of Over-The-Air Testing for New Space (Industrial Keynote)**
Benoit Derat, Rohde & Schwarz, Germany
- 352   **Helically Corrugated Interaction Regions for W-Band Gyrotron-Travelling Wave Amplifiers**
Craig R. Donaldson, Liang Zhang, Craig W. Robertson, Philip MacInnes, Colin G. Whyte, University of Strathclyde, UK
- 356   **Measurement and Analysis of FDM for E-Band Satellite Communication**
Simon Haussmann¹, Laura Manoliu¹, Lukas Gebert¹, Benjamin Schoch¹, Markus Koller¹, Jakob Meier¹, Fabian Steinmetz², Jens Freese³, Ralf Henneberger⁴, Axel Tessmann⁵, Sabine Klinkner¹, Ingmar Kallfass¹
¹Universität Stuttgart, Germany; ²Thales, Germany; ³Tesat-Spacecom, Germany; ⁴Radiometer Physics, Germany; ⁵Fraunhofer IAF, Germany
- 360   **Frequency and Phase Investigation of the Local Oscillator Offset in a W-Band Satellite Communication Link**
Laura Manoliu¹, Dominik Wrana¹, Benjamin Schoch¹, Simon Haussmann¹, Axel Tessmann², Ingmar Kallfass¹
¹Universität Stuttgart, Germany; ²Fraunhofer IAF, Germany
- 364   **A Heterodyne Transceiver for Hybrid-Integrated K-/Ka-Band Phased Arrays**
Kevin Erkelenz, Florian Goepfert, Noah Sielck, Alexander Koelpin, Arne F. Jacob, Technische Universität Hamburg, Germany

EuMC19: High Power Device and Amplifier Technology

Chair: José Carlos Pedro, Universidade de Aveiro, Portugal

Co-Chair: Gavin Watkins, Toshiba, UK

11:20-13:00, Wednesday 20th September 2023, Beta8/9











- 368   **A Low Loss, 6GHz Large-Signal Bandwidth Analog Pre-Distortion Linearizer for K-Band High Power Amplifiers**
Tommaso Cappello¹, Sarmad Ozan², Laura McDonald³, Andy Tucker³, Peter Krier³, Tudor Williams³, Kevin Morris⁴
¹Villanova University, USA; ²University of Bristol, UK; ³Filtronic, UK; ⁴University of Leeds, UK
- 372   **A 100V, 90W, 50% Efficiency Distributed Amplifier**
W. Veitschegger, Gabriele Formicone, John Walker, Integra Technologies, USA
- 376   **A 4kW, 100V GaN on SiC HEMT Transistor for 1.3GHz Particle Accelerator Applications**
Gabriele Formicone, James Custer, John Walker, Integra Technologies, USA
- 380   **Balanced Amplifier Design for Improvement of Reverse Intermodulation Distortion in Wireless Microphone Systems**
C. Krüger, T. Jeske, S. Hampel, Sennheiser, Germany
- 384   **HF Class-E Power Amplifier with Improved Efficiency for Mismatched Loads**
Frederick H. Raab, Green Mountain Radio Research, USA

EuMC20: Filters by Additive Manufacturing

Chair: Cristiano Tomassoni, Università di Perugia, Italy

Co-Chair: Adam Lamecki, Gdansk University of Technology, Poland

14:20–16:00, Wednesday 20th September 2023, Beta2











- 388   **Additive-Manufactured $TM_{01\delta}$ Mode Dielectric Resonators for Compact On-Board Wideband Filters**
Paolo Vallerotonda¹, Luca Pelliccia¹, Fabrizio Cacciamani¹, Cristiano Tomassoni², Ollid Bouzekri³
¹RF Microtech, Italy; ²Università di Perugia, Italy; ³ESA-ESTEC, The Netherlands
- 392   **BST-Based Tunable Helical Filter Operating in the Higher Order Mode**
Seyyed Mojtaba Pourjaafari, Raafat R. Mansour, University of Waterloo, Canada
- 396   **Bandpass Filter Based on 3D-Printed Ceramic Triple-Mode Resonator with Branches Combining TM and TE Mode Operation**
Patrick Boe¹, Daniel Miek¹, Dominik Brouczek², Michael Höft¹
¹CAU, Germany; ²Lithoz, Austria
- 400   **Rectangular Waveguide Filters Based on Deformed Dual-Mode Cavity Resonators**
Michał Baranowski¹, Lukasz Balewski², Adam Lamecki², Michał Mrozowski¹
¹Gdansk University of Technology, Poland; ²EM Invent, Poland
- 404   **A 3-D-Printing-Compatible 90°-Bending and Polarization-Rotated Waveguide Filter Based on Capsule-Shape Resonators and Spherical Joints**
Yuhong Ye, Jin Li, Sicheng Chen, Tao Yuan, Shenzhen University, China

EuMC21: Metamaterials and Metasurfaces

Chair: Pierre Blondy, XLIM (UMR 7252), France

Co-Chair: Ferran Martín, Universitat Autònoma de Barcelona, Spain

14:20–16:00, Wednesday 20th September 2023, Beta5

- 408   **A Stacked Transparent Metasurface for Wideband LP-to-CP Conversion and Phase Control**
Guowei Li, Yuehe Ge, Zhizhang Chen, Fuzhou University, China
- 412   **Metamaterial Waveguide Based Detector for Mass-Flow Measurements of Particulate Paint Solids**
Amrit Zoad¹, Alexander Kölpin², Andreas Penirschke¹
¹Technische Hochschule Mittelhessen, Germany; ²Technische Universität Hamburg, Germany
- 416   **Switchable FSS-Based 3D Printed Radome Using Diodes at 3.6GHz**
T.H. Le Dam¹, Alejandro Niembro-Martin², Thierry Lacrevez¹, Gregory Houzet¹, Damien Paulet³, Nadege Reverdy-Bruas⁴, Q. Bao Duong⁵, T. Phu Vuong¹
¹IMEP-LaHC (UMR 5130), France; ²Schneider Electric, France; ³UGA-IUT1, France; ⁴LGP2 (UMR 5518), France; ⁵S.mart Grenoble Alpes, France
- 420   **A Glide-Symmetric Reconfigurable Metasurface in Substrate-Integrated-Waveguide Technology**
Boris Fischer, Julien Sarrazin, Guido Valerio, GeePs (UMR 8507), France
- 424   **14dB Active Gain Magnetic Negative Permeability Metamaterial Cell with Self-Coupling Compensation**
Hongtao Zhong, David S. Ricketts, North Carolina State University, USA

EuMC22: Medical Microwave Applications and Dosimetric Studies

Chair: Jan Vrba, Czech Technical University in Prague, Czechia

Co-Chair: Christian Damm, Universität Ulm, Germany

14:20–16:00, Wednesday 20th September 2023, Beta7






- 428  **C** **Characterization of the Influence of Clothing and Other Materials on Human Vital Sign Sensing Using mmWave Radar**
Nils C. Albrecht, Jan P. Weiland, Dominik Langer, Marvin Wenzel, Alexander Koelpin, Technische Universität Hamburg, Germany
- 432  **C** **A High-Stability and High-Sensitivity Active Sensor for Non-Invasive Breast Cancer Detection**
Sandra Santiago-Mesas¹, Elizabeth Fernandez-Aranzamendi¹, Daniel Segovia-Vargas¹, Adrián Amor-Martín¹, Vicente González-Posadas²
¹Universidad Carlos III de Madrid, Spain; ²Universidad Politécnica de Madrid, Spain
- 436  **C** **Using Effective Medium Theory to Simulate Skin Cancer Detection with a Substrate-Integrated Waveguide Probe**
Nicolas Treier¹, Benedicta Fofo Doku¹, Denis Jaisson², Herman Jalli Ng², Serdal Ayhan², Marlene Harter¹
¹Hochschule Offenburg, Germany; ²Hochschule Karlsruhe, Germany
- 440  **C** **Microwave Diagnosis of Bone Fractures: An Artificial Intelligence-Based Approach**
Fardin Ghorbani¹, Sina Beyraghi², Javad Shabanpour³, Mir Emad Lajevardi⁴, Vahid Nayyeri¹, Pai-Yen Chen⁵, Omar M. Ramahi⁶
¹IUST, Iran; ²Universitat Pompeu Fabra, Spain; ³Aalto University, Finland; ⁴Islamic Azad University, Iran; ⁵University of Illinois Chicago, USA; ⁶University of Waterloo, Canada
- 444  **C** **Auto-Induced, Radiofrequency, Downlink Exposure Focused at the Human Ear**
Hanne Herssens, Arno Thielens, Ghent University, Belgium

EuMC23: Advanced THz Device and Photonic Techniques

Chair: Christian Carlowitz, FAU Erlangen-Nürnberg, Germany

Co-Chair: Guillaume Ducournau, IEMN (UMR 8520), France





14:20–16:00, Wednesday 20th September 2023, Beta8/9

- 448  **C** **Sub-THz Silicon-Micromachined Reconfigurable Beam-Steering Frontend**
Armin Karimi, Umer Shah, Joachim Oberhammer, KTH, Sweden
- 452  **C** **Compact High-Isolation Sub-THz Micro-Electromechanical SPST Switch**
Armin Karimi, Umer Shah, Joachim Oberhammer, KTH, Sweden
- 456  **C** **Comparison of the Performance of State-of-the-Art Photoconductive Receivers for Terahertz Photonic Spectrum Analysers**
Benedikt L. Krause, Sascha Preu, Technische Universität Darmstadt, Germany
- 460  **C** **Ultra-Stable Tunable THz System for 6G Communication Based on Photonics**
Taro Eichler¹, Thomas Puppe², Sebastian Müller², Timo Noack¹, Milan Deumer³, Simon Nellen³, Yuriy Mayzlin², Nico Riedmann¹, Lars Liebermeister³, Rafal Wilk², Robert B. Kohlhaas³, Nico Vieweg², Gerd Hechtfisher¹, Wilhelm Keusgen⁴
¹Rohde & Schwarz, Germany; ²TOPTICA Photonics, Germany; ³Fraunhofer HHI, Germany; ⁴Technische Universität Berlin, Germany
- 464  **C** **Photonics Assisted Analog-to-Digital Conversion of Wide-Bandwidth Signals by Orthogonal Sampling**
Younus Mandalawi, Janosch Meier, Mohamed I. Hosni, Karanveer Singh, Souvaraj De, Evans Baidoo, Thomas Schneider, Technische Universität Braunschweig, Germany

EuMC24: EuMC Poster 2







Chair: Amelie Hagelauer, Fraunhofer EMFT, Germany

16:00-18:20, Wednesday 20th September 2023, Exhibition

- 468  **C** **Experimental Demonstration of a High Capacity THz-Wireless Dual Link Transmission System**
Oliver Stiewe¹, Robert Elschner¹, Thomas Merkle², Kallyan Das¹, Stefan Weide¹, Colja Schubert¹, Ronald Freund¹
¹Fraunhofer HHL, Germany; ²Fraunhofer IAF, Germany
- 472  **C** **On Solving Higher Order Volume-Surface Integral Equations for Composite Conductor and Anisotropic Media Structures**
Zhi-peng Zhang¹, Qiang-ming Cai², Yong Li¹
¹Yun Micro Electronics, China; ²SWUST, China
- 476  **C** **Extracting Curvature Information from Low Fidelity Mesh for Electromagnetic Ray-Tracing Simulations in Automotive Scenarios**
Mohannad Saifo¹, Alexander Ioffe², Xiuzhang Cai³, Markus Stefer², Markus Clemens¹
¹Bergische Universität Wuppertal, Germany; ²Aptiv Services, Germany; ³Aptiv Services, USA
- 480  **C** **Switched-Mode Power Supply Impact on a Bluetooth Low Energy Receiver Inside a Microcontroller**
Pierre Malbec¹, Jean-Daniel Arnould¹, Christian Vollaire², Jean-Marc Duchamp³, David Chesneau⁴
¹TIMA (UMR 5159), France; ²Laboratoire Ampère (UMR 5005), France; ³G2Elab (UMR 5269), France; ⁴STMicroelectronics, France

EuMC24 continues next page...

EuMC24 continued...



- 484  **C** **Cylindrical Luneburg Lens Equipped with Conformal Graphene Strip as Efficient THz Absorber**
Iryna O. Mikhailikova¹, Sergii V. Dukhopelnykov²
¹V.N. Karazin Kharkiv National University, Ukraine; ²IETR (UMR 6164), France
- 488  **C** **Numerical Modeling and Simulation of Large Transmitarrays Antennas for X and Ka Band Applications**
Alessandro De O.C. Junior¹, André Barka¹, Hamza Kaouach²
¹ONERA, France; ²LAPLACE (UMR 5213), France
- 492  **C** **Determination of Manufacturing Tolerances Using Uncertainty Quantification for the Realization of a Dual Circularly Polarized Elliptical Feed Horn**
M.M. Bilgic, P. Meincke, T. Rubæk, TICRA, Denmark
- 496  **C** **Orthogonal Linear Polarization Dependent Bifunctional Meta-Mirror / Meta-Lens Antenna for Millimeter-Wave Applications**
Suchitra Tiwari¹, Amit K. Singh², Ankit Dubey¹
¹IIT Jammu, India; ²IIT Patna, India
- 500  **C** **Evaluation of a Ku-Band Phased Array's Performances with Co-Simulation Including Measurements**
H. Ngoc Nguyen, J. Lintignat, C. Menudier, C. Hallepee, M. Thevenot, XLIM (UMR 7252), France
- 504  **C** **Mobile Robots Design for Industrial Applications in Private 5G Networks: Essential Factors to Consider**
Ying Rao Wei, Jayabalaji Sathiyamoorthi, Mahib Rahman, Piotr Janik, Intel, Germany
- 508  **C** **Compact Millimeter-Wave Filtenna Fed by SIW with BC-CSRRs for Optimal Suppression**
Yiqiu Liang, Liyu Zhu, Zhiqiang Yu, Jianyi Zhou, Southeast University, China

EuMC25: Beamsteering Arrays and Reconfigurable Intelligent Surfaces

Chair: Stefania Monni, TNO, The Netherlands

Co-Chair: Simona Bruni, IMST, Germany

16:40–18:20, Wednesday 20th September 2023, Beta2






- 512  **Modeling Integrated Antennas and Unisolated High-Power Amplifiers in Infinite Scanning Arrays**
Martijn de Kok¹, Stefania Monni², Marc van Heijningen², Alessandro Garufo², Peter de Hek², A. Bart Smolders¹, Ulf Johannsen¹
¹Technische Universiteit Eindhoven, The Netherlands; ²TNO, The Netherlands
- 516  **An AI-Based Model for Smart Control of High-Mobility Phased Arrays**
Arman Bordbar¹, Luigi Boccia¹, Luca Catarinucci², Giandomenico Amendola¹, Riccardo Colella³
¹Università della Calabria, Italy; ²Università del Salento, Italy; ³CNR-IFC, Italy
- 520  **Approximating the Performance of a 28GHz Corrugated Horn Antenna with an 8×8 Time-Modulated Array**
Ricardo A.M. Pereira¹, Enrico Fazzini², Alessandra Costanzo², Diego Masotti², Nuno Borges Carvalho¹
¹Universidade de Aveiro, Portugal; ²Università di Bologna, Italy
- 524  **Nonlinear Modelling of Steerable Antenna Array by Ferroelectric Capacitors Based on Nanoscale Layers of HfZrO**
S. Trovarello¹, A. Di Florio Di Renzo¹, M. Aldrigo², Diego Masotti¹, M. Dragoman², Alessandra Costanzo¹
¹Università di Bologna, Italy; ²IMT Bucharest, Romania
- 528  **A Miniaturized 1-Bit Reflective Unit Cell for Reconfigurable Intelligent Surface**
Jiexi Yin, Yueheng Li, Thomas Zwick, KIT, Germany

EuMC26: Field Theory and Numerical Techniques

Chair: Alessandro Galli, Università di Roma “La Sapienza”, Italy

Co-Chair: Christian Damm, Universität Ulm, Germany

16:40–18:20, Wednesday 20th September 2023, Beta5



- 532  **A Fast Physical Optics Framework for Optimizing Quasi Optical Millimeter Wave Measurement Setups**
Tobias Körner, Jochen Altholz, Steffen Gerling, Jan Barowski, Christian Schulz, Ilona Rolfes, Ruhr-Universität Bochum, Germany
- 536  **Efficient Antenna Pattern Sampling Using Complex Source Beams for Millimeter Wave Short Range Scenarios**
Steffen Gerling, Tobias Körner, Jochen Altholz, Christian Schulz, Jan Barowski, Ilona Rolfes, Ruhr-Universität Bochum, Germany
- 540  **An Efficient WLP-Based Method with Operator Splitting Technique for Solving Wave Equation**
Jie Li, Min Tang, Junfa Mao, SJTU, China
- 544  **Diffraction Radiation Analysis of Finite Graphene-Covered Nanowire Grating Excited by Electron Beam**
Dariia O. Herasymova, NASU, Ukraine
- 548  **Emission Frequencies and Thresholds for Microsize Graphene Strip Grating Laser on Gain Substrate**
Fedir O. Yevtushenko, Sergii V. Dukhopelnykov, NASU, Ukraine

EuMC27: Microwave Sensing Techniques for Biological Materials

Chair: Katia Grenier, LAAS-CNRS, France

Co-Chair: Michal Cifra, Czech Academy of Sciences, Czechia

16:40–18:20, Wednesday 20th September 2023, Beta7






- 552  **C Broadband Analysis of Sample Permittivity on a Conductor-Backed Coplanar Waveguide**
Petr Kůrka, Jaroslav Havlíček, Daniel Havelka, Michal Cifra, Czech Academy of Sciences, Czechia
- 556  **C Tapered CPW Transmission Line for Enlarging Dynamic Range of Transmission Spectroscopy**
Marie Mertens¹, Raphaël Trouillon², Ke Wu², Bart Nauwelaers¹, Tomislav Markovic¹, Dominique Schreurs¹
¹KU Leuven, Belgium; ²Polytechnique Montréal, Canada
- 560  **C Fully 3D-Printed Microfluidic Substrate Integrated Waveguide Based Sensor for in vitro Diagnostics of Diabetes**
Abdelhak Hamid Allah, Guy Ayissi Eyebe, Frédéric Domingue, UQTR, Canada
- 564  **C Microfabricated Capacitive Microwave Biosensor for Label-Free Escherichia Coli Bacteria Detection**
Ilona Piekarz¹, Jakub Sorocki¹, Sabina Górska², Krzysztof Wincza¹, Sławomir Gruszczyński¹
¹AGH UST, Poland; ²Polish Academy of Sciences, Poland

EuMC28: Material and Waveguide Measurement

Chair: Ilona Piekarz, AGH UST, Poland

Co-Chair: Georg Gramse, Keysight Technologies, Austria

16:40–18:20, Wednesday 20th September 2023, Beta8/9

- 568  **C Complex Permittivity Extraction of IC-Package Materials Beyond 110GHz by Band-Limited Waveguide-Cavity Measurements**
Tim Pfahler, Gerald Gold, Felix Bachbauer, Jan Schür, Martin Vossiek, FAU Erlangen-Nürnberg, Germany
- 572  **C An Open Hemispherical Resonant Cavity for Relative Permittivity Measurements of Fluid and Solid Materials at mm-Wave Frequencies**
Gabriele Federico, Diego Caratelli, A. Bart Smolders, Ad Reniers, Technische Universiteit Eindhoven, The Netherlands
- 576  **C Waveguide Measurements of Highly Anisotropic Graphene Augmented Inorganic Nanofibers**
Nikolaos Xenidis¹, Serguei Smirnov¹, Aleksandra Przewłoka², Aleksandra Krajewska², Joachim Oberhammer¹, Dmitri Lioubtchenko¹
¹KTH, Sweden; ²Polish Academy of Sciences, Poland
- 580  **C Comparison of VNA and TDS Measurements for Material Characterization Using a Balanced-Type Circular Disk Resonator**
Yuto Kato¹, Masaichi Hashimoto², Eiji Kato², Akira Kuwahara², Hiroyuki Shiotsuka²
¹AIST, Japan; ²Advantest, Japan
- 584  **C Comparison of TRL Calibration Standards and Techniques for Waveguide S-Parameter Measurements up to Terahertz Frequencies**
James Skinner¹, James Champion², Nick Ridler¹
¹NPL, UK; ²TeraSi, Sweden

EuMC29: MHz to GHz Wireless Data and Power Transfer Systems

Chair: Jasmin Grosinger, Technische Universität Graz, Austria

Co-Chair: Alessandra Costanzo, Università di Bologna, Italy

09:00–10:40, Thursday 21st September 2023, Beta2






- 588  **C** **Impact of 2-ASK Back-Scattering Modulation on Harvesting Efficiency for 5.8GHz Batteryless Transponder Based on a Rectenna Array**
Marco Passafiume, Giovanni Collodi, Monica Righini, Alessandro Cidronali, Università di Firenze, Italy
- 592  **C** **Ultra-Thin RF Wireless Power Transmitter**
Alois Friedberger, Thomas Multerer, Aygün Baltacı, Jan Tepper, Dominic Schupke, Airbus, Germany
- 596  **C** **Six-Port Technology for Passive Millimeter-Wave Identification Systems**
Chaouki Hannachi¹, Matthieu Egels¹, Philippe Pannier¹, Serioja O. Tatu²
¹IM2NP (UMR 7334), France; ²INRS-EMT, Canada
- 600  **C** **Radiation Suppression Regime in Wireless Power Transfer Between Two Loop Antennas**
Nam Ha-Van, Constantin R. Simovski, Francisco S. Cuesta, Prasad Jayathurathnage, Sergei A. Tretyakov, Aalto University, Finland
- 604  **C** **Detection of Vulnerable Road Users Based on Spread Spectrum Modulated Millimeter Wave Tags**
A. Lazaro, R. Villarino, M. Lazaro, D. Girbau, Universitat Rovira i Virgili, Spain

EuMC31: Calibration and De-Embedding

Chair: Chong Li, University of Glasgow, UK

Co-Chair: Xiaobang Shang, NPL, UK

09:00–10:40, Thursday 21st September 2023, Beta5


- 608  **C** **VNA Calibration Using Coaxial Air Lines with Two Plug Connectors**
Frauke Gellersen, Karsten Kuhlmann, Florian Rausche, PTB, Germany
- 612  **C** **S-Parameters De-Embedding at Cryogenic Temperature Using One Reflect Standard**
Marie Mbeutcha, Frank Schäfer, Patrick Pütz, Gundolf Wieching, MPI for Radio Astronomy, Germany
- 616  **C** **RF Performances and De-Embedding Techniques of Passive Devices in 3D Homogeneous Integration at Sub-THz**
A. Oliveira¹, Olivier Valorge¹, Christophe Dubarry¹, Y. Roelens², M. Zaknune², Jose Lugo-Alvarez¹
¹CEA-Leti, France; ²IEMN (UMR 8520), France
- 620  **C** **Influence of Dimensional and Material Parameters and Their Uncertainties on Calculable Offset Shorts**
Andreas Schramm, Frauke Gellersen, Karsten Kuhlmann, PTB, Germany
- 624  **C** **Interlaboratory Investigation of On-Wafer S-Parameter Measurements from 110GHz to 1.1THz**
Xiaobang Shang¹, Nick Ridler¹, Uwe Arz², Gia Ngoc Phung², Isabelle Roch-Jeune³, Guillaume Ducournau³, Kamel Haddadi³, Thomas Flisgen⁴, Ralf Doerner⁴, Djamel Allal⁵, Divya Jayasankar⁶, Jan Stake⁶, Robin Schmidt⁷, Gavin Fisher⁸, Faisal Mubarak⁹
¹NPL, UK; ²PTB, Germany; ³IEMN (UMR 8520), France; ⁴FBH, Germany; ⁵LNE, France; ⁶Chalmers University of Technology, Sweden; ⁷Keysight Technologies, Belgium; ⁸FormFactor, Germany; ⁹VSL, The Netherlands

EuMC32: Beam-Steering and Beam-Switching Array Antennas

Chair: Bela Brian Szendrenyi, Advantest, USA

Co-Chair: Yi Wang, University of Birmingham, UK

09:00–10:40, Thursday 21st September 2023, Beta6






- (NA)  **C** **Gapwaves Waveguide Technology Comes of Age** (*Industrial Keynote*)
Carlo Bencivenni, Abbas Vosoogh, Abolfazl Haddadi, Gapwaves, Sweden
- 629  **C** **A 64-Element Ultra-Wideband 23–46GHz Tx/Rx 5G Phased Array with 50dBm Peak EIRP and 2.4Gb/s 64-QAM Operation**
Shufan Wang¹, Tian Liang¹, Abdulrahman Alhamed², Gabriel M. Rebeiz¹
¹University of California at San Diego, USA; ²King Saud University, Saudi Arabia
- 633  **C** **Multibeam Metasurface Antenna Based on a Single Substrate Layer and One Feeding Port for Millimetre Wave Applications**
Mohammed H. Arif, Adrien Guth, Muh-Dey Wei, Dirk Heberling, Renato Negra, RWTH Aachen University, Germany
- 637  **C** **A Wideband 16×16 Butler Matrix for Millimeter-Wave Beam-Switching Applications**
Mehri Borhani-Kakhki, Ahmed Shehata Abdellatif, Hari Krishna Pothula, David Wessel, Huawei Technologies, Canada
- 641  **C** **Radar-Based Human Activity Recognition with Range-Distributed Time-Doppler Sparse Point Cloud and Multi-Channel PointNet**
Beiran Wang, Chuanwei Ding, Haoyu Chen, Hong Hong, Xiaohua Zhu, NJUST, China

EuMC33: Satcom and mm-Wave Antennas

Chair: Arne F. Jacob, Technische Universität Hamburg, Germany

Co-Chair: Daniel Segovia-Vargas, Universidad Carlos III de Madrid, Spain

09:00–10:40, Thursday 21st September 2023, Beta7











- 645  **C** **New Design of a Bidirectional K- and Ka-Band Antenna Array for Multiple Beam-Steering**
Engelbert Tyroller, Andreas Krause, Stefan Lindenmeier, Universität der Bundeswehr München, Germany
- 649  **C** **A Planar Polarization-Agile Array with Shared Aperture at K/Ka-Band**
Noah Sielck, Kevin Erkelenz, Alexander Koelpin, Arne F. Jacob, Technische Universität Hamburg, Germany
- 653  **C** **A Compact Wide-Scanning Connected-Slot Array in a Standard PCB for Ku/K/Ka-Band Applications**
Syrine Hidri, Francesco Foglia Manzillo, CEA-Leti, France
- 657  **C** **Silicon Parallel-Plate Waveguide with Controlled Boundaries for Broadcast Applications in WiNoC Architecture**
Bryan Treguer, Thierry Le Gouguec, Pierre-Marie Martin, Rozenn Allanic, Cédric Quando, Lab-STICC (UMR 6285), France
- 661  **C** **Surface Wave Mitigation Based on Finite EBG Structures for W-Band Radar Millimetre-Wave MIMO Antenna Arrays**
Riana Helena Geschke, Carlos Sempere Chaves, Christian Krebs, Fraunhofer FHR, Germany

EuMC34: Wearable and Flexible Solutions for Energy Harvesting

Chair: Thomas Ußmüller, Universität Innsbruck, Austria

Co-Chair: Alessandra Costanzo, Università di Bologna, Italy

11:20–13:00, Thursday 21st September 2023, Beta2








- 665   **A Flexible Wearable Rectenna Using AMC for WBAN Applications**
Elie Zaraket, Yéro Dia, Ludivine Fadel, Laurent Oyhenart, Valérie Vigneras, IMS (UMR 5218), France
- 669   **Design of Compact and High-Efficiency Broadband Rectifier with Harmonic Suppression Transferring for Biomedical Implants Applications**
Gia Thang Bui, Dang-An Nguyen, Chulhun Seo, Soongsil University, Korea
- 673   **Flexible Textile Antenna for Detection of 5G Bandwidth in Wearable Systems**
J. Tavares¹, C. Loss², P. Pinho², H. Alves¹
¹INESC MN, Portugal; ²Instituto de Telecomunicações, Portugal
- 677   **Flexible Printed Rectenna Based on a 2.45GHz CPW Rectifier for Energy Harvesting Applications**
Alassane Sidibe, Alexandru Takacs, Daniela Dragomirescu, Samuel Charlot, LAAS-CNRS, France
- 681   **IR-UWB Reader for Credit Card-Sized NFC Chipless RFID Tag Using Asymmetrical Stepped Impedance Resonators**
Fuminori Sakai¹, Kazuo Ohta¹, Yoshimasa Amano¹, Mitsuo Makimoto², Koji Wada²
¹Sakura Tech, Japan; ²University of Electro-Communications, Japan

EuMC35: Innovative Concepts for Radar, Satcom and mm-Wave Antennas

Chair: Matthias Geissler, IMST, Germany

Co-Chair: Laure Huitema, XLIM (UMR 7252), France

11:20–13:00, Thursday 21st September 2023, Beta3/4






- (NA)   **Challenges and Outlook of the Overall Front-End of Future SATCOM Missions Based on Active Array Antennas (Industrial Keynote)**
Jean-Philippe Fraysse, Thales, France
- 686   **Filtenna Array Design via a Lossy Coupled-Resonators Filter Approach**
Matteo Oldoni¹, Gian Guido Gentili¹, Fabien Seyfert², Giuseppe Macchiarella¹, Cristina D'Asta¹
¹Politecnico di Milano, Italy; ²HighFSolutions, France
- 690   **A Monolithically Polyjet 3-D Printed Millimeter-Wave Quasi-Planar Air-Filled Cavity-Backed Patch Antenna with Enhanced Gain**
Jianqiu Qin, Jin Li, Yueguang Lu, Sicheng Chen, Kai-Dong Hong, Tao Yuan, Shenzhen University, China
- 694   **A Novel Type of 76GHz Array Antenna Based on Synthesis with Filter Technique**
Kenichi Iio¹, Isao Ohta²
¹Furuno Electric, Japan; ²University of Hyogo, Japan
- (NA)   **Dielectric Filled Waveguide Antenna for Air-Borne Application**
Madhumita Chakravarti¹, Anil Chepala², Asudeb Dutta¹
¹IIT Hyderabad, India; ²DRDO Hyderabad, India

EuMC36: Channel Modelling and Measurement

Chair: Jakub Sorocki, AGH UST, Poland

Co-Chair: Reiner Thomä, Technische Universität Ilmenau, Germany

11:20-13:00, Thursday 21st September 2023, Beta5






- 702  **C** **Ray-Optical Modeling of Wireless Coverage Enhancement Using Engineered Electromagnetic Surfaces: Experimental Verification at 28GHz**
Y. de Jong¹, R. Chaharmir¹, S. Raut¹, D. McLachlan¹, M. Zhang¹, G. Bedrosian², M. Schmiedekamp², J. DeLancey², R. Silber Belmonte²
¹Communications Research Centre Canada, Canada; ²Remcom, USA
- 706  **C** **Measurement and Statistics of Rain Attenuation on Terrestrial Link at 240, 270 and 300GHz**
Heejun Park, Jangsuk Choi, Hyunji Bae, Jaeho Seok, RRA, Korea
- 710  **C** **Contactless Flange Made the Sub-THz VNA Calibration and Testing Faster and More Accurate**
Lingyun Ren, Yonghui Shu, Eravant, USA
- 713  **C** **Complexity Reduction Techniques for a Frame Based Dynamic Ray Tracing Approach**
Enes Aksoy¹, Haroon Khan¹, Leszek Raschkowski², Lars Thiele², Slawomir Stanczak²
¹Huawei Technologies, Germany; ²Fraunhofer HHL, Germany
- 717  **C** **RCS-Based Quasi-Deterministic Ray Tracing for Statistical Channel Modeling**
Javad Ebrahimzadeh¹, Evgenii Vinogradov², Guy A.E. Vandenbosch¹
¹KU Leuven, Belgium; ²Technology Innovation Institute, UAE

EuMC37: Microwave Sensors for Material Measurements

Chair: Tuami Lasri, IEMN (UMR 8520), France

Co-Chair: Ilona Rolfes, Ruhr-Universität Bochum, Germany

11:20-13:00, Thursday 21st September 2023, Beta8/9

- 721  **C** **One-Port CSRR Structure for Dielectric Characterization of Lossy Materials**
Matko Martinic¹, Maede Chavoshi¹, Dominique Schreurs¹, Tomislav Markovic², Bart Nauwelaers¹
¹KU Leuven, Belgium; ²University of Zagreb, Croatia
- 725  **C** **Microwave Microfluidic Sensor for Detecting Organic and Inorganic Compounds in Water**
Amir Ebrahimi, Kamran Ghorbani, RMIT University, Australia
- 729  **C** **Analytical Design of Phase Variation-Based Dielectric Constant Sensors**
Zahra Mehrjoo, Amir Ebrahimi, Kamran Ghorbani, RMIT University, Australia
- 733  **C** **High Temperature Probe for Measuring Dielectric Parameters**
Baptiste Henriot¹, Jesse Allens Touoyem Talla², Olivier Tantot¹, Nicolas Delhote¹, Serge Verdeyme¹, Jaona Randrianalisoa², Thierry Duvaut², Michaël Charles³
¹XLIM (UMR 7252), France; ²ITheMM (EA 7548), France; ³CEA Le Ripault, France
- 737  **C** **Characterization of Edible Oils Subjected to Industrial Frying Processes Through High Sensitivity Microwave Sensors**
Jonathan Muñoz-Enano, Paris Vélez, Pau Casacuberta, Lijuan Su, Ferran Martín, Universitat Autònoma de Barcelona, Spain

EuMC38: MHz to GHz Components and Sub-Systems for Wireless Data and Power Transfer

Chair: Jasmin Grosinger, Technische Universität Graz, Austria

Co-Chair: Nuno Borges Carvalho, Universidade de Aveiro, Portugal

14:20-16:00, Thursday 21st September 2023, Beta2






- (NA)  **C** **Millimeter-Wave Ferrite Components Operating in Rectangular Waveguide Bands from 25 to 400GHz (Industrial Keynote)**
David Porterfield, Micro Harmonics, USA
- 742  **C** **Highly Efficient HEMT Rectifier with a Wide Dynamic Range Based on a Hybrid Coupler for Wireless Power Transfer**
Jinyao Zhang, Yi Huang, Jiafeng Zhou, University of Liverpool, UK
- 746  **C** **Backscatter Tag Based on an Actively-Controlled Reflection Amplifier**
M. Lazaro, A. Lazaro, R. Villarino, D. Girbau, Universitat Rovira i Virgili, Spain
- 750  **C** **Wireless Radiative Near-Field Links Through Wideband Bessel-Beam Launchers**
Edoardo Negri¹, Luca Del Biondo¹, Walter Fuscaldo², Paolo Burghignoli¹, Alessandro Galli¹
¹Università di Roma "La Sapienza", Italy; ²CNR-IMM, Italy
- 754  **C** **Data Transfer in an Injection-Locked Oscillator Coupled to an External Resonator**
Víctor Ardila, Franco Ramírez, Almudena Suárez, Universidad de Cantabria, Spain

EuMC39: OTA and Wideband Measurements

Chair: Marco Farina, Università Politecnica delle Marche, Italy

Co-Chair: Paola Russo, Università Politecnica delle Marche, Italy

14:20-16:00, Thursday 21st September 2023, Beta3/4











- 758  **C** **An Experimental Study on Efficient Antenna OTA Test Method for Automotive Applications**
Zhichao Chen, Lukas Berkelmann, Carsten Monka-Ewe, Bert Jannsen, Volkswagen, Germany
- 762  **C** **Comparison of OTA Test Methodologies for Vehicle EIRP Measurements**
Lukas Berkelmann, Carsten Monka-Ewe, Zhichao Chen, Bert Jannsen, Volkswagen, Germany
- 766  **C** **Deterministic Detection and Vector Band Stitching for the Measurement of 6G Wideband Test Signals**
Jean Pierre Teyssier, Nizar Messaoudi, Joel Dunsmore, Jan Verspecht, Keysight Technologies, USA
- 770  **C** **Wideband Cross-Domain Characterization of a W-Band Amplifier MMIC**
Benjamin Schoch¹, Dominik Wrana¹, Axel Tessmann², Ingmar Kallfass¹
¹Universität Stuttgart, Germany; ²Fraunhofer IAF, Germany
- 774  **C** **Sub-THz/mm-Wave Out-of-Band Distortion Product Measurements: A Hybrid Banded-Broadband Approach**
J. Martens, Anritsu, USA

EuMC40: 5G and MIMO Antennas

Chair: Dirk Heberling, RWTH Aachen University, Germany

Co-Chair: Ioan E. Lager, Technische Universiteit Delft, The Netherlands

14:20–16:00, Thursday 21st September 2023, Beta6






- 778   **Small Dual-Band 3D Beamforming MIMO Antenna**
Abel Zandamela, Nicola Marchetti, Adam Narbudowicz, Trinity College Dublin, Ireland
- 782   **A Highly Integrated 5G mm-Wave Phased Array System at N257/N261 Bands with 54dBm Linear EIRP**
Chih-Hsiang Ko, Tumay Kanar, Arjun Kamath, Calogero Presti, Himanshu Khatri, Jitesh Shah, Mohammad Ghadiri-Sadrabadi, Samet Zahir, Sataporn Pornpromlikit, Wei-Ting Wong, Ming Lim, Renesas Electronics, USA
- 786   **Influence of the Communication Environment on Orbital Angular Momentum (OAM) Mode Orthogonality**
Michael Wulff¹, Lei Wang², Alexander Koelpin¹, Christian Schuster¹
¹Technische Universität Hamburg, Germany; ²Heriot-Watt University, UK
- 790   **A Novel Dual-Wideband Four-Port MIMO Filtenna for Sub-6GHz 5G Communication Systems**
Alper Turkeli¹, Ali Kursad Gorur¹, Yasemin Altuncu²
¹Nevsehir Haci Bektas Veli University, Türkiye; ²Niğde Ömer Halisdemir University, Türkiye
- 794   **Circularly Polarized Patch Antenna Array for 5G Automotive Satellite Communications**
Umair Tayyab¹, Ashish Kumar¹, Hans-Peter Petry², Md. Golam Robbani¹, Thomas Wack³, Matthias A. Hein¹
¹Technische Universität Ilmenau, Germany; ²DeSK, Germany; ³Wiegand, Germany

EuMC41: EuMC Closing Session

Chair: Ilona Rolfes, Ruhr-Universität Bochum, Germany

Co-Chair: Amelie Hagelauer, Fraunhofer EMFT, Germany

16:40–18:20, Thursday 21st September 2023, Alpha6


- (NA)  **Session Welcome**
Ilona Rolfes¹, Amelie Hagelauer²
¹EuMC 2023 Chair; ²EuMC 2023 TPC Chair
- (NA)  **Quantum Computing — Building a New Computing Technology**
Heike Riel, IBM, Switzerland
- (NA)  **Beams from Space: The Future of Energy?**
Jean-Dominique Coste, Airbus, Germany
- (NA)  **Awards Ceremony**
Michael Gadringer, EuMW 2023 Awards Chair
- (NA)  **Closing Remarks**
Thomas Zwick, EuMW 2023 General Chair
- (NA)  **Invitation to EuMW 2024**
Guillaume Ducournau, EuMW 2024 General Chair


EuMIC/EuMC01 : Focused Session Low Noise mm-Wave Integrated Technologies for Sub-THz Wireless Communication


Chair: Alessandro Fonte, SIAE MICROELETTRONICA, Italy


Co-Chair: Luca Aluigi, Huawei Technologies, Italy


09:00–10:40, Tuesday 19th September 2023, Beta3/4

- (NA)  **C** **Design Methodologies for mm-Wave Transceivers in Bi(CMOS) for Next-Generation Wireless and Optical Applications (Industrial Keynote)**
Domenico Pepe, Renesas Design Zurich, Switzerland

- (NA)  **C** **Fully Integrated Built-In Self Test of Millimeter-Wave LNA Based on Avalanche Noise Diodes in 130nm SiGe BiCMOS Technology**
Guendalina Simoncini, Valentina Palazzi, Giulia Orecchini, Federico Alimenti, Università di Perugia, Italy

- (NA)  **C** **Modelling, Design, and Characterization Challenges of a Gallium Arsenide High-Linearity Low-Noise Amplifier with Gain Control at W-Band**
Patrick E. Longhi, Antonio Serino, Walter Ciccognani, Sergio Colangeli, Shikha Swaroop Sharma, Swati Sharma, Ernesto Limiti, Università di Roma "Tor Vergata", Italy

- (NA)  **C** **A D-Band Low-Noise-Amplifier in SiGe BiCMOS with Broadband Multi-Resonance Matching Networks**
Guglielmo De Filippi, Lorenzo Piotto, Andrea Bilato, Andrea Mazzanti, Università di Pavia, Italy

- (NA)  **C** **A Compact 120GHz LNA in 22nm FD-SOI with Back-Gate Controllable Variable-Gain**
M. Rack¹, Lucas Nyssens¹, Quang Huy Le², Dang Khoa Huynh², Thomas Kämpfe², Jean-Pierre Raskin¹, Dimitri Lederer¹
¹UCLouvain, Belgium; ²Fraunhofer IPMS, Germany

EuMIC/EuMC02 : Panel Session on European Chips Act

Chair: Wolfgang Heinrich, FBH, Germany

Co-Chair: Paolo Colantonio, Università di Roma "Tor Vergata", Italy

14:20–16:00, Tuesday 19th September 2023, Alpha5/6

- (NA) **C** **Introduction: What is the EU Chips Act**
Gerhard Kahmen, IHP, Germany

- (NA) **C** **The Research View: 3 Pitches by European RTOs (FMD, imec & CEA-Leti)**
Gerhard Kahmen¹, Nadine Collaert², Martin Gallezot³
¹IHP, Germany; ²imec, Belgium; ³CEA-Leti, France

- (NA) **C** **The Industrial View: Impulse Presentations by European Industries**
Volker Ziegler¹, Massimo C. Comparini²
¹Nokia, Germany; ²Thales, Italy

- (NA) **C** **The Foundry View: Panel with Foundry Representatives**



- (NA) **C** **Open Discussion**

EuMIC/EuMC03 : EuMIC/EuMC Poster

Chair: Ulrich Lewark, IMST, Germany

Co-Chair: Amelie Hagelauer, Fraunhofer EMFT, Germany

16:00–18:20, Tuesday 19th September 2023, Exhibition

- (NA)  **C Comparative Life Cycle Assessment of Hybrid Bonding and Copper Pillar Die-to-Wafer 3D Integrations for Sub-THz Applications**
Léa Roulleau, Laura Vauche, Olivier Valorge, Christophe Dubarry, Léa Di Cioccio, CEA-Leti, France
- (NA)  **C An Unconventional Measurement Technique for the Nonlinear Characterization of mm-Wave GaN HEMT**
Valeria Vadalà¹, Antonio Raffo², Gianni Bosi², Rocco Giofrè³, Paolo Colantonio³, Giorgio Vannini²
¹Università di Milano-Bicocca, Italy; ²Università di Ferrara, Italy; ³Università di Roma “Tor Vergata”, Italy
- 823  **C A Hybrid Radiating Element for 1-D Scanning Clustered Phased Array**
Raffaele De Marco, Emilio Arnieri, Giandomenico Amendola, Luigi Boccia, Università della Calabria, Italy
- (NA)  **C Experimental Validation of Class F Waveform Engineering in Class C Biasing Condition**
Francesco Manni¹, Rocco Giofrè¹, Franco Giannini¹, Valeria Vadalà², Gianni Bosi³, Antonio Raffo³, Giorgio Vannini³, Paolo Colantonio¹
¹Università di Roma “Tor Vergata”, Italy; ²Università di Milano-Bicocca, Italy; ³Università di Ferrara, Italy
- 831  **C New Approach to Absolute Power Measurements in the WR-3 Band**
Benjamin Röben¹, Karsten Lange², Priyanka Mondal³, Pierre Gellie³, Andreas Steiger¹
¹PTB, Germany; ²SLT Sensor- und Lasertechnik, Germany; ³Lytid, France

EuMIC/EuMC03 continues next page...

EuMIC/EuMC03 continued...






- 834  **C Phase Distortion Reduction of Flat Gain Envelope Tracked GaN RF PAs**
Morten Olavsbråten, Anders Ivar Hagen, Hans-Robert Løhren, NTNU, Norway
- 838  **C Analysis of the Dispersion Characteristics in Substrate Integrated Waveguides with Periodic Walls**
Raúl García¹, Ángela Coves¹, Ángel A. San Blas¹, Maurizio Bozzi²
¹Universidad Miguel Hernández de Elche, Spain; ²Università di Pavia, Italy
- 842  **C GaN-on-Porous Silicon for RF Applications**
Gilles Scheen¹, Romain Tuyvaerts¹, Pieter Cardinael², Enriquè Ekoga¹, Khaled Aouadi¹, Christophe Pavageau¹, Amin Rassekh¹, Massinissa Nabet², Sachin Yadav³, Jean-Pierre Raskin², Bertrand Parvais³, Mostafa Emam¹
¹Incize, Belgium; ²UCLouvain, Belgium; ³imec, Belgium
- 846  **C Bondwire Integration Challenges in E-Band Systems: From PCB to Die Level**
Sherif R. Zahran¹, Antonio Alati¹, Raffaele De Marco¹, Stefano Moscato², Alessandro Fonte², Giandomenico Amendola¹, Philippe Ferrari³, Luigi Boccia¹
¹Università della Calabria, Italy; ²SIAE MICROELETTRONICA, Italy; ³TIMA (UMR 5159), France
- 850  **C Air-Filled and Slow-Wave CNT-Based Substrate Integrated Waveguide**
Phi-Long Doan¹, Jordan Corsi¹, Tay Beng Kang², Rongtao Jiang³, Joseph de Saxce⁴, Philippe Coquet³, Jianxiong Wang³, Dominique Baillargeat⁴, Emmanuel Pistono¹, Florence Podevin¹
¹TIMA (UMR 5159), France; ²NTU, Singapore; ³CINTRA (UMI 3288), Singapore; ⁴XLIM (UMR 7252), France
- 854  **C Dual-Band Substrate Integrated Waveguide Filters with Independently Controllable Passband Based on Cambered Cavity and Circular Cavity**
Xian-Long Yang¹, Xiao-Wei Zhu¹, Xiang Wang², Rui-Jia Liu³
¹Southeast University, China; ²NJUST, China; ³University College Dublin, Ireland

EuMC/EuRAD01 : Waveforms for Distributed Networks and Integrated Communications and Sensing

Chair: Thomas Dallmann, Technische Universität Ilmenau, Germany

Co-Chair: Maria Sabrina Greco, Università di Pisa, Italy

11:20–13:00, Wednesday 20th September 2023, Beta3/4

- (NA)  **C** **A Dual-Carrier Linear-Frequency Modulated Waveform for High-Accuracy Localization in Distributed Antenna Arrays**
Ahona Bhattacharyya, Jason M. Merlo, Jeffrey A. Nanzer, Michigan State University, USA
- (NA)  **C** **Optimized Window Function for Improved Estimation Capabilities in 5G Joint Communication and Sensing**
Michael Hofstadler, Maximilian Larcher, Reinhard Feger, Andreas Springer, Andreas Stelzer, Johannes Kepler Universität Linz, Austria
- (NA)  **C** **Design of Long-Sequence Unimodular Waveforms Using an Original Autoencoder for MIMO Radar Systems**
Ryota Sekiya, Hiroki Mori, Hiromi Hashimoto, Junichiro Suzuki, Toshiba, Japan
- (NA)  **C** **Distributed Sensor Network for 3D Tag Localization Using Harmonic Radar at 61/122GHz ISM Band**
Steffen Hansen, Sandra Nowok, Alex Shoykhetbrod, Stefan Wickmann, Jan Wessel, Nils Pohl, Fraunhofer FHR, Germany
- (NA)  **C** **CP-DSSS for Radar-Centric Integrated Sensing and Communication**
Linda Gehre, Lucas Giroto de Oliveira, Axel Diewald, Thomas Zwick, Benjamin Nuss, KIT, Germany

EuMC/EuRAD02 : Focused Session Joint Communication and Radar Sensing — A Step Towards 6G Part 1

Chair: Reiner Thomä, Technische Universität Ilmenau, Germany

Co-Chair: Thomas Dallmann, Technische Universität Ilmenau, Germany

14:20–16:00, Wednesday 20th September 2023, Beta3/4











- (NA)  **C** **Distributed ISAC Systems — Multisensor Radio Access and Coordination**
Reiner Thomä, Thomas Dallmann, Technische Universität Ilmenau, Germany
- (NA)  **C** **6G Integrated Sensing and Communication: From Vision to Realization**
Thorsten Wild, Artjom Grudnitsky, Silvio Mandelli, Marcus Henninger, Junqing Guan, Frank Schaich, Nokia Bell Labs, Germany
- (NA)  **C** **Bistatic OFDM-Based Joint Radar-Communication: Synchronization, Data Communication and Sensing**
Lucas Giroto de Oliveira, David Brunner, Axel Diewald, Charlotte Muth, Laurent Schmalen, Thomas Zwick, Benjamin Nuss, KIT, Germany
- (NA)  **C** **Mutual Over-The-Air Frequency Synchronization of Continuous Wave Signals**
Thomas Dallmann, Reiner Thomä, Technische Universität Ilmenau, Germany
- (NA)  **C** **A Compact Reconfigurable Power Splitter Enabling a Full-Duplex Integrated Transceiver Employed for Joint Communication and Radar Sensing**
Farhad Bozorgi, Padmanava Sen, Barkhausen Institut, Germany

EuMC/EuRAD03: Antenna Techniques for Radar

Chair: Pierfrancesco Lombardo, Università di Roma "La Sapienza", Italy

Co-Chair: Alexander Yarovoy, Technische Universiteit Delft, The Netherlands

14:20–16:00, Wednesday 20th September 2023, Beta6











- (NA)   **Sparse 2D MIMO Antenna Designs Using Simulated Annealing**
Muge Bekar, Christopher John Baker, Marina Gashinova, University of Birmingham, UK
- (NA)   **Reconstructed 2D MIMO Using Burg Algorithm**
Muge Bekar, Christopher John Baker, Marina Gashinova, University of Birmingham, UK
- (NA)   **Monopulse Channels Beamforming with Overlapped Subarrays for Low-Cost Multi-Mission Radars**
Giulio Giovannetti, ELDES, Italy
- (NA)   **Avoidance of Near-Field Influences in Calibration Measurements of Radars by Means of Active Calibration Targets**
Matthias Linder, Benedikt Meinecke, Dominik Schwarz, Christian Waldschmidt, Universität Ulm, Germany
- (NA)   **Beam Space MIMO Radar at 24GHz Using Butler Matrices for Transmit and Receive Beamforming**
Reinhard Feger, Christoph Dutzler, Andreas Stelzer, Johannes Kepler Universität Linz, Austria

EuMC/EuRAD04: Focused Session Joint Communication and Radar Sensing — A Step Towards 6G Part 2

Chair: Aydin Sezgin, Ruhr-Universität Bochum, Germany

Co-Chair: Reiner Thomä, Technische Universität Ilmenau, Germany

16:40–18:20, Wednesday 20th September 2023, Beta3/4

- (NA)   **Map Fusion and Heterogeneous Objects Tracking in Joint Sensing and Communication Networks**
Elia Favarelli¹, Elisabetta Matricardi¹, Lorenzo Pucci¹, Enrico Paolini¹, Wen Xu², Andrea Giorgetti¹
¹Università di Bologna, Italy; ²Huawei Technologies, Germany
- (NA)   **Reinforcement Learning for Cognitive Integrated Communication and Sensing Systems**
Aya Mostafa Ahmed¹, Leila Gharsalli², Stefano Fortunati², Aydin Sezgin¹
¹Ruhr-Universität Bochum, Germany; ²IPSA, France
- (NA)   **Impact of Blockage on the Sensing Performance Using Distributed MIMO Architecture**
Adham Sakhnini¹, Mamoun Guenach², André Bourdoux², Sofie Pollin¹
¹KU Leuven, Belgium; ²imec, Belgium
- (NA)   **Radar-Sensing Based on Non-Contiguous OFDM Signals Using Compressed Sensing**
Andreas Bathelt, Ruben Thill, Fraunhofer FHR, Germany
- (NA)   **Radar Waveform Design for Sensing and Communications Coexistence**
Robin Amar¹, Ehsan Raei², Mohammad Alae-Kerahroodi¹, Bhavani Shankar M.R.¹
¹Université du Luxembourg, Luxembourg; ²Amphinicy Technologies, Luxembourg

EuMC/EuRAD05 : AESA & MIMO Antenna Technology

Chair: Stephen Harman, Thales, UK

Co-Chair: Matthias Weiss, Fraunhofer FHR, Germany

16:40–18:20, Wednesday 20th September 2023, Beta6








- (NA)   **A Configurable All Digital Antenna Array with a Feed-Forward Efficiency Enhancement Scheme**
Bulent Sen¹, Filiz Ece Filci²
¹NSPA, Luxembourg; ²Aselsan, Türkiye
- (NA)   **Evaluation of a Novel Commercial Beamforming Integrated Circuit for a Ka-Band AESA Radar Application**
Sören Harms, Gabriel El-Arnauti, Olaf Saalman, Andreas Fröhlich, Fraunhofer FHR, Germany
- (NA)   **Analysis and Simulation of a Coherent FMCW Lidar-Photonic Radar Combined Sensor System for Large Aperture Phased Array MIMO**
Stephan Kruse¹, Marc-Michael Meinecke², Pascal Kneuper¹, Tobias Schwabe¹, Heiko Gustav Kurz², J. Christoph Scheytt¹
¹Universität Paderborn, Germany; ²Volkswagen, Germany
- (NA)   **Analysis of 2D CA-CFAR for DDMA FMCW MIMO Radar**
Minh Q. Nguyen, Reinhard Feger, Thomas Wagner, Andreas Stelzer, Johannes Kepler Universität Linz, Austria
- (NA)   **A Scalable X-Band Overlapped Subarray Beamformer for Linear Phased Array Antennas**
Yasin Özer¹, Selçuk Parker²
¹Aselsan, Türkiye; ²Istanbul Technical University, Türkiye

EuMC/EuRAD06 : Innovative Designs for Radar, Satcom and mm-Wave Antennas

Chair: Frédéric Giancesello, STMicroelectronics, France

Co-Chair: Diego Caratelli, Technische Universiteit Eindhoven, The Netherlands

09:00–10:40, Thursday 21st September 2023, Beta3/4













- (NA)   **Active Phased Arrays for 5G and 6G Mobile Communication at Millimeterwaves (Industrial Keynote)**
Matthias Geissler, IMST, Germany
- 959   **Frequency Scanning X-Band Antenna for 3D Radar Systems**
S. Sekretarov, D. Vavriv, V. Vinogradov, A. Kravtsov, Y. Bulakh, V. Zolotarev, NASU, Ukraine
- 963   **Low-Profile and High-Gain Dual-Linearly Polarized Offset Reflector Antenna at W-Band**
Thi-Kim-Ngan Nguyen, David González-Ovejero, Ronan Sauleau, IETR (UMR 6164), France
- 967   **A Novel Automotive Palmtree Antenna for 5G Inside Scarabeus Ring Antennas for Satellite Reception**
Emanuel Panholzer, Stefan Lindenmeier, Universität der Bundeswehr München, Germany
- 971   **Circular Polarized Compact Dual Antenna Set for L-Band Space Applications**
Azat Meredov, Stefan Lindenmeier, Universität der Bundeswehr München, Germany

EuMC/EuRAD07 : EuMC/EuRAD Poster

Chair: Marlene Harter, Hochschule Offenburg, Germany









Co-Chair: Amelie Hagelauer, Fraunhofer EMFT, Germany

10:40-13:00, Thursday 21st September 2023, Exhibition

- 975   **IEEE 802.15.4z UWB Angle of Departure Tag Design for Indoor Positioning**
Sumin Han¹, Howon Yoo¹, Hosung Choo², Byung-Jun Jang¹
¹Kookmin University, Korea; ²Hongik University, Korea
- (NA)   **A Non-Linear Transmission Line with Secondary Soliton Decimation**
Tyler Kelley, Stephen Pancrazio, Pouya Emani, Nhat Tran, Anh-Vu Pham, University of California at Davis, USA
- (NA)   **Monopulse Angle Measurement with Orbital Angular Momentum Charge Distribution**
Shikang Li, Meng Zhang, Xianzhe Xu, Rentuo Tao, Yawei Chen, NRIET, China
- (NA)   **Portable Low-Cost Millimeter-Wave Radar Node for Short-Range Applications**
Ignacio Sardinero-Meirás¹, Elías Antolinos¹, Ignacio E. López-Delgado¹, Marcos Gómez-Bracamonte¹, Jaime Fernández-Martínez¹, Lorena Perez-Eijo², Marcos Arias², Borja Gonzalez-Valdes², Jesús Grajal¹
¹Universidad Politécnica de Madrid, Spain; ²Universidade de Vigo, Spain
- (NA)   **Time-Frequency Synchronization for CaCS-Based Radar Systems in Interference Scenarios**
Mohamad Basim Alabd, Joel Dittmer, Benjamin Nuss, Yueheng Li, Lucas Giroto de Oliveira, Axel Diewald, Thomas Zwick, KIT, Germany
- (NA)   **Design and Evaluation of a Joint Communication and Sensing System Using FMCW-Radar and FSK in V-Band**
Samira Faghih-Naini, Sebastian Peters, Thomas Kurin, Torsten Reissland, Robert Weigel, FAU Erlangen-Nürnberg, Germany

EuMC/EuRAD07 continues next page...

EuMC/EuRAD07 continued...











- (NA)   **Modeling, Analysis and Optimization of Low-Altitude Air Traffic Control in Joint Radar and Communication Networks**
Xianzhe Xu, Shikang Li, Rentuo Tao, Yawei Chen, Linghao Xia, Yuhao Yang, NRIET, China
- (NA)   **An Initialization Method for Ultra-Precise Holographic Wireless Local Positioning**
Stefan Brückner, Erik Sippel, Patrick Gröschel, Markus Hehn, Martin Vossiek, FAU Erlangen-Nürnberg, Germany
- (NA)   **Experimental Investigation of Millimeter-Wave 3D Image Projection Using Dielectric Lens for Security Application**
Arie Setiawan¹, Naruto Yonemoto², Hitoshi Nohmi³, Hiroshi Murata¹
¹Mie University, Japan; ²MPAT, Japan; ³Alouette Technology, Japan
- (NA)   **Design of a Contactless Vital-Signal Sensor Based on Six-Port Technology and Experiment of WiFi Interference**
Chun-Yu Fan¹, Adham Karakish², Muh-Dey Wei¹, Renato Negra¹
¹RWTH Aachen University, Germany; ²Fraunhofer FHR, Germany

EuMC/EuRAD08: Microwave Sensing Systems and Components

Chair: Thomas Musch, Ruhr-Universität Bochum, Germany

Co-Chair: Kamran Ghorbani, RMIT University, Australia

14:20–16:00, Thursday 21st September 2023, Alpha6


- (NA)   **Developments in Ray Tracing & the 6th Generation Radar Sensor Model**
Hasan Iqbal, Sreehari Buddappagari, Sandro Reith, Thomas Breitenberger, Continental, Germany
- 1016   **Model-Based Sensor Fusion Approach for FMCW Radar Sensors in Non-Destructive Testing**
Jochen Altholz, Francesca Schenkel, Nils Pohl, Ilona Rolfes, Jan Barowski, Ruhr-Universität Bochum, Germany
- 1020   **Experimental Verification of a Digital Delay Transponder Used as an In-Ice Synthetic Aperture Radar Reference Target**
Michael Stelzig¹, Andreas Benedikter², Ralf Horn², Marc Jäger², Martin Keller², Rolf Scheiber², Niklas Haberberger¹, Lena Krabbe¹, Gerhard Krieger², Martin Vossiek¹
¹FAU Erlangen-Nürnberg, Germany; ²DLR, Germany
- 1024   **A 30kW Peak – 350W CW Mechanically Controlled Low-Loss X-Band Variable-Ratio 2-Way Power Divider Using VESPEL Dielectric Material**
Maurizio R. Cirillo¹, Danio Salimbeni¹, Antonio Morini²
¹Rheinmetall, Italy; ²NotOnlyWaves, Italy
- 1028   **A Picosecond Pulse Transmission and Reception System for Next Generation Wireless Sensing and Imaging Applications**
MuhibUr Rahman, Ke Wu, Polytechnique Montréal, Canada

EuMC/EuRAD09: Advancement in Radar Systems and Concepts

Chair: Mayazzurra Ruggiano, Thales, The Netherlands

Co-Chair: Hasan Sharifi, HRL Laboratories, USA

14:20–16:00, Thursday 21st September 2023, Beta7

- (NA)   **Supporting Space Domain Awareness with the SMART-L MM Radar (Industrial Keynote)**
Erwin P. van der Poel, Thales, The Netherlands
- (NA)   **TanDEM-X Mission Status**
Christo Grigorov, Markus Bachmann, Johannes Böer, Thomas Kraus, Marie Lachaise, Manfred Zink, DLR, Germany
- (NA)   **Dynamic Multi-Target Detection and Focus in Maritime Conditions**
Anum Pirkani, Dillon Kumar, Liam Daniel, Edward Hoare, Mikhail Cherniakov, Marina Gashinova, University of Birmingham, UK
- (NA)   **Robustness of Photonics-Based Coherent Multi-Band MIMO Radar to Fiber-Based Signal Distribution**
A. Malacarne¹, S. Maresca², G. Pandey³, M.M.H. Amir³, A. Bogoni³, M. Scaffardi¹
¹CNIT, Italy; ²CNR-IEIT, Italy; ³Scuola Superiore Sant'Anna, Italy
- (NA)   **Cramer-Rao Lower Bound of Localization of a Moving Target by a Dynamic Multistatic Radar**
Detmer A. Bosma¹, Philipp Markiton²
¹TNO, The Netherlands; ²Fraunhofer FHR, Germany