

# **2020 50th European Microwave Conference (EuMC 2020)**

**Utrecht, Netherlands  
12 – 14 January 2021**

**Pages 1-574**



**IEEE Catalog Number: CFP20455-POD  
ISBN: 978-1-7281-7039-8**

**Copyright © 2020, European Microwave Association (EuMA)  
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:	CFP20455-POD
ISBN (Print-On-Demand):	978-1-7281-7039-8
ISBN (Online):	978-2-87487-059-0

**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](mailto:curran@proceedings.com)  
Web: [www.proceedings.com](http://www.proceedings.com)

CURRAN ASSOCIATES INC.  
**proceedings**  
.com

## EuMW01 : EuMW/EuMC Opening Session

*Chair: Frank E. van Vliet, TNO, The Netherlands*

*Co-Chair: Wim van Cappellen, ASTRON, The Netherlands*

*10:50-12:30, Tuesday 12 January 2021, Beatrix*

---

N/A

**C** **How Connectivity Technologies are Changing Vehicles**  
*Lars Reger, NXP Semiconductors, The Netherlands*

*Session List continues next page...*






## EuMC01 : Power Amplifiers for Sub 6 GHz Application

Chair: Olof Bengtsson, FBH, Germany

Co-Chair: Mark van der Heijden, NXP Semiconductors, The Netherlands

08:30-10:10, Tuesday 12 January 2021, Mission 2

---

- 1  **C Efficiency and Linearity of Digital “Class-C Like” Transmitters**  
*Dieuwert P.N. Mul<sup>1</sup>, Rob J. Bootsman<sup>1</sup>, Quinten Bruinsma<sup>1</sup>, Yiyu Shen<sup>1</sup>, Sebastian Krause<sup>2</sup>, Rüdiger Quay<sup>2</sup>, Marco J. Pelk<sup>1</sup>, Fred van Rijs<sup>3</sup>, Rob M. Heeres<sup>3</sup>, Sergio C. Pires<sup>3</sup>, Morteza Alavi<sup>1</sup>, Leo C.N. de Vreede<sup>1</sup>*  
*<sup>1</sup>Technische Universiteit Delft, The Netherlands; <sup>2</sup>Fraunhofer IAF, Germany; <sup>3</sup>Ampleon, The Netherlands*
- 5  **C A 2.4/3.5GHz Dual-Band Power Amplifier with Filter-Based Bias Network and SRFT Matching**  
*Saraunsh Bayaskar<sup>1</sup>, Paolo Enrico de Falco<sup>2</sup>, Taylor Barton<sup>2</sup>*  
*<sup>1</sup>Qorvo, USA; <sup>2</sup>University of Colorado Boulder, USA*
- 9  **C A Miniaturized 160W Power Amplifier with 40% Efficiency at 9dB Power Back-Off Over 2.3–4.7GHz**  
*Mustazar Iqbal, Rui Hou, Gunnar Johansson, Richard Hellberg, Bo Berglund, Ericsson, Sweden*
- 13  **C 2-GHz Class-E Power Amplifier Using a Compact Redundancy-Free Harmonic Tuning Circuit**  
*Shinichi Tanaka, Hirotaka Asami, Shibaura Institute of Technology, Japan*
- 17  **C A 90W 1–3GHz Power Amplifier Module**  
*Mohammad Ghazizadeh, Sayyed-Hossein Javid-Hosseini, Vahid Nayyeri, IUST, Iran*

Session List continues next page...






## EuMC02: Array Antennas

Chair: Ilona Rolfes, Ruhr-Universität Bochum, Germany

Co-Chair: Antti V. Räsänen, Aalto University, Finland

08:30-10:10, Tuesday 12 January 2021, Spark

---

- 21  **C Endfire Coupled-Mode Patch Antenna Array with Balanced Feeding**  
*Haozhan Tian, Tatsuo Itoh, University of California at Los Angeles, USA*
- 25  **C Gap-Waveguide Cavity Slot Array Based on Two Metal Layers at 120GHz**  
*Teng Li<sup>1</sup>, Florian Boes<sup>2</sup>, Karina Schneider<sup>2</sup>, Thomas Zwick<sup>2</sup>*  
*<sup>1</sup>Southeast University, China; <sup>2</sup>KIT, Germany*
- N/A  **C A Wideband Slot Array Antenna with Cosecant Squared Pattern**  
*Qiang Wang, Panpan Chen, Lin Pan, Fengyun Cui, Lincui Li, CAEP, China*
- 33  **C A C-Band Transmitarray for Spatial Multiplexing and Diversity Applications**  
*P. Turalchuk<sup>1</sup>, I. Munina<sup>1</sup>, V. Kirillov<sup>1</sup>, A. Verevkin<sup>1</sup>, D. Zelenchuk<sup>2</sup>*  
*<sup>1</sup>St. Petersburg Electrotechnical University, Russia; <sup>2</sup>Queen's University Belfast, UK*
- 37  **C A Low-Profile Shared-Aperture Dual-Band Broadband Antenna Array for SAR Applications**  
*Tao Dong, Ke Li, Zhenghuan Xia, Xinhua Li, CAST, China*

*Session List continues next page...*






## EuMC03 : Advanced Packaging Components and Techniques

Chair: Kamal K. Samanta, Sony, UK

Co-Chair: Miguel A., Sánchez-Soriano, University of Alicante, Spain

08:30-10:10, Tuesday 12 January 2021, Flash

---

- 41  **C** **BenzoCycloButene-Based In-Package Substrate Integrated Waveguides for Sub-THz Applications**  
*G. Acri<sup>1</sup>, E. Pistono<sup>1</sup>, F. Podevin<sup>1</sup>, Philippe Ferrari<sup>1</sup>, Luigi Boccia<sup>2</sup>, A.-S. Grimault-Jacquin<sup>3</sup>, N. Zerounian<sup>3</sup>, F. Aniel<sup>3</sup>, Loic Vincent<sup>4</sup>*  
*<sup>1</sup>RFIC-Lab (EA 7520), France; <sup>2</sup>Università della Calabria, Italy; <sup>3</sup>C2N (UMR 9001), France; <sup>4</sup>CIME Nanotech, France*
- 45  **C** **Large Scale Array Antenna Packaging for 5G mm-Wave Base Station**  
*Dohyuk Ha, Kwanghyun Baek, Juneseok Lee, Sanghoon Park, Jung-Ho Park, Jinsu Heo, YoungJu Lee, Samsung, Korea*
- 49  **C** **Integrated Microfluidic Cooling for S-Band 10-Watt CW Power Amplifiers on Hybrid PCBs**  
*Huaiqiang Yu, CETC 26, China*
- 53  **C** **A U-Band Rectangular Waveguide-to-Coplanar Waveguide Transition Using Metal Ridge**  
*Yunfeng Dong, Vitaliy Zhurbenko, T.K. Johansen, Technical University of Denmark, Denmark*
- 57  **C** **Via-Less Waveguide-to-Stripline Transition Using 2D Electromagnetic Bandgap Structure**  
*Zhi Li<sup>1</sup>, Kevin Xu<sup>1</sup>, Nathan Chordas-Ewell<sup>1</sup>, Dongyin Ren<sup>2</sup>, Jun H. Choi<sup>1</sup>, Ryan Wu<sup>2</sup>*  
*<sup>1</sup>SUNY Buffalo, USA; <sup>2</sup>NXP Semiconductors, USA*

Session List continues next page...






## EuMC04: Theoretical and Computational Electromagnetics

Chair: Francisco Mesa, Universidad de Sevilla, Spain

Co-Chair: Alessandro Galli, Università di Roma "La Sapienza", Italy

08:30-10:10, Tuesday 12 January 2021, Glow

---

- 61  **C** **Designing Microwave Circuits Using Genetic Algorithms Accelerated by Convolutional Neural Networks**  
*Takuma Akada, Kazuhiro Fujimori, Okayama University, Japan*
- N/A  **C** **A DE/WD/VM Hybrid Algorithm for Multiple-Constraint Synthesis of Concentric Ring Arrays**  
*Shaoyi Xie, Jiawei Li, Hao Shao, Letian Guo, Guangjian Deng, NINT, China*
- N/A  **C** **An Efficient Butterfly Factorization-Based Method for Electromagnetic Near-Field Calculations**  
*Xiao-Wei Huang, Xin-Qing Sheng, Beijing Institute of Technology, China*
- 73  **C** **A Randomized Low-Rank Decomposition Based Method for Solving Volume-Surface Integral Equation**  
*Yan-Nan Liu, CAEP, China*
- 77  **C** **Microwave Generation of Bessel-Gauss Beams: A Fully Vectorial Electromagnetic Approach**  
*W. Fuscaldo<sup>1</sup>, A. Benedetti<sup>2</sup>, D. Comite<sup>2</sup>, P. Burghignoli<sup>2</sup>, P. Baccarelli<sup>1</sup>, A. Galli<sup>2</sup>*  
*<sup>1</sup>Università di Roma Tre, Italy; <sup>2</sup>Università di Roma "La Sapienza", Italy*

*Session List continues next page...*


## EuMC06: EuMC Interactive Poster Session 1

Chair: Jan Geralt bij de Vaate, ASTRON, The Netherlands

Co-Chair: Mark Oude Alink, University of Twente, The Netherlands

12:30-14:20, Tuesday 12 January 2021, Hall 1



---

- 81  **C Miniature Wilkinson Power Divider Based on Slow-Wave Microstrip Technology**  
*Hamza Issa<sup>1</sup>, Darine Kaddour<sup>2</sup>, Philippe Ferrari<sup>3</sup>*  
*<sup>1</sup>Beirut Arab University, Lebanon; <sup>2</sup>LCIS (EA 3747), France; <sup>3</sup>RFIC-Lab (EA 7520), France*
- 85  **C Extended Smith Chart Concept and Application to Oscillator Analysis**  
*Shigeki Takeda<sup>1</sup>, Tetsuo Anada<sup>2</sup>, Chun-Ping Chen<sup>2</sup>*  
*<sup>1</sup>Antenna Giken, Japan; <sup>2</sup>Kanagawa University, Japan*
- 89  **C High Quality Integrated Inductor in Fan-Out Wafer-Level Packaging Technology for mm-Wave Applications**  
*Kavin Senthil Murugesan<sup>1</sup>, Mykola Chernobryvko<sup>2</sup>, Sherko Zinal<sup>2</sup>, Marco Rossi<sup>2</sup>,  
Ivan Ndip<sup>2</sup>, Mathias Boettcher<sup>2</sup>, Klaus Dieter Lang<sup>1</sup>, Marcel Wieland<sup>3</sup>, Christian Goetze<sup>3</sup>,  
Saquib Bin Halim<sup>3</sup>, Jean Trehwella<sup>3</sup>*  
*<sup>1</sup>Technische Universität Berlin, Germany; <sup>2</sup>Fraunhofer IZM, Germany;  
<sup>3</sup>GLOBALFOUNDRIES, Germany*
- 93  **C Coupled-Resonator Bandpass Power Dividers Based on Connected-Coupling Mechanisms**  
*Shih-Cheng Lin, Yuan-Chun Lin, Sheng-Fuh Chang, National Chung Cheng University, Taiwan*
- 97  **C Compact Wideband Bandpass Filter Using Miniaturized Staircase Interdigital Resonators**  
*Abdulrahman Widaa<sup>1</sup>, Chang Jiang You<sup>2</sup>, Mohammed Awad<sup>2</sup>, Jingye Cai<sup>2</sup>*  
*<sup>1</sup>Christian-Albrechts-Universität zu Kiel, Germany; <sup>2</sup>UESTC, China*

*EuMC06 continues next page...*









*EuMC06 continued...*

- 100  **C** **An X-Band Cross-Coupled SIW Cavity VCO**  
*T. van der Spuy, T. Stander, University of Pretoria, South Africa*
- 104  **C** **Wideband Transversal Acoustic Wave Filters: Application to Connected Cars**  
*Rafael Perea-Robles<sup>1</sup>, Jordi Mateu<sup>1</sup>, Carlos Collado<sup>1</sup>, Robert Aigner<sup>2</sup>*  
*<sup>1</sup>Universitat Politècnica de Catalunya, Spain; <sup>2</sup>Qorvo, USA*
- 108  **C** **A 24–38GHz CMOS Wideband Frequency Quadrupler for Multi-Band Applications**  
*Ping-Hsun Wu, ITRI, Taiwan*
- 112  **C** **Flexible Self-Resonant Detector Coil for Magnetic Resonance Imaging of Carbon-13**  
*Vitaliy Zhurbenko, Juan D. Sánchez-Heredia, Wenjun Wang, Jan H. Ardenkjær-Larsen,*  
*Technical University of Denmark, Denmark*
- 116  **C** **A Novel Compact Microstrip Diplexer with Closely Spaced Channels**  
*Ali Kursad Gorur<sup>1</sup>, Alper Turkeli<sup>1</sup>, Engin Dogan<sup>2</sup>, Ceyhan Karpuz<sup>3</sup>, Adnan Gorur<sup>2</sup>*  
*<sup>1</sup>Nevşehir University, Turkey; <sup>2</sup>Niğde Ömer Halisdemir University, Turkey; <sup>3</sup>Pamukkale University, Turkey*
- 120  **C** **Alternative Solutions for Reducing the Undesired Coupling Effect in Stub Loaded Microstrip Filters for Ka-Band Applications**  
*Celia Gómez Molina<sup>1</sup>, Juan Hinojosa<sup>1</sup>, Fernando Quesada Pereira<sup>1</sup>, Vicente E. Boria<sup>2</sup>,*  
*Marco Guglielmi<sup>2</sup>, Alejandro Álvarez Melcón<sup>1</sup>, Guisepppe Macchiarella<sup>3</sup>*  
*<sup>1</sup>Universidad Politécnica de Cartagena, Spain; <sup>2</sup>Universidad Politécnica de Valencia, Spain; <sup>3</sup>Politecnico di Milano, Italy*
- 124  **C** **Compact Dual-Band Bandpass Filter Using Single Perturbed Rectangular Patch Resonator with Stubs**  
*Jiawei Liu, Yonghong Zhang, Xiang Wan, UESTC, China*

*EuMC06 continues next page...*

*EuMC06 continued...*

- 128  **C** **Open-/Short- Circuited Coupled-Line Structures for the Design of High-Selectivity Bandpass Filter**  
*Photos Vryonides<sup>1</sup>, Salman Arain<sup>1</sup>, Abdul Quddious<sup>2</sup>, Symeon Nikolaou<sup>1</sup>*  
*<sup>1</sup>Frederick University, Cyprus; <sup>2</sup>University of Cyprus, Cyprus*
- 132  **C** **Phase De-Embedding of Microwave Filter with Use of Cauchy Method and Extraction of Polynomial Greatest Common Divisor**  
*Jedrzej Michalczyk, Jerzy Julian Michalski, SpaceForest, Poland*
- 136  **C** **A New Method to Design Ceramic Filters with Finite Transmission Zeros**  
*Huairan Yi, Zhengxiang Ma, Futurewei Technologies, USA*
- 140  **C** **A 28GHz >30dBm Output P1dB SPDT Switch with Integrated ESD Protection in CMOS 65nm**  
*Sunghyun Jang, Sunwoo Kong, Hui-Dong Lee, Jeehoon Park, Kwang-Seon Kim, Bonghyuk Park, ETRI, Korea*
- 144  **C** **Design of a Low Noise Amplifier MMIC from 71–76GHz Using GaAs mHEMT Technology**  
*Pratik D. Deshpande<sup>1</sup>, Kai Parow-Souchon<sup>2</sup>, Jim Mayock<sup>1</sup>, Qing Sun<sup>1</sup>, Ben Rackauskas<sup>2</sup>, Richard Reeves<sup>2</sup>, Petar Jankovic<sup>3</sup>, Václav Valenta<sup>3</sup>*  
*<sup>1</sup>Viper RF, UK; <sup>2</sup>RAL Space, UK; <sup>3</sup>ESA-ESTEC, The Netherlands*
- 148  **C** **Multi-Band, Multi-Technology Remote Unit (RU) Based on RFSoc**  
*S.S. Pereira, L. Almeida, A.S.R. Oliveira, Nuno Borges Carvalho, P.P. Monteiro, Universidade de Aveiro, Portugal*





## EuMC07: Wireless Communication Systems

Chair: Ilona Rolfes, Ruhr-Universität Bochum

Co-Chair: Alexander Koelpin, Brandenburgische Technische Universität, Germany



13:50-15:30, Tuesday 12 January 2021, Mission 1

---

- N/A  **C** **Millimeter-Wave and Sub-TeraHz Technology and Research Trends for High Data Rate Communications — An Industry View**  
*Renato Lombardi, Huawei Technologies, Italy*
- 153  **C** **5G mm-Wave Over-The-Air Measurements of an Agile Multi-Beam Front-End**  
*Steffen Spira, Kurt Blau, Reiner Thomä, Matthias A. Hein, Technische Universität Ilmenau, Germany*
- 157  **C** **D-Band Transmission Hub for Point to MultiPoint Wireless Distribution**  
*Maruf Hossain<sup>1</sup>, Viktor Krozer<sup>2</sup>, Trung Le<sup>3</sup>, Rupa Basu<sup>4</sup>, Rosa Letizia<sup>4</sup>, Ernesto Limiti<sup>5</sup>, François Magne<sup>6</sup>, Marc Marilier<sup>7</sup>, Antonio Ramirez<sup>8</sup>, Jeevan M. Rao<sup>4</sup>, Giacomo Ulisse<sup>2</sup>, Borja Vidal<sup>9</sup>, Hady Yacoub<sup>1</sup>, Claudio Paoloni<sup>4</sup>*  
*<sup>1</sup>FBH, Germany; <sup>2</sup>Goethe-Universität Frankfurt, Germany; <sup>3</sup>HF Systems Engineering, Germany; <sup>4</sup>Lancaster University, UK; <sup>5</sup>Università di Roma “Tor Vergata”, Italy; <sup>6</sup>WHEN-AB, France; <sup>7</sup>OMMIC, France; <sup>8</sup>Fibernova Systems, Spain; <sup>9</sup>Universidad Politécnica de Valencia, Spain*
- 161  **C** **Miniaturized Slot-Loaded SIW Resonator and its Application to C-Band Low Phase Noise Oscillator**  
*Samundra K. Thapa, Baichuan Chen, Adel Barakat, Kuniaki Yoshitomi, Ramesh K. Pokharel, Kyushu University, Japan*

*EuMC07 continues next page...*

*EuMC07 continued...*

- 165   **A 61-GHz RFID Frontend with SiGe Transceiver MMIC and SIW Coupling Network**  
*Dominic A. Funke<sup>1</sup>, Steffen Hansen<sup>2</sup>, Christian Bredendiek<sup>2</sup>, Thorben Greuter<sup>3</sup>,  
Gerd vom Bögel<sup>3</sup>, Armen Harutyunyan<sup>4</sup>, Raik Fiedler<sup>4</sup>, Andreas Heinig<sup>4</sup>, Nils Pohl<sup>1</sup>*  
*<sup>1</sup>Ruhr-Universität Bochum, Germany; <sup>2</sup>Fraunhofer FHR, Germany; <sup>3</sup>Fraunhofer IMS,  
Germany; <sup>4</sup>Fraunhofer IPMS, Germany*

## EuMC08 : Power Amplifiers Based on III-V & CMOS Technologies for 5G Applications

Chair: Paul Tasker, Cardiff Univeristy, UK

Co-Chair: Ana Peláez, Televes, Spain

13:50–15:30, Tuesday 12 January 2021, Mission 2

---

- N/A  **C** **4.5GHz mMIMO PA for 5G with Flip-Chip Integration**  
*Sergio C. Pires, Anh Nghiem, Ampleon, The Netherlands*
- 170  **C** **A 28GHz Power Amplifier Combing Linearizer, Adaptive Bias and  $G_m$  Compensation to Improve Back-Off and  $P_{1dB}$  Efficiency**  
*Yu-Teng Chang, Li-Cheng Hung, Hsin-Chia Lu, National Taiwan University, Taiwan*
- 174  **C** **A 28GHz and 38GHz High-Gain Dual-Band Power Amplifier for 5G Wireless Systems in 22nm FD-SOI CMOS**  
*Xin Xu<sup>1</sup>, Songhui Li<sup>1</sup>, Laszlo Szilagyi<sup>1</sup>, Christian Matthus<sup>1</sup>, Wolfgang Finger<sup>2</sup>, Corrado Carta<sup>1</sup>, Frank Ellinger<sup>1</sup>*  
*<sup>1</sup>Technische Universität Dresden, Germany; <sup>2</sup>GLOBALFOUNDRIES, Germany*
- 178  **C** **A 38-GHz High Linearity and High Efficiency Power Amplifier for 5G Applications in 65-nm CMOS**  
*Xin-Yi Li, Yu-Chun Chen, Yunshan Wang, Tian-Wei Huang, Huei Wang, National Taiwan University, Taiwan*
- 182  **C** **95GHz 13dBm IQ-Combined PA in 65nm CMOS**  
*Tal Elazar, Eran Socher, Tel Aviv University, Israel*






## EuMC09: Terahertz Electronic Devices

Chair: Jan Stake, Chalmers University of Technology, Sweden

Co-Chair: Jeffrey Hesler, Virginia Diodes, USA

13:50-15:30, Tuesday 12 January 2021, Quest

---

- N/A  **C** **Generation and Detection of Wideband Modulated Signals for Millimeter Wave Applications**  
*Jeffrey Hesler, Steven Durant, Theodore Reck, Eric Bryerton, Dan Koller, Gerhard Schoenthal, Virginia Diodes, USA*
- 187  **C** **InGaAs HEMT MMIC Technology on Silicon Substrate with Backside Field-Plate**  
*A. Leuther, L. John, R. Iannucci, T. Christoph, R. Aidam, T. Merkle, A. Tessmann, Fraunhofer IAF, Germany*
- 191  **C** **140-190GHz Broadband Amplifier in 300-nm InP/GaAsSb DHBT Technology**  
*Wei Quan, Sara Hamzeloui, Akshay M. Arabhavi, Ralf Flückiger, Olivier Ostinelli, C.R. Bolognesi, ETH Zürich, Switzerland*
- 195  **C** **Short-Range Wireless Transmitter Using Mesoscopic Dielectric Cuboid Antenna in 300-GHz Band**  
*Kazuki Yamada<sup>1</sup>, Yuto Samura<sup>1</sup>, Oleg Vladilenovich Minin<sup>2</sup>, Atsushi Kanno<sup>3</sup>, Norihiko Sekine<sup>3</sup>, Junichi Nakajima<sup>4</sup>, Igor Vladilenovich Minin<sup>2</sup>, Shintaro Hisatake<sup>1</sup>*  
*<sup>1</sup>Gifu University, Japan; <sup>2</sup>TSU, Russia; <sup>3</sup>NICT, Japan; <sup>4</sup>SoftBank, Japan*
- 199  **C** **A 119GHz Bandwidth Distributed Amplifier with a  $\pm 2$ ps Group Delay Variation**  
*B. van de Ven<sup>1</sup>, T. Shivan<sup>2</sup>, X. Liu<sup>1</sup>, Maruf Hossain<sup>2</sup>, Viktor Krozer<sup>2</sup>, Marion K. Matters-Kammerer<sup>1</sup>*  
*<sup>1</sup>Technische Universiteit Eindhoven, The Netherlands; <sup>2</sup>FBH, Germany*






## EuMC10: MIMO and 5G Antennas

Chair: Bart Smolders, Technische Universiteit Eindhoven, The Netherlands

Co-Chair: Thomas Zwick, KIT, Germany

13:50-15:30, Tuesday 12 January 2021, Expedition

---

- N/A  **C** **Advances in Integrated Transceivers and Antennas for 5G Mobile Communications**  
*F. Pivit<sup>1</sup>, W. Templ<sup>2</sup>*  
*<sup>1</sup>Nokia Bell Labs, Ireland; <sup>2</sup>Nokia Bell Labs, Germany*
- 204  **C** **MIMO Antenna Design with Reconfigurable Radiation Pattern and High Port Isolation**  
*Yi-Feng Cheng, Kwok-Keung M. Cheng, CUHK, China*
- 208  **C** **An Outphasing MIMO Architecture Prototype**  
*Bernhard Gäde, Stefan Erhardt, Georg Fischer, Ralf R. Müller, FAU Erlangen-Nürnberg, Germany*
- 212  **C** **Broadband Fan-Out Phased Antenna Array at 28GHz for 5G Applications**  
*Imran Aziz<sup>1</sup>, Dapeng Wu<sup>2</sup>, Erik Öjefors<sup>2</sup>, Johanna Hanning<sup>2</sup>, Erik Wiklund<sup>2</sup>, Dragos Dancila<sup>1</sup>*  
*<sup>1</sup>Uppsala University, Sweden; <sup>2</sup>Sivers IMA, Sweden*
- 216  **C** **A Novel Automotive Ultra-Wideband 5G-MIMO-Antenna Array Printed on a Foil**  
*Z. Toprak, S. Senega, S. Lindenmeier, Universität der Bundeswehr München, Germany*






## EuMC11: Waveguide and Horn Antennas

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

Co-Chair: Józef Modelski, Warsaw University of Technology, Poland

13:50-15:30, Tuesday 12 January 2021, Spark

---

- 220  **C** **Elliptical Dual-Polarized High Gain Horn Antenna for Cell Partitioning in Millimeter-Wave Mobile Communications**  
*Thomas A.H. Bressner<sup>1</sup>, Martin N. Johansson<sup>2</sup>, A.B. Smolders<sup>1</sup>, Ulf Johannsen<sup>1</sup>*  
<sup>1</sup>Technische Universiteit Eindhoven, The Netherlands; <sup>2</sup>Ericsson, Sweden
- 224  **C** **A Compact 30–50GHz Platelet Corrugated Feedhorn for Cryogenic Radio Astronomical Application**  
*C.-C. Chiong, C. Chen, C.-T. Ho, S.-T. Jian, Y.-J. Hwang, Academia Sinica, Taiwan*
- 228  **C** **A Cost-Effective W-Band Slotted Waveguide Antenna**  
*Stanislav Sekretarov, Artur Kondrykov, Dmytro Vavriv, NASU, Ukraine*
- 232  **C** **A Compact Substrate Integrated Self-Diplexing Antenna for WiFi and ISM Band Applications**  
*Sounik Kiran Kumar Dash<sup>1</sup>, Qingsha S. Cheng<sup>1</sup>, Rusan Kumar Barik<sup>1</sup>, Nrusingha Charan Pradhan<sup>2</sup>, Karthikeyan Sholampettai Subramanian<sup>2</sup>*  
<sup>1</sup>SUSTech, China; <sup>2</sup>NIT Tiruchirappalli, India
- 236  **C** **Substrate Integrated Waveguide Leaky-Wave Antennas with Tailored Characteristics for Millimeter-Wave Applications**  
*Dongze Zheng, Ke Wu, Polytechnique Montréal, Canada*








## EuMC12: Advanced Packaging Solutions for mmWave applications

Chair: Mehmet Kaynak, IHP, Germany

Co-Chair: Mikko Varonen, VTT Technical Research Centre of Finland, Finland

13:50-15:30, Tuesday 12 January 2021, Flash

---

- 240  **C** **Advanced Multilayer Components and Front-End Module for Millimetre-Wave and 5G Applications**  
*Kamal K. Samanta, AMWT, UK*
- 244  **C** **BiCMOS Through-Silicon Via (TSV) Signal Transition at 240/300GHz for MM-Wave & Sub-THz Packaging and Heterogeneous Integration**  
*Matthias Wietstruck, Steffen Marschmeyer, Christian Wipf, Matteo Stocchi, Mehmet Kaynak, IHP, Germany*
- 248  **C** **Common-Strip Coupler Mode-Matched Interface for mmW and THz Chip-to-Chip Waveguides**  
*Ahmed A. Sakr<sup>1</sup>, Walid M.G. Dyab<sup>2</sup>, Ke Wu<sup>3</sup>*  
*<sup>1</sup>Cairo University, Egypt; <sup>2</sup>Prince Sultan University, Saudi Arabia; <sup>3</sup>Polytechnique Montréal, Canada*
- 252  **C** **DC-to-Ka-Band Broadband Chip-to-Chip Interconnect Using Aerosol Jet Printing**  
*Jubaid Abdul Qayyum<sup>1</sup>, Cameron Crump<sup>1</sup>, John Albrecht<sup>1</sup>, Ahmet Cagri Ulusoy<sup>2</sup>, John Papapolymerou<sup>1</sup>*  
*<sup>1</sup>Michigan State University, USA; <sup>2</sup>KIT, Germany*
- 256  **C** **A CMOS-Compatible Solution for Propagation Channels on Silicon in the mm-Wave Band**  
*Ihsan El Masri, Thierry Le Gougec, Pierre-Marie Martin, Rozenn Allanic, Cédric Quendo, Lab-STICC (UMR 6285), France*

## EuMC13 : Numerical Methods in Microwave Technology

Chair: Ke Wu, Polytechnique Montréal, Canada

Co-Chair: Noushin Karimian, The University of Manchester, UK

13:50-15:30, Tuesday 12 January 2021, Glow

---

- N/A  **Volume Basis Functions in Method of Moments**  
*James C. Rautio, Matthew Thelen, Sonnet Software, USA*
- 260   **Power Delivery Network Impedance Profile and Voltage Droop Optimization**  
*Aurea E. Moreno-Mojica<sup>1</sup>, José E. Rayas-Sánchez<sup>1</sup>, Felipe J. Leal-Romo<sup>2</sup>*  
*<sup>1</sup>ITESO, Mexico; <sup>2</sup>Intel, Mexico*
- 264   **Technique for Eliminating Resonant Artifacts in Low Loss Material Measurement**  
*MuhibUr Rahman, Ke Wu, Polytechnique Montréal, Canada*
- N/A   **Spectral Analysis of a Fabry-Perot Open Resonator with a Plane-Wave Expansion Method**  
*Bartlomiej Salski, Tomasz Karpisz, Pawel Kopyt, Jerzy Krupka, Warsaw University of Technology, Poland*
- N/A   **A Fast Sensitivity Analysis Method for Lumped Impedance Elements in Antenna Design**  
*Bi-Yi Wu, Xin-Qing Sheng, Beijing Institute of Technology, China*






## EuMC14: Microwave and mmWave Systems

Chair: Kamran Ghorbani, RMIT University, Australia

Co-Chair: Jan Vrba, Czech Technical University in Prague, Czech Republic

16:10-17:50, Tuesday 12 January 2021, Mission 1

---

- 276  **C** **Output Signal Characteristics of Optical Fiber Feed Direct Digital RF Transmitter Using SFP+ Module**  
*Ryo Tamura, Mizuki Motoyoshi, Suguru Kameda, Noriharu Suematsu, Tohoku University, Japan*
- 280  **C** **Multi-Source Intermodulation in a Loaded-Line Phase Shifter**  
*Martin Mattsson, Dan Kuylenstierna, Chalmers University of Technology, Sweden*
- 284  **C** **Compact Microwave Based Water-Cut Sensor Suitable for Downhole Installation**  
*Muhammad Akram Karimi<sup>1</sup>, Muhammad Arsalan<sup>2</sup>, Atif Shamim<sup>1</sup>*  
*<sup>1</sup>KAUST, Saudi Arabia; <sup>2</sup>Saudi Aramco, Saudi Arabia*
- 288  **C** **Millimeter-Wave Outphasing Using Analog-Radio Over Fiber for 5G Physical Layer Infrastructure**  
*R.X.F. Budé, M.M.A. Versluis, G.I. Nazarikov, Simon Rommel, B.G.M. van Ark, Ulf Johannsen, Idelfonso Tafur Monroy, A.B. Smolders, Technische Universiteit Eindhoven, The Netherlands*
- 292  **C** **In-Vehicle Breathing Rate Monitoring Based on WiFi Signals**  
*Manzar Hussain<sup>1</sup>, Alper Akbilek<sup>1</sup>, Florian Pfeiffer<sup>1</sup>, Bernd Napholz<sup>2</sup>*  
*<sup>1</sup>perisens, Germany; <sup>2</sup>Mercedes-Benz, Germany*






## EuMC15 : Doherty and Load Modulated Power Amplifier Structures

Chair: Vittorio Camarchia, Politecnico di Torino, Italy

Co-Chair: Didier Belot, CEA-LETI, France

16:10-17:50, Tuesday 12 January 2021, Mission 2

---

- 296  **C** **A 1000W Wideband Recursive Four-Way Doherty Amplifier for Base-Station Application**  
*Xiaolong Yue, Bo Zhang, Xin Liu, Yongqiang Zhou, Lei Zhang, Ericsson, China*
- 300  **C** **High Power 400W Symmetric Doherty with Extended Back-Off Efficiency Range for 5G Cellular Infrastructure Applications**  
*Srinidhi Embar R., Roy McLaren, Mir Masood, NXP Semiconductors, USA*
- 304  **C** **Load Modulated Balanced Amplifier Designed for AM-PM Linearity**  
*Kimon Vivien<sup>1</sup>, Paolo Enrico de Falco<sup>2</sup>, Genevieve Baudoin<sup>1</sup>, Olivier Venard<sup>1</sup>, Pascal P.C. Felix<sup>3</sup>, Taylor Barton<sup>2</sup>*  
*<sup>1</sup>ESYCOM (UMR 9007), France; <sup>2</sup>University of Colorado Boulder, USA; <sup>3</sup>SOMOS Semiconductor, France*
- 308  **C** **High-Efficiency Asymmetric Doherty Power Amplifier with Spurious Suppression Circuit**  
*Yuki Takagi<sup>1</sup>, Naoki Hasegawa<sup>1</sup>, Yoshichika Ohta<sup>1</sup>, Ryo Ishikawa<sup>2</sup>, Kazuhiko Honjo<sup>2</sup>*  
*<sup>1</sup>SoftBank, Japan; <sup>2</sup>University of Electro-Communications, Japan*
- 312  **C** **500W Three-Way GaN Doherty Power Amplifier for Sub-6GHz 5G New Radio Base Transceiver Systems**  
*Hyunuk Kang<sup>1</sup>, Woojin Choi<sup>1</sup>, Inan Kim<sup>2</sup>, Dongoo Lee<sup>2</sup>, Youngoo Yang<sup>1</sup>*  
*<sup>1</sup>Sungkyunkwan University, Korea; <sup>2</sup>Wave Electronics, Korea*






## EuMC16: Terahertz Photonic Devices and System

Chair: Marion K. Matters-Kammerer, Technische Universiteit Eindhoven, The Netherlands

Co-Chair: Idelfonso Tafur Monroy, Technische Universiteit Eindhoven, The Netherlands

16:10-17:50, Tuesday 12 January 2021, Quest

---

- 316  **C** **Photonics-Enabled Millimetre-Wave Phased-Array Antenna with True Time Delay Beam-Steering**  
*Muhsin Ali<sup>1</sup>, Robinson Cruzoe-Guzmán<sup>1</sup>, Luis Enrique Garcia-Muñoz<sup>1</sup>, Frédéric van Dijk<sup>2</sup>, Guillermo Carpintero<sup>1</sup>*  
<sup>1</sup>Universidad Carlos III de Madrid, Spain; <sup>2</sup>III-V Lab, France
- 320  **C** **Investigation of De-Embedding Techniques Applied on Uni-Travelling Carrier Photodiodes**  
*Dimitrios Konstantinou<sup>1</sup>, Christophe Caillaud<sup>2</sup>, Simon Rommel<sup>1</sup>, Ulf Johannsen<sup>1</sup>, Idelfonso Tafur Monroy<sup>1</sup>*  
<sup>1</sup>Technische Universiteit Eindhoven, The Netherlands; <sup>2</sup>III-V Lab, France
- 324  **C** **All-Digital Outphasing Modulator for Radio-over-Fiber System**  
*Yuma Kase, Shinichi Hori, Naoki Oshima, Kazuaki Kunihiro, NEC, Japan*
- 328  **C** **A Low Power CMOS Driver Integrated with Mach-Zehnder Modulator for PAM4 Optical Transmissions**  
*Tai-Hsing Lee<sup>1</sup>, Jie Zhang<sup>1</sup>, Shang Hong<sup>2</sup>, Chi-Hsiang Hsu<sup>1</sup>, Sih-Han Li<sup>1</sup>, Shang-Chun Chen<sup>1</sup>, Sheu Shyh-Shyuan<sup>1</sup>, Chih-I Wu<sup>1</sup>, Shawn S.H. Hsu<sup>2</sup>*  
<sup>1</sup>ITRI, Taiwan; <sup>2</sup>National Tsing Hua University, Taiwan
- 332  **C** **Performance of Phase Modulated RoF for 5G Fronthaul Uplink**  
*Emine Moutaly<sup>1</sup>, Salim Faci<sup>2</sup>, Catherine Algani<sup>2</sup>, Anne-laure Billabert<sup>2</sup>, Philippos Assimakopoulos<sup>3</sup>, Nathan J. Gomes<sup>3</sup>*  
<sup>1</sup>Ecole Supérieure Polytechnique, Mauritania; <sup>2</sup>ESYCOM (UMR 9007), France; <sup>3</sup>University of Kent, UK






## EuMC17: Phased and Transmit Arrays

Chair: Ioan Lager, Technische Universiteit Delft, The Netherlands

Co-Chair: Thomas Emanuelsson, Gapwaves, Sweden

16:10-17:50, Tuesday 12 January 2021, Expedition

---

- 336  **C** **Modular and Scalable Millimeter-Wave Patch Array Antenna for 5G MIMO and Beamforming**  
*Lingyun Ren, Bohao Lu, Fang Lu, Yonghui Shu, Eravant, USA*
- N/A  **C** **Dual-Band Dual-Linearly Polarized Transmitarray at Ka-Band**  
*Reda Madi<sup>1</sup>, Antonio Clemente<sup>1</sup>, Ronan Sauleau<sup>2</sup>*  
*<sup>1</sup>CEA-Leti, France; <sup>2</sup>IETR (UMR 6164), France*
- 344  **C** **Origami-Inspired Shape-Changing Phased Array**  
*D. Elliott Williams, Charles Dorn, Sergio Pellegrino, Ali Hajimiri, Caltech, USA*
- 348  **C** **Amplitude Varying Phased Array Linearization**  
*Sara Hesami<sup>1</sup>, Sina Rezaei Aghdam<sup>1</sup>, John Dooley<sup>2</sup>, Thomas Eriksson<sup>1</sup>, C. Fager<sup>1</sup>*  
*<sup>1</sup>Chalmers University of Technology, Sweden; <sup>2</sup>Maynooth University, Ireland*
- 352  **C** **Sidelobe Level Suppression and Scan-Loss Compensation in a Wide-Angular Scanning Linear Array Using Subarrays Amplitude Control**  
*Fannush S. Akbar<sup>1</sup>, Leo P. Lighthart<sup>2</sup>, Gamantyo Hendranto<sup>1</sup>, Ioan E. Lager<sup>2</sup>*  
*<sup>1</sup>Institut Teknologi Sepuluh Nopember, Indonesia; <sup>2</sup>Technische Universiteit Delft, The Netherlands*






## EuMC18: 5G Antenna Systems

Chair: Dirk Heberling, RWTH Aachen University, Germany

Co-Chair: Józef Modelski, Warsaw University of Technology, Poland

16:10-17:50, Tuesday 12 January 2021, Spark

---

- 356  **C** **Dual-Polarized Integrated Lens Antenna for Outdoor 60GHz Point-to-Point Systems**  
*Andrey Mozharovskiy, Alexey Artemenko, Sergey Tikhonov, Sergey Churkin, Roman Maslennikov, Radio Gigabit, Russia*
- 360  **C** **28-GHz Wideband Dual-Polarized Parasitic-Patch Antenna Array on Tile-Scale Package**  
*M.W. Rousstia<sup>1</sup>, A. Shamsafar<sup>1</sup>, J. Zhao<sup>1</sup>, Sergio C. Pires<sup>1</sup>, J. Teixeira<sup>1</sup>, G. Scalise<sup>2</sup>, Luigi Boccia<sup>2</sup>*  
*<sup>1</sup>Ampleon, The Netherlands; <sup>2</sup>Università della Calabria, Italy*
- 364  **C** **Phased Array Antenna with Beamforming Network for 5G mmWave Communication System**  
*Anil Kumar Pandey, Keysight Technologies, India*
- N/A  **C** **Millimeter-Wave Dual-Polarized Filtering Patch Antenna Array for 5G Applications**  
*Yingqi Zhang, Wanchen Yang, Wenquan Che, Quan Xue, Shaowei Liao, Wenhai Zhang, SCUT, China*
- 372  **C** **Development of Flexible & Quasi-Optically Transparent CPW Antennas for 5G by Meshing Construction**  
*Maxime Wawrzyniak<sup>1</sup>, Julien Bras<sup>2</sup>, Aurore Denneulin<sup>2</sup>, Tân-Phu Vuong<sup>1</sup>*  
*<sup>1</sup>IMEP-LAHC (UMR 5130), France; <sup>2</sup>LGP2 (UMR 5518), France*






## EuMC19: 3D-Printing Technologies

Chair: John Papapolymerou, Michigan State University, USA

Co-Chair: Mehmet Kaynak, IHP, Germany

16:10-17:50, Tuesday 12 January 2021, Flash

---

- 376  **C** **3D-Printed 3dB Hybrid Coupler for D-Band Applications**  
*K. Lomakin, Laura Klein, Mark Sippel, Klaus Helmreich, Gerald Gold, FAU  
Erlangen-Nürnberg, Germany*
- 380  **C** **Optimization of the Conductivity of Microwave Components Printed by Inkjet on Polymeric Substrates by Photonic Sintering**  
*Chaimaa El Hajjaji<sup>1</sup>, Nicolas Delhote<sup>1</sup>, Serge Verdeyme<sup>1</sup>, Malgorzata Piechowiak<sup>2</sup>,  
Olivier Durand<sup>2</sup>*  
*<sup>1</sup>XLIM (UMR 7252), France; <sup>2</sup>CTTC, France*
- 384  **C** **Additively Manufactured Six-Port for mm-Wave Applications**  
*Laura Klein, K. Lomakin, Mark Sippel, Klaus Helmreich, Gerald Gold, FAU  
Erlangen-Nürnberg, Germany*
- 388  **C** **3D Printed Spherical Cavity Resonator With Fine Tuning Using Nanomagnetic Thin Film**  
*Yuxiao He<sup>1</sup>, Eric Drew<sup>2</sup>, Prem Chahal<sup>1</sup>, John Z. Zhang<sup>2</sup>, John Papapolymerou<sup>1</sup>*  
*<sup>1</sup>Michigan State University, USA; <sup>2</sup>Georgia Tech, USA*
- 392  **C** **A Fully Integrated Conductive and Dielectric Additive Manufacturing Technology for Microwave Circuits and Antennas**  
*Mengze Li<sup>1</sup>, Yang Yang<sup>1</sup>, Yunpeng Zhang<sup>2</sup>, Francesca Iacopi<sup>1</sup>, Shlomit Ram<sup>3</sup>,  
Jaim Nulman<sup>3</sup>*  
*<sup>1</sup>UTS, Australia; <sup>2</sup>UESTC, China; <sup>3</sup>Nano Dimension, Israel*








## EuMC20: Modelling of Field Radiation and Scattering

Chair: Alessandro Galli, Università di Roma "La Sapienza", Italy

Co-Chair: Guy Vandenbosch, KU Leuven, Belgium

16:10-17:50, Tuesday 12 January 2021, Glow

---

- 396  **C Plasmon Resonances of Conformal Graphene Strip Placed on Circular Dielectric Rod: from Microwaves to Infrared Range**  
*Sergii V. Dukhopelnykov, NASU, Ukraine*
- 400  **C Design of Three-Layer Radome for Millimeter-Wave Antenna**  
*Tomoshige Furuhi, Natsumi Minamitani, Shun Sakaida, Kaoru Sudo, Kengo Onaka, Takaya Wada, Hisao Hayafuji, Murata Manufacturing, Japan*
- 404  **C Improved Modeling of Radiation Effects in Coplanar Waveguides with Finite Ground Width**  
*G.N. Phung<sup>1</sup>, U. Arz<sup>2</sup>, K. Kuhlmann<sup>2</sup>, R. Doerner<sup>1</sup>, Wolfgang Heinrich<sup>1</sup>*  
*<sup>1</sup>FBH, Germany; <sup>2</sup>PTB, Germany*
- 408  **C H-Polarized Plane Wave Scattering by Cylindrically Conformal Periodic Finite Array with PEC and Resistive Patches**  
*Alexander Ye. Svezhentsev<sup>1</sup>, Vladimir Volski<sup>2</sup>, Guy A.E. Vandenbosch<sup>2</sup>*  
*<sup>1</sup>NASU, Ukraine; <sup>2</sup>KU Leuven, Belgium*
- 412  **C Scattering of Surface Waves by a Discontinuity in Surface Impedance**  
*Tobias Schaich<sup>1</sup>, Anas Al Rawi<sup>2</sup>, Mike Payne<sup>1</sup>*  
*<sup>1</sup>University of Cambridge, UK; <sup>2</sup>BT Labs, UK*






## EuMC21: Special Antenna Systems

Chair: Alexandros Feresidis, University of Birmingham, UK

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

08:30-10:10, Wednesday 13 January 2021, Mission 2

---

- 416  **C** **Electro-Mechanically Tunable Meta-Surfaces for Beam-Steered Antennas from mm-Wave to THz**  
*Muhammad S. Rabbani, James Churm, Alexandros Feresidis, University of Birmingham, UK*
- 420  **C** **A Tactical Broadband High Power Fork-Shaped Monopole Antenna**  
*Ahmad Emadeddin<sup>1</sup>, S.A. Akbarzadeh-Jahromi<sup>2</sup>, B.L.G. Jonsson<sup>1</sup>*  
*<sup>1</sup>KTH, Sweden; <sup>2</sup>University of Tehran, Iran*
- 424  **C** **Passive Antenna Systems Embedded into a Load Bearing Wall for Improved Radio Transparency**  
*Lauri Vähä-Savo<sup>1</sup>, Alejandra Garrido Atienza<sup>1</sup>, Christian Cziezerski<sup>1</sup>, Mikko Heino<sup>1</sup>, Katsuyuki Haneda<sup>1</sup>, Clemens Icheln<sup>1</sup>, Xiaoshu Lü<sup>2</sup>, Klaus Viljanen<sup>1</sup>*  
*<sup>1</sup>Aalto University, Finland; <sup>2</sup>University of Vaasa, Finland*
- 428  **C** **Compact Dual and Wide Band Monopole-Like Antenna Based on SRR for WLAN Applications**  
*Nilton Santos-Valdivia<sup>1</sup>, Patricia Castillo-Aranibar<sup>1</sup>, Alejandro García Lampérez<sup>2</sup>, Daniel Segovia-Vargas<sup>2</sup>*  
*<sup>1</sup>Universidad Católica San Pablo, Peru; <sup>2</sup>Universidad Carlos III de Madrid, Spain*
- 432  **C** **Compact Pattern-Switching Patch Antenna**  
*Abdullah Haskou, Anthony Pesin, Ali Louzir, InterDigital, France*

## EuMC22 : Novel Circuits Solutions for Energy Transfer in the Near-Field and Far-Field

Chair: Yi Wang, University of Birmingham, UK

08:30–10:10, Wednesday 13 January 2021, Expedition

---

- 436  **C** **Input-Power-Synchronous Adaptively Biased Wide-Dynamic-Range High-Efficiency Rectifier with Zero-Threshold GaAs HEMTs**  
*Jun Yamazaki, Ryo Ishikawa, Kazuhiko Honjo, University of Electro-Communications, Japan*
- 440  **C** **Automatically Switchable Two-Way Rectifier**  
*M. Del Prete<sup>1</sup>, D. Masotti<sup>2</sup>, A. Costanzo<sup>2</sup>*  
*<sup>1</sup>Datalogic, Italy; <sup>2</sup>Università di Bologna, Italy*
- 444  **C** **A High Sensitivity RF Energy Harvester for Diverse Environments**  
*Ibrahim Kagan Aksoyak<sup>1</sup>, Adamantia Chletsou<sup>2</sup>, John Papapolymerou<sup>2</sup>, Ahmet Cagri Ulusoy<sup>1</sup>*  
*<sup>1</sup>KIT, Germany; <sup>2</sup>Michigan State University, USA*
- 448  **C** **Proposal and Demonstration of Power Conversion-Chip/Amplifier Integrated Antenna**  
*Shinji Hara<sup>1</sup>, Asako Suzuki<sup>1</sup>, Hiroshi Hirayama<sup>2</sup>*  
*<sup>1</sup>Nagoya University, Japan; <sup>2</sup>Nagoya Institute of Technology, Japan*





## EuMC23 : [Focussed Session] Innovative Antennas for Cubesats and Small-Space Platforms

Chair: Nelson Fonseca, ESA-ESTEC, The Netherlands

Co-Chair: Mauro Ettorre, IETR, France

08:30-10:10, Wednesday 13 January 2021, Auditorium

---

- 452  **C** **Design of a Dual Circularly Polarized Elliptical Feed Horn for CubeSat Reflectarray Applications**  
*M.M. Bilgic, M. Zhou, P. Meincke, A. Ericsson, E. Jørgensen, M. Lumholt, TICRA, Denmark*
- 456  **C** **Compact Reconfigurable Antenna for Nanosatellites**  
*Simone Genovesi<sup>1</sup>, Francesco Alessio Dicandia<sup>2</sup>*  
*<sup>1</sup>Università di Pisa, Italy; <sup>2</sup>Greenwaves, Italy*
- 460  **C** **3D Printed Ceramic Low-Profile GNSS Antenna for SmallSats**  
*Gautier Mazingue, Maxime Romier, Nicolas Capet, ANYWAVES, France*
- 463  **C** **Compact End-Fire Antenna Designs for PicoSat Integration and Other Small Satellite Missions**  
*Victoria Gómez-Guillamón Buendía<sup>1</sup>, Symon K. Podilchak<sup>2</sup>, Salvatore Liberto<sup>1</sup>,  
Dimitris E. Anagnostou<sup>1</sup>, George Goussetis<sup>1</sup>, Constantin Constantinides<sup>3</sup>,  
Tom Walkinshaw<sup>3</sup>, Maarten van der Vorst<sup>4</sup>*  
*<sup>1</sup>Heriot-Watt University, UK; <sup>2</sup>University of Edinburgh, UK; <sup>3</sup>Alba Orbital, UK; <sup>4</sup>ESA-ESTEC,  
The Netherlands*





## EuMC24: Additive Manufacturing and Emerging Materials for mmWave Applications

Chair: Andrei Muller, EPFL, Switzerland

Co-Chair: Chris Clifton, Sony, UK

08:30-10:10, Wednesday 13 January 2021, Flash

---

- 467  **C** **High Performance Cooling Solution for Highly Integrated RF-PCBs**  
*Jens Leiß<sup>1</sup>, Thomas Ebert<sup>2</sup>, Marta Martínez-Vázquez<sup>1</sup>, Rens Baggen<sup>1</sup>*  
<sup>1</sup>IMST, Germany; <sup>2</sup>IQ evolution, Germany
- 471  **C** **Monolithic SLA-Based Capacitively-Loaded High-Q Coaxial Resonators and Bandpass Filters**  
*Kunchen Zhao, Dimitra Psychogiou, University of Colorado Boulder, USA*
- 475  **C** **3D Printed Double Ridged Waveguide Rotman Lens System**  
*Karina V. Hoel<sup>1</sup>, Nathan Jastram<sup>2</sup>, Stein Kristoffersen<sup>1</sup>, Dejan Filipovic<sup>2</sup>*  
<sup>1</sup>FFI, Norway; <sup>2</sup>University of Colorado Boulder, USA
- 479  **C** **A Minimally Invasive Monitoring Concept for Plasma-Assisted Surface Treatments in PET Bottles**  
*Dennis Pohle, Felix Mitschker, Jonathan Jenderny, Marcel Rudolph, Christian Schulz, Peter Awakowicz, Ilona Rolfes, Ruhr-Universität Bochum, Germany*





## EuMC25: Metamaterials for Circuits and Sensors

Chair: Ferran Martín, Universitat Autònoma de Barcelona, Spain

Co-Chair: Francisco Medina, Universidad de Sevilla, Spain

08:30-10:10, Wednesday 13 January 2021, Beam

---

- 483  **C** **Glide Symmetry to Improve the Bandgap Operation of Periodic Microstrip Defected Ground Structures**  
*Boules A. Mouris<sup>1</sup>, Armando Fernández-Prieto<sup>2</sup>, Ragnar Thobaben<sup>1</sup>, Jesús Martel<sup>2</sup>, Francisco Mesa<sup>2</sup>, Oscar Quevedo-Teruel<sup>1</sup>*  
<sup>1</sup>KTH, Sweden; <sup>2</sup>Universidad de Sevilla, Spain
- 487  **C** **Differential CRLH Coupled-Line Unit Cell with High Common Mode Rejection Ratio**  
*Mariam A. Ateyya, Amr M.E. Safwat, Ain Shams University, Egypt*
- 491  **C** **Capacitively-Loaded Slow-Wave Transmission Lines for Sensitivity Improvement in Phase-Variation Permittivity Sensors**  
*J. Coromina<sup>1</sup>, J. Muñoz-Enano<sup>1</sup>, P. Vélez<sup>1</sup>, A. Ebrahimi<sup>2</sup>, J. Scott<sup>2</sup>, Kamran Ghorbani<sup>2</sup>, F. Martín<sup>1</sup>*  
<sup>1</sup>Universitat Autònoma de Barcelona, Spain; <sup>2</sup>RMIT University, Australia
- 495  **C** **Implementation of K-Band Mushroom Meta-Material Filter for Satellite Applications**  
*Arash Arsanjani, Luke Robins, Reinhard Teschl, Wolfgang Bösch, Technische Universität Graz, Austria*
- 499  **C** **Compact Size Wideband 0-dB Microstrip Forward Coupler**  
*Mohamed A.G. Elsheikh, Amr M.E. Safwat, Ain Shams University, Egypt*

## EuMC27: [Focussed Session] Emerging Microwave Technologies in Asia-Pacific Region

Chair: Kamran Ghorbani, RMIT University, Australia

Co-Chair: Luca Perregrini, Università di Pavia, Italy

10:50–12:30, Wednesday 13 January 2021, Mission 2

---

- 503  **C** **A Polarization-Insensitive Frequency Selective Surface Based Resorber with Narrow-Band Absorption Between Two Transmission Bands**  
*Mehran M. Zargar<sup>1</sup>, Archana Rajput<sup>1</sup>, Kushmanda Saurav<sup>1</sup>, Shiban K. Koul<sup>2</sup>*  
<sup>1</sup>IIT Jammu, India; <sup>2</sup>IIT Delhi, India
- 506  **C** **Efficient Design and Experimental Verification of High-Q MPhC BPF for mm-Wave Applications**  
*Erika Katsuno<sup>1</sup>, Chun-Ping Chen<sup>1</sup>, Tetsuo Anada<sup>1</sup>, Shigeki Takeda<sup>2</sup>, Zhewang Ma<sup>3</sup>*  
<sup>1</sup>Kanagawa University, Japan; <sup>2</sup>Antenna Giken, Japan; <sup>3</sup>Saitama University, Japan
- 510  **C** **Compact SIW Based Wideband Phase Shifter Loaded with Square Complimentary Omega (SCO) Array**  
*Karthik Thothathri Chandrasekaran<sup>1</sup>, Arokiaswami Alphones<sup>1</sup>,  
Muhammad Faeyz Karim<sup>1</sup>, Nasimuddin<sup>2</sup>*  
<sup>1</sup>NTU, Singapore; <sup>2</sup>A\*STAR, Singapore






## EuMC28: Novel Wireless Power Transfer and Energy Harvesting Systems

Chair: Naoki Shinohara, Kyoto University, Japan

Co-Chair: Jiafeng Zhou, University of Liverpool, UK

10:50-12:30, Wednesday 13 January 2021, Expedition

---

- 514  **C** **An Electronically Steerable Millimeter-Wave Reflectarray for Wireless Power Delivery**  
*J. Gabriel Buckmaster, Thomas H. Lee, Stanford University, USA*
- 518  **C** **Evaluation of Simultaneous Wireless Information and Power Transfer with Distributed Antennas**  
*Ibrahim Can Sezgin, Jose-Ramon Perez-Cisneros, C. Fager, Chalmers University of Technology, Sweden*
- 522  **C** **An Ambient-Insensitive Battery-Less Wireless Node for Simultaneous Powering and Communication**  
*G. Paolini, D. Masotti, M. Guermandi, M. Shanawani, L. Benini, A. Costanzo, Università di Bologna, Italy*
- N/A  **C** **A 24GHz Unit Rectenna for Millimeter-Wave Power Transmission Application**  
*Hye-won Jo, Sol Kim, ByungKuon Ahn, Hyunyoung Cho, Jong-Won Yu, KAIST, Korea*
- 530  **C** **Loop Antenna Array System with Simultaneous Operation of OAM Multiplex Communication and Wireless Power Transfer**  
*Wataru Wada, Ryo Ishikawa, Akira Saitou, Hisanosuke Miyake, Haruki Kikuchi, Hiroshi Suzuki, Kazuhiko Honjo, University of Electro-Communications, Japan*








## EuMC29: Reconfigurable Planar Passive Components

Chair: Petronilo Martín-Iglesias, ESA-ESTEC, The Netherlands

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

10:50-12:30, Wednesday 13 January 2021, Flash

---

- 534  **C VO<sub>2</sub>-Based Transmit/Receive Switch**  
*Junwen Jiang, Raafat R. Mansour, University of Waterloo, Canada*
- 538  **C Low-Loss K-Band Photoconductive Switches in SIW Technology**  
*Elena Shepeleva<sup>1</sup>, Mikhail Makurin<sup>1</sup>, Anton Lukyanov<sup>1</sup>, Artem R. Vilenskiy<sup>2</sup>,  
Sergey L. Chernyshev<sup>3</sup>, Marianna V. Ivashina<sup>2</sup>*  
*<sup>1</sup>Samsung, Russia; <sup>2</sup>Chalmers University of Technology, Sweden; <sup>3</sup>Bauman Moscow State  
Technical University, Russia*
- 542  **C Reconfigurable Substrate Integrated Waveguide Circuits Using Dielectric Fluids**  
*Matthew Brown, Carlos E. Saavedra, Queen's University, Canada*
- 546  **C Wideband PCB-to-Connectors Impedance Adapters for Liquid Crystal-Based Low-Loss Phase Shifters**  
*Jinfeng Li, University of Cambridge, UK*
- 550  **C High-Performance Compact Reflection-Type Phase Shifter Operating at 2GHz Using a Transdirectional Coupler**  
*Olivier Occello<sup>1</sup>, Leonel Tiague<sup>1</sup>, Marc Margalef-Rovira<sup>1</sup>, Loic Vincent<sup>2</sup>,  
Fabien Ndagijimana<sup>3</sup>, Philippe Ferrari<sup>1</sup>*  
*<sup>1</sup>RFIC-Lab (EA 7520), France; <sup>2</sup>CIME Nanotech, France; <sup>3</sup>G2Elab (UMR 5269), France*


## EuMC30: Non-Planar Filters

Chair: Richard Snyder, RS Microwave, USA

Co-Chair: Cristiano Tomassoni, Università di Perugia, Italy

10:50-12:30, Wednesday 13 January 2021, Glow

---

- 554  **C Compact On-Board Dielectric Filters and Diplexers for High-Power Satellite Applications**  
*Luca Pelliccia<sup>1</sup>, Fabrizio Cacciamani<sup>1</sup>, Paolo Vallerotonda<sup>1</sup>, Alessandro Cazzorla<sup>1</sup>, Francesco Aquino<sup>1</sup>, Roberto Sorrentino<sup>1</sup>, Walter Steffè<sup>2</sup>, Cristiano Tomassoni<sup>3</sup>, Jaione Galdeano<sup>4</sup>, Petronilo Martin-Iglesias<sup>4</sup>*  
<sup>1</sup>RF Microtech, Italy; <sup>2</sup>Thales Alenia Space, Italy; <sup>3</sup>Università di Perugia, Italy; <sup>4</sup>ESA-ESTEC, The Netherlands
- 555  **C Hybrid Inline TE/TM Mode Dielectric Resonator Filters with Wide Spurious Free Range and Controllable Transmission Zeros**  
*Patrick Boe, Daniel Miek, Fynn Kamrath, Michael Höft, Christian-Albrechts-Universität zu Kiel, Germany*
- 559  **C Narrow-Band and Low-Loss Bandpass Filter for 5G Built of Silica-Based Post-Wall Waveguide**  
*Yusuke Uemichi<sup>1</sup>, Shinnosuke Tsuchiya<sup>1</sup>, Toru Yamaguchi<sup>1</sup>, Xu Han<sup>1</sup>, Osamu Nukaga<sup>1</sup>, Shuhei Amakawa<sup>2</sup>, Ning Guan<sup>1</sup>*  
<sup>1</sup>Fujikura, Japan; <sup>2</sup>Hiroshima University, Japan
- 563  **C A New Directional Filter Design**  
*Huairan Yi, Zhengxiang Ma, Futurewei Technologies, USA*
- N/A  **C Design of an X/Ku Band Overmoded Coaxial Waveguide Diplexer for High Power Microwaves**  
*Jiawei Li, Guangjian Deng, Letian Guo, NINT, China*



## EuMC31 : Frequency Selective Surfaces, Reflectors and Metamaterial Antennas

Chair: Christian Person, Télécom Bretagne, France

Co-Chair: Thomas Dallmann, Fraunhofer FHR, Germany

10:50-12:30, Wednesday 13 January 2021, Beam

---

- 571  **C** **Design of a Polarization Rotating FSS for Polarimetric Automotive Radar Measurements**  
*Arvid Sims<sup>1</sup>, Tim Freialdenhoven<sup>2</sup>, Thomas Dallmann<sup>2</sup>*  
*<sup>1</sup>RWTH Aachen University, Germany; <sup>2</sup>Fraunhofer FHR, Germany*
- 575  **C** **A Ka-Band Polarization Rotating Multilayer Reflector for Polarimetric Radars**  
*Tim Freialdenhoven, Thomas Dallmann, Fraunhofer FHR, Germany*
- 579  **C** **Gradient Optimization on Third Order Bandpasses for a 24GHz Metasurface Lens**  
*Christoph Kohlberger<sup>1</sup>, Gernot Hueber<sup>1</sup>, Christoph Wagner<sup>2</sup>, Andreas Stelzer<sup>3</sup>*  
*<sup>1</sup>Silicon Austria Labs, Austria; <sup>2</sup>Infineon Technologies, Austria; <sup>3</sup>Johannes Kepler Universität Linz, Austria*
- 583  **C** **FR-4 PCB Process-Based mm-Wave Phased Array Antenna Using Planar High-Impedance Surfaces**  
*Jae-Yeong Lee, Jaehyun Choi, Dongkwon Choi, Youngno Youn, Junho Park, Wonbin Hong, POSTECH, Korea*
- 587  **C** **An Equivalent Circuit Diagram for a Hexagonal Ring Frequency Selective Surface**  
*Andreas Röhrner<sup>1</sup>, Georg Strauss<sup>1</sup>, Thomas F. Eibert<sup>2</sup>*  
*<sup>1</sup>Hochschule München, Germany; <sup>2</sup>Technische Universität München, Germany*






## EuMC32 : EuMC Interactive Poster Session 2

Chair: Jan Geralt bij de Vaate, ASTRON, The Netherlands

Co-Chair: Mark Oude Alink, University of Twente, The Netherlands







12:30-14:20, Wednesday 13 January 2021, Hall 1

---

- 591  **C Photonic Microwave Oscillator Based on an Ultra-Stable-Laser and an Optical Frequency Comb**  
*Michele Giunta<sup>1</sup>, Maurice Lessing<sup>1</sup>, Jialiang Yu<sup>2</sup>, Marc Fischer<sup>1</sup>, Matthias Lezius<sup>1</sup>, Xiaopeng Xie<sup>3</sup>, Giorgio Santarelli<sup>4</sup>, Yann Le Coq<sup>5</sup>, Ronald Holzwarth<sup>1</sup>*  
<sup>1</sup>Menlo Systems, Germany; <sup>2</sup>PTB, Germany; <sup>3</sup>Peking University, China; <sup>4</sup>LP2N (UMR 5298), France; <sup>5</sup>SYRTE (UMR 8630), France
- 595  **C Design and Development of 3.5THz Schottky-Based Fundamental Mixer**  
*Divya Jayasankar<sup>1</sup>, Vladimir Drakinskiy<sup>2</sup>, Mats Myreemark<sup>2</sup>, Peter Sobis<sup>3</sup>, Jan Stake<sup>2</sup>*  
<sup>1</sup>RISE, Sweden; <sup>2</sup>Chalmers University of Technology, Sweden; <sup>3</sup>Omnisys Instruments, Sweden
- 599  **C A 122GHz On-Chip 3-Element Patch Antenna Array with 10GHz Bandwidth**  
*Vincent Lammert<sup>1</sup>, Mohamed Hamouda<sup>2</sup>, Robert Weigel<sup>1</sup>, Vadim Issakov<sup>2</sup>*  
<sup>1</sup>FAU Erlangen-Nürnberg, Germany; <sup>2</sup>Infineon Technologies, Germany
- 603  **C Development of Second-Harmonic Terahertz Gyrotrons with Highly Selective Cavities**  
*I.V. Bandurkin<sup>1</sup>, A.E. Fedotov<sup>1</sup>, A.P. Fokin<sup>1</sup>, M.Yu. Glyavin<sup>1</sup>, A.G. Luchinin<sup>1</sup>, I.V. Osharin<sup>1</sup>, D.B. Radishev<sup>1</sup>, A.V. Savilov<sup>1</sup>, A.V. Starodubov<sup>2</sup>, Y. Tatematsu<sup>3</sup>*  
<sup>1</sup>Russian Academy of Sciences, Russia; <sup>2</sup>Saratov State University, Russia; <sup>3</sup>University of Fukui, Japan
- 607  **C High Power High Efficiency 475–520GHz Source Based on Discrete Schottky Diodes**  
*Diego Moro-Melgar, Oleg Cojocari, Ion Oprea, ACST, Germany*








*EuMC32 continues next page...*

*EuMC32 continued...*

- 611  **C** **THz Wave Scattering by Double-Layer Infinite Graphene Strip Grating Without One Strip in Every Layer**  
*Mstyslav E. Kaliberda<sup>1</sup>, Leonid M. Lytvynenko<sup>2</sup>, Sergey A. Pogarsky<sup>1</sup>*  
*<sup>1</sup>V.N. Karazin Kharkiv National University, Ukraine; <sup>2</sup>NASU, Ukraine*
- 615  **C** **Evaluation of Twin Silver Nanotubes as a Possible Sensor of the Charged Particle Beam Position**  
*Dariia O. Herasymova, NASU, Ukraine*
- 619  **C** **Scattering of Natural Waves of Planar Dielectric Waveguide with PEC Wall by Graphene Strip Grating in THz Range**  
*Mstyslav E. Kaliberda<sup>1</sup>, Leonid M. Lytvynenko<sup>2</sup>, Sergey A. Pogarsky<sup>1</sup>*  
*<sup>1</sup>V.N. Karazin Kharkiv National University, Ukraine; <sup>2</sup>NASU, Ukraine*
- 623  **C** **Optimization Algorithms for Accurate FMCW Millimeter Wave and Terahertz Thickness Measurements**  
*Nina S. Schreiner<sup>1</sup>, Michael Bortz<sup>1</sup>, Wolfgang Sauer-Greff<sup>2</sup>, Ralph Urbansky<sup>2</sup>, Fabian Friederich<sup>1</sup>*  
*<sup>1</sup>Fraunhofer ITWM, Germany; <sup>2</sup>Technische Universität Kaiserslautern, Germany*
- N/A  **C** **Complex Conductivity Extraction in Monolayer Graphene at Microwave Frequency by Free Space Technique**  
*Houssemeddine Krraoui<sup>1</sup>, Charlotte Tripon-Canseliet<sup>2</sup>, Mahima Chaudhary<sup>2</sup>, Lilei Ye<sup>2</sup>, Yifeng Fu<sup>3</sup>, Zhuoying Chen<sup>1</sup>, Jean Chazelas<sup>4</sup>*  
*<sup>1</sup>LPEM (UMR 8213), France; <sup>2</sup>SHT Smart High Tech, Sweden; <sup>3</sup>Chalmers University of Technology, Sweden; <sup>4</sup>Thales, France*
- 631  **C** **Precision Phase Shift Measurement System in the Frequency Range of 1-18GHz**  
*Anton Widarta, AIST, Japan*

*EuMC32 continues next page...*

*EuMC32 continued...*

- 634  **C** **Aperture Synthesis Method to Investigate on the Reflection Properties of Typical Road Surfaces**  
*Jochen Jebramcik, Ilona Rolfes, Jan Barowski, Ruhr-Universität Bochum, Germany*
- 638  **C** **Hybrid Beamforming Analysis Based on MIMO Channel Measurements at 28GHz**  
*Joerg Eisenbeis, Magnus Tingulstad, Nicolai Kern, Zsolt Kollár, Jerzy Kowalewski, Pablo Ramos López, Thomas Zwick, KIT, Germany*
- 642  **C** **Angle Estimation of Coherent Targets via Toeplitz Induced Compressed Matrix Method for the Bistatic MIMO Radar**  
*Evans Baidoo, Jurong Hu, Bilguun Batbaatar, Benjamin Danso Kwakye, Hohai University, China*
- 646  **C** **A Logarithmic Frequency-Diverse Array System for Precise Wireless Power Transfer**  
*E. Fazzini, M. Shanawani, A. Costanzo, D. Masotti, Università di Bologna, Italy*
- 650  **C** **Gain Enhancement Technique for On-Chip Monopole Antenna**  
*Carmin Mustacchio, Luigi Boccia, Emilio Arneri, Giandomenico Amendola, Università della Calabria, Italy*
- 654  **C** **A Single Smart Cut POI Substrate Design for UHF, L and S Band Filters**  
*E. Butaud<sup>1</sup>, T. Laroche<sup>2</sup>, V. Barec<sup>1</sup>, A. Clairet<sup>2</sup>, M. Bousquet<sup>3</sup>, F. Bernard<sup>2</sup>, R. Caulmilone<sup>1</sup>, E. Michoulier<sup>2</sup>, E. Courjon<sup>2</sup>, I. Huyet<sup>1</sup>, B. Tavel<sup>1</sup>, G. Aspar<sup>2</sup>, Y. Lami<sup>3</sup>, A. Desfrane<sup>2</sup>, A. Raveski<sup>2</sup>, S. Ballandras<sup>2</sup>, C. Didier<sup>1</sup>*  
*<sup>1</sup>Soitec, France; <sup>2</sup>frech|n|sys, France; <sup>3</sup>CEA-Leti, France*
- 658  **C** **A Dynamic CAD Model for Phase Change Material (PCM) Switches**  
*Ines Bettoumi, Cyril Guines, Pierre Blondy, XLIM (UMR 7252), France*

*EuMC32 continues next page...*

EuMC 2020 Table of Contents

---

*EuMC32 continued...*

- 662  **C** **A Machine Learning-Based Microwave Device Model for Fully Printed VO<sub>2</sub> RF Switches**  
*Shuai Yang<sup>1</sup>, Ahmad Khusro<sup>2</sup>, Weiwei Li<sup>1</sup>, Mohammad Vaseem<sup>1</sup>, Mohammad Hashmi<sup>3</sup>,  
Atif Shamim<sup>1</sup>*  
*<sup>1</sup>KAUST, Saudi Arabia; <sup>2</sup>Jamia Millia Islamia, India; <sup>3</sup>Nazarbayev University, Kazakhstan*
- 666  **C** **Additive Manufacturing of Coplanar Transmission Lines on Alumina Substrate up to 24GHz Using Laser Assisted Selective Metallization**  
*K. Lomakin, L. Wang, A. Job, Robert Suess-Wolf, J. Franke, Gerald Gold, FAU  
Erlangen-Nürnberg, Germany*






## EuMC33 : Advances on RF Power Amplifier Behavioural Modelling and Characterisation

Chair: *Gustavo Avolio, Anteverta-mw, The Netherlands*

Co-Chair: *José Carlos Pedro, Instituto de Telecomunicações, Portugal*

13:50–15:30, Wednesday 13 January 2021, Mission 2

---

- N/A  **C** **Accurate and Efficient Modulation Distortion Analysis of Active Components**  
*Jan Verspecht, Keysight Technologies, USA*
- 672  **C** **An AM-PM Compensation of Differential Power Amplifier Using Capacitance Neutralization**  
*Takuma Torii, Masatake Hangai, Shintaro Shinjo, Mitsubishi Electric, Japan*
- 676  **C** **Emulation of Load Modulated Amplifiers Using Tabulated Load-Pull Data from a Single Amplifier**  
*Jose-Ramon Perez-Cisneros<sup>1</sup>, William Hallberg<sup>2</sup>, C. Fager<sup>1</sup>, Koen Buisman<sup>1</sup>*  
*<sup>1</sup>Chalmers University of Technology, Sweden; <sup>2</sup>Qamcom, Sweden*
- 680  **C** **On the Power and Beam Dependency of Load Modulation in mmWave Active Antenna Arrays**  
*Alberto Brihuega<sup>1</sup>, Matias Turunen<sup>1</sup>, Lauri Anttila<sup>1</sup>, Thomas Eriksson<sup>2</sup>, Mikko Valkama<sup>1</sup>*  
*<sup>1</sup>Tampere University, Finland; <sup>2</sup>Chalmers University of Technology, Sweden*
- 684  **C** **Incorporating Gate-Lag Effects into the Cardiff Behavioural Model**  
*Yashar Alimohammadi<sup>1</sup>, Eigo Kuwata<sup>1</sup>, Xuan Liu<sup>1</sup>, Ehsan M. Azad<sup>1</sup>, James Bell<sup>1</sup>, Lei Wu<sup>2</sup>, Paul Tasker<sup>1</sup>, Johannes Benedikt<sup>1</sup>*  
*<sup>1</sup>Cardiff University, UK; <sup>2</sup>Huawei Technologies, China*








## EuMC34: Recent Advances in RFID and IoT Sensors

Chair: Alessandra Costanzo, Università di Bologna, Italy

Co-Chair: Nuno Borges Carvalho, Instituto de Telecomunicações, Portugal

13:50-15:30, Wednesday 13 January 2021, Expedition

---






- N/A  **C** **Intelligent Packaging for Tropical Fruit Management and Ripening Monitoring**  
*C. Occhiuzzi<sup>1</sup>, N. D'Uva<sup>2</sup>, S. Nappi<sup>1</sup>, S. Amendola<sup>2</sup>, C. Gialluca<sup>3</sup>, V. Chiabrando<sup>4</sup>,  
L. Garavaglia<sup>3</sup>, G. Giacalone<sup>4</sup>, Gaetano Marrocco<sup>1</sup>*  
*<sup>1</sup>Università di Roma "Tor Vergata", Italy; <sup>2</sup>RADIO6ENSE, Italy; <sup>3</sup>ILPA Group, Italy;  
<sup>4</sup>Università di Torino, Italy*
- 690  **C** **A Time Dependent Temperature Compensated Limiter for Passive Differential UHF RFID**  
*Dominik Mair, Georg Saxl, Christof Happ, Moritz Fischer, Thomas Ussmueller, Universität Innsbruck, Austria*
- 694  **C** **Low-IF Interferometric Receiver Architecture for Massive-IoT Wireless Systems**  
*Intikhab Hussain, Ke Wu, Polytechnique Montréal, Canada*
- 698  **C** **High-Accuracy 3D SAW RFID Tag Localization Using a Multi-Antenna Mobile Robot Based Synthetic Aperture Approach**  
*Pau Caldero, Matthias Gareis, Martin Vossiek, FAU Erlangen-Nürnberg, Germany*
- 702  **C** **Energy Harvesting for Battery-Free Wireless Sensors Network Embedded in a Reinforced Concrete Beam**  
*Alassane Sidibe, Gaël Loubet, Alexandru Takacs, Daniela Dragomirescu, LAAS-CNRS, France*

## EuMC35 : Integrated Antennas

Chair: Ke Wu, Polytechnique Montréal, Canada

13:50-15:30, Wednesday 13 January 2021, Spark

---

- 706  **C** **Unified Integration of Self-Oscillating Mixer-Antenna for Compact Receiver Frontend**  
*Srinaga Nikhil Nallandhigal, Ke Wu, Polytechnique Montréal, Canada*
- 710  **C** **Quad-Beam Octa Cross-Slotted Pattern Reconfigurable Antenna for 5.8GHz Band Application**  
*Tarun Prakash, Raghvendra Kumar Chaudhary, Ravi Kumar Gangwar, IIT Dhanbad, India*
- 714  **C** **Investigation of Integration for OAM Communication Using Loop Antenna Array and Analysis of Alignment Tolerance for Practical Use**  
*Haruki Kikuchi, Akira Saitou, Hisanosuke Miyake, Wataru Wada, Hiroshi Suzuki, Ryo Ishikawa, Kazuhiko Honjo, University of Electro-Communications, Japan*
- 718  **C** **High Gain Beam-Steerable Reconfigurable Antenna Using Combined Pixel and Parasitic Arrays**  
*Devakumaran Subramaniam<sup>1</sup>, Muzammil Jusoh<sup>1</sup>, Thennarasan Sabapathy<sup>1</sup>, Ping Jack Soh<sup>1</sup>, Mohamed Nasrun Osman<sup>1</sup>, M. Alaydrus<sup>2</sup>, Callum J. Hodgkinson<sup>3</sup>, Symon K. Podilchak<sup>3</sup>, Dominique Schreurs<sup>4</sup>*  
*<sup>1</sup>Universiti Malaysia Perlis, Malaysia; <sup>2</sup>Universitas Mercu Buana, Indonesia; <sup>3</sup>University of Edinburgh, UK; <sup>4</sup>KU Leuven, Belgium*
- 722  **C** **Ka-Band Coupled-Resonator Filtering Magneto-Electric Dipole Antenna**  
*Hossein Sarbandi Farahani, Behrooz Rezaee, Wolfgang Bösch, Technische Universität Graz, Austria*






## EuMC36: Transmission Lines and Passive Components

Chair: Maurizio Bozzi, Università di Pavia, Italy

Co-Chair: Bart Nauwelaers, KU Leuven, Belgium

13:50-15:30, Wednesday 13 January 2021, Flash

---

- N/A  **C** **TFLE-Thin Film Lumped Elements Reflective and Non-Reflective Filtering Solutions**  
*R. Hershtig, K&L Microwave, USA*
- 727  **C** **Realization of Dual-Band Matching Networks Using Cascaded Filters**  
*Farzad Yazdani, Raafat R. Mansour, University of Waterloo, Canada*
- 731  **C** **A Wideband DC Isolated Substrate Integrated Coaxial Line Transition for System Integration**  
*Satya Krishna Idury, Soumava Mukherjee, IIT Jodhpur, India*
- 735  **C** **Millimeter-Wave E-Plane Transmission Lines in Multi-Layer Substrate**  
*Thanh Tuan Nguyen, Kunio Sakakibara, Nobuyoshi Kikuma, Nagoya Institute of Technology, Japan*
- 739  **C** **A Design Approach for an Integrated Self-Biased Ka-Band Isolator**  
*Wanja M. Gitzel<sup>1</sup>, Oktay Arıkan<sup>1</sup>, Manuel Heidenreich<sup>2</sup>, Jörg Töpfer<sup>2</sup>, Arne F. Jacob<sup>1</sup>*  
*<sup>1</sup>Technische Universität Hamburg-Harburg, Germany; <sup>2</sup>EAH Jena, Germany*




## EuMC37: Non-Planar Filters and Devices

Chair: Giuseppe Macchiarella, Politecnico di Milano, Italy

Co-Chair: Cristiano Tomassoni, Università di Perugia, Italy

13:50-15:30, Wednesday 13 January 2021, Glow

---

- 743  **C** **An Efficient Microwave Filter Design Procedure Based on Space Mapping**  
*J.C. Melgarejo, Marco Guglielmi, Santiago Cogollos, Vicente E. Boria, Universidad Politécnica de Valencia, Spain*
- 747  **C** **Enhancing the Out-of-Band Response of Hybrid Wide-Band Filters in Rectangular Waveguide**  
*Joaquin Valencia, Marco Guglielmi, Santiago Cogollos, Vicente E. Boria, Universidad Politécnica de Valencia, Spain*
- 751  **C** **A Substrate-Less Current Mode Combining Power Module Utilizing Ridge Gap Waveguide**  
*Jia-Chi Samuel Chieh, Alex Phipps, Everly Yeo, NIWC Pacific, USA*
- 755  **C** **Evaluating Resonant Cavity Surface Treatment Procedures with a New Unloaded Q-Factor Measurement Method**  
*Jure Soklič, Holger Arthaber, Technische Universität Wien, Austria*






## EuMC38: Metasurfaces and FSSs Applications

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

Co-Chair: Oscar Quevedo-Teruel, KTH, Sweden

13:50-15:30, Wednesday 13 January 2021, Beam

---

- N/A  **C** **Diffractive Metasurfaces for Microwave Beamforming Applications**  
*Ryan A. Stevenson, Kymeta, USA*
- 760  **C** **A Novel Fully Inkjet Printed Dual-Polarization Broadband Tuneable FSS Using Origami “Eggbox” Structure**  
*Yepu Cui, Samantha Van Rijs, Ryan Bahr, Manos Tentzeris, Georgia Tech, USA*
- 764  **C** **High Gain Arbitrarily-Oriented Linearly-Polarized Leaky-Wave Antenna by Tensorial Impedance Surfaces**  
*Amrollah Amini, Homayoon Oraizi, IUST, Iran*
- 768  **C** **Electromagnetic Analysis of a Jigsaw-Shaped FSS for Conformal Application**  
*Yan Zhang<sup>1</sup>, Tao Dong<sup>2</sup>, Da Sun<sup>1</sup>, Yecheng Wang<sup>1</sup>, Shanwei Lü<sup>1</sup>*  
*<sup>1</sup>Beihang University, China; <sup>2</sup>CAST, China*
- 772  **C** **Additively Manufactured Conformal All-Dielectric Frequency Selective Surface**  
*R. Adeline Mellita<sup>1</sup>, S.S. Karthikeyan<sup>2</sup>, P. Damodharan<sup>1</sup>*  
*<sup>1</sup>IIITDM Kancheepuram, India; <sup>2</sup>NIT Tiruchirappalli, India*






## EuMC39: Solid State High Power Amplifiers for Satellite and Radar Applications

Chair: Markus Mayer, ARELIS, France

Co-Chair: Bertrand Gerfault, Thales, France

16:10-17:50, Wednesday 13 January 2021, Mission 2

---

- 776  **C** **20W Linearized Q-Band Solid State Power Amplifier for Satellite Communication Application**  
*Rocco Giofrè<sup>1</sup>, Ernesto Limiti<sup>1</sup>, Antonino Massari<sup>2</sup>, Andrea Suriani<sup>2</sup>, Francesco Vitulli<sup>2</sup>*  
<sup>1</sup>Università di Roma "Tor Vergata", Italy; <sup>2</sup>Thales Alenia Space, Italy
- 780  **C** **Design and Characterization of a Ka Band 40W RF Chain Based on GH15-10 GaN Technology for Space Solid State Power Amplifier Applications**  
*A. Maati<sup>1</sup>, G. Mouchon<sup>1</sup>, J. Belluot<sup>1</sup>, P. Augoyat<sup>1</sup>, M. Dinari<sup>2</sup>, T. Huet<sup>2</sup>, Veronique Serru<sup>2</sup>, Marc Camiade<sup>2</sup>, A. Katz<sup>3</sup>*  
<sup>1</sup>Thales, France; <sup>2</sup>United Monolithic Semiconductors, France; <sup>3</sup>Linearizer Technology, USA
- 784  **C** **L-Band Digital Doherty SSPA Design for Compact SATCOM Terminal Applications**  
*Tomáš Götthans<sup>1</sup>, Roman Maršálek<sup>1</sup>, Tomáš Urbanec<sup>1</sup>, Martin Slanina<sup>1</sup>, Ondřej Kucera<sup>2</sup>, Kamil Pešek<sup>2</sup>, Suat Ayöz<sup>2</sup>, Amitabh Chowdhary<sup>3</sup>*  
<sup>1</sup>Brno University of Technology, Czech Republic; <sup>2</sup>Honeywell International, Czech Republic; <sup>3</sup>ESA-ESTEC, The Netherlands
- 788  **C** **A High Efficiency MMIC X-Band GaN Power Amplifier**  
*Mohammed Ayad<sup>1</sup>, Nicolas Poitrenaud<sup>1</sup>, Veronique Serru<sup>1</sup>, Marc Camiade<sup>1</sup>, Jan Gruenenpuett<sup>2</sup>, Klaus J. Riepe<sup>2</sup>*  
<sup>1</sup>United Monolithic Semiconductors, France; <sup>2</sup>United Monolithic Semiconductors, Germany
- 792  **C** **A 10W, 35% Power Added Efficiency 6 to 18GHz GaN Power Amplifier**  
*Ahmed Gasmi, Rémy Leblanc, Bertrand Wroblewski, Francois Lecourt, Julien Poulain, Adrien Cutivet, Ahmad Al Hajjar, OMMIC, France*


## EuMC40: [Focussed Session] Emerging Antenna Technologies for RFID Applications

Chair: Giovanni Andrea Casula, Università degli Studi di Cagliari, Italy

Co-Chair: Riccardo Colella, National Research Council, Italy

16:10–17:50, Wednesday 13 January 2021, Expedition

---

- 796  **C Miniaturized Grid Array Antenna for Body-Centric RFID Communications in 5G S-Band**  
*Jack D. Hughes<sup>1</sup>, C. Occhiuzzi<sup>2</sup>, John Batchelor<sup>1</sup>, Gaetano Marrocco<sup>2</sup>*  
<sup>1</sup>University of Kent, UK; <sup>2</sup>Università di Roma “Tor Vergata”, Italy
- 800  **C Millimeter-Wave Chipless RFID Tag for Authentication Applications**  
*Raymundo de Amorim Jr., Nicolas Barbot, Romain Siragusa, Etienne Perret, LCIS (EA 3747), France*
- 804  **C On Increasing of Read Range of Miniaturized UHF Tags**  
*I. Rakotomalala<sup>1</sup>, S. Tedjini<sup>1</sup>, Riccardo Colella<sup>2</sup>, Francesco P. Chietera<sup>3</sup>, P. Lemaitre-Auger<sup>1</sup>, Luca Catarinucci<sup>3</sup>*  
<sup>1</sup>LCIS (EA 3747), France; <sup>2</sup>CNR-IFC, Italy; <sup>3</sup>Università del Salento, Italy
- 808  **C A Smart Parking Sensor with Multi-Purpose Antenna for Car Detection and Sensor Charging**  
*Moritz Fischer, Marian Guggenberger, Thomas Ussmueller, Universität Innsbruck, Austria*
- 812  **C Laser-Fabricated Antennas for RFID Applications**  
*Almudena Rivadeneyra<sup>1</sup>, José F. Salmeron<sup>1</sup>, Noel Rodriguez<sup>1</sup>, Diego P. Morales<sup>1</sup>, Riccardo Colella<sup>2</sup>, Francesco P. Chietera<sup>3</sup>, Luca Catarinucci<sup>3</sup>*  
<sup>1</sup>Universidad de Granada, Spain; <sup>2</sup>CNR-IFC, Italy; <sup>3</sup>Università del Salento, Italy




## EuMC41: SATCOM and mmWave Antennas

Chair: Peter De Maagt, ESA-ESTEC, The Netherlands

Co-Chair: Matthias Geissler, IMST, Germany

16:10-17:50, Wednesday 13 January 2021, Spark

---

- 816  **C** **Flight Model 7-Panel Slot-Array Deployable Antenna Measurement Results of MicroX-SAR 100kg Class Demonstration Satellite**  
*Budhaditya Pyne<sup>1</sup>, Hirobumi Saito<sup>1</sup>, Prilando Rizki Akbar<sup>1</sup>, Koji Tanaka<sup>2</sup>, Jiro Hirokawa<sup>3</sup>, Takashi Tomura<sup>3</sup>*  
*<sup>1</sup>Synspective, Japan; <sup>2</sup>JAXA, Japan; <sup>3</sup>Tokyo Institute of Technology, Japan*
- 820  **C** **A Compact Low-Noise Frontend for Rx/Tx-Integrated SatCom Arrays**  
*Anton Sieganschin, Thomas Jaschke, Arne F. Jacob, Technische Universität Hamburg-Harburg, Germany*
- 824  **C** **Design of 94-GHz Wideband Waveguide-Feed Patch Antenna and Array in eWLB Package**  
*Chuanming Zhu, Zongming Duan, CETC 38, China*
- 828  **C** **Embedded 5G Wideband Dual-Polarized mm-Wave Antennas and 60-GHz Motion-Recognition mm-Wave Antennas in a Non-mm-Wave Antenna Integrating Packages (AiAiP) in a Full-Screen Metal-Framed Phone**  
*Huan-Chu Huang<sup>1</sup>, Ruipeng Li<sup>2</sup>*  
*<sup>1</sup>Etheta Communication Technology, China; <sup>2</sup>Pousen System Technology, China*








## EuMC42 : Planar Power Dividers/Combiners

Chair: Bart Nauwelaers, KU Leuven, Belgium

16:10-17:50, Wednesday 13 January 2021, Flash

---

- 832  **C** **Generalized Gysel Power Divider with Arbitrary Power Ratio and Real Termination Impedances**  
*Chao Gai, Yulong Zhao, Mohamed Helou, Fadhel Ghannouchi, University of Calgary, Canada*
- 836  **C** **Miniaturized Couplers with Combined Microstrip and Slotline Ports**  
*Mohamed H.A. Elsayaf, Amr M.E. Safwat, Ain Shams University, Egypt*
- 840  **C** **Broadband Equal-Split Planar 4-Way Power Divider/Combiner Suitable for High Power Applications**  
*Jeremy Furgal<sup>1</sup>, Kevin Xu<sup>2</sup>, Jun H. Choi<sup>2</sup>, Jay K. Lee<sup>1</sup>*  
*<sup>1</sup>Syracuse University, USA; <sup>2</sup>SUNY Buffalo, USA*
- 844  **C** **Dual-Band Semi-Lumped-Element Power Dividers at UHF/SHF Bands**  
*Tadashi Kawai, Kensuke Nagano, Akira Enokihara, University of Hyogo, Japan*
- 848  **C** **A Dual-Band Balun Architecture with Unequal Port-Terminations**  
*Rahul Gupta<sup>1</sup>, Sabina Kairatova<sup>2</sup>, Mohammad Hashmi<sup>2</sup>, Galymzhan Nauryzbayev<sup>2</sup>*  
*<sup>1</sup>IIT-Delhi, India; <sup>2</sup>Nazarbayev University, Kazakhstan*





## EuMC43 : Non-Planar Devices and Systems

Chair: Vicente Enrique Boria-Esbert, Universidad Politécnic de Valencia, Spain

Co-Chair: Richard Snyder, RS Microwave, USA

16:10-17:50, Wednesday 13 January 2021, Glow

---

- 852  **C Ridge Gap Waveguide Enabled Wireless Power Transfer for Electric Vehicle Applications**  
*Walid M.G. Dyab<sup>1</sup>, Mourad S. Ibrahim<sup>1</sup>, Ahmed A. Sakr<sup>2</sup>, Ke Wu<sup>3</sup>*  
*<sup>1</sup>Prince Sultan University, Saudi Arabia; <sup>2</sup>Cairo University, Egypt; <sup>3</sup>Polytechnique Montréal, Canada*
- N/A  **C A Compact Ridge Waveguide Four-Port Junction Circulator**  
*Guangjian Deng, Letian Guo, Jiawei Li, Wenhua Huang, Hao Shao, Shaoyi Xie, NINT, China*
- 860  **C Stripline Dual-Band Ferrite Circulators Operating on Weak Field Conditions**  
*Vincent Olivier<sup>1</sup>, Laure Huitema<sup>2</sup>, Bertrand Lenoir<sup>1</sup>, Hamza Turki<sup>1</sup>, Christophe Breuil<sup>1</sup>, Philippe Pouliguen<sup>3</sup>, Thierry Monediere<sup>2</sup>*  
*<sup>1</sup>INOVEOS, France; <sup>2</sup>XLIM (UMR 7252), France; <sup>3</sup>Ministère des Armées AID, France*
- 864  **C Broadband 32-Way E-Band Inline Power Combiner for High-Power MMIC Amplifiers**  
*Anil Kumar Pandey, Keysight Technologies, India*




## EuMC44: [Special Session] Silicon-Based Ka-Band Massive MIMO Antenna Systems for New Telecommunication Services

Chair: Ulf Johannsen, Technische Universiteit Eindhoven, The Netherlands

Co-Chair: Bart Smolders, Technische Universiteit Eindhoven, The Netherlands

16:10–17:50, Wednesday 13 January 2021, Beam

---



- N/A  **C SILIKA: Silicon-Based Ka-Band Massive-MIMO Antenna Systems for New Telecommunication Services**  
*A.B. Smolders, Technische Universiteit Eindhoven, The Netherlands*
- N/A  **C Antenna Systems for 5G mm-Wave Radio Access**  
*Guy A.E. Vandenbosch<sup>1</sup>, A. Lahuerta<sup>1</sup>, A. Roev<sup>2</sup>, Thomas A.H. Bressner<sup>3</sup>, Eduardo V.P. dos Anjos<sup>1</sup>, A. Elsakka<sup>3</sup>, A. Farsaee<sup>3</sup>, Marzieh Salarrahimi<sup>1</sup>, M. Moghaddam<sup>2</sup>, N. Amani<sup>2</sup>, P. Taghikhani<sup>2</sup>, C. van Puijenbroek<sup>3</sup>, T. Marinovic<sup>1</sup>, A.B. Smolders<sup>3</sup>, Ulf Johannsen<sup>3</sup>, M. Matters<sup>3</sup>, Frans M.J. Willems<sup>3</sup>, Marianna V. Ivashina<sup>2</sup>, R. Maaskant<sup>2</sup>, Thomas Eriksson<sup>2</sup>, C. Fager<sup>2</sup>, Marcel Geurts<sup>4</sup>, Martin N. Johansson<sup>5</sup>, Ulf Gustavsson<sup>5</sup>*  
<sup>1</sup>KU Leuven, Belgium; <sup>2</sup>Chalmers University of Technology, Sweden; <sup>3</sup>Technische Universiteit Eindhoven, The Netherlands; <sup>4</sup>NXP Semiconductors, The Netherlands; <sup>5</sup>Ericsson, Sweden
- N/A  **C IC Design Aspects for 5G mm-Wave Systems**  
*C. Fager<sup>1</sup>, Eduardo V.P. dos Anjos<sup>2</sup>, A. Roev<sup>1</sup>, P. Taghikhani<sup>1</sup>, Marianna V. Ivashina<sup>1</sup>, R. Maaskant<sup>1</sup>, Koen Buisman<sup>1</sup>, A. Höök<sup>3</sup>, Dominique Schreurs<sup>2</sup>, Guy A.E. Vandenbosch<sup>2</sup>, Marcel Geurts<sup>4</sup>*  
<sup>1</sup>Chalmers University of Technology, Sweden; <sup>2</sup>KU Leuven, Belgium; <sup>3</sup>Saab, Sweden; <sup>4</sup>NXP Semiconductors, The Netherlands

EuMC44 continues next page...

## EuMC 2020 Table of Contents

---

*EuMC44 continued...*






- N/A  **Signal Processing for mm-Wave Antenna Systems**  
*Ulf Gustavsson, Ericsson, Sweden*
- N/A  **The SILIKA Demonstrator**  
*Marcel Geurts<sup>1</sup>, Eduardo V.P. dos Anjos<sup>2</sup>, Marzieh Salarrahimi<sup>2</sup>*  
*<sup>1</sup>NXP Semiconductors, The Netherlands; <sup>2</sup>KU Leuven, Belgium*

## EuMC45 : [Special Session] Focus Day: Array Antennas for Radio Astronomy

Chair: Mark Bentum, Technische Universiteit Eindhoven, The Netherlands

08:30-10:10, Thursday 14 January 2021, Auditorium

---

- N/A  **C** **Aperture Arrays in Radio Astronomy Overview of Past, Present and Future Radio Telescopes**  
*M.J. Bentum, Technische Universiteit Eindhoven, The Netherlands*
- N/A  **C** **First in Flight Results of the NCLE Instrument — A Low Frequency Radio Receiver Exploring the Dark Ages in Lunar Orbit**  
*E. Bertels<sup>1</sup>, Z. De Groot<sup>1</sup>, J. Rotteveel<sup>1</sup>, M. Klein-Wolt<sup>2</sup>, C. Brinkerink<sup>2</sup>, H. Falke<sup>2</sup>, A.J. Boonstra<sup>3</sup>, H. van der Marel<sup>3</sup>, M. Ruiter<sup>3</sup>, Jinsong Ping<sup>4</sup>, Linjie Chen<sup>4</sup>, Mingyuan Wang<sup>4</sup>*  
<sup>1</sup>ISIS, The Netherlands; <sup>2</sup>Radboud Universiteit, The Netherlands; <sup>3</sup>ASTRON, The Netherlands; <sup>4</sup>Chinese Academy of Sciences, China
- N/A  **C** **The Mid-Frequency Aperture Array**  
*K. Zarb Adami, University of Oxford, UK*
- N/A  **C** **DISTURB: A 30MHz to 3GHz Solar Monitoring Phased Array System**  
*D.S. Prinsloo<sup>1</sup>, P. Benthem<sup>1</sup>, M.A. Brentjens<sup>1</sup>, P.P. Krüger<sup>1</sup>, D. Boersma<sup>1</sup>, L. Venema<sup>1</sup>, R. de Wild<sup>1</sup>, R. Fallows<sup>1</sup>, E. Loenen<sup>2</sup>, E. Platen<sup>2</sup>, P. Stewart<sup>2</sup>, L. Visser<sup>2</sup>, A. Bos<sup>2</sup>, B. van den Oord<sup>3</sup>, W. Bouwmeester<sup>4</sup>*  
<sup>1</sup>ASTRON, The Netherlands; <sup>2</sup>S&T, The Netherlands; <sup>3</sup>KNMI, The Netherlands; <sup>4</sup>Technische Universiteit Delft, The Netherlands
- N/A  **C** **Coherent Receiver Arrays for Radio Astronomy in the Terahertz Regime**  
*J.G. Bij de Vaate, SRON, The Netherlands*

## EuMC46: Advanced Planar Filter Principles and Technologies

Chair: Roberto Gómez-García, Universidad de Alcalá, Spain

Co-Chair: Miguel Sánchez-Soriano, Universidad de Alicante, Spain

08:30-10:10, Thursday 14 January 2021, Spark

---

- 882  **C** **Cover-Ended Resonators to Increase Corona Discharge Thresholds in Microstrip Bandpass Filters**  
*Aitor Morales-Hernández<sup>1</sup>, Miguel A. Sánchez-Soriano<sup>1</sup>, Stephan Marini<sup>1</sup>, Vicente E. Boria<sup>2</sup>, Marco Guglielmi<sup>2</sup>*  
<sup>1</sup>Universidad de Alicante, Spain; <sup>2</sup>Universidad Politécnica de Valencia, Spain
- 886  **C** **Comparative Analysis of Out-of-Band Power Handling Capacities for Lossy Filters**  
*Liang-Feng Qiu, Lin-Sheng Wu, Bin Xia, Jun-Fa Mao, Shanghai Jiao Tong University, China*
- 890  **C** **Co-Designed Quasi-Circulator and Bandpass Filter**  
*Andrea Ashley, Dimitra Psychogiou, University of Colorado Boulder, USA*
- 894  **C** **3-D Metal Printed Inline Quasi-Elliptic Bandpass Filter**  
*Jiayu Rao<sup>1</sup>, Kenneth Nai<sup>2</sup>, Jiasheng Hong<sup>1</sup>*  
<sup>1</sup>Heriot-Watt University, UK; <sup>2</sup>Renishaw, UK
- 897  **C** **High-Order Fully-Reconfigurable Balanced Bandpass Filters Using Mixed Technology Resonators**  
*Dakotah Simpson, Dimitra Psychogiou, University of Colorado Boulder, USA*






## EuMC47: Dielectric Measurements

Chair: Andrej Rumiantsev, MPI Corporation, Taiwan

Co-Chair: Xiaobang Shang, NPL, UK

08:30-10:10, Thursday 14 January 2021, Flash

---

- 901  **C** **Characterization of Permittivity of Liquids-in-Flow with Spherical Dielectric Resonators**  
*Georg Sterzl, Jan Hesselbarth, Universität Stuttgart, Germany*
- 905  **C** **Microwave Characterisation of the Coefficient of Thermal Expansion and the Thermal Evolution of Electric Conductivity for Metallised Substrate**  
*Thibault Charlet<sup>1</sup>, Olivier Tantot<sup>1</sup>, Nicolas Delhote<sup>1</sup>, Clément Hallépée<sup>1</sup>, Serge Verdeyme<sup>1</sup>, David Nevo<sup>2</sup>*  
*<sup>1</sup>XLIM (UMR 7252), France; <sup>2</sup>Thales Alenia Space, France*
- 909  **C** **Solid and Non-Solid Dielectric Material Characterization for Millimeter and Sub-Millimeter Wave Applications**  
*Daniel Bourreau, Alain Péden, Lab-STICC (UMR 6285), France*
- 913  **C** **Novel Method for Measuring Complex Permittivity of Thin Films at Millimeter Frequencies**  
*Yuto Kato, Masahiro Horibe, AIST, Japan*
- 917  **C** **New Methods for Improved Accuracy of Broad Band Free Space Dielectric Measurements**  
*J.W. Schultz<sup>1</sup>, R. Geryak<sup>1</sup>, J.G. Maloney<sup>2</sup>*  
*<sup>1</sup>Compass Technology Group, USA; <sup>2</sup>Maloney-Solutions, USA*






## EuMC48: Microwave Monitoring and Sensing of Biomedical Parameters

Chair: Luciano Tarricone, Università del Salento, Italy

Co-Chair: Marco Pasian, Università di Pavia, Italy

08:30-10:10, Thursday 14 January 2021, Glow

---

- 921  **C** **A High Frequency Dielectrophoresis Cytometer for Continuous Flow Biological Cells Refinement**  
*Thomas Provent<sup>1</sup>, Audrey Mauvy<sup>2</sup>, Rémi Manczak<sup>1</sup>, Sofiane Saada<sup>2</sup>, Claire Dalmay<sup>1</sup>, Barbara Bessette<sup>2</sup>, Fabrice Lalloué<sup>2</sup>, Arnaud Pothier<sup>1</sup>*  
<sup>1</sup>XLIM (UMR 7252), France; <sup>2</sup>CAPTUR (EA3842), France
- 925  **C** **Head Motion and Eyes Blinking Detection: A mm-Wave Radar for Assisting People with Neurodegenerative Disorders**  
*Emanuele Cardillo<sup>1</sup>, Gaia Sapienza<sup>2</sup>, Changzhi Li<sup>3</sup>, Alina Caddemi<sup>1</sup>*  
<sup>1</sup>Università di Messina, Italy; <sup>2</sup>Tre Ali Onlus, Italy; <sup>3</sup>Texas Tech University, USA
- 929  **C** **Heartbeat and Respiration Detection Using a Low Complexity CW Radar System**  
*Panagiota Kontou<sup>1</sup>, Souheil Ben Smida<sup>1</sup>, Spyridon Nektarios Daskalakis<sup>1</sup>, Symeon Nikolaou<sup>2</sup>, Mauro Dragone<sup>1</sup>, Dimitris E. Anagnostou<sup>1</sup>*  
<sup>1</sup>Heriot-Watt University, UK; <sup>2</sup>Frederick University, Cyprus
- 933  **C** **Measuring Vital Signs on Fingertip Using K-Band Spherical Dielectric Resonator**  
*Chung-Tse Chang<sup>1</sup>, Chin-Lung Yang<sup>1</sup>, Utpal Dey<sup>2</sup>, Jan Hesselbarth<sup>2</sup>*  
<sup>1</sup>National Cheng Kung University, Taiwan; <sup>2</sup>Universität Stuttgart, Germany
- 937  **C** **An Adaptive Filter Technique for Platform Motion Compensation in Unmanned Aerial Vehicle Based Remote Life Sensing Radar**  
*Shekh M.M. Islam<sup>1</sup>, Lana C. Lubecke<sup>2</sup>, Christian Grado<sup>1</sup>, Victor M. Lubecke<sup>1</sup>*  
<sup>1</sup>University of Hawaii at Manoa, USA; <sup>2</sup>Kalani High School, USA







## EuMC49: Front-End and Active Module

Chair: *Nathalie Deltimple, IMS (UMR 5218), France*

Co-Chair: *Ernesto Limiti, Università di Roma "Tor Vergata", Italy*

10:50-12:30, Thursday 14 January 2021, Expedition

---

- 941  **C** **Experimental Results of Advanced Wideband Data Converters for Direct K-Band Software Defined Radio**  
*R. Pilard, A. Glascott-Jones, B. Boujon, J. Duvernay, Teledyne e2v, France*
- 945  **C** **Ka-Band TDD Front-End with Gate Shunt Switched Cascode LNA and Three-Stack PA on 22nm FDSOI CMOS Technology**  
*Mikko Hietanen, Jere Rusanen, Janne P. Aikio, Nuutti Tervo, Timo Rahkonen, Aarno Pärssinen, University of Oulu, Finland*
- 949  **C** **Phase-Noise Reduction Through an External High-Q Network Using a Black-Box Oscillator Model**  
*M. Pontón, F. Ramírez, A. Herrera, A. Suárez, Universidad de Cantabria, Spain*
- 953  **C** **Iterative Learning Control for Signal Separation in Dual-RF Input Doherty Transmitter**  
*Jun Peng<sup>1</sup>, Weimin Shi<sup>2</sup>, Jingzhou Pang<sup>3</sup>, Fei You<sup>1</sup>, Songbai He<sup>1</sup>*  
*<sup>1</sup>UESTC, China; <sup>2</sup>HKUST, China; <sup>3</sup>University College Dublin, Ireland*
- 957  **C** **A Decade Bandwidth Mixers Based on Planar Transformers and Quasi-Vertical Schottky Diodes Implemented in GaAs MMIC Technology**  
*Nikolai Drobotun<sup>1</sup>, Daniil Danilov<sup>2</sup>, Alexey Drozdov<sup>2</sup>*  
*<sup>1</sup>TUSUR, Russia; <sup>2</sup>Micran, Russia*

## EuMC50: Compact Planar Filtering Devices

Chair: Jerzy Julian Michalski, SpaceForest, Poland

Co-Chair: Dimitra Psychogiou, University of Colorado Boulder, USA

10:50-12:30, Thursday 14 January 2021, Spark

---

- N/A  **C Full Planar Interdigital Filter Design Flow**  
*Itzhak Shapir, Wave Whisperer Microwave Consulting, Israel*
- 962  **C Surface Mountable L- and C-Band Pre-Distorted Filters for Frequency Converters of High Throughput Satellite Systems**  
*Paolo Vallerotonda<sup>1</sup>, Alessandro Cazzorla<sup>1</sup>, Davide Tiradossi<sup>1</sup>, Luca Pelliccia<sup>1</sup>, Roberto Sorrentino<sup>1</sup>, Francesco Vitulli<sup>2</sup>, Walter Steffè<sup>2</sup>, S. Di Nardo<sup>2</sup>, Francois Deborgies<sup>3</sup>, Giuseppe Venanzoni<sup>4</sup>, Cristiano Tomassoni<sup>4</sup>*  
*<sup>1</sup>RF Microtech, Italy; <sup>2</sup>Thales Alenia Space, Italy; <sup>3</sup>ESA-ESTEC, The Netherlands; <sup>4</sup>Università di Perugia, Italy*
- 966  **C Vertically Integrated Microwave-Filters Using Functional Via Structures in LTCC**  
*Ömer F. Yildiz<sup>1</sup>, Ole Thomsen<sup>2</sup>, Marc Bochard<sup>2</sup>, Cheng Yang<sup>1</sup>, Christian Schuster<sup>1</sup>*  
*<sup>1</sup>Technische Universität Hamburg-Harburg, Germany; <sup>2</sup>KOA, Germany*
- 970  **C Design and Comparison of Filter Structures in the Millimeter Wave Frequency Range on Outer- and Inner-Layers of Organic Circuit Boards**  
*Andreas Scharl<sup>1</sup>, Felix Sepaintner<sup>1</sup>, Johannes Jakob<sup>1</sup>, David Scholz<sup>1</sup>, Franz Xaver Röhr<sup>2</sup>, Werner Bogner<sup>1</sup>, Stefan Zorn<sup>2</sup>*  
*<sup>1</sup>Technische Hochschule Deggendorf, Germany; <sup>2</sup>Rohde & Schwarz, Germany*
- 974  **C Miniaturized Signal-Interference Bandpass Filters Using Resonant RF Signal Paths**  
*Dimitra Psychogiou<sup>1</sup>, Roberto Gómez-García<sup>2</sup>*  
*<sup>1</sup>University of Colorado Boulder, USA; <sup>2</sup>Universidad de Alcalá, Spain*






## EuMC51: Calibration and Characterisation Techniques

Chair: Nick Ridler, NPL, UK

Co-Chair: Ralf Doerner, FBH, Germany

10:50-12:30, Thursday 14 January 2021, Flash

---

- N/A  **C** **Broadband Wafer-Level Characterization of Next-Generation Semiconductors: Requirements, Challenges, and Solutions**  
*Andrej Rumiantsev, MPI, Taiwan*
- 979  **C** **Meander-Type Transmission Line Design for On-Wafer TRL Calibration up to 330GHz**  
*Marco Cabbia<sup>1</sup>, Marina Deng<sup>1</sup>, Sébastien Fregonese<sup>1</sup>, Chandan Yadav<sup>1</sup>, Arnaud Curutchet<sup>1</sup>, Magali De Matos<sup>1</sup>, Didier Céli<sup>2</sup>, Thomas Zimmer<sup>1</sup>*  
*<sup>1</sup>IMS (UMR 5218), France; <sup>2</sup>STMicroelectronics, France*
- 983  **C** **A CPW Excitation Using a Contactless Dielectric Waveguide Probe for the V-Band**  
*Amr Samir, Mohamed Basha, Ahmed M. Hegazy, Safieddin Safavi-Naeini, University of Waterloo, Canada*
- 987  **C** **Quantitative Scanning Microwave Microscopy of Few-Layer Platinum Diselenide**  
*Xiaopeng Wang<sup>1</sup>, Kuanchen Xiong<sup>1</sup>, Lei Li<sup>1</sup>, James C.M. Hwang<sup>1</sup>, Xin Jin<sup>2</sup>, Gianluca Fabi<sup>3</sup>, Marco Farina<sup>3</sup>, Oliver Hartwig<sup>4</sup>, Maximilian Prechtl<sup>4</sup>, Georg S. Düsberg<sup>4</sup>, Alexander Göritz<sup>5</sup>, Matthias Wietstruck<sup>5</sup>, Mehmet Kaynak<sup>5</sup>*  
*<sup>1</sup>Cornell University, USA; <sup>2</sup>Anokiwave, USA; <sup>3</sup>Università Politecnica delle Marche, Italy; <sup>4</sup>Universität der Bundeswehr München, Germany; <sup>5</sup>IHP, Germany*
- 991  **C** **Dispersion in Millimeter-Wave and THz Dielectric Waveguides: Modeling, Measurement and Performance Limitations**  
*Joren Vaes, Patrick Reynaert, KU Leuven, Belgium*





## EuMC52 : Biological Microwave Effects and Imaging Techniques

Chair: *Katia Grenier, LAAS, France*

Co-Chair: *Juan-Mari Collantes, Universidad del País Vasco, Spain*

10:50-12:30, Thursday 14 January 2021, Glow

---

- N/A  **C** **Novel Challenges and Available Solutions for in situ Real Time Specific Absorption Rate Assessment in any Environment and up to Millimeter Waves**  
*Gwenaël Gaborit<sup>1</sup>, Lionel Duvillaret<sup>2</sup>*  
*<sup>1</sup>IMEP-LAHC (UMR 5130), France; <sup>2</sup>Kapteos, France*
- 999  **C** **A Coplanar Waveguide System for Drug Delivery Mediated by Nanoelectroporation: An Experimental and Numerical Study**  
*Laura Caramazza, Alessandra Paffi, Micaela Liberti, Francesca Apollonio, Università di Roma "La Sapienza", Italy*
- 1003  **C** **Generating Bipolar nsPulsed Electric Field Using Transmission Line & Avalanche Transistors**  
*Ilan W. Davies, Chris P. Hancock, Bangor University, UK*
- 1007  **C** **7T MRI Loop Antenna for Carotid Imaging**  
*Lars Hinge<sup>1</sup>, Nicolai Mortensen<sup>1</sup>, Vitaliy Zhurbenko<sup>1</sup>, Vincent O. Boer<sup>2</sup>, Wenjun Wang<sup>1</sup>*  
*<sup>1</sup>Technical University of Denmark, Denmark; <sup>2</sup>Hvidovre Hospital, Denmark*
- 1011  **C** **Intracellular Delivery of Graphene Oxide Quantum Dots for Bio-Imaging and Ferric Ion Sensing Based on Bulk Acoustic Wave Resonator**  
*Miaosen Zhang, Shan He, Xuexin Duan, Wei Pang, Yanyan Wang, Tianjin University, China*






## EuMC54: Low Noise Amplifier and Phased Array Module

Chair: *Almudena Suárez Rodríguez, Universidad de Cantabria, Spain*

Co-Chair: *Jean-François Villemazet, Thales Alenia Space, France*

13:50-15:30, Thursday 14 January 2021, Expedition

---

- 1015  **C** **A Full Ka-Band GaN-on-Si Low-Noise Amplifier**  
*Dristy Parveg, Mikko Varonen, Mikko Kantanen, VTT Technical Research Centre of Finland, Finland*
- 1019  **C** **A High Linearity W-Band LNA with 21-dB Gain and 5.5-dB NF in 0.13 $\mu$ m SiGe BiCMOS**  
*Huanbo Li<sup>1</sup>, Jixin Chen<sup>2</sup>, Debin Hou<sup>1</sup>, Pinpin Yan<sup>1</sup>, Wei Hong<sup>2</sup>*  
*<sup>1</sup>Southeast University, China; <sup>2</sup>Chinese Academy of Sciences, China*
- 1023  **C** **A MMIC Low-Noise Amplifier Realized with Two Different Gate Length GaN-on-Si Technologies**  
*Lorenzo Pace<sup>1</sup>, Patrick Ettore Longhi<sup>1</sup>, Walter Ciccognani<sup>1</sup>, Sergio Colangeli<sup>1</sup>, Rémy Leblanc<sup>2</sup>, Ernesto Limiti<sup>1</sup>*  
*<sup>1</sup>Università di Roma "Tor Vergata", Italy; <sup>2</sup>OMMIC, France*
- 1027  **C** **G-Band Frequency Converters in 130-nm InP DHBT Technology**  
*Ahmed Hassona, Vessen Vassilev, Herbert Zirath, Chalmers University of Technology, Sweden*
- 1031  **C** **mm-Wave Active Phased Array SiP Module for UE Devices in 5G Communications**  
*Wenyao Zhai, Hari Krishna Pothula, Morris Repeta, David Wessel, Tong Wen, Huawei Technologies, Canada*





## EuMC55 : Antenna Characterisation Techniques

Chair: Nuno Borges Carvalho, Instituto de Telecomunicações, Portugal

Co-Chair: Olof Bengtsson, FBH, Germany



13:50-15:30, Thursday 14 January 2021, Flash

---

- 1035  **C Preliminary Characterization of the Digitally Formed Beams of PHAROS2 Phased Array Feed**  
*Giuseppe Pupillo<sup>1</sup>, Alessandro Navarrini<sup>1</sup>, Andrea Melis<sup>1</sup>, Raimondo Concu<sup>1</sup>, Pierluigi Ortu<sup>1</sup>, Pasqualino Marongiu<sup>1</sup>, Giovanni Naldi<sup>1</sup>, Simone Rusticelli<sup>1</sup>, Andrea Saba<sup>2</sup>, Alessandro Scalambra<sup>1</sup>, Luca Schirru<sup>1</sup>, Adelaide Ladu<sup>1</sup>, Tonino Pisanu<sup>1</sup>, Enrico Urru<sup>1</sup>*  
<sup>1</sup>INAF, Italy; <sup>2</sup>ASI, Italy
- 1039  **C Characterization and Calibration Challenges of an K-Band Large-Scale Active Phased-Array Antenna with a Modular Architecture**  
*Naimeh Ghaffarian, Wael A. Wahab, Amir Raeesi, Ehsan Alian Aminabad, Ardeshir Palizban, Ahmad Ehsandar, Milad Khaki, Mohammad-Reza Nezhad-Ahmadi, Safieddin Safavi-Naeini, University of Waterloo, Canada*
- 1043  **C A Low Complexity Approach for Calibration and Characterization of a Millimeter Wave Phased-Array Transceiver-Antenna Module**  
*Mehdi Salehi<sup>1</sup>, Mohammad-Reza Nezhad-Ahmadi<sup>2</sup>, Safieddin Safavi-Naeini<sup>1</sup>*  
<sup>1</sup>University of Waterloo, Canada; <sup>2</sup>mmSense Technologies, Canada
- 1047  **C A Reproducible Semi-Virtual Test-Drive for Analysis of Car-to-Car/Car-to-X Diversity Performance at 5.9GHz in Noisy Fading Conditions**  
*A. Dobler, O. Voitsun, S. Lindenmeier, Universität der Bundeswehr München, Germany*

*EuMC55 continues next page...*

*EuMC55 continued...*

- 1051   **A Preliminary Study on Uncertainty of NB-IoT Measurements in Reverberation Chambers**  
*Anouk Hubrechtsen<sup>1</sup>, Vincent T. Neylon<sup>2</sup>, Kate A. Remley<sup>2</sup>, Robert D. Jones<sup>2</sup>,  
Robert D. Horansky<sup>2</sup>, Laurens A. Bronckers<sup>1</sup>*  
<sup>1</sup>*Technische Universiteit Eindhoven, The Netherlands;* <sup>2</sup>*NIST, USA*






## EuMC56: [Focussed Session] Electromagnetics in Biomedical Applications

Chair: Maarten Paulides, Technische Universiteit Eindhoven, The Netherlands

Co-Chair: Desmond T.B. Yeo, GE Global Research, USA

13:50-15:30, Thursday 14 January 2021, Glow

---

- 1055  **C** **Ultra-High Field MRI RF Transmit Coil Arrays**  
*C. van Leeuwen, Bart R. Steensma, Alexander J.E. Raaijmakers, UMC Utrecht, The Netherlands*
- 1059  **C** **Non-Invasive Brain Stimulation: From Field Modeling to Neuronal Activation**  
*D.C.W. Klooster, E.A.L Raaijmakers, M.J.R.A. van Rossum, M.C. van Beurden, P.A.J.M. Boon, R.M.C. Mestrom, Technische Universiteit Eindhoven, The Netherlands*
- 1063  **C** **7T MRI Fractionated Dipole Antenna for Carotid Imaging**  
*Nicolai Mortensen<sup>1</sup>, Lars Hinge<sup>1</sup>, Vitaliy Zhurbenko<sup>1</sup>, Vincent O. Boer<sup>2</sup>*  
*<sup>1</sup>Technical University of Denmark, Denmark; <sup>2</sup>Hvidovre Hospital, Denmark*
- 1067  **C** **Simulation Comparison of Birdcage Coil and Metamaterial Liner for MRI at 3T and 4.7T**  
*Adam Maunder, Nicola De Zanche, Ashwin K. Iyer, University of Alberta, Canada*
- 1071  **C** **PNS Estimation of a High Performance Head Gradient Coil by a Coupled Electromagnetic Neurodynamic Simulation Method**  
*Yihe Hua, Desmond T.B. Yeo, Thomas K.F. Foo, General Electric, USA*



## EuMC57: [Special Session] In Recognition: Prof.Dr. A.T. de Hoop

Chair: Peter Zwamborn, TNO, The Netherlands

Co-Chair: Arnold van Ardenne, ASTRON (retired), The Netherlands

13:50-15:30, Thursday 14 January 2021, Media Arena

---

- N/A  **C A Few Introductory Remarks**  
*Arnold van Ardenne, ASTRON, The Netherlands*
- N/A  **C To Have “(De) Hoop” in Difficult Times**  
*Guy A.E. Vandenbosch, KU Leuven, Belgium*
- N/A  **C Time-Domain Antenna Engineering — A Story About Scientific Affinity**  
*Ioan E. Lager, Technische Universiteit Delft, The Netherlands*
- N/A  **C The Cagniard-deHoop Method of Moments — A New Time-Domain Integral Equation Technique Based on EM Reciprocity and the Cagniard-deHoop Method**  
*Martin Štumpf, Brno University of Technology, Czech Republic*






## EuMC58: EuMC Interactive Poster Session 3

Chair: Sander Bronckers, Technische Universiteit Eindhoven, The Netherlands

Co-Chair: Mark Oude Alink, University of Twente, The Netherlands





14:30-16:20, Thursday 14 January 2021, Hall 1

---

- 1079  **C** **Design of Wideband Frequency Selective Absorber Based on Multilayer Structures**  
*Ye Han, Longjie Xu, Hanjing Xu, Siyu Xie, NJUPT, China*
- 1083  **C** **A 2.5GHz Tunable Negative Varactor of Inductance Using Reconfigurable Non-Foster Circuit**  
*Ngoc Duc Au, Soongsil University, Korea*
- 1087  **C** **Design of a Cloak with Diagonally Slotted Square Patch for TE and TM Scattering Reduction**  
*Archana Rajput<sup>1</sup>, Mehran M. Zargar<sup>1</sup>, Kushmanda Saurav<sup>1</sup>, Shibani K. Koul<sup>2</sup>*  
*<sup>1</sup>IIT Jammu, India; <sup>2</sup>IIT Delhi, India*
- 1091  **C** **A Compact Load-Modulation Amplifier for Improved Efficiency Next Generation Mobile**  
*Ahmed M. Abdulkhaleq<sup>1</sup>, Maan A. Yahya<sup>2</sup>, Y. Al-Yasir<sup>3</sup>, N. Ojaroudi Parchin<sup>3</sup>, M. Sajedin<sup>4</sup>, Syed M.H. Syed Anera<sup>1</sup>, A. Rayit<sup>1</sup>, I.T.E. Elfergani<sup>4</sup>, R.A. Abd-Alhameed<sup>3</sup>, J. Rodriguez<sup>4</sup>*  
*<sup>1</sup>SARAS Technology, UK; <sup>2</sup>Northern Technical University, Iraq; <sup>3</sup>University of Bradford, UK; <sup>4</sup>Instituto de Telecomunicações, Portugal*
- 1095  **C** **A 65W Power Amplifier Without Load Modulation to Achieve 50% Efficiency at 8dB Power Back-Off Over 1.8-2.5GHz**  
*Paul Saad, Rui Hou, Richard Hellberg, Bo Berglund, Ericsson, Sweden*

*EuMC58 continues next page...*

*EuMC58 continued...*

- 1099  **C** **GaN-FET Class-E Amplifier for 60-MHz Radar**  
*Frederick H. Raab, Green Mountain Radio Research, USA*
- 1103  **C** **A High Efficiency Compact Class F GaN MMIC Power Amplifier for 5G Applications**  
*Rachit Joshi, Min-Hsin Liu, Shawn S.H. Hsu, National Tsing Hua University, Taiwan*
- 1107  **C** **Reliable Structural Failure Detection in Eye Bolts Using Reflectometry Signals**  
*H.V.H. Silva Filho<sup>1</sup>, D.C.P. Barbosa<sup>1</sup>, M.S. Coutinho<sup>1</sup>, M.T. de Melo<sup>1</sup>, R.G.M. dos Santos<sup>1</sup>, I. Llamas-Garro<sup>2</sup>*  
*<sup>1</sup>UFPE, Brazil; <sup>2</sup>CERCA CTTC, Spain*
- 1111  **C** **Integrated System with Enhanced Performances to Recover Energy from Microstrip Circuits**  
*Miguel A. Sánchez-Soriano<sup>1</sup>, Yves Quéré<sup>2</sup>, Cédric Quendo<sup>2</sup>*  
*<sup>1</sup>Universidad de Alicante, Spain; <sup>2</sup>Lab-STICC (UMR 6285), France*
- 1115  **C** **An Efficient Wireless Power Transfer for Retinal Prosthesis Using Artificial Intelligent Algorithm**  
*Nam Ha-Van<sup>1</sup>, Tung Lam Vu<sup>1</sup>, Minh Thuy Le<sup>2</sup>*  
*<sup>1</sup>Aalto University, Finland; <sup>2</sup>Hanoi University of Science & Technology, Vietnam*
- 1119  **C** **Cross-Polarization Chipless Tag for Orientation Sensing**  
*Nicolas Barbot, Olivier Rance, Etienne Perret, LCIS (EA 3747), France*
- 1123  **C** **Anti-Aliasing Digital Predistortion for Nonuniform-Sampling-Rate Concurrent Dual-Band Transmitters**  
*Long Chen<sup>1</sup>, Wenhua Chen<sup>1</sup>, Youjiang Liu<sup>2</sup>, Zhenghe Feng<sup>1</sup>*  
*<sup>1</sup>Tsinghua University, China; <sup>2</sup>CAEP, China*

*EuMC58 continues next page...*

*EuMC58 continued...*

- 1127  **C** **A Complementary Series-Parallel Resonant Circuit Pair and its Application in Linearization of Power Amplifiers**  
*Zeji Gu, Ampleon, USA*
- 1131  **C** **Technique for Load-Independent Millimeter-Wave Output Power Monitoring for Mass-Volume Testing**  
*Matthias Saurer, Oliver Frank, Vadim Issakov, Infineon Technologies, Germany*
- 1135  **C** **A Microstrip Filtering Patch Antenna with Asymmetric Gain Response**  
*Yun Wu<sup>1</sup>, Jinhao Dai<sup>1</sup>, Liang Sun<sup>1</sup>, Yi Wang<sup>2</sup>, Yunlong Lu<sup>3</sup>, Jifu Huang<sup>3</sup>*  
*<sup>1</sup>Chinese Academy of Sciences, China; <sup>2</sup>University of Birmingham, UK; <sup>3</sup>Ningbo University, China*
- N/A  **C** **A 79-GHz Automotive Wide-Beam Patch Antenna with I-Shaped Parasitic Elements**  
*Guan-Ren Su<sup>1</sup>, Eric S. Li<sup>1</sup>, Jia-Chang Chen<sup>2</sup>, Ting-Wei Kuo<sup>2</sup>, Yu-You Lin<sup>2</sup>, Kuo-Sheng Chin<sup>2</sup>*  
*<sup>1</sup>Taipei Tech, Taiwan; <sup>2</sup>Chang Gung University, Taiwan*
- N/A  **C** **Hemispherical Coverage Antenna Using Pattern Reconfiguration of Electronically Steerable Parasitic Array Radiator and Microstrip Patch**  
*ByungKuon Ahn, Hyunyoung Cho, Hye-won Jo, Ju-Ik Oh, Jong-Won Yu, KAIST, Korea*
- 1147  **C** **Antenna Library for IoT Devices with Antenna Boosters**  
*Jaume Anguera<sup>1</sup>, Carles Puente<sup>1</sup>, Aurora Andújar<sup>1</sup>, Rosa M. Mateos<sup>1</sup>, David Vye<sup>2</sup>, Milton Lien<sup>2</sup>*  
*<sup>1</sup>Fractus Antennas, Spain; <sup>2</sup>Cadence AWR, USA*
- 1151  **C** **Analysis and Optimization of Packaged Floating-Ground RF Power GaN-HEMTs**  
*Sophie Paul, Wolfgang Heinrich, Olof Bengtsson, FBH, Germany*

## EuMW03: EuMW/EuMC Closing Session

*Chair: Frank E. van Vliet, TNO, The Netherlands*

*Co-Chair: Wim van Cappellen, ASTRON, The Netherlands*

*16:10-17:50, Thursday 14 January 2021, Polar*

---

- N/A      **C** **Laser Communications: A Game Changer**  
*Laurent Grouès, Airbus, Germany*
- N/A      **C** **New Frontiers for Wave Engineering Using Metamaterials**  
*Andrea Alù, CUNY Graduate Center, USA*






## EuMIC/EuMC01 : Silicon Integrated Sub-mmWave Circuits

Chair: Christophe, Gaquière, IEMN (UMR 8520), France

Co-Chair: François Deborgies, ESA-ESTEC, The Netherlands

08:30-10:10, Tuesday 12 January 2021, Quest

---

- N/A  **C** **A 240-GHz FMCW Radar Transceiver with 10dBm Output Power Using Quadrature Combining**  
*Faisal Ahmed<sup>1</sup>, Muhammad Furqan<sup>1</sup>, Klaus Aufinger<sup>2</sup>, Andreas Stelzer<sup>3</sup>*  
<sup>1</sup>Infineon Technologies, Austria; <sup>2</sup>Infineon Technologies, Germany; <sup>3</sup>Johannes Kepler Universität Linz, Austria
- 1159  **C** **A 160GHz High Output Power and High DC-to-RF Efficiency Fundamental Oscillator in a 130-nm SiGe BiCMOS Process**  
*Xingcun Li, Wenhua Chen, Yunfan Wang, Zhenghe Feng, Tsinghua University, China*
- N/A  **C** **250GHz SiGe SPDT Resonator Switch**  
*Yehia Tawfik<sup>1</sup>, Ahamed Raju<sup>1</sup>, Mikko Varonen<sup>2</sup>, Md. Najmussadat<sup>1</sup>, Kari A.J. Halonen<sup>1</sup>*  
<sup>1</sup>Aalto University, Finland; <sup>2</sup>VTT Technical Research Centre of Finland, Finland
- N/A  **C** **Compact and Transfer Printable 64Gb/s Differential Transimpedance Amplifier in 130-nm BiCMOS**  
*Mesut Inac<sup>1</sup>, Adel Fatemi<sup>1</sup>, Friedel Gerfers<sup>2</sup>, Andrea Malignaggi<sup>1</sup>*  
<sup>1</sup>IHP, Germany; <sup>2</sup>Technische Universität Berlin, Germany
- N/A  **C** **A 122-242GHz Dynamic Frequency Divider in an Advanced BiCMOS Technology**  
*Badou Sene<sup>1</sup>, Herbert Knapp<sup>1</sup>, Daniel Reiter<sup>1</sup>, Nils Pohl<sup>2</sup>*  
<sup>1</sup>Infineon Technologies, Germany; <sup>2</sup>Ruhr-Universität Bochum, Germany






## EuMC/EuRAD01 : Radar Receivers and Front-Ends

Chair: Massimo C. Comparini, Telespazio, Italy

Co-Chair: Jens Engelmann, Thales, Germany

08:30-10:10, Thursday 14 January 2021, Expedition

---

- N/A  **C** **A 1.5–40GHz FMCW Radar Receiver Front-End**  
*Mantas Sakalas<sup>1</sup>, Niko Joram<sup>2</sup>, Frank Ellinger<sup>2</sup>*  
<sup>1</sup>BPTI, Lithuania; <sup>2</sup>Technische Universität Dresden, Germany
- N/A  **C** **Analysis of Time-Interleaved ADC Offset and Gain Mismatch Errors in PMCW Radar**  
*D. Rosenmuller<sup>1</sup>, Kostas Doris<sup>2</sup>, Georgi Radulov<sup>1</sup>, Marion K. Matters-Kammerer<sup>1</sup>*  
<sup>1</sup>Technische Universiteit Eindhoven, The Netherlands; <sup>2</sup>NXP Semiconductors, The Netherlands
- N/A  **C** **Analogue Baseband Processing for Single Chip Radar Proximity Sensor**  
*Maurice van Wanum, M. Polushkin, R. van Dijk, TNO, The Netherlands*
- 1186  **C** **Active MMIC Circulator Performance in a Phased-Array-Like Environment**  
*Laila Marzall<sup>1</sup>, Shane Verploegh<sup>1</sup>, Tommaso Cappello<sup>1</sup>, Michael Roberg<sup>2</sup>, Zoya Popović<sup>1</sup>*  
<sup>1</sup>University of Colorado Boulder, USA; <sup>2</sup>Qorvo, USA
- 1190  **C** **A 9 to 12.1GHz Sub-Sampling ADPLL Based on a Stochastic Flash TDC and a DCO with a “Folded” Common-Mode Resonator Exhibiting Less Than 90fs Jitter and a Peak FoMj of -248dB in 16nm FinFet CMOS**  
*R. Levinger, E. Shumaker, A. Farber, S. Bershansky, N. Geron, O. Degani, A. Ravi, R. Banin, E. Banin, J. Kadry, G. Horovitz, Intel, Israel*






## EuMC/EuRAD02 : [Special Session] Focus Day: Active Array Antennas for Space

Chair: Giovanni Toso, ESA-ESTEC, The Netherlands

Co-Chair: Natanael Ayllon, ESA-ESTEC, The Netherlands

10:50-12:30, Thursday 14 January 2021, Auditorium

---

- N/A  **C** **Recent Developments on MMIC for Active Array Antenna**  
*T. Huet<sup>1</sup>, H. Moula-Karimdjy<sup>1</sup>, Marc Camiade<sup>1</sup>, Veronique Serru<sup>1</sup>, G. Mouchon<sup>2</sup>, A. Maati<sup>2</sup>*  
<sup>1</sup>United Monolithic Semiconductors, France; <sup>2</sup>Thales, France
- N/A  **C** **Architecture and Capacity Evolution in Active Antennas for Earth Observation, Telecom, and Deep Space at AIRBUS DS SPAIN**  
*Antonio Montesano, Airbus, Spain*
- N/A  **C** **Additive Manufacturing: Enabling Technology for GEO Active Antennas**  
*Tomislav Debogovic<sup>1</sup>, Esteban Menargues<sup>1</sup>, Mathieu Billod<sup>1</sup>, José Ignacio Echeveste<sup>2</sup>, Francisco Cano<sup>2</sup>, Antonio Montesano<sup>2</sup>*  
<sup>1</sup>SWISSto12, Switzerland; <sup>2</sup>Airbus, Spain
- N/A  **C** **Active Antenna Development at Thales Alenia Space**  
*Christophe Benoist, Michael Blum, Anne Couarraze, Thierry Girard, Jérémie Le Guen, Benoit Lejay, Laurent Levert, Madivanane Nadarassin, Olivier Perrin, Thierry Rostan, Julien Rotureau, Hassan Solhi, Eric Vourch, Thales Alenia Space, France*
- N/A  **C** **Airbus UK Active Antenna Developments, Challenges and the Future**  
*Sonya Amos, Glyn Thomas, Steve McLaren, Carolina Tienda-Herrero, David Dupuy, Airbus, UK*



**EuMC/EuRAD03: [Special Session] Focus Day: Active Array Antennas for Defence**

*Chair: Peter Knott, Fraunhofer FHR, Germany*

*Co-Chair: Patrick Langlois, European Defence Agency, Belgium*

*13:50-15:30, Thursday 14 January 2021, Auditorium*

---

- N/A  **C Research Progress of Intelligent Active Phased Array Radar**  
*Jun Sun, CETC 14, China*
- N/A  **C Digital Frontends for Multi-Functional RF Systems**  
*Michael Brandfass, Hensoldt Sensors, Germany*
- N/A  **C Naval and Ground-Based Multi-Mission AESA Radars**  
*Simon van den Berg, Thales, The Netherlands*
- N/A  **C AESA Radar for Space Situational Awareness — About the Status of GESTRA**  
*H. Wilden<sup>1</sup>, C. Kirchner<sup>1</sup>, A. Brenner<sup>1</sup>, T. Eversberg<sup>2</sup>*  
*<sup>1</sup>Fraunhofer FHR, Germany; <sup>2</sup>DLR, Germany*
- N/A  **C AESA Radar Development at Lincoln Lab**  
*David Conway, MIT Lincoln Laboratory, USA*