

German Microwave Conference - GeMiC 2005 -

University of Ulm

April 5 - 7, 2005

www.gemic2005.de

Conference Proceedings

Editor: Wolfgang Menzel, University of Ulm

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Expert Groups:

Antennas
Microwave Techniques

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German IEEE
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Institut für Mikrowellen-
und Antennentechnik e. V.

Exhibition:

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About the Conference

The **German Microwave Conference - GeMiC 2005** - will be held at the University of Ulm from April 5 to 7, 2005. It is a new start to present a national and international forum for microwave researchers and engineers in Germany. The conference is supported by the **IEEE MTT Society**, the **German IEEE MTT/AP Chapter**, and the **Expert Groups "Microwave Techniques" and "Antennas"** of the German VDE/ITG. It is organized by the **German Institute for Microwave and Antenna Technology**, a scientific, non-profit organization with the intention to promote R&D activities at universities, research centers and companies in the fields of microwaves, antennas and optoelectronics.

The **GeMiC 2005** will be a three-days conference with 2 plenary and 12 normal sessions, including 5 invited and 60 contributed presentations from both German and international authors. It will provide ample room for scientific exchange of information about latest achievements in the field of technologies, circuits and systems. In order to get together and get to know each other, there will be a reception at the end of the first day.

Parallel to the conference, an exhibition will be organized by **GEROTRON**, where major suppliers and representatives of RF & microwave equipment will present their products. Furthermore, on Wednesday, April 6, an IEEE membership meeting will take place after the sessions. At the end of the conference on April 7, presentations and visits will be organized at the University of Ulm ("Electronic Devices and Circuits" and "Microwave Techniques" departments) and at local companies.

The conference and the exhibition will be held in the building of the Engineering Faculty of the University of Ulm situated in the western part of the University campus on the "Eselsberg". The city of Ulm itself is well known for its old city including the Fisherman's Quarter and the "Ulmer Münster" with the highest church spire of the world. Also the most famous German scientist, Albert Einstein, was born in Ulm.

Wolfgang Menzel
Conference Chairman

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Microwave Techniques, University of Ulm

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Tactron Elektronik

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Session Overview

Tuesday, April 5, 2005

Time	Room 1 (45.1)	Room 2 (45.2)
2.00 pm - 4.00 pm	1 Plenary Session I	—
4.00 pm - 4.20 pm	Break	
4.20 pm - 6.00 pm	2a Passive Circuits	2b Measurement Techniques
6.00 pm - 7.00 pm	Reception	

Wednesday, April 6, 2005

Time	Room 1 (45.1)	Room 2 (45.2)
8.30 am - 10.10 am	3a Passive Filters	3b Antenna Elements
10.10 am - 10.30 am	Break	
10.30 am - 12.30 pm	4a Active Filters	4b Antenna Arrays and Frequency Selective Surfaces
12.30 pm - 2.00 pm	Lunch	
2.00 pm - 4.00 pm	5 Plenary Session II	—
4.00 pm - 4.20 pm	Break	
4.20 pm - 6.00 pm	6a High Speed Digital Circuits	6b Antenna Systems & Propagation

Thursday, April 7, 2005

Time	Room 1 (45.1)	Room 2 (45.2)
8.30 am - 10.10 am	7a Active Devices	7b Field Theory & EMC
10.10 am - 10.30 am	Break	
10.30 am - 12.30 pm	8a Active Circuits	8b Radar, Sensors, Imaging
12.30 pm - 1.00 pm	Closing Session	
1.00 pm - 4.00 pm	Add-on Activities	

Sessions

Session 1 - Plenary Session I

Tuesday, April 5, 2005

2.00 PM - 4.00 PM

Session Chair: Wolfgang Menzel (University of Ulm)

Welcome Address

Prof. Dr. Karl-Joachim Ebeling, Rector University of Ulm

Welcome, Introduction to the Conference

Wolfgang Menzel, Conference Chairman

1-1: Large-Signal IMPATT-Mode Operation of AlGa_N/Ga_N HFET's (Invited)

R. J. Trew, G. L. Billbro

ECE Department, North Carolina State University, Raleigh, North Carolina, USA

1-2: High-Speed Analog and Digital IC's: Research Results and Applications (Invited)

W. Simbürger (1), K. Aufinger (1), J. Böck (1), S. Boguth (1), D. Kehrer (1), C. Kienmayer (1), H. Knapp (1), T. F. Meister (1), W. Perndl (2), M. Rest (1), C. Sandner (3), H. Schäfer (1), R. Schreiter (1), R. Stengl (1), R. Thüringer (1,4), M. Tiebout (1), H. D. Wohlmuth (1), M. Wurzer (1), A. L. Scholtz (1)

(1) Infineon Technologies, Munich, Germany

(2) now with BMW Motoren GmbH, Steyr, Austria

(3) Infineon Technologies, Villach, Austria

(4) Vienna University of Technology, Vienna, Austria

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Session 2a - Passive Circuits

Tuesday, April 5, 2005

4.20 PM - 6.00 PM

Session Chairs: Lorenz-Peter Schmidt (University of Erlangen)

Rolf Jakoby (Technical University of Darmstadt)

2a-1: Low-complexity RF-MEMS Technology for Microwave Phase Shifting Applications

C. Siegel (1), V. Ziegler (1), U. Prechtel (1), H. Schumacher (2)

(1) Corporate Research Centre, EADS Deutschland GmbH, Munich, Germany

(2) Dept. of Electron Devices and Circuits, University of Ulm, Ulm, Germany

2a-2: Microwave Breakdown Prediction in Rectangular Waveguide Based Components

C. Vicente (1), M. Mattes (2), D. Wolk (3), B. Mottet (1), H. L. Hartnagel (1), J. R. Mosig (2), D. Raboso (4)

(1) Institut für Hochfrequenztechnik, Technical University of Darmstadt, Darmstadt, Germany

(2) Lab. d'Electromagn. et Acoustique, Ecole Polytechnique Federale de Lausanne, Lausanne, Switzerland

(3) TESAT-Spacecom GmbH & Co. KG, Backnang, Germany

(4) ESA-ESTEC, Noordwijk, Netherlands

2a-3: Advanced Broadband 2nd-Level-Interconnects for LTCC Multi-Chip-Modules

Torben Baras, Arne F. Jacob

Hochfrequenztechnik, Technische Universität Hamburg-Harburg, Hamburg, Germany

2a-4: 2D Periodic Defected Ground Structure for Coplanar Waveguide

Ehab K. I. Hamad (1), Amr M. E. Safwat (2), Abbas S. Omar (1)

(1) Chair of Microwave and Comm. Eng., Otto-von-Guericke-University Magdeburg, Germany

(2) Electronics and Comm. Eng. Dept., Ain Shams University, Cairo, Egypt

2a-5: A Compact Differential Inductor with Improved Self-Resonance Frequency

Vito Minerva

Dept. of Electronics and Information, Polytechnic of Milan, Milan, Italy

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Session 2b - Measurement Techniques

Tuesday, April 5, 2005
4.20 PM - 6.00 PM

Session Chairs: Reinhard Knöchel (University of Kiel)
Arne Jacob (Technical University of Hamburg-Harburg)

2b-1: Neural Networks for Microwave Characterization of Arbitrary Shaped Material Samples in Leaky Cavities

Andreas Penirschke (1), Martin Schüssler (1), Martin Vossiek (2), Peter Gulden (3), Rolf Jakoby (1)

- (1) Institut für Hochfrequenztechnik, Technische Universität Darmstadt, Darmstadt, Germany
- (2) Technische Universität Clausthal, Clausthal-Zellerfeld, Germany
- (3) Siemens Corporate Technology, Munich, Germany

2b-2: A Multi-Layered Waveguide Technique for Determining Permittivity and Conductivity of Composite Materials

M. J. Akhtar (1), L. Feher (1), M. Thumm (1,2)

- (1) Inst. für Hochleistungsimpuls- und Mikrowellentechnik, Forschungsz. Karlsruhe, Karlsruhe, Germany
- (2) Institut für Höchstfrequenztechnik und Elektronik, Universität Karlsruhe, Karlsruhe, Germany

2b-3: Development of a Broadband Real-time Frequency Measurement System for High Power mm-Wave Gyrotrons

H. O. Prinz (1), A. Arnold (1,2), K. Koppenburg (1), M. Thumm (1,2)

- (1) Association EURATOM-FZK, IHM, Forschungszentrum Karlsruhe, Karlsruhe, Germany
- (2) Institut für Höchstfrequenztechnik und Elektronik, Universität Karlsruhe, Karlsruhe, Germany

2b-4: A Modular Vector Field Measurement System at 150 GHz, 300 GHz and 450 GHz

A. Hofmann, G. Seibert, M. Manglberger, A. Kalb, A. Göbel, S. Yao, J. Weinzierl, L.-P. Schmidt, H. Brand

Inst. for Microw. Engineering, University of Erlangen-Nuremberg, Erlangen, Germany

2b-5: Application of Double Reflector Compact Ranges for Time Domain RCS Measurements

Dietmar Fasold (1), Jürgen Hartmann (2), Philipp Rittsteiger (1)

- (1) Elect. Eng. and Information Techn. Dep., Munich University of Applied Sciences, Munich, Germany
- (2) Measurement Technology, EADS Astrium GmbH, Munich, Germany

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Session 3a - Passive Filters

Wednesday, April 6, 2005

8.30 AM - 10.10 AM

Session Chairs: Uwe Rosenberg (Marconi Communications, Backnang)

Georg Böck (Technical University of Berlin)

3a-1: Q-Factor Improvement of Compline Resonators

Michael Höft, Stefan Burger

Comm. Lab. of European Technology Center, Panasonic Electronic Devices GmbH, Lüneburg, Germany

3a-2: Design of WLAN Filters in LTCC and LCP System-On-Package Technologies

V. Palazzari (1), S. Pinel (2), M. M. Tentzeris (2), L. Roselli (1), J. Laskar (2), F. Alimenti (1)

(1) Dipartimento di Ingegneria Elettronica e dell'Informazione, Università di Perugia, Perugia, Italy

(2) School of Electrical and Computer Engineering, Georgia Inst. of Technology, Atlanta, USA

3a-3: Compact Suspended Stripline Quasi-Elliptic Low-Pass Filters

Wolfgang Menzel, Atallah Balalem

Microwave Techniques, University of Ulm, Germany

3a-4: Channel Branching Equipment for Outdoor Radio Transceivers Serving High Capacity (nxSTM-1) Short Haul Radio Links

Uwe Rosenberg, Jürgen Ebinger, Michael Knipp

Marconi Communications GmbH, Backnang, Germany

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Session 3b - Antenna Elements

Wednesday, April 6, 2005

8.30 AM - 10.10 AM

Session Chairs: Achim Dreher (DLR, Oberpfaffenhofen)

Josef Wenger (DaimlerChrysler, Ulm)

3b-1: A Matching Technique for Dual-Band Composite Right/Left Handed (CRLH) Transmission Line Resonator Antennas

S. Otto (1), A. Rennings (1), C. Caloz (2), P. Waldow (1)

(1) Department of Engineering, Duisburg-Essen University, Duisburg, Germany

(2) École Polytechnique de Montréal, Montréal, Canada

3b-2: A Highly Decoupled Dual Antenna Rx/Tx Arrangement Based on LTCC Modules

A. Rennings (1), M. Vesterling (1), A. Pimpertz (1), W. Schroeder (2), M. Leitner (3), P. Waldow (1)

(1) Department of Engineering, Duisburg-Essen University, Duisburg, Germany

(2) Technology & Innovation, Siemens Communications, Bocholt, Germany

(3) Epcos OHG, Deutschlandsberg, Austria

3b-3: Very Broadband Radiating Element

Eugen Arnold, Ingo Walter

EADS Deutschland GmbH, Ulm, Germany

3b-4: Focusing Element Aberration Reduction Procedure: Application to Spherical Metal Plate Lenses

E. Jehamy, G. Landrac, M. M. Ney

Lab. of Electronics and Systems for Telecomm., ENST-Bretagne, University of Western Brittany, Brest, France

3b-5: Meander Antenna with Backside Tuning Stubs

The Nan Chang, C. C. Kuo

Electrical Engineering Dept., Tatung University, Taipei, Taiwan

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Session 4a - Active Filters

Wednesday, April 6, 2005
10.30 AM - 12.30 PM

Session Chairs: Robert Schneider (DaimlerChrysler, Ulm)
Erwin Biebl (Technical University of Munich)

4a-1: 2 GHz Tunable Integrated Differential Active Bandpass Filter on Silicon

Zoheir Sassi (1), Sébastien Darfeuille (1), Bruno Barelaud (1), Laurent Billonnet (1), Bernard Jarry (1), Hervé Marie (2), Nguyen Tran Luan Le (2), Patrice Gamand (2)

(1) IRCOM, University of Limoges, Limoges, France

(2) Innovation Centre RF, Philips Semiconductors, Caen, France

4a-2: Selective Tunable Active Filter with Gain using Active Impedance Profile Technique

Sébastien Dardillac, Laurent Billonnet, Bernard Jarry

IRCOM, University of Limoges, Limoges, France

4a-3: Improved Magnitude Sensitive Detector Structure for Automatically Tuned Filters at Microwave Frequencies

Eckhard Neber (1), Laurent Billonnet (2), Bernard Jarry (2), Michael H. W. Hoffmann (1)

(1) Microwave Techniques, University of Ulm, Ulm, Germany

(2) IRCOM, University of Limoges, Limoges, France

4a-4: A Fully-Differential 2 GHz Tunable Recursive Bandpass Filter on Silicon

Sébastien Darfeuille (1), Zoheir Sassi (1), Bruno Barelaud (1), Laurent Billonnet (1), Bernard Jarry (1), Hervé Marie (2), Nguyen Tran Luan Le (2), Patrice Gamand (2)

(1) IRCOM, University of Limoges, Limoges, France

(2) Innovation Centre RF, Philips Semiconductors, Caen, France

4a-5: Transversal Notch Filter Design using Recursive Principles in MMIC Technology

B. Albert, L. Billonnet, B. Jarry

IRCOM, University of Limoges, Limoges, France

4a-6: Microwave Analogue FIR-Filter

Klaus Solbach, Taleb Oud Mohamed, Markus Neinhüs, Michael Tekloth

Hochfrequenztechnik, University Duisburg-Essen, Duisburg, Germany

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Session 4b - Antenna Arrays and Frequency Selective Surfaces

Wednesday, April 6, 2005
10.30 AM - 12.30 PM

Session Chairs: Klaus Solbach (University of Duisburg-Essen)
Dirk Heberling (IMST, Kamp-Lintfort)

4b-1: Phased Array Technology: Trends & Developments

Rens Baggen, Sybille Holzwarth, Martin Böttcher, Michael Eube
IMST GmbH, Kamp-Lintfort, Germany

4b-2: Proceeding for Calculating Large Arrays

Eugen Arnold
EADS Deutschland GmbH, Ulm, Germany

4b-3: Concept of Microwave Electronic Steered Array using Analogue FIR-Filter

M. Neinhüs, K. Solbach, S. Held
Hochfrequenztechnik, Universität Duisburg-Essen, Duisburg, Germany

4b-4: 94 GHz Zonal Rings Reflector for Helicopter Collision Avoidance

B. D. Nguyen, C. Migliaccio, C. Pichot
Lab. d'Electronique, Antennes et Télécom., Université de Nice-Sophia Antipolis, Valbonne, France

4b-5: Multi-layered Submillimetre FSS of Shifted Crossed Slot Elements for Applications in Radio Astronomy

Ge Wu (1), Volkert Hansen (1), Hans-Peter Gemünd (2), Ernst Kreysa (2)
(1) Chair of Electromagnetic Theory, University of Wuppertal, Wuppertal, Germany
(2) Max-Planck-Institute for Radioastronomy, Bonn, Germany

4b-6: A Frequency Selective Surface for Harmonic Suppression in THz-Multipliers

S. Biber, O. Günther, M. Bozzi, L. Perregrini, B. M. Fischer, A. Hofmann, P. U. Jepsen, H. Helm, L.-P. Schmidt
Inst. for Microwave Technology, University of Erlangen-Nuremberg, Erlangen, Germany

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Session 5 - Plenary Session II

Wednesday, April 6, 2005
2.00 PM - 4.00 PM

Session Chair: Michael Hoffmann (University of Ulm)

5-1: [Microwave Photonics - From Concepts to Applications \(Invited\)](#)

Dieter Jäger, Andreas Stöhr

Zentrum für Halbleitertechnik und Optoelektronik, University Duisburg-Essen, Duisburg, Germany

5-2: [RF-Payload for TerraSAR-X \(Invited\)](#)

Dietmar Pilz (1), Peter Feldle (2)

(1) EADS Deutschland GmbH, Defence Electronics, Synthetic Aperture RADAR, Friedrichshafen, Germany

(2) EADS Deutschland GmbH, Defence Electronics, Analogue Hardware, Ulm, Germany

5-3: [Automotive Radar - Status and Trends \(Invited\)](#)

Martin Schneider

Robert Bosch GmbH, Corporate Research, Hildesheim, Germany

5-4: [Trends in Automotive RF Wireless Applications and their Electromagnetic Spectrum Requirements](#)

Hans Ludwig Blöcher (1), Gerhard Rollmann (2), Steffen Gärtner (2)

(1) Research & Technology, DaimlerChrysler AG, Ulm, Germany

(2) DaimlerChrysler AG, Sindelfingen, Germany

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Session 6a - High Speed Digital Circuits

Wednesday, April 6, 2005

4.20 PM - 6.00 PM

Session Chair: Holger Heuermann (University of Applied Sciences Aachen)

6a-1: Sensitivity Matched Static Frequency Divider Using a 0.8 um SiGe HBT Technology

Ertugrul Sönmez, Sebastien Chartier, Peter Abele, Andreas Trasser, Hermann Schumacher
Dept. of Electron Devices and Circuits, University of Ulm, Germany

6a-2: Bias Dependent Boolean Multivalued Logic Application of Resonant Tunneling Bipolar Transistors

A. Matiss, J. Driesen, S. Ehrich, W. Prost, F.-J. Tegude
Department of Solid State Electronics, University Duisburg-Essen, Duisburg, Germany

6a-3: Performance Estimate for High-speed CMOS-Current-Mode-Logic Circuits based on Output Voltage Swing Considerations

Niels Christoffers, Renee Lerch, Bedrich J. Hosticka, Stephan Kolnsberg, Rainer Kokozinski
Fraunhofer Institute for Microelectronic Circuits and Systems, Duisburg, Germany

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Session 6b - Antenna Systems & Propagation

Wednesday, April 6, 2005

4.20 PM - 6.00 PM

Session Chairs: Heinz-Peter Feldle (EADS, Ulm)
Werner Wiesbeck (University of Karlsruhe)

6b-1: New Internal Beam-Forming Mirror System for a Multi-Frequency 1 MW F-Band Gyrotron

X. Yang (1), A. Arnold (1,2), E. Borie (1), G. Dammertz (1), O. Drumm (2), K. Koppenburg (1), O. Prinz (1,2), D. Wagner (3), M. Thumm (1,2)

(1) Association EURATOM-FZK, IHM, Forschungszentrum Karlsruhe, Karlsruhe, Germany

(2) Institut für Höchstfrequenztechnik und Elektronik, Universität Karlsruhe, Karlsruhe, Germany

(3) Association EURATOM-IPP, Max-Planck-Institut für Plasmaphysik, Garching, Germany

6b-2: Radiation-Based Alignment Method for Millimetre-Wave Antennas

Robert Schneider

DaimlerChrysler Research and Technology, Ulm, Germany

6b-3: Antenna Coupling on Electromagnetic Large Objects

I. Walter, E. Arnold, C. Holtzhausen, M. Sabielny

EADS Germany, Ulm, Germany

6b-4: Dominant Path Prediction Model for Indoor Scenarios

Gerd Wölflé (1), Rene Wahl (1), Philipp Wertz (2), Pascal Wildbolz (1), Friedrich Landstorfer (2)

(1) AWE Communications GmbH, Böblingen, Germany

(2) Institut für Hochfrequenztechnik, University of Stuttgart, Stuttgart, Germany

6b-5: Propagation Effekte beim Übergang von See auf Land und ihre Auswirkung auf ein RADAR

B. Michael, S. Ban

Defence Electronics, EADS Deutschland GmbH, Ulm, Germany

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Session 7a - Active Devices

Thursday, April 7, 2005
8.30 AM - 10.10 AM

Session Chairs: Hermann Schumacher (University of Ulm)
Erich Kasper (University of Stuttgart)

7a-1: 10 W Broadband Load-Pull for GaN/AlGaN Characterization

M. Gamal-El-Din, Bernd Bunz, Günter Kompa
Fachgebiet Hochfrequenztechnik, University of Kassel, Kassel, Germany

7a-2: Modeling of SiC MESFETs for Broadband PA Applications

Ahmed Sayed, Georg Böck
Microwave Engineering Group, Technische Universität Berlin, Berlin, Germany

7a-3: Key Issues of Compact Models for GaAs Heterojunction Bipolar Transistors

M. Rudolph, R. Doerner
Ferdinand-Braun-Institut für Höchstfrequenztechnik (FBH), Berlin, Germany

7a-4: Large Signal Bias Dependent Modeling of Avalanche Photodiode Based on Pulsed RF Measurement

A. Ghose, B. Bunz, J. Weide, G. Kompa
Dept. of High Frequency Engineering, University of Kassel, Kassel, Germany

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Session 7b - Field Theory & EMC

Thursday, April 7, 2005

8.30 AM - 10.10 AM

Session Chairs: Rolf Schuhmann (Technical University of Darmstadt)

Volkert Hansen (University of Wuppertal)

7b-1: Full-Wave Simulations and Extraction of Effective Material Parameters for Left-Handed Metamaterials

Rolf Schuhmann, Grzegorz Lubkowski, Thomas Weiland

Institut für Theorie Elektromagnetischer Felder, Technische Universität Darmstadt, Darmstadt, Germany

7b-2: Appropriate Wavelets with Compact Support for the Compression of FDTD Calculated Electromagnetic Fields

W. Bilgic, A. Rennings, P. Waldow

Department of Engineering, Duisburg-Essen University, Duisburg, Germany

7b-3: Convergence of the Finite Integration Technique on Various Mesh Types

Irina Munteanu, Franz Hirtenfelder

CST GmbH, Darmstadt, Germany

7b-4: A FPGA based TDEMI Measurement System for Quasi-peak Detection and Disturbance Analysis

Stephan Braun, Peter Russer

Lehrstuhl für Hochfrequenztechnik, Technische Universität München, Munich, Germany

7b-5: Device for Exposure of Inner Ear Hair Cells to RF Signals

A. El Ouardi (1), T. Reinhardt (1), J. Streckert (1), A. Bitz (1), V. Hansen (1), J. Engel (2), S. Münkner (2)

(1) Chair of Electromagnetic Theory, University of Wuppertal, Wuppertal, Germany

(2) Institute of Physiology, University Hospital Tübingen, Tübingen, Germany

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Session 8a - Active Circuits

Thursday, April 7, 2005
10.30 AM - 12.30 PM

Session Chairs: Wolfgang Heinrich (Ferdinand-Braun-Institut für Höchstfrequenztechnik, Berlin)
Laurent Billonnet (University of Limoges, France)

8a-1: A GaAs Distributed Amplifier with more than 7 Vpp Output for 40 GBit/s Modulators

M. Häfele (1), K. Beilenhoff (2), H. Schumacher (1)

(1) Dept. of Electron Devices and Circuits, University of Ulm, Ulm, Germany

(2) United Monolithic Semiconductors (UMS), Orsay, France

8a-2: A New Digital Predistortion Method For Power Amplifiers Linearization

Ovidiu Leulescu, Teodor Petrescu

Telecom. and Information Technology, University Politehnica of Bucharest, Bucharest, Romania

8a-3: Design of a Monolithic 79 GHz Rectenna with MOTT Diodes

Michael Morschbach, Simon Diemer, Michael Oehme, Erich Kasper

Institute of Semiconductor Engineering, University of Stuttgart, Stuttgart, Germany

8a-4: EVM- und BER-optimierter differentieller Einseitenbandmodulator

Holger Erkens, Holger Heuermann

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8a-5: Low Phase Noise X-Band Clapp Push-Push Oscillator

M. Schott, F. Lenk, W. Heinrich

Ferdinand-Braun-Institut für Höchstfrequenztechnik (FBH), Berlin, Germany

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Session 8b - Radar, Sensors, Imaging

Thursday, April 7, 2005
10.30 AM - 12.30 PM

Session Chairs: Jürgen Detlefsen (Technical University of Munich)
Alberto Moreira (DLR, Oberpfaffenhofen)

8b-1: A Forward Impulse Radiating Antenna for Subsurface Radars

A. Teggatz, A. Jöstingmeier, T. Meyer, A. S. Omar
Institute of Electronics, University of Magdeburg, Magdeburg, Germany

8b-2: Short Distance Related Security Millimeter-Wave Imaging Systems

A. Dallinger, S. Schelkshorn, J. Detlefsen
Lehrstuhl für Hochfrequenztechnik, Technische Universität München, Munich, Germany

8b-3: Non-contacting Localisation of Dielectric Objects with UWB-Pulses

Alexander Gülck, Thomas Lehmann, Ove Schimmer, Reinhard Knöchel
Microwave Group, Faculty of Engineering, University of Kiel, Kiel, Germany

8b-4: Digital Beamforming for High Resolution Wide Swath SAR Imaging

Nicolas Gebert, Gerhard Krieger, Alberto Moreira
Microwaves and Radar Institute, German Aerospace Center (DLR), Wessling, Germany

8b-5: Highly Integrated X-Band Microwave Modules for the TerraSAR-X Calibrator

Rainer Lenz, Karin Schuler, Werner Wiesbeck
Institut für Höchstfrequenztechnik und Elektronik, Universität Karlsruhe, Karlsruhe, Germany

8b-6: Cramèr-Rao-Bound for Coherent Dual-Band Radar Range Estimation

Uwe Siart, Simón Tejero, Jürgen Detlefsen
Institute for High-Frequency Engineering, Technische Universität München, Munich, Germany

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