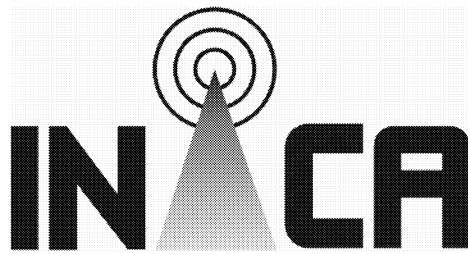


INICA 2007 International Conference on Antennas

Proceedings



Arabella Sheraton, Munich
March 28 - 30, 2007



Technical Program

2nd International ITG Conference on Antennas (INICA)

Opening Session:

Chairman: Klaus Solbach, University Duisburg-Essen, Germany

- Invited Paper: The European Network of Excellence ACE: A model for integration of antenna research activities in Europe** 1
Juan Mosig, EPFL Lausanne, Switzerland
- Invited Paper: The Promises of MIMO Systems from a Signal Processing Perspective** 4
Wolfgang Utschick, TU-München, Germany

Session 1: Propagation and Cellular Networks

Chairman: Thomas Kürner, TU-Braunschweig, Germany

- Synthesized Antenna Arrays for Future Mobile Networks** 5
J. Pontes, A. Lambrecht, M. Rütshlin, S. Schulteis, M. Porebska, T. Fügen and W. Wiesbeck, University of Karlsruhe, Germany
- Temporal Structure of the 60 GHz Wireless Channel** 10
Michael Peter and Wilhelm Keusgen, Heinrich-Hertz-Institut, Berlin and Andreas Kortke, Technical University of Berlin, Germany
- Fast Edge-Diffraction-Based Radio Wave Propagation Model for Graphics Hardware** 15
Tobias Rick, Rudolf Mathar, Institute of Theoretical Information Technology, RWTH Aachen University, Germany
- Different Array Configurations and Realistic Antenna Characteristics in the Downlink of WCDMA-Based Cellular Systems** 20
Stefan Bieder, Lars Häring and Andreas Czyliwki, University of Duisburg-Essen and Batu K. Chalise, Université catholique de Louvain, Belgium

Session 2: Test and Measurements

Chairman: Dietmar Fasold, FH-München, Germany

- Invited Paper: Satellite Antenna Measurements** 25
Christian Hunscher and Jürgen Hartmann, EADS Astrium GmbH, Munich, Germany
- A Dual-Polarised Dielectric Near-Field Probe** 33
M.M. Leibfritz, C.H. Schmidt, F.M. Landstorfer and T.F. Eibert, Universität Stuttgart, Germany
- High Resolution Equivalent Source Current Calculation for Planar Antennas** 36
Andreas Kortke, Technical University of Berlin, Germany
- Analysis and Measurement of Reflector Antennas in the mm-Wave Frequency Range** 41
J. Hartmann, J. Habersack, H.-J. Steiner, EADS Astrium GmbH, Munich, Germany

Session 3: MIMO-Systems and Diversity

Chairman: Heinz Lindenmeier, University of the Bundeswehr, München, Germany

- Antenna Diversity for Improving the BER in Mobile Digital Radio Reception Especially in Areas with Dense Foliage** 45
S. M. Lindenmeier, L. M. Reiter, D. E. Barié and J. F. Hopf, University of the Bundeswehr, Munich, Germany
- A 3-Port Antenna for MIMO-Applications** 49
Christos Oikonomopoulos-Zachos and Bernhard Rembold, RWTH-Aachen, Germany

Technical Program

2nd International ITG Conference on Antennas (INICA)

Interference Suppression Technique for Diversity Selection Combining in an Indoor Environment	53
Feng Xu, Ulrich Rückert, University of Paderborn, Germany	
MIMO-Antenna System Based on Orthogonality of the Characteristic Modes of a Mobile Device	58
Shameem Kabir Chaudhury, BenQ Mobile, Kamp-Lintfort, Germany, Werner L. Schroeder, mimoOn GmbH, Duisburg, Germany and H. J. Chaloupka, Bergische Universität Wuppertal, Germany	
Decoupling and Matching Network for Miniaturised 3-Port Antenna Arrays Based on 180° Couplers	63
Christian Volmer, Jörn Weber, Ralf Stephan, Kurt Blau and Matthias A. Hein, Technische Universität Ilmenau, Germany	
Session 4: UWB – Antenna Elements	
Chairman: Matthias Geissler, IMST GmbH, Kamp-Lintfort, Germany	
Invited Paper: Antennas for UWB-Systems	67
W. Wiesbeck and G. Adamiuk, University Karlsruhe, Germany	
A Directive Ultra-Wideband Dipole Antenna with Dielectric Rod and Reflector	72
Thomas F. Eibert and Marcel D. Blech, University Stuttgart, Germany	
Double-Fed Wideband Printed Monopole Antenna	76
Jagath Kumara Halpe Gamage and Irene Anite Jensen, SINTEF Information and Communication Technology, Norway	
UWB Antenna Transfer Property Characterization by FDTD Simulations	81
A. Papió-Toda, Universitat Politècnica de Catalunya, Barcelona, Spain, W. Sörgel, Universität Karlsruhe, Germany, J. Joubert, University of Pretoria, Pretoria, South Africa, and W. Wiesbeck, Universität Karlsruhe, Germany	
Session 5: Antenna Theory and Modelling	
Chairman: Dirk Heberling, IMST GmbH, Kamp-Lintfort, Germany	
Optimizing Multiband Antennas using Simulated Annealing	86
Mudrik Alaydrus and Thomas Eibert, University Stuttgart, Germany	
Antenna Modeling with the Hybrid Finite Element – Boundary Integral – Multilevel Fast Multipole – Uniform Geometrical Theory of Diffraction Method	91
Andreas Tzoulis, FGAN e.V., Germany and Thomas Eibert, University Stuttgart, Germany	
Auto Search Algorithm for Antenna Structure by Gradient Method Combined with Method of Moment	96
Ken Takei and Morihiko Ikegaya, Hitachi Cable Ltd., Japan	
Modeling Antenna Feeds by Electric and Magnetic Current Sheets in Conjunction with the Method of Moments	100
Dietmar Leugner, Rohde & Schwarz GmbH, München, Germany and Heinz-D. Brüns, Hamburg University of Technology, Germany	
Session 6: Arrays and Multiple Antennas	
Chairman: Roland Gabriel, Kathrein-Werke, Germany	

Technical Program

2nd International ITG Conference on Antennas (INICA)

Evaluation of Multiple Antenna Configurations	105
Wilhelm Keusgen, Heinrich-Hertz-Institut, Berlin, Germany	
Simulation and Measurement Based Correlation Estimation for Ultra Wideband Antenna Arrays	110
Christian Sturm, Malgorzata Porebska, Grzegorz Adamiuk, and Werner Wiesbeck, Universität Karlsruhe, Germany	
FIR-Filter based Equalization of Ultra Wideband Mutual Coupling on Linear Antenna Arrays	115
Markus Neinhüs, Sebastian Held and Klaus Solbach, University Duisburg-Essen, Germany	
Design and Experimental Results of a Spherical Antenna Array for a Conformal Array Demonstrator	120
Peter Knott, Research Institute for High Frequency Physics and Radar Techniques (FGAN-FHR), Wachtberg, Germany	
Session 7: Beam Forming and Pattern Optimization	
Chairman: Andriy Konovaltsev, DLR, Oberpfaffenhofen, Germany	
On the Influence of Windowing on the SNR Maximizing Antenna Pattern for Widebeam SAR Techniques	124
F. Gerbl and E. M. Biebl, Technische Universität München, Germany	
Pattern Degradation of Antennas caused by Covers	129
J. Christ and U. Oehler, Ericsson GmbH, Backnang, Germany	
Session 8: Satellite Antennas	
Chairman: Andreas Bollmann, SES-Astra, Luxemburg	
Performance Evaluation of a Lightweight Inter-Satellite Antenna (LISA) Breadboard Model	134
R. Lundin, J. Letschnik, U. Walter, Technical University of Munich, N. Nathrath, M. Trümper, NTP, Neubiberg/Munich, D. Fasold, Munich University of Applied Sciences, Germany	
The TerraSAR-X Antenna Model Approach	139
Markus Bachmann, Marco Schwerdt, Benjamin Bräutigam, DLR, Oberpfaffenhofen, Bernhard Grafmüller, Alexander Herschlein, Astrium GmbH, Munich, Germany and José Luis Álvarez-Pérez	
Flight Segment Microwave Link Antennas for Transmission of Ultra-Stable Time Signals	143
C. Hartwanger, R. Gehring, U. Hong, H. Wolf, Astrium GmbH, Munich and M.-P. Hess, J. Kehrler, A. Seidel, EADS Space Transportation, Immenstaad, Germany	
A Low-Cost Phased Array for Mobile Satellite Communications	148
M. Geissler, M. Böttcher, R. Gieron, M. Eube and P. Siatchoua, IMST GmbH, Kamp-Lintfort, Germany	
MiniTerminal – A Small Antenna for Satellite Reception	153
Rainer Wansch, Hans Adel and Harald Humpfer, Fraunhofer-Institut f. Integrierte Schaltungen, Erlangen, Germany	
Session 9: Terminal Antennas	
Chairman: Christof Rohner, Rhode & Schwarz, Germany	

Technical Program

2nd International ITG Conference on Antennas (INICA)

An Improved Compact Multi-Band Broadband Patch Antenna for Mobile Communication Systems	158
David Pouhè, Cyprian Fusi and Gerhard Mönich, Technische Universität Berlin, Germany	
Single Feed Circularly Polarized Microstrip Antenna Array	162
A. E. Abdulhadi and A. R. Sebak, Concordia University, Montreal, QC, Canada	
A Dual-Polarized Patch Antenna with High Decoupling	166
Tanja Biedermann, KATHREIN-Werke KG, Rosenheim, Germany	
Compact Multi-Antenna System for Cars with Electrically Invisible Phone Antennas for SDARS Frequencies	171
J. F. Hopf, L. M. Reiter and S. M. Lindenmeier, University of the Bundeswehr Munich, Neubiberg, Germany	
Combined Fractal Dipole Wire Antenna	176
Mustafa Khalid Tahir, University of Technology, Baghdad, Iraq	
Session 10: Antenna Elements	
Chairman: Achim Dreher, DLR, Oberpfaffenhofen, Germany	
Miniaturized Diversity Dipoles for a Localization System	181
Harald Humpfer, Rainer Wansch and Hans Adel, Fraunhofer-Institut f. Integrierte Schaltungen, Erlangen, Germany	
60 GHz Patch Antennas in LTCC Technology for High Data-Rate Communication Systems	186
L. Alhourri, S. Rentsch, R. Stephan, J.F. Trabert, J. Müller and M.A. Hein, Technische Universität Ilmenau, Germany	
Highly Directive Resonator Antennas Based on Composite Right/Left-Handed (CRLH) Transmission Lines	190
A. Rennings, T. Liebig, S. Otto and I. Wolff, IMST GmbH, Kamp-Lintfort, Germany and C. Caloz, École Polytechnique de Montréal, Québec, Canada	
A Novel Square-Spiral Strip Antenna	195
Ugur Saynak and Alp Kustepeli, Izmir Institute of Technology, Izmir, Turkey	
Session 11: Workshop SANTANA	
Chairman: Arne Jacob, TU-Hamburg-Harburg, Germany	
Smart Antenna Terminals for Broadband Mobile Satellite Communications at KA-Band	199
A. Geise, A. F. Jacob, K. Kuhlmann and H. Pawlak, TU Hamburg-Harburg and R. Gieron, P. Siatchoua, D. Lohmann, S. Holzwarth and O. Litschke, IMST GmbH, Kamp-Lintfort and M. V. T. Heckler, L. Greda and A. Dreher, DLR, Wessling and C. Hunscher, EADS Astrium GmbH, Munich, Germany	
Session 12: Radar and Direction Finding	
Chairman: Heinz-Peter Feldle, EADS Deutschland GmbH, Ulm, Germany	
Development of 77 GHz Radar Lens Antennas for Automotive Applications based on given Requirements	205
Thomas Binzer, Michael Klar, Volker Groß, Bosch GmbH, Leonberg, Germany	

Technical Program

2nd International ITG Conference on Antennas (INICA)

Extended Characterisation of a UHF Direction Finding Antenna with Optimized Radar Cross Section	210
Rainer Mueller, Ralf Lorch, EADS Deutschland GmbH, Ulm, and Wolfgang Menzel, University of Ulm, Germany	
Electro-Mechanical Beam Scanning Antenna using Rotating Ridge inside Waveguide Slot Array	213
Klaus Solbach and Davut Demirel, University Duisburg-Essen, Germany	
Antenna Arrays for RF-MEMS based 77 GHz On-Board Wake Vortex Detection Sensor	217
William Gautier, Armin Stehle, Bernhard Schönlinner, Volker Ziegler, Ulrich Prechtel, EADS Deutschland GmbH, Corporate Research Centre, Munich and Wolfgang Menzel, University of Ulm, Germany	
Session 13: EM-Exposure and Interaction	
Chairman: Christian Bornkessel, IMST GmbH, Kamp-Lintfort, Germany	
Invited Paper: The Bioelectromagnetic Side of Antenna Radiation – Exposure, Limits and Present Research	222
Christian Bornkessel, IMST GmbH, Kamp-Lintfort, Germany	
Measurement and Calculation of General Public Electromagnetic Exposure around GSM and UMTS Cellular Base Stations	225
Chr. Bornkessel, M. Schubert, IMST GmbH, Kamp-Lintfort, M. Wuschek, Deggendorf University of Applied Sciences, and P. Schmidt, EM-Institut GmbH, Regensburg, Germany	
Electromagnetic Exposure of the General Public to DVB-T and DAB Transmitters compared to analogue TV and FM Radio	230
M. Schubert, Chr. Bornkessel, IMST GmbH, Kamp-Lintfort, M. Wuschek, Deggendorf University of Applied Sciences, and P. Schmidt, EM-Institut GmbH, Regensburg, Germany	
Session 14: Workshop on Numerical Field Simulation Tools	
Chairman: Thomas Eibert, University Stuttgart, Germany	
Efficient Analysis of Complex Antenna Arrays using Empire XCell™	234
A. Wien, O. Litschke, M. Geissler and W. Simon, IMST GmbH, Kamp-Lintfort, Germany	
Overview of Recent Extensions in FEKO with Regard to the MLFMM and Cable Coupling	237
U. Jakobus and J. van Tonder, EM Software & Systems Ltd., South Afrika and F. Illenseer, EM Software & Systems GmbH, Böblingen, Germany	
Effective Antenna Simulations using CST MICROWAVE STUDIO ®	239
Franz Hirtenfelder, CST GmbH, Darmstadt, Germany	
Accelerated Simulation of Low Frequency Applications using Protheus/MLFMA	240
Daniela Wulf, Rainer Bunger and Jan Ritter, EADS Military Air Systems, Bremen and Ralf Beyer, MiCIAN GmbH, Bremen, Germany	
Session 15: Active Antennas and T/R-Modules	
Chairman: Klaus Solbach, University Duisburg-Essen, Germany	
Invited Paper: State of the Active Phased Array Technology	241
Heinz-Peter Feldle, EADS Deutschland GmbH, Ulm, Germany	

Technical Program

2nd International ITG Conference on Antennas (INICA)

A UMTS Mobile Communication Antenna with an Integrated Dual-Duplexed Low-Noise Receive Amplifier	246
Roland Rathgeber and Jens Nita, KATHREIN-Werke KG, Rosenheim, Germany	
High Sensitive T/R-Modules for RF Measurements in the mm-Wave Frequency Range	250
J. Hartmann, J. Habersack and H.-J. Steiner, EADS Astrium GmbH, Munich, Germany	