



**4th ESA Workshop on Millimetre Wave Technology and Applications
The 8th Topical Symposium on Millimeter Waves - TSMMW2006
The 7th MINT Millimeter-Wave International Symposium - MINT-MIS2006**

**February 15-17, 2006, Espoo, Finland
Dipoli Building, Street address: Otakaari 24, Espoo**

Preliminary Program

Wednesday, February 15, 2006			
8:00	Registration opens		
9:00	Opening A. V. Räisänen <i>MilliLab, Helsinki Univ. of Technology</i> Riccardo De Gaudenzi, <i>ESA/ESTEC, The Netherlands</i> K. Mizuno <i>Tohoku Univ., Japan</i> J.-W. Ra <i>GIST, Korea</i>		
PLENARY 1: Chair: A. Räisänen, F. Deborgies			
9:20	TeraHertz Astronomy from Space: Herschel and beyond T. de Graauw <i>SRON, The Netherlands</i>		
9:50	Frequency Multipliers for Local Oscillators at THz Frequencies A. Maestrini <i>Univ. de Paris 6, France</i>		
10:20	<i>Coffee</i>		
<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; border: none;"> SESSION A1: MILLIMETRE-WAVE MEASUREMENTS Chair: </td> <td style="width: 50%; border: none;"> SESSION B1: MILLIMETRE-WAVE LTCC Chair: </td> </tr> </table>		SESSION A1: MILLIMETRE-WAVE MEASUREMENTS Chair:	SESSION B1: MILLIMETRE-WAVE LTCC Chair:
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10:50	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; border: none;"> Quasi-Optical Millimetre-Wave Measurements on Magneto-Optical Constants of Gyrotropic Magnetic Thin Plate Material B. Yang, D.H. Martin, R.S. Donnan, and C.G. Parini <i>Department of Electronic Engineering, Queen Mary, University of London, UK</i> </td> <td style="width: 50%; border: none;"> 10:50 In-Depth Electrical Characterization of LTCC Substrates at Millimetre-Wave Frequencies up to 65 GHz M. Henry⁽¹⁾, C.E. Free⁽¹⁾, Q.Reynolds⁽²⁾, S. Malkmus⁽²⁾, and J.Wood⁽³⁾ <i>⁽¹⁾Advanced Technology Institute, University of Surrey, UK, ⁽²⁾Heraeus Circuit Materials Division, Germany, ⁽³⁾Heraeus Circuit Materials Division, USA</i> </td> </tr> </table>	Quasi-Optical Millimetre-Wave Measurements on Magneto-Optical Constants of Gyrotropic Magnetic Thin Plate Material B. Yang, D.H. Martin, R.S. Donnan, and C.G. Parini <i>Department of Electronic Engineering, Queen Mary, University of London, UK</i>	10:50 In-Depth Electrical Characterization of LTCC Substrates at Millimetre-Wave Frequencies up to 65 GHz M. Henry ⁽¹⁾ , C.E. Free ⁽¹⁾ , Q.Reynolds ⁽²⁾ , S. Malkmus ⁽²⁾ , and J.Wood ⁽³⁾ <i>⁽¹⁾Advanced Technology Institute, University of Surrey, UK, ⁽²⁾Heraeus Circuit Materials Division, Germany, ⁽³⁾Heraeus Circuit Materials Division, USA</i>
Quasi-Optical Millimetre-Wave Measurements on Magneto-Optical Constants of Gyrotropic Magnetic Thin Plate Material B. Yang, D.H. Martin, R.S. Donnan, and C.G. Parini <i>Department of Electronic Engineering, Queen Mary, University of London, UK</i>	10:50 In-Depth Electrical Characterization of LTCC Substrates at Millimetre-Wave Frequencies up to 65 GHz M. Henry ⁽¹⁾ , C.E. Free ⁽¹⁾ , Q.Reynolds ⁽²⁾ , S. Malkmus ⁽²⁾ , and J.Wood ⁽³⁾ <i>⁽¹⁾Advanced Technology Institute, University of Surrey, UK, ⁽²⁾Heraeus Circuit Materials Division, Germany, ⁽³⁾Heraeus Circuit Materials Division, USA</i>		

<p>11:10 Millimeter Wave Characterization of Rocks and Fluids J.A. Scales and M. Batzle <i>Department of Physics, Colorado School of Mines, USA</i></p> <p>11:30 Resistive Sensor for High Power Microwave Pulse Measurement in Millimetre-Wave Range Ž. Kancleris, M. Dagys, R. Simniškis, V. Tamošiūnas, and F. G. Agee <i>Microwave laboratory, Semiconductor Physics Institute, Vilnius, Lithuania</i></p> <p>11:50 Transient Effects in Optically Modulated Transmission Line Switches Operating at Millimeter Wave Frequencies G. Poesen⁽¹⁾, M. Vanden Bossche⁽²⁾, G. Koers⁽¹⁾, J. Stiens⁽¹⁾, and R. Vounckx⁽¹⁾ <i>⁽¹⁾Vrije Universiteit Brussel, LAMI/ETRO, Belgium, ⁽²⁾NMDG Engineering bvba, Belgium</i></p>	<p>11:10 Design and Processing of 60 GHz Antennas on Low Temperature Cofired Ceramic (LTCC) Substrates J. Säily⁽¹⁾, A. Lamminen⁽¹⁾, and A. Vimpari⁽²⁾ <i>⁽¹⁾VTT Technical Research Centre of Finland, Espoo, Finland, ⁽²⁾VTT Technical Research Centre of Finland, Oulu, Finland</i></p> <p>11:30 LTCC Technology for Innovative Millimeter Wave Bandpass Filters D. Baillargeat⁽¹⁾, S. Bila⁽¹⁾, S. Verdeyme⁽¹⁾, M. Lahti⁽²⁾, and T. Jaakola⁽²⁾ <i>⁽¹⁾IRCOM UMR CNRS 6615, University of Limoges, France, ⁽²⁾VTT Electronics, Oulu, Finland</i></p> <p>11:50 Low Noise Amplifier Module for 60 GHz Wireless Personal Area Network (WPAN) utilizing Multilayer Low Temperature Co-fired Ceramic Technology J.K. Mun, W.J. Chang, D.-Y. Kim, H.-G. Ji, J.-W. Lim, H.-K. Ahn and H. Kim <i>High Speed SoC Research Department, ETRI, Korea</i></p>
<p>12:10 Lunch</p>	
<p>PLENARY 2: Chair: K. Mizuno, J.-W. Ra</p>	
<p>13:00 Millimetre-Wave MIMO Mobile Propagation Channel Measurements P. Vainikainen <i>SMARAD, Helsinki Univ. of Technology, Finland</i></p> <p>13:30 120 GHz Wireless Link T. Nagatsuma <i>NTT, Japan</i></p> <p>14:00 60 GHz WPAN Standardization Within IEEE 802.15.3c R. Fisher <i>Oki Electric Industry Co., Ltd., Japan</i></p>	
<p>SESSION A2: WIRELESS ACCESS SYSTEMS Chair:</p>	<p>SESSION B2: SEMICONDUCTOR DEVICES Chair:</p>
<p>15:00 Channel Model and Performance of Ad'hoc Networks Based on IR-UWB at 60 GHz. A. Bendjaballah, H. Elghannudi, N. Deparis, A. Boe and L. Clavier <i>IRCICA / IEMN, France</i></p>	<p>15:00 Device Performance of Cryogenically Cooled In_{0.75}Ga_{0.25}As/In_{0.52}Al_{0.48}As High Electron Mobility Transistor Fabricated on (411)A-Oriented InP Substrate I. Watanabe⁽¹⁾, K. Shinohara⁽¹⁾, T. Kitada⁽²⁾, S. Shimomura⁽²⁾, A. Endoh⁽³⁾, Y. Yamashita⁽³⁾, T. Mimura⁽³⁾, S. Hiyamizu⁽²⁾, and T. Matsui⁽¹⁾ <i>⁽¹⁾National Institute of Info. & Com. Tech., Tokyo, Japan, ⁽²⁾Osaka University, Japan, ⁽³⁾Fujitsu Laboratories Limited, Kanagawa, Japan</i></p>

<p>15:20 On Human Body Measurements and Analysis at 62.4 GHz for Future Home Wireless Applications C.S. Leong⁽¹⁾, J. Richter⁽²⁾, and A.R. Nix⁽¹⁾ <i>(1)University of Bristol, Merchant Venturers Building, UK, (2)University of Glamorgan, School of Electronics, UK</i></p> <p>15:40 60 GHz Amplifier MMICs and Module for 60 GHz WPAN System N. Deparis, A. Boé, C. Loyez, L. Clavier, N. Rolland, P-A. Rolland <i>IRCICA / IEMN, France</i></p> <p>16:00 Millimetric Wireless Data Transmission System for Medical Indoor Application A. Konam, M. Himdi, A. Sharaiha, S. Crand, G. El-Zhein <i>Université de Rennes 1, France</i></p> <p>16:20 The Effects of Filtering and RF Amplifier Nonlinearity on the Performance of the E-band Gigabit Wireless Communications S.T. Choi, K. Hamaguchi and H. Ogawa <i>National Institute of Information and Communications Technology (NICT), Yokosuka, Japan</i></p>	<p>15:20 CMOS High Resistivity SOI: a Promising Technology for the Integration of Millimeter Wave Applications on Silicon F. Giancesello^(1, 2, 3), G. Dambrine⁽²⁾, D. Gloria⁽¹⁾, C. Raynaud⁽¹⁾, P. Scheer⁽¹⁾, S. Montusclat⁽¹⁾, S. Boret⁽¹⁾, C. Clement⁽¹⁾, F. Saguin⁽¹⁾, S. Lepilliet⁽²⁾, C. Tinella⁽¹⁾, J.M. Fournier⁽³⁾ and Ph. Benech⁽³⁾ <i>(1)STMicroelectronics, Crolles, France, (2)IEMN, Villeneuve d'Ascq France, (3)IMEP, Grenoble, France</i></p> <p>15:40 Numerical Simulation of Velocity Modulation Transistors F. Gámiz⁽¹⁾, C.Sampedro⁽¹⁾, A. Godoy⁽¹⁾, M.Prunnila⁽²⁾, and J. Ahopelto⁽²⁾ <i>(1)Departamento de Electrónica, Universidad de Granada, Spain, (2)VTT Information Technology, Espoo, Finland</i></p> <p>16:00 Silicon-Micromachining and Electrical Characterization of a 600 GHz Schottky-Diode Mixer with Integrated Octagonal Horn Antenna S. Biber⁽¹⁾, J. Schür⁽¹⁾, O. Cojocari⁽²⁾, H.L. Hartnagel⁽²⁾, L.-P. Schmidt⁽¹⁾ <i>(1)University of Erlangen-Nuremberg Institute for Microwave Technolog, Darmstadt, Germany, (2)ATech (Advanced Technologies Group), Technical University of Darmstad, Germany</i></p> <p>16:20 Integrated Schottky Diodes for a Sub-Harmonic Mixer at Millimetre Wavelengths J.-M. Rollin⁽¹⁾, H. Wang⁽²⁾, B. Thomas⁽³⁾, A. Maestrini^(4,2) and S. Davies⁽¹⁾ <i>(1)Department of Physics, University of Bath, UK, (2) LERMA, Observatoire de Paris, France, (3)Rutherford Appleton Laboratory, Oxfordshire, UK, (4)LISIF - Université Paris 6, France</i></p>
<p>OPEN FORUM (IN MICRONOVA BUILDING, STREET ADDRESS TIETOTIE 3)</p>	
<p>17:00 A Millimeter Wave Doppler Radar for Remote-Sensing Seismology J.A. Scales and M.L. Smith <i>Department of Physics, Colorado School of Mines, USA</i></p> <p>Active Millimeter/THz Waves High-Quality Imaging for Scientific, Medical and Homeland Security Applications I.V.Minin, O.V.Minin <i>Novosibirsk State Technical University, Novosibirsk, Russia</i></p> <p>Simulation and Realization of MM Wave Imaging System with FPA V.B.Khaikin⁽¹⁾, V.N.Radzikhovskiy⁽²⁾, S.E.Kuzmin⁽²⁾ and M.K.Lebedev⁽³⁾ <i>(1)Special Astrophysical Observatory/NRTT Lab St.Petersburg, Russia, (2)GNIC Iseberg, Kiev, Ukraine, (3)St.Petersburg Politechnical University/NRTT Lab, St.Petersburg, Russia</i></p>	

Reduction of Cross-Polarisation in Sub-Millimetre-wave Hologram-Based CATR by Using a Polarisation Grid

T. Koskinen, J. Häkli, J. Ala-Laurinaho, A. Lönnqvist, J. Mallat, V. Viikari, A.V. Räisänen
MilliLab, SMARAD Radio Laboratory, Helsinki University of Technology, Finland & ESA/ESTEC, the Netherlands

Reflection Measurements of Very Long Microwave Passive Components

O. D'Arcangelo⁽¹⁾, L. Figini⁽¹⁾, A. Simonetto⁽¹⁾, G. Mari⁽²⁾, S. Garavaglia⁽¹⁾, P. Battaglia⁽³⁾,
M. Bersanelli⁽²⁾, M. Pecora⁽³⁾, C. Sozzi⁽¹⁾, F. Villa⁽⁴⁾
⁽¹⁾*IFP-CNR, Milan, Italy*, ⁽²⁾*Università degli Studi di Milano, Dipartimento di Fisica, Milan, Italy*,
⁽³⁾*Alcatel Alenia Space, Italy*, ⁽⁴⁾*INAF-CNR, Bologna, Italy*

Measurement of Active and Passive Millimetre Wave Devices Using Microstrip to Coplanar Line Transitions

E. Artal, B. Aja, R. García, M. Detratti, L.A. Rodríguez
Departamento de Ingeniería de Comunicaciones ETSI Telecomunicación, Universidad de Cantabria

60 GHz Amplifier MMICs and Module for 60 GHz WPAN System

W.-J. Chang⁽¹⁾, H.-G. Ji⁽¹⁾, J.-W. Lim⁽¹⁾, H.-K. Ahn⁽¹⁾, J.-K. Mun⁽¹⁾, H. Kim⁽¹⁾ and S.-H. Oh⁽²⁾
⁽¹⁾*High Speed SoC Research Department, ETRI, Korea*, ⁽²⁾*Electronics Engineering Department, Chungnam National University, Korea*

V-band CPW Balanced Amplifier with Uniplanar Tandem Couplers

S.-W. Moon, T.-J. Baek, H.-J. Kwon, J.-K. Rhee, and S.-D. Kim.
Millimeter-wave INnovation Technology Research Center, Dongguk University, Seoul, Korea

Broadband Millimeter-wave Cascode Amplifier Using GaAs PHEMT

H.-J. Kwon, D. An, M.-G. Lee, S.-J. Lee, S.-W. Moon, T.-J. B., D.-H. Shin, H.-C. Park, and J.-K. Rhee
Millimeter-wave INnovation Technology Research Center, Dongguk University, Seoul, Korea

Modified Oversize Laser Cavity for THz Source

A. Dubey and H. Dave
Physical Research Laboratory, Ahmedabad, India

The Clinotron: a Promising Oscillator for mm- and Sub-mm Wave Regions

D. M. Vavriv
Department of Microwave Electronics, Institute of Radio Astronomy of the National Academy of Sciences of Ukraine, Kharkov, Ukraine

Design, Manufacturing and Testing of the Flight Model of the 4K Reference Load Unit for the Low Frequency Instrument on-board the Planck satellite.

L. Valenziano⁽¹⁾, F. Cuttaia⁽¹⁾, A. De Rosa⁽¹⁾, M. Sandri⁽¹⁾, L. Terenzi⁽¹⁾, N. Mandolesi⁽¹⁾, M. Bersanelli⁽²⁾, A. Mennella⁽²⁾, M. Tomasi⁽³⁾, A. Simonetto⁽⁴⁾
⁽¹⁾*INAF/IASF - Bologna, Italy*, ⁽²⁾*Dip. Fisica, Università di Milano, Italy*, ⁽³⁾*INAF/IASF - Milano, Italy*, ⁽⁴⁾*CNR/IFP, Italy*

Results of the Planck 70 GHz Receiver Protoflight Model Test Campaign

X. Dupac⁽¹⁾, S. Fogliani⁽¹⁾, M. Maris⁽¹⁾, F. Pasian⁽¹⁾, C. Vuerli⁽¹⁾, A. Zacchei⁽¹⁾, C. Baccigalupi⁽²⁾, M. Bersanelli⁽³⁾, D. Maino⁽³⁾, A. Mennella⁽³⁾, C. Burigana⁽⁴⁾, R. C. Butler⁽⁴⁾, N. Mandolesi⁽⁴⁾, G. de Gasperis⁽⁵⁾, and P. Natoli⁽⁵⁾
⁽¹⁾*Observatory of Trieste, Italy*, ⁽²⁾*SISSA Trieste, Italy*, ⁽³⁾*U. of Milan, Italy*, ⁽⁴⁾*INAF-IASF Bologna, Italy*, ⁽⁵⁾*U. of Rome Tor Vergata, Italy*

Design and Realization of a 122 GHz Folded Reflectarray Antenna with a Circular Waveguide Feed

M. Kheir
Dept. of Communications Engineering, Shorouk Academy. Cairo, Egypt.

Aperture Field Reconstructions by Cylindrical Near Field Measurements

A. Castelo, L. de Haro, J.L. Besada
Departamento Sistemas, Señales y Radiocomunicaciones, ETSI Telecomunicación, Universidad Politécnica de Madrid

An Accurate Analysis Technique for the Rooftop Mirror

M. Lumholt and S.B. Sørensen
TICRA, Copenhagen, Denmark

Designing Feeding Networks with CORPS: Coherently Radiating Periodic Structures

D. Betancourt and C. del Río Bocio
Antenna Group, Universidad Pública de Navarra, Spain

The Problem of Small Sizes in Millimetre Wave Semiconductor Devices

T. A. Briantseva⁽¹⁾, V. E. Lyubchenko⁽¹⁾, I. A. Markov⁽¹⁾, D.V. Lioubtchenko⁽²⁾
⁽¹⁾*Institute of Radioengineering and Electronics, Russian Academy of Sciences, Moscow, Russia,* ⁽²⁾*Radio Laboratory/SMARAD, Helsinki University of Technology, Finland*

Millimeter-Wave Mode Transformation in GaAs Two-Layer Dielectric Rod Waveguides

V.E. Lyubchenko⁽¹⁾, T.A. Briantseva⁽¹⁾, S.N. Dudorov⁽²⁾, D.V. Lioubtchenko⁽²⁾, I.A. Markov⁽¹⁾ and A.V. Räisänen⁽²⁾
⁽¹⁾*Institute of Radioengineering and Electronics, Russian Academy of Sciences, Moscow, Russia,* ⁽²⁾*Radio Laboratory/SMARAD, Helsinki University of Technology, Finland*

Novel High-Breakdown InGaAs/InAlAs pHEMTs for Radio Astronomy Applications

A.Bouloukou⁽¹⁾, A. Sobih⁽¹⁾, D. Kettle⁽²⁾, J. Sly⁽¹⁾ and M. Missous⁽¹⁾
⁽¹⁾*School of Electrical and Electronic Engineering, University of Manchester, UK,* ⁽²⁾*School of Physics and Astronomy, University of Manchester, UK*

Design of a Subharmonic 340 GHz GaAs Schottky Diode Mixer on Quartz with Integrated Planar LO-IF Duplexer

P. Sobis⁽¹⁾, J. Stake⁽¹⁾ and A. Emrich⁽²⁾
⁽¹⁾*Chalmers University of Technology, Department of microtechnology and nanoscience, Göteborg, Sweden,* ⁽²⁾*Omnisys Instruments AB, Göteborg, Sweden*

Studies of InGaAs/InP-Composite Channel and InGaAs/InP/n-InP-Composite Channel MHEMT on Breakdown Mechanism and Power Application.

S.-G. Choi, J.-H. Oh, B.-H. Lee, Y.-H. Baek, B.-O. Lim, S.-D. Kim and J.-K. Rhee.
Millimeter-wave INnovation Technology Research Center, Dongguk University, Seoul, Korea

Gate-Influenced Increase of Voltage Sensitivity in Asymmetrically Shaped 2DEG Microwave Diodes

A. Sužiedėlis⁽¹⁾, A. Kozič⁽¹⁾, Č. Paškevič⁽¹⁾, V. Petkun⁽¹⁾, J. Gradauskas⁽¹⁾, J. Požela⁽¹⁾, S. Ašmontas⁽¹⁾, H. Shtrikmann⁽²⁾, V. Kiseliiov⁽³⁾, T. Anbindeis⁽⁴⁾
⁽¹⁾*Semiconductor Physics Institute, Vilnius, Lithuania,* ⁽²⁾*Braun Center for Submicron Research, Weizmann Institute of Science, Israel,* ⁽³⁾*National Academy of Sciences of Ukraine, Usikov Institute for Radiophysics & Electronics, Kharkov, Ukraine,* ⁽⁴⁾*Elmika Ltd., Vilnius, Lithuania*

Simple and Accurate Model Parameter Extraction of Integrated Silicon Schottky Barrier Diode using Multi-Bias Optimization Method

J.-J. Kim⁽¹⁾, K. Lee⁽¹⁾, S. Lee⁽²⁾
⁽¹⁾*Samsung Electro-mechanics Co. Ltd., Suwon, Korea,* ⁽²⁾*Department of Electronic Engineering, Hankuk University of Foreign Studies, Yongin, Korea*

Design of a Low Noise Integrated Sub-Harmonic Mixer at 183GHz Using European Schottky Diode Technology

H. Wang⁽¹⁾, J.-M. Rollin⁽²⁾, B. Thomas⁽³⁾, S. Davies⁽²⁾, D. Matheson⁽³⁾ and A. Maestrini^(4,1)
⁽¹⁾*LERMA, Observatoire de Paris, France,* ⁽²⁾*Department of Physics, University of Bath, UK,* ⁽³⁾*Rutherford Appleton Laboratory, Oxforshire, UK,* ⁽⁴⁾*LISIF - Université Paris, France*

An Advanced Pull-up RF MEMS Switch with Low Actuation Voltage and High Isolation using Double Electrode

S.-D. Lee, B.-C. Jun, S.-D. Kim, and J.-K. Rhee
Millimeter-wave INnovation Technology Research Center, Dongguk University, Seoul, Korea

An Efficient Method of Range Resolution Correction for a Low-Cost FMCW Radar Using VCO Tuning Characteristics

J.D. Park, W.J. Kim
Agency for Defence Development, Daejeon, Korea

Thursday, February 16, 2006

PLENARY 3:

Chair: J. Tuovinen, T. Itoh

8:30 High-performance 94 GHz Single Balanced Mixer Based on 70 nm MHEMTs and DAML Technology

J.-K. Rhee
MINT, Korea

9:00 High Performance Millimeter-Wave ICs and Modules up to 300 GHz for Advanced Sensing Applications

M. Schlechtweg
Fraunhofer IAF, Germany

9:30 Microwave and Millimeter Wave Devices Based on Carbon Nanotube

M. Dragoman
LAAS, France and IMT, Romania

10:00 *Coffee*

**SESSION A3:
MILLIMETRE-WAVE MMICS**
Chair:

**SESSION B3:
INTEGRATED ANTENNAS**
Chair:

10:30 94 GHz MMIC Self Oscillating Double Conversion Mixer

S.-J. Lee, D. An, M.-K. Lee, T.-J. Baek,
H.-J. Kwon, D.-H. Shin, H.-C. Park, and
J.-K. Rhee
*Millimeter-wave INnovation Technology
Research Center, Dongguk University,
Seoul, Korea*

10:30 A 60-GHz Rectenna and Power Combining Technique

S. Lim and T. Itoh
*University of California, Los Angeles,
Electrical Engineering Department*

10:50 High-Performance GaAs Chipset for 60 GHz Broadband Telecommunication

M. Varonen, M. Kärkkäinen, J. Riska, P.
Kangaslahti and K. Halonen
*Helsinki University of Technology,
Electronic Circuit Design Laboratory*

10:50 Single-Material Shaped Intergated Lens Antennas: From the Synthesis to the Local Optimisation

R. Sauleau and B. Barès
*Institut d'Electronique et de
Télécommunications de Rennes (IETR),
France*

11:10 Design of the 60 GHz Down Conversion Mixer Integrated with 180° Rat-Race Coupler Using Surface Micromachining Technology

T.-J. Baek⁽¹⁾, B.-O. Lim⁽¹⁾, S.-C. Kim⁽¹⁾,
D.-H. Shin⁽¹⁾, D.-C. Park⁽²⁾, and J.-K.
Rhee⁽¹⁾

⁽¹⁾*Millimeter-wave INnovation
Technology Research Center, Dongguk
University, Seoul, Korea,* ⁽²⁾*Chungnam
National University, Korea*

11:10 Smart Antenna Based on Low-Temperature MEMS Switches and Quasi-Yagi Antennas for WPAN

A. Boé, M. Fryziel, N. Deparis, C. Loyez,
L. Clavier, N. Rolland and P.A. Rolland
IRCICA / IEMN, France

<p>11:30 Injection Locking VCO MMIC for V-band Wireless Applications M.-K. Lee⁽¹⁾, D. An⁽¹⁾, B.-H. Lee⁽¹⁾, M. Han⁽¹⁾, S.-J. Lee⁽¹⁾, H.-J. Kwon⁽¹⁾, T.-J. Baek⁽¹⁾, Y.-H. Kim⁽²⁾, H.-C. Park⁽¹⁾, H.-M. Park⁽¹⁾, J.-K. Rhee⁽¹⁾ <i>⁽¹⁾Millimeter-wave INnovation Technology Research Center, Dongguk University, Seoul, Korea, ⁽²⁾Electronic Engineering, PaiChai University, Daejeon, Korea</i></p> <p>11:50 Development of UTC-PD detectors J. Vukusic, H. Sunnerud, M. Sadeghi, P. Andrekson and J. Stake <i>Chalmers University of Technology, Department of microtechnology and nanoscience, Göteborg, Sweden</i></p>	<p>11:30 A 60-GHz 0.18-μm CMOS Millimeter-Wave RFIC-On-Chip Dipole Antenna with Integrated Balun H.-R. Chuang, S.-W. Kuo, C.-C. Lin, and L.-C. Kuo <i>Department of Electrical Engineering National Cheng Kung University, Tainan, Taiwan, ROC</i></p> <p>11:50 Millimeter Wave Planar Antennas Printed on Micromachined PDMS Substrates N. Tiercelin^(1,2), P. Coquet^(1,2), R. Sauleau⁽³⁾, V. Senez^(1,2), H. Fujita⁽¹⁾ <i>⁽¹⁾LIMMS/CNRS-IIS, CIRMM, IIS University of Tokyo, Japan, ⁽²⁾IEMN, Villeneuve d'Ascq, France, ⁽³⁾IETR, Rennes, France</i></p>
<p>12:10 Lunch</p>	
<p>PLENARY 4: Chair: A. Luukanen, M. Akaike</p>	
<p>13:00 Periodic Antenna Arrays and Thick Frequency-Selective Surfaces for Millimeter-Wave Applications Z. Popovic <i>Univ. of Colorado, USA</i></p> <p>13:30 Measurements of High Gain Antennas at Millimetre & Sub-Millimetre Wavelengths J. Lemanczyk <i>ESA/ESTEC, The Netherlands</i></p> <p>14:00 New Technology for Spectral-Spatial Sensing in the THz Region E. Brown <i>Univ. of California, Santa Barbara</i></p>	
<p>14:30 Coffee</p>	
<p>SESSION A4: REMOTE SENSING Chair:</p>	<p>SESSION B4: MILLIMETRE-WAVE ANTENNAS Chair:</p>
<p>15:00 Terahertz Circular Variable Filters E.N. Grossman⁽¹⁾, C.R. Dietlein⁽¹⁾, and A. Luukanen⁽²⁾ <i>⁽¹⁾Optoelectronics Division, National Institute of Standards and Technology, Boulder, CO, USA, ⁽²⁾Millilab, VTT Information Technology</i></p>	<p>15:00 A Computer Aided Design Tool for the Optimization of Arbitrarily Shaped Homogeneous Single- and Double-Shell Dielectric Lenses G. Godi, R. Sauleau, D. Thouroude <i>Institut d'Electronique et de Télécommunications de Rennes (IETR), France</i></p>

<p>15:20 Blackbody Calibration Targets with Ultralow Reflectivity at Submillimeter Wavelengths A. Murk⁽¹⁾, R. Wylde⁽²⁾, R. Spurrett⁽³⁾, P. Fürholz⁽¹⁾ and N. Kämpfer⁽¹⁾ <i>⁽¹⁾University of Bern, Switzerland,</i> <i>⁽²⁾Thomas Keating Ltd., Billingshurst, UK,</i> <i>⁽³⁾AEA Technology, Culham, UK</i></p> <p>15:40 Polarization Measurements with a Fully Polarimetric Imaging Radiometer at 91 GHz A. Duric and A. Magun <i>Institute of Applied Physics, University of Bern, Switzerland</i></p> <p>16:00 GEO Atmospheric Sounder Technology Project A. Emrich <i>Omnisys Instruments AB, Göteborg, Sweden</i></p>	<p>15:20 Design of Half Maxwell Fish-Eye Lens Antenna for Automotive Application in 77 GHz Band B. Fuchs⁽¹⁾, O. Lafond⁽¹⁾, M. Himdi⁽¹⁾, S. Rondineau⁽²⁾ <i>⁽¹⁾Institute of Electronics and Telecommunication of Rennes, University of Rennes 1, France,</i> <i>⁽²⁾University of Colorado, Electrical and Computer Engineering, USA</i></p> <p>15:40 Synthesis of Reflection-Type Phase Hologram for Compact Antenna Test Range at 310 GHz E. Noponen, J. Häkli, T. Koskinen, A. Lönnqvist, V. Viikari, J. Ala-Laurinaho, J. Mallat, and A.V. Räisänen <i>MilliLab, Radio Laboratory, Helsinki University of Technology, Finland</i></p> <p>16:00 Slotted Waveguide Array Antenna at W Band A. L. Das, A. Majumder, and S. Chakravarty <i>SAMEER Kolkata Centre, Dept. of Information Technology, Govt. of India, Kolkata, India</i></p>
<p>16:20 Break</p>	
<p>SESSION A5: MILLIMETRE-WAVE AND TERAHERTZ IMAGING Chair:</p>	<p>SESSION B5: SUB-MILLIMETRE WAVE ANTENNA MEASUREMENTS Chair:</p>
<p>16:40 Phenomenology of Passive Broadband Terahertz Images C. Dietlein⁽¹⁾, A. Luukanen⁽²⁾, F. Meyer⁽¹⁾, Z. Popovic⁽¹⁾, and E. Grossman⁽³⁾ <i>⁽¹⁾University of Colorado at Boulder, Department of Electrical and Computer Engineering, Boulder, CO, USA,</i> <i>⁽²⁾MilliLab, VTT Information Technology, Espoo, Finland,</i> <i>⁽³⁾National Institute of Standards and Technology, Optoelectronics Division, Boulder, CO, USA</i></p> <p>17:00 Passive Millimeter Wave and Terahertz Imaging of Concealed Threats with Semiconducting and Superconducting Bolometers A. Semenov⁽¹⁾, H. Richter⁽¹⁾, H.-W. Hübers⁽¹⁾, K.S. Il'in⁽²⁾, M. Siegel⁽²⁾, V. Zakaosarenko⁽³⁾ and H.-G. Meyer⁽³⁾ <i>⁽¹⁾German Aerospace Center (DLR), Berlin, Germany,</i> <i>⁽²⁾Institute of Micro- and Nanoelectronic Systems, University of Karlsruhe, Germany,</i> <i>⁽³⁾Institute for Physical High Technology, Jena, Germany</i></p>	<p>16:40 Comparative Analysis and Measurement of mm-Wave Applications J. Hartmann⁽¹⁾, J. Habersack⁽¹⁾, H.-J. Steiner⁽¹⁾, J. Lemanczyk⁽²⁾ <i>⁽¹⁾EADS Astrium GmbH, Antennas & Payload Test Center - Measurement Technology, Germany,</i> <i>⁽²⁾ESA/ESTEC, Electromagnetics Division, NL</i></p> <p>17:00 Hologram Based CATR Measurement of a 1.5 m Antenna at 650 GHz: Progress Report J. Ala-Laurinaho⁽¹⁾, J. Häkli⁽¹⁾, A. Karttunen⁽¹⁾, T. Koskinen⁽¹⁾, A. Lönnqvist⁽¹⁾, E. Noponen⁽¹⁾, J. Mallat⁽¹⁾, M. Vaaja⁽¹⁾, V. Viikari⁽¹⁾, A.V. Räisänen⁽¹⁾, J. Lemanczyk⁽²⁾ <i>⁽¹⁾MilliLab, SMARAD Radio Laboratory, Helsinki University of Technology, Finland,</i> <i>⁽²⁾ESA/ESTEC, the Netherlands</i></p>

<p>17:20 An Array of Superconducting Antenna-Coupled Microbolometers for Passive Video-Rate THz Imaging A. Luukanen⁽¹⁾, P. Helistö⁽²⁾, J.S. Penttilä⁽²⁾, H. Seppä⁽²⁾, H. Sipola⁽²⁾, C.R. Dietlein⁽³⁾, and E.N Grossman⁽⁴⁾ ⁽¹⁾ MilliLab, VTT Information Technology, Espoo, Finland, ⁽²⁾VTT Information Technology, Espoo, Finland, ⁽³⁾University of Colorado at Boulder, Department of Electrical and Computer Engineering, Boulder, CO, USA, ⁽⁴⁾National Institute of Standards and Technology, Optoelectronics Division, Boulder, CO, USA</p> <p>17:40 Random Phase Pattern Creation for Speckle Reduction in Active Millimeter Wave Imaging Systems G. Koers, I. Jaëger, J. Stiens, R. Vounckx Vrije Universiteit Brussel, LAMI/ETRO, Brussels, Belgium</p>	<p>17:20 Tri-Reflector CATR Antenna Pattern Verification of the MARSCHALS Airborne Millimetre-Wave Limb-Sounder at 300, 325 and 345 GHz C. Rieckmann⁽¹⁾, John Dupuy⁽¹⁾, R. S. Donnan⁽¹⁾, C. G. Parini⁽¹⁾, B. Moyna⁽²⁾, M. Oldfield⁽²⁾, D. Matheson⁽²⁾, and P. de Maagt⁽³⁾ ⁽¹⁾Queen Mary, University of London, Department of Electrical Engineering, London, UK, ⁽²⁾Millimetre-Wave Technology Group, Rutherford Appleton Laboratory, Oxfordshire UK, ⁽³⁾Antenna and Submillimetre Wave Section, Electromagnetics & Space Environments Division, European Space Agency, The Netherlands</p> <p>17:40 High Sensitive RF Test Modules for mm-Wave Measurement up to 500 GHz J. Hartmann⁽¹⁾, J. Habersack⁽¹⁾, H.-J. Steiner⁽¹⁾, Th. Rose⁽²⁾, R. Zimmermann⁽²⁾ ⁽¹⁾EADS Astrium GmbH, Antennas & Payload Test Center - Measurement Technology, Munich, Germany, ⁽²⁾Radiometer Physics GmbH, Meckenheim, Germany</p>
<p>19:00 Reception (Restaurant Sipuli, Street address: Kanavaranta 7, 00160 Helsinki Transportation from Conference Venue at 18:30)</p>	

Friday, February 17, 2006	
<p>PLENARY 5: Chair: T. Närhi, J.-K. Rhee</p>	
<p>8:30</p>	<p>Passive Millimetre Wave Imaging R. Appleby QuinetiQ, UK</p>
<p>9:00</p>	<p>Future Satellite Earth Observation Requirements in Millimetre and Sub-Millimetre Wavelength Region C.-C. Lin ESA/ESTEC, The Netherlands</p>
<p>9:30</p>	<p>Development of a SIS receiver for ALMA Band-10 S. Shitov NAOJ/IREE, Japan</p>
<p>10:20 Coffee</p>	

SESSION A6: INSTRUMENTS FOR RADIO ASTRONOMY Chair:	SESSION B6: TERAHERTZ SOURCES Chair:
<p>10:30 ALMA Band 9 Antenna and Front-End Quasi-Optical Analysis M. Candotti⁽¹⁾, A. Baryshev⁽²⁾, N. A. Trappe⁽¹⁾, T. Peacocke⁽¹⁾, J. Barkhof⁽²⁾, J. A. Murphy⁽¹⁾, W. Wild⁽²⁾ <i>⁽¹⁾NUIM – National University of Ireland, Maynooth Experimental Physics Department, Maynooth, Co.Kildare, Ireland, ⁽²⁾SRON – Netherlands Institute for Space Research and Kapteyn Astronomical Institute AV Groningen, The Netherlands</i></p> <p>10:50 Results of the Planck 70 GHz Receiver Protoflight Model Test Campaign M. Laaninen⁽¹⁾, P. Jukkala⁽¹⁾, N. Hughes⁽¹⁾, J. Varis⁽²⁾, J. Tuovinen⁽²⁾ <i>⁽¹⁾Elektrobit Microwave Ltd., Finland, ⁽²⁾MilliLab, VTT Information Technology</i></p> <p>11:10 8 mm band FPA Receiver Module for Multibeam Radio Telescope V.B.Khaikin⁽¹⁾, S.E.Kuzmin⁽²⁾, S.N.Kuzmin⁽³⁾, V.N.Radzikhovskij⁽²⁾ and J.Schulman⁽⁴⁾ <i>⁽¹⁾Special Astrophysical Observatory/NRTT Lab St.Petersburg, Russia, ⁽²⁾GNIC Iseberg, Kiev, Ukraine, ⁽³⁾St.Petersburg Politechnical University/NRTT Lab, St.Petersburg, Russia, ⁽⁴⁾HRL lab, USA</i></p> <p>11:30 Autocorrelation Spectrometers for (Sub)Millimetre Spectroscopy A. Emrich, S. Andersson, L. Landen, Torgil Kjellberg, Sten Gunnarsson <i>Omnisys Instruments AB, Göteborg, Sweden</i></p>	<p>10:30 Optimal Conversion Efficiency from Optical to THz radiation in Photoconductive Sources D.S. Kim⁽¹⁾ and D.S Citrin^(1,2) <i>⁽¹⁾School of Electrical and Computer Engineering, Georgia Institute of Technology, Atlanta, Georgia, USA, ⁽²⁾Georgia Tech Lorraine, Technopole Metz, France</i></p> <p>10:50 Transition and Phase Matching Coherent Terahertz Radiation N. N. Zinov'ev⁽¹⁾, A. S. Nikoghosyan⁽²⁾, R. M. Martirosyan⁽²⁾, A. A. Hakhoumian⁽²⁾ and J. M. Chamberlain⁽³⁾ <i>⁽¹⁾Solid State Electronics Division, Ioffe Physical Technical Institute of RAS, St.Petersburg, Russia, ⁽²⁾Department of Microwave Engineering, Yerevan State University, Yerevan, Armenia, ⁽³⁾Department of Physics, University of Durham, UK</i></p> <p>11:10 Optimization of Second-Harmonic Generation in Mid-Infrared Quantum Cascade Lasers J. Bai⁽¹⁾, D. S. Citrin^(1,2) <i>⁽¹⁾School of Electrical and Computer Engineering, Georgia Institute of Technology, Atlanta, Georgia, USA, ⁽²⁾Georgia Tech Lorraine, Technopole Metz, France</i></p> <p>11:30 High Power Millimetre Wave HBV Triplers J. Vukusic, A. Emadi, T. Bryllert, M. Sadeghi and J. Stake <i>Chalmers University of Technology, Department of microtechnology and nanoscience, Göteborg, Sweden</i></p>
<p>11:50 Lunch</p>	

SESSION A7: SPECIAL AMICOM SESSION ON MILLIMETRE-WAVE MEMS Chair:	SESSION B7: SUB-MILLIMETRE WAVE RECEIVERS Chair:
<p>12:40 Applications of RF-MEMS to millimeter waves Pierre Blondy <i>IRCOM, Univ. of Limoges, France</i></p>	<p>12:40 Terahertz Heterodyne Receiver with Quantum Cascade Laser and Hot Electron Bolometric Mixer H.-W. Hübers⁽¹⁾, S. G. Pavlov⁽¹⁾, H. Richter⁽¹⁾, A. D. Semenov⁽¹⁾, A. Tredicucci⁽²⁾, R. Köhler⁽²⁾, L. Mahler⁽²⁾, H. E. Beere⁽³⁾, D. A. Ritchie⁽³⁾, and E. H. Linfield⁽⁴⁾ <i>⁽¹⁾German Aerospace Center (DLR), Berlin, Germany, ⁽²⁾NEST-INFM and Scuola Normale Superiore, Pisa, Italy, ⁽³⁾Cavendish Laboratory, University of Cambridge, UK, ⁽⁴⁾School of Electronic and Electrical Engineering, University of Leeds, UK</i></p>
<p>13:00 Reconfigurable MEMS-Based High-Impedance Surfaces for Millimetre and Submillimetre Phase Shifters D. Chicherin⁽¹⁾, S. Dudorov⁽¹⁾, D. Lioubtchenko⁽¹⁾, V. Ovchinnikov⁽²⁾, S. Tretyakov⁽¹⁾, A. V. Räisänen⁽¹⁾ <i>⁽¹⁾Radio Laboratory/SMARAD, Helsinki University of Technology, ⁽²⁾Microelectronics Centre, Helsinki University of Technology</i></p>	<p>13:00 Experimental Characterisation of a Sub-Millimetre Wave Receiver Based on EBG Technology I. Ederra⁽¹⁾, A. Murk⁽²⁾, R. Gonzalo⁽¹⁾, B. Martínez⁽¹⁾, L. Azcona⁽³⁾, B. Alderman⁽³⁾, P. G. Huggard⁽³⁾, B. P. de Hon⁽⁴⁾, M. C. van Beurden⁽⁴⁾, L. Marchand⁽⁵⁾, P. de Maagt⁽⁵⁾ <i>⁽¹⁾Electrical and Electronic Engineering Department, Universidad Pública de Navarra, Spain, ⁽²⁾Institute of Applied Physics, University of Bern, Switzerland, ⁽³⁾Millimetre Technology Group, Rutherford Appleton Laboratory, Oxfordshire, UK, ⁽⁴⁾Faculty of Electrical Engineering, Division of Telecommunications Technology and Electromagnetics, Eindhoven University of Technology, The Netherlands, ⁽⁵⁾European Space Research and Technology Centre, ESTEC, The Netherlands</i></p>
<p>13:20 Beam steering reflectarrays R. Sorrentino <i>Univ. of Perugia, Italy</i></p>	<p>13:20 A Fixed-Tuned 380 GHz Schottky-Based Receiver on AlN & Quartz Substrates B. Thomas⁽¹⁾, B. Alderman⁽¹⁾, D. Matheson⁽¹⁾, P. de Maagt⁽²⁾. <i>⁽¹⁾Rutherford Appleton Laboratory, Oxfordshire, UK, ⁽²⁾ESA/ESTEC, The Netherlands</i></p>
<p>13:40 CMOS compatible MEMS varactors for millimeter waves T. Vähä-Heikkilä <i>MilliLab, VTT Information Technology, Finland</i></p>	<p>13:40 Terahertz Sources and Receivers for Imaging and Spectroscopy J.L. Hesler, D.W. Porterfield, D.S. Kurtz, T.W. Crowe <i>Virginia Diodes, Inc., USA</i></p>