

6th ITG International Vacuum Electronics Workshop 2018

September 6 – 7, 2018, Physikzentrum Bad Honnef (www.pbh.de), Germany

Workshop, Previous Day

Wednesday, September 5, 2018

15:00	ITG (VDE)-Fachausschuss MN 6 “Vakuumelektronik und Displays”, 132th Meeting Physikzentrum Bad Honnef (PBH), Conference room: Seminar room 1
18:30	Start of the ITG Workshop for all participants: Come Together Dinner & Evening Discussion, Physikzentrum Bad Honnef: Restaurant „Lichtenberg“ (in the cellar)

Workshop Program, 1st Day

Thursday, September 6, 2018

Location: Lecture Hall „Wilhelm und Else Heraeus“

09:00	Welcome Address: Wolfram Knapp, Workshop Chairman
	Session 1.1: Vacuum Electron Sources Chairman: Wolfram Knapp
09:05 <i>L1.1-1</i>	IMPROVEMENT DIRECTIONS OF MODERN VACUUM ELECTRON SOURCES Georg Gärtner Consultant, Reinhardstr. 66A, 52078 Aachen, Germany (till 2014 Philips Research Aachen)
09:30 <i>L1.1-2</i>	WORK FUNCTION OF DISPENSER CATHODES AND LIFE PREDICTION MODEL Jean-Michel Roquais Thales AVS France SAS, 2 rue Marcel Dassault, 78141 Vélizy-Villacoublay Cedex, France
09:55 <i>L1.1-3</i>	INVESTIGATIONS OF PYROELECTRIC CRYSTALS FOR VACUUM ELECTRON SOURCE AND X-RAY APPLICATIONS Markus Wilke¹, Lucas Hanns¹, Wolfram Knapp², Karsten Harnisch¹, Martin Ecke¹, Marco Zierau¹, Thorsten Halle¹ Otto-von-Guericke-Universität Magdeburg, Faculty of Mechanical Engineering, ¹ IWF and ² IFQ, Universitätsplatz 2, 39106 Magdeburg, Germany

10:20	Coffee Break
	Session 1.2: Field Emission and Pulsed Electron Beam Chairman: Andreas Lawall
10:50 <i>L1.2-1</i>	FIELD ELECTRON EMISSION THEORY FOR VACUUM ELECTRONICS Richard G. Forbes Advanced Technology Institute & Department of Electrical and Electronic Engineering, Faculty of Engineering & Physical Sciences, University of Surrey, Guildford, Surrey GU2 7XH, United Kingdom
11:20 <i>L1.2-2</i>	INVESTIGATION OF AN EMISSION CURRENT REGULATION CIRCUIT IN THE FREQUENCY DOMAIN Matthias Hausladen¹, Christoph Langer¹, Christian Pommesberger¹, Robert Lawrowski¹, Michael Bachmann², Mikhail Chamonine³, Rupert Schreiner¹ ¹ Faculty of General Sciences and Microsystems Technology, ³ Faculty of Electrical Engineering and Information Technology, OTH Regensburg, Seybothstraße 2, 93053 Regensburg, Germany, ² Ketek GmbH, Hofer Str. 3, 81737 München, Germany
11:45 <i>L1.2-3</i>	A FAST PULSED POWER SUPPLY FOR PULSED ELECTRON BEAM APPLICATIONS Martin Hochberg, Martin Sack, Dennis Herzog, Alfons Weisenburger, Georg Mueller Karlsruhe Institute of Technology (KIT), IHM, Herman-von-Helmholz-Platz 1, 76344 Eggenstein-Leopoldshafen, Germany
12:10	Lunch
	Session 1.3: Gyrotrons (I) Chairman: Günter Kornfeld
13:30 <i>L1.3-1</i>	ONGOING DEVELOPMENTS FOR THE KIT 2MW 170 GHz COAXIAL CAVITY GYROTRON PROTOTYPE S. Ruess^{1,2}, K.A. Avramidis¹, G. Gantenbein¹, Z. Ioannidis¹, S. Illy¹, P.C. Kalaria¹, T. Kobarg¹, I.Gr. Pagonakis¹, T. Ruess¹, T. Rzesnicki¹, M. Thumm^{1,2}, J. Weggen¹, and J. Jelonnek^{1,2} ¹ IHM, ² IHE, Karlsruhe Institute of Technology (KIT), Kaiserstr. 12, 76131 Karlsruhe, Germany
13:55 <i>L1.3-2</i>	NUMERICAL INVESTIGATIONS ON THE INFLUENCE OF INSERT MISALIGNMENT ON THE INSERT LOADING OF A 170 GHz, 2 MW COAXIAL-CAVITY GYROTRON Parth C. Kalaria¹, Marc George¹, Stefan Illy¹, Konstantinos A. Avramidis¹, Gerd Gantenbein¹, Sebastian Ruess^{1,2}, Manfred Thumm^{1,2}, and John Jelonnek^{1,2} ¹ Institute for Pulsed Power and Microwave Technology (IHM), ² Inst. of Radio Frequency Engineering and Electronics (IHE), Karlsruhe Institute of Technology (KIT), Kaiserstr. 12, 76131 Karlsruhe, Germany

<p>14:20 <i>L1.3-3</i></p>	<p>NUMERICAL STUDY OF VERY HIGH-ORDER VOLUME MODES AS POSSIBLE ALTERNATIVES TO THE $TF_{34,19}$ OPERATING MODE OF THE KIT 2MW-170 GHz COAXIAL CAVITY GYROTRON <u>M. Obermaier</u>¹, K.A. Avramidis¹, G. Gantenbein¹, S. Illy¹, S. Ruess¹, T. Ruess¹, M. Thumm^{1,2} and J. Jelonnek^{1,2} ¹IHM, ²IHE, Karlsruhe Institute of Technology, Kaiserstr. 12, 76131 Karlsruhe, Germany</p>
<p>14:45 <i>L1.3-4</i></p>	<p>STATUS OF THE GYROTRON MULTISTAGE DEPRESSED COLLECTOR DEVELOPMENT AT KARLSRUHE INTITUTE OF TECHNOLOGY <u>Chuanren Wu</u>¹, Ioannis Gr. Pagonakis¹, Stefan Illy¹, David Albert¹, Konstantinos A. Avramidis¹, Gerd Gantenbein¹, Manfred Thumm^{1,2}, and John Jelonnek^{1,2} ¹Institute for Pulsed Power and Microwave Technology (IHM), ²Inst. of Radio Frequency Engineering and Electronics (IHE), Karlsruhe Institute of Technology (KIT), Kaiserstr. 12, 76131 Karlsruhe, Germany</p>
<p>15:10</p>	<p>Coffee Break</p>
<p>15:40 <i>L1.4-1</i></p>	<p>Session 1.4: Gyrotrons (II) and Klystron Chairman: Ernst Bosch</p>
<p>15:40 <i>L1.4-1</i></p>	<p>MULTISTAGE COLLECTOR DESIGN BASED ON ExB DRIFT CONCEPT FOR GYROTRON <u>Benjamin Ell</u>¹, Ioannis Gr. Pagonakis¹, Chuanren Wu¹, and John Jelonnek^{1,2} ¹Institute for Pulsed Power and Microwave Technology (IHM), ²Inst. of Radio Frequency Engineering and Electronics (IHE), Karlsruhe Institute of Technology (KIT), Kaiserstr. 12, 76131 Karlsruhe, Germany</p>
<p>16:05 <i>L1.4-2</i></p>	<p>AN ADVANCED HIGHLY AUTOMATED TEST SYSTEM FOR THE VERIFICATION OF QUASI-OPTICAL GYROTRON COMPONENTS <u>T. Ruess</u>¹, K.A. Avramidis¹, M. Fuchs¹, G. Gantenbein¹, S. Illy¹, S. Ruess^{1,2}, T. Rzesnicki¹, M. Thumm^{1,2}, D. Wagner¹, J. Weggen¹, and J. Jelonnek^{1,2} ¹IHM, ²IHE, Karlsruhe Institute of Technology (KIT), Kaiserstr. 12, 76131 Karlsruhe, Germany ³Max Planck Institute for Plasma Physics, 85748 Garching, Germany</p>
<p>16:30 <i>L1.4-3</i></p>	<p>SIMULATIONS TOWARDS THE GENERATION OF ULTRA-SHORT PULSES WITH COUPLED GYRO-DEVICES <u>A. Marek</u>¹, K. A. Avramidis¹, S. M. Copplestone², N. S. Ginzburg³, S. Illy¹, J. Jelonnek^{1,4}, J. Jin¹, S. V. Mishakin³, P. Ortwein² and M. Thumm^{1,4} ¹IHM, ⁴IHE, Karlsruhe Institute of Technology (KIT), Karlsruhe, Germany ²Institute of Aerodynamics and Gas Dynamics, University of Stuttgart, Stuttgart, Germany ³Institute of Applied Physics, Russian Academy of Sciences (IAP- RAS), Nizhny Novgorod, Russia</p>
<p>16:55 <i>L1.4-4</i></p>	<p>TENTATIVE DESIGN OF X-BAND AND W-BAND KLYSTRONS WITH MODULATED HOLLOW BEAM <u>Jiwei Nie</u>¹, Heino Henke² ¹Bombardier Transportation GmbH, Am Rathenau Park 1, 16761 Hennigsdorf, Germany ²TU Berlin, Sekr. EN2, Einsteinufer 17, 10587 Berlin, Germany</p>

18:30	Workshop Dinner & Evening Discussion Physikzentrum Bad Honnef: Restaurant „Lichtenberg“ (in the cellar)
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Workshop Program, 2nd Day

Friday, September 7, 2018

Location: Lecture Hall “Wilhelm und Else Heraeus”

08:20	Check-out at PBH (<u>with paying for drinks</u>)
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	Session 2.1: Traveling-Wave Tubes (TWTs) Chairman: Manfred Thumm
08:40 <i>L2.1-1</i>	MEDIUM POWER HIGH EFFICIENCY Ka-BAND TWT Christof Dietrich, Wolfgang Dürr, Peter Ehret, Ernst Bosch Thales Deutschland GmbH, Söflinger Str. 100, 89077 Ulm, Germany
09:05 <i>L2.1-2</i>	IMPROVING TRAVELING-WAVE TUBES FOR MODULATED OPERATION IN BACK-OFF Djamschid Safi¹, Philip Birtel², Arne F. Jacob¹ ¹ Institut für Hochfrequenztechnik, Technische Universität Hamburg-Harburg (TUHH), Am Schwarzenberg-Campus 1, 21073 Hamburg, Germany ² Thales Electronic Systems GmbH, Söflinger Str. 100, 89077 Ulm, Germany
09:30 <i>L2.1-3</i>	OSCILLATION STARTING CURRENT APPROXIMATION BY TIME-DOMAIN SIMULATION IN TRAVELING-WAVE TUBES Moritz Hägermann¹, Philip Birtel², Arne F. Jacob¹ ¹ Institut für Hochfrequenztechnik, Technische Universität Hamburg-Harburg (TUHH), Am Schwarzenberg-Campus 1, 21073 Hamburg, Germany ² Thales Electronic Systems GmbH, Söflinger Str. 100, 89077 Ulm, Germany
09:55 <i>L2.1-4</i>	FIRST RESULTS OF A LOW-THz HELICAL GROOVE-GUIDE TWT Heino Henke, Markus Jäger TU Berlin, Sekr. EN2, Einsteinufer 17, 10587 Berlin, Germany
10:20	Coffee Break
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	<p>Session 2.2: Vacuum Interrupters Chairman: Gösta Mattausch</p>
<p>10:40 <i>L2.2-1</i></p>	<p>CURRENT INTERRUPTION PERFORMANCE OF AXIAL AND RADIAL MAGNETIC FIELD VACUUM INTERRUPTERS Erik D. Taylor, <u>Andreas Lawall</u>, Jörg Genzmer, Tilman Heydenreich Siemens AG, Energy Management Division, Rohrdamm 88, 13629 Berlin, Germany</p>
<p>11:05 <i>L2.2-2</i></p>	<p>VACUUM INTERRUPTERS EQUIPPED WITH TMF CONTACT SYSTEM AND CONTACT MATERIAL DIFFERENT FROM EACH OTHER – A STUDY UNDER SHORT CIRCUIT CURRENT CONDITIONS AND HIGH-SPEED ARC OBSERVATION DURING CURRENT INTERRUPTION <u>Dietmar Gentsch</u>, Kai Gorlt ABB AG, Calor Emag Mittelspannungsprodukte, Oberhausener Str. 33, 40472 Ratingen, Germany</p>
<p>11:30 <i>L2.2-3</i></p>	<p>COMBINED FIELD GRADING AND FIELD SHIELDING FOR DOUBLE BREAKING VACUUM CHAMBERS UNDER LIGHTNING IMPULSE STRESS <u>Benjamin Kühn</u>¹, Michael Kurrat¹, Dietmar Gentsch² ¹Institute for High Voltage Systems and Electrical Power Systems, Technische Universität Braunschweig, Schleinitzstr. 23, 38106 Braunschweig, Germany ²ABB AG, Calor Emag Mittelspannungsprodukte, Oberhausener Str. 33, 40472 Ratingen, Germany</p>
<p>11:55 <i>L2.2-4</i></p>	<p>PROCESSING OF THE RADIATION INTENSITY DISTRIBUTION AND ELECTRICAL DATA OF HIGH-CURRENT VACUUM ARCS BETWEEN TRANSVERSAL MAGNETIC FIELD CONTACTS FOR SOFTWARE-BASED EVALUATION <u>B. Weber</u>¹, T. Pieniak¹, M. Kurrat¹, D. Gentsch² ¹Institute for High Voltage Systems and Electrical Power Systems, Technische Universität Braunschweig, Schleinitzstr. 23, 38106 Braunschweig, Germany ²ABB AG, Calor Emag Mittelspannungsprodukte, Oberhausener Str. 33, 40472 Ratingen, Germany</p>
<p>12:20</p>	<p>Lunch</p>
	<p>Session 2.3: Spectroscopy and Nanogranular Material Chairman: Dietmar Gentsch</p>
<p>13:20 <i>L2.3-1</i></p>	<p>HIGH-SPEED VIDEO SPECTROSCOPY IN A VACUUM ARC DURING HIGH-CURRENT ANODE MODES <u>Diego Gonzalez</u>, Steffen Franke, Alireza Khakpour, Ralf Methling, Sergey Gortschakow, Dirk Uhrandt Leibniz Institute for Plasma Science and Technology, Felix-Hausdorff-Str. 2, 17489 Greifswald, Germany</p>

<p>13:45 <i>L2.3-2</i></p>	<p>MODIFIED LASER-INDUCED FLUORESCENCE-DIP SPECTROSCOPY IN XENON FOR MEASURING A WEAK ELECTRIC FIELD DISTRIBUTION AT THE EDGE OF ELECTRON EMISSION PLASMA <u>Zhen Wang, Wladimir An, Georg Mueller</u> Karlsruhe Institute of Technology, Institut für Hochleistungsimpuls- und Mikrowellentechnik (IHM), Hermann-von-Helmholtz-Platz 1, 76344 Eggenstein-Leopoldshafen, Germany</p>
<p>14:10 <i>L2.3-3</i></p>	<p>NANOGRANULAR COMPOUND MATERIAL LAYERS SERVE AS STORAGE FOR INFRA-RED TO ULTRA-VIOLET PHOTONS FOR THE ENERGY SUPPLY OF ELECTRIC MACHINES <u>Hans W. P. Koops</u> HaWilKo GmbH, Ernst Ludwig Str. 16, 64372 Ober-Ramstadt, Germany</p>
<p>14:35</p>	<p>Closing Words: Wolfram Knapp, Workshop Chairman</p>
<p>14:45</p>	<p>Coffee Break → End of Workshop: 15:00</p>