

5th ITG International Vacuum Electronics Workshop 2016

September 8 – 9, 2016, Physikzentrum Bad Honnef (www.pbh.de), Germany

Workshop, Previous Day

Wednesday, September 7, 2016

15:30	ITG (VDE)-Fachausschuss 8.6 “Vakuumelektronik und Displays”, 128th Meeting Physikzentrum Bad Honnef (PBH), Conference room: Wintergarten
18:30	Start of the ITG Workshop for all participants: Come Together Dinner & Evening Discussion, Physikzentrum Bad Honnef: Lichtenberg-Keller (at basement level)

Workshop Program, 1st Day

Thursday, September 8, 2016

Location: **Wilhelm und Else Heraeus Hörsaal**

08:30	Welcome Address: Wolfram Knapp, Workshop Chairman
	Session 1.1: Vacuum Technologies and Electron Sources Plasma Applications Chairman: Wolfram Knapp
08:40 <i>L1.1-1</i>	ENABLING TECHNOLOGIES, TECHNOLOGICAL WAVES AND FUTURE PERSPECTIVES OF VACUUM ELECTRONICS Georg Gärtner Consultant*, Aachen, Germany; * till 2014 Philips Research Aachen
09:05 <i>L1.1-2</i>	SI TIP FIELD EMISSION ELECTRON SOURCE FOR APPLICATION IN IONISATION VACUUM GAUGES Christian Prommesberger, Christoph Langer, Robert Ławrowski, Rupert Schreiner Faculty of General Sciences and Microsystems Technology, OTH Regensburg, D-93053 Regensburg, Germany
09:30 <i>L1.1-3</i>	DEVELOPMENT OF A TOROIDAL EB SOURCE FOR NON-THERMAL ELECTRON TREATMENT OF BULK GOODS Ignacio Gabriel Vicente-Gabas, Ralf Bluethner, Sebastian Schmidt, Goesta Mattausch, Frank-Holm Roegner FEP - Fraunhofer Institute for Organic Electronics, Electron Beam and Plasma Technology, Winterbergstr. 28, 01277 Dresden, Germany

<p>09:55 <i>L1.1-4</i></p>	<p>APPLICATIONS OF NANO-COMPOSITE MATERIALS CARRYING GA/cm² CURRENT DENSITY DUE TO A BOSE-EINSTEIN CONDENSATE AT ROOM TEMPERATURE PRODUCED BY FOCUSED ELECTRON BEAM INDUCED PROCESSING FOR MANY EXTRAORDINARY NOVEL TECHNICAL APPLICATIONS</p> <p>Hans W.P. Koops HaWilKo GmbH, Ernst Ludwig Str. 16, 64372 Ober-Ramstadt, Germany</p>
<p>10:20</p>	<p>Coffee Break</p>
<p>10:50 <i>L1.2-1</i></p> <p>11:15 <i>L1.2-2</i></p> <p>11:40 <i>L1.2-3</i></p> <p>12:05 <i>L1.2-4</i></p>	<p>Session 1.2: Space Cs Clock and Vacuum Measurements Chairman: Ernst Bosch</p> <p>COMBINED VACUUM GAUGE BASED ON MEMS PRESSURE SENSORS <u>Robert Degraf</u>, Christoph Langer, Florian Dams, Rupert Schreiner Faculty of General Sciences and Microsystems Technology, OTH Regensburg, D-93053 Regensburg, Germany</p> <p>RECENT ACHIEVEMENTS IN SERIAL CO-SPUTTERING Stefan Körner¹, Andreas Pflug², Michael Siemers², Volker Sittinger², Lucie Behnke³, Ruslan Muydinov¹, <u>Bernd Szyszka</u>¹ ¹TU Berlin, Chair TFD, Office HFT 5-2, Einsteinufer 25, 10587 Berlin, Germany ²Fraunhofer IST, Bienroder Weg 54e, 38108 Braunschweig, Germany ³Solayer GmbH, Sachsenallee 28, 01723 Kesselsdorf, Germany</p> <p>DEVELOPMENT OF THE OPTICAL SPACE CS CLOCK A. Douahi¹, <u>R. Schmeissner</u>¹, P. Dufreche¹, A. Brechenmacher¹, F. Chastellain², A. Romer², C. Roth², W.W. Coppoolse², N. Mestre¹, Michel Baldy¹ ¹Thales Electron Devices S.A.S, 2 rue Marcel Dassault, 78141 Vélizy-Villacoublay cedex, France ²RUAG AG, Schaffhauserstr. 580, 8052 Zurich, Swizerland</p> <p>THERMAL CONDUCTIVITY MEASUREMENT WITH “FREE FLOATING” MOLECULE DETECTOR Heinz Plöchinger Thyracont Vacuum Instruments GmbH, Max-Emanuel-Str. 10, 94036 Passau, Germany</p>
<p>12:30</p>	<p>Lunch</p>

<p>13:30 <i>L1.3-1</i></p> <p>13:55 <i>L1.3-2</i></p> <p>14:20 <i>L1.3-3</i></p> <p>14:45 <i>L1.3-4</i></p>	<p>Session 1.3: Gyrotrons (I) Chairman: Manfred Thumm</p> <p>RECENT STATUS OF GYROTRON RESEARCH AND DEVELOPMENT AT KIT AS PART OF THE EUROPAEN FUSION GYROTRON PROGRAM S. Illy¹, F. Albajar⁵, K. A. Avramidis¹, A. Bruschi⁷, J. Franck¹, F. Wilde^{1,3}, G. Gantenbein¹, J. P. Hogge⁴, J. Jin¹, P. Kalaria¹, I. Gr. Pagonakis¹, T. Rzesnicki¹, S. Ruess^{1,2}, M. Thumm^{1,2}, I. G. Tigelis⁶, C. Wu¹, J. Zhang¹, and J. Jelonnek^{1,2} ¹IHM, ²IHE, Karlsruhe Institute of Technology (KIT), D-76131 Karlsruhe, Germany, ³Max-Planck-Institut für Plasmaphysik, Teilinst. Greifswald, D-17491 Greifswald, Germany ⁴Swiss Plasma Center (SPC), Ecole Polytechnique Fédérale de Lausanne, CH-1015 Lausanne, Switzerland ⁵European Joint Undertaking for ITER and the Development of Fusion Energy (F4E), Barcelona, E 08019, Spain ⁶Faculty of Physics, National and Kapodistrian University of Athens, Zografou, GR-157 84, Athens, Greece ⁷Istituto di Fisica del Plasma, Consiglio Nazionale delle Ricerche, 20125 Milano, Italy</p> <p>OPERATION LIMITS OF A 236 GHZ HOLLOW-CAVITY GYROTRON FOR DEMO Parth C. Kalaria¹, Konstantinos A. Avramidis¹, Joachim Franck¹, Gerd Gantenbein¹, Stefan Illy¹, Ioannis Gr. Pagonakis¹, Manfred Thumm¹, John Jelonnek^{1,2} ¹IHM, ²IHE, Karlsruhe Institute of Technology (KIT), Kaiserstr. 12, 76131 Karlsruhe, Germany</p> <p>GYROTRON SIMULATIONS WITH CST STUDIO SUITE® Monika C. Balk CST AG, Bad Nauheimer Str. 19, 64289 Darmstadt, Germany</p> <p>ONGOING DEVELOPMENTS FOR THE KIT 2-MW 170 GHz COAXIAL CAVITY GYROTRON PROTOTYPE Sebastian Ruess^{1,2}, Gerd Gantenbein¹, Stefan Illy¹, Ioannis Gr. Pagonakis¹, T. Rzesnicki¹, Manfred Thumm^{1,2}, and John Jelonnek^{1,2} ¹IHM, ²IHE, Karlsruhe Institute of Technology (KIT), Kaiserstr. 12, D-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 KATHRIN Experiment Chairman: Ernst Bosch</p> <p>INSERT MISALIGNMENT IN COAXIAL GYROTRONS: PHYSICAL EFFECTS AND NUMERICAL TREATMENT Joachim Franck¹, Konstantinos A. Avramidis¹, Gerd Gantenbein¹, Stefan Illy¹, Ioannis Gr. Pagonakis¹, Manfred Thumm^{1,2}, John Jelonnek^{1,2} ¹Institute for Pulsed Power and Microwave Technology (IHM), ²Institute of High Frequency Techniques and Electronics (IHE), Karlsruhe Institute of Technology (KIT), Kaiserstr. 12, 76131 Karlsruhe, Germany</p>

16:05 <i>L1.4-2</i>	SIMULATION OF GYROTRON MULTISTAGE DEPRESSED COLLECTORS USING BEAM-SHAPE TRANSFORM AND E×B DRIFT Chuanren Wu¹, Ioannis Gr. Pagonakis¹, Stefan Illy¹, Gerd Gantenbein¹, Manfred Thumm^{1,2}, John Jelonnek^{1,2} ¹ IHM, ² IHE, Karlsruhe Institute of Technology (KIT), Kaiserstr. 12, D-76131 Karlsruhe, Germany
16:30 <i>L1.4-3</i>	VACUUM PERFORMANCE OF THE KATRIN EXPERIMENT Florian M. Fraenkle Karlsruher Institut für Technologie (KIT), Institut für Kernphysik (IKP), Hermann-von-Helmholtz-Platz 1, 76344 Eggenstein-Leopoldshafen, Germany
16:55 <i>L1.4-4</i>	PENNING DISCHARGE IN THE KATRIN PRESPECTROMETER Ferenc Glück Karlsruher Institut für Technologie (KIT), Institut für Kernphysik (IKP), Hermann-von-Helmholtz-Platz 1, 76344 Eggenstein-Leopoldshafen, Germany

18:30	Workshop Dinner & Evening Discussion Physikzentrum Bad Honnef: Lichtenberg-Keller (at basement level)
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Workshop Program, 2nd Day

Friday, September 9, 2016

Location: **Wilhelm und Else Heraeus Hörsaal**

08:40 <i>L2.1-1</i>	Session 2.1: Vacuum Interrupters Chairman: Volker Hinrichsen SHORT-CIRCUIT CURRENT INTERRUPTION IN LIQUID NITROGEN ENVIRONMENT Karsten Golde¹, Volker Hinrichsen¹, Dietmar Gentsch², Andreas Lawall³, Erik D. Taylor³ ¹ High Voltage Laboratories, Technische Universität Darmstadt, Darmstadt, Germany ² ABB AG, Ratingen, Germany ³ Siemens AG, Berlin, Germany
09:05 <i>L2.1-2</i>	MODEL FOR THE WELDING OF AXIAL MAGNETIC FIELD VACUUM INTERRUPTER CONTACTS Erik D. Taylor¹, Andreas Lawall¹, and Paul G. Slade² ¹ Siemens AG, Rohrdamm 88, Berlin, 13629 Germany ² Consultant, Ithaca, NY 14850, U.S.A.

<p>09:30 <i>L2.1-3</i></p> <p>09:55 <i>L2.1-4</i></p>	<p>“METAL VAPOUR IMPACT ON CERAMIC SURFACES OF VACUUM INTERRUPTER” AFTER CURRENT INTERRUPTION OPERATIONS DIELECTRIC PERFORMANCE AND SURFACE RESISTANCE MEASUREMENT: FINAL PRINCIPLE IN PRACTICE <u>Dietmar Gentsch</u>¹, <u>Michael Kurrat</u>², <u>Ingo Gramberg</u>² ¹ABB AG, Calor Emag Mittelspannungsprodukte, Oberhausener Str. 33, 40472 Ratingen, Germany ²Institute for High Voltage Technology and Electrical Power Systems, Technische Universität Braunschweig, Schleinitzstr. 23, 38106 Braunschweig, Germany</p> <p>MEASURING EMISSIVITY OF CONTACT MATERIAL USING THERMOGRAPHY CAMERA <u>Tobias Pieniak</u>¹, <u>Michael Kurrat</u>¹, <u>Dietmar Gentsch</u>² ¹Institute for High Voltage Technology 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>10:20</p>	<p>Coffee Break</p>
<p>10:50 <i>L2.2-1</i></p> <p>11:15 <i>L2.2-2</i></p> <p>11:40 <i>L2.2-3</i></p> <p>12:05 <i>L2.2-4</i></p>	<p><i>Session 2.2: Arc Investigations, Gas Discharge Tube, HEMP Thruster and Klystron</i> Chairman: Andreas Lawall</p> <p>INVESTIGATION OF HIGH CURRENT VACUUM ARCS DURING THE FORMATION OF ANODE MODES BY TIME AND SPACE RESOLVED SPECTROSCOPY <u>R. Methling</u>¹, <u>A. Khakpour</u>¹, <u>S. Gortschakow</u>¹, <u>D. Uhrlandt</u>¹, <u>St. Franke</u>¹, <u>S. Popov</u>², <u>A. Batrakov</u>², and <u>K. D. Weltmann</u>¹ ¹Leibniz Institute for Plasma Science and Technology, 17489 Greifswald, Germany ²Institute of High Current Electronics, Russian Academy of Sciences, 634055 Tomsk, Russia</p> <p>STACKED GAS DISCHARGE TUBE (GDT) AS A NEW OVERVOLTAGE PROTECTION DEVICE FOR RADIO BASE STATIONS (RBS) <u>Wolfgang Däumer</u>, <u>Robert Hoffmann</u>, <u>Frank Werner</u> EPCOS AG, A TDK GROUP COMPANY, Rohrdamm 88, 13629 Berlin, Germany</p> <p>THE HEMP-TRUSTER: CURRENT DEVELOPMENT AND PERSPECTIVE <u>Ralf Heidemann</u>¹, <u>S. Weis</u>¹, <u>A. Lazurenko</u>¹, <u>H. Stalzer</u>¹, <u>A. Genovese</u>¹, <u>P. Holtmann</u>¹, <u>N. Püttmann</u>² ¹Thales Deutschland GmbH Business Unit Electron Devices, Ulm, Germany, ²Deutsches Zentrum für Luft- und Raumfahrt e. V. (DLR) - Raumfahrt-Agentur, Bonn, Germany</p> <p>TENTATIVE DESIGN OF A W-BAND HOLLOW-BEAM KLYSTRON FOR FREQUENCY TRIPLING <u>Jiwei Nie</u>, <u>Heino Henke</u> Technische Universität Berlin, Sekr. EN-2, Einsteinufer 17, 10587 Berlin, Germany</p>

12:30	Lunch
	<p>Session 2.3: Traveling Wave Tubes (TWTs) Chairman: Manfred Thumm</p>
13:30 <i>L2.3-1</i>	<p>170W Ka WIDEBAND SPACE TRAVELING-WAVE TUBE (TWT) Luisa Fernandez Pena, Benoit Michel, <u>Sophie Kohler</u>, Jean Gastaud, Alain Laurent Thales Electron Devices S.A.S, 2 rue Marcel Dassault, 78141 Vélizy-Villacoublay cedex, France</p>
13:55 <i>L2.3-2</i>	<p>SIMULATION OF TRAVELING-WAVE TUBE MULTI-TONE BEHAVIOR <u>Djamschid Safi</u>¹, Philip Birtel², Frédéric André³, Arne F. Jacob¹ ¹Institut für Hochfrequenztechnik, Technische Universität Hamburg, Hamburg, Germany ²Thales Electronic Systems, Ulm, Germany ³Thales Electron Devices, Vélizy-Villacoublay, France</p>
14:20 <i>L2.3-3</i>	<p>BEAM FOCUSING IN SATCOM TWT INCLUDING THERMAL ELECTRONS <u>Philip Birtel</u>, Juergen Wegener, Jean-Francois David Thales Electronic Systems, 89075 Ulm, Germany</p>
14:45 <i>L2.3-4</i>	<p>ACCURATE FIELD SHAPE MODEL FOR BEAM-WAVE INTERACTION SIMULATION OF FOLDED-WAVEGUIDE TRAVELING-WAVE TUBES <u>Sascha Meyne</u>¹, Jean-François David², Arne F. Jacob¹ ¹Institut für Hochfrequenztechnik, Technische Universität Hamburg, Hamburg, Germany ²Thales Electron Devices, Vélizy-Villacoublay, France</p>
15:10	Closing Words: Manfred Thumm, Workshop Co-Chairman
15:20	Coffee Break → End of Workshop: 16:00