2013 IEEE 14th International Vacuum Electronics Conference

(IVEC 2013)

Paris, France
21 – 23 May 2013
Monday 20 May 2013

17:00-19:00 Registration open

Tuesday 21 May 2013

08:00 Registration

Plenary Session
Room: Louis Armand

08:30 Introduction
08:45 KA-SAT and Future HTS Systems 1
Fenech, H.; EUTELSAT
09:20 The European Spallation Source 3
McGinnis, D.; EUROPEAN SPALLATION SOURCE
09:55 The Diary of a TWT Engineer – Vacuum Tubes Don’t Suck 5
Carruthers, M.; Comtech Xicom Technology
10:30 Coffee Break
10:50 J. Pierce Award Ceremony
11:00 The Vitality of Vacuum Electronics 7
Armstrong, C.; L-3 Communications Electron Devices
11:35 ITER Project and RF systems 10
Beaumont, B.; ITER Organization

12:10 Lunch Break

Session 1A: Thermionic Cathodes I
Chair: T. Grant (Communications & Power Industries, LLC)
Room: Louis Armand

14:00 Keynote: Environmental Influence on MM-type Dispenser Cathodes used in VED's and Propulsion Systems 12
Thales Airsystems & Electron Devices GmbH, (GERMANY)
14:20 Advanced CPR Cathode Research 14
Ives, L.1; Read, M.1; Marsden, D.1; Collins, G.1; Falce, L.2; Busbaher, D.3; Effgen, M.3; Schwartzkopf, S.4; Malygin, A.5; Borchard, P.6
1Calabazas Creek Research, Inc., (UNITED STATES); 2Consultant, (UNITED STATES); 3Semicon Associates, Inc., (UNITED STATES); 4Ron Witherspoon, Inc., (UNITED STATES); 5Karlsruhe Institute of Technology, (GERMANY); 6Dymenko, LLC, (UNITED STATES)
14:40 A new Impregnated Dispenser Cathode 16
Shengyi, Yin1; Zhen, Peng2; Qiang, Zheng3; Yu, Wang3; Xinxin, Wang1; Yang, Li1
1Institute of Electronics, Chinese Academy of Sciences, (CHINA); 2University of Chinese Academy of Sciences, (CHINA); 3Institute of Electronics, Chinese Academy of Sciences, (CHINA)
15:00 Performance Comparison between Sintered Tungsten Dispenser Cathodes and Nano-Composite Scandate Dispenser Cathodes 18
Busbaher, D.1; Zhao, J.1; Gamzina, D.2; Luhmann, N.2
1Semicon Associates, (UNITED STATES); 2University of California Davis, (UNITED STATES)
15:20 1,000 A/cm2 Cathode: to be or not to be? 20
Taran, A.1; Kyslytsyn, O.1; Podshyvalova, O.1; Ordanjan, S.1
1National Aerospace University “Kharkiv Aviation Institute”, (UKRAINE); 2St. Petersburg State Technological Institute (Technical University), (RUSSIAN FEDERATION)
Performance Degradation Simulation for M-type Cathode Based on Ion Bombardment

Shi, X.; Fan, H.; Zhao, X.; Song, F.; Sun, X.

Southeast University, (CHINA); Science and Technology on Reliability Physics and Application Technology of Electronic Component Lab, (CHINA)

Session IB: Gyrodevices I

Chair: JP. Hogge (EPFL)
Room: Friedrich List

14:00 Keynote: First Tests of a 527 GHz Gyrotron for Dynamic Nuclear Polarization
Felch, K.; Blank, M.; Borchard, P.; Cauffman, S.; Rosay, M.; Tometich, L.
Communications and Power Industries, (UNITED STATES); Bruker Biospin, (UNITED STATES)

14:20 Compact Sub-THz Gyrotrons for Real-Time T-ray Imaging
Han, S.T.
Korea Electrotechnology Research Institute, (KOREA, REPUBLIC OF)

14:40 Manufacturing of a 263 GHz Continuously Tunable Gyrotron
Rozier, Y.; Legrand, F.; Lievin, C.; Racamier, J.-C.; Marchesin, R.; Alberti, S.; Braunmueller, F.; Hagge, J.-Ph.; Da Silva, M.; Tran, M.Q.; Tran, T.M.; Macor, A.
Thales Electron Devices, (FRANCE); Centre de Recherches en Physique des Plasmas, EPFL, (SWITZERLAND); Institute of Condensed Matter Physics, EPFL, (SWITZERLAND)

15:00 Analysis of Mode Competition in 10kW/28GHz Gyrotron
Karlsruhe Institute of Technology (KIT), (GERMANY); Karlsruhe Institute of Technology, (GERMANY); Calabazas Creek Research, Inc., (UNITED STATES); Institute of Aerodynamics and Gasdynamics, University of Stuttgart, (GERMANY)

15:20 The Study of a High Power TE11 Ku-Band Gyro-TWT
Wang, J.; Luo, Y.; Xu, Y.; Deng, X.
University of Electronic Science and Technology of China, (CHINA)

Session IC: Space Application

Chair: S. Voigt (DLR)
Room: Georges Stephenson

14:00 Keynote: TWTA versus SSPA: A Comparison Update of the Boeing Satellite Fleet On-Orbit Reliability
Nicol, E.F.; Mangus, B.J.; Grebliunas, J.R.; Woolrich, K.; Schirmer, J.R.
Boeing Company, (UNITED STATES); Space & Intelligence Systems, Boeing Corporation, (UNITED STATES)

14:20 Reliability of TWAs and MPMs in Orbit
Jaumann, G.; Gallego Jimenez, E.
TESAT, (GERMANY); TESAT Spacecom, (GERMANY)

14:40 Multibeam Satellites Performance Analysis in Non-Uniform Traffic Conditions
Aloisio, M.; Lizarroga, J.; Angeletti, P.; Alogha, N.
European Space Agency ESA-ESTEC, (NETHERLANDS)

15:00 Use of Flexible LCTWTA for Communication Satellites
Piro, F.; Joer, JP.; Fryris, I.
Eutelsat, (FRANCE); Eutelsat, (GREECE)

15:20 Radiation Cooled TWTA at End-Of-Life: An Evaluation of Thermal Evolution Over 15 Years
Kaliski, M.
Space Systems/Loral, LLC, (UNITED STATES)
15:40 CAN bus based TM/TC Interface for Microwave Power Modules in Satcom Payloads
Freese, J.; Kurz, R.; Artmann, J.; Stanka, T.
Tesat Spacecom, (GERMANY)

16:00 Coffee Break

Session 2A: Cold Cathodes I
Chair: P. Legagneux (Thales-TRT)
Room: Louis Armand

16:20 Keynote: Electron Over-Barrier Emission Mechanism of Single Layer Graphene
Liang, S.; Ang, L. K.
Singapore U of Technology and Design, (SINGAPORE)

16:40 High Average Power Field Emitter Cathode and Testbed For X/Ku-Band Cold Cathode TWT
1L-3 Communications Electron Devices, (UNITED STATES); 4SRI International, (UNITED STATES)

17:00 Carbon Nanotubes Electron Source
Ulisse, G.; Ciceroni, C.; Brunetti, F.; Di Carlo, A
University of Rome "Tor Vergata", (ITALY)

17:20 Synthesized and Field Emission Properties of Carbon Tubes/Graphene Composite Films
University of Electronic Science and Technology of China, (CHINA)

17:40 The Matrix Field Emission Cathodes based on Carbon Nanotubes for Vacuum Electronic Devices
Tarasov, E.; Gulyaev, Yuri; Sinitsyn, Nikolai; Targashov, Gennadi; Grigoriev, Yuri; Aban'shin, Nikolai; Schalaev, Pavel
2Saratov Devision of Kotelnikov Institute of Radio Engineering and Electronic of RAS, (RUSSIAN FEDERATION); 3SRI «Volga», (RUSSIAN FEDERATION); 4SRI «RPE «Almaz», (RUSSIAN FEDERATION)

Session 2B: Klystrons & Applications I
Chair: F. Peauger (CEA)
Room: Friedrich List

16:20 Keynote: Sheet Beam Extended Interaction Klystron (EIK) in W Band
Pasour, J.; Wright, E.; Nguyen, K.; Balkcum, A.; Levush, B.
1Naval Research Laboratory, (UNITED STATES); 2Beam Wave Research, Inc., (UNITED STATES); 3CPI, (UNITED STATES); 4Naval Research Lab, (UNITED STATES)

16:40 S-Band Sheet Beam Klystron Research and Development at SLAC
SLAC National Accelerator Laboratory, (UNITED STATES)

17:00 A 48GHz, 500W CW Extended Interaction Klystron
Dobbs, R.; Hyttinen, Mark; Steer, Brian
CPI Canada, (CANADA)

17:20 14 kW High Power X-Band to Ka-Band Klystron Frequency Multiplier
Fan, J.J.; Wang, Y.
Institute of Electronics, Chinese Academy of Sciences, (CHINA)

17:40 Development of a 10 kW CW High Efficiency S-Band PPM Klystron
Ferguson, P.; Read, M.; Marsden, D.; Bui, T.; Ives, L
Calabazas Creek Research, Inc., (UNITED STATES)
Session 2C: Space TW'Ts and TW'TA's
Chair: W. Menninger (L-3 Communications Electron Technologies)
Room: Georges Stephenson

16:20  **Keynote:** Very High efficiency Dual Flexible TW'TA, a flexible Concept allowing to deal with Performances and Schedule Constraints of Telecommunication Payloads  
Cuignet, E.; Tonello, E.; Maynard, J.; Boone, Ph.  
1THALES ALENIA SPACE, (BELGIUM); 2THALES ALENIA SPACE, (FRANCE); 3THALES ELECTRONIC DEVICES, (FRANCE)

16:40  Travelling Wave Tubes for Modern Satellite Communications  
Bosch, E.  
Thales Electron Devices, (GERMANY)

17:00  mm-Wave Space Helix TWT Performance and Experience  
Robbins, N.; Dibb, D.; Menninger, W.  
L-3 Electron Technologies, Inc., (UNITED STATES)

17:20  Space-Qualified, 160-Watt Radiation-Cooled, X-band Helix TWT  
Martin, R.; Menninger, W.; Zhai, X.; Blunk, S.; Feicht, J.; Mcgeary, W  
L-3 Communications, ETI, (UNITED STATES)

17:40  A Novel Design of L-Band Lineariser for TW'TA  
Li, S.  
Institute of Electronics, Chinese Academy of Sciences (IECAS), (CHINA)

18:45  **Welcome Cocktail sponsored by Thales Electron Devices**
Wednesday 22 May 2013

Session 3A: Klyscrons and Applications II
Chair: S. Choroba (DESY)
Room: Louis Armand

08:30 Keynote: Overview on Pulsed UHF Sources at Thales Electron Devices
Beunas, A.; Grezaud, M.; Bel, C.; Boussaton, A.; Dargès, B.
Thales Electron Devices, (FRANCE)

08:50 Applications of High Power Induction Output Tubes in High Intensity Superconducting Proton Linacs
McGinnis, D.; Garoby, R.; Gerick, G.; Lindroos, M.; Montesinos, E.; Sunesson, A.
1ESS, (SWEDEN); 2CERN, (SWEDEN)

09:10 Some Technical Problems of the C-Band Broadband Multi-Beam Klystron
Ding, Y.; Ding, H.; Shen, B.; Miao, Y.
Institute of Electronics, Chinese Academy of Sciences, (CHINA)

09:30 Design and Fabrication of a 10 MW, L-Band, Annular Beam Klystron
Read, M.; Ferguson, P.; Jackson, R.; Marsden, D.; Ives, L.
Calabazas Creek Research Inc., (UNITED STATES)

09:50 Lifetime and Reliability Analysis of Klystrons
Balkcum, A.; Habermann, T
CPI, (UNITED STATES)

10:10 Pulsed Depressed Collector for High-Efficiency RF Systems
Kemp, M.A.; Jensen, A.; Neilson, J.
SLAC National Accelerator Laboratory, (UNITED STATES)

Session 3B: 220 GHz
Chair: J. Booske (University of Wisconsin)
Room: Friedrich List

08:30 Keynote: Demonstration of a High Power, Wideband 220 GHz Serpentine Waveguide Amplifier Fabricated by UV-LIGA
1U.S. Naval Research Laboratory, (UNITED STATES); 2Beam-Wave Research, (UNITED STATES); 3Communications and Power Industries, Inc., (UNITED STATES)

08:50 A Compact, High-Power THz Source: Concept & Simulation
Bluem, H.; Jarvis, J.; Todd, A.; Jackson, R.
1Advanced Energy Systems, UNITED STATES; 2Jackson Science Consulting, UNITED STATES

09:10 Breakthrough UV-LIGA Microfabrication of Sub-mm and THz Circuits
Joye, C.; Cook, A.; Calame, J.; Abe, D.; Levush, B.
U.S. Naval Research Laboratory, UNITED STATES

09:30 220 GHz Power Amplifier Testing at Northrop Grumman
Kreischer, K.; Tucek, J.; Basten, M.; Gallagher, D
Northrop Grumman, (UNITED STATES)

09:50 220 GHz Ultra Wide Band TWTA: Nano CNC Fabrication and RF testing
University of California - Davis, (UNITED STATES)

10:10 High Power CW 264 GHz Tunable Extended Interaction Oscillator
Roitman, A.; Horoyski, P.; Steer, B.; Berry, D.
CPI Canada, (CANADA)
Session 3C: RF Modeling  
Chair: E. Bosch (TED)  
Room: Georges Stephenson

08:30  
**Keynote**: An External Circuit Model for Electromagnetic Particle-In-Cell Simulations  
Lin, M. C.; Zhou, C. D.; Smithe, D. N.  
Tech-X, (UNITED STATES)

08:50  
A 3D Large Signal Model for Helix TWT*  
David, J-F; Bariou, D.  
Thales Electron Devices, (FRANCE)

09:10  
TWT Stability for Frequencies near a Band Edge  
1SAIC, (UNITED STATES); 2University of Maryland, (UNITED STATES); 3Naval Research Laboratory, (UNITED STATES); 4Beam-Wave Research, Inc., (UNITED STATES)

09:30  
Conformal Time-Domain Particle-in-Cell Simulation of Vacuum Electronic Devices with Accurate Surface Loss  
Cooke, S.; Stantchev, G.  
Naval Research Laboratory, (UNITED STATES)

09:50  
SUNRAY-1D and SUNRAY-2.5D Codes for Large-Signal Analysis of a Space TWT  
Srivastava, V.  
CSIR Central Electronics Engineering Research Institute, (INDIA)

10:10  
Application of External Circuit Model to MIG Gun LFO Study  
Smithe, D.; Lin, M. C.; Zhou, S.  
Tech-X Corporation, (UNITED STATES)

10:30  
Coffee Break

Session 4A: High Power Microwaves I  
Chair: M. Clark (TMD Technologies Ltd)  
Room: Louis Armand

10:50  
**Keynote**: Numerical Evaluation of the Role of Reflectors to Maximize the Power Efficiency of an Axial Vircator  
Champeaux, S.; Gourard, P.; Cousin, R.; Larour, J.  
1CEA, (FRANCE); 2CST AG, (FRANCE); 3UoR, UMR7648 CNRS, Ecole Polytechnique, (FRANCE)

11:10  
Microwave Oscillations in the Recirculating Planar Magnetron  
1University of Michigan, (UNITED STATES); 2Air Force Research Laboratory, (UNITED STATES); 3Air Force Office of Scientific Research, (UNITED STATES)

11:30  
Self-similar Regimes of Short Electromagnetic Pulses Amplification and Compression by Quasi-Stationary Electron Beams  
Ryskin, N.M.; Ginzburg, N.S.; Zotova, I.V.  
1Saratov State University, (RUSSIAN FEDERATION); 2Institute of Applied Physics, RAS, (RUSSIAN FEDERATION)

11:50  
Unique Multi-Physics Approach of Self Phase Locked Magnetron (SPLM) System with CST STUDIO SUITE™  
Balk, Monika; Baek, Seungwon; Kim, Hyungjong; Kim, Khio; Choi, Jinjoo  
1CST AG, (GERMANY); 2CST OF AMERICA, Inc., (UNITED STATES); 3LIG NEX1, (KOREA, REPUBLIC OF); 4Kwangwoon University, (KOREA, REPUBLIC OF)

12:10  
Relativistic Magnetron-Driven Microwave Pulse Compressor based on the Traveling Wave Resonator  
Sayapin, A.; Levin, A.; Krasik, Ya.  
Technion, ISRAEL
Session 4B: Broadband and mm wave TWT’s
Chair: Jinjun Feng (Beijing, Vacuum Electronics Research Institute)
Room: Friedrich List

10:50  **Keynote: Development of High-Power Broadband Ka-band Cascaded-TWT**  120
1Beam-Wave Research, Inc., (UNITED STATES); 2Naval Research Laboratory, (UNITED STATES); 3ATK-Mission Research, (UNITED STATES); 4SAIC, (UNITED STATES)

11:10  Development of wide Band Helix Mini-TWT with "strong" Phase Velocity Control  122
Martorana, Rosario; Dionisio, R.; Nicosia, A.
Selex ES, (ITALY)

11:30  **1.8 kWatt Broad Band Ka-band TWT Power Booster**  124
Levush, B. ; Abe, D. ; Vlasov, A.N. ; Chernyavskiy, I. ; Cooke, S.J. ; Legarra, J. ; Nguyen, K.N. ; Cusick, M. ; Begum, R. ; Stockwell, B. ; Ramirez-Aldana, J.L. ; Chernin, D.
1Naval Research Laboratory, (UNITED STATES); 2Beam-Wave Research, Inc., (UNITED STATES); 3CPI, (UNITED STATES); 4SAIC, (UNITED STATES)

11:50  Investigation of 0.14THz Folded Waveguide TWT  126
Wang, Yajun
Institute of Electronic Engineering China Academy of Engineering Physics, (CHINA)

12:10  Modeling of the NRL G-Band TWT Amplifier Using the CHRISTINE and TESLA Simulation Codes  128
1Naval Research Laboratory, (UNITED STATES); 2Science Applications International Corp., (UNITED STATES); 3US Naval Research Laboratory, (UNITED STATES)

Session 4C: Cold Cathodes II
Chair: D. Whaley (L-3 Communications Electron Devices Division)
Room: Georges Stephenson

10:50  **Keynote: Microfocus X-Ray Tube Based on CNT Array**  130
University of Electronic Science and Technology of China, (CHINA)

11:10  Emittance and Emission from Arrays with Statistical Variation  132
Panagos, D. ; Jensen, K. ; Petillo, J.
1Science Applications International Corp., (UNITED STATES); 2US Naval Research Laboratory, (UNITED STATES)

11:30  Enhanced Field Emission from Chemically Synthesized Cadmium Sulphide-Polyaniline (CdS-PANI) Nanotube Composite  134
University of Pune, (INDIA)

11:50  3D Simulations of Secondary Electron Emission from Hydrogen-Terminated Diamond  136
Dimitrov, D. ; Wang, E. ; Smedley, J. ; Ben-Zvi, I. ; Rao, T.
1Tech-X Corporation, (UNITED STATES); 2Brookhaven National Laboratory, (UNITED STATES)

Hajimirzaheydarali, M.; Akbari, M.; Mohajerzadeh, S.
University of Tehran, (IRAN, ISLAMIC REPUBLIC OF)

12:30  Lunch Break

14:00-18:00  **Poster Session I**
Session 5A: Microwave Tube Technologies
Chair: F. Doveil (Univ. of Marseille)
Room: Louis Armand

14:00 **Keynote:** Diminishing Manufacturing Sources and Material Sources Impacting the Microwave Tube Industry 140
Mitsdarffer, K.
NSWC Crane, (UNITED STATES)

14:20 High Power RF Window for Multi-Megawatt Power Transmission 142
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1Calabazas Creek Research, Inc., (UNITED STATES); 2N.C. State University, (UNITED STATES); 3University of New Mexico, (UNITED STATES)

14:40 Preliminary Results on the Multipactor Effect Prediction in RF Components with Ferrites 144
Puech, J.
CNES, (FRANCE)

15:00 Ka-Band Gyro-TWA Waveguide Severs for Circularly Polarized Waves. 146
Whyte, C
University of Strathclyde, UNITED KINGDOM

15:20 A 15-Beam Electron Gun for an X-Band Klystron 148
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1Calabazas Creek Research, Inc., (UNITED STATES); 2Dymenso, LLC, (UNITED STATES)

15:40 Experimental Investigation of the Influence of Electron Incidence Angle on the Total Electron Emission Yield of Silver 150
Gineste, T 1; Belhaj, M 1; Bundaleski, N 2; Teodoro, O 2; Pons, C 1; Puech, J 3
1ONERA, (FRANCE); 2CEFITEC, (PORTUGAL); 3CNES, (FRANCE)

Session 5B: Microwave Circuit Design
Chair: KH. Hübner (TESAT spacecom)
Room: Friedrich List

14:00 **Keynote:** New Klystron Topology Based on Periodic Sequence of High Order Mode Cavities 152
Paoloni, C.
Lancaster University, (UNITED KINGDOM)

14:20 On the Use of Metamaterials for Increasing of Output Power of Multibeam Klystrons 154
Galdetskiy, A.
FSUE Istok, (RUSSIAN FEDERATION)

14:40 Corkscrew Modulated Hollow-Beam Klystron for High Power and Frequency Multiplying Applications 156
Grede, A. G.; Henke, H.
Technische Universitaet Berlin, (GERMANY)

15:00 Folded Meander-Line Slow-Wave Structure for Millimeter-Wave Traveling-Wave Tubes 158
Sumathy, M 1; Datta, S. K 2; Lalit, Kumar 2
1MTRDC, (INDIA); 2MTRDC/DRDO, (INDIA)

15:20 Design of an Unconnected Pair of Planar Helices with Straight-Edge Connections for Application in TWTs 160
Zhao, C. 1; Aditya, S. 1; Chua, C. 2; Jin, C. 3
1Nanyang Technological University, (SINGAPORE); 2Institute of High Performance Computing, A*STAR, (SINGAPORE); 3Institute of Microelectronics, A*STAR, (SINGAPORE)

15:40 Open Planar Sheath Slow-Wave Structure 162
Nguyen, L.; Antonsen, T.; Nusinovich, G
University of Maryland, College Park, (UNITED STATES)

16:00 Coffee Break
Session 6A: Gyrodevices II
Chair: E. Jensen (CERN)
Room: Louis Armand

16:20 **Keynote:** Recent Results in Development in Russia of Megawatt Power Gyrotrons for Fusion  

1. Institute of Applied Physics, (RUSSIAN FEDERATION); 2. GYCOM Ltd, (RUSSIAN FEDERATION); 3. Kurchatov Institute, (RUSSIAN FEDERATION)

16:40 Design and Operation of a 2 MW CW, RF Load for Gyrotrons  
Ives, L. 1; Mizuhara, M.; Collins, G.; Borchard, P.; Neilson, J.

1. Calabazas Creek Research, Inc., (UNITED STATES); 2. Dyomenso, LLC, (UNITED STATES); 3. Lexam Research, (UNITED STATES)

17:00 Status of high Power Gyrotron Development in JAEA  

Japan Atomic Energy Agency, (JAPAN)

17:20 Towards the Design of 100 kW, 95 GHz Gyrotron for Active Denial System Application  
Singh, Udaybir

CEERI, (INDIA)

17:40 Design of the EU-1MW Gyrotron for ITER  

1. Karlsruhe Institute of Technology (KIT), (GERMANY); 2. EPFL-CRPP, (SWITZERLAND); 3. National Technical University of Athens, (GREECE); 4. National and Kapodistrian University, (GREECE); 5. Istituto di Fisica del Plasma CNR, (ITALY); 6. Institute of Solid State Physics, University of Latvia, (LATVIA); 7. Thales Electron Devices, (FRANCE); 8. The European Joint Undertaking for ITER and the Development of Fusion Energy, (SPAIN)

Session 6B: Power Supplies and Transmitters
Chair: L. Nilsson (Saab)
Room: Friederich List

16:20 **Keynote:** A 100 Watt W-Band MPM  

L-3 Communications Electron Devices, (UNITED STATES)

16:40 Robust High-Average-Power Modulator  
Kempkes, Michael; Roth, Ian; Butler, Neal; Gaudreau, Marcel

Diversified Technologies, Inc., (UNITED STATES)

17:00 Progress of an Integrated TWT for Phased Array Application  
Hu, Y. F.; Feng, J. J.; Liu, M. H.; Cai, J.; Wu, X. P.; Liao, F. J

Beijing Vacuum Electronics Research Institute, (CHINA)

17:20 Affordable, Short Pulse Marx Modulator  
Kempkes, Michael; Phillips, Robert; Gaudreau, Marcel; Casey, Jeff

1. Diversified Technologies, Inc., (UNITED STATES); 2. Rockfield Research, Inc., (UNITED STATES)

17:40 A 200W High Power MPM  

L3 Communications Electron Devices, (UNITED STATES)

18:00 End of afternoon Sessions
18:45 Departure for Conference Dinner at Musee des Arts Forains
Thursday 23 May 2013

08:30-12:30 Poster Session II

Session 7A: Gyrodevices III
Chair: J. Jelonnek (KIT)
Room: Louis Armand

08:30 **Keynote: A High Gain Photonic Band Gap Gyrotron Amplifier**
Nanni, E.; Lewis, S.; Shapiro, M.; Temkin, R.
MIT, (UNITED STATES)

08:50 Operation of a Step-Frequency Tunable Gyrotron with a Diamond Brewster Angle Output Window
Karlsruhe Institute of Technology, (GERMANY); Max Planck Institut für Plasmaphysik, (GERMANY)

09:10 High-Power Ka-band Gyroklystron Oscillator with Time-Delayed Feedback
Institute of Applied Physics, RAS, (RUSSIAN FEDERATION)

09:30 W-band Gyro-TWA using a Cusp Electron Gun and a Helically Corrugated Interaction Region
He, W.
University of Strathclyde, (UNITED KINGDOM)

09:50 Experimental Study of a Q-Band Gyro-TWT
Liu, B.; Li, Z.; Wang, E.; Xu, Z.; Zhu, Y.; Feng, J.; Yan, T.
Beijing Vacuum Electronics Research Institute, (CHINA)

10:10 Frequency Multiplication in Relativistic Gyro-Klystron Operating with Combination of TE-TM Modes
Institute of Applied Physics, (RUSSIAN FEDERATION)

Session 7B: Beam Optics
Chair: D. Chernin (SAIC)
Room: Friedrich List

08:30 **Keynote: Design Considerations for Linear Beam Devices Employing Emittance Dominated Electron Beams**
Whaley, D.
L-3 Communications Electron Devices, (UNITED STATES)

08:50 Experimental Investigation on Sheet Electron Beam Transport with Electron Beam Measuring and Analyzing System Developed in IECA
Ruan, Cunjun; Li, Qingsheng; Wang, Shuzhong; Yang, Xiudong; Wu, Xunlei; Chongshan, Li
Key Laboratory of High Power Microwave Sources and Technologies, Institute of Electronics, Chinese Academy of Sciences, (CHINA)

09:10 Novel Scaling Laws for the Langmuir-Blodgett Solutions in Cylindrical and Spherical Diode
Zhu, Y. B.; Zhang, P.; Volfells, A.; Ang, L. K.; Lau, Y. Y.
Nanyang Technological University, (SINGAPORE); University of Michigan, (UNITED STATES); Reykjavik University, (ICELAND); Singapore U of Technology and Design, (SINGAPORE)
09:50 Analysis of Quadrupole Focusing Lattices for Electron Beam Transport in Traveling-Wave Tubes  
Nichols, K. 1; Schamiloglu, E. 1; Carlsten, B. 2  
1University of New Mexico, (UNITED STATES); 2Los Alamos National Laboratory, (UNITED STATES)

10:10 Electrostatic Focusing for a Field Emission Electron Source  
Jabotinski, V. 1; Pasour, J. 2; Nguyen, K. T. 2; Petillo, J. 2; Levush, B. 2; Abe, D. 2  
1Beam-Wave Research, UNITED STATES; 2U. S. Naval Research Laboratory, UNITED STATES; 3Scientific Applications International Corporation, UNITED STATES

10:30 Coffee Break

Session 8A: High Power Microwaves II  
Chair: A. Goldetskiy (ISTOK)  
Room: Louis Armand

10:50 Keynote: Locked Generation in Relativistic TWT near Region of Cyclotron Suppression of Parasitic Feedback  
Schamiloglu, E.  
University of New Mexico, (UNITED STATES)

11:10 Technological Development for X-band Plasma Assisted Slow Wave Oscillator (PASOTRON)  
Kumar, N.; Verma, D.; Ahmed, M.; Pal, U.; Kumar, M.; Prakash, R.; Srivastava, V  
CSIR-CEERI, (INDIA)

11:30 Plasma-Tunable Metamaterials and Periodic Structures  
Liu, Chien-Hao; Behdad, Nader  
Department of Electrical and Computer Engineering University of Wisconsin-Madison, (UNITED STATES);

11:50 High-Power Microwave Pulse Compressor Operating in Two Frequencies  
Shlapakovski, A.; Belin, L.; Krasik, Ya.  
Technion, (ISRAEL)

12:10 Feasibility of Quantum Analogues of Classical Microwave Devices on Longitudinal Interaction  
Mozgovoi, Yu. D. 1; Kanavets, V. I. 2; Khritkin, S. A. 1  
1National Research University Higher School of Economics, (RUSSIAN FEDERATION); 2Lomonosov Moscow State University, (RUSSIAN FEDERATION)

Session 8B: W Band TWT's  
Chair: R. Martorana (SELEX ES)  
Room: Friedrich List

10:50 Keynote: A 100 Watt W-Band MPM TWT  
L-3 Communications Electron Devices, (UNITED STATES)

11:10 Development of W-band Folded Waveguide pulsed TWT  
Cai, J.; Feng, Jinhun; Hu, Yinfu; Du, Yinhua; Tang, Ye; Liu, Jingkai; Dong, Ruitong; Chen, Ji; Wu, Xianping  
Beijing Vacuum Electronics Research Intitute, (CHINA);

11:30 Design of a Wideband High-Power W-band Serpentine TWT  
Nguyen, K. 1; Ludeking, L. 2; Cook, A. 3; Cooke, S. 2; Joye, C. 3; Calame, J. 2; Burke, A. 4; Wright, E. 1; Pershing, D. 1; Pasour, J. 2; Petillo, J. 2; Vlasov, A. 3; Chernin, D. 1; Abe, D. 3; Levush, B. 2  
1Beam-Wave Research, Inc., (UNITED STATES); 2ATK-Mission Research, (UNITED STATES); 3Naval Research Laboratory, (UNITED STATES); 4SAIC, (UNITED STATES)

11:50 Experimental Measurement of W-band Backward-Wave Amplification Driven by External Pulsed Signals  
Boik, C. W.  
Samsung Advanced Institute of Technology, (KOREA, REPUBLIC OF)
12:10 Effects of Random Circuit Fabrication Errors on the Mean and Standard Deviation of Small Signal Gain and Phase in a TWT
Rittersdorf, I.M. 1; Antonsen, Jr., T.M. 2; Chernin, D. 3; Lau, Y.Y. 4
1University of Michigan, (UNITED STATES); 2University of Maryland, (UNITED STATES); 3Science Applications International Corporation, (UNITED STATES)

12:30 Lunch Break

14:00-18:00 Poster Session III

Session 9A: Microwave Design and RF Modeling
Chair: N. Ryskin (Saratov)
Room: Louis Armand

14:00 Keynote: Parallel 2D Large-signal Modeling of Cascaded TWT Amplifiers
Chernyavskiy, I. 1; Vlasov, A. 2; Levush, B. 1; Antonsen, T. 3; Nguyen, K. 4
1Naval Research Laboratory, (UNITED STATES); 2Naval Research Laboratory, (UNITED STATES); 3SAIC, (UNITED STATES); 4Beam-wave Research Inc., (UNITED STATES)

14:20 Design of the Radio Frequency Section of a J-band Multiple Beam Klystron
1Central Electronics Engineering Research Institute (CSIR-CEERI), (INDIA); 2Greater Kolkata College of Engineering and Management, (INDIA)

14:40 Hamiltonian Description of Electron Dynamics and its Radiated Field in a Periodic Structure
ANDRÉ, F. 1; BERNARDI, P. 1; RYSKIN, N. M. 2; DOVEIL, F. 3; ELSKENS, Y. 4
1Thales Electron Devices, (FRANCE); 2Saratov State University, (RUSSIAN FEDERATION); 3UMR 7345 CNRS–Aix-Marseille-Université, (FRANCE)

15:00 Dispersive Properties of Serpentine and Folded Waveguide Circuits
Vlasov, A.; Chernyavskiy, I.; Levush, B.; Chernin, D.; Antonsen Jr., T.; Nguyen, K.
1Naval Research Laboratory, (UNITED STATES); 2Science Applications International Corporation, (UNITED STATES); 3Beam-Wave Research Inc., (UNITED STATES)

15:20 The Circuit Design and Particle-in-Cell Simulation for W-Band High-Power Extended Interaction Klystron
Zhang, C. Q.; Ruan, C. J.; Zhao, D.; Wang, S. Z.; Yang, X. D.
Institute of Electronics, Chinese Academy of Sciences, (CHINA)

15:40 Bi-helix SWS for High-Power TWTs
Pchelnikov, Y.N.; Vlasov, A.N.; Chernin, D.
1Consultant, (UNITED STATES); 2Naval Research Laboratory, (UNITED STATES); 3SAIC, (UNITED STATES)

Session 9B: Thermionic Cathodes II
Chair: I. Milsom (E2V Technologies)
Room: Friedrich List

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Wang, Xiaoxia; Zhao, Qinglan; Luo, Jiurun; Li, Yun; Liao, xianheng; Zhang, Qi
Institute of Electronics, Chinese Academy of Sciences, (CHINA)

14:20 Scandate Cathode with Sharp Transition
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1e beam, inc., (UNITED STATES); 2University of California, Davis, (UNITED STATES); 3e beam inc., (UNITED STATES)

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¹US Naval Research Laboratory, (UNITED STATES); ²Beam-Wave Research, (UNITED STATES); ³SAIC, (UNITED STATES)

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1Display Research Centre, School of Electronic Science and Engineering, Southeast University, Nanji, CHINA; 2Display Research Centre, School of Electronic Science and Engineering, Southeast University, Nanjin, CHINA; 3Department of Engineering, Electrical Engineering Division, University of Cambridge, CB3 OFA, Cambri, UNITED KINGDOM; 4Department of Engineering, Electrical Engineering Division, University of Cambridge, 9 J J Thomson Av, UNITED KINGDOM

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