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
       Fenech, H.; EUTELSAT
09:20  The European Spallation Source
       McGinnis, D.; EUROPEAN SPALLATION SOURCE
09:55  The Diary of a TWT Engineer – Vacuum Tubes Don’t Suck
       Carruthers, M.; Comtech Xicom Technology
10:30  Coffee Break
10:50  J. Pierce Award Ceremony
11:00  The Vitality of Vacuum Electronics
       Armstrong, C.; L-3 Communications Electron Devices
11:35  ITER Project and RF systems
       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
       Thales Airsystems & Electron Devices GmbH, (GERMANY)
14:20  Advanced CPR Cathode Research
       Malychin, A.; Borchard, P.
       1Calabazas Creek Research, Inc., (UNITED STATES); 2Consultant, (UNITED STATES); 3Semicon Associates, Inc., (UNITED STATES); 4Ron Witherspoon, Inc., (UNITED STATES); 5Karlsruhe Institute of Technology, (GERMANY); 6Dymenso, LLC, (UNITED STATES)
14:40  A new Impregnated Dispenser Cathode
       Shengyi, Yin; Zhen, Peng; Qiang, Zheng; Yu, Wang; Xinxin, Wang; Yang, Li
       1Institute of Electronics, Chinese Academy of Sciences, (CHINA); 2University of California Davis, (UNITED STATES)
15:00  Performance Comparison between Sintered Tungsten Dispenser Cathodes and Nano-Composite Scandate
       Busbaher, D.; Zhao, J.; Gamzina, D.; Luhmann, N.
       2Semicon Associates, (UNITED STATES); 3University of California Davis, (UNITED STATES)
15:20  1,000 A/cm2 Cathode: to be or not to be?
       Taran, A.; Kyslytsyn, O.; Podshyvalova, O.; Ordanjan, S.
       1National Aerospace University “Kharkiv Aviation Institute”, (UKRAINE); 2St. Petersburg State
       Technological Institute (Technical University), (RUSSIAN FEDERATION)
15:40 Performance Degradation Simulation for M-type Cathode Based on Ion Bombardment\(^\text{1}\) Shi, X. \(^\text{1}\); Fan, H. \(^\text{1}\); Zhao, X. \(^\text{1}\); Song, F. \(^\text{1}\); Sun, X. \(^\text{1}\) 
\(^{1}\text{Southeast University, (CHINA);}\) \(^{2}\text{Science and Technology on Reliability Physics and Application Technology of Electronic Component Lab, (CHINA)}\)

Session 1B: Gyrodevices I
Chair: J.P. Hogge (EPFL)
Room: Friedrich List

14:00 **Keynote:** First Tests of a 527 GHz Gyrotron for Dynamic Nuclear Polarization\(^\text{1}\) Felch, K. \(^\text{1}\); Blank, M. \(^\text{1}\); Borchard, P. \(^\text{1}\); Cauffman, S. \(^\text{1}\); Rosay, M. \(^\text{1}\); Tometch, L. \(^\text{2}\) 
\(^{1}\text{Communications and Power Industries, (UNITED STATES);}\) \(^{2}\text{Bruker Biospin, (UNITED STATES)}\)

14:20 Compact Sub-THz Gyrotrons for Real-Time T-ray Imaging\(^\text{1}\) Han, S.T. 
Korea Electrotechnology Research Institute, (KOREA, REPUBLIC OF)

14:40 Manufacturing of a 263 GHz Continuously Tunable Gyrotron\(^\text{1}\) Rozier, Y. \(^\text{1}\); Legrand, F. \(^\text{1}\); Lievin, C. \(^\text{1}\); Racamier, J.-C. \(^\text{1}\); Marchesin, R. \(^\text{1}\); Alberti, S. \(^\text{1}\); Braunmueller, F. \(^\text{2}\); Hogge, J.-Ph. \(^\text{1}\); Da Silva, M. \(^\text{2}\); Tran, M.Q. \(^\text{2}\); Tran, T.M. \(^\text{2}\); Macor, A. \(^\text{3}\) 
\(^{1}\text{Thales Electron Devices, (FRANCE);}\) \(^{2}\text{Centre de Recherches en Physique des Plasmas, EPFL, (SWITZERLAND);}\) \(^{3}\text{Institute of Condensed Matter Physics, EPFL, (SWITZERLAND)}\)

15:00 Analysis of Mode Competition in 10kW/28GHz Gyrotron\(^\text{1}\) Malygin, A. \(^\text{1}\); Ily, S. \(^\text{1}\); Pagonakis, I. Gr. \(^\text{1}\); Avramides, K. \(^\text{1}\); Thumm, M. \(^\text{2}\); Jelonnek, J. \(^\text{2}\); D’Andrea, D. \(^\text{2}\); Ives, L. \(^\text{2}\); Munz, C.-D. \(^\text{2}\) 
\(^{1}\text{Karlsruhe Institute of Technology (KIT), (GERMANY);}\) \(^{2}\text{Kalziphe Institute of Technology, (GERMANY);}\) \(^{3}\text{Institute of Aerodynamics and Gasdynamics, University of Stuttgart, (GERMANY)}\)

University of Electronic Science and Technology of China, (CHINA)

15:40 Effect of Window Reflection on Mode Competition in Gyrotron\(^\text{1}\) Usacheva, S.A. \(^\text{1}\); Chumakova, M.M. \(^\text{1}\); Glyavin, M.V. \(^\text{1}\); Novazhilo, Yu.V. \(^\text{1}\); Ryskin, N.M. \(^\text{1}\) 
\(^{1}\text{Saratov State University, (RUSSIAN FEDERATION);}\) \(^{2}\text{Institute of Applied Physics, RAS, (RUSSIAN FEDERATION)}\)

Session 1C: 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\(^\text{1}\) Nicol, E.F. \(^\text{1}\); Mangus, B.J. \(^\text{1}\); Grebliunas, J.R. \(^\text{1}\); Woolrich, K. \(^\text{1}\); Schirmer, J.R. \(^\text{1}\) 
\(^{1}\text{Boeing Company, (UNITED STATES);}\) \(^{2}\text{Space & Intelligence Systems, Boeing Corporation, (UNITED STATES)}\)

14:20 Reliability of TWTAs and MPMs in Orbit\(^\text{1}\) Jaumann, G. \(^\text{1}\); Gallego Jimenez, E \(^\text{2}\) 
\(^{1}\text{TESAT, (GERMANY);}\) \(^{2}\text{TESAT Spacecom, (GERMANY)}\)

14:40 Multibeam Satellites Performance Analysis in Non-Uniform Traffic Conditions\(^\text{1}\) Aloisio, M. ; Lizarraga, J. ; Angeletti, P. ; Alagha, N. 
European Space Agency ESA-ESTEC, (NETHERLANDS)

15:00 Use of Flexible LCTWT for Communication Satellites\(^\text{1}\) Piro, F. ; Joer, JP \(^\text{1}\); Frysiaras, I \(^\text{2}\) 
\(^{1}\text{Eutelsat, (FRANCE);}\) \(^{2}\text{Eutelsat, (GREECE)}\)

15:20 Radiation Cooled TWTs at End-Of-Life: An Evaluation of Thermal Evolution Over 15 Years\(^\text{1}\) 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); 2SRI 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; Torgashov, Gennadi; Grigoriev, Yuri; Aban'shin, Nikolai; Schalaev, Pavel
1Saratov Devison of Kotel'nikov Institute of Radio Engineering and Electronic of RAS, (RUSSIAN FEDERATION); 2Kotel'nikov 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: Friedrick 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.; 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 TWT's and TWTA's

Chair: W. Menninger (L-3 Communications Electron Technologies)

Room: Georges Stephenson

16:20 **Keynote:** Very High efficiency Dual Flexible TWTA, a flexible Concept allowing to deal with Performances and Schedule Constraints of Telecommunication Payloads

Cuignet, E.; Tonello, E.; Maynard, J.; Boone, Ph. 

1 THALES ALENIA SPACE, (BELGIUM); 2 THALES ALENIA SPACE, (FRANCE); 3 THALES 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 TWTA

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: Klystrons 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.; Darges, 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, H.; Shun, 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
Kimura, T.; Levush, B.
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
Chernin, D. 1; Antonsen, T.M. 2; Vlasov, A.N. 3; Nguyen, K.N. 4; Joye, C.D. 3; Cooke, S.J. 3; Levush, B. 3
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. 1; Gouard, P. 1; Cousin, R. 1; Larou, J. 3
1CEA, (FRANCE); 2CST AG, (FRANCE); 3LPP, UMR7648 CNRS, Ecole Polytechnique, (FRANCE)

11:10  Microwave Oscillations in the Recirculating Planar Magnetron
Franzi, M. 1; Gilgenbach, R. 1; French, D. 2; Hoff, B. 2; Lau, Y.Y. 1; Simon, D. 1; Greening, G. 1; Jordan, N. 1; Luginsland, J. 3
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. 1; Ginzburg, N.S. 2; Zotova, I.V. 2
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 1; Baek, Seungwon 2; Kim, Hyungjong 3; Kim, Kiho 3; Choi, Jinjoo 4
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

Nguyen, K. 1; Pershing, D. 1; Pasour, J. 2; Ludeking, L. 3; Wright, E. 1; Myers, R. 1; Vlasov, A. 2; Abe, D. 1; Levush, B. 2; Petillo, J. 1; Chernin, D. 2

1Beam-Wave Research, Inc., (UNITED STATES); 2Naval Research Laboratory, (UNITED STATES); 3ATK-Mission Research, (UNITED STATES)

11:10 Development of wide Band Helix Mini-TWT with "strong" Phase Velocity Control

Martorana, Rosario; Dionisio, R.; Nicosia, A.

Selex ES, (ITALY)

11:30 1.8 kWatt Broad Band Ka-band TWT Power Booster

Levush, B. 1; Abe, D. 1; Vlasov, A.N. 1; Chernyavskiy, I. 1; Cooke, S.J. 1; Legarra, J. 2; Nguyen, K.N. 1; Cusick, M. 2; Begum, R. 1; Stockwell, B. 2; Ramirez-Aldana, J.L. 1; Chernin, D. 2

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

11:50 Investigation of 0.14THz Folded Waveguide TWT

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

Vlasov, A. 1; Chernyavskiy, I. 1; Joye, C. 1; Cook, A. 1; Calame, J. 1; Levush, B. 1; Chernin, D. 2; Antonsen Jr., T. 2; Nguyen, K. 2

1Naval Research Laboratory, (UNITED STATES); 2Science Applications International Corporation, (UNITED STATES); 3Beam-Wave Research Inc, (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


University of Electronic Science and Technology of China, (CHINA)

11:10 Emittance and Emission from Arrays with Statistical Variation

Panagos, D. 1; Jensen, K. 1; Petillo, J. 1

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


University of Pune, (INDIA)

11:50 3D Simulations of Secondary Electron Emission from Hydrogen-Terminated Diamond

Dimitrov, D. 1; Wang, E. 2; Smedley, J. 1; Ben-Zvi, I. 1; Rao, T. 1

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
Mitsdarffer, K.
NSWC Crane, (UNITED STATES)

14:20 High Power RF Window for Multi-Megawatt Power Transmission
Ives, L ; Marsden, D ; Collins, G ; Lucovsky, G ; Zeller, D ; Schamiloglu, E
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
Puech, J.
CNES, (FRANCE)

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

15:20 A 15-Beam Electron Gun for an X-Band Klystron
Read, M ; Ives, L ; Ferguson, P ; Marsden, D ; Collins, G ; Borchard, P
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
Gineste, T ; Belhaj, M ; Bundaleski, N ; Teodoro, A ; Pons, C ; Puech, J
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
Paoloni, C.
Lancaster University, (UNITED KINGDOM)

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

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

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

15:20 Design of an Unconnected Pair of Planar Helices with Straight-Edge Connections for Application in TWTs
Zhao, C ; Aditya, S ; Chua, C ; Jin, C
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
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\[\textsuperscript{1}\]

Denisov, G. \[\textsuperscript{1}\]; Litvak, A.G. \[\textsuperscript{1}\]; Zapevalov, V.E. \[\textsuperscript{1}\]; Myasnikov, V.E. \[\textsuperscript{1}\]; Tai, E.M. \[\textsuperscript{2}\]; Popov, L.G. \[\textsuperscript{2}\]; Nichiporenko, V.O. \[\textsuperscript{2}\]; Uchasev, C.V. \[\textsuperscript{2}\]; Soluyanova, E.A. \[\textsuperscript{2}\]; Kazansky, I.V. \[\textsuperscript{2}\]; Kruglov, A.V. \[\textsuperscript{2}\]; Sokolov, E.V. \[\textsuperscript{2}\]; Il'in, V.I. \[\textsuperscript{2}\]

\[\textsuperscript{1}\]Institute of Applied Physics, (RUSSIAN FEDERATION); \[\textsuperscript{2}\]GUQOM Ltd, (RUSSIAN FEDERATION); \[\textsuperscript{3}\]Kurchatov Institute, (RUSSIAN FEDERATION)

16:40 Design and Operation of a 2 MW CW, RF Load for Gyrotrons\[\textsuperscript{1}\]

Ives, L. \[\textsuperscript{1}\]; Mizuhara, M. \[\textsuperscript{1}\]; Collins, G. \[\textsuperscript{1}\]; Borchard, P. \[\textsuperscript{2}\]; Neilson, J. \[\textsuperscript{2}\]

\[\textsuperscript{1}\]Calabazas Creek Research, Inc., (UNITED STATES); \[\textsuperscript{2}\]Dymenso, LLC, (UNITED STATES); \[\textsuperscript{3}\]Lexam Research, (UNITED STATES)

17:00 Status of high Power Gyrotron Development in JAEA\[\textsuperscript{1}\]


Japan Atomic Energy Agency, (JAPAN)

17:20 Towards the Design of 100 kW, 95 GHz Gyrotron for Active Denial System Application\[\textsuperscript{1}\]

Singh, Udaybir

CEERI, (INDIA)

17:40 Design of the EU-1MW Gyrotron for ITER\[\textsuperscript{1}\]

Paganakis, I. Gr. \[\textsuperscript{1}\]; Gantenbein, G. \[\textsuperscript{1}\]; Jelonnek, J. \[\textsuperscript{1}\]; Jin, J. \[\textsuperscript{1}\]; Illy, S. \[\textsuperscript{1}\]; Kern, S. \[\textsuperscript{1}\]; Piosczyk, B. \[\textsuperscript{1}\]; Rzesnicki, T. \[\textsuperscript{1}\]; Thumm, M. \[\textsuperscript{1}\]; Alberti, S. \[\textsuperscript{1}\]; Hogge, J.-P. \[\textsuperscript{1}\]; Slatter, C. \[\textsuperscript{1}\]; Tran, M.-Q. \[\textsuperscript{1}\]; Avramides, K. A. \[\textsuperscript{1}\]; Vomvoridis, J. L. \[\textsuperscript{1}\]; Ioannidis, Z. C. \[\textsuperscript{1}\]; Latas, G. P. \[\textsuperscript{1}\]; Tigelis, I. G. \[\textsuperscript{1}\]; Bruschi, A. \[\textsuperscript{1}\]; Lontano, M. \[\textsuperscript{1}\]; Dumbrajs, O. \[\textsuperscript{1}\]; Benin, P. \[\textsuperscript{1}\]; Rozier, Y. \[\textsuperscript{1}\]; Albajar, F. \[\textsuperscript{1}\]; Bonicelli, T. \[\textsuperscript{1}\]; Cismondi, F. \[\textsuperscript{1}\]

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

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**Session 6B: Power Supplies and Transmitters**

*Chair: L. Nilsson (Saab)*

*Room: Friedrich*

16:20 **Keynote:** A 100 Watt W-Band MPM\[\textsuperscript{1}\]


L-3 Communications Electron Devices, (UNITED STATES)

16:40 Robust High-Average-Power Modulator\[\textsuperscript{1}\]

Kempkes, Michael; Roth, Ian; Butler, Neil; Gaudreau, Marcel

Diversified Technologies, Inc., (UNITED STATES)

17:00 Progress of an Integrated TWT for Phased Array Application\[\textsuperscript{1}\]

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\[\textsuperscript{1}\]

Kempkes, Michael \[\textsuperscript{1}\]; Phillips, Robert \[\textsuperscript{1}\]; Gaudreau, Marcel \[\textsuperscript{1}\]; Casey, Jeff \[\textsuperscript{1}\]

\[\textsuperscript{1}\]Diversified Technologies, Inc., (UNITED STATES); \[\textsuperscript{2}\]Rockfield Research, Inc., (UNITED STATES)

17:40 A 200W High Power MPM\[\textsuperscript{1}\]


L3 Communications Electron Devices, (UNITED STATES)

18:00 End of afternoon Sessions

18:45 Departure for Conference Dinner at Musée 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
Gantenbein, G. 1; Dammertz, G. 1; Jelonnek, J. 1; Losert, M. 1; Samartsev, A. 1; Schlaich, A. 1; Scherer, T. 1; Strauss, D. 1; Thumm, M. 1; Wagner, D. 2
1Karlsruhe Institute of Technology, (GERMANY); 2Max Planck Institut für Plasmaphysik, (GERMANY)

09:10   High-Power Ka-band Gyroklystron Oscillator with Time-Delayed Feedback
Danilov, Yu.Yu. 1; Guznov, Yu.M. 1; Zaitsev, N.I. 1; Kuzikov, S.V. 1; Novozhilova, Yu.V. 1; Shevchenko, A.S. 1; Rozhnev, A.G. 2; Ryskin, N.M. 2
1Institute of Applied Physics, RAS, (RUSSIAN FEDERATION); 2Saratov State University, (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
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 1; Li, Qingsheng 1; Wang, Shuzhong 2; Yang, Xiudong 2; Wu, Xunlei 2; Chongshan, Li 2
1Key Laboratory of High Power Microwave Sources and Technologies, Institute of Electronics, Chinese A, (CHINA);
2Institute of Electronics, Chinese Academy of Sciences, (CHINA)

09:10   Advances in Beam Optics Analyzer
Bui, T.; Read, Mike; Ives, Lawrence; Marsden, David; Ferguson, Patrick; Calabazas Creek Research, Inc., (UNITED STATES);

09:30   Novel Scaling Laws for the Langmuir-Blodgett Solutions in Cylindrical and Spherical Diode
Zhu, Y. B. 1; Zhang, P. 2; Valfells, A. 3; Ang, L. K. 4; Lau, Y. Y. 2
1Nanyang Technological University, (SINGAPORE); 2University of Michigan, (UNITED STATES); 3Reykjavik University, (ICELAND); 4Singapore U of Technology and Design, (SINGAPORE)
09:50 Analysis of Quadrupole Focusing Lattices for Electron Beam Transport in Traveling-Wave Tubes
Nichols, K.; Schamiloglu, E.; Carlsten, B.
1University of New Mexico, (UNITED STATES); 2Los Alamos National Laboratory, (UNITED STATES)

10:10 Electrostatic Focusing for a Field Emission Electron Source
Jabotinski, V.; Pasour, J.; Nguyen, K.; Petillo, J.; Levush, B.; Abe, D.
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.; Beilin, L.; Krasik, Ya.
Technion, (ISRAEL)

12:10 Feasibility of Quantum Analogues of Classical Microwave Devices on Longitudinal Interaction
Mozgovoi, Yu. D.; Kanavets, V. I.; Khritkin, S. A.
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.; Peng, Jinjun; Hu, Yinfu; Du, Yinhua; Tang, Ye; Liu, Jingkai; Dong, Ruitong; Chen, Ji; Wu, Xianping
Beijing Vacuum Electronics Research Institute, (CHINA)

11:30 Design of a Wideband High-Power W-band Serpentine TWT
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
Baik, 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 Amplifier

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. 3; 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

Bandyopadhyay, A.K. 1; Maity, S. 2; Joshi, L.M. 3; Kant, D. 3; Singh, A.K. 4

2Central Electronics Engineering Research Institute (CSIR-CEERI), (INDIA); 4Greater 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. 1; DOVEIL, F. 2; ELSKENS, Y. 1

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. 1; Chernyavskiy, I. 1; Levush, B. 1; Chernin, D. 2; Antonsen Jr., T. 3; Nguyen, K. 3

1Naval Research Laboratory, (UNITED STATES); 2Naval Research Laboratory, (UNITED STATES); 3Science Applications International Corporation, (UNITED STATES); 4Beam-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. 1; Ruan, C. J. 2; Zhao, D. 2; Wang, S. Z. 2; Yang, X. D. 2

Institute of Electronics, Chinese Academy of Sciences, (CHINA)

15:40  Bi-helix SWS for High-Power TWTs

Phelvinikov, Y.N. 1; Vlasov, A.N. 2; Chernin, D. 3

1Consultant, (UNITED STATES); 2Naval Research Laboratory, (UNITED STATES); 3SAIC, (UNITED STATES)

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

14:00  Keynote: An Ammonium Perrhenate Impregnated Ni Sponge Oxide Cathode

Wang, Xiaoxia; Zhao, Qinglan; Luo, Jirun; Li, Jun; Liao, xianheng; Zhang, Qi

Institute of Electronics, Chinese Academy of Sciences, (CHINA)

14:20  Scandate Cathode with Sharp Transition

Vancil, B. 1; Brodie, I. 2; Schmidt, V. 2; Lorr, J. 3

1e beam, inc., (UNITED STATES); 2University of California, Davis, (UNITED STATES); 3e beam inc., (UNITED STATES)

14:40  Sol-gel Synthesis of Sc2O3 Doped W Nano-particle for Cathode Application


Seoul National University, (KOREA, REPUBLIC OF)
15:00 Surface Characteristics of Scandate Dispenser Cathodes during Life\textsuperscript{\textcopyright}\textregistered\texttrademark; Wang, Y.; Wang, J.; Zhang, X.; Wang, X.; Yang, F.; Liu, W.; Beijing University of Technology, (CHINA)
15:20 Emission Energy Barriers of Scandate Surfaces with adsorbed Ba and Ba-O using Density Functional Theory\textsuperscript{\textcopyright}\textregistered\texttrademark; Jacobs, R.; Morgan, D.; Booske, J.; University of Wisconsin- Madison, (UNITED STATES)
15:40 LaB6 Cathode Workfunction Evaluation\textsuperscript{\textcopyright}\textregistered\texttrademark; Katsap, V.; NuFlare Technology, UNITED STATES

16:00 Coffee Break

Session 10A: THz
Chair: C.Paoloni (Univ. of Lancaster)
Room: Louis Armand

16:20 Keynote: Testing of a 0.850 THz Vacuum Electronic Power Amplifier\textsuperscript{\textcopyright}\textregistered\texttrademark; Tucek, J. C.; Basten, M. A.; Gallagher, D. A.; Kreischer, K. E.; Northrop Grumman, (UNITED STATES)
16:40 Cherenkov-Like Radiation from Metallic Metamaterials\textsuperscript{\textcopyright}\textregistered\texttrademark; Park, G.-S.; Bera, Anirban; Sattorov, M.A.; Kwon, O.J.; Barik, R.K.; Min, S.H; Seoul National University, (KOREA, REPUBLIC OF)
17:00 G-Band Power Module Development at Northrop Grumman\textsuperscript{\textcopyright}\textregistered\texttrademark; Basten, M.A.; Tucek, J.C.; Gallagher, D.A.; Kreischer, K.E.; Electronic Systems, Northrop Grumman Corporation, (UNITED STATES)
17:20 Surface Resistance of Copper from 400 to 850 GHz\textsuperscript{\textcopyright}\textregistered\texttrademark; Kirley, M. P.; Booske, J. H.; University of Wisconsin-Madison, (UNITED STATES)
17:40 Periodic-Surface-Lattice Cavities for MM-Wave Vacuum Electronic Sources\textsuperscript{\textcopyright}\textregistered\texttrademark; MacLachlan, A.J. \textsuperscript{1}; Konoplev, I.V. \textsuperscript{2}; Robertson, C.W. \textsuperscript{1}; Phipps, A.R. \textsuperscript{1}; Phelps, A.D.R. \textsuperscript{1}; Cross, A.W. \textsuperscript{1} \textsuperscript{1}University of Strathclyde, (UNITED KINGDOM); \textsuperscript{2}University of Oxford, (UNITED KINGDOM)

Session 10B: Satcom and Space TWT’s
Chair: J.Puech (CNES)
Room: Friedrich List

16:20 Keynote: An 80 Watt Dual Ka/Q-Band Mini TWT\textsuperscript{\textcopyright}\textregistered\texttrademark; Taylor, J.; Chan, D.; Donald, A.; True, Richard; Vlahos, V.; Zubyk, A.; L-3 Communications Electron Devices, (UNITED STATES)
16:40 High Power Millimeter Wave Helix TWT Programs at L-3 ETI\textsuperscript{\textcopyright}\textregistered\texttrademark; Chong, C.; Cordrey, D.; Dawson, R.; Forster, J.; Layman, D.; Ramay, M.; Stolz, R.; Washington, C.; L-3 Communications Electron Technologies, Inc., (UNITED STATES)
17:00 Second Harmonic Suppression in Helix Traveling-Wave Tubes\textsuperscript{\textcopyright}\textregistered\texttrademark; Gehrmann, E. \textsuperscript{1}; Jacob, A.F. \textsuperscript{1}; Birteil, P. \textsuperscript{2}; Dürr, W. \textsuperscript{2} \textsuperscript{1}Technische Universität Hamburg-Harburg, (GERMANY); \textsuperscript{2}Thales Air Systems & Electron Devices GmbH, (GERMANY)
17:40 Hybrid Time-Domain Measurement and Pre-distortion of Broadband Complex Waveforms in a Ka-band TWT Amplifier

Stantchev, G. ¹; Abe, D. ¹; Levush, B. ²; Hanna, J. ²; Chernin, D. ³; Antonsen, T. ³

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

18:00 End of afternoon Sessions
Poster Session I - Wednesday 22 May, 14:00-18:00

**Beam Optics and other Modeling**

1.1 Sheet Electron Beam Formation and Transport in the Uniform Magnetic Field
- Tang, X. F.; Sha, G. W.; Duan, Z. Y.; Wang, Z. L.; Wei, Y. Y.; Gong, Y. B.
  University of Electronic Science and Technology of China, CHINA

1.2 Research on W-Band Sheet Beam Electron Optics System
- Yang, X. D.; Wang, S. Z.; Ruan, C. J.; Zhao, D.; Zhang, C. Q.
  Institute of Electronics, Chinese Academy of Sciences, CHINA

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

1.4 Space Charge Effect of Time-dependent Emission Current Excited from Ultrafast Laser
- Liu, Y. J.; Ang, L. K.
  1Nanyang Technological University, SINGAPORE; 2Singapore U of Technology and Design, SINGAPORE

1.5 3D Large-Signal Capability in Beam Optics Analyzer
- Bui, T.; Read, Mike; Ives, Lawrence
  Calabazas Creek Research, Inc., UNITED STATES

1.6 Multi-Source, Complex Beamline Model Development in MICHELLE eBEAM
- Ovtchinnikov, S.G.; Cooke, S.J.; Mkrtchyan, M.M.; Shtokhamer, R.; Vlasov, A.N.; Petillo, J.J.; Levush, B.
  1SAIC, UNITED STATES; 2Naval Research Laboratory, UNITED STATES

1.7 Efficient Algorithm for Numerical Integration of Motion Equations of Large Particles in Microwave Devices
- Kurayev, A.A.; Batura, M.P.; Rak, A.O.
  Belarusian State University of Informatics and Radioelectronics, BELARUS

1.8 Sheet Beam Design Using EOS
- Jin, X. L.
  University of Electronic Science and Technology of China, CHINA

1.9 The Research of Multi-Beam Gridded Electron Gun Simulation
- Tian, TH
  Nanjing Sanle Electronic Information Industry Group, Institute of Electronic Devices, Inc, CHINA

1.10 Comparison of PPM and Solenoidal Focusing in Multi-beam Electron Gun
- Sharma, RK.; Choyal, Y.; Nehra, A
  1CSIR-CEERI, Pilani, INDIA; 2DAV Indore, INDIA

**High Power Microwaves**

1.11 Resonance Effects in the Quantum Exchange Interaction of Electrons and Positrons Beams
  1National Research University Higher School of Economics, RUSSIAN FEDERATION; 2Lomonosov Moscow State University, RUSSIAN FEDERATION
1.12 Microwave Radiation of Passing and Counter Electron Beams in Electrodynamics Systems
Mozgovoi, Yu. D.; Khritkin, S. A.; Evdakimov, Yu. V.
1National Research University Higher School of Economics, RUSSIAN FEDERATION; 2Moscow Radiotechnical Institute of Russian Academy of Sciences, RUSSIAN FEDERATION

1.13 Features of the Interaction of Electron and Positron Beams in Smoothly Waveguide
Mozgovoi, Yu. D.; Khritkin, S. A.
National Research University Higher School of Economics, RUSSIAN FEDERATION

1.14 Self‐onization of the Electron‐Positron Medium
Mozgovoi, Yu. D.; Kanavets, V. I.; Khritkin, S. A.
1National Research University Higher School of Economics, RUSSIAN FEDERATION; 2Lomonosov Moscow State University, RUSSIAN FEDERATION

1.15 Asymmetric Immersed Pole Undulators for High‐Frequency Sources
Jackson, R.; Read, M.; Ives, R. L.
Calabazas Creek Research, Inc., UNITED STATES

1.16 Power Estimation of Electromagnetic Coupling Effectiveness by a X‐band Backward Wave Oscillator with Mode Conversion
1Seoul National University, KOREA, REPUBLIC OF; 2Agency for Defense Development, KOREA, REPUBLIC OF

1.17 The Cutoff Magnetron with the Reverse Magnetic System Design and the Device Development Prospects
Akimov, P. I.; Kalashnikov, D.A.; Melnichuk, G.V.; Senatov, O.I.; Sigalaev, V.N.; Freydovich, I.A.; Chudin, V.G.; Sergeev, K.L.
1FSUE R&PC Toriy, RUSSIAN FEDERATION; 2Joint stock company Spetsmagnit, RUSSIAN FEDERATION

1.18 On the Slow‐Wave Structure Operation in the Vicinity of the Cutoff Frequency and Means to Enhance the Cutoff Magnetron Life Characteristics
Akimov, P.I.; Kalashnikov, D.A.; Melnichuk, G.V.; Senatov, O.I.; Sigalaev, V.N.
FSUE R&PC, RUSSIAN FEDERATION

1.19 Recuperation in Superpower Cherenkov Oscillator with Inhomogeneous Magnetic Field
Kurayev, A.A.; Sinitsyn, A.K.; Rak, A.O.
Belarusian State University of Informatics and Radioelectronics, BELARUS

1.20 FSUE "R&P Corp. "Toriy" Powerful Vacuum RF Tubes
Melnichuk, G.V.; Akimov, P. I.; Komarov, D. A.; Korotkov, A. F.; Konnov, A. V.; Morev, S. P.; Nikitin, A. P.; Prokofiev, B. V.; Saharov, V. P.; Sigalaev, V. N.; Smirnov, V. A.; Freidovich, I. A.; Yakuschkin, E. P.
FSUE R&PC Toriy, RUSSIAN FEDERATION

1.21 Study on High Power Ka‐band Rectangular Double‐Grating Sheet Beam Device
Zhang, Y. B.; Cao, Z.; Wang, Z. L.; Wei, Y. Y.; Gong, H. R.; Wang, S. M.; Gong, Y. B.
1University of Electronic Science and Technology of China, (CHINA); 2China Electronics Standardization Institute, (CHINA)
1.22 Asymmetric Cross-Field Multi-Stage Depressed Collector with Half Cylinder Electrodes for Space Applications
Mercy Latha, A; Srivastava, V; Sharma, RK; Ghosh, SK
CSIR-CEERI, INDIA

1.23 Compact and Light-weight Multi-stage Depressed Collector for Space Traveling wave Tubes
Mercy Latha, A; Kaur, Jaspreet; Vishant, Gahlaut; Srivastava, V; Sharma, RK; Ghosh, SK
CSIR-CEERI, INDIA

1.24 Effects of Helix Support Geometry on Heat Dissipation from it in a Traveling-Wave Tube
Gahlaut, V.; Latha, A; Mercy; Alvi, P.A.; Sharma, RK; Srivastava, V.; Ghosh, SK
1Central Electronic Engineering Research Institute, INDIA; 2Banasthali University, INDIA

1.25 Development of K-band 50% efficiency 30W Helix TWT
Qu, Bo
Beijing Vacuum Electronics Research Institute, CHINA

1.26 Simulation and Experiment of K-band Space TWT Electron Gun
Wei, Y. X.; Huang, M. G.; Li, S. Q.; Li, X. X.; Hao, B. L.; Liu, P. K.
Institute of Electronics, Chinese Academy of Sciences, CHINA

1.27 Design and Experiment of a V- Band Helix TWT
Li, L.; Jinjun, F.; Bo, Q.; Yanhua, S.
Beijing Vacuum Electronics Research Institute, CHINA

1.28 Development of Ku-Band 150W Space TWT
Liang, Xiao feng
Beijing Vacuum Electronics Research Institute, CHINA

1.29 Fabrication and Emission Property of LaC2-Mo Cathode
Wang, Jinhua
Beijing University of Technology, CHINA

1.30 Plasma spraying metal-porous Cathodes for high-power Microwave Devices
Smirnov, V.A.; Akimov, P.I.; Melnichuk, G.V.; Chudin, V.G.; Nikitin, A.P.; Frey dovich, I.A.; Potapov, Y.A.; Sudakov, Y.S.; Bogoslovskaya, A.B.
1FSUE R&PC Toriy, RUSSIAN FEDERATION; 2Peoples Friendship University of Russia, RUSSIAN FEDERATION

1.31 Wetting and Micro-Structural Variations of Nano-Composite Brazing Fillers for Dispenser Cathode Manufacturing
Busbaher, D.; Liu, W.; Sekulic, D.
1Semicon Associates, UNITED STATES; 2University of Kentucky, UNITED STATES

1.32 Current-Noise Characteristics as an Instrument for Quality Estimation of hot Cathodes
Smirnov, V.A.; Chudin, V.G.; Vorobyev, M.D.; Akimov, P.I.; Chirkov, M.N.; Yudaev, D.N.
1FSUE R&PC Toriy, RUSSIAN FEDERATION; 2Moscow Power Engineering Institute, RUSSIAN FEDERATION
1.33 Composition and Work Function Relationship in Os-Ru-W Ternary Alloys
Swartzentruber, P.1; Balk, T.1; Roberts, S.1; Effgen, M.2
1 University of Kentucky, UNITED STATES; 2 Semicon Associates, UNITED STATES

1.34 Cathode Manufacturing Relational Data Collection and Process Control System
Wolverton-Spencer, L.; Effgen, M
Semicon Associates, UNITED STATES

1.35 Impregnation of High Purity Ba-Ca Aluminate on a Porous Tungsten Matrix Obtained from W-Cu Composite for TWT Thermionic Cathodes
Motta, C.1; Sene, F.2; Mancini, V.2; Santos, V.1
1 University of Sao Paulo, BRAZIL; 2 Nuclear and Energy Research Institute, BRAZIL

1.36 Thermionic Emission of Impregnated Dispenser Cathodes at Low Temperature
Zheng, Q.1; Yin, S.Y.1; Peng, Z.1; Wang, Y.1; Wang, X.1; Li, Y.1
1 Chinese Academy of Sciences, CHINA; 2 University of Chinese Academy of Sciences, CHINA

1.37 Work Function Measurements on Coated and Uncoated Tungsten Dispenser Cathodes Using a Kelvin Probe
Tarter, J.1; Swartzentruber, P.2; Balk, J.2
1 Semicon Associates, UNITED STATES; 2 University of Kentucky, UNITED STATES

1.38 The Effects of Mass Load on Cathode Etching and Hydrogen Consumption
Connor, Derrick; Faulkner, Scott
Semicon Associates, UNITED STATES

1.39 The Modeling and Mesh of a Simple Cathode-Heater Assembly Structure
Xin-wei, Li
Institute of Electronics, CHINA

1.40 Research about Cathode and heater Assembly of Gyrotron
Zhang, ZY
Nanjing Sanle Electronic Information Industry Group, Institute of Electronic Devices, Inc, CHINA

1.41 Emission Performance of Cathode coated with W+BaO/SrO/Sc2O3 Film prepared by PLD
Peng, Zhen1; Yin, Shengyi2; Zheng, Qiang1; Wang, Xinxin1; Wang, Yu2; Li, Yang2
1 Institute of Electronics, University of Chinese Academy of Sciences, CHINA; 2 Key Laboratory of High Power Microwave Sources and Technologies, Institute of Electronics, Chinese Ac, CHINA

1.42 Three-Dimensional Particle-in-Cell Simulations of Terahertz Smith-Purcell Radiation Generated from Tapered Grating
Liu, W.
Institute of Electronics, Chinese Academy of Sciences, CHINA

1.43 Nonrelativistic Electron Beam Control and Its Application in Terahertz Radiation Generation
Gong, H.; Xu, J.; Wang, Z.; Tang, T.; Gong, Y
University of Electronic Science and Technology of China, CHINA
1.44 Development on W-Band Coupled-Cavity Device
Sattorov, M. A.; Tanwar, A. K.; Bera, A.1; Barik, R. K.2; Min, S. H.2; Kwon, O.2; Park, G. S.2
1Seoul National University, KOREA, REPUBLIC OF; 2Seoul National University, KOREA, REPUBLIC OF

1.45 Photonic Crystals Assisted Slow Wave Structure for THz Vacuum Devices
Letizia, R; Paoloni, C; Mineo, M; Pinto, D
Lancaster University, UNITED KINGDOM

1.46 Structure Design and Simulation of Extended Interaction Oscillator
Zhong, Y.
Institute of Electronics, Chinese Academy of Sciences, CHINA

1.47 Cylindrical Equivalent Model for Fast Gain Calculation of Sub-terahertz Sheet Beam TWT and Beam Transport Analysis through Twisted SWS
Panda, P. C.1; Srivastava, Vishnu1; Vohra, Anil2
1CSIR-Central Electronics Engineering Research Institute, INDIA; 2Kurukshetra University, Kurukshetra Haryana, INDIA

1.48 Investigation of 0.14THz Pill-box Window for Folded Waveguide TWT
Chen, Z.; Wang, Y.J.
Institute of Electronic Engineering, China Academy of Engineering Physics, CHINA

1.49 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

1.50 Improvement of Cold Parameters of the double Corrugated Waveguide by Geometrical Shaping of the Corrugations
Mineo, M.; Paoloni, C.
Lancaster University, UNITED KINGDOM

1.51 Amplifiers of Millimetric and Submillimetric Wave Bands on Orbotron-Klystrons with Sheet Beams
Aksenchyk, A.V.; Yeryomka, V.D.; Kirinovich, I.F.; Kyryayev, A.A.
Belarusian State University of Informatics and Radioelectronics, BELARUS

1.52 Optimized Variants of 0.18 -THz Orbictron-Amplifier
Yeryomka, V.1; Kurayev, A.2; Sinitsyn, A.2
1Usikov IRE NASU, UKRAINE; 2BSUIR, BELARUS

1.53 A 0.65-THz BWO Based on Slotted Single-Grating Rectangular Waveguide
Xie, W.-Q.1; Wang, Z.-C.2; Luo, J.-L.2; Liu, Q.-L.2
1Chinese Academy of Science, CHINA; 2Institute of Electronics, Chinese Academy of Sciences, CHINA

1.54 Modeling and Characterization of a Slow-Wave Structure for a Sheet-Beam Sub-THz TWT Amplifier
Ryskin, N.M.1; Rozhnev, A.G.1; Karetinikova, T.A.1; Torgashov, G.V.1; Sinitsyn, N.I.2; Shalaev, P.D.2; Burtzev, A.A.4
1Saratov State University, RUSSIAN FEDERATION; 2Saratov Branch, Institute of Radio Engineering and Electronics, RAS, RUSSIAN FEDERATION; 3“Almaz” R&D Co., Saratov, RUSSIAN FEDERATION; 4“Almaz” R&D Co., Saratov, RUSSIAN FEDERATION
1.55 Simulation of High Frequency Structure for Extended Interaction Oscillator
Zhao, Chao
Institute of Electronics, Chinese Academy of Sciences, CHINA

1.56 Time-Domain Calculation Of The Interaction Of THz Backwave Oscillator
Liu, T.; Wang, Z.C.; Liu, P.K.
1China University of Petroleum, CHINA; 2Chinese Academy of Sciences, CHINA

W Band and other TWT’s
1.57 Double-Grating Rectangular Waveguide for W-Band Traveling-Wave Tube
Liu, Q.L.; Wang, Z.C.; Liu, P.K.; Xie, W.Q.
Institute of Electronics, Chinese Academy of Sciences, CHINA

1.58 W-Band Rectangular Ring-Bar Structure with Straight-Edge Connections
Chua, C.; Aditya, S.; Lau, Y. Y.
1Institute of High Performance Computing, A*STAR (Agency for Science, Technology and Research), SINGAPORE; 2School of Electrical and Electronic Engineering, Nanyang Technological University, SINGAPORE; 3Department of Nuclear Engineering and Radiological Sciences, University of Michigan, UNITED STATES

1.59 Development of a Wideband W-band Serpentine Waveguide TWT
1U.S. Naval Research Laboratory, UNITED STATES; 2Beam-Wave Research, Inc., UNITED STATES; 3SAIC, UNITED STATES

1.60 An Evaluation of Heat Dissipation Capability of Slow-wave Structure by Micro Fiber Bragg Grating Sensor Array
1Southeast University, CHINA; 2Beijing Vacuum Electronic Research Institute, CHINA

1.61 Reducing the Gain Change in Broadband TWT
Danilov, A.B.; I’ina, E.M.; Rafalovich, A.D.; Shalaev, P.D.
The Open Joint-Stock Company NPP “Almaz”, RUSSIAN FEDERATION

1.62 Coherence Resonance in TWT and BWO Autogenerators
Sadovnikov, S; Dmitriev, Boris; Zharkov, Yuri; Skorokhodov, Valentin
Saratov State University, RUSSIAN FEDERATION

1.63 Simulations of a Ka-Band 7-Beam coupled-cavity Traveling-Wave Tube when the operating Frequency is near one of the cutoff Frequencies.
Komarov, D. A.; Darmoae, A. N.; Makeev, A. E.; Morev, S.P.
FSUE R&PC Toriy, RUSSIAN FEDERATION
Poster Session II - Thursday 23 May 2013, 08:30-12:30

**Cold Cathodes**

2.1 Dielectric Enhancement of Electric Fields for a Noble Cold Cathode  
Chung, M.1; Chun, J.1; Mayer, A.2; Miskovsky, N.3; Cutler, P.4  
1University of Ulsan, KOREA, REPUBLIC OF; 2University of Namur, BELGIUM; 3Pennsylvania State University, UNITED STATES

2.2 Improved Field Emission Algorithms for Modeling Field Emission Devices Using a Conformal Finite-Difference Time-Domain Particle-In-Cell Method  
Lin, M. C.; Loverich, J.; Stoltz, P. H.; Nieter, C.  
Tech-X, UNITED STATES

2.3 Improving the Field Emission Property of Zinc Oxide by Directly Growing on Graphene Layer  
Zhao, N.; Shi, C.Y.; Qu, K.; Li, C.; Lei, W.; Zhang, X.B.  
School of Electronic Science and Engineering, Southeast University, CHINA

2.4 cancelled

2.5 High Current Density Edge Electron Emission from Graphene Paper  
Liu, J.; Li, N.; Zeng, B  
University of Electronic Science and Technology of China, CHINA

2.6 Novel Field Emission from Graphene Sheets supported by CNTs Arrays  
Qu, K.1; Zhang, X. B.2; Cole, M. T.1; Li, C.1; Zhao, N.2; Shi, C. Y.2; Ding, S. Y.2; Ying, K.4; Lei, W.2; Wang, B. P.2; Milne, W. I.4  
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 0FA, Cambri, UNITED KINGDOM; 4Department of Engineering, Electrical Engineering Division, University of Cambridge, 9 JJ Thomson Av, UNITED KINGDOM

2.7 Pulse Field Emission Characteristics of the Vertical Few-layer Graphene Cold Cathode  
Zhang, Y.; Deng, D.L.; Deng, S.Z.; Chen, J.; Xu, N.S.  
Sun Yat-sen university, CHINA

2.8 The Improvement of Field Emission Characteristic after high Temperature Sealing Process of Carbon Nano-Tube X-Ray Tube  
ETRI, KOREA, REPUBLIC OF

2.9 Implementation field-emitting Planar Matrices in Electron-Optic Systems of powerful RF Devices  
Darmaev, A. N.1; Aban'shin, N. P.1; Gorfinkel, B. I.1; Komarov, D. A.1; Makeev, A. E.1; Yakunin, A. N.1  
1Fsue &pC Toriy, RUSSIAN FEDERATION; 2Volga-Svet Co. Ltd, RUSSIAN FEDERATION; 3Institute of Precise Mechanics and Control, RAS, RUSSIAN FEDERATION

2.10 Highly Adhesive Carbon Nanotube Field Emitters with a Carbide Filler  
Electronics and Telecommunications Research Institute, REPUBLIC OF KOREA
2.11 Direct Synthesis of Carbon Nanotube on Stainless Steel Cathode
Zhang, Y.; Deng, S.Z.; Chen, J.; Xu, N.S.
Sun Yat-sen university, CHINA

2.12 Pressed Metal-Alloy Palladium-Barium Cathode.
Li, I.P.; Polivnikova, O.V.
1OJSC "Pluton", RUSSIAN FEDERATION; 2FSUE "Istok", RUSSIAN FEDERATION

2.13 The Field Emission Properties of Diamond-like Carbon Film Prepared by Filtered Cathodic Vacuum Arc
Wang, C.; Zhao, Z.W.; Chen, Y.Q.
Southeast University, CHINA

2.14 Design of Carbon Nanotube Cathode Electron Gun for Travelling Wave Tube Applications
Li, X.; Cai, S.; Bai, G.; Li, H.; Ding, M.; Feng, J.; Liao, F.
Beijing Vacuum Electronics Research Institute, CHINA

2.15 Enhanced Adsorption between Defective Carbon Nanotubes and Metal Chlorides based on First-Principles Calculations
Liu, Weihui; Xu, Shunfu
Shandong university of science and technology, CHINA

2.16 Study of Field Screening Effect for Cone-type Field Emitter Arrays
Li, Nannan; Zeng, Baoqing; Liu, Jianlong; Zhang, Hai; Guo, Jing; Xiang, Wei; Tan, Xiaohua; Jin, Dazhi; Qian, Muyang; Zhao, Xinghai
1University of Electronics Science and Technology of China, CHINA; 2Chinese Academy of Engineering Physics, CHINA

2.17 Simulation and Design of Surface-Conduction Field Emission Display
Li, Haiyan; Zhu, Zhuoya; Lei, Wei; Zhang, Xiaobing; Sun, Yajun; Li, Shuang
Southeast University, CHINA

Klystrons and ISM
2.18 A Kicker Driver for the Energetic Beam Arrangement
Kempkes, Michael; Arntz, Floyd; Gaudreau, Marcel
Diversified Technologies, Inc., UNITED STATES

2.19 The Research and Development of S-band High Power Multi-beam Klystrons
Shen, B.; Ding, Y.; Zhang, Z.; Gu, H.; Gao, D.
Institute of Electronics, Chinese Academy of Sciences, CHINA

2.20 A Technique for Resonant Frequency Measurement of Brazed Intermediate Cavities of Ku-Band Multiple-Beam Klystron
Bansiwal, Ashok
Microwave Tube Research and Development Centre, INDIA

2.21 Design and Particle-in-Cell Simulation of W-band CW Extended Interaction Klystron
Zhong, Y.
Institute of Electronics, Chinese Academy of Sciences, CHINA
2.22 A Way to Increase the Efficiency of Klystrons
Guzilov, I.A.
JSC “Basic technology of vacuum devices”, RUSSIAN FEDERATION

2.23 Simulation Study of a C-Band High Power Klystron
Zhang, Rui; Wang, Yong
IECAS, CHINA

2.24 Progress of Developing the 10MW L-Band Multi-Beam Klystron
Wang, Y.
Institute of Electronics, Chinese Academy of Sciences, CHINA

2.25 Progress of an S-band High Average Power Broadband Multi-beam Klystron
Gao, Dongping; Ding, Yaogen; Zhang, Zhaochuan; Shen, Bin; Zhang, Zhiqiang; Cao, Jin; Gu, Honghong; Wang, Caiying; Fang
Institute of Electronics, Chinese Academy of Sciences, CHINA

2.26 Some Physical Phenomena in the Collector Region of Multi-Beam Klystron
Ding, Y.; Shen, B.; Ding, H.; Gu, H.
Institute of Electronics, Chinese Academy of Sciences, CHINA

Microwave Circuit Design
2.27 A Novel Angular Log-Periodic Micro-Strip Meander-Line Slow Wave Structure for Low-Voltage and Wideband
Traveling Wave Tube
Wang, S. M.; Cao, Z.; Hou, Y.; Zhao, G. Q.; Wei, Y. Y.; Duan, Z. Y.; Wang, Z. L.; Gong, Y. B.
1 National Key Laboratory of Science and Technology on Vacuum Electronics, CHINA; 2 China Electronics Standardization Institute, CHINA

2.28 Investigation of a Novel Folded Waveguide Slow Wave Structure for Traveling Wave Tube
Hou, Y.; Xu, J.; Wang, S. M.; Zhao, G. Q.; Wei, Y. Y.; Duan, Z. Y.; Gong, Y. B.
National Key Laboratory of Science and Technology on Vacuum Electronics, CHINA

2.29 Modeling the Finite Thickness of Helix Slow-Wave Structures
Mahmoudi, Ali
University of Tehran, IRAN, ISLAMIC REPUBLIC OF

2.30 Novel SWS Designs for High Power Ka-band TWTs
Pchelnikov, Y.N.; Vlasov, A.N.; Chernin, D.
1 Consultant, UNITED STATES; 2 Naval Research Laboratory, UNITED STATES; 3 SAIC, UNITED STATES

2.31 Two cavity W-Band Sheet Beam Extended Interaction Klystron Simulation
Bhanu Naidu, V.; S K, Datta; kumar, Lalit
1 MTRDC, INDIA; 2 MTRDC, DRDO, INDIA

2.32 A Modified Slotted Helix Slow-Wave for High-Power Millimeter-Wave TWT
Liu, L.W; Wei, Y. Y; Yin, H. R; Xu, J; Zhao, G. Q; Huang, M. Z; Duan, Z. Y; Gong, Y. B
University of Electronic Science and Technology of China, CHINA
2.33 Scaled Design and Test of a Coupler for Micro-Reentrant Square-Cavities for Millimeter Wave Klystrons
Paolini, C.; Mineo, M.; Yin, H.; Zhang, L.; He, W.; Robertson, C.W.; Cross, A.W.; Ronald, K.; Phelps, A.D.R
1Engineering Department, UNITED KINGDOM; 2Lancaster University, UNITED KINGDOM; 3University of Strathclyde, UNITED KINGDOM

2.34 Design of multi-gap extended output cavity for W band Sheet beam EIK
Chen, Shuyuan; Ruan, Cunjun; Zhang, Changqing; Wang, Yong
Institute of Electronics, Chinese Academy of Sciences, CHINA

2.35 Design and Coldtest of High Frequency Interaction Structure for X-Band Sheet Beam Klystron
Zhao, D.; Ruan, C.; Liang, Y.; Zhang, C.; Wang, S.; Yang, X.
Institute of Electronics, Chinese Academy of Sciences, CHINA

2.36 Study the Effect of Positive Dispersion in Input Circuit of Broadband Helix Traveling Wave Tubes
Jin, X. L
University of Electronic Science and Technology of China, CHINA

2.37 Negative Dispersion Study of some typical Slow Wave Structures in Helix
Jin, X. L
University of Electronic Science and Technology of China, CHINA

2.38 Time-Domain PIC-Modeling of Suppression of Self-Modulation in the Multiple Cavity Klystron Oscillator with Delayed Feedback
Emelyanov, V.V.; Ryskin, N.M.
Saratov State University, RUSSIAN FEDERATION

2.39 S-Shaped Microstrip Meander-Line Slow-Wave Structure for W-Band Traveling-Wave Tube
Bai, N.
Southeast University, CHINA

2.40 S Parameters of a Single coupler Extracted from the Whole SWS System
Zhu, Zhaojun; Jia, Baofu; Wei, Chaolei; Yu, Bin
University of Electronic Science and Technology of China, CHINA

2.41 Analysis of an Inhomogenously Ridge-loaded Helix SWS Used in MPM
Zhu, Zhaojun; Jia, Baofu; Wei, Chaolei; Yu, Bin
University of Electronic Science and Technology of China, CHINA

RF Modeling
2.42 Modeling a Gyrotron Cavity Using a 3D CFDTD PIC Method
Lin, M. C.; Smithe, D. N.
Tech-X, UNITED STATES

2.43 Equivalent Capacitance of a Sheet Electron Beam
Pchelnikov, Yu. N.; Yelizarov, A. A.; Pchelnikov, A. G.
1retired, UNITED STATES; 2MIEM, RUSSIAN FEDERATION; 3Moscow State Expertise, RUSSIAN FEDERATION
2.44 Electron Waves in the Passbands and Stopbands of Periodic Slow-Wave Systems
Solntsev, V.A.
Moscow Institute of Electronics and Mathematics National Research University, RUSSIAN FEDERATION

2.45 Analytical Solutions of the Dispersion and Coupling Impedance for the Double Slot Coupled Cavity Slow Wave Structure in TWT
He, F.M.; Luo, Jirun; Zhu, Min; Guo, Wei
1 Institute of Electronics, Chinese Academy of Sciences, CHINA; 2 Institute of Electronics, Chinese Academy of Sciences, CHINA

2.46 SWS-based Methods for Non-Destructive Monitoring Absorbing Coatings
Pchelnikov, Yu.; Smirnov, A.
1 Retired Consultant, UNITED STATES; 2 Radia Beam Technologies, UNITED STATES

2.47 Why Aharonov-Bohm Effect Does Not Violate Locality Principle
Gritsunov, A.
KNEU, UKRAINE

2.48 A 3D Simulation Code for Folded Waveguide Traveling Wave Tubes
Jin, X. L
University of Electronic Science and Technology of China, CHINA

2.49 Three-Dimensional FE Modeling of Slow-Wave Structure for Traveling-Wave Tube without Matching Meshes
Jin, X. L
University of Electronic Science and Technology of China, CHINA

2.50 Simulation Computation Method for the Gap Impedance of Multi-gap Output Cavity with Double Coupling Apertures
Ge, M.; Wang, Y.
1 Key Laboratory of High Power Microwave Sources and Technologies, Institute of Electronics, Chinese, CHINA; 2 Key Laboratory of High Power Microwave Sources and Technologies, Institute of Electronics, Chinese A, CHINA

2.51 Operation of FDM Method in TE Modes Computation of Rectangular/Ridge Waveguide
Deng, DJC; Deng, jiacheng
Nanjing Sanle Electronic Information Industry Group, Institute of Electronic Devices, Inc, CHINA
**Gyrodevices**

3.1 Study of TM01 to TE11 Coaxial Transmission Mode Conversion

Zhu, Xian-neng; Niu, Xin-jian; Liu, Ying-hui; Yu, Xin-hua

1University of Electronic Science and Technology of China, CHINA; 2Guilin University of Electronic Technology, CHINA

3.2 A TE62 Mode Generator in W-Band Using Waveguide Transformation

Wen-yuan Shen, S.; Hu Wang, W.; Zhi-hui Geng, G.; Pu-Kun Liu, L.

1University of Chinese Academy of Sciences, CHINA; 2Institute of Electronics, Chinese Academy of Sciences, CHINA

3.3 Recent Experimental Results of Magnetron Injection Gun (MIG) for 42 GHz 200 kW Gyrotron

Khatun, Hasina; Singh, Udaybir

CSIR-Central Electronics Engineering Research Institute (CEERI), INDIA

3.4 Design of Triple-Frequency Gyrotron

Singh, Udaybir

CEERI, INDIA

3.5 Analysis of Parasitic Mode Oscillations for 95 GHz Gyrotron Beam Tunnel

Kumar, Nitin

CEERI, INDIA

3.6 Simulations and Experiments of a five Waveguide Output Structure for Gyro-devices Applications

Luo, J.; Cui, J.; Zhu, M.; Guo, W.

1Institute of Electronics, Chinese Academy of Sciences, CHINA; 2School of Information science and Engineering, Central South University, CHINA

3.7 Simulation of lossy Interaction Structure for Ka-band Gyro-TWT

Alaria, Mukesh

CEERI, INDIA

3.8 Design of Interaction Structure for 2THz Gyrotron Operating at Second Harmonic

Muppalla, Prudhvi

CEERI, INDIA

3.9 Design and Experiment of a U-Band TE01 Gyro-TWT

Xu, Y.; Xu, Y.

University of Electronic Science and Technology of China, CHINA

3.10 Experiment Study of A W-band Frequency Tunable Gyrotron Oscillator with an Over-length Cylindrical Cavity

Du, C.; Chang, T.; Liu, P.

1National Tsing Hua University, CHINA; 2Institute of Electronics, Chinese Academy of Sciences, CHINA

3.11 Research of Low Frequency Oscillations of ka Band TE01 Gyro-TWT

Youlei pu; Luo Yong, L.; Jiang Wei, J.; Liu Guo, l

University of Electronic Science and Technology of China, CHINA
3.12 Development of a Wide-Band Window in HE1,1 Guide for Gyrotrons

Read, M. 1; Bui, T. 1; Marsden, D. 1; Ives, R.L. 1; Stockwell, B. 2; Neilson, J. 3
1 Calabazas Creek Research Inc., UNITED STATES; 2 Communications and Power Industries, LLC, UNITED STATES; 3 Lexam Research, UNITED STATES

3.13 Design of a G-Band Harmonic Multiplying Gyrotron Traveling-Wave Amplifier with a Mode Selective Circuit

Yeh, Yi Sheng; Lai, C. H.; Chen, C. H.; Lin, T. Y.
Southern Taiwan University of Science and Technology, TAIWAN

3.14 Numerical Simulation of a 1.37 THz Gyro-Multiplier

Constable, D.A. 1; Bandurkin, I.V. 2; He, W. 1; Cross, A.W. 1; Savilov, A.V. 2; Phelps, A.D.R. 1; Bratman, V.L. 2; Ronald, K. 1
1 University of Strathclyde, UNITED KINGDOM; 2 Institute of Applied Physics, RUSSIAN FEDERATION

3.15 Experimental Study of High-Efficiency and high-gain Ka-Band Gyrotron-Traveling Wave-Tube

Wang, Efeng
National Key Laboratory of Science and Technology on Vacuum Electronics Beijing Vacuum Electronics Re, CHINA

3.16 Synthesis the Quasi-Optical Launcher using the Improved Equivalent Current Method

Wu, W.; Li, Hao; Fu, Hua; Xu, Jianhua; Li, Tianming
School of Physical Electronics, University of Electronic Science and Technology of China, CHINA

3.17 Quasi-optical Mode Converter for a Second Harmonic 0.4THz, 100kW Gyrotron Oscillator

Kim, S.G; Choi, Eunmi
UNIST, KOREA, REPUBLIC OF

3.18 Design Study of MIG for Dual-band Gyrotron

Lee, I.G.; Kim, S.G.; Choi, E.M.
Ulsan National Institute of Science and Technology (UNIST), KOREA, REPUBLIC OF

3.19 Numerical Simulation of a Dimpled-wall Quasi-optical Launcher for High Power Gyrotron Oscillators

Wang, Hu 1; Geng, Zhi-hui 2; Shen, Wen-yuan 3; Liu, Pu-kun 2
1 University of Chinese Academy of Sciences, CHINA; 2 Institute of Electronics, Chinese Academy of Sciences, CHINA; 3 Institute of Electronics, Chinese Academy of Sciences; University of Chinese Academy of Sciences, CHINA

3.20 Design of a 0.1THz Gyrotron with Complex Cavity

Liu, L
University of Electronic Science and Technology of China, CHINA

3.21 Measurement Study of Complex Cavity Frequency of W-Band Gyrotrons

Wang, Efeng
National Key Laboratory of Science and Technology on Vacuum Electronics Beijing Vacuum Electronics Re, CHINA

3.22 Numerical Simulation of Ka-Band Fundamental Complex Cavity Gyrotron

Liu, Chun-gong; Niu, Xin-jian; Liu, Ying-hui
University of Electronic Science and Technology of China, CHINA
3.23 Simulation of the Structure for W-Band Gyrokystron Amplifiers

Li, Teng-bao; Liu, Ying-hui; Niu, Xin-jian
University of Electronic Science and Technology of China, CHINA

3.24 Design of Adapted Phase Correcting Mirrors for Gyrotrons

Liu, J.; Jin, J.; Thumm, M.; Zhao, Q.; Li, H.
1Institute of Physical Electronics, University of Electronic Science and Technology of China, CHINA; 2Institute for Pulsed Power and Microwave Technology, Karlsruhe Institute of Technology, GERMANY

3.25 Thermal Analysis of Output Window of Ka-band Gyro-TWT

Zeng, Xu; Wang, Efeng; Liu, Bentian; Li, Ying, H.; Yan, Tiechang
Beijing Vacuum Electronics Research Institute, CHINA

3.26 The Design and Particle Simulation of a Q-band Gyro-TWT Based on Periodic Dielectric Loaded Waveguide

Tang, Yong; Luo, Yong
UESTC, CHINA

3.27 A Steady-state Multimode Analysis of Mode Competition in Gyro-TWT

Wang, Q.S.; Luo, J.R.; Peng, S.Y.; Jiao, C.Q.
Institute of Electronics, Chinese Academy of Sciences, CHINA

3.28 Study on high-frequency Structure for a Complex Cavity Gyrotron with gradual Transition

Liu, Fei
University of Electronic Science and Technology of China, CHINA

3.29 Design of the Magnetron Injection Gun for W-band Gyrotron Oscillator

Geng, G.
Institute of Electronics, Chinese Academy of Sciences, CHINA

3.30 Single-Anode Magnetron Injection Gun Design for 140GHz Gyrotron

Li, D.; Niu, X.; Liu, Y.H
University of Electronic Science and Technology of China, CHINA

3.31 The Thermal Analysis of Ka-band Gyrotron Beryllia Output Window

Li, RuLi; Niu, XinJian; Liu, YingHui
University of Electronic Science and Technology of China, CHINA

Microwave Tube Technologies

3.32 Development of Dual Anode Electron Gun and PPM Beam Focusing for Space Helix TWT

Sharma, RK; Arya, S; Mercy Latha, A; Pareek, P; Sharma, SM; Ghosh, SK; Srivastava, V
CSIR-CEERI, INDIA

3.33 Estimation of Permittivity and Loss Tangent of High Frequency Ceramics using Free Space Method

Yadav, V.; Kumar, N.; Singh, U.; Kumar, A.; Deorani, S.C.; Sinha, A.K.
1CEERI, INDIA; 2RR College, INDIA

3.34 Design of Sheet Beam Electron Gun for a X-Band Klystron

Central Electronics Engineering Research Institute, INDIA
3.35 Numerical modeling of Liquid Cooled CCTWT Collector
Singh, A. K.; SriKrishna, P.; Subramanian, S.
Microwave Tube Research & Development Centre, INDIA

3.36 Recent Development on the Modeling of Electrical Contact
Zhang, Peng; Lau, Y. Y.
University of Michigan, UNITED STATES

Bundaleski, N.¹; Behlaj, M.²; Gineste, T.²; Teodoro, O. M. N. D.⁴
¹CeFiTec, Faculdade de Ciências e Tecnologia, Universidade Nova de Lisboa, PORTUGAL; ²ONERA / DESP (Département Environnement Spatial), FRANCE

3.38 The Design Considerations of W-Band Broad Band Output Window
Wang, S.Z.¹; Ruan, C.J.¹; Yang, X.D.²; Zhao, D.²; Zhang, C.Q.²
¹Institute of electronics, Chinese Academy of Sciences, CHINA; ²Institute of Electronics, the Chinese Academy of Sciences, CHINA

3.39 Applications of Microwave Plasma CVD Diamond in mm TWTs
Ding, M. Q¹; Li, Li L²; Du, Ying H³; Hu, Yin F ; Chen, Bo²; Li, Li²; Feng, Jin J²
¹Beijing Vacuum Electronics Research Institute, CHINA; ²Beijing Vacuum Electronics Research Institute, CHINA

3.40 The Study of Mini Coupler by the Stepped-impedance Technology
Zhu, Zhaojun; Jia, Baofu; Cheng, Shaofei; Yu, Bin
University of Electronic Science and Technology of China, CHINA

3.41 Particularities of Reversible Magnetic Focusing System Development for Multi-Beams Klystrons
Akimov, P. I.¹; Nikitin, A. P.²; Melnichuk, G. V.²; Freydovich, I. A.²; Chudin, V. G.¹; Dormidontov, A. G.²; Drozdov, S. S.²; Sergeev, K. L.²; Lukin, A. A.²; Bogoslovskaya, A. B.³
¹FSUE R&PC Toriy, RUSSIAN FEDERATION; ²Joint stock company Spetsmagnit, RUSSIAN FEDERATION; ³Peoples Friendship University of Russia, RUSSIAN FEDERATION

3.42 RF Window for a 350 kW CW X-Band Klystron
Prokofiev, B.¹; Yegorov, A.¹; Grigoriev, A.²
¹FSUE "Scientific & Production Corp. "Toriy", RUSSIAN FEDERATION; ²Saint-Petersburg State Electrotechnical University, RUSSIAN FEDERATION

3.43 Rayleigh Scattering Measurement of Residual Gas Inside Microwave Vacuum Electronic Devices
Sun, Xiaohan
Southeast University, CHINA

3.44 Waveguide Window for a Broadband Multibeam Ka-Band Klystron
Prokofiev, B.¹; Freidovich, I.³; Balabanov, A.¹; Yegorov, A.¹; Zakirov, A.¹; Grigoriev, A.²
¹FSUE "Scientific & Production Corp. "Toriy", RUSSIAN FEDERATION; ²Saint-Petersburg State Electrotechnical University, RUSSIAN FEDERATION

3.45 Development of Output Structures for 650MHz CW Klystron
Zhang, X; Wang, Y
Electronic Institute of Chinese Academy of Sciences, CHINA
3.46 Growth of Graphite Film on Copper Foil by Plasma Enhanced Chemical Vapor Deposition
Shi, C.Y.; Zhao, N.; Zhao, Z.W.; Lei, W.
School of Electronic Science and Engineering, Southeast University, CHINA

3.47 Thermodynamic Analysis of the TWT Electron Gun
Qi, QWL
Nanjing Sanle Electronic Information Industry Group, Institute of Electronic Devices, Inc, CHINA

3.48 Other
The Ion Extraction Efficiency of Tiny Amounts of Gases Analysis with Quadrupole Mass Spectrometry
Ji, Xiaocong; Xiao, Mei; Wang, Hui; Liu, Shunming
Southeast University, CHINA

3.49 Application of Microwave Technology in Deep Desulfurization of Coking Coal
Yao, YT
Nanjing Sanle Microwave Technology Development Company Limited, CHINA

3.50 Components of Heating and Fueling of Fusion Plasmas
Kempkes, Michael; Schrock, Kenneth; Roth, Ian; Gaudreau, Marcel
Diversified Technologies, Inc., UNITED STATES

3.51 Switch Tube Test Set
Kempkes, Michael; Kinross-Wright, John; Jashari, Luan; Chipman, Chris
Diversified Technologies, Inc., UNITED STATES

3.52 DC-Link Capacitor Voltage Balancing using Redundant Vectors for Five-Level Neutral Point Clamped Voltage Source Inverter
Abdelkrim, T.1; Benamrane, K.1; Benkhelifa, Aeh.1; Bezza, B.1; Benslimane, T.2
1Division of Small Solar Plants, Unit of Applied Research in Renewable Energies, EPST - Center for Rene, ALGERIA; 2Laboratory of Automation and Electrification of Industrial Enterprises, University of Boumerdes, Uni, ALGERIA

3.53 Technologies for a C\X\Ku band pulsed MPM
Shi, SMM
Nanjing Sanle Electronic Information Industry Group, Institute of Electronic Devices, Inc, CHINA

3.54 A X-band Pulsed MPM for Radar System
Kou, Jianyong1; Wei, Yixue1; Zhang, Hongzhi1; Wang, Hefei1; Huang, Juguang2; Wang, Bin2; Zhang, Yong3; Yan, Bo3
1Beijing Vacuum Electronics Research Institute, CHINA; 2Southwest China Research Institute of Electronic Equipment, CHINA; 3University of Electronic Science and Technology of China, CHINA