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Monday 24 April 2017

07:30 Registration

Plenary Session

Room: Constellation Room

08:30 Welcome and Introduction

Plenary Session part 1: Vacuum Electronics in the big challenges of science

Chair: Natanael Ayllon (European Space Agency)

08:45 **Voyage inside the ITER Project N/A**

Dr. Sergio Orlandi; ITER

09:25 **Real Time Tomography – a high speed inspection technology for aviation security N/A**

Dr. Russell Luggar; Rapiscan Systems Ltd.

10:05 **Vacuum Electronics based RF systems at CERN N/A**

Erk Jensen; CERN

10:45 Coffee Break

Plenary Session part 2: Vacuum Electronics in the big challenges of science

Chair: Claudio Paoloni (Lancaster University)

11:00 **Rosetta: To Catch a Comet! N/A**

Prof. Mark McCaughrean; European Space Agency

11:45 J. Pierce Award for Excellence in Vacuum Electronics Ceremony

12:00 Award Winner Acceptance Speech

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Chair : M. Blank (CPI, United States of America)

Room : Constellation Room

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G. Denisov

Institute of Applied Physics/GYCOM, Nizhny Novgorod, Russian Federation

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L.G. Popov¹, A.V. Chirkov², G.G. Denisov², A.G. Litvak², V.I. Malygin², V.E. Zapevalov², M.V. Agapova¹, Yu.N. Belov¹, I.V. Kazansky¹, A.V. Kuzmin¹, V.E. Miasnikov¹, V.O. Nichiporenko¹, E.V. Sokolov¹, E.A. Soluyanov¹, E.M. Tai¹, S.V. Usachev¹

¹Gycom Ltd., Nizhny Novgorod, Russian Federation

²Institute of Applied Physics, Nizhny Novgorod, Russian Federation

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I.V. Zotova, N.S. Ginzburg, G.G. Denisov, M.N. Vilkov, A.S. Sergeev, S.V. Samsonov, S.V. Mishakin

Institute of Applied Physics RAS, Nizhny Novgorod, Russian Federation

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A. Sawant, D. Yu, D.S. Kim, M.S. Choe, E.M. Choi

Ulsan National Institute of Science and Technology (UNIST), ULSAN, South-Korea

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Karlsruhe Institute of Technology, KARLSRUHE, Germany

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J. Luo, Y. Tang, Y. Fan, Q. Zue, S. Li

Institute of Electronics, Chinese Academy of Sciences, BEIJING, China

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15:35-15:55 Poster Session I

Novel Slow Wave Structures

Chair : C. Armstrong (L3 Electron Devices, United States of America)

Room : Copernicus Extended Room

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N. M. Ryskin¹, A.I. Benedik¹, A.G. Rozhnev¹, N.I. Sinitsyn², G.V. Torgashov³, R.A. Torgashov¹

¹*Saratov State University, SARATOV, Russian Federation*

²*Saratov Branch, Institute of Radio Engineering and Electronics RAS, SARATOV, Russian Federation*

³*Saratov Branch, Institute of Radio Engineering and Electronics RAS, SARATOV, Russian Federation*

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T. R. Rowe, P. Forbes, N. Behdad, J. H. Booske

University of Wisconsin-Madison, MADISON, United States of America

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Johann Wolfgang Goethe-Universität, FRANKFURT AM MAIN, Germany

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L. Yue, J. Huang, G. Wu, Y. Wei, W. Wang, Y. Gong

University of Electronic Science and Technology of China, CHENGDU, China

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K.H Jang¹, J.J Choi¹, J.H Kim²

¹*Kwangwoon University, SEOUL, South-Korea*

²*Pohang Accelerator Laboratory, POHANG, South-Korea*

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A. V. Galdetskiy, E.A. Rakova

Istok, FRYAZINO, Russian Federation

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Chair : D. Whaley (L3 Electron Devices, United States of America)

Room : Alexander Graham Bell Room

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University of Wisconsin- Madison, MADISON, United States of America

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¹UC Davis, DAVIS, CA, United States of America
²Vacuum Process Engineering, Inc., SACRAMENTO, CA, United States of America
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 R. Ives¹, G. Collins¹, D. Marsden¹, M. Read¹, L. Falce¹, B. Mitsdarffer²
¹Calabazas Creek Research, Inc., SAN MATEO, CA, United States of America
²Naval Surface Warfare Center, CRANE, IN, United States of America
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 V. Katsap
 NuFlare Technology America, HOPEWELL JUNCTION, NY, United States of America
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Chair : N.C.L. Luhmann (UC Davis, United States of America)

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¹Beijing Vacuum Electronics Research Institute, BEIJING, China
²University of California Davis, DAVIS, United States of America
³Lancaster University, LANCASTER, United Kingdom
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 Institute of Electronics, Chinese Academy of Science, Beijing, 100190, China,
 PEKING, China
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 F. Toufexis¹, S. G. Tantawi¹, A. Jensen¹, V. A. Dolgashev¹, A. Haase¹, M. V. Fazio¹, P. Borchard²
¹SLAC National Accelerator Laboratory, MENLO PARK, United States of America
²Dymenso LLC, SAN FRANCISCO, United States of America
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 H. Gong¹, X. Lin¹, X. Meng¹, J. Xu¹, T. Tang¹, G. Travish²
¹University of Electronic Science and Technology of China, CHENGDU, China
²University of California, Los Angeles, LOS ANGELES, United States of America

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Y. Yao, G. Liu, J. Wang, Y. Luo
University of Electronic Science and Technology of China, CHENGDU, China

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Chair : M. Jensen (ESS, Sweden)

Room : Copernicus Extended Room

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¹Naval Research Laboratory, WASHINGTON, DC, United States of America
²Beam-wave Research, Inc., BETHESDA, MD, United States of America
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D. A. Constable¹, C. Lingwood¹, G. Burt¹, I. Syratchev², A. Yu. Baikov³, R. Kowalczyk⁴
¹Lancaster University, LANCASTER, United Kingdom
²CERN, GENEVA, Switzerland
³Moscow University of Finance & Law, MOSCOW, Russian Federation
⁴SLAC National Accelerator Laboratory, MENLO PARK, CA, United States of America
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V. C. R. Hill¹, G. Burt¹, D. Constable¹, C. Lingwood¹, C. Marrelli², I. Syratchev³
¹Lancaster University, LANCASTER, United Kingdom
²European Spallation Source ESS ERIC, LUND, Sweden
³CERN, GENEVA, Switzerland
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A. Mollard¹, C. Marchand¹, F. Peauger¹, J. Plouin¹, A. Beunas², R. Marchesin²
¹CEA, GIF-SUR-YVETTE CEDEX, France
²Thales Electron Devices, VÉLIZY-VILLACOUBLAY, France

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Chair : D. Bowler (e2v, United Kingdom)

Room : Alexander Graham Bell Room

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E2V Technologies, CHELMSFORD, United Kingdom

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Tuesday 25 April 2017

Space TWTs

Chair : *W.L.M. Menninger (L-3 Communications, ETI, United States of America)*

Room : *Constellation Room*

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E. Bosch
Thales Electronic System GmbH, ULM, Germany
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European Space Agency, NOORDWIJK, The Netherlands
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L-3 Communications, ETI, TORRANCE, United States of America
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Beijing Vacuum Electronic Research Institute and Vacuum Electronics National Lab, BEIJING, China
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A. Schlaich¹, M. Steininger-Fetzer¹, F. Rostan¹, P. Horowski², N. Ayllon³, A. Ostergaard³
¹*Airbus DS GmbH, FRIEDRICHSHAFEN, Germany*
²*CPI Satcom Division - East, GEORGETOWN, ONTARIO, Canada*
³*European Space Agency, NOORDWIJK, The Netherlands*
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D.C. Eze, W.L. Menninger
L-3 Communications Electron Technologies Inc., TORRANCE, United States of America
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Chair : *J. Sirigiri (Bridge12 Technologies Inc., United States of America)*

Room : *Copernicus Extended Room*

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W. Saabe¹, J. Sombrin², E. Ngoya¹, G. Soubercaze-Pun³, L. Lapierre³
¹*Xlim, LIMOGES, France*
²*Labex sigma-Lim, LIMOGES, France*
³*CNES, TOULOUSE, France*
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D. Chernin¹, T.M. Antonsen Jr.¹, K. Elliott¹, A.N. Vlasov²
¹*Leidos, Inc, WASHINGTON, DC, United States of America*
²*Naval Research Laboratory, WASHINGTON, DC, United States of America*
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G. Stantchev¹, S. Cooke¹, J. Petillo², K. Elliott²
¹*US Naval Research Laboratory, WASHINGTON, DC, United States of America*
²*Leidos, Inc., BILLERICA, MA, United States of America*
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Institute of Electronics, Chinese Academy of Sciences, BEIJING, China

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M.C. Balk¹, K.A. Avramidis², S. Illy², C. Wu²
¹CST AG, DARMSTADT, Germany
²Institute for Pulsed Power and Microwave Technology (IHM), KIT, KARLSRUHE, Germany
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Y.N. Pchelnikov
Pchelnikov's Consulting, Cary, United States of America
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Gyrotrons II

Chair : G.G. Denisov (Institute of Applied Physics, Russia)

Room : Alexander Graham Bell Room

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¹Max Planck Institute for Plasma Physics, GREIFSWALD, Germany
²IHM, Karlsruhe Institute of Technology (KIT), KARLSRUHE, Germany
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¹Institute of Applied Physics RAS, Nizhny Novgorod, Russian Federation
²Institute of Electrophysics, UB RAS, Russian Federation
³Moscow Engineering Physics Institute Joint Institute of High Temperatures, RAS, MOSCOW, Russian Federation
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V.N. Manuilov¹, G.G. Sominskii², E.P. Taradaev², T.A. Tumareva², M.Yu. Glyavin³
¹Nizhny Novgorod State University, Nizhny Novgorod, Russian Federation
²Peter the Great St. Petersburg Polytechnic University, ST. PETERSBURG, Russian Federation
³Institute of Applied Physics Russian Academy of Sciences (IAP RAS), Nizhny Novgorod, Russian Federation
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Institute of Applied Physics of the Russian Academy of Sciences (IAP RAS), Nizhny Novgorod, Russian Federation
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¹Saratov State University, SARATOV, Russian Federation
²University of Fukui, FUKUI, Japan
³University of Latvia, RIGA, Latvia
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Karlsruhe Institute of Technology (KIT), KARLSRUHE, Germany
- 10:20 Coffee Break

Mm-wave TWTs

Chair : J. Feng (Beijing Vacuum Electronics Research Institute, China)

Room : Constellation Room

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Institute of Applied Physics, China Academy of Engineering Physics, MIANYANG, China
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Beijing Vacuum Electronics Research Institute, BEIJING, China
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Ulsan National Institute of Science and Technology, ULSAN, South-Korea
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IOTs and Crossed Field Devices

Chair : Y. Ding (Institute of Electronics, Chinese Academy of Sciences, China)

Room : Copernicus Extended Room

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L-3 Communications Electron Devices Division, SAN CARLOS, CA, United States of America
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¹Thales Electron Devices, Velizy Villacoublay, France
²Communications & Power Industries, Palo Alto, United States of America
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¹University of Michigan, ANN ARBOR, United States of America
²Sandia National Laboratory, ALBUQUERQUE, NM, United States of America
³Air Force Research Laboratory, ALBUQUERQUE, NM, United States of America
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¹Saratov State Technical University, SARATOV, Russian Federation
²National Research Nuclear University „MEPhI,,, MOSCOW, Russian Federation

12:15 Lunch Break

Subassemblies

Chair : P. Angeletti (ESA, The Netherlands)

Room : Alexander Graham Bell Room

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R. L. Jaynes¹, A. M. Cook¹, D. K. Abe¹, J. M. Hanna²
¹U.S. Naval Research Laboratory, WASHINGTON, D.C., United States of America
²Beam-Wave Research, Inc., BETHESDA, MD, United States of America
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Y. Zheng¹, D. Gamzina¹, N.C. Luhmann Jr.¹, M. Moran²
¹University of California, Davis, DAVIS, United States of America
²High Voltage Outsourcing, LLC, DANBURY, United States of America
- 11:35 **A Depressed Collector for the 65 MW 5045 Klystron N/A**
R. Kowalczyk¹, E. Jongewaard¹, A. Haase¹, M. Kemp¹, A. Jensen², T. Habermann³, P. Kolda³, S. Lenci³, A. Shabazian³, B. Stockwell³
¹SLAC National Accelerator Laboratory, MENLO PARK, United States of America
²Leidos, BILLERICA, United States of America
³Communications Power Industries, PALO ALTO, United States of America
- 11:50 **A Pulsed Depressed Collector for a 5 MW S-Band Klystron 504**
M. Kemp¹, A. Haase¹, E. Jongewaard¹, R. Kowalczyk¹, T. Habermann², P. Kolda², S. Lenci², A. Shabazian², B. Stockwell², A. Jensen³
¹SLAC National Accelerator Laboratory, MENLO PARK, United States of America
²Communications and Power Industries, LLC, PALO ALTO, United States of America
³Leidos, BILLERICA, United States of America

Helix TWTs

Chair : P.H. Thouvenin (TED, France)

Room : Constellation Room

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L-3 Electron Technologies, Inc., TORRANCE, United States of America
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N. Chaudhary, M. Perrin, T. Grant, M. Chesnut, K. Mellon, G. Aymar, O. Sabev, J. Collazo, P. Casey, R. Shah
CPI, PALO ALTO, United States of America
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J. Hwu, J. Ren, D. Kress, L. Sadwick
InnoSys Inc, SALT LAKE CITY, United States of America

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M. Chesnut, N. Chaudhary, J. Collazo, M. Perrin, O. Sabev
Communications and Power Industries LLC, PALO ALTO, United States of America
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T. Ghosh, A. Tokeley, K. Rushbrook, D. Scott, G. Peters, T. Fox, I. Poston, D. Bowler
E2V, CHELMSFORD, United Kingdom
- 15:10 **Backward-Wave Oscillation Suppression in Helix Traveling-Wave Tubes by Magnetic Field Tapering 380**
M. Hägermann¹, P. Birtel², S. Meyne¹, D. Saff¹, A. Jacob¹
¹*Hamburg University of Technology, HAMBURG, Germany*
²*Thales Electronic Systems GmbH, ULM, Germany*

15:35 *Coffee Break*

15:55-17:25 Poster Session 2

18:00 *Departure by bus to the dinner venue*

19:30 *Start Gala Dinner*

Advanced Fabrication Techniques

Chair : N.M. Ryskin (Saratov State University, Russia)

Room : Copernicus Extended Room

- 13:50 **Keynote: Microfabrication Methods for a 233 GHz Traveling Wave Amplifier 253**
C.D. Joye¹, A.M. Cook¹, R.L. Jaynes¹, J.P. Calame¹, B.S. Albright¹, J.R. Lowe¹, D.K. Abe¹, K.T. Nguyen², E.L. Wright²
¹*U.S. Naval Research Lab, DISTRICT OF COLUMBIA, United States of America*
²*Beam-Wave Research, Inc., BETHESDA, United States of America*
- 14:10 **A Microfabricated V-Shaped Microstrip Meander-Line Slow-Wave Structure 115**
W. Shaomeng, S. Aditya
Nanyang Technological University, SINGAPORE, Singapore
- 14:25 **Additive Vacuum Electronics: Electron Beam Melting of Copper 157**
D. Gamzina¹, N.C. Luhmann Jr.¹, C. Ledford², T. Horn², I. Karakaut³, L. Lin³, P. Frigola⁴
¹*UC Davis, DAVIS, CA, United States of America*
²*CAMAL, NCSU, RALEIGH, NC, United States of America*
³*UC Berkeley, BERKELEY, CA, United States of America*
⁴*Radiabeam Technologies Inc., SANTA MONICA, CA, United States of America*
- 14:40 **3D-printed Mold Electroforming for Microfabrication of W-band TWT Circuits 205**
A. M. Cook, C. D. Joye, J. P. Calame, D. K. Abe
U.S. Naval Research Laboratory, WASHINGTON, D.C., United States of America
- 14:55 **MEMS Fabrication of H-plane and E-plane loaded 400 GHz TWT Amplifier 497**
L.R. Billa¹, X. Shi², M. Nadeem Akram¹, X. Chen¹
¹*University College of Southeast Norway, BORRE, Norway*
²*University of Electronic Science and Technology of China, CHENGDU, China*
- 15:10 **Investigation of RF and DC Plasma Electron Sources for Material Processing Applications 485**
S. Del Pozo¹, C. Ribton¹, D.R. Smith²
¹*TWI Ltd. & Brunel University London, CAMBRIDGE, United Kingdom*
²*Brunel University London, UXBRIDGE, United Kingdom*
- 15:35 *Coffee Break*

15:55-17:25 Poster Session 2

18:00 *Departure by bus to the dinner venue*

19:30 *Start Gala Dinner*

Electron Sources

Chair : R.L.I. Ives (Calabazas Creek Research, United States of America)

Room : Alexander Graham Bell Room

- 13:50 **Keynote: Development of New Generation of Cathodes using Additive manufacturing 29**
D. Busbaheer, J. Spors, J.O. Tarter
Ceradyne Inc., a 3M Company, LEXINGTON, United States of America
- 14:10 **Field Emission Study of Small Number of Carbon Fiber Field Emitters 3**
W.W. Tang¹, D.A. Shiffler¹, J.R. Harris¹, K.L. Jensen²
¹*Air Force Research Laboratory, KIRTLAND AFB, United States of America*
²*Naval Research Laboratory, WASHINGTON DC, United States of America*
- 14:25 **High Performance of X-ray Tube with Field-emission Cathode 193**
L. Wei, Z. Zuoya, Z. Xiaobing, C. Yitao, W. Baoping
Southeast University, NANJING, China
- 14:40 **Long-Life Photocathodes with High Quantum Efficiency 477**
R.L.Ives¹, E.J. Montgomery², G. Collins¹, D. Marsden¹, T. Bui¹
¹*Calabazas Creek Research, Inc., SAN MATEO, CA, United States of America*
²*University of Maryland, COLLEGE PARK, MD, United States of America*
- 14:55 **Improved field Emission from Tungsten Doped Reduced Graphene Oxide 527**
G. Park^{1,2}, R. Bhattacharya¹, I. Baek², R.K. Barik³, S. Kim², D. Hong², O. Kwon², M.A. Sattorov⁴
¹*School of Electrical & Computer Engineering, Seoul National University, SEOUL, South Korea* ²*Department of Physics & Astronomy, Seoul National University, SEOUL, South Korea* ³*CSIR-CEERI, PILANI, India* ⁴*Seoul-Teracom Inc, SEOUL, South Korea*
- 15:10 **Field Electron Emission Theory for Technology 378**
R. G. Forbes
University of Surrey, GUILDFORD, United Kingdom

15:35 *Coffee Break*

15:55-17:25 Poster Session 2

18:00 *Departure by bus to the dinner venue*

19:30 *Start Gala Dinner*

Wednesday 26 April 2017

Mm-wave Gyrotrons

Chair : J. Jelonnek (Karlsruhe Institute of Technology, Germany)

Room : Constellation Room

- 08:30 **Keynote: First CW Experiments with the EU ITER 1 MW, 170 GHz Industrial Prototype Gyrotron 131**
Z.C. Ioannidis¹, T. Rzesnicki¹, K. Avramidis¹, G. Gantenbein¹, S. Illy¹, J. Jin¹, T. Kobarg¹, I.Gr. Pagonakis¹, M. Schmid¹, M. Thumm¹, J. Jelonnek¹, V. Hermann², Y. Rozier², F.. Legrand², S. Alberti³, F. Braunmueller³, J-P. Hogge³, C. Schlatter³, J. Genoud³, M.Q. Tran³, W. Kasperek⁴, C. Lechte⁴, J.L. Vomvoridis⁵, J. Chelis⁶, G.P. Latsas⁶, A. Zisis⁶, I.G. Tigelis⁶, A. Bruschi⁷, M. Lontano⁷, F. Albajar⁸, T. Bonicelli⁸, P.-E. Frigot⁸, W. Bin⁷
¹Karlsruhe Institute of Technology, EGGENSTEIN-LEOPOLDSHAFEN, Germany
²Thales Electron Devices, VÉLIZY-VILLACOUBLAY, France
³Swiss Plasma Center, LAUSANNE, Switzerland
⁴University of Stuttgart, STUTTGART, Germany
⁵National Technical University of Athens, ATHENS, Greece
⁶National and Kapodistrian University of Athens, ATHENS, Greece
⁷Istituto di Fisica del Plasma, MILANO, Italy
⁸European Joint Undertaking for ITER and the Development of Fusion Energy, BARCELONA, Spain
- 08:50 **A 140 GHz Gyro-Amplifier using a Dielectric-loaded, Sever-less Confocal Waveguide 105**
A.V. Soane, S. Jawa, M.A. Shapiro, R.J. Temkin
MIT, CAMBRIDGE, United States of America
- 09:05 **W-band Helical-Waveguide Gyro-Twts Yielding High Gain and High Output Power: Design and Simulations 113**
S.V. Samsonov¹, A.A. Bogdashov¹, G.G. Denisov¹, I.G. Gachev¹, S.V. Mishakin¹, V.N. Manuilov²
¹Institute of Applied Physics, Russian Academy of Sciences, Nizhny Novgorod, Russian Federation
²Nizhny Novgorod State University, Nizhny Novgorod, Russian Federation
- 09:20 **Development of Multi-Frequency Gyrotrons in QST N/A**
Y. Oda, R. Ikeda, T. Kobayashi, K. Kajiwara, K. Takahashi, S. Moriyama, K. Sakamoto
National Institute of Quantum and Radiological Science and Technology, NAKA, Japan
- 09:35 **Terahertz Large-Orbit High-Harmonic Gyrotrons at IAP RAS: Recent Experiments and New Designs 344**
A.V. Saviolov, I.V. Bandurkin, V.L. Bratman, Yu.K. Kalynov, I.V. Osharin
Institute of Applied Physics, Russian Academy of Sciences, Nizhny Novgorod, Russian Federation
- 09:50 **Measurement of a W-Band Gyro-TWA Experiment based on a Helically Corrugated Interaction Region 415**
W. He, C.R. Donaldson, L. Zhang, P. McElhinney, J. Garner, K. Ronald, A.W. Cross, A.D.R. Phelps
The University of Strathclyde, GLASGOW, United Kingdom
- 10:15 Coffee Break

Modelling & Codes

Chair : B. Levush (Naval Research Laboratory, United States of America)

Room : Copernicus Extended Room

- 08:30 **Keynote: Application of Reciprocity to the Design of Electron Guns 286**
T. M. Antonsen¹, D. P. Chernin², J. J. Petillo²,
¹IREAP, COLLEGE PARK MD, United States of America
²Leidos, RESTON VA, United States of America
- 08:50 **Development of an Advanced Vector Analysis Code for Simulation of Electromagnetic Fields in Quasi-Optical Systems of High Power Gyrotrons 346**
A. Marek, J. Jin, J. Jelonnek, M. Thumm, A.S. Müller
Karlsruhe Institute of Technology, KARLSRUHE, Germany
- 09:05 **Developments of the MICHELLE Charged Particle Beam Optics Code for High Performance Computing 461**
J. Petillo¹, S. Ovtchinnikov¹, C. Kostas¹, D. Panagos¹, A.L. Jensen¹, A. Burke¹, E. Nelson¹, G. Stantchev², S. Cooke², B. Held³, A. Nichols³, S. Ayala³
¹Leidos, BILLERICA, United States of America
²US Naval Research Laboratory, WASHINGTON, DC, United States of America
³AWR-National Instruments, MEQUON, WI, United States of America
- 09:20 **Modeling Oscillations in TWTs using the TESLA Family of Codes 447**
I.A. Chernyavskiy¹, A.N. Vlasov¹, B. Levush¹, T.M. Antonsen Jr.², K.T. Nguyen³
¹Naval Research Laboratory, WASHINGTON, DC, United States of America
²Leidos, Inc., RESTON, VA, United States of America
³Beam-wave Research, Inc., BETHESDA, MD, United States of America
- 09:35 **Recent Advances in Beam Optics Analyzer 487**
T. Bui, R.L. Ives, M. Read
Calabazas Creek Research, Inc., MOUNTAIN VIEW, United States of America
- 09:50 **Electron-Wave Momentum Exchange and Time Domain Simulations Applied to Traveling Wave Tubes 506**
D.F.G. Minenna^{1,2,3}, Y. Elskens², F. André³
¹Centre National d'Études Spatiales, TOULOUSE, France
²University of Marseille, PIIM, France
³Thales Electronic Device, PARIS, France
- 10:15 Coffee Break

Travelling Wave Tubes

Chair : S. Voigt (DLR, Germany)

Room : Constellation Room

- 10:35 **Keynote: Helix Traveling-Wave Tube Interaction Simulation with CST Particle Studio 382**
D. Safi¹, P. Birtel², S. Meyne¹, A.F. Jacob¹
¹Hamburg University of Technology, HAMBURG, Germany
²Thales Electronic Systems GmbH, ULM, Germany
- 10:55 **Study of a 1.5 KW Average Output Power CC-TWT with a 10% Bandwidth Operating in X-band 270**
A. Mistretta¹, D. Bisconti¹, R. Martorana¹, A. Muratore²
¹Leonardo, PALERMO, Italy
²Teoresi S.p.A., TORINO, Italy
- 11:10 **Full Thermal Analyses for Slow-Wave Structure in Helix-TWT under Operation 421**
X. Sun¹, J. Zhang¹, H. Yuan¹, X. Zhao¹, N. Bai¹, C. Shen¹, H. Fan¹, B. Chen², J. Feng², T. Yan²
¹Southeast University, NANJING, China
²Beijing Vacuum Electronics Research Institute, BEIJING, China

- 11:25 **Design of Low Voltage Folded Waveguide Multiple Beam mini-TWTs 499**
A.N. Vlasov¹, J.C. Rodgers¹, J.A. Pasour¹, I.A. Chernyavskiy¹, S.J. Cooke¹, B. Levush¹, T.M. Antonsen Jr.², D. Chernin², K.T. Nguyen³
¹NRL, WASHINGTON, United States of America
²Leidos Inc., BILLERICA, United States of America
³Beam-Wave Research Inc., BETHESDA, United States of America

12:00 Lunch Break

12:00-13:30 Poster Session 3

High Power Vacuum Devices

Chair : J. Booske (University of Wisconsin, United States of America)

Room : Copernicus Extended Room

- 10:35 **Keynote: Study of the Oscillation Startup Time in a G-band EIO based on a Pseudospark-Sourced Electron Beam 388**
P. Peng, L. Bi, Z. Chang, F. Zeng, Y. Yin, B. Wang, L. Meng
University Of Electronic Science And Technology Of China, CHENGDU, China
- 10:55 **Novel Schemes of Powerful FEM-Oscillators and Amplifiers for Potential Applications 306**
N.Yu. Peskov¹, I.V. Bandurkin¹, N.S. Ginzburg¹, S.V. Kuzikov¹, A.V. Savilov¹, V.Yu. Zaslavsky¹, A.K. Kaminsky², E.A. Perelshtein², S.N. Sedykh²
¹Institute of Applied Physics RAS, Nizhny Novgorod, Russian Federation
²Joint Institute for Nuclear Research, DUBNA, Russian Federation
- 11:10 **THz Undulator Radiation of Dense Electron Bunches Stabilized in the Negative Mass Regime 376**
I.V. Bandurkin¹, V.L. Bratman¹, I.S. Kurakin¹, Y.S. Oparina¹, A.V. Savilov¹, N. Balal², Y. Lurie²
¹Institute of Applied Physics, Russian Academy of Sciences, Nizhny Novgorod, Russian Federation
²Ariel University, ARIEL, Israel
- 11:25 **Powerful Multichannel Planar FEMs based on Intense Parallel Sheet Beams 356**
N.Yu. Peskov¹, N.S. Ginzburg¹, A.S. Sergeev¹, V.Yu. Zaslavsky¹, A.V. Arzhannikov², P.V. Kalinin², S.A. Kuznetsov², S.L. Sinitsky², V.D. Stepanov², M. Thumm²
¹Institute of Applied Physics RAS, Nizhny Novgorod, Russian Federation
²Budker Institute of Nuclear Physics RAS, NOVOSIBIRSK, Russian Federation
- 11:40 **Comparison of 6 MW S-band Pulsed BAC MBK with the Existing SBKs 511**
I. Guzilov¹, O. Maslennikov¹, R. Egorov², I. Syrathev³, V. Kobets⁴, A. Sumbaev⁴
¹JSC "Vacuum device's basic technologies", MOSCOW, Russian Federation,
²M.V.Lomonosov Moscow State University, MOSCOW, Russian Federation
³CERN, GENEVA, Switzerland
⁴JINR, MOSCOW, Russian Federation

12:00 Lunch Break

12:00-13:30 Poster Session 3

Klystrons I

Chair : E. Bosch (Thales Electronic System, Germany)

Room : Constellation Room

- 13:30 **Keynote: Test of a BAC Klystron N/A**
R. Kowalczyk¹, A. Haase¹, E. Jongewaard¹, M. Kemp¹, J. Neilson¹, A. Jensen²
¹SLAC National Accelerator Laboratory, MENLO PARK, United States of America
²Leidos, BILLERICA, United States of America
- 13:50 **Development of a SpaceBorne C-Band Klystron for the MetOp-SG Mission 503**
P. Horoyski, R. MacHattie, R. Dobbs, D. Berry
CPI Canada, GEORGETOWN, Canada
- 14:05 **W-band Klystron Upconverter Driven by Pseudospark-Sourced Electron Beam 73**
L. Zhang^{1,2}, H. Yin^{1,2}, D. Constable^{2,3}, J. Zhao^{1,2}, W. He^{1,2}, A. W. Cross^{1,2}, G. Burt^{2,3},
C. Lingwood^{2,3}, C. Paoloni^{2,3}
¹University of Strathclyde, GLASGOW, United Kingdom
²Cockroft Institute Warrington, CHESHIRE, United Kingdom
³Department of Engineering, Lancaster University, LANCASTER, United Kingdom
- 14:20 **Upgrading the 250-kW CW X-band Klystron used in the Goldstone Solar System Radar 107**
E.L. Eisen, R. Begum, B. Stockwell, A. Waggoner, S. Cauffman, G. Aymar, S. Forrest, L. Zitelli, A. Staprans
Communications & Power Industries, LLC, PALO ALTO, United States of America
- 14:35 **Pre-Development of a C-Band Klystron Intended for Synthetic Aperture Radar in Space Application 268**
R. Martorana¹, D. Bisconti¹, A. Mistretta¹, A. Muratore²
¹Leonardo - Finmeccanica SpA, PALERMO, Italy
²Teoresi S.p.A., TORINO, Italy
- 14:50 **20MWp High-Efficiency L Band Multi-Beam Klystron for CLIC Drive Beam 326**
R. Marchesin, A. Beunas, P. Thouvenin, K. Haj Khelifa, Q. Vuillemin
Thales Electron Devices, VELIZY-VILLACOUBLAY, France
- 15:15 Coffee Break

15:15-15:35 Poster Session 3

Design of mm-wave Vacuum Devices

Chair : J.C.T. Tucek (Northrop Grumman Systems, United States of America)

Room : Copernicus Extended Room

- 13:30 **Keynote: Fabrication of W-band TWT for 5G Small Cells Backhaul 445**
F. André¹, S. Kolher¹, Q. Trung Le, A. Sabaawi³, G. Ulisse⁴, V. Krozer⁴, R. Letizia³, C. Paoloni³, R. Zimmermann⁴
¹Thales Electron Devices, VELIZY, PARIS, France
²HF Systems Engineering GmbH, KASSEL, Germany
³Lancaster University, LANCASTER, United Kingdom
⁴Goethe University of Frankfurt, FRANKFURT, Germany
- 13:50 **71 - 76 GHz Traveling Wave Tube for High Data Rate Satellite Communication 449**
X. Li, X. Huang, R. Letizia, C. Paoloni
Lancaster University, LANCASTER, United Kingdom
- 14:05 **3D Modeling of a Sheet-Beam Sub-THz Traveling Wave Tube 366**
T.A. Karetnikova^{1,2}, N.M. Ryskin^{1,2}, A.G. Rozhnev¹, A.E. Fedotov³, S.V. Mishakin³,
N.S. Ginzburg^{3,4}
¹Saratov State University, SARATOV, Russian Federation
²Saratov Branch, Institute of Radio Engineering and Electronics, SARATOV, Russian Federation
³Institute of Applied Physics, Nizhny Novgorod, Russian Federation
⁴Nizhny Novgorod State University, Nizhny Novgorod, Russian Federation

- 14:20 **Design of a 94 GHz Photonic Bandgap Based Extended Interaction Klystron Amplifier 109**
J.C. Stephens¹, M.A. Basten², K.E. Kreischer², G. Rosenzweig¹, M.A. Shapiro¹, R.J. Temkin¹, J.C. Tucek²
¹Massachusetts Institute of Technology, CAMBRIDGE, United States of America
²Northrop Grumman Systems Corp., ROLLING MEADOWS, United States of America
- 14:35 **Research Progress of a W-band 100-Watts Extended Interaction Oscillator 133**
Z. Qu, Z. Zhang, Y. Ding, S. Wang, Z. Zhang, Q. Li
Institute of Electronics, Chinese Academy of Sciences, BEIJING, China
- 14:50 **Design and Experiment of 0.13THz Folded-Waveguide Oscillator 135**
J. Yi, L. Wenqiang, H. Peng, S. Rui, H. Yinhu, M. Guowu, C. Hongbin
Institute of Applied Electronics, China Academy of Engineering Physics, MIANYANG, China

15:15 Coffee Break

15:15-15:35 Poster Session 3

Materials & Technologies

Chair : M. Clark (TMD, United Kingdom)

Room : Alexander Graham Bell Room

- 13:30 **Keynote: Long Pulse Operation of a High Power Microwave Source with a Metamaterial Loaded Waveguide 89**
X. Lu, J.S. Hummelt, M.A. Shapiro, R.J. Temkin
MIT, CAMBRIDGE, United States of America
- 13:50 **Dispenser Cathodes for E-Beam Lithography Machine: a Quick Take 13**
V. Katsap, C. Lai
NuFlare Technology America, HOPEWELL JUNCTION, NY, United States of America
- 14:05 **Study of AlN-FeSiAl Microwave Attenuation Ceramic 239**
Y. Zhang, S. Yin, X. Gao, H. Jin, H. Liu, Y. Ding
Institute of Electronics, Chinese Academy of Sciences, BEIJING, China
- 14:20 **Corrosion Mitigation Coatings for RF Sources and Components 276**
R.L. Ives¹, G. Collins¹, D. Marsden¹, T. Bui¹, B. Mitsdarffer², C.J. Oldham³, J.S. Daubert³, A.P. Gremaud³, G.N. Parsons³
¹Calabazas Creek Research, Inc., SAN MATEO, CA, United States of America
²Naval Surface Warfare Center, CRANE, IN, United States of America
³North Carolina State University, RALEIGH, NC, United States of America
- 14:35 **Recent Advances in High-Power Metamaterial Microwave Sources at UESTC 290**
Z. Duan¹, X. Tang², Y. Wang², X. Wang², F. Wang², Z. Wang², Y. Gong²
¹University of Electronic Science and Technology of China, CHENGDU, China
²UESTC, CHENGDU, China
- 14:50 **First Experimental Observation of Plasma Breakdown for Detection of Radioactive Material Using a Gyrotron in Real-Time 467**
D. Kim, D. Yu, A. Sawant, M.S. Choe, E.M. Choi
Ulsan National Institute of Science and Technology, ULSAN, South-Korea

15:15 Coffee Break

15:15-15:35 Poster Session 3

MPMs and mini-TWTs

Chair : D.K. Abe (Naval Research Laboratory, United States of America)

Room : Constellation Room

- 15:35 **Keynote: A Compact G-Band MPM Power Amplifier for High-Resolution Airborne Radar 255**
C.M. Armstrong¹, A. Zubyk¹, C Meadows¹, K Berg¹, D Chan¹, T Schoemehl¹, R Duggal¹, N Hinch¹, M. Martin¹, R. Kowalczyk², B. Weatherford², B. Tobin¹, M. Sweeney¹
¹L-3 Electron Devices, SAN CARLOS, United States of America
²Stanford Linear Accelerator, MENLO PARK, United States of America
- 15:55 **High PRF Microwave Power Module with Electronic Power Conditioner of enhanced features 265**
R. Martorana, D. Bisconti, A. Mistretta
Leonardo - Finmeccanica SpA, PALERMO, Italy
- 16:10 **Mini-TWT in Gain and Phase Matched Applications 519**
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E2V, CHELMSFORD, United Kingdom
- 16:25 **Development of Ka-Band 25 Watt Mini TWT 296**
Q. Liu, M. Huang, L. Yao
Institute of Electronics, Chinese Academy of Sciences, BEIJING, China
- 16:45 *Conference Closing Remarks*

Klystrons II

Chair : Y.B. Gong (UESTC, China)

Room : Copernicus Extended Room

- 15:35 **Study of a Rectangular Beam Extended Interaction Klystron in G-band 334**
C. Ruan, R. Li
Beihang University, BEIJING, China
- 15:55 **A High Efficiency S-band Klystron for Medical Accelerator System 183**
Z. Wan, J. Wang
Beijing Vacuum Electronics Research Institute, BEIJING, China
- 16:10 **Design and Analysis of a Multiple-Beam Extended Interaction Oscillator with Coaxial Structure 119**
Y. Yin, B. Wang, T. Zhang, F. Zeng, R. Peng, L. Bi, Z. Chang, L. Meng
University of Electronic Science and Technology of China, CHENGDU, China
- 16:25 **Development and Production of a 704 MHz, 1.5 MW Peak Power Klystron 463**
G. Aymar, E. Eisen, B. Stockwell, R. Begum, O. Sabev, S. Lenci, S. Torres,
Communications and Power Industries LLC, PALO ALTO, United States of America
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Relativistic Vacuum Devices

Chair : G.S. Park (Seoul National University, Korea)

Room : Alexander Graham Bell Room

- 15:35 **Keynote: Efficient Relativistic Magnetron with Lengthy Virtual Cathode Formed using the Magnetic Mirror Effect 274**
E. Schamiloglu¹, M.I. Fuks¹, A.A. Koronovskii², S.A. Kurkin²
¹University of New Mexico, ALBUQUERQUE, United States of America
²Saratov State University, SARATOV, Russian Federation

- 15:55 **Design and Simulation of a Relativistic Inverted Magnetron 53**
T.P. Fleming¹, M. Lambrecht¹, P. Mardahl¹, J. Keisling²
¹*Air Force Research Lab, EDGEWOOD, NEW MEXICO, United States of America,*
²*Leidos Inc., ALBUQUERQUE, United States of America*
- 16:10 **Experimental Realization of Pulse W-band Relativistic Gyrotron with 5 MW Output Power 358**
E.B. Abubakirov, A.V. Chirkov, G.G. Denisov, Yu.M. Guznov, S.Yu. Kornishin, A.N. Leontyev, O.P. Plankin, R.M. Rozental, A.S. Sedov, E.S. Semenov, N.A. Zavolsky, S.A. Zapevalov, V.E. Zapevalov
Institute of Applied Physics, Nizhny Novgorod, Russian Federation
- 16:25 **Design and Simulation of a High efficiency Relativistic Backward Wave Oscillator 63**
M.A. Ansari, M. Thottappan
Centre of Research in Microwave Tubes (CRMT), Department of Electronics Engineering, Indian Institute of Technology (BHU), India
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Poster Sessions

Poster session 1 - Monday 24 April 2017

15:35 – 15:55 / 17:25 – 18:25

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Pchelnikov's Consulting, Cary, United States of America
- 1.2 A Simple Pillbox-Type Mixed-Mode Window for High Power Microwave Devices 19**
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JSC, Scientific & Production Enterprise, Toriy, MOSCOW, Russian Federation
- 1.3 Development of MIG-Collector Test Module for 170 GHz, 1MW Gyrotron N/A**
K. Alaria, U. Singh, R. Poonia, A. Bera, A. Sinha
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Institute of Electronics, Chinese Academy of Sciences, BEIJING, China
- 1.5 THz Electromagnetic Radiation in Beam-Plasma System under Differentiations' Quantity 33**
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University of Electronic Science and Technology of China, CHENGDU, China
- 1.6 Equivalent Circuit Model of Terahertz Folded Waveguide Traveling Wave Tube 37**
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Institute of Electronics, Chinese Academy of Sciences, BEIJING, China
- 1.7 Metal-Alloyed 'Cold' Secondary Emission Cathode 47**
O.V. Polivnikova
JSCR@PC „Istok“, FRYAZINO, Russian Federation
- 1.8 Simplified Tape-Helix Analysis of Planar Helix Slow-Wave Structure Using Effective Dielectric Constant Method 57**
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- 1.9 The Design and Calculation of P-Band 1.2MW Multi-Beam Klystron 59**
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Institute of Electronics, Chinese Academy of Sciences, BEIJING, China
- 1.10 Design and Cold Simulation of a Metal PBG Cavity for Sub-millimeter Wave Gyrotron 61**
M. Thottappan, R. Singh
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- 1.11 A Super-Wide Band Output Circuit with Two Channels for Klystron Applications 77**
Z. Zhang
Institute of Electronics, Chinese Academy of Sciences, BEIJING, China

- 1.12 Simulation the Electron Transport Characteristic of GaN Photocathode 83**
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BVERI, BEIJING, China
- 1.13 Obtaining of Miniature Sheet Beam by Thin Masks on Scandia Doped Dispenser Cathodes N/A**
Y. Yang, Y. Wang, J. Wang
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