

# **2020 IEEE 21st International Conference on Vacuum Electronics (IVEC 2020)**

**Monterey, California, USA  
19 – 22 October 2020**



**IEEE Catalog Number: CFP20VAM-POD  
ISBN: 978-1-5386-8289-0**

**Copyright © 2020 by the Institute of Electrical and Electronics Engineers, Inc.  
All Rights Reserved**

*Copyright and Reprint Permissions:* Abstracting is permitted with credit to the source. Libraries are permitted to photocopy beyond the limit of U.S. copyright law for private use of patrons those articles in this volume that carry a code at the bottom of the first page, provided the per-copy fee indicated in the code is paid through Copyright Clearance Center, 222 Rosewood Drive, Danvers, MA 01923.

For other copying, reprint or republication permission, write to IEEE Copyrights Manager, IEEE Service Center, 445 Hoes Lane, Piscataway, NJ 08854. All rights reserved.

***\*\*\* This is a print representation of what appears in the IEEE Digital Library. Some format issues inherent in the e-media version may also appear in this print version.***

IEEE Catalog Number:	CFP20VAM-POD
ISBN (Print-On-Demand):	978-1-5386-8289-0
ISBN (Online):	978-1-5386-8288-3

**Additional Copies of This Publication Are Available From:**

Curran Associates, Inc  
57 Morehouse Lane  
Red Hook, NY 12571 USA  
Phone: (845) 758-0400  
Fax: (845) 758-2633  
E-mail: [curran@proceedings.com](mailto:curran@proceedings.com)  
Web: [www.proceedings.com](http://www.proceedings.com)

CURRAN ASSOCIATES INC.  
**proceedings**  
.com

# IVEC 2020

October 19 – 22, 2020

## IVEC 2020 eProceedings Table of Contents

### IVEC 2020 Chair's Welcome

Jagadishwar R. Sirigiri, *General Chair, IVEC 2020*

### IVEC 2020 Organization

### IVEC 2020 Acknowledgments

Paper Sessions		
Session 1: Microfabrication & THz I	Session 8: High Power Microwaves I	Session 15: Modeling: RF & Secondaries
Session 2: Power Supplies	Session 9: Scandate Cathodes	Session 16: Components
Session 3: Cold Cathodes	Session 10: Cathode Processing & Gun Development	Session 17: Microfabrication & THz II
Session 4: MMW TWTs	Session 11: High Power Microwaves II	Session 18: Thermionic Cathodes
Session 5: Multipactor	Session 12: Gyrotrons / Magnetrons	Session 19: Modeling: TWTs
Session 6: Klystron Manufacturing	Session 13: Klystron Frontiers	Session 20: TWTs
Session 7: Modeling: Guns & Collectors	Session 14: Space TWTs	Session 21: Gyrotrons
Plenary		
Poster Sessions		
Poster Session 1:	1. TWT/Linear Beam	2. Components Posters
	3. Gyrotrons Poster	
Poster Session 2:	4. Klystrons - Poster	5. High Power Microwaves
	6. Microfab/THz	
Poster Session 3:	7. Modeling	8. Cathodes/Materials/Electron Guns

### Session 1: Microfabrication & THz I

Chair: Jennifer Hwu, *Innosys*

#### 1-1: High Power Pulsed 263 GHz Extended Interaction Amplifier (Page 1)

Mark Hyttinen, *CPI Canada Inc.*  
Albert Roitman, *CPI Canada Inc.*  
Peter Horoyski, *CPI Canada Inc.*  
Henry Deng, *CPI Canada Inc.*

#### 1-2: TWTs for Point-to-Point D-Band Wireless Links (Page 3)

Rupa Basu, *Lancaster University*  
Laxma R. Billa, *Lancaster University*  
Jeevan M. Rao, *Lancaster University*  
Rosa Letizia, *Lancaster University*  
Claudio Paoloni, *Lancaster University*

**1-3: On a D-Band Traveling-Wave Tube for Wireless Links** (Page 5)

Rupa Basu, *Lancaster University*  
Laxma R. Billa, *Lancaster University*  
Jeevan M. Rao, *Lancaster University*  
Nicholas Renninson, *Lancaster University*  
Benjamin Rodgers, *Lancaster University*  
Quang Trung Le, *HF Systems Engineering GmbH*  
Rosa Letizia, *Lancaster University*  
Claudio Paoloni, *Lancaster University*

**1-4: Gated Silicon Field Emitter Array Characterization** (Page 7)

Ranajoy Bhattacharya, *Boise State University*  
Nedeljko Karaulac, *Massachusetts Institute of Technology*  
Winston Chern, *Massachusetts Institute of Technology*  
Akintunde I. Akinwande, *Massachusetts Institute of Technology*  
Jim Browning, *Boise State University*

---

**Session 2: Power Supplies**

Chair: Yehuda Goren, *Teledyne Electronic Technologies*

**2-1: AN/TPQ-18 Radar Transmitter** (Page 9)

Christopher Chipman, *Diversified Technologies, Inc. (DTI)*  
Philip Gordon, *Diversified Technologies, Inc. (DTI)*  
Luan Jashari, *Diversified Technologies, Inc. (DTI)*  
John Kinross-Wright, *Diversified Technologies, Inc. (DTI)*  
Marcel P.J. Gaudreau, *Diversified Technologies, Inc. (DTI)*  
Michael Kempkes, *Diversified Technologies, Inc. (DTI)*  
Rebecca Simpson, *Diversified Technologies, Inc. (DTI)*

**2-2: Gyrotron Pulse Modulator Test Stand** (Page 11)

Marcel P.J. Gaudreau, *Diversified Technologies, Inc. (DTI)*  
Craig Conecoff, *Diversified Technologies, Inc. (DTI)*  
Nigel Stuart, *Diversified Technologies, Inc. (DTI)*  
Luan Jashari, *Diversified Technologies, Inc. (DTI)*  
Tuan Nguyen, *Diversified Technologies, Inc. (DTI)*  
Michael Kempkes, *Diversified Technologies, Inc. (DTI)*  
Rebecca Simpson, *Diversified Technologies, Inc. (DTI)*

**2-3: Integrated System of a Mini-Marx Generator Charged by a Cockcroft-Walton Voltage Multiplier** (Page 13)

Zhaofeng Zhang, *Hanyang University*  
Kaviya Aranganadin, *Hanyang University*  
Hua-Yi Hsu, *National Taipei University of Technology*  
Po-Yu Chang, *National Cheng Kung University*  
Ming-Chieh Lin, *Hanyang University*

**2-4: High Power Density Electronic Power Conditioner for Airborne Transmitter** (Page 15)

Neeraj Kumar, *Microwave Tube Research and development Centre (MTRDC) & Defense in Research and Development Organization (DRDO)*  
A. J. Zabiulla, *Microwave Tube Research and development Centre (MTRDC) & Defense in Research and Development Organization (DRDO)*  
Pradheep H. N., *Microwave Tube Research and development Centre (MTRDC) & Defense in Research and Development Organization (DRDO)*  
P. Sidharthan, *Microwave Tube Research and development Centre (MTRDC) & Defense in Research and Development Organization (DRDO)*

---

**Session 3: Cold Cathodes**

Chair: Joan Yater, *Naval Research Laboratory*

**3-1: Diamond p-i-n-nanoC Diodes for Electron Emitters** (Page 17)

Franz A. Koeck, *Arizona State University*  
Manpuneet Benipal, *Advent Diamond*  
Harshad Surdi, *Arizona State University*  
Robert J. Nemanich, *Arizona State University*

**3-2: Field Emission Cathodes Fabricated from Bulk Carbon Nanotube Fibers and Films** (Page 19)

Steven B. Fairchild, *Air Force Research Laboratory, Materials & Manufacturing Directorate*  
Paul T. Murray, *Air Force Research Laboratory, Materials & Manufacturing Directorate*  
Salvador Portillo, *University of New Mexico*  
Genevieve Dion, *Drexel University*

**3-3: Observing Performance of Individual Metal-Coated Silicon Field Emitters in an X-Ray Generator** (Page 21)

Gil Travish, *Adaptix Ltd*  
Aquila Mavalankar, *Adaptix Ltd*  
Jamie Cameron, *Adaptix Ltd*

Manuel Fohler, *Adaptix Ltd*  
Isabel Gomes, *Adaptix Ltd*  
Silvia Sottini, *Adaptix Ltd*  
Nivedita Yumnam, *Adaptix Ltd*

- 3-5: Two-Color Laser Induced Electron Emission from Biased Metal Surface** (Page 23)  
Yi Luo, *Michigan State University*  
Peng Zhang, *Michigan State University*
- 

#### **Session 4: MMW TWTs**

Chair: Mark Basten, *Northrop Grumman*

- 4-1: Demonstration of a W-band TWT with 10 GHz Bandwidth** (Page 25)  
Alan Cook, *U.S. Naval Research Laboratory*  
Colin Joye, *U.S. Naval Research Laboratory*  
Reginald Jaynes, *U.S. Naval Research Laboratory*  
John Rodgers, *U.S. Naval Research Laboratory*  
Igor Chernyavskiy, *U.S. Naval Research Laboratory*  
Frank Wood, *U.S. Naval Research Laboratory*  
Edward Wright, *Beam-Wave Research, Inc.*  
Khanh Nguyen, *Beam-Wave Research, Inc.*  
Takuji Kimura, *CPI, LLC*  
John Atkinson, *CPI, LLC*  
Galen Aymar, *CPI, LLC*
- 4-2: A 50 Watt W-band MPM** (Page 27)  
Ji Chen, *National Key Laboratory of Science and Technology on Vacuum Electronics and Beijing Vacuum Electronics Research Institute*  
Fengyan Wang, *Southwest China Research Institute of Electronic Equipment*  
Zhiwei Zhang, *Southwest China Research Institute of Electronic Equipment*  
Zhigang Wang, *University of Electronic Science and Technology of China*  
Jialu Li, *National Key Laboratory of Science and Technology on Vacuum Electronics and Beijing Vacuum Electronics Research Institute*  
Chang Gao, *National Key Laboratory of Science and Technology on Vacuum Electronics and Beijing Vacuum Electronics Research Institute*  
Zhangxiong Zi, *National Key Laboratory of Science and Technology on Vacuum Electronics and Beijing Vacuum Electronics Research Institute*  
Jun Cai, *National Key Laboratory of Science and Technology on Vacuum Electronics and Beijing Vacuum Electronics Research Institute*
- 4-3: W-Band 30W Continuous-Wave Wide-Band Folded Waveguide TWT** (Page 29)  
Fei Li, *Chinese Academy of Sciences*  
Liu Xiao, *Chinese Academy of Sciences*  
Tianjun Ma, *Chinese Academy of Sciences*  
Yuhui Sun, *Chinese Academy of Sciences*  
Jiandong Zhao, *Chinese Academy of Sciences*  
Jian Wang,  
Linlin Cao, *Chinese Academy of Sciences*  
Hongxia Yi, *Chinese Academy of Sciences*  
Xinwen Shang, *Chinese Academy of Sciences*  
Mingguang Huang, *Chinese Academy of Sciences*
- 4-4: Design of a Multi-kW Ka-Band Elliptical Beam Amplifier with PPM Focusing** (Page 31)  
John Pasour, *US Naval Research Laboratory & Beam-Wave Research, Inc.*  
Khanh Nguyen, *Beam-Wave Research, Inc.*  
Edward Wright, *Beam-Wave Research, Inc.*  
Frank Wood, *US Naval Research Laboratory*  
Spence Albright, *US Naval Research Laboratory*  
Alexander Burke, *Leidos Corp.*  
Aaron Jensen, *Leidos Corp.*  
John Petillo, *Leidos Corp.*
- 4-5: 3D Meander Line Slow Wave Structure for W-band TWT** (Page 33)  
Juan M. Socuélamos, *Lancaster University*  
Rosa Letizia, *Lancaster University*  
Roberto Dionisio, *European Space Technology and Research Centre*  
Claudio Paoloni, *Lancaster University*
- 

#### **Session 5: Multipactor**

Chair: John Verboncoeu, *Michigan State University*

- 5-1: Multipactor Thresholds in a Planar Test Cell** (Page 35)  
Zachary C. Shaw, *Texas Tech University*  
Benedikt Esser, *Texas Tech University*  
James C. Dickens, *Texas Tech University*

John J. Mankowski, *Texas Tech University*  
Andreas A. Neuber, *Texas Tech University*

- 5-2: Multipactor Effects on Signal Quality in Transmission Lines with Impedance Mismatches** (Page 37)  
Patrick Wong, *University of Michigan & Michigan State University*  
Y. Y. Lau, *University of Michigan*  
Peng Zhang, *Michigan State University*  
Nicholas Jordan, *University of Michigan*  
Ronald Gilgenbach, *University of Michigan*  
John Verboncoeur, *Michigan State University*
- 5-3: Secondary Electron Yield Measurements on Materials of Interest to Vacuum Electron Communication Devices** (Page 39)  
Talal Malik, *University of New Mexico*  
Mark Gilmore, *University of New Mexico*  
Salvador Portillo, *University of New Mexico*  
Edl Schamiloglu, *University of New Mexico*
- 5-4: Analysis of Single-Surface Multipactor Discharge in the Frequency Domain** (Page 41)  
Asif Iqbal, *Michigan State University*  
Patrick Wong, *Michigan State University*  
John Verboncoeur, *Michigan State University*  
Peng Zhang, *Michigan State University*
- 5-5: A General Empirical Model of Secondary Electron Yield and Its Application in Monte Carlo Simulation of a Microporous Gold Surface** (Page 43)  
Asif Iqbal, *Michigan State University*  
Jonathan Ludwick, *University of Cincinnati*  
Steven Fairchild, *Air Force Research Laboratory*  
Marc Cahay, *University of Cincinnati*  
Daniel Gortat, *University of Cambridge*  
Martin Sparkes, *University of Cambridge*  
William O'Neill, *University of Cambridge*  
Tyson C. Back, *Air Force Research Laboratory*  
Peng Zhang, *Michigan State University*
- 5-6: Design, Simulation, and Testing of an S-Band Coaxial Multipactor Test-Cell** (Page 45)  
Stephen V. Langellotti, *University of Michigan*  
Nicholas M. Jordan, *University of Michigan*  
Y. Y. Lau, *University of Michigan*  
Ronald M. Gilgenbach, *University of Michigan*
- 

## Session 6: Klystron Manufacturing

Chair: Ed Eisen, *CPI Microwave Power Products Division*

- 6-1: Miniature Klystron for CubeSats** (Page 47)  
Bernard Vancil, *e beam, inc.*  
Jereme Shaver, *e beam, inc.*  
Forrest Bishop, *e beam, inc.*  
Malcolm Caplan, *Consultant*  
Danilo Radovich, *Consultant*
- 6-2: Noble Gas Retention Effect on Klystron High Voltage Stability** (Page 49)  
Andrew Cripps, *Communications and Power Industries*  
Mark Hyttinen, *Communications and Power Industries*  
Doug Yake, *Communications and Power Industries*  
Anna Moskvicheva, *Communications and Power Industries*
- 6-3: Reliability Optimization Techniques in High Power, High Duty Factor Klystrons** (Page 51)  
John Moss, *Oak Ridge National Laboratory*  
George Toby, *Oak Ridge National Laboratory*  
Timothy Miner, *Oak Ridge National Laboratory*  
Charles Peters, *Oak Ridge National Laboratory*
- 6-4: Multiple Beam Power Grid Tubes for High Frequency and High-Power Operation** (Page 53)  
Lawrence Ives, *Calabazas Creek Research, Inc.*  
Mike Read, *Calabazas Creek Research, Inc.*  
Thuc Bui, *Calabazas Creek Research, Inc.*  
David Marsden, *Calabazas Creek Research, Inc.*  
George Collins, *Calabazas Creek Research, Inc.*  
Thomas Habermann, *Calabazas Creek Research, Inc.*  
Ricky Ho, *Communications & Power Industries, LLC*  
Tom Cox, *Communications & Power Industries, LLC*  
Leroy Higgins, *Communications & Power Industries, LLC*  
Nileshwar Chaudary, *Communications & Power Industries, LLC*  
Christopher McVey, *Communications & Power Industries, LLC*  
James M. Potter, *JP Accelerator Works*

**6-5: Modular High-Power RF Sources for Compact Linear Accelerator Systems** (Page 55)

Brandon Weatherford, *SLAC National Accelerator Laboratory*  
Mark Kemp, *SLAC National Accelerator Laboratory*  
Xueying Lu, *SLAC National Accelerator Laboratory*  
Julian Merrick, *SLAC National Accelerator Laboratory*  
Emilio Nanni, *SLAC National Accelerator Laboratory*  
Jeffrey Neilson, *SLAC National Accelerator Laboratory*  
Ann Sy, *SLAC National Accelerator Laboratory*  
Sami Tantawi, *SLAC National Accelerator Laboratory*

**6-6: Manufacture of CEPC 650-MHz 800-kW CW Klystron** (Page 57)

Yunfeng Liao, *Chinese Academy of Sciences*  
Rui Zhang, *Chinese Academy of Sciences*  
Xiudong Yang, *Chinese Academy of Sciences*  
Zhihui Geng, *Chinese Academy of Sciences*

---

**Session 7: Modeling: Guns & Collectors**

Chair: Eric Nelson, *Los Alamos National Laboratory*

**7-2: Recent Advances in Beam Optics Analyzer** (Page 59)

Thuc Bui, *Calabazas Creek Research Inc.*  
Chris McKenzie, *Oxford Instruments X-ray Technology, Inc.*  
R. Lawrence Ives, *Calabazas Creek Research Inc.*

**7-3: A 2-1/2 Dimensional Model of Miram Curves** (Page 61)

Abhijit Jassem, *University of Michigan*  
David P. Chernin, *Leidos, Inc.*  
Serguei Ovtchinnikov, *Leidos, Inc.*  
John J. Petillo, *Leidos, Inc.*  
Yue Ying Lau, *University of Michigan*

**7-5: Transitions in Electron Emission and Gas Breakdown from Nanoscale to Microscale** (Page 63)

Amanda M. Loveless, *Purdue University*  
Adam M. Darr, *Purdue University*  
Allen L. Garner, *Purdue University*

---

**Session 8: High Power Microwaves I**

Chair: David Abe, *DARPA*

**8-1: Simulations and Experiments on Magnetically Insulated Line Oscillators at the University of Michigan** (Page 65)

Drew A. Packard, *University of Michigan*  
Christopher J. Swenson, *University of Michigan*  
Anna Cooleybeck, *University of Michigan*  
Brendan J. Sporer, *University of Michigan*  
Alexander E. Mazarakis, *University of Michigan*  
Nicholas M. Jordan, *University of Michigan*  
Y. Y. Lau, *University of Michigan*  
Ryan D. McBride, *University of Michigan*  
Ronald M. Gilgenbach, *University of Michigan*

**8-2: Backward-Wave Oscillator with Distributed Power Extraction Operating at an Exceptional Point of Degeneracy** (Page 67)

Tarek Mealy, *University of California, Irvine*  
Ahmed F. Abdelshafy, *University of California, Irvine*  
Filippo Capolino, *University of California, Irvine*

**8-3: Experiments on the Recirculating Planar Magnetron with Coaxial All-Cavity Extraction** (Page 69)

Nicholas M. Jordan, *University of Michigan*  
Drew A. Packard, *University of Michigan*  
Christopher J. Swenson, *University of Michigan*  
Sunkeerth Tummala, *University of Michigan*  
Y. Y. Lau, *University of Michigan*  
Ronald M. Gilgenbach, *University of Michigan*  
Matthew A. Franzi, *Air Force Research Laboratory*  
Brad W. Hoff, *Air Force Research Laboratory*

**8-4: Controlled Harmonic Frequency Locking in the Harmonic Recirculating Planar Magnetron** (Page 71)

Drew A. Packard, *University of Michigan*  
Nicholas M. Jordan, *University of Michigan*  
Y.Y. Lau, *University of Michigan*  
Ronald M. Gilgenbach, *University of Michigan*  
Brad W. Hoff, *Air Force Research Laboratory*

**8-5: Design and Simulation of a Relativistic S-Band Inverted Magnetron** (Page 73)

Timothy P. Fleming, *Air Force Research Laboratory*  
Peter J. Mardahl, *Air Force Research Laboratory*

- 8-6: Ka Band 20-Vane Non-p-Mode Magnetron** (Page 75)  
Bekir Bekirov, *Institute for Radiophysics and Electronics of NAS of Ukraine*  
Sergey N. Terekhin, *Institute for Radiophysics and Electronics of NAS of Ukraine*  
Viktor V. Zavertanniy, *Institute for Radiophysics and Electronics of NAS of Ukraine*  
Victor D. Yeryomka, *Institute for Radiophysics and Electronics of NAS of Ukraine*  
Mikhail V. Milcho, *Institute for Radiophysics and Electronics of NAS of Ukraine*  
Kostyantyn Ilyenko, *Institute for Radiophysics and Electronics of NAS of Ukraine*  
Valentyn P. Dzyuba, *State-Owned Enterprise Plant-Generator*  
Tetyana Yatsenko, *Becton, Dickinson and Company (BD)*
- 

## Session 9: Scandate Cathodes

Chair: Daniel Busbaher, *3M*

- 9-1: Lifetime Performance of Nanocomposite Scandate Tungsten Cathodes** (Page 77)  
Michelle Gonzalez, *University of California, Davis*  
Diana Gamzina, *SLAC National Accelerator Lab*  
Colin McElroy, *Vacuum Process Engineering Inc.*  
Carl Schalansky, *Vacuum Process Engineering Inc.*  
Neville C. Luhmann, Jr., *University of California, Davis*
- 9-2: Advanced Nano-Scandate Cathode** (Page 79)  
Daniel E. Bugaris, *Engi-Mat Co.*  
Claudia Goggin, *Engi-Mat Co.*  
Kerry Baker, *University of Kentucky*  
John Balk, *University of Kentucky*  
Daniel Busbaher, *Ceradyne, Inc., a 3M Company*  
Jack Tucek, *Northrop Grumman Corporation*
- 9-3: Recent Progress on Scandate Cathodes** (Page 81)  
Bernard Vancil, *e beam, inc.*  
Douglas Jones, *e beam, inc.*  
Michael Kleschuk, *e beam, inc.*  
Victor Schmidt, *e beam, inc.*  
Allen Vancil, *e beam, inc.*  
Wayne Ohlinger, *Consultant*  
Michael Green, *Consultant*
- 9-4: Temperature Effects on Desorption Behavior and Characteristic Wulff Shapes of Scandate Cathodes** (Page 83)  
Mujan N. Seif, *University of Kentucky*  
Thomas John Balk, *University of Kentucky*  
Matthew J. Beck, *University of Kentucky*
- 9-5: Characterization of Material Phases on the Surface and in the Near-Surface Region of Scandate Cathodes** (Page 85)  
Xiaotao Liu, *University of Kentucky*  
Matthew J. Beck, *University of Kentucky*  
T. John Balk, *University of Kentucky*  
Bernard K. Vancil, *E Beam, Inc.*
- 

## Session 10: Cathode Processing & Gun Development

Chair: Russell Martin, *L3Harris EDD*

- 10-1: Preparation of Tungsten Matrices of Dispenser Cathodes by Selective Laser Melting** (Page 87)  
Kaijie Luo, *Beijing University of Technology*  
Yunfei Yang, *Beijing University of Technology*  
Xuanming Liang, *Beijing University of Technology*  
Jie Ma, *Beijing University of Technology*  
Jinshu Wang, *Beijing University of Technology*
- 10-2: Electron Beam Melting of Pure Copper ? From Research to Industrialization** (Page 89)  
Ralf Guschlbauer, *Arcam EBM Center of Excellence, GE Additive*  
Pär Arumskog, *Arcam EBM Center of Excellence, GE Additive*  
Simon Eichler, *Arcam EBM Center of Excellence, GE Additive*
- 10-3: Practical and Technical Challenges of TWT Grid Spherical Radius Characterization** (Page 91)  
Timothy S. Dyer, *Elcon Precision LLC*
- 10-4: Characterization of a W-band TWT Electron Gun** (Page 93)  
Reginald Jaynes, *U.S. Naval Research Laboratory*  
Alan Cook, *U.S. Naval Research Laboratory*  
Colin Joye, *U.S. Naval Research Laboratory*  
John Rodgers, *U.S. Naval Research Laboratory*  
Edward Wright, *Beam-Wave Research, Inc.*  
Khanh Nguyen, *Beam-Wave Research, Inc.*



John Atkinson, *CPI, LLC*  
Takuji Kimura, *CPI, LLC*  
Galen Aymar, *CPI, LLC*

- 10-5: Barium Dispenser Cathode Operation in a Cesium Vapor Environment for Applications in Thermionic Converters** (Page 95)  
Daniel Velázquez, *Modern Electron, LLC*  
Hsin-I Lu, *Modern Electron, LLC*  
Mark Stone, *Modern Electron, LLC*  
Daniel Merthe, *Modern Electron, LLC*
- 

## Session 11: High Power Microwaves II

Chair: Dev Palmer, *DARPA*

- 11-4: A 3D-Printed Metamaterial Slow-Wave Structure for High-Power Microwave Generation** (Page 99)  
Antonio Breno de Alleluia, *University of New Mexico*  
Artem Kuskov, *University of New Mexico*  
Dmitrii Andreev, *University of New Mexico*  
Edl Schamiloglu, *University of New Mexico*  
Ahmed F. Abdelshafy, *University of California, Irvine*  
Mohamed A.K. Othman, *University of California, Irvine*  
Alexander Figotin, *University of California, Irvine*  
Filippo Capolino, *University of California, Irvine*
- 

## Session 12: Gyrotrons / Magnetrons

Chair: Mikhail Glyavin, *IAP RAS, Nizhny Novgorod*

- 12-1: Phase Measurements of a 140 GHz Confocal Gyro-Amplifier** (Page 101)  
Guy Rosenzweig, *Massachusetts Institute of Technology*  
Sudheer K. Jawla, *Massachusetts Institute of Technology*  
Julian F. Picard, *Massachusetts Institute of Technology*  
Michael A. Shapiro, *Massachusetts Institute of Technology*  
Richard J. Temkin, *Massachusetts Institute of Technology*
- 12-2: Upgrades of W-Band Gyro-TWA System for High-PRF Operation** (Page 103)  
Craig R. Donaldson, *University of Strathclyde*  
Liang Zhang, *University of Strathclyde*  
Adrian W. Cross, *University of Strathclyde*  
Colin G. Whyte, *University of Strathclyde*
- 12-3: Direct Coupled Gyrotrons for Plasma Heating** (Page 105)  
Lawrence Ives, *Calabazas Creek Research, Inc.*  
David Marsden, *Calabazas Creek Research, Inc.*  
George Collins, *Calabazas Creek Research, Inc.*  
Jeffrey Neilson, *Lexam Research*  
James Anderson, *General Atomics*  
Kurt Zeller, *General Atomics*
- 12-4: Design of TE<sub>01</sub> to HE<sub>11</sub> Mode Converter at 35GHz** (Page 107)  
Ling Gu, *Southwest Minzu University*  
Yinghui Liu, *University of Electronic Science and Technology of China*  
**Simulation of an Industrial Magnetron Using Cathode Modulation** (Page 111)  
Andong Yue, *Boise State University*
- 12-6:** Jim Browning, *Boise State University*  
Mike Worthington, *L3Harris Technologies*  
John Cipolla, *L3Harris Technologies*
- 

## Session 13: Klystron Frontiers

Chair: Takuji Kimura, *CPI Microwave Power Products Division*

- 13-1: Experimental Demonstration of a W-band Photonic Bandgap Klystron** (Page 113)  
Jacob Stephens, *Massachusetts Institute of Technology & Texas Tech University*  
Guy Rosenzweig, *Massachusetts Institute of Technology*  
John Tucek, *Northrop Grumman Systems Corp.*  
Ken Kreischer, *Northrop Grumman Systems Corp.*  
Michael Shapiro, *Massachusetts Institute of Technology*  
Richard Temkin, *Massachusetts Institute of Technology*
- 13-2: Experimental Demonstration of a W-Band Sheet Beam Klystron** (Page 115)  
Ding Zhao, *Chinese Academy of Sciences*  
Wei Gu, *Chinese Academy of Sciences*  
Qingsheng Li, *Chinese Academy of Sciences*  
Shuzhong Wang, *Chinese Academy of Sciences*  
Zhiqiang Zhang, *Chinese Academy of Sciences*
- 13-3: High-Efficiency, High Average Power, Multiple Beam Inductive Output Tubes** (Page 117)

Henry Freund, *Calabazas Creek Research, Inc.*  
Robert Lawrence Ives, *Calabazas Creek Research, Inc.*  
Thuc Bui, *Calabazas Creek Research, Inc.*  
Walter Sessions, *Georgia Tech Research Institute*

- 13-4: A 1.3 GHz 100 kW Ultra-high Efficiency Klystron** (Page 119)  
Michael Read, *Calabazas Creek Research Inc.*  
R. Lawrence Ives, *Calabazas Creek Research Inc.*  
Thomas Habermann, *Calabazas Creek Research Inc.*  
Thuc Bui, *Calabazas Creek Research Inc.*  
David Marsden, *Calabazas Creek Research Inc.*  
George Collins, *Calabazas Creek Research Inc.*  
Aaron Jensen, *Leidos*
- 13-5: Design Study of X-Band High Efficiency Klystrons for CLIC** (Page 121)  
Jinchi Cai, *Lancaster University & CERN*  
Igor Syrathev, *CERN*
- 13-6: A Multi-Beam Terahertz Coaxial Cavity Reflex Klystron** (Page 123)  
Hongyang Guo, *University of Electronic Science and Technology of China*  
Zhanliang Wang, *University of Electronic Science and Technology of China*  
Huarong Gong, *University of Electronic Science and Technology of China*  
Zhigang Lu, *University of Electronic Science and Technology of China*  
Zhaoyun Duan, *University of Electronic Science and Technology of China*  
Yubin Gong, *University of Electronic Science and Technology of China*  
Jinjun Feng, *Beijing Vacuum Electronics Research Institute*
- 

## Session 14: Space TWTs

Chair: Will Menninger, *L3Harris EDD*

- 14-1: NEC Network and Sensor Systems, Ltd. Q/V-band Helix TWT for Future High Throughput Satellite Uplink Applications** (Page 125)  
Naofumi Kosugi, *NEC Network and Sensor Systems, Ltd.*  
Daiki Matsumoto, *NEC Network and Sensor Systems, Ltd.*  
Tetsuo Machida, *NEC Network and Sensor Systems, Ltd.*  
Takatsugu Munehiro, *NEC Network and Sensor Systems, Ltd.*  
Yoshinori Mori, *NEC Network and Sensor Systems, Ltd.*  
Travis Stewart, *NEC Corporation of America*
- 14-4: NEC Network and Sensor Systems, Ltd. Development of the DBS Band 1250W peak, 750W CW, Helix TWT for Direct Broadcast Satellite Uplink** (Page 129)  
Taishi Masuda, *NEC Network and Sensor Systems, Ltd.*  
Daiki Matsumoto, *NEC Network and Sensor Systems, Ltd.*  
Tetsuo Machida, *NEC Network and Sensor Systems, Ltd.*  
Takatsugu Munehiro, *NEC Network and Sensor Systems, Ltd.*  
Yoshinori Mori, *NEC Network and Sensor Systems, Ltd.*  
Travis Stewart, *NEC Corporation of America*  
Kenji Nakajima, *NEC Network and Sensor Systems, Ltd.*
- 14-5: Design and Development of an X-Band Pulsed Helix TWT for Space Application** (Page 131)  
Talur Chanakya, *Microwave Tube Research and Development Centre*  
U. V. Chandramouli, *Microwave Tube Research and Development Centre*  
Subrata Kumar Datta, *Microwave Tube Research and Development Centre*  
S. Senthil Kumar, *Bharat Electronics Limited*
- 

## Session 15: Modeling: RF & Secondaries

Chair: John Petillo, *Leidos*

- 15-1: Density Functional Theory Calculations for the Simulation of Secondary Electron Yield** (Page 133)  
Ivana Matanovic, *University of New Mexico*  
Maciej P. Polak, *University of Wisconsin*  
Ryan S. Johnson, *University of New Mexico*  
Raul E. Gutierrez, *University of New Mexico*  
Dane Morgan, *University of Wisconsin*  
Edl Schamiloglu, *University of New Mexico*
- 15-2: Theoretical Modeling of Secondary Electron Yield Using First-Principles Input: Comparison with Experimental Measurements** (Page 135)  
Maciej Polak, *University of Wisconsin*  
Ivana Matanovic, *University of New Mexico*  
Ryan Johnson, *University of New Mexico*  
Raul E. Gutierrez, *University of New Mexico*  
Dane Morgan, *University of Wisconsin*
- 15-3: Modeling Stability of Vacuum Electronic Devices with the Large-Signal Code TESLA-Z** (Page 137)  
Igor A. Chernyavskiy, *Naval Research Laboratory*

Thomas M. Antonsen, *Leidos, Inc.*  
Alexander N. Vlasov, *Naval Research Laboratory*  
John C. Rodgers, *Naval Research Laboratory*  
Baruch Levush, *Naval Research Laboratory*

**15-5: Stopband and Coupling-Coefficient Estimation for Asymmetries in Helical Delay-Lines** (Page 139)

Moritz Hügermann, *Hamburg University of Technology*  
Philip Birtel, *Thales Deutschland GmbH*  
Arne F. Jacob, *Hamburg University of Technology*

**15-6: An Efficient Eigensolver for Extended Interaction Klystrons Based on Finite Element Method** (Page 141)

Li Xu, *University of Electronic Science and Technology of China*  
Hangxin Liu, *University of Electronic Science and Technology of China*  
Xing Li, *University of Electronic Science and Technology of China*  
Zhonghai Yang, *University of Electronic Science and Technology of China*  
Bin Li, *University of Electronic Science and Technology of China*

---

## Session 16: Components

Chair: Stefan Illy, *Karlsruhe Institute of Technology*

**16-1: Additive Manufacture of RF Loads for ITER** (Page 143)

Lawrence Ives, *Calabazas Creek Research, Inc.*  
Thuc Bui, *Calabazas Creek Research, Inc.*  
David Marsden, *Calabazas Creek Research, Inc.*  
George Collins, *Calabazas Creek Research, Inc.*  
Tim Horn, *North Carolina State University*  
Chris Ledford, *North Carolina State University*  
Jeff Neilson, *Lexam Research*

**16-3: A Vacuum Window Based on Metamaterial** (Page 145)

Jingxuan Shen, *Southeast University*  
Ningfeng Bai, *Southeast University*  
Changsheng Shen, *Southeast University*  
Xiaohan Sun, *Southeast University*  
Pan Pan, *Beijing Vacuum Electronics Institution*  
Jun Cai, *Beijing Vacuum Electronics Institution*  
Jinjun Feng, *Beijing Vacuum Electronics Institution*

**16-4: Research on Broadband High-Power Compact Oversized TE<sub>01</sub> Hexa-Polar Waveguide Bend** (Page 147)

Ding Li, *University of Electronic Science and Technology of China*  
Zewei Wu, *University of Electronic Science and Technology of China*  
Xiaoyi Liao, *University of Electronic Science and Technology of China*  
Yong Luo, *University of Electronic Science and Technology of China*

---

## Session 17: Microfabrication & THz II

Chair: Richard Kowalczyk

**17-1: Design and Test of Copper Printed RF Cavities** (Page 149)

Christopher Nantista, *SLAC National Accelerator Laboratory*  
Diana Gamzina, *SLAC National Accelerator Laboratory*  
Christopher Ledford, *North Carolina State University*  
Timothy Horn, *North Carolina State University*  
Paul Carriere, *Radiabeam Technologies*  
Pedro Frigola, *Radiabeam Technologies*

**17-2: Design of a 693 GHz Folded-Waveguide Traveling-Wave Tube Amplifier** (Page 151)

Mudit Pasagadagula, *Bridge12 Technologies, Inc.*  
Anshul Chandel, *Bridge12 Technologies, Inc.*  
Jagadishwar R. Sirigiri, *Bridge12 Technologies, Inc.*  
Yuan Zheng, *University of California, Davis*  
Neville C. Luhmann, Jr., *University of California, Davis*

**17-3: Design and Microfabrication of a Double Corrugated Waveguide for G-Band TWTs** (Page 153)

Rupa Basu, *Lancaster University*  
Laxma R. Billa, *Lancaster University*  
Jeevan M. Rao, *Lancaster University*  
Logan Himes, *University of California Davis*  
Yuan Zheng, *University of California Davis*  
Nicholas Renninson, *Lancaster University*  
Benjamin Rodgers, *Lancaster University*  
Rosa Letizia, *Lancaster University*  
Diana Gamzina, *SLAC National Accelerator Laboratory*  
Neville C. Luhmann, *University of California Davis*  
Claudio Paoloni, *Lancaster University*

- 17-4: Efficient Regime of Hybrid Surface-Radiating Waves in a THz Clinotron** (Page 155)  
Eduard Khutoryan, *O. Ya. Usikov Institute for Radiophysics and Electronics of NAS of Ukraine & University of Fukui*  
Sergey Ponomarenko, *O. Ya. Usikov Institute for Radiophysics and Electronics of NAS of Ukraine*  
Sergey Kishko, *O. Ya. Usikov Institute for Radiophysics and Electronics of NAS of Ukraine*  
Konstantin Lukin, *O. Ya. Usikov Institute for Radiophysics and Electronics of NAS of Ukraine*  
Yoshinori Tatematsu, *University of Fukui*  
Seitaro Mitsudo, *University of Fukui*  
Masahiko Tani, *University of Fukui*  
Alexei Kuleshov, *O. Ya. Usikov Institute for Radiophysics and Electronics of NAS of Ukraine & University of Fukui*
- 

## Session 18: Thermionic Cathodes

Chair: Max Mankin, *Modern Electron*

- 18-2: First-Principles Model of Miram Curve from Polycrystalline Tungsten Cathodes** (Page 157)  
Dongzheng Chen, *University of Wisconsin-Madison*  
Ryan Jacobs, *University of Wisconsin-Madison*  
Dane Morgan, *University of Wisconsin-Madison*  
John Booske, *University of Wisconsin-Madison*
- 18-3: Searching for Low Work Function Perovskite Oxides using Density Functional Theory** (Page 159)  
Tianyu Ma, *University of Wisconsin-Madison*  
Ryan Jacobs, *University of Wisconsin-Madison*  
Dane Morgan, *University of Wisconsin-Madison*  
John Booske, *University of Wisconsin-Madison*
- 18-4: Experimental Investigation of Bulk and Thin Film Perovskite SrVO<sub>3</sub> as a Thermionic Cathode Material** (Page 161)  
Lin Lin, *University of Wisconsin-Madison*  
Ryan Jacobs, *University of Wisconsin-Madison*  
Samuel D. Marks, *University of Wisconsin-Madison*  
Paul G. Evans, *University of Wisconsin-Madison*  
Dane Morgan, *University of Wisconsin-Madison*  
John Booske, *University of Wisconsin-Madison*
- 18-5: Long Lifetime Oxide Cathode for HIRFL-CSR Electron Cooler** (Page 163)  
Xiaoxia Wang, *Chinese Academy of Sciences*  
Shui Zhang, *Chinese Academy of Sciences*  
Xingqi Wang, *Chinese Academy of Sciences*  
Qinglan Zhao, *Chinese Academy of Sciences*  
Yun Li, *Chinese Academy of Sciences*
- 18-6: Self-Healing LaB<sub>6</sub> Emitters** (Page 165)  
Victor Katsap, *NuFlare Technology America, Inc*
- 

## Session 19: Modeling: TWTs

Chair: Filippo Capolino, *University of California, Irvine*

- 19-1: Adjoint Approach to Optimization and Sensitivity Analysis of Beam Wave Interaction in Vacuum Electronic Devices** (Page 167)  
Alexander N. Vlasov, *Naval Research Laboratory*  
Thomas M. Antonsen, Jr., *Leidos Inc.*  
David P. Chernin, *Leidos Inc.*  
Igor A. Chernyavskiy, *Naval Research Laboratory*
- 19-2: Progress with DIMOHA for Fast Time-Domain Simulations of Traveling-Wave Tubes** (Page 169)  
Frédéric André, *Thales AVS/MIS*  
Damien F. G. Minenna, *Thales AVS/MIS*  
Khalil Aliane, *Centre National d'Études Spatiales & Aix-Marseille Université & Thales AVS/MIS*  
Yves Elskens, *Aix-Marseille Université*  
Alexandre Poyé, *Aix-Marseille Université*  
Jérôme Puech, *Centre National d'Études Spatiales*  
Fabrice Doveil, *Aix-Marseille Université*
- 19-3: Stability Analysis of VE Amplifiers Based on Determinant Equations** (Page 171)  
Vadim Jabotinski, *Leidos*  
Thomas M. Antonsen, Jr., *Leidos*  
Alexander N. Vlasov, *Naval Research Laboratory*  
Igor A. Chernyavskiy, *Naval Research Laboratory*
- 19-4: Analysis of Power Holes in Helix Traveling-Wave Tubes with Non-Uniform Delay-Lines** (Page 173)  
Moritz Hägermann, *Hamburg University of Technology*  
Michael Wulff, *Hamburg University of Technology*  
Philip Birtel, *Thales Deutschland GmbH*  
Arne F. Jacob, *Hamburg University of Technology*

- 19-6: Design Method of Focusing Magnetic Field for Restraining Dynamic Defocusing of High Efficiency TWT** (Page 175)  
Jiahui Fan, *University of Electronic Science and Technology of China*  
Quan Hu, *University of Electronic Science and Technology of China*  
Yulu Hu, *University of Electronic Science and Technology of China*  
Xiaofang Zhu, *University of Electronic Science and Technology of China*  
Bin Li, *University of Electronic Science and Technology of China*  
Tao Huang, *University of Electronic Science and Technology of China*  
Xiaolin Jin, *University of Electronic Science and Technology of China*  
Li Xu, *University of Electronic Science and Technology of China*
- 

## Session 20: TWTs

Chair: Ziaoling Zhai, *L3Harris EDD*

- 20-1: A Large Bandwidth Double-layer Asymmetric Planar Microstrip Line Ka Band Traveling Wave Tube** (Page 177)  
Wenchen Xiang, *Southeast University*  
Ningfeng Bai, *Southeast University*  
Xiaohan Sun, *Southeast University*  
Pan Pan, *Beijing Vacuum Electronics Institution*  
Jun Cai, *Beijing Vacuum Electronics Institution*  
Jinjun Feng, *Beijing Vacuum Electronics Institution*  
Yang Xie, *Nanjing University of Science and Technology*  
Wei Hong, *Nanjing University of Science and Technology*
- 20-2: A Thermal Analysis Method for Dielectric Supported Ring-bar Meander Line Slow Wave Structure** (Page 179)  
Yang Dong, *University of Electronic Science and Technology of China*  
Hexin Wang, *University of Electronic Science and Technology of China*  
Zijun Chen, *University of Electronic Science and Technology of China*  
Zhanliang Wang, *University of Electronic Science and Technology of China*  
Zhigang Lu, *University of Electronic Science and Technology of China*  
Huarong Gong, *University of Electronic Science and Technology of China*  
Zhaoyun Duan, *University of Electronic Science and Technology of China*  
Yubin Gong, *University of Electronic Science and Technology of China*  
Shaomeng Wang, *Nanyang Technological University*
- 20-3: Collector Efficiency Enhancement in TWTs through Beam Refocussing Section** (Page 181)  
A. Mercy Latha, *CSIR — Central Electronics Engineering Research Institute*  
Vishant Gahlaut, *Banasthali University*  
S.K. Ghosh, *CSIR — Central Electronics Engineering Research Institute*
- 20-4: Design of Ka-Band High-Power TWT** (Page 183)  
Zhixin Yang, *University of Electronic Science and Technology of China*  
Qi Wang, *University of Electronic Science and Technology of China*  
Zugen Guo, *University of Electronic Science and Technology of China*  
Rujing Ji, *University of Electronic Science and Technology of China*  
Yubin Gong, *University of Electronic Science and Technology of China*  
Huarong Gong, *University of Electronic Science and Technology of China*
- 

## Session 21: Gyrotrons

Chair: Lawrence Ives, *Calabazas Creek Research*

- 21-1: Frequency Tuning and Spectrum Control in Sub-THz Gyrotrons** (Page 185)  
Mikhail Glyavin, *Institute of Applied Physics RAS*  
Gregory Denisov, *Institute of Applied Physics RAS*  
Alexey Fedotov, *Institute of Applied Physics RAS*  
Andrey Fokin, *Institute of Applied Physics RAS*  
Irina Zotova, *Institute of Applied Physics RAS*  
Alexander Bogdashov, *Institute of Applied Physics RAS*
- 21-3: Mechanical Design Study for Gyrotron ExB Drift Two-Stage Depressed Collector** (Page 187)  
Benjamin Ell, *Karlsruhe Institute of Technology (KIT)*  
Ioannis Gr. Pagonakis, *Karlsruhe Institute of Technology (KIT)*  
Chuanren Wu, *Karlsruhe Institute of Technology (KIT)*  
David Albert, *Karlsruhe Institute of Technology (KIT)*  
Gerd Gantenbein, *Karlsruhe Institute of Technology (KIT)*  
Stefan Illy, *Karlsruhe Institute of Technology (KIT)*  
Thorsten Kobarg, *Karlsruhe Institute of Technology (KIT)*  
Tomasz Rzesnicki, *Karlsruhe Institute of Technology (KIT)*  
Manfred Thumm, *Karlsruhe Institute of Technology (KIT)*  
John Jelonnek, *Karlsruhe Institute of Technology (KIT)*
- 21-4: Secondary Electron Simulations of a Gyrotron Collector with Magnetic Sweeping and Voltage Depression** (Page 189)  
Stephen Cauffman, *Communications & Power Industries*

- 21-6: An Improved Design for High-power Coaxial-cavity Gyrotron with Misaligned Insert** (Page 191)  
Shan Zhang, *Chinese Academy of Sciences & University of Chinese Academy of Sciences*  
Qianzhong Xue, *Chinese Academy of Sciences & University of Chinese Academy of Sciences*
- 

## Poster Session 1

### 1: TWT/Linear Beam

- P1-1: Design of a Source for GHz Ultra-Wide Bandwidth Applications Using the Two-Stream Instability** (Page 193)  
Derek Neben, *Los Alamos National Laboratory*  
Kip Bishofberger, *Los Alamos National Laboratory*  
Vitaly Pavlenko, *Los Alamos National Laboratory*  
Nikolai Yampolsky, *Los Alamos National Laboratory*
- P1-2: The Verification of the Expression of the Interaction Impedance and Ohmic Losses of the Nonuniform-Grating-Based Slow Wave Structure** (Page 195)  
Fengzhen Zhang, *Chinese Academy of Sciences & University of Chinese Academy of Sciences*  
Zhaochuan Zhang, *Chinese Academy of Sciences*  
Dongping Gao, *Chinese Academy of Sciences*  
Xiaoyan Wang, *Chinese Academy of Sciences & University of Chinese Academy of Sciences*
- P1-3: The Hot Dispersion Equation of the Backward Wave Oscillator with the Nonuniform Grating** (Page 197)  
Fengzhen Zhang, *Chinese Academy of Sciences & University of Chinese Academy of Sciences*  
Zhaochuan Zhang, *Chinese Academy of Sciences*  
Dongping Gao, *Chinese Academy of Sciences*  
Xiaoyan Wang, *Chinese Academy of Sciences & University of Chinese Academy of Sciences*
- P1-4: Analysis of High Frequency Characteristics for a Meander Line Slow-wave Structure** (Page 199)  
Zheng Wen, *Chinese Academy of Sciences & University of Chinese Academy of Sciences*  
Jirun Luo, *Chinese Academy of Sciences & University of Chinese Academy of Sciences*  
Yu Fan, *Chinese Academy of Sciences & University of Chinese Academy of Sciences*  
Chen Yang, *Chinese Academy of Sciences & University of Chinese Academy of Sciences*  
Fang Zhu, *University of Chinese Academy of Sciences*  
Min Zhu, *University of Chinese Academy of Sciences*  
Wei Guo, *University of Chinese Academy of Sciences*  
Yubin Gong, *University of Electronic Science and Technology of China*  
Jinjun Feng, *Beijing Vacuum Electronics Research Institute*
- P1-5: Design of Ridge-Loaded Slow-Wave System in Terahertz Band** (Page 201)  
Xiaohan Zhang, *Chinese Academy of Sciences & University of Chinese Academy of Sciences*  
Linlin Cao, *Chinese Academy of Sciences*  
Fei Li, *Chinese Academy of Sciences*  
Jun He, *Chinese Academy of Sciences*  
Mingguang Huang, *Chinese Academy of Sciences*
- P1-6: Research on Vacuum Test of Sealed TWT** (Page 203)  
Feng Zou, *Chinese Academic of Sciences & University of Chinese Academy of Sciences*  
Xin'ai Liu, *Chinese Academic of Sciences*  
Gang Wang, *Chinese Academic of Sciences & University of Chinese Academy of Sciences*  
Kangsong Tang, *Chinese Academic of Sciences*  
Fangfang Song, *Science and Technology on Reliability Physics and Application Technology of Electronic Component Laboratory*
- P1-8: Simulations of a Coaxial Multipactor Testbed** (Page 205)  
Rajani Budha, *University of New Mexico*  
Salvador Portillo, *University of New Mexico*  
Edl Schamiloglu, *University of New Mexico*
- P1-9: Application of Filter in TWT Energy Transmission Coupler** (Page 207)  
Lianbing Li, *University of Chinese Academy of Sciences & Chinese Academy of Sciences*  
Liu Xiao, *University of Chinese Academy of Sciences & Chinese Academy of Sciences*  
Hongxia Yi, *Chinese Academy of Sciences*  
Linlin Cao, *University of Chinese Academy of Sciences & Chinese Academy of Sciences*  
Shirui Miao, *University of Chinese Academy of Sciences & Chinese Academy of Sciences*
- P1-10: S Band Miniaturized Reversed Cherenkov Oscillator with Uniform Magnetic Focusing System** (Page 209)  
Hengyu Luo, *University of Electronic Science and Technology of China*  
Shengkun Jiang, *University of Electronic Science and Technology of China*  
Xin Wang, *University of Electronic Science and Technology of China*  
Tao Tang, *University of Electronic Science and Technology of China*  
Yubin Gong, *University of Electronic Science and Technology of China*  
Zhaoyun Duan, *University of Electronic Science and Technology of China*

- P1-11: Enhance the Efficiency of Sheet Beam TWT with Advanced Optimization Algorithm** (Page 211)  
Zeng Liu, *University of Electronic Science and Technology of China*  
Jianxun Wang, *University of Electronic Science and Technology of China*  
Yixin Wan, *University of Electronic Science and Technology of China*  
Qiang Liu, *University of Electronic Science and Technology of China*  
Yong Luo, *University of Electronic Science and Technology of China*
- P1-12: Effect of Noisy Input Signal and Electron Beam Velocity Nonuniform on Helix TWT Output Performance** (Page 213)  
Changsheng Shen, *Southeast University*  
Jin Zhang, *Southeast University*  
Hehong Fan, *Southeast University*  
Ningfeng Bai, *Southeast University*  
Xiaohan Sun, *Southeast University*
- P1-13: Simulation Design of TWT Based on CNT Cold Cathode** (Page 215)  
Yanan Liu, *University of Electronic Science and Technology of China*  
Xiaotao Xu, *University of Electronic Science and Technology of China*  
Xuesong Yuan, *University of Electronic Science and Technology of China*  
Rui Wang, *University of Electronic Science and Technology of China*  
Hailong Li, *University of Electronic Science and Technology of China*  
Bin Wang, *University of Electronic Science and Technology of China*  
Yong Yin, *University of Electronic Science and Technology of China*  
Lin Meng, *University of Electronic Science and Technology of China*  
Yang Yan, *University of Electronic Science and Technology of China*
- P1-14: Broad bandwidth Suspending Conformal Angular Meander Line Slow Wave Structure** (Page 217)  
Tenglong He, *University of Electronic Science and Technology of China*  
Duo Xu, *University of Electronic Science and Technology of China*  
Hexin Wang, *University of Electronic Science and Technology of China*  
Wei Shao, *University of Electronic Science and Technology of China*  
Zhanliang Wang, *University of Electronic Science and Technology of China*  
Zhigang Lu, *University of Electronic Science and Technology of China*  
Huarong Gong, *University of Electronic Science and Technology of China*  
Zhaoyun Duan, *University of Electronic Science and Technology of China*  
Yubin Gong, *University of Electronic Science and Technology of China*  
Jinjun Feng, *Beijing Vacuum Electronics Research Institute*
- P1-15: A Low-Voltage Backward Wave Oscillator Operating at THz Band** (Page 219)  
Wei Shao, *University of Electronic Science and Technology of China*  
Duo Xu, *University of Electronic Science and Technology of China*  
Zhanliang Wang, *University of Electronic Science and Technology of China*  
Huarong Gong, *University of Electronic Science and Technology of China*  
Tao Tang, *University of Electronic Science and Technology of China*  
Zhaoyun Duan, *University of Electronic Science and Technology of China*  
Zhigang Lu, *University of Electronic Science and Technology of China*  
Yanyu Wei, *University of Electronic Science and Technology of China*  
Yubin Gong, *University of Electronic Science and Technology of China*  
Jinjun Feng, *Beijing Vacuum Electronics Research Institute*
- P1-17: A Novel Feedback Circuit of Beam-Wave Interaction for THz Amplifier** (Page 221)  
Luanfeng Gao, *University of Electronic Science and Technology of China*  
Yulu Hu, *University of Electronic Science and Technology of China*  
Quan Hu, *University of Electronic Science and Technology of China*  
Xiaofang Zhu, *University of Electronic Science and Technology of China*  
Jianqing Li, *University of Electronic Science and Technology of China*  
Bin Li, *University of Electronic Science and Technology of China*  
Tao Huang, *University of Electronic Science and Technology of China*  
Wenkai Deng, *University of Electronic Science and Technology of China*  
Xiaobing Wang, *University of Electronic Science and Technology of China*
- P1-18: Thermal Impact on Metamaterial Absorber in Traveling-Wave Tube** (Page 223)  
Fuxian Zhong, *Southeast University*  
Ningfeng Bai, *Southeast University*  
Changsheng Shen, *Southeast University*  
Xiaohan Sun, *Southeast University*  
Pan Pan, *Beijing Vacuum Electronics Institution*  
Jun Cai, *Beijing Vacuum Electronics Institution*  
Jinjun Feng, *Beijing Vacuum Electronics Institution*
- P1-19: A 0.67-THz Sheet Electron-Beam TWT Based upon Sine Waveguide** (Page 225)  
Wuyang Fan, *University of Electronic Science and Technology of China*  
Shuanzhu Fang, *University of Electronic Science and Technology of China*  
Jin Xu, *University of Electronic Science and Technology of China*  
Lingna Yue, *University of Electronic Science and Technology of China*

Hairong Yin, *University of Electronic Science and Technology of China*  
Guoqing Zhao, *University of Electronic Science and Technology of China*  
Wenxiang Wang, *University of Electronic Science and Technology of China*  
Wenxin Liu, *Institute of Electronics, Chinese Academy of Science*  
Luwei Liu, *Anhui East China Photoelectric Technology Research Institute Co., Ltd*  
Dazhi Li, *Neubrex.Ltd*  
Yanyu Wei, *University of Electronic Science and Technology of China*

- P1-20: Development of an X-Band 600-W Pulsed Mini-TWT** (Page 227)  
Linlin Cao, *Chinese Academic of Sciences & University of Chinese Academy of Sciences*  
Liu Xiao, *Chinese Academic of Sciences & University of Chinese Academy of Sciences*  
Lianbing Li, *Chinese Academic of Sciences & University of Chinese Academy of Sciences*  
Xiaohan Zhang, *Chinese Academic of Sciences & University of Chinese Academy of Sciences*  
Xinwen Shang, *Chinese Academic of Sciences & University of Chinese Academy of Sciences*  
Yanwei Li, *Chinese Academic of Sciences & University of Chinese Academy of Sciences*  
Ning Li, *Chinese Academic of Sciences & University of Chinese Academy of Sciences*  
Mingguang Huang, *Chinese Academic of Sciences & University of Chinese Academy of Sciences*
- P1-21: PIC Simulation in the Reversed Magnetic Field of MW-DC Cyclotron Wave Converter** (Page 229)  
Maho Matsukura, *University of Tsukuba*  
Kohei Shimamura, *University of Tsukuba*  
Shigeru Yokota, *University of Tsukuba*  
Masafumi Fukunari, *University of Fukui*  
Yoshinori Tatematsu, *University of Fukui*
- P1-22: W-Band Multi-Beam Sine Waveguide Traveling-Wave Tube with Low Current Density** (Page 231)  
Shuanzhu Fang, *University of Electronic Science and Technology of China*  
Jin Xu, *University of Electronic Science and Technology of China*  
Xia Lei, *University of Electronic Science and Technology of China*  
Gangxiong Wu, *University of Electronic Science and Technology of China*  
Ruichao Yang, *University of Electronic Science and Technology of China*  
Pengcheng Yin, *University of Electronic Science and Technology of China*  
Hairong Yin, *University of Electronic Science and Technology of China*  
Lingna Yue, *University of Electronic Science and Technology of China*  
Guoqing Zhao, *University of Electronic Science and Technology of China*  
Wei Yang, *University of Electronic Science and Technology of China*  
Zhigang Lu, *University of Electronic Science and Technology of China*  
Yubin Gong, *University of Electronic Science and Technology of China*  
Wenxiang Wang, *University of Electronic Science and Technology of China*  
Yanyu Wei, *University of Electronic Science and Technology of China*
- P1-23: A New Type of 0.34-THz Sine Waveguide Slow-Wave Structure** (Page 233)  
Xueheng Zhang, *University of Electronic Science and Technology of China*  
Jin Xu, *University of Electronic Science and Technology of China*  
Shuanzhu Fang, *University of Electronic Science and Technology of China*  
Xuebing Jiang, *University of Electronic Science and Technology of China*  
Pengcheng Yin, *University of Electronic Science and Technology of China*  
Jingjing Luo, *University of Electronic Science and Technology of China*  
Yijun Hu, *University of Electronic Science and Technology of China*  
Xiuling Ge, *University of Electronic Science and Technology of China*  
Hairong Yin, *University of Electronic Science and Technology of China*  
Lingna Yue, *University of Electronic Science and Technology of China*  
Guoqing Zhao, *University of Electronic Science and Technology of China*  
W. Yang, *University of Electronic Science and Technology of China*  
W. X. Wang, *University of Electronic Science and Technology of China*  
Y. B. Gong, *University of Electronic Science and Technology of China*  
W. X. Liu, *Chinese Academy of Science*  
D. Z. Li, *Neubrex.Ltd.*  
Y. Y. Wei, *University of Electronic Science and Technology of China*
- P1-24: Analytical Analysis of Saturation Output Power for Traveling-Wave Tube** (Page 235)  
Zhang Shen, *University of Electronic Science and Technology of China*  
Hairong Yin, *University of Electronic Science and Technology of China*  
ShiRong Wang, *University of Electronic Science and Technology of China*  
DongDong Jia, *University of Electronic Science and Technology of China*  
Jun Cheng, *University of Electronic Science and Technology of China*  
Yue Zhao, *University of Electronic Science and Technology of China*  
Jin Xu, *University of Electronic Science and Technology of China*  
Lingna Yue, *University of Electronic Science and Technology of China*  
Guoqing Zhao, *University of Electronic Science and Technology of China*  
WenXiang Wang, *University of Electronic Science and Technology of China*  
L.W. Liu, *Anhui East China Photoelectric Technology Research Institute Co., Ltd*  
Y.Y Wei, *University of Electronic Science and Technology of China*
- P1-25: Joint Simulation of Electron Optical System and Beam-wave Interaction of V Band Folded**



### Waveguide TWT (Page 237)

Xiuling Ge, *University of Electronic Science and Technology of China*  
Jin Xu, *University of Electronic Science and Technology of China*  
Lingna Yue, *University of Electronic Science and Technology of China*  
Hairong Yin, *University of Electronic Science and Technology of China*  
Guoqing Zhao, *University of Electronic Science and Technology of China*  
Wenxiang Wang, *University of Electronic Science and Technology of China*  
Z.G Lu, *University of Electronic Science and Technology of China*  
T. Tao, *University of Electronic Science and Technology of China*  
H.R. Gong, *University of Electronic Science and Technology of China*  
Y.B Gong, *University of Electronic Science and Technology of China*  
Yanyu Wei, *University of Electronic Science and Technology of China*

### P1-27: Study of a Ka-Band Helix TWT with Semi-Metallic Rod (Page 239)

Xiaoxia Hu, *University of Electronic Science and Technology of China*  
Lingna Yue, *University of Electronic Science and Technology of China*  
Kai Chen, *University of Electronic Science and Technology of China*  
Shirong Wang, *University of Electronic Science and Technology of China*  
Maosong Gou, *University of Electronic Science and Technology of China*  
Guoqing Zhao, *University of Electronic Science and Technology of China*  
Jin Xu, *University of Electronic Science and Technology of China*  
Baorong Qiu, *Chengdu Guoguang Electric Co., Ltd.*  
Li Huang, *Chengdu Guoguang Electric Co., Ltd.*  
Wenxiang Wang, *University of Electronic Science and Technology of China*  
Hairong Yin, *University of Electronic Science and Technology of China*  
Wei Yang, *University of Electronic Science and Technology of China*  
Yanyu Wei, *University of Electronic Science and Technology of China*

### P1-28: Design and Cold Test of a Ka-band Fan-Shaped Metal Loaded Helix Traveling Wave Tube (Page 241)

Yixin Li, *University of Electronic Science and Technology of China*  
Lingna Yue, *University of Electronic Science and Technology of China*  
Baorong Qiu, *Guoguang Electric Co., Ltd.*  
Huaying Gao, *Guoguang Electric Co., Ltd.*  
Shirong Wang, *University of Electronic Science and Technology of China*  
Guoqing Zhao, *University of Electronic Science and Technology of China*  
Jin Xu, *University of Electronic Science and Technology of China*  
Hairong Yin, *University of Electronic Science and Technology of China*  
Zhaoyun Duan, *University of Electronic Science and Technology of China*  
Mingzhi Huang, *University of Electronic Science and Technology of China*  
Yubin Gong, *University of Electronic Science and Technology of China*  
Wenxiang Wang, *University of Electronic Science and Technology of China*  
Yanyu Wei, *University of Electronic Science and Technology of China*

---

## 2: Components Posters

### P2-3: Design of 94GHz TE<sub>11</sub>-HE<sub>11</sub> Mode Converter (Page 247)

Wei Zhang, *University of Electronic Science and Technology of China*  
Qian Wang, *University of Electronic Science and Technology of China*  
Xinjian Niu, *University of Electronic Science and Technology of China*

### P2-5: An Innovative Metal/Insulator/Metal Structure for Application of Damping Oscillator within One-Selector-One-Resistance (Page 249)

Chih-Yang Lin, *National Sun Yat-Sen University*  
Po-Hsun Chen, *Chinese Naval Academy*

### P2-7: Dynamics Analysis of Particles in Coaxial Lines Loaded Ceramic window (Page 251)

Yao Long, *Chinese Academy & University of Chinese Academy of Sciences*  
Zhang Rui, *Chinese Academy*  
Wang Yong, *Chinese Academy & University of Chinese Academy of Sciences*  
Zhang Xue, *Xiang tan University*

### P2-8: Compact Oversized TE<sub>01</sub>-to-TE<sub>11</sub> Mode Converter Based on Deformed Waveguide (Page 253)

Zewei Wu, *University of Electronic Science and Technology of China*  
Xiaoyi Liao, *University of Electronic Science and Technology of China*  
Minxing Wang, *University of Electronic Science and Technology of China*  
Ding Li, *University of Electronic Science and Technology of China*  
Jianxun Wang, *University of Electronic Science and Technology of China*  
Yong Luo, *University of Electronic Science and Technology of China*

---

## 3: Gyrotrons Poster

### P3-2: Design on a 100-kW-level Gyrotron Operating at 30 GHz (Page 255)

Yanyan Zhang, *Science and Technology on Electronic information Control Laboratory*  
Qiao Liu, *University of Electronic Science and Technology of China*

Rutai Chen, *University of Electronic Science and Technology of China*  
Lina Wang, *University of Electronic Science and Technology of China*  
Zhipeng Wang, *University of Electronic Science and Technology of China*

**P3-3: Electron Beam Defocusing for the Collector of W-band Large Power Gyrotron** (Page 257)

Guo Guo, *University of Electronic Science and Technology of China*  
Jianwei Liu, *University of Electronic Science and Technology of China*  
Xinjian Niu, *University of Electronic Science and Technology of China*  
Yinghui Liu, *University of Electronic Science and Technology of China*  
Hui Wang, *University of Electronic Science and Technology of China*

**P3-4: Simulation of Transverse Field Sweeping System with Different Modulation Waves for MW-Class Gyrotron** (Page 259)

Kai Wang, *Chinese Academy of Sciences & University of Chinese Academy of Sciences*  
Qianzhong Xue, *Chinese Academy of Sciences & University of Chinese Academy of Sciences*

**P3-5: Design and Study of W-band Gyrotron with Output Power of 150 kW Level** (Page 261)

Yujie Zhang, *University of Electronic Science and Technology*  
Qiao Liu, *University of Electronic Science and Technology*  
Yinghui Liu, *University of Electronic Science and Technology of China*  
Xinjian Niu, *University of Electronic Science and Technology*  
Jianwei Liu, *University of Electronic Science and Technology*

**P3-6: Investigation on a 170 GHz/230 GHz Dual Mode Megawatt-class Gyrotron For CFETR** (Page 263)

Qiao Liu, *University of Electronic Science and Technology of China*  
Xinjian Niu, *University of Electronic Science and Technology of China*  
Yinghui Liu, *University of Electronic Science and Technology of China*  
Jianwei Liu, *University of Electronic Science and Technology of China*  
Lina Wang, *University of Electronic Science and Technology of China*  
Jie Qing, *University of Electronic Science and Technology of China*

**P3-7: Design and Simulation of a 140GHz Gyro-TW with Dielectric Loaded Waveguide** (Page 265)

Rutai Chen, *University of Electronic Science and Technology of China*  
Sheng Yu, *University of Electronic Science and Technology of China*  
Zhipeng Wang, *University of Electronic Science and Technology of China*  
Tianzhong Zhang, *University of Electronic Science and Technology of China*  
Weihua Ge, *University of Electronic Science and Technology of China*

**P3-8: A Study on Instabilities of 220 GHz Confocal Waveguide Gyro-TWT** (Page 267)

Jie Yang, *Chinese Academy & University of Chinese Academy of Sciences*  
Shouxi Xu, *Chinese Academy*  
Yong Wang, *Chinese Academy & University of Chinese Academy of Sciences*  
Xiaoyan Wang, *Chinese Academy & University of Chinese Academy of Sciences*  
Lianzheng Zhang, *Chinese Academy*

**P3-9: Simulation of a 0.33-THz Second Harmonic Gyrotron Based on Double Confocal Cavity** (Page 269)

Xiaotong Guan, *University of Electronic Science and Technology of China*  
Wenjie Fu, *University of Electronic Science and Technology of China*  
Jiayi Zhang, *University of Electronic Science and Technology of China*  
Dun Lu, *University of Electronic Science and Technology of China*  
Xiaolei Zheng, *University of Electronic Science and Technology of China*  
Yang Yan, *University of Electronic Science and Technology of China*

**P3-12: Formation of Electron Flows for Diagnostic Gyrotrons by Electron-Optical Systems with Multi-Tip Field Emitters** (Page 271)

Gennadii Sominskii, *Peter the Great St.Petersburg Polytechnic University*  
Evgeny Taradaev, *Peter the Great St.Petersburg Polytechnic University*  
Vladimir Manuilov, *Institute of Applied Physics RAS*  
Mikhail Glyavin, *Institute of Applied Physics RAS*

**P3-13: Some Advantages of the Gyrotrons with Width Emitters** (Page 273)

Mikhail Proyavin, *Institute of Applied Physics RAS*  
Gregory Nusinovich, *University of Maryland*  
Olgiert Dumbrajs, *University of Latvia*  
Mikhail Glyavin, *Institute of Applied Physics RAS*

**P3-14: Design of Coaxial Resonator in  $TE_{28,8}$  Mode Generator** (Page 275)

Shuang Chen, *University of Electronic Science and Technology of China*  
Yinghui Liu, *University of Electronic Science and Technology of China*  
Jianwei Liu, *University of Electronic Science and Technology of China*  
Lina Wang, *University of Electronic Science and Technology of China*  
Xinjian Niu, *University of Electronic Science and Technology of China*  
Liwei Wang, *Beijing Jiaotong University*

**P3-15: Study on Beam Phase Correcting for Gyrotron Quasi-optical Mode Converter** (Page 277)

Guohui Zhao, *Taishan University*  
Yong Wang, *Chinese Academy & University of Chinese Academy of Sciences*  
Qianzhong Xue, *Chinese Academy & University of Chinese Academy of Sciences*

**P3-16: Study on Beam-Shaping Mirrors Based on Gaussian Beam Propagation Theory** (Page 279)

Guohui Zhao, *Taishan University*  
Yong Wang, *Chinese Academy & University of Chinese Academy of Sciences*  
Qianzhong Xue, *Chinese Academy & University of Chinese Academy of Sciences*

**P3-17: Design Studies of Quasi-Optical Mode Converter for 105 GHz High-Power Gyrotron** (Page 281)

Debasish Mondal, *Indian Institute of Technology Roorkee*  
S. Yuvaraj, *National Institute of Technology Andhra Pradesh*  
S. Adya, *Indian Institute of Technology Roorkee*  
A. S. Thakur, *Indian Institute of Technology Roorkee*  
M.V. Kartikeyan, *Indian Institute of Technology Roorkee*

**P3-18: Effect of the Position Variation of the Launcher Cut on the Conversion Efficiency of the Gaussian Beam in a Denisov-type Mode Converter** (Page 283)

Chen Yang, *Chinese Academy of Sciences & University of Chinese Academy of Sciences*  
Wenqi Li, *Chinese Academy of Sciences & University of Chinese Academy of Sciences*  
Zhiqiang Zhang, *Chinese Academy of Sciences & University of Chinese Academy of Sciences*  
ZhiXian Li, *Chinese Academy of Sciences & University of Chinese Academy of Sciences*  
Menglong Jiao, *Chinese Academy of Sciences & University of Chinese Academy of Sciences*  
Min Zhu, *Chinese Academy of Sciences*  
Wei Guo, *Chinese Academy of Sciences*  
Jirun Luo, *Chinese Academy of Sciences & University of Chinese Academy of Sciences*

**P3-19: Design of Mode Converter Based on Genetic Algorithm** (Page 285)

Qian Wang, *University of Electronic Science and Technology of China*  
Yinghui Liu, *University of Electronic Science and Technology of China*  
Jianwei Liu, *University of Electronic Science and Technology of China*  
Lina Wang, *University of Electronic Science and Technology of China*

**P3-23: Stabilization of Phase and Frequency of an S-Band Magnetron by Injection Locking** (Page 287)

Seong-Tae Han, *Korea Electrotechnology Research Institute & University of Science and Technology*  
Dokyun Kim, *Korea Electrotechnology Research Institute & University of Science and Technology*  
Jong-Soo Kim, *Korea Electrotechnology Research Institute*  
Jong-Ryul Yang, *Yeungnam University*

---

## Poster Session 2

### 4: Klystrons - Poster

**P4-1: Design of a doublegap Hughes-type coupled cavity for a K-band Extended Interaction Klystron** (Page 289)

Vincenzo A. Zito, *University of Palermo*  
Antonino Muratore, *University of Palermo*  
Patrizia Livreri, *University of Palermo*

**P4-2: Radial Multigap Resonant Cavity for W-Band High Power EIK** (Page 291)

Shaomeng Wang, *Nanyang Technological University*  
Yuanjin Zheng, *Nanyang Technological University*  
Sheel Aditya, *Nanyang Technological University*

**P4-3: Research on the Competition Mode Suppression in Coaxial Extended Interaction Structure** (Page 293)

Zhang Xu, *Chinese Academy & University of Chinese Academy of Sciences*  
Zhang Rui, *Chinese Academy & University of Chinese Academy of Sciences*  
Wang Yong, *Chinese Academy & University of Chinese Academy of Sciences*

**P4-4: Characteristics of Electric Field Distribution in a G-band Overmoded Extended Interaction Oscillator** (Page 295)

Che Xu, *University of Electronic Science and Technology of China*  
Lin Meng, *University of Electronic Science and Technology of China*  
Liangjie Bi, *University of Electronic Science and Technology of China*  
Zhiwei Chang, *University of Electronic Science and Technology of China*  
Bin Wang, *University of Electronic Science and Technology of China*  
Hailong Li, *University of Electronic Science and Technology of China*  
Yong Yin, *University of Electronic Science and Technology of China*

**P4-5: Analysis on Resonant Cavities of 231GHz EIA with Trapezoid Subwavelength Holes** (Page 297)

Yu Ji, *University of Electronic Science and Technology of China*  
Zongjun Shi, *University of Electronic Science and Technology of China*  
Ziqiang Yang, *University of Electronic Science and Technology of China*  
Feng Lan, *University of Electronic Science and Technology of China*

**P4-7: Design of X-Band 20-MW Klystron** (Page 299)

Toshiro Anno, *Canon Electron Tubes & Devices Co., Ltd.*  
Yoshihisa Okubo, *Canon Electron Tubes & Devices Co., Ltd.*

**P4-8: Numerical Simulation of Electron Bunching Characteristics of Inductive Output Tube** (Page 301)

Zhi-Hui Geng, *Chinese Academy of Sciences*  
Rui Zhang, *Chinese Academy of Sciences*  
Xiu-Dong Yang, *Chinese Academy of Sciences*  
Yun-Feng Liao, *Chinese Academy of Sciences*

## 5: High Power Microwaves

- P5-1: Development of Composites for Nonlinear Transmission Lines** (Page 303)  
Travis D. Crawford, *Purdue University*  
Andrew J. Fairbanks, *Purdue University*  
Xiaojun Zhu, *Purdue University*  
Julio A. Hernandez, *Purdue University*  
Tyler N. Tallman, *Purdue University*  
Allen L. Garner, *Purdue University*
- P5-2: Predicting Effective Dielectric Properties of Composites for Nonlinear Transmission Lines Using Effective Medium Theories and CST Microwave Studios** (Page 305)  
Xiaojun Zhu, *Purdue University*  
Andrew J. Fairbanks, *Purdue University*  
Travis D. Crawford, *Purdue University*  
Allen L. Garner, *Purdue University*
- P5-3: Compact and High-efficiency Metamaterial Extended Interaction Oscillator** (Page 307)  
Xin Wang, *University of Electronic Science and Technology of China*  
Hengyu Luo, *University of Electronic Science and Technology of China*  
Xuanming Zhang, *University of Electronic Science and Technology of China*  
Tao Tang, *University of Electronic Science and Technology of China*  
Zhanliang Wang, *University of Electronic Science and Technology of China*  
Huarong Gong, *University of Electronic Science and Technology of China*  
Yubin Gong, *University of Electronic Science and Technology of China*  
Baidyanath Basu, *Supreme Knowledge Foundation Group of Institutions*  
Zhaoyun Duan, *University of Electronic Science and Technology of China*
- P5-4: High Power Microwave Measurement Techniques at CEA-Gramat** (Page 309)  
Antoine Chauloux, *CEA-Gramat*  
Jean-Christophe Diot, *CEA-Gramat*  
Nicolas Ribière Tharaud, *CEA-Gramat*  
Jérémy Pothée, *CEA-Gramat*
- P5-7: Design Analysis of a Tunable Tapered Metallic Baffle  $TM_{01}$  to  $TE_{11}$  HPM Mode Converter** (Page 311)  
Vikram Kumar, *Sri Venkateswara College of Engineering & Technology*  
Pradip K. Jain, *National Institute of Technology Patna & IIT (BHU) Varanasi*
- P5-8: Power Capabilities of Vircators: A Comparison between Simulations, Experiments, and Theory** (Page 313)  
Ernesto Neira, *Technology and Innovation Institute*  
Felix Vega, *Technology and Innovation Institute*  
Chaouki Kasmi, *Technology and Innovation Institute*  
Fahad AlYafei, *Technology and Innovation Institute*
- P5-10: Power and Efficiency Enhancement of the Reltron Using Dual RF Output Cavities** (Page 315)  
Garima Dubey, *National Institute of Technology Patna*  
Manpura Mahto, *National Institute of Technology Patna*  
P. K. Jain, *National Institute of Technology Patna*
- P5-11: Design of the Quasi-Optical Transmission Line for Millimeter Wave Deep Drilling** (Page 317)  
Lina Wang, *University of Electronic Science and Technology of China*  
Xinjian Niu, *University of Electronic Science and Technology of China*  
Jianwei Liu, *University of Electronic Science and Technology of China*  
Qiao Liu, *University of Electronic Science and Technology of China*  
Shuang Chen, *University of Electronic Science and Technology of China*  
Liwei Wang, *Beijing Jiaotong University*
- 

## 6: Microfab/THz

- P6-2: Metal-Graphene Metamaterial for Wide Band Absorber** (Page 319)  
Renbin Zhong, *University of Electronic Science and Technology of China*  
Yan Liu, *University of Electronic Science and Technology of China*  
Yiqing Wang, *University of Electronic Science and Technology of China*  
Long Yang, *University of Electronic Science and Technology of China*  
Anchen Ma, *University of Electronic Science and Technology of China*  
Shenggang Liu, *University of Electronic Science and Technology of China*
- P6-3: T-shape Vane Slow-wave Structure for 220 GHz Sheet Beam Traveling-wave Tubes** (Page 321)  
Yiliang Xu, *University of Electronic Science and Technology of China*  
Shengkun Jiang, *University of Electronic Science and Technology of China*  
Merdan Wulam, *University of Electronic Science and Technology of China*  
Xin Wang, *University of Electronic Science and Technology of China*  
Zhanliang Wang, *University of Electronic Science and Technology of China*

Yubin Gong, *University of Electronic Science and Technology of China*  
Zhaoyun Duan, *University of Electronic Science and Technology of China*

**P6-4: A Three-stage Depressed Collector for 220 GHz Sheet Beam Traveling-wave Tubes** (Page 323)

Merdan Wulam, *University of Electronic Science and Technology of China*  
Shengkun Jiang, *University of Electronic Science and Technology of China*  
Yiliang Xu, *University of Electronic Science and Technology of China*  
Huarong Gong, *University of Electronic Science and Technology of China*  
Yubin Gong, *University of Electronic Science and Technology of China*  
Zhaoyun Duan, *University of Electronic Science and Technology of China*

**P6-6: Studies on Millimeter-band Low-Voltage Traveling-Wave Tubes with Planar Meander-Line**

**Slow-Wave Structures** (Page 325)

Andrei Starodubov, *Saratov State University*  
Anton Pavlov, *Saratov State University*  
Viktor Galushka, *Saratov State University*  
Alexey Serdobintsev, *Saratov State University*  
Ilya Kozhevnikov, *Saratov State University*  
Dmitry Bessonov, *Saratov State Technical University*  
Roman Torgashov, *Institute of Radio Engineering and Electronics RAS*  
Andrey Rozhnev, *Institute of Radio Engineering and Electronics RAS*  
Nikita Ryskin, *Institute of Radio Engineering and Electronics RAS*  
Sergei Molchanov, *Central Institute of Measurement Equipment*  
Igor Bakhteev, *Central Institute of Measurement Equipment*  
Giacomo Ulisse, *Goethe University Frankfurt*  
Viktor Krozer, *Goethe University Frankfurt*

**P6-7: Concept and Design of the Terahertz Vacuum Electronic Amplifier Integrated on a Chip** (Page 327)

Kaiwen Zhou, *University of Electronic Science and Technology of China*  
Bangrui Zhu, *University of Electronic Science and Technology of China*  
Weijie Wang, *University of Electronic Science and Technology of China*  
Yue Wang, *University of Electronic Science and Technology of China*  
Ding Li, *University of Electronic Science and Technology of China*  
Guo Liu, *University of Electronic Science and Technology of China*  
Jianxun Wang, *University of Electronic Science and Technology of China*  
Guoxiang Shu, *Shenzhen University*  
Yong Luo, *University of Electronic Science and Technology of China*

**P6-8: Design of G-band Folded Waveguide Traveling-wave Tube** (Page 329)

Ping Han, *University of Electronic Science and Technology of China*  
Zugen Guo, *University of Electronic Science and Technology of China*  
Zhixin Yang, *University of Electronic Science and Technology of China*  
Rujing Ji, *University of Electronic Science and Technology of China*  
Ruifeng Zhang, *University of Electronic Science and Technology of China*  
Huarong Gong, *University of Electronic Science and Technology of China*

**P6-9: The Smith-Purcell Radiation in the Grating-well Structure** (Page 331)

Ping Zhang, *University of Electronic Science and Technology of China*  
Yilin Pan, *University of Electronic Science and Technology of China*  
Xiaosong Wang, *University of Electronic Science and Technology of China*  
Lang Wang, *University of Electronic Science and Technology of China*  
Amir Aimidula, *Xinjiang University*  
Mingchun Tang, *Chongqing University*  
Yaxin Zhang, *University of Electronic Science and Technology of China*  
Lin Meng, *University of Electronic Science and Technology of China*

**P6-10: Research on New Grating Structure Based on 340GHz Super Smith-purcell Radiation** (Page 333)

Guanyi Zhang, *University of Electronic Science and Technology of China*  
Zhenhua Wu, *University of Electronic Science and Technology of China*  
Jian Zhang, *University of Electronic Science and Technology of China*  
Min Hu, *University of Electronic Science and Technology of China*  
Renbin Zhong, *University of Electronic Science and Technology of China*  
Shenggang Liu, *University of Electronic Science and Technology of China*

**P6-13: The Radiation of Two Dimension Dipole Oscillations in Subwavelength Hole Array** (Page 335)

Xiaosong Wang, *University of Electronic Science and Technology of China*  
Ping Zhang, *University of Electronic Science and Technology of China*  
Deqiang Zhao, *University of Electronic Science and Technology of China*  
Yilin Pan, *University of Electronic Science and Technology of China*  
Liangjie Bi, *University of Electronic Science and Technology of China*  
Yin Yong, *University of Electronic Science and Technology of China*  
Bin Wang, *University of Electronic Science and Technology of China*  
Hailong Li, *University of Electronic Science and Technology of China*  
Xuesong Yuan, *University of Electronic Science and Technology of China*  
Lin Meng, *University of Electronic Science and Technology of China*

- P6-14: 1 THz Trapezoidal Staggered Grating Traveling Wave Tube** (Page 337)  
Ruichao Yang, *University of Electronic Science & Technology of China*  
Jin Xu, *University of Electronic Science & Technology of China*  
Pengcheng Yin, *University of Electronic Science & Technology of China*  
Shuanzhu Fang, *University of Electronic Science & Technology of China*  
Gangxiong Wu, *University of Electronic Science & Technology of China*  
Xia Lei, *University of Electronic Science & Technology of China*  
Qian Li, *University of Electronic Science & Technology of China*  
Xuebin Jiang, *University of Electronic Science & Technology of China*  
Jinjing Luo, *University of Electronic Science & Technology of China*  
Lingna Yue, *University of Electronic Science & Technology of China*  
Hairong Yin, *University of Electronic Science & Technology of China*  
Guoqing Zhao, *University of Electronic Science & Technology of China*  
Wei Yang, *University of Electronic Science & Technology of China*  
Wenxiang Wang, *University of Electronic Science & Technology of China*  
Tianjun Ma, *Chinese Academy of Science*  
WenXin Liu, *Chinese Academy of Science*  
Yanyu Wei, *University of Electronic Science & Technology of China*
- 

## Poster Session 3

### 7: Modeling

- P7-1: Design and Modeling of a Microwave Plasma Enhanced Chemical Vapor Deposition System at 2.45 GHz** (Page 339)  
Yilang Jiang, *Hanyang University*  
Kaviya Aranganadin, *Hanyang University*  
Hua-Yi Hsu, *National Taipei University of Technology*  
Ming-Chieh Lin, *Hanyang University*
- P7-2: Thermal and Structural Analysis of Multi-stage Depressed Collector for G-band Traveling Wave Tubes** (Page 341)  
Yue Ou, *Chinese Academy of Sciences & University of Chinese Academy of Science*  
WenXin Liu, *Chinese Academy of Sciences & University of Chinese Academy of Science*  
LongLong Yang, *Chinese Academy of Sciences & University of Chinese Academy of Science*  
Zhengyuan Zhao, *Chinese Academy of Sciences & University of Chinese Academy of Science*
- P7-3: A Simulation Method to Determine the Assembly Distance between Cathode and Heater of Electron Gun** (Page 343)  
Jingyuan Che, *University of Electronic Science and Technology of China*  
Xiaofang Zhu, *University of Electronic Science and Technology of China*  
Yulu Hu, *University of Electronic Science and Technology of China*  
Quan Hu, *University of Electronic Science and Technology of China*  
Bin Li, *University of Electronic Science and Technology of China*  
Tao Huang, *University of Electronic Science and Technology of China*  
Xiaolin Jin, *University of Electronic Science and Technology of China*  
Li Xu, *University of Electronic Science and Technology of China*
- P7-4: A Steady-State Theoretical Model Applicable to Solving Klystron Beam-Wave Interaction** (Page 345)  
Guang Luo, *University of Electronic Science and Technology of China*  
Yulu Hu, *University of Electronic Science and Technology of China*  
Xiaofang Zhu, *University of Electronic Science and Technology of China*  
Quan Hu, *University of Electronic Science and Technology of China*  
Tao Huang, *University of Electronic Science and Technology of China*  
Bin Li, *University of Electronic Science and Technology of China*  
Li Xu, *University of Electronic Science and Technology of China*  
Xiaolin Jin, *University of Electronic Science and Technology of China*
- P7-5: Prototyping a Broadband Waveguide Circulator Centered at 2.45 GHz Using 3D Printing** (Page 347)  
Shijun Mi, *Hanyang University*  
Kaviya Aranganadin, *Hanyang University*  
Hua-Yi Hsu, *National Taipei University of Technology*  
Ming-Chieh Lin, *Hanyang University*
- P7-6: Self-Consistent Modeling of Waveguide Circulator under Realistic Magnetic Field for Industrial Applications** (Page 349)  
Kaviya Aranganadin, *Hanyang University*  
Hua-Yi Hsu, *National Taipei University of Technology*  
Ming-Chieh Lin, *Hanyang University*
- P7-7: Simulation and Design of 1THz Backward Wave Oscillator** (Page 351)  
Peipeng Wang, *University of Electronic Science and Technology of China*  
Zhenhua Wu, *University of Electronic Science and Technology of China*  
Min Hu, *University of Electronic Science and Technology of China*  
Jian Zhang, *University of Electronic Science and Technology of China*

Gaunyi Zhang, *University of Electronic Science and Technology of China*  
Shenggang Liu, *University of Electronic Science and Technology of China*

**P7-8: Particle-In-Cell Simulations of Beam-wave Interaction for Sub-Terahertz Folded Waveguide**

**Traveling Wave Tubes** (Page 353)

Zhengyuan Zhao, *Chinese Academy of Sciences & University of Chinese Academy of Science*  
WenXin Liu, *Chinese Academy of Sciences & University of Chinese Academy of Science*  
LongLong Yang, *Chinese Academy of Sciences & University of Chinese Academy of Science*  
Yue Ou, *Chinese Academy of Sciences & University of Chinese Academy of Science*

**P7-9: Research on Internal Temperature Prediction of Slow Wave Structure Based on Experimental**

**Data** (Page 355)

Xingqun Zhao, *Southeast University*  
Xiaoting Ying, *Southeast University*  
Xiaohan Sun, *Southeast University*

**P7-10: Simulation Exploration of Assembly Process and Key Parameters of TWT** (Page 357)

Xiaofang Zhu, *University of Electronic Science and Technology of China*  
Jingyuan Che, *University of Electronic Science and Technology of China*  
Yulu Hu, *University of Electronic Science and Technology of China*  
Quan Hu, *University of Electronic Science and Technology of China*  
Bin Li, *University of Electronic Science and Technology of China*  
Tao Huang, *University of Electronic Science and Technology of China*  
Xiaolin Jin, *University of Electronic Science and Technology of China*  
Li Xu, *University of Electronic Science and Technology of China*

**P7-11: Kinetic Analysis of Two-Dimensional Cyclotron Maser with Single Gratings** (Page 359)

Xiaofei Li, *Chinese Academy of Sciences & University of Chinese Academy of Sciences*  
Ding Zhao, *Chinese Academy of Sciences*  
Qianzhong Xue, *Chinese Academy of Sciences & University of Chinese Academy of Sciences*  
Yidong Xiang, *Chinese Academy of Sciences & University of Chinese Academy of Sciences*

**P7-12: Fast Optimization Design Method of Periodic Permanent Magnet Focusing System for**

**TWT** (Page 361)

Shilong Zhu, *University of Electronic Science and Technology of China*  
Quan Hu, *University of Electronic Science and Technology of China*  
Yulu Hu, *University of Electronic Science and Technology of China*  
Xiaofang Zhu, *University of Electronic Science and Technology of China*  
Tao Huang, *University of Electronic Science and Technology of China*  
Bin Li, *University of Electronic Science and Technology of China*  
Li Xu, *University of Electronic Science and Technology of China*  
Xiaolin Jin, *University of Electronic Science and Technology of China*

**P7-13: Dispersion Relation of Embed Beam-Wave Interaction for Planar Grating Structure Terahertz**

**Radiation Source** (Page 363)

LongLong Yang, *Chinese Academy of Sciences & University of Chinese Academy of Science*  
WenXin Liu, *Chinese Academy of Sciences & University of Chinese Academy of Science*  
Zhengyuan Zhao, *Chinese Academy of Sciences & University of Chinese Academy of Science*  
Yue Ou, *Chinese Academy of Sciences & University of Chinese Academy of Science*

---

## 8: Cathodes/Materials/Electron Guns

**P8-1: Quantitative Analysis of Single-Surface Dielectric Multipactor Susceptibility with Dual Carrier**

**Frequencies** (Page 365)

Shu Lin, *Xi'an Jiaotong University & Michigan State University*  
Asif Iqbal, *Michigan State University*  
Peng Zhang, *Michigan State University*  
John Verboncoeur, *Michigan State University*

**P8-2: Thermionic Emission of a Novel  $Y_2Hf_2O_7$  Ceramic Cathode Applied in High-Power Magnetron**

**Tubes** (Page 367)

Shikai Qi, *Institute of Electronics Engineering, Jiujiang University*  
Xiaoxia Wang, *Chinese Academy of Sciences*  
Xingqi Wang, *Chinese Academy of Sciences*  
Mingwei Hu, *Xidian University*  
Wei Zhang, *Jiujiang University*  
Li Liu, *Jiujiang University*

**P8-3: Design of a Planar Sheet-Beam Magnetron Injection Gun** (Page 369)

Yidong Xiang, *Chinese Academy of Sciences & University of Chinese Academy Sciences*  
Qianzhong Xue, *Chinese Academy of Sciences & University of Chinese Academy Sciences*  
Ding Zhao, *Chinese Academy of Sciences*  
Xiaofei Li, *Chinese Academy of Sciences & University of Chinese Academy Sciences*

**P8-7: Inverse Magnetron Injection Gun for 170GHz Gyrotron** (Page 371)

Chao Tang, *University of Electronic Science and Technology of China*  
Hui Wang, *University of Electronic Science and Technology of China*  
Zhiyuan Jin, *University of Electronic Science and Technology of China*

Xinjian Niu, *University of Electronic Science and Technology of China*  
Yinghui Liu, *University of Electronic Science and Technology of China*  
Jianwei Liu, *University of Electronic Science and Technology of China*

**P8-9: Simulated Comparison of Two Anode Types of Coaxial Electron Gun for 170GHz**

**Gyrotron** (Page 373)

Kai Wang, *Chinese Academy of Sciences & University of Chinese Academy of Sciences*  
Qianzhong Xue, *Chinese Academy of Sciences & University of Chinese Academy of Sciences*

**P8-10: Distribution of Desorption Products on Interior Surfaces of Scandate Cathode Test**

**Vehicle** (Page 375)

Mujan N. Seif, *University of Kentucky*  
Sydney Kolnsberg, *University of Kentucky*  
Thomas John Balk, *University of Kentucky*  
Matthew J. Beck, *University of Kentucky*  
Bernard K. Vancil, *E Beam, Inc.*

**P8-11: Miniaturized Metamaterial-based Sheet Beam Radiation Sources** (Page 377)

Xuanming Zhang, *University of Electronic Science and Technology of China*  
Hengyu Luo, *University of Electronic Science and Technology of China*  
Xin Wang, *University of Electronic Science and Technology of China*  
Tao Tang, *University of Electronic Science and Technology of China*  
Zhanliang Wang, *University of Electronic Science and Technology of China*  
Huarong Gong, *University of Electronic Science and Technology of China*  
Yubin Gong, *University of Electronic Science and Technology of China*  
Zhaoyun Duan, *University of Electronic Science and Technology of China*

**P8-13: Microwave Sintering of W-Ir Matrix for Improved Emission Performance of Cathode** (Page 379)

Junyan Gao, *Beijing University of Technology*  
Yunfei Yang, *Beijing University of Technology*  
Shilei Li, *Beijing University of Technology*  
Peng Hu, *Beijing University of Technology*  
Jinshu Wang, *Beijing University of Technology*

**P8-14: Environments Adaptability and Failure Analysis of Nanoscale Vacuum Channel**

**Transistors** (Page 381)

Xinghui Li, *Beijing Vacuum Electronics Research Institute*  
Panyang Han, *Beijing Vacuum Electronics Research Institute*  
Yunzhu Xie, *Beijing Vacuum Electronics Research Institute*  
Ting Du, *Beijing Vacuum Electronics Research Institute*  
Jun Cai, *Beijing Vacuum Electronics Research Institute*  
Jinjun Feng, *Beijing Vacuum Electronics Research Institute*

**P8-15: A Novel Tunable PCM Focusing System for a 220 GHz Sheet Beam Electron Gun** (Page 383)

Shengkun Jiang, *University of Electronic Science and Technology of China*  
Merdan Wulam, *University of Electronic Science and Technology of China*  
Yiliang Xu, *University of Electronic Science and Technology of China*  
Tao Tang, *University of Electronic Science and Technology of China*  
Zhanliang Wang, *University of Electronic Science and Technology of China*  
Huarong Gong, *University of Electronic Science and Technology of China*  
Yubin Gong, *University of Electronic Science and Technology of China*  
Zhaoyun Duan, *University of Electronic Science and Technology of China*

**P8-16: Digital Light Processing of Alumina Ceramics for Vacuum Electron Devices** (Page 385)

Bofeng Wang, *Chinese Academy of Sciences & University of Chinese Academy of Sciences*  
Yongqing Zhang, *Chinese Academy of Sciences*  
Zhaochuan Zhang, *Chinese Academy of Sciences*  
Xuhua Hu, *The Aerospace Information Research Institute, Chinese Academy of Sciences*  
GuanLi Zhou, *Chinese Academy of Sciences*  
Jianyong Zhou, *Chinese Academy of Sciences*  
Xiaoxia Wang, *Chinese Academy of Sciences*

**P8-17: Effect of Electron Irradiation on Properties of RTV560 Silicon Rubber** (Page 387)

Guangjiang Yuan, *Chinese Academy of Sciences*  
Ruiqi Li, *Harbin Institute of Technology*  
Wei Song, *Chinese Academy of Sciences*  
Mingyang Zhu, *Chinese Academy of Sciences*  
Guoxing Miao, *Chinese Academy of Sciences*  
Jiuchun Yan, *Harbin Institute of Technology*

**P8-18: Deposition of Tungsten Nanoparticles for Potential Use in Dispenser Cathodes** (Page 389)

Huanhuan Bai, *University of Kentucky*  
Matthew J. Beck, *University of Kentucky*  
Thomas John Balk, *University of Kentucky*

**P8-20: Quantifying Work Function Using Kelvin Probe Systems** (Page 391)

Antonio M. Mántica, *University of Kentucky*  
T. John Balk, *University of Kentucky*

**P8-21: Stability Improvement of Electron Gun for Millimeter Wave TWTs by Immersed Flow Focusing**



**System** (Page 393)

Ruofan Wang, *University of Electronic Science and Technology of China*  
Jin Xu, *University of Electronic Science and Technology of China*  
Lingna Yue, *University of Electronic Science and Technology of China*  
Hairong Yin, *University of Electronic Science and Technology of China*  
Guoqing Zhao, *University of Electronic Science and Technology of China*  
Wenxiang Wang, *University of Electronic Science and Technology of China*  
Y. B. Gong, *University of Electronic Science and Technology of China*  
J. J. Feng, *Beijing Vacuum Electronics Research Institute*  
Yanyu Wei, *University of Electronic Science and Technology of China*

**P8-22: Analytical Solution for Space Charge Limited Current Emission from a Sharp Tip Using**

**Variational Methods** (Page 395)

N. R. Sree Harsha, *Purdue University*  
Allen L. Garner, *Purdue University*

**P8-24: 3D-Design of Magnetron Injection Gun for 42GHz Second Harmonic Gyrotron** (Page 397)

Alok Mishra, *CSIR-Central Electronics Engineering Research Institute*  
Om Ranjan, *CSIR-Central Electronics Engineering Research Institute*  
A. Bera, *CSIR-Central Electronics Engineering Research Institute*  
M. V. Kartikeyan, *Indian Institute of Technology, Roorkee*

**P8-25: Design and Simulation of Magnetron Injection Guns for a 0.5 THz Frequency-Tunable Gyrotron** (Page 401)

Jie Huang, *University of Electronic Science and Technology of China*  
Tao Song, *University of Electronic Science and Technology of China*  
Wei Wang, *University of Electronic Science and Technology of China*  
Diwei Liu, *University of Electronic Science and Technology of China*

**P8-26: Application of Electrodynamic Admittances in the TWT Theory** (Page 403)

Yuriy N. Pchel'nikov, *Independent Consultant*

**P8-27: Novel Sawtooth Structure Loading to Mitigate Mode Competition in a 346 GHz Backward Wave Oscillator** (Page 405)

Christián Hurd, *University of California Davis*  
Yuan Zheng, *University of California Davis*  
Neville C. Luhmann, Jr., *University of California Davis*

**P8-28: Cold Test Design of the Open Resonant Cavity in a High-Order Mode Gyrotron** (Page 407)

Menglong Jiao, *Chinese Academy of Sciences & University of Chinese Academy of Sciences*  
Jirun Luo, *University of Chinese Academy of Sciences*  
Wei Guo, *University of Chinese Academy of Sciences*  
Yu Fan, *University of Chinese Academy of Sciences*  
Zheng Wen, *Chinese Academy of Sciences & University of Chinese Academy of Sciences*  
Chen Yang, *Chinese Academy of Sciences & University of Chinese Academy of Sciences*  
Zhixian Li, *Chinese Academy of Sciences & University of Chinese Academy of Sciences*  
Min Zhu, *University of Chinese Academy of Sciences*

**P8-29: Circuit Design and Simulation of a 0.85 THz Regenerative Feedback Oscillator** (Page 409)

Tianyi Li, *Beijing Vacuum Electronics Research Institute*  
Pan Pan, *Beijing Vacuum Electronics Research Institute*  
Dong Li, *Beijing Vacuum Electronics Research Institute*  
Weisi Meng, *Beijing Vacuum Electronics Research Institute*  
Jun Cai, *Beijing Vacuum Electronics Research Institute*  
Jinjun Feng, *Beijing Vacuum Electronics Research Institute*  
Tiechang Yan, *Beijing Vacuum Electronics Research Institute*

**P8-30: Simulation of Non-Periodic Folded Waveguide Slow-Wave Structure** (Page 411)

Duo Xu, *University of Electronic Science and Technology of China*  
Wei Shao, *University of Electronic Science and Technology of China*  
Hexin Wang, *University of Electronic Science and Technology of China*  
Tenglong He, *University of Electronic Science and Technology of China*  
Ningjie Shi, *University of Electronic Science and Technology of China*  
Zhigang Lu, *University of Electronic Science and Technology of China*  
Huarong Gong, *University of Electronic Science and Technology of China*  
Zhanliang Wang, *University of Electronic Science and Technology of China*  
Zhaoyun Duan, *University of Electronic Science and Technology of China*  
Yubin Gong, *University of Electronic Science and Technology of China*

**P8-31: Simulation and Analysis of the TE<sub>28,8</sub> Mode Excitation in an Open Resonant Cavity of Gyrotron** (Page 413)

Zhixian Li, *Chinese Academy of Sciences & University of Chinese Academy of Sciences*  
Zhiqiang Zhang, *Chinese Academy of Sciences*  
Menglong Jiao, *Chinese Academy of Sciences & University of Chinese Academy of Sciences*  
Chen Yang, *Chinese Academy of Sciences & University of Chinese Academy of Sciences*  
Zheng Wen, *Chinese Academy of Sciences & University of Chinese Academy of Sciences*  
Jirun Luo, *Chinese Academy of Sciences & University of Chinese Academy of Sciences*

**P8-32: Operation Condition of GW Class Magnetron with Diffraction Output in Particle-In-Cell**

**Simulation** (Page 415)

Shen Shou Max Chung, *National Penghu University of Science and Technology*  
Shih-Chung Tuan, *Oriental Institute of Technology*

**P8-33: Design of a G-Band EIK Three-Stage Depressed Collector** (Page 417)

Le Li, *University of Electronic Science and Technology of China*  
Qi Wu, *University of Electronic Science and Technology of China*  
Jin Xu, *University of Electronic Science and Technology of China*  
Lingna Yue, *University of Electronic Science and Technology of China*  
Hairong Yin, *University of Electronic Science and Technology of China*  
G. Q. Zhao, *University of Electronic Science and Technology of China*  
H. R. Gong, *University of Electronic Science and Technology of China*  
W. X. Wang, *University of Electronic Science and Technology of China*  
Z. G. Lu, *University of Electronic Science and Technology of China*  
Z. Y. Duan, *University of Electronic Science and Technology of China*  
Y. B. Gong, *University of Electronic Science and Technology of China*  
Yong Zhong, *Beijing Vacuum Electronics Research Institute*  
J. J. Feng, *Beijing Vacuum Electronics Research Institute*  
Dazhi Li, *Neubrex.Ltd.*  
Yanyu Wei, *University of Electronic Science and Technology of China*

---

**Plenary**

**30-1: Opportunities in Cathode Research Enabled by Advanced Nanoscale Material Control and Understanding** (Page 419)

Joan E. Yater, *U.S. Naval Research Laboratory*

---

**ADDITIONAL PAPERS**

<b>Experimental Hot Test Results of a Metamaterial-Enhanced Resistive Wall Amplifier Prototype</b> .....	97
<i>Patrick Forbes, John Booske, Nader Behdad</i>	
<b>The Effect of Absorbers on the Operation of a Coaxial Magnetron</b> .....	109
<i>Dmitry A. Komarov, Yury N. Paramonov, Denis A. Kalashnikov, Oleg V. Yakovlev, Sergey V. Surkov</i>	
<b>Progress on a 71 – 76 GHz folded waveguide TWT for satellite communications</b> .....	127
<i>Craig W. Robertson, Adrian W. Cross, Christopher Gilmour, David Dyson, Peter G. Huggard, Fiachra Cahill, Mat Beardsley, Roberto Dionisio, Kevin Ronald</i>	
<b>Design and Test of a C-Band Water Load</b> .....	245
<i>Rui Zhang, Xiudong Yang, Yunfeng Liao, Zhihui Geng, Zhiqiang Zhang</i>	