

# **2019 International Vacuum Electronics Conference (IVEC 2019)**

**Busan, South Korea  
28 April – 1 May 2019**



**IEEE Catalog Number: CFP19VAM-POD  
ISBN: 978-1-5386-7535-9**

**Copyright © 2019 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:    | CFP19VAM-POD      |
| ISBN (Print-On-Demand): | 978-1-5386-7535-9 |
| ISBN (Online):          | 978-1-5386-7534-2 |

**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

# TABLE OF CONTENTS

|                                                                                                                                                                                                                                                                                                                                                                                       |           |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
| <b>THEORETICAL INVESTIGATION INTO AN ULTRA-WIDEBAND HELIX TRAVELING-WAVE TUBE .....</b>                                                                                                                                                                                                                                                                                               | <b>1</b>  |
| <i>Xuanming Zhang ; Guang Yang ; Hailin Ou ; Zhaoyun Duan ; Zhanliang Wang ; Huarong Gong ; Yubin Gong ; Yanheng Zhao ; Qingdong Deng ; Zhaochang He</i>                                                                                                                                                                                                                              |           |
| <b>RESPONSE ANALYSIS OF RF SYSTEM OF A W-BAND EXTENDED INTERACTING OSCILLATOR.....</b>                                                                                                                                                                                                                                                                                                | <b>3</b>  |
| <i>Zhaowei Qu ; Zhiqiang Zhang ; Yaogen Ding ; Shuzhong Wang ; Qingsheng Li</i>                                                                                                                                                                                                                                                                                                       |           |
| <b>IMPROVEMENT OF HYBRID-TYPE HIGH-POWER GYROTRON LAUNCHER.....</b>                                                                                                                                                                                                                                                                                                                   | <b>5</b>  |
| <i>Wenqi Li ; Zhiqiang Zhang ; Ilrun Luo ; Yong Li ; Yu Fan</i>                                                                                                                                                                                                                                                                                                                       |           |
| <b>DESIGN OF A 1 KW OUTPUT POWER FOLDED WAVEGUIDE TWT OPERATING IN KA-BAND.....</b>                                                                                                                                                                                                                                                                                                   | <b>7</b>  |
| <i>Antonino Mistretta ; Vincenzo Zito ; Rosario Martorana ; Romina Badalamenti ; Antonino Muratore ; Patrizia Livreri</i>                                                                                                                                                                                                                                                             |           |
| <b>A MINIATURIZED HIGH-GAIN, HIGH-EFFICIENCY METAMATERIAL ASSISTED S-BAND EXTENDED INTERACTION KLYSTRON .....</b>                                                                                                                                                                                                                                                                     | <b>9</b>  |
| <i>Xin Wang ; Zhaoyun Duan ; Fei Wang ; Shifeng Li ; Shengkun Jiang ; Yubin Gong ; Baidyanath Basu</i>                                                                                                                                                                                                                                                                                |           |
| <b>AN S-BAND REVERSED CHERENKOV OSCILLATOR IN A NOVEL ALL-METAL METAMATERIAL MINIATURIZED SLOW-WAVE STRUCTURE .....</b>                                                                                                                                                                                                                                                               | <b>11</b> |
| <i>Xiaoyi Li ; Xirui Zhan ; Zhaoyun Duan ; Xin Wang ; Daxi Ji ; Yubin Gong ; Baidyanath Basu</i>                                                                                                                                                                                                                                                                                      |           |
| <b>DESIGN OF A 4KW CW X-BAND BROADBAND KLYSTRON.....</b>                                                                                                                                                                                                                                                                                                                              | <b>13</b> |
| <i>Yuan Liang ; Honghong Gu ; Yaogen Ding ; Haibing Ding ; Bin Shen ; Caiying Wang ; Yueqing Liu ; Xiangjun Wang ; Wei Li</i>                                                                                                                                                                                                                                                         |           |
| <b>DESIGN OF AN ELECTRON OPTICS SYSTEM FOR L-BAND KLYSTRON.....</b>                                                                                                                                                                                                                                                                                                                   | <b>15</b> |
| <i>Xiudong Yang ; Rui Zhang ; Zhiqiang Zhang</i>                                                                                                                                                                                                                                                                                                                                      |           |
| <b>STUDY OF GAUSSIAN MODE OUTPUT WINDOW FOR 140GHZ GYROTRON .....</b>                                                                                                                                                                                                                                                                                                                 | <b>17</b> |
| <i>Zhiliang Li ; Bentian Liu ; Yang Zhang ; Jinjun Feng</i>                                                                                                                                                                                                                                                                                                                           |           |
| <b>MANUFACTURING AND TEST OF THE 1 MW LONG-PULSE 84/126 GHZ DUAL-FREQUENCY GYROTRON FOR TCV .....</b>                                                                                                                                                                                                                                                                                 | <b>19</b> |
| <i>Rodolphe Marchesin ; Stefano Alberti ; Konstantinos A. Avramidis ; Andrea Bertinetti ; Jérémie Dubray ; Damien Fasel ; Gerd Gantenbein ; Jérémy Genoud ; Jean-Philippe Hogge ; John Jelonnek ; Jianbo Jin ; Stefan Illy ; Francois Legrand ; Blaise Marletaz ; Alberto Leggieri ; Laura Savoldi ; Philippe Thouvenin ; Ioannis Gr. Pagonakis ; Minh-Quang Tran ; Manfred Thumm</i> |           |
| <b>DESIGN OF AN RF CIRCUIT FOR L- BAND 25MW KLYSTRON .....</b>                                                                                                                                                                                                                                                                                                                        | <b>21</b> |
| <i>Rui Zhang ; Xiudong Yang ; Zhiqiang Zhang</i>                                                                                                                                                                                                                                                                                                                                      |           |
| <b>STUDY OF 140GHZ AND 170GHZ GYROTRONS FOR FUSION PLASMA ECRH .....</b>                                                                                                                                                                                                                                                                                                              | <b>23</b> |
| <i>Bentian Liu ; Jinjun Feng ; Yichi Zhang ; Yang Zhang ; Bo Chen</i>                                                                                                                                                                                                                                                                                                                 |           |
| <b>INFLUENCE OF DIFFERENT MAGNETIC FIELD PROFILES ON GYROTRON .....</b>                                                                                                                                                                                                                                                                                                               | <b>25</b> |
| <i>Xuwei Wang ; Qianzhong Xue ; Shan Zhang</i>                                                                                                                                                                                                                                                                                                                                        |           |
| <b>FABRICATION AND TEST OF A W-BAND THREE-SLOT-STAGGERED-LADDER COUPLED-CAVITY TWT CIRCUIT .....</b>                                                                                                                                                                                                                                                                                  | <b>27</b> |
| <i>Zhigang Lu ; Zhicheng Su ; Ruidong Wen ; Weihua Ge ; Zhanliang Wang ; Tao Tang ; Huarong Gong ; Yubin Gong</i>                                                                                                                                                                                                                                                                     |           |
| <b>TRANSMISSION CHARACTERISTICS OF DOUBLE STAGGERED GRATING WAVEGUIDE SWS: SIMULATION AND MEASUREMENT .....</b>                                                                                                                                                                                                                                                                       | <b>29</b> |
| <i>Weihua Ge ; Zhigang Lu ; Zhicheng Su ; Ruidong Wen ; Zhanliang Wang ; Tao Tang ; Huarong Gong ; Yubin Gong</i>                                                                                                                                                                                                                                                                     |           |
| <b>DESIGN AND SIMULATION OF AN X-BAND RBWO USING NON-UNIFORM BRAGG STRUCTURE .....</b>                                                                                                                                                                                                                                                                                                | <b>31</b> |
| <i>M.A. Ansari ; M. Thottappan</i>                                                                                                                                                                                                                                                                                                                                                    |           |
| <b>SIMULATIONS OF A W-BAND CIRCULAR TWT.....</b>                                                                                                                                                                                                                                                                                                                                      | <b>33</b> |
| <i>K. Nusrat Islam ; Edl Schamiloglu ; Andrey D. Andreev ; Frank Krawczyk ; Bruce Carlsten</i>                                                                                                                                                                                                                                                                                        |           |
| <b>OPTIMIZATION DESIGN OF GYROTRON QUASI-OPTICAL MODE CONVERTER LAUNCHER .....</b>                                                                                                                                                                                                                                                                                                    | <b>35</b> |
| <i>Zhao Guohui ; Wang Xuwei ; Xue Qianzhong ; Zhang Shan ; Wang Yong ; Zhang Lianzheng</i>                                                                                                                                                                                                                                                                                            |           |
| <b>DESIGN OF PHASE CORRECTING MIRROR FOR GYROTRON QUASI-OPTICAL MODE CONVERTER.....</b>                                                                                                                                                                                                                                                                                               | <b>37</b> |
| <i>Zhao Guohui ; Wang Xuwei ; Xue Qianzhong ; Zhang Shan ; Wang Yong ; Zhang Lianzheng</i>                                                                                                                                                                                                                                                                                            |           |

|                                                                                                                                                                               |           |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
| <b>DESIGN AND SIMULATION OF W-BAND SECOND HARMONIC PERIODICALLY LOADED GYRO-TWT AMPLIFIER.....</b>                                                                            | <b>39</b> |
| <i>Akash ; M. Thottappan</i>                                                                                                                                                  |           |
| <b>ANALYSIS ON THE RESONATOR IN A 140 GHZ GYROTRON.....</b>                                                                                                                   | <b>41</b> |
| <i>Kang An ; Yichi Zhang ; Zhiliang Li ; Bentian Liu</i>                                                                                                                      |           |
| <b>DESIGN OF WATER COOLING SYSTEM FOR 170GHZ, LONG-PULSE GYROTRON .....</b>                                                                                                   | <b>43</b> |
| <i>Yichi Zhang ; Bentian Liu ; Xu Zeng ; Yang Zhang</i>                                                                                                                       |           |
| <b>PARALLEL MULTI-BEAM AND ITS APPLICATION IN THZ BAND .....</b>                                                                                                              | <b>45</b> |
| <i>Kaichun Zhang ; Qian Xu ; Neng Xiong ; Wangju Xu</i>                                                                                                                       |           |
| <b>A KEY DESIGN AND EXPERIMENT OF A BROADBAND HIGH-POWER PULSED HELIX TWT.....</b>                                                                                            | <b>47</b> |
| <i>Jiangna Jiao ; Li Qiu ; Lei Zhang ; Baoliang Hao ; Jinjun Feng ; Yanmei Wang</i>                                                                                           |           |
| <b>PRELIMINARY EXPERIMENTAL INVESTIGATIONS INTO AN OVERSIZED COAXIAL RELATIVISTIC KLYSTRON AMPLIFIER AT KA BAND.....</b>                                                      | <b>49</b> |
| <i>Shifeng Li ; Zhaoyun Duan ; Hua Huang ; B. N. Basu ; Zhiwei Dang ; Yu Bai ; Zhanliang Wang ; Yubin Gong</i>                                                                |           |
| <b>DESIGN OF A SHEET BEAM ELECTRON GUN FOR 850GHZ STAGGERED DOUBLE VANE TRAVELING WAVE TUBE.....</b>                                                                          | <b>51</b> |
| <i>Wei Shao ; Hanwen Tian ; Zhanliang Wang ; Zhigang Lu ; Huarong Gong ; Tao Tang ; Zhaoyun Duan ; Yanyu Wei ; Yubin Gong ; Jinjun Feng</i>                                   |           |
| <b>DESIGN OF A TRIODE MIG FOR 140GHZ GYROTRON OSCILLATOR.....</b>                                                                                                             | <b>53</b> |
| <i>He Zhu ; Wei Guo ; Min Zhu ; Jirun Luo</i>                                                                                                                                 |           |
| <b>DESIGN AND FABRICATION OF G-BAND EXTENDED INTERACTION KLYSTRON WITH UNEQUAL-LENGTH SLOTS .....</b>                                                                         | <b>55</b> |
| <i>Renjie Li ; Shasha Li ; Cunjun Ruan ; Huafeng Zhang</i>                                                                                                                    |           |
| <b>S-BAND WIDEBAND MULTI-BEAM KLYSTRON WITH REVERSED PERMANENT MAGNET FOCUSING AND HIGH AVERAGE POWER.....</b>                                                                | <b>57</b> |
| <i>Li Ye ; Li Dong-Feng ; Yang Lu-Xuen ; Zuo Hai-Bo ; Wang Zi-Wei</i>                                                                                                         |           |
| <b>DESIGN OF A RF INTERACTION SYSTEM FOR A KA-BAND EIK.....</b>                                                                                                               | <b>59</b> |
| <i>Yihao Song ; Haibing Ding ; Ke Tang ; Ren Xiao</i>                                                                                                                         |           |
| <b>ELECTROMAGNETIC PARTICLE-IN-CELL SIMULATIONS OF DIELECTRIC MULTIPACTOR.....</b>                                                                                            | <b>61</b> |
| <i>Wang Huihui ; Liu Leaun ; Liu Degeng ; Meng Lin</i>                                                                                                                        |           |
| <b>LARGE-SCALE PARALLEL PARTICLE-IN-CELL CODE CHIPIC .....</b>                                                                                                                | <b>63</b> |
| <i>Dagang Liu ; Huihui Wang ; Laqun Liu ; Mengjun Xie</i>                                                                                                                     |           |
| <b>ANALYTICAL SOLUTION OF BEAM-WAVE INTERACTION HOT DISPERSION EQUATION WITH CYCLOTRON RESONANCE ENHANCEMENT EFFECT IN A PLANAR METALLIC GRATING.....</b>                     | <b>65</b> |
| <i>Jing Wang ; Yu Fan ; Gang Wang ; Jirun Luo</i>                                                                                                                             |           |
| <b>A 850GHZ FOLDED WAVEGUIDE BASED ON THIN DIELECTRIC.....</b>                                                                                                                | <b>67</b> |
| <i>Lu Wang ; Xiaohan Sun ; Wenehen Xiang ; Pan Pan ; Ningfeng Bai ; Jun Cai ; Changsheng Shen ; Jinjun Feng</i>                                                               |           |
| <b>SLOW WAVE STRUCTURE BASED ON DEFECT PHOTONIC CRYSTAL WAVEGUIDE.....</b>                                                                                                    | <b>69</b> |
| <i>Yang Xie ; Xiaohan Sun ; Wei Hong ; Pan Pan ; Ningfeng Bai ; Jun Cai ; Changsheng Shen ; Jinjun Feng</i>                                                                   |           |
| <b>SIMULATION OF ION NOISE IN TRAVELING WAVE TUBES .....</b>                                                                                                                  | <b>71</b> |
| <i>Qing Zhou ; Huarong Gona ; Zhanliang Wang ; Yubin Geng</i>                                                                                                                 |           |
| <b>DESIGN OF MW-CLASS L-BAND MAGNETRON WITH TE<sub>11</sub> TO TE<sub>10</sub> MODE CONVERTER .....</b>                                                                       | <b>73</b> |
| <i>Jung-Hoon Han ; Taek-Heon Kim ; Seung-Kab Ryu</i>                                                                                                                          |           |
| <b>TWO-BEAM KU-BAND OSCILLATOR-AMPLIFIER USING A PLANAR HELIX SLOW-WAVE STRUCTURE .....</b>                                                                                   | <b>75</b> |
| <i>Kumar M. M. Ajith ; Sheel Aditya</i>                                                                                                                                       |           |
| <b>ANALYSIS OF THERMAL LOSS IN THE THZ SHEET BEAM FOLDED WAVEGUIDE TWT .....</b>                                                                                              | <b>77</b> |
| <i>Fengying Lu ; Chao Zhao ; Yong Wang</i>                                                                                                                                    |           |
| <b>STUDY OF X-RAY SPECTRA ENERGY DISTRIBUTION EXCITED BY SPENT ELECTRONS IN AN X-BAND GYROTRON TRAVELING WAVE TUBE.....</b>                                                   | <b>79</b> |
| <i>Yue Wang ; Guo Liu ; Wei Jiang ; Jianxun Wang ; Yong Luo ; Guoxiang Shu</i>                                                                                                |           |
| <b>DESIGN AND EXPERIMENT OF AN E-BAND FOLDED WAVEGUIDE TRAVELING WAVE TUBE .....</b>                                                                                          | <b>81</b> |
| <i>Rujing Ji ; Zhixin Yang ; Zugen Guo ; Qi Wang ; Ping Han ; Huarong Gong</i>                                                                                                |           |
| <b>HIGH-POWER THZ WAVE GENERATION THROUGH COHERENT CHERENKOV RADIATION BASED ON A PLASMA DIELECTRIC WAKE-FIELD ACCELERATOR USING RELATIVISTIC ANNULAR ELECTRON BEAM .....</b> | <b>83</b> |
| <i>Sun-Hong Min ; Ohjoon Kwon ; Matlabjon Sattorov ; Seontae Kim ; Dongpyo Hong ; Chawon Park ; Ilsung Cho ; Bong Hwan Hong ; In Su Jung ; Won Taek Hwang ; Gun-Sik Park</i>  |           |

|                                                                                                                                                             |            |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|
| <b>DEVELOPMENT OF KA-BAND EXTENDED-INTERACTION KLYSTRON .....</b>                                                                                           | <b>85</b>  |
| <i>Haiping Feng ; Fujiang Sun ; Dongfeng Li</i>                                                                                                             |            |
| <b>A 600KW C-BAND BROADBAND KLYSTRON WITH WIDE PULSE-LENGTH .....</b>                                                                                       | <b>87</b>  |
| <i>Xiu Liu ; Dongfeng Li ; Jun Zhou ; Kun Wang ; Jiajia Ouyang ; Haizhi Zhang ; Yongmeig Liu ; Yueshuai Zhao ; Jitao Yang ; Sian Zhang</i>                  |            |
| <b>THERMAL AND STRESS ANALYSIS OF THE PLANAR SLOW WAVE STRUCTURE FOR KA-BAND TWT .....</b>                                                                  | <b>89</b>  |
| <i>Hexin Wang ; Zhanliang Wang ; Xinyi Li ; Tenglong He ; Duo Xu ; Tao Tang ; Zhaoyun Duan ; Yubin Gong ; Jinjun Feng</i>                                   |            |
| <b>LOSS MEASUREMENTS OF 220 GHZ FWSS .....</b>                                                                                                              | <b>91</b>  |
| <i>H S Sudhamani ; Sum Reddy ; Jyothi Balakrishnan</i>                                                                                                      |            |
| <b>STUDY OF SHEET BEAM ELECTRON OPTICAL SYSTEM AND ENERGY COUPLER FOR WIDEBAND 340GHZ TWT .....</b>                                                         | <b>93</b>  |
| <i>Kaicheng Wang ; Wei Shao ; Hanwen Tian ; Zhanliang Wang ; Zhigang Lu ; Huarong Gong ; Tao Tang ; Zhaoyun Duan ; Yanyu Wei ; Yubin Gong ; Jinjun Feng</i> |            |
| <b>MICROFABRICATION OF A CONFORMAL MICROSTRIP ANGULAR LOG-PERIODIC MEANDER LINE TWT .....</b>                                                               | <b>95</b>  |
| <i>Tenglong He ; Xinyi Li ; Hexin Wang ; Duo Xu ; Zhanliang Wang ; Zhigang Lu ; Huarong Gong ; Zhaoyun Duan ; Yubin Gong ; Jinjun Feng</i>                  |            |
| <b>ANALYSES OF TRANSMISSION CHARACTERISTICS OF ELECTROMAGNETIC WAVE IN CONFOCAL GYRO-TWT .....</b>                                                          | <b>97</b>  |
| <i>Yang Jie ; Xu Shouxi ; Wang Yong ; Wang Xiaoyan ; Zhao Guohui ; Zhang Lianzheng</i>                                                                      |            |
| <b>DESIGN AND SIMULATION OF A 650 GHZ FOLDED WAVEGUIDE TRAVELING WAVE TUBE .....</b>                                                                        | <b>99</b>  |
| <i>Xu Shouxi</i>                                                                                                                                            |            |
| <b>DIMOHA: TRAVELING-WAVE TUBE SIMULATIONS INCLUDING BAND EDGE AND MULTIPLE-CARRIERS OPERATIONS .....</b>                                                   | <b>101</b> |
| <i>Damien F.G. Mincna ; Yves Elskens ; Frédéric André ; Jérôme Puech ; Alexandre Poyé ; Fabrice Doveil ; Telma Pereira</i>                                  |            |
| <b>STUDY ON RADIAL CONVERGENT BEAM ANGULAR MIRROR SYMMETRICAL LOG-PERIODIC STRIP LINE SWS .....</b>                                                         | <b>103</b> |
| <i>Xinyi Li ; Zhanliang Wang ; Tenglong He ; Hexin Wang ; Zijun Chen ; Duo Xu ; Yubin Gong ; Yurong Liu ; Zhiqiang Gao ; Daxi Ji</i>                        |            |
| <b>DESIGN AND EXPERIMENT OF TE<sub>62</sub> QUASI-OPTICAL MODE GENERATOR FOR A W-BAND GYROTRON OSCILLATOR .....</b>                                         | <b>105</b> |
| <i>Zhi-Hui Geng ; Rui Zhang ; Xiao-Wan Hou ; Shou-Xi Xu ; Xiu-Dong Yang ; Gao-Feng Liu ; Yun-Feng Liao</i>                                                  |            |
| <b>THIRD HARMONIC CW GYROTRON WITH OPERATING FREQUENCY 1.2 THZ FOR A DNP /NMA SPECTROSCOPY .....</b>                                                        | <b>107</b> |
| <i>V.N. Manuilov ; T. Idehara ; S. Mitsudo ; O. Dumbrajs ; Glyavin M. Yu ; A.I. Tsvetkov</i>                                                                |            |
| <b>DESIGN OF HIGH-EFFICIENT POWERFUL CW TECHNOLOGICAL GYROTRON COMPLEX WITH OPERATING FREQUENCY 28 GHZ .....</b>                                            | <b>109</b> |
| <i>V.N. Manuilov ; Glyavin M. Yu ; M.D. Proyavin ; N.A. Zavolsky ; D.I. Sobolev ; M.V. Morozkin</i>                                                         |            |
| <b>SECOND HARMONIC 527 GHZ GYROTRON FOR DNP-NMR .....</b>                                                                                                   | <b>111</b> |
| <i>Sudheer Jawla ; Ivan Mastovsky ; Michael A. Shapiro ; Richard J. Temkin</i>                                                                              |            |
| <b>DEVELOPMENT OF A HIGH POWER KA-BAND EXTENDED INTERACTION KLYSTRON .....</b>                                                                              | <b>113</b> |
| <i>Ding Zhao ; Gaofeng Liu ; Wei Gu ; Tongli Ma ; Qianzhong Xue ; Zhiqiang Zhang</i>                                                                        |            |
| <b>A G-BAND WIDEBAND CW FOLDED WAVEGUIDE TWT .....</b>                                                                                                      | <b>115</b> |
| <i>Lei Wenqiang ; Hu Peng ; Huang Yinhu ; Jiang Yi ; Song Rui ; Chen Hongbin</i>                                                                            |            |
| <b>HIGH EFFICIENCY KLYSTRONS FOR ESS .....</b>                                                                                                              | <b>117</b> |
| <i>Chiara Marrelli</i>                                                                                                                                      |            |
| <b>BEAM CHARGE MONITOR FOR QUANTITATIVELY MEASURING ELECTRON BUNCH OF VERY LOW-CHARGE PULSE AND ULTRA-SHORT PULSE .....</b>                                 | <b>119</b> |
| <i>H. Choi ; H. Heo ; H.-S. Kang ; H. Bayle ; F. Stulle ; E. Touzain</i>                                                                                    |            |
| <b>SIMULATION OF A KA-BAND MODE CONVERTER FROM THE RECTANGULAR WAVEGUIDE TE<sub>10</sub> MODE TO THE CIRCULAR WAVEGUIDE TE<sub>02</sub> MODE .....</b>      | <b>121</b> |
| <i>Wang Xiaoyan ; Yang Jie ; Gao Dongping ; Zhang Fengzhen ; Wang Yong ; Zhang Lianzheng</i>                                                                |            |
| <b>VARIATION OF ELECTRON BEAM QUALITY IN A CONTINUOUSLY FREQUENCY-TUNABLE 500GHZ GYROTRON .....</b>                                                         | <b>123</b> |
| <i>Tao Song ; Chen Zhang ; Ning Zhang ; Wei Wang ; Diwei Liu ; Shenggang Liu</i>                                                                            |            |
| <b>SIMULATION OF THREE DIFFERENT MAGNETIC FIELD SWEEPING SYSTEMS FOR MW-CLASS GYROTRON .....</b>                                                            | <b>125</b> |
| <i>Kai Wang ; Qianzhong Xue</i>                                                                                                                             |            |

|                                                                                                                                                                                                                                              |            |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|
| <b>INITIAL EXPERIMENTAL RESULTS FOR A HIGH POWER FREQUENCY-TUNABLE SUB-THZ GYROTRON .....</b>                                                                                                                                                | <b>127</b> |
| <i>Xiaotong Guan ; Tongbin Yang ; Wenjie Fu ; Yang Yan ; Dun Lu</i>                                                                                                                                                                          |            |
| <b>INVESTIGATION ON A BROADBAND 220GHZ EXTENDED INTERACTION KLYSTRON .....</b>                                                                                                                                                               | <b>129</b> |
| <i>Wang Zicheng ; Qu ZhaoWei ; Li Lianbing ; Shang Xinwen ; Cao Linlin ; Tang Bojun ; Xiao Liu</i>                                                                                                                                           |            |
| <b>DESIGN OF A 50W 220GHZ TRAVELING WAVE TUBE.....</b>                                                                                                                                                                                       | <b>132</b> |
| <i>Xingwang Bian ; Ye Tang ; Lin Zhang ; Qiru Lu ; Ying Li ; Pan Pan ; Jun Cai ; Jinjun Feng</i>                                                                                                                                             |            |
| <b>STUDY ON BROADBAND RIDGE-LOADED SYMMETRICAL CONFORMAL MICROSTRIP MEANDER LINE TRAVELING WAVE TUBE AT KA- BAND .....</b>                                                                                                                   | <b>134</b> |
| <i>Duo Xu ; Hexin Wang ; Tenglong He ; Xinyi Li ; Zhigang Lu ; Huarong Gong ; Zhanliang Wang ; Zhaoyun Duan ; Yubin Gong</i>                                                                                                                 |            |
| <b>DISPERSION MEASUREMENTS OF 220 GHZ FWSS .....</b>                                                                                                                                                                                         | <b>136</b> |
| <i>Hs Sudhamani ; Sum Reddy ; Jyothi Balakrishnan</i>                                                                                                                                                                                        |            |
| <b>MODE COMPETITION AND OHMIC LOSSES IN HIGH-POWER COAXIAL-CAVITY GYROTRON.....</b>                                                                                                                                                          | <b>138</b> |
| <i>Shan Zhang ; Qianzhong Xue</i>                                                                                                                                                                                                            |            |
| <b>A 340GHZ 20W STAGGERED DOUBLE VANE TRAVELING WAVE TUBE.....</b>                                                                                                                                                                           | <b>140</b> |
| <i>Xianbao Shi ; Weihua Xiong ; Chunhua Wen</i>                                                                                                                                                                                              |            |
| <b>RESEARCH ON HIGH GAIN W BAND FOLDED WAVEGUIDE TRAVELING WAVE TUBE .....</b>                                                                                                                                                               | <b>142</b> |
| <i>Xianbao Shi ; Weihua Xiong ; Chunhua Wen</i>                                                                                                                                                                                              |            |
| <b>TEMPORAL STUDY OF DUAL FREQUENCY SINGLE SURFACE MULTIPACTOR BY MULTIPARTICLE MONTE CARLO SIMULATIONS .....</b>                                                                                                                            | <b>144</b> |
| <i>Asif Iqbal ; John Verboncoeur ; Patrick Wong ; Peng Zhang</i>                                                                                                                                                                             |            |
| <b>OPERATING THE KIT 170 GHZ 2 MW COAXIAL-CAVITY GYROTRON AT 204 GHZ: PERFORMANCE EXPECTATIONS AND FIRST COLD TEST OF THE QUASI-OPTICAL SYSTEM.....</b>                                                                                      | <b>146</b> |
| <i>Tobias Ruess ; Konstantinos A. Avramidis ; Gerd Gantenbein ; Zisis Ioannidis ; Stefan Illy ; Jianbo Jin ; Felix C. Lutz ; Ioannis Gr. Pagonakis ; Sebastian Ruess ; Tomasz Rzesnicki ; Manfred Thumm ; Dietmar Wagner ; John Jelonnek</i> |            |
| <b>SIMULATION OF HIGH-EFFICIENCY KLYSTRONS WITH THE COM AND CSM BUNCHING .....</b>                                                                                                                                                           | <b>148</b> |
| <i>Andrei Baikov ; Olga Baikova</i>                                                                                                                                                                                                          |            |
| <b>CHARACTERISTIC MEASUREMENTS OF A WIDEBAND GYRO-TWA OPERATING IN W-BAND.....</b>                                                                                                                                                           | <b>150</b> |
| <i>Wenlong He ; Liang Zhang ; Craig R. Donaldson ; Kevin Ronald ; Alan D.R. Phelps ; Adrian W. Cross ; Peter Cain</i>                                                                                                                        |            |
| <b>MEASUREMENT OF A BROADBAND INPUT COUPLER FOR A W-BAND GYRO-TWA.....</b>                                                                                                                                                                   | <b>152</b> |
| <i>Liang Zhang ; Craig R. Donaldson ; Adrian W. Cross ; Wenlong He</i>                                                                                                                                                                       |            |
| <b>TRANSMISSION CHARACTERISTICS OF 220 GHZ T-SHAPE STAGGERED DOUBLE-VANE SLOW WAVE STRUCTURE .....</b>                                                                                                                                       | <b>154</b> |
| <i>Guang Yang ; Zhaoyun Duan ; Shengkun Jiang ; Daxi Ji ; Tao Tang ; Huarong Gong ; Yubin Gong</i>                                                                                                                                           |            |
| <b>STUDY OF TWO-SECTION RECTANGULAR BEAM TWTS BASED ON FOLDED WAVEGUIDE .....</b>                                                                                                                                                            | <b>156</b> |
| <i>Fengying Lu ; Rui Zhang ; Yong Wang</i>                                                                                                                                                                                                   |            |
| <b>THE PRIMARY RESEARCH OF 140GHZ EIO .....</b>                                                                                                                                                                                              | <b>158</b> |
| <i>Bo Wang ; Zhenhua Wu ; Chuanhong Xiao ; Jie Qing ; Jielong Li ; Min Hu ; Renbin Zhong ; Shenggang Liu</i>                                                                                                                                 |            |
| <b>DEVELOPMENT OF A THZ BROADBAND MINI-GYROTRON.....</b>                                                                                                                                                                                     | <b>160</b> |
| <i>Chao-Hai Du ; Shi Pan ; Zi-Chao Gao ; Hui-Qi Bian ; Pu-Kun Liu</i>                                                                                                                                                                        |            |
| <b>160W L-BAND HIGH EFFICIENCY SPACE TWT .....</b>                                                                                                                                                                                           | <b>162</b> |
| <i>Yiqun Liu ; Hongxia Cheng ; Xiaoran Zhang ; Xiaoyu Dong ; Yulu Hu ; Tao Huang</i>                                                                                                                                                         |            |
| <b>TERAHERTZ GYRO-BWO USING A HIGH-ORDER WHISPERING-GALLERY MODE .....</b>                                                                                                                                                                   | <b>164</b> |
| <i>Shi Pan ; Chao-Hai Du ; Zi-Chao Gao ; Fan-Hong Li ; Hui-Qi Bian ; Pu-Kun Liu</i>                                                                                                                                                          |            |
| <b>GROUP DELAY DISTORTION OPTIMIZATION FOR A L-BAND HELIX TWT WITH A POSITIVE-TAPERED PITCH SEGMENT.....</b>                                                                                                                                 | <b>166</b> |
| <i>Wenkai Deng ; Yulu Hu ; Quan Hu ; Xiaofang Zhu ; Bin Li</i>                                                                                                                                                                               |            |
| <b>CIRCUIT DESIGN AND ANALYSIS OF AN EXTERNAL COUPLED MAGNETRON AT KA BAND FOR HIGH POWER APPLICATIONS.....</b>                                                                                                                              | <b>168</b> |
| <i>Yong Yin ; Minsheng Song ; Tianqi Hu ; Yu Zhao ; Bin Wang ; Hailong Li ; Lin Meng</i>                                                                                                                                                     |            |
| <b>PRIMARY STUDY ON HIGH FREQUENCY STRUCTURE OF 38GHZ EXTENDED INTERACTION OSCILLATOR .....</b>                                                                                                                                              | <b>170</b> |
| <i>Jielong Li ; Zhenhua Wu ; Chuanhong Xiao ; Jie Qing ; Bo Wang ; Min Hu ; Renbin Zhong ; Shenggang Liu</i>                                                                                                                                 |            |
| <b>DESIGN OF A 75GHZ LOW VOLTAGE-CONTINUOUS WAVE GYROTRON WITH MODE CONVERTER.....</b>                                                                                                                                                       | <b>172</b> |
| <i>Dun Lu ; Tongbin Yang ; Wenjie Fu ; Yang Yan ; Xiaotong Guan</i>                                                                                                                                                                          |            |

|                                                                                                                                                                                             |            |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|
| <b>DESIGN OF A W-BAND TRAVELING-WAVE TUBE BASED ON SINE WAVEGUIDE SLOW-WAVE STRUCTURE WITH SHEET ELECTRON BEAM.....</b>                                                                     | <b>174</b> |
| <i>S. Z. Fang ; J. Xu ; X. Lei ; X. B. Jiang ; P.C. Yin ; L. Li ; G.X. Wu ; R. C. Yang ; Q. Li ; H.R. Yin ; L. N. Yue ; G. Q. Zhao ; Y. B. Gong ; Y.Y. Wei ; W.X. Wang ; X. Xu ; Y. Lui</i> |            |
| <b>DESIGN STUDIES OF MINI-CHANNEL CAVITY COOLING FOR A 170 GHZ, 2 MW COAXIAL-CAVITY GYROTRON.....</b>                                                                                       | <b>176</b> |
| <i>Parth C Kalaria ; Philipp T Brucker ; Sebastian Ruess ; Stefan Illy ; Konstantinos A Avramidis ; Gerd Gantenbein ; Manfred Thumm ; John Jelonnck</i>                                     |            |
| <b>OVERSIZED W-BAND 2D PERIODIC LATTICE OSCILLATOR.....</b>                                                                                                                                 | <b>178</b> |
| <i>A. W. Cross ; A. J. Maclachlan ; C. W. Robertson ; L. Zhang ; C. R. Donaldson ; H. Yin ; A. D. R. Phelps ; K. Ronald</i>                                                                 |            |
| <b>KLYSTRON EFFICIENCY OPTIMIZATION BASED ON A GENETIC ALGORITHM.....</b>                                                                                                                   | <b>180</b> |
| <i>Hamel Pierrick ; Plouin Juliette ; Marchand Claude ; Peauger Franck</i>                                                                                                                  |            |
| <b>SELF-SIMILAR ANALYSIS OF SHORT PULSE AMPLIFICATION AND GENERATION IN CHERENKOV-TYPE DEVICES.....</b>                                                                                     | <b>182</b> |
| <i>Alena A. Rostuntsova ; Nikita M. Ryskin ; Naum S. Ginzburg</i>                                                                                                                           |            |
| <b>RESEARCH PROGRESS OF A SECOND HARMONIC GYROTRON.....</b>                                                                                                                                 | <b>184</b> |
| <i>Zi-Chao Gao ; Chao-Hai Du ; Shi Pan ; Fan-Hong Li ; Pu-Kun Liu</i>                                                                                                                       |            |
| <b>DOUBLE MULTI-GAP OUTPUT CAVITY FOR LOW VOLTAGE ULTRA-COMPACT W-BAND KLYSTRON.....</b>                                                                                                    | <b>186</b> |
| <i>Yuan Zheng ; Neville C. Luhmann ; Diana Gamzina ; Ann Sy ; Brandon R Weatherford</i>                                                                                                     |            |
| <b>DEVELOPMENT OF Q-BAND SPACE TRAVELING-WAVE-TUBES.....</b>                                                                                                                                | <b>188</b> |
| <i>Bo Qu ; Xiaofeng Liang ; Chen Guo ; Yanhua Shang ; Jinjun Feng ; Henghui Guo</i>                                                                                                         |            |
| <b>80 TO 100 WATTS TWT IN Q-BAND FOR SPACE DOWNLINK COMMUNICATION.....</b>                                                                                                                  | <b>192</b> |
| <i>Frederic Andre ; Justin Demory ; Jean Gastaud ; Wolfgang Dürr ; Dawid Kupidura ; Natanael Ayllon ; Roberto Dionisio ; Jérôme Puech</i>                                                   |            |
| <b>A NOVEL TE<sub>01</sub> INPUT COUPLER FOR A W-BAND GYROTRON TRAVELING-WAVE TUBE.....</b>                                                                                                 | <b>194</b> |
| <i>Chao Fang ; Guo Liu ; Wei Rao ; Yue Wang ; Shiyu Wang ; Jianxun Wang ; Wei Jiang ; Li Wang ; Yong Luo ; Guoxiang Shu</i>                                                                 |            |
| <b>EXPERIMENTS ON W-BAND HIGH-GAIN HELICAL-WAVEGUIDE GYRO-TWT.....</b>                                                                                                                      | <b>196</b> |
| <i>S.V. Samsonov ; A.A. Bogdashov ; G.G. Denisov ; I.G. Gachev</i>                                                                                                                          |            |
| <b>TOWARDS FUTURE THZ BAND GYROTRON DEVELOPMENT AND APPLICATIONS: RESULTS, TRENDS AND AIMS.....</b>                                                                                         | <b>198</b> |
| <i>Glyavin Mikhail ; Denisov Gregory</i>                                                                                                                                                    |            |
| <b>DEVELOPMENT OF A C-BAND HIGH EFFICIENCY KLYSTRON.....</b>                                                                                                                                | <b>200</b> |
| <i>Dmitriy A. Komarov ; Evgeny P. Yakushkin ; Yury N. Paramonov ; Alexander N. Darmaev</i>                                                                                                  |            |
| <b>THERMAL ANALYSIS OF MICRO-CHANNEL COOLING FOR A MEGAWATT GYROTRON TRAVELLING WAVE TUBE.....</b>                                                                                          | <b>201</b> |
| <i>Wei Rao ; Guo Liu ; Chao Fang ; Wei Jiang ; Jianxun Wang ; Li Wang ; Yong Luo ; Guoxiang Shu</i>                                                                                         |            |
| <b>HIGH-GAIN CONFOCAL GYRO- TWAS WITH A NONUNIFORM DISTRIBUTED CIRCUIT.....</b>                                                                                                             | <b>203</b> |
| <i>Yelei Yao ; Jianxun Wang ; Yong Luo ; Guoxiang Shu</i>                                                                                                                                   |            |
| <b>SIMULATION OF COLLECTOR INDUCED VOLTAGE IN HIGH-POWER MULTIPLE-BEAM KLYSTRON.....</b>                                                                                                    | <b>205</b> |
| <i>Alexander N. Darrnaev ; Dmitry A. Komarov ; Yury N. Paramonov ; Denis A. Kalashnikov</i>                                                                                                 |            |
| <b>HARMONIC COMPONENTS MEASUREMENT OF TWT WITH RECTANGULAR WAVEGUIDE OUTPUT STRUCTURE.....</b>                                                                                              | <b>207</b> |
| <i>Feng Zou ; Xin'ai Liu ; Gang Wang ; Guoxing Miao ; Fangfang Song</i>                                                                                                                     |            |
| <b>TUNING CHARACTERISTICS ANALYSIS OF A KA-BAND COAXIAL MAGNETRON.....</b>                                                                                                                  | <b>209</b> |
| <i>Minsheng Song ; Tianqi Hu ; Yin Yong ; Lin Meng ; Hailong Li ; Bin Wang</i>                                                                                                              |            |
| <b>A STUDY OF HARMONIC LOCKING BETWEEN OSCILLATORS IN A DUAL FREQUENCY MAGNETRON.....</b>                                                                                                   | <b>211</b> |
| <i>Drew A. Packard ; Geoffrey B. Greening ; Nicholas M. Jordan ; Steven C. Exelby ; Y.Y. Lau ; Ronald M. Gilgenbach ; Brad W. Hoff ; Jason F. Hammond</i>                                   |            |
| <b>RECENT ADVANCES IN RELATIVISTIC MDOS.....</b>                                                                                                                                            | <b>213</b> |
| <i>Edl Schamiloglu ; Mikhail Fuks ; Dmitrii Andreev ; Artem Kuskov</i>                                                                                                                      |            |
| <b>ANALYSIS OF THE EFFECT OF THE DIFFERENCE BETWEEN DESIGNING AND MACHINING ON ELECTRIC CHARACTERISTICS IN A 140GHZ GYROTRON OSCILLATOR CAVITY.....</b>                                     | <b>215</b> |
| <i>Chen Yang ; Min Zhu ; Wei Guo ; Jirun Luo</i>                                                                                                                                            |            |
| <b>MULTISTABILITY OF PHASE-LOCKED MODES IN A SYSTEM OF TWO DELAY-COUPLED GYROTRON OSCILLATORS.....</b>                                                                                      | <b>217</b> |
| <i>Asel B. Adilova ; Nikita M. Ryskin</i>                                                                                                                                                   |            |

|                                                                                                                                                                                                              |     |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|
| <b>A 70W 81-86GHZ E-BAND CW TRAVELLING WAVE TUBE</b> .....                                                                                                                                                   | 219 |
| <i>Zhangxiong Zi ; Shishuo Liu ; Qingmei Xie ; Shijing Li ; Jun Cai ; Shilu Zhao</i>                                                                                                                         |     |
| <b>A HIGH ORDER MODE SHEET-BEAM EXTENDED INTERACTION OSCILLATOR AT KA-BAND</b> .....                                                                                                                         | 221 |
| <i>Jiaxin Gong ; Liangjie Ie Bi ; Yong Yin ; Hailong Li ; Bin Wang ; Lin Meng</i>                                                                                                                            |     |
| <b>MECHANISMS OF INTENSE PULSES GENERATION IN GYRODEVICES</b> .....                                                                                                                                          | 223 |
| <i>Irina Zotova ; Alexey Fedotov ; Alexander Sergeev ; Vladimir Manuilov ; Roman Rozental ; Vladislav Zaslavsky ; Vladimir Bratman ; Naum Ginzburg</i>                                                       |     |
| <b>EXTENSION OF FREQUENCY TUNING BAND IN SUB-THZ GYROTRONS WITH STRONG EXTERNAL REFLECTIONS</b> .....                                                                                                        | 225 |
| <i>Michael Glyavin ; Irina Zotova ; Naum Ginzburg ; Alexey Fedotov ; Roman Rozental ; Seitaro Mitsudo ; Alexander Sergeev ; Toshitaka Idehara</i>                                                            |     |
| <b>MULTIPHYSICS ANALYSIS OF KA-BAND U-SHAPED MICROSTRIP LINE PLANAR TRAVELING WAVE TUBE</b> .....                                                                                                            | 226 |
| <i>Gangxiong Wu ; Ruichao Yang ; Hairong Yin ; Xia Lei ; Qian Li ; Shuangzhu Fang ; Lingna Yue ; Jin Xu ; Guoqing Zhao ; Wenxiang Wang ; Yubin Gong ; Yanyu Wei ; Yang Liu ; Fei Shen</i>                    |     |
| <b>GDS2H - V.2018: A COMPREHENSIVE COMPUTER CODE PACKAGE FOR THE DESIGN OF SECOND HARMONIC GYROTRONS</b> .....                                                                                               | 228 |
| <i>S. Yuvaraj ; S. Adya ; D. Mondal ; A. S. Thakur ; A. Agarwal ; M. V. Kartikeyan ; M. Thumm</i>                                                                                                            |     |
| <b>DESIGN STUDIES OF MAGNETRON INJECTION GUN FOR V AND W BAND GYROTRONS</b> .....                                                                                                                            | 230 |
| <i>Surbhi Adya ; M. V. Kartikeyan ; Udaybir Singh</i>                                                                                                                                                        |     |
| <b>NOVEL COLD CATHODE DESIGN FOR MM-WAVE (THZ) SPATIAL HARMONIC MAGNETRONS</b> .....                                                                                                                         | 232 |
| <i>Rajendra Kumar Verma ; Shivendra Maurya ; Rajendra Kumar Sharma</i>                                                                                                                                       |     |
| <b>DESIGN OF AN KA-BAND MULTIPLE-BEAM CORRUGATED WAVEGUIDE TWT</b> .....                                                                                                                                     | 234 |
| <i>Luanfeng Gao ; Yulu Hu ; Quan Hu ; Xiaofang Zhu ; Bin Li</i>                                                                                                                                              |     |
| <b>TAPE-HELIX ANALYSIS OF SHIELDED PLANAR HELIX SLOW-WAVE STRUCTURE</b> .....                                                                                                                                | 236 |
| <i>Kumar M. M. Ajith ; Sheel Aditya</i>                                                                                                                                                                      |     |
| <b>DEVELOPMENT OF THE SECOND HARMONIC DUAL MODE GYROTRON FOR OAM BEAM GENERATION</b> .....                                                                                                                   | 238 |
| <i>Ashwini Sawant ; Ingeun Lee ; Eunmi Choi</i>                                                                                                                                                              |     |
| <b>EXPERIMENTAL STUDY OF A 6 KW W-BAND PCM FOCUSED SHEET BEAM EIO</b> .....                                                                                                                                  | 240 |
| <i>Jianxun Wang ; Xiaoxiao Li ; Lingshan Rui ; Zeng Liu ; Guo Liu ; Wei Jiang ; Zewei Wu ; Yulu Hu ; Yong Luo</i>                                                                                            |     |
| <b>STUDY OF SLOW WAVE STRUCTURE WITH DOUBLE CORRUGATED WAVEGUIDE SHIELDED BY PHOTONIC CRYSTALS</b> .....                                                                                                     | 242 |
| <i>Hongxia Yi ; Liu Xiao ; Mingguang Huang</i>                                                                                                                                                               |     |
| <b>DESIGN OF Q BAND FOLDED WAVEGUIDE SLOW WAVE STRUCTURES WITH PHASE VELOCITY TAPER NEAR CUTOFF REGION</b> .....                                                                                             | 244 |
| <i>Ruifeng Zhang ; Qi Wang ; Ping Han ; Zhixin Yang ; Zugen Guo ; Rujing Ji ; Huarong Gong</i>                                                                                                               |     |
| <b>THERMAL ANALYSIS OF THE SLOW WAVE STRUCTURE (SWS) ASSEMBLY OF THE TRAVELLING WAVE TUBE</b> .....                                                                                                          | 246 |
| <i>Chirag Mistry ; Sanjay Kumar Ghosh</i>                                                                                                                                                                    |     |
| <b>POWERFUL W-BAND SURFACE-WAVE OSCILLATOR BASED ON HIGH-CURRENT RELATIVISTIC SHEET ELECTRON BEAM: DESIGN AND SIMULATIONS</b> .....                                                                          | 248 |
| <i>Nikolai Yu. Peskov ; Petr V. Kalinin ; Stanislav L. Sinitsky ; Andrey V. Arzhannikov ; Evgeny S. Sandalov ; Vasily D. Stepanov ; Naum S. Ginzburg ; Alexander S. Sergeev ; Vladislav Yu. Zaslavsky</i>    |     |
| <b>6 KW L-BAND PULSED MBK WITH BROAD FREQUENCY BAND OF 15%</b> .....                                                                                                                                         | 250 |
| <i>Igor Guzilov</i>                                                                                                                                                                                          |     |
| <b>INFLUENCE OF THE MAGNETIC FIELD AND IMPEDANCE OF PULSED POWER SYSTEM ON THE RESONANCE OF MAGNETRON WITH DIFFRACTION OUTPUT</b> .....                                                                      | 252 |
| <i>Shen Shou Max Chung ; Shih-Chung Tuan</i>                                                                                                                                                                 |     |
| <b>DESIGN OF A QUASI FLAT-ROOFED SINE WAVEGUIDE SLOW-WAVE STRUCTURE FOR 220GHZ TWT</b> .....                                                                                                                 | 254 |
| <i>Xuebing Jiang ; Jin Xu ; Hairong Yin ; Shuangzhu Fang ; Pengcheng Yin ; Xia Lei ; Gangxiong Wu ; Ruichao Yang ; Guo Guo ; Lingna Yue ; Wenxiang Wang ; Guoqing Zhao ; Yanyu Wei ; Dazhi Li ; Fei Shen</i> |     |
| <b>DEVELOPMENT OF 50W V-BAND SPACE TRAVELLING WAVE TUBE</b> .....                                                                                                                                            | 256 |
| <i>Ksong Tang ; Cha Gao ; Jitian Wang ; Feng Zou ; Gxing Miao ; X Bao Su ; Gang Wang</i>                                                                                                                     |     |
| <b>INVESTIGATION OF X-BAND COAXIAL MAGNETRON USING THREE-DIMENSIONAL PARTICLE-IN-CELL SIMULATION</b> .....                                                                                                   | 258 |
| <i>Jeong-Hun Lee ; Geun-Ju Kim ; Sanghoon Kim ; Yong-Seok Lee ; Insoo S. Kim ; Jung-Il Kim</i>                                                                                                               |     |
| <b>WIDEBAND CHAOTIC GENERATION IN K-BAND HELICAL WAVEGUIDE GYRO-TWT WITH EXTERNAL REFLECTIONS</b> .....                                                                                                      | 260 |
| <i>Alexander Bogdashov ; Naum Ginzburg ; Roman Rozental ; Sergey Samsonov ; Alexander Sergeev ; Irina Zotova</i>                                                                                             |     |

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |     |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|
| <b>A HIGH POWER W-BAND EXTENDED INTERACTION KLYSTRON</b> .....                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 261 |
| <i>Ying Wei ; Dongfeng Li ; Jun Zhou ; Jitao Yang ; Liang Yin ; Jiajia Ouyang</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |     |
| <b>ELECTROMAGNETIC AND THERMAL ANALYSIS OF HIGH-ORDER MODE RF WINDOW</b> .....                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 262 |
| <i>Xinde Sheng ; Jirun Luo ; Min Zhu ; Wei Guo ; Yu Fan</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |     |
| <b>SIMULATION STUDY OF COMPACT CARBON NANOTUBE COLD-CATHODE OSCILLATOR</b> .....                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 264 |
| <i>Xiaotao Xu ; Yifan Zu ; Xuesong Yuan ; Qingyun Chen ; Bin Wang ; Hailong Li ; Yang Yan</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |     |
| <b>CLOSED-FORM EXPRESSIONS FOR FREQUENCIES AND DIFFRACTION Q FACTORS OF OPEN GYROTRON CAVITY</b> .....                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 266 |
| <i>Andrey G. Rozhnev</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |     |
| <b>DEVELOPMENTS OF TERAHERTZ LARGE-ORBIT HIGH-HARMONIC GYROTRONS AT IAP RAS</b> .....                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 268 |
| <i>Ilya Bandurkin ; Vladimir Manuilov ; Vladimir Bratman ; Ivan Osharin ; Yuriy Kalynov ; Andrei Savilov</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |     |
| <b>DESIGN OF KA-BAND MW-LEVEL LOW-VOLTAGE HIGH-CURRENT GYROKLYSTRON</b> .....                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 270 |
| <i>Shiyu Wang ; Li Wang ; Chao Fang ; Yong Luo ; Guoxiang Shu ; Fuyong Zhang</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |     |
| <b>THIRD-HARMONIC OPERATING EXTENDED INTERACTION OSCILLATOR</b> .....                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 272 |
| <i>Ping Zhang ; Ying Yonq ; Xiaosong Wang ; Liangjie Bi ; Bin Wang ; Lin Meng</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |     |
| <b>COMPACT FREE-ELECTRON LASERS USING LASER DRIVEN CASCADED DIELECTRIC NANO-PILLAR ARRAYS</b> .....                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 274 |
| <i>Linbo Liang ; Weihao Liu ; Qika Jia ; Lin Wang ; Yalin Lu</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |     |
| <b>A NOVEL PHASE-LOCKING STRUCTURE APPLIED TO MILLIMETER-WAVE MAGNETRONS</b> .....                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 276 |
| <i>Tianqi Hu ; Minsheng Song ; Yong Yon ; Bin Wang ; Hailong Li ; Lin Meng</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |     |
| <b>FROM W7-X TOWARDS ITER AND BEYOND: 2019 STATUS ON EU FUSION GYROTRON DEVELOPMENTS</b> .....                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 278 |
| <i>John Jelonnek ; Gaetano Aiello ; Ferran Albaier ; Stefano Alberti ; Konstantinos A. Avramidis ; Andrea Bertinetti ; Philipp T. Brucker ; Alex Bruschi ; Ioannis Chelis ; Jérémie Dubray ; Francesco Fanale ; Damien Fasel ; Thomas Franke ; Gerd Gantenbein ; Saul Garavaglia ; Jérémy Genoud ; Gustavo Granucci ; Jean-Philippe Hogge ; Stefan Illy ; Zisis C. Ioannidis ; Jianbo Jin ; Heinrich Laqua ; George P. Latsas ; Alberto Lcggieri ; Francois Legrand ; Rodolphe Marchesin ; Alexander Marek ; Blaise Marlétaz ; Martin Obermaier ; Ioannis Gr. Pagonakis ; Dimitrios V. Peponis ; Sebastian Ruess ; Tobias Ruess ; Tomasz Rzesnicki ; Paco Sanchez ; Laura Savoldi ; T. Scherer ; D. Strauss ; Philippe Thouvenin ; Manfred Thumm ; Ioannis Tigelis ; Minh-Quang Tran ; Fabian Wilde ; Chuanren Wu ; Anastasios Zisis</i> |     |
| <b>INVESTIGATION ON W-BAND 100W THREE-SECTION RIDGE-LOADED FOLDED WAVEGUIDE TWT</b> .....                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 280 |
| <i>Fei Li ; Liu Xiao ; Jiandong Zhao ; Yuhui Sun ; Tianjun Ma ; Linlin Cao ; Jian Wang ; Hongxia Yi ; Xinwen Shang ; Mingguang Huang</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |     |
| <b>DESIGN AND ANALYSIS OF A HIGH-GAIN HIGH-POWER CASCADED 220GHZ FWGTWT</b> .....                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 282 |
| <i>Xiaochuan Zou ; Qianzhong Xue ; Xuwei Wang</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |     |
| <b>DESIGN STUDY OF HIGH EFFICIENCY CW KLYSTRON FOR CEPC</b> .....                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 284 |
| <i>O. Z. Xiao ; Z. S. Zhou ; Zaid-Un-Nisa ; S. C. Wang ; G.X. Pei ; D. Dong ; S. Fukuda</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |     |
| <b>71-76 GHZ FOLDED WAVEGUIDE TWT FOR SATELLITE COMMUNICATIONS</b> .....                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 286 |
| <i>C.W. Robertson ; A.W. Cross ; C. Gilmour ; D. Dyson ; P. G. Huggard ; F. Cahill ; M. Beardsley ; R. Dionisio ; K. Ronald</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |     |
| <b>DESIGN OF D-BAND DOUBLE CORRUGATED WAVEGUIDE TWT FOR WIRELESS COMMUNICATIONS</b> .....                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 288 |
| <i>Rupa Basu. Laxma R. Billa ; Jeevan M. Rao ; Rosa Letizia ; Claudio Paoloni</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |     |
| <b>NOVEL SCHEMES OF HIGH-POWER RELATIVISTIC VIRCATORS</b> .....                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 290 |
| <i>Semen Kurkin ; Alexey Koronovskii ; Artem Badarin ; Alexander Hramov ; Alexey Rak</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |     |
| <b>PRELIMINARY STUDY OF A NEW MEANDER LINE FOR W-BAND TWT</b> .....                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 292 |
| <i>Juan M. Socuëllamos ; Rosa Letizia ; Roberto Dionisio ; Claudio Paoloni</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |     |
| <b>RF-UNDULATORS AND POWERING SOURCES TOWARDS COMPACT EFFICIENT COMPTON FEL-SCATTRONS</b> .....                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 294 |
| <i>Nikolai Yu. Peskov ; Andrey N. Denisenko ; Andrey V. Savilov ; Edward B. Abubakirov ; Naum S. Ginzburg ; Alexander A. Vikharev ; Ilya V. Bandurkin ; Sergey V. Kuzikov ; Vladislav Yu. Zaslavsky</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |     |
| <b>DESIGN OF CEPC HIGH EFFICIENCY MULTIBEAM KLYSTRON</b> .....                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 296 |
| <i>Shengehang Wang ; Zusheng Zhou ; Un-Nisa Zaib ; Zhijun Lu ; Shilun Pei ; Dong Dong ; Ouzheng Xiao ; Guoxi Pei ; Shigeki Fukuda</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |     |
| <b>CONCEPTUAL RF DESIGN OF 3.7 GHZ 20 KW CW MAGNETRON FOR LHCD SYSTEM OF TOKAMAKS</b> .....                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 298 |
| <i>Aviraj R. Jadhav ; Joseph John ; Kushal Tuckley ; Harish V. Dixit ; P. K. Sharma</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |     |
| <b>DESIGN OF THE 94GHZ, TE<sub>62</sub> MODE GENERATOR USING QUASI-OPTICAL TECHNIQUES</b> .....                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 300 |
| <i>Shuang Chen ; Jinhao Li ; Yinghui Liu ; Jianwei Liu ; Xinjian Niu ; Hui Wang ; Guo Guo ; Lina Wang ; Tao Song</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |     |

|                                                                                                                                                      |            |
|------------------------------------------------------------------------------------------------------------------------------------------------------|------------|
| <b>DEVELOPMENT OF A SOLID STATE PULSED POWER SUPPLY IGBT MODULATOR FOR GYROTRON TWT .....</b>                                                        | <b>302</b> |
| <i>Youlei Pu ; Zewei Wu ; Junqian Jir ; Guo Liu ; Wei Jiang ; Zhigang Lu ; Yong Luo</i>                                                              |            |
| <b>INJECTION-LOCKED CW MAGNETRON FOR A WIRELESSLY-POWERED TV .....</b>                                                                               | <b>304</b> |
| <i>Bo Yang ; Tomohiko Mitani ; Naoki Shinohara</i>                                                                                                   |            |
| <b>DEVELOPMENT OF A HIGH EFFICIENCY COUPLED-CAVITY TRAVELING WAVE TUBE .....</b>                                                                     | <b>306</b> |
| <i>Daxi Ji ; Ling Zhu ; Wanchao Huang ; Hang Tian ; Yun Chen ; Xirui Zhan ; Zhaoyun Duan</i>                                                         |            |
| <b>THE CAUSE OF FORWARD LEAKAGE CURRENT IN PULSED MAGNETRON WITH DIFFRACTION OUTPUT.....</b>                                                         | <b>308</b> |
| <i>Shen Shou Max Chung ; Shih-Chung Tuan</i>                                                                                                         |            |
| <b>DEVELOPMENT OF AN X-BAND 650-KW PEAK OUTPUT POWER KLYSTRON WITH A 100-MHZ INSTANTANEOUS BANDWIDTH .....</b>                                       | <b>310</b> |
| <i>Zhu Fang ; Liu Yueqing ; Li Yakun ; Zhang Zhenxia ; Li Xiuxia ; Zhou Guanli ; Wang Weilong ; Zhang Zhaochuan ; Luo Jirun</i>                      |            |
| <b>SYSTEM DEVELOPMENT AND PERFORMACE EVALUATION OF A 0.272 THZ PULSED FOLDED WAVEGUIDE TRAVELING WAVE TUBE OSCILLATOR.....</b>                       | <b>312</b> |
| <i>Ingeun Lee ; Wonjin Choi ; Ashwini Sawant ; Mun Seok Choe ; Jinwoo Shin ; Runmi Choi</i>                                                          |            |
| <b>BEAM-MATCHING DESIGN FOR SUPPRESSING BEAM LOSSES IN HIGH-POWER KLYSTRONS .....</b>                                                                | <b>314</b> |
| <i>Jihyun Hwang ; Sung-Ju Park ; Yong-Jeong Park ; Won Namkung ; Dongho Yu ; Daehee Kim ; Sungsu Cha</i>                                             |            |
| <b>DESIGN STUDY OF TWO-PLANE FOCUSING PERIODICALLY CUSPED MAGNETS FOR A 300 GHZ SHEET BEAM TRAVELING-WAVE TUBE .....</b>                             | <b>316</b> |
| <i>Wonjin Choi ; Ingeun Lee ; Eunmi Choi ; Jinwoo Shin</i>                                                                                           |            |
| <b>TUNING RESULTS OF THE PULSE ENERGY DOUBLER .....</b>                                                                                              | <b>318</b> |
| <i>Kwanghoon Kim ; Soung-Soo Park ; Sang-Hee Kim ; Young-Lung Park ; Juho Hong ; Chang-Ki Min ; Heung-Soo Lee ; Heung-Sik Long</i>                   |            |
| <b>220GHZ SINE WAVEGUIDE BWO WITH LARGE BEAM TUNNEL.....</b>                                                                                         | <b>320</b> |
| <i>P.C. Yin ; H. R. Yin ; J. Xu ; S. Z. Fang ; X. Lei ; G.X. Wu ; L.N. Yue ; G.Q. Zhao ; W.X. Wang ; Y. Y. Wei ; Luqi Zhang ; Dazhi Li</i>           |            |
| <b>DEVELOPMENT OF MICRO FABRICATED SCANDATE DISPENSER CATHODE AND ELECTRON GUN FOR TERAHERTZ VACUUM ELECTRON DEVICES .....</b>                       | <b>322</b> |
| <i>Seong Lee ; Jung Hyo Park ; Jinwoo Shin ; Changgu Kim ; Joonho So</i>                                                                             |            |
| <b>DEVELOPMENT OF A HIGH-POWER TERAHERTZ FREE ELECTRON LASER USING A MICROTRON ACCELERATOR AND AN ELECTRO-MAGNETIC PLANAR UNDULATOR.....</b>         | <b>324</b> |
| <i>Sangyoon Bae ; Boris A. Gudkov ; Min Yong Jeon ; Sergey Miginsky ; Kyu-Ha Jang ; Young Uk Jeong ; Taesik Yoon ; Kitae Lee</i>                     |            |
| <b>EFFECT OF ELECTRON BEAM VELOCITY NONUNIFORM ON HELIX TWT OUTPUT PERFORMANCE.....</b>                                                              | <b>326</b> |
| <i>Changsheng Shen ; Ningfeng Bai ; Jin Zhang ; Xiaohan Sun ; Hehong Fan</i>                                                                         |            |
| <b>FABRICATION AND MEASUREMENTS OF A PLANAR SLOW WAVE STRUCTURE OPERATING IN V-BAND .....</b>                                                        | <b>328</b> |
| <i>Giacomo Ulisse ; Andrey Starodubov ; Viktor Galushka ; Viktor Krozer ; Alexey Serdobintsev ; Mikhail Samarskiy ; Nikita Ryskin ; Anton Pavlov</i> |            |
| <b>EFFECT OF THERMAL DEFORMATION ON THERMAL CONTACT RESISTANCE BETWEEN HELIX AND SUPPORT RODS IN HELIX TWT .....</b>                                 | <b>330</b> |
| <i>Jinyan Wang ; Jin Zhang ; Xiaohan Sun</i>                                                                                                         |            |
| <b>A THREE-DIMENSIONAL MODEL OF BEAM-WAVE INTERACTION IN A COUPLED-CAVITY TWT .....</b>                                                              | <b>332</b> |
| <i>Xinhe Wang ; Yu Fan ; Gang Wang ; Jirun Luo ; Min Zhu ; Wei Guo</i>                                                                               |            |
| <b>DEVELOPMENT OF MEGAWATT GYROTRONS IN IAP/GYCOM.....</b>                                                                                           | <b>334</b> |
| <i>G. Denisov ; A. Litvak ; E. Sokolov ; A. Chirkov ; A. Ereemeev ; E. Tai ; E. Soluyanov ; V. Myasnikov ; L. Popoy</i>                              |            |
| <b>MEGAWATT POWER-LEVEL G-BAND PLANAR GYROTRONS WITH TRANSVERSE ENERGY EXTRACTION .....</b>                                                          | <b>336</b> |
| <i>Naum Ginzburg ; Vladislav Zaslavsky ; Alexander Sergeev</i>                                                                                       |            |
| <b>ESTIMATING INTERNAL TEMPERATURE OF SLOW WAVE STRUCTURE BASED ON RBF NEURAL NETWORK AND DESIGNING TEST MODEL .....</b>                             | <b>338</b> |
| <i>Xingqun Zhao ; Xiaoting Ying ; Xiaohan Sun</i>                                                                                                    |            |
| <b>RESEARCH ON THE TEST METHOD OF OUTPUT HOT STANDING WAVE OF HIGH POWER TWT.....</b>                                                                | <b>340</b> |
| <i>Xin'ai Liu ; Feng Zou ; Gang Wang ; Guoxing Miao ; Fangfang Song</i>                                                                              |            |
| <b>THE CALCULATION AND DESIGN OF A 140GHZ MW-CLASS GYROTRON AT IECAS.....</b>                                                                        | <b>342</b> |
| <i>Min Zhu ; Jirun Luo ; Wei Guo ; Chen Yang ; Wenqi Li ; He Zhu</i>                                                                                 |            |

|                                                                                                                                                                      |            |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|
| <b>A NOVEL METHOD FOR TESTING THE INNER TEMPERATURE OF HELIX TWT UNDER OPERATION USING FBG .....</b>                                                                 | <b>344</b> |
| <i>Jin Zhang ; Lei Zhang ; Jinyan Wang ; Yanmei Wang ; Xiaohan Sun ; Jinjun Feng ; Baoliang Hao</i>                                                                  |            |
| <b>DEVELOPMENT OF ULTRASHORT PULSE GENERATORS BASED ON HELICAL GYRO-TWT WITH SATURABLE CYCLOTRON RESONANCE ABSORBER IN THE FEEDBACK LOOP .....</b>                   | <b>346</b> |
| <i>Naum Ginzburg ; Grigory Denisov ; Michael Vilkov ; Alexander Sergeev ; Sergey Samsonov ; Irina Zotova ; Alexander Bogdashov ; Alexander Marek ; John Jelonnek</i> |            |
| <b>DESIGN AND EXPERIMENT OF INPUT COUPLING SECTION FOR COUPLED-CAVITY TRAVELING WAVE TUBE .....</b>                                                                  | <b>348</b> |
| <i>Wei Guo ; Min Zhu ; Jirun Luo</i>                                                                                                                                 |            |
| <b>DESIGN OF A 0.35 THZ EXTENDED INTERACTION OSCILLATOR BASED ON PSEUDOSPARK-SOURCED SHEET ELECTRON BEAM.....</b>                                                    | <b>350</b> |
| <i>Jie Xie ; Adrian W. Cross ; Wenlong He ; Huabi. Yin ; Liang Zhang ; Alan D. R. Phelps</i>                                                                         |            |
| <b>O-TYPE MILLIMETER-WAVE BAND DEVICES ON THE SPIRAL BENT RECTANGULAR WAVEGUIDE.....</b>                                                                             | <b>352</b> |
| <i>Alexander Kurayev ; Semen Kurkin ; Alexey Rak ; Alexey Koronovskii ; Artem Badarin</i>                                                                            |            |
| <b>OPTIMIZATION OF VOLUME FREE-ELECTRON LASER WITH PHOTONIC CRYSTAL FOIL GRID STRUCTURE FOR OPERATION IN SUB-TERAHERTZ RANGE.....</b>                                | <b>354</b> |
| <i>Artem Badarin ; Nikita Frolov ; Alexey Rak ; Semen Kurkin</i>                                                                                                     |            |
| <b>INFLUENCE OF IONIZATION PROCESSES ON VIRTUAL CATHODE FORMATION.....</b>                                                                                           | <b>356</b> |
| <i>Artem Badarin ; Alexander Hramov ; Semen Kurkin ; Alexey Koronovskii</i>                                                                                          |            |
| <b>EXPERIMENTS ON A RECIRCULATING PLANAR CROSSED-FIELD AMPLIFIER .....</b>                                                                                           | <b>358</b> |
| <i>Steven C. Exelby ; Geoffrey B. Greening ; Nicholas M. Jordan ; Drew A. Packard ; Yue Ying Lau ; Ronald M. Gilgenbach ; Brad W. Hoff ; David Simon</i>             |            |
| <b>DESIGN OF SLOW WAVE STRUCTURE FOR G-BAND TWT FOR HIGH DATA RATE LINKS .....</b>                                                                                   | <b>360</b> |
| <i>Rupa Basu. Laxma R. Billa ; Jeevan M. Rao ; Rosa Letizia ; Claudio Paoloni</i>                                                                                    |            |
| <b>ENERGY EFFICIENT KLYSTRON OPERATION AT SATURATION: POSSIBILITY DUE TO NOVEL MODULATOR .....</b>                                                                   | <b>362</b> |
| <i>Rutambhara Yogi ; Carlos Martins</i>                                                                                                                              |            |
| <b>HYBRID MICROWAVE DEVICE BASED ON THE VIRCATOR WITH ADDITIONAL ELECTRODYNAMIC SECTION .....</b>                                                                    | <b>365</b> |
| <i>Andrey Starodubov ; Nikolay Kuznetsov ; Alexey Koronovskii ; Yurii Kalinin</i>                                                                                    |            |
| <b>STUDY ON BEAM WAVE INTERACTION AND MODE COMPETITION IN A FUSION GYROTRON USING 3-D EM PIC SIMULATION .....</b>                                                    | <b>367</b> |
| <i>Ming-Chieh Lin ; David N. Smithe</i>                                                                                                                              |            |
| <b>3-D EM PIC SIMULATION STUDY ON LOW-FREQUENCY OSCILLATION IN A FUSION GYROTRON.....</b>                                                                            | <b>369</b> |
| <i>Ming-Chieh Lin ; David N. Smithe</i>                                                                                                                              |            |
| <b>OPERATIONAL CHARACTERISTICS OF A 30KWW-BAND GYROTRON DEVELOPED AT KERI.....</b>                                                                                   | <b>371</b> |
| <i>Varun Pathania ; Hasina Khatun ; Seong-Tae Han</i>                                                                                                                |            |
| <b>DEFECT-ENHANCED FIELD ELECTRON EMISSION FROM WO<sub>3-X</sub> NANOWIRES .....</b>                                                                                 | <b>373</b> |
| <i>Zufang Lin ; Paibin Xie ; Jun Chen</i>                                                                                                                            |            |
| <b>EXPERIMENTAL STUDY ON AXIAL VIRTUAL CATHODE OSCILLATOR OPERATED USING 140J/170KV PULSED SOURCE .....</b>                                                          | <b>375</b> |
| <i>Se-Hoon Kim ; Chang-Jin Lee ; Kwang-Cheol Ko</i>                                                                                                                  |            |
| <b>ON FILTER SYSTEM TUNING OF WIDEBAND MULTIBEAM KLYSTRON WITH HIGH-MODE DOUBLE-GAP OUTPUT CAVITY .....</b>                                                          | <b>377</b> |
| <i>Anatoly Galdetskiy ; Nikita Golovanov ; Serguey Scherbakov</i>                                                                                                    |            |
| <b>BACKWARD-WAVE OSCILLATOR WITH DISTRIBUTED POWER EXTRACTION BASED ON EXCEPTIONAL POINT OF DEGENERACY AND GAIN AND RADIATION-LOSS BALANCE.....</b>                  | <b>379</b> |
| <i>Tarek Mealy ; Ahmed F. Abdelshafy ; Filippo Capolino</i>                                                                                                          |            |
| <b>LOW STARTING CURRENT OSCILLATOR BASED ON THE DEGENERATE BAND EDGE IN A DOUBLE HELIX SLOW WAVE STRUCTURE .....</b>                                                 | <b>381</b> |
| <i>Ahmed F. Abdelshafy ; Tarek Mealy ; Alexander Figotin ; Filippo Capolino</i>                                                                                      |            |
| <b>ALIGNMENT OF CARBON NANOTUBES INSIDE THE FIBERS THROUGH INTERFACIAL INTERACTION OF NANOPARTICLES FOR USING AS CATHODE FOR FIELD EMISSION.....</b>                 | <b>383</b> |
| <i>Muhammad Mohsin Hossain ; Dongpyo Hong ; Matlabjon Sattorov ; Seontae Kim ; Gun-Sik Park</i>                                                                      |            |
| <b>THE DESIGN AND MANUFACTURE OF VACUUM ELECTRONIC AMPLIFIERS: PROGRESS AND CHALLENGES.....</b>                                                                      | <b>385</b> |
| <i>Baruch Levush</i>                                                                                                                                                 |            |

|                                                                                                                                                                 |     |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|
| <b>FIELD EMISSION PROPERTIES OF POLYACRYLONITRILE(PAN) CARBON FIBERS OF VARIOUS PROCESSING TEMPERATURES.....</b>                                                | 390 |
| <i>Htet Win Aung ; E. P. Sheshin ; Wai Zin Hlaing ; Nyein Chan Kyaw</i>                                                                                         |     |
| <b>FIELD EMISSION PROPERTIES THIN FOILS BASED ON CARBON MATERIALS.....</b>                                                                                      | 393 |
| <i>Wai Zin Hlaing ; Nyein Chan Kyaw ; Evgeny P. Sheshin ; Htet Win Aung</i>                                                                                     |     |
| <b>PLANAR GRAPHENE EDGE FIELD EMITTER DESIGN WITH IMPROVED EMISSION CURRENT .....</b>                                                                           | 398 |
| <i>Jonathan L Shaw ; John B Boos ; Byoung Don Kong ; J. Mittereder</i>                                                                                          |     |
| <b>DESIGN OF 0.22THZ FOLDED-WAVEGUIDE OSCILLATOR.....</b>                                                                                                       | 400 |
| <i>Yi Jiang ; Wenqiang Lei ; Peng Hu ; Rui Song ; Huang Yinhu ; Ma Guowu ; Hongbin Chen ; Xiao Jin</i>                                                          |     |
| <b>STUDY OF AN AIRBORNE 220 GHZ TRAVELING WAVE TUBE AMPLIFIER.....</b>                                                                                          | 402 |
| <i>Pan Pan ; Ye Tang ; Yinxing Chen ; Jinjun Feng</i>                                                                                                           |     |
| <b>INVESTIGATION OF A W-BAND <math>\pi</math> BAND-EDGE OSCILLATOR.....</b>                                                                                     | 404 |
| <i>Jun Cai ; Yinghua Du ; Xiaoqing Zhang ; Jinjun Feng</i>                                                                                                      |     |
| <b>DESIGN OF A 0.67THZ FOLDED WAVEGUIDE TWT .....</b>                                                                                                           | 405 |
| <i>Huang Yinhu ; Rui Song ; Hu Peng ; Jiang Yi ; Wenqiang Lei ; Chen Hongbin</i>                                                                                |     |
| <b>STUDIES ON SUB-THZ SHEET-BEAM TWT WITH STAGGERED GRATING SLOW-WAVE STRUCTURE .....</b>                                                                       | 407 |
| <i>Anton A. Burtsev ; Aleksei V. Danilushkin ; Igor A. Navrotsky ; Andrey E. Ploskih ; Nikita M. Ryskin ; Vladimir N. Titov</i>                                 |     |
| <b>THE PHOTORESPONSE OF ZNO NANOWIRE COLD CATHODE FLAT PANEL DETECTOR USING ZNS PHOTOCONDUCTOR.....</b>                                                         | 409 |
| <i>Xinpeng Bai ; Zhipeng Zhang ; Kai Wang ; Juncong She ; Shaozhi Deng ; Ningsheng Xu ; Jun Chen</i>                                                            |     |
| <b>INVESTIGATION OF A SHEET BEAM RF STRUCTURE WITH BRAGG REFLECTOR FOR W BAND AMPLIFIER.....</b>                                                                | 411 |
| <i>Richards Joe Stanislaus ; Anirban Bera ; Rajendra Kumar Sharma</i>                                                                                           |     |
| <b>OUTPUT COUPLER FOR A THZ GYRO-AMPLIFIER.....</b>                                                                                                             | 413 |
| <i>Craig R. Donaldson ; Liang Zhang ; Wenlong He</i>                                                                                                            |     |
| <b>OPTIMIZATION OF 0.1 THZ PLANAR INTERACTION STRUCTURE FOR HIGHER EFFICIENCY .....</b>                                                                         | 415 |
| <i>Subhendu Chakraborty ; N. Purushothaman ; Nikita Gurjar ; Niraj Kumar ; R. K Sharma</i>                                                                      |     |
| <b>HIGHER HARMONIC OF SUPER-RADIANT SMITH-PURCELL RADIATION .....</b>                                                                                           | 417 |
| <i>Zijie Xiong ; Min Hu ; Xiaoqiuyan Zhang ; Zhenghua Wu ; Pengfei Hu ; Shaojie Chang ; Chuanhong Xiao ; Shenggang Liu</i>                                      |     |
| <b>A NEW TYPE OF THE SMALL-SIZED DOUBLE-GAP MULTI-BEAM KLYSTRON RESONATOR BASED ON GREEK-CROSS FRACTAL GEOMETRY.....</b>                                        | 419 |
| <i>Vladislav A. Tsarev ; Alexey Yu. Miroshnichenko ; Natalia A. Akafyeva</i>                                                                                    |     |
| <b>INVESTIGATION ON 0.5THZ BACKWARD WAVE OSCILLATOR BASED ON TWO-SECTION RECTANGULAR GRATINGS.....</b>                                                          | 421 |
| <i>Wenxin Liu ; Qiangqing Ye ; Xin Guo ; Chao Zhao ; Zhaochuan Zhang</i>                                                                                        |     |
| <b>FABRICATION OF HIGH RESOLUTION ELECTRON SOURCE FOR MICROSCOPE APPLICATION .....</b>                                                                          | 423 |
| <i>Ha Rim Lee ; Kyu Chang Park</i>                                                                                                                              |     |
| <b>OPERATION STATUS OF 80 MW KLYSTRON AND 200 MW MODULATOR FOR P AL- XFEL.....</b>                                                                              | 425 |
| <i>Soung-Soo Park ; Sang Hee Kim ; Kwang-Hoon Kim ; Yong Jung Park ; Chang-Ki Min ; Heung-Sik Kang</i>                                                          |     |
| <b>A NOVEL INTERLEAVED STRUCTURE HIGH-VOLTAGE TRANSFORMER AND ITS APPLICATION IN TWTA.....</b>                                                                  | 428 |
| <i>Depeng Bai ; Bin He ; Xiaoming Ji ; Weibo Huang ; Xinbo Ruan ; Bin Zhou</i>                                                                                  |     |
| <b>DESIGN AND MEASUREMENT OF INDUCTION VOLTAGE ADDER WITH AMORPHOUS METAL MAGNETIC CORES.....</b>                                                               | 432 |
| <i>Jong-Won Yang ; Heo Hoon ; Woosang Lee ; Young Joon Yoon ; Han-Yong Ryu</i>                                                                                  |     |
| <b>RESEARCH OF BROADBAND DIGITAL PREDISTORTION WITH LOW SAMPLING FREQUENCY.....</b>                                                                             | 434 |
| <i>Rong Lan ; Xin Hu ; Gang Wang ; Jirun Luo ; Lianbing Li ; Jingyan Song</i>                                                                                   |     |
| <b>ANALYSIS OF HIGH FREQUENCY FLYBACK CONVERTERS FOR HIGH-VOLTAGE LOW-POWER APPLICATIONS .....</b>                                                              | 436 |
| <i>Bin Zhao ; Gang Wang ; Dong Lei Wang</i>                                                                                                                     |     |
| <b>ANALYSIS AND DESIGN OF THE RESONANT CURRENT OF THE LCLC RESONANT CONVERTERS WITH CONSIDERATION OF ZERO-VOLTAGE SWITCHING AND ZERO-CURRENT SWITCHING.....</b> | 439 |
| <i>Bin Zhao ; Gang Wang ; Dong Lei Wang</i>                                                                                                                     |     |

|                                                                                                                                                  |     |
|--------------------------------------------------------------------------------------------------------------------------------------------------|-----|
| <b>A BROADBAND THREE-WAY POWER DIVIDER BASED ON E-Y STRUCTURE</b> .....                                                                          | 442 |
| <i>Zhe Wang ; Youlei Pu ; Wei Shao ; Xin Wang ; Yong Luo</i>                                                                                     |     |
| <b>A BROADBAND RIDGE GAP WAVEGUIDE TO MICRO-STRIP TRANSITION USING PROBE CURRENT COUPLING</b> .....                                              | 444 |
| <i>Songtao Peng ; Youlei Pu ; Wei Shao ; Xin Wang ; Yong Luo</i>                                                                                 |     |
| <b>DEVELOPMENT OF A 3.3 KJ SYSTEM AND A 300 KJ SYSTEM FOR TRIGGERED VACUUM SWITCH</b> .....                                                      | 446 |
| <i>Wung-Hoa Park ; Byung-Joon Lee ; Hyung Seop Kong ; Suk Ho An</i>                                                                              |     |
| <b>DESIGN OF A BROAD-BAND CIRCULAR WAVEGUIDE TE<sub>21</sub> MODE GENERATOR FOR COLD TEST OF GYRO-TWT</b> .....                                  | 448 |
| <i>Yong Xu ; Hao Li ; Tinghui Peng ; Miao Sun ; Yong Luo ; Guo Liu ; Jianxun Wang ; Wei Jiang ; Zewei Wu ; Hongfu Li</i>                         |     |
| <b>DESIGN OF A Q-BAND CIRCULAR WAVEGUIDE TE<sub>01</sub> MODE CONVERTER</b> .....                                                                | 450 |
| <i>Tinghui Peng ; Yong Xu ; Miao Sun ; Ya Mao ; Weijie Wang ; Yong Luo</i>                                                                       |     |
| <b>INTEGRATED KLYSTRON TEST STAND</b> .....                                                                                                      | 452 |
| <i>P.J. Gaudreau P.E. Marcel ; Luan Jashari ; Michael Kempkes ; Rebecca Simpson</i>                                                              |     |
| <b>ESS KLYSTRON PRODUCTION TEST STAND</b> .....                                                                                                  | 454 |
| <i>P.J. Marcel ; P.E. Gaudreau ; Ian Roth ; Noah Silverman ; Michael Kempkes ; Rebecca Simpson</i>                                               |     |
| <b>EVANESCENT MODE RESONANCE IN METASURFACE ANTENNA ON METAL SURFACE</b> .....                                                                   | 456 |
| <i>Jagannath Malik ; Sai Kiran Oruganti ; Woojin Park ; Bonyoung Lee ; Seoktae Seo ; Nak-Young Ko ; Dipra Paul ; Hak-Sun Kim ; Franklin Bien</i> |     |
| <b>MAGNETRON POWER MODULATOR FOR DRIVING A MICROTRON THZ FEL</b> .....                                                                           | 458 |
| <i>Taesik Yoon ; Sergey Miginsky ; Kitae Lee ; B. A. Gudkov ; Young Uk Jeong ; Min Yong Jeon ; Sangyoon Bae ; Kyu-Ha Jang</i>                    |     |
| <b>A VACUUM ARC DIAGNOSIS METHOD FOR THE HIGH VOLTAGE POWER SUPPLY OF VACUUM TUBES</b> .....                                                     | 461 |
| <i>Ramin Ayoubi ; Mostafa Rahmanian ; Shahriyar Kaboli</i>                                                                                       |     |
| <b>FREQUENCY AND PHASE LOCKING EXPERIMENTS ON A 2.45 GHZ MAGNETRON</b> .....                                                                     | 463 |
| <i>S. Y. Park ; Y.R. Heo ; J.Y. Kang ; D.G. Kim ; S. T. Han ; J. J. Choi</i>                                                                     |     |
| <b>RECTANGULAR- VERSUS SINE-CORRUGATED WAVEGUIDE POLARIZERS FOR KA-BAND GYRO-TWT</b> .....                                                       | 465 |
| <i>Alexey Kosogor ; Yuri Tikhov</i>                                                                                                              |     |
| <b>HFC THERMAL FIELD EMITTER: A BRIEF STUDY</b> .....                                                                                            | 467 |
| <i>Victor Katsap</i>                                                                                                                             |     |
| <b>LAB6 CATHODE WORKFUNCTION AND OPERATING TEMPERATURE</b> .....                                                                                 | 469 |
| <i>Victor Katsap ; Chising Lai</i>                                                                                                               |     |
| <b>STUDY ON SECONDARY ELECTRON MULTIPLICATION CHARACTERISTICS OF 1.3GHZ HIGH POWER COUPLER COLD WINDOW</b> .....                                 | 471 |
| <i>Yao Long ; Wang Yong ; Zhang Rui ; Zhang Xue</i>                                                                                              |     |
| <b>STUDY ON A NOVEL DIRECTIONAL COUPLER FOR RAPID POWER MEASUREMENT OF THE W BAND GYRO-TWT</b> .....                                             | 473 |
| <i>Xu Zeng ; Efeng Wang ; Jinjun Feng</i>                                                                                                        |     |
| <b>THE ELECTRON OPTICAL SYSTEM FOR 0.34-THZ FOLDED WAVEGUIDE TRAVELING WAVE TUBE</b> .....                                                       | 475 |
| <i>Peng Hu ; Wenqiang Lei ; Yi Jiang ; Yinhu Huang ; Rui Song ; Hongbin Chen</i>                                                                 |     |
| <b>THE VACUUM WINDOW FOR 0.34-THZ FOLDED WAVEGUIDE TRAVELING WAVE TUBE</b> .....                                                                 | 477 |
| <i>Peng Hu ; Wenqiang Lei ; Yi Jiang ; Yinhu Huang ; Rui Song ; Hongbin Chen</i>                                                                 |     |
| <b>INFLUENCE OF DIAMOND ON HEAT DISSIPATION CAPABILITY OF THE HELIX SLOW-WAVE STRUCTURES</b> .....                                               | 479 |
| <i>Yanwen Liu ; Hong Tian ; Yu-Xin Lu ; Wenqi Shi</i>                                                                                            |     |
| <b>ELECTRON OPTICAL SYSTEM WITH UNIFORM MAGNETIC FIELD FOR 220 GHZ SHEET BEAM TWT</b> .....                                                      | 481 |
| <i>Shengkun Jiang ; Zhaoyun Duan ; Xin Wang ; Guang Yang ; Shengming Li ; Zhanliang Wang ; Tao Tang ; Yubin Gong</i>                             |     |
| <b>DESIGN OF A LOW ASPECT RATIO ELECTRON GUN FOR A 220 GHZ SHEET ELECTRON BEAM EIK</b> .....                                                     | 483 |
| <i>Zhang Huafeng ; Ruan Cunjun</i>                                                                                                               |     |
| <b>STUDY OF A NANOCRYSTALLINE DIAMOND FOR COMPOSITE DIAMOND WINDOWS IN THZ TWTS</b> .....                                                        | 485 |
| <i>Q. Ming ; Lili Li ; Chengyi Hua ; Jun Cai ; Jinjun Feng</i>                                                                                   |     |
| <b>A NOVEL BEAM FORMING ELECTRODE FOR SHEET BEAM ELECTRON GUN</b> .....                                                                          | 487 |
| <i>Shaomeng Wang ; Sheel Aditya ; Yuanjin Zheng</i>                                                                                              |     |

|                                                                                                                                                                                                                     |            |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|
| <b>DESIGN AND MULTIPACTOR ANALYSIS OF A HIGH POWER RF WINDOW .....</b>                                                                                                                                              | <b>489</b> |
| <i>Mohit Kumar Joshi ; Tapeswar Tiwari ; Ratnajit Bhattacharjee</i>                                                                                                                                                 |            |
| <b>SPACE QUALIFICATION OF M- AND MMC-TYPE CATHODES AT HIGH CURRENT DENSITY .....</b>                                                                                                                                | <b>491</b> |
| <i>Christof Dietrich ; Jean-Michel Roquais ; Justin Demory ; Frédéric André</i>                                                                                                                                     |            |
| <b>RESEARCH OF ELECTRONIC OPTICAL SYSTEM WITH POWER OF 3KW AND BEAM DIAMETER OF 0.LMM.....</b>                                                                                                                      | <b>493</b> |
| <i>Jie Qing ; Zhenhua Wu ; Chuanhong Xiao ; Min Hu ; Renbin Zhong ; Shenggang Liu</i>                                                                                                                               |            |
| <b>MODELING OF A CONVERGING HOLLOW BEAM ELECTRON OPTIC SYSTEM FOR A KA-BAND EIK .....</b>                                                                                                                           | <b>495</b> |
| <i>Tongli Ma ; Ding Zhao ; Zhaochuan Zhang</i>                                                                                                                                                                      |            |
| <b>SIMULATION OF HIGH INJECTION EFFICIENCY OF MULTIBEAM DIODE FOR KA-BAND RELATIVISTIC KLYSTRON AMPLIFIER .....</b>                                                                                                 | <b>497</b> |
| <i>Zhiwei Dang ; Zhanliang Wang ; Hua Huang ; Shifeng Li ; Yu Bai ; Jinjing Luo ; Yubin Gong</i>                                                                                                                    |            |
| <b>DEVELOPMENT OF TUNING DIAPHRAGM FOR HIGH POWER CONTINUOUS WAVE KLYSTRON.....</b>                                                                                                                                 | <b>499</b> |
| <i>Yongqing Zhang ; Shengyi Yin ; Haibing Ding ; Xiangyang Gao ; He Jin ; Xiaoxin Sun</i>                                                                                                                           |            |
| <b>W-BAND TWT COMPONENT FABRICATION AND TESTING .....</b>                                                                                                                                                           | <b>501</b> |
| <i>Alan M. Cook ; Edward L. Wright ; Khanh T. Nguyen ; Colin D. Joye ; Frank. N. Wood ; B. Spence Albright ; John R. Lowe ; Reginald L. Jaynes ; Jeffrey P. Calame ; David K. Abe ; Takuji Kimura ; Galen Aymar</i> |            |
| <b>CIRCUIT FABRICATION METHODS FOR MILLIMETER-WAVE VACUUM ELECTRONICS .....</b>                                                                                                                                     | <b>503</b> |
| <i>Colin D. Joye ; Alan M. Cook ; Reginald L. Jaynes ; B. Spence Albright ; John R. Lowe ; John C. Rodgers ; Jeffrey P. Calame ; Scooter D. Johnson</i>                                                             |            |
| <b>OPTIMIZATION DESIGN OF GRIDDED ELECTRON GUN BASED ON MULTIPHYSICS SIMULATION.....</b>                                                                                                                            | <b>505</b> |
| <i>Xiaofang Zhu ; Quan Hu ; Yulu Hu ; Bin Li</i>                                                                                                                                                                    |            |
| <b>EFFECT OF PREPARATION PROCESS ON SURFACE ROUGHNESS OF PARTS FOR WELDING VACUUM ENVELOPE OF SPACE TRAVELING WAVE TUBE .....</b>                                                                                   | <b>507</b> |
| <i>Yuan Guangjiang ; Zhang Yuanmin ; Li Yunjin ; Zhai Dehui ; Song Wei ; Wang Xin</i>                                                                                                                               |            |
| <b>3D PRINTING OF MICROWAVE ATTENUATING OF FESIAL MATERIALS.....</b>                                                                                                                                                | <b>509</b> |
| <i>Yingqin Liu ; Yongqing Zhang ; Guanghua Li ; Xiangjun Wang ; He Jin ; Xiangyang Gao ; Bofeng Wang</i>                                                                                                            |            |
| <b>AN EMISSION MODEL CONSIDERING THE THERMAL VELOCITY OF ELECTRONS UNDER THE CONSTRAINT OF SPHERICAL SURFACE .....</b>                                                                                              | <b>511</b> |
| <i>Xiaobing Wang ; Quan Hu ; Yulu Hu ; Xiaofang Zhu ; Bin Li</i>                                                                                                                                                    |            |
| <b>MECHANICS SIMULATOR: AN ADVANCED 3D FE VIBRATION SIMULATION TOOL FOR MICROWAVE TUBES.....</b>                                                                                                                    | <b>513</b> |
| <i>Junhui Yin ; Li Xu ; Zhonghai Yang ; Bin Li</i>                                                                                                                                                                  |            |
| <b>A SIMULATION METHOD OF GRAPHITE HEAT EXTRUSION PROCESS FOR HIGH-FREQUENCY STRUCTURE OF HELIX TWTS .....</b>                                                                                                      | <b>515</b> |
| <i>Jingyuan Che ; Xiaofang Zhu ; Yulu Hu ; Quan Hu ; Bin Li</i>                                                                                                                                                     |            |
| <b>OPTIMIZATION OF THE CUT-CELL MESH-GENERATING CODE FOR SIMULATION OF VACUUM ELECTRONIC DEVICES.....</b>                                                                                                           | <b>517</b> |
| <i>Wenjin Cai ; Xiaolin Jin ; Xiaoliang Gu ; Tao Huang ; Bin Li</i>                                                                                                                                                 |            |
| <b>A BROADBAND LOW-LESSW-BAND PILL-BOX WINDOW .....</b>                                                                                                                                                             | <b>519</b> |
| <i>Tongbin Yang ; Dun Lu ; Wenjie Fu ; Yang Yan ; Xiaotong Guan</i>                                                                                                                                                 |            |
| <b>MULTI-COLOR COHERENT TERAHERTZ SMITH-PURCELL RADIATION BASED ON COMPOUND GRATING .....</b>                                                                                                                       | <b>521</b> |
| <i>Juan-Feng Zhu ; Chao-Hai Du ; Lu-Yao Bao ; Shi Pan ; Hui-Qi Bian ; Fan-Hong Li ; Pu-Kun Liu</i>                                                                                                                  |            |
| <b>STATISTICAL MODEL OF NON-UNIFORM EMISSION/ROM POLYCRYSTALLINE TUNGSTEN CATHODES.....</b>                                                                                                                         | <b>523</b> |
| <i>Dongzheng Chen ; Ryan Jacobs ; Vasilios Vlahos ; Dane Morvan ; John Booske</i>                                                                                                                                   |            |
| <b>CHARACTERIZATION OF W-BAND SERPENTINE WAVEGUIDE TWT CIRCUITS .....</b>                                                                                                                                           | <b>525</b> |
| <i>Reginald L. Jaynes ; Alan M. Cook ; Colin D. Joye ; Edward L. Wright</i>                                                                                                                                         |            |
| <b>COAXIAL MULTIPACTOR SUSCEPTIBILITY AT GHZ FREQUENCIES .....</b>                                                                                                                                                  | <b>527</b> |
| <i>Nicholas M. Jordan ; Flynn B. Darby ; Stephen V. Langellotti ; Y. Y. Lau ; Ronald M. Gilgenbach</i>                                                                                                              |            |
| <b>DIELECTRIC MATERIAL FOR THE ELECTRON ACCELERATOR VACUUM CHAMBER.....</b>                                                                                                                                         | <b>529</b> |
| <i>Tae-Yeon Lee ; Taekyun Ha</i>                                                                                                                                                                                    |            |
| <b>ELECTRON-OPTICAL SYSTEM WITH PLANAR-ARRANGED COARSE-STRUCTURED FIELD EMISSION CATHODES.....</b>                                                                                                                  | <b>531</b> |
| <i>Sergey Morev ; Kirill Kuzmich ; Victor Sahlin ; Alexander Darmaev ; Eduard Muraviev ; Dmitry Komarov ; Sergey Maslennikov</i>                                                                                    |            |

|                                                                                                                                                                                                             |     |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|
| <b>MEASUREMENT METHOD OF THE DISTRIBUTION OF FIELD EMISSION CURRENT</b> .....                                                                                                                               | 533 |
| <i>Dmitry Ozol ; Alexander Eliseev ; Maksim Garkusha ; Anton Pavlenko</i>                                                                                                                                   |     |
| <b>STUDY ON INHIBITION OF THE M-TYPE CATHODE EDGE EMISSION IN THE HIGH FREQUENCY VACUUM ELECTRONIC DEVICES</b> .....                                                                                        | 535 |
| <i>Hui Wang ; Pengyun Yang ; Wensheng Shao ; Ke Zhang ; Gaoyu Juan</i>                                                                                                                                      |     |
| <b>WORK FUNCTION AND ELECTRONIC STRUCTURE MEASUREMENTS ON NITROGEN-DOPED LAB6 THIN FILM BY SCANNING TUNNELING MICROSCOPE</b> .....                                                                          | 537 |
| <i>Katsumi Nagaoka ; Shun-Ichiro Ohmi</i>                                                                                                                                                                   |     |
| <b>THE APPLICATION OF ELECTRON BEAM WELDING ON VACUUM ELECTRON DEVICES</b> .....                                                                                                                            | 539 |
| <i>Bofeng Wang ; Xuhua Hu ; Guanli Zhou ; Jianyong Zhou ; Xiaoxia Wang ; Yongqing Zhang ; Zhaochuan Zhang</i>                                                                                               |     |
| <b>STUDY ON A MICROFABRICATION W-BAND PLANAR MEANDER-LINE SLOW-WAVE STRUCTURE</b> .....                                                                                                                     | 541 |
| <i>Andrey Starodubov ; Anton Pavlov ; Viktor Galushka ; Igor Bakhteev ; Alexey Serdobintsev ; Gennadiy Torgashov ; Peter Ryabukho ; Sergei Molchanov ; Roman Torgashov ; Andrey Rozhnev ; Nikita Ryskin</i> |     |
| <b>THE DIELECTRIC CONSTANT MEASUREMENT USING A TE01 MODE IN W-BAND</b> .....                                                                                                                                | 543 |
| <i>Hong Eun Choi ; Wonjin Choi ; Mun Seok Choe ; Evgenya Simakov ; Bruce Carlsten ; Muhammed Zuboraj ; Eun Mi Choi</i>                                                                                      |     |
| <b>AUTOMATIC MAGNETIC FIELD MEASUREMENT SYSTEM FOR TRAVELING WAVE TUBE BASED ON VIRTUAL INSTRUMENT</b> .....                                                                                                | 545 |
| <i>Jie Zhang ; Dapeng Gong ; Tao Huang ; Bin Li</i>                                                                                                                                                         |     |
| <b>SIMULATION OF A DOUBLE-GAP COUPLED CAVITY BASED ON FINITE ELEMENT METHOD</b> .....                                                                                                                       | 547 |
| <i>Hangxin Liu ; Li Xu ; Xiaofang Zhu ; Zhonghai Yang ; Bin Li</i>                                                                                                                                          |     |
| <b>SECONDARY ELECTRON EMISSION OF (MG-ZN-O)/(MGO-AU) BILAYER COMPOSITE FILM DEPOSITED BY SPUTTERING</b> .....                                                                                               | 549 |
| <i>Jie Li ; Wenbo Hu ; Qiang Wei ; Shengli Wu ; Yongdong Li ; Huiqing Fan</i>                                                                                                                               |     |
| <b>DESIGN OF A PHOTOCATHODE DC-GUN FOR GENERATING TRAIN OF SHEET-SHAPED ELECTRON BUNCHES</b> .....                                                                                                          | 551 |
| <i>Linbo Liang ; Weihao Liu ; Qika Jia ; Lin Wang ; Yalin Lu ; Yen-Chieh Huang</i>                                                                                                                          |     |
| <b>DESIGN STUDY OF THE ELECTRON BEAMLINE, AND THE BEAM OPTIMIZATION FOR THE AWAKE RUN 2 EXPERIMENT AT CERN</b> .....                                                                                        | 553 |
| <i>S. Y. Kim ; M. Dayyani Kelisani ; S. Doeber ; M. Chung</i>                                                                                                                                               |     |
| <b>EXACT ANALYTICAL SOLUTION FOR ULTRAFAST ELECTRON EMISSION DUE TO TWO-COLOR LASER FIELDS</b> .....                                                                                                        | 555 |
| <i>Yi Luo ; Peng Zhang</i>                                                                                                                                                                                  |     |
| <b>THE EFFECT OF MULTIPACTOR ON THE QUALITY OF A SIGNAL</b> .....                                                                                                                                           | 557 |
| <i>Patrick Y. Wong ; Y. Y. Lau ; Peng Zhang ; Nicholas Jordan ; Ronald M. Gilgenbach ; John Verboncoeur</i>                                                                                                 |     |
| <b>SEMICONDUCTOR-FREE FIELD-EMISSION NANOELECTRONICS: APPLICATION IN AIR-CHANNEL TRANSISTORS</b> .....                                                                                                      | 559 |
| <i>Shruti Nirantar ; Taimur Ahmed ; Guanghui Ren ; Philipp Gutruf ; Chengong Xu ; Madhu Bhaskaran ; Sumeet Walia ; Sharath Sriram</i>                                                                       |     |
| <b>3D PRINTING INTEGRATED FABRICATION OF CATHODEHEATER ASSEMBLY</b> .....                                                                                                                                   | 561 |
| <i>Xin Sun ; Wensheng Shao ; Huaichao Yang</i>                                                                                                                                                              |     |
| <b>THE WORK FUNCTION OF THE AMMONIUM PERRHENATE IMPREGNATED W MATRIX BA-W CATHODE</b> .....                                                                                                                 | 563 |
| <i>Xiaoxia Wang ; Xiaoqian Chen ; Shuai Zhang ; Yun Li ; Qi Zhang</i>                                                                                                                                       |     |
| <b>RESEARCH ON AUTOMATIC MEASUREMENT METHOD OF SATURATION CHARACTERISTICS OF BROADBAND TWT</b> .....                                                                                                        | 565 |
| <i>Dapeng Gong ; Tao Huang ; Jianqing Li ; Bin Li</i>                                                                                                                                                       |     |
| <b>STUDY ON ELECTRON BEAM BUNCHING IN A GIGAHERTZ OSCILLATING ELECTRIC-FIELD DIRECT-DRIVEN COLD-CATHODE ELECTRON GUN</b> .....                                                                              | 567 |
| <i>Yang Xing ; Yu Zhang ; Ningsheng Xu ; Yanlin Ke ; Baohong Li ; Shaozhi Deng</i>                                                                                                                          |     |
| <b>UNIST-EBIT VACUUM AND CONFINEMENT SYSTEM (WITH SIMULATIONS)</b> .....                                                                                                                                    | 569 |
| <i>Sungnam Park ; Kyung-Hun Yoo ; Moses Chung</i>                                                                                                                                                           |     |
| <b>INTERACTION IMPEDANCE MEASURING METHOD IN SINE WAVEGUIDE</b> .....                                                                                                                                       | 571 |
| <i>Qi Wu ; Jin Xu ; Shuanzhu Fang ; Pengcheng Yin ; Xuebing Jiang ; Xia Lei ; H.R. Yin ; L.N. Yue ; G.Q. Zh ; W.X. Wang ; Yanyu Wei</i>                                                                     |     |
| <b>ENHANCED RADIATION USING CERENKOV EFFECT IN FANO METAMERICAL</b> .....                                                                                                                                   | 573 |
| <i>Seontae Kim ; Dongpyo Hong ; Matlabjon Sattorov ; Muhammad Mohsin Hossain ; Sun-Hong Min ; Gun-Sik Park</i>                                                                                              |     |
| <b>INFLUENCE OF RECTANGULAR APERTURE ASPECT RATIO ON SHEET BEAM GENERATION</b> .....                                                                                                                        | 575 |
| <i>Nikita Gurjar ; M. Afaq Hossain ; R.K. Sharma ; Niraj Kumar</i>                                                                                                                                          |     |

|                                                                                                                                                                |     |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|
| <b>DESIGN OF W-BAND SHEET BEAM ELECTRON GUN WITH PCM FOCUSING</b> .....                                                                                        | 577 |
| <i>Subham Chowdhury ; A. K. Bandyopadhyay ; Debasish Pal ; Anirban Bera ; R. K Sharma</i>                                                                      |     |
| <b>TIME DEPENDENT OUTPUT CHARACTERISTICS OF HORN ANTENNAS</b> .....                                                                                            | 579 |
| <i>Jing-Shyang Yen ; Xuan-De Huang ; Chia-Wei Lin ; Kaviya Aranganadin ; Chii-Ruey Lin ; Ming-Chieh Lin ; Hua-Yi Hsu</i>                                       |     |
| <b>A MICROWAVE PLASMA JET CHEMICAL VAPOR DEPOSITION FOR DIAMOND FILM GROWTH</b> .....                                                                          | 581 |
| <i>Chun-Yu Lin ; Jing-Shyang Yen ; Hua-Yi Hsu ; Ming-Chieh Lin</i>                                                                                             |     |
| <b>LOCAL WORK FUNCTIONS OF MAGNETITE UNDER ELECTRIC FIELDS BASED ON FIRST PRINCIPLE CALCULATIONS</b> .....                                                     | 583 |
| <i>Liangliang Xu ; Nan Zhao ; Ming-Chieh Lin ; Tsan-Chuen Leung</i>                                                                                            |     |
| <b>LOCAL WORK FUNCTIONS OF CLEAN TUNGSTEN SURFACES UNDER ELECTRIC FIELDS BASED ON AB INITIO CALCULATIONS</b> .....                                             | 585 |
| <i>Yue Wang ; Liangliang Xu ; Ming-Chieh Lin ; Tsan-Chuen Leung</i>                                                                                            |     |
| <b>STUDY ON THE THERMAL EFFECT OF PHOTON-INDUCED ELECTRON EMISSION ENHANCEMENT</b> .....                                                                       | 587 |
| <i>Yanxiao Guo ; Hehong Fan ; Hang Du ; Xiaohan Sun ; Zhengqiang Bao ; Tian Liang ; Wenjing Hu</i>                                                             |     |
| <b>RESEARCH ON ACCELERATION OF A ELECTRON GUN SIMULATION MODULE</b> .....                                                                                      | 589 |
| <i>Hang Du ; Hehong Fan ; Yanxiao Guo ; Xiaohan Sun</i>                                                                                                        |     |
| <b>THERMAL SIMULATION OF A MULTIPLE BEAM ELECTRON GUN FOR KU-BAND KLYSTRON</b> .....                                                                           | 591 |
| <i>Ayan Kumar Bandyopadhyay ; Atmakuru Nagaraju ; Raktim Guha ; Rk Sharma ; Debasish Pal</i>                                                                   |     |
| <b>THERMALLY ASSISTED PHOTOEMISSION OF CEB6 AT HIGH TEMPERATURES</b> .....                                                                                     | 593 |
| <i>Konstantin Torgasin ; Toshiteru Kii ; Kenichi Morita ; Kazunobu Nagasaki ; Heishun Zen ; Hideaki Ohgaki ; Kai Masuda</i>                                    |     |
| <b>EMITTANCE EXCHANGE BASED BUNCH COMPRESSION AT ARGONNE WAKEFIELD ACCELERATOR FACILITY</b> .....                                                              | 595 |
| <i>Jimin Seok ; Gwanghui Ha ; John Gorham Power ; Manoel Conde ; Moses Chung</i>                                                                               |     |
| <b>STUDY OF A PROMISING ELECTRODYNAMIC PHOTONIC CRYSTAL-LIKE STRUCTURE INSIDE A RECTANGULAR WAVEGUIDE</b> .....                                                | 596 |
| <i>Andrey Starodubov ; Artem Badarin ; Viktor Galushka ; Anton Pavlov ; Yuri Kalinin ; Semen Kurkin ; Alexey Koronovskii</i>                                   |     |
| <b>TWIN GROWTH IN RF WINDOW CERAMIC AS A CRITERION FOR THE RESPONSE TIME OF PROTECTION SYSTEM IN HIGH POWER VACUUM TUBES</b> .....                             | 598 |
| <i>Shahriyar Kaboli</i>                                                                                                                                        |     |
| <b>COPPER RECONSIDERED: MATERIAL INNOVATIONS TO TRANSFORM VACUUM ELECTRONICS</b> .....                                                                         | 600 |
| <i>Diana Gamzina ; Michael Kozina ; Apurva Mehta ; Emilio A. Nanni ; Sami Tantawi ; Paul B. Welander ; Timothy Horn ; Christopher Ledford</i>                  |     |
| <b>QUALITY AND PERFORMANCE OF COMMERCIAL NANOCOMPOSITE SCANDATE TUNGSTEN MATERIAL</b> .....                                                                    | 602 |
| <i>Michelle Gonzalez ; Neville C. Luhmann ; Diana Gamzina ; Colin Mcelroy ; Carl Schalansky</i>                                                                |     |
| <b>HIGH-PERFORMANCE SCANDATE CATHODE</b> .....                                                                                                                 | 604 |
| <i>Daniel E. Bugaris ; Claudia Goggin ; Xiaomeng Zhang ; John Balk ; Daniel Busbaheer ; Jack Tucek</i>                                                         |     |
| <b>A PERIODIC CUSPED MAGNETIC - QUAD MAGNETIC FOCUSING SYSTEM FOR LOW VOLTAGE ULTRA-COMPACT W-BAND KLYSTRON</b> .....                                          | 606 |
| <i>Yuan Zheng ; Neville C. Luhmann ; Diana Gamzina ; Joe Olszewski ; Ann Sy ; Brandon R. Weatherford</i>                                                       |     |
| <b>DESIGN AND SIMULATION OF L-BAND MICROWAVE WAVEGUIDE CIRCULATOR WITH INCREASED EFFICIENCY AND BROAD BANDWIDTH</b> .....                                      | 608 |
| <i>Kaviya Aranganadin ; Hua-Yi Hsu ; Ming-Chieh Lin</i>                                                                                                        |     |
| <b>ELASTOSTATICS IN BEAM OPTICS ANALYZER</b> .....                                                                                                             | 610 |
| <i>Thuc Bui ; David Marsden ; R. Lawrence Ives</i>                                                                                                             |     |
| <b>COMPARISON OF THE EFFECT OF ROTATING ELECTRIC FIELDS AND ROTATING MAGNETIC FIELDS ON THE DIOCOTRON INSTABILITY USING PARTICLE-IN-CELL SIMULATIONS</b> ..... | 612 |
| <i>Young Hyun Jo ; Hae June Lee</i>                                                                                                                            |     |
| <b>HYDROTHERMALLY PREPARED REDUCED GRAPHENE OXIDE FREE STANDING FILM AS HIGH CURRENT FIELD EMITTER</b> .....                                                   | 614 |
| <i>Dongpyo Hong ; Seontae Kim ; Muhammad Mohsin Hossain ; Sun-Hong Min ; Matlabjon Sattorov ; Gun-Sik Park</i>                                                 |     |
| <b>DISPENSER M-TYPE CATHODES WITH ALLOY FILMS MADE ON THE BASIS OF OSMIUM OR RHENIUM FOR APPLICATION IN LONG LIFE MICROWAVE DEVICES</b> .....                  | 616 |
| <i>A.P. Makarov ; E.M. Zemchikhin</i>                                                                                                                          |     |

|                                                                                                                                                                                                                      |            |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|
| <b>PRESSED METAL-ALLOY PALLADIUM-BARIUM CATHODE .....</b>                                                                                                                                                            | <b>617</b> |
| <i>O. V. Pollnikov ; I.P. Li</i>                                                                                                                                                                                     |            |
| <b>FABRICATION OF HIGH CURRENT CARBON NANOTUBE BASED COLD CATHODE<br/>EMITTERS AND APPLICATIONS.....</b>                                                                                                             | <b>619</b> |
| <i>Hye In Lee ; Jung Su Kang ; Kyu Chang Park</i>                                                                                                                                                                    |            |
| <b>EXPERIENCE FROM KSTAR ECRH COMMISSIONING.....</b>                                                                                                                                                                 | <b>621</b> |
| <i>Young-Soon Bae</i>                                                                                                                                                                                                |            |
| <b>ANALYSIS OF HIGH FREQUENCY CHARACTERISTICS OF SHEET BEAM RECTANGULAR<br/>WAVEGUIDE GRATING OPERATING IN HIGH-ORDER MODE.....</b>                                                                                  | <b>624</b> |
| <i>Xiaofei Li ; Qianzhong Xue ; Ding Zhao</i>                                                                                                                                                                        |            |
| <b>LOW LEVEL RF CONTROL OF CYCLOTRON FOR NEUTRON CAPTURE THERAPY<br/>SYSTEM.....</b>                                                                                                                                 | <b>626</b> |
| <i>Sun-Hong Min ; In Su Jung ; Chawon Park ; Ilsung Cho ; Won Taek Hwang ; Bong Hwan Hong</i>                                                                                                                        |            |
| <b>HEAT DISSIPATION ANALYSIS OF M.2 NVME SOLID-STATE DRIVE IN VACUUM .....</b>                                                                                                                                       | <b>627</b> |
| <i>Eung Chang Lee ; Jinsung Rho ; Bong Jae Lee ; Heeyoub Kang</i>                                                                                                                                                    |            |
| <b>LOW SECONDARY ELECTRON YIELD MATERIALS FOR SPACE APPLICATIONS BASED<br/>ON AB INITIO COMPUTATION.....</b>                                                                                                         | <b>629</b> |
| <i>Min Peng ; Dawei Wang ; Yongdong Li ; Chunliang Liu</i>                                                                                                                                                           |            |
| <b>MULTI-STAGE SLOTTED WAVEGUIDE ARRAY ANTENNA FOR HIGH POWER<br/>APPLICATIONS.....</b>                                                                                                                              | <b>631</b> |
| <i>Taek-Heon Kim ; Jung-Hoon Han ; Seung-Kab Ryu</i>                                                                                                                                                                 |            |
| <b>DESIGN OF A 50W 220GHZ TRAVELING WAVE TUBE.....</b>                                                                                                                                                               | <b>633</b> |
| <i>Xingwang Bian ; Ye Tang ; Lin Zhang ; Qiru Lu ; Ying Li ; Pan Pan ; Jun Cai ; Jinjun Feng</i>                                                                                                                     |            |
| <b>X-BAND LINEAR ACCELERATOR FOR RADIOTHERAPY .....</b>                                                                                                                                                              | <b>635</b> |
| <i>Y. S. Lee ; G. J. Kim ; S.H. Kim ; J. H. Lee ; I.S. Kim ; Y. W. Choi ; J. I. Kim ; J. H. Hwang ; A.R Kim ; Y. J. Seol ;<br/>T. G. Oh ; N. Y. An ; Y. A. Oh ; Y. N. Kang</i>                                       |            |
| <b>OPERATION OF COMPACT X-BAND LINEAR ACCELERATOR SYSTEM MOUNTED ON THE<br/>GANTRY FOR RADIATION THERAPY .....</b>                                                                                                   | <b>637</b> |
| <i>Sanghoon Kiml ; Geun-Ju Kim ; Yong-Seok Lee ; Jeong-Hun Lee ; Insoo S. Kim ; Young-Wook Choi ; Jung-Il Kim<br/>; Jinho Hwang ; Aeran Kim ; Yunji Seol ; Taegeon Oh ; Nayoung An ; Youngah Oh ; Young-Nam Kang</i> |            |
| <b>CATHODOLUMINESCENT UV-SOURCES USING CARBON FIBER FIELD EMISSION<br/>CATHODES.....</b>                                                                                                                             | <b>639</b> |
| <i>Dmitry I. Ozol ; Evgenii P. Sheshin ; Natalia Yu. Vereschagina ; Maksim V. Garkusha ; Mikhail I. Danilkin ; Htet<br/>Win Aung</i>                                                                                 |            |
| <b>A NOVEL TERAHERTZ WAVE MICROSTRUCTURE PHASE SHIFTER LOADED IN<br/>RECTANGULAR WAVEGUIDE.....</b>                                                                                                                  | <b>641</b> |
| <i>Zongjun Shi ; Yujie Guo ; Yihong Zhou ; Xinjin Shi ; Ziqiang Yang ; Feng Lan</i>                                                                                                                                  |            |
| <b>REALIZATION OF ULTRA-STABLE HARD X-RAY FREE ELECTRON LASER .....</b>                                                                                                                                              | <b>643</b> |
| <i>H.-S. Kang</i>                                                                                                                                                                                                    |            |
| <b>DESIGN AND TUNING OF A C-BAND 6 MEV LINEAR ACCELERATING STRUCTURE.....</b>                                                                                                                                        | <b>645</b> |
| <i>Yongtao Liu ; Pan Pan ; Jingang Han ; Huanhuan Niu</i>                                                                                                                                                            |            |
| <b>RIGIME OF MULTI-STAGE TRAPPING IN A SECTIONED SYSTEM OF PROFILED RF<br/>UNDULATORS .....</b>                                                                                                                      | <b>647</b> |
| <i>Sergei Kuzikov ; Andrei Savilov ; Alexander Vikharev</i>                                                                                                                                                          |            |
| <b>PROGRESS OF HIGH POWER AND LONG-PULSE DUAL-FREQUENCY ECH SYSTEM IN<br/>KSTAR .....</b>                                                                                                                            | <b>649</b> |
| <i>Sunggug Kim ; Sonjong Wang ; Jongwon Han ; Mi Joung ; Inhyuk Rhee ; Jong-Gu Kwak</i>                                                                                                                              |            |
| <b>A STUDY OF PULSE CONTROL OF MILLIMETER-WAVE GYROTRON USING HIGH<br/>DENSITY PLASMA.....</b>                                                                                                                       | <b>651</b> |
| <i>Mun Seok Choe ; Ashwini Sawant ; Ingeun Lee ; Taegyu Han ; Wonjin Choi ; Eunmi Choi</i>                                                                                                                           |            |
| <b>DESIGN OF HIGH POWER VACUUM FEEDTHROUGH FOR MULTIPACTOR EFFECT<br/>SUPPRESSION.....</b>                                                                                                                           | <b>653</b> |
| <i>Kwangho Jang ; Hyunho Wi ; Kenji Saito ; Jonggu Kwak ; Sonjong Wang</i>                                                                                                                                           |            |
| <b>PROTOTYPE OF FIELD EMISSION CATHODOLUMINESCENT LAMP FOR GENERAL<br/>LIGHTING WITH A BUILT-IN AC-DC CONVERTER.....</b>                                                                                             | <b>655</b> |
| <i>Evgenii P. Sheshin ; Nikolai N. Chadaev ; Artem Yu. Kolodyazhnyj ; Alexandr O. Getman ; Dmitry I. Ozol</i>                                                                                                        |            |
| <b>MITIGATION OF THE DIOCOTRON INSTABILITY IN A HOLLOW ELECTRON BEAM<br/>USING ROTATING MAGNETIC FIELDS .....</b>                                                                                                    | <b>657</b> |
| <i>Cheongbin Cheon ; Young Hyun Jo ; Hae June Lee</i>                                                                                                                                                                |            |
| <b>DESIGN AND MODELING OF A MICROWAVE PLASMA ENHANCED CHEMICAL VAPOR<br/>DEPOSITION SYSTEM.....</b>                                                                                                                  | <b>658</b> |
| <i>Yilang Jiang ; Hua-Yi Hsu ; Kaviya Aranganadin ; Ming-Chieh Lin ; Jing-Shyang Yen</i>                                                                                                                             |            |

|                                                                                                                                        |            |
|----------------------------------------------------------------------------------------------------------------------------------------|------------|
| <b>CARBON NANOTUBE BASED COLD CATHODE EMITTER EMPLOYED X-RAY TUBE<br/>FABRICATION FOR MEDICAL IMAGING APPLICATIONS.....</b>            | <b>660</b> |
| <i>Yi Yin Yu ; Kyu Chang Park</i>                                                                                                      |            |
| <b>NOISE SUPPRESSION OF A 2.45GHZ MAGNETRON FOR WIRELESS POWER TRANSFER.....</b>                                                       | <b>662</b> |
| <i>Dokyun Kim ; Jinioo Choi ; Varun Pathania ; Jong-Soo Kim ; Suyeon Park ; Seong-Tae Han</i>                                          |            |
| <b>DEVELOPMENT OF THE GAS-CELL-BASED PLASMA SOURCE FOR LASER-WAKEFIELD<br/>ELECTRON ACCELERATION .....</b>                             | <b>664</b> |
| <i>Jinju Kim ; Min-Seok Kim ; Vanessa L.J. Phung ; Hyyong Suk ; Munsu Jin</i>                                                          |            |
| <b>RESEARCH ON HIGH THERMAL CONDUCTIVITY AND LOW LOSS TANGENT ALUMINUM<br/>NITRIDE CERAMICS .....</b>                                  | <b>666</b> |
| <i>Yang Yan-Ling ; Lu In-Ping</i>                                                                                                      |            |
| <b>ULTRASHORT BUNCH DURATION MEASUREMENT USING S-BAND RF DEFLECTOR IN<br/>UED SYSTEM AT KAERI .....</b>                                | <b>668</b> |
| <i>Sunjeong Park ; Key Young Oang ; Seong Hee Park ; Hyun Woo Kim ; Kyu-Ha Jang ; Young Uk Jeong ; In Hyung<br/>Beak ; Eun-San Kim</i> |            |
| <b>Author Index</b>                                                                                                                    |            |