GREETINGS

On behalf of the California Institute of Technology, I would like to welcome you to the Seventeenth International Conference on Infrared and Millimeter Waves. The conference will be held in lecture rooms here at Caltech; these rooms and the sessions are noted on the map. There will be a continental breakfast before the talks begin, starting at 8:00 AM in Dabney Lounge. Coffee and soft drinks will be available in Dabney Lounge throughout the conference sessions. On Monday and Wednesday there will be a buffet dinner that starts at 6:30 PM in the Rathskeller of the Athenaeum, the Caltech faculty club. The dinner will be free for conference attendees and their spouses (you will need to show your conference badge). I hope that this proves a productive meeting for all.

David Rutledge
Conference Chairman
A Athenaeum Rathskeller: Buffet dinner, Monday, Wednesday, 6:30 PM.
BI Beckman Institute, room 134: Millimeter waves.
BL Baxter Lecture Hall, upstairs from Ramo auditorium: FEL/ Gyrotron.
D Dabney Lounge: Registration, continental breakfast at 8 AM.
S Steele, room 102: Millimeter waves and Submillimeter.
ORGANIZATION COMMITTEE:

General Chairman: Kenneth J. Button

Conference Chairman: David B. Rutledge

Program Council:
James R. Birch (NPL)
T.J. Parker (U.Essex)
David B. Rutledge (CalTech)
Richard J. Temkin (MIT)
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Kenneth J. Button (Satellite Beach)
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Program Advisors:
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Jerold R. Izatt (Alabama)

Exhibit Manager:
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EE Dept.
Tufts University

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Kenneth J. Button
Box 372455
Satellite Beach, FL 32937-0455 USA
FAX&Tel: (407) 777-7293

Registrar:
Carol A. Arlington (MIT)
The eighteenth conference in this series will be held at the University of Essex in Colchester. Colchester is Britain's oldest recorded town with a rich and colorful past. It is situated in Essex about 60 miles north-east of London (about 50 minutes by train) in an attractive area near the coast surrounded by river estuaries, and it is close to the River Stour and the border with the county of Suffolk, which is a delightful area associated with the artist John Constable. The university is modern with a purpose built lecture block which can accommodate all parallel sessions in one building. Ample residential accommodation is available on campus within a few minutes walk of the lecture block, with a range of prices and facilities that should suit everyone.

The conference will cover progress in all areas of infrared and millimeter waves, including the following topics, with special emphasis on new fields of research. Sources: lasers, free electron lasers, gyrotrons, synchrotrons, frequency mixing, calibration and standards. Detectors: receivers, mixers, amplifiers, thermal and photon detectors, Schottky diodes, Josephson and SIS devices, imaging arrays, FET amplifiers. Guided propagation and components: waveguides and other structures, Gaussian beams integrated devices, optical fibers. Spectroscopic techniques: interferometric, laser and heterodyne spectroscopy, spectroscopy of solids, liquids and gases. Astronomy and atmospheric physics: techniques, results and interpretation. Applications in biology and medicine. Plasma interactions and diagnostics. Technical and industrial applications: imaging, remote sensing, non-destructive testing.

General Chairman:

Kenneth J. Button
P.O. Box 372455
Satellite Beach, FL 32937-0455

Conference Chairman:

T.J. Parker, Department of Physics, University of Essex, Wivenhoe Park, Colchester, CO4 3SQ, UK

Program Chairman:

J.R. Birch, Divisional of Electrical Science, National Physical Laboratory
Teddington, Middlesex TW11 OLW, UK
NOTES FROM THE EXHIBIT MANAGER

The annual millimeter and submillimeter wave exhibit will be held for two full days, Tuesday and Wednesday, December 15 and 16, 1992 from 8AM to 8PM, in the Dabney Lounge of the California Institute of Technology (Caltech).

The continental breakfast and morning and afternoon coffee will be served inside the exhibition room on Tuesday and Wednesday. The list below shows names of companies who have expressed their interest to participate at press time.

Mohammed N. Afsar (Tufts University)
Exhibit Manager

AB MILLIMETRE, SARTROUVILLE, FRANCE
COCHISE INSTRUMENTS, INC., HEREFORD, ARIZONA
DORADO COMPANY, SEATTLE, WASHINGTON
W. L. GORE AND ASSOCIATES, INC., NEWARK, DELWARE
GRUNER ASSOCIATES, LOS ANGELES, CALIFORNIA
HEWLETT-PACKARD COMPANY, SANTA ROSA, CALIFORNIA
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MILLITECH CORPORATION, SOUTH DEERFIELD, MASSACHUSETTS
MILLIMETER-IR SPECTRA, INC. SOMERVILLE, MASSACHUSETTS
MM-WAVE TECHNOLOGY INC., WALNUT, CALIFORNIA
QMC INSTRUMENTS LIMITED, MILE END ROAD, LONDON, U.K.
VARIAN ELECTRON DEVICES, PALO ALTO, CALIFORNIA
WILTRON COMPANY, MORGAN HILL, CALIFORNIA
1992 KENNETH J. BUTTON PRIZE

AWARDED TO

PROFESSOR DEREK H. MARTIN

The citation reads:

For contributions to the field of infrared and millimeter waves, especially for the invention of a polarizing interferometer that has been used in instruments that investigate the cosmic microwave background spectrum, characterize plasmas in Tokamak reactors, study atmospheric properties, and measure refractive indices of solids, liquids and gases.
CONFERENCE PROGRAM
Seventeenth International Conference on Infrared and Millimeter Waves
14-17 December 1992

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FINAL PROGRAM

The program listed in this Digest is the final conference program. A number of changes have been made from the preliminary program. Please disregard the preliminary program and use only the final program printed in this Digest.

Morning sessions begin at 0900 hours. Afternoon sessions begin at 1400 hours.

*Invited Keynote* papers are allotted 40 minutes, 30 minutes for presentation and 10 minutes for discussion; contributed papers are allotted 20 minutes, 15 minutes for presentation and 5 minutes for discussion.
M1.1 GYROTRON: FROM THE PHYSICS CONCEPT TO THE PHYSICS AND TECHNOLOGY ISSUES RELATED TO MEGAWATT SOURCES FOR FUSION REACTOR – (Invited Keynote) – M.Q. Tran, CRPP, EPFL, Lausanne, Switzerland

M1.2 SMITH-PURCELL RADIATION AT SUBMILLIMETER AND FAR-INFRARED WAVELENGTHS – J. Walsh, Dept. of Physics & Astronomy, Dartmouth College, 6127 Wilder Laboratory, Hanover, NH 03755; G. Doucas, J. Mulvey, M. Omori, Oxford University; M. Kimmitt, University of Essex

M1.3 COHERENT TRANSITION RADIATION – M. Ikezawa, Research Institute for Scientific Measurements, Tohoku University, Sendai 980, Japan

M1.4 PARAMETRIC DESIGN OF Ka-BAND TUNABLE WAVEGUIDE VOLTAGE CONTROLLED OSCILLATOR – N. Sultan, Canadian Space Agency, 240 Sparks St., West Tower, 8th Floor, Ottawa, Ontario K1A 1A1 Canada

M1.5 SPONTANEOUS EMISSION IN THE UNIFORM MAGNETIC FIELD WITH A DIELECTRIC MEDIUM – J. Soln, Harry Diamond Laboratories, 2800 Powder Mill Road, Adelphi, MD 20783

M1.6 A NEW INFRARED SYNCHROTRON BEAMLINE AT LURE – P. Roy, Y.-L. Mathis, A. Gerschel, Laboratoire pour l’Utilisation de Rayonnement Electromagnétique, Université Paris-Sud, 91405 Orsay, France; P. Calvani, Université di Roma La Sapienza, P.le A. Moro, 2, 00185 Roma, Italy

M1.7 TWO DIMENSIONAL JOSEPHSON JUNCTION ARRAY OSCILLATORS – B. Liu, A. Pance, M.J. Wengler, University of Rochester, NY
SESSION M2

Monday AM  HIGH T_c SUPERCONDUCTORS  Dec. 14

M2.1 FAR INFRARED ELLIPSOMETRIC SIGNATURE OF GAP AND OF UNKNOWN HIGH-TEMPERATURE PHASE OF YBaCuO – K-L. Barth, F. Keilmann, Max-Planck-Institut für Festkörperforschung, 7000 Stuttgart 80, Germany

M2.2 FAR INFRARED AND MID-INFRARED ABSORPTION IN (bI, pB)-sR-(CA,y)-cU-0 – P. Calvani, M. Capizzi, P. Dore, S. Lupi, P. Maselli, G. Paleologo, Univ di Roma La Sapienza, P.le A. Moro, 2, Roma, Italy; P. Roy, Y-L. Mathis, Lab pour l’Utilisation de Rayonnement Electromagnétique, Univ Paris-Sud, 91405 Orsay, France; H. Berger, Ecole Polytechnique, France

M2.3 FAR INFRARED RESPONSE OF THIN FILM Bi2Sr2CaCu2O8 USING THE UCSB-FEL – W. Prettl, H. Lengfellner, Univ of Regensburg, Germany; J.P. Kaminski, CFELS - Univ of California, Santa Barbara, CA; G. Schneider, P.G. Huggard, T. O’Brien, W. Blau, Trinity College, Dublin, Ireland

M2.4 SURFACE RESISTANCE AND FAR IR ABSORPTIVITY AT T=7 K, and T=65 K of High T_c YBaCuO SUPERCONDUCTORS – A. Hadni, X. Gerbaux, Lab Infrarouge Lointain, URA CNRS n° 809, Univ of Nancy I, BP 239, F-54506 Vandoeuvre les Nancy, France


M2.7 FABRICATION OF HIGH-T_c FILMS ON SILICON MEMBRANES FOR BOLOMETRIC DETECTORS – R. Parsons, L. Ngo Phong, G. Clarke, N. Osborne, F. Orfino, S. Wessel, Dept of Physics, The Univ of British Columbia, Vancouver, B.C., V6T 1Z1, Canada
M2.8 SENSITIVITY IMPROVEMENT OF GRANULAR THIN FILM HIGH Tc SUPERCONDUCTOR FIR DETECTION BY A POST ANNEALING PROCEDURE – Gi. Schneider, P.G. Huggard, W. Blau; Dept of Pure and Applied Physics, Trinity College, Dublin 2, Ireland; E. Stangl, D. Bäuerle, P. Schwab, X.Z. Wang, S. Proyer, Inst Angewandte Physik, Univ Linz, 4040 Linz, Austria; W. Prettl, Inst Angewendte Physik, Univ Regensburg, 8400 Regensburg, Germany

M2.9 AN EFFECT OF SPIN EXCITATIONS ON THE INFRARED-ACTIVE PHONONS IN YBa2Cu4O8 AND YBa2Cu3O7-δ SUPERCONDUCTORS – A.P. Litvinchuk, C. Thomsen, M. Cardona, Max-Planck-Institut für Festkörperforschung, Heisenbergstraße 1, D-7000 Stuttgart 80, Germany
**SESSION M3**

Monday AM  
CAVITIES/WAVEGUIDES  
Dec. 14

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<td>A. Jöstingmeier, A.S. Omar, J. Jelonnek, Technische Universität Hamburg-Harburg, Postfach 90 10 53, D-W-2100 Hamburg 90, Germany</td>
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<td>CONDITIONS TO ACHIEVE STABLE PROPAGATION OF A GAUSSIAN-BEAM-LIKE MODE MIXTURE IN A DEFORMED WAVEGUIDE</td>
<td>A. Möbius, J. Pretterebner, Kernforschungszentrum Karlsruhe, Inst. f. Technische Physik, P.O. Box 3640, D-W-7500 Karlsruhe, Germany</td>
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<td>J. Pretterebner, A. Möbius, M. Thumm, Univ. of Stuttgart, Pfaffenwaldring 31, D-W-7000 Stuttgart 80, Germany</td>
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<td>C.P. Moeller, General Atomics, P.O. Box 85608, San Diego, CA 92186</td>
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<td>J. Pretterebner, D. Wagner, Inst. f. Plasmaforschung, Univ. Stuttgart; M. Thumm, Univ. Karlsruhe, D-7500 Karlsruhe 1, Germany</td>
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<td>A. Möbius, Karlsruhe; J. Pretterebner, Univ. Stuttgart, Germany</td>
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M3.10 IMPROVED COMPONENTS FOR BEAM TRANSMISSION OF HIGH-POWER MILLIMETER WAVES – W. Kasparek, K.W. Kopp, G.A. Müller, P.G. Schüller, Inst. für Plasmaforschung der Universität Stuttgart, Germany; V. Erckmann, Max-Planck-Institut für Plasmaphysik, Garching, Germany
SESSION M4

Monday AM          FEL/CARM I          Dec. 14

M4.1 NRL UBITRON AMPLIFIER PERFORMANCE – D.E. Pershing, R.H. Jackson, R.D. Seeley, H.P. Freund, Naval Research Lab, Washington, DC

M4.2 FIRST OPERATION OF A COMPACT FEL IN THE MILLIMETER WAVE REGION – F. Ciocci, R. Bartolini, A. Doria, G.P. Gallerano, E. Giovenale, M.F. Kimmitt, G. Messina, A. Renieri, ENEA, Area INN, P.O. Box 65, 00044 Frascati (Rome), Italy

M4.3 RECENT ADVANCEMENT ON ORBITRON MASER TUBE AND ITS RADAR DEMONSTRATION – M.G. Niimura, R.J. Churchill, American Research Corp. of Virginia, Radford, VA; I. Alexeff, M. Rader, Univ. of Tennessee, Knoxville, TN

M4.4 THE STUTTGART RAMAN-FREE ELECTRON LASER PROJECT: THEORETICAL AND EXPERIMENTAL RESULTS – G. Renz, G. Spindler, Institut für Technische Physik, German Aerospace Research Est., Pfaffenwald 38-40, D-7000 Stuttgart 80, Germany

M4.5 ROBUST, PLASMA-BASED, VARIABLE PULSE-LENGTH ELECTRON BEAM SOURCE – R. Liou, T. Hsu, G. Kirkman, R. Temkin, M. Gundersen, Univ. of Southern California, Los Angeles, CA 90089

M4.6 SECOND HARMONIC MAGNICON AMPLIFIER EXPERIMENT – S.H. Gold, C.A. Sullivan, B. Hafizi, W.M. Manheimer, Naval Research Lab, Washington, DC 20375

M4.7 NONLINEAR ANALYSIS OF A MAGNICON OUTPUT CAVITY – B. Hafizi, S.H. Gold, W.M. Manheimer, P. Sprangle, Naval Research Lab, Washington, DC

M4.8 PHASE ORBITS OF THE EQUILIBRUM ELECTRONS IN A FEL WITH A REVERSED AXIAL GUIDE MAGNETIC FIELD – S.C. Zhang, Y. Xu, Dept. of Appl. Phys., Southwest Jiaotong Univ., Chengdu, Sichuan, P.R. China
SESSION M5

Monday PM FREQUENCY MULTIPLIERS & POWER COMBINERS Dec. 14

M5.1 PROGRESS IN QUASI-OPTICAL POWER COMBINING – (Invited Keynote) – J.W. Mink, US Army Research Office, Research Triangle Park, NC 27709; J.C. Wiltse, Georgia Tech Research Inst, Atlanta, GA 30332

M5.2 HIGH POWER MILLIMETER-WAVE QUASI-OPTICAL FREQUENCY TRIPLER ARRAYS USING RESONANT TUNNELLING DEVICES – E.I. Chung, H-X. Liu, C.W. Domier, N.C. Luhmann, Jr., Center for High Frequency Electronics, Dept of EE, Univ of California, Los Angeles, CA 90024

M5.3 PLANAR VARACTOR DIODE DEVELOPMENT – B.J. Rizzi, T.W. Crowe, Dept of EE, University of Virginia, Charlottesville, VA 22903

M5.4 HIGH Q QUANTUM-BARRIER-VARACTOR (QBV) DIODES FOR MILLIMETER WAVE MULTIPLIERS – K. Krishnamurthi, R.G. Harrison, H.C. Liu, T. Spring Thorpe, M. Buchanan, Carlton University, Ottawa, Canada K1S 5B6

M5.5 A NEW METHOD OF DETERMINATION OF THE I-V CHARACTERISTICS OF NEGATIVE DIFFERENTIAL CONDUCTANCE DEVICES – R.J. Hwu, A.M Abhyankar, University of Utah, Dept of EE, Salt Lake City, UT

M5.6 NEGATIVE DIFFERENTIAL RESISTANCE (NDR) FREQUENCY CONVERSION WITH GAIN – R.J. Hwu, S.C. Lee, A. Djuandi, University of Utah, Dept of EE, Salt Lake City, UT

M5.7 COMPARISON BETWEEN SINGLE AND BACK-TO-BACK VARACTOR DIODE CHARACTERISTICS AND FREQUENCY TRIPLING – R.J. Hwu, L.P. Sadwick, S.C. Lee, University of Utah

M5.8 A TWO DIMENSIONAL POWER COMBINING ARRAY EMPLOYING AN EXTENDED RESONANCE TECHNIQUE – A. Mortazawi, B.C. DeLoach Jr., Dept of Electrical and Cmpt Engr, Univ of Central Florida, Orlando, FL 32816
SESSION M6

Monday PM  MEASUREMENT TECHNIQUES  Dec. 14

M6.1 THE DESIGN OF THE HIGH-PERFORMANCE MILLIMETER-WAVE AND TERAHERTZ OPTIC SYSTEMS – (Invited Keynote) – D.H. Martin, Dept of Physics, Queen Mary and Westfield College, Mile End Road, London E1 4NS, UK

M6.2 FAR-INFRARED MICROSCOPY OF LOW-DIMENSIONAL SEMICONDUCTORS – (Invited Keynote) – R. Merz, F. Keilmann, Max-Planck-Institut für Festkörperforschung, 7000 Stuttgart 80, Germany

M6.3 DEVELOPMENT OF A NEW HIGH RESOLUTION FAR INFRARED FOURIER TRANSFORM SPECTROMETER – T. Dumelow, T.J. Parker, Dept of Physics, Univ of Essex, Wivenhoe Park, Colchester, CO4 3SQ, UK

M6.4 A HIGH PRECISION REFLECTOMETER FOR THE STUDY OF OPTICAL PROPERTIES OF MATERIALS IN THE SUBMILLIMETER – A.J. Gatesman, R.H. Giles, J. Waldman, Univ of Massachusetts at Lowell, Dept of Physics, Lowell, MA 01854

M6.5 SUB-MILLIMETER-WAVE COMPLEX CONDUCTIVITY MEASUREMENTS ON Ba$_{0.6}$K$_{0.4}$BiO$_3$, Y. Liu, J.F. Whitaker, Univ of Michigan, Center for Ultrafast Optical Science; C.E. Platt, Univ of Illinois, Science and Technology Center for Superconductivity

M6.6 VERY HIGH FREQUENCY ELECTRON SPIN RESONANCE – L-C. Brunel, Grenoble High Magnetic Field Laboratory, MPI-CNRS, BP 166, 38042 Grenoble Cedex 9, France

M6.7 CHARACTERIZATION OF 100 GHz GaAs/AlGaAs MULTIQUANTUM WELL AVALANCHE TRANSIT TIME DEVICES – C.C. Meng, H.R. Fetterman, Dept. of EE, Univ. of California, LA 90024; D. Streit, T. Block, Y. Saito, TRW, Redondo Beach, CA

M6.8 ALL-ELECTRONIC SUPICOSECOND PULSES FOR TERAHERTZ SIGNAL GENERATION AND DETECTION – D.W. Van Der Weide, J.S. Bostak, B.A. Auld, D.M. Bloom, Edward L. Ginzton Laboratory, Stanford Univ, Stanford, CA 94305

M6.9 MULTIQUANTUM-WELL DETECTION OF NANOSECOND FAR-INFRARED SUPER-RADIANT PULSES AT TEMPERATURES ABOVE 77 K – J. Waldman, E.R. Mueller, E.S. Jacobs, M.J. Coulombe, Submillimeter Technology Laboratory, Univ. of Massachusetts, Lowell, MA 01854; W.D. Goodhue, MIT Lincoln Lab; D.B. Moix, D.P. Scherrrer, F.K. Kneübuhl, Inst. of Quantum Electronics, Switzerland
SESSION M7

Monday PM  TRANSMISSION LINES  Dec. 14

M7.1 EXPERIMENTAL INVESTIGATION OF A QUASI-OPTICAL ANTENNA FOR A WHISPERING-GALLERY-MODE GYROTRON OUTPUT – J.A. Lorbeck, R.J. Vernon, Univ. of Wisconsin, 1415 Johnson Dr., Madison, WI

M7.2 FIRST RESULTS ON A 110 GHz EVACUATED TRANSMISSION LINE – J.M. Krieg, E. Giguët, P. Garin, A. Dubrovin, G. Mourier, Thomson Tubes Electroniques, 78141 Velizy Villacoublay, France

M7.3 DESIGN AND MEASUREMENTS OF HE_{11} & HE_{12} MODE CONVERTERS – T. Groubner, W. Kasparek, H. Kumrić, Univ. Stuttgart, Pfaffenwaldring 31, D-7000 Stuttgart 80 (Vaihingen) Germany

M7.4 DESIGN REVIEW OF THE MILLIMETRE-WAVE SYSTEM FOR ECRH ON THE FTU TOKAMAK – L. Argenti, A. Bruschi, S. Cirant, F. Granucci, G. Mirizzi, S. Nowak, A. Simonetto, G. Solari, Istituto di Fisica del Plasma, EURATOM/ENEA/CNR Association - Milano, Italy

M7.5 DISCUSSION ON CALCULATIONS OF MODE CONVERTERS IN CORRUGATED WAVEGUIDES – H. Kumrić, Univ. Stuttgart, Pfaffenwaldring 31, D-7000 Stuttgart 80 (Vaihingen) Germany

M7.6 WHISPERING-GALLERY-MODE GENERATION BY MEANS OF AN AZIMUTHAL ARRAY OF APERTURES – R.A. Peebles, M. Kasraian, R.J. Vernon, Univ. Wisconsin, 1415 Johnson Dr., Madison, WI 53706

M7.7 CALCULATION OF EIGENMODE MIXTURES IN CORRUGATED WAVEGUIDES – D. Wagner, J. Pretterebner, Univ. Stuttgart, Germany; M. Thumm, Univ. Karlsruhe, D-7500 Karlsruhe 1, Germany

M7.8 THE EFFECT OF TE_{03} MODE INTO TE_{01}–TE_{02} MODE CONVERTERS FOR HIGH POWER MILLIMETER WAVES APPLICATIONS – C.D.R. Bocio, T. Sancho, M. Sorolla, ETSEET-La Salle Dept. Comunicacions, Uni. Ramon Liull, Passeig Bonanova, 8, 08022 Barcelona, Spain

M7.9 RIGOROUS ANALYSIS OF SLOTTED-CIRCULAR WAVEGUIDES USED IN HIGHER HARMONIC GYROTRONS – A. Jöstingmeier, C. Rieckmann, A.S. Omar, Technische
M7.10 PRECISE MEASUREMENTS OF THE FIELDS OF APERTURE ANTENNAS LAUNCHING HIGH ORDER MODES – J. Pretterebner, D. Wagner, A. Möbius, Univ. Stuttgart, Pfaffenwaldring 31, D-W-7000 Stuttgart 80, Germany

M7.11 BEAM PRESHAPING IN A VLASOV ANTENNA LAUNCHER USING WALL PERTURBATIONS – S. Rauf, J.A. Lorbeck, R.J. Vernon, Univ. Wisconsin, Dept. of Elec. and Cmplt. Engr., 1415 Johnson Dr., Madison, WI

M7.12 EFFECTIVE CONVERSION OF HIGH WAVEGUIDE MODES TO EIGENWAVES OF OPEN MIRROR LINES – G.G. Denisov, M.I. Petelin, D.V. Vinogeadov, Inst. of Appl. Physics of Russian Academy of Science, Nizhny Novgorod, Russia


M8.3 MICROWAVE FEL EXPERIMENT AT CESTA - H. Bottollier-Curtet, A. Devin, J. Gardelle, G. Germain, J. Labrouche, P. Le Taillandier de Gabory, CEA/CESTA - BP N° 2 - 33114 Le Barp, France

M8.4 DESIGN OF A QUASIOPTICAL GYROTRON PUMPED IR FREE-ELECTRON LASER - A.W. Fliflet, W.M. Manheimer, Naval Research Lab, Washington, DC 20375

M8.5 ELECTRON TRAPPING IN RELATIVISTIC GYRO-DEVICES - P.E. Latham, G.S. Nusinovich, S. Tantawi, Laboratory for Plasma Research, Univ. of Maryland, College Park, MD 20742

M8.6 EFFICIENCY OF FREQUENCY UP-SHIFTED GYRO-DEVICES: CYCLOTRON HARMONICS VERSUS CARM OPERATION - G.S. Nusinovich, P.E. Latham, H. Li, Laboratory for Plasma Research, Univ. of Maryland, College Park, MD 20742

M8.7 A COMPACT RELATIVISTIC ELECTRON BEAM SOURCE FOR GENERATION OF FAR INFRARED RADIATION - C.R. Jones, M.J. Peters, J.M. Dutta, North Carolina Central University, Durham, NC 27707

M8.8 INFLUENCE OF THE ADIABATIC-MAGNETIC-FIELD DISTRIBUTION AT THE ENTRANCE ON THE OUTPUT POWER AND EFFICIENCY IN A FEL - S.C. Zhang, W.Y. Wang, Y. Xu, Dept. of Appl. Phys., Southwest Jiaotong Univ., Chengdu, Sichuan, P.R. China
M8.9 QUALITY OF ELECTRON BEAM DIAGNOSTIC SYSTEM FOR SG-1 FREE ELECTRON LASER AMPLIFIER – F. Luo, CAEP - China Acad. of Engr. Phys., P.O. Box 517-50, Chengdu, Sichuan 610003, P.R. China
**SESSION T1**

**Tuesday AM** | **MMW SYSTEMS** | **Dec. 15**

**T1.1** APPLICATIONS OF GYROTRONS TO RADAR AND ATMOSPHERIC SENSING – *(Invited Keynote)* – W. Manheimer, Code 4707, Naval Research Lab, Washington, DC 20375

**T1.2** RECENT ADVANCES ON W-BAND THEORY AND TECHNOLOGY IN CHINA – *(Invited Keynote)* – L. He, W. Hong, Y. Chen, Dept of Radio Engr, Southeast Univ, 210018 Nanjing, P.R.China

**T1.3** A PROPOSAL FOR NOVEL ACTIVE PHASED ARRAY RADAR – *(Invited Keynote)* – N. Fourikis, K.W. Eccleston, DSTO/MRD, PO Box 1500 Salisbury, South Australia 5108; D.R. Wehner, Radar and Electromagnetic Systems, 4410 Algeciras St, San Diego, CA

**T1.4** RADIOMETRIC GROUND SPEED SENSOR FEASIBILITY – J.C. Wiltse, Georgia Tech Research Institute, Atlanta, GA 30332

**T1.5** A MILLIMETER-WAVE RADIOMETER FOR DETECTING WIND SHEAR – R.W. McMillan, Georgia Tech Research Institute, Atlanta, GA 30332

**T1.6** WHISPERING GALLERY MODE IN DIELECTRIC WAVEGUIDE AND DIELECTRIC RESONATORS – S. Liu, Univ. of Electronic Science and Tech. of China; T. Lothar, Leeds Polytechnic, UK
SESSION T2

Tuesday AM MATERIALS PROPERTIES Dec. 15

T2.1 SUBMILLIMETER WAVE SPECTROSCOPY: DIELECTRIC MEASUREMENT, MATERIAL TESTING – (Invited Keynote) – G.V. Kozlov, Academy of Sciences of Russia, 38 Vavilova St, Moscow, Russia


T2.3 DIELECTRIC PROPERTIES OF SAPPHIRE AT MICROWAVE FREQUENCIES – J. Mollá, A. Ibarra, EURATOM-CIEMAT Association Inst Investigación Básica, CIEMAT, Avda. Complutense. 22 E-28040 Madrid, Spain

T2.4 WINDOW MATERIALS FOR HIGH POWER GYROTRONS – M.N. Afsar, H. Chi, Dept. of EE, Tufts Univ, Medford, MA 02155

T2.5 A NEW MICROWAVE AND MILLIMETER WAVE SPECTROMETER FOR PERMEABILITY MEASUREMENTS OF MAGNETIC MATERIALS – M.N. Afsar, H. Chi, Tufts University, Medford, MA 02155

T2.6 SILICONE BASED ANECHOICS AT TERAHERTZ FREQUENCIES – R.H. Giles, T.M. Horgan, J. Waldman, Univ of Massachusetts at Lowell, Dept of Physics, Lowell, MA 01854


T2.8 PHOTOACOUSTIC AND DOUBLE RESONANCE SPECTRA OF H2CS – A.M. Darwish, J.R. Izatt, Dept of Physics and Astronomy, Univ of Alabama, Tuscaloosa, AL 34587; J.C. Petersen, Danish Inst. of Fundamental Metrology, Denmark

T2.9 EFFECT OF THE ORGANIC SOLVENTS ON THE ABSORPTION BANDS IN THE IR-REGION OF THE SPECTRUM – M.I. Nasser, National Research Centre Dokki, Cairo, Egypt; A.H. Bassyouni, Univ of Zagazig, Egypt
SESSION T3

Tuesday AM  LASERS I  Dec. 15

T3.1 NEW PHENOMENA IN OPTICALLY PUMPED FAR-INFRARED SUPERRADIANT AND RAMAN EMISSIONS (Invited Keynote) – D.P. Scherrer, A.W. Kälin, R. Kesselring, J.S. Bakos, F.K. Kneubühl, Inst. of Quantum Electronics, Swiss Federal Inst. of Tech (ETH), CH-8093 Zurich, Switzerland

T3.2 NEW CONCEPT OF OPTICAL-FREE-INDUCTION-DECAY (OFID) PICOSECOND-PULSE 10μm-CO2-LASER SYSTEMS – D.P. Scherrer and F.K. Kneubühl, Inst. of Quantum Electronics

T3.3 COMPETITION BETWEEN FORWARD AND BACKWARD EMISSION IN AN OPTICALLY PUMPED FIR RING LASER – K. Matsushima*, N. Higashida, N. Sokabe, T. Ariyasu*, *Dept. EE, Kansai Univ, Japan; and Dept of Applied Physics, Osaka City Univ., Sugimoto, Osaka 558, Japan

T3.4 PHASE OF RADIATION FROM STIMULATED EMISSION – M. Hirooka, College of General Education, Osaka Univ, Toyonaka, Osaka, Japan

T3.5 HIGH POWER NS FIR RAMAN PULSES IN NH3 PUMPED BY A SHORT PULSE TAIL-FREE CO2 OSCILLATOR – S. Marchetti, R. Simili, IFAM-CNR, Via del Giardino 7, 56100, Pisa, Italy

T3.6 GAIN OF THE p-Ge INTERBAND LASER – H. Zuckermann, F. Keilmann, Max-Planck-Institut für Festkörperforschung, 7000 Stuttgart 80, Germany

T3.7 LINEWIDTH OF THE p-Ge LASER – V.N. Shastin, A.V. Murav’jov, S.G. Pavlov, Inst. of Applied Physics of Russian Academy of Science, Nizhny Novgorod 603600, Russia; E. Bründermann, M.F. Kimmit, H.P. Roeser, Max-Planck-Institut für Radioastronomie, Auf dem Hügel 69, D-5300 Bonn 1, Germany
SESSION T4

Tuesday AM GYROTRON I Dec. 15


T4.4 INVESTIGATION AND DEVELOPMENT OF GYROTRON AT THE INSTITUTE OF APPLIED PHYSICS – V. Flyagin, A. Goldenberg, V. Zapevalov, IAP, Nizhny Novgorod, Russia

T4.5 HIGH POWER OPERATION OF A 200-300 GHz GYROTRON OSCILLATOR – T.L. Grimm, P.M. Borchard, K.E. Kreischer, R.J. Temkin, MIT Plasma Fusion Center, Cambridge, MA 02139


T4.7 MULTIMEGAWATT GYROTRONS FOR ITER – K.E. Kreischer, W.C. Guss, R.J. Temkin, MIT Plasma Fusion Center, Cambridge, MA 02139
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<td><strong>T5.1</strong> ANTENNA-COUPLED THIN-FILM NANOMETER METAL-OXIDE-METAL INFRARED DIODES – <em>(Invited Keynote)</em> – I. Wilke, Y. Oppliger*, W. Herrmann, F.K. Kneubühl, Inst of Quantum Electronics, Swiss Federal Inst of Tech, CH-8093 Zurich, Switzerland; *CSEM, CH-2007 Neuchatel, Switzerland</td>
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<td><strong>T5.2</strong> DESIGN OF HIGH T(_c) BOLOMETERS ON SILICON MEMBRANES FOR A FAR INFRARED IMAGING ARRAY, S. Verghese, P.L. Richards, Dept of Physics, Univ of California and Materials Sciences Div, Lawrence Berkeley Lab, Berkeley, CA 94720; K. Char, Conductus Inc., Sunnyvale, CA 94086; D.K. Fork, Xerox PARC, Palo Alto, CA 94304; T.H. Geballe, Dept of Applied Physics, Stanford Univ, Stanford, CA 94305</td>
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<td><strong>T5.3</strong> High T(_c) COMPOSITE MICROBOLOMETERS – J.M. Lewis, D.P. Neikirk, Dept of Electrical and Cmptr Engr, The Univ of Texas at Austin, TX 78712</td>
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<td><strong>T5.4</strong> MECHANISM AND PROPERTIES OF ANTENNA COUPLED POINT-CONTACT WARM CARRIER DEVICES AT 10.6µm – T. Simizu, Y. Yasuoka, Dept of Electronic Engr, The National Defense Academy, Hashirimizu, Yokosuka 239 Japan</td>
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<td><strong>T5.5</strong> ON THE WORK MECHANISM OF MIM POINT CONTACT DIODES – G. Carelli, M. Inguscio, N. Ioli, A. Moretti, M. Prevedelli, F. Strumia, Dept di Fisica dell’Università CNR. p. Torricelli, 2, 56126 - Pisa, Italia; D. Pereira, UNICAMP, Brasil</td>
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<td><strong>T5.7</strong> FABRICATION OF SUBMICRON GaAs SCHOTTKY DIODES FOR MIXERS/DETECTORS OPERATING IN THE SUBMILLIMETER WAVE RANGE – T. Suzuki, J.J. Chang+, T. Nozokido++, K. Mizuno, R. Kuwano, Research Inst of Electrical Comm, Tohoku Univ, Japan; +Exploratory Research for Advanced Tech, Research Development Corp of Japan; ++Photodynamics Research Center, RIKEN</td>
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| **T5.8** A FULL HEIGHT WAVEGUIDE SIS MIXER FOR A WAVEGUIDE BAND OPERATION – A. Karpov, J. Blondel, C. Grassl, K.H. Gundlach, Institut de Radioastronomie
T5.9 FREQUENCY DEPENDENT SIMULATION OF PLANAR MILLIMETER-WAVE MIXER DIODES – J.A. Wells, N.J. Cronin, Univ of Bath, Bath BA2 7AY, UK

T5.10 THE RELIABILITY OF PLANAR GaAs SCHOTTKY DIODES – J.L. Bowers, W.L. Bishop, T.W. Crowe, Dept of EE, Univ of Virginia, Charlottesville, VA 22903

T5.11 A BROADBAND INTEGRATED MATCHING STRUCTURE FOR SIS-MIXERS – U. Kotthaus, K. Jacobs, KOSMA, Physikalisches Inst, Univ zu Köln, Zülpicher str. 77, D W-5000 Köln 1, Germany
SESSION T6

Tuesday PM SEMICONDUCTORS I Dec. 15


**T6.2** FAR INFRARED MEASUREMENTS ON DOPED GaAs/AlGaAs MULTIPLE QUANTUM WELLS—S.K. Kang, J.P. Bryant, T. Dumelow, T.J. Parker, Dept of Physics, Univ of Essex, Wivenhoe Park, Colchester, CO4 3SQ, UK; C.T. Foxon, J.W. Orton, J.J. Harris, Univ of Nottingham, University Park, Nottingham, NG7 2RD, UK

**T6.3** MAGNETOOPTICS ON CHROMIUM-BASED DILUTED MAGNETIC SEMICONDUCTORS—R. Krevet, M. von Ortenberg, Hochmagnetfeldanalage der Technischen Universität Braunschweig, Mendelssohnstrasse 3, D-3300 Braunschweig, Germany; A. Twardowski, Inst for Experimental Physics, Univ of Warsaw, Poland

**T6.4** INFRARED ABSORPTION SPECTRUM OF SINGLY IONIZED MAGNESIUM DONOR IMPURITIES IN SILICON—L.T. Ho, F.Y. Lin, W.J. Lin, Institute of Physics, Academia Sinica, Taipei, Taiwan

**T6.5** SILICON DOPED WITH GALLIUM PHOTOCONDUCTORS: EFFECT OF UNIAXIAL STRESS—C. Mény, G. Sirmain, J. Ristorcelli, M. Giard, C. Lucas, J. Léotin, Laboratoire de Physique des Solides, INSA, 31077 Toulouse Cedex, France

**T6.6** RESPONSE OF STRESSED GeGa PHOTOCONDUCTOR AT MILLIMETER WAVELENGTHS—C. Mény, J. Birch, J. Léotin, Laboratoire de Physique des Solides, France
SESSION T7

Tuesday PM  LASERS II  Dec. 14

T7.1 FAR INFRARED LASER LINES AND ASSIGNMENTS OF CH₃OH: A REVIEW - G. Moruzzi, F. Strumia, Dept. di Fisica dell'Università di Pisa, Italy; J.C.S. Moraes, Dept. de Ciencias, Brazil

T7.2 GENERATION OF TUNABLE FIR LASER PULSES WITH DURATIONS OF LESS THAN 100 ps - W. Schatz, M.A. Heusinger, R.S. Nebosis, K.F. Renk, Univ. of Regensburg, Regensburg, Germany; P.P. Lang, M.P.I. Plasmaphysik, Garching, Germany

T7.3 OBSERVATION OF NEW FIR LASER LINES FROM ¹²CH₃OH - D. Pereira, E.M. Telles, J.C.S. Moraes, A. Scalabrin, Inst. de Física-UNICAMP, Brasil; G. Carelli, N. Ioli, A. Moretti, F. Strumia, Deppartimento di Fisica, dell'Università, 56.100, Pisa, Italy

T7.4 ASSIGNMENT OF THE FTS SPECTRUM OF CD₃OH - G. Moruzzi, Dept di Fisica dell/Università di Pisa, Italy; R.M. Lees, L-H. Xu, Dept. of Physics, U of New Brunswick, Canada; B.P. Winnewisser, M. Winnewisser, Physikalisch-Chemisches Institut der Justus-Liebit-Universität Giessen, Germany

T7.5 FTIR SPECTROSCOPY OF THE LOWER VIBRATIONAL MODES OF 0-18 METHANOL - S.Zhao, R.M. Lees, U of New Brunswick, Canada; J.W.C. Johns, Herzberg Institute of Astrophysics, Canada; C.P. Chan, U of British Columbia, Canada

T7.6 INTERMODULATED PHOTOACOUSTIC MEASUREMENTS OF PRESSURE BROADENING COEFFICIENTS OF ¹²CH₃OH,ν₅ LINES BY CO₂ LASERS - H. Okabe, N. Sokabe, Dept of Applied Physics, Osaka City University, Japan

T7.7 TORSION-VIBRATION ENERGY STRUCTURE AND INTERACTIONS AMONG THE LOWER VIBRATIONAL MODES OF ¹³CD₃OH - L.H. Xu, R.M. Lees, U of New Brunswick, Canada; J.W.C. Johns, M. Noël, Herzberg Inst of Astrophysics, Canada

T7.8 NEW FAR INFRARED LASER LINES AND FREQUENCY MEASUREMENTS IN N₂H₄ AND ¹³CD₃OH MOLECULES PUMPED BY A CONVENTIONAL CO₂ LASER - E.C.C. Vasconcellos, Instituto de Fisica, Brasil; L.R. Zink, G.P. Galvão, K.M. Evenson, Inst Nacional de Pesquisas Espaciais, Brasil

T7.9 SUBMILLIMETER CYCLOTRON RESONANCE LASERS AND THEIR APPLICATIONS - Yu.B. Vasilyev, S.D. Suchalkin, Yu.L. Ivanov, AF Ioffe Inst, Academy of Sciences, Russia
T7.10 IR AND FIR OPTOACOUSTIC STARK SPECTROSCOPY OF THE $^{13}$C-O STRETCHING Q-BRANCH OF $^{13}$CD$_3$OH - D. Paraira, E.M. Talles, J.C.S. Moraes, A. Scalabrin, Inst de Fisica, UNICAMP, Brasil; G. Carelli, N. Ioli, A Moretti, F. Strumia, Dept di Fisica dell’Università, Italy
SESSION T8

Tuesday PM  

GYROTRON II  

Dec. 15

T8.1 35 GHz SLOTTED FOURTH HARMONIC GYRO-KLYSTRON – D.B. McDermott, C.K. Chong, N.C. Luhmann, Jr., Dept of EE, Univ. of California, Los Angeles, CA 90024

T8.2 THE NRL 85 GHz QUASIOPTICAL GYROKLYSTRON EXPERIMENT – R.P. Fischer, A.W. Fliflet, W.M. Manheimer, Naval Research Laboratory, Washington, DC 20375

T8.3 33.2 GHz, 3-CAVITY GYROKLYSTRON – J.D. McNally, M.P. Bobys, D.B. McDermott, N.C. Luhmann, Jr., Dept. of EE, Univ. of California, Los Angeles, CA

T8.4 INVESTIGATION OF ROTATING MODES IN HIGH POWER GYROTRONS – M. Blank, K.E. Kreischer, R.J. Temkin, MIT Plasma Fusion Center, Cambridge, MA 02139

T8.5 NUMERICAL OPTIMIZATION OF HIGH ORDER VOLUME-MODE GYROTRON CAVITIES WITH RESPECT TO MODE CONVERSION AND MODE COMPETITION – O. Dumbrajs, G. Gantenbein, M. Thumm, Inst. f. Technische Physik, Kernforschungszentrum Karlsruhe, Germany

T8.6 MODE COOPERATION IN GYROTRONS WITH HIGHLY OVERMODED CAVITY – K. Xu, M. Thumm, Kernforschungszentrum Karlsruhe GmbH, ITP Postfach 3640, D-7500 Karlsruhe 1, Germany

T8.7 SIDEBAND MODE COMPETITION IN A GYROTRON OSCILLATOR – W.C. Guss, M.A. Basten, K.E. Kreischer, R.J. Temkin, MIT Plasma Fusion Center, Cambridge, MA; T.M. Antonsen, Jr. S.Y. Cai, G. Saraph, B. Levush, Univ. of Maryland, College Park, MD


T8.9 POSSIBLE TEM MODE COMPETITION IN GYROTRONS WITH COAXIAL CAVITY – K. Xu, M. Thumm, Institut für Technische Physik, Karlsruhe, Germany

T8.10 AN AUTONOMOUS BEAM BUNCHER FOR ECM APPLICATIONS – J.L. Vomvoridis, D.J. Frantzeskakis, K. Hizanidis, Dept. of Electrical and Cmptr. Engr., National Technical University of Athens

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SESSION W1

Wednesday AM ANTIENNAS Dec. 16

W1.1 RECENT DEVELOPMENTS IN MILLIMETER-WAVE POWER TRANSMISSION AND CONVERSION – K. Chang, Dept of EE, Texas A&M Univ, College Station, TX 77843

W1.2 NEW DEVELOPMENTS FOR MONOLITHIC MILLIMETER-WAVE DIODE ARRAY BEAM CONTROLLERS – L.B. Sjogren, F. Wang, T. Liu, H-X.L. Liu, X-H. Qin, E. Chung, C.W. Domier, N.C. Luhmann, Jr., Dept of EE, Univ of California, 90024

W1.3 DIELECTRIC-SLAB LOADED INTEGRATED HORN ANTENNAS – G.V. Eleftheriades, C-Y. Chi, S.S. Gearhart, G.M. Rebeiz, NASA Ctr for Space Terahertz Technology, Univ of Michigan, Ann Arbor, MI

W1.4 NOVEL LOW TEMPERATURE SUPERCONDUCTING BOLOMETERS – M. Nahum, P.L. Richards, Dept of Physics, U.C. Berkeley and Materials Sciences Div, Lawrence Berkeley Lab, CA; M. Gaidis, D.E. Prober, Dept of Applied Physics, Yale Univ, New Haven, CT

W1.5 OFF-AXIS-FED FRESNEL ZONE PLATE ANTENNA – J.C. Wiltse, Georgia Tech Research Institute, Atlanta, GA 30332; C.A. Barrett, Texas Instruments, Dallas, TX


W1.7 EXPERIMENTAL ANALYSIS OF METAL COATED DIELECTRIC WAVEGUIDES – C.S. Yeh, N. Urimindi, J. Liu, J.K. Butler, Southern Methodist Univ, Dallas TX 75275


W1.9 FINITE SIZE EFFECTS OF WAVE COUPLING BY SEW GRATING ANTENNAS – R. Petruskevicius, Inst of Physics, A. Gostauto 12, Vilnius 2600, Lithuania

W1.10 ANTENNA ARRAY DESIGN USING WINDOW FUNCTIONS – S. Qi, Q. Yang, State Key Laboratory of Millimeter Wave, Dept of Radio Engr., Southeast Univ, Nanjing 210018, P.R. China
W1.11 TOLERANCE OPTIMIZATION OF LOW SIDELOBE ARRAYS USING A GENERAL NONLINEAR MINIMAX METHOD - Y. Qi, W. Hong, Y. Chen, Southeast Univ; Y. Jiao, Research Inst. of Antennas, Xidian Univ, Xian 710071, P.R. China
SESSION W2

Wednesday AM  SEMICONDUCTORS II  Dec. 16


W2.2 FAR INFRARED PHOTOCONDUCTIVITY IN n-GaAs AT FILAMENTARY CURRENT FLOW – V.A. Golubev, A.F. Ioffe Physico-Technical Inst, St. Petersburg, Russia; A. Schilz, O. Bauer, W. Prettl, Univ of Regensburg, Germany

W2.3 FAR INFRARED STUDY OF INTERFACE BROADENING IN GaAs/AlAs SUPERLATTICES – A.Z. Mamun, J.P. Bryant, T. Dumelow, T.J. Parker, S.R.P. Smith, R. York, Dept of Physics, Univ of Essex, Wivenhoe Park, Colchester, UK; C.T. Foxon, J.W. Orton, K.J. Moore, Univ of Nottingham, University Park, UK

W2.4 TEMPERATURE DEPENDENCE OF InSb REFLECTIVITY AT FIR FREQUENCIES: INTRINSIC AND DOPED CRYSTALS – C. Carelli, N. Ioli, A.M. Messina, A. Moretti, D. Pereira, S. Schepis, F. Strumia, Dipartimento di Fisica dell’Universita and CNR, Piazza Torricelli, 2 I-56126 Pisa, Italy

W3.1 MIXING EFFECT IN THE NH₃ ABSORPTION AND MIR EMISSION SPECTRA PUMPED BY A CONTINUOUSLY TUNABLE CO₂ LASER – S. Marchetti, R. Simili, M. Giorgi, IFAM-CRN, Via del Giardino 7, 56100 Pisa, Italy

W3.2 OPTIMUM OPERATING GAS PRESSURE OF MINIATURE OPFIRL – L. Yao, L. Yikun, Dept of Electronics, Zhongshan Univ, Guangzhou 510275, PR China

W3.3 STRIP GRATING OUTPUT COUPLERS FOR FAR INFRARED LASERS – R. Densing, C.E. Hawkins, III, Dept EE, Univ of Virginia, Charlottesville, VA; T.J. Scholz, Dept Physics, Univ of Virginia, Charlottesville, VA; A. Gatesman, Dept of Physics and Applied Physics, Univ of Massachusetts, Lowell, MA

W3.4 LENGTH AND PRESSURE DEPENDENCE OF METHYLFLOURIDE RAMAN FIR LASER EMISSION SPECTRA – J.R. Izatt, Dept. of Physics and Astronomy, Univ. of Alabama, Tuscaloosa, AL 35487; W. Schatz, K.F. Renk, Angewandte Physik Universität Regensburg, Germany

W3.5 INTERACTION ENHANCEMENT OF TWO-PHOTON PRECESSES IN MINIATURE OPFIRL – Y. Lin, X. Zheng, Zhongshan Univ., Guangzhou 510279 P.R. China
SESSION W4

Wednesday AM  GYROTRON III  Dec. 16


W4.2  CYCLOTRON HARMONIC GYROAMPLIFIER BASED ON ELECTROSTATIC MODES OF A BEAM-FILLED COAXIAL WAVEGUIDE – J.L. Hirshfield, Omega-P, Inc. 2008 Yale Station, New Haven, CT 06520

W4.3  NONLINEAR THEORY OF COHERENT FAST WAVE RADIATION FROM SPATIOTEMPORALLY MODULATED GYRATING ELECTRON BEAM – A.K. Ganguly, NRL, Washington, DC; J.L. Hirshfield, Omega-P, Inc., 2008 Yale Station, New Haven, CT


W4.5  CYCLOTRON RESONANCE MASERS WITH SLOW ELECTROMAGNETIC WAVES – G.S. Nusinovich, P.E. Latham, S. Tantawi, Lab for Plasma Research, Univ. of Maryland, College Park, MD 20742

W4.6  DESIGN OF EXPERIMENTAL DIELECTRIC LOADED WIDEBAND GYRO-TWT – K.C. Leou, D.B. McDermott, N.C. Luhmann, Jr., Dept. of EE, Univ. of California, Los Angeles, CA 90024

W4.7  POWERFUL MILLIMETER-WAVE AMPLIFIER WITH QUASI-OPTICAL STRUCTURE – N.L. Romashin, Inst. of Radioengineering and Electronics Russian Academy of Sciences, Marx av. 18. Moscow, 103907, Russia; A.I. Kleev, P.L. Kapitza Inst. for Physical Problems ul. Kosygina, 2, Moscow, 117973, Russia; V.A. Solntsev, B. Vuzovsky. 3/12. MIEM. Moscow, 109028, Russia

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SESSION W5

Wednesday PM RECEIVERS & ASTRONOMY Dec. 16

W5.1 250 GHz QUASI-INTEGRATED LOW-NOISE SCHOTTKY RECEIVER – W.Y. Ali-Ahmad, G.M. Rebeiz, NASA/Ctr for Space Terahertz Tech, Univ of Michigan, Ann Arbor, MI 48109; W. L. Bishop, T.W. Crowe, Univ. of Virginia-Charlottesville, VA 22901

W5.2 PERFORMANCE OF A 230 GHz SIS RECEIVER USING BROADBAND INTEGRATED MATCHING STRUCTURES – K. Jacobs, U. Kotthaus, KOSMA, Physikalisches Inst., Universität zu Köln, Zülpicher Str. 77, D W-5000 Köln 1, Germany

W5.3 REMOTE SENSING OF STRATOSPHERIC OH FROM HIGH ALTITUDE AIRCRAFT – M. Birk, F. Schreier, D. Hausamann, DLR Inst of Optoelectronics, 8031 Oberpfaffenhofen, Germany; S. Miller, Phillips Laboratory, Hanscom AFB, MA

W5.4 CURRENT-FREQUENCY CHARACTERISTIC OF SUBMICRON GaAs SCHOTTKY BARRIER DIODES WITH FEMTOFARAD CAPACITANCES – H.P. Roeser, R.U. Titz, G.W. Schwaab, M.F. Huegel 69, 5300 Bonn, Germany

W5.5 A 380 GHz SIS RECEIVER USING HIGH QUALITY AND HIGH CURRENT DENSITIES Nb/A10x/Nb JUNCTIONS – P. Feautrier, P. Febvre, R. Maoli, B. Leridon, G. Ruffie, J.C. Pernot, G. Beaudin, M. Hanus, M. Gheudin, P. Encrenaz, Observatoire de Meudon, DEMIRM, 5 place Janssen, 92195 Mendon, Cedex, France

W5.6 FIR-FTS VERSUS FIR-HETERODYNE SPECTROMETER: A SENSITIVITY COMPARISON FOR ATMOSPHERIC APPLICATION – M. Birk, DLR Inst of Optoelectronics, 8031 Oberpfaffenhofen, Germany


W5.8 BALLOON-BORNE IMAGING OF THE CYGNUS REGION AT 250 µm WAVELENGTH – G. Schenker, D. Huguenin, F.K. Kneubühl, Inst of Quantum Electronics, Swiss Federal Inst of Technology, Zurich, Switzerland

W5.9 STRATOSPHERIC BALLOON-BORNE TELESCOPE FOR SUBMILLIMETER-WAVE IMAGING OF ASTRONOMICAL OBJECTS – G. Schenker, A.P. Holenstein, D. Huguenin, F.K. Kneubühl, Inst of Quantum Electronices, Switzerland
W5.10 MICROWAVE RECEIVER SYSTEM WITH QUANTUM SUPERCONDUCTION JOSEPHSON JUNCTION – S.E. Anischenko, S.V. Korsunskiy, P.V. Khabayev, S.Y. Larkin, Scientific Research Center FONON, 37, Pobedy Av, KPI-3240, Kiev, Ukraine, 252056
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**W6.1** AN EIGHT-CHANNEL HIGH-POWER CONTIGUOUS-BAND MULTIPLEXER FOR BROADCASTING SATELLITE TRANSPONDERS – F. Suginosita, T. Nomoto, N. Yazawa, NHK Science and Tech Res Lab, 1-10-11, Kinuta, Setagaya-ku, Tokyo, 157, Japan

**W6.2** FIN-LINE PIN DIODE BPSK AND QPSK MODULATORS – L. He, X. Wu, X. Zhu, Dept of Radio Engr, Southeast Univ, 210018 Nanjing, P.R. China

**W6.3** REAL TIME REVIEW OF RAIN-BOW HOLOGRAM WITH DCP IN WHITE-LIGHT – H. Guo, Southwest Inst of Fluid Physics, P.O. Box 523-59 Chengdu, Sichuan, P.R. China

**W6.4** PROGRESS OF OPTICAL CONTROL OF QUASI-OPTICAL OSCILLATORS USING MESFETs – S. Kawasaki, T. Itoh, Dept. of EE, Univ. of California, Los Angeles, CA 90024

**W6.5** HIGH SPEED PIN DIODE SWITCH FOR NARROW PULSE GENERATION – B.K. Sarker, Special Radar Div, IIT Campus, Powai, Bombay 400 076, India

**W6.6** AlAs/InGaAs HETEROJUNCTION BARRIER VARACTOR DIODES – V.K. Reddy, D.P. Neikirk, Dept of Electrical and Cmptr Engr, The Univ of Texas at Austin, TX 78712

**W6.7** A BROADBAND Ka-BAND MICROSTRIP CIRCULATOR FOR INTEGRATED MILLIMETER SYSTEMS – W.B. Dou, Z.L. Sun, Millimeter Wave Lab., Dept of Radio Engr, Southeast University, 210018 Nanjing, P.R. China

**W6.8** ANALYSIS AND EXPERIMENT OF THE 3mm-BAND HIGHER ORDER MODES WAVEGUIDE Y-JUNCTION CIRCULATORS – W.B. Dou, Z.L. Sun, State Key Lab of Millimeter Waves, Dept of Radio Engr, Southeast University, 210018 Nanjing, P.R. China

**W6.9** WAVEGUIDE PIN DIODE SWITCH AT Ka-BAND – B.K. Sarker, S. Gupta, IIT Campus, Powai, Bombay, 400.076 India

**W6.10** UHF TO Ka BAND UPCONVERTER – S.K. Verma, G. Shankar, D. Singh, Defense Electronics Applications Lab, P.O. Box 54, Raipur Road, Dehradun 248 001 India
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<td>W7.2</td>
<td>CALIBRATION OF AN INFRARED POLARIMETER FOR ALCATOR C-MOD</td>
<td>C.H. Ma, D.P. Hutchinson, Oak Ridge Natl. Lab., TN 37831; J. Irby, MIT PFC, Cambridge, MA 02139</td>
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<td>W7.3</td>
<td>A BROADBAND REFLECTOMETER FOR THE GAMMA 10 TANDEM MIRROR</td>
<td>A. Mase, Y. Ito, T. Tokuzawa, A. Itakura, H. Satake, Y. Nagayama, T. Tamano, Plasma Res. Center, Univ. of Tsukuba, Tsukuba, Ibaraki 305, Japan</td>
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<td>W7.4</td>
<td>SCATTERING FROM THE TORTUS TOKAMAK PLASMA USING A GYROTRON</td>
<td>P.W. Fekete, K.D. Hong, G.F. Brand, T. Idehara, School of Physics, Univ. of Sydney, NSW, 2006 Australia; Faculty of Engr., Fukui Univ., Fukui 910, Japan</td>
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<td>W7.6</td>
<td>AN ICRF ANTENNA EDGE PLASMA DENSITY PROFILE DIAGNOSTIC FOR THE DIII-D TOKAMAK</td>
<td>T.S. Bigelow, G.R. Hansen, J.B. Wilgen, Oak Ridge National Lab; E. Doyle, T. Rhodes, UCLA, Los Angeles, CA</td>
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<td>W7.7</td>
<td>INTERFEROMETRY MEASUREMENT OF LINE AVERAGE ELECTRON DENSITY IN ALVAND IIC TOKAMAK</td>
<td>M. Ghorannevis, M. Avakian, Islamic Azad Univ., P.O. Box 19395-1775 Thran, Iran</td>
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<td>W7.8</td>
<td>APPLICATION OF NON-COHERENT REFLECTOMETRY METHOD FOR MEASUREMENT OF PLASMA CUT-OFF LAYER POSITION</td>
<td>V.V. Kulik, K.A. Lukin, V.A. Rakityansky, Inst. of Radiophysics and Electronics, Ukrainian Academy of Sciences, 12. Acad. Proskura st., 310085, Kharkov, Ukraine</td>
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SESSION W8

Wednesday PM  GYROTRON IV  Dec. 16

W8.1  STUDIES OF THE SELF-CONSISTENT FIELD STRUCTURE IN A QUASI-OPTICAL GYROTRON – *(Invited Keynote)* – T.M. Antonsen*, A. Bondeson, M. Roulin, M.Q. Tran, *University of Maryland, College Park, MD 20742; CRPP, 21 Av. des Bains, CH-1007 Lausanne, Switzerland

W8.2  HIGH POWER, LONG-PULSE, INTENSE e-BEAM, TAPERED GYROTRON-BACKWARD WAVE OSCILLATORS – R.M. Gilgenbach, M.T. Walter, P.R. Menge, T.A. Spencer, University of Michigan, Nuclear Engr. Dept. Ann Arbor, MI 48109

W8.3  MECHANISMS OF EFFICIENCY ENHANCEMENT IN GYRO BACKWARD WAVE OSCILLATORS WITH TAPERED MAGNETIC FIELDS – A.T. Lin, Univ. of California, Los Angeles, CA 90024

W8.4  EXPERIMENTAL STUDY OF AN INJECTION LOCKED GYROTRON BACKWARD WAVE OSCILLATOR – C.S. Kou, S.H. Chen, L.R. Barnett, K.R. Chu, Dept. of Physics, National Tsing Hua Univ., Hsinchu, Taiwan


W8.6  SECOND HARMONIC OPERATION OF GYROTRON V – K.D. Hong, G.F. Brand, T. Idehara, School of Physics, Univ. of Sydney, NSW, 2006 Australia; Faculty of Engineering, Fukui Univ., Fukui 910, Japan


W8.8  SINGLE STAGE HIGH POWER SECOND HARMONIC GYRO-TWT – Q.S. Wang, D.B. McDermott, A.T. Lin, N.C. Luhmann, Jr., Dept of EE, Univ. of California, Los Angeles, CA 90024; J. Pretterebner, Institut fur Plasmaforschung, Univ. of Stuttgart, Germany

NONSTATIONARY NONLINEAR THEORY OF FAST WAVE DEVICES – A.P. Chetverikov, Saratov State Univ., Astrahanskay, 83, Saratov 410071, Russia

STARTING CONDITIONS OF SPONTANEOUS OSCILLATIONS IN FAST WAVE DEVICES – A.P. Chetverikov, A.E. Konevetz, Saratov State Univ., Astrahanskay, 83, Saratov 410071, Russia
SESSION Th1

Thursday AM INTEGRATED CIRCUITS Dec. 17


Th1.2 SCALED MODELLING OF PLANAR ARRAY SIS MIXERS – H. Xue, R. Blundell, R. Padman, Cavendish Laboratory, Madingley Rd, Cambridge, CB3 OHE England


Th1.4 GaAs NONLINEAR TRANSMISSION LINES USING SCHOTTKY SUPERLATTICE BARRIER VARACTORS – W-M. Zhang, H. Shi, C.W. Domier, N.C. Luhmann, Jr., Ctr for High Frequency Electronics, Dept of EE, Univ of CA, Los Angeles, CA 90024

Th1.5 CHIP TO CHIP OPTICAL INTERCONNECTS IN A MULTICHIP MODULE ARCHITECTURE – J.A. Holmes, F.C. Jain, Univ. of Connecticut, 260 Glenn Brood Rd., Storrs, CT

Th1.6 CHARACTERIZATION OF MICROSTRIP MEANDER LINE SLOW-WAVE STRUCTURES FOR APPLICATIONS IN MM-WAVE PRINTED CIRCUITS – A.R. Jha, Jha Technical Consulting Services, 12354 Charlwood St, Cerritos, CA 90701

Th1.7 DEVELOPMENT OF NEW MICROWAVE AND MILLIMETER-WAVE END-COUpled BAND-PASS FILTERS USING BROADSIDE-COUpled COPLANAR WAVEGUIDE – C. Nguyen, Dept of EE, Texas A&M Univ, College Station, TX 77843

Th1.8 AN ACCURATE, HIGH RESOLUTION 30-250 GHz FREE-SPACE VECTOR TRANSMISSION MEASUREMENT SYSTEM USING MONOLITHIC GaAs ICs – Y. Konishi, M. Kamegawa, M. Case, R. Yu, M.J.W. Rodwell, Electrical and Cmptr Engr, Univ of California, Santa Barbara, CA 93106

Th1.9 SURFACE EMITTING CHARACTERISTICS OF SILICON WAVEGUIDES – N. Urimindi, C.S. Yeh, J. Liu, J.K. Butler, Southern Methodist Univ., Dallas, TX
SESSION Th2

Thursday AM

FILTERS

Dec. 17

Th2.1 LOW-PASS AND HIGH-PASS FILTERS USING COAXIAL-TYPE DIELECTRIC RESONATORS – S. Toyoda, Dept of EE, Osaka Inst of Technology, 5-16-1 Omiya, Asahi-ku, Osaka 535, Japan

Th2.2 POLARIZATION SENSITIVE REFLECTORS MADE BY GRIDS OF THICK WIRES – L. Argenti, A. Bruschi, S. Cirant, G. Granucci, A. Simonetto, G. Solari, Instituto de Fisica del Plasma, EURATOM/ENA/CNR, Milano, Italy

Th2.3 ACCURATE DETERMINATION OF THE RESONANT FREQUENCY OF A RECTANGULAR APERTURE IN WAVEGUIDE AND ITS FILTER APPLICATION – R. Yang, A.S. Omar, Technische Universität Hamburg-Harburg, Germany

Th2.4 SUSPENDED STRIPLINE LOW PASS FILTERS DESIGN USING THE TLM METHOD – L.R.A.X. de Menezes, A.H. Machado, H. Abdalla Júnior, Universidada de Brasilia

Th2.5 BROAD-BAND BAND-PASS FILTER WITH VARIABLE CENTER FREQUENCY AND BAND WIDTH – S. Toyoda, Dept of EE, Osaka Institute of Technology, Japan

Th2.6 WAVEGUIDE BANDPASS FILTER WITH IMPROVED STOP-BAND RESPONSE – R. Yang, A.S. Omar, Technische Universität Hamburg-Harburg, Germany

Th2.7 A RF TUNABLE FILTER BASED ON ACOUSTO-ELECTRO-OPTIC INTERACTION – G.M. Pacheco, Div de Astrofisica, Brasil

Th2.8 A NEW ACOUSTO-ELECTRO-OPTIC IMPROVED RESOLUTION DEFLECTOR FOR HIGH FREQUENCY OPERATION – G.M. Pacheco, Brasil

Th2.9 USING JOSEPHSON JUNCTIONS FOR SPECTRUM ANALYZING MICROWAVE SIGNALS OF MM- & SUBMM- FREQUENCY BANDS – S.Y. Larkin, S.E. Anischenko, P.V. Khabayev, V.V. Kamysin, S.V. Korsunskiy, Scientific-Research Center, 37, Pobedy AV., KPI-3240, Kiev, Ukraine, 252056
SESSION Th3

Thursday AM

OTHER SOURCES

Dec. 17

Th3.1 RECENT DEVELOPMENT OF FEL RESEARCH ACTIVITIES IN P.R.CHINA – (Invited Keynote) – S. Liu, Univ. of Electronic Science and Technology of China, Chengdu, Sichuan 610054, PRC


Th3.3 ANALYSIS OF TWO MUTUALLY COUPLED RADIAL LINE TRANSFORMERS IN DUAL-DIODE MILLIMETER-WAVE OSCILLATORS – J-P. Xu, S-F. Li, Dept of Electromagnetic Field Engr., Xidian Univ, Xidian, 710071, P.R. China

Th3.4 COAXIAL TWT OF MM WAVE REGION – V.D. Yeremka, Inst of Radiophysics and Electronics, Academy of Sciences of Ukraine

Th3.5 THEORETICAL STUDY OF HARMONIC INJECTION LOCKING OF MILLIMETER WAVE HARMONIC OSCILLATORS – J-P. Xu, Xidian University, P.R. China

Th3.6 GENERATORS OF STOCHASTIC OSCILLATIONS OF MM WAVE REGION – P.D. Burjunov, M.V. Mil’cho, A.B. Shermerevitch, B.P. Yephimov, V.D. Yeremka, Academy of Sciences of Ukraine


Th3.8 MILLITRON WITH BROADED AMPLIFICATION BAND – A.Ya. Belukcha, L.P. Mospan, A.A. Shtanko, V.D. Yeremka, Academy of Sciences of Ukraine


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SESSION Th4

Thursday AM  GYROTRON V  Dec. 17

Th4.1 NUMERICAL ANALYSIS OF A CRYOGENICALLY COOLED GYROTRON WINDOW
- F.V. Hartemann, P. Garin, G. Faillol, G. Mourier, Thomson Tubes Electroniques, 78141 Velizy, France; G. Tonon, J.P. Crenn, M. Bon-Mardion, CEA Cadarache, St-Paul-lès-Durance, France

Th4.2 EFFECT OF WINDOW TOLERANCES ON GYROTRON PERFORMANCE - O. Abo Elnor, K. Schünemann, Inst. Hochfrequenztechnik, Technical Univ. of Hamburg-Harburg, Germany


Th4.5 POLARIZATION SENSITIVE REFLECTORS MADE BY GRIDS OF THICK WIRES - L. Argenti, A. Bruschi, S. Cirant, G. Granucci, A. Simonetto, G. Solari, EURATOM/ENEA. CNR Association, Milano, Italy

Th4.6 MODE LOCKING IN A CLOSED CAVITY GYROTRON OSCILLATOR - A.H. McCurdy, Univ. of Southern California, Los Angeles, CA 90089


Th4.8 STEPS TOWARDS SYNTHESIS OF MAGNETIC FIELD PROFILES IN DEPRESSED COLLECTOR REGION OF GYROTRONS - J. Cooperstein, A. Singh, V.L. Granatstein, Univ. of Maryland, College Park, MD 20742

Th4.9 SOME FEATURES OF HIGH POWER GYROTRON OSCILLATOR FOR THE RADIATION SOURCE OF AN EM WIGGLER - Z. Yang, C. Tang, C. Zhang, Univ. of Electronic of Science and Technology of China, Sichuan 610054, P.R. China
SESSION Th5

Thursday PM GUIDED PROPAGATION Dec. 17

Th5.1 SOLITONS IN PERIODIC STRUCTURES – (Invited Keynote) – J. Feng, F.K. Kneubühl, Institute of Quantum Electronics, Swiss Federal Inst of Technology, CH-8093 Zurich, Switzerland

Th5.2 ANALYSIS OF H-PLANE WAVEGUIDE JUNCTIONS WITH PARTIAL-HEIGHT FERRITE AND METAL POST – Y.Y. Tsai, Technische Univ Braunschweig, Postfach 33 29, D-3300 Braunschweig, Germany; A.S. Omar, Technische Univ Hamburg-Harburg, Postfach 90 10 52, D-2100 Hamburg 90, Germany

Th5.3 A SIMPLE DIVIDE-BY MEASUREMENT METHOD FOR TRANSMISSION COEFFICIENT MEASUREMENTS OF NON-COAXIAL COMPONENTS – M. Li, K.A. Hummer, K. Chang, Dept of EE, Texas A&M Univ, College Station, TX 77843

Th5.4 PROPAGATION CHARACTERISTICS IN MULTILAYERED DIELECTRIC PERIODIC STRUCTURES – J.C.W.A. Costa, A.J. Giarola, School of EE, State Univ of Campinas (UNICAMP), 13081 Campinas, SP, Brazil

Th5.5 CHARACTERIZATION OF UNILATERAL FINLINE CONSIDERING THE CONDUCTOR THICKNESS – H.C.C. Fernades, E.A.M. de Souza, N.D. de Freitas, E.D. Barbosa, Dept. of EE, Tech Ctr, Fed Univ of Rio Grande do Norte, Cx. Postal 1583, Brazil

Th5.6 ANALYSIS AND EXPERIMENTS OF AN INTERCONNECT FOR MICROSTRIP LINES – G.M. Luong, K. Chang, Texas A&M Univ., College Station, TX

Th5.7 TM NONLINEAR ELECTROMAGNETIC WAVES GUIDED BY AN INHOMOGENEOUS MEDIUM – M.M. Shabat, Physics Dept, The Islamic Univ of Gaza, P.O. Box 108, Gaza, Gaza Strip, Via - Israel

Th5.8 ANALYSIS OF OPTICAL FIBERS HAVING AN UNIAXIAL ANISOTROPIC DIELECTRIC WITH A VARIABLE INDEX OF REFRACTION PROFILE, BY THE FINITE-DIFFERENCE METHOD – C.L.S.S. Sobrinho, Fed Univ of Pará, Depto. of EE, 66050 Belém, PA, Brazil; A.J. Giarola, UNICAMP, School of EE, 13081 Campinas, SP, Brazil

Th5.9 A GENERAL METHOD FOR ANALYZING EM WAVE SCATTERING FROM ARBITRARILY SHAPED TWO-DIMENSIONAL PERIODIC SURFACES – K. Liu, W. Hong, Dept of Radio Engr, Southeast Univ, Nanjing, 210018, P.R. China
Th5.10 ANALYSIS OF RECTANGULAR ANISOTROPIC DIELECTRIC WAVEGUIDES BY THE FINITE-DIFFERENCE METHOD - C.L.S.S. Souza, Federal Univ. of Pará, 66050 Belém, Brazil; A.J. Giarola, UNICAMP, 13081 Campinas, Brazil
Th6

Thursday PM POST DEADLINE I Dec. 17

Th6.1 BUILT-IN CONVERTER FOR HIGH-POWER GYROTRON – M.A. Shapiro, S.N. Vlasov, A.N. Kuftin, Inst. of Appl. Phys. Russian Acad. of Science, 46, Uljanov Street, Nizhny Novgorod, Russia

Th6.2 COMBINED WAVEGUIDE LINES FOR HIGH-POWER MILLIMETER WAVES – M.A. Shapiro, S.N. Vlasov, Inst. Appl. Phys. Russian Acad. of Sciences, Russia
SESSION Th8

Thursday PM GYROTRON VI Dec. 17

Th8.1 PARAMETERS OF GYROTRON ELECTRON BEAMS MEASURED BY THE METHOD OF RETARDING FIELDS – B. Piosczyk, Kernforschungszentrum Karlsruhe, ITP, Postfach 3640, D-7500 Karlsruhe 1, Germany

Th8.2 INFLUENCE OF ELECTRON BEAM ON TRANSVERSE STRUCTURE OF GYROTRON RADIATION – G.S. Nusinovich, Univ. of Maryland, College Park, MD 20742


Th8.5 HIGH POWER X-BAND AND K-BAND SECOND HARMONIC GYROKLYSTRON EXPERIMENTS – W. Lawson, H.W. Matthews, V. Specht, J.P. Calame, B. Hogan, M.K.E. Lee, C.D. Striffler, V.L. Granatstein, Laboratory for Plasma Research, Univ. of Maryland, College Park, MD 20742

Th8.6 MODE INTERACTION AT THE CYCLOTRON HARMONICS IN GYROTRON OSCILLATORS – G.P. Saraph, G.S. Nusinovich, T.M. Antonsen, B. Levush, Univ. of Maryland, College Park, MD

Th8.7 EXPERIMENTAL STUDY OF THE MODE SELECTIVE CIRCUITS FOR PHASE-CONTROLLED HARMONIC GYROTRONS OSCILLATORS AND AMPLIFIERS – H. Guo, J.P. Tate, M. Naiman, B. Levush, T.M. Antonsen, Jr., S.Y. Cai, G.S. Nusinovich, V.L. Granatstein, Univ. of Maryland, College Park, MD

Th8.8 SLOW EQUATIONS FOR HIGH-HARMONIC MODE COMPETITION INVESTIGATIONS IN GYROTRONS – G.F. Brand, T. Idehara, School of Physics, Univ. of Sydney, NSW, 2006 Australia; Faculty of Engineering, Fukui Univ., Fukui 910, Japan

Th8.9 STARTING CURRENT IN GYROTRON COAXIAL CAVITIES – R.A. Correa, J.J. Barroso, A. Montes, Laboratorio Associado de Plasma, Instituto Nacional de Pesquisas Espaciais, 12201 - São José dos Campos, SP - Brasil
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<td>LIMITING CURRENT IN GYROTRON COAXIAL CAVITIES</td>
<td>R.A. Correa, J. J. Barroso, Laboratorio Associado de Plasma, Instituto Nacional de Pesquisas Espaciais</td>
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<td>A COMPARATIVE STUDY FOR HIGH HARMONIC GYROTRONS WITH TWO STRUCTURES</td>
<td>H. Li, P. Du, J. Hu, Univ. of Electronic Sci. and Tech. of China, Chengdu, Sichuan, P.R. China</td>
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<td>THEORY OF HELICAL ELECTRON BEAMS IN GYROTRONS</td>
<td>A.N. Kuftin, V.N. Manuilov, B.V. Raisky, E.A. Solujanova, Sh.E. Tsimring, USSR Academy of Sciences</td>
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<td>GENERATOR AND AMPLIFIER REGIMES OF AUTOSONANT PENIOMAGNETRON</td>
<td>V.D. Yeremka, V.A. Zhurakhovskiy, Inst. of Radiophysics and Electronics, Acad. of Sci. of Ukraine</td>
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