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Front Matter: Volume 1929

David Rutledge

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SPIE.

Event: 17th International Conference on Infrared and Millimeter Waves, 1992, Pasadena, CA, United States

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

CALIFORNIA INSTITUTE OF TECHNOLOGY

- 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.
- G Gates, room 22 : Materials & Measurements.
- 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)

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**THE 18th INTERNATIONAL CONFERENCE ON
INFRARED AND MILLIMETER WAVES**

September 6-10, 1993

UNIVERSITY OF ESSEX

**Wivenhoe Park, Colchester, Essex, C04 3SQ
United Kingdom**

Sponsored by SPIE, The International Society of Optical Engineering

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

HUGHES AIRCRAFT COMPANY, TORRANCE, CALIFORNIA

M/A -COM, INC., BURLINGTON, MASSACHUSETTS

MICRO-NOW INSTRUMENTS COMPANY, SKOKIE, ILLINOIS

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

	MILLIMETER WAVES	MATERIALS MEASUREMENTS	MILLIMETER WAVES & SUBMILLIMETER	FEL/ GYROTRON
Mon AM	MMW Sources	High T_c Superconductors	Cavities/ Waveguides	FEL/CARM I
Mon PM	Freq. Multipliers & Power Combiners	Measurement Techniques	Transmission Lines	FEL/CARM II
Tues AM	MMW Systems	Material Properties	Lasers I	Gyrotron I
Tues PM	Detectors & Mixers	Semiconductors I	Lasers II	Gyrotron II
Wed AM	Antennas	Semiconductors II	Lasers III	Gyrotron III
Wed PM	Receivers & Astronomy	MMW Devices	Plasma Diagnostics	Gyrotron IV
Thurs AM	Integrated Circuits	Filters	Other Sources	Gyrotron V
Thurs PM	Guided Propagation	Post Deadline I	Post Deadline II	Gyrotron VI

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.

SESSION M1

Monday AM

MMW SOURCES

Dec. 14

-
- 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, Università 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 $\text{Bi}_2\text{Sr}_2\text{CaCu}_2\text{O}_8$ USING THE UCSB-FEL – W. Prettl, H. Lengfellner, Univ of Regensburg, Germany; J.P. Kaminski, CFELS - Univ of California, Santa Barbara, CA; Gi. 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
-
- M2.5** SUBMILLIMETER AND MICROWAVE RESIDUAL LOSSES IN EPITAXIAL FILMS OF Y-Ba-Cu-O AND Tl-Ca-Ba-Cu-O – D. Miller, P.L. Richards, Dept of Physics, U.C. Berkeley and Materials Sciences Division, Lawrence Berkeley Lab, Berkeley, CA; C.B. Eom, T.H. Geballe, Stanford Univ., Stanford, CA; S.M. Garrison, N. Newman, Conductus, Inc. Sunnyvale, CA; S. Etemad, A. Inam, T. Venkatesan, Bell Communications Research, Red Bank, NJ; J.S. Martens, Sandia Natl. Lab., Albuquerque, NM; W.Y. Lee, IBM Almaden, San Jose, CA; L.C. Bourne, Superconductor Technologies, Santa Barbara, CA
-
- M2.6** HARMONIC MIXING IN HIGH- T_c YBCO JOSEPHSON JUNCTIONS AT 94 GHz – Y. Yasuoka, K. Kawaguchi, T. Nozue, J. Chen, T. Yamashita, Dept of EE, The National Defense Academy, Hashirimizu, 239 Japan
-
- 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 T_c 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 Angewandte Physik, Univ Regensburg, 8400 Regensburg, Germany

M2.9 AN EFFECT OF SPIN EXCITATIONS ON THE INFRARED-ACTIVE PHONONS IN $\text{YBa}_2\text{Cu}_4\text{O}_8$ AND $\text{YBa}_2\text{Cu}_3\text{O}_{7-\delta}$ 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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- M3.1** SPECTRAL DOMAIN ANALYSIS OF OPEN CAVITIES – K.R. Chu, C.S. Kou, J.M. Chen, Y.C. Tsai, Dept of Phys., National Tsing Hua Univ., Hsinchu, Taiwan; C. Cheng, S.S. Bor, Dept. of EE, Chung Cheng Inst. of Tech., Taoyuan, Taiwan
-
- M3.2** ANALYSIS OF PARTIALLY OPEN CAVITY RESONATORS USING COMPLEX EIGEN-MODES – A. Jöstingmeier, A.S. Omar, J. Jelonnek, Technische Universität Hamburg-Harburg, Postfach 90 10 53, D-W-2100 Hamburg 90, Germany
-
- M3.3** CONDITIONS TO ACHIEVE STABLE PROPAGATION OF A GAUSSIAN-BEAM-LIKE MODE MIXTURE IN A DEFORMED WAVEGUIDE – A. Möbius, J. Pretterebner, Kernforschungszentrum Karlsruhe, Inst. f. Technische Physik, P.O. Box 3640, D-W-7500 Karlsruhe, Germany
-
- M3.4** DETERMINATION OF RESONANCE FREQUENCIES AND QUALITY FACTORS OF HIGH POWER MICROWAVE RESONATORS – D. Wagner, J. Pretterebner, Inst. f. Plasmaforschung, Univ. Stuttgart, Germany; M. Thumm, Universität Karlsruhe, D-7500 Karlsruhe, Germany
-
- M3.5** MODE COUPLING IN VARYING-RADIUS COAXIAL WAVEGUIDES – J. Shaffi, R.J. Vernon, Univ. of Wisconsin, Dept. of EE, 1415 Johnson Dr., Madison, WI 53706
-
- M3.6** IMPROVEMENT OF QUASI-OPTICAL MODE CONVERTERS BY LAUNCHING AN APPROPRIATE MIXTURE OF MODES – J. Pretterebner, A. Möbius, M. Thumm, Univ. of Stuttgart, Pfaffenwaldring 31, D-W-7000 Stuttgart 80, Germany
-
- M3.7** A COUPLED CAVITY WHISPERING GALLERY MODE TRANSDUCER – C.P. Moeller, General Atomics, P.O. Box 85608, San Diego, CA 92186
-
- M3.8** INADEQUACY OF COUPLED EQUATIONS FOR FORWARD TRAVELING WAVES IN CASE OF VERY LARGE WAVEGUIDE PERTUBATIONS – J. Pretterebner, D. Wagner, Inst. f. Plasmaforschung, Univ. Stuttgart; M. Thumm, Univ. Karlsruhe, D-7500 Karlsruhe 1, Germany
-
- M3.9** ON THE VALIDITY OF GEOMETRIC - OPTICAL MODE CONVERTER DESIGN – A. Möbius, Karlsruhe; J. Pretterebner, Univ. Stuttgart, Germany
-

M3.10 IMPROVED COMPONENTS FOR BEAM TRANSMISSION OF HIGH-POWER MILLIMETER WAVES – W. Kasperek, K.W. Kopp, G.A. Müller, P.G. Schüller, Inst. für Plasmaforschung der Universität Stuttgart, Germany; V. Erckmann, Max-Planck-Institut f. 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. Ciocchi, 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 EQUILIBRIUM 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 Cmptr 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 $\text{Ba}_{0.6}\text{K}_{0.4}\text{BiO}_3$, 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. Scherrer, F.K. Kneüßl, 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. Kasperek, 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 Llull, 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

Univ. Braunschweig, Inst. f. Hochfrequenztechnik, Postfach 33 29, D-W-3300 Braunschweig, Germany

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 Cmptr. 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. Vinogradov, Inst. of Appl. Physics of Russian Academy of Science, Nizhny Novgorod, Russia

SESSION M8

Monday PM

FEL/CARM II

Dec. 14

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- M8.1** THE 1 MW, 200 GHz FOM-FUSION-FEM – (*Invited Keynote*) – A.G.A. Verhoeven, W.A. Bongers, R.W. B. Best, A.M. van Igen, P. Manintveld, W.H. Urbnus, M.J. van der Wiel, FOM Instituut voor Plasmafysica Rijnhuizen, P.O. Box 1207, 3430 BE Nieuwegein, the Netherlands; V.L. Bratman, G.G. Denisov, A.V. Saviolov, M.Yu. Shmelyov, Inst. of Appl. Phys., Russia; H-U. Nickel, M. Thumm, Kernforschungszentrum Karlsruhe, Germany; G. Müller, W. Kasperek, J. Pretterebner, D. Wagner, Institut für Plasmaforschung, Stuttgart, Germany; M. Caplan, LLNL, Livermore, CA
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- M8.2** HIGH-POWER CYCLOTRON AUTORESONANCE MASER (CARM) EXPERIMENTS – (*Invited Keynote*) – S. Alberti, B. Danly, E. Giguët, G. Gulotta, T. Kimura, W.L. Menninger, J.L. Rullier, R.J. Temkin, Plasma Fusion Center, MIT, Cambridge, MA 02139
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- M8.3** MICROWAVE FEL EXPERIMENT AT CESTA – H. Bottollier-Curtet, A. Devin, J. Gardelle, G. Germain, J. Labrousche, P. Le Taillandier de Gabory, CEA/CESTA - BP N° 2 – 33114 Le Barp, France
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- M8.4** DESIGN OF A QUASIOPTICAL GYROTRON PUMPED IR FREE-ELECTRON LASER – A.W. Fliflet, W.M. Manheimer, Naval Research Lab, Washington, DC 20375
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- 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
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- 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
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- 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
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- 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
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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
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- 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
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- 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
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- T1.4** RADIOMETRIC GROUND SPEED SENSOR FEASIBILITY – J.C. Wiltse, Georgia Tech Research Institute, Atlanta, GA 30332
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- T1.5** A MILLIMETER-WAVE RADIOMETER FOR DETECTING WIND SHEAR – R.W. McMillan, Georgia Tech Research Institute, Atlanta, GA 30332
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- 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
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SESSION T2

Tuesday AM

MATERIALS PROPERTIES

Dec. 15

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- T2.1** SUBMILLIMETER WAVE SPECTROSCOPY: DIELECTRIC MEASUREMENT, MATERIAL TESTING – (*Invited Keynote*) – G.V. Kozlov, Academy of Sciences of Russia, 38 Vavilova St, Moscow, Russia
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- T2.2** CALIBRATION TECHNIQUE FOR A FIR/LMR SPECTROMETER TO USE IN MEASUREMENTS OF FREE RADICALS OF THE LOWER STRATOSPHERE – G.P. Galvao, E.C.C. Vasconcellos, L.R. Zink, J.M. Brown, K.M. Evenson, National Inst of Standards and Technology, 325 Broadway Av, Boulder, CO 80303
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- 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
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- T2.4** WINDOW MATERIALS FOR HIGH POWER GYROTRONS – M.N. Afsar, H. Chi, Dept. of EE, Tufts Univ, Medford, MA 02155
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- 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
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- 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
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- T2.7** PRESSURE BROADENING OF H₂O AND HDO BETWEEN 90 K AND 600 K – J.M. Dutta, T.M. Goyette, D.W. Ferguson, F.C. DeLucia, C.R. Jones, Dept of Physics, North Carolina Central Univ, Durham, NC 27707
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- 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
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- 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
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SESSION T3

Tuesday AM

LASERS I

Dec. 15

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- 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
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- T3.2** NEW CONCEPT OF OPTICAL-FREE-INDUCTION-DECAY (OFID) PICOSECOND-PULSE $10\mu\text{m}$ -CO₂-LASER SYSTEMS – D.P. Scherrer and F.K. Kneubühl, Inst. of Quantum Electronics
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- 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
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- T3.4** PHASE OF RADIATION FROM STIMULATED EMISSION – M. Hirooka, College of General Education, Osaka Univ, Toyonaka, Osaka, Japan
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- 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
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- T3.6** GAIN OF THE p-Ge INTERBAND LASER – H. Zuckermann, F. Keilmann, Max-Planck-Institut für Festkörperforschung, 7000 Stuttgart 80, Germany
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- 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
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SESSION T4

Tuesday AM

GYROTRON I

Dec. 15

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- T4.1** LONG-PULSE OPERATION OF A GYROTRON WITH BEAM/RF SEPARATION – *(Invited Keynote)* – K. Felch, T.S. Chu, J. Feinstein, H. Huey, H. Jory, J. Neilson, R. Schumacher, Varian Associates, Inc. 811 Hansen Way, Palo Alto, CA 94304
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- T4.2** 500 kW OPERATION OF A 140 GHz GYROTRON: EXPERIMENT AND SIMULATION – *(Invited Keynote)* – G. Gantenbein, E. Borie, G. Dammertz, O. Dumbrajs, M. Kuntze, H-U. Nickel, B. Piosczyk, M. Thumm, Kernforschungszentrum Karlsruhe GmbH, ITP Postfach 3640 D-7500 Karlsruhe 1, Germany
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- T4.3** DEVELOPMENT OF A HIGH POWER GYROTRON FOR ECH OF TOKAMAK PLASMA – K. Sakamoto, M. Tsuneoka, S. Maebara, A. Kasugai, H. Fujita, M. Kikuchi, T. Yamamoto, T. Nagashima, Japan Atomic Energy Res. Inst., Naka-machi, Naka-bun, Ibaraki-ken, Japan 311-01; T. Kariya, Y. Okazaki, N. Shirai, T. Okamoto, Toshiba Corp., Japan; K. Hayashi, Y. Mitsunaka, Y. Hirata, R&D Center, Toshiba Corp., Japan
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- T4.4** INVESTIGATION AND DEVELOPMENT OF GYROTRON AT THE INSTITUTE OF APPLIED PHYSICS – V. Flyagin, A. Goldenberg, V. Zapevalov, IAP, Nizhny Novgorod, Russia
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- 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
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- T4.6** DESIGN OF A 3 MW, 140 GHz GYROTRON WITH A COAXIAL CAVITY – M.E. Read, G. Nusinovich, B. Levush, O. Dumbrajs, G. Bird, Physical Sciences Inc.; K. Kreischer, MIT Plasma Fusion Center, Cambridge, MA 02139
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- 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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SESSION T5

Tuesday PM

DETECTORS & MIXERS

Dec. 15

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- T5.1** ANTENNA-COUPLED THIN-FILM NANOMETER METAL-OXIDE-METAL INFRARED DIODES – (*Invited Keynote*) – 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
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- T5.2** 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
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- T5.3** 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
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- T5.4** MECHANISM AND PROPERTIES OF ANTENNA COUPLED POINT-CONTACT WARM CARRIER DEVICES AT $10.6\mu\text{m}$ – T. Simizu, Y. Yasuoka, Dept of Electronic Engr, The National Defense Academy, Hashirimizu, Yokosuka 239 Japan
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- T5.5** 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
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- T5.6** 2 DEG ELECTRON BOLOMETRIC MIXERS: NEW RESULTS AND POTENTIAL FOR LOW-NOISE THz RECEIVERS – J-X. Yang, F. Agahi, D. Dai, C. Musante, W. Grammer, K.M. Lau, K.S. Yngvesson, Dept. of Elec. Eng., U of Massachusetts, Amherst, MA 01003
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- T5.7** 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
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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

Millimetrique, 300 Rue de la Piscine, Domaine Univ de Grenoble, F338406 Saint Martin d'Hères, France

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, Zùlpicher str. 77, D W-5000 Köln 1, Germany

SESSION T6

Tuesday PM

SEMICONDUCTORS I

Dec. 15

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- T6.1** INFRARED AND FAR-INFRARED MAGNETO-SPECTROSCOPY OF SEMICONDUCTORS IN HIGH MAGNETIC FIELD IN THE MEGAGAUSS RANGE – (*Invited Keynote*)
– N. Miura, J. Kono, O. Portugall, D. Barnes, Y. Imanaka, T. Takamasu, H. Nojiri, H. Yokoi, S. Takeyama, Inst for Solid State Physics, Univ of Tokyo, Roppongi, Minato-ku, Tokyo 106, Japan
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- 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
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- T6.3** MAGNETOOPTICS ON CHROMIUM-BASED DILUTED MAGNETIC SEMICONDUCTORS – R. Krevet, M. von Ortenberg, Hochmagnetfoldanlage der Technischen Universität Braunschweig, Mendelssohnstrasse 3, D-3300 Braunschweig, Germany; A. Twardowski, Inst for Experimental Physics, Univ of Warsaw, Poland
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- 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
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- T6.5** SILICON DOPED WITH GALLIUM PHOTOCONDUCTORS: EFFECT OF UNIAXIAL STRESS – C. Meny, 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
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SESSION T7

Tuesday PM

LASERS II

Dec. 14

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- 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
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- 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 Fisica-UNICAMP, Brasil; G. Carelli, N. Ioli, A. Moretti, F. Strumia, Dipartimento di Fisica, dell'Università, 56.100, Pisa, Italy
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- T7.4** ASSIGNMENT OF THE FTS SPECTRUM OF CD₃OH – G. Moruzzi, Dept di Fisica dell/Universita 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
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- 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
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- T7.6** INTERMODULATED PHOTOACOUSTIC MEASUREMENTS OF PRESSURE BROADENING COEFFICIENTS OF ¹²CH₃OH, ν_5 LINES BY CO₂ LASERS – H. Okabe, N. Sokabe, Dept of Applied Physics, Osaka City University, Japan
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- 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
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- 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
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- 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
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T7.10 IR AND FIR OPTOACOUSTIC STARK SPECTROSCOPY OF THE ^{13}C -O STRETCH-
ING Q-BRANCH OF $^{13}\text{CD}_3\text{OH}$ – 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

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- 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
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- T8.2** THE NRL 85 GHz QUASIOPTICAL GYROKLYSTRON EXPERIMENT – R.P. Fischer, A.W. Fliflet, W.M. Manheimer, Naval Research Laboratory, Washington, DC 20375
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- 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
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- 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
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- 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
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- 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
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- 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
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- T8.8** OPERATION OF A QUASI-OPTICAL GYROTRON WITH A GAUSSIAN OUTPUT COUPLER – J.P. Hogge, M. Pedrozzi, M.Q. Tran, T.M. Tran, H. Cao, P.J. Paris, CRPP, Ecole Polytechnique Fédérale de Lausanne, 21. Av. des Bains, CH-1007 Lausanne, Switzerland
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- T8.9** POSSIBLE TEM MODE COMPETITION IN GYROTRONS WITH COAXIAL CAVITY – K. Xu, M. Thumm, Institut für Technische Physik, Karlsruhe, Germany
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- 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

ANTENNAS

Dec. 16

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- W1.1** RECENT DEVELOPMENTS IN MILLIMETER-WAVE POWER TRANSMISSION AND CONVERSION – K. Chang, Dept of EE, Texas A&M Univ, College Station, TX 77843
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- 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
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- 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
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- 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
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- 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
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- W1.6** A MILLIMETER-WAVE SLOT-V ANTENNA – A. Moussessian, D.B. Rutledge, Div. of Engr. and Applied Sci., California Inst. of Technology, Pasadena, CA 91125
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- 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
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- W1.8** FABRICATION AND PERFORMANCE OF MMW AND SMMW PLATELET HORN ARRAYS – R.W. Haas, D. Brest, H. Mueggenburg, L. Lang, D. Heimlich, Aerojet Electronic Systems Div, Azusa, CA 91702
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- W1.9** FINITE SIZE EFFECTS OF WAVE COUPLING BY SEW GRATING ANTENNAS – R. Petruskevicius, Inst of Physics, A. Gostauto 12, Vilnius 2600, Lithuania
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- 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
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**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

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- W2.1** SUBMILLIMETER WAVES: A SUITABLE TOOL FOR BOTH RESONANT AND NON-RESONANT HIGH FIELD MAGNETO-SPECTROSCOPY ON NARROW GAP SEMICONDUCTORS – (*Invited Keynote*) – O. Portugall, Inst fur Halbleiterphysik und Optik, Technische Universitat Braunschweig, Germany; J. Lono, Y. Shimamoto, H. Yokoi, S. Takeyama, Livan Bockstal, K. Buchholz-Stepputis, N. Miura, F. Herlach, M. von Ortenberg, G. Baur, W. Dobrowolski
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- 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
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- 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
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- 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
-
- W2.5** FIR MAGNETOOPTICAL INVESTIGATION OF ZnMn_2As_2 – I. Laue, M. von Ortenberg, Technische Univ Braunschweig, D-3300 Braunschweig, Germany; A.N. Nateprov, E.K. Arushanov, Inst. of Appl. Phys., Academy of Sciences, Akademicheskaya 5, 277028 Kishinev, Moldavia
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SESSION W3

Wednesday AM

LASERS III

Dec. 16

- W3.1** MIXING EFFECT IN THE NH_3 ABSORPTION AND MIR EMISSION SPECTRA PUMPED BY A CONTINUOUSLY TUNABLE CO_2 LASER – S. Marchetti, R. Simili, M. Giorgi, IFAM-CRN, Via del Giardino 7, 56100 Pisa, Italy
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- 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
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- W3.4** LENGTH AND PRESSURE DEPENDENCE OF METHYLFLUORIDE 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
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- W3.5** INTERACTION ENHANCEMENT OF TWO-PHOTON PROCESSES IN MINATURE OPFIRL – Y. Lin, X. Zheng, Zhongshan Univ., Guangzhou 510279 P.R.China
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SESSION W4

Wednesday AM

GYROTRON III

Dec. 16

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- W4.1** BROAD-BAND GYRO-AMPLIFIER RESEARCH AT NRL – (*Invited Keynote*) – J.J. Choi, G.S. Park, S.Y. Park, C.M. Armstrong, R. Kyser, M.L. Barsanti, Naval Research Laboratory, Code 6840, Washington, DC 20375
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- 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
-
- W4.4** STREAK PHOTOGRAPHS OF CATHODE PLASMA FLARE SIMULTANEOUS WITH MM-WAVE EMISSION FROM A GYROTRON – S.N. Spark, K. Ronald, A.W. Cross, W. He, A.D.R. Phelps, Dept. of Physics and Applied Physics, Strathclyde Univ., Glasgow, G4 0NG, U.K.
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- 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
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- 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
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- 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

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- 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, Zùlpicher 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 Obernfafflerling, 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 Meudon, Cedex, France
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- W5.6** FIR-FTS VERSUS FIR-HETERODYNE SPECTROMETER: A SENSITIVITY COMPARISON FOR ATMOSPHERIC APPLICATION – M. Birk, DLR Inst of Optoelectronics, 8031 Oberpfaffenhofen, Germany
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- W5.7** THE 350 GHz AND 230 GHz MIXERS WITH THE TUNED SIS JUNCTIONS – A. Karpov, M. Carter, B. Lazareff, M. Voss, D. Billon-Pierron, K.H. Gundlach, Institut de Radioastronomie Millimetrique, 300 Rue de la Piscine, Domaine Univer de Grenoble, F-38406 Saint Martin, France
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- 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
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- 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 Electronics, Switzerland
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W5.10 MICROWAVE RECEIVER SYSTEM WITH QUANTUM SUPERCONDUCTION JOSEPH-
SON 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

SESSION W6

Wednesday PM

MMW DEVICES

Dec. 16

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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
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- 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
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- 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
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- 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
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- W6.5** HIGH SPEED PIN DIODE SWITCH FOR NARROW PULSE GENERATION – B.K. Sarker, Special Radar Div, IIT Campus, Powai, Bombay 400 076, India
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- 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
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- 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
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- 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
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- W6.9** WAVEGUIDE PIN DIODE SWITCH AT Ka-BAND – B.K. Sarker, S. Gupta, IIT Campus, Powai, Bombay, 400.076 India
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- 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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SESSION W7

Wednesday PM

PLASMA DIAGNOSTICS

Dec. 16

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- W7.1** DEVELOPMENT OF FIR LASERS FOR PLASMA DIAGNOSTICS ON LARGE HELICAL DEVICE (LHD) – S. Okajima*, K. Kawahata, Y. Naitou*, A. Ejiri, Y. Hamada, J. Fujita, *Appl. Phys. Lab., Chubu Univ., Kasugai, Aichi 487, Japan; National Inst. Fusion Sci., Nagoya, 464-01, Japan
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- W7.2** CALIBRATION OF AN INFRARED POLARIMETER FOR ALCATOR C-MOD – C.H. Ma, D.P. Hutchinson, Oak Ridge Natl. Lab., TN 37831; J. Irby, MIT PFC, Cambridge, MA 02139
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- W7.3** A BROADBAND REFLECTOMETER FOR THE GAMMA 10 TANDEM MIRROR – A. Mase, Y. Ito, T. Tokuzawa, A. Itakura, H. Satake, Y. Nagayama, T. Tamano, Plasma Res. Center, Univ. of Tsukuba, Tsukuba, Ibaraki 305, Japan
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- W7.4** SCATTERING FROM THE TORTUS TOKAMAK PLASMA USING A GYROTRON – 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
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- W7.5** THE STUDY OF DENSITY FLUCTUATIONS IN THE JIPP T-IIU TOKAMAK USING HCN LASER SCATTERING – K. Kawahata, A. Ejiri, Y. Hamada, J. Fujita, Natl. Inst. for Fusion Sci., Nagoya 464, Japan; S. Okajima, Dept. of Applied Physics, Chubu Univ., Kasugai 487, Japan
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- W7.6** AN ICRF ANTENNA EDGE PLASMA DENSITY PROFILE DIAGNOSTIC FOR THE DIII-D TOKAMAK – T.S. Bigelow, G.R. Hansen, J.B. Wilgen, Oak Ridge National Lab; E. Doyle, T. Rhodes, UCLA, Los Angeles, CA
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- W7.7** INTERFEROMETRY MEASUREMENT OF LINE AVERAGE ELECTRON DENSITY IN ALVAND IIC TOKAMAK – M. Ghorannevis, M. Avakian, Islamic Azad Univ., P.O. Box 19395-1775 Thran, Iran
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- W7.8** APPLICATION OF NON-COHERENT REFLECTOMETRY METHOD FOR MEASUREMENT OF PLASMA CUT-OFF LAYER POSITION – 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
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SESSION W8

Wednesday PM

GYROTRON IV

Dec. 16

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- 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
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- 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
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- 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
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- W8.5** DESIGN OF A 95 GHz SLOTTED HARMONIC GYRO-TWT AMPLIFIER – C.K. Chong, T.L. Stewart, C.F. Kinney, A.J. Balkcum, D.B. McDermott, N.C. Luhmann, Jr., Dept of EE, Univ. of California, Los Angeles, CA 90024; J. Pretterebner, Institut für Plasmaforschung, Univ. of Stuttgart, Germany; W.J. DeHope, Varian Assoc., Palo Alto, CA 94303
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- 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
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- W8.7** GYROTRON EXPERIMENTS USING CAVITIES OF DIFFERENT OHMIC Q – A.W. Cross, S.N. Spark, A.D.R. Phelps, Dept of Physics and Applied Physics, Strathclyde Univ., Glasgow, G4 ONG, U.K.
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- 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 für Plasmaforschung, Univ. of Stuttgart, Germany
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W8.9 GYROMAGNETRON OF 6-MM WAVE REGION – V.D. Yeremka, L.P. Mospan, Inst. of Radiophysics and Electronics, Academy of Sciences of Ukraine, 12 Acad. Proskura st., Kharkov, 310085, Ukraine

W8.10 NONSTATIONARY NONLINEAR THEORY OF FAST WAVE DEVICES – A.P. Chetverikov, Saratov State Univ., Astrahanskay, 83, Saratov 410071, Russia

W8.11 STARTING CONDITIONS OF SPONTANEOUS OSCILLATIONS IN FAST WAVE DEVICES – A.P. Chetverikov, A.E. Konevets, Saratov State Univ., Astrahanskay, 83, Saratov 410071, Russia

SESSION Th1

Thursday AM

INTEGRATED CIRCUITS

Dec. 17

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- Th1.1** A 35 GHz HBT MONOLITHIC GRID OSCILLATOR – M. Kim, E.A. Sovero*, R.M. Weikle II**, J.B. Hacker, M.P. DeLisio, D.B. Rutledge, Div of Engr, CA Inst of Tech, Pasadena, CA; *Rockwell International Science Center, 1049 Camino dos Rios, Thousand Oaks, CA 91360; **Dept of Applied Electron Physics, Chalmers Univ of Tech, S 41296 Goteborg, Sweden
-
- Th1.2** SCALED MODELLING OF PLANAR ARRAY SIS MIXERS – H. Xue, R. Blundell, R. Padman, Cavendish Laboratory, Madingley Rd, Cambridge, CB3 0HE England
-
- Th1.3** MICROSWITCH BEAM-STEERING GRID – J-C. Chiao, D.B. Rutledge, Div of Engr and Applied Science, California Institute of Technology, Pasadena, CA 91125
-
- 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
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- 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
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- Th1.9** SURFACE EMITTING CHARACTERISTICS OF SILICON WAVEGUIDES – N. Urimindi, C.S. Yeh, J. Liu, J.K. Butler, Southern Methodist Univ., Dallas, TX
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Th1.10 HYBRID INTEGRATION OF MILLIMETER WAVE DEVICES USING THE EPITAXIAL LIFTOFF (ELO) TECHNIQUE – A.J. Tsao, M.S. Islam, D.P. Neikirk, Dept of Electrical and Cmptr Engr, The Univ of Texas at Austin, Austin, TX 78712

SESSION Th2

Thursday AM

FILTERSDec. 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
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- 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
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- 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
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- Th2.4** SUSPENDED STRIPLINE LOW PASS FILTERS DESIGN USING THE TLM METHOD – L.R.A.X. de Menezes, A.H. Machado, H. Abdalla Júnior, Universidade de Brasilia
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- Th2.5** BROAD-BAND BAND-PASS FILTER WITH VARIABLE CENTER FREQUENCY AND BAND WIDTH – S. Toyoda, Dept of EE, Osaka Institute of Technology, Japan
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- 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
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- Th2.8** A NEW ACOUSTO-ELECTRO-OPTIC IMPROVED RESOLUTION DEFLECTOR FOR HIGH FREQUENCY OPERATION – G.M. Pacheco, Brasil
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- 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. Kamyshin, S.V. Korsunskiy, Scientific-Research Center, 37, Pobedy AV., KPI-3240, Kiev, Ukraine, 252056
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SESSION Th3

Thursday AM

OTHER SOURCES

Dec. 17

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- 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
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- Th3.2** DEVELOPMENT AND INVESTIGATION OF MM WAVE REGION KLYSTRONS IN INSTITUTE OF RADIOPHYSICS AND ELECTRONICS OF UKRAINIAN ACADEMY OF SCIENCES – A.Ya. Usikov, V.D. Yeremka, Inst of Radiophysics and Electronics, Academy of Sciences of Ukraine 12, Acad. Proskura st., Kharkov, 310085, Ukraine
-
- 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
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- Th3.4** COAXIAL TWT OF MM WAVE REGION – V.D. Yeremka, Inst of Radiophysics and Electronics, Academy of Sciences of Ukraine
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- Th3.5** THEORETICAL STUDY OF HARMONIC INJECTION LOCKING OF MILLIMETER WAVE HARMONIC OSCILLATORS – J-P. Xu, Xidian University, P.R. China
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- 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
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- Th3.7** ECHELETTRON WITH TREE BEAM ELECTRON FLOW OF MM WAVE REGION – A.Ya. Belukcha, A.I. Fisun, A.M. Fursov, V.D. Yeremka, Academy of Sciences of Ukraine
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- Th3.8** MILLITRON WITH BROADED AMPLIFICATION BAND – A.Ya. Belukcha, L.P. Mo-span, A.A. Shtanko, V.D. Yeremka, Academy of Sciences of Ukraine
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- Th3.9** HIGH-STABILITY SPHERE-CORNER-ECHELETTE OPEN RESONATOR GUNN-DIODE AND IMPATT-DIODE OSCILLATORS – O.I. Belous, A.I. Fisun, A.M. Fursov, Academy of Sciences of Ukraine
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SESSION Th4

Thursday AM

GYROTRON V

Dec. 17

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- Th4.1** NUMERICAL ANALYSIS OF A CRYOGENICALLY COOLED GYROTRON WINDOW – F.V. Hartemann, P. Garin, G. Faillon, 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
-
- Th4.3** DEVELOPMENT OF CRYOGENIC WINDOW FOR HIGH POWER MILLIMETER WAVE – T. Yamamoto, K. Yokokura, A. Kasugai, K. Salamoto, M. Tsuneoka, T. Nagashima, Japan Atomic Energy Research Inst., Japan; K. Itoh, Y. Saitoh, Toshiba Corp., Tokyo, Japan
-
- Th4.4** VACUUM WINDOWS FOR FREQUENCY TUNABLE HIGH-POWER MILLIMETER WAVE SYSTEMS – H-U. Nickel, U. Ambrosy, M. Thumm, Univ. Karlsruhe, Kaiserstr. 12, D-7500 Karlsruhe, Germany
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- 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
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- Th4.7** SUB μ -SECOND GYROTRON DIODE RECOVERY TIME AND 330 Hz PRF MEASUREMENTS – S.N. Spark, A.W. Cross, A.D.R. Phelps, Dept. of Physics and Appl. Phys., Strathclyde Univ., Glasgow, G4 ONG, U.K.
-
- 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
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SESSION Th5

Thursday PM

GUIDED PROPAGATION

Dec. 17

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- Th5.1** SOLITONS IN PERIODIC STRUCTURES – (*Invited Keynote*) – J. Feng, F.K. Kneubühl, Institute of Quntum Electronics, Swiss Federal Inst of Technology, CH-8093 Zurich, Switzerland
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- 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
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- 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
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- 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
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- 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
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- Th5.6** ANALYSIS AND EXPERIMENTS OF AN INTERCONNECT FOR MICROSTRIP LINES – G.M. Luong, K. Chang, Texas A&M Univ., College Station, TX
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- 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
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- 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
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- 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
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**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 Th7

Thursday PM

POST DEADLINE II

Dec. 17

Th7.

SESSION Th8

Thursday PM

GYROTRON VI

Dec. 17

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- 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
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- Th8.2** INFLUENCE OF ELECTRON BEAM ON TRANSVERSE STRUCTURE OF GYROTRON RADIATION – G.S. Nusinovich, Univ. of Maryland, College Park, MD 20742
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- Th8.3** DESIGN AND EXPERIMENTS OF HIGHER CYCLOTRON HARMONIC PENIOTRON OSCILLATORS – K. Yokoo, H. Shimawaki, H. Tadano, T. Ishiwara, K. Sagae, N. Sato, S. Ono, Research Inst. of Electrical Comm., Tohoku Univ., Sendai 980, Japan
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- Th8.4** 35 GHz GYRO-PENIOTRON AMPLIFIER EXPERIMENT – G.S. Park, J.L. Hirshfield, Omega-P, Inc., New Haven, CT 06520; R.H. Kyser, B-K Systems, Inc., Rockville, MD 20850; C.M. Armstrong, A.K. Ganguly, Naval Research Lab, Washington, DC 20375
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- 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
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- 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
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- 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
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- 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
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- Th8.9** STARTING CURRENT IN GYROTRON COAXIAL CAVITIES – R.A. Correa, J.J. Barroso, A. Montes, Laboratorio Asociado de Plasma, Instituto Nacional de Pesquisas Espaciais, 12201 - São José dos Campos, SP - Brasil
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- Th8.10** LIMITING CURRENT IN GYROTRON COAXIAL CAVITIES – R.A. Correa, J. J. Barroso, Laboratorio Associado de Plasma, Instituto Nacional de Pesquisas Espaciais, 12201 - São José dos Campos, SP - Brasil
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- Th8.11** A COMPARATIVE STUDY FOR HIGH HARMONIC GYROTRONS WITH TWO STRUCTURES – H. Li, P. Du, J. Hu, Univ. of Electronic Sci. and Tech. of China, Chengdu, Sichuan, P.R. China
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- Th8.12** THEORY OF HELICAL ELECTRON BEAMS IN GYROTRONS – A.N. Kuftin, V.N. Manuilov, B.V. Raisky, E.A. Solujanova, Sh.E. Tsimring, USSR Academy of Sciences, 46 Uljanov Str., 603600 Nizhny Novgorod, Russia
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- Th8.13** MATCHING OF THE FREQUENCY-TUNABLE GYROTRON TO THE OTHER MIRROR WAVEGUIDE – A.V. Chirkov, G.G. Denisov, M.Yu. Shmelyov, D.V. Vinogradov, Inst. of App. Physics of Russian Academy of Science, Nizhny Novgorod, Russia
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- Th8.14** GENERATOR AND AMPLIFIER REGIMES OF AUTORESONANT PENIOMAGNETRON – V.D. Yeremka, V.A. Zhurakhovskiy, Inst. of Radiophysics and Electronics, Acad. of Sci. of Ukraine, Kharkov, 310085, Ukraine
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