CONFERENCE PROGRAMME

Sixteenth International Conference on
Infrared and Millimeter Waves

26 - 30 August 1991

	MILLIMETER WAVES	MATERIALS PROPERTIES	MMW & SUBMM WAVES	GYROTRONS/ FEL
Mon AM	MMW Sources 1	High T_c Super-Conductors 1	MMW Astronomy & Atmos. Physics	Gyrotron 1
Mon PM	MMW Sources 2	High T_c Super-Conductors 2	Lasers 1	Gyrotron 2
Tues AM	Detectors & Mixers 1	Semiconductors Solids 1	Lasers 2	Gyrotron 3
Tues PM	Detectors & Mixers 2	Semiconductors Solids 2	Lasers 3	Gyrotron 4
Wed AM	MMW Systems	Measurement Techniques	Lasers 4	Gyrotron 5
Wed PM	MMW Devices	Guided Propagation 1	SubMM Devices/ Plasma Diagnostics	Gyrotron 6
Thurs AM	Radar	Material Properties 1	SubMM Detectors	FEL 1
Thurs PM	MMW Antennae	Material Properties 2	MMW Guides 1	FEL 2
Fri AM	Guided Propagation 2	Material Properties 3	MMW Guides 2	MMW Guides 3

On Monday a plenary opening session will be held at 09.00 a.m and the regular sessions will start at 09.20a.m. On all the other days, morning sessions begin at 09.00 a.m. and afternoon sessions at 02.00 p.m..

Invited Keynote papers are allotted 40 minutes, 30 minutes for presentation and 10 minutes for discussion; contributed papers are alloted 20 minutes, 15 minutes for presentation and 5 minutes for discussion.

16th International Conference on Infrared and Millimeter Waves, edited by Minh Quang Tran, Proc. of SPIE
Vol. 1576, 157601 · © (1991) 2017 SPIE · CCC code: 0277-786X/17/$18 · doi: 10.1117/12.2297714

FOREWORD

The Sixteenth International Conference on Infrared and Millimeter Waves is held from August 26th to 30th at the Ecole Polytechnique Fédérale de Lausanne, Switzerland. The scope of the Conference covers all aspects of IR and MM Waves generation and applications. The large number of contributions (more than 300) received from all countries attested to the importance of both the fields and the Conference. The Local Organizing Committee would like to take this opportunity to thank all the authors whose high quality work contributed to the success of the Conference.

The organization of the Conference was made possible through the sponsorship of the following institutions:

- the Ecole Polytechnique Fédérale de Lausanne
- the Fonds National Suisse pour la Recherche Scientifique (Grant No 21-30405.90)
- the Directorate General XII/FUSION of the Commission of the European Community

The generous support of industries, either through donations or through their participation in the exhibition, indicates their strong interest in IR and MM Waves. The Local Organizing Committee would like to thank:

- AB Millimetre, Sartrouville, France
- Amotec Electronic AG, Zollikerberg, Switzerland
- Bruker Analytische Messtechnik, Karlsruhe, Germany
- Edinburgh Instruments Ltd., Edinburgh, U.K.
- Farran Technology, Cork, Ireland
- LOT, Lonay, Switzerland
- Thomson TE, Boulogne-Billancourt, France

for their financial contributions.

The Local Organizing Committee has largely benefitted from the administrative infrastructure of the Centre de Recherches en Physique des Plasmas (CRPP). We would like to thank the director of the CRPP, Professor F. Troyon, whose encouragement was invaluable to us.

M. Q. Tran
Chairman of
the Local Organizing Committee

CONFERENCE ORGANIZATION

This Programme has benefitted from the efforts of the

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Kenneth J. Button

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C.O. WEISS, Phys. Techn. Bundesanstalt, Braunschweig (Germany)

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Seventeenth International Conference

on Infrared and Millimeter Waves

The next conference, the Seventeenth International Conference on Infrared and Millimeter Waves will be held at the

California Institute of Technology
Pasadena, California, USA
December 14-18, 1992

Abstract deadline: July 1, 1992

Those wishing to contribute a paper must submit their 35-40 word abstract to the Programme Chairman:

Kenneth J. Button
P.O. Box 2455

Satellite Beach, FL 32937, USA

Phone and Fax: 407 777 7793

The Preliminary Programme will be sent in late August, 1992 to everyone whose name is on the mailing list. To assure that your name is on the current mailing list, please send your name and address to the Programme Chairman.

KENNETH J. BUTTON PRIZE

On the occasion of the Fifteenth International Conference on Infrared and Millimeter Waves, a prize was initiated "to be awarded for outstanding contributors to the fields of infrared and millimeter waves". This prize will be awarded annually at the Conference. The 1991 prize committee consists of:

M.N. Afsar
K.J. Button
G. Mourier
K. Mizuno
T.J. Parker
R.J. Temkin
J.C. Wiltsee
M.Q. Tran, Chairman.

It was decided, under the chairman's suggestion, to formally name the prize "Kenneth J. Button Prize" in recognition of Professor K.J. Button's outstanding contribution to the IR & MM Wave Community both as a scientist and as the initiator and driving force of the series of conferences.

The 1991 Kenneth J. Button Prize is awarded to Professor Michael von Ortenberg, Technische Universität Braunschweig. The prize will be given during the Conference Banquet on Wednesday, August 28th, 1991.

M.Q. Tran
Chairman of the
1991 Kenneth J. Button Prize
Committee

KENNETH J. BUTTON PRIZE

awarded to

Michael von Ortenberg

When one refers to "The Wurzburg Conference" or to "von Ortenberg's Conference", one could mean the Fifth International Conference on Infrared and Millimeter Waves (1980), or the Fourteenth Conference (1989), or the forthcoming Wurzburg Conference to be held in the mid-1990's, or indeed, to one of the long series of conferences on "The Use of High Intensity Magnetic Fields in Semiconductor Research" (which dealt largely with submillimeter spectroscopy). Professor von Ortenberg not only organizes and manages these excellent conferences but he never fails to appear each year to contribute the results of his own research to the technical program and to offer "service of his profession" in any capacity that is needed.

His research accomplishments are truly formidable. For example, more than twenty years ago, he accepted the challenge to solve the electronic energy-band structure of the semiconductor tellurium with the use of submillimeter lasers and high intensity magnetic fields. Other very competent scientists had made little progress because tellurium was the most difficult material and had the most complicated energy band structure then known. Two years later, his experimental observations and theoretical descriptions left little more to be done. The problem was solved.

As everyone knows, it is not difficult to find qualified recipients for "The Prize" because there are so many who have given uninterrupted, unselfish service for a lifetime. Our 1991 recipient, Michael von Ortenberg, is one of these diligent, selfless contributors and his contributions will serve as an example when future Price committees try to find an even more qualified recipient.

Professor Kenneth J. Button

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Special session

in memoriam of

J. J. Gallagher

We have learnt with great sorrow that our colleague and friend J.J. Gallagher died on June 5th 1991. We would like to offer his family our condolences. As a tribute to his scientific contibutions in our field, the session **W2**, Measurement Techniques, will be organized in his memory.

On behalf of J.J. Gallagher's
colleagues and friends,
M. Q. Tran
Chairman of the
Local Organizing Committe

M1.1	RECENT ADVANCES IN HIGH FREQUENCY VACUUM ELECTRONICS (*Invited Keynote*) - R.K. Parker, Naval Research Laboratory, Department of the Navy, Electronics Science & Techn. Div., Washington DC 20375-5000, U.S.A.
M1.2	SIMULATION OF A 10.4 GHz TM05 VIRCATOR - J. Kim, S.P. Kuo, Weber Research Institute, Polytechnic University, Route 110, Farmingdale, NY 11735, U.S.A.
M1.3	DESIGN OF A HIGH PERVEANCE, FIELD-IMMERSED MAGNICON - S.H. Gold, B. Hafizi*, W.M. Manheimer, C.A. Sullivan, Beam Physics Branch, Plasma Physics Division, Naval Research Laboratory, Washington, D.C. 20375-5000, U.S.A., * Icarus Research, Bethesda, MD 20814, U.S.A.
M1.4	FEEDBACK INDUCED CHAOTIC TRANSITIONS IN CROSSED-FIELD DEVICES - S. Riyopoulos, Science Applications International Corporation, McLean, VA 22102, U.S.A.
M1.5	RUSSIAN SURFACE MILLIMETER WAVE MAGNETRONS - V.D. Eremka, C.Ja. Levin, L.P. Mospan, S.N. Terekchin, A.Ja. Usikov, Institute of Radiophysics and Electronics, Academy of Sciences of the Ukrainian SSR, 12, Acad. Proskura st., 310085 Kharkov, U.S.S.R.
M1.6	ECHELETTRON - SOURCE OF MILLIMETER WAVE RANGE WITH HIGH QUALITY SPECTRUM - A.Ja. Belukcha, B.M. Bulgakov, V.D. Eremka, A.I. Fisun, A.M. Fursov, Institute of Radiophysics and Electronics, Academy of Sciences of the Ukrainian SSR, 12, Acad. Proskura st., 310085 Kharkov, U.S.S.R.
M1.7	ELECTROMAGNETIC EMISSION FROM 2D PLASMONS IN SEMICONDUCTOR- DIELECTRIC STRUCTURE WITH METAL GRATING: STRICT THEORY - O.R. Matov, O.V. Polishchuk, V.V. Popov, Institute of Radio Engineering and Electronics, USSR Academy of Sciences, Saratov Branch, 410720 Saratov, U.S.S.R.

M2.1	STUDIES OF HIGH-Tc SUPERCONDUCTORS USING INFRARED SYNCHROTRON RADIATION (*Invited Keynote*) - G.L. Carr, Grumman Corporate Research Center, M.S. A02-26, Bethpage, NY 11714-3580, U.S.A.
M2.2	FERROMAGNETIC AND PARAMAGNETIC RESONANCES IN HIGH MAGNETIC FIELDS (*Invited Keynote*) - L. Van Bockstal, F. Scheerlinck, J. Witters and F. Herlach, Laboratorium voor Lage Temperaturen en Hoge-Veldenfysica, K.U. Leuven, B-3030 Leuven, Belgium
M2.3	PHOTORESPONSE OF THIN FILM HIGH-Tc SUPERCONDUCTORS TO FAR INFRARED LASER RADIATION - Gi. Schneider, P.G. Huggard, T. O'Brien, P. Lemoine, W. Blau, Department of Pure and Applied Physics, Trinity College, Dublin 2, Rep. of Ireland, and W. Prettl, Institut für angewandte Physik, Universität Regensburg, D-8400 Regensburg, Germany
M2.4	FIR RESPONSE OF HTC Tl-Ba-Ca-Cu-O FILMS - K. Schertzl, M. Hogan, D. Simms+, J. Betz, W. Blau+, H. Lengfellner, K.R. Renk, W. Prettle, Institut für Angewandte Physik, Universität Regensburg, D-8400 Regensburg, F.R.G., and +Department of Pure and Applied Physics, University of Dublin, Trinity College, Dublin 2, Ireland
M2.5	FAR-INFRARED STUDY OF PHONON ANOMALIES IN $RBa_2Cu_3O_{7-\delta}$ and $YBa_2Cu_4O_8$ SUPERCONDUCTORS - A.P. Litvinchuk*, C. Thomsen and M. Cardona, Max-Planck-Institut für Festkörperforschung, Heisenbergstrasse 1, D-7000 Stuttgart 80, Germany, *on leave from the Institute of Semiconductors, Ukrainian Academy of Sciences, 252650 Kiev 28, U.S.S.R.
M2.6	INFRARED PROPERTIES OF a- AND c-ORIENTIED EPITAXIAL YBCO FILMS - A.N. Ivlev, E.A. Tishchenko, P.L. Kapitza Institute for Physical Problems, USSR Academy of Science, Kosygina Street 2, 117973 Moscow, U.S.S.R.
M2.7	ELLIPSOMETRIC MEASUREMENTS OF FAR-INFRARED OPTICAL CONSTANTS - K.-L. Barth, F. Keilmann, Max-Planck-Institut für Festkörperforschung, D-7000 Stuttgart 80, Germany
M2.8	FIR SURFACE ELECTROMAGNETIC WAVES SPECTROSCOPY OF $YBa_2Cu_3O_{7-x}$ FILMS ON $SrTiO_3$ - V. Vaicikauskas, Institute of Physics, Lithuanian Academy of Sciences, Gostauto 12, 232600 Vilnius, Lithuania and G.N. Zhizhin, V.A. Yakovlev, Institute of Spectroscopy, Academy of Sciences USSR, Troitzk, 142 092 Moscow Region, USSR

M3.1 FAR-INFRARED OBSERVATIONS OF THE GALACTIC CYGNUS REGION WITH A BALLOON-BORNE TELESCOPE (*Invited Keynote*) - A. Holenstein, G. Schenker and F.K. Kneubühl, Infrared Physics Laboratory, ETH Zurich, CH-8093 Zürich, Switzerland and D. Huguenin, Geneva Observatory, CH-1290 Sauverny, Switzerland

M3.2 MEASUREMENTS OF TRACE STRATOSPHERIC MOLECULES USING FAR INFRARED AND MID INFRARED THERMAL EMISSION SPECTROSCOPY (*Invited Keynote)* - K.V. Chance, Harvard-Smithsonian Center for Astrophysics, Cambridge, Mass. 02138, U.S.A.

M3.3 TUNABLE FAR INFRARED SPECTROSCOPY OF 16 O3 OZONE - P. De Natale*, G. Di Lonardo**, L. Fusina**, M. Inguscio* and M. Prevedelli*, European Laboratory of Nonlinear Spectroscopy (LENS), Largo E. Fermi 2, I-50125 Firenze, Italy, *Dipartimento di Fisica dell' Università, Firenze, Italy **Dipartimento di Chimica Fisica e Inorganica, Bologna, Italy

M3.4 COLLISIONAL LINESHAPES OF OZONE FOR TRANSITIONS OF ATMOSPHERIC INTEREST IN THE SUBMILLIETER REGION - G. Buffa*, P. De Natale**, G. Di Lonardo***, L. Fusina***, M. Inguscio**, M. Prevedelli** and O. Tarrini*, European Laboratory of Nonlinear Spectroscopy (LENS), Largo E. Fermi 2, I-50125 Firenze, Italy, *Dipartimento di Fisica dell' Università, Pisa, **Dipartimento di Fisica dell' Università, Firenze, ***Dipartimento di Fisica dell'Università, Bologna, Italy

M3.5 AIRBORNE RADIOMETRIC OBSERVATIONS AT 89 AND 157 GHz: COMPARISON WITH GASEOUS ABSORPTION MODELS - C. Prigent, P. Abba, Lab. Radioastronomie Millimétrique, Observatoire de Meudon, F-92190 Meudon Cedex, France, P. Dupuy, Ecole de la Météorologie, Av. Coriolis, F-31057 Toulouse, France, J. Foot, British Meteorological Off., Remote Sensing Branch RAE, B Y70, Farnborough GU146TD, UK, S. English, Atmospheric Physics Lab., Univ. of Oxford, Parks Road, Oxford, U.K., A. Chedin, N. Scott, Lab. de Météorologie Dynamique, Ecole Polytechn., F-91128 Palaiseau, France

M3.6 FORWARD AND BACKWARD SCATTERING PROPERTIES OF THE MELTING LAYER OF PRECIPITATION - W. Zhang and E. Salonen, Helsinki University of Technology, Radio Laboratory, Otakaari 5A, SF-02150 Espoo, Finland

M3.7 COHERENT MEASUREMENT SYSTEM FOR ATMOSPHERIC TRANSMISSION BEHAVIOUR IN THE 140-144 GHz RANGE - G. Hochschild, R. Krupa, Kernforschungszentrum Karlsruhe, P.O. Box 3640, D-7500 Karlsruhe, Germany

M3.8 REMOTE SENSING OF THE ATMOSPHERE VIA FAR INFRARED LASER HETERODYNING SPECTROSCOPY: A FEASIBILTIY STUDY - S.M. Miller, M. Birk, D. Hausamann, Institute for Optoelectronics, German Aerospace Research Est. (DLR), D-8031 Oberpfaffenhofen, Germany

M4.1	INVESTIGATION OF GYROTRONS IN IAP (*Invited Keynote*) - G.G. Denisov, A.Sh. Fiks, V.A. Flyagin, A.L. Gol'denberg, V.I. Khizhnyak, A.N. Kuftin, V.I. Malygin, A.B. Pavelyev, V.G. Pavelyev, A.V. Pylin, V.E. Zapevalov, Institute of Applied Physics, Academy of Sciences USSR, 603600 Nizhny Novgorod, U.S.S.R.
M4.2	EXCITATION OF PARASITIC WAVES IN HIGH POWER GYROTRONS: THEORY AND EXPERIMENT - T.M. Antonsen Jr., S.Y. Cai, G. Seraph, B. Levush, Laboratory for Plasma Research, University of Maryland, College Park, MD 20742, U.S.A., and W.C. Guss, M. Basten, K.E. Kreischer, R.J. Temkin, Massachusetts Institute of Technology, Plasma Fusion Center, Cambridge, MA 02139, U.S.A.
M4.3	MULTIMODE SIMULATION OF HIGH FREQUENCY GYROTRONS - S.H. Gold, A.W. Fliflet, Beam Physics Branch, Plasma Physics Division, Naval Research Laboratory, Washington, D.C. 20375-5000, U.S.A.
M4.4	COLD CAVITY AND SELF-CONSISTENT APPROACHES IN THE THEORY OF MODE COMPETITION IN GYROTRONS - O. Dumbrajs, Arbeitsbereich Hochfrequenztechnik, Technische Universität Hamburg-Harburg, D-2100 Hamburg 90, Germany, G.S. Nusinovich, Laboratory for Plasma Research, University of Maryland, College Park, Maryland 20742, U.S.A.
M4.5	EFFECT OF WINDOW REFLECTIONS ON GYROTRON OPERATION - T.M. Antonsen Jr., S.Y. Cai, G.S. Nusinovich, Laboratory for Plasma Research, University of Maryland, College Park, MD 20742, U.S.A.
M4.6	NETWORK-THEORETICAL APPROACH TO THE GYROTRON OSCILLATOR - E. Jensen* and K. Schünemann, Technische Universität Hamburg-Harburg, D-2100 Hamburg 90, Germany, * now with CERN, Geneva, Switzerland
M4.7	DEVICE-CIRCUIT INTERACTION STUDIES OF GYROTRON OSCILLATORS - O.A. Abo-Elnor, E. Jensen*, K. Schünemann, Technische Universität Hamburg-Harburg, D-2100 Hamburg 90, Germany, and *now with CERN, Geneva, Switzerland
M4.8	THE SPACE-CHARGE EFFECTS IN ELECTROSTATIC ELECTRON CYCLOTRON RESONANCE MASER - C. Xiong, Z. Liu, S. Yu, S. Liu, University of Electronic Science and Technology, Institute of High Energy Electronics, Chengdu 610054 Sichuan, P.R. China

M5.1	GENERATION OF COHERENT SYNCHROTRON RADIATION BY LINAC *(Invited Keynote)* - M. Ikezawa, Research Institute for Scientific Measurements, Tohoku University, Sendai 980, Japan
M5.2	SOLID STATE OSCILLATORS FOR SELECTED FREQUENCIES BETWEEN 100 AND 700 GHz - H. Rothermel, Max Planck Institut für extraterrestrische Physik, D-8046 Garching bei München, Germany
M5.3	A 30 TO 100 GHz SOLID STATE NOISE SOURCE FOR MILLIMETRE-WAVE SPECTROMETRY - J.W. Bowen, Laboratory for Millimetre-Waves, Department of Physics, Queen Mary and Westfield College, University of London
M5.4	THE MM-WAVE MESFET OSCILLATORS CHARACTERIZATION - A. Karpov*, A. Kosov, Space Research Institute of USSR Academy of Sciences, Profsoyuznaya 84/32, 117810 Moscow, USSR * present address: Institut de Radioastronomie Millimetrique, 300 rue de la Piscine, F-38406 Saint Martin d'Hères, France
M5.5	FREQUENCY MODULATION OF FREE SPACE R.F. SIGNALS - M. Rader, I. Alexeff, University of Tennessee, Knoxville, TN 37996-2100, U.S.A.
M5.6	MODIFIED ACTIVE LAYER FOR RELIABLE EFFICIENT GUNN DIODES - J. Gorelik, Institut de Physique Appliquée, Dép. de Physique, Ecole Polytechnique Fédérale, 1015 Lausanne, S. Bose, D.M. Miller, Center for Electronic Materials and Devices, Dep. of Electrical Engineering, Penn. State University, University Park, PA 16802 USA
M5.7	LOW NOISE InP GUNN GENERATOR WITH SPHERE-ECHELETTE OPEN OSCILLATING SYSTEM - O.I. Belous, B.M. Bulgakov, A.I. Fisun, A.M. Fursov, A.S. Kosov, W.A. Zotov, Institute of Radiophysics and Electronics, Academy of Sciences of the Ukrainian SSR, 12, Acad. Proskura st., 310085 Kharkov, U.S.S.R.
M5.8	MILLITRON WITH THE MULTISTAGE SLOW WAVE STRUCTURE - A.Ja. Belukcha, V.D. Eremka, A.A. Katchan, L.P. Mospan, A.A. Shtanko, Institute of Radiophysics and Electronics, Academy of Sciences of the Ukrainian SSR, 12, Acad. Proskura st., 310085 Kharkov, U.S.S.R.
M5.9	LOW-NOISE MMW COMB SPECTRUM GENERATOR - A.V. Krasovsky, Yu.A. Morozov, N.I. Sinitsyn, Electronics of the USSR Academy of Sciences, Saratov Branch, 410720 Saratov, U.S.S.R.

M6.1	HIGH Tc SUPERCONDUCTORS (*Invited Keynote*) - K.F. Renk, Institut für Angewandte Physik, Universität Regensburg, D-8400 Regensburg, Germany
M6.2	APPLICATION OF HIGH-Tc SUPERCONDUCTORS AS REFLECTORS FOR FAR-INFRARED FABRY-PEROT RESONATORS - J. Schützmann, P. Wiese, X. Riederer, B. Gorshunov*, J. Betz, K.F. Renk, Institut für Angewandte Physik, Universität Regensburg, D-8400 Regensburg, Germany, *permanent address: Institute for General Physics, Academy of Sciences, Vavilov Street, Moscow 117942, U.S.S.R.
M6.3	THE DETECTION OF INFRARED RADIATION WITH A HIGH-Tc SUPERCONDUCTING MATERIAL INSIDE A WG DIELECTRIC RESONATOR - I. Longo, Istituto di Fisica Atomica e Molecolare del CNR, Via del Giardino 7, I-56127 Pisa, Italy
M6.4	HIGH SPEED NONLINEAR DETECTION OF SHORT PULSES OF MID AND FAR INFRARED RADIATION WITH A CURRENT BIASED GRANULAR THIN FILM OF Bi2Sr2CaCu2O8 - P.G. Huggard, Gi. Schneider, T. O'Brien, P. Lemoine, W. Blau, Physics Dept., Trinity College, Dublin 2, Ireland, and W. Prettl, Institut für Physik III, Universität Regensburg, D-8400 Regensburg, Germany
M6.5	APPLICATION OF HIGH-Tc SUPERCONDUCTORS AS OUTPUT COUPLERS FOR THE FAR-INFRARED p-GERMANIUM LASER - A.V. Bespalov*, P.T. Lang, J. Betz, K.F. Renk, Institut für Angewandte Physik, Universität Regensburg, D-8400 Regensburg, Germany, * permanent address: Institute of Applied Physics, Academy of Science of the USSR, 603600 Nizhnij Novgorod, U.S.S.R.
M6.6	BOLOMETRIC DETECTION OF 10 mm RADIATION WITH HIGH Tc SUPERCONDUCTING THIM FILMS - A. Kreisler, F. Teherani Hosseini, J.M. Depond, J. Baixeras, M. Redon, J.P. Derschka, G. Alquié, Université de Paris VI et XI, Lab. de Genie Electrique de Paris, F-91192 Gif-sur-Yvette Cedex, France
M6.7	A SENSITIVE HTSC THIN FILM BOLOMETER WITH ULTRA-WIDE WAVELENGTH RESPONSE - B. Dwir*, G. Dudle*, B.J. Kellett**, R. Behn***, D. Pavuna*, *IMO, Swiss Federal Institute of Technology, Ecublens, CH-1015 Lausanne, Switzerland, **Present address: Dep. Metallurgique, Ecole Polytechnique de Montréal, C.P. 6079A Montréal, Canada, ***CRPP, Swiss Federal Institute of Technology, 21, Av. des Bains, CH-1007 Lausanne, Switzerland
M6.8	THE EXPERIMENT STUDY OF MICROWAVE PHASE SHIFTER BY USING Bi-Sr-Ca-Cu-O BULK SUPERCONDUCTOR - S.Z. Cai, T. Zhao, Dept. of Electrical Engineering, Fudan University, Shanghai 200433, P.R. China

Session M7

Monday p.m. **Laser 1** August 26

M7.1	GENERATION OF ULTRASHORT FAR- INFRARED LASER PULSES OPTICALLY PUMPED WITH TRUNCATED HYBRID- 10μm- CO_2- LASER PULSES - D.P. Scherrer, A.W. Kälin, R. Kesselring and F.K. Kneubühl, Infrared Physics Laboratory, Institute of Quantum Electronics, ETH, CH-8093 Zurich, Switzerland
M7.2	GENERATION OF INTENSE SHORT FIR PULSES BY USE OF A PASSIVELY MODE LOCKED HIGH PRESSURE CO_2 LASER AS PUMP SOURCE - P.T. Lang, W. Schatz, K.F. Renk, Institut für Angewandte Physik, Universität Regensburg, D-8400 Regensburg, Germany and E.V. Beregulin, S.D. Ganichev, I.D. Yaroshetskii, A.F. Ioffe Institute, Academy of Sciences of the USSR, 194021 Leningrad, U.S.S.R.
M7.3	GENERATION OF PULSED FIR RADIATION IN A WIDE SPECTRAL RANGE WITH A D_2O RAMAN LASER - P.T. Lang, W. Schatz, K.F. Renk, Institut für Angewandte Physik, Universität Regensburg, D-8400 Regensburg, Germany
M7.4	TUNABLE FIR GENERATION WITH THE OPTICALLY PUMPED METHYLFLUORIDE RAMAN LASER - P.T. Lang, K.F. Renk, Institut für Angewandte Physik, Universität Regensburg, D-8400 Regensburg, Germany
M7.5	GENERATION OF A HIGH INTENSITY FAR-INFRARED PULSE BY SECOND STOKES SCATTERING IN A PARA-HYDROGEN RAMAN LASER - A. Tsunemi*, H. Koide*, K. Nagasaka*, K. Midorikawa and H. Tashiro, RIKEN, The Institute of Physical and Chemical Research, Japan, and *Department of Physics, Science University of Tokyo, Japan
M7.6	CD_3F FIR RAMAN LASER USING MULTIPASS CELL - V.A. Batanov, V.B. Fleurov, O.M. Khlebnikov, A.O. Radkevich and A.Yu. Volkov, Institute of Physics and Technology of the USSR Academy of Sciences, Krasikova 25A, 117218 Moscow, Krasikova 25A, U.S.S.R.
M7.7	SMALL-SIGNAL GAIN IN CW OPTICALLY PUMPED FAR-INFRARED LASERS - A. Harth, R. Janker, Laboratories for High Frequency Technology, University Erlangen-Nürnberg, Cauerstr. 9, D-8520 Erlangen, Germany
M7.8	RESEARCH ON AN OPTICALLY PUMPED FIR-RINGLASER - H.K.E. Stadermann and P.B. van der Wal, Max-Planck-Institut für Radioastronomie, Auf dem Hügel 69, D-5300 Bonn 1, Germany
M7.9	MATCHING THE PUMP BEAM IN OPTICALLY PUMPED FAR-INFRARED RING LASERS - R. Janker, Laboratories for High Frequency Technology, University Erlangen-Nürnberg, Cauerstr. 9, D-8520 Erlangen, Germany

M8.1	MEGAWATT POWER LEVEL GYROTRONS (*Invited Keynote*) - K.E. Kreischer, M.A. Basten, T.L. Grimm, W.C. Guss, R.J. Temkin, Plasma Fusion Center, Massachusetts Institute of Technology, Cambridge, MA 02139, U.S.A.
M8.2	EXPERIMENTAL STUDIES OF A 120 GHz MEGAWATT GYROTRON - T. Kikunaga, T. Shimozuma, H. Asano, Y. Yasojima and K. Nakashima, Central Research Laboratory, Mitsubishi Electric Corp., Amagasaki, Hyogo 661, Japan
M8.3	DESIGN OF A 1 MW GYROTRON WITH BEAM/RF SEPARATION - J. Neilson, K. Felch, J. Feinstein, H. Huey, H. Jory, R. Schumacher, M. Tsirulnikov, Varian Associates Inc., 811 Hansen Way, MS-B118, Palo Alto, CA 94304, U.S.A.
M8.4	DAPHNE: A PROGRAMMING ENVIRONMENT FOR GYROTRON OPTIMIZATION - R. Gruber, S. Merazzi, T.M. Tran, Centre de Recherches en Physique des Plasmas, Ass. Euratom-Confédération Suisse, Ecole Polytechnique Fédérale de Lausanne, 21, Av. des Bains, CH-1007 Lausanne, Switzerland
M8.5	MAGNETRON INJECTION GUNS OR GYROTRONS: PROBLEMS OF INSTABILITY - V.K. Lygin, V.N. Manuilov, Sh.E. Tsimring, V.E. Zapevalov, Institute of Applied Physics of the USSR Academy of Sciences, 603600 Nighny Novgorod, U.S.S.R.
M8.6	SOVIET INDUSTRIAL GYROTRONS - V.E. Myasnikov, A.P. Cayer, S.D. Bogdanov, V.I. Kurbatov, Scientific Production Union, "Microvolna" Trade Department, 1, vl. Usacheva, 119 048 Moscow, U.S.S.R.
M8.7	SPACE CHARGE INSTABILITIES IN GYROTRON BEAMS - H. Li, T.M. Antonsen Jr., Laboratory for Plasma Research, University of Maryland, College Park, MD 20742, U.S.A.
M8.8	DETERMINATION OF THE ELECTRON BEAM VELOCITY IN A GYROTRON BY MEANS OF THOMSON SCATTERING - G. Soumagne, M.R. Siegrist, M.Q. Tran, Centre de Recherches en Physique des Plasmas, Association Euratom-Confédération Suisse, Ecole Polytechnique Fédérale de Lausanne, 21, Av. des Bains, CH-1007 Lausanne, Switzerland

Session T1

Tuesday a.m. **Detectors & Mixers 1** August 27

T1.1	A 100-115 GHz SIS RECEIVER FOR ASTRONOMY - H. Ogawa, Department of Astrophysics, Nagoya University, Chikusa-Ku, Nagoya 464-01, Japan
T1.2	AN OPEN STRUCTURE SIS MIXER FOR 350 GHz - H. Rothermel, Max Planck Institut für extraterrestrische Physik, D-8046 Garching, Germany, and D. Billon-Pierron, K.H. Gundlach, Institut de Radioastronomie Millimétrique (IRAM), F-38406 St Martin d'Hérès, France
T1.3	RECEIVER DEVELOPMENT WITH Nb/Al-OXIDE/Nb SIS MIXERS IN THE FREQUENCY RANGES OF (210-270) AND (320-370) GHz - M.C. Carter, S. Navarro, A. Karpov, D. Billon-Pierron, T. Lehnert, K.H. Gundlach, IRAM, Institut de Radio Astronomie Millimétrique, 300 Rue de la Piscine, F-38406 St Martin d'Hères, France
T1.4	MIXER GAIN CALCULATIONS OF A SIS WAVEGUIDE MIXER USING AN INTEGRATED TUNING STRUCTURE - K. Jacobs, U. Kotthaus, B. Vowinkel, Universität zu Köln, 1. Physikalisches Institut, Zülpicher Str. 77, D-5000 Köln 41, Germany
T1.5	TWO-DIMENSIONAL ELECTRON GAS HOT-ELECTRON MIXERS FOR MILLIMETER WAVES AND SUBMILLIMETER WAVES - J.-X. Yang, W. Grammer, D. Dai, F. Agahi, K.M. Lau and K.S. Yngvesson, Department of Electrical & Computer Engineering, University of Massachusetts, Amherst, MA 01003, U.S.A.
T1.6	SUBHARMONIC MIXERS FOR SHORT MILLIMETRE WAVELENGTHS - N.J. Cronin, R. James, J.A. Wells, School of Physics, University of Bath, Claverton Down, Bath BA2 7AY, U.K.
T1.7	A MODULAR 300 GHz WAVEGUIDE MIXER WITH ULTRA-BROAD IF-BANDWIDTH - B. Stöckel, Laboratories for High Frequency Technology, University Erlangen-Nürnberg, Cauerstrasse 9, D-8520 Erlangen, Germany
T1.8	SPURIOUS-RESPONSE SUPPRESSION CHARACTERIZATION OF SPACE QUALIFIED MILLIMETER WAVE MIXERS: A DISTRIBUTED AND PARASITIC EFFECTS APPROACH - S.A. Kosmopoulos, C. Cornacchini, Space Engineering s.r.l., Via dei Berio 91, I-00155 Roma, Italy
T1.9	AN EFFICIENT ANALYSIS APPROACH FOR MICROWAVE AND MILLIMETER-WAVE MESFET MIXERS - C. Nguyen, Dep. of Electrical Engineering, Texas A&M University, College Station, Texas 77843-3128, and C.G.. Christodoulou, Dep. of Electrical Engineering, University of Central Florida, Orlando, Florida 32816-0116, U.S.A.
T1.10	WIDE SPECTRUM THIN METALLIC FIL DETECTORS OF ELECTROMAGNETIC RADIATION - P.I. Nikitin, D.G. Satukov, S.A. Uglov, V.I. Konov, Institute of General Physics, USSR Academy of Sciences, Vavilov Street 38, Moscow 117942, U.S.S.R.

Session T2

Tuesday a.m. **Semiconductors Solids 1** August 27

T2.1 MAGNETIC FIELDS: COUNTERPARTS OF INFRARED AND MILLIMETER WAVES (*Invited Keynote*) - M. von Ortenberg, Institut für Halbleiterphysik und Optik, Hochmagnetfeldanlage der Technischen Universität Braunschweig, Mendelssohnstr. 3, D-3300 Braunschweig, Germany

T2.2 MAGNETO-OPTICS IN HgCdMnTe AND HgMnTe IN PULSED MAGNETIC FIELDS UP TO 35 TESLA - L. Van Bockstal, K. Van Droogenbroeck, F. Herlach,Dept. Natuurkunde, K.U. Leuven, Celestijnenlaan 200D, B-3030 Leuven, Belgium, and V.A. Smirnov, V.I. Ivanov-Omskii, A.F. Ioffe Physico-Technical Institute, Leningrad, U.S.S.R.

T2.3 FAR INFRARED MAGNETOREFLECTIVITY MEASUREMENTS ON HgSe:Cr - M. Hausenblas, A. Witowski, A. Wittlin*, P. Wyder, Max-Planck-Institut für Festkörperforschung, Hochfeld-Magnetlabor, B.P. 166X, F-38042 Grenoble-Cedex, France, * Permanent address: High Field Magnet Laboratory, University of Nijmengen, 6525 ED Nijmengen, Netherlands

T2.4 FIR-MAGNETOSPECTROSCOPY OF HgSe:Fe WITH A SLIGHTLY ANOMALOUS SKIN EFFECT - K. Buchholz-Stepputtis, O. Portugall, M. von Ortenberg, Institut für Halbleiterphysik und Optik, TU Braunschweig,Mendelsohnstr. 3, D-3300 Braunchschweig, Germany, W. Dobrowolski, Instytut Fizyki Polskiej Akademii Nauk, Al. Lotnikow 32/46, PL-02-668 Warszawa, Poland

T2.5 THE EFFECT OF INTERBAND EXCITATION ON THE CYCLOTRON RESONANCE OF InGaAs/InP QUANTUM WELLS - S.C. Shen (a,b), W. Lu (a,b), M. von Ortenberg (a), C. Wetzel (c), a) Institut für Optik und Halbleiterphysik und Hochmagnetfeldanlage der Technischen Universität Braunschweig, D-300 Braunschweig, Germany, b) Shanghai Institute of Technical Physics, Academia Sinica, Shanghai 200 083, P.R. Of China, c) Physik-Department E16 Technische Universität München, D-8049 Garching, Germany

T2.6 FAR-INFRARED MAGNETOSPECTROSCOPY ON THE S=1 SPIN CHAIN IN *NENP* - W. Lu (a,b) J. Tuchendler (c), M. von Ortenberg (a), J.P. Renard (d), a) Institut für Halbleiterphysik und Optik, Hochmagnetfeldanlage der Technischen Universität Braunschweig, D-3300 Braunschweig, Germany, b) Shanghai Institute of Technical Physics, Academia Sinica, Shanghai, P.R. China, c) Laboratoire de Dispositifs Infrarouge et Micro-Ondes, Université Paris VI, F-75230 Paris, France, d) Institut d'Electronique Fondamentale, Université Paris Sud, F-91405 Orsay, France

T2.7 MAGNETO-OPTICAL PROPERTIES OF InSb AT HIGH TEMPERATURES - P.Y. Liu, J.C. Maan, Max Planck Institut für Festkörperforschung, Hochfeldmagnetlabor, BP 166X, F-38042 Grenoble Cedex, France

T2.8 TIME OF ENERGY RELAXATION OF CARRIERS IN H- -BAND - A.I. Demin and V.A. Batanov, Institute of Physics and Technology of the USSR Academy of Sciences, Krasikova 25A, 117218 Moscow, U.S.S.R., and I.E. Trofimov and V.N. Mursin, P.N. Lebedev Physical Institute, USSR Academy of Sciences, Leninski pr 53, Moscow, U.S.S.R.

Session T3

Tuesday a.m. **Laser 2** August 27

T3.1	QUANTUM-MECHANICAL ANALYSIS OF FAR-INFRARED LASER OSCILLATION IN p-TYPE GERMANIUM (*Invited Keynote*) - S. Kuroda, Institute of Materials Science, University of Tsukuba, Tsukuba, Ibaraki 305, Japan and S. Komiyama, Department of Pure & Applied Sciences, College of Arts and Sciences, University of Tokyo, Komaba 3-8-1, Meguro-Ku, Tokyo 153, Japan
T3.2	DETAILED ANALYSIS OF THE EMISSION SPECTRA OF THE LIGHT-HEAVY HOLE p-GE LASER - W. Heiss, C. Kremser, K. Unterrainer, Institut für Experimentalphysik, Universität Innsbruck, Austria, and E. Gornik, Walter-Schottky-Institut, TU-München, D-8046 Garching, Germany
T3.3	INVESTIGATION OF THE PUMPING MECHANISM OF THE p-GE CYCLOTRON RESONANCE LASER - C. Kremser, C. Wurzer, K. Unterrainer, Institut für Experimentalphysik, Universität Innsbruck, Austria, and E. Gornik, Walter-Schottky-Institut, TU-München, D-8046 Garching, Germany
T3.4	NARROW BAND TUNABLE SUB-MILLIMETER HOT HOLE SEMICONDUCTOR LASER - L.E. Vorobjev, S.N. Danilov, D.V. Donetzky, Yu.V. Kochegarov, V.I. Stafeev, D.A. Firsov, Leningrad State Technical University, 195251 Leningrad, U.S.S.R.
T3.5	MODULATION OF LIGHT RADIATION IN DOUBLE HETEROJUNCTION LASER MM BAND ELECTROMAGNETIC SIGNAL AND PICOSECOND PULSES - T.Yu. Bagaeva, V.B. Gorfinkel, B.M. Gorbovitsky, I.I. Filatov, Institute of Radio Engineering and Electronics, Saratov Branch, Sakko-i-Vanzetti 21, 410720 Saratov, U.S.S.R.
T3.6	NUMERICAL STUDY OF AN OPTICALLY-PUMPED 385μm-D2O LASER FOR THE SINGLE-MODE OPERATION - K. Sasaki, K. Matsuoka, Y. Tsubouchi, N. Takada, M. Nagatsu, T. Tsukishima, Department of Electrical Engineering, Nagoya University, Nagoya 464-01, T. Okada, Department of Electrical Engineering, Kyushu University, Hakozaki, Fukuoka 812, S. Okajima, Department of Applied Physics, Chubu University, Kasugai, Aichi 487, Y. Tsunawaki, Department of Electrical Engineering, Osaka Sangyo University, Daito, Osaka 574, S. Sudo, Plasma Physics Laboratory, Kyoto University, Uji, Kyoto 611, K.-N. Sato, National Institute for Fusion Science, Nagoya 464-01, Japan
T3.7	NUMERICAL SIMULATION OF RAMAN PROCESSES FOR ARBITRARY FIELD POLARIZATIONS - V.A. Batanov, A.O. Radkevich, A.L. Telyatnikov and A.Yu. Volkov, Institute of Physics and Technology of the USSR Academy of Sciences, Krasikova 25A, 117218 Moscow, U.S.S.R.
T3.8	STIMULATED EMISSION ON SHALLOW ACCEPTOR STATES OF GERMANIUM - S.V. Demihovsky, A.V. Murav'ev, S.G. Pavlov, V.N. Shastin, Institute of Applied Physics, USSR Academy of Sciences, 46 Uljanov Street, 603600 Nizhny Novgorod, U.S.S.R.
T3.9	MINIATURE OPFIRL WITH BROAD FREQUENCY TUNABILITY - Y. Lin, X. Luo, Zhongshan University, Dept. of Electronics, Guangzhou, P.R. China

T4.1	EXPERIMENTAL STUDY OF A QUASI-OPTICAL GYROTRON OPERATING AT THE SECOND HARMONIC - S. Alberti, M.Q. Tran, Centre de Recherches en Physique des Plasmas, Association Euratom-Confédération Suisse, Ecole Polytechnique Fédérale de Lausanne, 21, Av. des Bains, CH-1007 Lausanne, Switzerland
T4.2	DESIGN OF A QUASIOPTICAL GYROTRON EXPERIMENT WITH LARGE MIRROR SEPARATION - T.A. Hargreaves, A.W. Fliflet and R.P. Fischer, Beam Physics Branch, Plasma Physics Division, U.S. Naval Research Laboratory, Washington, D.C. 20375-5000, U.S.A.
T4.3	DESIGN OF AN 85GHz QUASIOPTICAL GYROKLYSTRON - R.P. Fischer, T.A. Hargreaves, A.W. Fliflet and W.M. Manheimer, Beam Physics Branch, Plasma Physics Division, U.S. Naval Research Laboratory, Washington, D.C.20375-5000, U.S.A.
T4.4	STUDIES OF HIGH POWER 10-30 GHz AMPLIFICATION FROM TWO-CAVITY GYROKLYSTRONS - W. Lawson, P.E. Latham, V. Specht, C.D. Striffler, J.P. Calame, W. Main, V.L. Granatstein, Lab. for Plasma Research, University of Maryland, College Park, MD 20742, U.S.A.
T4.5	STUDIES OF HIGH POWER X-BAND AMPLIFICATION FROM AN OVER-MODED THREE-CAVITY GYROKLYSTRON WITH A TUNABLE BUNCHER CAVITY - S. Tantawi, W. Main, P.E. Latham, B. Hogan, H. Matthews, M. Rimlinger, W. Lawson, C.D. Striffler and V.L. Granatstein Lab. for Plasma Research, University of Maryland, College Park, MD 20742, U.S.A.
T4.6	PERFORMANCE CHARACTERISTICS OF THE NTHU GYROTRON TRAVELING WAVE AMPLIFIER - K.R. Chu, L.R. Barnett, C.S. Kou, W.K. Lau, H.Y. Chen, S.H. Chen, Department of Physics, National Tsing Hua University, Hsinchu, Taiwan
T4.7	EXPERIMENTAL STUDY OF A BROADBAND MILLIMETER-WAVE GYROTRON TRAVELING WAVE AMPLIFIER - G.S. Park*, S.Y. Park**, R.H. Kyser***, C.M. Armstrong, A.K. Ganguly and R.K. Parker, Naval Research Laboratory, Code 6840, Washington, DC 20375, U.S.A., *Omega-P. Inc., New Haven, CT 06520, U.S.A., **Pohang Institute of Science and Technology, Korea ***B-K Systems, Inc., MD 20850, U.S.A.
T4.8	HARMONIC OPERATION OF GYROKLYSTRON AMPLIFIERS - P.E. Latham, G. Nusinovich and B. Levush, Laboratory for Plasma Research, University of Maryland, College Park, MD 20742, U.S.A.
T4.9	HIGH POWER, HARMONIC GYRO-TWTs - Q.S. Wang, C.K. Chong, C.S. Kou*, D.B. McDermott, N.C. Luhmann Jr., A.T. Lin and K.R. Chu*, Department of Electrical Engineering, University of California at Los Angeles, Los Angeles, CA 90024, U.S.A., *Permanent address: National Tsing Hua University, Taiwan, ROC
T4.10	THEORY OF PARAMETRIC INSTABILITIES IN GYRO-DEVICES AT CYCLOTRON HARMONICS - G. Nusinovich, Lab. for Plasma Research, University of Maryland, College Park, MD 20742, U.S.A.

Session T5

Tuesday p.m. **Detectors & Mixers 2** August 27

T5.1	MILLIMETER WAVE GaAs SCHOTTKY BARRIER PHOTODIODES - K.Y. Hur, R.C. Compton, School of Electrical Engineering, Cornell University, Ithaca, NY 14853, U.S.A.
T5.2	A NOVEL MM-WAVE TRIPLER IN WAVEGUIDE-MICROSTRIP MIXED STRUCTURE - F. Xiao, K. Gong, Z. Feng, Tsinghua University, Beijing 100084, P.R. China
T5.3	A BROAD-BAND HARMONIC 300 GHz MIXER WITH FLEXIBLE LO-FEED - B. Stöckel, Laboratories for High Frequency Technology, University Erlangen-Nürnberg, Cauerstrasse 9, D-8520 Erlangen, Germany
T5.4	ABSOLUTE POWER AND ENERGY MEASUREMENT FOR MILLIMETER AND SUBMILLIMETER WAVES - D.H. Martin, G.W. Poulson, R.J. Wylde, Laboratory for Millimeter Waves, Department of Physics, Queen Mary & Westfield College, Mile End Road, London E1 4NS, U.K.
T5.5	A MILLIMETER-WAVE PYROELECTRIC DETECTOR - M.R. Webb, University of St. Andrews, Department of Physics and Astronomy, St. Andrews FIFE KY16 9SS, Scotland, U.K.
T5.6	ACCURATE CHARACTERIZATION OF VARACTORS WITH fF CAPACITANCE - T.J. Tolmunen*+**, S. Nilsen***, O. Boric *, M.A. Frerking**, E. Kollberg***, *Helsinki University of Technology, Radio Laboratory, SF-02150 Espoo, Finland, **Jet Propulsion Laboratory, Pasadena, CA91109, U.S.A., ***Chalmers Univ. of Tech., Applied Electron Physics, S-41296 Göteborg, Sweden
T5.7	NEW SUBMILLIMETER-WAVE SCHOTTKY-BARRIER MIXER DIODES: FIRST RESULTS - N.J. Keen, Max-Planck-Institut für Radioastronomie, Auf dem Hügel 69, D-5300 Bonn 1, A. Grüb and H.L. Hartnagel, Institut für Hochfrequenztechniz, Techn. Hochschule Darmstadt, Merckstr. 25, D-6100 Darmstadt, J. Freyer, Institut für allg. Elektrotechnik und angewandte Elektronik, Techn. Universität München, Arcisstr. 21, D-8000 München 2, Germany
T5.8	DIRECT DETECTION WITH Nb-BASED TUNNEL JUNCTIONS AT 74GHz - J. Mees, E. Kreysa, Max-Planck-Institut für Radioastronomie, Auf dem Hügel 69, D-5300 Bonn 1, Germany and T. Lehnert, K.H. Gundlach, Institut de Radioastronomie Millimétrique (IRAM), 300, rue de la Piscine, Domaine Universitaire, F 38406 Saint-Martin d'Hères, France
T5.9	8mm TOTAL POWER RADIOMETER WITH PERIODIC CALIBRATION - Z. Zhang, Z. Luo, Department of Electronics and Information, Huazhong University of Science & Technology, 430074 Wuhan, Hubei, P.R. China
T5.10	Ka-BAND NONRADIATIVE DIELECTRIC WAVEGUIDE INTEGRATED RECEIVER FRONT-END - L.C. Liao, Department of Electrics and Information Engineering, Huazhong University of Science & Technology, 430074 Wuhan, Hubei, P.R. China

T6.1 FIR NONLINEAR METHODS IN SEMICONDUCTOR TRANSPORT *(Invited Keynote)* - F. Keilmann, Max-Planck-Institut für Festkörperforschung, D-7000 Stuttgart 80, Germany

T6.2 CHARACTERISATION OF CdTe/CdxHg1-xTe/CdTe HETEROSTRUCTURES ON GaAs SUBSTRATES BY DISPERSIVE FOURIER TRANSFORM SPECTROSCOPY - S.K. Kang, T. Dumelow, A.A. Hamilton, T.J. Parker and D.R. Tilley, Department of Physics, University of Essex, Wivenhoe Park, Colchester, CO4 3SQ, U.K., and O.V. Baranova, S.N. Ershov and M.I. Vasilevskiy, Faculty of Applied Physics and Microelectronics, Gorky State University, 37, Sverdlova Street, Gorky, 603000, USSR

T6.3 FAR-INFRARED LASER SPECTROSCOPY OF SHALLOW ACCEPTORS IN SEMIMAGNETIC p-Hg1-x-y CdxMnyTe ALLOYS - E.I. Georgitse, V.I. Ivanov-Omskii, V.F. Movilae, D.I. Tsypishka, JOFFE Physical-Technical Institute, Academy of Sciences of the USSR., 194021 Leningrad, U.S.S.R.

T6.4 FAR INFRARED STUDY OF SURFACE AND INTERFACE POLARITONS IN CdTe/CdxHg1-xTe/CdTe HETEROSTRUCTURES DEPOSITED ON GaAs SUBSTRATES BY PLASMA ASSISTED *MOCVD* - T. Dumelow, A.A. Hamilton, S.K. Kang, T.J. Parker and D.R. Tilley, Department of Physics, University of Essex, Wivenhoe Park, Colchester, Essex CO4 3SQ, U.K., and S.N. Ershov, M.I. Vasilevskiy, Faculty of Applied Physics and Microelectronics, Gorky State University, 37, Sverdlova Street, Gorky, 603000, U.S.S.R.

T6.5 SELF-ALIGNED METAL-SiO2-InP BASED MISFETs HAVING MODULATION DOPED CHANNELS - F. Jain, S. Islam and E. Donkor, University of Connecticut, Electrical and Systems Engineering, U-157, 260 Glenbrock Road, Storrs, CT 06269-3157, U.S.A.

T6.6 LOW LYING ENERGY LEVELS OF CsFeC13 - H. Ohta, N. Makita, K. Yoshida, M. Motokawa, Department of Physics, Faculty of Science, Kobe University, Rokkodai, Nada, Kobe 657, Japan

T6.7 EPR IN TEA(TCNQ)2 AND MEM(TCNQ)2 AT FIR FREQUENCIES - P. Janssen, A. Mordijck, Kath. Universiteit Leuven, Lab. voor Lage Temperaturen en Hoge-Veldenfysica, Celestijnenlaan 200 D, B-3001 Leuven, Belgium

T6.8 INFLUENCE OF FAR INFRARED RADIATION ON THE CURRENT OF DOUBLE BARRIER RESONANT TUNNELING DEVICES - C. Kutter, V.A. Chitta, R.E.M. de Bekker and J.C. Maan, Max-Planck-Institut für Festkörperforschung, HML, 166X, F-38042 Grenoble Cedex, France, S.J. Hawksworth, J.M. Chamberlain and M. Henini, Department of Physics, Nottingham University, Nottingham NG7 2RD, U.K., and G. Hill, Department of Electronic and Electrical Engineering, University of Sheffield, Sheffield, S1 3JD, U.K.

T6.9 ON RESONANCE PHOTO-TUNNELING IN QUANTUM-WELL HETEROSTRUCTURES - Ar.G. Alexanian, Al.G. Alexanian, R.K. Kazarian, L.A. Matevossian, H.S. Nickogossian, Institute of Radiophysics and Electronics, Armenian Academy of Sciences, Ashtarak 2, Armenia 378410, U.S.S.R.

T7.1 TUNABLE HETERODYNE SPECTROMETRY USING COHERENT SUBMILLIMETER WAVES COMPONENTS AND METHODS *(Invited Keynote)* - D. Boucher, R. Bocquet, W. Chen, Laboratoire de Spectroscopie Hertzienne, USTL P5 59655 Villeneuve d'Ascq Cedex, France

T7.2 CH3OH LASER LINE ASSIGNMENT REVISITED BY FTS AND A NEW LINE ANALYSIS ROUTINE - G. Moruzzi, J.C.S. Moraes*, F. Strumia, Dipartimento di Fisica dell' Università di Pisa, Piazza Torricelli 2, I-56126 Pisa, Italy, R. M. Lees, Department of Physics, University of New Brunswick, Fredericton, New Brunswick E3B 5A3, Canada, B.P. Winnewisser, M. Winnewisser, Physik.-Chem. Institut der Justus-Liebig-Universität, Heinrich-Buff-Ring 58, D-6300 Giessen, Germany, *permanent address: Departamento de Ciencias, UNESP,15378 Ilha Solteira, Brazil

T7.3 THE INFRARED SPECTRUM OF CH3OH: EVIDENCE FOR STATE MIXINGS - G. Moruzzi, J.C.S. Moraes*, F. Strumia, Dipartimento di Fisica dell' Università di Pisa, Piazza Torricelli 2, I-56126 Pisa, Italy, R. M. Lees, Department of Physics, University of New Brunswick, Fredericton, New Brunswick E3B 5A3, Canada, I. Mukhopadhyay, Laser Programme, Centre for Advanced Technology, Rajendranagar, Indore 452012, India, B.P. Winnewisser, M. Winnewisser, Physikalisch-Chemisches Institut der Justus-Liebig-Univ., Heinrich-Buff- Ring 58, D-6300 Giessen, Germany *permanent address: Departamento de Ciencias,UNESP, 15378 Ilha Solteira, Brazil

T7.4 ABSORPTION SPECTROSCOPY IN GASES BY WIDEBAND MODE TUNABLE CO_2 RF LASERS - S. Marchetti, R. Simili, IFAM-CNR, Via del giardino 7, I-56100 Pisa, Italy

T7.5 FREQUENCY-RESOLVED SPECTRAL MEASUREMENT OF A HIGH POWER D2O LASER - M. Nagatsu, K. Sasaki, N. Takada, Y. Tsubouchi, T. Tsukishima, Dept. of Electrical Engineering, Nagoya University, Nagoya 464-01, T. Okada, Dept. of Electrical Engineering, Kyushu University, Kasuga, Fukuoka 816, S. Okajima, Dept. of Applied Physics, Chubu University, Kasugai, Aichi 487, K. Mizuno, Research Inst. of Electrical Communication, Tohoku University, Sendai 980, K.N. Sato, National Institute for Fusion Science, Nagoya 464-01, S. Sudo, Plasma Physics Laboratory, Kyoto University, Uji, Kyoto 611, Y. Tsunawaki, Dept. of Electrical Engineering, Osaka Sangyo University, Daito, Osaka 574, Japan

T7.6 13CD3OH and 12CD3OH OPTICALLY PUMPED BY A 13CO_2 LASER: OBSERVATION AND ASSIGNMENTS OF FIR LASER LINES - A. Scalabrin, D. Pereira, Instituto de Fisica, UNICAMP, Campinas, 13.081, Brasil, and G.P. Galvao, K.M. Evenson, NIST, Boulder CO 80303, U.S.A.

T7.7 STUDY OF THE Q BRANCH OF 13CD3OH - A. Scalabrin, D. Pereira, Instituto de Fisica - Unicamp, 13081 Campinas S.P., Brazil, G. Carelli, N. Ioli, J.C.S. Moraes*, A. Moretti, F. Strumia, Dipartimento di Fisica dell'Università and CNR,56126 Pisa, Italy, * Permanent adress: Departamento de Ciencias, FEIS-UNESP, 15378 I. Solteira-SP, Brasil

T7.8	FTIR SPECTROSOPY OF THE CH3-ROCKING, OH-BENDING, CH3-DEFORMATION AND OVERTONE C-O STRETCH BANDS OF O-18 METHANOL - S. Zhao, R.M. Lees and M. Moghbelalhossein, CEMAID and Department of Physics, University of New Brunswick, Fredericton, N.B., Canada E3B 5A3, and C.P. Chan, CEMAID and Department of Chemistry, University of British Columbia, Vancouver, B.C., Canada V6T 1W5
T7.9	FTIR SPECTROSOPY AND FIR LASER ASSIGNMENTS FOR 13CD3OH - L.-H. Xu, R.M. Lees and J.W.C. Johns*, CEMAID and Physics Department, University of New Brunswick, Fredericton, N.B. E3B 5A3, Canada, *Herzberg Institute of Astrophysics, National Research Council of Canada, Ottawa, Ont. K1A 0R6, Canada

T8.1	140 GHz GYROTRON DEVELOPMENT FOR PLASMA HEATING (*Invited Keynote*) - E. Borie, G. Dammertz, O. Dumbrajs*, G. Gantenbein, T. Geist**, M. Kuntze, A. Möbius, H.-U. Nickel, B. Piosczyk, M. Thumm**, Kernforschungszentrum Karlsruhe, ITP, Postfach 3640, D-7500 Karlsruhe 1, Germany, * Technische Universität Hamburg-Harburg, Arbeitsbereich Hochfrequenztechnik ** Universität Karlsruhe, Institut für Höchstfrequenztechnik und Elektronik, D-7500 Karlsruhe, Germany
T8.2	DESIGN OF A HIGH POWER 140 GHz GYROTRON OSCILLATOR OPERATING IN AN ASYMMETRIC VOLUME MODE AT KfK - G. Gantenbein, E. Borie, A. Möbius, B. Pioscyk, M. Thumm*, Kernforschungszentrum Karlsruhe GmbH, ITP, Postfach 3640, D-7500 Karlsruhe 1, *Universität Karlsruhe, Inst. f. Höchstfrequenztechnik und Elektronik, D-7500 Karlsruhe, Germany
T8.3	KINETIC THEORY OF A GYROTRON WITH ECCENTRICITY OF THE ELECTRON BEAM IN A CAVITY - O. Dumbrajs, Arbeitsbereich Hochfrequenztechnik, Technische Universität Hamburg-Harburg, D-2100 Hamburg 90, Germany, S. Liu*, College of Engineering, Department of Electrical and Computer Engineering, The University of Tennessee Knoxville, U.S.A., * On leave of absence from the Chendu Institute of Radio Engineering, Peoples Republic of China
T8.4	RELATIVISTIC BACKWARD WAVE OSCILLATORS: THEORY AND EXPERIMENT - B. Levush, T. Antonsen Jr., A. Bromborsky*, W.R. Lou, D. Abe, S. Miller, Y. Carmel, J. Rodgers, V. Granatstein, W. Destler, Laboratory for Plasma Research, University of Maryland, College Park, MD 20742, U.S.A., *Harry Diamond Laboratories, Adelphi, MD 20783, U.S.A.
T8.5	A HIGH-EFFICIENCY QUASI-OPTICAL MODE CONVERTER FOR WHISPERING GALLERY MODE GYROTRONS - M. Blank, K.E. Kreischer, R.J. Temkin, Plasma Fusion Center, Massachusetts Institute of Technology, Cambridge, Mass. 02139, U.S.A.
T8.6	LINEWIDTH MEASUREMENT ON A 140GHz GYROTRON - T. Geist, M. Thumm, W. Wiesbeck, Universität Karlsruhe, Institut für Höchstfrequenztechnik und Elektronik, Kaiserstrasse 12, D-7500 Karlsruhe, Germany
T8.7	CONTIGUOUS FILTERBANK RECEIVER FOR A PULSED 140GHz GYROTRON - T. Geist, M. Thumm, W. Wiesbeck, Universität Karlsruhe, Institut für Höchstfrequenztechnik und Elektronik, Kaiserstrasse 12, D-7500 Karlsruhe, Germany
T8.8	100 kW, 46-63 GHz SEVERED GYRO-BWO - G. Vasilakos, T.R. Stephenson, G.D. Ramlow, D.B. McDermott, N.C. Luhmann Jr., Department of Electrical Engineering, University of California, Los Angeles, CA 90024, U.S.A., and M. Caplan, Lawrence Livermore National Laboratory, Livermore, CA 94550. U.S.A.
T8.9	SUPERCONDUCTING MAGNET FOR A HIGH POWER, HIGH FREQUENCY QUASI-OPTICAL GYROTRON - W.D. Markiewicz, Intermagnetics General Corp., Guilderland, New York, M.E. Read, Physical Sciences Inc., Alexandria, VA22314, U.S.A.

W1.1	QUASI-OPTICAL POWER GENERATION AND MEASUREMENT TECHNIQUE (*Invited Keynote*) - T. Itoh, Dept. of Electrical Engineering, University of California, Los Angeles, Los Angeles, CA 90024-1594, U.S.A.
W1.2	QUASI-OPTICAL RECEIVER TECHNOLOGY (*Invited Keynote*) - D.B. Rutledge, R.M. Weickle II, M. Kim, J.B. Hacker and M.P. De Lisio, Division of Engineering and Applied Science, Caltech, Pasadena CA 91125, U.S.A.Caltech, Pasadena CA 91125, U.S.A.
W1.3	24 GHz FET OSCILLATOR WITH SLOT ANTENNA FOR QUASI-OPTICAL TRANSMITTER - S. Kawasaki, T. Itoh, Department of Electrical Engineering, University of California, Los Angeles, Los Angeles, CA 90024-1594, U.S.A.
W1.4	IMAGE-LINE VOLTAGE CONTROLLABLE ACTIVE ANTENNAS - A. M. Kirk, K. Chang, Department of Electrical Engineering, Texas A&M University, College Station, Texas 77843-3128, U.S.A.
W1.5	A Ka-BAND INTEGRATED ACTIVE NOTCH ANTENNA - J. A. Navarro, Y.H. Shu, K. Chang, Department of Electrical Engineering, Texas A&M University, College Station, Texas 77843-3128, U.S.A.
W1.6	A QUASI-OPTICAL POWER COMBINING ARRAY WITH EXTERNALLY INJECTION-LOCKED ELEMENTS - J. Birkeland, Department of Electrical Engineering, University of Texas at Austin, Austin TX 78712-1084, U.S.A. and T. Itoh, Department of Electrical Engineering, UCLA, Los Angeles, CA 90024-1594, U.S.A.
W1.7	COMPLEX FOR DETECTING DEFECTS IN RADIOTRANSPARENT OBJECTS - A.A. Vertiy, I.V. Ivanchenko, I.Ya. Gudym, N.A. Popenko, Institute of Radiophysics and Electronics, Academy of Sciences of the Ukrainian SSR, 310085 Kharkov, U.S.S.R.
W1.8	LIGHT CONTROLLED MILLIMETER-WAVE DEVICES - V.V. Gusakov, L.I. Kats, Department of Physics, Saratov State University, Astrachanskaya 83, 410601 Saratov, U.S.S.R.

Session in memoriam of J.J. Gallagher

W2.1 FAR INFRARED SPECTROMETER BASED ON THE CYCLOTRON RESONANCE EMISSION SOURCE - W. Knap*, D. Dur, A. Raymond, A. Dubois, G.E.S. Université des Sciences et Techniques du Languedoc, Place E. Bataillon, F-34060 Montpellier, France, and C. Meny, J. Leotin, Laboratoire de Physique des Solides I.N.S.A., F-31077 Toulouse, France, and S. Huant, SNCI/CNRS, BP 166X, 38042 Grenoble, France, and B. Etienne, L2M/CNRS, 196 Avenue Henri Ravera, 92220 Bagneux, France *Warsaw University, Hoza 69, PL 00681 Warsaw, Poland

W2.2 A HIGH RESOLUTION, FAR-INFRARED ELECTRON SPIN RESONANCE SPECTROMETER AT 250GHz - K.A. Earle, D.E. Budil, W.B. Lynch, J.H. Freed, Baker Laboratory, Dept. of Chemistry, Cornell University, Ithaca, New York 14850, U.S.A.

W2.3 FAR INFRARED REFLECTION FABRY-PEROT INTERFEROMETER IN HIGH MAGNETIC FIELDS - J.J. Koning, W. Joss*, P. Wyder, Hochfeld Magnetlabor, Max-Planck-Institut für Festkörperforschung, B.P. 166X, F-38042 Grenoble-Cedex, France.-*Permanent address: Nova Werke AG., Vogelsangstr. 24,3807 Effretikon, Switzerland

W2.4 DIFFERENTIAL MAGNETOOPTICAL FABRY-PEROT-INTERFERENCE-STRUCTURES FOR THE CHARACTERIZATION OF BURIED-LAYER SYSTEMS - R. Nies, F.R. Kessler, K. Wiesenthal, Institut für Halbleiterphysik und Optik und Hochmagnetfeldanlage, Technische Universität Braunschweig, Postfach 3329, D-3300 Braunschweig, Germany

W2.5 HIGH RESOLUTION FT-SPECTROMETER FOR USE WITH INFRARED SYNCHROTRON RADIATION - K.D. Möller, Fairleigh Dickinson University, Teaneck, New Jersey 07666, New Jersey Institute of Technology, Newark, N.J. 07102, U.S.A., T.J. Sears and G.P. Williams, Brookhaven National Laboratory, Upton, L.I. New York 11973, U.S.A.

W2.6 A PHOTOACOUSTIC CELL FOR FIR MAGNETOSPECTROSCOPY ON SEMICONDUCTORS AT LOW TEMPERATURES - A. Schilz, L. Huber, T. Hecht, M. Weispfenning, W. Prettl, Institut für Angewandte Physik, Universität Regensburg, D-8400 Regensburg, Germany

W2.7 MICROWAVE TRANSMISSION OF II-VI EPITAXIAL LAYERS IN A PARTIALLY FILLED WAVEGUIDE - P. Greiner, L. Polignone, C.R. Becker, R. Geick, Physikalisches Institut, Am Hubland, D-8700 Würzburg, Germany

W2.8 FAR INFRARED ELLIPSOMETRY OF CONVERGED BEAM THEORY AND EXPERIMENT - A.B. Sushkov, Institute of Spectroscopy, USSR Academy of Science, Troitsk, Moscow Region 142092, and E.A. Tishchenko, Institute for Physical Problems, USSR Academy of Science, Kosyginastr. 2, 117973 Moscow, U.S.S.R.

Session in memoriam of J.J. Gallagher

W2.9 NONLINEAR PROPERTIES OF FABRY-PEROT INTERFEROMETER IN THE CONDITIONS OF INHOMOGENEOUS BROADENING OF ELECTRON PARAMAGNETIC RESONANCE (EPR) LINE - A.A. Vertiy, S.P. Gavrilov, S.G. Chumachenko, Institute of Radiophysics and Electronics, Academy of Sciences of the Ukrainian SSR, 310085 Kharkov, U.S.S.R.

W3.1	SMALL SIGNAL GAIN IN OPTICALLY PUMPED MOLECULAR VAPOUR - J.S. Bakos, K. Mandula, Z. Sörlei, Central Research Institute for Physics of the Hungarian Academy of Sciences, P.O.Box 49, H-1525 Budapest, Hungary
W3.2	DESIGN AND APPLICATION OF FAR INFRARED LASER MESH COUPLERS - R. Densing, A. Erstling, M. Gogolewski, Department of Electrical Engineering, University of Virginia, Charlottesville, Va. 22903, U.S.A., H.P. Gemünd, G. Lundershausen, Max-Planck-Institut für Radio Astronomie, D-W-5300 Bonn, Germany
W3.3	OPTICAL PROPERTIES OF FIR METALLIC GRIDS. FABRY-PEROT INTERFEROMETER - H. Blancher, R. Occelli, JM. Moynault, Lab. Optique et Spectrometrie Laser, Faculté des Sciences et Techniques St-Jérôme, Case 131, F-13397 Marseille Cédex 13, France
W3.4	INTERFEROMETRIC STUDY OF DAMAGE MECHANISMS TO OPTICAL COMPONENTS BY HIGH POWER INFRARED RADIATION - D. Aubert, P. Baulaigue, Laboratoire optique et spectrométrie laser, Faculté des Sciences de St. Jérôme, Service 131, F-13397 Marseille Cedex 13, France
W3.5	A VARIABLE OUTPUT COUPLER FOR FAR-INFRARED RING LASERS - R. Janker, A. Krüger, Laboratories for High Frequency Technology, University Erlangen-Nürnberg, Cauerstr. 9, D-8520 Erlangen, Germany
W3.6	FREQUENCY-SELECTIVE PROPERTIES OF WAVEGUIDE CO_2 LASER WITH A DISTANT PLANE MIRROR - S.N. Chirikov, S.T. Kornilov, E.D. Protsenko, M.I. Pschikov, Moscow Engineering Physics Institute, Kashirskoe sh. 31, 115409 Moscow GSP-3, U.S.S.R.
W3.7	NONLINEAR DIFFRACTION OF GENERATED FIR WAVE BEAMS IN OPTICALLY PUMPED RAMAN LASER - V.A. Batanov, V.S. Petriv, A.O. Radkevich and A.Yu. Volkov., Institute of Physics and Technology of the USSR Academy of Sciences, Krasikova 25A, 117218 Moscow, U.S.S.R.
W3.8	EFFECT OF MEDIUM ON THE FREQUENCY OF IR-ABSORPTION - M.I. Nasser, National Research Center, Physics Department, Dokki, Cairo, Egypt
W3.9	SELF-ABSORPTION REVISION FOR THE THEORY OF OPFIRL - Y. Lin, X. Zheng, X. Luo, X. Lin, Zhongshan University, Dept. of Electronics, Guangzhou, P.R. China
W3.10	CHARACTERISTICS OF A MOLECULAR LASER OPTICALLY PUMPED BY A HIGH-POWER CO_2 LASER FOR DETECTION EXPERIMENTS - T. Hori and N. Hiromoto, Communications Research Laboratory, Tokyo 184, Japan

W4.1	PENIOTRON DEVELOPMENT (*Invited Keynote*) - K. Yokoo, Research Institute of Electrical Communication, Tohoku University, Katahira 2-1-1, Sendai 980, Japan
W4.2	COMPETITION FROM OTHER HARMONIC INTERACTIONS IN THE GYROPENIOTRON - A.K. Ganguly, A.W. Fliflet, S. Ahn, US Naval Research Laboratory, Washington, DC20375, U.S.A.
W4.3	A UNIFIED THEORY OF GYROTRON AND PENIOTRON INTERACTIONS - C.N. Lashmore-Davies, AEA Fusion, Culham Laboratory, Abingdon, Oxfordshire, OX14 3DB, England
W4.4	DESIGN OF A SIXTEENTH CYCLOTRON HARMONIC CUSPTRON OF AN INVERTED CONFIGURATION - J. Pehowich and S.P. Kuo, Weber Research Institute, Polytechnic University, Farmingdale, NY 11735, U.S.A.
W4.5	FASTWAVE GROWTH FROM INTERACTIONS WITH SPATIOTEMPORALLY MODULATED GYRATING BEAMS - J.L. Hirshfield, OMEGA-P, Inc., P.O.Box 2008, Yale Station, New Haven, CT 06517, U.S.A.
W4.6	PENIOMAGNETRON WITH THE HOMOGENEOUS MAGNETOSTATIC FIELD AT THE HIGH HARMONICS - V.D. Eremka, V.A. Zhurakhovskiy, A.M. Kovalenko, Institute of Radiophysics and Electronics, Academy of Sciences of the Ukrainian SSR, 12, Acad. Proskura st., 310085 Kharkov, U.S.S.R.
W4.7	AMPLIFICATION AND GENERATION OF ELECTROMAGNETIC OSCILLATIONS IN PENIOTRON-LIKE CYCLOTRON RESONANCE MASERS - D.I. Trubetskov, A.P. Chetverikov, Saratov State University, Astrachanskaya 83, 410071 Saratov, U.S.S.R.
W4.8	AUTORESONANT PENIOTRONS ARE THE EFFECTIVE SOURCES OF MM AND SUBMM WAVES - V.D. Eremka, V.A. Zhurakhovskiy, A.M. Kovalenko, Institute of Radiophysics and Electronics, Academy of Sciences of the Ukrainian SSR, 12, Acad. Proskura st., 310085 Kharkov, U.S.S.R.

Session W5

Wednesday p.m. **MMW Devices** August 28

W5.1	ON-WAFER PHASE LOCKING OF A MICROWAVE OSCILLATOR FOR HIGH-SPEED OPTICAL WAVEFORM SAMPLING - E.A. Chauchard, M.G. Li, Ch.H. Lee, Joint Program for Advanced Electronics Materials, Electrical Engineering Dept., University of Maryland, College Park, MD 20742, U.S.A. and H.-L. A. Hung, COMSAT Laboratories, Clarksburg, MD 20871, U.S.A.
W5.2	A MM-WAVE NETWORK ANALYZER SYSTEM WITH FUNDAMENTAL FREQUENCY CONVERSION - B. Stöckel, Laboratories for High Frequency Technology, University Erlangen-Nürnberg, Cauerstrasse 9, D-8520 Erlangen, Germany
W5.3	A MILLIMETERWAVE VECTOR ANALYSER - M.C. Carter, F. Mattiocco, IRAM, Institut de Radio Astronomie Millimétrique, 300 Rue de la Piscine, F-38406 St Martin d'Hères, France
W5.4	VECTOR MEASUREMENTS IN THE MILLIMETER & SUBMILLI-METER - P. Goy, AB Millimetre, 61-71 rue Léon Jouhaux, 78500 Sartrouville, France, J.M. Raimond, M. Gross, Laboratoire de Spectroscopie Hertzienne, Unité de recherche URA 18 de l'Ecole normale supérieure et de Paris 6, associée au CNRS, 24 rue Lhomond 75231 Paris Cedex 05, France
W5.5	A TUNABLE QUASI-OPTICAL ISOLATOR - K. Eigler, R. Schieder, B. Vowinkel, I. Physikalisches Institut, Universität zu Köln, Zülpicher Str. 77, D-5000 Köln 41, Germany
W5.6	A 140 GHz, QUASI-OPTICAL NOTCH FILTER - A.R. Harvey, Physics and Astronomy Dept., University of St. Andrews, Fife KY16 9SS, Scotland, U.K.
W5.7	DICHROIC DIPLEXER DESIGN FOR MILLIMETER WAVES - C. Letrou, Institut National des Télécommunications, 9, Rue Charles Fourier, F-91011 Evry-Cedex, France, and M. Gheudin, DEMIRM, Observatoire de Paris-Meudon, Place Jules Janssen, F-92195 Meudon Cedex, France
W5.8	S-PARAMETER MEASUREMENTS USING A THREE-PROBE CIRCUIT - Ming-Yi Li, Kai Chang, Department of Electrical Engineering, Texas A&M University, College Station, Texas 77843-3128, U.S.A.
W5.9	ESTIMATION OF THE UNCERTAINTY OF MMW SIX-PORT REFLEC-TOMETER - K. Gong, Z. Feng, J. She, J. Wang, Department of Electronic Engineering, Tsinghua University, Beijing 100084, P.R. China
W5.10	DIFFERENTIAL RADIOPOLARIMETER OF MILLIMETER WAVES - A. Khokhlov, Department of Physics, Saratov State University, Astrakhanskaya 83, 410601 Saratov, USSR
W5.11	AN ELECTRIC-FIELD CROSS-CORRELATION FOURIER TRANSFORM MILLIMETER WAVE SPECTROMETER - H. Ding, H. Li, G. Zhang, Electronics Dept., Zhongshan University, P.R. China (510275)

W5.12 NONLINEAR MODES OF OPERATION OF A QUASIOPTICAL RESONATOR WITH THE PARAMAGNETIC LAYER - A.A. Vertiy, S.P. Gavrilov, S.I. Tarapov, Institute of Radiophysics and Electronics, Academy of Sciences of the Ukrainian SSR, 12, Acad. Proskura Street, 310085 Kharkov, U.S.S.R.

Session W6

Wednesday p.m. **Guided Propagation 1** August 28

W6.1 INFLUENCE OF SURFACE CURRENT EXPANSIONS IN THE ANALYSIS OF DIELECTRIC-LOADED CAVITIES WITH THE EQUIVALENCE PRINCIPLE - A. Jöstingmeier, A.S. Omar, Technische Universität Hamburg-Harburg, Arbeitsbereich Hochfrequenztechnik, D-2100 Hamburg 90, Germany

W6.2 QUALITY FACTOR INVESTIGATION OF COUPLED DIELECTRIC WAVEGUIDE - R.P. Singh, A.K. Tiwari, Department of Electronics, Maulana Azad College of Technology, Bhopal, India

W6.3 FINITE-DIFFERENCE METHOD FOR THE ANALYSIS OF AN INFINITE ARRAY OF RECTANGULAR DIELECTRIC WAVEGUIDES - C.L. da S.S. Sobrinho, Department of Electrical Engineering, Fed. University of Para, (UFPa), Caixa Postal 918, 66 050 Belém, PA, Brazil, and A.J. Giarola , School of Electrical Engineering, State University of Campinas (UNICAMP), Caixa Postal 6101, 13 081 Campinas, SP, Brazil

W6.4 A NEW APPROACH FOR ANALYSIS AND DESIGN OF NRD-GUIDE FILTERS - S. Xu, X. Wu, Dept. of Radio and Electronics, University of Science and Technology of China, Hefei, Anhui 230026, P.R. China and Y. Tsukasa, Tohoku University, Research Institute of Electrical Communication, Katahira 2-1-1, Sendai 980, Japan

W6.5 ANALYSIS OF UNSYMMETRIC COUPLED GROOVE NRD GUIDES - L. Xiao, W. Zhang, Southeast University, Department of Radio Engineering, Nanjing 210018, P.R. China

W6.6 HIGH-ORDER MODES IN A QUASI-OPTICAL CAVITY - J.X. Ge, S. Li, Department of Radio Engineering, Southeast University, Nanjing 210018, P.R. China

W6.7 MODE MATCHING ANALYSIS OF DISPERSION CHARACTERISTICS OF ASYMMETRICAL DOUBLE GROOVE GUIDES - S. Xu, L. Yin,Department of Radio and Electronics, University of Science and Technology of China, Anhui, Hefei, 230026, P.R. China

W6.8 BULK ELECTROMAGNETIC WAVES IN MAGNETOACTIVE SEMICONDUCTOR-DIELECTRIC PERIODIC STRUCTURES - R. Brazis, L. Safonova, Institute of Semiconductor Physics, Lithuanian Academy of Sciences, Gostauto 11, Vilnius 232600, U.S.S.R.

W7.1	FAR-INFRARED NEAR-FIELD MICROSCOPE - R. Merz and F. Keilmann, Max-Planck-Institut für Festkörperforschung, D-7000 Stuttgart 80, Germany
W7.2	HIGH ORDER HARMONIC MIXING UP TO 2.4 THz USING THIN FILM JOSEPHSON TUNNEL JUNCTIONS - M.C. Wicks, P.R. Haycocks, Division of Electrical Science, National Physical Laboratory, Teddington, Middlesex TW11 0LW, U.K.
W7.3	SUBMILLIMETER WAVE SUPERCONDUCTING FLUX-FLOW OSCILLATOR - K. Sakai 1), J. Inatani 2), H. Kobayashi 3), M. Ono 3), S. Kodaira 4), K. Yoshida 5), 1) Kansai Advanced Research Center, Communication Research Laboratory, Iwaoka, Kobe-shi, Hyogo, 651-24; 2) Nobeyama Radio Observatory, National Radio Observatory, Nagano, 384-13; 3) Deptartment of Applied Physics, Osaka University, Suita, Osaka 565; 4) Kisarazu National College of Technology, Kisarazu, Chiba, 292; 5) Department Electronics, Kyushu University, Fukuoka, 812, Japan
W7.4	A SIMPLE METHOD TO OPTIMIZE THE SIGNAL TO NOISE RATIO OF GASEOUS PHOTOACOUSTIC SYSTEMS - A. Scalabrin, D. Pereira, Instituto de Fisica, UNICAMP, Campinas, 13.081, Brasil
W7.5	HIGH SPEED MILLIMETRE WAVE REFLECTOMETRY - D.R. Vizard, B.N. Lyons, R. O'Dubhgaill, Farran Technology Limited, Cork, Ireland
W7.6	ECE DIAGNOSTICS ON THE FRASCATI TOKAMAK UPGRADE - P. Buratti, O. Tudisco, M. Zerbini, Associazione EURATOM-ENEA sulla Fusione, Centro Ricerche Energia Frascati, C.P. 65, I-00044 Frascati, Rome, Italy
W7.7	TWO DIMENSIONAL SUBMILLIMETER INTERFEROMETER WITH HIGH TIME RESOLUTION BY USING A SUPER ROTATING GRATING - T. Maekawa, K. Makino, T. Minami, K. Hanada, Y. Terumichi, S. Tanaka, Dept. of Physics, Kyoto University, Kyoto 606, Japan, S. Kubo, National Institute for Fusion Science, Nagoya 464-01, Japan, M. Nagatsu, Faculty of Engineering, Nagoya University, Nagoya 464-01, Japan, T. Suzuki, Research Institute of Electrical Communication, Tohoku University, Sendai 980, Japan
W7.8	MULTICHANNEL BARREL-SHAPED OPEN RESONATOR FOR MICROWAVE PLASMA DIAGNOSTICS - V.N. Derkach, B.E. Sverdlenko, A.A. Vertiy, Institute of Radiophysics and Electronics, Academy of Sciences of the Ukrainian SSR, 310085 Kharkov, U.S.S.R.
W7.9	A RESONANT INFRARED PHOTOCONDUCTOR WITH UNIT QUANTUM EFFICIENCY - J. Farhoomand* and R.E. McMurray Jr., NASA/Ames Research Center, Moffett Field, CA 94035, U.S.A.,*Orion TechnoScience, Palo Alto, CA 94303,

W8.1	HIGH POWER MILLIMETER WAVE HEATING IN MTX - K.I. Thomassen, S.L. Allen, T.A. Casper, M.E. Fenstermacher, J.H. Foote, E.B. Hooper, C.J. Lasnier, M.A. Makowski, W.H. Meyer, K. Oasa*, G.D. Porter, B. Rice, K. Sakamoto*, B.W. Stallard, R.D. Wood, Lawrence Livermore National Laboratory, P.O. Box 808, Livermore, CA 94550, U.S.A.,* Japan Atomic Energy Research Institute, Tokai-mura, Ibaraki, Japan
W8.2	GYROTRON EXPERIMENTS USING A SUPERCONDUCTING MAGNET - S.N. Spark, A.W. Cross, A.D.R. Phelps, Department of Physics and Applied Physics, University of Strathclyde, Glasgow G4 0NG, U.K.
W8.3	APPLICATION OF AXIAL VELOCITY BEAMS TO THE ELECTRON CYCLOTRON MASER - J.L. Vomvoridis, M.A. Hambakis, C.T. Iatrou* and K. Hizzanidis, Department of Electrical Engineering, National Technical University of Athens, Athens, Greece *present address: Thomson Tubes Electroniques, F-78141 Velizy Cedex, France
W8.4	THE STABILITY OF ELECTRON MOTION IN THE ELECTROSTATIC ELECTRON CYCLOTRON RESONANCE MASER - C. Xiong, S. Liu, University of Electronic Science and Technology, Institute of High Energy Electronics, Chengdu 610054, Sichuan, P.R. China
W8.5	LONG-PULSE CARM OSCILLATOR WITH IMPROVED BRAGG RESONATOR - B.G. Danly, J.C. Cheng, G. Gulotta, W.L. Menninger and R.J. Temkin, Plasma Fusion Center, Massachusetts Institute of Technology, Cambridge, MA 02139, U.S.A., M. Thumm, Institut für Höchstfrequenztechnik und Elektronik, Universität Karlsruhe, Karlsruhe, Germany, J. Pretterebner and D. Wagner, Institut für Plasmaforschung, Universität Stuttgart, Stuttgart, Germany
W8.6	SHORT-PULSE HIGH-POWER 17 GHz CARM AMPLIFIER - W.L. Menninger, B.G. Danly, C. Chen, D.L. Goodman*, G. Gulotta, R.J. Temkin, Plasma Fusion Center, Massachusetts Institute of Technology, Cambridge, MA 02139, U.S.A. *Also with SRL
W8.7	THEORY OF A CARM WITH A FABRY-PEROT RESONATOR - A.W. Fliflet, R.B. McCowan and T.A. Hargreaves, Beam Physics Branch, Plasma Physics Division, Naval Research Laboratory, Washington, D.C. 20375-5000, U.S.A.
W8.8	PROPOSAL FOR A NOVEL HIGH-POWER QUASIOPTICAL CARM OSCILLATOR - Z. Yang, Research Institute of High Energy Electronis, University of Electronic Science and Technology, Chengdu 610054, Sichuan, P.R. China
W8.9	GENERAL FORMULA OF THE ENERGY TRANSFER RATE IN GYROTRON, CARM, AND LONWIGGLER FEL OSCILLATORS - S. Zhang, Department of Applied Physics, Southwest Jiaotong University, Chengdu 610031, P.R. China
W8.10	THE USE OF THE WAVE METHOD IN THE THEORY OF CYCLOTRON RESONANCE MASERS - A.P. Turlov, A.P. Chetverikov, Saratov State University, Astrachanskaya 83, 410071 Saratov, U.S.S.R.

W8.11 NON-STEADY-STATE PROCESSES IN A GYRO-BWO - A.Y. Dmitriev, D.I. Trubetskov, A.P. Chetverikov, Saratov State University, Astrachanskaya 83, 410071 Saratov, U.S.S.R.

Session Th1

Thursday a.m. **Radar** August 29

Th1.1	FUTURE DIRECTIONS FOR MILLIMETER-WAVE SYSTEMS *(Invited Keynote)* - N. Fourikis, Microwave Radar Division, Surveillance Research Laboratory, Defence Science & Technology Organisation, P.O.Box 1650, Salisbury, S. A. 5108, Australia
Th1.2	PROGRESS IN MILLIMETER WAVE SYSTEM APPLICATIONS IN THE U.S. - J.C. Wiltse, Georgia Tech Research Institute, Georgia Institute of Technology, Atlanta, Georgia 30332, U.S.A.
Th1.3	A 95 GHz ANTENNA/SCANNER FOR AIRBORNE OPERATION - R.W. McMillan, T.L. Lane, J.A. Scheer, W.C. Parnell*, E.L. Masters and J.F. Kirksey, Georgia Institute of Technology, Georgia Tech. Research Institute, Atlanta, GA 30332, U.S.A. *W.C. Parnell is with the 3246th Test Wing, U.S. Air Force, Eglin AFB, Florida 32542, U.S.A.
Th1.4	DEVELOPMENT OF A MULTISPECTRAL AIRBORNE INSTRUMENTATION SYSTEM (AIS) - W.C. Parnell, T.L. Lane, Georgia Tech. Research Institute, Georgia Institute of Technology, Atlanta, GA 30332, U.S.A.
Th1.5	RADAR APPLICATIONS OF GIGAWATT SOURCES AT MILLIMETER WAVE FREQUENCIES - J.A. Bruder, M. L. Belcher, Georgia Tech Research Institute, Georgia Institute of Technology, Atlanta, Georgia 30332, U.S.A.
Th1.6	A DUAL FREQUENCY MILLIMETER WAVE RADAR IMAGING INSTRUMENTATION SYSTEM - T.L. Lane, M.C. Brinkmann, B.H. Hudson, Georgia Tech. Research Institute, Georgia Institute of Technology, Atlanta, GA 30332, U.S.A., and K. Hilliard, U.S. Army Missile Command, Restone Arsenal, Huntsville, AL, U.S.A.
Th1.7	LADAR/RADAR DUAL MODE OPERATION SYSTEM FOR ENHANCING TRACKING RANGE AND ACCURACY - J. Gavan and A. Peled, Center for Technological Education Holon (CTEH), affiliated Tel-Aviv University, 52 Golomb Street, Holon 58102, Israel
Th1.8	TWO METHODS OF FRACTAL DIMENSION COMPUTATION APPLIED TO MILLIMETER WAVE RADAR STATIONARY TARGET DETECTION - J.I. Butterfield, Georgia Tech. Research Institute, Georgia Institute of Technology, Atlanta, GA 30332, U.S.A.

Th2.1	HIGH POWER RF WINDOWS IN FUSION REACTORS - L. Rebuffi, NET Team, c/o MPI für Plasmaphysik, D-8046 Garching, Germany
Th2.2	PLANE TRANSVERSE WAVEGUIDE WINDOWS - SURVEY OF FORMULAS FOR REFLECTION, TRANSMISSION, AND ABSORPTION - H.-U. Nickel, M. Thumm, Kernforschungszentrum Karlsruhe GmbH, ITP, Postfach 3640, D-7500 Karlsruhe 1, Germany
Th2.3	THE TEMPERATURE FUNCTION OF THE ANISOTROPIC PERMITTIVITY OF SAPPHIRE - A. Ibarra, J. Molla, Euratom-CIEMAT Association, Avda. Complutense 22, E-28040 Madrid, Spain, and R. Heidinger, G. Link, Association KfK-Euratom, Kernforschungszentrum Karlsruhe, P.O. Box 3640, D-7500 Karlsruhe 1, Germany
Th2.4	MILLIMETER WAVE COMPLEX REFRACTIVE INDEX AND DIELECTRIC PERMITTIVITY MEASUREMENTS OF CRYSTALLINE SAPPHIRE BETWEEN 4 AND 300 K - M.N. Afsar, H. Chi, Tufts University, Department of Electrical Engineering, Medford, Massachusetts 02155-5528, U.S.A.
Th2.5	THE IMPACT OF EXTRINSIC CONDUCTIVITY ON THE MM-WAVE DIELECTRIC LOSS IN HIGH RESISTIVITY SILICON - R. Heidinger, A. Kumlin, Association KfK-Euratom, Kernforschungszentrum Karlsruhe, Institut für Materialforschung, P.O. Box 3640, D-7500 Karlsruhe 1, Germany
Th2.6	INCREASED DIELECTRIC LOSS IN HIGH RESISTIVITY SILICON UNDER X-RAY IRRADIATION - R. Heidinger, A. Kumlin, Association KfK-Euratom, Kernforschungszentrum Karlsruhe, Institut für Materialforschung, P.O. Box 3640, D-7500 Karlsruhe 1, Germany, and A. Ibarra, J. Molla, Euratom-CIEMAT Association, CIEMAT, Avda. Complutense 22, E-28040 Madrid, Spain
Th2.7	PRECISION DIELECTRIC MEASUREMENTS AT 100 GHz BAND USING AN OPEN RESONATOR - B. Komiyama, M. Kiyokawa, T. Matsui, Communications Research Laboratory, Koganei Tokyo 184, Japan
Th2.8	SURFACE MELTING AT CERAMIC WINDOWS DUE TO HIGH-POWER MILLIMETER WAVES - H.-U. Nickel*, J. Halbritter**, Kernforschungszentrum Karlsruhe GmbH, P.O.Box 3640, D-7500 Karlsruhe 1, Germany, *Institut für Technische Physik, **Institut für Material und Festkörperforschung I

Th3.1 GENERATION-RECOMBINATION MODEL OF THE AVALANCHE BREAKDOWN, FAR INFRARED PHOTODETECTOR - F. Brown, Physics Department, Williams College, Williamstown, MA 01267, U.S.A.

Th3.2 A 625-650 GHz HETERODYNE RECEIVER FOR AIRBORNE OPERATION - H. Nett, S. Crewell, K. Künzi, University of Bremen, Institute of Remote Sensing, P.O. Box 330440, D-2800 Bremen 33, Germany

Th3.3 HETERODYNE DETECTORS FOR 30-300 μm - M.F. Kimmitt, Department of Physics, University of Essex, GB-Colchester CO4 3SQ, U.K.

Th3.4 POLARISATION DEPENDENT PERFORMANCE OF ANTENNA-COUPLED THIN-FILM SUBMICRON METAL-METALOXIDE-METAL (MOM) DIODES - I. Wilke, W. Herrmann, F.K. Kneubühl, Institute of Quantum Electronics, Swiss Federal Institute of Technology (ETH), CH-8093 Zurich, Switzerland

Th3.5 IR DETECTION AT WAVELENGTHS UP TO 200 MICRONS IN EXTRINSIC SEMICONDUCTOR DEVICES - A.G.U. Perera, R.E. Sherriff, M.H. Francombe, and R.P. Devaty, Univeristy of Pittsburgh, Applied Technology Laboratory, Pittsburgh, PA 15260, U.S.A.

Th3.6 GaAs SCHOTTKY DIODES FOR MIXING APPLICATIONS BEYOND 1THz - T.W. Crowe, P.A.D. Wood, W.C.B. Peatman and B.J. Rizzi, Semiconductor Device Laboratory, Department of Electrical Engineering, University of Virginia, Charlottesville, Virginia 22903, U.S.A.

Th3.7 HIGH PURITY GaAs AS A FAR INFRARED PHOTOCONDUCTOR - J. Farhoomand* and R.E. McMurray Jr., NASA/Ames Research Center, Moffett Field, CA 94035, U.S.A., *Orion TechnoScience, Palo Alto, CA 94303, E. Haller, Lawrence Berkely Laboratory, University of California, Berkely, CA, U.S.A., E. Bauser and I. Filier, Max Planck-Institute, Stuttgart, Germany

Th3.8 NOISE DEPENDENCE OF SUBMILLIMETER WAVE Pt/GaAs SCHOTTKY DIODES ON INTERFACE DEFECTS AND TEMPERATURE - T. Suzuki, H. Shinohara, T. Nozokido, Y. Kudo, H. Warashina*, K. Mizuno, Research Institute Elecectrical Communication, Tohoku University, Sendai 980, Japan, and *Sendai National College of Technology, Sendai 980, Japan

Th3.9 THEORETICAL AND EXPERIMENTAL EVALUATION OF SCHOTTKY MICROJUNCTION DETECTORS UP TO 10 THz - A. Sentz, Q.P. Pham, M. Medlouni, A. Kreisler+, Lab. de Dispositifs Infrarouge et Microondes, Université de Paris 6 (Tour 12), 4 Place Jussieu, F-75005 Paris, France,
+Present address: Lab. de Génie Electrique de Paris, ESE, Plateau du Moulon, F-91192 Gif-sur-Yvette Cedex, France

Th3.10 ELECTRON BALLISTIC TRANSPORT IN SUBMICRON GaAs SCHOTTKY BARRIER DIODE - A.Yu. Gorbachev, V.B. Gorfinkel, I.I. Filatov, Institute of Radio Engineering and Electronics, Academy of Sciences of the USSR, Saratov Branch, Sakko-i-Vanzetti 21, 410720 Saratov, U.S.S.R.

Th4.1	HIGH-POWER Ka-BAND FREE-ELECTRON MASER EXPERIMENT *(Invited Keynote)* - F. Hartemann, T.S. Chu, P. Papavaritis, B.G. Danly and R.J. Temkin,Plasma Fusion Center, Massachusetts Institute of Technology, Cambridge, MA 02139, U.S.A., G. Faillon, G. Mourier, T. Trémeau and M. Bres, Thomson Tubes Electroniques, F-78141 Vélizy, France
Th4.2	MILLIMETER WAVE FREE ELECTRON LASER AMPLIFIERS: EXPERIMENTS AND DESIGNS - S.W. Bidwell, Z.X. Zhang, T.M. Antonsen Jr., D.M. Bensen, W.W. Destler, H.P. Freund*, V.L. Granatstein, P.E. Latham, B. Levush, D.J. Radack* and J. Rodgers, The University of Maryland, Laboratory for Plasma Research, College Park, MD 20742, U.S.A., and *Science Applications International Corporation, McLean, VA 22102, U.S.A.
Th4.3	OPERATION OF THE SAPPHIRE CERENKOV LASER - E.E. Fisch, F.L. Hacker and J.E. Walsh, Department of Physics, Dartmouth College, Hanover, NH 03755, U.S.A.
Th4.4	GENERATION OF SUBNANOSECOND HIGH POWER FAR INFRARED PULSES USING A FEL PUMPED PASSIVE RESONATOR - J. Burghoorn, J.P. Kaminski*, R.C. Strijbos, T.O. Klaassen, W.Th. Wenckebach, Delft University of Technology, Faculty of Applied Physics, P.O. Box 5046, NL-2600 GA Delft, The Netherlands, * Center for Free Electron Laser Studies, University of California, Santa Barbara, CA 93106, U.S.A.
Th4.5	LONG PULSE EXPERIMENT OF CIRCULAR FREE ELECTRON LASER - H. Sekita, T. Mizuno, H. Ohta, M. Kitora, Y. Naito, H. Saito, Institute of Space and Astronautical Science, 3-1-1 Yoshinodai, Sagamihara, Kanagawa 229, Japan
Th4.6	DESIGN OF A 1 MW, cw, 200 GHz FREE ELECTRON MASER - A.G.A. Verhoeven, P.W. van Amersfoort, R.W.B. Best, A.M. van Ingen, A.B. Sterk, W.H. Urbanus, A. Verheul, M.J. van der Wiel, Association Euratom-FOM, FOM Instituut voor Plasmafysica Rijnhuizen, NL-3430 BE Nieuwegein, The Netherlands, W. Kasparek, J. Pretterebner, D. Wagner, M. Thumm* Universität Stuttgart, Institut für Plasmaforschung, Stuttgart, Germany *Universität Karlsruhe, Inst. für Höchstfrequentztechnik und Elektronik, Karlsruhe, Germany
Th4.7	DIFFRACTION OF MILLIMETER-WAVE COHERENT CHERENKOV RADIATION EMITTED FROM AN INTENSE ELECTRON BUNCH - J. Ohkuma, S. Okuda, K. Tsumori, K. Sakai*, Radiation Laboratory, The Institute of Scientific and Industrial Research, Osaka University, Mohogaoka, Ibaraki, Osaka 567, Japan, *Communication Research Laboratory, Kansai Research Center, Iwaoka, Kobe, Hyogo 647, Japan
Th4.8	MODIFIED ORBITRON EXPERIMENTS AND SIMULATION - M.G. Niimura, R.J. Churchill, American Research Corporation of Virginia, Radford, VA 24143, U.S.A.

Th4.9 EXPERIMENTAL INVESTIGATION OF ELECTROMAGNETICALLY PUMPED FREE-ELECTRON-LASER - J. Wu, J. Li, B. Zhang, Z. Yang, W. Ma, T. Deng, X. Chen, X. Zhou, Z. Liang, High Energy Electronis Research Institute, University of Electronic Science and Technology of China, Chengdu, Sichuan 610054, P.R. China

Th4.10 MULTIMODE COHERENT COUPLING AND OPTICAL GUIDING IN RAMAN FREE-ELECTRON LASERS - C. Wang, Z. Wu, M. Lin, H. Li, S. Liu, High Energy Electronis Research Institute, University of Electronic Science and Technology of China, Chengdu, Sichuan 610054, P.R. China

Th5.1	RECENT DEVELOPMENTS IN FRESNEL ZONE PLATE ANTENNAS AT MILLIMETER WAVELENGTHS - J.C. Wiltse, Georgia Tech Research Institute, Georgia Institute of Technology, Atlanta, Georgia 30332, U.S.A.
Th5.2	NOVEL WIDE BAND RADAR PHASED ARRAYS - N. Fourikis, N. Lioutas, Microwave Radar Division, Surveillance Research Laboratory Defence Science & Technology Organsation, P.O.Box 1650, Salisbury, S. A. 5108, Australia
Th5.3	A TABULAR SYNTHESIS TECHNIQUE FOR BROADBANDING/THINNING LINEAR PHASED ARRAYS - M.N. Cohen, Georgia Tech. Research Institute, 7220 Richardson Road, Smyrna, Georgia 30080, U.S.A.
Th5.4	SKEW-GRID FREQUENCY SELECTIVE SURFACE WITH RECTANGULAR APERTURES FOR USE ON A KA-BAND BEAM WAVEGUIDE ANTENNA - J.C. Chen, P.H. Stanton, Jet Propulsion Laboratory, California Institute of Technology, Pasadena, CA, U.S.A.
Th5.5	NOVEL POWER COMBINING CIRCULAR ARRAYS OPERATING AT MM-WAVELENGTHS - N. Fourikis, Microwave Radar Division, Surveillance Research Laboratory, Defence Science and Technology Organisation, P.O.Box 1650, Salisbury, S.A. 5108, Australia
Th5.6	A HIGH GAIN QUASI-MONOLITHIC HORN ANTENNA - G.V. Eleftheriades, G.M. Rebeiz, NASA Center for Space Terahertz Technology, University of Michigan, Ann Arbor MI 48109-2122, U.S.A.
Th5.7	A MILLIMETERWAVE ARRAY ANTENNA USING DIELECTRIC RADIATORS WITH PRE-BEAMFORMING CHARACTERISTICS - S. Bartels, W. Holpp, Telefunken Systemtechnik, Command and Control, Guidance Systems Division, Sedanstrasse 10, D-7900 Ulm (Donau), Germany
Th5.8	RADIATION PATTERN OF EQUIANGULAR SPIRAL ANTENNA MEASURED AT SHORT MILLIMETER WAVES - M. Yamamoto, K. Watazawa, Sumitomo Heavy Industries Ltd., Tanashi, Tokyo 188, Japan, and J. Inatani, A. Sakamoto, Nobeyama Radio Observator, National Astronomical Observatoy of Japan, Nobeyama, Nagano 384-13, Japan
Th5.9	SANDWICH SLOTLINE ANTENNA FOR SUBMILLIMETER WAVELENGTHS - P.R. Acharya, Chalmers University of Technology, Dept.of Applied Electron Physics, S-412 96 Göteborg, Sweden
Th5.10	DUAL-FREQUENCY, ELECTRONICALLY STEERABLE, MM-WAVE, PHASED ARRAY ANTENNA USING MMIC TECHNOLOGY - A.R. Jha, Jha Technical Consulting Services, Cerritos, CA 90701, U.S.A.
Th5.11	A NEW MILLIMETER WAVE INTEGRATED ANTENNA - W. Hong, Department of Radio Engineering, Southeast University, Nanjing 210018, P.R. of China

Th6.1 MEASUREMENTS OF COMPLEX DIELECTRIC PERMITTIVITY AND MAGNETIC PERMEABILITY OF Ba- AND Sr- FERRITES - M.N. Afsar, H. Chi, X.i Li, Tufts University, Department of Electrical Engineering, Medford, Massachusetts 02155-5528, U.S.A.

Th6.2 DETERMINATION OF THE OPTICAL CONSTANTS n AND k OF AN ABSORBING MATERIAL WITH THE HELP OF A TRANSPARENT MATERIAL COATING - X. Gerbaux and A. Hadni, Laboratoire Infrarouge Lointain, L.M.C.P.I. U.R.A. C.N.R.S. 807, Université de Nancy 1, P.O. Box 239, F-54506 Vandoeuvre-lès-Nancy Cedex, France

Th6.3 LASER SATURATION OF THE HYDRIDE ION LOCAL MODE VIBRATION IN CaF_2 - W.J. Knott, P.T. Lang, K.F. Renk, Institut für Angewandte Physik, Universität Regensburg, D-8400 Regensburg, Germany, and J.A. Campbell, G.D. Jones, Department of Physics, University of Canterbury, Christchurch, New Zealand

Th6.4 MAGNETIC AND ELECTRIC DIPOL ACTIVE MAGNONS IN Fe_2SiO_4 and Co_2SiO_4 - C. Brotzeller, H. Jaitner, B. Hock, O. Neumann, P. Greiner, R. Geick, W. Treutmann*, S. Hosoya**, Physikalisches Institut der Universität Würzburg, Am Hubland, D-8700 Würzburg, Germany, * Mineralogisches Institut der Universität Marburg, Lahnberge, D-3550 Marburg, Germany, ** Inst. Materials Research, Tohoku University, 980 Sendai, Japan

Th6.5 GROUP THEORETICAL CONSIDERATIONS AND MAGNETIC EXCITATIONS OF $CaCoSi_2O_6$ - T. Pabst, C. Brotzeller, J. Lindner, R. Geick, Physikalisches Institut der Universität Würzburg, Am Hubland, D-8700 Würzburg, Germany and W. Treutmann, Mineralogisches Institut der Universität Marburg, Lahnberge, D-3550 Marburg, Germany

Th6.6 PURE ROTATIONAL SPECTRUM OF HD BY HIGH RESOLUTION FOURIER TRANSFORM SPECTROSCOPY IN THE FAR INFRARED - L. Ulivi*, P. De Natale**, M. Inguscio**, European Laboratory of Nonlinear Spectroscopy (LENS), Largo E. Fermi 2, I-50125 Firenze, Italy, * Istituto di Elettronica Quantistica del CNR, Firenze, **Dipartimento di Fisica dell' Università, Firenze, Italy

Th6.7 PHONON MODES IN KH_2PO_4 - TYPE CRYSTALS - B. Wyncke, F. Brehat, Laboratoire Infrarouge Lointain (L.M.C.P.I. - U.R.A. 809 C.N.R.S.), Université de Nancy I, BP 239, F-54506 Vandoeuvre lès Nancy CEDEX, France

Th6.8 CONDUCTIVITY OF NONMETALLIC MATERIALS AT SUBMILLIMETER WAVES - G.V. Kozlov, A.A. Volkov, A.S. Rakitin, B.P. Gorshunov, Institute of General Physics, USSR Academy of Sciences, Vavilov Street 38, Moscow 117942, U.S.S.R.

Th6.9 OBSERVATION OF DIFFERENT TYPES OF IMPURITY RESONANCE MODES IN $YFeO_3$ AND ANTIFERROMAGNETIC RESONANCE MODE CROSSING IN SUBMILLIMETER WAVE BAND - A.M. Balbashov, A.G. Berezin, Ju.V. Bobryshev, P.Ju. Marchukov, I.V. Nikolaev, E.G. Rudashevsky, General Physics Institute of the USSR Academy of Sciences, Vavilov St. 38, 117942 Moscow, U.S.S.R.

Th7.1 AVOIDANCE OF EDGE DIFFRACTION EFFECTS OF WGM-FED QUASI-OPTICAL ANTENNAS BY FEED WAVEGUIDE DEFORMATION - A. Möbius, Kernforschungszentrum Karlsruhe, Institut für Technische Physik, P.O. Box 3640, D-7500 Karlsruhe, Germany and J. Pretterebner, Institut für Plasmaforschung der Universität Stuttgart, Pfaffenwaldring 31, D-7000 Stuttgart 80, Germany

Th7.2 FOCUSING DUAL-REFLECTOR QUASI-OPTICAL ANTENNA FOR WHISPERING- GALLERY-MODE GYROTRONS - J.A. Lorbeck and R.J. Vernon, University of Wisconsin-Madison, Department of Electrical and Computer Engineering, 1415 Johnson Drive, Madison, WI 53711, U.S.A.

Th7.3 TRANSFORMATION OF A WAVEGUIDE CAUSTIC INTO A GAUSSIAN FREESPACE CAUSTIC WITH THE HELP OF A QUASI OPTICAL MODE CONVERTER - J. Pretterebner, W. Kasparek, Institut für Plasmaforschung, Universität Stuttgart, Pfaffenwaldring 31, D-7000 Stuttgart 80, Germany

Th7.4 BRAGG REFLECTOR DESIGN IN HIGHLY OVERSIZED WAVEGUIDES - D. Wagner, J. Pretterebner, W. Thumm*, Institut für Plasmaforschung, Universität Stuttgart, Pfaffenwaldring 31, D-7000 Stuttgart 80, Germany, *present address: Kernforschungszentrum Karlsruhe, Institut für Technische Physik, and Universität Karlsruhe, Institut für Hochfrequenztechnik und Elektronik, D-7500 Karlsruhe, Germany

Th7.5 ELLIPSOIDAL DIFFRACTION GRATING AS OUTPUT COUPLER FOR QUASI-OPTICAL GYROTRONS - J.P. Hogge, H. Cao, W. Kasparek*, T.M. Tran, M.Q. Tran, P.J. Paris, Centre de Recherches en Physique des Plasmas, Association Euratom Confédération Suisse, Ecole Polytechnique Fédérale de Lausanne, 21, Av. des Bains, CH-1007 Lausanne, Switzerland, and *Institut für Plasmaforschung, Universität Stuttgart, Pfaffenwaldring 31, D-7000 Stuttgart 80, Germany

Th7.6 DISTORTION AND CROSS POLARIZATION OF A SIMPLE GAUSSIAN BEAM ON DIFFRACTION FROM GRATING COUPLERS FOR Q.O. GYROTRONS - H. Cao, J.P. Hogge,T.M. Tran, M.Q. Tran, Centre de Recherches en Physique des Plasmas, Ass. Euratom Confédération Suisse, Ecole Polytechnique Fédérale de Lausanne, 21, Av. des Bains, CH-1007 Lausanne, Switzerland

Th7.7 NUMERICAL AND EXPERIMENTAL STUDIES OF QUASI-OPTICAL HIGH POWER MICROWAVE LAUNCHERS - L. Nicolas, Laboratoire d'Electronique de Lyon, ECL, F-69131 Ecully Cedex, France, K.A. Connor, S.J. Salon, Rensselaer Polytechniqc Institute, Troy, NY 12180-3590, USA, B.G. Ruth, L.F. Libelo, Harry Diamond Laboratories, Adelphi, Maryland 20783-1197, USA

Th7.8 DEVELOPMENT OF FFT MODE-CONVERSION DETECTOR - K. Ohkubo, M. Hosokawa, S. Kubo, M. Sato, Y. Takita, T. Kuroda, National Institute of Fusion Science, Furocho, Chikusa-ku, Nagoya 414-01, Japan

Session Th8

Thursday p.m. **FEL 2** August 29

Th8.1	FIR AND MM COMPACT FEL (*Invited Keynote*) - A. Doria, G.P. Gallerano, M.F. Kimmitt*, ENEA, Area INN, Dipartimento Sviluppo Tecnologie di Punta, P.O. Box 65, I-00044 Frascati (Roma), Italy, * permanent address: University of Essex, Colchester, U.K.
Th8.2	TRANSPORTATION OF INTENSE RELATIVISTIC ELECTRON BEAMS IN A BIFILIAR HELICAL WIGGLER - P. Wang, K. Hu, S. Huang, Institute of Applied Electronics, P.O.Box 523-65, Chengdu, Sichuan 610003, P.R. China
Th8.3	RADIATION SPECTRUM MEASUREMENTS IN THE FREE-ELECTRON LASERS - Y. Chen, K. Hu, S. Fu, CAEP, Institute of Applied Electronics, P.O.Box 523-65, Chengdu, 610 003 Sichuan, P.R. China
Th8.4	ELECTRON MOTION AND CAVITY MODES IN THE ORBITRON MASER - M. Rader, I. Alexeff, University of Tennessee, Knoxville, TN 37996-2100, U.S.A.
Th8.5	FREQUENCY DOMAIN ANALYSIS OF THE OROTRON - S. Lütgert, Technische Universität Hamburg-Harburg, Arbeitsbereich Hochfrequenz, D-2100 Hamburg 90, Germany
Th8.6	GRATING-COUPLED OSCILLATOR EXPERIMENTS AT SUBMILLIMETER/ FIR WAVELENGHTS - E.J. Price, J.E. Killoran and J.E. Walsh, Department of Physics & Astronomy, Dartmouth College, Hanover, NH 03755, U.S.A.
Th8.7	COMMISSIONING THE FREE ELECTRON LASER FOR INFRARED EXPERIMENTS - C.A.J. van der Geer, R.J. Bakker, A.F.G. van der Meer, D. Oepts, P.W. van Amersfoort, FOM-Instituut voor Plasmafysica 'Rijnhuizen', Associatie EURATOM-FOM, P.O. Box 1207, NL-3430 BE Nieuwegein, Nederland
Th8.8	A FIR SOURCE BASED ON THE DEMODULATION OF PICOSECOND ELECTRON PULSES - C.R. Jones, J.M. Dutta, Deptartment of Physics, North Carolina Central University, Durham NC, U.S.A.
Th8.9	INFLUENCE OF THE FIELD DISTRIBUTION FORM IN THE ELECTRON BEAM MOTION DIRECTION OF FORMING SPACE HARMONICS IN THE OROTRON ELECTRODYNAMICS SYSTEM INTERACTION REGION - Ye.A. Myasin, S.G. Tshigarev, T.A. Lytkina, Institute of Radioengineering and Electronics, Academy of Sciences of the USSR, 18 Marx Av., Moscow, GSP-3, USSR, A.N. Vlasov, Moscow State University, Moscow, USSR
Th8.10	STATIC FIELD-WAVE COUPLING THEORY FOR CYCLOTRON-UNDULATOR HYBRID FEL WITH REALIZABLE CUSP WIGGLER - Y. Yu, University of Electronic Science and Technology, Dept. of Electronic Engineering, Chengdu 610054 Sichuan, P.R. China

F1.1	ANALYSIS OF ASYMMETRIC COUPLED CYLINDRICAL MICROSTRIP LINES - L.M. de Mendonça, A.G. d'Assunçao, Electrical Engineering Department, Federal University of Rio Grande do Norte, UFRN, 59.075 Natal, RN, Brazil, C.S. da Rocha, Electrical Engineering Department, Federal University of Paraiba, (UFPB), 58.100 Campina Grande, PB, Brazil
F1.2	ANALYSIS OF PARALLEL-COUPLED RIB AND INVERTED STRIP WAVEGUIDES - R. Parente de Oliveira, Department of Electrical Engineering, Fed. University of Para, 66 050 Belém, PA, Brazil and A.J. Giarola, UNICAMP, Faculty of Electrical Engineering, D.M.O., Campinas 13 081 Sao Paulo, Brazil
F1.3	RESONANT FREQUENCY OF RECTANGULAR MICROSTRIP PATCHES ON MAGNETIZED FERRITE SUBSTRATES - E.J.A. Dantas, A.G. d'Assuncao, Electrical Engineering Department, Federal University of Rio Grande do Norte, UFRN, 59072 Natal, RN, Brazil
F1.4	DYNAMIC ANALYSIS OF COUPLED MICROSTRIP LINES ON FERRITE SUBSTRATES - M.R.M.L. Albuquerque, A.G. d'Assuncao, Electrical Engineering Department, Federal University of Rio Grande do Norte (UFRN), 59.072 Natal, RN, Brazil, A.J. Giarola, School of Electrical Engineering, State University of Campinas (UNICAMP), 13081 Campinas, SP, Brazil
F1.5	WAVE PROPAGATION IN TWO-DIMENSIONALLY PERIODIC THIN-FILM WAVEGUIDES - T. Dong, Department of Electronics and Information, Huazhong University of Science and Technology, Wuchang, Hubei 430074, P.R. China
F1.6	LOSSES IN METAL-DIELECTRIC WAVEGUIDE WITH WEDGE-SHAPED CONDUCTOR - A. Svezhentsev, V. Veremey, Institute of Radiophysics and Electronics, Academy of Sciences of the Ukrainian SSR, 310085 Kharkov, U.S.S.R.
F1.7	A RIGOROUS ANALYSIS FOR DISPERSION CHARACTERISTICS OF DIELECTRIC PERIODIC STRUCTURES - OBLIQUE INCIDENCE CASE - L. Sun, Institute of Remote Sensing Application, Chinese Academy of Sciences and Department of Radio and Electronics, and S. Xu, University of Science and Technology of China, Hefei, Anhui, P.R. China
F1.8	CALCULATION OF EXTERNAL CIRCUIT IMPEDANCE OF A SINGLE-CAVITY TWO-DEVICES HARMONIC POWER COMBINER - J.X. Ge, S. Li, Department of Radio Engineering, Southeast University, Nanjing 210018, P.R. China
F1.9	THE COMPACT INFORMATION SENSOR FOR MULTIZONE SCENE ANALYSIS SYSTEMS - Yu. D. Samorodov, R.I. Bankgalter, V.N. Gromyko, P.V. Byrulin, R.A. Amiryan, V.I. Anisimov. L.A. Nedoresov, V.I. Semyonov, E.G. Alekseev, V.V. Anischuk, Research and Production Corporation "Istok", 141120 Fryazino Moscow Region, U.S.S.R.

F2.1 MEASUREMENTS OF THE ABSORPTION OF LYSOZYME-WATER AND ALANINE IN THE 10-60 cm-1 RANGE USING INFRARED SYNCHROTRON RADIATION - K.D. Möller, Fairleigh Dickinson University, Teaneck, New Jersey 07666, New Jersey Institute of Technology, Newark, N.J. 07102, U.S.A., J. Smith, Section de Biophysique des Protéines et des Membranes, Département de Biologie Cellulaire et Moléculaire, CEN-Saclay, F-91191 Gif-sur-Yvette, France, S. Steinhauser, U.S. Army AMCCOM, Picatinny Arsenal, N.J. 07806-5000, U.S.A., G.P. Williams, Brookhaven National Laboratory, Upton, L.I. New York 11973, U.S.A.

F2.2 WATER VAPOR ABSORPTION IN THE 190-213 GHz REGION LABORATORY EXPERIMENTS - A. Bauer and M. Godon, Laboratoire de Spectroscopie Hertzienne, Associé CNRS, Université de Lille I, F-59655 Villeneuve D'Ascq Cedex, France

F2.3 TEMPERATURE DEPENDENCES OF PRESSURE-BROADENED WATER VAPOR LINES AT 183 AND 380 GHz - J.M. Dutta, T.M. Goyette*, F.C. DeLucia*, C.R. Jones, Department of Physics, North Carolina Central University, Durham NC, U.S.A., *Department of Physics, Ohio State University, Columbus, OH 43210, U.S.A.

F2.4 VERY LOW OPTICAL SOURCE: INVESTIGATION OF INDUCED ABSORPTION SPECTRA OF CO_2, N_2, CH_4 AT 1.8CM-1 BETWEEN 230 AND 300K - JM. Moynault, R. Occelli, H. Blancher, Lab. Optique et Spectrometrie Laser, Faculté des Sciences et Techniques St-Jérôme, Case 131, F-13397 Marseille Cédex 13, France

F2.5 INFRARED STUDY OF THE THERMAL BEHAVIOUR OF γ-IRRADIATED POLY-(VINYL ALCOHOL) - M.A. Moharram, S.M. Rabie* and A.Y. Daghistani, National Research Center, Cairo, Egypt, *Middle Eastern Regional Center for the Arab Countries, Cairo, Egypt

F2.6 INCREASING OF ENZYME ACTIVITY UNDER THE INFLUENCE OF FIR LASER EMISSION - V.A. Batanov, A.I. Demin, V.B. Fleurov, N.N. Tulyakov and A.Yu. Volkov, Institute of Physics and Technology of the USSR Academy of Sciences, Krasikova 25A, 117218 Moscow, U.S.S.R., and V.M. Govorun, A.B. Kapitanov and V.E. Tretyakov, Institute of Physico-chemical Medicine, Pirogovskaya 1A, Moscow, U.S.S.R.

F2.7 DELAY IN A.LAIDLAWII CELLS GROWTH UNDER THE INFLUENCE OF FIR LASER EMISSION - V.A. Batanov, A.I. Demin and N.N. Tulyakov, Institute of Physics and Technology of the USSR Academy of Sciences, Krasikova 25A, 117218 Moscow, U.S.S.R., and M.Yu. Aksenov, V.M. Govorun and A.B. Kapitanov, Institute of Physico-chemical Medicine, Pirogovskaya 1A,Moscow, U.S.S.R.

F2.8 INVESTIGATION OF MATERIALS OF POLARIZED NUCLEAR TARGET IN THE MILLIMETER WAVE RANGE - A.A. Vertiy, I.V. Ivanchenko, N.A. Popenko, S.I. Tarapov, Institute of Radiophysics and Electronics, Academy of Sciences of the Ukrainian SSR, 310085 Kharkov, U.S.S.R.

F3.1	ERRORS IN SOLUTIONS FOR WAVEGUIDES OF ELLIPTICAL CROSS-SECTION - J.C. Wiltse and T.H. Gfroerer, Georgia Tech Research Institute, Georgia Institute of Technology, Atlanta, Georgia 30332, U.S.A.
F3.2	PARFUM-CW: A PROGRAM TO ANALYZE RADIATED FIELDS USING MINIMIZATION IN TERMS OF CIRCULAR WAVEGUIDE MODES - A. Simonetto, G. Solari, Istituto di Fisica del Plasma, CNR, v. Bassini 15, I-20133 Milano, Italy
F3.3	WHISPERING-GALLERY MODE DIELECTRIC RESONATORS FOR MILLIMETER WAVE INTEGRATED CIRCUIT FILTERS AND OSCILLATORS - A.E. Centeno, G.B. Morgan, School of Electrical, Electronic and Systems Engineering, University of Wales, College of Cardiff, P.O.Box 904, Cardiff, Britain, CF1 3YH, U.K.
F3.4	QUASIOPTICAL FOURIER METHOD OF SPATIAL STRUCTURE ANALYSIS OF ELECTROMAGNETIC FIELDS - V.N. Derkach, A.A. Vertiy, Institute of Radiophysics and Electronics, Academy of Sciences of the Ukrainian SSR, 310085 Kharkov, U.S.S.R.
F3.5	ELECTROMAGNETIC RADIATION CONTROL IN METALLIC WAVEGUIDE WITH GYROTRTROPIC SEMICONDUCTOR WALL - A. Laurinavicius, K. Pozela, Lithuanian Academy of Sciences, Semiconductor Physics Institute, K. Pozelos 52, 232600 Vilnius, U.S.S.R.
F3.6	THE NEW TECHNIQUE OF TIME-DOMAIN ANALYSIS OF DISCONTINUITIES IN PLANAR TRANSMISSION LINE - L. Chen, S.-F. Li, Southeast University, Department of Radio Engineering, Nanjing 210018, P.R. China
F3.7	ANALYSIS OF SUSPENDED SUBSTRATE STRIPLINE CROSSBAR - L. Han and Y. Wang, Department of Radio Engineering, Southeast University, Nanjing 210018, P.R. China
F3.8	PHASE-SPACE MILLIMETRE-WAVE OPTICS - G. Nemes, A. Stratan, M. Nemes, Institute of Atomic Physics, P.O. Box MG-6, Bucharest-Magurele, Romania
F3.9	8mm NRD FLEXIBLE WAVEGUIDE - M. Zhu, L. Zhu, Dept. of Electronics and Information Engineering, Huazhong University of Science & Technology, 430074 Wuhan, Hubei, P.R. China

Session F4

Friday a.m. **MMW Guides 3** August 30

F4.1	R & D OF THE QUASI-OPTICAL TRANSMISSION COMPONENTS FOR ECH - S. Kubo, K. Ohkubo, M. Hosokawa, M. Sato, Y. Takita and T. Kuroda, National Institute of Fusion Science, Nagoya, 464-01, Japan
F4.2	DEVELOPMENT OF CORRUGATED WAVEGUIDE COMPONENTS FOR ECH MEGAWATT MILLIMETER-WAVE TRANSMISSION SYSTEM ON LHD - K. Miyamoto, M. Goto*, T. Kume*, T. Ebisui**, O. Ishida**, K. Nakashima, Nuclear Fusion Development Dept., Mitsubishi Electric Corporation, 2-2-3, Marunouchi, Chiyoda-ku, Tokyo 100, and K. Ohkubo, S. Kubo, M. Hosokawa, M. Sato, Y. Takita, T. Kuroda, National Institute for Fusion Science, Furo-cho, Chikusa-ku, Nagoya 464-01, Japan *Comm. Equipment Works, Mitsubishi Electric Corporation, 8-1-1, Tsukaguchi-honmachi, Amagasaki, Hyogo 661, **Electro-Optics and Microwave Systems Laboratory, Mitsubishi Electric Corporation, 5-1-1, Ofuna, Kamakura, Kanagawa 247, Japan
F4.3	HALF MEGAWATT 106 GHz ECRH SYSTEM FOR HELIOTRON-E - M. Sato*, H. Zushi, K. Nagasaki, M. Iima, S. Kobayashi, K. Sakamoto, S. Sudo, F. Sano, T. Obiki, K. Ohkubo*, M. Hosokawa*, S. Kubo*, M. Thumm**, Plasma Physics Laboratory, Kyoto University, Kyoto, Japan, * National Institute for Fusion Science, Nagoya, Japan, ** KfK Karlsruhe, Karlsruhe, F.R.Germany
F4.4	MEASUREMENTS ON ELLIPTICAL WAVES FOR ECR HEATING ON RTP - A.G.A. Verhoeven, W.A. Bongers, A.M. van Ingen, O.G. Kruijt, J. Stakenborg and the RTP Team, Association EURATOM-FOM, FOM Instituut voor Plasmafysica Rijnhuizen, P.O. Box 1207, NL-3430 BE Nieuwegein, The Netherlands
F4.5	COMPLETE SET OF WAVEGUIDE ELEMENTS FOR 120-180 GHz BAND - R.S. Avagian, K.R. Agababian, M.Ts. Aivazian, Yu.N. Kazantsev, R.M. Martir- ossian, Radiophysics and Electronics Institute, Armenian Academy of Sciences, Ashtarack 2 Armenia, 378410, USSR
F4.6	MILLIMETER-WAVE RADIOMETERS COMPLEX - R.S. Avagian, K.R. Agabian, G.G. Gabrielian, A.A. Esoyan, L.V. Madossian, R.M. Martirosyian, R.L. Meli- kian, A.K. Mouroyan, E.R. Nalbandian, S.A. Tevossian, Institute of Radiophysics and Electronics, Armenian Academy of Sciences, 378410, Ashtarack-2, Armenia, USSR

EXHIBIT

The exhibit will be held at the Ecole Polytechnique Fédérale de Lausanne from Tuesday to Thursday, August 27th to 29th, 1991, from 9 a.m. to 5 p.m. At the time of press, the following firms have expressed their interest in participating in the exhibit:

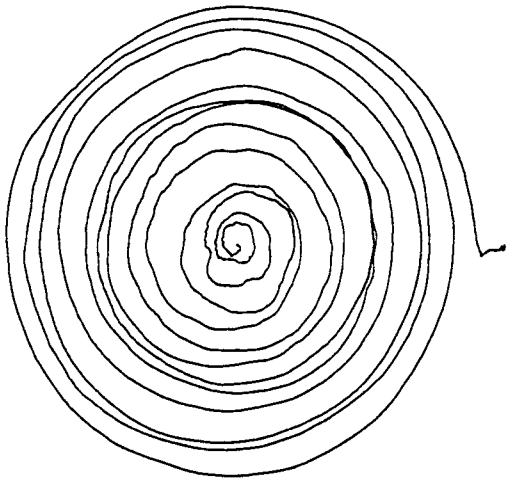
- AB Millimetre, Sartrouville, France
- Bruker Analytische Messtechnik, Karlsruhe, Germany
- Edinburgh Instruments Ltd., Edinburgh, U.K.
- Farran Technology, Cork, Ireland
- QMC Instruments Ltd, London, U.K.
- Thomson TE, Boulogne-Billancourt, France
- Wiltron and its local representative Amotec Electronic AG, Zollikerberg, Switzerland

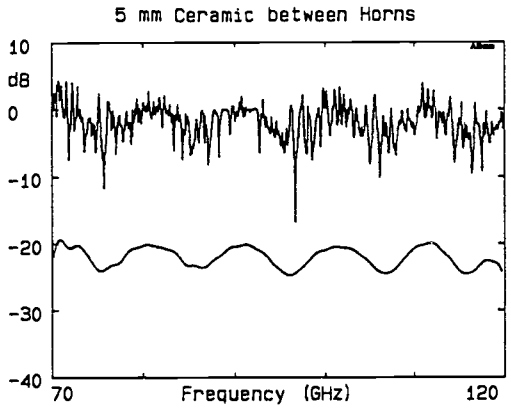
8-1000 GHz

VECTOR MEASUREMENTS ON YOUR TABLE

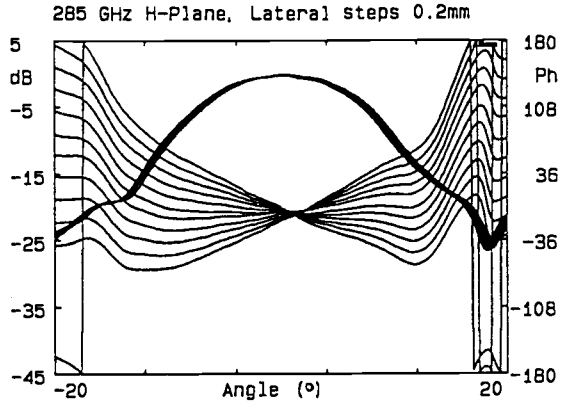
Millimeter Vector Network Analyzer

>100 dB to 60 GHz
>80 dB to 110 GHz (140 dB option)





Above: Top: transmission through a ceramic sample inserted between two horns. Notice the perfect repeatability of two successive sweeps. Bottom: same, downshifted by 20 dB and showing the standing waves (10 GHz period) inside the sample (ε' = 8.4, measured by the phase rotation). The shorter-period standing waves between the horns have been cut out using Fourier transform.



Above: Top, amplitude; bottom, phase. Angular antenna pattern and centering of a conical horn. (The dynamic range at 285 GHz is ca. 90 dB.)

Above: A bevelled 35-mm thick Altuglas sample is inserted between two horns at 186 GHz. The detected phase rotation (13 turns) gives the permittivity ε' = 2.6, and the decrease in amplitude (-6.4 dB at center) gives the loss angle tan δ = 0.007.

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