
SESSION M1

Ballroom (Mauka) 7th Floor

Monday AM

December 5, 1988

R. W. McMillan, *Presider*

MMW SOURCES I

- M1.1** MMW GRID OSCILLATORS - (*Invited Keynote, 40 min.*) - D. Rutledge, Z.B. Popovic and M. Kim, Cal Tech, Pasadena, CA 91125
- M1.2** A FEEDBACK MODEL OF MILLIMETRE WAVE HARMONIC OSCILLATORS AND ITS APPLICATION - J-P. Xu and S-F. Li, Southeast Univ, Nanjing, P.R. China
- M1.3** TIME DEPENDENT SIMULATION OF THE QUANTUM WELL INJECTION TRANSIT TIME DIODE - D.R. Miller, V.P. Kesan, R.L. Rogers, C.M. Maziar, and D.P. Neikirk, Dept of Elec and Cmptr Engr, U of Texas at Austin, Austin, TX 78712
- M1.4** LINEAR ANALYSIS OF THE HIGH-POWER MAGNETRON - R. Stark and H. Uhm, Naval Surface Warfare Center, Silver Spring, MD
- M1.5** POWER COMBINING FET OSCILLATOR USING COUPLED RAMPART LINE ANTENNAS - J. Birkeland and T. Itoh, Dept EE, University of Texas, Austin, TX
- M1.6** A 94/47 GHz FREQUENCY HALVER USING A GaAs GUNN-DEVICE - H. Barth, AEG Aktiengesellschaft, Sedanstrasse 10/Postbox 1730, 7900Ulm/F.R.Germany
- M1.7** DESIGN OF A Ka-BAND TWO-WAY POWER COMBINING SOURCE MODULE USING PLANAR CIRCUIT APPROACH - F-M. Yang and C-K. C. Tzuang, I of Comm Engr, Natl Chiao Tung U, Hsinchu, Taiwan, R.O.China
- M1.8** PARAMETRIC ANALYSIS OF GaInAs DEVICES FOR MM-WAVE APPLICATIONS - A.R. Jha, JHA Technical Consulting Services, 12345 Charwood St, Cerritos, CA 90701
- M1.9** LARGE SIGNAL CHARACTERISTIC OF GUNN DIODE IN FUNDAMENTAL MODE AND HARMONIC MODE MMW OSCILLATOR - N. Chen, S.F. Li, Z.L. Sun, Dept Radio Engineering, Southeast Univ, Nanjing, PRC

SESSION M2

Mahimahi Room, 3rd Floor

Monday AM

December 5, 1988

MMW MODULATION OF LIGHT

Chi Lee, *Presider*

- M2.1** ADVANCED LIGHTWAVE TECHNOLOGY - VERY LARGE CAPACITY OPTICAL COHERENT COMMUNICATIONS - (*Invited Keynote, 40 min*) - K. Nosu, NTT Labs, Take 1-2356, Tokosuka-shi, Kanagawa-ken, Japan 238-03
- M2.2** MICROWAVE MODULATION OF LIGHT (*Invited, 30 min*) - T. Seuta, Dept of Elec Engr, Osaka Univ, Toyonaka-Shi, Osaka 560 Japan
- M2.3** GENERATION AND DETECTION OF MILLIMETER WAVE MODULATED LIGHT WITH HIGH SPEED DIODE LASERS AND PHOTODETECTORS - (*Invited, 30 min*) - J. Bowers, Dept Elec And Cmptr Engr, U of California, Santa Barbara, CA 93106
- M2.4** MMW MODE-LOCKING OF SEMICONDUCTOR LASERS - (*Invited, 30 min*) - R. Tucker, U. Koren, G. Raybon, C. A. Burrus, G. E. Eisenstein, Bell Telephone Laboratories, Holmdel, NJ 07733
- M2.5** OPTICALLY CONTROLLED MILLIMETER WAVE PHASED ARRAY ANTENNAS - (*Invited, 30 min.*) - P. R. Herczfeld and A. S. Daryoush, Center for Microwave/Lightwave Engineering, Drexel Univ., Philadelphia, PA 19101
- M2.6** GaAs TRAVELING-WAVE OPTICAL MODULATOR USING A MODULATED COPLANAR STRIP ELECTRODE WITH PERIODIC CROSS-TIE OVERLAY - H.-Y. Lee and T. Itoh, Dept Elec and Cmptr Engr, The U of Texas at Austin, Austin, TX

SESSION M3

Papio Room, 3rd Floor

Monday AM December 5, 1988

MMW ANTENNAS

J. M. Mink, Presider

- M3.1** A NEW CLASS OF SCANNABLE MILLIMETER WAVE ANTENNAS (*Invited Keynote*) – Arthur A. Oliner, Polytechnic University, 333 Jay St, Brooklyn, NY 11201
- M3.2** INTEGRATED CIRCUIT ACTIVE ANTENNA ELEMENTS AND SPATIAL POWER COMBINING (*Invited Keynote*) – Kai Chang, K.A. Hummer and J.L. Klein, Texas A&M Univ., College Station, TX 77843
- M3.3** DETECTOR ANTENNA ARRAY WITH A DIELECTRIC LENS FOR MILLIMETER-WAVE IMAGING – K. Uehara, T. Yonekura, H. Nishimura, K. Mizuno, Research Inst of Elec Communication, Tohoku Univ, Sendai, 980 JAPAN; D. B. Rutledge, California I of Technology, Pasadena, CA 91125
- M3.4** OMNI-DIRECTIONAL PERIODIC ROD ANTENNA T_{Mon} MODE EXCITATION – S. Xu, Dept of Radio and Electronics, U of Science and Technology of China, Hefei, Anhui, P. R. CHINA
- M3.5** EFFICIENCY OF MM-WAVE HORN IMAGING ARRAYS – G. M. Rabeiz, Y. Guo, P. A. Stimson and D. B. Rutledge, California I of Technology, Pasadena, CA 91125
- M3.6** ANTENNAS ON LAYERED SUBSTRATES – R. L. Rogers, D. P. Neikirk, H. Ling and T. Itoh, Univ. Texas, Austin, TX 78712

SESSION M4

Ballroom (Makai), 7th Floor

Monday AM December 5, 1988

FEL I

A.K. Ganguly, Presider

- M4.1** NEW DIRECTIONS IN MMW VACUUM ELECTRONIC RESEARCH – (*Invited Keynote*) R.J. Barker, U.S. Air Force Office of Scientific Research, AFOSR/NP Bolling Air Force Base, DC 20332-6448
- M4.2** SHORT-PERIOD WIGGLER FREE ELECTRON LASER WITH A SHEET ELECTRON BEAM – (*Invited Keynote*) J.H. Booske, Lab for Plasma Research, U of Maryland, College Park, MD 20742
- M4.3** TUNABLE MICRO-UNDULATORS FOR FREE ELECTRON LASERS – S.C. Chen, G. Bekefi and S. DiCecca, Dept Physics and Plasma Fusion Center, MIT, Cambridge, MA 02139
- M4.4** THE EFFECT OF WIGGLER FIELD ERRORS ON THE PERFORMANCE OF FELs – E. Esarey, W. Marable, Berkeley Research Associates, Springfield, VA; C.M. Tang and P. Sprangle, Plasma Physics Div, Naval Research Lab, Washington, DC 20375-5000
- M4.5** COLLECTIVE INSTABILITY IN CIRCULAR FREE ELECTRON LASER – Y. Kawai, H. Saito, Inst. of Space and Astron. Science, Yoshinodai, Sagamihara, Japan 229; J. Wurtele, MIT Plasma Fusion Center, 167 Albany St NW16, Cambridge, MA 02139
- M4.6** THE ANALYSIS OF RADIATION HARMONICS IN THE FEL USING THE SOURCE DEPENDENT EXPANSION METHOD – C.M. Tang, P. Sprangle, Plasma Physics Div, Naval Research Lab, Washington, DC 20375-5000; S. Riyopoulos, Science Applications Intl. Corp, McLean, VA
- M4.7** SUPPRESSION OF SIDEBANDS BY DIFFRACTION IN A FEL – T.M. Antonsen, Jr., Lab for Plasma Research, U of Maryland, College Park, MD 20742; G. Laval, Ecole Polytechnique, France
- M4.8** ANALYSIS AND NONLINEAR SIMULATION OF A HELICAL QUADRUPOLE WIGGLER FOR MILLIMETER WAVES – J.E. Scharer, S.F. Chang, and O.C. Eldridge, Univ of Wisconsin, Madison, WI

SESSION M5

Ballroom (Mauka), 7th Floor

Monday PM December 5, 1988

MMW SOURCES II

S-F. Li, Presider

- M5.1** DEVELOPMENT OF HIGH EFFICIENCY FREQUENCY MULTIPLIERS FOR 130-350 GHz - T. Tolmunen, A. Räsänen and M. Sironen, Helsinki U of Tech, Radio Lab, Otakaari 5 A, SF-02150 Espoo, Finland
- M5.2** PERIODIC MONOLITHIC MILLIMETER-WAVE QUANTUM WELL OSCILLATOR - A. Mortazawi, V.P. Kesan, D.P. Neikirk, and T. Itoh, Dept Elec & Cmptr Engr, The U of Texas at Austin, Austin, TX 78712
- M5.3** RIGOROUS FIELD ANALYSIS OF IMPEDANCES OF SOME MILLIMETER WAVE OSCILLATOR CAVITIES - W. Hong and S-F. Li, Southeast U, Nanjing, P.R. China
- M5.4** THEORY OF THE DIOTRON INSTABILITY IN HIGH POWER MAGNETRON - H.S. Uhm and H.C. Chen, Naval Surface Warfare Center, White Oak, Silver Spring, MD 20903-5000; H.E. Brandt, Harry Diamond Laboratory, Adelphi, MD 20783-1197
- M5.5** POWER COMBINING SYSTEM USING TWO PUSH PULL POWER AMPLIFIERS - S. Toyoda, Dept Elec Engr, Osaka I of Tech, 5-16-1 Omiya Aaahi-ku, Osaka 535, Japan
- M5.6** QUASI-OPTICAL RESONATOR FOR MILLIMETER AND SUB-MILLIMETER WAVE SOLID-STATE SOURCES - M. Hieda, M. Nakayama, K. Mizuno, T. Ajikata and D.B. Rutledge*, Research I of Elec Comm, Tohoku U, Sendai 980, Japan; *California I of Tech, Pasadena, CA 91125
- M5.7** NUMERICAL SIMULATION OF THE DIOTRON INSTABILITY IN PLANAR DIODE GEOMETRY - H.C. Chen and H.S. Uhm, Naval Surface Warfare Center, White Oak, Silver Spring, MD 20903-5000
- M5.8** RESONANT-TUNNELING DEVICES FOR MILLIMETER-WAVE GENERATION - R.K. Mains and G.I. Haddad, Ctr for High-Frequency Microelectronics, Dept Elec Engr & Cmptr Science, The U of Michigan, Ann Arbor MI 48109
- M5.9** PARAMETRIC AMPLIFICATION USING SUPERCONDUCTING TUNNEL JUNCTIONS - H.K. Olsson and t. Claeson, Chalmers Univ of Tech, S-41296 Göteborg, Sweden

SESSION M6

Mahimahi Room, 3rd Floor

Monday PM December 5, 1988

OPTICAL TECHNOLOGY FOR MMW

Tatsuo Itoh, Presider

- M6.1** PICOSECOND OPTOELECTRONICS AND MILLIMETER-WAVE TECHNOLOGY - (*Invited, 40 min.*) - C.H. Lee, Dept Elec Engr, U of Maryland, College Park, MD 20742
- M6.2** OPTICAL GENERATION AND CONTROL OF MILLIMETER WAVES - *Invited, 30 min* - L. Goldberg, Naval Research Labs, Washington, DC
- M6.3** EXPERIMENTAL PERFORMANCE OF AN OPTICALLY CONTROLLED COPLANAR WAVEGUIDE PHASE SHIFTER WITH A THICK GaAs BURIED LAYER - P. Cheung, D.P. Neikirk and T. Itoh, U of Texas, Austin, TX
- M6.4** STRUCTURAL CONTROL OF MICROSTRIP DISPERSION FOR SHAPING GIGA-HERTZ-BANDWIDTH PULSES - E. Yamashita, K. Atsuki and Y. Qian, U of Electro-comm., Chofu-shi, Tokyo, Japan 182
- M6.5** OPTOELECTRONICS AND ELECTROMAGNETICS: VIDEO TO VISIBLE - *Invited, 30 min* - A.P. DeFonzo, Dept of Elec & Cmptr Engr, U of Massachusetts, Amherst, MA 01003
- M6.6** INVERTED SLOT LINE FOR MILLIMETER-WAVE OPTICAL MODULATOR - T. Yoneyama and T. Kato, Research I of Elec Comm, Tohoku U, 2-1-1 Katahira, Sendai, 980 Japan
- M6.7** AN OPTOELECTRONIC TECHNIQUE FOR S-PARAMETER MEASUREMENTS OF GaAs MONOLITHIC INTEGRATED CIRCUITS - P. Polak-Dingels, H-L. A. Hung*, K.J. Webb**, T.T. Lee, T. Smith*, and C.H. Lee**, The Lab fo Physical Sciences, College Park, MD 20742; *COMSAT Labs, Clarksburg, MD 20871; **U of Maryland, College Park, MD 20742
- M6.8** EFFECT OF THE LIGHT ON THE ELEMENTS OF THE ELECTRIC SCHEME OF A HEMT - D. Pasquet, B. Zemour, J.L. Gautier, P. Pouvil, ENSEA, Les Chenes Pourpres, 95000 Cergy, France

SESSION M7

Papio Room, 3rd Floor

Monday PM

December 5, 1988

ASTRONOMY

A. Räisänen, Presider

- M7.1** SYSTEMATIC SURVEY OF STAR FORMATION REGIONS WITH THE 4 m MILLIMETER-WAVE TELESCOPE AT NAGOYA UNIVERSITY - MOLECULAR OUTFLOWS AS THE EARLIEST STAGE OF STAR FORMATION - (*Invited Keynote*) - Y. Fujui, Dept of Astrophysics, Nagoya Univ, Chikusa, Nagoya 464, Japan
- M7.2** JOSEPHSON LOCAL OSCILLATOR FOR INTEGRATED RADIOASTRONOMICAL RECEIVERS - R. Monaco, S. Pagano, C. Costabile, Istituto di Cibernetica, I-80072 Arco Felice (NA), Italy
- M7.3** A BROADBAND LOW NOISE SIS RECEIVER FOR SUBMILLIMETER ASTRONOMY - T.H. Buttgenback¹, R.E. Miller², M.J. Wengler^{1,3}, D.M. Watson¹, T.G. Philips¹, ¹ Division of Physics, Mathematics and Astronomy, California I of Tech, Pasadena, CA 91125; ² AT&T Bell Labs, Murray Hill, NJ 07974; ³ Dept of Elec Engr, U of Rochester, Rochester, NY 14627
- M7.4** BALLOON-BORNE OBSERVATIONS OF THE CYGNUS REGION IN THE FAR INFRARED - C.G. Degiacomi, A. Holenstein, F.K. Kneubühl, Infrared Physics Lab, ETH, 8093 Zurich, Switzerland; D. Huguenin, Geneva Observatory, 1290 Sauverny, Switzerland
- M7.5** 490 GHz SOLID STATE SOURCE WITH VARACTOR-QUINTUPLER - R. Rüdiger and P. Zimmermann, Radiometer-physics, Bergerwiesenstr. 15, 5309 Meckenheim, West Germany
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SESSION M8

Ballroom (Makai), 7rd Floor

Monday PM

December 5, 1988

FEL II

J.E. Walsh, Presider

- M8.1** HIGH POWER, MILLIMETER WAVE FEL FOR PLASMA HEATING APPLICATIONS - (*Invited Keynote*) - R.A. Jong and T.J. Orzechowski, Lawrence Livermore Nat'l Lab, Livermore, CA
- M8.2** CURRENT THEORETICAL AND EXPERIMENTAL ISSUES ON FREE-ELECTRON LASERS - (*Invited Keynote*) - F. Hartemann, J.M. Buzzi, G. Mourier and M. Faillon, Thomson-CSF, 2 Rue Latecoere, B.P. 23-78141, Velizy-Villacoublay, France
- M8.3** MODE COMPETITION, SUPPRESSION AND CONTROL IN FEL OSCILLATORS - B. Levush and T. Antonsen, Jr., Lab for Plasma Research, U of Maryland, College, Park, MD 20742
- M8.4** HIGH HARMONIC EMISSION IN THE UNIFORM MAGNETIC FIELD FREE-ELECTRON LASER - J. Soln, Harry Diamond Labs, 2800 Powder Mill Rd, Adelphi, MD 20783
- M8.5** A HIGH POWER, 600 μ m WAVELENGTH FREE-ELECTRON LASER - D.A. Kirkpatrick, NRL, Washington, DC 20375-5000; G. Bekefi, A.C. DiRienzo, Dept Physics and Research Lab of Electron., MIT, Cambridge, MA 02139; H.P. Freund and A.K. Ganguly, NRL, Washington, DC 20375-5000
- M8.6** 3-D MOTION OF ELECTRONS IN COMBINED REALISTIC HELICAL WIGGLER WITH AXIAL GUIDE FIELD FOR FREE-ELECTRON LASER - S-C. Zhang, Z. Zhang and S. Zhou, Dept Physics, Chengdu I of Radio Engr, Chengdu, Sichuan, China
- M8.7** BETATRON-SYNCHROTRON RESONANCES IN FREE ELECTRON LASER - Y-J. Shi, I of Atomic Energy, P.O. Box 275(18), Beijing, China
- M8.8** HIGH-GAIN FREE ELECTRON LASER WITH VARIABLE PARAMETER WIGGLERS - Z-X. Hui, Xinan I of Elec Engr, P.O. Box 517, Chengdu, P.R.China
- M8.9** THE EFFICIENCY IMPROVEMENT OF A RAMAN FREE-ELECTRON LASER - Z. Wang, Z. Lu, L. Zhang, and J. Chen, Shanghai I of Optics and Fine Mechanics, Academia Sinica, P.O. Box 8211, Shanghai, PRC
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SESSION T1

Ballroom (Mauka), 7th Floor

Tuesday AM

December 6, 1988

MMW SYSTEMS I

J. C. Wiltse, Presider

- T1.1** MILLIMETER WAVE RADAR-CURRENT STATUS AND FUTURE DIRECTIONS - (*Invited Keynote, 40 min*) - E.K. Reedy, Georgia Tech Research Inst, GA Inst Tech, Atlanta, GA 30332
- T1.2** NEW TRENDS IN MILLIMETER WAVE MISSILE SEEKER DESIGN - (*Invited Keynote, 40 min*) - T.T. Fong, TRW Inc, Redondo Beach, CA 90278
- T1.3** A PROTOTYPE COMMERCIAL ORBITRON MASER FOR MILLIMETER RADAR - M.G. Nilmira and R.J. Churchill, American Research Corp of Virginia; I. Alexeff, F. Dyer and M. Radar, University of Tennessee, Dept Elec and Cmptr Engr, Knoxville, TN 37996-2100
- T1.4** A LOW-LOSS HIGH-POWER FILTER FOR DIRECT BROADCAST SATELLITE TRANSPONDERS - T. Nomoto, Science and Technical Research Laboratories, 1-10-11, Kinuta, Setagaya, Tokyo, 157, Japan
- T1.5** MILLIMETRIC CHARACTERIZATION USING AN 80 GHz MONOSTATIC HIGH POWER POLARIMETRIC RADAR - G.N. Crisp, P.A. Blakelock, K.E. Potter, C.E. Burnett, MEDL Microwave, Doddington Rd, Lincoln, LN6 3LF, England
- T1.6** A MODEL BASED TECHNIQUE FOR MILLIMETER WAVE TARGET RECOGNITION - F.A. Sadjadi, Honeywell, Systems and Research Ctr MN65-2300, 3660 Technology Dr, Minneapolis, MN 55418
- T1.7** RECENT ADVANCES IN MILLIMETER WAVE UP AND DOWN CONVERTERS - C. Oleson, A. Larsen, R. Chew and W. Day, Varian Solid State Microwave Div, 3251 Olcott St, Santa Clara, CA 95054
- T1.8** 205 GHz SIS RECEIVER DEVELOPMENT FOR REMOTE SENSING APPLICATIONS - W.R. McGrath, C.N. Byrom, B.N. Ellison*, M.A. Frerking, and R.E. Miller**, Jet Propulsion Lab, Pasadena, CA; *California Inst of Tech, Pasadena, CA; **AT&T Bell Labs, Murray Hill, NJ

SESSION T2

Mahimahi Room, 3rd Floor

Tuesday AM

December 5, 1988

MICROWAVE-OPTICAL INTERACTIONS

T. Sueta, Presider

- T2.1** OPTICAL TECHNOLOGY APPLIED TO SubMM/MMW - (*Invited Keynote, 40 min.*) - H.R. Fetterman, Dept Electrical Engineering, U of California, Los Angeles, CA
- T2.2** HIGH FREQUENCY MODULATION OF SEMICONDUCTOR LASERS - A.P. DeFonzo, Dept of Electrical and Computer Engineering, U of Massachusetts, Amherst, MA 01003
- T2.3** LIGHT-CONTROLLED MICROSTRIP LINE COUPLER - H. Shimazaki, Faculty of Engineering, Osaka Univ, Suita 564, Japan; M. Tsutsumi, Faculty of Engineering and Design, Kyoto I of Technology, Kyoto 606, Japan
- T2.4** OPTICAL GENERATION AND DISTRIBUTION OF MICROWAVE SIGNALS - G.J. Simonis and K.G. Purchase, LABCOR, Harry Diamond Lab, 2800 Powder Mill Road, Adelphi, MD 20783-1197

SESSION T3

Mahimahi Room, 3rd Floor

Tuesday AM

December 6, 1988

PLASMA DIAGNOSTICS I

K. Kawahata, Presider

- T3.1** INFLUENCE OF WAVELENGTH ON THE PERFORMANCE OF COLLECTIVE THOMSON SCATTERING FOR ALPHA-PARTICLE DIAGNOSTICS - (*Invited Keynote*) - P.P. Woskov, D.R. Cohn, J.S. Machuzak and D.Y. Rhee, MIT Plasma Fusion Center, Cambridge, MA 02139
- T3.2** A CO₂ LASER THOMSON SCATTERING DIAGNOSTIC FOR THE MEASUREMENT OF FUSION PRODUCT ALPHA PARTICLES - R.K. Richards, C.A. Bennett*, L.K. Fletcher**, H.T. Hunter and D.P. Hutchinson, Oak Ridge Natl Lab, Oak Ridge, TN 37831; *On sabbatical leave from U of North Carolina of Asheville; **Tennessee Technological Univ, Cookeville, TN
- T3.3** ECRH OF TRAPPED ELECTRONS IN TOKAMAKS - S.P. Kuo, Polytechnic U, Farmingdale, NY 11735; M.C. Lee, MIT, Cambridge, MA 02139
- T3.4** PLASMA DENSITY PROFILE IMAGING BY MICROWAVE HETERODYNE SYSTEM AND ELECTRON ACCELERATION IN CROSS FIELD ACCELERATION SCHEME - (*30 min.*) Y. Nishida, H. Okazaki, Y. Yamada, T. Shinozaki and N.C. Luhmann, Dept Elec Engr, Utsunomiya Univ Utsunomiya, Tochigi 321 JAPAN

SESSION T4

Papio Room, 3rd Floor

Tuesday AM December 6, 1988

MMW GUIDES

S. T. Peng, Presider

- T4.1** MEGAWATT CW MILLIMETER WAVE TRANSMISSION SYSTEMS - (*Invited Keynote*) - M. Thumm, H. Barkley, W. Kasparek, G.A. Müller and P.G. Schuller, Institut für Plasmaforschung, Universität Stuttgart, Pfaffenwaldring 31, D-7000 Stuttgart 80, West Germany
- T4.2** LOW LOSS, BROADBAND, MULTIMODE, CIRCULAR CORRUGATED WAVEGUIDE PERFORMANCE - A. Cavallo, J. Doane, R. Cutler, Princeton Plasma Physics Lab, Princeton University, Princeton, NJ 08540; J. Brenner, Brenner Tool and Die, Croydon, PA 19020
- T4.3** INITIAL OPERATION OF A POLARIZATION-CONTROLLED BEAMED ECH LAUNCHER - T.S. Bigelow, C.R. Schaich and T.L. White, Oak Ridge Nat'l Lab, P.O. Box Y, MS-2, Bldg. 9101-2, Oak Ridge, TN 37831
- T4.4** VERY SHORT QUASI-PERIODIC AND APERIODIC MODE CONVERTERS FOR 60 AND 140 GHz GYROTRONS - M.J. Buckley, G.H. Luo, R.J. Vernon, Dept Electrical and Cmptnr Engr, U of Wisconsin, Madison, Wisconsin 53711
- T4.5** AN X-BAND VLASOV-TYPE MODE CONVERTOR - B.G. Ruth, D. Schlesiger and R.K. Dahlstrom, Harry Diamond Laboratories, ATTN: SLCHD-NW-RI, 2800 Powder Mill Rd, Adelphi, MD 20783-1197
- T4.6** A QUASI-OPTICAL CONVERTER FOR EFFICIENT CONVERSION OF WHISPERING GALLERY MODES INTO NARROW BEAM WAVES - A. Möbius, K. Kreischer and R. Temkin, MIT Plasma Fusion Center, 167 Albany St NW16, Cambridge, MA 02139
- T4.7** REALISTIC PROSPECTS FOR SUPERCONDUCTING GYROTRON RESONATORS - J. Halbritter, G. Hochschild, J. Jödicke, Kernforschungszentrum Karlsruhe, Inst. f. Technische Physik, D-7500 Karlsruhe, Fed Rep Germany
- T4.8** DESIGN OF THE CIT GYROTRON ECRH TRANSMISSION SYSTEM - J.A. Casey, P. Woskov, D. Cohn, R. Temkin, MIT Plasma Fusion Center, 167 Albany St NW16, Cambridge, MA 02139
- T4.9** PRELIMINARY LOW-POWER INVESTIGATION OF TE_{0n} MODE VLASOV LAUNCHERS - P.J. Sealy and R.J. Vernon, Dept Elec and Cmptnr Engr, U of Wisconsin, Madison, WI 53711

SESSION T5

Ballroom (Makai), 7th Floor

Tuesday AM December 6, 1988

FEL III

W.M. Manheimer, Presider

- T5.1** OBSERVATION OF UBITRON FUNDAMENTAL MODE AMPLIFICATION - (*Invited Keynote*) - R.H. Jackson, D.E. Pershing and H. Bluem, Vacuum Electronics Branch, Code 6842, Naval Research Lab, Washington, DC 20375-5000
- T5.2** FREQUENCY SPECTRUM OF THE UCSB FEL - (*Invited Keynote*) - L. Elias, CREOL, U Central Florida, (12424 Research Parkway, Suite 400), Orlando, FL 32826
- T5.3** OPTIMIZATION OF A PLANAR OROTRON - J.E. Walsh, J.A. Jackson, E.M. Marshall, Dartmouth College, Hanover, NH 03755
- T5.4** THE CIRCULAR ORBIT LINEAR THEORY OF AXIAL INJECTION ORBITRON MASER OSCILLATORS - J.M. Burke, Burke Technologies, Inc., San Diego, CA 92111-1316
- T5.5** PULSED AND STEADY-STATE MULTIANODE ORBITRON MASERS - I. Alexeff, F. Dyer, and M. Rader, U of Tennessee, Knoxville, TN 37996-2100
- T5.6** HIGH EFFICIENCY OPERATION OF THE MODIFIED PENIOTRON USING TE₁₁ RECTANGULAR WAVEGUIDE CAVITY - K. Yokoo, M. Razeghi, N. Sato and S. Ono, Research I of Elec Communication, Tohoku U, Sendai 980, Japan
- T5.7** AUTO-RESONANT PENIOTRON FOR HIGH POWER MILLIMETER WAVE GENERATION WITH AN EXTREMELY HIGH EFFICIENCY - K. Yokoo, S. Ono, N. Sato, Research I of Elec Communication, Tohoku U, Sendai 980, Japan

SESSION T6

Ballroom (Mauka), 7th Floor

Tuesday PM December 6, 1988

MMW SYSTEMS II

E. Reedy, Presider

- T6.1** MMW COMMUNICATIONS TECHNOLOGY - (*Invited Keynote*) - R. Ying, Hughes Aircraft Co., Torrance, CA
- T6.2** MEASUREMENT OF COHERENCE BANDWIDTH FOR AN URBAN MILLIMETER WAVE RADIO LINK - R.S. Cole, H.J. Thomas, G.L. Siqueira, University College, London WC1F 7SE, England

SESSION T7

Ballroom (Mauka), 7th Floor

Tuesday PM December 6, 1988

MMW DETECTORS & MIXERS

J. Archer, Presider

- T7.1** MILLIMETER-WAVE SIS RECEIVERS OF NOBEYAMA RADIO OBSERVATORY - (*Invited Keynote*) - J. Inatani, Nobeyama Radio Observatory, Nobeyama, Nagano 384-13, Japan
- T7.2** A NEW FUNDAMENTALLY PUMPED BALANCED MIXER FOR G-BAND (140-220 GHz) - I. Galin, Aerojet ElectroSystems Company, Azusa, CA 91702
- T7.3** LARGE-AREA BOLOMETERS FOR MILLIMETER-WAVE POWER CALIBRATION - G.M. Rebeiz, C. Ling, Univ of Michigan, Ann Arbor, MI 48109; D.B. Rutledge, Div of Engr and Appl Science, California I of Tech, Pasadena, CA 91125
- T7.4** SERIES-CONNECTED JOSEPHSON-EFFECT MIXERS FOR MILLIMETER-WAVE RADIATION - H. Ohta*, T. Matsui and B. Komiyama, Radio Res Lab, Ministry of Posts and Telecomm, Nukui-ki tamachi 4-2-1, Koganei-shi 184, Tokyo, Japan; *The I of Physical and Chem Research, Hirosawa 2-1, Wako-shi Saitama 351-01, Japan
- T7.5** A QUASI-OPTICAL SLOT-RING MIXER MONOPULSE ARRAY - R. Gingras¹, G.M. Hegazi², T.L. Korzeniowski¹, K.D. Stephan³, J. Wolverson⁴, and K.S. Yngvesson³, ¹ Missile Systems Div, Raytheon Co, Tewksbury, MA; ² COMSAT Labs, Clarksburg, MD; ³ Dept Elec & Cmpt Engr, U of Massachusetts, Amherst, MA; Air Force Armament Labs, Air to Ground Systems Div, Eglin Airforce Base, FL
- T7.6** PLANAR SUBHARMONIC MIXER FOR 183 GHz - N.J. Cronin, S.P. Marsh, P.J. Reece, U of Bath, School of Physics, Claverton Down, Bath BA2 7AY England

SESSION T8

Mahimahi Room, 3rd Floor

Tuesday PM December 6, 1988

PLASMA DIAGNOSTICS II

Y. Nishida, Presider

- T8.1** A MULTICHANNEL SUBMILLIMETER WAVE INTERFEROMETER SYSTEM ON ATF - (*Invited Keynote, 40 min*) - D.P. Hutchinson, C.H. Ma, K.L. Vander Sluis, C.A. Bennett* and J. Lee**, Oak Ridge Natl Lab, Oak Ridge, TN
- T8.2** DEVELOPMENT OF STABLE, HIGH POWER CW FIR LASER FOR PLASMA DIAGNOSTIC - Q. Zu, S. Ruan, F. He, B. Li, Y. Xu, Inst. Physics, Chinese Acad. Sci, Beijing, PRC
- T8.3** FIR POLARIMETER/INTERFEROMETER FOR JIPP T-II U - A. Yasuda, Tokyo U of Mercantile Marine, Etchujima, Koto-ku, Tokyo 135, Japan; K. Kawahata and J. Fujita, I of Plasma Physics, Nagoya University; S. Okajima, Chubu Univ; Y. Nagayama, The U of Tokyo, Japan
- T8.4** A MULTICHANNEL HCN LASER INTERFEROMETER FOR ELECTRON DENSITY MEASUREMENTS ON THE JIPP T-IIU TOKAMAK - K. Kawahata and J. Fujita, I of Plasma Physics, Nagoya U, Nagoya, Japan; A. Yasuda, Tokyo U of Mercantile Marine, Tokyo Japan; S. Okajima, Chubu U, Ksaugai 487, Japan
- T8.5** SCATTERING OF MILLIMETRE-SUBMILLITRE RADIATION FROM THE TORTUS TOKAMAK PLASMA - M.D. Bowden, P.W. Fekete, M.J. Ballico, G.F. Brand, I.S. Falconer, B.W. James and K.J. Moore, School of Physics, U of Sydney, NSW 2006, Australia; T. Idehara, Fukui University, Japan
- T8.6** A HIGH POWER CH₃OH LASER SYSTEM USING STARK STABILIZED CO₂ PUMP LASERS - D.P. Hutchinson, C.A. Bennett*, J. Lee**, L.K. Fletcher, C.H. Ma and K.L. Vander Sluis, Oak Ridge Natl Lab, Oak Ridge, TN
- T8.7** SIMULTANEOUS MULTILINE OPERATION OF A FORMIC ACID LASER AND APPLICATIONS - M.D. Bowden, I.S. Falconer, B.W. James, U of Sydney, NSW, Australia; L.B. Whitbourn, CSIRO Lindfield, NSW 2070, Australia; J.C. Macfarlane, CSIRO, Australia
- T8.8** ION TEMPERATURE MEASUREMENTS IN A TOKAMAK BY COLLECTIVE THOMSON SCATTERING OF FIR LASER RADIATION - R. Behn, D. Dicken*, J. Hackmann*, S.A. Salito and M.R. Siegrist, Ecole Polytechnique Federale Lausanne, Switzerland
- T8.9** DESIGN AND CALIBRATION OF A TWO-CHANNEL LOW NOISE HETERODYNE RECEIVER AT 10.6 μ m - C.A. Bennett, R.K. Richards, and D.P. Hutchinson, Oak Ridge Natl Lab, Oak Ridge, TN 37831
- T8.10** CALIBRATION OF 10-CHANNEL GRATING POLYCHROMATOR - K. Kawahata, M. Sakamoto, J. Fujita, Inst of Plasma Physics, Nagoya Univ, Chikusa-ku, Nagoya 464-01, Japan; H. Matsuo, Dept of Astrophysics, Nagoya Univ; K. Sakai, Dept of Applied Physics, Osaka Univ, Suita, Osaka 565, Japan
- T8.11** A STARK-TUNED CH₃OH LASER FOR USE IN HIGH FREQUENCY MODULATED INTERFEROMETRY - D.K. Mansfield, M. Vocaturo, L. Guttadora, Princeton Univ. Plasma Physics Lab, Princeton, NJ 08543

SESSION T9

Papio Room, 3rd Floor

Tuesday PM

December 6, 1988

ATMOSPHERIC PHYSICS

E. E. Altshuler, *Presider*

- T9.1** THE EFFECTS OF TURBULENCE IN CLEAR AND TURBID ATMOSPHERES ON MILLIMETER WAVE PROPAGATION - R.W. McMillan and R.A. Bohlander, GA Inst of Tech, Atlanta, GA 30332; R.J. Hill and S.F. Clifford, Natl Oceanic and Atmos Admin, Boulder CO 80303
- T9.2** ATMOSPHERIC ATTENUATION AND DELAY RATES BETWEEN 1 GHz AND 1 THz - (*Invited Keynote*) - H. Liebe, NTIA/ITS, 325 Broadway, Boulder, CO 80803
- T9.3** AN ALGORITHM FOR ESTIMATING CLOUD ATTENUATION AT MILLIMETER WAVELENGTHS - E.E. Altshuler, R.A. Marr, Rome Air Devlmt Center/EECP, Electromagnetics Directorate, Hanscom AFB, MA 01731-5000
- T9.4** MILLIMETER WAVE ATMOSPHERIC PROGAGATION STUDY AT CRL - T. Ihara*, T. Manabe**, J. Awaka**, Y. Furuhashi***, *Kashima Space Res Ctr, Comm Res Lab, Ministry of Posts and Telecomm, 893-1 Hirai, Kashima-machi, Ibaraki-ken, 314 Japan; **Comm Res Lab, Ministry of Posts and Telecomm, 2-1, Nukuikita-machi 4-chome, Koganei-shi, Tokyo 184, Japan; ***ATR Optical and Radio Comm Res Lab, Twin21 MID Tower, 2-1-61, Shiromi, Higashi-ku, Osaka 540 Japan
- T9.5** FOR FUTURE METEOROLOGICAL MILLIMETER-WAVE RADIATIVE TRANSFER MODEL AND AN AIRBORNE CAMPAIGN - C. Prigent, Dept de radioastronomie Millimetrique, Observatoire de Meudon, 92190 Meudon, France; P. Abba, Alcatel-Espace, France; N.A. Scott, Lab de Météorologie Dynamique, France
- T9.6** MESOPHERIC RADIOWAVE PROPAGATION IN THE 60GHZ BAND AFFECTED BY PROPERTIES OF ZEEMAN-SPLIT OXYGEN LINES - H.J. Liebe, G.A. Hufford and A.S. Katz, Natl Telecomm and Info Admin, I for Telecomm Sciences, 325 Broadway, Boulder, CO 80303

SESSION T10

Ballroom (Makai), 7th Floor

Tuesday PM

December 6, 1988

GYROTRON I

V.L. Granatstein, *Presider*

- T10.1** STATUS AND FUTURE PLANS OF HIGH POWER SOURCES FOR PLASMA HEATING - (*Invited Keynote*) - T.V. George, U.S. Dept of Energy, Office of Fusion Energy, Washington, DC 20545
- T10.2** MEGAWATT GYROTRONS FOR ECR HEATING - (*Invited Keynote*) - K. Felch, C. Hess, E. Jongewaard, H. Jory, H. Huey and R. Pendleton, Varian Associates, Inc., 611 Hansen Way, Palo Alto, CA 94303
- T10.3** EXPERIMENTAL STUDIES ON THE 120 GHz GYROTRON OF MITSUBISHI ELECTRIC CORP. - T. Kikunaga, T. Shimozuma, H. Asano, Y. Yasojima, Y. Murai, K. Nakashima and T. Tsukamoto, Central Research Laboratory, Mitsubishi Electric Corp., Amagasaki, Hyogo, 661 Japan
- T10.4** THE DESIGN OF MEGAWATT GYROTRONS FOR THE COMPACT IGNITION TOKAMAK - K.E. Kreischer, T. Grimm, A.W. Mobius, and R.J. Temkin, MIT Plasma Fusion Center NW-16, 167 Albany St, Cambridge, MA 02139
- T10.5** 8 GHz HIGH POWER GYROTRON WITH DEPRESSED COLLECTOR - P. Muggli, H.-G. Mathews*, M.Q. Tran, G. Agosti*, S. Alberti*, A. Perrenoud, T.M. Tran, Ecole Polytechnique Federale de Lausanne, 1007 Lausanne, Switzerland; *Asea Brown Boveri Ltd., Dept EKR, 5401 Baden, Switzerland
- T10.6** DEPRESSED COLLECTORS FOR GYROTRONS - M.E. Read and Alan J. Dudas, Physical Sciences, Inc., 635 Slaters Lane, Suite G101, Alexandria, VA 22314; W. Lawson and A. Singh, Lab for Plasma and Fusion Energy Studies, U of Maryland, College Park, MD 20742
- T10.7** MADEY THEOREM IN GYROTRON - S-C. Zhang, Dept of Phsyics, Chengdu I of Radio Engr, chengdu, Sichuan, P.R.China
- T10.8** GYROTRON IV - A NEW TUNABLE GYROTRON - G.F. Brand, School of Physics, U of Sydney, NSW 2006, Australia

SESSION W1

Ballroom (Mauka), 7th Floor

Wednesday AM

December 7, 1988

GUIDED PROPAGATION I

A. A. Oliner, Presider

- W1.1** MODELLING OF MMW STRUCTURE IN THE TIME DOMAIN USING TRANSMISSION LINE MODELLING (T.L.M.) - (*Invited Keynote*) W. Hoefer, Electrical Engineering, University of Ottawa, Ottawa, Ontario, Canada
- W1.2** CHARACTERISTICS OF COUPLED PLANAR STRIP-SLOT RESONATORS WITH MULTIPLE-LAYER DIELECTRICS - A. Rong and S. Li, Dept of Radio Engineering, Southeast U, Nanjing, P.R.China
- W1.3** EXCITATION AND TRANSMISSION MEASUREMENTS OF DIELECTRIC ROD WAVEGUIDE HE₁₁-MODE IN THE 50-150 GHz RANGE - Y. Yamamoto and K. Fujisawa, Dept of Electrical Engineering and Electronics, Faculty of Engineering, Osaka Sangyo U, Daito, Osaka, 574, Japan
- W1.4** A NEW APPROACH FOR THE ANALYSIS OF WAVEGUIDES WITH MULTIPLY CONNECTED CROSS SECTION - A.S. Omar and K. Schünemann, Technische Universität Hamburg-Harburg, Arbeitsbereich Hochfrequenztechnik, Postfach 90 14 03, D-2100 Hamburg 90, West Germany
- W1.5** MODAL ANALYSIS OF CIRCULAR BIFURCATION FOR CCTWTs - F. Lin and A.S. Omar, Technische Universität Hamburg-Harburg, Arbeitsbereich Hochfrequenztechnik, Postfach 90 14 03, D-2100 Hamburg 90, West Germany
- W1.6** ANALYSIS OF ECCENTRIC ANNULAR WAVEGUIDES - Y. Xu and A.S. Omar, Technische Universität Hamburg-Harburg, Arbeitsbereich Hochfrequenztechnik, Postfach 90 14 03, D-2100 Hamburg 90, West Germany
- W1.7** CHARACTERISTICS OF DOUBLE GROOVE GUIDE FOR 100 GHz OPERATION - Y.M. Choi, Hong Kong Polytechnic, Kowloon, Hong Kong

SESSION W2

Mahimahi Room, 3rd Floor

Wednesday AM

December 7, 1988

HIGH T_c SUPERCONDUCTORS I

Mohammed N. Afsar, Presider

- W2.1** PROCESSING AND ELECTRICAL PROPERTIES OF HIGH T_c SUPERCONDUCTORS - (*Invited Keynote*) - R.B. Poepfel, M.T. Lanagan, J.P. Singh, K.C. Goretta, J.T. Dusek, S.E. Dorris, U Balachandran, C. Bohn and J.R. Delaven, Ceramic Technology Div, Argonne Natl Laboratory, Argonne IL 60439
- W2.2** EXPLORING THE LOW LYING EXCITATION SPECTRA OF HIGH T_c SUPERCONDUCTORS - (*Invited Keynote*) - A.J. Sievers, Dept of Physics, Cornell U, Ithaca, NY
- W2.3** AN OPEN RESONATOR FOR TESTING SURFACE RESISTIVITY OF SUPERCONDUCTOR FILMS AND METALLIC SAMPLES AT 100-120 GHz - (*Invited Keynote*) - T. Matsui, M. Kiyokawa and B. Komiyama, Communications Research Lab, Koganei, Tokyo 184, Japan
- W2.4** ANTIFERROMAGNETIC ORDER IN HIGH T_c SUPERCONDUCTOR OXIDES - S. Yoshimori and M. Kawamura, Dept of Physical Elec, Faculty of Engr, Tokyo Inst of Technology, Japan
- W2.5** MEASUREMENT OF SUPERCONDUCTOR SURFACE IMPEDENCE BY USING A PARALLEL PLATES OPEN CAVITY RESONATOR EXCITED BY DIELECTRIC ROD HE₁₁-MODE - F. Fujisawa, Y Yamamoto and F. Okuda, Dept of Elec Engr and Electron, Faculty of Engr, Osaka Sangyo Univ, Osaka 574, Japan
- W2.6** OPEN TUBE RESONATORS FOR MILLIMETER/SUBMILLIMETER-WAVE SURFACE RESISTIVITY MEASUREMENTS - P.P. Woskov, D.Y. Rhee and D.R. Cohn, MIT Plasma Fusion Center, Cambridge, MA 02139
- W2.7** MMW DETECTION BY SUPERCONDUCTING FILMS - APPLICATIONS OF HIGH TEMPERATURE SUPERCONDUCTING FILMS - Y.-Y. Jeong and K. Rose, Center for Integrated Electron, Rensselaer Polytechnic Inst, Troy, NY

SESSION W3

Papio Room 3rd Floor

Wednesday AM December 7, 1988

SubMM DETECTORS

B. J. Clifton, Presider

- W3.1** A FAST, WIDE-SPECTRAL RANGE PHOTOCONDUCTIVITY FIR-DETECTOR SYSTEM - M. von Ortenberg and J. Geiger, Physikalisches Institut der Universitaet Wuerzburg, D-8700 Wuerzburg, F.R. Germany
- W3.2** HIGH DYNAMIC RANGE INFRARED DETECTORS - A.G.U. Perera and D.D. Coon, U of Pittsburgh, Pittsburgh, PA
- W3.3** PYROELECTRIC INFRARED DETECTORS FOR PRECISION EARTH SENSOR - K. Nakamura, T. Ishigaki, A. Kaneko, S. Takahashi, J. Nishida, Matsushita Research I Tokyo, Inc., R&D Project Teams, 3-10 1 Higashimita Tama-ku Kawasaki-Shi, Japan 214; Y. Wakabayashi and H. Nakamura, National Space Devl'mt Agency of Japan, Tsukuba Space Center, 2-1-1 Sengen Tsukuba-Shi Ibaraki, Japan 305
- W3.4** THE DEPENDENCE OF GaAS SCHOTTKY DIODE NOISE ON DRY ETCHING DAMAGE - T. Suzuki, T. Iinuma and K. Mizuno, Research I Electrical Communication, Tohoku U, Sendai 980, Japan
- W3.5** MINIMIZATION OF HEATING EFFECTS OF A MECHANICALLY STABLE MOM POINT CONTACT DIODE FOR HIGH POWER CO₂ LASER DETECTION - C. Yu and S. Tan, Dept of Electrical Engineering, North Carolina A&T State University, Greensboro, NC 27411
- W3.6** CHARACTERISTICS OF A SCHOTTKY BARRIER DIODE MIXER WITH CONICAL HORN ANTENNA FOR SUBMILLIMETER WAVELENGTHS - H. Nett, Max-Planck-Institut für Radioastronomie, Auf dem Hügel 69, 5300 Bonn 1, West Germany; and B.J. Clifton, M.I.T. Lincoln Laboratory, P.O. Box 73, Lexington, MA 02173
- W3.7** CONVERSION LOSS AND NOISE FIGURE THEORETICAL ESTIMATION OF A SINLE MIM DIODE SUBMILLIMETER MIXER - W.N.A. Pereira, Instituto Militar de Engenharia, Rio de Janeiro, Brazil; and M. Pyee, ENSAE, 10, Av E.Belin - 31055 Toulouse Cedex, France
- W3.8** ADIABATIC DEMAGNETIZATION COOLER FOR FAR INFRARED DETECTOR - A. Sato, T. Yazawa, Toshiba Research and Development Center, Ukishima, Kawasaki, Japan; J. Yamamoto, Low Temperature Center, Osaka University, Suita, Osaka, Japan
- W3.9** THE STUDY OF ANTIREFLECTION DIELECTRIC FILM MATERIAL ON MERCURY CADMIUM TELLURIDE ir DETECTOR SURFACE - Shu Yuwen and Luo Yuanhai, North China Research Institute of Electro-Optics, P.O. Box 8511, Beijing, China
- W3.10** ON THE WORK MECHANISM OF MIM POINT CONTACT DIODE - G. Carelli, N. Ioli, A. Moretti, D. Pereira, M. Prevedelli, F. Strumia, Dept di Fisica, Univ di Pisa-Italy; M. Inguscio, Univ di Napoli, Italy

SESSION W4

Ballroom (Makai), 7th Floor

Wednesday AM December 7, 1988

GYROTRON II

T.V. George, Presider

- W4.1** MODE CAPTURE EXPERIMENTS ON THE 150 GHz GYROTRON - (*Invited Keynote*) - KfK Gyrotron Team, presented by G. Hochschild, Kernforschungszentrum Karlsruhe, Institut für Technische Physik, Postfach 3640, D-7500 Karlsruhe, Fed Rep Germany
- W4.2** PRELIMINARY RESULTS FROM THE UNIVERSITY OF MARYLAND X-BAND GYROKLYSTRON - W. Lawson, J. Calame, D. Welsh, M. Skopec, B. Hogan, M. Naimann, J. Renbaum, and M.E. Read*, Lab for Plasma Research, U of Maryland, College Park, MD 20742; *Physical Sciences, Inc., Alexandria, VA 22314
- W4.3** MODE INTERACTION IN A PRIMED GYROTRON - A.H. McCurdy, Omega-P Inc., 2008 Yale Station, New Haven, CT 06520; C.M. Armstrong, Code 6842, Naval Research Lab, Washington, DC 20375-5000
- W4.4** 85 GHz TE_{1,3} PHASE-LOCKED GYROKLYSTRON OSCILLATOR EXPERIMENT - J.M. Burke*, M.A. Czarnaski**, R.P. Fischer**, M. Giangrave, A.W. Fliflet and W.M. Manheimer, Plasma Physics Div, Naval Research Lab, Washington, DC 20375-5000; *Burke Technologies, Inc., San Diego, CA 92111; **Jaycor, Inc., Vienna, VA 22180
- W4.5** FEASIBILITY OF 30 GHz GYROKLYSTRON AMPLIFIERS FOR DRIVING LINEAR SUPERCOLLIDERS - V.L. Granatstein, W. Lawson and P.E. Latham, Lab for Plasma Research, U of Maryland, College Park, MD 20742
- W4.6** AC SPACE CHARGE IN MODERATELY RELATIVISTIC GYROTRONS - P.E. Latham and T.M. Antonsen, Jr., Lab for Plasma Research, U of Maryland, College Park, MD 20742
- W4.7** THE THEORY OF LARGE-ORBIT GYRO-KLYSTRON WITH INCLUSION OF SPACE CHARGE EFFECT - H-B. Jiang and S. Yu, High Energy Electronics Research Institute, Chengdu I of Radio Engr, Chengdu, Sichuan, P.R.China
- W4.8** CALCULATION OF LIMITING CURRENT IN CONNECTION WITH APPLICATION TO GYROTRON - H.S. Uhm and C. Grebogi, Naval Surface Warfare Center, White Oak, Silver Spring, MD 20903-5000

SESSION W5

Ballroom, 7th Floor

Wednesday PM

December 7, 1988

GUIDED PROPAGATION II

Y. Kobayashi, *Presider*

- W5.1** NONRADIATIVE SYMMETRICAL DIELECTRIC GRATING WAVEGUIDE FOR MMW DBR GUNN OSCILLATORS - Z.-W. Li, Dept of Radio Engr, Southeast U, Nanjing, Jiangsu, P.R. China
- W5.2** NUMERICAL RESULTS ON DIELECTRIC RESONATORS INSIDE WAVEGUIDES - A. Jöstingmeier and A.S. Omar, Technische U, Hamburg-Harburg, Hamburg 90 FRG
- W5.3** NON-LINEAR TLM MODELLING OF HIGH-FREQUENCY VARIATOR MULTIPLIERS AND HALVERS - S. Kosmopoulos and W.J.R. Hofer, U of Ottawa, Ottawa, Canada; A. Gagnon, Telemus Inc., Nepean, Ont. Canada
- W5.4** NUMERICAL MODELING OF GENERALIZED MILLIMETER-WAVE TRANSMISSION MEDIA WITH FINITE ELEMENT AND TRANSMISSION LINE MATRIX METHODS - Eswarappa, G. Costache, W. Hofer, U of Ottawa, Ottawa, Ont. Canada
- W5.5** POLARIZATION CONVERSIONS IN DIELECTRIC STRIP WAVEGUIDES - Z.M. Lu, S.L. Wang, S.T. Peng, New York I of Tech, Old Westbury, NY; H. Jenkinson, US Army Armament Res, Devlmt & Engr Ctr, Picatinny, NJ 07806
- W5.6** THE SOLUTION OF END EFFECTS OF SLOT LINE BY OPEN CAVITY METHOD - Y. Chen, Southeast, Nanjing, PRC
- W5.7** SPECIALLY CONFIGURED ULTRA-LOW-LOSS DIELECTRIC WAVEGUIDES FOR MM/Sub-MM WAVES - C. Yeh, UCLA, Los Angeles, CA; F. Shimabukuro, Aerospace Corp, Los Angeles, CA
- W5.8** ANALYSIS OF MICROSTRIP LINES ON FERRITE AND ANISOTROPIC DIELECTRIC SUBSTRATES - M.R.M.L. Albuquerque, A.G. D'Assuncao, M.R.G. Maia, UFRN-Natal, RN, Brazil; A.J. Giarola, State U of Campinas, Campinas, Brazil
- W5.9** ANALYSIS OF FINLINES ON BIAXIAL ANISOTROPIC DIELECTRIC - F.D.A.F. Tejo, UFPB-DEE-C.P. Campina Grande; A.G. D'Assuncao, UFRN-DEE-Natal; A.J. Giarola, UNICAMP-FEE-DMO-Campinas, Brazil
- W5.10** SINGLE MODE PROPAGATION IN MAGNETOOPTICAL WAVEGUIDES - J.H. Marco, L. Grau, F. Canal, Univ. Politecnica de Catalunya, Barcelona, Spain

SESSION W6

Mahimahi Room, 3rd Floor

Wednesday PM

December 7, 1988

HIGH T_c SUPERCONDUCTORS II

A.J. Sievers, *Presider*

- W6.1** MAKING SENSE OF SUPERCONDUCTING INFRARED SENSORS - (*Invited Keynote, 40 min*) - S. Wolf, Naval Research Lab, Washington, DC
- W6.2** FAR-IR REFLECTIVITY AND MAGNETIC FIELD DEPENDENCE OF HIGH T_c SUPERCONDUCTORS - M.N. Afsar and H. Chi, Tufts Univ, EE Dept, Medford, MA 02155
- W6.3** FAR INFRARED REFLECTIVITY OF CERAMIC HIGH T_c SUPERCONDUCTORS - K.F. Renk, W. Ose, J. Schützmann, T. Zetterer, H.H. Otto, J. Keller and K.F. Renk, Fakultät f Physik, Univ Regensburg, Regensburg, W. Germany; B. Roas and L. Schultz, Siemens AG, FRG
- W6.4** FAR INFRARED OPTICAL PROPERTIES OF HIGH T_c SUPERCONDUCTORS - S. Onari, T. Hiroaki, A. Ono, S. Hidaka and T. Arai, Inst of Applied Physics, Univ of Tsukuba, Tsukuba, Ibaraki 305, Japan
- W6.5** FAR INFRARED PHOTO RESPONSE OF GRANULAR SUPERCONDUCTING FILMS - U. Strom and S.A. Wolf, NRL, Washington, DC; S. Perkowitz and G.L. Carr, Emory Univ, Atlanta, GA
- W6.6** MICROWAVE CHARACTERISTICS OF BULK AND POWDERED HIGH T_c SUPERCONDUCTORS - A. Meulenberg, H-L. Hung, and G. Tough, COMSAT Labs, Clarksburg, MD 20871
- W6.7** RF MEASUREMENTS OF HIGH TEMPERATURE SUPERCONDUCTING MATERIAL - K. Chang, R.K. Pandey, M.K. Skrehot, M. Li, G.R. Gilbert, K.W. Goeking, B.L. Gries, D.L. Mabus J.C. McCleary, Dept of EE, Texas A&M Univ, College Station, TX 77843
- W6.8** FTIR ABSORBANCE STUDIES OF Cu-O BANDS OF YBa₂Cu₃O₇ IN SEMICONDUCTING AND SUPERCONDUCTING PHASE - M.M. Pradhan, R.K. Garg and M. Arrora, Natl Physical Lab, New Delhi 110012, India
- W6.9** PERMITTIVITY OF HIGH T_c CERAMICS AT CENTIMETER AND MILLIMETER WAVELENGTHS - R.L. Moore and J.M. Bourgeois, GTRI, GA Inst Tech, Atlanta, GA 30332

SESSION W7

Papio Room, 3rd Floor

Wednesday AM

December 7, 1988

SubMM DEVICES

K. Mizuno, *Presider*

- W7.1** CHARACTERISTICS AND PERFORMANCE OF THE NATIONAL SYNCHROTRON LIGHT SOURCE INFRARED BEAMLINE - (*Invited, 30 min.*) - G. P. Williams, C. J. Hirschmugl, D.P. Siddons and E.A. Sullivan, Brookhaven Natl. Lab, Upton, NY 11973; K.D. Moeller, P. Petrone and E. Angelides, Fairleigh Dickinson Univ, Teaneck, NJ 07666; and Y.J. Chabal AT&T Bell Labs, Murray Hill, NJ 07974; F.M. Hoffman, Exxon Research Labs, Annandale, NJ 08801
- W7.2** OPTICALLY-PUMPED NH₃ LASERS - A VERY STABLE FREQUENCY SOURCE - J. Reid and K.J. Siemsen, McMaster U and Natl Research Council of Canada
- W7.3** PRESSURE EFFECTS ON THE FREQUENCY OF OPFIR LASERS - R.L. Crownover and F.C. DeLucia, Duke University; D.D. Skatrud, Army Research Office, P.O. Box 12211, Research Triangle Park, NC 27709-2211
- W7.4** TUNABLE 690 GHz SIXTUPLER WITH FUNDAMENTAL GUNN-OSCILLATOR - R. Rüdiger and P. Zimmermann, Radiometer-physics, Bergerwiesenstr. 15, 5309 Meckenheim, West Germany
- W7.5** LASER RADAR RANGE IMPROVED OPTIMIZATION FOR DETECTING AND TRACKING AIRBORNE COOPERATIVE TARGETS - J. Gavan, Center for Technological Education Holon, P.O.B. 305, Holon 58102, Israel; A. Korman, Techno Science Ltd, P.O.B. 1784, Ramat Gan, Israel
- W7.6** INITIAL ATTEMPTS TO OBSERVE LONG WAVELENGTH PHASE CONJUGATION IN AN ARTIFICIAL KERR MEDIUM - P.A. Krug, School of Physics, U of Sydney, NSW 2006, Australia; D.K. Mansfield, Plasma Physics Lab, Princeton Univ, Princeton, NJ 98544
- W7.7** SUBMILLIMETER WAVE LOW TEMPERATURE ADMITTANCE OF N-GaAs AND InP DIODE STRUCTURES USING TRANSPORT ANALYSIS - C.M. Krowne, Electronics Science and Tech Div, Naval Research Lab, Washington, DC 20375-5000
- W7.8** ANALYSIS OF SCATTERING FROM OIL FILM ON SEA SURFACE WITH MODEL OF STRATIFIED MEDIUM WITH SLIGHTLY ROUGH INTERFACES - Shanjia Xu and Ligu Sun, Dept of Radio and Elec, U of Science and Tech of China, Hefei, Anui 230029, P.R.China
- W7.9** MICROFABRICATED SUBMILLIMETER BWO EXPERIMENTS - L.R. Barnett, J.M. Baird, R.W. Grow, Dept of Elec Engr, U of Utah, Salt Lake, UT 84112
- W7.10** STUDY OF OPTICAL OUTPUT COUPLERS FOR SUBMILLIMETER WAVELENGTH BACKWARD-WAVE OSCILLATORS (BWO's) - J.D. Cook, Dept of Physics, Eastern Kentucky U, Richmond, KY 40474; N. Stankiewicz, NASA/Lewis Research Ctr, Cleveland, OH 44135

SESSION W8

Ballroom (Makai), 7th Floor

Wednesday PM

December 7, 1988

GYROTRON III

J.M. Baird, *Presider*

- W8.1** OPERATION AND PROSPECTS OF HIGH-POWER, HIGH-FREQUENCY QUASI-OPTICAL GYROTRONS - (*Invited Keynote*) - CRPP and ABB Quasi-Optical Gyrotron Development Group, presented by M.Q. Tran, CRPP, Lausanne, Switzerland
- W8.2** OPERATION OF A QUASI-OPTICAL GYROTRON WITH VARIABLE OUTPUT COUPLING - A.W. Fliflet, T.A. Hargreaves*, W.M. Manheimer, R.P. Fischer**, and M.L. Barsanti**, NRL, Washington, DC 20375-5000
- W8.3** NONLINEAR THEORY OF A QUASI-OPTICAL GYROTRON WITH AN ELECTRON BEAM AT AN OBLIQUE ANGLE - C.Y. Wang*, K.E. Kreischer, R.J. Temkin, MIT Plasma Fusion Center NW16, 167 Albany St, Cambridge, MA 02139;
- W8.4** 120 GHz AXISYMMETRIC QUASI-OPTICAL GYROTRON - Y. Itoh, M. Komuro, K. Hayashi and T. Sugawara, Toshiba Corp., 4-1, Ukishimacho, Kawasaki-ku, Kawasaki 210 Japan
- W8.5** DESIGN OF A QUASI-OPTICAL GYROTRON WITH A SHEET ELECTRON BEAM - M.E. Read and A.J. Dudas, Physical Sciences, Alexandria, VA; J. Petillo and A. Drobot, Science Applications Int'l Corp, McLean, VA
- W8.6** MODE STABILITY IN A QUASI-OPTICAL GYROTRON - W.M. Manheimer, NRL, Washington, DC; T.M. Antonsen and B. Levush, U of Maryland, College Park, MD
- W8.7** MODE COMPETITION IN QUASI-OPTICAL GYROTRONS - S. Riyopoulos, Science Applications Int'l Corp, McLean, VA; W.M. Manheimer and A. Fliflet, NRL, Washington, DC
- W8.8** FREQUENCY STEP-TUNABLE GYROTRON - O. Dumbrajs, Arbeitsbereich Hochfrequenztechnik, Technische U, Hamburg-Harburg, D-2000 Hamburg 90, FRG; B. Piosczyk, Kernforschungszentrum Karlsruhe, I fur Technische Physik, Karlsruhe FRG
- W8.9** SIMULATION OF THE ELECTROSTATIC CYCLOTRON INSTABILITY ON AN ANNULAR ELECTRON BEAM - F.S. Kuo, Dept of Physics, Nat'l Central U, Chung-Li Taiwan, P.R. China; J.J. Su, Dept of Physics, Los Angeles, CA; K.R. Chu, Physics Dept, Nat'l Tsing Hua U, Hsinchu, Taiwan ROC

SESSION Th1

Ballroom (Mauka), 7th Floor

Thursday AM December 8, 1988

INTEGRATED CIRCUITS I

C. Seashore, Presider

- Th1.1** MILLIMETRE-WAVE MONOLITHIC AND HYBRID INTEGRATED CIRCUIT TECHNOLOGY - (*Invited Keynote*) - J.W. Archer, CSIRO, Epping NSW 2121, Australia
- Th1.2** AN EFFECTIVE MODEL OF E-PLANE METAL SEPTUM FOR MILLIMETER WAVE INTEGRATED CIRCUIT DESIGN - J. Hong, 98 Market Road, Gu Lang Yi, Xiamen, Fujian, P.R.China
- Th1.3** BROADBAND PHASE MODULATORS IN INTEGRATED FIN-LINE TECHNIQUE FOR MILLIMETRE-WAVE APPLICATIONS - E. Kpodzo, Bell-Northern Research, P.O. Box 3511, Station C, Ottawa, Canada K1Y 4H7
- Th1.4** GaAs TRAVELLING WAVE SCHOTTKY CONTACT COPLANAR WAVEGUIDE WITH APPLICATIONS TO MIMIC - D.R. Singh, Honeywell, MN38-3300, 10400 Yellow Circle Dr, Minnetonka, MN 55434; K.S. Champlin, Dept Elec Engr, U of Minnesota, Minneapolis, MN 55454
- Th1.5** OPTIMAL DESIGN OF MILLIMETER WAVE INTEGRATED E-PLANE DIPLEXERS - J. Hong and J. Shi, Dept of Radio Engr, Fuzhou Univ, Fujian, P.R.China
- Th1.6** INTEGRATED CIRCUIT ACTIVE ARRAYS AND SPATIAL POWER COMBINERS USING APERTURE COUPLED PATCH ANTENNAS - K. Chang, K.A. Hummer and J.L. Klein, Dept of Elec Engr, Texas A&M Univ, College Station, TX 77843-3128
- Th1.7** UNIVERSAL TEST FIXTURE FOR MONOLITHIC MM-WAVE INTEGRATED CIRCUITS USING A NOVEL DEEMBEDDING PROCEDURE - R.R. Romanofsky and K.A. Shalkhauser, NASA Lewis Research Center, Cleveland, Ohio 44135
- Th1.8** ON THE MEASUREMENT OF MM-WAVE PROPAGATION CHARACTERISTICS OF GaAs MICROSTRIP LINES - R.R. Romanofsky, K.L. Adaway, and K.B. Bhasin, NASA Lewis Research, Cleveland, Ohio 44135

SESSION Th2

Mahimahi Room, 3rd Floor

Thursday AM December 8, 1988

NEAR MMW MEASUREMENTS & TECHNIQUES

T. Matsui, Presider

- Th2.1** INTERNATIONAL SAMPLE EXCHANGE FOR THE COMPARISON OF NEAR-MILLIMETER WAVE CHARACTERIZATIONS OF MATERIALS - (*Invited Keynote, 40 min*) - G.J. Simonis and J.R. Birch*, Harry Diamond Labs, Adelphi, MD; *Nat'l Physical Lab, Div of Elec Science, Middlesex, U.K.
- Th2.2** SOLID STATE SPECTROSCOPY IN FAR IR AND MM WAVES REGIONS BY SYNCHROTRON RADIATION - (*Invited Keynote, 40 min*) - T. Nanba, Dept of Physics, Tohoku U, Sendai 980, Japan
- Th2.3** MILLIMETER WAVE MEASUREMENT OF COMPLEX PERMITTIVITY BY IMPROVED DIELECTRIC DISK RESONATOR METHOD - Y. Kobayashi and J. Sato, Dept Elec Engr, Saitama U, Urawa, Saitama 338, Japan
- Th2.4** NEAR MMW DIELECTRIC MEASUREMENTS BY MEANS OF A NON-DISPERSIVE FOURIER TRANSFORM SPECTROMETER OPTIMIZED BELOW 15cm^{-1} REGION - K. Sakai, T. Nakano and Y. Ichioka; Dept Applied Physics, Osaka U, Suita, Osaka 565, Japan; H. Matsuo and K. Kawahata, Nagoya U, Chikusa, Nagoya 464, Japan
- Th2.5** THE MARPLE ALGORITHM FOR THE AUTOREGRESSIVE SPECTRAL ESTIMATES OF SMMW FOURIER TRANSFORM SPECTROSCOPY DATA - G. Zhang and G. Zhou, Elec Dept, Zhongshan U, Guangzhou, P.R.C.
- Th2.6** SOME NEW PROPERTIES OF LOADED RESONATORS - L.F. Libelo and G.E. Pisane, Harry Diamond Labs, Adelphi, MD
- Th2.7** NEAR-MILLIMETER WAVELENGTH MEASUREMENTS OF COMPLEX INDEX VALUES OF SEVERAL POLYMER MATERIALS - G.J. Simonis and M. Stead, Harry Diamond Labs, Adelphi, MD
- Th2.8** THEORY AND PRACTICE IN OPEN RESONATOR MEASUREMENTS OF MULTI-LAYER SAMPLES - T. Wells, GTRI, GA Inst Tech, Atlanta, GA
- Th2.9** DIELECTRIC PROPERTIES OF COMPOSITE STRIPLINE/RADOME MAT'LS - R.L. Moore and A. MacDonald, GTRI, GA Inst Tech, Atlanta, GA

SESSION Th3

Papio Room, 3rd Floor

Thursday AM December 8, 1988

LASERS I

K. M. Evenson, Presider

- Th3.1** PHYSICAL PROCESSES AND DEVELOPMENT OPPORTUNITIES IN FAR-INFRARED LASERS - (*Invited Keynote*) Frank C. LeDucia, Duke University, Durham, NC 27706
- Th3.2** WIDE-BAND GERMANIUM LASERS IN THE RANGE FROM FAR-INFRARED TO MILLIMETER WAVES - (*Invited Keynote*) S. Komiyama, Dept of Pure and Applied Sciences, University of Tokyo, Kamaba, Tokyo 153, JAPAN
- Th3.3** OPTICALLY PUMPED MID-INFRARED NH₃ LASERS - (*Invited Keynote*) J. Reid, Lumonics Inc., Kanata, Ontario, CANADA K2K 1Y3
- Th3.4** ¹⁵NH₃ RAMAN FIR LASER - W. Zhu and J.R. Izatt, Dept of Physics and Astronomy, University of Alabama, Tuscaloosa, AL 35487
- Th3.5** SUBMILLIMETER-WAVE LASER PUMPED BY AN EMQ-SWITCHED CO₂ LASER - H. Shirai, J. Bae, T. Nishida, K. Mizuno, Research Institute of Electrical Communication, Tohoku University, Sendai 980, JAPAN
- Th3.6** LINEWIDTH AND POLARIZATION OF AN OPTICALLY-PUMPED GAAS SURFACE-EMITTING LASER WITH INTEGRATED BRAGG REFLECTORS - J. Faist, F. Morier-Genoud, D. Martin, M.A. Dupertuis, J.D. Ganiere, F.K. Reinhart, Inst. Optoelectronics, PHB-Ecublens, CH-1015, Lausanne, Switzerland
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SESSION Th4

Ballroom (Makai), 7th Floor

Thursday AM December 8, 1988

GYROTRON IV

N.C. Luhmann, Presider

- Th4.1** MILLIMETER WAVE CARM AMPLIFIER EXPERIMENT - (*Invited Keynote*) - B.G. Danly, K.D. Pendergast and R.J. Temkin, MIT Plasma Fusion Center, Cambridge, MA 02139
- Th4.2** DESIGN AND ANALYSIS OF A 1 GIGAWATT 250 GHz CARM AMPLIFIER USING AN INDUCTION LINAC - M. Caplan and J.K. Boyd, Lawrence Livermore Nat'l Lab, P.O. Box 808, Livermore, CA
- Th4.3** THE NRL 100 GHz COLD-CATHODE CARM - R.B. McCowan, C.A. Sullivan, A.W. Fliflet, D.A. Kirkpatrick, Science Applications Int'l Corp, McLean, VA 22101; W.M. Manheimer, S.H. Gold, W.M. Manheimer, W.M. Black, A.K. Kinkead and M. Sucey, Code 4740, Plasma Physics Div, Naval Research Lab, Washington, DC 20375
- Th4.4** CYCLOTRON AUTORESONANCE MASER (CARM) EC HEATING SOURCE FOR HIGH FIELD TOKAMAKS - Q.S. Wang, A.T. Lin, N.C. Luhmann, Jr. and D.B. McDermott, UCLA, Los Angeles, CA; K.R. Chu, Nat'l Tsing Hua U Taiwan, Rep of China
- Th4.5** OPTICAL GUIDING IN THE CYCLOTRON AUTORESONANCE MASER - R.G. Kleva and B. Levush, U of Maryland, College Park, MD 20742; P. Sprangle, Naval Research Lab, Washington, DC 20375
- Th4.6** INITIAL OPERATION OF A CHERENKOV CARM - H. Cao, D.B. McDermott and N.C. Luhmann, Jr., UCLA, Los Angeles, CA
- Th4.7** HIGH POWER, MULTI-CAVITY PHASE-LOCKED GYROTRON OSCILLATOR EXPERIMENT - S.H. Gold, A.W. Fliflet, W.M. Black, D.A. Kirkpatrick, SAIC, McLean, VA 22101; W.M. Manheimer, Plasma Physics Div, Naval Research Lab, Washington, DC 20375-5000
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SESSION Th5

Ballroom (Mauka), 7th Floor

Thursday PM

December 8, 1988

INTEGRATED CIRCUITS II

W. Hoefler, Presider

- Th5.1** MW MONOLITHIC INTEGRATED CIRCUITS: IMPLICATIONS AND APPLICATIONS - (*Invited Keynote*) - C.R. Seashore, Honeywell, Inc., 10400 Yellow Circle Dr, Minnetonka, NM 55343
- Th5.2** DOMINANT MODE PROPAGATION CHARACTERISTICS FOR DIELECTRIC TAPE IMAGE LINE - J.C. Wiltse, GTRI, Georgia Inst. Tech, Atlanta, GA 30332
- Th5.3** MONOLITHIC WATT-LEVEL MILLIMETER-WAVE BARRIER-INTRINSIC-N⁺ (BIN) DIODE-GRID FREQUENCY TRIPLER ARRAY - R.J. Hwu, N.C. Luhmann, Jr., Dept of Elec Engr, U of CA, Los Angeles, CA 90024; D.B. Rutledge, CIT, Pasadena; D. Streit, T. O'Neill, TRW, Redondo Beach, CA; B. Hancock, U. Lieneweg, JPL, Pasadena, CA
- Th5.4** ANALYSIS OF A NOVEL MONOLITHIC GaAs MIS PHASE SHIFTER - M.E. McKaughan and F.C. Jain, U of Connecticut, Dept Elec and Systems Engr, U-157, Room 312, 260 Glenbrook Rd, Storrs, CT 06268
- Th5.5** MILLIMETER-WAVE MMIC PACKAGING DESIGN - M.J. Gawronski, J.R. Lamberg, D.R. Singh, Honeywell Inc, 10400 Yellow Circle Dr, Minnetonka, MN 55343
- Th5.6** SCATTERING OF PLANE WAVE BY MICROSTRIP LINES - S.T. Peng, NY Inst of Technology, Old Westbury, NY 11568; R.T. Kinasewitz, US Army Armament Research, Devl'mt and Engr Ctr, Picatinny, NJ 07806-5000
- Th5.7** FINLINE-DISPLACEMENT ISOLATOR - THE THEORETICAL AND EXPERIMENTAL INVESTIGATION - J. Huang and Q. Yang, Dept of Radio Engr, Southeast University, Nanjing, China
- Th5.8** DESIGN AND PERFORMANCE OF 20 AND 45 GHz MMIC LANGE COUPLERS - J.E. Wallace and G.A. Ellis, Boeing Electronics Company, High Tech Center, P.O. Box 24969, M/S 7J-65, Seattle, WA 98124
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SESSION Th6

Mahimahi Room, 3rd Floor

Thursday PM

December 8, 1988

MATERIALS CHARACTERIZATION

G. J. Simonis, Presider

- Th6.1** FAR-INFRARED AND SURFACE LAYERS - (*Invited Keynote, 40 min*) - A. Hadni and X. Gerbaux, U of Nancy 1, Nancy, France
- Th6.2** CHARACTERIZATION OF THE INFRARED AND FAR-INFRARED PROPERTIES OF SAPPHIRE AND QUARTZ - M.E. Thomas and R.I. Joseph, The John Hopkins U, Applied Physics Lab, Laurel, MD 20707; G.J. Simonis and M. Stead, LABCOM Harry Diamond Labs, Adelphi, MD 20783
- Th6.3** SOFT MODE SPECTROSCOPIC STUDY OF FERROELECTRIC PHASE TRANSITION IN Li₂Ge₇O₁₅ - M. Wada, A. Sawada*, and Y. Ishibashi*, Dept of Physics, Faculty of Liberal Arts, Shinshu U, Matsumoto 390, Japan; *Synthetic Crystals Res Lab, Faculty of Engr, Nagoya U, Nagoya 464, Japan
- Th6.4** FAR IR TRANSMISSION SPECTRA OF ROCHELLE SALT AT 5K - X. Gerbaux and A. Hadni, U of Nancy 1, Nancy, France
- Th6.5** MEASUREMENT OF THE SPECTRAL THERMAL EMISSION FROM TECHNICAL INFRARED RADIATORS - A. Leupin, H. Vetsch and F.K. Kneubühl, Infrared Physics Lab, ETH, Aarich, Switzerland
- Th6.6** THE RELATION BETWEEN IR AND VIS SPECTRAL PROPERTIES OF GLASSES AND THE ENERGY TRANSFER THROUGH WINDOWS - R. Furler, P. Williams and F.K. Kneubühl, ETH, Zurich, Switzerland
- Th6.7** EFFECT OF TEMPERATURE OF IR-ABSORPTION OF DIPHENYL - M.I. Nasser and M.A. Moharram, Physics Dept, Natl Research Ctr, Dokki, Cairo, Egypt
- Th6.8** MEASUREMENT OF THE DIELECTRIC CONSTANT OF FERROELECTRIC KH₂PH₄ AT 35 GHz BY TRANSMISSION IN A WAVEGUIDE - M. Horioka, Dept Electronics, Kanazawa Inst Tech, Kanazawa 921, JAPAN
- Th6.9** TEMPERATURE INDEPENDENT PERMITTIVITIES IN COMPOSITES OF TWO OR MORE DIELECTRICS - R.L. Moore and J. Estrada, GTRI, Atlanta, GA
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SESSION Th7

Papio Room, 3rd Floor

Thursday PM December 8, 1988

LASERS II

F. K. Kneubühl, Presider

- Th7.1** FAR-INFRARED LASER SPECTROSCOPY - (*Invited Keynote*) K. M. Evenson, National Bureau of Standards, Boulder, CO 80303
- Th7.2** SPECTROSCOPY AND FIR LASER EMISSION: PERISCOPE TO THE VIBRATIONAL WORLD OF METHANOL AND METHYLAMINE - (*Invited Keynote*) R. M. Lees, U of New Brunswick, Fredericton, NB, Canada E3B 5A3
- Th7.3** TEMPERATURE AND PRESSURE DEPENDENCE OF CH₃F RAMAN FIR LASER EMISSION - Yu Guan and J. R. Izatt, Dept of Physics and Astronomy, U of Alabama, Tuscaloosa, AL 35487
- Th7.4** HOMOGENOUS LINEWIDTHS AND LEVEL-CROSSING SIGNALS OF SOME PUMP TRANSITIONS OF ¹²CH₃OH cw LASER LINES - N. Sokabe, K. Matsushima and A. Murai, Dept of Applied Physics, Osaka City University, Osaka, Japan
- Th7.5** IR SPECTRA AND FIR LASER ASSIGNMENTS FOR 0-18 METHANOL - R.M. Lees, W. Lewis-Bevan, J.W.C. Johns and D.P. Donovan, Physics Department, U of New Brunswick, Box 4400, Fredericton, NB, Canada E3B 5A3
- Th7.6** FIR LASER ASSIGNMENTS FOR METHYLAMINE - R.M. Lees, Physics Department, U of New Brunswick, Box 4400, Fredericton, NB Canada E3B 5A3; W. Lewis-Bevan, So. Illinois Univ, Carbondale, IL 62901
- Th7.7** DETERMINISTIC CHAOS IN OPTICALLY PUMPED FAR-INFRARED RAMAN LASERS - S. Rai and J.R. Izatt, Dept Physics, U of Alabama, Tuscaloosa, AL 35487; J. Rai and C. M. Bowden, Research Directorate Research, Development, and Engineering Ctr., U.S. Army Missile Command, Redstone Arsenal, AL 35898-5248

SESSION Th8

Ballroom (Makai), 7th Floor

Thursday PM December 8, 1988

GYROTRON V

R.J. Barker, Presider

- Th8.1** EXPERIMENTAL RESULTS ON RELATIVISTIC GYRO-DEVICES - R. McCowan, S. Gold, W.M. Black and W.M. Manheimer, Plasma Physics Div, Naval Research Lab, Washington, DC 20375-5000
- Th8.2** INTENSE ELECTRON BEAM CYCLOTRON MASERS WITH MICROSECOND PULSELENGTHS - R.M. Gilgenbach, J.G. Wang, J.J. Choi, C. Outten and T. Spencer, Intense Energy Beam Interaction Lab, Nuclear Engr Dept, The U of Michigan, Ann Arbor, MI 48109-2104
- Th8.3** EXPERIMENTAL INVESTIGATION OF THE EFFECTS OF A NEUTRALIZING BACKGROUND PLASMA ON THE OPERATION OF A HIGH CURRENT GYROTRON - D.A. Kirkpatrick*, S.H. Gold, A.K. Kinkead, W.M. Manheimer, C.A. Sullivan*, Plasma Physics Div, Naval Research Lab, Washington, DC 20375-5000; *Science Applications Int'l Corp, McLean, VA 22102
- Th8.4** DESIGN OF A 1 MW GYRO-TWT - C.S. Kou, D.B. McDermott, C.K. Chong and N.C. Luhmann, Jr., UCLA, Los Angeles, CA
- Th8.5** EFFICIENCY ENHANCEMENT IN GYRO-BWO BY TAPERED MAGNETIC FIELD - A.K. Ganguly and S. Ahn, US Naval Research Lab, Washington, DC 20375-5000
- Th8.6** OPERATION OF A 140 GHz TUNABLE BACKWARD-WAVE GYROTRON OSCILLATOR - W.C. Guss, K. Kreischer, R. Temkin, MIT Plasma Fusion Center NW16, Cambridge, MA 02139; M. Caplan, Lawrence Livermore Nat'l Lab, P.O. Box 808, Livermore, CA; D. Pirkle, Varian Associates, 611 Hansen Way, Palo Alto, CA
- Th8.7** A GYROTRON TWT AMPLIFIER EXPERIMENT DESIGNED FOR HIGH STABILITY - L.R. Barnett, K.R. Chu, C.C. Tu, L.H. Chang and H.N. Liu, Dept of Physics, National Tsing Hua U, Hsinchu, Taiwan 30043, Rep of China
- Th8.8** AN EXPERIMENTAL SIXTEENTH HARMONIC CUSPTRON DEVICE - S.P. Kuo, K.K. Tiong, and P.E. Miller, Polytechnic U, Farmingdale, NY 11735
- Th8.9** RESONATOR WITH A CURVED WALL FOR A GYROTRON - O. Dumbrajs, Arbeitsbereich Hochfrequenztechnik, Technische U, Hamburg-Harburg, D-2000 Hamburg 90, FRG; H. Wenzelburger, Kernforschungszentrum Karlsruhe, I für Datenverarbeitung in der Technik, Karlsruhe, FRG

SESSION F1

Ahi Room, 3rd Floor

Friday AM December 9, 1988

MMW DEVICES I

K. Chang, Presider

- F1.1** MODULATION OF INTENSE RELATIVISTIC ELECTRON BEAMS FOR HIGH POWER MICRO- AND MILLIMETER WAVE GENERATION - THEORY AND SIMULATION - J. Krall, Science Applications Intl. Corp, McLean, VA; Y.Y. Lau, M. Friedman and V. Serlin, NRL, Washington, DC
- F1.2** MILLIMETER-WAVE SUSPENDED PARALLEL-COUPLED FILTERS AT Ka AND W-BAND - T.C-C. Ho and K. Chou, Chung Shan I of Science, Lung- Tan, Taiwan, ROC
- F1.3** THE PRINTED-CIRCUIT RAT-RACE-TYPE DIRECTIONAL COUPLER FOR LARGER POWER-SPLIT RATIO - I. Ohta, I. Hagino, and T. Kaneko, Faculty of Engr, Himeji I of Tech, 2167 Shosha, Himeji-shi, 671-22, Japan
- F1.4** CIRCULATOR USING GaAs DUAL-GATE FET - S. Toyoda, Dept Elec Engr, Osaka I of Tech, Osaka, Japan
- F1.5** AN EXPERIMENTAL STUDY OF JOSEPHSON EFFECT IN BULK YBaCuO - S.Z. Cai, Y.S. Hou and E.X. Yu, E.E. Dept, Fudan Univ, Shanghai, P.R.China
- F1.6** A SIMPLE AND LOW COST 3-PROBE MEASUREMENT TECHNIQUE USING MICROSTRIP CIRCUITS - K. Chang, M. Li and T. Sauter, Dept Elec Engr, Texas A&M Univ, College Station, TX
- F1.7** EXPERIMENTAL RESULTS OF A HIGH Q QUASI-OPTICAL REFLECTION CAVITY - K.A. Lee and M.A. Frerking, JPL, California I of Tech, Pasadena, CA 91109
- F1.8** CW DOPPLER SYSTEMS FOR EXTERNAL URODYNAMIC STUDY, COMPARISON BETWEEN ELECTROMAGNETIC WAVE AND AIRBORNE ULTRASOUND - Yasuhito Takeuchi, Yokogawa Medical Systems, Ltd., Tokyo, 190 Japan
- F1.9** DEVELOPMENT OF A BROADBAND 3-mm PHF H-PLANE WAVEGUIDE CIRCULATOR - D. Zhang and Z. Wu, Applied Phys. Inst, Box 83, Chengdu, Sichuan, P.R.China
- F1.10** DETERMINATION OF I-V CHARACTERISTICS OF NEGATIVE CONDUCTANCE DEVICES FROM MICROWAVE REFLECTION COEFFICIENTS - P. Huang, A. Botula, N.C. Luhmann, Jr, and D.S. Pan, UCLA, Los Angeles, CA 90024

SESSION F2

Mahimahi Room, 3rd Floor

Friday AM December 9, 1988

SEMICONDUCTORS

M. von Ortenberg, Presider

- F2.1** SUBMILLIMETER WAVE EMISSION FROM SEMICONDUCTOR SUPERLATTICES - (*Invited Keynote, 40 min*) - M. Helm, E. Colas, P. England, F. DeRosa, S.J. Allen, Jr, Bell Communications Research, Red Bank, NJ 07701-7020
- F2.2** FAR-INFRARED NON-ASTIGMATIC CZERNY-TURNER MONOCHROMETER FOR STRESSED Ge:Ga PHOTOCONDUCTOR EXPERIMENTS - N. Hiramoto and T. Itabe, Communications Research Laboratory, Koganei, Tokyo 184, Japan; H. Takami, Nat'l Astron. Sci; H. Okuda, H. Matsuhara, H. Shibai and T. Nakagawa, I Space & Astron Sci., Japan
- F2.3** HIGH FREQUENCY SEMICONDUCTOR HETEROSTRUCTURE DEVICE ANALYSIS - C.M. Krowne and G.B. Tait, NRL, DC
- F2.4** FAR INFRARED ABSORPTION SPECTRA OF AMORPHOUS (As₂S₃)-(Sb₂S₃) SEMICONDUCTORS AND THE SPATIAL CHARGE FLUCTUATION - K. Matsuishi, T. Anzaki, S. Onari and T. Arai, Inst of Applied Physics, U of Tsukuba, Tsukuba, Ibaraki 305, Japan
- F2.5** INFRARED ABSORPTION SPECTRUM OF Ge(Na) - L.T. Ho, Inst of Physics, Academia Sinica, Taipei, Taiwan, R.O.China
- F2.6** EFFECTS OF ANNEALING ON THE ELECTRICAL PROPERTIES OF Cd_{0.2}Hg_{0.8}Te GROWN BY LPE - I. Yasumura and K. Sato, Mitsubishi, Elec Corp, Amagasaki 661, Japan; Y. Yoshida and Y. Komine, Mitsubishi Elec Corp, Itami 664, Japan
- F2.7** MILLIMETER AND SUBMILLIMETER WAVE OPTICAL AND DIELECTRIC PROPERTIES OF SINGLE CRYSTAL HIGH PURITY SILICON - M.N. Afsar, Tufts U, Dept of EE, Medford, MA
- F2.8** INVESTIGATION OF ELECTRONIC SUB-BAND STRUCTURES IN PbTe/Pb_{1-x}Sn_x SUPERLATTICES BY SUB-MM MAGNETOABSORPTION SPECTRA - S. Shimomura, Y. Urakawa, S. Takaoka and K. Murase, Osaka U, Toyonaka 560, Japan
- F2.9** BAND EDGE STRUCTURE OF Pb_{1-x}Sn_xTe DOPED WITH INDIUM BY FAR-INFRARED MAGNETOPLASMA REFLECTION METHOD - S. Takaoka, S. Shimomura, H. Takahashi and K. Murase, Osaka U, Toyonaka 560, Japan
- F2.10** LOW FREQUENCY IMPURITY VIBRATION MODES IN II-VI SEMICONDUCTORS - W. Lu, H. Ye, W. Xu, S.C. Shen, and W. Giriat, Centra de Fisica, Caracas, Venezuela

SESSION F3

Papio Room, 3rd Floor

Friday AM December 9, 1988

LASERS III

J. R. Izatt, Presider

- F3.1** NOVEL ASPECTS OF FAR-INFRARED GAS LASERS (*Invited Keynote*) - F. K. Kneubühl, Infrared Physics Laboratory, ETH, 8093 Zurich, Switzerland
- F3.2** THEORY OF OPTICALLY PUMPED FAR INFRARED LASERS (*Invited Keynote*) - Y. Lin, Zhongshan University, Quanzhou, P.R.China
- F3.3** LINE SELECTION IN OFF-RESONANTLY PUMPED SYSTEMS (*Invited Keynote*) - M.A. Dupertuis, Swiss Federal Institute of Technology, Lausanne, Switzerland
- F3.4** THE INVERSE SMITH-PURCELL EFFECT AT SUBMILLIMETER WAVELENGTHS - J. Bae, K. Furuya, H. Shirai, T. Nishida, T. Nozokido, and K. Mizuno, Research Institute of Electrical Communication, Tohoku University, Sendai, 980 Japan
- F3.5** UNTUNED CAVITY RESONATOR FOR THE FAR INFRARED - Hong Tang and J.R. Izatt, Dept of Physics and Astronomy, U of Alabama, Tuscaloosa, AL 35487
- F3.6** COPPER AND MOLYBDENUM MIRRORS FOR HIGH POWER TEA CO₂ LASER - Y. Tsunawaki*, K. Yoshida**, K. Ohta***, S. Aramaki***, H. Okamoto***, M. Yamanaka** and S. Nakai**, *Dept of Elec Engr and Electronics, Osaka Industrial U, Nakagaito, Daito, Osaka 574, Japan; **Institute of Laser Engineering, Osaka U, Yamada-oka, Suita, Osaka 565, Japan; ***Central Research Laboratory, Nippon Mining Company, Toda, Saitama 335, Japan
- F3.7** DOUBLE-GRATING 10-ATMOSPHERE CO₂-TE LASER - W. Zhu and J.R. Izatt, Dept of Physics and Astronomy, U of Alabama, Tuscaloosa, AL 35487
- F3.8** MICROWAVE AND MILLIMETRE-WAVE SPECTRA OF ¹³CD₃OH - K.V.L.N. Sastry, I. Mukhopadhyay, R.M. Lees, J. VanderLinde and D. Donovan, Dept of Physics, U of N.B., Fredericton, N.B. Canada

SESSION F4

Ballroom (Makai), 7th Floor

Friday AM December 9, 1988

GYROTRON VI

M.Q. Tran, Presider

- F4.1** SOME PHYSICS ISSUES OF GYRO-TWT AND CARM AMPLIFIERS - (*Invited Keynote*) - K.R. Chu, Nat'l Tsing Hua U, Hsinchu, Taiwan, ROC; A.T. Lin, N.C. Luhmann, UCLA, CA
- F4.2** LARGE SIGNAL OPERATION OF A TAPERED GYRO-TWT AMPLIFIER - S.Y. Park*, R.H. Kyser**, C.M. Armstrong and R.K. Parker, NRL, Washington, DC; *Omega-P, New Haven, CT; **B-K Systems, Inc., Rockville, MD
- F4.3** HIGH CURRENT DENSITY CATHODES FOR MICROWAVE TUBES - M.E. Read and A.J. Dudas, Physical Sciences, Alexandria, VA; P. Oettinger, Thermo Electron, Waltham, MA
- F4.4** A NON-ADIABATIC ELECTRON GUN FOR GYROTRONS - B. Piosczyk, Kernforschungszentrum Karlsruhe, I fur Technische Physik, Postfach 3640, D-7500 Karlsruhe 1, Fed Rep Germany
- F4.5** FREQUENCY DOMAIN ANALYSIS OF A GYROTRON - E. Jensen and K. Schünemann, Technische U Hamburg-Harbury, Postfach 90 14 03, D-2100 Hamburg 90, West Germany
- F4.6** EXPERIMENTS WITH A 35 GHz CYCLOTRON AUTO-RESONANCE MASER (CARM) AMPLIFIER - G. Bekefi, A. DiRienzo, C. Leibovitch and B. Danly, MIT, Cambridge, MA
- F4.7** OPERATION OF HARMONIC GYROTRONS IN THE SUBMILLIMETER REGION - S. Spira, K.E. Kreischer and R.J. Temkin, MIT Plasma Fusion Center NW16, Cambridge, MA 02139
- F4.8** PARAMETER SPACE SEARCH FOR PENIOTRON MODES - V. Ayres, J.Y. Choe, K. Boulais, and H.S. Uhm, Naval Surface Warfare Center, Silver Spring, MD; S. Ahn and A. Ganguly, NRL
- F4.9** NON-LINEAR ANALYSIS OF A GYRO-PENIOTRON OSC. - P. Vitello, Science Applications Int'l, McLean, VA
- F4.10** PREBUNCHED HIGH HARMONIC GYROTRON - C.S. Kou, D.B. McDermott and N.C. Luhmann, Jr., UCLA, CA
- F4.11** LINEAR ANALYSIS OF THE HIGH-POWER MAGNETRON - R. Stark and H. Uhm, Silver Spring, MD

SESSION F5

Abi Room 3rd Floor

Friday PM

December 9, 1988

MMW DEVICES II

(15 minute papers, 1300 hours)

M. Frerking, *Presider*

- F5.1** DIRECT PROBING OF HIGH-FREQUENCY GaAs ICs BY PICOSECOND ELECTRO-OPTIC SAMPLING - *Invited Keynote* - R.K. Jain, Amoco Tech Co, PO Box 400, Naperville, IL 60566
- F5.2** INVERTED L DIELECTRIC GUIDE FOR MILLIMETER WAVE FREQUENCIES - A.K. Tiwari and R.P. Singh, Dept of Electron Engr, Maulana Azad College of Tech, BHOPAL - 462 007 (M.P) India
- F5.3** SYMMETRY AND PERIODICITY FOR MILLIMETER-WAVE DEVICES - W.N. Cain and R.W. Grow, Microwave Dev and Phys Electron, Dept of EE, U of Utah, Salt Lake City, UT 84112

SESSION F6

Mahimahi Room, 3rd Floor

Friday PM

December 9, 1988

MATERIALS CHARACTERIZATION II

(15 minute papers, 1300 hours)

K. Sakai, *Presider*

- F6.1** MILLIMETER WAVE CHARACTERIZATION OF HIGH T_c SUPERCONDUCTING MATERIALS - L. Wade, I. Galin, S. Gillespie, P. George, R. Haas, E. Witteles, Aerojet Electro Systems, 1100 W. Hollyvale St, P.O. Box 296, Azusa, CA 91702
- F6.2** MICROWAVE LOSSES IN HIGH-T_c SUPERCONDUCTING MICROSTRIP RING RESONATORS - J. Takemoto, F. Oshita, H. Fetterman, Dept Elec Engr, U of California, Los Angeles, CA 90024; P. Kobrin, E. Sovero, Rockwell Intl Science Ctr, 1049 Camino dos Rios, Thousand Oaks, CA 91360
- F6.3** MICROWAVE PHASE CONJUGATION IN ARTIFICIAL KERR MEDIA - R. Shih, H.R. Fetterman, B. Bobbs, Dept Elec Engr, U of California, Los Angeles, CA 90024; W.W. Ho, R. McGraw, D. Rogovin, Rockwell Intl Science Ctr, 1049 Camino dos Rios, Thousand Oaks, CA 91360
- F6.4** DIELECTRIC PROPERTIES OF COMPOSITE STRIPLINE/RADOME MATERIALS - R.L. Moore and A. MacDonald, GTRI, GA I of Tech, Atlanta, GA 30332
- F6.5** TEMPERATURE INDEPENDENT PERMITTIVITIES IN COMPOSITES OF TWO OR MORE DIELECTRICS - R.L. Moore and J. Estrada, GTRI, GA I of Tech, Atlanta, GA 30332
- F6.6** THEORY AND PRACTICE IN OPEN RESONATOR MEASUREMENTS OF MULTI-LAYER SAMPLES - T. Wells, GTRI, GA I of Tech, Atlanta, GA 30332
- F6.7** MAGNETOPOLARON EFFECTS IN CdTe - J. Oberti, M. Goiran, M. Bouchelagem, J. Léotin, Lab de Physique des Solides, associé au CNRS INSA, Ave de Rangueil, 31077 Toulouse-Cedex, France; R. Triboulet, Meudon, France
- F6.8** QUANTUM LIMIT ELECTRON-PHONON SCATTERING STUDIES IN SEMICONDUCTORS BY FAR-INFRARED CYCLOTRON RESONANCE - H. Kobori, T. Ohyama and E. Otsuka, College of General Education, Osaka Univ, Toyonaka, Osaka 560 Japan
- F6.9** FAR-INFRARED CYCLOTRON RESONANCE STUDIES OF IMPURITY SCATTERING IN Ge, GaAs AND InSb - H. Kobori, T. Ohyama and E. Otsuka, College of General Education, Osaka Univ, Toyonaka, Osaka 560, Japan
- F6.10** BROADBAND DIELECTRIC MEASUREMENTS WITH PICOSECOND TRANSIENT RADIATION - G. Arjavalingam, Y. Pastol, J.-M. Halbout and G.V. Kopcsay, IBM, P.O. Box 218, Yorktown, Heights, NY 10598
- F6.11** WAVEFRONT DIVIDING INTERFEROMETERS FOR INFRARED SYNCHROTRON RADIATION - K.D. Moeller*, D.P. Sidons, C.J. Hirschmugl, P. Petrone*, and G.P. Williams, Natl Synchrotron Light Source, Brookhaven Natl Lab, Upton, NY 11973; *Physics Dept, Fairleigh Dickinson U, Teaneck, NJ 07666

SESSION F7

Papio Room, 3rd Floor

Friday PM

December 9, 1988

ATMOSPHERIC PROPAGATION

(1300 hours; 15 minute papers)

K. J. Button, Presider

- F7.1** MILLIMETRE-WAVELENGTH PULSE PROPAGATION THROUGH THE EARTH'S ATMOSPHERE - C.J. Gibbins, Rutherford Appleton Lab, Chilton, Didcot, Oxfordshire, OX11 0QX, UK
- F7.2** STATISTICS OF PROPAGATION AT MILLIMETRIC, INFRARED AND OPTICAL WAVELENGTHS - C.J. Gibbins, Rutherford Appleton Lab, Chilton, Didcot, Oxfordshire, OX11 0QX, UK

SUBMILLIMETER WAVES

(15 minute papers; 1415 hours)

- F7.3** FAR-INFRARED DETECTOR USING $\text{BaPb}_{0.7}\text{Bi}_{0.3}\text{O}_3$ THIN FILM JOSEPHSON ELEMENT - A. Sawada, K. Sato, Y. Enomoto* and T. Murakami*, Synthetic Crystal Res Lab, Faculty of Engr, Nagoya Univ, Nagoya 464-01 Japan; *NTT Electrical Commctn Lab, Tokai, Ibaraki-ken 319-11 Japan
- F7.4** GaAs SCHOTTKY BARRIER MIXER DIODES FOR THE FREQUENCY RANGE FROM 1 - 10 THz - T.W. Crowe, Dept of Elec Engr, Thornton Hall, Univ of Virginia, Charlottesville, VA 22901
- F7.5** MICROWAVE ATTENUATION TECHNIQUES APPLICABLE TO INFRARED WINDOWS FOR USE ON ELECTRO-OPTICAL SENSORS - W. Hasan, The Perkin-Elmer Corp, 761 Main Ave, Norwalk, CT 06859
- F7.6** FABRICATION AND ANALYSIS OF GaAs SCHOTTKY BARRIER DIODES FABRICATED ON THIN MEMBRANES FOR TERAHERTZ APPLICATIONS - L.K. Seidel and T.W. Crowe, Dept of Elec Engr, Thornton Hall, Univ of Virginia, Charlottesville, VA 22901
- F7.7** WAVEFRONT DIVIDING INTERFEROMETERS FOR INFRARED SYNCHROTRON RADIATION - K.D. Moeller D.P. Sidons*, C.J. Hirschmugl*, P. Petrone and G.P. Williams*, National Synchrotron Light Source, Brookhaven Natl Lab, Upton, NY 11973; *Physics Dept, Fairleigh Dickinson Univ, Teaneck, NJ 07666
- F7.8** COHERENT MECHANICAL FIR DOPPLER SHIFTING FOR HETERODYNE APPLICATIONS - U.H.W. Lammers, R.A. Marr, J.B. Morris, Rome Air Development Center, Hanscom AFB, MA
- F7.9** DPR IN DyAl GARNET AT MM AND SUBMM WAVELENGTHS - P. Janssen, Lab Temperaturen en Hoge-Veldenfysica, Leuven, Belgium; W.P. Wolf, Yale Univ, Becton Ctr, New Haven, CT 06520

SESSION F8

Ballroom (Makai), 7th Floor

Friday PM

December 9, 1988

GYROTRON AND FREE ELECTRON LASERS

(15 minutes, 1300 hours)

K.R. Chu, Presider

- F8.1** CIRCULAR ELECTRIC HYBRID CAVITY FOR THE HARMONIC AUTO-RESONANT PENIOTRON (HARP) - J.M. Baird, R.C. Freudenberger, R.W. Grow, and L.R. Barnett, Dept Elec Engr, Univ of Utah, Salt Lake City, UT
- F8.2** SELF-CONSISTENT TRANSMISSION LINE ANALYSIS OF THE GYROTRON TRAVELING-WAVE AMPLIFIER - J.E. Arrington, R.W. Grow, J.M. Baird, and L.R. Barnett, Dept Elec Engr, Univ of Utah, Salt Lake City, UT
- F8.3** SIMULATION OF THE ELECTROSTATIC CYCLOTRON INSTABILITY ON AN ANNULAR ELECTRON BEAM - F.S. Kuo, Dept of Physics, Natl Central U, Chung-Li, Taiwan, R.O.China; K.R. Chu, Dept Physics, Natl Tsing Hua U, Hsinchu, Taiwan 30043, R.O.China
- F8.4** THE SURFACE-MATCHING METHOD FOR SOLVING PERIODIC AND HELICALLY-PERIODIC SLOW WAVE STRUCTURES FOR TRAVELING-WAVE SIMULATION - K.J. Bunch and R.W. Grow, Dept Elec Engr, Univ Utah, Salt Lake City, UT 84112
- F8.5** RADIATION PATTERNS WITH SUPPRESSED SIDELOBES FOR QUASI-OPTICAL MODE CONVERTERS - M. Thumm, L. Rebuffi*, H.J. Barkley, A. Jacobs, G.A. Müller, Inst für Plasmaforschung, Univ Stuttgart, Pfaffenwaldring 31, D-7000 Stuttgart 80, FRG
- F8.6** IN-WAVEGUIDE TE₀₁-TO-WHISPERING GALLERY MODE CONVERSION USING PERIODIC WALL PERTURBATIONS - M. Thumm and A. Jacobs, Univ Stuttgart, FRG
- F8.7** THE DIRECT CONVERSION TO A GAUSSIAN BEAM FROM TE₀₃ GYROTRON MODES - H.J. Barkley, Univ Stuttgart, FRG
- F8.8** SERPENTINE WAVEGUIDE TRAVELING WAVE TUBE (TWT) WITH FULL GAIN AND BROAD BANDWIDTH AT MILLIMETER WAVE FREQUENCIES - G. Dohler, D. Gallagher, R. Moats, Northrop Defense Syst Div, 600 University Dr, Arlington Heights, IL 60004
- F8.9** SPACE CHARGE EFFECTS IN THE BALLISTIC MODEL OF FREE ELECTRON LASER INTERACTIONS - G. Dohler, Northrop, IL.
- F8.10** WINDOW MATERIALS FOR 280 GHz CONTINUOUS WAVE GYROTRON - M.N. Afsar, Dept Elec Engr, Tufts Univ, Halligan Hall, Medford, MA and MIT/PFC
- F8.11** SMALL-SIGNAL ANALYSIS OF A FREE ELECTRON CYCLOTRON RESONANCE LASER - C. Wang, Res Lab of Microwave Electron, Chengdu I of Radio Engr, PRChina
- DESIGN AND OPERATION OF RIBBON BEAMS FOR GYROTRONS - A.M. Ferendeci, ECE Dept, Univ Cincinnati, Cincinnati, Ohio 45221