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1994
IEEE MTT-S
INTERNATIONAL MICROWAVE SYMPOSIUM
DIGEST

*1994 Microwave Symposium
Technical Program Schedule*



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1994 Microwave Symposium Technical Program Schedule

Session TU1A (Joint with MMWMCS) Signal Control Circuits Room 1

TU
1A

TU
1B

8:30 a.m.–10:00 a.m.

Tuesday, May 24, 1994

Chairman: T. Kemerley—Air Force Wright Laboratory
Co-Chairman: H. Huang—COMSAT Laboratories

TU1A-1	A Compact Wideband Balanced Mixer	5
8:30 a.m.	M.C. Tsai, M.J. Schindler, W. Struble, M. Ventresca, R. Binder, R. Waterman, and D. Danzilio	
TU1A-2	A Novel Planar Double-Balanced 6-18 GHz MMIC Mixer	9
8:50 a.m.	W.R. Brinlee, K.R. Varian, and A.M. Pavo	
TU1A-3	A Novel, Injection Locked Oscillator MMIC with Combined Ultra-Wide-Band Active Combiner/Divider and Amplifiers	13
9:10 a.m.	T. Tokumitsu, K. Kamogawa, I. Toyoda, and M. Aikawa	
TU1A-4	5 mW GaAs HBT Low Power Consumption X-Band Amplifier	17
9:30 a.m.	K.W. Kobayashi, A.K. Oki, L.T. Tran, D.K. Umemoto, and D.C. Streit	

Session TU1B Time Domain Methods Room 2

8:30 a.m.–10:00 a.m.

Tuesday, May 24, 1994

Chairman: P.P. Russe—Ferdinand Baun Institut

TU1B-1	Direct Derivation of the TLM Symmetrical Condensed Node from Maxwell's Equations Using Centered Differencing and Averaging	23
8:30 a.m.	H. Jin, R. Vahldieck, and J. Huang	
TU1B-2	Efficient 3D-SCN-TLM Diakoptics for Waveguide Components	27
8:50 a.m.	M. Righi and W.J.R. Hoefer	
TU1B-3	Efficient Modes Extraction and Numerically Exact Matched Sources for a Homogeneous Waveguide Cross-Section in a FDTD Simulation	31
9:10 a.m.	T.-W. Huang, B. Houshmand, and T. Itoh	
TU1B-4	A New Stable and Very Dispersive Boundary Condition for the FD-TD Method	35
9:30 a.m.	P.-Y. Zhao, J. Litva, and K.-L. Wu	
TU1B-5	Improvements of the 2-D-FDTD Method for the Simulation of Small CPWs on GaAs Using Time Series Analysis	39
9:40 a.m.	S. Hofschien and I. Wolff	
TU1B-6	Time Domain Simulation of Three Dimensional Microwave Structures by the Method of Characteristics	43
9:50 a.m.	N. Orhanovic and V.K. Tripathi	

Session TU1C

Optical Transmitters

Room 3

8:30 a.m.–10:00 a.m.

Tuesday, May 24, 1994

Chairman: Carol Gee—Ortel Corporation

TU1C-1	Distributed Microwave Effects in High Speed Semiconductor Lasers	49
8:30 a.m.	D.A. Tauber, R. Spickermann, R. Nagarajan, T.E. Reynolds, A.L. Holmes, Jr., and J.E. Bowers	
TU1C-2	AlGaAs/GaAs Ridge Waveguide Lasers on Semi-Insulating Substrate with Airbridged Contacts with 21 GHz Modulation Response Frequency	53
8:50 a.m.	H. Dong and A. Gopinath	
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9:00 a.m.	W. Freking, W. Yang, A. Ghiasi, and A. Gopinath	
TU1C-4	Close-in Carrier Phase Noise of Laser with Coherent Feedback	61
9:10 a.m.	T.-D. Ni, X. Zhang, and A.S. Daryoush	
TU1C-5	A CPW Phase Lock Loop for Diode-Laser Stabilization	65
9:20 a.m.	L. D'Evelyn, L. Hollberg, and Z.B. Popovic	
TU1C-6	Analysis of Harmonics, Compression, and Intermodulation Distortion in Quadratic Electro-optic Intensity Modulators	69
9:40 a.m.	C.L. Goldsmith, R. Magnusson, and K. Alavi	
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9:50 a.m.	Y. Kobayashi, Y. Akatsu, K. Nakagawa, Y. Imai, and H. Kikuchi	

Session TU1D

Sources and Control Components

Room 6C

8:30 a.m.–10:00 a.m.

Tuesday, May 24, 1994

Chairman: Bernard E. Sigmon—Motorola GSTG, Inc.

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8:30 a.m.	P. Onno, N. Jain, C. Souchuns, and J. Goodrich	
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8:50 a.m.	S.R. Mazumder and R.C. Waterman	
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Tuesday, May 24, 1994

Chairman: Lionel E. Davis—UMIST

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8:50 a.m.	N.W. Harris, J.A. Weiss, B. Lax, and G.F. Dionne	
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9:10 a.m.	C.R. Boyd, Jr.	
TU1E-4	Ferrite Phase Shifters Using Stress Insensitive Garnet Materials	113
9:30 a.m.	J.T. Vaughn, P.R. Cox, G.P. Rodrigue, and G.R. Harrison	

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TU
3A

Session TU2G (Plenary)

Waves and Microwaves

Room 6B

10:15 a.m.–12:00 noon

Tuesday, May 24, 1994

Session TU3A (Joint with MMWMCS)

Millimeter-Wave Receiver MMICs

Room 1

1:30 p.m.–3:00 p.m.

Tuesday, May 24, 1994

Chairman: Hing-Loi A. Hung—Raytheon Co.

Co-Chairman: Marvin Cohn—Westinghouse Electric Corporation

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2:10 p.m.	H. Blanck, S.L. Delage, S. Cassette, E. Chartier, D. Floriot, M.-A. Poisson, C. Brylinski, D. Pons, P. Roux, P. Bourne, and P. Quentin	
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1:30 p.m.–3:00 p.m.

Tuesday, May 24, 1994

Chairman: Michael Dydyk—Motorola

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Tuesday, May 24, 1994

Chairman: Norman Dietrich—AT&T Bell Laboratories

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Session TU3D

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1:30 p.m.—3:00 p.m.

Tuesday, May 24, 1994

Chairman: J.B. Horton—TRW

- TU3D-1** **Welcome**
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- TU3D-2** **Keynote Address: Return to Yesteryear—Evolution of a Book**
1:50 p.m. Bob Wenzel
- TU3D-3** **Featured Speakers**
2:10 p.m. Seymour Cohn, George Matthaei, Leo Young, Ted Jones, Bud Crystal, Ralph Levy, and Clark Bell
- TU3D-4** **Closing Remarks: The Future—Prognosis for the Book**
3:10 p.m. Jerry Fiedziusko

Session TU3E

Superconducting Components and Subsystems Room 6D

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Tuesday, May 24, 1994

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Session TU3F

Open Forum I

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Tuesday, May 24, 1994

Chairman: Jitendra Goel—TRW

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Session TU4A

(Joint with MMWMCS)

Novel Monolithic Technology

Room 1

3:30 p.m.–5:00 p.m.

Tuesday, May 24, 1994

Chairman: Tom Midford—Hughes GaAs Operations
Co-Chairman: Roger Sudbury—MIT Lincoln Laboratory

TU4A-1 3:30 p.m.	A Broadband, Planar, Monolithic Resistive Frequency Doubler S.A. Maas and Y. Ryu	443	
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TU4A-3 4:10 p.m.	Ka-Band GaAs HBT PIN Diode Switches and Phase Shifters D. Teeter, R. Wohlert, B. Cole, G. Jackson, E. Tong, P. Saledas, M. Adlerstein, M. Schindler, and S. Shanfield	451	TU 4A
TU4A-4 4:30 p.m.	35 GHz Pulsed HBT MMIC Amplifiers R.M. Wohlert, G. Jackson, and M.G. Adlerstein	455	
TU4A-5 4:50 p.m.	A Monolithic 2-52 GHz HEMT Matrix Distributed Amplifier in Coplanar Waveguide Technology R. Heilig, D. Hollmann, and G. Baumann	459	

Session TU4B

New Guided-Wave Structures and Phenomena Room 2

3:30 p.m.–5:00 p.m.

Tuesday, May 24, 1994

Chairman: Song-Tsuen Peng—National Chiao Tung University

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|------------------|---|------------|
| TU4B-1 | Propagation Characteristics of TE-Waves Guided by Thin Films Bounded by Nonlinear Media | 465 |
| 3:30 p.m. | J.-G. Ma and I. Wolff | |
| TU4B-2 | Properties of NRD-Guide and H-Guide Higher-Order Modes: Physical and Nonphysical Ranges | 469 |
| 3:50 p.m. | C. Di Nallo, F. Frezza, A. Galli, P. Lampariello, and A.A. Oliner | |
| TU4B-3 | Full-Wave and Experimental Investigations of Resonant and Leaky Phenomena of Microstrip Step Discontinuity Problems With and Without Top Cover | 473 |
| 3:50 p.m. | W.-T. Lo, C.-K.C. Tzuang, S.-T. Peng, and C.H. Lin | |
| TU4B-4 | Terahertz-Bandwidth Characterization of Coplanar Waveguide on Dielectric Membrane via Time-Domain Electro-Optic Sampling | 477 |
| 4:30 p.m. | H. Cheng, J.F. Whitaker, T.M. Weller, and L.P.B. Katehi | |

Session TU4C

Lightwave Communications Systems and Components Room 3

3:30 p.m.–5:00 p.m.

Tuesday, May 24, 1994

Chairman: P.R. Herczfeld—Drexel University

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|------------------|--|------------|
| TU4C-1 | Fibre-Optical Technologies for 30/60 GHz Pico-Cellular PCN and Mobile Systems | 483 |
| 3:30 p.m. | R. Heidemann, R. Hofstetter, and H. Schmuck | |
| TU4C-2 | Cascaded External Optical Modulation Link for Radio Distribution | 487 |
| 3:50 p.m. | H. Ogawa, K. Horikawa, and Y. Nakasuka | |
| TU4C-3 | Highly Linear and Transparent 3-18 GHz Optical Microwave Link | 491 |
| 4:10 p.m. | T.N. Nielsen, U. Gliese, K.E. Stubkjaer, T. Christensen, and H. Hoegh | |
| TU4C-4 | Balanced Cascaded Optical Intensity Modulator Links for Frequency Multiplexing and Mixing | 495 |
| 4:30 p.m. | Y. Nakasuga, K. Horikawa, and H. Ogawa | |
| TU4C-5 | A 2-10 GHz GaAs MMIC Opto-Electronic Phase Detector for Optical Microwave Signal Generators | 499 |
| 4:50 p.m. | M. Bruun, U. Gliese, A.K. Petersen, T.N. Nielsen, and K.E. Stubkjaer | |