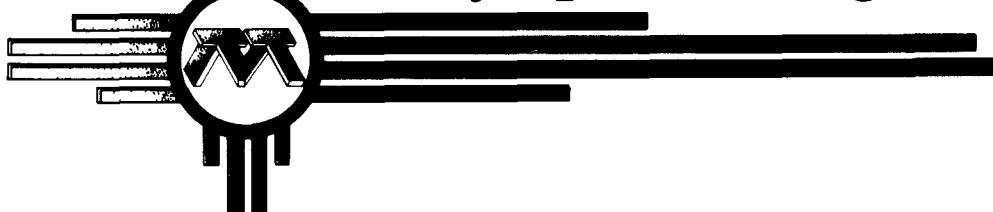


1992 IEEE  **International Microwave
MTT-S Symposium Digest**



Panel Sessions

Workshops

MTT-S Panel Sessions

PSF: Technology Transfer

Date: June 4, 1992
Time: 11:30 a.m.–1:00 p.m.
Location: To Be Announced
Sponsor: IMP 1992 Steering Committee
Organizers: Robert L. Hutchins, BDM
Shyam H. Gurbaxani, UNM and USAF Phillips Laboratory

Abstract:

Recent international business and political developments have produced fundamental changes in the role of national laboratories. The State of New Mexico with its DOE and DOD laboratories—LANL, SNL, USAF Phillips Lab, WSMR, and others—has played a key role in the legislation and implementation of Technology Transfer. A distinguished panel of scientists and administrators along with some invited papers will present the status of this newly evolving subject.

MTT-S IMS Workshops

The workshop format includes invited speakers discussing a variety of topics. Participation by the workshop attendees is encouraged by providing an adequate period of time after each invited talk for discussion pertaining to that talk. Attendees are encouraged to bring a few viewgraphs to assist in "making a point."

Workshops

WSH: Role of Concurrent Design Engineering in Microwave Systems Design

Date: June 5, 1992
Time: 8:30 a.m.–5:30 p.m.
Location: Dona Ana Room—Convention Center
Sponsors: MTT-1 Microwave Computer-Aided Design
MTT-16 Microwave Systems
MTT-17 Manufacturing
Organizers: Ravender Goyal, Mentor Graphics Corp.
Jitendra Goel, TRW
Speakers: Don Carter, Mentor Graphics Corp.
Elliot Cohen, DARPA
Barry Perlman, US LABCOM
Jim Solomon, Cadence

Abstract:

The evolution of CAE and CAD tools has made possible Integrated Circuit and Hybrid designs of increasing complexity, but these advances have been accompanied by greater difficulty at the production and test stages. Under these circumstances design engineers need to combine and balance creativity and real-world constraints in an enhanced (design-to-delivery) concurrent engineering process. The purpose of this workshop will be to address the following topics:

1. Introduction: Concepts of concurrent design engineering (CDE)
2. Implementation of CDE concepts in Electronic Systems Design
3. Software tools for CDE: Present status
4. Design flow in microwave systems design
5. Application of CDE in microwave system design

Workshops

WSI: MMIC Design Techniques for First-Pass Success

Date: June 5, 1992
Time: 8:30 a.m.–5:30 p.m.
Location: San Miguel Room—Convention Center
Sponsor: MTT-15 Microwave Field Theory
MTT-6 Microwave and Millimeter-Wave Integrated Circuits
MTT-1 Microwave Computer-Aided Design
Organizers: Arvind K. Sharma, TRW/ESG
Prof. Tatsuo Itoh, University of California
Speakers: Barry S. Perlman, U.S. Army ETDL
Anthony M. Pavio, Texas Instruments
Robert A. Pucel, Raytheon
Inder J. Bahl, ITT
Allen Podell, Pacific Monolithics
Barry R. Allen, TRW
Yi-Chi Shih, Hughes Aircraft Co.
Walter R. Curtice, Walter R. Curtice Consulting

Abstract:

Recent advances in GaAs devices and processing technology have made monolithic microwave and millimeter-wave integrated circuit (MMIC) technology suitable for various military and space communication systems. However, their applicability and affordability require considerable emphasis on their producibility. Successful technology insertions require design of high performance circuits which will pass the performance window with maximum yield.

The concept of manufacturing based MMIC design requires maintaining a balance between performance and manufacturing—referred to as producibility engineering. It requires careful consideration in the areas of processing, device characterization and modeling, circuit simulation tools to accurately predict the performance of MMICs prior to fabrication. Appropriate design methodologies are required to reduce the number of design iterations and to obtain the prescribed performance in just one iteration, or alternatively, achieve FIRST-PASS success.

In the first session of the workshop, in-depth tutorial discussions as well as state-of-the-art reviews on analytical and numerical techniques, empirical modeling and experimental characterization of active devices as well as passive structures will be presented. Both linear and nonlinear device modeling including parameter extraction and determination of scalable equivalent circuits will be discussed for MESFETs, HEMTs, and HBTs. For lumped, distributed, interacting as well as design-specific passive structures frequently used in MMICs, various analytical and numerical techniques including the use of various available electromagnetic simulators will be discussed. In addition, the workshop will focus on recent computer aided design techniques to enhance the simulation accuracy on linear and nonlinear microwave circuits.

Workshops

WSK: CAD of Nonlinear Microwave Circuits Using Field Theoretical Methods

<i>Date:</i>	June 5, 1992
<i>Time:</i>	8:30 a.m.–5:30 p.m.
<i>Location:</i>	Mesilla Room—Convention Center
<i>Sponsors:</i>	MTT-1 Computer Aided Design
<i>Organizers:</i>	K. C. Gupta, University of Colorado at Boulder Chris Snowden, University of Leeds, England Ingo Wolff, Duisburg University, Germany
<i>Speakers:</i>	I. Wolff C. Snowden Y. L. Chow W. R. L. Hoefer D. Wilson K. C. Gupta

Abstract:

During the last several years, much effort has been spent on the separate development of software for analyzing linear passive circuits using field theoretical approaches and nonlinear circuits using network theoretical background. Both areas are now well developed:

For the passive linear circuit design powerful methods like the finite difference time domain technique or the spectral domain analysis with roof-top function current description enable the analyze of circuit components, circuits with arbitrary metallization structures and three-dimensional component structure. In nonlinear microwave circuit design, the harmonic balance technique in particular has been developed to a high standard. In parallel time-domain analysis techniques are available, but they still have certain restrictions in their applicability to microwave problems. The analysis on nonlinear active circuits is based on nonlinear equivalent circuit models and more recently advanced physical device models.

The next natural step in microwave and millimeterwave circuit design must be the combination of linear passive and nonlinear active circuit design to produce a circuit design tool which is based on a field theoretical background and has full access to available nonlinear design techniques. It shall be the aim of the proposed workshop to demonstrate the latest state-of-the-art in the approach and to show new directions for the future. The emphasis will be upon three main aspects:

- Discussion of those field theoretical methods and active device models which are suitable for integration in a nonlinear design process, especially dividing into time-domain and frequency domain techniques.
- Discussion of nonlinear design techniques available for application in microwave circuit design and their applicability to distributed circuit design.
- Combinations of variations of the above discussed techniques to a combined, fullwave nonlinear circuit analysis.

Workshops

WSL: Visit to the Very Large Array Radio Telescope

Date: June 5, 1992
Time: 8:30 a.m.–5:30 p.m.
Location: VLA Site Visit—Busing arranged at registration
Sponsor: IMS 1992 Steering Committee
Organizer: P. Napier, National Radio Astronomy Observatory
Shyam Gurbaxani, Univ. of New Mexico and USAF Phillips Lab
Speakers: P. Napier
R. Norrod
W. Brundage
R. Perley

Abstract:

The VLS is a Y shaped array of twenty-seven 25 m diameter antennas located on the Plains of San Augustine 200 km SW of Albuquerque. The antennas can be moved on rail mounted transporters into any of four different array sizes in which the arms of the Y are 600 m, 1.9 km, 6.4 km or 21 km long. Communication between the antennas and the central control building is provided by buried 60 m diameter circular waveguide operating in the low-loss TE_01 mode.

This workshop focuses on the applications of microwave technology to radio astronomy. In particular we will concentrate on the frequency range 75 MHz to 43 GHz. Short talks will be given on the design of various aspects of large arrays including array geometry, high-performance frequency-flexible antennas, cryogenic HEMT receivers, high phase stability LO, distribution systems, and data processing algorithms for self calibrating the phase of the array elements.

Workshops

WSM: Phased Arrays: A Technology Assessment

Date: June 5, 1992
Time: 8:30 a.m.–5:30 p.m.
Location: Cimarron Room—Convention Center
Sponsors: MTT-1 Microwave Computer Aided Design
MTT-3 Lightwave Technology
MTT-6 Microwave & Millimeter-Wave Integrated Circuits
MTT-11 Microwave Measurements
Organizers: Richard A. Sparks
Barry Perlman
Speakers: Dr. Eli Brookner, Raytheon
Richard Sparks, Raytheon
Toshikazu Tsukii, Raytheon
Dr. Gailon Brehm, T.I.
Dr. Doug Maki, M/A-Com
Frank Sullivan, Raytheon
John Barr, Hewlett-Packard
Gary Lewis, ITT-GTC
Prof. Peter Herczfeld, Drexel University
Prof. K. C. Gupta, University of Colorado
Prof. Ingo Wolff, University of Duisburg (tentative)
Dr. Madhu Gupta, Hughes Aircraft Company

Abstract:

This one day workshop will address emerging technologies that are relevant to both active and passive phased arrays and their implementation. Speakers from several MTT-S Technical Committees will discuss the impact that recent developments in CAD software, monolithic devices and circuits and measurements techniques will have on the design, manufacture and testing of future phased arrays. An assessment of current array systems will be presented and the application potential of lightwave technology to array antennas will be reviewed.

Workshops

WSN: Cost and Producibility of Ferrite Components

Date: June 5, 1992
Time: 8:30 a.m.–12:30 p.m.
Location: Pecos Room—Convention Center
Sponsor: MTT-S 13 Microwave Ferrites
Organizers: W. Hord, Microwave Applications Group
A. Beyer, University of Duisburg
Speakers: L. Davis, University of Manchester, England
E. Schloemann, Raytheon
P. Cetnar, General Electric Aerospace Co.
D. Webb, Naval Research Laboratory
K. Ivanov, Academy of Sciences, Bulgaria
P. Cox and T. Taylor, Electromagnetic Sciences Co.

Abstract:

The purpose of this workshop is to explore those factors affecting the cost, performance and producibility of ferrite components. This will provide a forum for the interchange of information between component designers and system designers. A presentation of models suitable for CAD ferrite components will be followed by discussions on CAM and automated testing for medium (up to 5000 pieces) and large (greater than 5000 pieces) production.