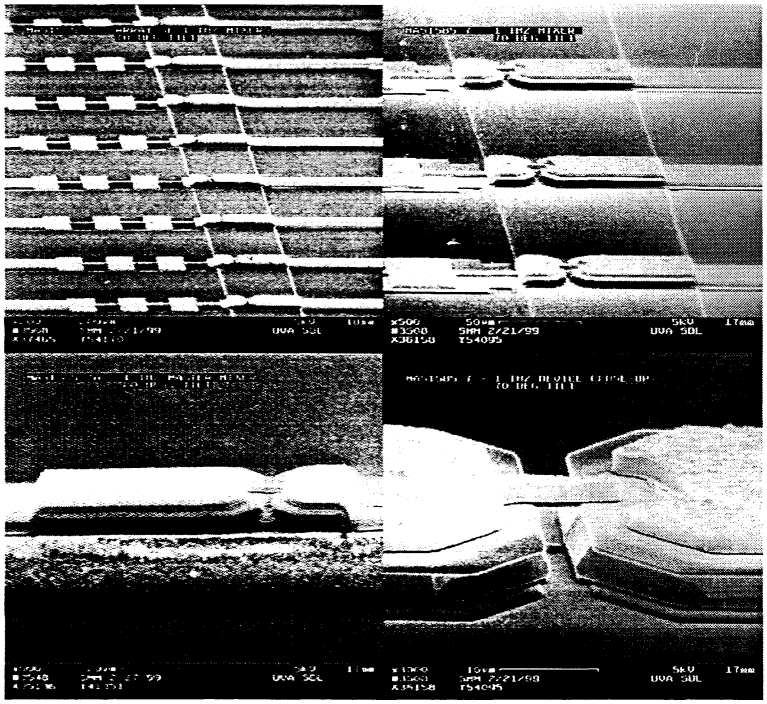
PROCEEDINGS

Tenth International Symposium on Space Terahertz Technology

March 16 – 18, 1999

On the Grounds of
The University of Virginia
Charlottesville, Virginia



GaAs Mixers Integrated on a Quartz Substrate

Organized by: University of Virginia, Applied Electrophysical Laboratory

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Organizing Committee

Thomas W. Crowe, University of Virginia
Robert M. Weikle, II, University of Virginia

PREFACE

The Tenth International Symposium on Space Terahertz Technology was held on the Grounds of the University of Virginia on March 16-18, 1999. A total of sixty-two papers were presented, including thirteen poster papers. There were about 150 attendees from over a dozen countries representing academia, industry and national laboratories. The topics ranged from terahertz mixers and sources through new circuit architectures, materials and antennas. Continuing a recent trend, research on Hot Electron Bolometric Mixers contributed the most papers. However, SIS mixers remain dominant below about 1 THz and Schottky mixers continue to improve for applications that either can not afford or do not require cooling. Although there continues to be much work on terahertz sources, including frequency multipliers, flux-flow oscillators and photomixers, this remains the major obstacle to greater implementation of terahertz technology. Clearly, new ideas are still needed and the existing technologies must be better supported if they are to reach their full potential in time for major upcoming programs such as ESA's Far-Infrared and Submillimeter Telescope and NRAO's Millimeter Array.

Recently, there has been much discussion about the future of the symposium. Although there is strong consensus that it provides a vital service to the community and should continue, it lacks a strong base of administrative support. To address this problem, we have formed an administrative steering committee consisting of the six most recent conference hosts. These include Gabriel Rebeiz, Jonas Zmuidzinas, Robert Weikle, Ray Blundell, Rob McGrath and Tom Crowe. The first action of the committee has been to approve Jack East of the University of Michigan as the host of the eleventh symposium to be held in May 2000. Other issues to be addressed include an organized method to determine future sites, possible extension of the symposium beyond space applications and reaching out to include the direct detector community or pulsed terahertz technology. We also must consider forging closer ties to agencies that have supported the symposium, such as NASA and IEEE, as well as other agencies. If you have any suggestions with regard to these or other STT issues, please forward them to any member of the steering committee.

Thomas W. Crowe
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The SEMs on the cover show several views of GaAs mixer circuits integrated on a quartz substrate by the MASTER process, courtesy S.M. Marazita, University of Virginia.

Due to a printer's error, page 47 was duplicated on page 28. Therefore, all page numbers after page 28 are off by one.

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DAY 1 – TUESDAY, MARCH 16

Opening Session

Welcoming Remarks	Tom Crowe	UVa	

Session 1: Sources 1 — **Chair: Phil Koh**

Time Resolved Measurements of Flux-Flow Oscillator Linewidth	U. Mueller, K. Jacobs	KOSMA, U. Cologne	13
Design of a Distributed Terahertz Photomixer	E. Duerr, K. McIntosh, S. Verghese	MIT	28
Traveling-Wave Photomixers Based On Noncollinear Optical/Terahertz Phase-Matching	S. Matsuura, G. Blake, J. Pearson, R. Wyss, C. Kadow, A. Jackson, A. Gossard	Caltech, JPL, UCSB	37
Heterostructure Barrier Varactors on Copper Substrate for Generation of Millimeter- and Submillimeter-Waves	L. Dillner, J. Stake, S. Hollung, C. Mann, E. Kollberg	Chalmers, RAL	47
The Complete Analytical Simulation of Heterostructure Barrier Varactor Frequency Multipliers	L. Dillner, M. Oldfield, C. Mann B. Alderman	Chalmers, RAL, U. Nottingham	57

Session 2: Schottky Mixers — **Chair: Richard Bradley**

177-207 GHz Radiometer Front End, Single-Side-Band Measurements	I. Galin, C. Schnitzer, R. Dengler,O. Quintero	Aerojet, JPL	69
Progress in Submillimeter Wavelength Integrated Mixer Technology	S. Marazita, K. Hui, J. Hesler, W. Bishop, T. Crowe	UVa	73
Anti-Parallel Planar Schottky Diodes for Subharmonically-Pumped 220 GHz/Mixer	C.-I. Lin, M. Rodriguez-Girones, A. Simon, J. Zhang, P. Piironen, V. Mottonen, J. Louhi,	Darmstadt, HUT	85

Day 3 – Wednesday, March 18

Session 9: Sources II — **Chair: Gerhard Schwaab**

Session 10: Circuits and Components — **Chair: Sigfrid Yngvesson**

Session 11: HEB III – Analysis **Chair: Stafford Withington**