

PROCEEDINGS OF SPIE

***Terahertz, RF, Millimeter, and
Submillimeter-Wave Technology
and Applications XIX***

**Laurence P. Sadwick
Tianxin Yang**
Editors

**19–22 January 2026
San Francisco, California, United States**

Sponsored and Published by
SPIE

Volume 13895

Proceedings of SPIE 0277-786X, V. 13895

SPIE is an international society advancing an interdisciplinary approach to the science and application of light.

The papers in this volume were part of the technical conference cited on the cover and title page. Papers were selected and subject to review by the editors and conference program committee. Some conference presentations may not be available for publication. Additional papers and presentation recordings may be available online in the SPIE Digital Library at SPIDigitalLibrary.org.

The papers reflect the work and thoughts of the authors and are published herein as submitted. The publisher is not responsible for the validity of the information or for any outcomes resulting from reliance thereon.

Please use the following format to cite material from these proceedings:

Author(s), "Title of Paper," in *Terahertz, RF, Millimeter, and Submillimeter-Wave Technology and Applications XIX*, edited by Laurence P. Sadwick, Tianxin Yang, Proc. of SPIE 13895, Seven-digit Article CID Number (DD/MM/YYYY); (DOI URL).

ISSN: 0277-786X

ISSN: 1996-756X (electronic)

ISBN: 9781510697072

ISBN: 9781510697089 (electronic)

Published by

SPIE

P.O. Box 10, Bellingham, Washington 98227-0010 USA

Telephone +1 360 676 3290 (Pacific Time)

SPIE.org

Copyright © 2026 Society of Photo-Optical Instrumentation Engineers (SPIE).

Copying of material in this book for internal or personal use, or for the internal or personal use of specific clients, beyond the fair use provisions granted by the U.S. Copyright Law is authorized by SPIE subject to payment of fees. To obtain permission to use and share articles in this volume, visit Copyright Clearance Center at copyright.com. Other copying for republication, resale, advertising or promotion, or any form of systematic or multiple reproduction of any material in this book is prohibited except with permission in writing from the publisher.

Printed in the United States of America by Curran Associates, Inc., under license from SPIE.

Publication of record for individual papers is online in the SPIE Digital Library.

**SPIE. DIGITAL
LIBRARY**

SPIDigitalLibrary.org

Paper Numbering: A unique citation identifier (CID) number is assigned to each article in the Proceedings of SPIE at the time of publication. Utilization of CIDs allows articles to be fully citable as soon as they are published online, and connects the same identifier to all online and print versions of the publication. SPIE uses a seven-digit CID article numbering system structured as follows:

- The first five digits correspond to the SPIE volume number.
- The last two digits indicate publication order within the volume using a Base 36 numbering system employing both numerals and letters. These two-number sets start with 00, 01, 02, 03, 04, 05, 06, 07, 08, 09, 0A, 0B ... 0Z, followed by 10-1Z, 20-2Z, etc. The CID Number appears on each page of the manuscript.

Contents

vii *Conference Committee*

MATERIALS FOR THZ AND GHZ DEVICES I

- 13895 02 **High-Q enhancement of all-dielectric guided-mode resonance using 3D printing (Invited Paper)** [13895-2]

MATERIALS FOR THZ AND GHZ DEVICES II

- 13895 03 **Wideband dielectric rod antenna implemented on FR-4 substrate for THz application** [13895-3]
- 13895 04 **Highly-selective dual-band Terahertz metamaterial absorber with integrated circular splitting resonators** [13895-4]
- 13895 05 **Comprehensive designs and analyses of multiband terahertz metamaterial absorbers based on MIM structures** [13895-5]
- 13895 06 **Encryption of 300 GHz-band wireless signal using optical vector modulator-type encoder** [13895-7]

TERAHERTZ SOURCES I

- 13895 07 **A compact and tunable 0.285 THz source using a six-section constructive wave oscillator** [13895-8]
- 13895 08 **Long-distance dissemination of highly-stable comb-rooted terahertz waves for next generation communication** [13895-10]
- 13895 09 **Output power of laser chaos excited THz wave using chaotic supremacy** [13895-11]

DETECTORS AND SENSORS II

- 13895 0A **Silicon photonic crystal emitter for multigas sensing** [13895-16]
- 13895 0B **Scalable silicon-integrated antenna-coupled terahertz detectors in BiCMOS for broadband imaging and spectroscopy** [13895-18]

RF, SUB-MILLIMETER-WAVE I

- 13895 0C **Generation of terahertz wave by multiplying microwaves generated by optical beats** [13895-19]
- 13895 0D **Toward scalable photonic RF front-ends: stability and thermal management in multicarrier generation for satellite flexible payloads** [13895-20]
- 13895 0E **CMOS-fabricated electro-optomechanical microdisk resonator with DC-tunable mechanical dissipation** [13895-22]

RF, SUB-MILLIMETER-WAVE II

- 13895 0F **Comparison between the FMCWs in microwave domain generated by a pure electrical equipment and a hybrid opto-electronic system (Invited Paper)** [13895-23]

TERAHERTZ SOURCES AND DETECTORS

- 13895 0G **Fast estimation of dispersion curves of different modes of corrugated cylindrical waveguides using analytical models for terahertz particle accelerators** [13895-50]
- 13895 0H **On the impact of imperfect polarizers for the calibration of polarimetric terahertz systems** [13895-31]
- 13895 0I **Design and application of hybrid terahertz metasurface for selective target detection in complex biochemical systems** [13895-32]

SPECTROSCOPY, IMAGING, SIMULATIONS AND MODELING

- 13895 0J **Smart Cities: visible light communication and deep reinforcement learning for intelligent traffic systems** [13895-29]
- 13895 0K **Microwave technologies: development, simulation, and application in material processing and recycling** [13895-30]
- 13895 0L **Evaluation of mixed plastics by terahertz wave** [13895-33]

TERAHERTZ DIFFRACTION, REFLECTOMETRY, AND SPECTROSCOPY

- 13895 0M **Guided terahertz reflectometry for inline quality assessment of solder joints: concept and modeling approach (Invited Paper)** [13895-47]
- 13895 0N **Terahertz emission spectroscopy on pn junctions (Invited Paper)** [13895-48]

IMAGING AND COMPUTER VISION

- 13895 OO **Limited angle phase-contrast Terahertz tomography** [13895-35]
- 13895 OP **High-speed optical scanning system for terahertz radiation with 10x10mm² scan field, 23mm working distance and 10kHz repetition rate** [13895-36]

DETECTORS AND SENSORS SPECTROSCOPY AND IMAGING

- 13895 OQ **Nanometer-precision wafer thinning monitoring via comb-based terahertz Fabry-Pérot interferometry** [13895-38]
- 13895 OR **A new method of terahertz detection based on photoluminescence modulation** [13895-39]

POSTER SESSION

- 13895 OS **Improvement of ranging precision in a FMCW LiDAR by digital Kalman filtering** [13895-42]
- 13895 OT **Development of composite feedstocks as a preliminary step toward additive manufacturing of high refractive index fibers for terahertz applications** [13895-44]
- 13895 OU **Analysis of frequency response of completely aerosol jet printed CNTFET as a switch** [13895-45]
- 13895 OV **Terahertz optical response of silicone-based polymers: chain-length effects and backbone-dependent molecular interactions** [13895-51]

DIGITAL POSTER SESSION

- 13895 OW **Improved design of mmWave test structures for BEoL varactors based on HfO₂/ZrO₂ superlattice** [13895-6]