

PROCEEDINGS OF SPIE

Terahertz Emitters, Receivers, and Applications XIII

Manijeh Razeghi
Alexei N. Baranov
Editors

21–22 August 2022
San Diego, California, United States

Sponsored and Published by
SPIE

Volume 12230

Proceedings of SPIE 0277-786X, V. 12230

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 Emitters, Receivers, and Applications XIII*, edited by Manijeh Razeghi, Alexei N. Baranov, Proc. of SPIE 12230, Seven-digit Article CID Number (DD/MM/YYYY); (DOI URL).

ISSN: 0277-786X

ISSN: 1996-756X (electronic)

ISBN: 9781510654440

ISBN: 9781510654457 (electronic)

Published by

SPIE

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

Telephone +1 360 676 3290 (Pacific Time)

SPIE.org

Copyright © 2022 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

v *Conference Committee*

SESSION 1 THZ DETECTION AND IMAGING

- 12230 02 **Laser terahertz emission microscopy for silicon electronics (Invited Paper)** [12230-2]
- 12230 04 **Low-noise terahertz-wave detection by Fermi-level managed barrier diode (Invited Paper)** [12230-5]
- 12230 05 **Plasmon mediated terahertz frequency response with AuGe self-assembled hole-arrays over gallium arsenide** [12230-3]

SESSION 2 SOURCES OF THZ RADIATION

- 12230 06 **High power, room temperature, terahertz sources, and frequency comb based on difference-frequency generation at CQD (Keynote Paper)** [12230-6]
- 12230 07 **Bias-free GeSn terahertz large area emitter on Si substrate** [12230-8]

SESSION 3 THZ AND MICROWAVE COMMUNICATIONS

- 12230 0A **Bridging the 100 GHz-10 THz domain with unipolar quantum optoelectronics (Invited Paper)** [12230-10]
- 12230 0B **Design concept of a low-terahertz imaging radar** [12230-11]
- 12230 0C **Ultra-low noise 300 GHz signal generation with a Kerr soliton comb (Invited Paper)** [12230-12]
- 12230 0D **Triple barrier resonant tunneling diodes for THz emission and sensing (Invited Paper)** [12230-13]

SESSION 4 SPECTROSCOPY AND BIOMEDICAL APPLICATIONS

- 12230 0E **On the study of the THz metamaterials to deal with the dielectric response of the cancerous biological tissues (Invited Paper)** [12230-14]
- 12230 0H **Long-range electrodynamic interactions between proteins assessed by THz spectroscopy (Invited Paper)** [12230-23]

SESSION 5 NEW TRENDS IN THZ TECHNOLOGY

12230 0I **Recent progress in the development of grating-gate InGaAs-channel HEMTs for fast and sensitive THz detection (Invited Paper) [12230-18]**

12230 0J **Silicon-based all-electronic quasi-optical pairs for THz frequency range (Invited Paper) [12230-20]**

POSTER SESSION

12230 0L **Terahertz data analysis for the design and characterization of thin films [12230-22]**

12230 0M **Optical properties in the THz band of polymeric materials under different 3D printing specifications [12230-15]**