PROCEEDINGS OF SPIE

Silicon Photonics XVI

Graham T. Reed Andrew P. Knights Editors

6–11 March 2021 Online Only, United States

Sponsored and Published by SPIE

Volume 11691

Proceedings of SPIE 0277-786X, V. 11691

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

Silicon Photonics XVI, edited by Graham T. Reed, Andrew P. Knights, Proc. of SPIE Vol. 11691, 1169101 · © 2021 SPIE · CCC code: 0277-786X/21/\$21 · doi: 10.1117/12.2596641

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 SPIEDigitalLibrary.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 *Silicon Photonics XVI*, edited by Graham T. Reed, Andrew P. Knights, Proceedings of SPIE Vol. 11691 (SPIE, Bellingham, WA, 2021) Seven-digit Article CID Number.

ISSN: 0277-786X

ISSN: 1996-756X (electronic)

ISBN: 9781510642171

ISBN: 9781510642188 (electronic)

Published by

SPIE

P.O. Box 10, Bellingham, Washington 98227-0010 USA
Telephone +1 360 676 3290 (Pacific Time) · Fax +1 360 647 1445

SPIE.org

Copyright © 2021, Society of Photo-Optical Instrumentation Engineers.

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 copying fees. The Transactional Reporting Service base fee for this volume is \$21.00 per article (or portion thereof), which should be paid directly to the Copyright Clearance Center (CCC), 222 Rosewood Drive, Danvers, MA 01923. Payment may also be made electronically through CCC Online 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. The CCC fee code is 0277-786X/21/\$21.00.

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.



Paper Numbering: Proceedings of SPIE follow an e-First publication model. A unique citation identifier (CID) number is assigned to each article 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

WAVEGUIDES 11691 04 Polarization splitters for micron-scale silicon photonics [11691-1] 11691 05 A wideband polarization rotator-splitter based on imec iSiPP50G silicon photonics platform [11691-2] 11691 06 Performance of an a-Si:H MMI multichannel beam splitter analyzed by computer simulation [11691-3] 11691 07 High performance optical filters based on advanced coupled Sagnac loop waveguide reflector structures (Invited Paper) [11691-4] MANUFACTURING TECHNOLOGY 11691 0A Silicon photonic integrated circuit for co-packaging with switch ASIC (Invited Paper) [11691-7] 11691 0C SiEPICfab: the Canadian silicon photonics rapid-prototyping foundry for integrated optics and quantum computing (Invited Paper) [11691-9] 11691 OE Wafer-level vacuum sealing for packaging of silicon photonic MEMS [11691-11] **EMERGING APPLICATIONS** 11691 0G **3D** imaging via silicon-photonics-based LIDAR (Keynote Paper) [11691-13] 11691 OL Silicon photonics nonlinear switch as conditional circulator for single-aperture LIDAR systems [11691-18] INTEGRATION OF SILICON, GERMANIUM, AND III-VS 11691 OM Ge-on-Si based mid-infrared plasmonics [11691-19] 11691 00 Temperature tolerance of a hybrid III-V/Si distributed feedback semiconductor laser with a large quality factor [11691-21] 11691 0Q Intensity noise and modulation dynamic of epitaxial quantum dot semiconductor lasers on silicon (Invited Paper) [11691-23]

ACTIVE SILICON DEVICES

	ACITY DILICON DEVICES
11691 OR	Si capacitive modulator integration in a 300mm silicon photonics platform using different annealing conditions (Invited Paper) [11691-24]
11691 OS	An improved 1D diode model for the accurate modeling of parasitics in silicon modulators [11691-25]
11691 OT	Compact model of in-waveguide silicon photoconductive heater-detectors for tuning photonic circuits [11691-26]
11691 OU	Ultrasmall high efficiency all-optical switch with single silicon nanoparticle [11691-27]
	POSTER SESSION
11691 OV	Silicon photonics based digital half-adder using micro-ring resonator structures [11691-28]
11691 OZ	A new heuristic method for optimizing Y-branches using genetic algorithm with optimal dataset generated with particle swarm optimization [11691-32]
11691 10	Automatic design of NxN integrated Beneš optical switch [11691-33]
11691 11	Statistical assessment of silicon photonics components in multi-project wafers [11691-34]
11691 12	Non-linear spot-size converter coupler for germanium/Si photodetectors [11691-35]
11691 14	Investigating the applicability of ferroelectric hafnium-zirconium-oxide-based nanowire transistors in silicon photonics [11691-37]
11691 16	Towards high-Q 1D photonic crystal waveguide resonator in SOI for mid-infrared applications [11691-39]