PROCEEDINGS OF SPIE

Next-Generation Optical Communication: Components, Sub-Systems, and Systems IX

Guifang Li Xiang Zhou Editors

5–6 February 2020 San Francisco, California, United States

Sponsored by SPIE

Cosponsored by
Corning Incorporated (United States)
NTT Electronics (Japan)

Published by SPIE

Volume 11309

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 Next-Generation Optical Communication: Components, Sub-Systems, and Systems IX, edited by Guifang Li, Xiang Zhou, Proceedings of SPIE Vol. 11309 (SPIE, Bellingham, WA, 2020) Seven-digit Article CID Number.

ISSN: 0277-786X

ISSN: 1996-756X (electronic)

ISBN: 9781510633810

ISBN: 9781510633827 (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 © 2020, 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/20/\$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

∨ ∨ii	Authors Conference Committee
SESSION 1	OPTICAL COMMUNICATIONS: JOINT KEYNOTE SESSION WITH CONFERENCES 11307, 11308, AND 11309
11309 02	Recent breakthroughs in hollow core fiber technology (Keynote Paper) [11309-1]
SESSION 2	SDM
11309 04	Collective measurement of DMD in 6-mode 19-core fiber using low-coherence digital holography [11309-3]
11309 06	Optimizing quasi-adiabaticity and its application in photonic lantern devices [11309-5]
11309 08	Mode-selective switch for ROADM using volume holograms and spatial light modulator [11309-7]
11309 09	Spatial mode exchange technique using volume holograms with a random optical diffuser to reduce modal cross-talks [11309-8]
SESSION 3	FIBERS AND DEVICES
11309 0A	DCI systems with ultra-low loss and low dispersion fiber (Invited Paper) [11309-9]
11309 0C	Integrated Nyquist transmitter for data rates up to 100 Gbps [11309-11]
11309 0E	Joint-compensation of silicon photonics modulator in short reach coherent networks [11309-13]
11309 OF	Integrated-optic spectrum synthesis circuit for manipulating 64 frequency components [11309-15]
SESSION 4	TRANSMISSION SYSTEMS
11309 OI	Beyond 100-Tb/s ultra-wideband transmission in S, C, and L bands over single-mode fiber (Invited Paper) [11309-18]

11309 OK	Frequency offset estimation algorithm for a multi-subcarrier coherent fiber optical system [11309-20]
11309 OL	Applications of machine-learning in optical communications and networks (Invited Paper) [11309-21]
11309 00	Trajectory redesign within a complex intersection for VLC ready connected cars [11309-24]
	POSTER SESSION
11309 OP	Optimization of waveguide photodetector with thin absorbing layer and large responsivity [11309-25]
11309 0P 11309 0Q	Optimization of waveguide photodetector with thin absorbing layer and large responsivity