

PROCEEDINGS OF SPIE

Laser Radar Technology and Applications XXVII

Gary W. Kamerman
Lori A. Magruder
Monte D. Turner
Editors

3–7 April 2022
Orlando, Florida, United States

6–12 June, 2022
ONLINE

Sponsored and Published by
SPIE

Volume 12110

Proceedings of SPIE 0277-786X, V. 12110

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 *Laser Radar Technology and Applications XXVII*, edited by Gary W. Kamerman, Lori A. Magruder, Monte D. Turner, Proc. of SPIE 12110, Seven-digit Article CID Number (DD/MM/YYYY); (DOI URL).

ISSN: 0277-786X

ISSN: 1996-756X (electronic)

ISBN: 9781510650961

ISBN: 9781510650978 (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*

ATMOSPHERIC SENSING

12110 02 **Monte Carlo analysis of elastic and inelastic atmospheric LIDAR data products using high fidelity simulator** [12110-1]

12110 03 **Laser particle sizer for plume-induced ejecta clouds** [12110-2]

LIDAR COMPONENTS

12110 04 **Multi-junction long-wavelength laser diode in long range LiDAR for high speed autonomous vehicles** [12110-3]

12110 05 **Photon counting linear mode global shutter flash LIDAR for improved range performance** [12110-5]

12110 06 **Radiation damages of silicon avalanche photodiodes in analog mode used in space lidars** [12110-7]

3D LIDAR SYSTEMS

12110 07 **Automated insect recognition in unlabeled lidar field measurements** [12110-8]

12110 08 **Low SWaP, commercially-available Geiger-mode lidar system** [12110-10]

12110 09 **An overview of ICESat-2 bathymetric capabilities and discoveries** [12110-11]

CALIBRATION AND ACCURACY

12110 0A **Dynamic geo-referenced scanning of aerial lidar systems** [12110-12]

3D PROCESSING AND PRODUCTS

12110 0B **Automatic alignment of mixed-resolution 3D point cloud data** [12110-14]

12110 0C **Impact of beam parameters on the performance of a topo-bathymetric lidar sensor** [12110-16]

POSTER SESSION

12110 0D **Analog-to-digital versus time-to-digital conversion for analysis of low signal-to-noise ratio pulsed laser ranging return signal** [12110-25]