PROCEEDINGS OF SPIE

Unconventional Imaging and Adaptive Optics 2021

Jean J. Dolne Mark F. Spencer Editors

1–5 August 2021 San Diego, California, United States

Sponsored and Published by SPIE

Volume 11836

Proceedings of SPIE 0277-786X, V. 11836

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

Unconventional Imaging and Adaptive Optics 2021, edited by Jean J. Dolne, Mark F. Spencer, Proc. of SPIE Vol. 11836, 1183600 · © 2021 SPIE · CCC code: 0277-786X/21/\$21 · doi: 10.1117/12.2606291

Proc. of SPIE Vol. 11836 118360O-1

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 Unconventional Imaging and Adaptive Optics 2021, edited by Jean J. Dolne, Mark F. Spencer, Proc. of SPIE 11836, Seven-digit Article CID Number (DD/MM/YYYY); (DOI URL).

ISSN: 0277-786X ISSN: 1996-756X (electronic)

ISBN: 9781510645103 ISBN: 9781510645110 (electronic)

Published by **SPIE** P.O. Box 10, Bellingham, Washington 98227-0010 USA Telephone +1 360 676 3290 (Pacific Time) SPIE.org Copyright © 2021 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.



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

ATMOSPHERIC CHARACTERIZATION: JOINT SESSION WITH 11834 AND 11836

- 11836 01 Profiling atmospheric turbulence along a slant path using LEDs and a camera bank [11836-1]
- 11836 03 Wave-optics sampling constraints in the presence of speckle and anisoplanatism [11836-3]

AERO EFFECTS

- 11836 06 Investigation of aero-mechanical jitter on a hemispherical turret [11836-6]
- 11836 07 Pressure sensitive paint measurements on a hemispherical turret [11836-8]

UNCONVENTIONAL ADAPTIVE OPTICS

- 11836 08 Wavefront compensation based on stochastic parallel gradient descent algorithm for Earth observation telescope [11836-9]
- 11836 09 Wide-angle, high-resolution three-dimensional (3D) imaging using non-mechanical beam steering [11836-10]
- 11836 0A Design and calibration of a closed loop tip-tilt control for a pyramid-Shack-Hartmann hybrid wave-front sensor [11836-11]
- 11836 OB Voltage tunable multispectral imaging lens [11836-12]

DIGITAL HOLOGRAPHY

- 11836 OC Optimal signal and reference strengths for a digital-holography wavefront sensor [11836-14]
- 11836 0D Model-based digital holographic imaging using mulit-shot data [11836-16]
- 11836 OE Image sharpening on 3D intensity data in deep turbulence with scintillated illumination [11836-17]
- 11836 OF Digital holographic tomography for path-resolved turbulence measurements (Invited Paper) [11836-13]

UNCONVENTIONAL IMAGING

- 11836 0IPhase-error mitigation in optical interferometric imaging [11836-19]
- 11836 0J Compact infrared imaging lidar system for obstacle detection and mapping in sensor fusion [11836-21]
- 11836 0K Scattering tunneling effect and its application in super resolution modes manipulation [11836-23]
- 11836 OL Block-based streaming blind deconvolution for space-variant turbulence mitigation [11836-20]
- 11836 0M Spatial light modulation and optical mixing for snapshot hyperspectral imaging architectures [11836-22]