PROCEEDINGS OF SPIE

Polarization Science and Remote Sensing XII

Meredith K. Kupinski
Joseph A. Shaw
Editors

5–6 August 2025
San Diego, California, United States

Sponsored and Published by
SPIE

Volume 13615

Proceedings of SPIE 0277-786X, V. 13615

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 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 *Polarization Science and Remote Sensing XII*, edited by Meredith K. Kupinski, Joseph A. Shaw, Proc. of SPIE 13615, Seven-digit Article CID Number (DD/MM/YYYY); (DOI URL).

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

ISBN: 9781510691384
ISBN: 9781510691391 (electronic)

Published by
SPIE
P.O. Box 10, Bellingham, Washington 98227-0010 USA
Telephone +1 360 676 3290 (Pacific Time)
SPIE.org
Copyright © 2025 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
SPIEDigitalLibrary.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*

POLARIZATION METROLOGY AND INSTRUMENTATION

13615 02 **Hyperspectropolarimetric microscope based on channeled polarimetry** [13615-3]

13615 03 **Demonstration and evaluation of a snapshot Mueller matrix channeled spectropolarimeter** [13615-5]

13615 04 **Stokes camera with wide field of view by fisheye lens** [13615-6]

POLARIZATION IN REMOTE SENSING I

13615 05 **Observing and simulating the polarization neutral point dependence on atmospheric turbidity** [13615-8]

13615 06 **Cloud top observations of LWIR spectro-polarimetry** [13615-10]

13615 07 **Channeled infrared polarimeter (CHIRP) performance simulation** [13615-11]

13615 08 **ASL2025: parameterized polarimetric datasets for remote sensing applications** [13615-12]

POLARIZATION IN REMOTE SENSING II

13615 09 **Geometry-optimized strategies for polarimetric image fusion and display** [13615-13]

13615 0A **Application of the PReMA algorithm to remove the polarization-albedo bias from remote sensing imagery** [13615-17]

13615 0B **Cross-variety validation of a polarimetric glare correction algorithm for maize** [13615-18]

13615 0C **Polarization ray-trace-based modeling using preflight characterization of the multiangle imager for aerosols (MAIA) satellite instrument** [13615-15]

POLARIZATION IN VISION AND COMPUTER VISION

13615 0D **Inferring geometry and material properties from Mueller matrices with machine learning** [13615-20]

13615 0E **Ex vivo recreation of Haidinger's brush** [13615-21]

13615 0F **Near real-time polarization rendering** [13615-22]

POLARIZATION-BASED OPTICAL SYSTEMS AND COMPONENTS

13615 0G **Polarimetric calibration of a compact multispectral all-sky polarization imager** [13615-23]

13615 0H **Reconstructing inhomogeneous birefringence using a tensor-valued backprojection** [13615-28]

13615 0I **A simple method for calculating geometric phase evolution from Jones calculus** [13615-29]

ASTRONOMICAL POLARIMETRY

13615 0J **Polarization of the Moon as a function of lunar phase angle in visible and near infrared spectral bands** [13615-30]

13615 0K **Optical design and polarimetric performance of a SmallSat UV polarimeter to study interstellar dust: PUFFINS** [13615-31]

13615 0L **ZetaPersei: a package for polarimetric astronomical observations and instrument calibration** [13615-32]

POSTER SESSION

13615 0M **Complex Fourier demodulation approach for a partial and complete Stokes polarimeter** [13615-34]

13615 0N **A probabilistic calibration procedure for the CORSAIR polarimeter** [13615-36]

13615 0O **Experimental generation of vector Mathieu-Gauss beams** [13615-37]

DIGITAL POSTER SESSION

13615 0P **Optical skyrmions for wireless communications** [13615-24]