

PROCEEDINGS OF SPIE

# ***Sensors, Systems, and Next-Generation Satellites XXIV***

**Steven P. Neeck  
Arnaud Hélière  
Toshiyoshi Kimura**  
*Editors*

**21–25 September 2020  
Online Only, United Kingdom**

*Sponsored by*  
SPIE

*Cooperating Organisations*  
European Optical Society  
KTN – Knowledge Transfer Network (United Kingdom)  
Technology Scotland (United Kingdom)  
Visit Scotland (United Kingdom)  
BARSC – British Association of Remote Sensing (United Kingdom)  
EARSeL—European Association of Remote Sensing Laboratories (Germany)  
ISPRS—International Society for Photogrammetry and Remote Sensing

*Published by*  
SPIE

**Volume 11530**

Proceedings of SPIE 0277-786X, V. 11530

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

Sensors, Systems, and Next-Generation Satellites XXIV, edited by Steven P. Neeck, Arnaud Hélière,  
Toshiyoshi Kimura, Proc. of SPIE Vol. 11530, 1153001 · © 2020 SPIE  
CCC code: 0277-786X/20/\$21 · doi: 10.1117/12.2584928

Proc. of SPIE Vol. 11530 1153001-1

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 [SPIDigitalLibrary.org](http://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 *Sensors, Systems, and Next-Generation Satellites XXIV*, edited by Steven P. Neeck, Arnaud Hélière, Toshiyoshi Kimura, Proceedings of SPIE Vol. 11530 (SPIE, Bellingham, WA, 2020) Seven-digit Article CID Number.

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

ISBN: 9781510638730  
ISBN: 9781510638747 (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](http://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](http://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.

**SPIE. DIGITAL  
LIBRARY**

[SPIDigitalLibrary.org](http://SPIDigitalLibrary.org)

---

**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

---

## JAPANESE MISSIONS

---

- 11530 06 **ALOS-4 current status** [11530-2]
- 11530 08 **Vegetation observation using LIDAR and imager from space: A status report of MOLI** [11530-4]

---

## EUROPEAN MISSIONS

---

- 11530 0B **The ESA Sentinel next-generation land and ocean optical imaging architectural study: an overview** [11530-7]
- 11530 0C **Next generation gravity mission: status of the design and discussion on alternative drag compensation scenarios** [11530-8]
- 11530 0D **The infrared Fourier transform spectrometer and the infrared imager instrument concepts for the FORUM mission, ESA's 9th Earth Explorer** [11530-9]
- 11530 0F **GEOBS: medium spatial resolution optical instrument concept for disaster and security monitoring from GEO** [11530-11]

---

## FPA I

---

- 11530 0G **T2SLS focal planes for compact remote sensing instruments** [11530-12]
- 11530 0H **Developments in the SAPHIRA family of HgCdTe APD infrared arrays for low flux sensing: present and future** [11530-13]
- 11530 0I **Development of high-performance graphene-HgCdTe detector technology for mid-wave infrared applications** [11530-14]

---

## US MISSIONS II

---

- 11530 0N **The role of NASA Engineering and Safety Center (NESC) in advancing NASA's Earth science missions (past, present, and future)** [11530-19]
- 11530 0O **Mitigating the GOES-17 ABI thermal anomaly using predictive calibration** [11530-20]
- 11530 0P **Product maturity process for ABI L1b and CMI products for GOES-R series** [11530-21]

---

**FPA II**

---

- 11530 0Q **GaN/AlGaIn avalanche photodiode detector technology for high performance ultraviolet sensing applications** [11530-22]
- 11530 0R **Development of UV to IR band nanostructured antireflection coating technology for improved detector and sensor performance** [11530-23]

---

**SMALLSAT I**

---

- 11530 0T **Small satellites landscape: ESA Earth observation with a focus on optical missions** [11530-25]
- 11530 0U **Cubesats for monitoring atmospheric processes (CubeMAP): a constellation mission to study the middle atmosphere** [11530-26]
- 11530 0W **Design concepts for distributed synthetic aperture radar enabling innovative missions and imaging techniques by microsats** [11530-28]

---

**SMALLSAT II**

---

- 11530 0Y **A compact, lightweight and quasi-athermal Optical Bench for iSIM170** [11530-30]
- 11530 0Z **Development of CubeSat with COTS camera enabling EO with high GSD** [11530-31]
- 11530 11 **Enabling and assuring autonomy in small satellite missions** [11530-33]

---

**POSTERS**

---

- 11530 12 **Two-port SAW delay line based on AlN alloying with transition metals: application to acoustic sensors** [11530-47]

---

**CALIBRATION I**

---

- 11530 14 **Improvements in the calibration of the NOAA-20 VIIRS day-night band low gain stage using a solar diffuser** [11530-35]
- 11530 15 **Performance assessments of the SNPP and N20 VIIRS DNB using observations of bright stars** [11530-36]
- 11530 16 **A moon stitching algorithm for the Meteosat third generation FCI instrument** [11530-37]

## CALIBRATION II

---

- 11530 17 **Evaluation of vicarious calibration for airborne sensors using RadCalnet** [11530-38]
- 11530 18 **Assessment of MODIS and VIIRS calibration consistency for reflective solar bands calibration using vicarious approaches** [11530-39]
- 11530 19 **Assessment of MODIS collection 6.1 thermal emissive band calibration using hyperspectral IASI observations** [11530-40]
- 11530 1A **MODIS detector differences using deep convective clouds and desert targets** [11530-41]
- 11530 1B **Assessment of MODIS on-orbit polarization impact on detector relative calibration** [11530-42]

## CALIBRATION III

---

- 11530 1C **MODIS reflective solar bands lunar calibration update and improvements** [11530-43]
- 11530 1D **Monitoring VIIRS thermal emissive bands long-term performance using lunar observations** [11530-44]
- 11530 1E **Analysis of the on-orbit response-versus-scan-angle for the MODIS SWIR bands derived from lunar observations** [11530-45]

