PROCEEDINGS OF SPIE

Remote Sensing of the Ocean, Sea Ice, Coastal Waters, and Large Water Regions 2019

Charles R. Bostater Jr. Xavier Neyt Françoise Viallefont-Robinet Editors

9–10 September 2019 Strasbourg, France

Sponsored by SPIE

Cooperating Organisations European Optical Society ISPRS—International Society for Photogrammetry and Remote Sensing EARSeL—European Association of Remote Sensing Laboratories (Germany)

Published by SPIE

Volume 11150

Proceedings of SPIE 0277-786X, V. 11150

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 Remote Sensing of the Ocean, Sea Ice, Coastal Waters, and Large Water Regions 2019, edited by Charles R. Bostater Jr., Xavier Neyt, Françoise Viallefont-Robinet, Proceedings of SPIE Vol. 11150 (SPIE, Bellingham, WA, 2019) Seven-digit Article CID Number.

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

ISBN: 9781510630031 ISBN: 9781510630048 (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 © 2019, 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/19/\$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

Authors

vii

ix	Conference Committee
хі	Introduction
SESSION 1	WATER COLOR SENSING
11150 02	Accurate monitoring of the Danube Delta dynamics using Copernicus data (Invited Paper) [11150-1]
11150 04	A low-cost small unmanned surface vehicle (sUSV) for very high-resolution mapping and monitoring of shallow marine habitats [11150-3]
11150 05	Simulation and experimental study on sun glint regional characteristics based on the Chinese ocean colour satellites [11150-4]
11150 06	Natural effects on remote sensing of water quality parameters data: a case study on available algorithms at the Jupia Reservoir, Brazil [11150-5]
SESSION 2	MULTISPECTRAL AND HYPERSPECTRAL SENSING
11150 07	Multi- and hyperspectral polarimetric imaging of the ocean surface [11150-6]
11150 09	Deep canonical correlation analysis for hyperspectral image classification [11150-8]
11150 0A	Water wave glint corrections, water depth, light attenuation, and WorldView-3 remote sensing algorithms for Indian River lagoon [11150-9]
SESSION 3	WATER SURFACE WAVES AND SENSING
11150 0D	Remote sensing of water surface small gravity waves characteristics using fixed platform and drone imagery [11150-11]
11150 OE	An application to Mediterranean Sea of the SEVIRI level 2 processor for surface parameters [11150-12]
11150 OF	Spaceborne SAR observations of internal solitary waves in the Chukchi and Beaufort Seas [11150-13]

11150 0G Evaluating ocean wave spectra derived from quad-polarized GF-3 wave mode SAR images against buoys [11150-14]

11150 OH Features of monitoring near the mouth zones by contact and contactless methods [11150-15]

SESSION 4 OIL FILMS AND WATER SURFACE SENSING

- 11150 01Health security and environment capability of slick detection, characterization, and
quantification in the offshore domain thanks to radar or optical imagery (Invited Paper)
[11150-16]
- 11150 0J Drift and shape of oil slicks on the water surface [11150-17]
- 11150 OK A phenomenological model of wave damping due to oil films [11150-18]
- 11150 OL Variation of summertime sea surface salinity of the Arctic Ocean during 2011-2017 [11150-19]

SESSION 5 LASER SENSING OF WATER

- 11150 0M Development of a time-of-flight laser scanning system for underwater applications (Invited Paper) [11150-20]
- 11150 0N Sea wave dynamics visualization and its interaction with the surface atmosphere by LED minilidar [11150-21]
- 11150 OP Ultraviolet fluorescence lidar (UFL) as a high-resolution measurement tool for water quality parameters used as ground-truth data for Sentinel-2 regional models [11150-23]

SESSION 6 SEA ICE AND SAR WATER SENSING

- 11150 0Q Remote sensing of sea ice in the Caspian Sea [11150-24]
 11150 0R SAR analysis of the ice loss by marine-terminating ice tongues in polar environment [11150-25]
- 11150 0S Statistical and dynamical properties of ocean eddies in Fram Strait from spaceborne SAR observations [11150-26]
- 11150 0T On-site helicopter-borne high-resolution image acquisition and mosaicking for investigation of drifting Arctic sea ice [11150-27]
- 11150 0U CO₂ fluxes in the marine atmospheric boundary layer for hurricane conditions on the base of SAR images of sea surface [11150-28]

SESSION 7 SATELLITE AND IN-SITU SENSING

11150 0V	Daytime sea surface temperature retrieval using short-wave infrared channel(s) [11150-29]
11150 OW	Distinctive features of the Vistula lagoon outflow by remote sensing and oceanographic experiments data [11150-30]
11150 OZ	Quality evaluation of Chinese ocean color satellite images of coastal zone [11150-33]
11150 10	Integration in-situ measurement and medium resolution imagery to develop digital health chart: preliminary study of coral reefs on small islands, Spermonde Archipelago, Indonesia [11150-34]
	POSTER SESSION
11150 12	An unsupervised feature learning method to distinguish Sargassum [11150-31]
11150 14	Sea surface temperature changes with katabatic winds observed from IR and SAR images [11150-37]
11150 15	Development and application of the HAB automatic monitoring system in the East China Sea [11150-38]
11150 16	The spatial distribution of salinity in the Pearl River Estuary in China from space [11150-39]
11150 18	Threshold stability of different algorithms for green tide detection base on geostationary ocean color imager [11150-42]
11150 1B	Satellite-based estimating chlorophyll-a concentration in the marginal Northwest Pacific [11150-45]
11150 1C	Assessment of surface oil pollution risks of the southeastern Black Sea based on long-term satellite data [11150-46]
11150 1E	Developing a two-step method for detecting red tide in East China Sea using MERIS data [11150-48]
11150 1F	The retrieval of wind wave characteristics by the underwater solar path image: slope frequency spectrum [11150-49]
11150 11	On the features of Doppler velocities estimation with coherent radar of high spatial resolution [11150-52]
11150 1J	Slick bands kinematics due to marine current and wind: study and simulation [11150-53]
11150 1K	An effect of sound generation due to surfactant films on the water surface illuminated by intensive IR radiation [11150-54]

- 11150 1L Statistical characteristics of Doppler velocity shift in artificial slick on sea surface [11150-55]
- 11150 1M Damping of surface waves due to turbulence in application to the problem of ocean remote sensing [11150-56]
- 11150 10 Fluorescence of organic films various origin and thickness to develop a method of their remote sensing on the sea surface: laboratory studies [11150-58]
- 11150 1P Investigation of short-scale sea wave spectra with optical and radiometric methods [11150-59]
- 11150 1R Characterization of surface currents from subsequent satellite images of organic slicks on the sea surface [11150-61]
- 11150 1S Satellite and in-situ observations of a river confluence zone [11150-62]
- 11150 1T Quality weighting in gridding Aquarius sea surface salinity [11150-63]
- 11150 10 On possibility of remote detection of gas leaks from underwater pipelines using specific slick signatures [11150-64]
- 11150 1V Mathematical models and algorithms for modeling the location signals reflected from the underlying surfaces of the earth, sea, and coastal waters [11150-67]
- 11150 1W Environmental conditions favoring coccolithophore blooms in subarctic and arctic seas: a 20year satellite and multi-dimensional statistical study [11150-68]