

PROCEEDINGS OF SPIE

Coastal Ocean Remote Sensing

Robert J. Frouin

ZhongPing Lee

Editors

26–27 August 2007

San Diego, California, USA

Sponsored and Published by

SPIE

Volume 6680

Proceedings of SPIE, 0277-786X, v. 6680

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

The papers included 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. The papers published in these proceedings 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 this book:

Author(s), "Title of Paper," in *Coastal Ocean Remote Sensing*, edited by Robert J. Frouin, ZhongPing Lee, Proceedings of SPIE Vol. 6680 (SPIE, Bellingham, WA, 2007) Article CID Number.

ISSN 0277-786X
ISBN 9780819468284

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 © 2007, 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 \$18.00 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/07/\$18.00.

Printed in the United States of America.

Publication of record for individual papers is online in the SPIE Digital Library.



SPIEDigitalLibrary.org

Paper Numbering: Proceedings of SPIE follow an e-First publication model, with papers published first online and then in print and on CD-ROM. Papers are published as they are submitted and meet publication criteria. A unique, consistent, permanent citation identifier (CID) number is assigned to each article at the time of the first publication. Utilization of CIDs allows articles to be fully citable as soon they are published online, and connects the same identifier to all online, print, and electronic versions of the publication. SPIE uses a six-digit CID article numbering system in which:

- The first four 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. The complete citation is used on the first page, and an abbreviated version on subsequent pages. Numbers in the index correspond to the last two digits of the six-digit CID number.

Contents

vii Conference Committee

SESSION 1 INVERSION OF THE ELECTROMAGNETIC SIGNAL: ATMOSPHERIC CORRECTION SCHEMES

- 6680 02 **A general ocean color atmospheric correction scheme based on principal components analysis: Part I. Performance on Case 1 and Case 2 waters** [6680-01]
L. Gross-Colzy, Capgemini Space Unit (France); S. Colzy, Magellum (France); R. Frouin, Scripps Institution of Oceanography (USA); P. Henry, Ctr. National des Etudes Spatiales (France)
- 6680 03 **A general ocean color atmospheric correction scheme based on principal components analysis: Part II. Level 4 merging capabilities** [6680-02]
L. Gross-Colzy, Capgemini Space Unit (France); S. Colzy, Magellum (France); R. Frouin, Scripps Institution of Oceanography (USA); P. Henry, Ctr. National d'Études Spatiales (France)
- 6680 04 **Constrained linear inversion of satellite ocean-color data** [6680-03]
R. Frouin, Scripps Institution of Oceanography (USA); B. Pelletier, CNRS, Univ. de Montpellier II (France)
- 6680 05 **Maximum entropy regularization for inferring aerosol vertical distribution from light scattering measurements** [6680-04]
B. Pelletier, CNRS, Univ. Montpellier II (France); R. Frouin, Scripps Institution of Oceanography (USA); P. Dubuisson, Univ. du Littoral Côte d'Opale (France)
- 6680 06 **Optimization of Cox and Munk sun-glint model using ADEOS/II GLI data and SeaWinds data** [6680-05]
L. Li, Tokai Univ. (Japan) and Ocean Univ. of China (China); H. Fukushima, K. Suzuki, Tokai Univ. (Japan); N. Suzuki, Kyoto Univ. (Japan)

SESSION 2 INVERSION OF THE ELECTROMAGNETIC SIGNAL: RETRIEVAL OF WATER PROPERTIES

- 6680 08 **Improving the accuracy of water and bottom properties derived from remote sensing reflectance via artificial neural network** [6680-07]
M. Zhang, Winona State Univ. (USA); Z. Lee, Naval Research Lab. (USA); J. Guan, Winona State Univ. (USA)
- 6680 0B **Reconstruction of vertical profiles of chlorophyll concentration** [6680-10]
R. P. Souto, Federal Univ. of Rio Grande do Sul (Brazil); M. Kampel, H. F. de Campos Velho, S. Stephany, National Institute for Space Research (Brazil)
- 6680 0C **Fluorescence contribution to reflectance spectra for a variety of coastal waters** [6680-11]
A. Gilerson, J. Zhou, S. Hlaing, I. Ioannou, R. Amin, B. Gross, F. Moshary, S. Ahmed, City College, CUNY (USA)

- 6680 0D **Determination of primary bands for global ocean-color remote sensing** [6680-12]
Z. Lee, R. Arnone, Naval Research Lab. (USA); K. Carder, College of Marine Science (USA);
M. He, Ocean Univ. of China (China)

SESSION 3 EVALUATION OF ALGORITHMS AND PRODUCTS

- 6680 0E **Automated validation of satellite derived coastal optical products** [6680-13]
P. E. Lyon, R. A. Arnone, R. W. Gould, Z. P. Lee, P. M. Martinolich, S. D. Ladner, B. Casey,
Naval Research Lab. (USA); H. Sosik, Woods Hole Oceanographic Institution (USA);
D. Vandemark, H. Feng, R. Morrison, Univ. of New Hampshire (USA)
- 6680 0G **Approach for the long-term spatial and temporal evaluation of ocean color satellite data products in a coastal environment** [6680-15]
P. J. Werdell, B. A. Franz, S. W. Bailey, NASA Goddard Space Flight Ctr. (USA);
L. W. Harding, Jr., Univ. of Maryland Ctr. for Environmental Science (USA); G. C. Feldman,
NASA Goddard Space Flight Ctr. (USA)
- 6680 0H **Measurement of oceanic chlorophyll by LIDAR, MODIS, fluorometry and above-water radiometry** [6680-16]
M. Kampel, J. A. Lorenzzetti, Instituto Nacional de Pesquisas Espaciais (Brazil); C. M. Bentz,
PETROBRAS (Brazil); R. A. Nunes, PUC-Rio (Brazil); R. Paranhos, Univ. Federal do Rio de Janeiro (Brazil); F. M. Rudorff, Instituto Nacional de Pesquisas Espaciais (Brazil);
A. T. Politano, PETROBRAS (Brazil)
- 6680 0I **Results in coastal waters with high resolution in situ spectral radiometry: The Marine Optical System ROV** [6680-17]
M. Yarbrough, M. Feinholz, S. Flora, T. Houlihan, Moss Landing Marine Labs. (USA);
B. C. Johnson, National Institute of Standards and Technology (USA); Y. S. Kim, Perot Systems Corp. (USA); M. Y. Murphy, M. Ondrusek, NOAA/NESDIS/STAR (USA); D. Clark, Marine Optical Consulting (USA)
- 6680 0J **Simultaneous measurement of up-welling spectral radiance using a fiber-coupled CCD spectrograph** [6680-18]
M. Yarbrough, S. J. Flora, M. E. Feinholz, T. Houlihan, Moss Landing Marine Labs. (USA);
Y. S. Kim, Perot Systems Group (USA); S. W. Brown, B. C. Johnson, National Institute of Standards and Technology (USA); K. Voss, Univ. of Miami (USA); D. K. Clark, Marine Optical Consulting (USA)

SESSION 4 CHARACTERIZATION AND VARIABILITY OF THE COASTAL OCEAN: COMPOSITION AND BIO-OPTICAL PROPERTIES I

- 6680 0L **Optical characterization and age estimates of river plumes on the U.S. west coast** [6680-20]
R. M. Kudela, S. L. Palacios, Univ. of California, Santa Cruz (USA)
- 6680 0M **Phytoplankton distribution on the East China Sea determined by the interaction between the Yangtze River runoff and the Kuroshio** [6680-21]
M. Fukuda, I. Asanuma, Tokyo Univ. of Information Sciences (Japan)

- 6680 ON **Particulate beam attenuation coefficient, bacteria abundance, and production in marine nearshore waters** [6680-22]
M. A. Montes-Hugo, R. A. Reynolds, M. Vernet, D. Stramski, V. Wright, Scripps Institution of Oceanography (USA)
- 6680 OO **Bio-optical variability in coastal waters of southeast Brazil** [6680-23]
M. Kampel, Instituto Nacional de Pesquisas Espaciais (Brazil); S. A. Gaeta, Univ. de São Paulo (Brazil); J. A. Lorenzetti, Instituto Nacional de Pesquisas Espaciais (Brazil); M. Pompeu, Univ. de São Paulo (Brazil); F. M. Rudorff, Instituto Nacional de Pesquisas Espaciais (Brazil); R. J. Frouin, Scripps Institution of Oceanography (USA)

SESSION 5 CHARACTERIZATION AND VARIABILITY OF THE COASTAL OCEAN: COMPOSITION AND BIO-OPTICAL PROPERTIES II

- 6680 OP **Spatial and spectral resolution considerations for imaging coastal waters** [6680-25]
C. O. Davis, M. Kavanagh, R. Letelier, Oregon State Univ. (USA); W. P. Bissett, D. Kohler, Florida Environmental Research Institute (USA)
- 6680 OQ **Possible satellite oceanography on coastal waters during the NPP stage** [6680-26]
J. Zhu, I. Asanuma, Tokyo Univ. of Information Sciences (Japan); C. Zhao, Ocean Univ. of China (China); B. Huang, Xiamen Univ. (China)

SESSION 6 CHARACTERIZATION AND VARIABILITY OF THE COASTAL OCEAN: PROCESSES, INTERACTIONS, AND MODELING

- 6680 OS **Forecasting coastal optical properties using ocean color and coastal circulation models** [6680-28]
R. A. Arnone, Naval Research Lab. (USA); B. Casey, Planning Systems Inc. (USA); D. Ko, P. Flynn, L. Carrolo, Naval Research Lab. (USA); S. Ladner, Planning Systems, Inc. (USA)
- 6680 OT **MODIS imagery as a tool for synoptic water quality assessments in the southern California coastal ocean** [6680-29]
N. P. Nezlin, Southern California Coastal Water Research Project (USA); P. M. DiGiacomo, NOAA/NESDIS (USA); B. H. Jones, K. M. Reifel, Univ. of Southern California (USA); J. A. Warrick, USGS Coastal and Marine Geology Program (USA); S. C. Johnson, Aquatic Bioassay and Consulting Labs. (USA); M. J. Mengel, Orange County Sanitation District (USA)
- 6680 OU **Ocean color remote sensing of turbid plumes in the southern California coastal waters during storm events** [6680-30]
F. Lahet, D. Stramski, Scripps Institution of Oceanography (USA)
- 6680 OV **Multi-parametric observation of biological contribution to surface structure of the water in archipelagos** [6680-31]
I. Asanuma, D. Hasegawa, Tokyo Univ. of Information Sciences (Japan); Y. Arvelyna, Tokyo Univ. of Marine Science and Technology (Japan)
- 6680 OW **Investigation on ballast water exchangeable area in the Bay of Bengal using MODIS/Aqua** [6680-32]
K. Kozai, H. Ishida, Kobe Univ. (Japan); K. Okamoto, Y. Fukuyo, The Univ. of Tokyo (Japan)

- 6680 0X **Submerged turbulence detection with optical satellites** [6680-33]
 C. H. Gibson, Univ. of California, San Diego (USA) and Scripps Institution of Oceanography (USA); R. N. Keeler, Directed Technologies, Inc. (USA); V. G. Bondur, Aerocosmos Scientific Ctr. of Aerospace Monitoring (Russia); P. T. Leung, Texas A&M Univ. (USA); H. Prandke, ISW Wassermesstechnik (Germany); D. Vithanage, Oceanit Labs., Inc. (USA)
- 6680 0Y **Evaluation of offshore wind energy potential using SAR and MM5** [6680-34]
 K. Kozai, T. Ohsawa, Kobe Univ. (Japan)

POSTER SESSION

- 6680 10 **Assessing dynamics micro-regions in the Great Islands of the Gulf of California based on MODIS aqua imagery products** [6680-36]
 F. J. Flores-de-Santiago, E. Santamaría-del-Ángel, A. González-Silvera, A. Martínez-Díaz-de-León, R. Millán-Núñez, Autonomous Univ. of Baja California (Mexico); J. M. Kovacs, Nipissing Univ. (Canada)
- 6680 11 **Ultra-high-resolution near-coastal wind retrieval for QuikSCAT** [6680-37]
 M. P. Owen, K. M. Stuart, D. G. Long, Brigham Young Univ. (USA)
- 6680 12 **Satellite estimates of chlorophyll-a concentration in the Brazilian southeastern continental shelf and slope waters, southwestern Atlantic** [6680-41]
 M. Kampel, Instituto Nacional de Pesquisas Espaciais (Brazil); S. A. Gaeta, Univ. de São Paulo (Brazil); J. A. Lorenzetti, Instituto Nacional de Pesquisas Espaciais (Brazil); M. Pompeu, Univ. de São Paulo (Brazil)
- 6680 13 **Development of finer spatial resolution optical properties from MODIS** [6680-42]
 S. D. Ladner, Planning Systems, Inc. (USA); J. C. Sandige, P. E. Lyon, R. A. Arnone, R. W. Gould, Z. P. Lee, P. M. Martinolich, Naval Research Lab. (USA)
- 6680 14 **Simple and efficient technique for spatial/temporal composite imagery** [6680-43]
 B. Casey, Planning Systems, Inc. (USA); R. Arnone, P. Flynn, Naval Research Lab. (USA)
- 6680 15 **Influence of solar radiation absorbed by phytoplankton on the thermal structure and circulation of the tropical Atlantic Ocean** [6680-44]
 R. Frouin, K. Ueyoshi, Scripps Institution of Oceanography (USA); M. Kampel, Instituto Nacional de Pesquisas Espaciais (Brazil)
- 6680 16 **Analysis of SeaWiFS imagery over the southwestern Atlantic Ocean during the March 2002 R/V IOFFE cruise** [6680-45]
 F. d. M. Rudorff, Instituto Nacional de Pesquisas Espaciais (Brazil); R. J. Frouin, Scripps Institution of Oceanography (USA); M. Kampel, Instituto Nacional de Pesquisas Espaciais (Brazil); O. Kopelevich, P.P. Shirshov Institute of Oceanology (Russia); V. Lutz, Instituto Nacional de Investigación y Desarrollo Pesquero (Argentina)
- 6680 17 **A test of empirical and semi-analytical algorithms for euphotic zone depth with SeaWiFS data off southeastern China** [6680-47]
 J. Chen, S. Shang, Xiamen Univ. (China); J. Tang, State Oceanic Administration (China); Z. Lee, Naval Research Lab. (USA); H. Hong, M. Dai, W. Zhai, Xiamen Univ. (China)

Author Index

Conference Committee

Conference Chairs

Robert J. Frouin, Scripps Institution of Oceanography (USA)
ZhongPing Lee, Naval Research Laboratory (USA)

Program Committee

Robert A. Arnone, Naval Research Laboratory (USA)
Ichio Asanuma, Tokyo University of Information Sciences (Japan)
Christopher W. Brown, CICS, ESSIC-NOAA (USA)
Curtiss O. Davis, Oregon State University (USA)
Arnold G. Dekker, Commonwealth Scientific and Industrial Research Organisation (Australia)
Roland Doerffer, GKSS-Research Center, Institute for Coastal Research (Germany)
Milton Kampel, Instituto Nacional de Pesquisas Espaciais (Brazil)
Samantha Lavender, University of Plymouth (United Kingdom)
Mervyn J. Lynch, Curtin University of Technology (Australia)
Richard L. Miller, NASA Stennis Space Center (USA)
Frank E. Muller-Karger, University of South Florida (USA)
Richard P. Santer, Université du Littoral Côte d'Opale (France)

Session Chairs

- 1 Inversion of the Electromagnetic Signal: Atmospheric Correction Schemes
Robert J. Frouin, Scripps Institution of Oceanography (USA)
- 2 Inversion of the Electromagnetic Signal: Retrieval of Water Properties
ZhongPing Lee, Naval Research Laboratory (USA)
- 3 Evaluation of Algorithms and Products
Milton Kampel, Instituto Nacional de Pesquisas Espaciais (Brazil)
- 4 Characterization and Variability of the Coastal Ocean: Composition and Bio-Optical Properties I
Arnold G. Dekker, Commonwealth Scientific and Industrial Research Organisation (Australia)

- 5 Characterization and Variability of the Coastal Ocean: Composition and Bio-Optical Properties II
Arnold G. Dekker, Commonwealth Scientific and Industrial Research Organisation (Australia)
- 6 Characterization and Variability of the Coastal Ocean: Processes, Interactions, and Modeling
Ichio Asanuma, Tokyo University of Information Sciences (Japan)