## **PROCEEDINGS OF SPIE**

## Remote Sensing of the Environment: The 17th China Conference on Remote Sensing

Qingxi Tong Xingfa Gu Boqin Zhu Editors

27–31 August 2010 Hangzhou, China

#### Organized by

Chinese National Committee for Remote Sensing

Hosted by

Association on Environment Remote Sensing of China• Hangzhou Normal University The Institute of Remote Sensing Applications, Chinese Academy of Sciences

International Sponsors SPIE • International Society for Digital Earth • UNDESA GAID e-SDDC • Asian Association on Remote Sensing IEEE Beijing Section

#### Sponsored by

National Remote Sensing Center of China • Association on Environment Remote Sensing Of China • Committee of Remote Sensing For Geology, The Geological Society of China • Committee on Ocean Remote Sensing, Chinese Society of Oceanography • Committee on Satellite Meteorology and Space Weather, China Meteorological Society • Committee on Space Remote Sensing, Chinese Society of Space Research • Committee on Photogrammetry and Remote Sensing, Chinese Society of Aeronautics and Astronautics • Committee on Space Remote Sensing, Chinese Association of Automation • Committee on Software Industry, China Association for Geographic Information System • Committee on Remote Sensing, Chinese Land Society • Chinese Hydraulic Engineering Society • Affiliated Society of Land Information and Remote Sensing, Chinese Land Society • Chinese Universities • Committee on Environmental Information System and Remote Sensing, Chinese Land Society • Chinese Universities • Committee on Environmental Information System and Remote Sensing, Chinese Land Society • Chinese Universities • Committee on Environmental Information System and Remote Sensing, Chinese Land Society • Chinese Universities • Committee on Environmental Information System and Remote Sensing, Chinese Society of Chinese Universities • Committee on Environmental Information System and Remote Sensing, Chinese Society of Chinese Universities • Committee on Environmental Information System and Remote Sensing, Chinese Society of Chinese Universities • Committee on Environmental Information System and Remote Sensing, Chinese Society of Chinese Universities • Committee on Environmental Information System and Remote Sensing, Chinese Society of Environmental Sciences

#### Local Organizers

Hangzhou Normal University • Zhejiang Science and Technology Association • Zhejiang Development and Reform Commission Zhejiang Economic and Information Technology Commission • Zhejiang Provincial Department of Education • Zhejiang Science and Technology Department • Zhejiang Provincial Department of Land and Resources • Zhejiang Bureau of Surveying and Mapping

#### Special Support

Tianjin Branch of Remote Sensing Information Technology Company, Ltd. •Strategic Alliances of Industrial and Technical Innovation for Remote Sensing Data Processing and Analysis • Strategic Alliances of Industrial and Technical Innovation for Small Satellite Remote Sensing Systems

Published by SPIE

Volume 8203

#### Proceedings of SPIE, 0277-786X, v. 8203

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 Remote Sensing of the Environment: The 17th China Conference on Remote Sensing, edited by Qingxi Tong, Xingfa Gu, Boqin Zhu, Proceedings of SPIE Vol. 8203 (SPIE, Bellingham, WA, 2011) Article CID Number.

ISSN 0277-786X ISBN 9780819488442

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 © 2011, 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/11/\$18.00.

Printed in the United States of America Vm7 i ffUb 5 ggc WJUH gž ₺Wži bXYf JW bgY Zca GD-9.

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



**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 as 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

- ix Conference Committees
- xiii Introduction

#### THEORY AND TECHNOLOGY

- 8203 02 **Field investigation system and its application in forest pest survey** [8203-02] Y. Qiao, Y. Chang, Y. Zhang, W. Li, J. Jian, Institute of Remote Sensing Applications (China)
- A method of relative radiometric correction for linear push-broom CCD Image without calibration device onboard [8203-03]
   M. Yan, Beijing Landview Mapping Information Technology Co., Ltd. (China); Z. Wang, Beijing Landview Mapping Information Technology Co., Ltd. (China) and Twenty First Century Aerospace Technology Co., Ltd. (China); S. He, F. Wu, B. Yu, Beijing Landview Mapping Information Technology Co., Ltd. (China)
- 8203 04 Lunar and Mars orbital stereo image mapping [8203-04] M. Peng, Z. Yue, Y. Liu, K. Di, Institute of Remote Sensing Applications (China)
- 8203 05 Rover localization from long stereo image sequences using visual odometry based on bundle adjustment [8203-05]
   W. Wan, Z. Liu, K. Di, Institute of Remote Sensing Applications (China)
- Removing the stripe noise in HJ-1A HSI images [8203-06]
   H. Gao, State Key Lab. of Remote Sensing Science (China), Graduate Univ. of Chinese Academy of Sciences (China), and The Ctr. for National Spaceborne Demonstration

 (China); X. Gu, T. Yu, X. Li, State Key Lab. of Remote Sensing Science (China) and The Ctr. for National Spaceborne Demonstration (China); J. Zhi, State Key Lab. of Remote Sensing Science (China), The Ctr. for National Spaceborne Demonstration (China), and Henan Univ. (China); Y. Xie, X. Ma, State Key Lab. of Remote Sensing Science (China), The Ctr. for National Spaceborne Demonstration (China), and Henan Polytechnic Univ. (China)

- 8203 07 The analysis on parameters of the payload on hyperspectral satellite [8203-07]
   D. Wang, China Aero Geophysical Survey & Remote Sensing Ctr. for Land and Resources (China); F. Hou, Capital Normal Univ. (China); Z. Li, China Geological Survey (China);
   F. Dang, R. Yang, Z. Xiao, China Aero Geophysical Survey & Remote Sensing Ctr. for Land and Resources (China)
- Joint rectification of image series classification results based on trajectory analysis [8203-08]
   D. Wang, Tianjin Institute of Urban Construction (China) and Institute of Remote Sensing Applications (China); J. Gong, Institute of Remote Sensing Applications (China); L. Zhang, Tianjin Institute of Urban Construction (China) and Institute of Remote Sensing Applications (China)

8203 09 The application of precise point positioning in the IMU/GPS-supported photogrammetry [8203-09]

M. Liao, Y. Li, L. Zhang, X. Chen, China TopRS Technology Co., Ltd. (China)

- Modeling the bidirectional reflectance distribution function (BRDF) of water based on Monte Carlo simulation [8203-10]
   Z. Ling, Hangzhou Normal Univ. (China); B. Zhou, Hangzhou Normal Univ. (China) and Zhejiang Univ. (China); J. Jiang, Hangzhou Normal Univ. (China); W. Dou, F. Zhou, Zhejiang Univ. (China)
- Signal to noise ratio simulation of lake water color monitoring oriented satellite remote sensing system [8203-11]
   J. Tian, B. Peng, J. Wang, X. Li, Nanjing Univ. (China)
- Effect of instrument tilts on in-water radiometric profile measurements and data analysis [8203-12]
   B. Tao, State Oceanic Administration (China), Shanghai Institute of Technical Physics (China), and Graduate School of Chinese Academy of Sciences (China); Z. Mao, B. Yan, State Oceanic Administration (China); B. Jin, PLA Univ. of Science and Technology (China)
- Methods to locate and eliminate the solar specular reflection point in the meteorological satellite images [8203-14]
   W. Li, Beijing Aviational Institute (China); B. Huang, Beijing Aviational Institute (China) and Physical Institute Beijing Univ. (China); J. Bai, X. Wang, Beijing Aviational Institute (China)
- 8203 0E Status monitoring and exception handling mechanism for geospatial information services [8203-13]

D. Zhang, B. Xie, Hangzhou Normal Univ. (China); Y. Ma, Zhejiang Univ. (China)

#### ALGORITHM AND MODEL

- 8203 OF Intercalibration of SVISSR/FY-2 thermal infrared channels with AIRS/Aqua channels [8203-15] G. Jiang, Y. Jin, Fudan Univ. (China)
- 8203 0G A 3-dimensional polynomial model for geometric corrections of airborne SAR images

   [8203-16]
   J. Song, Ctr. for Earth Observation and Digital Earth (China) and Graduate Univ. of the Chinese Academy of Sciences (China); J. Liao, Ctr. for Earth Observation and Digital Earth (China)
- 8203 0H Orthoimage seamline searching based on minimizing local maximum algorithm [8203-17] C. Zhong, Remote Sensing College of Wuhan Univ. (China); Y. Yang, Wuda Geoinformatics Co., Ltd. (China)
- 8203 01 Delay/Doppler radar altimeter simulation echoes from different sea states [8203-18] L. Shi, Ctr. for Space Science and Applied Research (China) and Graduate School of the Chinese Academy of Science (China); H. Liu, K. Xu, S. Yang, X. Xu, Ctr. for Space Science and Applied Research (China)

# Rice identification using TerraSAR-X data [8203-19] L. Guo, Z. Pei, S. Zhang, Q. Wang, Ministry of Agriculture of China (China); H. McNairn, J. Shang, X. Jiao, Agriculture and Agri-Food Canada (Canada)

8203 0K Comparison of Landsat-7 ETM+ and ASTER NDVI measurements [8203-20] H. Xu, T. Zhang, Fuzhou Univ. (China)

## 8203 0L Aerosol optical depth retrieval over land using FY-3A data and its application in dust monitoring [8203-21]

L. Mei, State Key Lab. of Remote Sensing Science (China) and Graduate Univ. of the Chinese Academy of Sciences (China); Y. Xue, State Key Lab. of Remote Sensing Science (China) and London Metropolitan Univ. (United Kingdom); J. Guang, State Key Lab. of Remote Sensing Science (China); Y. Li, Y. Wang, H. Xu, X. He, State Key Lab. of Remote Sensing Science (China) and Graduate Univ. of the Chinese Academy of Sciences (China); S. Jiang, X. Jiao, Shandong Univ. of Science and Technology (China); Z. Chen, Ctr. for Earth Observation and Digital Earth (China) and Graduate Univ. of the Chinese Academy of Sciences (China); J. Ai, Guangdong Electronics Industry Institute (China)

- 8203 0M The inversion of average vegetation height using ICESat GLAS and MODIS data: a case study of three provinces in Northeastern China [8203-22]
   F. Cheng, Yunnan Normal Univ. (China) and Ctr. for Earth Observation and Digital Earth (China); C. Wang, Ctr. for Earth Observation and Digital Earth (China); X. Jiang, Academy of Opto-Electronics (China)
- Space-borne hyperspectral remote sensing imagery noise eliminating based on CFFT self-adapted by optimal SNR [8203-23]
   Q. Liu, Q. Lin, L. Wang, Q. Wang, Ctr. for Earth Observation and Digital Earth (China) and Key Lab. of Digital Earth (China); F. Miao, STATE Grid AC Engineering Construction Co. (China)

#### INFORMATION EXTRACTION

- 8203 00 Monitor the microwave thermal emission anomaly around the Yushu earthquake fault zone by using AMSR-E data [8203-24] H. Chen, Y. Jin, Fudan Univ. (China)
- Mapping land cover of the Yellow River source using multi-temporal Landsat images
   [8203-25]
   Y. Hu, Ctr. for Earth Observation and Digital Earth (China) and Xi'an Univ. of Science &
   Technology (China); L. Liu, L. Liu, Q. Jiao, Ctr. for Earth Observation and Digital Earth (China);
   J. Jia, Xi'an Univ. of Science & Technology (China)
- 8203 0Q Spectral matching based on hidden Markov model [8203-26] J. Fu, N. Shu, X. Kong, Wuhan Univ. (China)
- 8203 OR Synthesis of multi-scale segmentation results based on land cover categories [8203-27] L. Yi, Z. Wu, Wuhan Univ. (China); G. Zhang, Academy of Opto-Electronics (China); Y. Zhang, Wuhan Univ. (China)

- 8203 0S The extraction of mangrove within intertidal zone based on multi-temporal HJ CCD images [8203-28]
   S. Li, Q. Tian, Nanjing Univ. (China); T. Yu, X. Gu, Institute of Remote Sensing Applications (China)
- Wetland extraction of Yancheng coastal area based on ALOS data [8203-29]
   Y. Weng, Southeast Univ. (China) and State Key Lab. of Remote Sensing Science (China);
   X. Fan, J. Tao, Southeast Univ. (China)
- 8203 0U The application and research of anomaly extraction process by remote sensing in the vegetation-covered area: an example in Chengmenshan of JiuJiang district [8203-30] Y. Chen, Jiangxi Institute of Geology Survey (China); P. T. Zhang, Exploration and Development of Geology and Mineral Resources Ctr. of Jiangxi Province (China); P. Xu, Jiangxi Institute of Geology Survey (China)
- 8203 0V Object and rule based approach for classification of high spatial resolution data over urban areas [8203-31]

L. Ni, Ctr. for Earth Observation and Digital Earth (China)

#### **RESOURCES, ENVIRONMENT, AND DISASTER**

- 8203 0W Land-cover change of the wuda coal fire area [8203-32] C. Zhang, Y. Guan, S. Guo, Institute of Remote Sensing Application (China); J. Li, The High Technology Research and Development Ctr. (China) and National Remote Sensing Ctr. of China (China); J. Wu, Beijing Normal Univ. (China); Y. Jia, Shenhua Wuhai Energy Co. Ltd. (China); D. Cai, Institute of Remote Sensing Application (China); H. Duan, X. Zhang, Shenhua (Beijing) Remote Sensing&GEO-Engineering Co. Ltd. (China); T. Zhao, Shenhua Wuhai Energy Co. Ltd. (China); X. An, L. Kang, Institute of Remote Sensing Application (China)
- 8203 0X The influence of urban reconstruction in urban heat island effect: Cangxia area of Fuzhou City, China [8203-33] F. Tang, H. Xu, Fuzhou Univ. (China)
- 8203 0Y Changes of forest in northeast China over the past 25 years: an analysis based on remote sensing technique [8203-34] L. Shi, Peking Univ. (China)
- Analysis of acid rain effects on vegetation in eco-regions in China based on AVHRR/NDVI [8203-35]
   J. Jin, Nanjing Univ. (China); H. Jiang, Nanjing Univ. (China) and Zhejiang Agriculture and Forestry Univ. (China); X. Zhang, Nanjing Univ. (China); X. Xu, China Meteorological Administration (China)
- Bamage assessment of Haiti earthquake emergency using high resolution remote sensing imagery [8203-36]
   L. Wang, A. Dou, X. Wang, Y. Dong, X. Ding, Institute of Earthquake Science (China); Z. Li, Liaoning Seismological Bureau (China); X. Yuan, Y. Qiu, Institute of Earthquake Science (China)

- 8203 11 Technology and application of emergency spatial data management [8203-37]
  H. Du, Capital Normal Univ. (China), The Ctr. of Surveying and Mapping (China), Beijing Key Lab. of Resources Environment and GIS (China), and 3D Information Acquisition and Application Key Lab. of the Education Ministry (China); H. Gong, Capital Normal Univ. (China), Beijing Key Lab. of Resources Environment and GIS (China), and 3D Information Acquisition and Application Key Lab. of Resources Environment and GIS (China); H. Gong, Capital Normal Univ. (China), Beijing Key Lab. of Resources Environment and GIS (China), and 3D Information Acquisition and Application Key Lab. of the Education Ministry (China); Z. Jiang, J. Jia, Z. Quan, The Ctr. of Surveying and Mapping (China)
- 8203 12 **Drought monitoring in Yunnan province with AMSR-E-based data** [8203-38] S. Wang, R. Zhong, Q. Li, M. Qin, Capital Normal Univ. (China)
- 8203 13 Analysis of the ancient river system in Loulan period in Lop Nur region [8203-39] J. Zhu, P. Jia, Y. Nie, Institute of Remote Sensing Applications (China)
- 8203 14 Spatial scale of chlorophyll-a concentration in Lake Taihu by using remote sensing images
   [8203-40]
   Y. Bao, Q. Tian, Nanjing Univ. (China)
- The investigation of special information distilling method of land use in karst area based on CBERS-02B and analysis on application: a case study of Duyun, Guizhou [8203-41]
   J. Hu, M. Luo, Y. An, Guizhou Normal Univ. (China)
- 8203 16 Typical disaster damage target extraction method based on object oriented classification [8203-42]
  G. Wang, Institute of Remote Sensing Applications (China); F. Wang, National Astronomical Observatories (China); J. Chen, Institute of Remote Sensing Applications (China); S. Chen,

Observatories (China); J. Chen, Institute of Remote Sensing Applications (China); S. Chen, National Disaster Reduction Ctr. of China (China)

- Besign of highway landslide warning and emergency response systems based on UAV [8203-43]
   Y. Huang, S. Yi, Z. Li, S. Shao, X. Qin, Research Institute of Highway (China) and Environmental Protection Ctr. (China)
- 8203 18 Wetland information extraction of remote sensing imagery based on Markov random field theory [8203-44]

D. Zhang, Hangzhou Normal Univ. (China); Y. Wu, Zhejiang Univ. (China)

Applications of RADARSAT-2 in remote sensing dynamic monitoring of land use [8203-45]
 B. Cheng, Ctr. for Earth Observation and Digital Earth (China); Y. Chai, China Land
 Surveying and Planning (China); L. Kou, G. He, Ctr. for Earth Observation and Digital Earth (China); L. Wen, Y. Zhan, China Land Surveying and Planning (China)

#### INTEGRATED AND OTHERS

8203 1A Assessment on aerosol direct radiative forcing over China land areas based on satellite data [8203-46]
 L. Chen, China Meteorological Administration (China); G. Shi, B. Wang, Institute of Atmospheric Physics (China); P. Zhang, China Meteorological Administration (China)

- Risk evaluation of available phosphorus loss in agricultural land based on remote sensing and GIS [8203-47]
  X. Ding, Hangzhou Normal Univ. (China); B. Zhou, Hangzhou Normal Univ. (China) and Zhejiang Univ. (China); J. Xu, T. Liu, B. Xie, Hangzhou Normal Univ. (China)
- Association of influenza virus isolation with environmental factors in mainland China based on remote sensing and GIS [8203-48]
   Y. Ren, Y. Liu, L. Hu, J. Fan, Institute of Remote Sensing Applications (China); X. Li, Institute of Remote Sensing Applications (China) and Beijing Normal Univ. (China)
- 8203 1D Optical absorption properties of water components in Xixi wetland of Hangzhou [8203-49]
   F. Zhou, Zhejiang Univ. (China); B. Zhou, Zhejiang Univ. (China) and Hangzhou Normal Univ. (China); W. Zhu, Hangzhou Normal Univ. (China); W. Dou, Zhejiang Univ. (China); Z. Ling, Hangzhou Normal Univ. (China)
- 8203 1E Aerosol direct radiative forcing at the top of atmosphere based on satellite remote sensing over China seas: a preliminary study [8203-50]
   Z. Hao, D. Pan, F. Gong, State Oceanic Administration (China)
- 8203 1F The statistical prediction model for prospecting Nickel-Copper deposit based on aster remote sensing-geochemistry data in JinChuan and its peripheral [8203-51]
   S. Chen, China Univ. of Geosciences (China), Guilin Univ. of Technology (China), Key Lab. of Geological Engineering Ctr. of Guangxi Province (China), and Ministry of Education (China); H. Wu, Guilin Univ. of Technology (China), Key Lab. of Geological Engineering Ctr. of Guangxi Province (China), and Ministry of Education (China); J. Chen, China Univ. of Geosciences (China)
- Application of ATOVS radiance assimilation to numerical simulation of a mesoscale heavy rainfall [8203-52]
   H. Bing, Beijing Univ. (China) and Beijing Aviation Meteorology Institute (China); B. Jie, L. Wei, X. Wang, Beijing Aviation Meteorology Institute (China)
- 8203 1H **Residential mobility microsimulation models** [8203-53] Y. Wang, L. Wu, Peking Univ. (China)

Author Index