REMOTE SENSING.

ADVANCE TECHNICAL PROGRAMME

Centre de Congrès Pierre Baudis
Toulouse, France

Conferences:
21-24 September 2015

CO-LOCATED WITH
SPIE SECURITY + DEFENCE 2015
Two Meetings. One Location. One Price.

WWW.SPIE.ORG/RS15PROGRAMME
INVITATION TO ATTEND

It is our pleasure to welcome your attendance at the 2015 SPIE International Symposium on Remote Sensing. An excellent technical programme has been prepared, focusing on recent advances in sensor technology, next-generation satellites, remote sensing of the Earth and its environment, atmospheric propagation, and signal and image processing.

This year’s event will be held in Toulouse, France, and is the 22nd SPIE Remote Sensing Europe meeting. Previous symposia were held at various locations throughout Europe, including in Rome, London, Paris, Sicily, Barcelona, Crete, Grand Canary, Bruges, Stockholm, Florence, Cardiff, Prague, Berlin, Edinburgh, Dresden, and Amsterdam.

Well over 600 presentations prove again that this event is recognized as an important forum for science, government, and industry to access and share information on remote sensing. The event’s focus is especially on the research aspects of remote sensing, with a concentration on European and international science and technology.

The symposium features ten conferences that include oral and poster presentations, as well as a plenary session. A Welcome Reception will provide an opportunity to exchange ideas and network in a more personal way. The 22nd SPIE Symposium on Remote Sensing will be co-located with the 12th SPIE European Security & Defence Symposium, and will provide an excellent opportunity to explore new opportunities to collaborate with new partners from other fields of activity.

The programme promises an exciting week, with excellent science and technology in a setting conducive to international interchange, and we would be pleased to have your participation.

Finally, don’t miss this opportunity to visit beautiful Southern France and see the historic Ville Rose (“Pink City”) Toulouse, the home of European aerospace.
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Zhensen Wu, Xidian Univ. (China)

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# Daily Event Schedule

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| **Special Events** | | | |
| Welcome Reception | Poster Session | | |

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**About Toulouse**

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Toulouse, also known as ‘Ville Rose’, is France’s fourth biggest city. Located in the southwest region of the country between the Atlantic Ocean and Mediterranean Sea, it is also influenced by the Pyrenees. The city dates back 2,000 years with historic buildings in the central area. Toulouse is now widely recognised as the centre of cutting-edge European technology. The city and surrounding areas have a rich and diverse culture, famous for traditional produce including wine, foie gras, cheeses, and other traditional regional dishes.

For further information on sightseeing and tourist information, please see the Toulouse Tourism website: [http://www.uk.toulouse-tourisme.com](http://www.uk.toulouse-tourisme.com) or alternatively, take a look at [http://www.toulousedefrance.com](http://www.toulousedefrance.com)

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THIS PROGRAMME IS CURRENT AS OF JUNE 2015

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REMOTE SENSING/SECURITY + DEFENCE PLENARY SESSIONS
Monday 21 September 2015 • 16:00 to 19:15 • Location: Auditorium

16:00 to 16:20
Welcome and Introduction
2015 Security + Defence Symposium Chair
DAVID H. TITTERTON, UK Defence Academy, United Kingdom
2015 Remote Sensing Symposium Chair
CHARLES R. BOSTATER, Marine-Environmental Optics Lab & Remote Sensing Center, Florida Institute of Technology, United States

16:20 to 16:25
Presentation of SPIE Travel Scholarship to
Ezequiel Pawelko, Instituto de Investigaciones Científicas y Técnicas para la Defensa (Argentina) and Vadim Nenashev, Saint-Petersburg State Univ. of Aerospace Instrumentation (Russian Federation)

16:25 to 17:10
The World in a Point Cloud
Grady Tuell, Electro-Optical Systems Lab (EOSL), Georgia Tech Research Institute (United States)
Over the past 40 years, airborne lidar has emerged as one of the most important 3D imaging technologies. It is especially valuable for surveying the coastal zone, where 3D point clouds can be used to generate continuous topographic and bathymetric elevation models. When fused with passive hyperspectral data, the resulting spectral point clouds contain a wealth of environmental information about the beach, seafloor, and water column. These data support many communities of interest including nautical charting, beach monitoring and restoration, fisheries habitat monitoring, coral reef monitoring, and coastal and climate change detection studies. These uses are global in scale and importance, and nicely illustrate how an optical-based remote sensing technology may be used to support development of national and international products and policies.

When considering the evolution of lidar, it is interesting to note that advances in lidar usually are based on evolutions in one of the technological enablers. Specifically, advances in lasers, detectors, digitizers, navigation systems and computers make new concepts and designs in lidar possible. Importantly, the builders of lidars collaborate with and purchase from, a global network of suppliers. In this “International Year of Light”, it is interesting to examine how this global network supports the design of a new lidar system. GTRI has recently developed a novel hybrid bathymetric lidar combining a linear-mode, waveform-resolved green lidar with an infrared lidar based on a GmAPD 3D camera. Here, we will describe this hybrid lidar and illustrate how an international network of suppliers has contributed to it.

Biography: Grady Tuell is the Associate Director of GTRI’s Electro-optical Systems Lab (EOSL). Dr. Tuell has more than 30 years experience in the design, development, and deployment of advanced imaging systems for use in coastal and marine environments. This experience spans industry, academia, and government. He has been a pioneer in the development of data fusion algorithms and paradigms for combining multi-sensor datasets for seafloor mapping, and has worked to evolve bathymetric lidar from a depth-measuring technique into an environmental mapping technology. Prior to joining GTRI, he worked at Optech International from 2002-2011, where he was the co-founder and President, and was the project manager for the Coastal Zone Mapping and Imaging Lidar (CZMIL) and the Countermine Lidar UAV-Based System (CLUBS) projects. From 1999-2002, he was an Assistant Professor at the University of Florida, and from 1980-1998, he was a Commissioned Officer in the NOAA Corps. He retired from NOAA holding the rank of Commander, and was recognized with the U.S. Department of Commerce Gold Medal for introducing imaging spectroscopy, lidar, and SAR into NOAA’s shoreline mapping program. In March 2014, Dr. Tuell was appointed to a 3-year term of the Mapping Science Committee of the U.S. National Research Council, and he is the recipient of the SPIE 2015 George W. Goddard Award.

17:10 to 17:55
Policy and Technology: Addressing Technical Challenges
Anne Harrington, Defense Nuclear Nonproliferation for the National Nuclear Security Administration (United States)
Abstract not available
Biography: Anne Harrington, is the Deputy Administrator for Defense Nuclear Nonproliferation for the National Nuclear Security Administration. Previously, Ms. Harrington was the Director of the U.S. National Academy of Sciences Committee on International Security and Arms Control (CISAC) a position she held from March 2005 to October 2010.

Ms. Harrington served for 15 years in the U.S. Department of State, where she was Acting Director and Deputy Director of the Office of Proliferation Threat Reduction and a senior U.S. government expert on nonproliferation and cooperative threat reduction. She has dedicated much of her government career to developing policy and implementing programs aimed at preventing the proliferation of WMD and missile expertise in Russia and Eurasia, and also launched similar efforts in Iraq and Libya. Her State Department assignments include serving as the U.S. senior coordinator for efforts to redirect former Soviet WMD/misile experts 1993-1998. She was based in Moscow from 1991 to 1993, where she was the Senior Advisor to the U.S. Delegation to the International Science and Technology Center (ISTC) Preparatory Committee and Science Analyst at the U.S. Embassy in Moscow. She was instrumental in negotiating the agreements that established the ISTC and the Science and Technology Center in Ukraine (STCU), and the agreement between the United States and Kazakhstan for the secure storage of spent fuel and safe shutdown of the Aktau BN-350 breeder reactor.

She was selected to attend the National Defense University’s National War College in 2002-2003, where she was also a research fellow and authored the paper, “Reducing the Threat from Biological Weapons: Perspectives on U.S. Policy.” Ms. Harrington has been author or co-author on a number of papers on countering biological threats.

17:55 to 19:15
Panel Discussion
CubeSats for Earth Remote Sensing and Security and Defence Applications
MODERATOR: Charles R. Bostater, Marine-Environmental Optics Lab & Remote Sensing Center, Florida Institute of Technology (United States)
PANELISTS: Luca Maresi, European Space Research and Technology Ctr. (Netherlands); Jeroen Rotteveel, Innovative Solutions In Space BV (Netherlands); Didier Alary, Airbus Defence and Space (France); Doug Liddle, Surrey Satellite Technology Ltd. (United Kingdom)

As part of the plenary talks, a special panel discussion will be held concerning CubeSats and their associated sensing technologies for earth remote sensing and security and defence applications. The symposium chairs will moderate and facilitate audience participation and discussion. The panel will present their papers followed by questions and answers. This plenary panel represents our first joint symposium plenary panel on a topic of interest to both Remote Sensing, as well as Security + Defence attendees.
SPECIAL EVENTS

Welcome Reception
Monday 21 September 2015 .......................... 19:30 to 22:00
All attendees are invited to relax, socialise, and enjoy light refreshments.
Due to limited space and numbers, guests will be admitted on a first-come, first-served basis. Please contact the onsite registration desk for tickets.
Please remember to wear your conference registration badges. Dress is casual.

Poster Session
Tuesday 22 September 2015 .................... 17:30 to 19:15
All symposium attendees are invited to attend the Tuesday poster session provided as an opportunity to enjoy networking and refreshments while reviewing poster papers. The interactive poster sessions are designed to promote opportunities for networking with colleagues in your field. Attendees are encouraged to review the high-quality papers that are presented in this alternate format and to interact with the poster authors. Participants are requested to wear their conference registration badges to the poster sessions.
Poster presenters may begin posting their poster papers starting at 10:00 hrs on Tuesday in the Conference Area Hallway. Each poster presenter is provided a space 0.95 x 1.20m in which to display a summary of the paper. Poster authors are requested to attend the official poster session and should be at their papers on Tuesday from 17:30 to 19:15 hrs to answer questions from attendees. Poster presenters who have not set up by 17:30 on Tuesday will be considered a "no show" and their manuscript will not be published. SPIE assumes no responsibility for posters left up after 19:15 pm on Tuesday. Any papers left on the boards at that time will be considered unwanted and will be discarded.

Best Student Paper Awards
As a committed supporter of excellence in student research, SPIE supports Best Student Paper Awards at SPIE conferences across the globe. In addition to cash prizes and award certificates, winners receive SPIE Digital Library downloads and complimentary SPIE Student Membership.
The awards are designed to encourage and acknowledge excellence in oral and poster student paper presentations. Best student papers will be recognised within each of the Remote Sensing conferences.
In order to be considered for this award, the student must meet the following requirements:
• Student must be the presenting author at the conference and must make their oral presentation as scheduled
• Student must be the leading author of the manuscript
• Papers submitted by graduate and undergraduate students are eligible
• Student must enter the best student paper award by responding to an award announcement e-mail
• The best student paper award announcement will follow the acceptance notification and will include all details necessary to enter and qualify for the competition
• A panel of experts will evaluate the papers, both for quality and content.

Co-located SPIE Security + Defence Plenary Session
Please visit http://spie.org/sd15programme for more information.
See the latest in technology innovations and future applications.

THE SPIE SENSING EXHIBITION, 23-24 SEPTEMBER 2015, IN TOULOUSE - CENTRE OF THE EUROPEAN AEROSPACE INDUSTRY.

SPIE Security + Defence (co-located with SPIE Remote Sensing) attracts more than 900 attendees in these combined technology areas. This event enables exhibitors to reach two distinct yet relevant audiences, while exploring new opportunities of collaboration with partners from other fields of activity.

WHY WALK THE EXHIBIT FLOOR?
To talk with experts in sensing technologies—remote and defence—and see the latest advances.

To get face-to-face time with products and research, as well as the experts (scientists, engineers, developers) who are behind them. Get questions answered that day while being able to make side-by-side comparisons.

Come to Toulouse to make connections with suppliers and project partners.

Exhibition admission is included with your technical registration, or you can register for the free exhibition only. For more Exhibition details, visit the website: www.spie.org/sdprogramme

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Remote Sensing for Agriculture, Ecosystems, and Hydrology

Conference Chairs: Christopher M. U. Neale, Univ. of Nebraska Lincoln (United States); Antonino Maltese, Univ. degli Studi di Palermo (Italy)

Programme Committee: Shahid Habib, NASA Goddard Space Flight Ctr. (United States); Antonino Maltese, Univ. degli Studi di Palermo (Italy); Christopher M. U. Neale, Univ. of Nebraska Lincoln (United States)

TUESDAY 22 SEPTEMBER

OPENING REMARKS ........................................ 8:30 TO 8:40

SESSION 1 .................................................. TUE 8:40 TO 10:00
Natural Resources Monitoring
Session Chair: Christopher M. U. Neale, Univ. of Nebraska Lincoln (United States)

An assessment of vegetation degradation in the semi-arid lands of Sudan using vegetation indices of multispectral imagery, Majdaïlaïn Rahamatallah Abualgasim, GWT-TUD GmbH (Germany); Babatunde A. Osunmadewa, Check Abdel Kader Baba, Elmir Casaplovics, Technische Univ. Dresden (Germany). [9637-1]

Estimation of crop parameters using multitemporal optical and radar polarimetric satellite data, Julie Belbeder, Renny Freuzal, Ctr. d’Etudes Spatiales de la Biosphère (France); Yannick Philippets, Ctr. d’Etudes Spatiales de la Biosphère (France) and Ecole Nationale des Sciences Géographiques (France); Laurent Ferro-Famil, Univ. de Rennes 1 (France); Frederic Baup, Ctr. d’Etudes Spatiales de la Biosphère (France). [9637-2]

Seasonal parameter extraction of paddy rice fields in west Java, using multitemporal MODIS imagery datasets, Riswan S. Sianturi, Willem Nieuwenhuis, International Institute for Geo-Information Science and Earth Observation (Netherlands). [9637-3]

A remote sensing approach to calculate plant available nitrogen at the sprayfield and subwatershed scales from swine concentrated animal feeding operations in North Carolina, Elizabeth Christenson, Marc Sene, The Univ. of North Carolina at Chapel Hill (United States). [9637-4]

SESSION 2 .................................................. TUE 10:30 TO 12:20
Hyperspectral, Spectroscopy and Fluorescence
Session Chair: Antonino Maltese, Univ. degli Studi di Palermo (Italy)

A critique of field spectroscopy and the challenges and opportunities it presents for remote sensing for agriculture, ecosystems, and hydrology (Invited Paper), Alasdair Mac Arthur, The Univ of Edinburgh (United Kingdom). [9637-5]


An advanced fluorescence lidar system for the acquisition of interleaved active (LIF) and passive (SIF) fluorescence measurements on vegetation, Valentina Raimondi, Lorenzo Palombi, Paola Di Ninni, Istituto di Fisica Applicata Nello Carrara (Italy). [9637-7]

Estimation of leaf chlorophyll content using variable importance for projection (VIP) with hyperspectral data, Peng He, Xingang Xu, Xiaoyu Song, National Engineering Research Ctr. for Information Technology in Agriculture (China). [9637-8]

Identification of disease stress on citrus through leaf chlorophyll content retrieval by PROSPECT model with field spectroscopy, Munirali R. Badnakhe, Jagarlapudi Adinarayana, Surya S. Durbha, Indian Institute of Technology Bombay (India). [9637-9]

Lunch/Exhibition Break .................................... TUE 12:20 to 13:20

SESSION 3 .................................................. TUE 13:20 TO 15:00

UV and High Spatial Resolution Imagery
Session Chair: Antonino Maltese, Univ. degli Studi di Palermo (Italy)

Complementing airborne laser bathymetry with UAV-based lidar for capturing alluvial landscapes, Gottfried Mandburger, Technische Univ. Wien (Austria); Martin Pfenngbauer, Alexander Haring, Peter Rieger, Ursula Riegler, RIEGL Laser Measurement Systems GmbH (Austria); Martin Wieser, Philipp Giria, Technische Univ. Wien (Austria). [9637-10]

Olive trees LAI estimation using TLS and UAV, Rosanna Sicortino, Tiziano Caruso, Francesco Paolo Mannu, Mauro Lo Brutto, Univ. degli Studi di Palermo (Italy). [9637-11]

Evaluation of vegetation index estimation by drones for different crops, Lúcio A. C. Jorge, Ricardo Y. Inamasu, Ziany N. Brandão, EMBRAPA (Brazil). [9637-12]

The inversion model of soil organic matter of cultivated land based on hyperspectral technology, Xiaoxue Gu, Yancang Wang, Xiaoyu Song, Xinggang Xu, National Engineering Research Ctr. for Information Technology in Agriculture (China). [9637-13]

Mangrove species mapping in Kuala Sepatang Mangrove Forest, Perak using high-resolution airborne data, Muhammad Zubir Mat Jafi, Beoh Boon Chun, Hwee San Lim, Univ. Sains Malaysia (Malaysia). [9637-14]

SESSION 4 .................................................. TUE 15:30 TO 18:10

Image Classification
Session Chair: Christopher M. U. Neale, Univ. of Nebraska Lincoln (United States)

Introduction of a multifunctional tool for the evaluation of uncertainty and accuracy in multitemporal object-based land use classification, Patrick W. K. Knoefel, Fabian Löv, Julius-Maximilans-Univ. Würzburg (Germany); Henning Gerstmann, Markus Moeller, Martin-Luther Univ. Halle-Wittenberg (Germany); Xingmei Xu, Helmholtz-Zentrum für Umweltforschung GmbH (Germany); Christopher Conrad, Julius-Maximilans-Univ. Würzburg (Germany). [9637-16]

A fast and versatile algorithm for object generic classification in RapidEye images, Salvador L. Esparan-Govea, Colegio de Postgraduados (Mexico); Fermín Pascual-Ramírez, Univ. Nacional Autonoma de Mexico (Mexico); José-Luis Oropeza-Mota, Mario R. Martinez-Menes, Colegio de Postgraduados (Mexico). [9637-17]

An object-based image analysis and change detection approach for developing a green cadastre for monitoring and preserving of private urban gardens: case study of Hashemieh district, Mashhad, Iran, Hossein Vahidi, Wanglin Yan, Keio University (Japan). [9637-18]

Assessment of the contribution of MERIS full-resolution image time series to produce maps of soil properties for environmental monitoring, Ruxandra Veselita, ICIP Bucharest (Romania); Peter Rieger, Alexander Haring, Peter Rieger, Ursula Riegler, RIEGL Laser Measurement Systems GmbH (Austria). [9637-19]

Likelihood-based image segmentation and classification of agricultural fields: monitoring agricultural landcover in the Biddinghuizen study area, the Netherlands, Ali Ghorfi Fesahani, Univ. Twente (Netherlands); Ali Akbar Akbar, K.N. Toosi Univ. of Technology (Iran, Islamic Republic of). [9637-21]

RGB picture vegetation indexes for High-Throughput Phenotyping Platforms (HTPPa), Shawn C. Wolf, Univ. de Barcelona (Spain); George El-Haddad, Expert Software Engineering Consultant (Lebanon); Omar Vergara-Diaz, José Luis Araus, Univ. de Barcelona (Spain). [9637-22]

Land usage analysis: a random forest approach, Nasru Minallah, Hidayat U. Rehman, Univ. of Engineering & Technology, Peshawar (Pakistan). [9637-23]

Comparing maximum likelihood, support vector machine, and neural networks classification algorithms for classifying tobacco crops in Northwestern Pakistan, Shahbaz Khan, Aziz Ahmed, Muhammad Muaz, Nasru Minallah, Manzoor Ali, Muhammad Yasir, Univ. of Engineering & Technology, Peshawar (Pakistan). [9637-23]
POSTER SESSION ........................................... TUE 17:30 TO 19:15

Conference attendees are invited to attend the Remote Sensing poster session held on Tuesday, 17:30 to 19:15. Posters will be on display after 10:00 Tuesday morning in the Conference Hallway. Authors of poster papers will be present to answer questions concerning their papers during the Tuesday Poster Session. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Attendees are required to wear their conference registration badges to the poster sessions. Poster authors, view poster presentation guidelines and set-up instructions at http://spie.org/02294.xml.

Estimation spatiotemporal distribution of evapotranspiration using MODIS images and SEBS algorithm in Ghorveh and Dehgolan district, Kwestan Jalali, Islamic Azad Univ. (Iran, Islamic Republic of) ............................................... [9637-61]

Analysis of principal elements of land surface temperature retrieval from AVHRR over Tibetan Plateau, Qingni Huang, Zhengan Cao, Lixin Dong, China Meteorological Administration (China) ................................................ [9637-62]

Validation of land surface temperature products of MODIS and FY3C over Tibetan Plateau, Qingni Huang, Zhengan Cao, Guizai Li, Lixin Dong, China Meteorological Administration (China) ................................................ [9637-63]

Winter wheat GPC estimation with fluorescence-based sensor measurements of canopy (Stand-by Oral Presentation), Xiaoyu Song, National Engineering Research Ctr. for Information Technology in Agriculture (China); Jihua Wang, Beijing Research Ctr. for Agricultural Standards and Testing (China); Xiaohu Gu, Xin-Gang Xu, National Engineering Research Ctr. for Information Technology in Agriculture (China) ................................................ [9637-64]

Performance of fluorescence retrieval method and fluorescence spectrum reconstruction under various sensor spectral configurations, Rong Li, Leng Zhao, BeiHang Univ. (China) .......................................................... [9637-65]

Building spectral library for saltmarsh classification with hyperspectral and hyperion hyperspectral remote sensing data, Siddhar M. Rasel, Macquarie Univ. (Australia) .......................................................... [9637-66]

The impact of different reference panels on spectral reflectance coefficients of some biological water pollutants, Agnieszka Jenerowicz, Piotr Walczykowski, Agata Orzych, Military Univ. of Technology (Poland) .......................................................... [9637-67]

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Hydrological modeling of watersheds and morphometric study of Begnas and Rupa lake. Sanjeevan Shrestha, Mahesh Thapa, Bipayan Banjara, Government of Nepal (Nepal); Ramesh K. Maskey, Kathmandu Univ. (Nepal). .......................................................... [9637-70]

Linking the CN parameters to land cover changes derived from LANDSAT imagery on a flood area. Antonio Novelli, Eufemia Tarantino, Cnr, Gabriella Balasco, Alberto Ferruccio Piccinii, Politecnico di Bari (Italy) .......................................................... [9637-71]

Flow estimation using satellite-derived rainfall on inaccessible area. Joo-Hun Kim, Yun-Seok Choi, Kyung-Tak Kim, Korea Institute of Construction Technology (Korea); Hyung-Chae Lee, Kyung-Tak Kim, Korea Institute of Construction Technology (Korea); Kwestan Jalali, Islamic Azad Univ. (Iran, Islamic Republic of) ................................................ [9637-72]

Water level and SWH variations in the water reservoirs of the Volga river cascade on the base of SARAL/AltiKa observations, Gallina Ryubshukina, Institute of Applied Physics (Russian Federation); Yuliya Troitskaya, Institute of Applied Physics (Russian Federation) and A.M. Obukhov Institute of Atmospheric Physics (Russian Federation). .......................................................... [9637-73]

The applicability of FORMOSAT-2 images to coastal waters/bodies classification, Ana C. Teodoro, Lia Duarte, Pedro Silva, Univ. do Porto (Portugal) .......................................................... [9637-74]

Drought assessment using satellite-derived meteorological parameters and NDVI in Polotar region, Saad Ul Haque, Institute of Space Technology (Pakistan); Shabir Ahmad, Institute of Space Technology (Pakistan); Muhammad Umer, IPO, Institute of Space Technology (Pakistan) .......................................................... [9637-75]

Multisatellite data for estimating total discharge in the Volta River basin of West Africa, Vagner G. Ferreira, Hohai Univ. (China). .......................................................... [9637-76]

Optimizing the impact of saline irrigation on water productivity in Rechna Doab (Pakistan) using RS, GIS and hydrological models under different irrigation scenarios, Qaisar Sadique, Northwestern A&F Univ. (China) .......................................................... [9637-77]

Integration of remote sensing technology to geographic information system for sustainable planning of water resources, Nejat Evslavibudhoglu, Ankara Univ. (Turkey); Egnar Ozdikililer, Istanbul Technical Univ. (Turkey) .......................................................... [9637-78]

Changing planform of Ichamati River and land use/land cover using RS and GIS techniques, Bikesh Sharma, Vidyasagar Univ. (India) .......................................................... [9637-79]

Comparisons of precipitation data from satellites and ground measurements in North Korea, Kwon, Yong-Jin Park, Dong-Bin Shin Yongsei Univ. (Republic of Korea); Joo-Hun Kim, Kyung-Tak Kim, Korea Institute of Construction Technology (Korea, Republic of) .......................................................... [9637-80]

Using remote sensing to determine spatial and temporal variability of interception storage capacity in wetlands ecosystems in Biebrza Valley, Poland, Joanna Suliga, Vrije Univ. Brussel (Belgium); Jaroslav Chomaranski, Warszaw Univ. of Life Sciences SGGW (Poland); Ann van Griensven, Vrije Univ. Brussel (Belgium) and UNESCO-IHE Institute for Water Education (Belgium); Boud Verbeiren, Vrije Univ. Brussel (Belgium) .......................................................... [9637-81]

Processing of airborne laser scanning data to generate accurate DTM for surface watered wetlands overgrown by dense vegetation, Dorota Miroslawa-Siwek, Sylwia Szporak-Wasilewska, Mateusz Gromowuk, Warsaw Univ. of Life Sciences SGGW (Poland) .......................................................... [9637-82]

Fires detection from hyperspectral data using neural network approach, Alessandro Piscini, Stefania Amici, Istituto Nazionale di Geofisica e Vulcanologia (Italy) .......................................................... [9637-83]

Study on the meteorological monitoring and prewarning system and countermeasures of forest fire danger, Melying Yuan, Bureau of Heilongjiang (China) .......................................................... [9637-84]

Application of thermal remote sensing for deriving land surface temperature relationship to land use/cover patterns, Seyed Mohammad Blumstein, Christophe Fatras, Eric Mougin, Fabricre Papa, Observatoire Midi-Pyrénées (France); Catherine Pigrinet, Observatoire de Paris (France); Pierre Borderes, ONERA (France); Sylvain Biancambia, Stéphane Caimant, Observatoire Midi-Pyrénées (France) .......................................................... [9637-85]

Assessment of the forest restoration process after a fire using decoding of high-resolution satellite images, Yuri P. Rozhkov, State Nature Reserve Olekminsky (Russian Federation); Maria Y. Kondakova, Hydrochemical Institute of Polar Regions (Russia) .......................................................... [9637-86]

Mapping areas invaded by Prosopis Juliflora in Somalliland on Landsat 8 imagery, Felix Rembold, European Commission Joint Research Ctr. (Italy); Ugo Leonardi, Food and Agriculture Organization of the United Nations (Kenya); Wabir Ng. Univ. (Australia); Huzina Guda, Food and Agriculture Organization of the United Nations (Kenya); Clement Atzberger, Univ. für Bodenkultur Wien (Austria); Andrew Adam-Bradford, Human Relief Foundation (United Kingdom); Michele Meroni, European Commission Joint Research Ctr. (Italy) .......................................................... [9637-87]

Ecological changes detection in southern Australia using remote sensing techniques: case of Oasis of Brezina, Taoauf Lakhdar, Ecole normale supérieure de Laghouat (Algeria) .......................................................... [9637-88]

Spatio-temporal distribution of desert locust in Sudan, Mohammed A. Eltoum, Mohammad Sal D. Mohammad, Univ. of Khartoum (Sudan) .......................................................... [9637-89]

Dielectric properties of marsh vegetation, Tatiana D. Kochetkova, Valentin I. Susyayev, Anna S. Serebryakova, Nizhniy Novgorod State Technical University (Russia) .......................................................... [9637-90]

Altimetric backscattering signatures at Ka, Ku and S bands over global land surfaces, Fabien Blarel, Frederic Frappart, Benoît Legrésy, Denis Blumstein, Bernard Mougenot, Gilles Boulet, Crt. d’Etes Spatiaux de la Biosphère (France) .......................................................... [9637-92]

Compiling, Curr. a climatic project of rice cultivation in the Central African Republic, Gouray Guéye, Institut National Agronomique de Kinshasa (Democratic Republic of Congo); Bernard Mougenot, Gilles Boulet, Crt. d’Etes Spatiaux de la Biosphère (France) .......................................................... [9637-93]

Forecasting of cereals yields in a semi-arid area using the agrometeorological model -SAPY- combined to optical SPOT/HR images, Aicha Chahli, Institut de Recherche pour le Développement (Tunisia) and Institut National Agronomique de Tunis (Tunisia); Mehrez Zribi, Crt. d’Etes Spatiaux de la Biosphère (France); Zohra Lili Chabaane, Institut National Agronomique de Tunis (Tunisia); Bernard Mougenot, Gilles Boulet, Crt. d’Etes Spatiaux de la Biosphère (France) .......................................................... [9637-94]

Winter wheat growth spatial variation monitoring through hyperspectral remote sensing image, Xiaoyu Song, National Engineering Research Ctr. for Information Technology in Agriculture (China); Jihua Wang, Beijing Research Ctr. for Agricultural Standards and Testing (China); Xin-Gang Xu, National Engineering Research Ctr. for Information Technology in Agriculture (China); Wai-Tim Ng, Univ. für Bodenkultur Wien (Austria); Hussein Gadain, Food and Agriculture Org. of the United Nations (UN); Xiaoyu Song, National Engineering Research Ctr. (Italy) .......................................................... [9637-95]

Application of agrometeorological spectralmodel in rice area in southern Brazil, Janice F. Leivas, Antônio Heriberto C. de Castro Teixeira, Ricardo G. Andrade, Daniel C. Victoria, Embrapa Monitoramento por Satélite (Brazil) .......................................................... [9637-96]

Investigation and assessment of space and time changes of biomass using remote sensing data on mountain ecosystems, Armeni, Vahagn Muradyan, The Center for Ecological-Noosphere Studies of the (Armenia) .......................................................... [9637-98]

Study of monitoring the freezing injury of winter wheat at over-wintering period based on HUTA-HSI image, Boiling Li, Henan Institute of Meteorological Science (China) and Key Lab. of Agrometeorological Safeaguard and Applied Technique (China); Shuyan Li, Henan Institute of Meteorological Science (China) .......................................................... [9637-98]
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Improving spatial heterogeneity of spring maize yield simulation at field scale by assimilating time series HJ-1 CCD data into WOFOST model. Zhiqiang Cheng, Jiush Meng, Institute of Remote Sensing and Digital Earth (China) .......................................................... [9637-99]  
Delay-tolerant mobile network protocol for rice field monitoring using wireless sensor networks. Alexandre Guittion, LIMOS CNRS (France); Frederic Andres, National Institute of Informatics (Japan); Jatras Lopes Cardoso Jr., Ctr. de Tecnologia da Informacao Renato Archer (Brazil); Aneseak Awiakruk, Kasetsart Univ. (Thailand) .......................................................... [9637-100]  
Supporting precision agriculture with comprehensive application of satellite remote sensing. Jihua Meng, Jin Xu, Zhiqiang Cheng, Wenquan Dong, Institute of Remote Sensing and Digital Earth (China); Yafang Li, China Univ. of Geosciences (China) .......................................................... [9637-101]  
Mapping crop type based on phenological characteristics using time-series NDVI of operational land imager data in its irrigated perimeter. Mammoor Aljafray, Jamal-eddie Ouazem, Abderrazzak El Harfi, Faculté des Sciences et Techniques Béni-Mellal (Morocco); Ali EL Mohamed, Naima Bouch, Rabti F. Ouazzani, COSUMAR SUTA (Morocco); Rachid Lhissou, Amine Jellouli, Mohcine Chakouri, El mostafa Bachou, Faculté des Sciences et Techniques Béni-Mellal (Morocco) .......................................................... [9637-107]  
Estimation of pasture production using remote sensing in a holm oak savanna rangeland. Pedro J. Gómez-Grallat, Ana M. Garcia, Instituto de Investigación y Formación Agraria y Pesquera (Spain); Cristina Aguilera, Grupo de Dinámica Fluvial e Hidrología (Spain); Elisabet Carpio, Belen A. Cario, Mario Patricio González-Dugo, Instituto de Investigación y Formación Agraria y Pesquera (Spain) .......................................................... [9637-106]  
Identification and characterization of agro-ecological infrastructures by remote sensing. Daniele Ducrot, Ctr. d’Estudes Spatiales de la Biosphère (France); Sylvie Duthoit, Véronique Chret, Ecole d’Ingénieurs de PURPAN (France); Alexandre d’Abrac, Ctr. d’Estudes Spatiales de la Biosphère (France); Christophe Saussie, CETIOM (France) .......................................................... [9637-104]  
Early pest detection in soybean plantations from UAV: a case study for caterpillar detection. Pablo Muse, Matías Talían, Gabriel Lema, Pedro Mastrangelo, Monica Almansa, German Fernandez Flores, CSG Ingenieros (Uruguay); Enrique Castillogui, Univ. de la Republica (Uruguay); Ignacio Fernandez Liñares, Germán Fernandez Liñares, CSG Ingenieros (Uruguay) .......................................................... [9637-103]  
Optical remote sensing of salt-affected soils. Rumiana Kancheva, Dentista Boncsova, Georgi Georgiev, Space Research and Technology Institute (Bulgaria) .......................................................... [9637-105]  
Validation of FPAR product inversed by DnD model and evaluation of the agreement between several kinds of FPAR products. Li Li, Haiting Zhang, Institute of Remote Sensing and Digital Earth (China) .......................................................... [9637-107]  
Assessing the explanatory power of minimum temperature, water stress and fraction of diffuse radiation on crop yield and light-use-efficiency in Mediterranean areas. Alvaro Moreno, Univ. de Valencia (Spain); Sergio Sanchez, Univ. de Valéncia (Spain); Maria Amparo Gilabert Navarro, Beatriz Martinez, Univ. de Valéncia (Spain); Arnaud Carrara, Fundación Centro de Estudios Ambientales Mediterraneos (Spain) .......................................................... [9637-109]  
Correlation between the recreational activities and productivity of coastal areas: a case study in the low-lying coastal stretch in the Bay of Bengal coast, India. Srikanta Sannigrahi, Indian Institute of Technology Kharagpur (India) .......................................................... [9637-110]  
Monitoring regional winter wheat late frost injury using remote sensing data, WOFOST model and SHAW model. Nan Wang, Junming Liu, China Agricultural Univ. (China) .......................................................... [9637-111]  
Investigation variation of carbon dioxide based on GOSAT data in Agricultural Univ. (China); Xiaohui Li, Huaizhong Zhang, Institute of Remote Sensing and Digital Earth (China) .......................................................... [9637-112]  
An assessment of the impact of climate change effects on forest land cover based on satellite data, Maria A. Zoran, National Institute of Research and Development for Optoelectronics (Romania); Adrian I. Dida, Univ. Transilvania Brasov (Romania) .......................................................... [9637-113]  
NDVI trend at a global scale from 1982-2012 with climate changes. Meng Guo, Northeast Normal Univ. (China) .......................................................... [9637-114]  
Vegetation water use monitoring at basin scale using remote sensing. Elisabet Carpio, Ana Andreu, Maria Patricio González-Dugo, Instituto de Investigación y Formación Agraria y Pesquera (Spain) .......................................................... [9637-24]  
Satellites in agriculture: precision and commercialisation in Germany. Lisa M. Gutermuth, Humboldt-Univ. zu Berlin (Germany) .......................................................... [9637-25]  
Study on multi-spectral data of cultivated land change in urban fringe area based on the multiple regression model: a case study in Tirurukkadi, Chennai metropolitan area. Manonmani R, Anna Univ. Chennai (India) .......................................................... [9637-26]  
Evaluating and predicting water consumption by irrigated agriculture and spread of agricultural fields in the semi-arid regions of the northeastern Negev. Israel. Assaf Chen, Ben-Gurion Univ. of the Negev (Israel); Inzhak Benenson, Tel Aviv Univ. (Israel); Amnon Kanieli, Ben-Gurion Univ. of the Negev (Israel) .......................................................... [9637-27]  
Analysing the impact of natural and anthropogenic stresses on crop production in Iraq using time series of remote sensing data. Saeid Hamad, Qader, University of Southampton (United Kingdom) .......................................................... [9637-28]  
Evapotranspiration and Energy Balance I  
Session Chair: Antonino Maltese, Univ. degli Studi di Palermo (Italy)  
Photosynthetically active radiation estimation to cotton crop ground cover: using satellite multispectral imagery in NaushahroFeroze, Sindh-Pakistan, Sajdaa Pervaaz, Queensland Univ. of Technology (Australia); Mudassar H. Adeel, Univ. of Karachi (Pakistan) .......................................................... [9637-29]  
Water balance indicators from MODIS images and agrometeorological data in Minas Gerais state, Brazil. Antonio Heriberto C. de Castro Teixeira, Janice F. Leivas, Ricardo G. Andrade, Daniel C. Victoria, Edson L. Bolf, Embrapa Monitoramento por Satélite (Brazil) .......................................................... [9637-30]  
Evaluation of disaggregated thermal images for evapotranspiration estimation in Barrax test site. Marc Quisquet, Juan Manuel Sanchez, Univ. de Castilla-La Mancha (Spain); Vicente Caselles, Univ. de Valencia (Spain); Ramón López-Uera, ITAP-FUNDESCAMP (Spain) .......................................................... [9637-31]  
Continuous evapotranspiration monitoring at watershed scale over a dehesa ecosystem. Elisabet Carpio, Mario Patricio González-Dugo, Instituto de Investigación y Formación Agraria y Pesquera (Spain); Martha Anderson, Kate Semmens, Agricultural Research Service (United States); Ana Andreu, Instituto de Investigación y Formación Agraria y Pesquera (Spain); Feng Gao, William P. Kustas, Agricultural Research Service (United States) .......................................................... [9637-32]  
Study on spatial variations of surface parameters and heat fluxes during the HIWATER-MUSOEEX campaign. Zhi Qiang Peng, Institute of Remote Sensing and Digital Earth (China) and Univ. of Chinese Academy of Sciences (China); Xiaozhou Xiu, Institute of Remote Sensing and Digital Earth (China); Ti Zhou, Institute of Remote Sensing and Digital Earth (China); Beth Chu, Univ. of Chinese Academy of Sciences (China) .......................................................... [9637-33]  
Lunch/Exhibition Break. .......................................................... Wed 12:20 to 13:20  
Evapotranspiration and Energy Balance II  
Session Chair: Antonino Maltese, Univ. degli Studi di Palermo (Italy)  
Testing two temporal upsampling schemes for the estimation of the time variability of the actual evapotranspiration. Antonino Maltese, Fulvio Capodici, Giuseppe Ciriaolo, Goffredo La Loggia, Univ. degli Studi di Palermo (Italy) .......................................................... [9637-34]  
Mapping oak savanna evapotranspiration at regional scale using thermal based remote sensing. Ana Andreu, Maria Patricio González-Dugo, Instituto de Investigación y Formación Agraria y Pesquera (Spain); Maria Jose Polo-Gomez, Instituto Interuniversitario de Investigación del Sistema Tierra en Andalucia Universidad de Córdoba (Spain); Pedro J. Gómez-Giralde, Instituto de Investigación y Formación Agraria y Pesquera (Spain); William P. Kustas, Agricultural Research Service (United States) .......................................................... [9637-35]  
Generation of day-avet Evapotranspiration at 30m resolution by fusion of MODIS and Landsat-8 data. Jiyoung Ke, Capital Normal Univ. (China); Junghung Im, Sunyeung Park, Ulsan National Institute of Science and Technology (Korea, Republic of) .......................................................... [9637-36]
Modelling radiation and energy balances with Landsat 8 images under different thermohydrological conditions in the Brazilian semi-arid region. Antônio Herberto C. de Castro Teixeira, Janice F. Leivas, Ricardo G. Andrade, Embrapa Monitoramento por Satélite (Brazil); Fernando B. Tangularo Hernandez, Renato Alberto M. Franco, São Paulo State Univ. (Brazil) .................................. [9637-37]

Assessment of crop evapotranspiration and irrigation water demand in the lower Niobrara River, Nebraska (USA) by combining remote sensing-based energy and water balances. Christopher M. U. Neale, Univ. of Nebraska Lincoln (United States); Isidro Campos, Patricio Grassini, Univ. of Nebraska-Lincoln (United States) .................................................. [9637-38]

SESSION 8 ............................... WED 15:30 TO 18:10
Hydrology and Irrigation
Session Chair: Christopher M. U. Neale, Univ. of Nebraska Lincoln (United States)

Soil moisture operational product system (SMOPS) for numerical weather prediction and drought monitoring. Xiwu Zhan, National Oceanic and Atmospheric Administration (United States) .......................... [9637-39]

Determination of water body structures for small rivers using remote sensing data. Pierre Karrasch, Daniel Henzen, Sebastian Hunger, Max Hörold, Technische Univ. Dresden (Germany) ........................................ [9637-40]

Analysis of soil moisture in southern Africa. Alzira G. Ramos, Rogers Harsine, Maria João Pereira, Amilcar Soares, Instituto Superior Técnico (Portugal) ............................................................ [9637-41]

Inter-annual response of the rainfall-runoff relationship to wildfire in a Mediterranean forested watershed. Noa Ohana-Levi, Ben-Gurion Univ. of the Negev (Israel); Amir Givati, Water Authority (Israel); Amnon Karmeli, Ben-Gurion Univ. of the Negev (Israel) ........................................................ [9637-42]

Analysis of water supply and demand in the Ghataprabha River basin, Rajat K. Panda, Nagarajan Ramakrishna, Indian Institute of Technology Bombay (India) .......................................................... [9637-43]

A multilevel and multiscale soil moisture and temperature regular monitoring network aim at multisatellite remote sensing application in Tibet Plateau. Lixin Dong, National Satellite Meteorological Ctr. (China) ....................... [9637-44]

Monitoring irrigation volumes using high-resolution NDVI image time series: calibration and validation in the Kairouan plain (Tunisia). Sameh Saadi, Institut National Agronomique de Tunis (Tunisia); Vincent Simonneaux, Gilles Boulet, Bernard Mougenot, Ctr. d’Etudes Spatiales de la Biosphère (France); Zohra Lili Chabaane, Univ. of Carthage (Tunisia) and Institut National Agronomique de Tunisie (Tunisia) ........................................ [9637-45]

Assessment of drought in savannah region of Nigeria using geospatial techniques, Olusola Gbolahan Oduyayo, Univ. of Lagos (Nigeria); Oluwatola Adeola, Obafemi Awolowo Univ. (Nigeria); Linda Abegunde, NCRES (Nigeria) .......................................................... [9637-46]

THURSDAY 24 SEPTEMBER
SESSION 9 ............................... THU 8:30 TO 10:10
Vegetation and Carbon Monitoring
Session Chair: Shahid Habib, NASA Goddard Space Flight Ctr. (United States)

Carbon cycle and ecosystem priorities for the next decade: outcomes of a workshop on earth science remote sensing needs. Scott Goetz, Woods Hole Research Ctr. (United States); Forrest G. Hall, NASA Goddard Space Flight Ctr. (United States) .................................................. [9637-47]

Monitoring carbon stocks and change in Miombo woodlands using remotely-sensed reflected and emitted energy, Harun A. Makandi, Univ. of Dar Es Salaam (Tanzania, United Republic of) ................................ [9637-48]

The variation of crop phenology in North China from 1982 to 2011: impacts on crop productivity. Xin Du, Institute of Remote Sensing and Digital Earth (China) ................................................ [9637-49]

GLORI: a new airborne GNSS reflectometry instrument for land surface monitoring. Erwan Motte, Pascal Fanise, Mehrez Zribi, Ctr. d’Etudes Spatiales de la Biosphère (France) .................................................. [9637-50]

Assessment of seasonal trends in the derived guinea savannah zone of Nigeria using AVHRR NDVI time series for the period of 1982-2011: a regional case study of Kwara State, Babatunde A. Osunmadewa, Christine Wessollik, Pierre Karrasch, Elmar Csaplovics, Technische Univ. Dresden (Germany) .................................................. [9637-51]
Remote Sensing of the Ocean, Sea Ice, Coastal Waters, and Large Water Regions 2015

Conference Chairs: Charles R. Bostater Jr., Florida Institute of Technology (United States); Stelios P. Mertikas, Technical Univ. of Crete (Greece); Xavier Neyt, Royal Military Academy (Belgium)

Programme Committee: Richard J. Breitlow, Jean-Paul Bruyant, ONERA (France); Alexander Gilerson, The City College of New York (United States); Carlton R. Hall, Dynamac Corp. (United States); Heinz-Detlef Kronfeldt, Technische Univ. Berlin (Germany); Frederic Lamy, ONERA (France); Ana M. Martins, Univ. dos Açores (Portugal); Caroline Nichol, The Univ. of Edinburgh (United Kingdom); Petri Pellikka, Univ. of Helsinki (Finland)

TUESDAY 22 SEPTEMBER

POSTER SESSION ................................itur 17:30 TO 19:15

Conference attendees are invited to attend the Remote Sensing poster session held on Tuesday 17:30 to 19:15. Posters will be on display after 10:00 Tuesday morning in the Conference Hallway. Authors of poster papers will be present to answer questions concerning their papers during the Tuesday Poster Session. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Attendees are required to wear their conference registration badges to the poster sessions. Poster authors, please, present summary guidelines and set-up instructions at http://spie.org/x323234.xml.

Mangrove density mapping with multimodal remote sensing data and mangrove development impact analysis seen from environmental and society aspects: case study in Sidoarjo, east Java. Akbar Cahyadi Pratama Putra, M. Randy Aswin, Tantri Utami Widaningtyas, Univ. Gadjah Mada (Indonesia). [9638-20]

Study on the seasonal migration of suspended sediment in the Taiwan Strait based on remote sensing. Xiaohui Xu, Jian Chen, The Third Institute of Oceanography, SOA (China). [9638-21]

Restoration of cloud contaminated ocean color images using sediment transport model. Xuefei Yang, Shanghai Institute of Technical Physics (China); Zhuhui Mao, The Second Institute of Oceanography, SOA (China) and Shanghai Institute of Technical Physics (China); Jianyu Chen, Haiqing Huang, Qiankun Zhu, Fang Gong, The Second Institute of Oceanography, SOA (China). [9638-22]

The spatial-temporal distribution of particulate organic carbon in the Pearl River estuary, Dong Liu, Zhejiang Univ. (China); Jianyu Chen, Haiqing Huang, Fang Gong, Jian Wei, The Second Institute of Oceanography, SOA (China). [9638-23]

Investigation of mechanisms of generation, development and evolution of vortex structures in the northeastern part of the Black Sea and in the southeastern part of the Baltic Sea. Olga Y. Lavrova, Space Research Institute (Russian Federation); Evgeny V. Krayushkin, Lomonosov Moscow State Univ. (Russian Federation); Nikolay N. Golenko, Maria N. Golenko, P.P. Shirshov Institute of Oceanology (Russian Federation). [9638-24]

Observations of SST diurnal variability in the South China Sea. Qiangting Guo, Dongfang Chen, Zhejiang Univ. (China); Yuanjuan He, Haiqing Huang, Qiankun Zhu, Fang Gong, The Second Institute of Oceanography, SOA (China). [9638-25]

Estimation of marine primary production from MODIS data using phytoplankton absorption-based model. Ma Sheng, Wu Bin, Aerospace DongFangHong Satellite Co., Ltd. (China); Tao Zui, Institute of Remote Sensing and Digital Earth (China). [9638-26]


Estimation of phytoplankton biomass and chlorophyll concentration using MODIS data. Yuanhong Bu, Zhejiang Univ. (China); Haiqing Huang, Qiankun Zhu, Fang Gong, The Second Institute of Oceanography (SOA), China. [9638-30]


Improving MODIS ocean color retrieval through the use of the JPL DarkOcean algorithm. Ask Zhang, Xuefei Yang, Steve C. Chu, Shanghai Institute of Technical Physics (China). [9638-32]

WEDNESDAY 23 SEPTEMBER

OPENING REMARKS ........................................... 8:30 TO 8:40

SESSION 1 ...................................................... 8:40 TO 10:10

RADAR REMOTE SENSING

Session Chair: Xavier Neyt, Royal Military Academy (Belgium)


Assessment of the corrected CMOD5n ocean backscatter model using ERS scatterometer data. Anis El Youncha, Xavier Neyt, Royal Military Academy (Belgium). [9638-2]

On the measurement of sea ice area from sea ice concentration data sets. Fiorigi F. Parmiggiani, Istituto di Scienze dell’Ambiente e del Clima (Italy); Mauro Boccolari, Univ. degli Studi di Modena e Reggio Emilia (Italy). [9638-3]

Monitoring of landfast sea ice in West Antarctica using multisensor data and machine learning approaches. Maae Kim, Jungho Im, Hyunghan Han, Ulsan National Institute of Science and Technology (Korea, Republic of); Hyun-Soo Kim, Korea Polar Research Institute (Korea, Republic of). [9638-4]
SESSION 2  . . . . . . . . . . . . . . . . . . . . . . . . . . . . WED 10:30 TO 11:50

Sea Surface Modelling
Session Chair: Nicolas Pinel, ALYOTECH France (France)

Simulation of infrared emissivity and reflectivity of oil films on sea surfaces, Nicolas Pinel, Goulven Monnier, ALYOTECH France (France); Irina Sergievskaya, Institute of Applied Physics (Russian Federation); Christophe Bourlier, L’Univ. Nantes Angers Le Mans (France) .................................................. [9638-5]

Spreading of oil films on the sea surface: radar/optical observations and physical mechanisms, Stanislav A. Ermakov, Institute of Applied Physics (Russian Federation) and Volga State Univ. of Water Transport (Russian Federation); Ivan Kapustin, Institute of Applied Physics (Russian Federation); Eugeny Makarov, Baseride Technologies Pte Ltd. (Singapore); Irina Sergievskaya, Institute of Applied Physics (Russian Federation); Jose da Silva, Univ. do Porto (Portugal). .......................................................... [9638-6]


Application of compressive sensing to radar altimeter design, Yunhua Zhang, Wenshui Zhai, Xiao Dong, Xiang Gu, Xiaojin Shi, Ctr. for Space Science and Applied Research (China) ........................................ [9638-8]

Lunch/Exhibition Break .............................. Wed 11:50 to 13:10

SESSION 3  . . . . . . . . . . . . . . . . . . . . . . . . . . . . WED 13:10 TO 15:10

Optical and Thermal Remote Sensing
Session Chair: Alexander Gilerson, The City College of New York (United States)

Multiband algorithm for the estimation of chlorophyll concentration in the Chesapeake Bay, Alexander Gilerson, The City College of New York (United States); Michael Ondrusek, NOAA National Environmental Satellite, Data, and Information Service (United States); Maria Tzortziou; Robert Foster, Ahmed El-Habashi, The City College of New York (United States); Surya Prakash Tiwari, Red Sea Research Ctr. (Saudi Arabia); Samir Ahmed, The City College of New York (United States) ............................................. [9638-9]

Algorithms for retrieval of harmful algal blooms in the West Florida Shelf from VIIRS satellite observations without the need for a fluorescence channel, Samir Ahmed, Ahmed El-Habashi, Alexander Gilerson, The City College of New York (United States) ......................................... [9638-10]

Detection of ocean thermal fronts using thermal IR imagery, Irina Gladkova, Faizal Shahriar, The City College of New York (United States); Alexander Ignatov, NOAA National Environmental Satellite, Data, and Information Service (United States); Yury Khilai, Global Science & Technology, Inc. (United States). .................................................. [9638-11]

Wave period estimation from satellite images using linear wave theory, Céline Danilo, Farid Meigani, Univ. degli Studi di Trento (Italy) ................................................ [9638-12]

Revealing of various factors influence on concentration and spatial distribution of suspended matter based on remote sensing data, Olga Y. Lawrave, Space Research Institute (Russian Federation); Dmitry M. Soloviev, Marine Hydrophysical Institute (Russian Federation); Marina I. Mityagina, Alexey Y. Brochikov, Space Research Institute (Russian Federation) ................................................ [9638-13]

Optical multispectral remote sensing of ocean surface, Victor I. Titov, Institute of Applied Physics (Russian Federation) .................................................. [9638-14]

SESSION 4  . . . . . . . . . . . . . . . . . . . . . . . . . . . . WED 15:40 TO 17:00

Coastal and Inland Remote Sensing
Session Chair: Charles R. Bostater Jr., Florida Institute of Technology (United States)

Surface and subsurface optical and acoustic sensing in support of coastal waterway dredging, Charles R. Bostater Jr., Florida Institute of Technology (United States) ............................................. [9638-15]

Subpixel mapping of water boundaries using pixel swapping algorithm (case study: Tagliamento River, Italy), Milad Niroumand Jadidi, Alfonso Vitti, Univ. degli Studi di Trento (Italy) .................................................. [9638-16]

Estimation of river discharge based on remote sensing of a river plume, Alexander Osadchiev, P.P. Shirshov Institute of Oceanology (Russian Federation) .................................................. [9638-17]

Coastal water quality monitoring using geostationary ocean color imager (GOCI) satellite data and machine learning approaches, Eunna Jang, Jungho Im, Sungyuhn Ha, Ulsan National Institute of Science and Technology (Korea, Republic of) .................................................. [9638-18]
CONFERENCE 9639
Monday - Thursday 21-24 September 2015 • Proceedings of SPIE Vol. 9639

Sensors, Systems, and Next-Generation Satellites

Conference Chairs: Roland Meynart, European Space Research and Technology Ctr. (Netherlands); Steven P. Neeck, NASA Headquarters (United States); Haruhiisa Shimoda, Tokai Univ. (Japan)
Conference Co-Chair: Toshiyoshi Kimura, Japan Aerospace Exploration Agency (Japan)
Programme Committee: Olivier Saint-Pe, Airbus Defence and Space (France); Xiaoxiong J. Xiong, NASA Goddard Space Flight Ctr. (United States)

MONDAY 21 SEPTEMBER
OPENING REMARKS ............................................ 8:30 TO 8:40

SESSION 1 ........................................... MON 8:40 TO 10:30
European Missions
Session Chair: Roland Meynart, European Space Research and Technology Ctr. (Netherlands)
Overview of ESA Earth observation missions (Invited Paper), Roland Meynart, European Space Research and Technology Ctr. (Netherlands) .......... [9639-1]
The flexible combined imager onboard MTG: from design to calibration, Yannig Durand, Pascal Hallbert, Mark Wilson, Mourir Lekouma, Semen Grabarnik, Donny M. Aminou, Paul Blythe, European Space Agency (Netherlands); Bruno Napierala, Jean-Louis Canaud, Olivier Pigouche, Julien Ouaknine, Bernard Verez, Thales Alenia Space (France) .......... [9639-2]
CNES Cal/Val expertise centre for Sentinel-2 in orbit tests (TEC-52): architecture and data processing, Julien Nosavan, Thierry Trémas, Jean-Louis Raynaud, Ctr. National d’Études Spatiales (France) .......... [9639-3]
Sentinel-2 radiometric image quality commissioning: first results, Sophie Lachérade, Vincent Lonjou, Ctr. National d’Études Spatiales (France); Morgan Farges, Capgemini Technology Services (France); Philippe Garnet, Sébastien Março, Jean-Louis Raynaud, Thierry Trémas, Ctr. National d’Études Spatiales (France); Philippe Martimort, Claudia Isola, François Spoto, European Space Research and Technology Ctr. (Netherlands) .......... [9639-4]
Sentinel-2/MSI absolute calibration: first results, Vincent Lonjou, Sophie Lachérade, Bertrand Fougnie, Philippe Garnet, Sébastien Março, Jean-Louis Raynaud, Thierry Trémas, Ctr. National d’Études Spatiales (France); Philippe Martimort, Claudia Isola, François Spoto, European Space Research and Technology Ctr. (Netherlands) .......... [9639-5]

SESSION 2 ........................................... MON 11:00 TO 12:30
US Missions
Session Chair: Steven P. Neeck, NASA Headquarters (United States)
The NASA Earth Science Flight Program: an update (Invited Paper), Steven P. Neeck, NASA Headquarters (United States) .......... [9639-6]
Landsat-8: status and on-orbit performance, Brian L. Markham, NASA Goddard Space Flight Ctr. (United States); Julia A. Barei, NASA Goddard Space Flight Ctr. (United States); Ron A. Morfitt, U.S. Geological Survey (United States); Melissa Yang, Barry Dunn, Anum Barki, NASA Langley Research Ctr. (United States); Elena M. Georgieva, Tomomi Nio, Toshiyuki Konishi, Riko Oki, Takeshi Masaki, Takashi Kubota, Yuki Kawanishi, Misako Kachi, Takuji Kubota, Koji Nakau, Takeo Imai, Taikan Oki, Takeshi Masaki, NASA Goddard Space Flight Ctr. (United States) .......... [9639-7]
The Global Ecosystem Dynamics Investigation-GEDI, Ralph Dubayah, Univ. of Maryland, College Park (United States); Scott Goetz, Woods Hole Research Ctr. (United States); I. Bryan Blair, NASA Goddard Space Flight Ctr. (United States); Toshiyoshi Kimura, Japan Aerospace Exploration Agency (Japan) .......... [9639-8]
Earth radiation budget continuity observations: the Radiation Budget Instrument (RBI), Kory J. Prestriel, NASA Langley Research Ctr. (United States); Mohan Shankar, Science Systems and Applications, Inc. (United States); Anum Barki, NASA Langley Research Ctr. (United States); Elena M. Georgieva, NASA Goddard Space Flight Ctr. (United States); Melissa Yang, Barry Dunn, NASA Langley Research Ctr. (United States) .......... [9639-9]
Lunch Break ........................................ Mon 12:30 to 13:40

SESSION 3 ........................................... MON 13:40 TO 15:30
Japanese Missions I
Session Chairs: Haruhiisa Shimoda, Tokai Univ. (Japan); Toshiyoshi Kimura, Japan Aerospace Exploration Agency (Japan)
Overview of Japanese Earth observation programs (Invited Paper), Haruhiisa Shimoda, Tokai Univ. (Japan) .......... [9639-10]
ASTER VNIR 15 years growth to the standard imaging radiometer in remote sensing, Masaru Hiramatsu, Hitomi Inada, NERC Corp. (Japan); Fumihiro Sakuma, Masakuni Kikuchi, Japan Space Systems (Japan) .......... [9639-11]
Onboard calibration of the ASTER instrument over fifteen years, Fumihiro Sakuma, Masakuni Kikuchi, Koji Tatsuki, Japan Space Systems (Japan); Hitomi Inada, NERC Corp. (Japan); Shigeki Akagi, Mitsubishi Electric Corp. (Japan); Hidehiko Oto, Fujitsu Ltd. (Japan) .......... [9639-12]
ALOS-2 initial results, Yukihiro Kankaku, Shinichi Suzuki, Masanobu Shimada, Japan Aerospace Exploration Agency (Japan) .......... [9639-13]
On-orbit performance of the Compact Infrared Camera (CIRC) onboard ALOS-2, Michito Sakai, Haruyoshi Katayama, Ei Kato, Yasuhiro Nakajima, Toshiyoshi Kimura, Japan Aerospace Exploration Agency (Japan); Koji Nakau, Hokkaido Univ. (Japan) .......... [9639-14]

PLENARY SESSION .......................... MON 16:00 TO 19:15
Remote Sensing and Security + Defence Joint Plenary Session
• Grady Tuell, Georgia Tech Research Institute (United States)
The World in a Point Cloud
• Anne Harrington, National Nuclear Security Administration (United States)
Policy and Technology: Addressing Technical Challenges
• Panel Discussion
CubeSats for Earth Remote Sensing and Security and Defense Applications
For details, please see the Special Events section in the printed programme, or follow the Special Events Link at the URLs below.
http://spie.org/security-defence-europe.xml
http://spie.org/remote-sensing-europe.xml

TUESDAY 22 SEPTEMBER
SESSION 4 ............................... TUE 9:00 TO 10:20
Japanese Missions II
Session Chairs: Haruhiisa Shimoda, Tokai Univ. (Japan); Toshiyoshi Kimura, Japan Aerospace Exploration Agency (Japan)
Current status of the dual-frequency precipitation radar on the global precipitation measurement core spacecraft, Kinji Furukawa, Masahiro Kojima, Tomomi Nio, Toshiyuki Konishi, Riko Oki, Takeshi Masaki, Takashi Kubota, Yuki Kaneko, Misako Kachi, Japan Aerospace Exploration Agency (Japan); Toshio Iguchi, Hiroshi Hanado, Katsuhiko Nakagawa, National Institute of Information and Communications Technology (Japan) .......... [9639-16]
SESSION 5  TUE 10:50 TO 12:30

Japanese Missions III

Session Chairs: Haruhisa Shimoda, Tokai Univ. (Japan); Toshiyoshi Kimura, Japan Aerospace Exploration Agency (Japan)

The results of the critical design of GOSAT-2: mission and satellite, Masakazu Nakajima, Takahiro Miyakawa, Kei Shiomi, Yukie Yajima, Japan Aerospace Exploration Agency (Japan) .................. [9639-19]

Concept study of a vegetation lidar on International Space Station, Toshiyoshi Kimura, Tadashi Imai, Daisuke Sakaiizawa, Takashi Kobayashi, Junpei Murooka, Japan Aerospace Exploration Agency (Japan) ........ [9639-20]

Planed submillimeter limb sounder (SMILES-2) for measurement of temperature, wind, and chemical species in the middle atmosphere, Satoshi Ochiai, Hiroshi Yotsumoto, Takehiro Miyakawa, Kei Shiomii, Yukie Yajima, Japan Aerospace Exploration Agency (Japan) .................. [9639-21]

Sensitivity study of SMILES-2 for chemical species, Naohiro Manago, Chiba Univ. (Japan); Hirouki Ozeki, Toho Univ. (Japan); Satoshi Ochiai, Philippe Baron, National Institute of Information and Communications Technology (Japan); Makoto Suzuki, Japan Aerospace Exploration Agency (Japan) [9639-22]

Measurement of stratospheric and mesospheric winds with a submillimeter wave limb sounder: results from JEM/SMILES and simulation study for SMILES-2, Philippe Baron, National Institute of Information and Communications Technology (Japan); Naohiro Manago, Chiba Univ. (Japan); Hirouki Ozeki, Toho Univ. (Japan); Yoshisada Imajiri, Yoshinari Uzawa, Satoshi Ochiai, Philippe Baron, National Institute of Information and Communications Technology (Japan); Makoto Suzuki, Institute of Space and Astronautical Science (Japan) and Japan Aerospace Exploration Agency (Japan) [9639-23]

Lunch/Exhibition Break .................................. TUE 12:30 TO 13:40

SESSION 6  TUE 13:40 TO 15:20

Focal Plane Assemblies I

Session Chair: Olivier Saint-Pe, Airborne Defence and Space (France)

Visible and infrared detector developments supported by the European Space Agency, Nick Neilson, Kyriakos Minogiou, Christostomon Yolanda, Yves Leveillant, Roland Meynard, Jean-Loup Bézy, Mustapha Zahir, Bruno Leone, Alessandra Ciapponi, European Space Agency (Netherlands) .................. [9639-24]

Low dark current MCT-based focal plane arrays for the LWIR and VLWIR developed at AIM, Pierre Castelein, Olivier Gravrand, CEA-LETI (France); Olivier Boulade, Vincent Ciapponi, European Space Agency (Netherlands) ................. [9639-25]

Infrared detectors development and characterization at Sofradir/LETI/SAP and Japan Aerospace Exploration Agency (Japan); Toshimasa Nakajima, Yuki Ohsano, Hiroshi Yotsumoto, Takehiro Miyakawa, Kei Shiomii, Yukie Yajima, Japan Aerospace Exploration Agency (Japan) .................. [9639-18]

NGP, a new large format infrared detector for observation, hyperspectral and spectroscopic space missions in VISIR, SWIR and MWIR wavebands. An improved version, Christiane Fasquelle, Bruno Fafqué, Philippe Chorier, Sofradir (France) .................. [9639-26]

Multiband CMOS sensor simplify FPGA design, Bill W. Wang, CMOS Sensor Inc. (Taiwan); Jer Ling, National Space Organization (Taiwan) .................. [9639-27]

A compact X-ray laser array generator for the Chang’E-3 lunar rover, Haruhisa Shimoda, Tokai Univ. (Japan); Makoto Suzuki, National Institute of Information and Communications Technology (Japan); Takeshi Manabe, National Institute of Information and Communications Technology (Japan); Takeshi Manabe, Japan Space Systems (Japan); Yoshiyuki Irimajiri, Yoshinori Uzawa, Philippe Baron, National Institute of Information and Communications Technology (Japan); Makoto Suzuki, Institute of Space and Astronautical Science (Japan) and Japan Aerospace Exploration Agency (Japan) [9639-23]

Conference Program as of June 2015

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SESSION 7  TUE 15:50 TO 17:10

Focal Plane Assemblies II

Session Chair: Olivier Saint-Pe, Airborne Defence and Space (France)

A high-line rate 2048-pixel modular SWIR linear array for Earth observations missions, Ankur Anchalia, Rosa M. Vinella, Koen van der Zanden, Xenics NV (Belgium); Patrick J. Merken, Xenics NV (Belgium) and Royal Military Academy (Belgium); Jan P. Vermeiren, Xenics NV (Belgium) .................. [9639-29]

Sensor system development for the WSO-UV (World Space Observatory–UltraViolette) space-based astronomical telescope, Chris Hayes-Thakore, Stephen N. Spark, Steve Hurrell, Paul Trinder, 3DV technologies plc (United Kingdom) .................. [9639-30]

InAs photodiode for low temperature sensing, Xinmin Zhou, Ju Shen Ng, Chee Hing Tan, Univ. of Sheffield (United Kingdom) .................. [9639-31]

Extended scene wavefront sensor for space application, Thierry T. Borner, Karen Raveli, Gates Collyar, SODERN (France) .................. [9639-32]

POSTER SESSION  TUE 17:30 TO 19:15

Conference attendees are invited to attend the Remote Sensing poster session held on Tuesday 17:30 to 19:15. Posters will be on display after 10:00 Tuesday morning in the Conference Hallway. Authors of poster papers will be present to answer questions concerning their papers during the Tuesday Poster Session. Check the posters and ask questions of the authors and experts about your professional interest and network with colleagues in your field. Attendees are required to wear their conference registration badges to the poster sessions. Poster authors, view poster presentation guidelines and set-up instructions at http://spie.org/x32334.

Image quality analysis of geosynchronous space array camera under micro vibration of pulse tube cryocooler, Yue Wang, Wang Shigeki Agaki, Mitsubishi Electric Corp. (Japan); Hidetokio Ono, Fujitsu Ltd. (Japan) .................. [9639-73]

ASTER 15 years challenging task on-orbit operation, Masakazu Kikuchi, Fumisaku Sukuma, Kenji Tatsumi, Japan Space Systems (Japan); Naohiro Manago, Tsukasa Inoue, Yukishita Tsuchiya, National Astronomical Observatory of Japan; Takeshi Manabe, Japan Space Systems (Japan); Takeshi Manabe, Japan Aerospace Exploration Agency (Japan) .................. [9639-23]

Comparison of thermal infrared emissivity retrieved with the absolute emissivity method and the TES method with theoretical model, Jian-Wei Ding, Wei Wang, Yu Bai, Jianyu Chen, The Second Institute of Oceanography, SOA (China) .................. [9639-76]

Aurora activities observed by SNPP VIIRS day night band during a long period geomagnetic storm event on April 29-30, 2014, Xi Shao, Univ. of Maryland, College Park (United States); Changyoung Cao, NOAA National Environmental Satellite, Data, and Information Service (United States); Bin Zhang, Univ. of Maryland, College Park (United States); Wenhui Wang, ERT, Inc. (United States); Shing F. Fung, NASA Goddard Space Flight Center (United States) .................. [9639-77]

ASTER System operating achievement for 15 years on orbit, Hitomi Inada, Yoshiyuki Ito, NEC Corp. (Japan); Shigeki Akagi, Mitsubishi Electric Corp. (Japan); Hidetokio Ono, Fujitsu Ltd. (Japan) .................. [9639-75]

Rugged: an operational, open-source solution for Sentinel-2 mapping, Luc Maisonneuve, Jean Seyral, Guillaume Prat, Jonathan Guinet, Aude Essespet, CS Systemes d’information (France) .................. [9639-80]

Pixel pattern method using Markov random field for measurements of closely spaced objects by optical sensors, Xueying Wang, Jun Li, Weidong Sheng, Wei An, National Univ. of Defense Technology (China) .................. [9639-81]

Application of high-precision matching about multisensor in fast stereo imaging, Hu Jing Zhang, Academy of Opto-Electronics (China) and Chinese Academy of Sciences (China); Ankur Anchalia, Rosa M. Vinella, Koen van der Zanden, Xenics NV (Belgium); Patrick J. Merken, Xenics NV (Belgium) and Royal Military Academy (Belgium); Jan P. Vermeiren, Xenics NV (Belgium) .................. [9639-29]
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Applicability research of smart camera for the application of unmanned aerial vehicle, Ho Hyun Jeong, Dong Yoon Shin, Chou Uong Choi, Pukyong National University (Korea, Republic of) ........................................ [9639-85]

S-NPP VIIRS day-night band on-orbit calibration and performance update, Kwofu V Chiang, Houda Chen, Science Systems and Applications, Inc. (United States); Chengbo Sun, Global Science and Technology, Inc. (United States); Samuel Anderson, Science Systems and Applications, Inc. (United States); Xiaoxiong Xiong, NASA/GSFC (United States) .......................... [9639-86]

SESSION 8  ........................................... WED 8:30 TO 10:10

Calibration I

Session Chair: Xiaoxiong J. Xiong, NASA Goddard Space Flight Ctr. (United States)

Comparison of S-NPP VIIRS and PLEIADES lunar observations, Xiaoxiong J. Xiong, NASA Goddard Space Flight Ctr. (United States); Sophie Lachérade, Bertrand Fougnie, Ctr. National d’Études Spatiales (France); Jon P. Fulbright, Zhipeng Wang, Science Systems and Applications, Inc. (United States) [9639-33]

S-NPP VIIRS SDR calibration assessment and improvement, Kwofu V Chiang, Ning Lei, Jon P. Fulbright, Samuel Anderson, Science Systems and Applications, Inc. (United States); Sergey Gusev, Chengbo Sun, Global Science and Technology, Inc. (United States); Xiaoxiong Xiong, NASA/GSFC (United States) .......................... [9639-34]

A summary of the joint GSICS –CÉOS/IVOS lunar calibration workshop: moving towards intercalibration using the Moon as a transfer target, Sébastien C. Wagner, Tim J. Hewison, EUMETSAT (Germany); Thomas C. Stone, U.S. Geological Survey (United States); Sophie Lachérade, Bertrand Fougnie, Ctr. National d’Études Spatiales (France); Xiaoxiong J. Xiong, NASA Goddard Space Flight Ctr. (United States) .......................... [9639-35]

Assessment of MODIS on-orbit spatial performance, Daniel Link, Zhipeng Wang, Science Systems and Applications, Inc. (United States); Xiaoxiong J. Xiong, NASA Goddard Space Flight Ctr. (United States) .......................... [9639-36]

Cross-calibration of the reflective solar bands of Terra MODIS and Landsat 7 Enhanced Thematic Mapper plus over PICS using different approaches, Anit Angal, Jake Brinkmann, Science Systems and Applications, Inc. (United States); Nischal Mishra, South Dakota State Univ. (United States); Daniel Link, Science Systems and Applications, Inc. (United States); Xiaoxiong J. Xiong, NASA Goddard Space Flight Ctr. (United States); Dennis L. Helder, South Dakota State Univ. (United States) .......................... [9639-37]

SESSION 9  ........................................... WED 10:40 TO 12:20

Calibration II

Session Chair: Xiaoxiong J. Xiong, NASA Goddard Space Flight Ctr. (United States)

Evaluation of VIIRS and MODIS thermal emissive band calibration consistency using Dome C, Shravan Madhavan, Aisheng Wu, Jake Brinkmann, Brian N. Wenny, Science Systems and Applications, Inc. (United States); Xiaoxiong J. Xiong, NASA Goddard Space Flight Ctr. (United States) .......................... [9639-38]

Tracking Terra MODIS on-orbit polarization sensitivity using pseudo-invariant desert sites, Aisheng Wu, Xu Geng, Science and Systems Applications, Inc. (United States); Andrew Wald, Global Science & Technology, Inc. (United States); Xiaoxiong J. Xiong, NASA Goddard Space Flight Ctr. (United States) .......................... [9639-39]


LandSat-8 calibration inter-consistency with ocean color missions, Nirn Palhevan, NASA Goddard Space Flight Ctr. (United States) and Sigma Space Co. (United States); John R. Schott, Rochester Institute of Technology (United States) .......................... [9639-41]

SESSION 10  ........................................... WED 13:30 TO 15:10

Calibration III

Session Chair: Xiaoxiong J. Xiong, NASA Goddard Space Flight Ctr. (United States)

Selemonicographic coordinate mapping of lunar observations by GOES imager, Xi Shao, ERT, Inc. (United States) and Univ. of Maryland, College Park (United States); Xiangyuan Wu, National Oceanic and Atmospheric Administration (United States); Fangfang Yu, ERT, Inc. (United States) .......................... [9639-43]

Preparation of a new autonomous instrumented radiometric calibration site: Gobabeb, Namib Desert, Claire L. Greenwell, Agneszka Bliek, Amelia Marks, Emma R. Woollams, National Physical Lab. (United Kingdom); Béatrice Berthelot, Magellium (France); Aimé Meygret, Sébastien Marcq, Ctr. National d’Études Spatiales (France); Marc Bouvet, European Space Research and Technology Ctr. (Netherlands); Nigel Fox, National Physical Lab. (United Kingdom) .......................... [9639-44]

Development of a sensor web for vicarious-sites measurement based on self-calibrating LED radiometers, Roberto Filippio, Emanuele Taralli, Mauro Rajeri, Giorgio Brida, Istituto Nazionale di Ricerca Metrologica (Italy); Simon R. G. Hall, Agnieszka Bliek, Claire L. Greenwell, Nigel Fox, National Physical Lab. (United Kingdom) .......................... [9639-45]

Vicarious calibration of KOMPSAT-3 AEISS, Ho Yong Ahn, Pukyong National Univ. (Korea, Republic of); Jinsoo Kim, Inje Univ. (Korea, Republic of); Chuloung Choi, Dong Yoon Shin, Pukyong National Univ. (Korea, Republic of) .......................... [9639-46]

Advantages of calibration attitude maneuvers for spaceborne microwave radiometer missions, Spencer Farrar, Linwood Jones, Univ. of Central Florida (United States); David W. Draper, Ball Aerospace & Technologies Corp. (United States) .......................... [9639-47]

SESSION 11  ........................................... WED 15:40 TO 16:40

Calibration IV

Session Chair: Xiaoxiong J. Xiong, NASA Goddard Space Flight Ctr. (United States)

The Traceable Radiometry Underpinning Terrestrial and Helio Studies (TRUTHS) mission, Paul Green, Nigel Fox, National Physical Lab. (United Kingdom); Daniel R. Lobb, Surrey Satellite Technology Ltd. (United Kingdom) .......................... [9639-48]

Creation and validation of Spectralon BRDF targets and standards, Christopher N. Durell, Labsphere, Inc. (United States) .......................... [9639-49]

China radiometric calibration sites ground-based automatic observing systems for CAL/VAL, Yong Zhang, Zhiguo Rong, Xiuqing Hu, National Satellite Meteorological Ctr. (China); Xitian Ba, Dunhuang Meteorological Bureau (China) .......................... [9639-50]

SESSION 12  ........................................... WED 16:40 TO 17:40

Missions and Technologies I

Overview of test and application of the multispectral camera on ZY-3 Satellite, Weijun Cai, Beijing Institute of Space Mechanics and Electricity (China) .......................... [9639-51]

Research on integrated design of platform and payload for the high-resolution space camera, Dewei Sun, Sun Xin, Jinqiang Wang, Xiao-Yong Wang, Beijing Institute of Space Mechanics and Electricity (China) .......................... [9639-52]

Deployment simulation of a deployable reflector for earth science application, Xiaokai Wang, Houfei Fang, Be Cai, Xiaojun Ma, Shanghai YS Information Technology Co., Ltd. (China) .......................... [9639-53]
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SESSION 13  ........................................THU 9:00 TO 10:20

Missions and Technologies II

Radiometric uncertainty per pixel for the Sentinel-2 L1C products, Javier
Gorroño, National Physical Lab. (United Kingdom); Ferran Gascon, European
Space Agency (Italy); Nigel Fox, National Physical Lab. (United
Kingdom). ................................................................ [9639-53]

G-MAP: a novel night vision system for satellites, Thomas Miletli, European
Space Research and Technology Ctr. (Netherlands) and Univ. Studi di
Trieste (Italy); Luca Maresi, Alessandro Zuccaro Marchi, European Space
Research and Technology Ctr. (Netherlands); Giorgia Pontetti, G & A Engineering
S.r.l. (Italy). ................................................................ [9639-52]

Photonic front-end for the next-generation of space SAR applications, Miguek A. Piqueras, Teresa Menguay, DAS Photonics (Spain); Bartos Chmielak,
AMG GmbH (Germany); Alfredo Catalani, Space Engineering S.p.A (Italy); Peter
G. Huggard, RAL Space (United Kingdom); Rubén Ortuño, Univ. Politécnica de
Valencia (Spain). ................................................................ [9639-51]

Two conceptual designs for optical system of next-generation small
satellites, Sayyed Ashkan Adibi, Shahid Bahonar Univ. of Kerman (Iran, Islamic
Republic of); Azam Karami, Shahid Bahonar Univ. of Kerman (Iran, Islamic
Republic of) and Univ. Antwerp (Belgium). ......................... [9639-50]

SESSION 14  ........................................THU 10:50 TO 12:30

Missions and Technologies III

Material choices and resulting dimensional stability of optical systems
in orbit, Tony B. Hull, The Univ. of New Mexico (United States); Thomas
Westerhoff, SCHOTT AG (Germany). ........................... [9639-58]

Design and fabrication of a VNIR Offner imaging spectrometer, Andreas
Gebhardt, Thomas Peschel, Christoph Damm, Fraunhofer-Institut für
Angewandte Optik und Feinmechanik (Germany); Ingo Walter, Deutsches
Zentrum für Luft- und Raumfahrt e.V. (Germany); Matthias Beier, Uwe D.
Zeitner, Hans-Christoph Eckstein, Fraunhofer-Institut für Angewandte Optik und
Feninnechanik (Germany). ........................................... [9639-59]

Research on Dyson imaging spectrometer based on Fery prism, Linlin Pei,
JR., Academy of Opto-Electronics (China). ......................... [9639-60]

Visible spectral imager for occultation and nightglow (VISION) for the
PICASSO Mission, Heikki Saari, Antti Näsilä, Christer Holm Lund, Rami
Mannila, Harri J. Ojanen, Ismo Nääkkö, VTT Technical Research Ctr. of Finland
Ltd. (Finland); Didier Fussen, Didier Pieroux, Philippe Demoulin, Emmanuel
Dekemper, Filip Vanhelleghem, Belgian Institute for Space Aeronomy
(Belgium). ................................................................. [9639-61]

The ESA RADGLASS activity: a radiation study of non rad-hard glasses, Ilias G. Manolis, Jean-Loup Bézy, Ramon J. Vink, Atul Deep, Munadi Ahmad,
Emmanuel Amorim, Roland Meynart, European Space Research and Technology
Ctr. (Netherlands). .................................................. [9639-62]

Lunch Break .................................................................. Thu 12:30 to 13:40

SESSION 15  ........................................THU 13:40 TO 15:20

Missions and Technologies IV

Operational requirements for multispectral and hyperspectral sensors
collecting essential climate variables (ECVs) for the next 20 years, Douglas
B. Helmuth, Lockheed Martin Corp. (United States). ............ [9639-63]

Design tradeoffs for a high-resolution, wide-field camera for a small-
satellite Earth observation mission, Denis P. Naughton, CGS S.p.A. (Italy);
Stefano Pieracconi, CGS S.p.A. (Italy); Paolo Sandri, CGS S.p.A. (Italy) .... [9639-64]

A new service support tool for COSMO-SkyMed: civil user coordination
service and civil request management optimization, Maria Girolamo Daraio,
Patrizia Sacco, Maria Liliera Battagliere, Luca Fasano, Alessandro Coletta,
Agenzia Spaziale Italiana (Italy). ................................... [9639-65]

The COSMO-SkyMed ground and ILS+OPS segments upgrades for full
civilian capacity exploitation, Luca Fasano, Giuseppe Francesco De Luca,
Mauro Cardone, Rosa Loizzo, Patrizia Sacco, Maria Girolamo Daraio, Agenzia
Spaziale Italiana (Italy). ........................................... [9639-66]

OPTIMA: advanced methods for the analysis, integration and optimization
of PRISMA mission products, Danoselva Guzzi, Ivan Pippi, Bruno Aliazz,
Stefano Baronti, Roberto Carla, Cinzia Lastris, Yanni Nardino, Valentina Raimondi,
Leonardo Santurri, Massimilano Selva, Istituto di Fisica Applicata Nello Cerrara
(Italy); Luciano Alparone, Istituto di Fisica Applicata Nello Cerrara (Italy) and
Univ. degli Studi di Firenze (Italy); Andrea Garzelli, Istituto di Fisica Applicata
Nello Cerrara (Italy) and Univ. degli Studi di Siena (Italy); Ettore Lopinto, Cristina
Ananass, Agenzia Spaziale Italiana (Italy); Alessandro Barducci, SOFAS S.R.L.
(Italy). ................................................................. [9639-67]

SESSION 16  ........................................THU 15:40 TO 17:00

Missions and Technologies V

Visible and near-infrared imaging spectrometer (VNIS) for in-situ lunar
surface measurements, Zhiping He, Rui Xu, Chunli Li, Gang Lv, Lijun Yuan,
Binyong Wang, Rong Shu, Jianyu Wang, Shanghai Institute of Technical Physics
(China). ................................................................. [9639-68]

Positioning accuracy imperment of three-line mapping satellite after
using laser altimeter, Qiang Dou, Qipeng Cao, Jun Zhu, Yan Li, Aerospace
DongFangHong Satellite Co., Ltd. (China). ........................ [9639-69]

Low-mass planar photon imaging technique with high-resolution and
wide spatial frequency, Yue Zhang, Beijing Institute of Space Mechanics and
Electricity (China). .................................................. [9639-70]

An on-orbit spectral calibration method for dispersive spectral imaging
system, YU DAI, Chinese Academy of Science (China) ............ [9639-71]
Remote Sensing of Clouds and the Atmosphere

Conference Chairs: Adolfo Comorón, Univ. Politécnica de Catalunya (Spain); Evgueni I. Kassianov, Pacific Northwest National Lab. (United States); Klaus Schäfer, Karlsruher Institut für Technologie (Germany)

Conference Co-Chair: Richard H. Picard, ARCON Corp. (United States)

Programme Committee: Aldo Amodeo, Istituto di Metodologie per l’Analisi Ambientale (Italy); Christoph C. Borel-Donohue, Air Force Institute of Technology (United States); Young Joon Kim, Gwangju Institute of Science and Technology (Korea, Republic of); Konradin Weber, Fachhochschule Düsseldorf (Germany)

TUESDAY 22 SEPTEMBER

POSTER SESSION ............................... TUE 17:30 TO 19:15

Conference attendees are invited to attend the Remote Sensing poster session held on Tuesday 17:30 to 19:15. Posters will be on display after 10:00 Tuesday morning in the Conference Hallway. Authors of poster papers will be present to answer questions concerning their papers during the Tuesday Poster Session. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Attendees are required to wear their conference registration badges to the poster sessions. Poster authors, view poster presentation guidelines and set up instructions at http://spie.org/x32234.xml.

Influence of urban agglomerations on optical properties of aerosols based on remote sensing observations, Olga Zavaritskaya, Konstfut M. Markowicz, Univ. of Warsaw (Poland) ............................................... [9640-36]

Geoinformation system for prediction of forest fire danger caused by solar radiation using remote sensing data, Nikolay V. Baranovskiy, Elena P. Yankovich, Tomsk Polytechnic Univ. (Russian Federation) .................. [9640-37]

Quantitative interpretation of MODIS cloud mask: impact on cloud amount estimation, Andrzej Kotarba, Space Research Ctr. (Poland) ........................................ [9640-38]

Solar radiation environment study in the near-space atmosphere over China area, Dongdong Fan, Aerospace DongFangHong Satellite Co., Ltd. (China); Xingfeng Chen, Zhengqiang Li, Institute of Remote Sensing and Digital Earth (China); Xiaodong Mei, Ocean Univ. of China (China) .................. [9640-39]

The estimation of surface solar radiation considering the distortion of the cloud shadow on complex terrain, Bin Li, Institute of Remote Sensing and Digital Earth (China) ............................................... [9640-40]

Detection of severe air pollution from multidirectional perspectives, Sonoyo Mukai, Kyoto College of Graduate Studies for Informatics (Japan); Itaru Sano, Makio Nakata, Mitaka, Kyusyu University (Japan); Yankovich, Tomsk Polytechnic Univ. (Russia) ........................................ [9640-41]

Air quality assessment from surface and space, Itaru Sano, Makio Nakata, Mitaka, Kyusyu University (Japan); Sonoyo Mukai, Kyoto College of Graduate Studies for Informatics (Japan) ............................................... [9640-42]

Estimation of solar radiation by using modified Heilosat-II method and COMS-MI imagery, Wonseok Choi, Ahram Song, Yongil Kim, Seoul National Univ. (Korea, Republic of) ........................................ [9640-43]

Exploting the structure of microwave radiometer-derived temperature profile for stable boundary layer height estimation, Umar Saed, Univ. Politecnica de Catalunya (Spain); Francisco Risco-caballero, Univ. Politecnica de Catalunya (Spain) and Institut d’Estudis Espacials de Catalunya (Spain); Susanne Crevell, Univ. zu Köln (Germany) ............................................... [9640-44]

Synergy of remote sensing and UAV measurements in retrieval of vertical structure of the aerosol absorbing properties, Michal T. Chilinski, Krzysztof M. Markowicz, Univ. of Warsaw (Poland) ............................................... [9640-45]

Improvement of PM2.5 density distribution visualization system using ground-level sensor network and Mie lidar, Hiroshi Okumura, Taiga Aihaya, Yu Kojiro, Shinya Okano, Saga Univ. (Japan); Osamu Uchino, National Institute for Environmental Studies (Japan) and Meteorological Research Institute (Japan); Isamu Morino, Tatsuya Yokota, National Institute for Environmental Studies (Japan); Tomohiro Naga, Tetsu Sakai, Takashi Maki, Akhiro Yamazaki, Meteorological Research Institute (Japan); Kohei Ari, Saga Univ. (Japan) ............................................... [9640-46]

Time-series MODIS satellite and in-situ data for spatio-temporal distribution of aerosol pollution assessment over Bucharest metropolitan area, Maria A. Zoran, Roxana S. Savastru, Dan M. Savastru, National Institute of Research and Development for Optoelectronics (Romania) .................. [9640-47]

Development of new shipborne aureometer to measure the intensities of direct and scattered solar radiation on rolling and pitching vessel, Hiroshi Kobayashi, Univ. of Yamanashi (Japan); Masataka Shiozawa, National Institute of Polar Research (Japan) ............................................... [9640-48]

WEDNESDAY 23 SEPTEMBER

OPENING REMARKS ........................................ 8:50 TO 9:00

SESSION 1 ............................................ WED 9:00 TO 12:20

Lidar, Radar, and Passive Atmospheric Measurements I

Session Chair: Klaus Schäfer, Karlsruher Institut für Technologie (Germany)

Aerosol properties from combined oxygen A-band radiances and lidar (Invited Paper), David Wheatley, NASA Langley Research Ctr. (United States); Pengwai Zhai, Univ. of Maryland, Baltimore County (United States); Yongxiang Hu, NASA Langley Research Ctr. (United States) .................. [9640-1]

The ESA-JAXA EarthCARE clouds, aerosol and radiation explorer mission: overview and development status, Dulce Lajas, European Space Research and Technology Ctr (Netherlands); Michael Elisinger, European Space Agency - European Centre for Space Applications and Telecommunications (ESA-ECSTASY) (United Kingdom); Tobias Wehr, Robert Koopman, Alain Lefebvre, European Space Research and Technology Ctr. (Netherlands) ........................................ [9640-2]

94 GHz doppler wind satellite mission concept, Chung-Chi Lin, Björn Rommen, Christopher Buck, Dirk Schüttmeyer, European Space Research and Technology Ctr. (Netherlands) ........................................ [9640-3]

Deriving aerosol properties from measurements of the Atmosphere-Surface Radiation Automatic Instrument (ASRAI), Hua Xu, Donghui Li, Zhengqiang Li, Xingfeng Chen, Institute of Remote Sensing and Digital Earth (China); Kao-Biao Zheng, Xin Li, Anhui Institute of Optics and Fine Mechanics (China) ............................................... [9640-4]

Comparison of unfiltered Ceres radiances measured from the S-NPP and Aqua Satellites over matched sites, Zbigniew P. Szewczyk, Science Systems and Applications, Inc. (United States) ............................................... [9640-5]

Design and performances of microcameras and photometers instruments on TARANIS satellite for an advanced characterization of transient luminous event in the upper atmosphere, Fanny Le Mer-Dachard , Eloide Cansot, Philippe-Jean Hébert, Thomas Farges, Ctr. National d’Etudes Spatiales (France); Karen Ravel, SODERN (France); Stéphanie Gallacq, Berlin Technologies (France) ............................................... [9640-6]

Performance test of the synergetic use of simulated lidar and microwave radiometer observations for mixing-layer height detection, Umar Saed, Univ. Politecnica de Catalunya (Spain); Francesc Risco-caballero, Univ. Politecnica de Catalunya (Spain) and Institut d’Estudis Espacials de Catalunya (Spain); Susanne Crevell, Univ. zu Köln (Germany) ............................................... [9640-7]

Use of the fragmentary spectrum registration method for Raman spectroscopy, Alexander V. Fadeyev, Vitaliy E. Pozhar, Vladislav I. Pustovoit, Scientific and Technological Ctr, for Unique Instrumentation (Russian Federation) ............................................... [9640-8]

Lunch/Exhibition Break .................................. Wed 12:20 to 13:30

SESSION 2 ............................................ WED 13:30 TO 14:30

Lidar, Radar, and Passive Atmospheric Measurements II

Session Chair: Klaus Schäfer, Karlsruher Institut für Technologie (Germany)

Doppler capable FMCW cloud detection radar, Salih Coskun, Middle East Technical Univ. (Turkey) and ASELSAN Inc. (Turkey); Mert Celik, Middle East Technical Univ. (Turkey) and Makteksan Defense Ind. Inc. (Turkey); Ali Ozgur Yilmaz, Sencor Koc, Middle East Technical Univ. (Turkey) and Makteksan Defense Ind. Inc. (Turkey) ............................................... [9640-9]

A division of aperture polarimeter of light for remote sensing, Hongwen Gao, Shaanxi Open Univ. (China) ............................................... [9640-10]
SESSION 3 ............................... WED 14:30 TO 17:20
Remote Sensing of Clouds
Session Chair: Evgenii I. Kassianov, Pacific Northwest National Lab. (United States)
Comparing different methods to retrieve cloud top height from Meteosat satellite data, Ilaria Tabone, Univ. degli Studi di Torino (Italy); Susana Briz, Antonio Jesus de Castro González, Univ. Carlos III de Madrid (Spain); Claudio Cassandro, Silvia Ferrarese, Roberto Cremonini, Mario Bertaina, Univ. degli Studi di Torino (Italy); Anna Anzalone, INAF - Istituto di Astrofisica Spaziale e Fisica Cosmica di Palermo (Italy); Francesco Iagro, Univ. degli Studi di Napoli Federico II (Italy) ................................................ [9642-12]
On the reliability of satellite observations for diagnosing indirect aerosol effects, Daniel Merk, Hartwig Deneke, Leibniz Institut für Troposphärenforschung (Germany); Bernhard Pospichal, Univ. Leipzig (Germany); Patrick Seifert, Leibniz-Institut für Atmosphärenphysik e.V. (Germany) ................................................ [9642-13]
Study of the widespread haze clouds over China with A-Train satellite observations, Menghui Tao, Liangfu Chen, Zhifeng Wang, Institute of Remote Sensing and Digital Earth (China); Changyu Huo, Institute of Remote Sensing and Digital Earth (China) ................................................ [9642-14]
Clouds observations with high resolution FMCW cloud profiling radar FALCON-A at the arctic station in Ny-Alesund, Toshiaki Takano, Yohei Kavamura, Hiroyuki Nakata, Tamio Takamura, Chiba Univ. (Japan); Masatake Shiobara, National Institute of Polar Research (Japan) .............................. [9642-15]
Numerical modeling of polarization properties of the return signals in ground-based lidar cloud sensing, Evgeniya G. Kablukova, Institute of Computational Mathematics and Mathematical Geophysics (Russian Federation); Boris A. Kargin, Institute of Computational Mathematics and Mathematical Geophysics (Russian Federation) and Novosibirsk State Univ. (Russian Federation); Andrey A. Lisenko, V.E. Zuev Institute of Atmospheric Optics (Russian Federation) and National Research Tomsk State Univ. (Russian Federation) ................................................ [9642-16]
Analysis of heavy precipitation caused by the vortices in the lee of the Tibetan Plateau from TRMM observations, Guangqi Li, Chengdu Univ. of Information Technology (China) ................................................ [9642-17]
Monthly validation of TRMM rainfall distribution over west of Iran, Khalil Vallazadeh Kannan, Soodabeh Namdari, Ali Akbar Rasuly, Univ. of Tabriz (Iran), Islamic Republic of of, ....... [9642-18]

THURSDAY 24 SEPTEMBER
SESSION 4 ............................... THU 9:00 TO 12:00
Radiative Transfer
Session Chair: Evgenii I. Kassianov, Pacific Northwest National Lab. (United States)
Characterization of optical properties, microphysical properties and vertical structure of aerosols using passive and active remote-sensing observations over the Mediterranean during the ChArMEx/ADRIMEX experiment (Invited Paper), Marc Mallet, CNRS-Laboratoire d’Aérologie (France) ........................................ [9642-19]
Estimation of aerosol direct radiative forcing in Barcelona and Lecce during the 2013 ADRIMEX campaign, Rubén Barragan, Univ. Politécnica de Catalunya (Spain); Salvatore Romano, Univ. del Salento (Italy); Michalík Scard, Univ. Politécnica de Catalunya (Spain); Pasquale Burlizzi, Maria-Rita Perrone, Univ. del Salento (Italy); Adolfo Comerón, Univ. Politécnica de Catalunya (Spain); Pasquale Burlizzi, Maria-Rita Perrone, Univ. del Salento (Italy); Adolfo Comerón, Univ. Politécnica de Catalunya (Spain) ................................................ [9642-20]
How well can we estimate areal-averaged spectral surface albedo from ground-based transmission in the Atlantic coastal area?, Evgenii I. Kassianov, Connor Flynn, Laura Rihimaki, Dail Chand, Pacific Northwest National Lab. (United States); James Bamard, Univ. of Nevada, Reno (United States); Cristina Marinovich, Kyo-Sun Lim, Pacific Northwest National Lab. (United States) ................................................ [9642-21]
Cloud radiative characteristic parameter calculation for space-based remote sensing sensors, Hongxia Wang, Xiaojian Xu, Beihang Univ. (China) ................................................ [9642-22]
Neural network-based fast forward model for the infrared sounder aboard INSAT 3D, Deo Kumar, Krishnamoorthy Chandramouli, Indian Institute of Technology Madras (India) ................................................ [9642-23]
The thermal infrared radiative properties of dust aerosol over ocean, Zengzhou Hao, Delu Pan, Fang Gong, Jianyu Chen, Tianyu Wang, The Second Institute of Oceanography, SOA (China) ................................................ [9642-24]
**CONFERENCE 9641**

**Tuesday 22 September 2015 • Proceedings of SPIE Vol. 9641**

**Optics in Atmospheric Propagation and Adaptive Systems**

**Conference Chairs:** Karin U. Stein, Fraunhofer-Institut für Optronik, Systemtechnik und Bildauswertung (Germany); John D. Gonglewski, European Office of Aerospace Research and Development (United Kingdom)

**Programme Committee:** Ivo Buske, Deutsches Zentrum für Luft- und Raumfahrt e.V. (Germany); Sylvain Cheinet, Institut Franco-Allemand de Recherches de Saint-Louis (France); David C. Dayton, Applied Technology Associates (United States); Gregory C. Dente, Air Force Research Lab. (United States); Dennis Dion Jr., Defence Research and Development Canada, Valcartier (Canada); Stephen M. Hammei, Space and Naval Warfare Systems Command (United States); Vladimir P. Lukin, V.E. Zuev Institute of Atmospheric Optics (Russia); Cheryl Matson, Univ. of California, San Diego (United States); Sergio R. Restaino, U.S. Naval Research Lab. (United States); Jim Riker, Air Force Research Lab. (United States); Marc J. F. Séchaud, ONERA (France); Alexander M. J. van Eijk, TNO Defence, Security and Safety (Netherlands); Arthur D. van Rheenen, Norwegian Defence Research Establishment (Norway); Mikhail A. Vorontsov, Proc. Roy. Soc. (United Kingdom); Karin U. Stein, Fraunhofer-Institut für Optronik, Systemtechnik und Bildauswertung (Germany) ............... [9641-1]

**Tuesday 22 September**

WELCOME AND INTRODUCTION .................. 8:50 TO 9:00
Karin U. Stein, Fraunhofer-Institut für Optronik, Systemtechnik und Bildauswertung (Germany)

SESSION 1 ....................................... TUE 9:00 TO 10:30
Characterization of the Environment I
Overview of remote sensing activities at the Institute of Maritime Technology, South Africa (Invited Paper), Willem H Gunter, IMT (South Africa) .................. [9641-1]
Estimation of the refractive index structure parameter Cn2 via image analysis of a point source, Leif Humbert, Ivo Buske, Deutsches Zentrum für Luft- und Raumfahrt e.V. (Germany) .................. [9641-2]
Shortwave infrared for night vision applications: illumination levels and sensor performance, Uwe Adomeit, Jürgen Krieg, Fraunhofer-Institut für Optronik, Systemtechnik und Bildauswertung (Germany) .................. [9641-3]
Ultimate turbulence experiment: simultaneous measurements of Cn2 near the ground using six devices and eight methods, Lydia I. Yatcheva, Rui Almeida de Sa Barros, Max Segel, Detlev Sprung, Erik Sucher, Christian Eisele, Zsyzmon Gladysz, Fraunhofer-Institut für Optronik, Systemtechnik und Bildauswertung (Germany) .................. [9641-4]

SESSION 2 ....................................... TUE 11:00 TO 12:20
Characterization of the Environment II
Influence of aerosols on atmospheric transmission at the Baltic Sea: comparison of experimental results with model simulations using MODTRAN, Silke Vogelbacher, Detlev Sprung, Karin Stein, Fraunhofer-Institut für Optronik, Systemtechnik und Bildauswertung (Germany) ............... [9641-5]
The shower curtain effect paradoxes, Gregoire Tremblay, AEREX avionique inc. (Canada); Robert Benetier, Les Instruments Optiques du St-Laurent Inc. (Canada); Gilles Roy, Defence Research and Development Canada, Valcartier (Canada) ............... [9641-6]
Polarimetric active imaging in dense fog, Robert Benetier, Les Instruments Optiques du St-Laurent Inc. (Canada); Xiaoying Cao, Lidar (Canada); Gregoire Tremblay, AEREX avionique inc. (Canada); Gilles Roy, Defence Research and Development Canada, Valcartier (Canada) ............... [9641-7]
New optical receiving system design for portable camera lidar, Laian Qin, Anhui Institute of Optics and Fine Mechanics (China) ............... [9641-8]
Lunch/Exhibition Break .................. Tuesday 12:20 to 13:40

SESSION 3 ....................................... TUE 13:40 TO 15:00
Laser Beam Propagation
Prediction of optical communication link availability: real-time observation of cloud patterns using a ground-based thermal infrared camera, Clément Berin, IRT A. de Saint Exupéry (France) and Reuninwatt (France); Sylvain Cros, Reuninwatt (France); Laurent St-Antonin, IRT A. de Saint Exupéry (France); Nicolas Schmutz, Reuninwatt (France) .................. [9641-9]
Laser beam propagation through turbulence and adaptive optics for beam delivery improvement, Stéphane Nicolas, Norwegian Defence Research Establishment (Norway) .................. [9641-10]
Investigation of dual-wavelength laser beam propagation along the in-door atmospheric path, Vladimir Y. Venediktov, Alina V. Gorelaya, Elena V. Shuberkova, Saint Petersburg Electrotechnical University "LETI" (Russian Federation) ....... [9641-11]
Turbulent phase noise on asymmetric two-way ground-satellite coherent optical links, Clélia Robert, Jean-Marc Conan, ONERA (France); Peter Wolf, Observatoire de Paris (France) ............... [9641-12]

SESSION 4 ....................................... TUE 15:30 TO 16:50
Optical Systems
Theoretical and experimental analysis of perspective elongation for sodium laser guide star, Feng Wang, China Academy of Engineering Physics (China) ............... [9641-13]
TOPTICA’s robust sodium guide star laser system, Martin Enderlein, Robin Schwerdt, Bernhard Ernsterberger, Wilhelm Kaenders, TOPTICA Photonics AG (Germany); Daoping Wei, Vladimir Karpov, Wallace R. L. Clements, MPB Communications Inc. (Canada) .................. [9641-14]
Residual distortions caused by the size of a reference source, Vladimir P. Lukin, V.E. Zuev Institute of Atmospheric Optics (Russian Federation) ....... [9641-15]
Enhanced monolithic diffraction gratings with high efficiency and reduced polarization sensitivity for remote sensing applications, Peter Triebel, Torsten Diehl, Tobias Moeller, Carl Zeiss Microscopy GmbH (Germany); Alexandre Gatto, Alexander Pesch, Lars Erdmann, Matthias Burkhardt, Alexander Kalies, Carl Zeiss, Jena GmbH (Germany) ............... [9641-16]

SESSION 5 ....................................... TUE 16:50 TO 17:50
Turbulence Deconvolution
Fast PSF estimation under anisoplanatic conditions, Francesco de Asis Molina Martel, Fraunhofer-Institut für Optronik, Systemtechnik und Bildauswertung (Germany); Roberto Baena Galle, Univ. de Barcelona (Spain); Zsyzmon Gladysz, Fraunhofer-Institut für Optronik, Systemtechnik und Bildauswertung (Germany) ............... [9641-17]
Image enhancement methods for turbulence mitigation and the influence of different color spaces, Claudia S. Huebner, Fraunhofer-Institut für Optronik, Systemtechnik und Bildauswertung (Germany) ............... [9641-18]
The real-time atmospheric turbulence modeling and compensation with use of adaptive optics, Anna Lykova, Moscow State Univ. of Mechanical Engineering (Russian Federation); Alexis Kudryashov, Moscow State Univ. of Mechanical Engineering (Russian Federation); Julia Sheldakova, Moscow State Univ. of Mechanical Engineering (Russian Federation) ............... [9641-19]

POSTER SESSION .................. TUESDAY 17:30 TO 19:15
Conference attendees are invited to attend the Remote Sensing poster session held on Tuesday 17:30 to 19:15. Posters will be on display after 10:00 Tuesday morning in the Conference Hallway. Authors of poster papers will be present to answer questions concerning their papers during the Tuesday Poster Session. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Attendees are required to wear their conference registration badges to the poster sessions. Poster authors, view poster presentation guidelines and set-up instructions at http://spie.org/i32234.xml
Characterizing aerosol hygroscopic growth all over China based on in-situ meteorological data and its application on satellite estimation of surface particulate matters (PM), Zifeng Wang, Liangfu Chen, Minghui Tao, Jinhua Tao, Institute of Remote Sensing and Digital Earth (China) ............... [9641-20]
Propagation of a flipped mode through the turbulence, Ángel M. Fernández Álvarez, Univ. d’Angers (France) and Univ. Técnica Federico Santa María (Chile) and Pontificia Univ. Católica de Valparaíso (Chile); Darío G. Pérez, Pontificia Univ. Católica de Valparaíso (Chile); Régis Barillé, Univ. d’Angers (France) .................................................. [9641-21]

Measurements of parabolic mirrors aberrations in hyperspectral microscope, Anna Lylova, Moscow State Univ. of Mechanical Engineering (Russian Federation); Sergey Kalenkov, Moscow State Univ. of Mechanical Engineering (Russian Federation); Alexander Shtanko, Moscow State Univ. of Mechanical Engineering (Russian Federation); Julia Sheldakova, Moscow State Univ. of Mechanical Engineering (Russian Federation) ............. [9641-22]

Airborne experiment results for spaceborne atmospheric synchronous correction system, Wenyu Cui, Weining Yi, Lili Du, Xiao Liu, Anhui Institute of Optics and Fine Mechanics, CAS (China) .............................. [9641-23]
**CONFERENCE 9642**

**Wednesday - Thursday 23-24 September 2015 • Proceedings of SPIE Vol. 9642**

**SAR Image Analysis, Modeling, and Techniques**

_**Conference Chairs:** Claudia Notarnicola, EURAC research (Italy); Simontetta Paloscia, Istituto di Fisica Applicata Nello Carrara (Italy); Nazzareno Pierdicca, Univ. degli Studi di Roma La Sapienza (Italy)_

_**Programme Committee:** Richard Bamler, Deutsches Zentrum für Luft- und Raumfahrt e.V. (Germany); Fabio Bovenga, CNR ISSIA (Italy); Fabio Covello, Agenzia Spaziale Italiana (Italy); Mihai P. Datcu, Deutsches Zentrum für Luft- und Raumfahrt e.V. (Germany); Fabio Del Frate, Univ. degli Studi di Roma “Tor Vergata” (Italy); Linda E. Marchese, INO (Canada); Antonio Moccia, Univ. degli Studi di Napoli Federico II (Italy); Francesco Nirchio, Agenzia Spaziale Italiana (Italy); Luca Pascoli, EURAC research (Italy); Emanuele Santi, Istituto di Fisica Applicata Nello Carrara (Italy); Stefan Schneiderbauer, EURAC research (Italy); David Small, Univ. of Zürich (Switzerland)_

### TUESDAY 22 SEPTEMBER

**POSTER SESSION ............................ TUE 17:30 TO 19:15**

Conference attendees are invited to attend the Remote Sensing poster session held on Tuesday 17:30 to 19:15. Posters will be on display after 10:00 Tuesday morning in the Conference Hallway. Authors of poster papers will be present to answer questions concerning their papers during the Tuesday Poster Session. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Attendees are required to wear conference registration badges to the poster sessions. Poster authors, view poster presentation guidelines, and see set-up instructions at http://www.spie.org/s2294.xml.

A new MIMO SAR system based on Alamouti space-time coding scheme and OFDM-LFM waveform design, Xiaojin Shi, National Space Science Ctr. (China) .................................................. [9642-23]

Automatic change detection in multitemporal X- and P-band SAR imagery using the difference between the digital elevation models, Rafael Rosa, Brador Industra S/A (Brazil) and Instituto Tecnológico de Aeronáutica (Brazil); David Fernandes, Instituto Tecnológico de Aeronáutica (Brazil); João B. Nogueira Jr., Santo Antonio Energia S/A (Brazil) .......................... [9642-24]

Spatial-temporal heterogeneity of land subsidence evolution in Beijing based on InSAR and cluster analysis, Yinghai Ke, Yingchen Li, Zeng Deng, Dan Li, Capital Normal Univ. (China) ................................ [9642-25]

Refocusing of ground moving targets for range migration algorithm in FMCW SAR, Pu Cheng, Qin Xin, Zhan Wang, Jianwei Wan, National Univ. of Defense Technology (China) ................................ [9642-26]

**Classification accuracy of urban ULCI map based on SAR dual-polarimetric data:** Ahmed I. Ramzi, National Authority for Remote Sensing and Space Sciences (Egypt) .......................... [9642-27]


Estimation of physical and inorganic chemical indicators of water quality by using SAR images, Muntader A. Shareef, Abdelmalek Toumi, Ali Khenchaf, Ecole Nationale Supérieure de Techniques Avancées Bretagne (France) [9642-29]

Speckle filtering in PolSAR images by bilateral distance, Muntadher A. Shareef, Abdelmalek Toumi, Ali Khenchaf, Mihaela Stan, Anca-Andreea Popescu, Dan Alexandru Stoicescu, Univ. Politehnica of Bucharest (Romania); Damia Bensalem, Lamia Smiri, Youcef Smara, Technological University of Algiers (Algeria); Houda Latrache, Univ. des Sciences et de la Technologie Houari Boumediene (Algeria) .................. [9642-30]

Robust optical and SAR multisensor image registration, Yingdan Wu, Hubei Univ. of Technology (China); Yang Ming, CCCC Second Highway Consultants Co., Ltd. (China) ................................ [9642-31]

Modeling algorithm for SAR image based on fluctuations of echo signal of the Earth’s surface, Vadim Nenashev, Alexander Shepelov, Saint-Petersburg State Univ. of Aerospace Instrumentation (Russian Federation). ................................................. [9642-32]

Extraction of building areas from high-resolution SAR images based on tensor locality preserving projection, Bo Cheng, Institute of Remote Sensing and Digital Earth (China) ........................................ [9642-33]

**Effect of Faraday rotation angle and the orientation angle on the polarimetric decomposition, Houda Latrache, Univ. des Sciences et de la Technologie Houari Boumediene (Algeria) .................. [9642-34]

A methodology for outperforming filtering results in the interferometric process, Vassilia Karathanassi, Arlinda Saeqellari-Likoka, National Technical Univ. of Athens (Greece) .................. [9642-35]

Monitoring of “urban villages” in Shenzhen, China from high-resolution GF-1 and TerraSAR-X data, Demin Zhang, Thomas Blaschke, Univ. Hamburg (Germany); Elena Nikolaeva, Olga Sykioti, Panagiotis Elias, Charalampos C. Koutsonis, National Observatory of Athens (Greece) .......................... [9642-36]

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**WEDNESDAY 23 SEPTEMBER**

**OPENING REGARDS .................................. 8:30 TO 8:40**

**SESSION 1 ................................. WED 8:40 TO 10:00**

**SAR Application 1**

**Session Chair:** Simontetta Paloscia, Istituto di Fisica Applicata Nello Carrara (Italy)

Multitemporal retrieval of soil moisture from SMAP radar data, Fabio Fascati, Nazzareno Pierdicca, Sapienza Univ. di Roma (Italy); Luca Pulvirenti, CIMA Research Foundation (Italy); Emanuele Santi, Simontetta Paloscia, Simone Pettinato, Istituto di Fisica Applicata Nello Carrara (Italy); Felix Greifeneder, Claudia Notarnicola, EURAC (Italy); Wolfgang Wagner, Sebastian Hahn, Mariette Vreugdenhil, Christoph Reimer, Technische Univ. Wien (Austria) .................................................. [9642-2]

Large-scale robust identification of snow cover areas from multitemporal COSMO-SkyMed images, Simone Pettinato, Emanuele Santi, Simontetta Paloscia, Bruno Alizzi, Stefano Baronti, Istituto di Fisica Applicata Nello Carrara (Italy); Andrea Garzelli, Univ. degli Studi di Siena (Italy) .......................... [9642-3]

Land-cover classification in SAR Images using dictionary learning, Gizem Aktas, Fatih Nar, Çagdas Bak, Nigar Sen, SDT Uzay & Savunma Teknolojileri (Turkey) .................................................. [9642-4]

**SESSION 2 ................................. WED 10:30 TO 12:20**

**SAR Application II**

**Session Chair:** Emanuele Santi, Istituto di Fisica Applicata Nello Carrara (Italy)

Cosmo-SkyMed and RADARSAT-2 image investigation for the monitoring of agricultural areas (Invited Paper), Simontetta Paloscia, Simone Pettinato, Emanuele Santi, Istituto di Fisica Applicata Nello Carrara (Italy); Claudia Notarnicola, Felix Greifeneder, Giovanni Cuozzo, EURAC (Italy); Irene Nicolaini, B. Demir, Lorenzo Bruzzone, Univ. degli Studi di Trento (Italy) .... [9642-5]

The contribution of ALOS PALSAR data for land cover change mapping in central Kalimantan, Indonesia, Yan Gao, Univ. Nacional Autónoma de México (Mexico); Kazuyo Hirose, Japan Space Systems (Japan); Mitsuhiro Osaki, Hokkaido Univ. (Japan) ........................................ [9642-6]

Multitemporal intensity and coherence analysis of SAR images for land cover change detection on the Island of Crete, Elena Nikolaeva, Olga Sykioti, Panagiotis Elias, Charalampos C. Koutsonis, National Observatory of Athens (Greece) .......................... [9642-7]
MODIS VCF data (2000 - 2010) for deforestation and forest degradation
hotspots detection and its validation with multi-temporal Landsat TM and
ALOS PALSAR data, Yan Gao, Jean François Mas, Univ. Nacional Autónoma
de México (Mexico); Kazuyo Hiose, Japan Space Systems (Japan); Mitsuru
Osaki, Hokkaido Univ. (Japan) ........................................ [9642-8]
Canonical Huynen decomposition of radar targets, Dong Li, Yunchu Zhang,
Ctr. for Space Science and Applied Research (China) . . . . . . . . . . [9642-9]
Lunch/Exhibition Break ........................................ Wed 12:30 to 13:30
SESSION JS1 ........................................ WED 13:40 TO 15:20
Joint Session 1: SAR Data Processing I
Session Chair: Lorenzo Bruzzone, Univ. degli Studi di Trento (Italy)
Joint Session of Conference 9642 and Conference 9632
Understanding target delineation using simple probabilistic modelling,
Christopher J. Willis, BAE Systems (United Kingdom) . . . . . . . [9643-46]
Reducing scalloping in synthetic aperture radar images using a composite
image transform, Knuh Landmark, Norwegian Defence Research Establishment
(Norway); Anne H. S. Solberg, Univ. i Oslo (Norway) ............ [9643-47]
Curvelet-based compressive sensing for InSAR raw data, Marcello G. Costa,
Marcelo S. da Silva Pinho, Instituto Tecnológico de Aeronáutica (Brazil) [9643-48]
Modelling backscattering of adjacent buildings in VHR SAR images for
complex urban area analysis, Davide Pirrone, Francesca Bovolo, Fondazione
Bruno Kessler (Italy); Lorenzo Bruzzone, Univ. degli Studi di Trento (Italy)
................................ [9643-49]
Azmith sidelobe suppression technique for near-field MIMO radar
imaging, Yongze Liu, Xiaojuan Xu, Beihang Univ. (China) ............ [9643-50]
SESSION JS2 ........................................ WED 15:50 TO 17:30
Joint Session 2: SAR Data Processing II
Session Chair: Claudia Notarnicola, EURAC (Italy)
Joint Session of Conference 9642 and Conference 9643
Implementation of a fast-time domain processor for FMCW synthetic
aperture radar data, Max Friold, Univ. of Zürich (Switzerland); Peter Weiling,
Armusuisse (Switzerland); Stephan Stanko, Fraunhofer FHR (Germany); Erich H.
Meier, Univ. of Zürich (Switzerland) . . . . . . . . . . . . . . . . . . . . . . . . . [9642-10]
An object oriented approach to detect earthquake damage in urban area:
application to Cosmo SkyMed imagery of L’Aquila earthquake, Roberta
Annibale, Sapienza Univ. di Roma (Italy); Marco Chini, Luxembourg Institute
of Science and Technology (Luxembourg); Nazzareno Pierdicca, Sapienza Univ.
di Roma (Italy); Christian Bignami, Salvatore Stramondo, Istituto Nazionale
de Geofisica e Vulcanologia (Italy); Fabrizio Noto, METIS S.r.l. (Italy); Tanya Scalla,
D’Appollonia Rome (Italy); Antonio Martellini, Antonio Mammella, CNR Istituto per
le Tecnologie della Costruzione (Italy) ................................ [9642-11]
On the geocolocation accuracy of COSMO-SkyMed products, Davide O. Nitti,
Raffaele Nutricato, GAP S.r.l. (Italy); Rino Lorusso, Nunzia Lombardi, Agenzia
Spaziale Italiana (Italy); Fabio Bovenga, CNR ISSIA (Italy); Maria F. Bruno, Maria
T. Chiaraudì, Polo Tecnologico di Bari (Italy); Giovanni Milillo, Agenzia Spaziale Italiana
(Italy) ................................................................................ [9642-12]
Visual analytics for semantic queries of TerraSAR-X image content,
Daniela Espinoza-Molina, Mihai P. Datcu, Deutsches Zentrum für Luft- und Raumfahrt
e.V. (Germany) ................................................ [9642-13]
An efficient de-speckling method for SAR images using combined NSCT
and SWT transforms, Soumya Oraiah, Yocef Smara, Univ. des Sciences et de la
Technologie Houari Boumediene (Algeria) . . . . . . . . . . . . . . . . . . [9642-14]
THURSDAY 24 SEPTEMBER
SESSION 3 ........................................ THU 08:40 TO 10:00
SAR Interferometry
Session Chair: Fabio Bovenga, CNR ISSIA (Italy)
Detection of land subsidence at natural gas extraction sites using
Persistent Scatterer Interferometry, Andre C. Kalia, Michaela Frei, Thomas
Lege, Bundesanstalt für Geowissenschaften und Rohstoffe (Germany) ....... [9642-15]
Sparsity driven autofocus for multipass SAR tomography, Fiona Muirhead,
Benedict Mulgrew, Iain H. Woodhouse, The Univ. of Edinburgh (United Kingdom);
David Greig, Selex ES (United Kingdom) . . . . . . . . . . . . . . . . . . . . . . . . . [9642-16]
An integrated remote sensing approach for landslide susceptibility mapping
at the volcanic islands of Vulcano and Lipari (Eolian Island, Italy), Maria
Marcella, Silvia Sciocchi, Sapienza Univ. di Roma (Italy); José A. Palenzuela
Barea, Univ. de Granada (Spain); Susi Pepe, Eugenio Sansosti, Giuseppe
Sorani, Piero Tizzani, Istituto per il Rilevamento Elettromagnetico dell’Ambiente
(Italy) ................................................................. [9642-17]
The PSIG procedure to Persistent Scatterer Interferometry (PSI)
using X-band and C-band Sentinel-1 data, María Cueva-González,
Michele Crosetto, Núria Devanthèry, Oriol Monserrat, Ctr. Tecnológico de
Telecomunicaciones de Catalunya (Spain); Bruno Crippa, Univ. degli Studi di
Milano (Italy) ................................................ [9642-18]
SESSION 4 ........................................ THU 10:30 TO 11:50
SAR Processing and Interferometry
Session Chair: Nazzareno Pierdicca, Sapienza Univ. di Roma (Italy)
Analysis of the geometric accuracy of spaceborne SAR systems, Carlos
Villamil Lopez, Rainer Speck, Deutsches Zentrum für Luft- und Raumfahrt e.V.
(Germany) ................................................................. [9642-19]
Multitemporal SAR interferometry for landslide analysis: requirements and
prospects from recent satellite missions, Fabio Bovenga,Alberto Refice,
Guido Pasquariello, CNR ISSIA (Italy); Raffaele Nutricato, Davide O. Nitti,
GAP S.r.l. (Italy); Janusz Wasowski, Consiglio Nazionale delle Ricerche (Italy) [9642-20]
Advanced DinSAR analysis for building damage assessment in large urban
areas: an application to the city of Roma, Italy, Maria Marcella, Peppe J. V.
D’Aranno, Silvia Sciocchi, Marianna Scutti, Alberico Sonnessa, Sapienza Univ.
di Roma (Italy); Stefania Arangio, Stronger S.r.l. (Italy); Manuela Bonano, Istituto
per il Rilevamento Elettromagnetico dell’Ambiente (Italy) .................. [9642-21]
Interferometric SAR imaging by transmitting stepped frequency chaotic
noise signals, Yuhua Zhang, Xiang Gu, Xiao Dong, Wenshuai Zhai, Xiaojin Shi,
Xueyan Kang, Ctr. for Space Science and Applied Research (China) . . . [9642-22]
Lunch Break ................................................... Thu 11:50 to 13:00
SESSION 5 ........................................ THU 13:00 TO 14:50
Tutorial: Introduction to SAR Interferometry for Ground Motion Analysis
Fabio Bovenga, National Research Council, ISSIA (Italy)
Synthetic aperture radar (SAR) multi-temporal interferometry (MTI) is one of the
most promising satellite-based remote sensing techniques for promoting new
research opportunities on ground instability hazards caused by e.g., landsliding,
subsidence, active faulting. MTI is attractive because it can provide millimetric
precision measurements of slow ground surface displacements over large areas
(<1000 km2) with limited vegetation cover.
Nowadays, interferometric SAR datasets are available from either historical
archive (ex. ERS-1/2, ENVISAT) or satellite operational missions, acquired with
different wavelengths, spatial resolutions, look angles, and polarizations. MTI
processing algorithm are continuously evolving according to the new SAR data
characteristics which open new application opportunities.
The tutorial introduces the theoretical aspects of radar interferometry and the
basics of MTI processing, and provides examples of applications to ground
surface motion detection and monitoring, as detailed in the following:
• Introduction to Synthetic Aperture RADAR (SAR) satellite system: Range
  and Azimuth resolution, scattering mechanisms (speckle noise, layover,
  foreshortening and shadow effects), acquisition modes, satellite missions and
  SAR data availability.
• Theoretical basis of SAR Interferometry (InSAR): SAR principles, InSAR
  acquisition configurations, InSAR phase content (height, displacements) and
  noise (coherence and error sources), processing steps.
• Multi-temporal Interferometry (MTI): coherent target detection, processing
  schemes (Persistent Scatterers, SBAS and similar), measurement precision
  and limitations (number of images, deformation model, aliasing, geometrical
  distortions).
• Examples of InSAR applications to ground surface motion detection and
  monitoring.
• InSAR satellite missions: past, present, future, L/C/X band sensors.
The tutorial is addressed also to researchers without advanced knowledge in
SAR interferometry.
CLOSING REMARKS ..................................... 14:50 TO 15:00
CONFERENCE 9643
Monday - Wednesday 21–23 September 2015 • Proceedings of SPIE Vol. 9643

Image and Signal Processing for Remote Sensing

Conference Chair: Lorenzo Bruzzone, Univ. degli Studi di Trento (Italy)
Conference Co-Chairs: Jon Atli Benediktsson, Univ. of Iceland (Iceland); Francesca Bovolo, Fondazione Bruno Kessler (Italy)

Programme Committee: Selim Aksoy, Bilkent Univ. (Turkey); Luciano Alparone, Univ. degli Studi di Firenze (Italy); José M. Bioucas-Dias, Univ. Técnica de Lisboa (Portugal); Gustavo Camps-Valls, Univ. de València (Spain); Jocelyn Chanussot, Lab. des Images et des Signaux (France); Chi-Hau Chen, Univ. of Massachusetts Dartmouth (United States); Fabio Dell’Acqua, Univ. degli Studi di Pavia (Italy); Begüm Demir, Univ. degli Studi di Trento (Italy); Peijun Du, Nanjing Univ. (China); Giles M. Foody, The Univ. of Nottingham (United Kingdom); Andrea Garzelli, Univ. degli Studi di Siena (Italy); Jordi Ingla, Ctr. d’Etudes Spatiales de la Biosphère (France); Gabriele Moser, Univ. degli Studi di Genova (Italy); Allan A. Nielsen, Technical Univ. of Denmark (Denmark); Ryuei Nishii, Kyushu Univ. (Japan); Antonio J. Plaza Miguel, Univ. de Extremadura (Spain); John A. Richards, The Australian National Univ. (Australia); Josiane B. Zerubia, INRIA Sophia Antipolis - Mediterranée (France)

MONDAY 21 SEPTEMBER

OPENING REMARKS .......................... 8:25 TO 8:30

SESSION 1 .................................. MON 8:30 TO 10:10

Sentinel-2 Mission
Session Chair: Jordi Ingla, Ctr. d’Etudes Spatiales de la Biosphère (France)

Sentinel-2 geometric image quality commissioning: first results, Florence Languille, Cécile Dechoz, Angélique Gaudel, Daniel Gresilou, Françoise de Lussy, Thierry Trémazés, Ctr. National d’Etudes Spatiales (France); Claudia Isola, Philippe Martimort, European Space Research and Technology Ctr. (Netherlands); Vincent Poulin, Thales Services (France) .................................. [9643-1]

MACCS: Multi-Mission Atmospheric Correction and Cloud Screening tool for high-frequency revisited data processing, Beatrice Petruch, Mireille Huc, Ctr. National d’Etudes Spatiales (France); Thomas Feuvrier, Caroline Rufflet, CS Systèmes d’information (France); Olivier Hagolle, Vincent Lonjou, Camille Desjardins, Ctr. National d’Etudes Spatiales (France) .......................... [9643-2]

The ground prototype processor: Level-1 production during Sentinel-2 in-orbit acceptance, Beatrice Petruch, Cécile Dechoz, Sophie Lachérade, Céline L’Helguen, Ctr. National d’Etudes Spatiales (France); Cécile Picard, Thales Services (France); Jean-Louis Raynaud, Julien Nosavan, Ctr. National d’Etudes Spatiales (France); Amandine Rolland, Thales Services (France); Thierry L. Trémazés, Ctr. National d’Etudes Spatiales (France); Claudia Isola, Philippe Martimort, François Spoto, European Space Research and Technology Ctr. (Netherlands) . [9643-3]

Sentinel-2A: presentation of the CAL/VAL commissioning phase, first images, Thierry L. Trémazés, Cécile Dechoz, Sophie Lachérade, Julien Nosavan, Beatrice Petruch, Ctr. National d’Etudes Spatiales (France); Claudia Isola, Philippe Martimort, European Space Research and Technology Ctr. (Netherlands)[9643-4]

Sentinel-2 global reference image, Cécile Dechoz, Florence Languille, Ctr. National d’Etudes Spatiales (France); Cécile Picard, Thales Services (France); Vincent Poulin, Ctr. National d’Etudes Spatiales (France); Claudia Isola, Philippe Martimort, European Space Research and Technology Ctr. (Netherlands) [9643-5]

SESSION 2 .................................. MON 10:40 TO 12:20

Remote Sensing Missions, Techniques, and Products
Session Chair: Lorenzo Bruzzone, Univ. degli Studi di Trento (Italy)

Bulk processing of the Landsat MSS/ETM+ archive of the European Space Agency, Roberto Biasiutti, Ferran Gascon, Peggy Fischer, Bianca Hoensch, European Space Agency (Italy); Marco Meloni, Alessandra Paolucci, Serco SpA (Italy); Luca Galli, Sergio Mica, Advanced Computer Systems S.p.A. (Italy); Amy Northrop, Samantha Lavender, Telespazio Vega UK (United Kingdom); Sébastien Saunier, Magellium (France) .......................... [9643-6]

Star-based defocus computing technique for PLEIADES-HR satellites, Virginie Amberg, Christophe Latry, Ctr. National d’Etudes Spatiales (France); Laurent Bernard, Magellium (France) .......................... [9643-7]

ScaRaB: first results of absolute and cross calibration, Thierry L. Trémazés, Ctr. National d’Etudes Spatiales (France); Ouahid Aznay, CS Systèmes d’information (France); Michel Dejus, Ctr. National d’Etudes Spatiales (France); Olivier Chomette, Lab. de Météorologie Dynamique (France) .......................... [9643-8]

End-to-end performance analysis using engineering confidence models and a ground processor prototype, Klaas Kruse, Maximilian Sauer, Thomas Jäger, Michael Schmitt, Markus Huchler, Airbus Defence and Space (Germany); Kotska Wallace, Arnaud Heliere, Michael Eisinger, Alain Lefebvre, European Space Agency Netherlands; Mat Maher, Mark Chang, Tracey Phillips, Surrey Satellite Technology Ltd. (United Kingdom); Bryan T. G. de Goeij, Frits van der Knaap, Adriaan Van’t Hof, TNO (Netherlands) .................................. [9643-9]

Enhancement on spotlight COSMO-SkyMed SAR products, Rino Lorussu, Agenzia Spaziale Italiana (Italy) and Univ. degli Studi della Basilicata (Italy); Giovanni Millò, Agenzia Spaziale Italiana (Italy) .......................... [9643-10]

Lunch Break .................................. Mon 12:20 to 13:40

SESSION 3 .................................. MON 13:40 TO 15:20

Image Enhancement and Filtering
Session Chair: Andrea Garzelli, Univ. degli Studi di Siena (Italy)

Multiscale statistical image despription algorithm, Vincent Martin, Ctr. National d’Etudes Spatiales (France); Arnaud Kelbert, Thales Services (France) .................................. [9643-11]

Noise correlation-based adaptive polarimetric image representation for contrast enhancement of a polarized beacon in fog, Swapnesh Panigrahi, Julian Fade, Mehdi Alouini, Institut de Physique de Rennes (France) .................................. [9643-12]

Performance prediction for 3D filtering of multichannel images, Oleksi S. Rubel, Ruslan A. Kozhemiakin, Sergey K. Abramov, Vladimir V. Lukin, National Aerospace Univ. (Ukraine); Benoît Vozel, Kacem Chehdi, Univ. de Rennes 1 (France) .................................. [9643-13]

Advanced signal processing based on support vector regression for lidar applications, Michela Gefusis, Univ. degli Studi di Roma “Tor Vergata” (Italy); Andrea Murari, Consorzio FPyX-Association EURATOM-ENEA (Italy); Andrea Malizia, Michele Lungaroni, Emmanuele Peluso, Stefano Parracino, Univ. degli Studi di Roma “Tor Vergata” (Italy); Jesus Vega, Ctr. de Investigaciones Energéticas, Medioambientales y Tecnológicas (Spain); Pasqualino Gaudio, Univ. degli Studi di Roma “Tor Vergata” (Italy) .................................. [9643-14]

An improved mutual information similarity measure for registration of multimodal remote sensing images, Maha Shadaydeh, Tamás Sziráni, Hungarian Academy of Sciences (Hungary) .................................. [9643-15]

PLENARY SESSION .......................... MON 16:00 TO 19:15

Remote Sensing and Security + Defence Joint Plenary Session

• Grady Tuell, Georgia Tech Research Institute (United States)
• Anne Harrington, National Nuclear Security Administration (United States)
• Policy and Technology: Addressing Technical Challenges
• Panel Discussion

CubeSats for Earth Remote Sensing and Security and Defense Applications
For details, please see the Special Events section in the printed programme, or follow the Special Events Link at the URLs below:

http://spie.org/security-defence-europe.xml

http://spie.org/remote-sensing-europe.xml
SESSION 6 ......................... TUE 13:40 TO 15:20

Image Classification

Session Chair: Lorenzo Bruzzone, Univ. degli Studi di Trento (Italy)

Feature learning for multilabel land cover classification, Konstantinos T. Karalas, Technical Univ. of Crete (Greece) and Foundation for Research & Technology-Hellas (Greece); Grigorios Tsagkatakis, Foundation for Research and Technology-Hellas (Greece); Michalis Zervakis, Technical Univ. of Crete (Greece); Panagiota Tsakaldes, Foundation for Research and Technology-Hellas (Greece) and Univ. of Crete (Greece) ........................................ [9643-26]

Compressed histogram attribute profiles for the classification of VHR remote sensing images, Romano Battiti, Béguin Demir, Lorenzo Bruzzone, Univ. degli Studi di Trento (Italy) ........................................................ [9643-27]

Multipath sparse coding for scene classification in very high resolution satellite images, Jianfan Fan, Shijian Lu, Institute for Infocomm Research (Singapore) ........................................ [9643-28]

Reliability of segmentation quality measures as indicators of land cover classification accuracy and performance, Andreja Švab Lenarčič, Nataša Đurić, Slovenian Ctr. of Excellence for Space Sciences and Technologies (Slovenia); Klemen Rittip, Univ. of Ljubljana (Slovenia); Klemen Čotar, Slovenian Ctr. of Excellence for Space Sciences and Technologies (Slovenia); Kristoř Šoltíř, Research Ctr. of the Slovenian Academy of the Sciences and Arts (Slovenia) and Slovenian Ctr. of Excellence for Space Sciences and Technologies (Slovenia) .................................................. [9643-29]

SMV: an algorithm to calculate the simplex of maximal volume in R^n based upon Gram-Schmith process, Jairo Salazar, Ctr. de Investigación y de Estudios Avanzados del Instituto Politécnico Nacional (Mexico); Andres Mendez, Investigación y de Estudios Avanzados del Instituto Politécnico Nacional (Mexico) .................................................. [9643-30]

SESSION 7 ......................... TUE 15:50 TO 17:30

Data Fusion

Session Chair: Andrea Garzelli, Univ. degli Studi di Siena (Italy)

Are spectral or spatial methods better for pansharpening? An evaluation for four sample methods based on spatial modulation of pixel spectra, Andrea Garzelli, Univ. degli Studi di Siena (Italy); Luciano Alparone, Univ. degli Studi di Firenze (Italy); Gemire Vivone, STO-CMRE (Italy) ........................................ [9643-31]

Potential accuracy of translation estimation between radar and optical images, Michi I. L. Ues, National Space Univ. (Turkey); Batur Özbilir, National Space Univ. de Rennes 1 (France); Vladimir V. Lukin, National Aerospace Univ. (Ukraine); Kacem Chehdi, Univ. de Rennes 1 (France) ........................................ [9643-32]

Multiresolution fusion of radar sounder and altimeter data for the application to marine algae identification, Arta-Maria Ilisei, Lorenzo Bruzzone, Univ. degli Studi di Trento (Italy) ........................................ [9643-33]

Local hyperspectral data multisharpening based on linear/linear-quadratic nonnegative matrix factorization by integrating lidar data, Fatima Zohra F. Belhauache, Univ. Des Sciences et de la Technologie d’Oran Mohamed Boudiaf (Algeria) and Institut de Recherche en Astrophysique et Planétologie (France); Moussa Sofiane Karoui, Univ. Des Sciences et de la Technologie d’Oran Mohamed Boudiaf (Algeria) and Ctr. National des Techniques Spatiales (Algeria) and Institut de Recherche en Astrophysique et Planétologie (France); Yannick Deville, Institut de Recherche en Astrophysique et Planétologie (France); Abdeliaiz Ouamri, Univ. Des Sciences et de la Technologie d’Oran Mohamed Boudiaf (Algeria) ........................................ [9643-34]

An approach for combining aerial lidar and high-resolution imagery using Gaussian processes, Yanfong Li, Sildomar T. Montero, Eli Saber, Rochester Institute of Technology (United States) ........................................ [9643-35]

POSTER SESSION .................. TUE 17:30 TO 19:15

Conference attendees are invited to attend the Remote Sensing poster session held on Tuesday 17:30 to 19:15. Posters will be on display after 10:00 Tuesday morning in the Conference Hallway. Authors of poster papers will be present to answer questions concerning their papers during the Tuesday Poster Session. Come view the posters, enjoy light refreshments, ask questions, and network with conference attendees in your field. Authors are required to wear their registration badges to the poster sessions. Poster authors, view poster presentation guidelines and set-up instructions at http://spie.org/32234.xml.

Error analysis of remote sensing image field stitching based on virtual focal plane, Chunyu Yue, Hongyan He, Yunfai Bao, Kun Xing, Nan Zhou, Beijing Institute of Space Mechanics and Electricity (China) ........................................ [9643-51]

Designing an efficient LT-code with unequal error protection for image transmission, Fabio della Marques, Ctr. Federal de Educación Tecnológica de Goias (Brazil) and Instituto Tecnológico de Aeronáutica (Brazil); Christoph Schwartz, Marcelo S. da Silva Pinho, Instituto Tecnológico de Aeronáutica (Brazil); Weller A. Fimaro, UFJF (Brazil) ........................................ [9643-52]

Unsupervised nonparametric weighted feature extraction using geometrical measures in prototype space for hyperspectral imagery, Moheen Ghamary Ast, Mohammad Reza Mosbaher, K.N.Toosi Univ. of Technology (Iran, Islamic Republic of); Barat Mojarradi, Iran Univ. of Science and Technology (Iran, Islamic Republic of) ........................................ [9643-53]

Unsupervised and stable LBG algorithm for data classification: application on aerial multicomponent images, Akar Taher, Koya Univ. (Iraq) and Univ. de Rennes 1 (France); Ladeh Abdulrahman, Koya Univ. (Iraq); Rasber Rashid, Koya Univ. (Iraq) and The Univ. of Buckingham (United Kingdom) ........................................ [9643-54]

Lossy compression of hyperspectral images using shearlet transform and 3D-SPECK, Azam Karami, Shahid Bahonar Univ. of Kerman (Iran, Islamic Republic of) ........................................ [9643-55]

An image matching method based on closed edges incorporated with vertex angles, Baoming Zhang, Xiaowei Chen, Jun Lu, Zhihui Gong, Hanjiao Guo, Zhengzhou Institute of Surveying and Mapping (China) ........................................ [9643-56]
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Fast geometric processing for unmanned aerial vehicle images of large area, Hailao Guo, Baoming Zhang, Jun Lu, Chunxue Jiang, Junfeng Xu, Zhengzhou Institute of Surveying and Mapping (China) .... [9643-57]

Size-varying small target detection for infrared image processing, Mao Li, Rui Zhu, Yuli Long, Wei An, Yiyu Zhou, National Univ. of Defense Technology (China) .... [9643-58]

Remote sensing in the categorization of the urban sprawl in metropolitan zones, Omar Ortiz Meraz, Clemencia Santos Cerquera, Univ. Nacional de Colombia (Colombia) .... [9643-59]

A novel scheme for automatic nonrigid image registration using deformation invariant feature and geometric constraint, Zhipeng Deng, Lin Lei, Hui Yi, Shilin Zhou, National Univ. of Defense Technology (China) .... [9643-60]

A fast sparse unmixing method for hyperspectral images using iterative detection and estimation, Mohammad Saleh Hashemi, Azam Karami, Shahid Bahorun Univ. (Iran, Islamic Republic of) .... [9643-61]

A new polarimetric active radar calibrator and calibration technique, Jianguo Tang, Xiaojuan Xu, BeiHang Univ. (China) .... [9643-62]

A landmark matching algorithm using the improved generalised Hough transform, Binbin Chen, Xin-Pu Deng, National Univ. of Defense Technology (China) .... [9643-63]

A hyperspectral imagery anomaly detection algorithm based on local three-dimensional orthoradial space projection, Xing Zhang, Gorgui Xin, National Univ. of Defense Technology (China) .... [9643-64]

Lossy compression of hyperspectral images using block coordinate descent search and compress sensing methods, Shrin Hassanazadeh, Shahid Bahorun Univ. of Kerman (Iran, Islamic Republic of); Azam Karami, Shahid Bahorun Univ. of Kerman (Iran, Islamic Republic of) .... [9643-65]

Fusion of multispectral satellite images by using IHS and local fractal dimension, Mohamed Khider, Souniya Ouarabi, Youssef Smara, Univ. des Sciences et de la Technologie Houari Boumediene (Algeria) .... [9643-66]

Local correlation tracking to recover doppler shifts from solar observations with an EUV slitless spectrograph, Hans T. Courrier, Charles C. Kankelborg, Montana State Univ. (United States) .... [9643-67]

Colored coded-apertures for spectral image unmixing, Hector M. Vargas, Henry Arguello, Univ. Industrial de Santander (Colombia) .... [9643-68]

Calibration of mirror angle error for hyper spectral imagery with motion compensation model, Zhilin Liu, Hai Baoqing, Chinese Academy of Sciences (China) .... [9643-69]

Bionic spacial-spectral correlation filter for hyper-spectral anomaly detection, Min Li, Xinnan Fan, Xuewu Zhang, Hanyan Xu, Hohai Univ. (China) .... [9643-70]

Small target detection based on human visual system utilizing distance information, Linna Yang, Wei An, Zai-ping Lin, An-dong Li, National Univ. of Defense Technology (China) .... [9643-71]

Self-adaptive infrared small target detection in compressive domain, An-dong Li, Zai-ping Lin, Wei An, Linna Yang, National Univ. of Defense Technology (China) .... [9643-72]

Accurate multisource forest species mapping using the multiple spectral-spatial classification approach, Dimitris G. Stavrakoudis, Ioannis Z. Gitas, Christos G. Karydas, Aristotle Univ. of Thessaloniki (Greece); Polychronis Kolokoussis, Vassilia Karathanassi, National Technical Univ. of Athens (Greece) .... [9643-73]

Introduction of a generic INR architecture and its ultimate form, Handol Kim, Korea Aerospace Research Institute (Korea, Republic of) .... [9643-74]

Space-based infrared scanning sensor LOS determination and calibration using star observation, Jun Chen, Zhan Xu, Xin-Pu Deng, Wei An, Jun-Jang Yang, National Univ. of Defense Technology (China) .... [9643-75]

A study of selected textural features usefulness for impervious surface coverage estimation using Landsat images, Katarzyna K. Bernat, Wojciech Drzewiecki, AGH Univ. of Science and Technology (Poland) .... [9643-76]

Unsupervised change detection from multitemporal SAR images based on a detail preserving approach and a robust threshold estimation, Boulberbah Chaibira, Takedine Skanderi, Aichouchel Belhadj Aissa, Univ. des Sciences et de la Technologie Houari Boumediene (Algeria) .... [9643-77]

Method for infrared image background suppression based on sparse decomposition, Lihua Wu, Weidong Sheng, National Univ. of Defense Technology (China) .... [9643-78]

Applied noncentral Chi-squared distribution in CFAR detection of hyperspectral projected images, Zhiyong Li, Dong Chen, National Univ. of Defense Technology (China); Guoping Yang, Wuhan Univ. (China); Kefeng Ji, Gang Wang, National Univ. of Defense Technology (China) .... [9643-79]

A comparative study of Landsat TM and RapidEye imagery for two-stage impervious surface coverage estimation, Katarzyna K. Bernat, Wojciech Drzewiecki, AGH Univ. of Science and Technology (Poland) .... [9643-80]

Modified wavelet kernel methods for hyperspectral image classification, Pui-Hai Hsu, Xun-Man Huang, National Taiwan Univ. (Taiwan) .... [9643-81]

Inshore ship detection in high-resolution satellite image: approximation of harbors using sea-land segmentation, Beril Besbinar, Aydin A. Alatan, Middle East Technical Univ. (Turkey) .... [9643-82]

A new method to obtain uniform distribution of ground control points based on regional statistical information, Ma Chao, Wei An, Xin-Pu Deng, National Univ. of Defense Technology (China) .... [9643-83]

Fuzzy ontologies for semantic interpretation of remotely sensed images, Khlefia Djerdiri, Ctr. National des Techniques Spatiales (Algeria); Mimoun Maïkhi, Univ. de Sidi-Bel-Abbes (Algeria) .... [9643-84]

Hyperspectral imaging for landmine detection, Ihab Makki, Politecnico di Torino (Italy) and Lebanese Univ. (Lebanon); Rafic Younes, Clovis Fransis, Lebanese Univ. (Lebanon); Massimo Zucchetti, Politecnico di Torino (Italy) .... [9643-85]

Nonlinear sparse separation and semantic source identification, Hela Elmanai, Ecole Superieure des Communications de Tunis (Tunisia); Kaouther Selma, Univ. d'El-Manar (Tunisia) .... [9643-86]

Comparison of ARSIS concept with Fourier domain methods for VHR images, Aijer Akoguz, Mehri Hayirsever, Ahmet H. Kayran, Sedef Kert Pinar, Istanbul Technical Univ. (Turkey) .... [9643-87]

The use of extreme learning machines in land changes classification: a case study of Novo Progreso, Brazil, Helder A. Louzada, Ana C. Quintão Sirarenva, Evaldo Goncalves Pelaes, Univ. Federal do Pará (Brazil) .... [9643-88]

A research of selected textural features for detection of asbestos-cement roofing sheets using orthoimages, Jyotsava Ksiaziek, AGH Univ. of Science and Technology (Poland) .... [9643-89]

Statistical and structural pattern recognition techniques for single pulse detection of fire smoke by lidar, Cherifa Sabrina Amrouch, Basma El Amel Boussaha, Ecole Nationale Superieure d’Informatique (Algeria); Mohammed Triache, Ctr. de Developpement des Technologies Avancees (Algeria) .... [9643-90]

Unsupervised methodology for change detection and analysis: a comparative study of classifiers models, Ana C. Quintão Sirarenva, Evaldo Goncalves Pelaes, Univ. Federal do Pará (Brazil) .... [9643-91]

Object detection in rural areas using hyperspectral imaging, Yusuf Artan, Tafik Ozturk, HAVELANS.A.S.T.(Turkey) .... [9643-92]

Utilizing hyperspectral remote sensing imagery for afforestation planning of partially covered areas, Fatih Omruuzun, Didem Ozisik Baskurt, Middle East Technical Univ. (Turkey); Hazan Daglayan, Attilm Univ. (Turkey); Yasemin Yardimci Cetin, Middle East Technical Univ. (Turkey) .... [9643-93]

An effective band selection approach for classification in remote sensing imagery, Huseyn Cukur, Hamidullah Binol, Faruk S. Uslu, Abdullah Bil, Yildiz Technical Univ. (Turkey) .... [9643-94]
WEDNESDAY 23 SEPTEMBER

SESSION 8 ............................. WED 8:30 TO 10:10
Multitemporal Analysis and Change Detection

Session Chair: Francesca Bovolo, Fondazione Bruno Kessler (Italy)

Analysis on the effectiveness of multitemporal COSMO-SkyMed images for crop classification, Rocchina Guarni, Agenzia Spaziale Italiana (Italy); Lorenzo Bruzzone, Massimo Sartoni, Univ. degli Studi di Trento (Italy); Luigi Dini, Agenzia Spaziale Italiana (Italy). .......................................................... [9643-36]

A fast and reliable change detection feature from bi-temporal amplitude SAR images, Andrea Garzelli, Claudia Zoppelti, Univ. degli Studi di Siena (Italy) .................................................. [9643-37]

Fully polarimetric high-resolution airborne SAR image change detection with morphological component analysis, Elias Mendez Dominguez, Univ. Zürich (Switzerland); Daniel Henke, Univ. Zurich (Switzerland); David Small, Erich H. Meier, Univ. Zürich (Switzerland). .......................................................... [9643-38]

Change detection in quad and dual pol, single- and bi-frequency SAR data, Allan A. Nielsen, Knut Conradsen, Henning Skriver, Technical Univ. of Denmark (Denmark) .......................................................... [9643-39]

Change detection in UAV video mosaics combining a feature-based approach and extended image differencing, Günter Saur, Wolfgang Krüger, Fraunhofer-Institut für Optronik, Systemtechnik und Bildauswertung (Germany) .................................................. [9643-40]

SESSION 9 ............................. WED 10:40 TO 12:20
Object Detection

Session Chair: Allan A. Nielsen, Technical Univ. of Denmark (Denmark)

A game-theoretic tree matching approach for object detection in high-resolution remotely sensed images, Yulong Liang, Nathan D. Cahill, Eli Saber, David W. Messinger, Rochester Institute of Technology (United States). .......................................................... [9643-41]

Object-based detection of vehicles in airborne data, Hendrik Schilling, Dimitri Bulatov, Wolfgang Middelmann, Fraunhofer-Institut für Optronik, Systemtechnik und Bildauswertung (Germany) .................................................. [9643-42]

A GUI visualization system for airborne lidar image data to reconstruct 3D city model, Yoshiyuki Kawata, Kohei Kozumi, Kanazawa Institute of Technology (Japan) .......................................................... [9643-43]

L-shaped corner detector for rooftop extraction from satellite/aerial imagery, Hui Li Tan, Shijian Lu, Jiayuan Fan, Institute for Infocomm Research (Singapore) .......................................................... [9643-44]

Information theoretic boundary detection based on user interaction and cubic splines, Can Demirkesen, TÜBITAK UZAY (Turkey); Ugur M. Leloglu, Middle East Technical Univ. (Turkey) .......................................................... [9643-45]

Lunch/Exhibition Break, Wed 12:20 to 13:40
Earth Resources and Environmental Remote Sensing/GIS Applications

Conference Chairs: Ulrich Michel, MU Consulting (Germany); Karsten Schulz, Fraunhofer-Institut für Optronik, Systemtechnik und Bildauswertung (Germany)

Conference Co-Chairs: Manfred Ehlers, Univ. Osnabrück (Germany); Konstantinos G. Nikolakopoulos, Univ. of Patras (Greece); Daniel Civco, Univ. of Connecticut (United States)

Programme Committee: Thomas Blaschke, Univ. Salzburg (Austria); Markus Boldt, Fraunhofer-Institut für Optronik, Systemtechnik und Bildauswertung (Germany); Tilman U. Bucher, Deutsches Zentrum für Luft- und Raumfahrt e.V. (Germany); Dimitri Bulatov, Fraunhofer-Institut für Optronik, Systemtechnik und Bildauswertung (Germany); Ni-Bin Chang, Univ. of Central Florida (United States); Garik Gutman, NASA Headquarters (United States); Marguerite M. Madden, The Univ. of Georgia (United States); Derya Maktav, Istanbul Technical Univ. (Turkey); Matthias S. Moeller, Austrian Academy of Sciences (Austria); Pablo H. Rosso, RapidEye AG (Germany); Florian Savopoulo, Natural Resources Canada (Canada); Jochen Schiewe, HafenCity Univ. Hamburg (Germany); Wenzhong Shi, The Hong Kong Polytechnic Univ. (Hong Kong, China); Alexander Siegmund, University of Education Heidelberg (Germany); Karl Staenz, Univ. of Lethbridge (Canada); Kerstin Voss, University of Education Heidelberg (Germany); Christiane H. Weber, Ecole Nationale Supérieure de Physique de Strasbourg (France)

TUESDAY 22 SEPTEMBER

OPENING REMARKS. ...................................... 13:50 TO 14:00

SESSION 1 ............................................. TUE 14:00 TO 15:00

Sensors and Platforms

Session Chair: Karsten Schulz, Fraunhofer-Institut für Optronik, Systemtechnik und Bildauswertung (Germany)

Solar diffusers in Earth observation instruments with an illumination angle of up to 70 degrees: design and verification of performance in BSDL, Bilgihan Gür, Hams Boll; TNO Technical Sciences (Netherlands) .................. [9644-1]

Analysis of spectral data and images for assessing state of vegetables, Denitsa Borisova, Valentian Atanassov, Georgi Jelev, Space Research and Technology Institute (Bulgaria); Kiril Alexiev, Petia Koprinkova-Hristova, Institute of Information and Communication Technologies (Bulgaria) ........................ [9644-2]

A comparative study between Landsat-8 OLI and Landsat-7 ETM+, for sensor signal-to-noise performance, spectral distortion, spectral signature matching and land surface temperature: a study in the Iraq landscape, Shaheen M. Ahtimiize, Kirkik Univ. (Iraq) ........................ [9644-3]

SESSION 2 .............................................. TUE 15:30 TO 17:50

Environmental Monitoring Concepts I

Session Chair: Markus Boldt, Fraunhofer-Institut für Optronik, Systemtechnik und Bildauswertung (Germany)

Floor mapping from Sentinel-1 and Landsat-8 data, a case study from river Envo, Yasar Ceyhun, Ktohr, Konstantinos G. Nikolakopoulos, Univ. of Patras (Greece) .................. [9644-4]

Height estimation of boreal and deciduous forests from interferometric TanDEM-X coherence data, Aire Olesk, Regio, Ltd. (Estonia) .......... [9644-5]

Aboveground forest biomass estimation combining information from optical and SAR remotely sensed imagery, Dimitris G. Stavroukoudis, Aristotle Univ. of Thessaloniki (Greece); Kleanthis Karamvasis, National Technical Univ. of Athens (Greece); Dimitris Zianis, National Agricultural Research Foundation (Greece); Ioannis Z. Gitas, Aristotle Univ. of Thessaloniki (Greece); Vassilis Karathanassi, National Technical Univ. of Athens (Greece); Gavrilo Spyriglou, National Agricultural Research Foundation (Greece); Vassilis Andronis, National Technical Univ. of Athens (Greece); Kalliopi Radoglou, Democritus Univ. of Thrace (Greece) ........ [9644-6]

Results of long-term oil spill monitoring in the Black Sea and the Caspian Sea with synthetic aperture radars, Andrei Y. Ivanov, P.P. Shirshov Institute of Oceanology (Russian Federation); Alexey A. Kucheko, RIKS4T (Russian Federation); Natalia Evrushenko, ScanEX Research and Development Ctr. (Russian Federation); Nadezhda Terleeva, P.P. Shirshov Institute of Oceanology (Russian Federation) ..................... [9644-7]

Factors influencing the detectability of oil pollution using vegetation indices in the Niger Delta mangrove region, Bashir Adamu, Univ. of Leicester (United Kingdom) ........................................... [9644-8]

Application of remote sensing in wetland monitoring: case study Hamoun wetland, Saeideh Maleki, Alireza Sofianian, Isfahan Univ. of Technology (Iran); Islamic Republic of; Sassan Saatchi, Jet Propulsion Lab. (United States) [9644-9]

POSTER SESSION. ........................................ TUE 17:30 TO 19:15

Conference attendees are invited to attend the Remote Sensing poster session held on Tuesday 17:30 to 19:15. Posters will be on display after 10:00 Tuesday morning in the Conference Hallway. Authors of poster papers will be present to answer questions concerning their papers during the Tuesday Poster Session. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Attendees are required to wear their conference registration badges to the poster sessions. Poster authors, view poster presentation guidelines and set-up instructions at http://spie.org/x32234.xml.

Remote sensing technology in combination with geographic information system (GIS) for rare vegetation conservation in Azerbaijan, Yelena M. Gambarova, Adil Gambarov, R.I.S.K. Co. (Azerbaijan) ....... [9644-43]

Global land cover mapping using satellite data and climate information, Noriko Suya, Tenri Univ. (Japan); Kanako Muramatsu, Nara Women’s Univ. (Japan); Motomasa Daigo, Doshisha Univ. (Japan); Fumio Ochiai, Nara Women’s Univ. (Japan) ........................................................ [9644-44]

Diachronic analysis of the occupation of the steppe area of the Wilaya of Sidi Bel’Abbes (Western Algeria), Abdesslam Ait Skhiri, Algerian University, Univ. Djillali Liabes (Algeria) .................. [9644-45]

Development of the Philippine Hydrologic Dataset (PHD) from lidar and other remotely-sensed data, Anjilin Mae C. Perez, Roel M. De la Cruz, defenseman C. Gaspa, Dominic E. Ibañez, Noel Jeromel D. Tumakohon, Nestor T. Olindo Jr., Ariel C. Blanco, Univ. of the Philippines, Diliman (Philippines) ................ [9644-46]

Detecting of soil salinization dynamics in irrigated Tadla Plain using Landsat TM/OLI imagery, Abdarrazak El Harti, Rachid Lhissou, Asma Dakir, Basma Naouli, Jamal-eddine Ouzemou, El Mostafa Bachaou, Abderrahimne El Ghnani, Faculty of Science and Technology Beni Mellal (Morocco); Mohammed Hassenou, Office Régional de Mise en Valeur Agricole du Tadla (Morocco) .................. [9644-47]

Headward erosion and deep erosion estimations in the wider area of Nemea, Greece, using GIS and freely available DSM, Konstantina K. Mexia, Univ. of Patras (Greece) ........ [9644-48]

Study of the climate change of Northeast China over hundred years and its influence, Nanping Xu, Meteorological Bureau of Heilongjiang (China) [9644-49]

Diachronic analysis of salt-affected areas in Biskra area (Algeria) using remote sensing techniques, Gabriel M. Akrasini, Maria T. Melis, Cristina Buttia, Univ. degli Studi di Cagliari (Italy); Claudio Arras, Univ. degli Studi di Cagliari (Italy) and Univ. degli Studi di Sassari (Italy); John M. Bradd, Univ. of Wollongong (Australia); Giorgio Ghiglieri, Univ. degli Studi di Cagliari (Italy) and Univ. degli Studi di Sassari (Italy) .................. [9644-50]

MODIS dust detection on the Mediterranean area: a web application for data sharing, Maria T. Melis, Univ. degli Studi di Cagliari (Italy); Francesco Dessi, Istituto di Scienze dell’Atmosfera e del Clima (Italy); Paolo Loddo, Paolo Loddo (Italy); Luca Naltiza, Luca Naltiza (Italy) .................. [9644-51]
Remote Sensing for Archaeology, Cultural and Natural Heritage

Session Chair: Valentina Raimondi, Istituto di Fisica Applicata Nello Carrara (Italy)

Modelling prehistoric terrain models using lidar data: a geomorphological approach, Veit Höfler, Christine Wessollek, Pierre Karrasch, Technische Universität Dresden (Germany).

An integrated multimodal approach to cultural heritage conservation and documentation: from remotely-sensed lidar imaging to historical archive data, Valentina Raimondi, Lorenzo Palombi, Istituto di Fisica Applicata Nello Carrara (Italy); Annalisa Morelli, SO.IN.G Strutture e Ambiente S.r.l (Italy); Massimo Chimenti, Culturenuova s.r.l (Italy); Sara Peroni, FABERrestau s.n.c (Italy); Ute Dercks, Kunsthistorisches Institut in Florenz (Italy); Alessia Andreotti, Univ. di Pisa (Italy); Giovanni Bartolozzi, Istituto di Fisica Applicata Nello Carrara (Italy); Marco Bini, Elab Scientific s.r.l (Italy); Ilaria Bonaduce, Univ. di Pisa (Italy); Susanna Bracci, Emma Cantiani, Marla Perlombardi, CNR-Istituto per la Conservazione e la Valorizzazione dei Beni Culturali (Italy); Costanza Cuacci, Istituto di Fisica Applicata Nello Carrara (Italy); Laura Ferelli, Kunsthistorisches Institut in Florenz (Italy); Monica Galeotti, Opificio delle Pietre Dure (Italy); Irene Maleci, CNR-Istituto per la Conservazione e la Valorizzazione dei Beni Culturali (Italy); Alessandra Malquori, Scuola di Studi Umanistici e della Formazione (Italy); Emanuela Masi, Art-Test s.a.s. (Italy); Marco Montanelli, AK Innovation s.r.l. (Italy); Roberto Olmi, Marcello Piccolo, Istituto di Fisica Applicata Nello Carrara (Italy); Louis D. Pierelli, NIKE Restauro Opere D’Arte Snc (Italy); Daniela Pinna, Opificio delle Pietre Dure (Italy); Cristiana Rimesini, CNR-Istituto per la Conservazione e la Valorizzazione dei Beni Culturali (Italy); Sara Rutigliano, Culturenuova s.r.l. (Italy); Barbara Sacchi, CNR-Istituto per la Conservazione e la Valorizzazione dei Beni Culturali (Italy); Sergio Stella, Bel Chimica S.r.l (Italy); Gabriella Torini, NIKE Restauro Opere D Arte Snc (Italy).

Remote sensing modelling of cellulose, lignin and wax content of Pistacia for phylogenetic analysis, Giorgi Kozhoridze, Nikolai Orlovsky, Leah Orlovsky, Dan G. Blumberg, Aivi Golan-Goldhirsh, Ben-Gurion Univ. of the Negev (Israel).

Hazard Mitigation Geologic Applications I

Session Chair: Konstantinos G. Nikolopoulos, Univ. of Patras (Greece)

Active landslide monitoring using remote sensing data, GPS measurements and cameras on board UAV, Konstantinos G. Nikolopoulos, Katerina Kavoura, Nikolaos Depountis, Nikolakis Argyropoulos, Ioannis Koukouvelas, Nikolaos Sbatakakis, Univ. of Patras (Greece).

Lithological mapping of igneous and metamorphic rocks in the Central Eastern Desert of Egypt using remote sensing data, Mohamed Fouda Sadek, National Authority for Remote Sensing and Space Sciences (Egypt).

WebGIS for calculation of main geomagnetic field parameters on the basis of ESRI ArcGIS API, Andrei V. Vorobev, Gulnara R. Shakirova, Ufa State Aviation Technical Univ. (Russian Federation).

Assessment of sediment yield and identification of check dam sites by using remote sensing and GIS techniques, Nida Samad, Muhammad H. Ch, Ctr. for Geographic Information Systems (Pakistan); Muhammad Asif, Ctr. of Excellence in Water Resource Management (Pakistan); Muhammad Saleem, Climate Change, Alternate Energy and Water Resources Institute (Pakistan); Qudiaa Hamid, Ctr. for Geographic Information System (Pakistan); Umar Babar, Punjab Univ. College of Information Technology (Pakistan); Shahid Fareed, Punjab Univ. College of Information Technology (Pakistan) and Univ. of Torino (Italy); Hassan Tanir, Ctr. for Geographic Information System (Pakistan).

Lunch/Exhibition Break

Wed 11:50 to 13:00
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Session 5: Hazard Mitigation Geologic Applications II

Wednesday 13:00 to 15:00

Session Chair: Konstantinos G. Nikolakopoulos, Univ. of Patras (Greece)

Concept of an advanced hyperspectral remote system for pipeline monitoring, Göksu Keskin, Caroline Teutsch, Andreas Lenz, Wolfgang Middelmann, Fraunhofer-Institut für Optronik, Systemtechnik und Bildauswertung (Germany).

Hydrocarbon microseepage mapping using signature based target detection techniques, Hiald Soydan, Alper Koz, Sebnem Düzgün, Aydin A. Alatan, Middle East Technical Univ. (Turkey).

Quarry monitoring using GPS measurements and UAV photogrammetry, Konstantinos G. Nikolakopoulos, Ioannis Koukouvoulis, Nikolaos Argyropoulos, Vasileios Megalo kokononou, Univ. of Patras (Greece).

Soil volume estimation in debris flow areas using lidar data in the 2014 Hiroshima, Japan rainstorm, Hiroshi Mura, Hiroshi Te, Hiroshi Shiraishi, Univ. of Hiroshima, Japan.

The use of UAV to document sloping landscapes to produce digital elevation models To examine environmental degradation, Kyriacos Themistocleous, Athos Apsigou, Cyprus Univ. of Technology (Cyprus); Myma de Hoop, Utrecht Univ. (Netherlands); Angeles Garcia-Mayor, Wageningen Univ. (Netherlands); Max Rietkerk, Stefan C. Dekker, Utrecht Univ. (Netherlands).

Evaluation of multitemporal percent tree cover data for detection of deforestation and forest degradation, Yan Gao, Jean F. Mas, Jaime Paneque-Galvez, Margaret Skutsch, Univ. Nacional Autónoma de México (Mexico).

Hazard zone mapping of Kedarnath region using remote sensing and FR method, Hirshabth Gupta, Shashank Bhushan, Jyagyu Agrawal, Indian School of Mines (India).


Estimation of evapotranspiration in Mongolian steppe area of Mongolia combining satellite and ground data, Sanjaa Tuya, Nas-Urt Tugjsuren, Mongolian Univ. of Science and Technology (Mongolia); Jadamba Battbayar, National Agency of Meteorology and Environmental Monitoring (Mongolia); Battshuur Azzaya, Mongolian Acad. of Science, and Technology (Mongolia).

This programme is current as of June 2015.
Conference Chairs: Upendra N. Singh, NASA Langley Research Ctr. (United States); Doina Nicoleta Nicolae, National Institute of Research and Development for Optoelectronics (Romania)

Programme Committee: Arnošt Alexa, Rijksuniversiteit voor Volksgezondheid en Milieu (Netherlands); Lucas Alados-Arboledas, Univ. de Granada (Spain); Andreas Behrendt, Univ. Hohenheim (Germany); Gerhard Ehret, Deutsches Zentrum für Luft- und Raumfahrt e.V. (Germany); Benny B. S. Christensen, LEO (United States); Philippe L. Keckhut, LATMOS (France); George J. Komar, NASA Headquarters (United States); Eduardo Landulfo, Instituto de Pesquisas Energéticas e Nucleares (Brazil); Kohei Mizutani, National Institute of Information and Communications Technology (Japan); Lucia Mona, Istituto di Metodologie per l'Analisi Ambientale (Italy); Alexandros D. Papayannis, National Technical Univ. of Athens (Greece); Gelsomina Pappalardo, Istituto di Metodologie per l'Analisi Ambientale (Italy); Vincenzo Rizi, Univ. degli Studi dell'Aquila (Italy); Laurent Sauvage, Leosphere France (France); Georgios D. Tzeremes, European Space Agency (Netherlands); Ulla Wanner, Leibniz Institut für Troposphärenforschung (Germany); Jirong Yu, NASA Langley Research Ctr. (United States)

Monday 21 September

Opening Remarks ........................................... 8:25 to 8:30

Session 1 ............................................. MON 8:30 to 10:20

New Developments in Lidar Technology I

Double-pulsed 2-micron IPDA lidar validation for atmospheric CO2 measurements (Invited Paper), Upendra N. Singh, Tamer F. Refaat, Jirong Yu, Mulugeta Petros, Ruben G. Remus, NASA Langley Research Ctr. (United States) . . . . [9645-1]

Atmospheric CO2 remote sensing system based on high brightness semiconductor lasers and single photon counting detection, Antonio Perez-Serrano, Maria Fernanda Vitera Suarez, Ignacio Esquivias, Univ. Politécnica de Madrid (Spain); Michaela Faugeron, Michel Krakowski, Frédéric van Dijk, III-V Lab. (France); Gerd Kochen, Martin Traub, Fraunhofer-Institut für Lasertechnik (Germany); Pawel Adamiec, Juan Barbero, Alter Technology (Spain); Xiao Ai, John G. Rarity, Univ. of Bristol (United Kingdom); Mathieu Quatrevalet, Gerhard Ehret, Deutsches Zentrum für Luft- und Raumfahrt e.V. (Germany) . . . . [9645-2]

Advanced intensity-modulation continuous-wave lidar techniques for ASCENDS CO2 column measurements, Joel F. Campbell, Bing Lin, Amin R. Nehrir, Fenton W. Harrison, Byron L. Meadows, NASA Langley Research Ctr. (United States) . . . . . . [9645-3]

Developing the CO2 Sounder lidar as a candidate for the ASCENDS Mission: an update, James B. Anthone, NASA Goddard Space Flight Ctr. (United States); Anand K. Ramanathan, Univ. of California, College Park (United States); Haris Riris, NASA Goddard Space Flight Ctr. (United States); Graham R. Allan, Sigma Space (United States); Jeffrey R. Chen, Anthony W. Yu, Xiaoli Sun, NASA Goddard Space Flight Ctr. (United States) . . . . [9645-4]

Signal to noise ratio estimation of the ASCENDS CarbonHawk Experiment Simulator (ACES) for Atmospheric CO2 Measurements, Songsheung Chen, Amin R. Nehrir, Larry B. Petway, NASA Langley Research Ctr. (United States); Yingyu Bai, Solar Systems and Applications, Inc. (United States); Fenton W. Harrison, Joel F. Campbell, Byron L. Meadows, Bing Lin, Michael D. Obland, NASA Langley Research Ctr. (United States); Edward V. Browell, Science, Technology, and Research Support Services (United States) . . . . . . . . . [9645-5]

Session 2 ............................................. MON 10:50 to 12:30

New Developments in Lidar Technology II

Session Chair: Upendra N. Singh, NASA Langley Research Ctr. (United States)

Multipulsed transmitter for DIAL sensing of atmospheric water vapour, methane and carbon dioxide in the 2 μm region, Dominique Mammez, Ewan Cadiou, Jean-Baptiste Dherbecourt, Myriam Raybaut, Jean-Michel Melkonian, Antoine Godard, Guillaume Gorji, ONERA (France); Jacques R. Peton, Univ. Pierre et Marie Curie (France); Michel Lafetvre, ONERA (France) . . . . . . . . . . . . [9645-6]

A robust optical parametric oscillator and receiver telescope for differential absorption lidar of greenhouse gases, Iain Robinson, James W. Jack, The Univ. of Edinburgh (United Kingdom); Cameron F. Rae, Univ. of St. Andrews (United Kingdom); John B. Moncrieff, The Univ. of Edinburgh (United Kingdom) . . . . . . . . . . . . [9645-7]

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Lidar Technologies, Techniques, and Measurements for Atmospheric Remote Sensing

Langley Mobile Ozone Lidar (LMO) results from the Denver, CO DISCOVER-AQ campaign, Russell J. De Young, NASA Langley Research Ctr. (United States); Denis Plutiau, Science Systems and Applications, Inc. (United States); William Carrion, Coherent Applications, Inc. (United States); Reza Ganoie, Science Systems and Applications, Inc. (United States) . . . . . . . [9645-8]

LED mini-Raman lidar for hydrogen gas detection, Tatsuo Shinina, Chiba Univ. (Japan); Kazuo Noguchi, Kenji Tsuji, Chiba Institute of Technology (Japan) . . . . . . . . . . . . [9645-9]

Increase of bistatic lidar resolution by several cameras, Mohammad Mohseni Fazeli, Ahmad Darudi, Amir Masoumi, Hamidreza Darabian, Univ. of Zanjan (Iran, Islamic Republic of) . . . . . . . . . . . . [9645-10]

Lunch/Exhibition Break ................................ Mon 12:30 to 13:40

Session 3 ............................................. MON 13:40 to 15:30

New Developments in Lidar Technology III

Session Chair: Upendra N. Singh, NASA Langley Research Ctr. (United States)

Design study for an airborne multi-wavelength, multi-depolarization high-spectral resolution lidar (Invited Paper), Ilya Serikov, Max-Planck-Institut für Meteorologie (Germany); Doina N. Nicolae, National Institute of Research and Development for Optoelectronics (Romania); Vasiliis Amiridis, National Observatory of Athens (Greece); Holger Linne, Björn Brügmann, Max-Planck-Institut für Meteorologie (Germany) . . . . [9645-11]

Long range wind lidars based on novel high spectral brilliance all-fibered sources, Laurent Lombard, Beatrice Augiere, Agnès Dolfi-Bouteuyre, Didier Goular, Matthieu Valla, William Renard, Julien Le Gouët, Anne Durecu, Christophe Planchat, Pierre Boudron, Guillaume Canat, Claudine Besson, Onera (France) . . . . . . . [9645-12]

CW Lidar for wind sensing featuring numerical range scanning and strong inherent suppression of disturbing reflections, Ernst Brinkmeyer, Technische Univ. Hamburg-Harburg (Germany) . . . . . . . . . . . . [9645-13]

An innovative rotational Raman lidar to measure the temperature profile from the surface to 30 km altitude, Alain Hauchecorne, Philippe L. Keckhut, Jean Francois Mariscal, Eric D’Almeida, Pierre-Richard Dahoo, Jacques Porteneuve, LATMOS (France) . . . . . . . . . . . . [9645-14]

ALAR: a novel lidar system for vegetation height retrieval from space, Pierluigi Foglia Manzillo, Chris van Dijk, Simon C. Conticello, Marco Esposito, cosine Research B.V. (Netherlands); Rudi Lussana, Federica Villa, Davide Tamborini, Franco Zappa, Alberto Tos, Politecnico di Milano, Dipartimento di Elettronica, Informazione e Bioingegneria (Italy); Andreas Roncat, Norbert Pfeifer, TU Wien, Department of Geodesy and Geoinformation (Austria); Dimitris Lampidis, Logikon Labs (Greece); Thomas Entner, Entner Electronics (Austria) . . . . . . . [9645-15]
CONFERENCE 9645

PLENARY SESSION .......................... MON 16:00 TO 19:15
Remote Sensing and Security + Defence Joint Plenary Session
- Grady Tuell, Georgia Tech Research Institute (United States)
  The World in a Point Cloud
- Anne Harrington, National Nuclear Security Administration (United States)
  Policy and Technology: Addressing Technical Challenges
- Panel Discussion
  CubeSats for Earth Remote Sensing and Security and Defense Applications

For details, please see the Special Events section in the printed programme, or follow the Special Events Link at the URLs below.

http://spie.org/security-defence-europe.xml
http://spie.org/remote-sensing-europe.xml

TUESDAY 22 SEPTEMBER

SESSION 4 ................................. TUE 8:30 TO 10:00
Lidar Applications to Regional and Global Issues I
Session Chair: Doina Nicoleta Nicola, National Institute of Research and Development for Optoelectronics (Romania)

Aerosol cloud interaction: a multiphase-scenario-based methodology (Invited Paper), Eduardo Landulfo, Instituto de Pesquisas Energéticas e Nucleares (Brazil); Fabio Juliano S. da Silva Lopes, Univ. de São Paulo (Brazil); Juan Luis Guerrero-Rascado, Lucas Alados-Arboledas, Univ. de Granada (Spain). ................................. [9645-16]

Use of lidar water vapor retrieval for assessment of model capability to simulate water vapor profiles, Lev Labzovskii, National Institute of Research and Development for Optoelectronics (Romania) and Univ. of Bucharest (Romania); Ioannis Biniotiglou, National Institute for Research and Development for Optoelectronics (Romania); Alexandros D. Papayannis, National Technical Univ. of Athens (Greece); Robert F. Banks, José Maria Balsadano, Barcelona Supercomputing Ctr. - Ctr. Nacional de Supercomputación (Spain). ................................. [9645-15]

A comparison and evaluation between ICESat/GLAS altimetry and mean sea level in Thailand, Didaspanh Naksen, Royal Thai Survey Dept (Thailand) and Beihang Univ. (China); Dong Kai YANG, Beihang Univ. (China). ................................. [9645-19]

SESSION 5 ................................. TUE 10:30 TO 12:40
Lidar Applications to Regional and Global Issues II
Session Chair: Doina Nicoleta Nicola, National Institute of Research and Development for Optoelectronics (Romania)

EARLINET quality assurance efforts building up to the ACTRIS Lidar Calibration centre (Invited Paper), Volker Freudenthaler, Ludwig-Maximilians-Universität München (Germany). ................................. [9645-20]

Aerosol variability in Romania from combined remote sensing data, Doina N. Nicola, Anca V. Nencu, Simona Andrei, National Institute of Research and Development for Optoelectronics (Romania); Alexandru Dandocsi, National Institute of Research and Development for Optoelectronics (Romania) and Univ. Politehnica of Bucharest (Romania); Horatiu Stefanie, National Institute of Research and Development for Optoelectronics (Romania); Ioannis Biniotiglou, National Institute of Research and Development for Optoelectronics (Romania) and Univ. Babes-Bolyai (Romania). ................................. [9645-21]

Spatial mapping of greenhouse gases using laser absorption spectrometers at local scales of interest, Jeremy T Dobler, Nathan Blume, Michael Braun, Exelis Inc (United States); T. Scott Zaccheo, Timothy Pernini, Christopher Botos, Atmospheric Environmental Research, Inc. (United States). ................................. [9645-22]

A novel technique for retrieval particle size distribution in boundary layer, Hamidreza Darabian, Ahmad Darudi, Amir Masoumi, Mohammad Mohseni Fazel, Univ. of Zanjan (Iran, Islamic Republic of). ................................. [9645-25]

POSTER SESSION .......................... TUE 17:30 TO 19:15
Conference attendees are invited to attend the Remote Sensing poster session held on Tuesday 17:30 to 19:15. Posters will be on display after 10:00 Tuesday morning in the Conference Hallway. Authors of poster papers will be present to answer questions concerning their papers during the Tuesday Poster Session. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Attendees are required to wear their conference registration badges to the poster sessions. Poster authors, view poster presentation guidelines and set-up instructions at http://spie.org/x32234.xml.

Estimation of particle mass concentration from eight-year lidar measurements in Seoul, Korea and its application to Asian dust and pollution events, Sang-Woo Kim, Man-Hae Kim, Huidong Yeo, Seoul National Univ. (Korea, Republic of); Nobuo Sugimoto, National Institute for Environmental Studies (Japan). ................................. [9645-26]

Determination of the backscatter ratio from data of lidar with two close wavelengths, Ivan V. Grigorov, Dimitar V. Stoyanov, Georgi V. Kolarov, Institute of Electronics (Bulgaria). ................................. [9645-28]

Calibrated depolarization retrievals using lidar, Livio Belegrante, National Institute of Research and Development for Optoelectronics (Romania); Volker Freudenthaler, Ludwig-Maximilians-Universität München (Germany); Anca V. Nencu, Jeri G. Vašilescu, National Institute of Research and Development for Optoelectronics (Romania); Ioannis Biniotiglou, National Institute of Research and Development for Optoelectronics (Romania); Cristian M. Radu, Valentin F. Benciu, Doina N. Nicola, National Institute of Research and Development for Optoelectronics (Romania). ................................. [9645-30]

DIAL measurements of the vertical ozone distribution at the Siberian lidar station, Oleg A. Romanovski, V.E. Zuev Institute of Atmospheric Optics (Russia); Victor K. Kolesnikov, Tomsk State Univ. (Russia); Sergey S. I. Dolgii, Alexey A. Nezvzorov, Vladimir D. Burlakov, Alexey A. Nevzorov, V.E. Zuev Institute of Atmospheric Optics (Russian Federation); Olga V. Kharchenko, V.E. Zuev Institute of Atmospheric Optics (Russian Federation). ................................. [9645-27]

A portable imaging lidar for lower boundary layer atmospheric measurement, Xiaoxin Liu, Anhui Institute of Optics and Fine Mechanics (China). ................................. [9645-29]

A method of precision airborne laser scanning and collaborative design in expressway reconstruction, Fei Yu, Chujiang Chen, China Communications Construction Co., Ltd. (China). ................................. [9645-31]

Remote sensing solutions using GIS with mobile or land laser scanning, Ahmet Erdol?du, Engineer (Turkey). ................................. [9645-32]

One-year monitoring of the atmosphere over Penang Island using a ground-based lidar,Mohamad Zubir Mat Jafi, Wei Ying Khor, Hwee San Lim, Wan Shen Hwee, Univ. Sains Malaysia (Malaysia). ................................. [9645-24]
High-Performance Computing in Remote Sensing

Conference Chairs: Borphin Huang D.D.S., Univ. of Wisconsin-Madison (United States); Sebastián López, Univ. de Las Palmas de Gran Canaria (Spain); Zhensen Wu, Xidian Univ. (China)

Conference Co-Chairs: Jose M. Nascimento, Instituto de Telecomunicações (Portugal); Lizhe Wang, Institute of Remote Sensing and Digital Earth (China); Jun Li, Sun Yat-Sen Univ. (China)

Program Committee: Saeed H. Al-Mansoori, Emirates Institution for Advanced Science and Technology (United Arab Emirates); Boris A. Alpatov, Rayzan State Radio Engineering Univ. (Russian Federation); Chein-I Chang, Univ. of Maryland, Baltimore County (United States); Yang-Lang Chang, National Taipe Univ. of Technology (Taiwan); Mingmin Chi, Fudan Univ. (China); Qian Du, Mississippi State Univ. (United States); Dustin Feld, Univ. zu Köln (Germany); Carlos E. Garcia Gonzalez, Univ. Complutense de Madrid (Spain); Lixin Guo, Xidian Univ. (China); Eduardo Juarez, Univ. Politécnica de Madrid (Spain); Tsengdar J. Lee, NASA Headquarters (United States); Francesco Leporati, Univ. degli Studi di Pavia (Italy); Qiuguang Miao, Xidian Univ. (China); Caner Özcan, Karabük Univ. (Turkey); Enrique S. Quintana-Ortí, Univ. Jaume I (Spain); Prashanth Reddy Marpu, Masdar Institute of Science & Technology (United Arab Emirates); Jarno Mielikainen, Univ. of Wisconsin-Madison (United States); Antonio J. Plaza, Univ. de Extremadura (Spain); Jeffery J. Puschell, Raytheon Space & Airborne Systems (United States); Shen-En Qian, Canadian Space Agency (Canada); Sergio Sanchez Martinez, Masdar Institute of Science & Technology (United Arab Emirates); Roberto Sarmiento, Univ. de Las Palmas de Gran Canaria (Spain); Valeriy V. Strotov, Rayzan State Radio Engineering Univ. (Russian Federation); Yuliya Tarabalka, INRIA Sophia Antipolis - Mediterranean (France); Carole Theibaut, Ctr. National d’Etudes Spatiales (France); Tanya Vladimirova, Univ. of Surrey (United Kingdom); Shih-Chieh Wei, Tamkang Univ. (Taiwan); Jiaji Wu, Xidian Univ. (China)

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TUESDAY 22 SEPTEMBER

SESSION 4 ............................ TUE 8:30 TO 10:10
High Performance Computing IV
Session Chair: Jose M. Nascimento,
Instituto de Telecommunicações (Portugal)

GPU-Based ray tracing algorithm for high-speed propagation prediction in
multiroom indoor environments, Xiaowei Guan, Lixin Guo, Zhongyu Liu, Xidian
University (China) ................................................... [9646-16]

Performance tuning Weather Research and Forecasting (WRF) Goddard
longwave radiative transfer scheme on Intel Xeon Phi, Jarno Mielikainen,
Bormin Huang, Hung-Lung A. Huang, Univ. of Wisconsin-Madison (United
States) ........................................................... [9646-17]

A novel hardware-friendly algorithm for hyperspectral linear unmixing, Raúl
Guerra, Luciana Santos, Sebastián López, Roberto Sarmiento, Univ. de Las
Palmas de Gran Canaria (Spain) ................................... [9646-18]

The scale effects of anisotropic land surface reflectance: an analysis with
Landsat and Modis imagery, Lu Bai, Xun Huang, Zhenhao Wu, Lixin Guo,
Xidian Univ (China) ................................................... [9646-19]

Parallel implementation of the multiple endmember spectral mixture
analysis algorithm for hyperspectral unmixing, Sergio Bernabé García,
Guillermo Botella, Manuel Prieto-Matías, Univ. Complutense de Madrid (Spain);
Antonio J. Plaza Miguel, Univ. de Extremadura (Spain) .................. [9646-20]

SESSION 5 ......................... TUE 10:40 TO 12:20
High Performance Computing V
Session Chair: Lizhe Wang,
Institute of Remote Sensing and Digital Earth (China)

MESMA based on collaborative sparse unmixing, Xiang Xu, Jun Li, Sun-Yat-
Sen Univ. (China) ................................................... [9646-21]

Semi-supervised classification tool for DubaiSat-2 multispectral images,
Saeed H. Al-Mansoori, Emirates Institution for Advanced Science and
Technology (United Arab Emirates) .................................. [9646-22]

Region of interest detection in remote sensing images based on integer
wavelet transform and color opponent mechanism, Libao Zhang, Jie Chen,
Jue Zhang, Beijing Normal Univ. (China) ................................ [9646-23]

Performance portability study of an automatic target detection and
classification algorithm for hyperspectral image analysis using OpenCL,
Sergio Bernabé García, Francisco D. Igual, Guillermo Botella, Carlos E. García
González, Manuel Prieto-Matías, Univ. Complutense de Madrid (Spain); Antonio
J. Plaza Miguel, Univ. de Extremadura (Spain) .......................... [9646-24]

Accelerating the prediction-based lower triangular transform for data
compression using Intel MIC, Shih-Chieh Wei, Tamkang Univ. (Taiwan);
Bormin Huang, University of Wisconsin-Madison (United States) ........ [9646-25]

Lunch/Exhibition Break ................................. Tue 12:20 to 13:30

SESSION 6 ............................ TUE 13:30 TO 15:10
High Performance Computing VI
Session Chair: Jun Li, Sun-Yat-Sen Univ. (China)

Optimizing the Betts-Miller-Janjic cumulus parameterization on the Intel
Xeon Phi Many-Core coprocessor, Melin Huang, Bormin Huang, Hung-Lung
A. Huang, Univ. of Wisconsin-Madison (United States) ........... [9646-26]

Parallel hyperspectral compressive sensing method on GPU, Sergio
Bernabé García, Gabriel Martín Hernández, Jose M. Nascimento, Instituto de
Telecomunicaciones (Portugal) ........................................... [9646-27]

Bistatic scattering characteristics of the vegetation base on the second-
order vector radiative transfer theory, Yuanyuan Zhang, Xidian Univ (China);
Zhensen Wu, Xidian Univ. (China); Kaiyuan Fu, Xidian Univ (China) .... [9646-28]

GPU-based parallel clustered different pulse code modulation, Wenzhe Li,
Jiaji Wu, Wanqiu Kong, Xidian Univ (China) ............................. [9646-29]

Hyperspectral unmixing based on local collaborative sparse regression,
Shaoquan Zhang, Jun Li, Sun Yat-Sen Univ. (China); José M. Boucas-Dias,
Univ. de Lisboa (Portugal); Antonio J. Plaza Miguel, Univ. de Extremadura
(Spain) .............................................................. [9646-30]
REGISTRATION

Onsite Registration and Badge Pick-Up Hours
Main Entrance Foyer
Sunday 20 September .......................... 16:00 to 18:00 hrs.
Monday 21 September .......................... 7:30 to 17:00 hrs.
Tuesday 22 September .......................... 8:00 to 17:00 hrs.
Wednesday 23 September ...................... 8:30 to 17:00 hrs.
Thursday 24 September ....................... 8:30 to 16:00 hrs.

Exhibition Opening Hours
Tuesday 22 September .......................... 10:00 to 17:00 hrs.
Wednesday 23 September ...................... 10:00 to 16:00 hrs.

Conference Registration
Includes admission to all conference sessions, plenaries, panels, and poster sessions, admission to the Exhibition, Welcome Reception, coffee breaks, and a choice of proceedings. (Students get one online proceedings volume.)

Exhibition Registration
Exhibition-Only visitor registration is complimentary.

Early Registration Pricing and Dates
Conference registration prices increase by €110/$150 (Students, €40/$50) after 1 September 2015. The online form will automatically display the increased prices.

SPIE Member, SPIE Student Member, and Student Pricing
- SPIE Members receive a conference registration discount. Discount is applied at the time of registration.
- Student registration rates are available only to undergraduate and graduate students who are enrolled full time and have not yet received their Ph.D. Post-docs may not register as students. A student ID number or proof of student status is required with your registration.

Press Registration
For credentialed press and media representatives only. Please email contact information, title, and organization to media@spie.org.

SPIE Cashier
Registration Area
Open during registration hours

Registration Payments
If you are paying by cash or cheque as part of your onsite registration, wish to add a special event requiring payment, or have questions regarding your registration, visit the SPIE Cashier.

Receipts and Certificate of Attendance
Preregistered attendees who did not receive a receipt or attendees who need a Certificate of Attendance may obtain those from the SPIE Cashier.

Badge Corrections
Badge corrections can be made by the SPIE Cashier. Please have your badge removed from the badge holder and marked with your changes before approaching the counter.

Refund Information
There is a €40/$50 service charge for processing refunds. Requests for refunds must be received by 9 September 2015; all registration fees will be forfeited after this date. Membership dues, SPIE Digital Library subscriptions, or Special Events purchased are not refundable.

U.S. Government Credit Cards
U.S. Government credit card users: have your purchasing officer contact the credit card company and get prior authorization before attempting to register. Advise your purchasing agent that SPIE is considered a 5968 company for authorization purposes.

AUTHOR / PRESENTER INFORMATION

Speaker Check-In and Preview Station
Room Latécoère
Monday through Thursday .......................... 8:00 to 17:00 hrs
All conference rooms have a computer workstation, projector, screen, lapel microphone, and laser pointer. All presenters are requested to come to Speaker Check-In with their memory devices or laptops to confirm their presentation display settings.

Poster Set-up Instructions
Concorde 2
22 September 2015, 17:45 to 19:15
Poster presenters can begin to post their papers at 10:00 on Tuesday. Each poster presenter is provided a space 0.95 x 1.20m in which to display a summary of the paper. Poster presenters will stand by their posters from 17.45 to 19:15 to answer questions. Poster presenters who have not set up by 17.45 on Tuesday will be considered a “no show” and their manuscript will not be published. Posters must be removed at the end of the poster session since the poster boards will then be removed and the remaining posters discarded. SPIE assumes no responsibility for posters left up after the end of each poster session.
GENERAL INFORMATION

ONSITE SERVICES

Internet Access
Room Mermoz
Complimentary wired Internet access is available; in Room Mermoz, attendees can hook up their laptops or use provided workstations. Internet speed depends on the number of users.

SPIE Conference App
Search and browse the programme, special events, participants, exhibitors, and more. Free Conference Apps available for iPhone and Android phones.

SPIE Luggage and Coat Check
Luggage, package, and coat storage are available during registration hours (Tuesday until 19:30 hrs). Please note hours; no late pickup available.

City Information
For further information on sightseeing and tourist information, please see the Toulouse Tourism website: http://www.toulouse-vis-it.com/

Urgent Message Line
An urgent message line is available during registration hours: +33(0) 5 62 30 40 96.

Lost and Found
Registration Desk, during registration hours
Found items will be kept at the Registration Desk until closing each day and then turned over to Pierre Baudis Congress Centre Security. At the end of the meeting, all found items will be turned over to Facility Security.

FOOD AND BEVERAGE SERVICES

Coffee Breaks
Monday 21 and Thursday 24: Outside conference rooms
Tuesday 22 and Wednesday 23: Salle Caravelle 1
Complimentary coffee will be served twice daily, at 10:00 and 15:00. Check individual conference listings for exact times and locations.

Food and Refreshments for Purchase
There are a number of restaurants in the immediate neighborhood of the Pierre Baudin Congress Centre where food and drinks can be bought. http://www.spie.org/RestaurantGuide

Hotels
Centre de Congrès Pierre Baudis
11 esplanade Compans Cafarelli
BP 889
31685 Toulouse cedex 6
France
Tel: +33 (0)5.62.30.40.00
Fax: +33 (0)5.62.30.40.01
Web: http://www.centre-congres-toulouse.fr/

Hotel Reservations
BOOK EARLY FOR BEST RATES AND BEST SELECTION.
Early booking deadline is 22 July and is based on a first-come, first-served basis.
A limited number of hotel rooms have been blocked with the Accor Group of hotels, all of which are in walking distance of the Pierre Baudis Congress Centre. Please use Accor Group online booking service to book your hotel.
After this date, the rates will revert to regular booking rates. SPIE recommends that you do cross-check any options via the Internet to find the best deal.
AIRPORT INFORMATION

Toulouse-Blagnac International Airport is serviced by a number of airlines (Air France, Bmi regional, British Airways, Brussels Airlines, EasyJet, Flybe, Germanwings, KLM, Lufthansa, and others: http://www.toulouse.aeroport.fr/en/airports/airlines) with several direct flights a day. For price enquiries and to book your tickets, please visit the airlines’ websites or speak to your travel agent.

The Toulouse-Blagnac International Airport is located 7km (4 miles) from the centre. Call +33 (0)5-61-42-44-00 for flight information or visit the website at http://www.toulouse.aeroport.fr/en.

AIRPORT SHUTTLE SERVICE

Between 5:30 and 0:15, the airport shuttle departs every 20 minutes from the airport and has six stops in the city centre: Pont du Bearnais – Compans Caffarelli (= Pierre Baudis Conference Centre) – Place Jeanne d'Arc – Allées Jean-Jaurès – Matabiau Gare SNCF – Train station. The journey time is approximately 20 minutes, depending on traffic. At the time of going to print, a single ticket is €8.00, and a return ticket is €15.00. For more information, please visit the website at http://www.toulouse.aeroport.fr/en/passengers/go/access-airport/airport-shuttle or phone +33 (0)5 34 60 64 00.

SCHEDULE:

Airport to Toulouse
First departure from airport: 5:30
Last departure from airport daily: 0:15

Toulouse to Airport
First departure from coach station daily: 5:00
Last departure from coach station: 21:20

For more up-to-date information, please visit the following websites:

PUBLIC TRANSPORT

BY RAIL

From Paris, several high-speed TGV trains take approximately 5 hours to arrive in Toulouse every day. There are also regular trains from Bordeaux (2 hours’ trip) and from Marseille (4 1/2 hours trip). For more information, please visit the website at http://www.sncf.com/en/passengers or phone +33 (0)8-36-35-35-35 for rail information and schedules.

BY CAR

Toulouse has direct motorway connections to the main capitals of Northern and Southern Europe, and you should expect to spend 6 to 7 hours driving from Paris to Toulouse.

Take A 10 south to Bordeaux, connecting to A62 to Toulouse. A61 (Carcassonne, Montpellier, Barcelona), A62 (Montauban, Agen, Bordeaux, Limoges, Paris), A64 (Foix, Lourdes, Bayonne, San Sebastian), A68 (Lavaur, Albi) A66 (Pamiers, Foix, Andorra).

For information on the “Autoroute du Sud de la France”, please call: Tel +33 (0)8 36 68 09 79 or call the South-west road information centre at: Tel +33 (0)5 56 96 33 33.

To find out about parking your car in Toulouse, please visit: http://www.vincipark.com/en/

PUBLIC TRANSPORT IN TOULOUSE

In addition to an extensive bus system, Toulouse has a modern metro system. The VAL (Véhicule Automatique Léger) metro system is made up of driverless (automatic) rubber-tired trams. The nearest stop to the Congress Centre is “Compans Caffarelli” on Line B.

The underground operates from 5.15 hrs to midnight, Monday to Thursday, and to 0.42 hrs on Fridays and Saturdays. Trains run every 6 minutes off-peak and every 1min20 at peak times.

For further information, contact Contact Allô Tisséo Allô Tisséo, Espace Transport, 7 place Esquirol 31000 Toulouse, Tel +33 (0)5 61 41 70 70, http://www.tisseo.fr/en/home.
Full paid registration includes your choice of Proceedings of SPIE (excluding student registrations). See the attached list for product order numbers for proceedings options from this meeting. You will need a product order number when you make your proceedings choice on the registration form.

**Available as part of registration:**

- **Symposium CD Collection**—a searchable CD of one or multiple proceedings volumes. Available within 8 weeks of the meeting.
- **Symposium Online Collection**—online access to multiple related proceedings volumes via the SPIE Digital Library. Available as papers are published.
- **Printed Proceedings Volume**—a printed book of a single proceedings volume. Available 6 weeks after the meeting.
- **Online Proceedings Volume**—online access to a single proceedings volume via the SPIE Digital Library. Available as papers are published.

You may also purchase additional proceedings products beyond what you choose with your registration plan. (Note: Online proceedings volumes not available for separate purchase.) See below for pricing and product order numbers.

### Single Proceedings Volumes

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<td>9637 DL9637</td>
<td>Remote Sensing for Agriculture, Ecosystems, and Hydrology XVII, Christopher M. U. Neale, Antonino Maltese</td>
<td>€120/$130</td>
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<td>9639 DL9639</td>
<td>Sensors, Systems, and Next-Generation Satellites XIX, Roland Meynart, Steven P. Neec, Harushita Shimoda</td>
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<td>9640 DL9640</td>
<td>Remote Sensing of Clouds and the Atmosphere XX, Adalfo Comeron, Evgenii I. Kassianov, Klaus Schafer</td>
<td>€65/$70</td>
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<td>9641 DL9641</td>
<td>Optics in Atmospheric Propagation and Adaptive Systems XVIII, Karin U. Stein, John D. Gogolewski</td>
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<td>9642 DL9642</td>
<td>SAR Image Analysis, Modeling, and Techniques XV, Claudia Notarnicola, Simenetta Palasca, Nazzareno Pizzi</td>
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### Online collections are not available for separate purchase.

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<tr>
<td>9644 DL9644</td>
<td>Earth Resources and Environmental Remote Sensing/GIS Applications VI, Ulrich Michel, Karsten Schulz</td>
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### Collections

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<td>N/A DLCS89</td>
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• A full-length manuscript (minimum 6 pages) for any accepted oral or poster presentation will be submitted for publication in the SPIE Digital Library, printed conference Proceedings, and CD. (Some SPIE events have other requirements that the author is made aware of at the time of submission.)

• Only papers presented at the conference and received according to publication guidelines and timelines will be published in the conference Proceedings and SPIE Digital Library (or via the requirements of that event).

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Underage Persons on Exhibition Floor Policy
For safety and insurance reasons:
• No persons under the age of 18 will be allowed in the exhibition area during move-in and move-out.
• Children 14 and older, accompanied by an adult, will be allowed in the exhibition area during open exhibition hours only.
• All children younger than 14, including babies in strollers and toddlers, are not allowed in the exhibition area at any time.

Unauthorized Solicitation Policy
Unauthorized solicitation in the Exhibition Hall is prohibited. Any non-exhibiting manufacturer or supplier observed to be distributing information or soliciting business in the aisles, or in another company’s booth, will be asked to leave immediately.

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