



Technical Programme

SPIE Europe
Security+Defence



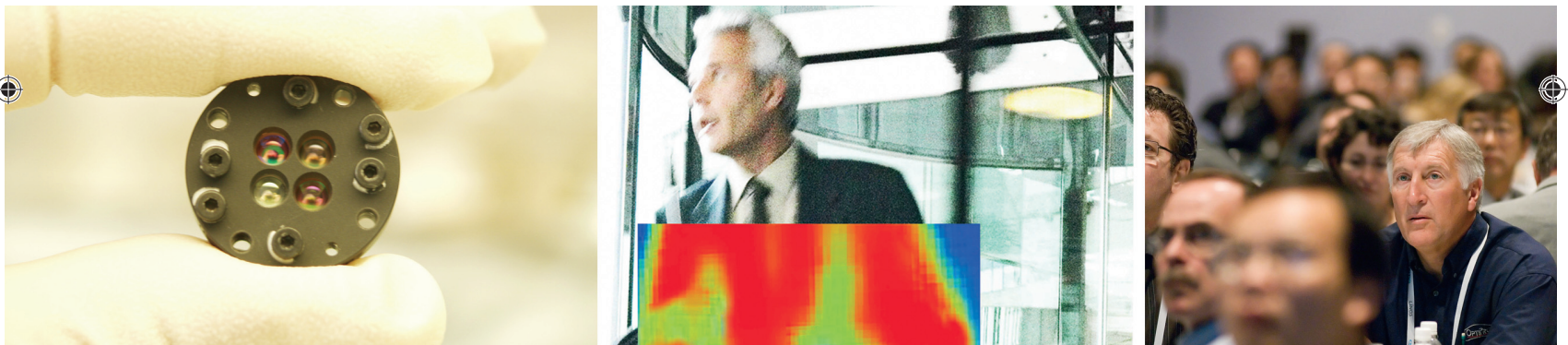
SPIE Europe
Remote Sensing



Conferences: 31 August–3 September 2009

Exhibition: 1–2 September 2009

bcc Berliner Congress Centre
Berlin, Germany





Welcome!

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Berlin, Germany

SPIE Europe Security+Defence



David H. Titterton
Defence Science and Technology
Lab.
United Kingdom
2009 Symposium Chair



Reinhard R. Ebert
FGAN-FOM Research Institute for
Optronics and Pattern Recognition,
Germany
2009 Symposium Co-Chair

Cooperating Organisations



SPIE would like to express its deepest appreciation to the symposium chairs, conference chairs, Programme committees, and session chairs who have so generously given of their time and advice to make this symposium possible. The symposium, like our other conferences and activities, would not be possible without the dedicated contribution of our participants and members.

This Programme is based on commitments received up to the time of publication and is subject to change without notice.

Left cover image: Courtesy of SCHOTT. Center cover image: Courtesy of Thruision

SPIE Europe Remote Sensing



Steven P. Neeck,
NASA Headquarters (USA)
2009 Symposium Chair



Karin Stein, FGAN-FOM Research
Institute for Optronics and Pattern
Recognition (Germany)
2009 Symposium Co-Chair

Cooperating Organisations





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Daily Schedule

Monday	Tuesday	Wednesday	Thursday
31 August	1 September	2 September	3 September

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Security+Defence Conferences

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Special Events

Security+Defence Plenary Session 16.00 to 17.45 Remote Sensing Plenary Session 18.00 to 19.40 Welcome Reception 20.00 to 21.30	Posters 17.45 to 19.15 	Lab Tour and Demo of Gigahertz to Terahertz Technology 17.00 to 20.00
Security+Defence Exhibition 10.00 to 17.00 10.00 to 16.00		





Special Events

Monday 31 August

16.05 to 16.10

2008 Rudolf Kingslake Medal and Prize

Room B05/06

SPIE is honored to present the winners of the 2008 Rudolf Kingslake Medal and prize in recognition of the most noteworthy original paper to appear in SPIE's journal *Optical Engineering*, on the theoretical or experimental aspects of optical engineering.

This award is to be presented to

Milan Maksimović

Manfred Hammer

E. W. C. (Brenny) van Groesen

for their paper titled "Coupled optical defect microcavities in one-dimensional photonic bandgap structures and quasi-normal modes", published in the November 2008 issue of *Optical Engineering*.

Presented by **Ralph James**, SPIE President Elect, Brookhaven National Lab., United States.

16.10 to 16.15

Presentation of SPIE Fellowship

Room B05/06

Presentation to **Prof. David Titterton**, Defence Science and Technology Lab, United Kingdom for **specific achievements in high-power lasers**.

Presented by **Gary W. Kamerman**, FastMetrix, Inc., United States

20.00 to 21.30

Welcome Reception

Spagos Bar, Park Inn Hotel

All attendees are invited to relax, socialize, and enjoy light refreshments. Please remember to wear your conference registration badges. Dress is casual.

Tuesday 1 September

17.30 to 19.00

Poster Session

Conference Hallway

Conference attendees are invited to attend the Poster Session on Tuesday evening to network, enjoy light refreshments, and view the poster papers. 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 19.00 to answer questions. Poster presenters who have not set up by 17.00 on Monday 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 Europe assumes no responsibility for posters left up after the end of each poster session.

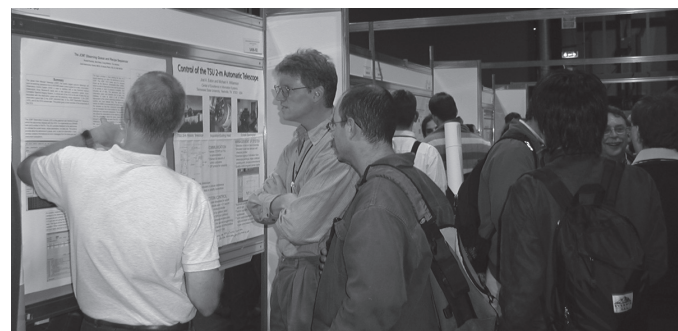
Wednesday 2 September

17.00 to 20.00

Lab Tour and Demo of Gigahertz to Terahertz Technology

At the occasion of SPIE Europe Security and Defence and Remote Sensing Symposia, the FGAN Research Institute for High Frequency Physics and Radar Techniques (FHR, www.fhr.fgan.de), the Fraunhofer Heinrich Hertz Institute for Telecommunications (HHI, www.hhi.fraunhofer.de/pc/), and the Fraunhofer Institute for Applied Solid State Physics (IAF, www.iaf.fraunhofer.de) would like to use this opportunity and invite all interested experts to a lab tour and demonstrations at the HHI. The HHI is located within 10 min from the conference location. We will present our latest results in- Electromagnetic Sensors and Radar Technology (FGAN, Helmut Essen)

- Handheld Terahertz Generation and 40-100GHz Optoelectronics (HHI, Martin Schell)
 - GHz- and THz-Modules for Security Portals (IAF, Michael Schlechtweg) Lab tours and live demonstrations of the following technologies will follow:- Handheld Terahertz Spektroskopie (HHI)
 - Millimetre Wave Near Field SAR Scanner for Concealed Weapon Detection (FGAN)
 - 3-Dimensional Imaging without Glasses (HHI)
 - High-Frequency High-Power Amplifier Modules (IAF)
- The tour will end with an informal discussion panel and a small reception.



Plenary Presentations

Monday 31 August • Room: B05/06

Security+Defence Symposium Plenary Session

16.00 to 16.05

Welcome and Introduction

2009 Symposium Chairs



David H. Titterton, Defence Science and Technology Lab., United Kingdom



Reinhard R. Ebert, FGAN-FOM Research Institute for Optronics and Pattern Recognition, Germany

16.05 to 16.10

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Presentation of SPIE Fellowship



Presentation to **Prof. David Titterton**, Defence Science and Technology Lab, United Kingdom, for **specific achievements in high-power lasers**

Presented by **Gary W. Kamerman**, FastMetrix, Inc., United States

16.15 to 17.00

Joint Research for Tomorrow's Security and Defence



MinRat Rainer Krug, Federal Ministry of Defence, BMVg, Germany

Germany and Europe are faced with new risks and threats in the globalized environment of the twenty-first century. Today, international terrorism, organized crime, the proliferation of weapons of mass destruction, and even the effects of distant regional crises and conflicts threaten our security and that of our allies. In order to cope with these challenges successfully, Germany's and Europe's security policy must have available a broad and diverse spectrum of instruments and options - both military and civilian. Thus, preventive security measures will necessitate an even closer integration of political,

military, economic, humanitarian and intelligence tools for conflict prevention and crisis management purposes.

Defence research activities are driven by the demands derived by the necessary capabilities of modern armed forces. On the other hand, it is worth to underline that research and technology activities of defence research institutions and the respective industry are - wherever possible - conducted by using relevant results of the civilian-sector research as a starting point ("add-on principle"). This modern complex approach to security and defence therefore includes synergies gained from civilian security research and used in defence research. That development is reflected by the increasing integration of defence research institutions into the overall research community in Germany. The security research emphasises not only on the safety of citizens itself but as well on the security of infrastructures and utilities, on intelligent surveillance and border security, on restoring security and safety in case of crisis, on improving security systems integration, and - last but not least - on the coordination of research efforts in the areas of civil security and military defence research.

For the Bundeswehr as one element of the national security precaution, there are many areas of interest that correlate with similar topics of the civilian security research sector ("dual-use aspects"); e.g. CBRNE detection, protection technologies, sensors & surveillance technologies, non-lethal effectors, IT nets & interoperability, satellite-based crisis prevention, robotic & autonomous systems, and highly mobile energy sources. A joint effort of civil security and military defence resources is the logical consequence.

Political, social, and technological developments have dramatically changed the security environment where risks and vulnerabilities have become more diverse and less visible. The new threats of our societies ignore national state borders and target European interests - within EU territory and outside, as well. Therefore, national and international co-operation in security and defence research must contribute to an efficient exchange of ideas, experience, and knowledge on how to cope jointly with future challenges of our security.

Biography: **MinR Rainer Krug** is the Head of Branch "Research and Technology Strategy and Planning, International Cooperation in R&T" of the the FMOD Armaments Directorate. Major steps in his professional career include entering service in the German Armed Forces in 1974. From 1975 to 1978 he was a part of the Armed Forces University Munich, and until 1986 served in different positions in the German Army. In 1986 MinR Rainer Krug entered the Civil Service of the German Armed Forces, and until 1997 worked as the assistant chief of section, "Sonartechnologie, Underwater weapons, Torpedotechnologie, Surface Ship Torpedo Defence" in the Federal Ministry of Defence.

Until 2001 he continued serving as the Head of the "Sonartechnologie, Hydroacoustic Systems" and, the Federal Office for Defence Technology and Procurement (BWB). From 2001 to 2004 Mr. Krug worked as the Director of the Defence Technology at the Federal Academy for Defence Administration and Technology (BAKWVT). In July 2004 Rainer Krug was appointed to FMOD to form the new Branch "Armament related Aspects of German Armed Forces Transformation (NEC, CD&E)". Since May 2008 he is the Head of Branch "Research and Technology Strategy, International Cooperation in R&T".

17.00 to 17.45

Optronics Research in Germany



Maurus Tacke, Director, Research Institute for Optronics and Pattern Recognition (FOM), Research Establishment for Applied Science (FGAN), Germany

Optronics sensors play a key role in contemporary defence and security applications. While in former times the range of operations was usually determined by the range of guns, today this limit is often shifted to the range of sensors. Night operations are one of the examples. Hence optronics research is of vital interest and found in all nations with sufficient technological basis. The presentation aims at giving an overview of German optronics research, a feeling of where at present the priorities are seen, and typical results.

Biography: Director of the Research Institute for Optronics and Pattern Recognition (FOM) of the Research Establishment for Applied Science (FGAN), **Prof. Maurus Tacke** received the Dipl.-Phys. of the University of Freiburg in 1972, the Dr. rer. nat. of the University of Stuttgart in 1976 (thesis at Max Planck Institute of Solid State research, Stuttgart), the Dr. habil. degree of the University of Wuerzburg in 1984, where he teaches since then.

His scientific career started on terahertz science: solid state spectroscopy, optically pumped lasers and integrated optics, followed by applied spectroscopy, especially in applications of mid infrared tuneable diode lasers, and development of mid infrared diode lasers.

Since 1999 Prof. Tacke has been in his present position as director of FGAN-FOM, widening his scientific interest to questions of image analysis. He teaches physics at the University of Wuerzburg, and image analysis topics at the Technical University of Karlsruhe. He is a member of the NATO Research and Technology Organization Board.



Plenary Presentations

Monday 31 August • Room: B05/06

Remote Sensing Symposium Plenary Session

18.00 to 18.10

Welcome and Introduction

2009 Symposium Chairs



Steven P. Neeck, NASA
Headquarters (USA)



Karin Stein, FGAN-FOM Research
Institute for Optronics and Pattern
Recognition (Germany)

18.10. to 18.55

R&D capacities in the German Earth Observation Program



Thomas Reiter, German Aerospace
Ctr., Germany

The presentation provides an overview on Germany's current and future earth observation satellite systems. Several technologies are addressed: SAR, hyperspectral imaging and very high resolution (VHR) optical satellites.

Since the 1980's Germany is pursuing a consequent roadmap of SAR remote sensing with substantial innovations at every development step. While the first multi-frequency SAR SIR-C (1994) and the first single-pass SAR interferometer SRTM (2000) have been implemented in cooperation with NASA and ASI, TerraSAR-X (since 2007) is the first German SAR satellite of the new meter resolution class. TerraSAR-X delivers VHR data of unprecedented geometric and radiometric accuracy, i.e. for disaster management, urban mapping, ship detection, glacier monitoring, or oceanography. In interferometric mode it is able to detect and measure surface motion and structural deformation of buildings in the millimetre range. In October 2009 TanDEM-X will be launched. TanDEM-X and TerraSAR-X will form a single-pass interferometer for 3D mapping of the entire land mass of the earth at HRTI-3, and for selected areas at HRTI-4, accuracy levels. In parallel to the VHR X-band SAR line, a novel L-band mission, Tandem-L, is under study jointly with NASA/JPL. The mission objective is the systematic and global mapping of dynamic processes of the earth, in particular biomass, tectonic motion, and ice dynamics.

The cartographic and geodetic capabilities of SAR systems are complemented by the thematic interpretation power of hyperspectral remote sensing. After many years of airborne system operation and product development, Germany's first hyperspectral satellite system EnMAP will be launched in 2012. The primary goal of EnMAP is to measure and analyze quantitative diagnostic parameters describing key processes on the Earth's surface. EnMAP products will be tailored to support management of agricultural and forest ecosystems, hazard assessment, mineral exploration and the assessment of water quality and dry land degradation.

The most recent remote sensing sensor and system developments in Germany are related to VHR optical imaging. HiROS is a satellite concept for sub-meter resolution, mainly for commercial and security related applications. A multi-satellite constellation will reduce revisit time to the requirements of this class of users. HiROS will feature stereo capability for near-real time generation 3D city models and 3D change detection.

The systems concepts of these development lines are presented as well as examples of scientific data exploitation from diverse application fields. The increase of interpretation capabilities by sensor-data fusion is demonstrated.

Biography: **Thomas Reiter** is a member of the Executive Board of DLR, and is responsible for space research and development.

Thomas Reiter graduated in aviation and space engineering from the Federal Armed Forces University in Neubiberg. He was stationed with the 43rd fighter-bomber squadron in Oldenburg and worked at the European Space Agency (ESA) as part of the development team for a manned space vehicle (Hermes).

In 1992, Thomas Reiter joined the European astronaut team at ESA; from September 1997 to March 1999, Thomas Reiter was posted to the German Air Force as Commander of the Flight Group of a Tornado fighter-bomber squadron.

After his return to ESA, he supported the ATV team, worked on the ERA robotics project and from June 1999 to March 2000 continued his training for the Russian segment of the international space station at the Russian Cosmonaut Training Centre in "Star City". From September 2001 to September 2004, Thomas Reiter worked with the Columbus project team on preparations for the European research module.

From 4 July to 22 December 2006, Thomas Reiter participated in the Astrolab mission, the first European long-term mission on board the international space station.

Thomas Reiter is a holder of the German Federal Service Cross (Großes Bundesverdienstkreuz).

18.55 to 19.40

Earth Science Applications from Space: An Update on the Decadal Survey



Richard A. Anthes, President,
University Corporation for
Atmospheric Research, United
States

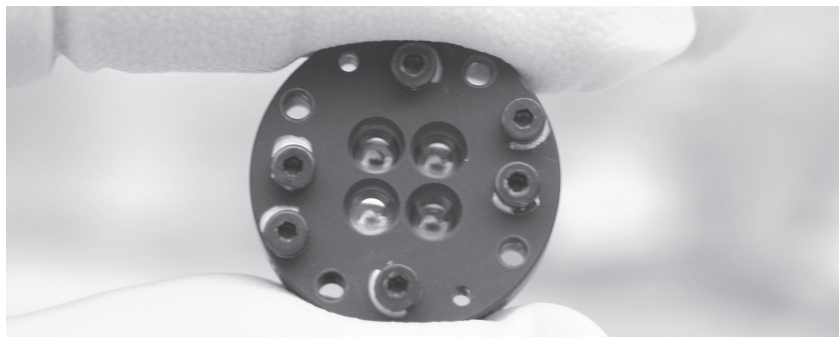
Natural and human-induced changes in the Earth system—from our planet's interior to the land surface, atmosphere, and oceans—affect all aspects of life. If we are to understand and respond to these changes, we need a foundation of observations collected from the land, sea, air, and space, integrated for maximum usefulness in forecast models and other tools for decision making.

In January 2007 the National Research Council released the first ever decadal survey of the Earth Sciences. The report Earth Science and Applications from Space: National Imperatives for the Next Decade and Beyond, available at <http://books.nap.edu/catalog/11820.html>, describes 17 space missions for the next decade and represents a balanced approach to observing Earth from space. The report asserts that obtaining practical benefits for humankind can and should play an equal role with the quest to acquire new knowledge about Earth. Their overarching objective is a program of science and applications that will enhance economic competitiveness, protect life and property, and assist in the stewardship of our home planet for present and future generations.

This talk gives a brief summary of the recommended Earth observing missions and provides an update on the status of their implementation.

Biography: **Richard Anthes** is the president of the University Corporation for Atmospheric Research (UCAR), which manages the National Center for Atmospheric Research (NCAR). He is a highly regarded atmospheric scientist, author, educator and administrator who has contributed considerable research in the atmospheric sciences. Dr. Anthes has published over 100 peer-reviewed articles and books and participated on or chaired over 40 different U.S. national committees. He has also received numerous awards for his sustained contributions to the atmospheric sciences. In October 2003 he was awarded the Friendship Award by the Chinese government, the most prestigious award given to foreigners, for his contributions over the years to atmospheric science and weather forecasting in China. He was co-chair in 2004-2007 of the first ever National Research Council "Decadal Survey" for Earth Science observations from space. Most recently, Dr. Anthes served as President of the American Meteorological Society for 2007.

SPIE Europe Remote Sensing



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Remote Sensing

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Technical Committee

Charles R. Bostater, Florida Institute of Technology (United States)
Lorenzo Bruzzone, Univ. degli Studi di Trento (Italy)
Daniel L. Civco, Univ. of Connecticut (United States)
Adolfo Comerón, Univ. Politècnica de Catalunya (Spain)
John Gonglewski, Air Force Research Lab (United States)
Shahid Habib, NASA Goddard Space Flight Ctr. (United States)
Anton Kohnle, FGAN-FOM (Germany)
Antonino Maltese, Univ. degli Studi di Palermo (Italy)
Stelios P. Mertikas, Technical Univ. of Crete (Greece)
Roland Meynart, European Space Research and Technology Ctr. (Netherlands)
Ulrich Michel, Univ. of Education Heidelberg (Germany)

Christopher M. Neale, Utah State Univ. (United States)
Steven P. Neeck, NASA Headquarters (United States)
Xavier Neyt, Royal Belgian Military Academy (Belgium)
Claudia Notarnicola, Carlo Gavazzi Space (Italy)
Richard H. Picard, Air Force Research Lab. (United States)
Francesco Posa, Istituto Nazionale di Fisica Nucleare (Italy)
Klaus Schäfer, Forschungszentrum Karlsruhe (Germany)
Haruhisa Shimoda, Japan Aerospace Exploration Agency (Japan)
Upendra N. Singh, NASA Langley Research Ctr. (United States)
Karin Stein, FGAN-FOM (Germany)
Miguel Vélez-Reyes, Univ. de Puerto Rico Mayagüez (Puerto Rico)



Conference 7472

Tuesday-Thursday 1-3 September 2009 • Proceedings of SPIE Vol. 7472

Remote Sensing for Agriculture, Ecosystems, and Hydrology XI

Conference Chairs: **Christopher M. U. Neale**, Utah State Univ. (USA); **Antonino Maltese**, Univ. degli Studi di Palermo (Italy)

Conference Co-Chairs: **Katja Richter**, Univ. degli Studi di Napoli Federico II (Italy); **Richard A. M. de Jeu**, Vrije Univ. Amsterdam (Netherlands)

Programme Committee: **Guido D'Urso**, Univ. degli Studi di Napoli Federico II (Italy); **Manfred Owe**, NASA Goddard Space Flight Ctr. (USA)

Tuesday 1 September

Opening Remarks

Room: A05. Tues. 13.15 to 13.20

Christopher M. U. Neale, Utah State Univ. (USA);
Antonino Maltese, Univ. degli Studi di Palermo (Italy)

SESSION 1

Room: A05. Tues. 13.20 to 15.00

Hydrological and Ecosystem Modeling

Session Chair: **Antonino Maltese**, Univ. degli Studi di Palermo (Italy)

13.20: **A blended, global snow product for snow cover extent, snow water equivalent and snowmelt**, James L. Foster, Dorothy K. Hall, NASA Goddard Space Flight Ctr. (United States); John Eylander, U.S. Air Force (United States); Son V. Nghiem, Jet Propulsion Lab. (United States) [7472-01]

13.40: **Tidal flood monitoring in marsh estuary areas from Landsat TM data**, María J. Polo, Univ. de Córdoba (Spain); María P. González-Dugo, Instituto de Investigación y Formación Agraria y Pesquera (Spain); Jesús Regodón, Univ. de Córdoba (Spain) [7472-02]

14.00: **Testing the performance of the MNDVI vegetation index on ALOS data**, George A. Skianis, Univ. of Athens (Greece); Konstantinos G. Nikolakopoulos, Institute of Geology & Mineral Exploration (Greece); Dimitrios A. Vaiopoulos, Univ. of Athens (Greece) [7472-03]

14.20: **Hydrological impacts of land cover change (1954-2007) in Dragonja catchment (Slovenia)**, Hylke Beck, Giulia Salvini, Vrije Univ. Amsterdam (Netherlands) [7472-04]

14.40: **Modeling of streamflow change induced by climate warming in a poorly gauged mountainous watershed using multi-source remote sensing data**, Zhandong Sun, Nanjing Institute of Geography and Limnology (China); Christian Opp, Thomas A. Hennig, Philipps-Universität Marburg (Germany) [7472-05]

Coffee Break 15.00 to 15.30

SESSION 2

Room: A05. Tues. 15.30 to 17.30

Land Use and Change Detection

Session Chair: **Christopher M. U. Neale**, Utah State Univ. (USA)

15.30: **Modelling of regional winter and summer crop areas in Central Italy (Tuscany) using low resolution AVHRR time series**, Clement Atzberger, Felix Rembold, European Commission Joint Research Ctr. (Italy) [7472-06]

15.50: **Storm damage assessment support service in the US corn belt using RapidEye satellite imagery**, Maria A. Capellades, Sandra Reigber, Marika Kunze, RapidEye AG (Germany) [7472-08]

16.10: **Vegetation cover change detection in Chamela-Cuixamala, Mexico**, Betsabe De la Barreda Bautista, Alejandra A. López-Caloca, Ctr. de Investigación en Geografía y Geomática (Mexico) [7472-09]

16.30: **Monitoring the urban expansion of northwestern Athens due to the Olympic games using multitemporal satellite data and GIS techniques**, Konstantinos G. Nikolakopoulos, Panagiotis G. Tsombos, Institute of Geology & Mineral Exploration (Greece) [7472-10]

16.50: **Using neural networks to map Africa's land cover with Landsat SLC-off imagery**, Matthew J. Aitkenhead, Univ. of Aberdeen (United Kingdom) [7472-11]

17.10: **Multitemporal burnt area detection methods based on a couple of images acquired after the fire event**, Roberto Carlà, Leonardo Santurri, Claudio Conese, Laura Bonora, Consiglio Nazionale delle Ricerche (Italy) [7472-90]

POSTER SESSION Tues. 17.45 to 19.15

All symposium attendees are invited to attend 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.

Poster presenters may post their poster papers starting at 10.00 on Tuesday in the Conference Area Hallway. Any papers left on the boards following the end time of the poster session will be considered unwanted and will be discarded. SPIE Europe assumes no responsibility for posters left up after the end of the poster session. Poster authors should be at their papers from 17.45 to 19.15 to answer questions from attendees. Attendees are requested to wear their conference registration badges to the poster sessions.

Application of Remote Sensing and GIS for Salt-Affected Soils Detection, A Case Study: Western Part of the Talas Valley, Kyrgyzstan, Kokoeva Gulzat Nurzat, Univ. Libre de Bruxelles (Belgium) [7472-43]

Assimilation of satellite suspended matter concentration into a numerical sediment model of Changjiang estuary adjacent area, Youzhuan Ding, Fang Gong, Delu Pan, State Oceanic Administration (China) [7472-55]

Dynamic change and causal analysis of lake groups in Ruoqiang County, China, Mingguo Ma, Yi Song, Qianzhao Gao, Ji Liang, Cold and Arid Regions Environmental and Engineering Research Institute (China) [7472-56]

Urban land cover changes assessment by satellite remote sensing imagery, Maria A. Zoran, National Institute of Research & Development for Optoelectronics (Romania) [7472-57]

Watershed prioritization for catchment management: using remote sensing and geographic information system, A. S. Ravikummar, H. B. Balakrishna, Bangalore Univ. (India) [7472-59]

Using remote sensing and GIS for precision farming applications in El Salhia area, Ismailia, Egypt, Alaa H. El Nahry, National Authority for Remote Sensing and Space Sciences (Egypt) [7472-60]

Impact of groundwater resource temporal-spatial change in Manasi River Valley on ecological security of irrigation region landscape, Junfeng Li, Shihezi Univ. (China) [7472-61]

The Application of Unified Surface Water Capacity Method in Drought Remote Sensing Monitoring, Hongwei Zhang, Huailiang Chen, Henan Institute of Meteorological Science (China); Shen Shuanghe, Nanjing University of Information Science & Technology (China) [7472-62]

Monitoring drought dynamics in Huanghuai region of China using AVHRR-based vegetation health indices comparison with ground data, Mingwei Zhang, Xiaoxiang Zhu, Jinlong Fan, Guicai Li, Yeping Zhang, China Meteorological Administration (China) [7472-63]

The application study of using temperature/vegetation drought index in regional drought monitoring, Yeping Zhang, Xiaoxiang Zhu, Mingwei Zhang, Yuanyuan Zhang, China Meteorological Administration (China) [7472-64]

The drought monitoring, precaution and loss estimating in China, Huailiang Chen, Hongwei Zhang, Henan Institute of Meteorological Science (China) [7472-65]

The Application of Normalized Multi-Band Drought Index (NMDI) Method in Cropland Drought Monitoring, Hongwei Zhang, Huailiang Chen, Henan Institute of Meteorological Science (China); Shen Shuanghe, Nanjing University of Information Science & Technology (China) . [7472-66]

The optimal hyperspectral quantitative models for Chlorophyll-a of Chlorella vulgaris, Qian Cheng, Xiuju Wu, Zhejiang Gongshang Univ. (China) [7472-67]

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Study on the spectrum response of Cyanobacter to the Pb²⁺ pollution, Xiuju Wu, Qian Cheng, Zhejiang Gongshang Univ. (China) [7472-68]

Retrieval of vegetation parameters from hyperspectral and multi-angular CHRIS/PROBA data based on simulated annealing algorithm, Junlei Tan, Cold and Arid Regions Environmental and Engineering Research Institute (China) and Graduate Univ. of Chinese Academy of Sciences (China); Mingguo Ma, Cold and Arid Regions Environmental and Engineering Research Institute (China); Yi Song, Cold and Arid Regions Environmental and Engineering Research Institute (China) and Graduate Univ. of Chinese Academy of Sciences (China) [7472-69]

The spectral characteristics of *Stellera chamaejasme* L. with varied density, Qian Jinbo, Lanzhou Univ. (China); Mingguo Ma, Cold and Arid Regions Environmental and Engineering Research Institute (China) [7472-70]

Generation of crop inventory by using multiple satellite images, Yuzo Suga, Hiroshima Institute of Technology (Japan); Tomohisa Konishi, Nihon CADIC Co., Ltd. (Japan) [7472-73]

Water balance in Lake Izabal (Guatemala) from in-situ measurements, numerical modelling and ENVISAT products, Jesús Gómez-Enri, Camilo Medina, Jose J. Alonso, Pilar Villares, Univ. de Cádiz (Spain) . . . [7472-74]

Retrieval of land surface temperature from satelliteborne microwave radiometer data and validation of atmospheric correction, Takashi Maeda, JAXA, EORC (Japan) [7472-75]

Methods of microwave radiometric monitoring and modeling for assessment and prognosis of emergency hydrological situations development in regional scale, Sergey P. Golovachev, Anatolij M. Shutko, Eugene P. Novichikhin, Vladimir F. Krapivin, Institute of Radio Engineering and Electronics (Russian Federation); Igor A. Sidorov, Vega Radio Engineering Corp. (Russian Federation); Alexander A. Chukhlantsev, Institute of Radio Engineering and Electronics (Russian Federation); Roland Haarbrink, Miramap Co. (Netherlands) [7472-76]

Complex microwave transmittivity of tree crowns, Alexander Chukhlantsev, Sergey Golovachev, Vladimir Kobylanskiy, Svetoslav Marechek, Yuri Tsargorodtsev, Institute of Radio Engineering and Electronics (Russian Federation) [7472-77]

Assimilation of soil moisture observed and FPAR retrieved from modis in LPJ-DGVM, Xufeng Wang, Mingguo Ma, Yi Song, Cold and Arid Regions Environmental and Engineering Research Institute (China) [7472-78]

A real-time drought monitoring method-cropland soil moisture index (CSMI) and application, Huailiang Chen, Hongwei Zhang, Henan Institute of Meteorological Science (China) [7472-79]

Detection of vegetation LUE based on chlorophyll fluorescence separation algorithm from Fraunhofer line, Liangyun Liu, Bing Zhang, Ctr. for Earth Observation and Digital Earth (China) [7472-80]

Comparison of three vegetation indices from MODIS and Landsat ETM+, Bo Liu, Institute of Remote Sensing Applications (China) and Graduate Univ. of Chinese Academy of Sciences (China); Lifu Zhang, Institute of Remote Sensing Applications (China); Bing Zhang, Ctr. for Earth Observation and Digital Earth (China); Yuemin Yue, Institute of Subtropical Agriculture (China) [7472-81]

Applying remote sensing techniques into crop emergence monitoring, Yanbo He, China Meteorological Administration (China); Jingwen Guo, Wageningen Univ. (Netherlands) [7472-82]

Critical analysis of empirical ground heat flux equations on a cereal field using micrometeorological data, Carmelo Cammalleri, Goffredo La Loggia, Antonino Maltese, Univ. degli Studi di Palermo (Italy) . . . [7472-83]

Estimation of reference evapotranspiration using NOAA/AVHRR and agro-meteorological data in coastal zone of North Sinai, M. A. El-Shirbeny, National Authority for Remote Sensing and Space Sciences (Egypt) [7472-84]

Monitoring winter-wheat phenology in North China estimated using time-series MODIS EVI data, Mingwei Zhang, Jinglong Fan, Xiaoxiang Zhu, Guicai Li, Yeping Zhang, China Meteorological Administration (China) [7472-85]

Disease detection in sugar beet fields: a multi-temporal and multi-sensoral approach on different scales, Anne-Katrin Mahlein, Institute for Crop Science and Resource Conservation (Germany) and Univ. Bonn (Germany); Christian Hillnhütter, Thorsten Mewes, Zentrum für Fernerkundung der Landoberfläche (Germany); Christine Scholz, Univ. Bonn (Germany); Ulrike Steiner, Heinz-Willhelm Dehne, Erich-Christian Oerke, Institute for Crop Science and Resource Conservation (Germany) and Univ. Bonn (Germany) [7472-86]

Evaluating crop land productivity using MODIS derived time series field greenness and water index in North China Plain, Zhen Wang, Suying Chen, Shengwei Zhang, Yuping Lei, Institute of Genetics and Developmental Biology (China) [7472-87]

Assessment of nitrate leaching on agriculture region using remote sensing and model, Yuping Lei, Suying Chen, Zhen Wang, Shengwei Zhang, Institute of Genetics and Developmental Biology (China) . [7472-88]

Identification of reversibility of land desertification phenomenon using risk matrix based on LU/LC changes, Yogesh Y. Agarwadkar, Indian Institute of Technology, Bombay (India) [7472-89]

Wednesday 2 September

SESSION 3

Room: A05. Wed. 08.40 to 10.00

Irrigation Water Management

Session Chair: Katja Richter,
Univ. degli Studi di Napoli Federico II (Italy)

08.40: **Earth observation products for operational irrigation management: the PLEIADES project**, Guido D'Urso, Univ. degli Studi di Napoli Federico II (Italy); Anna Osann, Alfonso Calera Belmonte, Univ. de Castilla-La Mancha (Spain); Francesco Vuolo, Ariespace s.r.l. (Italy); Katja Richter, Univ. degli Studi di Napoli Federico II (Italy) [7472-12]

09.00: **Irrigation water use monitoring at watershed scale using series of high-resolution satellite images and meteorological data**, Adolfo Díaz, Maria P. González-Dugo, Instituto de Investigación y Formación Agraria y Pesquera (Spain); Silvia Escuin, La Empresa Pública Desarrollo Agrario y Pesquero, S.A. (Spain); Luciano Mateos, Instituto de Agricultura Sostenible (Spain); Francisco Cano, La Empresa Pública Desarrollo Agrario y Pesquero, S.A. (Spain); Victor J. Cifuentes, Confederación Hidrográfica del Guadalquivir (Spain); José L. Tirado, Nicolás Oyonarte, La Empresa Pública Desarrollo Agrario y Pesquero, S.A. (Spain) . . . [7472-13]

09.20: **Integration of wireless sensor network and remote sensing for monitoring irrigation demand in Cyprus**, Athos Agapiou, Cyprus Univ. of Technology (Cyprus); Giorgos C. Papadavid, Cyprus Univ. of Technology (Cyprus) and Agricultural Research Foundation (Cyprus); Diofantos G. Hadjimitsis, Cyprus Univ. of Technology (Cyprus) . . [7472-14]

09.40: **Application of SEBS to drought monitoring in north China plain**, Yanbo He, Houquan Lu, China Meteorological Administration (China); Jingwen Guo, Wageningen Univ. (Netherlands); Jinlin Wang, China Meteorological Administration (China) [7472-15]

Coffee Break 10.00 to 10.30

SESSION 4

Room: A05. Wed. 10.30 to 11.30

Estimation of Vegetation Parameters

Session Chair: Antonino Maltese, Univ. degli Studi di Palermo (Italy)

10.30: **Reflectance modeling of vineyards under water stress based on the coupling between 3D architecture and water balance model**, Raul Lopez-Lozano, Frédéric Baret, Ctr. de Recherches d'Avignon (France); Bruno Tisseyre, Univ. Montpellier (France); Eric Lebon, Institut National de la Recherche Agronomique (France); Iñaki Garcia de Cortazar, Ctr. d'Ecologie Fonctionnelle et Evolutive (France) [7472-17]

10.50: **The estimation of the soil salinity vegetation features in the steppe zone using remote sensing data and field investigation (the south part of Central Siberia, Khakasia, Russia)**, Natalia A. Slyusar, Nickolay S. Pechurkin, Institute of Biophysics (Russian Federation) [7472-18]

11.10: **Studying backscattered spectra dynamics of vegetation in the south of Central Siberia based on satellite data**, Irina Pugacheva, Institute of Biophysics (Russian Federation) [7472-19]

Lunch Break 11.30 to 13.10



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SESSION 5

Room: A05. Wed. 13.10 to 15.30

Forestry and Coastal Applications

Session Chair: Christopher M. U. Neale, Utah State Univ. (USA)

- 13.10: **Burned forest mapping using Quickbird imagery for fire disturbance**, Choen Kim, Kookmin Univ. (Korea, Republic of) . . . [7472-20]
- 13.30: **Remote sensing analysis of forest vegetation changes due to climate and anthropogenic impacts**, Maria A. Zoran, National Institute of Research & Development for Optoelectronics (Romania) [7472-21]
- 13.50: **Remote sensing estimates of boreal forest vegetation rate in Siberian region**, Irina V. Pasko, Institute of Biophysics (Russian Federation) [7472-22]
- 14.10: **Discussion the change of landscape ecology structure for the different forestry features**, Chun-Pin Chang, Chung Chou Univ. of Technology (Taiwan) [7472-23]
- 14.30: **Coralline reefs classification in Banco Chinchorro, Mexico**, Ameris I. Contreras Silva, Alejandra A. López-Caloca, Ctr. de Investigación en Geografía y Geomática (Mexico) [7472-24]
- 14.50: **Integration of micro-sensor technology and remote sensing for monitoring coastal water quality in a municipal beach in Paphos-Cyprus**, Diofantos G. Hadjimitsis, Marinos G. Hadjimitsis, Cyprus Univ. of Technology (Cyprus) [7472-25]
- 15.10: **Study of spectra-structural characteristics of marine phenomena in MODIS images in the ROPME Sea Area**, Peter Petrov, Fahad A. Alawadi, Regional Organization for the Protection of the Marine Environment (Kuwait) [7472-26]
- Coffee Break 15.30 to 16.00

SESSION 6

Room: A05. Wed. 16.00 to 17.40

Lidar and Radar Applications in Hydrology

Session Chair: Richard A. M. de Jeu, Vrije Univ. Amsterdam (Netherlands)

- 16.00: **A 30 year global record of remotely sensed vegetation water content**, Richard A. M. de Jeu, Vrije Univ. Amsterdam (Netherlands); Thomas R. Holmes, USDA Agricultural Research Service (United States); Guido van der Werf, Vrije Univ. Amsterdam (Netherlands) [7472-28]
- 16.20: **Sensitivity analysis on the relationship between vegetation growth and multi-polarized radar data**, Fulvio Capodici, Goffredo La Loggia, Univ. degli Studi di Palermo (Italy); Guido D'Urso, Univ. degli Studi di Napoli Federico II (Italy); Antonino Maltese, Giuseppe Ciruolo, Univ. degli Studi di Palermo (Italy) [7472-29]
- 16.40: **Evaluation of dual-polarimetric TerraSAR-X data for the assessment of soil thickness in tropical peatland forest of central Indonesia**, Arief Wijaya, Prashanth R. Marpu, Richard Gloaguen, Technische Univ. Bergakademie Freiberg (Germany) [7472-30]
- 17.00: **Algorithm development for snow destiny estimation using polarimetric advanced SAR data**, Gulab Singh, Gopalan Venkataraman, Indian Institute of Technology, Bombay (India) [7472-31]
- 17.20: **Space-borne two-dimensional synthetic aperture centimeter-wave full-component stokes vector radiometric interferometer for monitoring of emergency situations in ocean-atmosphere system and soil hydrology**, Sergey P. Golovachev, Gennady Zagorin, Vladimir Abyazov, Vladimir Krapivin, Anatolij Shutko, Institute of Radio Engineering and Electronics (Russian Federation) [7472-32]

Thursday 3 September

SESSION 7

Room: A05. Thurs. 08.30 to 10.10

Thermal Infrared Remote Sensing

Session Chair: Antonino Maltese, Univ. degli Studi di Palermo (Italy)

- 08.30: **Spatial distribution of soil water content from airborne thermal and optical remote sensing data**, Katja Richter, Mario Palladino, Guido D'Urso, Univ. degli Studi di Napoli Federico II (Italy); Francesco Vuolo, Ariespace s.r.l. (Italy) [7472-33]
- 08.50: **Terrain induced discrepancy between ASTER and MODIS land surface temperature products**, Yuanbo Liu, Nanjing Institute of Geography and Limnology (China); Yousuke Noumi, Okayama Univ. of Science (Japan) [7472-34]
- 09.10: **Comparison of three methods based on the temperature-NDVI diagram for soil moisture characterization**, Jean-Claude Krapez, ONERA (France) [7472-35]
- 09.30: **The effect of mesoscale mountains on precipitation horizontal and vertical distribution over South China**, Suxing Zhu, Haiming Xu, Nanjing Univ. of Information Science & Technology (China) [7472-36]
- 09.50: **Monitoring geothermal activity in Yellowstone National Park using airborne thermal infrared remote sensing**, Christopher M. U. Neale, Saravanan Sivarajan, Utah State Univ. (United States); Osama Z. Akasheh, The Univ. of Texas at Austin (United States); Cheryl Jaworowski, Henry Heasler, U.S. National Park Service (United States) [7472-37]
- Coffee Break 10.10 to 10.40

SESSION 8

Room: A05. Thurs. 10.40 to 12.00

Energy Balance and Evapotranspiration

Session Chair: Antonino Maltese, Univ. degli Studi di Palermo (Italy)

- 10.40: **Multitemporal terrestrial evapotranspiration (ET) estimation using GOES satellite images and GIS in a cloudy region**, Ni-Bin Chang, Univ. of Central Florida (United States) [7472-38]
- 11.00: **Comparison between energy balance and mass balance models for actual evapotranspiration assessment**, Alessandro Gentile, Univ. degli Studi di Palermo (Italy); Lars Pierce, California State Univ., Monterey Bay (United States); Giuseppe Ciruolo, Univ. degli Studi di Palermo (Italy); Gong Zhang, Lee F. Johnson, NASA Ames Research Ctr. (United States); Goffredo La Loggia, Univ. degli Studi di Palermo (Italy); Ramakrishna Nemani, NASA Ames Research Ctr. (United States) [7472-39]
- 11.20: **Effects of rainfall events on the evapotranspiration retrieved by an energy balance model**, Antonino Maltese, Carmelo Cammalleri, Giuseppe Ciruolo, Goffredo La Loggia, Univ. degli Studi di Palermo (Italy) [7472-40]
- 11.40: **Estimation of land surface energy flux for grassland base on satellite remote sensing**, Yi Song, Cold and Arid Regions Environmental and Engineering Research Institute (China) and Graduate Univ. of Chinese Academy of Sciences (China); Mingguo Ma, Cold and Arid Regions Environmental and Engineering Research Institute (China); Xufeng Wang, Cold and Arid Regions Environmental and Engineering Research Institute (China) and Graduate Univ. of Chinese Academy of Sciences (China) [7472-41]
- Lunch Break 12.00 to 13.20

SPIE Europe Remote Sensing

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SESSION 9

Room: A05..... Thurs. 13.20 to 15.00

Vegetation and Crop Monitoring I

Session Chair: Guido D'Urso,
Univ. degli Studi di Napoli Federico II (Italy)

13.20: **Spectral signature measurement during the whole life cycle of annual crops and irrigation management over Cyprus using remote sensing and spectro-radiometric data**, Giorgos C. Papadavid, Diofantos G. Hadjimitsis, Cyprus Univ. of Technology (Cyprus).....[7472-42]

13.40: **Monitoring phenology of forest in contiguous United State using MODIS**, Min Li, John J. Qu, George Mason Univ. (United States).....[7472-54]

14.00: **Identification of combined vegetation indices for the early detection of plant diseases**, Till Rumpf, Anne-Katrin Mahlein, Dirk Doerschlag, Lutz Plümer, Univ. Bonn (Germany).....[7472-44]

14.20: **Temporal influences on normalized difference vegetation index**, Yuanbo Liu, Nanjing Institute of Geography and Limnology (China); Yousuke Noumi, Okayama Univ. of Science (Japan).....[7472-45]

14.40: **An image reconstruction method for the crop growth simulation**, Yanbo He, Yingyu Hou, Shili Wang, China Meteorological Administration (China).....[7472-50]

Coffee Break..... 15.00 to 15.30

SESSION 10

Room: A05..... Thurs. 15.30 to 17.10

Vegetation and Crop Monitoring II

Session Chair: Christopher M. U. Neale, Utah State Univ. (USA)

15.30: **Airborne remote sensing in precision viticulture: assessment of quality and quantity vineyard production using multispectral imagery, a case study in Velletri, Rome surroundings (Central Italy)**, Gianluca Tramontana, Dario Papale, Univ. degli Studi della Tuscia (Italy); Claudio Belli, Terrasystem s.r.l (Italy); Filippo Girard, Univ. degli Studi della Tuscia (Italy); Paolo Pietromarchi, Domenico Tiberi, Maria C. Comandini, Consiglio per la Ricerca e la Sperimentazione in Agricoltura (Italy).....[7472-47]

15.50: **Wheat growth modelling by a combination of a biophysical model approach and hyperspectral remote sensing data**, Natascha M. Oppelt, Christian-Albrechts-Univ. zu Kiel (Germany).....[7472-48]

16.10: **Integrating multiple sources of remote sensing data for regional rice yield estimation**, Yang Liu, George Mason Univ. (United States).....[7472-49]

16.30: **Potential of hyperspectral remote sensing for monitoring of sugarcane African stalk borer *Eldana saccharina* walker (Lepidoptera: Pyralidae)**, Tholang A. Mokhele, Univ. of KwaZulu-Natal (South Africa).....[7472-51]

16.50: **Estimating biochemical variables of fodder crops with canopy hyperspectral reflectance**, Suchit K. Rai, Sanjoy K. Das, Arvind K. Rai, Indian Grassland and Fodder Research Institute (India).....[7472-53]



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Remote Sensing of the Ocean, Sea Ice, and Large Water Regions 2009

Conference Chairs: **Charles R. Bostater, Jr.**, Florida Institute of Technology (USA); **Stelios P. Mertikas**, Technical Univ. of Crete (Greece); **Xavier Neyt**, Royal Belgian Military Academy (Belgium); **Miguel Velez-Reyes**, Univ. de Puerto Rico Mayagüez (USA)

Programme Committee: **Karine Caillault**, ONERA (France); **Eurico J. D'Sa**, Louisiana State Univ. (USA); **Alexander Gilerson**, City College/CUNY (USA); **Ana M. Martins**, Univ. dos Açores (Portugal)

Monday 31 August

Opening Remarks

Room: B03 **Mon. 08.25**

Charles R. Bostater, Florida Institute of Technology (USA)

SESSION 1

Room: B03 **Mon. 08.30 to 11.40**

Ocean and Water Color Imagery

Session Chair: **Eurico J. D'Sa**, Louisiana State Univ. (USA)

08.30: **Particulate absorption properties from MODIS ocean color and four in-situ transects in the Southeastern Bering Sea Shelf during July, 2008** (*Invited Paper*), Puneeta Naik, Eurico J. D'Sa, Louisiana State Univ. (United States); Joaquim I. Goes, Helga Gomes, Bigelow Lab. for Ocean Sciences (United States) [7473-01]

09.00: **Multivariate interpretation algorithm for water quality in the Baltic Sea**, Harald Krawczyk, Andreas Neumann, Stefan Riha, Deutsches Zentrum für Luft- und Raumfahrt e.V. (Germany) [7473-02]

09.20: **MODIS and MERIS detection of Dinoflagellate blooms using the RBD technique**, Ruhul Amin, Alexander Gilerson, Barry M. Gross, Fred Moshary, Samir A. Ahmed, The City College of New York (United States) [7473-03]

09.40: **Wind influence on chlorophyll variability along the Louisiana-Texas coast from satellite wind and ocean color data**, Eurico J. D'Sa, Mitsuko Korobkin, Louisiana State Univ. (United States) [7473-04]

Coffee Break 10.00 to 10.20

10.20: **Multangular hyperspectral investigation of polarized light in case 2 waters**, Alberto Tonizzo, Jing Zhou, Alexander Gilerson, The City College of New York (United States); Jacek Chowdhary, Columbia Univ. (United States); Barry M. Gross, Fred Moshary, Samir A. Ahmed, The City College of New York (United States) [7473-05]

10.40: **Cooperative aquatic sensing using the telesupervised adaptive ocean sensor fleet**, John M. Dolan, Gregg W. Podnar, Stephen Stancliff, Kian Hsiang Low, Carnegie Mellon Univ. (United States); Alberto Elfes, Jet Propulsion Lab. (United States); John Higinbotham, Emergent Space Technologies (United States); Jeffrey C. Hosler, Tiffany A. Moisan, John Moisan, NASA Goddard Space Flight Ctr. (United States) [7473-06]

11.00: **Water quality monitoring of the Great Barrier Reef during extreme flood events: a challenge for remote sensing algorithms**, Thomas Schroeder, Arnold G. Dekker, Vittorio E. Brando, Lesley A. Clementson, Commonwealth Scientific and Industrial Research Organisation (Australia) [7473-07]

11.20: **New algorithm for MODIS chlorophyll fluorescence line height retrieval: performance and comparison with the current product**, Ioannis Ioannou, Jing Zhou, Alexander Gilerson, Barry M. Gross, Fred Moshary, Samir A. Ahmed, The City College of New York (United States) [7473-08]

Lunch Break 11.40 to 13.10

SESSION 2

Room: B03 **Mon. 13.10 to 15.00**

Imaging of the Water Surface

Session Chairs: **Xavier Neyt**, Royal Belgian Military Academy (Belgium); **Stelios P. Mertikas**, Technical Univ. of Crete (Greece)

13.10: **Improving coastal altimeter products by a new retracking approach** (*Invited Paper*), Jesús Gómez-Enri, Univ. de Cádiz (Spain); Paolo Cipollini, Christine Gommenginger, National Oceanography Ctr. (United Kingdom); Stefano Vignudelli, Instituto di Biofisica, CNR (Italy); Jerome Benveniste, ESRIN (Italy); Pilar Villares, Univ. de Cádiz (Spain); Graham Quartly, Peter Challenor, Scott Gleason, National Oceanography Ctr. (United Kingdom); Salvatore Dinardo, ESRIN (Italy) [7473-09]

13.40: **Radiometric cross-calibration of spaceborne scatterometers: first results**, Anis El Youncha, Xavier Neyt, Marc Acheroy, Royal Belgian Military Academy (Belgium) [7473-10]

14.00: **An enhancement of the Gavdos dedicated facility for the absolute calibration of Jason-2 satellite radar altimeter**, Stelios P. Mertikas, Thanassis Papadopoulos, Rigas T. Ioannides, Achilles Tripolitsiotis, Akis Frantzis, Technical Univ. of Crete (Greece) ... [7473-11]

14.20: **Infrared measurements of sea surface radiation: the MIRAMER campaign**, Karine Caillault, Sandrine Fauqueux, Luc Labarre, Pierre Simoneau, ONERA (France) [7473-12]

14.40: **Modeling the influence of water waves upon remote sensing imagery and the underwater light field**, Charles R. Bostater, Jr., Florida Institute of Technology (United States) [7473-13]

Coffee Break 15.00 to 15.30

SESSION 3

Room: B03 **Mon. 15.30 to 17.50**

Imagery and In Situ Water Characterization

Session Chair: **Miguel Velez-Reyes**, Univ. de Puerto Rico Mayagüez (USA)

15.30: **Resolution enhancement of hyperspectral data using multispectral imagery**, Michael E. Winter, Pacific Spectral Technology (United States); Edwin M. Winter, Technical Research Associates, Inc. (United States); Scott G. Beaven, Space Computer Corp. (United States); Michael J. Schlagen, Technical Research Associates, Inc. (United States) [7473-14]

15.50: **An assessment of the accuracy and precisions of water quality parameters retrieved with the particle swarm optimisation**, Glenn Campbell, The Univ. of Southern Queensland (Australia); Stuart R. Phinn, The Univ. of Queensland (Australia) [7473-15]

16.10: **Calibration and validation of a generic multisensor algorithm for mapping of turbidity in turbid waters**, Bouchra Nechad, Griet Neukermans, Kevin G. Ruddick, Royal Belgian Institute of Natural Sciences (Belgium) [7473-16]

16.30: **Fusion of hyperspectral imagery and bathymetry information for inversion of bioptical models**, Maria C. Torres-Madronero, Miguel Velez-Reyes, James A. Goodman, Univ. de Puerto Rico Mayagüez (United States) [7473-18]

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16.50: **Active remote sensing to assess the seawaters quality**, Jeni G. Vasilescu, Livio Belegante, National Institute of Research & Development for Optoelectronics (Romania) [7473-19]

17.10: **Role of surface winds in SAR signatures of oceanic internal waves in the Northern South China Sea**, Weigen Huang, Xilin Gan, Jingsong Yang, Bin Fu, Chen Peng, State Oceanic Administration (China) [7473-21]

17.30: **Variability of lake ice-snow covers, Krasnoyarskiy kraii, Russia, from Terra/MODIS and Envisat/MERIS**, Maxim Chernetskiy, Denis Rogozin, Anatoly P. Shevyrnogov, Nelli Guseynova, Institute of Biophysics (Russian Federation) [7473-23]

Remote Sensing 2009 Plenary Session

Room: B05/06 Mon. 18.00 to 19.40

18.00 to 18.10 **Welcome and Introduction**
Steven P. Neeck, NASA Headquarters (USA)
Karin Stein, FGAN-FOM Research Institute for Optronics and Pattern Recognition (Germany)
2009 Symposium Chairs

18.10. to 18:55 **R&D capacities in the German Earth Observation Program**
Thomas Reiter, German Aerospace Ctr., Germany

18.55 to 19.40 **Earth Science Applications from Space: An Update on the Decadal Survey**
Richard A. Anthes, President, University Corporation for Atmospheric Research, United States
See p. 7 for information.

Investigation of sea roughness with complex of optical devices, Viktor Titov, Institute of Applied Physics (Russian Federation); V. A. Bakhanov, ; O. N. Kemarskaja, Alexandr G. Luchinin, J. I. Troizkaja, Emma M. Zuikova, Institute of Applied Physics (Russian Federation) [7473-28]

China imaging altimeter and its possible oceanic applications, Jingsong Yang, State Oceanic Administration (China) [7473-29]

Satellite assessment of air-sea CO₂ flux distribution and variability in China Yellow Sea, Yan Bai, Xianqiang He, Delu Pan, State Oceanic Administration (China) [7473-30]

Research on the dynamic map service publishing of marine remote sensing images, Feng Zhang, Renyi Liu, Nan Liu, Zhejiang Univ. (China) [7473-31]

Satellite-based real-aperture radar image spectrum simulation with Wen's wave spectrum, Ren Lin, Le Yang, State Oceanic Administration (China) [7473-32]

Dynamics of surface chlorophyll distribution as marker of the hydrological processes in the European seas (by satellite data), Anatoly P. Shevyrnogov, Galina Vysotskaya, Artem V. Khodyaev, Institute of Biophysics (Russian Federation) [7473-33]

Resolution enhancement of SZ-4 scatterometer (CN/SCAT) data, Robby Chan, National Satellite Ocean Application Service (China) [7473-34]

Oceanic and atmospheric internal waves in non-tidal seas: radar observation and contact measurements, Olga Y. Lavrova, Marina I. Mityagina, Space Research Institute (Russian Federation); Andrey N. Serebryany, Andreyev Acoustics Ctr. (Russian Federation) and Space Research Institute (Russian Federation) [7473-35]

Conservative behavior of CDOM optical properties in Changjiang River Estuary, China, Yang Xu, Zhejiang Univ. (China) [7473-36]

Analysis of simulated and actual airborne remote sensing imagery for characterization of surface water wave spectra, Charles R. Bostater, Jr., Florida Institute of Technology (United States) [7473-37]

Direct use of microwave radiometric measurements for analysis of the ocean-atmosphere interaction, Alexander G. Grankov, Alexander A. Mil'shin, Vladimir F. Krapivin, Institute of Radio Engineering and Electronics (Russian Federation) [7473-38]

Tuesday 1 September

POSTER SESSION Tues. 17.45 to 19.15

All symposium attendees are invited to attend 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.

Poster presenters may post their poster papers starting at 10.00 on Tuesday in the Conference Area Hallway. Any papers left on the boards following the end time of the poster session will be considered unwanted and will be discarded. SPIE Europe assumes no responsibility for posters left up after the end of the poster session. Poster authors should be at their papers from 17.45 to 19.15 to answer questions from attendees. Attendees are requested to wear their conference registration badges to the poster sessions.

Development of services for marine environmental observation and monitoring using remote sensing data, Susan Niebergall, Bundesamt für Seeschifffahrt und Hydrographie (Germany); Björn Baschek, Bundesanstalt für Gewässerkunde (Germany); Andreas Neumann, Deutsches Zentrum für Luft- und Raumfahrt e.V. (Germany); Jens Schroeter, Alfred-Wegener-Institut für Polar- und Meeresforschung (Germany); Kerstin Stelzer, Brockmann Consult GmbH (Germany) [7473-17]

An adaptive lidar, Victor G. Oshlakov II, Institute of Atmospheric Optics (Russian Federation); Mikhail I. Andreev, Zuev Institute of Atmospheric Optics (Russian Federation); Dimitry D. Malykh, Tomsk State Univ. (Russian Federation) [7473-20]

The study on dynamic changes of NPP in coastal ocean of China, Haiying Li, Hongchun Peng, Huaihai Institute of Technology (China); Ji Liang, Cold and Arid Regions Environmental and Engineering Research Institute (China); Meiping Sun, Huaihai Institute of Technology (China) [7473-22]

Using quasistationary areas to detect ocean currents from space, Artem V. Khodyaev, Institute of Biophysics (Russian Federation) [7473-24]

Inherent error of Envisat ASAR level 2 algorithm and its correction, Jingsong Yang, State Oceanic Administration (China) [7473-25]

The black water around the Yangtze River estuary, Xianqiang He, State Oceanic Administration (China) [7473-26]

Development of a new algorithm of suspended sediment concentration from satellite remote sensing data in the East China Sea, Zhihua Mao, State Oceanic Administration (China) [7473-27]

Conference 7474

Monday-Thursday 31 August-3 September 2009 • Proceedings of SPIE Vol. 7474

Sensors, Systems, and Next-Generation Satellites XIII

Conference Chairs: **Roland Meynart**, European Space Agency (Netherlands); **Steven P. Neeck**, NASA Headquarters (USA); **Haruhisa Shimoda**, Japan Aerospace Exploration Agency (Japan)

Programme Committee: **Shahid Habib**, NASA Goddard Space Flight Ctr. (USA); **Olivier Saint-Pe**, EADS Astrium (France); **Philippe M. Teillet**, Univ. of Lethbridge (Canada)

Monday 31 August

SESSION 1

Room: B09. Mon. 08.40 to 12.20

European Missions

Session Chair: **Roland Meynart**, European Space Research and Technology Ctr. (Netherlands)

08.40: **The European GMES programme: atmospheric composition monitoring with Sentinel 4- and Sentinel-5** (*Invited Paper*), Roland Meynart, Marco Arcioni, Gregory Bazalgette, Jean-Loup Bézy, Joerg Langen, Yasjka Meijer, European Space Research and Technology Ctr. (Netherlands) [7474-01]

09.10: **Sentinel-1 CSAR mission status**, Paul Snoeij, Evert Attema, Malcolm Davidson, Guido Levrini, Bjorn Rommen, Nicolas Floury, European Space Research and Technology Ctr. (Netherlands) . . [7474-02]

09.30: **Sentinel-2 optical high resolution mission for GMES land operational services**, Ferran Gascon, Philippe Martimort, François Spoto, European Space Research and Technology Ctr. (Netherlands) . . [7474-03]

09.50: **Sentinel-3 mission overview**, Ulf Klein, Bruno Berruti, Craig Donlon, Johannes Frerick, Constantin E. Mavrocordatos, Jens Nieke, Juergen Stroede, Helge Rebhan, European Space Research and Technology Ctr. (Netherlands) [7474-04]

Coffee Break 10.10 to 10.40

10.40: **Meteosat third generation (MTG): status of space segment definition**, Donny M. Aminou, European Space Research and Technology Ctr. (Netherlands) [7474-05]

11.00: **Meteosat third generation (MTG): critical technology pre-development activities**, Donny M. Aminou, Roland Meynart, Paul Blythe, Jean-Loup Bezy, European Space Research and Technology Ctr. (Netherlands) [7474-06]

11.20: **Environmental mapping and analysis program (EnMAP): mission description and review of phase C activities**, Hermann J. Kaufmann, Karl Segl, Luis Guanter, GeoForschungsZentrum Potsdam e.V. (Germany); Stefan Hofer, Klaus-Peter Förster, Timo Stuffer, Kayser-Threde GmbH (Germany); Andreas A. Mueller, Rudolf G. Richter, Christian Chlebek, Deutsches Zentrum für Luft- und Raumfahrt e.V. (Germany) [7474-07]

11.40: **TROPOMI, the solar backscatter satellite instrument for air quality and climate, heads towards detailed design**, Johan de Vries, Robert Voors, Dutch Space B.V. (Netherlands); Gerard Otter, Nick C. J. van der Valk, TNO Science and Industry (Netherlands); Ilse Aben, Ruud W. M. Hoogeveen, Annemieke M. S. Gloude-mans, Netherlands Institute for Space Research (Netherlands); Agnes Mika, BMT ARGOS (Netherlands); Marcel R. Dobber, Pepijn Veefkind, Pieter F. Levelt, Koninklijk Nederlands Meteorologisch Instituut (Netherlands) [7474-08]

12.00: **Sustainable satellite constellation development, calibration and on-orbit results**, Owen Hawkins, Stephen Mackin, DMC International Imaging Ltd. (United Kingdom); Z. de Groot, Surrey Satellite Technology Ltd. (United Kingdom) [7474-09]

Lunch Break 12.20 to 13.40

SESSION 2

Room: B09. Mon. 13.40 to 15.30

US Missions

Session Chair: **Steven P. Neeck**, NASA Headquarters (USA)

13.40: **NASA Earth Science Missions overview** (*Invited Paper*), Steven P. Neeck, Stephen M. Volz, NASA Headquarters (United States) [7474-10]

14.10: **Aquarius/SAC-D Mission: preparation towards launch**, Amit Sen, David Durham, Jet Propulsion Lab. (United States); Daniel Caruso, Carlos Falcon, Comision Nacional de Actividades Espaciales (Argentina) [7474-11]

14.30: **CERES FM-5 on the NPP spacecraft: continuing the Earth radiation budget climate data record**, Kory J. Priestley, Louis Smith, NASA Langley Research Ctr. (United States) [7474-12]

14.50: **Progress in developing a geostationary AMSU**, Bjorn H. Lambrigtsen, Jet Propulsion Lab. (United States) [7474-13]

15.10: **The next generation geostationary operational environmental satellite: GOES-R the United States advanced weather Sentinel**, Hal J. Bloom, National Oceanic and Atmospheric Administration (United States) [7474-14]

Coffee Break 15.30 to 16.00

SESSION 3

Room: B09. Mon. 16.00 to 17.30

Japanese Missions I

Session Chair: **Haruhisa Shimoda**, Japan Aerospace Exploration Agency (Japan)

16.00: **Overview of Japanese Earth observation programs** (*Invited Paper*), Haruhisa Shimoda, Japan Aerospace Exploration Agency (Japan) [7474-15]

16.30: **Validation of precise digital surface model generated by PRISM onboard ALOS**, Takeo Tadono, Masanobu Shimada, Japan Aerospace Exploration Agency (Japan); Junichi Takaku, Remote Sensing Technology Ctr. of Japan (Japan) [7474-17]

16.50: **On-orbit performance of TANSO-FTS and CAI on GOSAT**, Akihiko Kuze, Hiroshi Suto, Kei Shiomi, Masakatsu Nakajima, Takashi Hamazaki, Japan Aerospace Exploration Agency (Japan) [7474-18]

17.10: **Initial results of GOSAT TANSO calibration**, Kei Shiomi, Tomoko Kina, Shuji Kawakami, Japan Aerospace Exploration Agency (Japan); Yasushi Mitomi, Mayumi Yoshida, Riko Higuchi, Nami Sekio, Fumie Kataoka, Remote Sensing Technology Ctr. of Japan (Japan) . . . [7474-19]

Remote Sensing 2009 Plenary Session

Room: B05/06 Mon. 18.00 to 19.40

18.00 to 18.10 **Welcome and Introduction**
Steven P. Neeck, NASA Headquarters (USA)
Karin Stein, FGAN-FOM Research Institute for Optronics and Pattern Recognition (Germany)
2009 Symposium Chairs

18.10. to 18:55 **R&D capacities in the German Earth Observation Program**
Thomas Reiter, German Aerospace Ctr., Germany

18.55 to 19.40 **Earth Science Applications from Space: An Update on the Decadal Survey**
Richard A. Anthes, President, University Corporation for Atmospheric Research, United States

See p. 7 for information.

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Tuesday 1 September

SESSION 4

Room: B09. Tues. 09.00 to 12.20

Japanese Missions II

Session Chair: Haruhisa Shimoda,
Japan Aerospace Exploration Agency (Japan)

09.00: **Upper atmospheric CO₂ concentration retrieved from thermal infrared spectrum as observed by GOSAT TANSO-FTS (TIR) sensor**, Ryoichi Imasu, Naoko Saitoh, The Univ. of Tokyo (Japan); Kei Shiomi, Hiroshi Suto, Akihiko Kuze, Masakatsu Nakajima, Japan Aerospace Exploration Agency (Japan). [7474-20]

09.20: **Current status of GOSAT higher level products by NIES GOSAT DHF**, Hiroshi Watanabe, Hironari Ishihara, Kenji Hayashi, Tatsuya Yokota, Fumie Kawazoe, National Institute for Environmental Studies (Japan). [7474-21]

09.40: **Long-term observations of water and climate by AMSR-E and GCOM-W**, Keiji Imaoka, Misako Kachi, Hideyuki Fujii, Marehito Kasahara, Norimasa Ito, Keizo Nakagawa, Taikan Oki, Haruhisa Shimoda, Japan Aerospace Exploration Agency (Japan) [7474-22]

10.00: **Development status of the second-generation global imager (SGLI) on GCOM-C**, Kazuhiro Tanaka, Yoshihiko Okamura, Japan Aerospace Exploration Agency (Japan); Takahiro Amano, Masaru Hiramatsu, Koichi Shiratama, NEC TOSHIBA Space Systems, Ltd. (Japan). [7474-23]

Coffee Break 10.20 to 10.50

10.50: **Development status of cloud profiling radar for EarthCARE**, Hirotaka Nakatsuka, Hiroaki Horie, Kazuyuki Okada, Yasuo Sakaide, Toshiyoshi Kimura, Japan Aerospace Exploration Agency (Japan); Yuichi Ohno, Kenji Sato, Nobuhiro Takahashi, Hiroshi Kumagai, National Institute of Information and Communications Technology (Japan) [7474-24]

11.10: **Status of algorithm development and CAL/VAL plans in the JAXA GPM project**, Misako Kachi, Riko Oki, Shuji Shimizu, Takuji Kubota, Naofumi Yoshida, Japan Aerospace Exploration Agency (Japan); Toshio Iguchi, National Institute of Information and Communications Technology (Japan); Kenji Nakamura, Nagoya Univ. (Japan) and Japan Aerospace Exploration Agency (Japan) [7474-25]

11.30: **Overview of Japan's advanced land observing satellite-2 mission (Invited Paper)**, Shinichi Suzuki, Yuji Osawa, Yasushi Hatooka, Yukihiko Kankaku, Tomohiro Watanabe, Japan Aerospace Exploration Agency (Japan) [7474-26]

12.00: **Conceptual design of advanced land observing satellite-3**, Hiroko Imai, Yuji Osawa, Yasushi Hatooka, Shinichi Suzuki, Japan Aerospace Exploration Agency (Japan) [7474-27]

Lunch Break 12.20 to 13.40

SESSION 5

Room: B09. Tues. 13.40 to 14.20

Japanese Missions III

Session Chair: Haruhisa Shimoda,
Japan Aerospace Exploration Agency (Japan)

13.40: **JEM/SMILES observation capability**, Yasuko J. Kasai, Philippe Baron, Satoshi Ochiai, Jana Mendrok, National Institute of Information and Communications Technology (Japan); Joachim Urban, Donal Murtagh, Joakim Moller, Chalmers Univ. of Technology (Sweden); Takeshi Manabe, Osaka Prefecture Univ. (Japan); Kenichi Kikuchi, Toshiyuki Nishibori, Takuki Sano, Japan Aerospace Exploration Agency (Japan) [7474-28]

14.00: **Sub-millimeter wave radiometer for observation of cloud ice: proposal for Japanese mission**, Jana Mendrok, National Institute of Information and Communications Technology (Japan); Dong Liang Wu, Jet Propulsion Lab. (United States); Stefan A. Buehler, Luleå Univ. of Technology (Sweden); Patrick Eriksson, Chalmers Univ. of Technology (Sweden); Yasuko J. Kasai, National Institute of Information and Communications Technology (Japan). [7474-29]

SESSION 6

Room: B09. Tues. 14.20 to 17.20

Calibration I

Session Chair: Philippe M. Teillet, Univ. of Lethbridge (Canada)

14.20: **MERIS calibration: 7th Year in space**, Steven Delwart, European Space Research and Technology Ctr. (Netherlands); Ludovic Bourg, ACRI-ST (France). [7474-30]

14.40: **MODIS thermal emissive band detector bias**, Brian N. Wenny, Xu Geng, Science Systems and Applications, Inc. (United States); Xiaoxiong Xiong, NASA Goddard Space Flight Ctr. (United States) [7474-31]

15.00: **MODIS thermal emissive band calibration stability derived from surface targets**, Brian N. Wenny, Science Systems and Applications, Inc. (United States); Xiaoxiong Xiong, NASA Goddard Space Flight Ctr. (United States); Jennifer L. Dodd, Science Systems and Applications, Inc. (United States) [7474-32]

Coffee Break 15.20 to 15.40

15.40: **Error analysis of CERES instrument edition 3 data products**, George L. Smith, National Institute of Aerospace (United States) [7474-33]

16.00: **RapidEye constellation radiometric relative accuracy measurement using lunar images**, Joe S. Steyn, George Tyc, Keith Beckett, MacDonald, Dettwiler & Associates Ltd. (Canada); Michael Oxford, RapidEye AG (Germany); Yoshi Hashida, Surrey Satellite Technology Ltd. (United Kingdom) [7474-34]

16.20: **Cross-comparison of the IRS-P6 AWiFS sensor with the L5 TM, L7 ETM+ & Terra MODIS sensors**, Gyanesh Chander, U.S. Geological Survey (United States); Xiaoxiong Xiong, NASA Goddard Space Flight Ctr. (United States); Amit Angal, Taeyoung Choi, Science Systems and Applications, Inc. (United States) [7474-35]

16.40: **Concatenation of terrestrial reference standard sites for systematic post-launch calibration monitoring of multiple space-based imaging sensors**, Philippe M. Teillet, Univ. of Lethbridge (Canada); Nigel P. Fox, National Physical Lab. (United Kingdom) [7474-36]

17.00: **Recent progress on cross-comparison of terra and aqua MODIS calibration using dome C**, Xiaoxiong Xiong, NASA Goddard Space Flight Ctr. (United States); Aisheng Wu, Amit Angal, Brian N. Wenny, Science Systems and Applications, Inc. (United States) . [7474-37]

POSTER SESSION Tues. 17.45 to 19.15

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Data quality, calibration and validation methods for remote sensing images, Sergey A. Smyrnov, Anton V. Sydorenko, Institute of Space Research (Ukraine) [7474-72]

Structure Optimization of Coated LPFG Based on Dual-peak Resonance, Zhengtian Gu, Univ. of Shanghai for Science and Technology (China) [7474-73]

Study on the cross-calibration of CBERS-02B CCD by MODIS, Minwei Zhang, Institute of Remote Sensing Applications (China); Junwu Tang, National Satellite Ocean Application Service (China) [7474-74]

An analysis of three-bar method for on-orbit MTF estimation, Xianbin Li, Qi Wang, The Academy of Opto-Electronics (China) [7474-75]

Effect of reduction of aperture on distribution of Zernike aberrations in the wave front error of a telescope, Neeraj Mathur, A. S. Kiran Kumar, Dinavahi Subrahmanyam, Jaimin T. Desai, Indian Space Research Organisation (India) [7474-76]



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Analysis of large size mirror for deformation to differentiate between gravity and fabrication error, Neeraj Mathur, A. S. Kiran Kumar, Dinavahi Subrahmanyam, Jaimin T. Desai, Indian Space Research Organisation (India) [7474-78]

Growth and characterisation of InAsN dilute nitride semiconductor alloys for the mid-infrared spectral range, Martin I. de la Mare, Qian Zhuang, Anthony Krier, Lancaster Univ. (United Kingdom) [7474-79]

Design of Ku-band 2GHz bandwidth transmitter based on stepped frequency chirp signals, Yunhua Zhang, Xiangkun Zhang, Wenshuai Zhai, Ctr. for Space Science and Applied Research (China). [7474-80]

The Chinese environment satellite mission status and future, Delu Pan, Fang Gong, Yan Bai, Jianyu Chen, State Oceanic Administration (China) [7474-81]

Wednesday 2 September

SESSION 7

Room: B09. Wed. 09.20 to 10.20

Calibration II

Session Chair: Philippe M. Teillet, Univ. of Lethbridge (Canada)

09.20: **A vacuum-compatible flat plate radiometric source for system-level testing of optical sensors**, Steven W. Brown, National Institute of Standards and Technology (United States); Robert A. Barnes, Science Applications International Corp. (United States); Allan W. Smith, Keith R. Lykke, National Institute of Standards and Technology (United States); Dan M. Walker, The Aerospace Corp. (United States); Robert W. Lambeck, NASA Goddard Space Flight Ctr. (United States); Bruce W. Guenther, National Oceanic and Atmospheric Administration (United States) [7474-39]

09.40: **Traceable calibration of radiation sources from the visible to the far infrared for spaceborne applications at PTB**, Dieter R. Taubert, Christian Monte, Berndt Gutschwager, Jürgen Hartmann, Jörg Hollandt, Physikalisch-Technische Bundesanstalt (Germany) [7474-40]

10.00: **The reduced background calibration facility for detectors and radiators at the Physikalisch-Technische Bundesanstalt**, Christian Monte, Berndt Gutschwager, Jörg Hollandt, Physikalisch-Technische Bundesanstalt (Germany) [7474-41]

Coffee Break 10.20 to 10.50

SESSION 8

Room: B09. Wed. 10.50 to 11.50

FPA I

Session Chair: Olivier Saint-Pe, EADS Astrium (France)

10.50: **Two-dimensional VLWIR arrays for Meteosat 3rd generation**, Stefan Hanna, Andreas Bauer, Holger Bitterlich, Martin Bruder, Markus Haiml, Karl C. Hofmann, Karl-Martin Mahlein, Hans-Peter Nothaft, Richard Wollrab, Johann Ziegler, AIM Infrarot-Module GmbH (Germany) . [7474-43]

11.10: **Development of a SWIR multispectral detector for GMES/Sentinel-2**, Aurelien Dariel, Philippe Chorier, Cédric Leroy, Véronique Bourrillon, Bertrand Terrier, SOFRADIR (France) [7474-44]

11.30: **Sofradir SWIR hyperspectral detectors for space applications**, Yoanna-Reine Nowicki-Bringuier, Philippe Chorier, SOFRADIR (France) [7474-45]

Lunch Break 11.50 to 13.30

SESSION 9

Room: B09. Wed. 13.30 to 17.00

FPA II

Session Chair: Olivier Saint-Pe, EADS Astrium (France)

13.30: **A fast 1024 pixel, 12.5 µm Pitch InGaAs linear array for FBG sensing applications**, Jan P. Vermeiren, Urbain Van Bogget, Jonas L. Bentell, Alexandre de Kerckhove, Thierry Colin, XenICs NV (Belgium) [7474-46]

13.50: **Enhanced broadband (11–15 µm) QWIP FPAs for space applications**, Alexandru Nedelcu, Thales Research & Technology (France) [7474-47]

14.10: **A visible and NIR multilinear array dedicated to Sentinel 2 multispectral imager**, Michel Breart de Boisanger, Franck Larnaudie, Saïprasad Guiry, Olivier Saint-Pé, EADS Astrium (France); Philippe Martin-Gonthier, Franck Corbière, Pierre Magnan, Ecole Nationale Supérieure de l'Aéronautique et de l'Espace (France); Neil Guyatt, e2v Technologies PLC (United Kingdom). [7474-48]

14.30: **Monolithic and hybrid backside illuminated active pixel sensor arrays**, Koen De Munck, Kyriaki Minoglou, Rao Padmakumar, Deniz Sabuncuoglu Tezcan, IMEC (Belgium); Jan Bogaerts, Cypress Belgium (Belgium); Iacopo Fici Veltroni, Galileo Avionica (Italy); Chris Van Hoof, Piet De Moor, IMEC (Belgium). [7474-49]

14.50: **Total dose and displacement damage effects in the radiation hardened CMOS HAS APS**, Dirk Van Aken, Cypress Semiconductor Corp. (Belgium); Dominique Herve, EADS SODERN (France). . . [7474-50]

Coffee Break 15.10 to 15.40

15.40: **10000 pixels wide CMOS frame imager for earth observation from a HALE UAV**, Stefan Livens, Bavo Delauré, Flemish Institute for Technological Research (Belgium); Gert Schippers, Cypress Semiconductor Corp. (Belgium) [7474-51]

16.00: **Design of image sensors for hyperspectral applications**, Paul Jerram, David G. Morris, Tim Eaton, David J. Burt, S. Peppiatt, e2v technologies plc (United Kingdom). [7474-52]

16.20: **The AsteroidFinder focal plane**, Harald Michaelis, Stefano Mottola, Ekkehard Kührt, Michael Solbrig, Matthias Tschentscher, Gabriele Messina, Karsten Scheibe, Thomas Behnke, Deutsches Zentrum für Luft- und Raumfahrt e.V. (Germany) [7474-53]

16.40: **First demonstration and performances of AlGaIn based focal plane array for deep-UV imaging**, Jean-Luc Reverchon, Shailendra Bansropun, Jean-Patrick Truffer, Eric M. Costard, Thales Research & Technology (France); Eric Frayssinet, Julien Brault, Jean-Yves Duboz, Ctr. de Recherche sur l'Hétéro-Epitaxie et ses Applications (France); Idir Mourad, Synchrotron SOLEIL (France) [7474-54]

SPIE Europe Remote Sensing



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Thursday 3 September

SESSION 10a

Room: B09. Thurs. 09.00 to 12.10

Missions and Sensing II

Session Chairs: **Steven P. Neeck**, NASA Headquarters (USA);
Roland Meynart, European Space Research and Technology Ctr.
(Netherlands)

09.00: **System performance simulation, calibration and data processing for the Proba-V mission**, Tanja Van Achteren, Iskander Benhadj, Wouter Dierckx, Jan C. Dries, Geert Duhoux, Walter Heyns, Kris Nackaerts, Sindy Sterckx, Flemish Institute for Technological Research (Belgium) [7474-57]

9.20: **Laboratory characterisation of the MEDUSA optical system for multi-spectral earth observation from a stratospheric HALE UAV**, Bavo Delauré, Stefan Livens, Flemish Institute for Technological Research (Belgium); Didier Beghuin, LAMBDA-X SA (Belgium) [7474-58]

09.40: **Hyper spectral satellite constellation for land management**, Raymond M. Bell, Jr., Timothy N. Miller, Douglas B. Helmuth, Lockheed Martin Corp. (United States) [7474-59]

10.00: **Development activities for interferometer based hyperspectral sounder instrument**, Frederic J. Grandmont, Philippe Giaccari, Jacques G. Giroux, Louis-Phillipe A. Bibeau, James Veilleux, Martin C. Larouche, ABB Inc. (Canada) [7474-60]

Coffee Break 10.20 to 10.50

10.50: **RapidEye product quality assessment**, Keith Beckett, Chris Rampersad, Rony Putih, Joe S. Steyn, George Tyc, MacDonald, Dettwiler & Associates Ltd. (Canada); Andreas Brunn, Scott Douglass, Horst Weichelt, RapidEye AG (Germany) [7474-61]

11.10: **Novel miniaturized hyperspectral sensor for UAV and space applications**, Heikki K. Saari, Ville-Veikko Aallos, Altti Akujärvi, Tapani Antila, Uula P. Kantojärvi, Jussi Mäkynen, Christer Holmlund, VTT Information Technology (Finland); Jyrki Ollila, VTT Elektronikka (Finland) [7474-62]

11.30: **Development of a micro-satellite compatible FTS sounder for sun-occultation measurements**, Philippe Giaccari, Louis M. Moreau, Jacques G. Giroux, Marc-André Soucy, ABB Inc. (Canada) [7474-63]

11.50: **Advancement of optical component control for an imaging Fabry-Perot interferometer**, Allen M. Larar, William B. Cook, Michael A. Flood, Joel F. Campbell, Charlie Boyer, NASA Langley Research Ctr. (United States) [7474-64]

Lunch Break 12.10 to 13.50

SESSION 10b

Room: B09. Thurs. 13.50 to 15.10

Missions and Sensing II

Session Chairs: **Steven P. Neeck**, NASA Headquarters (USA);
Roland Meynart, European Space Research and Technology Ctr.
(Netherlands)

13.50: **New sensor technology for spacecraft navigation applications**, George Dekoulis, Lancaster University (United Kingdom) [7474-65]

14.10: **An uncooled mid wave and thermal infrared payload for fire monitoring**, Christian Proulx, Min Wang, François Châteauneuf, INO (Canada); Jean-Francois Hamel, NGC Aerospace Ltd. (Canada); Alain Royer, Univ. de Sherbrooke (Canada); Jean de Lafontaine, NGC Aerospace Ltd. (Canada) [7474-66]

14.30: **The OMPS Limb Profiler instrument: an alternative data analysis and retrieval algorithm**, Didier F. Rault, NASA Langley Research Ctr. (United States); J. D. Lumpe, Thomas D. Eden, Jr., Computational Physics, Inc. (United States) [7474-82]

14.50: **First Flight Results from a Mid-wave Airborne Hyperspectral Spectrographic Imager**, Stephen Achal, Hanford Deglint, Rita Cheng, Warren Shaw, Alejandra Umana-Diaz, Zachary Jacobs, ITRES Research Ltd. (Canada) [7474-83]

Coffee Break 15.10 to 15.30

SESSION 11

Room: B09. Thurs. 15.30 to 16.30

Applications of Global Earth Observations in Addressing Societal Benefits

Session Chair: **Shahid Habib**, NASA Goddard Space Flight Ctr. (USA)

15.30: **Triana II a new constellation of operational earth remote sensing satellites**, Raymond M. Bell, Jr., Douglas B. Helmuth, Lockheed Martin Corp. (United States) [7474-67]

15.50: **Treaty monitoring from space: satellite imagery analysis for verifying treaty compliance**, Irmgard Niemeyer, Technische Univ. Bergakademie Freiberg (Germany) [7474-69]

16.10: **Comprehensive evaluation of eco-tourism resources in Hangzhou based on GIS**, Qian Cheng, Xiuju Wu, Zhejiang Gongshang Univ. (China) [7474-71]

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Monday-Tuesday 31 August-1 September 2009 • Proceedings of SPIE Vol. 7475

Remote Sensing of Clouds and the Atmosphere XIV

Conference Chairs: **Richard H. Picard**, Air Force Research Lab. (USA); **Klaus Schäfer**, Forschungszentrum Karlsruhe (Germany); **Adolfo Comeron**, Univ. Politécnic de Cataluña (Spain); **Michiel van Weele**, Koninklijk Nederlands Meteorologisch Instituut (Netherlands)

Programme Committee: **Roland Harig**, Technische Univ. Hamburg-Harburg (Germany); **Nicolaos I. Sifakis**, National Observatory of Athens (Greece); **Konradin Weber**, Fachhochschule Düsseldorf (Germany); **Aldo Amodeo**, Consiglio Nazionale delle Ricerche (Italy); **Evgueni Kassianov**, Pacific Northwest National Lab (USA); **James R. Slusser**, Colorado State Univ. (USA); **Wei Gao**, Colorado State Univ. (USA); **Sonnik Clausen**, Danmarks Tekniske Univ. (Denmark)

Monday 31 August

Welcome and Introduction

Room: A01 **Mon. 09.00 to 09.10**

Session Chair: **Richard H. Picard**, Air Force Research Lab. (USA)

SESSION 1

Room: A01 **Mon. 09.10 to 11.50**

Remote Sensing of Clouds

Session Chair: **Evgueni I. Kassianov**, Pacific Northwest National Lab. (USA)

09.10: **New MERIS cloud screening**, Carsten Brockmann, Brockmann Consult GmbH (Germany); Richard Santer, Univ. du Littoral Côte d'Opale (France); Uwe Krämer, Kerstin Stelzer, Brockmann Consult GmbH (Germany); Philippe Goryl, ESRIN (Italy) [7475-03]

09.30: **The diurnal cycle of marine stratocumulus clouds from SEVIRI: implications for the first indirect aerosol effect**, Ralf Bennartz, Andi Walther, Univ. of Wisconsin-Madison (United States) [7475-04]

09.50: **CLIM: a cloud imager to provide sounders with agile sighting**, Thierry L. Trémas, Ctr. National d'Etudes Spatiales (France) [7475-05]

Coffee Break 10.10 to 10.30

10.30: **Three-dimensional effects and shortwave cloud radiative forcing associated with shallow cumuli over the central North America**, Larry K. Berg, Pacific Northwest National Lab. (United States); David L. Mills, Jr., Univ. of South Carolina (United States); Evgueni I. Kassianov, Charles N. Long, Pacific Northwest National Lab. (United States) [7475-06]

10.50: **Observations of clouds on various oceans with the cloud profiling radar Falcon-I**, Toshiaki Takano, Jun Yamaguchi, Hideji Abe, Tamio Takamura, Chiba Univ. (Japan) [7475-07]

11.10: **A preliminary classification of cirrus clouds over Sao Paulo city by systematic lidar observations and comparison with CALIPSO and AERONET data**, Eduardo Landulfo, Eliane G. Larroza, Fábio J. da Silva Lopes, Instituto de Pesquisas Energéticas e Nucleares (Brazil) .. [7475-08]

11.30: **Evaluation of the height assignment of semi-transparent clouds using simulated Meteosat spectral radiances**, Regis Borde, European Organisation for the Exploitation of Meteorological Satellites (Germany); Philippe Dubuisson, Univ. des Sciences et Technologies de Lille (France) [7475-09]

Lunch Break 11.50 to 13.00

SESSION 2

Room: A01 **Mon. 13.00 to 14.40**

Remote Sensing of the Middle and Upper Atmosphere

Session Chair: **Christopher J. Mertens**, NASA Langley Research Ctr. (USA)

13.00: **Development of a geomagnetic storm correction to the international reference ionosphere model E-region electron densities using TIMED/SABER observations**, Christopher J. Mertens, Jose Fernandez, NASA Langley Research Ctr. (United States); Xiaojing Xu, Science Systems and Applications, Inc. (United States); Dieter Bilitza, George Mason Univ. (United States); James M. Russell III, Hampton Univ. (United States); Martin G. Mlynczak, NASA Langley Research Ctr. (United States) [7475-10]

13.20: **Auroral Radiance Enhancement Modeling with SAMM2**, Hoang Dothe, James W. Duff, John Gruninger, Raphael Panfili, Spectral Sciences, Inc. (United States); James H. Brown, Air Force Research Lab. (United States) [7475-11]

13.40: **Temperature and aerosol soundings in the middle atmosphere at different mid and high-latitude lidar stations during day and night**, Michael Gerding, Gerd Baumgarten, Josef Höffner, Jens Fiedler, Ronald Eixmann, Franz-Josef Lübken, Leibniz-Institut für Atmosphärenphysik e.V. (Germany) [7475-12]

14.00: **TIMED/SABER measurements of the boreal mesosphere during unusual winters: longitudinal structure and planetary waves**, Richard H. Picard, Jeremy R. Winick, Air Force Research Lab. (United States); Peter P. Wintersteiner, ARCON Corp. (United States); Martin G. Mlynczak, NASA Langley Research Ctr. (United States); James M. Russell III, Hampton Univ. (United States); Larry L. Gordley, GATS, Inc. (United States) [7475-13]

14.20: **Remote sensing of planetary upper atmospheric plasma irregularities using a new passive interferometer**, George Dekoulis, Lancaster University (United Kingdom) [7475-14]

SESSION 3

Room: A01 **Mon. 14.40 to 17.50**

Radiative Transfer

Session Chair: **Richard H. Picard**, Air Force Research Lab. (USA)

14.40: **Top of atmosphere thermal flux retrieval for the EarthCARE Mission: a preview**, Carlos Domenech, Tobias Wehr, Kotska Wallace, European Space Research and Technology Ctr. (Netherlands) .. [7475-15]

15.00: **CERES (FM2) Instrument in Field Campaigns of 2008**, Z. Peter Szweczyk, Science Systems and Applications, Inc. (United States); Kory J. Priestley, NASA Langley Research Ctr. (United States) [7475-16]

Coffee Break 15.20 to 15.50

15.50: **Infrared radiative transfer model for aerosol clouds: implications to remote sensing by ground-based and airborne sensors**, Avishai Ben-David, U.S. Army Edgewood Chemical Biological Ctr. (United States); Charles E. Davidson, Science and Technology Corp. (United States) [7475-17]

16.10: **Atmospheric sounding under cloudy atmospheric conditions**, Xu Liu, Daniel K. Zhou, Allen M. Larar, William L. Smith, Jr., NASA Langley Research Ctr. (United States) [7475-18]

16.30: **Full spectrum broken cloud scene simulation**, Robert L. Sundberg, Steven C. Richtsmeier, Spectral Sciences, Inc. (United States) [7475-19]



Conference 7475

16.50: **The 3D radiative effects of clouds in aerosol retrieval: can we remove them?**, Evgueni I. Kassianov, Mikhail Ovchinnikov, Larry K. Berg, Sally A. McFarlane, Connor Flynn, Pacific Northwest National Lab. (United States) [7475-20]

17.10: **Fourier decomposition of sharply peaked phase functions: Legendre expansions versus trapezoidal rule**, Alain Sei, Northrop Grumman Aerospace Systems (United States) [7475-21]

17.30: **Sensitivity of atmospheric circulation models to upper tropospheric relative humidity derived from satellite observed radiances**, Jules R. Dim, Hiroshi Murakami, Japan Aerospace Exploration Agency (Japan); Takahashi Y. Nakajima, Tokai Univ. (Japan); Tamio Takamura, Chiba Univ. (Japan); Masahiro Hori, Japan Aerospace Exploration Agency (Japan) [7475-22]

Remote Sensing 2009 Plenary Session

Room: B05/06 Mon. 18.00 to 19.40

- 18.00 to 18.10 **Welcome and Introduction**
Steven P. Neeck, NASA Headquarters (USA)
Karin Stein, FGAN-FOM Research Institute for Optronics and Pattern Recognition (Germany)
2009 Symposium Chairs
- 18.10. to 18:55 **R&D capacities in the German Earth Observation Program**
Thomas Reiter, German Aerospace Ctr., Germany
- 18.55 to 19.40 **Earth Science Applications from Space: An Update on the Decadal Survey**
Richard A. Anthes, President, University Corporation for Atmospheric Research, United States
See p. 7 for information

Tuesday 1 September

SESSION 4

Room: A01 Tues. 09.00 to 12.40

Lidar, Radar, and Passive Atmospheric Measurement Techniques

Session Chairs: **Adolfo Comeron**, Univ. Politècnica de Catalunya (Spain); **Klaus Schäfer**, Forschungszentrum Karlsruhe GmbH (Germany)

09.00: **Three-dimensional observations of atmospheric humidity with a scanning differential absorption lidar**, Andreas Behrendt, Volker Wulfmeyer, Gerd Wagner, Andrea Riede, Heinz Bauer, Marcus Radlach, Florian Späth, Sandip Pal, Univ. Hohenheim (Germany) [7475-23]

09.30: **Determination of mixing layer heights by ceilometer and influences upon air quality at Mexico City airport**, Klaus Schäfer, Edgar Flores-Jardines, Stefan M. Emeis, Forschungszentrum Karlsruhe GmbH (Germany); Michel Grutter, Univ. Nacional Autónoma de México (Mexico); Peter Wiesen, Ralf Kurtenbach, Bergische Univ. Wuppertal (Germany); Christoph Munkel, Vaisala GmbH (Germany) [7475-24]

09.50: **Mixing layer height monitoring in Beijing by ceilometer**, Klaus Schäfer, Stefan M. Emeis, Peter Suppan, Forschungszentrum Karlsruhe GmbH (Germany); Xian Tang, Jinyuan Xin, Yuesi Wang, Institute of Atmospheric Physics (China); Stefan Norra, Joachim Vogt, Univ. Karlsruhe (Germany); Christoph Munkel, Vaisala GmbH (Germany) [7475-25]

10.10: **Improved near-range performance of a low-cost one lens lidar scanning the boundary layer**, Christoph Munkel, Vaisala GmbH (Germany); Stefan M. Emeis, Klaus Schäfer, Forschungszentrum Karlsruhe GmbH (Germany); Burghard Brümmer, Univ. Hamburg (Germany) [7475-26]

Coffee Break 10.30 to 11.00

11.00: **Aerosol stratification characterization of an astronomical site by means of a backscatter lidar at the Roque de los Muchachos Observatory**, Michaël Sicard, Sergio Tomás, M. Nadzri Reba, Adolfo Comeron, Oscar Batet, Constantino Muñoz, Alejandro Rodriguez, Francisco Rocabenbosch, Univ. Politècnica de Catalunya (Spain); Casiana Muñoz, Jesus J. Fuensalida, Instituto de Astrofísica de Canarias (Spain) [7475-27]

11.20: **Microphysical properties and distribution retrieval with a variable base point algorithm**, Lukas Osterloh, Christine Böckmann, Univ. Potsdam (Germany) [7475-28]

11.40: **On mathematical relationships between integrated backscattered light and integrated depolarization ratios for linear and circular polarization for water droplets, fog-oil and dust**, Xiaoying Cao, Royal Military College of Canada (Canada); Gilles A. Roy, Nathalie Roy, Defence Research and Development Canada (Canada); Robert Bernier, Les Instruments Optiques du St-Laurent Inc. (Canada) [7475-29]

12.00: **The application of integrated satellite observation in IASI data processing**, Haibing Sun, Perot Systems Government Service (United States); Walter Wolf, National Oceanic and Atmospheric Administration (United States); Lihang Zhou, Perot Systems Government Service (United States); Christopher D. Barnet, Mitchell D. Goldberg, National Oceanic and Atmospheric Administration (United States) [7475-31]

12.20: **URMS/AMSP (universal radiation measurement system/ airborne multi-spectral sunphoto- and polarimeter)**, Thomas Ruhtz, Andre Hollstein, Jonas von Bismarck, Rene Preusker, Juergen Fischer, Freie Univ. Berlin (Germany) [7475-32]

Lunch Break 12.40 to 14.00

SESSION 5

Room: A01 Tues. 14.00 to 16.10

Atmospheric Profiling of Aerosols, Trace Gases, and Meteorological Parameters

Session Chair: **Roland Harig**, Technische Univ. Hamburg-Harburg (Germany)

14.00: **Retrieval of aerosol optical depth using regionally derived surface albedos**, Ana Picon, Eduardo Hernandez, Matthias Jerg, Barry M. Gross, Fred Moshary, Samir A. Ahmed, The City College of New York (United States) [7475-33]

14.20: **Assessment of the effectiveness of atmospheric correction methods using standard calibration targets, ground measurements and aster images**, Kyriacos Themistocleous, Diofantos G. Hadjimitsis, Cyprus Univ. of Technology (Cyprus) [7475-34]

14.40: **Determining Aerosol Radiative Properties Using the Integrating Nephelometer**, Laura Mihai, National Institute for Lasers, Plasma and Radiation Physics (Romania) and Univ. of Bucharest (Romania); Sabina Stefan, Ioana Ungureanu, Univ. of Bucharest (Romania) [7475-35]

Coffee Break 15.00 to 15.30

15.30: **AIRS in atmospheric and climate research**, Bjorn H. Lambrigtsen, Jet Propulsion Lab. (United States) [7475-36]

15.50: **Enhanced monitoring of sulfur dioxide sources with hyperspectral UV sensors**, Arlin J. Krueger, Nickolay A. Krotkov, Kai Yang, Univ. of Maryland, Baltimore County (United States) [7475-38]

SESSION 6

Room: A01 Tues. 16.10 to 17.10

Remote Sensing by FTIR, DOAS, and Other Spectrometric Methods

Session Chair: **Klaus Schäfer**, Forschungszentrum Karlsruhe GmbH (Germany)

16.10: **Remote detection of hazardous gases by imaging Fourier transform spectroscopy**, Roland Harig, Technische Univ. Hamburg-Harburg (Germany) [7475-39]

16.30: **New Method for Estimating Greenhouse Gas Emissions from Livestock Buildings Using Open-Path FTIR Spectroscopy**, Susana Briz, Univ. Carlos III de Madrid (Spain); José Barrancos, Dácil Nolasco, Gladys Mellán, Eleazar Padrón, Nemesio Pérez, Instituto Tecnológico y de Energías Renovables S.A. (Spain) [7475-40]

16.50: **Application of open-path spectroscopic measurement techniques (FTIR) for the up-scaling of greenhouse gas emissions from soils**, Klaus Schäfer, Carsten Jahn, Stefan M. Emeis, Nils-Demian Landmeyer, Christoph Bonecke, Joris Fahle, Forschungszentrum Karlsruhe GmbH (Germany); Jürgen Böttcher, Michael Wiwiorra, Leibniz Univ. Hannover (Germany); Armin Raabe, Anja Schleichardt, Univ. Leipzig (Germany) [7475-41]



Conference 7475

Wrap Up

Room: A01 **Tues. 17.10 to 17.20**

Session Chair: Richard H. Picard, Air Force Research Lab. (USA)

POSTER SESSION **Tues. 17.45 to 19.15**

All symposium attendees are invited to attend 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.

Poster presenters may post their poster papers starting at 10.00 on Tuesday in the Conference Area Hallway. Any papers left on the boards following the end time of the poster session will be considered unwanted and will be discarded. SPIE Europe assumes no responsibility for posters left up after the end of the poster session. Poster authors should be at their papers from 17.45 to 19.15 to answer questions from attendees. Attendees are requested to wear their conference registration badges to the poster sessions.

Remote Sensing of Clouds

Comparison of cloud height and depth from atmospheric modelling and ceilometer measurements, Dina Santos, Maria João T. Costa, Ana Maria Silva, Rui Salgado, Daniele Bortoli, Univ. de Evora (Portugal) [7475-42]

Nonparametric segmentation of clouds from multispectral MSG-SEVIRI imagery, Albano Gonzalez, Juan C. Perez, Montserrat Armas, Univ. de La Laguna (Spain) [7475-43]

Cloud detection and classification from multispectral satellite data, Maria João T. Costa, Daniele Bortoli, Univ. de Evora (Portugal) . . [7475-44]

Sea fog characteristics based on MODIS data and streamer model, Zengzhou Hao, Delu Pan, Fang Gong, Jianyu Chen, State Oceanic Administration (China) [7475-45]

An object-oriented based daytime over land fog detection approach using EOS/MODIS data, Xiongfei Wen, Liangming Liu, Wei Li, Wuhan Univ. (China) [7475-46]

Estimation of optical thickness of volcanic ash clouds over the ocean from satellite data, Bringfried M. Pflug, Deutsches Zentrum für Luft- und Raumfahrt e.V. (Germany) [7475-47]

Radiative Transfer

Spectral surface albedo derived from GOME-2/MetOp measurements, Bringfried M. Pflug, Diego Loyola, Deutsches Zentrum für Luft- und Raumfahrt e.V. (Germany) [7475-48]

To define the form of particles on a polarization state of the scattering optical radiation, Vladimir P. Budak, Sergey V. Korkin, Konstantin N. Korolev, Moscow Power Engineering Institute Technical Univ. (Russian Federation) [7475-49]

A Monte Carlo Simulation of Radiative Transfer in the Atmosphere applied to TOTAL-DOAS., Margherita Premuda, Samuele S. Masieri, Istituto di Scienze dell'Atmosfera e del Clima, CNR (Italy); Daniele Bortoli, Istituto di Scienze dell'Atmosfera e del Clima, CNR (Italy) and Univ. de Evora (Portugal); Federico Margelli, Fabrizio Ravegnani, Andrea Petritoli, Istituto di Scienze dell'Atmosfera e del Clima, CNR (Italy); Ivan Kostadinov, Istituto di Scienze dell'Atmosfera e del Clima, CNR (Italy) and Bulgarian Academy of Science (Bulgaria); Giorgio Giovanelli, Istituto di Scienze dell'Atmosfera e del Clima, CNR (Italy); Enrico Cupini, CNR external cooperator (Italy) [7475-50]

Snow reflectivity inversion using Wiscombe-Warren model, Ji Liang, Jian Wang, Lizong Wu, Cold and Arid Regions Environmental and Engineering Research Institute (China) [7475-51]

The retrieval of solar surface insolation with neural network method from geostationary satellite data, Soo-Jae Park, Kyung-Soo Han, Jong-Min Yeom, Ga-Lam Lee, Kyoung-Jin Pi, Pukyong National Univ. (Korea, Republic of) [7475-52]

Atmospheric Profiling of Aerosols, Trace Gases, and Meteorological Parameters

Global simulation of tropospheric water vapor measurements through the Normalized Differential Spectral Attenuation (NDSA) approach: setup, scintillation model and performance evaluation, Luca Facheris, Fabrizio Cuccoli, Univ. degli Studi di Firenze (Italy); Enrica Martini, Univ. degli Studi di Siena (Italy); Gottfried Kirchengast, Susanne Schweitzer, Univ. Graz (Austria) [7475-37]

Estimation of aerosol properties derived from CAI on GOSAT, Itaru Sano, Sonoyo Mukai, Kinki Univ. (Japan); Makiko Mukai, Japan Aerospace Exploration Agency (Japan); Brent N. Holben, Ilya Slutsker, NASA Goddard Space Flight Ctr. (United States) [7475-53]

Evaluation of seasonal change of aerosol properties from satellite and simulations, Makiko Mukai, Japan Aerospace Exploration Agency (Japan) [7475-54]

Synthetic monitoring of Asian dust from space, ground and/or simulations, Sonoyo Mukai, Itaru Sano, Kinki Univ. (Japan); Makiko Mukai, Japan Aerospace Exploration Agency (Japan) [7475-55]

Statistics of water vapour column above the Roque de los Muchachos observatory, Begoña M. García-Lorenzo, Instituto de Astrofísica de Canarias (Spain) [7475-57]

Ozone and nitrogen dioxide vertical distributions at the Italian Antarctic station during 2000-2008, Daniele Bortoli, Univ. de Evora (Portugal) and Consiglio Nazionale delle Ricerche (Italy); Ana Maria Silva, Univ. de Evora (Portugal); Fabrizio Ravegnani, Giorgio Giovanelli, Ivan Kostadinov, Andrea Petritoli, Samuele S. Masieri, Margherita Premuda, Istituto di Scienze dell'Atmosfera e del Clima, CNR (Italy); Hermano T. Martins, Univ. de Evora (Portugal) [7475-58]

Comparison of spatial ozone measurements from satellite AIRS and Danum Valley GAW baseline station: DMV over Sabah & Sarawak, Malaysia, Jasim M. Rajab, Mohd Zubir Mat Jafri, Hwee San Lim, Abdullah Khiruddin, Univ. Sains Malaysia (Malaysia) [7475-60]

Remote Sensing by FTIR, DOAS, and Other Spectrometric Methods

Monitoring of tropospheric compounds at Evora station with multi-axis hyperspectral measurements, Daniele Bortoli, Univ. de Evora (Portugal) and Consiglio Nazionale delle Ricerche (Italy); Ana Filipa Domingues, Manuel A. Martinez, Ana Maria Silva, Maria João T. Costa, Univ. de Evora (Portugal) [7475-61]

Ozone and nitrogen dioxide total columns over Evora, Portugal during 2007-2008, Ana Filipa Domingues, Univ. de Evora (Portugal); Daniele Bortoli, Univ. de Evora (Portugal) and Institute of Atmospheric Sciences and Climate (Italy); Manuel Antón, Univ. de Evora (Portugal) and Univ. de Extremadura (Spain); Ana Maria Silva, Univ. de Evora (Portugal) . [7475-62]

Lidar, Radar, and Passive Atmospheric Measurement Techniques

Simulations of remote sensing instruments signals on the basis of cloud model results, Aleksandra E. Kardas, Univ. of Warsaw (Poland); Sally A. McFarlane, Pacific Northwest National Lab. (United States); Hugh D. Morrison, Univ. Corp. for Atmospheric Research (United States); Jennifer M. Comstock, Pacific Northwest National Lab. (United States); Wojciech W. Grabowski, Univ. Corp. for Atmospheric Research (United States); Szymon P. Malinowski, Univ. of Warsaw (Poland) [7475-63]

Guideline work on ground-based remote-sensing techniques in Germany, Christoph Münkel, Vaisala GmbH (Germany); Dirk A. Engelbart, Deutscher Wetterdienst (Germany); Ljuba Woppowa, Kommission Reinhaltung der Luft im VDI und DIN (Germany) [7475-64]

Ultraviolet Ground- and Space-Based Measurements

UV intensity and dose meter, Tanja Blank, Yurii Goldberg, Ioffe Physico-Technical Institute (Russian Federation) [7475-66]

Conference 7476

Wednesday-Thursday 2-3 September 2009 • Proceedings of SPIE Vol. 7476

Optics in Atmospheric Propagation and Adaptive Systems XII

Conference Chairs: Anton Kohnle, FGAN-FOM Research Institute for Optronics and Pattern Recognition (Germany); Karin Stein, FGAN-FOM Research Institute for Optronics and Pattern Recognition (Germany); John D. Gonglewski, Air Force Research Lab. (USA)

Programme Committee: David C. Dayton, Applied Technology Associates (USA); Denis Dion, Jr., Defence Research and Development Canada (Canada); Stephen M. Hammel, Space and Naval Warfare Systems Ctr., San Diego (USA); Vladimir P. Lukin, Institute of Atmospheric Optics (Russian Federation); Charles L. Matson, Air Force Research Lab. (USA); Sergio R. Restaino, Naval Research Lab. (USA); Jennifer C. Ricklin, Defense Advanced Research Projects Agency (USA); Jim F. Riker, Air Force Research Lab. (USA); Marc J. F. Séchaud, ONERA (France); Mikhail A. Vorontsov, Army Research Lab. (USA)

Tuesday 1 September

POSTER SESSION Tues. 17.45 to 19.15

All symposium attendees are invited to attend 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.

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Reliability of detecting optical vortex with a Shark-Hartmann wavefront sensor in a scintillated vortex beam, Mingzhou Chen, Christopher J. Dainty, National Univ. of Ireland, Galway (Ireland) [7476-22]

Design and test of an adaptive optics system prototype for laser beam jitters reduction, Salvatore Grasso, Univ. degli Studi di Roma Tre (Italy); Fausto Acernese, Rocco Romano, Univ. degli Studi di Salerno (Italy); Fabrizio Barone, Istituto Nazionale di Fisica Nucleare (Italy) [7476-25]

Wednesday 2 September

Introductory Remarks

Room: B07/08 Wed. 08.30 to 08.40

Anton Kohnle, FGAN-FOM Research Institute for Optronics and Pattern Recognition (Germany)

Opening Session

Room: B07/08 Tue. 08.40 - 09:00

Mitigation of atmospheric effects on system performance, Anton Kohnle, FGAN-FOM Research Institute for Optronics and Pattern Recognition (Germany) [7476-26]

SESSION 1

Room: B07/08 Wed. 09.00 to 10.00

Characterisation of the Propagation Environment I: Maritime Environment

Session Chair: Karin Stein, FGAN-FOM (Germany)

09.00: Measurements of mixing height layer variability during the Ligurian air-sea interaction experiment (LASIE 2007), Joerg Foerster, Forschungsanstalt der Bundeswehr für Wasserschall und Geophysik (Germany) [7476-01]

09.20: Influence of atmospheric propagation in the maritime boundary layer on the measured RCS of ships, Helmut W. Essen, Hans-Hellmuth Fuchs, Gert A. Lindquist, Anke Pagels, FGAN-Forschungsinstitut für Hochfrequenzphysik und Radartechnik (Germany) [7476-02]

09.40: Comparison of distance dependence of ship signature and intensity of ship exhaust gas measured in both MWIR and LWIR transmission bands, Arthur D. van Rheenen, Erik Brendhagen, Lars T. Heen, Norwegian Defense Research Establishment (Norway) . . . [7476-03]

Coffee Break 10.00 to 10.30

SESSION 2

Room: B07/08 Wed. 10.30 to 11.30

Characterisation of the Propagation Environment II

Anton Kohnle, FGAN-FOM Research Institute for Optronics and Pattern Recognition (Germany)

10.30: Millimetre wave propagation through vegetation, Helmut W. Essen, Dirk Nuessler, Nora von Wahl, Sven Heinen, FGAN-Forschungsinstitut für Hochfrequenzphysik und Radartechnik (Germany) [7476-04]

10.50: SWIR sky-glow cloud correlation with NIR and visible clouds: an urban and rural comparison, Chad A. St. Arnauld, Air Force Research Lab. (United States); David C. Dayton, Applied Technology Associates (United States); John D. Gonglewski, Laura E. Durr, Air Force Research Lab. (United States); G. Fertig, Applied Technology Associates (United States) [7476-06]

11.10: Problem of terawatt femtosecond pulse self-reflection from nonlinear focus and plasma in atmosphere, Oleg K. Khasanov, Grigory V. Rusetsky, Olga M. Fedotova, Institute of Solid State and Semiconductor Physics (Belarus); Anatoly P. Sukhorukov, Lomonosov Moscow State Univ. (Russian Federation) [7476-07]

Lunch Break 11.30 to 13.30

SESSION 3

Room: B07/08 Wed. 13.30 to 14.50

Propagation and Imaging through Optical Turbulence I

Session Chair: Marc J. F. Séchaud, ONERA (France)

13.30: Measurement and prediction of optical turbulence effects as function of altitude in the marine boundary layer, Arie N. de Jong, TNO Defence, Security and Safety (Netherlands) [7476-08]

13.50: Laser speckle and atmospheric scintillation dependence on laser spectral bandwidth, David C. Dayton, Applied Technology Associates (United States); Laura E. Durr, John D. Gonglewski, Chad A. St. Arnauld, Air Force Research Lab. (United States); G. Fertig, Applied Technology Associates (United States) [7476-09]

14.10: Numerical simulation for coherent and partially coherent beams propagation through atmospheric turbulence, Xianmei Qian, Wenyue Zhu, Ruizhong Rao, Anhui Institute of Optics and Fine Mechanics (China) [7476-10]

14.30: Characterization of a laser beam propagating through the turbulent atmosphere, Fedor V. Shugaev, Evgeni N. Terentiev, Ludmila S. Shtemenko, Olga I. Dokukina, Tatiana A. Petrova, Lomonosov Moscow State Univ. (Russian Federation) [7476-11]

Coffee Break 14.50 to 15.20



Conference 7476

SESSION 4

Room: B07/08 Wed. 15.20 to 16.20

Propagation and Imaging through Optical Turbulence II

Session Chair: **Mikhail A. Vorontsov**, Army Research Lab. (United States)

15.20: **Turbulence characterization by studying laser beam wandering in a differential tracking motion setup**, Dario G. Perez, Pontificia Univ. Católica de Valparaíso (Chile); Luciano Zunino, Ctr. de Investigaciones en Ópticas A.C. (Argentina) and Univ. Nacional de La Plata (Argentina); Damián Gulich, Gustavo Funes, Ctr. de Investigaciones en Óptica, A.C. (Argentina); Mario Garavaglia, Univ. Nacional de la Plata (Argentina) [7476-12]

15.40: **Statistical behaviour of atmospheric turbulence at the Teide Observatory**, Begoña M. García-Lorenzo, Instituto de Astrofísica de Canarias (Spain) [7476-13]

16.00: **Estimation of adaptive optics parameters from wind speed: results for the Teide Observatory**, Begoña M. García-Lorenzo, Instituto de Astrofísica de Canarias (Spain) [7476-14]

Thursday 3 September

SESSION 5

Room: B07/08 Thurs. 08.30 to 10.10

Mitigation of Atmospheric Effects and System Performance I: Systems

Anton Kohnle, FGAN-FOM Research Institute for Optronics and Pattern Recognition (Germany)

08.30: **Coherent beam combining with adaptive compensation of dynamic phase aberrations**, Mikhail A. Vorontsov, Army Research Lab. (United States); Thomas Weyrauch, Univ. of Maryland, College Park (United States); Leonid A. Beresnev, Gary W. Carhart, Larry Huntley, Army Research Lab. (United States); Ling Liu, Univ. of Maryland, College Park (United States); Konley H. Aschenbach, Army Research Lab. (United States) [7476-15]

08.50: **Wavefront modifier with integrated sensor**, Michael S. Griffith, Leslie C. Laycock, Duncan P. Rowe, BAE Systems (United Kingdom) [7476-16]

09.10: **Progress on the development of a zonal bimorph deformable mirror**, Michael S. Griffith, Leslie C. Laycock, Duncan P. Rowe, BAE Systems (United Kingdom); Richard M. Myers, Durham Univ. (United Kingdom); Peter Doel, Univ. College London (United Kingdom) . . [7476-17]

09.30: **Adaptive optics concepts and systems for multipurpose applications at near horizontal line of sight: developments and results**, Gabriele Marchi, Corinne Scheiffling, Forschungsgesellschaft für Angewandte Naturwissenschaften e.V. (Germany) [7476-18]

09.50: **Two channel wavefront sensor arrangement employing Moiré deflectometry**, Saifollah Rasouli, Institute for Advanced Studies in Basic Sciences (Iran, Islamic Republic of); Anamparambu N. Ramaprakash, Inter-Univ. Ctr. for Astronomy (India) [7476-19]

Coffee Break 10.10 to 10.30

SESSION 6

Room: B07/08 Thurs. 10.30 to 11.50

Mitigation of Atmospheric Effects and System Performance II: Techniques and Application

Session Chair: **John D. Gonglewski**, Air Force Research Lab. (USA)

10.30: **Wavefront sensors for adaptive optical systems**, Vladimir P. Lukin, Oleg N. Emaleev, Nina N. Botygina, Peter Konyaev, Institute of Atmospheric Optics (Russian Federation) [7476-20]

10.50: **Modal phase correction for large-aperture ground-based telescope with multi-guide stars**, Vladimir P. Lukin, Lidia A. Bolbasova, Institute of Atmospheric Optics (Russian Federation) [7476-21]

11.10: **Experimental detection of phase singularities using a Shack-Hartmann wavefront sensor**, Kevin Murphy, Ruth Mackey, Christopher J. Dainty, National Univ. of Ireland, Galway (Ireland) [7476-23]

11.30: **Study of the rationality upon adopting 2-level model to deal with interaction between long-pulse, circularly-polarized light and the sodium atoms**, Youkuan Li, Institute of Applied Physics and Computational Mathematics (China) [7476-24]

SPIE Europe Remote Sensing



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Conference 7477A

Monday-Tuesday 31 August-1 September 2009 • Proceedings of SPIE Vol. 7477

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); **Sebastiano Bruno Serpico**, Univ. of Genoa (Italy)

Programme Committee: **Luciano Alparone**, Univ. degli Studi di Firenze (Italy); **Elisabetta Binaghi**, Univ. degli Studi dell'Insubria (Italy); **José M. Bioucas-Dias**, Instituto Superior Técnico (Portugal); **Francesca Bovolo**, Univ. degli Studi di Trento (Italy); **Gustavo Camps-Valls**, Univ. de València (Spain); **Jocelyn Chanussot**, Grenoble Institute of Technology (France); **Chi Hau Chen**, Univ. of Massachusetts (USA); **David A. Clausi**, Univ. of Waterloo (Canada); **Melba M. Crawford**, Purdue Univ. (USA); **Giles M. Foody**, The Univ. of Nottingham (United Kingdom); **Enguerran Grandchamp**, The Univ. of the Antilles and Guyana (France); **Jordi Inglada**, CNES (France); **Gabriele Moser**, Univ. degli Studi di Genova (Italy); **Allan A. Nielsen**, Danmarks Tekniske Univ. (Denmark); **Ryuei Nishii**, Kyushu Univ. (Japan); **Antonio J. Plaza**, Univ. de Extremadura (Spain); **John A. Richards**, The Australian National Univ. (Australia); **Anne S. Solberg**, Univ. I Oslo (Norway); **Josiane B. Zerubia**, INRIA Sophia Antipolis (France); **Fabio Dell'Acqua**, Università di Pavia (Italy)

Monday 31 August

Opening Remarks

Room: A08 **Mon. 10.25**

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

SESSION 1

Room: A08 **Mon. 10.30 to 12.10**

Analysis of Very High Resolution Images with Morphological Filters

Session Chair: **Jocelyn Chanussot**, Grenoble Institute of Technology (France)

10.30: **Recent developments in morphological image processing for remote sensing** (*Invited Paper*), Pierre Soille, European Commission Joint Research Ctr. (Italy) [7477A-01]

11.30: **Modeling structural information for building extraction with morphological attribute filters**, Mauro Dalla Mura, Univ. degli Studi di Trento (Italy); Jon A. Benediktsson, Univ. of Iceland (Iceland); Claudio Persello, Lorenzo Bruzzone, Univ. degli Studi di Trento (Italy) [7477A-02]

11.50: **Segmentation of high resolution satellite imagery based on mean shift algorithm and morphological operations**, Orsan Aytekin, Ilkay Ulusoy, Ugur Halici, Middle East Technical Univ. (Turkey) [7477A-03]

Lunch Break 12.10 to 13.40

SESSION 2

Room: A08 **Mon. 13.40 to 15.00**

Analysis of Very High Resolution Images and Pansharpening

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

13.40: **A novel remote sensing region based image fusion using contourlet transform**, Soad Ibrahim, Univ. of Guelph (Canada) [7477A-04]

14.00: **Fast weighted least squares pan-sharpening**, Andrea Garzelli, Univ. degli Studi di Siena (Italy); Luciano Alparone, Univ. degli Studi di Firenze (Italy); Luca Capobianco, Filippo Nencini, Univ. degli Studi di Siena (Italy) [7477A-05]

14.20: **Roads extraction from high resolution satellite images using the wavelet transform**, Tamer M. T. Abdel-Hady, National Authority for Remote Sensing and Space Sciences (Egypt) [7477A-06]

14.40: **Airport runway detection in satellite images by adaboost learning**, Ugur Halici, Ugur Zongur, Orsan Aytekin, Ilkay Ulusoy, Middle East Technical Univ. (Turkey) [7477A-07]

Coffee Break 15.00 to 15.30

SESSION 3

Room: A08 **Mon. 15.30 to 17.10**

Image and Signal Analysis Methods

Session Chair: **Chi Hau Chen**, Univ. of Massachusetts Dartmouth (USA)

15.30: **On the role of advanced signal processing in remotely sensing**, Chi H. Chen, Univ. of Massachusetts Dartmouth (United States) [7477A-08]

15.50: **Probabilistic reasoning on object occurrence in complex scenes**, Alexander Bauer, Fraunhofer-Institut für Informations- und Datenverarbeitung (Germany) [7477A-09]

16.10: **Processing of images based on blind evaluation of noise type and characteristics**, Vladimir V. Lukin, Sergey K. Abramov, Nikolay N. Ponomarenko, Mikhail L. Uss, National Aerospace Univ. (Ukraine); Benoit Vozel, Kacem Chehdi, Univ. de Rennes 1 (France); Jaakko Astola, Tampere Univ. of Technology (Finland) [7477A-10]

16.30: **A new approach for registering remote sensing images from various modalities**, Christophe Palmann, Sébastien Mavromatis, Jean Sequeira, Univ. de la Méditerranée (France) [7477A-11]

16.50: **Accessible high performance computing solutions for near real-time image processing for time critical applications**, Conrad M. Bielski, Dominik Brunner, Guido Lemoine, European Commission Joint Research Ctr. (Italy) [7477A-12]

Remote Sensing 2009 Plenary Session

Room: B05/06 **Mon. 18.00 to 19.40**

18.00 to 18.10 **Welcome and Introduction**
Steven P. Neeck, NASA Headquarters (USA)
Karin Stein, FGAN-FOM Research Institute for Optronics and Pattern Recognition (Germany)
2009 Symposium Chairs

18.10. to 18:55 **R&D capacities in the German Earth Observation Program**
Thomas Reiter, German Aerospace Ctr., Germany

18.55 to 19.40 **Earth Science Applications from Space: An Update on the Decadal Survey**
Richard A. Anthes, President, University Corporation for Atmospheric Research, United States

See p. 7 for information



Conference 7477A

Tuesday 1 September

SESSION 4

Room: A08. Tues. 08.30 to 10.10

Classification of Hyperspectral Images

Session Chair: Pierre Soille,
European Commission Joint Research Ctr. (Italy)

08.30: **Spectral-spatial analysis in hyperspectral remote sensing: from morphological profiles to classified segmentation** (*Invited Paper*), Jocelyn Chanussot, Grenoble Institute of Technology (France); Jon A. Benediktsson, Mathieu Fauvel, Yuliya Tarabalka, Univ. of Iceland (Iceland). [7477A-13]

09.30: **Semi-supervised hyperspectral classification and segmentation using logistic sparse regression and multilevel logistic prior**, Jun Li, José M. Bioucas-Dias, Instituto de Telecomunicações (Portugal); Antonio J. Plaza, Univ. de Extremadura (Spain) . . . [7477A-14]

09.50: **Dependent component analysis for hyperspectral image classification**, Qian Du, Mississippi State Univ. (United States); Ivica Kopriva, Institut Ruder Bošković (Croatia) [7477A-15]

Coffee Break 10.10 to 10.40

SESSION 5

Room: A08. Tues. 10.40 to 12.00

Classification and Anomaly Detection in Hyperspectral Images

Session Chair: José M. Bioucas-Dias,
Univ. Técnica de Lisboa (Portugal)

10.40: **Wavelet decomposition for reducing flux density effect on hyperspectral classification**, Ophir Almog, Maxim Shoshany, Technion-Israel Institute of Technology (Israel). [7477A-16]

11.00: **Nonlinear mixture model for hyperspectral unmixing**, Jose M. Nascimento, Instituto Superior de Engenharia de Lisboa (Portugal); José M. Bioucas-Dias, Instituto de Telecomunicações (Portugal) . . . [7477A-17]

11.20: **Performance loss of multivariate detection algorithms due to covariance estimation**, Charles E. Davidson, Science and Technology Corp. (United States); Avishai Ben-David, U.S. Army Edgewood Chemical Biological Ctr. (United States). [7477A-18]

11.40: **Improved covariance matrix estimation: interpretation and experimental analysis of different approaches for anomaly detection applications**, Stefania Matteoli, Marco Diani, Giovanni Corsini, Univ. di Pisa (Italy) [7477A-19]

Lunch Break 12.00 to 13.30

SESSION 6

Room: A08. Tues. 13.30 to 15.10

Analysis and Compression of Hyperspectral Images

Session Chair: Luciano Alparone, Univ. degli Studi di Firenze (Italy)

13.30: **A fast sequential endmember extraction algorithm based on unconstrained linear spectral unmixing**, Javier Plaza, Antonio J. Plaza, Univ. de Extremadura (Spain) [7477A-20]

13.50: **Linear spectral unmixing of near-infrared hyperspectral data from Juventae Chasma, Mars**, Lorenz Wendt, Freie Univ. Berlin (Germany); Jean-Philippe Combe, The Bear Fight Ctr. (United States); Patrick C. McGuire, The Univ. of Chicago (United States); Janice L. Bishop, SETI Institute (United States); Gerhard Neukum, Freie Univ. Berlin (Germany) [7477A-21]

14.10: **Oblique Hyperspectral Radiometric Phenomenology Study**, Emmett J. Lentilucci, Rochester Institute of Technology (United States). [7477A-22]

14.30: **Study of hyperspectral and multispectral images compression using vector quantization in development of CCSDS international standards**, Shen-En Qian, Canadian Space Agency (Canada) . [7477A-23]

14.50: **Compression of hyperspectral data for automated analysis**, Anna Linderhed, Niclas Wadströmer, Karl-Göran Stenborg, Swedish Defence Research Agency (Sweden); Harald Nautsch, Linköping Univ. (Sweden) [7477A-24]

Coffee Break 15.10 to 15.40

SESSION 7

Room: A08. Tues. 15.40 to 17.20

Compression and Change Detection

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

15.40: **Lossless compression of hyperspectral data from new-Generation imaging spectrometers: lookup-table prediction, fast lossless prediction and classified linear spectral prediction**, Luciano Alparone, Univ. degli Studi di Firenze (Italy); Bruno Aiazzi, Stefano Baronti, National Research Council (Italy) [7477A-25]

16.00: **Automatic image registration through histogram-based image segmentation**, Hernâni Gonçalves, José A. Gonçalves, Luís Corte-Real, Univ. do Porto (Portugal) [7477A-26]

16.20: **Object-based change detection and classification**, Irmgard Niemeyer, Florian Bachmann, Andre John, Clemens Listner, Prashanth R. Marpu, Technische Univ. Bergakademie Freiberg (Germany) . [7477A-27]

16.40: **Kernel principal component and maximum autocorrelation factor analyses for change detection**, Allan A. Nielsen, Technical Univ. of Denmark (Denmark); Morton J. Canty, Forschungszentrum Jülich GmbH (Germany) [7477A-28]

17.00: **Gaussianization for remote sensing image change detection**, Valero Laparra, Jordi Muñoz Mari, Jesus Malo Lopez, Gustavo Camps-Valls, Univ. de València (Spain) [7477A-29]

POSTER SESSION Tues. 17.45 to 19.15

All symposium attendees are invited to attend 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.

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Segmentation of remote sensing images for building detection, Hamid Moayeri, Islamic Azad Univ. (Iran, Islamic Republic of). [7477A-34]

A Multiscale Segments Selection and Feature Weighting Approach for Classification of high resolution Multispectral Imagery over Urban Areas, Leiguang Wang, Qianqing Qin, Tiancan Mei, Guoying Liu, Wuhan Univ. (China) [7477A-35]

Automatic house detection from high-resolution satellite imagery, Yoriko Kazama, Tao Guo, Hitachi, Ltd. (Japan) [7477A-36]

Statistics analysis on SPOT 5 classification accuracy of different data fusion methods, Heli Lu, Institute of Geographical Sciences and Natural Resources Research (China); Guifang Liu, Henan Univ. (China). [7477A-37]

Simulation of hyperspectral images from multispectral images based on universal pattern decomposition method, Bo Liu, Lifu Zhang, Institute of Remote Sensing Applications (China); Bing Zhang, Ctr. for Earth Observation and Digital Earth (China) [7477A-38]

On the differential distance measurement of satellite images, Jianwei Tao, Peking Univ. (China) [7477A-39]

The research on relative radiometric normalization for change detection of multi-temporal images, HanSong Zhang, State Oceanic Administration (China) and Zhejiang Univ. (China); Jianyu Chen, Zhihua Mao, State Oceanic Administration (China) [7477A-40]

Moving Train Imaging by Stationary Two-Channel Radar, Yunhua Zhang, Wenshuai Zhai, Xiangkun Zhang, Ctr. for Space Science and Applied Research (China) [7477A-41]

An experimental study on verification of the compact airborne imaging spectrometer system, Kwangjae Lee, Younsoo Kim, Sangsoon Yong, Yongseung Kim, Korea Aerospace Research Institute (Korea, Republic of). [7477A-42]

Change detection method for remotely sensed images based on multivariate analysis method and statistical test, Hiroshi Okumura, Ryohei Yamasaki, Tatsunori Goto, Kohei Arai, Saga Univ. (Japan). [7477A-43]

SPIE Europe Remote Sensing

Conference 7477A

- ICA-based visual words in comparison with gradient based method for under meter high resolution satellite images characterization**, Payam Birjandi, Telecom ParisTech (France); Mihai P. Datcu, Deutsches Zentrum für Luft- und Raumfahrt e.V. (Germany)[7477A-44]
- An infrared precision radiation thermometer for the calibration of remote sensing instrumentations under vacuum**, Berndt Gutschwager, Physikalisch-Technische Bundesanstalt (Germany); Reno Gärtner, Raytek GmbH (Germany); Jörg Hollandt, Physikalisch-Technische Bundesanstalt (Germany)[7477A-45]
- Object-based remote sensing imagery classification using geographical ontology**, Djerriri Khelifa, Ctr. National des Techniques Spatiales (Algeria); Malki Mimoun, Univ. de Djillali Liabes (Algeria)[7477A-46]
- Knowledge extraction using remote sensing images**, Erick López-Ornelas, Rocio Abascal-Mena, Univ. Autónoma Metropolitana (Mexico)[7477A-47]
- Soil moisture estimation from microwave remote sensing data with non-linear machine learning techniques**, Luca Pasolli, Univ. degli Studi di Trento (Italy); Claudia Notarnicola, EURAC research (Italy); Lorenzo Bruzzone, Univ. degli Studi di Trento (Italy)[7477A-48]
- Endmember search techniques based on lattice auto-associative memories: a case study on vegetation discrimination**, Gonzalo Urcid-Serrano, Instituto Nacional de Astrofísica, Óptica y Electrónica (Mexico); Juan Carlos Valdiviezo-Navarro, Instituto Nacional de Astrofísica, Óptica y Electrónica (Mexico); Gerhard X. Ritter, Univ. of Florida (United States)[7477A-49]
- Image deblurring by motion estimation for remote sensing**, Yueting Chen, Qi Li, Huajun Feng, Zhongliang Fu, Zhihai Xu, Zhejiang Univ. (China)[7477A-50]

- 10.40: Real-time optical processor prototype for remote SAR applications**, Linda Marchese, Michel Doucet, INO (Canada); Bernd Harnisch, Martin Suess, European Space Agency (Netherlands); Pascal Bourqui, Mathieu Legros, Nichola Desnoyers, Ludovic Guillot, Luc Mercier, Maxime Savard, Anne Martel, Alain Bergeron, INO (Canada)[7477B-54]
- 11.00: New pattern recognition methods for identifying oil spills from satellite remote sensing data**, Fahad A. Alawadi, Univ. of Southampton (United Kingdom)[7477A-33]
- Closing Remarks. Wed. 11.20 to 11.25**

Wednesday 2 September

Introductory Remarks

Room: A08. Wed. 08.45 to 08.50

Claudia Notarnicola, EURAC-Institute of Applied Remote Sensing (Italy); **Lorenzo Bruzzone**, Univ. degli Studi di Trento (Italy)

SESSION 8

Room: A08. Wed. 08.50 to 11.20

SAR Signal and Image Processing

Session Chair: **Lorenzo Bruzzone**, Univ. degli Studi di Trento (Italy); **Claudia Notarnicola**, EURAC-Institute of Applied Remote Sensing (Italy)

Joint Session with Conference 7477B: SAR Image Analysis, Modeling, and Techniques

- 08.50: An evaluation of multiresolution despeckling on Cosmo/SkyMed SAR data**, Luciano Alparone, Fabrizio Argenti, Tiziano Bianchi, Univ. degli Studi di Firenze (Italy); Bruno Aiazzi, Stefano Baronti, Istituto di Fisica Applicata Nello Carrara (Italy); Ciro D'Elia, Univ. degli Studi di Cassino (Italy)[7477B-51]
- 09.10: An advanced technique for building detection in VHR SAR images**, Adamo Ferro, Dominik Brunner, Lorenzo Bruzzone, Univ. degli Studi di Trento (Italy)[7477A-30]
- 09.30: Coherent simulation of SAR images for scene analysis and ATR**, Horst Hammer, Karsten Schulz, Forschungsgesellschaft für Angewandte Naturwissenschaften e.V. (Germany)[7477B-53]
- 09.50: Automatic registration of SAR and optical imagery using cross-cumulative residual entropy**, Mark R. Pickering, Xiao Yi, Xiuping Jia, Australian Defence Force Academy (Australia)[7477A-32]
- Coffee Break 10.10 to 10.40



Conference 7477B

Wednesday 2 September 2009 • Proceedings of SPIE Vol. 7477

SAR Image Analysis, Modeling, and Techniques

Conference Chairs: **Claudia Notarnicola**, EURAC-Institute of Applied Remote Sensing (Italy); **Francesco Posa**, Politecnico di Bari (Italy)

Programme Committee: **Richard Bamler**, Deutsches Zentrum für Luft- und Raumfahrt e.V. (Germany); **Giovanni Milillo**, Agenzia Spaziale Italiana (Italy); **Antonio Moccia**, Univ. degli Studi di Napoli Federico II (Italy); **Paolo Pampaloni**, Istituto di Fisica Applicata Nello Carrara (Italy); **Nazzareno Pierdicca**, Univ. degli Studi di Roma, La Sapienza (Italy); **Stefan Schneiderbauer**, EURAC (Italy)

Tuesday 1 September

POSTER SESSION Tues. 17.45 to 19.15

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Statistical and separability properties of the polarimetry SAR matrix elements, Ala Bahrami, Mahmoud Reza Sahebi, Mohammad Javad Valadan Zouj, Salman Ahmady, Maryam Dehghani, K.N.Toosi Univ. of Technology (Iran, Islamic Republic of)[7477B-70]

SAR observations of atmospheric gravity waves over the East China Sea, Weigen Huang, Xilin Gan, Jingsong Yang, Bin Fu, Chen Peng, State Oceanic Administration (China)[7477B-71]

A new ship detection model in ENVISAT SCAN SAR imagery, Chen Peng, State Oceanic Administration (China)[7477B-72]

Estimating 3rd dimension data from SAR images, Ozkan Eren, Zeki Coskun, Istanbul Technical Univ. (Turkey)[7477B-73]

Wednesday 2 September

Introductory Remarks

Room: A08 Wed. 08.45 to 08.50

Lorenzo Bruzzone, Univ. degli Studi di Trento (Italy); **Claudia Notarnicola**, EURAC-Institute of Applied Remote Sensing (Italy);

SESSION 10

Room: A08 Wed. 08.50 to 11.20

SAR Signal and Image Processing I

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

Joint Session with Conference 7477A: Image and Signal Processing for Remote Sensing

08.50: An evaluation of multiresolution despeckling on Cosmo/SkyMed SAR data, Luciano Alparone, Fabrizio Argenti, Tiziano Bianchi, Univ. degli Studi di Firenze (Italy); Bruno Aiazzi, Stefano Baronti, Istituto di Fisica Applicata Nello Carrara (Italy); **Ciro D'Elia**, Univ. degli Studi di Cassino (Italy)[7477B-51]

09.10: An advanced technique for building detection in VHR SAR images, Adamo Ferro, Dominik Brunner, Lorenzo Bruzzone, Univ. degli Studi di Trento (Italy)[7477A-30]

09.30: Coherent simulation of SAR images for scene analysis and ATR, Horst Hammer, Karsten Schulz, Forschungsgesellschaft für Angewandte Naturwissenschaften e.V. (Germany)[7477B-53]

09.50: Automatic registration of SAR and optical imagery using cross-cumulative residual entropy, Mark R. Pickering, Xiao Yi, Xiuping Jia, Australian Defence Force Academy (Australia)[7477A-32]

Coffee Break 10.10 to 10.40

10.40: Real-time optical processor prototype for remote SAR applications, Linda Marchese, Michel Doucet, INO (Canada); Bernd Harnisch, Martin Suess, European Space Agency (Netherlands); Pascal Bourqui, Mathieu Legros, Nichola Desnoyers, Ludovic Guillot, Luc Mercier, Maxime Savard, Anne Martel, Alain Bergeron, INO (Canada)[7477B-54]

11.00: New pattern recognition methods for identifying oil spills from satellite remote sensing data, Fahad A. Alawadi, Univ. of Southampton (United Kingdom)[7477A-33]

Opening Remarks

Room: A08 Wed. 13.55 to 14.00

Francesco Posa, Politecnico di Bari (Italy); **Claudia Notarnicola**, EURAC-Institute of Applied Remote Sensing (Italy)

SESSION 11

Room: A08 Wed. 14.00 to 15.00

Interferometry

Session Chair: **Francesco Posa**, Politecnico di Bari (Italy)

14.00: Terrasar-x InSAR multipass analysis on Venice, Italy, Davide O. Nitti, R. Nutricato, Politecnico di Bari (Italy); Fabio Bovenga, Univ. degli Studi di Bari (Italy); Alberto Refice, Istituto Radio Astronomia, CNR (Italy); Domenico Conte, Maria T. Chiaradia, Luciano Guerriero, Univ. degli Studi di Bari (Italy)[7477B-55]

14.20: PS-INSAR experiments for the analysis of urban ground deformation using STAMPS, Marwa Chendeb El Rai, Elisabeth Simonetto, Ecole Supérieure des Géomètres et Topographes (France)[7477B-56]

14.40: PSInSAR: detection of localized surface deformations with a modified StaMPS-algorithm, Markus Even, Alexander Schunert, Karsten Schulz, Forschungsgesellschaft für Angewandte Naturwissenschaften e.V. (Germany); Uwe Soergel, Leibniz Univ. Hannover (Germany)[7477B-57]

Coffee Break 15.00 to 15.30

SESSION 12

Room: A08 Wed. 15.30 to 17.10

Applications I

Session Chair: **Claudia Notarnicola**, EURAC-Institute of Applied Remote Sensing (Italy)

15.30: L'Aquila Earthquake and Wilkins Ice Shelf disintegration watched by the COSMO-SkyMed constellation, Fabrizio Battazza, Fabio Covello, Gemma Manoni, Agenzia Spaziale Italiana (Italy); Luca Pietranera, e-Geos S.p.A./Telespazio S.p.A. (Italy); Giovanni Valentini, Agenzia Spaziale Italiana (Italy)[7477B-74]

15.50: Iceberg detection using Cosmo-SkyMed satellite constellation images, F. F. Parmiggiani, Istituto di Scienze dell'Atmosfera e del Clima (Italy); M. Moctezuma, D. Morales, Univ. Nacional Autónoma de México (Mexico)[7477B-58]

16.10: Snow cover mapping for hydrological applications, Paolo Pampaloni, Simone Pettinato, Marco Brogioni, Emanuele Santi, Giovanni Macelloni, Simonetta Paloscia, Istituto di Fisica Applicata Nello Carrara, CNR (Italy)[7477B-59]

16.30: A model-based approach for mapping floods using Cosmo-SkyMed data, Luca Pulvirenti, Marco Chini, Univ. degli Studi di Roma La Sapienza (Italy); Laura Candela, Agenzia Spaziale Italiana (Italy); Leila Guerriero, Univ. degli Studi di Roma Tor Vergata (Italy); Nazzareno Pierdicca, Univ. degli Studi di Roma La Sapienza (Italy)[7477B-60]



Conference 7477B

16:50: **The combination of PS InSAR techniques and 'classical' monitoring methods for landslide investigations within the GMES service portfolio**, Stefan Schneiderbauer, EURAC Research (Italy); Andrea Tamburini, Marco Bianchi, Tele-Rilevamento Europa T.R.E. s.r.l. (Italy); Claudia Strada, Provincia Autonoma di Bolzano-Alto Adige (Italy)[7477B-61]

Thursday 3 September

SESSION 13

Room: A08. Thurs. 08.40 to 10.00

Applications II

Session Chair: Francesco Posa, Politecnico di Bari (Italy)

08:40: **Combining bistatic and monostatic radar measurements for retrieving soil moisture**, Nazzareno Pierdicca, Ludovico De Titta, Luca Pulvirenti, Francesca Ticconi, Univ. degli Studi di Roma La Sapienza (Italy); Marco Brogioni, Istituto di Fisica Applicata Nello Carrara (Italy)[7477B-62]

09:00: **Spatial and temporal soil moisture monitoring in semi-arid and humid areas with high resolution ASAR images**, Claudia Notarnicola, EURAC research (Italy); Simonetta Paloscia, Simone Pettinato, Istituto di Fisica Applicata Nello Carrara, CNR (Italy); Giovanni Preziosa, Politecnico di Bari (Italy); Emanuele Santi, Istituto di Fisica Applicata Nello Carrara, CNR (Italy); Bartolomeo Ventura, Univ. degli Studi di Bari (Italy) [7477B-63]

09:20: **Maps of physical and morphological parameters of Titan surface derived from radar and radiometric data**, Bartolomeo Ventura, Univ. degli Studi di Bari (Italy)[7477B-64]

09:40: **Soil moisture retrieval from SAR images as a calibration tool for soil moisture index derived from thermal inertia with MODIS images**, Claudia Notarnicola, Marc Zebisch, EURAC research (Italy); Bartolomeo Ventura, Univ. degli Studi di Bari (Italy)[7477B-65]

Coffee Break 10.00 to 10.30

SESSION 14

Room: A08. Thurs. 10.30 to 11.50

Applications III

Session Chair: Claudia Notarnicola, EURAC-Institute of Applied Remote Sensing (Italy)

10:30: **Comparison of algorithms for the classification of polarimetric SAR data**, Vito Alberga, Dirk C. Borghys, Royal Belgian Military Academy (Belgium); Giuseppe Satalino, Istituto di Studi sui Sistemi Intelligenti per l'Automazione, CNR (Italy); Doroteya K. Staykova, Goeteborg Univ. (Sweden); Alexander Borghgraef, Fabian D. Lapiere, Christiaan Perneel, Royal Belgian Military Academy (Belgium)[7477B-66]

10:50: **Experience gained with texture modeling and classification of 1 meter resolution SAR images**, Daniela Espinoza-Molina, Gottfried Schwarz, Mihai P. Datcu, Deutsches Zentrum für Luft- und Raumfahrt e.V. (Germany)[7477B-67]

11:10: **Urban area structuring mapping using an airborne polarimetric SAR image**, Elisabeth Simonetto, Charbel Malak, Ecole Supérieure des Géomètres et Topographes (France)[7477B-68]

11:30: **Hybrid space-airborne bistatic SAR geometric resolutions**, Antonio Moccia, Alfredo Renga, Univ. degli Studi di Napoli Federico II (Italy)[7477B-69]



Conference 7478

Monday-Thursday 31 August-3 September 2009 • Proceedings of SPIE Vol. 7478

Remote Sensing for Environmental Monitoring, GIS Applications, and Geology IX

Conference Chairs: **Ulrich Michel**, Univ. of Education Heidelberg (Germany); **Daniel L. Civco**, Univ. of Connecticut (USA)

Conference Co-Chairs: **Manfred Ehlers**, Univ. Osnabrück (Germany); **Hermann J. Kaufmann**, GeoForschungsZentrum Potsdam e.V. (Germany)

Programme Committee: **Thomas Blaschke**, Paris-Lodron-Univ. Salzburg (Austria); **Tilman U. Bucher**, Deutsches Zentrum für Luft- und Raumfahrt e.V. (Germany); **Garik Gutman**, NASA Headquarters (USA); **Martin Kappas**, GWDG (Germany); **Rosa Lasaponara**, Istituto di Metodologie per l'Analisi Ambientale (Italy); **Marguerite M. Madden**, The Univ. of Georgia (USA); **Derya Maktav**, Istanbul Technical Univ. (Turkey); **Nicola Masini**, Consiglio Nazionale delle Ricerche (Italy); **Konstantinos G. Nikolakopoulos**, Institute of Geology & Mineral Exploration (Greece); **Florian Savopol**, Natural Resources Canada (Canada); **Karsten Schulz**, Forschungsgesellschaft für Angewandte Naturwissenschaften e.V. (Germany); **Alexander Siegmund**, Pädagogische Hochschule Heidelberg (Germany); **Karl Staenz**, Univ. of Lethbridge (Canada); **John L. van Genderen**, ITC (Netherlands); **Christiane H. Weber**, Univ. Louis Pasteur (France)

Monday 31 August

Opening Remarks

Room: A03 **Mon. 13.50 to 14.00**

Ulrich Michel, Univ. of Education Heidelberg (Germany);
Daniel L. Civco, Univ. of Connecticut (USA)

SESSION 1

Room: A03 **Mon. 14.00 to 15.20**

Radar/SAR Application and Technique

Session Chair: **Karsten Schulz**, Physikalisch-Technische Bundesanstalt (Germany)

14.00: **Detection of ground deformation in the Sharm El-Shiekh broader area (Sinai Peninsula, Egypt) by satellite SAR interferometry**, Tarek A. Seleem, Suez Canal Univ. (Egypt); Michael Fomelis, Univ. of Athens (Greece); Issaak Parcharidis, Harokopio Univ. of Athens (Greece) [7478-01]

14.20: **Segmentation and fusion of building features based on InSAR and optical data**, Antje Thiele, Forschungsgesellschaft für Angewandte Naturwissenschaften e.V. (Germany); Jan Dirk Wegner, Leibniz Univ. Hannover (Germany); Erich Cadario, Karsten Schulz, Forschungsgesellschaft für Angewandte Naturwissenschaften e.V. (Germany); Uwe Soergel, Leibniz Univ. Hannover (Germany) . . . [7478-03]

14.40: **Characterization of the distribution of water vapour for DINSAR studies on the volcanic island of Tenerife, Canary Islands**, Antonio M. Eff-Darwich, Univ. de La Laguna (Spain) . . . [7478-04]

15.00: **CovAmCoh-Analysis: a method to improve the interpretation of high resolution repeat pass SAR images of urban areas**, Karsten Schulz, Antje Thiele, Forschungsgesellschaft für Angewandte Naturwissenschaften e.V. (Germany) . . . [7478-05]

Coffee Break 15.20 to 15.50

SESSION 2

Room: A03 **Mon. 15.50 to 17.30**

Archaeology, Cultural and Natural Heritage Geospatial Infrastructure I

Session Chair: **Rosa Lasaponara**, Consiglio Nazionale delle Ricerche (Italy)

15.50: **Small drones for geo-archeology in the steppes: locating and documenting the archeological heritage of the Orkhon Valley in Mongolia**, Martin E. Oczipka, Frank Lehmann, Michael Neid, Deutsches Zentrum für Luft- und Raumfahrt e.V. (Germany); Birte Ahrens, Jan Bemann, Henny Piezonka, Univ. Bonn (Germany) . . . [7478-06]

16.10: **UAV systems for photogrammetric recording in archaeological areas: problems, suggestions, and products**, Filiberto Chiabrando, Fulvio Rinaudo, Francesco C. Nex, Davide Marenchino, Dario Piatti, Politecnico di Torino (Italy) . . . [7478-07]

16.30: **Some effects of the background removal of interest in archaeological GPR prospecting**, Raffaele Persico, Istituto per i Beni Archeologici e Monumentali, CNR (Italy); Francesco Soldovieri, Istituto per il Rilevamento Elettromagnetico dell'Ambiente, CNR (Italy) . . [7478-02]

16.50: **Integration of lidar data and optical imagery for the archaeological study of Vignale plateau (Lazio): preliminary results**, Rosa Lasaponara, Istituto di Metodologie per l'Analisi Ambientale, CNR (Italy); Yvonne Backe Forsberg, Istituto Svedese di Studi Classici a Roma (Italy); Rossella Coluzzi, Istituto di Metodologie per l'Analisi Ambientale, CNR (Italy); Annibale Guariglia, GEOCART s.r.l. (Italy); Richard Holmgren, ARCDoc (Sweden); Nicola Masini, Istituto per i Beni Archeologici e Monumentali, CNR (Italy) . . . [7478-09]

17.10: **An integrated methodology for landscape reconstruction: the abandoned villages in Basilicata region**, Maria Danese, Marilisa Biscione, Istituto per i Beni Archeologici e Monumentali, CNR (Italy); Rossella Coluzzi, Rosa Lasaponara, Istituto di Metodologie per l'Analisi Ambientale, CNR (Italy); Beniamino Murgante, Univ. degli Studi della Basilicata (Italy); Nicola Masini, Istituto per i Beni Archeologici e Monumentali, CNR (Italy) . . . [7478-10]

Remote Sensing 2009 Plenary Session

Room: B05/06 **Mon. 18.00 to 19.40**

18.00 to 18.10 **Welcome and Introduction**
Steven P. Neeck, NASA Headquarters (USA)
Karin Stein, FGAN-FOM Research Institute for
Optronics and Pattern Recognition (Germany)
2009 Symposium Chairs

18.10. to 18:55 **R&D capacities in the German Earth Observation Program**
Thomas Reiter, German Aerospace Ctr., Germany

18.55 to 19.40 **Earth Science Applications from Space: An Update on the Decadal Survey**
Richard A. Anthes, President, University Corporation
for Atmospheric Research, United States

See p. 7 for information.

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Tuesday 1 September

SESSION 3

Room: B03. Tues. 08.40 to 10.00

Archaeology, Cultural and Natural Heritage Geospatial Infrastructure II

Session Chair: Nicola Masini,
Consiglio Nazionale delle Ricerche (Italy)

08.40: **The contribution of high resolution satellite images to the production of base-maps and cartographies for archaeological research in Turkey and Iraq**, Giuseppe Scardozi, Istituto per i Beni Archeologici e Monumentali, CNR (Italy). [7478-11]

09.00: **Antaeus: an open GIS environment for archaeological applications**, Vito Roberto, Massimiliano Hofer, Univ. degli Studi di Udine (Italy) [7478-109]

09.20: **Aerial monitoring and environmental protection: aerial photography as an instrument for checking landscape damage**, Patrizia Tartara, Istituto per i Beni Archeologici e Monumentali, CNR (Italy) [7478-13]

09.40: **The use of aerial photographs for studying and planning archaeological parks: the samples of Cerveteri and Veio**, Patrizia Tartara, Istituto per i Beni Archeologici e Monumentali, CNR (Italy) [7478-14]

Coffee Break 10.00 to 10.30

SESSION 4

Room: B03. Tues. 10.30 to 11.50

Data Fusion

Session Chair: Pablo H. Rosso, Univ. Osnabrück (Germany)

10.30: **Fusion of multisource and multiscale remote sensing data for water availability assessment in a metropolitan region**, Ni-Bin Chang, Univ. of Central Florida (United States). [7478-15]

10.50: **Ameliorating the spatial resolution of hyperion hyperspectral data**, Konstantinos G. Nikolakopoulos, Panagiotis G. Tsombos, Institute of Geology & Mineral Exploration (Greece); George A. Skianis, Dimitrios A. Vaiopoulos, Univ. of Athens (Greece) [7478-16]

11.10: **Interpretability of TerraSAR-X fused data**, Pablo H. Rosso, Manfred Ehlers, Sascha Klonus, Univ. Osnabrück (Germany) . . . [7478-17]

11.30: **Fusion of KH-series declassified satellite imagery and Landsat MSS data in support of multitemporal urban land cover classification**, Daniel L. Civco, Anna Chabaeva, Jason Parent, Univ. of Connecticut (United States). [7478-18]

Lunch Break 11.50 to 13.10

SESSION 5

Room: B03. Tues. 13.10 to 15.30

Geological Remote Sensing

Session Chair: Panagiotis G. Tsombos,
Institute of Geology & Mineral Exploration (Greece)

13.10: **Rock discrimination and geological mapping of Gabal Gharib area, north eastern desert of Egypt with remote sensing application**, Mohamed Fouad Sadek, Safaa M. Hassan M.D., National Authority for Remote Sensing and Space Sciences (Egypt) [7478-19]

13.30: **Exploration of Wadi Zerka Ma'in rotational fault and its drainage pattern, Eastern of DeadSea, by means of remote sensing and 3D geological model.**, Taleb S. A. Odeh, Richard Gloaguen, Technische Univ. Bergakademie Freiberg (Germany). [7478-20]

13.50: **DEM from ALOS and comparison with airphoto DEM: the case of Thessaloniki, Greece**, Panagiotis G. Tsombos, Konstantinos G. Nikolakopoulos, Institute of Geology & Mineral Exploration (Greece); George Lathourakis, GEO INFORMATION A.E. (Greece) [7478-21]

14.10: **Hyperspectral fluorescence lifetime lidar for geological exploration**, Bruno Bourliaguet, Nicolas Hô, François Babin, Frédéric Émond, INO (Canada) [7478-22]

14.30: **Application of GIS to the assessment of geological hazards in Laoshan district of Qingdao city**, Anqing Ma, Ocean Univ. of China (China) [7478-23]

14.50: **Updating the 1/50.000 geological maps of IGME with remote sensing data, GPS measurements and GIS techniques: the case of KEA Island**, Konstantinos G. Nikolakopoulos, Panagiotis G. Tsombos, Dimitrios Mitropoulos, Institute of Geology & Mineral Exploration (Greece); Bernhard Grasmann, Christoph Iglseder, Konstantin Petrakakis, Monica Müller, Alexander Hugh Rice, Klaus Voit, Andreas Zámolyi, Univ. Wien (Austria); Erich Draganits, Technische Univ. Wien (Austria) [7478-66]

15.10: **Airborne UV/Vis actinic measurements in the lower Antarctic stratosphere**, Fabrizio Ravegnani, Andrea Petritoli, Daniele Bortoli, Samuele Masieri, Margherita Premuda, Giorgio Giovanelli, Istituto di Scienze dell'Atmosfera e del Clima, CNR (Italy) [7478-110]

Coffee Break 15.30 to 16.00

SESSION 6

Room: B03. Tues. 16.00 to 17.40

Environmental Monitoring I

16.00: **Remote sensing techniques for mining waste characterization**, Maria A. Zoran, National Institute of Research & Development for Optoelectronics (Romania) [7478-24]

16.20: **Multitemporal analysis of land cover pattern change using remote sensing data**, Katarzyna Ostapowicz, Izabela Sitko, Jagiellonian Univ. in Krakow (Poland) [7478-25]

16.40: **The online NOAA-NASA OMI/AIRS/MODIS/AVHRR volcanic ash/SO₂ cloud and aerosol index monitoring system**, Gilberto A. Vicente, National Oceanic and Atmospheric Administration (United States); Arlin J. Krueger, Univ. of Maryland, Baltimore County (United States); Wilfrid Schroeder, Univ. of Maryland, College Park (United States); George Serafino, National Oceanic and Atmospheric Administration (United States). [7478-26]

17.00: **Air pollution monitoring through the application of atmospheric correction for Aster imagery**, Diofantos G. Hadjimitsis, Kyriacos Themistocleous, Cyprus Univ. of Technology (Cyprus) [7478-27]

17.20: **Development of distributed radiometer network for validation of satellite aerosol products**, Miguel Bustamente, Barry M. Gross, Fred Moshary, The City College of New York (United States); Shobha Kondrugunta, National Oceanic and Atmospheric Administration (United States) [7478-28]

POSTER SESSION Tues. 17.45 to 19.15

All symposium attendees are invited to attend 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.

Poster presenters may post their poster papers starting at 10.00 on Tuesday in the Conference Area Hallway. Any papers left on the boards following the end time of the poster session will be considered unwanted and will be discarded. SPIE Europe assumes no responsibility for posters left up after the end of the poster session. Poster authors should be at their papers from 17.45 to 19.15 to answer questions from attendees. Attendees are requested to wear their conference registration badges to the poster sessions.

Verification of DSM product by using TerraSAR-X and EROS-B stereo pair images, Yuza Suga, Hiroshima Institute of Technology (Japan); Tomohisa Konishi, Nihon CADIC Co., Ltd. (Japan). [7478-12]

17.45: **Analyses of forest fire danger based on remote sensing in subtropical monsoon zone**, Shu-E Huang, Meteorological Research Institute of Jiangxi Province (China) [7478-30]

Fusion of Landsat TM and ground spectrometry data in monitoring of non-operating mine, Denitsa Borisova, Hristo N. Nikolov, Solar-Terrestrial Influences Lab. (Bulgaria) [7478-67]

Morphological and lithological aspects in the North-eastern Libyan desert by remote sensing, Gabriele Bitelli, Pietro Vittorio Curzi, Emanuele Mandanici, Univ. degli Studi di Bologna (Italy) [7478-68]

Modeling techniques for gaining additional urban space, Holger Thunig, Simone Naumann, Alexander Siegmund, Pädagogische Hochschule Heidelberg (Germany) [7478-69]

Monitored landscape change of Lake Baiyangdian wetland with dynamic reed area based on remote sensing, Zhen Wang, Suying Chen, Shengwei Zhang, Hongjun Li, Yuping Lei, Institute of Genetics and Developmental Biology (China) [7478-70]



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- East-Asia land surface emissivity maps generated from Terra/ASTER data archives**, Hideyuki Tonooka, Ibaraki Univ. (Japan); Minoru Urai, National Institute of Advanced Industrial Science and Technology (Japan) [7478-71]
- Flood disaster monitoring with ALOS/PALSAR observation**, Noriyuki Kawano, Earth Observation Research Center, Japan Aerospace Exploration Agency (Japan) [7478-72]
- Monitoring of geological activity on astronomical sites of the Canary Islands, Hawaii and Chile.**, Antonio M. Eff-Darwich, Univ. de La Laguna (Spain) [7478-73]
- Study on forest fire danger district division in Lushan mountain based on RS and GIS**, Jinxiang Xiao, Jiangxi Agricultural Univ. (China) . [7478-74]
- Estimation of Taiwanese farmland consolidation**, Chun-Pin Chang, Chung Chou Univ. of Technology (Taiwan); Yi-Chang Chen, National Chin-Yi Univ. of Technology (Taiwan) [7478-75]
- Detecting the change of Lianyungang during the period of 1987-2007 using remote sensing**, Haiying Li, Hongchun Peng, Meiping Sun, Huaihai Institute of Technology (China); Ji Liang, Cold and Arid Regions Environmental and Engineering Research Institute (China) [7478-76]
- Detection of land-use/land-cover change in the Hohe Tauern National Park (Austria) using an object-based classification approach: first results**, Katharina Kern, Wolfgang Sulzer, Gerhard Karl Lieb, Univ. Graz (Austria) [7478-78]
- Research on the dynamic change of ecosystem benefits in Hangzhou Xixi wetland based on Citygreen model and remote sensing**, Qian Cheng, Xiuju Wu, Zhejiang Gongshang Univ. (China) [7478-79]
- Beach hydromorphological classification through image classification techniques applied to remotely sensed data**, Ana C. Teodoro, Joaquim Pais-Barbosa, Fernando Veloso-Gomes, Francisco Taveira-Pinto, Univ. do Porto (Portugal) [7478-80]
- Key technologies of land use information extraction based upon multisource remote sensing data: a case study of hilly-plain transition region in the middle and lower reaches of the Yellow River**, Guifang Liu, Heli Lu, Henan Univ. (China) and Institute of Geographical Sciences and Natural Resources Research (China) [7478-82]
- Algorithm for image fusion based on DEM and remote sensing image**, Xiuju Wu, Qian Cheng, Zhejiang Gongshang Univ. (China) [7478-83]
- The impact study of urban heat island effect caused by surface land use changes**, Tien-Yin Chou, Chih-Hung Liu, Yuanling Chang, Feng Chia Univ. (Taiwan) [7478-84]
- Land-cover change and its time-series analysis using remotely sensed imageries in Zhoushan Islands from 1970**, Jianyu Chen, State Oceanic Administration (China) [7478-85]
- Spatiotemporal landscape pattern change of Xixi urban wetland growth in Hangzhou**, Daijian Tang, Qian Cheng, Qijia Lou, Zhejiang Gongshang Univ. (China) [7478-86]
- Urban expansion of Suzhou city and its driving forces analysis**, Bo Liu, Institute of Remote Sensing Applications (China) and Graduate Univ. of the Chinese Academy of Sciences (China); Jinyong Xu, Zengxiang Zhang, Institute of Remote Sensing Applications (China); Bing Zhang, Ctr. for Earth Observation and Digital Earth (China) [7478-87]
- The effects of chlorophyll-a and SST in the South China Sea area by typhoon near last decade**, Dongyang Fu, Guangdong Ocean Univ. (China); Delu Pan, State Oceanic Administration (China) [7478-88]
- A comparative analysis of land cover changes among different source regions of dust emission in East Asia**, Kyoung-Jin Pi, Kyung-Soo Han, Jong-Min Yeom, Ga-Lam Lee, Soo-Jae Park, Pukyong National Univ. (Korea, Republic of) [7478-89]
- Mechanical monolithic tiltmeter for low frequency measurements**, Fausto Acernese, Univ. degli Studi di Salerno (Italy); Rosario De Rosa, Univ. degli Studi di Napoli Federico II (Italy); Gerardo Giordano, Rocco Romano, Univ. degli Studi di Salerno (Italy); Fabrizio Barone, Istituto Nazionale di Fisica Nucleare (Italy) [7478-90]
- Analysis of Land use change in the Manasi oasis of arid region, northwestern China using remote sensing and GIS**, Xiaohong Gao, Qinghai Normal Univ. (China); Ji Liang, Cold and Arid Regions Environmental and Engineering Research Institute (China); Shixin Wu, Xinjiang Institute of Ecology and Geography (China) [7478-91]
- Tropospheric profile of NO₂ over the Po Valley measured with Scan DOAS spectrometer**, Samuele Masieri, Istituto di Scienze dell'Atmosfera e del Clima, CNR (Italy); Daniele Bortoli, Istituto di Scienze dell'Atmosfera e del Clima, CNR (Italy) and Univ. de Evora (Portugal); Andrea Petritoli, Ivan Kostadinov, Margherita Premuda, Fabrizio Ravegnani, Giorgio Giovanelli, Istituto di Scienze dell'Atmosfera e del Clima, CNR (Italy); Enrico Pisoni, Luisa Volta, Claudio Carnevale, Univ. di Brescia (Italy) [7478-92]
- Object-oriented image analysis for monitoring urban expansion in the city of Riyadh, Saudi Arabia**, Housein A. Mashee, Technical Collage in Riyadh (Saudi Arabia) [7478-93]
- Long term seismic noise acquisition and analysis in the Homestake mine with tunable monolithic sensors**, Fausto Acernese, Univ. degli Studi di Salerno (Italy); Rosario De Rosa, Univ. degli Studi di Napoli Federico II (Italy); Riccardo De Salvo, California Institute of Technology (United States); Gerardo Giordano, Univ. degli Studi di Salerno (Italy); Jan Harms, Vuk Mandic, Univ. of Minnesota, Twin Cities (United States); Angelo Sajeve, Univ. di Pisa (Italy); Thomas Trancynger, DUSEL (United States); Fabrizio Barone, Istituto Nazionale di Fisica Nucleare (Italy) [7478-94]
- Satellite and geophysical data for earthquake precursors assessment**, Maria A. Zoran, National Institute of Research & Development for Optoelectronics (Romania) [7478-96]
- GASCOD/A4pi UV-Vis spectroradiometer: airborne and ground-based deployments**, Ivan Kostadinov, Giorgio Giovanelli, Daniele Bortoli, Samuele Masieri, Andrea Petritoli, Margherita Premuda, Fabrizio Ravegnani, Istituto di Scienze dell'Atmosfera e del Clima, CNR (Italy) [7478-97]
- Calculation of light field in 3D cylinder cloud for greenhouse gases monitoring via GOSAT**, Dmitry A. Klyuykov, Vladimir P. Budak, Moscow Power Engineering Institute Technical Univ. (Russian Federation) [7478-98]
- Mining spectral libraries to study sensors' discrimination ability**, Germain Forestier, Univ. de Strasbourg (France); Jordi Inglada, Ctr. National d'Etudes Spatiales (France); Cédric Wemmert, Pierre Gancarski, Univ. de Strasbourg (France) [7478-99]
- Estimation of virtual dimensionality of hyperspectral data by principle component analysis and higher order statistical method**, Majid M. Oskoui, Sahand Univ. of Technology (Iran, Islamic Republic of) [7478-100]
- Spatial data requirements of carbon balance modelling**, Markus Törmä, Pekka Härmä, SYKE Finnish Environment Institute (Finland); Tiina Markkanen, Tuula Aalto, Finnish Meteorological Institute (Finland) [7478-101]
- Tunable mechanical monolithic horizontal sensor with high Q for low frequency seismic noise measurement**, Fausto Acernese, Univ. degli Studi di Salerno (Italy); Rosario De Rosa, Gerardo Giordano, Univ. degli Studi di Napoli Federico II (Italy); Rocco Romano, Univ. degli Studi di Salerno (Italy); Fabrizio Barone, Istituto Nazionale di Fisica Nucleare (Italy) [7478-102]
- Digital and interactive learning modules: a way to integrate remote sensing methods in secondary education**, Kerstin Voss, Roland Goetzke, Henryk Hodam, Univ. Bonn (Germany) [7478-103]
- Terrestrial chemical spill information system through remote sensing, GIA and V.B. 6.0**, G. S. Dwarakish, Angel Jebas, G. Srinikethan, National Institute of Technology Karnataka (India); Usha Natesan, Anna Univ. (India) [7478-104]
- Adaptation of building extraction rule sets derived from MFC3 and UltraCamD arial image data sets**, Anna Maria Trosset, Frank Lehmann, Tilman U. Bucher, Deutsches Zentrum für Luft- und Raumfahrt e.V. (Germany) [7478-105]
- The most effective statistical approach to correct environmental satellite data**, Md Z. Rahman, LaGuardia Community College (United States); Leonid M. Roytman, The City College of New York (United States) [7478-106]
- Evaluating the ecotourism potentials of Naharkhoran area in Gorgan**, Jafar Oladi, Natural Resource Univ. (Iran, Islamic Republic of) . [7478-107]
- Spatial explicit assessment of the rural exodus syndrome in the Mediterranean area**, Christof J. Weissteiner, Consultant (Italy); Kristin Boettcher, European Commission Joint Research Ctr. (Italy); Mirco Boschetti, Daniela Stroppiana, Pietro Alessandro Brivio, Paola Carrara, Istituto per il Rilevamento Elettromagnetico dell'Ambiente, CNR (Italy) [7478-108]



Conference 7478

Wednesday 2 September

SESSION 7

Room: A03. Wed. 09.00 to 10.00

Environmental Monitoring II

Session Chair: **Anna Maria Trosset**, Deutsches Zentrum für Luft- und Raumfahrt e.V. (Germany)

09.00: **Accuracy improving for image based forest fire recognizing and spatial positioning**, Qingwen Qi, Lily Jiang, Institute of Geographical Sciences and Natural Resources Research (China); Chaohui Guo, China Ctr. for Resource Satellite Data and Applications (China); An Zhang, Xi Cheng, Institute of Geographical Sciences and Natural Resources Research (China) [7478-29]

09.20: **A remote sensing constellation for world wide wildfire monitoring**, Raymond M. Bell, Jr., Douglas B. Helmuth, Christopher A. Lents, Andrew T. Cochrane, Lockheed Martin Corp. (United States) [7478-31]

09.40: **Environmental monitoring of Galway Bay: fusing data from remote and in-situ sources**, Edel M. O'Connor, Dublin City Univ. (Ireland); Jer P. Hayes, IBM Ireland (Ireland); Alan F. Smeaton, Noel E. O'Connor, Dermot Diamond, Dublin City Univ. (Ireland) [7478-32]

Coffee Break 10.00 to 10.30

SESSION 8

Room: A03. Wed. 10.30 to 11.50

Environmental Monitoring III

Session Chair: **Michael Wurm**, Deutsches Zentrum für Luft- und Raumfahrt e.V. (Germany)

10.30: **Applications of Terra MODIS data for Iraq marshland monitoring**, Sergio Teggi, Francesca Despini, Univ. degli Studi di Modena e Reggio Emilia (Italy); Lorenza Bovio, Francesco Immordino, MED INGEGNERIA (Italy) [7478-33]

10.50: **Water stress monitoring using NDWI around deserts of China and Mongolia**, Ga-Lam Lee, Kyung-Soo Han, Jong-Min Yeom, Kyoung-Jin Pi, Soo-Jae Park, Pukyong National Univ. (Korea, Republic of) [7478-34]

11.10: **Evaluation on wetland classification in Yancheng Natural Reserve, China using HJ-1 Data**, Shuhe Zhao, Chunjing Wen, Chunhong Wang, Yun Li, Ping Zuo, Nanjing Univ. (China) [7478-35]

11.30: **Glacier surface change monitoring using multi-temporal satellite imagery, case study: Alamchal glacier, northern Iran**, Mahsa Moussavi, Mohammad Javad Valadan Zouj, Mahmoud Reza Sahebi, Yousef Rezaei, K.N.Toosi Univ. of Technology (Iran, Islamic Republic of) [7478-36]

Lunch Break 11.50 to 13.20

SESSION 9

Room: A03. Wed. 13.20 to 15.00

Urban Remote Sensing

Session Chair: **Antje Thiele**, FGAN-FOM (Germany)

13.20: **Detecting settlement types as key indicators for urban dynamic with SPOT5-data in the mega-urban area of the Pearl River Delta (China)**, Bodo Coenradie, Digitale Dienste Berlin (Germany); Sebastian d'Oleire-Oltmanns, Birgit Kleinschmit, Technische Univ. Berlin (Germany) [7478-37]

13.40: **The effectiveness of morphology and street networks in determining models of urban growth at different spatial scales of analysis**, Nicola Colaninno, Bahaaeddin I. Alhaddad, Josep Roca, Univ. Politècnica de Catalunya (Spain) [7478-38]

14.00: **Urban landcover mapping using different spectral mixture analysis methods**, Liviu-Florin V. I. Zoran, Carmen C. Ionescu Golovanov, Polytechnical Univ. of Bucharest (Romania); Maria A. Zoran, National Institute of Research & Development for Optoelectronics (Romania) [7478-39]

14.20: **Topographical change detection from UAV imagery in Tianjin, PR China**, Wen Ling Xuan, Beijing Univ. (China) [7478-40]

14.40: **Research on the model of urban land use change cellular automata based on fuzzy reasoning**, Hao Wu, Wuhan Univ. of Technology (China) [7478-41]

Coffee Break 15.00 to 15.30

SESSION 10

Room: A03. Wed. 15.30 to 16.30

Environmental Monitoring IV

Session Chair: **Claas Olehowski**, Pädagogische Hochschule Heidelberg (Germany)

15.30: **Monitoring coastal water quality in a municipal beach in Paphos-Cyprus using aster image data**, Diofantos G. Hadjimitsis, Cyprus Institute of Technology (Cyprus); Marinos G. Hadjimitsis, Cyprus Univ. of Technology (Cyprus) [7478-42]

15.50: **Estimation of water quality parameters using ASTER data in case-II waters of Mumbai, West Coast of India**, Mohor Bhattacharya, Yogesh Y. Agarwadkar, Samee Azmi, Arun B. Inamdar, Indian Institute of Technology, Bombay (India) [7478-43]

16.10: **Monitoring vegetation dynamics with SPOT-VEGETATION NDVI time-series data in Tarim Basin, Xinjiang, China**, Hongxiu Wan, Zhandong Sun, Nanjing Institute of Geography and Limnology (China); Yongming Xu, Nanjing Univ. (China) and Nanjing Univ. of Information Science & Technology (China) [7478-44]

SESSION 11

Room: A03. Wed. 16.30 to 17.30

Environmental Monitoring V

Session Chair: **Hannes Taubenböck**, Deutsches Zentrum für Luft- und Raumfahrt e.V. (Germany)

16.30: **Remote Sensing and GIS-based study of potential erosion and degradation areas of the island of Fogo (Cape Verde Islands)**, Claas Olehowski, Alexander Siegmund, Pädagogische Hochschule Heidelberg (Germany) [7478-45]

16.50: **GIS application for spatial landslide analysis using statistical based models**, Biswajeet Pradhan, Dresden Univ. of Technology (Germany); Saro Lee, Korea Institute of Geoscience & Mineral Resources (Korea, Republic of); Manfred F. Buchroithner, Dresden Univ. of Technology (Germany) [7478-46]

17.10: **Forest crown closure assessment using multispectral imagery**, Juwairia Mahboob, Institute of Geographical Information Systems (Pakistan) [7478-47]

Thursday 3 September

SESSION 12

Room: A03. Thurs. 08.30 to 09.50

Airborne and High Resolution Remote Sensing I

Session Chair: **Frank Lehmann**, Deutsches Zentrum für Luft- und Raumfahrt e.V. (Germany)

08.30: **Airborne camera and spectrometer experiments and data evaluation**, Frank Lehmann, Tilman U. Bucher, Sebastian Pless, Jürgen Wohlfeil, Heiko Hirschmüller, Deutsches Zentrum für Luft- und Raumfahrt e.V. (Germany) [7478-48]

08.50: **A modular, interactive software-concept for radiometric and geometric correction of airborne and spaceborne linescanner images**, Jürgen Wohlfeil, Tilman U. Bucher, Deutsches Zentrum für Luft- und Raumfahrt e.V. (Germany) [7478-49]

09.10: **Automated object recognition derived from MFC3 arial image data using object based classification**, Martin E. Oczipka, Anna Maria Trosset, Frank Lehmann, Deutsches Zentrum für Luft- und Raumfahrt e.V. (Germany) [7478-50]

09.30: **Solutions for near real time cartography from a mini-quadrotors UAV**, Antoine Gademer, Ecole Supérieure d'Informatique Electronique Automatique (France) and Univ. Paris-Est Marne-la-Vallée (France); Laurent Beaudoin, Loïca Avanthey, Vincent Germain, Ecole Supérieure d'Informatique Electronique Automatique (France); Jean-Paul Rudant, Univ. Paris-Est Marne-la-Vallée (France) [7478-51]

Coffee Break 09.50 to 10.20



Conference 7478

SESSION 13

Room: A03. Thurs. 10.20 to 11.40

Airborne and High Resolution Remote Sensing II

Session Chair: **Tilman U. Bucher**, Deutsches Zentrum für Luft- und Raumfahrt e.V. (Germany)

10.20: **Airborne MFC 3-1 for large-scale mapping of densely populated areas at the Andaman Sea coast of Thailand**, Martin E. Oczipka, Frank Lehmann, Deutsches Zentrum für Luft- und Raumfahrt e.V. (Germany); Florian Siegert, Florian Moder, RSS Remote Sensing Solutions GmbH (Germany); Ralf Ludwig, Ludwig-Maximilians-Univ. München (Germany); Horst Sterr, Univ. of Kiel (Germany) [7478-52]

10.40: **High resolution airborne image data for 3D modelling and risk assessment of tsunami hazards**, Martin E. Oczipka, Frank Lehmann, Deutsches Zentrum für Luft- und Raumfahrt e.V. (Germany); Florian Moder, Florian Siegert, RSS Remote Sensing Solutions GmbH (Germany) [7478-53]

11.00: **Vulnerability assessment towards tsunami threats using multisensoral remote sensing data**, Hannes Taubenböck, Michael Wurm, Joachim Post, Achim Roth, Günter Strunz, Stefan W. Dech, Deutsches Zentrum für Luft- und Raumfahrt e.V. (Germany) [7478-54]

11.20: **Derivation of population distribution for vulnerability assessment in flood-prone German cities using multisensoral remote sensing data**, Michael Wurm, Deutsches Zentrum für Luft- und Raumfahrt e.V. (Germany) and Julius-Maximilians-Univ Würzburg (Germany); Hannes Taubenböck, Achim Roth, Stefan W. Dech, Deutsches Zentrum für Luft- und Raumfahrt e.V. (Germany) [7478-55]

Lunch Break 11.40 to 13.20

SESSION 14

Room: A03. Thurs. 13.20 to 15.00

Classification - Evaluation

Session Chair: **Jochen Schiewe**, HafenCity Univ. Hamburg (Germany)

13.20: **From fuzzy and object based classification to fuzzy and object based uncertainty evaluation**, Jochen Schiewe, HafenCity Univ. Hamburg (Germany); Manfred Ehlers, Univ. Osnabrück (Germany); Christoph Kinkeldey, HafenCity Univ. Hamburg (Germany); Daniel Tomowski, Univ. Osnabrück (Germany) [7478-56]

13.40: **Fuzzy segmentation for geographic object-based image analysis**, Ivan A. Lizarazo, Paul Elsner, Birkbeck Univ. of London (United Kingdom) [7478-57]

14.00: **The analysis accuracy assessment of Corine land cover**, Yraida Romano, Bahaaeddin I. Alhaddad, Josep Roca, Univ. Politècnica de Catalunya (Spain) [7478-58]

14.20: **Geostatistical regularization of inverse models for the retrieval of vegetation biophysical variables**, Clement Atzberger, European Commission Joint Research Ctr. (Italy); Katja Richter, Dept. of Agricultural Engineering and Agronomy (DIAAT), Univ. Neaples (Italy) [7478-59]

14.40: **Comparative analysis of multitemporal NDVI-based land use**, Ni-Bin Chang, Univ. of Central Florida (United States) [7478-60]

Coffee Break 15.00 to 15.30

SESSION 15

Room: A03. Thurs. 15.30 to 16.30

Environmental Monitoring VI

Session Chair: **Daniel L. Civco**, Univ. of Connecticut (USA)

15.30: **Remote sensing based modelling time series of fractional vegetation cover and leaf area index for grassland region in Central Asia**, Pavel A. Propastin, Martin Kappas, Georg-August-Univ. Göttingen (Germany) [7478-61]

15.50: **Multi-temporal airborne remote sensing of intertidal sediment dynamics**, Paul Elsner, Birkbeck Univ. of London (United Kingdom) [7478-62]

16.10: **Cruise Ships flow rate emission evaluated by means of a passive DOAS instrument**, Samuele S. Masieri, Margherita Premuda, Istituto di Scienze dell'Atmosfera e del Clima, CNR (Italy); Daniele Bortoli, Istituto di Scienze dell'Atmosfera e del Clima, CNR (Italy) and Univ. de Evora (Portugal); Ivan Kostadinov, Andrea Petritoli, Fabrizio Ravegnani, Giorgio Giovanelli, Istituto di Scienze dell'Atmosfera e del Clima, CNR (Italy) [7478-64]

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Please note the room change scheduled for Tuesday, 1 September.

Conf. 7478 will be in room A03 on Monday, Wednesday & Thursday. On Tuesday only, the conference will move to room B03.

Conference 7479

Monday-Tuesday 31 August-1 September 2009 • Proceedings of SPIE Vol. 7479

Lidar Technologies, Techniques, and Measurements for Atmospheric Remote Sensing V

Conference Chair: **Upendra N. Singh**, NASA Langley Research Ctr. (USA)

Conference Co-Chair: **Gelsomina Pappalardo**, Consiglio Nazionale delle Ricerche (Italy)

Programme Committee: **Arnoud Apituley**, Rijksinstituut voor Volksgezondheid en Milieu (Netherlands); **Andreas Behrendt**, Univ. Hohenheim (Germany); **Gerhard Ehret**, DLR Standort Oberpfaffenhofen (Germany); **Martin J. Endemann**, European Space Research and Technology Ctr. (Netherlands); **Pierre H. Flamant**, Ecole Polytechnique (France); **Bruce M. Gentry**, NASA Goddard Space Flight Ctr. (USA); **Animesh Jha**, Univ. of Leeds (United Kingdom); **Philippe L. Keckhut**, Ctr. National de la Recherche Scientifique (France); **Gennadii G. Matvienko**, Institute of Atmospheric Optics (Russian Federation); **Roland Neuber**, Alfred-Wegener-Institut für Polar- und Meeresforschung (Germany); **Doina N. Nicolae**, National Institute of Research & Development for Optoelectronics (Romania); **Alexandros D. Papayannis**, National Technical Univ. of Athens (Greece); **Valentin B. Simeonov**, Ecole Polytechnique Fédérale de Lausanne (Switzerland); **Ulla Wandinger**, Leibniz-Institut für Troposphärenforschung e.V. (Germany); **Matthias Wiegner**, Ludwig-Maximilians-Univ. München (Germany); **David M. Winker**, NASA Langley Research Ctr. (USA)

Monday 31 August

Opening Remarks

Room: A04 Mon. 08.25 to 08.30

Upendra N. Singh, NASA Langley Research Ctr. (USA)

SESSION 1

Room: A04 Mon. 08.30 to 11.50

Clouds and Aerosols

Session Chairs: **Upendra N. Singh**, NASA Langley Research Ctr. (USA); **Gelsomina Pappalardo**, Consiglio Nazionale delle Ricerche (Italy)

08.30: **Aerosol optical properties from multiwavelength lidar measurements in Romania** (*Invited Paper*), Doina N. Nicolae, Camelia L. Talianu, Anca V. Nemuc, National Institute of Research & Development for Optoelectronics (Romania) [7479-01]

09.00: **Aerosol investigation with multiwavelength lidar**, Anna K. Jagodnicka, Michal Posyniak, Tadeusz Stacewicz, Szymon P. Malinowski, Univ. of Warsaw (Poland) [7479-02]

09.20: **EZ lidar dust transit phenomena observations in Seoul, Korea**, Simone Lolli, Laurent Sauvage, Sophie Loaec, Leosphere France (France) [7479-03]

09.40: **Initial approach in biomass burning aerosol transport tracking with satellites, sunphotometer and lidar in Brazil**, Eduardo Landulfo, Fabio J. S. Lopes, Instituto de Pesquisas Energéticas e Nucleares (Brazil) [7479-04]

Coffee Break 10.00 to 10.30

10.30: **Dynamic PM2.5 estimators based on PBL height and aerosol climatology**, Barry M. Gross, Lina Cordero, Fred Moshary, Samir A. Ahmed, The City College of New York (United States) [7479-05]

10.50: **Application of principal component analysis to lidar data filtering and analysis**, Vladimir V. Zavyalov, Gail E. Bingham, Heidi Johnson, Utah State Univ. (United States) [7479-06]

11.10: **Retrieving atmospheric properties with an optimal estimation inverse method of lidar measurements**, Eduardo Landulfo, Wellington C. de Jesus, Instituto de Pesquisas Energéticas e Nucleares (Brazil) [7479-07]

11.30: **Simple backscattering lidar system for detection of clouds**, Sangapillai Veerabuthiran, Missile Facilities Laser Science and Technology Ctr. (India) [7479-08]

Lunch Break 11.50 to 13.30

SESSION 2

Room: A04 Mon. 13.30 to 15.00

CALIPSO—Space-based Observation

Session Chairs: **Doina N. Nicolae**, National Institute of Research & Development for Optoelectronics (Romania); **Eduardo Landulfo**, Instituto de Pesquisas Energéticas e Nucleares (Brazil)

13.30: **Characterizing the 3D global distribution of aerosol with CALIPSO observations** (*Invited Paper*), David M. Winker, NASA Langley Research Ctr. (United States); Chieko Kittaka, Science Systems and Applications, Inc. (United States) [7479-09]

14.00: **Analysis of the EARLINET correlative measurements for CALIPSO**, Gelsomina Pappalardo, Lucia Mona, Istituto di Metodologie per l'Analisi Ambientale, CNR (Italy); Ulla Wandinger, Ina Mattis, Leibniz-Institut für Troposphärenforschung e.V. (Germany); Holger Linne, Max-Planck-Institut für Meteorologie (Germany); Aldo Amodeo, Istituto di Metodologie per l'Analisi Ambientale, CNR (Italy); Albert Ansmann, Leibniz-Institut für Troposphärenforschung e.V. (Germany); Arnoud Apituley, Rijksinstituut voor Volksgezondheid en Milieu (Netherlands); Lucas Alados-Arboledas, Univ. de Granada (Spain); Dimitris S. Balis, Aristotle Univ. of Thessaloniki (Greece); Anatoli Chaikovskiy, Institute of Physics (Belarus); Adolfo Comeron, Univ. Politècnica de Catalunya (Spain); Giuseppe D'Amico, Istituto di Metodologie per l'Analisi Ambientale, CNR (Italy); Volker Freudenthaler, Ludwig-Maximilians-Univ. München (Germany); Aldo Giunta, Istituto di Metodologie per l'Analisi Ambientale, CNR (Italy); Ivan V. Grigorov, Institute of Electronics (Bulgaria); Detlef Müller, Leibniz-Institut für Troposphärenforschung e.V. (Germany); Alexandros D. Papayannis, National Technical Univ. of Athens (Greece); Maria Rita Perrone, Univ. del Salento (Italy); Aleksander Pietruczuk, Institute of Geophysics (Poland); Manuel Pujadas, Ctr. de Investigaciones Energéticas, Medioambientales y Tecnológicas (Spain); Vincenzo Rizi, Univ. degli Studi dell'Aquila (Italy); Nicola Spinelli, Consorzio Nazionale Interuniversitario per le Scienze Fisiche della Materia (Italy); Matthias Wiegner, Ludwig-Maxim [7479-10]



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14.20: Coordinated lidar observations of Saharan dust over Europe in the frame of Earlinet-ASOS project during Calipso overpasses: a strong dust case study analysis with modeling support, Alexandros D. Papayannis, National Technical Univ. of Athens (Greece); Vassilis Amiridis, National Observatory of Athens (Greece); Lucia Mona, Istituto di Metodologie per l'Analisi Ambientale, CNR (Italy); Rodelize-Elisabeth Mamouri, National Technical Univ. of Athens (Greece); Arnoud Apituley, Rijksinstituut voor Volksgezondheid en Milieu (Netherlands); Lucas Alados-Arboledas, Univ. de Granada (Spain); Dimitris S. Balis, Aristotle Univ. of Thessaloniki (Greece); Anatoli Chaikovski, B.I. Stepanov Institute of Physics (Belarus); Ferdinando de Tomasi, Univ. del Salento (Italy); Ivan V. Grigorov, Institute of Electronics (Bulgaria); Ove K. Gustafsson, Swedish Defence Research Agency (Sweden); Holger Linne, Max-Planck-Institut für Meteorologie (Germany); Ina Mattis, Leibniz-Institut für Troposphärenforschung e.V. (Germany); Valentin Mitev, Observatoire Cantonal de Neuchâtel (Switzerland); Francisco Molero, Ctr. de Investigaciones Energéticas, Medioambientales y Tecnológicas (Spain); Detlef Müller, Gwangju Institute of Science and Technology (Korea, Republic of); Doina N. Nicolae, National Institute of Research & Development for Optoelectronics (Romania); Carlos Perez, Ctr. Nacional de Supercomputación (Spain); Aleksander Pietruczuk, Institute of Geophysics (Poland); Jean-Philippe Putaud, European Commission Joint Research Ctr. (Italy); Francois Ravetta, Univ. Pierre et Marie Curie (France); Vincenzo Rizi, Univ. degli Studi dell'Aquila (Italy); Franziska Schnell, Ludwig-Maximilians. [7479-11]

14.40: Three+two Raman lidar system configuration for space-borne active remote sensing system validation over Athens, Greece in the frame of the EARLINET-ASOS and ESA-CALIPSO projects, Rodelize-Elisabeth Mamouri, Alexandros D. Papayannis, National Technical Univ. of Athens (Greece); Vassilis Amiridis, National Observatory of Athens (Greece); Panayotis Kokkalis, National Technical Univ. of Athens (Greece); Carlos Perez, Ctr. Nacional de Supercomputación (Spain); Georgios Tsaknakis, National Technical Univ. of Athens (Greece). [7479-12]
Coffee Break 15.00 to 15.30

SESSION 3

Room: A04. Mon. 15.30 to 17.40
DIAL and Raman Measurements

Session Chairs: **David M. Winker**, NASA Langley Research Ctr. (USA); **Thomas D. Wilkerson**, Space Dynamics Lab. (USA)

15.30: Performance modeling for A-SCOPE, a space borne lidar measuring atmospheric CO₂ (Invited Paper), Jerome C. Caron, Yannig Durand, Jean-Loup Bezy, Roland Meynart, European Space Research and Technology Ctr. (Netherlands). [7479-13]

16.00: Preliminary tropospheric ozone DIAL, water vapour and aerosol lidar measurements during ARC-IONS, Kevin B. Strawbridge, Bernard J. Firanski, Environment Canada (Canada). [7479-14]

16.20: A novel 2 μm, frequency conversion based, laser transmitter for CO₂ DIAL, Myriam Raybaut, Antoine Godard, Ajmal K. Mohamed, Michel Lefebvre, ONERA (France); Fabien Marnas, Pierre H. Flamant, Lab. de Météorologie Dynamique (France); Axel Bohman, Peter Geiser, Peter Kaspersen, Norsk Elektro Optikk A/S (Norway) [7479-15]

16.40: Raman water vapour concentration measurements for the reduction of false alarms in forest fire detection, Pasquale Gaudio, Carlo Bellecci, Michela Gelfusa, Andrea Malizia, Maria Richetta, Piergiorgio Ventura, Univ. degli Studi di Roma Tor Vergata (Italy); Teresa Lo Feudo, Univ. della Calabria (Italy). [7479-16]

17.00: DIAL sensed C₂H₄ and C₂H₄:O₃ mutual coherence, Taieb Gasmi, Saint Louis Univ., Madrid Campus (Spain) [7479-17]

17.20: First principle methodology for lidar Raman water vapor calibration, Eduardo Landulfo, Ani S. Torres, Renata F. Da Costa, Instituto de Pesquisas Energéticas e Nucleares (Brazil); David N. Whiteman, NASA Goddard Space Flight Ctr. (United States); Demetrius D. Venable, Howard Univ. (United States). [7479-18]

Remote Sensing 2009 Plenary Session

Room: B05/06 Mon. 18.00 to 19.40

18.00 to 18.10 Welcome and Introduction
Steven P. Neeck, NASA Headquarters (USA)
Karin Stein, FGAN-FOM Research Institute for Optronics and Pattern Recognition (Germany)
2009 Symposium Chairs

18.10. to 18:55 R&D capacities in the German Earth Observation Program
Thomas Reiter, German Aerospace Ctr., Germany

18.55 to 19.40 Earth Science Applications from Space: An Update on the Decadal Survey
Richard A. Anthes, President, University Corporation for Atmospheric Research, United States
See p. 7 for information.

Tuesday 1 September

SESSION 4

Room: A04. Tues. 08.30 to 11.30

Wind Observations

Session Chairs: **Alexandros D. Papayannis**, National Technical Univ. of Athens (Greece); **Barry M. Gross**, The City College of New York (USA)

08.30: Development, deployment and wind profiling from a 2-micron, coherent-detection Doppler lidar transceiver during wind measurement intercomparison (Invited Paper), Upendra N. Singh, Grady J. Koch, Michael J. Kavaya, Jirong Yu, Jeffrey Y. Beyon, NASA Langley Research Ctr. (United States) [7479-19]

09.00: Visible wind: wind profile measurements at low altitude, Thomas D. Wilkerson, Bill Bradford, Space Dynamics Lab. (United States); Alan B. Marchant, Utah State Univ. (United States); Cordell Wright, Thomas Apedaile, Space Dynamics Lab. (United States). [7479-20]

09.20: Development of the one-sided nonlinear adaptive Doppler shift estimation techniques, Jeffrey Y. Beyon, Grady J. Koch, Upendra N. Singh, Michael J. Kavaya, NASA Langley Research Ctr. (United States); Judith A. Serror, California State Univ., Los Angeles (United States) [7479-21]

09.40: Development of a compact laser for ChemCam Instrument and potential use for wind measurement on Mars, Benoit Faure, Muriel Saccoccio, Ctr. National d'Etudes Spatiales (France); Eric Durand, Thales Laser S.A. (France); Sylvestre Maurice, Ctr. d'Etude Spatiale des Rayonnements (France). [7479-22]

Coffee Break 10.00 to 10.30

10.30: Long range wind lidar for atmospheric dynamic studies, Jean-Pierre Cariou, Matthieu Boquet, Simone Lolli, Laurent Sauvage, Remy Parmentier, Leosphere France (France) [7479-23]

10.50: A review of uses of lidar in the wind power industry, Peter J. M. Clive, SgurrEnergy Ltd. (United Kingdom) [7479-24]

11.10: Computation model of the Doppler Lidar measurements for planetary boundary layer, Alexander P. Shelekhov, Institute of Atmospheric Optics (Russian Federation). [7479-31]

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POSTER SESSION Tues. 17.45 to 19.15

All symposium attendees are invited to attend 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.

Poster presenters may post their poster papers starting at 10.00 on Tuesday in the Conference Area Hallway. Any papers left on the boards following the end time of the poster session will be considered unwanted and will be discarded. SPIE Europe assumes no responsibility for posters left up after the end of the poster session. Poster authors should be at their papers from 17.45 to 19.15 to answer questions from attendees. Attendees are requested to wear their conference registration badges to the poster sessions.

Tunable injection-seeded Q-switched Nd:GSAG laser at 943nm for water vapor detection. Xin Wang, Frank Kallmeyer, Sha Wang, Hans-Joachim Eichler, Technische Univ. Berlin (Germany); Zhifeng Lin, Chunqing Gao, Beijing Institute of Technology (China)[7479-26]

Multiwavelength micropulse lidar for atmospheric aerosol investigation, Michal Posyniak, Tadeusz Stacewicz, Maciej Miernecki, Anna K. Jagodnicka, Szymon P. Malinowski, Univ. of Warsaw (Poland)[7479-27]

Solid-state Raman frequency converters for CO₂-DIAL systems at 1.6 μm, Hanjo Rhee, Technische Univ. Berlin (Germany); Victor A. Lisinetskii, B.I. Stepanov Institute of Physics (Belarus); Alexander A. Kaminskii, A.V. Shubnikov Institute of Crystallography (Russian Federation); Hans-Joachim Eichler, Technische Univ. Berlin (Germany)[7479-28]

Aerosol plume observations by the ground-based lidar, sun-photometer and satellite: cases analysis, Yonghua Wu, Chuen-meei Gan, Barry M. Gross, Fred Moshary, Samir A. Ahmed, The City College of New York (United States)[7479-29]

Comparison of lidar calibration at 1064-nm channel using the water-phase and cirrus clouds, Yonghua Wu, Shuki Chaw, Barry M. Gross, Fred Moshary, Samir A. Ahmed, The City College of New York (United States)[7479-30]



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Bold = SPIE Member

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David H. Titterton
Defence Science and Technology Lab.
United Kingdom
2009 Symposium Chair



Reinhard R. Ebert
FGAN-FOM Research Institute for
Optronics and Pattern Recognition,
Germany
2009 Symposium Co-Chair

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Conference 7480

Tuesday-Thursday 1-3 September 2009 • Proceedings of SPIE Vol. 7480

Unmanned/Unattended Sensors and Sensor Networks VI

Conference Chair: **Edward M. Carapezza**, DARPA and Univ. of Connecticut (USA)

Programme Committee: **James S. Albus**, National Institute of Standards and Technology (USA); **Mehdi Anwar**, Univ. of Connecticut (USA); **Sachi Desai**, US Army RDECOM-ARDEC (USA); **Grant R. Gerhart**, U.S. Army Tank-Automotive Research, Development and Engineering Ctr. (USA); **Todd M. Hintz**, Space & Naval Warfare Systems Command SPAWARSCEN (USA); **Myron E. Hohil**, U.S. Army Research, Development and Engineering Command (USA); **Ivan Kadar**, Interlink Systems Sciences, Inc. (USA); **Leslie C. Laycock**, BAE Systems (United Kingdom); **Nino Srour**, Army Research Lab. (USA); **Huub A.J.M. van Hoof**, TNO Defense, Security and Safety (Netherlands)

Tuesday 1 September

Opening Remarks

Room: A04. Tues. 14.00 to 14.10

Edward M. Carapezza, DARPA and Univ. of Connecticut (USA)

Keynote Session 1

Room: A04. Tues. 14.10 to 15.30

Session Chair: **Edward M. Carapezza**, DARPA and Univ. of Connecticut (USA)

14.10: **Discovery, invention and innovation for combating irregular warfare (Keynote Presentation)** (*Invited Paper*), Cary Chabalowsky, U.S. Army (United States) [7480-01]

14.50: **Informationally connected distributed machines** (*Invited Paper*), John M. Dolan, Carnegie Mellon Univ. (United States) [7480-02]

Coffee Break 15.30 to 16.00

SESSION 1

Room: A04. Tues. 16.00 to 17.40

Force Protection and Security Session

Session Chairs: **Todd M. Hintz**, Space & Naval Warfare Systems Command SPAWARSCEN (USA); **Myron E. Hohil**, U.S. Army Research, Development and Engineering Command (USA)

16.00: **The future of force protection: integrate and automate**, Carlos E. Lama, Naval Surface Warfare Ctr. (United States); Joseph Fagan, U.S. European Command (United States) [7480-03]

16.20: **Persistent monitoring of coastal and riverine areas**, Edward M. Carapezza, DARPA and Univ. of Connecticut (United States) . . . [7480-04]

16.40: **A building block approach to security at shipping ports**, Robert C. Huck, Mouhammad K. Al-Akkoumi, Samer Shammaa, James J. Sluss, Jr., Sridhar Radhakrishnan, Thomas L. Landers, Univ. of Oklahoma (United States) [7480-05]

17.00: **Probabilistic methods to identify security-relevant behavior of people using a sparse network of lidar sensors**, Konrad Wenzl, Heinrich Ruser, Christian Kargel, Univ. der Bundeswehr München (Germany) [7480-06]

17.20: **Remote control of open groups of remote sensors**, Peter S. Sapaty, National Academy of Sciences of Ukraine (Ukraine) . . . [7480-42]

POSTER SESSION Tues. 17.45 to 19.15

All symposium attendees are invited to attend 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.

Poster presenters may post their poster papers starting at 10.00 on Tuesday in the Conference Area Hallway. Any papers left on the boards following the end time of the poster session will be considered unwanted and will be discarded. SPIE Europe assumes no responsibility for posters left up after the end of the poster session. Poster authors should be at their papers from 17.45 to 19.15 to answer questions from attendees. Attendees are requested to wear their conference registration badges to the poster sessions.

Unattended ground sensor (UGS) deployable simulation, training and mission planning system, James N. Falasco, Crane Wireless Monitoring Solutions (United States) [7480-40]

New unmanned system for robotic vehicles positioning, George Dekoulis, Lancaster Univ. (United Kingdom) [7480-41]

Wednesday 2 September

Keynote Session II

Room: A04. Wed. 08.30 to 09.50

Session Chairs: **Edward M. Carapezza**, DARPA and Univ. of Connecticut (USA); **Grant R. Gerhart**, U.S. Army Tank-Automotive Research, Development and Engineering Ctr. (USA)

08.30: **The looming crisis of air traffic capacity: can vortex dynamics help** (*Invited Paper*), Fazle Hussain, Univ. of Houston (United States) [7480-07]

09.10: **Intelligent robotics in sensor network applications** (*Invited Paper*), Mark Campbell, Cornell Univ. (United States) . . . [7480-08]

SESSION 2

Room: A04. Wed. 09.50 to 12.00

Unmanned System Technologies I

Session Chairs: **Grant R. Gerhart**, U.S. Army Tank-Automotive Research, Development and Engineering Ctr. (USA); **Todd M. Hintz**, Space & Naval Warfare Systems Command SPAWARSCEN (USA)

09.50: **Unmanned air systems (UAS) autonomous collision avoidance system (ACAS)** (*Invited Paper*), Robert T. Hintz, Naval Air Warfare Ctr. (United States) [7480-09]

Coffee Break 10.30 to 11.00

11.00: **Miniature unmanned vehicle for counter IED in Afghanistan**, David R. Erickson, Defence Research and Development Canada (Canada) [7480-10]

11.20: **A new approach for determining the reliability of unmanned ground vehicles using fuzzy logic**, Harpreet Singh, Adam Mustapha, Wayne State Univ. (United States); Grant R. Gerhart, U.S. Army Tank-Automotive Research, Development and Engineering Ctr. (United States) [7480-11]

11.40: **Micro unmanned aerial vehicle**, Jayant Ratti, George Vachtsevanos, Georgia Institute of Technology (United States) . . [7480-12]

Lunch Break 12.00 to 13.30



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SESSION 3

Room: A04. Wed. 13.30 to 14.30

Unmanned System Technologies II

Session Chairs: **Grant R. Gerhart**, U.S. Army Tank-Automotive Research, Development and Engineering Ctr. (USA); **Todd M. Hintz**, Space & Naval Warfare Systems Command SPAWARSYSCEN (USA)

13.30: **Simulation of an algorithm for determining the reliability of unmanned ground vehicles**, Harpreet Singh, Arati M. Dixit, Kassem Saab, Wayne State Univ. (United States); Grant R. Gerhart, U.S. Army Tank-Automotive Research, Development and Engineering Ctr. (United States) [7480-14]

13.50: **Sample-based perception, anticipation and planning for robots in an urban environment** (*Invited Paper*), Mark Campbell, Jason Hardy, Cornell Univ. (United States) [7480-15]

14.10: **Collaborating miniature drones for surveillance and reconnaissance**, Axel Bürkle, Fraunhofer-Institut für Informations-und Datenverarbeitung (Germany) [7480-16]

SESSION 4

Room: A04. Wed. 14.30 to 16.40

Advanced Free Space Optical Communications, Techniques and Applications

Session Chair: **Leslie C. Laycock**, BAE Systems (United Kingdom)

14.30: **Mobile optical high-speed data links with small terminals** (*Invited Paper*), Dirk Giggenbach, Deutsches Zentrum für Luft- und Raumfahrt e.V. (Germany) [7480-17]

Coffee Break 15.10 to 15.40

15.40: **Cockpit to helmet optical wireless link: prototype hardware demonstration**, Henry J. White, Malcolm A. Watson, Nigel B. Aldridge, BAE Systems (United Kingdom); Jonathan Lam, Ministry of Defense (United Kingdom); Richard Atkinson, Optical Antenna Solutions (United Kingdom) [7480-19]

16.00: **Ultra high efficiency 1550nm multi-junction pulsed laser diodes**, Jean-François Boucher, Laser Components Canada, Inc. (Canada); Ville Vilokkinen, Modulight, Inc. (Finland); Paul Rainbow, Laser Components Canada, Inc. (Canada); Petteri Uusimaa, Modulight, Inc. (Finland); Jari Lyytikäinen, Sanna Ranta, Tampere Univ. of Technology (Finland) [7480-21]

16.20: **Modulated retroreflection over an extended range using a MEMS-based optical tag**, Andrew M. Scott, Mark E. McNie, Nicola Price, David Combes, Gilbert W. Smith, Kevin D. Ridley, Kevin M. Brunson, David C. Jones, David O. King, QinetiQ Ltd. (United Kingdom); Keith L. Lewis, Sciovis Ltd. (United Kingdom) [7480-22]

Thursday 3 September

Keynote Session III

Room: A04. Thurs. 08.30 to 09.10

Session Chairs: **Edward M. Carapezza**, DARPA and Univ. of Connecticut (USA); **Todd M. Hintz**, Space & Naval Warfare Systems Command SPAWARSYSCEN (USA)

08.30: **Perspective on undersea distributed networked systems** (*Invited Paper*), Pierre J. Corriveau, Naval Undersea Warfare Ctr. (United States) [7480-23]

SESSION 5

Room: A04. Thurs. 09.10 to 10.30

Sensor Networks

Session Chairs: **Myron E. Hohil**, U.S. Army Research, Development and Engineering Command (USA); **Todd M. Hintz**, Space & Naval Warfare Systems Command SPAWARSYSCEN (USA)

09.10: **Integration of self-organizing map (SOM) and kernel density estimation (KDE) for network intrusion detection**, Yuan Cao, Haibo He, Hong Man, Stevens Institute of Technology (United States); Xiaoping Shen, Ohio Univ. (United States) [7480-24]

09.30: **Energy minimization for multi-hop sensor networks**, Hongbing Cheng, Yu-Dong Yao, Stevens Institute of Technology (United States) [7480-25]

09.50: **Gestalt-based integrity of distributed networked systems**, Peter S. Sapaty, National Academy of Sciences of Ukraine (Ukraine) . . [7480-26]

10.10: **Integrated tactical surveillance system**, Kevin Benson, Crane Aerospace and Electronics (United States) [7480-27]

Coffee Break 10.30 to 11.00

SESSION 6

Room: A04. Thurs. 11.00 to 12.20

Target Detection and Tracking

Session Chairs: **Myron E. Hohil**, U.S. Army Research, Development and Engineering Command (USA); **Sachi V. Desai**, U.S. Army Research, Development and Engineering Command (USA)

11.00: **Automatic detection of hostile behaviour**, Bert van den Broek, Gertjan Burghouts, Sebastiaan P. van den Broek, Arthur Smith, TNO Defence, Security and Safety (Netherlands) [7480-28]

11.20: **Multiple targets detection and tracking by using Ada-Boost and particle filter Gaussian process dynamical model**, Yafeng Yin, Haibo He, Hong Man, Stevens Institute of Technology (United States) [7480-29]

11.40: **Using a multiple analytical distribution filter for underwater localization**, Dov Kruger, Hongyuan Shi, Yingying Chen, Hongbo Liu, Jie Yang, Len Imas, Stevens Institute of Technology (United States) [7480-30]

12.00: **Utilizing active ultrasonic transducer for intrusion detection**, Sachi V. Desai, Shafik Quoraishee, U.S. Army Research, Development and Engineering Command (United States) [7480-31]

Lunch Break 12.20 to 14.00

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SESSION 7

Room: A04. Thurs. 14.00 to 15.00

Novel Technologies

Session Chairs: **Myron E. Hohil**, U.S. Army Research, Development and Engineering Command (USA); **Sachi V. Desai**, U.S. Army Research, Development and Engineering Command (USA)

14.00: **Linear array using flexible substrate on pH sensing**, Kuan-Yu Lee, Tai-Ping Sun, National Chi Nan Univ. (Taiwan) [7480-32]

14.20: **On the recognition of compromise in sensing systems: rewired acoustic arrays and distorted route estimation and classification**, David J. Thornley, Imperial College London (United Kingdom); Thyagaraju Damarla, Army Research Lab. (United States); Mani B. Srivastava, Univ. of California, Los Angeles (United States) [7480-33]

14.40: **Computational redundancy reduction navigation techniques for aeronautics defense systems**, George Dekoulis, Lancaster Univ. (United Kingdom) [7480-35]

Coffee Break 15.00 to 15.30

SESSION 8

Room: A04. Thurs. 15.30 to 17.10

Active and Passive Imagers, Image Sensing and Processing

Session Chairs: **Mehdi Anwar**, Univ. of Connecticut (USA); **Tariq Manzur**, Naval Undersea Warfare Ctr. (USA)

15.30: **Laser fabrication of silicon carbide detector for gas sensing and focal plane array imaging**, G. Lim, CREOL, The College of Optics and Photonics, Univ. of Central Florida (United States); Tariq Manzur, Undersea Warfare Electromagnetic Systems Development (United States); Aravinda Kar, CREOL, The College of Optics and Photonics, Univ. of Central Florida (United States) [7480-36]

15.50: **Improved object geo-location in airborne camera images using tight integration of vision and navigation data**, Christoph Kessler, Natalie M. Frietsch, Christian Schlaile, Gert F. Trommer, Univ. Karlsruhe (Germany) [7480-37]

16.10: **Image-based augmentation of an autonomous VTOL-MAV**, Natalie M. Frietsch, Christoph Kessler, Oliver Meister, Christian Schlaile, Justus Seibold, Gert F. Trommer, Univ. Karlsruhe (Germany) . . . [7480-38]

16.30: **Escherichia Coli counting using lens-free imaging for sepsis diagnosis**, SangJun Moon, Fahim Manzur, Harvard Medical School (United States); Tariq Manzur, Naval Undersea Warfare Ctr. (United States); Catherine Klapperich, Boston Univ. (United States); U. Demirci, Harvard Medical School (United States) [7480-43]

16.50: **GaN-Based THz Advanced Quantum Cascade Lasers for Manned and Unmanned Systems**, Mehdi Anwar, Univ. of Connecticut (United States); Tariq Manzur, Naval Undersea Warfare Ctr. (United States) [7480-44]



Conference 7481

Monday-Thursday 31 August-3 September 2009 • Proceedings of SPIE Vol. 7481

Electro-Optical and Infrared Systems: Technology and Applications VI

Conference Chairs: **David A. Huckridge**, QinetiQ Ltd. (United Kingdom); **Reinhard R. Ebert**, Forschungsgesellschaft für Angewandte Naturwissenschaften e.V. (Germany)

Programme Committee: **Christopher Carl Alexay**, Chris Alexay Optical Design (USA); **Jan Y. Andersson**, Acreo AB (Sweden); **Rainer Breiter**, AIM Infrarot-Module GmbH (Germany); **Gordon A. Cain**, Octec Ltd. (United Kingdom); **David J. Clarke**, SELEX GALILEO (United Kingdom); **Stefania De Vito**, SELEX GALILEO (Italy); **Peter N. Dennis**, QinetiQ Ltd. (United Kingdom); **Per S. W. Fredin**, Saab Bofors Dynamics AB (Sweden); **Norman S. Kopeika**, Ben-Gurion Univ. of the Negev (Israel); **José Manuel López-Alonso**, Univ. Complutense de Madrid (Spain); **John F. Parsons**, Thales Optronics Ltd. (United Kingdom); **Stanley R. Rotman**, Ben-Gurion Univ. of the Negev (Israel); **Christopher W. Slinger**, QinetiQ Ltd. (United Kingdom)

Monday 31 August

Opening Remarks

Room: B05/06 Mon. 08.50

Reinhard R. Ebert, FGAN-FOM (Germany);
David A. Huckridge, QinetiQ Ltd. (United Kingdom)

SESSION 1

Room: B05/06 Mon. 09.00 to 11.40

Sensor Processing and Scene Modeling

Session Chairs: **Reinhard R. Ebert**, FGAN-FOM (Germany);
David A. Huckridge, QinetiQ Ltd. (United Kingdom)

09.00: **Automatic target recognition in laser radar imagery** (*Invited Paper*), Walter Armbruster, FGAN-FOM (Germany) [7481-01]

09.30: **A framework for the development and assessment of target classification algorithms**, Robert Hansford, Mike Nicholas, QinetiQ Ltd. (United Kingdom) [7481-02]

09.50: **Approximate non-parametric feature extraction applied to classification system data**, Kathrin Dorn, Sabino M. Gadaleta, M. Can Altinigneli, EADS Deutschland GmbH (Germany) [7481-04]

10.10: **Assisted interpretation of infrastructure facilities from aerial imagery**, Alexander Bauer, Fraunhofer-Institut für Informations-und Datenverarbeitung (Germany) [7481-05]

Coffee Break 10.30 to 11.00

11.00: **Thermal scene analysis via finite element model and finite difference time domain numerical solution of the electromagnetic wave propagation in the short wave and long wave infrared band**, Alessandro Albertoni, BFI Optilas (Italy) [7481-06]

11.20: **PcSitoS: A new tool for image-based IR system simulation**, Hans J. Greif, Robert Weiss, FGAN-FOM (Germany) [7481-07]

SESSION 2A

Room: B05/06 Mon. 11.40 to 12.20

Spectral and Multiband Sensors I

Session Chairs: **Christopher Carl Alexay**, StingRay Optics, LLC (USA); **Gordon A. Cain**, GE Fanuc Intelligent Platforms (United Kingdom); **John F. Parsons**, Thales Optronics Ltd. (United Kingdom)

11.40: **A new imaging FTIR spectroradiometer**, Louis M. Moreau, Claude B. Roy, Christian A. Vallières, Marc-André Soucy, ABB Inc. (Canada) [7481-08]

12.00: **Miniaturization of vNIR and SWIR hyperspectral sensors**, Detlev M. Even, Christopher P. Warren, Arleen Velasco, Rick E. Holasek, Barry A. Swartz, NOVASOL (United States) [7481-09]

Lunch Break 12.20 to 14.00

SESSION 2B

Room: B05/06 Mon. 14.00 to 15.20

Spectral and Multiband Sensors II

Session Chairs: **Christopher Carl Alexay**, StingRay Optics, LLC (USA); **Gordon A. Cain**, GE Fanuc Intelligent Platforms (United Kingdom); **John F. Parsons**, Thales Optronics Ltd. (United Kingdom)

14.00: **Ultraviolet through infrared imager performance testing**, Jason A. Mazzetta, Stephen D. Scopatz, Electro Optical Industries, Inc. (United States) [7481-10]

14.20: **Improved target detection by IR dual-band image fusion**, Uwe Adomeit, Ebert Reinhard, FGAN-FOM (Germany) [7481-11]

14.40: **Fusion of heterogeneous multiple camera systems with panoramic capabilities in a Harbor Environment**, Piet B. W. Schwing, Robertus Kemp, Henk A. Lensen, TNO Defence, Security and Safety (Netherlands) [7481-12]

15.00: **Multispectral system for perimeter protection of stationary and moving objects**, Mieczyslaw Szustakowski, Wieslaw M. Ciurapinski, Marek Zyczkowski, Norbert Palka, Mariusz Kastek, Rafal Dulski, Grzegorz Bieszczad, Tomasz Sosnowski, Military Univ. of Technology (Poland) [7481-13]

Coffee Break 15.30 to 15.55

Security & Defence 2009 Plenary Session

Room: B05/06 Mon. 16.00 to 17.45

16.00 to 16.10 **Welcome and Introduction**
David H. Titterton, Defence Science and Technology Lab., United Kingdom
Reinhard R. Ebert, FGAN-FOM Research Institute for Optronics and Pattern Recognition, Germany
2009 Symposium Chairs

16.05-16:10 **2008 Rudolf Kingslake Medal and Prize**

16.10-16:15 **Presentation of the SPIE Fellowship**

16.15-17:00 **Joint Research for Tomorrow's Security and Defence**

MinRat Rainer Krug, Federal Ministry of Defence, BMVg, Germany

17.00-17.45 **Optronics Research in Germany**

Maurus Tacke, Director, Research Institute for Optronics and Pattern Recognition (FOM), Research Establishment for Applied Science (FGAN), Germany

See p. 6 for information.

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Conference 7481

Tuesday 1 September

SESSION 3

Room: B05/06 Tues. 08.50 to 11.50

Detectors

Session Chairs: **David J. Clarke**, SELEX GALILEO (United Kingdom);
Peter N. Dennis, QinetiQ Ltd. (United Kingdom);
Rainer Breiter, AIM INFRAROT-MODULE GmbH (Germany);
Jan Y. Andersson, Acreo AB (Sweden)

08.50: **Advanced III/V quantum-structure devices for high performance infrared focal plane arrays** (*Invited Paper*), Robert H. Rehm, Fraunhofer-Institut für Angewandte Festkörperphysik (Germany) [7481-14]

09.20: **Latest developments in MCT for next generation of infrared staring arrays**, Michel Vuillemeret, Frederic P. Pistone, Yann Reibel, SOFRADIR (France) [7481-16]

09.40: **Advanced ROIC design for versatile fast gated IR imaging and enhanced passive imaging with 320x256 HgCdTe electron avalanche photodiode FPA**, Michel Zecri, Xavier Lefoul, SOFRADIR (France) [7481-17]

10.00: **Activation and evaluation of GaN photocathodes**, Yunsheng Qian, Benkang Chang, Jiangliang Qiao, Yijun Zhang, Rongguo Fu, Yafeng Qiu, Nanjing Univ. of Science & Technology (China) [7481-18]

Coffee Break 10.20 to 10.50

10.50: **Novel technology for polymer-based microbolometers**, Andreas Nocke, Marcus Wolf, Helmut Budzier, Karl-Friedrich Arndt, Gerald U. Gerlach, Technische Univ. Dresden (Germany) [7481-19]

11.10: **Uncooled amorphous silicon IRFPA technology for high performance and high volume applications**, Jean-Luc M. Tissot, Michel Vilain, Olivier Legras, Sebastien Tinnes, Christophe Minassian, Patrick Robert, ULIS (France) [7481-20]

11.30: **PMN-PT single crystals for uncooled infrared detection applications**, Yanxue Tang, Shanghai Normal Univ. (China) . . . [7481-22]

Lunch Break 11.50 to 13.40

SESSION 4

Room: B05/06 Tues. 13.40 to 17.00

Sensors and Related Technologies I

Session Chairs: **Per S. W. Fredin**, Saab Bofors Dynamics AB (Sweden); **Stefania De Vito**, SELEX GALILEO (Italy);
José Manuel López-Alonso, Univ. Complutense de Madrid (Spain);
Christopher W. Slinger, QinetiQ Ltd. (United Kingdom)

13.40: **Flexible 640 x 480 pixel infrared camera module for fast prototyping**, Alain Bergeron, Loïc Le Noc, Bruno Tremblay, Luc Mercier, François Lagacé, François Duchesne, Julie Lambert, Michel Jacob, Linda E. Marchese, Hubert Jerominek, INO (Canada) [7481-23]

14.00: **Adding thermal information to a 3D model of a crime scene**, Miranda van Iersel, Henny Veerman, TNO Defence, Security and Safety (Netherlands) [7481-24]

14.20: **A technique for ghosting artifacts removal in scene-based methods for non-uniformity correction in IR systems**, Alessandro Rossi, Marco Diani, Giovanni Corsini, Univ. di Pisa (Italy) [7481-25]

14.40: **Method of detectors offset correction in thermovision camera with uncooled microbolometric focal plane array**, Grzegorz Bieszczad, Tomasz Orzanowski, Tomasz Sosnowski, Mariusz Kastek, Military Univ. of Technology (Poland) [7481-26]

Coffee Break 15.00 to 15.30

15.30: **Pyroelectric sensors and classification algorithms for border/perimeter security** (*Invited Paper*), Eddie L. Jacobs, The Univ. of Memphis (United States) [7481-27]

16.00: **Controllable time dependent and dual band emission infrared source to test missile warning systems in the field**, Dario Cabib, Amir Gil, Larry Davidzon, CI Systems (Israel) Ltd. (Israel) [7481-28]

16.20: **Optimizing the design of electro-optical mini-satellite imagers for ships detection using a realistic and fast simulator**, Fabian D. Lapiere, Alexander Borghraef, Marijke Vandewal, Royal Belgian Military Academy (Belgium) [7481-29]

16.40: **Development of a real time multiple target, multi camera tracker for civil security applications**, Hans G. Akerlund, SAAB Dynamics AB (Sweden) [7481-30]

POSTER SESSION Tues. 17.45 to 19.15

All symposium attendees are invited to attend 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.

Poster presenters may post their poster papers starting at 10.00 on Tuesday in the Conference Area Hallway. Any papers left on the boards following the end time of the poster session will be considered unwanted and will be discarded. SPIE Europe assumes no responsibility for posters left up after the end of the poster session. Poster authors should be at their papers from 17.45 to 19.15 to answer questions from attendees. Attendees are requested to wear their conference registration badges to the poster sessions.

Contribution of generation-recombination processes at inner interface of MBE-grown Hg_{1-x}Cd_xTe heterostructure to dark current of small active area photodiode, Mikhail S. Nikitin, Galina V. Chekanova, Alpha (Russian Federation); Albina A. Drugova, Viacheslav A. Kholodnov, Institute of Radio-engineering and Electronics (Russian Federation) [7481-36]

Fiber optic temperature sensor with frequency output, František Hanáček, Vladimír Vašínek, Jan Skapa, Petr Šiška, Jan Látal, Petr Koudelka, Technical Univ. of Ostrava (Czech Republic) . . . [7481-37]

Contribution to the study of night-time driving devices with thermal cameras and EMCCD, Catalin A. Spulber, Octavia V. C. Borcan, Pro Optica S.A. (Romania) [7481-38]

Data fusion concept in multispectral system for perimeter protection of stationary and moving objects, Wieslaw M. Ciurapinski, Rafal Dulski, Mariusz Kastek, Mięczyślaw Szustakowski, Grzegorz Bieszczad, Marek Zyczkowski, Piotr Trzaskawka, Marek Piszczek, Military Univ. of Technology (Poland) [7481-39]

Validating temporal response models for an uncooled LWIR camera, Matthew M. Adams, Stuart I. Wilson, QinetiQ Ltd. (United Kingdom) [7481-40]

Measurement of sniper infrared signatures, Mariusz Kastek, Rafal Dulski, Piotr Trzaskawka, Grzegorz Bieszczad, Military Univ. of Technology (Poland) [7481-41]

Infrared images simulation software, Mariusz Kastek, Rafal Dulski, Tomasz Sosnowski, Tadeusz Piatkowski, Henryk Polakowski, Military Univ. of Technology (Poland) [7481-42]

Method calibration for thermovision camera with uncooled microbolometric detector array, Tomasz Sosnowski, Grzegorz Bieszczad, Henryk Madura, Tomasz Orzanowski, Military Univ. of Technology (Poland) [7481-43]

Mutispectral image fusion for target detection, Masha Maltz, Marom Leviner, Ben-Gurion Univ. of the Negev (Israel) [7481-44]



Conference 7481

Wednesday 2 September

SESSION 5

Room: B05/06 Wed. 08.30 to 10.20

Sensors and Related Technologies II

Session Chairs: **Reinhard R. Ebert**, FGAN-FOM (Germany);
David A. Huckridge, QinetiQ Ltd. (United Kingdom)

08.30: **Optical limiting performance of nanoparticles in liquid and solid media** (*Invited Paper*), Stefanie Dengler, Gunnar Ritt, Bernd Eberle, FGAN-FOM (Germany) [7481-31]

09.00: **Protection of optical systems against laser radiation**, Gunnar Ritt, Stefanie Dengler, Bernd Eberle, FGAN-FOM (Germany) . . . [7481-32]

09.20: **MTF Measurement of Infrared Optical Systems**, Andre Lengwenus, Patrik Erichsen, Trioptics GmbH (Germany) [7481-33]

09.40: **Innovative infrared multigas sensors by electro-optical systems technology applications**, Dumitru G. Ulieru, SITEX 45 SRL (Romania); Alina C. Matei, National Institute for Research and Development in Microtechnologies (Romania); Elena Ulieru, Adrian Tantau, SITEX 45 SRL (Romania); Oana Ulieru, Mitsubishi Sector (Italy) [7481-34]

10.00: **The research on spectral matching technique of low-light-level and infrared fusion optoelectronic detector**, Lei Liu, Chang Benkang, Nanjing Univ. of Science & Technology (China) [7481-35]

SPIE Europe Security + Defence

Conference 7482A

Wednesday-Thursday 2-3 September 2009 • Proceedings of SPIE Vol. 7482A

Electro-Optical Remote Sensing

Conference Chairs: **Gary W. Kamerman**, FastMetrix, Inc. (USA); **Ove K. Steinvall**, Swedish Defence Research Agency (Sweden)

Programme Committee: **Jeffrey W. Grantham**, Northrop Grumman Information Technology (USA); **Robert J. Grasso**, Northrop Grumman Electronic Systems (USA); **Dennis K. Killinger**, Univ. of South Florida (USA); **Vasyl Molebny**, National Taras Shevchenko Univ. of Kyiv (Ukraine); **C. Russell Philbrick**, The Pennsylvania State Univ. (USA); **Peter N. Randall**, QinetiQ Ltd. (United Kingdom); **Philippe Réfrégier**, Institut Fresnel (France); **Monte D. Turner**, Defense Advanced Research Projects Agency (USA); **Maria Josefa Yzuel**, Univ. Autònoma de Barcelona (Spain)

Tuesday 1 September

POSTER SESSION Tues. 17.45 to 19.15

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Applying hyperspectral detection algorithms to detection and tracking of floating mines in infrared video sequences. Alexander Borghgraef, Fabian D. Lapierre, Royal Belgian Military Academy (Belgium); Yves Dupont, Kwartier Koningin Elisabeth (Belgium); Wilfried R. Philips, Univ. Gent (Belgium); Marc Acheroy, Royal Belgian Military Academy (Belgium)[7482A-16]

Contributions to the evaluation of observability performance in difficult ambient conditions, for observation equipment during night and day, Octavia V. C. Borcan, Pro Optica S.A (Romania); Catalin A. Spulber, Pro Optica S.A. (Romania)[7482A-17]

Polarisation transform analysis for detection of shallow buried landmines, Kailash C. Tiwari, Dharmendra P. Singh, Manoj K. Arora, Indian Institute of Technology Roorkee (India)[7482A-18]

Wednesday 2 September

Opening Remarks

Room: A01 Wed. 08.25 to 08.30

Gary W. Kamerman, FastMetrix, Inc. (USA);
Ove K. Steinvall, Swedish Defence Research Agency (Sweden)

SESSION 1

Room: A01 Wed. 08.30 to 10.00

Laser Systems

Session Chair: **Ove Steinvall**,
Swedish Defence Research Agency (Sweden)

08.30: **Scanning of low-signature targets using time-correlated single-photon counting** (Invited Paper), Nils J. Krichel, Angus McCarthy, Robert J. Collins, Heriot-Watt Univ. (United Kingdom); Verónica Fernández, Institute of Applied Physics (Spain); Andrew M. Wallace, Gerald S. Buller, Heriot-Watt Univ. (United Kingdom)[7482A-01]

09.00: **Advance in active night vision for filling the gap in remote sensing**, Ofer David, Ron Schneider, Roy Israeli, Elbit Systems Ltd. (Israel)[7482A-02]

09.20: **Optical sensor for the management of radar antenna distortions.** Guillaume Lesueur, Thales Air Systems S.A. (France) and Ecole Nationale Supérieure d'Ingenieurs de Caen et Ctr. de Recherche (France); Hervé Gilles, Sylvain Girard, Mathieu Laroche, Ecole Nationale Supérieure d'Ingenieurs de Caen et Ctr. de Recherche (France); Thomas Merlet, Morgan Queguiner, Thales Air Systems S.A. (France) ..[7482A-03]

09.40: **Results from the search-lidar demonstrator project for detection of small sea-surface targets,** Johan C. van den Heuvel, Frank J. M. van Putten, Leo H. Cohen, Rob A. W. Kemp, Gijs C. Franssen, TNO Defence, Security and Safety (Netherlands)[7482A-04]

Coffee Break 10.00 to 10.30

SESSION 2

Room: A01 Wed. 10.30 to 11.30

Laser System Modeling and Characterization I

Session Chair: **Ove Steinvall**,
Swedish Defence Research Agency (Sweden)

10.30: **Laser radar modeling for simulation and performance evaluation,** Tomas R. Chevalier, Ove K. Steinvall, Swedish Defence Research Agency (Sweden)[7482A-05]

10.50: **Characterization measurements of ASC FLASH 3D ladar,** Håkan Larsson, Frank Gustafsson, Swedish Defence Research Agency (Sweden); Bruce Johnson, Jack Woods, Air Force Research Lab. (United States)[7482A-06]

11.10: **Target detection and characterization by monostatic Ladar Bidirectional Reflectance Distribution Function (BRDF) using polarimetric discriminants,** George C. Giakos, Univ. of Akron (United States); Richard H. Picard, Phan D. Dao, Air Force Research Lab. (United States)[7482A-08]

Lunch Break 11.30 to 13.30

SESSION 3

Room: A01 Wed. 13.30 to 15.00

Passive EO Sensing and Processing

Session Chair: **Gary W. Kamerman**, FastMetrix, Inc. (USA)

13.30: **Polynomial background estimation using visible light video streams for robust automatic detection in a maritime environment** (Invited Paper), Tanja Y. C. van Haarst, Royal Netherlands Navy (Netherlands) and Univ. van Amsterdam (Netherlands); Krispijn Scholte, CAMS Force Vision (Netherlands)[7482A-09]

14.00: **Temporal resolution enhancement from motion,** Malcolm P. Rollason, Graham H. Watson, Malcolm Strens, QinetiQ Ltd. (United Kingdom)[7482A-10]

14.20: **Automated video enhancement and fusion from distorted short-exposure images,** Mathieu Aubailly, Univ. of Maryland, College Park (United States); Mikhail A. Vorontsov, Gary W. Carhart, Army Research Lab. (United States); Michael T. Valley, Sandia National Labs. (United States)[7482A-11]

14.40: **Effective approaches to real-time hyperspectral target detection in surveillance applications,** Nicola Acito, Giovanni Corsini, Marco Diani, Stefania Matteoli, Univ. di Pisa (Italy)[7482A-12]

Coffee Break 15.00 to 15.30

SESSION 4

Room: A01 Wed. 15.30 to 16.40

Laser System Modeling and Characterization II

Session Chair: **Gary W. Kamerman**, FastMetrix, Inc. (USA)

15.30: **TBA1** (Invited Paper),[7482A-13]

16.00: **Wall induced turbulence distortions of optical measurements,** Ove K. S. Gustafsson, Markus Henriksson, Lars J. Sjöqvist, Swedish Defence Research Agency (Sweden)[7482A-14]

16.20: **Database for chemical weapons detection: data acquired and first analysis for a multiwavelength DIAL,** Pasquale Gaudio, Carlo Bellecci, Arnaldo D'Amico, Corrado Di Natale, Michela Gelfusa, Sergio Martellucci, Eugenio Martinelli, Maria Richetta, Piergiorgio Ventura, Univ. degli Studi di Roma Tor Vergata (Italy); Arianna Antonucci, Francesco Pasquino, Valeria Della Rocca, Alessandro Sassolini, Ctr. Tecnico Logistico Interforze NBC (Italy)[7482A-15]

Conference 7482B

Thursday 3 September 2009 • Proceedings of SPIE Vol. 7482B

Photonic Components and Architectures in Defence Systems

Conference Chairs: **Keith L. Lewis**, Electro Magnetic Remote Sensing Defence Technology Ctr. (United Kingdom); **Richard C. Hollins**, Defence Science and Technology Lab. (United Kingdom); **Thomas J. Merlet**, Thales Air Systems S.A. (France)

Programme Committee: **Helen Bennett**, QinetiQ Ltd. (United Kingdom); **Tibor Berceci**, Budapest Univ. of Technology and Economics (Hungary); **Béatrice Cabon**, Ecole Nationale Supérieure d'Electronique et de Radioélectrique de Grenoble (France); **Bill Crossland**, Univ. of Cambridge (United Kingdom); **Didier J. Decoster**, Univ. des Sciences et Technologies de Lille (France); **Daniel Dolfi**, Thales Research & Technology (France); **Steven R. Jost**, BAE Systems (USA); **Chris R. Lawrence**, QinetiQ Ltd. (United Kingdom); **Javier Marti**, Univ. Politécnica de Valencia (Spain); **Alwyn J. Seeds**, Univ. College London (United Kingdom); **Maurice Stanley**, QinetiQ Ltd. (United Kingdom); **Mauro Varasi**, Crisel Instruments, s.r.l. (Italy); **Rebecca A. Wilson**, QinetiQ Ltd. (United Kingdom)

Thursday 3 September

Welcome and Introduction

Room: A01 **Thurs. 08.55 to 09.00**

Keith L. Lewis, Electromagnetic Remote Sensing Defence Technology Ctr. (United Kingdom)

SESSION 5

Room: A01 **Thurs. 09.00 to 10.00**

Radar and Microwave Photonics

Session Chair: **Keith L. Lewis**, Sciovis Ltd. (United Kingdom)

09.00: **Phonon-photon interactions for very low noise RF optical links**, Mehdi Alouni, Stephanie Molin, Ghaya Baili, Daniel Dolfi, Thales Research & Technology (France); Thomas J. Merlet, Thales Air Systems S.A. (France) [7482B-20]

09.20: **Transreceiving beacons for radar testing**, Alexandre B. Marceaux, Thomas Eudes, Julien Clement, Anthony Renoult, Morgan Queguiner, Thomas Merlet, Thales Air Systems S.A. (France) . . [7482B-21]

09.40: **Underwater acoustic sensors based on fiber Bragg gratings**, Andrea Cusano, Marco Pisco, Antonello Cutolo, Univ. degli Studi del Sannio (Italy); Giuseppe Parente, Giuseppe Lanza, Armando Laudati, OptoSmart s.r.l. (Italy); Michele Giordano, Univ. degli Studi di Napoli Federico II (Italy); Stefania Campopiano, Univ. degli Studi di Napoli Parthenope (Italy) [7482B-22]

Coffee Break 10.00 to 10.30

SESSION 6

Room: A01 **Thurs. 10.30 to 11.10**

Photonic Devices and Displays

Session Chair: **Keith L. Lewis**, Sciovis Ltd. (United Kingdom)

10.30: **A high-resolution, scalable three-dimensional volumetric display**, James J. Sluss, Jr., Univ. of Oklahoma (United States); Hakki H. Refai, 3DIcon Corp. (United States) [7482B-24]

10.50: **A Novel Color Mixing Control System for Light Emitting Diodes**, Chia-Hung Wang, Tai-Ping Sun, National Chi Nan Univ. (Taiwan) [7482B-25]

SESSION 7

Room: A01 **Thurs. 11.10 to 11.50**

Applications

Session Chair: **Keith L. Lewis**, Sciovis Ltd. (United Kingdom)

11.10: **Temperature-insensitive silicon photoconductor**, James A. Harder, Elbit Systems of America, Ft. Worth (United States); Michaelene Sprague, Elbit Systems of America, Ft Worth (United States) [7482B-27]

11.30: **Mid and long infrared detection modules for picosecond range measurements**, Dariusz Stanaszek, Jozef Piotrowski, Adam Piotrowski, Waldemar Gawron, Zbigniew Orman, Ryszard Paliwoda, Mirosław Brudnowski, Jarosław Pawluczyk, Magdalena Pedzinska, VIGO System S.A. (Poland); Zbigniew Bielecki, Military University of Technology (Poland) [7482B-28]

SPIE Europe Security + Defence

Conference 7482C

Thursday 3 September 2009 • Proceedings of SPIE Vol. 7482C

Military Applications in Hyperspectral Imaging and High Spatial Resolution Sensing

Conference Chairs: **Gary J. Bishop**, BAE Systems (United Kingdom); **John D. Gonglewski**, Air Force Research Lab. (USA)

Programme Committee: **Len Cooke**, BAE Systems (United Kingdom)

Thursday 3 September

Welcome and Introduction

Room: A01 **Thurs. 13.30 to 13.40**

Gary J. Bishop, BAE Systems (United Kingdom);
John D. Gonglewski, Air Force Research Lab. (United States)

SESSION 8

Room: A01 **Thurs. 13.40 to 16.30**

Military Applications

Session Chair: **Gary J. Bishop**, BAE Systems (United Kingdom)

13.40: **Miniaturized hyperspectral systems for airborne ISR missions**,
Detlev M. Even, Rick E. Holasek, Barry A. Swartz, Christopher P. Warren,
Keith Nakanishi, John Lam, NOVASOL (United States) [7482C-30]

14.00: **A novel remote sensing region based image fusion using
contourlet transform**, Soad Ibrahim, Univ. of Guelph (United
States) [7482C-31]

14.20: **Hyperspectral target detection using heavy-tailed distributions**,
Christopher J. Willis, BAE Systems (United Kingdom) [7482C-32]

14.40: **Subpixel target detection and enhancement**, Kailash C. Tiwari,
Dharmendra P. Singh, Manoj K. Arora, Indian Institute of Technology
Roorkee (India) [7482C-33]

Coffee Break 15.00 to 15.30

15.30: **SWIR sky-glow prediction from NIR and visible clouds: an
urban and rural comparison**, G. Fertig, David C. Dayton, Applied
Technology Associates (United States); Laura E. Durr, John D.
Gonglewski, Chad A. St. Arnaud, Air Force Research Lab.
(United States) [7482C-34]

15.50: **Airborne infrared hyperspectral mapping using Fourier-
transform spectrometer technology**, Philippe Lagueux, Martin
Chamberland, Vincent Farley, Jean-Philippe Gagnon, Matthias Rolland,
Simon Savary, Yan Montembeault, André Villemaire, Telops (Canada);
Caroline Turcotte, Eldon Puckrin, Pierre Lahale, Defence Research and
Development Canada (Canada) [7482C-35]

16.10: **Advances in real time spectral tracking**, Gary D. Bishop, Ainsley
Killey, Philip Dale, Matthew D. Porter, Adrian Blagg, BAE Systems (United
Kingdom) [7482C-36]

Conference 7483

Monday-Tuesday 31 August-1 September 2009 • Proceedings of SPIE Vol. 7483

Technologies for Optical Countermeasures VI

Conference Chairs: **David H. Titterton**, Defence Science and Technology Lab. (United Kingdom); **Mark A. Richardson**, Cranfield Univ. (United Kingdom)

Programme Committee: **Ian Elder**, SELEX GALILEO (United Kingdom); **Anton Kohnle**, Forschungsgesellschaft für Angewandte Naturwissenschaften e.V. (Germany); **Stephen P. McGeoch**, Thales Optronics Ltd. (United Kingdom); **Julie Poupard**, Délégation Générale pour l'Armement (France); **Ove K. Steinvall**, Swedish Defence Research Agency (Sweden); **Mark R.G. Taylor**, Defence Science and Technology Organisation (Australia); **Jonathan A. Terry**, Univ. of St. Andrews (United Kingdom); **Hans Dieter Tholl**, Diehl BGT Defence GmbH & Co. KG (Germany); **Brian Butters**, Chemring Countermeasures (United Kingdom)

Monday 31 August

Opening Remarks

Room: B07/08 Mon. 09.00 to 09.10

David H. Titterton, Defence Science and Technology Lab. (United Kingdom)

KEYNOTE SESSION

Room: B07/08 Mon. 09.10 to 09.55

Session Chair: **David H. Titterton**, Defence Science and Technology Lab. (United Kingdom)

09.10: **Progress in the development of high-power solid-state lasers for directed energy applications** (*Invited Paper*), Harro Ackermann, HEL Joint Technology Office (United States) [7483-01]

SESSION 2

Room: B07/08 Mon. 09.55 to 12.05

Laser Development

Session Chair: **Ove Steinvall**, Swedish Defence Research Agency (Sweden)

09.55: **Development of military lasers for optical countermeasures in the mid-IR** (*Invited Paper*), Andrew Sijan, SELEX GALILEO (United Kingdom) [7483-02]

Coffee Break 10.25 to 10.55

10.55: **Applications of high power lasers on the battlefield** (*Invited Paper*), Yehoshua Y. Kalisky, Nuclear Research Ctr. Negev (Israel) [7483-03]

11.25: **Latest results on power scaling monolithic high efficiency 2 µm fiber lasers and amplifiers**, Victor Khitrov, Thomas Ehrenreich, John P. Edgecumbe, Kanishka Tankala, Adrian Carter, Scott Christensen, Bryce N. Samson, Nufem (United States) [7483-04]

11.45: **Visible and mid-IR output using a pulsed fibre laser pump source**, Ian Elder, SELEX GALILEO (United Kingdom) [7483-05]

Lunch Break 12.05 to 14.00

SESSION 3

Room: B07/08 Mon. 14.00 to 15.10

Ultrafast Lasers

Session Chair: **Paul A. Crump**, Ferdinand-Braun-Institut für Höchstfrequenztechnik (Germany)

14.00: **Review of ultrashort pulse lasers for military remote sensing and rangefinding** (*Invited Paper*), Robert A. Lamb, SELEX GALILEO (United Kingdom) [7483-06]

14.30: **Femtosecond lasers for countermeasure applications**, Gijs C. Franssen, Ric Schleijsen, Johan C. van den Heuvel, TNO Defence, Security and Safety (Netherlands); Helge Buersing, Bernd Eberle, Dominik Walter, FGAN-FOM (Germany) [7483-08]

14.50: **MIR-generation with short and ultra short laser pulses using frequency conversion in periodically poled Lithiumniobate**, Gregor Anstett, FGAN-FOM (Germany); Felix Ruebel, Technische Univ. Kaiserslautern (Germany) [7483-09]

Coffee Break 15.10 to 15.55

Security & Defence 2009 Plenary Session

Room: B05/06 Mon. 16.00 to 17.45

16.00 to 16.10 **Welcome and Introduction**
David H. Titterton, Defence Science and Technology Lab., United Kingdom
Reinhard R. Ebert, FGAN-FOM Research Institute for Optronics and Pattern Recognition, Germany
2009 Symposium Chairs

16.05-16:10 **2008 Rudolf Kingslake Medal and Prize**

16.10-16:15 **Presentation of the SPIE Fellowship**

16.15-17:00 **Joint Research for Tomorrow's Security and Defence**
MinRat Rainer Krug, Federal Ministry of Defence, BMVg, Germany

17.00-17.45 **Optronics Research in Germany**
Maurus Tacke, Director, Research Institute for Optronics and Pattern Recognition (FOM), Research Establishment for Applied Science (FGAN), Germany
See p. 6 for information.

Tuesday 1 September

SESSION 4

Room: B07/08 Tues. 08.30 to 09.30

Semiconductor Lasers

Session Chair: **Ian Elder**, SELEX GALILEO (United Kingdom)

08.30: **Advances in spatial and spectral brightness in 800-1100nm GaAs-based high power broad area lasers**, Paul A. Crump, Hans Wenzel, Götz Erbert, Günther Tränkle, Ferdinand-Braun-Institut für Höchstfrequenztechnik (Germany) [7483-10]

08.50: **Diode laser arrays for 1.8 to 2.3 µm wavelength range**, "Márc T. Kelemen, Jürgen Gilly, m2k-laser GmbH (Germany); Jens Biesenbach, DILAS Diodenlaser GmbH (Germany); Joachim Wagner, Fraunhofer-Institut für Angewandte Festkörperphysik (Germany) [7483-11]

09.10: **High power, high efficiency quantum cascade laser systems for directional infrared countermeasures and other defense and security applications**, Richard Maulini, Arkadiy Lyakh, Alexei G. Tsekoun, Rowel Go, Michael Lane, Tyson Macdonald, C. Kumar N. Patel, Pranalytica, Inc. (United States) [7483-12]

SPIE Europe Security + Defence

Conference 7483

SESSION 5

Room: B07/08 Tues. 09.30 to 11.20

DIRCM Considerations

Session Chair: Hans Dieter Tholl,
Diehl BGT Defence GmbH & Co. KG (Germany)

09.30: **Laser pointing in the vicinity of jet engine plumes**, Ric H. Schleijpen, TNO Defence, Security and Safety (Netherlands) ... [7483-13]

09.50: **Infrared semiconductor laser modules for DIRCM applications**, Frank Fuchs, Marcel Rattunde, Benno Roesener, Stefan Hugger, Quankui Yang, Wolfgang Bronner, Rolf Aidam, Klaus Köhler, Joachim Wagner, Fraunhofer-Institut für Angewandte Festkörperphysik (Germany); Michael Raab, Eugen Romasew, Hans Dieter Tholl, Diehl BGT Defence GmbH & Co. KG (Germany) [7483-14]

Coffee Break 10.10 to 10.40

10.40: **Laser sources for DIRCM at CILAS**, Bruno Crépy, Guillaume Closse, Sandrine Cussat-blanc, Jean-Pierre Lemette, Jean-Michel Melkonian, Jean E. Montagne, Pierre Morin, Marc Le Neve, Olivier Squaglia, CILAS Orléans (France) [7483-15]

11.00: **Eye safe laser based DIRCM systems**, Stefan Scherbarth, Andrea Thum-Jäger, EADS Deutschland GmbH (Germany) [7483-16]

SESSION 6

Room: B07/08 Tues. 11.20 to 12.20

Platform Protection I

Session Chair: Ric H.M.A. Schleijpen,
TNO Defence, Security and Safety (Netherlands)

11.20: **Analysis of first Generation infrared MANPAD attacks on fast jets**, James Jackman, Mark A. Richardson, Cranfield Univ. (United Kingdom); Brian Butters, Roy H. Walmsley, Nicolas Millwood, Chemring Countermeasures (United Kingdom); Peter W. Yuen, David B. James, Cranfield Univ. (United Kingdom) [7483-17]

11.40: **MANPADS protection for civil aircraft using an expendable decoy**, Roy H. Walmsley, Chemring Countermeasures (United Kingdom); Johan Friede, Saab Avionics (Sweden); Nicolas Millwood, Brian Butters, Chemring Countermeasures (United Kingdom) [7483-18]

12.00: **A MATLAB /Simulink Methodology For Simulating Dynamic Imaging IR Missile Scenarios For Use In Countermeasure Development and Evaluation**, Jason P. Tremblay, Tactical Technologies Inc. (Canada); Jason Tremblay, Claude R. Viau, Tactical Technologies, Inc. (Canada) [7483-19]

Lunch Break 12.20 to 13.50

SESSION 7

Room: B07/08 Tues. 13.50 to 15.10

Platform Protection II

13.50: **Comparison of the emission of IR decoy flare under controlled laboratory and on-field conditions**, Carmen Sanchez Oliveros, Raquel Macias, Laura Martin, Institute of Technology Marañosa (Spain) . [7483-20]

14.10: **Improving rotorcraft survivability to RPG attack using inverse methods**, David Anderson, University of Glasgow (United Kingdom) [7483-21]

14.30: **Quantitative assessment of laser dazzling effects on a CCD-camera through pattern-recognition-algorithms performance measurements**, Pierre Bourdon, Anne Durécu, Olivier Vasseur, ONERA (France) [7483-22]

14.50: **Integrated variable-fidelity modelling for remote sensing system design**, David Anderson, University of Glasgow (United Kingdom) [7483-23]

Coffee Break 15.10 to 15.40

SESSION 8

Room: B07/08 Tues. 15.40 to 17.20

Supporting Technologies

Session Chair: Brian Butters,
Chemring Countermeasures (United Kingdom)

15.40: **Field trials for determining the visible and infrared transmittance of screening smoke**, Carmen Sanchez Oliveros, Carlos Rosique, Guillermo Santamaria, Institute of Technology Marañosa (Spain) [7483-24]

16.00: **Monostatic Ladar demonstrator with micro-optical bidirectional beam control**, Matthias Rungenhagen, Manuel Kunz, Eugen Romasew, Hans Dieter Tholl, Diehl BGT Defence GmbH & Co. KG (Germany) [7483-25]

16.20: **Laser formed firearm microstamping technology: a pre-planned counterinsurgency intelligence gathering tool**, Todd E. Lizotte, Hitachi Via Mechanics (USA), Inc. (United States) [7483-28]

16.40: **Atmospheric tip/tilt compensation for laser beam tracking with amateur telescopes**, Ivo Buske, Wolfgang Riede, Deutsches Zentrum für Luft- und Raumfahrt e.V. (Germany) [7483-29]

17.00: **Tracking illicit small arms trafficking: firearm microstamping of small arms and light weapon exports**, Todd E. Lizotte, Orest Ohar, Hitachi Via Mechanics (USA), Inc. (United States) [7483-30]

Closing Remarks

Room: B07/08 Tues. 17.20 to 17.30

Brian Butters, Chemring Countermeasures (United Kingdom)



Conference 7484

Tuesday 1 September 2009 • Proceedings of SPIE Vol. 7484

Optically Based Biological and Chemical Detection for Defence V

Conference Chairs: **John C. Carrano**, Carrano Consulting (USA); **Charles J. Collins**, Luminex Corp. (USA)

Programme Committee: **David W. Cullin**, ICx Technologies (USA); **Richard K. DeFreez**, ICx Mesosystems (USA); **Sherry A. Dunbar**, Luminex Corp. (USA); **E. Virginia Foot**, Defence Science and Technology Lab. (United Kingdom); **William F. Hug**, Photon Systems, Inc. (USA); **Thomas H. Jeys**, MIT Lincoln Lab. (USA); **Mikael Lindgren**, Norwegian Univ. of Science and Technology (Norway); **C. Kumar N. Patel**, Pranalytica, Inc. (USA); **David W. Sickenberger**, U.S. Army Research, Development and Engineering Command (USA)

Tuesday 1 September

Opening Remarks

Room: A03. Tues. 08.30 to 08.40

John C. Carrano, Carrano Consulting (USA);
Charles J. Collins, Luminex Corp. (USA)

SESSION 1

Room: A03. Tues. 08.40 to 10.40

Chemical Sensing

Session Chair: **John C. Carrano**, Carrano Consulting (USA)

08.40: **Laser photoacoustic spectroscopy for chemical detection** (*Invited Paper*), Chandra Kumar N. Patel, Pranalytica, Inc. (United States) [7484-01]

09.10: **A survey of chemical and explosives detection** (*Invited Paper*), Augustus W. Fountain III, U.S. Army Edgewood Chemical Biological Ctr. (United States) [7484-02]

09.40: **Dusty microplasmas for on-site spectroscopic analysis of atomic and molecular liquids**, John W. Sweeney, Chester G. Wilson, Louisiana Tech Univ. (United States) [7484-03]

10.00: **Liquid explosive detection from outside of the bottle by NIR**, Hideo Itozaki, Yuji Yamauchi, Osaka Univ. (Japan) [7484-04]

10.20: **Broad band tunable quantum cascade lasers for stand-off detection of explosives**, Borislav Hinkov, Frank Fuchs, Jan Mathis Kaster, Quankui Yang, Wolfgang Bronner, Rolf Aidam, Klaus Köhler, Joachim Wagner, Fraunhofer-Institut für Angewandte Festkörperphysik (Germany) [7484-05]

Coffee Break 10.40 to 11.00

SESSION 2

Room: A03. Tues. 11.00 to 12.10

LIDAR

Session Chair: **Charles J. Collins**, Luminex Corp. (USA)

11.00: **Mobile demonstrator for biological aerosol standoff detection** (*Invited Paper*), Steffen Frey, Holger Wille, JENOPTIK Laser, Optik, Systeme GmbH (Germany); Frank Wilsenack, Wehrwissenschaftliches Institut für Schutztechnologien - ABC-Schutz (Germany) [7484-06]

11.30: **Bioaerosols standoff detection referenced simultaneously with particle concentration (ppl) and viability (ACPLA) units**, Sylvie Buteau, Jean-Robert Simard, Susan Rowsell, Defence Research and Development Canada (Canada) [7484-07]

11.50: **UK LIF lidar for stand-off BW aerosol detection**, Rebecca J. Hopkins, Karen L. Baxter, Michael J. Castle, Stephen J. Barrington, Nicola V. Felton, Joseph W. Jones, Kit Risbey, Defence Science and Technology Lab. (United Kingdom) [7484-08]

Lunch Break 12.10 to 13.50

SESSION 3

Room: A03. Tues. 13.50 to 16.40

Diagnostics/Bio Sensing I

Session Chair: **Chandra Kumar N. Patel**, Pranalytica, Inc. (USA)

13.50: **The Nexus environmental sensing and diagnostics** (*Invited Paper*), John C. Carrano, Carrano Consulting (United States) [7484-10]

14.20: **MFSI and the BAND Program** (*Invited Paper*), M. Allen Northrup, Microfluidic Systems (United States) [7484-11]

14.50: **Deep ultraviolet semiconductor light sources for sensing and security** (*Invited Paper*), Maxim Shatalov, Sensor Electronic Technology, Inc. (United States) [7484-18]

15.20: **Laser diagnostic system based on blood cell scattering**, Yaroslav V. Savenko, National Technical Univ. of Ukraine (Ukraine) [7484-12]

Coffee Break 15.40 to 16.00

16.00: **Research on portable readout sensing platform for the application of electrochemical biosensors**, Kuan-Yu Lee, Tai-Ping Sun, National Chi Nan Univ. (Taiwan) [7484-13]

16.20: **Determination of hazardous microbiological samples**, Mario Mordmüller, Technische Univ. Clausthal (Germany); Christian Bohling, Andreas John, SECOPTA GmbH (Germany); Wolfgang Schade, Technische Univ. Clausthal (Germany) [7484-14]

SESSION 4

Room: A03. Tues. 16.40 to 18.00

Diagnostics/Bio Sensing II

Session Chair: **John C. Carrano**, Carrano Consulting (USA)

16.40: **A novel biological detection system for defense and diagnostics** (*Invited Paper*), Charles J. Collins, Luminex Corp. (United States) [7484-15]

17.10: **LIF bio-aerosol threat triggers: then and now** (*Invited Paper*), Richard K. DeFreez, ICx Mesosystems (United States) [7484-16]

17.40: **Evaluation of biological aerosol stand-off detection at a field trial**, Per Jonsson, Magnus Elmqvist, Ove K. S. Gustafsson, Fredrik Kullander, Rolf Persson, Göran Olofsson, Torbjörn Tjärnhage, Swedish Defence Research Agency (Sweden); Øystein Farsund, Trym V. Haavardsholm, Gunnar Rustad, Norwegian Defence Research Establishment (Norway) [7484-17]

SPIE Europe Security + Defence

Conference 7485

Wednesday-Thursday 2-3 September 2009 • Proceedings of SPIE Vol. 7485

Millimetre Wave and Terahertz Sensors and Technology

Conference Chairs: Keith A. Krapels, U.S. Army Night Vision & Electronic Sensors Directorate (USA); Neil A. Salmon, QinetiQ Ltd. (United Kingdom)

Programme Committee: Amir Abramovich, Ariel Univ. Ctr. of Samaria (Israel); Nicholas J. Bowring, Manchester Metropolitan Univ. (United Kingdom); Markus Peichl, DLR Standort Oberpfaffenhofen (Germany); Douglas T. Petkie, Wright State Univ. (USA); Christopher A. Schuetz, Univ. of Delaware (USA)

Tuesday 1 September

POSTER SESSION Tues. 17.45 to 19.15

All symposium attendees are invited to attend 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.

Poster presenters may post their poster papers starting at 10.00 on Tuesday in the Conference Area Hallway. Any papers left on the boards following the end time of the poster session will be considered unwanted and will be discarded. SPIE Europe assumes no responsibility for posters left up after the end of the poster session. Poster authors should be at their papers from 17.45 to 19.15 to answer questions from attendees. Attendees are requested to wear their conference registration badges to the poster sessions.

Modeling of thermal emissivity of covered bulk explosive materials in the THz range, Wieslaw M. Ciurapinski, Mieczyslaw Szustakowski, Norbert Palka, Marek Zyczkowski, Radoslaw Ryniec, Marek Piszczek, Military Univ. of Technology (Poland) [7485-25]

3D resolving R and B functions in ultra-resolution and targeting problems, Evgeni N. Terentiev, Lomonosov Moscow State Univ. (Russian Federation); Nikolai E. Terentiev, The Univ. of Queensland (Australia); Yuliy V. Poluyanov, O2 (Germany) [7485-26]

Wednesday 2 September

Introductory Remarks

Room: A06 Wed. 08.50 to 09.00

Session Chairs: Keith A. Krapels, U.S. Army Night Vision & Electronic Sensors Directorate (USA); Neil Anthony Salmon, QinetiQ Ltd. (United Kingdom)

SESSION 1

Room: A06 Wed. 09.00 to 10.00

Sensor Systems I

Session Chairs: Keith A. Krapels, U.S. Army Night Vision & Electronic Sensors Directorate (USA); Amir Abramovich, Ariel Univ. Ctr. of Samaria (Israel)

09.00: **Millimeter-wave radar systems for biometric applications**, Douglas T. Petkie, Erik Bryan, Carla Benton, Brian D. Rigling, Wright State Univ. (United States) [7485-02]

09.20: **Development of a compact THz heterodyne spectrometer for standoff detection of explosive materials**, Heiko Richter, Alexei Semenov, Sergeij G. Pavlov, Deutsches Zentrum für Luft- und Raumfahrt e.V. (Germany); Lukas Mahler, Alessandro Tredicucci, Scuola Normale Superiore di Pisa (Italy); Harvey E. Beere, David A. Ritchie, Univ. of Cambridge (United Kingdom); Konstantin Il'in, Michael Siegel, Univ. Karlsruhe (Germany); Heinz-Wilhelm Hübers, Deutsches Zentrum für Luft- und Raumfahrt e.V. (Germany) [7485-03]

09.40: **Handheld terahertz spectrometer for the detection of liquid explosives**, Norman Krumbholz, Christian Jansen, Maik Scheller, Technische Univ. Braunschweig (Germany); Thomas Müller-Wirts, Sven Lübbecke, TEM Messtechnik GmbH (Germany); Ronald Holzwarth, Rainer Scheunemann, Menlo Systems GmbH (Germany); Bernd Sartorius, Helmut Röhle, Dennis Stanze, Fraunhofer-Institut für Nachrichtentechnik Heinrich-Hertz-Institut (Germany); Jörg Beckmann, Lars von Chrzanowski, Uwe Ewert, Bundesanstalt für Materialforschung und -prüfung (Germany); Martin Koch, Technische Univ. Braunschweig (Germany) [7485-04]

Coffee Break 10.00 to 10.20

SESSION 2

Room: A06 Wed. 10.20 to 11.50

Sensor Systems II

Session Chairs: Neil Anthony Salmon, QinetiQ Ltd. (United Kingdom); Markus Peichl, Deutsches Zentrum für Luft- und Raumfahrt e.V. (Germany)

10.20: **Ultra wide band detection of on body concealed weapons using the out of plane polarised late time response** (Invited Paper), Stuart W. Harmer, Nacer Rezgui, Nicholas J. Bowring, David A. Andrews, Alex Shenfield, Ali Atiah, Manchester Metropolitan Univ. (United Kingdom) [7485-05]

10.50: **An unobtrusive liquid sensor utilizing a micromilled spark gap transmitter and resonant cavity**, Heath A. Berry, Chester G. Wilson, Louisiana Tech Univ. (United States) [7485-06]

11.10: **Millimetre wave and laser system for environmental monitoring**, Yaroslav V. Savenko, Fedir Repa, National Technical Univ. of Ukraine (Ukraine) [7485-07]

11.30: **Millimetre-wave measuring system for biomedical applications**, Yaroslav V. Savenko, Fedir Repa, National Technical Univ. of Ukraine (Ukraine) [7485-08]

Lunch Break 11.50 to 13.10

SESSION 3

Room: A06 Wed. 13.10 to 15.00

Signatures/Materials Measurements

Session Chairs: Nicholas J. Bowring, Manchester Metropolitan Univ. (United Kingdom); Christopher A. Schuetz, Phase Sensitive Innovations, Inc. (USA)

13.10: **Terahertz standoff identification under real world conditions** (Invited Paper), Joachim Jonuscheit, Michael Herrmann, Christian Wiegand, Michael Theuer, Sabine Wohnsiedler, René Beigang, Fraunhofer-Institut für Physikalische Messtechnik (Germany) . . . [7485-09]

13.40: **Towards real-time active THz range imaging for security applications**, Torsten Löffler, Holger Quast, SynView GmbH (Germany) [7485-10]

14.00: **Further analysis and evaluation of the results of the NATO common shield: DAT#7 experiment (defence against terrorism)**, Stephan Dill, Markus Peichl, Matthias Jirousek, Helmut Suess, Deutsches Zentrum für Luft- und Raumfahrt e.V. (Germany) [7485-11]

14.20: **Measurements of aerospace materials and their interpretation for non-destructive testing**, Neil A. Salmon, QinetiQ Ltd. (United Kingdom) [7485-12]

14.40: **Nondestructive terahertz imaging for aerospace applications**, Douglas T. Petkie, Izaak V. Kemp, Carla Benton, Christopher Boyer, Lindsay Owens, Jason A. Deibel, Wright State Univ. (United States); Christopher D. Stoik, Matthew J. Bohn, Air Force Institute of Technology (United States) [7485-13]

Coffee Break 15.00 to 15.30



Conference 7485

SESSION 4

Room: A06 Wed. 15.30 to 17.00

Systems Modeling/Analysis/Simulation/Testing

Session Chairs: **Douglas T. Petkie**, Wright State Univ. (USA);
Amir Abramovich, Ariel Univ. Ctr. of Samaria (Israel)

15.30: **Analytical performance comparison of active and passive SMMW imaging for contraband detection** (*Invited Paper*), Harry B. Wallace, Mark J. Rosker, MMW Concepts LLC (United States) . . [7485-14]

16.00: **Studies of millimeter-wave phenomenology for helicopter brownout mitigation**, Christopher A. Schuetz, Phase Sensitive Innovations, Inc. (United States); E. Lee Stein, Jr., Jesse P. Samluk, Daniel G. Mackrides, John P. Wilson, Univ. of Delaware (United States); Richard D. Martin, Thomas E. Dillon III, Phase Sensitive Innovations, Inc. (United States); Dennis W. Prather, Univ. of Delaware (United States) . . . [7485-15]

16.20: **Experimental validation of a distributed aperture optical system for millimeter-wave imaging**, Thomas E. Dillon III, Christopher A. Schuetz, Richard D. Martin, Phase Sensitive Innovations, Inc. (United States); E. Lee Stein, Jr., Jesse P. Samluk, Daniel G. Mackrides, Univ. of Delaware (United States); Mark Marotznik, The Catholic Univ. of America (United States); Dennis W. Prather, Univ. of Delaware (United States) . . . [7485-16]

16.40: **Millimeter wave sensor requirements for maritime small craft identification**, Keith A. Krapels, U.S. Army Night Vision & Electronic Sensors Directorate (United States); Evelyn J. Boettcher, DCS Corp. (United States) . . . [7485-17]

Thursday 3 September

SESSION 5

Room: A06 Thurs. 08.30 to 10.00

Components I

Session Chair: **Markus Peichl**, Deutsches Zentrum für Luft- und Raumfahrt e.V. (Germany)

08.30: **Advanced Gunn diode as high power terahertz source for a millimetre wave high power multiplier** (*Invited Paper*), Faisal Amir, Colin Mitchell, The Univ. of Manchester (United Kingdom); Novak Farrington, e2v technologies (UK) Ltd. (United Kingdom); Mohamed Missous, The Univ. of Manchester (United Kingdom) . . . [7485-18]

09.00: **Traceable terahertz power measurement by using optical methods**, Andreas Steiger, Berndt Gutschwager, Peter Meindl, Christian Monte, Ralf Müller, Lutz Werner, Jörg Hollandt, Physikalisch-Technische Bundesanstalt (Germany) . . . [7485-19]

09.20: **First operation of 8x8 glow discharge detector VLSI focal plane array towards mm wave and THz radiation video rate imaging**, Norman S. Kopeika, Ben-Gurion Univ. of the Negev (Israel); Amir Abramovich, Ariel Univ. Ctr. of Samaria (Israel); Orly Yadid-Pecht, Hezi Joseph, Ben-Gurion Univ. of the Negev (Israel); Avihai Akram, Ariel Univ. Ctr. of Samaria (Israel); Alexander Belenky, Simon Lineykin, Ben-Gurion Univ. of the Negev (Israel) . . . [7485-20]

09.40: **Millimeter-wave monolithic integrated circuits for imaging and remote sensing at 140, 200 and 300 GHz**, Ingmar Kalfass, Axel Tessmann, Arnulf Leuther, Hermann Massler, Michael Schlechtweg, Oliver Ambacher, Fraunhofer-Institut für Angewandte Festkörperphysik (Germany) . . . [7485-21]

Coffee Break 10.00 to 10.30

SESSION 6

Room: A06 Thurs. 10.30 to 11.30

Components II

Session Chairs: **Keith A. Krapels**,
U.S. Army Night Vision & Electronic Sensors Directorate (USA);
Neil Anthony Salmon, QinetiQ Ltd. (United Kingdom)

10.30: **Terahertz imaging with a quantum cascade laser and amorphous-silicon microbolometer array**, François Simoens, Thomas Durand, Jérôme Meilhan, Commissariat à l'Energie Atomique (France); Stefano Barbieri, Carlo Sirtori, Wilfried Mainault, Univ. Paris Diderot (France) . . . [7485-22]

10.50: **Possible innovative configurations for compact tunable terahertz sources**, Antonello Cutolo, Alessandro Ferrara, Univ. degli Studi del Sannio (Italy); Danilo Mascolo, STMicroelectronics (Italy); Armando Ricciardi, Univ. degli Studi di Napoli Parthenope (Italy) [7485-23]

11.10: **Image reconstruction with sub-diffraction resolution in radio vision devices of millimeter and terahertz region using receiving arrays and image scanning**, Alexander N. Vystavkin, Andrey Pestryakov, Sergey E. Bankov, Vladimir M. Chebotarev, Institute of Radio-Engineering and Electronics (Russian Federation) . . . [7485-24]



Conference 7486

Monday-Tuesday 31 August-1 September 2009 • Proceedings of SPIE Vol. 7486

Optics and Photonics for Counterterrorism and Crime Fighting V

Conference Chair: **Colin Lewis**, Ministry of Defence (United Kingdom)

Programme Committee: **David J. Barrett**, QinetiQ Ltd. (United Kingdom); **Robert Bower**, Ministry of Defence (United Kingdom); **Douglas Burgess**, Burgess Consulting (United Kingdom); **Howard J. Cummins**, HMGCC (United Kingdom); **Brian E. Foulger**, Ministry of Defence (United Kingdom); **Dennis E. Moellman**, Consultant (USA); **Neil C. Shand**, Defence Science and Technology Lab. (United Kingdom); **Robert J. Stokes**, Univ. of Strathclyde (United Kingdom)

Monday 31 August

Introductory Remarks

Room: A06 Mon. 08.30 to 08.40

Session Chair: **Colin Lewis**, Ministry of Defence (United Kingdom)

SESSION 1

Room: A06 Mon. 08.40 to 09.40

Forensics

Session Chair: **Robert J. Stokes**, Univ. of Strathclyde (United Kingdom)

08.40: **The use of sulfur nitrides as fingerprint developers**, Paul F. Kelly, Roberto King, Banshi Shah, Roger Mortimer, Loughborough Univ. (United Kingdom). [7486-01]

09.00: **Forensic applications of Raman spectroscopy and imaging**, Thomas Olschewski, Renishaw plc (United Kingdom); Robert Stokes, Univ. of Strathclyde and Cascade Technologies (United Kingdom); Matthew Bloomfield, Mathew Jones, Tim Smith, Renishaw plc (United Kingdom); Niamh NicDaeid, Univ. of Strathclyde (United Kingdom). [7486-25]

09.20: **Nanoparticle-enhanced methods for the optical detection and labelling of ricin**, Alastair W. Wark, Jun Yu, Univ. of Strathclyde (United Kingdom). [7486-03]

SESSION 2

Room: A06 Mon. 09.40 to 11.10

Biometrics

Session Chair: **Robert Bower**, Ministry of Defence (United Kingdom)

09.40: **Palprint cues interpretation using graph relaxation for biometrics authentication**, Dakshina R. Kisku, BCREC (India); Hunny Mehrotra, National Institute of Technology Rourkela (India); Jamuna K. Sing, Jadavpur Univ. (India); Phalguni Gupta, Indian Institute of Technology Kanpur (India). [7486-04]

10.00: **Remote sensing of stress using electro-optics technique**, Tong Chen, Peter W. Yuen, Kan Hong, Aristeidis Tsitiridis, Firmin Kam, James Jackman, David B. James, Mark A. Richardson, Cranfield Univ. (United Kingdom). [7486-05]

Coffee Break 10.20 to 10.50

10.50: **3D contextual maps for face recognition in security applications**, Andrej Košir, Igor Perkon, Drago Bracun, Janez Možina, Jurij F. Tašič, Univ. of Ljubljana (Slovenia). [7486-06]

SESSION 3

Room: A06 Mon. 11.10 to 12.30

Stand-Off Detection I

Session Chair: **Brian E. Foulger**, Ministry of Defence (United Kingdom)

11.10: **The stand-off methamphetamine detection (SOMAD) program**, Detlev M. Even, Philip P. Lin, Rick E. Holasek, NOVASOL (United States). [7486-07]

11.30: **Development of a QCL based IR polarimetric system for the stand-off detection and location of IEDs**, Erwan L. Normand, Cascade Technologies Ltd. (United Kingdom). [7486-08]

11.50: **Identification of explosive media using their spectrum dynamics under the action of THz pulse**, Vyacheslav A. Trofimov, Svetlana A. Varentsova, Lomonosov Moscow State Univ. (Russian Federation); Jian Chen, Xi-Cheng Zhang, Rensselaer Polytechnic Institute (United States). [7486-09]

12.10: **Advances in Raman spectroscopy in the forensics and security arena**, Michael D. Hargreaves, Cobalt Light Systems (United Kingdom); Pavel Matousek, Science and Technology Facilities Council and Cobalt Light Systems (United Kingdom); Howell G. M. Edwards, Univ. of Bradford (United Kingdom). [7486-24]

Lunch Break 12.30 to 13.40

SESSION 4

Room: A06 Mon. 13.40 to 14.20

Stand-Off Detection II

Session Chair: **Brian E. Foulger**, Ministry of Defence (United Kingdom)

13.40: **Chemical agent detection and identification with a hyperspectral imaging infrared sensor**, Philippe Lagueur, Vincent Farley, Martin Chamberland, André Villemaire, Alexandre Vallières, Telops (Canada). [7486-10]

14.00: **Stand-off detection of hazardous liquids with active hyperspectral imaging**, Chris R. Howle, Chris D. Dyer, Defence Science and Technology Lab. (United Kingdom). [7486-11]

Panel Discussion

Room: A06 Mon. 14.20 to 15.30

The Future for Optics and Photonics in Security

Moderator: **Dennis E. Moellman**, Consultant (USA)

Coffee Break 15.30 to 15.55

Security & Defence 2009 Plenary Session

Room: B05/06 Mon. 16.00 to 17.45

16.00 to 16.10 **Welcome and Introduction**
David H. Titterton, Defence Science and Technology Lab., United Kingdom

Reinhard R. Ebert, FGAN-FOM Research Institute for Optronics and Pattern Recognition, Germany
2009 Symposium Chairs

16.05-16:10 **2008 Rudolf Kingslake Medal and Prize**

16.10-16:15 **Presentation of the SPIE Fellowship**

16.15-17:00 **Joint Research for Tomorrow's Security and Defence**

MinRat Rainer Krug, Federal Ministry of Defence, BMVg, Germany

17.00-17.45 **Optronics Research in Germany**
Maurus Tacke, Director, Research Institute for Optronics and Pattern Recognition (FOM), Research Establishment for Applied Science (FGAN), Germany

See p. 6 for information.



Conference 7486

Tuesday 1 September

SESSION 5

Room: A06 Tues. 08.30 to 10.10

Imaging Technology

Session Chair: **Colin Lewis**, Ministry of Defence (United Kingdom)

08.30: **Surveillance video behaviour profiling and anomaly detection (Invited Paper)**, Tao Xiang, Shaogang Gong, Queen Mary, Univ. of London (United Kingdom) [7486-12]

08.50: **Latest developments in the i-lids performance standard: from multiple standard camera views to new imaging modalities**, Kingsley Sage, Adam Nilski, Ian Sillett, Home Office Scientific Development Branch (United Kingdom) [7486-13]

09.10: **A biological cortex like target recognition and tracking in cluttered background**, Aristeidis Tsitiridis, Peter W. Yuen, Kan Hong, Firmin Kam, Tong Chen, James Jackman, David B. James, Mark A. Richardson, Cranfield Univ. (United Kingdom) [7486-14]

09.30: **Active infrared (IR) hyperspectral imaging system utilising broadly tunable OPO**, Graeme P. A. Malcolm, M Squared Lasers Ltd. (United Kingdom) and Univ. of St. Andrews (United Kingdom); Gareth T. Maker, Gordon Robertson, M Squared Lasers Ltd. (United Kingdom); Malcolm H. Dunn, David J. M. Stothard, Univ. of St. Andrews (United Kingdom) [7486-15]

09.50: **Detection and classification of stress using thermal imaging technique**, Kan Hong, Peter W. Yuen, Firmin Kam, Aristeidis Tsitiridis, Tong Chen, James Jackman, David B. James, Mark A. Richardson, Cranfield Univ. (United Kingdom) [7486-16]

Coffee Break 10.10 to 10.40

SESSION 6

Room: A06 Tues. 10.40 to 11.20

Encryption Technology

Session Chair: **Howard J. Cummins**, Her Majesty's Government Communications Ctr. (United Kingdom)

10.40: **A new simultaneous compression and encryption method for images suitable to optical correlation**, Ayman Alfalou, Marwa Elbouz, Alain Loussert, Institut Supérieur de l'Electronique et du Numerique (France) [7486-17]

11.00: **Simultaneous multiplexing and encoding of multiple images based on the double random phase encryption system**, Ayman Alfalou, Institut Supérieur de l'Electronique et du Numerique (France) ... [7486-18]

SESSION 7

Room: A06 Tues. 11.20 to 12.40

Signal Processing and Data Fusion

Session Chair: **Douglas Burgess**, Burgess Consulting (United Kingdom)

11.20: **Multichannel system for restoration of signal and for identification of medium**, Vyacheslav A. Trofimov, Svetlana A. Varentsova, Lomonosov Moscow State Univ. (Russian Federation) [7486-19]

11.40: **Image processing technology for enhanced situational awareness**, Scott F. Page, Moira Smith, Duncan L. Hickman, Mark Bernhardt, Waterfall Solutions Ltd. (United Kingdom) [7486-20]

12.00: **The fusion of MIR absorbance and NIR Raman spectroscopic techniques for identification of improvised explosive materials in multiple scenarios**, Robert J. Stokes, Cascade Technologies Ltd. (United Kingdom) and Univ. of Strathclyde (United Kingdom); Erwan L. Normand, Cascade Technologies Ltd. (United Kingdom) [7486-21]

12.20: **Multiview segmented filter for multi-correlation: application to 3D face recognition**, Ayman Alfalou, Institut Supérieur de l'Electronique et du Numerique (France); Christian Brosseau, Univ. de Bretagne Occidentale (France) [7486-22]

Lunch Break 12.40 to 14.00

Panel Discussion

Room: A06 Tues. 14.00 to 15.00

Getting the best performance by the combined use of optics and signal processing - hardware and software approaches that work together and complement each other.

Moderator: **Douglas Burgess**, Burgess Consulting (United Kingdom)

Closing Remarks

Room: A06 Tues. 15.00 to 15.10

Session Chair: **Colin Lewis**, Ministry of Defence (United Kingdom)

POSTER SESSION Tues. 17.45 to 19.15

All symposium attendees are invited to attend 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.

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A temperature insensitive silicon photodetector, James A. Harder, Michaelene W. Sprague, Elbit Systems of America (United States) [7486-23]

Conference 7487

Monday 31 August 2009 • Proceedings of SPIE Vol. 7487

Optical Materials in Defence Systems Technology

Conference Chairs: **James G. Grote**, Air Force Research Lab. (USA); **François Kajzar**, Univ. d'Angers (France); **Roberto Zamboni**, Consiglio Nazionale delle Ricerche (Italy)

Programme Committee: **Chantal Andraud**, École Normale Supérieure de Lyon (France); **Carrie M. Bartsch**, General Dynamics Information Technology (USA); **Werner J. Blau**, Trinity College Dublin (Ireland); **Larry R. Dalton**, Univ. of Washington (USA); **Manfred Eich**, Technische Univ. Hamburg-Harburg (Germany); **Patrick Feneyrou**, Thales Research & Technology (France); **Barrett Flake**, European Office of Aerospace Research and Development (USA); **Emily M. Heckman**, General Dynamics Information Technology (USA); **Charles Y. C. Lee**, Air Force Research Lab. (USA); **Antoni Cz. Mitus**, Politechnika Wroclawska (Poland); **Dieter Neher**, Univ. Potsdam (Germany); **Robert L. Nelson**, Air Force Research Lab. (USA); **Fahima Ouchen**, Air Force Research Lab. (USA); **Ullrich Pietsch**, Univ. Siegen (Germany); **Ileana Rau**, Univ. Politehnica Bucuresti (Romania); **Marina Saphiannikova**, Leibniz-Institut für Polymerforschung Dresden e.V. (Germany); **Niyazi Serdar Sariciftci**, Johannes Kepler Univ. Linz (Austria); **Kenneth D. Singer**, Case Western Reserve Univ. (USA)

Monday 31 August

Opening Remarks

Room: A05..... Mon. 08.25 to 08.30

James G. Grote, Air Force Research Lab. (USA);
François Kajzar, Univ. d'Angers (France);
Roberto Zamboni, Consiglio Nazionale delle Ricerche (Italy)

SESSION 1

Room: A05..... Mon. 08.30 to 10.20

Molecular Based Devices: Materials and Architectures I

Session Chair: **Roberto Zamboni**,
Consiglio Nazionale delle Ricerche (Italy)

08.30: **Semiconductor design for tuned charge transport characteristics** (*Keynote Presentation*) (*Invited Paper*), Antonio F. Facchetti, Northwestern Univ. (United States) and Polyera Corp. (United States) [7487-01]

09.10: **Light-emitting field-effect transistor technology: a novel strategy towards electrically pumped organic lasing** (*Keynote Presentation*) (*Invited Paper*), Michele Muccini, Raffaella Capelli, Stefano Toffanin, Consiglio Nazionale delle Ricerche (Italy); Gianluca Generali, ; Roberto Zamboni, Consiglio Nazionale delle Ricerche (Italy) [7487-02]

09.50: **Low-power organic phototransistors** (*Invited Paper*), Thomas D. Anthopoulos, John Labram, Paul H. Wöbkenberg, Donal D. C. Bradley, Imperial College London (United Kingdom) [7487-03]

Coffee Break 10.20 to 10.40

SESSION 2

Room: A05..... Mon. 10.40 to 12.40

Molecular Based Devices: Materials and Architectures II

Session Chair: **Michele Muccini**,
Istituto per lo Studio dei Materiali Nanostrutturati (Italy)

10.40: **Integrated sensors for point of care detection** (*Invited Paper*), John C. de Mello, Imperial College London (United Kingdom) . . . [7487-04]

11.10: **Organic electronic biological sensing: what are we up to?** (*Invited Paper*), Luisa Torsi, Maria D. Angione, Maria Magliulo, Univ. degli Studi di Bari (Italy); Antonia Mallardi, Istituto per i Processi Chimico-Fisici, CNR (Italy); Gerardo Palazzo, Univ. degli Studi di Bari (Italy) [7487-05]

11.40: **Energy transfer in electrophosphorescent polymer composites** (*Invited Paper*), Jacek Ulanski, Technical Univ. of Lodz (Poland) . [7487-06]

12.10: **Combining sol-gel process and nonlinear absorption: towards efficient functional materials for laser protection** (*Invited Paper*), Stephane Parola, Cedric Desroches, Frederic Chaput, Univ. Claude Bernard Lyon 1 (France); Bertil Eliasson, Umeå Univ. (Sweden); Mikael Lindgren, Norwegian Univ. of Science and Technology (Norway); Cesar Lopes, Swedish Defence Research Agency (Sweden) [7487-07]

Lunch Break 12.40 to 13.40

SESSION 3

Room: A05..... Mon. 13.40 to 15.40

Photoactive Materials

Session Chair: **François Kajzar**, Univ. d'Angers (France)

13.40: **Kinematic and dynamic light scattering from 3D photonic crystals** (*Invited Paper*), Ullrich Pietsch, Björn C. Brüser, Univ. Siegen (Germany) [7487-08]

14.10: **New trends in architecture of azo-polymer materials with applications in optical field** (*Invited Paper*), Ana-Maria Albu, Ileana Rau, Polytechnical Univ. of Bucharest (Romania); Dumitru Mircea Vuluga, Ctr. for Organic Chemistry Costin D. Nenitescu (Romania); Dan Sorin Vasilescu, Polytechnical Univ. of Bucharest (Romania) [7487-09]

14.40: **Theory of light-induced deformations in azobenzene polymers: structure-property relationship** (*Invited Paper*), Vladimir P. Toshchevnikov, Marina Saphiannikova, Gert Heinrich, Leibniz-Institut für Polymerforschung Dresden e.V. (Germany) [7487-10]

15.10: **CMP process comparison for 150mm larger area InSb (111) B focal plane array substrates** (*Invited Paper*), Patrick Flint, Lisa P. Allen, Gordon Dallas, Daniel Bakken, Kevin Blanchat, Galaxy Compound Semiconductors, Inc. (United States); Shiva Vangala, William D. Goodhue, Christopher Santeufemio, Univ. of Massachusetts Lowell (United States); David Bliss, Helen M. Dauplaise, Air Force Research Lab. (United States) [7487-11]

Coffee Break 15.40 to 16.00

Security & Defence 2009 Plenary Session

Room: B05/06 Mon. 16.00 to 17.45

16.00 to 16.10 **Welcome and Introduction**
David H. Titterton, Defence Science and Technology Lab., United Kingdom
Reinhard R. Ebert, FGAN-FOM Research Institute for Optronics and Pattern Recognition, Germany
2009 Symposium Chairs

16.05-16:10 **2008 Rudolf Kingslake Medal and Prize**

16.10-16:15 **Presentation of the SPIE Fellowship**

16.15-17:00 **Joint Research for Tomorrow's Security and Defence**
MinRat Rainer Krug, Federal Ministry of Defence, BMVg, Germany

17.00-17.45 **Optronics Research in Germany**
Maurus Tacke, Director, Research Institute for Optronics and Pattern Recognition (FOM), Research Establishment for Applied Science (FGAN), Germany
See p. 6 for information.



Conference 7487

Tuesday 1 September

SESSION 4

Room: A05. Tues. 08.20 to 11.10

NLO Properties and Applications

08.20: **Concepts to build nonlinear optical biomaterials in a bottom-up approach** (*Invited Paper*), Pierre F. Brevet, Univ. Claude Bernard Lyon 1 (France) [7487-12]

08.50: **Measurement of the quadratic hyperpolarizability of the collagen triple helix and application to second harmonic imaging of natural and biomimetic collagenous tissues** (*Invited Paper*), Ariane Deniset-Besseau, Mathias Strupler, Ecole Polytechnique (France) and CNRS (France) and Inserm U696 (France); Julien Duboisset, Univ. Claude Bernard Lyon 1 (France) and CNRS (France); Paulo De Sa Peixoto, Univ. Pierre et Marie Curie (France) and CNRS (France); Emmanuel Benichou, Univ. Claude Bernard Lyon 1 (France) and CNRS (France); Cécile Fligny, Pierre-Louis Tharaux, Institut National de la Santé et de la Recherche Médicale (France); Gervaise Mosser, Univ. Pierre et Marie Curie (France) and CNRS (France); Pierre-François Brevet, Univ. Claude Bernard Lyon 1 (France) and CNRS (France); Marie-Claire Schanne-Klein, Ecole Polytechnique (France) [7487-13]

09.20: **Broadly tunable LiInSe₂ optical parametric oscillator pumped by a Nd:YAG laser**, Georgi Marchev, Aleksey Tyazhev, Max-Born-Institut für Nichtlineare Optik und Kurzzeitspektroskopie (Germany); Vitaliy Vedenyapin, Institute of Mineralogy and Petrography (Russian Federation); Dmitri B. Kolker, Novosibirsk State Technical Univ. (Russian Federation); Alexander Yelissev, Sergei Lobanov, Ludmila I. Isaenko, Institute of Mineralogy and Petrography (Russian Federation); Jean-Jacques Zondy, Institut National de Métrologie (France); Valentin Petrov, Max-Born-Institut für Nichtlineare Optik und Kurzzeitspektroskopie (Germany) [7487-14]

09.40: **Design of near-infrared dyes for nonlinear optics: towards optical limiting applications at telecommunication wavelengths**, Quentin Bellier, Pierre-Antoine Bouit, Ecole Normale Supérieure de Lyon (France); Kenji Kamada, National Institute of Advanced Industrial Science and Technology (Japan); Patrick Feneyrou, Thales Research & Technology (France); Olivier Maury, Chantal Andraud, Ecole Normale Supérieure de Lyon (France) [7487-15]

Coffee Break 10.00 to 10.20

10.20: **Holographic patterning of organic-inorganic and Ic containing nanocomposites** (*Invited Paper*), Joachim Stumpe, Oksana Sakhno, Leonid Goldenberg, Fraunhofer-Institut für Angewandte Polymerforschung (Germany) [7487-23]

10.50: **Progress in ZnGeP₂ and AgGaS₂ crystal growth, first results on difference-frequency generation and optical parametric oscillation**, Johan Petit, ONERA (France); Said A. Said Hassani, Ctr. National de la Recherche Scientifique (France); Pierre Galtier, Univ. de Versailles Saint-Quentin-en Yvelines (France); Antoine Godard, Myriam Raybaut, Michel Lefebvre, ONERA (France) [7487-17]

SESSION 5

Room: A05. Tues. 11.10 to 12.50

Biopolymers and Devices

Session Chair: Antonio F. Facchetti, Northwestern Univ. (USA)

11.10: **Gelatin and DNA-based ionic conducting membranes** (*Invited Paper*), James G. Grote, Air Force Research Lab. (United States); Agnieszka Pawlicka, Univ de São Paulo (Brazil) [7487-18]

11.40: **Silk photonics** (*Invited Paper*), Fiorenzo G. Omenetto, Tufts Univ. (United States) [7487-19]

12.10: **Rapid nanoimprinting of silk fibroin films**, Jason Amsden, Tufts Univ. (United States); Ashwin Gopinath, Boston Univ. (United States); David L. Kaplan, Tufts Univ. (United States); Luca Dal Negro, The Photonics Ctr. at Boston Univ. (United States); Fiorenzo G. Omenetto, Tufts Univ. (United States) [7487-20]

12.30: **Eco-sustainable bio-based optoelectronic devices**, Roberto Zamboni, Gianluca Generali, Raffaella Capelli, Stefano Toffanin, Catherine C. Kitts, Michele Muccini, Consiglio Nazionale delle Ricerche (Italy); James G. Grote, Rajesh R. Naik, Air Force Research Lab. (United States); Jason Amsden, David L. Kaplan, Fiorenzo G. Omenetto, Tufts Univ. (United States) [7487-21]

POSTER SESSION Tues. 17.45 to 19.15

All symposium attendees are invited to attend 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.

Poster presenters may post their poster papers starting at 10.00 on Tuesday in the Conference Area Hallway. Any papers left on the boards following the end time of the poster session will be considered unwanted and will be discarded. SPIE Europe assumes no responsibility for posters left up after the end of the poster session. Poster authors should be at their papers from 17.45 to 19.15 to answer questions from attendees. Attendees are requested to wear their conference registration badges to the poster sessions.

Synthesis and characterization of organic-inorganic polymers from new methacrylate monomers and silane derivatives, Florica Adriana Nicolescu, Victor Valentin Jerca, Ctr. for Organic Chemistry Costin D. Nenitescu (Romania); Ana-Maria Albu, Polytechnical Univ. of Bucharest (Romania); Dumitru Mircea Vuluga, Ctr. for Organic Chemistry Costin D. Nenitescu (Romania); Dan Sorin Vasilescu, Polytechnical Univ. of Bucharest (Romania) [7487-22]

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Exhibition: 1–2 September 2009

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 Berlin, Germany

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Tuesday, 1 September	08.00 to 17.00
Wednesday, 2 September	08.00 to 17.00
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Your full symposium registration fee includes admission to all conference sessions, poster sessions, coffee breaks, welcome reception and registration for the exhibition.

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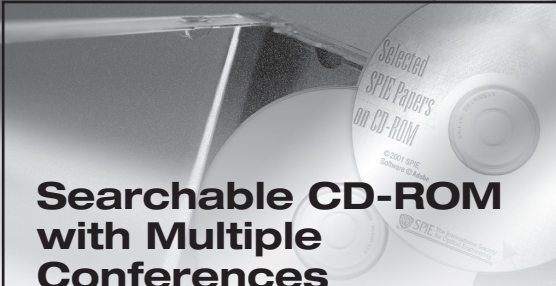
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