PROCEEDINGS OF SPIE

SPIDigitalLibrary.org/conference-proceedings-of-spie

Front Matter: Volume 7116

, "Front Matter: Volume 7116," Proc. SPIE 7116, Optically Based Biological and Chemical Detection for Defence IV, 711601 (30 October 2008); doi: 10.1117/12.817093

SPIE.

Event: SPIE Security + Defence, 2008, Cardiff, Wales, United Kingdom

PROCEEDINGS OF SPIE

Optically Based Biological and Chemical Detection for Defence IV

**John C. Carrano
Arturas Zukauskas**
Editors

**16–17 September 2008
Cardiff, Wales, United Kingdom**

Sponsored by
SPIE Europe

Cooperating Organisations
EMRSDTC—The Electro-Magnetic Remote Sensing Defence Technology Centre
(United Kingdom)
FOI— Swedish Defence Research Agency (Sweden)
Institute of Photonics (United Kingdom)
Luminex Corporation (USA)
Technium OptIC (United Kingdom)
WOF—Welsh Opto-electronics Forum (United Kingdom)

Published by
SPIE

Volume 7116

Proceedings of SPIE, 0277-786X, v. 7116

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

The papers included in this volume were part of the technical conference cited on the cover and title page. Papers were selected and subject to review by the editors and conference program committee. Some conference presentations may not be available for publication. The papers published in these proceedings reflect the work and thoughts of the authors and are published herein as submitted. The publisher is not responsible for the validity of the information or for any outcomes resulting from reliance thereon.

Please use the following format to cite material from this book:

Author(s), "Title of Paper," in *Optically Based Biological and Chemical Detection for Defence IV*, edited by John C. Carrano, Arturas Zukauskas, Proceedings of SPIE Vol. 7116 (SPIE, Bellingham, WA, 2008) Article CID Number.

ISSN 0277-786X

ISBN 9780819473486

Published by

SPIE

P.O. Box 10, Bellingham, Washington 98227-0010 USA

Telephone +1 360 676 3290 (Pacific Time) · Fax +1 360 647 1445

SPIE.org

Copyright © 2008, Society of Photo-Optical Instrumentation Engineers

Copying of material in this book for internal or personal use, or for the internal or personal use of specific clients, beyond the fair use provisions granted by the U.S. Copyright Law is authorized by SPIE subject to payment of copying fees. The Transactional Reporting Service base fee for this volume is \$18.00 per article (or portion thereof), which should be paid directly to the Copyright Clearance Center (CCC), 222 Rosewood Drive, Danvers, MA 01923. Payment may also be made electronically through CCC Online at copyright.com. Other copying for republication, resale, advertising or promotion, or any form of systematic or multiple reproduction of any material in this book is prohibited except with permission in writing from the publisher. The CCC fee code is 0277-786X/08/\$18.00.

Printed in the United States of America.

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

SPIDigitalLibrary.org

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

- The first four digits correspond to the SPIE volume number.
- The last two digits indicate publication order within the volume using a Base 36 numbering system employing both numerals and letters. These two-number sets start with 00, 01, 02, 03, 04, 05, 06, 07, 08, 09, 0A, 0B ... 0Z, followed by 10-1Z, 20-2Z, etc.

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

Contents

v Conference Committee

IDENTIFIERS AND DIAGNOSTICS

- 7116 03 **Novel optical sensors for detection of toxins, viruses, and bacteria** [7116-03]
G. D. Emmerson, I. J. G. Sparrow, D. Bhatta, J. E. SohnaSohna, Stratophase Ltd. (United Kingdom)
- 7116 05 **Low cost LED-based xMAP analyzer for multiplexed diagnosis and environmental detection of biological agents** [7116-05]
C. J. Collins, A. Altman, W. Roth, J. C. Carrano, Luminex Corp. (United States)

CHEMICAL AND EXPLOSIVE DETECTION

- 7116 09 **A gas micromechanical sensor based on surface plasmons resonance** [7116-09]
J. Hastanin, Y. Renotte, Univ. de Liège (Belgium); K. Fleury-Frenette, J. M. Defise, Ctr. Spatial de Liège (Belgium); S. Habraken, Univ. de Liège (Belgium) and Ctr. Spatial de Liège (Belgium)

ASSAYS AND SIGNATURES

- 7116 0C **Improved laser-induced fluorescence method for bio-attack early warning detection system** [7116-12]
G. Feugnet, E. Lallier, A. Grisard, Thales Research & Technology (France); L. McIntosh, J. E. Hellström, Cobolt AB (Sweden); P. Jelger, F. Laurell, Kungliga Tekniska Högskolan (Sweden); C. Albano, Umetrics AB (Sweden); M. Kaliszewski, M. Wlodarski, J. Mlynczak, M. Kwasny, Z. Zawadzki, Z. Mierczyk, K. Kopczynski, Wojskowa Akademia Techniczna (Poland); A. Rostedt, M. Putkiranta, M. Marjamäki, J. Keskinen, Tampere Univ. of Technology (Finland); J. Enroth, K. Janka, R. Reinivaara, L. Holma, Dekati Ltd. (Finland); T. Humppl, The Finnish Defence Forces (Finland); E. Battistelli, Galileo Avionica S.p.A. (Italy); E. Iliakis, G. Gerolimos, Teletel S.A. (Greece)

BIO-AEROSOL DETECTION I

- 7116 0D **Overview of the TAC-BIO detector (Invited Paper)** [7116-13]
J. Cabalo, M. DeLucia, A. Goad, J. Lacis, F. Narayanan, D. Sickenberger, U.S. Army Edgewood Chemical Biological Center (United States)
- 7116 0F **Single aerosol particle selection and capture using laser scattering and fluorescence** [7116-16]
J. D. Eversole, V. Sivaprakasam, Naval Research Lab. (United States); T. A. Pletcher, D. Keller, Sarnoff Corp. (United States)

- 7116 0G **The optical detection system of FABIOLA** [7116-17]
E. Battistelli, R. Paolinetti, C. Pompei, S. Puccini, Galileo Avionica S.p.A. (Italy)

BIO-AEROSOL DETECTION II

- 7116 0I **Low-cost real-time multiparameter bio-aerosol sensors (Invited Paper)** [7116-19]
V. E. Foot, Defence Science and Technology Lab. (United Kingdom); P. H. Kaye, W. R. Stanley, Univ. of Hertfordshire (United Kingdom); S. J. Barrington, Defence Science and Technology Lab. (United Kingdom); M. Gallagher, A. Gabey, The Univ. of Manchester (United Kingdom)
- 7116 0J **Dual-wavelength-excitation single-particle fluorescence spectrometer/particle sorter for real-time measurement of organic carbon and biological aerosols (Invited Paper)** [7116-20]
Y.-L. Pan, Yale Univ. (United States); R. G. Pinnick, S. C. Hill, Army Research Lab. (United States); H. Huang, R. K. Chang, Yale Univ. (United States)

DEVICES AND SPECTROSCOPY

- 7116 0N **A reagentless real-time method for the multiparameter analysis of nanoparticles as a potential 'trigger' device** [7116-24]
B. Carr, J. Knowles, J. Warren, NanoSight Ltd. (United Kingdom)
- 7116 0O **Advanced double-pulse UV source for laser-induced fluorescence of bio-aerosols** [7116-25]
G. Feugnet, A. Grisard, E. Lallier, Thales Research & Technology (France); L. McIntosh, J. Hellström, Cobolt AB (Sweden)

CHEMICAL AND EXPLOSIVE DETECTION III

- 7116 0Q **Database for chemical weapons detection: first results** [7116-28]
C. Bellecci, P. Gaudio, M. Gelfusa, S. Martellucci, M. Richetta, P. Ventura, A. Antonucci, Univ. of Rome Tor Vergata (Italy); F. Pasquino, V. Ricci, A. Sassolini, NBC Joint Logistic Technical Ctr. (Italy)
- 7116 0R **Cumulative sum and neural network approach to the detection and identification of hazardous chemical agents from ion mobility spectra** [7116-29]
M. Ruotsalainen, J. Vihonen, J. Jylhä, J. Kauppila, Tampere Univ. of Technology (Finland); O. Anttalainen, Environics Oy (Finland); A. Visa, Tampere Univ. of Technology (Finland)
- 7116 0S **Remote detection of liquids by Raman line imaging** [7116-15]
C. R. Howle, C. D. Dyer, Defence Science and Technology Lab. (United Kingdom); K. J. Baldwin, R. J. White, Avacta Ltd. (United Kingdom)
- 7116 0T **Detection of explosive related nitroaromatic compounds (ERNC) by laser-based ion mobility spectrometry** [7116-31]
R. Laudien, Optimare GmbH (Germany); D. Riebe, T. Beitz, H.-G. Löhmannsröben, Univ. Potsdam (Germany)

Author Index

Conference Committee

Symposium Chair

David H. Titterton, Defence Science and Technology Laboratory
(United Kingdom)

Conference Chairs

John C. Carrano, Luminex Corporation (United States)
Arturas Zukauskas, Vilnius University (Lithuania)

Program Committee

Charles J. Collins, Luminex Corporation (United States)
David W. Cullin, ICx Technologies, Inc. (United States)
Richard K. DeFreez, ICx Mesosystems (United States)
Sherry A. Dunbar, Luminex Corporation (United States)
Virginia E. Foot, Defence Science and Technology Laboratory (United Kingdom)
William F. Hug, Photon Systems, Inc. (United States)
Thomas H. Jeys, MIT Lincoln Laboratory (United States)
Mikael Lindgren, Norwegian University of Science and Technology (Norway)
Chandra K. Patel, Pranalytica, Inc. (United States)
David W. Sickenberger, U.S. Army Research, Development and Engineering Command (United States)
Ngai M. Wong, Defense Threat Reduction Agency (United States)

Session Chairs

- 1 Keynote Session
John C. Carrano, Luminex Corporation (United States)
- 2 Identifiers and Diagnostics
John C. Carrano, Luminex Corporation (United States)
- 3 Chemical and Explosive Detection
Dean P. Neikirk, The University of Texas at Austin (United States)
- 4 Assays and Signatures
Amy L. Altman, Luminex Corporation (United States)
- 5 Bio-Aerosol Detection I
Thomas H. Jeys, MIT Lincoln Laboratory (United States)

- 6 Bio-Aerosol Detection II
Charles J. Collins, Luminex Corporation (United States)
- 7 Devices and Spectroscopy
Chandra-Kumar N. Patel, Pranalytica, Inc. (United States)
- 8 Chemical and Explosive Detection III
Charles J. Collins, Luminex Corporation (United States)