PROCEEDINGS OF SPIE

SPIDigitalLibrary.org/conference-proceedings-of-spie

Front Matter: Volume 9990

, "Front Matter: Volume 9990," Proc. SPIE 9990, High-Power Lasers 2016: Technology and Systems, 999001 (27 December 2016); doi: 10.1117/12.2264059

SPIE.

Event: SPIE Security + Defence, 2016, Edinburgh, United Kingdom

PROCEEDINGS OF SPIE

High-Power Lasers 2016: Technology and Systems

**Harro Ackermann
Willy L. Bohn
David H. Titterton**
Editors

**28–29 September 2016
Edinburgh, United Kingdom**

Sponsored by
SPIE

Cooperating Organisations
Innovation Centre for Sensor and Imaging Systems (United Kingdom)
ADS Scotland (United Kingdom)
The Knowledge Transfer Network (United Kingdom)
Visit Scotland (United Kingdom)
European Regional Development Fund (Belgium)
Technology Scotland (United Kingdom)

Published by
SPIE

Volume 9990

Proceedings of SPIE 0277-786X, V. 9990

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

High-Power Lasers 2016: Technology and Systems, edited by Harro Ackermann,
Willy L. Bohn, David H. Titterton, Proc. of SPIE Vol. 9990, 999001 · © 2016 SPIE
CCC code: 0277-786X/16/\$18 · doi: 10.1117/12.2264059

Proc. of SPIE Vol. 9990 999001-1

The papers 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. Additional papers and presentation recordings may be available online in the SPIE Digital Library at SPIDigitalLibrary.org.

The papers 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 these proceedings:

Author(s), "Title of Paper," in *High-Power Lasers 2016: Technology and Systems*, edited by Harro Ackermann, Willy L. Bohn, David H. Titterton, Proceedings of SPIE Vol. 9990 (SPIE, Bellingham, WA, 2016) six-digit Article CID Number.

ISSN: 0277-786X

ISSN: 1996-756X (electronic)

ISBN: 9781510603844

ISBN: 9781510603851 (electronic)

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 © 2016, 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/16/\$18.00.

Printed in the United States of America.

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

**SPIE. DIGITAL
LIBRARY**

SPIDigitalLibrary.org

Paper Numbering: Proceedings of SPIE follow an e-First publication model. A unique citation identifier (CID) number is assigned to each article at the time of publication. Utilization of CIDs allows articles to be fully citable as soon as they are published online, and connects the same identifier to all online and print versions of the publication. SPIE uses a six-digit CID article numbering system structured as follows:

- 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.

Contents

v	Authors
vii	Conference Committee

NOVEL LASER SYSTEMS AND POWER SCALING

9990 03	Investigation on scalable high-power lasers with enhanced 'eye-safety' for future weapon systems (Invited Paper) [9990-2]
---------	--

DIODE PUMPED ALKALI LASERS AND OTHER ADVANCED GAS LASERS

9990 0C	Thermal effects in Cs DPAL and alkali cell window damage (Invited Paper) [9990-8]
9990 0D	Comparative study of DPAL and XPAL systems and selection principal of parameters [9990-9]
9990 0E	Conceptual design of a space-based O₂ laser for defense [9990-10]
9990 0F	Experimental and theoretical study of the performance of optically pumped cesium vapor laser as a function of the pump-to-laser beam overlap [9990-18]

LASER INTERACTION AND DAMAGE

9990 0G	Study on the laser irradiation effects on coating reinforced glass fiber/resin composite material [9990-11]
9990 0H	High-energy laser interaction with solids: a laser safety perspective [9990-12]
9990 0I	Neutralization of improvised explosive devices by high-power lasers: research results from the FP7 project ENCOUNTER [9990-21]
9990 0J	Laser irradiation effects on thin aluminum plates subjected to surface flow [9990-13]
9990 0K	Simulation study of the lethality effect of high-power laser with supersonic air flow [9990-14]

POSTER SESSION

9990 0L	Laser-based space debris removal: design guidelines for coherent coupling power transmission [9990-15]
9990 0N	The optical waveguide generated by acoustic waves emitted from femtoseconds filaments [9990-17]

Authors

Numbers in the index correspond to the last two digits of the six-digit citation identifier (CID) article numbering system used in Proceedings of SPIE. The first four digits reflect the volume number. Base 36 numbering is employed for the last two digits and indicates the order of articles within the volume. Numbers start with 00, 01, 02, 03, 04, 05, 06, 07, 08, 09, 0A, 0B...0Z, followed by 10-1Z, 20-2Z, etc.

Auslender, Ilya, 0F
Barmashenko, Boris D., 0F
Bigotta, S., 03
Châteauneuf, Marc, 0H
Chen, Minsun, 0G, 0J
Cheng, Minshun, 0K
Cohen, Tom, 0F
Daigle, Jean-François, 0H
Diener, K., 03
Eichhorn, M., 03
Galecki, L., 03
Geiss, L., 03
Han, Gaoce, 0D
Huang, Wei, 0D
Ibach, T., 03
Jiang, Houman, 0G, 0J
Kästel, Jürgen, 0L
Knize, R. J., 0C
Kosareva, O. G., 0N
Lebiush, Eyal, 0F
Lexow, B., 0I
Li, Hui, 0D
Li, Zhiyong, 0D
Lueck, M., 0I
Osterholz, J., 0I
Pankratov, V. V., 0N
Panov, N. A., 0N
Peng, Xin, 0J, 0K
Pudo, Dominik, 0H
Rosenwaks, Salman, 0F
Rotondaro, M. D., 0C
Scharf, H., 03
Schöner, J., 03
Shaffer, M. K., 0C
Shipilo, D. E., 0N
Speiser, Jochen, 0L
Takehisa, K., 0E
Tan, Rongqing, 0D
Théberge, Francis, 0H
Vincent, G., 03
von Salisch, M., 03
Wickert, M., 0I
Yandulsky, M. M., 0N
Zhang, Tianyu, 0G
Zhang, Xiangyu, 0G
Zhao, Guomin, 0J, 0K
Zhdanov, B. V., 0C

Conference Committee

Symposium Chairs

David H. Titterton, United Kingdom Defence Academy
(United Kingdom)

Symposium Co-chairs

Ric Schleijpen, TNO Defence, Security and Safety (Netherlands)
Karin Stein, Fraunhofer-Institut für Optronik, Systemtechnik und
Bildauswertung (Germany)
Stuart S. Duncan, Leonardo-Finmeccanica (United Kingdom)

Conference Chairs

Harro Ackermann, High Energy Laser Joint Technology Office
(United States)
Willy L. Bohn, BohnLaser Consult (Germany)
David H. Titterton, UK Defence Academy (United Kingdom)

Session Chairs

- 1 Novel Laser Systems and Power Scaling
Willy L. Bohn, BohnLaser Consult (Germany)
- 2 Fiber Lasers and Beam Scaling
Martin C. Richardson, CREOL, The College of Optics and Photonics,
University of Central Florida (United States)
- 3 Diode Pumped Alkali Lasers and Other Advanced Gas Lasers
Boris V. Zhdanov, U.S. Air Force Academy (United States)
- 4 Laser Interaction and Damage
David H. Titterton, UK Defence Academy (United Kingdom)