PROCEEDINGS OF SPIE

SPIDigitalLibrary.org/conference-proceedings-of-spie

Front Matter: Volume 10192

, "Front Matter: Volume 10192," Proc. SPIE 10192, Laser Technology for
Defense and Security XIII, 1019201 (2 June 2017); doi: 10.1117/12.2281103

SPIE.

Event: SPIE Defense + Security, 2017, Anaheim, CA, United States

PROCEEDINGS OF SPIE

Laser Technology for Defense and Security XIII

**Mark Dubinskii
Stephen G. Post**
Editors

**11 April 2017
Anaheim, California, United States**

Sponsored and Published by
SPIE

Volume 10192

Proceedings of SPIE 0277-786X, V. 10192

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

Laser Technology for Defense and Security XIII, edited by Mark Dubinskii, Stephen G. Post, Proc. of SPIE
Vol. 10192, 1019201 · © 2017 SPIE · CCC code: 0277-786X/17/\$18 · doi: 10.1117/12.2281103

Proc. of SPIE Vol. 10192 1019201-1

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 *Laser Technology for Defense and Security XIII*, edited by Mark Dubinskii, Stephen G. Post, Proceedings of SPIE Vol. 10192 (SPIE, Bellingham, WA, 2017) Seven-digit Article CID Number.

ISSN: 0277-786X

ISSN: 1996-756X (electronic)

ISBN: 9781510608856

ISBN: 9781510608863 (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 © 2017, 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/17/\$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 seven-digit CID article numbering system structured as follows:

- The first five 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	<i>Authors</i>
vii	<i>Conference Committee</i>

SESSION 1	NOVEL LASERS AND LASER DESIGNS
10192 07	Polarized millijoule fiber laser system with high beam quality and pulse shaping ability [10192-6]
SESSION 2	MID-IR LASER MATERIALS AND CRYSTALLINE FIBER DEVELOPMENT
10192 09	Efficient Pr³⁺ laser material excitation by three-for-one cross-relaxation [10192-8]
10192 0B	Optical characterizations on surface-polished polycrystalline YAG (yttrium aluminum garnet) fibers [10192-10]
SESSION 3	LASER DIODE DEVELOPMENT
10192 0D	High-power pump diodes for defense applications [10192-12]
10192 0E	Single and dual-chip high peak-power semiconductor laser [10192-14]
SESSION 4	LASER APPLICATIONS: BEAM COMBINING
10192 0G	A compact dual-wavelength fiber laser: some design aspects [10192-16]
10192 0H	Direct diode laser illumination and pointing at eye-safe SWIR wavelengths [10192-17]
10192 0I	Analysis of a space debris laser removal system [10192-18]
10192 0J	Remote laser drilling and sampling system for the detection of concealed explosives [10192-19]
10192 0K	Target-in-the-loop phasing of a fiber laser array fed by a linewidth-broadened master oscillator [10192-20]
	POSTER SESSION
10192 0M	From visible to mid-infrared supercontinuum generation using tellurite fiber with 1064 nm pump [10192-22]

- 10192 0N **Theoretical analysis of fused tapered side-pumping combiner for all-fiber lasers and amplifiers** [10192-23]
- 10192 0O **Damage characteristics of the optical element in resonant cavity irradiated by high power continuous wave laser** [10192-24]
- 10192 0P **Laser ablation molecular isotopic spectroscopy (LAMIS) towards the determination of multivariate LODs via PLS calibration model of ^{10}B and ^{11}B Boric acid mixtures** [10192-25]

Authors

Numbers in the index correspond to the last two digits of the seven-digit citation identifier (CID) article numbering system used in Proceedings of SPIE. The first five 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.

Akpovo, Codjo A., 0P	Straub, Jeremy, 0I
Alegria, Kim, 0D	Su, Jingqin, 07
Ban, Christian, 0G	Theiß, C., 0J
Bedford, Robert, 0E	Thiagarajan, Prabhu, 0H
Braker, Joe, 0D	Tian, Xiaocheng, 07
Brown, Dean P., 0B	Tyler, Glenn A., 0K
Caliva, Brian, 0H	Urbas, Augustine M., 0B
Chen, Zilun, 0N	Usechak, Nicholas G., 0B
Cook, Gary, 0B, 0E	Wild, D., 0J
Corns, Randall G., 0B	Xu, Dangpeng, 07
Dubinskii, Mark, 09	Yan, Baozhu, 0O
Ebert, Chris, 0D	Zadravec, Dusan, 0G
Fan, Mengqiu, 07	Zhang, Rui, 07
Gjesvold, Evan, 0I	Zhou, Dandan, 07
Goings, John, 0H	Zhu, Na, 07
Griffin, Benjamin, 0B	Zhu, Qihua, 07
Gu, Yanran, 0N	Zong, Zhaoyu, 07
Guiney, Tina, 0D	
Han, Kai, 0M, 0O	
Harris, C. D., 0P	
Hay, Randall S., 0B	
Holl, G., 0J	
Hou, Jing, 0M, 0N	
Huang, Zhihua, 07	
Hyde, Milo W., IV, 0K	
Irwin, David, 0D	
Jing, Feng, 07	
Johnson, Lewis, 0P	
Kadhim, Ali H., 0B	
Kim, Hyunjun, 0B	
Kokoczka, Christopher, 0E	
Lee, HeeDong, 0B	
Lei, Chengmin, 0M, 0N	
Leng, Jinyong, 0N	
Li, Hongxun, 07	
Liu, Zejin, 0O	
Lou, Zhaokai, 0O	
McDaniel, Sean A., 0B	
Merkle, Larry D., 09	
Moor, Nick, 0H	
Myers, Joshua, 0E	
Profeta, Luisa T. M., 0P	
Pschyklenk, L., 0J	
Pu, Dongsheng, 0M	
Rosado Garcia, Carlos, 0K	
Shugart, Kathleen N., 0B	
Song, Rui, 0M, 0O	
Stapleton, Dean, 0D	
Stowe, Ashley C., 0P	

Conference Committee

Symposium Chair

Donald A. Reago Jr., U.S. Army Night Vision & Electronic Sensors
Directorate (United States)

Symposium Co-chair

Arthur A. Morrish, Raytheon Space and Airborne Systems
(United States)

Conference Chairs

Mark Dubinskii, U.S. Army Research Laboratory (United States)
Stephen G. Post, Missile Defense Agency (United States)

Conference Program Committee

Patrick A. Berry, Air Force Research Laboratory (United States)
Lawrence Grimes, High Energy Joint Technology Office
(United States)
Anthony M. Johnson, University of Maryland, Baltimore County
(United States)
Albert A. Ogloza, Naval Postgraduate School (United States)
Steven G. Patterson, DILAS Diode Laser, Inc. (United States)

Session Chairs

- 1 Novel Lasers and Laser Designs
Stephen G. Post, Missile Defense Agency (United States)
- 2 Mid-IR Laser Materials and Crystalline Fiber Development
Jun Zhang, Air Force Research Laboratory (United States)
- 3 Laser Diode Development
Mark Dubinskii, U.S. Army Research Laboratory (United States)
- 4 Laser Applications: Beam Combining
Walter Fink, High Energy Laser Joint Technology Office (United States)