Front Matter: Volume 6703


Event: Optical Engineering + Applications, 2007, San Diego, California, United States
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:


ISSN 0277-786X
ISBN 9780819468512

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 © 2007, 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/07/$18.00.

Printed in the United States of America.

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

SPIEDigitalLibrary.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

SESSION 1 X-RAY GENERATION AND APPLICATION

6703 02 Some 10-fs x-ray emission switches (Invited Paper) [6703-01]
F. B. Rosmej, Univ. Pierre et Marie Curie (France); R. W. Lee, D. H. G. Schneider, H.-K. Chung,
Lawrence Livermore National Lab. (USA)

6703 05 LASERIX: a European versatile high rep-rate facility for applications in the XUV range
[6703-04]
D. Ros, G. Jamelot, M. Pittman, F. Plé, S. Kazamias, O. Guilbaud, K. Cassou, A. Klisnick,
J. Habib, J.-C. Lagron, P. Jaeglé, A. Huetz, liXAM (France); J.-P. Chambaret, S. Sebban,
P. Zeitoun, G. Mourou, Lab. d'Optique Appliquée (France)

6703 07 Modern x-ray sources based on university-scale 1 MA z-pinch generators [6703-06]
V. L. Kantsyrev, Univ. of Nevada, Reno (USA)

6703 08 Progress report on a 14.4-nm micro-exposure tool based on a laser-produced-plasma: debris mitigation system results and other issues [6703-26]
S. Bollanti, ENEA (Italy); D. Amodio, ENEA guest (Italy); A. Conti, Cilea (Italy); P. Di Lazzaro,
F. Floro, L. Mezi, D. Murra, A. Torre, ENEA (Italy); C. E. Zheng, EiEn, S.p.A. (Italy); D. Garoli,
M. G. Pelizzo, P. Nicolosi, LUXOR-INFN-DEI, Univ. di Padova (Italy); V. Mattarello, V. Rigato,
INFN-Lab. Nazionali di Legnaro (Italy); Media Lario Technologies (Italy); A. Gerardino,
CNR-INFN (Italy)

SESSION 2 EUV X-RAY SOURCES AND APPLICATIONS

6703 09 CO₂ laser-produced Sn plasma as the solution for high-volume manufacturing EUV lithography [6703-07]
A. Endo, T. Abe, H. Hoshino, Y. Ueno, M. Nakano, T. Asayama, H. Komori, G. Soumagne,
H. Mizoguchi, A. Sumitani, K. Toyoda, Extreme Ultraviolet Lithography System Development
Association (Japan)

6703 0A Dynamics of laser-produced Sn-based plasmas for a monochromatic 13.5-nm extreme ultraviolet source [6703-08]
Y. Tao, M. S. Tillack, K. L. Sequoia, R. A. Burdt, F. Najmabadi, Univ. of California, San Diego
(USA)

6703 0B Theoretical and experimental investigation of soft x-rays emitted from TIN plasmas for lithographic application [6703-09]
P. Demir, Middle East Technical Univ. (Turkey); E. Kacar, E. Akman, Univ. of Kocaeli (Turkey);
S. K. Bilkmen, Middle East Technical Univ. (Turkey); A. Demir, Univ. of Kocaeli (Turkey)
Micro- and nanoprocessing of organic polymers using a compact laser plasma EUV source equipped with EUV optical systems [6703-10]
H. Fiedorowicz, A. Bartnik, Military Univ. of Technology (Poland); K. Jakubczak, Institute of Physics and the Institute of Plasma Physics (Czech Republic); R. Jarocki, J. Kostecki, Military Univ. of Technology (Poland); L. Pina, Czech Technical Univ. (Czech Republic); R. Rakowski, A. Szczurek, M. Szczurek, Military Univ. of Technology (Poland)

New 100-Hz repetition rate soft x-ray laser plasma source for ultrafast XANES applications [6703-11]
S. Fourmaux, INRS-EMT, Univ. du Québec (Canada); L. Lecherbourg, INRS-EMT, Univ. du Québec (Canada) and LULI, CNRS-CEA-Univ. Paris 6 Ecole Polytechnique (France); M. Chagnon, H. C. Bandulet, INRS-EMT, Univ. du Québec (Canada); P. Audebert, LULI, CNRS-CEA-Univ. Paris 6 Ecole Polytechnique (France); J. C. Kieffer, INRS-EMT, Univ. du Québec (Canada)

SESSION 3 ATTOSECOND PULSE AND HIGH HARMONIC GENERATION

High-order harmonic generation experiments with IR laser pulses (Keynote Paper) [6703-12]
D. Comtois, H.-C. Bandulet, E. Bisson, INRS-Énergie, Matériaux et Télématicomunications (Canada); A. Borowiec, National Research Council (Canada); H. Pépin, INRS-Énergie, Matériaux et Télématicomunications (Canada); P. B. Corkum, National Research Council (Canada); J.-C. Kieffer, INRS-Énergie, Matériaux et Télématicomunications (Canada); D. M. Villeneuve, National Research Council (Canada)

Measurement of attosecond XUV pulses generated with polarization gating by two-dimensional photoelectron spectroscopy [6703-13]
S. Ghimire, X. Feng, Z. Chang, Kansas State Univ. (USA)

Carrier envelope phase effects on polarization gated attosecond spectra [6703-15]
M. M. Shakya, S. Gilbertson, H. Mashiko, C. Nakamura, C. Li, E. Moon, Z. Duan, J. Tackett, Z. Chang, Kansas State Univ. (USA)

SESSION 4 ULTRAFAST DETECTORS AND APPLICATIONS

New ultrafast x-ray streak camera for the advanced laser light source facility [6703-18]
C. Martel, S. Fourmaux, L. Lecherbourg, H. Bandulet, J. C. Kieffer, INRS Énergie, Matériaux et Télématicomunications (Canada)

Space charge effects in the axis-photonique PX-1 x-ray streak camera [6703-19]
M. H. Edwards, N. Booth, Z. Zhai, G. J. Talents, Univ. of York (United Kingdom); T. Dzelzainis, C. L. S. Lewis, The Queen’s Univ. of Belfast (United Kingdom); P. Foster, M. Streeter, D. Neely, Rutherford Appleton Lab. (United Kingdom)

Calibration of gated MCP responses in the x-ray region: spatial gain variation [6703-20]
Front and back side processed unintentionally doped GaAs Schottky detectors for X-ray detection [6703-21]
F. Semendy, SEDD, Army Research Lab. (USA); S. Singh, Prime Circuits (USA); M. Litz, P. Wijewarnasuriya, K. Blaine, N. Dhar, SEDD, Army Research Lab. (USA)

Pixel array detector for the capture of femtosecond duration x-ray images [6703-22]
H. T. Philipp, L. J. Koerner, M. Hromalik, M. W. Tate, Cornell Univ. (USA); S. M. Gruner, Cornell Univ. (USA) and CHESS, Cornell Univ. (USA)

Author Index
Conference Committee

Conference Chairs

Zenghu Chang, Kansas State University (USA)
George A. Kyrala, Los Alamos National Laboratory (USA)
Jean-Claude Kieffer, Institut National de la Recherche Scientifique, Énergie, Matériaux et Télécommunications, Université du Québec (Canada)

Program Committee

Bernhard W. Adams, Argonne National Laboratory (USA)
Fred Bijkerk, FOM-Institute for Plasma Physics Rijnhuizen (Netherlands)
Paul B. Corkum, National Research Council Canada (Canada)
Anatoly Y. Faenov, Institute for High Temperatures (Russia)
Roger W. Falcone, University of California, Berkeley (USA)
Henryk Fiedorowicz, Military University of Technology (Poland)
Philip A. Heimann, Lawrence Berkeley National Laboratory (USA)
Xun Hou, Xi'an Institute of Optics and Precision Mechanics (China)
Paul A. Jaanimagi, University of Rochester (USA)
Victor L. Kantsyrev, University of Nevada, Reno (USA)
Ronnie L. Shepherd, Lawrence Livermore National Laboratory (USA)
Jin Wang, Argonne National Laboratory (USA)

Session Chairs

1 X-Ray Generation and Application
   Victor L. Kantsyrev, University of Nevada, Reno (USA)

2 EUV X-Ray Sources and Applications
   Henryk Fiedorowicz, Military University of Technology (Poland)

3 Attosecond Pulse and High Harmonic Generation
   George A. Kyrala, Los Alamos National Laboratory (USA)

4 Ultrafast Detectors and Applications
   Philip A. Heimann, Lawrence Berkeley National Laboratory (USA)
   Jin Wang, Argonne National Laboratory (USA)