## PROCEEDINGS OF SPIE

## Advances in X-Ray/EUV Optics and Components XIII

Shunji Goto Christian Morawe Ali M. Khounsary Editors

20 August 2018 San Diego, California, United States

Sponsored and Published by SPIE

**Volume 10760** 

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 SPIEDigitalLibrary.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 Advances in X-Ray/EUV Optics and Components XIII, edited by Shunji Goto, Christian Morawe, Ali M. Khounsary, Proceedings of SPIE Vol. 10760 (SPIE, Bellingham, WA, 2018) Seven-digit Article CID Number.

ISSN: 0277-786X

ISSN: 1996-756X (electronic)

ISBN: 9781510620919

ISBN: 9781510620926 (electronic)

Published by

SPIF

P.O. Box 10, Bellingham, Washington 98227-0010 USA Telephone +1 360 676 3290 (Pacific Time)· Fax +1 360 647 1445 SPIF org

Copyright © 2018, 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/18/\$18.00.

Printed in the United States of America 'Vm7 i ffUb '5 ggc WJUhY gz & Wzi bXYf 'JW bgY 'Zfca 'GD-9.

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



**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	Authors
Vii	Conference Committee
ix	Introduction
SESSION 1	METROLOGY
10760 02	The ALS OSMS: Optical Surface Measuring System for high accuracy two-dimensional slope metrology with state-of-the-art x-ray mirrors [10760-2]
10760 03	Design and demonstration of tunable soft x-ray lateral shearing and Hartmann wavefront sensors [10760-3]
SESSION 2	MULTILAYERS
10760 05	The new ESRF thin-film x-ray reflectometer [10760-5]
10760 06	Ion-assisted magnetron sputter deposition of B4C-doped Ni/Ti multilayer mirrors [10760-6]
SESSION 3	GRATINGS AND MIRRORS
10760 09	Design and realization of a grazing-incidence plane-grating monochromator [10760-9]
10760 0A	Forming an ultrathin and lightweight Wolter type-1 x-ray micropore optics into a single substrate [10760-10]
10760 0D	Optics design of a micro-focusing protein crystallography beamline using a wave calculation [10760-13]
SESSION 4	SOURCES AND CRYSTAL OPTICS
10760 OE	Laser wakefield driven x-ray sources in Canada: a brillant future for agriculture and global food security [10760-14]

## **POSTER SESSION**

10760 0J **A dual-bandwidth multilayer monochromator system** [10760-19]