PROCEEDINGS OF SPIE

Advanced Laser Processing and Manufacturing VIII

Minghui Hong Ting Huang Yuji Sano Jianhua Yao Editors

12–14 October 2024 Nantong, China

Sponsored by SPIE COS—Chinese Optical Society

Cooperating Organizations

Tsinghua University (China) • Peking University (China) • University of Science and Technology of China (China) • Zhejiang University (China) • Tianjin University (China) • Beijing Institute of Technology (China) • Beijing University of Posts and Telecommunications (China) • Nankai University (China) • Changchun University of Science and Technology (China) • University of Science and Technology (China) • Capital Normal University (China) • Huazhong University of Science and Technology (China) • Beijing Jiaotong University (China) • China Jiliang University (China) • Shanghai Institute of Optics and Fine Mechanics, CAS (China) • Changchun Institute of Optics, Fine Mechanics and Physics, CAS (China) • Institute of Semiconductors, CAS (China) • Institute of Optics and Electronics, CAS (China) • Institute of Physics, CAS (China) • Shanghai Institute of Technical Physics, CAS (China) • China Instrument and Control Society (China) • Optical Society of Japan (Japan) • Optical Society of Korea (Republic of Korea) • Australian and New Zealand Optical Society • Optics and Photonics Society of Singapore (Singapore) • European Optical Society

Supporting Organizations

China Association for Science and Technology (CAST) (China)
Department of Information of National Nature Science Foundation, China (NSFC) (China)

Published by SPIE

Volume 13234

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 Advanced Laser Processing and Manufacturing VIII, edited by Minghui Hong, Ting Huang, Yuji Sano, Jianhua Yao, Proc. of SPIE 13234, Seven-digit Article CID Number (DD/MM/YYYY); (DOI URL).

ISSN: 0277-786X

ISSN: 1996-756X (electronic)

ISBN: 9781510681965

ISBN: 9781510681972 (electronic)

Published by

SPIE

P.O. Box 10, Bellingham, Washington 98227-0010 USA Telephone +1 360 676 3290 (Pacific Time) SPIE.ora

Copyright © 2024 Society of Photo-Optical Instrumentation Engineers (SPIE).

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 fees. To obtain permission to use and share articles in this volume, visit Copyright Clearance Center 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.

Printed in the United States of America by Curran Associates, Inc., under license from SPIE.

 $\hbox{Publication of record for individual papers is online in the SPIE \ Digital \ Library.}$



Paper Numbering: A unique citation identifier (CID) number is assigned to each article in the Proceedings of SPIE 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

Symposium Committees ix Conference Committee WELDING AND RELATED PHENOMENA 13234 03 Oscillating laser hot-wire welding morphology quality control of aluminum alloys [13234-2] 13234 04 Study on oscillating laser welding of plastic and metal dissimilar materials [13234-3] LASER APPLICATIONS IN LITHOGRAPHY 13234 07 Laser self-reference technique for high-precision lithographic alignment [13234-7] 13234 08 Interference laser lithography for sub-wavelength gratings in visible light [13234-8] 13234 09 Fabrication of optical mosaic gratings [13234-9] 13234 0A Free-space and solid-matrix-media diffraction neural network masks made by two-photon **lithography** [13234-10] FEMTO/PICO-SECOND LASER PROCESSING 13234 OB Micropore processing technology and quality evaluation of HTCC based on UV picosecond laser [13234-11] 13234 0C Ring-shaped random structures inscription in multimode fibers assisted by a spatial light modulator [13234-12] **ADDITIVE MANUFACTURING** 13234 OF The microstructure and arc-ablation property of Cu-Ta alloy prepared by laser directed energy deposition [13234-16] 13234 0G An ultrasensitive 3D-printed nano mechanics sensor [13234-17]

LASER SURFACE MODIFICATION

13234 OI	Laser hybrid electrochemical surface modification of titanium alloys (Invited Paper) [13234-19]
13234 OJ	Investigation on laser annealing mechanism of fused silica optics polished by ${\rm CO_2}$ lasers based on fictive temperature distribution [13234-20]
13234 OK	Femtosecond laser processing of superhydrophobic microstructures on the surface of AH36 steel plate [13234-22]
13234 OL	Laser ablation of alumina structural ceramics using fiber lasers and simulation analysis [13234-23]
	POSTER SESSION
13234 0M	Effect of laser power and focal spot size on the performance of LPBF systems [13234-5]
13234 00	Multispot laser peening using phase modulated laser beam [13234-24]
13234 OP	Laser peening in a high-vacuum environment [13234-25]
13234 0Q	Morphology and free-electron density evolution in ablation of fused silica with mJ-level femtosecond pulsed laser [13234-26]
13234 OR	Laser-induced fabrication of polymer templates for directed assembly of nanostructures [13234-27]
13234 OS	Optimizing 3D ceramic printing: a mixed powder approach to enhance surface quality and forming precision [13234-28]
13234 OT	Research on the thermo-mechanical coupled numerical simulation of laser cladding 316L+H13/20%WC composite coatings on H13 steel surface [13234-29]
13234 0U	Experimental study on the laser cladding of H13+H13/20%WC composite coating on H13 steel surface [13234-30]
13234 OV	Superwetting surface processed by a femtosecond laser for spontaneous directional transport of fluid [13234-31]
13234 OW	New technological solutions for the manufacturing and sharpening of three-flute drills [13234-32]
13234 0X	Thermal resistance investigate of copper-copper interface based on femtosecond laser periodic microstructure [13234-33]
13234 OY	Laser cladding of wear-resistant coatings based on chromium and molybdenum carbides [13234-34]