PROCEEDINGS OF SPIE

Frontiers in Ultrafast Optics: Biomedical, Scientific, and Industrial Applications XVIII

Peter R. Herman Michel Meunier Roberto Osellame Editors

28–30 January 2018 San Francisco, California, United States

Sponsored by SPIE

Cosponsored by Amplitude Systèmes (France) TRUMPF Inc. (United States)

Published by SPIE

Volume 10522

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 Frontiers in Ultrafast Optics: Biomedical, Scientific, and Industrial Applications XVIII, edited by Peter R. Herman, Michel Meunier, Roberto Osellame, Proceedings of SPIE Vol. 10522 (SPIE, Bellingham, WA, 2018) Seven-digit Article CID Number.

ISSN: 0277-786X

ISSN: 1996-756X (electronic)

ISBN: 9781510615298

ISBN: 9781510615304 (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 © 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 gž & Wži 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

٧	Authors
vii	Conference Committee
ix	Introduction
	BIOMEDICAL APPLICATIONS OF ULTRAFAST LASERS
	BIOMEDICAL ATTECATIONS OF GERMANS EASERS
10522 03	Femtosecond laser-triggered molecular release from biodegradable polymer microcapsules incorporated in gelatin hydrogel [10522-2]
10522 05	Scattering properties of ultrafast laser-induced refractive index shaping lenticular structures in hydrogels $[10522-4]$
	SURFACE STRUCTURING WITH ULTRAFAST LASERS
10522 OF	Surface functionalization of metal surfaces by large-area USP laser texturing [10522-13]
10522 0G	Plasmonic colours on bulk metals: laser colouring of large areas exhibiting high topography (Invited Paper) [10522-14]
	NOVEL TECHNIQUES FOR MATERIAL CHARACTERIZATION
	NO VE TECHNIQUE FOR MATERIAL CHARACTERIZATION
10522 OH	Beam shaping and in-situ diagnostics for development of transparent materials processing (Invited Paper) [10522-15]
10522 01	Supercontinuum generation in large-mode-area photonic crystal fibers for coherent Raman microspectroscopy [10522-16]
	ADVANCES IN ULTRAFAST LASER ABLATION
10522 OS	Suppression of ablation by double-pulse femtosecond laser irradiation (Invited Paper) [10522-25]
10522 OU	Which period ripples will form on the ablated surface: subwavelength or deep-subwavelength? (Invited Paper) [10522-27]

ADVANCED ULTRAFAST LASERS FOR MATERIAL PROCESSING 10522 10 Generation of TW-scale mid-IR femtosecond pulses using a dual-chirped optical parametric amplification (Invited Paper) [10522-33] 10522 11 Material processing with fiber based ultrafast pulse delivery [10522-34] 3D GLASS MODIFICATION 10522 16 Glass cutting optimization with pump-probe microscopy and Bessel beam profiles [10522-39] 10522 17 Distortion-compensated multifocusing of ultrashort pulse beams using a cascade optical system [10522-40] POSTER SESSION 10522 1E Single-shot temporal characterization of kilojoule-level, picosecond pulses on OMEGA EP [10522-46] 10522 1F High-speed 'multi-grid' pulse-retrieval algorithm for frequency resolved optical gating [10522-47] 10522 1H One-step synthesis of three-dimensional microtubes with single exposure of structured femtosecond optical vortices [10522-49] 10522 11 Enhanced ablation with a femtosecond-nanosecond dual-pulse [10522-51] 10522 1M Switching waves dynamics in optical bistable cavity-free system at femtosecond laser pulse propagation in semiconductor under light diffraction [10522-55] 10522 1N Short pulse characterization requires recognizing inseparability of auto-correlation and spectral measurements [10522-56] 10522 1S The laser-only single-event effects test method for space electronics based on ultrashortpulsed-laser 'local irradiation' [10522-61] 10522 1U Qualitative analysis of single shot ablation craters with ultra-short pulses [10522-63]

Rapid prototyping of 2D glass microfluidic devices based on femtosecond laser assisted

selective etching process [10522-64]

10522 1V