SLPC2014

The First Smart Laser Processing Conference 2014

April 22–24, 2014

Pacifico Yokohama, Yokohama, Japan

http://www.jlps.gr.jp/slpc2014/

Advance Program

updated March 6, 2014

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Program

Program

Oral Session

Day 1: Tuesday, April 22

Room 303

OPIC Plenary II-9

14:30 SLPC0-1 **Plenary** I000

Thrust areas of laser materials processing in the past, present and future, Reinhart Poprawe[1], Christian Hinke[2], Ingomar Kelbassa[2], [1]*Fraunhofer Institute for Laser Technology ILT, Germany,* [2]*Lasertechnology LLT at RWTH Aachen University, Germany*

15:10 *Break*

Room 413

Opening

15:30 Opening remarks, Yasuhiro Okamoto (Okayama University, Japan)

Room 413

Session 1: Advanced Lasers and Optical Technologies for Smart Processing

Chairs: Andreas Ostendorf (Ruhr University, Germany)
Satoshi Wada (RIKEN, Japan)

15:45 SLPC1-1 **Invited** I002

Inline coherent imaging of laser materials processing: Development, diagnosis and control, Paul Webster[1,2], Cole Van Vlack[1], Christopher M. Galbraith[2], James M. Fraser[2], [1]*Laser Depth Dynamics Inc., Canada,* [2]*Queen's University, Canada*

16:15 SLPC1-2 C003

A new 60 W 355 nm laser for precision manufacturing, Rajesh Patel[1], James Bovatsek[1], Ashwini Tamhankar[1], [1]*Spectra Physics, USA*

16:30 SLPC1-3 C005

Laser processing by using multi-level free-form 3D micro-fabricated DOE, Akihide Hamano[1], Atsushi Yamada[1], Takeshi Takada[2], Yoshiyuki Usuki[1], [1]*Material Research Laboratory, R&D Division, Furukawa Co. Ltd., Japan,* [2]*R&D Planning Department, R&D Division, Furukawa Co. Ltd., Japan*

16:45 SLPC1-4 C016

The study of the phase difference of beam splitters structure in the fiber-optic Mach-Zehnder interferometer, Jun-Ting J. Huang[1], Chien-Hsing Chen[2], Chih-To Wang[2], Wei-Te Wu[1], [1]*National Pingtung University of Science and Technology, Taiwan,* [2]*National Chung Cheng University, Taiwan*

17:00 SLPC1-5 C018

Development of the path generation algorithm for large-area laser pattern using the manual input control point, Kwangho Yoon[1], Kyunghan Kim[1], Jaehoon Lee[1], [1]*Korea Institute of Machinery and Materials, Korea*

17:15 SLPC1-6 C025

Fiber-delivery and compression of milli-Joule femtosecond pulses and micromachining, Benoit Debord[1], Madhoussoudhana Dontabactouny[1], Meshaal Alharbi[1], Coralie Fourcade-Dutin[1], Clemens Hönninger[3], Eric Mottay[3], Quentin Mocaer[3], Luca Vincetti[4], Frederic Gerome[1,2], Fetah Benabid[1,2], [1]*GPPMM Group, Xlim Research Institute, France,* [2]*GLOphotonics S.A.S, France,* [3]*Amplitude Systèmes, France,* [4]*University of Modena and Reggio Emilia, Italy*

OPIC2014 Banquet

18:00 **OPIC2014 Banquet (Room 501+502)**
20:00

Day 2: Wednesday, April 23

Room 313+314

Session 2: Short Wavelength Applications

Chairs: Lin Li (The University of Manchester, UK)
Masahito Katto (Miyazaki University, Japan)

8:30 SLPC2-1 **Invited** I012

Update of EUV source development status for HVM lithography, Hakaru Mizoguchi[1], Hiroaki Nakarai[1], Tamotsu Abe[1], Takeshi Ohta[1], Krzysztof M Nowak[2], Yasufumi Kawasuji[1], Hiroshi Tanaka[1], Yukio Watanabe[1], Tsukasa Hori[1], Takeshi Kodama[1], Yutaka Shiraishi[1], Tatsuya Yanagida[1], Tsuyoshi Yamada[1], Taku Yamazaki[1], Shinji Okazaki[1], Takashi Saitou[1], [1]*Gigaphoton Inc., Oyama Facility, Japan,* [2]*Gigaphoton Inc., Hiratsuka Facility, Japan*

9:00 SLPC2-2 **Invited** I017

Laser induced front side etching using Excimer laser, Klaus Zimmer[1], [1]*Leibniz Institute of Surface Modification, Germany*

9:30 SLPC2-3 C006

Straight through hole drilling in machinable ceramics, Susumu Nakamura[1], Takumi Miura[2], Masaya Tsuta[2], [1]*Department of Electrical and Electronic Systems Engineering, Nagaoka National College of Technology, Japan,* [2]*Electrical & Mechanical Systems Engineering Advanced Course, Nagaoka National College of Technology, Japan*

9:45 SLPC2-4 C031

Improvement of junction properties of ZnO nanowire/GaN hetetojunction using selective laser processing, Daisuke Nakamura[1], Norihiro Tetsuyama[1], Tetsuya Shimogaki[1], Mitsuhiro Higashihata[1], Tatsuo Okada[1], [1]*Kyushu University, Japan*

10:00 Break

Room 313+314

Session 3: Micro Nano Processing

Chairs: John Lopez (University of Bordeaux, CNRS, France)
Masayuki Fujita (Institute for Laser Technology, Japan)

10:30 SLPC3-1 **Invited** I006

Laser direct writing of graphene patterns on glasses under ambient condition, Yongfeng Lu[1], W. Xiong[1], W.J. Hou[1], L. J. Jiang[1], Jean-Francois Silvain[1,2], Lan Jiang[3], [1]*University of Nebraska - Lincoln, USA,* [2]*Institut de Chimie de la Matière Condensée de Bordeaux (ICMCB), CNRS, France,* [3]*Beijing Institute of Technology, China*

11:00 SLPC3-2 **Invited** I010

Ultrashort pulsed laser processing: Laser quantum ejection from transparent thin film and their promising applications, Peter Herman[1], Kitty Kumar[2], Kenneth K. C. Lee[1], Jianzhao Li[1], Stephen Ho[1], Jun Nogami[2], [1]*Department of Materials Science and Engineering, University of Toronto, Canada,* [2]*Department of Electrical and Computer Engineering, University of Toronto, Canada*

11:30 SLPC3-3 C004

Laser micromachining of bio-absorbable polymers: Impact of the laser process parameters on the machining throughput and quality, Frank Hendricks[1], Raj Patel[2], Victor Matylitsky[1], [1]*High Q Laser, Newport Corp., Austria,* [2]*Spectra Physics, Newport Corp., USA*

11:45 Lunch Time

Exhibition Hall C

Session 4 : Poster

Chair: Masahito Katto (Miyazaki University, Japan)

12:30 **Poster Session**

14:15 Break

Room 313+314

Session 5: Ultrashort Pulsed Laser Processing I

Chairs: Yongfeng Lu (University of Nebraska-Lincoln, USA)
Mitsuhiro Terakawa (Keio University, Japan)

14:45 SLPC5-1 **Invited** I003

Parameters of influence in surface ablation and texturing of metals using high-power ultrafast laser, John Lopez[1], Marc Faucon[2], Raphael Devillard[1], Yoann Zaouter[3], Clemens Hönninger[3], Eric Mottay[3], Rainer Kling[2], [1]*University of Bordeaux, CNRS, France,* [2]*ALPHANOV, France,* [3]*Amplitude Systèmes, France*

15:15 SLPC5-2 **Invited** I005

Double-pulsed ultrafast laser welding of glasses toward enhancement of process efficiency, Koji Sugioka[1], Sizhu Wu[1], Katsumi Midorikawa[1], [1]*RIKEN, Japan*

15:45 SLPC5-3 C030

Ultrafast mechanisms in semiconductor micro- and nano-processing by temporally shaped femtosecond laser pulses, Panos A Loukakos[1], Marios Barberoglou[1], David Gray[1], G. D. Tsibidis[1], Emmanuel Stratakis[1], Costas Fotakis[1], [1]*Foundation for Research and Technology - Hellas, Greece*

Room 313+314

Session 6: Ultrashort Pulsed Laser Processing II

Chairs: Peter R. Herman (University of Toronto, Canada)
Masaki Hashida (Kyoto University, Japan)

16:30 SLPC6-1 **Invited** I011

Ultrafast laser processing: A new route to innovative manufacturing, Jiyeon Choi[1], [1]*Department of Laser & Electron Beam Application, Korea Institute of Machinery and Materials, Korea*

17:00 SLPC6-2 C008

Monolithic fabrication of electrofluidic glass microchips based on femtosecond laser direct-write technique, Jian Xu[1], Katsumi Midorikawa[1], Koji Sugioka[1], [1]*RIKEN Center for Advanced Photonics, Japan*

17:15 SLPC6-3 C024

Cutting strengthened glass using bursts of picosecond pulses from a MOPA fiber laser, David Gay[1], Louis Desbiens[1], Steeve Lavoie[2], Yves Taillon[1], [1]*INO, Canada,* [2]*Allied Scientific Pro, Canada*

17:30 SLPC6-4 C033

Plasma expansion during laser structuring of metals with ps pulse bursts, Claudia Hartmann[1,2], Arnold Gillner[2], [1]*Chair for Laser Technology, Technical University Aachen, Germany,* [2]*Fraunhofer Institute for Laser Technology ILT, Germany*

SLPC2014 Banquet

18:30 **SLPC2014 Banquet (to be announced)**

20:30

Day 3: Thursday, April 24

Room 313+314

Session 7: Additive Manufacturing and Advanced Surface Processing

Chairs: Reinhart Poprawe (Fraunhofer Institute for Laser Technology ILT, Germany)
Hitoshi Nakano (Kinki University, Japan)

8:30 SLPC7-1 **Invited** I016

Opportunities and challenges in laser 3D printing, Bo Gu[1], [1]*Bos Photonics, USA*

9:00 SLPC7-2 **Invited** I007

Advanced laser processing technology in BAMTRI, Shuili Gong[1], [1]*Beijing Aeronautical Manufacturing Technology Research Institute, P.R.China*

9:30 SLPC7-3 C014

Effect of defects on mechanical properties of 316 stainless steel fabricated by selective laser melting, Huaixue Li[1], Baiying Huang[1], Li Ding[1], Yudai Wang[1], Shuili Gong[1], [1]*Beijing Aeronautical Manufacturing Technology Research Institute, China*

9:45 SLPC7-4 **Invited** I013

Enhancement of fatigue properties of FSW joints of A6061 aluminum alloy by laser peening, Yuji Sano[1], Kiyotaka Masaki[2], [1]*Toshiba Corporation, Japan,* [2]*Okinawa National College of Technology, Japan*

10:15 SLPC7-5 C013

Laser peening systems and the effects of laser peening on aeronautical metals sheet, Shikun Zou[1], Shuili Gong[1], [1]*Beijing Aeronautical Manufacturing Technology Research Institute, China*

10:30 Break

Room 313+314

Session 8: Bio-medical and Photonics Applications

Chairs: Eric Mottay (Amplitude Systemes, France)
Koji Sugioka (RIKEN, Japan)

11:00 SLPC8-1 **Invited** I004

Novel applications by femtosecond laser in electronics and medical device industries, Chung-Wei Cheng[1,2], Cen-Ying Lin[2], Ping-Han Wu[2], Kuang-Po Chang[2], Ji-Bin Horng[2], Wei-Te Wu[3], Keng-Liang Ou[4,5,6,7], [1]*National Chiao Tung University, Taiwan,* [2]*Industrial Technology Research Institute, Taiwan,* [3]*National Pingtung, University of Science and Technology, Taiwan,* [4]*Taipei Medical University, Taiwan,* [5]*Research Center for Biomedical Devices and Prototyping Production, Taipei Medical University, Taiwan,* [6]*Research Center for Biomedical Implants and Microsurgery Devices, Taipei Medical University, Taiwan,* [7]*Taipei Medical University-Shuang Ho Hospital, Taiwan*

11:30 SLPC8-2 **Invited** I009

Femtosecond laser generated optically generated sub-100 nm structures for biomedical and technical applications, Karsten Koenig[1], Andreas Ostendorf[2], [1]*Saarland University, Germany,* [2]*Ruhr University, Germany*

12:00 SLPC8-3 C001

Femtosecond laser integration of high-performance microoptical devices into 3D microchannel for optofluidic application, Dong Wu[1], Jian Xu[2], Sizhu Wu[1], Katsumi Midorikawa[1], Koji Sugioka[1,2], [1]*Laser Technology Laboratory, RIKEN, Japan,* [2]*RIKEN-SIOM Joint Research Unit, RIKEN, Japan*

12:15 Lunch Time

Room 313+314

Session 9: Processing of CFRP

Chairs: Rajesh Patel (Spectra Physics, USA)
Kunihiko Washio (Paradigm Laser Research Ltd., Japan)

13:15 SLPC9-1 **Invited** I008

Laser machining of CFRP composite—A comparison of fibre, Nd:YAG, CO_2, DPSS and picosecond laser processing, Lin Li[1], [1]*The University of Manchester, UK*

13:45 SLPC9-2 C002

Investigations in wavelength adapted Laser Remote Treatment of fiber reinforced polymers, Annett Klotzbach[1], Andreas Fürst[1,2], Jan Hauptmann[1], Eckhard Beyer[1,2], [1]*Fraunhofer Institute Material and Beam Technology, Germany,* [2]*Technische Universität Dresden, Germany*

14:00 SLPC9-3 C029

Micromachining of thin CFRP with UV-ps laser pulses, Masayuki Fujita[1], Hiroshi Ohkawa[2], Masataka Otsuka[2], Toshihiro Somekawa[1], Yoshinobu Maeda[2], Yosuke Orii[3], Koji Inaba[3], George Okada[3], Noriaki Miyanaga[4], [1]*Institute for Laser Technology, Japan,* [2]*Kinki University, Japan,* [3]*Spectronix Corporation, Japan,* [4]*Institute of Laser Engineering, Osaka University, Japan*

14:15 SLPC9-4 CP035

Laser cutting of CFRP by Q-CW fiber laser, Hiroki Yoshida[1], Sho Yamazaki[1], Hitoshi Fukagawa[1], Tomoyuki Tanaka[2], Tomihiko Imai[2], Hiroshige Ogawa[2], [1]*Gifu University, Japan,* [2]*Technological Innovation Center GIFU, Japan*

14:30 SLPC9-5 CP039

Influences of laser scanning conditions for CFRP processing with fiber laser, Kenjiro Takahashi[1], Masahiro Tsukamoto[1], Shinichiro Masuno[1], Yuji Sato[1], Masafumi Matsushita[2], Hidetsugu Yoshida[3], Koji Tubakimoto[3], Hisanori Fujita[3], Noriaki Miyanaga[3], Akira Fujisaki[4], Shunichi Matsushita[4], Takeshi Yamamura[5], Masahiro Ishikawa[5], Tomokazu Sakagawa[5], Masayuki Fujita[6], Hiroyuki Niino[7], Yoshihisa Harada[7], Mayu Muramatsu[7], Michiteru Nishino[8], Tamotsu Kamiya[9], [1]*Joining and Welding Research Institute, Osaka University, Japan,* [2]*Shin Nippon Koki Co., Ltd., Japan,* [3]*Institute of Laser Enginnering, Osaka University, Japan,* [4]*Furukawa Electric Co. Ltd., Japan,* [5]*Advanced Laser Research Laboratory, Kataoka Corporation, Japan,* [6]*Institute of Laser Technology, Japan,* [7]*Advanced Industrial Science and Technology, Japan,* [8]*Mitsubishi Chemical Co., Ltd., Japan,* [9]*Advanced Laser and Process Technology Research Association, Japan*

14:45 Break

Room 313+314

Session 10: Industrial Applications

Chairs: Bo Gu (Bos Photonics, USA)
Kohji Hirano (Nippon Steel & Sumitomo Metal Corporation, Japan)

15:15 SLPC10-1 **Invited** I014

Laser-based micro-processing for electronics industries, Haibin Zhang[1], [1]*Electro Scientific Industries, Inc., USA*

15:45 SLPC10-2 **Invited** I015

Laser processing for display glass, Seiji Shimizu[1], [1]*Mitsuboshi Diamond Industrial Co., LTD., Japan*

16:15 SLPC10-3 C012

Laser drilling with ps laser and ms laser in thermal barrier coated single-crystal alloy, Xiaobing Zhang[1], Ruifeng Sun[1], Wei Zhang[1], Shuili Gong[1], [1]*Beijing Aeronautical Manufacturing Technology Research Institute, China*

16:30 SLPC10-4 C019

Smart laser tracking, welding and monitoring, Jean-Paul Boillot[1], Raynald Simoneau[1], Jean Claude Fontaine[1], Jacques-Andre Gaboury[1], Nobumasa Torii[2], [1]*Servo-Robot Inc., Canada,* [2]*Servo-Robot Japan, Japan*

16:45 SLPC10-5 C034

Freeform beam shaping for industrial technologies based on fiber or fiber-coupled lasers, Alexander V. Laskin[1], Vadim Laskin[1], [1]*AdlOptica GmbH, Germany*

Room 313+314

Closing

17:00 Closing remarks, Masahiro Tsukamoto (Osaka Univeristy, Japan)

17:15 end

Poster Session

SLPC2014 Poster Session

12:30–14:15, Wednesday, April 23 at Exhibition Hall C

Chair: Masahito Katto (Miyazaki University, Japan)

Advanced Lasers and Optical Technologies for Smart Processing

SLPC4p-1 C009

All-fiber microfluidic Mach-Zehnder interferometer for detection of calcium hydroxide, Jian-Neng Wang[1], Wei-Te Wu[2], Chien-Hsing Chen[3], Ping-Li Shen[1], [1]*National Yunlin University of Science and Technology, Taiwan,* [2]*National Pingtung University of Science and Technology, Taiwan,* [3]*National Chung Cheng University, Taiwan*

SLPC4p-2 C017

A study of the reflective cladding-off cylindrical fiber sensor, Yu-Tse Y. Kao[1], Wei-Te Wu[1], [1]*National Pingtung University of Science and Technology, Taiwan*

SLPC4p-3 C023

Method for measuring of the contrast of Multi-Beam-Interference with a gaussian beam-shape, Michael Steger[1,2], Simon Boes[2], Sven Thilker[2], Arnold Gillner[2], [1]*Chair for Laser Technology, Technical University Aachen, Germany,* [2]*Fraunhofer Institute for Laser Technology, Germany*

SLPC4p-4 C011

Holographic vector wave femtosecond laser processing, Satoshi Hasegawa[1], Yoshio Hayasaki[1], [1]*Center for Optical Research and Education (CORE), Utsunomiya University, Japan*

SLPC4p-5 C020

Solid-state-like fiber lasers: Ultrahigh repetition rate femtosecond fiber laser and applications, Zhigang Zhang[1], Aimin Wang[1], Chen Li[1], Xiang Gao[1], Guizhong Wang[1], Jian Zang[1], [1]*Peking University, China*

SLPC4p-6 C021

Multifunctional laser system for micromachining of various materials, Michael Milenky[1], Eugene Raevsky[1], Dmitry Saprykin[1], [1]*Electronic Special Technological Equipment, Research & Development Institute, Russia*

SLPC4p-7 CP036

Demonstration of heat resistant Bragg grating by femtosecond laser processing for vibration monitoring, Akihiko Nishimura[1], Yusuke Takenaka[2], Takehiro Furuyama[2], Takuya Shimomura[3], Takaya Terada[3], Hiroyuki Daido[3], [1]*Japan Atomic Energy Agency, Kizugawa, Japan,* [2]*A-Tech, Japan,* [3]*Japan Atomic Energy Agency, Tsuruga, Japan*

Short Wavelength Applications

SLPC4p-8 CP038

A simplified fabrication technique for TFBG for the simultaneous measurement of refractive index and temperature of liquids, Akihiro Kameyama[1], Atsushi Yokotani[1], Masahito Katto[2], [1]*Faculty of Engineeing, University of Miyazaki, Japan,* [2]*Center of Collaborative Research and Community Cooperation, University of Miyazaki, Japan*

Micro Nano Processing

SLPC4p-9 C010

The absorption property change of quartz in micromachining by ns pulsed CO_2 laser, Kota Yamasaki[1], Hiroshi Ikenoue[1], Yousuke Watanabe[1], Daisuke Nakamura[1], Tatsuo Okada[1], [1]*Kyushu University, Japan*

SLPC4p-10 C022

Localized CO_2 laser smoothing of defects on EUV Ti-doped silica substrates, Alain Cournoyer[1], Martin Briand[1], Yanbin Duval[1], [1]*INO, Canada*

Ultrashort Pulsed Laser Processing

SLPC4p-11 C007

Formation of periodic nanowire array by femtosecond laser irradiation, Yasutaka Nakajima[1], Hisashi Shimizu[2], Takuya Shinohara[2], Mitsuhiro Terakawa[2], [1]*Department of Electronics and Electrical Engineering, Keio University, Japan,* [2]*School of Integrated Design Engineering, Keio University, Japan*

SLPC4p-12 CP037

Periodic grating structures on metal self-organized by double pulse irradiations, Laura Gemini[1], Masaki Hashida[1], Takaya Nishii[1], Yasuhiro Miyasaka[1], Hitoshi Sakagami[2], Shunsuke Inoue[1], Shuji Sakabe[1], [1]*Kyoto University, Japan,* [2]*National Institute for Fusion Science, Japan*

SLPC4p-13 C027

Investigation of micro-welding characteristics of Si and glass by picosecond pulsed laser, Imaduddin Helmi Wan Nordin[1], Yasuhiro Okamoto[1], Isamu Miyamoto[2], Akira Okada[1], [1]*Okayama University, Japan,* [2]*Osaka University, Japan*

Industrial Applications

SLPC4p-14 C026

Thin film CIGS cell scribing using a high energy femtosecond fiber amplifier, Franck Morin[1], Yoann Zaouter[1], Clemens Hönninger[1], Eric Mottay[1], Quentin Mocaer[1], Brendan Dunne[2], Rui De Almeida[3], Jean Pierre Aguerre[3], [1]*Amplitude Systèmes, France,* [2]*NEXCIS Photovoltaic Technology, France,* [3]*Mondragon Assembly, France*

SLPC4p-15 C015

Double-sided laser-arc hybrid welding of high strength steel thick plate, Liqun Li[1], Jiecai Feng[1], Yanbin Chen[1], [1]*Harbin Institute of Technology, China*

Additive Manufacturing and Advanced Surface Processing

SLPC4p-16 C032

Research progress on the high power laser processing technique, Liping Feng[1], Aiping Wu[1], [1]*Beijing Institute of Opto-Electronic Technology, China*

SLPC4p-17 C028

Effects of laser peening parameters on plastic deformation of metallic materials, Miho Tsuyama[1], Yasuteru Kodama[2], Yukio Miyamoto[2], Ippei Kitawaki[2], Toshiya Shibayanagi[3], Masahiro Tsukamoto[4], Hitoshi Nakano[1], [1]*Faculty of Science and Engineering, Kinki University, Japan,* [2]*Program in Electronic Engineering, Interdisciplinary Graduate School of Science and Engineering, Kinki University, Japan,* [3]*Faculty of Engineering, Toyama University, Japan,* [4]*Joining and Welding Research Institute, Osaka University, Japan*

Processing of CFRP

SLPC4p-18 CP040

Experimental study on CFRP cutting with nanosecond laser in air and Ar gas ambience, Yuji Sato[1], Masahiro Tsukamoto[1], Fumihiro Matsuoka[2], Kenjiro Takahashi[1], Shinichiro Masuno[1], Tomomasa Ohkubo[3], Hitoshi Nakano[2], [1]*Joining and Welding Research Institute, Osaka University, Japan,* [2]*Kinki University, Japan,* [3]*Tokyo Institute of Technology, Japan*

Poster Session

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