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Digital Photonic Production Across All Scales

Additive Manufacturing in Micro Scale (C103)

Christian Noelke, Matthias Gieseke, Stefan Kaierle
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David Havrilla, Patrick Haug, Thomas Harrer, Volker Rominger, Marco Holzer, Andrey Andreev

Vertical-Down Hybrid Welding in Ship Building - The Next Innovation Step (104)
Simon Olschok, Uwe Reisgen, Christoph Turner

Investigating the Weld Depth Behaviour Using Different Observation Techniques: X-ray, Inline Coherent Imaging and Highspeed Observation During Welding Ice (105)
Meiko Boley, Paul Webster, Rudolf Weber, Cole Van Vlack, James Fraser, Thomas Graf, Peter Berger

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Marine Resources and Sub-Products Valorisation for Medical Applications by Laser Assisted Techniques (301)
Mohamed Boutinguiza, Rafael Comesana, Jesus Del Val, Felipe Arias-Gonzalez, Joaquin Penide, Felix Quintero, Antonio Riveiro, Fernando Lusquinos, Juan Pou

Combinatorial Laser-Assisted Development of Novel Ti-Ta Alloys for Biomedical Applications (303)
Amelia Almeida, Martim Teixeira, Carole Loable, Odila Florencio, J.S. Fernandes, Rui Vilar

Bioactive Glass Coatings on Al2O3-Zro2 Composite Substrates by Laser Cladding for Orthopaedic Applications (304)
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Thermohydraulic Modeling of Pulsed Laser Welding (402)
Vincent Bruyere, Charline Touvrey, Patrick Namy
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Morgan Dal, P. Peyre

Complete Heat and Fluid Flow Modeling of Keyhole Formation and Collapse During Spot Laser Welding (405)

Mickael Courtois, Muriel Carin, Philippe Le Masson, Sadok Gaied, Mikhael Balabane

Simulation of Process Dynamics in Laser Beam Brazing (406)

Michael Dobler, Karl-Heinz Leitz, Andreas Otto, Michael Schmidt

A Finite Volume Alternate Direction Implicit Approach to Modelling Selective Laser Melting (407)

Sankhya Mohanty, Jesper Hattel

2D Modeling of Surface Tension Effect During Laser Metal Cutting (408)

El-Hachemi Amara, Karim Kheloufi, Toufik Tamsaout

Numerical Analysis of the Influence of Beam Characteristics Onto The Process Dynamics During Laser Cutting (409)

Stefanie Kohl, Michael Schmidt

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Parameter Tolerance Evaluation When Laser Cutting in Decommissioning Applications. (501)

Paul Hilton

A Comparative Experimental Study of Laser Fusion Cutting of Steel with 1 Micron and 10 Microns Laser Wavelengths (502)

Koji Hirano, Remy Fabbro

Energy Conditions of a High-Quality Cut at the Laser-Oxygen Cutting with Fiber and Co2 Lasers (503)

Victor Shulyatyev, Alexander Golyshev, Alexander Malikov, Anatoly Orishich

Analysing the Temperature Distribution at the Cutting Front and Inside the Cutting Kerf During Co2-Laser Cutting of Aluminium (504)
Michael Jarwitz, Rudolf Weber, Thomas Graf

The Novel Technology for Thick Glass Cutting with Small Power Laser Saw (505)

Chao Huang, Shi Bai, Jimin Chen

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Martin Stambke, Jean Pierre Bergmann, Benedikt Ruhdorfer

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Martin Devrient, Philipp Amend, Michael Schmidt

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Viktor Mamuschkin, Mirko Aden, Christoph Engelmann, Alexander Olowinsky, Arnold Gillner, Sibylle Glaser

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Saara Ruotsalainen, Petri Laakso, Veli Kujanpaa

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Petri Laakso, Saara Ruotsalainen, Veli Kujanpaa, Gerhard Otto, Alexander Olowinsky

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Stefan Janssen, Hermann Uchtmann, Ingomar Kelbassa

Cax Process Chain for Laser Drilling of Tool Molds (702)

Hermann Uchtmann, Ingomar Kelbassa

Research on Laser Drilling in Diverse Modes by Ns Pulse Laser (703)

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Heng Zhao, Dongyun Zhang, Rui Wu, Congyang Li

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Michael Scaggs, Gilbert Haas

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Antti Salminen, Seppo Leppanen

Induction Assisted Gma-Laser Hybrid Welding of High-Strength Fine-Grain Structural Steels (902)
Rabi Lahdo, Oliver Seffer, Andre Springer, Stefan Kaierle, Ludger Overmeyer, Mareike Collmann, Peter Schaumann, Jörg Neumeyer, Holger Schulbe, Bernard Nacke

Hybrid Laser Welding of Cladded Tubes. (904)
Frederic Coste

Hybrid Laser Welding of Single Sided Fully Penetrated Fillet Welds (905)
Wojciech Suder, Josef Camilleri, Stewart Williams

Study of Filler Metal Mixing and Its Implication on Weld Homogeneity of Laser-Hybrid and Laser Cold-Wire Welded Thick Austenitic Stainless Steel Joints (906)
Miikka Karhu, Veli Kujanpaa, Andrey Gumenyuk, Marco Lammers

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Ulrich Thombansen, Andrei Diatlov

Numerical Simulation and Experimental Investigation of Three-Dimensional Gas-Jet Transportation of Powder Particles In Direct Material Deposition (1002)
Pascal Aubry, Oleg Kovalev, Alexander Zaitsev, Irina Kovaleva, Igor Smurov, Rezak Mezari, Thierry Malot, Kevin Verdier

Experimental Analysis of the Influence of Process Parameters on the Melt Pool Formation and Stability in Powder Bed Laser (1006)
Pascal Aubry, Runchen Cao, Kevin Verdier

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Torbjörn Ilar, Ingemar Eriksson, Alexander Kaplan

**Porosity Suppression In Laser Welding of Pure Nickel and Stainless Steel (1103)**

Xudong Zhang, Nobuaki Kobayashi, Yasuhiro Motegi, Norihiro Yade

**Numerical Simulation of Wire Temperature Field for prediction of Wire Transfer Stability in Laser Hot Wire Welding (1104)**

Zheng Shiqing, Wen Peng, Feng Zahenhua, Shan Jiguo

**Detection and Repairing of Weld Defects (1105)**

Peter Berger, Timo Bauknecht, Meiko Boley, Felix Abt, Rudolf Weber, Thomas Graf

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Christoph Leyens, Frank Brueckner, Thomas Finaske, Steffen Nowotny, Eckhard Beyer, Sebastian Thieme

**Laser-Based Generation of Precise Functional Structures and Components (1202)**

Frank Brueckner, Mirko Riede, Thomas Finaske, Steffen Nowotny, Christoph Leyens, Eckhard Beyer

**Integrated Rapid 3D Mapping and Laser Additive Repair of Gas Turbine Engine Components (1203)**

Lijue Xue, Yangsheng Li, Jianyin Chen, Shaodong Wang, Glen Campbell, Matt Donovan

**Optimization of the Laser Direct Metal Deposition Process in 5-Axis Configuration. (1204)**

Didier Boisselier, Simon Sankare

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Joerg Volpp, Daniel Freimann

**Laser Beam Welding in Vacuum of Thick Plate Structural Steel (1304)**

Stefan Jakobs, Simon Olschok, Uwe Reisgen

**Laser and Electron Beam Welding of 25 Mm Thick A516 Gr.70 Steel (1305)**
James Chen, Andrew Laver, Renata Zavadil, Jie Liang, Wenyue Zheng

**Effect of Shielding Gas Composition on Co2-Laser Welding Quality (1307)**

Jukka Siltanen, Ville-Matti Nurmela, Ilpo Maaranen, Sakari Tihinen, Jukka Komi, Jurgen Scholz, Jyrki Honkanen, Bo Williams

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**Direct Metal Deposition of Functional Graded Material (1401)**

Armando Yanez, Jose M. Amado, Javier N. Montero, M. J. Tobar

**Measurement of Particle Density Distribution of Powder Nozzles for Laser Material Deposition (1402)**

Stefan Mann, Leonardo de Melo, Peter Abels

**Multi-Beam Laser Additive Manufacturing (1403)**

Rahul Patwa, Hans Herfurth, Josh Chae, Jyoti Mazumder

**Embedding Optical Fibers Into Stainless Steel Using Laser Additive Manufacturing (1404)**

Dirk Havermann, William N. Macpherson, Robert R.J. Maier, Duncan P. Hand

**Automated Laser Metal Deposition Welding in the Field of Tool and Mould Making (1405)**

Markus Franz, Conrad Haupt, Jens Bliedtner, Jean Pierre Bergmann

**Direct Metal Deposition of Titanium Matrix Composites: Optimization of the Process and Microstructural Analysis (1406)**

S. Pouzet, P. Peyre, O. Castelnau, C. Gorny, C. Colin

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Philipp von Witzendorff, Lorenz Gehrmann, Stefan Kaierle, Ludger Overmeyer, Martin Bielenin, Jean Pierre Bergmann

**Analysis of Laser Welding of Different Aluminum Alloys (1503)**

Dirk Frederik De Lange, Osbaldo Galicia Gutierrez, Ricardo Romero-Mendez, Bernard J. Aalderink

**Effects of Dual-Beam Laser Welding and Pulse Shaping on Cracking Susceptibility of Aa 5754 Aluminum (1505)**
Multi-Pass-Narrow-Gap-Laser- Beam-Welding of Hot Crack Sensitive Thick Aluminum Plates (1506)
Renald Schedewy, Berndt Brenner, Dirk Dittrich, Eckhard Beyer

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Qiwen Wu, Mingxing Ma, Weiming Zhang, Wenjin Liu, Cunyuan Peng

Laser Cleaning of Carbonaceous Deposits on Combustion Engine Components (1604)
Yingchun Guan, Chih-Hsing Liu, Gnian Cher Lim, Hong Yu Zheng, Ming Hui Hong

Study on the Friction and Wear Behavior of Laser Surface Strengthened Railway Steel (1605)
Yinlan Zheng, Qianwu Hu, Xiaoyan Zeng

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Nobuyuki Abe, Masahiro Tsukamoto, Yoshihiko Hayashi, Hiroyuki Yamazaki, Daichi Tanigawa, Yoshihiro Tatsumi, Mikio Yoneyama

A Study on Attenuation of a Nd:Yag Laser Power by Co-Axial and Off-Axial Nozzle Powder Stream during Cladding (1702)
Wei Ya, Federico Hernandez Sanchez, Belavendram Pathiraj, Bert Huis In t Veld

A Highly Versatile Novel Technique Based on Laser Cladding to Produce Coatings in the Micrometer Range (1703)
Jesus Del Val, Fernando Lusquinos, Rafael Comesana, Antonio Riveiro, Felix Quintero, Juan Pou

Clad Height Control in Laser Cladding Using a Nonlinear Optimal Output Tracking Controller (1704)
Mohammad Farshidianfar, Amir Khajepour, Saeid Khosravani, Adrian Gerlich

Microstructure and Hardness of FeCrNiCoMn High-Entropy Alloy Coating Prepared by Laser Cladding With Pre-Alloyed Gas Atomized Powder (1705)
Jianhua Yao, Ziqing Weng, Gang Dong, Lijing Yang
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Jianhua Yao, Qunli Zhang, Shirui Guo, Haiming Lai, Jianqiang Kong

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Welding of Dissimilar Metallic Materials Using a Scanned Laser Beam (1801)

Paola De Bono, Paul Hilton, Jon Blackburn, Michael Gittos, Sullivan Smith

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Hui-chi Chen, Guijun Bi, Mui Ling Sharon Nai, Jun Wei

Effect of Process Parameters on the Weld Quality in Laser Welding of Az31B Magnesium Alloy in Lap Joint Configuration (1803)

Masoud Harooni, Radovan Kovacevic, Blair Carlson

Laser Processing of Thin Copper and Aluminium Thin Sheets with Green (532Nm) and Infrared (1064Nm) Pulsed Laser Beam Sources (1804)

Paola De Bono, Ioannis Metsios, Jon Blackburn, Paul Hilton

Dissimilar Joining of Titanium Alloy Ti-6Al-4V to Aluminum Alloy 2024 Via Laser Welding (1805)

Vittorio Alfieri, Fabrizia Caiazzo, Vincenzo Sergi

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High-Efficiency Laser Processing of CFRP (1901)

Rudolf Weber, Volkher Onuseit, Simon Tscheulin, Thomas Graf, Markus Grafried

Dependence of Cutting Carbon Fiber Reinforced Plastics with nanosecond Laser On The Laser Wavelength and Oxygen Concentration of the Air. (1902)

Shinichiro Masuno, Kenjiro Takahashi, Yuji Sato, Masahiro Tsukamoto, Kazuya Miyagawa, Kazuki Nakai, Tatsuya Nariyama

Macro-Structuring of Composite Material by UV-Laser Ablation (1903)

Hagen Dittmar, Peter Jaeschke, Oliver Suttmann, Ludger Overmeyer

Correlation of Interlaminar and Tensile Properties with Resulting Thermal Impact While CFRP Laser Processing (1904)

Oliver Suttmann, Peter Jaeschke, Heinz Haferkamp
Investigations on Processing of Carbon Fiber Reinforced Plastics Using Ultrashort Pulsed Laser Radiation with High Average Power (1905)

Johannes Finger, Marco Weinand, Dirk Wortmann

Investigations of Multi-Wavelengths Treatment at Composite Materials (1906)

Annett Klotzbach, Andreas Fuerst, Frank Kretzschmar, Karsten Zenger, Jan Hauptmann, Eckhard Beyer

Study of Carbon-Fiber-Reinforced-Polymer Under Moderate Laser Intensity. Application to Laser Drilling. (1907)

Laurent Berthe, Frederic Coste, Frederic Vales

Optimization of Laser Parameters for Structural Bonding of CFRP Components with Paste Adhesive (1908)

Deniz Ozel, Lale Sacan, Basak Basarir, Ayhan Kilic, Aysun Dogangun Akin

The Damage Characteristics and Mechanism of Cfrp during Laser Joining of Cfrp/Mild Steel Dissimilar Joint (1909)

Tan Xianghu, Zhang Jing, Shan Jiguo, Shanglu Yang, Ren Jialie

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Joonas Pekkarinen, Antti Salminen, Veli Kujanpaa, Jarmo Ilonen, Lasse Lensu, Heikki Kalviainen

Microstructure Control During Laser Deposition of Nickel-Based Superalloy Ds Rene80 (2002)

Heng Zhao, Dongyun Zhang, Zhibo Li, Xuanyang Cao, Tiechuan Zuo


Jonne Nakki, Henri Pajukoski, Jari Tuominen, Petri Vuoristo


Mohammad Farshidianfar, Amir Khajepour, Meysar Zeinali, Adrian Gerlich

Microstructure of Mcraly Coatings on Steel Substrates (2009)

Armando Yanez, Jose M. Amado, Vicente Amigo, M. J. Tobar, Javier N. Montero
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Laser-Welded Sandwich Floor for Marine Container (2101)
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Laser Welding of Fully Austenitic Twinning Induced Plasticity (TWIP) Steels (2103)
Velten Behm, Stefan Huinink, Manuel Otto, Matthias Hofemann, Andre Springer, Stefan Kaierle

Measuring the Influence of Laser Welding on Fatigue Crack Propagation in High Strength Steel (2104)
Jesper Sundqvist, Ingemar Eriksson, Alexander Kaplan, Jan Granstrom, Karl-Gustaf Sundin, Markku Keskitalo, Kari Mantyjarvi

Laser Welding for Hot-Stamped Tailor Welded Blanks with High Strength Steel/High Energy Absorption Steel (2105)
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Dicing of Thin Si Wafers with a Picosecond Laser Ablation Process (M201)
Christian Fornaroli, Jens Holtkamp, Arnold Gillner

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Jarno Kaakkunen, Martti Silvennoinen, Kimmo Paivasaari, Petri Laakso, Pasi Vahimaa

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John Lopez, Yoann Zaouter, Eric Mottay, Clemens Hoenninger, Marc Faucon, Rainer Kling, Remi Torres, Patrick Georges, Marc Hanna

Structuring Features of Micro- and Nano-Ripples Induced by Oblique Incident Linear Polarized Femtosecond Laser Irradiating Metal Surface (M304)
Xiang Ming Dong, Haiying Song, Song Liu, Shibing Liu

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Peixun Fan, Minlin Zhong, Cheng Lin, Jiangyou Long, Hongjun Zhang

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Rainer Paetzel, Ralph Delmdahl, Rolf Senczuk, Jan Brune
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Sapphire Cutting with Pulsed Fiber Lasers (M403)

Christoph Ruettimann, Noemie Dury, Colin Woratz, Stefan Woessner

Beam Shaping Unit for Microprocessing on the Base of Refractive Beam Shapers (M404)

Alexander Laskin, Nerijus Siaulys, Gintas Slekys, Vadim Laskin

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Victor Matylitsky, Frank Hendricks, Rajesh Patel

New Micro and Nano Laser Machining Applications with a Versatile Ultrashort Pulse Laser System and Diffractive Optical Elements (M406)

Erwin Steiger, Ulrich Radel, Siegfried Pause

Expansion of Pulsed Laser Process Limits Through Pulsed Fiber Lasers (M407)

Christoph Ruettimann, Ulrich Duerr, Noemie Dury, Ronald Holtz

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Comparison Between Laser Technologies and Alternative Processes on Paint and Polymer Layer Removal on Composite Substrate (M1001)

Charly Loumena, Anthony Kirsch, Rainer Kling

Experimental Investigation of Cfrp Ablation with Uv and N-Ir Nanosecond Lasers (M1002)

Yuji Sato, Masahiro Tsukamoto, Kenjiro Takahashi, Shinichiro Masuno, Kazuki Nakai, Tatsuya Nariyama, Hitoshi Nakano

From Fs - Ns: Influence of the Pulse Duration Onto the Material Removal Rate and Machining Quality for Metals (M1004)

Benjamin Lauer, Beat Jaeggi, Marc Schmid, Beat Neuenschwander

Large Angle of Bragg Diffraction Using Interference Of Acoustic Wave Inside Acousto-Optic Deflector (M1005)

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Duan Jun, Huan Yang, Xiaoyan Zeng, Leiming Deng

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Masayuki Fujita, Toshihiro Somekawa, Tetsuo Samoto, Hideki Hirano, Kousuke Hikichi, Shuji Tanaka, Masayoshi Esashi

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Ilya Mingareev, Tobias Bonhoff, Ashraf El-Sherif, Tim Biermann, Wilhelm Meiners, Ingomar Kelbass, Martin Richardson

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Sinisa Vukelic, Panjawat Kongsuwan, Y. Lawrence Yao

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Andreas Patschger, Michael Guepner, Jens Bliedtner, Jean Pierre Bergmann

*Extension of the Process Boundaries for the Soldering of Elongated Interconnectors with a Simultaneous Energy Deposition (M604)*

Simon W. Britten, Wolfgang Fiedler, Alexander Olowinsky, Arnold Gillner

*Laser Joining of Charge-Collection Tapes Onto Cigs Photovoltaics Modules (M605)*

Ralf Nett, Kerstin Kowalick, Manuel Joop, Benjamin Schoeps, Andreas Ostendorf, Christoph Ruettimann, David Bremaud

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Philipp von Witzendorff, Oliver Suttmann, Ludger Overmeyer, Manuel Stompe, Lutz Rissing

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Frank Zibner, Joachim Ryll, Jens Holtkamp, Arnold Giller

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Heiko Bruening

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Markus Roehner, Susanna Friedel, Bert Kremser, Klaus Stolberg, Ewa Ziolkowski

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Ehsan Toyserkani, Amir Azhari, Elahe Jabari

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Oliver Suttmann, Jan F. Duesing, Juergen Koch, Ludger Overmeyer
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Juan Pou, Mohamed Boutinguiza, Jesus Del Val, Antonio Riveiro, Rafael Comesana, Fernando Lusquinos

Synthesis of gallium nitride nanoplates using laser-assisted metal organic chemical vapor deposition (N103)
H.R. Golgir, P. Thirugnanam, Y.S. Zhou, Y. Gao, Yongfeng Lu

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Johannes Finger, Martin Reininghaus, Dirk Wortmann, Zhao Cao, Thomas Taubner

Laser Sintering Process of Ag Nanoparticle Based Ink on Polyethylene Terephthalate for Printed Electronics (N403)
Juan Carlos Hernandez-Castaneda, Gnian Cher Lim, Gary Ka Lai Ng, Lok Boon Keng, H.Y. Zheng

Ultrafast Laser Texturing of Ti-6AL-4V Surfaces for Biomedical Applications (N405)
Amelia Almeida, Alexandre Cunha, Marie-Christine Durrieu, Rui Vilar, Omar Farouk Zouani

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Three-Dimensional Laser Ablation for Functionalization of Non-Planar Optical Surfaces (N503)
Roman Kleindienst, Ronald Kampmann, Sebastian Stoebenau, Stefan Sinzinger
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Zhe Sun, Qiang Li, Xin Chen, Hong Lei, Yongling Hui, Menghua Jiang

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**Adaptive Laser Cladding System with Variable Spot Sizes (P108)**
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Junjie Chi, Pingxue Li, Haowei Hu, Yifei Yao, Guangju Zhang, Chun Yang, Ziqiang Zhao

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**Contribution to the Replacement of Cobalt-Free Hardfacing Coating by Laser Cladding in Fast Neutron Reactors (P113)**
Nadege Caron, Van De Tran, Pascal Aubry, Cecile Blanc

**Measurement of Several Tens Pico-Second Laser Pulses using a Single-Shot Frequency Resolved Optical Grating Method (P115)**
Hoon Jeong, Dongjoo Lee

**Observation of Cross-Section Surface After Cutting of Cfrp with Uv Laser (P133)**
Tatsuya Nariyama, Kazuki Nakai, Masahiro Tsukamoto, Yuji Sato, Shinichiro Masuno, Kenjiro Takahashi, Fumihiro Matsuoka, Hitoshi Nakano

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Henri Pajukoski, Jonne Nakki, Jari Tuominen, Petri Vuoristo, Steffen Nowotny, Sebastian Thieme

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Thiwanka Wickramasooriya, Aravinda Kar, Raj Vaidyanathan

**Fatigue Properties of Laser Clad Round Steel Bars (P140)**

Jari Tuominen, Jonne Nakki, Jarmo Poutala, Petri Vuoristo, Juha Miettinen, Tuomo Peltola, Minhaj Alam, Alexander Kaplan

**Laser Cladding of AG-HA Composite Layer on Ti6Al4V (P145)**

Hau-Chung Man, Xiangmei Liu

**Femtosecond Laser Ablation of Bovine Cortical Bone (P151)**

Rui Vilar, Liliana Cangueiro

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Nishiyama Yasuhiro, Minoru Yoshida, Hiraku Yabuno