

# The 18th International Conference on Precision Engineering (ICPE2020)

## Program of Oral and Poster Sessions

### Note

- 1) Presenters are marked with "○".
- 2) All information is based on the final paper submitted through the online submission system.

## 【 Oral Sessions 】

### A-1 Digital design and manufacturing systems

- A-1-1 Investigation of bending stress at tooth and rib root fillet of high strength spiral bevel gear fabricated by five axis controlled machining center  
○Masahiro Saito<sup>1</sup>, Sinya Toyota<sup>1</sup>, Toshiki Hirogaki<sup>2</sup>, Eiichi Aoyama<sup>2</sup>  
(1.Asano Gear Co.,Ltd. 2.Doshisha University)
- A-1-2 Virtual quality inspection and tool wear estimation based on machine internal data  
○Tiandong Xi<sup>1</sup>, Sebastian Kehne<sup>1</sup>, Marcel Fey<sup>1</sup>, Christian Brecher<sup>1</sup>  
(1.RWTH Aachen University)
- A-1-3 A Study on Machining Process Analysis of Recognized Machining Features Based on Form-Shaping Motions  
○Wataru Komatsu<sup>1</sup>, Keiichi Nakamoto<sup>1</sup>  
(1.Tokyo University of Agriculture and Technology)
- A-1-4 Wrinkle Redesign Based on KANSEI Requirements and Processing System  
○Koki Nozomuto<sup>1</sup>, Hideki Aoyama<sup>1</sup>, Yukio Mori<sup>2</sup>  
(1.Keio University 2.NANJO Auto Interior Co., Ltd)
- A-1-5 Multi-objective FMS Scheduling Considering Machine Eligibility as Cutting Tools Management  
○Takumi Shimada<sup>1</sup>, Haruhiko Suwa<sup>1</sup>  
(1.Setsunan University)
- A-1-6 Assembly shop scheduling for collaboration of humans, robots and AGVs  
○Kosuke Inoue<sup>1,2</sup>, Hideki Aoyama<sup>1</sup>  
(1.Keio University 2.Makino Milling Machine Co., Ltd.)
- A-1-7 Production Line Design that Compromising Human Workers Attitude and Robotic Cells Utilization using Genetic Algorithm  
○Daiki Kajita<sup>1,2</sup>, Nobuyuki Moronuki<sup>1</sup>  
(1.Tokyo Metropolitan University 2.Hitachi, Ltd.)
- A-1-8 Proposal of a Detection Method of Similar Target Shapes for Automated Process Planning  
○Satoshi Yanagimoto<sup>1</sup>, Kiyokazu Saito<sup>2</sup>, Keiichi Nakamoto<sup>1</sup>  
(1.Tokyo University of Agriculture and Technology 2.IRISO SEIMITSU CO., Ltd.)
- A-1-9 Gap Generation for 3D Printed Assembly by Using Signed Distance Fields  
○Junhyuk Lee<sup>1</sup>, Yutaka Ohtake<sup>1</sup>, Tatsuya Yatagawa<sup>1</sup>, Hiromasa Suzuki<sup>1</sup>  
(1.The University of Tokyo)

### A-3 Advanced system design and applications

- A-3-1 Development of observation system for extraction of mental model  
○Hiroki Kajimura<sup>1</sup>, Daisuke Kono<sup>1</sup>, Go Sato<sup>2</sup>, Kentaro Mori<sup>2</sup>, Takashi Kusumi<sup>1</sup>, Atsushi Matsubara<sup>1</sup>  
(1.Kyoto University 2.Mitsubishi Electric Corporation)
- A-3-3 LSTM Model for Estimation of Order Quantity of Manufacturer by Using POS Data  
○Koji Iwamura<sup>1</sup>, Jinshan He<sup>1</sup>, Nobuhiro Sugimura<sup>2</sup>, Yoshiyuki Hirahara<sup>3</sup>  
(1.Osaka Prefecture University 2.Yamato University 3.Toshiba Tec Corporation)
- A-3-4 A structural analysis method to identify factors of complex regional issues  
○Naoki Muraoka<sup>1</sup>, Atsuto Nagayama<sup>1</sup>, Yuya Mitake<sup>1</sup>, Mar'atus Sholihah<sup>1</sup>, Yoshiki Shimomura<sup>1</sup>  
(1.Tokyo Metropolitan University)

## **A-4 CAD/CAM technologies**

- A-4-1 Prediction of machined surface properties by Boolean calculation on 3D-CAD  
○Akio Hayashi<sup>1</sup>, Yoshitaka Morimoto<sup>1</sup>  
(1.Kanazawa Institute of Technology)
- A-4-2 Parallel offset computation free from conflicts between threads  
○Daiki Ishii<sup>1</sup>, Masatomo Inui<sup>1</sup>, Nobuyuki Umezu<sup>1</sup>  
(1.Ibaraki University)
- A-4-3 Thickness evaluation of solid model in triple-dexel representation  
Yu Huang<sup>1</sup>, ○Masatomo Inui<sup>1</sup>, Nobuyuki Umezu<sup>1</sup>  
(1.Ibaraki University)
- A-4-4 Curvature Estimation on Triangle Meshes Using a Dual-graph Neural Network  
○Yu Shimada<sup>1</sup>, Yutaka Ohtake<sup>1</sup>, Tatsuya Yatagawa<sup>1</sup>, Hiromasa Suzuki<sup>1</sup>  
(1.The University of Tokyo)
- A-4-5 Proposal of an Operation Planning System Using Case-Based Reasoning with Adjustment for Case Retrieval  
○Ryo Tsukamoto<sup>1</sup>, Tetsuya Asano<sup>2</sup>, Keiichi Nakamoto<sup>1</sup>  
(1.Tokyo University of Agriculture and Technology 2.AI KOKU ALPHA Corporation)
- A-4-6 A Study on Machining Features Recognition for 5-axis Index Milling on Multi-Tasking Machine Tools  
○Yuto Watanabe<sup>1</sup>, Keiichi Nakamoto<sup>1</sup>  
(1.Tokyo University of Agriculture and Technology)
- A-4-7 A Study on Sample Data Generation to Evaluate a Neural Network Based Process Planning System  
○Naofumi Komura<sup>1</sup>, Mayu Hashimoto<sup>1</sup>, Keiichi Nakamoto<sup>1</sup>  
(1.Tokyo University of Agriculture and Technology)
- A-4-8 A Study on Eye Tracking While Understanding Mechanical Drawings to Visualize Skills for Process Planning  
○Takumu Yoshikawa<sup>1</sup>, Keiichi Nakamoto<sup>1</sup>  
(1.Tokyo University of Agriculture and Technology)
- A-4-9 A Study for Improving Productivity of Impeller by CAM Software  
○Qi Zou<sup>1</sup>, Yukitoshi Ihara<sup>1</sup>  
(1.Osaka Institute of Technology)
- A-4-10 Effect of tilting direction-angle and pick feed direction on tilt milling with ball end mill  
○Mitsuru Terada<sup>1</sup>, Koichi Morishige<sup>1</sup>  
(1.The University of Electro-Communications)

## **B-1 Advanced cutting technologies**

- B-1-1 Improvement in quality of machined surfaces using shape information generated by CAD  
○Kiwamu SAITO<sup>1</sup>, Yosuke OOTOMO<sup>1</sup>, Masako SUDO<sup>1</sup>, Osamu HANAOKA<sup>1</sup>  
(1.FANUC corporation)
- B-1-2 Proposal of a Framework for Empirical Modelling of Complex Machining Phenomena  
○Adirake Chainawakul<sup>1</sup>, Koji Teramoto<sup>1</sup>, Zejian Wu<sup>1</sup>, Takahiro Katsube<sup>1</sup>  
(1.Muroran Institute of Technology)
- B-1-3 Real time end milling simulator for cutting force monitoring  
○Kazuki Kaneko<sup>1</sup>, Isamu Nishida<sup>1</sup>, Ryuta Sato<sup>1</sup>, Keiichi Shirase<sup>1</sup>  
(1.Kobe university)
- B-1-4 Study on high quality cutting on slot liner in EV motor  
○Teppei Onuki<sup>1</sup>, Libo Zhou<sup>1</sup>, Hiroshi Matahira<sup>2</sup>, Kenichi Nakayama<sup>2</sup>, Hideaki Onozuka<sup>2</sup>, Jun Matsui<sup>2</sup>, Jun Shimizu<sup>1</sup>, Hiroataka Ojima<sup>1</sup>  
(1.Ibaraki University 2.Hitachi automotive systems, Ltd.)
- B-1-5 Surface Roughness of Finished Surface by Processing with Short Pulse Laser  
○Kosuke Hasegawa<sup>1</sup>, Xiaoxu Liu<sup>1</sup>, Satoru Maegawa<sup>1</sup>, Fumihito Itoigawa<sup>1</sup>  
(1.Nagoya Institute of Technology)

- B-1-6 Effects of double rake angle tool in low-speed cutting of high-purity iron  
 ○Junya Sezutsu<sup>1</sup>, Fumihiro Itoigawa<sup>1</sup>, Shinya Hayakawa<sup>1</sup>, Satoru Maegawa<sup>1</sup>, Xiaoxu Liu<sup>1</sup>  
 (1.Nagoya Institute of Technology)
- B-1-7 Drilling performance and behavior of cutting edge shape of diamond-coated carbide drill  
 in drilling of zirconia ceramics  
 ○Masato Okada<sup>1</sup>, Fuya Yoshimoto<sup>1</sup>, Hidehito Watanabe<sup>2</sup>, Takuya Miura<sup>1</sup>, Masaaki Otsu<sup>1</sup>  
 (1.University of Fukui 2.UNION TOOL CO.)
- B-1-8 Effect of edge radius on surface finishing with end mill  
 ○Yuki Inoue<sup>1</sup>, Fumihiro Uchiyama<sup>1</sup>, Ryota Uchiyama<sup>1</sup>, Takashi Matsumura<sup>2</sup>  
 (1.Uchiyama Hamono. Co.,Ltd 2.Tokyo Denki University)
- B-1-9 Residual stress characteristics on machined surface machined by Low Frequency  
 Vibration-cutting  
 ○Yo Kamada<sup>1</sup>, Hiroyuki Sasahara<sup>1</sup>  
 (1.Tokyo University of agriculture and technology)
- B-1-10 Application of Metal Cutting Process to Improvement of High Performance Stainless Steel  
 ○Fumihisa Nagashima<sup>1</sup>, Yuki Nakagawa<sup>1</sup>, Masahiko Yoshino<sup>1</sup>  
 (1.Tokyo Institute of Technology)
- B-1-12 Empirical investigation and Modelling of Work Tool interface Temperature in machining of  
 Inconel 718 under different cooling conditions  
 ○Krishan Chanaka Wickramasinghe<sup>1</sup>, Hiroyuki Sasahara<sup>1</sup>  
 (1.Tokyo University of Agriculture and Technology)
- B-1-13 Thermomechanical modeling of the stress state in the chip formation zone considering the  
 built-up layer and built-up edge formation  
 ○Xiaoqi Song<sup>1</sup>, Haruto Fujita<sup>1</sup>, Yukio Takahashi<sup>1</sup>, Weiming He<sup>2</sup>, Tohru Ihara<sup>1</sup>  
 (1.Chuo University 2.University of Shanghai for Science and Technology)
- B-1-14 Improvement of Finished Surface Roughness Based on Knowledge from Visualization of Built-  
 up Edge Behavior  
 ○Yusaku Ando<sup>1,2</sup>, Yuki Sumiya<sup>2</sup>, Tomonori Ishihara<sup>2</sup>, Yasuhiro Oba<sup>2</sup>, Fumihiro Itoigawa<sup>1</sup>  
 (1.Nagoya Institute of Technology 2.DENSO CORPORATION)
- B-1-16 Performance of High Pressure Coolant in Interrupted Cutting of Inconel 718  
 ○Chi Hsin Liu<sup>1</sup>, Tatsuya Sugihara<sup>1</sup>, Toshiyuki Enomoto<sup>1</sup>  
 (1.Osaka University.)
- B-1-17 Effect of Liquid Lanolin as a Lubricant on the Cutting Performance in MQL Machining of  
 ○Toshiaki Wakabayashi<sup>1</sup>, Hiroya Isozaki<sup>1</sup>, Yusuke Mimura<sup>1</sup>, Toshifumi Atsuta<sup>2</sup>, Yasuharu  
 Matsushima<sup>2</sup>  
 (1.Kagawa University 2.Kagawa Prefectural Industrial Technology Center)
- B-1-18 Elucidation of Influencing Factors for Lubrication in Intermittent Cutting with Very Short Cutting  
 ○Yoshiki Nakamura<sup>1</sup>, Fumihiro Itoigawa<sup>1</sup>, Shinya Hayakawa<sup>1</sup>, Satoru Maegawa<sup>1</sup>, Xiaoxu Liu<sup>1</sup>  
 (1.Nagoya Institute of Technology)
- B-1-19 A Novel Design Concept of Tuned Mass Damper for Chatter in End Milling Process  
 ○Yutaka Nakano<sup>1</sup>, Takumi Kobayashi<sup>1</sup>, Hiroki Takahara<sup>1</sup>  
 (1.Tokyo Institute of Technology)
- B-1-20 Development of a Rapid Chatter Detection System  
 ○Ryosuke Ikeda<sup>1</sup>, Kazuki Takahei<sup>1</sup>, Tomoya Fujita<sup>1</sup>  
 (1.Mitsubishi Electric)
- B-1-21 Chatter Vibration and Machined Surface Properties in Turn-milling  
 ○Masahiro Makino<sup>1</sup>, Koji Utsumi<sup>2</sup>, Hiroyuki Sasahara<sup>1</sup>  
 (1.Tokyo University of Agriculture and Technology 2.Hitachi, Ltd.)
- B-1-22 Investigation of Search Range for Suppression of Chatter Vibrations by Randomized  
 algorithm  
 ○Takaya Kondo<sup>1</sup>, Jumpei Kitayama<sup>2</sup>, Shintaro Mizuno<sup>1</sup>, Hirohisa Narita<sup>1</sup>, Takashi Kubo<sup>1</sup>  
 (1.Meijo University 2.YAMAZAKI MAZAK Corporation)

## **B-2 Advanced grinding technologies**

- B-2-1 Grinding Force Distributions and Wear Behaviors of Grain Cutting Edges in Deep Grinding using Seeded Gel Abrasive Grinding Wheel  
○Masakazu Fujimoto<sup>1</sup>, Keisuke Shimizu<sup>2</sup>  
(1.Kindai University 2.Aoyama Gakuin University)
- B-2-2 Trial Production of Recycled-Grinding Wheel for Wet Polishing using Spent Grinding Wheel  
○Takeshi Hamada<sup>1</sup>, Akira Mizobuchi<sup>1</sup>, Atsuyoshi Tashima<sup>2</sup>, Keita Horimoto<sup>1</sup>, Tohru Ishida<sup>1</sup>  
(1.Tokushima Univ. 2.Ishihara Kinzoku Co., Ltd)
- B-2-4 Investigation of Crystallographic Aspects of Subsurface Damage Induced by Grinding Using Micro Raman Tomographic Imaging  
○Teppei Onuki<sup>1</sup>, Shunsuke Kan<sup>1</sup>, Wanpiao Lin<sup>1</sup>, Wentong Lu<sup>1</sup>, Kousuke Hasegawa<sup>1</sup>, Hirotaka Ojima<sup>1</sup>, Jun Shimizu<sup>1</sup>, Libo Zhou<sup>1</sup>  
(1.Ibaraki University)
- B-2-5 Grinding CFRP with Cold Air Supply from inside of Thin Walled Electrodeposited Grinding Wheel  
○Yoshiyuki Kita<sup>1</sup>, Yukio Ito<sup>1</sup>, Hiroyuki Sasahara<sup>1</sup>  
(1.Tokyo University of Agriculture and Technology)
- B-2-6 Improvement of Form Accuracy of Slender Workpiece in Cylindrical Traverse Grinding with  
○Hidetaka Fujii<sup>1</sup>, Takashi Onishi<sup>1</sup>, Chinhu Lin<sup>2</sup>, Moriaki Sakakura<sup>3</sup>, Kazuhito Ohashi<sup>1</sup>  
(1.Okayama University 2.YAMAMOTO METAL TECHNOS CO., LTD. 3.Daido University)
- B-2-7 Effect of a coolant supply assist sheet included in a woven metal wire tool with electrodeposited diamond grains on CFRP core drilling  
○Masahiro Kawabata<sup>1</sup>, Mamoru Nomura<sup>2</sup>, Yukio Ito<sup>1</sup>, Hiroyuki Sasahara<sup>1</sup>  
(1.Tokyo University of Agriculture and Technology 2.IBARAKI GRINDING WHEEL Co., Ltd.)
- B-2-8 An Effect of a Setting Depth of Cut in a Face Grinding Process with a Single Layer Electro Plated Diamond Grinding Wheel with Periphery R Shape  
○Takanori FUJIWARA<sup>1</sup>, Koudai HIRAMATSU<sup>3</sup>, Takuro HASHIGUCHI<sup>4</sup>, Takashi TSUJINO<sup>2</sup>, Ryo KOMATSUBARA<sup>1</sup>, Takashi ONISHI<sup>1</sup>, Hiroyuki KODAMA<sup>1</sup>, Kazuhito OHASHI<sup>1</sup>  
(1.Okayama University 2.TOYOTA MOTOR Corp. 3.Panasonic Corp., 4.Kobe Steel,Ltd.,)
- B-2-9 Accurate Estimation of Workpiece Dimension in Plunge Grinding without Sizing Gauge  
○Takashi ONISHI<sup>1</sup>, Yuki MURATA<sup>1</sup>, Kohei FUJIWARA<sup>1</sup>, Moriaki SAKAKURA<sup>2</sup>, Kazuhito OHASHI<sup>1</sup>  
(1.Okayama University 2.Daido University)

## **B-3 Micro/Nano machining and figurings**

- B-3-1 Surface processing of a  $\mu$ -channel-cut crystal monochromator for reflection self-seeding of hard X-ray free-electron laser  
○Shotaro Matsumura<sup>1</sup>, Shota Nakano<sup>1</sup>, Yasuhisa Sano<sup>1</sup>, Taito Osaka<sup>2</sup>, Ichiro Inoue<sup>2</sup>, Satoshi Matsuyama<sup>1</sup>, Makina Yabashi<sup>2</sup>, Kazuto Yamauchi<sup>1</sup>  
(1.Osaka University 2.RIKEN SPring-8 Center)
- B-3-2 Numerically Controlled Plasma Chemical Vaporization Machining Using an Array-Type Electrode with an Intermittent Gas Flow System  
○Ryohei Asada<sup>1</sup>, Ken Nishida<sup>1</sup>, Shinya Okayama<sup>1</sup>, Satoshi Matsuyama<sup>1</sup>, Kazuto Yamauchi<sup>1</sup>, Yasuhisa Sano<sup>1</sup>  
(1.Osaka University)
- B-3-3 An attempt of micro/nanofabrication of SiC single crystal with plasma electrolysis  
○Shunda Zhan<sup>1,2</sup>, Jiajun Lu<sup>1</sup>, Yonghua Zhao<sup>1</sup>  
(1.Southern University of Science and Technology 2.Harbin Institute of Technology)
- B-3-4 Performance Improvement in Dieless Punching of Ultrasmall-Diameter Holes  
○Shinya Araki<sup>1</sup>, Hayata Hamafuji<sup>1</sup>, Kai Egashira<sup>1</sup>, Keishi Yamaguchi<sup>1</sup>  
(1.Kyoto Institute of Technology)

- B-3-5 Precise Simulation of Femtosecond Laser Processing Based on Identification of Ablation Parameters by On-Machine Measurement  
○Hiroyuki Kawakami<sup>1</sup>, Shunsuke Nabetani<sup>1</sup>, Masahiro Ueda<sup>1,2</sup>, Hideki Aoyama<sup>1</sup>, Kazuo Yamazaki<sup>2</sup>  
(1.Keio University 2.University of California)

#### **B-4 Nano-scale surface finishings**

- B-4-1 Basic Study on Polishing Process of Nonwoven Nanofiber Pad with a Ball-Nose Tool  
○Ning Yu<sup>1</sup>, Wei Wu<sup>2</sup>, Toshiki Hirogaki<sup>1</sup>, Eiichi Aoyama<sup>1</sup>, Hiroyoshi Sota<sup>2</sup>  
(1.Doshisha University 2.M-TechX Inc.)
- B-4-2 Improvement of Edge Surface Flatness in Polishing of Silicon Wafers  
○Senju MATSUI<sup>1</sup>, Urara SATAKE<sup>1</sup>, Toshiyuki ENOMOTO<sup>1</sup>  
(1.Osaka University)
- B-4-3 Experimental Investigation of Torques Acting on Upper and Lower Platens in Double-sided Lapping  
○Ryo Ozaki<sup>1</sup>, Yohei Hashimoto<sup>1</sup>, Hinako Hashimoto<sup>1</sup>, Tatsuaki Furumoto<sup>1</sup>, Tomohiro Koyano<sup>1</sup>, Akira Hosokawa<sup>1</sup>  
(1.Kanazawa University)
- B-4-4 Liquid-electrolyte-free electrochemical surface finishing of GaN surface using a solid polymer  
○Junji Murata<sup>1</sup>, Yoshito Nishiguchi<sup>2</sup>  
(1.Ritsumeikan University 2.Kindai University)
- B-4-5 Obtaining of atomically smooth 4H-SiC (0001) surface by optimizing anodic oxidation parameters in slurryless electrochemical mechanical polishing  
○Xu Yang<sup>1</sup>, Xiaozhe Yang<sup>1</sup>, Kentaro Kawai<sup>1</sup>, Kenta Arima<sup>1</sup>, Kazuya Yamamura<sup>1</sup>  
(1.Osaka University)
- B-4-6 Effects of ultrasonic vibration on slurryless electrochemical mechanical polishing of 4H-SiC (0001) surface  
○Xiaozhe Yang<sup>1</sup>, Xu YANG<sup>1</sup>, Kentaro KAWAI<sup>1</sup>, Kenta ARIMA<sup>1</sup>, Kazuya YAMAMURA<sup>1</sup>  
(1.Osaka University)
- B-4-7 Improvement of Processing Time by Utilizing Cover Plate in Gyro Barrel Finishing  
○Yugo Nakayama<sup>1</sup>, Yohei Hashimoto<sup>1</sup>, Takuma Ito<sup>1</sup>, Tatsuaki Furumoto<sup>1</sup>, Tomohiro Koyano<sup>1</sup>, Akira Hosokawa<sup>1</sup>  
(1.Kanazawa University)

#### **B-5 Non-traditional machinings and additive manufacturings**

- B-5-1 Development of Control Method by Variation Range of Gap Voltage in Multi-wire EDM Slicing with Group Power Supplying  
○Tomoya Takegawa<sup>1</sup>, Shusei Tabuchi<sup>1</sup>, Yasuhiro Okamoto<sup>1</sup>, Akira Okada<sup>1</sup>, Haruya Kurihara<sup>2</sup>  
(1.Okayama University 2.Makino Milling Machine Co., Ltd)
- B-5-2 Study on Improvement of EDM Characteristics by Stamp Flushing  
○Katana Sato<sup>1</sup>, Masanori Kunieda<sup>1</sup>  
(1.The University of Tokyo)
- B-5-3 Influence of discharge current pulse shape on machining characteristics of steel workpiece in EDM  
Mayu Shinohara<sup>1</sup>, ○Masanori Kunieda<sup>1</sup>  
(1.The University of Tokyo)
- B-5-4 Release Resistance of Compression-molded Thermosetting Resin from EDMed Metal Mold  
○Ryoji Kitada<sup>1</sup>, Yuki Ikeuchi<sup>2</sup>, Akira Okada<sup>2</sup>  
(1.Sojo University 2.Okayama University)
- B-5-5 Fundamental Study on Double-Layered Surface Formation by Electrical Discharge Machining  
○Yuki Ikeuchi<sup>1</sup>, Shun-ichiro Tsuetani<sup>1</sup>, Ryoji Kitada<sup>2</sup>, Akira Okada<sup>1</sup>  
(1.Okayama University 2.Sojo University)

- B-5-6 Increasing aspect ratio of micro holes drilled by electrochemical machining using electrostatic induction feeding method  
 ○Kojiro Arimatsu<sup>1</sup>, Masanori Kunieda<sup>1</sup>  
 (1.The University of Tokyo)
- B-5-7 Machining properties of electrochemical machining using phosphoric acid aqueous solution  
 ○Nozomi Kodutsumi<sup>1</sup>, Hayato Komatsu<sup>1</sup>, Takumi Suzuki<sup>1</sup>, Mitsuo Uchiyama<sup>1</sup>  
 (1.KANTO GAKUIN University)
- B-5-8 Roughness evaluation of sintered AlN surface processed by plasma-assisted polishing using diamond grinding stone  
 ○RONGYAN SUN<sup>1</sup>, Kenta ARIMA<sup>1</sup>, Kentaro KAWAI<sup>1</sup>, Kazuya YAMAMURA<sup>1</sup>  
 (1.Osaka University)
- B-5-9 Development of a dicing process for 4H-SiC wafers by Plasma Chemical Vaporization Machining (PCVM) using a metal slit mask  
 ○Yuma Nakanishi<sup>1</sup>, Risa Mukai<sup>1</sup>, Satoshi Matsuyama<sup>1</sup>, Kazuto Yamauchi<sup>1</sup>, Yasuhisa Sano<sup>1</sup>  
 (1.Osaka University)
- B-5-11 Improvement in microstructure by wire arc additive manufacturing with finishing process  
 ○Yu Nakata<sup>1</sup>, Junichi Kaneko<sup>1</sup>, Takeyuki Abe<sup>1</sup>  
 (1.Saitama University)
- B-5-12 Modeling and control for preventing stubbing or droplets in Laser Metal-wire Deposition process  
 ○Shun Kayashima<sup>1</sup>, Takashi Hashimoto<sup>1</sup>, Takeyuki Abe<sup>2</sup>, Junichi Kaneko<sup>2</sup>  
 (1.Mitsubishi Electric Corp. 2.Saitama University)
- B-5-13 Influence of laser power on spatter particle generation in Powder Bed Fusion process  
 ○Kazushi OISHI<sup>1</sup>, Tatsuo FURUMOTO<sup>1</sup>, Satoshi ABE<sup>2</sup>, Mitsugu YAMAGUCHI<sup>1</sup>, Yohei HASHIMOTO<sup>1</sup>, Tomohiro KOYANO<sup>1</sup>, Akira HOSOKAWA<sup>1</sup>  
 (1.Kanazawa university 2.Panasonic Corporation Life Solutions Company)
- B-5-14 Design Optimization of infill pattern structure and continuous fiber path for CFRP-AM  
 ○Koki Jimbo<sup>1</sup>, Toshitake Tateno<sup>1</sup>  
 (1.Meiji University)
- B-5-15 Optimization of the Fabricating Conditions on Laser Metal-wire Deposition using Ti-6Al-4V  
 ○Rie Imoto<sup>1</sup>, Takenao Tsurumaki<sup>1</sup>, Yusuke Yamamoto<sup>2</sup>, Keiichi Noriyama<sup>2</sup>, Hiroyuki Sasahara<sup>1</sup>  
 (1.Tokyo University of Agriculture and Technology 2.Mitsubishi Heavy Industries Machine)
- B-5-16 Molding on Curved Surface in WAAM by Shape Monitoring and Feedback  
 ○Hiroki Masuda<sup>1</sup>, Hiroyuki Sasahara<sup>1</sup>  
 (1.Tokyo University of Agriculture and Technology)
- B-5-17 Fabrication of Ni/Co based functionally graded materials with WAAM  
 ○Ren Kobayashi<sup>1</sup>, Naoya Fujita<sup>1</sup>, Hideaki Nagamatsu<sup>1</sup>, Hiroyuki Sasahara<sup>1</sup>  
 (1.Tokyo University of Agriculture and Technology)
- B-5-18 Influence of Preheating in Friction Surfacing of A5052  
 ○Kiyotaka Takada<sup>1</sup>, Naoya Fujita<sup>1</sup>, Hiroyuki Sasahara<sup>1</sup>  
 (1.Tokyo University of Agriculture and Technology)
- B-5-19 Analysis of the Machinability and Machining effects on Properties of Inconel 718 Additive Manufacturing Products  
 ○Gustavo Quadra Vieira dos Santos<sup>1</sup>, Jun`ichi Kaneko<sup>1</sup>, Takeyuki Abe<sup>1</sup>  
 (1.Saitama University)
- B-5-20 Influence of processing conditions on porosity in WAAM-block structures with aluminum alloy  
 ○Hideaki Nagamatsu<sup>1</sup>, Alessio Pagliai<sup>2</sup>, Hiroyuki Sasahara<sup>1</sup>  
 (1.Tokyo university of agriculture and technology 2.University of Florence)

## B-6 Energy beam processings

- B-6-1 Micro-welding Characteristics of Glass Plates with Gap by Picosecond Pulsed Laser  
 ○Takumi Fujiwara<sup>1</sup>, Zhiyong Ouyang<sup>1</sup>, Yasuhiro Okamoto<sup>1</sup>, Akira Okada<sup>1</sup>  
 (1.Okayama University)

- B-6-2 Study on High-efficiency and High-quality Micro-welding of Copper by Superposition of 532 nm and 1064 nm Lasers  
 ○Shota Kawasaki<sup>1</sup>, Yasuhiro Okamoto<sup>1</sup>, Martin Ruthandi Maina<sup>1</sup>, Akira Okada<sup>1</sup>, Shin-ichi Nakashiba<sup>2</sup>, Norio Nishi<sup>2</sup>  
 (1.Okayama University 2.Kataoka Corporation)
- B-6-3 Laser healing of machining-induced microcracks in single-crystal sapphire  
 ○Kentaro Adachi<sup>1</sup>, Yuta Nishide<sup>2</sup>, Norihisa Sugizaki<sup>2</sup>, Jiwang Yan<sup>1</sup>  
 (1.Keio University 2.Olympus Corporation)
- B-6-4 Fundamental Study on Micro-edge Filletting by Using Large-area Electron Beam Irradiation Method  
 ○Zehua Zhou<sup>1</sup>, Tsubasa Sakai<sup>1</sup>, Togo Shinonaga<sup>1</sup>, Akira Okada<sup>1</sup>  
 (1.Okayama University)
- B-6-5 Edge shaping and structural modification of CVD polycrystalline diamond coated tool with femtosecond laser  
 ○Xiaoxu Liu<sup>1</sup>, Satoru Maegawa<sup>1</sup>, Hiroko Furuhashi<sup>1</sup>, Shingo Ono<sup>1</sup>, Fumihiro Itoigawa<sup>1</sup>  
 (1.Nagoya Institute of Technology)
- B-6-6 Surface fabricating Process in Pulse Laser Grinding of PCBN Cutting Tools  
 ○Xianlong Ni<sup>1</sup>, Xiaoxu Liu<sup>1</sup>, Satoru Maegawa<sup>1</sup>, Fumihiro Itoigawa<sup>1</sup>  
 (1.Nagoya Institute of Technology)
- B-6-7 Experimental study for precision forming of tools with complicated shapes using PLG(Pulse Laser Grinding)  
 ○Keiichi Yasui<sup>1</sup>, Satoru Maegawa<sup>1</sup>, Fumihiro Itoigawa<sup>1</sup>  
 (1.Nagoya Institute of Technology)

## **B-7 Advanced die/molding and polymer processing**

- B-7-1 Factor Analyzing of Defects in Copper Alloy Castings Manufactured by Sand Mold Based on Machine Learning and Its Experimental Examination  
 Makoto Nikawa<sup>1</sup>, ○Ryohei Oie<sup>1</sup>, Sho Sakai<sup>1</sup>, Miho Ota<sup>2</sup>, Masayuki Koyama<sup>2</sup>, Yoshihiro Tsuji<sup>3</sup>, Yoshiki Mizutani<sup>4</sup>, Minoru Yamashita<sup>1</sup>  
 (1.Gifu University 2.MIZSEI MFG Co., Ltd. 3.Miyama Chuzou Co., Ltd. 4.Gifu Prefectural Industrial Technology Center)
- B-7-2 Impact Joining of Aluminum Alloy and Pure Copper Plates at Their Edges  
 Minoru Yamashita<sup>1</sup>, ○Toru Iwatsuka<sup>1</sup>, Makoto Nikawa<sup>1</sup>  
 (1.Gifu University)
- B-7-3 Polymer Additive Effects in Injection Molded Metal-Polymer Direct Joining  
 ○Shuohan Wang<sup>1</sup>, Fuminobu Kimura<sup>1</sup>, Shuaijie Zhao<sup>1</sup>, Eiji Yamaguchi<sup>2</sup>, Nayuta Horie<sup>2</sup>, Yusuke Kajihara<sup>1</sup>  
 (1.The University of Tokyo 2.SINTOKOGIO, LTD)  
 Metal-polymer injection molded direct joining: replication procedure and injection speed effect
- B-7-4 for several scales of surface structures  
 ○Shotaro Kadoya<sup>1</sup>, Fuminobu Kimura<sup>1</sup>, Takashi Yanagishita<sup>2</sup>, Yusuke Kajihara<sup>1</sup>  
 (1.The University of Tokyo 2.Tokyo Metropolitan University)
- B-7-5 Feasibility of injection molded direct joining of steel and polymer  
 ○Weiyan Chen<sup>1</sup>, Fuminobu Kimura<sup>1</sup>, Eiji Yamaguchi<sup>2</sup>, Nayuta Horie<sup>2</sup>, Yusuke Kajihara<sup>1</sup>  
 (1.The University of Tokyo 2.SINTOKOGIO LTD.)

## **C-1 Advanced machine tools and elements**

- C-1-1 Simulation of power consumption during machine tool operation from NC data  
 ○Fumiya Arai<sup>1</sup>, Akio Hayashi<sup>1</sup>, Yoshitaka Morimoto<sup>1</sup>  
 (1.Kanazawa Institute of Technology)
- C-1-2 Power Consumption Simulation of Feed Drive System Driven by a Ball Screw Considering with the Motor Efficiency Changes  
 ○Massimiliano Rigacci<sup>1</sup>, Ryuta Sato<sup>1</sup>, Keiichi Shirase<sup>1</sup>  
 (1.Kobe University)

- C-1-3 Stability of Endmill Processing by Servo Feed Drive under Electric Power Saving Condition  
 ○Mikio Nito<sup>1</sup>, Toshiki Hirogaki<sup>1</sup>, Eiichi Aoyama<sup>1</sup>  
 (1.Doshisha University)
- C-1-4 Development of an Online Identification System for System Identification of Machine Tool  
 ○Tomoya Fujita<sup>1</sup>, Tiandong Xi<sup>2</sup>, Sebastian Kehene<sup>2</sup>, Marcel Fey<sup>2</sup>, Christian Brecher<sup>2</sup>  
 (1.Mitsubishi Electric Corporation 2.RWTH Aachen University)
- C-1-5 The effect of screw locking methods and anchor bolt design on CNC machine tools  
 ○LI-WEI TSENG<sup>1</sup>, Cheng-Yan Wu<sup>1</sup>, Hao-Yu Tsai<sup>1</sup>, Cheng-Hao Chung<sup>1</sup>, Wei-Lun Huang<sup>2</sup>  
 (1.National Changhua University of Education 2.Precision machinery research & development)
- C-1-6 Design of a Self-compensating Restrictor for Hydrostatic Bearings by Multilayer Perceptron  
 ○Chao-Chun Cheng<sup>1</sup>, Yu-Hsiu Huang<sup>1</sup>, Cheng-Kuo Sung<sup>1</sup>  
 (1.National Tsing Hua University)
- C-1-7 Performance Evaluation and Sensitivity Analysis of a 3-UPU Parallel Kinematic Manipulator  
 Yu-Jen Chiu<sup>2</sup>, ○Tien-Hung Huang<sup>1</sup>, Chih-Hsuan Hsiang<sup>1</sup>, Pei-Hung Yang<sup>1</sup>, Yan-Sung Chen<sup>1</sup>,  
 Cheng-Kuo Sung<sup>1</sup>  
 (1.National Tsing Hua University 2.Taipei City University of Science and Technology)
- C-1-8 Multi-encoder-based cutting force estimation with Kalman filter in machine tools with multiple-inertia dynamics  
 ○Keisuke Yamamoto<sup>1</sup>, Shuntaro Yamato<sup>1</sup>, Yasuhiro Kakinuma<sup>1</sup>  
 (1.Keio University)
- C-1-9 Kinematic Smoothing for Singularity Avoidance in 5-axis Machining  
 ○Shingo Tajima<sup>1</sup>, Burak Sencer<sup>2</sup>, Hayato Yoshioka<sup>1</sup>  
 (1.Tokyo Institute of Technology 2.Oregon State University)
- C-1-10 Effect of anisotropy of dynamic characteristics of cutting system on vibration stability  
 ○Takaaki Hashimoto<sup>1</sup>, Daisuke Kono<sup>2</sup>, Masataka Furusawa<sup>2</sup>, Atsushi Matsubara<sup>2</sup>  
 (1.JTEKT Corporation 2.Kyoto University)
- C-1-11 Fast Parameters Identification of Process-Machine Interaction Model in Milling  
 ○Kazuki Takahei<sup>1</sup>, Ryosuke Ikeda<sup>1</sup>, Tomoya Fujita<sup>1</sup>, Satoshi Miwa<sup>2</sup>, Norikazu Suzuki<sup>2</sup>  
 (1.Mitsubishi Electric Corporation 2.Nagoya University)
- C-1-12 Reduction of the influence on machining surface caused by tool non-repeatable run-out of rolling bearing spindle for machine tools  
 ○Yuta SHOWA<sup>1,2</sup>, Hayato YOSHIOKA<sup>2</sup>  
 (1.Makino Milling Machine CO., LTD. 2.Tokyo Institute of Technology)
- C-1-13 Suppression of Chatter Vibration using a Tailstock with an Eddy Current Brake  
 ○Madoka Nakao<sup>1</sup>, Keigo Takasugi<sup>1</sup>, Naoki Asakawa<sup>1</sup>  
 (1.Kanazawa University)
- C-1-14 Study on machine tool spindle with excellent thermal stability  
 ○Akihiro Tojo<sup>1</sup>, Daisuke Kono<sup>1</sup>  
 (1.Kyoto University)
- C-1-15 Reduction of the 3rd-harmonic noise in the output signal of a magnetoresistance sensor  
 ○Tun-Che Wu<sup>1</sup>, Chin-Yuan Huang<sup>1</sup>, Cheng-Kuo Sung<sup>1</sup>  
 (1.National Tsing Hua University)
- C-1-16 Experimental Verification of Contactless Dynamic Spindle Testing by Eddy Current Brake  
 ○Hitomi Sakai<sup>1</sup>, Keigo Takasugi<sup>1</sup>, Naoki Asakawa<sup>1</sup>  
 (1.Kanazawa University)
- C-1-17 Condition of machining feasibility of five-axis machine tools with slanted rotary axes  
 ○Naoki Wakai<sup>1</sup>, Keigo Takasugi<sup>1</sup>, Naoki Asakawa<sup>1</sup>  
 (1.Kanazawa University)
- C-1-18 Simulation of Cubic-machining Tests by Five-axis Machining Center with the Consideration of Workpiece Coordinate System  
 ○Zongze LI<sup>1</sup>, Ryuta SATO<sup>1</sup>, Keiichi SHIRASE<sup>1</sup>, Shigehisa SAKAMOTO<sup>2</sup>  
 (1.Kobe University 2.Kumamoto University)
- C-1-20 Study on features and smart functionality of sheet metal parts for machine tools  
 ○Yohei Yamaguchi<sup>1</sup>, Toshiki Hirogaki<sup>2</sup>, Eiichi Aoyama<sup>2</sup>  
 (1.DMG MORI SEIKI CO.,LTD. 2.Doshsha University)



- C-1-21 Cutting-Trace Shape Control of Machined Surface by Radius End Mill with a Five-Axis-Controlled Machine Tool  
○Junya Hanayama<sup>1</sup>, Toshiki Hirogaki<sup>1</sup>, Eichi Aoyama<sup>1</sup>  
(1.Doshisha University)

## C-2 Micro systems and machine elements

- C-2-1 New shape microneedle array for medical application  
○Shunya Matsushima<sup>1</sup>, Kazuya Yamada<sup>1</sup>, Yuki Mizuno<sup>1</sup>, Tatsuya Fukuda<sup>1</sup>, Tkakahiro Ito<sup>1</sup>, Tomohiro Hikima<sup>1</sup>, Sunao Murakami<sup>1</sup>, Hirotada Tsubaki<sup>1</sup>, Masaya Hara<sup>2</sup>, Yasunori Tashiro<sup>2</sup>,  
(1.Kyushu Institute of Technology 2.Mishima Kosan Co.,Ltd.)
- C-2-2 Fabrication of microneedle array for medical application  
○Kazuya Yamada<sup>1</sup>, Shunya Matsushima<sup>1</sup>, Yuki MIZUNO<sup>1</sup>, Tatsuya FUKUDA<sup>1</sup>, Kanae TAKASAWA<sup>1</sup>, Takahiro ITO<sup>1</sup>, Sunao MURAKAMI<sup>1</sup>, Tomohiro HIKIMA<sup>1</sup>, Hirotada TSUBAKI<sup>1</sup>, Masaya HARA<sup>2</sup>, Yasunori TASHIRO<sup>2</sup>, Masaaki MATSUO<sup>2</sup>  
(1.Kyushu institute of technology 2.Mishima Kosan Co.,Ltd.)
- C-2-3 Impulse-driven Capsule for Medical Inspection  
○Yuichiro KAWASHIMA<sup>1</sup>, Kenta ASAI<sup>1</sup>, Shotaro WATANABE<sup>1</sup>, Takahiro ITO<sup>1</sup>, Sunao MURAKAMI<sup>1</sup>, Kaoru KARASAWA<sup>2</sup>, Chihiro KATSUTA<sup>2</sup>, Akane TANAKA<sup>2</sup>, Hiromu KUTSUMI<sup>3</sup>  
(1.Kyushu Institute of Technology 2.Tokyo University of Agriculture and Technology 3.Shiga University of Medical Science)
- C-2-4 Quantification of Disturbance Error of Magnetic Encoder by Simulation  
○Chihiro Murayama<sup>1</sup>, Shigeaki Maruyama<sup>2</sup>, Hideki Aoyama<sup>1</sup>, Kazuo Yamazaki<sup>3</sup>  
(1.Keio University 2.Magnescale CO., Ltd. 3.University of California Davis)

## C-3 Robotics and mechatronics

- C-3-1 Active vibration control of a compact mobile robot for nondestructive inspection of underground infrastructure facilities  
○Takaaki Sato<sup>1</sup>, Masato Mizukami<sup>1</sup>  
(1.Muroran Insititute of Technology)
- C-3-2 Estimation of thermal influence on 2D positioning error of a SCARA-type robot over the entire  
○Kandai Kawano<sup>1</sup>, Soichi Ibaraki<sup>1</sup>  
(1.Hiroshima University)
- C-3-3 Estimation of Working Plate Control with Dual-Arm SCARA Robot based on Image Processing of Rolling Ball  
○Tatsushi Hayashima<sup>1</sup>, Nobutoshi Ozaki<sup>1</sup>, Kohei Shimizu<sup>1</sup>, Masao Nakagawa<sup>2</sup>, Toshiki Hirogaki<sup>1</sup>, Eiichi Aoyama<sup>1</sup>  
(1.Doshisha University 2.National Traffic Safety and Environment Laboratory)
- C-3-4 Robot Arm Manipulation for Periodic Motion of Unknown Rope  
○Kenta TABATA<sup>1</sup>, Hiroaki SEKI<sup>1</sup>, Tokuo TSUJI<sup>1</sup>, Tatsuhiro HIRAMITSU<sup>1</sup>, Masatoshi HIKIZU<sup>2</sup>  
(1.Kanazawa University 2.Komatsu University)
- C-3-5 Study on Lateral Movement Mechanism of Wire-suspended Robot for Wall Inspection  
○Kan Tokioka<sup>1</sup>, Kunio Uenishi<sup>1</sup>, Hiroaki Seki<sup>1</sup>, Tokuo Tsuji<sup>1</sup>, Tatsuhiro Hiramitsu<sup>1</sup>, Yoshihiko Hayakawa<sup>2</sup>, Kiyoji Kishimoto<sup>2</sup>  
(1.Kanazawa University 2.Central Nippon Highway Engineering Nagoya, Co., Ltd.)
- C-3-6 Identification of a novel kinematic model of a 6-DOF robot with bidirectional angular positioning deviation of rotary axes  
○Koki Fukuda<sup>1</sup>, Soichi Ibaraki<sup>1</sup>, MD Moktadir Alam<sup>1</sup>, Sho Morita<sup>2</sup>, Hiroshi Usuki<sup>2</sup>, Naohiro Ohtsuki<sup>3</sup>, Hirotaka Yoshioka<sup>3</sup>  
(1.Hiroshima University 2.The University of Tokyo 3.Kawasaki Heavy Industries, Ltd)
- C-3-7 Impact Hammering Control of Musical Saw with a Humanoid robot for Industrial Automation  
○Atsuyuki Miura<sup>1</sup>, Hiroaki Hanai<sup>1</sup>, Toshiki Hirogaki<sup>1</sup>, Eiiti Aoyama<sup>1</sup>  
(1.Doshisha University)

- C-3-8 Influence of Shaft Support Stiffness on Driving Performance under Differential Motion of Planetary Gear Train  
 ○Seiya Hamada<sup>1</sup>, Kazutoshi Otokodani<sup>1</sup>, Tomoki Fukuda<sup>1</sup>, Masao Nakagawa<sup>2</sup>, Toshiki Hirogaki<sup>1</sup>, Eiichi Aoyama<sup>1</sup>  
 (1.Doshisha University 2.National Traffic Safety and Environment Laboratory)
- C-3-9 Acceleration control based bilateral control using accelerometer  
 ○Satoshi Yoshimoto<sup>1</sup>, Ken Sasaki<sup>1</sup>  
 (1.The University of Tokyo)
- C-3-10 Influence of the opposing block surface profile in the performance of a pump using the ultrasonic transducer and opposing block for liquid.  
 ○Shoya YAMAMOTO<sup>1</sup>, Masaya Takasaki<sup>1</sup>, Daisuke Yamaguchi<sup>1</sup>, Eiryō Ko<sup>1</sup>, Yuji Ishino<sup>1</sup>,  
 (1.Saitama university)
- C-3-11 Study of Langevin type transducer amplitude modulation for haptic application  
 ○Yuto Yoshihara<sup>1</sup>, Daisuke Yamaguchi<sup>1</sup>, Yuji Ishino<sup>1</sup>, Masaya Takasaki<sup>1</sup>, Takeshi Mizuno<sup>1</sup>  
 (1.Saitama University)
- C-3-12 Enhancing the TCP position controllability and force observability of a feed drive axis with two direct length measuring systems  
 ○Sebastian Kehne<sup>1</sup>, Marcel Fey<sup>1</sup>, Werner Herfs<sup>1</sup>, Christian Brecher<sup>1</sup>  
 (1.RWTH Aachen University)
- C-3-13 B-spline based optimal feed-rate generation of industrial feed drive systems and application to a CNC machine  
 ○Kazuya Uehara<sup>1</sup>, Naoki Uchiyama<sup>1</sup>  
 (1.Toyohashi University of Technology)

#### **C-4 Ultra precision controls**

- C-4-1 Controlled Performance of a Segmented Fast Steering Mirror Driven by Piezoelectric Actuators  
 ○Rina Nishida<sup>1</sup>, Jianpeng Zhong<sup>1</sup>, Tadahiko Shinshi<sup>1</sup>  
 (1.Tokyo Institute of Technology)
- C-4-2 A Digital Charge Control Strategy for Reducing Hysteresis in Piezoelectric Actuators  
 ○Jianpeng Zhong<sup>1</sup>, Rina Nishida<sup>1</sup>, Tadahiko Shinshi<sup>1</sup>  
 (1.Tokyo Institute of Technology)

#### **D-1 Nano-scale measurements and calibrations**

- D-1-1 Measurement of molar concentration spectrum for nanoparticle with multi-modal nanoparticle size distribution using nanoparticle chip  
 ○Jiaqing Zhu<sup>1</sup>, Terutake Hayashi<sup>1</sup>, Syuhei Kurokawa<sup>1</sup>  
 (1.Kyushu University)
- D-1-2 Nano-scale THz Spectroscopic System for Thermal Evanescent Wave  
 ○Ryoko Sakuma<sup>1</sup>, Kuan-Ting Lin<sup>1</sup>, Sunmi Kim<sup>2</sup>, Fuminobu Kimura<sup>1</sup>, Yusuke Kajihara<sup>1</sup>  
 (1.The University of Tokyo 2.National Institute of Information and Communications Technology)
- D-1-3 Controlling the pulse duration of X ray free electron lasers with rotated inclined crystals  
 ○Shota Nakano<sup>1</sup>, Taito Osaka<sup>2</sup>, Shotaro Matsumura<sup>1</sup>, Yasuhisa Sano<sup>1</sup>, Kazuto Yamauchi<sup>1</sup>, Makina Yabashi<sup>2</sup>  
 (1.Osaka University 2.RIKEN SPring-8 Center)
- D-1-4 Optical detection of fine particulate defects with autonomous search-and-split liquid probe  
 ○Chikara Odagiri<sup>1</sup>, Shotaro Kadoya<sup>1</sup>, Masaki Michihata<sup>1</sup>, Kiyoshi Takamasu<sup>1</sup>, Satoru Takahashi<sup>1</sup>  
 (1.The University of Tokyo)
- D-1-5 Detection of Surface Roughness by Ellipsometry based on Spin Hall Effect of Light  
 ○Zhehan Li<sup>1</sup>, Yasuhiro Mizutani<sup>1</sup>, Yasuhiro Takaya<sup>1</sup>  
 (1.Osaka University)
- D-1-6 Dimensional measurement of micrometer-scale aperture using a surface interaction force detection type microprobe  
 ○Daichi Kato<sup>1</sup>, So Ito<sup>1</sup>, Kazuhide Kamiya<sup>1</sup>, Kimihisa Matsumoto<sup>1</sup>  
 (1.Toyama Prefectural University)

- D-1-7 Improving the spatial resolution of passive near-field microscope with a 10 nm-sharp tungsten  
 ○Hitomi Nakajima<sup>1</sup>, Lin Kuan-Ting<sup>1</sup>, Ryoko Sakuma<sup>1</sup>, Fuminobu Kimura<sup>1</sup>, Yusuke Kajihara<sup>1</sup>  
 (1.The University of Tokyo)
- D-1-8 Improvement of environmental fluctuation in sinusoidal frequency modulation interferometer for sub-nano meter displacement measurement  
 ○Masato Higuchi<sup>1</sup>, Tomohiro Sowa<sup>1</sup>, Dong Wei<sup>1</sup>, Masato Aketagawa<sup>1</sup>  
 (1.Nagaoka University of Technology)
- D-1-9 Aspheric Optical Element Testing with the Three-dimensional Nanoprofiler Based on Normal Vector Tracing Method  
 ○Takeshi Ashizawa<sup>1</sup>, Kota Hashimoto<sup>1</sup>, Mikiya Ikuchi<sup>1</sup>, Jungmin Kang<sup>2</sup>, Katsuyoshi Endo<sup>1</sup>  
 (1.Osaka University 2.IMRAM, Tohoku University)
- D-1-10 Uncertainty evaluation of form error measurement of probe tip ball using a rotating reference sphere  
 ○So Ito<sup>1</sup>, Daichi Kato<sup>1</sup>, Daisuke Tsutsumi<sup>1</sup>, Kazuhide Kamiya<sup>1</sup>, Kimihisa Matsumoto<sup>1</sup>  
 (1.Toyama Prefectural University)
- D-1-11 Calibration of Rotary Encoder Mounted on Non-Contact Three Dimensional Nano-profiler Using Normal Vector Tracing Method  
 ○Kota Hashimoto<sup>1</sup>, Mikiya Ikuchi<sup>1</sup>, Takeshi Ashizawa<sup>1</sup>, Katsuyoshi Endo<sup>1</sup>  
 (1.Osaka University)
- D-1-12 Comparison for pulse interval calibration of an optical frequency comb compressed by an etalon  
 ○Tatsuya KUME<sup>1</sup>, Hiromasa Yasuda<sup>2</sup>, Tsutomu Mibe<sup>1</sup>, Masaki Michihata<sup>2</sup>, Satoru Takahashi<sup>2</sup>  
 (1.High Energy Accelerator Organization 2.The University of Tokyo)
- D-1-13 Vibration insensitive single-shot interferometry using a wide-field laser microscope  
 ○Isami NITTA<sup>1</sup>, Yosuke Tsukiyama<sup>1</sup>  
 (1.Niigata University)
- D-1-14 Development of Apparatus for In-line Total Inspection of Burr and Dimension  
 Tatsuki Otsubo<sup>1</sup>, ○Wang Jingwei<sup>1</sup>, Takanori Yazawa<sup>1</sup>, Yosuke Miyazaki<sup>2</sup>  
 (1.Nagasaki University 2.YANMAR HOLDINGS CO., LTD.)
- D-1-15 Spatial-frequency-based evaluation of image reconstruction by structured-illumination microscopy with deep learning  
 ○Ren Ichikawa<sup>1</sup>, Hiromasa Kume<sup>1</sup>, Masatoshi Nishikawa<sup>2</sup>, Shotaro Kadoya<sup>1</sup>, Masaki Michihata<sup>1</sup>, Kiyoshi Takamasu<sup>1</sup>, Satoru Takahashi<sup>1</sup>  
 (1.The University of Tokyo 2.Hosei University)
- D-1-16 Fabrication of Three Dimensional High Aspect Ratio Structure by Oblique incident Talbot  
 ○Ryu Ezaki<sup>1</sup>, Yasuhiro Mizutani<sup>1</sup>, Yoshihiko Makiura<sup>2</sup>, Yasuhiro Takaya<sup>1</sup>  
 (1.Osaka University 2.KURABO INDUSTRIES LTD.,)
- D-1-17 Observatory of Nano-scale Polishing Phenomena during SiO<sub>2</sub>-CMP process by Compact Apparatus applying Optical Evanescent Field  
 ○THITIPAT PERMPATDECHAKUL<sup>1</sup>, PANART KHAJORNRUNGRUANG<sup>1</sup>, KEISUKE SUZUKI<sup>1</sup>, ARAN BLATTLER<sup>1</sup>  
 (1.Kyushu Institute of Technology)

## D-2 Surface metrologies of nano-scale structures

- D-2-1 Nano-Groove Formation on Si(111) Surfaces by Chemical Etching Assisted by Ag Nanowires  
 ○ZHIDA MA<sup>1</sup>, SEIYA MASUMOTO<sup>1</sup>, KENTARO KAWAI<sup>1</sup>, KAZUYA YAMAMURA<sup>1</sup>, KENTA ARIMA<sup>1</sup>  
 (1.Osaka University)
- D-2-2 Energy dissipation of electrical stimulated graphene construction  
 ○Hao Zhang<sup>1</sup>, Kuan-Ting Lin<sup>1</sup>, Yusuke Kajihara<sup>1</sup>  
 (1.The University of Tokyo)

- D-2-3 Formation of Graphene with Low Pit Density on SiC Assisted by Plasma Oxidation and Its Characterization  
 ○Makoto Ochi<sup>1</sup>, Ouki Minami<sup>1</sup>, Yasuhisa Sano<sup>1</sup>, Kentaro Kawai<sup>1</sup>, Kazuya Yamamura<sup>1</sup>, Kenta Arima<sup>1</sup>  
 (1.Osaka University)
- D-2-4 Study on non-destructive optical depth measurement of periodic micro-structured surfaces beyond diffraction limit  
 ○Yosho Kanda<sup>1</sup>, Hiromasa Kume<sup>1</sup>, Shotaro Kadoya<sup>1</sup>, Masaki Michihata<sup>1</sup>, Kiyoshi Takamasu<sup>1</sup>, Satoru Takahashi<sup>1</sup>  
 (1.The University of Tokyo)

### **D-3 Mechano photonics engineering and optical applications**

- D-3-1 Development of ultraprecise X-ray focusing mirrors based on Wolter geometry  
 ○Takato Inoue<sup>1</sup>, Jumpei Yamada<sup>2</sup>, Satoshi Matsuyama<sup>1</sup>, Nami Nakamura<sup>1</sup>, Taito Osaka<sup>2</sup>, Hirokatsu Yumoto<sup>3</sup>, Takahisa Koyama<sup>3</sup>, Haruhiko Ohashi<sup>3</sup>, Makina Yabashi<sup>2,3</sup>, Tetsuya Ishikawa<sup>2</sup>, Kazuto Yamauchi<sup>1</sup>  
 (1.Osaka University 2.RIKEN SPring-8 Center 3.Japan Synchrotron Radiation Research Institute)
- D-3-2 Precise wavefront measurement using grating interferometer for sub-10 nm XFEL focusing system  
 ○Nami Nakamura<sup>1</sup>, Jumpei Yamada<sup>2</sup>, Satoshi Matsuyama<sup>1</sup>, Takato Inoue<sup>1</sup>, Taito Osaka<sup>2</sup>, Hirokatsu Yumoto<sup>3</sup>, Takahisa Koyama<sup>3</sup>, Haruhiko Ohashi<sup>3</sup>, Makina Yabashi<sup>2,3</sup>, Tetsuya Ishikawa<sup>2</sup>, Kazuto  
 (1.Osaka University 2.RIKEN SPring-8 Center 3.Japan Synchrotron Radiation Research Institute)

### **D-4 Advanced image processings and applications**

- D-4-1 Correction of Camera Parameters for a Stereo Camera System with Narrow Fields of View  
 ○Ryota Ogawa<sup>1</sup>, Shuta Ohji<sup>1</sup>, Akio Mizutani<sup>1</sup>, Hisao Kikuta<sup>1</sup>  
 (1.Osaka Prefecture University)
- D-4-2 Visual Simulation Method for Classification and Quantification of Sensory Parameters in Judging Mirror Surface  
 ○Motohiro Ihara<sup>1</sup>, Iwao Yamaji<sup>1</sup>, Katsuji Fujii<sup>2</sup>, Takeshi Wanatabe<sup>2</sup>, Masataka Yauchi<sup>3</sup>, Atsushi Matsubara<sup>1</sup>  
 (1.Kyoto University 2.NS TOOL Co., Ltd. 3.BIG DAISHOWA SEIKI Co., Ltd.)
- D-4-3 Skill extraction by analyzing motion during TIG welding  
 ○Ryota Banno<sup>1</sup>, Hirohisa Narita<sup>1</sup>, Yasunori Kobayashi<sup>2</sup>, Masamichi Sakaguchi<sup>3</sup>, Hideo Fujimoto<sup>3,4</sup>  
 (1.Meijo University 2.Narita Mfg.,Ltd. 3.Nagoya Institute of Technology 4.GrandTech Fujimoto Co.,Ltd.)
- D-4-4 Development of 3D Topography Acquisition System for Abrasive Grains based on Deep Learning  
 ○Hiroataka Ojima<sup>1</sup>, Liu Yinglong<sup>1</sup>, Libo Zhou<sup>1</sup>, Jun Shimizu<sup>1</sup>, Teppei Onuki<sup>1</sup>  
 (1.Ibaraki University)
- D-4-5 Stereo Measurement of Cross-Sectional Shape of Weld Beads by Marking  
 ○Mitsuaki Yoshimura<sup>1</sup>, Yonghoon Ji<sup>2</sup>, Kazunori Umeda<sup>1</sup>  
 (1.Chuo University 2.JAIST)

### **D-5 Advanced 3 dimensional digital processings**

- D-5-1 Shape Enhancement Based on 3D Print Preview for Preserving Semantic Shape Details on 3D Printed Surface  
 ○Yifan Yang<sup>1</sup>, Yutaka Ohtake<sup>1</sup>, Hiromasa Suzuki<sup>1</sup>, Tatsuya Yatagawa<sup>1</sup>  
 (1.The University of Tokyo)

- D-5-2 Automatic Generation of Implicit Surface Model from 3D-scanned Data of Plastic Bottles  
 ○Reon Matsui<sup>1</sup>, Yutaka Ohtake<sup>1</sup>, Hiromasa Suzuki<sup>1</sup>, Tatsuya Yatagawa<sup>1</sup>, Jun Hotta<sup>2</sup>  
 (1.The University of Tokyo 2.Zodiac)
- D-5-3 Scanning Angle Selection Methods for Multiple X-ray Computed Tomography to Reduce Metal Artifacts  
 ○Yingqi Tan<sup>1</sup>, Yutaka Ohtake<sup>1</sup>, Hiromasa Suzuki<sup>1</sup>  
 (1.The University of Tokyo)
- D-5-4 Simple Textured Polygon Model Generation from Multiple TLS Point Clouds  
 ○Shinichiro Imai<sup>1</sup>, Hiroaki Date<sup>1</sup>, Satoshi Kanai<sup>1</sup>, Yoshinori Moribe<sup>2</sup>, Masaki Nakamura<sup>2</sup>  
 (1.Hokkaido University 2.SANKI Engineering Corporation)
- D-5-5 Deterioration Detection for Wall Surfaces of Large-Scale Structure Using Dense Point Cloud  
 ○Erika Yamamoto<sup>1</sup>, Iku Yoshiouchi<sup>1</sup>, Hiroshi Masuda<sup>1</sup>  
 (1.The University of Electro-Communications)
- D-5-6 Precise Denoising of 3D Point Clouds with Awareness of Point-Wise Measuring Quality  
 ○Kohei Tsubooka<sup>1</sup>, Satoshi Kanai<sup>1</sup>, Hiroaki Date<sup>1</sup>, Tatsuo Hariyama<sup>2</sup>, Masahiro Watanabe<sup>2</sup>  
 (1.Hokkaido University 2.Hitachi, Ltd.)

## F-1 Advanced surface processings

- F-1-1 Surface nanostructuring of silicon by intermediate-pressure hydrogen plasma treatment  
 ○Toshimitsu Nomura<sup>1</sup>, Kenta Kimoto<sup>1</sup>, Hiroaki Kakiuchi<sup>1</sup>, Kiyoshi Yasutake<sup>1</sup>, Hiromasa Ohmi<sup>1</sup>  
 (1.Osaka university)
- F-1-2 Formation of Trench Pattern on Ge Surface by Enhanced Chemical Etching Using Chemically Modified Graphene Flakes  
 ○Ryo Mikurino<sup>1</sup>, Ayumi OGASAWARA<sup>1</sup>, Tomoki HIRANO<sup>1</sup>, Kentaro KAWAI<sup>1</sup>, Kazuya YAMAMURA<sup>1</sup>, Kenta ARIMA<sup>1</sup>  
 (1.Osaka university)
- F-1-3 Plasma chemical vaporization machining of Ga<sub>2</sub>O<sub>3</sub> using chlorine-based gas  
 ○Taiki Sai<sup>1</sup>, Yuma Nakanishi<sup>1</sup>, Satoshi Matsuyama<sup>1</sup>, Kazuto Yamauchi<sup>1</sup>, Yasuhisa Sano<sup>1</sup>  
 (1.Osaka university)
- F-1-4 Deposition of polymer composite by low pressurized cold spray  
 ○Jongbeom Choi<sup>1</sup>, Yuki Hirata<sup>1</sup>, Naoto Ohtake<sup>1</sup>, Hiroki Akasaka<sup>1</sup>  
 (1.Tokyo Institute of Technology)
- F-1-5 Study on the growth of silicon films at low temperatures in atmospheric-pressure plasma excited by very high-frequency power  
 ○Shigeto Nawata<sup>1</sup>, Masaya Maegawa<sup>1</sup>, Hiromasa Ohmi<sup>1</sup>, Hiroaki Kakiuchi<sup>1</sup>, Kiyoshi Yasutake<sup>1</sup>  
 (1.Osaka university)
- F-1-6 Characterization of silicon oxide thin films deposited at low temperatures using an atmospheric-pressure plasma-enhanced chemical vapor deposition technology  
 ○Masaya Maegawa<sup>1</sup>, Sigeto Nawata<sup>1</sup>, Hiromasa Ohmi<sup>1</sup>, Hiroaki Kakiuchi<sup>1</sup>, Kiyoshi Yasutake<sup>1</sup>  
 (1.Osaka university)
- F-1-7 Diamond synthesis from graphite by hydrogen plasma induced chemical transport  
 ○Naoto Komatsu<sup>1</sup>, Atsuhisa Togo<sup>1</sup>, Hiroaki Kakiuchi<sup>1</sup>, Kiyoshi Yasutake<sup>1</sup>, Hiromasa Ohmi<sup>1</sup>  
 (1.Osaka university)
- F-1-8 Gas composition dependence of material removal rate in plasma assisted polishing of single crystal diamond  
 ○Nian Liu<sup>1</sup>, Naoya Yoshitaka<sup>1</sup>, Kohki Sugawara<sup>2</sup>, Hideaki Yamada<sup>3</sup>, Daisuke Takeuchi<sup>3</sup>, Yuko Akabane<sup>2</sup>, Kenichi Fujino<sup>2</sup>, Kentaro Kawai<sup>1</sup>, Kenta Arima<sup>1</sup>, Kazuya Yamamura<sup>1</sup>  
 (1.Osaka University 2.TDC Corporation 3.National Institute of Advanced Industrial Science and Technology (AIST))
- F-1-9 Rapid surface nitriding of titanium alloy and stainless steel by a nanosecond laser  
 ○KEI ZAKO<sup>1</sup>, Kazutoshi Katahira<sup>2</sup>, Atsushi Ezura<sup>3</sup>, Jun Komotori<sup>1</sup>  
 (1.Keio University 2.Institute of Physical and Chemical Research 3.Industrial Technology center of Tochigi Prefecture)

- F-1-10 Study of temperature measurement of burnishing process  
○Hidetake Tanaka<sup>1</sup>, Masato Takahashi<sup>1</sup>  
(1.Sophia University)

## **F-2 Micro fabrications for functional surfaces**

- F-2-1 Friction Characteristics of Textured Metal Surfaces by Vibration-assisted Microcutting in Dry Sliding  
○Jun Shimizu<sup>1</sup>, Tomotaka Nakayama<sup>1</sup>, Takeyuki Yamamoto<sup>1</sup>, Hirotaka Ojima<sup>1</sup>, Teppei Onuki<sup>1</sup>,  
(1.Ibaraki University)
- F-2-2 Theoretical analysis of the diffraction characteristics of dual-period holographic gratings  
○Takeru Fugono<sup>1</sup>, Shuzo Masui<sup>1</sup>, Shotaro Kadoya<sup>1</sup>, Masaki Michihata<sup>1</sup>, Satoru Takahashi<sup>1</sup>  
(1.The University of Tokyo)
- F-2-4 Transfer method of hydrothermally synthesized TiO<sub>2</sub> nanorods on FTO substrate  
○Renato Serizawa<sup>1</sup>, Nobuyuki Moronuki<sup>1</sup>  
(1.Tokyo Metropolitan University)
- F-2-5 Cell Affinity of Textured Ti Surface by Microcutting  
○Yoshiaki Fukahori<sup>1</sup>, Jun Shimizu<sup>1</sup>, Kazuaki Nagayama<sup>1</sup>, Hirotaka Ojima<sup>1</sup>, Teppei Onuki<sup>1</sup>, Libo Zhou<sup>1</sup>, Takeyuki Yamamoto<sup>1</sup>  
(1.Ibaraki University)
- F-2-6 Sustained Drug Release System using Poly-pyrrole Membrane Micro-actuator  
○Kodai Kawaguchi<sup>1</sup>, Kenta Kato<sup>1</sup>, Arata Kaneko<sup>1</sup>  
(1.Tokyo Metropolitan University)
- F-2-7 Development of new type of SERS substrate fabricated by NPF method  
○Yusuke Kubota<sup>1</sup>, Yuki Nakagawa<sup>1</sup>, Takatoki Yamamoto<sup>1</sup>, Tadaaki Nagao<sup>2</sup>, Masahiko Yoshino<sup>1</sup>  
(1.Tokyo Institute of Technology 2.International Center for Materials Nanoarchitectonics (MANA), National Institute for Materials Science (NIMS))

## **G-1 Bio-medical engineering and applications**

- G-1-1 Development of Microfluidic Device for Simultaneous Detection of Multiple Plant Viruses  
○Daigo Natsuhara<sup>1</sup>, Kisuke Tanaka<sup>1</sup>, Moeto Nagai<sup>1</sup>, Yuko Mizukami<sup>2</sup>, Norikuni Saka<sup>2</sup>, Takayuki Shibata<sup>1</sup>  
(1.Toyohashi University of Technology 2.Aichi Agricultural Research Center)
- G-1-2 Valveless Micropump Actuated by an Axial Magnetic Coupling of Two Ring Multi-pole NdFeB  
○Chao QI<sup>1</sup>, Dong HAN<sup>1</sup>, Tadahiko SHINSHI<sup>1</sup>  
(1.Tokyo Tech)
- G-1-3 Lactic acid bacteria of different shapes flowing through deterministic lateral displacement  
○Guangchong Ji<sup>1</sup>, Naotomo Tottori<sup>1</sup>, Takasi Nisisako<sup>1</sup>  
(1.Tokyo Institute of Technology)

## **H-1 MEMS/NEMS**

- H-1-1 Ultra-flexible, Thin, Calorimetric Nanosheet based Freshness Sensor for Intelligent Food Packaging  
○GaneshKumar Mani<sup>1</sup>, Kazuyoshi Tsuchiya<sup>1</sup>  
(1.Tokai University)
- H-1-2 Reproducible formation of graphene nanopore within 10 nm using helium ion microscope  
○Shougo Sugita<sup>1</sup>, Tomoki Tsuji<sup>1</sup>, Kenta Arima<sup>1</sup>, Kazuya Yamamura<sup>1</sup>, Kentaro Kawai<sup>1</sup>  
(1.Osaka university)
- H-1-3 Functional Janus Alginate Hydrogels Synthesized via a Microfluidic Emulsion-based External  
○Yingzhe Liu<sup>1</sup>, Takasi Nisisako<sup>1</sup>  
(1.Tokyo Institute of Technology)
- H-1-4 Parallel generation of biphasic droplets in microfluidic channels arrayed on slits  
○Siyuan Xu<sup>1</sup>, Takasi Nisisako<sup>1</sup>  
(1.Tokyo Institute of Technology)

- H-1-5 Deterministic Single Cell Encapsulation using a Nozzle Array for 3D Cell Assembly  
○Anuj Tiwari<sup>1</sup>, Kentaro Tanagi<sup>1</sup>, Keisuke Mitomi<sup>1</sup>, Takayuki Shibata<sup>1</sup>, Moeto Nagai<sup>1</sup>  
(1.Toyohashi University of Technology)

## 【 Poster Session 】

- P-2 Fundamental research on 3D measurement of freeform features  
○Mari Watanabe<sup>1</sup>, Kazuya Matsuzaki<sup>1</sup>, Osamu Sato<sup>1</sup>, Yoshiya Fukuhara<sup>2</sup>, Masato Terasawa<sup>2</sup>  
(1.AIST 2.Mitsubishi Hitachi Power Systems, Ltd)
- P-3 Intelligent Diagnosis for Cutting State of Machine Tool  
○Taro Nakano<sup>1</sup>, Kento Inoue<sup>2</sup>, Hiroshi Koresawa<sup>2</sup>, Hiroyuki Narahara<sup>2</sup>, Syuichi Ishida<sup>3</sup>, Taisei Motomura<sup>3</sup>, Tatsuo Tabaru<sup>3</sup>  
(1.Industrial Technology Center of Saga 2.Kyushu Institute of Technology 3.National Institute of Advanced Industrial Science and Technology)
- P-4 Turning of Difficult-to-machine Materials with High Pressure Coolant  
Akira Hosokawa<sup>1</sup>, Kazuki Kuwabara<sup>1</sup>, ○Koki Kosugi<sup>1</sup>, Tomohiro Koyano<sup>1</sup>, Tatsuaki Furumoro<sup>1</sup>, Yohei Hashimoto<sup>1</sup>  
(1.Kanazawa University)
- P-5 Investigation on Surface Topography of Vibration-Assisted Turning  
Yu-Hsun Lai<sup>1</sup>, ○Jhy-Cherng TSAI<sup>1</sup>, Yu-Cheng Wei<sup>2</sup>  
(1.National Chung-Hsing University 2.Hosea Precision Co., Ltd.)
- P-6 Surface Properties of Sintered Tungsten Carbide with Ultra-Fine Grains in Cutting by Diamond-Coated Ball-End Tools  
○Tetsuo Samukawa<sup>1</sup>, Kazuo Shiramizu<sup>1</sup>, Haruhiko Suwa<sup>1</sup>  
(1.Setsunan University)
- P-7 UV nanoimprint of fine hairs mimicking gecko sole structure  
○Akira Ochi<sup>1</sup>, Shingo Terashima<sup>1</sup>, Chikako Tatsukawa<sup>1</sup>, Tomokazu Takahashi<sup>1</sup>, Masato Suzuki<sup>1</sup>, Seiji Aoyagi<sup>1</sup>  
(1.Kansai university)
- P-8 Investigation on Resolution of 1:1 Projection Exposure Using an Element Lens of Gradient-Index Lens Array  
○Hiroshi KOBAYASHI<sup>1</sup>, Wataru SAKAKIBARA<sup>1</sup>, Yukihiro DOMON<sup>1</sup>, Toshiyuki HORIUCHI<sup>1</sup>  
(1.Tokyo Denki University)
- P-9 Micropowder Blasting with Mask Temperature Control for Microchannel Fabrication in Glass  
○Mikinari Takada<sup>1</sup>, Hiromasa Yagyu<sup>1</sup>  
(1.Kanto Gakuin University)
- P-10 Research on Projection Exposure Using Quarter-Millimeter Squared Optical Fibers  
○Fuga YOSHIDA<sup>1</sup>, Kazumori YOSHIDA<sup>1</sup>, Yuta SUZUKI<sup>1</sup>, Junya IWASAKI<sup>1</sup>, Toshiyuki HORIUCHI<sup>1</sup>, Hiroshi KOBAYASHI<sup>1</sup>  
(1.Tokyo Denki University)
- P-11 High-Resolution X-Ray Diffraction Measurement of Sapphire Substrate for Detection of Subsurface Damages  
○Hideo Aida<sup>1</sup>, Ryo Yoshihara<sup>1</sup>, Hidetoshi Takeda<sup>1</sup>, Yutaka Kimura<sup>2</sup>, Toshiro Doi<sup>3</sup>  
(1.Nagaoka University of Technology 2.Aoyama Gakuin University 3.Kyushu University/Doi Laboratory Inc.)
- P-12 Relationship between removal rate and slurry content of polishing pad in high downward  
○Ryotaro Higashi<sup>1</sup>, Hidetoshi Takeda<sup>1</sup>, Hideo Aida<sup>1</sup>  
(1.Nagaoka University of Technology)
- P-13 Selective surface modification by localized H-treatment with electrochemical jet  
○Yonghua Zhao<sup>1</sup>, Guodong Zhang<sup>1</sup>, Chong Zhao<sup>1</sup>, Satoru Kakudo<sup>2</sup>, Masanori Kunieda<sup>2</sup>  
(1.Southern University of Science and Technology 2.The University of Tokyo)

- P-14 Study for Intelligent Laser Heat Treatment Based on Process Temperature Monitoring  
 ○Mitsuhiro Goto<sup>1,2</sup>, Keiji Ogawa<sup>3</sup>, Hirotaka Tanabe<sup>2</sup>, Takuto Yamaguchi<sup>4</sup>, Hideki Hagino<sup>4</sup>  
 (1.Fuji High Frequency Co.,LTD. 2.The University of Shiga Prefecture 3.Ryukoku University  
 4.Osaka Research Institute of Industrial Science and Technology)
- P-15 High Efficiency Femtosecond Laser Fabrication of Quartz glass  
 ○Junji Sone<sup>1</sup>, Masahiro Ueda<sup>2</sup>, Kazuo Yamazaki<sup>2</sup>  
 (1.Tokyo Polytechnic University 2.University of California Berkeley)
- P-16 Fundamental investigation for measuring heat transfer coefficients using simplified model of machine tool components  
 ○Hozumi Kanabe<sup>1</sup>, Shumpei Ikushima<sup>1</sup>, Jumpei Kusuyama<sup>1</sup>, Yohichi Nakao<sup>1</sup>  
 (1.Kanagawa University)
- P-18 Mechatronic Simulation of Vertical Machining Center  
 ○Cheng-Chieh Lo<sup>1</sup>, Chien Yu Lin<sup>1</sup>, Hsin Sheng Yang<sup>1</sup>, CHUNG WEI WU<sup>1</sup>  
 (1.Precision Machinery Research & Development Center)
- P-19 Accuracy evaluation method on the five-axis machining centers by Square 3x3 machining  
 Shigehiko Sakamoto<sup>1</sup>, ○Atsushi Yokoyama<sup>2,1</sup>, Kazumasa Nakayasu<sup>2</sup>, Toshihiro Suzuki<sup>2</sup>, Shinji Koike<sup>2</sup>, Ryuta Sato<sup>3</sup>  
 (1.Kumamoto University 2.Makino Milling Machine Co., Ltd. 3.Kobe University)
- P-20 Development of tool shape estimation system with integrated multi-directional silhouette  
 ○Jun'ichi Kaneko<sup>1</sup>, Mayumi Kaneko<sup>1</sup>, Takeyuki Abe<sup>1</sup>  
 (1.Saitama University)
- P-21 Characterization of High-speed Polishing System with Small Rectangular Polisher  
 ○Shinsuke Matsui<sup>1</sup>, Kouta Hiroshima<sup>1</sup>, Harusihige Suzuki<sup>1</sup>, Atsunobu Une<sup>2</sup>  
 (1.Chiba Institute Technology 2.professor emeritus at National Defense academy)
- P-22 Precision control technique of broadband transmission laser beam  
 ○Rintaro Shimogawa<sup>1</sup>, Syun Jono<sup>1</sup>, Kiyotaka Izumi<sup>1</sup>, Takeshi Tsujimura<sup>1</sup>  
 (1.Saga University)
- P-23 Service Life prediction of line-patterned release coated silicon mold for UV-NIL  
 ○Tetsuma Marumo<sup>1</sup>, Jun Taniguchi<sup>1</sup>  
 (1.Tokyo University of Science)
- P-24 Stable replication technique of anti-reflection structure using high-hardness and anti-fouling UV curable resin  
 ○Daiki Okazaki<sup>1</sup>, Tadashi Ando<sup>1</sup>, Shin Hiwasa<sup>2</sup>, Jun Taniguchi<sup>1</sup>  
 (1.Tokyo University of Science 2.Autex Inc.)
- P-25 Development of X-ray adaptive focusing optics with four mirrors deformable between concave and convex shapes  
 ○Yuka Nishioka<sup>1</sup>, Hiroyuki Yamaguchi<sup>1</sup>, Satoshi Matsuyama<sup>1</sup>, Junki Sonoyama<sup>2</sup>, Kazuteru Akiyama<sup>2</sup>, Hiroki Nakamori<sup>3</sup>, Yasuhisa Sano<sup>1</sup>, Yoshiki Kohmura<sup>4</sup>, Makina Yabashi<sup>4</sup>, Tetsuya Ishikawa<sup>4</sup>, Kazuto Yamauchi<sup>1</sup>  
 (1.Osaka university 2.TOYAMA 3.JTEC Corporation 4.RIKEN/SPring-8)
- P-26 Proposal of Surrounding Structure Estimation Method Using Ambient Light  
 Yusuke Nagahata<sup>1</sup>, ○Eri Yamabe<sup>1</sup>, Naoya MIWA<sup>1</sup>, Bilal Ahmed Mir<sup>1</sup>, Tohru Sasaki<sup>1</sup>, Kenji Terabayashi<sup>1</sup>  
 (1.University of Toyama)
- P-27 Development of a System for Monitoring Patients with Dementia in a Hospital Using a Depth Sensor  
 ○Mikio Fujio<sup>1</sup>, Nobuhide Ito<sup>1</sup>  
 (1.National Institute of technology, Numazu Collage)
- P-28 High-rate Preparation of Hydrophobic Fluorocarbon Film from CF<sub>4</sub> Feedstock Gas by Solid Source Aided Plasma Chemical Vapor Deposition Technique  
 ○Hiromichi Nakatsuka<sup>1</sup>, Rei Tanaka<sup>1</sup>, Hiroaki Kakiuchi<sup>1</sup>, Kiyoshi Yasutake<sup>1</sup>, Hiromasa Ohmi<sup>1</sup>  
 (1.Osaka University)
- P-29 Realization of high quality Fe<sub>3</sub>O<sub>4</sub> thin film on atomically flat and high crystallinity MgO substrate  
 ○Ai Isohashi Osaka<sup>1</sup>, Daisetsu Toh<sup>1</sup>, Kazuto Yamauchi<sup>1</sup>, Yasuhisa Sano<sup>1</sup>, Hidekazu Tanaka<sup>1</sup>, Azusa Nakamoto Hattori<sup>1</sup>  
 (1.Osaka University)



- P-30 Microfabrication of Resin Surface Using Variable-pulse-width-picosecond Laser  
 ○Tomoki Fujihira<sup>1</sup>, Kenji Yamazawa<sup>2</sup>, Takeshi Fujimoto<sup>2</sup>, Masahiro Takeda<sup>2</sup>, Yoshinori Teshima<sup>1</sup>  
 (1.Chiba Institute of Technology 2.RIKEN)
- P-31 Microstructure fabrication method using a novel electrolyte-free electrochemical treatment with patterned polymer electrolyte membranes  
 ○Ryohei Umezaki<sup>1</sup>, Junji Murata<sup>1</sup>  
 (1.Ritsumeikan university)
- P-32 Optimization of Multipoint Light Irradiation Conditions for Using Microalga Euglena Gracilis as a Unidirectional Driving Source  
 ○Yoshiyuki OYAMA<sup>1</sup>, Takuya KOHNO<sup>2</sup>, Takayuki SHIBATA<sup>1</sup>, Moeto NAGAI<sup>1</sup>  
 (1.Toyohashi University of Technology 2.Gifu National College of Technology)
- P-33 Less-invasive Photo-irradiation Cell Patterning Using GelMA for Massively Parallel 3D Single-cell Assembly  
 ○Takeru Fukunaga<sup>1</sup>, Yuya Suzuki<sup>1</sup>, Azusa Kage<sup>1</sup>, Takayuki Shibata<sup>1</sup>, Moeto Nagai<sup>1</sup>  
 (1.Toyohashi University of Technology)
- P-34 Development of suction jig for preventing skin deformation and assisting needle puncture  
 ○Yuki Okumura<sup>1</sup>, Tomokazu Takahashi<sup>1</sup>, Masato Suzuki<sup>1</sup>, Seiji Aoyagi<sup>1</sup>, Ryota Hosomi<sup>1</sup>, Kenji Fukunaga<sup>1</sup>, Tomoyuki Hikitsuchi<sup>2</sup>, Yumi Kawajiri<sup>2</sup>, Koji Nakayama<sup>2</sup>, Hajime Matsumoto<sup>3</sup>, Hideki Nishikawa<sup>4</sup>, Fumio Sudo<sup>4</sup>, Ryoza Futaku<sup>4</sup>, Tomonori Takazawa<sup>5</sup>  
 (1.Kansai university 2.Dainihon Jochugiku CO. LTD. 3.Aiki Riotech corporation 4.Futa-Q LTD 5.Gunma University)
- P-35 Fabrication of Hyaluronic Acid Microneedle Array with High Aspect Ratio  
 Shingo Terashima<sup>1</sup>, Chikako Tatsukawa<sup>1</sup>, Tomokazu Takahashi<sup>1</sup>, Masato Suzuki<sup>1</sup>,  
 ○Seiji Aoyagi<sup>1</sup>  
 (1.Kansai University)
- P-36 Soft thermal nanoimprint of jagged shaped microneedle made of polylactic acid  
 Shingo Terashima<sup>1</sup>, Chikako Tatsukawa<sup>1</sup>, Tomokazu Takahashi<sup>1</sup>, Masato Suzuki<sup>1</sup>, ○Seiji Aoyagi<sup>1</sup>  
 (1.Kansai University)
- P-37 Development of skin puncture device that gives both rotation and alternating vibration to a pair of two microneedles  
 ○Atsushi Ueda<sup>1</sup>, Tomokazu Takahashi<sup>1</sup>, Masato Suzuki<sup>1</sup>, Seiji Aoyagi<sup>1</sup>, Ryota Hosomi<sup>1</sup>, Kenji Fukunaga<sup>1</sup>, Tomoyuki Hikitsuchi<sup>2</sup>, Yumi Kawajiri<sup>2</sup>, Koji Nakayama<sup>2</sup>, Tommonori Takazawa<sup>3</sup>, Hajime Matsumoto<sup>4</sup>, Hideki Nishikawa<sup>5</sup>, Fumio Sudo<sup>5</sup>, Ryoza Futaku<sup>5</sup>  
 (1.Kansai University 2.Dainihon Jochugiku Co, Ltd. 3.Gunma University 4.Aiki Riotech Corporation 5.FUTA-Q, Ltd.)
- P-38 Channel clogging induced by long-chain DNAs in a deterministic lateral displacement blood processing device  
 ○Yuki Oka<sup>1</sup>, Tatsuya Yoshizawa<sup>1</sup>, Shuhei Ogawa<sup>1</sup>, Toshihiro Suzuki<sup>2</sup>, Syuhei Takada<sup>1</sup>, Ryushin Mizuta<sup>1</sup>, Masanori Hayase<sup>1</sup>  
 (1.Tokyo University of Science 2.Teikyo University)
- P-39 Experimental production of cell manipulation device using vibration  
 ○Akira KAKUTA<sup>1</sup>, Hiromichi NAKADATE<sup>2</sup>, Miyabi HAGIWARA<sup>1</sup>  
 (1.Tokyo National College of Technology 2.Shinshu University)