

**Poster session: Wednesday 5<sup>th</sup> June 2019, 13.45 – 15.30**

**Poster session: Thursday 6<sup>th</sup> June 2019, 11:00 – 12:00**

ICE No	Poster No	
		<b>Session 1: Advances in Precision Engineering</b>
ICE19105	P1.01	<b>Thermal expansion control in heat assisted machining of calcium fluoride single crystals</b> Yan Jin Lee <i>Department of Mechanical Engineering, National University of Singapore, Singapore</i>
ICE19111	P1.02	<b>Investigations of different compliant manipulator concepts for a high-precise rotational motion</b> Philipp Gräser <sup>1</sup> , Sebastian Linß <sup>2</sup> , Lena Zentner <sup>2</sup> , René Theska <sup>1</sup> <i>Technische Universität Ilmenau, Department of Mechanical Engineering</i> <sup>1</sup> <i>Institute of Design and Precision Engineering, Precision Engineering Group</i> <sup>2</sup> <i>Compliant Systems Group</i>
ICE19113	P1.03	<b>On the development and qualification of multiaxial designs of nanofabrication machines with ultra precision tool rotations</b> Ralf Schienbein <sup>1</sup> , Florian Fern <sup>2</sup> , René Theska <sup>1</sup> , Roland Füll <sup>2</sup> <sup>1</sup> <i>Institute of Design and Precision Engineering, Precision Engineering Group, Department of Mechanical Engineering, Technische Universität Ilmenau, Germany</i> <sup>2</sup> <i>Institute of Process Measurement and Sensor Technology, Department of Mechanical Engineering, Technische Universität Ilmenau, Germany</i>
ICE19114	P1.04	<b>Simulation analysis of the effect of tool geometry in diamond turning of KDP crystal</b> S.Zhang, W.J.Zong <i>Center for Precision Engineering, Harbin Institute of Technology, Harbin, China</i>
ICE19130	P1.05	<b>From nanometric to meso-scale characterisation of friction using nanoindentation</b> Ervin Kamenar <sup>1</sup> , Marko Perčić <sup>1</sup> , Saša Zelenika <sup>1</sup> <sup>1</sup> <i>University of Rijeka, Faculty of Engineering &amp; Centre for Micro- and Nanosciences and Technologies, Croatia</i>
ICE19168	P1.06	<b>Effect of Cutting Edge Radius of Diamond Tool on Micro Cutting of Single Crystalline Silicon Carbide</b> Shoichiro Sekiya <sup>1</sup> , Takayuki Kitajima <sup>1</sup> , Akinori Yui <sup>1</sup> <sup>1</sup> <i>National Defense Academy, Hashirimizu, Yokosuka, Kanagawa, Japan</i>
ICE19182	P1.07	<b>Calibration method of hybrid machining process in the green ceramic combining micro-milling and laser machining</b> Anthonin Demarbaix <sup>1</sup> , Edouard Rivière-Lorphèvre <sup>1</sup> , François Ducobu <sup>1</sup> , Adrien Dolimont <sup>1</sup> , Fabrice Petit <sup>2</sup> , Enrique Juste <sup>2</sup> <sup>1</sup> <i>University of Mons- Faculty of Engineering-Machine Design and Production Engineering Lab, Belgium</i> <sup>2</sup> <i>BCRC-INISMa (member of EMRA) Research and Technological Support Department, Belgium</i>

- ICE19190 P1.08 Development of handling - and alignment tools for flexible substrates**  
**Matthias Mohaupt<sup>1</sup>, Gerd Harnisch<sup>1</sup>, Christoph Damm<sup>1</sup>, Uta Schmidt<sup>1</sup>, Thomas Bolz<sup>1</sup>**  
<sup>1</sup>*Fraunhofer Institute for Applied Optics and Precision Engineering*
- ICE19202 P1.09 Development of a manual multi-axes workpiece adjustment system for ultra-precision diamond machining**  
Hiroo Shizuka<sup>1</sup>, Kai Rickens<sup>2</sup>, Oltmann Riemer<sup>2</sup>, Don A. Lucca<sup>3</sup>  
<sup>1</sup>*Shizuoka University, 3-5-1 Johoku Naka-ku Hamamatsu Shizuoka 432-8561 Japan*  
<sup>2</sup>*Leibniz Institute for Materials Engineering IWT Bremen, Laboratory for Precision Machining (LFM), MAPEX Center for Materials and Processes, University of Bremen, Bremen, Germany*  
<sup>3</sup>*School of Mechanical and Aerospace Engineering, Oklahoma State University, USA*
- ICE19227 P1.10 Flexure mechanism with increased dynamic performance by overconstraining using viscoelastic material**  
Sven Klein Avink<sup>1</sup>, Marijn Nijenhuis<sup>1</sup>, Wilma Dierkes<sup>2</sup>, Jacques Noordermeer<sup>2</sup>, Dannis Brouwer<sup>1</sup>  
<sup>1</sup>*Precision Engineering, Faculty of Engineering Technology, University of Twente, The Netherlands*  
<sup>2</sup>*Elastomer Technology and Engineering, Faculty of Engineering Technology, University of Twente, The Netherlands*
- ICE19228 P1.11 Mechanical properties of an adjustable weighing cell prototype**  
Maximilian Darnieder<sup>1</sup>, Markus Pabst<sup>2</sup>, Thomas Fröhlich<sup>2</sup>, Lena Zentner<sup>3</sup>, René Theska<sup>1</sup>  
*Technische Universität Ilmenau, Department of Mechanical Engineering*  
<sup>1</sup>*Institute for Design and Precision Engineering, Precision Engineering Group*  
<sup>2</sup>*Institute for Process Measurement and Sensor Technology, Process Measurement Technology Group*  
<sup>3</sup>*Compliant Systems Group*
- ICE19229 P1.12 A hybrid laser ablation and chemical etching process for manufacturing nature-inspired anisotropic superhydrophobic structures**  
Yukui Cai<sup>1</sup>, Xichun Luo<sup>1\*</sup>, Zongwei Xu<sup>2</sup>, King Hang Aaron Lau<sup>3</sup>, Fei Ding<sup>1</sup>, Yi Qin<sup>1</sup>  
<sup>1</sup>*Centre for Precision Manufacturing, DMEM, University of Strathclyde, UK*  
<sup>2</sup>*State Key Laboratory of Precision Measuring Technology & Instruments, Tianjin University, Tianjin, China*  
<sup>3</sup>*WestCHEM/Department of Pure & Applied Chemistry, University of Strathclyde, UK*
- ICE19264 P1.13 Improvement of the surface roughness on the friction stir burnishing**  
Yoshimasa Takada<sup>1</sup>, Hiroyuki Sasahara<sup>2</sup>  
<sup>1</sup>*NIKKISO CO., LTD., Japan*  
<sup>2</sup>*Tokyo University of Agriculture and Technology, Japan*

- ICE19265 P1.14 Micro product and process fingerprints for zero-defect net shape micromanufacturing**  
 Guido Tosello<sup>1</sup>, Mert Gulcur<sup>2</sup>, Ben Whiteside<sup>2</sup>, Phil Coates<sup>2</sup>, Antonio Luca<sup>3</sup>, Pablo Vinícius de Sousa Lia Fook<sup>3</sup>, Oltmann Riemer<sup>3</sup>, Igor Danilov<sup>4</sup>, Matin Yahyavi Zanjani<sup>4</sup>, Matthias Hackert-Oschätzchen<sup>4</sup>, Andreas Schubert<sup>4</sup>, Federico Baruffi<sup>1</sup>, Soufian Ben Achour<sup>1</sup>, Matteo Calao<sup>1</sup>, Chris Valentin Nielsen<sup>1</sup>, Giuliano Bissacco<sup>1</sup>, Emanuele Cannella<sup>1,5</sup>, Anette Rasmussen<sup>5</sup>, Mattia Bellotti<sup>6</sup>, Krishna Saxena<sup>6</sup>, Jun Qian<sup>6</sup>, Dominiek Reynaerts<sup>6</sup>, Teguh Santoso<sup>7</sup>, Wahyudin Syam<sup>7</sup>, Richard Leach<sup>7</sup>, Sandeep Kuria Kose<sup>8</sup>, Paolo Parenti<sup>8</sup>, Massimiliano Annoni<sup>8</sup>, Yukui Cai<sup>9</sup>, Xichun Luo<sup>9</sup>, Yi Qin<sup>9</sup>, Henning Zeidler<sup>10,11</sup>  
<sup>1</sup>*Department of Mechanical Engineering, Technical University of Denmark, Kgs. Lyngby, Denmark*  
<sup>2</sup>*RKT Centre for Polymer MNT, Faculty of Engineering and Informatics, University of Bradford, Bradford, UK*  
<sup>3</sup>*Laboratory for Precision Machining, Leibniz Institute for Materials Engineering IWT, University of Bremen, Bremen, Germany*  
<sup>4</sup>*Chemnitz University of Technology, Professorship Micromanufacturing Technology, Chemnitz, Germany*  
<sup>5</sup>*IPU, Kgs. Lyngby, Denmark*  
<sup>6</sup>*Department of Mechanical Engineering, KU Leuven, Member Flanders Make, Leuven, Belgium*  
<sup>7</sup>*Manufacturing Metrology Team, University of Nottingham, Nottingham, UK*  
<sup>8</sup>*Mechanical Engineering Department, Politecnico di Milano, Milano, Italy*  
<sup>9</sup>*Centre for Precision Manufacturing, Design, Manufacture & Engineering Management, University of Strathclyde, Glasgow, UK*  
<sup>10</sup>*Institute of Machine Elements, Design and Manufacturing, Professorship for Additive Manufacturing, TU Bergakademie Freiberg, Freiberg, Germany*  
<sup>11</sup>*Beckmann-Institut für Technologieentwicklung, Chemnitz, Germany*
- ICE19284 P1.15 Fabrication of nano-and micro-structured surface using spatial beat of evanescent wave interference lithography**  
 Shuzo Masui<sup>1</sup>, Masaki, Michihata<sup>2</sup>, Kiyoshi Takamasu<sup>1</sup>, Satoru Takahashi<sup>2</sup>  
<sup>1</sup>*Department of Precision Engineering, The University of Tokyo*  
<sup>2</sup>*Research Center for Advanced Science and Technology, The University of Tokyo*
- ICE19289 P1.16 Nanostructured ZnO thin film based CO2 sensor by RF sputtering technique**  
 Anuroop Shrivastava<sup>1</sup>, Ganesh Kumar Mani<sup>2</sup>, Kazuyoshi Tsuchiya<sup>2,3</sup>  
<sup>1</sup>*Graduate School of Engineering, Tokai University, Japan*  
<sup>2</sup>*Micro/Nano Technology Center, Tokai University, Japan*  
<sup>3</sup>*Department of Precision Engineering, Tokai University, Japan*
- ICE19292 P1.17 Development and evaluation of the novel FAB gun**  
 Ryo Morisaki<sup>1</sup>, Yuuki Hirai<sup>1</sup>, Junpei Sakurai<sup>1</sup>, Mizue Mizoshiri<sup>2</sup>, Chiemi Oka<sup>1</sup>, Takami Hirai<sup>3</sup>, Tomonori Takahashi<sup>3</sup>, Hiroyuki Tsuji<sup>3</sup>, Seiichi Hata<sup>1</sup>  
<sup>1</sup>*Nagoya University*  
<sup>2</sup>*Nagaoka University of Technology*  
<sup>3</sup>*NGK INSULAORS, LTD*

- ICE19293 P1.18 Large size seamless nano patterned molders using direct laser writing**  
Geehong Kim<sup>1</sup>, Soongeun Kwon<sup>1</sup>, Hyungjun Lim<sup>1</sup>, Keebong Choi<sup>1</sup>, and Jaejong Lee<sup>1</sup>  
<sup>1</sup>*Korea Institute of Machinery and Materials, Daejeon, Republic of Korea*
- ICE19314 P1.19 Fabrication of functionalised surfaces on Gum metal (Ti-30Nb) using micromachining**  
Sara Hawi<sup>1</sup>, Andrew Dickins<sup>1</sup>, Goncalo Rodrigues Pardal<sup>1</sup>, Claudiu Giusca<sup>1</sup>, Oliver Pearce<sup>2</sup>, Saurav Goel<sup>1</sup>  
<sup>1</sup>*School of Aerospace, Transport and Manufacturing, Cranfield University, Cranfield, UK*  
<sup>2</sup>*Milton Keynes Uni hospital, Milton Keynes, UK*
- ICE19335 P1.20 Thermal errors of a 5- axis CNC milling centre equipped with different spindle units**  
**Otakar Horejš<sup>1</sup>, Martin Mareš<sup>1</sup>, Jan Hornych<sup>1</sup>**  
<sup>1</sup>*Czech Technical University in Prague, Faculty of Mechanical Engineering, Department of Production Machines and Equipment, Prague, Czech Republic*
- ICE19360 P1.21 Geometrical shape assessment of additively manufactured features by continuous liquid interface production vat photopolymerization method**  
A. Davoudinejad<sup>a</sup>, A. K. Jessen<sup>a,b</sup>, S. D. Farahani<sup>b</sup>, N. Franke<sup>c</sup>, D. B. Pedersen<sup>a</sup>, G. Tosello<sup>a</sup>  
<sup>a</sup>*Department of Mechanical Engineering, Technical University of Denmark, Lyngby, Denmark*  
<sup>b</sup>*Danfoss Cooling section, Kolding, Denmark*  
<sup>c</sup>*Danfoss, Nordborgvej, Nordborg, Denmark*
- ICE19361 P1.22 Direct fabrication of microstructured surfaces by additive manufacturing**  
A. Davoudinejad<sup>a</sup>, D.B Pedersen<sup>a</sup>, G. Tosello<sup>a</sup>  
<sup>a</sup>*Department of Mechanical Engineering, Technical University of Denmark, Lyngby, Denmark*
- ICE19362 P1.23 Simulation of thin features machining by micro end-milling using finite element modelling**  
Ali Davoudinejad, Dongya Li, Yang Zhang, Guido Tosello  
*Department of Mechanical Engineering, Technical University of Denmark, Lyngby, Denmark*
- ICE19283 P1.24 Acoustic finite element analysis and fabrication of an ultrasonic waveguide for cooling**  
Hyunse Kim, Euisu Lim, Yanglae Lee, Jong-Kweon Park  
*Korea Institute of Machinery and Materials, Daejeon, Republic of Korea*
- ICE19204 P1.25 Micro-cutting of a MMC-composite for enhanced injection moulds**  
E. Uhlmann<sup>1,2</sup>, M. Polte<sup>1,2</sup>, C. Hein<sup>1</sup>, J. Polte<sup>1</sup>, C. Jahnke<sup>1</sup>  
<sup>1</sup>*Fraunhofer Institute for Production Systems and Design Technology IPK, Germany*  
<sup>2</sup>*Institute for Machine Tools and Factory Management IWF, Technische Universität Berlin, Germany*
- ICE19296 P1.26 Development of an adaptive toolpath planning strategy for diamond face turning of freeform surfaces**  
Wenbin Zhong, Zhen Tong, Wanqun Chen, Xiangqian Jiang  
*EPSRC Future Metrology Hub, Centre for Precision Technologies, University of Huddersfield, UK*

**ICE19345 P1.27 Micromechanical analysis of influence of particle volume fraction on mechanical behaviour of Al-Li/B4C metal matrix composites**  
Chetan S. Patil<sup>1</sup>, Dineshsingh G. Thakur<sup>2</sup>  
<sup>1,2</sup>*Defence Institute of Advanced Technology, (DU), , India*

**ICE19350 P1.28 Reflective Optics developments at Thales SESO**  
Luca PEVERINI<sup>1</sup>, Monique IDE<sup>1</sup>, Christian du Jeu<sup>1</sup>  
<sup>1</sup>*THALES SESO SAS, 530 Rue Frederic Joliot – CS 30504 - 13593 Aix en Provence-France*

## **Session 2: Measuring Instruments**

**ICE19106 P2.01 Acoustic frequency measurement of an ultrasonic actuator designed for the use in a vibration-assisted air bearing spindle for micro machining**  
Sebastian Greco<sup>1</sup>, Andreas Lange<sup>1</sup>, Benjamin Kirsch<sup>1</sup>, Jan C. Aurich<sup>1</sup>  
<sup>1</sup>*Technische Universität Kaiserslautern; Institute for Manufacturing Technology and Production Systems*

**ICE19123 P2.02 Temperature control for an ultra-precision high speed spindle**  
Byron Knapp, Dave Arneson, Dan Oss  
*Professional Instruments Company, Hopkins, Minnesota, USA*

**ICE19126 P2.03 Study on the protection performance of a grinding wheel safety guard made of polycarbonate plate**  
Takuya Fukui<sup>1</sup>, Akinori Yui<sup>1</sup>, Takayuki Kitajima<sup>1</sup>  
<sup>1</sup>*Mechanical Systems Engineering, National Defense Academy, Japan*

**ICE19141 P2.04 Measurement concept for the correction of beam misalignment of a Pseudo-Abbe comparator for diameter and form calibrations**  
Christian Hesse<sup>1</sup>, Otto Jusko<sup>1</sup>  
<sup>1</sup>*Dept. 5.3 "Coordinate Metrology", Physikalisch-Technische Bundesanstalt, Braunschweig, Germany*

**ICE19151 P2.05 Thermal error characteristic analysis for a large precision EDM machine tool due to environmental temperature**  
Zhaoxi Zhao<sup>1,2</sup>, Zhenlong Wang<sup>1,2</sup>, Yukui Wang<sup>1,2</sup>, Jianyong Liu<sup>3</sup>  
<sup>1</sup>*Key Laboratory of Micro-systems and Micro-structures Manufacturing of Ministry of Education, Harbin Institute of Technology, Harbin, , P R China*  
<sup>2</sup>*School of Mechatronics Engineering, Harbin Institute of Technology, Harbin, P R China*  
<sup>3</sup>*Beijing Institute of Electromachining, Beijing, P R China*

**ICE19173 P2.06 Thermal characterization and modelling of a gantry-type machine tool linear axis**  
Philip Blaser<sup>1</sup>, Christian Hauschel<sup>1</sup>, Roman Rüttimann<sup>1</sup>, Pablo Hernández-Becerro<sup>2</sup>, Josef Mayr<sup>2</sup>, Konrad Wegener<sup>1</sup>  
<sup>1</sup>*Institute of Machine Tools and Manufacturing (IWF), Zurich, Switzerland*  
<sup>2</sup>*Inspire AG, Zurich, Switzerland*

- ICE19177 P2.07 Development of multi-functional machine tool capable of micro pattern processing**  
Sungcheul Lee<sup>1</sup>, Seung-Kook Ro<sup>1</sup>, Soo-Hun Lee<sup>2</sup>, Jong-Kweon Park<sup>1</sup>  
<sup>1</sup>*Department of Ultra Precision Machines and Systems, Korea Institute of Machinery and Materials, Deajeon, South Korea*  
<sup>2</sup>*Department of Mechanical Engineering, Suwon, South Korea*
- ICE19189 P2.08 Measuring setup for the investigation of the reproducibility of tool changing interfaces for high-precision devices**  
Florian Weigert<sup>1</sup>, Roman Hebenstreit<sup>1</sup>, René Theska<sup>1</sup>  
<sup>1</sup>*Technische Universität Ilmenau, Department of Mechanical Engineering, Institute for Design and Precision Engineering, Precision Engineering Group*
- ICE19211 P2.09 Geometrical error identification of a 3-axis machine tool with the laser tracker outside of the machine**  
Pablo Pérez<sup>1</sup>, José Antonio Albajez<sup>1</sup>, Jorge Santolaria<sup>1</sup>, Sergio Aguado<sup>2</sup>  
<sup>1</sup>*Department of Design and Manufacturing Engineering, University of Zaragoza, Zaragoza, Spain*  
<sup>2</sup>*Centro Universitario de la Defensa, Zaragoza, Spain*
- ICE19216 P2.10 High-speed, roll to roll coherence scanning interferometry in a laser texturing process**  
C. Bermudez, P. Martínez, C. Cadevall, R. Artigas  
*Sensofar Tech SL, Barcelona, Spain*
- ICE19238 P2.11 A novel weighing cell for KRISS kibble balance** Kyung-Taek Yoon<sup>1</sup>, Hyun-Ho Lim<sup>1</sup>, Sung-Hoon Kang<sup>1</sup>, Dongmin Kim<sup>2</sup>, Young-Man Choi<sup>1</sup>  
<sup>1</sup>*Department of Mechanical Engineering, Ajou University, Republic of Korea*  
<sup>2</sup>*Center for Mechanical Metrology, Korea Research Institute of Standards and Science(KRIS), Republic of Korea*
- ICE19242 P2.12 Design optimization for static and dynamic characteristics of linear motion stages**  
Gyungho Khim<sup>1</sup>, Hyun-Soo Kim<sup>1</sup>, Jeong Seok Oh<sup>1</sup>, Chun-Hong Park<sup>1</sup>  
<sup>1</sup>*Korea Institute of Machinery and Materials*
- ICE19291 P2.13 On-machine optical surface topography measurement sensor based on focus variation**  
Subbareddy Darukumalli<sup>1,2</sup>, Teguh Santoso<sup>1</sup>, Wahyudin P. Syam<sup>1</sup>, Franz Helml<sup>2</sup> and Richard Leach<sup>1</sup>  
<sup>1</sup>*Manufacturing Metrology Team, University of Nottingham, Nottingham, UK*  
<sup>2</sup>*Alicona Imaging GmbH, Raaba, Austria*
- ICE19341 P2.14 Accuracy evaluation of an optical 3D profiler integrated on a machine tool adapted for laser micro-processing**  
Gorka Kortaberria<sup>1</sup>, Bruno Santamaria<sup>1</sup>, Jon Etxarri<sup>1</sup>, Eneko Gomez-Acedo<sup>1</sup>, Jon Lambarri<sup>1</sup>  
<sup>1</sup>*IK4-Tekniker*
- ICE19352 P2.15 Machine tool health verification**  
James Moore<sup>1</sup>, Andrew Mantle<sup>2</sup>, Jon Stammers<sup>1</sup>,  
<sup>1</sup>*The University of Sheffield Advanced Manufacturing Research Centre with Boeing*  
<sup>2</sup>*Rolls-Royce plc.*

- ICE19357 P2.16 A study on the feasibility of in-process compensation of cutting force induced errors using axes motors absorbed current**  
Alessandro Checchi<sup>1</sup>, Giuseppe Dalla Costa<sup>1</sup>, Christian Haastруп Merrild<sup>2</sup>, Giuliano Bissacco<sup>1</sup>, Hans Nørgaard Hansen<sup>1</sup>  
<sup>1</sup>*Technical University of Denmark DTU, Department of Mechanical Engineering, Denmark*  
<sup>2</sup>*Danish Advanced Manufacturing Research Center, Herning, Denmark*
- ICE19364 P2.17 Advanced synchrotron diffractometer**  
Gheorghe Olea, Norman Huber, Wolfgang Schulein  
*HUBER Diffraction and Positioning GmbH & Co.KG*
- ICE19108 P2.18 Geometry error precise measurement based rotation accuracy prediction method for hydrostatic rotary table**  
Jun Zha<sup>1,2</sup>, Hangcheng Zhang<sup>1</sup>, Yipeng Li<sup>1</sup>, Yaolong Chen<sup>1,3</sup>, Kejia Liu<sup>1,2</sup>  
<sup>1</sup>*School of Mechanical Engineering, Xi'an Jiaotong University, Shaanxi, China*  
<sup>2</sup>*Shenzhen Research School, Xi'an Jiaotong University, Hi-Tech Zone, Shenzhen, China*  
<sup>3</sup>*State Key Laboratory of Manufacturing System Engineering, Xi'an Jiaotong University, Shaanxi, China*
- ICE19201 P2.19 Test bench for characterization of high precision hydrostatic bearings**  
Harkaitz Urreta<sup>1\*</sup>, Ibai Berrotaran<sup>1</sup>, Luis Norberto Lopez de Lacalle<sup>2</sup>  
<sup>1</sup>*IK4-IDEKO Research Center, Elgoibar – Basque Country, Spain*  
<sup>2</sup>*EHU University of the Basque Country, Bilbao – Basque Country, Spain*
- ICE19338 P2.20 Volumetric error assessment of dual head machines through a shearing technique**  
Aitor Olarra<sup>1</sup>, Mikel Zubieta<sup>2</sup>, Gorka Kortaberria<sup>1</sup>  
<sup>1</sup>*IK4-Tekniker*
- ICE19340 P2.21 Temperature control of an ultra-precision machine**  
Aitor Olarra<sup>1</sup>, Eneko Gomez-Acedo<sup>1</sup>, Itzal del Hoyo<sup>1</sup>, Susana López<sup>1</sup>, Tomás Morlanes<sup>2</sup>  
<sup>1</sup>*IK4-Tekniker*  
<sup>2</sup>*Fagor Aotek*
- ICE19353 P2.22 Micro-milling stability indicator by pseudo-inverse of time series**  
Shashwat Kushwaha<sup>1</sup>, Benjamin Gorissen<sup>1</sup>, Jun Qian<sup>1</sup>, Dominiek Reynaerts<sup>1</sup>  
*Micro- & Precision Engineering group, Department of Mechanical Engineering, KU Leuven, Belgium*
- ICE19156 P2.23 Phase detection type SPR (PD-SPR) sensor for thin film's thickness and optical constants**  
Qinggang Liu<sup>1</sup>, Yaopu Lang<sup>1</sup>, Haojie Song<sup>1</sup> and Chong Yue<sup>1</sup>  
<sup>1</sup>*State Key Laboratory of Precision Measurement Technology and Instruments, Tianjin University, China*
- ICE19329 P2.24 In-situ axis error detection module**  
Thomas Furness<sup>1\*</sup>, Simon Fletcher<sup>1</sup>, Andrew Longstaff<sup>1</sup>, Andrew Bell<sup>1</sup>, Steve Mcvey<sup>2</sup>  
<sup>1</sup>*The University of Huddersfield, UK*  
<sup>2</sup>*MTT Ltd*

**ICE19306 P2.25 Improvement of laser microphone using self-coupling effect for spherical sound wave detection**  
Daisuke Mizushima, Norio Tsuda, Jun Yamada  
*Aichi Institute of Technology*

**Session 3: Additive Manufacturing & Replication**

**ICE19142 P3.01 Optimization of a self- peeling vat for precision vat photopolymerization setups**  
Macarena M. Ribó<sup>1</sup>, Anna H. Danielak<sup>1</sup>, Jakob S. Nielsen<sup>1</sup>, Aminul Islam<sup>1,2</sup>, David B. Pedersen<sup>1</sup>  
<sup>1</sup>*Department of Mechanical Engineering, Technical University of Denmark*  
<sup>2</sup>*Centre for Acoustic-Mechanical Micro Systems (CAMM), Technical University of Denmark*

**ICE19183 P3.02 Process and product fingerprint concept for microinjection moulding of thermoplastic microneedle arrays**  
Mert Gulcur<sup>1</sup>, Ben Whiteside<sup>1</sup>, Pablo Fook<sup>2</sup>, Kai Rickens<sup>2</sup>, Oltmann Riemer<sup>2</sup>  
<sup>1</sup>*Centre for Polymer Micro and Nano Technology, University of Bradford, Bradford, UK*  
<sup>2</sup>*Leibniz Institute for Materials Engineering IWT, LFM, Bremen, Germany*

**ICE19230 P3.03 Multi- material additive manufacturing of steels using laser powder bed fusion**  
Venkata Karthik Nadimpalli<sup>1</sup>, Thomas Dahmen<sup>1</sup>, Emilie Hørddum Valente<sup>1</sup>, Sankhya Mohanty<sup>1</sup>, David Bue Pedersen<sup>1</sup>  
<sup>1</sup>*Technical University of Denmark, Department of Mechanical Engineering, Denmark*

**ICE19318 P3.04 Influence of atmosphere on microstructure and nitrogen content in AISI 316L fabricated by laser-based powder bed fusion**  
Emilie Hørddum Valente<sup>1</sup>, Venkata Karthik Nadimpalli<sup>1</sup>, Sebastian Aagaard Andersen<sup>1</sup>, David Bue Pedersen<sup>1</sup>, Thomas L. Christiansen<sup>1</sup>, Marcel A. J. Somers<sup>1</sup>  
<sup>1</sup>*Technical University of Denmark, Department of Mechanical Engineering, Lyngby, Denmark*

**ICE19334 P3.05 Quality assurance of reference specimens manufactured by continuous liquid interface production using coordinate metrology**  
M. Kain<sup>a</sup>, A. Davoudinejad<sup>a</sup>, D. Quagliotti<sup>a</sup>, J. S. Nielsen<sup>a</sup>, K. Liltorp<sup>a</sup>, D. B. Pedersen<sup>a</sup>, S. D. Farahani<sup>b</sup>, N. Franke<sup>c</sup> and G. Tosello<sup>a</sup>  
<sup>a</sup>*Department of Mechanical Engineering, Technical University of Denmark, Lyngby, Denmark*  
<sup>b</sup>*Danfoss Cooling section, Kolding, Denmark*  
<sup>c</sup>*Danfoss, Nordborg, Denmark*

**ICE19343 P3.06 A critique of solutions and research to the challenges of adopting metallic additive-layer manufacture in full-scale production**  
Robert Bush<sup>1</sup>, Farid Dailami<sup>1</sup>  
<sup>1</sup>*Bristol Robotics Lab, UK*

**ICE19107 P3.07 Micro-blasting of 316L tubular lattice manufactured by laser powder bed fusion**  
Jiong Zhang  
*Department of Mechanical Engineering, Faculty of Engineering, National University of Singapore, Singapore*



**ICE19101 P3.08 Structured 3D elastomeric composites with hybrid functionalities via 3D printing**  
Yu Liu<sup>1</sup>, Jiawen Xu<sup>1</sup>, Erwei Shang<sup>1</sup>, Yanqiu Chen<sup>1</sup>, Zhenyu Wang<sup>1</sup>, Qiang Zhang<sup>1</sup>, Jun Ren<sup>1</sup>  
<sup>1</sup>*School of Mechanical Engineering, Jiangnan University, Wuxi, China*

**Session 4: Metrology**

**ICE19116 P4.01 Development of the trilateration optical comb tracking system adopting ball lenses as references and targets**  
Shusei Masuda<sup>1</sup>, Tomohiko Takamura<sup>1</sup>, Winarno Agustinus<sup>2</sup>, Hirokazu Matsumoto<sup>1</sup>, Satoru Takahashi<sup>1</sup>, Kiyoshi Takamasu<sup>1</sup>  
<sup>1</sup>*Department of Precision Engineering, The University of Tokyo, Tokyo*  
<sup>2</sup>*Department of Mechanical Engineering, Vocational College Gadjah Mada University*

**ICE19122 P4.02 Metrological traceability of an ultra-accurate CMM XENOS**  
Michael Neugebauer<sup>1</sup>, Matthias Franke<sup>1</sup>, Daniel Heißelmann<sup>1</sup>, Karin Kniel<sup>1</sup>, Ralf Bernhardt<sup>2</sup>, Klaus Bendzulla<sup>2</sup>  
<sup>1</sup>*Physikalisch-Technische Bundesanstalt, Department, Coordinate Metrology, Braunschweig*  
<sup>2</sup>*Carl Zeiss Industrielle Messtechnik GmbH, Oberkochen*

**ICE19129 P4.03 Design of the new dual-mode torque standard machine using the kilogram redefinition principle**  
MyeongHyeon Kim<sup>1</sup>, In-Mook Choi<sup>1</sup>  
<sup>1</sup>*Center for mechanical metrology, Division of Physical metrology, Korea Research Institute of Standards and Science, Daejeon, Republic of Korea*

**ICE19160 P4.04 Effect of grinding wheel-workpiece interactions in fine grinding on material removal of silicon based on molecular dynamics analysis**  
H. Tanaka, S. Shimada  
*Osaka Electro-Communication University, Japan*

**ICE19184 P4.05 Surface integrity investigation of ground ceramic workpieces for biomedical Applications**  
Pablo Fook<sup>1</sup>, Oltmann Riemer<sup>1</sup>, Bernhard Karpuschewski<sup>1</sup>  
<sup>1</sup>*Laboratory for Precision Machining (LFM), Leibniz Institute for Materials Engineering (IWT), MAPEX Center for Materials and Processes, University of Bremen, Germany*

**ICE19191 P4.06 Temperature effects in X-ray computed tomography**  
Marko Katic<sup>1</sup>, Gorana Barsic<sup>1</sup>, Danijel Sestan<sup>1</sup>, Nenad Ferdelji<sup>1</sup>  
<sup>1</sup>*University of Zagreb, Faculty of mechanical engineering and naval architecture*

- ICE19212 P4.07 Surface extraction procedures based on gradient algorithm for X-ray computed tomography measurement of multi-material parts**  
 S. Ontiveros<sup>1</sup>, R. Jiménez-Pacheco<sup>2</sup>, J.A. Yagüe-Fabra<sup>3</sup>,  
 F. Zanini<sup>4</sup>, S. Carmignato<sup>4</sup>  
<sup>1</sup>*Department of Industrial Engineering, Autonomous University of Baja California, Mexico*  
<sup>2</sup>*Centro Universitario de la Defensa, Carretera de Huesca, Spain*  
<sup>3</sup>*I3A, Universidad de Zaragoza, Zaragoza, Spain*  
<sup>4</sup>*University of Padova, Department of Management and Engineering (DTG), Vicenza, Italy*
- ICE19213 P4.08 Thermal expansion coefficient analysis by Fabry-Pérot interferometer**  
 Hung-Ta Shih<sup>1</sup>, Yung-Cheng Wang<sup>2</sup>, Pi-Cheng Tung<sup>1</sup>, Lih-Horng Shyu<sup>3</sup>, Chung-Ping Chang<sup>4</sup>, Jhe-Sian Li<sup>2</sup>  
<sup>1</sup>*Department of Mechanical Engineering, National Central University, Taiwan*  
<sup>2</sup>*Department of Mechanical Engineering, National Yunlin University of Science and Technology, Taiwan*  
<sup>3</sup>*Department of Electro-Optical Engineering, National Formosa University, Taiwan*  
<sup>4</sup>*Department of Mechanical and Energy Engineering, National Chiayi University, Taiwan*
- ICE19240 P4.09 Long range wire based yaw and straightness measuring system for a 50 m bench**  
 Anke Bossen<sup>1</sup>, Marc Trösch<sup>1</sup>, Alain Küng<sup>1</sup>, Felix Meli<sup>1</sup>  
<sup>1</sup>*Federal Institute of Metrology METAS, Switzerland*
- ICE19244 P4.10 Customized design of artefacts for additive manufacturing**  
 Saint-Clair T. Toguem<sup>1</sup>, Charyar Mehdi-Souzani<sup>1</sup>, Nabil Anwer<sup>1</sup>, Hichem Nourira<sup>2</sup>  
<sup>1</sup>*LURPA, ENS Paris-Saclay, Univ. Paris-Sud, Paris, France*  
<sup>2</sup>*Laboratoire National de Métrologie et d'Essais (LNE), Paris, France*
- ICE19254 P4.11 Dual low coherence scanning interferometer for rapidly measuring large step**  
 Hyo Mi Park<sup>1</sup>, Ki-Nam Joo<sup>1</sup>  
<sup>1</sup>*Department of Photonic Engineering, Chosun University, Republic of Korea*
- ICE19258 P4.12 A comparison of non-linearity correction algorithms in optical interferometry**  
 Angus Bridges<sup>1,2</sup>, Andrew Yacoot<sup>1</sup>, Thomas Kissinger<sup>2</sup>, Ralph P. Tatam<sup>2</sup>  
<sup>1</sup>*National Physical Laboratory, Teddington, UK*  
<sup>2</sup>*Centre for Engineering Photonics, Cranfield University, UK*
- ICE19263 P4.13 First measurements of onset of tip flight for micro-probes with diamond and Silicon tips for fast roughness measurements**  
 Heinrich Behle<sup>1</sup>, Jannick Langfahl-Klabes<sup>1</sup>, Jürgen Kirchhoff<sup>1</sup>, Uwe Brand<sup>1</sup>, Michael Fahrbach<sup>2,3</sup>,  
 Erwin Peiner<sup>2,3</sup> and Michael Drexel<sup>4</sup>  
<sup>1</sup>*Physikalisch-Technische Bundesanstalt (PTB), Braunschweig, Germany*  
<sup>2</sup>*Institut für Halbleitertechnik (IHT), TU Braunschweig, Braunschweig, Germany*  
<sup>3</sup>*Laboratory of Emerging Nanometrology (LENA), Braunschweig, Germany*  
<sup>4</sup>*Breitmeier Messtechnik GmbH, Ettlingen, Germany*

- ICE19267 P4.14 Measurement of mechanical characteristics using micro devices with force sensing**  
 Tohru Sasaki<sup>1</sup>, Yudai Fujiwara<sup>2</sup>, Kaoru Tachikawa<sup>3</sup>, Takuya Wakashima<sup>3</sup>,  
 Kenji Terabayashi<sup>1</sup>, Mitsuru Jindai<sup>1</sup>, Kuniaki Dohda<sup>4</sup>  
<sup>1</sup>*Department of Mechanical and Intellectual Systems Engineering, University of Toyama*  
<sup>2</sup>*Graduate School of Science and Engineering for Education, University of Toyama*  
<sup>3</sup>*Faculty of Engineering, University of Toyama*  
<sup>4</sup>*Department of Mechanical Engineering, Northwestern University*
- ICE19271 P4.15 Geometry of X-ray computed tomography systems: a sensitivity analysis of detector angular misalignments on dimensional measurements**  
 E. Sbettega<sup>1</sup>, F. Zanini<sup>1</sup>, S. Carmignato<sup>1</sup>  
<sup>1</sup>*Department of Management and Engineering, University of Padova, Vicenza, Italy*
- ICE19272 P4.16 X-ray computed tomography for dimensional measurements of threaded parts**  
 F. Zanini<sup>1</sup>, S. Carmignato<sup>1</sup>  
<sup>1</sup>*Department of Management and Engineering, University of Padua, Vicenza, Italy*
- ICE19273 P4.17 Accuracy of fiber length measurements using X-ray computed tomography for the analysis of composite materials**  
 F. Zanini<sup>1</sup>, S. Carmignato<sup>1</sup>  
<sup>1</sup>*Department of Management and Engineering, University of Padua, Vicenza, Italy*
- ICE19274 P4.18 Scanning characterization of polymer coating layers using contact resonance with piezoresistive microprobes**  
 Michael Fahrbach<sup>1,2</sup>, Sebastian Backes<sup>3</sup>, Brunero Cappella<sup>3</sup> and Erwin Peiner<sup>1,2</sup>  
<sup>1</sup>*Institute of Semiconductor Technology (IHT), Braunschweig University of Technology, Braunschweig, Germany*  
<sup>2</sup>*Laboratory for Emerging Nanometrology (LENA), Braunschweig, Germany*  
<sup>3</sup>*Bundesanstalt für Materialforschung und -prüfung (BAM), Berlin, Germany*
- ICE19275 P4.19 Development of an in-situ inspection system for additive manufacturing based on phase measurement profilometry**  
 Yue Liu<sup>1</sup>, Zonghua Zhang<sup>3</sup>, Liam Blunt<sup>1</sup>, Grant Saunby<sup>2</sup>, Jason Dawes<sup>2</sup>,  
 Ben Blackham<sup>2</sup>, Hussein Abdul Rahman<sup>4</sup>, Chris Smith<sup>5</sup>, Feng Gao<sup>1</sup>, Xiangqian Jiang<sup>1</sup>  
<sup>1</sup>*EPSRC Future Metrology Hub, University of Huddersfield UK*  
<sup>2</sup>*Manufacturing Technology Centre, Coventry, UK*  
<sup>3</sup>*School of Mechanical Engineering, Hebei University of Technology, Tianjin, China*  
<sup>4</sup>*Higher Colleges of Technology, UAE*  
<sup>5</sup>*Reliance Precision, UK*
- ICE19281 P4.20 NPL Areal Standard: a multi-function calibration artefact for surface topography measuring instruments**  
 Lakshmi P Nimishakavi<sup>1</sup>, Christopher W Jones<sup>1</sup>, Claudiu L Giusca<sup>2</sup>  
<sup>1</sup>*National Physical Laboratory, Teddington, UK*  
<sup>2</sup>*Surface Engineering and Precision Institute, Cranfield University, UK*

- ICE19282 P4.21 Design and manufacture of components for the development of superconducting gravity gradiometer**  
In-Mook Choi<sup>1</sup>, In-Seon Kim<sup>1</sup>, Gracia Kim<sup>1</sup>, Myeong-Hyeon Kim<sup>1</sup>, Jinseok Jang<sup>1</sup>  
<sup>1</sup>*Korea Research Institute of Standards and Science*
- ICE19321 P4.22 Gear measurements using optical point autofocus profiling**  
Hamid Hadian<sup>1</sup>, Samanta Piano<sup>1</sup>, Xiaobing Feng<sup>2</sup>, Richard Leach<sup>1</sup>  
<sup>1</sup>*Manufacturing Metrology Team, Faculty of Engineering, University of Nottingham, Nottingham, UK*  
<sup>2</sup>*School of Mechanical Engineering, Shanghai Jiao Tong University, Shanghai, China*
- ICE19347 P4.23 Tapping AFM measurements artefacts in the acquisition of high-aspect-ratio rectangular nanostructures using dedicated sharp tips**  
Dario Loaldi<sup>1</sup>, Danilo Quagliotti<sup>1</sup>, Matteo Calaan<sup>1</sup>, Ilja Czolkos<sup>2</sup>, Alicia Johansson<sup>2</sup>, Theodor Nielsen<sup>2</sup>, Jørgen Garnæs<sup>3</sup> and Guido Tosello<sup>1</sup>  
<sup>1</sup>*Department of Mechanical Engineering, Technical University of Denmark, Kgs. Lyngby, Denmark*  
<sup>2</sup>*NIL TECHNOLOGY ApS, Kgs. Lyngby, Denmark*  
<sup>3</sup>*Danish Fundamental Metrology A/S, Hørsholm, Denmark*
- ICE19358 P4.24 An integrated framework of reference for the qualification of personnel in coordinate metrology**  
Enrico Savio<sup>1</sup>, Marco Menoncin<sup>1</sup>, Michael Marxer<sup>2</sup>, Nabil Anwer<sup>3</sup>, Tino Hausotte<sup>4</sup>, Paul Bills<sup>5</sup>, Liam Blunt<sup>5</sup>  
<sup>1</sup>*Università di Padova, Department of Industrial Engineering, Padova, Italy*  
<sup>2</sup>*Interstaatliche Hochschule für Technik Buchs, Institute PWO, Switzerland*  
<sup>3</sup>*École Normale Supérieure Paris-Saclay, France*  
<sup>4</sup>*Institute of Manufacturing Metrology, Friedrich-Alexander-Universität Erlangen-Nürnberg (FAU), Germany*  
<sup>5</sup>*Centre for Precision Technologies, University of Huddersfield, UK*
- ICE19207 P4.25 In-process portable photogrammetry using optical targets for large scale industrial metrology**  
A. Mendikute<sup>1</sup>, I. Leizea<sup>1</sup>, I. Herrera<sup>1</sup>, J.A. Yagüe-Fabra<sup>2</sup>  
<sup>1</sup>*IK4-Ideko, Basque Country, Spain*  
<sup>2</sup>*I3A, Universidad de Zaragoza, Zaragoza, Spain*
- ICE19259 P4.26 Analysis and comparison of projector calibration methods to reduce the uncertainty propagation of camera calibration on a camera-projector measuring system**  
Tiscareño, J<sup>1</sup>, Albajez, J.A.<sup>2</sup>, Santolaria, J.<sup>3</sup>  
<sup>1,2,3</sup>*Departament of Design and Manufacturing Engineering. University of Zaragoza, Zaragoza, Spain*
- ICE19136 P4.27 The effects of x-ray computed tomography filament degradation on extracted areal surface texture data**  
Jonathan Slocombe<sup>1</sup>, Andrew Townsend<sup>1</sup>, Katie Addinall<sup>1</sup>, Liam Blunt<sup>1</sup>  
<sup>1</sup>*EPSRC Centre for Innovative Manufacturing in Advanced Metrology, School of Computing and Engineering, University of Huddersfield, UK*

- ICE19298 P4.28 The challenges in edge detection and porosity analysis for dissimilar materials additive manufactured components**  
 Ahmed Tawfik<sup>1</sup>, Radu Racasan<sup>1</sup>, Desi Bacheva<sup>2</sup>, Liam Blunt<sup>1</sup>, Paul Bills<sup>1</sup>  
<sup>1</sup> *EPSRC Future Advanced Metrology Hub, University of Huddersfield, Huddersfield, UK*  
<sup>2</sup> *HiETA Technologies Ltd, Bristol, UK*
- ICE19269 P4.29 Use the computed tomography for the automatic tool correction of the mould injection process**  
 Katharina Richter<sup>1</sup>, Martin Peterek<sup>1</sup>, Robert H. Schmitt<sup>1</sup>  
<sup>1</sup> *RWTH Aachen - WZL*

#### **Session 5: Mechanical Manufacturing Processes**

- ICE19102 P5.01 Proposal of fixed abrasive wire tool for thin wires considering mirror cutting**  
 Yasuyuki Kamimura<sup>1</sup>, Kensuke Tsuchiya<sup>1</sup>  
<sup>1</sup> *Institute of Industrial Science, University of Tokyo, Japan*
- ICE19103 P5.02 Development of a new drilling tool for machining of CFRP-metal-composites**  
 K. Dröder<sup>1</sup>, H.-W. Hoffmeister<sup>1</sup>, M. Alberg<sup>1</sup>  
<sup>1</sup> *Institute of Machine Tools and Production Technology, Technische Universität Braunschweig, Germany*
- ICE19115 P5.03 Monitoring of cutting state in micro milling of lithium niobate**  
 Kenji Shimana<sup>1</sup>, Tetsuya Oshige<sup>1</sup>, Shinichi Yoshimitsu<sup>1</sup>, Yuya Kobaru<sup>1</sup>, Eiji Kondo<sup>2</sup>  
<sup>1</sup> *National Institute of Technology, Kagoshima College, Japan*  
<sup>2</sup> *Graduate School of Science and Engineering, Kagoshima University, Japan*
- ICE19118 P5.04 Effect of grain wear on material removal behaviour of sapphire in ultra-precision grinding**  
 Xingshi Gu<sup>1</sup>, Qingliang Zhao<sup>1</sup>, Bing Guo<sup>1</sup>  
<sup>1</sup> *School of Mechanical and Electrical Engineering, Harbin Institute of Technology, Harbin, P.R. China*
- ICE19120 P5.05 Custom made electroless plated dicing blades for micro machining operations**  
 Peter A. Arrabiyeh<sup>1</sup>, Marius Heintz<sup>1</sup>, Benjamin Kirsch<sup>1</sup>, Jan C. Aurich<sup>1</sup>  
<sup>1</sup> *University of Kaiserslautern; Institute for Manufacturing Technology and Production Systems*
- ICE19132 P5.06 On-machine profile measurement of a large-scale mandrel in ultra-precision turning**  
 Duo Li<sup>1</sup>, Yutao Liu<sup>1</sup>, Zheng Qiao<sup>1</sup>, Jiadai Xue<sup>1</sup>, Yangong Wu<sup>1</sup>, Bo Wang<sup>1</sup>  
<sup>1</sup> *Centre for Precision Engineering, Harbin Institute of Technology, Harbin, China*
- ICE19135 P5.07 Automated workpiece setting operation and its errors compensation on an ultraprecision machine tool**  
 Meng Xu<sup>1</sup>, Ren Kitakawa<sup>1</sup>, Keiichi Nakamoto<sup>1</sup>, Yoshimi Takeuchi<sup>2</sup>  
<sup>1</sup> *Tokyo University of Agriculture and Technology, Japan*  
<sup>2</sup> *Chubu University, Japan*

- ICE19144 P5.08 Investigation on optimum abrasive size of cBN electroplated end-mill for CFRP machining**  
Tatsuya Furuki<sup>1</sup>, Shinnosuke Yamashita<sup>1</sup>, Toshiki Hirogaki<sup>2</sup>, Eiichi Aoyama<sup>2</sup>, Ruriko Kometani<sup>2</sup>, Kiyofumi Inaba<sup>3</sup>, Kazuna Fujiwara<sup>3</sup>  
<sup>1</sup>*Gifu University*  
<sup>2</sup>*Doshisha University*  
<sup>3</sup>*Kamogawa Co., Ltd.*
- ICE19152 P5.09 Polishing characteristics of sapphire wafers using high rotation small-diameter tool**  
Tetsuro Onozawa, Kenichiro Yoshitomi, Yoshinori Shimada, Atsunobu Une  
*National Defense Academy, Japan*
- ICE19153 P5.10 Neural network based ensemble model for optimization of cutting fluid supplication in milling process**  
Geun Byeong Chae<sup>1</sup>, Beomsik Sim<sup>1</sup>, Wontaek Song<sup>2</sup>, Wonkyun Lee<sup>3</sup>  
<sup>1</sup>*Student, School of Mechanical Engineering, Chungnam National University, Republic of Korea*  
<sup>2</sup>*Student, School of Mechanical Engineering, Yonsei University, Republic of Korea*  
<sup>3</sup>*School of Mechanical Engineering, Chungnam National University, Republic of Korea*
- ICE19176 P5.11 Study on surface finishing strategy of ultrahard nanotwinned diamond**  
Tianye Jin<sup>1</sup>, Junyun Chen<sup>2</sup>, Qingliang Zhao<sup>1</sup>  
<sup>1</sup>*Center for Precision Engineering, School of Mechatronics Engineering, Harbin Institute of Technology, Harbin, China*  
<sup>2</sup>*College of Vehicles and Energy, Yanshan University, Qinhuangdao, China*
- ICE19178 P5.12 Effect of thermal conductivity on the achievable flow length of micro injection moulded parts**  
Antonio Luca, Carla Flosky, Oltmann Riemer  
*Laboratory for Precision Machining (LFM), Leibniz Institute for Materials Engineering — IWT, Germany*
- ICE19179 P5.13 Influence of the metal working fluid quantity on process results when micro milling cp-titanium with 50 µm diameter micro end mills**  
Sonja Kieren-Ehse<sup>1</sup>, Martin Bohley<sup>1</sup>, Benjamin Kirsch<sup>1</sup>, Jan C. Aurich<sup>1</sup>  
<sup>1</sup>*TU Kaiserslautern; Institute for Manufacturing Technology and Production Systems*
- ICE19195 P5.14 Influence of the alloy composition on acoustic emission signals in discontinuous micro cutting of steel**  
A. Beinhauer<sup>1,2</sup>, K. Vetter<sup>1,3</sup>, C. Heinzl<sup>1,2</sup>, O. Riemer<sup>1,2</sup>, H. Freiße<sup>1,3</sup>  
<sup>1</sup>*University of Bremen, Faculty of Production Engineering, MAPEX Center for Materials and Processes, Bremen, Germany*  
<sup>2</sup>*Leibniz Institute for Materials Engineering IWT, Bremen, Germany*  
<sup>3</sup>*BIAS Bremen Institute of Applied Laser Technology, Bremen, Germany*
- ICE19200 P5.15 Formation mechanism of grain boundary steps in cutting of NiTi alloy**  
Hao Yang<sup>1</sup>, Katsuhiko Sakai<sup>1</sup>, Hiroo Shizuka<sup>1</sup>, Kouta Fujii<sup>1</sup>, Tetsuo Nagare<sup>2</sup>  
<sup>1</sup>*Shizuoka University, 3- Shizuoka, Japan*  
<sup>2</sup>*National Institute of Technology, Shizuoka, Japan*

- ICE19206 P5.16 Study of surface integrity in ultrasonic elliptical vibration assisted cutting of Ti-6Al-4V titanium alloy**  
Rongkai Tan<sup>1</sup>, Xuesen Zhao<sup>1</sup>, Tao Sun<sup>1</sup>, Xicong Zou<sup>2</sup>, Zhenjiang Hu<sup>1</sup>  
<sup>1</sup>*Center for Precision Engineering, Harbin Institute of Technology, Harbin, PR China*  
<sup>2</sup>*School of Mechatronics Engineering, Heilongjiang University, Harbin, PR China*
- ICE19217 P5.17 Sub-divisional error of optical encoder and its influence upon surface topography in ultra-precision diamond turning**  
Yutao Liu, Zheng Qiao, Duo Li, Jiadai Xue, Yangong Wu, Bo Wang  
*Center for Precision Engineering, Harbin Institute of Technology, Harbin, China*
- ICE19218 P5.18 Correction grinding of a wafer profile using freezing pin chuck**  
Kenichiro Yoshitomi, Atsunobu Une  
*National Defense Academy, Japan*
- ICE19234 P5.19 Constrained motion control of a 5-axis manipulator for the finishing application**  
Sangki Park<sup>1</sup>, Daegwon Koh<sup>1</sup>, Sun-Kyu Lee<sup>1</sup>  
<sup>1</sup>*School of mechanical engineering, Gwangju Institute of Science and Technology, Republic of Korea*
- ICE19246 P5.20 Finite element analysis of force-displacement curves with different self-piercing riveting joint configurations**  
Yunpeng Liu<sup>1</sup>, Li Han<sup>2</sup>, Xianping Liu<sup>1</sup>  
<sup>1</sup>*School of Engineering, University of Warwick, Coventry CV4 7AL, UK*  
<sup>2</sup>*Jaguar Land Rover, Coventry, UK*
- ICE19247 P5.21 Numerical study of deformation behaviour during self-pierce riveting process**  
Huan Zhao<sup>1</sup>, Li Han<sup>2</sup>, Xianping Liu<sup>1</sup>  
<sup>1</sup>*School of Engineering, University of Warwick, Coventry, UK*  
<sup>2</sup>*Jaguar Land Rover, Coventry, UK*
- ICE19250 P5.22 Development of sequential processing combining cutting and forming**  
Shinichi Ninomiya<sup>1</sup>, Yoji Yamada<sup>1</sup>, Manabu Iwai<sup>2</sup>  
<sup>1</sup>*Nippon Institute of Technology*  
<sup>2</sup>*Toyama Prefectural University*
- ICE19255 P5.23 Improvement of surface roughness by oblique cutting in diamond turning**  
Tsunehiro NAKAGAWA<sup>1,2</sup>, Hirofumi SUZUKI<sup>1</sup>, Mutsumi OKADA<sup>1</sup>, Katsuhiro MIURA<sup>3</sup>  
<sup>1</sup>*Department of Mechanical Engineering, Chubu University, Kasugai, Aichi, Japan*  
<sup>2</sup>*Nacro Co. Ltd., Asahi, Osaka, Japan*  
<sup>3</sup>*Mitaka Kohki Co. Ltd., Mitaka, Tokyo, Japan*

- ICE19268 P5.24 Wettability and liquid flow control in microfluidic channels by vibration assisted micro milling**  
 Lu Zheng<sup>1</sup>, Wanqun Chen<sup>2,3</sup>, Dehong Huo<sup>1</sup>, John Hedley<sup>1</sup>  
<sup>1</sup>*Mechanical Engineering, School of Engineering, Newcastle University, UK*  
<sup>2</sup>*EPSRC Future Metrology Hub, Centre for Precision Technologies, University of Huddersfield, Huddersfield, UK*  
<sup>3</sup>*Centre for Precision Engineering, Harbin Institute of Technology, Harbin, P. R. China*
- ICE19299 P5.25 Fabrication of the randomized micro pyramid pattern based on v-groove using normally distributed depth of cut in ultra-precision planing process**  
 Tae-Jin Je<sup>1,2</sup>, Ji-Young Jeong<sup>1,2</sup>, Doo-Sun Choi<sup>1</sup>, Jun-Sae Han<sup>1</sup>  
<sup>1</sup>*Dept. of NanoManufacturing Technology, Korea Institute of Machinery and Materials(KIMM), Korea*  
<sup>2</sup>*Dept. of NanoMechatronics, University of Science & Technology(UST), Korea*
- ICE19301 P5.26 Investigation on residual stress of high chromium alloy in mechanical process based on molecular dynamics**  
 Xiaoguang Guo<sup>1</sup>, Song Yuan<sup>1</sup>, Yang Li<sup>1</sup>, Zhuji Jin<sup>1</sup>, Renke Kang<sup>1</sup>, Hang Gao<sup>1</sup>  
<sup>1</sup>*Key Laboratory for Precision and Non-Traditional Machining Technology of Ministry of Education, Dalian University of Technology, Dalian, China*
- ICE19304 P5.27 Double-sided lapping of thin copper substrate by textured fixed-abrasive pad**  
 Bo Pan<sup>1</sup>, Renke Kang<sup>1</sup>, Haiyang Fu<sup>1</sup>, Xianglong Zhu<sup>1</sup>, Jiang Guo<sup>1</sup>  
<sup>1</sup>*Key Laboratory for Precision and Non-traditional Machining of Ministry of Education, Dalian University of Technology, Dalian, China*
- ICE19305 P5.28 Study on high precision measurement of chemical mechanical polishing removal rate of YAG crystal**  
 Zhang Zili<sup>1</sup>, Jin Zhuji<sup>1</sup>, Kang Renke<sup>1</sup>, Zhu Xianglong<sup>1</sup>, Han Xiaolong<sup>1</sup>, Mu Qing<sup>1</sup>  
<sup>1</sup>*Key Laboratory for Precision and Non-Traditional Machining Technology of Ministry of Education, Dalian University of Technology, Dalian, China*
- ICE19317 P5.29 Investigation on surface/subsurface damage mechanism in yttrium aluminum garnet crystal lapping and polishing**  
 Qing Mu<sup>1</sup>, Zhuji Jin<sup>1</sup>, Renke Kang<sup>1</sup>, Xianglong Zhu<sup>1</sup>, Xiaolong Han<sup>1</sup>, Zili Zhang<sup>1</sup>  
<sup>1</sup>*Key Laboratory for Precision and Non-traditional Machining Technology of Ministry of Education, Dalian University of Technology, Dalian, China*
- ICE19328 P5.30 Using the confined etchant layer technique to process the 3d micro-structures by adjusting the voltage**  
 Xiaole Wang<sup>1</sup>, Lianhuan Han<sup>1,2</sup>, Yongda Yan<sup>1</sup>  
<sup>1</sup>*Center for Precision Engineering, Harbin Institute of Technology, P.O. Box 413, Harbin 150001, China*  
<sup>2</sup>*State Key Laboratory of College of Chemistry and Chemical Engineering, Xiamen University, Xiamen, China*



- ICE19349 P5.31 Twin-wire electrical discharge grinding for shaping tapered micro rods**  
 Yan-Qing Wang<sup>1,2,3</sup>, Mattia Bellotti<sup>1,2</sup>, Zan Li<sup>3</sup>, Jun Qian<sup>1,2</sup>, Dominiek Reynaerts<sup>1,2</sup>  
<sup>1</sup>*Micro & Precision Engineering group, Department Mechanical Engineering, KU Leuven, Belgium*  
<sup>2</sup>*Member Flanders Make, Leuven, Belgium*  
<sup>3</sup>*College of Mechanical Engineering, Taiyuan University of Technology, Taiyuan, China*
- ICE19356 P5.32 Thermal characterization of a micro polishing machine and effect on path strategy compensation**  
 Soufian Ben Achour<sup>1</sup>, Alessandro Checchi<sup>1</sup>, Giuliano Bissacco<sup>1</sup>, Leonardo De Chiffre<sup>1</sup>  
<sup>1</sup>*Department of Mechanical Engineering, Technical university of Denmark, Denmark*
- ICE19359 P5.33 An investigation of factors affecting surface generation in ultrasonic vibration assisted diamond cutting of hard-brittle materials**  
 Chi Fai Cheung<sup>1</sup>, Chunjin Wang<sup>1</sup>, Jiangbo Chen<sup>1</sup>, David Robertson<sup>2</sup>, Benjamin Bulla<sup>2</sup>, Lai Ting Ho<sup>1</sup>  
<sup>1</sup>*State Key Laboratory of Ultra-precision Machining Technology, Department of Industrial and Systems Engineering, The Hong Kong Polytechnic University, Hung Hom, Kowloon, Hong Kong, China*  
<sup>2</sup>*son-x Gmbh, Aachen, Germany*
- ICE19163 P5.34 Study on the workpiece temperature in the side milling of CFRP**  
 Takayuki Kitajima, Kimiko Hanamoto and Akinori Yui  
*Department of Mechanical Systems Engineering, National Defense Academy, Japan*
- ICE19192 P5.35 Continuous conductive electrical discharge machining for ultra-high aspect ratio holes**  
 M.Tanjilul<sup>1</sup>, A.Senthil Kumar<sup>1</sup>  
<sup>1</sup>*Department of Mechanical Engineering, National University of Singapore, Singapore*
- ICE19236 P5.36 Machined surface improvement of CFRP routing process using cryogenic cooling method**  
 Tae-Gon Kim<sup>1</sup>, Kangwoo Shin<sup>1</sup>, Hyo-Young Kim<sup>1</sup>, Seok-Woo Lee<sup>1</sup>, Gyuho Kim<sup>2</sup>, Byung-Kwon Min<sup>2</sup>  
<sup>1</sup>*Korea Institute of industrial Technology (KITECH), Cheonan, South Korea*  
<sup>2</sup>*Yonsei university, Seoul, South Korea*
- ICE19170 P5.37 Tool wear characteristic in micro taper end milling of pre-hardened steel**  
 Kazuya Hamaguchi<sup>1</sup>, Koichi Okuda<sup>2</sup>  
<sup>1</sup>*Hyogo prefectural Institute of Technology*  
<sup>2</sup>*University of Hyogo*
- ICE19148 P5.38 Ultra-precision-milling of silicon by means of single crystal diamond tools**  
 E. Uhlmann<sup>1,2</sup>, M. Polte<sup>1,2</sup>, D.A. Rolon<sup>1</sup>, S. Kühne<sup>1</sup>  
<sup>1</sup>*Institute for Machine Tools and Factory Management IWF, Technische Universität Berlin, Germany*  
<sup>2</sup>*Fraunhofer Institute for Production Systems and Design Technology IPK, Germany*

- ICE19196 P5.39 Manufacturing of graphite electrodes with high geometrical requirements**  
 E. Uhlmann<sup>1,2</sup>, Y. Kuche<sup>1</sup>, J. Polte<sup>1</sup>, M. Polte<sup>1,2</sup>  
<sup>1</sup>Fraunhofer Institute for Production Systems and Design Technology IPK, Germany  
<sup>2</sup>Institute for Machine Tools and Factory Management IWF, Technische Universität Berlin, Germany
- ICE19199 P5.40 Cutting force prediction in micro-milling considering the cutting edge micro-geometry**  
 E. Uhlmann<sup>1,2</sup>, J. Polte<sup>1</sup>, H.M. Wiesner<sup>1</sup>, Y. Kuche<sup>2</sup>, M. Polte<sup>1,2</sup>  
<sup>1</sup>Fraunhofer Institute for Production Systems and Design Technology IPK, Germany  
<sup>2</sup>Institute for Machine Tools and Factory Management IWF, Technische Universität Berlin, Germany
- ICE19221 P5.41 Influence of tool neck length on tool deflections during micromilling of an ultrafine grained low- carbon steel**  
 Cleiton L. F. de Assis<sup>1</sup>, Renato G. Jasinevicius<sup>2</sup>  
<sup>1</sup>Federal Institute of Sao Paulo, Campus Votuporanga-Brazil  
<sup>2</sup>University of Sao Paulo, Sao Carlos-Brazil
- ICE19248 P5.42 Modification of flute geometry for enhanced tool life in gun drilling of Inconel 718**  
 Wee Keong Neo, Xinquan Zhang, Guan Leong Tnay, Kui Liu  
 Singapore Institute of Manufacturing Technology, Singapore
- ICE19121 P5.43 Analysis of rotary friction welding parameters between the electrolytic copper and the CuCrZr alloy to guarantee electrical conductivity**  
 Wagner de Campos Sabor<sup>1</sup>; Francisco Yastami Nakamoto<sup>2</sup>; Givanildo Alves dos Santos<sup>3</sup>; Carlos Frajuca<sup>4</sup> Vinicius Torres dos Santos<sup>5</sup>; Marcio Rodrigues<sup>6</sup>, Breno Nishida<sup>7</sup>, Mariana Hernandez<sup>8</sup>  
<sup>1, 2, 3, 4, 7, 8</sup>Instituto Federal de Ciência e Tecnologia de São Paulo  
<sup>5, 6</sup>Termomecanica - São Paulo S.A.

#### Session 6: Non-Mechanical Manufacturing Processes

- ICE19188 P6.01 A preliminary study on a machine learning robot polishing cell**  
 Max Schneckenburger<sup>1</sup>, Luis Garcia<sup>1</sup>, Rainer Börret<sup>1</sup>, Edda Rädlein<sup>2</sup>  
<sup>1</sup>Aalen University of Applied Science, Centre for Optical Technologies, Aalen, 73430, Germany  
<sup>2</sup>Universtiy Ilmenau, Department of Inorganic-Nonmetallic Materials, Ilmenau, Germany
- ICE19194 P6.02 Molecular modification of surface to control its wettability with high stability**  
 Nobuyuki Moronuki<sup>1</sup>, Kisho Miyamoto<sup>2</sup>, Syutaro Nakamura<sup>2</sup>  
<sup>1</sup>Tokyo Metropolitan University  
<sup>2</sup>Graduate School of Systems Design, Tokyo Metropolitan University

- ICE19197 P6.03 Thermal effect on surface shape in atmospheric plasma processing**  
 Peng Ji<sup>1</sup>, Huiliang Jin<sup>2</sup>, Xing Su<sup>1</sup>, Duo Li<sup>1</sup>, Yutao Liu<sup>1</sup> and Bo Wang<sup>1</sup>  
<sup>1</sup>Centre for Precision Engineering, Harbin Institute of Technology, 92 West Dazhi Street, Nan Gang District, Harbin 150001, China  
<sup>2</sup>Research Center of Laser Fusion CAEP, MianYang, China
- ICE19285 P6.04 Influence of water temperature and existence of hydroxyl group on the strength of injection molded direct joining samples**  
 Shuaijie Zhao<sup>1</sup>, Shotaro Kadoya<sup>1</sup>, Fuminobu Kimura<sup>1</sup>, Eiji Yamaguchi<sup>2</sup>, Nayuta Horie<sup>2</sup>, Yusuke Kajihara<sup>1</sup>  
<sup>1</sup>Institute of Industrial Science, The University of Tokyo, 4-6-1 Komaba, Meguro-ku, Tokyo, Japan  
<sup>2</sup>SINTOKOGIO, LTD.
- ICE19324 P6.05 Investigation on flatness in electrochemical mechanical polishing by polishing pad with holes**  
 Zuotao Liu<sup>1</sup>, Zhuji Jin<sup>1</sup>, Jiang Guo<sup>1</sup>  
<sup>1</sup>Key Laboratory for Precision and Non-Traditional Machining Technology of Ministry of Education, Dalian University of Technology
- ICE19333 P6.06 Revamp of a conventional start hole EDM-Machine to a near dry EDM-Machine for the manufacturing of holes in a dental alloys CoCrMo**  
 Mathias Lorenz<sup>a</sup>, Tassilo-Maria Schimmelpfennig<sup>a</sup>  
<sup>a</sup>Hochschule Wismar, University of Applied Science Technology, Business and Design, Wismar, Germany
- ICE19300 P6.07 Chemical reaction mechanism of Cu surface in aqueous H2O2 : MD simulations using ReaxFF reactive force field**  
 Xiaoguang Guo<sup>1</sup>, Xiaoli Wang<sup>1</sup>, Zhuji Jin<sup>1</sup>, Renke Kang<sup>1</sup>, Hang Gao<sup>1</sup>, Xiaohong Lu<sup>1</sup>  
<sup>1</sup>Key Laboratory for Precision and Non-Traditional Machining Technology of Ministry of Education, Dalian University of Technology, Dalian, China
- ICE19138 P6.08 Die- sinking EDM of a SiC- boride-composite**  
 E. Uhlmann<sup>1,2</sup>, J. Polte<sup>1</sup>, C. Jahnke<sup>1</sup>, C.- S. Wolf<sup>2</sup>, U. Degenhardt<sup>3</sup>  
<sup>1</sup>Fraunhofer Institute for Production Systems and Design Technology PK, Germany  
<sup>2</sup>Institute for Machine Tools and Factory Management IWF, Technische Universität Berlin, Germany  
<sup>3</sup>FCT Ingenieurkeramik GmbH, Frankenblick, Germany
- ICE19346 P6.09 Electroconsolidation of nanocomposite material for gasturbine blades**  
 Edwin Gevorkyan<sup>1</sup>, Mirosław Rucki<sup>2</sup>, Vasily Dutka<sup>3</sup>, Zbigniew Siemiatkowski<sup>2</sup>, Dmitrij Morozow<sup>2</sup>  
<sup>1</sup>Materials and Manufacturing Technology for Transport Applying Products Dept., Ukrainian State University of Railway Transport, Ukraine  
<sup>2</sup>Kazimierz Pulaski University of Technology and Humanities in Radom, Poland  
<sup>3</sup>Institute of Superhard Materials, Ukraine National Academy, Kiev, Ukraine

## Session 7: Traceability

- ICE19363 P7.01 The influence of assembly on stem taper texture and measurement uncertainty**  
Karl Dransfield<sup>1</sup>, Radu Racasan<sup>1</sup>, James Williamson<sup>1</sup>, Liam Blunt<sup>1</sup>, Paul Bills<sup>1</sup>  
<sup>1</sup>*EPSRC Future Advanced Metrology Hub, University of Huddersfield, Huddersfield, UK*

## Session 8: Mechatronics

- ICE19109 P8.01 Adaptive tracking control of dual position loops drive using active-disturbance-rejection control**  
Baozhu Xue<sup>1</sup>, Chengyong Zhang<sup>1</sup>, Longfei Zhang<sup>1</sup>, Miannuo Chen<sup>1</sup>, Yaolong Chen<sup>1</sup>  
<sup>1</sup>*State Key Laboratory for Manufacturing Systems Engineering, Xi'an Jiaotong University, Shaanxi, China*
- ICE19154 P8.02 Cyber-physical system for real-time estimation of friction characteristics of machine tool feed drives**  
Ok Hyun Jo<sup>1</sup>, Namhyun Kim<sup>1</sup>, SeungHo Lee<sup>2</sup>, Kang Jae Lee<sup>2</sup>, Wonkyun Lee<sup>3</sup>  
<sup>1</sup>*Student, School of Mechanical Engineering, Chungnam National University, Republic of Korea*  
<sup>2</sup>*Manager, Advanced Machine Tool Technology Team Doosan Machine Tools*  
<sup>3</sup>*Corresponding Author, Assistant professor, School of Mechanical Engineering, Chungnam National University, Daejeon, Republic of Korea*
- ICE19157 P8.03 Pose optimization of robot machining system for improving position accuracy**  
Namhyun Kim<sup>1</sup>, Jaeyoon Shim<sup>1</sup>, Daejin Oh<sup>1</sup>, Hyunjung Kim<sup>1</sup>, Wonkyun Lee<sup>2</sup>  
<sup>1</sup>*Student, School of Mechanical Engineering, Chungnam National University, Republic of Korea*  
<sup>2</sup>*Corresponding author, Assistant professor, School of Mechanical Engineering, Chungnam National University, Republic of Korea*
- ICE19159 P8.04 Fundamental investigation of influence of air compressibility on displacement control performances of aerostatic bearings**  
Yohichi Nakao<sup>1</sup>, Daiki Fukui<sup>1</sup>, Satsuki Yamazaki<sup>1</sup>, Junpei Kusuyama<sup>1</sup>, Dmytro Fedorynenko<sup>1</sup>  
<sup>1</sup>*Kanagawa University*
- ICE19164 P8.05 Error compensation strategies for productivity improvement in ultra-precision cutting**  
Berend Denkena<sup>1</sup>, Benjamin Bergmann<sup>1</sup>, Per Schreiber<sup>1</sup>  
<sup>1</sup>*Institute of Production Engineering and Machine Tools (IFW), Leibniz Universität Hannover, An der Universität, Garbsen, Germany*

- ICE19172 P8.06 Control of dynamic compliance at cutting point of small and long end mill aiming suppression of chatter by hybrid spindle system with rolling and active electromagnetic bearings**  
Eiji Kondon<sup>1</sup>, Ryouta Fukudome<sup>1</sup>, Mitsunari Oda<sup>2</sup>, Noriyoshi Kumazawa<sup>1</sup>  
<sup>1</sup>*Kagoshima University*  
<sup>2</sup>*Makino Milling Machine Co. Ltd.*
- ICE19187 P8.07 2D positioning control strategy for a nanopositioning stage**  
L.C. Díaz-Pérez<sup>1</sup>, M. Torralba<sup>2</sup>, J.A. Albaje<sup>1</sup>, J.A. Yagüe-Fabra<sup>1</sup>  
<sup>1</sup>*I3A, Universidad de Zaragoza, Zaragoza, Spain*  
<sup>2</sup>*Centro Universitario de la Defensa, Zaragoza, Spain*
- ICE19214 P8.08 Control concept to minimize the settling time for positioning of a 3-dof inchworm with piezoelectric elements**  
Akihiro Torii<sup>1</sup>, Yushi Takaki<sup>1</sup>, Suguru Mototani<sup>1</sup>, Kae Doki<sup>1</sup>  
<sup>1</sup>*Aichi Institute of Technology, Japan*
- ICE19223 P8.09 Enhancement of dynamic stiffness of fast tool servo by acceleration feedback**  
Fei Ding<sup>1</sup>, Xichun Luo<sup>1</sup>, Yukui Cai<sup>1</sup>  
<sup>1</sup>*Centre for Precision Manufacturing, DMEM, University of Strathclyde, UK*
- ICE19239 P8.10 Modified matrix method for modelling of multi degree-of-freedom flexure stage** Hyun-Ho Lim, Kyung-Taek Yoon, Sung-hoon Kang, Young-Man Choi  
*Department of Mechanical Engineering, Ajou University, Republic of Korea*
- ICE19261 P8.11 Analytical model of the force between a rectangular coil and a cuboidal permanent magnet**  
Anlin Chen<sup>1,2</sup>, Ming Zhang<sup>1,2</sup>, Yu Zhu<sup>1,2</sup>, Zhouyu Huai<sup>1,2</sup>, Kaiming Yang<sup>1,2</sup>  
<sup>1</sup>*State Key Laboratory of Tribology, Department of Mechanical Engineering, Tsinghua University, Beijing, China*  
<sup>2</sup>*Beijing Key Lab of Precision/Ultra-precision Manufacturing Equipments and Control, Tsinghua University, Beijing, China*
- ICE19313 P8.12 Analysis of the motion mechanism for aero-engine horizontal assembly**  
Hang Gao, Tianyi Zhou, Xuanping Wang, Lun Li  
*Key Laboratory for Precision and Non-traditional Machining Technology of Ministry of Education, Dalian University of Technology, Dalian China*
- ICE19320 P8.13 Accuracy enhancement by thermal error minimisation of a turning-milling centre in regard to its multi-functionality**  
Martin Mareš<sup>1</sup>, Otakar Horejš<sup>1</sup>, Jan Hornych<sup>1</sup>  
<sup>1</sup>*Czech Technical University in Prague, Faculty of Mechanical Engineering, Department of Production Machines and Equipment, RCMT, Prague, Czech Republic*

- ICE19323 P8.14 A method for sensor placement for high-precision position control of mechanical structures**  
Alexander Kharitonov<sup>1</sup>, Christoph Merkl<sup>2</sup>  
<sup>1</sup>University of Applied Sciences Würzburg-Schweinfurt, Germany, <sup>2</sup>Carl Zeiss SMT GmbH, Oberkochen, Germany
- ICE19330 P8.15 In-situ ablation monitoring device for micro-print patterns on a thin and transparent substrate**  
HyungTae Kim<sup>1</sup>, Yoon Jae Moon<sup>2</sup>, Heuseok Kang<sup>2</sup>, and Jun Young Hwang<sup>2</sup>  
<sup>1</sup>Smart Manufacturing Technology Group, Korea Institute of Industrial Technology (KITECH), Korea  
<sup>2</sup>Micro/Nanoscale Manufacturing R&BD Group, Korea Institute of Industrial Technology (KITECH), Korea
- ICE19119 P8.16 Performance-oriented data driven controller tuning for smooth and precise tray indexing**  
Xiaocong Li<sup>1,4</sup>, Zilong Cheng<sup>2,3,4</sup>, Jun Ma<sup>3,4</sup>, Chek Sing Teo<sup>1,4</sup>, Haiyue Zhu<sup>1,4</sup>, Kok Kiong Tan<sup>3,4</sup>  
<sup>1</sup>Mechatronics Group, Singapore institute of Manufacturing Technology, Singapore  
<sup>2</sup>NUS Graduate School for Integrative Sciences and Engineering, National University of Singapore  
<sup>3</sup>Department of Electrical and Computer Engineering, National University of Singapore  
<sup>4</sup>SIMTech-NUS Joint Lab on Precision Motion Systems, Department of Electrical and Computer Engineering, National University of Singapore
- ICE19158 P8.17 Design and control of a VCM actuator for an active vibration isolation system**  
HyunHo Lee<sup>1,2</sup>, KiHyun Kim<sup>3</sup>, TaeGon Kim<sup>1</sup>, SeokWoo Lee<sup>1</sup>, HyoYoung Kim<sup>1</sup>  
<sup>1</sup>Manufacturing System R&D Group, Research Institute of Sustainable Manufacturing System, KITECH  
<sup>2</sup>Department of Mechanical Engineering, Ajou University  
<sup>3</sup>School of Mechatronics Engineering, Korea Polytechnic University
- ICE19280 P8.18 Position control solution along 3 degrees of freedom and with easy implementation for laboratory and workshop**  
Olivier Acher<sup>1</sup>, Thanh-Liem Nguyen<sup>1</sup>, Jean-Marc Martin<sup>1</sup>, Mustapha Sallami<sup>1</sup>, Benoit Varitille<sup>2</sup>, Serge Maneuf<sup>2</sup>  
<sup>1</sup>HORIBA France SAS, Passage Jobin Yvon, France  
<sup>2</sup>MICRO-CONTROLE Spectra-Physics SAS, MKS Instruments, France
- ICE19169 P8.19 A kalman-filtering based iterative learning control algorithm**  
Liu Yang<sup>1,2</sup>, Li Li<sup>1</sup>, Song Fazhi<sup>1,2</sup>, Tan Jiubin<sup>1</sup>  
<sup>1</sup>Institute of Ultra-precision Optoelectronic Instrument Engineering, Harbin Institute of Technology  
<sup>2</sup>Department of Control Science and Engineering, Harbin Institute of Technology
- ICE19278 P8.20 Assessment of moving stage performances used in scientific instrumentation**  
Pierre-Alix Carles<sup>1</sup>, Thanh-Liem Nguyen<sup>2</sup>, Olivier Acher<sup>2</sup>  
<sup>1</sup>Institut Photovoltaïque d'Île-de-France (IPVF), France  
<sup>2</sup>HORIBA France SAS, Passage Jobin Yvon, , France