

## PROGRAM OF THE 45th TEXTILE RESEARCH SYMPOSIUM IN KYOTO

September 14, 15 and 16, Kyoto, Conference Room No.1  
The 60<sup>th</sup> anniversary hall, Kyoto Institute of Technology

| <b>14<sup>th</sup> September (Thursday)</b> |   |
|---|---|
| 9:00~10:00                                  | <i>Registration</i>   |
| 10:00~10:10                                 | <i>Opening</i>  |
| 10:10~10:35                                 | <b><i>Keynote Speech 1: Dr. Tsuyoshi Nishiwaki, ASICS Corporation, Japan</i></b>  |
| 10:35~12:15                                 | <b><i>Session 1 : Fiber Science and Engineering</i></b>   |
| 12:15~13:30                                 | <i>Lunch</i>  |
| 13:30~15:30                                 | <i>Poster presentation (1F K101 in East Building No. 3)</i><br><i>Museum Tour (The 60<sup>th</sup> anniversary hall 2F)</i>   |
| 15:30~15:55                                 | <b><i>Keynote Speech 2: Professor B. K. Behera, Indian Institute of Technology Delhi, India</i></b>   |
| 15:55~17:35                                 | <b><i>Session 2 : Nano Fibers and Smart Textiles</i></b>  |
| 18:00~19:30                                 | <i>Welcome Party (4F in Building No.13)</i>   |
| <b>15<sup>th</sup> September (Friday)</b>   |   |
| 8:30~                                       | <i>Registration</i>   |
| 9:30~9:55                                   | <b><i>Keynote Speech 3: Professor Xioming Tao, The Hong Kong Polytechnic University, H.K.</i></b>   |
| 9:55~10:45                                  | <b><i>Session 3 : Apparel Science and Production Technology</i></b>   |
| 10:45~11:00                                 | <i>Coffee break</i>   |
| 11:00~12:15                                 | <b><i>Session 4 : Fabric Handle and Sense Evaluation</i></b>  |
| 12:15~13:30                                 | <i>Lunch</i>  |
| 13:30~13:55                                 | <b><i>Keynote Speech 4: Professor Jiri Militky, Technical University of Liberec, Czech Republic</i></b>   |
| 13:55~15:10                                 | <b><i>Session 5 : Composite and Industrial Textile (2F K201 in East Building No. 3)</i></b> <b><i>Session 6 : Dyeing and Finishing (3F K301 in East Building No. 3)</i></b> |
| 15:10~15:25                                 | <i>Coffee break</i>   |
| 15:25~16:40                                 | <b><i>Session 5 : Composite and</i></b> <b><i>Session 6: Dyeing and Finishing</i></b>   |
| 16:40~17:05                                 | <b><i>Industrial Textiles</i></b>   |
| 17:05~18:00                                 | <i>Short trip to Symposium Party Venue</i>  |
| 18:00~20:00                                 | <i>Symposium Party</i>  |
| <b>16<sup>th</sup> September (Saturday)</b> |   |
| 8:30~                                       | <i>Registration</i>   |
| 9:15~10:05                                  | <b><i>Session 7 : Designs and Quality of Textiles</i></b>   |
| 10:05~10:20                                 | <i>Coffee break</i>   |
| 10:20~11:55                                 | <b><i>Session 8 : Science and Technology of Textile Machinery</i></b>   |
| 11:55~12:05                                 | <i>Closing Address</i>  |
| 12:05~13:00                                 | <i>Lunch</i>  |
| 13:00~                                      | <i>Excursion</i>  |

**14<sup>th</sup> September (Thursday)**9:00~10:00 **Registration**10:00~10:10 **Opening**10:10~10:35 **Keynote speech 1****Textile impact on high performance sporting gear**Tsuoyoshi Nishiwaki  
ASICS Corporation, Japan10:35~12:15 **Session 1 : Fiber Science and Engineering**

1. **Sound absorption and compression properties of perpendicular-laid nonwovens**  
Tao Yang, Xiaoman Xiong, Rajesh Mishra, Jan Novak, Jiri Militky  
Technical University of Liberec, Czech Republic
2. **Line lighting systems based on the side emitting optical fibers**  
Dana Kremenakova, Jiri Militky, Rajesh Mishra  
Technical University of Liberec, Czech Republic
3. **Simultaneous fiber structure formation and dyeing of poly(ethylene terephthalate) fibers through cold-drawing in ethanol**  
Dong Woo Go, Rina Khanum, Wataru Takarada, Arun Aneja\*, Takeshi Kikutani  
Tokyo Institute of Technology, Japan  
\*:East Carolina University, USA
4. **Dependence of thermal-contact properties on compression of furs and fabrics**  
Jiang Shaochen, Shen Hua, Sachiko Sukigara  
Kyoto Institute of Technology, Japan

12:15~13:30 **Lunch**13:30~15:30 **Poster presentation, Museum Tour****01P-1a Tensile properties of high-strength aramid fibers after fatigue**Suguru Yagi, Yuya Yomogizawa, Kaname Sugimura, Akihiro Suzuki, Katsufumi Tanaka, Midori Takasaki,  
Haruki Kobayashi  
Kyoto Institute of Technology, Japan**02P-2b Influence of electrolyte on the self-organization of liquid silk**Yutaka Kawahara, Ayumi Sato  
Gunma University, Japan**03P-1a Structure development of various poly(lactic acid)s in high-speed melt spinning process**Nanjaporn Rounpaisan, Wataru Takarada, Takeshi Kikutani  
Tokyo Institute of Technology, Japan**04P-2b Unique multiple melting behavior of high-speed melt spun polylactide fibers and its kinetics analysis**Natsumi Fukushi, Miku Yoshizawa, Shota Onosato\*, Motohiro Hanada\*,  
Midori Takasaki\*\*, Wataru Takarada\*\*\*, Yutaka Kawahara\*, Takeshi Kikutani\*\*\*,  
Haruki Kobayashi\*\*, Katsufumi Tanaka\*\*  
Miyagi University of Education, Japan  
\*:Gunma University, Japan

\*\*:Kyoto Institute of Technology, Japan

\*\*\*:Tokyo Institute of Technology, Japan

- 05P-1a Improvement in filtration performance of hydrophobic nanofiber fabric by ethanol treatment**  
Yuya Kishida, Yasuhito Mukai  
Nagoya University, Japan
- 06P-2b Heat sensitive filament for 3D printers**  
Hiroki Murotani, Takatoshi Nakatani, Futoshi Yamada, Kenji Hasegawa, Kenji Kode  
UNITIKA LTD., Japan
- 07P-1a Study on formation of metallic oxide supported functional paper and its catalytic activity**  
Sota Sawaki, Haruhiro Ino, Yoichi Kodera\*  
Kyoto Institute of Technology, Japan  
\*:National Institute of Advanced Industrial Science & Technology(AIST), Japan
- 08P-2b Resources of ethical down**  
Junya Kuroyanagi, Narumi Suda, Ken Kuroda\*, Toshikatsu Kawada\*\*  
UMOU SCIENCE LAB, Japan  
\*:ECO LAND, Japan  
\*\*:Kawada Feather Co., Ltd, Japan
- 09P-1a Adsorption characteristics of protein by cibacron blue-supported nanofiber fabric**  
Takuro Sumi, Yasuhito Mukai  
Nagoya University, Japan
- 10P-2b Selective adsorption characteristics of gold ions by nylon nanofiber fabric**  
Yasuhito Mukai, Tomoaki Tanabe  
Nagoya University, Japan
- 11P-1b Proposal of “L<sup>∞</sup> PLUS” system for waste textile**  
Yoshinori Fujio, Keisuke Yamagata, Yasuaki Hara, Teruo Kimura\*  
Kurabo Industries LTD., Japan,  
\*:Kyoto Institute of technology, Japan
- 12P-2a Relationship between large deflection behavior and the components of woven fabric**  
Ryo Hashizume, Rina Wakako, Toshiyasu Kinari  
Kanazawa University, Japan
- 13P-1b Acoustic properties and internal structure of foam containing pulp and foaming agent composed of acrylic polymer/liquid hydrocarbon**  
Mizue Kakehi, Takuma Kiribayashi\*, Hideyuki Uematsu\*, Shuichi Tanoue\*  
Industrial Technology Center of Fukui Prefecture, Japan  
\*:University of Fukui, Japan
- 14P-2a Twisting form in the twisting part of disc friction false-twisting machine**  
Satoshi Tomohiro, Naoto Kaneda, Toshiyasu Kinari\*  
National Institute of Technology Fukui College, Japan  
\*:Kanazawa University, Japan
- 15P-1b Flame retardant material for high visibility work clothes**  
Junji Hamada, Haruki Morikawa, Atsushi Kuwabara  
Toray Industries, Inc., Japan
- 16P-2a Surging in false-twisting machine**  
Kouichi Hayashida, Naoto Kaneda, Toshiyasu Kinari\*  
National Institute of Technology Fukui College, Japan  
\*:Kanazawa University, Japan

**17P-1b Relation between the surface gloss and the weave on the polyester fabric**

Miwa Iwashita, Atsuji Masuda, Tetsuhiko Murakami, Seiji Kawabata,  
Shinya Seko\*, Yoshiyuki Iemoto\*, Hideyuki Uematsu\*, Shuichi Tanoue\*  
Industrial Technology Center of Fukui Prefecture, Japan  
\*:University of Fukui, Japan

**18P-2b Flow of non-newtonian fluid through a microchannel with an abrupt contraction**

Kazunori Yasuda, Takayuki Hirai, Akichika Kimura, Motosuke Sogo, Yukiharu Iwamoto  
Ehime University, Japan

**19P-1a Foaming of cellulose derivatives in supercritical CO<sub>2</sub>**

Tatsuya Suzuki, Satoko Okubayashi  
Kyoto Institute of Technology, Japan

**20P-2b Development of the wool non-chlorine machine washable method**

Masukuni Mori

**21P-1a Low temperature dyeing for natural fibre by using (+)-catechin**

Kaito Okada, Takanori Matsubara\*  
Tokushima University, Japan  
\*:College of Industrial Technology, Japan

**22P-2b Deodorant mechanism for model malodorous substances by mordant-dyed cotton and wool fabrics**

Toshiko Amemiya  
Ochanomizu University, Japan

**23P-1a Hair colouring by using tea extracts**

Katsuki Watanabe, Chihiro Sakurai\*, Takanori Matsubara\*\*  
Gifu University, Japan  
\*:Simane University, Japan  
\*\*:College of Industrial Technology, Japan

**24P-2b Levelness study of cotton fabric dyed in different solvents**

Chi-wai Kan, Yiu-lun Tang  
The Hong Kong Polytechnic University, Hong Kong

**25P-1a Dyeing for natural fibre by utilising chemical reaction of anthocyanins part I  
Dyeing methods - dyeability relations**

Asuka Sato, Hinata Inoue, Yoshihito Niimoto, Takanori Matsubara,  
Kaori Miura\*, Kenichi Fujimori\*  
College of Industrial Technology, Japan  
\*:Glico Nutrition Co., Ltd., Japan

**26P-2b Modification of wool fiber surface using combined keratinase-protease treatment and the characterization**

Chendi Tu, Sachiko Sukigara  
Kyoto Institute of Technology, Japan

**27P-1a Dyeing for natural fibre by utilising chemical reaction of anthocyanins part II  
Effects of dyeing conditions**

Yoshihito Niimoto, Hinata Inoue, Asuka Sato, Takanori Matsubara,  
Kaori Miura\*, Kenichi Fujimori\*  
College of Industrial Technology, Japan  
\*:Glico Nutrition Co., Ltd., Japan

**28P-2a Preparation of carbonized PAN nanofiber fabric and its properties of solute adsorption**

Bijun Huang, Yasuhito Mukai, Kazuma Osawa, Toshihira Irisawa, Yasuhiro Tanabe  
Nagoya University, Japan

- 29P-1b Development of silk based artificial blood vessel by electro-spinning method**  
 Yoshihiro Yamashita, Yoshiyuki Tsukahara\*, Masataka Sata\*\*,  
 Ikue Suzuki\*\*\*, Toshifumi Hiraoki\*\*\*, Tetsuo Asakura\*\*\*  
 Osaka Seikei Collage, Japan  
 \*:The University of Shiga Prefecture, Japan  
 \*\*:Tokushima University, Japan  
 \*\*\*:Tokyo University of Agriculture and Technology, Japan
- 30P-2a Optimization of plasma processing conditions for improving on adhesion of glass fiber composite materials**  
 Shota Naito, Jian Shi, Mamoru Mizuno, Masaya Sugimoto  
 Akita Prefectural University, Japan
- 31P-1b Study on the preparation microcapsule of AIP/ZHS and the flame retardation of PVC membrane materials**  
 Jian Han, Juanjuan Su, Bin Zhang  
 Zhejiang Sci-Tech University, China
- 32P-2a Hoop tension evaluation of CFRP with braided structure by hydraulic experiment**  
 Kento Kawai, Takuru Suehiro, Nanang Endriatno, Toshiyasu Kinari  
 Kanazawa University, Japan
- 33P-1b Resinification technique of feather keratin**  
 Yutaka Kawahara, Hiroaki Ohnishi  
 Gunma University, Japan
- 34P-2a Mechanical properties of needle punched chopped strand mat composite with open hole**  
 Daiki Ichikawa, Ryo Marui\*, Tohru Morii\*\*, Akio Ohtani  
 Kyoto Institute of Technology, Japan  
 \*:Marui Textile Machinery Co., Ltd, Japan  
 \*\*:Shonan Institute of Technology, Japan
- 35P-1b Development of the molding method for polyurea**  
 Yutaka Kawahara, Shunsuke Otoyama  
 Gunma University, Japan
- 36P-2b An estimation method of material damping properties for textile composites by mesh superposition method**  
 Yoshifumi Suzuki, Kin'ya Matsumoto, Yasumasa Nakanishi  
 Mie University, Japan
- 37P-1b Influence of the brand name and the price on evaluating in “shittori” for baby’s underwear**  
 Yukari Suehiro, Sachiko Sukigara\*  
 Mukogawa Women's University, Japan  
 \*:Kyoto Institute of Technology, Japan
- 38P-2a Durability and comfort of carseat**  
 Funda Buyuk Mazari, Antonin Havelka, Adnan Mazari  
 Technical university of Liberec, Czech Republic
- 39P-1b Visual surface roughness of legs with pantyhose and color effect of pantyhose fabric**  
 Lina Wakako, Toshiyasu Kinari  
 Kanazawa University, Japan

- 40P-2a Survey on thermal condition and micro climate in bedding for assessment of sleeping comfort - Comparison between Hong Kong and Japan –**  
 Yuki Kobayashi, Takayuki Ueno, Naohide Nishiyama, Yoshitaka Niimi, Hiroyuki Kanai,  
 Siyu Lin\*, Xiao Liao\*, Lei Yao\*, Edwin Keh\*  
 Shinshu University, Japan  
 \*:Hong Kong Research Institute of Textiles and Apparel, Hong Kong
- 41P-1b A measure of comfort: KES texture measurement technology for objective evaluation**  
 Sean Huang, Kei Kawauchi  
 Kato Tech Co., Ltd., Japan
- 42P-2a Analysis of frictional behavior of spunbond nonwoven by whisker type tactile sensor**  
 Thinzar Phyo Wyint\*\*\*\*, Toshiyasu Kinari\*, Hiroshi Tachiya\*,  
 Lina Wakako\*, Mari Inoue\*\*  
 \*:Kanazawa University, Japan  
 \*\*:Kobe University, Japan  
 \*\*\*:Yangon Technological University, Myanmar
- 43P-1b Quality and preference of jackets: a comparison between students and non-students**  
 Saori Kitaguchi, Mariko Kumazawa, Kou Sugahara, Takahiro Iida, Tetsuya Sato,  
 Sachiko Sukigara  
 Kyoto Institute of Technology, Japan
- 44P-2a Friction properties for fabrics by linear/rotational dragging with tactile sensor**  
 Shinnosuke Yoneda, Toshiyasu Kinari, Hiroshi Tachiya, Lina Wakako  
 Kanazawa University, Japan
- 45P-1b A study of the interactions of softening agents and nanoparticles with respect to the handle of wool fabrics**  
 Momoko Sugimura, Steve McNeil\*, Larissa Zaitseva\*  
 Niigata University, Japan  
 \*:AgResearch Ltd, New Zealand
- 46P-2a Application of ring method for denim fabrics and its relations with mechanical and surface properties**  
 Nazli Uren, Ayse Okur  
 Dokuz Eylul University, Turkey
- 47P-1b Appearance and handle design of cotton crepe fabrics for women's dresses**  
 Hiroko Yokura, Sachiko Sukigara\*  
 Shiga University, Japan  
 \*:Kyoto Institute of Technology, Japan
- 48P-2b The price of the T-shirt which Japanese students assume**  
 Ibuki Hosomi, Kouhei Kagotani, Pandya Shiddharth Pandya\*, Yukie Tsuji  
 Kobe Gakuin University, Japan  
 \*:Kobe International University, Japan
- 49P-1b Research about the kimono which put on at a coming-of-age ceremony**  
 Sae Taguchi, Kousuke Hamada, Ryouta Syouji, Siddharth Pandya\*, Yukie Tsuji  
 Kobe Gakuin University, Japan  
 \*:Kobe International University, Japan

15:30~15:55 **Keynote speech 2****3D fabrics and their applications**

B. K. Behera

Indian Institute of Technology Delhi, India

15:55~17:35 **Session 2 : Nano Fibers and Smart Textiles****5. Plasma mediated coating of fibers by conductive layers**

Jiri Militky, Veronika Tunakova, Roman Pulicek, Josef Vecernik\*

Technical University of Liberec, Czech Republic

\*:Vecernik s.r.o., Alsovice, Czech Republic

**6. Mechanical properties of the flexible conductive yarn**

Atsuji Masuda, Takahiro Tsuji, Akiko Uejima,

Tomoaki Harii\*, Yoshihiro Iwasaki\*, Eiji Tajima\*, Takayoshi Koizumi\*

Industrial Technology Center of Fukui Prefecture., Japan

\*:URASE CO., Ltd., Japan

**7. Formation of superamphiphobic inorganic nanofiber mats using silane coupling agents with short perfluoroalkyl chain**

Koji Nakane, Shuya Gao, Akiyoshi Ohgoshi\*, Tadayuki Isaji\*, Masaaki Ozawa\*

University of Fukui, Japan

\*:Nissan Chemical Industries,Ltd., Japan

**8. Molding and mechanical property of keratin based composite material using ionic liquid**

Haruhiro Ino, Keisuke Komuro, Teruo Kimura, Yoichi Koderu\*

Kyoto Institute of Technology, Japan

\*:National Institute of Advanced Industrial Science &amp; Technology (AIST), Japan

18:00~19:30

**Welcome Party****15<sup>th</sup> September (Friday)**8:30~ **Registration**9:30~9:55 **Keynote speech 3****Textile-based wearable system for monitoring upper-arm muscle contraction during dynamic flexion**

Xiaoming Tao

The Hong Kong Polytechnic University, H.K.

9:55~10:45 **Session 3 : Apparel Science and Production Technology****9. Thermophysiological and sewing properties of firefighter clothing**

Adnan Mazari, Antonin Havelka, Funda Buyuk Mazari

Technical University of Liberec, Czech Republic

**10. The compression properties of towel under various water contents**

Yuriko Kibayashi, Hiroko Yokura\*, Sachiko Sukigara

Kyoto Institute of Technology, Japan

\*:Shiga University, Japan

**- Coffee Break 15 min -**

11:00~12:15    **Session4 : Fabric Handle and Sense Evaluation****11. Effect of fiber length on hand and dimension changes of cotton knit fabrics by laundering**

Nagisa Hirata, KyoungOk Kim, Masayuki Takatera, Kyosuke Kanda\*, Masatoshi Kawakami\*  
Shinshu University, Japan

\*:Kondo Cotton Spinning Co., Ltd., Japan

**12. Objective evaluation of the handle of towels**

Mari Inoue, Kazuki Chiba, Hiromi Nakaya, Yusuke Hayashi  
Kobe University, Japan

**13. Nonlinearity evaluation of soft materials by ball indentation imitating palpation**

Atsushi Sakuma, Asuka Nagai, Etsuko Takayama\*  
Kyoto Institute of Technology, Japan

\*:Tokyo University of Agriculture and Technology, Japan

12:15~13:30        **Lunch**

13:30~13:55    **Keynote speech 4****Multilayered perpendicular nonwovens for advanced thermal and acoustic insulation**

Jiri Militky, Rajesh Mishra, Mohanapriya Venkataraman, Tao Yang  
Technical University of Liberec, Czech Republic

14:00~15:15    **Session5 : Composite and Industrial Textiles****14. Interesting different mechanical behaviours of 3D warp interlock fabrics for composite material**

F. Boussu, D. Soulat, C. Huniade, S. Picard\*

\*:ENSAIT, GEMTEX Université de Lille1, France

**15. Activated carbon structures from fibrous wastes**

Jiri Militky, Vijiy Valeti, Salman Naeem  
Technical University of Liberec, Czech Republic

**16. Introduction of new fire blocking textile “GULFENG®” composed of PPS and Ox-PAN**

Masaru Harada, Hiroshi Tsuchikura, Atsushi Kuwabara  
Toray Industries, Inc., Japan

**- Coffee Break 15 min -**



15:30~17:10 **Session5: Composite and Industrial Textiles****17. Optimization of formulations with basalt fiber**

Promoda Kumar Behera, Vijay Baheti, Jiri Militky, Holmer Savastano Junior  
Technical University of Liberec, Czech Republic

**18. Laser engraving based application of silica aerogel into nonwovens for thermal insulation**

Xiaoman Xiong, Rajesh Mishra, Jiri Militky, Hiroyuki Kanai\*  
Technical University of Liberec, Czech Republic  
\*:Shinshu University, Japan

**19. Fatigue damage analysis under tension loading for textile composites**

Kazutaka Mukoyama, Koushu Hanaki, Tetsusei Kurashiki  
Osaka University, Japan

**20. Study on the damage propagation under three point bending for a short glass fiber reinforced composites by an injection mold**

Li Xingshengsheng, T.Kurashiki, M.Zako, K.Kobayashi\*, T.Yamamoto\*, G. Yamada\*, T.Sakakibara\*  
Osaka University, Japan  
\*:ITOCHU Techno-Solutions Corp, Japan

14:00~15:15 **Session6 : Dyeing and Finishing****21. Casein treated flame retardant cotton textiles**

Sajid Faheem, Vijay Baheti, Maros Tunak, Jakub Wiener, Jiri Militky  
Technical University of Liberec, Czech Republic

**22. Soil resistant finishing technology “TECHNO CLEAN®”**

Shota Takeshita, Atsushi Kuwabara, Keiji Takeda  
Toray Industries, Inc., Japan

**23. Dyeability in hair dyeing using dyestuffs prepared from biobased materials**

Hidekazu Yasunaga, Akiko Takahashi, Kazue Ito, Masahisa Ueda, Saina Taniguchi,  
Asami Yano, Chinami Seki, Hiroshi Osaki, Tomoyasu Kida\*, Takanori Matsubara\*  
Kyoto Institute of Technology, Japan  
\*:College of Industrial Technology, Japan

- Coffee Break 15 min -

15:30~16:45 **Session6 : Dyeing and Finishing****24. Present situation of supercritical fluid dyeing and finishing**

Teruo Hori, Isao Tabata, Kazumasa Hirogaki  
University of Fukui, Japan

**25. Synthesis of nano-porous flexible para-aramid aerogel fiber**

Kazumasa Hirogaki, Arata Uchimura, Yumiko Suzuki, Lei Du, Isao Tabata, Teruo Hori  
University of Fukui, Japan

**26. Improvement in dyeability of UHMPWE fiber using supercritical CO<sub>2</sub>**

Jaehyuk Ma, Satoko Okubayashi  
Kyoto Institute of Technology, Japan

18:00~20:00      **Symposium Party**

**16<sup>th</sup> September (Saturday)**

8:30~ **Registration**

9:15~10:05 **Session 7 : Designs and Quality of Textiles**

**27. Numerical analysis for deformation behavior of textile under bi-axial tensile loading**

Yuki Kitahara, Atsushi Yokoyama  
Kyoto Institute of Technology, Japan

**28. Measurement of effective thermal conductivity of synthetic and regenerated fiber assemblies in low fiber volume fraction**

Morihiro Yoneda, Ai Ogawa, Michiyo Tada  
Nara Women's University, Japan

**- Coffee Break 15 min -**

**10:20~11:55 Session 8 : Science and Technology of Textile Machinery**

**29. Research into the causes of center marks in spandex plated fabric**

Shunji Takeuchi, Kazuki Nishioka, Hideyuki Uematsu, Shuichi Tanoue  
University of Fukui, Japan

**30. An experimental study of the roller drafting parameters**

Tatsumori Matsumoto  
Murata Machinery, Ltd., Japan

**31. Vortex spinning - technology, applications and market**

Akitsugu Mori  
Murata Machinery Japan

**32. Bio innovative design and manufacture of CFRP pre form by braiding technology**

Toshiyasu Kinari, Nanang Endriatno, Kento Kawai, Takuru Suehiro, Jiro Sakamoto, Satoshi Kitayama  
Kanazawa University, Japan

11:55~12:05 **Closing Address**

12:05~ **Excursion**