

**OS21: The 19th International Students / Young Birds Seminar on
Multi-scale Flow Dynamics**

November 6, 2023
CON-SAKURA 2

OS21-1 – OS21-24
15:10-15:40 Short Oral Presentation
15:50-17:20 Poster Presentation

November 7, 2023
CON-SAKURA 2

OS21-25 – OS21-48
10:00-10:30 Short Oral Presentation
10:40-12:10 Poster Presentation

OS21-49 – OS21-72
13:25-13:55 Short Oral Presentation
13:55-14:40 & 14:50-15:35 Poster Presentation

- OS21-1 **Structural Optimization of Flexible Multibody Systems with Deployment Mechanism**
Satoshi Watanabe, Shuonan Dong, Keisuke Otsuka, Kanjuro Makihara (Tohoku University, Japan)
- OS21-2 **Optical Absorption Characteristics of Perovskite Photovoltaic Cells by Fluctuational Electromagnetics**
Ryo Sugimoto, Shunsuke Ito, Kota Ono, Atsushi Sakurai (Niigata University, Japan)
- OS21-3 **Temperature Measurement of Carbon Materials under Applied Voltage by Raman Spectroscopy**
Tomoyuki Sugano, Takumi Hasegawa, Atsushi Sakurai (Niigata University, Japan)
- OS21-4 **Effective Semi-Active Energy Harvesting from Structural Vibration Using Magnetostrictive Transducer**
Yuusuke Kobayashi, An Li, Keisuke Otsuka, Kanjuro Makihara (Tohoku University, Japan)
- OS21-5 **Numerical Study and Process Improvement of Micro-structured Gas Separator Utilizing the Soret Effect**
Shunsuke Nobe, Ryo Masuo, Mimori Osada, Naoki Ono (Shibaura Institute of Technology, Japan)

- OS21-6 **Heat Transfer Enhancement of Flow Boiling with Copper Heated Surface Having Microstructures and Relationship between Heat Flux and Bubble Point Density**
Shunsuke Sasaki, Shuhei Hayashi, Kouta Onodera, Tatsuhiko Aizawa, Naoki Ono (Shibaura Institute of Technology, Japan)
- OS21-7 **Study on Pressure Profile for Various Fuel Flow Rates in a Scramjet Combustor with Dual-cavity Flameholder**
Kei Norimatsu, Satoshi Nishiura, Taku Kudo, Akihiro Hayakawa (Tohoku University, Japan)
- OS21-8 **Study on Evaporation Behavior and Diffusion Coefficient of Water Inside Coated Layer in Drying Process**
Daisuke Negishi, Ken Akase, Naoki Ono (Shibaura Institute of Technology, Japan)
- OS21-9 **Visualization of Marangoni Liquid Flow in a Rotating System During Wafer Drying**
Hibiki Nakagami, Atsushi Sakai, (Shibaura Institute of Technology, Japan) Tomoatsu Ishibashi (EBARA Corporation, Japan), Naoki Ono (Shibaura Institute of Technology, Japan)
- OS21-10 **Meso-microscale Coupled Simulation of Wind under Varying Atmospheric Stabilities over Complex Terrain**
Yilei Song, Guolin Ma, Linlin Tian, Pengcheng Xiao (Nanjing University of Aeronautics and Astronautics, China), Xiyun Lu (Nanjing University of Aeronautics and Astronautics / University of Science and Technology of China, China), Ning Zhao, Chunling Zhu (Nanjing University of Aeronautics and Astronautics, China)
- OS21-11 **State Estimation of Multibody Model Using State Observer Based on Differential Algebraic Equation**
Taiki Okada, Shuonan Dong, Ryo Kuzuno, Yuya Takahashi, Yoshitaka Shizuno, Keisuke Otsuka, Kanjuro Makihara (Tohoku University, Japan)
- OS21-12 **Remaining Life Assessment in Fiber Ropes by System Invariant Analysis Technology (SIAT) with Acoustic Testing**
Kazuki Sasada, Sho Takeda, Tetsuya Uchimoto (Tohoku University, Japan), Tomoya Soma (NEC Corporation, Japan), Makoto Kimura (Tokyo Seiko Rope Mfg. Co., Ltd., Japan)
- OS21-13 **Marangoni Convection with Supplying Pure Water in a Rotating System during Wafer Drying**
Atsushi Sakai, Hibiki Nakagami (Shibaura Institute of Technology, Japan), Tomoatsu Ishibashi (EBARA Corporation, Japan), Naoki Ono (Shibaura Institute of Technology, Japan)
- OS21-14 **Application of Aerodynamic Topology Optimization Design to Multi Element Airfoil**
Tatsunari Kobara, Wataru Yamazaki (Nagaoka University of Technology, Japan)

- OS21-15 **Flutter Harvester Using Flexible Plates with Piezoelectric Film**
Taisei Mukogawa, Shuonan Dong (Tohoku University, Japan), Yu Jia (Aston University Birmingham, UK), Yu Shi (University of Leeds, UK), Constantinos Soutis (The University of Manchester, UK), Hiroki Kurita, Fumio Narita, Keisuke Otsuka, Kanjuro Makihara (Tohoku University, Japan)
- OS21-16 **Molecular Dynamics Study of Li-ion Transport Properties in Solid Electrolyte $\text{Li}_6\text{PS}_5\text{Cl}$**
Tongxu Wang, Sheng-Feng Huang, Takashi Tokumasu (Tohoku University, Japan)
- OS21-17 **Time-resolved Multi-scale Droplet Shape Measurement of Superspreading Wetting of Nanofluid**
Akira Hoshino, Eita Shoji, Tetsushi Biwa, Masaki Kubo, Takao Tsukada, Takaaki Tomai, Tadafumi Adschiri (Tohoku University, Japan)
- OS21-18 **Evaluation of Uniform and Surface Compressive Residual Stress in Carbon Steel by Eddy Current Magnetic Signature Method**
Kodai Takigami, Sho Takeda (Tohoku University, Japan), Tetsuya Uchimoto (Tohoku University / ELYTMAX IRL3757, CNRS, Tohoku University, Université de Lyon, INSA-Lyon, École Centrale de Lyon, Japan)
- OS21-19 **Effects of Propeller Rotation Speed on Aerodynamic Performance of Wing in Tractor-Configuration**
Masaki Okawa, Ren Nishimura, Haruka Kurahashi, Tsubasa Ikami, Hiroki Nagai (Tohoku University, Japan)
- OS21-20 **Arc Interruption Performances for Various Gases with Same Mass Flow Rates**
Takumi Suzuki, Hiroya Miyagi (University of Tsukuba, Japan), Kei Maeshima, Tomoyuki Yoshino, Tadashi Mori (Toshiba Energy Systems & Solutions Corporation, Japan), Takayasu Fujino (University of Tsukuba, Japan)
- OS21-21 **Arbitrary Lagrangian-Eulerian Non-linear Finite Element Analysis of Tethered Structure with Large Deformation**
Yuya Takahashi, Ryo Kuzuno, Shuonan Dong, Taiki Okada, Yoshiki Shizuno, Keisuke Otsuka, Kanjuro Makihara (Tohoku University, Japan)
- OS21-22 **Dynamic of Vertically Clamped Flexible Filament in Wavy Flow**
Jiantao Zhang, Takashi Nakamura (Tokyo Institute of Technology, Japan)
- OS21-23 **Investigation of Efficient/Inefficient Arrangement of HEPA Air Purifiers in Indoor Ventilation**
Hayato Takaku, Gaku Hirokawa, Wataru Yamazaki (Nagaoka University of Technology, Japan), Hideto Takahashi (Takasago Thermal Engineering Co., Ltd., Japan)
- OS21-24 **Visualization of Natural Convection Boundary Layer Using BOS Method and Assessment of its Usefulness**
Shogo Ogasawara, Yuya Iseki, Toshihiro Sawamura, Takuma Kogawa (National Institute of Technology, Hachinohe College, Japan)

- OS21-25 **Numerical Research of Wind Flow and Wind Turbine Wake over the Typical Complex Terrain**
Guolin Ma, Linlin Tian, Yilei Song, Ning Zhao (Nanjing University of Aeronautics and Astronautics, China)
- OS21-26 **Experimental Investigation on Dynamic Instability at Transonic Speeds of Thin-aeroshell Reentry Capsule**
Rito Kawano, Tsubasa Ikami, Hiroki Nagai (Tohoku University, Japan), Kazuhiko Yamada (Japan Aerospace Exploration Agency, Japan)
- OS21-27 **Three-Dimensional Thermal Analysis of Stone-Incorporated Sauna Stoves Using OpenFOAM**
Yuka Awaji, Takuma Kogawa (National Institute of Technology, Hachinohe College, Japan)
- OS21-28 **Evaluation of Heat Transfer under Laser Treatment by Non-Fourier Effect**
Takato Tanaka, Toma Wada, Takuma Kogawa (National Institute of Technology, Hachinohe College, Japan)
- OS21-29 **Performance Evaluation of Hydrodynamic Thrust Bearing for Centrifugal Blood Pumps by CFD Simulation**
Takafumi Masuda (Hirosaki University, Japan), Eiji Okamoto (Tokai University, Japan), Daisuke Sakota, Ryo Kosaka (National Institute of Advanced Industrial Science and Technology, Japan), Tetsuya Yano (Hirosaki University, Japan)
- OS21-30 **Study on Drying Process of Blood Drop - Automatic Classification of Drying Processes by Using Deep Learning -**
Masahiro Fukuda, Tetsuya Yano (Hirosaki University, Japan)
- OS21-31 **Enhanced Cascaded Lattice Boltzmann Model for Droplet Impact on Superhydrophobic Surfaces**
Yunjie Xu, Linlin Tian, Chunling Zhu, Ning Zhao (Nanjing University of Aeronautics and Astronautics, China)
- OS21-32 **Numerical Simulation for the Breakup Behavior of a Liquid Jet in a Cross-flow with an Electric Field**
Kohei Hayashi (Kyushu Institute of Technology, Japan), Minori Shirota (Hirosaki University, Japan), Yoshihide Mawatari, Masato Yamamura, Yasuhiro Saito (Kyushu Institute of Technology, Japan)
- OS21-33 **Evaluation of Fiber Misalignment in CFRP with Curvature Using Eddy Current Testing**
Kei Sasaki, Sho Takeda, Tetsuya Uchimoto, Hiroyuki Kosukegawa (Tohoku University, Japan), Jin Inoue (Mitsubishi Electric Corporation, Japan)
- OS21-34 **Changes in Light Scattering Properties of Suspensions Containing Erythrocytes with Swelling and Collapse**
Sora Ishizuka, Tetsuya Yano (Hirosaki University, Japan)

- OS21-35 **Thermal Fluid Analysis for Gas Mixing in an Internal Condensation Reactor for Methanol Synthesis**
Akiyoshi Toba (Kyushu Institute of Technology, Japan), Shota Shimokawara (Electric Power Development Co., Ltd., Japan), Yasuhiro Saito (Kyushu Institute of Technology, Japan)
- OS21-36 **Influence of Propeller Wake on Mars Airplane Wing Geometry**
Nana Hasegawa, Masahiro Kanazaki (Tokyo Metropolitan University, Japan), Hiroki Nagai (Tohoku University, Japan)
- OS21-37 **Numerical Analysis of Internal Flowfield in Star-Shaped Grains using Building-Cube Method**
Shoya Yoshinaga, Keishiro Yoshida (Kanazawa Institute of Technology, Japan), Shinichiro Ogawa, Daisuke Sasaki (Osaka Metropolitan University, Japan)
- OS21-38 Cancelled
- OS21-39 **Molecular Dynamics Study on Mechanical Balance at Three-phase Contact Line of Interfacial Nanobubble**
Yusuke Jonosono (University of The Ryukyus, Japan), Shin-ichi Tsuda (Kyushu University, Japan), Takashi Tokumasu (Tohoku University, Japan), Hiroki Nagashima (University of The Ryukyus, Japan)
- OS21-40 **Development of Numerical Analysis Method for Cavity Flame-Holder in Supersonic Flow Using Building-Cube Method**
Kentaro Miyata, Shinichiro Ogawa, Daisuke Sasaki, Koichi Mori (Osaka Metropolitan University, Japan)
- OS21-41 **POD Analysis of the Unsteady Behavior of Wind Turbine Wakes on Escarpment**
Lin-lin Tian, Peng-cheng Xiao, Yi-lei Song, Ning Zhao (Nanjing University of Aeronautics and Astronautics, China)
- OS21-42 **Basic Research on the Aerodynamic Characteristics of 3-D Wings in the Martian Atmospheric Environment**
Sayuri Takaya, Daiju Numata (Tokai University, Japan)
- OS21-43 **Visualization of Sonic Boom Phenomena Using Anodized-Aluminum Pressure Sensitive Paint**
Chika Yamada, Daiju Numata (Tokai University, Japan)
- OS21-44 **Study on Unsteady Aerodynamic Phenomena around Re-entry Vehicles Using Ballistic Range**
Masashi Yamamoto, Daiju Numata (Tokai University, Japan)
- OS21-45 **Numerical Investigation on Airfoils by the Synergistic Effect of Blowing and Suction**
Yukun Sun, Tongguang Wang (Nanjing University of Aeronautics and Astronautics, China)

- OS21-46 **Study on Combining Method of Time Series Flow Fields with Different Phases around Airfoil for Unsteady PIV**
Haruka Kurahashi, Tsubasa Ikami, Hiroki Nagai (Tohoku University, Japan)
- OS21-47 **Electron Dynamics Evaluation in Different Temperature Using Au/TiO₂ and Au/SiO₂ Nano Particles Dispersion**
Saeki Nakano, Ryugo Hosokawa, Yuta Ito (Yamagata University, Japan), Kakeru Fujiwara (Kanazawa University, Japan), Tetsuro Katayama (Tokushima University, Japan), Takao Oto, Takayuki Chiba, Hiroki Gonome (Yamagata University, Japan)
- OS21-48 **Study on the Pyrolysis of Trimethyl Phosphate and Dimethyl Methyl Phosphonate Using a Micro Flow Reactor with a Controlled Temperature Profile**
Ryotaro Matsumoto, Keisuke Kanayama, Kenta Tamaoki, Masahiko Izumi, Hisashi Nakamura, Takuya Tezuka, Kaoru Maruta (Tohoku University, Japan)
- OS21-49 **Simultaneous and Non-Simultaneous Drop Impact onto a Wall**
Henrik Sontheimer, Leon Elsaßer, Peter Stephan, Tatiana Gambaryan-Roisman (Technical University of Darmstadt, Germany)
- OS21-50 **Bending of Bundle of Vorticity Lines in a Vortex and its Relationships to Vortical Flow Characteristics in Homogeneous Isotropic Turbulence**
Kaito Uchima, Katsuyuki Nakayama (Aichi Institute of Technology, Japan)
- OS21-51 **Integrating Wing and Fuselage for Silent Supersonic Transport Designed at On-Track and Off-Track Conditions**
Akari Akashi (Tohoku University, Japan), Koji Shimoyama (Kyushu University, Japan), Shigeru Obayashi (Tohoku University, Japan)
- OS21-52 **Study on Aerodynamic Characteristics of Airfoils at Supersonic Flight in the Martian Atmospheric Environment**
Tomoyuki Takizawa, Daiju Numata (Tokai University, Japan)
- OS21-53 **Evaluation of the Effect of Radiative Heat Transfer on the Thermal Resistance of Foamed Insulation Materials**
Tomoki Kitazume, Yuki Kanda, Atsuki Komiya (Tohoku University, Japan)
- OS21-54 **Optimal Design of Wavelength-Selective Emitters for Thermophotovoltaic Power Generation Using Carbon Nanotube Thin Films by Machine Learning**
Kio Kumagai, Kana Suzuki (Niigata University, Japan), Taishi Nishihara, Yuhei Miyauchi (Kyoto University, Japan), Atsushi Sakurai (Niigata University, Japan)
- OS21-55 **Fundamental Study of Two-color AA-PSP for Surface Pressure Measurement on Free-flight Projectile**
Yuma Kawamata, Daiju Numata (Tokai University, Japan)
- OS21-56 **Deposition Patterns of Evaporating Sugar-Coffee Drops on Heated Surfaces**
Kyosuke Ando, Kazuma Taguchi, Takahiro Okabe (Hirosaki University, Japan)
- OS21-57 **Topological Data Analysis for Estimation of Rock Fracture Structure**
Togo Hasumi (Tohoku University, Japan), Yusuke Imoto (Kyoto University, Japan), Jun Miyanaga, Tomoki Uda, Anna Suzuki (Tohoku University, Japan)

- OS21-58 **The Effects of a Slit in a Hydrofoil on the Thermodynamic Self-Suppression Effect for Tip Leakage Vortex Cavitation**
Yuto Oda, Junnosuke Okajima (Tohoku University, Japan), Yuka Iga (Tohoku University / Japan Aerospace Exploration Agency, Japan)
- OS21-59 **Numerical Simulation of Bubble Shape and Heat Transfer During Nucleate Pool Boiling of FC-72**
Hikaru Ishibashi, Koki Ota (Tohoku University, Japan), Peter Stephan (TU Darmstadt, Germany), Junnosuke Okajima (Tohoku University, Japan)
- OS21-60 **Numerical Study on a Supercritical Airfoil: Interactions of Vortex Generator-Induced Wake and Shock Waves**
Yuta Tsukamoto, Keiichi Kitamura (Yokohama National University, Japan)
- OS21-61 **Influence on Flow Velocity Variation on Heat Transfer of Subcooled Boiling in High Speed Flow**
Fumitaka Ono, Junnosuke Okajima (Tohoku University, Japan)
- OS21-62 **Dynamic Modeling and Aeroelastic Response Study of Ultra-Long Flexible Wind Turbine Blade**
Zhao Zizhen, Wang Tongguang, Wang Long, Zhang Baoxu (Nanjing University of Aeronautics and Astronautics, China)
- OS21-63 **Estimation of Fracture Network Structures Using Heat and Solute Tracers**
Mufan Qiao, Keiichiro Goto (Tohoku University, Japan), Julien Maes (Heriot-Watt University, UK), Alexandros Patsoukis Dimou, Jun Miyanaga, Anna Suzuki (Tohoku University, Japan)
- OS21-64 **Research on Optimization of Efficiency of Francis Turbine Based on CFturbo**
Jie Song, Xin Li, Haifeng Gong, Shuai Feng, Lijuan Fu (Chongqing University of Technology, China)
- OS21-65 **Validation of Momentum Conservation Model to Isothermal Drop Impacts on Solid Surfaces**
Takumu Yamaya, Kazuaki Maeda, Yusuke Nakagawa, Taimei Miyagawa, Minori Shirota (Hirosaki University, Japan)
- OS21-66 **Adhesion Force Acting on Climbing Drops on Heated Ratchets with Heterogeneous Wettability Surfaces**
Ryota Ato, Taimei Miyagawa, Minori Shirota (Hirosaki University, Japan)
- OS21-67 **Time Variation in Temperature Distribution on a Solid Surface during Impacts of Molten Tin Drops**
Kazuaki Maeda, Yusuke Nakagawa, Taimei Miyagawa, Takahiro Okabe, Minori Shirota (Hirosaki University, Japan)

- OS21-68 **Effects of Electrical Charge on the Shape Oscillation of Falling Drop**
Ryoichiro Miura, Ayaka Kodama, Taimei Miyagawa, Takahiro Okabe, Yohsuke Matsushita (Hirosaki University, Japan), Yasuhiro Saito (Kyushu Institute of Technology, Japan), Yoshiya Matsukawa, Hideyuki Aoki (Tohoku University, Japan), Masatoshi Daikoku (Hachinohe Institute of Technology, Japan), Junichi Fukuno (Honda Motor Co., Ltd., Japan), Minori Shirota (Hirosaki University, Japan)
- OS21-69 **Characterization of Single Drop Formation from a Needle Using Event-Based Camera**
Takahito Kosugi, Ryo Yamamoto, Kazuaki Maeda, Taimei Miyagawa (Hirosaki University, Japan), Yohko Kimura (CenturyArks Co., Ltd., Japan), Minori Shirota (Hirosaki University, Japan)
- OS21-70 **Development of Fast-Response PSP for Surface Pressure Measurement on Airfoils of the Mars Airplane**
Hiroshi Manome, Daiju Numata (Tokai University, Japan)
- OS21-71 **Effects of Aerodynamic Devices on Airfoil Flow in the Martian Atmospheric Environment**
Rena Minohara, Daiju Numata (Tokai University, Japan)
- OS21-72 **Aerodynamic Performance Study on a Parafoil Airfoil with an Upper Surface Slit**
Wang Zhen, Wang Tongguang, Zhong Wei, Feng Kai, Zhou Kang, Li Xudong (Nanjing University of Aeronautics and Astronautics, China)