

**OS19: The 20th International Symposium on Advanced Fluid Information
(AFI-2020)
IFS Collaborative Research Forum**

Online

October 28, 2020

Chair: Suguru Miyauchi (Tohoku University, Japan)

11:10-12:40 **Short Oral Presentation**

(3 min for Short Oral Presentation)

- CRF-1 **Optimization of Blood Mimicking Fluids Optical and Rheological Properties**
Simon Tupin (Tohoku University, Japan), Karim Mazeau (CERMAV-CNRS and University of Grenoble Alpes, France)
- CRF-2 **Development of Averaged Geometries for CFD Benchmarking of Intracranial Aneurysmal Flow**
Simon Tupin (Tohoku University, Japan), Khalid M. Saqr (Arab Academy for Science, Technology and Maritime Transport, Egypt)
- CRF-3 **New Index for the Evaluation of Coupling between Stent Degradation and Vessel Remodeling**
Aike Qiao, Hanbing Zhang, Sicong Liu (Beijing University of Technology, China), Hongfang Song (Capital Medical University, China), Wenyu Fu (Beijing Union University, China), Hitomi Anzai, Makoto Ohta (Tohoku University, Japan)
- CRF-4 **Computational Simulation on Improving Intravascular Treatment Device's Performance**
Narendra Kurnia Putra, Johanna Muliany, Bonfilio Nainggolan, (Institut Teknologi Bandung, Indonesia), Tomo Kinoshita, Makoto Ohta, Suprijanto (Institut Teknologi Bandung, Indonesia), Hitomi Anzai (Tohoku University, Japan)
- CRF-5 **Hemodynamics of Full-Scale Patient-Specific Aneurysm Model in Cerebral Artery**
Gaku Tanaka (Chiba University, Japan), Ryuhei Yamaguchi (Tohoku University, Japan), Tomoaki Yamazaki (Chiba University, Japan), Nadia S. Shafii (Universiti Teknologi Malaysia, Malaysia), Hitomi Anzai (Tohoku University, Japan), Kahar Osman (Universiti Teknologi Malaysia, Malaysia), Makoto Ohta (Tohoku University, Japan)
- CRF-6 **Development of Sugar Type Distribution by Glycosylation Based on Protein Subcellular Localization**
Kenji Etchuya (Aoyama Gakuin University, Japan), Makoto Ohta (Tohoku university, Japan), Yuri Mukai (Meiji University, Japan)
- CRF-7 **Mathematical Modeling of the Glycocalyx Based on the Molecular Dynamics for Blood Flow Analysis Considering Microstructures on Blood Vessel Walls: Fundamental Analysis for a Couette Flow between Lipid Membranes**
Suguru Miyauchi, Toshiyuki Hayase (Tohoku University, Japan), Xi Zhuo Jiang, Yiannis Ventikos (University College London, United Kingdom)

CRF-8 **A Machine-learning Approach for Computation of Cardiovascular Function Parameters from Pulse Wave of Limbs**
Xiaorui Song, Xuezheng Wang, Shigang Wang, Chunyu Zhu (Taishan Medical University, China), Gaoyang Li, Hitomi Anzai (Tohoku University, Japan), Aike Qiao (Beijing University of Technology, China), Makoto Ohta (Tohoku University, Japan)

CRF-9 **The Role of Signal-anchor Region of Type II Transmembrane Protein in Subcellular Localization**
Yuri Mukai, Tatsuki Kikegawa (Meiji University, Japan), Makoto Ohta (Tohoku University, Japan), Kenji Etchuya (Aoyama Gakuin University, Japan)

Break

Chair: Suguru Miyauchi (Tohoku University, Japan)

13:30-15:00 **Short Oral Presentation**

(3 min for Short Oral Presentation)

CRF-10 **Endothelial Cell Migration under Oscillatory Flow**
Kenichi Funamoto (Tohoku University, Japan), Eugenia Corvera Poire (National Autonomous University of Mexico, Mexico)

CRF-11 **3D Human Blood-Brain Barrier Chip for Central Nervous System Drug Development**
Momoko Sato, Yuuka Sakamaki, Mai Inagaki (Tokushima University, Japan), Ken-ichi Funamoto (Tohoku University, Japan), Masanori Tachikawa (Tokushima University, Japan)

CRF-12 **Concentration Enhancement of Reactive Chemical Species by Plasma-activated Microbubbles Jet in a Water Recirculation System**
Mu-Chien Wu (National Chiao Tung University, Taiwan / Tohoku University, Japan), Satoshi Uehara, Tomoki Nakajima, Takehiko Sato (Tohoku University, Japan), Jong-Shinn Wu (National Chiao Tung University, Taiwan)

CRF-13 **The Effects of Atmospheric-pressure Cold Plasma Generated Electrical Field, Short-life Species, and Long-life Species on Cancer Cells**
Po-Chien Chien, Chao-Yu Chen (National Chiao Tung University, Taiwan), Takehiko Sato (Tohoku University, Japan), Yun-Chien Cheng (National Chiao Tung University, Taiwan)

CRF-14 **Numerical Analyses of Transport Characteristics of Discharge Species Generated by Cold Atmospheric Plasma on Cell Membrane using Fluid Model and Molecular Dynamics**
Shota Yamauchi, Kazuaki Abe, Yuya Oishi, Ippei Yagi, Satoshi Uchida (Tokyo Metropolitan University, Japan), Takehiko Sato (Tohoku University, Japan)

CRF-15 **Characteristics of Jetting from Micro Cavitation Bubbles**
Satoshi Uehara, Takahito Akimura, Tomoki Nakajima, Kiyonobu Ohtani (Tohoku University, Japan), Outi Supponen (University of Colorado Boulder, USA), Mohamed Farhat (Ecole Polytechnique Federale de Lausanne (EPFL), Switzerland), Takehiko Sato (Tohoku University, Japan)

CRF-16 **Improvement of Pressure Measurement Method in a Laser-Induced Cavitation Bubble**
Satoshi Uehara, Sayaka Kamata, Tomoki Nakajima, Yuka Iga (Tohoku University, Japan), Seiji Kanazawa (Oita University, Japan), Takehiko Sato (Tohoku University, Japan)

CRF-17 **Science of Ultrafine Drop and High Speed Impact**
Takehiko Sato (Tohoku University, Japan), Masao Watanabe (Hokkaido University, Japan), Takeru Yano (Osaka University, Japan), Yuka Iga (Tohoku University, Japan), Kazumichi Kobayashi (Hokkaido University, Japan), Toshiyuki Hayase, Jun Ishimoto, Makoto Ohta, Atsuki Komiya, Hidemasa Takana, Kiyonobu Ohtani, Junnosuke Okajima, Satoshi Uehara, Suguru Miyauchi, Hitomi Anzai (Tohoku University, Japan)

Break

Chair: Yoshiaki Abe (Tohoku University, Japan)

15:20-16:50 **Short Oral Presentation**

(3 min for Short Oral Presentation)

CRF-18 **Progress in Development of an Efficient Uncertainty Quantification Method via Combination of POD and Compressed Sensing**
Arash Mohammadi, Mehrdad Raisee (University of Tehran, Iran), Koji Shimoyama (Tohoku University, Japan)

CRF-19 **Prediction of the Flutter Boundary in Aeroelasticity via a Support Vector Machine**
Pramudita Satria Palar, Faiz Izzaturahman, Lavi Rizki Zuhul (Bandung Institute of Technology, Indonesia), Koji Shimoyama (Tohoku University, Japan)

CRF-20 **Multi-objective Optimization of Multiscale Grid Using Deep Learning**
Takuya Kitamura (Nagasaki University, Japan), Koji Shimoyama (Tohoku University, Japan)

CRF-21 **Development of Multi-Color Pressure-Sensitive Paint for Ballistic Range Experiment**
Daiju Numata (Tokai University, Japan), Kiyonobu Ohtani (Tohoku University, Japan)

CRF-22 **Flight Attitude Stabilizing by Side-jet Generated by Detached Shock Pulsation**
Faming Wang, Yuki Yoshitomi, Fumihiko Iwasaki, Toshiharu Mizukaki (Tokai University, Japan), Kiyonobu Ohtani (Tohoku University, Japan)

CRF-23 **Ballistic Range Experiment of a Hypersonic Free Flight Cylinder in Argon**
Gouji Yamada, Shun Takahashi (Tokai University, Japan), Kiyonobu Ohtani (Tohoku University, Japan)

CRF-24 **Centreline Reflection of Axisymmetric Shock Waves in Supersonic Ring Wedge Intakes**
Hideaki Ogawa, Chihiro Fujio (Kyushu University, Japan), Ben Shoesmith (McGill University, Canada), Sannu Mölder (Ryerson University, Canada), Evgeny Timofeev (McGill University, Canada), Georgy Shoen (Khristianovich Institute of Theoretical and Applied Mechanics, Russia), Kiyonobu Ohtani (Tohoku University, Japan)

- CRF-25 **Damage Assessment for Twisted Tape Tether on Space Debris**
Honoka Tomizaki, Ryohei Kobayashi, Mayumi Suzuki, Nanami Karasawa,
 Kiyonobu Ohtani, Kanjuro Makihara (Tohoku University, Japan)
- CRF-26 **Study on Improvement of Washing Effect for Textile Using the Underwater Explosion**
Kazutaka Kitagawa, Hayate Ueda (Aichi Institute of Technology, Japan), Kiyonobu Ohtani, Yasufumi Konishi (Tohoku University, Japan)
- CRF-27 **Experimental and Numerical Study of Shock Wave Attenuation in a Shock Tube**
Kenichi Sakamoto, Yosuke Sato, Takeharu Sakai (Tottori University, Japan),
 Kiyonobu Ohtani (Tohoku University, Japan)
- CRF-28 **High-fidelity Flow Simulation around a Low-pressure Turbine Blade and Cross-platform Implementation with PyFR**
Yoshiaki Abe (Tohoku University, Japan), Freddie D. Witherden (Texas A&M University, USA), Kazuhiko Komatsu (Tohoku University, Japan), Brian C. Vermeire (Concordia University, Canada), Peter E. Vincent (Imperial College London, United Kingdom), Kozo Fujii (Tokyo University of Science, Japan)

Break

Chair: Yoshiaki Abe (Tohoku University, Japan)

17:10-18:40 **Short Oral Presentation**

(3 min for Short Oral Presentation)

- CRF-29 **Sonic-boom Evaluation in Realistic Atmospheres: Introduction of the SEIRA Project**
Hiroshi Yamashita, Bastian Kern (German Aerospace Center, Germany), Shigeru Obayashi (Tohoku University, Japan), Takashi Misaka (National Institute of Advanced Industrial Science and Technology, Japan), Takahiro Ukai (Osaka Institute of Technology, Japan)
- CRF-30 **Novel Experimental-Computational Research Framework for In-depth Understanding of Cancer Mechanobiology**
Ryo Torii (University College London, United Kingdom), Kenichi Funamoto (Tohoku University, Japan)
- CRF-31 **Modelling Core Scale: Investigation of Multiscale Porosity Using 3D Printed Micromodels**
Julien Maes (Heriot-Watt University, United Kingdom), Anna Suzuki (Tohoku University, Japan)

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Chair: Koji Shimoyama (Tohoku University, Japan)

9:20-10:50 **Short Oral Presentation**

(3 min for Short Oral Presentation)

- CRF-32 **A Numerical Investigation of the Turbulence Effect on Pressure Rise Time**
Takahiro Ukai, Honami Nakagawa (Osaka Institute of Technology, Japan),
Kiyonobu Ohtani (Tohoku University, Japan)
- CRF-33 **Integrated Analysis of an Operating Jet Engine with an Airframe - A First Attempt**
Kazuhiro Chiba, Haruki Ishikawa (The University of Electro-Communications, Japan),
Yoshinori Oba (IHI Corporation, Japan), Shigeru Obayashi (Tohoku University,
Japan)
- CRF-34 **Study on Aerodynamic Effect of Corrugation at Low Reynolds Numbers**
Daisuke Sasaki, Ryuta Naganuma, Takumi Takase, Naoto Hayashi, Kaisei
Mizumoto, Takeshi Akasaka, Masato Okamoto (Kanazawa Institute of Technology,
Japan), Shun Takahashi (Tokai University, Japan), Shigeru Obayashi, Koji
Shimoyama (Tohoku University, Japan)
- CRF-35 **Numerical Study on Backward-facing Step Flow Separation Control by SDBD
Plasma Aerodynamic Actuation**
Chenguang Lai, Hang Fu, Zhiwei Ling, Yuting Zhou (Chongqing University of
Technology, China), Shigeru Obayashi (Tohoku University, Japan)
- CRF-36 **Proposal for the Transportation System with a Roadable Aircraft between Isolated
Islands in Okinawa**
Seiichiro Morizawa (National Institute of Technology, Okinawa College, Japan),
Ryotaro Sakai (JAXA, Japan), Ryota Kikuchi (Kyoto University, Japan), Daichi
Yamabata (National Institute of Technology, Okinawa College, Japan), Shigeru
Obayashi (Tohoku University, Japan)
- CRF-37 **Ultra-fine Surface Roughness Effect on Boundary Layer Transition**
Shingo Hamada, Aiko Yakeno (Tohoku University, Japan), Bagus Nugroho
(Melbourne University, Australia), Shigeru Obayashi (Tohoku University, Japan)
- CRF-38 **Non-newtonian Multiphase Flow Using Immersed Boundary Method**
Shotaro Nara, Yuki Kawamoto, Shun Takahashi (Tokai University, Japan),
Shigeru Obayashi (Tohoku University, Japan)
- CRF-39 **Development of a Small Birdlike High-performance Flying Robot**
Tadateru Ishide, Yasuaki Takagi, Sakichi Otsubo, Hajime Izumi (National Institute
of Technology, Kisarazu College, Japan), Koji Shimoyama, Shigeru Obayashi
(Tohoku University, Japan)
- CRF-40 **Investigations on Aerodynamic Effect of Morphing Flap and Distributed Propulsion
System**
Yuki Kamiyama, Daisuke Yariwake, Edyta Dzieminska (Sophia University, Japan),
Aiko Yakeno, Yoshiaki Abe, Shigeru Obayashi (Tohoku University, Japan)

CRF-41 **Improvement of Aerodynamics of Objects Clothed with Air Permeable Fabrics**
Yuki Kataoka, Hiroaki Hasegawa (Utsunomiya University, Japan), Kazuya Seo (Yamagata University, Japan), Shigeru Obayashi (Tohoku University, Japan)

CRF-42 **Relation between Flow-induced Vibration and Noise Generation of a Fluttering Flag in a Free Stream**
Miyu Okuno, Reon Nishikawa, Osamu Terashima (Toyama Prefectural University, Japan), Yasufumi Konishi (Tohoku University, Japan)

Break

Chair: Hidemasa Takana (Tohoku University, Japan)

11:10-12:40 **Short Oral Presentation**

(3 min for Short Oral Presentation)

CRF-43 **Data-driven Modeling of Flow in Complex Structures**
Anna Suzuki (Tohoku University, Japan), James Minto (University of Strathclyde, Scotland)

CRF-44 **Geothermal Onsen Seminar**
Anna Suzuki (Tohoku University, Japan), Roland Horne (Stanford University, USA)

CRF-45 **New Parameterization Methods for Uncertainty Quantification of Geothermal Models**
Elvar K. Bjarkason (Tohoku University, Japan), Ruanui Nicholson, Oliver J. Maclaren (University of Auckland, New Zealand), Anna Suzuki (Tohoku University, Japan)

CRF-46 **CO₂ Detection Using an Ionic Liquid-Core Fiber-Optic Structure and Material Optimization Using Machine Learning**
Miku Okura (The University of Electro-Communications, Japan), Hidemasa Takana (Tohoku University, Japan), Xinyue Wang, Yue Huang, Fumio Ohuchi, Xinyue Wang (University of Washington, USA), Rei Furukawa (The University of Electro-Communications, Japan)

CRF-47 **Control of Reaction Field in Cavitation Plasma for High-speed and Eco-friendly Synthesis of Carbon Catalysts**
Nozomi Takeuchi, Shoya Yamazaki, Sota Imaizumi (Tokyo Institute of Technology, Japan), Hidemasa Takana (Tohoku University, Japan)

CRF-48 **Formation and Propagation of Ionization Waves During Ns Pulse Breakdown in Plane-to-Plane Geometry**
Keegan Orr (Ohio State University, USA), Xin Yang (Xi'an Jiaotong University, China), Ilya Gulko, Igor V. Adamovich (Ohio State University, USA), Hidemasa Takana (Tohoku University, Japan)

CRF-49 **Development of Numerical Modeling on Enhancement of CO₂ Absorption by Ionic Liquid Electrospray**
Hidemasa Takana (Tohoku University, Japan), Takayasu Fujino (University of Tsukuba)

CRF-50 **Numerical Simulation of a Thermal Plasma Reactor for the Wastes to Energy**
Sooseok Choi (Jeju National University, Republic of Korea), Hidemasa Takana (Tohoku University, Japan)

CRF-51 **Study on MHD Phenomena in Co-axial Energy Conversion Device**
Hiromichi Kobayashi (Keio University Japan), Hidemasa Takana (Tohoku University, Japan), Ryo Sasaki, Takayasu Fujino (University of Tsukuba, Japan)

Break

Chair: Koji Fujita (Tohoku University, Japan)

13:30-15:00 **Short Oral Presentation**

(3 min for Short Oral Presentation)

CRF-52 **Surface Pressure Measurements using Two-Color PSP over a Free Flight Object in a Ballistic Range Facility -2**
Daiki Kurihara, Joseph Gonzales, Hirotaka Sakaue (University of Notre Dame, USA), Naoki Tanaka, Kazuma Yomo, Koji Fujita, Hiroki Nagai (Tohoku University, Japan)

CRF-53 **Establishment of High-accuracy Analysis Method of Spacecraft Thermal System using Data Assimilation (2)**
Hiroki Nagai, Hiroto Tanaka (Tohoku University, Japan), Takashi Misaka (National Institute of Advanced Industrial Science and Technology, Japan)

CRF-54 **Study of Coaxial Inversion Rotor Aimed at Realizing Mars Helicopter (3)**
Hiroki Nagai, Koji Fujita, Atsushi Yamaguchi (Tohoku University, Japan), Akira Oyama (ISAS/JAXA, Japan), Kouichi Yonezawa (Central Research Institute of Electric Power Industry, Japan), Keiichi Kitamura, Yoshikatsu Furusawa (Yokohama National University, Japan), Makoto Sato (Kogakuin University, Japan), Masahiro Kanazaki (Tokyo Metropolitan University, Japan)

CRF-55 **Development of Prediction Model for Heat Pipe Performance Using One Dimensional Discrete Bubble Model**
Kaoru Takemura, Shotaro Nara, Shun Takahashi (Tokai University, Japan), Hiroki Nagai, Takuya Adachi (Tohoku University, Japan)

CRF-56 **Efficient Flight Simulation of MABE-2 Toward Global Trajectory Optimization**
Masahiro Kanazaki, Hiroto Kittaka (Tokyo Metropolitan University, Japan), Koji Fujita, Hiroki Nagai (Tohoku University, Japan)

CRF-57 **Qualitative Density Measurement of Wake Region behind Re-entry Capsule: Improvements in Accuracy of 3D Reconstruction by Evaluating the View-Angle of Measurement System**
Masato Yamagishi, Yusuke Yahagi, Masanori Ota (Chiba University, Japan), Yusuke Hirose (Tokyo Salesian College of Technology, Japan), Shinsuke Udagawa (Tokyo Metropolitan College of Industrial Technology, Japan) Tatsuro Inage (Shonan Institute of Science, Japan), Shigeya Kubota (Toyota Compact Car Company, Japan), Koji Fujita, Kiyonobu Ohtani, Hiroki Nagai (Tohoku University, Japan)

- CRF-58 **Numerical Simulation of Flowfields over Mars Entry Capsules II**
Michiko Ahn Furudate, Dongoh Seo (Chungnam National University, Republic of Korea), Bok Jik Lee (Seoul National University, Republic of Korea), Nomura Masayuki, Hiroki Nagai (Tohoku University, Japan)
- CRF-59 **Development of PSP Measurement Technique using Structured Illumination**
Satoshi Katayama, Yu Matsuda (Waseda University, Japan), Yasuhiro Egami (Aichi Institute of Technology, Japan), Tsubasa Ikami, Hiroki Nagai (Tohoku University, Japan)
- CRF-60 **Numerical Study on Transonic Flow Characteristics over Return Capsules**
Seoem Han, Bok Jik Lee (Seoul National University, Republic of Korea), Michiko Ahn Furudate (Chungnam National University, Republic of Korea), Nomura Masayuki, Hiroki Nagai (Tohoku University, Japan)
- CRF-61 **Active and Passive Control of Unsteady Cavitation on a Hydrofoil**
Takaho Ochiai (Tohoku University, Japan), Ebrahim Kadivar (University of Duisburg-Essen, Germany), Koki Sugaya, Junnosuke Okajima, Yuka Iga (Tohoku University, Japan)
- CRF-62 **Combustion Characteristic of Suspended Single Droplet of Oleic and Linoleic Acids as the Major Component of Jatropha Methyl Ester**
Akihiro Hayakawa (Tohoku University, Japan), Willyanto Anggono (Petra Christian University, Indonesia), Gabriel Jeremy Gotama (Tohoku University, Japan), Yusuf Hilario, William Stefanus (Petra Christian University, Indonesia)
- CRF-63 **Heat-Loss Effects on the Dynamic Behavior of Hydrogen-Air Lean Premixed Flames Under the High-Pressure Conditions**
Satoshi Kadowaki, Taisei Furuyama, Kazumasa Kawata, Toshiyuki Katsumi (Nagaoka University of Technology, Japan), Hideaki Kobayashi (Tohoku University, Japan)

Break

Chair: Hiroyuki Miki (Tohoku University, Japan)

15:20-16:50 **Short Oral Presentation**

(3 min for Short Oral Presentation)

- CRF-64 **Clarifying Interaction Mechanisms between Plasma and Catalysts by Using Neutral Beam**
Masaharu Shiratani (Kyushu University, Japan), Susumu Toko, Seiji Samukawa (Tohoku University, Japan)
- CRF-65 **Estimating Thermal and Optical Properties of Si-Nanopillar/SiGe Composite Film by a Piezoelectric Photothermal Measurements**
Tomoki Harada, Yuki Arata (University of Miyazaki, Japan), Daisuke Ohori, Seiji Samukawa (Tohoku University, Japan), Tetsuo Ikari, Atsuhiko Fukuyama (University of Miyazaki, Japan)

- CRF-66 **Electrical Characteristics of Double Barrier AlInGaN/GaN HEMTs**
Yiming Li, Min-Hui Chuang, Niraj Man Shrestha, Daisuke Ohori (National Chiao Tung University, Taiwan), Seiji Samukawa (Tohoku University, Japan)
- CRF-67 **Study on the Function of Au-DLC Nano-composite Coatings Acting as Thermo-sensor in the Sliding Interface under Severe Corrosive Conditions**
Minoru Goto (National Institute of Technology, Ube College, Japan), Hiroyuki Miki (Tohoku University, Japan), Kosuke Ito (Nihon University, Japan), Sho Takeda (Tohoku University, Japan)
- CRF-68 **Estimation of Focal Mechanisms of Large Number of Induced Seismicity to Understand Fracture System in the Geothermal Reservoir**
Kangnan Yan (Tohoku University, Japan / Chengdu University of Technology, China), Yusuke Mukuhira (Tohoku University, Japan), Rubinstein Justin (USGS, USA), Norbeck Jack (Fervo Energy, USA)
- CRF-69 **Detection of S-wave Arrival of Low SNR Event using Polarization**
Sun Jingyi, Yusuke Mukuhira (Tohoku University, Japan), Norimitsu Nakata, Michael Fehler (Massachusetts Institute of Technology, USA)
- CRF-70 **First Application Result of DCDA Method to the Rock Core Samples from Underground Geoscience Laboratory**
Xiaodong Ma (ETH Zurich, Switzerland), Yusuke Mukuhira, Takatoshi Ito (Tohoku University, Japan)
- CRF-71 **Sporadic Propagation of Spatiotemporal Patterns in a Plankton Model**
Evgeniy Dats, Sergey Minaev (Institute of Applied Mathematics, Russia), Junnosuke Okajima (Tohoku University, Japan), Taisia Miroshnichenko (The Lebedev Physical Institute RAS, Russia)
- CRF-72 **Radiative Transfer Analysis in Soot Smoke and Water Mist for Development of Thermal Barrier Fire Extinguishing Devices**
Hiroki Gonome, Yuto Takagi, Taichi Nagao, Mizuho Ono (Yamagata University, Japan), Takuma Kogawa (National Institute of Technology, Hachinohe College, Japan), Junnosuke Okajima (Tohoku University, Japan)
- CRF-73 **Modeling on Boiling and Bubble Dynamics Induced by Laser Emitted from Optical Fiber**
Junnosuke Okajima (Tohoku University, Japan / Far Eastern Branch of the Russian Academy of Sciences, Russia), Roman Fursenko (Siberian Branch of the Russian Academy of Sciences, Russia), Sergey Mokrin (Far-Eastern Federal University, Russia), Vladimir Gubernov (Lebedev Physical Institute of the Russian Academy of Sciences, Russia), Sergey Minaev (Far Eastern Branch of the Russian Academy of Sciences, Russia)
- CRF-74 **Development of Spinning Device Using Filmwise Pumping-up Mechanism with Induction Heating and Rotating Cone**
Kenji Takahashi, Takahiro Adachi, Takeshi Akinaga, Kana Akinaga (Akita University, Japan), Junnosuke Okajima, Atsuki Komiya (Tohoku University, Japan)

- CRF-75 **Study of Hydrothermal Behaviors of Impinging Droplets on a Heated Wall**
Takahiro Okabe, Yuka Akiyama (Hirosaki University, Japan), Junnosuke Okajima (Tohoku University, Japan), Minoru Shirota (Hirosaki University, Japan)
- CRF-76 **Experimental Evaluation of Objective Function for Perdition of IR Camera's Sensitivity**
Takuma Kogawa (National Institute of Technology, Hachinohe College, Japan), Junnosuke Okajima, Atsuki Komiya (Tohoku University, Japan), Shigenao Maruyama (National Institute of Technology, Hachinohe College, Japan)

October 30, 2020

Chair: Hisashi Nakamura (Tohoku University, Japan)

8:00-9:00 **Short Oral Presentation**

(3 min for Short Oral Presentation)

- CRF-77 **Solid Oxide Fuel Cells Replacement of a Traditional Catalytic Converter**
Thomas S. Welles, Jeongmin Ahn (Syracuse University, USA), Hisashi Nakamura (Tohoku University, Japan)
- CRF-78 **Experimental and Chemical Kinetics Modeling Study of Nitromethane Oxidation in Shock Tubes and a Micro-flow Reactor with a Controlled Temperature Profile**
Olivier Mathieu (Texas A&M University, USA), Hisashi Nakamura (Tohoku University, Japan), Clayton Mulvihill (Texas A&M University, USA), Yoshimichi Yamamoto, Takuya Tezuka (Tohoku University, Japan), Eric L. Petersen (Texas A&M University, USA)
- CRF-79 **Active Control of High-speed Boundary Layer Flows**
Adrian Sescu (Mississippi State University, USA), Mohammed Z. Afsar (University of Strathclyde, United Kindgom), Shanti Bhushan (Mississippi State University, USA), Yuji Hattori, Makoto Hirota (Tohoku University, Japan)
- CRF-80 **Brent B. Skabelund** (Arizona State University, USA), Hisashi Nakamura, Kaoru Maruta (Tohoku University, Japan), Jeongmin Ahn (Syracuse University, USA), Ryan J. Milcarek (Arizona State University, USA)
- CRF-81 **Multifunctional Hybrid Filaments Comprising Aligned Nanocellulose and Carbon Nanotubes Synthesized by a Field-assisted Flow Focusing Method**
Anthony B. Dichiarà, Heather G. Wise (University of Washington, USA), Hidemasa Takana (Tohoku University, Japan)
- CRF-82 **Vortex-current Filaments with Buoyancy**
 Ching Chang, Stefan G. Llewellyn Smith, (UCSD, USA), Yuji Hattori (Tohoku University, Japan)

Break

Chair: Gota Kikugawa (Tohoku University, Japan)

9:20-10:50 **Short Oral Presentation**

(3 min for Short Oral Presentation)

- CRF-83 **Integral Modelling of an Unsteady Natural Convection Boundary Layer**
Junhao Ke, Nicholas Williamson, Steven W. Armfield (The University of Sydney, Australia), Atsuki Komiya (Tohoku University, Japan)
- CRF-84 **A Study on Nano-scale Interfacial Phenomena of Surface-modified Nanoparticle Suspension**
Masaki Kubo, Toshiki Otsuka, Eita Shoji, Takao Tsukada, Atsuki Komiya (Tohoku University, Japan)
- CRF-85 **Quantitative Visualization of Flow Bifurcation in Laminar Rayleigh-Bénard Convection with Combined PSI and PIV**
Shuqi Xu (Australian National University, Australia), Yongling Zhao (ETH Zurich, Switzerland), Atsuki Komiya (Tohoku University, Japan), Juan F. Torres (Australian National University, Australia)
- CRF-86 **Numerical Simulation of Mass Transfer and Structural Change with Solid-gas Reaction in a Full-scale Porous Model**
Yui Numazawa, Yoshiya Matsukawa, Yohsuke Matsushita, Hideyuki Aoki, Atsuki Komiya (Tohoku University, Japan)
- CRF-87 **Molecular Dynamics Simulation on Surface Nanobubble at the Graphite-water Interface with Pentanol Surfactants**
Takuma Hori (Tokyo University of Agriculture and Technology, Japan), Gota Kikugawa (Tohoku University, Japan), Ichiro Ueno, Yoichiro Matsumoto (Tokyo University of Science, Japan)
- CRF-88 **Modeling of the Contact Line and Contact Angle Dynamics based on the Molecular Dynamics Simulation**
Akinori Fukushima (University of Fukui, Japan), Takashi Tokumasu (Tohoku University, Japan)
- CRF-89 **Analysis of Transport Phenomena of Oxygen Ion in Dual-phase Electrolyte Material**
Hiroki Nagashima (University of the Ryukyus, Japan), Jeongmin Ahn (Syracuse University, USA), Takashi Tokumasu (Tohoku University, Japan)
- CRF-90 **MD Analysis of Formation Process of PEFC's Catalyst Layer**
Hiroya Mikami, Shin-ichiro Wakashima (National Institute of Technology, Ichinoseki College, Japan), Takashi Tokumasu (Tohoku University, Japan)
- CRF-91 **Molecular Kinetic Analysis of Quantum Effect on Bubble Nucleation in Liquid Hydrogen**
Ryuji Takahashi (Kyushu University, Japan), Hiroki Nagashima (University of the Ryukyus, Japan), Takashi Tokumasu (Tohoku University, Japan), Satoshi Watanabe, Shin-ichi Tsuda (Kyushu University, Japan)

CRF-92 **Lattice Constant between Magnesium Oxide Thin Film Deposited on Silicon Substrate**
Satoru Kaneko (KISTEC / Sagamihara Surface Laboratory, Japan), Rieko Sudo (Sagamihara Surface Laboratory, Japan), Shigeo Yasuhara, Tamio Endo (Japan Advanced Chemicals, Japan), Manabu Yasui, Masahito Kurouchi (KISTEC, Japan), Musa Can (Istanbul University, Turkey), Shalima Shawuti (Sabanci University, Turkey), Yoshimi Nakamaru, Chiemi Kokubun, Eri Miyake, Takashi Tokumasu (Tohoku University, Japan)

CRF-93 **Scattering Properties of Gas Molecules on Interfaces of Nanostructures using Molecular Dynamics Analysis**
Yusuke Kosaki, Hideki Takeuchi (National Institute of Technology, Kochi College, Japan), Ikuya Kinefuchi (The University of Tokyo, Japan), Takashi Tokumasu (Tohoku University, Japan)

Break

Chair: Makoto Hirota (Tohoku University, Japan)

11:10-12:40 **Short Oral Presentation**

(3 min for Short Oral Presentation)

CRF-94 **Performance of 2D Nanomaterials as an Additive in Fatty Acid Methyl Ester (FAME) based Biolubricant: Molecular Dynamic Simulation**
Rizky Ruliandini, Nasruddin (Universitas Indonesia, Indonesia), Takashi Tokumasu (Tohoku University, Japan)

CRF-95 **Numerical Investigation of Pressure Distribution in a Microchannel by the DSMC Method**
Pavel Vashchenkov, Yevgeniy Bondar (Institute of Theoretical and Applied Mechanics SB RAS, Russia), Shigeru Yonemura (Tohoku University, Japan)

CRF-96 **Experimental Study on the Radial Particle Distributions of Neutrally Buoyant Spheres in a Dilute Suspension Flow through a Circular Microchannel**
Misa Kawaguchi, Tomohiro Fukui (Kyoto Institute of Technology, Japan), Kenichi Funamoto (Tohoku University, Japan), Miho Tanaka, Mitsuru Tanaka, Shigeru Murata (Kyoto Institute of Technology, Japan), Suguru Miyauchi, Toshiyuki Hayase (Tohoku University, Japan)

CRF-97 **Numerical Study of a French Horn Mouthpiece with Compressible Direct Numerical Simulation**
Rei Sumita, Ryoya Tabata (Kyushu Institute of Technology, Japan), Taizo Kobayashi (Kyushu University, Japan), Ki'nya Takahashi (Kyushu Institute of Technology, Japan), Yuji Hattori (Tohoku University, Japan)

CRF-98 **Analysis of a Vortical Axis based on Local Axis Geometry**
Katsuyuki Nakayama, Kazuma Doi (Aichi Institute of Technology, Japan), Yuji Hattori (Tohoku University, Japan)

CRF-99 **Instability and Wave Interactions in Helical Vortices**
Yuji Hattori (Tohoku University, Japan), Ivan Delbende (LIMSI, France), Maurice Rossi (Universite de Paris VI, France)

CRF-100 **Fluid Dynamics and Energy/scalar Transport in Coexisting Flows of Turbulence and Non-turbulence: Cases of Dual-wake Flow and Plane Jet**
Yasuhiko Sakai, Yasumasa Ito, Koji Iwano (Nagoya University, Japan), Toshiyuki Hayase (Tohoku University, Japan), Yi Zhou (Nanjing University of Science and Technology, China), Kenji Kito (Nagoya University, Japan)

OS20: AFI-2020 IFS Lyon Center Collaborative Research Forum

October 29, 2020

Chair: Jean-Yves Cavaille, Lucile Joly-Pottuz (Tohoku University, Japan)

17:10-19:10 **Presentation**

- OS20-1 **Computational Simulation on Particle Laden Flow during Polymer Cold-Spray Process**
Chrystelle Bernard, Hidemasa Takana (Tohoku University, Japan), Olivier Lame (Université de Lyon, France), Kazuhiro Ogawa, Jean-Yves Cavaille (Tohoku University, Japan)
- OS20-2 **Response Characteristics of Cellulose Nanofibril under AC Electric Field during Flow Focusing**
Hidemasa Takana, Mengfei Guo (Tohoku University, Japan)
- OS20-3 **Stochastic Fluid Dynamics Simulations of Velocity Distribution in Protoplasmic Streaming**
Vladislav Egorov, Olga Maksimova (Cherepovets State University, Russian Federation), Irina Andreeva (Peter the Great St. Petersburg Polytechnic University, Russian Federation), Hiroshi Koibuchi, Satoshi Hongo, Shinichiro Nagahiro, Toshiyuki Ikai, Madoka Nakayama, Shuta Noro (National Institute of Technology, Sendai College, Japan), Tetsuya Uchimoto (Tohoku University, Japan), Jean-Paul Rieu (Université Claude Bernard Lyon 1, France)
- OS20-4 **EMAR Measurements of a Carbon Steel Thinning in a Corrosive Environment**
Gildas Diguët, Hina Miyauchi, Sho Takeda, Tetsuya Uchimoto, Nicolas Mary, Toshiyuki Takagi (Tohoku University, Japan)
- OS20-5 **Low-Field Modeling of Heusler MultiPhysic Memory Alloys**
Mickaël LALLART (Tohoku University, Japan/ INSA-Lyon, France), Hiroyuki MIKI, Linjuan YAN, Gildas DIGUET, Makoto OHTSUKA and Gaël SEBALD (Tohoku University, Japan)
- OS20-6 **Role of Charge Carrier Transport on the Understanding of Polyurethane Actuation**
Kaori Yuse, Gildas Coativy (Université de Lyon, France), Gildas Diguët (Tohoku University, Japan), Véronique Perrin, Laurence Seveyrat, Sébastien Livi (Université de Lyon, France) and Jean-Yves Cavaille (Université de Lyon, France/ Tohoku University, Japan)

October 30, 2020

Chair: Carole Findel, Tetsuya Uchimoto (Tohoku University, Japan)

17:10-19:10 **Presentation**

- OS20-7 **Hypoxia Triggers Collective Aerotactic Migration in Dictyostelium Discoideum**
Olivier Cochet-Escartin (Université Claude Bernard Lyon 1, France), Satomi Hirose, Kenichi Funamoto (Tohoku University, Japan), Christophe Anjard, Jean-Paul Rieu (Université Claude Bernard Lyon 1, France)
- OS20-8 **Elucidation of the Pathophysiology of Skin Sodium and Water Metabolism**
Asadur Rahman, Akira Nishiyama (Kagawa University, Japan), Thomas Elguedj (INSA-Lyon, France), Jun Ishimoto (Tohoku University, Japan)
- OS20-9 **Effect of Micropores Patterning in Separated Plate on Protein Hindered Diffusion Phenomena**
Atsuki Komiya, Ryo Watanabe, Yuki Kanda (Tohoku University, Japan), Juan F. Torres (Australian National University, Australia), Sébastien Livi (Université de Lyon, France)
- OS20-10 **Stability and Transition to Turbulence of Taylor Vortex in a Gap between Rotating Two Cones**
Takahiro Adachi, Widiast Toshiharu, Kana Akinaga (Akita University, Japan), Atsuki Komiya (Tohoku University, Japan), Daniel Henry, Valery Botton (Lyon University(INSA), France)
- OS20-11 **Study of the Effect of Ammonia Addition on the Stabilization of a Non-premixed Methane Jet Flame in an Air Coflow**
Sophie Colson (Université Claude Bernard Lyon1, France/ Tohoku University, Japan), Manuel Kuhni, Cédric Galizzi, Dany Escudié (Université Claude Bernard Lyon1, France), Hideaki Kobayashi (Tohoku University, Japan)
- OS20-12 **Coupled Computing of Fluid-Structure Interaction Problems for Multiphase Energy Systems**
Jun Ishimoto (Tohoku University, Japan), Thomas Elguedj (INSA de Lyon, France)