

**OS19: The 19th International Symposium on Advanced Fluid Information
(AFI-2019)
IFS Collaborative Research Forum**

TACHIBANA

November 7, 2019

Chair: Simon Tupin (Tohoku University, Japan)

9:00-10:30 **Short Oral Presentation**
(2.5 min for Short Oral Presentation)

- CRF-1: **Aerodynamic Drag Reduction using a Coating Material in Flapping Wing**
Tadateru Ishide, Yasuaki Takagi, Sakichi Otsubo, Tomoharu Kaeriyama
(National Institute of Technology, Kisarazu College, Japan), Koji Shimoyama, Shigeru Obayashi (Tohoku University, Japan)
- CRF-2: **Chemical Interpretation of the Two-Stage Cool Flame of Diethylether**
Yasuyuki Sakai (University of Fukui, Japan), Hisashi Nakamura, Toru Sugita, Takuya Tezuka (Tohoku University, Japan)
- CRF-3: **Kriging with Mixed Kernel (MK) for Complex Aerospace Problems**
Rhea P. Liem, Kehinde Oyetunde (HKUST, Hong Kong), Pramudita Satria Palar (Institut Teknologi Bandung, Indonesia), Koji Shimoyama (Tohoku University, Japan)
- CRF-4: **Application of Core-based Inversion to Reconstruct Stress Field in an Underground Geoscience Laboratory**
Xiaodong Ma (ETH Zurich, Switzerland), Yusuke Mukuhira, Takatoshi Ito (Tohoku University, Japan)
- CRF-5: **Validation of Fracture Permeability Estimated by Integrated Approach of Microseismic Observations and Reservoir Engineering Modeling**
Meihua Yang (Chengdu University of Technology, China / Tohoku University, Japan), Yusuke Mukuhira (Tohoku University, Japan), Jack H. Norbeck (U.S. Geological Survey, USA / Lawrence Berkeley National Laboratory, USA), Justin L. Rubinstein (U.S. Geological Survey, USA)
- CRF-6: **Control Arraying of Cage-shaped Protein with Core and Surface Modification**
Ichiro Yamashita (Osaka University, Japan), Naofumi Okamoto (Nara Institute of Science and Technology, Japan), Seiji Samukawa (Tohoku University, Japan)
- CRF-7: **Derivative-Enhanced Surrogate Models For Aerodynamic Design**
Lavi Rizki Zuhail, Kemas Zakaria, Pramudita Satria Palar (Institut Teknologi Bandung, Indonesia), Koji Shimoyama (Tohoku University, Japan)

- CRF-8: **Damage Assessment for Hollow Cylindrical Tether considering Oblique Collision**
Michihiro Fujiwara, Honoka Tomizaki, Kiyonobu Ohtani (Tohoku University, Japan), Sunao Hasegawa (ISAS/JAXA, Japan), Kanjuro Makihara (Tohoku University, Japan)
- CRF-9: **Comparison of 2D and 3D Simulation Models for Deployable Wing**
Keisuke Otsuka, Takahiro Suzaki (Tohoku University, Japan), Yinan Wang (University of Warwick, UK), Koji Fujita, Hiroki Nagai, Kanjuro Makihara (Tohoku University, Japan)
- CRF-10: **Experimental Study on the Flow-induced Noise from a Flag**
Reon Nishikawa, Osamu Terashima (Toyama Prefectural University, Japan), Yasufumi Konishi (Tohoku University, Japan), Taisei Ito, and Ken-ichi Sugioka (Toyama Prefectural University, Japan)
- CRF-11: **Validation of Fast-Pressure-Sensitive Paint for Measuring Small Pressure Fluctuation**
Yasuhiro Egami, Yuya Yamazaki (Aichi Institute of Technology, Japan), Yu Matsuda (Waseda University, Japan), Tsubasa Ikami, Hiroki Nagai (Tohoku University, Japan)
- CRF-12: **Significant Reduction of Thermal Conductivity of Si Nanopillar/SiGe Composite Film Fabricated by Neutral Beam Etching Investigated by a Piezoelectric Photothermal Measurements**
Tomoki Harada, Tsubasa Aki (University of Miyazaki, Japan), Daisuke Otori, Seiji Samukawa (Tohoku University, Japan), Tetsuo Ikari, Atsuhiko Fukuyama (University of Miyazaki, Japan)
- CRF-13: **Effects of High Concentration of CO₂ on Flame Propagation Characteristics of CH₄/CO₂/Air Laminar Premixed Flames**
Akihiro Hayakawa (Tohoku University, Japan), Ekenechukwu C. Okafor (National Institute of Advanced Industrial Science and Technology, Japan), Willyanto Anggono (Petra Christian University, Indonesia)
- CRF-14: **Optical Properties of 1-ethyl-3-methylimidazolium Acetate before and after Carbon Dioxide Exposure**
Miku Okura, Rei Furukawa (The University of Electro-Communications, Japan), Hidemasa Takana (Tohoku University, Japan), Fumio Ohuchi (University of Washington, USA)
- CRF-15: **Pressure Effects in Thin Water Film by Molecular Dynamics**
Manish Gupta, Sidharth P. Raut, An Zou (Syracuse University, USA), Takashi Tokumasu (Tohoku University, Japan), Shalabh C. Maroo (Syracuse University, USA)
- CRF-16: **Experimental and Chemical Kinetics Modeling Study of Nitromethane in Shock Tubes and a Micro-Flow Reactor with a Controlled Temperature Profile**
Olivier Mathieu (Texas A&M University, USA), Yoshimichi Yamamoto (Tohoku University, Japan), Clayton R. Mulvihill, Eric L. Petersen (Texas A&M University, USA), Takuya Tezuka, Hisashi Nakamura (Tohoku University, Japan)

- CRF-17: **Large-Scale Simulation of Mass Transfer and Structural Change with Solid-Gas Reaction in Porous Media: Investigation of Diffusion Term**
Yui Numazawa, Yohsuke Matsushita, Hideyuki Aoki, Atsuki Komiya (Tohoku University, Japan)
- CRF-18: **Aerodynamic Drag Reduction of a Heavy Truck with Efficient Global Optimization Method**
Chenguang Lai, Wenpeng Huang (Chongqing University of Technology, China), Qingyang Wang (China Automotive Engineering Research Institute Co., Ltd, China), Yuting Zhou (Chongqing University of Technology, China), Shigeru Obayashi (Tohoku University, Japan)
- CRF-19: **Understanding Tribological Behavior of hBN Nanoparticles in Trimethylolpropane trioleate (TMPTO) Based Bio-lubricants : Molecular Dynamic Simulation**
Rizky Ruliandini, Nasruddin (Universitas Indonesia, Indonesia), Takashi Tokumasu (Tohoku University, Japan)
- CRF-20: **Oxygen Transport Analysis in Catalyst Layer of Polymer Electrolyte Fuel Cell**
Masataka Nakauchi, Takuya Mabuchi (Tohoku University, Japan), Yuta Yoshimoto, Toshihiro Kaneko, Ikuya Kinefuchi (The University of Tokyo, Japan), Hideki Takeuchi (National Institute of Technology, Kochi College, Japan), Takashi Tokumasu (Tohoku University, Japan)
- CRF-21: **Solid Oxide Fuel Cells Replacement of a Traditional Catalytic Converter**
Thomas S. Welles, Jeongmin Ahn (Syracuse University, USA), Hisashi Nakamura (Tohoku University, Japan)
- CRF-22: **Electric Field Measurements in Atmospheric Pressure Discharges by Electric Field Induced Second Harmonic (E-FISH) Generation**
M. Simeni Simeni (Ohio State University, USA), Y. Tang (Tsinghua University), K. Orr, I. Adamovich (Ohio State University, USA), H. Takana (Tohoku University, Japan), H. Nishiyama (Osaka University, Japan)
- CRF-23: **Effect of Droplet Diameter on Thermal Barrier Performance against Thermal Radiation from Fire**
Hiroki Gonome, Taichi Nagao (Yamagata University, Japan), Takuma Kogawa (National Institute of Technology, Hachinohe College, Japan), Shuichi Moriya, Junnosuke Okajima (Tohoku University, Japan)
- CRF-24: **Clarification the Transient Mechanism of Cavitation Instabilities**
Donghyuk Kang (Saitama University, Japan), Pin Fu, Yuka Iga (Tohoku University, Japan)
- CRF-25: **Experiment of Light-driven Micromotor with Epicyclic Motion**
Noboru Yamada, Vuong Van Thai, Hiroki Sato (Nagaoka University of Technology, Japan), Junnosuke Okajima, Atsuki Komiya (Tohoku University, Japan)

- CRF-26: **Study on the Function of Me-DLC Nano-composite Coatings Acting as Thermo-sensor in the Sliding Interface**
Minoru Goto (Ube College, Japan), Toshiyuki Takagi (Tohoku University, Japan), Kosuke Ito (Nihon University, Japan), Hiroyuki Miki, Hiroyuki Kosukegawa (Tohoku University, Japan)
- CRF-27: **Influence of Fatigue Damage on NDE of Plastic Strain in RAFM Steel using Electromagnetic NDE Methods**
Zhenmao Chen, Manru He, Hong-En Chen, Shejuan Xie (Xi'an Jiaotong University, China), Tetsuya Uchimoto and Toshiyuki Takagi (Tohoku University, Japan)
- CRF-28: **Numerical Investigation of Rarefied Gas Flow in Microchannel by the DSMC Method**
Pavel Vashchenkov, Yevgeniy Bondar (Institute of Theoretical and Applied Mechanics SB RAS, Russia), Shigeru Yonemura (Tohoku University, Japan)
- CRF-29: **The Effects of Heat Loss on the Dynamics of Hydrogen-Air Premixed Flames**
Satoshi Kadowaki, Yuta Kusano, Toshiyuki Katsumi (Nagaoka University of Technology, Japan), Hideaki Kobayashi (Tohoku University, Japan)
- CRF-30: **Double-gate Single-electron Transistor Formed by Fe Nanodot Array**
Takayuki Gyakushi, Yuki Asai, Atsushi Tsurumaki-Fukuchi, Masashi Arita, Yasuo Takahashi (Hokkaido University, Japan), Seiji Samukawa (Tohoku University, Japan)
- CRF-31: **Fuel Sensitivity on End-gas Autoignition Behavior during Knocking Combustion**
Hiroshi Terashima (Hokkaido University, Japan), Hisashi Nakamura (Tohoku University, Japan)
- CRF-32: **Fully Automated Optimum Design under an External Computer Environment**
Taiki Hatta, Masataka Sawahara, Kazuhisa Chiba (The University of Electro-Communications, Japan), Shigeru Obayashi (Tohoku University, Japan)
- CRF-33: **Structure and Properties of Diamond Like Carbon-Magnetic Metal Nano-composite Films**
Yiweng Zhang (Tianjin University, China), Hiroyuki Kosukegawa, Diao Zhuo, Hiroyuki Miki, Toshiyuki Takagi (Tohoku University, Japan)
- CRF-34: **Analysis of Oxygen Ion Conduction in Dual-phase Electrolyte Membrane**
Hiroki Nagashima (University of the Ryukyus, Japan), Ryan Falkenstein-Smith, Jeongmin Ahn (Syracuse University, USA), Takashi Tokumasu (Tohoku University, Japan)
- CRF-35: **Simulation of Thermoelectric Properties for SiNW-SiGe_{0.3} Composite Using Landauer Approach**
Ming-Yi Lee, Yiming Li, Min-Hui Chuang (National Chiao Tung University, Taiwan), Daisuke Ohori, Seiji Samukawa (Tohoku University, Japan)

10:30-10:40 Break

Chair: Hitomi Anzai (Tohoku University, Japan)

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

(2.5 min for Short Oral Presentation)

- CRF-36: **Numerical and Experimental Investigation of Centreline Shock Reflection in Ring-Shaped Supersonic Intake Geometries**
Hideaki Ogawa (Kyushu University, Japan, and RMIT University, Australia), Shuvayan Brahmachary, Chihiro Fujio, Taiki Watanabe (Kyushu University, Japan), Kiyonobu Ohtani (Tohoku University, Japan)
- CRF-37: **Development of Numerical Modeling on Enhancement of CO₂ Absorption by Ionic Liquid Electrospray**
Hidemasa Takana, Koji Kawatani (Tohoku University, Japan), Takayasu Fujino (University of Tsukuba, Japan)
- CRF-38: **High-Speed Imaging of Primary Breakup in Electrosprays**
Noritsune Kawaharada (Leibniz University Hannover, Germany), Hidemasa Takana (Tohoku University, Japan), Friedrich Dinkelacker (Leibniz University Hannover, Germany)
- CRF-39: **Numerical Simulation of Dynamic Derivatives for Mars Airplane Balloon Experiment-2 (MABE-2)**
Masahiro Kanazaki, Hiroto Kittaka (Tokyo Metropolitan University, Japan), Akira Oyama (Japan Aerospace Exploration Agency, Japan), Koji Fujita, Hiroki Nagai (Tohoku University, Japan)
- CRF-40: **Spectroscopy of Shocked Radiating Flows for Re-entry Flight**
Gouji Yamada, Mizuki Kajino, Fumiteru Kikuchi (Tokai University, Japan), Kiyonobu Ohtani (Tohoku University, Japan)
- CRF-41: **Tensile Strength and Fracture Behavior of Single Abaca Fiber**
Zahrul Fuadi, Sabri Sabri, Samsul Rizal, Hiroomi Homma (Syiah Kuala University, Indonesia), Toshiyuki Takagi, Hiroyuki Kosukegawa, Hiroyuki Miki (Tohoku University, Japan)
- CRF-42: **Simulation of Reverse Piezoelectricity in Ferroelectric Polymers by Finsler Geometry Model**
Vladislav Egorov (Cherepovets State University, Russia), Hiroshi Koibuchi (National Institute of Technology, Japan), Olga Maksimova (Cherepovets State University, Russia), Chrystelle Bernard (Tohoku University, Japan), Jean-Marc Chenal (INSA Lyon, France), Lame Oliver (INSA Lyon, France), Gildas Diguët, Gael Sebald (Tohoku University, Japan), Jean Yves Cavaille (INSA Lyon, France), Toshiyuki Takagi (Tohoku University, Japan)

- CRF-43: **Analysis and Modeling of the Transport Properties of the Contact Line Based on the Molecular Dynamics Simulation**
Akinori Fukushima (University of Fukui, Japan), Takashi Tokumasu (Tohoku University, Japan)
- CRF-44: **Internal Defect of Plastic-fabricated Carbon Fiber Reinforced Thermo Plastics**
Yuya Kodaira (Shinshu University, Japan), Toshiyuki Takagi, Hiroyuki Miki, Hiroyuki Kosukegawa (Tohoku University, Japan), Noboru Nakayama (Shinshu University, Japan)
- CRF-45: **In-plane Relation Between Magnesium Oxide Thin Film and Silicon Substrate**
Satoru Kaneko (KISTEC, Japan), Rieko Sudo (Sagamihara Surface Lab., 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, Kayoko Konda, Takashi Tokumasu (Tohoku University, Japan)
- CRF-46: **Experimental and Numerical Study on Unsteady Aerodynamic Characteristics**
Daisuke Sasaki, Takeshi Akasaka, Masato Okamoto, Kentaro Ouchi, Yusuke Shikada, Yuya Yamaguchi, Shota Fukatsu, Akira Shirakawa, Hiroki Oshima (Kanazawa Institute of Technology, Japan), Shigeru Obayashi, Koji Shimoyama (Tohoku University, Japan)
- CRF-47: **A Study of Eigen-Vortical-Axis Line in Hierarchical Flow Scales in Turbulence**
Katsuyuki Nakayama, Hayato Hori (Aichi Institute of Technology, Japan), Yuji Hattori (Tohoku University, Japan)
- CRF-48: **Electron Blocking Layer Based Interfacial Engineering for Improving Triboelectric Performance**
Wook Kim, Jiseop Yu, Hee Jae Hwang (Kyung Hee University, Republic of Korea), Takeru Okada, Seiji Samukawa (Tohoku University, Japan), Dukhyun Choi (Kyung Hee University, Republic of Korea)
- CRF-49: **Numerical Prediction of Flow Characteristics around Moving Objects in Multiphase Flow**
Shun Takahashi, Yusuke Mizuno (Tokai University, Japan), Takayuki Nagata (Tohoku University, Japan), Yuki Kawamoto, Kota Fukuda (Tokai University, Japan), Shigeru Obayashi (Tohoku University, Japan)
- CRF-50: **Application of Two-phase Thermo-fluid Simulation for Accurate Design of Oscillating Heat Pipe**
Kaoru Takemura, Yuki Kawamoto, Shun Takahashi, Hiroaki Nagashima (Tokai University, Japan), Takuya Adachi, Hiroki Nagai (Tohoku University, Japan)

- CRF-51: **Quantitative Density Measurement of Unsteady Flow around Projectile by Colored-Grid Background Oriented Schlieren**
Yusuke Hirose, Takumi Nagashima, Yusuke Yahagi, Masanori Ota (Chiba University, Japan), Shinsuke Udagawa (Tokyo Metropolitan College of Industrial Technology, Japan), Tatsuro Inage, Kazuki Fujita (Shonan Institute of Technology, Japan), Hideki Kiritani, Koji Fujita, Kiyonobu Ohtani, Hiroki Nagai (Tohoku University, Japan)
- CRF-52: **Evaluation of Prediction Method for 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)
- CRF-53: **Triple-phase Contact Line Dynamics of Sticky and Slippery Surfaces**
 Raza Gulfam, Peng Zhang (Shanghai Jiao Tong University, China), Hiroki Nagai (Tohoku University, Japan)
- CRF-54: **Study of Coaxial Inversion Rotor Aimed at Realizing Mars Helicopter**
Hiroki Nagai, Koji Fujita (Tohoku University, Japan), Akira Oyama (JAXA, Japan), Kouichi Yonezawa (Central Research Institute of Electric Power Industry, Japan)
- CRF-55: **Alignment of Cellulose Nanofibrils and Carbon Nanotubes in a Flow Focusing System Assisted by Electric Field**
Heather Wise (University of Washington, USA), Hidemasa Takana (Tohoku University, Japan), Anthony Dichiara (University of Washington, USA)
- CRF-56: **Investigation of LSI Architecture and Analog Memory Devices for Brain-like Systems**
 Kenya Yamashita, Masataka Harada, Takashi Morie (Kyushu Institute of Technology, Japan), Atsushi Tsurumaki-Fukuchi, Masashi Arita, Yasuo Takahashi (Hokkaido University, Japan), Seiji Samukawa (Tohoku University, Japan)
- CRF-57: **Optimization of Airfoil for Mars Exploration Aircraft Propeller**
Kitae Park, Shinkyu Jeong (KyungHee University, Korea), Hiroki Nagai (Tohoku University, Japan)
- CRF-58: **Establishment of High-accuracy Analysis Method of Spacecraft Thermal System using Data Assimilation**
 Hiroki Nagai, Hiroto Tanaka (Tohoku University, Japan), Takashi Misaka (AIST, Japan)
- CRF-59: **Transition to Turbulence in Side-wall Intracranial Aneurysm: A Comparative PIV and LES Study**
 Simon Tupin (Tohoku University, Japan), Khalid M. Saqr (Arab academy for Science, Technology and Maritime Transport, Egypt), Makoto Ohta (Tohoku University, Japan)

- CRF-60: **The Role of Signal-anchor Region of Type II Transmembrane Protein in Subcellular Localization**
Yuri Mukai, Tatsuki Kikegawa, Yuriko Suda, Yuki Kobayashi (Meiji University, Japan), Makoto Ohta (Tohoku University, Japan), Motomichi Doi (AIST, Japan), Kenji Etchuya (Aoyama Gakuin University, Japan)
- CRF-61: **Mechanical Analysis of a Novel Biodegradable Zinc Alloy Stent Based on a Degradation Model**
 Kun Peng, Xinyang Cui, Sicong Liu, Aike Qiao (Beijing University of Technology, China), Hitomi Anzai, Makoto Ohta (Tohoku University, Japan)
- CRF-62: **Large-scale Numerical Analysis of Discharge Active Species Behavior at Plasma-biological Interface**
Satoshi Uchida, Kazuki Toda, Atsushi Kokubu, Shota Yamauchi, Kazuaki Abe (Tokyo Metropolitan University, Japan), Takehiko Sato (Tohoku University, Japan)
- CRF-63: **Investigation of Bioheat Transfer Characteristics of Skin Tumor during Non-invasive Measurement of Thermal Conductivity**
Takahiro Okabe (Hirosaki University, Japan), Taku Fujimura, Junnosuke Okajima (Tohoku University, Japan), Shigenao Maruyama (National Institute of Technology, Hachinohe College, Japan)
- CRF-64: **Numerical Simulations as Evaluation and Planning Method for Cellular Biofluidic Experiments**
Narendra Kurnia Putra (Institut Teknologi Bandung, Indonesia), Zi Wang, Muhammad Shiddiq Sayyid Hashuro, Haoran Wang (Tohoku University, Japan), Suprijanto (Institut Teknologi Bandung, Indonesia), Makoto Ohta, Hitomi Anzai (Tohoku University, Japan)
- CRF-R1: **Micro-combustion of n-Butane for Power Generation Applications**
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-R2: **Microchannel Burners for Energy Production on the Basis of Microcombustion**
Sergey Minaev (Far-Eastern Federal University, Russia), Kaoru Maruta (Tohoku University, Japan), Roman Fursenko (ITAM SB RAS, Russia), Alexander Kirdyashkin (TSC, Russia), Vladimir Gubernov (Lebedev Physical Institute RAS, Russia)
- CRF-R3: **Link Between Tracer and Microseismic Analysis to Comprehensive Understanding of Hydraulic Feature of Fractured Geothermal Reservoir**
Anna Suzuki, Yusuke Mukuhira (Tohoku University, Japan), Roland N. Horne, Ayaka Abe, Adam J. Howkins (Stanford University, USA), Takuya Ishibashi (AIST, Japan), Peter K. Kang (University of Minnesota, USA)
- CRF-J1: **Progress in the Research of Fundamentals and Utilizations of Carbon Free Energy Carriers**
Hideaki Kobayashi (Tohoku University, Japan)

CRF-J2: **Multiphase Flow and Interfacial Transport Phenomena at Phase and Material Boundaries**

Shigeru Obayashi, Seiji Samukawa, Toshiyuki Takagi (Tohoku University, Japan), Hirofumi Wada (Ritsumeikan University, Japan), Takeru Okada, Yutaka Watanabe (Tohoku University, Japan), Mitsuo Hashimoto (Nireco Corporation, Japan), Takashi Iijima (AIST, Japan), Philippe Guy (INSA de Lyon, France), Lalita Udpa (Michigan State University, USA), Yuji Hattori, Hiroki Nagai, Koji Shimoyama, Makoto Hirota, Aiko Yakeno, Gota Kikugawa, Atsuki Komiya, Sho Takeda, Jun Ishimoto, Tetsuya Uchimoto, Hiroyuki Kosukegawa (Tohoku University, Japan)

12:10-13:10 **Lunch and Poster Session** (CRF-1 to 64, CRF-R1 to R3, J1, J2)

Chair: Naoya Ochiai (Tohoku University, Japan)

13:10-14:40 **Short Oral Presentation**

(2.5 min for Short Oral Presentation)

CRF-65: **Characteristics of Jetting from Micro Cavitation Bubbles Under Multiple Pressure Waves**

Satoshi Uehara, Takahito Akimura, Tomoki Nakajima, Kiyonobu Ohtani (Tohoku University, Japan), Outi Supponen, Mohamed Farhat (Ecole Polytechnique Federale de Lausanne, Switzerland), Takehiko Sato (Tohoku University, Japan)

CRF-66: **Measurement of Electrical Charge in Fine Bubbles Generated by Plasma in Water**

Takehiko Sato, Ryo Kumagai, Satoshi Uehara, Tomoki Nakajima, Kiyobu Ohtani (Tohoku University, Japan), Takashi Miyahara (Shizuoka University, Japan), Tatsuyuki Nakatani (Okayama University of Science, Japan)

CRF-67: **Development 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-68: **Effect on Wing Grid for the Aerodynamic Design**

Seiichiro Morizawa (National Institute of Technology, Okinawa College, Japan), Shigeru Obayashi (Tohoku University, Japan)

CRF-69: **Numerical Analysis of Morphing Flaps on High-lift Devices with Pneumatic Controls**

Yuki Kamiyama, Edyta Dzieminska, Shota Hanada (Sophia University, Japan), Aiko Yakeno, Sigeru Obayashi, Yoshiaki Abe (Tohoku University, Japan)

- CRF-70: **Influence of Electric Potential Induced by Atmospheric Pressure Plasma on Cell**
Takamasa Okumura (NIT, Ichinoseki College, Japan), Chia-Hsing Chang, Takehiko Sato (Tohoku University, Japan)
- CRF-71: **Influence of Vanadium on Thermoelectric Properties of $\text{Fe}_2\text{Ti}_{1-x}\text{V}_x\text{Sn}$ Heusler Alloys**
Vladimir Khovaylo, Anastasiya Taranova, Andrey Novitskii, Andrei Voronin, Erzhan Ashim (National University of Science and Technology "MISIS", Russia), Sergei Taskaev (Chelyabinsk State University, Russia), Hiroyuki Miki, Toshiyuki Takagi (Tohoku University, Japan)
- CRF-72: **Experimental Study for Identifying the Singular Point in Airfoil Wakes Dominated by the Global Instability**
Shohei Takagi (Tokyo Metropolitan University), Yasufumi Konishi, Hiroyuki Okuizumi (Tohoku University, Japan), Ayumu Inasawa (Tokyo Metropolitan University, Japan), Shigeru Obayashi (Tohoku University, Japan)
- CRF-73: **Rarefied Gas Simulations Using Quasiparticle Pairs and Exact Solution**
Vladimir Saveliev (Institute of Ionosphere, NCSRT, Kazakhstan), Shigeru Yonemura, Otic John (Tohoku University, Japan)
- CRF-74: **On a Rotating Hollow Cylinder in Flight**
Yusuke Naito (Doshisha University, Japan), Hirochika Tanigawa (Maizuru National College of Technology, Japan), Jun Ishimoto, Masami Nakano (Tohoku University, Japan), Takashi Noguchi, Katsuya Hirata (Doshisha University, Japan)
- CRF-75: **Numerical Study on Air-jet Instruments Compared with Edge Tone**
Sho Iwagami, Ryoya Tabata (Kyushu Institute of Technology, Japan), Taizo Kobayashi (Kyushu University, Japan), Kin'ya Takahashi (Kyushu Institute of Technology, Japan), Yuji Hattori (Tohoku University, Japan)
- CRF-76: **Fluid Flow Analysis of an Atmospheric-pressure Microplasma Ejected from a Narrow Nozzle**
Hiroyuki Yoshiki, Kenji Otsuka (NIT, Tsuruoka College, Japan), Takehiko Sato, Tomoki Nakajima, Satoshi Uehara (Tohoku University, Japan)
- CRF-77: **Measurement of Particle Concentration Profiles of a Dilute Suspension in Different Reynolds Number Conditions**
Misa Kawaguchi, Tomohiro Fukui (Kyoto Institute of Technology, Japan), Kenichi Funamoto (Tohoku University, Japan), Mitsuru Tanaka, Shigeru Murata (Kyoto Institute of Technology, Japan), Suguru Miyauchi, Toshiyuki Hayase (Tohoku University, Japan)
- CRF-78: **Investigation of a Time Response of cntTSP Sensor for a Dynamic Visualization of the Laminar-to-turbulent Boundary Layer Transition**
Daisuke Yorita, Jonathan Lemarechal, Christian Klein (German aerospace Center, Germany), Koji Fujita, Tsubasa Ikami, Hiroki Nagai (Tohoku University)

- CRF-79: **The Stall Characteristics of Ski Jumping Suit Fabric with Different Air Permeability**
Toru Takahashi, Yuki Kataoka, Hiroaki Hasegawa (Utsunomiya University, Japan), Kazuya Seo (Yamagata University, Japan), Shigeru Obayashi (Tohoku University, Japan)
- CRF-80: **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-81: **An Effect of Pressure Rise Time on Shock-Turbulence Interaction**
Takahiro Ukai, Honami Nakagawa (Osaka Institute of Technology, Japan), Kiyonobu Ohtani, Aiko Yakeno (Tohoku University, Japan)
- CRF-82: **A Study on Nano-scale Interfacial Phenomena of Surface-modified Nanoparticle Suspension**
Eita Shoji, Masaki Kubo, Takao Tsukada, Atsuki Komiya, Gota Kikugawa (Tohoku University, Japan)
- CRF-83: **Flow Characteristics of Wall Elasticity in a Full-Scale Patient-Specific Middle Cerebral Aneurysm**
Gaku Tanaka (Chiba University, Japan), Nadia S. Shafii (Universiti Teknologi Malaysia, Malaysia), Gaku Takizawa, Tomoaki Yamazaki (Chiba University), Simon Tupin, Hitomi Anzai (Tohoku University, Japan), Kahar Osman (Universiti Teknologi Malaysia, Malaysia), Ryuhei Yamaguchi, Makoto Ohta (Tohoku University, Japan)
- CRF-84: **Aerodynamics of a Badminton Shuttlecock with Spin**
Masaki Kobayashi, Kenichi Nakagawa, Hiroaki Hasegawa (Utsunomiya University, Japan), Hiroki Nagai (Tohoku University, Japan)
- CRF-85: **Development of Spinning Device Using Filmwise Pumping-up Mechanism with Induction Heating and Rotating Cone**
Shunsuke Omi, Takahiro Adachi, Jun Kanamori (Akita University, Japan), Junnosuke Okajima (Tohoku University, Japan)
- CRF-86: **Instability and Wave Interactions in Helical Vortices**
Yuji Hattori (Tohoku University, Japan), Ivan Delbende (LIMSI, France), Maurice Rossi (Universite de Paris VI, France)
- CRF-87: **Active Control of High-speed Boundary Layer Flows**
Adrian Sescu (Mississippi State University, U.S.A.), Mohammed Z. Afsar (University of Strathclyde, U.K.), Shanti Bhushan (Mississippi State University, U.S.A.), Yuji Hattori, Makoto Hirota (Tohoku University, Japan)

- CRF-88: **Non-scale Up Flow Behavior Visualization Using in Vivo And in Vitro in the Middle Cerebral Artery Aneurysm “Normotensive, Hypertension and Anti-coagulant Effect to Mca Aneurysm Rupture”**
Nadia Shaira binti Shafii (Universiti Teknologi Malaysia, Malaysia), Ryuhei Yamaguchi (Tohoku University, Japan), Muhammad Rashidi Abdul Kadir, Ahmad Zahran Md Khudzari(Universiti Teknologi Malaysia, Malaysia), Gaku Tanaka (Chiba University, Japan), Simon Tupin, Atsushi Saitoh, Makoto Ohta (Tohoku University, Japan), Kahar Osman (Universiti Teknologi Malaysia, Malaysia)
- CRF-89: **Quantum Molecular Dynamics Analysis 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-90: **Flight Attitude Stabilizing by Side-jet Generated by Detached Shock Pulsation**
Toshiharu Mizukaki, Anna Kouno, Yuki Yoshitomi, Fumihiko Iwasaki (Tokai University), Kiyonobu Ohtani (Tohoku University)
- CRF-91: **Numerical Simulation of Flowfields Over Mars Entry Capsules**
Michiko Furudate (Chungnam National University, South Korea), Bok Jik Lee (Seoul National University, South Korea), Nomura Masayuki, Hiroki Nagai (Tohoku University, Japan)
- CRF-92: **Comparison of Data Assimilation Methods in Fluid Problems**
Takashi Misaka (AIST, Japan), Shigeru Obayashi (Tohoku University, Japan)
- CRF-93: **Time-Resolved Pressure Measurement on the Surface of a Supersonic Spherical Projectiles by Using a Bi-Luminophore PSP**
Daiju Numata (Tokai University, Japan), Kiyonobu Ohtani (Tohoku University)
- CRF-94: **Fluid Dynamics and Energy/scalar Transport in Coexisting Flows of Turbulence and Non-turbulence: Cases of Dual-wakes, Grid-turbulence and Complex Jet**
Yasuhiko Sakai, Yasumasa Ito, Koji Iwano (Nagoya University, Japan), Toshiyuki Hayase (Tohoku University, Japan), Yi Zhou (Nanjing University of Science and Technology, China), Jihong Yu, Pravin Ananta Kadu (Nagoya University, Japan)
- CRF-95: **Experimental Feasibility Study on a V/STOL Aircraft with Upper Surface Blowing**
Taiki Okumura, Mizuki Inoue, Kenichi Sakamoto, Hiromitsu Kawazoe (Tottori University, Japan), Shigeru Obayashi (Tohoku University, Japan)
- CRF-96: **Molecular Dynamics Analysis of Surfactant Effect on Water-gas Interface**
Takuma Hori (Tokyo University of Agriculture and Technology, Japan), Gota Kikugawa (Tohoku University, Japan), Ichiro Ueno, Yoichiro Matsumoto (Tokyo University of Science, Japan)

- CRF-97: **Study on Washing Effect for Textile using the Underwater Explosion**
Kazutaka Kitagawa (Aichi Institute of Technology, Japan), Kiyonobu Ohtani, Yasufumi Konishi (Tohoku University, Japan)
- CRF-98: **Surface Pressure Measurements using Two-Color PSP over a Free Flight Object in a Ballistic Range Facility**
Daiki Kurihara, Steven Claucherty, Joseph Gonzales, Hiroataka Sakaue (University of Notre Dame, USA), Hideki Kiritani, Koji Fujita, Hiroki Nagai (Tohoku University, Japan)
- CRF-R4: **High-performance Implementation of Inlet Turbulence Generation for GPU-based Parallel Computation**
Yoshiaki Abe (Tohoku University, Japan), Freddie D. Witherden (Texas A&M University, USA), Giorgio Giangaspero (Imperial College London, UK), Brian Vermeire (Concordia University, Canada), Arvind Iyer, Peter E. Vincent (Imperial College London, UK)
- CRF-J3: **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 Miyachi, Hitomi Anzai (Tohoku University, Japan)

14:40-14:50 Break

14:50-16:20 **Poster Session (CRF-65 to 98, CRF-R4, J3)**

OS20: AFI-2019 IFS Lyon Center Collaborative Research Forum

- OS20-1 **“Elastomer Materials: From Practical Aspects to Fundamental Questions”**
(Invited)
Laurent Chazeau (INSA-Lyon, France)
- OS20-2 **Behavior by Design : a New Way of Thinking About Mechanical Properties**
G. Martin, E. Plancher, L. Héraud, P. Lhuissier, R. Dendievel (Université Grenoble Alpes, France), D. Fabrègue (INSA Lyon, France), JJ. Blandin (Université Grenoble Alpes, France)
- OS20-3 **Coarse-grained Modeling and Monte Carlo Study of Strain Induced Crystallization of Rubbers**
Hiroshi Koibuchi (National Institute of Technology, Sendai College, Japan), Vladislav Egorov, Olga Maximowa (Cherepovets State University, Russian Federation), Chrystelle Bernard (ELyTMaX UMI 3757, CNRS-Université de Lyon, Tohoku University, International Joint Unit / Tohoku University, Japan), Jean-Marc Chenal, Olivier Lame (INSA Lyon, France), Gildas Diguët, Gael Sebald (ELyTMaX UMI 3757, CNRS-Université de Lyon, Tohoku University, International Joint Unit, Japan), Jean-Yves Cavaille (INSA Lyon, France), Toshiyuki Takagi (Tohoku University, Japan), Laurent Chazeau (INSA Lyon, France)
- OS20-4 **Investigation of the Thermal Behavior of In-flight Polymer Particle during Cold-Spray Process**
Chrystelle Bernard (Tohoku University / ELyTMaX UMI 3757, CNRS-Université de Lyon, Tohoku University, International Joint Unit, Japan), Hidemasa Takana (Tohoku University, Japan), Gildas Diguët (ELyTMaX UMI 3757, CNRS-Université de Lyon, Tohoku University, International Joint Unit, Japan), Kesavan Ravi (Tohoku University / ELyTMaX UMI 3757, CNRS-Université de Lyon, Tohoku University, International Joint Unit, Japan), Olivier Lame (INSA Lyon, France), Kazuhiro Ogawa (Tohoku University / ELyTMaX UMI 3757, CNRS-Université de Lyon, Tohoku University, International Joint Unit, Japan), Jean-Yves Cavaille (ELyTMaX UMI 3757, CNRS-Université de Lyon, Tohoku University, International Joint Unit, Japan)
- OS20-5 **Electrical Conductivity Versus Electrostriction in Di-block Polyurethane: New Insights**
Kaori Yuse (INSA Lyon, France), Gildas Diguët, Jean-Yves Cavaille (ELyTMaX UMI 3757, CNRS-Université de Lyon, Tohoku University, International Joint Unit, Japan)
- OS20-6 **Protein Mass Transfer Control by Using Hindered Diffusion in Membrane**
Atsuki Komiya, Ryo Watanabe (Tohoku University, Japan), Sébastien Livi (INSA Lyon, France)
- OS20-7 **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)

- OS20-8 **Multiscale Design for Composite Aircraft Wings** (*Invited*)
Yoshiaki Abe (Tohoku University, Japan), Tomonaga Okabe (Tohoku University, Japan / University of Washington, USA), Shugo Date (Tohoku University, Japan)
- OS20-9 **Stability and Transition to Turbulence of Taylor Vortex in a Gap between Rotating Two Cones**
Takahiro Adachi, Kentaro Usuki (Akita University, Japan), Atsuki Komiya (Tohoku University, Japan), Daniel Henry, Varelly Botton (Lyon University, France)
- OS20-10 **Piping System, Risk Management Based on Wall Thinning Monitoring and Prediction**
Toshiyuki Takagi (Tohoku University / ELyTMaX UMI 3757, CNRS-Université de Lyon, Tohoku University, International Joint Unit, Japan), Philippe Guy (INSA-Lyon, France), Yutaka Watanabe, Hiroshi Abe, Shinji Ebara (Tohoku University, Japan), Tetsuya Uchimoto (Tohoku University / ELyTMaX UMI 3757, CNRS-Université de Lyon, Tohoku University, International Joint Unit, Japan), Takayuki Aoki, Mitsuo Hashimoto, Ryoichi Urayama, Hongjun Sun (Tohoku University, Japan), Thomas Monnier, Jérôme Antoni, Bernard Normand (INSA-Lyon, France), Nicolas Mary (ELyTMaX UMI 3757, CNRS-Université de Lyon, Tohoku University, International Joint Unit, Japan), Ryo Morita, Shun Watanabe (Central Research Institute of Electric Power Industry, Japan), Atsushi Iwasaki (Gunma University, Japan), Hiroyuki Nakamoto (Kobe University, Japan), Christophe Reboud, Pierre Calmon, Edouard Demaldent, Vahan Baronian, Xavier Artusi, Sylvain Chatillon, Alain Lhemery (CEA-LIST, France)
- OS20-11 **Coupled Computing of Fluid-Structure Interaction Problems for Multiphase Energy Systems**
Jun Ishimoto (Tohoku University, Japan), Thomas Elguedj (INSA de Lyon, France)
- OS20-12 **Back Surface Roughness Measurement Based on Attenuation of Ultrasonic Wave**
Hiroyuki Nakamoto (Kobe University, Japan), Philippe Guy (INSA de Lyon, France), Toshiyuki Takagi, Tetsuya Uchimoto (Tohoku University / ELyTMaX UMI 3757, CNRS-Université de Lyon, Tohoku University, International Joint Unit, Japan), Kazuya Hamaguchi (Hyogo Prefectural Institute of Technology, Japan)
- OS20-13 **Monitoring the Damage of the Polymers by Non-destructive Control**
Lucas Ollivier-Lamarque, Tetsuya Uchimoto (Tohoku University / ELyTMaX, Japan), Nicolas Mary (ELyTMaX, Japan), Sabrina Marcelin, Benoit Ter-Ovanessian, Sébastien Livi (INSA Lyon, France)

OS20-14 **Modelling Materials Behavior for Advanced Electromagnetic Non Destructive Testing Techniques**

Bhaawan Gupta (ELyTMaX UMI 3757, CNRS-Université de Lyon, Tohoku University, International Joint Unit, Japan / INSA-Lyon, France / Tohoku University, Japan), Gael Sebald (ELyTMaX UMI 3757, CNRS-Université de Lyon, Tohoku University, International Joint Unit, Japan), Benjamin Ducharne (INSA-Lyon, France), Tetsuya Uchimoto, Toshiyuki Takagi (ELyTMaX UMI 3757, CNRS-Université de Lyon, Tohoku University, International Joint Unit / Tohoku University, Japan)

Fluid Science Research Award Lecture

TACHIBANA

November 7, 2019

Chair: Shigeru Obayashi (Tohoku University, Japan)

16:30- **Quantum Turbulence**

16:55 Makoto Tsubota (Osaka City University, Japan)

17:00- **Development of Flow Visualization for PVA-H Biomodel**

17:25 Makoto Ohta (Tohoku University, Japan)

17:30- **Polymers based materials: between Fluids and Solids**

17:55 Jean-Yves Cavaille (INSA, France / Tohoku University, Japan)