

# **JSSUME2018 HAMAMATSU**

**15<sup>th</sup> Joint Symposium between Sister Universities  
in Mechanical Engineering**

**August 18(Sat.)-20(Mon.), 2018**

**Shizuoka University, Japan**

Organized by

**Shizuoka University, Japan**

Co-organized by

**Nagasaki University, Japan**

**Yeungnam University, Korea**

**Yokohama National University, Japan**

Supported by

**Hamamatsu and Lake Hamana Tourism Bureau**

**Suzuki Foundation**

**Engineering Promotion Fund in Shizuoka University**

# Overall Schedule

August 18(Sat.)

19:00-21:00 Welcome Party

August 19(Sun.)

9:00- Registration

9:30-17:00 Technical Sessions

18:00-20:00 Banquet

August 20(Mon.)

10:00- Committee Meeting

## Program of Technical Sessions

August 19(Sun.)

	Room A	Room B	Room C	Room D
9:30-				
10:45-	Fluid Engineering I	Advanced Measurement I	Advanced Materials I	Machinery and Control I
11:00-				
12:00-	Fluid Engineering II	Advanced Measurement II	Advanced Materials II	Machinery and Control II
13:00-	Lunch Break			
14:15-	Plenary			
14:30-				
15:30-	Flow and Aerodynamics I	Thermal Engineering I	Mechanics of Materials I	Human and Bio-Engineering I
15:45-				
17:00-	Flow and Aerodynamics II	Thermal Engineering II	Mechanics of Materials II	Human and Bio-Engineering II
18:00-	Banquet in Hotel Concorde Hamamatsu			

**Plenary Lecture** (Chair: Mitsuhiro Fukuta, Shizuoka University)

**13:00-14:15 Room A**

**Space Elevator; Its Research and Development at Present**

*Yoshiki Yamagiwa (Shizuoka University)*

# Technical Sessions (August 19th)

## **Fluid Engineering I** (Chair: Dong Jin Kang, Yeungnam University)

**9:30-10:45 Room A**

### **[Keynote] Automatic differentiation for helmholtz type equation of state**

*Tomohiko Yamaguchi\* (Nagasaki University), Satoru Momoki (Nagasaki University)*

### **Influence of lubricant oil on flow pattern of refrigerant in a narrow tube**

*Katsuya Nishihata\* (Shizuoka University), Mitsuhiro Fukuta (Shizuoka University), Masaaki Motozawa (Shizuoka University)*

### **Interaction of a pair of slightly different size bubbles rising in-line**

*Hiroya Yamamoto\* (Shizuoka University), Toshiyuki Sanada (Shizuoka University)*

### **Verification of the friction mechanism between PVA brush and contacting surface using total reflection method**

*Masanao Hanai\* (Shizuoka University), Toshiyuki Sanada (Shizuoka University), Akira Fukunaga (Ebara Corporation), Hirokuni Hiyama (Ebara Corporation)*

### **Effects of temperature on torques and its temporal fluctuation generated during PVA brush rotation**

*Keishi Yamada\* (Shizuoka University), Toshiyuki Sanada (Shizuoka University), Akira Fukunaga (Ebara Corporation), Hirokuni Hiyama (Ebara Corporation)*

## **Fluid Engineering II** (Chair: Yasushi Kakimoto, Shizuoka University)

**11:00-12:00 Room A**

### **Optimization of a Recirculation Flow Type Casing Treatment with Guide Vanes for Centrifugal Compressors**

*Binbin Cheng\* (Nagasaki University), Shouta Miyashita (Nagasaki University), Daisaku Sakaguchi (Nagasaki University)*

### **Optimization of an Aerofoil Type Diffuser for Centrifugal Compressors**

*Ryota Ishihara\* (Nagasaki University), Yusuke Kawachi (Nagasaki University), Yoshiki Ishibashi (Nagasaki University), Daisaku Sakaguchi (Nagasaki University)*

### **Application of maximum bubble pressure on inspection of clustering structure in magnetic fluid**

*Soichiro Ishii\* (Shizuoka University), Masaaki Motozawa (Shizuoka University), Mitsuhiro Fukuta (Shizuoka University)*

## **Numerical study of multiphase droplet migration by OpenFOAM**

*Fan Bai\** (Yeungnam University), *Hongna Zhang* (Sun Yat-Sen University), *Sang Woo Joo* (Yeungnam University)

## **Flow and Aerodynamics I (Chair: Daisaku Sakaguchi, Nagasaki University)**

### **14:30-15:30 Room A**

#### **Wind Tunnel Experiment on Slender Body Aerodynamics with Asymmetric Protuberances at Mach 1.5**

*Kazuaki Kawauchi\** (Yokohama National University), *Toshiaki Harada* (Yokohama National University), *Keiichi Kitamura* (Yokohama National University), *Satoshi Nonaka* (JAXA)

#### **The Influences of Band-Support-Structure of Rigid Supersonic Parachute on Its Surface Flow-field and Drag Coefficient**

*Kanta Fukumoto\** (Yokohama National University), *Keiichi Kitamura* (Yokohama National University), *Kouichi Mori* (Nagoya University), *Ryota Kurata* (Nagoya University)

#### **Pressure Loss Prediction of a Heat Exchanger under Frosting Condition Using a Model Made with a 3D printer**

*Shu Takachi\** (Shizuoka University), *Katsuyoshi Fukiba* (Shizuoka University), *Sun Han* (Nagoya University)

#### **Numerical Study of Aerodynamic Performance of a Quadcopter Propeller**

*Joong Ho Kim\** (Yeungnam University), *Dong Jin Kang* (Yeungnam University)

## **Flow and Aerodynamics II (Chair: Toshiyuki Sanada, Shizuoka University)**

### **15:45-17:00 Room A**

#### **Numerical study on flow characteristics for cross flow fan**

*Atushi Takahashi\** (Shizuoka University), *Yasushi Kakimoto* (Shizuoka University)

#### **Study on numerical analysis of Thermal creep flow on the edge of thin plate**

*Hiroki Tanaka\** (Yokohama National University), *Hiroaki Matsumoto* (Yokohama National University), *Takayuki Morokuma* (Yokohama National University)

#### **Numerical Analysis of thermal induced flow in the free molecular limit**

*Shohei Okano\** (Yokohama National University), *Hiroaki Matsumoto* (Yokohama National University), *Takayuki Morokuma* (Yokohama National University)

### **Study on the flow system based on Thermal induced flow**

*Kento Koga\** (Yokohama National University), *Hiroaki Matsumoto* (Yokohama National University),  
*Takayuki Morokuma* (Yokohama National University)

### **Experiment of thermal convection using a phase-changing fluid**

*Yoji Inoue\** (Shizuoka University), *Takashi Mashiko* (Shizuoka University), *Yuki Sakurai* (Shizuoka University), *Ichiro Kumagai* (Meisei University)

## **Advanced Measurement I (Chair: Yoshihiko Sano, Shizuoka University)**

### **9:30-10:45 Room B**

#### **Evaluation of Launch Performance of Laser Propulsion Considering Energy Loss due to Beam Expansion**

*Tomoki Kamei\** (Shizuoka University), *Takahiro Ono* (Shizuoka University), *Makoto Matsui* (Shizuoka University), *Koichi Mori* (Nagoya University)

#### **Evaluation of Sensitivity and Time Resolution in Electron Density Measurement using CO2 laser**

*Takashi Okamoto\** (Shizuoka University), *Makoto Mastui* (Shizuoka University)

#### **Investigation of generation and emission intensity of sonoluminescence using phosphoric acid**

*Ryoma Hara\** (Shizuoka University), *Makoto Matsui* (Shizuoka University)

#### **Development of an Apparatus for In-line Total Inspection of Burr and Dimension**

*Yosuke Miyazaki\** (Nagasaki University), *Takanori Yazawa* (Nagasaki University), *Tatsuki Otsubo* (Nagasaki University), *Hiroki Tokunaga* (Panasonic Co.,Ltd.)

#### **Torsion, strain, and temperature sensor based on helical long-period fiber gratings**

*Kota Tanaka\** (Shizuoka University), *Ranmanathan Subramanian* (Shizuoka University), *Hongpu Li* (Shizuoka University)

## **Advanced Measurement II (Chair: Moghtada Mobedi, Shizuoka University)**

### **11:00-12:00 Room B**

#### **Observation of liquid infiltration into a closed-end hole by acoustic wave irradiation**

*Yuuki Furuya\** (Shizuoka University), *Hiroki Tameike* (Shizuoka University), *Toshiyuki Sanada* (Shizuoka University)

#### **Study on visualization of thickness distribution of the various liquid film during bubble coalescence process**

*Shogo Kato\** (Yokohama National University), *Takayuki Morokuma* (Yokohama National University),  
*Hiroaki Matsumoto* (Yokohama National University)

## **Observation Study on Foaming Phenomenon of Lubrication Oil During Startup Period**

*Tengku Mohamad Faris\* (Shizuoka University), Mitsuhiro Fukuta (Shizuoka University), Masaaki Motozawa (Shizuoka University)*

## **Thermal Engineering I (Chair: Takuto Araki, Yokohama National University)**

### **14:30-15:30 Room B**

#### **Soot Formation from a Gasoline Surrogate Fuel behind a Reflected Shock Wave**

*Mariko Tanaka\* (Yokohama National University), Yuki Nagata (Yokohama National University), Kazuhiro Ishii (Yokohama National University), Yoshimitsu Kobashi (Hokkaido University)*

#### **A Study on Rotating Detonation Engines Using Different Chamber Sizes**

*Wataru Kurata\* (Yokohama National University), Haruhiro Kawana (Yokohama National University), Kazuhiro Ishii (Yokohama National University)*

#### **Effects on Wall Temperature of a Shock Tube on Spontaneous Ignition**

*Yuuki Mitamura\* (Yokohama National University), Kazuhiro Ishii (Yokohama National University)*

#### **Simulation of flame phenomenon near vertical wall using FDS**

*Yuichirou Ambe\* (Nagasaki University), Syunsuke Hirakawa (Nagasaki Prefectural Police), Ryuichirou Uchino (Nagasaki Prefectural Police), Hideki Maruta (Nagasaki Prefectural Police), Akihide Saimoto (Nagasaki University)*

## **Thermal Engineering II (Chair: Tomohiko Yamaguchi, Nagasaki University)**

### **15:45-17:00 Room B**

#### **Effects of the existence of MPL and GDL porosity to the local temperature and water distribution in the PEFC**

*Kaito Shigemasa\* (Yokohama National University), Takuto Araki (Yokohama National University)*

#### **Numerical Analysis of Water Freezing at Cold Startup of Polymer Electrolyte Fuel Cells**

*Satoshi Nishimura\* (Yokohama National University), Shoki Inoue (Yokohama National University), Yusuke Tamada (Yokohama National University), Yota Otsuki (Yokohama National University), Takuto Araki (Yokohama National University)*

#### **An experimental study of drying process in a porous material**

*Ayato Takeda\* (Shizuoka University), Yoshihiko Sano (Shizuoka University), Fujio Kuwahara (Shizuoka University)*

**Three-dimensional numerical solution procedure for conduction-convection conjugate problems associated with complex geometrical configurations using Cartesian coordinate**

*Keisuke Kurita\* (Shizuoka University), Yoshihiko Sano (Shizuoka University), Fujio Kuwahara (Shizuoka University), Akira Nakayama (Shizuoka University)*

**Developing Criteria for Evaluation of Solid/liquid Phase Change Material Heat Exchangers**

*Chunyang Wang\* (Shizuoka University), Moghtada Mobedi (Shizuoka University), Fujio Kuwahara (Shizuoka University), Akira Nakayama (Shizuoka University, Wuhan Polytechnic University)*

**Advanced Materials I (Chair: Yoshinobu Shimamura, Shizuoka University)**

**9:30-10:45 Room C**

**[Keynote] Conductive Films of Sonicated MWCNTs on Stretchable Substrates**

*Vineet Kumar\* (Yeungnam University), Dong-Joo Lee (Yeungnam University)*

**Measurement of kinetic-inductance nonlinearity in an NbTiN thin film toward a novel superconducting-magnetometer development**

*Hitomi Maeda\* (Shizuoka University), Keita Takeshita (Shizuoka University), Masanori Takeda (Shizuoka University), Hirataka Terai (NICT)*

**Facile method for enhancing conductivity of printed carbon nanotubes electrode via simple rinsing process**

*Xinlin Li\* (Yeungnam University), Keon-Woo Kim (Yeungnam University), Sang Woo Joo (Yeungnam University), Junseok Seo (Korea National University of Transportation), Jihoon Lee (Korea National University of Transportation), Tae Kyu An (Korea National University of Transportation), Se Hyun Kim (Yeungnam University)*

**Electrical properties of large area MoS<sub>2</sub>: P thin film prepared by sulfurizing Mo thin film by CVD method**

*Tomohiro Momose\* (Shizuoka University), Atsushi Nakamura (Shizuoka University)*

**An Experimental Study on the imprinting process in cold working for making printed electrical components**

*Jaehun Chung\* (Yeungnam University), Cheonghwan Lee (Yeungnam University), Cheolho Bai (Yeungnam University), Jaesool Shim (Yeungnam University)*

## **Advanced Materials II** (Chair: Dong Joo Lee, Yeungnam University)

**11:00-12:00 Room C**

### **Resistance welding of carbon fiber reinforced thermoplastics by using unidirectionally aligned carbon nanotube sheet**

*Yuhi Suzuki\* (Shizuoka University), Hiroaki Okabe (Shizuoka University), Yoshinobu Shimamura (Shizuoka University), Keiichiro Tohgo (Shizuoka University), Tomoyuki Fujii (Shizuoka University)*

### **The Change of Fiber Diameter with Voltage Variation in Electrospinning**

*Ting Dong\* (Yeungnam University), Tae Jo Ko (Yeungnam University), Min Cheol Kim (Yeungnam University), Waqas Ul Arifeen (Yeungnam University)*

### **New Method for Curing Process of Carbon Fiber Reinforced Polymer by Using PMECH Method**

*Kazuhiro Takeda\* (Shizuoka University), Muhammad Irfan Bin Rosman (Akita University), Osamu Kamiya (Akita University), Motoi Fujishima (Akita Industrial Technology Center), Rie Nobe (Akita Industrial Technology Center)*

### **Stretchable Transparent Electrodes for Wearable Electronic Equipment**

*Jihyo Yang\* (Yeungnam University), Kisoo Yoo (Yeungnam University)*

## **Mechanics of Materials I** (Chair: Akihide Saimoto, Nagasaki University)

**14:30-15:30 Room C**

### **[Keynote] Multiscale Fracture Mechanics Modeling for Predicting Fatigue Crack Growth of Polymer Nanocomposites**

*Hyunseong Shin\* (Yeungnam University), Maenghyo Cho (Seoul National University)*

### **Nucleation of stress corrosion cracking in stainless steel based on surface strain distribution**

*Ryohei Yamakawa\* (Shizuoka University), Tomoyuki Fujii (Shizuoka University), Keiichiro Tohgo (Shizuoka University), Yoshinobu Shimamura (Shizuoka University)*

### **Monte Carlo simulation of stress corrosion cracking on surface with welding defects of Ni-based alloy**

*Naoya Ogasawara\* (Shizuoka University), Tomoyuki Fujii (Shizuoka University), Keiichiro Tohgo (Shizuoka University), Yoshinobu Shimamura (Shizuoka University), Yohei Sakakibara (IHI Corporation), Gen Nakayama (IHI Corporation)*

### **Mechanical properties of an interface between stainless steel and pure titanium fabricated by SPS**

*Masaki Suzuki\* (Shizuoka University), Tomoyuki Fujii (Shizuoka University), Keiichiro Tohgo (Shizuoka University), Yoshinobu Shimamura (Shizuoka University)*

## **Mechanics of Materials II** (Chair: Tomoyuki Fujii, Shizuoka University)

**15:45-17:00 Room C**

### **[Keynote] Interference effect among parallel-aligned planar surface cracks**

*Akihide Saimoto\* (Nagasaki University)*

### **A Mesh-Free Analysis of Planar Crack under Thermal Stresses due to Heat Source**

*Yohei Sonobe\* (Nagasaki University), Akihide Saimoto (Nagasaki University)*

### **Preparation and Mechanical Properties of Nanomaterial-embedded Elastomer Composites**

*Youngno Seo\* (Yeungnam University), Jungwook Choi (Yeungnam University)*

### **Study on thermal radiation characteristics of Deployable Cube**

*Kazunari Toda\* (Shizuoka University), Shoko Arita (Shizuoka University), Yoshiki Yamagiwa (Shizuoka University), Itsuki Fukuta (Shizuoka University)*

### **Influence of specimen thickness on fatigue behavior of a steel subjected to alternative bending**

*Masafumi Fujioka\* (Shizuoka University), Tomoyuki Fujii (Shizuoka University), Keiichiro Tohgo (Shizuoka University), Muhamad Safwan Bin Muhamad Azmi (Universiti Malaysia Perlis), Yoshinobu Shimamura (Shizuoka University)*

## **Machinery and Control I** (Chair: Byeongil Kim, Yeungnam University)

**9:30-10:45 Room D**

### **Effect of wedge angle to the performance electro mechanical brakes**

*Jeong Hun Park\* (Yeungnam University), Sang Shin Park (Yeungnam University)*

### **A study of gear noise in relation to teeth meshing observed by photoelastic technique**

*Takeshi Suzuki\* (Yokohama National University), Shin Morishita (Yokohama National University)*

### **Active Handling Feel Modulation Based on Robust Admittance Control for a Steer-By-Wire System**

*Chansu Jung\* (Yeungnam University), Kanghyun Nam (Yeungnam University)*

### **Small Autonomous Vehicle Design for University Student Competition in Korea**

*Chanjong Jang\* (Yeungnam University), Pyung Hwang (Yeungnam University), Hyoyun Kim (Yeungnam University), Daewhan Ki (Yeungnam University), Daekyun Park (Yeungnam University), Seoyeong Park (Yeungnam University)*

## **Machinery and Control II** (Chair: Atsushi Nakamura, Shizuoka University)

**11:00-12:00** Room D

### **[Keynote] Design of Ultra-High Speed Permanent Magnet Machine Considering Speed Response Characteristics**

*Myung-Seop Lim\* (Yeungnam University)*

### **Experimental Analysis of Beam depending on Passive Patch Location**

*Kyeongnak Lee\* (Yeungnam University), Byeongil Kim (Yeungnam University)*

### **Development of an Automatic Cable Inspection Robot for Cable-Stayed Bridge**

*Shinji Yamaguchi\* (Nagasaki University), Ikuo Yamamoto (Nagasaki University), Shozo Nakamura (Nagasaki University), Youichi Simomoto (Nagasaki University), Murray Lawn (Nagasaki University), Takuya Sakuragi (Nagasaki University), Tsuyosi Fujiki (Chodai Co.LTD), Shinobu Kakehashi (Chodai Co.LTD), Takatoshi Miura (Chodai Co.LTD), Rin Shueyoshi (Kyouwakiden Industry Co.LTD), Sumio Sakai (Kyouwakiden Industry Co.LTD), Sadaharu Nakashima (Kyouwakiden Industry Co.LTD)*

### **Effectiveness of autonomous speed control using inter-vehicle communication on crossing roads**

*Ryo Iwase\* (Shizuoka University), Yuichi Kobayashi (Shizuoka University), Takashi Mashiko (Shizuoka University), Susumu Ishihara (Shizuoka University)*

## **Human and Bio-Engineering I** (Chair: Takashi Mashiko, Shizuoka University)

**14:30-15:30** Room D

### **Surface modification of polystyrene in ammonia environment with ultraviolet light irradiation**

*Hitoshi Miyazaki\* (Shizuoka University), Kazunari Takahashi (Tokai University), Kazuki Hosoya (Tokai University), Satoru Iwamori (Tokai University)*

### **Effects of Mechanical Vibration on Cultured Cells to Regenerate Cartilage**

*Tomoaki Nozawa\* (Yokohama National University), Toshihiko Shiraishi (Yokohama National University)*

### **Effects of Mechanical Vibration on Cultured Nerve Cells**

*Yuto Hoshi\* (Yokohama National University), Toshihiko Shiraishi (Yokohama National University)*

### **Numerical simulation of mass transport phenomenon in an On-line HDF**

*Ryusei Iida\* (Shizuoka University), Yoshihiko Sano (Shizuoka University), Fujio Kuwahara (Shizuoka University)*

## **Human and Bio-Engineering II (Chair: Takanori Yazawa, Nagasaki University)**

**15:45-17:00 Room D**

### **Development of air-urethane combination mattress**

*Kodai Matsuyama\* (Shizuoka University), Takashi Mashiko (Shizuoka University), Yasushi Kakimoto (Shizuoka University)*

### **Design of a Force Field Control Device by Acoustic Holography for Ultrasound Therapy**

*Kazuaki Miyamoto\* (Yokohama National University), Toshihiko Shiraishi (Yokohama National University)*

### **A Study of Trapping Objects by Acoustic Holography**

*Takatoshi Hase\* (Yokohama National University), Toshihiko Shiraishi (Yokohama National University)*

### **Influence of magnetic field on clogging phenomena of magnetic fluid flow in micro channel**

*Shunsuke Seto\* (Shizuoka University), Masaaki Motozawa (Shizuoka University), Mitsuhiro Fukuta (Shizuoka University)*