

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

# Technical Sessions (August 19th)

## Plenary (Chair: Mitsuhiro Fukuta, Shizuoka Univ.)

13:00-14:15 Room A

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

*Yoshiki Yamagiwa*

## Fluid Engineering I (Chair: TBD)

9:30-10:45 Room A

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

*Tomohiko Yamaguchi\*, Satoru Momoki*

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

*Katsuya Nishihata\*, Mitsuhiro Fukuta, Masaaki Motozawa*

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

*Hiroya Yamamoto\*, Toshiyuki Sanada*

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

*Masanao Hanai\*, Toshiyuki Sanada, Akira Fukunaga, Hirokuni Hiyama*

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

*Keishi Yamada\*. Toshiyuki Sanada, Akira Fukunaga, Hirokuni Hiyama*

## Fluid Engineering II (Chair: TBD)

11:00-12:00 Room A

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

*Cheng BinBin\*, Shouta Miyashita, Daisaku Sakaguchi*

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

*Ryota Ishihara\*, Yusuke Kawachi, Yoshiki Ishibashi, Daisaku Sakaguchi*

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

*Soichiro Ishii\*, Masaaki Motozawa, Mituhiro Fukuta*

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

*Fan Bai\*, Hongna Zhang, Sang Woo Joo*

## **Flow and Aerodynamics I (Chair: TBD)**

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

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

*Kazuaki Kawauchi\*, Toshiaki Harada, Keiichi Kitamura, Satoshi Nonaka*

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

*Kanta Fukumoto\*, Keiichi Kitamura, Kouichi Mori, Ryota Kurata*

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

*Shu Takachi\*, Katsuyoshi Fukiba, Sun Han*

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

*Joong Ho Kim\*, Dong Jin Kang*

## **Flow and Aerodynamics II (Chair: TBD)**

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

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

*Atushi Takahashi\*, Yasushi Kakimoto*

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

*Hiroki Tanaka\*, Hiroaki Matsumoto, Takayuki Morokuma*

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

*Shohei Okano\*, Hiroaki Matsumoto, Takayuki Morokuma*

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

*Kento Koga\*, Hiroaki Matsumoto, Takayuki Morokuma*

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

*Yoji Inoue\*, Takashi Mashiko, Yuki Sakurai, Ichiro Kumagai*

## **Advanced Measurement I (Chair: TBD)**

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

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

*Tomoki Kamei\*, Takahiro Ono, Makoto Matsui, Koichi Mori*

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

*Takashi Okamoto\*, Makoto Mastui*

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

*Ryoma Hara\*, Makoto Matsui*

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

*Yosuke Miyazaki\*, Takanori Yazawa, Tatsuki Otsubo, Hiroki Tokunaga*

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

*Kota Tanaka\*, Ranmanathan Subramanian, Hongpu Li*

## **Advanced Measurement II (Chair: TBD)**

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

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

*Yuuki Furuya\*, Hiroki Tameike, Toshiyuki Sanada*

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

*Shogo Kato\*, Takayuki Morokuma, Hiroaki Matsumoto*

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

*Tengku Mohamad Faris Tengku Salehudin\*, Mitsuhiro Fukuta, Masaaki Motozawa*

## **Thermal Engineering I (Chair: TBD)**

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

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

*Mariko Tanaka\*, Yuki Nagata, Kazuhiro Ishii, Yoshimitsu Kobashi*

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

*Wataru Kurata\*, Haruhiro Kawana, Kazuhiro Ishii*

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

*Yuuki Mitamura\*, Kazuhiro Ishii*

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

*Yuichirou Ambe\*, Syunsuke Hirakawa, Ryuichirou Uchino, Hideki Maruta, Akihide Saimoto*

## **Thermal Engineering II (Chair: TBD)**

**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\*, Takuto Araki*

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

*Satoshi Nishimura\*, Shoki Inoue, Yusuke Tamada, Yota Otsuki, Takuto Araki*

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

*Ayato Takeda\*, Yoshihiko Sano, Fujio Kuwahara*

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

*Keisuke Kurita\*, Yoshihiko Sano, Fujio Kuwahara, Akira Nakayama*

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

*Chunyang Wang\*, Moghtada Mobedi, Fujio Kuwahara, Akira Nakayama*

## **Advanced Materials I (Chair: TBD)**

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

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

*Vineet Kumar\*, Dong-Joo Lee*

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

*Hitomi Maeda\*, Keita Takeshita, Masanori Takeda and Hirataka Terai*

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

*Xinlin Li\*, Keon-Woo Kim, Sang Woo Joo, Junseok Seo, Jihoon Lee, Tae Kyu An, Se Hyun Kim*

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

*Tomohiro Momose\*, Atsushi Nakamura*

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

*Jaehun Chung\*, Cheongwan Lee, Cheolho Bai, Jaesool Shim*

## **Advanced Materials II (Chair: TBD)**

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

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

*Yuhi Suzuki\*, Hiroaki Okabe, Yoshinobu Shimamura, Keiichiro Tohgo, Tomoyuki Fujii*

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

*Ting Dong\*, Tae Jo Ko, Min Cheol Kim, Waqas Ul Arifeen*

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

*Kazuhiro Takeda\*, Muhammad Irfan, Bin Rosman, Osamu Kamiya, Motoi Fujishima, Rie Nobe*

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

*Jihyo Yang\*, Kisoo Yoo*

## **Mechanics of Materials I** (Chair: TBD)

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

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

*Hyunseong Shin\*, Maenghyo Cho*

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

*Ryohei Yamakawa\*, Tomoyuki Fujii, Keiichiro Tohgo, Yoshinobu Shimamura*

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

*Naoya Ogasawara\*, Tomoyuki Fujii, Keiichiro Tohgo, Yoshinobu Shimamura, Yohei Sakakibara, Gen Nakayama*

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

*Masaki Suzuki\*, Tomoyuki Fujii, Keiichiro Tohgo, Yoshinobu Shimamura*

## **Mechanics of Materials II** (Chair: TBD)

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

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

*Akihide Saimoto\**

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

*Yohei Sonobe\*, Akihide Saimoto*

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

*Youngno Seo\*, Jungwook Choi*

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

*Kazunari Toda\*, Shoko Arita, Yoshiki Yamagiwa, Itsuki Fukuta*

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

*Masafumi Fujioka\*, Tomoyuki Fujii, Keiichiro Tohgo, Muhamad Safwan Bin Muhamad Azmi, Yoshinobu Shimamura*



## **Machinery and Control I (Chair: TBD)**

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

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

*Jeong Hun Park\*, Sang Shin Park*

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

*Takeshi Suzuki\*, Shin Morishita*

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

*Chansu Jung\*, Kanghyun Nam*

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

*Chanjong Jang\*, Pyung Hwang, Hyoyun Kim, Daewhan Ki, Daekyun Park, Seoyeong Park*

## **Machinery and Control II (Chair: TBD)**

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

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

*Myung-Seop Lim\**

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

*Kyeongnak Lee\*, Byeongil Kim*

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

*Shinji Yamaguchi\*, Ikuo Yamamoto, Shozo Nakamura, Youichi Simomoto, Murray Lawn, Takuya Sakuragi, Tsuyosi Fujiki, Shinobu Kakehashi, Takatoshi Miura, Rin Shueyoshi, Sumio Sakai, Sadaharu Nakashima*

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

*Ryo Iwase\*, Yuichi Kobayashi, Takashi Mashiko, Susumu Ishihara*

## **Human and Bio-Engineering I (Chair: TBD)**

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

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

*Hitoshi Miyazaki\*, Kazunari Takahashi, Kazuki Hosoya, Satoru Iwamori*

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

*Tomoaki Nozawa\*, Toshihiko Shiraishi*

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

*Yuto Hoshi\*, Toshihiko Shiraishi*

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

*Ryusei Iida\*, Yoshihiko Sano, Fujio Kuwahara*

## **Human and Bio-Engineering II (Chair: TBD)**

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

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

*Kodai Matsuyama\*, Takashi Mashiko, Yasushi Kakimoto*

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

*Kazuaki Miyamoto\*, Toshihiko Shiraishi*

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

*Takatoshi Hase\*, Toshihiko Shiraishi*

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

*Shunsuke Seto\*, Masaaki Motozawa, Mitsuhiro Fukuta*