The 19th Annual Conference on
Liquid Atomization and Spray Systems - ASIA

October 18th (Wed.) ~ 21st (Sat.), 2017
Seogwipo KAL Hotel, Jeju, Korea

Technical Program
Overview of ILASS-ASIA 2017

The 19th Annual Conference on Liquid Atomization and Spray Systems - ASIA

- Title: 19th Annual Conference on Liquid Atomization and Spray Systems - Asia
- Dates: October 18th (Wed.) ~ 21st (Sat.), 2017
- Venue: Seogwipo KAL Hotel, Jeju, Korea
- Official Language: English
- ILASS-ASIA Members: China (ILASS-China), Japan (ILASS-Japan), Korea (ILASS-Korea), Taiwan (ILASS-Taiwan), India (ILASS-India) and other Asian countries
Conference Chairman

Prof. Choongsik Bae (Korea Advanced Institute of Science and Technology, Korea)

Committee Member

Prof. Mun Soo Chon (Korea National University of Transportation, Korea)
Dr. Hyun Chul Kim (Korea Automotive Technology Institute, Korea)
Dr. Seungmook Oh (Korea Institute of Machinery & Materials, Korea)
Dr. Yonggyu Lee (Korea Institute of Machinery & Materials, Korea)
Prof. Sungwook Park (Hanyang University, Korea)
Prof. Suhan Park (Chonnam National University, Korea)
Prof. Jung Goo Hong (Kyungpook National University, Korea)
### October 18, 2017 (Wednesday)

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<th>Time</th>
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<tbody>
<tr>
<td>17:00</td>
<td>Welcome Reception</td>
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### October 19, 2017 (Thursday)

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<tr>
<td>08:00</td>
<td>Registration</td>
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<tr>
<td>09:00</td>
<td>Opening Ceremony</td>
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<tr>
<td>09:30</td>
<td>Keynote Speech I, II (USA, Taiwan)</td>
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<td>10:50</td>
<td>Coffee Break</td>
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<tr>
<td>11:10</td>
<td>(Session A)</td>
<td>Flow &amp; Injection</td>
<td>Droplet (I)</td>
<td>Combustion (I)</td>
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<tr>
<td>12:00</td>
<td>Lunch</td>
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<tr>
<td>13:00-13:30</td>
<td>ILASS-Korea Annual General Meeting</td>
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<td>14:50</td>
<td>Coffee Break</td>
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<tr>
<td>15:10</td>
<td>(Session C)</td>
<td>Spray Behavior &amp; Atomization (I)</td>
<td>Breakup &amp; Atomization (I)</td>
<td>Impingement Spray</td>
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<td>16:30</td>
<td>Coffee Break</td>
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<tr>
<td>16:50</td>
<td>(Session D)</td>
<td>Spray Behavior &amp; Atomization (II)</td>
<td>Breakup &amp; Atomization (II)</td>
<td>Modeling (I)</td>
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<tr>
<td>18:10</td>
<td>Coffee Break</td>
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<tr>
<td>18:20</td>
<td>Coffee Break</td>
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<tr>
<td>18:30</td>
<td>Banquet</td>
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- 4 -
### October 20, 2017 (Friday)

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<td>Registration</td>
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<tr>
<td>09:00 ~ 11:00</td>
<td>Keynote Speech III, IV, V (Korea, Japan, China)</td>
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<tr>
<td>11:00 ~ 11:10</td>
<td>Coffee Break</td>
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<tr>
<td>11:10 ~ 11:40</td>
<td>ILASS-Asia Annual General Meeting</td>
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<td>11:40 ~ 13:00</td>
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<td>Coffee Break</td>
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<tr>
<td>14:40 ~ 16:00</td>
<td>Spray Behavior &amp; Atomization (IV)</td>
<td>Breakup &amp; Atomization (IV)</td>
<td>Flash Boiling</td>
<td>Spray &amp; Combustion in Compression-Ignition Engine (II)</td>
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<td>16:00 ~ 16:10</td>
<td>Coffee Break</td>
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<tr>
<td>16:10 ~ 16:40</td>
<td>Closing Ceremony</td>
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### October 21, 2017 (Saturday)

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<th>Time</th>
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<tbody>
<tr>
<td>09:00 ~ 13:00</td>
<td>Regional Board Meeting</td>
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Keynote Speech I (09:30 ~ 10:10, October 19, 2017)
TBD

Keynote Speech II (10:10 ~ 10:50, October 19, 2017)
“Spray and Droplet Combustion of Pyrolysis Bio-oil from Lignocellulosic Biomass”

Keynote Speech III (09:00 ~ 10:40, October 20, 2017)
TBD

Keynote Speech IV (09:40 ~ 10:20, October 20, 2017)
"Spray Boundary Definition and Air Entrainment"

Keynote Speech V (10:20 ~ 11:00, October 20, 2017)
"Engine Fuel Spray Atomization, Evaluation and Ignition"
Session A - 11:10 ~ 12:10, October 19

[A-1] Flow & Injection

[1] Experimental Study of Discharge Coefficient with Non-Circular Effervescent Type Twin-Fluid Nozzle
Sang Ji Lee (Kyungpook Nat’l Univ., Korea), Kun Woo Ku (KATECH, Korea), Hyun Jin Yoon (Gumi Univ., Korea), Jung Goo Hong (Kyungpook Nat’l Univ., Korea)

Seokgyu Jeong, Yunjae Chung, Youngbin Yoon (Seoul Nat’l Univ., Korea)

Sakda Thongchai, Hyojin Kim, Ocktaeck Lim (Univ. of Ulsan, Korea)

[A-2] Droplet (Ⅰ)

[1] Instability of a Viscoelastic Jet Containing Micro-nano Bubbles
Xiao Cui, Luo Xie, Lijun Yang (Beihang Univ., China)

Boqi Jia, Lijun Yang (Beihang Univ., China)

[3] Breakup Behavior of Oppositely Charged Droplet in Different Media
Yuanping Huo, Junfeng Wang, Hailong Liu, Ziwen Zuo, Rui Wang (Jiangsu Univ., China)

[A-3] Combustion (Ⅰ)

[1] Validation of Spray Evaporation Model via Simultaneous Measurements of Liquid and Vapor Concentration of a Single Plume Spray
Zhe Sun, Xue Dong, Peng Yin, Tianyun Li, David L.S.Hung, Min Xu (Shanghai Jiao Tong Univ., China)

Junsun Lee (Univ. of Science and Technology, Korea), Yonggyu Lee (Korea Institute of Machinery & Materials, Korea)

Tae Kyung Lee, Hyung Eun Min, Han Ho Song (Seoul Nat’l Univ., Korea)
Session B - 13:30 ~ 14:50, October 19

[B-1] Spray & Droplet Measurement

● [1] 2-D Imaging of Concentration Distribution in High-Pressure Jets by Laser-Induced Fluorescence of Ambient Gas
Weiquan Shi, Tie Li, Zhifei Zhang, Bin Wang (Shanghai Jiao Tong Univ., China)

Kang Yang, Shintaro Yasaki, Keiya Nishida, Yoichi Ogata (Univ. of Hiroshima, Japan)

J.Lim, J.Green, Y.Sivathanu (En’Urga Inc., USA)

● [4] High-Speed X-Ray Imaging of Pressurized Metered-dose Inhaler Sprays with Variable Ethanol Content

[B-2] Droplet (II)

Xiaoqing Zhang, Tie Li, Jianpeng Song, Bin Wang (Shanghai Jiao Tong Univ., China)

● [2] The Effects of Temperature on Evaporation and Coking of Gasoline Droplets on a Hot Surface
Haoyi Song, Jin Xiao, Xinqi Qiao, Dehao Ju, Zhen Huang (Shanghai Jiao Tong Univ., China)

● [3] Impact of Two Drops on a Dry Surface
Chun-Kuei Chen, Sheng-Qi Chen, Ta-Hui Lin (Nat’l Cheng Kung Univ., Taiwan)

Luo Xie, Xiao Cui, Lijun Yang (Beihang Univ., China)

[B-3] Combustion (II)

● [1] Combustion Characteristics of an Isopropanol Droplet doped with Al₂O₃ and SiO₂ Nanoparticles
Tsai Hsuan-Wei, Pan Kuo-Long (Nat’l Taiwan Univ., Taiwan)

Hyemin Kim (Korea Nat’l Univ. of Transportation, Korea)
[3] Combustion Origin Soot Particle Aggregation with Water Steam Addition
Yoshihiro Kobayashi, Taichi Shindo, Masataka Arai (Tokyo Denki Univ., Japan)

Shubhra Kanti Das, Kim Hyojin, Ocktaeck Lim (Univ. of Ulsan, Korea)

[B-4] Emission / Heat Transfer

[1] Characteristics of NOx Emission by Effect of Ambient Temperature On-Road Conditions
Dong In Lee, Young Soo Yu, Junepyo Cha, Mun Soo Chon (Korea Nat'l Univ. of Transporation, Korea)

[2] NOx Emission Characteristics regarding to Speed per Acceleration and Acceleration On-road Conditions
Young Soo Yu, Dong In Lee, Mun Soo Chon, Junepyo Cha (Korea Nat'l Univ. of Transporation, Korea)

Sangjae Park, Jinyoung Jung, Choongsik Bae (Korea Advanced Institute of Science and Technology, Korea)

[4] An Experimental Study of Methanol Partial Oxidation using Various Catalysts under Sprays
Wei-Hsin Chen and Yu-Zhi Guo (National Cheng Kung Univ., Taiwan)

Pavel Karpov, Alexandr Nazarov, Nikolay Miskiv, Anatoly Serov, Viktor Terekhov (Institute of Thermophysics SB RAS, Russia)
Session C - 15:10 ~ 16:30, October 19

[C-1] Spray Behavior & Atomization (Ⅰ)

1. Analysis of Non-Evaporating Spray Characteristics from Jatropha Methyl Ester and its Blends
   Annisa Bhikuning (Doshisha Univ., Japan / Trisakti Univ., Indonesi), Naoki Matsumoto, Tomoyuki Mukayama, Eriko Matsumura, Jiro Senda (Doshisha Univ., Japan)

2. Effects of Ambient Pressure and Injection Pressure on Diesel and Natural Gas Dual Fuel Spray
   Changsheng Shao, Qian Wang, Xiaoqiang Tan (Jiangsu Univ., China)

3. Spray Characteristics of GDI Injectors with Different Hole Diameter
   Seungcheon Ro, Jeonghyun Park, Hanbin Jo, Suhan Park (Chonnam Nat’l Univ., Korea)

4. Behavior of GDI Fuel Spray Adhered on a Wall
   Kengo Jinnai, Yoshihiro Kobayashi, Masataka Arai (Tokyo Denki Univ., Japan)

[C-2] Breakup & Atomization (Ⅰ)

1. Effect of Liquid Properties on Atomization Characteristics of Liquid Jet across Sheet-Like Air Flow
   T.Yamaguchi, T.Okabe, M.Shirota, T.Inamura (Hirosaki Univ., Japan), M.Daikoku (Hachinohe Institute of Technology, Japan), T.Soma, Y.Saito, Y.Matsushita, H.Aoiki (Tohoku Univ., Japan), J.Fukuno (Honda Engineering Co., Ltd., Japan)

2. Breakup Length of Planar Liquid Sheet with Cocurrent Air Flows
   Ryota Kawabata, Ippei Oshima, Shingo Nishiyama, Akira Sou (Kobe Univ., Japan), Kazuaki Matsuura (Japan Aerospace Exploration Agency, Japan)

[C-3] Impingement Spray

1. Adhesion Characteristics of Fuel Spray Impinging on Flat Wall under High-Temperature and High-Pressure Ambient Condition
   Shintaro Uchitomi, Hongliang Luo, Keiya Nishida, Youichi Ogata (Univ. of Hiroshima, Japan), Wu Zhang, Tatsuya Fujikawa (Mazda Motor Corp., Japan)

   Naoto Mizobuchi, Hiroki Kambe, Eriko Matsumura (Doshisha Univ., Japan), Takaaki Kitamura (Japan Automobile Research Institute, Japan)

3. Experimental and CFD Calculation of Flat Wall Impinging Fuel Spray in High-Pressure Cross-Flow Ambient Injected by VCO Nozzle for DISI Engine
   Zhanbo Si, Nagisa Shimasaki, Keiya Nishida, Youichi Ogata (Hiroshima Univ., Japan), Chenglong Tang, Zuohua Huang (Xi’an Jiaotong Univ., China)
  Junghyun Kim (Seoul Nat’l Univ., Korea), Luigi Alloca, Alessandro Montanaro (Istituto Motori, Italy), Kyoungdoug Min (Seoul Nat’l Univ., Korea)

[C-4] Cavitation

  Rubby Prasetya, Takumi Kasahara, Kazuya Kotani, Takashi Miwa, Akira Sou (Kobe Univ., Japan), Seoksu Moon (AIST, Japan), Yoshitaka Wada, Yoshiharu Ueki, Hideaki Yokohata (Mazda Motor Corp., Japan)

● [2] Effect of String Cavitation and Initial Air Bubbles in Diesel Injector Tapered Nozzles on Subsequent Spray
  Genmiao Guo, Zhixia He, Zhou Chen, Shenxin Sun, Zhengyang Zhang (Jiangsu Univ., China)

● [3] String Cavitation and 3D PIV in Multi-Hole Injector
  Hiroaki Nakano, Rubby Prasetya, Shinichiro Deguchi, Takashi Miwa, Akira Sou (Kobe Univ., Japan), Keiya Nishida, Akira Nakashima (Univ., of Hiroshima, Japan), Yoshitaka Wada, Yoshiharu Ueki, Hideaki Yokohata (Mazda Motor Corp., Japan)

  Zhixia He, Weiwei Shang, Qian Wang, Xianyin Leng, Wenjun Zhong, Jiawei Cao, Bei Li (Jiangsu Univ., China)
Session D - 16:50 ~ 18:10, October 19

[D-1] Spray Behavior & Atomization (Ⅱ)

● [1] Study on Spray Characteristics of Pressure Swirl Atomizer with Swirling Air Flow under the Subatmospheric Pressure
Takehiko Seo, Naoki Hiruta, Masato Mikami (Yamaguchi Univ., Japan)

● [2] Effect of Swirl Chamber Length on Droplet Size Distribution in a Pressure Swirl Atomizer
Reza Alidoost Dafsari, Foad Vashahi, Rakhu Chandrahasan, Jeekun Lee (Chonbuk Nat’l Univ., Korea)

Saurabh Kumar Gupta, M.Murugesa Pandian, Anand Krishnasamy (Indian Institute of Technology Madras, India)

Fang Mingcheng, Wang Qian, He Zhixia, Wang Shengquan (Jiangsu Univ., China)

[D-2] Breakup & Atomization (Ⅱ)

Chien-Hua Fu, Osamu Imamura, Kazuhiro Akihama, Hiroshi Yamasaki (Nihon Univ., Japan)

● [2] Microscopic Observation of Primary Break-up and Droplet Behavior near Nozzle Hole under Diesel-Like Conditions
Yijie Wei, Tie Li, Bin Wang (Shanghai Jiao Tong Univ., China)

Mohammed Asad, Hirshikesh Gadgil, Sudarshan Kumar (Indian Institute of Technology Bombay, India)

D.P.Mishra, Manisha B. Padal, Swarup Y. Jejurkar (Indian Institute of Technology Kanpur, India)

[D-3] Modeling (Ⅰ)

● [1] A Model for Predicting the Transient Spray Dynamics of Engine Multiple Injections
Weidi Huang, Seoksu Moon, Jeeyeon Jeon (AIST, Japan), Ya Gao, Zhilong Li, Jin Wang (Argonne Nat’l Lab., USA)

Nobuyuki Kawahara, Shuhei Takada, Eiji Tomita (Okayama Univ., Japan)

● [3] Molecular Dynamics Simulation of Supercritical Spray at Micro & Nano Scale
Zhang Yunxiao, Fu Qingfei, Yang Lijun (Beihang Univ., China)
Session E - 13:00 ~ 14:20, October 20

[E-1] Spray Behavior & Atomization Mechanism (Ⅲ)

[1] Effect of Prefilmer Edge Thickness on Spray Characteristics in Prefilming Airblast Atomizer
Naoki Katagata, Toshihiro Sakaki, Takahiro Okabe, Takao Inamura (Hirosaki Univ., Japan), Koji Fumoto (Aoyama Gakuin Univ., Japan), Minori Shirota (Hirosaki Univ., Japan)

[2] Studies on Injection and Mixture Characteristics of High Pressure H₂ and O₂ in Ar Atmosphere
Deng Jun, Gong Xuehai, Gong Yinchun, Li Liguang (Tongji Univ., China)

Xinsheng Wang, Bin Chen (Xi’an Jiaotong Univ., China)

[E-2] Breakup & Atomization (Ⅲ)

[1] Mean Drop Size Measurements with LSD, PDIA and PDA Techniques in an Airblast Spray
Aniket P. Kulkarni, Vivek Kumar Dhimore, D. Deshmukh (Indian Institute of Technology Indore, India)

Huijun Kim, Sungwook Park (Hanyang Univ., Korea)

Zhong Huang, Tingting Zhang, Dehao Ju, Xinqi Qiao, Jin Xiao, Zhen Huang (Shanghai Jiao Tong Univ., China)

[4] Experimental Study of Nanofluid Droplet Spreading on a Solid Substrate
Hai Long Liu, Rui Wang, Yuan-Ping Huo, Jun-Feng Wang (Jiangsu Univ., China)

[E-3] Modeling (Ⅱ)

[1] Steady Single and Two-Phase Flow RANS Simulation of Pressure Swirl Nozzle
Foad Vashahi, Shahnaz Rezaei, Jeekun Lee (Chonbuk Nat’l Univ., Korea)

Kye Eun Lee, Na Young Kim, Young Jun Cho, Dong Ryul Lee (Hyundai KEFICO, Korea), Sungwook Park (Hanyang Univ., Korea)

This tentative program may change in detail.
Bom Lee (Chungbuk Nat’l Univ., Korea), Wonjae Yoon (Space Solutions Co., Ltd., Korea), Kyubok Ahn (Chungbuk Nat’l Univ., Korea)

● [1] Effects of Superheat Degree and Injection Pressure on the Spray Penetration and Dispersion
Qinglin Xu, Min Xu, David L.S.Hung, Tianyun Li, Xue Dong (Shanghai Jiao Tong Univ., China)
Junkyu Park, Donghwan Kim (Hanyang Univ., Korea), Hyuckmo Kwon, Joonkyu Lee, Sohong Lee (Hyundai Motor Company, Korea), Sungwook Park (Hanyang Univ., Korea)
Seungwoo Kang, Wonkyu Cho, Choongsik Bae (KAIST, Korea)

Session F - 14:40 ~ 16:00, October 20

[F-1] Spray Behavior & Atomization Mechanism (IV)
● [1] Liquid Column Trajectory in Acoustically-Modulated Crossflows
Yoonho Song, Donghyun Hwang, Kyubok Ahn (Chungbuk Nat’l Univ., Korea)
Hyung Sun Park (Kyungpook Nat’l Univ., Korea), Kun Woo Ku (KATECH, Korea), Hyun Jin Yoon (Gumi Univ., Korea), Jung Goo Hong (Kyungpook Nat’l Univ., Korea)
Mun Hee Lee, Wook Hwan Yeo, Dong Hyun Nam, Jung Goo Hong (Kyungpook Nat’l Univ., Korea)
● [4] Experimental Study on Spray Characteristics of the Internal Impinging Nozzle
Jiachen Zhai, Zongjie Hu, Wei Xie, Huizhi Chen (Tongji Univ., China), Cong Xue, Yufeng Wang (Jiangsu Riying Electronics Co., Ltd.), Zhijun Wu (Tongji Univ., China)

[F-2] Breakup & Atomization (IV)
● [1] The Transition from Dripping to Jetting of a Water Jet under Rigid Body Rotation
Chun-Chia Chang, Chun-Kuei Chen, Ta-Hui Lin (Nat’l Cheng Kung Univ., Taiwan)
● [2] Characterization of Shear and Extensional Rheology of Fibre Suspensions prior to Breakup and Atomization
Siti N.M.Rozali, A.H.J.Paterson, J.P.Hindmarsh (Massey Univ., New Zealand), Lee M. Huffman (The New Zealand Institute for Plant&Food Research Ltd., New Zealand)
V.D.Chaudhari, R.D.Lanjekar, D.Deshmukh (Indian Institute of Technology Indore, India)
T.-W. Lee, Jung-Eun Park (Arizona State Univ., USA), Ryoichi Kurose (Kyoto Univ., Japan)

[F-3] Flash Boiling

● [1] The Potential of Flash-Boiling Sprays for Improved Mixture Preparation and Increased Flame Propagation Speed
Sanghoon Kook (The Univ. of New South Wales, Australia)

Jeeyeon Jeon, Seoksu Moon, Weidi Huang (AIST, Japan), Kiyotaka Sato, Takeshi Nagasawa (Mazda Motor Corp., Japan)

● [3] Transient Structure and Footprint of Iso-Octane Impinging Spray under Room and Low Temperature
Hujie Pan, Di Xiao, Min Xu, David Hung, Xue Dng (Shanghai Jiao Tong Univ., China)

● [4] Injector Tip Wetting Visualization under Flash-Boiling and Non-Flash Boiling Conditions
Chansoo Park, Jinyoung Jung, Choongsik Bae (KAIST, Korea), Heechang Oh, Juhun Lee (Hyundai Motors Company, Korea)


● [1] Spray and Combustion Characterization of the Alcohol Blends in the High-Pressure High-Temperature Conditions
Ob Nilaphai, Camille Hespel (Université d’Orléans, France), Somchai Chanchaona (King Mongkut’s University of Technology, Thailand), Christine Mounaim-Rousselle (Université d’Orléans, France)

Krishna Ahuja, Li Yueh-Heng (Nat’l Cheng Kung Univ., Taiwan)

Hugo Ajrouche, Ob Nilaphai, Bruno Moreau, Camille Hespel, Fabrice Foucher, Christine Mounaim-Rousselle (Université d’Orléans, France)

This tentative program may change in detail.
Poster Session
The 19th Annual Conference on Liquid Atomization and Spray Systems - ASIA

Schedule: October 19, 11:10 ~ October 20, 16:00

- **Comparison of Injection and Spray Characteristics of Water and n-heptane in a MPI Injector**
  Jeonghyun Park (Chonnam Nat'l Univ., Korea), Kyunghwan Lee (Sunchon Nat'l Univ., Korea), Suhan Park (Chonnam Nat'l Univ., Korea)

- **Study on Combustion and Emissions Reduction Characteristics of Pilot Injection Strategy in a Compression Ignition Engine on Butanol Blended Biodiesel Fuel**
  Kibong Choi, Hyun Gu Roh (Induk Univ., Korea)

- **Gas Turbine Combustor Sizing Methodology using Fuel Atomization and Evaporation Characteristics**
  Jeongun Park, Daesik Kim (Gangneung-Wonju Nat'l Univ., Korea)

- **Noise Improvement of Intake Duct System in a Passenger Car**
  JunHo Lee, ChungHee Kim, HyunChul Kim (KATECH, Korea), YoungDuck Yun (Korea Wecosta Co., Ltd., Korea)

- **Warm-Up Characteristics of a Gasoline Engine with the Exhaust Heat Recovery System**
  ChungHui Kim, SangWook Han, HyunChul Kim (KATECH, Korea)

- **Traffic Sign Recognition Algorithm Development based on Deep Learning for Smart Vehicle**
  Byunchul Yim, Duksun Yun, Hyunchul Kim (KATECH, Korea)

- **Study on the Oil Collecting Efficiency and Piston Temperature in accordance with Cooling Gallery Inlet Shape**
  Yunsub Sin, Sangwook Han, Hyunchul Kim (KATECH, Korea), Younsul Yoo (Dongsuh Federal-Mogul Co., Ltd., Korea)

This tentative program may change in detail.