

20th Annual Conference of *ILASS-Asia*

Conference venue

Yamaguchi University, Tokiwa Campus, Lecture Building D
2-16-1 Tokiwadai, Ube, Yamaguchi 755-8611, Japan
<http://www.lass-japan.gr.jp/english/activity/ILASS-Asia2019/venue.html>

Main Hall: D11
Room A: D21
Room B: D22
Room C: D24
Room D: D33
Room E: D34

Special Lecture (Chair: Prof. M. MIKAMI, Yamaguchi Univ., Japan)
December 21 (Saturday) 17:00 - 17:40 Main Hall (D11)

Giant Drops and Sprays in Low-Gravity Environments
Professor Mark Weislogel, (Portland State University)

Plenary Lecture I (Chair: Y. Yoon, Seoul National Univ., Korea)
December 21 (Saturday) 9:20 - 10:00 Main Hall (D11)

Vortex Induced String Cavitation in Diesel Injector Nozzles and Its Effects on Spray Atomization
Professor Zhixia He, (Jiangsu University)

Plenary Lecture II (Chair: L. LI, Tongji Univ., China)
December 21 (Saturday) 16:20 - 17:00 Main Hall (D11)

Droplet-Cloud-Combustion Experiments “Group Combustion” aboard Kibo on the ISS
Professor Masato Mikami, (Yamaguchi University)

Plenary Lecture III (Chair: N. Kawahara, Okayama Univ., Japan)
December 22 (Sunday) 9:00 - 9:20 Main Hall (D11)

Reference Sprays for Aligning the Spray Community
Professor Vincent McDonell, (University of California, Irvine (President of ILASS-Int.))

Plenary Lecture IV (Chair: N. Kawahara, Okayama Univ., Japan)
December 22 (Sunday) 9:20 - 10:00 Main Hall (D11)

Regulation and spray of High-test Peroxide: Challenge and Development
Professor Chih-Yung Wu, (National Cheng Kung University)

Plenary Lecture V / Invited Lecture for ILASS-Japan Symposium

(Chair: Y. Moriyoshi, Chiba Univ., Japan)

December 22 (Sunday) 15:00 - 15:40 Main Hall (D11)

Nozzle Tip Wetting of Multi-Hole GDI Injectors and Its Control Strategies

Professor Seoksu Moon, (Inha University)

Welcome reception

Date and Time;

December 21, Saturday 18:00 – 20:00

Venue;

Cafeteria 2nd floor of the Welfare Building in Tokiwa Campus of Yamaguchi University

Banquet

Date and Time;

December 22, Sunday 19:00—21:00

Venue;

International Hotel Ube

1-7-1, Shima, Ube, Yamaguchi, 755-0047 Japan

Tel. +81-836-32-2323

<http://kokusaihotel-ube.co.jp/english>

Acknowledgement

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20th Annual Conference of *ILASS-Asia*

December 21, 2019 (Saturday)

	Room A	Room B	Room C	Room D	Room E
8:00 –	Registration				
9:00 – 9:20	Opening Ceremony (Main Hall)				
9:20 – 10:00	Plenary Lecture I (Main Hall) Professor Zhixia He, (Jiangsu University) “Vortex Induced String Cavitation in Diesel Injector Nozzles and Its Effects on Spray Atomization”				
10:00 – 10:20	Break				
10:20 – 11:20	A1: Diesel Spray I	B1: Spray Impingement	C1: Diagnostics	D1: Spray Behavior I	E1: Atomizers/ Injectors I
11:20 – 11:40	Break				
11:40 – 12:40	A2: Bio Diesel Fuel I	B2: Gasoline Spray I	C2: Atomization Mechanism I	D2: Spray Behavior II	E2: Atomizers/ Injectors II
12:40 – 14:00	Lunch ILASS-Asia Board Meeting (Room C)				
14:00 – 15:00	A3: Bio Diesel Fuel II	B3: Gasoline Spray II	C3: Numerical Simulation I	D3: Flashing Spray I	E3: Atomizers/ Injectors III
15:00 – 15:20	Break				
15:20 – 16:00	A4: Spray Combustion I	B4: Industrial Application	C4: Atomization Mechanism II	D4: Flashing Spray II	E4: Droplet behavior I
16:00 – 16:20	Break				
16:20 – 17:00	Plenary Lecture II (Main Hall) Professor Masato Mikami, (Yamaguchi University) “Droplet-Cloud-Combustion Experiments “Group Combustion” aboard Kibo on the ISS”				
17:00 – 17:40	Special Lecture (Main Hall) Professor Mark Weislogel, (Portland State University) “Giant Drops and Sprays and other Large Capillary Fluidic Phenomena aboard Spacecraft”				
17:40 – 18:00	Break				
18:00 – 20:30	Welcome Reception				

December 22, 2019 (Sunday)

	Room A	Room B	Room C
9:00 – 9:20	Plenary Lecture III (Main Hall) Professor Vincent McDonnell, (University of California, Irvine (President of ILASS-Int.)) “Reference Sprays for Aligning the Spray Community”		
9:20 – 10:00	Plenary Lecture IV (Main Hall) Professor Chih-Yung Wu (National Cheng Kung University) “Regulation and spray of High-test Peroxide: Challenge and Development”		
10:00 – 10:20	Break		
10:20 – 11:20	A5: Diesel Spray II	B5: Numerical Simulation II	C5: Droplets Behavior II
11:20 – 11:40	Break		

11:40 – 12:40	A6: Diesel Spray III	B6: Numerical Simulation III	C6: Droplets Behavior III
12:40 – 14:00	Lunch ILASS-Japan Board Meeting (Room C)		
14:00 – 14:40	A7: Spray Combustion II	B7: Flashing Spray III	
14:40 – 15:00	Break		
15:00 – 15:40	Plenary Lecture V / Invited Lecture for ILASS-Japan Symposium (Main Hall) Professor Seoksu Moon, (Inha University) “Nozzle Tip Wetting of Multi-Hole GDI Injectors and Its Control Strategies”		

28th ILASS-Japan Symposium			
	Room A	Room B	Room C
16:00 – 16:50	JA-11: Flow in Nozzle / Cavitation (JA-111 ~ JA-112)	JB-11: Atomization in Aerospace I (JB-111 ~ JB-112)	JC-11: Wall Impingement (JC-111 ~ JC-112)
16:50 – 17:05	Break		
17:05 – 17:45	ILASS-Japan General Assembly Meeting (Main Hall)		
17:45 – 19:00	Move to Banquet by Bus		
19:00 – 21:00	Banquet (International Hotel Ube)		

December 23, 2019 (Monday)

	Room A	Room B	Room C
9:00 – 10:40	JA-21: Diesel Spray I (JA-211 ~ JA-213)	JB-21: Atomization in Aerospace II (JB-211 ~ JB-213)	JC-21: Atomization Mechanism I (JC-211 ~ JC-214)
10:40 – 11:00	Break		
11:00 – 12:40	JA-22: Diesel Spray II (JA-221 ~ JA-223)	JB-22: Fuel / Combustion (JB-221 ~ JB-224)	JC-22: Atomization Mechanism II (JC-221 ~ JC-224)
12:40 – 14:00	Lunch		
14:00 – 15:40	JA-23: Gasoline Spray (JA-231 ~ JA-234)	JB-22: Measurement Method (JB-231 ~ JB-234)	JC-22: Atomization Mechanism III (JC-231 ~ JC-233)
15:40 – 16:00	Break		
16:00 – 16:15	Award Ceremony of Best Presentation (Main Hall)		

*General sessions of the 28th ILASS-Japan Symposium are given in Japanese.

Program of Technical Sessions

【General Report】 *Speaker

Presentation: 20 minutes (including 5 minutes for discussion)

December 21 (Saturday)

A1: Diesel Spray I (Chair: K. Nishida, Hiroshima Univ., Japan)

10:20-11:20 Room A

【ILASS-Asia2019-040】 **Dynamic Evolution of Near-Nozzle Diesel Sprays and Its Modeling**

Raditya Hendra PRATAMA, *Weidi HUANG, Huifeng GONG (AIST), Seoksu MOON (Inha University)

【ILASS-Asia2019-057】 **Characterization of the Primary Break-Up on near-Nozzle Gas Entrainment of Diesel Spray by High-Speed PTV Technique**

Yijie WEI, *Tie LI, Xinyi ZHOU, Xinran WANG (Shanghai Jiao Tong University)

【ILASS-Asia2019-053】 **An Experimental Study on Prediction of Wall Wetting by Fuel Blended Ratio and Spray Characteristics**

Woongil KIM, Youngkun KIM, Seungchul WOO, Seungju BAEK (Hanyang University), Byounghyounk MIN (Hyundai Motor Company), *Kihyung LEE (Hanyang University)

A2: Bio Diesel Fuel I (Chair: Y. Ogata, Hiroshima Univ., Japan)

11:40-12:40 Room A

【ILASS-Asia2019-029】 **Effect of Jatropha Methyl Ester Mixed with n-Tridecane on Spray Characteristics**

* Xin LI (Doshisha University), Annisa BHIKUNING (Doshisha University, Trisakti University), Eriko MATSUMURA, Jiro SENDA (Doshisha University)

【ILASS-Asia2019-051】 **Effects of Biodiesel Blending Ratio on Combustion Characteristics and Particle Emission (An Experimental Study on Blended Biodiesel Fuel with Maximum Blending Ratio 50)**

Heesun KWON, Khawar MOHIUDDIN, Jihwan JANG (Hanyang University), Hyuckmo KWON, Joon Kyu LEE (Hyundai Motor Company), *Sungwook PARK (Hanyang University)

【ILASS-Asia2019-045】 **Modeling of Fuel/Air Mixture Formation and Combustion Process of a Compression Ignition Engine Fueled with Biodiesel and Its Blends**

Jonghui CHOI, Bumjun PARK, Heesun KWON, *Sungwook PARK (Hanyang University)

A3: Bio Diesel Fuel II (Chair: Y. Ogata, Hiroshima Univ., Japan)

14:00-15:00 Room A

【ILASS-Asia2019-047】 Optical Study Spray and Combustion Characteristics of Gasoline/Hydrogenated Catalytic Biodiesel in a Constant Volume Combustion Chamber

*Wenjun ZHONG, Qilong XIANG, Zhixia HE, Qian WANG (Jiangsu University)

【ILASS-Asia2019-048】 The Effect of Oxygen Percentage on the Spray Combustion Characteristics of Biodiesel Waste Cooking Oil

*Mega Nur S ASONGKO, M. Ikhsan ANSHORY, M. Abiel PRADIPTA, Widya WIJAYANTI (Brawijaya University)

【ILASS-Asia2019-071】 Flame-Spread Behavior of Biodiesel (B20) in a Microgravity Environment

*Herman SAPUTRO, Laila FITRIANA (Sebelas Maret University), Fudhail A MUNIR (Universiti Teknikal Malaysia Melaka), Bawono W GUMELAR (Sebelas Maret University), Masato MIKAMI (Yamaguchi University)

A4: Spray Combustion I (Chair: N. Kawahara, Okayama Univ., Japan)

15:20-15:40 Room A

【ILASS-Asia2019-061】 Effects of Geometry and Operating Conditions on the Spray and Flame Structure of a Quasi-Two Dimensional Pintle Injector

*Peng CHENG, Huiyuan CHEN, Qinglian LI (Science and Technology on Scramjet Laboratory, National University of Defense Technology)

【ILASS-Asia2019-062】 Investigation on the Structures of the Spray and Flame in a Quasi-Two Dimensional Model Pintle Engine

Qinglian LI, *Peng CHENG, Huiyuan CHEN (National University of Defense Technology)

B1: Spray Impingement (Chair: Y. Kobayashi, Tokyo Denki Univ., Japan)

10:20-11:20 Room B

【ILASS-Asia2019-081】 A Combined Experimental-Numerical Investigation of Spray Impingement on Surface with Stepped Geometries

Christoph STEINBERG, Mengqi LIU, Xuesong LI, Min XU, *David L.S. HUNG (Shanghai Jiao Tong University)

【ILASS-Asia2019-016】 Influence of Pressure Conditions on Film Breakup Induced by Co-Flow in Spray Impingement

Di XIAO (Shanghai Jiao Tong University), Yukihiro ICHIKAWA (Hiroshima University), Xuesong LI (Shanghai Jiao Tong University), David HUNG (Shanghai Jiao Tong University), Keiya NISHIDA (Hiroshima University), *Min XU (Shanghai Jiao Tong University)

【ILASS-Asia2019-063】 Experimental Investigations of Wall Jet Droplet Impact on Spray Impingement Fuel Film Formation

Hujie PAN, Di XIAO, Min XU, *Xuesong LI (Shanghai Jiao Tong University)

B2: Gasoline Spray I (Chair: Z. Wu, Tongji Univ., China)

10:45-12:00 Room B

【ILASS-Asia2019-070】 Fuel Film Formation and Wall Temperature Drop by Spray Impingement on a Wall
Yoshiki KOMURO, *Yoshihiro KOBAYASHI, Masataka ARAI (Tokyo Denki University)

【ILASS-Asia2019-025】 Development and Validation of a Model for the Formation, Heat Transfer, and Evaporation of Liquid Films in Direct Injection Gasoline Engines
*Yoshimitsu KOBASHI (Hokkaido University), Tatsuya KUBOYAMA (Chiba University), Yoshio ZAMA (Gunma University)

【ILASS-Asia2019-064】 Droplet Diameter Distribution Measurements of a Gasoline DISI Injector Using PDA
*Nobuyuki KAWAHARA, Bunta MORI, Eiji TOMITA (Okayama University)

B3: Gasoline Spray II (Chair: J. Hayashi, Kyoto Univ., Japan)

14:00-15:00 Room B

【ILASS-Asia2019-031】 Numerical Investigation of the Influence of Needle Motion on In-Nozzle Flow and Spray Jet Orientation
Wenbo ZHAO, Yonghong WU, Zhilong LI, Liguang LI, *Zhijun WU (Tongji University)

【ILASS-Asia2019-060】 Effects of In-Cylinder Flow and Injection Strategy on Particulate Emissions in Gasoline Direct Injection Engine
Ziyoung LEE, *Sungwook PARK (Hanyang University)

【ILASS-Asia2019-037】 Experiments and Modeling of Spray Collapse of Gasoline Direct Injection Injector at High Injection Pressure
*Huijun KIM, Donghwan KIM, Sungwook PARK (Hanyang University)

B4: Industrial Application (Chair: J. Hayashi, Kyoto Univ., Japan)

15:20-16:00 Room B

【ILASS-Asia2019-034】 Spray Distance and Impact Correlations for Speed with Rotational Nozzles
Hiroshi TAKIGUCHI, *Tsuyoshi MARUYAMA, Hiroyuki TAKAHASHI (Spraying System Co.)

【ILASS-Asia2019-042】 Hydrogen Production from Autothermal Reforming of Methanol over a H-Bn-Pt/Al₂O₃ Catalyst under Sprays
*Yu-Qi SU, Wei-Hsin CHEN, Bo-Jih LIN, Guan Bang CHEN, Fang-Hsien WU (National Cheng Kung University)

C1: Diagnostics (Chair: Y. Zama, Gunma Univ., Japan)

10:20-11:20 Room C

【ILASS-Asia2019-013】 Wavelet-based Optical Flow Velocimetry
Alexander NICOLAS (University of Edinburgh), Mattias RAHM (Swedish Defense Research Agency), Brian PETERSON (University of Edinburgh), *Mark LINNE (University of Edinburgh)

【ILASS-Asia2019-077】 The Visualization of Liquid and Gas Motion in Airblast Atomization Using Simultaneous Two-Phase PIV Measurement
*Yuki IWAKI, Narumi ANDO, Mitsunori ITOH (IHI Corp.)

【ILASS-Asia2019-086】 Developing the Evaluation Method of Atomization Characteristics Focused on Partial Structure of Liquid Spray
*Yusuke ONO, Tsutomu MATSUURA (Gunma University), Nagayoshi HIROMITSU (IHI Corp.), Takahiro MIYAOKA, Hikaru CHIBA, Keitaro ISODA, Tsuneaki ISHIMA (Gunma University)

C2: Atomization Mechanism I (Chair: L. Li, Tongji Univ., China)

11:40-12:40 Room C

【ILASS-Asia2019-010】 Experimental and Numerical Investigation of Cross-sectional Distribution of Liquid Jets in Supersonic Crossflow
Chenyang LI, *Qinglian LI, PeiBo LI, Yaozhi ZHOU (National University of Defense Technology)

【ILASS-Asia2019-043】 Modeling of a Liquid Jet Bending in a Sheet-Like Air Flow
*Satoru HIMORI, Tomoko KIMURA, Takahiro OKABE, Minori SHIROTA, Takao INAMURA (Hirosaki University), Shinobu SAWAGUCHI, Masatoshi DAIKOKU (Hachinohe Institute of Technology), Yohsuke MATSUSHITA, Hideyuki AOKI (Tohoku University), Junichi FUKUNO (Honda Engineering Co., Ltd.)

【ILASS-Asia2019-009】 Study on the Vibration-Induced Droplet Atomization
Chenghan SUN, Fushui LIU, *Yikai LI (Beijing Institute of Technology)

C3: Numerical Simulation I (Chair: I. Oshima, JAMSTEC., Japan)

14:00-15:00 Room C

【ILASS-Asia2019-006】 Investigation of the Grid Density Effect on a VOF-Based Numerical Analysis of Primary Atomization by Crossflow
* Taisuke NAMBU, Yasuhiro MIZOBUCHI (Japan Aerospace Exploration Agency)

【ILASS-Asia2019-018】 Computation of Spray Flows Using Quadratic Formula for the Primary Atomization
* T.-W. LEE, Benjamin GREENLEE, J.E. PARK (Arizona State University), Milan HNIZDIL, Miroslav RAUDENSKY (Brno University of Science and Technology)

【ILASS-Asia2019-019】 Weakly Compressible SPH for Free Surface Flow
*Mingyu ZHANG (Institute of Applied Physics and Computational Mathematics)

C4: Atomization Mechanism II (Chair: M. Daikoku, Hachinohe Inst. Tech.)

15:20-16:00 Room C

【ILASS-Asia2019-021】 The Dripping Phenomena of a Rotating Liquid Jet
Cheng-Yao TSAI, Yu-Chie KUO, Chun-Kuei CHEN*, Ta-Hui LIN* (National Cheng Kung University)

【ILASS-Asia2019-087】 Perforation Dynamics of Free-Surface Circular Liquid Sheet
*Chetankumar S. VEGAD, Amit KUMAR, Satyanarayanan R. CHAKRAVARTHY
(Indian Institute of Technology Madras)

D1: Spray Behavior I (Chair: C. Inoue, Kyushu Univ., Japan)

10:20-11:20 Room D

【ILASS-Asia2019-024】 An Experimental Study on Multi-Nozzle Hollow Cone Sprays
*Narendra DEV, D. SIVAKUMAR (Indian Institute of Science)

【ILASS-Asia2019-033】 Symmetric Transverse Acoustic Excitation of a Hollow Cone Spray Sheet with Air Swirl
*Rohit BHATTACHARJEE, Aravind BABU, Satyanarayanan CHAKRAVARTHY
(Indian Institute of Technology Madras)

D2: Spray Behavior II (Chair: C. Inoue, Kyushu Univ., Japan)

11:40-12:20 Room D

【ILASS-Asia2019-028】 Bag Formation and Breakup of Planar Liquid Sheet by Cocurrent Air Flows
* Kazuki OISHI, Tomoki IMAI, Shingo NISHIYAMA (Kobe University), Ippei OSHIMA (Japan Agency for Marine-Earth Science and Technology), Akira SOU (Kobe University)

【ILASS-Asia2019-049】 Effect of ALR on the Atomization Characteristics of Pre-Filming Airblast Nozzle for Gas Turbine Engines
Mir Muhammad TAREQ Reza ALIDOOST DAFSARI (Chonbuk National University), Seungchae JUNG (Hanwha Aerospace, Republic of Korea), *Jeekeun LEE (Chonbuk National University)

D3: Flashing Spray I (Chair: J. Senda, Doshisha Univ., Japan)

14:00-15:00 Room D

【ILASS-Asia2019-074】 The Influence of the Ambient Condition on the Hollow Cone Spray in a Constant Volume Combustion Chamber
* Sanguk LEE, Sangjae PARK, Choongsik BAE (KAIST)

【ILASS-Asia2019-026】 Viewing the Flash-Boiling Spray Collapse from the Perspective of Plume-to-Plume Interaction
Qinglin XU, Xuesong LI, *Min XU (Shanghai Jiao Tong University)

【ILASS-Asia2019-005】 Effect of Ambient Temperature on Flash-Boiling Spray Penetration Based on Dimensionless Numbers

Shangning WANG, Xuesong LI (Shanghai Jiao Tong University), Tianyun LI (United Automotive Electronic Systems Co., Ltd), Shangze YANG, *Min XU (Shanghai Jiao Tong University)

D4: Flashing Spray II (Chair: Y. Kobashi, Hokkaido Univ., Japan)

15:20-16:00 Room D

【ILASS-Asia2019-035】 Effects of Nozzle Hole Layout of a Multi-Hole Type GDI Injector on Spray Collapse

Donghwan KIM (Hanyang University), Yongwook YU (Hyundai Motor Group), *Sungwook PARK (Hanyang University)

【ILASS-Asia2019-069】 Study of Flash Boiling Spray Combustion in a Spark Ignition Direct Injection Optical Engine under Different Injection Timings Using Digital Image Processing Diagnostics

Zhe SUN, Min XU, Zhen MA, *Xuesong LI (Shanghai Jiao Tong University)

E1: Atomizers/Injectors I (Chair: T. Katsumi, Nagaoka Univ. of Tech., Japan)

10:20-11:20 Room E

【ILASS-Asia2019-017】 An Experimental Study on the Spray Characteristics of Shear Coaxial Injectors

Keunseok LEE, *Kyubok AHN (Chungbuk National University)

【ILASS-Asia2019-023】 Mist Formation of Gas-Liquid Coaxial Injectors for Small-size Rocket Engine

*Gijeong JEONG, Yeseung LEE, Youngbin YOON (Seoul National University)

【ILASS-Asia2019-015】 A Novel Twin-Fluid Atomizer for Small-Scale Combustion Systems

*Mohammed Asad KHAN, Hrishikesh GADGIL, Sudarshan KUMAR (Indian Institute of Technology Bombay)

E2: Atomizers/Injectors II (Chair: M. Ikeda, NIT Tokuyama Collage, Japan)

11:40-12:40 Room E

【ILASS-Asia2019-014】 Effects of Annular Gap Size and Tip Thickness on Self-Pulsation Characteristics for Liquid-Centered Swirl Coaxial Injectors

* Xiao BAI, Liyong SHENG, *Qinglian LI, Peng CHENG (National University of Defense Technology)

【ILASS-Asia2019-052】 Atomization and Dynamic Characteristics of Swirl Injectors with Pulsed Liquid Supply

Ding-wei ZHANG, *Qing-fei FU, Huan-ran WANG, Li-jun YANG (Beijing University of Aeronautics and Astronautics)

【ILASS-Asia2019-027】 Effect of Dimensionless Numbers on Spray Angle and Breakup Length of Swirl Effervescent Atomizer
Zulkifli ABDUL GHAFAR, *Salmiah KASOLANG, Ahmad Hussein ABDUL HAMID (Universiti Teknologi MARA Selangor)

E3: Atomizers/Injectors III (Chair: M. Ikeda, NIT Tokuyama Collage, Japan)

14:00-15:00 Room E

【ILASS-Asia2019-082】 Experimental Study on Atomization Characteristics of Green Propellant for Monopropellant RCS
*Hisayoshi ITO, Yoshito KURODA, Raiki OMATSU, Keisuke HANZAWA, Toshiyuki KATSUMI, Satoshi KADOWAKI (Nagaoka University of Technology)

【ILASS-Asia2019-012】 Effects of the Shape of Radial Orifices on the Flow and Spray Characteristics of Pintle Injector
*Huiyuan CHEN, *Qingliang LI, Peng CHENG (National University of Defense Technology)

【ILASS-Asia2019-011】 Working Mechanism and Behavior of Collision Nebulizer
*James Q. FENG, Liang-Sin GO, Jenny CALUBAYAN, Robert TOMASKA (Optomec, Inc.)

E4: Droplets Behavior I (Chair: M. Shirota, Hirosaki Univ., Japan)

15:20-16:00 Room E

【ILASS-Asia2019-020】 Behavior Observation of Micro Explosion during the Combustion of n-Tridecane Water Emulsified Fuel
Mitsumasa IKEDA, *Shotaro OMICHI (NIT Tokuyama Collage)

【ILASS-Asia2019-068】 A Molecular Dynamics Study of the Bi-component Liquid Fuel Vaporization Characteristics at Sub/Supercritical Environments
*Yanzhi ZHANG (Jiangsu University), Ming JIA (Dalian University of Technology), Ping YI, Zhixia HE (Shanghai Jiao Tong University)

December 22 (Sunday)

A5: Diesel Spray II (Chair: K. Komada, Fukuoka Inst. of Tech., Japan)

10:20-11:20 Room A

【ILASS-Asia2019-044】 Effect of Diesel Spray Flow Around a Glow Plug on Ignitability of the Spray
*Toshiya TAJIMA, Yoshio ZAMA (Gunma University), Tomoyuki HAYAKAWA, Manabu OKINAKA (NGK Spark Plug co., Ltd.) Tomohiko FURUHATA (Gunma University)

【ILASS-Asia2019-073】 Effects of Ultra-High Pressure Injection and Small Hole Diameter on Fuel Spray and Combustion Characteristics of Multi-Hole Injector
*Chang ZHAI, Yu JIN , Masashi MURAMATSU, Keiya NISHIDA, Yoichi OGATA
(University of Hiroshima)

A6: Diesel Spray III (Chair: T. Lie, Shanghai Jiao Tong Univ., China)

11:40-12:40 Room A

【ILASS-Asia2019-088】 Transient Cavitation Structure inside Real Scale Transparent Nozzles
*Noritsune KAWAHARADA, Lennart THIMM, Friedrich DINKELACKER (Leibniz University Hannover)

【ILASS-Asia2019-066】 Change in Diesel Spray Characteristics Based on Injector Drive Current Control
*Tomohiro IWASAKI (Nagasaki University), Manabu SAITO (IRS Corp.), Keisuke KOMADA (Fukuoka Institute of Technology), Daisaku SAKAGUCHI, Hironobu UEKI (Nagasaki University)

【ILASS-Asia2019-067】 Experimental and Computational Study of Diesel Spray under Non-Evaporating and Evaporating Conditions
*SAFIULLAH, Shinichi KAKAMI, Keiya NISHIDA, Yoichi OGATA (Hiroshima University)

A7: Spray Combustion II (Chair: S. Park, Hanyang Univ., Korea)

14:00-14:40 Room A

【ILASS-Asia2019-032】 Combustion and Emission Characteristics of Micro-Pilot Injection Dual-Fuel Engine
Minhoo CHOI (Hanyang University), Jaeyeop SEO (Korea Shipbuilding & Offshore Engineering), *Sungwook PARK (Hanyang University)

【ILASS-Asia2019-072】 Combustion of n-Octane/Ethanol Mixture in a Meso-Scale Combustor Using Electro spray Technique
*Cheng YOU, Takatoshi KUWATA, Takehiko SEO, Masato MIKAMI (Yamaguchi University)

B5: Numerical Simulation II (Chair: W. H. CHEN, National Cheng Kung Univ., Taiwan)

10:20-11:20 Room B

【ILASS-Asia2019-030】 Analysis of Droplet Evaporation by Simulation of Three-Dimensional Attenuator System
Yumi URUNO, Im Tae JEONG, *Jaewon CHUNG (Korea University)

【ILASS-Asia2019-003】 Liquid Jet under Forced Perturbation with Low-Velocity Coaxial Gas Flow
Delara SOLTANI, *Maziar SHAFARAEI (University of Tehran)

B6: Numerical Simulation III (Chair: M. Oshima, Toyama Pref. Univ., Japan)

11:40-12:40 Room B

【ILASS-Asia2019-058】 A Numerical Framework for Simulating Fire Sprinkler Atomization
*Karl V. MEREDITH (FM Global), Vuko VUKČEVIĆ² (University of Zagreb)

【ILASS-Asia2019-022】 Numerical Simulations of Two-Phase Flow for PM_{2.5} in a Healthy and COPD Human Airways
Justus Kavita MUTUKU (National Cheng Kung University), *Wei-Hsin CHEN (National Cheng Kung University, National Chin-Yi University of Technology), *Wen-Che HOU, Wen Jhy LEE (National Cheng Kung University)

【ILASS-Asia2019-041】 A CFD Study on Two-Phase Transient Flow and Deposition of Pharmaceutical Aerosols in Downstream Asthmatic Airways
* Che Ming CHANG, Wei Hsin CHEN, Justus Kavita MUTUKU (National Cheng Kung University)

B7: Flashing Spray III (Chair: Y. Kobashi, Hokkaido Univ., Japan)

14:00-14:40 Room B

【ILASS-Asia2019-004】 Characteristics of In-Nozzle Flash Boiling Bubbles and Its Effect on Near-Nozzle Spray
Shangze YANG, Xuesong LI (Shanghai Jiao Tong University), David L.S. HUNG (Shanghai Jiao Tong University, University of Michigan-Shanghai Jiao Tong University Joint Institute), *Min XU (Shanghai Jiao Tong University)

【ILASS-Asia2019-080】 Static and Dynamic Characteristics of Step Nozzle Internal Flow and Near-Field Spray under Flash Boiling Conditions
Qiaozhi ZHAI, Shangze YANG, Xuesong LI, *David L.S. Hung, Min XU (Shanghai Jiao Tong University)

C5: Droplets Behavior II (Chair: M. Shirota, Hirosaki Univ., Japan)

10:20-11:20 Room C

【ILASS-Asia2019-001】 Viscous Dissipation, Helicity and Enstrophy of Bouncing Droplets Undergoing Off-Center Collision
Chengming HE (The Hong Kong Polytechnic University), Xi XIA (The Hong Kong Polytechnic University, Shanghai Jiao Tong University), *Peng ZHANG (Shanghai Jiao Tong University)

【ILASS-Asia2019-065】 Experimental Evaluation of Multi-Droplet Impingement over Superhydrophobic Surfaces
*Jorge Duarte BENTHER, Cameron STANLEY, Gary ROSENGARTEN (RMIT University)

【ILASS-Asia2019-075】 Numerical Study on Evaporation and Low-Temperature Oxidization of a Droplet Pair with Different Diameters
Satoshi TAKAHASHI, *Hiroya TANAKA, Hiromu NAKAMURA, Osamu MORIUE
(Kyushu University)

C6: Droplets Behavior III (Chair: N. Kawahara, Okayama Univ., Japan)

11:40-12:40 Room C

【ILASS-Asia2019-083】 Droplet Dynamics on a Hot Cylindrical Body
*Chandramouli. S, Satyanarayanan SESHADRI (IIT Madras)

【ILASS-Asia2019-079】 Role of Vapor Flow in the Rim Breakup of a Dynamic Leidenfrost Drop
Ai ISHIO, Masaki KATO, Yuka AKIYAMA, Takahiro OKABE, *Minori SHIROTA
(Hirosaki University)

【ILASS-Asia2019-038】 Experimental Study on Impact and Evaporation Behavior of High-Speed Fine Droplets onto a Heated Dry Surface
*Tetsuya ODA (Tottori University), Naoya YAMANE (Mitsui E&S Holdings Corp.),
Ryou WATANABE (Tottori University), Taishi MIYAMOTA, Shunsuke MAEDA
(Tottori University), Hideaki YOKOHATA, Yoshiharu UEKI, Kento ONISHI,
Yoshitaka WADA (Mazda Motor Corp.)

Program of Technical Sessions of 28th ILASS-Japan Symposium

【General Report】, (Prompt Report), *Speaker
Presentation 15 min / Question 10 min

December 22 (Sunday)

JA-11: Flow in Nozzle / Cavitation

16:00–16:50 Room A (D21)

(JA-111) **Observation of Cavitation in the Nozzle Throat for Spray of High Viscosity Liquid**

*Shusuke TAKEYAMA (Toyota Tech. Inst.), Keiji TAKENO, Hiroki KAWANOUE

(JA-112) **Behaviors of Internal Flow and Spray of Twin-Fluid Atomizer (2nd Report, Detailed Observations of Flow Pattern)**

*Wenjing XING (Hiroshima Univ.), Keiya NISHIDA, Youichi OGATA, Kazuaki HASHIGUCHI (MHI), Kazunori SATO (MHPS)

JB-11: Atomization in Aerospace I

16:00–16:50 Room B (D22)

【JB-111】 **Spray Characteristics of Multi-element Impinging Injector for Spacecraft Engine**

*Yusuke FUJIMOTO (Kyusyu Univ.), Shun MATSUMOTO, Chihiro INOUE

【JB-112】 **Spray Flux Distribution of High-speed Planar Air-blast Atomizer**

*Hiroaki YOSHIDA (Kyusyu Univ.), Chihiro INOUE, Junya KOUWA (IHI), Mitsunori ITOH (IHI)

JC-11: Wall Impingement

16:00–16:50 Room C (D23)

【JC-111】 **Effect of Nozzle Hole Geometry on Vaporization Characteristics of High Pressure Gasoline Sprays Impinging on a Wall**

*Kotaro TAKEDA (MAZDA), Ryosuke HARA, Wu ZHANG, Tatsuya FUJIKAWA, Masahisa YAMAKAWA, Yukihiko ICHIKAWA (Hiroshima Univ.), Keiya NISHIDA, Yoichi OGATA

【JC-112】 **Wall Temperature Change during Fuel Spray Impingement on a Wall**

*Yutaro KASUYA (Tokyo Denki Univ.), Yoshiki KOMURO, Yoshihiro KOBAYASHI, Masataka ARAI

December 23 (Monday)

JA-21: Diesel Spray I

9:00–10:40 Room A (D21)

【JA-211】 **Magnified Imaging of Diesel Spray near Injector Nozzle**

*Naohiro HAMAGUCHI (Kyoto Univ.), Jun HAYASHI, Hiroshi KAWANABE

【JA-212】 **Study on Spray Internal EGR for Improvement of Thermal Efficiency and Reducing Emission of Diesel Engine (Evaluation of Spray Characteristics of CO₂ Gas Dissolved Fuel Spray)**

*Jumpei YAMAMOTO (Doshisha Univ.), Tomoyuki MUKAYAMA, Jiro SENDA, Eriko MATSUMURA

[JA-213] Study of Droplet Number Density in Near-nozzle Region of Diesel Fuel Sprays

*Takeshi TANAKA (Nagasaki Univ.), Manabu SAITO (IRS), Keisuke KOMADA (Fukuoka Inst. of Tech.), Daisaku SAKAGUCHI (Nagasaki Univ.), Hironobu UEKI

JA-22: Diesel Spray II

11:00–12:40 Room A (D21)

[JA-221] Measurement of Droplet Size Distribution of Diesel Spray by Means of Microscopic Imaging

*Masashi Muramatsu (Hiroshima Univ.), Yu Jin, Keiya NISHIDA, Yoichi OGATA

[JA-222] The Effects of Needle Valve Motion on Transient Flow in Fuel Injector and Liquid Jet

*Kohei MATSUKAMI (Kobe Univ.), Takashi MIWA, Akira SOU, Yoshitaka WADA (MAZDA), Yoshiharu UEKI, Hideaki YOKOHATA

[JA-223] Four Dimensional Cavitation Flow in Multi-Hole Fuel Injector and Spray Behavior

*Katsuhisa NAKAMICHI (Kobe Univ.), Masashi WAKISAKA, Yuta OKUNAKA, Takashi MIWA, Akira SOU, Keiya NISHIDA (Hiroshima Univ.), Yoshitaka WADA (MAZDA), Yoshiharu UEKI, Hideaki YOKOHATA

JA-23: Gasoline Spray

14:00–15:40 Room A (D21)

[JA-231] Quantitative Analysis of Vapor Concentration in Unsteady Evaporating Gasoline Spray with LIEF Method

*Dai MATSUDA (Doshisha Univ.), Eriko MATSUMURA, Jiro SENDA

[JA-232] Study of Gasoline Spray for Air-fuel Mixture Formation by Fuel Heating (Effect of Fuel Evaporation on Gasoline Spray by Fuel Heating)

*Yasuhiro NAGAI (Doshisha Univ.), Eriko MATSUMURA, Jiro SENDA

[JA-233] Visualization and Analysis of Spray Root Behavior in Multi-hole Injector for Direct Injection Gasoline Engine (Effect of Variation of Spray Cone Angle on the Wrinkled Structure of Spray)

*Koki YASUMA (Doshisha Univ.), Eriko MATSUMURA, Jiro SENDA

[JA-234] Investigation of Spray Characteristics for Change of Fuel Injection Pressure Drop in PFI Engine

*Yuki YOSHIDA (Doshisha Univ.), Eriko MATSUMURA, Jiro SENDA, Yoshiya INOUE (Mitsubishi Motors), Yoshihiro SUGATA, Dai TANAKA

JB-21: Atomization in Aerospace II

9:00–10:40 Room B (D22)

[JB-211] Atomization Process of a Planar Liquid Sheet by Cocurrent Air Flows (Visualization of the Liquid Sheet Atomization and the Model of Droplet Sizes)

*Ippei OSHIMA (JAMSTEC), Akira SOU (Kobe Univ.)

[JB-212] Atomization Process of a Planar Liquid Sheet by Cocurrent Air Flows (Formation and Breakup of Ligaments after the Rupture of a Bag)

*Tomoki IMAI (Kobe Univ.), Kazuki OISHI, Shingo NISHIYAMA, Ippei OSHIMA (JAMSTEC), Akira SOU (Kobe Univ.)

【JB-213】 Atomization Process of Planar Liquid Sheet with Skew Air Flows

*Shingo NISHIYAMA (Kobe Univ.), Kazuki OISHI, Tomoki IMAI, Akira SOU, Kazuaki MATSUURA (JAXA)

JB-22: Fuel / Combustion

11:00–12:40 Room B (D22)

【JB-221】 Experimental Study on Unsteadiness of n-Decane Single Droplet Evaporation with Various Initial Droplet Diameters at High Pressures and High Temperature Using Microgravity Conditions

*Yosuke MURAKAMI (Nihon Univ.), Hiroshi NOMURA, Yusuke SUGANUMA

【JB-222】 Study of Particulate Emission Characteristics by Fuel Components of Direct Injection Gasoline Engine

*Sangmyeong KIM (Chiba Univ.), Junichi ARIKAWA (Nihon Univ.), Tatsuya KUBOYAMA (Chiba Univ.), Yasuo MORIYOSHI, Kazuhiro AKIHAMA (Nihon Univ.), Jun HASHIMOTO (Oita Univ.)

【JB-223】 Experimental Analysis of Gasoline Spray Characteristics for a Direct Injection SI Engine Using Fuel Mixed with High Boiling Component

*Yu INOUE (Doshisha Univ.), Eriko MATSUMURA, Jiro SENDA, Kazumasa TAMURA (KOBELCO Research Inst. Inc.), Daiki KIHARA

JB-23: Measurement Method

14:00–15:40 Room B (D22)

【JB-231】 Measurements of Velocity and Size of Droplets by Laser Velocimeters

*Ichiro HONDA (Nagasaki Univ.), Manabu SAITO (IRS), Keisuke Komada (Fukuoka Inst. of Tech.), Daisaku Sakaguchi (Nagasaki Univ.), Hironobu UEKI

【JB-232】 Simultaneous Measurement of Droplet Diameter and Velocity near the Nozzle Exit of a Common Rail Injector

*Rikuya YAMADA (Okayama Univ.), Nobuyuki KAWAHARA, Eiji TOMITA

【JB-233】 Effect of Rotating Shutter Opening Time on Particle Size Distribution in Immersion Method

*Daiki MURAYAMA (Tokyo City Univ.), Rikio WATANABE

(JB-234) A trial of Visualization for Solid Particles of the Spray Droplet in Micro Slurry-Jet Erosion

*Motohiro OSHIMA (Toyama Pref. Univ.), Koya FUKUSHIMA, Toshiro MIYAJIMA

JC-21: Atomization Mechanism I

9:00–10:40 Room C (D23)

【JC-211】 Numerical Calculation of Engine with Atomization Effect due to Shock Wave

*Yasuhiro SOGABE (Waseda Univ.), Ken NAITOH

【JC-212】 Atomization of Fuel Spray in Pulsed Supermulti-jets Engine

*Lujiang SHI (Waseda Univ.), Yasuhiro SOGABE, Ken NAITOH, Hajime ITO, Yuuki ISSHIKI, Yoshiki KOBAYASHI, Yusuke TADA, Nozomu KIKUCHI, Aya HOSOI

【JC-213】 Characteristics of Oil Jet Ejected from a Nozzle with Different Types of a 90 Degree Bend Pipe

*Mikimasa KAWAGUCHI (Hiroshima Univ.), Goichi NITTA, Keita MIMURA, Keiya NISHIDA,

Akira NAKASHIMA (MAZDA), Ryo YAMAMOTO, Masanobu KOUTOKU, Yoichi OGATA
(Hiroshima Univ.)

(JC-214) **Droplet Puffing and Fine Droplets Formation by Gas Bubble Bursting**

*Hiroyasu SAITOH (Shibaura Inst. of Tech.), Asami HAYASHI, Chihiro INOUE (Kyusyu Univ.)

JC-22: Atomization Mechanism II

11:00–12:40 Room C (D23)

[JC-221] Systematic Evaluation of Spray Behavior Injected by Urea SCR Injector

*Mizuki YOSHIDA (Doshisha Univ.), Soushi MIURA, Naoto AMANO, Eriko MATSUMURA

(JC-222) **Characteristics of Spheroidized Iron Powder by Water Atomization Method**

*Makoto NAKASEKO (JFE Steel Co.)

(JC-223) **Visualization of Drop Fragmentation by High-Speed Water Spray**

*Wataru HIKITA (Kyusyu Univ.), Chihiro INOUE, Makoto NAKASEKO (JFE Steel Co.)

[JC-224] Influence of Ultrasonic Standing Wave on the Atomization Characteristics of Falling Droplets

*Kengo TOYOTA (Muroran Inst. of Tech.), Mitsutomo HIROTA, Hiroyasu SAITOH (Shibaura Inst. of Tech.)

JC-23: Atomization Mechanism III

14:00–15:40 Room C (D23)

[JC-231] Effect of Nozzle Shape on Flow Field of Gas Atomization

*Kazuki YOSHIMURA (Hitachi Metals), Nobuhiko CHIWATA, Takuhei KAWANO,

[JC-232] Improvement of Cathode Adhesion of Solid Oxide Fuel Cell by Electrostatic Spray Deposition

*Satoshi SUGAWARA (Nihon Univ.), Hiroshi NOMURA, Yusuke SUGANUMA

[JC-233] Influence of Multi-nozzle Arrangements on Spray Generation in Electrostatic Atomization

*Masahiro TAKAYANAGI (Gunma Univ.), Kento KOBAYASHI, Seiichi SHIGA, Mikiya ARAKI,
Juan Carlos GONZALEZ PALENCIA