

# JSRAE Annual Conference, Presentation Program (18th Aug.)

- (1) Each presentation has 20 minutes including 5 minutes for discussion.
- (2) Symbol (○/◎) shows speakers.
- (3) For multiple authors from the same institution, the affiliation of the first author from each institution is mentioned. The affiliation(s) of other author(s) is same as the preceding author.

----- The 1st Day -----

## Room A 7 September (Wed.)

### Organized Session OS-9

#### "Technological Development in Heat Exchangers"

Organizers: HIROTA Masafumi (Mie Univ.),  
SASAKI Naoe (Nihon Univ.), GAO Lei (Fukuoka Univ.)

#### 09:20~10:40 OS-9(1) [Chairperson: GAO Lei (Fukuoka Univ.)]

- A111 Study on thermal-hydraulics characteristics around a tube in two-phase flows across horizontal tube bundle  
◎BABA Misaki (Kobe Univ.) , MIYAZAKI Takeru, MURAKAWA Hideki, SUGIMOTO Katsumi, ASANO Hitoshi, TAKENAKA Nobuyuki, ITO Daisuke (Kyoto Univ.) , SAITO Yasushi
- A112 Study of Pressure Drop Characteristics in Plate-Fin Heat Exchanger  
○SHIKICHI Kazuaki (The Kansai Electric Power) , ASANO Hitoshi (Kobe Univ.)
- A113 Void Fraction Characteristics of Vertically Upward One-Component Gas-Liquid Two-Phase Flows in Small Diameter Square Tube  
◎MURATA Yuma (Kobe Univ.) , GOMYO Taisaku, UKENA Ryosuke, MURAKAWA Hideki, ASANO Hitoshi, SUGITA Katsuhiko (TEPCO) , UMEZAWA Shuichi
- A114 Hysteresis phenomena of annular flow dryout within small-size channels -Development of a thermodynamic model-  
○GIANNETTI Niccolò ( Waseda Univ. ) , YAMAGUCHI Seiichi, SAITO Kiyoshi

### International Session IS

#### "Advancement in HVAC&R Technologies in Asia"

Organizers: TOJO Kenji (TOJO R&D Design Office / Waseda Univ.), KAWABATA Katsuhiro (Daikin Industries), ASANO Hitoshi (Kobe Univ.)

#### 11:00~12:20 IS-1(1) [Chairperson: TAIRA Shigeharu (Daikin Industries)]

- A121 Analysis of Mixed Convection Thermal Enhancement in a Novel Flat-Plate Solar Water Collector Using Metal-Foam Blocks  
○HUANG Po-chuan ( National Taipei Univ. of Technology ) , TSAI Fu-po, Hwang Hsiu-Ying
- A122 (Cancel)
- A123 An experimental investigation on boiling and condensation heat transfer in multiport mini channel  
◎BASHAR M. Khairul ( Saga Univ. ) , KUDO Yasuhiro, RAHMAN M. Mostaqur, KARIYA Keishi, MIYARA Akio
- A124 Design and Fabrication of A Defrost Device Utilizing Heat Pump Applied to a Refrigerator  
○KUAN Yean-der ( National Chin-Yi Univ. of Technology ) , CHENG Chin-sheng, CHIU Yu-wei

### Organized Session OS-11

#### "Phenomena and Application Technology on Frost, Snow and Ice"

KATO Masashi (Mayekawa MFG.),  
MATSUMOTO Ryosuke (Kansai Univ.)

#### 13:20~15:40 OS-11(1) [Chairpersons: SHIMOMURA Nobuo (N.I.T., Niihama College) , MATSUMOTO Ryosuke (Kansai Univ.)]

- A131 [Keynote] Freezing of Swelling Porous Media with Donnan Equilibrium  
○AOKI Kazuo (Nagaoka Univ. of Technology)
- A132 Effects of cooling surfaces on frosting phenomena under natural convection  
◎NAKAJIMA Shun (Tamagawa Univ.) , OHKUBO Hidetoshi
- A133 Formation and growth of frost crystals on the surface with fine irregularities  
○YAJIMA Takeshi (TEPCO HD) , OHKUBO Hidetoshi (Tamagawa Univ.) , NAKAJIMA Shun, INOUE Daisuke, SAWAMURA Yuuki, SEKI Mitsuo (NATIMICS)
- A134 An influence of Micro-Machined Surface on the Defrost Time  
○SHIMOMURA Nobuo (N.I.T., Niihama College)
- A135 Investigation of the frost reduction by use of the ultrasonic vibration

©HASEGAWA Sho (Tohoku Univ.) , SHAOLIN Xu, SHIMADA Keita, MIZUTANI Masayoshi, KURIYAGAWA Tsunemoto

A136 Study on Defrosting with Ultrasound Focusing Device

©INOUE Sho (National Institute of Technology, Ichinoseki College) , HOSHI Takayuki (The Univ. of Tokyo)

#### Workshop WS-1

##### "Trends in Development of Heat Exchangers"

Moderators: FUJINO Hirokazu(Daikin Industries),

SUZUKI Hideaki (Toshiba Carrier),

ASANO Hitoshi (Kobe Univ.)

16:00~17:00 WS-1(1) [Chairperson: FUJINO Hirokazu (Daikin Industries)]

A141 KOBELCO's Microchannel Heat Exchanger Development Activity - Special application such as Hydrogen refueling station -

○MIWA Yasutake (KOBELCO) , NOISHIKI Koji

A142 Heat Exchanger Miniaturization by Diffusion Bonding Technology

○SUZUKI Yutaka (WELCON) , SAITO Takashi

A143 A Study on Condensing Performance of Heat Exchanger with "Innovative Smart Channel"<sup>®</sup> using R410A Refrigerant

○WANG Kaijian (Fujitsu General Laboratories) , OKUYAMA Akira, TAKAHASHI Toshihiko

17:00~18:00 WS-1(2) [Chairperson: SUZUKI Hideaki (Toshiba Carrier Corporation)]

A151 The Trend of the Microchannel Heat Exchanger for Air-conditioners and its Future Development

○HAYASE Gaku (Samsung Electronics)

A152 Development of Heat Exchangers for High Efficiency Multi-stage CO<sub>2</sub> Refrigerant Air Conditioning System

○KAJI Ryuhei (Daikin Industries)

A153 Activity of the Research Project "Advanced Heat Transfer Technology to develop for various environments"

○ASANO Hitoshi (Kobe Univ.)

**Room B 7 September (Wed.)**

#### Organized Session OS-3

##### "Performance Evaluation of Air-conditioners, Chillers and Heat Pump Water Heaters"

Organizers: WATANABE Choyu (Chubu Electric Power),

NISHIMURA Nobuya (Osaka City Univ.),

SAITO Kiyoshi (Waseda Univ.)

09:20~10:40 OS-3(1) [Chairperson: WAKUI Tetsuya (Osaka Prefecture Univ.)]

B111 Numerical and Experimental Investigations on Optimization of Ejectors

©CHEN Zuozhou (The Univ. of Tokyo) , DANG Chaobin, HIHARA Eiji

B112 Study on off-design performance and optimization of ejector-vapor compression cooling system using solar energy

○JIN Xu (Northeast Dianli Univ.) , CHEN Zuozhou (The Univ. of Tokyo) , DANG Chaobin, HIHARA Eiji

B113 Theoretical and Experimental Study on High Temperature Heat Pumps Using an HFO Refrigerant

○WATANABE Choyu (Chubu Electric Power) , Ikegame Toru (Nagoya Univ.) , IMAGAWA Takuya, NAKASHIMA Yuta, HAYASHI Yuta, YAMAMOTO Taishi

B114 Study on the design and development of evaluation method of low cost & high efficiency GSHP -Part 12 Examination of the high-efficiency GSHP for DHW-

©KUBO Kento (Hokkaido Univ.) , LIU Hongzhi, NAGANO Katsunori, KATSURA Takao, NAKAMURA Makoto, KUBOTA Kokan (Sunpot)

11:00~12:20 OS-3(2) [Chairperson: SAITO Kiyoshi (Waseda Univ.)]

B121 Optimization of Operating Conditions of a Multi-split Type Air-conditioning System for Buildings -Optimization of Operating Condition Under Low Cooling Loads-

○WAKUI Tetsuya (Osaka Prefecture Univ.) , HASHIKAWA Takahiro, YOKOYAMA Ryohei

B122 Performance Estimation of Multi-split Type Air-conditioning System by Support Vector Regression

○WAKUI Tetsuya (Osaka Prefecture Univ.) , WAKAI Seigo, YOKOYAMA Ryohei

B123 Development of Performance Improved Light Commercial Air Conditioners under Middle and Low Load Range

○HAMASAKI Motoki (Toshiba Carrier) , KIGUCHI Yukio, YAMAZAKI Tadayuki, KANAMORI Masaki, NAMIWO Takashi (Chubu Electric Power)

B124 Influences of LED Lights on Air-conditioning Load and Energy Consumption in Building for Business Use -2nd Report: Influence of Air-conditioner Partial Load Characteristics on the Energy Consumption-

○MIYAOKA Yoichi (Chudenkogyo) , KABASHIMA Nobutaka (Mie Univ.) , NAKAYAMA

Hiroshi (Chubu Electric Power), NAMIWO Takashi,  
HIROTA Masafumi (Mie Univ.)

**13:20~14:40 OS-3(3) [Chairperson: WATANABE Choyu  
(Chubu Electric Power)]**

B131 Study on High Efficiency Air Conditioner for Data  
Centers -3rd Report: Influence of Components  
upon Gas Injection Cycle-

○ UDAGAWA Yosuke ( NTT FACILITIES ) ,  
FUTAWATARI Naoki, KOHATA Yuji, YANAGI  
Masahide, SAITO Kiyoshi ( Waseda Univ. ) ,  
YAMAGUCHI Seiichi, OHNO Keisuke,  
OKUMURA Kenta

B132 Study on High Efficiency Air Conditioner for Data  
Centers -4th Report: Step Response Analysis-

© FUTAWATARI Naoki ( NTT FACILITIES ) ,  
UDAGAWA Yosuke, KOHATA Yuji, YANAGI  
Masahide, SAITO Kiyoshi ( Waseda Univ. ) ,  
YAMAGUCHI Seiichi, OHNO Keisuke,  
OKUMURA Kenta

B133 Energy Reduction of Air Conditioning for Data  
Centers Using Forced Circulation Phase Change  
Cooling

© MATSUNAGA Arihiro ( NEC ) , SATO Masanori,  
CHIBA Masaki, SAKUMA Hisato, TODOROKI  
Koichi, WADA Mizuki, YOSHIKAWA Minoru

B134 Development of a Simple Measuring Method of  
Actual Performances of Room Air Conditioner  
-Examination on Novel Nondestructive Prediction  
Methods of Refrigerant Flow Rate-

© KANO Naoki ( Osaka City Univ. ) , TODO Hiroki,  
NISHIMURA Nobuya

**15:00 ~ 16:20 OS-3(4) [Chairperson: NISHIMURA  
Nobuya (Osaka City Univ.)]**

B141 Evaluation method of compression type heat pump  
for actual driving performance -Construction of  
evaluation device and proposition of unsteady  
evaluation method-

© BAN Toshinori ( Waseda Univ. ) , OHNO Keisuke,  
YAMAGUCHI Seiichi, SAITO Kiyoshi ( Waseda  
Univ. ) , YAMAGUCHI Hideki ( NILIM )

B142 Refrigerant leakage detection for gas-engine-driven  
compression-type heat pump -Part 1: Proposal of  
refrigerant leakage detection method-

© OHNO Keisuke ( Waseda Univ. ) , NAKAGAWA  
Yasuaki, SAITO Kiyoshi, FURUHASHI Yuma  
( Tokyo Gas ) , WAKABAYASHI Tsutomu ( Osaka  
Gas ) , HIROTA Kazuma ( Toho Gas )

B143 Refrigerant leakage detection for gas-engine-driven  
compression-type heat pump -Part 2: Experimental  
application of a refrigerant leakage detection method

○ HIROTA Kazuma ( Toho Gas ) , FURUHASHI  
Yuma ( Tokyo Gas ) , WAKABAYASHI Tsutomu  
( Osaka Gas ) , OHNO Keisuke ( Waseda Univ. ) ,  
NAKAGAWA Yasuaki, SAITO Kiyoshi

B144 Refrigerant leakage detection for gas-engine-driven  
compression-type heat pump -Part 3: Leakage  
detection method in the presence of a refrigerant  
receiver-

○ WAKABAYASHI Tsutomu ( Osaka Gas ) ,  
FURUHASHI Yuma ( Tokyo Gas ) , HIROTA Kazuma  
( Toho Gas ) , OHNO Keisuke ( Waseda Univ. ) ,  
NAKAGAWA Yasuaki, SAITO Kiyoshi

**Organized Session OS-4**

**"Simulation Techniques for Air-conditioners,  
Chillers and Heat Pump Water Heaters"**

**Organizers: SAITO Kiyoshi (Waseda Univ.),  
NONAKA Masayuki (Hitachi-Johnson Controls  
Air Conditioning)**

**16:40 ~ 18:00 OS-4(1) [Chairperson: NONAKA  
Masayuki (Hitachi-Johnson Controls Air  
Conditioning)]**

B151 Optimum control of compression type heat pump  
systems -2nd report : Parameter studies on the  
manipulated variables and the disturbance-

○ YOSHIDA Tokitaka ( Waseda Univ. ) , BAN  
Toshinori, OHNO Keisuke, YAMAGUCHI Seiichi,  
SAITO Kiyoshi

B152 Evaluation of VRF Air-conditioners about control  
way

○ MATSUMOTO Kuniyasu ( The Kansai Electric  
Power ) , OHNO Keisuke ( Waseda Univ. ) ,  
YAMAGUCHI Seiichi, SAITO Kiyoshi

B153 Numerical modeling of low-grade heat driven ejector  
refrigeration system

○ REDO Mark Anthony ( Waseda Univ. ) , BERANA  
Menandro ( Univ. of the Philippines ) , SAITO Kiyoshi  
( Waseda Univ. )

B154 Numerical Analysis for Liquid-Film Thickness of  
Slug Flow in Microchannels with Interface Capturing  
Method

○ MATSUDA Kazuya ( Hitachi ) , ENDOH Kazuhiro

**Room C 7 September (Wed.)**

**Organized Session OS-8**

**"Present Status and Future Development  
of Compressors"**

**Organizers: FUKUTA Mitsuhiro (Shizuoka Univ.),  
SAWAI Kiyoshi (Hiroshima Institute of Technology)**

**09:20 ~ 10:40 OS-8(1) [Chairperson: SAWAI Kiyoshi (Hiroshima Institute of Technology)]**

- C111 Study on Tangential Leakage along Tip Seal in Scroll Compressors  
©KITAMURA Takuya (Shizuoka Univ.) , FUKUTA Mitsuhiro, MOTOZAWA Masaaki
- C112 High Efficiency Inverter Scroll Compressors  
○ MIZUSHIMA Yasuo ( Daikin Industries ) , MURAKAMI Yasuhiro, KITAURA Hiroshi, MATSUKAWA Kazuhiko, KATOH Katsumi, TSUKA Yoshitomo
- C113 Development of Hydrocarbon Scroll Compressor for High Temperature Heat Pump  
©SHIGA Motoyasu (Mayekawa MFG.) , OKU Tatsuya, SATO Harumi, NISHIO Toshio, SONOBE Tadashi, MATSUI Akira
- C114 CFD analysis of suction path in Screw Compressor  
©NAKAYA Eita (Hitachi-Johnson Controls Air Conditioning) , YONEMOTO Ryuichiro, KATO Eisuke

**Seminar SN-1**

**"Seminar on Compressor Technology"**

**Moderators: TOJO Kenji (TOJO R&D Design Office / Waseda Univ.), SUMIDA Kazuhisa (Toshiba Carrier)**

**11:00~12:00 SN-1(1) [Chairperson: TOJO Kenji (TOJO R&D Design Office / Waseda Univ.)]**

- C121 High Efficiency Heat Pump Water Heater Using CO<sub>2</sub> Refrigerant  
○WATANABE Michiharu (Hitachi) , TSUBONO Isamu, FUSHIKI Takayuki (Hitachi Appliances) , MUKAI Yugo, ONUMA Satoshi
- C122 Development of Large Capacity Twin Rotary Compressor Mounted in "Universal Smart X 3-series" Air-Source Heat Pump Units.  
○ HATAYAMA Masahiro ( Toshiba Carrier Corporation) , TATEISHI Akio, TOOYAMA Shingo, MORITA Takeru, SHIDA Shougo
- C123 Variable Refrigerant Flow (VRF) Air Conditioner using Flat-Tube Heat Exchanger  
○ MATSUDA Takuya ( Mitsubishi Electric Corporation ) , AOYAMA Yutaka, MORIKAWA Yudai, KONAGAYOSHI Teruaki, OGA Takuya

**International Session IS**

**"Advancement in HVAC&R Technologies in Asia"**

**13:20~14:40 IS-1(2) [Chairperson: TOJO Kenji (TOJO R&D Design Office / Waseda Univ.)]**

- C131 Air distribution design to enhance thermal comfort and energy saving for field events of the Taipei Dome  
○LIN Jin-taung (NEXTEK Company) , HUANG Yu-ren, CHUAH Yew Khoy (National Taipei Univ. of Technology)
- C132 Positioning Accuracy Improvement of a Single Axial Moving Carrier Utilizing an Environmental Control Technology  
○ LUO Win-jet ( National Chin-Yi Univ. of Technology ) , HUANG Zheng-Jun, LI Kun-Yinh, CHAO Zhan-Yong (Industrial Technology Research Institute)
- C133 CFD Simulations to Determine the Loading Characteristics of a Micro-hydrodynamic Bearing at Different Designs of Herringbone Grooves  
○ LEE Yee-Ting ( National Taipei Univ. of Technology ) , YANG An-Shik, LIU Chien-Sheng (National Chung-Cheng Univ.) , CHANG Yu-Hao, JUAN Yu-Hsuan ( National Taipei Univ. of Technology)
- C134 Conceptual feasibility study on heat pumps integration in power plants for low heat release -Thermo-economic estimation in the circumstance of South Korea-  
○ ROH Chulwoo ( Korea Institute of Energy Research ) , LEE Gilbong, BAIK Young-Jin, SHIN Hyung-Ki, LEE Beomjoon, CHO Junhyun

**Workshop WS-4**

**"Present and Future Solid State Refrigeration and Heat Pump Technologies"**

**Moderators: FUJITA Asaya (AIST), KAWANAMI Tsuyoshi (Kobe Univ. • AIST)**

**15:00 ~ 16:40 WS-4(1) [Chairperson: KAWANAMI Tsuyoshi (Kobe Univ.)]**

- C141 [Keynote] Magnetocaloric Effect and Magnetic Refrigeration - From Materials Aspect  
○WADA Hirofumi (Kyushu Univ.)
- C142 Thermal characteristics of Mn alloy packing duct in room-temperature magnetic refrigerator  
©OKUBO Tatsuya (Tokyo Institute of Technology) , OKAMURA Tetsuji, HIRANO Naoki ( Chubu Electric Power ) , PE Sanchoru (Sanden AT)
- C143 Effects Of Magnetocaloric Wire on Increase in Magnetic refrigeration Cycle  
○NOMURA Ryujiro (Fujikura) , UENO Kota, KONDO Masahiro, TAKEUCHI Katsuhiko, KIZAKI Takeshi
- C144 Entropy compensation between electron correlation and degree of freedom in solid state substances  
○FUJITA Asaya (AIST)

**17:00 ~ 18:20 WS-4(2) [Chairperson: FUJITA Asaya (AIST)]**

- C151 **[Keynote]** Research and Development on Magnetocaloric Heat Pump Device in Hokkaido  
○HIRANO Shigeki (HRO) , TOBA Atsuya, SUZUKI Hayato, KAWANAMI Tsuyoshi (Kobe Univ.)
- C152 Heat loss estimation of magnetic heat pump aiming at railway air-conditioner application  
◎MIYAZAKI Yoshiki (Railway Technical Research Institute) , IKEDA Kazuya, WAKI Koichiro, KAWANAMI Tsuyoshi (Kobe Univ.)
- C153 Status Quo and Prospects for Solid State Heat Pump Technologies  
○KAWANAMI Tsuyoshi (Kobe Univ.)

**Room D 7 September (Wed.)**

**Organized Session OS-5**

**"Desiccant/Humidity Control/  
Open Cycle Air Conditioning"**

**Organizers: MIYAZAKI Takahiko (Kyushu Univ.),  
KUBOTA Mitsuhiro (Nagoya Univ.),  
TSUJIGUCHI Takuya (Kanazawa Univ.),  
YAMAGUCHI Seiichi (Waseda Univ.)**

**09:20 ~ 10:40 OS-5(1) [Chairperson: TSUJIGUCHI Takuya (Kanazawa Univ.)]**

- D111 Development of Desiccant Air Conditioning System using Wakkanai Siliceous Shale Part 24- Summer period performance evaluation of a detached house with a retrofitted ground source free cooling and desiccant ventilation unit in Hokkaido  
◎SATO Reo (Hokkaido Univ.) , NAGANO Katsunori, NAKAMURA Makoto, OGURA Ryo (ex-Hokkaido Univ.) , NABESHIMA Yuki (Toyohashi Tech.) , AOKI Chiemi (Techno Frontier) , NIKI Kohsuke (Sunpot) , HURUKAWA Osamu
- D112 Development of Desiccant Air Conditioning System using Wakkanai Siliceous Shale -Part 25 Experimental Study of Chemicals Transfer from RA to SA in Desiccant rotor  
○AOKI Chiemi (Techno frontier) , NAGANO Katsunori (Hokkaido Univ.) , NAKAMURA Makoto, TOGAWA Junya, MIYAWAKI Sakura, WAKISAKA Kiyoshi, KOMAKI Ayumi, NABESHIMA Yuki (Toyohashi Univ. of Technology)
- D113 Development of Desiccant Air Conditioning System using Wakkanai Siliceous Shale Part 26- Summer period performance evaluation of retrofitted desiccant ventilation unit by MATLAB modeling

◎OGURA Ryo (ex-Hokkaido Univ.) , SATOU Reo (Hokkaido Univ.) , NAGANO Katsunori, NAKAMURA Makoto, NABESHIMA Yuki (Toyohashi Tech.) , AOKI Chiemi (Techno Frontier) , NIKI Kohsuke (Sunpot) , HURUKAWA Osamu

- D114 Development of Desiccant Air Conditioning System using Wakkanai Siliceous Shale -Part27 Experimental study of the effect of a purge zone-  
◎ NABESHIMA Yuki (Toyohashi Univ. of Technology) , NAGANO Katsunori (Hokkaido Univ.) , AOKI Chiemi (Techno frontier) , NAKAJIMA Toshimitsu, NIKI Kohsuke (Sunpot) , TOGAWA Junya (JESCO)

**11:00 ~ 12:20 OS-5(2) [Chairperson: MIYAZAKI Takahiko (Kyushu Univ.)]**

- D121 Development of hybrid dehumidifier consisted of desiccant honeycomb block  
◎ITO Shinichi (Mitsubishi Electric) , HAMADA Mamoru, TANAKA Manabu
- D122 Investigation of Air-Conditioning System in Plant Factory Suitable for Snowy Region  
○AKAHIRA Akira (Aomori Prefectural Industrial Technology Research Center)
- D123 Study on Energy Consumption of Desiccant Air-Conditioning System for Low-Humidity Environment - Parameter Study by Numerical Analysis -  
◎ITO Suguru (Azbil) , OMAGARI Yasuhito, YAMAGUCHI Seiichi (Waseda Univ.) , SAITO Kiyoshi
- D124 Development and Performance Study of -70 °CDP Super Low Dew Point Dehumidifier Using One Rotor be Used for All Outside Air  
○JIN Weili (Seibu Giken) , IWASAKI Mayu, TAGURI Eiji, OKANO Hiroshi

**13:40 ~ 14:40 OS-5(3) [Chairperson: OSAKA Yugo (Kanazawa Univ.)]**

- D131 Performance of the Desiccant Humidity using the CO<sub>2</sub> Heat Pump  
○KOMATSU Fujio (Mayekawa MFG.) , FURUDATE Takahiro, NOGUCHI Takeshi
- D132 Experimental study of a frost-free air-source heat pump water heater system  
○ZHANG Li (Central Research Institute of Electric Power Industry) , SAIKAWA Michiyuki
- D133 Application of Desiccant Air Conditioning Systems for Agricultural Product Storage  
MAHMOOD Muhammad Hamid (Kyushu Univ.) ,  
○MIYAZAKI Takahiko, KOYAMA Shigeru

**15:00 ~ 16:20 OS-5(4) [Chairperson: YAMAGUCHI Seiichi (Waseda Univ.)]**

- D141 Effective Thermal Conductivity Measurement of Composite Organic Sorbent Particles  
HORIBE Akihiko (Okayama Univ.) , HARUKI Naoto, YAMADA Yutaka, ©SEGAWA Ryosuke
- D142 Adsorption Characteristics of Desiccant Element with Organic Adsorbent  
○ASANO Hitoshi (Kobe Univ.) , MURATA Kenta, YAMAGUCHI Hideki (Osaka Gas) , TAGUCHI Masaaki
- D143 Water Adsorption Rate on Adsorbent Layer Coated with ALPO Zeolite  
○KUBOTA Mitsuhiro (Nagoya Univ.) , HANAOKA Noriko, MATSUDA Hitoki
- D144 Sorption Performance of Desiccant Coated Heat Exchangers  
©HIGASHI Tomohiro (The Univ. of Tokyo) , ZHANG Li (Central Research Institute of Electric Power Industry) , SAIKAWA Michiyuki, YAMAGUCHI Mao (The Univ. of Tokyo) , DANG Chaobin, HIHARA Eiji

**16:40 ~ 18:00 OS-5(5) [Chairperson: KUBOTA Mitsuhiro (Nagoya Univ.)]**

- D151 Dehumidification Behavior of an Adsorbent coated on Hot water - heat exchanger.  
© ISHIKURA Hiroki ( Kanazawa Univ. ) , LI Xiaodong, TSUJIGUCHI Takuya, OSAKA Yugo, KODAMA Akio
- D152 Water Transfer Properties of Compact Honeycomb Unit with Sorbent Material  
HORIBE Akihiko (Okayama Univ.) , HARUKI Naoto, YAMADA Yutaka, ©TANIMOTO Kazufumi, NAKAMURA Takashi ( Calsonic Kansei ) , MARUYAMA Tomohiro
- D153 Sorption performance of desiccant coated heat exchanger by weight measuring method  
©YAMAGUCHI Mao (The Univ. of Tokyo) , HIGASHI Tomohiro, DANG Chaobin, HIHARA Eiji
- D154 Performance optimization of a packed bed liquid desiccant air conditioning system  
○VARELA Richard Jayson (Waseda Univ.) , YAMAGUCHI Seiichi, SAITO Kiyoshi, HARADA Masatoshi (Dyna-Air) , MIYAUCHI Hikoo

**Room E 7 September (Wed.)**

**Workshop WS-2**

**"Geothermal Heat Utilization in Shallow Layer"**

**Moderators: SASAKI Naoe (Nihon Univ.),  
TAKEDA Tetsuaki (Univ. of Yamanashi)**

**11:00~12:20 WS-2(1) [Chairperson: OGUMA Masahito (Nihon Univ.)]**

- E121 Development of design and performance prediction tool for the shallow ground source heat pump system using vertical spiral ground heat exchangers and its application  
○KATSURA Takao (Hokkaido Univ.) , NAGANO Katsunori, NGUYEN Hai Dang, AKAI Hitoshi (Fukushima Univ.) , OE Motoaki (INOAC Housing & Construction Materials)
- E122 Performance of Various Kinds of Heat Exchanger Piles Using Foundation Pile  
○MIYAMOTO Shigenobu (Fukui Univ.) , NAGAI Niro, TAKEUCHI Masanori, HASHIZUME Yoshimitsu (Mitani Sekisan) , SASAKI Takashi
- E123 Development of optimum design method for the heat recovery ground source heat pump system  
© MIYASHITA Yoshiki ( Hokkaido Univ. ) , KATSURA Takao, NGUYEN Hai Dang, NAGANO Katsunori, NAKAMURA Yasushi (Nippon Steel & Sumikin Engineering)
- E124 Study on the Predictive Control of District Heating and Cooling System Using a Geothermal Heat Pump  
○OHSAKI Ayano (Okayama Univ.) , FUKUMIYA Kenji (AGRICLUSTER) , HIRAO Naotake (Institute of Technologists)

**13:20 ~ 15:20 WS-2(2) [Chairperson: SASAKI Naoe (Nihon Univ.)]**

- E131 **[Keynote]** R&D of Ground Source Heat Pump Systems with Pile Heat Exchangers  
○KAKIZAKI Takao (Nihon Univ.) , OGUMA Masahito (Nihon Univ.)
- E132 Heat Pump System for Ground Source Utilization with Pile Heat Exchangers -Thermal Performances of a Brine Heat Pump-  
○SATO Takashi (Nihon Univ.) , OGUMA Masahito
- E133 Heating characteristics of shallow ground-source heat-pump system in the Fukushima Demonstration House  
©ARAI Yusuke (Nihon Univ.) , ITO Kosuke, YASHIRO Hikaru, KAGEYAMA Chiaki (Dwelling Environment Design Room)
- E134 Effect Prediction of Factors on Shallow Ground Thermal Environment  
○TANAKA Saburo (Nihon Univ.) , SASAKI Naoe
- E135 Development of a Ground Source Heat Reference Map - Suggestion for Common Platform -  
○FUNABIKI Ayako (Nihon Univ.) , ANDO Koichi (Nihon Univ.) , OGUMA Masahito (Nihon Univ.) , SATOH Tsuyoshi (Koshin-Toshi Consultants)

**15:40~17:40 WS-2(3) [Chairperson: TAKEDA Tetsuaki (Univ. of Yamanashi)]**

- E141 **[Keynote]** The development of Geothermal Heat Pump System for single-family houses -Take advantage of ground improvement pile and direct expansion method underground heat exchanger -  
○ YODA Osamu (Fujishima) , OGASAWARA Toshiro ( Saitama Industrial Promotion Public Corporation) , HIDA Yoshimasa (Fujishima) , WATANABE Hiromi, OKUBO Hiroji, TAKEDA Tetsuaki (Univ. of Yamanashi) , FUNATANI Shumpei
- E142 Development of the Predictive Control of District Heating and Cooling System Using a Geothermal Heat Pump  
○ FUKUMIYA Kenji ( AGRICLUSTER ) , OGASAWARA Toshiro ( Saitama Industrial Promotion Public Corporation) , HIRAO Naotake (Institute of Technologists) , KUBOTA Takeshi (AGRICLUSTER) , KIKUCHI Yusuke
- E143 Demonstration tests of the Ground Source Heat Pump system in Yamanashi and its Evaluation of Energy Saving Effect  
HAGIHARA Toshio (Hagihara Boring) , ONO Toshio, NAKAZAWA Toshiya, ○ ISHIGURO Shuhei (Univ. of Yamanashi)
- E144 Field Tests on Heat Pump Air-Conditioning System using Shallow Ground Heat Source -Proposal of Low-Cost Underground Heat Exchanger-  
○ NAGAI Niro (Univ. of Fukui) , TSUBOTA Kazushi, SUGANUMA Yuto, MIYAMOTO Shigenobu, KAWAKAMI Takehiko (CORONA) , HASHIZUME Yoshimitsu (Mitani Sekisan)
- E145 Development of ground source heat pump that use direct expansion method  
○ TAKEDA Tetsuaki (Univ. of Yamanashi) , FUNATANI Shumpei, ISHIGURO Shuhei

----- The 2nd Day -----

**Room A 8 September (Thu.)**

**Organized Session OS-9**

**"Technological Development in Heat Exchangers"**

**09:20 ~ 10:40 OS-9(2) [Chairperson: SASAKI Naoe (Nihon Univ.)]**

- A211 Condensation heat transfer of Low-GWP refrigerants on a vertical finned surface  
◎ FUKUDA Sho (Kyushu Univ.) , TAKATA Nobuo, MATSUMOTO Tatsuya, KOYAMA Shigeru
- A212 Condensing Heat Transfer Characteristic in Quadrilobed tube with a clearance for leak detection for Heat Pump Water Heater

◎ KAWAGUCHI Taihei (Kobe Univ.) , MURATA Yuma, ASANO Hitoshi, HARA Hitoshi (Noritz) , ASANO Tomonori

- A213 Effect of Mixed Oil on Flow Characteristics of CO<sub>2</sub> Critical Flow through an Orifice  
◎ KAWANO Shin (Kobe Univ.) , ASANO Hitoshi, TAKIGUCHI Koji (Fuji Electric) , ISHIDA Shin, TUCHIYA Toshiaki
- A214 Effect of Oil on Flashing Boiling Two-phase Flow in Capillary Tubes  
◎ TAKAKUSHI Shuhei (Fukuoka Univ.) , GAO Lei, TATARA Yusuke, HONDA Tomohiro

**International Session IS**

**"Advancement in HVAC&R Technologies in Asia"**

**11:00 ~ 12:20 IS-1(3) [Chairperson: KARIYA Keishi (Saga Univ.)]**

- A221 The Comparison of Heat Transfer Performance between Helical Coil Heat Exchanger and Wrap-Around Coil Heat Exchanger  
○ SHIH Yang-cheng (National Taipei Univ. of Technology) , LIN Champ, SHIH Shih-hao (Electronics Testing Center) , CHAO Ling-yu (Industrial Technology Research Institute) , CHOU Jui-fah (Alpha Engineering)
- A222 The Effects of Degrees Subcooling and Operating Time on Spray Cooling Heat Transfer Performance Using Nanofluids As Coolant  
○ CHANG Tong-bou (National Chiayi Univ.) , CHEN Rong-horng, LIN Tsung-han
- A223 Forced Impinging Cooling Enhancement Across Multiple Heated Blocks By Porous Covers  
○ HUANG Po-chuan (National Taipei Univ. of Technology) , TSAI Fu-po, HWANG Hsiu-ying
- A224 Analysis of Enhanced Electronic cooling by pulsating impinging flow and porous covers  
○ HUANG Po-chuan (National Taipei Univ. of Technology) , TSAI Fu-po, HWANG Hsiu-ying

**Room B 8 September (Thu.)**

**General Session GS**

**09:40 ~ 10:40 GS-1(1) [Chairperson: YOSHIDA Atsumasa (Osaka Prefecture Univ.)]**

- B211 (Cancel)
- B212 A study for the energy saving performance of Hydrocarbon mixtures by catalysis  
◎ KATSUMATA Ikuma (Kanagawa Institute of Technology) , YADA Naoyuki, OYAMA Toru (GLOBALGAS) , NAKAGAWA Terumichi

- B213 Consideration on applicability of lumber drying system with high temperature water-circulation type heat pump  
 ○TAKAYAMA Tsukasa (Toshiba Carrier), KAIDA Takenobu (Central Research Institute of Electric Power Industry), KATAOKA Hiroyoshi (Shimane Prefecture Mountainous Region Research Center)
- B214 The Investigation of the Third Generation Hybrid Hot Water Unit -The Primary Energy Performance Progress of The Hybrid Hot Water Unit-  
 ○MURAMATSU Yasuhito (Rinnai), KOHNO Hideo, AKAKI Nobuyuki, SOBUE Tsutomu, IMAI Seishi

**11:00 ~ 12:20 GS-1(2) [Chairperson: NISHIMURA Nobuya (Osaka City Univ.)]**

- B221 Approach of Facility Renewal aiming at Zero Energy Building -3rd Report: Inspection of dedicated air conditioning system by renewable energy and Measurement of energy consumption-  
 ○NISHIZAWA Makoto (Sanken Setsubi Kogyo), TOMURO Yasuhiro, YUKI Ryosuke, KUWAHARA Ryoichi
- B222 Environmental diagnosis method of the plant factory based on measurement and analysis of environmental distribution and growth distribution of vegetables  
 ○MORIUCHI Koji (Seiken), UEDA Yasushi, YOSHIDA Atsumasa (Osaka Prefecture Univ.), KINOSHITA Shinichi
- B223 Development of slim and translucent vacuum insulation panels to contribute retrofitting insulation for existing buildings  
 ◎MURAKAMI Tomoaki (Hokkaido Univ.), KATSURA Takao, YANG Zhang, NAGANO Katsunori
- B224 The Performance Evaluation Method of Air Curtain at the Entrance of Refrigerating Warehouse  
 ○ONO Hiroyuki (Airtech Japan), ITAKURA Kazuki, WATANABE Naoki, OKAMOTO Mamoru

**Room C 8 September (Thu.)**

**Organized Session OS-8  
 "Present Status and Future Development  
 of Compressors"**

**09:20 ~ 10:40 OS-8(2) [Chairperson: MORIMOTO Takashi (Panasonic)]**

- C211 Study of Flow Characteristics of Oil Viscosity Pump for Refrigerant Compressor -2nd Report: Experimental Evaluation of Flow Characteristics about Various Oil Groove-

- ◎MINEMOTO Atsushi (Hiroshima Institute of Technology), DOI Manabu, SAWAI Kiyoshi, ISHII Noriaki (Osaka Electro Communication Univ.), IIDA Noboru (Panasonic), KINJO Kenji
- C212 Property Measurements of Nano-oil  
 ◎MAKIDA Naoki (Shizuoka Univ.), MOTOZAWA Masaaki, FUKUTA Mitsuhiro
- C213 Evaluation of dissolution of Lubricants and Refrigerants  
 ◎MATSUMOTO Tomoya (Idemitsu Kosan), KANEKO Masato, KAWAGUCHI Yasuhiro
- C214 Experimental investigation on oil outflow characteristics in horizontal compressor  
 ◎MORIYAMA Takashi (Mitsubishi Electric), MURAKAMI Hiroki

**Seminar SN-1  
 "Seminar on Compressor Technology"**

**11:00~11:50 SN-1(2) [Chairperson: TOJO Kenji (TOJO R&D Design Office / Waseda Univ.)]**

- C221 High Performance Centrifugal Chiller GART, GART-I Series  
 ○HASEGAWA Asushi (Mitsubishi Heavy Industries), MIYAMOTO Jun, YAWATA Naoki, WAJIMA Kazuki, UEDA Kenji
- C222 Trends in Low-Gwp Refrigerants  
 ○FUKUSHIMA Masato (ASAHI GLASS)

**Room D 8 September (Thu.)**

**Organized Session OS-6  
 "Refrigerators/Heat Pumps Based on Absorption,  
 Adsorption or Chemical Reactions"  
 Organizers: AKISAWA Atsushi (Tokyo Univ. of  
 Agriculture and Technology),  
 NISHIMURA Nobuya (Osaka City Univ.),  
 SAITO Kiyoshi (Waseda Univ.),  
 HAMAMOTO Yoshinori (Kyushu Univ.)**

**09:40 ~ 10:40 OS-6(1) [Chairperson: HAMAMOTO Yoshinori (Kyushu Univ.)]**

- D211 Development of silica/aluminum composite adsorbent for water-vapor adsorption cooling  
 ◎KONGDAM Chompassorn (Kanazawa Univ.), KUMITA Mikio, KODAMA Akio, HIGASHI Hidenori, SETO Takafumi, OTANI Yoshio
- D212 Study on Adsorption Heat Pump using Natural Mesoporous Material 3rd report: Development of the Heat Exchanger with Adsorbent and Evaluation of Cooling Ability  
 ○TOGAWA Junya (Nihon Netsugen System), MORITA Atsushi (Hokkaido Univ.), NAKAMURA

Makoto, NAGANO Katsunori, MATSUMOTO Takuya (Nihon Netsugen System), OMAE Seiya, KUROISHI Hiroaki, HARADA Katsuhiko

- D213 Adsorption heat pump for vehicle cooling system  
○ MAEDA Shinnosuke (Calsonic Kansei), MARUYAMA Tomohiro, KAWAMATA Toru, ONDA Tadayoshi

**11:00 ~ 12:20 OS-6(2) [Chairperson: KUMITA Mikio (Kanazawa Univ.)]**

- D221 Development of adsorption heat pump using HFC-134a / activated carbon  
○ IWASE Daichi (Nagoya Univ.), KUWATA Kazuki, MATSUDA Takayuki, KOBAYASHI Noriyuki
- D222 Heat Transfer Performance for Rotary Type of Reactor used to Chemical Heat Pump  
○ WATANABE Fujio (AIT), ITO Seiya (Nagoya Univ.), ICHIKI Tomohiro (AIT), HASATANI Masanobu, KOBAYASHI Noriyuki (Nagoya Univ.)
- D223 Estimation of an influence of heat capacity of adsorbent heat exchanger on cooling and heating energy supply from adsorption chiller driven by solar thermal energy  
○ HAMAMOTO Yoshinori (Kyushu Univ.), MORI Hideo
- D224 Method for Estimating Optimum Cycle Time based on Adsorption Chiller Parameters  
○ IGUCHI Kejiro (Tokyo Univ. of Agriculture and Technology), NAKAYAMA Masayuki, AKISAWA Atsushi

**Room E 8 September (Thu.)**

**Organized Session OS-11  
"Phenomena and Application Technology  
on Frost, Snow and Ice"**

**09:00 ~ 10:40 OS-11(2) [Chairperson: KATO Masahi (Mayekawa MFG.)]**

- E211 Experimental Study of Delaying Frost Formation on Surfaces of Precooler Tubes Using Vertical Finned-Tube  
○ TOKAWA Satoru (Waseda Univ.), HIRABAYASHI Yosuke, KINOSHITA Yoshiaki, SATO Tetsuya
- E212 Effects of various parameters on heat transfer and flow field of a cooling tube with a splitter plate under frosting condition  
○ YOSHIMURA Yusuke (Shizuoka Univ.), FUKIBA Katsuyoshi, SATO Sota, NAO Kyosuke
- E213 Frost Formation between Concave and Convex-Patterned Flat Plates under Forced

Convection -Detailed Observation 'High Speed VTR' with Using Micro Scope Camera-

○ DOSHIDA Hiroki (Waseda Univ.), MASAFUMI Katsuta, RYOU Miyahara

- E214 Characteristics of Frost Formation and Heat Transfer in the Plate-fin Tube Heat Exchanger -Effect of the Bypass Flow Channel-

○ KAGEBAYASHI Kazuma (Kansai Univ.), MATSUMOTO Ryosuke, UECHI Takuma

- E215 Heat and Mass Transfer Characteristics of Frost Formation in Finless Flat Tube Heat Exchanger for Refrigeration

○ ONISHI Hajime (Kanazawa Univ.), SHIMAMOTO Takahiro (Murata Machinery), TADA Yukio (Kanazawa Univ.)

**11:00 ~ 12:20 OS-11(3) [Chairperson: FUKIBA Katsuyoshi (Shizuoka Univ.)]**

- E221 The effect of surface wettability and roughness on the frost growth observed by SEM  
○ TOKOROYAMA Takayuki (Akita Univ.)
- E222 Measurement of Frost Density Profile by X-ray Radiography  
○ UECHI Takuma (Kansai Univ.), MATSUMOTO Ryosuke, KAGEBAYASHI Kazuma, ITO Daisuke (Kyoto Univ.), SAITO Yasushi
- E223 Measurement of Three-dimensional Microstructure of Frost Layer by Using X-ray Computed Tomography  
○ UECHI Takuma (Kansai Univ.), MATSUMOTO Ryosuke, KAGEBAYASHI Kazuma
- E224 Estimation of the Water Behavior in Defrosting Process by Using Neutron Radiography  
○ MATSUMOTO Ryosuke (Kansai Univ.), YOSHIMURA Tomoya (Yanmar Energy Systems), UMEKAWA Hisashi (Kansai Univ.), AMI Takeyuki, ITO Daisuke (Kyoto Univ.), SAITO Yasushi

-----The 3rd Day -----

**Room A 9 September (Fri.)**

**Organized Session OS-9  
"Technological Development in Heat Exchangers"**

**09:00~10:20 OS-9(3) [Chairperson: HIROTA Masafumi (Mie Univ.)]**

- A311 Basic Study on Effects of Dimensions on Mechanism of Heat Transfer Enhancement around Heating Components by Pulsating Flow  
○ SUZUKI Nobuaki (Iwate Univ.), FUKUE Takashi, HIROSE Kouiti, SHIRAKAWA Hidemi (Toyama College), SAGA Yousuke (Iwate Univ.)

- A312 Study on Tube-in-Fin Heat Exchanger  
○ENDO Kazuhiro (Hitachi)
- A313 Performance improvement of spiral tube gas cooler for the heat pump water heater  
◎TAKAYAMA Keisuke (Mitsubishi Electric) , HATANAKA Kensaku, KOIDE Toru, MIYAKAWA Kodai
- A314 Development of an Industrial High Performance and High Temperature Heat Pump -Heat Transfer Characteristics of Supercritical R600 in Plate Heat Exchangers-  
○NISHIDA Kosaku (Mayekawa MFG.) , KUDO Mizuo, KOBAYASHI Keizo, MACHIDA Akito, SAITO Kiyoshi (Waseda Univ.) , OHTA Yutaka, KATSUTA Masafumi

**10:40~12:00 OS-9(4) [Chairperson: NISHIDA Kousaku (Mayekawa MFG.)]**

- A321 Heat Transfer Performance of Lattice Structure Fabricated Using Metal 3D Printing  
○SHINOMIYA Naruaki ( TRI Osaka ) , NAKAMOTO Takayuki, KIMURA Takahiro, YAMAGUCHI Shinpei, KATAGIRI Kazuaki
- A322 Heat Transfer Enhancement for Water Side in 4-Leaves-Tube-Type Heat Exchanger  
○KIMURA Fumiyoshi (Univ. of Hyogo) , YUSOF Amir Fawwaz, HORI Toshihiro (Noritz) , OOTOMO Ichiro, NAKATSUKA Yusuke, ASANO Hitoshi (Kobe Univ.)
- A323 Laminar flow forced convection heat transfer of Al<sub>2</sub>O<sub>3</sub>-water nanofluids in a tube  
○AKAMATSU Masato ( Yamagata Univ. ) , KOBAYASHI Yudai, YASUHARA Kaoru
- A324 Performance Evaluation and Temperature Profile Visualization of an Open Evaporative Cross-flow Cooling Tower  
◎AKIMOTO Takahiro (Fukuoka Univ.) , GAO Lei, NAKAMURA Kota, OKAMOTO Isao ( Kuken Kogyo)

**13:00~14:20 OS-9(5) [Chairperson: INOUE Norihiro (Tokyo Univ. of Marine Science and Technology)]**

- A331 Experimental study on image processing at multi measurement point of falling liquid film evaporation on square frustum projection type evaporation heat transfer tube  
○TAKAHASHI Hiroyuki (Kobelco & Materials Copper Tube) , IWAMOTO Hideki, MATSUNO Tomonobu
- A332 Characteristics of Refrigerant Flow in Evaporator for Refrigerator during Defrosting process  
◎KITAGAWA Hiroki (Saga Univ.) , KARIYA Keishi, ISHIDA Kenji, MIYARA Akio

- A333 Experimental Study on Refrigerant Two-Phase Flow Distribution in Multi-Pass Channel  
◎SONDA Kensuke (Waseda Univ.) , KATSUTA Masafumi, NIKI Yuhei
- A334 Experimental Study on Distributions of Gas-Liquid Refrigerant Flows in Multi-Pass Channels  
NAKAO Yuki (Mie Univ.) , EKAWA Akira, ○HIROTA Masafumi, SATO Hideaki (DENSO)

**14:40~16:00 OS-9(6) [Chairperson: KONDOU Chieko (Nagasaki Univ.)]**

- A341 Boiling heat transfer of water flowing vertically upward in a circular mini-channel  
◎NAKAMURA Taichi (UEC) , OHNO Masaharu, ISLAM MD. Amirul (Kyushu Univ.) , ENOKI Koji, OKAWA Tomio, OZAWA Mamoru (Kansai Univ.)
- A342 A simulation for the flow fluctuation of boiling flow in parallel mini-channels  
○MIYATA Kazushi (Kyushu Univ.) , SAITOH Masashi (The Univ. of Tokyo) , MORI Hideo (Kyushu Univ.) , HAMAMOTO Yoshinori
- A343 Experiments of Heat transfer and pressure drop of R32 inside horizontal multiport tube with triangular channels  
◎EDA Hikaru (Tokyo Univ. of Marine Science and Technology) , JIGE Daisuke, INOUE Norihiro
- A344 Cooling performance of micro-channel heat transfers  
◎ZHENG Chen (The Univ. of Tokyo) , DANG Chaobin, HIHARA Eiji

**16:20 ~ 17:40 OS-9(7) [Chairperson: MIYARA Akio (Saga Univ.)]**

- A351 Effect of Tube Diameter on Boiling Heat Transfer and Pressure Drop of R32 inside Horizontal Small-Diameter Microfin Tubes  
◎SAGAWA Kentaro (Tokyo Univ. of Marine Science and Technology) , JIGE Daisuke, INOUE Norihiro
- A352 Evaporation Heat Transfer and Pressure Drop Characteristics of R245fa inside Microfin Tubes  
◎WATANABE Kazuhide (Tokyo Univ. of Marine Science and Technology) , JIGE Daisuke, INOUE Norihiro
- A353 Electronics Cooling Device Using Low-GWP Refrigerants and Super-Hydrophilic Surface  
◎UMEMOTO Shohei (Nagasaki Univ.) , GODA Akito, KONDOU Chieko, KOYAMA Shigeru (Kyushu Univ.) , MITOOKA Yutaka (Industrial Technology Center of Okayama Prefecture)
- A354 Effect of Flow Direction of Heating Medium on Boiling Heat Transfer Characteristics of Upward Boiling Flows in a Single-Channel Plate-Fin Heat Exchanger

©UENO Takayuki (Kobe Univ.) , ASANO Hitoshi,  
SHIKICHI Kazuaki (KEPCO)

**Room B 9 September (Fri.)**

**Organized Session OS-2**

**"Refrigerating System towards Low-Carbon Societies"**

**Organizers: NAKAYAMA Shinichi (Fuji Electric),  
SUZUKI Koji (Sanki Engineering)**

**09:20 ~ 10:20 OS-2(1) [Chairperson: NAKAYAMA  
Shinichi (Fuji Electric)]**

- B311 Performance evaluation of the air conditioner system  
using Low-GWP refrigerants  
○ENYA Atsushi (Mitsubishi Heavy Industries) ,  
MURAKAMI Kenichi
- B312 Study of Suitable Refrigeration Oil for Low GWP  
Refrigerants  
○SAITO Rei (Japan Sun Oil Company) , SUZUKI  
Yoshinori, FUKUHARA Takao
- B313 Energy conservation of refrigerated display case by  
the inverter control  
©KATAYOSE Ryota (Waseda Univ.) , KATSUTA  
Masafumi, SHIKANO Tatsuya

**10:40 ~ 11:40 OS-2(2) [Chairperson: SUZUKI Koji  
(Sanki Engineering)]**

- B321 Thermal partition for large-scale places by Air  
Curtain  
○NAKAMURA Shingo (Fuji Electric) , ASADA  
Tadashi, TAMURA Takeshi
- B322 Evaluation of the effects on COP by the Pressure  
Pulsation in Two-Stage Compressed Injection Cycle  
○SEKIYA Sachio (Hitachi) , KUBOTA Atsushi,  
NONAKA Masayuki (Hitachi-Johnson Controls Air  
Conditioning) , DAISAKA Hisashi
- B323 Effect of the saving of energy by the use of the  
household electrical appliance for Residences  
-Clothing drying by room air conditioner in a living  
room and Energy saving technique of the  
refrigerator-  
○YAGI Yasuko (The Kansai Electric Power) ,  
KIKUOKA Yasuhira (Kanden Engineering (former  
The Kansai Electric Power))

**Workshop WS-3**

**"Cutting-Edge Technologies for  
Optimization of Heat Pump System"**

**Moderators: HAMAMOTO Yoshinori (Kyushu Univ.),  
KASAHARA Shinichi (Daikin Industries)**

**13:00 ~ 14:20 WS-3(1) [Chairperson: KASAHARA  
Shinichi (Daikin Industries)]**

- B331 **[Keynote]** Introducing the newest case of Deep  
Learning and its applications - Considering for the  
manufacturing industry -  
○SATO Akira (XCompass)

- B332 Heat Pump Performance for Demand Response  
Program in the United Kingdom First Report -  
Introduction to Smart Community Demonstration  
Project in Manchester, U.K.  
○MASUDA Ryoh ( Daikin Industries ) ,  
NAKAGAWA Koichi, YOSHIMI Manabu

- B333 Anomaly detection of facilities in transitional state  
○SUZUKI Hideaki (Hitahi) , SUMIDA Satoshi

**14:40 ~ 16:00 WS-3(2) [Chairperson: HAMAMOTO  
Yoshinori (Kyushu Univ.)]**

- B341 **[Keynote]** R&D Center for the Plant factory in  
Osaka Prefecture Univ. and Environment Control in  
the Cultivation Room  
○YOSHIDA Atsumasa (Osaka Prefecture Univ.)
- B342 Energy optimization technology for convenience  
stores  
○SHIOTA Hideaki (Fuji Electric) , KIDO Takeshi,  
TAKEDA Hisataka
- B343 The Energy Conservation Technology and Airflow  
Control of Split-type Air Conditioner with  
Twin-propeller Fans  
○HAMADA Shingo ( Mitsubishi Electric ) ,  
YOSHIKAWA Hiroshi

**Room C 9 September (Fri.)**

**Organized Session OS-10**

**"Thermophysical Properties of Refrigerants"**

**Organizers: AKASAKA Ryo (Kyushu Sangyo Univ.),  
MATSUDA Kenji (The Japan Refrigeration and Air  
Conditioning Industry Association),  
KAYUKAWA Yohei (AIST)**

**09:20~10:20 OS-10(1) [Chairperson: MATSUDA Kenji  
(JRAIA)]**

- C311 A Helmholtz Energy Equation of State for  
R-1224yd(Z)  
○AKASAKA Ryo (Kyushu Sangyo Univ.) ,  
FUKUSHIMA Masato (Asahi Glass) , LEMMON  
Eric W. (NIST)
- C312 Thermodynamic Properties of Low-GWP Alternative  
Refrigerants  
○FUKUSIMA Masato ( Asahi Glass ) ,  
HASHIMOTO Mai, HAYAMIZU Hiroki,  
AKASAKA Ryo (Kyushu Sangyo Univ.)
- C313 Maximum Density Region of Aqueous Solution of  
Ammonia

○ OGUCHI Kosei ( Kanagawa Institute of Technology)

**10:40 ~ 12:00 OS-10(2) [Chairperson: KAYUKAWA Yohei (AIST)]**

C321 The Fire Behavior of Mildly Flammable Refrigerants in Enclosed Space

○ KAWASHIMA Mitsuru (Mitsubishi Electric) , MAEDA Akira

C322 PVT Property Measurements for a Gaseous Low-GWP Refrigerant R1234ze(Z) by a Developed High-temperature Burnett Apparatus

◎ JIANG Shiheng (Kyushu Univ.) , SAKODA Naoya, KOHNO Masamichi, KOYAMA Shigeru, TAKATA Yasuyuki

C323 Measurement of thermal conductivity and viscosity of refrigerant R1234ze(Z) in high temperature region

○ KARIYA Keishi ( Saga Univ. ) , ISLAM Mohammad Ariful, ALAM Md. Jahangir, MIYARA Akio

C324 Measurements of the Isobaric Specific Heat Capacity of Refrigerant 125 in the Gaseous Region

○ MATSUGUCHI Atsushi ( National Defense Academy) , KAGAWA Noboru, WATANABE Koichi (Keio Univ.)

**Organized Session OS-7**

**"Heat and Mass Transport Phenomena with Solid-Liquid Phase Change"**

**Organizers: ASAOKA Tatsunori (Shinshu Univ.), TERAOKA Yoshikazu (Kanazawa Univ.)**

**13:00~14:40 OS-7(1) [Chairperson: ASAOKA Tatsunori (Shinshu Univ.)]**

C331 Experimental Study on Supercooling Suppression of Phase Change Material Dispersed in Emulsion

◎ ABE Wataru ( Kobe Univ. ) , KAWANAMI Tsuyoshi, FUMOTO Koji (Hirosaki Univ.) , SHIRAI Katsuaki (Kobe Univ.) , HIRASAWA Shigeki

C332 Effect of bubble nuclei on freezing of supercooled water containing electrolyte ions by ultrasonic waves

◎ YAKO Jun (Tokyo Institute of Technology) , HOZUMI Tsutomu, OKAWA Seiji

C333 Investigation on Rapid Prediction Method of Freezing Process by using Transient Thermal Network Method - 2nd Report: Improvement of Prediction Accuracy in the case of Several Types of Seafood-

○ FUKUE Takashi (Iwate Univ.) , HIROSE Koichi, KONISHI Kenta

C334 Study on Solid-Liquid Phase Change Problem around Heat Transfer Tubes -Investigation of Freezing

Phenomena around two elliptical tubes for developing prediction method of Bridging Time-

◎ WANG Qiangsheng (Iwate Univ.) , HIROSE Koichi, FUKUE Takashi, ZHANG Qingming

C335 Study on rapid cooling of a hot steel plate using ice slurry

◎ TAKADA Shinya (Hirosaki Univ.) , FUMOTO Koji, KAWANAMI Tsuyoshi ( Kobe Univ. ) , INAMURA Takao (Hirosaki Univ.)

**15:00 ~ 16:20 OS-7(2) [Chairperson: TERAOKA Yoshikazu (Kanazawa Univ.)]**

C341 Solidification characteristics of ice slurry flowing in rectangular channel

◎ MATSUTAKE Rintaro (Aoyama Gakuin Univ.) , KUMANO Hiroyuki

C342 Continuous ice generation method of ice containing ozone micro-bubbles - Investigation on concentration of ozone micro-bubbles concentration fixed in ice-

◎ SEKINE Koki (Chuo Univ.) , MATSUMOTO Koji, MINAMIYA Kazuyuki, KUBOTA Hiroyuki

C343 Generation of the TBAB/CO<sub>2</sub> double hydrate slurry for latent heat transportation at low temperature

◎ SENDA Tomohiro (Kobe Univ.) , SUZUKI Hiroshi, HIDEMA Ruri, KOMODA Yoshiyuki, KUSABE Takahiro (Daikin Applied Systems) , TOBAYAMA Hiroteru, IWATA Tetsurou

C344 Characteristics of Flowable Latent Heat Storage Material for High Temperature Applications

◎ ABE Shunsuke (Shinshu Univ.) , OGASAWARA Kazuki, KUBOKI Kensuke, ASAOKA Tatsunori

**Room D 9 September (Fri.)**

**Workshop WS-5**

**"Overview of Thermally Driven Heat Pumps and Heat Storage Technologies"**

**Moderator: Atsushi AKISAWA (Tokyo Univ. of Agriculture and Technology)**

**09:00 ~ 10:25 WS-5(1) [Chairperson: YAMAGUCHI Seiichi (Waseda Univ.)]**

D311 The Latest technological development trends in absorption refrigerating machines

○ YAMAMOTO Kazunori (Kawasaki Thermal Eng.)

D312 Applications of the absorption heat pump

○ IRIE Tomoyoshi (Ebara Refrigeration Equipment & Systems)

D313 Trends of absorption heat pump research in ISHPC 2014

○ IKUMI Yonezo (Waseda Univ.)

D314 Thermal Storage System for Thermal Gap Solution

○ SUZUKI Hiroshi (Kobe Univ.)

**10:40 ~ 12:00 WS-5(2) [Chairperson: MIYAZAKI Takahiko (Kyushu Univ.)]**

- D321 Leading-edge trend of the adsorption chiller  
-Applications and technical development-  
○KITO Tsuyoshi (Mayekawa MFG.)
- D322 Development of super-compact adsorber  
-Acceleration of ad/de-sorption by micro-fin structure-  
○OKAMOTO Yoshiyuki (DENSO) , TAKEUCHI Shinsuke, KITAGAWA Shinya, NAGASHIMA Hisao
- D323 R&D of compact and high performance desiccant ventilation units  
-Application of Wakkanai siliceous shale as a natural meso-porous material-  
○NAGANO Katsunori (Hokkaido Univ.)
- D324 To extend usage of desiccant dehumidification  
-Difference between static use and rotation use-  
○WATANABE Yutaka (Okayama Univ.)

**Organized Session OS-6  
"Refrigerators/Heat Pumps Based on Absorption,  
Adsorption or Chemical Reactions"**

**13:00~14:20 OS-6(3) [Chairperson: AKISAWA Atsushi (Tokyo Univ. of Agriculture and Technology)]**

- D331 Maximization of solar energy utilization on single-double-effect absorption chiller  
©LUBIS Arnas (Waseda Univ.) , JEONG Jongsoo, SAITO Kiyoshi, YABASE Hajime, ALHAMID M. Idrus ( Universitas Indonesia ) , NASRUDDIN Nasruddin
- D332 Starting Characteristic Analysis of Solar-assisted Absorption Air-conditioning System  
©NAKAGAWA Hiroyuki (Osaka City Univ.) , SATO Ryota, NISHIMURA Nobuya, TERAOKA Kazutaka (Osaka Gas)
- D333 Power-saving natural chiller PR type, PR type genelink  
○ISHIZAKI Shuji ( Panasonic ) , KOBAYASHI Takahiro, IKEDA Hiroki
- D334 Dual Hot Water Heat Recovery Absorption Chiller-Heater  
○MIYOSHI Nobutaka (Hitachi-Johnson Controls Air Conditioning)

**14:40 ~ 16:00 OS-6(4) [Chairperson: SAITO Kiyoshi (Waseda Univ.)]**

- D341 Applicability of Ionic Liquid to Absorption Refrigeration Cycles  
○AKISAWA Atsushi (Tokyo Univ. of Agriculture and Technology ) , TAKABE Rinosuke, NAKAYAMA Masayuki, OHNO Hiroyuki

- D342 Discussion of absorption refrigeration cycle with a separable ionic liquid utilizing low grade heat sources

©TAKABE Rinosuke (Tokyo Univ. of Agriculture and Technology) , AKISAWA Atsushi, NAKAYAMA Masayuki, OHNO Hiroyuki, KOSAI Yoshikazu (Kawasaki Thermal Engineering) , SASAKI Sinji

- D343 Studies on the heat and mass transfer characteristics of ionic liquid in the absorber of CO<sub>2</sub> Compression / Absorption Hybrid Cycle with using ionic liquid as the solvent

©SUGIYAMA Toshiki (Waseda Univ.) , KATSUTA Masafumi, MORITA Kenrou, NAKAJIMA Syunsuke

- D344 Thermophysical properties of absorbents suitable for absorption refrigerators for automotive use

○INADA Takaaki (AIST) , TOMITA Hiroyuki, NAKAGAWA Keiichi, TAKEMURA Fumio, TSUBOUCHI Osamu (Aisin Seiki) , HIHARA Eiji (The Univ. of Tokyo)

**16:20 ~ 17:20 OS-6(5) [Chairperson: NISHIMURA Nobuya (Osaka City Univ.)]**

- D351 Marangoni convection within absorptive falling films over an inclined wall -Modelling and numerical simulations-

○ GIANNETTI Niccolò ( Waseda Univ. ) , YAMAGUCHI Seiichi, SAITO Kiyoshi

- D352 Experimental study on absorption phenomenon of a falling film absorber

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- D353 Study of hollow fiber membrane for small absorption refrigerator

©TAIRA Naoki (The Univ. of Tokyo) , HONG Sungjoo, DANG Chaobin, HIHARA Eiji

**Room E 9 September (Fri.)**

**Organized Session OS-1**

**"Low Temperature Application and Technology for Food and Biological Materials"**

**Organizers: ARAKI Tetsuya(The Univ. of Tokyo), KUDOU Ken-ichi(Aomori Prefectural Industrial Technology Research Center)**

**09:20 ~ 10:20 OS-1(1) [Chairperson: UENO Shigeaki (Saitama Univ.)]**

- E311 Relation between refrigeration and death of Anisakis larvae : Effect of the medium composition on the freezing and death of Anisakis larvae

© TAKEUCHI Megumi ( Aomori Pref. Indus. Technol. Res. Center ) , MATSUBARA Hisashi,

TAKAHASHI Tadashi, KUDOH Ken-ichi, WATANABE Manabu (Tokyo Univ. of Marine Science and Technology), SUZUKI Toru

E312 Study on cryopreservation of Medaka Eggs by micro-injection of cryoprotectant

©ONISHI Ryo (Kyushu Institute of Technology Univ.), TANIGAWA Hirofumi, TSURUTA Takaharu

E313 Recrystallization of Ice Crystals in Nanofiber Solutions

○KIMIZUKA Norihito (Miyagi Univ.), IFUKU Shinsuke (Tottori Univ.)

**10:40~12:00 OS-1(2) [Chairperson: ARAKI Tetsuya (The Univ. of Tokyo)]**

E321 [Keynote] Change in free ornithine content of the extract by freeze processing of the brackish-water bivalve *Corbicula japonica*

○UCHISAWA Hidemitsu (Aomori Pref. Indus. Technol. Res. Center), KUDOH Ken-ichi

E322 Effects of Low-Temperature Treatment on the Composition of Chinese yam

○TAKAHASHI Tadashi (Aomori Prefectural Industrial Technology Research Center), KUDOH Ken-ichi, SUZUKI Toru (Tokyo Univ. of Marine Science and Technology)

E323 Development of Viscosity Regulation Method for Barley Flour

○UENO Shigeaki (Saitama Univ.), SASAO Shoji (The Univ. of Tokyo), ZHANG Xilin, ARAKI Tetsuya, HAYASHI Mayumi (Niigata Univ. of Pharmacy and Life Sciences), SHIGEMATSU Toru

**13:00~14:20 OS-1(3) [Chairperson: KUDOH Ken-ichi (Aomori Prefectural Industrial Technology Research Center)]**

E331 Effect of Freezing and Thawing Process on the Quality of Alfonsino

○KONO Shinji (Mayekawa MFG.), IMAMURA Hikaru, KON Madoka, EHARA Makoto, TAKAHASHI Yasuo (Chiba Prefectural Federation of Fisheries Co-operative Associations), KISSEI Kazuya, TSUCHIYA Katsuo, HIROSAWA Masumi

E332 Micro- to macro-scale measurement of bubbles in bread dough

©OGAWA Chiharu (Nihon Univ.), NISHIO Saya, DO Gabsoo, MAEDA Tatsuro (Nisshin Foods), BAE Yeonghwan (Sunchon National Univ.), SASE Sadanori (Nihon Univ.)

E333 Effect of electrolyte on the freeze-concentrated glass transition temperature of carbohydrate solution -to prevent the collapse of freeze-dried lactic acid bacteria-

○KAWAI Kiyoshi (Hiroshima Univ.), TENG Da, SHUTO Mikajiri, HAGURA Yoshio

E334 Prediction of Drying of Packed Frozen Food under the Fluctuating Temperature Circumstance

○WATANABE Manabu (Tokyo Univ. of Marine Science and Technology), YAMADA Ryosuke, SUZUKI Toru

**14:40~15:40 OS-1(4) [Chairperson: KAWAI Kiyoshi (Hiroshima Univ.)]**

E341 Comparison of the physical and chemical attributes of frozen durian pulp (*Durio zibethinus* Murray) in different thawing processes

©TAGUBASE Jackie Lou (The Univ. of Tokyo), UENO Shigeaki (Saitama Univ.), YOSHIE Yumiko (Toyo Univ.), ARAKI Tetsuya (The Univ. of Tokyo)

E342 Measurement of hot-air and superheated steam drying characteristics of frozen pizza dough and surface color as well as viscoelastic properties of baked pizza dough

○ARAKI Tetsuya (The Univ. of Tokyo), MING Lingke, KONO Shinji (Mayekawa MFG.), IMAMURA Hikaru, SAGARA Yasuyuki (Food Kansei Communications)

E343 Aroma properties of durian pulp (*Durio zibethinus* Murray) during freezing and thawing

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