



Final Program

The 7th International Heat Pipe Symposium

October 12 - 16, 2003

Seogwipo KAL Hotel, Jeju-Do, Korea



**Organized by
Korean Society of Mechanical Engineers
Heat Pipe Section**

<http://www.heatpipe.or.kr/7ihps.htm>

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7IHPS Committees

International Advisory Board

Prof. Akbarzadeh, A.	Australia
Prof. Delil, A. A. M.	Netherlands
Prof. Groll, M.	Germany
Prof. Maezawa, S.	Japan
Prof. Ong, K. S.	Malaysia
Prof. Peterson, P.	U. S. A.
Dr. Polasek, F.	Czech Republic
Dr. Shyu, R. J.	Taiwan
Prof. Terdtoon, P.	Thailand
Dr. Yamamoto, T.	Japan
Prof. Zhuang, J.	China

Symposium Organizing Committee

Prof. Joon Hong Boo	Hankuk Aviation University, Chairman
Dr. Ki Woo Lee	Korea Institute of Energy Research
Prof. Jong Soo Kim	Pukyong National University
Dr. Young Soo Lee	Korea Institute of Energy Research
Mr. Sang Sik Kim	Daehong, Ltd.
Dr. Kwang Soo Kim	Apack, Inc.
Dr. Yoon Pyo Lee	Korea Institute of Science and Technology
Prof. Jeong Se Suh	Geongsang National University
Prof. Chul Ju Kim	Sung KyunKwan University
Prof. Choi, Kyung Hyun	Jeju National University

Secretariats, principal

Mr. Soo Yong Park	
Mr. Won Bok Chung	Hankuk Aviation Univeriy

Supporting Organizations

Korean Society of Mechanical Engineers	DongHwa Entec
Japan Association for Heat Pipes	Seki Hi-Tech Co., Ltd.
Hankuk Aviation University	DF Tec.
Daehong Enterprise Co., Ltd.,	Ruytech Co., Ltd.
Apack, Inc.	Saewoon Sys-Tech

General Information

Features of the Symposium

The Symposium will provide an opportunity to exchange information and experience on virtually all aspects of heat pipes and thermosyphons. Professionals in academia, industry, and research and development institutions are cordially invited for friendly discussion in a unique environment of Jeju island, Korea. Fundamental heat and mass transfer aspects of heat pipes and the problems associated with evaporation / condensation, phase change, materials, two-phase flow and especially the manufacturing of these devices as well as their applications will be covered during the symposium. The Symposium consists mainly of single oral sessions for the presentation of papers

The topics of the Symposium includes, but not limited to, the followings :

- ▶ Fundamental study on thermal and fluid dynamic phenomena associated with various types of heat pipes and two-phase closed thermosyphons
- ▶ Theoretical and experimental studies in the process of research and development of heat pipes including capillary pumped loops(CPL), loop heat pipes(LHP), oscillating heat pipes, micro heat pipes, etc.
- ▶ Microelectronics, power electronics cooling and electronics packaging
- ▶ Applications in manufacturing process and material processing
- ▶ Industrial and environmental applications including heat pipe heat exchangers in conventional energy or new and renewable energy systems
- ▶ Aerospace applications including space thermal control and avionics
- ▶ Material compatibility and life test

Symposium Language The Symposium language is English

Venue

Grand Ballroom Diamond, Seogwipo KAL Hotel, Seogiwpo city, Jeju-do, Korea

Technical Sessions

Regular papers: Each Technical Session consists of 3 to 5 papers. Twenty minutes are allocated to each regular paper for 15 minute presentation and 5 minute discussion (including Q&A.).

Keynote papers: Forty minutes are allocated for each Keynote paper, normally for 35 minute presentation and 5 minute Q&A.

Poster Session Papers: The authors have ample time up to one hour and forty minutes to explain their work to a group of interested people. It is up to authors how many times they repeat and what to explain. Enjoy freedom of presentation methods and time interval.

Presentation Aids : For regular papers and keynote paper, OHP, beam projector with laptop PC (loaded with MS Power Powerpoint and Word), and slide projector are provided as presentation aids. Please load your presentation file into laptop PC well in advance of your presentation time.

Authors'(Speakers') Preparation Room

The room named Camellia (see floor information) on B1 floor, across the entrance of the Grand Ballroom Diamond, is open to speakers to review or edit their presentation materials. The room

is equipped with PC's, and printers and is open 19:00-21:00 on October 12, and 07:30-18:00 for the other days. Ask secretariats for assistance if you have any special request.

Name Tag and Participants' Rights

Each Participants receives a name tag at the registration desk. Please be sure to wear this tag at all times as it provides you with access to all venues and catering. Each tag denotes what functions you are attending. If you have booked extra tickets these will be given to you in your registration pack. All participants are welcome to attend the Opening and Closing ceremony.

◇ **Regular Participant**

- Attendance at all sessions, - Preprint
- Full symposium proceedings (after the Symposium)
- Welcome reception, all lunches, coffee & tea, banquet, half-day tour

◇ **Spouse/ Family member**

- Welcome reception, a half-day tour and banquet, morning and afternoon coffee and tea, lunches and a special program for extra sightseeing and tour

◇ **Student**

- Welcome reception, a half-day tour, coffee and tea and lunches

Registration

The registration fee is 480,000 KRW(Korean Won) (approx. US\$407) if registered by August 20, 2003. This covers a complete set of preprints of papers presented at the Symposium as well as the welcome reception, a half-day tour and banquet, morning and afternoon tea, lunches and proceedings (after the symposium). A late registration fee of 520,000 KRW (approx. US\$430) will be applied if registered after August 20, 2003. The registration fee for each accompanying person (spouses or family members) is 260,000 KRW (approx. US\$220) which includes welcome reception, a half-day tour and banquet, morning and afternoon tea, lunches and a special program for extra sightseeing and tour during the symposium hours. A reduced fee of 220,000 KRW (approx. US\$186) is available for students, which does not include the conference dinner and proceedings. On-site registration can be made at the symposium desk.

All Symposium fees are based on the Korean Won (KRW) excluding any handling charges or bank fees. The amounts in US Dollars in the below is just for a reference. An exact payment in KRW should be calculated by daily exchange rate on the day of payment (or bank transfer). Please consult with your bank for estimation of the additional charges and fees you need to pay and make sure that the 7IHPS receive an exact net amount.

	By August 20, 2003	Late fee (additional, after August 20, 2003)
Regular participants	480,000 KRW (approx. US\$407)	40,000 KRW (approx. US\$ 34)
Spouse (no proceedings)	260,000 KRW (approx. US\$ 220)	20,000 KRW (approx. US\$ 17)
Students (no proceedings, no banquet)	220,000 KRW (approx. US\$ 186)	20,000 KRW (approx. US\$ 17)
Optional banquet for student	40,000 KRW (approx. US\$ 34)	
Extra copy of proceedings (only for who registered)	40,000 KRW (approx. US\$ 34)	

Registration Desk, Secretariat

◇ **Registration desk :** Located just in front of Grand Ballroom Diamond, B1 floor.

Operation time

Sunday, October 12 -- 10:00 ~ 20:00,

Monday, October 13 and Tuesday, October 14 -- 07:30 ~ 20:00,

Wednesday, October 15-- 07:30 ~ 10:00,

Thursday, October 16-- 07:30 ~ 14:00,

◇ Secretariat

The Symposium Secretariat is located on first floor under the ground of the hotel. The Secretariat will be the focal point for any participants's message, having a message board available. The secretariat will be manned with staff for the duration of the Symposium.

Accommodation and Meals (Seogwipo KAL Hotel)

More than 50 rooms have been reserved for the symposium participants in the Seogwipo KAL Hotel. KAL Hotel is the Symposium Venue and specially discounted room rates have been arranged for symposium participants. Limousine bus is available every 15 minutes from Jeju International Airport to Seogwipo KAL Hotel (travel time: 75 minutes, fare: 4,700 Korean Won). The discounted room rate is applicable only through the Symposium Organizing Committee with the Registration Form. Please be advised that the following charge is for the room, and not for the people (tax is included).

Single and Twin/Double bed room(for two people)	95,000 KRW / night (approx. US\$ 81)
Ondol room(no bed, floor only, for two people)	95,000 KRW / night (approx. US\$ 81)
Optional Ocean View	30,000 KRW / night (approx. US\$ 25)
Each additional person exceeding two	30,000 KRW / night (approx. US\$ 25)
Breakfast (Buffet)	15,000 KRW / meal (approx. US\$ 13)

Post-symposium Program

Golf, horseback riding, fishing, hiking, etc are available with best (discounted) prices upon request of the participants. The Organizing Committee selected the official travel agent of the Symposium to help every participant enjoy any kind of activity with significantly discounted expenses. Please notify us in advance if you have any interest in this.

Exhibition

A display area at the Symposium venue will be provided for the participants who would like to exhibit their products. For further details on floor space and costs, please contact the Symposium Organizing Committee.

Official Events

Welcome Reception (6:00 p.m., Sunday, October 12, 2003)

At the Grand Ballroom Diamond (B1 floor), meet with old and new friends, enjoy relaxing time after a travel to the Symposium Venue. Snacks, light meal, cocktails, and sort drink will be served.

Opening Ceremony (08:40 - 09:00 a.m., Monday, October 13, 2003)

At Grand Ballroom Diamond on B1 floor. Please be seated by 08:20 a.m.

Banquet (18:20-20:00, Tuesday, October 14, 2003)

At the Garden Plaza (outdoor lawn beside swimming pool, exit from the B1 floor). Participants invited to reserved tables are requested to honor the invitation and to make their way promptly to those tables. Other participants may choose a table of their choice. Dinner Buffet will be served with alcoholic and non-alcoholic drinks. Enjoy beautiful scenery facing the ocean as you are having dinner. Several toasts are expected for the future and prosperity of the IHPS

Half -day Tour (10:30-18:00, Wednesday, October 15, 2003)

For the sightseeing of symposium participants a half-day tour is provided by the Organizing Committee. The tour will cover the most typical aspects of Jeju Island and the expense is free. Please be gathered at the hotel lobby by 10:30 a.m. Tour around a few typical attractions in eastern Jeju by chartered buses. The tour completes at Jeju-city. Casual dressing with sneakers is preferable.

Culture Performance (18:00-19:00, Wednesday, October 15, 2003)

At the Halla Art Hall in Jeju city, the Jeju Provincial Culture and Arts Troupe will show performance consisted of traditional Korean and Jeju style folk dances.

Korean Dinner (19:30-20:30, Wednesday, October 15, 2003)

Korean dinner in a local restaurant in Jeju-city. Return to hotel about 21:30 by chartered bus.

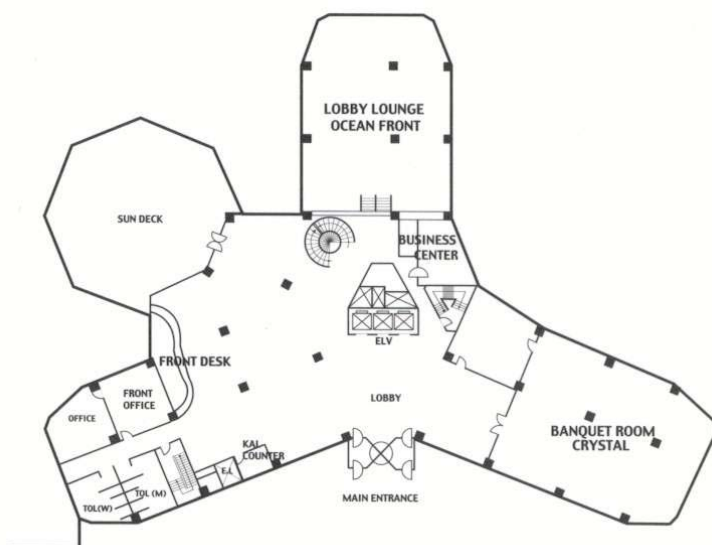
Closing Ceremony (12:40, Thursday, October 16, 2003,)

At Grand Ballroom Diamond, a film taken during the Symposium period will be displayed from 12:30.

Spouse and Family Program (Monday October 13 and Tuesday October 14)

A special program will be organized for registered spouses and family members of the participants for extra sightseeing and tour during the symposium hours. Jeju island is full of natural beauties including several waterfalls in the Seogwipo areas, famous botanical gardens, natural caves, etc. Operates Monday and Tuesday only, from 09:00-11:30 and 13:30-15:30. Casual dressing with sneakers is preferable.

Symposium Venue Floor Information

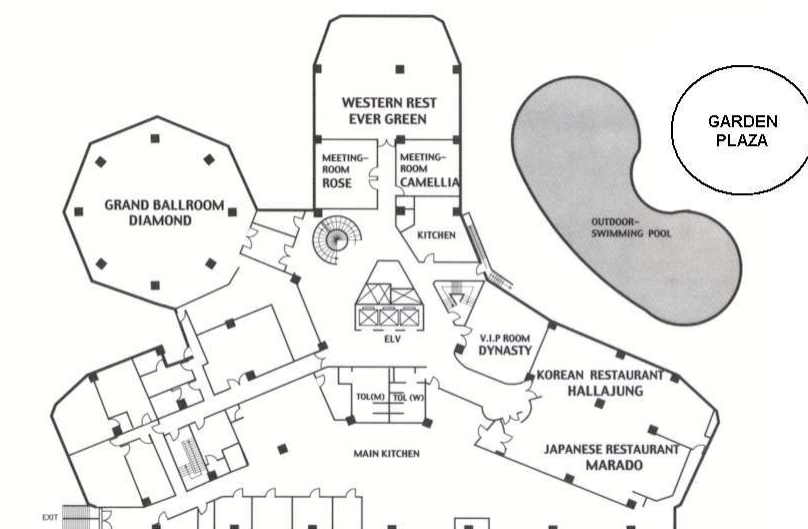


First floor

Breakfast: Lobby lounge
buffet restaurant

Front desk: Hotel check-in
(after registration for 7IHPS)
and check-out

Business Center: Internet, Fax, PC

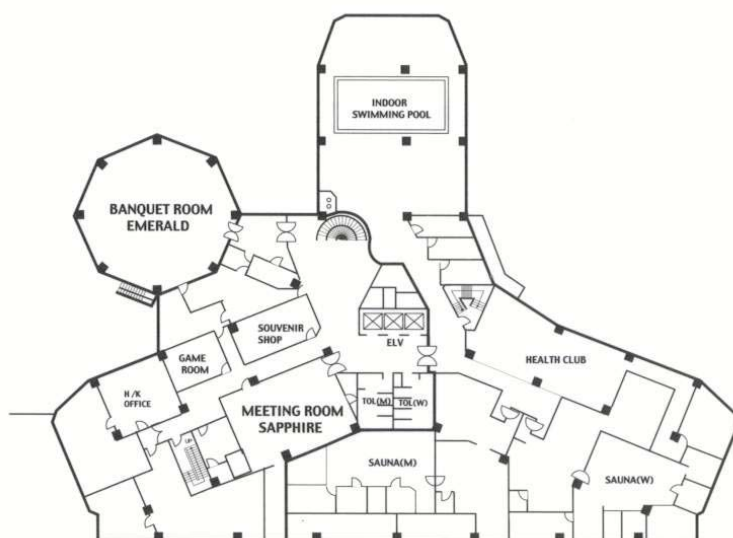


B1 floor

Grand ballroom Diamond:
Welcome reception,
Opening ceremony
Technical Sessions
Closing ceremony

Registration desk:
Outside of Diamond

Banquet: Garden Plaza
Preparation room: Camellia
Lunch: Hallajung(Korean)
Marado (Japanese)
Evergreen (Western)



B2 floor

50% Discount Coupons available for
7IHPS participants to use

- Health club
- Sauna

Ask registration desk for details.

List of Chair Persons

※ Chair persons take care of the Keynote lecture preceding their Technical Sessions.

No	Session Name	Date	Time	Name of Session Co-chairs	
A	Thermosyphons I	Oct. 13, Mon.	09:00-10:40	Akbarzadeh, A.(RMIT Univ., Australia)	
				Han, K.I.(Pukyong National Univ., Korea)	
B	Capillary Pumped Loops		11:00-12:00	Maydanik, Y.(Institute of Thermal Physics, Russia)	
				Kim, K.S.(APACK, Inc., Korea)	
C	Heat Pipes		13:00-14:40	Imura, H.(Kumamoto Univ., Japan)	
				Lee, Y. P.(KIST, Korea)	
D	Heat Pipe Application I		15:00-16:40	Cao, J.(CAST, China)	
				Suh, J.S.(GyeongSang National Univ., Korea)	
E	Cooling of Electric and Electronic Systems		17:00-18:20	Mantelli, M.B.H.(Federal Univ. of Santa Catarina, Brazil)	
				Kim, C.J.(Sungkyunkwan Univ., Korea)	
P	Poster Session		19:20-20:40	Prisniakov, V.(National Academy of Science, Ukraine)	
				Lee, K.W.(KIER, Korea)	
F	Micro Heat Pipes	Oct. 14, Tue.	08:00-10:00	Kang, S.W.(Tamkang Univ., Taiwan)	
				Murakami, M.(Univ. of Tsukuba, Japan)	
G	Thermosyphons II		10:20-12:00	Terdtoon, P.(Chiang Mai Univ., Thailand)	
				Hong, J.K.(Kyung Won Univ., Korea)	
H	Miniature Heat Pipes		13:00-14:40	Dvirnyi, V.(Reshetnov's NPO PM, Russia)	
				Baek, B.J.(Chonbuk National Univ., Korea)	
I	Loop Heat Pipes I		15:00-16:40	Hou, Z.(CAST, China)	
				Lefevre, F.(INSA de Lyon, France)	
J	Heat Pipe Heat Exchangers		17:00-18:00	Noie, S. H.(Ferdowsi Univ. of Mashhad, Iran)	
				Kobayashi, Y.(ISAS, Japan)	
K	Oscillating Heat Pipes I		Oct. 15, Wed.	08:00-09:00, 09:10-10:10	Ong, K.S.(Monash Univ., Malaysia)
L	Loop Heat Pipes II				Kim, J.S.(Pukyong National Univ.)
M	Oscillating Heat Pipes II	Oct. 16, Thu.	08:00-10:00	Dobson, R. T.(Univ. of Stellenbosch, South Africa)	
				Lee, Y. S.(KIER, Korea)	
N	Heat Pipe Application II		10:20-11:40	Kadoguchi, Katsuhiko(AIST, Japan)	
				Lee, K. W.(KIER, Korea)	

Technical Session Schedule

Monday, October 13

08:40 - 09:00 Opening Ceremony

Co-chair : Akbarzadeh, A.(RMIT Univ., Australia) and Han, K. I.(Pukyong National Univ., Korea)

09:00 - 09:40 Keynote Lecture (I)

V-1 *A Future Thermal Solution by Using the Family of Heat Pipe*
Katsuta, M. (Waseda University, Japan)

Session A, Thermosyphons (I)

09:40 - 10:40

- A-1 *A Simple Theoretical Model of a Thermosyphon*
Ong, K.S. (Monash University Malaysia, Malaysia)
- A-2 *An Anti-Gravity Thermosyphon with a Switching Valve*
Imura, H., Koito, Y., Ichinomiya, T. (Kumamoto University, Japan)
- A-3 *Experimental investigation of a Two Phase Closed Thermosyphon*
Noie, S.H.*, Kalaei, M.H.** , Khoshnoodi, M.** (* Ferdowsi University of Mashhad,
** Sistan and Baluchestan University, IRAN)

Session B, Capillary Pumped Loops (I)

Co-chair : Maydanik, Y.(Institute of Thermal Physics, Russia) and Kim, K.S.(APACK, Inc., Korea)

11:00 - 12:00

- B-1 *Analysis of Heat and Mass Transfer with Phase Change in the Porous Wick of a Capillary Pump*
Takahashi, A.R., Oliveira, A.A.M., Bazzo, E. (Federal University of Santa Catarina, Brazil)
- B-2 *Numerical Investigation on Evaporator for Capillary Pumped Loops*
Qian, J., Xuan, Y. (Nanjing University of Science & Technology, China)
- B-3 *Development of High Performance Sintered Wicks for CPLs*
Li, Q., Xuan, Y. (Nanjing University of Science & Technology, China)

Co-chair : Imura, H.(Kumamoto Univ., Japan) and Lee, Y.P.(KIST, Korea)

13:00 - 13:40 Keynote Lecture (II)

V-2 *Natural Flows - Its Nature and Applications -*
Lee, J.H. (Yonsei University, Korea)

Session C, Heat Pipes

13:40 - 14:40

- C-1 *About Functioning of the Heat Pipe in Condition of Gravity and Vibration*
Prisniakov, K., Marchenko, O., Melikaev, Y, Nikolaenko, Y., Prisniakov, V.
(Institute Geotechnical Mechanics of National Academy of Science, Ukraine)
- C-2 *Analysis of the Optimal Mass of Working Fluid for Heat Pipe with Axially Grooved Wicks*
Suh, J.S., Byun, G.S., Kang, C.H. (GyeongSang National University, Korea)
- C-3 *Effect of Rotational Acceleration on Internal Flow Patterns of Radially Rotating Heat Pipe at Normal Operating Condition*
Waowaew, N.*, Terdtoon, P*, Maezawa, S.** , Kamonpet, P.* , Wongratanaphisan, T.*
(* Chiang Mai University, Thailand, ** Seikei University, Japan)

Co-chair : Cao, J.(CAST, China) and Suh, J. S.(GyeongSang National Univ., Korea)

15:00 - 15:40 Keynote Lecture (III)

- V-3 *The Effects of Non-condensable Gases on the Performance of Loop Thermosyphon Heat Exchangers*
Dube, V.* , Akbarzadeh, A.*, Andrews, J.* , Mochizuki, M.** (*RMIT University, Australia, **Fujikura Ltd., Japan)

Session D, Heat Pipe Application (I)

15:40 - 16:40

- D-1 *Thermosyphon Kit for Conversion of Electrical Bakery Ovens to Gas*
Mantelli, M.B.H.*, Lopes, A.* , Martins, G.J.M.* , Zimmerman, R.* , Baungartner, R.* , Landa, H.G.** (* Federal University of Santa Catarina, ** Cidade Universitaria, Brazil)
- D-2 *Development of Heat Pipe Heating Roller in Laser Printer*
Kim, K.S.*, Kim, H.B.* , Lee, K.W.** (* APACK, Inc. , ** Samsung Electronics Co., Korea)
- D-3 *Overview Latest Technologies Using Heat Pipe and Vapor Chamber for Cooling of High Heat Generation Notebook Computer*
Mochizuki, M., Nguyen, T., Mashiko, K., Saito, Y., Nguyen, T., Wu, X.P., Wuttijumnong, V. (Fujikura Ltd., Japan)

Session E, Cooling of Electrical and Electronic Systems

Co-chair : Mantelli, M.B.H.(Federal University of Santa Catarina, Brazil) and Kim, C.J.(Sungkyunkwan Univ., Korea)

17:00 - 18:20

- E-1 *Fundamental Investigations on Heat Transfer Characteristics of Heat Sinks with a Vapor Chamber*
Koito, Y.*, Motomatsu, K.* , Imura, H.* , Mochizuki, M.** , Saito, Y.** (* Kumamoto University, ** Fujikura Ltd., Japan)
- E-2 *Research and Development of Heat Pipe Heat-sink For CDMA Base Station Power Module*
Zhuang, J.*, Tao, H.** , Zhang, H.** (* Nanjing HETE Energy Conservation & Environmental Protection Co. Ltd., ** Nanjing University of Technology, China)
- E-3 *A Compact Cooling System with Triple Technologies*
Bintoro, J.S.* , Akbarzadeh, A.**, Mochizuki, M.*** , Nguyen, T.*** (* Georgia Institute of Technology, USA, ** RMIT University, Australia, *** Fujikura Ltd., Japan)
- E-4 *A Generalized Mathematical Model to Account for the Effect of Liquid-vapor Interfacial Shear Stress of a Heat Pipe with a Grooved Wick Structure: Modified Shah Method*
Seo, J.K., Kim, S.J., Do, K.H. (Korea Advanced Institute of Science and Technology, Korea)

Session P, Poster Session

Co-chair : Prisniakov, V.(National Academy of Science, Ukraine) and Lee, K.W.(KIER, Korea)

19:20 - 20:00

- P-C-4 *Study on the Heat Transfer Characteristics in a Copper-Water Variable Conductance Heat Pipe with Non-condensable Gas Reservoir*
Park, K.H.*, Lee, K.W*, Lee, W.H*, Lee, K.J.* , Suh, J.S.** (* Korea Institute of Energy Research, ** Gyeongsang National University, Korea)
- P-C-5 *Analysis of Thermal Control Performance of Variable Conductance Heat Pipe with Axially Grooved Wick*
Suh, J.S.*, Park, Y.S.* , Chung, K.T.* , Lee, K.W.** , Park, K.H.** (* GyeongSang National University, ** Korea Institute of Energy Research, Korea)
- P-C-6 *Performance of Heat Pipes for Solar Collector using Binary Mixture Working Fluid*
Jung, E.G.* , Chung, W.B.* , Boo, J.H.*, Kwak, H.Y.** (*Hankuk Aviation University, **Korea Institute of Energy Research, Korea,)
- P-C-7 *A Study on the Heat Transfer Characteristics of Medium Temperature Heat Pipe*
Chang, K.C.*, Lee, Y.S.* , Kim, J.R. Jang, Y.S.**

- (* Korea Institute of Energy Research, ** Kyung-nam College of Information & Technology, Korea)
- P-D-4 *Numerical Simulation for the Thermal Design of IU-2Way Server*
Won, M.H.*, Moon, W.S.***, Baek, B.J.***, Pak, B.C.** (*APACK, Inc., **Chonbuk National Univ., Korea)
- P-F-5 *The Effects of Various Transverse Accelerations and Their Induced Body Forces on the Cooling Performance of Micro Heat Pipes*
 Katsuta, M., Jalilvand, A., Homma, Y. (Waseda University, Japan)
- P-F-6 *Mathematical Modeling and Thermal Optimization of a Micro Heat Pipe with Curved Triangular Grooves*
Do, K.H., Kim, S.J., Seo, J.K.
 (Korea Advanced Institute of Science and Technology, Korea)
- P-F-7 *Forced Convective Flows in Microchannels for Cooling Electronic Devices*
 Jung, J.Y.* , Kwak, H.Y.* , Karng, S.W.**, Lee, Y.P.**
 (* Chung-Ang University, **Korea Institute of Science and Technology, Korea)
- P-H-4 *Influence of the Inclination Angle on the Operational Performance of a Miniature High-Temperature Sodium Heat Pipe*
Zhao, W.*, Zhuang, J.***, Zhang, H.** (* Jinan University, ** Nanjing University of Technology, China)
- P-I-4 *Proposed Loop Heat Pipe Experiment to be Tested at the International Space Station*
 Riehl, R.R.* , Bazzo, E.** , Bednov, S.M.***, Prokhorov, Y.M.**** (*National Institute of Space Research-DMC/Satellite, **Federal Univ. of Santa Catarina, Brazil ***Keldysh Research Center, ****Rocket Space Corporation Energia, Russia)
- P-I-7 *An Experimental study on the Operational Characteristics of Closed Loop Type Thermosyphon for Solar Hot Water Heater*
Kang, M.C.*, Kang, Y.H.* , Chun, W.G.** (* Korea Institute of Energy Research, ** Cheju National University, Korea)
- P-J-4 *Experimental Study on R-134A Condensation Heat Transfer Characteristics in Shell and Plate Heat Exchangers*
Park, J.H., Kim, Y.S. (Pukyong National University, Korea)
- P-K-8 *Effect of Number of Turns and Working Fluids on Heat Transfer Characteristics of A Closed-End Oscillating Heat Pipe at Critical State*
Katpradit, T.*, Wongratanaphisan, T.* , Kamonpet, P.* , Terdtoon, P.* , Akbarzadeh, A.**
 (* Chiang Mai University, Thailand, ** Royal Melbourne Institute of Technology, Australia)
- P-K-9 *Mathematical Modeling of a Closed-Loop Oscillating Heat Pipe at Normal Operating Condition*
Sakulchangsattajai, P.*, Kamonpet, P.* , Wongratanaphisan, T.* , Terdtoon, P.* , Murakami, M.**
 (* Chiang Mai University, Thailand, ** University of Tsukuba, Japan)
- P-N-5 *Development and Application of Evacuated Tube Solar Collectors with Heat Pipe in Korea*
Kwak, H.Y.*, Boo, J.H.** , Chung, W.B.**
 (*Korea Institute of Energy Research, ** Hankuk Aviation University, Korea)

Tuesday, October 14

Co-chair : Kang, S.W.(Tamkang Univ., Taiwan) and Murakami, M.(Univ. of Tsukuba, Japan)

08:00 - 08:40 Keynote Lecture (IV)

V-4 *History, Status Quo and Future of Heat Pipe Chemical Reactors*

Zhuang, J.*, H.***, Wang, Z.*** (*Nanjing HETE Energy Conservation & Environmental Protection Co., Ltd., **Nanjing University of Technology, China, ***Qilu Petrochemical Research Institute, China)

Session F, Micro Heat Pipes

08:40 - 10:00

- F-1 *Theoretical Analysis of Two-phase Heat Spreaders with Different Cross-section Micro Grooves*
Lefevre, F., Revellin, R., Lallemand, M. (Institut National des Sciences Appliquées, France)
- F-2 *Heat Transfer Characteristics in Flat Plate Micro Heat*
Katsuta, M.*, Homma, Y.*, Hosoya, N.*, Shindo, T.*, Sotani, J.***, Kimura, Y.***, Nakamura, Y.**
 (*Waseda University, ** Furukawa Electric, Japan)
- F-3 *Operating Performance of Micro Heat Pipe for Thin Electronic Packaging*
Moon, S.H., Hwang, G., Ko, S.C., Kim, Y.T. (Electronics & Telecommunications Research Inst., Korea)
- F-4 *Mathematical Model for Predicting the Transport Phenomena of the Evaporating Meniscus Region in a Capillary Channel*
Park, K.W., Lee, K.S. (Hanyang University, Korea)

Session G, Thermosyphons (II)

Co-chair : Terdtoon, P.(Chiang Mai Univ., Thailand) and Hong, J.K.(Kyung Won Univ., Korea)

10:20 - 12:00

- G-1 *Heat Transfer Performance of a Vibrated Two-phase Closed Thermosyphon*
Shalaby, M.A., Sultan, G.I., Salam, A.A. (Mansoura University, Egypt)
- G-2 *A Comparison of the Heat Transfer Performance of Thermosyphon Using a Straight Groove and a Helical Groove*
Han, K.I.*, Cho, D. H.***, Park, J.U.***, Lee, S.H.*** (* Pukyong National Univ., ** Daejin Univ., Korea)
- G-3 *Creep Behavior of HDPE Thermosyphon under Long Term Operation*
Kamonpet, P.*, Booddachan, K.*, Terdtoon, P.*, Preechawuttipong, I.*, Kobayashi, Y.**
 (* Chiang Mai University, Thailand, ** Institute of Space and Astronautical Science, Japan)
- G-4 *An Experimental Study of a Closed Two-Phase Loop Thermosyphon with Two Evaporators in Arrangement*
Kim, C.J., Yoo, B.O., Park, Y.J. (Sungkyunkwan University, Korea)
- G-5 *Tensile Strength of HDPE Thermosyphon*
Booddachan, K.*, Kamonpet, P.*, Terdtoon, P.*, Sutjaritakul, T.*, Kobayashi, Y.**
 (* Chiang Mai University, Thailand, ** Institute of Space and Astronautical Science, Japan)

Co-chair : Dvirnyi, V.(Reshetnov's NPO PM, Russia) and Baek, B.J.(Chonbuk National Univ., Korea)

13:00 - 13:40 Keynote Lecture (V)

- V-5 *Activity of Japan Association for Heat Pipe*
 Yamamota, T.*, Matsumoto, S.** (* Waseda University, Japan, ** National Research Institute for Advanced Industrial Science and Technology, Japan)

Session H, Miniature Heat Pipes

13:40 - 14:40

- H-1 *Fabrication of Film Type Heat Pipe*
Kang, S.W.*, Tsai, M.C.*, Lin, Y.H.** (* Tamkang University, ** St. John's & St. Mary's Institute of Technology, Taiwan)
- H-2 *Thermal Performance of a Grooved Flat-Strip Heat Pipe with Multiple Heat Source Locations*
Boo, J. H., Park, S. Y., (Hankuk Aviation University, Korea)
- H-3 *Miniature Heat Pipe with Arterial Powder Capillary Structure*
Maziuk, V.V. (Powder Metallurgy Institute, Republic of Belarus)

Co-chair : Hou, Z.(CAST, China) and Lefevre, F.(INSA de Lyon, France)

15:00 - 15:40 Keynote Lecture (VI)

- V-6 *Loop Heat Pipes - Development and Application*
Maydanik, Y. (Institute of Thermal Physics, Russia Academy of Science, Russia)

Session I, Loop Heat Pipes (I)

15:40 - 16:40

- I-1 *Transient and Start-up Behavior of a Double-Condenser Design LHP for Monitor of All Sky X-ray Image (MAXI)*
Nagai, H.*, Muto, M.**, Murakami, M.**, Ueno, S.*, Matsuoka, M.* (*National Space Development Agency of Japan, ** Univ. of Tsukuba, Japan)
- I-2 *Miniature Loop Heat Pipes for CPU Cooling.*
Kiseev, V.M.*, Nepomnyashy, A.S.*, Gruzdova, N.L.*, Kim, K.S.**
(*Ural State University, Russia, **APACK, Inc., Korea)
- I-3 *Waste Heat Transportation by High-Speed Two-Phase Flow in a Closed Loop with a Vapor Accumulation Evaporator*
Kadoguchi, K.*, Yamazaki, M** (*Institute for Energy Utilization, AIST, Japan, **International Energy Agency, France)

Session J, Heat Pipe Heat Exchangers

Co-chair : Noie, S.H.(Ferdowsi Univ. of Mashhad, IRAN) and Kobayashi, Y.(ISAS, Japan)

17:00 - 18:00

- J-1 *The Experimental Study on the Improvement of Enthalpy Efficiency of HPHE with Water Spray on Condenser Section*
Hong, J.K.*, Choi, S.G.*, Yang, K.O.**, Byun, Y.S.** (*Kyungwon Univ., ** Yupoong Co. Ltd., Korea)
- J-2 *Research on Heat Transfer Enhancement in Heat Pipe Heat Exchangers*
Sun, S., Zhang, H. (Institute of Heat Pipe Technology University of Technology, China)
- J-3 *Characteristics of Exchanger using the Heat Pipes for Low Temperature Waste Water*
Jun, C.H.*, Lee, K.W.**, Lee, Y.S.**, Jang, K.C.**, Jang, Y.S.***
(*Dong-A Univ., **Korea Institute of energy and research, *** Kyung-nam college of Information & Technology, Korea)

Wednesday, October 15

Co-chair : Ong, K.S.(Monash Univ., Malaysia) and Kim, J.S.(Pukyong National Univ.)

Session K, Oscillation Heat Pipes (I)

08:00 - 09:00

- K-1 *Thermal Characterization of an Ammonia-charged Pulsating Heat Pipe*
Dobson, R.T., Graf, G. (University of Stellenbosch, South Africa)
- K-2 *Refrigerant Fluorinated Ethers and Heat Pipe Heat Exchanger for Peltier Cooling System*
Maezawa, S.*, Gi, K.*, Sakiura, J.**, Yamazaki, N.**, Katoh, T.***, Akachi, H.***
(* Seikei University, ** Fujitsu Ltd., ***TS-Heatronics Co., Japan)
- K-3 *Effects of Evaporator Section Lengths, Number of Turns and Working Fluid on Internal Flow Patterns of a Closed-End Oscillating Heat at Normal Operating Condition*
Rittidech, S.*, Terdtoon, P.**, Murakami, M.***, Kamonpet, P.***, Jompakdee, W.**
(* Mahasarakham Univ., Thailand, ** Chiang Mai University, Thailand, ***Institute of Engineering Mechanics and Systems, Japan)

Session L, Loop Heat Pipes (II)

09:10 - 10:10

- L-1 *Heat Transfer Characteristics in an Evaporator Section of a Looped Parallel Thermosyphon*
Kaminaga M., Feroz, C., Watanabe, H., Matsumura, K. (Ibaraki University, Japan)
- L-2 *Heat Transfer Characteristics of Loop Thermosyphon Applied Heat Pump Dryer*

Phaphuangwittayakul, W.*, Kamonpet, P.*, Terdtoon, P.*, Klongpanich, W.*,
 Vorayos, N.*, Raghavan, G.S.V.** (* Chiang Mai University, Thailand, ** McGill University, Montreal,
 Canada)

- L-3 *Startup and Operating of a Loop Heat Pipe at Different Evaporator Orientations*
Cao, J., Hou, Z. (Chinese Academy of Space Technology, China)

Thursday, October 16

Co-chair : Dobson, R. T.(Univ. of Stellenbosch, South Africa) and Lee, Y. S.(KIER, Korea)

08:00 - 08:40 Keynote Lecture (VII)

- V-7 *A Closed Look to A Closed-End Oscillating Heat Pipe*
Terdtoon, P. (Chiang Mai University, Thailand)

Session M, Oscillation Heat Pipes (II)

08:40 - 10:00

- M-1 *Effect of Aspect Ratios and Internal Diameter on Performance Limit of A Closed-End Oscillating Heat Pipe Using Refrigerant Blend as Working Fluid*
Anuchitchanchai, P., Wongratanaphisan, T., Kamonpet, P., Terdtoon, P. (Chiang Mai Univ., Thailand)
- M-2 *Experimental Study on Hydration Heat Control of The Mass Concrete Using Oscillating Capillary Heat Pipe*
Kim, J.S., Hung, B.N., Kim, T.H., Kim, J.H., Ha, S.J., Kim, M.S. (Pukyong National Univ., Korea)
- M-3 *Internal Flow Patterns of a Closed-End Oscillating Heat Pipe at Normal Operating Condition: Effect of Internal Friction*
Srihajong N., Terdtoon, P., Kamonpet, P., Jompakdee, W., Attabhanyo, R. (Chiang Mai Univ., Thailand)
- M-4 *Effects of Evaporator Lengths, Number of Turns and Working Fluids on Internal Flow Patterns of a Vertical Closed-Loop Oscillating Heat Pipe*
Charoensawan, P.*, Terdtoon, P., Kamonpet, P., Ingsuwan, P. (Chiang Mai University, Thailand)

Session N, Heat Pipe Application (II)

Co-chair : Kadoguchi, K.(AIST, Japan) Lee, K. W.(KIER, Korea)

10:20 - 11:40

- N-1 *Perspective Thermo Control System for a Spacecraft having Onboard Equipment with Increased Heat Release*
Dvirnyi, V., Dorokhov, V., Bartenev, V., Loganov, A. (Reshetnov's NPO PM, Russia)
- N-2 *The Application of Heat Pipe Embedded Panel for the Transponder of Communication and Broadcasting Satellite (CBS) Payload System*
Park, J.H.*, Choi, J.S.*, Lee, S.P.*, Woo, H.J.** (*Electronic and Telecommunications Research Institute, ** Korea Aerospace Industries, Korea)
- N-3 *Heat Pipes Applied in Spacecraft*
Miao, J.Y., Shao, X., Li, T., Cao, J., Mi, M., Wei, Y.H. (Chinese Aerospace of Science and Technology Corporation, China)
- N-4 *Thermosyphon as an Energy Saver in Aeroponic System: A Case of Mathematical Modeling*
Srihajong, N.*, Ruamrungsri, S.*, Terdtoon, P.*, Kamonpet, P.*, Ohyama, T.**
 (* Chiang Mai University, Thailand, ** Niigata University, Japan)

11:40 - 12:40 Lunch

12:40 - 13:20 Closing Ceremony

Final Program Timetable of 7IHPS

Time	Oct. 12 (Sun)	Oct. 13 (Mon)	Oct. 14 (Tue)		Oct. 15 (Wed)		Oct. 16 (Thu)		Time		
8:00			Keynote Lecture (IV) Prof. Zhuang, Z. (Nanjing Univ., China)		Oscillating Heat Pipes (I)	K-1	Keynote Lecture (VII) Prof. Terdtoon, P. (Chiang Mai Univ., Thailand)	8:00			
8:10						K-2		8:10			
8:20						K-3		8:20			
8:30						8:30					
8:40		Opening Ceremony (Grand Ballroom)		F-1	Coffee Break	Oscillating Heat Pipes (II)	M-1	8:40			
8:50									8:50		
9:00				Keynote Lecture (I) Prof. Katsuta, M. (Waseda Univ., Japan)			Micro Heat Pipes	F-2	M-2	9:00	
9:10											9:10
9:20									9:20		
9:30									9:30		
9:40			A-1	F-4			Loop Heat Pipes (II)	L-1	M-3	9:40	
9:50										L-2	9:50
10:00								L-3		10:00	
10:10	Registration & check-in (Entrance of Grand Ballroom Diamond, B1)	Thermosyphons (I)	A-2	Coffee Break		Coffee Break		10:10			
10:20					G-1	Heat Pipe Application (II)	N-1	10:20			
10:30			A-3		G-2		N-2	10:30			
10:40		Coffee Break			G-3		N-3	10:40			
10:50			G-4		N-4		10:50				
11:00		CPLs	B-1	Thermosyphons (II)	Half-day Tour (Pyo-Seon folk village, San-gum-buri crater, Seong-San Il-Chul-Bong, Natural History Museum, etc.)		Lunch Hallajung (Korean, B1) Marado (Japanese,B1)		11:00		
11:10									B-2	G-5	11:10
11:20									B-3	11:20	
11:30									11:30		
11:40								11:40			
11:50								11:50			
12:00			Lunch	Lunch				12:00			
12:10		Hallajung (Korean, B1) Marado (Japanese,B1)	Hallajung (Korean, B1) Marado (Japanese,B1)				12:10				
12:20						12:20					
12:30						12:30					
12:40						12:40					
12:50		Keynote Lecture (II) Prof. Lee, Jin Ho (Yonsei Univ., Korea)	Keynote Lecture (V) Dr. Yamamoto, T. (JAHP, Japan)		Colsing Ceremony (Grand Ballroom)		12:50				
13:00							13:00				
13:10							13:10				
13:20							13:20				
13:30			C-1	Miniature Heat Pipes	H-1		13:30				
13:40	Heat Pipes						C-2	H-2	13:40		
13:50									C-3	H-3	13:50
14:00				14:00							
14:10				14:10							
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17:30							17:30				
17:40	Welcome Reception (Grand Ballroom Diamond)	Cooling of Electrical & Electronic Systems	E-1	Heat Pipe Heat Exchangers	J-1		17:40				
17:50			E-2		J-2		17:50				
18:00			E-3		J-3		18:00				
18:10			E-4				18:10				
18:20		Dinner (at your own cost)		Banquet	Cultural Performance (Jeju Provincial Culture & Arts Troupe) at Halla Art Hall, Jeju city		18:20				
18:30							(Garden Plaza, Outdoor B1)	Korean Dinner	18:30		
18:40									18:40		
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Travel Information

General Information about Jeju-Do (Island)

Jeju island is the premier tourist destination in Korea because of the stunning natural scenery and superior tourist amenities. Scenic beaches, waterfalls, cliffs and caves lie in harmony, and the mild weather makes Jeju an even more ideal tourist destination. Mt. Halla (Hall-san) in Jeju island has flora and fauna of both temperate and tropical varieties, coexisting on the mountain. The Jungmun Tourist Complex is a comprehensive tourist resort and provides top-quality accommodations and tourist facilities. The Population of Jeju island is 528,360 currently and the component ratio which is between male and female in Jeju island is 49.4% to 50.6%(female). The ratio of Jeju population to the nation is 13% and the average population per household is 3.3. Jeju has a subtropical, oceanic climate, and four distinct seasons; spring, summer, fall and winter. The average temperature of Jeju is about 16 °C. The amount of annual rainfall in Jeju is the highest in Korea, which is 1,530mm in the record annual average precipitation. Jeju Island is also well known for a lava cave zone throughout the world. There are more than 100 lava caves in Jeju, of which only 60 caves have been discovered in public. Seogwipo is famous for its location on the southern tip of the island, featuring the magnificent Mt. Halla and Seogwipo coastline with beautiful cliffs and rock formations. The city came to the forefront of international tourism in 2002 with the construction of the World-Cup Stadium and the Seogwipo Tourist Complex. Other tourist spots include Jungmun Beach, Cheonjeyeon Waterfall, Yeomiji Botanical Gardens and Oedolgae (Rock). Travelling to Jeju Island will be fantastic, marvellous enough by means of them.

Weather

It is expected that we will have a typical autumn weather in Jeju during the 7IHPS period. It will be warm and pleasant during the day and cool during the night. High's will be between 20 and 23°C (Celsius or Centigrade), and Low's will be between 12 and 15°C. Average temperature in the middle of October will be around 18°C. Jeju is well known for its windy weather because it is basically an island facing the Pacific Ocean. It is recommended to bring a wind jacket. Rain is very rare during the period unless a Typhoon approaches, which is also hardly expected at this time of the year.

Electricity

220 Volts 60 cycles throughout the country

Health Insurance

It is recommended that before leaving country, participants arrange their health and accident insurance through local travel agencies or medical associations. Jeju has numerous clinics and hospitals catering to a variety of needs. Major public and private hospitals are equipped with the latest medical technology.

Currency Exchange and Banking facilities

Banking business hours in Jeju are 9:00 a.m. - 4:30 p.m., Monday through Friday. The unit of currency in Korea is Won (KRW). Bank notes are issued in denominations of 1000, 5000 and 10,000 Won. Coins are 10, 50, 100, and 500 Won. Korean Won may freely float against major currencies and is usually 1,150 - 1,200 Wons per US Dollar. Normally the exchange rate at bank is the most favorable. After the banks are closed, you can exchange money at your hotels.

Traveler's Checks and Credit Cards

Most banks and all major international hotels will cash traveler's checks. You will also need your passport as identification. Major hotels, restaurants and shops are accustomed to the well-known international credit cards.

Business Hours

Government and business offices are opened from 9:00 a.m. to 18:00 p.m., Monday through Friday, and from 9:00 a.m. to 13:00 p.m., Saturday. Department Stores in Jeju are opened from 10:00 a.m. to 20:00 p.m. (generally 7 days a week)

Tipping

A 10% service charge is included in the prices at hotels and large restaurants. Tip is not compulsory, but if you wish, gratuity is normally 5-10%.

Telephone

Public phones cost 50 Won per 3 minutes for a local call and minimum 200 Won per minute for domestic long distance. Phone cards are widely available and you may purchase one from the Information Desk at the airport or at the hotel.

Jeju International Airport

The international airport is an hour and a quarter by Limousine bus service from the symposium venue. There are almost fifty flights operating daily between Jeju and Seoul (Gimpo) domestic airport.

Passport and Visa Requirements

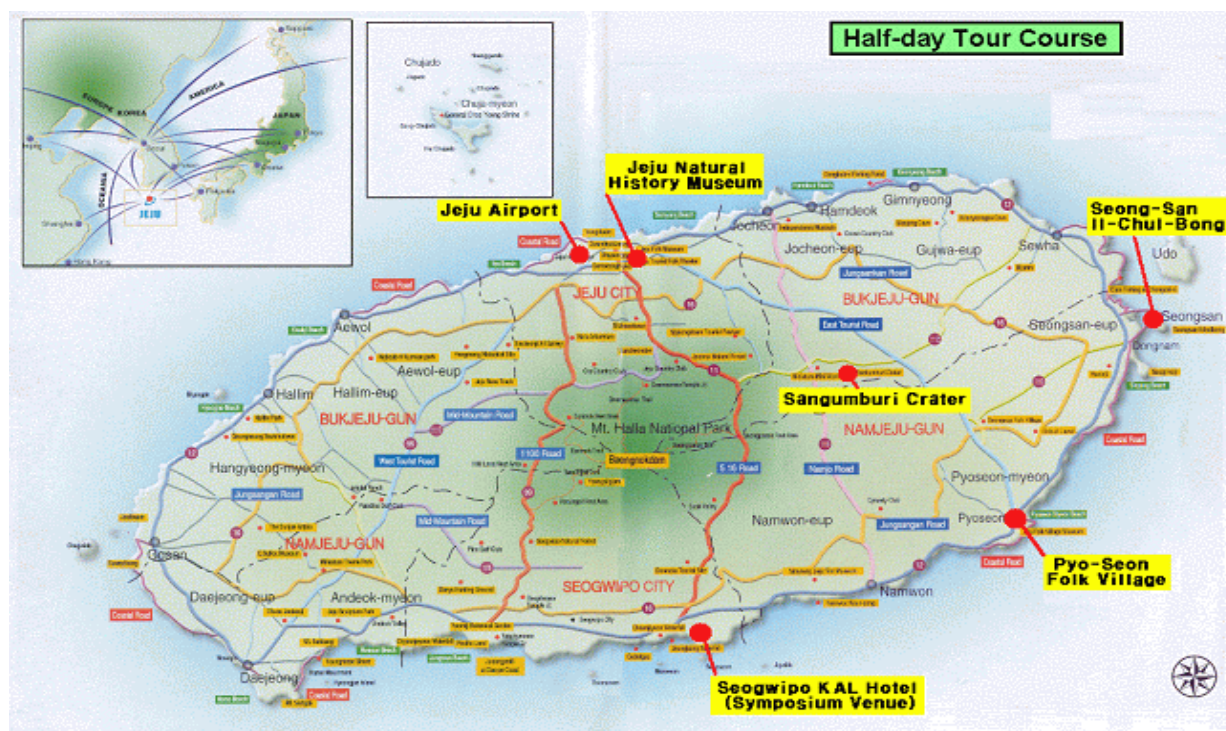
Entry visa is required unless your country has special agreement with Korean government. Contact your local Korean Consulate or travel agent for more information.

Direct Flight Schedule of Jeju International Airport

DEPARTURE	ARRIVAL	DAY	FLIGHT NO.	TIME
Incheon	Jeju	SUN	OZ8551	17:20-18:35
		SUN	KE1423	17:30-18:35
Shanghai	Jeju	FRI	OZ380	16:00-18:20
		TUE, SUN	MU5023	20:25-22:30
Beijing	Jeju	TUE, FRI	KE856	11:55-15:20
Tokyo	Jeju	MON, WED, FRI, SAT	KE718	09:45-12:15
Fukuoka	Jeju	WED	OZ135	10:00-10:55
		MON, FRI, SAT, SUN	OZ135	11:55-13:00
Jeju	Fukuoka	MON, FRI, SAT, SUN	OZ136	10:00-10:55
		TUE	OZ136	18:30-19:25
Jeju	Tokyo	MON, WED, FRI, SAT	KE717	18:20-20:30
Jeju	Beijing	TUE, FRI	KE855	09:10-10:45
Jeju	Shanghai	FRI	OZ379	14:30-15:00
		TUE, SUN	MU5024	23:00-22:50
Jeju	Incheon	SUN	OZ8552	18:55-20:00
		SUN	KE1424	19:20-20:25

Symposium Half-day Tour (Oct. 15, Wednesday, 10:30 - 18:00)

The half-day tour will consist of 4 typical natural places in eastern Jeju. Participants will move with 3 or 4 chartered buses, in each of which an English-speaking tour guide will attend the participants. Lunch will be served in the bus to save time. Either sandwich or laver(seaweed)-rolled rice along with soft drink will be served. The tour will be followed by a folk dance performance by the Jeju Provincial Culture and Arts Troupe at the Halla Art Hall, which is located in Jeju-city. To conclude the tour, participants will have typical Korean or Jeju-style dinner after the performance. The tour spots are marked red in the Jeju map. If you have some time before and after the Symposium period, you may as well exclude those spots from your private tour plan.



1. Pyo-Seon folk village

A reproduction of a traditional village on the island. It has an area of 4,550m² with a fishing village, outdoor exhibition of fishing tools, a stage for shaman rituals and the house of Intangible Cultural Properties. 81 traditional thatched roof houses from the village. there are a total of 117 buildings.

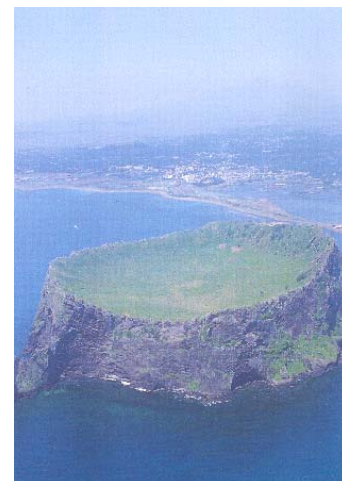


2. San-gum-buri crater

Sangumburi is the only crater in Jeju island that is not sitting on top of a mountain but in the middle of a vast grassland. The crater is slightly larger than the Baek-rok-dam crater of Mt. Halla. Strangely, the crater never fills up with water no matter how much it rains. Also inhabited by 420 different species of plants. It is a natural botanical garden. Golden eulalia fields decorate the autumn scenery.

3. Seong-San Il-Chul-Bong

Seong-San is the name of town in eastern Jeju. The meaning of il-chul-bong is "sunrise peak". This is a plateau like basin which is the crater of an extinct volcano. It just out on a peninsula far into the sea. The sunrise view from Seong-San peak is truly majestic and considered to be the best of the "10 Scenic Wonders of Yeongju". the basin has an area of little over 9,000m² and is covered with grass. Ninety nine jagged rocks stand along the rim of the crater producing an image like a crown.



4. Jeju Folklore and Natural History Museum

Dubbed as the island within the island, this museum has collected all the folklore, fauna and flora of the Jeju. The Natural History Exhibit Hall is composed of 6 exhibition rooms for rocks, marine animals, plants, insects, birds and mammals. The Folklore Exhibition is divided into different sections: Housing, Clothing and Everyday Life.

Cultural Performance (18:00-19:00 October 14, at Halla Art Hall, Jeju city)

by Jeju Provincial Culture & Arts Troupe

Organized solely for the 7IHPS participants, this enchanting performance is a complimentary program provided by the Organizing Committee. Please bring your camera or camcorder and get them ready before the performance.



Attractions near Symposium Venue

There are many attractions in Seogwipo area, within 10 to 20 minutes by taxi from the Seogwipo KAL Hotel. It is good idea to visit some of them if you have free time before or after the Symposium. A few recommendable places are listed below. For more detail tour information, ask hotel front desk.

1. Cheon-ji-yeon Waterfall

Columns of water fall down the cliff and break into the underneath pond. A quiet path through the sub-tropical forest leads the visitors to the fall, and a separate one takes them back to the entrance. Mutae Eels (*Anguilla Marmorata*, Natural Monument No. 258) inhabit the pond, and Dampalsu Trees(*Elaeocarpus Jollingeri*, Natural Monument) also are found in nearby valleys.



2. Yeo-mi-ji Botanical Garden



The best botanical garden in Asia that should not be missed. 2,000 species of rare plants and 1,700 species of flowers and trees. There is a central observatory tower that looks as far out as Mara Island, the southernmost tip of Korean territory. The Garden is 1,120 m² in area and features a dome shaped greenhouse with a fertilization garden, aquatic plant garden, tropical fruit tree garden, cactus garden. Japanese, Italian and French style gardens are also created outdoors.

3. Chun-je-yeon Waterfall

The 2-tier cascade waterfall and the surrounding area are so mysteriously beautiful that it has been named the "Pond of Heaven's Emperor"(Cheon-je-yeon). The legend says that 7 nymphs who were hand maids of the Emperor descended from Heaven in the middle of the night to bathe in the pool. There is an arched bridge above the pond named Seonimgyo with the figures of 7 maidens sculpted on it. Another carved figure named Obokcheon stands next to the fall. They say that if you throw a coin into the bag that the figure holds you will receive all of the "Five Blessings in Life."

4. Jung-mun Beach

The white sands and the black stones unique to Jeju form a wonderful harmony. The beach arches in the shape of a bow and is covered with jinmosal, a sand with a very special coloring. Frequently used for filming movies or TV dramas. Ideal for wind surfing and other maritime sports. A variety of events all year round will make your vacations here unforgettable. In July '97, it was selected as the best beach by the Federation of Environmental Movement after it conducted a nationwide "Water Quality Survey."

Domestic Transportation

1. From Incheon International Airport to Seogwipo KAL Hotel, Jeju

This is a guide leading the international participants to the 7IHPS Venue once they arrive at the Incheon International Airport (Airport Code; ICN) via international flights.

Near Seoul area, the Incheon International Airport is mainly for international flights, and the Gimpo Airport accommodates almost all domestic flights. The two airports are 35 minutes apart from each other (limousine bus operates every 5 to 10 minutes all day).

Sundays only, there are two flights from Incheon directly to Jeju. These two are connection flights of certain inbound international flights. The leaving times are 17:20 (Asiana Airlines) and 17:30 (KAL - Korean Airlines). But there is very little chance for 7IHPS participants to take these planes.

Most of the participants will have to use Gimpo Airport to take domestic flight to Jeju International Airport. In this case, passengers have to take the Airport Limousine Bus at the designated bus stops (3B, 4A, 10B, 11A : all on the 1st (ground) floor, right outside of the building) of Incheon International Airport. It takes about 35 minutes to Gimpo Airport and the bus fare is KRW 6,000 (approx. USD 5). From Gimpo Airport, more than 50 flights are operated between Jeju everyday (From 07:00 to 21:55).

After arriving at Jeju International Airport, most of the participants will use Limousine Bus to Seogwipo KAL Hotel. On October 12 (Sun) and October 13 (Mon), the Organizing Committee will dispatch a 7IHPS guide (wearing '7IHPS' badge) right in front of the Information Desk on the first floor of the Jeju airport.

Please make sure to take Bus Number 600 on the ground level, outside of airport building. The bus operates at every 25 minutes. Travel time will be 80 minutes and the bus fare is KRW 4,700.

Please be advised that this bus line (No. 600) is not just for the Seogwipo KAL Hotel, but also for some other deluxe hotels in the way. About 20 minutes before getting to Seogwipo KAL Hotel, it will stop at several luxury hotels in the Jung Mun resort area.

Some participants will use rental car service available at the Jeju airport. The travel time will be about 50 minutes to Seogwipo KAL Hotel. If you would like to rent a car, you would better contact us for a discounted rate available through the official travel agent for 7IHPS.

If you are interested in direct international flights from Japan or China to Jeju, please check our homepage: in 'Link & Information' Menu, click 'Direct international flights'

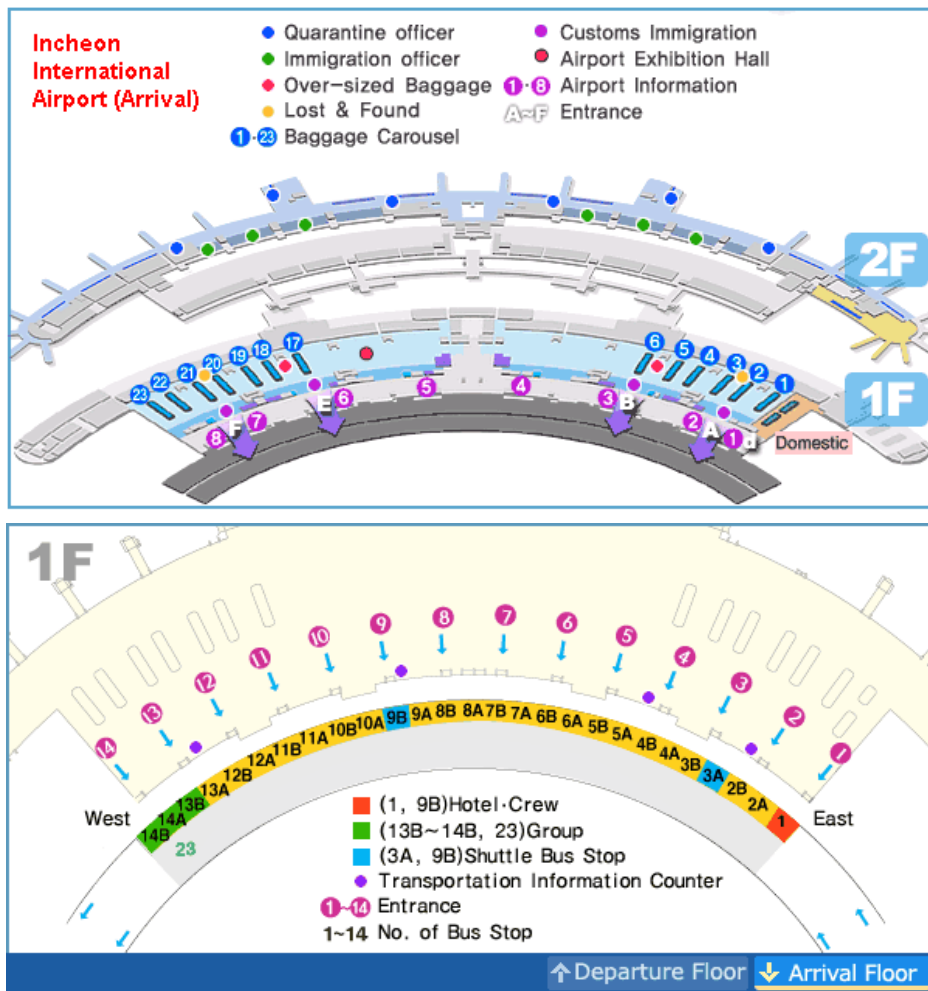
Form Incheon International Airport(ICN) To Seogwipo KAL Hotel

- (1) Incheon International Airport (ICN) $\xrightarrow{\text{by Airplane}}$ Jeju Airport (CJU) $\xrightarrow{\text{by Bus}}$ Seogwipo KAL Hotel
- (2) Incheon International Airport (ICN) $\xrightarrow{\text{by Bus}}$ Gimpo Airport (GMP) $\xrightarrow{\text{by Airplane}}$ Jeju Airport (CJU) $\xrightarrow{\text{by Bus}}$ Seogwipo KAL Hotel



From Incheon International Airport(ICN) To Jeju International Airport(CJU)

Airline	STD	Flight No.	Travelling Time (min)	Fare, One Way (KRW)
Asiana	17:20	OZ 8551	65	76,900 + airport tax(4,000)
KAL	17:30	KE 1423		



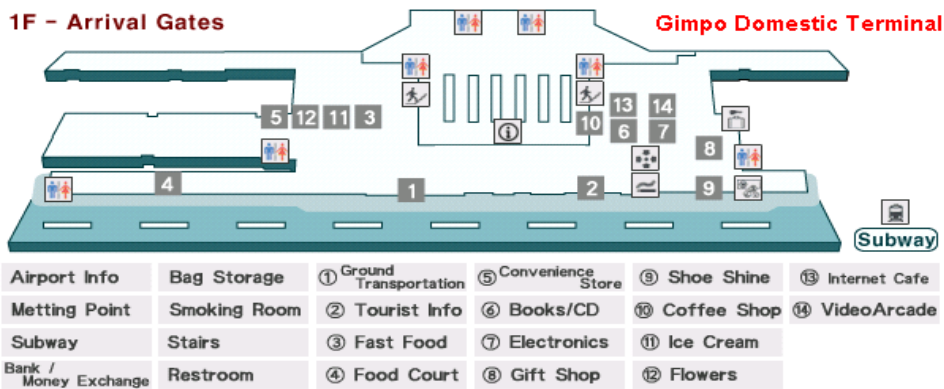
From Incheon International Airport(ICN) To Gimpo Airport(GMP)

Destination	Bus Stop No.	First Bus	Last Bus	Interval (min)	Travelling Time (min)	Fare (KRW)	Bus Service Company
Gimpo Airport	3B,10B	05:00	20:30	5~10	35	6,000	Korea City Air Terminal +82-2-551-0077~8
Gimpo Airport	4A,11A	04:40	21:50				KAL +82-2-2667-0386~89

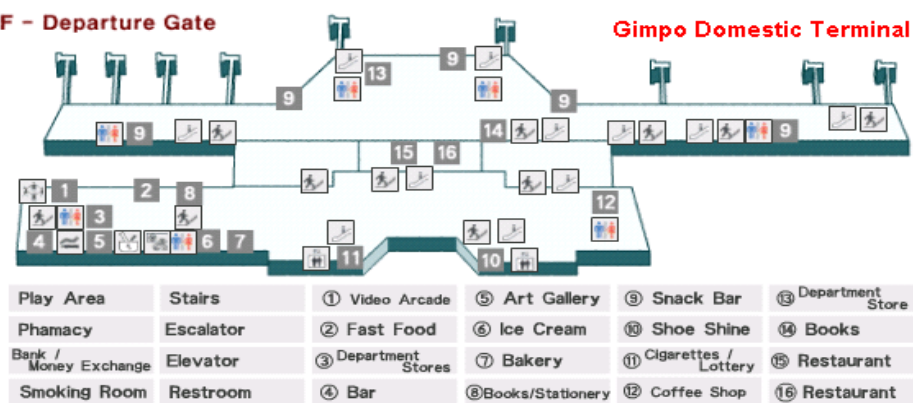


Gimpo Airport

1F - Arrival Gates



3F - Departure Gate



From Gimpo Airport To Jeju Airport

Destination	First Departure	Last Departure	Interval (min)	Travelling Time (min)	Fare, (KRW)	Airline
Jeju Airport	06:40	20:50	10~20	65	76,900 + airport tax(4,000)	KAL Asiana



From Jeju Airport To Seogwipo KAL Hotel

Destination	Bus No.	First Bus	Last Bus	Interval (min)	Travelling Time (min)	Fare (KRW)	Bus Service Company
Seogwipo KAL Hotel	600	60:20	21:50	25	80	4,700	Samyoung Bus (064)713-7000



Seogwipo KAL Hotel



Location: 486-3 Topyeong-dong,
Seogwipo-city, Jeju-do

Contacts: Tel (064)733-2001

Toll Free - (080)200-2001

Reservations - (02)310-6677

Fax - (064)733-9377

Home Page: www.kalhotel.co.kr

E-Mail : kalhotel@koreanair.co.kr

B. Return Route

For return to Jeju Airport, you have to take the Airport Limousine Bus from Seogwipo KAL Hotel. Jeju Airport has three departure gates. One is International departure gate and others are domestic departure gates. For those who need to go to Incheon International Airport, please read the following direction.

After arriving at Gimpo Airport, you have to go out of Domestic Airport Terminal. In front of the building, you will see many bus stops. The the last stop (to your left) is for the Airport Limousine Bus in Seoul. Bus numbers for Incheon International Airport are 600, 601, 604, 604-1, 603, 607, 608 and 4. Travel time will be 80 minutes and the fares are KRW 4,500 for Deluxe City Buses and KRW 6,000 for KAL Airport Limousine Bus (No. 4). The difference occurs from bus type.

At the Incheon International Airport, the bus stops on the third floor (departure floor), which is connected to departure check-in counters.



From Seogwipo KAL Hotel To Jeju Airport(CJU)

Destination	Bus No.	First Departure	Last Departure	Interval (min)	Travelling Time (min)	Fare (KRW)	Bus Service Company
Jeju Airport	600	06:10	21:30	25	80	4,700	Samyoung Bus +82-64-713-7000



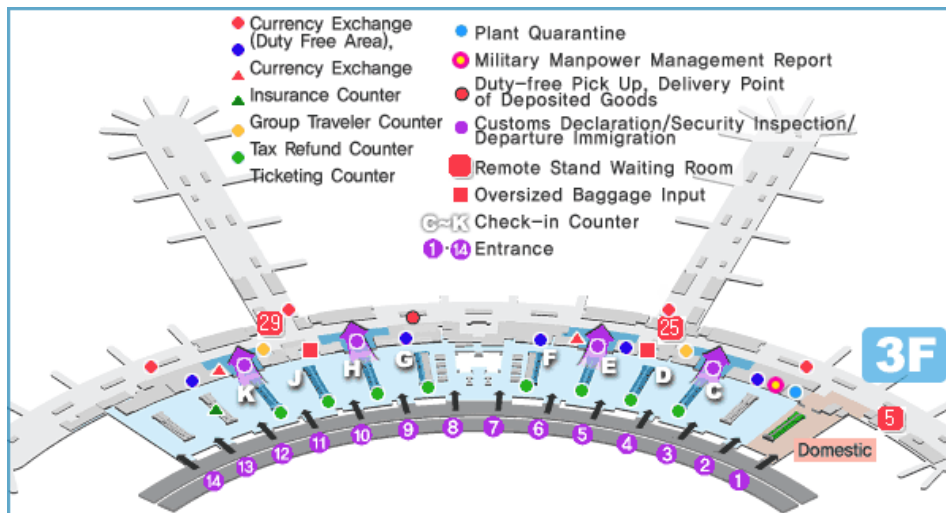
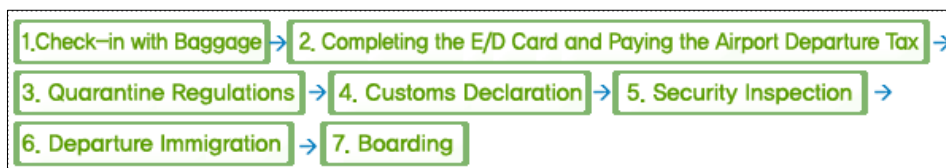
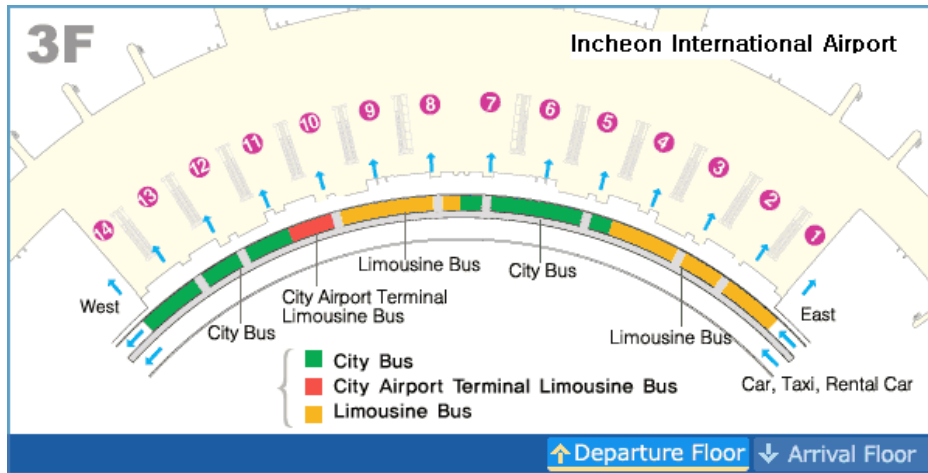
From Jeju Airport(CJU) To Gimpo Airport(GMP)

Destination	First Departure	Last Departure	Interval (min)	Travelling Time (min)	Fare, One Way (KRW)	Airline
Gimpo Airport	06:55	20:30	10~20	65	76,900 + TAX(4,500)	KAL Asiana



From Gimpo Airport(GMP) To Incheon International Airport(ICN)

Type	Bus No.	First Departure	Last Departure	Interval (min)	Travelling Time (min)	Fare (KRW)	Bus Service Company
Deluxe City Bus	600, 601, 604, 604-1, 603, 607, 608	06:10	21:30	10-15	80	4,500	Airport Limousine 82-2-664-9898
Limousine Bus	4	07:00	22:30	30	80	6,000	KAL Limousine 82-2-2667-0383/4



Links

- ◇ Incheon International Airport <http://www.airinfo.co.kr/Eng/home.jsp>
- ◇ Gimpo Airport <http://www.airport.co.kr/eng/dba/airport/gimpo/index.html>
- ◇ Jeju Airport <http://www.airport.co.kr/eng/dba/airport/jeju/index.html>
- ◇ Busan/Gimhae Airport <http://www.airport.co.kr/eng/dba/airport/gimhae/index.html>