Nanjing, China
Nov 6-Nov 9, 2009

PROGRAMME

THE 6TH INTERNATIONAL SYMPOSIUM ON HEATING, VENTILATING AND AIR CONDITIONING

Organized by

東南大學 SOUTHEAST UNIVERSITY

Co-organized by

清華大學 Tsinghua University

香 港 大 學 THE UNIVERSITY OF HONG KONG

江苏制冷学会 JIANGSU ASSOCIATION OF REFRIGERATION

http://www.ishvac09.org.cn

Contents

WELCOME TO ISHVAC09

It is our pleasure to welcome you all to attend the 6th International Symposium on Heating, Ventilating and Air Conditioning - ISHVAC09 in Nanjing, China from November 6 to 9, 2009, organized by Southeast University, and co-organized by Tsinghua University and the University of Hong Kong.

The conference series was initiated in Tsinghua University in 1991, and was held every 4 years. It has been the premier international HVAC conference initiated in China and has played a significant role in the development of HVAC and indoor environment research and industry in China. It has always been well attended by researchers and academics from worldwide.

Considering the recent attention on building energy consumption and energy efficiency, ISHVAC09 will provide a platform for discussing recent research and development on different aspects of HVAC systems and components, with a focus on building energy consumption, energy efficiency and indoor environment.

We welcome you to ISHVAC09 and enjoy yourself in Nanjing, the old and charming city.

Zhang Xiaosong

Prof. Xiaosong Zhang, Chair, Southeast University
Prof. Yingxin Zhu, Co-Chair, Tsinghua University
Prof. Yuguo Li, Co-Chair, The University of Hong Kong
Prof. Zhenqian Chen, Co-Chair, Southeast University

Secretariat

(1) Dr. Hua Qian, Executive General Secretary
School of Energy and Environment, Southeast University
Mobile Phone: +86-136 4518 6001
(2) Mr. Yonggao Yin, Secretary
School of Energy and Environment, Southeast University
Mobile phone: +86-136 1151 5279
(3) Ms. Jin Wang, Secretary
School of Energy and Environment, Southeast University
Mobile phone: +86-158 5056 6684

Email: ishvac09@gmail.com
Website: www.ishvac09.org.cn

Arrival at Nanjing Lukou International Airport (Code: NKG)

Nanjing Lukou international airport (Airport Code: NKG) now offers 85 air routes to over 50 cities, including Beijing, Shanghai, Hong Kong, Macau, Bangkok, Singapore and Seoul. After you exit the customs service, please go to the taxi stand and tell the driver to go to your hotel or International Conference Hotel Nanjing. (You may print your hotel name in English and Chinese below and give it to your taxi driver). The taxi cost from the airport to International Conference Hotel Nanjing is around RMB ¥150 (US $22). It is highly recommended that you use taxi for local transportation. Please keep taxi receipts and write down the driver's license number that is displayed on front of the passenger seat and taxi license plate number if you have experienced any problems.

Arrival at Nanjing Railway Station

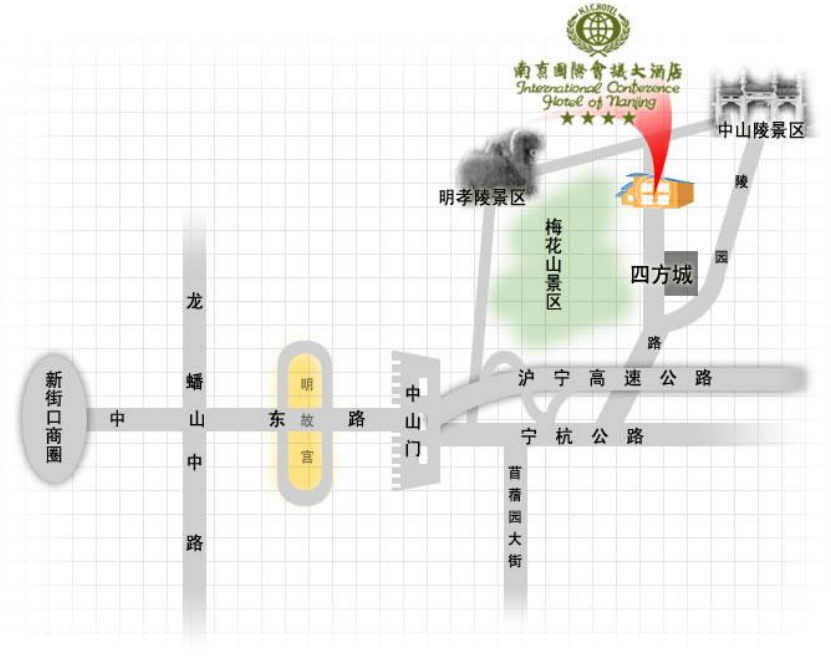
Nanjing has a convenient rail network, with direct trains to Beijing(8 hours), Shanghai (2 hours), Yangzhou (1 hour), Tianjing, Harbin, Changchun, Shenyang, Hangzhou (4 hours), Xi'an and etc. There are four passenger stations in Nanjing. The Nanjing Train Station, located in the northern suburb near the Xuanwu Lake, is the main passenger station in the city. All trains passing and leaving from Nanjing stop at this station. The taxi cost from the Nanjing railway station to International Conference Hotel Nanjing is around RMB ¥18 (US $2.5). Please do not take an unlicensed taxi offered in the railway station. It is highly recommended that you use taxi for local transportation. The bus, tour line 1 (游 1), also can take you from Nanjing Railway Station to the conference venue, and the cost is RMB ¥2 (US $0.3).

Accommodation

The following hotels could be used by ISHVAC09 conference participants and their accompanying persons.

(1) **International Conference Hotel Nanjing** (★★★★★) (The Conference Venue)
Website: http://www.nic-hotel.com/english/1.htm
Add: No.2 Sifangcheng, Zhongshanling, Nanjing, China
Tel: +86-25-84430888 Fax: +86-25-84439255

Chinese Name:
南京国际会议中心酒店（五星）
地址：中国南京中山陵四方城 2 号
电话:025-84430888，传真：025-84439255



Map of Conference Venue and Accommodation

Badges

A name badge will be issued to each registered participant. The name badge must be worn for all the conference events, including social events.

Conference Assistants

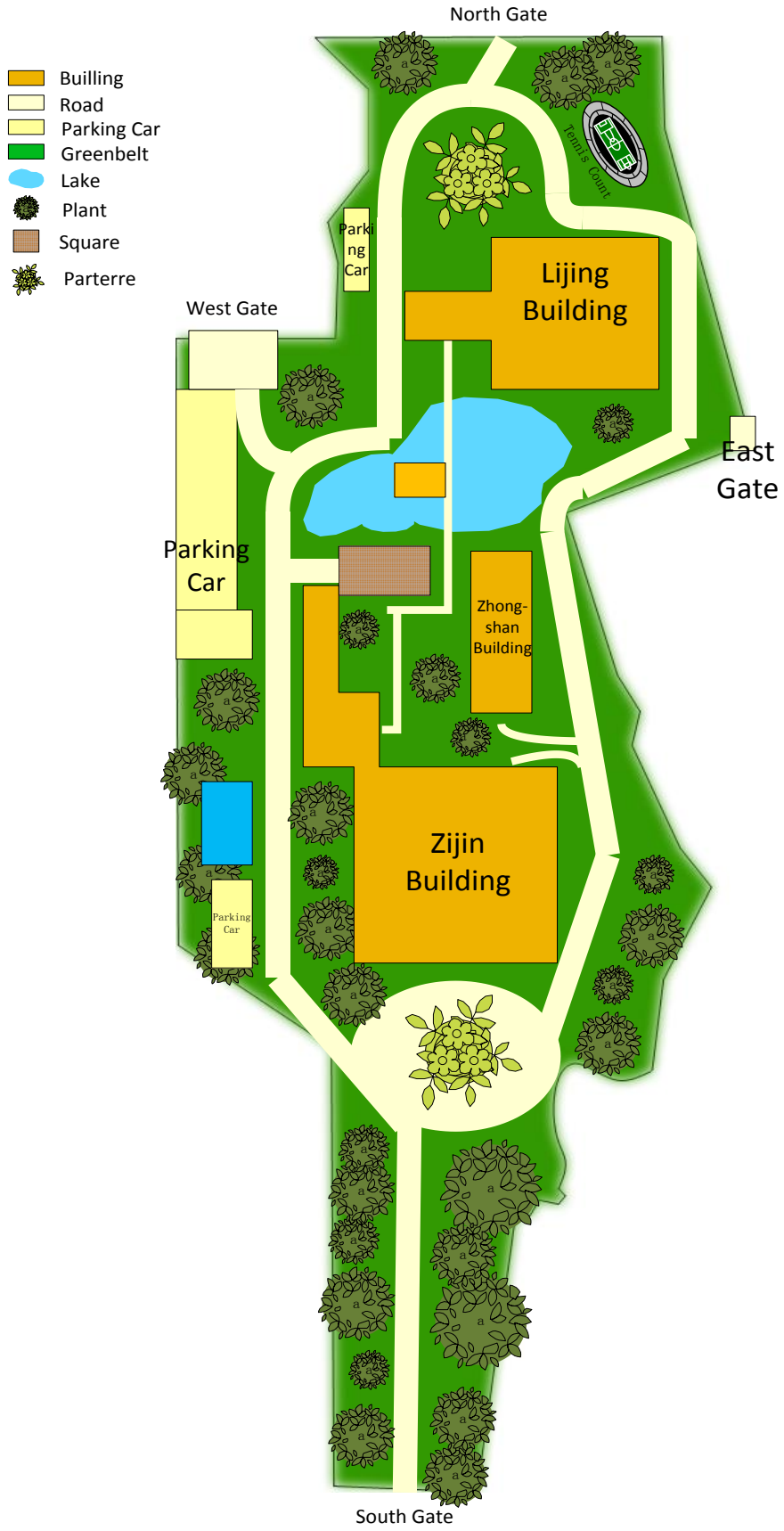
All conference assistants will wear a white T-shirt. Should you have any questions regarding the conference, please do not hesitate to ask them for help.

Conference Venue

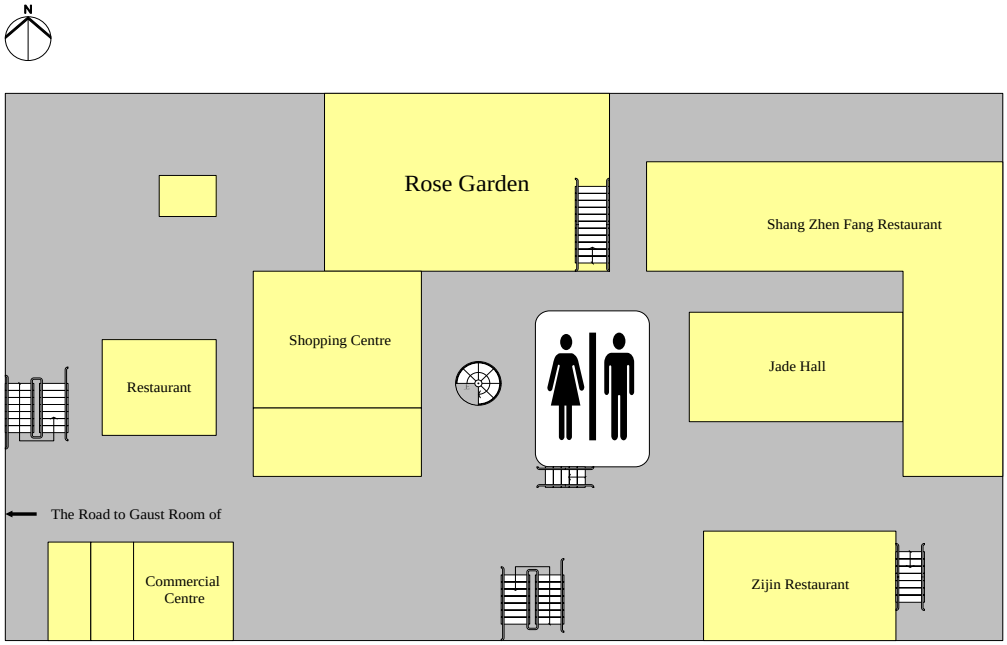
ISHVAC09 will be held at International Conference Hotel Nanjing, a five-star international hotel, which is located in the green forested east suburb of Nanjing at the foot of the Purple Mountain scenic area, close to Ming tomb and the Sun Yat-sen Mausoleum. It is about 6 km to Southeast University and 5km to Xinjiekou Shopping Center.

Some photos of the conference venue

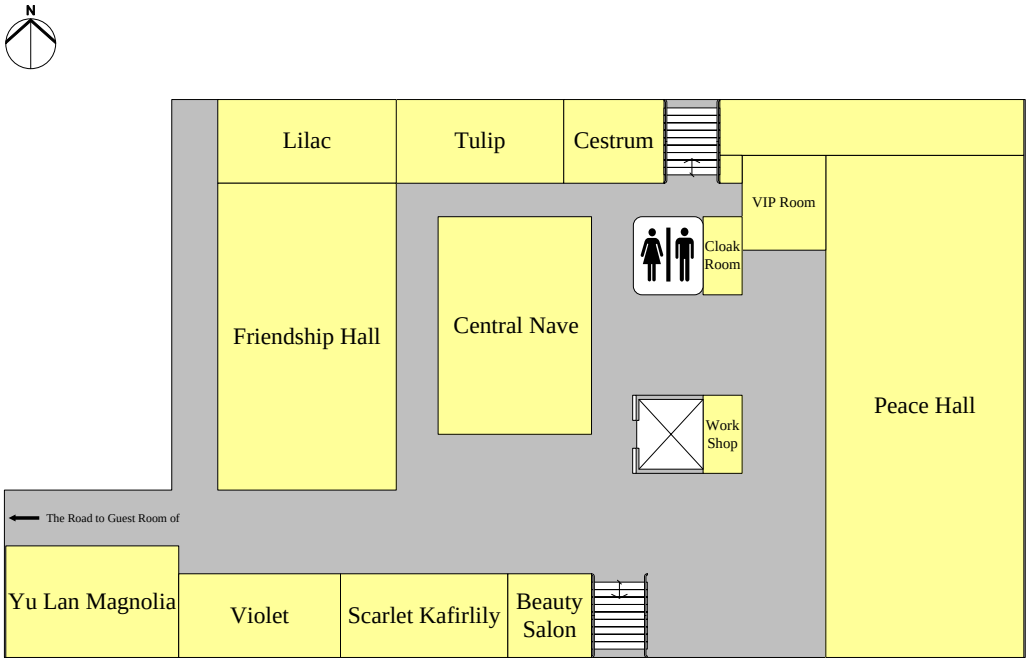
花園酒店



Map of the inside of international conference hotel



The layout of the hotel of Zijin Building on the first floor



The layout of the hotel of Zijin Building on the second floor

ROOM A (Peace Hall)	Opening Ceremony, Plenary Session I, in Zijing Building
ROOM B (Friendship Hall)	Plenary Sessions II Closing Ceremony, in Zijing Building
ROOM C (Scarlet Kafirlily Hall)	Parallel Sessions in Zijing Building

ROOM D (Violet Hall)	Parallel Sessions in Zijing Building
ROOM E (Yu Lan Magnolia Hall)	Parallel Sessions in Zijing Building
ROOM F (Cestrum Hall)	Parallel Sessions in Zijing Building
ROOM G (Lilac Hall)	Poster Sessions in Zijing Building
Registration Desk **Information Desk** **Tours and Ticket Desk**	Registration desk is placed at First Floor at the lobby, Nov 6, 2009. The Information Stand is set at the lobby at the first floor during the whole conference. ISHVAC09 assistants will help you with practical information, such as finding a restaurant, an interesting place to go, etc.
Poster Sessions	Room G will be occupied for Poster Session for whole day of Nov 7, 8, 2009.
Coffee and Tea Breaks	Corridor at the Second Floor outside of session rooms

Conference Publications

All accepted full papers are published in the conference proceedings on a USB and in a printed version. The USB proceedings will be distributed to all registered participants at the registration. The printed proceedings and additional copies of the USB proceedings can be purchased at the conference.

One set of printed proceedings: US $150 or RMB ¥1,050. ISHVAC09 can mail to your address with an additional postage fee.
One additional copy of the USB proceedings: US $20 or RMB ¥150.

Language

The official language of the ISHVAC09 is English.

Registration

Registration Hours
The Registration Desk and Information Desk will be opened:
09:00-20:00 on Nov 6
08:00-17:00 on Nov 7-8

The Registration for Participants and Students Includes
Opening ceremony
All plenary, parallel, and poster sessions

One USB of conference proceedings
Coffee and tea breaks
Welcome reception on Nov 6
Lunches from Nov 6 to 9
Banquet on Nov 7
Closing ceremony

The Registration for Accompanying Persons Includes

Welcome reception on Nov 6
Lunches from Nov 6 to 8 in hotel and Nov 9 in tour
Banquet on Nov 7

Security

Any security concerns should be brought to the attention of the Conference Secretariat immediately.

Smoking

This is a non-smoking conference, and smoking is not permitted inside the conference venues.

Instruction for Oral Presenters

It is highly recommended that an oral presenter practice his/her talk several times prior to the presentation. The presenter must make sure he/she can complete the presentation in twelve (12) minutes during the practice. Note that when the presenter presents to a large audience, a ten-minute presentation may take about 15 minutes to finish.

A presenter is kindly requested to be in the meeting room ten (10) minutes prior to the beginning of the session. The presenter should check if the PowerPoint file works in the computer. Introduce himself/herself to the session chair, co-chair, and other presenters in the same session. Due to limited time, the introduction by the session chair and co-chair for each presenter will be very brief. Each presenter is asked to please prepare a brief note as follows and gives it to the session chair or co-chair. For example: "Jin Wang will present the paper entitled: 'The Effect of Ventilation Rate in Controlling Airborne Infection' that is authored and co-authored by Dr. Hua Qian and Prof. Xiaosong Zhang. Jin Wang is studying as a second grade postgraduate in school of Energy and Environment of Southeast University, Nanjing, China." When the session chair or co-chair asks a presenter to start the presentation, the presenter should please:

1. Start the talk immediately on the topic and avoid another introduction by the presenter.
2. Pace the talk to end before the scheduled ending time. This will allow time for questions and discussion.
3. Listen carefully to the questions from audience and answer them briefly. If the presenter cannot answer the questions briefly, ask for a private discussion after the session.
4. Adhere to session chair's instructions.

Instruction for Poster Presenters

Poster presenters are encouraged to set up posters from AM 8:00-10:00, NOV 7, 2009. Presenters are then kindly requested to remove posters by 15:30, Nov 8.

Poster presenters must be available in front of their posters during the poster session on Nov 7, 2009 between 13:00 and 15:00. In order to attract a large audience to the poster, the presenter should start to give a summary of the results if there are more than four people standing around the poster. If there are fewer people around, a presenter should encourage an audience by approaching others and asking: "Do you have any questions about my poster?" or "Could I explain more to you about the results shown on my poster?"

Instruction for Session Chairs

Session chairs are required to strictly limit the duration of presentations and to moderate the discussions towards the end of each session. The total number of papers in a session will be around 6-9 but may vary from session to session. Chairs are asked to refer to the final

program for more detailed information on their session. Of each 12-15minutes presentation, the first 12 minutes is scheduled for presentations and the last 2-5 minutes for discussion. At least one question to each presenter should be prepared by the session chairs. The format of the discussion should be agreed between the session chairs. In order to comply with the time limits the chairs are requested to follow the following guidelines:

1. Arrive in the session room not later than 12 minutes before the scheduled start of the session to check that all required A/V and other auxiliary equipments is ready for use. There will be a conference assistant in the room to help. The conference assistant will tell briefly chairs on whether all PowerPoint presentation files are uploaded to the conference computer.
2. Check whether each speaker is present and collect the introduction notes from each speaker.
3. Start the session on time.
4. Remind the audience to turn off their cellular phones prior to the first presentation. The organizers may provide Chairs with a "No cellular phones" slide if needed.
5. Introduce each speaker briefly. (Example: " Jin Wang will present the paper entitled: 'The Effect of Ventilation Rate in Controlling Airborne Infection' that is authored and co-authored by Dr. Hua Qian and Prof. Xiaosong Zhang. Jin Wang is studying as a second grade postgraduate in school of Energy and Environment of Southeast University, Nanjing, China.").
6. Check that each speaker has the microphone correctly positioned or attached. The conference assistant will help with this task.
7. Make sure that each speaker can see/hear the warning signal when one minute of the allotted time remains. Each speaker has 12 minutes for oral presentation with 3 minutes discussion or questions after the presentation.
8. Stop the presentation right on time.
9. Make sure the next speaker is ready at the podium.
10. If a presenter does not appear to present a scheduled paper, then go ahead with the next presentation and use the time for additional discussion after all the presentations have been made.
11. During the discussion period, try to ensure that all the papers are discussed by preparing one question for each presentation.
12. At the end of your session, thank all speakers for their presentations and thank the audience for their participation in the discussion and for attending the session. Remind the audience of the additional opportunity to discuss the short presentations at each poster.

Opening Ceremony

15:30-18:00 on Friday, Nov 6 in ROOM A (Peace Hall) on the International Conference Hotel.
Name badge is required for admission.

Welcome Reception

Time: Friday Nov 6 18:30.
Add: Peace Hall
Participants: All paticipants

Banquet

18:30-22:00 on Saturday Nov 7 in Peace Hall or Sunward Fishery Restaurant
If the banquet is in Peace Hall

18:30 PM - 18:45PM	Welcome at the Peace Hall in the Hotel
18:45 PM – 22:10PM	Banquet time

If the banquet is in Sunward Fishery Restaurant

18:30 PM - 18:45PM	Gather at the gate of the Zijing Building
18:45 PM	Departure to Sunward Fishery Restaurant
19:10 PM	Arrive at Sunward Fishery Restaurant
19:10 PM – 22:10PM	Banquet time

Ticket is required for admission.

Closing Ceremony

17:00-18:00 on Sunday, Nov 8 in ROOM B (Friendship Hall) on the second floor of International Conference Hotel.

The two best post paper's award to be issued.
Conclusions to ISHVAC09
Introduction by the next ISHVAC conference chairman

Name badge is required for admission.

Lunch and Dinner

For participants and their accompanying persons, lunches will be provided in Rose Hall. Lunch is from 12:00 to 13:30 from Nov 6 to Nov 8.

Coffee and Tea

Coffee and tea will be served in the Corridor adjacent to each session Hall.

Social Tour

All participants will be arranged to visit Shuangliang corporation, the pioneering refrigeration and sustainable building technologies company in Nov 9 morning and be arranged to take a tour to Wuxi, the famous tourism city in China and visit the largest bronze standing Buddha in the world. A luncheon will be served during the visit and tour. The tour will be finished in Nov 9 afternoon.

Banks & ATMs

Normal banking hours in Nanjing are from 09:00 to 17:00. Exchange of major international currencies can be made. There are automatic cash dispensers (ATMs), usually located in connection with a bank branch, which accept a variety of international credit cards. The cards accepted are indicated on the dispenser. There is no Bank at Nanjing International Conference Hotel.

Credit Cards

All major international credit cards are in general use in International Conference Hotel. However at the registration desk you could not use Visa and MasterCard to pay for registration fees. Exchange rate for major currencies is as following: US 1$=RMB 6.8¥; Euro 1€=RMB 9¥; HK 1$=RMB 0.88¥.

Business Center

The front desk in International Conference Hotel can help you for most daily business service, including mail delivery and book train ticket.

Currency Exchange

In China, only Chinese Yuan (RMB) is used. However, currency exchange services can be found at airports, most hotels, and large shopping centers. International Conference Hotel can change money for their guests. When exchanging money, please keep your receipt so that you can change any remaining Chinese Yuan back to foreign currency when leaving China. You may cash Chinese Yuan from an ATM with your credit card or bank debit card.

Electricity

The electrical current in China is 220V 50Hz, and most hotels provide 110V outlets for shavers. The electric outlets in China will generally work with plugs from North America, Japan, and Korea so no converters are needed. For European and Australian participants, you can ask the waiter bring an adapter to you.

Emergency

Police: Call 110
Ambulance: Call 120
Fire: Call 119
All emergency issues must be reported to the ISHVAC09 Conference Secretariat. In case of emergency, please contact the Information Desk. For ambulance, please call 120. In case of illness, please contact Conference Secretariat, who will help you to find a doctor or hospital.

Insurance

The registration fee does not include insurance for the participants regarding accidents, sickness or loss of personal property. ISHVAC09 participants should make their own arrangements with respect to health and travel insurance before leaving their countries.

Internet

All guestrooms in International Conference Hotel Nanjing are equipped with network cable.

Free internet service is provided.

Lost and Found

Any articles found should be taken to the Registration Desk/Information Desk. Lost property can be claimed at the same place.

Message Center

You can post or find messages on the message board located near the left side of gate at the first floor.

Public Toilets

Many public toilets in Nanjing do not provide toilet paper. Please carry some with you when you go outside the hotel and conference center.

Tax

All the prices listed in China include tax, unless the tax is stated explicitly.

Taxi

Taxi is relatively inexpensive. Taxi can be found 24 hours a day. Nanjing taxi is available from the major tourist hotels. Taxi is equipped with meters. Cost of per km (after the flag falls) is displayed on a sticker on the right front window. The flag fall rate is 10 RMB. After the first 3 km, every 1 km is 2.8 RMB daylight. After 23:00 night, the price is little more expensive than daylight. Please ask for the receipt when you pay the taxi fee. The receipt records taxi number, time and distance automatically. If you lost property in the taxi, it may help you find it back.

Phones

You can buy an IC card and use it on most public telephones, including those inside the International Conference Hotel. The cost of IC cards range from RMB ¥50 to RMB ¥100. To dial outside of China, call 00-country code-city code-local number, e.g. 00-1-123-4567890.

Time zone

China is Eastern Zone +8.

Tipping

Tipping is not expected for all the services in China, such as taxi, hotel, restaurants, cinemas, etc. However, a small tip could be left to hotel porters and tour guides for extraordinary service. The prices in most hotels and restaurants include service charges, unless the service charge is explicitly listed in the hotel bill or restaurant menu.

Water

Please drink only boiled water or bottled water. Hotels usually provide one or two bottles of water for their guests free of charge every room. There is special drink water tape in the Internation Conference Hotel Nanjing providing drink water.

Weather

In Nov 6-8, the average temperature is in the range of 15-22^{o}C. It is the best time in Nanjing and mostly sunny. It is also the best time for people to appreciate the Autumn landscapes of Nanjing. The latest weather can be available from: http://www.weathercity.com/cn/32/nanjing/

Travel Information from/to Nanjing

Nanjing is with convenient air, rail, and land transportation. You can find some information of Nanjing on the following website: http://www.nju.gov.cn/english/index.asp

General Timetable

Date and Time		Nov 6 Fri	NOV 7 Sat	Nov 8 Sun	Nov 9 Mon
AM	08:00-10:15	Registration 8:00-20:00 Lobby First Floor	Oral Sessions: Sat-AM1-T01.1 Room C Sat-AM1-T07.1 Room D Sat-AM1-T02.1 Room E Poster Sessions Room G	Oral Sessions: Sun-AM1-T04.2 Room C Sun-AM1-T10.1 Room D Sun-AM1-T12.1 Room E Poster Sessions Room G	TOUR full day
	10:15-10:45		Tea Break: Corridor	Tea Break: Corridor	
	10:45-12:30		Oral Sessions: Sat-AM2-T04.1 Room C Sat-AM2-T09.1 Room D Sat-AM2-T11.1 Room E Poster Sessions Room G	Oral Sessions: Sun-AM2-T05.2 Room C Sun-AM1-T08.2 Room D Sun-AM1-T11.2 Room E Poster Sessions Room G	
Noon	12:00-14:00	Buffet Lunch	Buffet Lunch	Buffet Lunch	Tour lunch
PM	14:00-16:15	15:30 Opening Ceremony Room A	Oral Sessions: Sat-PM1-T03.1 Room C Sat-PM1-T05.1 Room D Sat-PM1-T06.1 Room E Sat-PM1-AI Room F Poster Sessions Room G	Forum (13:30-15:30): Sun-PM1-F1 Room B Sun-PM1-F2 Room C Sun-PM1-W1 Room D	
	16:15-16:45	Plenary session:	Tea Break: Corridor	15:30-16:00 Tea Break: Corridor	
	16:45-18:30	Fri-PM-P1 Room A	Oral Sessions: Sat-PM2-T08.1 Room C Sat-PM2-T02.2 Room D Sat-PM2-T07.2 Room E Poster Sessions Room G	Plenary session: Sun-PM2-P2 Room B Closing Ceremony Room B	
	18:30	Welcome reception	Banquet and show	Chair Dinner	Free

Summary of the Technical Program

Friday, Nov 6 2009

Sessions	Titles	Room No.
15:30-18:00		
FRI-PM-P1	Plenary Session I	A

Saturday, Nov 7 2009

Sessions	Titles	Room No.
08:00-10:15		
Sat-AM1-T01.1	Sustainable Buildings	C
Sat-AM1-T07.1	Thermal Comfort	D
Sat-AM1-T02.1	HVAC System	E
Poster session	All topics	G
10:45-12:30		
Sat-AM2-T04.1	Refrigeration System	C
Sat-AM2-T09.1	Indoor air pollutants and cleaning	D
Sat-AM2-T11.1	Energy Utilization and Efficiency	E
Poster session	All topics	G
14:00-16:15		
Sat-PM1-T03.1	Energy supply	C
Sat-PM1-T05.1	R&HVAC components	D
Sat-PM1-T06.1	Indoor/outdoor air Quality R&HVAC components	E
Sat-PM1-AI	Advanced industrial technology in sustainable buildings	F
Poster session	All topics	G
16:45-18:30		
Sat-PM2-T08.1	Indoor/outdoor air flow	C
Sat-PM2-T02.2	HVAC System	D
Sat-PM2-T07.2	Thermal comfort	E
Poster session	All topics	G

Sunday, Nov 8 2009

Sessions	Titles	Room No.
08:00-10:15		
Sun-AM1-T04.2	Refrigeration system	C
Sun-AM1-T10.1	Renewable energy	D
Sun-AM1-T12.1	Building envelope	E
Poster session	All topics	G
10:15-12:30		
Sun-AM2-T05.2	R&HVAC components	C
Sun-AM2-T08.2	Indoor/outdoor air flow	D
Sun-AM1-T11.2	Energy Utilization and Efficiency	E

Poster session	All topics	G
13:30-15:30		
Sun-PM1-F1	Forum of 12th five-year project research direction: How to face the challenge of global warming.	B
Sun-PM1-F2	The new WHO guideline on Natural ventilation for infection control	C
Sun-PM1-W1	Mission of IEA/ECBCS/Annex 53 Total Energy use in Buildings -Analysis and evaluation methods	D
16:00-18:30		
Sun-PM2-P2	Plenary Session Ⅱ	B

Introduction to the Technical Program

ISHVAC09 Technical program consists of

Plenary sessions, each plenary speaker has 45 minutes for presentation;

Parallel sessions, each presenter has 15 minutes for presentation, including discussion;

Poster sessions, each presenter can discuss with the participants in front of his/her poster on Nov 8 13：00-15：00

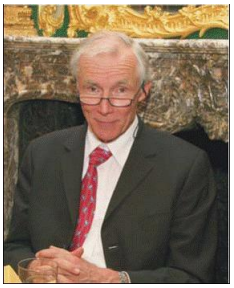
Plenary Sessions

Four internationally renowned scholars have been invited as the plenary session speakers at ISHVAC09. Their topics of presentation are:

Prof. Yi Jiang

Department of Building Science & Technology, School of Architecture, Tsinghua University,China

P1.1 Status and challenges of HVAC in large commercial buildings



Prof. Jean Lebrun

Thermodynamics Laboratory , University of Liège, Belgium

P1.2 Heat Pumping and Reversible Air Conditioning: what we learned from the IEA-ECBCS annex 48 project?

Prof. Hiroshi Yoshino

Tohoku University, Japan

P2.1 Energy and environment of residential buildings in China and Japan

Prof. Jensen Jianshun Zhang

Syracuse University, USA.

P2.2 Integrated IAQ Strategy via Source Control, Ventilation and Air Purification

Parallel and Poster Sessions

The parallel and poster sessions consisted of peer-reviewed papers/abstracts organized in the following topics:

T01	Sustainable building	T07	Thermal comfort
T02	HVAC System	T08	Indoor/outdoor air flow
T03	Energy supply	T09	Indoor air pollutants and cleaning
T04	Refrigeration system	T10	Renewable energy
T05	R&HVAC components	T11	Energy Utilization and Efficiency
T06	Indoor/outdoor air Quality	T12	Building envelope

Session Codes

All the sessions have been assigned a code, such as "Sat-AM2-T??". The items before '-' stand for:
Sat-PM = Nov 7, 2009 (Saturday) afternoon session (AM);
Sat-PM1 = The first session on Nov 7, 2009 (Saturday) afternoon (PM);
Sat-PM2 = The second session on Nov 7, 2009 (Saturday) afternoon (PM);

The items after the '-' stand for:
P = Plenary sessions
T = Theme of ISHVAC09
Po=Poster sessions

The number before the dot stands for the sequence number of topics/plenary sessions. The number after the dot is the sequential number of the sessions for the topics/plenary sessions.

For example: "Sat-PM1-T02.2" means the second part of topic three to be presented in the second session on Nov 7, 2009 (Saturday) afternoon.

Paper Codes

All papers have been assigned a code as the submission of topics, such as "T01-O-01-04".
T01 = Theme item number, it varied according to the 12 themes.
O, P, N = Oral session paper, Poster session paper or No-show paper.
01-04=paper's identification number which was assigned when the authors submitted their papers (Such as the Original ID of 01-04 is T01-004).

For example: “T01-O-01-04” means the paper will be presented in the oral session of Themes 1, and the original paper’s identification number assigned in submission is the T01-004.

Best Posters

The ISHVAC09 will award two best posters, i.e. the Best Poster Paper Award.

Friday Nov 6, 2009

15:30—16:00 Opening Ceremony

Room: Hall A

Chair: Xiaosong Zhang, Yingxin Zhu, Yuguo Li and Zhenqian Chen

Chinese folk music

Welcome addresses

- Welcome speech from organizers
- Welcome speech from president of SEU
- Welcome speech from Yi Jiang

Practical information by Hua Qian

Session FRI-PM1-P1: Plenary Session Ⅰ

16:00—18:00 Room: A

Chairs: Jan sundell (USA), Ruzhu Wang (China)

P1.1 Status and challenges of HVAC in large commercial buildings

Prof. Yi Jiang

Department of Building Science & Technology, School of Architecture, Tsinghua niversity,China

P1.2 Heat Pumping and Reversible Air Conditioning: what we learned from the IEA-ECBCS annex 48 project?

Prof. Jean Lebrun

Thermodynamics Laboratory , University of Liège, Belgium

Session SAT-AM1-T01.1: Sustainable building

8:00-10:15 Room: C

Chairs:Yanfeng Liu, Yi Zhang

T01-O-01-06 **A Green Energy Building on the Campus of Shanghai Jiao Tong University**
Shuai Deng, Ruzhu Wang, Yanjun Dai, Xiaoqiang Zhai, Junru Shen
Shanghai Jiao Tong University

T01-O-01-19 **A Case Study on the Influence of the Site Selection on the Natural Ventilation in a Chinese Traditional Folk House**
Mingjing Xie, Guoqiang Zhang, Quan Zhang, Feng Xu, Ke Wang
Hunan University

T01-O-01-28 **Optimization of Energy Use for Heating/Cooling and Lighting for a Typical Office Building in a Moderate Climate**
Wout Parys, Dirk Saelens, Hugo Hens
K.U.Leuven

T01-O-02-29 **A Quantitative Study on Factors Affecting Heat Consumption of Residential Buildings**
Di Zhang, Rui Li
Beijing University of Civil Engineering and Architecture

T01-O-01-21 **Energy Saving Potential of Passive and Low Energy Cooling Techniques in Buildings in Ghana**
Samuel Amos-Abanyie, Fred Ohene Akuffo, Victor Kutin-Sanwu
Kwame Nkrumah University of Science and Technology

T01-O-01-11 **The Heating System of a Beijing Courtyard—Restoration and Renovation Project of a Beijing Pilot Courtyard---Renovation Program of Beijing Pilot Courtyard**
Dan Zhu, Deying Li
Beijing University of Civil Engineering and Architecture

T01-O-02-03 **A Simulation Study on the Capacity Control of a Direct-Expansion Variable-air-volume Air Conditioning System**
Wu Chen, Wensheng Yu, Shiming Deng
Jimei University; Hong Kong Polytechnic University

T01-O-02-01 **Testing and Diagnosis on a Heating System in Beijing**
Hongbing Chen, Deying Li, Ping Wei, Yaodong Lan
Beijing University of Civil Engineeing and Architecture; Beijing Polytechnic College;Hebei Engineering and Technical College

Session SAT-AM1-T07.1: Thermal Comfort

8:00-10:15 Room: D

Chairs: Kuanrong Qiu, Zhiwei Lian

T07-O-05-05 **Computational Fluid Dynamic Study on the Effect of Cooling Tower Plume in an Alley of a Mega City**
Man Him Chan, Chun-Ho Liu, Daniel W.T. Chan
Welsh School of Architecture, Cardiff University; The University of Hong Kong；Hong Kong Polytechnic University

T07-O-05-40 **A Discussion of Skin Temperature Measurement Method**
Zhiwei Lian,Youhui Peng, Li Pan
Zhongyuan University of Technology; Shanghai Jiao Tong University

T07-O-05-38 **Evaluation of Human Thermal Comfort using the Mean Skin Temperature**
Weiwei Liu, Zhiwei Lian, Qihong Deng
Central South University; Shanghai Jiao Tong University

T07-O-05-43 **The Effect of Regional Difference on IESD-Fiala Model**
Shigang Li, Zhiwei Lian, Li Pan, Yuemei Wang
Shanghai Jiao Tong University

T07-O-05-58 **Windows Dimension Optimization for Better Thermal Comfort in Summer Based on Analytical Models**
Wei Yin, Guoqiang Zhang, Wei Yang, Wang Xiao
Hunan University

T07-O-05-59 **Study on the Indoor Thermal Environment of a University Classroom in Tianjin Region**
Hua Yang, Binghong Yan, Chunhua Sun
HeBei University of Technology

T07-O-05-62 **Effects of Thermal Discomfort on the Performance of Office Work and Physiological Behaviours**
Li Lan, Pawel Wargocki, Zhiwei Lian, Jørn Toftum
Shanghai Jiao Tong University;Technical University of Denmark

T07-O-01-46 **Measurement and Field Survey of Indoor Thermal Comfort in Rural Housing of Northern China in Winter**
Li Huang, Yingxin Zhu, Qin Ouyang, Bin Cao
Tsinghua University

T07-O-05-78 **An experimental study on the effects of climatic characteristics on people's adaptability to the thermal environment**
Juan Yu, Yingxin Zhu, Qin Ouyang, Bin Cao, Xiang Zhou, Guoguang Cao, Kaiyu Sun
Donghua University; Tsinghua University

Session SAT-AM1-T02.1: HVAC System

8:00-10:15 Room: E

Chairs: Angui Li, Qingyan Chen

T02-O-02-53 **An Experimental Study on Operating Characteristics of DVM Air Conditioning System under Part Load Condition**
Dongliang Zhang, Xu Zhang
Tongji University

T02-O-04-09 **Numerical Simulation of an Air Source Heat Pump for Low Temperature Climates**
Meng Huo, Shugang Wang, Xu Jin, Qiren Wu
Dalian University of Technology

T02-O-04-17 **Thermodynamic Comparative Analysis of Heat Pump Cycles**
Yingbai Xie, Yingfu Liu, Luxiang Zong, Ganglei Sun
North China Electric Power University

T02-O-04-28 **Performance Characteristic Analysis of Double- U Tube Ground-Source Heat Pump System in Winter**
Yan Ren , Chao Chen , Yongfei Wang , Ye Zhang
Beijing University of Technology

T02-O-04-40 **Development of a High Efficient Ground Source Heat Pump**
Luis Coelho, Rita Cerdeira, João Garcia, Konstantin Karytsas, Dimitrios Mendrinos,Burkhard Sanner, Marcel Abry
Escola Superior de Tecnologia de Setubal; Centre for Renewable Energy Sources, Greece; European Geothermal Energy Council (EGEC); CIAT, B.P., France

T02-O-04-58 **A Study of the Mechanical Draft Heating/Cooling Tower Heat Pump System**
Yi Luo, Rongsheng Ma, Xingfeng Ding, Zhilin Wang
Yang Zhou University

T02-O-07-03 **A Case Study of a Ground-Source Heat Pump System in an East China Office Building**
Zhengrong Li, Mingming Zhao, Sheng Yu, Haozhu Li
Tongji University

T02-O-09-06 **An Integrated Heat Recovery Air-Conditioning System (IHRACS) with Double-Heating Series-Wound Heat Pump Part I+II**
Ling Ye, Yiqiang Jiang, Yang Yao, Zuiliang Ma, Fuhe Lu
Harbin Institute of Technology; Beijing Capital Development Holding (Group) Co.

Session SAT-AM2-T04.1: Refrigeration system

10:45-12:00 Room: C

Chairs: David A. Johnston, Xu Zhang

T04-O-04-21 **A Study of Liquid Desiccant System Performance**

Hesamedin Salarian, Hessam Taherian, Hosain Ghadamian, Morteza Khalaji assadi

Islamic Azad University branch of Nour; Babol (Noshirvani) University of Technology; Islamic Azad University branch of Science & Research

T04-O-04-53 **A New Water Source Heat Pump Water Heater and Chiller**

Ying You

Quantum Energy Technologies Pty Ltd

T04-O-04-35 **Energy Analysis of a Coupled Power and Refrigeration Cycle**

Maneesh Dubey, SPS Rajput, P.K. Nag

Maulana Azad National Institute of Technology; IIT, India

T04-O-04-46 **Discussion on Improvement of the Traditional Dehumidifying Technology**

Li Wang, Zhiwei Lian

Shanghai Jiao Tong University

T04-O-11-08 **Experimental Investigation of the Crystallization Process of Nanofluid with a DSC Technique**

Ying Chen, Lisi Jia

Guangdong University of Technology

T04-O-11-25 **Performance Analyses of the Aircraft Low-power Thermoelectric Refrigeration System**

Xingjuan Zhang, Yubai Wang

Beihang University

T04-O-09-38 **NH3-H2O Solution Cooling Absorption Refrigeration Driven by Fishing Boat Diesel Exhaust Heat**

Yaping Chen, Chenmin Lin, Tian Ying

Southeast University

Session SAT-AM2-T09.1: Indoor air pollutants and cleaning

10:45-12:00 Room: D

Chairs: Chun-Ho Liu, Huanxin Chen

T09-O-05-64 **A Method for Measuring the Diffusion and Partition Coefficients of Volatile Organic Compounds in Barrier Layers**
Zhongkai He, Wenjuan Wei, Yinping Zhang
Tsinghua University; Huazhong University of Science and Technology

T09-O-05-70 **An Insight of PTR-MS-Based Measurement of Large VOCs**
Cong Liu, Yinping Zhang
Tsinghua University

T09-O-08-10 **Beyond Ozone: Cleaning Outdoor Air for Improved IAQ**
Christopher O. Muller, Larry Jin
Purafil, Inc.; Purafil Asia

T09-O-08-11 **Clearing the Air: Advances in Affordable Filtration for IAQ**
Christopher O. Muller, Larry Jin
Purafil, Inc.; Purafil Asia

T09-O-06-33 **Applying the State-Space Method to Simulate the Instantaneous Field of Indoor Gaseous Contaminant Concentration**
Xinke Wang, Yinping Zhang, Fenghao Wang
Xi'an Jiaotong University; Tsinghua University

T09-O-05-75 **Field and Laboratory Measurements on Dust Associated with Microbial Contamination in Centralized Air-conditioning Systems**
Angui Li, Juanjuan Hou, Lingzhi Yao
Xi'an University of Architecture and Technology

Session SAT-AM2-T11.1: Energy Utilization and Efficiency

10:45-12:00 Room: E

Chairs: Jili Zhang, Jorma O. Pietilainen

T11-O-02-47 **Prediction of the Energy Savings of a System Combining Air-conditioner's Outdoor Unit with Hydroponic-cultivated Roof Plant**
Fulin Wang, Harunori Yoshida, Michiko Yamashita
Tsinghua University; Okayama University of Science;Taisei Corp.

T11-O-02-51 **Calculation of the Yearly Energy Performance of Heating Systems Based on the European Building Energy Directive and Related CEN Standards**
Bjarne W. Olesen
Technical University of Denmark

T11-O-03-03 **Analysis of Indoor Swimming Pool Temperatures and Operation Regularities**
Peng Sun, Jingyi Wu, Ruzhu Wang, Yuxiong Xu
Shanghai Jiao Tong University

T11-O-03-05 **Statistical Analyses on Winter Energy Consumption Characteristics of Residential Buildings in Some Cities of China**
Shuqin Chen, Nianping Li, Hiroshi Yoshino, Jun Guan
Hunan University; Lawrence Berkeley National Lab;Tohoku University

T11-O-01-18 **A Survey of Decorative Materials for Enhanced Ceiling Thermal Insulation**
Masoud Taheri Shahraein, Lihua Zhao, Qinglin Meng
South China University of Technology

T11-O-09-54 **Experimental Thermal Performance of a Novel Solar-Air Source Heat Pump System for Domestic Water Heating**
Guoying Xu, Xiaosong Zhang, Yuehong Zhang
Southeast University

Session SAT-PM1-T03.1: Energy supply

14:00-16:15 Room: C

Chairs: Chen Huang, Guangyu Cao

T03-O-07-17 **Parametric Optimization on a Power System for a Micro-CCHP System**
Yinglin Li, Xiaosong Zhang
Nanjing Normal University; Southeast University

T03-O-03-11 **Energy Flexible Heating Systems – Integration of Heating Stations in Buildings**
Raymond Riise, Bjørn R. Sørensen, Bjørnulf Jensen
Narvik University College

T03-O-03-14 **An Experimental Study on Direct Radiant Floor Heating System with DSHP using R22 Flow**
Xinli Wei, Zhangchuan Zeng, Jifu Lu, Jinjing Wu, Wanren Chen, Zongdi Wei
Zhengzhou University; Zhengzhou Reborn Energy Technology Development Co.

T03-P-04-39 **Study of CO2 Heat Pump for Coupled Hot Water Supply and Room Heating System**
Shengchun Liu, Zhili Sun, Yitai Ma, Qiuju Liu
Tianjin University of Commerce; Tianjin University

T03-O-07-14 **Integrated Micro-CHP Systems for Residential Applications**
Kuanrong Qiu, Skip Hayden
Canmet Energy-Ottawa, Natural Resources Canada

T03-O-09-09 **Comparison of Two District Cooling Systems Utilizing Cold Energy of Liquefied Natural Gas**
Tao Wang, Wensheng Lin, Anzhong Gu
Shanghai Jiao Tong University

T03-O-09-12 **Operating Performance of Combined Heat Systems Based on Surface Water Heat Pump and Peak Shaving Boiler**
Jianfeng Qian, Peng Liu, Jili Zhang
Harbin University of Commerce; Dalian University of Technology

T03-O-03-22 **Simulation Study on Combustion System of Tankless Gas Water Heater**
Bu Qiu, Liliang Dou
Southeast University; A.O.Smith Water Heater (China) Co.

T03-O-07-07 **Experimental Study of a Low-temperature Electrical Radiant Floor Heating System**
Xiangqiang Kong, Ying Li, Ruzhu Wang, Songtao Hu
Shandong University of Science and Technology; Shanghai Jiao Tong University; Qingdao Technological University

Session SAT-PM1-T05.1: R&HVAC components

14:00-16:15 Room: D

Chairs: Luis Coelho, Neng Zhu

T05-O-02-06 **A Study on Fuzzy Control Technology of Constant Temperature and Constant Humidity Air-Conditioning System**
Ankang Kan, Houde Han, Jun Ji, Houmin Liu
Shanghai Maritime University

T05-O-02-34 **Application Analysis of Self-operated Dynamic Control Valve in a Heating System**
Yu Shan, Rui Li
Beijing University of Civil Engineering and Architecture

T05-O-04-57 **Air Interaction around Outdoor Air-cooled Condensers**
Jian Zhang, Shugang Wang, Tengfei (Tim) Zhang
Dalian University of Technology

T05-O-09-24 **Research and Development of Thermal Properties Test Device of Deep Ground Soil for Ground Source Heat Pump**
Zhiwei Lian, Xin Yu, Jianping Chen, Li Pan
Shanghai Jiao Tong University; Shanghai Research Institute of Building Science

T05-O-09-32 **Model-Based Intelligent Simulation of Underground Heat Exchanger**
Bo Fan, Xinqiao Jin, Zhimin Du, Hua Dong, Xuebin Yang
Shanghai Jiao Tong University; Qingdao Technology University

T05-O-09-33 **Numerical Analysis on the Heat Transfer Characteristics of Vertical U-Tube Ground Heat Exchanger Used in Ground Coupled Heat Pump**
Weibo Yang, Mingheng Shi, Zhenqian Chen
Yangzhou University; Southeast University

T05-O-09-42 **Study on Heat Charge and Discharge Performance of Phase Change Thermal Storage in Solar Energy - Fresh Air Heating System**
Hailiang Luo, Chao Chen, Zhiyong Li, Yaning Xue, Ye Zhang
Beijing University of Technology

T05-O-09-45 **Heat Transfer Properties of Porous Surface Tubes under the Vacuum Conditions**
Xuesheng Wang, Jingjing Dai, Jianli Cong, Qinzhu Chen
East China University of Science and Technology

T05-O-10-01 **Wavelet Packet and Neural Network Methods for Fixed Bias Fault Diagnosis for Air Handling Unit Sensors**
Xuebin Yang, Zhimin Du, Xinqiao Jin, Bo Fan, Yibo Guo, Yunyu Yang
School of Mechanical Engineering, Shanghai Jiao Tong University

Session SAT-PM1-T06.1: Indoor/outdoor air Quality

14:00-16:15 Room: E

Chairs: Jianlei Niu, Nianping Li

T06-O-01-22 **A Case Study on the Influence of the Patio on the Indoor Environment in Summer in a Chinese Traditional Folk House**
Mingjing Xie, Guoqiang Zhang, Feng Xu, Jin Zhou, Quan Zhang
Hunan University

T06-O-05-06 **Distribution Characteristics of Respiratory Aerosols in Enclosed Environments**
Naiping Gao, Jianlei Niu, Lidia Morawska
Tongji University, Shanghai; Hong Kong Polytechnic University; Queensland University of Technology

T06-O-05-13 **Investigation and Analysis Summer on Indoor Air Quality of One Urban Large Commercial Office Building in Changsha City, China**
Xiaoqing Wei, Nianping Li,Hui Zhou, Shubo Xiao, Lijun Hu
Hunan University

T06-O-05-31 **A Survey of Indoor Air Quality in New Residences in North-East Area, Japan**
Masatoshi Tanaka, Kazuko Tanaka, Tetuhito Fukushima
Fukushima College; Fukushima Medical University

T06-O-05-36 **Modeling Indoor CO2 Concentration Stratification Dynamics in a Ventilated Room using a Simplified Physical Model**
Zhongwei Sun, Shengwei Wang, Fu Xiao
The Hong Kong Polytechnic University

T06-O-05-51 **Concentration of Phthalate in Dorm Rooms and its Association with Asthma and Allergy**
Yuexia Sun, Zhigang Wang, Desheng Wang, Yufeng Zhang, Jan Sundell
University of Texas at Tyler, Texas; Tianjin University; Tianjin Municipal Engineering Design & Research Institute

T06-O-08-04 **Air Treatment Process and Application of an Fresh Air Exchanger**
Li Li, Xiangdong Xue
Jimei University

T06-O-05-76 **Droplet Generation due to Two Health Care Procedures - A Preliminary Study**
Xiaojian Xie, Yuguo Li, Hequan Sun, Li Liu
Nanjing Normal University; The University of Hong Kong

T06-O-08-09 **Experimental Study of the Air Quality's Amelioration in the Toll-Booth using Personalized Ventilation**
Hua Yang, Chengying Qi, Lei Liu, Cai Chen, Binghong Yan
HeBei University of Technology

Session SAT-PM1-AI: Advanced industrial technology in sustainable buildings
14:00-16:15 Room: F
Chairs: Liang Cai, Jianzhong Zhang

The road of energy saving and environmental protection for 26 years--Advanced sustainable technolgies in Shuangliang.
Shuangliang Group

Solar energy developement and application--Advanced sustainable technolgies in Sunrain.
Jiangsu Sunrain Solar Energy Co.,Ltd

Pioneering energy saving air conditioner -- Tica air conditioning technologies
Nanjing TICA Air-Conditioning Co.,Ltd

Comprehensive Solutions for sustainable buildings
York by Johnson Controls

Session SAT-PM2-T08.1: Indoor/outdoor air flow

16:45-18:30 Room: C

Chairs: Baizhan Li, C.Y.H. Chao

T08-O-05-71 **Dependence of City Ventilation by Thermal Buoyancy on Thermal Stratification**
Lina Yang, Yuguo Li
University of Hong Kong

T08-O-06-37 **Experimental Study of Indoor Temperature Distribution for Displacement Ventilation System**
Jingshan Li, Xianmin Guo, Kai Min
Tianjin University of Commerce

T08-O-06-05 **Effect of Atrium Size on Thermal Buoyancy-driven Ventilation of High-rise Residential Buildings: A CFD Study**
Minhui Zhang, Nianping Li, Enxiang Zhang, Sujuan Hou, Dongyue He, Jing Li
Hunan University

T08-O-06-09 **Smoke Diffusion Characteristics in Tunnel Fires using Natural Ventilation**
Zhongyuan Yuan, Bo Lei, Pengyun Chen
Southwest Jiaotong University

T08-O-06-13 **Effects of Building Interference on Natural Ventilation for High-Rise Residential Buildings**
James O.P. Cheung, Chun-Ho Liu
The University of Hong Kong

T08-O-06-35 **Experimental Studies of the Attached Plane Jet Velocity Distribution after Impinging the Corner in a High Room**
Guangyu Cao, Mika Ruponen, Jarek Kurnitski
Helsinki University of Technology

Session SAT-PM2-T02.2: HVAC system

16:45-18:30 Room: D

Chairs: Xianmin Guo, João Garcia

T02-O-09-17 **Feasibility of Urban Sewage Source Heat Pump System with Freezing Latent Heat Collection**

Jianfeng Qian, Jili Zhang, Dexing Sun

Harbin University of Commerce; Dalian University of Technology; Harbin Institute of Technology

T02-O-02-32 **Selecting HVAC Systems for Typical UK Office Buildings**

Ivan Korolija, Yi Zhang, Ljiljana Marjanovic-Halburd, Vic I Hanby

De Montfort University; Anglia Ruskin University

T02-O-04-02 **Application of the Water Loop Variable Refrigerant Flow Air-Conditioning System in Large-Scale Buildings in Cold Climate**

Tingting Sun, Long Ni, Yang Yao, Zuiliang Ma

Harbin Institute of Technology

T02-O-09-27 **The Alternate Operation Characteristics of a Solar-ground Source Heat Pump System**

Weibo Yang, Mingheng Shi, Zhenqian Chen

Yangzhou University; Southeast University

T02-O-04-56 **A Study of the Ground Source Heat Pump System in Shanghai Minhang Archives in the Heating Mode**

Xin Yu, Ruzhu Wang, Xiaoqiang Zhai

Shanghai Jiao Tong University

T02-O-05-01 **Experimental Study of HVAC in a Large Space Atrium in Winter**

Huizhong Zhao, Zhifen Lin , Chen Huang , Min Zhang, Lihui Wang , Rong Ren

University of Shanghai for Science and Technology; Shanghai Ocean University

Session SAT-PM2-T07.2: Thermal Comfort

16:45-18:30 Room: E

Chairs: Guoqiang Zhang, Lin Duanmu

T07-O-05-79 **Field Study of Human Thermal Comfort and Thermal Adaptability during Summer and Winter in Beijing**

Bin Cao, Yingxin Zhu, Qin Ouyang, Xiang Zhou, Li Huang

Tsinghua University

T07-O-05-69 **Classification of the Indoor Thermal Quality: Results from a Field Campaign**

Roberta Ansaldi, Stefano P Corgnati, Marco Filippi

Tebe Research Group, Politecnico di Torino

T07-O-06-32 **CFD Simulation and Analysis of Thermal Comfort Level in an Operating Theatre in the Tropics**

Yat H. Yau, M.H.H Mohyi

University of Malaya

T07-O-07-16 **Active Adaptive Behavior and Energy Saving**

Fang Wang, Xiaosong Zhang, Wenyun Zhu, Qu Hu

Southeast University; Nanjing University of Science & Technology; Treenity Real Estate Limited Company

T07-O-05-72 **Experimental Study on Thermal Environment in a Large Space Building with a Low Sidewall Air Supply**

Chen Huang, Wen Liu, ZhiJun Zou, Rong Ren, Lei Chen

University of Shanghai for Science and Technology

T07-O-05-11 **Effect of Local Thermal Sensation on the Overall in Stable Non-uniform Environment**

Qianru Ding, Quan Jin, Xiangli Li, Lin Duanmu

Dalian University of Technology

T07-O-05-14 **Draft Sensation under a Jet Nozzle Supply Air System in a Large Enclosure**

Ning Cai, Chen Huang, Weiwu Cao

University of Shanghai for Science and Technology

Session SUN-AM1-T04.2: Refrigeration system

8:00-10:15 Room: C

Chairs: Ivan Korolija, Xinqiao Jin

T04-O-03-09 **Experimental Study on Characteristics of Trans-critical Heat Pump Water Heater Using Refrigerant HFC125**
Fang Wang, Zhiwei Lian, Xiaowei Fan, Fengkun Wang
Shanghai Jiao Tong University; Zhongyuan Uniuversity of Technology

T04-O-03-23 **Numerical Analysis on a Novel Water Chiller Using Liquid Desiccant**
Rongquan Cao, Xiaosong Zhang, Yonggao Yin
Southeast University

T04-O-04-01 **Optimum Design and Experimental Study on a High Efficient Adsorber -I Design and Mathematical Models I+II**
Y.L. Liu, Z.Z. Xia, R.Z. Wang
Shanghai Ocean University; Shanghai Jiao Tong University

T04-O-02-54 **Optimum Operation of Air-Cooled Chillers with Multiple Refrigeration Circuits**
Jia Yang, K.T. Chan, Xiangsheng Wu
The Hong Kong Polytechnic University; Logistical Engineering University

T04-O-11-13 **Performance Comparisons of Different Radiant Cooling Panel Positions**
Zhihong Gao, Xiaohua Liu, Yi Jiang
Tsinghua University

T04-O-11-21 **Study on Preparation and Stability of Zinc Ferrite Nano-Particle Suspension of Ammonia Solution**
Liu Yang, Kai Du, Xiaosong Zhang, Xiaofeng Niu
Southeast University; Hong kong Polytechnic University

T04-O-04-55 **Performance Study on a Heat Pump Driven Three-stage Liquid Desiccant Deep Dehumidification Processor**
Haiqiang Zhang, Xiaohua Liu, Yi Jiang
Tsinghua University

T04-O-09-08 **A Sintered Zeolite-coated Bed for Adsorption Air Conditioning Systems**
Xuesheng Wang, Zhiyu Ni
East China University of Science and Technology

Session SUN-AM1-T10.1: Renewable energy

8:00-10:15 Room: D

Chairs: Guanyi Chen, Masatoshi Tanaka

T10-O-03-10 **Application of Ground Source Heat Pump to a Supermarket in Portugal**
João Garcia, Luis Coelho, Rita Cerdeira, Burkhard Sanner, Philippe Lentz and Nicolas Frechin
Escola Superior de Tecnologia de Setubal, Campus de IPS, Portugal; European Geothermal Energy Council (EGEC); SAUNIER & ASSOCIES,France

T10-O-09-01 **Coal and Biomass Fly-ash Products for Hybrid Desiccant Ventilation System**
C.W. Kwong, C.L. Wu, C.Y.H. Chao
The University of Adelaide; The Hong Kong University of Science and Technology

T10-O-09-05 **Dynamic Performances of Solar Heat Storage System using Packed Bed**
Shuangmao Wu, Guiyin Fang, Xu Liu
Nanjing University

T10-O-09-10 **Compensation for Differential Energy Balance across a Building Incorporating Solar Energy Systems**
David A. Johnston
Northumbria University

T10-O-09-16 **Experimental Investigation on a Closed-cycle Solar Adsorption Cooling System**
Xiaoqiang Zhai, Ruzhu Wang
Shanghai Jiao Tong University

T10-O-09-31 **A Study on a Novel Solar Heating and Humidification System with Desiccant Rotor**
Dong La, Yanjun Dai, Hui Li, Yong Li, Ruzhu Wang
Shanghai Jiao Tong University; Engineering Research Center of Solar Power and Refrigeration, MOE

T10-O-09-44 **Simulation on Mutil-heat Sources Solar Heat Pump Used for Water and Residential Heating**
Lei Yang, Xiaosong Zhang
Southeast University

T10-O-09-46 **A Theoretical Analysis on Multi-effect Distillation System Driven by Tidal Energy and Low Grade Energy**
Yefeng Liu, Kuiwen Zhao
University of Shanghai for Science and Technology

T10-O-01-40 **Application of Phase Change Heat Storage Materials in a Building**
Min Li, Zhishen Wu, Zhenqian Chen, Changhai Peng
Southeast University

Session SUN-AM1-T12.1: Building envelope

8:00-10:15 Room: E

Chairs: Raymond Riise, Lizhi Zhang

T12-O-01-23 **Ideal Non-Linear Thermal Properties of Building Internal Thermal Mass in a Passive Solar Room Based on a Simplified Thermal Model**
Ruolang Zeng, Xin Wang, Yinping Zhang, Feng Jiang
Tsinghua University

T12-O-11-09 **Experimental Research on the Heat Storage and Discharge Performance of a New Phase Change Material**
Tonghua Zou, Lijun Ma, Jianxing Chen,Yulin Xue
Tianjin University of Commerce

T12-O-01-41 **Air Tightness of New Residential Buildings in Finland**
Keijo A. Kovanen, Jarmo Laamanen, Timo Kauppinen, Lin Duanmu
VTT, Technical Research Centre of Finland; Dalian University of Technology

T12-O-05-15 **Decay Rates and Time Lags of Heat Conduction in Building Construction under In Situ Conditions**
Changhai Peng, Zhishen Wu, Zhenqian Chen, Min Li
Southeast University; Ibaraki University

T12-O-11-27 **A Numerical Model to Evaluate the Thermal Behavior of Active Transparent Facades**
Fabio Zanghirella, Marco Perino
TEBE Research Group, Department of Energetics, Politecnico di Torino

T12-O-09-47 **Effect of Carbon Fiber on Thermal Properties of N-Docosane Phase Change Materials**
Min Li, Zhishen Wu, Wei Sun, Zhenqian Chen, Changhai Peng
Southeast University

T12-O-02-49 **Effective Cooling Storage Capacity Characteristics of Supercooled Phase-Change Materials for Building Cooling Applications**
Shuo Zhang, Jianlei Niu
The Hong Kong Polytechnic University

T12-O -05-77 **A Fractal Model for VOCs Diffusive Transport in Dry Porous Building Materials**
Xiaozhong Shen, Zhenqian Chen,Changhai Peng, Min Li
Southeast University; Wuxi Institute of Commerce

Session SUN-AM2-T05.2: R&HVAC components

10:45-12:30 Room: C

Chairs: Bjørn R. Sørensen, Qihong Deng

T05-O-10-06 **Application of Data Fusion and FDD for Improving the Performance of Chiller Sequencing Control**

Shengwei Wang, Yongjun Sun, Gongsheng Huang, Fu Xiao

The Hong Kong Polytechnic University

T05-O-10-08 **A Study on Non-calorimetric Method for Assessing the Equivalent Thermal Resistance of Building Enclosures**

Hui Zhang, Bing Xiao, Weifeng Shen, Yuetian Chen, Lin Lu

Southeast University; Nanjing Hospital of Nanjing Military Area

T05-O-10-09 **Neural Network Based Fault Isolation in the Air Handling Unit**

Zhimin Du, Xinqiao Jin, Xuebin Yang, Bo Fan

Shanghai Jiao Tong University

T05-O-09-37 **Falling Film Flow and Heat Transfer with Dual-Side Film-Inversion on Vertical Plate Surfaces in Absorber**

Yaping Chen, Chenmin Lin, Chenjie Shi, Mingheng Shi

Southeast University

T05-O-04-08 **Design Calculation of Porous Ceramics Tube Type Dew Point Indirect Evaporative Cooler**

Xiuming Mao, Xiang Huang, Li Wen

Xi'an Polytechnical University

T05-O-04-12 **Performance of a U-vertical Direct-expansion Ground Heat Pump**

Wei Yang, Guoqiang Zhang, Jin Zhou

Hunan University

T11-O-02-50 **Energy-saving Analysis of a Hybrid Ground-coupled Heat Pump Project**

Qin Xue, Jiufa Chen,Hongqi Zheng, Weilai Qiao, Erming An

Southeast University

Session SUN-AM2-T08.2: Indoor/outdoor air flow

10:45-12:30 Room: D

Chairs: Suming Jin, Yat H. Yau

T08-O-06-22 **Discussion on the energy-efficiency and comfortof different air distribution**
Rong Ren, Chen Huang, Huizhong Zhao, Ning Cai
University of Shanghai for Science and Technology

T08-O-06-23 **Smoke-Control Effects in the Horizontal Aisle of a High-rise Building**
Jingxian Li, Jiapeng He, Chengyin Jing, Ru Zhou
Nanjing University of Technology

T08-O-06-29 **Experimental Investigation of Effects of Air Supply and Heater Positioning on Air Distribution**
Yuemei Wang, Zhiwei Lian, Jiuwu Liu, Dahai Qi
Shanghai Jiao Tong University

T08-O-06-31 **Jet Main Region Specification Method in CFD Simulations for Room Air Movement Analysis**
Zhigang Wang, Shan He, Dong Han, Yuexia Sun
Tianjin University

T08-O-08-08 **Numerical Solution of Condensation from Turbulent Flow of Gasoline Vapor in Vertical Tubes**
Zhiwei Zhao, Kai Du
Southeast University

T08-O-06-21 **CFD Simulation of Multiple Solutions of Smoke Flow in a Simple Building**
Jian Gong, Yuguo Li
The University of Hong Kong

T08-O-08-15 **Experimental Verification of Pressure Drop for a New Fibrous Filter Media Model**
Bin Zhou, Xiaosong Zhang, Kai Du, Hua Qian, Paolo Tronville, Richard Rivers
Southeast University

Session SUN-AM2-T11.2: Energy Utilization and Efficiency

10:45-12:30 Room: E

Chairs: Xundong Yang, Samuel Amos-Abanyie

T11-O-05-66 **Relationships between Energy Consumption and Energy Saving Consciousness of Residential Buildings in Sendai City**

Sayuri Nishiya, Hiroshi Yoshino, Shuzo Murakami, Shiho Kawada

Tohoku University

T11-O-09-21 **Simulation of the Chinese Detached House Energy Performance with the Kang Heating System**

Guangyu Cao, Juha Jokisalo, Guohui Feng, Jarek Kurnitski, Lin Duanmu, Mika Vuolle

Helsinki University of Technology; Shenyang Jianzhu University; Dalian University of Technology; EQUA Simulation Finland Oy

T11-O-11-28 **Investigation and Comparison for Building and Transportation Energy Consumption in Typical Cities in China**

Zhe Li, Borong Lin, Shengyuan Zhang, Yi Jiang

Tsinghua University

T11-O-11-10 **Research on Technologies and Index System of Building Energy Saving in China**

Yuwu Li, Linlin Cheng, Yuquan Sun, Shouquan Li, Liangguang Tian

Shandong Supervision and Inspection Institute for Product Quality; National Quality Supervision and Inspection Center (Shandong); Shandong Institute of Metrology; Shandong Bureau of Quality and Technical Supervision

T11-O-11-29 **Experimental Study on the Effect of Magnetic Field on the Heat Conductivity and Viscosity of Ammonia-Water**

Xiaofeng Niu, Kai Du, Fu Xiao

Southeast University; The Hong Kong Polytechnic University

T11-O-02-36 **A Comparative Study on Energy Efficiency and Indoor Thermal Comfort of DOAS Applied to Multi-zone Air-conditioning Systems**

Gaoming Ge, Fu Xiao, Lizhi Zhang

The Hong Kong Polytechnic University; South China University of Technology

T11-O-04-05 **Improvement of Hydrophilicity of Porous PVDF Membranes with LiCl Additives**

Lixia Pei, Lizhi Zhang

South China University of Technology

Session SUN-PM1-F1: Forum of 12th five-year project research direction: How to face the challenge of global warming impact on building energy consumption (Language: Chinese)
13:30-15:30 Room: B
Chair: Xiaosong Zhang, Yinping Zhang

Speakers
All participants

Introduction

Global warming is hot issue in the current world especially in Building energy consumption, because most refrigerants are greenhouse gases and a warming climate will affect both the performance of existing building stock and the design of new buildings. Furthermore, about one third energy consumption is due to building energy utilization. Reducing building energy or promoting sustainable technology in built environment will reduce energy using and greenhouse gases releasing. So the cycling interaction between global warming and buildings need study and discuss. The study of impact of global warming on building energy use and thermal performance may be supported. Finally, the potential mitigation and adaptation strategies to the global warming are discussed in this forum. The discussed results may be referred by the ministry of science and technology of PRC to make strategies for 12th five-year project.

Session SUN-PM1-F2: The new WHO guideline on Natural ventilation for infection control
13:30-15:30 Room: C
Chair: Yuguo Li

Speakers
Yuguo Li - Introducing the new WHO guideline on natural ventilation
Jan Sundel - The WHO expert panel assessment
Qian Hua -The Grantham Hospital Measurement

Introduction

To minimize cross infection risk, imbalanced ventilation systems are used in the so-called airborne isolation rooms to achieve negative pressure relative to the corridor for airborne diseases such as TB. These isolation rooms are expensive to build and operate, and the ventilation flow rate is limited to 12 air change per hour. It is known that a higher ventilation rate is able to provide a higher dilution capability. However, use of higher ventilation rates also means a higher energy cost for mechanical ventilation. Today, there are only a limited number of such isolation rooms in each country or city, and may be none in some resource-limited countries.

Is natural ventilation an option? Recently, WHO has recommended natural ventilation among the most effective measures to manage infections from serious respiratory disease in health care facilities. A new WHO guideline will be issued soon. The moderators have participated in drafting a design guideline of natural ventilation design for infection control for World Health Organization.

List of questions to be discussed during the forum
What if natural ventilation cannot create negative pressure?
What if there is no sufficient driving force? Is hybrid ventilation an option?
What if there is insufficient number of mechanically ventilated isolation rooms as they are expensive to build?
Is mechanical ventilation always reliable?
How other aspects such as noise, air pollution, insect vectors and security affect our choice?
What are the issues to be considered for retrofit buildings?
Are there evidences that mechanical ventilation works? How to collect?
Are there the evidences that natural ventilation works? How to collect?
Can we improve the WHO guideline?

Session SUN-PM1-W1: Mission of IEA/ECBCS/Annex 53 Total Energy use in Buildings -Analysis and evaluation methods

13:30-15:30 Room: D

Chairs: Hiroshi Yoshino and Yi Jiang

Speakers

Hiroshi Yoshino (Japan)	Introduction of the Annex 53
Mark Levine (USA)	Subtask A: Definition
Yi Jiang(China)	Subtask B1: Case study
Jorma Pietilainen (Finland)	Subtask B2: Data collection
Stefano Paolo Corgnati(Italy)	Subtask C: Statistical Analysis
Philippe Andre(Belgium) & Ad van der Aa(Netherland)	Subtask D: Energy Performance Analysis

Introduction

One of the most significant barriers for achieving the goal of substantially improving energy efficiency of buildings is the lack of knowledge about the factors determining the real energy use. There is often a significant discrepancy between the designed and the real total energy use in buildings, in which a complex array of factors play a significant role, including the user/occupant behavior. The reasons for this discrepancy are generally poorly understood, and often have more to do with the role of human behavior than the building design.

For that, the new annex entitled as“Total Energy use in Buildings -Analysis and evaluation methods-“ was initiated in the last November.

The ultimate outcome of this annex is to strengthen the robust prediction of energy usage in buildings, thus enabling the proper assessment of short- and long-term energy saving measures, policies, technologies. The main objectives are to:

- develop a new methodology for analysis of building energy use that makes it possible to investigate the effects of the main influencing factors
- demonstrate how these data can be used to provide meaningful indicators of energy performance of buildings (for example expression of energy use for different end uses that are generally applicable among different buildings)
- develop a methodology for performance prediction of energy saving policies and technologies that includes the influence of a number of related factors
- development of methodologies and technologies for long term monitoring of the energy use in buildings.

Session SUN-PM2-P2: Plenary Session II

16:00—18:00 Room: B

Chairs: Bjarne W. Olesen (Denmark), YinPing Zhang(China)

P2.1 Energy and environment of residential buildings in China and Japan

Prof. Hiroshi Yoshino

Tohoku University, Japan

P2.2 Integrated IAQ Strategy via Source Control, Ventilation and Air Purification

Prof. Jensen Jianshun Zhang

Syracuse University, USA

Poster Session: Nov. 7, 8
Room: G

Theme 1: Sustainable building

T01-P-01-07 **A Survey on Energy Consumption and Operation Management Status of Public Buildings in Changsha, China**
Hui Zhou, Nianping Li, Ailin Lin, Ji Ni, Lijun Hu, Xiaoqing Wei
Hunan University

T01-P-01-09 **A Study of Safety Design Status of High Occupancy Public Building Areas in Changsha, China**
Zhian Li, Nianping Li, Yinghua Zhao, Hui Zhou
Hunan University

T01-P-01-12 **The Influence of the Width of Cantilever Plate of Bay Window on Energy Consumption in the Region of Hot Summer and Cold Winter**
Weichuan Cheng, Jiapeng He, Rong Shi, Zhen Chen
Nanjing University of Technology; Jiangsu Council of Finance Iinvestment

T01-P-01-20 **Investigation and Analysis of Home Energy Consumption in Six Cities**
Yang Zhang, Zhijia Huang, Guozhi Zhang
Anhui University of Technology

T01-P-01-43 **Energy Efficiency Analysis of a Chiller using Variable Chilled Water and Cooling Water Flow Control**
Xiantai Wen, Caihua Liang, Xiaosong Zhang, Guoying Xu
Southeast University

T01-P-01-08 **Survey on Energy Consumption and Indoor Thermal Environment of University Building in Changsha, China**
Peizhe Tian, Hui Zhou, Nianping Li, Qie Su
Beijing Union University; Hunan University

T01-P-01-39 **Simulation and Analysis of the Cooling and Energy Saving Technology of One All-glass-wall Atrium in Hot-summer and Cold-winter Areas**
Tianfu Deng, Jingguang Li, Wenyu Zhang, Hongwu Fang, Jihong Hang
Shanghai Research Institute of Building Sciences (Group) Co.

T01-P-01-05 **"Per Capita Building Energy Consumption Occupied Space(PCEOS)" for Evaluation of Building Energy Consumption**
Xiang Yuan, Weiding Long, Xiaoqiang Jiang
Tongji University

Theme 2: HVAC System

T02-P-02-07 **Optimization Study on Cold Source of Central Air Conditioning in Residential Buildings**
Wei Cai, Lina Zhang, Zhaohui Wu, Xiaodong Wen
Ningbo University of Technology

T02-P-02-17 **Air Conditioning System of a Comprehensive Thermal Test Station of Refrigerated Containers and Experimental Analysis**
Jun Ji, Houde Han, Ankang Kan
Shanghai Maritime University

T02-P-02-24 **Energy Performance Evaluation of an Air-conditioning System in a Large Scale Office Building by Commissioning**
Weijie Zhang, Jiuling Liu, Jieqing Jia
Hebei University of Engineering

T02-P-02-37 **Discussion on the Application of Variable-air-volume Air-conditioning System on Ships**
Junjie Guo, Wu Chen, Zhenxiong Cai, Chaoyu Zheng
Jimei University

T02-P-04-63 **Recent Research and Developments on the System of Independent Heat and Humidity Control Air Conditioning System**
Shikui Lu, Xiaosong Zhang
Southeast University; Jiangsu University of Science and Technology

T02-P-09-23 **Experimental Studies of the Aerodynamic Field Cold-State Modeling System**
Xianglong Liu, Guangcai Gong
Hunan University

T02-P-09-48 **Simulation of the Periodical Heat Transfer Performance of Vertical Ground Heat Exchanger**
Xinnan Song, Zhipeng Zhang, Lihong Liu
Jiangsu University

T02-P-02-04 **Comparion of Thermal Storage Air Conditioning for High-rise Buildings in Typical Cities of Differernt Climatic Zones**
Wei Cai, Xubo Yu, Danjun Wang, Linlin Gong, Jie Yang
Ningbo University of Technology

T02-P-02-21 **A New Method of Cooling and Heating Load Calculation**
Shu Zhang, Maoyu Zheng, Xiao Wang, Wenyong Zhang
Harbin Institute of Technology; Daqing Petroleum Institute

T02-P-02-27 **A Study on Heating Characteristics of the Combined Radiant Floor Heating & Cooling System with Uneven Tubing**
Qingqing Li, Chao Chen, Jie Lin, Ye Zhang, Zhuo Li, Pin Wu
Beijing University of Technology; Qingdao Agriculture University

T02-P-04-07 **Experimental Study of Cooling Performance of Gravity Air-conditioning**
Cuimin Li, Jianing Zhao, Xiumu Fang
Harbin Institute of Technology

T02-P-04-31 **Experimental Study of the Characteristics of an Air Source Heat Pump with Enhanced Vapor Injection**
Hu Huang, Zhongbin Zhang , Jinzhu Gong, Dongxue Yuan, Qihe Li
Nanjing Normal University

T02-P-04-67 **Performance Simulation and Analysis of New Solar Assisted Air-Source Heat Pump Heating System**
Caihua Liang, Xiaosong Zhang, Xiuwei Li, Xia Zhu
Southeast University

T02-P-04-68 **Characteristic and Performance Simulation of the Heat Pump Part of a New Solar Assisted Air-source Heat Pump System Heating System**
Caihua Liang, Xiaosong Zhang, Xia Zhu, Xiuwei Li
Southeast University

T02-P-01-32 **Different Sustainable Assessment Methods Compared: a New Approach is Needed**
Wim Zeiler, John van Deursen, Gert Boxem
Technische Universiteit Eindhoven

Theme 3: Energy supply

T03-P-01-16 **Studies on Seasonal Cooling Storage and Release of the Building Energy Piles System**
Peng Li, Zhongzhu Qiu
Tongji University; Shanghai University of Electric Power

T03-P-02-08 **A Study on Pipes Impedance Identification in a Realistic Heat-supply Network**
Yongxin Liu, Pinghua Zou, Yonghu Kang
Harbin Institute of Technology; Harbin Huaneng District Heating Co.

T03-P-03-13 **An Experimental Study on Continuous and Intermittent Control for Radiant Floor Heating System with DSHP**
Xinli Wei, Jinjing Wu, Jifu Lu, Zhangchuan Zeng, Wanren Chen, Zongdi Wei
Zhengzhou University; Henan Reborn Energy Technology Development Co.

T03-P-07-01 **Experimental Study of an Micro-Combined Cooling, Heating and Power System with an Adsorption Chiller**
Xiangqiang Kong, Ying Li, Ruzhu Wang, Xinghua Huang
Shandong University of Science and Technology; Shanghai Jiao Tong University

T03-P-07-12 **A Study of the Preheating Temperature of Directly Buried Heat-Supply Pipeline Based On Intermediate Stress**
Fei Wang, Guowei Wang, Pinghua Zou
Taiyuan University of Technology; Harbin Institute of Technology

T03-P-07-13 **A New Type of Energy Efficient Central Heating System**
Fei Wang, Xin Yang
Taiyuan University of Technology

T03-P-07-10 **Simulation and Analysis of the Control Effectiveness of TRVS in District Heating Systems**
Baoping Xu, Lin Fu, Hongfa Di
China Architecture Design and Consultation Co.; Tsinghua University

T03-P-02-15 **Neural Networks Application in Heating Networks Leakage Fault Diagnosis**
Cuihong Lei, Pinghua Zou, Zhongyi He
Harbin Institute of Technology

T03-P-09-54 **Experimental Thermal Performance of a Novel Solar-Air Source Heat Pump System for Domestic Water Heating**
Guoying Xu, Xiaosong Zhang, Yuehong Zhang
Southeast University

Theme 4: Refrigeration systems

T04-P-02-13 **Application of Fuzzy Control Technology on the Marine Heat Exchanger Control System**
Houde Han, Ankang Kan, Lili Sha
Shanghai Maritime University

T04-P-04-34 **A Study of a Solar-driven Diffusion-absorption Refrigerator with an Adiabatic Spray Absorber**
Handong Wang
Shenzhen Polytechnic

T04-P-09-03 **Evaporative Cooling Techniques for Handling Outdoor Air**
Dan Chen, Changzhi Yang, Jinghua Yu
Hunan University

T04-P-11-15 **Experimental Study on a Small-scale Domestic Diffusion-Absorption Refrigerator**
Handong Wang
Shenzhen Polytechnic

T04-P-11-19 **Numerical Simulation of Flow Field in Link Joint Textile Fiber Dryer**
Xinli Wei, Jia Chang, Jun Zhang, Xinling Ma, Lei Shi, Bin Wu
Zhengzhou University; Zhengzhou Textile Machinery Co.

T04-P-11-24 **A Calculating Method for Matching Enthalpy Parameters of Three-wheel Bootstrap High Pressure Water Separation Refrigeration System for Aircrafts**
Xingjuan Zhang, Chunxin Yang, Feng Li
Beihang University

T04-P-04-10 **Adsorption Refrigeration and Indirect Evaporative Cooling——A Double-Effect Hybrid Vehicular Air Conditioning System**
Zhongbao Liu, Qingbo Ma, Shuang Yang ,Qiang Zhang
Beijing University of Technology

T04-P-04-11 **Mathematical Modelling of a Two-Stage Evaporative Cooling System with a New Kind of Directive Water Evaporative Cooling Air Conditioner**
Zhongbao Liu, Shuang Yang, Qingbo Ma, Qiang Zhang
Beijing University of Technology

T04-P-04-32 **Performance of a Ground-Water Assistant Air-source Compound Heat Pump in Refrigerating Conditions**
Guanghui Zhou, Yin Liu, Shengjie Chen, Chao Zhang, Qixun Guo
Zhongyuan University of Technology

T04-P-04-30 **Experimental Study of the Dynamic Heat Storage Process by Jetting Water in Direct-evaporation Ice-storage Air-conditioning**
Xueqing Chen, Ying Chen, Yongkang Shi
Guangdong University of Technology

T04-P-02-11 **Study on the Running Mode of the Evaporative-Cooling-Assisted Air-conditioning in Mid-humidity Region**
Xiang Huang, Chao Wang, Fangcheng Xu, Zhenghua Yan, Zhixiang Wu
Xi'an Polytechnic University

T04-P-01-44 **An Energy-Saving Air-Conditioning System Based on Liquid Desiccant**
Cai Wen, Xiaosong Zhang
Southeast University

T04-P-04-65 **Optimization Design of Waste Heat Driven Two-stage LiBr-H2O Absorption Refrigerator with Heat Pipe**
Wenbin Wu, Yongchang Zhu, Sumin Jin
Nanjing University of Technology

T04-P-04-66 **Parametric Study on an Air-heated Desiccant Solution Regenerator**
Yonggao Yin, Xiaosong Zhang
Southeast University

Theme 5: R&HVAC components

T05-P-04-19 **Numerical Simulation of GWHP with Superheated Vapor Heat Recovery**
Chao Zhang, Guanghui Zhou, Xiaodan Zhao
Zhongyuan University of Technology

T05-P-04-48 **Application Analysis of Air-source Heat Pump Unit**
Zongyi Shao, Yufeng Wang, Rui Fang
Beijing University of Civil Engineering & Architecture

T05-P-04-49 **On the Installation of Ground Source Heat Pump Exchanger under Earth**
Zongyi Shao, Ruixiang Wang, Rui Fang
Beijing University of Civil Engineering & Architecture

T05-P-04-54 **Experimental Study of the Compressor for the R410a Heat Pump Water Heater System**
Fengkun Wang, Xiaowei Fan, Zhiwei Lian, Fang Wang
Zhongyuan University of Technology; Shanghai Jiao Tong University

T05-P-09-36 **A Study of the Heat Pipes Equipped Heat Exchanger That Works in the Saturated Humid Air**
Lei Shi, Jun Zhang, Xinling Ma, Xinli Wei
Zhengzhou University

T05-P-04-61 **Three-dimensional Temperature Field Simulation of Ground Heat Exchangers with Groundwater Flow**
Hui Long, Yuejin Yu, Zhouquan Feng
Nanjing Normal University; HKUST

T05-P-07-15 **Technical and Economic Analysis of the Combined Heating System with a Coal-fired Basic Heat-source and Gas-fired Boilers as Peak Load Heat-sources**
Haichao Wang, Wenling Jiao, Jingcheng Liu, Pinghua Zou
Harbin Institute of Technology; Beijing Gas and Heating Engineering Design Institute

T05-P-05-65 **A Performance Study on Dehumidification Systems using a Thermosyphon-based Heat Pipe Heat Exchanger**
Caixia Qian, Xiaohua Zhu, Xiaobao Zhao
Nanjing Normal University

T05-P-04-60 **Performance Simulation of Condensing Heat Exchanger in Different Work Conditions**
Jing Wang, Weixing Yuan, Xiugan Yuan
Beihang University

T05-P-11-26 **Application of the Flue Type of Variable Pressure and Check Valve in Kitchen Ventilation System**
Jingye Zhao, Jie Xu, Yue Guo
Beijing Institute of Civil Engineering and Architecture

T05-P-04-62 **Experiment Study on Heat Dissipation Performance of Heating-only Fan Coil**
Xiaozhou Wu, Jianing Zhao
Harbin Institute of Technology

T05-P-04-04 **Experimental Research on the Operational Characteristics of Free Cooling**

Box for Communication Base Station

Yanbing Gao, Huanli Zhao, Jun Liu

AIRSYS Refrigeration Engineering Technology (Beijing) Co.

Theme 6: Indoor/outdoor air Quality

T06-P-05-19 **Experimental Investigation on Accessibility of Supply Air and Contaminant Source in Ventilated Room**
Xiaojun Ma, Xiaoliang Shao, Fenfei Zhu, Hao Cai, Xianting Li
Tsinghua University

T06-P-05-41 **Study of Ozone Emission and IAQ in Computer Laboratory**
Adnan Husain, Mohamad Zainal Md Yusof, Nurul Zakiah Zamri, Baizura Aini Azizi, Abdul Mutalib Leman
University of Tun Hussein Onn Malaysia (UTHM)

T06-P-05-55 **Indoor Air Quality in Four Types of Vehicles in China**
Xiaojiang Ye, Zhaoxia Zhou, Huanxin Chen, Yuangao Wen, Zhijian Hou, Shiqin Liu
Huazhong University of Science and Technology; Wuhan Institute of Technology; Wuhan University of Science and Technology; Shenzhen Polytechnic

T06-P-05-74 **The Subjective Questionnaire Survey and Objective Measurement of Main Pollutions Existing in Residential Environments, China**
Angui Li, Phil Jones, Chunjiang Wu, Kenan Zhang
Xi'an University of Architecture and Technology

T06-P-05-30 **Effect of Airspeed on Removel Performance of Particles in an UFAD Room**
Can Li, Nianping Li
Hunan University of Technology; Hunan University

T06-P-05-68 **The Effect of Ventilation Rate in Controlling Airborne Infection**
Jin Wang, Hua Qian, Xiaosong Zhang
Southeast University

T06-P-05-10 **The Application of Dissipative Structure Theory in Evaluation of Urban Air Quality**
Furen Zhang, Hui Zhang, Panpan Deng
Chongqing Jiaotong University

Theme 7: Thermal comfort

T07-P-05-03 **A Field Study of Thermal Comfort in Outdoor Environment in Guangzhou, China**
Yongchao Zhai, Ling Jin, Qinglin Meng, Yufeng Zhang, Lihua Zhao
South China University of Technology; South China Agricultural University

T07-P-05-12 **Effect of Indoor Thermal Environment in Two Typical Roof Buildings in the Hot Summer Warm Winter Zone**
Wenchao Wang, Lihua Zha, Jun Ren, Qinglin Meng
South China University of Technology; Guangzhou Institute of Building Science

T07-P-05-17 **Thermal Study of a School Buildings in Summer Conditions**
Jiafang Song, Ting Yao, Longyun Ding
Tianjin polytechnic University; Nankai University

T07-P-05-26 **A Study of Rural Indoor Thermal Environment in Western Sichuan after the Wenchuan Earthquake**
Jianbo Zhang, Nanyang Yu, Jiying Liu, Lei Yuan
Southwest Jiaotong University

T07-P-05-28 **A Study of the Micro Thermal Environment Planning of a Commercial District**
Weijie Zhang, Jing Qi, Xin Li
Hebei University of Engineering

T07-P-05-45 **Simulation of Building Environment in a Residential District**
Chuan Sun, Shuiming Shu, Guozhong Ding, Xinghua Hu, Xiaoqing Zhang
Huazhong University of Science and Technology

T07-P-05-50 **Urban Buildings Thermal Environment Research based on BP Neural Network**
Ning Li, Jinxiang Liu, Xiaochun Chen, Gao Ding
Nanjing University of Technology; China Architecture Design & Research Group

T07-P-05-54 **Indoor Thermal Environment, Ventilation and Health Symptoms in a Physics Laboratory**
Xiaojiang Ye, Duanyong Li, Zhaoxia Zhou, Huanxin Chen, Zhijian Hou, Yuangao Wen, Baojun Yi, Shiqin Liu
Wuhan Institute of Technology; Huazhong University of Science and Technology; Shenzhen Polytechnic; Wuhan University of Science and Technology

T07-P-05-57 **Evaluation of a Thermal Comfort Model on Dynamical Air Conditioning**
Yudang Xu, Jiani Mao, Fujiang Chen, Gang Wei
Huazhong University of Science and Technology

T07-P-05-73 **Thermal Comfort Assessment and Energy Consumption Analysis about the System of Ground Source Heat Pump Combined with Radiant Heating/Cooling**
Shikui Lu, Yan Lv, Xiaosong Zhang
Southeast University; Jiangsu University of Science and Technology

T07-P-06-04 **Effect of Indoor Heat Intensity on Thermal Environment in High-rise Residential Building with Atrium**

Dongyue He, Nianping Li, Enxiang Zhang , Jing Li, Sujuan Hou, Minhui Zhang
Hunan University; Beijing Union University

T07-P-02-05 **Thermal Sensation Based Humidity Control to Improve Thermal Comfort and Energy Consumption in Non Hot-Dry Climate Zones**
Jin W Moon, Jae D Chang
University of Kansas

T07-P-05-08 **Adaptive Thermal Comfort Model in the Cold Climate**
Jian Wang, Zhaojun Wang
Heilongjiang Institute of Science and Technology; Harbin Institute of Technology

T07-P-05-27 **Field Measurement of the Convective Heat Transfer Coefficients on Impervious Surface in Urban Area**
Jiantao Shao, Jing Liu, Jianing Zhao, Zhipeng Fu, Wenwu Zhang
Harbin Institute of Ttechnology

T07-P-05-56 **Indoor Thermal Environment and Energy Consumption of Dynamic Air Conditioning**
Yudang Xu, Jiani Mao, Fujiang Chen, Gang Wei
Huazhong University of Science and Technology

Theme 8: Indoor/outdoor air flow

T08-P-05-22 **Numerical Simulation on Air Dispersion of the Fabric Air Distribution System in Pure-Penetration Mode**
Fujiang Chen, Huanxin Chen, Junlong Xie, Zhaohui Shu, Yunpeng Hu, Jiani Mao
Huazhong University of Science and Technology

T08-P-05-29 **CFD Study of an Air-conditioning System using Displacement Ventilation and Chilled Radiant Panel**
Jingye Zhao, Shaobo Ren, Jinghui Chang
Beijing Institute of Civil Engineering and Architecture

T08-P-05-34 **An Experimental Study of Displacement Ventilation in Offices with Internal Heat Source**
Bin Liu, Yanhong Huang, Kai Min
Tianjin University of Commerce

T08-P-06-02 **The Influence of Occupants' Uncertainty on the Airflow in an Atrium of a High Residential Building in Winter**
Sujuan Hou, Nianping Li, Chuawang Li, Minhui Zhang, Dongyue He, Jing Li
Hunan University; Beijing Union University

T08-P-06-03 **Influence of Horizontal Openings on Buoyancy-driven Natural Ventilation of an Atrium in High-rise Residential Buildings**
Jing Li, Nianping Li, Chuawang Li, Minhui Zhang, Sujuan Hou, Dongyue He
Hunan University; Beijing Union University

T08-P-06-06 **Influence of Window Distribution on Ventilation Effect in High-Rise Residential Buildings with a Light Well**
Fang Ruan, Nianping Li, Jing Li, Sujuan Hou, Minhui Zhang, Dongyue He
Hunan University; Xiangtan University

T08-P-06-11 **Analysis of the Under-Floor Air Supply System**
Chengfu He, Jingye Zhao
Beijing University of Civil Engineering and Architecture

T08-P-06-12 **A Study of the Effectiveness of Fans in School Buildings using CFD Simulations**
Jiafang Song, Dongdong Feng, Longyun Ding
Tianjin Polytechnic University; Hebei University of Technology; Nankai University

T08-P-06-14 **Design Procedure for PV Arrays Cooling Ducts to Ventilate in the Building**
Daliang Zhong, Hong Qin
Guangdong University of Technology

T08-P-06-16 **Natural Ventilation in a Railway Station Waiting Room**
Huizhi Zhong, Bo Lei, Ya Feng
Southwest Jiaotong University,China Southwest Architecture Design & Research Institute

T08-P-06-17 **Numerical Simulation and Experimental Study of a New Type of Automatic Wind Catcher**
Zhiyuan Li, Chao Chen, Liaoran Huo
Beijing University of Technology

T08-P-11-04 **A Numerical Study of Air Jet Impinging on a Cone**
Jingye Zhao, Jinghui Chang
Beijing University of Civil Engineering and Architecture

T08-P-06-38 **Numerical and Experimental Study of Air Flow Distribution in Large Space**
Guangyuan Liu, Chunyan Xu, Daixiang Zhou
Yangzhou University

T08-P-11-07 **A Study of the Boundary Layer Flow Field on Continuous Moving Surface in Power Law Fluids by PIV Measurement**
Hao Zhang, Xinxin Zhang, Liancun Zheng, Yuancheng Wang
Shandong Jianzhu University; University of Science and Technology Beijing

T08-P-05-52 **Effect of Air Outflow Angle of a Wall-mounted Air-conditioner on the Indoor Thermal Environment**
Lei Guo, Jigang Zhang, Li Fu, Yanhua Lai, Shusheng Zhang
Shandong University

T08-P-06-37 **Experimental Study of Indoor Temperature Distribution for Displacement Ventilation System**
Jingshan Li, Xianmin Guo, Kai Min
Tianjin University of Commerce

T08-P-06-07 **Analysis of the Excergy Transfer and Efficiency of Buoyancy-Driven Ventilation**
Li Wang, Nianping Li
Hunan University

T08-P-05-16 ***The Influence of Types of Radiation Terminals on Indoor Temperature and Velocity Distribution***
Yongmei Xuan, Fu Xiao, Shengwei Wang
Hong Kong Polytechnic University

T08-P-06-39 **Distribution of Contaminants Breathing and Coughing out by a Patient with Different Postures in a Single-bed Ward**
Yonggao Yin, Jitendra K. Gupta, Xiaosong Zhang, Qingyan Chen
Southeast University

T08-P-06-40 **Role of Natural Ventilation in Indoor Air Temperature and Air Quality Analyses during Cooking Time**
Xiaohong Zheng, Hua Qian, Xiaosong Zhang
Southeast University

T08-P-05-39 ***Measurement of Ventilation Rates Using Tracer Gas Method in Walk-in Stability Chamber***
Adnan Husain, Mohamad Zainal Md Yusof, Nurul Zakiah Zamri, Ishak Mohd Basir, Abdul Mutalib Leman
University of Tun Hussein Onn Malaysia

Theme 9: Indoor air pollutant and cleaning

T09-P-05-48 **CFD Modeling of the Effect of Moisture on the Performance of Air Cleaner in an Office**
Ye Wang, Baoqing Deng, Chang Nyung Kim
University of Shanghai for Science and Technology; Kyung Hee University

T09-P-05-63 **Three-dimensional RNG k-ε Numerical Simulation on Indoor Air Pollutant Discharging by Natural Ventilation in Multi-hatch Room**
Fankang Meng, Jue Wang, Minghui Yan, Shan Gao
Liaoning Technical University

T09-P-08-13 **Effects of the Geometrical Parameters and Operating Conditions on the Filtration Efficiency of the Plain Wave Fabric Filter using Response Surface Methodology**
Fuping Qian, Haigang Wang
Anhui University of Technology

T09-P-08-14 **Test Methods of Pollutant Cleaning Performance of an Air Cleaner**
Gaofeng Deng, Zenghe Li, Liangjun Jin, Mengmeng Ding, Zhichao Wang
Beijing University of Chemical Technology; China Academy of Building Research

T09-P-08-12 **A Study of Removing House Dust in Indoor Environments**
Lu Yang, Yoshino Hiroshi, Takaki Rie, Endo Suguru, Kurihara Genta, Mochida Akashi
Tohoku University

T09-P-05-61 **Contribution Estimation of Outdoor Nitrogen Dioxide on Indoor Air Quality of House Using Indoor Mass Balance**
Eunkyung Kwon, Jianfei Shuai, Hyunsoo Lee, Wonho Yang, Moonhyun Kim
Catholic University of Daegu; Daegu University

T09-P-05-60 **Impact of Temperature on the Initial Emittable Concentration of VOC in Building Materials: Experiment and Model Development**
Jianyin Xiong, Yinping Zhang
Tsinghua University

T09-P-05-49 **Numerical Simulation of VOCs Distribution with an Air Cleaner in a Classroom**
Jiaqing Zhou, Baoqing Deng, Chang Nyung Kim
Kyung Hee University; University of Shanghai for Science & Technology

T09-P-09-52 **Numerical Study on Phase Change Heat Transfer of Paraffin Filled in Aluminum Foams in Solar Flat-plate Collector**
Zhenqian Chen, Donghua Peng, Min Li, Changhai Peng
Southeast University

Theme 10: Renewable energy

T10-P-04-06 **The Research on Ground Source Heat Pumps in China**
Wei Yang, Jin Zhou, Guoqiang Zhang
Hunan University

T10-P-09-02 **Discussion on Active Solar Heating of Rural Residence**
Wei Cai, Lina Zhang, Xubo Yu, Guozhen Xie
Ningbo University of Technology; Beijing University of Civil Engineering and Architecture

T10-P-09-13 **Design of Solar Heat Pump Combined Drying Device and Test of the Drying Performance of Aquatic Products**
Min Li, Zhiqiang Guan, Xiaoqiang Jiang, Shenglan Guo, Lijing Zheng
Guangdong Ocean University

T10-P-09-14 **Thermal Economical Ananysis of Cool-storage Mode Solar Photovoltaic Module with ——A Combination of Heat Pump System**
Qihui Bu, Hong Qin, Chenmian Deng
GuangDong University of Technology

T10-P-09-15 **Experiment Study on Low-temperature Heating Performance of a New Solar-air Multi-source Heat Pump**
Guanghui Zhou, Yin Liu, Cen Zhang, Shengjie Chen, Chao Zhang
Zhongyuan University of Technology

T10-P-09-19 **Theoretical and Experimental Study of Solar Assisted Heat Pump System for Grain Storage Drying**
Haifeng Li,Yanjun Dai,Yong Li,Zongliang Li, Xianli Lu, Sufen Gao, Lei Wei
Shanghai Jiao Tong University; State Grain Reserves Kunming Depot; China Grain Reserves Corporation; Henan Weilai Machines Engineering, Co.

T10-P-09-26 **Theoretical and Experimental Investigation On All-Glass Vacuum Tube Collector Heat Transfer Characteristics**
Zhiyong Li,Chao Chen,Hailiang Luo,Ye Zhang,Yaning Xue
Beijing University of Technology

T10-P-09-29 **Quantities Appraisal of Renewable Energy Resource and Energy Saving for Buildings**
Gaijing Zhang, Weiding Long, Xiang Yuan
Tongji University

T10-P-09-41 **Bottlenecks of Straw Densification Briquetting Fuel (SDBF) Application in China**
Xutao Wang, Lisha Liu, Bailiang Zhang
Henan University of Urban Construction; Henan Quality Ploytechnic; Henan Agricultural University

T10-P-09-43 **Application of Solar Hot Water Systems in Shanghai**
Jianrong Yang, Ge Chen
Shanghai Research Institute of Building Science

T10-P-09-18 **Experimental Study on Heating Buildings with Cool-Storage Mode Solar Photovoltaic Module**

Hong Qin, Renyuan Zhang, Hui Shen, Baoxin Shi, Chenmian Deng, Zhennan Liang
GuangDong University of Ttechnology

T10-P-09-30 **Utilization of Solar Energy for Building Operation**
Lisa Guan, Guangnan Chen
Queensland University of Technology; University of Southern Queensland

T10-P-09-53 **Dehumidification Assisted Evaporative Super-cooling Method for Ice Slurry Producing**
Xiuwei Li, Xiaosong Zhang
Southeast University

Theme 11: Energy Utilization and Efficiency

T11-P-01-10 **The Impact of Shading on Building Daylighting and Energy Consumption**
Zhengrong Li, Zhengtao Ai, Sheng Yu, Peng Li
Tongji University

T11-P-03-04 **A Study of Energy Consumption of Air-conditioning System for Subsistent Government Offices in the Changsha City of China**
Lijun Hu, Nianping Li, Xiaoqing Wei, Ailin Lin
Hunan University

T11-P-04-22 **Experimental Study of the Performance of a Heat Recovery Heat-exchanger**
Yucai Cong, Rui Li, Haitao Nie
Beijing University of Civil Engineering and Architecture

T11-P-09-39 **Energy Saving Analysis on Heat Recovery in Wheel System Based on Life Cycle Cost**
Jinmei Feng, Zhiwei Lian, Xiangping Zhu, Zhaochun Wu, Hongliang Xu
Shanghai Institute of Technology; Shanghai Jiao Tong University

T11-P-09-49 **Inventory Analysis Model Improvement of Life Cycle Energy Upstream Phase**
Jing Wan, Xu Zhang, Zhiqiang Wu
Tongji University

T11-P-11-16 **Structure snd Performance Analysis of Energy Saving Pump Used in Air Conditioning System**
Yuanquan Liu, Xinbo Jiang, Xiaowen Cai, Jie Zhang
University of South China; Yan Cheng Hotel

T11-P-11-20 **Cool Storage Air Conditioning Reconstruction of Energy-Efficiency Technology for Existing Buildings**
Fuxin Niu, Long Ni, Yang Yao, Zuiliang Ma
Harbin Institute of Technology

T11-P-11-06 **Numerical Simulation of Flow and Heat Transfer over Louvered Fin Arrays for High Power Electronic Cooling**
Jie Deng, Nanyang Yu
Southwest Jiaotong University

T11-P-02-25 **Transmission Electricity Consumption of Heating System and Building Energy Saving**
Zongyi Shao, Yufeng Wan , Ye Zhang
Beijing University of Civil Engineering & Architecture;Xinjiang University of Civil Engineering & Architecture Institute

T11-P-11-14 **Analysis of Method of Northern Existing Residential Buildings Energy Conservation Retrofit**
Peng Zhao, Deying Li, Yanli Ren
hanghai Research Institude of Building Sciences(Group) Co.,Ltd.; Beijing Institute of Civil Engineering and Architecture; Beijing Union University

T11-P-02-14 **Investigation and Analysis of Energy Consumption for Public Buildings in Jiaxing**
Xiaoyan Wu, Changzhi Yang, Feng Zhan

Jiaxing University; Hunan University

T11-P-03-08 **Exergy Analysis: a Three-heat-source (Air, Wastewater & Energy Recycle) Hot Water System**

Zhongbin Zhang, Hu Huang, Dongdong Yang, Jia Yu, Zemin Chen

Nanjing Normal University; Hefei General Machinery Research Institute; Suke Air Energy Research Institute

T11-P-04-18 **Energy Consumption Analysis of a Liquid Desiccant Air-conditioning System for Industrial Buildings**

Yidan Tang, Xiaohua Liu

Beijing Institute of Architectural design; Tsinghua University

T11-P-02-30 **Influences of Green Star Rating Tool on HVAC System Design**

Lisa Guan, Guangnan Chen

Queensland University of Technology; University of Southern Queensland

T11-P-11-30 **Study on Restraining Frost Growth at Initial Stage by Hydrophobic Coating and Hygroscopic coating**

Liang Cai, Ronghan Wang, Puxiu Hou, Xiaosong Zhang

Southeast University

T11-P-11-31 **Study on the Fluctuations of Cooling Load and Natural Room Temperature of Different Indoor Zones**

Geng Wang, Zhichao Wang, Xiaosong Zhang, Tao Yuan

Southeast University; China Academy of Building Research

T11-P-11-32 **Convection Heat Transfer of Fluid's Laminar Forced Internal Flow inside a Tube Inserted with Porous Medium under Constant Heat Flux Condition**

Wei Luan, Dongwen Zhang

State Nuclear Electric Power Planning Design& Research Institute

T11-P-02-19 **Screw Chillers Model Suitable for Variable Operating Condition**

Xiaoqiang Jiang, Weiding Long

Tongji University; Guangdong Ocean University

Theme 12: Building envelope

T12-P-01-01 **Effect of Moisture Transfer on Hygrothermal Performance and Conduction Loads of Multilayer Wall of South China**
Xingguo Guo, Youming Chen, Yongqiang Deng, Le Zhang, Yuhang Wang
Hunan University; Key Laboratory of Building Safety and Energy Efficiency, MOE; Dalian Welcome M.E Engineering CO.

T12-P-01-02 **Effect of Solar Radiation on Hygrothermal Performance of Multi-layer Wall of South China**
Le Zhan, Youming Chen, Xingguo Guo
Hunan University

T12-P-01-03 **The Application and Method of Optimum Insulation Thickness for Exterior Walls of Residential Buildings in Summer Hot and Winter Cold Zone of China**
Zhijia Huang, Guozhi Zhang, Yang Zhang, Dongfang Liu, Fuping Qian
Anhui University of Technology

T12-P-09-51 **Thermal Performance of Double Skin Fa çade Windows**
Guoqing He
Zhejiang University

T12-P-01-33 **Energy Consumption Analysis Of Aluminum Alloy Venetian Blinds Movable External Sunshade In Hot Summer And Cold Winter Areas**
Danping Yang, Jiapeng He, Weichuan Cheng
Nanjing University of Technology

T12-P-06-15 **Analysis of Influencing Factors on Thermal Load Characteristics of Office Building Envelopes in China**
Weijie Zhang, Pengyun Liang, Jiuling Liu
Hebei University of Engineering

T12-P-11-01 **The Effects of Water Saturation Ratio on Steady Heat Transfer Characteristics of the Exterior Wall before and after It Is Insulated**
Jibo Long, Nianping Li
Hunan University; Xiangtan University

T12-P-11-05 **On-Site Measurement of Thermal Characteristics of Building Envelopes**
J.J. Cheng, Y.F.Gong, X.S.Zhang, F. Yang, L. Xie
Nanjing University of Technology; Southeast University

T12-P-01-45 **Comparison with Shading Effect for Solar Diffuse Radiation between East and West through a Venetian Shading System**
Yiran Cao, Xiaosong Zhang, Weihua Yang, Xing Jin, Tong Qiu
Southeast University; Shanghai Research Institute of Building Science

T12-P-01-26 **A Case Study on Optimum Insulation Thickness of a Residential Roof in Hot Summer and Cold Winter Zone of China (part Ⅰ+ Ⅱ)**
Jinghua Yu, Changzhi Yang , Liwei Tian ,Dan Chen
Hunan University; China Railway Siyuan Survey and Design Group Co.

ACKNOWLEDGEMENT

Organizing Committee

Xiaosong Zhang (Chair)	Southeast University
Yingxin Zhu (Co-Chair)	Tsinghua University
Zhenqian Chen (Co-chair, S.G.)	Southeast University
Yuguo Li (Co-chair)	University of Hong Kong
Hua Qian (E.S.G.)	Southeast University
Kai Du	Southeast University
Bin Zhou	Southeast University
Yaping Chen	Southeast University
Hui Zhang	Southeast University
Jiufa Chen	Southeast University
Xin Wang	Tsinghua University
Yongping Chen	Southeast University
Shanfeng Mao	Southeast University
Yonggao Yin	Southeast University

ACKNOWLEDGEMENT

Scientific Committee

Yi Jiang (Chair, China)

Hazim Awbi (UK)
William Bahnfleth (USA)
Pradeep Bansal (N.Z.)
I. Beausoleil-Morrison (Canada)
C. Y. H. Chao (HK, China)
Qingyan Chen (USA)
Zhenqian Chen (China)
Qihong Deng (China)
Lei Fang (Denmark)
Leon R. Glicksman (USA)
P. Haves (USA)
Hugo Hens (Belgium)
Jan Hensen (Netherlands)
Sture Holmberg (Sweden)
Shinsuke Kato (Japan)
Bruno Keller (Switzerland)
Min S. Kim (Korea)
Shigeru Koyama (Japan)
Sanjay Kumar (India)
Angui Li (China)
Baizhan Li (China)
Xianguo Li (Canada)
Zhiwei Lian (China)
Haiyan Lin (China)
John C. Little (USA)
Jiaping Liu (China)
Weiding Long (China)
Qinglin Meng (China)
Dirk Müller (Germany)
Shuzo Murakami (Japan)

Nobuo Nakahara (Japan)
Vincenzo Naso (Italy)
Peter V. Nielsen (Denmark)
Jianlei Niu (China)
B. W. Oleson (Denmark)
Saffa Rifat (UK)
Mats Sanderberg (Sweden)
Dietrich Schmidt (Germany)
Henggen Shen (China)
Jan Sundell (Denmark)
Dexiang Tian (China)
Branislav Todorovic(Serbia)
Ruzhu Wang (China)
Shengwei Wang (HK, China)
Yew Wah Wong (Singapore)
Yuanwei Wu (China)
Wei Xu (China)
Jinyue Yan (Sweden)
Yang Yao (China)
Harunori Yoshida (Japan)
Hiroshi Yoshino (Japan)
Shijun You (China)
Guoqiang Zhang (China)
Jensen Zhang (USA)
Xiaosong Zhang (China)
Yinping Zhang (China)
Xu Zhang (China)
Rongyi Zhao (China)
Neng Zhu (China)
Yingxin Zhu (China）

ACKNOWLEDGEMENT

ASHRAE
American Society of Heating, Refrigerating and Air-conditionings Engineers
http://www.ashrae.org/

IEHB
Indoor Environment and Health Brach, Chinese Society for Environmental Sciences
http://www.chinacses.org/cn/chinaiehb/iehb.html

CAR
China Association of Refrigeration
http://www.car.org.cn/

CCHVAC
Committee of Heating, ventilation and Air-conditioning, Chinese Architecture Association, CHINA
http://www.chinaasc.org/html/zoujinxuehui/zhishufenhui/20070419/68.html

IIR
International Institute of Refrigeration, E2
http://www.iifiir.org/

ISIAQ
International Society of Indoor Air Quality and Climate
http://www.isiaq.org

KOSIE
Korean Society for Indoor Environment
http://en.kosie.or.kr/index.php

SCANVAC
Scandinavian Federation of Heating, Ventilation and Sanitary Engineering Associations
http://www.scanvac.net/

SHASE
Society of Heating, Air-conditioning and Sanitary Engineers of Japan, JAPAN
http://www.shasej.org/

ACKNOWLEDGEMENT

NSFC
National Nature Science Foundation of China

Southeast Univercity
http://seu.edu.cn/

双良
Shuangliang Group
http://www.shuangliang.com.cn/index.asp

太阳雨
Jiangsu Sunrain Solar Energy Co.,Ltd
http://www.lygtyy.com/

天加
Nanjing TICA Air-Conditioning Co.,Ltd
http://www.ticachina.com/

东芝开利
Toshiba Carrier Air-Conditioning Sales (Shanghai) Co., Ltd
http://www.toshiba-airconditioning.com.cn/

York by Johnson Controls
http://www.york.com/

Author Index (oral)

Author Index (poster)

AUTHOR INDEX (POSTER)

AUTHOR INDEX (POSTER)

AUTHOR INDEX (POSTER)

AUTHOR INDEX (POSTER)

AUTHOR INDEX (POSTER)

AUTHOR INDEX (POSTER)

AUTHOR INDEX (POSTER)

AUTHOR INDEX (POSTER)

AUTHOR INDEX (POSTER)

Chair Index

心若善