



ROOMVENT 2022 Conference Xi'an

THE 16TH ROOMVENT CONFERENCE

Conference Program

16th-19th September, 2022, Xi'an, China

Hosted by

Xi'an University of Architecture and Technology, Xi'an, China

Umeå University, Umeå, Sweden



Xi'an University of
Architecture and Technology



UMEÅ
UNIVERSITET

Live streaming

(September 16th, 14:00-16:20

September 19th, 16:30-18:00)



Bilibili

Conference website: <https://www.roomvent2022.com>

ACKNOWLEDGEMENT

ENDORISING ORGANIZATIONS

- Scandinavian Federation of Heating, Ventilation and Sanitary Engineering Associations in Denmark, Finland, Iceland, Norway and Sweden (SCANVAC)
- Federation of European Heating, Ventilation and Air-conditioning Associations (REHVA)
- American Society of Heating Refrigerating and Air-conditioning Engineers (ASHRAE)
- China Committee of Heating, Ventilation & Air-conditioning (CCHVAC)
- Aalto University
- Shandong Jianzhu University
- International Jointed Research Center for Building Service Science and Underground Space Environment , Shaanxi



SUPPORTING JOURNALS

- Building Simulation
- Building and Environment
- Indoor and Built Environment
- Sustainable Cities and Society
- Intelligent Building International
- Journal of HV&AC

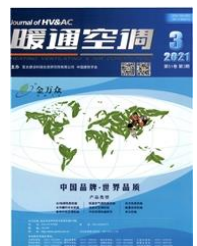
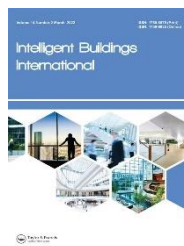
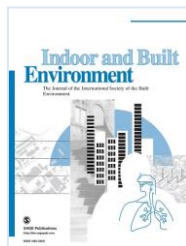
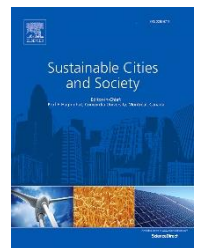


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WELCOME TO ROOMVENT 2022

Dear colleagues,

On behalf of the Organizing Committee, it is our great honor and pleasure to welcome you to the 16th ROOMVENT CONFERENCE (ROOMVENT 2022), September 16-19, 2022, Xi'an, China.

The ROOMVENT Conference is a well-established conference series within the discipline of ventilation research in the area of ventilation and air distribution in rooms, initiated by the SCANVAC and first held in 1987 in Stockholm. It is the leading international event in the area of ventilation and air distribution in rooms.

At the end of 2019, COVID-19 broke out and swept the world. It is the fact, that the pandemic has changed the way people live, learn and work. The ROOMVENT 2022 is held in this special occasion. We have to be moved online. However, the good side is, the pandemic has drawn more and more attention to ventilation issues.

We hope this conference will provide an exclusive opportunity, and an excellent forum for policy-makers, designers, researchers, engineers, and other professionals to share their experience, disseminate technical information, new ideas, and discuss the latest developments and future direction in the fields of HVAC and built environment.

Finally, we welcome you to ROOMVENT 2022 !



Angui Li Dr, Professor
President of ROOMVENT 2022
Xi'an University of Architecture & Technology,
Xi'an, PR China



Thomas Olofsson Dr, Professor
Co-President of ROOMVENT 2022
Umeå University, Umeå, Sweden



INTERNATIONAL SCIENTIFIC COMMITTEE

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Hans Martin MATHISEN

INTERNATIONAL SCIENTIFIC COMMITTEE

Arsen MELIKOV
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Marco PERINO
Pertti PASANEN
Claude-Alain ROULET
Saffa RIFFAT
Mats SANDBERG
Mika RUPONEN
Stefano SCHIAVON
Mattheos SANTAMOURIS
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Richard J. SHAUGHNESSY
Mariusz SKWARCZYNSKI
Aimo TAIPALE
Jelena SREBRIC
Kwok wai THAM

Shin-hici TANABE
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Hans WIGO
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Bin YANG
Runming YAO
Xudong YANG
Wei YE
Yang YAO
Shijun YOU
Hiroshi YOSHINO
Yanping YUAN
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Junfeng (Jim) ZHANG
Guoqiang ZHANG
Tengfei ZHANG
Linhua ZHANG
Xu ZHANG
Xiaosong ZHANG
Lei ZHAO
Xudong ZHAO
Yinping ZHANG
Yingxin ZHU

ORGANIZING COMMITTEE

Angui LI (President)
Thomas OLOFSSON (Co-President)
Risto KOSONEN (SCANVAC Adviser)
Bin YANG (Secretary General)
Ran GAO
Ou HAN
Bingye SONG
Jing XIONG
Ying ZHANG

CONFERENCE CONTACT DETAILS

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PRESENTERS' AND CHAIRS' INFORMATION

Instruction for Oral Presenters

The presenters are kindly requested to enter the virtual meeting room via the designated link **15 minutes prior to the beginning of the session**. For the presentations, all presenters should communicate **in English**.

At the very beginning of the presentation, the speaker would be allowed to turn on the camera and microphone with the permission of session chairs.

Afterwards, the conference staff will play the pre-recorded presentation video.

After the video is played, the presenter should open his/her PowerPoint file and share the screen for the discussion. Presenters are required to answer questions from the participants in English.

Instruction for Session Chairs

Session chairs are kindly requested to enter the virtual meeting room via the designated link **15 minutes prior to the beginning of the session**.

At the beginning of the session, session chairs should briefly introduce the information about the session to the participants. For each presentation, the **first 10 minutes** are scheduled for the pre-recorded video, and the **last 5 minutes** are scheduled for discussion. Session chairs are required to organize the discussion after each pre-recorded video. Chairs kindly are asked to refer to the final program for more detailed information on their session.

- NOTE:** (1) All papers for oral presentation can be found with your **paper ID**. More instructions for both oral speakers and session chairs can be found in the **Operation Manuals**.
(2) The conference program is based on **UTC/GMT+8 hours**.
(3) From September 14th-19th, if you have any problems with logging into VOOV Meeting/Tencent Meeting, please join the ZOOM (ID: **950 3952 3812**, Password 212121) for instant talk. ZOOM can be only used for solving software problem.

CONFERENCE PROGRAM INTRODUCTION

ROOMVENT 2022 Conference program consists of

Plenary sessions (English only) : Including the opening ceremony, keynote speeches, the summary of parallel sessions and workshops, and the closing session.

Parallel sessions (English only) : Including oral presentations. Each presenter has **15 minutes** for presentation, including discussion.

Workshops (English only) : Each workshop will last **90 minutes** and be composed of five to seven communications of around **10 minutes** each and a consequent debate.

Keynote Speakers

Nine internationally renowned scholars have been invited to give the keynote speeches in ROOMVENT 2022. Each speaker has **40 minutes** for presentation and **10 minutes** for discussion.



Prof. Mats
SANDBERG
University of Gävle



Prof. Tianshou ZHAO
Southern University of
Science and
Technology



Prof. Risto
KOSONEN
Aalto University



Prof. Shinsuke KATO
Tokyo University



Prof. Chandra
SEKHAR
National University
of Singapore



Prof. Xianting LI
Tsinghua University



Prof. John LIN
City University
of Hong Kong









Prof. Stefano SCHIAVON
University of California
at Berkeley



Prof. Poh Seng LEE
National University
of Singapore

GENERAL TIMETABLE

	Virtual room 1	Virtual room 2	Virtual room 3	Virtual room 4
	<div>Regions other than China's Mainland (VOOV Meeting Users) https://meeting.roomvent2022.com/virtual_room_1/international </div> <div>China's Mainland (Tencent Meeting Users) https://meeting.roomvent2022.com/virtual_room_1/china </div>	<div>Regions other than China's Mainland (VOOV Meeting Users) https://meeting.roomvent2022.com/virtual_room_2/international </div> <div>China's Mainland (Tencent Meeting Users) https://meeting.roomvent2022.com/virtual_room_2/china </div>	<div>Regions other than China's Mainland (VOOV Meeting Users) https://meeting.roomvent2022.com/virtual_room_3/international </div> <div>China's Mainland (Tencent Meeting Users) https://meeting.roomvent2022.com/virtual_room_3/china </div>	<div>Regions other than China's Mainland (VOOV Meeting Users) https://meeting.roomvent2022.com/virtual_room_4/international </div> <div>China's Mainland (Tencent Meeting Users) https://meeting.roomvent2022.com/virtual_room_4/china </div>
FRIDAY, SEPTEMBER 16 TH , 2022				
14:00-14:30	Opening and welcome			
14:40-16:20	Keynote speech 1,2			
16:20-16:30	Tea Break			
16:30-18:15	Session 1	Session 2	Session 3	Workshop 1
	Respiratory infection risk (1)	Underground environment (1)	Microenvironment around occupants	Advanced airflow distribution
SATURDAY, SEPTEMBER 17 TH , 2022				
8:30-10:00	Session 4	Session 5	Session 6	Session 7
	Respiratory infection risk (2)	Underground environment (2)	Thermal comfort (1)	Natural ventilation (1)
10:00-10:15	Tea Break			
10:15-12:00	Session 8	Session 9	Session 10	Workshop 2
	Airborne contaminants (1)	Underground environment (3)	Thermal comfort (2)	Low-carbon ice and snow making
12:00-14:00	Lunch Time			
14:00-16:30	Keynote speech 3,4,5			
16:30-16:45	Tea Break			
16:45-18:15	Session 11	Session 12	Workshop 3	Workshop 4
	Respiratory infection risk (3)	Underground environment (4)	Occupant behaviour on the energy performance	Urban climate modelling and measurement
SUNDAY, SEPTEMBER 18 TH , 2022				
8:30-10:00	Session 13	Session 14	Session 15	Session 16
	Airborne contaminants (2)	Ventilation performance (1)	Airflow around buildings	Airflow measurement and visualization
10:00-10:15	Tea Break			
10:15-12:15	Session 17	Session 18	Session 19	Session 20
	Airborne contaminants (3)	Ventilation performance (2)	Indoor climate (1)	Contaminant control (1)
12:15-14:00	Lunch Time			
14:00-16:30	Keynote speech 6,7,8			
16:30-16:45	Tea Break			
16:45-18:15	Session 21	Session 22	Workshop 5	Workshop 6
	Ventilation performance (3)	Occupant behavior and ventilation	The role of ventilation in controlling transmission	PCM materials for thermal comfort
MONDAY, SEPTEMBER 19 TH , 2022				
8:30-10:00	Session 23	Session 24	Session 25	Session 26
	Contaminant control (2)	Ventilation performance (4)	Indoor climate (2)	Indoor climate (3)
10:00-10:15	Tea Break			
10:15-12:00	Session 27	Session 28		
	Contaminant control (3)	Airflow simulation (1)		
12:00-14:00	Lunch Time			
14:30-16:15	Session 29	Session 30	Session 31	Workshop 7 Updates on research and practice in ventilation (15:00~16:30)
16:15-16:30	Natural ventilation (2)	Airflow simulation (2)	Air distribution	
16:15-16:30	Tea Break			
16:30-17:20	Keynote speech 9			
17:20-18:00	Closing session			

The conference program is based on Beijing Standard Time (UTC/GMT+8 hours).

City	Country	Coordinated Universal Time
Beijing	China	UTC+8
Singapore	Singapore	
Seoul	South Korea	UTC+9
Tokyo	Japan	
Sydney	Australia	UTC+10
London	United Kingdom	UTC+1
Lisbon	Portugal	
Berlin	Germany	UTC+2
Paris	France	
Prague	Czech Republic	
Oslo	Norway	
Amsterdam	Netherlands	
Copenhagen	Denmark	
Milan	Italy	
Warsaw	Poland	
Bern	Switzerland	
Stockholm	Sweden	
Helsinki	Finland	UTC+3
San Francisco	United States	UTC-7
Syracuse		UTC-4



Virtual room 1

Links for regions other than China's Mainland (VOOV Meeting Users)

https://meeting.roomvent2022.com/virtual_room_1/international



Links for China's Mainland (Tencent Meeting Users)

https://meeting.roomvent2022.com/virtual_room_1/china























Time	Speakers	No./Topics
14:40-15:30 Sep.16	Prof. Mats SANDBERG University of Gävle	K1 Ventilation as I see it
15:30-16:20 Sep.16	Prof. Tianshou ZHAO Southern University of Science and Technology	K2 Innovating energy storage technologies through interdisciplinary approach
14:00-14:50 Sep.17	Prof. Stefano SCHIAVON University of California at Berkeley	K3 Providing thermal comfort with air movement
14:50-15:40 Sep.17	Prof. John LIN City University of Hong Kong	K4 What to ventilate, room or people?
15:40-16:30 Sep.17	Prof. Risto KOSONEN Aalto University	K5 The role of ventilation to enhance wellbeing under a changing climate
14:00-14:50 Sep.18	Prof. Chandra SEKHAR National University of Singapore	K6 Sustainable and resilient ventilation systems – the way forward and the key players
14:50-15:40 Sep.18	Prof. Shinsuke KATO Tokyo University	K7 Power balance model interpretation of CFD results
15:40-16:30 Sep.18	Prof. Poh Seng LEE National University of Singapore	K8 Experimental validation and numerical optimization of finned-tube heat exchanger and air supply duct for a novel passive displacement cooling system
16:30-17:20 Sep.19	Prof. Xianting LI Tsinghua University	K9 Quantity and grade of cooling heating load in non-uniform indoor environment























No.	Time	Chairs	Topics	Links for regions other than China's Mainland (VOOV Meeting Users)	Links for China's Mainland (Tencent Meeting Users)
1	16:30-18:00 Sep.16	Arsen K. MELIKOV Technical University of Denmark Risto KOSONEN Aalto University	Advanced airflow distribution	Virtual room 4 	Virtual room 4
2	10:15-12:00 Sep.17	Xinrong ZHANG Peking University Xiaohua LIU Tsinghua University	Low-carbon ice and snow making science and technology	Virtual room 4 	Virtual room 4
3	16:45-18:15 Sep.17	Shen WEI University College London Song PAN Beijing University of Technology	The impact of occupant behaviour on the energy performance of buildings	Virtual room 3 	Virtual room 3
4	16:45-18:15 Sep.17	Jian HANG Sun Yat-sen University Zhiwen LUO Cardiff University	Multi-physics of urban climate modelling and measurement	Virtual room 4 	Virtual room 4
5	16:45-18:15 Sep.18	Hua QIAN Southeast University Li LIU Tsinghua University	The role of ventilation in controlling the transmission of respiratory pathogens through the air	Virtual room 3 	Virtual room 3
6	16:45-18:15 Sep.18	Thomas OLOFSSON Umeå University Hongxia ZHOU Umeå University	Phase change materials as a strategy to improve thermal comfort and energy efficiency in buildings	Virtual room 4 	Virtual room 4
7	15:00-16:30 Sep.19	Xiaofeng ZHENG University of Nottingham Hua ZHONG Nottingham Trent University	Updates on the research, practice and regulation in building ventilation and related	Virtual room 4 	Virtual room 4

























No.	Topics	Links for regions other than China's Mainland (VOOV Meeting Users)	Links for China's Mainland (Tencent Meeting Users)
Session 1	Respiratory infection risk (1)	Virtual room 1 	Virtual room 1 
Session 2	Underground environment (1)	Virtual room 2 	Virtual room 2 
Session 3	Microenvironment around occupants	Virtual room 3 	Virtual room 3 
Session 4	Respiratory infection risk (2)	Virtual room 1 	Virtual room 1 
Session 5	Underground environment (2)	Virtual room 2 	Virtual room 2 
Session 6	Thermal comfort (1)	Virtual room 3 	Virtual room 3 
Session 7	Natural ventilation (1)	Virtual room 4 	Virtual room 4 
Session 8	Airborne contaminants (1)	Virtual room 1 	Virtual room 1 
Session 9	Underground environment (3)	Virtual room 2 	Virtual room 2 
Session 10	Thermal comfort (2)	Virtual room 3 	Virtual room 3 



No.	Topics	Links for regions other than China's Mainland (VOOV Meeting Users)	Links for China's Mainland (Tencent Meeting Users)
Session 11	Respiratory infection risk (3)	Virtual room 1 	Virtual room 1 
Session 12	Underground environment (4)	Virtual room 2 	Virtual room 2 
Session 13	Airborne contaminants (2)	Virtual room 1 	Virtual room 1 
Session 14	Ventilation performance (1)	Virtual room 2 	Virtual room 2 
Session 15	Airflow around buildings	Virtual room 3 	Virtual room 3 
Session 16	Airflow measurement and visualization	Virtual room 4 	Virtual room 4 
Session 17	Airborne contaminants (3)	Virtual room 1 	Virtual room 1 
Session 18	Ventilation performance (2)	Virtual room 2 	Virtual room 2 
Session 19	Indoor climate (1)	Virtual room 3 	Virtual room 3 
Session 20	Contaminant control (1)	Virtual room 4 	Virtual room 4 



No.	Topics	Links for regions other than China's Mainland (VOOV Meeting Users)	Links for China's Mainland (Tencent Meeting Users)
Session 21	Ventilation performance (3)	Virtual room 1 	Virtual room 1 
Session 22	Occupant behavior and ventilation	Virtual room 2 	Virtual room 2 
Session 23	Contaminant control (2)	Virtual room 1 	Virtual room 1 
Session 24	Ventilation performance (4)	Virtual room 2 	Virtual room 2 
Session 25	Indoor climate (2)	Virtual room 3 	Virtual room 3 
Session 26	Indoor climate (3)	Virtual room 4 	Virtual room 4 
Session 27	Contaminant control (3)	Virtual room 1 	Virtual room 1 
Session 28	Airflow simulation (1)	Virtual room 2 	Virtual room 2 
Session 29	Natural ventilation (2)	Virtual room 1 	Virtual room 1 
Session 30	Airflow simulation (2)	Virtual room 2 	Virtual room 2 
Session 31	Air distribution	Virtual room 3 	Virtual room 3 

AGENDA

Live streaming
 (September 16th,
 14:00-16:20)



Weibo



Bilibili

FRIDAY, SEPTEMBER 16TH, 2022 14:00-16:20

Plenary Session

Links for regions other than China's Mainland (VOOV Meeting Users)

https://meeting.roomvent2022.com/virtual_room_1/international



Links for China's Mainland (Tencent Meeting Users)

https://meeting.roomvent2022.com/virtual_room_1/china



Opening Ceremony

Chaired by **Angui LI**

Welcome addresses

Virtual room 1

14:00-14:30

- From *Risto KOSONEN*, the president of SCANVAC
- From Department of Science and Technology of Shaanxi Province
- From the president of Xi'an Univ. of Architecture & Technology
- From *Thomas OLOFSSON*, the co-president of ROOMVENT 2022

Keynote speeches

Chaired by **Thomas OLOFSSON**

Keynote speech 1

Virtual room 1

14:40-15:30

Ventilation as I see it
Mats SANDBERG

Keynote speech 2

15:30-16:20

Innovating energy storage technologies through interdisciplinary approach
Tianshou ZHAO

FRIDAY, SEPTEMBER 16TH, 2022 16:30-18:15

Parallel Session 1 - Respiratory infection risk (1)

Chair: Yuguo LI, Jianlin LIU

Virtual room 1

Links for **regions other than China's Mainland** (VOOV Meeting Users)

https://meeting.roomvent2022.com/virtual_room_1/international



Links for **China's Mainland** (Tencent Meeting Users)

https://meeting.roomvent2022.com/virtual_room_1/china



Time	Paper ID	Title
16:30 - 16:45	Roomvent 2022-1-00321	Respiratory infection risk based ventilation and room conditioning design method with year-round thermal comfort control in modern office buildings <i>Martin KIIL, Raimo SIMSON, Karl-Villem VÕSA, Alo MIKOLA, Martin THALFELDT, Jarek KURNITSKI</i>
16:45 - 17:00	Roomvent 2022-3-00427	Various pathogen-laden aerosol deposition in the realistic human airway during inhalation <i>Danting LUO, Xiaohong ZHENG, Hua QIAN</i>
17:00 - 17:15	Roomvent 2022-2-00372	Ventilation and low-cost strategies on mitigating COVID-19 infection disease transmission in indoor environment <i>Chen REN, Shijie CAO</i>
17:15 - 17:30	Roomvent 2022-1-00262	Aerosol transmission risk of COVID-19 when passengers move slowly in a line at the airport terminal <i>Yu ZHAO, Yao FENG</i>
17:30 - 17:45	Roomvent 2022-1-00041	Exploring the potentials of micro-environment ventilation in mitigating airborne transmission risk <i>Weixin ZHAO, Simo KILPELÄINEN, Risto KOSONEN, Sami LESTINEN</i>
17:45 - 18:00	Roomvent 2022-2-00177	Experimental evaluation of the airborne infection probability in ventilated office room at different supply airflow rates <i>Aleksandra LIPCZYNSKA, Mariya P. BIVOLAROVA, Linxuan GUO, Wojciech KIERAT, Arsen K. MELIKOV</i>
18:00 - 18:15	Roomvent 2022-1-00602	Study on acquired infection of patients in waiting space of fever clinic <i>Shuo LIU, Ying WANG, Yiran LU, Yifan LI, Yi WANG, Li LIU</i>

FRIDAY, SEPTEMBER 16TH, 2022 16:30-18:00

Parallel Session 2 - Underground environment (1)

Chair: Yanfeng LI, Aileen YANG

Virtual room 2

Links for **regions other than China's Mainland** (VOOV Meeting Users)

https://meeting.roomvent2022.com/virtual_room_2/international

Links for **China's Mainland** (Tencent Meeting Users)

https://meeting.roomvent2022.com/virtual_room_2/china



Time	Paper ID	Title
16:30 - 16:45	Roomvent 2022-2-00219	Reduced-scale experimental and numerical investigation on the energy and smoke control performance of natural ventilation systems in a high-rise atrium <i>Haohan SHA, Xin ZHANG, Xiguan LIANG, Dahai QI</i>
16:45 - 17:00	Roomvent 2022-2-00327	Investigation on energy consumption characteristics in different time scales of a metro station <i>Bowen GUAN, Xinke WANG, Xiaohua LIU, Tao ZHANG</i>
17:00 - 17:15	Roomvent 2022-2-00616	Wind tunnel modeling experiments on ventilation characteristics of underground metro station with sunken squares <i>Jianjian ZHAO, Jing LIU, Hu GAO, Zhen WANG, Jiankai DONG, Chongxu JIANG, Yanling NA</i>
17:15 - 17:30	Roomvent 2022-2-00623	The feasibility of jet fan-assisted ventilation for temperature control of heating belts on a downward-facing sphere in a scientific facility <i>Yiqun LI, Wenhao TANG, Chao WU, Yu XUE, Wei YE, Xu ZHANG</i>
17:30 - 17:45	Roomvent 2022-4-00105	Fire safety of ventilation systems and fire incidence reports in norwegian schools <i>Aileen YANG, Andreas AAMODT, Per Henning SAMUELSEN, Brynhild Garberg OLSØ, Anne-Marit HAUKEØ, Christoph MERANER</i>
17:45 - 18:00	Roomvent 2022-4-00018	Experimental study on the temperature distribution in a cross-type interchange subway station fire scenario <i>Jiaxin LI, Yanfeng LI, Xiangling DUANMU, Lei LI</i>

FRIDAY, SEPTEMBER 16TH, 2022 16:30-18:15

Parallel Session 3 - Microenvironment around occupants

Chair: Kazuhide ITO, Zhengtao AI

Virtual room 3

Links for **regions other than China's Mainland** (VOOV Meeting Users)

https://meeting.roomvent2022.com/virtual_room_3/international

Links for **China's Mainland** (Tencent Meeting Users)

https://meeting.roomvent2022.com/virtual_room_3/china



Time	Paper ID	Title
16:30 - 16:45	Roomvent 2022-1-00363	Numerical simulation of the human microenvironment around the occupants <i>Eusébio CONCEIÇÃO, M^a Inês CONCEIÇÃO, M^a Manuela LÚCIO, João GOMES, Hazim AWBI</i>
16:45 - 17:00	Roomvent 2022-1-00534	Development of three-dimensional clothing model for a computer-simulated person integrated with a thermoregulation model <i>Sena HYODO, Kei MUROTA, Sung-jun YOO, Kazuhide ITO</i>
17:00 - 17:15	Roomvent 2022-1-00211	Measurement of the convective heat transfer coefficient of the human body in the lift-up design <i>Siqi ZHOU</i>
17:15 - 17:30	Roomvent 2022-1-00298	Human re-breathing ratio under typical conditions <i>Jie ZONG, Zhengtao AI</i>
17:30 - 17:45	Roomvent 2022-1-00620	A preliminary experimental study on the user behaviors and aerosol emissions of electric toothbrushes <i>Wenhao TANG, Yiqun LI, Wei YE</i>
17:45 - 18:00	Roomvent 2022-4-00326	Research on the ratio between the convection and radiation heat exchange amount of the face and head of manikin in the thermal comfort condition <i>Xinwei YANG, Lihui WANG, Xinhui BAI, Changjiang MA, Jianan MA, Jialiang ZHU</i>
18:00 - 18:15	Roomvent 2022-1-00482	The effect of local thermal sensation on overall thermal sensation in older people under warm conditions: a chamber room study <i>Minzhou CHEN, Azin Velashjerdi FARAHANI, Risto KOSONEN, Simo KILPELÄINEN, Sami LESTINEN</i>

FRIDAY, SEPTEMBER 16TH, 2022 16:30-18:00

Workshop 1

Virtual room 4

Chair: Arsen K. MELIKOV, Co-Chair: Risto KOSONEN

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Advanced airflow distribution

A wide range of pollutants has been found indoors and their adverse effect on occupants' health has been recognized. Airborne transmission of respiratory infectious diseases indoors has been recognized as well. Air distribution in spaces is important for transport of pollution and viruses and the exposure of occupants. At present increase of ventilation rate is recommended for reduction of exposure, mainly due to dilution. However, the increase of the ventilation rate leads to increase of energy consumption and need of large and costly ventilation systems. Instead, proper design and control of advanced air distribution in spaces can be considered. The objective of this workshop is to present the new REHVA Guidebook on Target Ventilation, to discuss the ongoing work and to collect suggestions for its improvement.

Speakers	Institution	Topic
Arsen MELIKOV	Technical University of Denmark	Occupant Targeted Ventilation
Xianting LI	Tsinghua University	Non-uniform air distribution
Angui LI	Xi' an University of Architecture and Technology	Wall-attached ventilation
John Zhang LIN	City University of Hong Kong	Stratum ventilation
Guangyu CAO	Norwegian University of Science and Technology	Protected occupied zone ventilation
Risto KOSONEN	Aalto University	Air distribution with individually controlled room systems

SATURDAY, SEPTEMBER 17TH, 2022 8:30-10:00

Parallel Session 4 - Respiratory infection risk (2)

Chair: Xinhua XU, Shijie CAO

Virtual room 1

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Time	Paper ID	Title
8:30 - 8:45	Roomvent 2022-2-00261	Estimation of infection risk through airborne transmission in large open spaces with different air distributions <i>Jialei SHEN, Kaloki NABUTOLA, Michael J.BIRNKRANT, Peter J.MCKINNEY, Bing DONG, Jianshun ZHANG</i>
8:45 - 9:00	Roomvent 2022-1-00299	Advanced ventilation chair for source control of respiratory infectious diseases <i>Chen LIN, Zhengtao AI</i>
9:00 - 9:15	Roomvent 2022-2-00228	Characteristics of aerosol dispersion in isolation wards under the mixing and perforated ceiling air supplying ventilation strategies <i>Guang NIU, Feifei WANG, Hanlin YANG, Xinhua XU</i>
9:15 - 9:30	Roomvent 2022-2-00630	Intervention of personalized ventilation on interpersonal airborne disease transmission <i>Yijing REN, Shihai PAN, Na LI, Chunwen XU</i>
9:30 - 9:45	Roomvent 2022-1-00599	The motion law of aerosols produced by human respiration under the action of thermal plume in ventilated room <i>Songlin WU, Hanqing WANG, Chengjun LI, Qiuxin LIU</i>
9:45 - 10:00	Roomvent 2022-1-00524	Assessment on the expectation for built environment usage and its influencing factors during the pandemic <i>Jiao JIAO, Jianlin LIU, Yongxin XIE</i>

SATURDAY, SEPTEMBER 17TH, 2022 8:30-10:00

Parallel Session 5 - Underground environment (2)

Chair: Ping CUI, Yan TONG

Virtual room 2

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Time	Paper ID	Title
8:30 - 8:45	Roomvent 2022-2-00117	Research on the prediction of energy-saving potential of traffic cave based on BP neural network <i>Zhengye WANG, Tong REN, Hong ZHANG</i>
8:45 - 9:00	Roomvent 2022-4-00199	Simulation of thermal and moisture transport with dehumidifier systems in underground pumped storage power station <i>Huimin YAO, Ang LI, Yuling LV, Xiong SHEN</i>
9:00 - 9:15	Roomvent 2022-4-00034	Field measurement of thermal environment and air pollution level inside an urban road tunnel during the evening rush hour <i>Kongfei YU, Yong YANG, Jiale CHEN, Lin XU</i>
9:15 - 9:30	Roomvent 2022-4-00044	Study on ventilation effect for a large space in an underground hydropower station <i>Zhihe SU, Yanfeng LI, Wei TIAN</i>
9:30 - 9:45	Roomvent 2022-3-00250	Investigation of performance parameters of building thermal battery <i>Y.Z. ZHANG, S.G. WANG, S. JIANG, J.H. WANG, X.Z. WU, T.F. ZHANG</i>
9:45 - 10:00	Roomvent 2022-4-00189	Dynamic evolutions of traffic wind influenced by moving vehicles for urban road tunnel with shafts <i>Weihao HUANG, Yan TONG, Gangyu LV, Baolian DAI, Tao PENG</i>

SATURDAY, SEPTEMBER 17TH, 2022 8:30-10:00

Parallel Session 6 - Thermal comfort (1)

Chair: Kailiang HUANG, Guodan LIU

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Time	Paper ID	Title
8:30 - 8:45	Roomvent 2022-1-00039	Research on the calculation method of dressing thermal resistance based on infrared thermal imaging technology <i>Guodan LIU, Shan JIANG, Yihang JI, Yao ZHANG, Gang WANG, Shimin LIANG, Shuwei LIANG</i>
8:45 - 9:00	Roomvent 2022-1-00050	Thermal response test analysis of adults and preschoolers under radiant floor heating environment in a hot-summer and cold-winter area <i>Na LIU, Dong LIU, Xiaozhou WU, Jun WANG, Jialan WEN</i>
9:00 - 9:15	Roomvent 2022-1-00138	Fluence of different heating charging modes on thermal comfort in cold area <i>Linxiao XIE, Haiyan YAN, Fangning SHI, Meng LI, Dongyu LU, Cheng CHENG</i>
9:15 - 9:30	Roomvent 2022-1-00164	Experimental study on the thermal comfort and physiological responses of the elderly in unstable environments <i>Zixuan ZHANG, Yuxin WU, Hong LIU, Baizhan LI, Risto KOSONEN</i>
9:30 - 9:45	Roomvent 2022-1-00241	Analysis of regulation characteristics in acceptable thermal comfort zone under cooling conditions <i>Yingxian ZHAI, Lie MA, Meng LIU, Yujie HE, Chengdong ZHOU, Xin XIE, Longkang DAI, Huan LIU</i>
9:45 - 10:00	Roomvent 2022-1-00309	Field study of thermal comfort of indoor fitness places in cold region <i>Chenyang JIA, Shengkai ZHAO, Siru GAO, yuanyuan TONG, Yongchao ZHAI</i>

SATURDAY SEPTEMBER 17TH, 2022 8:30-10:00

Parallel Session 7 - Natural ventilation (1)

Chair: Hiroshi YOSHINO, Fuyun ZHAO

Virtual room 4

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Time	Paper ID	Title
8:30 - 8:45	Roomvent 2022-3-00029	Study on the dynamic natural ventilation rates of occupied residence <i>Shuwei LIU, Yiwen JIAN, Wenbo ZHU, Xundong GU, Mengmeng BIAN, Zijia LIU</i>
8:45 - 9:00	Roomvent 2022-1-00404	Study on measurement and design strategy of residential room natural ventilation in calm wind climate zone -- a case study of household in Chengdu <i>Qinglong GAO, Yueyang LI, Bin JIANG, Jinlong OUYANG</i>
9:00 - 9:15	Roomvent 2022-2-00120	Experimental of natural ventilation in a semi-transparent photovoltaic double skin façade in summer <i>Yuhan NI, Xiaopeng SHI, Xingyu LEI, Luhang WANG, Chunwen XU</i>
9:15 - 9:30	Roomvent 2022-2-00179	A case study: Optimization of energy performance in a naturally ventilated office building <i>Cong LI, Youming CHEN, Quan ZOU</i>
9:30 - 9:45	Roomvent 2022-2-00184	Impact of non-uniform heat flux on ventilation performance of solar chimney <i>Yang CAI, Xiaoyan HUANG, Binghua HONG, Jianwei HE, Fuyun ZHAO</i>
9:45 - 10:00	Roomvent 2022-2-00332	Study on the performance of Trombe wall in hot summer and cold winter climate under non-air conditioning condition <i>Yuan ZHANG, Ziyang ZHU, Jiangtian ZHU, Jing LUO, Jie LI, Xiaoqin SUN</i>

SATURDAY, SEPTEMBER 17TH, 2022 10:15-12:00

Parallel Session 8 - Airborne contaminants (1)

Chair: Jun WANG, Yanpeng WU

Virtual room 1

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Time	Paper ID	Title
10:15 - 10:30	Roomvent 2022-1-00144	Numerical simulation of pollutant diffusion in public toilets <i>Xin YIN, Xinshan SUN, Minkai BAI, Zhan LIU</i>
10:30 - 10:45	Roomvent 2022-1-00218	Gaseous pollution source term estimation based on the adjoint-regularization method <i>Yuanqi JING, Zhonglin GU, Fei LI, Kai ZHANG</i>
10:45 - 11:00	Roomvent 2022-2-00449	Quantitative assessment of indoor CO2 concentration of a comprehensive office building <i>Lei WANG, Yanling WANG, Fang WANG, Haiyan WANG</i>
11:00 - 11:15	Roomvent 2022-3-00215	Measured analysis of indoor pollutant concentration and air change rate in winter in the postgraduate dormitory of a university in Shenyang <i>Guohui FENG, Yong HE, Ziqiang ZHOU, Jiasen SONG</i>
11:15 - 11:30	Roomvent 2022-5-00269	Numerical Simulation of radon migration influenced by heat-moisture coupled model in aerated concrete wall under different outdoor temperature and humidity conditions <i>Yuanchao CHEN, Dong XIE, Guojie CHEN, Shiliang DAI, Suyao LIU</i>
11:30 - 11:45	Roomvent 2022-1-00531	Characteristics of indoor ozone pollution in residential buildings based on outdoor air pollution <i>Lijun JING, Jun WANG</i>
11:45 - 12:00	Roomvent 2022-1-00265	Indoor environmental quality and pollutant dispersion estimation inside a bus at the downtown areas of Dalian, China <i>Yu ZHAO, Chenmin GU, Xiaocheng SONG</i>

SATURDAY, SEPTEMBER 17TH, 2022 10:15-12:00

Parallel Session 9 - Underground environment (3)

Chair: Hua QIAN, Lihui WANG

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Time	Paper ID	Title
10:15 - 10:30	Roomvent 2022-4-00266	Research on hydrogen leakage and dispersion characteristics in indoor thermal stratification environment <i>Zhiyong SHU, Wenqing LIANG, Xiaohong ZHENG, Hua QIAN</i>
10:30 - 10:45	Roomvent 2022-4-00335	An improved method for determining the interface height of smoke layer in a tunnel fire <i>Kang XIONG, Fang LIU, Miaocheng WENG</i>
10:45 - 11:00	Roomvent 2022-4-00324	Simulation study on the dynamic velocity field of the supplying jet coupled with the platform piston wind in non-screen door subway stations <i>Jialiang ZHU, Lihui WANG, Zhiling LI, Jianan MA, Changjiang MA, Xinwei YANG</i>
11:00 - 11:15	Roomvent 2022-4-00629	The impact of jet fans layout on the CO concentration distribution inside tunnel for the congestion scenario <i>Lin XU, Jiale CHEN, Kongfei YU, Jie LIU, Mingxuan QIU</i>
11:15 - 11:30	Roomvent 2022-5-00416	Experimental study for humidification performance of air-to-water type hollow fiber membrane humidifier <i>Suyoung JO, Yongkwon KANG, Gyubae LEE, Jaewon JOUNG, Jaeweon JEON</i>
11:30 - 11:45	Roomvent 2022-5-00606	Crowd infection and its prevention strategy in a subway station based on social force model <i>Meng YAO, Huiming HUANG, Lina WANG, Kang YANG, Haihang CUI, Li CHEN, Min ZHOU</i>
11:45 - 12:00	Roomvent 2022-3-00195	Study on oxygen concentration distribution of Sejila mount tunnel construction based on fluent <i>Guohui FENG, Yuhua LIU, Jialin SUN, Yan ZANG</i>

SATURDAY, SEPTEMBER 17TH, 2022 10:15-11:45

Parallel Session 10 - Thermal comfort (2)

Chair: Li LAN, Haiying WANG

Virtual room 3

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Time	Paper ID	Title
10:15 - 10:30	Roomvent 2022-1-00165	Gender difference in the effect of perceived control <i>Dongyu LU, Hanyan YAN, Zhen SUN, Fangning SHI</i>
10:30 - 10:45	Roomvent 2022-1-00546	Field study on human thermal comfort and indoor air quality in university dormitory buildings <i>Shengkai ZHAO, Liu YANG, Siru GAO, Yongchao ZHAI</i>
10:45 - 11:00	Roomvent 2022-1-00548	Study on prediction model of thermal sensation under local draft in low pressure environment <i>Baowei GE, Haiying WANG, Zan XU, Jiankai LI, Dongyang CHEN</i>
11:00 - 11:15	Roomvent 2022-1-00554	A review of heat stress evaluation indices in extremely hot environments <i>Guohui FENG, Yan ZANG, Jialin SUN, Yuhan LIU</i>
11:15 - 11:30	Roomvent 2022-1-00328	A questionnaire investigation on people's sleep and health in constant temperature and humidity environment in China <i>Huili YU, Liping CHEN, Shimin LIANG, Songtao HU, Rujin LIU</i>
11:30 - 11:45	Roomvent 2022-1-00166	Effect of indoor air temperature on thermal sensation with seasonal variation <i>Cheng CHENG, Haiyan YAN, Jingyuan GAO, Fangning SHI, Dongyu LU, Linxiao XIE, Zhen SUN, Guodong YUAN</i>

SATURDAY, SEPTEMBER 17TH, 2022 10:15-12:00

Workshop 2

Virtual room 4

Chair: *Xinrong ZHANG*, Co-Chair: *Xiaohua LIU*

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Low-carbon ice and snow making science and technology

The Winter Olympics made winter sports more and more popular. In order to provide enthusiasts with good conditions for winter sports, it is necessary to artificially make ice and snow. Ice and snow making processes consume a lot of energy and also Freon substance, which lead to serious global warming and ozone layer depletion. Natural refrigerants, such as carbon dioxide, are used to replace Freon substances to achieve low carbon snow making and ice rinks. In this session, related science, technology and standard will be presented and discussed.

Speakers	Institution	Topic
Borong LIN	Tsinghua University	Study and application of green evaluation standard for ice and snow sport venues
Jin MA	Hua Shang International Engineering Co., Ltd.	Ice rink by transcritical CO ₂ refrigeration cycle with whole heat recovery
Xinrong ZHANG	Peking University	
Ruixiang WANG	Beijing University of Civil Engineering and Architecture	Water atomization process for outdoor snow maker
Qiu-Yun ZHENG	Peking University	Application of transcritical carbon dioxide in artificial snow making above zero degree
Wenyu LIN	Tsinghua University	Thermal and humid environment construction in ice rinks



SATURDAY, SEPTEMBER 17TH, 2022 14:00-16:30

Plenary Session

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Virtual room 1

Keynote speeches

Chaired by *Xianting LI*

Keynote speech 3

14:00-14:50 Providing thermal comfort with air movement

Stefano SCHIAVON

Keynote speech 4

14:50-15:40 What to ventilate, room or people?

John LIN

Keynote speech 5

15:40-16:30 The role of ventilation to enhance wellbeing under a changing climate

Risto KOSONEN

SATURDAY, SEPTEMBER 17TH, 2022 16:45-18:15

Parallel Session 11 - Respiratory infection risk (3)

Chair: Risto KOSONEN, Zhengrong LI

Virtual room 1

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Time	Paper ID	Title
16:45 - 17:00	Roomvent 2022-1-00301	Temporal and spatial aerosol transmission from the exhalation of an infected person in an office environment <i>Sami LESTINEN, Simo KILPELÄIENE, Risto KOSONEN, Pertti PASANEN</i>
17:00 - 17:15	Roomvent 2022-2-00178	Airborne infection probability in relation of room air distribution: An experimental investigation <i>Aleksandra LIPCZYNSKA, Mariya P. BIVOLAROVA, Linxuan GUO, Wojciech KIERAT, Arsen K. MELIKOV</i>
17:15 - 17:30	Roomvent 2022-3-00047	Infection dynamics of SARS-CoV-2 in mucus layer of the human nasal cavity-nasopharynx <i>Hanyu LI, Kazuki KUGA, Kazuhide ITO</i>
17:30 - 17:45	roomvent 2022-3-00254	Influence of different air distribution on ventilation effectiveness in negative pressure hospital wards <i>Zhengrong LI, Yanbo FENG, Han ZHU, Xiwen FENG, Xueke FAN, Yize YU, Xiangyu SUN</i>
17:45 - 18:00	Roomvent 2022-3-00333	Investigation of methods regarding the effectiveness of ventilation strategies in an operating room on the removal of airborne germs using tracer particles <i>Lukas SCHUMANN, Yunus Emre CETIN, Martin KRIEGEL</i>
18:00 - 18:15	Roomvent 2022-1-00302	Assessment and mitigation of infection risk caused by a coughing person <i>Simo KILPELÄIENE, Sami LESTINEN, Risto KOSONEN</i>

SATURDAY, SEPTEMBER 17TH, 2022 16:45-18:15

Parallel Session 12 - Underground environment (4)

Chair: Zhijian LIU, Xiaoliang SHAO

Virtual room 2

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Time	Paper ID	Title
16:45 - 17:00	Roomvent 2022-4-00061	Optimization of ventilation system for a main power plant in an underground pumped storage power station <i>Chentong LEI, Desheng XU, Shan FENG, Yanfeng LI, Huimin LU</i>
17:00 - 17:15	Roomvent 2022-4-00118	Numerical simulation of bus hole ventilation in Jinghe Dongzhuang hydropower station <i>Tong REN, Zhengye WANG, Hong ZHANG, Zhengguang XU, Xiaoke CHANG, Ran GAO</i>
17:15 - 17:30	Roomvent 2022-4-00323	The evolution characteristics of soil heat storage of the sidewalls in subway stations with years <i>Xianming ZENG, Lihui WANG, Xuecheng ZOU, Liyuan YIN, Jian CHENG</i>
17:30 - 17:45	roomvent 2022-4-00361	Influence of ventilation and decentralized purification on pollutant control in urban highway tunnels without exhaust shaft <i>Dapeng HE, Zhen YUE, Yindong ZHANG, Fei XIE, Moning CHANG, Qiwei DONG, Yemin LIU, Xiaoliang SHAO, Xianting LI</i>
17:45 - 18:00	Roomvent 2022-1-00486	Are radiators ready for the challenges of the future: A review of advancements in radiators <i>Anjan Rao PUTTIGE, Kailun FENG, Weizhuo LU, Thomas OLOFSSON</i>
18:00 - 18:15	Roomvent 2022-1-00441	Phase change materials influence on temperature variation in buildings <i>Hongxia ZHOU, André ANDERSSON, Thomas OLOFSSON</i>

SATURDAY, SEPTEMBER 17TH, 2022 16:45-18:15

Workshop 3

Virtual room 3

Chair: *Shen WEI*, Co-Chair: *Song PAN*

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The impact of occupant behaviour on the energy performance of buildings

Through many years of study, the significant contribution of occupant behaviour in building performance has been well acknowledged in both academic and industrial fields. However, due to the complexity and uncertainties of occupant behaviour, there is still a long way to go, to better consider occupant behaviour in both design and operation stages. This workshop will include both research presentations and discussions that are relevant to this topic and hopefully provide guidance to future studies in this area.

Speakers	Institution	Topic
Yuanchen WANG	University of Stuttgart	Using a calibrated multi-zone building model to analyse the impact of occupant behaviour on building performance
Jiasen SONG	Shenyang Jianzhu University	Study on window-opening habit of urban residential buildings in Liaoning province
Meng LIU	Chongqing University	Classification and Analysis of User Behavior based on Action Duration in Residential Split-type Air Conditioners
Neveen HAMZA	Newcastle University	The influence of people with dementia behaviours on the environmental design of hospitals
Jihyun YOO	Hanyang University	An analysis of natural ventilation and ventilation load in relation to occupants' window opening behaviour in residential buildings
Fangning SHI	Henan Polytechnic University	Behavioral Adaptation of Different Set Point Temperature Modes in Office Buildings with Split Air Conditioners

SATURDAY, SEPTEMBER 17TH, 2022 16:45-18:15

Workshop 4

Virtual room 4

Chair: *Jian HANG*, Co-Chair: *Zhiwen LUO*

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Multi-physics of urban climate modelling and measurement

Multi-physics of urban climate modelling has the characteristics of multi-physical processes which have been and will be considered in previous and future research. An advanced understanding of multi-physic urban sciences with mechanical and thermal physical processes is significant for formulating effective technologies and policies to improve urban air quality, city ventilation and urban thermal environment, which may contribute to healthy, energy-efficient, sustainable urban climate for the future.

Speakers	Institution	Topic
Yuan CHAO	National Unviersity of Singapore	Impacts of trees-grass area ratio on thermal environment, energy saving, and carbon benefits
Yaxing DU	Sun Yat-sen University	Efficient simulation of pollutant dispersion in urban environment by recurrence CFD
Liu LIN	Guangdong University of Technology	Multi-application of Local Climate Zone scheme on block-scale urban thermal environment
Xiaoxiong XIE	University of Reading	Impact of urban climate on building natural ventilation potential in China
Liyue ZENG	Sun Yat-sen University	Impacts of urban morphology on thermal environment: understanding from traverse and scaled outdoor measurements

SUNDAY, SEPTEMBER 18TH, 2022 8:30-10:00

Parallel Session 13 - Airborne contaminants (2)

Chair: *Xinke WANG, Yong CHENG*

Virtual room 1

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Time	Paper ID	Title
8:30 - 8:45	Roomvent 2022-1-00337	Effect of outlet location on indoor air quality for stratum ventilation under heating mode <i>Jiangang LEI, Shasha GAO, Yixin LIU, Yong CHENG</i>
8:45 - 9:00	Roomvent 2022-1-00405	The gradient-boosting decision tree model can predict the concentration of PAEs in children bedroom <i>Chanjuan SUN, Qinghao WANG, Chen HUANG, Jingguang LI, Jialing ZHANG, Zhijun ZOU, Lang TIAN</i>
9:00 - 9:15	Roomvent 2022-1-00414	Study on indoor air radon measurement in a university in Shanghai <i>Haoquan NI, Minyi PAN, Yanmei YIN, Jingyu CHEN, Zhijun ZOU, Hao LI, Chanjuan SUN, Chunxiao SU</i>
9:15 - 9:30	Roomvent 2022-1-00551	Health survey of the elderly in Huizhou traditional villages <i>Mengyuan BIAN, Wenwen ZHAO, Zhijia HUANG, Zunli KOU, Heng ZHOU</i>
9:30 - 9:45	Roomvent 2022-2-00558	Numerical investigation on the effect of ventilation on the distribution of phthalate esters in the residential environment <i>Sijing WU, Lingyi KANG, Runjie LI, Xinke WANG, Xiaojun ZHOU</i>
9:45 - 10:00	Roomvent 2022-1-00560	Associations between indoor VOCs and childhood asthma in Shanghai, China: an analysis stratified by frequency of window opening during night <i>Lele ZHOU, Chen HUANG, Rongchun LU, Xueying WANG, Zhijun ZOU</i>

SUNDAY, SEPTEMBER 18TH, 2022 8:30-10:00

Parallel Session 14 - Ventilation performance (1)

Chair: Naiping GAO, Yong WANG

Virtual room 2

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Time	Paper ID	Title
8:30 - 8:45	Roomvent 2022-2-00016	Performance analysis of air curtains on indoor environment and dehumidification energy consumption in a low humidity plant <i>Yubin TANG, Qihua TAO, Jianwen ZHENG</i>
8:45 - 9:00	Roomvent 2022-2-00032	Experimental study on the robustness of ventilation system in the control of walking-induced disturbance <i>Jianlin REN, Junjie HE, Xiangfei KONG</i>
9:00 - 9:15	Roomvent 2022-2-00055	The destructive time of temperature stratification during human movement and the recovery time after the human movement in the displacement ventilation system <i>Lu FENG, Ruibin LI, Yi ZHAO, Naiping GAO</i>
9:15 - 9:30	Roomvent 2022-2-00240	Study on the thermal performance under the implement of multi-vent module-based adaptive ventilation <i>Weijia ZHANG, Weirong ZHANG, Haotian ZHANG</i>
9:30 - 9:45	Roomvent 2022-2-00297	Evaluation of the performance of ventilative cooling systems with different control parameters <i>Yan HU, Zhengtao AI, Guoqiang ZHANG</i>
9:45 - 10:00	Roomvent 2022-2-00357	Experimental and numerical study on the cooling performance of a new earth-air heat exchanger(EAHE) system with a supply air static pressure chamber <i>Qizhi YANG, Zhiru HU, Zhuo ZHOU, Yuxin ZHANG, Bin WANG, Yong WANG</i>

SUNDAY, SEPTEMBER 18TH, 2022 8:30-10:00

Parallel Session 15 – Airflow around buildings

Chair: Hongqiang MA, Bin ZHOU

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Time	Paper ID	Title
8:30 - 8:45	Roomvent 2022-2-00159	Study on wind environment of semi-open space in hot-arid and hot-humid climate zones in rural areas <i>Li AN, Haiyan YAN, Xingyi CHEN</i>
8:45 - 9:00	Roomvent 2022-2-00210	Boundary layer wind tunnel tests of outdoor airflow field around urban buildings: A review of methods and status <i>Yi ZHAO, Ruibin LI, Lu FENG, Yan WU, Naiping GAO</i>
9:00 - 9:15	Roomvent 2022-2-00579	Simulation research on airflow distribution performance of solar greenhouse heating system in northwest China <i>Zhijie CUI, Wanling HU, Yilin ZHANG, Tianxu JI, Wenlong LI, Yong GUAN</i>
9:15 - 9:30	Roomvent 2022-3-00289	Research status and control measures of air pollutants in urban areas caused by traffic sources <i>Xinlin ZHAI, Qing HUANG, Guoli MA, Bin ZHOU</i>
9:30 - 9:45	Roomvent 2022-3-00251	Configurations and exergy analysis of district heating substations with main renewable energy <i>Y.J. GAO, S.G. WANG, S. JIANG, X.Z. WU, J.H. WANG, T.F. ZHANG, Z.J. MA</i>
9:45 - 10:00	Roomvent 2022-2-00295	Numerical study on the periodicity of urban heat dome flow <i>Yan ZHANG, Yifan FAN</i>

SUNDAY, SEPTEMBER 18TH, 2022 8:30-9:45

Parallel Session 16 - Airflow measurement and visualization

Chair: *Jing LIU, Hao CAI*

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Time	Paper ID	Title
8:30 - 8:45	Roomvent 2022-1-00634	A study on the influence of different blowing systems on indoor thermal environment and air quality in underfloor air conditioning system <i>Yuki ARAO, Ryoichi KUWAHARA</i>
8:45 - 9:00	Roomvent 2022-3-00249	Mean wind velocity distribution at near-ground level obtained through field measurements <i>Jiading ZHONG, Jianlin LIU, Guoming LIANG</i>
9:00 - 9:15	Roomvent 2022-3-00466	Real-time visualization of simulated indoor aerosol dispersion based on a new markov chain model <i>Chenni ZENG, Xiong MEI, Yi YI, Changwei JIANG</i>
9:15 - 9:30	Roomvent 2022-3-00561	Improving indoor multiphysics prediction with local measurements based on data assimilation <i>Weixin QIA, Jing LIU, Ming TANG, Hu GAO</i>
9:30 - 9:45	Roomvent 2022-5-00580	A 3D source localization method based on whale optimization algorithm: Experiments for locating a time-varying source in a dynamic indoor environment <i>Yu LIAO, Jingyu LU, Hao CAI, Biao ZHANG, Fei LI, Bin ZHOU</i>

SUNDAY, SEPTEMBER 18TH, 2022 10:15-12:00

Parallel Session 17 - Airborne contaminants (3)

Chair: Junseok PARK, Jianjian WEI

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Time	Paper ID	Title
10:15 - 10:30	Roomvent 2022-1-00406	Prediction of household dust mite concentration based on machine learning algorithm <i>Chanjuan SUN, Leyang LI, Shijie HONG, Chen HUANG, Jingguang LI, Zhijun ZOU</i>
10:30 - 10:45	Roomvent 2022-2-00622	Ventilation strategies on indoor particles in day-care centers <i>Junseok PARK, Sungwon CHP, Jihyun YOO</i>
10:45 - 11:00	Roomvent 2022-1-00360	Health risk assessment of airborne bacteria and fungi in different-type buildings in Kunming, a typical temperate Chinese city <i>Shengqi WANG, Hua QIAN</i>
11:00 - 11:15	Roomvent 2022-1-00393	Development of a bioaerosol experimental system for virus stability measurement <i>Huoquan ZHU, Lei WANG, Jianjian WEI</i>
11:15 - 11:30	Roomvent 2022-1-00515	Release of bacterial aerosols from air conditioning system in office buildings <i>Huihui YANG, Xian LI, Lu QIU</i>
11:30 - 11:45	Roomvent 2022-2-00604	Simulation research on ventilation control of gaseous pollutants in urban sentry boxes <i>Yanyan LI, Haiguo YIN, Xin DENG, Linfeng LIANG, Yongchao ZHAI</i>
11:45 - 12:00	Roomvent 2022-3-00487	CFD modelling of a pulsed jet formed during an idealized isolated cough <i>Marina ZASIMOVA, Vladimir RIS, Nikolay IVANOV</i>

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Parallel Session 18 - Ventilation performance (2)


Chair: Chao SHEN, Xiuying YAN

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Time	Paper ID	Title
10:15 - 10:30	Roomvent 2022-3-00394	The effect of layout of finned tube heat exchangers in a novel cooling system of the thermal environment in data centers <i>Ye WANG, Wenke ZHENG, Yiqiang JIANG, Cheng SUN</i>
10:30 - 10:45	Roomvent 2022-3-00474	Automatic compliance check of window-to-wall ratio software embedded intelligent algorithms in revit modeling <i>Xiuying YAN, Xiudong WANG, Dawei LI, Xiulian YAN, Kaixing FAN, Dalong LIU</i>
10:45 - 11:00	Roomvent 2022-5-00247	Energy consumption baselining and benchmarking of green office <i>Ruxin YIN, Yiqun PAN, Zhiliang DING</i>
11:00 - 11:15	Roomvent 2022-5-00036	Study on the cooling energy saving potential of a novel radiative cooling paints in building application <i>Kaiyu JIANG, Kai ZHANG, Zijie SHI, Haoran LI</i>
11:15 - 11:30	Roomvent 2022-5-00287	Performance analysis of a passive mixing strategy assisted heat-pump-driven liquid-desiccant air-conditioning system <i>Jaehae LEE, Seongyong CHEON, Minseong KIM, Hyolim PARK, Jaeweon JEONG</i>
11:30 - 11:45	Roomvent 2022-5-00375	Case analysis of thermal defect detection of near-zero energy building envelope based on infrared thermography <i>Huanyu LI, Guohui FENG, Yi PU, Han WANG</i>
11:45 - 12:00	Roomvent 2022-2-00380	Comparative study on cooling performance of two PCM-assisted EAHEs and traditional EAHE <i>Tiecheng ZHOU</i>
12:00 - 12:15	Roomvent 2022-5-00617	Energy-efficient retrofitting with incomplete building information:a data-driven approach <i>Kailun FENG, Weizhuo LU, Santhan Reddy PENAKA, Erik EKLUND, Staffan ANDERSSON, Thomas OLOFSSON</i>

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Parallel Session 19 - Indoor climate (1)

Chair: Dong YANG, Xin WANG

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Time	Paper ID	Title
10:15 - 10:30	Roomvent 2022-1-00052	Correlating indoor and outdoor temperature and humidity in megacities in China <i>Mengya YANG, Hao LEI</i>
10:30 - 10:45	Roomvent 2022-1-00123	The combination of earth-to-air heat exchanger (EAHE) and phase change material (PCM) for indoor thermal environment regulation <i>Xin GUO, Haibin WEI, Dong YANG</i>
10:45 - 11:00	Roomvent 2022-1-00186	Thermal environment characteristics of large space building with stratified air conditioning based on Block-Gebhart model during the cooling season <i>Yufeng MIAO, Chen HUANG, Tong YANG, Jingsi MA, Xin WANG, Fei WANG</i>
11:00 - 11:15	Roomvent 2022-1-00381	The characteristics of indoor temperature field distribution in northern office buildings and the influencing factors <i>Xu JIN, Yue HE, Shi LIU, Zhongyan LIU, Pei LIU</i>
11:15 - 11:30	Roomvent 2022-1-00420	The characteristics of thermal environment and comfort of residential buildings during winter in hot summer and cold winter climate zone of China <i>Rong WANG, Jun LI, Jiali MA, Wei PENG</i>
11:30 - 11:45	Roomvent 2022-1-00428	Improving indoor thermal environment of residential buildings under typical heating methods in Xinjiang, China <i>Rong WANG, Jiali MA, Jun LI, Wei PENG</i>
11:45 - 12:00	Roomvent 2022-5-00600	Performance analysis of the different radiant floor cooling systems in the pfifice building in Shandong province,China <i>Mengying CUI, Meng SU, Jiyong LIU</i>

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Parallel Session 20 - Contaminant control (1)

Chair: Junjie LIU, Xiaojun MA

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Time	Paper ID	Title
10:15 - 10:30	Roomvent 2022-5-00229	Optimization research based on local exhaust of oil mist particles in cutting machine tool <i>Qinpeng MENG, Fei WANG, Qidong LI, Xin WANG, Chengjie LIN, Xudong WANG</i>
10:30 - 10:45	Roomvent 2022-1-00089	Differences of filtration performances between PTFE filter material and rGO filter material <i>Y. CUI, Y.S. FAN, X. ZHANG, H. WANG, K.X. XUE, W.K. WEI, M. LI</i>
10:45 - 11:00	Roomvent 2022-1-00410	Exploring the distribution of ultraviolet radiation intensity of parabolic reflector at different overall heights <i>Jiachen LI, Deshi CHEN, Wenda MIAO, Jianye ZHAO, Chunxiao SU</i>
11:00 - 11:15	Roomvent 2022-2-00048	Control strategy of fan filter units in cleanroom considering of the moving personnel <i>Chenjuyu LIANG, Jiaan ZHAO, Huan WANG, Xianting LI</i>
11:15 - 11:30	Roomvent 2022-2-00224	An experimental investigation on indoor air pressure performance of multi-compartment pharmacy cleanroom under local fume hood operating scenario <i>Jiujiu CHEN, Xiaojun MA, Chunwang LI</i>
11:30 - 11:45	Roomvent 2022-5-00270	Experimental study on the disinfection of microbial contamination by the microwave radiation on a typical filter coated with absorbing material <i>Yuan ZHANG, Feifei WANG, Xinhua XU</i>
11:45 - 12:00	Roomvent 2022-2-00244	Influence of the purification system of machining factories on indoor air quality <i>Yukun WANG, Zhengwei LONG, Xiong SHEN</i>

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Plenary Session

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Virtual room 1

Keynote speeches

Chaired by **John LIN**

Keynote speech 6

14:00-14:50 Sustainable and resilient ventilation systems – the way forward and the key players

Chandra SEKHAR

Keynote speech 7

14:50-15:40 Power balance model interpretation of CFD results

Shinsuke KATO

Keynote speech 8

15:40-16:30 Experimental validation and numerical optimization of finned-tube heat exchanger and air supply duct for a novel passive displacement cooling system

Poh Seng LEE

SUNDAY, SEPTEMBER 18TH, 2022 16:45-18:15

Parallel Session 21 - Ventilation performance (3)

Chair: Jianlei NIU, Eusébio CONCEIÇÃO Virtual room 1

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Time	Paper ID	Title
16:45 - 17:00	Roomvent 2022-2-00366	Energy performance of a solar greenhouse used as heat source in ventilation systems <i>Eusébio CONCEIÇÃO, M^a Inês CONCEIÇÃO, João GOMES, M^a Manuela LÚCIO, Hazim AWBI</i>
17:00 - 17:15	Roomvent 2022-1-00027	Measurement of particle removal performance for a novel design of range hood <i>Lei SHU, Lei FANG, Henning GRØNBÆK, Jacob BENDTSEN, Bjarne W. OLESEN</i>
17:15 - 17:30	Roomvent 2022-2-00431	Occupant seating optimization to reduce lighting energy consumption and improve comfort <i>Linwen LIAN, Hui XIE, Yuanyuan SONG</i>
17:30 - 17:45	Roomvent 2022-2-00497	Danish, Estonian and Finnish NZEB requirements comparison with European Commission recommendations for office buildings in Nordic and Oceanic climates <i>Raimo SIMSON, Endrik ARUMÄGI, Kirsten Engelund THOMSEN, Kim Bjarne WITTCHEN, Jarek KURNITSKI</i>
17:45 - 18:00	Roomvent 2022-2-00608	A preliminary research on the periodic characteristics of a ventilation system with fluid oscillator <i>Bing LIANG, Haidong WANG</i>
18:00 - 18:15	Roomvent 2022-3-00263	Research on the influence of ventilation mode on the condensation risk at the wall radiant terminal <i>Zhengrong LI, Wenxuan YU, Heyu WANG, Xiwen FENG</i>

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Parallel Session 22 - Occupant behavior and ventilation

Chair: Baizhan LI, Lijuan WANG

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Time	Paper ID	Title
16:45 - 17:00	Roomvent 2022-1-00139	Behavioral adaptation of different set point temperature modes in office buildings with split air conditioners <i>Fangning SHI, Haiyan YAN, Mengru DONG, Zhen SUN, Guodong YUAN, Cheng CHENG, Dongyu LU, Linxiao XIE</i>
17:00 - 17:15	Roomvent 2022-1-00336	Study on window-opening habit of urban residential buildings in Liaoning province <i>Jiasen SONG, Guohui FENG, Kailiang HUANG, Wen SUN, Yixian ZHANG</i>
17:15 - 17:30	Roomvent 2022-2-00245	Research on air-conditioning usage behavior in offices with different occupancy <i>Fei ZENG, Yiqun PAN, Huiyan DENG, Zhizhong HUANG</i>
17:30 - 17:45	Roomvent 2022-2-00334	Classification and analysis of user behavior based on action duration in residential split-type air conditioners <i>Xiaobei GU, Meng LIU</i>
17:45 - 18:00	Roomvent 2022-3-00100	Using a calibrated multi-zone building model to analyse the impact of occupant behaviour on building performance <i>Yuanchen WANG, Aini MAIXIWUER, Dirk SCHWEDE, Konstantinos STERGIAROPOULOS</i>
18:00 - 18:15	Roomvent 2022-4-00516	A review of phase change materials <i>Guohui FENG, Tianyu WANG, Na HE, Gang WANG</i>

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Workshop 5
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Chair: *Hua QIAN*, Co-Chair: *Li LIU*

The role of ventilation in controlling the transmission of respiratory pathogens through the air

The COVID-19 pandemic has changed the way people live, learn and work. People wear masks, practice social distancing, and avoid gatherings. The impact the pandemic on the economics drives find the routes of transmission, which can help us take accurate and proper methods to control it. More and more evidence show that respiratory pathogens may transmit through air, iterating the importance of ventilation. This workshop invited the young actively scholars in this field, to present their own findings and to discuss the hot issue. The more scientific definition of respiratory infection diseases and better ventilation design are pursuit.

Speakers	Institution	Topic
Hua QIAN	Southeast University	Background of the transmission of respiratory pathogens through the air
Caroline GAO	Monash University	Respiratory infection transmission risks profiling and knowledge translation
Ying WANG	Central South Hospital of China	Precautions for preventing transmission of respiratory diseases in health care facilities: COVID-19 as an example
Sasan SADRIZADEH	KTH Royal Institute of Technology	The effect of body position on the airborne transmission of respiratory aerosols
Tengfei ZHANG	Tianjin University	Infectious exposure risk when flushing toilet and using hand dryer
Guangyu CAO	Norwegian University of Science and Technology	Ventilation against airborne transmission of infectious diseases in post COVID pandemic
Li LIU	Tsinghua University	Role of ventilation and lead to discussion

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Workshop 6

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Chair: *Thomas OLOFSSON*, Co-Chair: *Hongxia ZHOU*

Phase Change materials as a strategy to improve thermal comfort and energy efficiency in buildings

Phase change materials have been studied quite long time ago, but there are still limited real application of them on buildings. As the energy crisis appear, the price of energy (fuel, for instance) keeps increasing. The study of PCMs therefore becomes quite promising. In this session, the application/effect of phase change materials (PCMs) in the building systems, including how and where to locate, the selection, the thermal characters of PCMs, etc. will be discussed. The effect of PCMs in building systems will focus on two major parts: the energy consumption and the thermal comfort. The strategy/measurement of these two topics are also welcomed if without touching PCMs. The improvement has been achieved by using PCMs and the expected future research directions will also be covered in this session.

Speakers	Institution	Topic
Hongxia ZHOU	Umeå University	Phase change materials influence on temperature variation in buildings
Dongyin NIU	Harbin Institute of Technology	Preparation of Inorganic Phase Change Materials and Its Application in Thermal Storage
Shaopeng GUO	Xi'an University of Architecture and Technology	Mobilized Thermal Energy Storage Technology
Zhipei HU	Suzhou University of Science and Technology	Simulation on the effect of fin arrangement in enhancing melting process of PCM in a rectangular unit
Anjan Rao PUTTIGE	Umeå University	Use of PCM in district heating networks
Nan ZHANG Bokai QIU	Southwest Jiaotong University	Study on the thermal performance of phase change material walls and selection strategy in underground shelters
Hui LI	Shandong Jianzhu University	Shape stabilized PCMs with high thermal conductivity via the in-situ N-doped carbon

MONDAY, SEPTEMBER 19TH, 2022 8:30-10:00

Parallel Session 23 - Contaminant control (2)

Chair: Yuesheng FAN, Jun GAO

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Time	Paper ID	Title
8:30 - 8:45	Roomvent 2022-1-00093	Filtration performance of new reduced graphene oxide air filter material against bacteria in the atmosphere during the initial stage of heating <i>Kexin XUE, Yuesheng FAN, Xin ZHANG, Huan WANG, Weikang GAN, Yong CUI, Ming LI</i>
8:45 - 9:00	Roomvent 2022-2-00107	Simulation on the effect of local exhaust ventilation in removing surgical smoke <i>Wentao WANG, Sihang JIANG, Huan WANG, Xianting LI</i>
9:00 - 9:15	Roomvent 2022-2-00311	Emission characteristics of formaldehyde from natural gas combustion and effects of hood exhaust in Chinese kitchens <i>Zihao ZHENG, Hemiao ZHANG, Hua QIAN, Jingguang LI, Cong LIU</i>
9:15 - 9:30	Roomvent 2022-2-00359	Static pressure reset control method for roof fans in centralized cooking exhaust systems <i>Yanlei YU, Jun GAO</i>
9:30 - 9:45	Roomvent 2022-2-00513	Numerical analysis on performance of different ceiling coverage of fan filter units in semiconductor fabs <i>Jiaan ZHAO, Xianting LI, Wei XU</i>
9:45 - 10:00	Roomvent 2022-1-00272	Influence of ventilation on airborne fungi in greenhouses: A case study of tomato greenhouses <i>Jing XIONG, Dingmeng WU, Ying ZHANG, Angui LI, Yicun HOU, Lin HUANG, Wenjun LEI, Linhua ZHANG, Can XIONG, Xianglin FAN, Anjing LI and Minqiang LI</i>

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Parallel Session 24 - Ventilation performance (4)

Chair: Jae-Weon JEONG, Wei YE

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Time	Paper ID	Title
8:30 - 8:45	Roomvent 2022-5-00424	Applicable design of multi-functional cascade heat pump system for an office building <i>Beomjun KIM, Hyejin CHO, Soojin LEE, Taekdon KWON, Jae-Weon JEONG</i>
8:45 - 9:00	Roomvent 2022-5-00426	The future development path of low carbon building design <i>Chang XI, Shijie CAO</i>
9:00 - 9:15	Roomvent 2022-5-00572	Thermal insulation solution for opaque envelopes through a unique classification method and a novel dynamic thermal insulation solution – Experimental study on the thermal performance of a modular thermo-activated wall <i>Sarula CHEN, Tianxin CHANG, Yang YANG</i>
9:15 - 9:30	Roomvent 2022-5-00615	Building-to-vehicle and vehicle-to-building concepts toward net zero energy building: a small solar house case study in China <i>Yingzhen HOU, Neng ZHU, Shenyang NI, Zhiyuan ZHANG</i>
9:30 - 9:45	Roomvent 2022-5-00638	A study on the economic efficiency of zero energy house and regional characteristics <i>Kouki TOKUTOMI, Ryoichi KUWAHARA</i>
9:45 - 10:00	Roomvent 2022-2-00009	Effects of multi-orifice plate with different geometric parameters on flow distribution of plenum chamber for ventilation duct systems <i>Wanqing ZHANG, Xin GAO, Angui LI</i>

MONDAY, SEPTEMBER 19TH, 2022 8:30-10:00

Parallel Session 25 - Indoor climate (2)

Chair: Xiaozhou WU, Jiying LIU

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Time	Paper ID	Title
8:30 - 8:45	Roomvent 2022-1-00549	Field study on thermal environment and adaptation of workers in winter <i>Zan XU, Haiying WANG, Baowei GE, Jiankai LI, Lin SUN</i>
8:45 - 9:00	Roomvent 2022-1-00601	Experimental study on operating characteristic for a combined radiant floor and fan coil cooling system in under low temperature and high humidity <i>Xuwei ZHU, Jing REN, Farun AN, Lina YANG, Jiying LIU</i>
9:00 - 9:15	Roomvent 2022-2-00116	Exploring the optimal return air height of different air supply modes based on energy consumption analysis and TOPSIS evaluation method <i>Jianlin REN, Shasha DUAN, Xiangfei KANG</i>
9:15 - 9:30	Roomvent 2022-2-00221	Comparison of indoor air distribution in a ceiling cooling room with different mechanical ventilation systems <i>Hao GAO, Mingming ZHAO, Jie GAO, Xiaozhou WU</i>
9:30 - 9:45	Roomvent 2022-2-00151	Assessment of thermal comfort and air quality of room conditions by impinging jet ventilation integrated with ductless personalized ventilation <i>Pengju LIU, Bin YANG</i>
9:45 - 10:00	Roomvent 2022-2-00538	Analysis on night ventilation effect of buildings with different energy consumption levels in Shenyang <i>Xiaoxu LI, Kailiang HUANG, Guohui FENG, Danyang JING, Dan LIU, Jiawei LI</i>

MONDAY, SEPTEMBER 19TH, 2022 8:30-9:45

Parallel Session 26 - Indoor climate (3)

Chair: Weirong ZHANG, Xilian LUO

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Time	Paper ID	Title
8:30 - 8:45	Roomvent 2022-2-00612	Study on vent spacing of multi-vent module-based adaptive ventilation for reducing contaminant diffusion <i>Haotian ZHANG, Weirong ZHANG, Weijia ZHANG</i>
8:45 - 9:00	Roomvent 2022-2-00625	Local environment control of the open visitor corridor within a large space exhibition hall of site museum <i>Xingyu HUANG, Xilian LUO, Bin CHANG, Zhaolin GU</i>
9:00 - 9:15	Roomvent 2022-3-00214	Actual measurement and analysis of winter thermal environment of a graduate student studio in shenyang based on Airpak numerical simulation <i>Guohui FENG, Ziqiang ZHOU, Yong HE, Jiasen SONG</i>
9:15 - 9:30	Roomvent 2022-1-00059	Real time non-invasive measurements of human thermal physiology signals and thermal comfort/discomfort poses <i>Xiaojing LI, Bin YANG</i>
9:30 - 9:45	Roomvent 2022-1-00345	Carbon dioxide generation rates and subjects'perception of IAQ of office activities under different ambient temperatures <i>Siru GAO</i>

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Parallel Session 27 - Contaminant control (3)

Chair: Huangxi FU, Ying SHENG

Virtual room 1

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Time	Paper ID	Title
10:15 - 10:30	Roomvent 2022-1-00213	Molecular simulation to analyze the effect of ultrafine particles on indoor organic gaseous pollutants removal by activated carbon <i>Ying SHENG, Mingyang WANG</i>
10:30 - 10:45	Roomvent 2022-1-00085	Performance assessment of a liquid desiccant system for formaldehyde removal based on a novel criterion <i>Jiachun HU, Lixia WEN, Xingyu WANG, Huangxi FU</i>
10:45 - 11:00	Roomvent 2022-1-00095	Study on static adsorption characteristics of a new reduced graphene oxide air filter material for volatile formaldehyde from glue <i>Weikang GAN, Yuesheng FAN, Xin ZHANG, Huan WANG, Kexin XUE, Yong CUI, Ming LI</i>
11:00 - 11:15	Roomvent 2022-1-00530	Study on indoor ozone removal by PRM under the influence of typical factors <i>Lijun JING, Jun WANG</i>
11:15 - 11:30	Roomvent 2022-1-00588	Measurement and prediction of breakthrough curve of low-concentration toluene adsorbed by activated carbon <i>Ying SHENG, Qingqing DONG, Qiang REN, Mingyang WANG</i>
11:30 - 11:45	Roomvent 2022-2-00453	The dynamic partitioning of airborne phthalates in indoor environment: Effects of ventilation <i>Subei BU, Yanling WANG, Haiyan WANG, Fang WANG, Yufei TAN</i>
11:45 - 12:00	Roomvent 2022-5-00096	Experimental study on structure and performance of dedusting filter material modified by reducing graphene oxide spraying <i>Ming LI, Yuesheng FAN, Xin ZHANG, Huan WANG, Yong CUI, Kexin XUE, Weikang GAN</i>

MONDAY, SEPTEMBER 19TH, 2022 10:15-11:45

Parallel Session 28 - Airflow simulation (1)

Chair: Tatsuhiko YAMAMOTO, Yanyu LU

Virtual room 2

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Time	Paper ID	Title
10:15 - 10:30	Roomvent 2022-2-00025	Fast fluid dynamics simulation of the airflow around a single bluff body <i>Jiejie HUANG , Ruibin LI, Zhanpeng LIU, Yi ZHAO, Lu FENG, Yan WU, Naiping GAO</i>
10:30 - 10:45	Roomvent 2022-2-00054	Analysis of convective heat transfer coefficient using shear stress-based velocity scale <i>Tatsuhiko YAMAMOTO</i>
10:45 - 11:00	Roomvent 2022-2-00106	Determination of the discharge coefficient through vent driven by a non-Boussinesq plume <i>Yang LIU, Zhongwei HUANG, Lan HUANG</i>
11:00 - 11:15	Roomvent 2022-2-00286	Prediction method of steady concentration of passive contaminant in ventilation system with air recirculation: contaminant released in the air duct <i>Yu LIU, Yemin LIU, Xiaoliang SHAO</i>
11:15 - 11:30	Roomvent 2022-2-00543	Integration of airflow zonal model and building energy simulation for large space buildings <i>Yanyu LU, Zhifu CHEN, Site HU, Jing LIU</i>
11:30 - 11:45	Roomvent 2022-3-00145	Numerical study on airflow performance and mechanical characteristics of centrifugal fan <i>Minkai BAI, Haihui TAN, Zhan LIU</i>

MONDAY, SEPTEMBER 19TH, 2022 14:30-16:15

Parallel Session 29 - Natural ventilation (2)

Chair: Qihong DENG, Yongcai LI

Virtual room 1

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Time	Paper ID	Title
14:30 - 14:45	Roomvent 2022-2-00290	Evaluation of an automatic opening window system to maintain adequate ventilation rates <i>Akane TSUTSUMI, Sihwan LEE</i>
14:45 - 15:00	Roomvent 2022-2-00300	A numerical study on natural ventilation promotion and control in experimental house with fluid diode window <i>Hong HU, Hideki KIKUMOTO, Bingchao ZHANG</i>
15:00 - 15:15	Roomvent 2022-2-00341	Preliminary study on influence of outdoor trees on natural ventilation of teaching buildings <i>Shengnan NIU, Annan WANG, Xing JIN</i>
15:15 - 15:30	Roomvent 2022-2-00374	Study on ventilation performance of inclined solar chimney coupled with indoor heat source <i>Congtong LIN, Yonggang LEI</i>
15:30 - 15:45	Roomvent 2022-2-00457	Exploration on the characteristics of natural ventilation in bedrooms and its determination method <i>Chen HUANG, Jialing ZHANG, Qinhou ZHANG, Zhijun ZOU, Lele ZHOU, Yufeng MIAO</i>
15:45 - 16:00	Roomvent 2022-2-00598	Characteristics of thermal stratification and its effects on HVAC energy consumption for an atrium building in south China <i>Baolian DAI, Yan TONG, Tao PENG, Weihao HUANG</i>
16:00 - 16:15	Roomvent 2022-1-00233	Simulation study on indoor thermal environment improvement in multi-story buildings assisted by natural ventilation <i>Yufu BAI, Ningjing ZHAO, Tianhe LONG, Yongcai LI</i>

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Parallel Session 30 - Airflow simulation (2)

Chair: Xudong YANG, Tengfei ZHANG

Virtual room 2

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Time	Paper ID	Title
14:30 - 14:45	Roomvent 2022-3-00193	Evaluation of fast fluid dynamics with different solving schemes on scalar transport equation for predicting indoor contaminant concentration <i>Pengzhi ZHOU, Haidong WANG, Yuwei DAI, Chen HUANG</i>
14:45 - 15:00	Roomvent 2022-3-00252	Numerical analysis on temporal size change of expiratory droplets by considering component variation <i>Yunchen BU, Ryoza OOKA, Hideki KIKUMOTO, Wonseok OH</i>
15:00 - 15:15	Roomvent 2022-3-00253	A model based on Markov chain for prompt prediction of the airborne gaseous pollutant transport in aircraft cabins <i>Yun WEI, Tengfei ZHANG</i>
15:15 - 15:30	Roomvent 2022-3-00296	Comparing the performance of RANS turbulence models between different cavity flow benchmarks <i>Elyas LARKERMANI, Vegardmikkelsen BJERKELI, Laurent GEORGES</i>
15:30 - 15:45	Roomvent 2022-3-00382	Predicting unsteady indoor temperature distributions by POD-DNN <i>Chenghao WEI, Ryoza OOKA, Bingchao ZHANG, Qi ZHOU</i>
15:45 - 16:00	Roomvent 2022-3-00458	CFD modeling of a self-oscillatory airflow regime in the test ventilated room with plane supply opening <i>Nikolay IVANOV, Marina ZASIMOVA, Ekaterina STEPASHEVA, Vasilisa KUDRYAVTSEVA</i>
16:00 - 16:15	Roomvent 2022-5-00197	Construction and research on the navigation condition of oil supply vessels <i>Shiding HONG, Chaokui QIN, Haifeng DAI, Xin LAI</i>

MONDAY, SEPTEMBER 19TH, 2022 14:30-16:15

Parallel Session 31 - Air distribution

Chair: Alan KABANSKI, Wei LIU

Virtual room 3

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Time	Paper ID	Title
14:30 - 14:45	Roomvent 2022-1-00051	Numerical evaluation of the performance of two air distribution systems in a generic multi-layer vertical farm <i>Luyang KANG, Twan van HOOFF</i>
14:45 - 15:00	Roomvent 2022-1-00094	Mechanisms of ventilation for overall and local airborne infection risk controls <i>Sheng ZHANG</i>
15:00 - 15:15	Roomvent 2022-1-00373	Case study of a multiple confluent jets system in a virtual chamber <i>Eusébio CONCEIÇÃO, M^a Inês CONCEIÇÃO, M^a Manuela LÚCIO, João GOMES, Hazim AWBI</i>
15:15 - 15:30	Roomvent 2022-1-00503	Plenum airflow distribution and its influence on the performance of a diffuse ceiling ventilation <i>Alan KABANSKI, Elisabet LINDEN, Too-Chukwu C. OGBUAGU, Douglas MACCUTCHEON, Torbjorn PERSSON</i>
15:30 - 15:45	Roomvent 2022-2-00012	The effects of room length on jet momentum flux <i>Wei LIU, Mats SANDBERG</i>
15:45 - 16:00	Roomvent 2022-2-00508	A case study on airflow characteristics in greenhouses with adaptive wall-based attachment ventilation <i>Ou HAN, Angui LI, Jiaxing LI</i>
16:00 - 16:15	Roomvent 2022-1-00011	Pollution and moisture infiltration effect assessment based on data-driven analysis for aircraft heritage protection <i>C. OSWALD, M. KUCHAR, J. FIŠER, M. KHOL, I. OSWALDOVÁ, G. SIMEUNOVIĆ, T. VYHLÍDAL, L. ROBBIOLO, M. BRUNET, C. MONTICELLI, A. BALBO, C. CHIAVARI, C. MARTINI, E. BERNARDI, E. GUILMINOT, J. ECHINARD</i>

MONDAY, SEPTEMBER 19TH, 2022 15:00-16:30
Workshop 7
Virtual room 4
Chair: Xiaofeng ZHENG, Co-chair: Hua ZHONG
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Updates on the research, practice and regulation in building ventilation and related

Building ventilation is becoming increasingly important to safeguard our health, safety, comfort and productivity in indoor environment, which is particularly justified by the recent COVID-19 related pandemic and constantly changing environment. To deliver a desirable indoor environment in an energy efficient manner remains a huge challenge as it needs our governments, research organisations, designers, construction industries and building users to work together to break the regulatory, technical, practical, economic and social barriers. As part of RoomVent2022, this workshop aims to bring international researchers and practitioners together to introduce relevant research developments, regulatory requirements and industry practices, and discuss potential solutions to address the challenges we face in delivering effective, efficient and climate resilient ventilations in buildings.

Speakers	Institution	Topic
Adeline MELOIS	CEREMA	Regulatory requirement of building ventilation and ductwork airtightness in France
Luke SMITH	Build Test Solutions Ltd	Low Pressure Pulse technique for measuring enclosure integrity and air change rates
Ben ROBERTS	Loughborough University	Indoor air quality and ventilation strategies during the Events Research Programme to reduce transmission of airborne disease
Yijiang WANG	China University of Mining and Technology	The impact of thermal insulation on cooling energy consumption and optimal insulation thickness for underground tunnel
Parastoo SADEGHIAN	Blueair AB	Computational fluid dynamics application in indoor air quality and health

MONDAY, SEPTEMBER 19TH, 2022 16:30-18:00

Plenary Session

Virtual room 1

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Live streaming
(September 19th,
16:30-18:00)



Bilibili

Keynote speech

Chaired by *Risto KOSONEN*

Keynote speech 9

16:30-17:20 **Quantity and grade of cooling heating load in non-uniform indoor environment**

Xianting LI

Closing session

Chaired by *Thomas OLOFSSON*

- 17:20-18:00
- From *Risto KOSONEN*, announcement of the Best Paper Awards
 - From *Angui LI*, summary & acknowledgement
 - From *Thomas OLOFSSON*, invitation from ROOMVENT 2024



Xi'an University of
Architecture and Technology



ROOMVENT 2022
Conference Xi'an

THE 16TH ROOMVENT CONFERENCE

16th-19th September, 2022, Xi'an, China

Conference Program



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