

Kansas City Conference Product Titles

Extended Abstracts

KC-19-A001

Experimental Investigation of Two-Phase Flow Heat Transfer of R410A and ZnO Nanolubricant Mixture in a Smooth Tube

Pratik S. Deokar, Student Member ASHRAE; Lorenzo Cremaschi, PhD, Member ASHRAE

KC-19-A002

Heating of Supercritical Carbon Dioxide in Small Channels

Saad A. Jajja; Jessa M. Sequeira; Brian M. Fronk, PhD, PE, Associate Member ASHRAE

KC-19-A003

Permeability and Rate-of-Rise of Additively-Manufactured Wicking Structures

Jordan A. Morrow, Student Member ASHRAE; Nhicolas Aponte; Ryan A. Huber, Student Member ASHRAE; Partha P. Chakraborty; G.A. Riley; Melanie M. Derby, Member ASHRAE

KC-19-A004

Uncertainties on Cooling Energy Based on Computational Indoor Air Modeling in Sports Facilities

Samah Ben Ayed, PhD, Associate Member ASHRAE; Donghun Kim, PhD; Jeff Borggaard, PhD; Eugene Cliff, PhD

KC-19-A005

IEQ in High-Performance Urban Elementary Schools

Emily Oldham, Associate Member ASHRAE; Hyojin Kim, PhD, Member ASHRAE

KC-19-A006

Performance of Spiral and Plain Finned-Tube Evaporator Coils for Novel Defrost System in Commercial Freezers

Mostafa H. Sharqawy, PhD, PEng; Sameh M. I. Saad, PhD; Punnoose Abraham, Student Member ASHRAE; Kazi K. Ahmed

KC-19-A007

A Review of Adaptive Thermal Comfort Implementation in International Thermal Comfort Standards

Ongun B. Kazanci, PhD, Associate Member ASHRAE; Daniel Coakley, PhD, Associate Member ASHRAE; Bjarne W. Olesen, PhD, Presidential Member, Fellow Member ASHRAE

KC-19-A008 (Withdrawn)

KC-19-A009

Investigation of a Solid Oxide Fuel Cell in a Residential Furnace During Rapid Thermal Cycling

Ryan J. Milcarek, PhD, Member ASHRAE; Mengyuan Chu; Jeongmin Ahn, PhD, Member ASHRAE

KC-19-A010

Effect of Climate Change and Extreme Weather Events on the Thermal Conditions of Canadian Multi-unit Residential Buildings

Fuad Mutasim; Baba Hua Ge, PhD, PEng, Member ASHRAE

KC-19-A011

Modeling Urban Microclimates of Extreme Weathers by Integrating City Fast Fluid Dynamics and City Building Energy Model

Liangzhu (Leon) Wang, PhD, PEng, Member ASHRAE; Ali Katal, Student Member ASHRAE; Mohammad Mortezaazadeh Dorostkar, Student Member ASHRAE

KC-19-A012

Dimensionless CFD Analysis of Reynolds Independence and Similarity in Urban and Built Environment Airflows

Liangzhu (Leon) Wang, PhD, PEng, Member ASHRAE; Chang Shu, Student Member ASHRAE

KC-19-A013

Effect of Inlet Duct Design on Fan Performance of Indoor Air Handling Unit

Md Yeam Hossain, Student Member ASHRAE; Christian Bach, PhD, Associate Member ASHRAE; Omer San, PhD, Ardiyansyah Yatim, PhD, Member ASHRAE

KC-19-A014

A Field Evaluation of the Airflow Performance of Fan-Coil Units

Dennis L. O'Neal, PhD, PE, Fellow Member ASHRAE; Peng Yin, PhD, Associate Member ASHRAE

KC-19-A015

Comparison of Hydronic Fan-Coil Unit Energy Consumption with Modulation and On-Off

Zahra Sardoueiniasab, Student Member ASHRAE; Peng Yin, PhD, Associate Member ASHRAE; Dennis O'Neal, PhD, PE, Fellow Member ASHRAE

KC-19-A016

Empirical Modeling of Variable Air Variable Water Fan Coil Units in Cooling Mode for Building Energy Calculations

Peng Yin, PhD, Associate Member ASHRAE; Tanjebul Alam, Student Member ASHRAE; Dennis O'Neal, PhD, PE, Fellow Member ASHRAE

KC-19-A017

Air Leakage Analysis in Parallel Fan-Powered Terminal Units Using EnergyPlus

Zahra Sardoueinassab, Student Member ASHRAE; Peng Yin, PhD, Associate Member ASHRAE; Dennis O'Neal, PhD, PE

KC-19-A018

Automatic Fault Detection and Diagnosis of Air Handling Unit Using an Online Machine Learning Algorithm

Majid Karami, Student Member ASHRAE; Liping Wang, Member ASHRAE

KC-19-A019

Sensitivity Analysis of Optimal Energy in Buildings to Environment Parameters

Samah Ben Ayed, PhD, Associate Member ASHRAE; Jeff Borggaard, PhD; Eugene Cliff, PhD

KC-19-A020

Methodology to Evaluate Sensitive Levels of Inputs for US Commercial Building Models

Yunyang Ye, Student Member ASHRAE; Kathryn Hinkelman, Student Member ASHRAE; Wangda Zuo, PhD, Member ASHRAE; Gang Wang, PhD, PE, Member ASHRAE

KC-19-A021

Model-Based Home Envelope Performance Evaluation: A Use Case of Data from Connected Thermostats

Junke Wang, Student Member ASHRAE; Choon Yik Tang, PhD, Li Song, PhD, PE, Member ASHRAE

KC-19-A022 (WITHDRAWN)

KC-19-A023

Solubilities and Diffusivities of HFC and HFO Refrigerants in a Synthetic Polyol Ester Lubricant Oil

Ana Rita C. Morais, PhD; Luke D. Simoni, PhD; Aaron M. Scurto, PhD; Mark B. Shiflett, PhD, PE

KC-19-A024

Investigating the Thermodynamic and Transport Properties of Hydrofluorocarbon: Ionic Liquid Mixtures with Applications Towards Refrigerant Gas Separations

David L. Minnick, PhD; Ana Rita C. Morais, PhD; Mark B. Shiflett, PhD, PE

KC-19-A025

Thermodynamic and Kinetic Analysis of Ammonia in Ionic Liquids for Absorption Refrigeration

Tugba Turnaoglu; Mark B. Shiflett, PhD, PE

KC-19-A026

Two-Objective Genetic Algorithm Optimization of Chilled Water Plant Design

Nabil Nassif, PhD, PE, Member ASHRAE; Nihal AlRaees, Student Member ASHRAE; Fouad Al Rifaie, Student Member ASHRAE

KC-19-A027

Smart Integrated Optimization Technique for Large Chilled Water Systems

Mostafa Tahmasebi, Student Member ASHRAE; Nabil Nassif, PhD, PE, Kevin Eaton; Rand Talib, Student Member ASHRAE

KC-19-A028

An Approach for Motor Efficiency with Variable Frequency Drives

Gang Wang, PhD; Zufen Wang; Zhitao Han, PhD; Li Song, PhD

KC-19-A029

The Impacts of Variable Frequency Drives on Drive System Efficiency

Zhitao Han, PhD; Zufen Wang; Gang Wang, PhD, PE, Member ASHRAE

KC-19-A030

Algorithmically Generated Chiller Performance Curves for Building Energy Simulation

Jeremy Lerond, Affiliate Member ASHRAE

KC-19-A031

Barriers to Energy Controls Delivering Real Savings

Reid Hart, PE, Member ASHRAE; Michael Rosenberg, Fellow Member ASHRAE

KC-19-A032

Enhancing Traditional Building Energy Model Calibration with Physics-Based Inverse Models

Han Li, Associate Member ASHRAE; Tianzhen Hong, PhD, PE, Member ASHRAE; Marina Sofos, PhD

KC-19-A033

Influence of Source Location and Ventilation Rates on Contaminant Dispersion Pattern in an Aircraft Cabin

James Bennett, Member ASHRAE; Veronica Dos Santos Teixeira; Yanhui Zhang; Shamia Hoque, Associate Member ASHRAE

KC-19-A034

Particle and Chemical Emissions from 3D Printers and Their Potential Health Impacts

Qian Zhang, PhD; Aika Davis, PhD; Marilyn Black, PhD, Fellow Member ASHRAE; Rodney Weber, PhD

KC-19-A035

A Study of Chemical Exposure from Consumer Products Used in Residential Environments

Aika Davis, PhD, Member ASHRAE; Debra Harris, PhD; Marilyn Black, PhD, Fellow Member ASHRAE

KC-19-A036 (WITHDRAWN)

KC-19-A037

A Desiccant Wheel Application with Condenser Water Cooling and Low-Grade Geothermal Energy in Humid Climates

Jiajun Liao, Student Member ASHRAE; David E. Claridge, PhD, PE, Fellow/Life Member ASHRAE

KC-19-A038

Real-Time Optimization of Energy Efficiency for Cold Climate Heat Pumps with Extremum Seeking Control

Wenyi Wang; Yaoyu Li, Member ASHRAE

KC-19-A039

Identifying Models of HVAC Systems Using ARIMAX

Fan Feng, Student Member ASHRAE; Zheng O'Neill, PhD, PE, Member ASHRAE

KC-19-A040

Break-Point Statistical Formulations for Whole Building Heating Hot Water Consumption Modeling

Hongxiang Fu, Student Member ASHRAE; Juan-Carlos Baltazar, PhD, PE; David E. Claridge, PhD, PE, Fellow Member ASHRAE

KC-19-A041

Inferring Occupant Counts from Wi-Fi Data through Random Forest

Zhe Wang, PhD; Tianzhen Hong, Member ASHRAE

KC-19-A042

Experimental Test Chamber for Testing Innovative PCM Building Envelope Assemblies in Full Scale Applications

Sajith Wijesuriya, Student Member ASHRAE; Paulo Cesar Tabares-Velasco, PhD, Associate Member ASHRAE

KC-19-A043

Window Enhancements in Prototype Buildings

Chitra Nambiar, Associate Member ASHRAE; Supriya Goel, Associate Member ASHRAE; Michael Rosenberg, Fellow Member ASHRAE; Jian Zhang, PhD, Member ASHRAE

Conference Papers

KC-19-C001

Development of a New Prototype Energy Model for Data Centers

Kaiyu Sun, Member ASHRAE; Tianzhen Hong, PhD, PE, Member ASHRAE; Xuan Luo

KC-19-C002

Improving Data Center and Telecommunication System HVAC Design from Lessons Learned in Retro-Commissioning

Richard Pavlak, PE, Fellow ASHRAE; Nick Pavlak, Member ASHRAE

KC-19-C003

First Steps to Maintain a Large Fleet of Building Energy Models

Daniel L. Villa, PE, Member ASHRAE; Joshua R. New, PhD, Member ASHRAE; Mark Adams, Member ASHRAE; Aaron Garrett, PhD; Gerald R. Gallegos, PE, Member ASHRAE

KC-19-C004

Simulation based Fault Impact Analysis for the Secondary School in the U.S.

Yanfei Li, Student Member ASRHAE; Zheng O'Neill, PhD, PE, Member ASHRAE

KC-19-C005

Thermodynamic Analysis of a Vortex Tube Integrated Subcritical Vapour Compression Cycle

Akhilesh Arora, PhD

KC-19-C006

Three-Dimensional Computations for Forced Convection of Air in Offset-Strip Fin Channels: Effects of Fin Offset Length

D. Shi, Student Member ASHRAE; K.-T. Lin; M.A. Jog, PhD; R.M. Manglik, PhD, Fellow ASHRAE

KC-19-C007

Personalized Thermal Demand Prediction Algorithm Based on Wrist Temperature and Heart Beat

Linhao Li; Chenlu Zhang

KC-19-C008 (WITHDRAWN)

KC-19-C009

Air Conditioner Control Strategy Based on Thermal Comfort Improvement Model

Guan-Wen Chen; Hung-Wen Lin, PhD, Member ASHRAE; Chung-Inn Yong; Deqing Moo; Yin-Chun Tsai

KC-19-C010

Study of Heat Exchanger Inlet Air Velocity Distribution for Ducted Tests in a Psychrometric Chamber

Abraham J. Lee, Student Member ASHRAE; Christian K. Bach, PhD, Associate Member ASHRAE; Craig R. Bradshaw, PhD, Member ASHRAE

KC-19-C011

Potency of Cyclic Degradation Coefficient in Characterizing Dynamic Air Conditioner Operation

Rohit Dhumane, Student Member ASHRAE; Jiazhen Ling, PhD, Associate Member ASHRAE; Vikrant Aute, PhD, Member ASHRAE; Reinhard Radermacher, PhD, Fellow ASHRAE; Allen Chad Kirkwood, Member ASHRAE; Jack Esformes, Member ASHRAE

KC-19-C012

Improvement of Unitary Equipment and Heat Exchanger Testing Methods

Md Yeam Hossain, Student Member ASHRAE; Romit Maulik; Hyunjin Park, Student Member ASHRAE; Mansoor Ahmed; Christian K. Bach, PhD, Associate Member ASHRAE; Omer San, PhD

KC-19-C013

Integrated Sizing Methodology for a hybridGEOTABS Building

Mohsen Sharifi; Rana Mahmoud; Eline Himpe, PhD; Jelle Laverge, PhD

KC-19-C014

Radiant Ceiling Panels: An Analysis of Load Shifting, Energy Use, and Comfort in a Laboratory House Setting

James Haile, PE; David Springer, Member ASHRAE

KC-19-C015

Impact of Microclimate and Macroclimate on Building Energy Consumption

Carlo Bianchi, PhD, Student Member ASHRAE; Jermy Thomas, Student Member ASHRAE; Amanda D. Smith, PhD, Associate Member ASHRAE

KC-19-C016

City-Scale High-Resolution WRF-UCM Urban Weather Predictions Compared to a Dense Network of Ground-Based Weather Station Data for Assessment of Urban Building Energy Consumption

Elham Jahani, Student Member ASHRAE; Soham Vanage, Student Member ASHRAE; David Jahn, PhD; William Gallus, PhD; Kristen Cetin, PhD, PE, Member ASHRAE

KC-19-C017

The Influence of Role Models on the Sustainability of the Engineering Profession in the UK: A Case Study

Ina Colombo, PhD; Ollie Folyan, PhD; Nike Folyan, PhD; Reneth Mckenzie-Schoetz

KC-19-C018

Examination of a Novel R410A Replacement

Kenneth Schultz, PhD, Member ASHRAE; Steve Kujak, Member ASHRAE

KC-19-C019

Performance of Displacement Ventilation for Hospital Patient Rooms with Varying Cooling Loads

Kishor Khankari, PhD, Fellow Member ASHRAE

KC-19-C020

Designing Simplified Airborne Infection Isolation Rooms to Reduce Infection Rate in Future Pandemics

Merethe C. Lind; Hannu Koskela; Bård Venås, Anders Welde Vikan; Petri Kalliomäki; Trond Thorgeir Harsem

KC-19-C021

Infectious Passenger Isolation System for Aircraft

Ian Darrah; James S. Bennett, Member ASHRAE; Byron W. Jones, Fellow Member ASHRAE; Mohammad H. Hosni, Fellow Member ASHRAE

KC-19-C022

Codes, Standards, and OSHA Regulations Impacting Occupant Health and Safety in Buildings

Stephen W. Duda, PE, HFDP, HBDP, BEAP, Fellow Member ASHRAE

KC-19-C023

A Real-Time Platform for Assessment of Chiller-Side Demand Response Strategies

Fan Feng, Student Member ASHRAE; Zhengwei Li, PhD; Zheng O'Neill, PhD, PE, Member ASHRAE

KC-19-C024

Modelling Moisture Sources Due to Air Leakage with the HAMT Extension for EnergyPlus

Florian Antretter, Member ASHRAE; Simon Pallin, PhD, Member ASHRAE

KC-19-C025

Ventilation Design Considerations for Occupant Health in Aircraft Painting Facilities Under OSHA Requirements

James S. Bennett, PhD, Member ASHRAE

KC-19-C026

Development of a Semi-Empirical Model for Predicting the Pressure Drop of Nanofiber Air Filters

Ye Bian; Li Zhang, PhD; Chun Chen, PhD, Associate Member ASHRAE

KC-19-C027

Long-term Monitoring and Simulation of a Vertical Closed-Loop Ground Source Heat Pump System Used in the Cold Climate of the U.S.

Rui Miao, Student Member ASHRAE; Yao Yu, PhD, Associate Member ASHRAE; Xiaou Hu, Student Member ASHRAE; Todd Sirotiak, PhD, PE

KC-19-C028

Design and Construction of a Geothermal CO₂ Air Conditioner

Paul Kalinowski, Associate Member ASHRAE; Dennis Nasuta, Associate Member ASHRAE; Cara Martin, BEMP, Associate Member ASHRAE

KC-19-C029

Machine-Learning in a Model Predictive Controller for the Management of Domestic Hot Water Systems

Louis-Gabriel Maltais, Student Member ASHRAE; Louis Gosselin, PEng, PhD, Member ASHRAE

KC-19-C030

Bio-Sensing and Reinforcement Learning Approaches for Occupant-Centric Control

Chenlu Zhang; Zhiang Zhang; Vivian Loftness

KC-19-C031

Defining Typical Occupancy Schedules and Behaviors in Residential Buildings Using the American Time Use Survey

Debrudra Mitra, Student Member ASHRAE; Yiyi Chu, Student Member ASHRAE; Nicholas Steinmetz, Student Member ASHRAE; Kristen Cetin, PhD, PE, Member ASHRAE; Paul Kremer, Associate Member ASHRAE; Jayde Lovejoy, Student Member ASHRAE

KC-19-C032

Data-Driven Leakage Detection in Air-Handling Units on a University Campus

Megan K. McHugh, Student Member ASHRAE; Travis Isakson, PE; Zoltan Nagy, PhD, Member ASHRAE

KC-19-C033

An Interactive Building Control for the Integrative HVAC System Featuring Personalized Cooling in Office Buildings

Siliang Lu, PhD, Student Member ASHRAE; Erica Cochran Hameen, PhD; Yue Zou, PhD, Member ASHRAE

KC-19-C034

Using Text Analytics on Operator Logbooks for Performance Benchmarking: A Case Study

Saptak Dutta, Student Member ASHRAE; Burak Gunay, PhD, Member ASHRAE; Scott Bucking, PhD, Member ASHRAE

KC-19-C035

Model Predictive Control of Cool Thermal Energy Storage Under Different Electricity Rate Structures

Amy Van Asselt, PhD, Associate Member ASHRAE

KC-19-C036

Modeling and Analysis of Compact Evacuated Tube with PCM for a Tank-Less Solar Water Heating System

Mohamed Osman; Mohamed Abokersh; Omar Huzayyin, PhD, Member ASHRAE; Mohamed Elmorsi, PhD, Member ASHRAE

KC-19-C037

Best Practices for Full-Scale Testing and Energy Savings, Daylighting and Visual Comfort Evaluation of Dynamic Shading

Niraj Kunwar, Student Member ASHRAE; Kristen S Cetin, PhD, PE, Member ASHRAE; Ulrike Passe, Associate Member ASHRAE

KC-19-C038

Occupant Window Usage and Cooling Energy Consumption: A Case Study

Jayson Bursill, Student Member ASHRAE; William O'Brien, PhD, Associate Member ASHRAE; Ian Beausoleil-Morrison, PhD, PEng, Member ASHRAE

KC-19-C039

Unmanned Aerial Vehicles Application in Building Envelope Thermal Energy Assessment in Saudi Arabia

Ayman Youssef, PE, Member ASHRAE; Ahmed Alawfi; Faisal Al Musa; Muhammad Elias

Technical Papers

KC-19-001

Uncertainty Analysis of a Numerical Performance Model for an Inflatable Fabric Evaporative Cooling Tower

S. Duong; R. Craven; S. Garner; S. Idem, PhD, Member ASHRAE

KC-19-002

Achieving Health and Comfort in High-Rise Residential Buildings by Using a Dynamic-Hybrid Air Permeable Ceiling (DHAPC)

Mohd Firrdhaus Mohd Sahabuddin, Student Member ASHRAE; Cristina Gonzalez-Longo, PhD

KC-19-003

Fire Hazard Analysis of Energy-Saving, High-Volume Low-Speed (HVLS) Fan Systems in Large Spaces

Xiaolei Chen, PhD; Frank Wang, PE

KC-19-004

Analysis on Applicability and Feasibility of Popularizing the Naphthalene Sublimation Technique in Island-Reef Areas

Y.P. Cui; J.C. Xie, PhD; P. Xue, PhD; J.P. Wang

KC-19-005

Load Forecasting and Equipment Sequencing in a Central Heating and Cooling Plant: A Case Study

H. Burak Gunay, PhD, Member ASHRAE; Araz Ashouri, PhD; Weiming Shen, PhD, PEng

KC-19-006

A Preliminary Analysis on the Use of Low-Cost Data Streams for Occupant-Count Estimation

H. Burak Gunay, PhD, Member ASHRAE; Araz Ashouri, PhD; Weiming Shen, PhD, PEng; Guy Newsham, PhD; William O'Brien, PhD, PEng, Associate Member ASHRAE

KC-19-007 (RP-1766)

Development of a Unified Tool for Analysis of Room Loads and Conditions

Charles S. Barnaby, BEMP, Fellow/Life Member ASHRAE; Peter Simmonds, PhD, Fellow Member ASHRAE

KC-19-008

A New Algorithm to Measure the Convergence of PSO with an Application to Hydronic Design in Buildings

Ramiro H. Bravo PhD, PE, Member ASHRAE; Forrest W. Flocker, PhD, PE

KC-19-009

Performance Evaluation of a Three-Fluid Liquid Desiccant Membrane Air-Conditioning System

Devin Storle, Associate Member ASHRAE; Mohamed R.H. Abdel-Salam, PhD, PEng, LEED GA, Member ASHRAE; Carey J. Simonson, PhD, PEng, Fellow Member ASHRAE

KC-19-010

Geothermal Heat Pumps—Simply Efficient

Lisa Meline, PE, Member ASHRAE; Steve Kavanaugh, PhD, Fellow/Life Member ASHRAE

KC-19-011

Chronological Variations in ASHRAE Handbook Refrigerant Thermodynamic and Transport Properties from 1981 to 2017

Paul H. Nagy, Student Member ASHRAE; Michael B. Pate, Life Member ASHRAE