



2014 ASHRAE/IBPSA-USA Building Simulation Conference
September 10-12, 2014
Atlanta Marriott Buckhead
Atlanta, GA

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Wednesday, September 10

Wednesday, September 10, 7:00 AM-8:00 AM
Breakfast

Wednesday, September 10, 7:30 AM-8:00 AM
Vendor Demonstration: IES

Wednesday, September 10, 8:15 AM-9:15 AM

Welcome Remarks and Keynote Address

Chair: Dennis Knight, P.E., Member, Whole Building Systems, LLC, Charleston, SC

BIM to SIM: Trends in Buildings, Technologies and Tools

Drury Crawley, Ph.D., Fellow ASHRAE, Bentley Systems, Inc., Washington, DC

Wednesday, September 10, 9:15 AM-10:45 AM
Lighting and Daylighting 1

The Ever Changing Sky – BIM Model in Daylighting Study

Yun-Shang Chiou, Ph.D. and Pei-Chung Huang, National Taiwan University of Science and Technology, Taipei, Taiwan

Comparison of Integrated Simulation Tools for LEED V4 Daylight Credit Assessment

Ahoo Malekafzali Ardakan, Ph.D.¹, Ladan Ghobad, Ph.D.² and Jianxin Hu, Ph.D.¹, (1)North Carolina State University, Raleigh, NC, (2)Interface Engineering, Washington D.C., DC

Complex Geometry Facades in Building Energy Simulations and Standards

Won Hee Ko, Buro Happold, Los Angeles, CA

Wednesday, September 10, 9:15 AM-10:45 AM
Modeling and Algorithm Advances

Towards Standardized Building Properties Template Files for Early Design Energy Model Generation

Timur Dogan, Student Member, Carlos Cerezo Davila and Christoph F. Reinhart, Dr.Eng., Massachusetts Institute of Technology, Cambridge, MA

Reducing Energyplus Run Time for Code Compliance Tools

Rahul A. Athalye, Associate Member¹, Krishnan Gowri, Ph.D., Member², Robert W. Schultz¹ and Jason Glazer, P.E., Member³, (1)Pacific Northwest National Laboratory, Richland, WA, (2)Pacific Northwest National Laboratory, Seattle, WA, (3)GARD Analytics, Inc., Arlington Heights, IL

Using the BEopt Automated Residential Simulation Test Suite to Enable Comparative Analysis Between Energy Simulation Engines

Paulo Cesar Tabares-Velasco, Ph.D., Associate Member, Jeff Maquire, Scott Horowitz and Craig Christensen, National Renewable Energy Laboratory, Golden, CO

Wednesday, September 10, 9:15 AM-10:45 AM
BIM in the Cloud 1

Cloud Simulation for Data Driven Design at SOM

Matthew Shaxted, Affiliate¹, Jason Kirkpatrick, Associate Member², Jon Sargent, Affiliate², Sebastian Claussnitzer, Affiliate³ and Arpan Bakshi, Affiliate³, (1)Skidmore Owings & Merrill LLP, Chicago, IL, (2)Skidmore Owings & Merrill LLP, San Francisco, CA, (3)Skidmore, Owings & Merrill LLP (SOM), New York, NY

Daylighting in the Cloud: Fast, Seamless, Managed (Day)Lighting Analysis for Architects

R David Scheer, Member, Autodesk, SF, CA

Glazing in the Cloud

Susan Reilly, Member, Group14 Engineering, Inc., Denver, CO

Wednesday, September 10, 9:15 AM-10:45 AM
Codes and Rating Systems 1

Mechanical Calculations and Code Compliance with Revit

Ionel Petrus, P.E., Associate Member and Daniel McGee, Associate Member, SmithGroupJJR, Washington, DC

Modeling, Benchmarking and Validating Performance: Why Energy Should be a Secondary Concern

Ruairi Barnwell, Member and Shona O Dea, Member, DLR Group, Chicago, IL

The Cold Truth about Modeling Thermostats and Behavior

Bryan Urban, Fraunhofer Institute, Boston, MA

Wednesday, September 10, 10:45 AM-11:15 AM
Break

Wednesday, September 10, 11:15 AM-12:15 PM
Combined Use of Multiple Tools

Linking Simulation Programs, Advanced Control and FDD Algorithms with a Building Management System Based on the Functional Mock-up Interface and the Building Automation Java Architecture Standards

Thierry Stephane Nouidui, Ph.D. and Michael Wetter, Ph.D., Member, Lawrence Berkeley National Laboratory, Berkeley, CA

Coupled Simulation of Indoor Environment, HVAC and Control System By Using Fast Fluid Dynamics and the Modelica Buildings Library

Wangda Zuo, Ph.D., Member¹, Michael Wetter, Ph.D., Member², Dan Li¹, Mingang Jin, Student Member³ and Qingyan Chen, Ph.D., Fellow ASHRAE³, (1)University of Miami, Coral Gables, FL, (2)Lawrence Berkeley National Laboratory, Berkeley, CA, (3)Purdue University, West Lafayette, IN

Wednesday, September 10, 11:15 AM-12:15 PM
Modeling for Controls

Development of Control Benefit Evaluation Tool for Small Commercial Buildings

Donghun Kim¹, Eugene M Cliff, Ph.D.², James Braun, Ph.D., Fellow ASHRAE¹ and Jeff Borggaard, Ph.D.², (1)Purdue University, West Lafayette, IN, (2)Virginia Tech, Blacksburg, VA

Adaptive and Predictive Control of Thermally Activated Building Systems

Martin Schmelas, M.D., Thomas Feldmann and Elmar Bollin, Offenburg University of Applied Sciences, Offenburg, Germany

Wednesday, September 10, 11:15 AM-12:15 PM
BIM in the Cloud 2

Advanced Analysis of Complex Energy Systems Using Parametric Building Energy Models

Scott Duncan, Ph.D., Linyu Zhang, Yongchang Li, Ph.D., Michael Balchanos, Ph.D., Kisun Song and Juhyun Kim, Georgia Institute of Technology, Atlanta, GA

Commercial Model-Predictive Control through Cloud Computing: The Performance-Price Tradeoff

Peter May-Ostendorp, Ph.D., Associate Member¹, Sandro Plamp¹ and Gregor Henze, Ph.D., P.E., Member², (1)QCoefficient, Chicago, IL, (2)University of Colorado, Boulder, CO

Wednesday, September 10, 12:15 PM-1:30 PM

Lunch

Wednesday, September 10, 1:00 PM-1:30 PM

Vendor Demonstration: DesignBuilder USA

Wednesday, September 10, 1:45 PM-3:00 PM

Cloud Computing

Scaling Building Energy Modeling Horizontally in the Cloud with Openstudio

Nicholas L. Long, Member, Brian L. Ball, Ph.D., Katherine A. Fleming, Ph.D. and Daniel L. Macumber, Member, National Renewable Energy Laboratory, Golden, CO

A Graphical Tool for Cloud-Based Building Energy Simulation

Daniel L. Macumber, Member, Brian L. Ball, Ph.D. and Nicholas L. Long, Member, National Renewable Energy Laboratory, Golden, CO

Challenges, Limitations, and Success of Cloud Computing for Parallel Simulation of Multiple Scenario and Co-Simulation

Livio Mazzarella, Ph.D., P.E., Martina Pasini, Ph.D. and Narges Shahmandi Hoonejan, P.Eng., Politecnico di Milano, Milano, Italy

Wednesday, September 10, 1:45 PM-3:00 PM

Lighting and Daylighting 2

A Radiance-Based Building Energy Model to Evaluate the Performance of Complex Fenestration Systems

Bruno Bueno, Dr.Ing., Elena Guidolin, Jan Wienold, Dr.Ing. and Tilmann E. Kuhn, Fraunhofer ISE, Freiburg, Germany

Irradiance Caching for Global Illumination Calculation on Graphics Hardware

Nathaniel L. Jones and Christoph F. Reinhart, Dr.Ing., Massachusetts Institute of Technology, Cambridge, MA

Wednesday, September 10, 1:45 PM-3:00 PM
Life Cycle Cost Analysis 1

Energy Simulation for Future Weather Extremes

Tristan Truyens, P.Eng., Associate Member, DIALOG, Toronto, ON, Canada

The Impacts of Duct Design on Life Cycle Costs of Central Residential Heating and Air-Conditioning Systems

Brent Stephens, Ph.D., Associate Member, Illinois Institute of Technology, Chicago, IL

Wednesday, September 10, 1:45 PM-3:00 PM
Codes and Rating Systems 2

Automated Compliance Modeling - California and Beyond

Dimitri Contoyannis, P.E., Member, Architectural Energy Corp, San Francisco, CA

Overview of 2013 California Residential Title 24 Compliance Software

Charles S. Barnaby, Member, Wrightsoft Corp., Lexington, MA

Wednesday, September 10, 3:00 PM-3:30 PM
Break

Wednesday, September 10, 3:30 PM-5:00 PM
BIM and Airflow

Room: Suwanee

Automated CFD Simulation System with BIM for Green Mark Certification

Nari Yoon, Associate Member, Nobuyuki Oshitani and Yuya Andz, Cradle North America, Beavercreek, OH

BIM-Based Processes and Standardized Information Exchanges for Multizone Airflow Analysis

Sanghoon Lee, Ph.D, Jason W. DeGraw, Ph.D., Member, William P. Bahnfleth, Ph.D., P.E., Fellow ASHRAE, Robert M. Leicht, Ph.D. and John I. Messner, Ph.D., The Pennsylvania State University, University Park, PA

Wednesday, September 10, 3:30 PM-5:00 PM
Fault Detection and Diagnosis

Room: Buckhead B

An FMI-based Toolchain for the Adoption of Model-based FDD

Marco Bonvini, Ph.D., Michael Wetter, Ph.D., Member and Michael D. Sohn, Ph.D., P.E., Lawrence Berkeley National Laboratory, Berkeley, CA

Tools for Evaluating Air Flow Network of Dual Duct Double Fan Systems

Shokouh Pourarian, Ph.D.¹, Jin Wen, Ph.D., Member¹, Xiwang Li, Student Member¹, Daniel Veronica, Member², Xiaohui (Joe) Zhou³ and Ran Liu, Ph.D., Student Member⁴, (1)Drexel University, Philadelphia, PA, (2)National Institute of Standards and Technology (NIST), Gaithersburg, MD, (3)Iowa Energy Center, Ames, IA, (4)Iowa Energy Center, Ankeny, IA

Wednesday, September 10, 3:30 PM-5:00 PM

Design Firms 1

Room: Heritage AB

BIM Integration Best Practices for Today's Engineering Firm

David Butts, Gannett Fleming, Raleigh, NC

Change in an Engineering Firm: It Really Happened

Mark Mergenschroer, TME, Inc, Little Rock, AR

Integrated Workflow of Building Information Modeling (BIM) Software with Building Energy Modeling Simulation

Nick Gmitter, P.E., Associate Member and David Quirk, P.E., Member, DLB Associates, Eatontown, NJ

Integrating Building Simulation and the Design Process

Brendan Hall, P.E., Member, Ben Arnett, Associate Member, Emy McGann and Dennis Wessel, P.E., Karpinski Engineering, Cleveland, OH

Wednesday, September 10, 3:30 PM-5:00 PM

Design Firms 2

Room: Buchead A

Laboratory Systems: Impact of Functional, Operational and Climatic Parameters (Paper)

Shreshth Nagpal, Member and Jagan Pillai, Associate Member, Atelier Ten, New York, NY

Comparing Methods for Modeling VRF Systems

Bryce K. Cox, P.E., Member, CH2M HILL, Corvallis, OR

The Impact of Occupancy Behavior on Energy Consumption in Low Income Residential Buildings

Bing Dong, Ph.D., Member, The University of Texas at San Antonio, San Antonio, TX

The Design of Natural Ventilation Strategies of an Office Tower through Simulation

Emir A. Pekdemir, Associate Member and Matthew Herman, Buro Happold, Chicago, IL

Wednesday, September 10, 5:00 PM-5:30 PM

Vendor Demonstration: Trane

Room: Heritage C

Thursday, September 11

Thursday, September 11, 7:00 AM-8:00 AM

Breakfast

For Hotel Guests: Lennox Dining Room in the Lobby; For Non-Guests: Heritage Pre-Function in Conference Center

Thursday, September 11, 7:30 AM-8:00 AM

Vendor Demonstration: Carrier Corporation

Room: Heritage C

Thursday, September 11, 8:15 AM-8:45 AM

KEYNOTE

Cloud-based BIM to BEM for Early Design

Room: Heritage AB

Krishnan Gowri, Ph.D., Member, Autodesk, Tukwila, WA

Energy modeling in early design stages is the key to getting architects involved in the critical decision making stages for energy efficiency building design. But several challenges remain in the creation of models, multiple simulations for parametric analysis and data visualization for design decision making. This keynote will highlight the recent breakthrough for energy analytical model development during conceptual design, cloud-based parallel simulations for parametric analysis and new energy dashboard visualization techniques for customized review of analytical results. These advancements provide a vision for evolutionary energy model development that can originate from early design BIM which can be updated and used throughout the building life cycle.

Thursday, September 11, 9:00 AM-10:30 AM

Calibration 1

Room: Buckhead A

An Energyplus Whole Building Energy Model Calibration Method for Office Buildings Using Occupant Behavior Data Mining and Empirical Data

Khee Poh Lam, Ph.D.¹, Jie Zhao¹, B. Erik Ydstie¹, Jason Wirick², Meiwei Qi³ and Jihyun Park¹, (1)Carnegie Mellon University, Pittsburgh, PA, (2)Phipps Conservatory and Botany Garden, Pittsburgh, PA, (3)Tsinghua University, Beijing, China

Post-Occupancy Evaluation and Partial-Calibration of 18 Design-Phase Energy Models

Holly W. Samuelson¹, Arash Ghorayshi, P.Eng.² and Christoph F. Reinhart, Dr.Eng.³, (1)Harvard University Graduate School of Design, Cambridge, MA, (2)MMM Group Ltd., formerly Enermodal Engineering, Kitchener, ON, Canada, (3)MIT, Cambridge, MA

Is Monthly and Whole Building Level Calibration Enough? : A Detailed Modeling and Calibration Study of an Ultra-Efficient Occupancy Simulated House

Piljae Im, Ph.D., Member and Mahabir Bhandari, Member, Oak Ridge National Laboratory, Oak Ridge, TN

Spreadsheet Tool Development for Visualizing Building Performance and Simulation Data to Help Calibrating Models

Simon Sansregret, M.D., Member and Karine Lavigne, Hydro-Quebec, Shawinigan, QC, Canada

Thursday, September 11, 9:00 AM-10:30 AM

Uncertainty, Assumptions and Sensitivity

Room: Suwanee

Sizing HVAC Systems Under Uncertainty

Yuming Sun, Ph.D., Student Member, Li Gu, C. F. Jeff Wu and Godfried Augenbroe, Georgia Institute of Technology, Atlanta, GA

Impact of Modeler Decisions on Simulation Results

Pamela Berkeley¹, Philip Haves, Ph.D., Fellow ASHRAE² and Erik Kolderup, P.E., Member³, (1)University of California, Berkeley, Berkeley, CA, (2)Lawrence Berkeley National Laboratory, Berkeley, CA, (3)Kolderup Consulting, San Francisco, CA

Right-Sizing a Residential Photovoltaic System Under the Influence of Demand Response Programs and in the Presence of System Uncertainties

Yuna Zhang and Godfried Augenbroe, Georgia Institute of Technology, Atlanta, GA

The Impact of Default Assumptions from Simulation Protocols on Predicted Energy Consumption in Office Buildings in Australia

Daniel Daly, Paul Cooper and Zhenjun Ma, University of Wollongong, Wollongong, Australia

Thursday, September 11, 9:00 AM-10:30 AM

Urban Scale Modeling

Room: Buckhead B

Campus-Wide Integrated Building Energy Simulation

Willy Bernal, Ph.D., Truong Nghiem, Dr.Ing., Madhur Behl, Ph.D. and Rahul Mangharam, Dr.Ing., University of Pennsylvania, Philadelphia, PA

Urban Energy Modeling: GIS as an Alternative to BIM

Praveen Sehrawat and Karen Kensek, University of Southern California, Los Angeles, CA

Urban Scale Modelling – How Generalised Models CAN Help Communities Half Their Energy Use in 30 YEARS

Annie Marston, Ph.D.¹, Peter Garforth², Oliver Baumann¹ and Gerd Fleischhammer³, (1)Ebert and Baumann Consulting Engineers Inc., Washington, DC, (2)Garforth International, Toldeo, OH, (3)Ingenieurbüro GF LLC, Nußloch, Germany

Site-Level Energy Monitoring and Analysis using Koopman Operator Methods

Michael Georgescu, Student Member and Igor Mezic, Ph.D., University of California, Santa Barbara, Santa Barbara, CA

Thursday, September 11, 9:00-10:30 AM

Modeling Tools Market-Reality Session 1: Design Workflow

Room: Heritage AB

Major modeling and simulation vendors participate in an all-day session to explain and answer questions about their software's capabilities. Specific questions are posed to the vendors, who provide their answers and then answer questions from the audience. Confirmed vendors are: Autodesk, Carrier, EnergyPlus, eQuest, IES, OpenStudio, Sefaira, Trane and TRNSYS.

Thursday, September 11, 10:30 AM-10:45 AM

Break

Thursday, September 11, 10:45 AM-12:00 PM

Calibration 2

Room: Buckhead B

A Novel Calibration Methodology for Heating Coil Models Using Real Data and Modelica Models

Jesús Febres, Raymond Sterling and Marcus M. Keane, National University of Ireland, Galway, Ireland

Calibration of an Energyplus Simulation of a Phase Change Material Product using Experimental Test Cell Data

Nathan Brown, Santosh Philip, Ibone Santiago Trojaola, Susan Ubbelohde and George Loisos, Loisos + Ubbelohde, Alameda, CA

A Guide to Bayesian Calibration of Building Energy Models

Matthew Riddle, Ph.D. and Ralph T. Muehleisen, Ph.D., P.E., Member¹, Argonne National Laboratory, Lemont, IL

Thursday, September 11, 10:45 AM-12:00 PM

Optimization

Room: Suwanee

Early Design Analysis Using Optimization Techniques in Design/Practice

Sukreet Singh¹ and Karen M. Kensek², (1)Cunningham Group Architecture Inc, Denver, CO, (2)University of Southern California, Los Angeles, CA

Performance Based Architectural Design Optimization: Automated 3D SPACE Layout using Simulated Annealing

Hwang Yi and Yun Kyu Yi, Ph.D., University of Pennsylvania, Philadelphia, PA

Optimization of the Water-Cooled Chiller Plant System Operation

Sen Huang and Wangda Zuo, Ph.D., Member, University of Miami, Coral Gables, FL

Thursday, September 11, 10:45 AM-12:00 PM

Uncertainty Analysis of Building Energy Retrofit Assessments

Room: Buckhead A

Chair: Ellen Franconi, Ph.D., Member, Rocky Mountain Institute, Boulder, CO; Godfried Augenbroe, Georgia Institute of Technology, Atlanta, GA

The session brings three invited speakers together to share their work that considers energy savings uncertainty as part of efficiency opportunity assessments in existing buildings. The presentations outline assessment methods that incorporate uncertainty analysis and address its ramifications on investment decision-making. The session will conclude with a 15-minute Q&A discussion about UA and its application in today's market.

Incorporating Uncertainty Analysis into a Building Retrofit Analysis Using Openstudio and Energyplus

Hayes Zirnhelt, Rocky Mountain Institute, Boulder, CO

A Methodology for Transparent Risk Assessment of Energy Efficiency Investments

Qinpeng Wang and Benjamin Lee, Georgia Institute of Technology, Atlanta, GA

Case Study of Retrofit Application in High Rise Apartments: Investment Decisions Under Uncertainty

Paola Sanguinetti, University of Kansas, Lawrence, KS

Thursday, September 11, 10:45 AM-12:00 PM

Modeling Tools Market-Reality Session 2: Code and Rating Documentation

Room: Heritage AB

Thursday, September 11, 12:00 PM-1:15 PM

Lunch

Room: Lennox Dining Rooming (Hotel Lobby)

Thursday, September 11, 1:00 PM-1:30 PM

Vendor Demonstration: Sefaira

Room: Heritage C

Thursday, September 11, 1:30 PM-3:00 PM

Energy Efficiency / Modeling and Algorithm Advances

Room: Buckhead B

An Improved Method of Modeling Infiltration in Commercial Building Energy Models

Lisa C. Ng, Ph.D., Associate Member, Steven J. Emmerich, Member and Andrew K. Persily, Ph.D., Member, National Institute of Standards and Technology, Gaithersburg, MD

Development of a Simplified Model of the Switchable Exhaust Air Insulation Window

Chong Zhang, Jinbo Wang, Xinhua Xu and Jing Kang, Huazhong University of Science & Technology, Wuhan, China

Inverse Modeling to Estimate the Effective Leakage Area in Buildings

Te Qi, Member¹, Zheng O'Neill, Ph.D., P.E., Member² and Godfried Augenbroe³, (1)The Beck Group, Dallas, TX, (2)United Technologies Research Center, East Hartford, CT, (3)Georgia Institute of Technology, Atlanta, GA

Thursday, September 11, 1:30 PM-3:00 PM

Retrofits

Room: Suwanee

BIM-Extracted Energyplus Model Calibration for Retrofit Analysis of a Historically Listed Building in Switzerland

Clayton Miller, Associate Member, Daren Thomas, Silvia Domingo Irigoyen, Christian Hersberger, Zoltan Nagy, Ph.D., Dino Rossi and Arno Schlueter, Ph.D., ETH Zürich, Zürich, Switzerland

Design and Modeling Strategies for Retrofit to Natural Ventilation

Santosh Philip, Abe Shameson, Nathan Brown, George Loisos and Susan Ubbelohde, Loisos + Ubbelohde, Alameda, CA

Evaluating Energy Efficiency Retrofits in Multifamily Housing

Piljae Im, Ph.D., Member and Mini Malhotra, Ph.D., Associate Member, Oak Ridge National Laboratory, Oak Ridge, TN

An Overview of the Web-Based Integration of Energy, Daylight, and Airflow Simulations to Facilitate Implementation of Energy Efficiency Measures

Mohammad Heidarinejad¹, Matthew Dahlhausen, Student Member¹, Joshua R. Wentz², Jin Bin Li¹, Mujing Wang¹, Ying Sun¹, Nicholas Mattise¹, Craig Casey¹, Jelena Srebric, Ph.D., Member¹ and Richard Mistrick, Ph.D., P.E.¹, (1)The Pennsylvania State University, University Park, PA, (2)Energy Efficient Buildings HUB (EEB HUB), Philadelphia, PA

Thursday, September 11, 1:30 PM-3:00 PM

Life Cycle Cost Analysis 2

Room: Buckhead A

Applying Monte Carlo Methods to Life Cycle Cost Analysis for ESPC Projects

Anthony Sclafani, P.E., Associate Member, Apollo Solutions Group, Portland, OR

Minimizing Risks of Energy Modeling to Life Cycle Costs

Scott W. Walters, P.E., Member, AMEC Environment & Infrastructure Inc., Kennesaw, GA

Verifying Savings: Model Projections Vs Measured Performance in a Large Scale Incentive Program

Maria Karpman, Member¹, Eric Readdy² and Valentina Rozanova, P.E.², (1)Karpman Consulting, Glastonbury, CT, (2)TRC, New York, NY

Thursday, September 11, 1:30-3:00 PM

Modeling Tools Market-Reality Session 3: Net-Zero and Low Energy Design

Room: Heritage AB

Thursday, September 11, 3:00 PM-3:30 PM
Break

Thursday, September 11, 3:30 PM-5:00 PM
HVAC Component Modeling: Heat Pumps / Heat Exchangers / CHP

Room: Suwanee

Energy Modeling of a Combined Cooling, Heating and Power Plant Using the Evergreen Building Energy Simulation Tool

Xin Hu, Ph.D., P.E., Member¹, Xiang Liu, Ph.D.² and Liangcai Tan, Ph.D., P.E., Member³, (1)PG&E Company, San Francisco, CA, (2)Nexant, San Francisco, CA, (3)HDR Architecture Inc., San Francisco, CA

Potential of Decentralized Heat Pumps to Improve the Financial Viability of a Solar District Heating System with Seasonal Thermal Storage

Mathilde Krebs, Humberto Quintana and Michaël Kummert, Polytechnique Montreal, Montreal, QC, Canada

Simulation Modeling of Earth-to-Air Heat Exchanger (Buried Pipe) for the Performance Analysis of a School Building in Mid-Atlantic Region

Sedighehsadat Mirianhosseinabadi¹, Soolyeon Cho, Ph.D., Member¹, Eun Chul Kang² and Euy-Joon Lee, Ph.D.², (1)North Carolina State University, Raleigh, NC, (2)Korea Institute of Energy Research, Daejeon, South Korea

Thursday, September 11, 3:30 PM-5:00 PM
State of the Art BIM 1

Room: Buckhead B

Simulation and Optimization of a Multiple-Building Campus Loop with Ground Coupled HVAC System

Shane R. Mason, P.E., Member, Greensleeves LLC, Findlay, OH

Standards Data Dictionary - Extended Xml for Modeling

Roger Hedrick, Member, Architectural Energy Corporation, Boulder, CO

Thursday, September 11, 3:30-5:00 PM
Modeling Tools Market-Reality Session 4: Existing Building Applications

Room: Heritage AB

Vendor Demonstration: BUILDlab

Room: Heritage C

Thursday, September 11, 6:00 PM-7:00 PM
Reception

Room: Buckhead A and Heritage Pre-Function

Thursday, September 11, 7:00 PM-9:00 PM
Dinner and Awards

Room: Heritage AB

Friday, September 12

Friday, September 12, 7:00 AM-8:00 AM

Breakfast

For Hotel Guests: Lennox Dining Room (Hotel Lobby), For Non-Guests Heritage Prefunction in Conference Center

Friday September 12, 7:30 AM-8:00 AM

Vendor Demonstration: Cradle North America, Inc.

Room: Heritage C

Friday, September 12, 8:15 AM-10:00 AM

HVAC Component Modeling

Room: Buckhead B

Comparison of Actual Supply Air Fan Performance Data to ASHRAE 90.1 Standard-2010 and DOE Commercial Reference Buildings Part Load Fan Energy Use Formula

Parichehr Salimifard¹, Payam Delgoshaei, Ph.D.², Ke Xu, Ph.D.² and James Freihaut, Ph.D.¹, (1)The Pennsylvania State University, University Park, PA, (2)Energy Efficient Buildings Hub, Philadelphia, PA

HVAC Degradation and Asset Management - A Novel Application of Whole Building Simulation

Jianmin Zhu¹, Khashayar Mahani¹, Mohsen A. Jafari, Ph.D.¹, Yan Lu, Ph.D.² and Emmanuel Bisse², (1)Rutgers, the State University of New Jersey, Piscataway, NJ, (2)Siemens Corporate Research, Princeton, NJ

Dynamic Simulation of Regulation Demand Response by VAV HVAC Systems

David H. Blum, Student Member and Leslie Norford, Ph.D., Member, Massachusetts Institute of Technology, Cambridge, MA

Impact of External Static Pressure on Residential Heating and Cooling Energy Use in Hot Climates

Peng Yin, Student Member, James F. Sweeney, Associate Member and Michael Pate, Ph.D., P.E., Member, Texas A&M University, College Station, TX

Friday, September 12, 8:15 AM-10:00 AM

Occupant Behavior

Room: Suwanee

Including Occupants in Building Performance Simulation: Integration of an Agent-Based Occupant Behavior Algorithm with Energyplus

Jared Langevin, Student Member, Jin Wen, Ph.D., Member and Patrick L. Gurian, Ph.D., Drexel University, Philadelphia, PA

Pedestrian Simulation Based on BIM Data

Hermann Georg Mayer, Ph.D.¹, Wolfram Klein, Ph.D.¹, Christian Frey², Simon Daum³, Peter M. Kielar³ and Andre Borrmann³, (1)Siemens AG, Corporate Technology, Munich, Germany, (2)Siemens Schweiz AG, Building Technologies, Zug, Switzerland, (3)Technische Universität München, Munchen, Germany

A Framework for Modeling Occupancy Schedules and Local Trips based on Activity Based Surveys

Tarek Rakha, Cody M. Rose and Christoph F. Reinhart, Dr.Ing., Massachusetts Institute of Technology, Cambridge, MA

User Related Energy Uses and Their Impact on Heating Demand in Swedish Residential Buildings

Hans Bagge, Ph.D., Associate Member, Dennis Johansson, Ph.D., Associate Member and Victor Fransson, Lund University, Lund, Sweden

Friday, September 12, 8:15 AM-10:00 AM

Codes and Rating Systems 3

Room: Buckhead A

Energy Use of Commercial Buildings That Comply with Prescriptive Code: A Comparative Analysis

Cheryl M. Saldanha, P.E., Simpson Gumpertz & Heger Inc., New York, NY

Inverse Modelling As an Accurate and Computationally Cheap Energy Assessment Tool

Alfonso P. Ramallo-González, Ph.D., Associate Member, University of Bath, Bath, United Kingdom

Paving the Road: Common Challenges to Modeling Energy Impacts of Building Codes

Holly Farah and Allen Lee, Ph.D., Cadmus Group, Portland, OR

Using Modeling to Evaluate Compliance with Multiple Code Pathways

Eli M. Caudill and Allen Lee, Ph.D., Cadmus Group, Portland, OR

Friday, September 12, 8:15 AM-10:00 AM

State of the Art BIM 2

Room: Heritage AB

Extreme Makeover: Energyplus Edition!

Amir Roth¹, Edwin S. Lee, Ph.D.², Luigi G Polese² and Jason Glazer, P.E., Member³, (1)United States Department of Energy, Washington, DC, (2)National Renewable Energy Laboratory, Golden, CO, (3)GARD Analytics, Inc., Arlington Heights, IL

Making the Round Trip Between Building Information Modeling (BIM) and Analytical Modeling Using Autodesk Revit and IES Virtual Environment (VE)

Jean A Carriere, Affiliate, Trailloop, Ottawa, ON, Canada

Strengthening EnergyPlus to Enable Advanced Building Energy Models

Michael J. Witte, Ph.D., Member¹, Edwin S. Lee, Ph.D.², Lixing Gu, Ph.D., P.E., Member³, Richard Raustad³, Tianzhen Hong, Ph.D., P.E., Member⁴ and Daeho Kang, Ph.D.⁵, (1)GARD Analytics, Inc., Arlington Heights, IL, (2)National Renewable Energy Laboratory, Golden, CO, (3)Florida Solar Energy Center, Cocoa, FL, (4)Lawrence Berkeley National Laboratory, Berkeley, CA, (5)Pacific Northwest National Laboratory, Richland, WA

Updated Coupling Method and Tools to Address Combined Airflow, Heat Transfer and Contaminant Transport (TRNSYS/CONTAM)

W. Stuart Dols, Member, National Institute of Standards and Technology, Gaithersburg, MD

Friday, September 12, 10:00 AM-10:30 AM

Break

Friday, September 12, 10:30 AM-12:00 PM

Large-scale Studies / Big Data

Room: Buckhead B

Building Simulation Modelers – Are We Big Data Ready?

Jibonananda Sanyal, Ph.D., Associate Member and Joshua New, Ph.D., Member, Oak Ridge National Laboratory, Oak Ridge, TN

Development of Residential Prototype Building Models and Analysis System for Large-Scale Energy Efficiency Studies Using Energyplus

Vrushali Mendon, Member and Z. Todd Taylor, Pacific Northwest National Laboratory, Richland, WA

Parametric Analysis Tool to Study the Effects of Energy Conservation Measures on Building Energy Use Across California

Ingrid Chaires, Associate Member, Alexej Goehring, P.E., Mallory Taub, Student Member and David Barker, Arup, San Francisco, CA

Friday, September 12, 10:30 AM-12:00 PM

Moisture

Room: Suwanee

Simulating Water: Supply and Demand in the Built Environment

Fred J. Betz, Ph.D.¹ and Willa Kuh², (1)Affiliated Engineers, Inc., Madison, WI, (2)Affiliated Engineers, Boston, MA

A Data Visualization Tool for Hygrothermal Analysis

Ajith Rao, Ph.D., Associate Member¹ and Vamshi Gooje, Associate Member², (1)USG, Libertyville, IL, (2)Thornton Tomasetti, Portland, ME

Using Measured Data to More Accurately Evaluate Freeze-Thaw Risk When Insulating Solid Masonry Walls

Jason Der Ananian and Sean O'Brien, P.E., Member, Simpson Gumpertz & Heger, Inc., New York, NY

Cooling System by Evaporation of Water in a Fibrous Wall

Adrian R. Katili¹, Abdelkrim Trabelsi, Dr.Ing.² and Joseph Virgone, Dr.Ing.², (1)University of Indonesia, Depok, Indonesia, (2)University of Claude Bernard Lyon 1, Villeurbanne, France

Friday, September 12, 10:30 AM-12:00 PM

Design Firms 3

BEM to BIM: Developing a "Throw-Away" Energy Model

Amber Wood, P.E. and Don Saal, P.E., Associate Member, NORESKO, Boulder, CO

Early Phase Design Energy Modeling to Right-Size the Building Enclosure

Jillian Burgess, The Facade Group, Philadelphia, PA

Energy Modeling Process Efficiency with BIM

Jeremy McClanathan, P.E., Member, CDi Engineers, Seattle, WA

IEA EBC Annex 60: New Generation Computational Tools for Building and Community Energy Systems Based on the Modelica and Functional Mockup Interface Standards

Michael Wetter, Ph.D., Member, Lawrence Berkeley National Laboratory, Berkeley, CA

Friday, September 12, 10:30 AM-12:00 PM

State of the Art BIM 3

Room: Buckhead A

Building Energy Engineering Models and BIM Data: Conflicts and a Research Agenda

Brent Griffith, TBD, TBD, CO

Doing More with Less: Creating High Performing Energy Systems with BIM/IPD

Maxwell Nichols and Anna Morton, P.E., Member, dbHMS, Chicago, IL

Efficient and Effective BIM to CFD

Nelson Marques, Ph.D., Susana Ramalho, Dr.Ing. and Bruno Santos, Dr.Ing., blueCAPE Lda, Lisbon, Portugal

Portfolio-Scale Building Energy Modeling: Applications and Methods

Joseph Deringer, Life Member¹, Peter T. May-Ostendorp, Ph.D., Associate Member² and Brian Coffey, Ph.D.³, (1)Institute for the Sustainable Performance of Buildings (SuPerB), Berkeley, CA, (2)Xergy Consulting, Durango, CO, (3)LBNL - BUILDlab - UCL, Ithaca, NY

Friday, September 12, 12:10 PM-12:20 PM

Closing Ceremony

Summary and closing remarks.

Room: Heritage AB

Friday, September 12, 12:20 PM – 1:00 PM

Grab-and-Go Boxed Lunches

Heritage Pre-Function

Friday, September 12, 1:00 PM – 4:00 PM

BEMP Certification Exam

Room: Augusta