

NSB 2011 - Sessions on Monday 30th May

Monday 8:15 - 8:45

Symposium Opening

Juha Vinha, Place: Small Auditorium

Monday 8:45 - 10:00

Keynote session 1, Chair: Juha Vinha, Place: Small Auditorium

Forty years of building physics research – for what benefit?

Ingemar Samuelson

Monday 10:30 - 12:00, Session 1

A1 - Air-tightness of buildings <i>Chair: Miimu Airaksinen, Place: Small Auditorium</i>	B1 - Computational fluid dynamics simulations <i>Chair: John Grunewald, Place: Sopraano conference room</i>	C1 - Thermal bridge calculations <i>Chair: Berit Time, Place: Studio auditorium</i>
Dwelling air-tightness in a 55 years old estate Hugo Hens	Simulation and Experimental Validation of Chaotic Behavior of Airflow in a Ventilated Room Jos van Schijndel	Evaluation of the thermal bridges of prefabricated concrete large-panel and brick apartment buildings in Estonia Simo Ilomets, Targo Kalamees & Leena Paap
Usability of data from commissioned tests for estimating trends and distribution of air tightness in the building stock Sverre Bjørn Holøs, Thor-Oskar Relander & Sverre Inge Heimdal	Numerical Simulation of Building Components - Towards an Efficient Implementation of Air Convection in HAM-models Jelle Langmans, Andreas Nicolai, Ralf Klein, John Grunewald & Staf Roels	A Parametric study of the thermal performance of embedded Vacuum Insulation Panels Kjartan Gudmundsson
Important factors to achieve an airtight building Paula Wahlgren	Influence of ambient air speed on convective heat transfer coefficient at natural convection regime Peter Mihálka, Milan Držik & Peter Matiašovský	New Developments in Mitigation of Thermal Bridges Generated by Light Gage Steel Framing Components Peter Engelmann, Bryan Urban & Jan Kosny
Air tightness of structural elements and internal air leakages in a multi-apartment building Anu Aaltonen, Kimmo Lähdesmäki & Juha Vinha	Numerical modeling of wind-induced cavity ventilation for a low-rise building Kristine Nore, Bert Blocken & Jan Vincent Thue	Arranging Insulation for Better Thermal Resistance in Concrete and Masonry Wall Systems Bryan Urban, Peter Engelmann, Elisabeth Kossecka & Jan Kosny
Measurements and modelling of airflows in houses using passive sampling and HAM software Emmanuel Adu Essah	Influence of wind direction and urban surroundings on natural ventilation of a large football stadium Twan van Hooff & Bert Blocken	

Monday 13:15 - 14:45, Session 2

A2 - Regulations and air-tightness of constructions <i>Chair: Jan Vincent Thue, Place: Small Auditorium</i>	B2 - HAM transport in porous material <i>Chair: Thomas Bednar, Place: Sopraano conference room</i>	C2 - Thermal bridge standards and calculations <i>Chair: Staf Roels, Place: Studio auditorium</i>
<p>Air leakages through cross laminated timber (CLT) constructions Hans Boye Skogstad, Lars Gullbrekken & Kristine Nore</p> <p>Recent Changes in the Building Envelope Air Leakage Regulations and Practices in the US Maria Spinu & Brian Erickson</p> <p>How to ensure low radon concentrations in indoor environments Ida Wraber & Torben Valdbjørn Rasmussen</p> <p>Energy implications of different infiltration models Matthias Haase</p> <p>Experimental testing of rain tightness of wind barrier and sealing of window joints Hans Boye Skogstad, Sivert Uvsløkk & Ola Asphaug</p>	<p>Towards a Semi-Generic Simulation Framework for Mass and Energy Transport in Porous Materials Andreas Nicolai & John Grunewald</p> <p>Hygrothermal behaviour of a hemp concrete wall: influence of sorption isotherm modelling Yacine Aït Oumeziane, Marjorie Bart, Sophie Moissette, Christophe Lanos, Sylvie Prétot & Florence Collet</p> <p>Sensitivity analysis of total pressure gradient on wood drying Kamilia Abahri, Rafik Belarbi, Mahfoud Tahlaiti & Boudjema Remki</p>	<p>The importance of a common method and correct calculation of thermal bridges Björn Berggren & Maria Wall</p> <p>Current calculation rules for thermal bridges and resulting problems for the practical use Kai Schild, Wolfgang Willems & Georg Hellinger</p> <p>Practical implementation of a harmonic conductance model in thermal simulation software Tomasz Kornicki</p> <p>Sensitivity analyses of thermal bridges: confrontation with the new Belgian EPB-methodology Marc Delghust, Willem Huyghe & Arnold Janssens</p> <p>A pragmatic approach to incorporate the effect of thermal bridging within the EPBD-regulation Staf Roels, Mieke Deurinck, Marc Delghust, Arnold Janssens & Dirk Van Orshoven</p>

Monday 15:15 - 16:45, Session 3

A3 - Validation of calculation methods and results <i>Chair: Carl-Eric Hagetoft, Place: Small Auditorium</i>	B3 - Material properties and determination methods <i>Chair: Phalguni Mukhopadhyaya, Place: Soprano conference room</i>	C3 - Energy standards and life-cycle analysis <i>Chair: Svend Svendsen, Place: Studio auditorium</i>
<p>Validation of a coupled CFD-HAM model with a climate chamber experiment on a small wall sample Marnix Van Belleghem, Marijke Steeman, Arnold Janssens & Michel De Paepe</p> <p>Experimental validation of two simplified thermal zone models Pavel Kopecký</p> <p>Comparison of measured and calculated temperature and relative humidity with varied and constant air flow in the façade air gap S. Olof Hägerstedt & Lars-Erik Harderup</p> <p>Comparison of calculated and measured values of wall assembly tests using Delphin 5 Anssi Laukkarinen & Juha Vinha</p> <p>Importance of moisture transport, snow cover and soil freezing to ground temperature predictions Huining Xu & Jeffrey D. Spitler</p>	<p>Determination of Hygrothermal Properties for Building Materials using Inverse Modeling Techniques Jos van Schijndel, Sander Uittenbosch & Tom Thomassen</p> <p>Properties, Requirements and Possibilities for Traditional, State-of-the-Art and Future Thermal Building Insulation Materials and Solutions Bjørn Petter Jelle, Arild Gustavsen, Berit Time, Hans Boye Skogstad & Arvid Dalehaug</p> <p>The Effect of Leakage through the Sealant in the Cup Test Method Elina Manelius & Juha Vinha</p> <p>Correlation between thermal conductivity and elastic modulus of porous building materials – power law functions of porosity Peter Matiašovský & Lubomir Bagel</p> <p>Hygrothermal Properties of Biobased Polyurethane Foam Insulation for Building Envelope Construction Phalguni Mukhopadhyaya, Tri-Dung Ngo, Minh-Tan Ton-That, Jean-Francois Masson & Gordon Sherrer</p>	<p>Sustainability of Polyurethane Thermal Insulation Pasi Käkälä & Janne Jormalainen</p> <p>Life Cycle Analysis as an Effective Instrument to find sustainable solutions and identify Energy- as well as Cost Saving Potentials Frank U. Vogdt & Anika Dittmar</p> <p>Zero Emission Building Envelopes - Comparison of Different Wall Constructions in a Life Cycle Perspective Thomas Haavi & Arild Gustavsen</p> <p>Method for use of economical optimization in design of nearly zero energy buildings Sanne Hansen & Svend Svendsen</p> <p>Low-energy buildings in Europe – Building envelope performance and energy standards Katharina Thullner, Dennis Johansson & Ulla Janson</p>

NSB 2011 - Sessions on Tuesday 31st May

Tuesday 8:45 - 10:00

Keynote session 2, Chair: *Anker Nielsen*, Place: *Small Auditorium*
 Low energy buildings – the basis for realizing the strategy for independency of fossil fuels in 2050
Svend Svendsen

Tuesday 10:30 - 12:00, Session 4

A4 - Roof and floor simulations Chair: <i>Shuichi Hokoi</i> , Place: <i>Small Auditorium</i>	B4 - Hysteresis effect Chair: <i>Peter Matiašovský</i> , Place: <i>Sopraano conference room</i>	C4 - Thermal comfort Chair: <i>Lars-Erik Harderup</i> , Place: <i>Studio auditorium</i>
<p>Cool roofing in cold climates: A contradiction or a potential for energy savings? Mark Murphy, Steinar Grynning, Bjørn Petter Jelle, Arild Gustavsen & Matthias Haase</p> <p>Proposal for a modified Glaser-Method for the risk assessment of flat timber roofs Bernd Nusser, Thomas Bednar & Martin Teibinger</p> <p>Vapour control design of wooden structures including moisture sources due to air exfiltration Hartwig M. Künzle, Daniel Zirkelbach & Beate Schafaczek</p> <p>Frost insulation of the Finnish slab on ground foundation Miimu Airaksinen & Jorma Heikkinen</p> <p>Probabilistic analysis of hygrothermal conditions and mould growth potential in cold attics Carl-Eric Hagentoft & Angela Sasic Kalagasidis</p>	<p>Inverse analysis of the bound water diffusion coefficient in small samples of wood from sorption tests Romain Rémond, Giana Almeida & Patrick Perré</p> <p>Sorption behavior of various lignocellulosic building materials Giana Almeida, Romain Rémond & Patrick Perré</p> <p>Critical moisture contents – during water absorption and drying Peter Matiašovský & Lubomir Bagel</p> <p>Hysteresis and Temperature Dependency of Moisture Sorption –New Measurements Carsten Rode & Kurt K. Hansen</p> <p>Water vapour sorption of building materials – modelling of scanning curves Olga Koranthaljova</p>	<p>Potential influence of the heating demand by choice of thermal mass and comfort interval Fredrik Ståhl</p> <p>Effect of Energy Renovation on Thermal Sensation and Comfort during Heating Season Riikka Holopainen & Pekka Tuomaala</p> <p>Field study of the thermal environment created by a radiant heating system in a detached house for sleep thermal comfort Christopher Leung & Hua Ge</p> <p>Evaluating Occupant Comfort in Social Housing Following Building Envelope Upgrades Kurtis Topping & Philip Parker</p>

A5 - Roof solutions in lab and field experiments <i>Chair: Folke Björk, Place: Small Auditorium</i>	B5 - Water vapour transport <i>Chair: Hans Janssen, Place: Sopraano conference room</i>	C5 - Indoor climate <i>Chair: Helmi Kokotti, Place: Studio auditorium</i>
<p>Experimental and numerical investigations to compare the thermal performance of IR reflecting insulation and mineral wool Matthias Kersken & Almuth Schade</p> <p>A new method for drying out low pitched cold deck roofs Niels Peter Kloch</p> <p>Frost Damage in Roof Tiles in Relatively Warm Areas in Japan: Water Absorption and Freezing-Thawing Experiments Chiemi Iba & Shuichi Hokoi</p> <p>Application of risk assessment technique to attics Kimmo Kurkinen & Carl-Eric Hagentoft</p> <p>Study of the thermal performance of an integrated photovoltaic-thermal hybrid air collector coupled with a ventilation device Ya Brigitte Assoa, Olivier Flechon, Benjamin Boillot & François Sauzedde</p> <p>Technical analysis of moisture transfer qualities of mildly sloping roofs Ari-Veikko Kettunen</p>	<p>Inverse analysis of water vapour transport in building materials using genetic algorithm Jan Kočí, Jiří Maděra, Jaromír Žumár, Zbyšek Pavlík & Robert Černý</p> <p>Vapour permeability and water absorption of different exterior paint systems Ruta Miniotaite</p> <p>Analysis of the cell wall distribution in a growth ring on the water vapour transport in Spruce wood Wolfgang Zillig, Dominique Derome & Jan Carmeliet</p> <p>A transient method for determination of water vapour diffusion coefficient of building materials as function of relative humidity Zbyšek Pavlík, Jaromír Žumár, Milena Pavlíková, Miloš Jerman & Robert Černý</p> <p>Thermal diffusion of water vapour in porous materials: true or false? Hans Janssen</p>	<p>The influence of external wall thermal mass on indoor air parameters stability Anatolijs Borodinecs, Baiba Gaujena, Valdis Varavs & Andris Kreslins</p> <p>Indoor Climate and Humidity Loads in Old Rural Houses with Different Usage Profiles Üllar Alev, Targo Kalamees & Endrik Arumägi</p> <p>Sustainable Retrofitting Strategies for Museum Buildings - Development and Assessment of Retrofitting Strategies Sven Steinbach, Michaela Hoppe, Volker Huckemann, Anke Schenk, Lars Klemm & Heiko Werdin</p> <p>User behaviour regarding natural ventilation – state of the art and research needs Christine Mayer & Florian Antretter</p> <p>Investigation on moisture and indoor environment in eight Danish houses Kasper Risgaard Jensen, Rasmus Lund Jensen, Jesper Nørgaard, Rasmus O. Justesen & Niels C. Bergsøe</p> <p>Passive sampling as a method for air exchange measurements for whole building simulation of historic buildings Ralf Kilian, Stefan Bichlmair, Barbara Wehle & Andreas Holm</p>

Tuesday 15:30 - 17:15, Session 6

A6 - ETICS and new wall solutions <i>Chair: Jesper Arfvidsson, Place: Small Auditorium</i>	B6 - Material damages and durability <i>Chair: Stig Geving, Place: Soprano conference room</i>	C6 - Cooling and other low energy systems <i>Chair: Angela Sasic Kalagasidis, Place: Studio auditorium</i>
<p>Hygrothermal behaviour of ETICS – Numerical and experimental study Eva Barreira & Vasco Peixoto de Freitas</p> <p>Vacuum Insulated Glass Sandwiches: Assembly, characteristics and application of the new high insulating facade panel Tanja Skottke & Wolfgang Willems</p> <p>Development of a moisture safe connection for stud walls Johan Jönsson & Miklós Molnár</p> <p>An Innovative Approach to Retrofitting Multi-Unit Residential Buildings Using a Nested Thermal Envelope Design™ Marianne Touchie, Kim Pressnail, Russell Richman & Erin Dixon</p> <p>Heated External Insulation Composite Systems to avoid Biological Defacement Julia v. Werder, Daniel Kogan, Michael Sack, Helmuth Venzmer & Winfried Malorny</p> <p>Renovation of a detached single-family house into an energy efficient low energy house Tine Steen Larsen, Steffen Maagaard & Rasmus Lund Jensen</p>	<p>Effect of variable hygro-thermal conditions on chemical degradation of concrete structures due to alkali-silica reaction Dariusz Gawin, Francesco Pesavento, Witold Grymin & Mateusz Wyrzykowski</p> <p>Setpoint control for air heating in a church to minimize moisture related mechanical stress in wooden interior parts Henk Schellen & Jos van Schijndel</p> <p>Non-uniform moisture influence on multilayer corrugated plywood shell Jānis Šliseris & Kārlis Rocēns</p> <p>Influence of moisture sorption on deformations of building materials Ruta Miniotaite</p> <p>Characterization of damage-induced evolution of building materials hygric properties Simon Rouchier, Monika Woloszyn, Geneviève Foray & Jean-Jacques Roux</p>	<p>A study on the integration of upgraded weather forecast in a predictive control of building cooling systems Angela Sasic Kalagasidis</p> <p>Exergy analysis of cooling systems and strategies Marco Molinari & Petra Karlstöm</p> <p>Relevance of modelling insulation layer in ground storage system design Alberto Lazzarotto</p> <p>Low Exergy Systems for High-Performance Buildings and Communities Dietrich Schmidt & Guðni Jóhannesson</p> <p>Development of a quasi-steady-state assessment method of night cooling Hilde Breesch, Kim Goethals & Arnold Janssens</p> <p>Evaluation of the applicability of the quasi-steady-state overheating indicator for offices and schools Kim Goethals & Arnold Janssens</p>

NSB 2011 - Sessions on Wednesday 1st June

Wednesday 8:45 - 10:00

Keynote session 3, Chair: Ralf Lindberg, Place: Small Auditorium
 Building inspections in Finland – fighting against moulds
Juhani Pirinen

Wednesday 10:30 - 12:00, Session 7

A7 - Walls in field measurements Chair: Monika Woloszyn, Place: Small Auditorium	B7 - Moisture problems and design solutions Chair: Juhani Pirinen, Place: Sopraano conference room	C7 - Energy efficiency in office buildings Chair: Juhani Heljo, Place: Studio auditorium
<p>Infrared measurements on a ventilated cladding for assessing its surface temperature and heat transfer calculation Matthieu Labat, Geraldine Garnier, Monika Woloszyn & Jean Jacques Roux</p> <p>Rehabilitation of basement walls with moisture problems by the use of vapour open exterior thermal insulation Stig Geving, Marius Kvalvik & Espen Martinsen</p> <p>Long-term measurement and hygrothermal simulation of an interior insulation consisting of reed panels and clay plaster Paul Wegerer & Thomas Bednar</p> <p>Moisture and mould in prefabricated timber frame constructions during production until enclosure of the house Lars Olsson, Kristina Mjörnell & Pernilla Johansson</p>	<p>Methods for investigation of technical status before renovation and evaluation of renovation measures for the building envelope Kristina Mjörnell, Thorbjörn Gustavsson & Angela Sasic Kalagasis</p> <p>Interior Mould Growth Risk Reduction - Application of Nonlinear Programming for Envelope Optimisation Nuno Ramos, Isabel Ribeiro, João Delgado, Vasco Peixoto de Freitas & Teresa Esteves</p> <p>Rising damp, a reoccurring problem in basements – a case study with different attempts to stop the moisture Eva Birgit Møller & Birgit Olsen</p> <p>Testing methods for moisture content in concrete, dealing with floor coverings: State-of-the-Art in Finland Sami Niemi & Juha Komonen</p>	<p>The potential for energy efficient building design - differences between Europe and the Arctic Petra Vladykova & Carsten Rode</p> <p>Validation and Analysis of Energy Performance Using Dynamic Simulations and Comparisons with Detailed Measurements Azra Korjenic, Tanja Höfer, Christoph Deseyve & Thomas Bednar</p> <p>Impact of Outdoor Climate and Life Style on the Total Energy Use in Office Buildings Markus Leeb, Christoph Deseyve, Tanja Höfer, Azra Korjenic & Thomas Bednar</p> <p>Evaluating effects of different scenarios in the design phase on the carbon footprint of an office building Pellervo Matilainen & Miimu Airaksinen</p>

Wednesday 13:15 - 14:45, Session 8

A8 - Wall simulations <i>Chair: Hua Ge, Place: Small Auditorium</i>	B8 - Moisture problems and technical solutions <i>Chair: Matti Pentti, Place: Sopraano conference room</i>	C8 - Energy efficiency in schools and day-care buildings <i>Chair: Guðni Jóhannesson, Place: Studio auditorium</i>
<p>Assessment of the Risk for Mold Growth in a Wall Retrofitted with Vacuum Insulation Panels Pär Johansson</p> <p>Is ventilation of timber façades essential? Daniel Kehl, Severin Hauswirth & Heinz Weber</p> <p>A numerical study of the hygrothermal performance of capillary active interior insulation systems Evy Vereecken & Staf Roels</p> <p>Walls with Rising Damp Problems: Predicting Water Capillary Rise Ana Sofia Guimarães, João Quesado Delgado & Vasco Peixoto de Freitas</p> <p>Considerations to the hygrothermal behavior of exterior walls in timber frame construction with direct rendering Britta Rosenau</p>	<p>Humidity Control in Historic Buildings through Adaptive Ventilation - A Case Study Tor Broström, Carl-Eric Hagentoft & Magnus Wessberg</p> <p>Evaluation of the climate for conservation of the adoration of the mystic lamb in the St. Bavo Cathedral in Ghent Lien De Backer, Marnix Van Belleghem, Marijke Steeman, Arnold Janssens & Michel De Paepe</p> <p>Control strategies for demand controlled ventilation in dwellings Toke Rammer Nielsen & Christian Drivsholm</p> <p>The hygrothermal performance in Hellerup Church, Denmark Poul Klenz Larsen</p>	<p>Evaluation and Parametric Optimization of the Heating Load and Comfort Conditions in a School Building Ricardo Almeida & Vasco Peixoto de Freitas</p> <p>Implementation of realistic boundary conditions – analysis of their effect on the net annual heating demand in passive schools Barbara Wauman, Hilde Breesch & Dirk Saelens</p> <p>Simulation as a Tool for Optimizing Energy Demand of Rooms as a Part of the Strategy "Towards Green Campuses in Egypt" Mina Michel Samaan, Ahmed Nabih Ahmed, Osama M.A. Farag & Magdi El-Sayed Khalil</p> <p>Investigation of ventilation strategies for the day-care institutions Olena Kalyanova Larsen, Alireza Afshari & Per Heiselberg</p> <p>Energy-Surplus Day-care Centre for Children Michaela Hoppe, Anna Hoier, Hans Erhorn & Bernhard Asböck</p>

Wednesday 15:15 - 16:45, Session 9

A9 - Walls in lab tests <i>Chair: Ingemar Samuelson, Place: Small Auditorium</i>	B9 - Effects of climate change simulations <i>Chair: Jos van Schijndel, Place: Soprano conference room</i>	C9 - Windows and solar shadings <i>Chair: Jarek Kurnitski, Place: Studio auditorium</i>
<p>Rising Damp in Historic Buildings: The Wall Base Ventilation System Ana Sofia Guimarães, João Quesado Delgado & Vasco Peixoto de Freitas</p> <p>Hygrothermal response of highly insulated timber frame walls with an exterior air barrier system: laboratory investigation Jelle Langmans, Ralf Klein & Staf Roels</p> <p>Tensile cracking of ventilated rendered rain-screen cladding systems Miklós Molnár, Carl-Magnus Capener, Johan Jönsson & Kenneth Sandin</p> <p>An experimental method for assessing heat and moisture response of a massive timber wall exposed to summer climatic conditions Helisoa Rafidiarison, Eric Mougel & Alexis Nicolas</p> <p>Water penetration through clay brick veneer wall Vera Straka</p>	<p>Modeling multiple indoor climates in historic buildings due to the effect of climate change Jos van Schijndel, Henk Schellen & Marco Martens</p> <p>Effect of hot weather periods in moderate climate regions on approach to slab thermal design in residential buildings Anna Staszczuk, Tadeusz Kuczyński & Jan Radoń</p> <p>Computational modelling of the impact of climate change on the indoor environment of a historic building in the Netherlands Zara Huijbregts, Rick Kramer, Jos van Schijndel & Henk Schellen</p> <p>Mould Growth inside an Attic concerning Four Different Future Climate Scenarios Vahid Nik</p> <p>An approach to assess future climate change effects on indoor climate of a historic stone church Florian Antretter, Teresa Schöpfer & Ralf Kilian</p>	<p>Solar Shading Systems and Thermal Performance of Windows in Nordic Climates Steinar Grynning, Arild Gustavsen & Berit Time</p> <p>Energy savings potential with electrochromic switchable glazing Mark Murphy, Arild Gustavsen, Bjørn Petter Jelle & Matthias Haase</p> <p>Assimilation of solar heat gains in residential buildings Hans Bagge</p> <p>Heat transfer in ventilated double facades with obstructions Matthias Haase</p> <p>Assessment of solar shading systems for building envelopes Leonardo Marques Monteiro & Anesia Barros Frota</p>

NSB 2011 - Sessions on Thursday 2nd June

Thursday 8:30 - 10:00, Session 10

A10 - Simulation methods and snow-on-roof models <i>Chair: Targo Kalamees, Place: Small Auditorium</i>	B10 - Mould growth models <i>Chair: Hannu Viitanen, Place: Sopraano conference room</i>	C10 - Energy efficiency in residential buildings <i>Chair: Vasco Peixoto de Freitas, Place: Studio auditorium</i>
<p>Snow melting and freezing on older townhouses Anker Nielsen & Johan Claesson</p> <p>Drying out capacity and snow melting risk for ventilated wooden roofs - a parameter study Sivert Uvsløkk</p> <p>Application of ADI Splitting Methods to Two-Dimensional Building Envelope System Solvers Anne Paepcke, Andreas Nicolai & John Grunewald</p> <p>An Extensible Calculation Framework for Climate Data and Boundary Conditions Stefan Vogelsang & Andreas Nicolai</p> <p>Performance Assessment of Interior Insulations by a Stochastic Method Jianhua Zhao, Rudolf Plagge & John Grunewald</p>	<p>Mould growth on building materials in laboratory and field experiments Kimmo Lähdesmäki, Kati Salminen, Juha Vinha, Hannu Viitanen, Tuomo Ojanen & Ruut Peuhkuri</p> <p>Classification of material sensitivity – New approach for mould growth modeling Tuomo Ojanen, Ruut Peuhkuri, Hannu Viitanen, Kimmo Lähdesmäki, Juha Vinha & Kati Salminen</p> <p>Modelling reliability of structure with respect to incipient mould growth Krystyna Pietrzyk, Ingemar Samuelson & Pernilla Johansson</p> <p>m-model: a method to assess the risk for mould growth in wood structures with fluctuating hygrothermal conditions Åse Tagerö, Charlotte Svensson Tengberg & Bengt Bengtsson</p> <p>Mould Growth in Attics and Crawlspace Pernilla Johansson, Gunilla Bok & Annika Ekstrand-Tobin</p>	<p>Natural ventilation around open ground floor with pilotis in highrise residential buildings in tropical areas Abdul Razak Sapian, Noor Hanita Abdul Majid & Shuichi Hokoi</p> <p>Holistic energy retrofitting of multi-storey building to low energy level Martin Morelli, Henrik M. Tommerup, Morten K. Tafdrup & Svend Svendsen</p> <p>Costs of retrofit measures in the Swedish residential building stock – an evaluation for three scenarios on future energy prices Érika Mata, Angela Sasic Kalagasidis & Filip Johnsson</p> <p>The impact of physical rebound effects on the heat losses in a retrofitted dwelling Mieke Deurinck, Dirk Saelens & Staf Roels</p> <p>Analyses of sustainability and environmental impacts of steel framed buildings – Example from practice in Romania Viorel Ungureanu, Adrian Ciutina & Dan Dubina</p>

Thursday 10:30 - 12:00, Session 11

A11 - Night-time cooling and moisture buffering experiments <i>Chair: Hugo Hens, Place: Small Auditorium</i>	B11 - Durability of structures <i>Chair: Jón Sigurjónsson, Place: Sopraano conference room</i>	C11 - Energy efficiency in single-family houses <i>Chair: Carsten Rode, Place: Studio auditorium</i>
<p>Humidity buffering of building interiors by absorbent materials Tim Padfield & Lars Aasbjerg Jensen</p> <p>Initial development of a combined PCM and TABS solution for heat storage and cooling Michał Pomianowski, Per Heiselberg & Rasmus Jensen</p> <p>Experimental investigation of the influence of different flooring emissivity on night-time cooling using displacement ventilation Jérôme Le Dréau, Line Karlsen, Michał Litewnicki, Lars Michaelsen, Anders Møllerskov, Håkon Ødegaard, Louise Svendsen, Rasmus Lund Jensen & Anna Marszał</p> <p>Experimental investigation of the influence of obstacle in the room on passive night-time cooling using displacement ventilation Michał Pomianowski, Farzad Khalegi, Giedrius Domarkas, Jonas Taminskas, Karol Bandurski, Kit Madsen, Søren Gedsø, Rasmus Jensen</p> <p>Experimental investigation of the heat transfer in a room using night-time cooling by mixing ventilation Rasmus Lund Jensen, Jesper Nørgaard, Ole Daniels, Rasmus O. Justesen, Morten S. Madsen, Kenneth B. Mikkelsen & Claus Topp</p>	<p>Influence of Climate Change to Concrete Buildings – Preliminary study Jukka Lahdensivu, Hanna Tietäväinen & Pentti Pirinen</p> <p>Building Envelope Commissioning for Extreme Climates David de Sola, Kevin D. Knight & Bryan J. Boyle</p> <p>Deterioration of building envelope of wooden apartment buildings built before 1940 based on external survey Paul Klößeiko, Tõnis Agasild & Targo Kalamees</p> <p>Modelling of service life and durability of wooden structures Hannu Viitanen, Tomi Toratti, Lasse Makkonen, Sven Thelandersson, Tord Isaksson, Eva Früwald, Jöran Jermer, Fin Englund & Ed Suttie</p> <p>Designing Single-ply Membrane “Cool Roof” Systems for Service and Durability Thomas Hutchinson</p>	<p>Integrating Renewable Energy Generation through Demand-Side-Management Kai Morgenstern, Herena Torio & Christina Sager</p> <p>A Low-energy Building under Arctic Conditions - Experiences After Five Years of Operation Carsten Rode, Petra Vladykova & Martin Kotol</p> <p>Net zero-energy family house – simple approach and built example Jan Tywoniak & Kamil Staněk</p> <p>Implementing zero energy buildings in harsh Nordic climate conditions Janne Jormalainen</p>

Thursday 12:00 - 12:15

<p>Symposium Closing <i>Juha Vinha, Place: Small Auditorium</i></p>
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