



POLITECNICO DI TORINO
Repository ISTITUZIONALE

Building Simulation Applications BSA 2013 - Proceedings of 1st IBPSA Italy conference

Original

Building Simulation Applications BSA 2013 - Proceedings of 1st IBPSA Italy conference / Baratieri M.; Corrado V.; Gasparella A.; Patuzzi F.. - STAMPA. - (2013), pp. 1-417.

Availability:

This version is available at: 11583/2517537 since:

Publisher:

Bozen-Bolzano University Press

Published

DOI:

Terms of use:

openAccess

This article is made available under terms and conditions as specified in the corresponding bibliographic description in the repository

Publisher copyright

(Article begins on next page)

Konferenzbeiträge / Atti / Proceedings

Building Simulation Applications BSA 2013

1st IBPSA Italy conference

Bozen-Bolzano, 30th January – 1st February 2013

Edited by

Marco Baratieri, Vincenzo Corrado,

Andrea Gasparella, Francesco Patuzzi

bu,press

bozen
bolzano
university
press



FREIE UNIVERSITÄT BOZEN
LIBERA UNIVERSITÀ DI BOLZANO
FREE UNIVERSITY OF BOZEN · BOLZANO

Konferenzbeiträge / Atti / Proceedings

Building Simulation Applications BSA 2013

1st IBPSA Italy conference

Bozen-Bolzano, 30th January – 1st February 2013

Edited by

Marco Baratieri, Vincenzo Corrado,

Andrea Gasparella, Francesco Patuzzi

bu,press

bozen
bolzano
university
press

Scientific committee

Jan Hensen – Technische Universiteit Eindhoven
Ardeshir Mahdavi – TU Wien Austria
Natale Arcuri – Università della Calabria
Paolo Baggio – Università di Trento
Vincenzo Corrado – Politecnico di Torino
Andrea Gasparella – Free University of Bozen-Bolzano

Organizing committee

Paolo Baggio – Università degli Studi di Trento
Marco Baratieri – Free University of Bozen-Bolzano
Francesca Cappelletti – IUAV University of Venice
Alfonso Capozzoli – Politecnico di Torino
Vincenzo Corrado – Politecnico di Torino
Enrico Fabrizio – Politecnico di Torino
Andrea Gasparella – Free University of Bozen-Bolzano
Norbert Klammsteiner – Energytech G.m.b.H./S.r.l - Bozen-Bolzano
Francesco Patuzzi – Free University of Bozen-Bolzano
Paola Penna – Free University of Bozen-Bolzano
Piercarlo Romagnoni – IUAV University of Venice

Other reviewers and chairmen

Marco Manzan – University of Trieste
Luigi Marletta – University of Catania
Livio Mazarella – Politecnico di Milano
Marco Noro – University of Padova
Giovanni Pernigotto – Free University of Bozen-Bolzano
Alessandro Prada – Free University of Bozen-Bolzano
Fabio Sicurella – Professional Engineer, Catania

Design: DOC.bz

Printing: Dipdruck, Bruneck-Brunico

© 2013 by Bozen-Bolzano University Press

Free University of Bozen-Bolzano

All rights reserved

1st edition

www.unibz.it/universitypress

ISBN 978-88-6046-058-5

Digital edition: <http://purl.org/bzup/publications/978-88-6046-058-5>

Table of contents

Introduction <i>Andrea Gasparella</i>	1
Predictive building systems control logic with embedded simulation capability <i>Ardeshir Mahdavi</i>	3
The air energy balance equation paradox <i>Livio Mazzarella</i>	15
BENIMPACT Suite: a tool for ZEB whole life cycle analysis <i>Silvia Demattè, Maria Cristina Grillo, Angelo Messina, Antonio Frattari</i>	29
Daylight harvesting: a multivariate regression linear model for predicting the impact on lighting, cooling and heating <i>Stefano Moret, Marco Noro, Konstantinos Papamichael</i>	39
Derivation of meteorological reference year with hourly interval for Italy <i>Gianluca Antonacci, Ilaria Todeschini</i>	49
The admittance method for calculating the internal temperature swings in free running buildings <i>Luigi Marletta, Gianpiero Evola, Maria Giuga, Fabio Sicurella</i>	59
Interoperability between building information models and software for lighting analysis <i>Chiara Aghemo, Laura Blaso, Daniele Dalmasso, David Erba, Matteo Del Giudice, Anna Osello, Giovanni Fracastoro, Anna Pellegrino, Pablo Ruffino</i>	69
Active slab design by lab tests and modelling <i>Stefano Avesani, Daniel Neyer, Paolo Baldracchi, Ulrich Filippi Oberegger, Roberto Lollini</i>	79
Investigation of different simulation tools for solar photovoltaic modules <i>Francesco Frontini, Matteo Marzoli, Narghes Doust</i>	89
Social and energy redevelopment of an old building <i>Stefano Fortuna, Paolo Neri, Fabio Peron</i>	95
Extending the use of parametric simulation in practice through a cloud based online service <i>Emanuele Naboni, Yi Zhang, Alessandro Maccarini, Eljan Hirsch, Daniele Lezzi</i>	105
Dynamic modelisation of interaction between wall and indoor air <i>Lorenzo Moro, Piercarlo Romagnoni, Paolo Baggio</i>	113
Toward an EnergyPlus decision tool for evaluation of energy performances during early-stage building design <i>Marco Picco, Marco Marengo</i>	121
Lighting control system: energy efficiency and users' behaviour in office buildings <i>Michela Chiogna, Antonio Frattari</i>	131
Quasi-steady state calculation method for energy contribution of sunspaces: a proposal for the European standard improvement <i>Francesco Passerini, Rossano Albatici, Antonio Frattari</i>	141

Thermal performance of the building walls <i>Balaji N.C., Monto Mani, Venkatarama Reddy B.V.</i>	151
Simulation of wind-driven ventilation in an urban underground station <i>Roberta Ansuini, Alberto Giretti, Roberto Larghetti, Costanzo Di Perna</i>	161
Comfort and energy performance of a HVAC system under real conditions for an office block <i>Paolo Valdiserri, Cosimo Marinosci, Laura Pedretti</i>	171
Integrated BIPV performance assessment for tropical regions: a case study for Bangalore <i>Gayathri Aaditya, Rohitkumar Pillai, Monto Mani</i>	181
Multi-objective optimisation of external shading devices for energy efficiency and visual comfort <i>Gianluca Rapone, Onorio Saro, Giovanni Zemella</i>	191
Procedure for buildings' energy modelling suited for integrated control simulation <i>Chiara Dipasquale, Matteo D'Antoni, Roberto Fedrizzi, Michaël Kummert, Luigi Marletta</i>	199
Influence of the boundary conditions on the definition of a reference residential building for the Italian context <i>Davide Bettoni, Matteo D'Antoni, Roberto Fedrizzi</i>	209
Optimisation of an HVAC system for energy saving and thermal comfort in a university classroom <i>Giovanni Semprini, Cosimo Marinosci, Alessandro Gober</i>	217
An open access tool for building energy audits harmonizing European standards <i>Daniele Testi, Elena Menchetti, Eva Schito, Walter Grassi</i>	225
Energy performance of shading devices for thermal and lighting comfort in offices <i>Anna Maria Atzeri, Giovanni Pernigotto, Francesca Cappelletti, Andrea Gasparella, Athanasios Tzempelikos</i>	233
Parametrical analysis for the evaluation of the technical and economic effectiveness of different refurbishment measures <i>Francesca Cappelletti, Paola Penna, Piercarlo Romagnoni, Andrea Gasparella</i>	243
Buildings and biomass cogeneration systems: integrated simulation approach <i>Dario Prando, Francesco Patuzzi, Giovanni Pernigotto, Andrea Gasparella, Marco Baratieri</i>	253
On the influence of several parameters in energy model calibration: the case of a historical building <i>Roberta Pernetti, Alessandro Prada, Paolo Baggio</i>	263
Energy simulation and design of a hot box suitable for dynamic tests of building envelope opaque components <i>Alessandro Prada, Davide S. Gigli, Andrea Gasparella, Marco Baratieri</i>	275
The effect of material uncertainties on envelope heat transfer simulations <i>Alessandro Prada, Paolo Baggio, Marco Baratieri, Andrea Gasparella</i>	285
Quasi-steady state and dynamic simulation approaches for the calculation of building energy needs: Part 1 thermal losses <i>Giovanni Pernigotto, Andrea Gasparella</i>	295
Quasi-steady state and dynamic simulation approaches for the calculation of building energy needs: Part 2 thermal gains <i>Giovanni Pernigotto, Andrea Gasparella</i>	305
Improving summer energy performance of highly insulated buildings through the application of a thermal analysis by numerical simulation <i>Ilaria Ballarini, Vincenzo Corrado</i>	313

Energy performance characterisation of vented opaque envelope through simplified methodologies <i>Vincenzo Corrado, Alice Gorrino, Simona Paduos</i>	323
Impact of using cool paints on energy demand and thermal comfort of a residential building <i>Diana Dias, João Machado, Vítor Leal, Adélio Mendes</i>	333
Long term evaluation of building energy performance: comparison of the test reference year and historical data series in the North Italian climates <i>Giovanni Pernigotto, Gianluca Antonacci, Paolo Baggio, Andrea Gasparella, Jan Hensen</i>	343
Analysis of the impact of ventilated cavities on the performance of opaque components <i>Alessandro Prada, Marco Baratieri, Andrea Gasparella</i>	353
GA-optimisation of a curtain wall façade for different orientations and climates <i>Debora Bogar, Gianluca Rapone, Ardeshir Mahdavi, Onorio Saro</i>	363
Use of PCM materials for the reduction of thermal energy requirements in buildings <i>Francesco Reda, Domenico Mazzeo, Natale Arcuri, Roberto Bruno</i>	373
Energy and daylighting interaction in offices with shading devices <i>Francesca Mazzichi, Marco Manzan</i>	385
Evaluating the nature and significance of ambient wind regimes on solar photovoltaic system performance <i>Abhishek Rao, Monto Mani</i>	395
Thermo-fluid dynamics of woody biomass flue gas in the heat accumulation stoves <i>Paolo Scotton, Daniele Rossi, Mauro Barberi, Stefano De Toni</i>	407
List of authors	<i>I F I Á</i>