Editorial

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Indoor Air 2014—the 13th International Conference on Indoor Air Quality and Climate was held in Hong Kong, on July 7–12, 2014. This topical issue aims to disseminate knowledge and ideas that were generated, presented and discussed among the over-1000 participants. From the high number of modelling- and simulation-related presentations in Indoor Air 2014, a selected number of participants were invited to submit papers. These top-quality submissions were vigorously reviewed and selected for the current topical issue of *Building Simulation: An International Journal*.

The Indoor Air conference series is the flagship conference organised by the International Society of Indoor Air Quality and Climate (ISIAQ), also widely recognised as a top international conference in the indoor environmental quality (IEQ) research field. Since its first edition in 1978, this conference series has been bringing together researchers from a broad base of background and expertise, promoting interdisciplinary scientific collaborations covering all research related to IEQ. The latest edition of the Indoor Air conference series—Indoor Air 2014, was hosted by the University of Hong Kong, Hong Kong SAR. The conference included topics on health, epidemiology, pollutant chemistry and biology, building physics, thermal comfort, energy, urban climate, policies, etc. In the conference, modelling and simulation continued to demonstrate their value as they are increasingly being employed as a tool for various indoor-related scientific researches.

Computational fluid dynamics (CFD) simulation remains as one of the most widely adopted and recognised tools for indoor airflow fundamentals and pollutant dynamics research. Innovations in various air distributions such as displacement ventilation (DV), underfloor air distribution

(UFAD), personalised ventilation (PV), stratum ventilation (SV), etc., are shown to provide potentials to improve IEQ, energy efficiency and thermal comfort. CFD simulation provides space- and time-resolved solutions for airflow and pollutant dynamics analysis to facilitate the continuous advancement of indoor air distribution technologies. Increasing number of studies employ multiple simulation models to deal with multi-physic problems. Coupling energy simulation model with zonal contaminant transport model for comprehensive Energy-IEQ building analysis is gaining popularity. The research on indoor pathogen transport and exposure has received tremendous attentions, especially since the SARS outbreak in 2003. Various simulation methods that combine CFD and pathogen dynamics models have been developed to provide new insights into the indoor pathogen transport fundamentals. A great number of studies were conducted to provide more accurate and detailed boundary conditions, including detailed human body and respiratory track geometries obtained from advanced sensing techniques. The information is highly important for subsequent simulation studies.

Finding an accurate and efficient method to model and simulate the indoor airflow continued to be a major challenge. The conference brought in researchers who devote efforts in alternative and advanced models and simulation methods such as large eddy simulations (LES), lattice Boltzmann method (LBM), reduced order models, etc. Studies on adopting the graphical processing unit (GPU) for fast fluid dynamics simulation have shown tremendous progress and advancements. Modelling and simulation continue to evolve into a more robust and effective methodology for indoor air researches. Indoor Air 2014 provided an excellent platform

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for scientists, engineers, policy makers and other stakeholders to exchange their ideas and to forge opportunities for collaborations.

It is our great pleasure to thank all authors and co-authors for their tremendous efforts in writing and revising their papers for this topical issue. We would also like to extend our gratitude to all peer reviewers for their scientifically rigorous reviews and constructive comments. This topical issue also includes five other papers that cover various advanced building simulation research topics. The

papers in this topical issue address some of the most concerned problems in buildings and IEQ. The contributions from the authors and co-authors are important to the continuous development of the research field. We would like to express our appreciation to Prof. Xudong Yang of Tsinghua University and all staff members of *Building Simulation: An International Journal* for their great efforts in publishing this topical issue to disseminate the results of the Indoor Air 2014 conference.