

PHYSMOD 2022
PROGRAM OF THE WORKSHOP

Legend: **Invited talk**
 Student presentation
 Online presentation

[Affiliation concerns the first author]

Monday, 29 August, 2022

8:20 – 8:50 **Registration**

8:50 – 9:00 **Welcome**

Klára Jurčáková, Institute of Thermomechanics of the Czech Academy of Sciences

Session 1 - Scale interactions and correlations, Chair: Eric Savory

9:00 – 9:30 **Scale interaction and the large-scales influence in the urban canopy**

Laurent Perret, Centrale Nantes, Nantes, France

9:30 – 9:50 **Roughness Sublayer effect on the law of the wall modeled by a "co-spectral link"**

Yardena Bohbot-Raviv, V. Babin, G. G. Katul, Institute for Biological research, Ness Ziona, Israel

9:50 – 10:10 **Surface pressure, velocity and concentration correlations in an urban canopy layer**

David Birch, J. Wingrave, M. Placidi, University of Surrey, Guildford, United Kingdom

10:10 – 10:30 **Scale analysis of turbulent statistics over real urban surface: A wind tunnel study**

Fei Li, Ziwei Mo, Chun-Ho Liu, The University of Hong Kong, Hong Kong

10:30 – 11:00 **Coffee break**

Session 2 - Urban canopy and buildings 1, Chair: Matteo Carpentieri

11:00 – 11:20 **Turbulent flows around multi-scaled buildings - a comparative study of wind tunnel experiments and Large Eddy Simulations**

Benedikt Seitzer, F. Harms, B. Leidl, University of Hamburg, Germany

11:20 – 11:40 **Lattice-Boltzmann Large-Eddy Simulations of the flow field and dispersion around a bidimensional obstacle**

Sofia Fellini, G. Lamaison, E. Lévêque, P. Salizzoni, L. Soulhac, Ecole Centrale Lyon, France

11:40 – 12:00 **The influence of building structures on ground level air movement and pollutant input in courtyards**

Frank Harms, T. Szyszka, B. Leidl, University of Hamburg, Germany

12:00 – 12:20 **Modelling Airflow over Pitched-Roof Buildings**

Matthew Coburn, S. Herring, Z-T. Xie, University of Southampton, United Kingdom

12:20 – 12:40 **Tall buildings drag: the effect of multiscale urban morphologies**

Cameron Southgate-Ash, M. Placidi, University of Surrey, Guildford, United Kingdom

12:40 – 12:50 **Poster presentations**

12:50 – 14:20 **Lunch break**

Session 3 - Urban canopy and buildings 2, Chair: Laurent Perret

- 14:20 – 14:40 **Cyclists Exposure to Vehicle Emissions in Urban Canyons**
Joy Wingrave (Schmeer), M. Placidi, University of Surrey, Guildford, United Kingdom
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- 14:40 – 15:00 **Effect of an upstream tall building on a street canyon flow**
Haoran Du, Eric Savory, Laurent Perret, University of Western Ontario, London, Canada
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- 15:00 – 15:20 **Wake Flows of a Cluster of Tall Buildings**
Saad Inam, C. H. Nguyen, D. Lasagna, Z-T. Xie, University of Southampton, United Kingdom
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- 15:20 – 15:40 **New guideline – better guideline? The new VDI code of practice for wind tunnel modeling of atmospheric flow and dispersion processes**
Bernd Leitl, W. Bächlin, W. Theurer, F. Harms, R. Lieb, R. Höffer, C. Kalender-Wevers, V. Hildebrand, B. Bauhofer, University of Hamburg, Germany

15:40 – 16:10 **Coffee break**

Session 4 - Non-neutral stratification, Chair: Bernd Leitl

- 16:10 – 16:30 **Wind Tunnel Modelling of the Jack Rabbit II Mock Urban Environment Chlorine Releases**
Tom Spicer, Chad T. Smith, University of Arkansas, Fayetteville, USA
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- 16:30 – 16:50 **Struggles of Heavy Gas Dispersion Experiments**
Simon Michel, B. Leitl, F. Harms, University of Hamburg, Germany
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- 16:50 – 17:10 **Effect of non-neutral stratification on urban flow and dispersion**
Matteo Carpentieri, D. Marucci, P. Hayden, University of Surrey, Guildford, United Kingdom
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- 17:10 – 17:30 **Wake flows of wind turbines in stably stratified boundary layers**
Marco Placidi, C. Deebank, M. Bastankhah, University of Surrey, Guildford, United Kingdom

19:00 – 21:00 **Dinner on the boat**

Tuesday, 30 August, 2022**Session 5 - Vegetation**, Chair: Márton Balczó

- 8:40 – 9:10 **Using Doppler wind lidars to measure kinematic quantities across the lower atmosphere**
Markus Kayser, E. Päschke, C. Detring, F. Beyrich, C. Becker, V. Lehman, R. Leinweber, Lindenber
Meteorological Observatory, Tauche OT Lindenber, Germany
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- 9:10 – 9:30 **Influence of vegetation on urban canyon ventilation. Part I : experimental and numerical investigation of averaged concentration and bulk exchange velocity.**
Marilina Barulli, S. Fellini, A. Del Ponte, L. Ridolfi, L. Shoulha, M. Marro, A. Emmanuelli, P. Salizzoni, Politecnico di Torino, Turin, Italy
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- 9:30 – 9:50 **Influence of vegetation on urban canyon ventilation. Part II: velocity field and turbulent mass fluxes**
Annika Vittoria Del Pont, S. Fellini, M. Barulli, L. Ridolfi, L. Shoulha, M. Marro, P. Salizzoni, Politecnico di Torino, Turin, Italy
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- 9:50 – 10:10 **Dry deposition of particulate matter on urban green infrastructure with parameterised drag effects**
Tess Ysebaert, R. Samson, S. Denys, University of Antwerp, Belgium
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- 10:10 – 10:30 **Wind tunnel measurement on the flow and traffic emission dispersion around roadside building with green vegetation belt**
Bao-Shi Shiau, H.P. Huang, National Taiwan Ocean University, Taiwan
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- 10:30 – 10:50 **A comparison of turbulent flows over idealized urban and vegetation canopy**
Ruiqi Wang, Ziwei Mo and Chun-Ho Liu, The University of Hong Kong, Hong Kong
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- 10:50 – 11:20 **Coffee break**

Session 6 - Methodology, Chair: Frank Harms

- 11:20 – 11:40 **Measuring wall shear forces with a simple pressure transducer?**
Nikhil Raghuvanshi, F. Harms, B. Leiti, T. Glanert, University of Hamburg, Germany
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- 11:40 – 12:00 **Prediction of turbulence generated by non-homogeneous grids for applications to experimental atmospheric boundary layer generation**
Thomas Huret, G. Tanguy, C. Vassilicos, L. Jacquin, Q. Gallas, ONERA, Lille, France
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- 12:00 – 12:20 **Evaluation of differences between DMD and OPD in coherent structures detection**
Zuzana Kluková, Š. Nosek, Z. Jaňour, Institute of Thermomechanics, Prague, Czechia
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- 12:20 – 12:40 **Statistical assessment of the ventilation of street canyons based on time-resolved wind tunnel experiments**
Bálint Papp, B. Istók, M. Koren, M. Balczó, G. Kristóf, Budapest University of Technology and Economics, Hungary
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- 12:40 – 13:00 **Transient Wind Forcing: a method for modelling wind shear in building-scale Large Eddy Simulations**
Márton Koren, M. Balogh, G. Kristóf, Budapest University of Technology and Economics, Hungary
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- 13:00 – 14:30 **Lunch break**
- 14:45 **Bus departure**
- 16:00 – 17:30 **Excursion in the Aerodynamical laboratory in Nový Knín**
- 18:00 – 21:30 **Dinner on the Dobříš Chateau**
- 22:30 **Return to Prague**

Wednesday, 31 August, 2022**Session 7 - Urban canopy and buildings 3**, Chair: Yarden Bohbot-Raviv

- 8:40 – 9:00 **Predicting mean wind profiles and pollutant dispersion inside urban canopies**
Huanhuan Wang, E. Furtak-Cole, K. Ngan, City University of Hong Kong, Hong Kong
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- 9:00 – 9:20 **Large-Eddy Simulation of the Atmospheric Boundary Layer Flows over Different Urban-Like Morphologies**
Wai-Chi Cheng, Sun Yat-sen University, Zhuhai, China
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- 9:20 – 9:40 **Application of a microscale ship plume parameterization in a city-scale air quality model**
Ronny Badeke, V. Matthias, M. Karl, M.O.P. Ramacher, D.A. Schwarzkopf, D. Grawe, Helmholtz-Zentrum Hereon, Geesthacht, Germany
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- 9:40 – 10:00 **Coarse grid and implicit LES for urban pollutant dispersion**
Tom Lauriks, W. Munters, J. van Beeck, Siegfried Denys, University of Antwerp, Belgium
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- 10:00 – 10:20 **Turbulent Flows in the Inertial- and Roughness-sublayer over Real Urban Morphology: A Comparison of Wind tunnel Experiment and Large-eddy Simulation**
Ziwei Mo, Chun-Ho Liu, The University of Hong Kong, Hong Kong
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- 10:20 – 10:50 **Coffee break**

Session 8 - Urban canopy and buildings 4, Chair: Marco Placidi

- 10:50 – 11:10 **Experimental investigation of the heat removal and air ventilation in urban area using simultaneous PIV-LIF measurement in water tunnel**
Yunpeng Xue, Y. Zhao, S. Mei, Y. Chao, J. Carmeliet, Singapore-ETH Centre, Singapore
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- 11:10 – 11:30 **PIV-PLIF measurements of pollutant dispersion in atmospheric boundary layer flow in a water channel**
Desmond Lim, C. Vanderwel, University of Southampton, United Kingdom
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- 11:30 – 11:50 **Quadrant Analysis of Two-height Canopy Flow Modeled in a Wind Tunnel**
Valery Babin, L. Shig, E. Fattal, R. Shnapp, A. Liberzon and Y. Bohbot-Raviv, Institute for Biological Research, Ness Ziona, Israel
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- 11:50 – 12:10 **Different boundary conditions for LES solver PALM 6.0 used for ABL in tunnel experiment**
Hynek Řezníček, J. Geletič, M. Bureš, P. Krč, J. Resler, K. Vrbová, A.Trush, P. Michálek, L. Beneš, M. Sühri, Institute for computer science, Prague, Czechia
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- 12:10 – 12:30 **Computational Simulations of Gases Dispersion in Built-up Environment under changes in Roof Shape configurations**
Mohamed Yassin, M. Jasem, M.Shlash, Kuwait Institute for Scientific Research, Kuwait
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12:30 – 14:00 **Lunch Break**

Session 9 - Applications, Chair: Klára Jurčáková

- 14:00 – 14:20 **Use of atmospheric boundary-layer LES fields for an operational Lagrangian dispersion model**
Ariane Emmanuelli, G. Lamaison, L.Soulhac, Ecole Centrale Lyon, France
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- 14:20 – 14:40 **Wind tunnel measurements of airflows and gas concentrations downwind a naturally-ventilated pig building model**
Qianying Yi, D. Janke, L. Thormann, S. Hempel, B. Amon, T. Amon, Leibniz Institute for Agricultural Engineering and Bioeconomy (ATB), Postdam, Germany
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- 14:40 – 15:00 **Operational dispersion model for emergency services**
Hana Chaloupecká, Institute of Thermomechanics , Prague, Czechia
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- 15:00 – 15:20 **Aspects of dosage from short and long duration emissions**
Alan Robin, P. Hayden, D. Gallacher, S. Pace, H. Chaloupecka, University of Surrey, Guildford, United Kingdom
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- 15:20 – 16:00 **Final discussion and the best student presentation award**
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POSTERS**Concentration fluctuations in atmospheric boundary layer**

Claudia Schiavini, L. Soulhac, P. Salizzoni, M. Marro, Ecole Centrale Lyon, France

The control of buoyant smoke in transversally ventilated tunnels with the presence of a longitudinal flow

Cosimo Peruzzi, P. Salizzoni, M. Marro, P. Cingi, D. Angeli, T. Kubwimana, A. Mos, Ecole Centrale Lyon, France

Experimental study of natural ventilation in realistic urban environments

Matteo Carpentieri, Hayden, P. Singh, L. Morina, M. Mian Muhammad, University of Surrey, Guildford, United Kingdom

Temporal, Spatial, and Spatio-temporal correlation of the velocity fluctuations

Klára Jurčáková, Institute of Thermomechanics , Prague, Czechia
