

CURRICULUM VITAE

Personal information

Name, first name Defraeye, Thijs
Date, place of birth 25/04/1983, Roeselare, Belgium
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Research interests and competences

Research interests: *Computational engineering – Soft materials – Transdermal drug delivery – Food science – Convective cooling and drying processes – Electrohydrodynamics – Biomimetic sensors*

Competences: *Computational fluid dynamics (RANS, LES) – Finite element modeling – Multiscale modeling – Non-destructive imaging (X-ray imaging, neutron computed tomography, magnetic resonance imaging) – Wind-tunnel experiments (particle image velocimetry, hot-wire anemometry).*

Academic publishing and scientific reviewing activities

Publications: 76 peer-reviewed journal papers

Patents: 1 patent

h-index: 23 (Scopus), 29 (Google Scholar)

Reviewer for 27 scientific journals with impact factor, including *Drying Technology, Energy, Energy Conversion and Management, Environmental Modeling & Software, Food and Bioprocess Technology, Innovative Food Science and Emerging Technologies, International Journal of Heat and Mass Transfer, Journal of Food Engineering, Postharvest Biology and Technology, Journal of Cleaner Production, Trends in Food Science & Technology*

Member of International Editorial Advisory Board of *Drying Technology* and *Postharvest Biology and Technology*.

Education

01/2011 PhD in Engineering, Department of Civil Engineering, KU Leuven, Belgium

07/2006 Master in Civil Engineering, Department of Civil Engineering, KU Leuven, Belgium

Employment

03/2018 – present Senior scientist at Laboratory for Biomimetic Membranes and Textiles (Empa, Switzerland)

10/2014 – 02/2018 Scientist at Laboratory for Multiscale Studies in Building Physics (Empa, Switzerland)
Senior research fellow at Chair of Building Physics (ETH Zürich, Switzerland)

10/2011 – 09/2014 Postdoctoral research fellow on personal 3-year grant of Research Foundation Flanders (FWO). Host: Prof. B. Nicolai of Division of Mechatronics, Biostatistics and Sensors - MeBioS (KU Leuven, Belgium). *Joint affiliation with ETH Zürich/Empa from 09/2013-09/2014*

02/2011 – 09/2011 Postdoctoral research fellow at Division of Mechatronics, Biostatistics and Sensors -

MeBioS ([KU Leuven](#), Belgium)

11/2010 – 01/2011 Research fellow at Chair of Building Physics ([ETH Zürich](#), Switzerland)

09/2006 – 10/2010 PhD candidate at Laboratory of Building Physics ([KU Leuven](#), Belgium)

Funding ID & projects as Principal Investigator (only major projects)

- 2017 [KTI R&D project](#) (26032.1 PFLS-LS, Switzerland). *Transport of ripe mangoes from overseas markets to Switzerland by ship instead of airfreight* – **507 kCHF**
- 2016 [SNSF project](#) (200021_169372, Swiss National Science Foundation, Switzerland). *Convective cooling of heat-sensitive products organized in macro-porous assemblies: a novel conjugate method* – **194 kCHF**
- 2016 [KTI project](#) (18155.2 PFLS-LS, Switzerland). *Artificial fruit sensor system for monitoring the thermal behavior of fruit in the cold chain* – **94 kCHF**
- 2015 [SNSF project](#) (200021_160047, Swiss National Science Foundation, Switzerland). *Solar drying of soft cellular materials: a multiscale approach* – **191 kCHF**
- 2015 [Coop Research Program grant](#) (ETHZ World Food System Center, Switzerland). *Eco-smart ventilated packaging for fresh fruit using virtual cold chains* – **217 kCHF**
- 2013 [SNSF R'Equip](#) (206021_150782, Swiss National Science Foundation, Switzerland) & [ETHZ Scientific Equipment Program grant](#). *Multi-scale fluid-tunnel facility for the built environment* – **1'110 kCHF** (I coordinated the proposal and led the project with an 80% contribution, but I could not officially apply as PI at that time)
- 2011 [Postdoctoral fellowship grant](#) (Research Foundation Flanders FWO, Belgium). *Multiscale modeling of convective heat and mass exchange of plant leaves* (3-year research project, personal funding, success rate 2011: 28%) – **235 kEUR**

Supervision of Master & PhD students

Co-supervisor of 4 ongoing PhD theses: L. Manickathan – K. Prawiranto – G. Tagliavini ([ETH Zürich](#)), S. Rogge ([KU Leuven](#)).

Jury member of 7 completed PhD theses: T. van Hooff ([Eindhoven University of Technology](#)), M. Abera – W. Aregawi – K. Kuffi – M. van Dael ([KU Leuven](#)), T. Berry – S. Getahun ([Stellenbosch University](#)).

Co-supervisor or jury member of 10 completed Master theses at [KU Leuven](#), [EPFL](#), [University of Stellenbosch](#) and [Eindhoven University of Technology](#).

Teaching activities

2014 – present Lecturer (full course), Building Physics II (BSc, 30 hours), [ETH Zürich](#), Switzerland

2011 – 2012 Guest lecturer, Physical Transport Phenomena, [KU Leuven](#), Belgium

2006 – 2010 Teaching assistant, Building Physics, [KU Leuven](#), Belgium

Organization of conferences and workshops

Organizer of [PACKCHAIN](#) workshop at [ETH Zürich](#) “[New cold-chain and packaging technologies to reduce food losses](#)” (Zürich 2017)

Organizer of [5 Topical Days on High-Performance Multiscale Modeling](#) (2016-present, Empa, Switzerland)

Co-organizer of 4 international conferences: *PhysMod 2015 (Zürich)*, *InsideFood 2013 (Leuven)*, *13th ICWE Conference 2011 (Amsterdam)*, *Building Physics Symposium 2008 (Leuven)*

Keynotes at following conferences

- Physics of Drying Conference (Paris 2018)
- 10th Citrus Research Symposium (Drakensberg 2018)
- COMSOL Multiphysics Conference (Lausanne 2018)
- 7th International European Asphalt Technology Association (EATA) Conference (Zürich 2017)
- Gordon Research Conference on “Flow & Transport in Permeable Media” (Girona 2016)

Prizes, awards, fellowships

2011 Postdoctoral fellowship grant (Research Foundation Flanders FWO, Belgium). *Multiscale modeling of convective heat and mass exchange of plant leaves* (3-year project, personal funding)

Recent collaborations

Research institutes

- Agroscope Wädenswil - Product Quality, Innovation and Nutrition (Switzerland, *Dr. A. Bühlmann, Dr. S. Petignat-Keller*)
- ETH Zürich (Switzerland, Ecological Systems Design, *Prof. S. Hellweg*)
- ETH World Food System Center (Switzerland, *M. Grant*)
- Dalhousie University (Canada, *Prof. A. Martynenko*)
- Citrus Research International (South Africa, *Dr. P. Cronjé*)
- KU Leuven - Division of Mechatronics, Biostatistics and Sensors (Belgium, *Prof. B. Nicolai, Dr. P. Verboven*)
- Paul Scherrer Institute (Switzerland, *Dr. E. Lehmann*)
- University of Stellenbosch - South African Research Chair in Postharvest Technology (South Africa, *Prof. L. Opara*)

Companies

- Coop Genossenschaft (Switzerland, *A. Böhlen*)
- Giovanelli Fruchtimport AG (Switzerland, *R. Giovanelli*)
- Delica AG (Switzerland, Migros Industries, *I. Weinberger*)
- Johnson Matthey (Israel, *G. Ward*)

Measurement campaigns at large-scale facilities

10 beamtimes on neutron imaging and synchrotron X-ray imaging (3-5 days each) at the Paul Scherrer Institute (PSI, Switzerland). *I was the PI for 7 of these beamtimes.*

5 wind-tunnel test campaigns (2-3 days each) on cyclist aerodynamics and aerodynamics of cyclist clothing at German-Dutch Wind Tunnels (The Netherlands) and TU Dresden (Germany).

Media coverage

PACKCHAIN project in [Coop Zeitung](#)

Artificial fruit sensor in [BBC](#), [Empa Quarterly](#), [3D Printing Industry](#), [Phys.Org](#), [Fruchthandel.de](#)

LIST OF PUBLICATIONS

Publications in international peer-reviewed scientific journals

Number	76 publications
h-index	23 (Scopus), 29 (Google Scholar)

The complete publication list can be found on following website

<https://www.empa.ch/web/det/publications>

2018

76. **Defraeye T.**, Martynenko A. (2018), Future perspectives for electrohydrodynamic drying of biomaterials, *Drying Technology* 36, 1-10. [DOI and postprint](#)
75. **Defraeye T.**, Radu A. (2018), Insights in convective drying of fruit by coupled modeling of fruit drying, deformation, quality evolution and convective exchange with the airflow, *Applied Thermal Engineering* 129, 1026-1038. [DOI and postprint](#)
74. Wu W., Haller P., Cronje P., **Defraeye T.** (2018), Full-scale experiments in forced-air precoolers for citrus fruit: Impact of packaging design and fruit size on cooling rate and heterogeneity, *Biosystems Engineering* 169, 115-125. [DOI and postprint](#)
73. Wu W., **Defraeye T.** (2018), Identifying heterogeneities in cooling and quality evolution for a pallet of packed fresh fruit by using virtual cold chains, *Applied Thermal Engineering* 133, 407-417. [DOI and postprint](#)
72. Wu W., Cronje P., Nicolai B., Verboven P., Opara U.L., **Defraeye T.** (2018), Virtual cold chain to model the postharvest temperature history and quality evolution of fresh fruit – A case study for citrus fruit packed in a single carton, *Computers and Electronics in Agriculture* 144, 199-208. [DOI and postprint](#)
71. Manickathan L., **Defraeye T.**, Allegrini J., Derome D., Carmeliet J. (2018), Parametric study of the influence of environmental factors and tree properties on the transpirative cooling effect of trees, *Agricultural and Forest Meteorology* 248, 259-274. [DOI and postprint](#)
70. Lal S., Lucci F., **Defraeye T.**, Poulikakos L.D., Partl M.N., Derome D., Carmeliet J. (2018), CFD modeling of convective scalar transport in a macroporous material for drying applications, *International Journal of Thermal Sciences* 123, 86-98. [DOI](#)

2017

69. **Defraeye T.**, Wu W., Prawiranto K., Fortunato G., Kemp S., Hartmann S., Cronje P., Verboven P., Nicolai B. (2017), Artificial fruit for monitoring the thermal history of horticultural produce in the cold chain, *Journal of Food Engineering* 215, 51-60. [DOI and postprint](#)
68. **Defraeye T.** (2017), Impact of size and shape of fresh-cut fruit on the drying time and fruit quality, *Journal of Food Engineering* 210, 35-41. [DOI and postprint](#)
67. **Defraeye T.**, Radu A. (2017), Convective drying of fruit: a deeper look at the air-material interface by conjugate modeling, *International Journal of Heat and Mass Transfer* 108, 1610-1622. [DOI and postprint](#)
66. **Defraeye T.**, Verboven P. (2017), Moisture barriers to control drying of fresh-cut fruit: quantifying their impact by modeling, *Food and Bioproducts Processing* 101, 205–213. [DOI and postprint](#)
65. **Defraeye T.** (2017), When to stop drying fruit: Insights from hygrothermal modelling, *Applied Thermal Engineering* 110, 1128–1136. [DOI and postprint](#)

64. **Defraeye T.**, Verboven P. (2017), Convective drying of fruit: Role and impact of moisture transport properties in modelling, *Journal of Food Engineering* 193, 95-107. [DOI and postprint](#)
63. Berry T.M., Fadji T.S., **Defraeye T.**, Opara U.L. (2017), The role of horticultural carton vent hole design on cooling efficiency and compression strength: A multi-parameter approach, *Postharvest Biology and Technology* 124, 62-74. [DOI](#)
62. Derome D., Kubilay A., **Defraeye T.**, Blocken B., Carmeliet J. (2017), Ten questions concerning modeling of wind-driven rain in the built environment, *Building and Environment* 114, 495-506. [DOI](#)
61. Radu A., **Defraeye T.**, Ruch P., Carmeliet J., Derome D. (2017), Insights from modeling dynamics of water sorption in spherical particles for adsorption heat pumps, *International Journal of Heat and Mass Transfer* 105, 326–337. [DOI](#)

2016

60. **Defraeye T.**, Radu A., Derome D. (2016), Recent advances in drying at interfaces of biomaterials, *Drying Technology* 34, 1904-1925. [DOI and postprint](#)
59. **Defraeye T.** (2016), Towards more efficient intermittent drying of fruit: insights from combined hygrothermal-quality modelling, *Innovative Food Science and Emerging Technologies* 38, 262-271. [DOI and postprint](#)
58. **Defraeye T.**, Nicolai B., Mannes D., Aregawi W., Verboven P., Derome D. (2016), Probing inside fruit slices during convective drying by quantitative neutron imaging, *Journal of Food Engineering* 178, 198-202. [DOI and postprint](#)
57. **Defraeye T.**, Nicolai B., Kirkman W., Moore S., van Niekerk S., Verboven P., Cronjé P. (2016), Integral performance evaluation of the fresh-produce cold chain: A case study for ambient loading of citrus in refrigerated containers, *Postharvest Biology and Technology* 112, 1-13. [DOI and postprint](#)
56. Kuffi K., **Defraeye T.**, Nicolai B., De Smet S., Geeraerd A., Verboven P. (2016), CFD modelling of industrial cooling of large beef carcasses, *International Journal of Refrigeration* 69, 324-339. [DOI](#)
55. Berry T.M., **Defraeye T.**, Nicolai B., Opara U.L. (2016), Multi-parameter analysis of cooling efficiency of ventilated fruit cartons using CFD: Impact of vent hole design and internal packaging, *Food and Bioprocess Technology* 9, 1481-1493. [DOI](#)

2015

54. **Defraeye T.**, Cronjé P., Verboven P., Opara U.L., Nicolai B. (2015), Exploring ambient loading of citrus fruit into reefer containers for cooling during marine transport using computational fluid dynamics, *Postharvest Biology and Technology* 108, 91-101. [DOI and postprint](#)
53. **Defraeye T.**, Cronjé P., Berry T., Opara U.L., East A., Hertog M., Verboven P., Nicolai B. (2015), Towards integrated performance evaluation of future packaging for fresh produce in the cold chain, *Trends in Food Science & Technology* 44, 201-225. [DOI and postprint](#)
52. **Defraeye T.**, Verboven P., Opara U.L., Nicolai B., Cronjé P. (2015), Feasibility of ambient loading of citrus fruit into refrigerated containers for cooling during marine transport, *Biosystems Engineering* 134, 20-30. [DOI and postprint](#)
51. Martin M., **Defraeye T.**, Derome D., Carmeliet J. (2015), A film flow model for analysing gravity-driven, thin wavy fluid films, *International Journal of Multiphase Flow* 73, 207-216. [DOI](#)
50. Rogge S., **Defraeye T.**, Herremans E., Verboven P., Nicolai B. (2015), A 3D contour based geometrical model generator for complex-shaped horticultural products, *Journal of Food Engineering* 157, 24-32. [DOI](#)

2014

49. **Defraeye T.** (2014), Advanced computational modelling for drying processes - a review, *Applied Energy* 131, 323-344. [DOI and postprint](#)
48. **Defraeye T.**, Lambrecht R., Delele M.A., Ambaw A., Opara U.L., Cronjé P., Verboven P., Nicolai B. (2014), Forced-convective cooling of citrus fruit: cooling conditions and energy consumption in relation to package design, *Journal of Food Engineering* 121, 118-127. [DOI and postprint](#)
47. **Defraeye T.**, Derome D., Verboven P., Carmeliet J., Nicolai B. (2014), Cross-scale modelling of transpiration from stomata via the leaf boundary layer, *Annals of Botany* 114 (4), 711-723. [DOI and postprint](#)
46. **Defraeye T.**, Derome D., Aregawi W., Cantré D., Hartmann S., Lehmann E., Carmeliet J., Voisard F., Verboven P., Nicolai B. (2014), Quantitative neutron imaging of water distribution, venation network and sap flow in leaves, *Planta* 240 (2), 423-436. [DOI and postprint](#)
45. **Defraeye T.**, Blocken B., Koninckx E., Hespel P., Verboven P., Nicolai B., Carmeliet J. (2014), Cyclist drag in team pursuit: influence of cyclist sequence, stature and arm spacing, *Journal of Biomechanical Engineering* 136 (1), 011005. [DOI and postprint](#)
44. Nicolai B., **Defraeye T.**, De Ketelaere B., Herremans E., Hertog M., Saeys W., Toricelli A., Vandendriessche T., Verboven P. (2014), Nondestructive measurement of fruit and vegetable quality, *Annual Review of Food Science and Technology* 5, 285-312. [DOI](#)
43. Aregawi W., **Defraeye T.**, Saneinejad S., Vontobel P., Lehmann E., Carmeliet J., Verboven P., Derome D., Nicolai B. (2014), Understanding forced convective drying of apple tissue: combining neutron radiography and numerical modelling, *Innovative Food Science & Emerging Technologies* 24, 97-105. [DOI](#)
42. Abera M.K., Verboven P., **Defraeye T.**, Fanta S.W., Hertog M., Carmeliet J., Nicolai B. (2014), A plant cell division algorithm based on cell biomechanics and ellipse fitting, *Annals of Botany* 114 (4), 605-617. [DOI](#)
41. Abera M.K., Verboven P., Herremans E., **Defraeye T.**, Fanta S.W., Ho Q.T., Carmeliet J., Nicolai B. (2014), 3D virtual pome fruit tissue generation based on cell growth modeling, *Food and Bioprocess Technology* 7 (2), 542-555. [DOI](#)
40. Ambaw A., Verboven P., Delele M.A., **Defraeye T.**, Tijskens E., Schenk A., Verlinden B., Opara L.U., Nicolai B. (2014), CFD-based analysis of 1-MCP distribution in commercial cool store rooms: porous medium model application, *Food and Bioprocess Technology* 7 (7), 1903-1916. [DOI](#)
39. Rogge S., Beyene S., Herremans E., Hertog M., **Defraeye T.**, Verboven P., Nicolai B. (2014), A geometrical model generator for quasi-axisymmetric biological products, *Food and Bioprocess Technology* 7 (6), 1783-1792. [DOI](#)
38. Herremans E., Verboven P., **Defraeye T.**, Rogge S., Ho Q.T., Hertog M., Verlinden B., Bongaers E., Wevers M., Nicolai B. (2014), X-ray CT for quantitative food microstructure engineering: The apple case, *Nuclear Instruments & Methods in Physics Research B: Beam Interactions with Materials and Atoms* 324, 88-94. [DOI](#)
37. Herremans E., Melado-Herreros A., **Defraeye T.**, Verlinden B., Hertog M., Verboven P., Val J., Fernández-Valle M.E., Bongaers E., Estrade P., Wevers M., Barreiro P., Nicolai B. (2014), Comparison of X-ray CT and MRI of watercore disorder of different apple cultivars, *Postharvest Biology and Technology* 87, 42-50. [DOI](#)
36. Ho Q.T., Verboven P., Fanta S.W., Abera M.K., Retta M.A., Herremans E., **Defraeye T.**, Nicolai B. (2014), A multiphase pore scale network model of gas exchange in apple fruit, *Food and Bioprocess Technology* 7 (2), 482-495. [DOI](#)

35. Van Dyck T., Verboven P., Herremans E., **Defraeye T.**, Van Campenhout L., Wevers M., Claes J., Nicolai B. (2014), Characterisation of structural patterns in bread as evaluated by X-ray computer tomography, *Journal of Food Engineering* 123, 67-77. [DOI](#)

2013

34. **Defraeye T.**, Aregawi W., Saneinejad S., Vontobel P., Lehmann E., Carmeliet J., Verboven P., Derome D., Nicolai B. (2013), Novel application of neutron radiography to forced convective drying of fruit tissue, *Food and Bioprocess Technology* 6 (12), 3353-3367. [DOI and postprint](#)
33. **Defraeye T.**, Verboven P., Derome D., Carmeliet J., Nicolai B. (2013), Stomatal transpiration and droplet evaporation on leaf surfaces by a microscale modelling approach, *International Journal of Heat and Mass Transfer* 65, 180-191. [DOI and postprint](#)
32. **Defraeye T.**, Verboven P., Ho Q.T., Nicolai B. (2013), Convective heat and mass exchange predictions at leaf surfaces: Applications, methods and perspectives, *Computers and Electronics in Agriculture* 96, 180-201. [DOI and postprint](#)
31. **Defraeye T.**, Lambrecht R., Ambaw A., Delele M.A., Opara U.L., Cronjé P., Verboven P., Nicolai B. (2013), Forced-convective cooling of citrus fruit: package design, *Journal of Food Engineering* 118 (1), 8-18. [DOI and postprint](#)
30. **Defraeye T.**, Lehmann V., Gross D., Holat C., Herremans E., Verboven P., Verlinden B., Nicolai B. (2013), Application of MRI for tissue characterisation of 'Braeburn' apple, *Postharvest Biology and Technology* 75, 96-105. [DOI and postprint](#)
29. **Defraeye T.**, Verboven P., Nicolai B. (2013), CFD modelling of flow and scalar exchange of spherical food products: turbulence and boundary-layer modelling, *Journal of Food Engineering* 114 (4), 495-504. [DOI and postprint](#)
28. **Defraeye T.**, Blocken B., Carmeliet J. (2013), Influence of uncertainty in heat-moisture transport properties on convective drying of porous materials by numerical modelling, *Chemical Engineering Research and Design* 91 (1), 36-42. [DOI and postprint](#)
27. Aregawi W., **Defraeye T.**, Saneinejad S., Vontobel P., Lehmann E., Carmeliet J., Derome D., Verboven P., Nicolai B. (2013), Dehydration of apple tissue: intercomparison of neutron tomography with numerical modelling, *International Journal of Heat and Mass Transfer* 67, 173-182. [DOI](#)
26. Aregawi W., **Defraeye T.**, Verboven P., Herremans E., De Roeck G., Nicolai B. (2013), Modelling of coupled water transport and large deformation during dehydration of apple tissue, *Food and Bioprocess Technology* 6 (8), 1963-1978. [DOI](#)
25. Ambaw A., Verboven P., **Defraeye T.**, Schenk A., Opara U., Nicolai B. (2013), Effect of box materials on the distribution of 1-MCP gas during cold storage: a CFD study, *Journal of Food Engineering* 119 (1), 150-158. [DOI](#)
24. Ambaw A., Verboven P., Delele M.A., **Defraeye T.**, Tijssens E., Schenk A., Nicolai B. (2013), CFD modelling of the 3D spatial and temporal distribution of 1-methylcyclopropene in a fruit storage container, *Food and Bioprocess Technology* 6 (9), 2235-2250. [DOI](#)
23. Ambaw A., Verboven P., **Defraeye T.**, Tijssens E., Schenk A., Opara U.L., Nicolai B. (2013), Porous medium modeling and parameter sensitivity analysis of 1-MCP distribution in boxes with apple fruit, *Journal of Food Engineering* 119 (1), 13-21. [DOI](#)
22. Ambaw A., Delele M., **Defraeye T.**, Ho Q.T., Opara U.L., Nicolai B., Verboven P. (2013), The use of CFD to characterize and design post-harvest storage facilities: Past, present and future, *Computers and Electronics in Agriculture* 93, 184-194. [DOI](#)
21. Blocken B., **Defraeye T.**, Koninckx E., Carmeliet J., Hespel P. (2013), CFD simulations of the aerodynamic drag of two drafting cyclists, *Computers & Fluids* 71, 435-445. [DOI](#)

20. Ho Q.T., Carmeliet J., Datta A.K., **Defraeye T.**, Delele M.A., Herremans E., Opara L., Ramon H., Tijssens E., van der Sman R., Van Liedekerke P., Verboven P., Nicolai B. (2013), Multiscale modeling in food engineering, *Journal of Food Engineering* 114 (3), 279-291. [DOI](#)

2012

19. **Defraeye T.**, Herremans E., Verboven P., Carmeliet J., Nicolai B. (2012), Convective heat and mass exchange at surfaces of horticultural products: a microscale CFD modelling approach, *Agricultural and Forest Meteorology* 162-163, 71-84. [DOI and postprint](#)
18. **Defraeye T.**, Blocken B., Derome D., Nicolai B., Carmeliet J. (2012), Convective heat and mass transfer modelling at air-porous material interfaces: overview of existing methods and relevance, *Chemical Engineering Science* 74, 49-58. [DOI and postprint](#)
17. **Defraeye T.**, Blocken B., Carmeliet J. (2012), CFD simulation of heat transfer at surfaces of bluff bodies in turbulent boundary layers: evaluation of a forced-convective temperature wall function for mixed convection, *Journal of Wind Engineering and Industrial Aerodynamics* 104-106, 439-446. [DOI and postprint](#)
16. **Defraeye T.**, Houvenaghel G., Carmeliet J., Derome D. (2012), Numerical analysis of convective drying of gypsum boards, *International Journal of Heat and Mass Transfer* 55 (9-10), 2590-2600. [DOI and postprint](#)
15. **Defraeye T.**, Blocken B., Carmeliet J. (2012), Analysis of convective heat and mass transfer coefficients for convective drying of a porous flat plate by conjugate modelling, *International Journal of Heat and Mass Transfer* 55 (1-3), 112-124. [DOI and postprint](#)
14. Moonen P., **Defraeye T.**, Dorer V., Blocken B., Carmeliet J. (2012), Urban Physics: effect of the microclimate on comfort, health and energy demand, *Frontiers of Architectural Research* 1, 197-228. [DOI](#)
13. van Hooff T., Blocken B., **Defraeye T.**, Carmeliet J., van Heijst G.J.F. (2012), PIV measurements of a plane wall jet in a confined space at transitional slot Reynolds numbers, *Experiments in Fluids* 53 (2), 499-517. [DOI](#)
12. van Hooff T., Blocken B., **Defraeye T.**, Carmeliet J., van Heijst G.J.F. (2012), PIV measurements and analysis of transitional flow in a reduced-scale model: Ventilation by a free plane jet with Coanda effect, *Building and Environment* 56, 301-313. [DOI](#)
11. Saneinejad S., Moonen P., **Defraeye T.**, Derome D., Carmeliet J. (2012), Coupled CFD, radiation and porous media transport model for evaluating evaporative cooling in an urban environment, *Journal of Wind Engineering and Industrial Aerodynamics* 104-106, 455-463. [DOI](#)
10. Allegrini J., Dorer V., **Defraeye T.**, Carmeliet J. (2012), An adaptive temperature wall function for mixed convective flows at exterior surfaces of buildings in street canyons, *Building and Environment* 49, 55-66. [DOI](#)

2011

9. **Defraeye T.**, Blocken B., Carmeliet J. (2011), An adjusted temperature wall function for turbulent forced convective heat transfer for bluff bodies in the atmospheric boundary layer, *Building and Environment* 46 (11), 2130-2141. [DOI and postprint](#)
8. **Defraeye T.**, Blocken B., Koninckx E., Hespel P., Carmeliet J. (2011), Computational fluid dynamics analysis of drag and convective heat transfer of individual body segments for different cyclist positions, *Journal of Biomechanics* 44 (9), 1695-1701. [DOI and postprint](#)
7. **Defraeye T.**, Blocken B., Carmeliet J. (2011), Convective heat transfer coefficients for exterior building surfaces: Existing correlations and CFD modelling, *Energy Conversion & Management* 52 (1), 512-522. [DOI and postprint](#)

6. Saneinejad S., Moonen P., **Defraeye T.**, Carmeliet J. (2011), Analysis of convective heat and mass transfer at the vertical walls of a street canyon, *Journal of Wind Engineering and Industrial Aerodynamics* 99 (4), 424-433. [DOI](#)

2010

5. **Defraeye T.**, Carmeliet J. (2010), A methodology to assess the influence of local wind conditions and building orientation on the convective heat transfer at building surfaces, *Environmental Modelling & Software* 25 (12), 1813-1824. [DOI and postprint](#)
4. **Defraeye T.**, Blocken B., Koninckx E., Hespel P., Carmeliet J. (2010), Computational fluid dynamics analysis of cyclist aerodynamics: Performance of different turbulence-modelling and boundary-layer modelling approaches, *Journal of Biomechanics* 43 (12), 2281-2287. [DOI and postprint](#)
3. **Defraeye T.**, Blocken B., Koninckx E., Hespel P., Carmeliet J. (2010), Aerodynamic study of different cyclist positions: CFD analysis and full-scale wind-tunnel tests, *Journal of Biomechanics* 43 (7), 1262-1268. [DOI and postprint](#)
2. **Defraeye T.**, Blocken B., Carmeliet J. (2010), CFD analysis of convective heat transfer at the surfaces of a cube immersed in a turbulent boundary layer, *International Journal of Heat and Mass Transfer* 53 (1-3), 297-308. [DOI and postprint](#)

2009

1. Blocken B., **Defraeye T.**, Derome D., Carmeliet J. (2009), High-resolution CFD simulations for forced convective heat transfer coefficients at the facade of a low-rise building, *Building and Environment* 44 (12), 2396-2412. [DOI](#)

Patents

Defraeye T. WO2017081257: Artificial horticultural product. ([PCT/EP2016/077441](https://patents.google.com/patent/WO2017081257)), filed 11/11/2016 (priority date 12/12/2015).

Contributions to books

- Verboven P., **Defraeye T.**, Nicolai B. (2018), Measurement and visualization of food microstructure: Fundamentals and recent advances, In: Devahastin S. (Ed.), Food Microstructure and Its Relationship with Quality and Stability, Woodhead Publishing, UK (ISBN: 978-0-08-100764-8) [DOI](#)
- Carmeliet J., Blocken B., **Defraeye T.**, Derome D., Moisture phenomena in whole building performance prediction, In: Hensen J.L.M. & Lamberts R. (Eds.), Building Performance Simulation for Design and Operation, Taylor and Francis, London, UK, 2011. [DOI](#)

Oral contributions to international conferences

The oral contributions correspond to the conference proceedings listed above.

Keynotes at international conferences:

- Gordon Research Conference on “Flow & Transport in Permeable Media” (Girona 2016) with the presentation “*Drying of cellular biomaterials: insights at the air-material interface by multiscale modelling and experiments*”
- 7th International European Asphalt Technology Association (EATA) Conference (Zürich 2017) with the presentation “*Fluid transport in porous asphalt: perspectives for urban heat island mitigation*”

PhD Thesis

1. **Defraeye T.** (2011), Convective heat and mass transfer at exterior building surfaces, PhD Thesis, University of Leuven, Belgium. (supervisors: Prof. Carmeliet, Prof. De Roeck; co-supervisor: Prof. B. Blocken)