



CBE Publications & Report List September 2017

Papers that summarize research by CBE and affiliated institutions have appeared in the following journals, trade magazines, and conference proceedings. Many of these publications are also available from the eScholarship Repository, on-line at http://escholarship.org/uc/cedr_cbe.

2017

Xu, Z., G. Hu, C. Spanos, and S. Schiavon. 2017. PMV-Based Event-Triggered Mechanism for Building Energy Management under Uncertainties. *Energy and Buildings*. October.

<http://doi.org/10.1016/j.enbuild.2017.07.008> www.escholarship.org/uc/item/2z597468 **NEW**

Dennis, A. 2017. Global trends of thermal comfort in air conditioned and naturally ventilated offices in six climates. Master of Science Thesis. Dept. of Architecture, University of California, Berkeley.

www.escholarship.org/uc/item/1nt5m269 **NEW**

Raftery, P., C. Duarte, S. Schiavon, and F. Bauman. 2017. A new control strategy for high thermal mass radiant systems. Accepted for publication in Proceedings of *Building Simulation Conference 2017*. August.

www.escholarship.org/uc/item/5tz4n92b **NEW**

Ko, W.H. and S. Schiavon. 2017. Balancing Thermal and Luminous Autonomy in the Assessment of Building Performance. Accepted for publication in Proceedings of *Building Simulation Conference 2017*. August.

www.escholarship.org/uc/item/7b4909sf **NEW**

Smith, M.J., K. Warren, D. Cohen-Tanugi, S. Shames, K. Sprehn, J. Schwartz, H. Zhang, and E. Arens. 2017. Augmenting Smart Buildings and Autonomous Vehicles with Wearable Thermal Technology. *Proceedings of HCI International 2017*. July. www.escholarship.org/uc/item/9q24x8p3 **NEW**

Zhai, Y., E. Arens, K. Elsworth, and H. Zhang. 2017. Selecting air speeds for cooling at sedentary and non-sedentary office activity levels. *Building and Environment*. June.

<https://doi.org/10.1016/j.buildenv.2017.06.027> **NEW**

Higgins, C. and K. Carbonnier. 2017. Energy Performance of Commercial Buildings with Radiant Heating and Cooling. Internal report. June. www.escholarship.org/uc/item/34f0h35q **NEW**

Paliaga, G., F. Farahmand, P. Raftery, and J. Woolley. 2017. TABS Radiant Cooling Design & Control in North America: Results from Expert Interviews. Internal report. June. www.escholarship.org/uc/item/0w62k5pg

NEW

Dutra de Vasconcellos, G. 2017. Evaluation of Annual Sunlight Exposure (ASE) as a Proxy to Glare: A Field Study in a NZEB and LEED Certified Office in San Francisco. Master of Science Thesis. Dept. of Architecture, University of California, Berkeley. www.escholarship.org/uc/item/3js1z0b8 **NEW**

Talami, R., C. Karmann, F. Bauman, S. Schiavon, and P. Raftery. 2017. Recent trends in radiant system technology in North America. Internal report. April. www.escholarship.org/uc/item/7pz8p9r6 **NEW**

Bauman, F., P. Raftery, J. Kim, S. Kaam, S. Schiavon, H. Zhang, E. Arens, K. Brown, T. Pepper, C. Blumstein, D. Culler, M. Andersen, G. Fierro, G. Paliaga, A. Pande, H. Cheng, and J. Stein. 2017. Changing the Rules: Innovative Low-Energy Occupant-Responsive HVAC Controls and Systems. Final project report, California Energy Commission. March. www.escholarship.org/uc/item/23t9k6rm **NEW**

Karmann, K., F. Bauman, P. Raftery, S. Schiavon, W. Frantz, and K. Roy. 2017. Cooling capacity and acoustic performance of radiant slab systems with free-hanging acoustical clouds. *Energy and Buildings*. March. www.escholarship.org/uc/item/8r07k5g3 **NEW**

Kaam, S., P. Raftery, H. Cheng, and G. Paliaga. 2017. Time-averaged ventilation for optimized control of variable-air-volume systems. *Energy and Buildings*. March. www.escholarship.org/uc/item/5jq443p4
<http://dx.doi.org/10.1016/j.enbuild.2016.11.059> **NEW**

Filingeri, D., H. Zhang, and E. Arens. 2017. Characteristics of the local cutaneous sensory thermoneutral zone. *Journal of Neurophysiology*. February. <http://dx.doi.org/10.1152/jn.00845.2016>
<http://jn.physiology.org/content/117/4/1797> **NEW**

Ning, B., S. Schiavon, and F. Bauman. 2017. A novel classification scheme for design and control of radiant system based on thermal response time. *Energy and Buildings*. February. www.escholarship.org/uc/item/2j75g92w <http://dx.doi.org/10.1016/j.enbuild.2016.12.013> **NEW**

Cheung, T., S. Schiavon, E. Gall, M. Jin, and W. Nazaroff. 2017. Longitudinal assessment of thermal and perceived air quality acceptability in relation to temperature, humidity, and CO₂ exposure in Singapore. *Building and Environment*. January. www.escholarship.org/uc/item/483474qj **NEW**

2016

Liu, S., S. Schiavon, A. Kabanshi, and W. Nazaroff. 2016. Predicted Percentage Dissatisfied with Ankle Draft. *Indoor Air*. December. www.escholarship.org/uc/item/9076254n <http://dx.doi.org/10.1111/ina.12364> **NEW**

Liu, S., L. Yin, W.K. Ho, K.V. Ling, and S. Schiavon. 2016. A Tracking Cooling Fan Using Geofence and Camera-Based Indoor Localization. *Building and Environment*. November. www.escholarship.org/uc/item/5br8q4x4
<http://dx.doi.org/10.1016/j.buildenv.2016.11.047> **NEW**

de Dear, R., V. Foldvary, H. Zhang, E. Arens, M. Luo, T. Parkinson, X. Du, W. Zhang, C. Chun, and S. Liu. 2016. Comfort is in the mind of the beholder: A review of progress in adaptive thermal comfort research over the past two decades. *The Fifth International Conference on Human-Environment System*. Nagoya, Japan. October 29-November 2. <http://dx.doi.org/10.1016/j.buildenv.2017.01.014>
www.escholarship.org/uc/item/62n2985w **NEW**

Karmann, C., S. Schiavon, and F. Bauman. 2016. Thermal comfort in buildings using radiant vs. all-air systems: A critical review. *Building and Environment*. October. www.escholarship.org/uc/item/1vb3d1j8 **NEW**

Schiavon, S., B. Yang, Y. Donner, V. Chang, and W. Nazaroff. 2016. Thermal comfort, perceived air quality and cognitive performance when personally controlled air movement is used by tropically acclimatized persons. *Indoor Air*. October. <http://dx.doi.org/10.1111/ina.12352> **NEW**

- Kim, H. and E. Macdonald. 2016. Measuring the effectiveness of San Francisco's planning standard for pedestrian wind comfort. *International Journal of Sustainable Development and World Ecology*. October. www.escholarship.org/uc/item/748006tf **NEW**
- Kim, A., S. Schiavon, L. Graham, and W.H. Ko. 2016. Lighting for circadian health: Survey module and non-invasive open-source wearable sensor system. Internal report. October. www.escholarship.org/uc/item/8bf683j8 **NEW**
- Zhao, P., T. Peffer, R. Narayanamurthy, G. Fierro, P. Raftery, S. Kaam, and J. Kim. 2016. Getting into the zone: how the internet of things can improve energy efficiency and demand response in a commercial building. *Proceedings of ACEEE Summer Study on Energy Efficiency in Buildings*. Pacific Grove, CA. August 21-26. 12 pp. www.escholarship.org/uc/item/5bm711zk
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- Andersen, M., G. Fierro, S. Kumar, J. Kim, E. Arens, H. Zhang, P. Raftery, and D. Culler. 2016. Well-connected microzones for increased building efficiency and occupant comfort. *Proceedings of ACEEE Summer Study on Energy Efficiency in Buildings*. Pacific Grove, CA. August 21-26. 16 pp. www.escholarship.org/uc/item/7710g5cb
- Feng, J.D., S. Schiavon, and F. Bauman. 2016. New method for the design of radiant floor cooling systems with solar radiation. *Energy and Buildings* 125, 9-18. August. <http://dx.doi.org/10.1016/j.enbuild.2016.04.048> www.escholarship.org/uc/item/5sj3h2s5
- Gall, E., T. Cheung, I. Luhung, S. Schiavon, and W. Nazaroff. 2016. Real-time monitoring of personal exposure to carbon dioxide. *Building and Environment* 104, 59-67. August. <http://dx.doi.org/10.1016/j.buildenv.2016.04.021> www.escholarship.org/uc/item/0q1269cv
- Gandhi, P. and G. Brager. 2016. Commercial office plug load energy consumption trends and the role of occupant behavior. *Energy and Buildings* 125, 1-8. August. [doi:10.1016/j.enbuild.2016.04.057](https://doi.org/10.1016/j.enbuild.2016.04.057)
- Altomonte, S., S. Saadouni, S. Schiavon. 2016. Occupant Satisfaction in LEED and BREEAM-Certified Office Buildings. *Proceedings of PLEA 2016 - 36th International Conference on Passive and Low Energy Architecture: Cities, Buildings, People: Towards Regenerative Environments*. Los Angeles, CA. July 10-13. www.escholarship.org/uc/item/77j647gr
- Gall, E., T. Cheung, L. Luhung, S. Schiavon, and W. Nazaroff. 2016. Real-time measurement of personal exposures to carbon dioxide. *Proceedings of the 14th International Conference Indoor Air 2016*. Ghent, Belgium. July 3-8.
- Landsman, J. and G. Brager. 2016. Performance, prediction, and optimization of night ventilation across different climates: an assessment of mechanical and natural night ventilation *Proceedings of PLEA 2016 - 36th International Conference on Passive and Low Energy Architecture: Cities, Buildings, People: Towards Regenerative Environments*. Los Angeles, CA. July 11-13. www.escholarship.org/uc/item/5cq9t8d2
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- Filingeri, D. 2016. Neurophysiology of skin thermal sensations. *Comprehensive Physiology* 6, 1429-1491. July. <http://dx.doi.org/10.1002/cphy.c150040>

Adams, K., E. Arens, D. Banks, S. Brunswick, G. Carrilho da Graca, N. Daish, S. Dutton, M. Fountain, B. Fisk, R. Gerard, F. Gillan, G. Gross, P. Haves, M. Hill, A. Honnekeri, M. Hovanec, T. Lawton, P. Linden, M. Pigman, P. Switenki, G. Szakats, R. Thomas, Y. Zhai, and H. Zhang. 2016. Natural ventilation for energy savings in California commercial buildings. Final Project Report, California Energy Commission. June. 516 pp.

<http://www.escholarship.org/uc/item/4cd386s7>

Foldvary, V. 2016. Assessment of indoor environmental quality in residential buildings before and after renovation. Doctor of Philosophy Dissertation. Dept. of Civil Engineering, Slovak University of Technology in Bratislava. June. www.escholarship.org/uc/item/7p13k7zd

Landsman, J. 2016. Performance, Prediction and Optimization of Night Ventilation across Different Climates. Master of Science Thesis. Dept. of Architecture, University of California, Berkeley.

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Indraganti, M., J. Lee, H. Zhang, and E. Arens. 2016. Why is the Indian Sari an all-weather gear? Clothing insulation of Sari, Salwar-Kurti, Pancha, Lungi, and Dhoti. *Proceedings of the 9th Windsor Conference*. April. www.escholarship.org/uc/item/0080t60q (Earlier version in *Proceedings of the 8th Windsor Conference*. April 2014. <http://www.escholarship.org/uc/item/1wp225b2>)

Kim, H., and E. Macdonald. 2016. Does wind discourage sustainable transportation mode choice? Findings from San Francisco, California, USA. *Sustainability* 8, 257. March. <http://dx.doi.org/10.3390/su8030257> www.escholarship.org/uc/item/6gz6t90p

Schiavon, S., D. Rim, W. Pasut, and W. Nazaroff. 2016. Sensation of draft at uncovered ankles for women exposed to displacement ventilation and underfloor air distribution systems. *Building and Environment* 96, 228-236. February. <http://dx.doi.org/10.1016/j.buildenv.2015.11.009>

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Yang, B., S. Schiavon, C. Sekhar, K.W. Cheong, K.W. Tham, and W. Nazaroff. 2015. Cooling efficiency of a brushless direct current stand fan. *Building and Environment* 85, 196-204.

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Indraganti, M., J. Lee, H. Zhang, and E. Arens. 2015. Thermal adaptation and insulation opportunities provided by different drapes of Indian saris. *Architectural Science Review* 58, 1.

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- Gandhi, P. 2015. Commercial office plug load energy consumption trends and the role of occupant behavior. Master of Science Thesis. Dept. of Architecture, University of California, Berkeley. www.escholarship.org/uc/item/2c76d4nw
- Schiavon S., B. Yang, W.C. Chang, and W. Nazaroff. 2015. Effect of air temperature and personally controlled air movement on thermal comfort for tropically acclimatized persons. *Proceedings of the 9th International Symposium on Heating, Ventilation and Air Conditioning (ISHVAC) and the 3rd International Conference on Building Energy and Environment (COBEE)*. Tianjin, China. July 12-15.
- Schiavon, S., F. Bauman, B. Tully, and J. Rimmer. 2015. Chilled ceiling and displacement ventilation system: Laboratory study with high cooling load. *Science and Technology for the Built Environment* (Previously HVAC&R). <http://dx.doi.org/10.1080/23744731.2015.1034061> <http://escholarship.org/uc/item/58m8302p>
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- Walker, K. 2015. Indoor environment quality in LEED buildings: Understanding conditions affecting performance. Masters of Science Thesis. Dept. of Architecture, University of California, Berkeley. www.escholarship.org/uc/item/13p0k3sx
- Adams, R.I., S. Bhangar, W. Pasut, E.A. Arens, J.W. Taylor, S.E. Lindow, W.W. Nazaroff, and T.D. Bruns. 2015. Chamber bioaerosol study: Outdoor air and human occupants as sources of indoor airborne microbes. *PLoS ONE* 10(5): e0128022. [DOI: 10.1371/journal.pone.0128022](https://doi.org/10.1371/journal.pone.0128022)

Yang, B., S. Schiavon, C. Sekhar, K.W. Cheong, K.W. Tham, and W. Nazaroff. 2015. Cooling efficiency of a brushless direct current stand fan. *Building and Environment*. 196-204.

<http://dx.doi.org/10.1016/j.buildenv.2014.11.032> <http://www.escholarship.org/uc/item/0mx5r4hd>

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Bhangar, S., R. Adams, W. Pasut, J.A. Huffman, E. Arens, J. Taylor, T. Bruns, and W. Nazaroff. 2015. Chamber bioaerosol study: Human emissions of size-resolved fluorescent biological aerosol particles. *Indoor Air*.

<http://dx.doi.org/10.1111/ina.12195> www.escholarship.org/uc/item/67d8h687

Brager, G., H. Zhang, and E. Arens. 2015. Evolving opportunities for providing thermal comfort. *Building Research and Information*, Vol. 43, No. 3, 1–14.

<http://dx.doi.org/10.1080/09613218.2015.993536>
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Hoyt, T., E. Arens, and H. Zhang. 2015. Extending air temperature setpoints: Simulated energy savings and design considerations for new and retrofit buildings. *Building and Environment* 88, 89-96.

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Kim, H., and E. Macdonald. 2015. Wind and the city: An evaluation of San Francisco's planning approach since 1985. *Environment and Planning B*. September.

<http://dx.doi.org/10.1177/0265813515607474>
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Arens, E., T. Hoyt, X. Zhou, L. Huang, H. Zhang and S. Schiavon. 2015. Modeling the comfort effects of short-wave solar radiation indoors. *Building and Environment* 88, 3-9. (Earlier version in *Proceedings of the 13th International Conference Indoor Air 2014*, Hong Kong. July 7-12)

<http://dx.doi.org/10.1016/j.buildenv.2014.09.004> <https://escholarship.org/uc/item/89m1h2dg>

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Filingeri, D. 2014. Why wet feels wet? An investigation into the neurophysiology of human skin wetness perception. Doctoral Thesis. Dept. of Philosophy, Loughborough University.

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