

CONTENTS

Host Chapter, Officers, and Conferences and Expositions Committee	viii
State of the Society Address, Timothy G. Wentz, 2016–2017 ASHRAE President.....	ix
Technical Program	xi

TECHNICAL PAPERS

LV-17-001	Accounting for Non-Quadratic Behavior of AHU Systems in Determination of Airflow Rate Mikhail Nudelman, PE, Member ASHRAE; Ed Kernerman, PhD, PE; Nicholas Muscolino, Associate Member ASHRAE	3
LV-17-002	Analysis of Refrigeration and HVAC Impacts on Supermarket Energy Performance (RP-1467) Michael J. Brandemuehl, PhD, PE, Fellow ASHRAE; Penelope Cole	8
LV-17-003	BIM-Enabled Operations and Maintenance Work Processes (RP-1609) Robert J. Hitchcock, PhD, Member ASHRAE; John Butterfield, PE; Elizabeth Ford Wilkins, PE; Francisco Forns-Samso	20
LV-17-004	Comparison of Approaches to Deep Energy Retrofit of Buildings with Low and High Internal Loads and Ventilation Requirements Michael Case, PhD, Associate Member ASHRAE; Alexander Zhivov, PhD, Member ASHRAE; Don Fisher, Life Member ASHRAE; Richard Liesen, PhD, Member ASHRAE	25
LV-17-005	Deep Energy Retrofit of Presidio Army Barracks Jay Tulley, PE; Alexander Zhivov, PhD, Member ASHRAE; Brian Clark, PE, CPMP	39
LV-17-006	Deep Energy Retrofits in Federal Buildings: The Value, Funding Models, and Best Practices Matt Jungclaus, Affiliate Member ASHRAE; Cara Carmichael; Chris McClurg, PE; Margaret Simmons; Randall Smidt; Kinga Porst Hydras, Member ASHRAE; Sharon Conger; Alexander Zhivov, PhD, Member ASHRAE; Fred Winter; John Shonder, Member ASHRAE; Cyrus Nasser, Member ASHRAE.....	55
LV-17-007	Determination of Heat Transfer Coefficient Between Heated Floor and Space Using the Principles of ANSI/ASHRAE Standard 138 Test Chamber M. Fatih Evren, Student Member ASHRAE; Abuzer Özsunar, PhD; Atilla Biyikoglu, PhD, Member ASHRAE; Birol Kilkis, Fellow ASHRAE.....	71
LV-17-008	Determination of Solar Heat Gain Coefficients for Semitransparent Photovoltaic Windows: An Experimental Study Konstantinos Kapsis, PhD, Student Member ASHRAE; Andreas Athienitis, PhD, PEng, Member ASHRAE; Stephen Harrison, PhD, PEng, Member ASHRAE	82
LV-17-009	Development of a Heat Transfer Model for Ceiling Radiant Cooling Panels through a Combined Experimental and Simulation Study Jyotirmay Mathur, PhD, Member ASHRAE; Mahabir Bhandari, PhD, Member ASHRAE; Vivek Kumar; Yasin Khan; Prateek Srivastava.....	95
LV-17-010	Diurnal and Seasonal Experimental Performance of a Solar Collector- <i>cum</i> -Regenerator Gezahegn H. Tafesse, PhD; S.C. Mullick, PhD; Sanjeev Jain, PhD, Member ASHRAE	105
LV-17-011	Effect of Supply Air Temperature on Air Distribution in a Room with Radiant Heating and Mechanical Ventilation Xiaozhou Wu, PhD; Lei Fang, PhD; Bjarne W. Olesen, PhD, Fellow/Life Member ASHRAE; Jianing Zhao, PhD; Fenghao Wang, PhD	120

LV-17-012	Energy Analysis of LEED Silver Certified Dining Hall on an Academic Campus— A Revisit Three Years After its Initial Certification (GIA 14–15) Stefan Bangerth, Student Member ASHRAE; Michael M. Ohadi, PhD, Fellow ASHRAE; Chauncey A. Jenkins.....	129
LV-17-013	Energy Solution for Laboratory Facilities Lawrence R. Meisenzahl, Member ASHRAE	140
LV-17-014	Evaluation of Alternative Refrigerants for Mini-Split Air Conditioners Omar Abdelaziz, PhD, Member ASHRAE; Som S. Shrestha, PhD, BEMP, Member ASHRAE....	147
LV-17-015	Experimental Comparison of Energy-Optimal Coordinated Control Strategies for Heat Pump Systems Chao Wang, Student Member ASHRAE; Bryan P. Rasmussen, PhD, PE, Member ASHRAE; Kyaw Wynn, Associate Member ASHRAE	162
LV-17-016	Experimental Measurement of Frosting Limits in Cross-Flow Air-to-Air Energy Exchangers Mohammad Rafati Nasr, PhD, Associate Member ASHRAE; Carey J. Simonson, PhD, PEng, Fellow ASHRAE	174
LV-17-017	Implementation of Advanced DER EPC Business Models in Dormitories in Mannheim/Germany Rüdiger Lohse, Martina Riel	182
LV-17-018	Infiltration and Heating Load Analysis of an Apartment with Respect to Window Type, Window Location, and Lock Operation Jong Jun Park; Young Il Kim, PhD, PE, Member ASHRAE; Kwang-Seop Chung, PhD	201
LV-17-019	In-Situ Fan Curve Calibration for Virtual Airflow Sensor Implementation in VAV Systems Alejandro Rivas Prieto, Student Member ASHRAE; Wesley M. Thomas; Gang Wang, PhD, PE, Member ASHRAE; Li Song, PhD, PE, Member ASHRAE.....	215
LV-17-020	Measurement and Verification of Efficiency Upgrades in Chilled-Water Systems Abdul Qayyum Mohammed, Associate Member ASHRAE; Mohamed Tatari; John Seryak, PE; Shawn Brown, PhD.....	230
LV-17-021	Optimization under Economic Uncertainty: A Methodology to Determine the Effects of Solar Variability on Energy and Economics Scott Bucking, PhD, Associate Member ASHRAE	244
LV-17-022	Development of a Portable, Small-Scale Multi-Nozzle Flowmeter with Exit Pressure Control Sang Taek Oh, Associate Member ASHRAE; Young Il Kim, PhD, PE, Member ASHRAE; Kwang-Seop Chung, PhD	254
LV-17-023	Potential of U-Shaped Heat Pipe Heat Exchanger in Tropical Climates for Low Sensible Heat Ratio Applications Amit Sharma, PhD; Sanjeev Jain, PhD, Member ASHRAE; S.C. Kaushik, PhD; Amit Kakkar	263
LV-17-024	Reducing the Need for Electrical Storage by Coupling Solar PVs and Precooling in Three Residential Building Types in the Phoenix Climate Reza Arababadi, PhD, Student Member ASHRAE; Kristen Parrish, PhD.....	279
LV-17-025	Sequencing Control of Parallel Pumps in Variable-Flow Systems Using Wire-to-Water Efficiency Gang Wang, PE, PhD, Member ASHRAE; Xuejing Zheng, PhD; Koosha Kiamehr, Student Member ASHRAE.....	291

LV-17-026	Wireless Heating Management System and Tenant Usage Behavior in Bulk-Metered Apartment Buildings: A Case Study	
	Zixiao Shi, Student Member ASHRAE; William O'Brien, PhD, Associate Member ASHRAE; Daniel Dicaire, PEng; Yitian Hu	302
	Index of Technical Papers, Volume 123, Part 1	314