Barley, C.D. 2007. Test Protocol for Room-to-Room Distribution of Outside Air by Residential Ventilation Systems, National Renewable Energy Laboratory (NREL), Golden, CO

Braun, J. E. and Chaturvedi N. 2002. An inverse gray-box model for transient building load prediction. HVAC&R Research 8(1): 73-99

DOE. 2011. Building Technologies Program Air Leakage Guide. Retrieved 01/31, 2018, from https://www.energycodes.gov/sites/default/files/documents/BECP_Buidling%20Energy%20Code%20Resource%20Guide%20Air%20Leakage%20Guide_Sept2011_v00_lores.pdf

DOE. 2018. Blower Door Test. Retrieved 01/31, 2018, from https://energy.gov/energysaver/blower-door-tests

EnergyPlus. 2018. Retrieved 02/09, 2018, from https://energyplus.net/

eQuest. 2018. Retrieved 02/09, 2018, from http://www.doe2.com/equest/

Gowri, K., et al. 2009. Infiltration Modeling Guidelines for Commerical Building Energy Analysis. D. o. Energy, Pacific Northwest National Laboratory.

Hancock, E., et al. 2002. Building America System Performance Test Practices: Part 2, Air Exchange Measurements, Citeseer

Jiménez, M., et al. 2008. Estimation of non-linear continuous time models for the heat exchange dynamics of building integrated photovoltaic modules. Energy and Buildings 40(2): 157-167

Lee K-h and Braun JE. 2008. Model-based demand-limiting control of building thermal mass. Building Environ 2008 43(10): 1633-46

Li, X. and Wen J. 2014. Review of building energy modeling for control and operation. Renewable and Sustainable Energy Reviews 37: 517-537

Muehleisen, R. 2017. Acoustic Building Infiltration Measurement System (ABIMS). Retrieved 01/31, 2017, from https://energy.gov/sites/prod/files/2017/04/f34/7_31390_Muehleisen_031617-1200.pdf

Niu, F. and Yu Y. 2014. Location and optimization analysis of capillary tube network embedded in active tuning building wall Energy 97: 36-45

O'Neill, Z. and Narayanan S. 2014. Model-based estimation of cold room temperatures in a supermarket refrigeration system. Applied Thermal Engineering 73(1): 819-830

O'Neill, Z., et al. 2010. Model-based thermal load estimation in buildings. Proceedings of SimBuild 4(1): 474-481

Radecki, P and Hencey B. 2012. Online building thermal parameter estimation via unscented Kalman filtering. American Control Conference (ACC), 2012. IEEE, 2012

U.S. Energy Flow. 2016. Retrieved 02/09, 2018, from https://www.eia.gov/totalenergy/data/monthly/pdf/flow/total_energy.pdf

Wan, E. A. and Van Der Merwe R. 2012. The unscented Kalman filter for nonlinear estimation. Adaptive Systems for Signal Processing, Communications, and Control Symposium 2000. AS-SPCC. The IEEE 2000, Ieee

NOMENCLATURE

T_{os}: (°C) outside surface temperature
T_{is}: (°C) inside surface temperature
T_{in}: (°C) zone air temperature
q_1: (W) zone infiltration heat flux
q_2: (W) outside surface convection heat flux
q_3: (W) inside surface solar radiation heat flux
R_1: (K/W) inside convection resistance
R_2: (K/W) wall conduction resistance
R_3: (K/W) outside convection resistance
C: (J/K) wall heat capacitance
R_i: (K/W) thermal resistance for single layer
L: (m) wall thickness
k: (W/m^{2}K) thermal resistance
ρ: (kg/m^3) single wall layer material density
C_p: (J/kgK) specific heat
α: solar absorptivity
h_{os}: (W/m^{2}K) outside surface convection heat transfer coefficient
q: (W) outside surface solar incident radiation heat transfer rate.
q_1: (W) zone infiltration heat loss or heat gain
q_2: (W) outside convection heat flux
F: EKF state-space equation matrix
x: EKF state
u: EKF input
v: EKF process noise
G: EKF measurement equation mater
w: EKF measurement noise
J: the Jacobian matrix for state space matrix
H: the Jacobian matrix for measurement matrix
RMSE: root-mean-square error
$\overline{x}$: mean value of EKF estimation
X_{EKF}: EKF estimated infiltration resistance
X_{E+}: EnergyPlus Calculated infiltration resistance
n: the total estimation time step number