**TC 4.10 Research Subcommittee Minutes**

**Virtual Meeting, 01/30/2022**

The research subcommittee met on Thursday (01/30) at 07:00 pm-08:00 pm EST. There were \_9\_ attendees in the meeting. Revolving submission deadlines: March 15, May 15th, August 15th, and December 15th.

**Current Status of TC 4.10 RTARs, WSs, and Projects.**

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| **Projects** | **PMS** | **Title** | **Status** |
| 1675-RP | Jim VanGilder, Mark Seymour, John Groenewold, (Greg), Wangda Zuo | Guidance for CFD Modeling of Data Centers | * Final report submitted to TC4.10 and TC9.9 * To be voted by TC 4.10 in Las Vegas |
| **Bidding** | **PMS** | **Title** | **Status** |
|  |  |  | No project for bidding this time |
| **WSs** | **Author(s)** | **Title** | **Status** |
| 1744 | Malcolm Cook, James Lo, Duncan Phyfe**,** Mike Koupriyanov,  **Duncan Phillips** | Guidelines for Accurate CFD Modeling of Natural Ventilation | * Re-submitted 03/13/2020 * RAC feedback 06/02/2020 * To be revisited (Duncan) * Possibility for PTAR, Standard 62.1 group (rules-based), James to contact 62.1. * Subcommittee meeting (Duncan P.) * To be dropped? |
| 1827 | James Bennet,  Mike Koupriyanov,  Duncan Phyfe,  **Brian Krafthefer** (Ray H.). | Particle Inhalation Modeling of Aircraft Cabins as Sparse Non-uniform Spaces Phase I | * WS revised per RAC comments * Contacted TC 9.3; responded 06/22/2020. * TC 9.3 voted to co-sponsor, communicated in Summer 2021. * (TC 2.4 co-sponsorship) |
| **RTAR** | **Author(s)** | **Title** | **Status** |
| 1828 | (Chao-Hsin Lin),  Charlie Lin,  Chun Chen  Jamie B. | Flow Characteristics of Installed Flex *Ducts* | * RTAR submitted to RAC 05/15/2017, * to be revised without TC 5.2 |
| 1908 | Shichao Liu, Hui Zhang,  Leon Wang, Jim Van Gilder,  Mohammad Heidarinejad | A Simplified CFD Modeling Method to Assess Thermal Environment and Air Quality in Buildings with Ceiling Fans | * Submitted 05/15/2020 * Co-sponsor: TC 2.1 * RAC accepted with comments 07/10/2020 |
| New | Leon Wang,  Donghyun Rim,  **Himanshu Sharma,**  (Anthony Fontanini) | Constructing Surrogate and Reduced Order Models for Stratified Flows | * RTAR drafted 06/25/2017 * Revision to be done based on discussions before next meeting * To be sent to TC 4.10 members |
| New | James Lo & the machine learning working group | ML in indoor environment. Topics TBD. | * PTART first? * RTAR being discussed. |
| New | Jim VanGilder, Mark Seymour, Charlie Lin, Mohammad Heidarinejad | Resistance by compact model, momentum model for directional devices; CFD and experiments | * RTAR by 03/15/22 * Jim to start by emails |
| New | Jim VanGilder & Mark Seymour | Data center models | * RTAR |

Updates on Request for Support on RTAR/WS

Co-Sponsor WS-1874 “Climate Design Conditions for Roof Top HVAC Equipment” (TC 4.2, Joe Huang). in bidding. John Zhai from TC 4.10 involved in discussions. Shichao Liu on PES.

Co-Sponsor RTAR-1868 “Feasibility of Predicting Indoor Formaldehyde, VOC, and CO2 Concentration using Simplified Inputs to Air Quality Models in New Office Buildings” (SSPC 62.1, Author: Lisa Ng, Atila, Gourish, Meng). Similar to RP-1596. TC 2.8 also involved. Xudong Yang is interested. Less than $200k.

Co-sponsor WS-1748 “Assess and Implement Natural and Hybrid Ventilation Models in Whole-building Energy Simulations (Phase 2)” (led by TC 4.7, Authors: Tony Fontanini, Joe Huang). The WS has received comments from RAC for revision/re-submission. WS to be shared by Tony and voted on by TC 4.10.

**New Ideas:**

* **Machine learning CFD (James Lo, Himanshu, Donghyun Rim, Charlie Lin).**
* **COVID-19 related. Social distancing. Ventilation rate. BCs. Mask. Quick RTAR/WS. With TC 2.1. (Leon. Ray, James, Duncan, Mohammad, Malcolm, Donghyun, Yang-Seon Kim, Reza). Combine it with the 1827-WS (aircraft). Buildings: ventilation types/conditions ~ infection risk with CFD (Duncan Phillips) for ETF. Duncan P. to update the TC4.10.** 
  + **New ideas need to be developed. Can we got everything done for this subject?**
* **Ventilation effectiveness by SSPC 62.1, looking for co-sponsor with TC 4.10, possible RTAR in the next couple of weeks (Malcolm, Duncan P.).**
* **Benchmark cases for CFD (Mike, James, Duncan, Jim). ASHRAE certified cases. Existing and new cases. Reference buildings? Simple Geometries?** 
  + **PTAR first (Lead: xx, Mohammad, Chao Ding)**
* CFD modeling of chemical reaction in building. With experimental data. (Donghyun, Atila, Shamia). RTAR to be developed.