

IBPSA Project 2: BOPTTEST  
Task 3 Emulator development  
Virtual Progress Meeting  
05/02/2024  
6:00 AM –7:00 AM U.S. Pacific Time

Participation

	Name	Affiliation
1	David Blum	LBNL
1	Ettore Zanetti	
1	Davide Fop	Politecnico di Torino
1	Kun Zhang	École de Technologie Supérieure (ÉTS)
1	Alireza Yaghoubi	
1	Matthias Van Hove	Danmarks Tekniske Universitet
1	Iago Cupeiro	Denergy
1	Zhe (Walter) Wang	Hong Kong University of Science and Technology

Minutes:

**Current Emulator developments**

- Multizone Hydronic Simple [Bart, Iago]

Unit tests are passing. However as highlighted in [issue465](#), problems were found with control behavior:

- Significant simultaneous heating and cooling every morning before occupancy. Fancoil would open the cooling coil and heating coil at the same time. From discussion with Iago it emerged that Fancoils may turn on before occupancy to pre-condition the building. However there should not be simultaneous heating and cooling. Iago to take a look in the incoming weeks
- AHU supplying ventilation, problem with bypass and weird temperature. This causes heating during the Summer period. Dave found the issue in the heat recovery heat exchanger bypass junction, in the flow path there is a parameter (inflow/outflow) that changes the value of the enthalpy (look at the comments on the issues) to the wrong one. There is still a bit of heating during the Summer even after fixing this. The remaining sources seem to be due to the control of the air handling units and PID control, but are harder to fix without messing with the quick air dynamics control of the AHU.

Iago will take a look at the comments in the incoming weeks.

- Large Office [Yan, Xing] –  
Xing is addressing Kun's review comments and he is done with most of them. Xing was able to simulate a full year with no problems and was not able to reproduce end of year simulation error. Kun will run simulation on windows instead of Linux to see if error persists.  
Xing to resume work on this Test case in a couple of weeks.
- ADRENALIN Emulators and general update [Harald] – no update. Probably close to starting [competition](#)
- DOPTTEST [Javier]  
Lieve mentioned in Task 2 meeting that new PhD students are taking on the project. No update, Ettore to reach out to students to see if they are interested joining Task 3 meetings to give updates on DOPTTEST.
- Twozone Apartment Hydronic [Ettore]  
Laura sent updated BOPTTEST model to Ettore, he will take care of updating the model.

### **New emulators proposals**

- **[Matthias Van Hove] Senior high school in Denmark.** L shape building 30x3 m on 3 levels for a total of 1500m<sup>2</sup> 37 zones (10 of which are classrooms). The HVAC is made up of radiators and air heating connected to a district system. Classrooms have radiators and an air system, while the other rooms have only radiators. No storage or renewable sources are present. There is a Modelica model implementation currently available that uses IDEAS library (it models all the 37 zones and runs 1 year simulation in a couple of hours)
- **[Matthias Van Hove] Single family house in Denmark.** 8x14 m with 12 rooms on 2 levels for a total of 256m<sup>2</sup>. Brick building with 3cm of insulation and double pane windows. HVAC currently consists of a boiler with radiators, to be refurbished using an air source heat pump and ventilation system. No storage or renewable sources are present. The model is currently implemented in Modelica using the IDEAS library.
- **[Kun Zhang] K-12 school in Canada.** Building data should be available from Canadian sources. If this is not the case archetype from DOE will be used and adapted to Canadian building standard and HVAC. Electrical boilers/Heat pumps with radiators for external zones and VAV systems for internal zones. Novel brick storage system with electrical heating (up to 800C) will be tested. The model will be developed in SPAWN and has a total of 25 zones.

### **Matthias test case presentation discussion**

No presentation from Matthias.

### **Ettore presentation discussion**

Link to presentation:

[20240502\\_Task3IBPSAProject2\\_emulatorrepository.pdf](#)

Presentation discussion:

-Test case subcategories could be tags (this makes it easier for test cases to have multiple tags) and Github has a system to tags files that could be used.

-Question on what are design guidelines for BOPTTEST?

Boptest design guideline is reported on the [website](#) and the [review document](#) could also help the test case developer

-From discussion it emerged that hosting a staging repository might add a lot of overhead during the release phase. A staging branch in the core testcase repository including all test cases in development could be a better way to go.

- Develop cheat-sheet table with typical values

For example internal gains are provided in Ashrae. Should it be only a list of references to the original source?(standard and regulations) or also a google sheet containing some of the values.