IBPSA Project 1

International Building Performance Simulation Association

New and upcoming developments BuildingSystems library

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Present development for the Building system library

Tools and functions

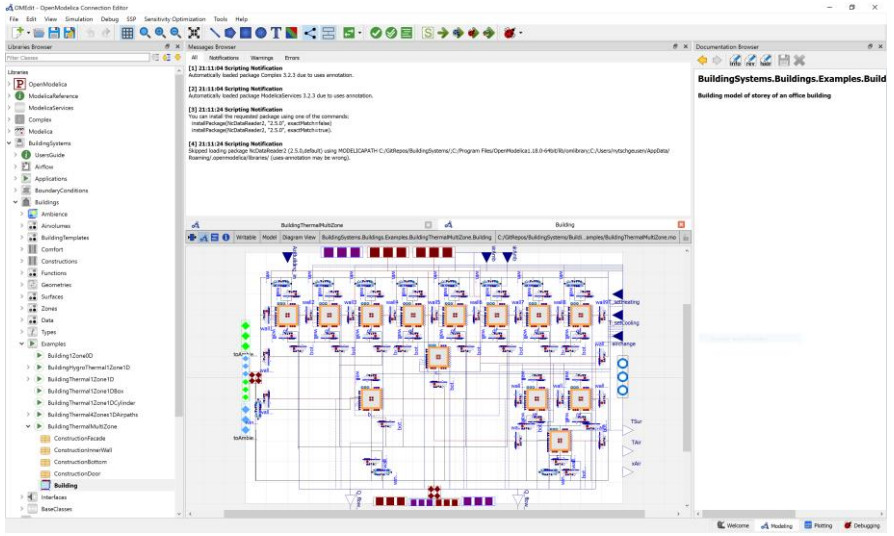
- Library extension for openHAB under development
- New template for CoTeTo-code generator for an 3D spatial discretized zone model (3D air elements, detailed radiation exchange) under development

Compatibility

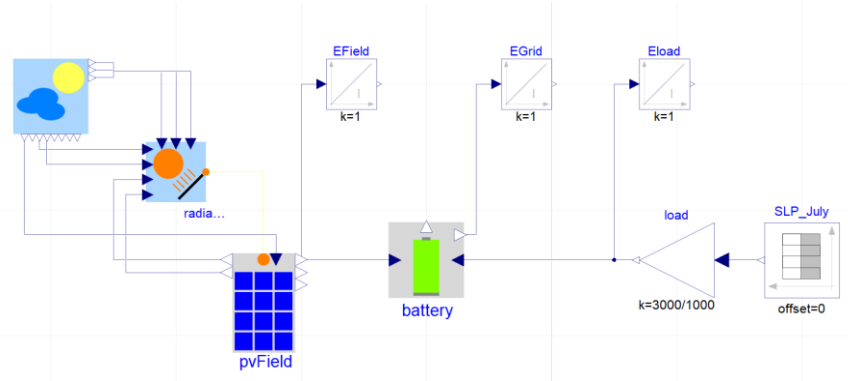
- Model adaptations for the building model for an improved compability with OpenModelica (tests with version v1.18.0)

Models

- New electric battery model (PhD C. Banhardt)
- The photovoltaic model could be merged with similar models (AixLIb, IDEAS, Buildings), … to a common IBPSA library model



Test for the multi-zone building model with openModelica



Photovoltaic and electric battery model

Interactive Virtual Reality environment for indoor climate simulation

Objectives

- Immersive user integration in an interactive VR simulation environment
- Physical feedback for users of simulated model states
  → e.g., reproduction of the simulated indoor air temperature in a space
- Real-time coupling of Modelica models with Unity → 3D visualization and with openHAB → control of (air conditioning) devices

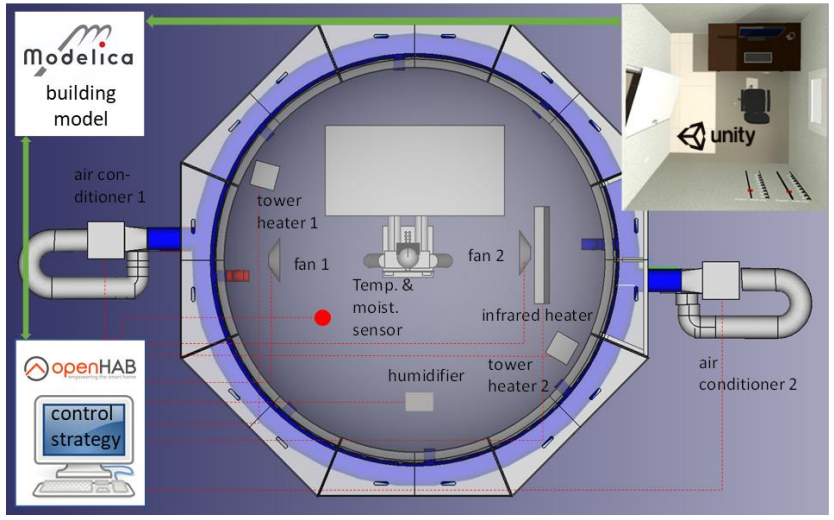
State of development

- First prototype with a full hardware and software integration works
  → 2 conference papers published (Building Simulation 2021 and 14th International Modelica conference 2021)

Next steps

- Integration of more detailed room models (geometrical view factors and radiation model, discretized air volume model)
- Improvement of the control strategy (HVAC devices)

Demo of the interactive VR simulation environment:
https://www.youtube.com/watch?v=d_r-V7sBt4k



Test bed of a VR simulation environment with physical feedback for the user

Contact

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