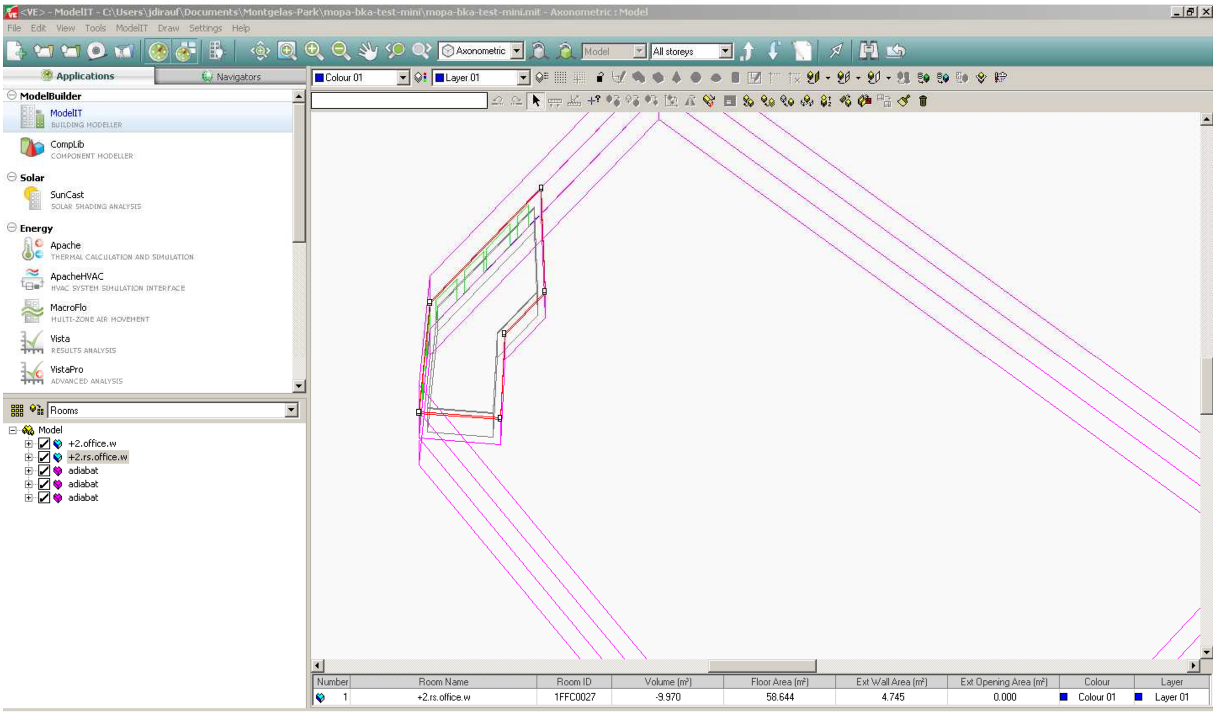
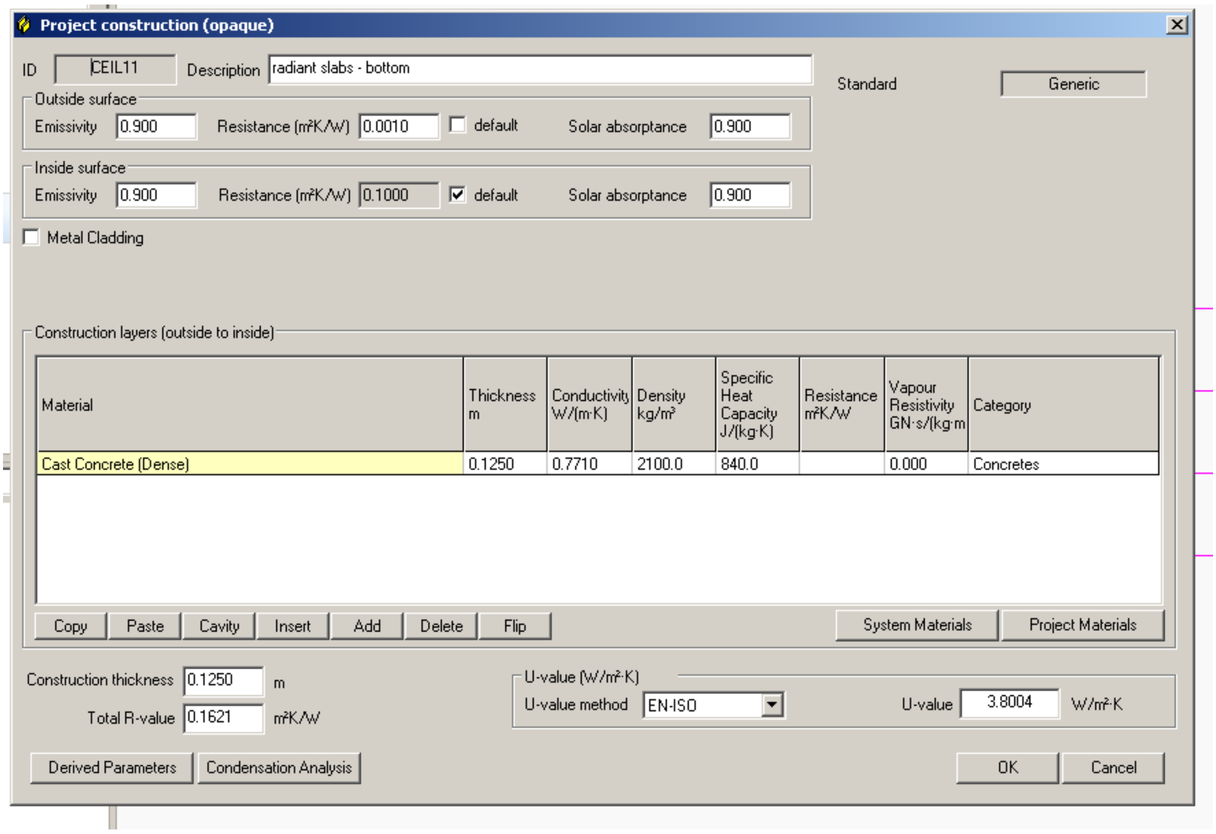
I reduced my model to one room, to test the radiant slab. It has one exterior surface, the rest is adiabatic. To simulate a radiant slab, I created a zone with volume nearly to 0.

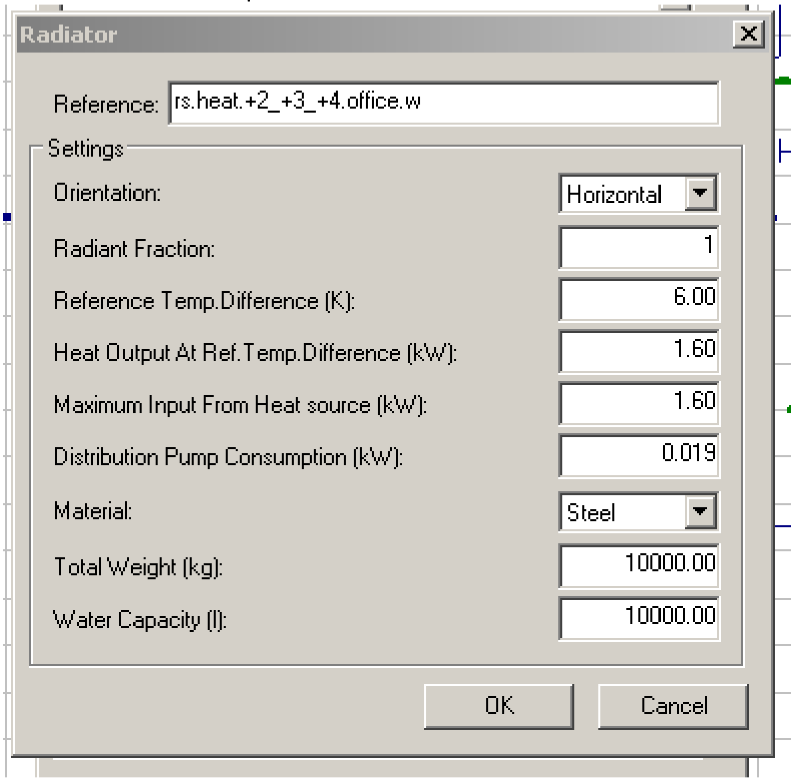


The ceiling from the radiant slab to the room is as following:



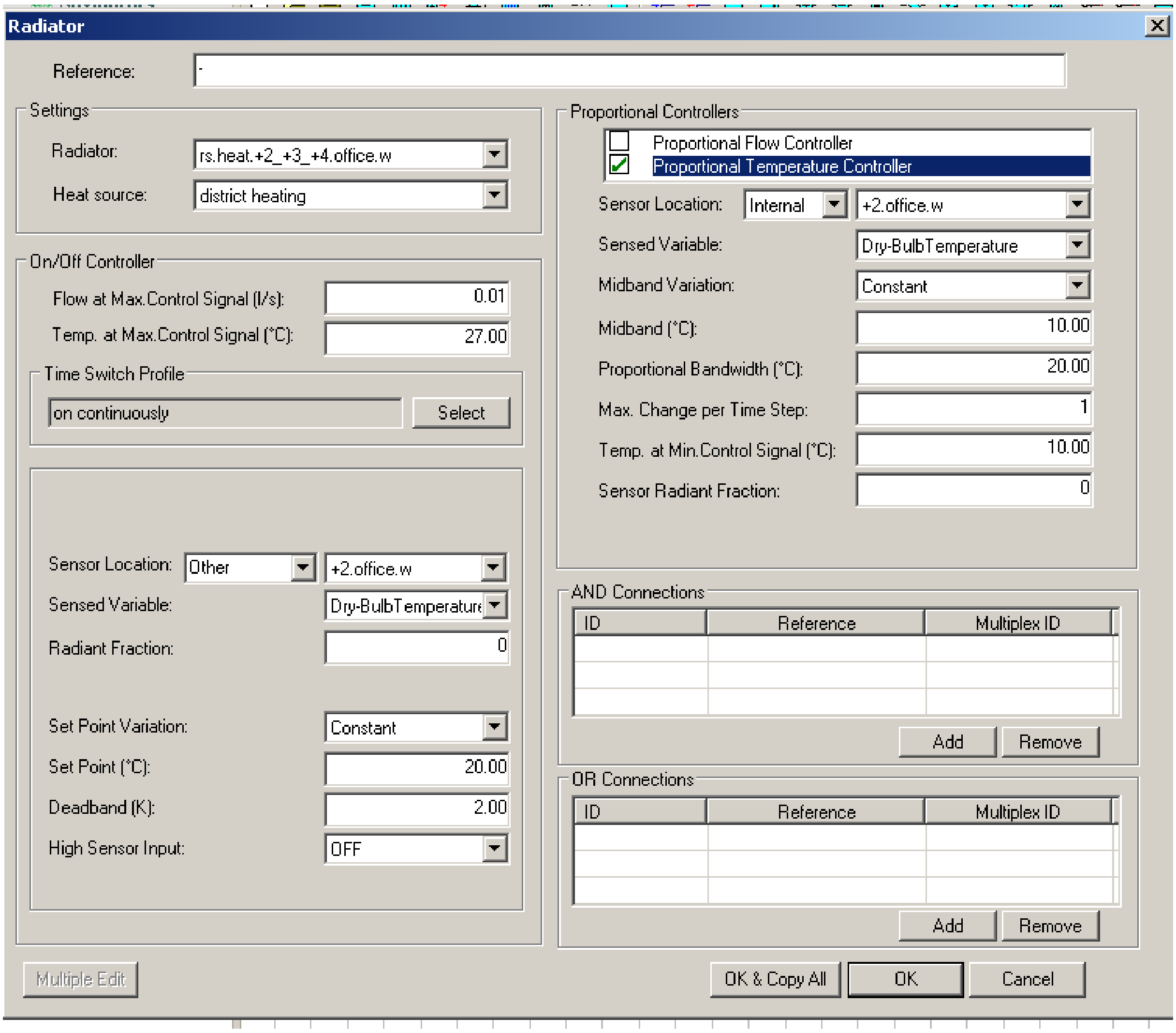
Which is half of the concrete slab with conductivity tested by THERM.

In the radiant zone I put a radiator:

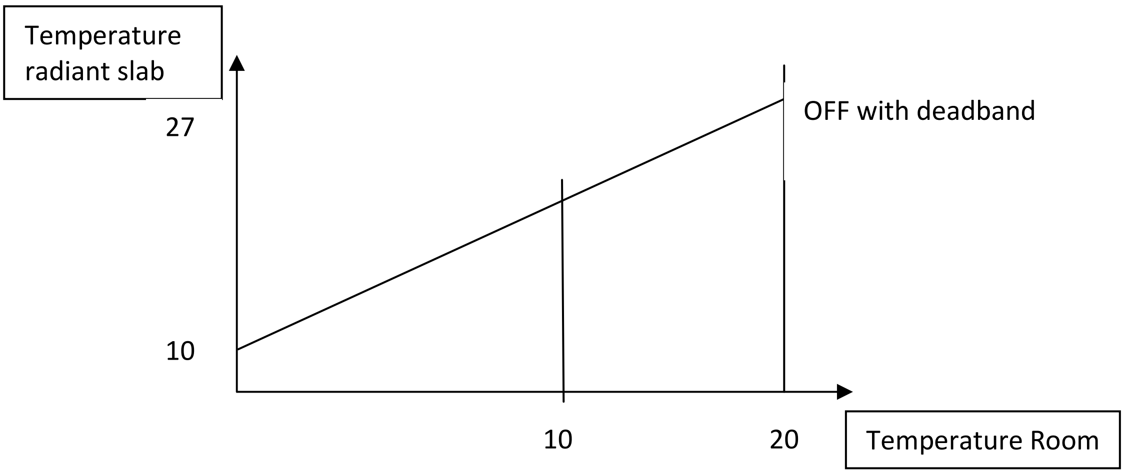


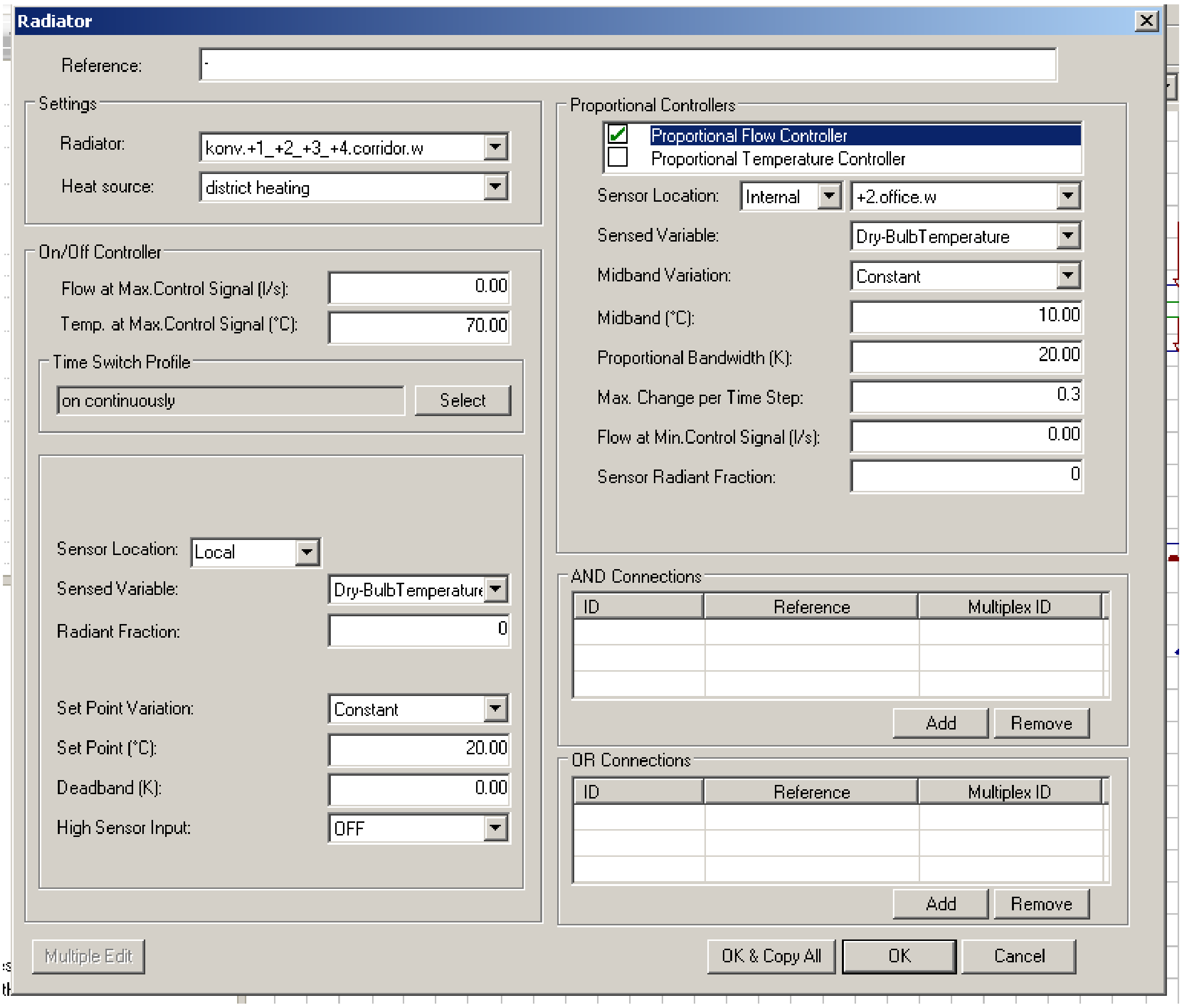
With radiant fraction =1 and the kW of the whole slab.
(I'm unsure what the effect of total weight and water capacity is, found no difference between 1kg/1l and 10000kg/10000l)

The radiant is controlled as the following:



Which should mean the following:





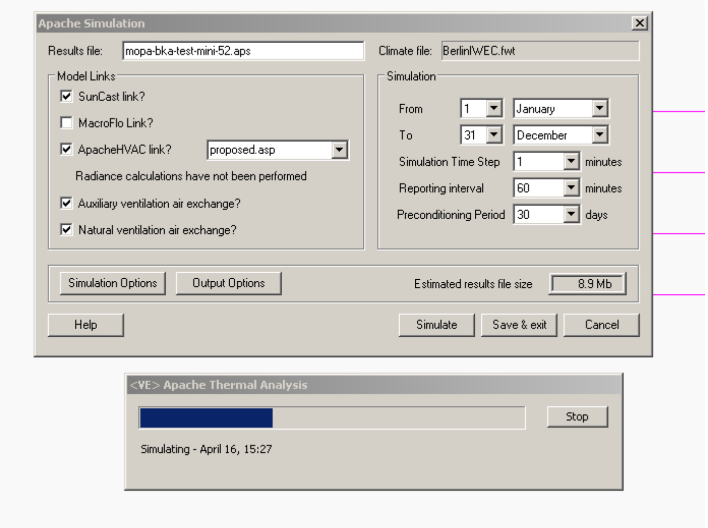
in addition to that, a radiator is the room to cover peak loads. It has a setpoint of 20. The room is served by a VAV, with 2 ach when occupied. Entering air temperature is constant 20°C

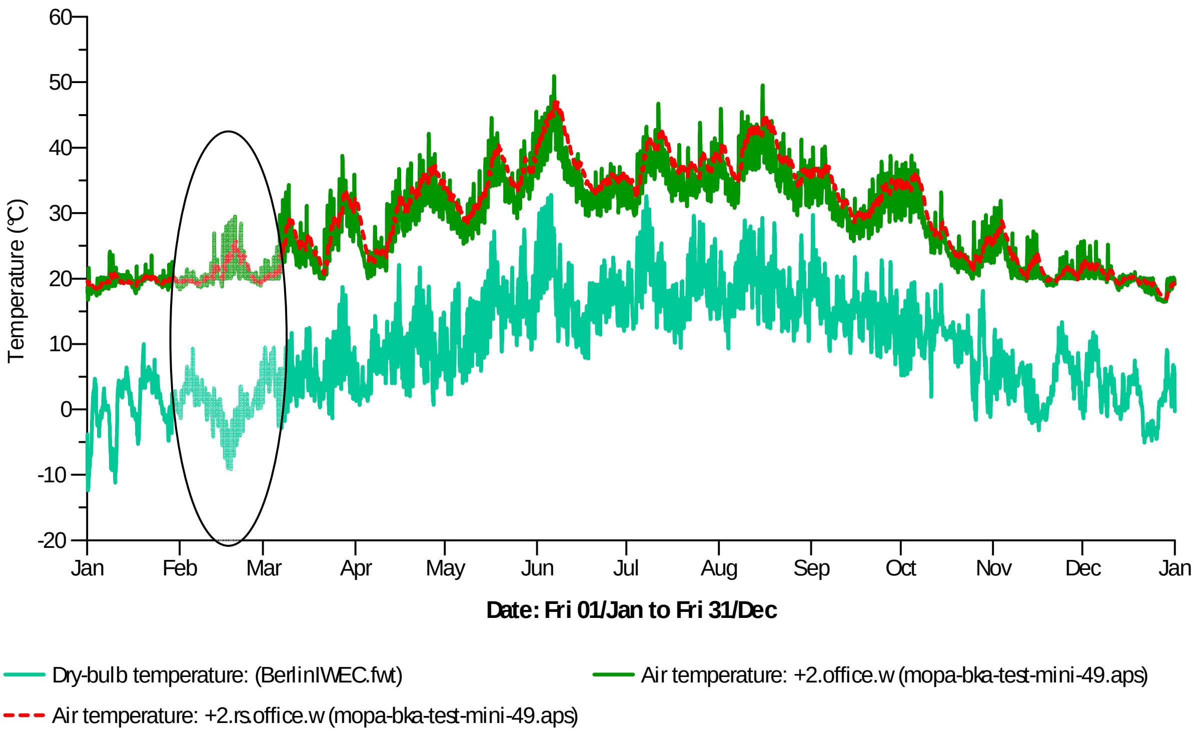
So both heaters sense the temperature of the room and have a setpoint of 20°C, so if the room temperature exceeds 20°C,(or 21 with deadband), the heaters should stop working.

My problems:

1. But if this is the case I can't explain the temperature rise over 25 °C in march on the following diagram.
2. In my understanding the air temperature in the radiant slab should be much higher if I want to simulate the reality, because the radiant zone represents the radiant slabs, an even on the surface to the room should be a temperature of 23 degrees, when the room has 20. But when I rise the flow rate of the radiator to get the 23 degrees, the room temperature exceeds 28 degrees and more…

I tested nearly 100 cases so it would be really great, if you can help me in any way, I'm at the end of my knowledge.


Apache Simulation
Results file: mopa-bka-test-mini-52.aps
Climate file: BerlinIWEC.fwt
Model Links
SunCast link?
MacroFlo Link?
ApacheHVAC link? proposed.asp
Radiance calculations have not been performed
Auxiliary ventilation air exchange?
Natural ventilation air exchange?
Simulation
From 1 January
To 31 December
Simulation Time Step 1 minutes
Reporting interval 60 minutes
Preconditioning Period 30 days
Simulation Options
Output Options
Estimated results file size 8.9 Mb
Help
Simulate
Save & exit
Cancel
<VE> Apache Thermal Analysis
Stop
Simulating - April 16, 15:27


Temperature (°C)
60
50
40
30
20
10
0
-10
-20
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Jan
Date: Fri 01/Jan to Fri 31/Dec
Dry-bulb temperature: (BerlinIWEC.fwt)
Air temperature: +2.office.w (mopa-bka-test-mini-49.aps)
Air temperature: +2.rs.office.w (mopa-bka-test-mini-49.aps)