

# Radiant vs Fan Coil Cooling Sproul Hall, UC Davis

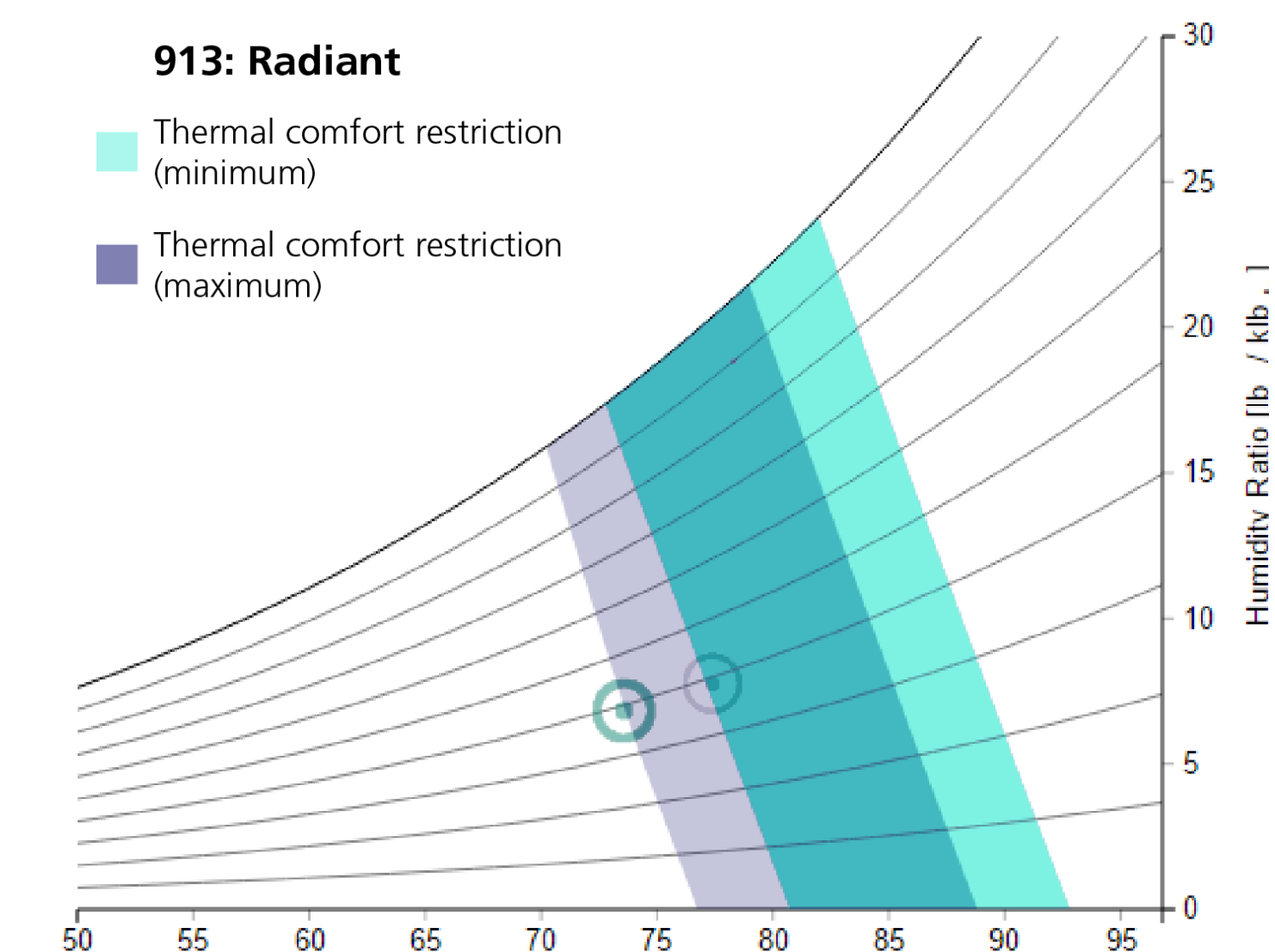
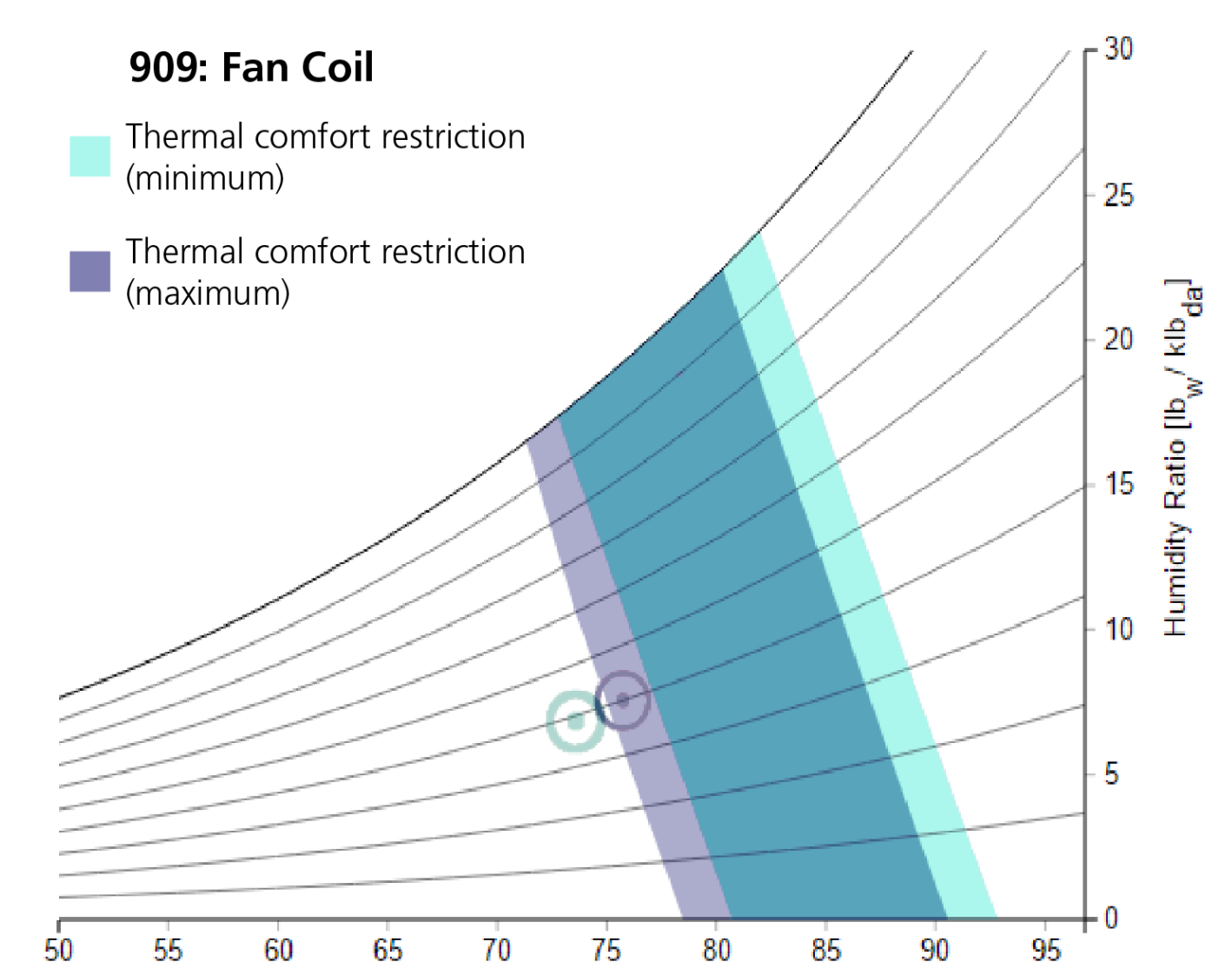
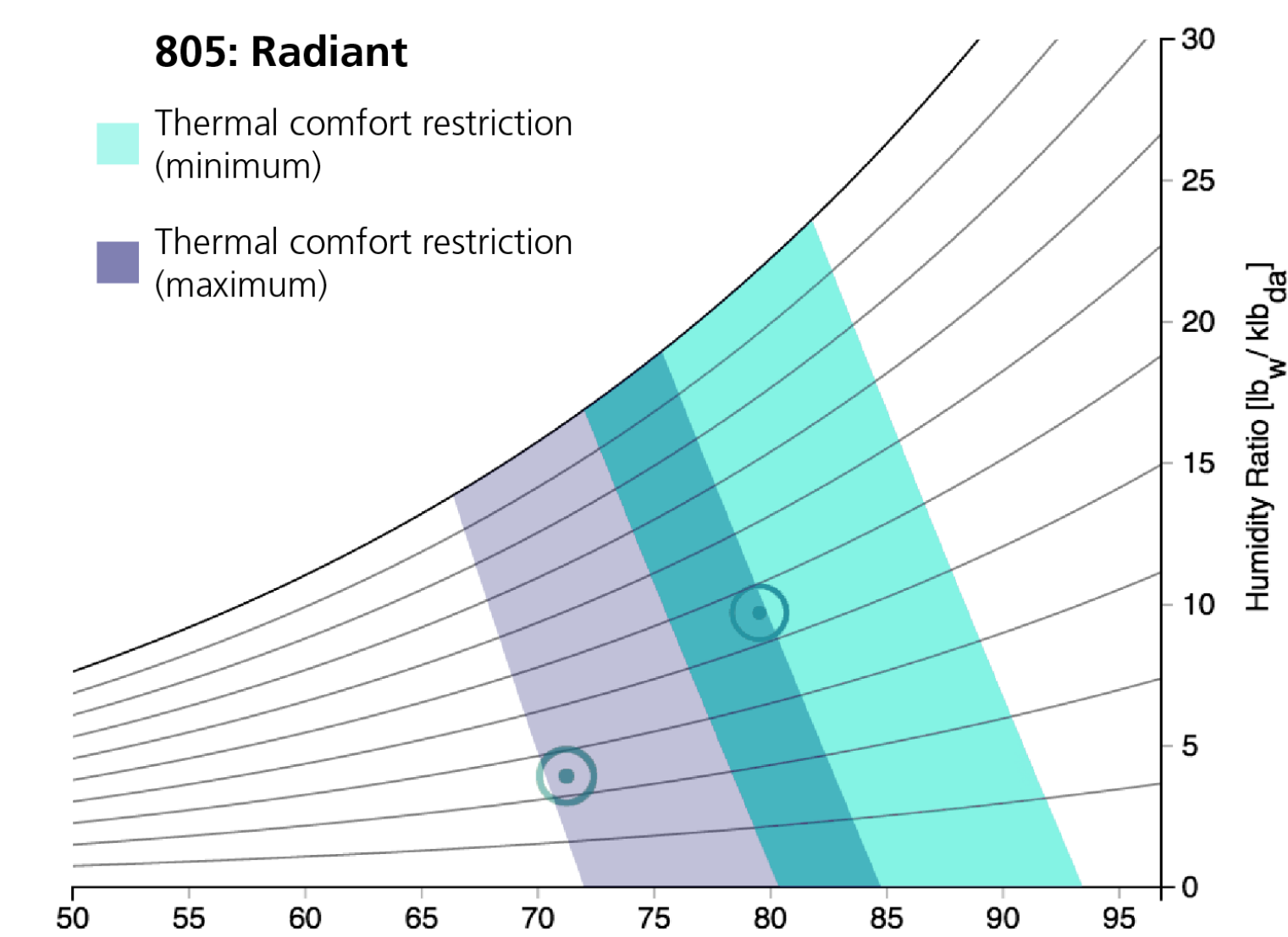
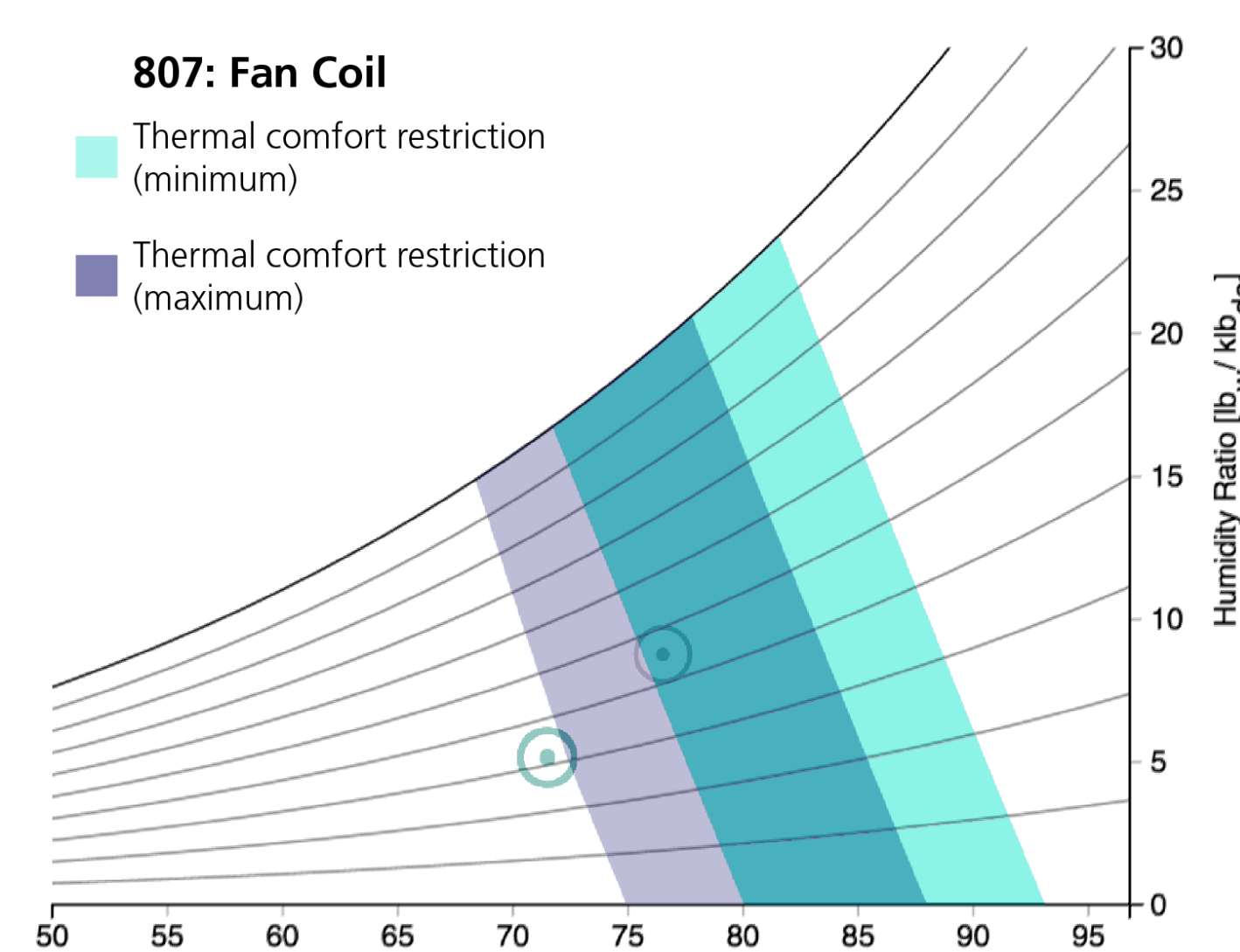
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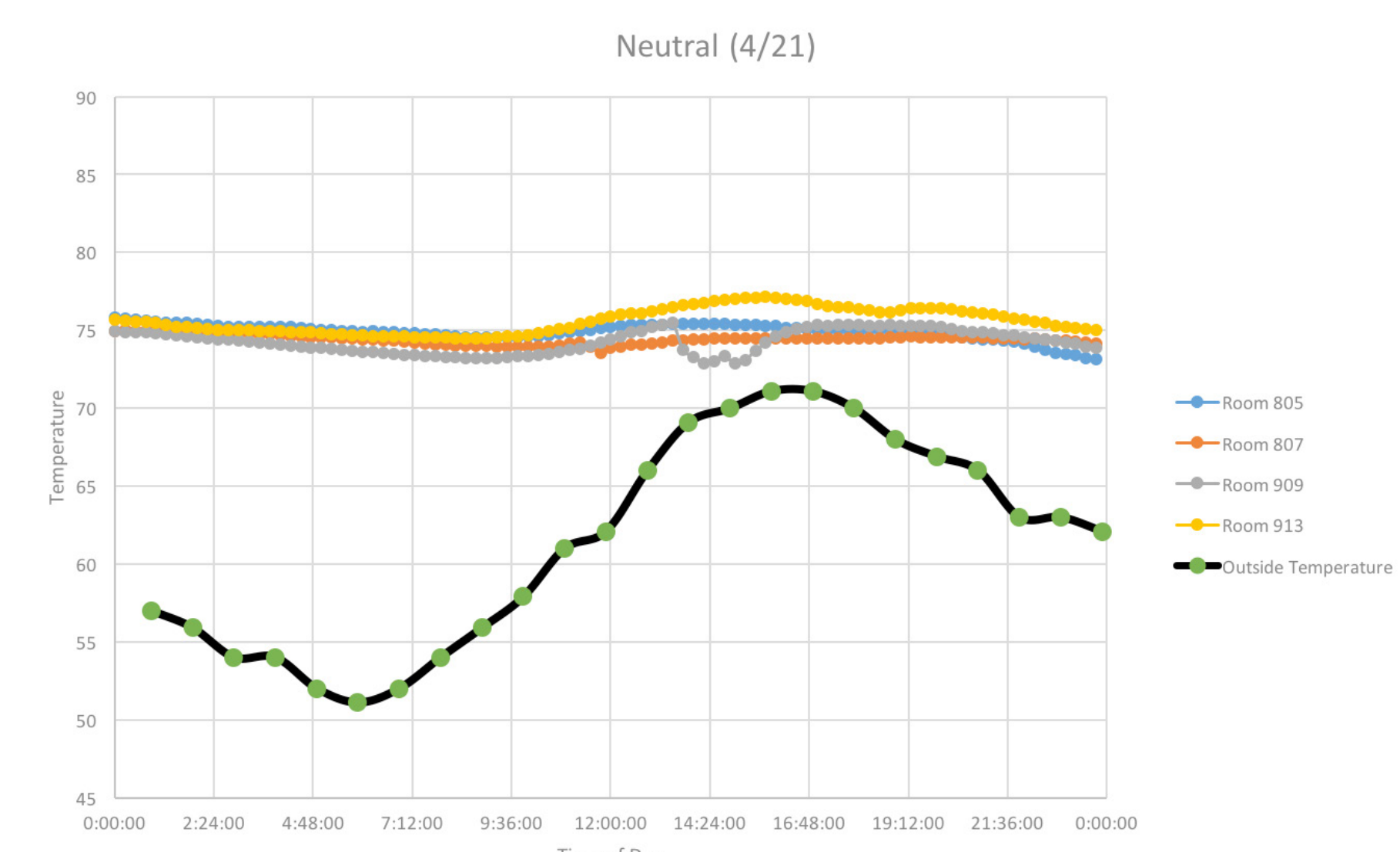
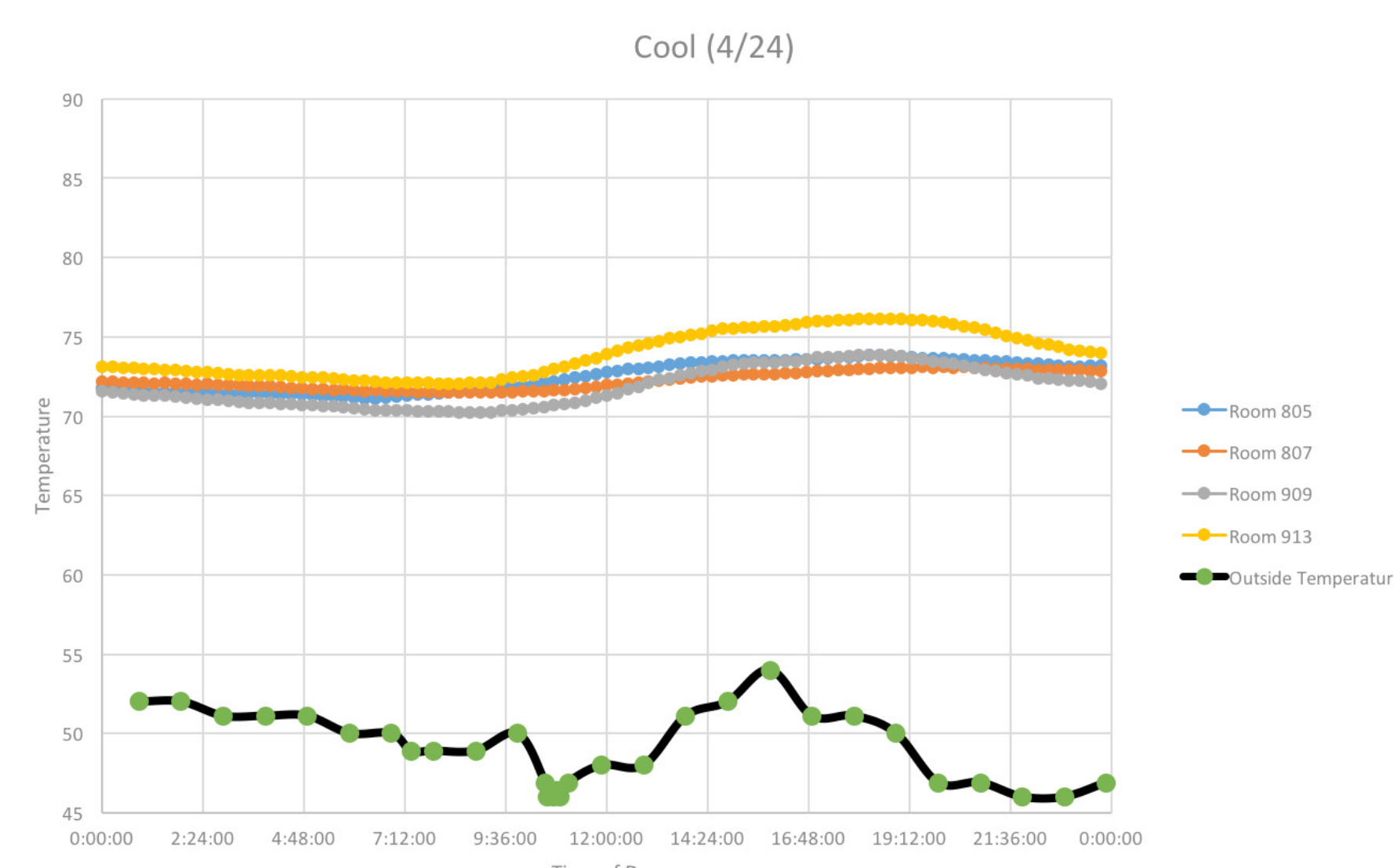
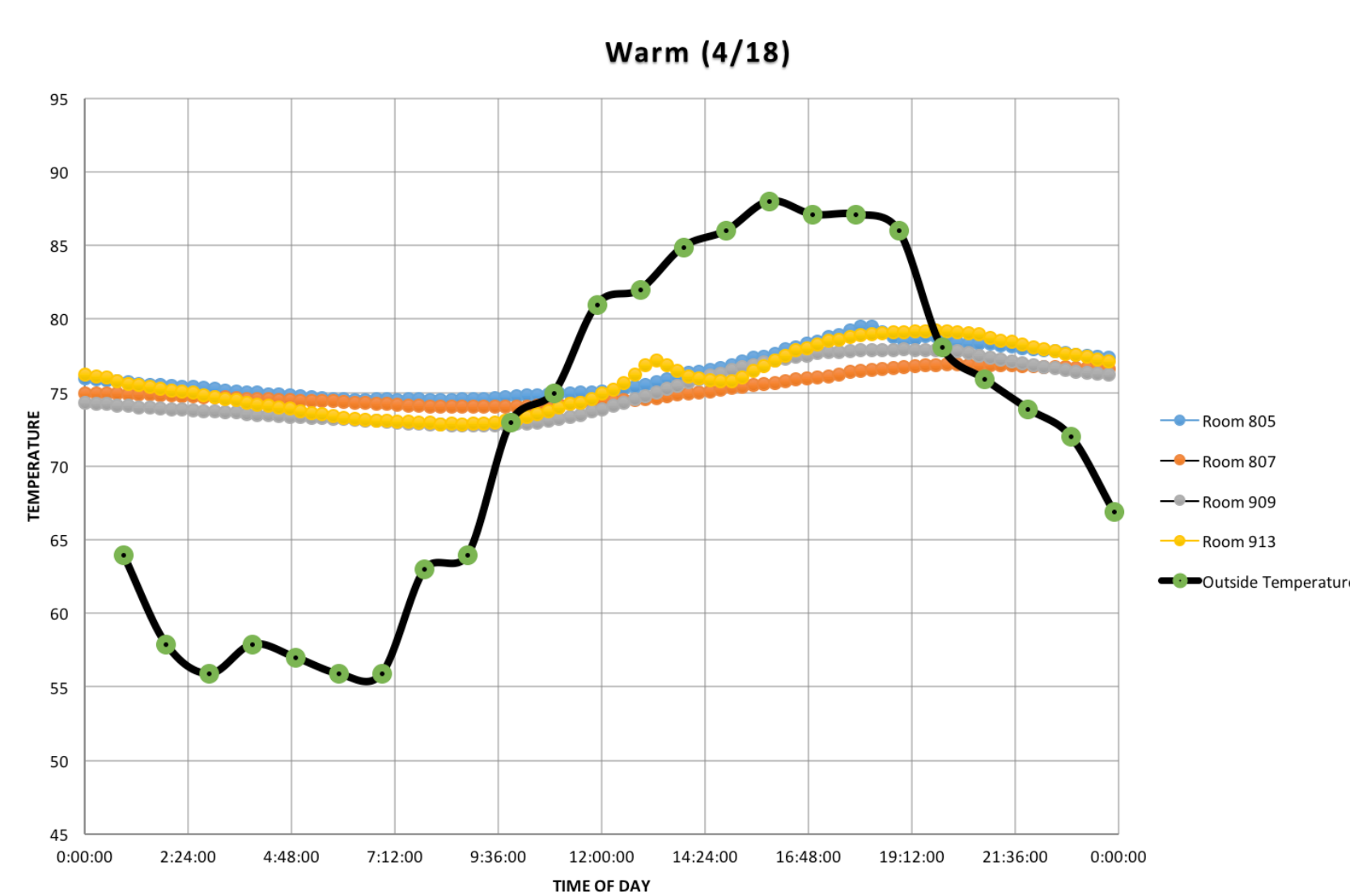
## WHAT IS THIS PROJECT?

The University of California, Davis is on a constant pursuit of studying and implementing more efficient processes when utilizing energy. With this in mind, the Energy and Conservation Office has begun a case study in Sproul Hall. Currently, the building is fitted with an aging fan coil heating and cooling system that is in need of a replacement. This study focused on eight south facing test rooms located on the eighth and ninth floors of Sproul hall; four of which were fitted with a new radiant system and the others with new fan coils. This investigation evaluated both the thermal comfort levels of room occupants and the energy efficiency of a radiant versus fan coil system. Of specific concern, was the cooling load and demand of the building and whether or not the radiant system could match or even surpass the performance abilities, in context to thermal comfort, of the current fan coil systems.

## ARE THE RESULTS SIGNIFICANT? THERMAL COMFORT RANGE



## TEMP. FLUCTUATIONS



## HOW WE DID IT.

- 1 Occupant Surveys
- 2 Personal Evaluations
- 3 Data Analysis

## REFERENCES

Center for the Built Environment, University of California Berkeley, <http://cbe.berkeley.edu/comforttool/>  
The Weather Company LLC, <https://www.wunderground.com/history/airport/KSAC/2016/4/18/DailyHistory.html>.  
Energy Conservation Office, University of California, Davis.

## CONCLUSIONS

Based on the data that was collected over the course of approximately two months, it can be inferred that the radiant system was able to provide a similar level of thermal comfort as the fan coil system during the early spring months. As far as energy efficiency, no concrete conclusions can be made as the data that was collected was not specific to the individual systems in each of the isolated test rooms. There is, however, data corresponding to the entirety of the building but again, cannot be used to directly compare the competing systems.

## FURTHER STUDIES

Collect data over the course of a few years to help find a norm ensuring that outlying data is identified and analysis of relative humidity and temperature fluctuations can be done over a temporal range. Additionally, more accessibility to TherMOOstat would increase feedback. Isolation of each room's energy demand will aid in determining the efficiency of each system. Comparison of a third party, radiant panel, retrofitted building of similar size and occupancy to Sproul can provide energy usage data for further analysis.