I think this is a well-written paper that reports on a well-designed set of experiments. It provides new and valuable information for those who might wish to use the mercury passive sampling method developed by this research group. I think it deserves publication in AMT. I only have a few comments beyond those that have already been brought up by the other reviewers:

- At the end the authors talk about how the observed sampling rate was lower in their laboratory experiments than they observed in the field, and they offer a number of explanations for this. One possibility I think they should consider is that the sampler behaves differently in outdoor environments because of gas-phase and particle-phase constituents of ambient air that exist at much lower concentrations in a laboratory environment.
    - It is possible that some gases in the atmosphere react with mercury or mercury compounds on or in the charcoal sorbent, or perhaps take up active sites on the charcoal, driving mercury back into the gas phase.
    - It is also possible (and more likely, I think) that particulate matter deposits in the pores of the Radiello sampler body, closing off the diffusive pathway and reducing the uptake rate (or sorbing Hg before it can make it to the sorbent cartridge). Figure 3 shows that uncleaned Radiellos had a lower mean mercury loading than new or cleaned Radiellos. The variability was high, so the difference was not significant, but statistical noise may be covering up an important behavior of the sampler that needs to be investigated in future studies.
- I am confused by the sentence that starts on line 309. I don't understand how the authors calculated the sampling rate "as the average of single point calibrations." My guess about what they mean is that they calculated the sampling rate of several samplers by comparing against the tekran, and then averaged those values. I think it would be good to reword this.
- The authors point out that Hg passive samplers developed by others have greater variability, obscuring the temperature relationship this paper was able to show. However, if the other studies the authors mention used measurements collected in outdoor conditions to look for temperature relationships, their results would likely contain more variability than the controlled indoor conditions used in this study, so the comparison would be unjustified.
- I am struck by the very low variability in Figure 2 compared to the apparently much higher variability in Figure 1. I think the authors don't comment enough on the high variability in their wind experiments. My best guess about what is going on is that the wind speed was not constant over time in the wind experiments. Since wind speed was only measured for 5 minutes at the beginning and again at the end of each weeks-long experiment, the real wind speed during these experiments in not known with a great deal of certainty. I think it would be useful to add a bit more discussion of the highly variable wind measurements.
- The authors touch on the high sensitivity of the sampling rate to wind speeds below 1 m/s, but they didn't make measurements in that range. Passive samplers, including the Radiello, are often used in indoor environments. I would like to see the authors include an explicit statement about this limitation of the sampler when it is used in indoor environments.