Response to Comments by Anonymous Referee #3

This paper was well written in general, as there are English first language authors, although there is a small section that maybe was added and not checked by them were the language needs revising.

We would appreciate if the reviewer could identify the small section where the language needs revising. A co-author whose first language is English will proof-read the final version of the text.

The use of passive samplers is very important as many places are inaccessible to Tekran type instruments. It would be useful for the reader not know what sort of corrections are required based on temperature, wind speed, and air pressure, so they can evaluate their usefulness for their site. Otherwise a useful comparison of a very necessary low-cost low power mercury monitoring system.

We appreciate the overall positive assessment of the merits of our study.

In the current evaluation of the three passive air samplers, we have chosen to use sampling rates that are assumed invariant with respect to meteorological conditions. In other words, the performance metrics involving a comparison with the Tekran-derived air concentrations (e.g. Table 2, Figure 3) apply to a situation when a PAS is used with a constant sampling rate. Note, however, that many of the performance metrics (LOD, LOQ, precision) are independent of the chosen sampling rate.

One reason for assuming a constant sampling rate in the current comparison is that the dependence of the sampling rate on temperature and wind speed has so far only been quantified for one of the samplers, i.e. the sampler developed by the University of Toronto on which the *Mer*PAS® is based (McLagan et al., 2018a). On lines 115 to 116, we had written: "Results for the *Mer*PAS® with temperature-adjusted sampling rates, that had also been submitted were disregarded, as they were the only set of results seeking to take into account this effect." As stated in response to comments by reviewer #1, the variability of the sampling rate of the IVL-PAS and CNR-PAS with meteorological parameters still needs to be fully investigated.

We should also add, that the evidence of the value of adjusting sampling rates to the wind speeds and temperatures prevailing during a PAS's deployment is still somewhat mixed:

- McLagan et al. (2018b) concluded in their evaluation of the MerPAS at numerous sites around the world: "Adjusting the sampling rate to deployment-specific temperatures and wind speeds does not decrease the difference in active–passive concentration further, but reduces its variability by leading to better agreement in Hg concentrations measured at sites with very high and very low temperatures and very high wind speeds."
- On line 117 of the current manuscript, we had indicated that: "Temperature adjustment did not improve the accuracy of the *Mer*PAS® results."

We suggest that more evaluations of the PAS performance at sites with extremes in temperature and wind speed will be required to judge the merit of adjusting the sampling rate for deployment-specific conditions.

References

McLagan, D.S., B. Abdul Hussain, H. Huang, Y.D. Lei, F. Wania, C.P.J. Mitchell. Identifying and evaluating urban mercury emission sources through passive sampler-based mapping of atmospheric concentrations. *Environ. Res. Lett.* **2018a**, *13*, 074008.

McLagan, D.S., C.P.J. Mitchell, A. Steffen, H. Hung, C. Shin, G.W. Stupple, M.L. Olson, W.T. Luke, P. Kelley, D. Howard, G.C. Edwards, P.F. Nelson, H. Xiao, G.-R. Sheu, A. Dreyer, H. Huang, B. Abdul Hussain, Y. D. Lei, I. Tavshunsky, F. Wania. Global evaluation and calibration of a passive air sampler for gaseous mercury. *Atmos. Chem. Phys.* **2018b**, *18*, 5905-5919.