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Interactive comment on "The effects of meteorological parameters and diffusive barrier reuse on the sampling rate of a passive air sampler for gaseous mercury" *by* David S. McLagan et al.

Anonymous Referee #2

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Title: The effects of meteorological parameters and diffusive barrier reuse on the sampling rate of a passive air sampler for gaseous mercury

Comments: The manuscript by McLagan et al. presents interesting new data to assess performance of a novel passive method for gaseous mercury determination. This is currently a very important field of research and it may have beneficial applications in different environmental contexts all over the world, finding a large international audi-

ence.

Particularly worthy is the pursuit of the authors to adopt cost-effective procedures (i.e. Radiellos reuse) measuring their impact on the analytical quality of data. Indeed, it is essential for a passive sampling method to be low cost for being effective in pollution surveys with high spatial resolution and for supporting air quality management .

The paper by McLagan et al. is well written. The title is clear and informative; the abstract concisely reports well the rationale and the main results of the paper. Also, the introduction is correctly conceived with a logical and continuous development of the different points leading to the statement of the aim of the research. The result and discussion section is well organized and the data, although coming from multiple experiments of different design, are presented intelligibly through few figures (3). However there is room to improve caption of figure 1 (lines 283-289). It may be difficult for readers to get out of the symbols used which are of similar shape and color. Please check correspondence of colors and shapes of symbols in the figure with those reported in the legend in parentheses in the caption. In my opinion, the fact that similar colors are used for the relationships (reported irrespectively of the deployment length) of each configuration and the color symbols used for different deployment periods (weeks) may be confusing. At line 270 a R2 of 0.66 is reported in apparent incoherence with those two R2 reported in the figure 1 for the configuration 2. The Authors in this latter case should explain better in the text the difference of calculations. In the same sentence it is stated that "SR is most sensitive to wind speed between 0 and 1 m s-1" (lines 270-271) which may not be the same meaning of the previous sentence at the line 265 "The SR was most sensitive at lower wind speed". Although the latter sentence is understandable, it could be improved to make it clearer to the readers.

I have no remarks on analytical quality of data as the analyses have been carried through sound methodologies and reliable instrumentations (i.e. USEPA method; Leco Instrument) under verified quality control measures (i.e. SRMs, monitoring of analytical precision and recovery). Experiments seem to me well conceived and correctly

implemented.

In the research Authors showed that the tested passive sampler provided very precise data for gaseous mercury which were little affected by variability of temperature over a large interval, reflecting different potential conditions of deployment in the field. More importantly it came up the robustness of data that can be obtained by the configuration for outdoor deployments (yellow Radiello® with windshield) which resulted very little affected by wind conditions. The potential reusability of radiello for multiple deployment cycles without detriment of the analytical performances, as tested in this research, is a key feature in the cost management of this passive sampler.

In my opinion, the manuscript provide novel information, well reported, which is essential to support a new methodology that is meeting actual needs for monitoring of gaseous mercury. This allow me to recommend the manuscript by McLagan et al. for publication in Atmospheric Measurement Techniques.

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